

**UNIVERSITAT JAUME I**  
**SCHOOL OF HUMANITIES AND SOCIAL SCIENCES**  
**DEPARTAMENT OF ENGLISH STUDIES**



**DOCTORAL DISSERTATION**

**European Doctorate**

**The Communicative Theory of Terminology (CTT) applied to  
the development of a corpus-based specialised dictionary  
of the ceramics industry.**

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**PhD supervisors: Santiago Posteguillo Gómez and M<sup>a</sup> José Esteve Ramos**

**Castellón, June 2008**



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*To my parents;  
There's no bigger fortune than you.*



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*As we express our gratitude,  
we must never forget  
that the highest appreciation is not to utter words,  
but to live by them.*

**John Fitzgerald Kennedy**

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## **SUMMARY IN SPANISH**

### **RESUMEN DE LA TESIS DOCTORAL EN CASTELLANO**

(según la normativa académica de la Universitat Jaume I para las tesis escritas en una lengua distinta al castellano o valenciano)



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## LIST OF ACRONYMS AND ABBREVIATIONS

<b>AENOR</b>	Asociación Española de Normalización y Certificación
<b>AFNOR</b>	Association Française de Normalisation
<b>AMN</b>	Asociación Mercosur de Normalización
<b>ASCER</b>	Asociación Española de Fabricantes de Azulejos y Pavimentos Cerámicos
<b>ASTM</b>	American Society for Testing and Materials
<b>CTT</b>	Communicative Theory of Terminology
<b>CEN</b>	Comité Europeo de Estandarización (European Committee for Standardisation)
<b>CETIVA</b>	Centro de Terminología Industrial de la Comunidad Valenciana
<b>COPANT</b>	Comisión Panamericana de Normas Técnicas
<b>DB</b>	Database
<b>DIN</b>	Deutsches Institut für Normung
<b>EAGLES</b>	European Advisory Group on Language Engineering Standard
<b>EN</b>	English Norm
<b>FAQ</b>	Frequently Asked Questions
<b>GTT</b>	General Theory of Terminology
<b>GL</b>	General language
<b>IATE</b>	Inter-Active Terminology in Europe
<b>ICEX</b>	Instituto Español de Comercio
<b>ICT</b>	Information and Communication Technologies
<b>ICONTEC</b>	Instituto Colombiano de Normas Técnicas y Certificación
<b>ICV</b>	Instituto de Cerámica y Vidrio
<b>IEC</b>	International Electrotechnical Commission
<b>IEV</b>	International Electrotechnical Vocabulary
<b>INFOTERM</b>	International Information Centre for Terminology
<b>IPA</b>	Inglés Profesional y Académico
<b>ISA</b>	International Standardisation Association
<b>ISO</b>	International Organisation for Standardisation

<b>ITC</b>	Instituto de Tecnología Cerámica
<b>IULA</b>	Instituto interUniversitario de Lingüística Aplicada
<b>IULMA</b>	Instituto interUniversitario de Lenguas Modernas Aplicadas
<b>IVEX</b>	Instituto Valenciano de la Exportación
<b>KWIC</b>	Key Word in context
<b>LGP</b>	Laguage for General Purposes
<b>LPA</b>	Lenguaje Profesional y Académico
<b>LSP</b>	Language for Specific Purposes
<b>LU</b>	Lexical unit
<b>MI</b>	Mutual Information
<b>OCR</b>	Optical Character Recognition
<b>PAE</b>	Profesional and academic English
<b>PAL</b>	Profesional and Academic Language
<b>PAS</b>	Profesional and academic Spanish
<b>SGBD</b>	Sistema Gestor de Bases de Datos
<b>SL</b>	Source language
<b>Stnd. TTR</b>	Standardised Type-Token ratio
<b>TC/37</b>	Technical Committee 37
<b>TERMCAT</b>	Centre de Terminologia Catalana
<b>TIC</b>	Tecnologías de la Información y la Comunicación
<b>TL</b>	Target language
<b>TTR</b>	Type-Token ratio
<b>TU</b>	Terminological unit
<b>UNE</b>	Una Norma Española
<b>UNI</b>	Ente Nazionale Italiano de Unificazione
<b>WST</b>	WordSmith Tools 4.0

## **Abstract**

This PhD dissertation is the result of an ongoing process aimed at the creation of a bilingual corpus-based specialised active dictionary of the ceramic industry, with the Communicative Theory of Terminology (CTT) as its mainstay. According to the grounding principles of the CTT, this research has departed from a corpus-based approach in which terms have been analysed *in vivo* and characterised from the natural habitat in which they are given in specialised communication/discourse. In this light, it has been put forward how the study of terms – made possible thanks to the activity of compiling and describing them, called terminography – may be complemented by the wider projection of specialised lexicography for the compilation and elaboration of LSP, user-oriented and user-friendly quality products in the form of dictionaries. This specialised lexicographical dimension of the work has necessarily implied the need to renew the concept of speciality language dictionaries applied to the ceramic industry and has given way to the creation of a (prospective) active dictionary in this field with a marked emphasis on context. Accordingly, the importance of pragmatic aspects in a work of this sort, has made it necessary to undertake an in-depth revision and analysis of the socio-economic context for the research in order to be able to establish and solve the specific terminological needs that the ceramic industrial discourse community may find. On the basis of this theoretical framework, the method of study followed for the development of the prospective dictionary has comprised 8 broad stages: the stage of work preparation and corpus compilation, the elaboration of the field diagram, the stage of documentary corpus management, term extraction, data processing, revision and normalisation and finally, the edition stage. Two main types of results have been presented: those obtained through work in progress in the different stages of the method and final ones strictly speaking, that is, 4,000 English-Spanish entries in their final format (as they will appear in the prospective dictionary) belonging to the letters A, B, N, O, U and V of a complete dictionary which will include a total of 26,000 entries.

**Keywords:** specialised language(s), Professional and Academic Language (PAL), corpus linguistics, terminology, terminography, terminotics, Communicative Theory of Terminology (CTT), specialised lexicography, active dictionary, ceramics industry.

## SUMMARY IN SPANISH

### RESUMEN DE LA TESIS DOCTORAL EN CASTELLANO

(según la normativa académica de la Universitat Jaume I para las tesis escritas en una lengua distinta al castellano o valenciano)

- **Título de la tesis en castellano**

La Teoría Comunicativa de la Terminología (TCT) aplicada al desarrollo de un diccionario especializado basado en corpus de la industria cerámica.

- **Resumen**

Esta tesis es el resultado de un proyecto destinado a la creación de un diccionario activo, bilingüe (Inglés-Español, Español-Inglés) y especializado de la industria cerámica y azulejera con la Teoría Comunicativa de la Terminología como su pilar teórico principal. Debido al posicionamiento teórico adoptado, la investigación aquí presentada ha partido de un estudio de corpus (compilado *ad hoc*) en el que los términos han sido analizados *in vivo* y caracterizados de acuerdo al “habitat” en el que se hallan en el texto especializado. Así pues, la aproximación hecha al estudio de la terminología industrial cerámica hace pertinente el uso de la etiqueta “lexicografía especializada” a la hora de referirnos a un trabajo como éste en el que se ha tratado de ir más allá de la práctica terminográfica para dar lugar a un estudio en el que se prima el contexto, las asociaciones naturales de los términos (colocaciones) y la naturaleza comunicativa de la terminología. En esta tesis se ha presentado de manera progresiva, además de un marco teórico detallado y coherente con el fin último de la investigación, la metodología utilizada para la elaboración del diccionario en curso, ampliamente basada en el uso de programas informáticos tanto para la explotación del corpus (WordSmith Tools 4.0), como para la creación de la base de datos terminológica (TermStar XV) y la generación de entradas finales (GENDIC). Así pues, esta tesis presenta de manera progresiva los resultados obtenidos en cada etapa del método de trabajo y 4,000 entradas finales (en este caso del inglés al español) correspondientes a las letras A, B, N, O, U y V del diccionario.

- **Objeto y objetivos de la investigación**

Este proyecto de tesis trata, desde un enfoque teórico-práctico, una de las ramas del inglés de especialidad considerada de mayor interés en el contexto socio-económico específico de la Comunidad Valenciana por su aplicación a ámbitos científicos e industriales como es el caso de la cerámica. En concreto, lo que se pretende con este proyecto es la creación dentro de la lexicografía especializada, de un diccionario bilingüe activo inglés-español, español-inglés de terminología de la industria cerámica y azulejera.

En los últimos años, se ha puesto de especial manifiesto la necesidad de crear diccionarios que satisfagan las necesidades específicas de los usuarios a los que van dirigidos (Kromann, Riiber, Rosbach, 1991). En este sentido, Cowie (1979, en Kromann, Riiber, Rosbach, 1991) apuntó que el alcance, organización y metalenguaje utilizados en los diccionarios deberían analizar y reflejar de manera más fidedigna las necesidades referenciales y los tipos de usuarios a los que van dirigidos. Por lo tanto, queda claro que un asunto clave a la hora de llevar a cabo un proyecto de este tipo es la consideración de cómo van a abordarse esas necesidades detectadas en los usuarios potenciales y destinatarios de la obra lexicográfica, de modo que decisiones del tipo diccionario bilingüe o monolingüe, descriptivo o prescriptivo, etc. deben ser consideradas de modo adecuado

Así pues, este proyecto nace de la necesidad de “llenar un vacío” existente en la comunicación especializada dentro del ámbito industrial cerámico contribuyendo a la mejora de la comunicación entre expertos y haciendo un especial hincapié en el aspecto terminológico de esta comunicación.

La terminología, como material que trata de la compilación, descripción, gestión y presentación de los términos pertenecientes a dominios de especialidad en una o más lenguas, no es una actividad práctica que se justifique por sí sola sino dentro de un panorama más amplio, en este caso el distrito industrial cerámico. Así pues, la terminología ha sido concebida a lo largo de la presente tesis doctoral como un campo de conocimiento destinado a la resolución de necesidades sociales y ligada a la optimización de la comunicación entre profesionales (expertos).

Considerando todos estos factores, el principal objetivo de esta tesis puede resumirse fácilmente con su mismo título: desarrollar un diccionario bilingüe (Inglés-Español, Español-Inglés) de la industria cerámica basado en la Teoría Comunicativa

de la Terminología (TCT). Este objetivo general puede, a su vez, dividirse en los siguientes objetivos específicos:

- Analizar y examinar en profundidad el contexto de uso la herramienta lexicográfica bilingüe a desarrollar (análisis de necesidades) con el fin de mostrar la necesidad de crear un diccionario que satisfaga las demandas específicas del sector cerámico industrial y que responda de modo realista a “lo que se necesita” desde el punto de vista terminológico-comunicativo en este ámbito.
- Crear un diccionario activo, fácil para el usuario, que refleje de modo fidedigno la realidad terminológica analizada y que cumpla con las expectativas y necesidades de los usuarios potenciales, De este modo, explicar la conveniencia de usar la denominación “lexicografía especializada” (frente a la más limitada noción de “terminografía”) a la hora de referirnos a un trabajo como éste.
- Mostrar la importancia de la terminología en el estudio de los lenguajes especializados/Lenguaje Profesional y Académico (LPA) y analizar, describir y destacar los beneficios del uso de córpora como herramientas para la extracción y observación de información terminológica real.
- Justificar el hecho de presentar la TCT como la manera más realista y adecuada de abordar el estudio de la terminología en contraposición a otras teorías como la Teoría General de la Terminología (TGT), señalando las inconsistencias y debilidades de este tipo de concepciones previas de la terminología y los trabajos terminográficos.
- Dar cuenta de modo detallado de la naturaleza comunicativa de la terminología y su interdisciplinariedad, así como presentar un estudio que integre los aspectos más teóricos de la terminología con una práctica coherente.
- Proporcionar un relato detallado del marco teórico y método de trabajo adoptados en este estudio y proporcionar una explicación coherente de su

idoneidad, basada en los resultados obtenidos y las conclusiones que de todo ello se desprenden.

Así pues, el objetivo básico de lo que será el diccionario especializado de la industria cerámica y azulejera es, en primer lugar, sistematizar dentro de la lexicografía contrastiva (inglés español, español-inglés), las unidades léxicas de la industria cerámica y del azulejo. El objetivo ha sido mostrar el proceso de elaboración (y una serie de resultados que representan proporcionalmente lo que será el diccionario final) donde, además de presentarse la esperada relación de equivalencias de las unidades léxicas del citado ámbito, el usuario pueda encontrar un ejemplo ilustrativo de lo que allí se cita, una explicación que esclarezca más el término en caso de necesidad así como remisiones a otras palabras vinculadas. Asimismo se ha pretendido ofrecer un repertorio de los principales campos semánticos de aquellas unidades léxicas en tratamiento y una amplia lista de colocaciones, es decir, palabras que de forma frecuente concurren con otras en contextos reales. Por todo ello, básicamente, lo que pretende distinguir a este diccionario de otros muchos elaborados sobre la misma temática o simplemente de otros diccionarios de especialidad, es la perspectiva pragmática desde la que está siendo realizado y que se fragua en la elaboración de un diccionario activo en contra de los tradicionales diccionarios pasivos. De este modo, se ha trabajado en la elaboración de un diccionario donde cada entrada incluya hasta 8 tipos distintos de información técnica, gramatical o pragmática y que tenga en cuenta al posible usuario(s) del diccionario. Así pues, las entradas del diccionario, tanto las presentadas como resultados finales en esta tesis como las que faltan por desarrollar, contienen información del tipo:

- parte del discurso (adj, adv. n., v., etc.)
- género (m / f)
- traducción
- campo semántico
- colocaciones/acrónimos
- ejemplos
- citas
- comentario técnico

De igual manera, el diccionario pretende ajustarse a los criterios de pertinencia, claridad y economía que tan beneficiosos consideramos para el proyecto que nos ocupa y para el campo lexicográfico en general: el criterio de pertinencia determinará que las unidades léxicas pertenezcan a alguno de los epígrafes del árbol de campo, es decir, a algún campo semántico propio de la especialidad, en este caso la industria cerámica. El criterio de claridad es básico de cara a la funcionalidad del producto una vez concluido y se ve reflejado, por ejemplo, en la numeración de las distintas acepciones que un término dado pueda tener. Por su parte, el criterio de economía hará, por ejemplo, que excluyamos del diccionario las acuñaciones esporádicas, así como aquellas consolidadas pero que gozan de tal transparencia semántica que su significado es claramente deducible partiendo del significado de las palabras que lo componen.

Otro de los objetivos planteados es, como ya se ha explicado, trabajar desde la perspectiva terminológica definida por Cabré (1999, a, b), que enfatiza la necesidad de aportar materiales en el campo de la terminología que satisfagan las demandas comunicativas que se presentan en los campos de especialidad y que, por tanto, respondan a las expectativas de una sociedad en constante evolución y que se decanta, muchas veces por pura necesidad, por enfoques más pragmáticos y aplicables que teóricos:

La terminología, en cuanto materia que concierne a la recopilación, descripción, tratamiento y presentación de los términos propios de los campos especializados en una o más lenguas, no es una actividad práctica que se justifique por sí sola, sino que está destinada a resolver necesidades sociales vinculadas a la optimización de la comunicación entre especialistas y profesionales-ya sea directamente o mediante la traducción-, o relacionados con el proceso de normalización de una lengua. Esa concepción más pragmática y aplicada de la terminología conecta mejor con el espíritu de la sociedad actual: las reflexiones epistemológicas han cedido terreno a actitudes más pragmáticas, y la resolución de necesidades comunicativas reales de la forma más rápida y eficaz posible ha sustituido la reflexión sobre los principios en que se asientan las cuestiones terminológicas, así como la forma de resolverlas. (Cabré 1993: 49)

Además, otro objetivo clave en este proyecto de tesis es responder a las presiones que surgen fruto de las demandas socio-económicas del sector cerámico industrial, especialmente en la Comunidad Valenciana, con el fin de potenciar la competitividad en términos de competencia lingüística y comunicativa tanto en la

terminología cerámica en inglés como en español, así como tratar de adaptarse a las necesidades lingüísticas del mercado nacional e internacional.

En resumen, en la presente tesis se ha tratado de proporcionar un enfoque coherente, tanto desde el punto de vista como aplicado, para el desarrollo de una obra lexicográfica especializada (un diccionario bilingüe especializado) que cumpla las expectativas y satisfaga las necesidades del usuario potencial de la obra (especialistas y traductores). Los 4.000 términos presentados (entradas del diccionario) como resultados finales parecen corroborar la pertinencia del método de trabajo (explicado en la siguiente sección) y los enfoques teóricos adoptados.

- **Planteamiento y metodología utilizados**

La imagen pública de los diccionarios ha ido cambiando desde una posición más autoritaria por parte de los lexicógrafos hacia una elaboración del diccionario que es más consciente del posible usuario del producto. Desde que apareció el concepto de “diccionario de aprendices” (learners' dictionary) la publicación de los diccionarios ha tenido cada vez más en cuenta al usuario de diccionarios, puesto que éste es, en última instancia, el cliente que va a usar y valorar el producto ofrecido. El desarrollo de diccionarios electrónicos ha contribuido a ver aún más a los diccionarios como un producto de mercado, ya que en la actualidad cualquier diccionario electrónico o de soporte informático puede ser una herramienta más de trabajo dentro de las muchas ofertas de un paquete informático. Así pues hoy en día se hace necesario un análisis de necesidades que incluya el estudio de la tipología de usuarios a la que pueda dirigirse un diccionario (Hartmann, 1987, 1989). Del mismo modo, se hace preciso el análisis de las necesidades específicas de cada tipo de usuario (Cowie 1987). Asociado al análisis de necesidades se encuentra el estudio de tales necesidades en base a diferentes destrezas, es decir, el uso de diccionario para comprender o elaborar textos orales o escritos.

No conviene tampoco olvidar que, aunque son numerosos los diccionarios y glosarios existentes sobre el tema propuesto (cerámica), debemos tomar en consideración los años en que fueron elaborados, los 80 y principios de los 90, para entender de qué manera y hasta qué punto es preciso renovar la concepción de

diccionario especializado aplicado a la industria cerámica. Algunos ejemplos concretos de estos diccionarios publicados en las décadas de los 80 y 90 son: *Dictionary of Ceramics Arthur Dodd* (1994); *Porcelana, cerámica y cristal* (Ángel Escárzaga, 1986); *Ceramic Glossary* (Walter W. Perkins (ed.), 1984) and *Ceramic Dictionary* (Freiburg Schmid, 1997). En ellos es claramente apreciable la ausencia de ejemplos, colocaciones e información gramatical y técnica, algo que sí se incluye en nuestra propuesta de diccionario activo y que resulta básico a la hora de entender y captar en su totalidad el significado y los matices semánticos de un término o expresión, contribuyendo todo ello a mejorar la competencia lingüística del hablante así como a incrementar la eficiencia y eficacia de las industrias azulejeras a la hora de llevar a cabo transacciones en inglés o español.

Con este fin, la metodología utilizada en la elaboración del diccionario, se basa en un corpus de textos reales producidos por expertos y en el uso de herramientas de las tecnologías de la información, documentación e informática. Las aportaciones del campo de la informática en terminología (terminótica o ingeniería lingüística) han influido de un modo espectacular, especialmente a la hora de compilar dicha terminología, así como a la hora de organizar el trabajo en sí. Esto se traduce, tal y como se muestra en la tesis, en la posibilidad de acceder a corpóra representativos en formato electrónico y de digitalizar aquellos en formato impreso, así como en la utilización y explotación de los bancos de datos textuales, terminológicos y de conocimientos. La informática aporta una gran y variada cantidad de recursos, herramientas y soportes que facilitan las tareas, muchas veces altamente repetitivas, que tiene que realizar el terminólogo y agiliza de modo asombroso y efectivo el proceso de búsqueda y procesamiento de datos.

Así pues, la metodología de trabajo empleada en esta tesis ha constado de ocho fases:

1. La definición del trabajo
2. La preparación y compilación del corpus
3. La elaboración del árbol de campo
4. La gestión y el análisis documentales
5. El vaciado
6. El procesamiento de los datos
7. La revisión y la normalización

## 8. La edición

En primer lugar, la definición del trabajo (fase 1) comprende:

- la definición de los destinatarios: la selección de términos, el corpus utilizado e incluso el modo de presentación de los datos variará dependiendo del público al que vaya dirigido el diccionario. En este caso, los destinatarios serán principalmente todo el sector de la población relacionado profesionalmente con la industria cerámica, es decir expertos, como por ejemplo técnicos, ingenieros, comerciales, docentes e investigadores en la materia, así como traductores
- las funciones lingüísticas, es decir, delimitar para qué va a servir el diccionario: en nuestro caso se trata de una función descriptiva, puesto que el trabajo se limita a recopilar los términos de un campo de especialidad y el diccionario como producto final se convierte en un instrumento de valor referencial.
- la delimitación temática, valorando el alcance conceptual y temático que la obra debe tener. Esta delimitación temática del campo conceptual de nuestro trabajo (la industria cerámica y del azulejo), así como de los ámbitos relacionados con ella (mineralogía, procesos químicos, explotación de canteras...) nos permitirán prescindir *a priori* de aquellos sectores que no estén ligados a nuestro campo de investigación.
- Por último encontramos la constitución del equipo de trabajo, la selección de asesores y de los recursos de los que se puede hacer uso (recursos materiales y económicos). La necesidad de estos recursos, la mayor parte de ellos de carácter informático, sostienen la tesis expuesta al principio de la importancia adquirida por las nuevas tecnologías y aportan una mayor agilidad y eficacia al trabajo llevado a cabo.

La segunda etapa, (preparación y compilación del corpus) se entiende en nuestro caso como el planteamiento de la metodología de trabajo y la adquisición y compilación de los materiales necesarios para la correcta elaboración y gestión del corpus. Un corpus, se caracteriza por ser “una colección de textos del lenguaje natural, seleccionados para caracterizar el estado de una lengua o una variedad de la misma” (Sinclair, 1991), por lo que nos proporcionará información lingüística real y la posibilidad de analizar el uso de los términos en contextos naturales.

En esta fase, en la que, principalmente, prepararemos todo el material necesario para posteriormente trabajar con él, recopilaremos y centralizaremos tantas muestras textuales significativas como podamos encontrar, teniendo en cuenta que este proceso de compilación es algo abierto hasta el momento en que todos los microcampos del área se consideren cubiertos y el corpus sea lo suficientemente representativo. Se primarán pues los textos disponibles en las dos lenguas de trabajo (inglés-español), también llamados textos paralelos, que tendrán prioridad sobre los estrictamente monolingües.

Así pues, en esta fase de preparación y compilación del corpus, se lleva a cabo una búsqueda documental e institucional intensiva. La búsqueda documental es de un lado terminológica, es decir, basada en diccionarios ya existentes y, del otro, textual, es decir, utiliza textos (*córpore*) que ilustran el uso de los términos. La búsqueda documental supone la identificación y recuperación de textos de especialidad: libros, artículos de divulgación, manuales, etc. y del mismo modo incluye la búsqueda y recuperación de precedentes como glosarios y diccionarios elaborados por especialistas, diccionarios electrónicos y bases de datos terminológicas especializadas. Sin embargo, a la hora de buscar la documentación hemos de establecer unos criterios de selección que garanticen la fiabilidad de los resultados. La información debe ser pertinente o representativa del campo en el que se trabaja, completa (incluyendo todos los aspectos relacionados con el tema del trabajo) y actual, reflejando la realidad lingüística del campo tratado.

La búsqueda institucional, por su parte, puede facilitar el trabajo terminográfico, ya que permite compilar informaciones más relevantes, de mayor prestigio o autoridad. Este tipo de búsqueda permite el conocimiento de la organización institucional del sector implicado así como la identificación de los distintos organismos del campo de

especialidad y en ella compilaremos básicamente normas nacionales y comunitarias (normas UNE y EN de AENOR).

La tercera fase consiste en la elaboración de un árbol de campo basado en la noción de *campo semántico*: “conjunto de nociones que pueden agruparse bajo una sola noción clave” (Auger y Rousseau:1984). La realización de éste árbol de campo permitirá el establecimiento de la relación entre una forma lingüística (palabra, término, etc.) y una realidad (abstracta o concreta) a través de una noción. Así pues, el árbol de campo es la representación gráfica del “esqueleto” del área de especialidad y proporciona una visión global de la misma. La confección de este diagrama u ontología nos sirve de guía para seleccionar los términos a incluir así como para establecer el primer elemento de definición de las unidades terminológicas (mediante abreviaturas que indican el campo semántico al que pertenece el término y que aparecen al lado de éste en la entrada).

En la 4ª fase del método de trabajo, la de gestión y análisis del corpus, las muestras textuales que definitivamente van a configurar el mismo se almacenan como una colección de ficheros en el ordenador. Dicho almacenamiento se lleva a cabo a través de un proceso de digitalización mediante el escáner (en el caso de tratarse de textos que no puedan ser obtenidos directamente en formato electrónico), un proceso de reconocimiento óptico de caracteres (*Optical Character Recognition,*) u OCR, de revisión y corrección y, en último lugar de conversión del texto a formato plano (txt.). Sin embargo, antes de escanear un documento, deben anotarse los datos de las muestras seleccionadas en el documento de control, que incluirá el nombre del autor, el título y el origen del documento. Asimismo, deben fotocopiarse, para una correcta gestión del corpus, las muestras del documento así como las páginas en las que se recojan los datos identificativos del documento y el índice. Después de haber digitalizado todas las páginas mediante el proceso de escaneado, tendremos que seleccionar manualmente las zonas a las que luego el programa aplicará el OCR, evitando incluir información que se considera no relevante para nuestros objetivos como puede ser: fórmulas matemáticas, tablas, gráficos, números de página, notas a pie, referencias bibliográficas y demás. Es decir, habrá un proceso de digitalización y un proceso de selección manual de las zonas a procesar.

Los errores que se adviertan en el texto después de la fase de reconocimiento de caracteres no se corregirán desde el programa de OCR sino en una etapa posterior y desde Word.

La fase de vaciado (5<sup>a</sup>) se centra en la extracción de los términos o candidatos a términos a partir de unas listas de frecuencia y del análisis contextual proporcionados por el programa WordSmith Tools 4.0. Así pues, lo que se lleva a cabo en esta fase de vaciado es un primer procesamiento de los textos empleando WordSmith Tools 4.0 con el objeto de identificar cadenas de caracteres que son potencialmente términos. A esto se le llama extracción terminológica. Mediante WordSmith Tools, se puede crear pues un listado de palabras bien por orden alfabético, bien por frecuencia bien por ambos, se pueden producir líneas de concordancias y se pueden obtener datos estadísticos. Con “Wordlist” obtenemos listados de palabras (posibles términos) que en este caso se agrupan por frecuencias. Estas listas nos sirven para determinar las palabras más frecuentes en nuestro corpus, con lo que ya podemos formarnos una primera idea de si el corpus ha sido bien diseñado y es, por tanto, representativo, coherente con el ámbito de especialidad y equilibrado. Una utilidad adicional que incorporan estos programas de concordancias es la posibilidad de introducir listados de palabras gramaticales o *stopwordlist*, palabras sin contenido específico, usuales, pero que sólo generan ruido, es decir, que no resultan útiles para nuestros fines. Estas *stopwordlists* actúan por tanto como filtro de datos no deseados. Wordlist también nos proporciona listados de información mutua (IM) que constituyen una primera aproximación a las propiedades combinatorias de los términos y que nos indican si la aparición de una base y un colocado es estadísticamente significativa o fruto de la casualidad.

Una vez obtenidas las primeras listas de posibles términos tiene lugar el análisis contextual de esos términos potenciales, tanto monoléxicos como poliléxicos detectados mediante el análisis de frecuencias y la IM. Este análisis contextual se basa en la observación de ejemplos de uso, relaciones, concordancias, colocaciones, etc. y se lleva a cabo mediante la aplicación “Concord”. Así pues, esta aplicación permite, entre otras muchas opciones clave para el trabajo terminográfico, el análisis de las colocaciones en uso (principalmente mediante la aplicación “Collocates” y también “Patterns”) y proporciona el contexto necesario para el correcto análisis de los términos mediante los listados de concordancias (“Concordance” y “Source text”).

Una vez estos análisis han sido llevados a cabo y la extracción terminológica ha concluido tiene lugar la asignación de equivalentes en ambas lenguas de trabajo, a lo que le sigue la fase de procesamiento de los datos (6ª). En esta fase, los términos, sus equivalentes y sus información lingüística correspondiente son almacenados en la base de datos terminológica TermStar XV, en la que dos repertorios terminológicos han sido creados, uno en inglés y otro en español. Es en esta fase cuando se decide sobre la información que queremos que contenga el trabajo terminológico. Será entonces cuando configuraremos un modelo de distribución de los campos en la base de datos (*layout*) e incluiremos los campos que componen la ficha terminológica, rellenándolos de acuerdo a un protocolo establecido.

La fase siguiente, la de revisión y normalización (7ª), consiste básicamente en revisar y normalizar las informaciones así como los neologismos (en caso de que los hubiera) en una tabla de Access a la que los datos han sido exportados desde TermStar para poder exportarlos de nuevo en la última fase del método al generador de diccionarios.

La última etapa es la edición (8ª), en la cual, mediante la programación en Visual Basic se exportarán, como acabamos de decir, los datos desde Access a GENDIC (Generador de diccionarios v.1.0), que generará automáticamente el documento final (las entradas) en versión *rtf*.

Como conclusión final, recalcar de nuevo que los avances tecnológicos resultan claves en la metodología propuesta.

- **Aportaciones originales**

La aportación original más inmediata de este estudio son las 4.000 entradas presentadas como ejemplo ilustrativo de lo que será e incluirá el diccionario final de la industria cerámica. Así pues, estas entradas finales, correspondientes a la versión inglés-español de las letras A, B, N, O, U y V muestran el tipo de informaciones y la estructura de las entradas en el diccionario.

Hasta el momento no tenemos constancia de la existencia de ningún diccionario de este tipo en el campo de la industria cerámica por lo que consideramos que este estudio constituye una aportación original en toda regla y una visión innovadora y práctica de lo que debería ser una obra lexicográfica práctica y moderna y de los principios en que debería sustentarse. Entre otros aspectos, el posicionamiento teórico

adoptado (la TCT), la importancia dada al usuario potencial de la obra, su enfoque activo, el estudio del contexto socio-económico en el que se insertará la obra lexicográfica y la metodología de trabajo empleada, completamente basada en las nuevas tecnologías y en los avances obtenidos en el campo de la terminología, constituyen una propuesta de sistematización del trabajo terminográfico que consideramos altamente beneficiosa y extrapolable a otro tipo de obras lexicográficas, constituyendo por tanto una aportación importante al campo de estudio.

- **Conclusiones obtenidas y futuras líneas de investigación**

De modo resumido y de acuerdo con los objetivos planteados al comenzar esta tesis, las conclusiones finales que pueden extraerse son las siguientes:

- Esta tesis ha tratado de analizar en profundidad el contexto socio-económico y de uso de la obra de lexicografía especializada en desarrollo. Para ello, se ha llevado a cabo un estudio que establece la necesidad de crear un diccionario que satisfaga las demandas comunicativas específicas del distrito cerámico industrial desde un punto de vista bilingüe (Inglés-Español, Español-Inglés).
- Los 4000 términos presentados en esta tesis como resultados finales parecen ilustrar, a pequeña escala, lo que el diccionario activo final pretende ser: una obra lexicográfica especializada, fácil para el usuario, en la que la realidad terminológica analizada se presenta y refleja sin ocurrencias artificiales y que cumple con las expectativas de los usuarios potenciales. Estos rasgos han determinado el uso de la etiqueta “lexicografía especializada” a la hora de referirnos a un trabajo como este, en vez de la más generalizada denominación “terminografía”, que si bien puede ser válida igualmente, es menos precisa en un caso como éste. Del mismo modo, de acuerdo al planteamiento teórico adoptado, el lenguaje se ha concebido a lo largo de esta tesis como un continuum, en el que, palabra y término no han sido concebidos como unidades completa y perfectamente delimitadas sino como unidades léxicas que pueden activar (en el caso de las unidades terminológicas) o no sus rasgos especializados dependiendo del contexto específico en el que aparezcan.

- Este estudio ha intentado mostrar la importancia de la terminología para el estudio del Lenguaje Profesional y Académico (LPA) y más específicamente para la correcta caracterización de los diferentes lenguajes especializados desde un punto de vista discursivo. Del mismo modo, esta perspectiva comunicativa ha originado el análisis de la terminología desde el discurso especializado real, es decir, partiendo siempre del texto especializado en el que las unidades terminológicas son utilizadas por expertos. A su vez, este modo de concebir los lenguajes especializados (junto con la teoría de la terminología en la que se basa este estudio), ha hecho necesario el uso de un corpus para la extracción y observación de estos términos.
- El estudio presentado parece haber justificado la elección de la TCT como el enfoque más realista a la hora de aproximarnos al estudio de la terminología debido a los factores mencionados en puntos anteriores y que podrían resumirse en la dimensión comunicativa y discursiva de la terminología y en la necesidad de analizar los términos siempre desde la base de textos reales producidos por expertos reales. Esta investigación ha defendido pues los beneficios y la conveniencia de un enfoque como la TCT mediante el análisis de su coherencia interna, en contraposición a otras teorías como la TGT, cuyos puntos débiles y contradicciones han sido puestos de manifiesto.
- En base a la TCT y a la simple observación de la realidad, y más específicamente de la realidad del campo de especialidad tratado, esta tesis ha tratado de dar cuenta de forma detallada de la naturaleza comunicativa de la terminología y su naturaleza interdisciplinar, que hace de la unidad terminológica una unidad con múltiples facetas y que integra los aspectos teóricos de la terminología con una práctica coherente de la misma. En este contexto, el análisis de la naturaleza combinatoria o el comportamiento colocacional de las unidades terminológicas ha sido un factor fundamental ampliamente considerado en esta investigación.
- La presente tesis ha intentado proporcionar un marco teórico y un método de trabajo sistemático y coherente, que parece haber sido efectivo a la hora de cumplir los objetivos propuestos y que parece haber dado lugar a resultados

específicos útiles desde el punto de vista terminológico y por tanto comunicativo, en el marco de la industria cerámica.

Esta tesis, con un claro fin aplicado, ha intentado tratar todos los aspectos relevantes a la hora de llevar a cabo una investigación como la que aquí se ha planteado. No obstante, hay muchos puntos que han ido apareciendo a lo largo de los años que ha durado este proceso y que me gustaría poder abordar próximamente como futuras líneas de investigación.

Obviamente el trabajo que de forma natural debe seguir al presentado aquí es la compleción del diccionario en sí, con una extensión aproximada total de 26.000 términos. Además, considero que podría ser muy interesante y positivo abordar las implicaciones y aplicaciones pedagógicas de este tipo de trabajo para la enseñanza-aprendizaje de la terminología (entendida como disciplina, metodología y conjunto de términos) a nivel universitario y para una mejor comprensión del fenómeno de los lenguajes de especialidad. Igualmente, podría resultar interesante llevar a cabo una investigación más pormenorizada sobre las industrias de la lengua y los beneficios de las aplicaciones terminóticas, así como un estudio detallado de las aplicaciones más relevantes en este campo.

Finalmente, se enumeran a continuación otras líneas de investigación que podrían iniciarse en base a este trabajo de tesis doctoral:

- Un estudio de tipologías textuales destinado a mejorar las técnicas de compilación de córpora, su equilibrio y representatividad.
- Un estudio comparativo con diccionarios previos en este u otros campos de especialidad.
- Estudios comparativos que profundicen en las nociones de y diferencias entre lo general y lo especializado.
- Una investigación específica (comparativa o no) sobre glosarios, tesauros, los aspectos diacrónicos de los lenguajes de especialidad y

cómo se reflejan en los diccionarios, viendo pues su evolución a lo largo del tiempo.

- Una reflexión sobre las nociones de descriptivo y prescriptivo en los trabajos terminográficos.
- Una reflexión en profundidad sobre las ontologías y sus posibles aplicaciones en trabajos de este tipo.
- Los fenómenos de polisemia, homonimia y sinonimia en los lenguajes especializados.
- Las nociones de diccionarios productivos e interactivos.
- La dicotomía bilingüe-monolingüe.
- La conceptualización de la realidad y la descripción léxica desde un punto de vista cognitivo.
- Las posibilidades de Internet como mega-corpus.
- La posibilidad de extender este estudio a otras lenguas (alemán, italiano, etc.).

Espero pues poder llevar a cabo estas líneas de investigación abiertas durante la elaboración de la presente tesis doctoral en un futuro próximo.

*Enseñó al hombre la Naturaleza  
las varias inflexiones de la lengua  
y la necesidad nombró las cosas.*

**Lucretius**

## **I. THEORETICAL FRAMEWORK**

To begin with, and as the title of the work itself indicates, this doctoral thesis is the result of an ongoing process aimed at the creation of a bilingual corpus-based specialised active dictionary of the ceramic industry, with the Communicative Theory of Terminology (CTT) (Cabré, 1999 a) as its mainstay. Although the complete dictionary as such is still under development, this thesis has tried to describe and analyse this development process in a progressive way, and pains have been taken to make it comprehensive, coherent, systematic and close to the reality it seeks to characterise from a terminological point of view. Accordingly, the final result of this project will consist of a total of around 4,000 entries, and the whole dictionary is intended to be finished for October 2008.

The first section of this doctoral thesis offers a comprehensive theoretical framework accounting for the objectives, principles and methods on which this work is sustained. These basic aspects are presented in a progressive, integrating fashion with the aim of facilitating the global comprehension of this framework. In order to understand the relevance of all these reflections and their appropriateness for the correct understanding of this work, figure I.38 at the end of this section shows a concluding graphic representation of the way and order in which these theoretical issues have been approached.



*Motivation is what gets you started.  
Habit is what keeps you going.*

**Jim Ryun**

## **1. OBJECTIVES AND MOTIVATION**

In recent years it has been increasingly urged that dictionaries should be designed to meet the specific needs of the groups of users for whom they are intended (Kromann, Riiber, Rosbach, 1991). In this sense, Cowie (1979, in Kromann, Riiber, Rosbach, 1991) noticed that the scope, organisation and meta-language of dictionaries should analyse and reflect more closely the reference needs (and levels of sophistication) of the classes of user for whom they are intended.

Therefore, a key issue before starting to undertake any project of the sort presented here is the consideration of how to meet the needs of prospective users so that decisions on whether to create a monolingual or bilingual dictionary, a descriptive or prescriptive one, etc. are taken appropriately.

Hence, this project came to light as a proposal aimed at “filling a gap” in specialised communication and contributing to the improvement of the communication between specialists in the ceramic industrial district<sup>1</sup>, the focus being on the terminological aspect of this communication. In this way, a bilingual specialised lexicographical work like this based on the results of a deep needs analysis from the linguistic point of view was believed to be necessary.

Terminology, as a subject that deals with the compilation, description, management and presentation of the terms that belong to the speciality fields of one or more languages, is not a practical activity that can be justified in itself but within a wider scope – in this case the ceramic industrial district. Terminology has thus been conceived throughout this work as a field of knowledge aimed at solving social needs and linked to the optimisation of the communication between specialists and professionals, something which, up to now, has not been done in the ceramic tile industry.

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<sup>1</sup> The reason for using the term “district” instead of the more common denomination of “sector” is explained in section I.7.1.

Taking all these factors into account the main objective of this dissertation can be easily summarised in its title: the development<sup>2</sup> of a bilingual (English-Spanish, Spanish-English) dictionary of the ceramic industry based on the Communicative Theory of Terminology.

This main goal may, in turn, be subdivided into the following specific objectives:

- To analyse and examine in depth the context of use of the specialised lexicographical tool to be designed (needs analysis) so as to ascertain and show the necessity to create a dictionary that satisfies the specific demands of the ceramic industrial sector and that realistically responds to “what is needed”.
- To create a user-friendly, active dictionary<sup>3</sup> which realistically reflects the terminological reality analysed and which fulfils the expectations and needs of prospective users; consequently, to explain the appropriateness of using the label “specialised lexicography” to define a work like this.
- To show the importance of terminology in the study of specialised languages/Professional and Academic Language (PAL) and to analyse, describe, highlight and explain the benefits of a corpus as a tool for the extraction and observation of real, natural terminological data.
- To justify the reason for presenting the CTT as the most realistic and suitable way of approaching terminology, in opposition to other theories like the GTT, by pointing out the shortcomings and flaws of previous conceptions in lexicographical and terminographical works.
- To provide a detailed account of the communicative nature of terminology and its interdisciplinarity and present a study which integrates the theoretical aspects of terminology with a coherent practice of it.

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<sup>2</sup> The complete dictionary as such has not been finished yet. However, this doctoral thesis shows an illustrative preview of 4,000 terms from this dictionary (from a prospective total of 26,000).

<sup>3</sup> Represented in part here by the 4,000 final entries presented in this study.

- To provide a detailed account of the theoretical framework and method of work followed to carry out a study like this and supply a coherent explanation for the understanding of its adequacy and appropriateness compared to other conceptions.

To sum up, all through these pages attempts have been made to provide a coherent approach – from both the theoretical and the applied points of view – to the development of a specialised lexicographical tool (specialised dictionary) which meets the expectations of the prospective user for whom it has been designed. The 4,000 terms presented as the results of the study seek to corroborate this method of work. And this is the reason why, as the different sections of this work show, a reflection on numerous theoretical issues and approaches, as well as an analysis of the field of industrial ceramics and the communicative necessities it presents, had to be undertaken in order to understand exactly the kind of work to be done.



*Language is not an abstract construction of the learned, or of dictionary makers, but is something arising out of the work, needs, ties, joys, affections, tastes, of long generations of humanity, and has its bases broad and low, close to the ground.*

Noah Webster

## **2. PROFESSIONAL AND ACADEMIC LANGUAGE/SPECIALISED LANGUAGES**

El intercambio permanente entre lenguaje especializado y lengua común, así como los problemas que de él se derivan requieren una mediación consciente entre ambas áreas. Sólo es posible asegurar o facilitar la comunicación entre expertos y legos y entre los expertos de distintas áreas, si un número cada vez mayor de partícipes en el proceso comunicativo se esfuerza activamente por lograr esa comunicación y se ocupa de las cuestiones lingüísticas que se plantean. (Arntz and Picht, 1995: 42)

### **2.1 Language and how to detect specialisation: is there a clear-cut boundary between the general and the specialised?**

As happens in almost every aspect of life, there is more than one possible way to approach the issue of whether the general and the specialised (in terms of language) are delimited by a clear-cut boundary which allows for an easy distinction. Two main viewpoints thus appear in this respect:

- On the one hand, the view of those supporting the idea that a clear, sharp line can be drawn between the general and the specific or specialised, and that a criterion justifying such a distinction can be established. For them, the main criterion allowing this division is the specialisation of the addresser, that is, the fact that a given discourse or text has been produced by a specialist addresser that conceptually controls the subject matter:

We may want to postulate the separate system at the grammatical, semantic or pragmatic level or any combination of these. There are many reasons for establishing a separate pragmatic dimension, e. g. separate user groups, different topics, different situations. On the semantic level the situation is less clear as we have separate lexical items, but also many common ones, and we know that considerable variation exists in the use of special lexical items as indeed there is

variation in what we attribute to the lexicon of a special subject. On the grammatical level we may have some syntactic, morphological and phonological differences between general and special and between special languages but we would wish to stress the similarities in order to preserve a unified notion of a language in the same way as we define dialects as variations of a national language and do not normally go beyond national language boundaries. (Sager *et al.*, 1980: 2)

- On the other hand, the view of those who believe that between the specialised and the non-specialised there is a continuum, since the difference between general and specialised is a matter of degree. For them, it is neither adequate nor natural to force a limit between what is considered to be specialised or not, since many factors have an influence on it. This is why they consider it more sensible to talk about discourse, texts, documents or languages being specialised to a greater or lesser extent, depending on some parameters or on others.

Bearing these considerations in mind, I have regarded it to be beneficial for this research (which is obviously focused on language) to adopt an integrating version of both views that is closer to the second one, but sets out from the fact that it is not so much languages that are specialised but the use made of them in specialised contexts:

Dentro del ámbito del discurso especializado o los distintos discursos de especialidad que se producen ofrecen una amplia gama de posibilidades, que abarcan desde un discurso marcadamente especializado hasta una variedad de discurso fronterizo con la lengua común. (IULA, 2007 c)

Basically, cognitive factors are responsible for establishing a dividing line that allows a general text to be differentiated from a specialised one. However, this issue of tracing a dividing line is a very controversial one that is not at all easy to establish, and is what has led many scholars to resort to the specialisation continuum. However, this difficulty does not necessarily imply that a specialist in a subject matter is unable to establish what is specialised for him/her, since there seems to be a prototypicality index with respect to the so-called specialised discourses created in terms of their thematic area, goal, the field in which they are used, and so forth.

Por ejemplo, los discursos de la física, la química, la biología, la geología, la matemática, la estadística, la lingüística, la antropología, la historia, la arquitectura, la estética, la economía teórica, etc., serían más prototípicos de lo especializado

que los de la banca, la bolsa, el comercio o las finanzas; y más periféricos aún serían los discursos de la restauración, la peluquería, la ferretería, los deportes o los remedios caseros. No obstante, si mantenemos que sólo las condiciones cognitivas (el control sobre la estructura conceptual del ámbito) determinan que una producción discursiva es especializada, lo que hace variar la percepción de más o menos especializado en dos producciones del más alto nivel de especialización será la mayor o menor opacidad de la temática, producto de que sea más o menos difundida socialmente. (IULA, 2007 c)

If, according to what has been commented so far, we accept the fact that between the specialised and the non-specialised there may be a boundary (more or less precise or acute), as different authors claim, then obviously the next question that has to be asked in this research is how can specialised languages be differentiated from non-specialised ones? That is to say, how can “specialisation” be detected? Following the IULA (2007 c), for a text to be considered as specialised, together with the lexicon criterion, other pragmatic, functional, thematic, textual-linguistic and cognitive criteria must also concur:

1) From a pragmatic point of view, it can be said that the factors that characterise the production, transmission and reception process of specialised discourse are determined by the following aspects:

- the producer or addresser; a specialist or a person with a high degree of competence in the subject matter;
- the addressee, who expects to be informed;
- the predominant function (informative);
- the tone, which is formal, although different levels of formality are accepted;
- the situation, which is always professional.

2) From a functional point of view there is also a series of common traits shared by every language that is considered to be specialised: their basic function is the transmission of information and their respective terminologies are used to denominate the concepts of a specialised area.

3) From the point of view of the topic, texts that are normally specialised usually belong to the following disciplines (although exceptions are possible): scientific-

technical subjects, exact sciences, experimental sciences, social sciences, human sciences, professions and specialised activities.

4) From the textual point of view, specialised texts possess an overall specific configuration that characterises them and makes them easy to differentiate from the configuration that characterises other kinds of texts<sup>4</sup>. They also present a regular style (scientific-technical style) which shows variations depending on the topic and on the different levels on which it is dealt with. To sum up, these texts are:

- Concise (with little redundancy);
- Precise (with no ambiguity);
- Objective or depersonalised (not very or not at all emotive).

5) Finally, the IULA (2007 c) points out that the most intrinsic trait is that, from a cognitive point of view, texts are specialised when they convey precise knowledge resulting from a very specific process of conceptualisation of reality undertaken and validated by consensus among specialists in the field.

Hence, depending on the degree of accomplishment of these factors, “specialisation” in language can be detected and measured, something which has allowed me to establish some sort of delimitation in this respect, but always from a continuum point of view which does not (cannot) abruptly separate general from specialised language as has been explained in subsequent sections.

## **2.2 General/common language vs. specialised language(s)**

Las lenguas especializadas surgen dentro de la lengua común pero se diferencian de ella en que su objetivo último es el cubrir las necesidades específicas de comunicación formal y funcional que se plantean en cada una de las profesiones u oficios de los diversos ámbitos técnicos y científicos. (Gómez de Enterría, 1998: 30)

As Arntz and Picht (1995) state, the fundamental importance of general language for specialised language is obvious. As these authors explain, in the same way that formalised language (such as a mathematical formula) cannot exist without natural

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<sup>4</sup> Literary texts, religious texts, advertising texts, etc.

language, neither can specialised language be conceived without common, general language, in spite of the fact that the latter can survive on its own. However, it is a fact that the influence of specialised language on common/general language is not new at all and nowadays the influence is even greater due to the increasing presence of science and technology in everyday life.

At the same time that specialised language becomes more precise and concise, it progressively loses the capacity to be widely or generally understood. This leads to a situation in which fewer and fewer people are capable of understanding texts about highly specialised areas to which they do not regularly devote their efforts.

La principal justificación de la existencia de los lenguajes especializados y de su desarrollo consiste en exigir a los científicos y técnicos que se esfuercen en la precisión incluso en el ámbito lingüístico. Nuevas ideas y nuevos objetos requieren denominaciones que aún no estén “adjudicadas”, o sea, que no puedan confundirse con otras. La lengua común, si es que puede librarse del peligro de confusión, sólo lograría hacerlo mediante paráfrasis excesivamente largas [...] Pero la descripción exhaustiva no resultaría adecuada para la comunicación especializada, que a la vez exige concisión y claridad. Por esto son imprescindibles unos medios especiales, convenidos entre los interlocutores afectados, para hacer posible la comunicación en y sobre su área especializada. (Arntz and Picht, 1995: 42)

This study presents the development and a sample of the results of a corpus-based dictionary on ceramic industry terminology and, consequently, this implies that a specific or specialised “kind” of language has been dealt with, so that the ceramic industrial district in general and more particularly the products, processes and activities involved in it have been comprehensively referred to.

One of the main aims in this section has been to “prepare the ground” for the project from a theoretical point of view by reflecting on and identifying the different pragmatic and linguistic features that characterise this kind of specialised language and make it different from the non-specialised one. Once these features had been identified, it was also easier to create a model for accurately and correctly representing the specialised language and its terminology according to the CTT in order to finally develop a specialised lexicographical work. The knowledge of what specialised languages are and imply has also contributed to create a more accurate corpus that was specifically designed for the purposes previously established and from which it was possible to extract the terms that presumably conform the terminological panorama of the field of industrial ceramics.

Alcaraz (2000) defines language as the instrument by which a community communicates (see the concept of discourse community in section I.7.2) and, as such, it is not solely used in everyday communication but also in specialised contexts – what Alcaraz (2000) calls “professional contexts”. The language used in everyday communication has been traditionally known as general or common language, whereas the language used in professional or specific contexts is usually known as specialised, special or speciality language. The general or common language is made up of a series of subcodes that are selected by speakers throughout the communicative process, depending on what they want to express and the communicative situation, or context, in which they are immersed. For this same author, the term *lengua de especialidad* (specialised language), derived from the French term *langue d’éspecialité*, refers to the specific language used by some specialists and professionals in order to transmit information and negotiate the terms, concepts and knowledge of a given field of knowledge, that is to say, to confirm the existing terms by delimiting their field of application and modifying them, whether totally or partially (Alcaraz, 2000). The term “specialised language” has also received a number of alternative names that may be considered, in general terms, as being synonymous: the already-mentioned special language, speciality language, special subject language and language for specific purposes (LSP)<sup>5</sup>, although this last denomination is better applied, according to its origin, to the field of teaching (Sager *et al.*, 1980)<sup>6</sup>, as is explained in section I.2.5.

Alcaraz (2000) also adds to his definition of specialised language a shade of meaning because, as he points out, this “kind” of language has also been called “technolect”, although he concedes it is more restrictive<sup>7</sup> and less preferable than the label “specialised language”. In spite of this, in Alcaraz’s (2000) view, the term specialised language and the grouping of some of these specialised languages under the aforementioned label of LSP is better and more accurately expressed in the case of English by the acronym IPA (*Inglés Profesional y Académico*), what I have called

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<sup>5</sup> In opposition to Language for General Purposes (LGP).

<sup>6</sup> Throughout this study, the denomination “specialised language” (referring to the specific case of the ceramic industry) has been the preferred one, and it is considered to belong to the wider category of PAL.

<sup>7</sup> It is more restrictive because it only comprises the subcode made up of the lexicon of a given discipline.

PAE<sup>8</sup> (Professional and Academic English) in English. Vargas (2005) explains that Alcaraz (2000) coins this term to refer to the modality of English that includes the grouping of the different specialised languages that arise in the academic world and during the practice of the corresponding professions.

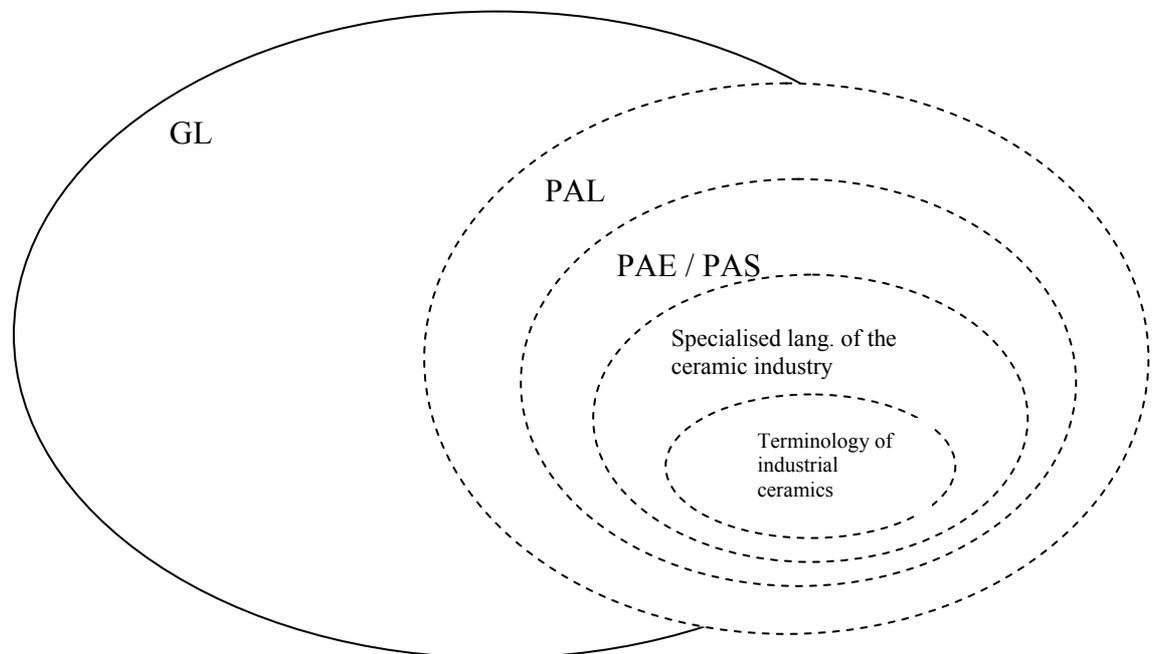
Existen muchas lenguas de especialidad, tantas como actividades humanas (la de los políticos, los militares, los comerciantes, los religiosos, etc.). Con un buen número de ellas se ha formado un núcleo de subvariedades llamado “inglés profesional y académico (IPA)”, que coincide en líneas generales con lo que en inglés se llama ESP (English for Specific Purposes), y en español, IFE (inglés para fines específicos). Utilizamos el nombre de “inglés profesional y académico” porque nos parece mucho más concreto que el de “inglés para fines específicos” (...) Así lo estima también Widdowson (1998: 3-4), para quien cualquier uso que hagamos del lenguaje siempre será “específico”, porque servirá para un fin concreto. De esta forma cuando emitimos un mensaje oral o escribimos algo sobre una hoja de papel o en el ordenador estamos dando un uso específico al lenguaje. (Alcaraz, 2000: 15)

Consequently, from this reflection arises what I have called (following Alcaraz’s (2000) and Aguado’s (2001) proposal) PAL<sup>9</sup> (Professional and Academic Language), understood as being a way to concentrate specialised languages under a single denomination. Accordingly, in order to follow a consistent and coherent way to refer to this linguistic phenomenon, in general, throughout this work the term “specialised language” has been the most commonly used to refer to a single specific specialised language (in this case, the one used in the ceramics industry), whereas PAL has been the preferred denomination to refer to specialised languages as a whole. Taking all this into account and in accordance with the integrating view between general and specialised languages outlined in the previous section, the linguistic consideration of this work in this respect could be presented as the diagrammatic structure in figure I.1. This diagram conceives specialised language both as a *continuum* made up of inclusive relationships which go from the general to the specific in terms of language and as a somehow independent phenomenon with certain peculiarities with respect to general language. Despite this, these inclusive dimensions do not constitute closed, clear-cut, absolute boundaries because the very nature of language does not allow this

<sup>8</sup> Together with PAE, we may also have PAS (Professional and Academic Spanish), which would be another dimension of PAL (Professional and Academic Language).

<sup>9</sup> Aguado (2001) points out that the result of the investigations in this field can be extended to every language and give as a result what would be called LPAs (“Lenguajes Profesionales y Académicos”) what I have called in English PAL(s) (Professional and Academic Language(s)).

to be so, as far as I conceive it. This is the reason why the diagram is represented with discontinuous lines:



**Figure I.1:** Figure illustrating the integrating consideration of specialised and general language in this bilingual (English-Spanish; Spanish-English) study. GL: General Language; PAL: Professional and Academic Language; PAE: Professional and Academic English; PAS: Professional and Academic Spanish.

Directly related with this is the fact that many times every day, as we participate in different communicative situations, we use a wide range of varieties of language. These situations may range from talking to a friend to reading a research article or from having a business meeting to speaking to a child. These varieties of language that we use in different situations are referred to as registers:

*Los registros* son, pues, las variedades de una lengua de acuerdo con el *uso* que se hace de ella. Caracterizado de una forma más precisa, un registro es el subcódigo de una determinada lengua, según unos determinados rasgos léxico-gramaticales. (Halliday, McIntosh and Strevens, 1964: 77 in Alcaraz, 2000: 23)

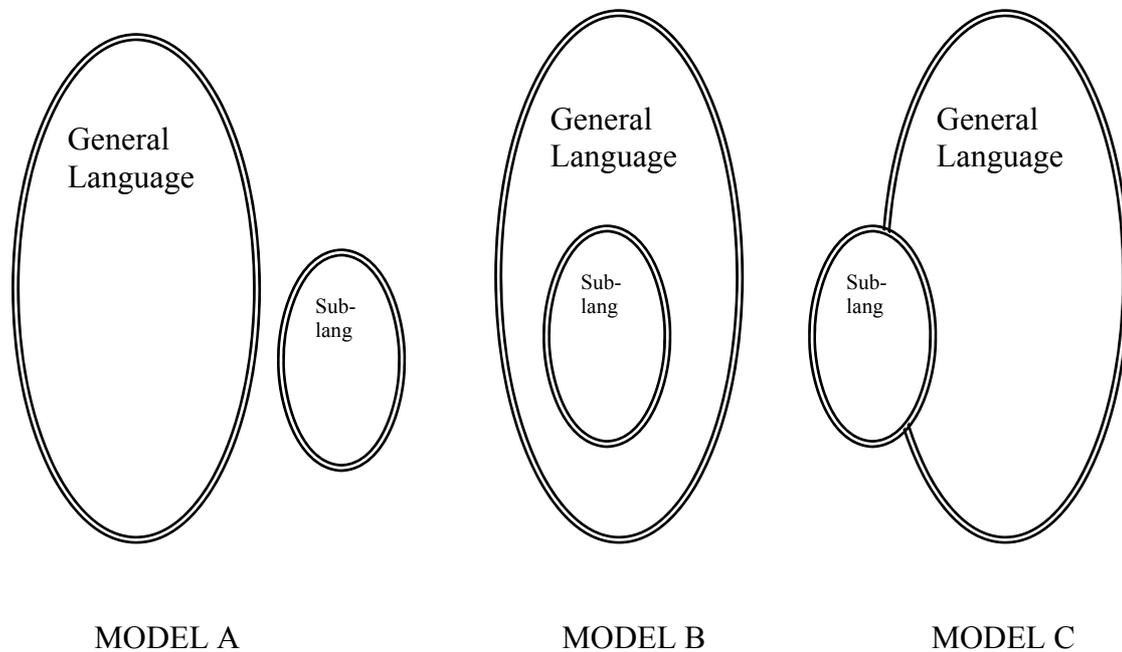
Therefore, a register may be defined as the variety of a language aimed at accomplishing a communicative goal in a specific professional or academic framework, so that in general terms, it can be stated that the concept of “register” also refers to the concept expressed by *langue d’espécialité* or specialised language.

For Cabré (1993: 127), a particular language is made of a diverse group of subcodes that speakers use “according to their dialectal modalities”, and which they select according to the expressive necessities and the particular characteristics of the communicative context in which they are located. However, even with these codes that make language a complex system with multiple varieties, each general language consists of a set of rules and units (phonological, morphological, lexical, semantic and discursive) that are common to every speaker of this language. The group of rules, units and restrictions that form part of the knowledge of the majority of the speakers of a language constitutes the so-called common or general language, and the units of this common language are used in situations that can be described as “unmarked”.

In contrast, specialised languages are used to refer to “a group of subcodes (which partially coincide with the subcode of the common language) characterised by a series of “special” peculiarities. These traits are specific to each speciality language and can refer to the topic, the kind of interlocutor, the communicative situation, the speaker’s intention, the medium in which the communicative interchange takes place and so on. Therefore, the situations in which specialised languages are used can be considered as “marked”. However, even when, according to this, general language and specialised languages may (at least in theory) seem clearly delimited in their fields of work, in reality this is not so. Closely related to what has been discussed in section I.2.1, Vargas (2005) states that establishing a neat dividing line between general and specialised language or between specialised languages is a controversial issue from which two main theories arise (Ciapuscio and Kugel, 2002). The first is that of the linguists who try to clearly fix the limits and boundaries between the two kinds of languages in their works (Sager *et al.*, 1980) and the second is that of the linguists who, unable to clearly establish these boundaries, prefer the notion of *continuum* to account for this phenomenon. In Balboni’s (1986: 3) words, “from simple LSP to the most formal LSP there is a continuum” because, in spite of the fact that there exist specific features of different types (textual, functional, and so forth) for each specialised language, these traits are not enough “to make a razor to cut the continuum” (*ibid.*: 4).

To go deeper into the diverging views on this topic, figure I.2 below illustrates the many different conceptions this issue gives rise to. Ahmad (1995, in Pérez 2002) summarises the different views on the topic by regarding the relationship between the

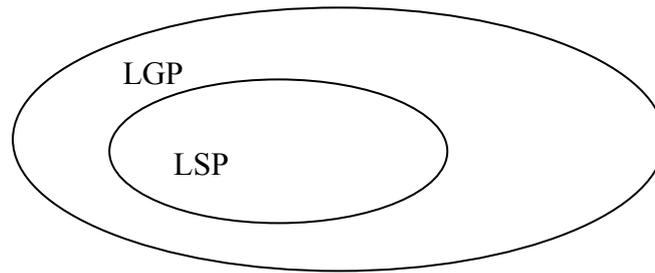
natural language and specialised languages in the three different models represented in figure I.2.



**Figure I.2:** Illustrative view of the possible relations that can be established between the general language and specialised languages (sub-languages).

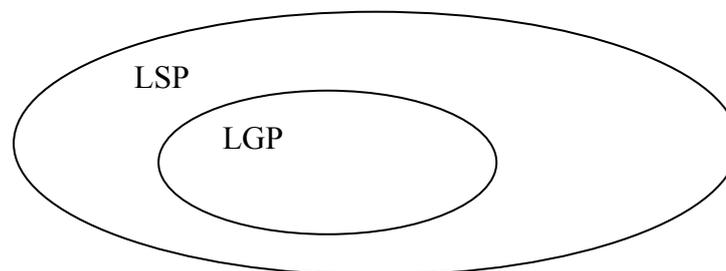
The viewpoint of this author is closer to model C, the one adopted in this work, because he believes that the relations between the general language and the specialised language must be considered not as the juxtaposition of both or as a subsystem of the general language, but as the “merging of a subset of the general language with a set of specific elements of its own” (Pérez, 2002).

According to Bergenholtz and Tarp (1995), most linguists make a basic distinction between language for general purposes and language for special (or specific) purposes: language for general purposes (LGP) may be seen as a synonym of standard language, and all languages for specific/special purposes are regarded as elements of the general language. This corresponds to the view that a certain language system is determined by the general-language system and that, to a greater or lesser extent, all LSPs make use of the general-language system and can be found within it. They illustrate this approach as reproduced in figure I.3 (Bergenholtz and Tarp, 1995: 17).



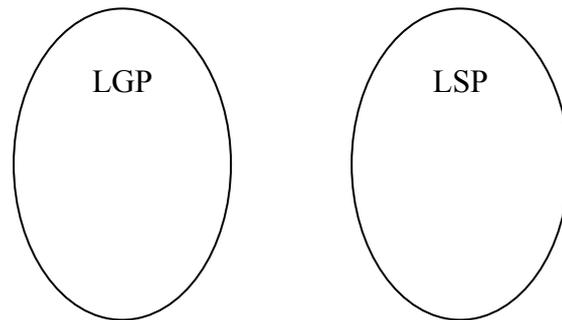
**Figure I.3:** Relations between Language for General Purposes (LGP) and Language for Specific Purposes (LSP).

However, other linguists take the opposite view. For them, all general language expressions are also found in special languages and according to this lexically-oriented approach, LGP is a subset of LSP (Bergenholtz and Tarp, 1995: 17). Figure I.4 illustrates this view.



**Figure I.4:** Relation between Language for General Purposes (LGP) and Language for Specific Purposes (LSP) contrary to the one illustrated in figure I.3.

According to Bergenholtz and Tarp (1995), and from a communicative point of view, LGP and LSP are used in completely different situations. LSP refers to the language used by experts for communicating within their areas of expertise but, as expert knowledge cannot be presupposed in daily communication, general language must be resorted to. Although it is to a certain extent possible to refer to the same things by using general language, communication runs the risk of becoming so oversimplified that the whole can no longer be considered LSP. Thus, LSP and LGP are equal, yet distinct phenomena, as illustrated by the model (Bergenholtz and Tarp, 1995: 17) in figure I.5.

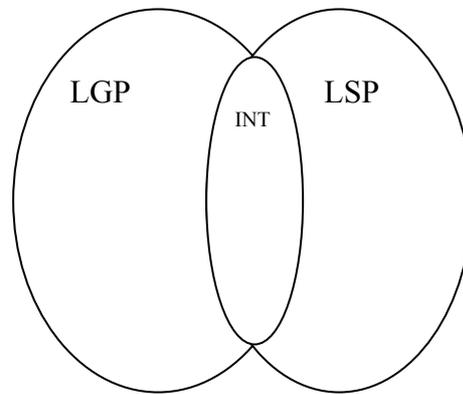


**Figure I.5:** LGP and LSP as perfectly differentiated linguistic realities.

Delving again into Cabré's (1993: 148) views in this respect, "algunos autores han concebido los lenguajes especializados por la temática como sistemas totalmente diferenciados de la lengua común. Esta afirmación, en términos absolutos no parece muy adecuada". According to this author, the autonomy this approach defends would only be possible if after the comparison of two texts, one general and one specialised, they did not present any kind of linguistic coincidence and therefore the idea that they come from isolated systems could be coherently defended. Cabré (1993) stresses the fact that both texts will show highly significant linguistic coincidences that reveal that they have been constructed on the basis of a common system. At the same time, however, she also declares that the texts would also present important differences that could lead us to conclude that, in certain aspects, they come from different codes: the code that unifies them is the common language, and the code that diversifies them is the specialised language. In conclusion, both codes share an intersection relation that partially coincides with model C proposed by Ahmad (1995) in figure I.2 and which is in accordance with the integrating view adopted for this research.

In general, LSP will make use of (only) part of this assumed general language, such as certain possible grammatical constructions and not all general-language words; nevertheless, special technical terms and, in some cases, also register-specific structures are also used. This is shown by the model in figure I.6, in which the intersection (INT) between LGP and LSP is made up of structures and elements occurring in both LGP and LSP. This intersection is another possible way of illustrating a conception of LGP and LSP (specialised language) that is very similar to the one adopted in this work. From the point of view of lemma selection, the

intersection comprises those words in specialised texts (here referred to as “common words”) which are not normally lemmatised in LSP dictionaries (Bergenholtz and Tarp, 1995: 18-19).



**Figure I.6:** Intersection between LGP and LSP.

Finally, another possibility is to dismiss the existence of LGP as a phenomenon in its own right altogether, assuming instead that each usage is specific to a certain situation. This approach implies that every language variety is an LSP (Bergenholtz and Tarp, 1995: 18).

If the views in this respect of other researchers on the field are considered, the IULA (2007 c) states, for instance, that the frequent use of the denomination specialised or special language implies accepting that the communicative resources used in certain circumstances present some idiosyncrasy (something “special” or “different”). However, if the concept of language is analysed in depth and if the real features of every specialised language are observed, most of their differences and peculiarities would not allow us to differentiate them from the linguistic resources used in non-specialised language or general language. Consequently, the claim that a different specialised language exists would make no sense. However, this is not the only possible interpretation of this topic and, as this research group goes on to explain, three different views coexist in this respect:

- 1) the view of those who consider specialised languages to be codes that can be completely differentiated from general or non-specialised language:

(...) cada llenguatge d'especialitat seria un mitjà de comunicació relativament independent i, respecte del llenguatge comú (llenguatge global), seria el mateix que el particular és al general; la seva particularitat es trobaria només en la selecció i la disposició dels recursos lingüístics per a un objectiu determinat i no en els recursos lingüístics per ells mateixos. (Hoffmann, 1998: 48) (...) Un llenguatge d'especialitat és el conjunt de tots el recursos lingüístics que s'utilitzen en un àmbit comunicatiu (delimitable pel que fa a l'especialitat) per tal de garantir la comprensió entre les persones que treballen en aquest àmbit. (Hoffmann, 1998: 51)

2) the view of those who believe that the only difference between specialised languages and general language lies in the specialised lexicon used by the former:

(...) une délimitation rigoureuse entre technique et non-technique se révèle toujours délicate en matière de langage, ce dont témoignent les hésitations des faiseurs de dictionnaires depuis qu'ils opèrent cette discrimination nécessaire. (...) L'appartenance d'un vocable à un domaine technique est acquise par le fait d'être utilisé dans une communication à thème et en situation techniques. (Quemada, 1978: 1148-1149)

3) the view of those who believe that specialised language is a functional register that constitutes a subgroup within the general code of language:

(...) los lenguajes de especialidad o lenguajes especializados son registros funcionales caracterizados por una temática específica "tratada de determinada manera", o mejor aún, conceptualizada de forma específica. Y todo ello producido en situaciones de comunicación en las que el emisor o los emisores son específicos (personas que han adquirido conscientemente un conocimiento especializado, fundamentalmente los especialistas de una determinada materia), el tipo de situación también lo es (fundamentalmente profesional y siempre dentro de un nivel de formalidad aunque esta formalidad admita grados distintos) y la función comunicativa que les es inherente es la informativa, sin menoscabo que cada producción use estrategias discursivas distintas. (Cabré, 2004: 2)

In this work, and according to what has been stated previously, the third view has been the one adopted to frame the whole research, assuming thus that specialised languages do not constitute a code that is totally or completely differentiated from general language, although, as the IULA (2007 c) states, “con todo, se utiliza la expresión lenguajes por tradición y por sentido metafórico (como el lenguaje de las abejas, el lenguaje de las flores, etc.)”. Accordingly, specialised languages are conceived as, or are believed to be, functional varieties of general language, which are, however, differentiated from it by a group of characteristics that are activated when a series of specific communicative circumstances are given: the topic is specialised, the

speakers are specialists, the situation is formal and professional, from a discursive point of view some information is trying to be transmitted, and so on.

En definitiva, se mantiene el término lenguaje, pero utilizado en el sentido de discurso, discurso que se desarrolla en un contexto y con una determinada finalidad comunicativa. De hecho, son estas circunstancias comunicativas las que permiten la actualización de un conjunto de características lingüísticas (entre ellas las léxicas, pero también morfológicas, sintácticas, rutinas discursivas, etc.) que confieren al texto su carácter especializado. Estas características no están delimitadas y asociadas a cada uno de los "sublenguajes" o registros funcionales, sino que existen virtualmente, y es en función de la situación pragmática y comunicativa que se activan unas en detrimento de otras. (IULA, 2007 c)

To end this reflection, I have considered it relevant to analyse in some depth the adjective “specialised”, which, when applied to language, can be said to have an ambiguous character since it may report two different realities:

1. A language is specialised when it deals with a specialised topic, that is to say, the adjective refers to the specificity of the topic dealt with, which does not belong to the general or common domain. In this way, specialised languages would correspond to those used in the different academic and technical disciplines and professional activities.

(...) si la comunicació especialitzada exigeix una adequació discursiva a possibilitats variades, un llenguatge d'especialitat no pot ser un subconjunt estructuralment monolític de recursos que es produeixen de manera constant, sinó que ha de presentar varietats en funció dels usos i de les circumstàncies comunicatives. (Cabré, 1999 c: 154)

According to the IULA (2007 c), this does not imply, however, that a language such as that of chemistry or physics is more specialised than the language of cooking or games. It is more accurate, however, to talk about tendencies and state that a chemistry text, because of its subject matter, is more likely to be specialised than one about cooking, but the topic is not an indispensable condition or a decisive one.

(...) la determinació del caràcter especialitzat d'una temàtica no rau tant en ella mateixa com en l'òptica des de la qual s'aborda en el missatge. Així, qualsevol objecte considerat tradicionalment científic, si és presentat (codificat i transmès) banalment, en el sentit que es transmet com un contingut no precís, que no es desxifra en relació amb una estructura preestablerta de significació, o la seva transmissió simplement no pretén ser referencial, esdevé matèria de comunicació no especialitzada. I a la inversa, qualsevol objecte de la realitat més

comuna pot ser tractat també de manera estructurada i precisa si es codifica-descodifica en referència a una estructura sistemàtica rigorosament establerta, esdevenint en aquest cas objecte de coneixement especialitzat. (Cabré, 1999 c: 154)

This means that the context of a cooking text can be dealt with in a highly specialised way and, consequently, can be more specialised than a popularising chemistry text.

2. A language is specialised (or special or specific) in relation to the different communicative factors that it may present with respect to general language. Thus, here the label refers to the possibility of intrinsic variation that a language has.

With respect to this second point, there are a series of variables that may be different and, depending on how they overlap, give rise to different functional registers:

- Channel, basis for the differentiation of oral and written languages;
- Topic, which allows general and specialised topics to be delimited;
- Degree of formality between the speakers;
- The communicative purpose, the basis for establishing the different discursive functions in a text and related with the communicative purpose in each specific case: expound, argue, classify, explain, describe, etc.

Following the IULA (2007 c), according to these variables, a language would be specialised because of its deviation with respect to the standard of communication that would correspond to or coincide with spontaneous oral discourse on a non-specialised topic that is fairly formal and with a basically referential function.

However, before going any further with the general language-specialised language dichotomy, and on the basis of the variables mentioned above, Cabré (2002) refers to the notions of horizontal and vertical variation and contends that there are two basic factors which allow both the characterisation of specialised languages and the creation of a typology of the texts considered to be specialised. These essential factors are subject matter and degree of specialisation:

- Subject matter<sup>10</sup> (horizontal variation). According to this criterion, texts can be typologised depending on the discipline or field of knowledge they deal with. In this sense, Hoffman (1998: 62) states that “la fixació dels àmbits comunicatius i dels seus llenguatges d’especialitat condueix a una determinada estructura [see figure I.7], que designarem amb el nom de *divisió horitzontal*”.
- Degree or level of specialisation or abstraction to be found in the content of a message (vertical variation). Following Hoffman (1998: 62):

Quan parlem d’una estratificació vertical dels llenguatges d’especialitat, no pensem ni en una estratificació social del parlant ni en una valoració de cada estrat, sinó que més aviat ens referim a la creixent precisió que experimenta el llenguatge en la comunicació especialitzada. La precisió en el llenguatge està relacionada amb el seu perfeccionament continu com a instrument de coneixement i de comunicació, del concret a l’abstracte, del particular al general, de l’aspecte a l’essència.

The fundamental criterion according to which texts are typologised vertically is the level of specialisation: “de acuerdo con este criterio los textos se han clasificado en *muy especializados o altamente especializados, medianamente especializados y de bajo nivel de especialización*” (Cabré, 2002: 13). The correlation between this classification and the kind of texts, according to their knowledge transmission function, gives as a result the distinction between texts that transmit knowledge from specialist to specialist, from specialist to novice, and popularising texts for a public that may be interested in the topic without being a specialist or a novice in the field.

Hoffman (1987, in Cabré, 2002: 31) combines four variables of analysis for the characterisation of specialised texts as illustrated in figure I.7:

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<sup>10</sup> This criterion, however, has never been as crystal-clear or easy to apply to specialised texts as expected, especially when this speciality concept has widened so much in the last few decades and has surpassed the boundaries of the traditional scientific-technical disciplines (Cabré, 2002).

	Nivel de abstracción	Forma lingüística	Ámbito	Participantes en la comunicación
A	Más elevado	símbolos artificiales para elementos y relaciones	Ciencias fundamentales teóricas	científico ↔ científico
B	Muy elevado	símbolos artificiales para elementos; lenguaje general para las relaciones (sintaxis)	Ciencias experimentales	científico (técnico) ↔ científico (técnico)
C	Elevado	lenguaje natural con terminología especializada y sintaxis muy controlada	Ciencias aplicadas y técnica	científico (técnico) ↔ directores científico-técnicos de la producción material
D	Bajo	lenguaje natural con terminología especializada y sintaxis relativamente libre	Producción material	directores científico-técnicos de la producción material ↔ maestros ↔ trabajadores especializados
E	Muy bajo	lenguaje natural con algunos términos especializados y sintaxis libre	Consumo	representantes del comercio ↔ consumidores ↔ consumidores

**Figure I.7:** Table for the characterisation of specialised texts according to Hoffman’s (1987) vertical and horizontal variation.

Thus, by means of horizontal variation, specialised languages can be classified according to the topics dealt with, whereas vertical variation accounts for the fact that each speciality topic or subject matter can be expressed in texts with different levels of specialisation. Therefore, every level would be determined by the degree of abstraction in which a subject matter is presented and by its cognitive adequacy to the addressee and the communicative situation.

Consequently, one may argue that there are different specialised languages depending on the subject matter dealt with and in the way of dealing with them, thus allowing thematically specialised texts to be produced. Moreover, depending on the degree of abstraction that these contents present, texts can show different levels of specialisation. However, specialised languages usually present common features, that is, a homogeneous and general group of features that justify the generalisation and the proposal of an abstract field called “specialised language” that allows the production of specialised discourse.

### 2.3 Specialised language: why not LSP (in this work)?

Choosing one form or another (for instance, specialised language or LSP) to refer to the linguistic phenomenon analysed here is more important than may be thought at first sight, since in many cases one label or another carries with it or is associated with a different way of conceiving things. However, what is beyond any doubt is the importance granted nowadays to specialised languages and the fundamental role they play in contemporary societies. It is a fact that the number of people (specialists)

devoted to the study, description and application of these languages is increasingly growing and this is mainly due to three facts highlighted by the IULA (2007 c):

- The new role played nowadays by applied linguistics within the frame of general linguistics;
- The social needs regarding plurilingualism;
- The importance given to specialities by current societies.

It is this panorama (so dependent on the linguistic necessities and communicative features of the current world) that has enhanced the study of LSPs and has led to talk about specialised languages, or speciality or special languages. However, many questions have arisen regarding denominations in the field of specialised languages and the only true conclusion in this respect is that:

Con todo, no existe un consenso generalizado ni sobre el uso del término lenguaje aplicado a los recursos usados en situaciones especializadas, ni sobre el contenido del adjetivo especializado, y menos aún, sobre la distinción entre lo general y lo especializado aplicado al lenguaje. (IULA, 2007 c)

The denomination Language for Specific Purposes is nowadays used together with the expression “specialised languages” to refer to the oral and written linguistic resources, as well as those of a non-linguistic nature, used in the different professional domains.

The denomination “language for specific purposes” is basically due to the fact that the aforementioned professional domains include a great variety of expressions and communicative situations in which the use of a series of resources and precise communicative techniques are required. Hence:

La denominación lenguajes para propósitos específicos se usa fundamentalmente en los ámbitos de la enseñanza-aprendizaje de lenguas (...). Más específicamente, lo que se enseña no es una lengua especializada en su totalidad, sino más bien el conjunto de las estrategias comunicativas que el aprendiz podrá utilizar para producir los discursos (orales y escritos) de los diversos contextos socio-profesionales. (IULA, 2007 c)

Thus, as its name implies, LSP deals basically with the teaching of languages oriented towards solving and covering a determined number of linguistic necessities within the different speciality fields that exist.

Hoy en día, la necesidad de enseñar los recursos utilizados en una situación profesional, tanto en lenguas extranjeras como en la lengua propia, ha dado lugar a un número muy importante de cursos de formación. (IULA, 2007 c)

This denomination of LSP responds essentially to the fact that the ultimate purpose of teaching and learning this language for specific purposes is mainly aimed at the acquisition of knowledge about the functioning of specific aspects of the languages of the different specialities on the part of an individual or collective. By so doing, they can learn to act and express themselves in specific situations within a given field and thereby improve their conceptual knowledge of it.

In the specific case of this study, however, even though the phenomenon of specialised language as a whole has also been analysed, we have focused on a very specific, specialised language, namely that of industrial ceramics. This denomination has therefore been preferred to LSP in this work.

#### **2.4 Professional and Academic Language (PAL) / specialised languages: their characterisation**

In the following subsections the key aspects of specialised languages or PAL(s) are analysed in order to provide a comprehensive characterisation of them.

##### **2.4.1 General features**

According to what has been explained hitherto in previous sections and as summarised by Schröder (1991, in Vargas, 2005), the features that best characterise Professional and Academic Language in general or the different specialised languages in particular are:

- they are not defined in opposition to common or general language (GL). They are sublanguages that belong to a specific field of specialised communication and use the communicative and linguistic resources of a specific linguistic and cultural system. They do so depending on the content, the goal and the communicative situation of the text or discourse;

- they are differentiated according to two variables: a) through a horizontal division in which the different specialised discourses are classified depending on the topic being treated; and b) through a vertical division which pays attention to the different levels of communication produced within the frame of a specialised field;
- they are functional languages whose main objective is to make specialised communication as effective as possible;
- they present and undergo variations over time;
- they are not just stylistic variants or terminological subsystems because all the basic features that characterise specialised texts must be considered;
- they include the use of non-linguistic elements in the stage of text formulation, so that the concept of specialised communication would be more precise than the concept of language for specific purposes.

In addition to this, specialised languages present the following traits that allow us to identify and characterise them:

- a) Cuentan con una conceptualización previa bastante controlada;
- b) no suelen admitir (en teoría) nuevas unidades si no están establecidas y conceptualizadas previamente;
- c) no tienen (en teoría) términos polisémicos; la polisemia del léxico común deviene homonimia en el léxico especializado;
- d) la forma escrita de los términos es prioritaria sobre su forma oral;
- e) los términos especializados tienden a tener validez supranacional en muchos casos;
- f) no suelen materializar ni la función emotiva ni la función poética del lenguaje, al menos en el grado en que ocurre en los textos del lenguaje general.

(Cabré, 1993: 131-132)

Hoffman (1985) is the author of a series of studies on the specific linguistic characteristics that differentiate specialised texts from non-specialised ones. With this aim in mind, Hoffman (1985) compiled a large corpus with a huge variety of texts from the main European languages. In this way he identified a series of features

common to all, or at least to a great number of, specialised languages. Regarding the morphosyntactic traits of these specialised languages, Hoffman (1985: 105ff) summarised the results he obtained as follows:

- The verb loses its specific temporal reference and is nearly always given in present, especially in the third person singular;
- Often the verb is in passive form;
- The verb as a lexical category plays a rather secondary role;
- The noun plays an important role;
- Singular forms are given with more frequency than plural ones;
- The adjective appears quite frequently.

With regard to the lexical features of specialised languages, that is to say, to the structure of specialised lexicon, the boundaries between the two (i.e. specialised and non-specialised vocabulary) admit many different interpretations.

However, in spite of possible interpretations or conceptions of specialised languages, what must be kept as a mainstay is that specialised language is not only limited to and characterised by the use of specialised vocabulary, but also by presenting another series of (mainly syntactic and structural) traits at text level. Nevertheless, if there is something that shapes and characterises specialised discourse, it is the lexical dimension of its specialised texts, that is to say, their terminology, as is explained throughout section I.4.

As has already been mentioned, one of the meanings of the adjective “specialised” applied to language has to do with the “different” characteristics that a given language presents with respect or in relation to general language. From all the defining features that specialised languages possess, the most inherent to the very notion of “specialised” is the conceptual control of information (IULA, 2007 c):

El grado de especialización de una materia o de un texto depende de un conjunto de criterios diferentes, pero lo que sí es común a toda producción especializada es la existencia de un control conceptual sobre el contenido. Las personas que poseen un mayor control conceptual son los especialistas de la materia y sus conocimientos se van consolidando a través del discurso que utilizan para comunicarse con otros especialistas y por medio de obras terminológicas creadas para cubrir esas finalidades (glosarios, vocabularios, diccionarios, etc.). En

resumen, el grado de especialización de un tema estará directamente relacionado con la conceptualización establecida por los especialistas de cada ámbito.)

However, there are many other traits that allow the specialised character of a given discourse to be established, and these traits are very often of a linguistic nature.

#### **2.4.2 Definition and general features of the specialised text**

Specialised discourse is normally and advisably given and analysed in the form of specialised texts that are mainly (although not exclusively) characterised by “special” lexical features. Regarding the shaping of specialised languages into specific linguistic instances, that is to say, specialised texts, Hoffmann (1991: 61) defines them as follows:

The LSP text is the instrument and at the same time the result of a communicative activity carried out in connection with a specified professional (e.g. scientific) activity; it consists of a finite, ordered set of pragmatically, semantically and syntactically coherent/cohesive sentences/utterances (textemes) or units equivalent to them, which, being complex language signs, correspond to complex propositions in human thinking and to complex states of affairs in reality. (Hoffmann, 1991: 61)

From Hoffman’s (1991) definition it can be extracted that this kind of texts have a series of specific features of a pragmatic, syntactic and semantic nature that characterise their discourse communities (see section I.7.2) and which give them a specificity within the whole group of texts produced in a language:

- these texts are originated within a situation of communication of specialised knowledge (socio-productive activity);
- they are, at the same time, the tool for undertaking the communication of such specialised knowledge;
- the languages within which specialised texts are produced make use of complex linguistic signs to reflect an objective reality.

Vargas (2005) explains that linguists and, more particularly, terminologists coincide in the view that specialised discourses operate with a particular lexicon

responsible for the “representation of reality” (Alcaraz, 2000). Following Varantola (1986), some linguists consider that the only aspect that deserves attention in the analysis of these discourses is terminology, or the group of specialised words of a given field of knowledge or activity. However,

Tradicionalmente se ha dicho que el léxico es el elemento que permite diferenciar más explícitamente la lengua general de los lenguajes de especialidad y, a su vez, los diferentes lenguajes de especialidad entre sí. No obstante, los rasgos distintivos que presenta un discurso especializado no radican exclusivamente en el uso de un léxico específico, de una terminología propia. Por ello, en la enseñanza de todo lenguaje de especialidad deberían incluirse también otros aspectos relacionados con factores pragmático-comunicativos. (IULA, 2007 c)

Nevertheless, it can be stated that the specific terminology of each speciality field is one of the elements that better “delimits” and differentiates general language from the specialised one in which it is used (Vargas, 2005):

Uno de los puntos que nos permiten establecer diferencias claras entre el lenguaje común y el especializado, como entre los distintos lenguajes especializados entre sí es, (...), el uso de una terminología específica. Podemos afirmar que la terminología desempeña un papel fundamental para caracterizar el lenguaje especializado, y para establecer y clasificar los distintos lenguajes de especialidad. (Cabré, 1993: 166)

Thus, in Alcaraz’s (2000: 42) words, “al vocabulario de las ‘lenguas de especialidad’ se le llama metalenguaje o terminología”, which is what I have intended to analyse in the field of ceramics as the paradigmatic (but not the only) aspect of specialised language.

The degree of specialisation of a text varies depending on various factors and it is therefore not enough to just determine what can be considered to be specialised or not – it is also necessary to ascertain the degree of speciality it displays. Vargas (2005) summarises the criteria established by various authors in order to “measure” the level of specialisation of a text, as illustrated in figure I.8.

Autor /criterios	Criterios	
	Cognitivos/Pragmáticos	Lingüísticos
<b>Hoffmann (1998)</b>	Grado de abstracción	Número de términos
	Ámbito	Número de símbolos
	Participantes en la comunicación	Tipo de sintaxis (+ ó - rígida)
<b>Arntz (1995)</b>	Ámbito	Número de términos
		Complejidad de los términos
		Frecuencia y complejidad de los elementos comunicativos paralingüísticos
<b>Cabré y Doménech (2001)</b>	Perspectiva del tema	Número de palabras que forman parte de una UCE
		Número de UCE diferentes
	Emisor/receptor	Presencia de sinonimia y paráfrasis

**Figure 1.8:** Vargas' (2005: 70) synthesis of different criteria for determining the level of specialisation of texts.

In my opinion, the best way to structure this research and the best approach to deal with these issues is to consider that the system of communication that interlocutors use in a specific field of knowledge includes, on the one hand, the general language (from which syntax, morphology and part of the lexicon are used) and, on the other hand, the subcode that is characteristic of the speciality field as such, which contains the terminology that is specific to that field. In addition to this, a focus on pragmatic issues (an aspect neglected and even forgotten for many years) is also necessary. If terms, as key components of specialised languages, are considered, for Cabré (1993) they are units that appear in combination with one another and with other units from the common language or from a different speciality area, thus constituting the specialised discourse. Apart from presenting a threefold character (formal, conceptual and functional) that makes them part of a grammatical system, terms (which could be defined as the communication units of specialised discourse) are also pragmatic units of communication and reference, and as such they appear in specific discourses

undertaken in specific communication situations and by individuals with different features. This pragmatic perspective is the one which best establishes the differences between common lexicon and terminology to be found in a text. Cabré (1993: 221) refers to the five main features that, in her opinion, allow common lexicon to be differentiated from terminology (see figure I.9):

- La función básica que se propone;
- La temática que tratan;
- Los usuarios;
- Las situaciones comunicativas;
- Los tipos de discurso.

LÉXICO COMÚN		TERMINOLOGÍA	
Función básica	Conativa, emotiva, fática y otras	Función básica	Referencial
Temática	Genérica	Temática	Específica
Usuarios	Generales	Usuarios	Especializados
Situación com.	- Formalizada	Situación com.	+ Formalizada
Discurso	General	Discurso	Profesional y científico

**Figure I.9:** Cabré's (1993: 22) pragmatic factors to distinguish between common lexicon and terminology.

To sum up, one of the main conclusions to the sections we have seen so far is that the boundaries between PAL and general language are not clearly established because, although there are many different features that characterise them, these are not enough to trace a perfectly delimited and neat dividing line (probably because no such line exists). Although I am not going to deal with this phenomenon in depth, this impossibility to delimit the boundaries between a specialised language and general language in an absolute way is made apparent, for instance, on the lexical level, where one may find that the lexical units of a given specialised language or from GL are transferred from one field to another. Although in theory, terminology and general or

common words are quite easily differentiated, in practice these differences are not so clearly established, as the discontinuous lines in figure I.1 showed and as the “intersection theory” between the two defends.

### **2.4.3 The construction of specialised discourse: pragmatic, communicative and discursive aspects**

Because of the communicative approach adopted throughout this research and in its final product – the prospective dictionary – it is important to point out that, in order to have/acquire real cognitive competence and lexical or terminological competence, we need to know the pragmatic variables that may influence every speciality field (IULA, 2007 c). Hence, it is necessary to delve into the aspects presented by each discourse regarding addressees, topics, channels, means, functions, communicative purposes and so on. These aspects are necessary because, as happens in every communicative phenomenon, specialised communication varies with respect to the situation, use and circumstances in which it takes place. All these aspects are important since, according to the Communicative Theory of Terminology, communicative success does not only depend on the correct use of the linguistic resources that define any good specialised discourse but also on the fact that such discourse is pragmatically adequate in the context in which it is given (Cabr , 1999 a).

Thus, in this section the linguistic-discursive aspects that constitute a prototypical specialised discourse have been dealt with. These aspects include:

- It must be conceptually controlled and adapted to the speciality field;
- It must be precise (without ambiguity). A discourse is precise when it conveys knowledge which is also precise and which is the result of a very specific process of conceptualisation of reality, i.e. the one undertaken and validated by consensus among the specialists of a field. In this aspect, the terminology established by specialists plays a fundamental role. Precision has to do with correctness and systematicity and is opposed to the vagueness that could lead to misinterpretations or to cause problems in understanding;

- It must be concise (without redundancy), that is to say, concision is opposed to informative redundancy, or additional information which does not add any content, so that ideas are presented without rhetorical artifices, thus expressing what is relevant and doing so in a straightforward, concise way;
- It must be objective as regards the necessary degree of depersonalisation. Hence, the addresser must try to separate him or herself from what is being said, using all the necessary linguistic resources to achieve this;
- It must be systematic (with a control of denominative variation) and use the most adequate or accurate denominative forms. The degree of denominative variation will depend on the level of specialisation and on the discursive purposes of each text.

Having now broadly characterised specialised discourse, the next section deals with the key aspect of specialised languages that this study focuses on – terminology.

#### **2.4.4 Terminology as the main articulator of specialised discourse**

Obviously, terminology is the most evident, visible and easily “palpable” characteristic of specialised discourses (or, if preferred, of specialised languages or texts). Researchers in the IULA (2007 b) contend that specialised lexicon is a key element that allows the different specialised discourses to be characterised since terms are, on most occasions, the best way to identify a speciality area or to distinguish among different domains:

A su vez, la enseñanza y aprendizaje de la terminología de una especialidad es la garantía del aprendizaje del conocimiento especializado, ya que los términos representan conceptos y la adquisición de los conceptos clave de una materia supone, a la larga, el dominio (total o parcial) de dicha materia.

Going a little bit deeper into this topic, it can be said that terminology is a fundamental element in the study of specialised languages, that is to say, a key issue

for the characterisation of specialised discourse, and there are three main reasons for this:

- 1) Terms are perfectly delimited by a community of specialists, who are the people communicating and producing the discourses of a speciality field.
- 2) Terms are the units that best concentrate specialised knowledge and the ones that best represent and transfer the concepts (the content) of a speciality.
- 3) From a semantic and conceptual point of view, terms are the linguistic elements that best guarantee the precision required in every specialised communication, that is, the exchange of knowledge among the members of a professional community, no matter what their source language may be.

Hence, as can be deduced, not only does terminology guarantee the acquisition of knowledge and the concepts of the speciality field, but it also plays a crucial role in the transfer of knowledge and in the discursive productions of the speciality:

Los términos desempeñan un papel importante en la representación y transferencia de conocimiento especializado en un texto o en un discurso porque constituyen nudos sintéticos de contenido especializado. (IULA, 2007 b)

However, to gain a correct understanding of the cognitive structure of a text or the functioning of terminology, it is not enough to study terms in isolation. This is the reason why three important aspects must be included in the study of terminology:

- 1) The conceptual relations existing between the terminological units.

In terminology, it is important to account for not only isolated terms but for the structure and conceptual relations among them. This is useful because in real communication, that is, in a text or discourse from a speciality area, terms (understood as cognitive knots) are linked by different relations which make them form an interrelated cognitive whole.

As explained in section II.2.3, these relations have been established for the prospective dictionary of industrial ceramics by creating the field diagram of the domain.

- 2) The morphological aspects of terminological units.

Las unidades terminológicas presentan diferentes estructuras que corresponden a determinados procesos de formación morfológica: las composiciones cultas en medicina, cierto tipo de sufijación en química, etc. Buena prueba de ello son términos como hepatitis, serología, nitrato, sulfúrico, etc. (IULA, 2007 b)

This aspect is particularly interesting in this work if we consider that the user of the dictionary may benefit from it and more easily understand the semantics of many terminological units as well as use this morphological knowledge in the future for the semantic decoding of new terms (neologisms), especially in a constantly changing and evolving field like the one considered here.

### 3) Syntactic combinatorial aspects of the terminological units.

As happens with general language, in speciality contexts there are phenomena involving the restricted combination of lexical units (IULA, 2007 b). Hence, although it is often not impossible to decode the meaning of the combination from the sum of the meanings of its components, a non-specialist is frequently unaware of the units that must be used within the specialised discourse to express a given meaning. Closely related to this is the notion of collocation – a key aspect in the dictionary entries presented here and dealt with in greater depth in section I.6.4.5.3.

Si decimos "el azúcar se ha quemado" sabemos a qué experiencia nos referimos. Pero, en cambio, la frase no es correcta desde un punto de vista científico, porque deberíamos decir que el azúcar se ha descompuesto. Pero si decimos. "¡Descomponed el azúcar!" nadie sabrá qué ha de hacer. La primera expresión corresponde a una experiencia y se vincula a una acción: es significativa, aunque sea incorrecta; la segunda sólo tendría significado en el marco de una teoría química, que aún no se conoce. (Izquierdo, 2001: 71)

Another key aspect for the correct understanding and use of terminology is what has been called in studies on the didactics of specialised languages “subtechnical lexicon”, which is opposed to purely technical lexicon in the sense that the latter is the exclusive lexicon of each specialised discourse. In fact, the best way to understand the phenomenon of subtechnical lexicon is to acknowledge that each field has a terminology that is exclusive of it and a terminology which is shared with other specialities or with general language.

(...) en la didáctica de las lenguas extranjeras con fines específicos parece existir la creencia generalizada de que la enseñanza necesita dedicar más tiempo al llamado léxico subtécnico que al léxico técnico mismo, éste último siendo considerado como monosémico y universal. (Vangehuchten, 2003: 18)

In the next section, the approach used for the retrieval of terminological units, that is, to extract the technical and subtechnical vocabulary which is to become the entries in the dictionary, is explained.



*Knowledge of the world is only to be  
acquired in the world, and not in a closet.*

**Lord Chesterfield**

### **3. CORPUS LINGUISTICS**

#### **3.1 Corpus linguistics: an empirical approach to the description and analysis of language in use**

Every science aiming at the formulation and rejection or corroboration of hypotheses to account for certain aspects of reality must be strongly based on the data that this same reality offers. This kind of data are commonly known in natural sciences as empirical data and in spite of their (at least apparently) more scientific nature, human sciences can also take them as their foundation. These empirical data come from and reflect the aspect of reality they are trying to describe, thus making the validation or the rejection of hypotheses possible. In this light, it seems coherent to think that those studies – like this one – aimed at explaining or showing a portion of reality are better undertaken if they set out from empirical data which reflect and form part of this very same reality. Therefore, linguistics needs elements of true reference as much as natural sciences do in order to provide a real and realistic view of language and to confirm hypotheses about language, its use and also to show its behaviour in context.

In order to progressively delve into this issue, I have first introduced the theoretical hints necessary to understand the way this study has been approached as a whole from corpus linguistics. Corpus linguistics is a discipline whose importance and influence in linguistic studies is constantly increasing and developing nowadays. Its use is being extended to a wide range of linguistic disciplines and it is characterised by two basic aspects (Vargas, 2005): a) the aforementioned empirical study of language in use with the aim of describing it, and b) the use of a computer for data storage and analysis, as explained in detail in section I.3.2.3.

In the specific case of this study, the main aim is to identify and characterise the terms that form and shape the speciality field of the ceramic industrial district and to present them taking into account their communicative dimension of use (pragmatic

aspects and real contexts), which only a corpus can provide us with, in order to determine all the terminological features that must be known for effective, accurate and proper communication in this speciality field. The corpus used in this study has allowed us to identify the terms belonging to the speciality domain analysed, and also to detect their frequencies of use, their most characteristic collocations and the way in which these specialised lexical units or terminological units<sup>11</sup> are used in real communication and shape the speciality field of industrial ceramics.

Consequently, the decision to adopt a corpus-based approach in this study instead of another approach to linguistic analysis was mainly due to the scope and reliability of the analyses that corpus-linguistics offers because of its intrinsic characteristics, which were specified by Biber, Conrad and Reppen (1998) as the fact that:

- it uses a large and principled collection of natural texts (the “corpus”), as the basis for the analysis;
- it is empirical, so that it allows the analysis of the actual patterns of language use in these natural texts;
- it makes extensive use of computers for analysis, using both automatic and interactive techniques that facilitate and make the work more reliable;
- it depends on both quantitative and qualitative analytical techniques.

Terminology benefits greatly from the use of linguistic corpora since a corpus is conceived as a more powerful methodology from the point of view of the scientific method, because it is open to objective verification of results (Leech, 1992). Hence, terminology (but even more specifically its practical activity, terminography) benefits from the information that a corpus may provide when it comes to elaborating terminographical applications like dictionaries. Thanks to the use of corpora, the task of discovering neologisms or words with a low frequency of use, observing the different meanings a lexical form may have, detecting collocations or patterns and obtaining real examples of use, is easier and much more feasible and reliable.

What can be deduced from previous information is that there is a constant necessity to work with authentic texts that allow the terminographer to study the real

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<sup>11</sup> Also called UCE (*Unidad de Conocimiento Especializado*) in Cabré and Estopà's (2002) terms and USK (Unit of Specialised Knowledge) in my adaptation of their denomination.

use made of language both in oral and written discourse, especially if we consider the increasing influence and importance granted to contextual and pragmatic factors in current linguistic studies. However, as is explained in subsequent sections, although the statistical and empirical analysis of the language had started even before the 1950s and had to go through many upheavals until it could continue to spread and grow, with the astonishing developments in computer science, it is living its “golden age”. Thanks to this positive evolution, the management of the data contained in corpora has become a more feasible task, from which very significant results can be obtained. In this way, although technological advancements have substantially changed for the better the way of approaching corpus linguistics and the benefits coming directly from it (statistical and empirical analysis of the language), it can be stated that the essence of this kind of research remains faithful to that with which it started more than half a century ago.

This tendency of analysing language in context was originated in the views of authors prior to the advent of corpus linguistics as such. Firth (1935: 38), for instance, put forward the notion that data had to be extracted from “speech sequences operating in contexts of situation which are typical, recurrent, and repeatedly observable”. Nearly 60 years later and in the same way, Stubbs (1993: 2) added certain elements to this statement and systematised it in a principle (the second one of the eight he proposes): “Language should be studied in actual, attested, authentic instances of use, not as intuitive, invented, isolated sentences”.

This second principle leads easily onto the third of Stubbs’s (1993:3) principles, which states that “the unit of study must be the whole text”. As is observed throughout section 6, all these principles and views on which corpus linguistics is grounded are directly related with the conception and elaboration of active dictionaries like the one we have intended to develop in this study.

However, like almost any discipline or approach, corpus linguistics is not an instance of universal agreement and has also encountered “enemies” who have proclaimed its lacks and failures, Chomsky (1964, 1965 and 1968) being the most salient opponent to early corpus linguistics.

Nevertheless, in spite of Chomsky’s reservations, experience shows every day that using samples of the actual language employed in naturally occurring texts is highly beneficial, in the specific case of this study, for determining the kind of linguistic-terminological needs of the prospective users of the specialised dictionary of

ceramics terminology, and therefore for selecting the terms to be included in it and the way of presenting them. This can also be coherently associated with the aim of creating an active dictionary intended at providing the user with all the information necessary in real-world communication, emphasising not so much other more theoretical aspects but those more directly related with real and true users' demands:

Corpus-linguistics shows how an analysis of language use goes beyond traditional grammatical description to ask why the language should have multiple structures that are so similar in their grammatical function and meaning. Until recently many investigations of language use were either unfeasible or simply impossible. The corpus-based approach, however, provides a means of handling large amounts of language and keeping track of many contextual factors at the same time. It therefore has opened the way to a multitude of new investigations of language use. (Biber, Conrad and Reppen, 1998: 3)

Corpus linguistics is thus presented in this study as the best way to determine language use and to create tools (like the prospective dictionary of ceramics terminology) that make effective communication possible even in highly specialised contexts like the one under study. Despite this, it is not a simple task, since large amounts of language collected from many sources have had to be analysed in order to make sure that conclusions were not wrongly based on the idiosyncrasies of just a few speakers. This is probably the most important strength and, at the same time, the most difficult-to-avoid weakness in corpus linguistics. Comprehensive studies of use require the empirical analysis of large databases extracted from authentic texts (like the ones a corpus-based approach offers) since comprehensive studies of use cannot rely on intuition, anecdotal evidence or small samples. In this respect, in the section devoted to criteria for corpus design (section I.6.4.2.1) the aspects considered for selecting a representative corpus of the field of ceramics have been specified.

There are many areas of linguistics that can be addressed with the corpus-based approach. In the particular case of specialised lexicography (or terminography), and more specifically for “specialised dictionary makers”, this approach makes it possible to examine the linguistic and non-linguistic associations of a given word as well as to include information about the most common uses, frequency of related words, collocates/collocations-phraseological units, and the contexts in which words and meanings are most commonly found. In addition to this, grammatical structures can also be analysed from the perspective of their use by means of corpus-based techniques. The enormous development this has represented in modern lexicography

can be easily understood if we think about the past, in which “dictionary makers” generally limited, or had to limit, their task to identifying the possible meanings of a word. In order to better illustrate these facts, part of the information that can be obtained from the analysis of the corpus this study is based on is explained in more detail in the method and results section (sections II and III, respectively).

### **3.2 A historical overview on the evolution of language study: the rise of corpus linguistics**

The first time the term *corpus linguistics* as such appears in the linguistic arena was during the 1980s, after the first generation of electronic<sup>12</sup> corpora. This term aims to cover a new approach in linguistics, i.e. the study of large quantities of text through computer tools. As Leech (1992: 105) puts it:

The term “corpus linguistics” made only occasional appearances until the publication of a book of that title [Corpus Linguistics: recent Developments in the Use of Computer Corpora in English Language Research] edited by Aarts and Meijs (1984).

In a brief and simple way, Corpus Linguistics refers to those linguistic studies that are mainly based on the analysis of textual corpora (Pérez, 2002), but this definition lacks certain aspects that can be successfully completed with the help of other authors’ definitions. According to Sinclair (1991: 171), “(...) a corpus is a collection of naturally-occurring language text, chosen to characterise a state or variety of a language”. Some years later, Sinclair (1996: 4) offered another definition of corpus which constitutes a step forward in the conception of this discipline: “a collection of pieces of language that are selected and ordered according to explicit linguistic criteria in order to be used as a sample of the language”. However, these definitions still lack certain aspects underlying the work undertaken within corpus linguistics nowadays, something that Sanchez’s (1995) definition of corpus completes with the inclusion of the computer component:

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<sup>12</sup> The adjective “electronic” is not really necessary nowadays for referring to or to make explicit this characteristic of a corpus since it is implicit in the modern concept of corpus. However, it should be borne in mind that “electronic” means “computerised”.

Un corpus lingüístico es un conjunto de datos lingüísticos (pertenecientes al uso oral o escrito de la lengua, o ambos) sistematizados según determinados criterios suficientemente extensos en amplitud y profundidad de manera que sean representativos del total del uso lingüístico o de algunos de sus ámbitos, y dispuestos de tal modo que puedan ser procesados mediante ordenador con el fin de obtener resultados varios y útiles para la descripción y el análisis. (Sánchez *et al.*, 1995: 8-9)

Indeed, the technological dimension of corpora nowadays cannot be forgotten in the definition of corpus. In fact, working with large corpora (some of which can reach several million words) using only manual methods is an altogether unrealistic feat today. In this sense, Hunston (2002: 2) also adds a technological dimension to the traditional concept of corpus and affirms that corpora are “collections of texts (or parts of texts) that are stored and accessed electronically”.

In spite of this, the second definition of corpus provided by Sinclair (1996) above can be considered to be the official one, since it has been adopted by EAGLES (European Advisory Group on Language Engineering Standard). In broad terms (leaving aside the fact that it does not include the computer element) Sinclair’s (1996) definition is highly representative and complete, since it contains some fundamental aspects that must be included in any definition of corpus for it to be a complete and comprehensive one. Two of these essential features are the fact that the texts that form part of a corpus must belong to real situations (pieces of real discourse and consequently containing real language) and their inclusion in the corpus must be determined by a series of explicit linguistic criteria aimed at ensuring that these texts can be used as representative samples of a language. Nevertheless, in spite of the benefits that corpus linguistics presents at first sight, it is also true that its way through history has not been as easy as might be thought. In the following subsections a global view of the evolution of corpus linguistics has been provided in order to better understand the current (rather privileged, I would say) situation of corpus linguistics. Corpus linguistics has evolved in three different stages, in each of which its role has also been radically different: early corpus linguistics, the advent of its main critic, Noam Chomsky, and a revival era closely related to ICT<sup>13</sup> whose plenitude has been reached nowadays with the huge number of possibilities offered for the exploitation of corpora.

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<sup>13</sup> Information and Communication Technologies (ICT); in Spanish TIC (Tecnologías de la Información y la Comunicación).

### 3.2.1 Early corpus linguistics

“Early corpus linguistics” is the term used by McEnery and Wilson (2001) to describe these linguistic studies before the advent of Chomsky, that is to say, corpus-based studies prior to 1950.

The idea of using real examples and studying the language in context is not new at all. Lexicographers, for instance, have been gathering textual quotations for a long time and, already in the 1950s, linguists like Jespersen or Harris in America openly supported this way of approaching the study of a language. Even earlier, field linguists like Boas (1940), who studied American-Indian languages, and later linguists from the structuralist tradition used a corpus-based methodology (McEnery and Wilson, 2001), although the term “corpus linguistics” as such was not yet used at the time. However, the first works that originated what is known nowadays as corpus linguistics as such were those of Firth (1935) in Great Britain, followed by those undertaken by his disciples Halliday and Sinclair. Firth (1935) was first influenced by the work of the English ethnologist Malinowski (1923), who observed through his studies how language could not be understood outside the culture and the social context of the statement. This observation originated the appearance of the term *context of situation*<sup>14</sup>, which, in Firth’s (1935: 37) words, is the means through which meaning is achieved: “the complete meaning of a word is always contextual, and no study of meaning apart from a complete context can be taken seriously”.

In order to show a wider and more complete panorama of early corpus linguistics I have considered it interesting to also provide a brief overview of some other interesting and specific investigations in the arena of corpus-based studies predating 1950. Significantly, language acquisition in children, for instance, was roughly studied back in the years between 1876 and 1926 through the analysis of carefully compiled and composed parental diaries which gathered and recorded children’s locutions. Even nowadays, things have not changed that much in this respect and it is not strange to find diary studies for language acquisition research. In this way, these “primitive corpora” can be said to constitute the genesis of corpus studies applied to, for instance, acquisitional issues, such as the ones undertaken by Ingram (1978). In this same field,

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<sup>14</sup> This term refers to “the environment of the text” (Halliday and Hassan, 1985: 5) and is the leitmotiv of the COBUILD dictionaries.

after this period of diary studies, corpora compilation and collection diversified giving way to the appearance of large sample studies, mainly in the period between 1927 and 1957, in which corpora were collected from a large number of children with the aim of contributing to language acquisition research by establishing norms of development.

Another interesting corpus-based study predating 1950 was that dealing with spelling conventions, in which Kading (1897) made use of an 11-million-word corpus of German to “collocate frequency distributions of letters and sequences of letters in German” (McEnery and Wilson, 2001). If we consider the technical media available at the time, the size of the corpus is impressive (it is a really large and impressive corpus even nowadays) and is not far at all from modern corpora in terms of size.

The field of foreign language pedagogy was also studied by means of corpus-based studies. Linguists such as Fries and Traver (1940) and Bongers (1947) used corpora with such aims in mind. In fact, as Kennedy (1992) noted, the link between corpus and second language pedagogy in the early half of the 20<sup>th</sup> century was so strong that vocabulary lists for foreign learners were often extracted or derived from corpora. However, these issues regarding the wide use of corpora in different language studies are dealt with in more detail in section I.3.4.

### **3.2.2 Corpus linguistics questioned: the advent of Noam Chomsky**

If “early corpus linguistics” is the term used to refer to this linguistic discipline before the advent of Noam Chomsky, the key question is why and how this author constituted such a turning point in linguistics at the time. This was so mainly because he changed the empirical direction linguistics was adopting with early corpus linguistics towards what has been called “rationalism”. He was the main precursor of this change which, moreover and surprisingly, was undertaken in a relatively short period of time and in which he invalidated and denied the action and value of corpus linguistics as a reliable source for extracting linguistic evidence and making linguistic enquiries. Hence, although corpus linguistics was becoming increasingly accepted and used in early corpus linguistics, that is to say, before the advent of Chomsky, it is a fact that it experimented a period (in the 60s and 70s) in which this acceptance was not so because at that time the linguistics defended by Chomsky was the preferred trend in the linguistic panorama.

Therefore, Noam Chomsky, the main representative of Generativism, was the linguist who spoke out most strongly against the use of textual corpora in linguistic research and the one who endangered its development and prevalence the most. The main reason he alleged for introducing such a radical change in the evolution that linguistics was experimenting was that, according to his views, the corpus could never be a useful tool for the linguist since the linguist must seek to model language competence rather than performance (Chomsky, 1965 in McEnery and Wilson, 2001).

In order to understand better the multiple shortcomings Chomsky found in corpus linguistics, it may be necessary to make explicit what is meant by “competence” and “performance”. Competence can be described as the tacit, internalised knowledge of a language a speaker has, whereas “performance” is considered to be the “material”, external evidence of such competence and the usage made of it on particular occasions when factors other than linguistic ones may affect its forms. For Chomsky (1965), competence is the key factor for explaining, characterising and, hence, analysing a speaker’s knowledge of a language, whereas performance is just a minor issue to consider, a poor aspect of language if compared with the potential offered by competence. Thus, the main and initial criticism Chomsky exerted over corpus linguistics was on the basis that “a corpus is by its very nature a collection of externalised utterances – it is performance data and is therefore a poor guide for modelling linguistic competence” (Chomsky, 1965 in McEnery and Wilson, 2001) and this is so because there are many factors that can alter the way we speak (performance) on any particular occasion, i.e. speaking after drinking too much.

Chomsky made further criticisms on the work of early corpus linguistics on the basis of two fundamental, although flawed, assumptions, i.e. for early corpus linguists, the sentences of a natural language were finite and could be collected and enumerated.

Hence, in its early years “linguists ... regarded the corpus as the sole explicandum of linguistics” (Leech, 1991 in McEnery and Wilson, 2001), thus considering such a corpus as the unique source of evidence for a new linguistic theory, Chomsky claimed that the number of sentences in a natural language is not just and merely arbitrarily large, but potentially infinite since the total number of combinatorial choices (both lexical and syntactic) to be made when producing a sentence allow the creation of an infinite number of them. Hence, early generativist trends departed from the idea that the number of statements of a language is non-finite, so that the existence

of a finite data repertoire that was adequate enough to explain all the mechanisms of linguistic production was not possible. In Chomsky's (1965: 4) words "linguistic theory is mentalistic, since it is concerned with discovering the mental reality underlying actual behaviour". In this way, a rationalist approach with an introspective basis was preferred, according to which an ideal speaker with a linguistic competence that allows him/her to produce statements in his/her language was the best way to describe language. Following Vargas (2005), for Chomsky (1965), the object of study of linguistic investigation is the "underlying mental reality" (Alcaraz, 1990: 90) and so he does not give any importance to observation, invalidating the corpus as a source of true data in linguistic research. In Chomsky's (1965) view, the linguist must aim at the creation of theoretical models that explain linguistic competence, not performance (contrary to what Halliday and Sinclair propose).

However, it would not be fair either to oversimplify the issue by stating as a general claim that every single linguist working with corpus linguistics agreed with the two flawed statements commented above. Although Harris (1951) is probably the most characteristic defender of these views of early corpus linguistics, according to which the sentences in a natural language had a finite nature that meant they could be collected and enumerated, other linguists like Hockett (1948) suggested that "the purpose of the linguist working in the structuralist tradition "is not simply to account for utterances which comprise his corpus" but rather to "account for utterances which are not in his corpus at a given time" (Leech, 1991 in McEnery and Wilson, 2001).

In this sense, Chomsky's criticism to early corpus linguistics is coherent and well-grounded since a number of linguistic phenomena corroborate the non-finite nature of language: centre embedding, for instance can give rise to an infinite number of sentences of this sort: "the child that killed the bird that ate the fly that saw the cat...". Accordingly and in Chomsky's views, the only way to provide a complete account for the grammar of a language is through the description of its rules, which in the case of syntactic ones are considered to be finite by Chomsky even when they can and in fact do give way to an infinite number of sentences.

In addition to this, Chomsky also put forward the disregarded value assigned to introspection as another of its main criticisms to corpus linguistics. Chomsky based such criticism on a fact as simple as: if our finite corpus does not contain the sentence *he shines Tony books*, on what basis can we conclude that it is ungrammatical if, in

addition, there may be sentences in the corpus such as *he gives Tony books, he lends Tony books* or *he owes Tony books*, which suggest that it is grammatically correct and acceptable? (McEnery and Wilson, 2001). Hence, although early corpus linguistics denied its use, introspection seems to be the best way to get to grips with cases of this nature. Even in the case of a common linguistic phenomenon like ambiguity, the most successful way to disambiguate misleading structures seems to be not only the observation of physical form but the consideration of introspective judgements and knowledge (the terminologist’s intuition is a key factor for term extraction and analysis). McEnery and Wilson (2001) propose the following example containing ambiguous structures in order to illustrate how it is only through introspection (speakers’ reflections and intuitions of the language) that we know that Fido is the name of a dog so that it is Fido the one eating the dog food and Tony the one who reads the book:

*Tony and Fido sat down – he read a book of recipes*  
*Tony and Fido sat down – he ate a can of dog food*

Hence, for Chomsky, at times the very same intuition the speakers of a language possess can save time and work, making it unnecessary to search in a corpus if we delve into our own linguistic competence.

Apart from the aspects earlier, there are some other aspects of corpus linguistics that have also been criticised: its probabilistic view of language, the technique used and the status of corpus linguistics as an independent discipline or as a methodology. At this point, in order to provide a brief summary on the main points that have been mentioned to distinguish between Corpus Linguistics and Generativism, Vargas’ (2005) summary on the topic has been included in figure I.10:

	<b>Corpus Linguistics</b>	<b>Generativism</b>
<b>Method</b>	EMPIRICISM	RATIONALISM
<b>Linguistic data</b>	CORPUS	INTUITION
<b>Object of study</b>	PERFORMANCE	COMPETENCE

**Figure I.10:** Adapted from Vargas (2005). *Basic differences between Corpus Linguistics and Generativism.*

Taking up again what has already been mentioned at the beginning of this section, on the one hand, Corpus Linguistics uses an empiricist method consisting in the construction of knowledge through experience. From a linguistic point of view, this implies giving prevalence to the observation of the linguistic data in real-use situations, these data being gathered in the form of a corpus. On the other hand, however, Generativism imposes rationalism as the method that should lead scientific investigations related to language. This rationalism claims that knowledge comes from principles established *a priori*. According to this paradigm, language is observed through the “intuitive and introspective” judgements (Alcaraz, 1990) of the researcher, who, at the same time, will be the one in charge of explaining the linguistic intuitions that every speaker has about his/her language (Levin, 1963).

In spite of the prominent role played by Chomsky against corpus linguistics, which led him to be considered as the “architect” of the crisis it suffered at the time, there were other linguists who also showed their rejection of it. Although Chomsky’s criticisms were more theoretical, there were also problems of the practicality of corpus linguistics, which linguists like Abercrombie (1963) summarised with the definition of the corpus-based approach as a sum of “pseudo-procedures”. In order to understand this criticism better, McEnery and Wilson (2001) ask their readers to imagine searching through Kading’s (1879) 11-million-word corpus with the sole help of their eyes. Obviously, analysing an 11-million-word corpus with purely human means is prohibitively time-consuming and exhausting, as well as error-prone and expensive, so that Abercrombie’s criticism seems to have a sensible and coherent basis after all. It is a fact that early corpus linguistics required a series of data processing abilities which, although available nowadays thanks to technology, did not exist at that time.

Consequently, the impact these criticisms made on corpus-linguistics inflicted such an influential, immediate and profound “wound” that corpus linguistics was almost abandoned in the 1950s, though it never completely disappeared or died.

### **3.2.3 The revival of corpus linguistics: Chomsky questioned and the fundamental role of computer technology in corpus analysis**

In spite of the harmful repercussion Chomsky’s criticisms had on corpus linguistics, not all corpus-based work stopped with Chomsky’s advent. In fields such

as language acquisition the gathering and observation of naturally occurring evidence remained the dominant approach to the field since, obviously, in the case of children who were just a few months old, it would be almost impossible to make them express their introspective judgements to the linguist/psychologist; according to McEnery and Wilson (2001) “introspective judgements are only available to us when our meta-linguistic awareness has developed”, which is not the case with small children. In the case of phonetics, naturally observed data were also the dominant source of evidence ahead of introspections of any kind. In this sense it is also significant that even Chomsky (1964) recognised the importance of performance data as a source of evidence for language acquisition studies.

Hence, introspective data also present weak points, which make the benefits that Chomsky claimed so strongly for (in detriment of corpus data) not so crystal-clear. Thus, following McEnery and Wilson (2001), Chomsky’s proposal of introspective data prevalence was not ideal either since:

- 1) Naturally occurring data is observable and verifiable by everyone. Introspective judgements are unobservable, and therefore much more difficult to verify.
- 2) Introspective data is artificial. Sampson (1992) argues that the type of sentence analysed by the introspective linguist is a long way from the type of evidence we tend to see typically occurring in a corpus. By artificially manipulating the informant, we artificially manipulate the data itself.
- 3) Human beings have only the vaguest notion of the frequency of a construct or a word. Corpora are sources of quantitative information beyond compare. However, frequency-based data is not available via introspective means.

In this light, the benefits of corpus data started to become clearer again and corpus linguistics re-emerged with renewed strength and fewer flaws. In this regard:

1. A corpus is open to the objective verification of results, which makes it a more powerful methodology, especially from the point of view of the scientific method (Leech 1992).
2. Contrary to what Chomsky argued – that is to say, that language production (performance) was a poor reflection of language competence – Labov (1969) pointed out the grammatical character of the majority of utterances in all contexts. As McEnery and Wilson (2001) put it, “we are not saying that all

sentences in a corpus are grammatically acceptable, but it seems probable that Chomsky's (1968: 88) claim that performance data is 'degenerate' is an exaggeration".

3. In spite of Chomsky's rejection, quantitative data has proved to be useful to linguistics. Many studies undertaken years ago such as Svartvik's (1996) study of passivisation already relied on quantitative data extracted from corpora.
4. Although Abercrombie's appreciation on the time-consuming, expensive and error-prone nature of corpus linguistics was quite realistic in early corpus linguistics, this is no longer so thanks to the technological development the field has undergone in recent times. Nowadays, the advancement of computer science has given way to powerful computer aids and software capable of carrying out work with no errors and processing large corpora in just a few seconds.

Hence, although it must be acknowledged that early corpus linguistics presented many failures and shortcomings that led to its being questioned by authors like Chomsky, it is also true that many of Chomsky's appreciations can also be tinged and questioned.

Chomsky's impact on linguistics has been enormous and the harmful influence his views had on corpus linguistics is undeniable. However, as has been stated at the beginning of this section, corpus linguistics was never entirely abandoned in the 1950s (and neither did it suddenly and spontaneously re-appear in the 1980s – it was more of a process). There were a series of important pioneer corpus linguists who went on with their research during the "Chomskian influx years"; Quirk (1960), for example, started his ambitious Survey of English Usage (SEU) in 1961 and in that same year Francis and Kucera began to work (the process took them 20 years) on the famous Brown Corpus. The same happened with the already-mentioned work undertaken by Svartvik in 1975, the purpose of which was to construct the London-Lund corpus. Hence, although these linguists and their corpus-based works were in a minority situation at the time (the approach used for undertaking their research being almost an exception), it is also true that they never let corpus linguistics completely disappear and thanks to

them, and to others who followed their lead afterwards, corpus linguistics managed to revive in subsequent years.

Despite this, the “boom” experimented by corpus linguistics has been relatively recent and mainly caused by the technological advancements experimented by computer science, which can be considered the mainstay of corpus linguistics: “the availability of the computerised corpus and the wider availability of institutional and private computing facilities do seem to have provided a spur to the revival of corpus linguistics” (McEnery and Wilson, 2001).

In the late 70s and early 80s, personal computers became a relatively easy-access tool and it was then that the use of corpora, together with computer tools for their processing and exploitation, merged and began to develop towards the boom we know today. This new technological context made an important contribution to the revival of corpus linguistics after the Generativists’ attacks, since “the resurgence of corpus linguistics can be measured in terms of the increasing power of computers and of the exponentially increasing size of corpora” (Leech, 1991: 9-10).

Therefore, corpus linguistics is directly and intrinsically connected with computer technology and benefits from its development and evolution, especially due to the large amounts of data to be dealt with, which would be difficult if not impossible to handle with only traditional/manual methods.

Looking into this in more detail, the connection between computers and the compilation and creation of large corpora has been a key element for overcoming some of the theoretical and practical criticism targeted towards corpus linguistics. This link has even originated the already mentioned fact that nowadays the term “corpus linguistics” implicitly or explicitly contains the characteristic of being computer-readable as a defining trait. In this respect, it would be enough to mention again Hunston’s (2002) or Sánchez’s (1995) definitions of the concept of corpus (see section I.3.2), which incorporate a technological dimension that makes of corpora collections of texts (or parts of texts) that are stored and accessed electronically.

Regarding the general contributions of computer science to corpus linguistics in general and to the methodology used in this research in particular, it is important to highlight the influence and advantages with which it contributes to almost any stage in the compilation and management of terminologies. The automatic analysis of texts and the possibility of dealing effectively with huge amounts of information have changed

the basis of terminological compilation and terminographical analysis for the better. Hence, the possibility of analysing huge amounts of data has also modified the conception and management of terminological work. In fact, computer science offers resources and tools that make the most repetitive tasks (data search, retrieval and treatment, etc.) much easier, quicker, and even more accurate in almost every stage of a terminological work, but this has been dealt with in more detail in section I.5.2, devoted to *terminotics*.

Electronic corpora have thus become an essential means for the investigation of the structure of the language in use, for proving linguistic hypotheses, for knowing the different meanings that words acquire depending on the context in which they appear, and for developing technologies for the processing of natural language (Vargas, 2005).

Accordingly, one of the characteristics of modern corpus-based analysis is its extensive use of computers for undertaking such analyses; several of the advantages of this approach stem from the fact that this use of computers allows the linguistic researcher to quickly identify and analyse complex patterns of language use, while at the same time allowing an impressive amount of data storage. Apart from this, computers can also be used interactively, allowing the human specialist to make difficult linguistic judgements or to make decisions while the computer saves the data. Moreover, computers provide reliable and consistent analyses that are not affected by human traits such as changing one's mind or getting tired.

Nowadays, an empirical approach to language would be unfeasible in its wider instances without the technological developments that allow the creation and exploitation of increasingly extensive and complex corpora. Therefore, in this work, the kind of corpus used was, according to Rafel and Soler (2003: 41), an automated corpus: “un corpus automatizado (o informatizado) es aquel que se ha codificado de manera estándar y homogénea para diferentes tareas de recuperación de la información”.

The corpora used before computers were introduced were limited by a series of circumstances arising directly from the manual treatment of the information, namely, the lack of systematicity in the treatment of information, the participation of non-specialists in the tasks of corpus constitution (resulting in errors of analysis and classification of the linguistic data) and the use of intuitive criteria. However,

La utilización del ordenador permite una mayor sistematicidad en el tratamiento de grandes volúmenes de datos, de manera que no es necesario recurrir a ciertos tratamientos manuales ni a la aplicación de criterios intuitivos que pueden desviar o enmascarar los datos que se desean estudiar.

La introducción de los medios informáticos en la constitución, el procesamiento y la explotación de corpus ha permitido tratar grandes volúmenes de información de una manera sistemática y objetiva, sin la intervención de factores externos que no tienen que formar parte de la investigación, como por ejemplo la intuición del lingüista.

(Rafel and Soler 2003: 47)

Consequently, “whatever philosophical advantages we may eventually see in a corpus, it is the computer which allows us to exploit corpora on a large scale with speed and accuracy” (McEnery and Wilson, 2001).

As has already been mentioned and as is explained in detail in subsequent sections, nowadays, the term *corpus* is almost a synonym of the term “electronic corpus” or “computer-readable corpus”. Such a quasi-equivalent relationship is mainly due to the crucial role played by computer technology for corpora processing and analysis nowadays. In comparison to a human being, the time and effort a computer needs to carry out various processes at the same time are almost negligible if compared with humans. Hence, this machine-readable feature assigned to corpora nowadays is basically due to what has been called the “marriage of machine and corpus”, which allows the user to search for any word in the corpus, to retrieve all the examples of such a word in just a second and to explore thousands or millions of words easily, quickly and successfully. Machines can also perform difficult calculations, display the data in different and diverse forms which may be adapted to the kind of research undertaken, they can sort data according to certain parameters or filters and they may arrange the data alphabetically or according to frequency parameters. Moreover, thanks to them, we can analyse words in their naturally occurring environments (contexts of use) in the form of concordance lines, which make it much easier to analyse collocates.

All the things enumerated above can be achieved easily thanks to powerful computers and adequate software. The specific software and the method used in this study for the exploitation of the corpus (with specialised lexicographical objectives) are explained in detail in section II of this work.

### 3.3 Corpus defining traits and types of corpora

The notion of corpus<sup>15</sup> runs the risk of being confused with the examination of single texts. This is so because any collection of more than one text can, in principle at least and according to early corpus linguistics, be considered a corpus. However, nowadays, when we are immersed in modern linguistics, the term corpus has evolved and added certain features and connotations to the more simple definition of “a collection of texts” as has already been explained in section I.3.2. There are four basic features inherent to the concept of corpus in modern corpus linguistics. These defining traits of modern corpus linguistics are, according to McEnery and Wilson (2001): sampling and representativeness, finite size, machine-readable form and a standard reference.

According to Ahmad and Davies (1992: 22):

A corpus-based approach enables the terminologist to identify, study and record terms in their natural habitat, and translators, as users of the term bank, to have customised access to a full set of information about all the terms and related terminological data of a domain.

However, before starting to use any corpus, linguists must be aware of the importance of designing a good corpus that constitutes a smaller but representative sample of the linguistic phenomenon, variety or language under study.

If one intends to work with a corpus, then two possibilities are presented: to work with an already elaborated corpus or to elaborate the corpus so that it can be designed in the way that best fits the objectives and necessities set out at the beginning. In both cases, the quality of the corpus will determine the results of the linguistic research and so it is worth taking into account a series of parameters that can guarantee this quality up to a certain extent (and also guarantee that a corpus is so and can be called so, and is not just a collection of texts gathered at random). In accordance with this, there are certain issues that must be taken into account for the design of a corpus and these features are considered as forming part not only of the corpus as such but also of the methodology used for corpus compilation (however, this methodology is analysed in more detail in the section devoted to corpora in the

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<sup>15</sup> CORPUS: from the Latin for “body”, so a corpus “is”, literally, any body of text.

method (II.2), this section being mainly given over to the theoretical explanation of the characteristics corpora should have in general).

Starting from the fact that a corpus is not just a collection of randomly selected and gathered texts, but a collection of texts that seeks to represent a part of a language, the appropriateness of this corpus will be mainly determined by its representativeness in terms of the area under study. “The appropriate design for a corpus therefore depends upon what it is meant to represent” (Biber, Conrad and Reppen, 1998: 246).

What seems obvious, whatever the topic area or the research objectives of a given corpus might be, is that the representativeness criterion is crucial in the compilation and design stage since it will determine the kind of research questions to be posed, as well as the level of generalisability and reliability that can be given to the results of the research. However, representing a language or a part of it is not an easy issue at all because it is impossible to know “the full extent of variation in language or all the contextual variables that need to be covered in order to capture all variation in texts” (Biber, Conrad and Reppen, 1998: 246). Closely related to this is the criticism of the corpus approach made by Chomsky which states that, if language is assumed to be infinite, then any corpus will be skewed and insufficient. The implications of such criticism are then clear: with a corpus-based approach to language study it is more than probable that some utterances are excluded because of being rare and others which may be far more common might be excluded simply by chance or at random. In the same way, however, and also due to probability or chance, extremely rare utterances might be included several times in a corpus, the result being a frequency that is not exactly representative of, for instance, a variety of language. This criticism made by Chomsky leads us directly to acknowledge the importance of representativeness, since taking into account and measuring the representativeness of the linguistic samples that go to make up a corpus is the only way to obtain a corpus that realistically describes a linguistic variety or a language. This need to look for representativeness has also been favoured by modern computer technology, since not only does it allow researchers to collect and compile much larger corpora than those Chomsky could think about in the 1950s, but also to construct less biased and much more representative corpora.

Following McEnery and Wilson (2001):

We are therefore interested in creating a corpus which is maximally representative of the variety under examination, that is, which provides us with

an as accurate a picture as possible of the tendencies of that variety, as well as their proportions. What we are looking for is a broad range of authors and genres which, when taken together, may be considered to “average out” and provide a reasonably accurate picture of the entire language population in which we are interested.

These key features (authenticity, representativeness and size) are analysed in depth in the section devoted to considerations for work preparation and corpus compilation (section I.6.4.2) but, apart from these, there are other characteristics that have already been mentioned that nowadays shape modern corpora, such as finite size, machine-readable form and standard reference. It is obvious that the generative potential of a language is immense, so that the number of utterances that can be constructed in a language is infinite. However, as McEnery and Wilson (2001) state, the term “corpus” also implies a body of text of finite size, with the exception of monitor corpora<sup>16</sup>. For instance, at Birmingham University, John Sinclair’s COBUILD team have been engaged in the construction of one of these monitor corpora, the main advantages of which are their non-static character, since new texts can always be added (unlike the synchronic cut provided by finite corpora), and their scope, due to the fact they are constantly absorbing new samples and thus becoming larger and larger. However, these monitor corpora are not such a reliable source of quantitative data (as opposed to qualitative data) since changes in their size are constant and they are normally less rigorously sampled than finite corpora.

With this exception of monitor corpora in mind, it can be said, however, that it is much more common for a corpus to consist of a finite number of words. For example, the Brown Corpus contains 1,000,000 words and the common thing to do is to establish beforehand, prior to beginning a corpus-based project, the approximate size such a corpus will have and thus the amount of data to work with. In this way, it is commonplace that, unlike in a monitor corpus, once a corpus reaches its intended size (a certain number of running words of text) no more textual samples are added and the corpus stops increasing in size. An interesting exception to this is, however, the case of the London-Lund corpus, which saw its number of integrating textual samples and hence its size increased in the mid-1970s in order to cover a wider and more modern variety of genres.

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<sup>16</sup> A monitor corpus is an open-ended entity or “collection of texts” (as Sinclair’s team prefers to call it), that is to say, a corpus in which texts are constantly being added so that it gets bigger and bigger.

In addition to this, it may be important to mention again the fact that, nowadays, the modern term “corpus” carries almost implicitly with it the feature “machine-readable”. This was not the case before the “computer boom” experienced in the last two decades and the term “corpus” was only used in reference to manually compiled printed text. This machine-readable feature is what determines the main advantages that modern corpora display with respect to written or spoken formats, since they offer the possibility of being searched and manipulated at high speeds and can easily be enriched with extra information.

Apart from the features of modern corpora we have already mentioned, McEnery and Wilson (2001) also state that there is often a *tacit* understanding that a corpus constitutes a standard reference for the language variety that it represents, supposing that it will be widely available to other researchers as happens with many corpora, such as the Brown corpus, the LOB corpus and the London-Lund corpus. As explained in section I.3.4, a number of areas of language study have greatly benefited from the exploitation of corpus data. This has been and is so because of four main advantages with which these corpus data may contribute to different and varied areas of language study. Thus, following McEnery and Wilson (2001), from a general point of view, the main characteristics and advantages of corpora are as follows:

- Sampling and quantification. According to what has been mentioned with respect to representativeness, a corpus is sampled always bearing in mind that one of the major goals is that it must represent the population to the maximum degree possible, so that any findings extracted from the corpus can be generalised to the larger population. Consequently, this fact of representing the population makes quantification in corpus linguistics really meaningful, since it comprises representative information about a variety of a language as a whole and not just about the fraction of language analysed at a given moment.
- Ease of access. It is obvious that dealing with already elaborated corpora may save researchers a lot of time and work. This is so because they do not have to go through the issues of sampling, collecting and encoding. In addition to this, once corpora have been obtained (which, in general, is not difficult since most corpora are either free or low-cost) current technological advancements in the

form of concordance programs make it easy and fast to access, manage and analyse the data a corpus may contain.

- Enriched data. Although this is not the case of the corpus used in this study, it is a reality that many corpora are enriched with additional linguistic information. An example of this additional information would be, for instance, part-of-speech annotation, parsing and prosodic transcription, thus giving rise to annotated corpora, which can be easier to interpret and more specific than other corpora which have not been annotated.
- Naturalistic data. This feature is probably one of the greatest potentials of corpora since it allows, for the most part, access to unmonitored, naturalistic data which are the product of real social contexts, thus constituting one of the most (if not *the* most) powerful and reliable suppliers of data to be examined. The most important factor of corpus linguistics for the study of language is the usage of empirical data that enable the linguist to make objective statements rather than subjective ones. Empirical data allow investigations to be based not only on the researcher's perceptions or intuitions or on the individual's own internalised cognitive perception of language, but on real data extracted from real discourse.

Regarding the types of corpora that can be compiled, the most characteristic and probably the most widely known and used kinds of corpora are reference corpora. These **reference corpora** contain the standard vocabulary of a language and so they can be used for a multitude of purposes mainly because, among other things, if they are large enough, they reveal the contexts in which words are embedded and with which other words they give rise to collocations. Accordingly:

A typical reference corpus will represent what the discourse community agrees to be what a fairly educated member of the middle class would read outside of work, mostly in printed form, but also handwritten or typed; and, in principle at least, it should also contain a sample of what they would hear, in conversations, at more formal social events, or on the radio. (Teubert and Cermáková, 2004: 118)

Hence, reference corpora are carefully construed and have a deliberate composition, the British National Corpus with its 100 million words being a good

example. However, reference corpora may be construed with another goal – that of being benchmarks for special corpora, which leads us to another category in this corpora typology. These **special corpora**, which are normally smaller than reference ones (generally a million words or so) are compiled in order to fit a specific, specialised research focus or goal, that is to say, they are compiled to undertake research in which the objective is not the analysis of standard language as a whole, but the analysis of some special phenomenon (accordingly, this is the kind of corpus used in this study).

Another kind of corpus in the typology, an alternative to the reference one, is the **opportunistic** or **cannibalistic corpus**, based on the assumption that every corpus is imbalanced, so it does not claim to represent a language or to reflect discourse. This assumption makes it possible to manage the problem of balance or representativeness from a different angle and, as Teubert and Cermakova state (2004: 120), the opportunistic corpus is the result of collecting all the documents one can lay hands upon (which makes them open-ended and, in certain aspects such as intentionality, rather different from what has been considered a proper corpus in this study). In this sense, the best cannibalistic or opportunistic corpus is the one that is documented in the most comprehensive way and, furthermore, the larger it is, the better.

Another corpus in this typology is the **monitor corpus**, which is a corpus that monitors language change. This kind of corpus is especially useful for lexical change studies since it is, in principle at least, regularly updated and open-ended, and this study of lexical change is translated into the more specific possibility of undertaking research not only on the introduction of new words into the discourse, which is the most obvious one, but on other factors that Teubert and Cermakova enumerate as (2004: 121):

- The change of frequency of words or other units of meaning (compounds, multi-word units, collocations, set-phrases), which is often indicative of a change in meaning or in the domain in which words are used;
- The occurrence of new words;
- The occurrence of new larger units of meaning;
- Changing context profiles, i.e. changes in the frequencies of words occurring in the contexts of words or other units of meaning.

Another important kind of corpus is the **parallel corpus** or what in certain contexts is also known as a translation corpus. This kind of corpus can be defined as a

corpus of original texts in one language and their translations into another or several other languages. However, sometimes parallel corpora do not contain texts in the original language but only translations of the same text in different languages. This is the reason why a subtype of parallel corpora consists of reciprocal parallel corpora, which contain original texts and translated texts in all the languages involved. In general, and for most applications, sentence alignment will be necessary so that a unit in one language corresponds to the equivalent unit in another language. However, this sentence alignment, which at first used to be done by hand, is not easy at all even with the automatic means available nowadays because alignment is a time-consuming process which requires substantial human intervention due to the reasons given below:

- Firstly, although it may not seem so, it is rather difficult to identify sentence endings automatically since full stops also designate abbreviations (*etc.* standing for etcetera, 2. standing for second, and so forth), which do not necessarily occur at the end of a sentence.
- Secondly, as may be easily noticed, one sentence in a source language may correspond to two or even more sentences in a target language or the other way round so that the instability of sentences as units is quite clearly shown. The translator's whim also has much to do with things in this sense, since it is a common practice even to omit sentences in a translation or introduce new ones.

These are probably the reasons for the scarce number of parallel corpora of a considerable size (more than 5 million words per language) existing nowadays. In spite of this, there is an aspect which is even trickier for alignment and that is the lexical level. This is so because ideally, each unit of meaning in the source corpus should be linked to the equivalent in the target one but this, as reality shows, is not always so. In Teubert and Cermakova's (2004: 124) words:

Lexical alignment uses statistical procedures and/or lexicon look-up. Neither is very reliable. It is because bilingual dictionaries (and the lexicons derived from them) are not very instructive that we turned to parallel corpora in the first place. [...] We will still be given both *work* and *labour* and also some other words like *employment* or *job* as equivalent of French *travail*. If we want to find out more, we have to look at the contexts in which *travail* is embedded when it is translated as *work*, as opposed to the contexts in which *travail* is embedded

when it is translated as *labour*. Thus, if we have to translate *travaux* followed by the adjective *préparatoires*, our parallel corpus tells us that this phrase is never translated as *preparatory labours* but always as *preparatory work* (with a singular phrase in English corresponding to the French plural phrase).

Finally, I would like to mention another “type” of corpus which is acquiring an increasing and pre-eminent role among linguists: the Internet as a virtual corpus (see also section I.6.4.2.1 C). The Internet, due to the billions of texts contained in it, is by far the largest existing library nowadays (although it is not infinite, it is certainly inexhaustible) and turns out to be particularly useful for finding out if a word is in current use or if a word or phrase we have heard of really exists. However, one must be cautious with the information to be found on the net since the freedom it offers allows anyone to add his/her contributions, regardless of their quality. The Internet is a virtual corpus and, like the discourse of any language community, we cannot expect to access it as a whole (Teubert and Cermakova, 2004: 125).

### **3.4 The use of corpora in language studies**

The benefits of corpus linguistics for the study of language are numerous and varied, especially if we consider the fact that, strictly speaking, a corpus is a body of text that has been carefully sampled and is intended to constitute a maximally representative sample of a language or language variety, and if corpus linguistics, strictly speaking again, is seen as an empirical approach to language studies in general.

Thus, in the following subsections I have provided a general overview – mainly grounded on McEnery and Wilson’s (2001) work on the topic – on the roles played by corpora in a number of different fields of study directly related with language. The focus of this outline of the matter is on why and how corpus data have contributed and still contribute to the advancement and development of each of these areas in the same way it has done in this research. The following sections also constitute an integrated account of some of the most widely-known and used corpora nowadays, such as the Brown or the LOB corpora, among many others.

### **3.4.1 Corpora in speech research**

In speech research, the data contained in a spoken corpus are important because of a number of features. For example, apart from providing a broad sample of speech, it can extend over a wide selection of variables such as genre and speakers' gender, age and class, which allows both generalisations to be made about spoken language and studies to be conducted on variation within it.

In addition to this, corpora provide a sample of naturalistic speech (i.e. a reflection of the language that is spoken in "real life" and is free of any production monitoring by the speaker, as for example the case of suppressing a regional accent) rather than speech produced under artificial conditions.

Moreover, as McEnery and Wilson (2001) put it, "because the transcribed corpus has usually been enhanced with prosodic and other annotations it is easier to carry out large-scale quantitative analyses than with fresh raw data". Spoken corpora usually present annotations at the level of prosody, which make phonetic and phonological research more feasible and efficient. However, when more than just one type of annotation has been used, it is also possible to study, for instance, the interrelations between phonetic annotations and syntactic structure.

### **3.4.2 Corpora in lexical studies**

This subsection is especially important for the work described in this research. Although the discipline of corpus linguistics as such is rather recent, the use of empirical data in lexicography dates back much further. Already in the 19<sup>th</sup> century the Oxford Dictionary used citations to illustrate and study the use of words, and even before that, Samuel Johnson had already illustrated his dictionary with real examples extracted from literature.

However, as science evolves with the times, with the help of powerful tools from computer science, corpora have also changed the way in which linguistics can look at language. Nowadays, a corpus (understood as a collection of machine-readable texts compiled for a purpose) can call up and gather together in a few seconds all the instances of a word or phrase contained in a corpus of many millions of words. This ability to call up and retrieve word combinations (and not just single individual words)

together with the existence of tools which calculate, for instance and among other measures, mutual information (MI) scores with the aim of establishing relationships between co-occurring words, make it possible to treat and analyse phrases and collocations more systematically. This information is very important since, as McEnery and Wilson (2001) state, “a phraseological unit may constitute a piece of technical terminology or an idiom, and collocations are important clues to specific word sense”. In this way, by consulting the natural use made of words or phrases in a (natural) corpus, lexicographers may either supplement or refute their intuitions. The advent of corpora in modern lexical studies allows dictionaries to be produced and revised much more quickly than before, thus enabling both up-to-date information about language and more complete and precise definitions to be obtained thanks to the larger number of natural examples examined. The examples that lexicographers may extract from corpora allow them, for example, to see all the instances of a particular collocate at the same time. Apart from this, it is also important to notice that corpus data contain a rich amount of textual information which can be of great importance for the lexicographer, such as regional variety, author, date, genre, and part-of-speech tags.

### **3.4.3 Corpora and grammar**

Together with lexical studies, grammatical (or syntactical) studies have been the most frequent types of research which have resorted to corpora. This has been so because corpora benefits syntactical research due to two main aspects:

- Their potential for the testing of hypotheses derived from grammatical theory, which is possible thanks to the usage of empirical data.
- Their potential for the representative quantification of a whole language variety.

However, the use of corpora for grammar studies met with the rejection of those supporting the rationalist grammatical theory, which since the 1950s has given rise to the rational-theory based/empiricist-descriptive division in linguistics. This split has led to these two approaches being viewed as radically opposed and in direct

competition with each other. In spite of this, it is also true that there is a group of researchers who have used corpora with the aim of testing essentially rationalist grammatical theory. In this respect, as McEnery and Wilson (2001) comment:

At Nijmegen University, for instance, primarily rationalist formal grammars are tested on real-life language found in computer corpora (Aarts 1991). The formal grammar is first devised by reference to introspective techniques and to existing accounts of the grammar of the language. The grammar is then loaded into a computer parser and is run over a corpus to test how far it accounts for the data in the corpus. The grammar is then modified to take account of those analyses which it missed or got wrong.

In order to provide some more examples of the relationship between corpora and grammar it can be said that, apart from small-scale studies of grammar for quantitative data analysis using corpora, nowadays there is an increasing interest in the more systematic study of grammatical frequency, of which Oostdijk and de Haan's (1994) studies aiming at the analysis of the frequency of the various English clause types constitute a good example.

#### **3.4.4 Corpora and semantics**

According to McEnery and Wilson (2001), the contributions of corpora to semantics are mainly twofold:

- To help to establish an objective approach to semantics which takes into account indeterminacy and gradience. In this respect, Mindt (1991) shows how a corpus can be used to provide objective criteria for the assignation of meanings to linguistic terms. In Mindt's views, in semantics meanings are all-too-frequently described according to the linguist's own intuitions (the rationalist approach already explained). For this author, semantic distinctions can be reached by considering the environment of the linguistic entities as empirical objective indicators of semantic distinctive features. These distinctive features that make semantic distinctions possible are also associated in texts with characteristic observable contexts such as syntactic, morphological and prosodic features.

- To establish the notions of fuzzy categories and gradience more firmly. This second point, which is also directly related to the first one, is easily observable by looking empirically at natural language in corpora: contrary to what theoretical linguistics proclaim<sup>17</sup>, clear-cut boundaries do not exist. Instead, a fuzzy model, like the one fostered by corpora, accounts for the “semantic reality” much better by establishing gradients of membership which are connected with frequency of inclusion. Therefore, as suggested by psychological work on categorisation, cognitive categories are not usually hard and fast as theoretical linguistics maintain but categories with fuzzy boundaries, so that, as McEnery and Wilson (2001) concede, “it is not so much a question of whether an item belongs to one category or the other, but how often it falls into one category as opposed to the other one”.

### 3.4.5 Corpora in pragmatics and discourse analysis

The London-Lund corpus has been, up to the moment, the most widely used corpus for undertaking much of the work in the area of research on pragmatics and discourse analysis. This has been so because it was, until very recently, the only truly conversational corpus. In this sense, corpora have contributed to pragmatics and discourse analysis by furthering our understanding of how conversation works with respect to lexical items and phrases which have conversational functions.

An example of a study undertaken in this light is that of Stenstöm (1984), who was able to correlate discourse items such as *well*, *sort of* and *you know* with pauses in speech and showed that such correlations related to whether the speaker expects a response from his/her interlocutor or addressee (McEnery and Wilson, 2001).

Nowadays, however, the availability of new conversational corpora, such as the spoken part of the BNC (British National Corpus), is a useful tool to extend and replicate previous studies that were more grounded on written corpus sources, since the amount of conversational data available and the social/geographical range of people recorded increase constantly.

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<sup>17</sup> According to theoretical linguistics, categories are usually perfectly delimited so that an item either belongs to a category or it does not.

### **3.4.6 Corpora and sociolinguistics**

Many studies have been undertaken in the field of sociolinguistics (most of them in the area of language and gender) based on the use of corpora. An example of a study in this field may be Kjellmer's (1986) investigation using the Brown and LOB corpora in order to examine the masculine bias in American and British English. What he did was to look at the occurrence of masculine and feminine pronouns and the occurrence of the items man/men and woman/women, the result being, as expected, the fact that the frequencies of the male items were much higher than those of the female ones. In spite of this and interestingly, the female items were more common in British English than in American English. However, in the same way corpora studies may corroborate hypotheses, they may also reject others and this is what happened with the second of Kjellmer's hypotheses: he thought that women would be less "active", that is, that they would be more frequently the objects than the subjects of verbs, but this was not supported by corpora evidence, in which men and women had similar subject/object ratios.

### **3.4.7 Corpora and stylistics**

In order to better understand why and how can corpora play a useful role in stylistics studies, Leech and Short (1981) pointed out that stylistics often demands the use of quantification to back up judgements which may appear to be subjective rather than objective. This statement (which can be extended to almost any area of knowledge) makes it sensible to investigate stylistics through corpora, not only to conduct research on broad issues such as gender and the general varieties of a language or to find important sources of data for their research, but also for more humble or limited goals such as the study of individual texts or authors. If what we want to study or define is, for instance, an author's particular style, the first thing to do is to examine the different ways the author's tendencies are manifested in order to express things, e.g. long sentences vs. short sentences, technical vs. non-technical vocabulary, and so on. However, this task requires a complementary action, namely to make comparisons not only internally within the author's work but also with other authors or with a variety as a whole.

The amount of work undertaken in stylistics with the use of corpora is important and comprehends various studies, although one of the most common uses has been to look at the differences between spoken and written language.

Altenberg's (1984) studies, for instance, analysed the differences in the ordering of cause-result constructions and Tottie (1991) looked at the differences in negation strategies. Other works looked at variations between genres using subsamples of corpora as databases. As McEnery and Wilson (2001) put it:

For example, Wilson (1992) used sections from the LOB and Kolhapur corpora, the Augustan Prose Sample and a sample of modern English conversation to examine the usage of *since* and found that casual *since* had evolved from being the main casual connective in late seventeenth century writing to being characteristic of formal learned writing in the twentieth century.

### **3.4.8 Corpora in the teaching of languages and linguistics**

The area of language teaching (and more specifically the resources and practices in the teaching of language and linguistics) is probably the domain which most clearly reflects the division between rationalist and empirical approaches. The first approach, the rationalist one, is easily observable in textbooks containing only invented examples whose descriptions are based upon intuition or second-hand accounts, whereas the second approach, the empirical one, is the one used in books which use examples and descriptions from corpora or other sources of real-life language data. As McEnery and Wilson (2001) put it, examples directly extracted from a corpus are highly beneficial and productive in the language learning arena since they constitute the kind of sentences students will encounter in a real-life situation.

Apart from this, corpora are highly beneficial in language teaching since, apart from constituting the aforementioned provider of empirical teaching data, they can be used to compare and critically look at other improvable existing language teaching materials. In general, it can be said that such studies proved the considerable differences encountered between what textbooks teach and the real, actual use of language native speakers (as evidenced by corpora). Among these studies which followed similar methodologies, both Kennedy (1987 a, 1987 b) and Holmes (1988) deserve a special mention. The former looked at ways of expressing frequency and

quantifications in English as a Second Language (ESL) textbooks, while the latter observed and studied ways of expressing doubt and certainty, also in ESL textbooks.

Following McEnery and Wilson (2001):

Some textbook gloss over important aspects of usage, or foreground less frequent stylistic choices at the expense of more common ones. The general conclusion from these studies is that non-empirically based teaching materials can be misleading and that corpus studies should be used to inform the production of material so that the more common choices of usage are given more attention than those which are less common.

In the case of linguistics, the second aspect dealt with in this section, it can be stated that corpora have also been used in the teaching of linguistics. If we take Kirk's (1994) study as an example we will be able to better understand the application of corpora to linguistics. What Kirk (1994) did was to make his students base their projects on corpus data, which they analysed according to Brown and Levinson's politeness theory or Grice's co-operative principle. According to McEnery and Wilson (2001), with this approach Kirk was introducing his students to the use of corpora in a twofold way: firstly, by teaching them variation in English as such and, secondly, by presenting them with the grounding principles and main features of a corpus-based approach to linguistic analysis.

In the same way, computer-assisted language learning constitutes a further application of corpora in this field. In this light, it is interesting to mention the work undertaken at Lancaster University by McEnery and Wilson (1993), which analysed the role of corpus-based computer software for teaching undergraduates the grounding principles and rudiments of grammatical analysis.

### **3.4.9 Corpora and historical linguistics**

Historical linguistics can be seen as a kind of corpus linguistics, since the texts from a historical period or in a "dead" language form a closed corpus of data which can only be extended by the (re-)discovery of previously unknown manuscripts or books. In order to study ancient Greek, for example, one may resort to the *Thesaurus Linguae Graecae* corpus which contains most of the extant ancient Greek literature.

In spite of this, from a practical point of view it can be said that historical linguistics has not followed what we would call a strict corpus linguistics paradigm.

Instead, it has presented a stronger tendency towards taking a selective approach to empirical data by looking for evidence of particular phenomena and making rough estimates at frequency instead of attempting to produce representative samples.

More recently, however, historical linguistics has undergone a change in its approach, “resulting in an upsurge in strictly corpus-based historical linguistics and the building of corpora for this purpose” (McEnery and Wilson, 2001) and having as its most paradigmatic example the Helsinki corpus. Other English historical corpora (still in development) are the Zürich Corpus of English newspapers (ZEN), the Lampeter Corpus of Early Modern English Tracts, and the ARCHER corpus. Paying a closer look at the Helsinki corpus, this approximately 1.6 million-word corpus of English language covers from the earliest Old English period (before AD 850) to the end of the Early Modern Period (1710). It covers a wide range of genres, regional varieties and sociolinguistic variables (age, gender and social class) which make it representative and it is also divided into three main periods: Old English, Middle English and Early Modern English.

It is significant to observe how studies like that of Peitsara (1993) (who used the Helsinki corpus to calculate the frequencies of different prepositions by introducing agent phrases in four different subperiods) allow work to be carried out on the evolution undergone by language through time. However, they also make it possible to observe how many other works on historical corpora are qualitatively similar to the work carried out in modern language corpora.

Nonetheless, as happens with corpus linguistics in general (as we have seen in previous sections), historical linguistics is neither an object of universal agreement nor devotion. In this sense, Rissanen (1989) pointed out the importance of being aware of the limitations corpus linguistics had and, more specifically, this author identified three main problems associated with the use of historical corpora:

- The “philologist’s dilemma”: What Rissanen calls the danger that the in-depth knowledge of language history (to be obtained from the observation and study of original texts in their context) may be supplanted by the use of a corpus and a computer.

- The “God’s truth fallacy”: The danger that a corpus is used as a “God’s truth”, in the sense that it is considered to provide representative conclusions about the entire language period, leaving aside other important considerations such as understanding the limitations of corpora regarding the genres it does and does not cover.
- The “mystery of vanishing reliability”: In Rissanen’s views, the more variables are used in the sampling and coding of the corpus (periods, genres, age, gender, etc.), the harder it is to fully represent each one and to achieve statistical reliability, the building of larger corpora being the most effective way to solve this problem.

However, although Rissanen’s reservations are valid, logical and important, as McEnery and Wilson (2001) put it, they “should not diminish the value of corpus-based linguistics, rather they should serve as warnings of possible pitfalls which need to be taken on board by scholars, since with appropriate care they are surmountable”.

#### **3.4.10 Corpora in dialectology and variation studies**

Corpora have been used for a long time in order to establish comparisons between language varieties (geographical variation) and their description. In this sense, most of the corpora used in variation studies have tried to follow as much as possible the sampling procedures of other corpora of a similar sort in order to maximise the degree of comparability and allow reliable and fruitful comparison. Thus and again following McEnery and Wilson (2001), “the LOB corpus contains roughly the same genres and sample sizes as the Brown corpus [...] The Kolhapur Indian corpus is also broadly parallel to Brown and LOB [...]”.

As for dialectology, few examples of dialect corpora exist at present in spite of the empirical character of this discipline. This is probably so because dialectology has tended to concentrate on experiments and less controlled samples rather than on the use of corpora. However, it is a fact that what could be called elicitation experiments have tended to focus on vocabulary and pronunciation, leaving somewhat aside other aspects like syntax, which dialect corpora make it possible to study. In this way, and

provided that corpora are always compiled and sampled bearing in mind the premise of being representative, it can be said that qualitative as well as quantitative conclusions can be posed from the dialectological point of view about a given population as a whole. Just to mention a couple of examples of dialectological corpora, the Helsinki corpus of English dialects and the Kirk's Northern Ireland Transcribed Corpus of Speech (NITCS) can be said to constitute the two most paradigmatic instances of dialect corpora, both of which consist of conversations with a fieldworker.

### 3.4.11 Corpora and psycholinguistics

Corpora constitute an important source of data for the development of materials for laboratory experiments. Regarding the issues that can be analysed through corpora studies in psycholinguistics, Schreuder and Kerkman (1987) stress the importance of considering frequency in a number of cognitive processes, including word recognition. As McEnery and Wilson (2001) point out:

The psycholinguist should not go blindly into experiments in areas such as this with only a vague notion of frequency to guide the selection and analysis of materials. Sampled corpora can provide psycholinguists with more concrete and reliable information about frequency, including the frequencies of different senses and parts of speech of ambiguous words (if the corpora are annotated).

An example of corpora-based psycholinguistics studies is that conducted by Garnham *et al.* (1981), through which it was possible to classify and count the frequency of error types, which also made it a provider of some estimate of the general frequency of these by comparing them to the speaker's overall output. This study of the occurrence of speech errors was grounded in the use of the London-Lund corpus.

Finally, and just to mention another potential or possible application of corpora (although a minority one) in this field, corpora also play an important role in the analysis of language pathologies in which an accurate picture of abnormal data becomes necessary and hence must be constructed before it is possible to formulate a hypothesis or to test what may be wrong in the human language processing system.

### 3.4.12 Corpora and cultural studies

Corpora and cultural studies can be said to be a field of rather recent advent. After the completion of the LOB corpus of British English, Hofland and Johansson's (1982) study of its vocabulary compared with the vocabulary of the American Brown corpus constitutes one of the starting points for the use of a corpus to tell us about cultures. This study found very interesting differences which surpassed purely linguistic issues, such as spelling (*colour/color*) or morphology (*got/gotten*). Hence, Leech and Fallon (1992) used the data obtained in the previous study together with KWIC concordances of the two aforementioned corpora in order to study and check up the sense in which words were being used. What they did next was to group the statistically significant differences into fifteen broad categories containing concepts whose frequencies revealed differences between the two countries and which were of a cultural and not a linguistic nature. For instance, travel words were found to be more frequent in American than in British English as well as words belonging to the domain of crime and the military. As McEnery and Wilson (2001) suggest, "in general, the findings seemed to suggest a picture of American culture at the time of the two corpora (1961) that was more macho and dynamic than British culture".

### 3.4.13 Corpora and social psychology

Other domains of knowledge apart from linguistics also take advantage of the benefits of corpus linguistics. The best example of this is psycholinguistics, whose experts, social psycholinguists, need access to naturalistic, real data which cannot be reproduced in laboratory conditions.

One of the areas of socio-psycholinguistic research which arouses most interest is that of how people attempt to explain things and how they do so. These explanations constitute an important area of research for the socio-psychologist since they reveal the way in which people regard their environment, and naturally occurring texts such as newspapers constitute the perfect data for this kind of study. In spite of this, most of everyday human interaction takes place through speech and that is why oral corpora like the London-Lund corpus (of spoken language) have been used by researchers such

as Antaki and Naji (1987) as a source of data to try to explain the phenomena occurring in everyday conversation.



*If names are not correct,  
language will not be in accordance  
with the truth of things*

Confucius

#### **4. TERMINOLOGY: A KEY ELEMENT IN THE STUDY OF PAL/SPECIALISED LANGUAGES**

Following Cabré (1993, in Hoffman, 1998), although not all the specialists share the same ideas about specialised languages (or PAL), there are a couple of points of universal agreement amongst them. These points are, first of all, the fact that the communications produced within this “framework” refer to very specific areas of knowledge and secondly that, according to this point of view, every speciality area, as well as academic disciplines, jobs and professions would be considered areas of specialised knowledge. Consequently, the expression and transmission of such knowledge could require the use of specific units and rules and it is in this sense that one may talk about special or specialised languages and their terminologies.

As has already been dealt with, terminology is a key element in the study of PAL or specialised discourse because it is a fundamental integrating part of it, that is, the most prototypical “feature” of specialised language.

In this research, two main ways of approaching and conceiving terminology have been put forward and analysed: in the first one, called the General Theory of Terminology (GTT), a static and normalising view of the terms (adopted from the Vienna School) was proposed whereas in the second one, the Communicative Theory of Terminology, we find those linguists who conceive terms as elements from the natural language found in specialised texts. In this work I have endorsed the second view since I consider it to be the most realistic approach to terminology.

##### **4.1 Terminology: a historical review**

Although the systematisation of terminology and the fixing of its scientific status are very recent (that is to say, terminology started to take shape as a discipline

relatively few years ago) terminological practice dates back a lot further in time (Cabr , 1993). This is not strange at all if we consider that, from a practical point of view, terminology has always existed as the means through which the communicative necessity of referring to any concept belonging to a specialised field can be solved.

Already in the 18th century the works undertaken by Lavoisier and Berthold in chemistry, or Linn  in botany or zoology highlighted the interest that the fixing of the denominations of scientific concepts has always had for its true and real protagonists, i.e. specialists. However, although the “soul” of terminology was present in these denominations, the work carried out by these authors was known as “nomenclatures” (not yet terminology), Versalius being the precursor of these “scientific nomenclatures”.

The word “nomenclature” was defined by the naturalist Duhamel du Montceau in 1785 as “the art of classifying the objects of a science and naming them” until the word “terminology” was first used by the German Christian Gottfried Sch tz (1747-1832) as an alternative to “nomenclature”, (the adjective *terminologisch* was first used in 1788).

Hence, in the early 19<sup>th</sup> century, more specifically in 1801, and mainly due to the progressive internationalisation of science, scientists began to suggest the need to have rules for term formation for each discipline, and it was at that time that terminology started to be named and used as such in France. It was then when terminology started to be considered and conceived as an organised practice regulated by a set of work norms. In this respect, as Cabr  (1999 a) concedes, the compilation and study of the specialised lexical units of different professional fields has, since distant times, been carried out within the scope of lexicography and dialectology. Nonetheless, it was not until the unification and regulation of the vocabulary of various scientific disciplines, during the 17<sup>th</sup> and 18<sup>th</sup> centuries, that these endeavours began to be consciously conceived as an organised and coherent activity.

However, while in the 18<sup>th</sup> and 19<sup>th</sup> century scientists were the ones leading the concern for terminology, in the 20<sup>th</sup> century technicians were showing greater involvement in terminology-related issues, probably due to the high degree of specialisation of their fields of knowledge and the communicative necessities arising from them. The accelerated progress of the different technical branches and the rapid development of technology created a demand from the very beginning (and even more nowadays), not only to denominate the new concepts that appeared as a consequence

of this progress but mainly to harmonise the new denominations in order to provide some sort of unified, coherent and consistent system of denomination. The scientific development and the progress experimented through the centuries, together with the increasing use of the languages in each country, led to scientists' and specialists' creating terms for the different concepts of their fields of knowledge. In Rey's (1995: 49) words:

During the simultaneous expansion of knowledge and the growth of technology and communication in the eighteenth century, terminology was seen as a necessary tool for overcoming some of the difficulties associated with these multiple developments.

The first works that really and accurately warranted the denomination of *terminological* date back to 1906. They were undertaken by the International Electrotechnical Commission (IEC) and were finished in 1938, thirty years later, with the appearance of the *International Electrotechnical Vocabulary* (IEV). It was during the 1930s that what is considered to be modern terminology as such appeared and numerous efforts were made to establish its linguistic grounds. These efforts were especially significant in Germany, Austria, Czechoslovakia and the Soviet Union, giving rise to the appearance of different Schools, among which a special mention is due to those of Vienna, Prague and the Soviet Union, which belong to what is known as the "linguistic-terminological current".

In this historical context and in the field of engineering the figure of the Austrian Eugen Wüster (1898-1977) emerged and stood out. He is considered to be the founder of modern terminology and the main representative of the Vienna School. At the time, the Russian D. S. Lotte (1889-1950), founder of the Soviet School of Terminology, also came onto the scene. Thus, modern terminology as such arose during the 1930s and, in its early days at least, developed mainly thanks to Wüster's works in Vienna. In general terms, the grounding principles of modern terminology can be found in Wüster's PhD dissertation<sup>18</sup>, where the reasons for systematising the methodology of work in terminology are explained and the grounding principles for terminological works and the main features of a methodology for the management of terminological data are established. However, at that time, Wüster focused his interest mainly on

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<sup>18</sup> *Internationale Sprachnormung in der Technik, besonders in der Elektrotechnik*. International Normalisation in the Technical Fields, especially in Electrotechnics

methodological and normative issues, rather than theoretical ones (his interest in theory was to start later) and his first works were chiefly oriented towards eliminating ambiguities in technical and scientific communication.

In 1971, his most theoretical work appears, where the GTT<sup>19</sup> is described (see section I.4.1.1). However, despite the important role played by himself in this field, in the opening session of the Infoterm symposium in 1975, Wüster attributed the intellectual “paternity” of terminology to 4 scientists: the German A. Schloman, the first to consider the systematic character of terms; the Swiss linguist F. de Saussure, the first to highlight the systematicity of languages; the Russian E. Dressen, the first to draw attention to the importance of normalisation and the driving force of the ISA organisation<sup>20</sup>; and the Englishman J. E. Holmstrom, who fostered (from the UNESCO) the international spread of terminologies and was the first to call for an international organism that dealt seriously with this discipline.

Personal considerations apart, what seems obvious is that terminology arises from the practice and from the necessity observed and experienced by scientists and technicians to standardise their disciplines from a conceptual and denominative perspective, with the ultimate aim of guaranteeing professional communication and effective knowledge transmission (Cabr , 1999 a).

Although the history of terminology is disclosed in more detail in subsequent sections (and since the origins of terminology as such have been outlined in previous paragraphs), I have included below a summary on the evolution of terminology in its more recent stages in order to provide a general panorama of its evolution as a whole. Following a chronological axis, Auger (1988 in Cabr , 1993: 28) structures modern terminology in four fundamental stages:

- 1 The origins (from 1930 to 1960). The first theoretical texts by Wüster and Lotte appeared in this stage, which was basically characterised by the preparation of terminological methods of work that took into account the systematic character of the terms.

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<sup>19</sup> Also known as Classical Theory of Terminology or Traditional Theory of Terminology (Cabr , 1993).

<sup>20</sup> ISA (International Standardisation Association), founded in 1926, was the first international standards organisation and was the foregoer of the ISO (International Organisation for Standardisation), the current international standardisation body.

- 2 The structuring (from 1960 to 1975). During this period, the most important advances in the field of terminology came from the development of macrocomputing and documentary techniques. At the same time, the first data banks appeared and the International Organisation of Terminology began to work.
- 3 The “flourishing/blooming” (from 1975 to 1985). In this stage, it became clear that terminology played a significant role in the process of modernising a language and the society in which it is used. Moreover, the expansion of microcomputing gave rise to a change in the conditions of terminological work and data treatment.
- 4 The widening (since 1985). This is where we are at the present moment. Computer science has become one of the most important elements fostering and enhancing the change. Apart from this, terminologists have access to both tools and work resources that are better adapted to their necessities, easier to use and more effective. In addition to this, the growth of the new market of language industries, in which terminology has a special place, is an element that must also be taken into consideration.

#### **4.1.1 The General Theory of Terminology (GTT)**

If a closer look is taken at the principles and mainstays of the General Theory of Terminology a series of aspects must necessarily be tackled, including its origins, defining traits and factors that lead to a renewal with respect to this terminological conception.

##### **a) Origins of the GTT**

The Vienna School, founded on the grounds of the General Theory of Terminology, continued with the research started by Wüster in 1930. This research included a series of studies about specific problems in terminology and constituted the

postulates of the GTT (Cabré, 1993): the production of normalised documents about the vocabulary of terminological work, the systematisation of the methods of working, data transfer and the presentation of terminological products.

At the time this classical theory saw the light, Wüster's worries were of a very practical nature, that is, mainly methodological and normative, rather than theoretical, since he considered terminology as a tool for disambiguating scientific and technical communication. However, the postulates of the GTT (represented by the School of Prague, the Soviet Union School and mainly by the Vienna School, with its highest exponent, Eugen Wüster) do not take into account the communicative dimension of terminology. The main postulates and the importance attributed to the concept by the Vienna School, and thus by the Classical Theory, can be easily appreciated in the words of Felber (1979), one of its members, who explains how Wüster established and developed the first principles for the management of specialised lexicon and emphasised the ruling position devoted to the conceptual dimension:

Els temes principals d'una Teoria General de la terminologia són: l'essència dels conceptes i de la formació de conceptes; les característiques dels conceptes; les relacions entre conceptes dins dels sistemes conceptuals; la descripció dels conceptes (mitjançant definicions); l'atribució de termes i conceptes, o bé, de conceptes i termes i la seva formació. (Felber, 1979 in Hoffman, 1998: 28)

Wüster's main objective was to normalise and set the relationship between term and concept with the final aim of constructing hierarchical systems of concepts. Hence, the General Theory of Terminology is grounded on the view that:

La naturaleza del concepto, las relaciones conceptuales, la relación término-concepto y la atribución de términos a los conceptos ocupan un lugar clave. Este enfoque del concepto al término separa el método de trabajo de la terminología del que caracteriza a la lexicografía. Los terminógrafos, que son los prácticos de la terminología, tienen por objeto la atribución de denominaciones a los conceptos: actúan pues del concepto hacia el término (proceso onomasiológico); los lexicógrafos, prácticos de la lexicología, parten de la denominación, que es la entrada de diccionario, y la caracterizan funcional y semánticamente: se mueven en la dirección contraria, del término hacia el concepto (proceso semasiológico). (Cabré, 1993: 33-34)

Therefore, the first period of terminology as a proper discipline is mainly characterised, according to the GTT, by the consideration and use of methods of work that take into account the systematic nature of terms. Theoretical considerations, such as those regarding the nature of terms were to appear later on

when terminological practice starts to be organised and structured in different subjects as a direct result of this practice.

In this way, the new proposals and new directions that terminology was to progressively and increasingly adopt appeared as a result of reactions against the proposals (principles and method) for the description of meaning that the traditional schools of terminology prescribed. These traditional schools, to which Wüster belonged, firmly believed in the need for standardisation with the clear objective of improving special language communication. In Temmerman's views (2000: 19), traditional terminology was based on a few premises which were considered to be unquestionable:

- concepts are clear-cut and can be defined on the basis of necessary and sufficient condition;
- univocity of terms is essential for unambiguous and therefore effective and efficient communication;
- and figurative language and change of meaning are linguistic subjects which are of no concern to Terminology, as Terminology restricts itself to the onomasiological perspective.

The following section offers an account of the factors that unleashed the thought that changes needed to be made in terminology.

### **b) The GTT: features of a theory to be revisited**

Vargas (2005) contends that, in spite of being called a theory, the theoretical framework underlying classical terminology is more closely linked to the principles of a practical discipline whose main aim is to harmonise the terminological vocabularies at a world level to make specialised communication fluid and unambiguous. In this regard, the methodology of the GTT is of prescriptive and normalising nature, instead of acquiring theoretical postulates that explain the true functioning of the aforementioned vocabularies. Despite this, Wüster also recognised that terminology consists of a theoretical dimension when he referred to the concepts of monovalence and univocity (1979) but also when, with his theory, he was the first to lay the foundations that made it possible to develop theoretical postulates applied to terminology.

The main weakness of this classical theory is that the limits of the scope of action of the GTT do not take into account the communicative and pragmatic aspects inherent

to the lexicon of the different specialised languages. In a way, the GTT can be considered a reductionist theory, since it reduces the terminological unit to its denominative condition and presents a lack of interest in the pragmatic and communicative aspects of terms, while failing to recognise their formal and conceptual variation. For the GTT, there are three main aspects that characterise terms:

- 1) Concepts exist independently of the term that designates them.
- 2) The biunivocal nature of terms: there is a single form for each concept and a concept for each form.
- 3) Terms are independent of context.

Hence, the two main shortcomings which have led to the questioning of Wüster's terminological theory can be summarised in two main points: the *reductionism* in the way of conceiving the subject and its applications, and the excessive *standardisation* the discipline was subjected to in the name of the universality of the principles that sustained it (Cabr , 1999 a).

However, before analysing in more depth the shortcomings of the GTT, it is perhaps worth pointing out here that its most outstanding characteristic is its focus on the concept, as well as its orienting terminological works towards the normalisation of terms and notions. Moreover, according to supporters of the GTT, it is the onomasiological approach (from the concept to the term) that distinguishes the method of working used in terminology from that employed in lexicography, as shown in figure I.11.

<b>Terminology</b>	<b>Lexicology</b>
<b>application</b>	<b>application</b>
<b>Terminography</b>	<b>Lexicography</b>
<b>from concept to term</b> ↓ Attributes denominations to concepts	<b>from term to concept</b> ↓ It departs from denomination and establishes the functional and semantic features
<b>ONOMASIOLOGICAL PROCESS</b>	<b>SEMASIOLOGICAL PROCESS</b>

**Figure L11:** Onomasiological and semasiological approaches.

However, one of the main criticisms that can be made about the General Theory of Terminology is the fact that, from a communicative point of view, it does not “conceive reality in a realistic way”. Thus, it assumes a uniformity in communication which is not so and which makes it ignore many communicative dimensions that are present in every interaction, whether specialised or not. Following Cabré (1999 a), the GTT alone is not enough to accurately and effectively explain and understand the complexity of real terminology. Basically, this is so because the number of communicative and informative necessities terminology has to fulfil is not successfully and fully covered by the postulates of the GTT, which are rather limited in their scope.

Hence, it is not so much that the Classical Theory of Terminology is not internally coherent but that it presents a rather reductionist-oriented view of terminology that has proved to be more social than Wüster and his followers acknowledged. This reductionism affecting the GTT makes it a theory that is unable to provide a complete account of the complexity of the terminological phenomenon in specialised communication. This is what has led the General Theory of Terminology to become a theory that works with rather unrealistic premises, whether consciously or unconsciously, since it seems to assume the existence of some sort of universal

language that gives rise to a uniformity in specialised communication which in reality is not so. According to Cabré (1999 a), this view is what makes the GTT confuse *what terminology is* with *what we would like it to be* and consequently what has made this classical theory present and follow a methodology considered as being universally valid and uniform, whatever the specialised subject field, the finality pursued or the language used. Consequently, this conception makes it rather useless to resort to the notion and specificity of the context in which communication is always given.

This artificial, reductionist and non-realistic way of conceiving the specialised linguistic phenomenon has given way to prescriptions that are too tight and uniform and are more inspired in what language should be if it were completely logical, expectable, regular and controlled than in what it really is. The GTT does not contemplate, for instance, the possibility that language can be used in spontaneous situations and the fact that this spontaneity does not stop communication from being specialised.

Hence, the GTT has received various criticisms focused on certain aspects or on others, depending on the viewpoint or the perspective this criticism came from (Cabré, 1999 a):

a) From the social perspective, contrary to what the GTT proclaimed, the communicative character of terminology has been emphasised through the importance of its social role<sup>21</sup> as being a more decisive one than just its representational role or the standardisation of terms.

b) From a linguistic perspective, different critical voices have been raised against the weakness of some of the points that the GTT presents:

- Firstly, a great deal of criticism has supported the view that terminology is natural language and not artificial language so that, broadly speaking, it shares the characteristics of general language.

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<sup>21</sup> This study is a clear example of this, as it is a specialised lexicographical (or terminographical) work contextualised in a social reality that makes it relevant and socially pertinent (see the section I.7 “Context for the Research”).

- Secondly, the fact that the Traditional Theory considered terms as units without syntactical interest and consequently irrelevant for the discourse has been criticised. This reductive view is, however, a logical consequence of considering that terminology must focus, methodologically speaking, in searching the denominations for already established concepts always with a standardising objective as a final goal.
- And thirdly, attention has also been drawn to the contradiction of defending the univocity and monosemy of terms on the part of the Classical Theory when the data directly extracted from reality present results that definitely contradict these conditions.

c) From a cognitive perspective, the basic criticism made about the General Theory of Terminology has been focused on the notion of concept, a deeply idealistic notion completely removed from the cognitive conception of social base that is predominant nowadays. Thus, the presumed universality of the concept and the belief that specialities – independently of subject fields and languages – are uniform, close and static, have also been a motif of controversy mainly due to the impossibility of validating such concepts with empirical data. The conception of specialities as perfectly separated areas that lack any internal realism and offer the possibility of all of them being described by the same pattern, together with the plain character of the term (or, at least, of its identification), have been other main characteristics that have led this classical conception of terminology to be questioned. Thus, critical voices accused this theory of being unable to establish a corpus of true conditions that are capable of explaining the data of the specialised reality.

Hence, what has been explained up to now regarding the GTT may lead to the view that Wüster established a rather restrictive object of analysis and work functions in which most things were taken for granted. Wüster delimited the terminological object and its functions so much that, for him, terminological activity was limited to the compilation of concepts and terms for the standardisation of speciality terms. In other words, his aim was to set the standardised notions and denominations of speciality terms (understood as units integrated by the association of a concept and a denomination of symbolic character from science and/or technology) with the ultimate

aim of ensuring the univocity of professional communication. Therefore, there are many aspects and features of Wüster's proposal that identify it as a rather reductionist one. Broadly speaking, many of the aspects of terminology proposed by this theory are presented without an empirical basis or justification, leaving to one side or even ignoring the real functioning of data in the reality of specialised communication. If we delve a little deeper into this reductionism, we can specifically notice the reductionist approach of Wüster's proposal in the following aspects signalled by Cabré (1999 a):

- The goals attributed to terminology are limited to ensuring the univocity of professional communication. This fact contradicts the complexity of the intrinsic interdisciplinary character of speciality areas and the wide range of socio-professional necessities that require an adequate terminological activity.
- The form of the terminological units is reduced to their denominative condition, disregarding the linguistic elements that form part of them and their internal morphological structures.
- As a logical consequence of the reductionist view of terms (such as merely having a denominative function), the syntactical aspects of the terminological units have not been taken into account. Consequently, research on the grammatical functioning of terminology has not advanced in parallel to the work undertaken on the lexical unit of the language and thus the terminological databases showed poor grammatical information.
- The fact it ignores the communicative and discursive aspects of terminological units (another consequence of the pre-eminence and even exclusivity assigned to the denominative function) has not allowed it to participate in the recently initiated investigation about the contribution of terminology to textual characterisation in its different types and levels of abstraction.
- The working method with a prescriptive basis is presented as valid for every kind of investigation, regardless of the topic or subject of the work, of its goals, of the contexts in which it is undertaken and of the linguistic typology. This

method has been generated on the basis of the silence adopted with respect to the formal and conceptual variation of the specialised units (although it is something inherent to language and communication, whether general or specialised).

Consequently, these inadequacies of the GTT have been noted for several years and have become even more evident as terminology started to be extracted from running text (corpora) (Cabré, 1999 a).

### **c) Shaping a renovation in terminology**

In accordance with what has been analysed hitherto, terminology was represented from the 1940s onwards almost exclusively by Wüster's General Theory of Terminology and only rather "recently" has its validity been questioned by different authors from different fields (linguistics or philosophy of science) on the basis of two main factors: the observation of terminological data in their real functioning and the experiments undertaken by psychology about how we (as human beings) categorise the objects of reality.

Thus, the restrictions and the reductionist view posed by the GTT have made it necessary to call for a renovation. Hence, worldwide, several people involved in terminological issues have manifested the need to revisit the Classical Theory of Terminology with a twofold fundamental objective, that is, to overcome the restrictive character of its grounding principles and to widen the limitations of its methodological proposals.

From the Vienna School itself, attention has been drawn to the need to provide the theory with greater flexibility and a more "open" character.

However, the voices that called for a renovation did not have a clear and common view regarding certain crucial aspects that had to be clearly established for the creation of a new alternative theory. As Picht (1996: 278) puts it:

[...] los progresos futuros de la terminología se encuentran sitiados por numerosos problemas para los cuales todavía no se han propuesto soluciones adecuadas. Una cuestión que se debe plantear es la formulación de una amplia (sic) teoría general de la terminología, capaz de adaptar los nuevos aspectos que

han surgido durante los últimos 17 años, de manera que se incorporen a una estructura lógica completa.

Nonetheless, there is a fact that seems to be widely agreed upon and defended by both the followers of the Vienna School and those who defend alternative positions: terminology must be placed theoretically in the wide range of disciplines relative to knowledge. The main problem then becomes the diversity of opinions that come to the fore when questions regarding the delimitation of the field of study and the definition of the scientific object are posed. Hence, all these claims, together with the well-grounded belief that the complex nature of terminology cannot be accurately and completely accounted for by the GTT, have given rise to the appearance of a new basis for a novel theory that displays a more “sensitive” approach to terminology and its implications: the Communicative Theory of Terminology (Cabré, 1999 a). However, this theory is actually the result of a long process in which new postulates that have arisen as developments on and reactions to the GTT (without disregarding the important role played by Wüster’s theory) finally gave rise to this new theory.

Nevertheless, this path towards a new, more comprehensive and more realistic theory of terminology has been long and hard, and has required huge amounts of observation on the failures and weaknesses of previous conceptions, especially the GTT. Thus, the CTT (the terminological theory which constitutes the foundation of this doctoral thesis) arose from the evident shortcomings of the GTT and from the real terminological necessities observed and experienced in speciality domains.

Hence, the state of the art towards the end of the times in which the GTT was still the ruling position in terminology was that more and more critical voices appeared calling for solutions to the shortcomings it presented. These critical voices claimed that terminology required a deep and determined revision of its grounding principles that was not limited, as had been done up to then, to denying the validity of every single postulate of the GTT or to strongly defending its relevance and adequacy.

La terminología se debate hoy en día entre la defensa de los principios de la Teoría General de la Terminología (TGT), inicialmente suficientes para determinadas finalidades (normalización conceptual y denominativa de los términos), y la búsqueda de nuevos caminos que puedan dar cuenta de la complejidad de las unidades terminológicas en el marco de la comunicación especializada (Cabré, 1999 a: 69)

It is in this light that the CTT started to be conceived as the alternative to the Classical Theory, one of its principal strengths consisting in the fact that it incorporated what was considered to be one of the main weaknesses of the GTT: the corroboration of its principles by contrasting them with empirical data that allowed them to be maintained, qualified or revoked. Hence, the following section describes the beginning of the process which led to the appearance of the Communicative Theory of Terminology and a complete account of it as the mainstay of this work.

#### **4.1.2 A “new” theory of terminology: initial considerations for the CTT**

Prior to the design of a new theory of terminology (or any other theory) an analysis of the state of the art must be conducted. In this case, this analysis was carried out by posing different questions that defined the lines of action of the new theory and its way of approaching terminology. Following Cabré (1999 a), author of the CTT, the first question to be clearly and sharply defined was: *What is [terminology] about?* – that is to say, a definition of what terminology is as a discipline. However, doing so required the formulation of other questions such as *What does terminology want to “describe” as a discipline or as a field of knowledge?* and *What is its “object of analysis”?* In Cabré’s view (1999 a) this last issue can only be dealt with by acknowledging the existence of two different and possible objects: on the one hand, the communicative units belonging to the specialised disciplines (formal and content functional units) and, on the other hand, specialised knowledge in abstract. That is to say, two different perspectives can be managed to answer these questions: the first one would conceive the object of terminology as (specialised) knowledge in general, so that terminology would be placed in the field of cognitive sciences and only partially considered part of linguistics, whereas if the object of terminology is the units of (specialised) knowledge, terminology can be situated within linguistics or semiotics.

Another question that needs to be answered for the revision of the traditional theory and for the design of a new and more realistic one was *How are these units of analysis dealt with?* For this, Cabré’s (1999 a) reflections on how to deal with the units of analysis of terminology start by posing the question of whether the object of terminology is knowledge or the units of knowledge, and her reflections are based on a series of further questions: if the object of terminology is knowledge, from which

specific perspective is knowledge analysed? Which specific contribution does terminology offer in relation to other subjects which also analyse knowledge? Is it necessary to postulate different realities when we speak about science or the general world? Or would it be better to talk about different perceptions of the same reality? Does terminology analyse the relationship between knowledge and reality as language philosophy has already done? Must terminology study how language is acquired, systematised, categorised and how it becomes a concept, how it becomes thought? Should every kind of knowledge (emotive, relational, general and specialised) be included in the field of study of terminology? Must terminology establish a relationship between knowledge and the units of knowledge? What kind of units of knowledge must be included? And, if the object of study is the units of knowledge in general, what is the nature of these units? Are they language or not? And if so, are they natural language or not?

Another issue to be dealt with is the *functions* terminological units may have. Although it is generally assumed and agreed upon that terms accomplish two basic functions at the same time (representing specialised knowledge and being vehicles for the transmission of this knowledge), accepting such a double function does not necessarily imply that the notions of representation and transfer are necessarily univocal. Following Cabré again (1999 a), essentially *representational* terminology can be (although does not necessarily have to be) artificial and arbitrary and can control variation perfectly well, thus preserving the principles of univocity and monosemy defended by the Classical Theory. However, essentially *communicational* natural terminology must necessarily be real, in the sense that it must be effectively, directly and fundamentally used and, consequently, because it is real, it presents variation. This distinction shapes the dichotomy between representational and communicational terminology of “*in vitro*” (standardised) knowledge or “*in vivo*” (natural, spontaneous) knowledge. This inevitably carries with it a first consequence: on the one hand, communicational, natural terminology must necessarily be descriptive and considerations as to whether it is adequate or not to intervene in order to reduce such variation will only be made in a stage that is subsequent to the process of compilation, that is to say, in a stage of analysis and problem resolution. On the other hand, terminology which is essentially representational of the standardised knowledge can be prescriptive so as to control variation. Moreover, both modalities of

terminology are aimed at achieving different goals: the representational one is more oriented towards the standardising necessities of international communication, towards documentation and towards certain strict linguistic policies of intervention and knowledge engineering that seek to simplify and control expressive variations as much as possible. The essentially communicational terminology, however, turns out to be especially useful for translation, specialised expression and language standardisation in sociolinguistic contexts regulated by policies which allow variation.

Another issue that needs to be analysed in order to determine the status of terminology and to design a new theory that accounts for it is the question of *What is meant to be a “field” of interdisciplinary knowledge?* in contrast or in opposition to what is implied by being a *“discipline”*. If we depart from the observable fact that reality is so complex that no single discipline can provide or show knowledge as a whole, then it is necessary to consider that the study of knowledge is necessarily interdisciplinary, that is to say, it must be undertaken through the concurrence of various disciplines. For instance, taking an illustrative example from Cabré (1999 a), language is the object of study of linguistics and it is much more than just a grammar; nevertheless, linguistic theory has decided to study it firstly as a grammar, this being neither an impediment for later going deeper into other aspects of language as an object (such as language acquisition or language use) nor for leaving the analysis of other aspects such as cognitive, discursive or neurobiological features to other disciplines.

In this reflection, in which more questions have been posed than answers given, a series of initial features proposed by Cabré (1999 a) before definitely shaping her CTT have been presented. These considerations for the creation of a new theory of terminology (explained in the next section) comprise and include both representational and communicational functions as well as their materialisation at different levels of formality and for diverse specialised fields with very different and varied structures.

#### **4.2 The Communicative Theory of Terminology (CTT)**

In the following subsections, a comprehensive account of the different aspects shaping the Communicative Theory of Terminology has been provided.

#### 4.2.1 The object of study of the CTT

It is commonplace and necessary in any research to establish and determine its object of study in order to act in a logical and coherent manner. Likewise, we must also rely on a well-established and precise theory that allows us to coherently deal with such an object. According to Cabré (1999 a), the *units called terminological*<sup>22</sup> are the first object of study of terminology as a discipline and these units must be analysed functionally, formally and semantically, including a description of their double systematicity, which is general with respect to the system of language they form part of, and specific with respect to the terminology of the area of speciality in which they are given and used. Such a description must lead to generalisations that allow for the construction of a wider theory which accounts for the terms as units of the natural language and which allows for the progressive integration of the theory of terms into increasingly wider theories that finally explain human knowledge in general. In this way, the importance and need to approach the terminological object from a precise and well-established theory does not prevent the analysis of such an object from progressively integrating aspects from other disciplinary views.

This initial proposal (which is the basis of the CTT) makes it possible, at a first stage, to focus on term study in natural language and to successfully delimit its field of study. In the same way, it opens up the possibility of explaining that the interest in terminology goes beyond the scientific space of linguistics and allows elements from other disciplines (or knowledge areas) to be incorporated into term analysis, as happens, for instance, with communication sciences. As Cabré (1999 a) puts it, within these communication sciences, terminology would figure among the group of communicative resources – including artificial and non-verbal ones – to be resorted to and, finally, the whole would be included in a wider theory that would account for knowledge in general.

Accordingly it seems that the most crystal-clear way of explaining this issue of the terminological object is to understand the area of study of terminology as an object which is organised in concentric circles comprising an increasingly complex and wide series of phenomena. Consequently, in Cabré's (1999 a) proposals prior to the development of the CTT as such, the object which can be placed closer to terminology

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<sup>22</sup> Terminological Units (TUs)

is the terminological unit understood as being a unit from natural language. At the same time, these units share alternative or complementary systems (artificial ones included) with the space of analysis of communication theory and shape or form a theory of communication which at the same time forms a theory of knowledge. Hence, as Cabré (1999 a) concedes, the linguistic, cognitive and ontological aspects of terminology would integrate in the first theory of the natural language as different aspects of the same object of study.

With her proposal, however, Cabré (1999 a) tries to make the possibility of focusing on homogeneous units of a linguistic basis for the study of terminology compatible with the viability of going beyond their linguistic aspects in order to account for the complexity of the TUs, a complexity which, on the other hand, could be reclaimed by all the other units of natural language. Since the dissatisfaction produced by previous theories which accounted exclusively for competence (not taking into account acquisition or performance) has been constantly emphasised, Cabré (1999 a) wanted to highlight the fact that the multifaceted linguistic-cognitive-social character of the terminological units is not exclusive of them, but also of all the units of language.

In order to better understand the CTT as a whole, it is necessary to understand its integrating aspects and considerations. In the following subsections, the object of study of the CTT (together with other related aspects) is progressively introduced in order to provide a complete panorama of the way this object of study is dealt with in this theory and the reasons for constituting such an object.

#### **4.2.1.1 Preliminary considerations**

Generally speaking, there are two main positions regarding the similitude or divergence between terms (or terminological units – TUs) and words:

The first position (which is closely related to the view of those who consider that there is a perfectly limited boundary separating general and specialised knowledge) is the one adopted by those who maintain that term and word, even though they both belong to the lexical component, are different units. Terminological units have been traditionally dealt with as units that are different from lexical units (understood as words from general language). From the linguistic point of view, the aspects generally

mentioned as being distinctive of TUs with respect to words, especially in the works immediately following the General Theory of Terminology, are the following:

- Monosemic and mononymic character;
- An essentially nominal character;
- A relationship of non-interdependence between meaning and form linked to the onomasiological approach of their treatment;
- Membership to a single thematic area of speciality.

According to Adelstein (2004: 55), this distinction between terms (or terminological units) and words posed by traditional terminology is based on:

- a) una necesidad de análisis epistemológica de contar con una unidad propia de análisis;
- b) unos postulados orientados al trabajo terminológico y/o a la planificación lingüística;
- c) una perspectiva teórica más orientada a la representación del conocimiento que a la descripción de la naturaleza lingüística de las unidades de representación de conocimiento.

If this first position is adopted, the first theoretical consequence derived from it is that words and terms would form different lexicons in the speakers' knowledge. Thus, speakers would develop differentiated lexicons: on the one hand, a lexicon as speakers of a language (integrated by the words of this language) and, on the other hand, a lexicon as experts in a given speciality or specialised field (integrated by the concepts of that speciality). In conclusion, the implication of this view is that terms would be units belonging to a system that is completely differentiated and identified with each specific field of speciality and would represent the conceptual structure of that speciality.

However, many experimental psychology studies have proved that specialised and non-specialised knowledge is organised in the human mind simultaneously and that the acquisition of new specialised knowledge is always carried out on the basis of some previous knowledge, be it general or specialised. Sometimes, a concept is learnt with no previous knowledge about it but on other occasions a new concept is learnt by associating it with another formal unit that has already been interiorised with another sense. In addition to this, in some other cases, the conceptual information that a speaker had already associated to a denominative unit is redistributed through the

increase, loss or change of some traits of content and, in still other cases, new pragmatic conditions are associated to previously known units.

Desde las ciencias cognitivas, se cuestiona la noción de conocimiento especializado tratado aisladamente y se pone en tela de juicio su uniformidad y su alejamiento del conocimiento general. Desde la lingüística, se objeta sobre todo la limitación impuesta por la TGT de interesarse sólo por los aspectos prescriptivos de los términos y de considerar a los términos como unidades diferentes a las unidades léxicas propias de la lengua general. Y desde la sociología, en cambio, se rechaza la concepción idealista de los términos, el carácter plano atribuido a la comunicación especializada, donde los términos pierden parcialmente su condición de unidades de la lengua natural y sus valores pragmáticos, y se niega la variación discursiva. (Cabré y Estopà, 2002: 143-144)

Moreover, if a close observation of TUs in their natural contexts – that is to say, in the texts produced in specific communicative situations – is performed, it can be seen that TUs present very similar characteristics to those of the words of general language.

Hence, if the cognitive simultaneity mentioned above exists, it seems logical and necessary to assume that words and terms share room within the same grammatical lexicon, that is to say, what in cognitive terms would be expressed as words and terms sharing common knowledge areas or spaces. This leads us directly to the second position.

The second position is the one adopted by those who, in spite of acknowledging their specific characteristics, consider terms and words to be the same kind of unit.

De acuerdo con una visión lingüística de los términos, partimos de la hipótesis que las unidades terminológicas comparten muchas características con las unidades del lenguaje natural y que la comunicación especializada tiene un estatus que no es completamente ajeno al que tiene la comunicación general. Presuponemos también que el conocimiento especializado no es uniforme ni está completamente separado del general en todas las situaciones de comunicación. (Cabré, 2001 a: 130)

According to this position, terms are no longer isolated units constituting their own system but instead units that are incorporated into the lexicon of a speaker when (after a hard process of acquiring specialised knowledge) he/she reaches the role of specialist. Thus, these speakers would be at the same time speakers and professionals and will possess a huge amount of (formal, semantic, functional, pragmatic and encyclopaedic) knowledge about their area of speciality associated to lexical units.

Therefore, terminological units can be said to belong to natural language and to integrate or form part of the grammars of particular languages and to share many characteristics with the units of natural language. This fact entails three direct consequences, as pointed out by the IULA (2007 b):

- that specialised communication has a status which is not alien to that of general communication;
- that the speaker does not possess differentiated lexical competences;
- and that general and specialised linguistic knowledge are also integrated.

Consequently, with this threefold statement and with this position what is defended is that terms do not form part of a system that is independent from that of words or other methods of expression and communication, rather, they overlap with these systems.

*Considerados en su contexto natural, i. e. en los textos o discursos producidos en situaciones de comunicación especializada concretas, las UT y las palabras no parecen diferenciarse tanto. En todo caso, las diferencias entre estas entidades no parecen ser respecto de su estatuto semiótico, sino relativas a cierta especificidad en su funcionamiento. (Adelstein, 2004: 55)*

However, the differences between term and word are not limited to the use of the term in speciality domains and, although not so relevant, there are other distinctive aspects. The differences between term and word are structured, according to the IULA (2007 b), on 5 levels:

1. Cognitive level

On this level, a frontier between term and word can be highlighted. The knowledge that the specialist in a subject matter has allows him/her to establish a series of clear and precise limits of what is and what is not a term within their speciality. Hence, a term does always occupy a place inside the conceptual structure of this subject matter and the specialist is the person with the widest knowledge of this structure.

2. Semantic level

Terms have a series of clear semantic limits established by the specialists in each subject matter. This implies or means that every terminological unit is more precise than another unit of the lexicon of the language in which precision does not play such a fundamental role. This is so because, according to the IULA (2007 b), the semantic description of the lexical unit will have to contain:

- Un conjunto de rasgos generales en el que se incluyen todos aquellos rasgos sistemáticos asociados a la unidad léxica y constantes en todas sus realizaciones discursivas y un conjunto de rasgos generales casi-sistemáticos que aparecen automáticamente en aquellas situaciones que cumplen unos determinados requisitos pragmáticos: nivel de especialización, emisor, receptor, etc.
  
- Un conjunto de rasgos especializados entre los que están aquellos rasgos ligados a uno o más ámbitos temáticos y otra serie de rasgos especializados libres correspondientes a la unidad en cuestión. Estos últimos son rasgos exclusivos de las realizaciones de la unidad léxica como término.

### 3. Semantic-pragmatic level

The specification of the kinds of situation in which each group of features is updated constitutes the pragmatic characterisation of the lexical unit. The pragmatic parameters determining the selection or correct actualisation of the traits for the values of the term are the following: the field, the topic, the way of dealing with this topic, the kind of text, the kind of addresser and addressee, and the kind of communicative situation.

### 4. Semantic-syntactic level

Basically, the kind of lexical units that can be updated as terms belong to the noun category. This becomes apparent in the fact that the fundamental differences between specialised and non-specialised texts are based on the kind of referentiality. Hence, in specialised texts, there is an almost exclusive predominance of the referential function and, in fact, the terminological units from the adjective or verb category are usually morphologically related to a nominal unit.

## 5. Formal level

Terminological updatings can be monolexical and polylexical. However, depending on the domain of speciality, terminological units present structures that correspond to certain formation processes, for instance, cult or hybrid formation in medicine, certain kinds of suffixation in chemistry, etc.

### 4.2.1.2 The hypothesis of the lexical unit (LU) in the CTT

Partimos, pues, de la hipótesis de la UL de la TCT de Cabré (Cabré 1999d, 2000; Cabré and Adelstein 2001; Adelstein and Cabré, 2000) que plantea que la unidad léxica no es PER SE palabra ni término, sino que se trata de una forma léxica que, de acuerdo con la situación comunicativa en la que se emplee, activa un valor especializado o no. La información semántica, según Cabré, está organizada en rasgos y módulos o paquetes de rasgos, que se activan de maneras diversas según cada situación, dando lugar a uno de los sentidos posibles de la UL (Adelstein 2001, 90-91)

Thus – and this is the conception of term adopted in this work in accordance with the principles of the CTT – the term is the updating of certain traits or modules of traits according to specialised communicative situations. It is a unit in use and one of the possible ways of finding a lexical unit in discourse. In consequence, the features and the discursive-communicative situations are what determine the selective activation of information, be it through formally specialised units (units used exclusively and only in specialised contexts although with a potential general value) or through units that are specialised in meaning (lexical units used with a specific sense in specialised contexts and with an open sense in non-specialised ones<sup>23</sup>).

Hence, within this proposal it is assumed that in the lexical competence of a speaker neither words nor terms exist, but instead lexical units and semantic traits that may activate (or not) specialised values according to the contexts in which they are found. These traits that can be activated might be general morphosyntactic traits of the unit or specific semantic and pragmatic traits that would describe their specialised character within a given context.

Considerados en su contexto natural, i. e. en los textos o discursos producidos en situaciones de comunicación especializada concretas, las UT y las palabras no parecen diferenciarse tanto. En todo caso, las diferencias entre estas entidades

<sup>23</sup> What is normally known as sub-technical vocabulary.

no parecen ser respecto de su estatuto semiótico, sino relativas a cierta especificidad en su funcionamiento." (Adelstein, 2004: 55)

Accordingly, the main objectives that a discipline like terminology should have are (IULA, 2006 a):

- describir formal, semántica y funcionalmente las unidades léxicas que pueden adquirir valor terminológico;
- dar cuenta de cómo se activa este valor terminológico, haciendo referencia a la estructuración en rasgos y módulos de rasgos semánticos;
- explicar los parámetros que activan la selección de rasgos especializados o, lo que es lo mismo, el paso de una unidad léxica sin valor especializado a una unidad léxica especializada; y finalmente,
- explicar las relaciones de las unidades terminológicas con otros tipos de signos del mismo o distinto sistema para hacer progresar el conocimiento sobre la comunicación especializada y las unidades que se usan en ella.

Thus, as Adelstein states (2001: 5):

Los trabajos de Cabré (1999a, b), en los que evalúa y revisa los presupuestos de la TGT, señalan que la descripción y la explicación del funcionamiento de las unidades de especialidad puede hacerse desde diversas perspectivas, en tanto y en cuanto tienen un carácter poliédrico. Según Cabré, desde la lingüística, las UT, en principio, no se distinguirían de las unidades léxicas. Así, propone la hipótesis de que la unidad léxica no es *per se* palabra o término, sino que se trata de una forma léxica a la cual está asociada una gran cantidad de información semántica, que puede tener un valor especializado o no especializado según cuál sea el contexto de uso.

Consequently, and in order to progressively continue reasoning out the way of conceiving terms adopted in this study, the next section attempts to provide a comprehensive account of other aspects that are crucial in this conception according to the CTT.

#### **4.2.1.3 Terms / terminological units (TUs) in the CTT and The Theory of Doors (*La Teoría de las Puertas*)**

In Wüster's views, the object of terminology was to express concepts through denominations from natural or artificial languages. In this context, Wüster refers to terms to allude to the nominal units of natural language that denominate specialised concepts.

Vargas (2005) explains how the Classical Theory defends that the way of analysing and dealing with terms differs from that of dealing with words in three main senses:

- 1) Every terminological work has as its departure point a number of concepts which must be perfectly determined (Felber, 1987). Concepts exist independently from the terms that designate them because they are mental abstractions (representing features assigned to objects, facts, phenomena, etc.) to which we assign labels.
- 2) Wüster considers that the terminologist is only interested in terminologies or vocabularies and does not take into account morphology or syntax, from which it is implicit that grammatical rules only pertain to the general language. Wüster was not at all interested in the study of the terms in use but in establishing what they represented.
- 3) The terminologist is only interested in the synchronic study of terms.

Hence, traditionally, the word (understood as the unit of natural language) and the term (understood as the unit of specialised languages) have been distinguished. Nowadays, however, new proposals have been developed that conceive word and term as values of a same unit of the lexicon, depending on their context of use. Hence, as aforementioned, the notion of lexical unit would designate here an entity that is not identified with words or terms – a unit which is *per se* neither word nor term – but a form associated to, among other things, a great amount of semantic information.

La unidad léxica es una entidad más abstracta que el término o la palabra que subsume los valores que se realizan en el uso no especializado y en el especializado o, lo que es lo mismo, una unidad léxica es potencialmente término y no término (IULA 2006 a).

According to the CTT there are two “observation points” from which terminological units can be analysed:

On the one hand, they can be analysed *in vitro*, that is to say, outside their natural context and in an isolated way by means of the units contained in dictionaries,

databases or thesauruses. When we observe terminological units *in vitro*, these units possess a meaning and a form which could be described as stable and well-delimited.

On the other hand, observation *in vivo* is also possible and this implies analysing units in their natural habitat in specialised communication, through the analysis of texts, whether oral or written, produced in real, natural situations. These units show a diversification that is produced without exception (although with different degrees) in any given specialised text.

In this sense, Cabré and Estopà (2002: 145) state:

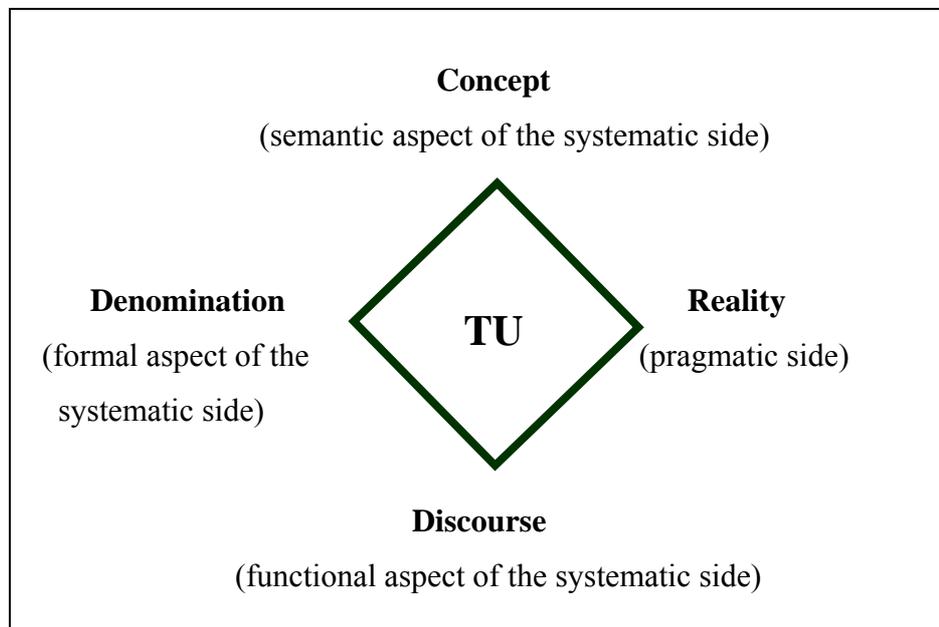
El pilar en que se fundamenta nuestra aportación de base comunicativa y fundamentos cognitivos es el *texto especializado*, pues éste nos permite observar los términos *in vivo*, en su funcionamiento natural. El análisis del término en el texto abre la puerta a tres observaciones importantes en el desarrollo de la terminología como campo de estudio: en primer lugar permite observar la diversificación formal, conceptual y funcional de las unidades terminológicas. En segundo lugar, permite detectar otras unidades de conocimiento especializado más allá de las terminológicas; y en tercer lugar permite situar las unidades de conocimiento especializado en una estructura cognitiva multirrelacional.

As has already been explained, formally and semantically terms do not seem to differ much from words, but if pragmatic or communicative criteria are adopted, the differences between the two become more acute (Cabré, 1993). The most outstanding peculiarity of terminology in contrast to the common lexicon is that the former is used to designate the concepts belonging to specialised disciplines and activities. Consequently, as may be deduced, terms are mainly known by specialists in each of these subjects and appear with a high frequency in the specialised documents of each discipline.

El conjunto de las palabras especializadas de una determinada disciplina (y también de un ámbito de actividad específica) constituye, como se sabe, la terminología propia de esa especialidad. Los términos, que son las unidades de base de la terminología, designan los conceptos propios de cada disciplina especializada. (Cabré 1993: 169)

To proceed further into Cabré's (1993: 169) views on this topic, she states that terms, just like words from common language "son unidades sígnicas distintivas y significativas al mismo tiempo, que se presentan de forma natural en el discurso especializado". Accordingly, they have a systematic side (formal, semantic and

functional) and also show another pragmatic side, since they are units used in specialised communication to designate the objects of a pre-existent reality (see figure I.12 below):



**Figure I.12:** Adaptation of Cabré's (1993) representation of the terminological unit.

Cabré (1993) goes on to explain how terms, like any other significant unit of a linguistic system, form part of a structured system in which they occupy a particular level (the level of lexical units). They relate to the rest of the units on the same level and to the units on the other levels and, together, participate in the construction of discourse. Hence, the relationships established by terms, both with the lexicon in general and with the rest of the components of grammar, do not display any specificity that makes them systematically different from the relationships that words simultaneously maintain with their grammatical environment. However, as Cabré states (1993), it must be acknowledged that within the lexical component of a language, terms do relate far more closely with the other terms from the same discipline (with which they constitute specific structured subsystems) than with terms from other thematic areas.

Si los términos son unidades de un sistema léxico (incluyendo el léxico común y los distintos léxicos especializados) que forma parte del sistema gramatical general, la terminología debe participar de las mismas reglas de construcción de frases y de

constitución del discurso que las demás unidades léxicas de la lengua. (Cabré, 1993: 170).

Therefore, if the proposal that terminology is an integral part of the lexical system of a “grammar” is accepted, terms are seen to be *signic* units which can be linguistically analysed from three different points of view (Cabré, 1993):

Formal (the denomination):

Desde una perspectiva formal, los términos son conjuntos fonológicos susceptibles de ser articulados fonéticamente – y de ser representados gráficamente – con una estructura interna constituida por morfemas. (Cabré 1993: 171)

Semantic (the concept):

Desde un punto de vista semántico, los términos son unidades de referencia a una realidad, y por lo tanto están dotados de un significado que puede describirse como un conjunto de rasgos distintivos. (Cabré 1993: 171)

Functional (category and distribution):

Desde una perspectiva funcional, los términos son unidades distribucionales que requieren un entorno lingüístico determinado, y que en el discurso se encuentran frecuentemente combinados con otros términos específicos (la fraseología). (Cabré 1993: 171)

Although the word “term” is used to designate the complete terminological unit (formed by denomination and concept), it is also used as a synonym of denomination. This previous hint can be especially useful for attempting to explain certain aspects regarding denomination and to understand, first of all, Cabré’s words (1993) when she concedes that the formal aspect of the terminological unit is known in terminology as “denomination” and also “term”.

Linguistics, cognition and communication are three unavoidable aspects that must be considered in the study of terms as the elements that constitute its multifaceted nature.

Hence, bearing all these aspects in mind, it seems plausible to consider that terminological units can also be analysed from diverse perspectives. These different perspectives can be established according to different parameters, such as the dichotomies general/specialised, lexical/grammatical, expression/communication, synchronic/diachronic, grammatical/social, etc. Terminology is then, like a complex object, a discipline that can be analysed from different points of view. Each of these

points of view, which are concentrated in a unit corresponding to each sphere, constitutes the principal object of a different discipline.

Accordingly, in Cabré's and Estopà's views (2002), the contributions made by linguistics, psychology and the philosophy of science to terminology in recent times have allowed such an object to be recovered, not as an exclusive object of linguistics, but also of other disciplines (Rey, 1979; Sager, 1990; Gambier, 1991; Gaudin, 1991; Slodzian, 1995; Condamines, 1994; Cabré, 1994, 1999 a; Temmerman, 1998; Ciapuscio, 2000).

Most of the criticism that the GTT has received over the years (the most significant part of which has been reproduced in this work) refers, basically, to the insufficiency that has arisen from the idealisation of reality, knowledge and communication, as well as to the limited scope of this proposal, which is reduced to standardisation. Such criticism comes from three different perspectives or approaches: cognitive, linguistic and social.

- Cognitive science grounds its critical views on the fact that the notion of specialised knowledge is dealt with by the GTT in an isolated way, which brings to the fore the question of its uniformity and its moving away from general knowledge.
- Linguistics basically questions the limitation imposed on the part of the GTT, this being translated as paying attention and showing interest exclusively for the prescriptive aspects of terms, considering them as units that are completely and radically different to the lexical units that characterise general language.
- Sociology rejects the idealised conception of terms, the plain character attributed to specialised communication – where terms partially lose their condition of units from natural language and their pragmatic features – and the negation of discursive variation.

Hence, according to the CTT, the conception of terminology as a knowledge domain of a necessarily interdisciplinary nature that accounts for the terms and that integrates the cognitive, linguistic and communicative aspects of the terminological

units is what has led to the formulation of the Theory of Doors (*Teoría de las Puertas*) (Cabré, 1999 a, 2000 a). This theory accounts for the multidisciplinary nature of the terminological object and states that the object *term* is a semiotic, linguistic, cognitive and social unit that can be dealt with by and from different perspectives<sup>24</sup>, the only condition being the fulfilment of the following three principles (Cabré, 2002):

- To start out from the principle that a discipline can never account for an object in its totality, but only contribute to the description and explanation of such an object.
- To conceive the units of specialised knowledge, as well as every unit of natural language, as multifaceted units that are cognitive, linguistic and social.
- To assume that, in order to properly and accurately deal with an object, a particular perspective must be adopted and made explicit. In terminology this positioning requires the selection of a single entrance door for the description of the units that convey the specialised knowledge.

Hence, this theory of terms has been construed on the basis of different linguistic theories and includes different aspects of cognition and communication theory. According to the *Theory of Doors*, one may go into the terminological study through one of its doors, and later establish the necessary connections or links, that is to say, one may, for instance, “go in” from the knowledge until the linguistic and communicative matter is reached, or vice versa.

If we open the linguistic door, it must be noted that units that are considered to be terminological can be analysed at the same time from a formal, semantic and functional side; they are then considered to be similar to lexical units (which are not specialised) because, apart from sharing these three aspects, both kinds of units belong to a bigger lexical category. In the case of terminological units, there is no universal agreement on whether this bigger category is only and always the noun (Wüster, 1979; Sager, 1990) or the noun, the adjective and the verb (Cabré, 1994; Dubuc, 1985). It is precisely this

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<sup>24</sup> These different perspectives are the “*puertas*” (doors) which we may go through to analyse terminological units. We can opt for analysing these units by going through the semiotic, linguistic, cognitive and social doors.

condition the one that differentiates them from other units that are also semantic, formal and functional, such as morphological, phraseological or orational units. In consequence, functionally, both lexical and terminological units belong to one of the grammatical categories established. Also from the formal point of view, both the terminological and lexical units share the same structures and are explained by the same grammatical rules. From the semantic point of view they are not different either, since they are units with a meaning (and one or more senses) that can be represented through a definition. Finally, from the pragmatic point of view, both units participate in the communication scheme that is presupposed for any communicative interaction. Hence, one may wonder what the specificity of the terminological units is. According to Cabré (1999 a) and Lara (1999) it lies in the signification process: the processes used to categorise the same reality are what distinguish the specialist from the layman even though both of them use the same form. In an example proposed by Cabré (2002: 4) “La unidad *sal* es para el no especialista *un condimento usado en la alimentación*, pero para el químico es *cloruro de sodio*”.

Moreover, as Gutiérrez (1998) points out, these categorisation procedures are different not only between the specialist and the layman. They can also be different between specialists, since not all of them analyse or understand reality in the same way: each topical area has its own objectives and references that make the perspective from which things are observed vary. Taking one of Gutiérrez’s (1998: 23) examples in this respect:

Así, por ejemplo, las rickettsias son para los médicos agentes bacteriológicos que causan las rickettsiosis y, en cambio, para los biólogos son bacterias parásitas intracelulares de los vertebrados que tienen un ciclo natural en el que intervienen artrópodos hematófagos que pertenecen a la familia de las rickettsiacias y al orden de los rickettsiales.

Therefore, if we assume that terminological units share the same characteristics as the lexical units of a natural language, it can be presupposed that the terminological and lexical units are not different grammatical units (Cabré, 2002). What is different, however, is the specialised/non-specialised value they acquire in a conversation. Hence, according to Cabré and her proposal (2002), TUs are lexical units that are singularly activated by their pragmatic conditions, which make the terminological character of a unit a pragmatic value conferred by the discursive conditions in which a text is given within an area; that is to say, it depends on its use in a given and specific expressive and

situational context. Consequently, a lexical unit is formed by a group of semantic parameters, some of which are activated, some of which are not, depending on their use in a specific domain (Cabr , 2002). Moreover, it is not true that the condition of specialised value is unique or static. The same unit may, on the one hand, activate different specialised values depending on the subject matter in which it is used (horizontal variation). On the other hand, the same lexical unit within the same specialised area may be more or less specialised, since the trait of specialised value carries with it gradual values of precision (accuracy), concision and scientific character (vertical variation). The examples that Cabr  (2002) proposes to illustrate these two types of variation are, on the one hand, the lexical unit *consorcio* (consortium), which is an example of horizontal variation because it can be used in a non-specialised context or in specialised contexts that involve different topics. On the other hand, the example proposed to illustrate vertical variation is the lexical unit *h gado* (liver), which in texts about medicine is treated with different levels of specialisation.

To sum up, terms cannot be explained in an autonomous way independently from other denominative signs with which they share the “space” of specialised communication, nor isolated from the other signs of natural language made up of a form and a meaning (Cabr , 1999 a, 2003). Accordingly, terminology is presented as an interdisciplinary and multi-entry field of knowledge:

- Terminology is considered a field of knowledge and leaves apart the label “discipline”. In this line, it is assumed that the structuring of knowledge around a well-delimited object shapes a field of knowledge;
- It is assumed that every object of study is interdisciplinary *per se* and as such it can be tackled or approached from different subject matters. This characteristic is embodied in the principle of the multifaceted nature of the object;
- It considers that every field of knowledge structured around an object facilitates a multiple entry to this object. The object is always the same but the “entrance door” to it may be different. This proposal is embodied in the “Theory of Doors/Doors Model” (Cabr  1999 a).

Consequently, if this view is followed, terminology is an interdisciplinary field of knowledge whose central object of study are terminological units, which, due to their multifaceted nature, can be approached as units of language, their conceptual condition or their socio-communicative function.

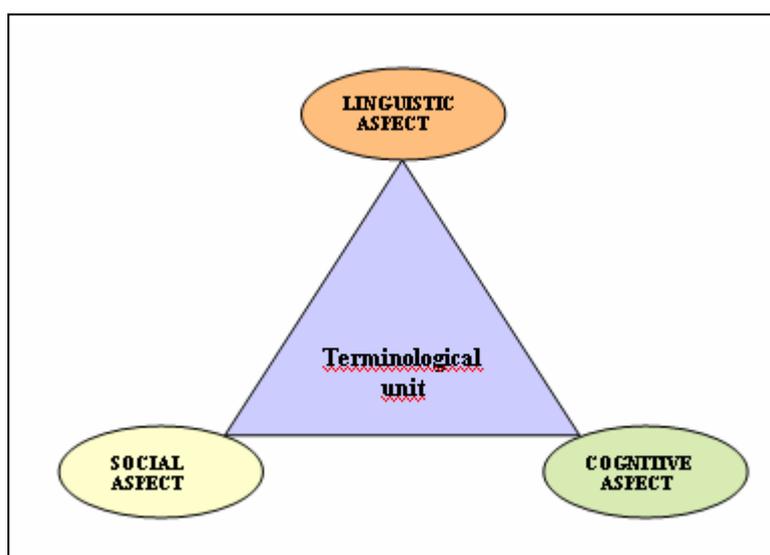
Thus, in order to completely understand the CTT it is necessary to be aware of the importance of the “Theory of Doors” (Cabr , 1999 a, 2000 a), which accounts for the already-mentioned interdisciplinary nature of terminology and the multidisciplinary and multifaceted nature of the terminological object in a structured and coherent way.

#### **4.2.2 Grounding principles of the CTT**

On the basis of what has been mentioned hitherto, Cabr  (1999 a) and her team introduced some of the grounding elements of their proposal for a new theory of terminology. These elements are presented in the form of principles (understood as the inherent conditions to be accomplished, or the alternative possibilities formulated in terms of whether a given feature is possessed or not) which facilitate or block the attribution of certain characteristics or the accomplishment of certain processes. Following Cabr  (1999 a), the way of approaching and accounting for terminology is sustained upon 6 basic principles from which the CTT can be coherently explained:

##### a) Principle of the multifaceted nature of the term (see section I.4.2.1.3)

According to this principle, terminological units are inherently multifaceted, that is to say, they are units that integrate three aspects in one, i.e. the linguistic, cognitive and social dimensions (see figure I.13). This multifaceted nature is present, regardless of the fact that a study on terms may adopt an integrating position or, conversely, may be limited to examining a single phenomenon within just one aspect.



**Figure I.13:** Illustration of the multifaceted nature of the terminological unit.

#### b) Principle of the communicative character of terminology

According to this principle (which is one of the most decisive and characteristic in the CTT, as its very name indicates), every terminological unit pursues a communicative goal, in either an immediate or a remote way. If this goal is immediate, it is materialised in the form of direct or indirect communication. Direct communication, on the one hand, takes place among experts, in didactic discourse or that used in the popularisation of science, among other possibilities. On the other hand, indirect communication can be understood as the communication via a process such as translation, interpretation or specialised journalism. In other cases, explains Cabré (1999 a), communication makes use of terminological units to represent knowledge, that is, to label the “knowledge knots” belonging to concepts of the specialised world. In these cases, the remote goal (in contrast to the aforementioned immediate goal) of such representation is to favour the univocity of communication among experts (international denominative standards) or among experts and expert systems (in documentation and in computational linguistics applied to knowledge engineering), thus creating a new conception of reality or conceptualising a new reality.

c) Principle of variation

According to the principle of variation, any process of communication inherently implies variation and such variation can be made explicit in alternative forms of denomination for the same concept (synonymy) or in the semantic openness of one form (polysemy). This principle applies to all terminological units, although it admits different degrees according to the conditions of each type of communicative situation. The greatest degrees of variation would be accomplished by the terms aimed for use in popularising science and technology, whereas the smallest degree of variation is the one corresponding to terminology standardised by groups of experts. The intermediate degree is represented by terminology used in natural, everyday communication between specialists.

d) The natural language condition

Terminologies must be located within a specific area of knowledge where its object is defined. This statement implies the acceptance that an object of analysis is established only when it is defined within a field of knowledge. In this sense, the field of study of terminology is defined in terms of its location within a field of knowledge. (Cabré, 2002: 11-12)

Consequently, as Cabré states, this is the only possible explanation for the wide range of interpretations given to the terminological unit up till now, and which can be summarised in the following perspectives:

- For linguistics, terminology is a part of the lexicon of a grammar specialised by topical, pragmatic and semantic criteria.
- For the different specialised subjects or areas, it is a means of professional expression and communication as well as a system for representing the structural knowledge of specialised areas.
- For translation, interpretation and technical writing, terminology is a group of communication units whose evaluation is measured in terms of equivalence, adequacy, precision and economy criteria.

- For linguistic planning, terminology is an area of language where intervention is needed in order to reaffirm the existence, utility and survival of a language understood as a means of expression.

Very significantly, in all the options or perspectives put forward above, terminological units have a tripartite character: linguistic, cognitive and social (see figure I.13).

Despite this, terminology is viewed differently by those disciplines that are not interested in it from the communicative (and consequently linguistic) point of view but from the representational (and only indirectly from the communicative) point of view. Such a view would be the one adopted by terminology within knowledge engineering, documentation or international standardisation. In these cases, like any other communicative sign, units also accomplish the aforementioned principles since they are units with a tripartite (linguistic, social and communicative) character; but they may also present idiosyncratic aspects.

However, this condition of natural language attributed to terminology implies a series of consequences determined by the grammar that describes this natural language. Hence, the general morphological, syntactic and semantic properties of the words of a language also act on terms.

e) The special communication condition (attributed to terms)

It can be easily deduced from everyday evidence that general communication and specialised communication share common elements – such as the communicative scheme, the processes produced, the linguistic functions, the interchange conditions and so on – but they also present differences in certain aspects. If a deeper analysis is undertaken in this respect, specialised communication<sup>25</sup> is seen to differ from general communication in the selection of units, in the organisation of discourse, in the frequency of the linguistic functions that are selected, and so on.

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<sup>25</sup> The adjective “specialised” is understood here as that which accomplishes all the necessary semantic and pragmatic requisites, that is to say, it is topically marked, it is produced in a professional setting or situation, it belongs to a formal register and does not acquire its meaning directly from an object of reality but from a pre-established structure (Cabr , 1993).

In addition to this, there seems to be rather general agreement on the fact that scientific-technical communications elaborated on the basis of specialised languages – and in contrast to texts produced by general communication – are (overall) characterised by three main elements or aspects:

- The global semantic aspect: concise texts, which are usually hardly redundant, precise (this precision understood as the lack of ambiguity) and depersonalised (lacking the emotive function).
- The preponderance attributed to lexicon and, more specifically, within the lexicon, the quantitative and qualitative importance of nominalisations and nominal forms.
- The formal aspect of discourse: the high degree of elaboration of a text and, in certain areas or subjects, the integration of semiotic symbolic systems within the text.

Thus, there is fairly broad agreement upon the idea that specialised languages form a kind of subgroup within general language. In this sense, and after having analysed many scientific-technical communications, that is to say, the texts produced in such situations, Rondeau (1984) stated that the term “specialised language” can only be understood as a subgroup of the general language and differing from common language in the textual, lexical and pragmatic-functional dimension.

From the textual point of view, specialised texts are characterised by a specific global configuration.

From the pragmatic point of view, specialised languages are generally characterised by their easier intercomprehension beyond the peculiarities of particular languages. In this sense and following Beaugrande (1987, in Cabré 2004: 7) “LSPs tend to share much of their resources not merely with LGPs, but also often have common cognate resources. LSP thus tends to be more ‘international’, or indeed ‘universal’, than does LGP”.

Finally, from the lexical point of view, specialised texts are specific because of the terminologies they use. These terminologies can present various degrees of specialisation and levels of signification as well as different levels of peculiarity,

depending on the kind of subject or knowledge area and the level of abstraction in which this is dealt.

To sum up, if Rondeau's (1984) views are accepted, it can be said that from a textual point of view general and specialised communication share the same "territory", make use of the same linguistic and textual rules and processes and, broadly speaking, their greatest discrepancy or difference lies in the selection of units and the frequency with which each resource is updated in the discourse.

Pour nous la langue de spécialité sera une sous-langue de la langue dite naturelle, enrichie d'éléments brachygraphiques, à savoir, abrégatifs et idéographiques, qui s'intègrent à elle en se conformant à ses servitudes grammaticales. (Kocourek, 1982 in Cabré 2000 a: 13)

#### f) The specialisation condition

Having a specialised character is a necessary condition that must be accomplished by the discourse in order to be considered special. However, what is not so clearly agreed is the definition of "specialised" and the different degrees it may present. Following Cabré (1999 a), what seems obvious is that if the adjective "specialised" is used exclusively to refer to discourse dealing with some strongly structured scientific-technical field, the notion of specialisation is stronger than if it is also applied to specialised activities. Whatever the case may be, within each speciality, discourse can be produced at different levels, thus also implying a different *terminological density*.

The fact that humbler occupations like nursing, book-keeping and cooking and even hobbies also involve special areas on human interest and therefore also require and indeed have their own special language is much less often acknowledged. Since practically every human activity can be attributed to one subject or another, all language could be split into so many subject languages and the word "special" would be superfluous. (Sager *et al.*, 1980 in Cabré, 1999 b: 64)

In Cabré's (1999 a) view, the condition of "specialised" is accomplished by those texts in which the conceptualisation they transmit has been achieved from the perspective of the speciality and the specialist, and not from the optic of the common speaker. Thus, the specialisation of a text is not so much based on the subject matter it acts as a vehicle for, but on the way this subject matter is conveyed.

If the degree of specialisation of communication is considered, Cabré (2000 a) states that it is not only dependent on the terminological density a text may present but also on the amount of expressive variation that can be resorted to when referring to a single concept. Hence, a highly specialised text tends to be precise, concise and systematic, its terminology tending towards monosemy and univocity. However, if the degree of specialisation decreases, the discourse shows features more akin to general expression. These features refer, for instance, to the fact that from a semantic point of view there will be more contextual variation, redundancy, ambiguity and a greater lack of precision; from a formal point of view, it will have greater variation as regards lexical synonymy, and it will show a greater use of paraphrastic formulae which contain analytical explanations of concepts. However, on a more specialised level, these concepts would be explained synthetically.

#### **4.2.3 Characterisation of the CTT**

Bearing in mind what has been explained so far and if we focus on the CTT as a whole, it can be said that from the 90s onwards, terminology has been undergoing a process of renewal. We have been witness to a deep critical revision of the theoretical and methodological postulates upholding the Classical Theory or GTT, leaving aside the idealised and normalising view of terms that characterised it. The appearance of other approaches, such as the sociolinguistic trend, made terminology go on with its development to a *descriptive* perspective in opposition to the *prescriptive* one that had prevailed up to that time. Rey (1979), for instance, proposes understanding of terminological production from a descriptive point of view because specialised lexical units are real linguistic issues and not homogeneous and ideal entities without conceptual ambiguities.

Therefore, new approaches to terminology have been developed which constitute a step forward with respect to the GTT. As has already been mentioned, terminology has progressively abandoned the main goal pursued by traditional postulates in the field, that is to say, to control and even eliminate linguistic variation. However, the modern conception of terminology does not imply rejecting terminological standardisation completely: it understands it as a means of intervention whose adoption

will be considered positive or not depending on each situation and on each communicative context.

Following Vargas (2005), the new proposals of terminology are grounded in the principle according to which knowledge can only be produced and known through its materialisation in its different semiotic systems, among which the verbal one is the one that dominates in sciences and technology. Thus, contrary to what Wüster proclaimed:

Los conceptos son elementos de la estructura del conocimiento y, como tales, ocupan un lugar importante dentro de la filosofía de la ciencia y las teorías cognoscitivas. La terminología trata de conceptos y, por tanto, de estructuras del conocimiento sólo en la medida en que están representadas en el léxico de la lengua. (Sager, 1995: 36 in Vargas, 2005:192-193)

Consequently, a theory in which terms are conceived as linguistic and communicative units (CTT) will not have concept as a key point (GTT).

As has been progressively introduced in previous sections, Cabré was the first to provide an argued criticism of the GTT and to show the explanatory and descriptive shortcomings to be found in it. She does not question the whole GTT but criticises mainly the normalising and uniforming ideal it aims at, which ignores the communicative dimension of terms. In Cabré's (1999 a: 110) words, Wüster's theory:

Establece un objeto de análisis y unas funciones de trabajo muy restrictivos, por cuanto limita el objeto a las unidades unívocas normalizadas propias de los ámbitos científico-técnicos, reduce la actividad terminológica a la recopilación de conceptos y de términos para la normalización (fijación de nociones y denominaciones estandarizadas) de los términos, circunscribe los ámbitos especializados a la ciencia y la técnica y limita sus objetivos a asegurar la univocidad de la comunicación profesional, fundamentalmente en el plano internacional.

Therefore, Cabré's work gathers a series of postulates in the form of a new theory of terminology grounded on the communicative aspects of specialised languages, leaving aside the normalising systematic conception that is characteristic of the Traditional Theory. Thus, this renewing effort was shaped into the already-mentioned CTT proposed by Cabré (1999 a and 2000 c among other works).

Throughout the previous sections most of the features that constitute the mainstays of the CTT have been progressively introduced. Hence, in accordance with what has been commented above, the CTT is a theory of a linguistic basis that explains terminology as a group of denominative-conceptual units from natural language

representing specialised knowledge within a precise thematic area and hence acting as a vehicle to convey professional natural communication.

Hence, the pillars of the CTT are mainly grounded on 7 basic assumptions that have made linguistic reflection advance and evolve (Cabr , 2000 a) and which characterise the CTT as follows:

- It considers reality to be only one and assumes that just the ways of approaching, conceptualising and categorising it give way to two kinds of knowledge: general and specialised.
- It understands that general and specialised knowledge, which share the field of study of cognitive science, can manifest themselves formally through the units of articulated natural language or through units of other symbolic languages.
- It assumes that, placed in articulated natural language, knowledge of the world is materialised in referential units that are integrated within the grammar of the speaker and that, within this grammar, they form part of the lexical component.
- It considers that the speakers' knowledge, if materialised in linguistic units, is included in their grammar-based linguistic competence and the knowledge of the units of reference in the pragmatic module of their grammar.
- It postulates that referential language units included in a speaker's grammar are neither words nor terms – neither in the first instance nor in the abstract. Instead, they are believed to be units of the lexicon of which, according to the features of the communicative situation, only a specific set of characteristics is selected from the totality which describe them. Consequently, any unit having a reference can potentially be a term or a word. However, it is also possible that some highly specialised units in special subjects may become only terms, as they are always used to denominate special concepts. In spite of this, this does not mean either that they are unable or cannot eventually become part of the general language due to the spread of special knowledge.

- It maintains that the fact that all referential units have the possibility of becoming both terms or words (when expressing special or general knowledge respectively) does not mean or imply that they function as both in all cases. In consequence, the lexical component of grammar would contain only the real information and not the potential information for every unit.
- It maintains that a model like the one suggested can only be sustained if it sets out from a strong lexical theory that contemplates a lexical component in a grammar model that includes, apart from grammatical data, pragmatic and encyclopaedic information about the units of grammar. Moreover, it must possess a mechanism that accounts for the selection of traits (not marked / marked) undertaken by the speaker in a given situation. This selection process could be designed as a mechanism of activation of the marked thematic features when the communicative characteristics so require.

Hence, the CTT (which was already constituted as a proper theory after a deep reflection on the shortcomings of former theories of the sort) pays attention in all its dimensions to the linguistic variation that so annoyed Wüster and takes into account the conceptual, textual and discursive features of terms. Cabré (1999 a) thus conceives a new theoretical framework applied to terms and observes them *in vivo*, that is to say, as they appear in different communicative situations and, therefore, subject to change. At the same time she takes into consideration the different degrees of specialisation a text, a term or some given knowledge may present:

Tanto el conocimiento especializado como los textos especializados, como las unidades terminológicas pueden darse a diferentes niveles de especialización y describirse en distintos niveles de representación. Sólo así, los términos pueden explicarse en toda su realidad comunicativa y representacional. (Cabré, 1999 a: 126)

According to what has been mentioned so far, the main features on which the CTT is built can be summarised as follows (Vargas, 2005):

- Terminology is an autonomous interdisciplinary subject, not simply an autonomous one, something which must be clearly stated within a theory of language which is at the same time inserted within a theory of communication

and knowledge. This linguistic theory includes linguistic, as well as cognitive and pragmatic, aspects.

- The resemblances and differences between general and specialised knowledge are explained by this theory within the competence of the speaker-specialist without dissociating them, although at the same time the singularities of each of them are maintained.
- It explains the interdisciplinarity of terminological units and accounts for the diversity of views that the different specialists involved have of them. Therefore, it conceives terminological units as multifaceted units made up of the three disciplinary aspects that describe them, i.e. linguistic, cognitive and pragmatic.
- It provides an explanation for the fact that a concept may form part of the conceptual structure of different disciplines, assuming, however, that a term may be used in the field of a speciality area and transferred from one speciality to another or from the general language to a specialised language.
- It assumes the polysemic character of terms, so that it also takes into account the possibility of specialised units becoming “trivialised” in some particular moment, of the continuous “terminologising” of units from the general language, as well as the possibility of there being a constant entrance of terms from one speciality field to another (pluri-terminologising).
- It admits synonymy as a real phenomenon within natural specialised communication.
- It must take into account that terminological units are processed in a natural way in the discourse and that, consequently, they have a syntactic projection that goes beyond the denominative limits and varies depending on the discourse being dealt with.

- It considers the variation of the discourse and establishes the variables that describe this variation in the field of communication in general, and in specialised communication in particular.

To sum up, terminology has experienced a qualitative “leap forward” in the sense that the former privileged position of the conceptual schemata in scientific-technological fields has given way to the privileged role of the text or discourse, which accounts for the important role played by corpus linguistics in this work. This change, undertaken mainly thanks to the efforts of Rey (1975), Sager (1993) and, of course, Cabré (1999 a), among others, has made it possible to develop a theory of terminology that takes into account the different aspects of languages within their pragmatic scope and that, therefore, fits within this study and the approaches chosen for it. In Vargas’ (2005: 196) words:

La TCT ha abierto nuevos caminos más apropiados y adecuados para la tarea terminográfica pues asume la diversificación discursiva en razón del tipo de situación, del destinatario, de la temática, del nivel de especialización de los textos, del grado de formalidad, de la finalidad del discurso, entre otros aspectos.

Therefore, the CTT not only takes into account the linguistic, pragmatic and communicative aspects of the specialised lexical units, but also designates the specialised text as the base unit for its analysis. In this way, terminological research acquires a textual dimension that allows the terminologist to observe texts in context, which at the same time leads to the adoption of a phraseological dimension. Thanks to this, not only single terms have been studied in this research, but also other kinds of combinations of terms that work within the specialised text.

This communicative theory of terminology leaves to one side the more restrictive views of the classical one, based on a systematic normalising conception. Throughout these sections I have tried to account for the main postulates of this Communicative Theory and its different views about the essence and aims of terminology. In a way, I have attempted to show how the GTT was developed to fulfil a specific necessity and how many of its contributions have been and still are vital for terminology, so that terminologists will always be in debt to it; no-one can deny the importance of the GTT in the process of establish of terminology as a field of knowledge by determining its object of study. However, its shortcomings and failures (namely and mainly the fact it

ignores the communicative dimension of terminology) cannot be forgotten and, consequently, the step forward represented by the CTT has been thought to constitute the best alternative to account for terminology in general and to frame this study, as well as being the most realistic way to do it.

### **4.3 Terminology as a field of knowledge and its relationship with lexicology, lexicography and terminography**

For the correct development of this study, it has also been necessary to take a closer look at terminology, terminography, lexicology and lexicography and their fields of work – something that has helped to shape and place this project within a coherent theoretical framework. All too frequently, the boundaries between disciplines or fields of knowledge are too blurred due to the proximity, similarity, merging nature and subtleties of their functions, topics and goals. In this particular case this is so because of the interdisciplinarity of linguistic activity in general and, more specifically, of terminological practice. Therefore, in order to clarify the scope of action of these highly related “disciplines”, one must be aware of the ways in which they are interrelated and cooperate with each other, as well as know the most significant and even opposing views regarding their scopes and roles that have been put forward by different authors.

When it comes to distinguishing between terminology/terminography and lexicology/lexicography, most authors usually establish a parallel correspondence between lexicology and terminology and lexicography and terminography. On the one hand, lexicology is understood as the discipline focused on the study and description of the lexicon of a language and lexicography is conceived as the applied branch of lexicology and focuses on the elaboration of dictionaries. On the other hand, and correspondingly, terminology is considered an area of theoretical and methodological study, terminography being the applied, practical aspect of terminology responsible for the elaboration of specialised dictionaries. Accordingly, lexicology is to terminology what lexicography is to terminography (Pérez, 2002).

But why, then, are terminology, terminography, lexicology and lexicography disciplines which may present blurred boundaries that need to be clarified? Alcaraz and Martínez Linares’ (1997) definition of lexicography and lexicology may

contribute to start forming an idea about these issues. In its second and more modern sense, in the quotes below, the word lexicography refers to both a theoretical and a practical dimension (in a way, the same as what happens with the use of the label “terminology” to refer also to its applied dimension, which is also known as terminography). Lexicography thus in a way absorbs the more theoretical field of action of what has been traditionally known as lexicology (meaning 1 in the quotation below).

LEXICOGRAFÍA 1) Atendiendo a su cometido estrictamente práctico, la “lexicografía” se ha venido definiendo como el arte o la técnica de componer léxicos o diccionarios (Casares, 1950; Lázaro Carreter, 1968; DRAE), siendo su contrapartida, en el plano teórico, la LEXICOLOGÍA, disciplina encargada del estudio científico del léxico y, en consecuencia, de los principios que rigen la elaboración de todo tipo de obras lexicográficas (Fernández Sevilla, 1974).

2) Actualmente, el término “lexicografía” designa tanto a la técnica científica de componer diccionarios, léxicos, etc., como la disciplina lingüística que proporciona las bases teóricas y metodológicas de la praxis lexicográfica. (DRAE, 1992; Alvar, 1993, Azorín, 1994)

However, Fernández-Sevilla (1974, in Martínez de Sousa 1995: 254) tries to assign to lexicology the importance he thinks it deserves. In Fernández-Sevilla’s words (1974: 17):

“no existe acuerdo acerca de qué deba ser la lexicología, cuáles sus límites y alcance. Ni siquiera existe unanimidad en relación con la legitimidad de su propia existencia”

In addition, he concedes that:

“no pocos opinan que la lexicología ni siquiera tiene razón de ser en el marco de la lingüística de nuestro tiempo. Su presunto cometido deberían repartírselo la semántica, la fonología, la morfología y hasta la lexicografía. Sin embargo, parece lícito y necesario postular su existencia y desarrollo, entendiéndola como disciplina lingüística que se ocupa del vocabulario global de una lengua como conjunto estructurado, de la medida y volumen del mismo, de sus movimientos y tendencia generales, según las épocas; es decir, de los problemas generales relativos al sistema o conjuntos estructurados de palabras”. (Fernández-Sevilla, 1974: 18-19)

Sager’s (1990) considerations on this topic go a step further and establish a rather delimited boundary between terminology (in its wider sense including terminography) and lexicography that is coherent with Sager’s separate, independent vision of LSP and general language (see section I.2.1):

Terminology is the study and the field of activity concerned with the collection, description, processing and presentation of terms, i.e. lexical items belonging to specialised areas of usage of one or more languages. In its objectives it is akin to lexicography which combines the double aim of generally collecting data about the lexicon of a language with providing information, and sometimes even an advisory, service to language users. The justification of considering it a separate activity from lexicography lies in the different nature of the data traditionally assembled, the different background of the people involved in this work, and to some extent in the different methods used. (Sager (1990: 2 in Pérez, 2002)

I do not totally agree with this view since he traces a too abrupt line between general and specialised languages, between terms and words, between onomasiological and semasiological methods. In my opinion, language is a *continuum* that is better defined by inclusive relationships which contemplate language as a whole, with different degrees of specialisation that range from general language to the more specific or specialised instances of it – these specialised instances also being able to constitute a somehow independent phenomenon with its own particularities (see section I.2). In this sense, all the words in a language, regardless of their degree of specialisation, form the lexicon of this language and consequently lexicology is the wider discipline in which this study or any study dealing with terminology can be contextualised.

According to Cabré (1993: 80), theoretical lexicology is responsible for describing the words in a language. Its goal is to explain as accurately as possible the functioning of the speaker's lexicon. However, even though descriptive lexicology aims at no applicative objective for the lexicon, this does not prevent applied linguistics from having a more practical interest for the subject. Lexicography is one of the disciplines responsible for this topic and in charge of the principles of dictionary elaboration. To establish the same parallelism as the one established with terminology and terminography, it can be said that, for Cabré (1993), lexicography is an applied branch of lexicology that deals with the elaboration of dictionaries, a dictionary being, in Cabré's (1993: 80) words:

a linguistic product that gathers a selected group of words (or other language units) and illustrates them with a series of information. The group of dictionary entries constitutes its macrostructure and the information about the entries, its microstructure.

For some other authors, one of them is part of the other (terminology is part of lexicology) while for some others they are differentiated subjects. Although I tend to

consider that terminology can, in general, be regarded as part of lexicology, in 1993, before the CTT emerged, Cabré (1993) pointed out certain diverging traits that made it more advisable to treat them individually and some others that did not. These factors are specified below, although highlighting the fact that some of these views have been changed over time owing to the new considerations introduced by the CTT some years later.

- Regarding the field of work, lexicology deals with the whole group of words that the speaker of a language knows, that is to say, it deals with the analysis and description of the lexical competence of the speaker, whereas terminology only focuses on the words belonging to a speciality field (like ceramics) or a professional area (like commerce or industry). Therefore, their fields of work participate in a relationship of inclusion, i.e. the field of lexicology is wider and includes terminology (indeed, in the case of specialists, their lexical competence as speakers includes terminology). Therefore, according to the criterion of the field of work, terminology is part of lexicology.
- Moreover, although the focus of the work is different, one being more general (lexicology) and the other more specific or specialised (terminology), in this study and according to the CTT, terms have been considered first as lexical units, components of the whole lexicon of the speaker. In other words, terms are primarily considered to be lexical units which, depending on certain factors of different natures, may or may not activate the specialised traits necessary to become terms. However, no-one can deny their specialised nature or the specific pragmatic and contextual features they present, which make them lexical units with different levels of specialisation appearing in specific contexts. Therefore, they are also terms. This leads us directly to the next point.
- Regarding the base unit, lexicology deals with the study of words whereas terminology is responsible for the study of terms. A word is a unit described by a group of systematic linguistic characteristics with the property of referring to an element from reality. From the linguistic point of view, a word is a unit

characterised by having a phonic and graphic form, a simple or complex morphological structure, a grammatical characterisation and a meaning that describes the class to which a given element belongs, the same as a term. The difference lies in the fact that a term is a unit of similar linguistic characteristics used in a speciality domain. Accordingly, a word belonging to a specialised domain would be a term. However, especially from a pragmatic point of view, there are certain features that allow a distinction to be made, as has already been mentioned in the previous point. Pragmatically, terms and words are distinguished by their users, the situation in which they are normally used, the subject matter they deal with, and the kind of discourse in which they normally appear. All these features act as the “activators” of the specialised character of terms but in their origin, the lexical unit is the base unit both in lexicology and in terminology.

- From the point of view of the applied objectives, terminology and lexicology can also be distinguished by the objectives they have. Lexicology, if considered from the point of view of theoretical linguistics, deals with words with the objective of showing the linguistic competence of speakers, whereas terminology deals with terms with the aim of fixing a reference form (Cabré, 1993). However, I do not wholly agree with this since, as has already been discussed, terminology may have prescriptive but also descriptive objectives (the ones pursued in this study). Even Cabré (1999 a), some years later, acknowledges that this distinction is not valid nowadays, since terminology always needs to be descriptive in the beginning and may have a final descriptive objective as well.
- With respect to the method of working, lexicological works set out from a theoretical hypothesis that will be rejected or validated through the analysis of samples of the speakers’ productions; terminology does not explain any behaviour, but looks for the denominations of concepts of have been previously established. Over time, however, this distinction regarding the method of working has also become relative and not so clear; semasiology has

also proved to be widely used and useful for terminological works like the one presented here.

Thus, although in 1993 the comparison between the pragmatic aspects and prospective goals of terminology (denomination and normalisation) and lexicology (description) led Cabré to differentiate between the two subjects, their comparison nowadays gives rise to a more confusing situation. It can be argued that the work process of both lexicography and terminography is materialised in compilations of lexical or terminological units in the form of dictionaries. Moreover, description has become an essential step in any work involving the creation of dictionaries, whether they are specialised or not.

Before reconsidering some of these aspects by means of the CTT, Cabré (1993) goes on to explain how lexicography and terminography are differentiated by other aspects that make a common language dictionary a different product from a specialised terminology dictionary:

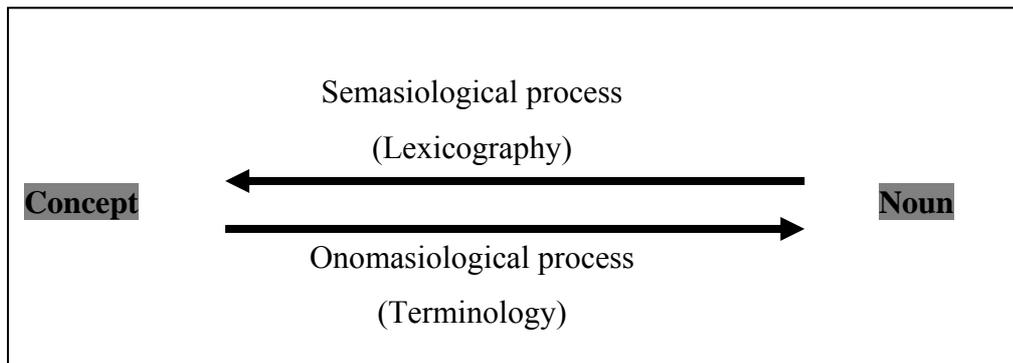
- The linguistic aspects of dictionaries: the elaboration of a dictionary goes through several stages, and in each of these stages, the author(s) make(s) a series of choices that will result in dictionaries of different kinds. It is at this point that terminological and lexicological works are mainly differentiated, because in terminological projects, in some stages of the elaboration process, certain possibilities are selected while others are rejected because they are deemed to be more suitable for general language dictionaries or, at least, not appropriate for a specialised one. Terminologists make use of specialised documentation, whether oral or written, as their only material source; they select the entries according to the topic of work and they preserve only the information that can be considered relevant (according to relevance criteria) in terminology. In this respect, I agree with Cabré's considerations, but one must consider as well that general language dictionaries also make a selection, excluding those lexical units that are considered to be too specialised.
- The function of the terminographical work: if the aforementioned linguistic aspects of dictionaries already allow us to establish differences between

terminography and lexicography, the main goal to be reached by both subjects makes this distinction even clearer. Following Cabré (1993), in terminology, the elaboration of dictionaries leads to normalisation (in the sense of standardisation) of the terms belonging to a given speciality domain. Terminological work is not usually limited to compiling the denominations of a given area with an informative or descriptive function. Apart from this, the intention is to fix certain terminological units as normalised forms with the aim of achieving professional, precise, modern and univocal communication. Accordingly, in lexicography, the only dictionaries that, at least partially, coincide with terminology due to their function are normative ones. In this case, the words they contain are correct according to an academic institution that supports them, whereas in terminology, normalised forms are preferred because users (specialists) have agreed on them (Cabré 1993). With the CTT, however, Cabré (1999 b) started to consider the need for description in terminology, at least in its initial stages, and this reconsideration is what allowed the creation of descriptive specialised dictionaries like the one presented here. Thus, the dictionary entries presented in section VI.4 are aimed at contributing to the achievement of professional, precise, modern and univocal communication, but not at fixing certain terminological units as normalised forms because, among other reasons, I lack the authority to do so.

- The work process in terminography: the orientation of the process of work in terminography does not coincide with that of lexicography either; in this case the elaboration of a general lexicon dictionary starts out from a list of words that constitutes the inventory of the entries of a dictionary. The lexicographer then proceeds to semantically describe them by means of the definition. The process is then semasiological – we go from the form to the meaning (Cabré, 1993).

The process of work in terminology goes the other way round. The terminologist establishes first a list of concepts that form part of a notional structure. The concepts belonging to this structure are interrelated logically and ontologically and their group constitutes the conceptual system of a discipline or specialised activity. The terminologist then attributes to each conceptual

square a denomination that corresponds to the form that the specialists effectively use when referring to the concept of a notional structure. This process, which goes from the concept to the denomination in terminology, is called an onomasiological process (Cabr  1993) and is illustrated, together with the semasiological one, in figure I.14:



**Figure I.14:** Cabr 's (1993) views on semasiological and onomasiological processes.

Nowadays, with the CTT, Cabr 's (1999 b) views have also changed in this respect and a less abrupt line has been traced, since reality constantly shows that semasiology is also used in terminology, especially when a corpus is used, as in this case.

In spite of the apparent distinction that can be made between both the object of study of the terminological and lexicographical approach (words from the general lexicon and terms, respectively) and the approach to this object (from the word to its designation in one case and from the concept to the term that designates it in the other), for Sager, in 1991, the reality of the terminographical practice placed both disciplines much closer:

Traditional terminological theory identifies its approach as "onomasiological", i.e. a "naming" approach, because, in principle, it starts from concepts and looks for the names of these concepts. By contrast, the lexicographical approach is called "semasiological", i.e. a "meaning" approach, because it starts from words and looks for their meaning. In reality, the onomasiological approach only characterises the scientist who has to find a name for a new concept (an invention, a new tool, measurement, etc.); the terminologist, like the lexicographer, usually starts from an existing body of terms to start with. (Sager, 1990, in P rez, 2002)

Cabr  (1993) considers that the fundamental aspect that separates terminology from lexicology is the conception that both disciplines have of the language:

lexicology grounds its study in lexical units and does not conceive meaning if it is not linked to a word. In contrast, terminology, and especially the GTT, focuses its attention on the concepts, which are considered to be previous to lexical expression, and can be conceived independently of the terminological denomination assigned in each language (Pérez, 2002).

Another feature in order to distinguish between terminological and lexicological studies may be the interest in the grammatical and contextual behaviour of their units of study. In the lexicological and lexicographical field, increasing importance is granted to the study of word behaviour, both in their grammatical co-text and in their sociolinguistic context, and they are considered to be basic elements for discourse construction. In contrast, on terminology, terms have traditionally been studied in an isolated way, with a minimal interest in the study of their morphology or syntax (Pérez, 2002), although this tendency seems to have been overcome nowadays, especially if a corpus linguistics approach is followed.

In this sense, one of the objectives of this study is to show the importance of giving the contextual and co-textual study of terms the importance they deserve, because the sociolinguistic situation in which they are used is decisive in order to obtain and reflect all the shades of meaning a term may have and consequently to try to obtain an effective tool for accurate specialised communication. Thus, taking this fact as our starting point, the importance of creating an active dictionary like the one proposed and under development here becomes more easily understandable.

Another characteristic that makes terminological studies different from lexicological and lexicographical ones is, as has already been mentioned, the kind of product offered to their users, i.e. the kind of dictionary or terminological lexicon. The difference arises in the starting point traditionally assigned to each discipline. Terminology has been thought to depart from the concept, whereas lexicography departs from lexical units (Pérez, 2002). However, in this study, even when dealing with terms, the lexical units (prospective terms) provided by the corpus have been taken as the starting point.

After these initial reflections on these disciplines, in subsequent sections (and with the objective of clarifying the blurred boundaries that terminology, terminography, lexicology and lexicography may present nowadays) I have examined some of these aspects in greater depth. In section I.4.2.1 a basic aspect for

understanding the CTT has already been dealt with, namely, the definition of the nature of the objects of study of terminology and lexicology, which has made it necessary to elaborate on the notions of word, term and lexical unit.

To go on with my clarification of this aspect, in the next section (I.4.3.1) I have tried to establish the limits of terminology with respect to linguistics and more specifically to lexicology.

Finally, in order to coherently conclude how this study has been approached, the methodology used for the elaboration of the most prototypical lexicographical and terminological applications was analysed in search of an answer to a final and crucial question that is directly related with the kind of work presented here, i.e. is terminology specialised lexicography?

#### **4.3.1 Terminology and lexicology: independent disciplines?**

Apart from the reflections in this respect made in the previous section, there are two main viewpoints when posing the question of whether lexicology and terminology are independent disciplines:

- On the one hand, we find those defending the idea that terminology and lexicology are two disciplines with nothing in common and so they are completely differentiated. They view terminology as an autonomous discipline;
- On the other hand, we find those who argue that terminology can also be explained from linguistics, since specialised lexical units can be described from a language theory. They conceive terminology as part of lexicology (and hence as part of linguistics).

If we delve further into this topic, we will observe that grammar has traditionally been considered to be made up of 4 basic modules: the phonological, syntactic, semantic and lexical modules. Lexicology is the linguistic discipline responsible for describing the lexical module of a language. That is to say, it is the module in charge of the description of the group of lexical units a language is made up of, together with the rules that allow their formation, the use speakers make of them and the mechanisms

that allow the lexical component to be related with the other components of the grammar of this language.

As a discipline<sup>26</sup>, terminology must have a series of well-established theoretical bases together with a specific object of study. However, as has been introduced above, there is no universal agreement regarding this object of study: for some people the object of study of terminology are the concepts of each speciality field (GTT). For others, however, the object of study are the lexical units that denominate these concepts, and which are made up of form and meaning, thus constituting a special kind of lexical units called specialised lexical units or TUs (CTT). This dichotomy regarding lexicology and terminology is the origin of the current panorama in terminology and has also favoured the appearance of questions like: are lexicology and terminology independent disciplines? Is terminology part of lexicology? or Is terminology (part of) linguistics? These questions (already indirectly answered in previous sections), which arise from the aforementioned dichotomy, have resulted in the two contradictory views just mentioned and which we will now attempt to explain in more detail.

On the one hand, those who defend that terminology is an autonomous discipline are mainly supporters of the views and ideas of Wüster's General Theory of Terminology, proposed in the 50s. Consequently, following Wüster and his GTT, terminology is an autonomous discipline, completely independent from linguistics because:

1) Terminology departs from concepts with the final aim of establishing delimitations among them and, in consequence, it presupposes the independence of these concepts with respect to linguistic forms<sup>27</sup>. In this way and according to this view, for terminology, concepts are prior to and independent from the denominations or terms that designate them, whereas lexicology is always based on words and cannot conceive meaning without them.

<sup>26</sup> The term "field of knowledge" has been preferred to that of "discipline" to refer to terminology as a whole in this study, in spite of the wide acceptance of the latter.

<sup>27</sup> In this respect, as Cabré (1993: 48) notes down: *una prueba de ello es que los conceptos no siempre se representan mediante unidades de carácter lingüístico (unidades morfológicas, léxicas o fraseológicas), sino también por medio de símbolos, fórmulas, o iconografías que no pertenecen al sistema de la lengua.*

- 2) Given the ruling position of concepts, terminology studies only the lexicon of a language, leaving aside its syntactical projections or its morphology. However, lexicology never ignores grammar, and words are described taking into account their possible contexts of use.
  
- 3) Terminology focuses its analysis from a synchronic point of view, without considering the diachronic aspects of terms. However, for lexicology, both approaches are interesting.
  
- 4) Terminology only takes into consideration the conscious and generally agreed formation of language (what is called the prescriptive norm), whereas lexicology generally accepts the study of language as an object of natural evolution and the norm is the result of use.
  
- 5) Terminology prioritises the written form of terms and not their phonetic form, which is the one favoured by linguistics.

Thus, in spite of the fact that from a historical point of view terminology has developed, up to now, “hand by hand” with other disciplines such as linguistics and conceptology, those who support and maintain that it is an autonomous discipline ground their views on the belief that it possesses a series of specific theoretical principles. The reason for this is based on the assumption that two different objects of study are dealt with, i.e. words, in the case of linguistics, and concepts, in the case of terminology. Thus, this view originated in the belief that two different objects of study were enough to justify that a discipline such as terminology could be dealt with and developed while leaving linguistics completely out of the picture. In this sense, Cabré (1993: 83-84) points out that:

Si partimos del principio de que la terminología es una aproximación a las palabras distinta de la que hace la lingüística, la materia que se ocupa de los términos debe tener elementos que muestren claramente esta especificidad. Wüster señala dos que son fundamentales: la aproximación al objeto de estudio y las características de los diccionarios que se elaboran en una y otra perspectiva

And Adelstein (2004: 13) adds:

Dado que una disciplina, en principio, se distingue de otras por tener un objeto de estudio discreto, para constituirse como disciplina la terminología necesitó distinguir su objeto del de la lingüística: opuso el término a la palabra.

On the other hand, those who maintain that terminology is an integrated part of lexicology sustain their views in the following points:

- 1) The object of study of terminology are the terms that appear in the oral and written texts created by professionals;
- 2) these terms, framed within the text, are the lexical units through which specialised knowledge is accessed;
- 3) terminology is understood as a “theory of terms”, understood as units of the lexicon and not as a “theory of concepts”.

Accordingly, terminology *is* linguistics provided that terms (that constitute its object) form part of language. In this sense, and since this doctoral thesis is based on the Communicative Theory of Terminology, it is interesting to note that this second viewpoint has been regarded as the most plausible one for the study of terminology (understood as an integrated part of lexicology and, hence, of linguistics). This is therefore the conception adopted in this study:

La terminología, en nuestra opinión, no puede explicarse autónomamente, al margen de otros signos denominativos dotados de capacidad referencial con los que comparte el espacio de la comunicación especializada, ni aisladamente de los signos del lenguaje natural compuestos de forma y significado. [...] Así pues, en contraste con las suposiciones de la TGT, en nuestra propuesta teórica, que denominamos Teoría Comunicativa de la Terminología (TCT), partimos del supuesto que los términos no son unidades aisladas que constituyen un sistema propio, sino unidades que se incorporan en el léxico de un hablante en cuanto adquiere el rol de especialista por el aprendizaje de conocimientos especializados. (Cabré, 2001 a: 130- 131).

However, whereas linguistics deals with the study of language conceived or understood as a grammatical and/or social system made up of components on different levels (phonology, morphology, lexicon, syntax and discourse), terminology, as a matter of study and application, would only deal with language from one of these components, i.e. the lexical one. Consequently, when the question of whether terminology is linguistics is posed, one could answer that terms, as an integral part of

the lexical component, form part of language and may be studied by linguistics and, more specifically, by lexicology and terminology. Nevertheless, this does not necessarily imply that terminological units cannot be tackled from other speciality fields.

Desde una perspectiva lingüística puede afirmarse que la terminología es lexicología especializada o una lexicología de las unidades léxicas especializadas. No obstante hay que precisar que la terminología no es exclusivamente una parte de la lingüística, sino que también es deudora de otras disciplinas como la filosofía u otras diferentes especialidades. Por ello, un aproximación lingüística a la terminología debe tener en cuenta su carácter interdisciplinar. (Cabré, 2001 a: 131).

If this interdisciplinary character of terminology is considered together with the fact that terminology is the result of the intersection between linguistics and other disciplines (of a very different nature in most cases), the result is that terminology is a subject that forms part of the language sciences, due to the fact that language is its grounding element, that is, its substance. Terminology is language. However, as an intersection discipline, it can be considered both from the linguistic perspective and from the perspective of the other disciplines that form part of it, namely (Cabré, 1993: 83):

- Desde la lingüística, la terminología es una parte del léxico especializada por criterios temáticos y pragmáticos;
- Desde las disciplina científico-técnicas, la terminología es el reflejo formal de su organización conceptual y, en consecuencia, un medio inevitable de expresión y comunicación;
- Desde la perspectiva del usuario (ya sea directo o intermediario), la terminología es un conjunto de unidades de comunicación, útiles y prácticas, que deben evaluarse en función de criterios de economía, de precisión y de adecuación a su expresión.

Accordingly, for Cabré (1993: 37) there are four different approaches regarding the study and practice of terminology:

- Para los lingüistas, la terminología es una parte del léxico especializada por criterios temáticos y pragmáticos.
- Para los especialistas, la terminología es el reflejo formal de la organización conceptual de una especialidad, y un medio inevitable de expresión y de comunicación profesional.
- Para los usuarios (directos e intermediarios) la terminología es un conjunto de unidades de comunicación, útiles y prácticas cuyo valor se mide en función de criterios de economía, de adecuación y de precisión.
- Para los planificadores lingüísticos, la terminología es un ámbito del lenguaje donde se debe intervenir para reafirmar la existencia, la utilidad y la

pervivencia de una lengua, y para garantizar, mediante su modernización, su continuidad como medio de expresión.

Bearing in mind these four approaches, which comprehend and clarify the scope of terminology, two broad perspectives of this discipline could be stated: the first one involves all those people using it for communication, whether directly or through intermediaries, and the second one is the perspective of those who work on it, either with the goal of producing glossaries, making communication easier, or with other information-related objectives. Therefore, it could be argued that terminology presents two different dimensions that are related to each other, i.e. the linguistic and the communicative. Therefore, for Cabré (1993), the word ‘terminology’ designates at least three different concepts:

- 1) referring to the discipline, terminology is the conceptual basis and the group of principles that govern the study of terms;
- 2) regarding methodology, it comprehends the guidelines used during the terminographical work;
- 3) when it comes to the designation of the group of terms of each specific thematic area, terminology is the group of terms of a given speciality area.

In order to deal in depth with this topic and better define terminology as such, Vargas’ (2005) views on the topic are also very useful. For her, terminology as a discipline has received increasing attention from theoreticians and linguists because it is the field of knowledge responsible for the study of the lexical elements that form part of a structured system of concepts in which terms are the main elements that lead the knowledge of a given scientific, technical or professional community (see section I.7.2: “The discourse community”). The international norm ISO 1087-1 (in Vargas 2005: 169) defines terminology as: “el conjunto de designaciones que pertenecen a un lenguaje especial y como ciencia que estudia la estructura, formación, desarrollo, uso y gestión de terminologías en varios ámbitos”.

For Cabré (1993), for specialists, terminology is a formal reflection of the conceptual organisation of a speciality field and an unavoidable means by which professionals express and communicate with each other. In an attempt to pay attention to all the aforementioned aspects, the *Asociación Internacional de Terminología*

defines it as “el estudio y uso de sistemas de símbolos y signos lingüísticos empleados en la comunicación humana en áreas especializadas del conocimiento” (Sager 1993: 23). This definition, which contemplates the interdisciplinary aspect of terminology, again highlights the fact that, as an applied discipline, terminology is related to lexicography and uses techniques from science and information technologies.

Terminology is also used to refer to the structured group of terms used within a given field of knowledge (medical terminology, ceramics terminology, etc.). These terms, when appearing in texts used by specialists, acquire a clearly defined and even restricted meaning.

In order to complete and clarify these issues regarding terminology, I have included a series of brief definitions on the topic:

In Frawley’s (2003: 225) words:

Terminology is an interdisciplinary study of the principles and theoretical bases of concepts, concept systems, and the designation of concepts in scientific, technical and other professional fields. Its origin lies in the efforts made in order to solve professional communication problems resulting from the internationalisation of commerce, technology, and science in the 20th century (...).

For Lewandowski (1982: 352), terminology is conceived as “el vocabulario técnico, el léxico específico de una ciencia; el conjunto de los términos de una especialidad, que forma un terreno especial en el léxico de una lengua.”

In this study, however, the way of understanding terminology as a field of knowledge is in line with Alcaraz and Martínez Linares’ (1997: 503) views, which in turn fully coincide with Cabré’s (1993) ones (mentioned above). According to this viewpoint the word ‘terminology’ is defined and used in three situations:

- 1) Conjunto de términos especializados de una disciplina; en este sentido es sinónimo de metalenguaje.
- 2) Ciencia interdisciplinar (lingüistas, especialistas de la materia) que estudia la confección y el análisis de términos especializados.
- 3) La teoría especializada en el análisis de los términos.

To sum up, as has already been explained in section I.4.1, during the 18<sup>th</sup> and 19<sup>th</sup> centuries, scientists were mainly concerned with the proliferation of denominations in different and varied fields of knowledge or speciality areas which, consequently, led to the need to “put them in order”. Their main aim, then, was to “clear up” the mess of forms and relationships between forms and concepts that made communication more difficult. Thus, terminology arose from the explicit necessity specialists have always had (and still have) of ordering the denominations of their conceptual systems with the aim of achieving a more reliable professional communication.

However, these scientists concerned with the proliferation of denominations were not interested in knowing the nature of the concept or the theoretical grounds governing the creation of new terms. The theoretical questions about the nature of a term were posed later, when terminological practice started to become, at least minimally, organised in certain fields. This was the approach Wüster first adopted: he paid special interest to terminological compilation and normalisation methods and, afterwards, he began to look into the theoretical aspects of the terms themselves.

Nowadays, terminological theory develops almost hand-in-hand with practice, with the intention of solving communicative linguistic problems. In addition to this, terminology is continuously developing, fostered by the evolution of science and technology, the changes produced in international relationships and the importance acquired by information and communication technologies, among other reasons.

Terminology, as a subject that is concerned with the compilation, description, management and presentation of the terms that belong to the speciality fields of one or more languages, is not a practical activity that can be justified by itself, but must be considered within a wider scope. It has to be aimed at solving social needs linked to the optimisation of the communication between specialists and professionals (whether directly or through translation) or related to the process of normalising the language. This pragmatic and applied conception of terminology fits better into the spirit of current society (Cabré, 1993) and the CTT.

The interdisciplinarity of terminology is determined by the characteristics of the terminological units that are, at the same time, language units (linguistics), cognition elements (cognitive science) and communication “vehicles” (communication theory). Terms appear in specialised communication (documentation) and are usually processed by computers in the terminographical activity (computer science).

To conclude, it can be said that, in the conception of terminology as a discipline there also exist diverging opinions and trends. Cabré (1993, in Vargas, 2005) differentiates 3 positions: in the first, certain authors who feel close to the GTT defend the autonomy and self-sufficiency of terminology as a discipline with its own grounds, although they acknowledge the close historical relationship it has had throughout history with other disciplines. In the second one, it is considered as part of other disciplines (such as linguistics or philosophy) and therefore lacking any kind of autonomy. In the third view, authors like Cabré (1999 a) defend, as has already been explained, the autonomy of terminology but at the same time highlighting its interdisciplinary character because of its adoption of concepts and methods from other disciplines. Thus, it is influenced by the scientific-technical areas to which it renders service. According to Cabré (1999 a), terminology is a discipline that benefits from the grounds of other disciplines, selects elements from them and builds its own original space, and in this sense it is different from other scientific fields. For other authors within this position, like Loening and Sonnenveld (1993), terminology results in a multidisciplinary field of study (with knowledge coming from different sciences such as computer science, linguistics, and so on) but with methods and principles of its own.

#### **4.3.2 Descriptive versus prescriptive terminology**

Despite the fact that the prospective specialised lexicographical tool (the specialised dictionary of the ceramic industry) under development in this study has a descriptive character, I thought it would be a good idea to close this reflection on terminology as a field of knowledge by presenting some of the most significant aspects of terminology as regards its most paradigmatic and internationally relevant function, i.e. prescription or normalisation. In addition to this, even descriptive terminology is benefited and influenced by certain aspects of normalisation, such as normalised documents (which can be compiled for the creation of a working corpus) or the bodies and associations of terminology, as explained in subsequent sections.

But, what is really meant by normalisation?

La normalización, en su sentido más general, es "una actividad que consiste en establecer, con respecto a problemas reales o potenciales, disposiciones para uso común y repetido, encaminadas al logro del grado óptimo de orden en un

contexto dado. La normalización consta de tres procesos: formulación, publicación e implementación de las normas". (ICONTEC, 2003)

When referring to languages, the term “normalisation” refers to two different concepts which have been used in terminology:

- Giving priority to certain linguistic forms that become “norms”. This first sense of normalisation, which is synonymous to standardisation, is used to create a hierarchy of the different denominative possibilities for a concept, one of them being considered the reference form (however, more than one possibility may be accepted). This reference form or denomination is the one that is called the *normalised term*, a concept prototypically used within the context of international communication.
- The extension or area of use of a language for which a normal situation of use (that is regular and without restrictions) is desired. This second way of conceiving terminology is used in situations of linguistic planning and refers to the process that turns a language into usual (it is used by its speakers in every communicative situation). In this case, the normalisation of terminology deals with the implantation of terms in real use.

Following Cabré (1993), in its first sense, normalisation is the result of a decision reached by consensus by a representative commission which is gathered and kept in a document called a *norm*, in which the different aspects agreed upon among the parts are specified and where their contexts of application are used. Among the different aspects suitable for being the object of a norm (basic components of the corpus gathered for this study, as illustrated in section III.1.1), one may find: the products and/or processes of industrial and service sectors, units of measurement, terminology, and so forth.

Terminological normalisation can be applied in two different fields:

- The normalisation of terms.
- The normalisation of the principles and methods of theoretical and applied methodology.

With respect to the way terminology is organised, there are six different parameters taking part in it with respect to a specific social, political and linguistic context:

1. Planning, coordination and management of the terminological resources
2. Terminological work
3. Normalisation of the terms; this implies the fixing of forms that are considered to be standard, as well as the assessment of those repeatedly used to designate the very same concept
4. Diffusion of the normalised terms and resolution of terminological queries
5. Implantation of the terminology in the different areas of work and activity
6. Formation of terminology; this entails the training of specialists for the elaboration of, or participation in, terminological projects

Focusing on point 3, the normalisation of terms, the IULA (2006 b) describes it as:

un proceso complejo que comprende distintas operaciones: la unificación de conceptos y sistemas de conceptos, la definición de términos, la reducción de homonimia, la eliminación de sinonimia, la fijación de denominaciones, la creación de nuevos términos, etc.

Following the IULA (2006 b):

El proceso de normalización se basa en una serie de principios y criterios que es necesario respetar:

- su aplicabilidad al conjunto de lenguajes de especialidad;
- la participación de los especialistas en la elaboración de las normas;
- la aprobación de la norma por parte de un organismo competente;
- la difusión de la terminología estandarizada mediante una norma; etc.

If point 6 in the list above – the one dealing with the formation of terminology (terminological neology) – is considered in depth, this neology may be understood as an activity of creating new denominations, which is considered necessary in domains of speciality due to the constant appearance of new concepts (the ceramic industry is a

clear example of this phenomenon since it is in constant evolution.) Neologisms are then a special kind of term that appear in fields such as:

- Lexicography (since general language dictionaries must be updated)
- Terminology (since the denominations of specialised languages must be created or adapted)
- Linguistic planning (since criteria for orienting lexical creation must be established)

The decisions adopted by normalising committees about new denominative proposals aimed at filling “gaps” in a specialised lexicon make up an array of possibilities that are interrelated with one another and are normally oriented by a series of preferential political criteria. Following the IULA (2006 b), according to these criteria, normalisation bodies can make different decisions about a neologism: accept it (both if it is a loan or a lexical creation), reject it, and accept it but adapting it to the linguistic system if it is a loan. In the same way, the IULA (2006 b) proceeds, the terminological normalisation bodies usually accept neologisms if:

- They are necessary
- They are widely used
- They have been spread in the professional field or area in question
- They have been gathered by general lexicography
- They have been spread by a linguistic body
- They show a parallelism with other languages of similar culture

Looking at this topic in more detail, Estopà (2003, in IULA 2006 b) divides the criteria for the acceptability of a neologism into three different kinds:

a) Linguistic criteria:

- Phonetic and orthographic adequacy
- Morphological adequacy
- Semantic adequacy (precision, transparency and a motivated form)

- Syntactic adequacy

b) Terminological criteria:

- Relation between notion and denomination
- Term included in an array of notions and denominations, not an isolated unit
- Formal analogy with other related terms of the same field
- Analogy with other languages
- Respect for the terminological trends of each field
- Preference for Greek-Latin forms
- Adequacy to the recommendations of the international normalising committees

c) Pragmatic and sociolinguistic criteria:

- Level of formation of the users and degree of linguistic sensibility
- Current trends
- Social and professional prestige in means of diffusion and dissemination
- Real necessity of creation
- Belonging to a formal register
- No pejorative connotations
- Euphony and ease of pronunciation
- Brevity, simplicity and synthetic character of the term
- Mnemotechnic ease
- Frequency of use
- Dissemination of the form
- Consensus by specialists
- Viability, feasibility of the proposal (analysed or determined through polls)

#### **4.3.2.1 The normalisation of principles and methods of theoretical and applied terminology**

Terminology as a discipline and terminography as a practice have also been the object of international normalisation on the part of ISO Technical Committee 37.

Among the main terminological norms created by this Technical Committee, it is worth mentioning:

- ISO 704:2000 "Terminology work - Principles and methods";
- ISO 860:1996 "Terminology work - Harmonization of concepts and terms" (norm currently under review);
- ISO 1087-1:2000 "Terminology work - Vocabulary - Part 1: Theory and application";
- ISO 1087-2:2000 "Terminology work - Vocabulary - Part 2: Computer applications";
- ISO 12620:1999 "Computer applications in terminology - Data categories" (norm currently under review);
- ISO 12616:2002 "Translation-oriented terminography";
- ISO/TR 12618:1994 "Computer aids in terminology - Creation and use of terminological databases and text corpora".

The dissemination of normalised terminology is usually done through norms or recommendations. Following the IULA (2006 b), the main steps to be taken into account in the creation of a terminological norm are the following:

- hacer un inventario de los términos disponibles en el campo o subcampo de especialidad; es decir, compilar y registrar los términos;
- examinar los términos compilados para identificar los conceptos individuales y específicos a definir;
- organizar los términos bien sea por campos semánticos o alfabéticamente;
- separar los términos permitidos de los preferidos. Usar los términos permitidos (sinónimos) sólo en caso de que el término preferido se deba evitar por alguna razón en especial, y
- agregar un índice alfabético al final de la norma terminológica para evitar el uso excesivo de referencias cruzadas.

#### **4.3.2.2 The role of the specialist and the terminologist in terminological normalisation**

Specialists play an important role in basically two moments of the process of terminological normalisation:

- In term fixation; specialists are the main source when it comes to confirming all the possible variants of a term, indicating the “use”, proposing neologisms, deciding about cases of synonymy, choosing the equivalents of terms in other languages and disseminating the normalised terms.
- In concept fixation. The specialist is the person in charge of “delimiting” the concept belonging to the term that is being normalised, that is to say, the person who places the concept within the field and subfield to which it belongs within the conceptual system.

Hence, and following the IULA (2006 b):

Los especialistas juegan un papel importante en la normalización de la terminología porque son ellos, a fin de cuentas, sus verdaderos usuarios. Ciertamente, el establecimiento de las nomenclaturas tiene su base en el consenso sobre los conceptos, los sistemas de conceptos y el uso de los términos. Por consiguiente, para que el proceso de normalización tenga éxito se debe alcanzar el consenso entre los especialistas de las diferentes áreas del conocimiento y los terminólogos.

Regarding the role of the terminologist “la normalización de los términos es un trabajo de equipo en el que deben participar especialistas y terminólogos” (Cabré 1993: 437).

In this very same sense, Rondeau (1984) states that the terminologist intervenes in three stages of the process:

- in the preparation of materials (in the elaboration of the normalisation dossier)
- in the discussions about the terms proposed for normalisation, contributing to them with his/her knowledge on morphology, etymology, lexicology, stylistics and methodology of the definition, and
- in the dissemination of the normalised terms through glossaries or norms.

What seems beyond question, thus, is the important role played by terminologists in terminological normalisation, a process that is also determined by the existence and work of bodies devoted to this aim.

### 4.3.2.3 Terminological normalisation bodies

The important role of terminological normalisation bodies in the process of the same name is beyond question. Depending on their scope, there are three main kinds of terminological normalisation bodies (IULA, 2006 b): international, national, and regional bodies.

1. International bodies. Among these, the paradigm of international terminological normalisation bodies is the ISO (International Organisation for Standardisation), set up in 1947 as a non-governmental organisation with the aim of creating norms that fostered the improvement of international communication. The ISO publishes the results of its technical work as a series of international norms and it is the Technical Committee 37 (TC/37) of the ISO, called “Terminology: principles and coordination”, that is in charge of establishing the principles of terminology. ISO norms are the standards issued by the International Organisation for Standardisation. The TC/37 prepares international norms for:

- Principles and methods of terminology
- Vocabulary of terminology
- Terminography
- Design and elaboration of terminology norms
- Computer-assisted terminology
- Documentation about terminology
- Codes and codification in the terminological field
- Computer applications in terminology

Another international body for terminological normalisation is the ASTM (American Society for Testing and Materials), founded in 1989, as a world forum for the development and publication of norms about materials, products, systems and services. In 1995, the managing board of the ASTM created the E02 terminology committee, whose main objective was to develop a clear and systematic terminology in ASTM norms and in other documents.

Another body worth mentioning is the European Committee for Standardisation (CEN), founded in 1961 by different normalisation bodies in the European Union. EN norms are the standards developed by the European Committee for Standardisation.

## 2. National bodies

- In Europe:
  - Asociación Española de Normalización y Certificación (AENOR). Organisation devoted to the development of standards and certification in every sector, terminology included. It is responsible for the elaboration of the Spanish norms (UNE norms).
  - Ente Nazionale Italiano de Unificazione (UNI): Italian body in charge of normalisation tasks. It participates as a member of international bodies such as ISO and CEN.
  - Association Française de Normalisation (AFNOR), whose objective is to ensure the competitiveness and the influence of the French standardisation system within the international context. It is a member of ISO and CEN.
  - Deutsches Institut für Normung (DIN), which coordinates its activities with, and represents Germany in, international standardisation bodies, i.e. CEN (European Committee for Standardisation) and ISO (International Organisation for Standardisation).

Regarding the documents (norms) produced by these European bodies, for instance, DIN EN norms are European norms – with an English version – which have been enacted in Germany through the DIN institute, UNE EN norms are European norms (also with an English version) which have been enacted in Spain through AENOR, and so on.

- In Latin America it is worth mentioning:
  - Instituto Argentino de Normalización (IRAM), member of ISO (International Organisation for Standardisation), IEC (International Electrotechnical Commission), COPANT (Comisión Panamericana de Normas Técnicas) and AMN (Asociación de Normalización del MERCOSUR).

- Associação Brasileira de Normas Técnicas, responsible for technological normalisation in Brazil and also a member of ISO, IEC, COPANT and AMN.
  - Instituto Colombiano de Normas Técnicas y Certificación (ICONTEC), a member of ISO, IEC and COPANT and devoted to normalisation, certification and formation tasks.
  - Dirección General de Normas (Mexico), also a member of ISO.
3. Regional bodies. In this respect, in Spain there are terminology bodies for the Spanish communities that have languages other than Spanish, among which we find:
- Centre de Terminologia Termcat, whose main aim is the promotion, elaboration and dissemination of terminological resources together with the normalisation of Catalan neologisms and the possibility of relying on expert terminological advice that facilitates the use of the language in scientific, technical and socio-economic contexts.
  - Centro Vasco para la Terminología y la Lexicografía (UZEI), created with the aim of contributing to the linguistic normalisation of Euskera (Basque language).

#### **4.3.2.4 Cooperation bodies, associations and terminology networks**

There are different public entities devoted to the research and promotion of terminology and that have to do with terminological normalisation in an indirect way. The chart below (figure I.15), elaborated by the IULA (2006 b), shows the most relevant ones:

Organización, asociación o centro	Dirección
Unión Latina: Dirección de Terminología e Industrias de la Lengua (DTIL)	<a href="http://dtil.unilat.org/">http://dtil.unilat.org/</a>
International Information Centre for Terminology (INFOTERM)	<a href="http://www.infoterm.info/about_us/why_terminology.php">http://www.infoterm.info/about_us/why_terminology.php</a>
Sociedad para la terminología y la transferencia de conocimiento (GTW)	<a href="http://gtw-org.uibk.ac.at/">http://gtw-org.uibk.ac.at/</a>
Associació Catalana de Terminologia (ACATERM)	<a href="http://acaterm.net/">http://acaterm.net/</a>
Asociación Europea de Terminología (AET)	<a href="http://www.eaft-aet.net/">http://www.eaft-aet.net/</a>
Asociación española de terminología (AETER)	<a href="http://www.aeter.org/home.asp">http://www.aeter.org/home.asp</a>
Asociazione italiana per la terminologia (ASSITERM)	<a href="http://web.tiscali.it/assiterm91/">http://web.tiscali.it/assiterm91/</a>
Société française de terminologie (SFT)	<a href="http://www.laterminologie.net/">http://www.laterminologie.net/</a>
Centro vasco para la terminología y la lexicografía (UZEI)	<a href="http://www.uzei.com/home.asp">http://www.uzei.com/home.asp</a>
Associação Portuguesa de Terminologia (TERMIP)	<a href="http://www.fcsh.unl.pt/termip/">http://www.fcsh.unl.pt/termip/</a>
Associação de Informação Terminológica (AIT)	<a href="http://www.ait.pt/">http://www.ait.pt/</a>
The Swedish Centre for Terminology (Terminologicentrum TNC)	<a href="http://www.tnc.se/">http://www.tnc.se/</a>
Asociación venezolana de terminología (VENTERM)	---
Asociación de organizaciones y sociedades para la terminología de los países nórdicos (NORDTERM)	<a href="http://www.nordterm.net/">http://www.nordterm.net/</a>
Comisión Paraguaya de Terminología (PARATERM)	---
Comisión uruguaya de terminología para el MERCOSUR (URUTERM)	<a href="http://www.mec.gub.uy/arch_geral/URUTERM.HTM">http://www.mec.gub.uy/arch_geral/URUTERM.HTM</a>
Centre de Terminologie de Bruxelles (CTB)	<a href="http://www.ilmh.be/ctb">http://www.ilmh.be/ctb</a>
Centre de recherche en terminologie (TERMISTI)	<a href="http://www.termisti.refer.org/termisti.htm">http://www.termisti.refer.org/termisti.htm</a>
Danish Centre for Terminology (DANTERMcentret)	<a href="http://www.danterm.dk/">http://www.danterm.dk/</a>
Centre de Recherches en Terminologie et Traduction (CRTT)	<a href="http://recherche.univ-lyon2.fr/crtt/">http://recherche.univ-lyon2.fr/crtt/</a>
Servei de llengües i terminologia de la Universtat Politècnica de Catalunya (SLT)	<a href="http://www2.upc.edu/slt/serveis/terminologia/">http://www2.upc.edu/slt/serveis/terminologia/</a>
IULATERM (IULA)	<a href="http://www.iula.upf.es/iulaterm/tpreses.htm">http://www.iula.upf.es/iulaterm/tpreses.htm</a>
Technical Committee For Scientific And Technical Terminology Standardization (Ukraine)	<a href="http://www.lp.edu.ua/tc.terminology/TK_En/TK_main_En.htm">http://www.lp.edu.ua/tc.terminology/TK_En/TK_main_En.htm</a>
German Information and Documentation Centre for Terminology (DEUTERM)	<a href="http://www.iim.fh-koeln.de/deuterm">http://www.iim.fh-koeln.de/deuterm</a>
German Institute for Terminology e.V (DIT)	<a href="http://www.DIT-online.com">http://www.DIT-online.com</a>
Red iberoamericana de terminología (RITERM)	<a href="http://www.riterm.net/">http://www.riterm.net/</a>
Red Panlatina de terminología (REALITER)	<a href="http://www.realiter.net/es/index.htm">http://www.realiter.net/es/index.htm</a>
Internacional Network Terminology (TERMNET)	<a href="http://linux.termnet.org/">http://linux.termnet.org/</a>
Red colombiana de terminología (COLTERM)	<a href="http://idiomas.udea.edu.co/%7Egitt/colterm.html">http://idiomas.udea.edu.co/%7Egitt/colterm.html</a>
Red Internacional francófona de neología y de terminología (RINT)	---
TermRom-Moldova	<a href="http://cnt.dnt.md/">http://cnt.dnt.md/</a>
TermRom-Bucarest	<a href="http://www.cimec.ro/">http://www.cimec.ro/</a>

**Figure I.15:** Public entities devoted to the research and promotion of terminology (IULA, 2006 b).



*If language is not correct,  
then what is said is not what is meant:  
If what is said is not what is meant,  
then what must be done remains undone;  
If this remains undone,  
morals and art will deteriorate;  
If justice goes astray,  
the people will stand about in helpless confusion.  
Hence there must be no arbitrariness in what is said.  
This matters above everything.*

Confucius

## **5. SPECIALISED LEXICOGRAPHY (TERMINOGRAPHY)**

Once the most theoretical aspects of this work have been presented and justified and given that this study belongs to “applied linguistics”, it is necessary at this point to focus on the applied side of it, which has lead us to the elaboration of the prospective specialised dictionary of ceramics terminology. With this aim in mind, we conducted an in-depth consideration and reflection on the applied branch of terminology, i.e. terminography – or even better stated in this specific context, specialised lexicography.

### **5.1 The applications of lexicology and terminology: lexicography and terminography**

As has already been explained, in general, in this study the way of conceiving terminology corresponds to the definition put forward by Cabré (1993), Sager (1993) and Alcaraz and Martínez Linares (1997, 2000):

- 1) “El conjunto de principios y de bases conceptuales que rigen el estudio de los términos” (Cabré, 1993:82), that is to say, the theory or theoretical groundings.
- 2) “El conjunto de directrices que se utilizan en el trabajo terminográfico” (Cabré, 1993:82), that is to say, the practice of this discipline: the study

and field of work related to the compilation, description and presentation of terms in one or more languages. It is for this second sense of terminology that Rey (1975) suggested the aforementioned name of “terminography”.

- 3) “El conjunto de términos de una determinada actividad” (Cabré, 1993:82), that is to say, the vocabulary of a specialised thematic field.

Hence, for the second sense of terminology Rey (1975) proposed the name “terminography”. Cabré (1993) corroborates this view by considering the stages of compilation, systematisation and presentation of the terms characteristic of a specific domain or speciality as being part of the terminographical activity. In this respect Sager (1994) also comments on the coherence of the denomination since the practical work within terminology, that is to say, terminography, is very similar to that undertaken within lexicography. Therefore, the term “terminography” is semantically appropriate given that it follows the same logic as analogous formations, such as the already-mentioned disciplines of lexicography or even bibliography. In the same line, Vargas (2005) uses the term “terminography” to refer to the practical activity of terminology that is responsible for the elaboration of dictionaries, vocabularies, glossaries, databases and any other kind of terminological application in a given specialised field. In Lorente’s (2001: 84) words, terminography is:

El conjunto de actividades que conducen al diseño y a la producción de todas aquellas aplicaciones terminológicas que se basan en la idea de un inventario léxico con informaciones asociadas.

However, as Pérez (2002) points out, there is an issue that must be taken into account within this framework: the relative newness of the term “terminography” in comparison to the well-established lexicographic tradition. This term, “terminography”, was first used in 1975 when the *International Organisation for Standardisation* (ISO 1087) introduced the term to refer to that part of terminology devoted to the production of terminological dictionaries (Bergenholtz and Tarp, 1995: 10). It is also quite usual to find that, with the exception of certain publications (Sager, 1994 and Meyer and Mackintosh, 1996, among others), the terms “terminology” and “terminography” are very often used without distinction, including only occasional

references to terminography or using other denominations such as terminology processing (Wright and Budin, 1997) or terminology management (Sager, 1990) in order to cover the applied aspects of terminology. As has been explained earlier, in this study the word terminology has been used on many occasions as entailing both a theoretical (terminology) and a practical/applied (terminography) dimension – as suggested by the definitions proposed by Cabré (1993), Sager (1993) and Alcaraz and Martínez Linares (1997, 2000). Terminology in its wider sense and scope therefore includes the terminographical practice, since without the terms forming part of a domain and without the principles and conceptual bases that govern the study of terms, that is to say, without terminology in its purest sense, terminography would not exist and would make no sense.

Nowadays, closely linked to terminology and its practice (terminography), that is to say, to terminology in its wider sense, we can also find “Terminotics” (see section I.5.2) and all the benefits and advantages it entails for studies like the one presented here, so dependent on computer-aided tools.

## **5.2 Terminotics: terminology, linguistic engineering and computational linguistics**

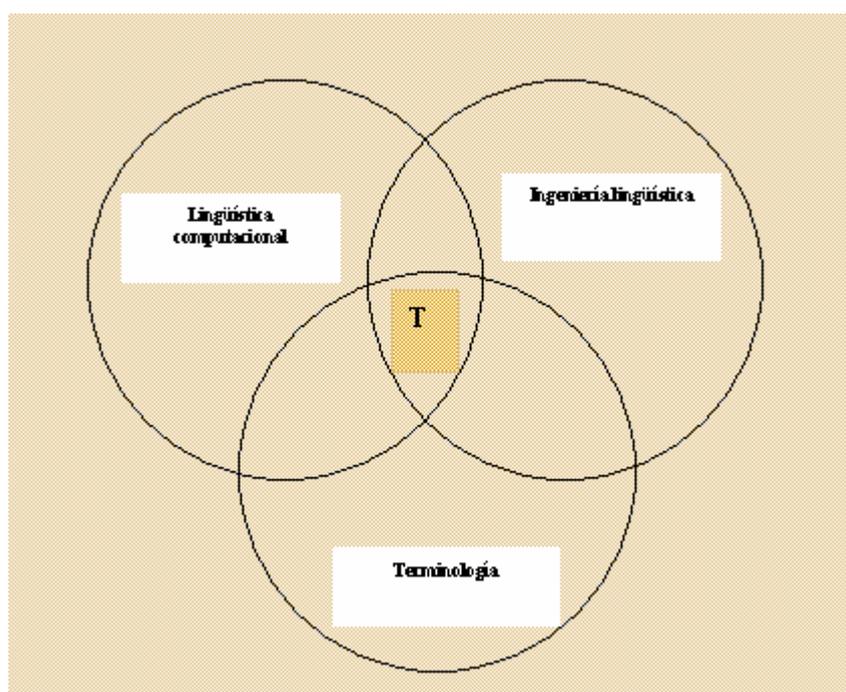
In order to understand what is meant by terminotics and its importance for terminological research in general and for this study in particular, it is crucial to take up again what is meant by terminology and to introduce the concepts of linguistic engineering and computational linguistics.

As has already been explained, terminology is conceived as the discipline that deals with the study of terms, understood as both the group of principles underlying term compilation and the group of terms from a specialised field and their codification in the form of dictionaries, databases, vocabularies, thesauruses, etc.

Computational linguistics, on the other hand, is focused on the study of language with models that can be implemented with computer technology. When it started, computational linguistics aimed at establishing systems of automatic translation. However, in the 80s, when it became clear that the expectations created could not easily be accomplished, a more applied approach of computational linguistics appeared, i.e. natural language engineering or linguistic engineering. Hence, linguistic engineering is described by the IULA (2007 d) as the application of the knowledge

about a language for the development of computer systems able to recognise, understand, interpret and generate human language in all its forms. Accordingly, computational linguistics and linguistic engineering can be said to complement each other, the former representing the research approach and the latter the applied approach.

Terminology uses computational linguistics and linguistic engineering in order to constitute its own object of work, in order to improve its applications or to better organise the terminographical process. Accordingly, the convergence between computational linguistics (investigation), linguistic engineering (application) and terminology (understood both as the group of principles governing the compilation of terms and as the group of terms as such) is materialised in the branch of terminology called terminotics – represented by T in figure I.16.



**Figure I.16:** Graphic representation of Terminotics (T) as the convergence point between computational linguistics, linguistic engineering and terminology. (IULA, 2007 d).

Consequently, terminotics stands at a mid-way point between computational linguistics (computer science applied to the treatment of language data), linguistic engineering (development of resources and tools) and terminology. It thus becomes a research object in applied linguistics and a pragmatic object linked to the industrialisation of linguistic products:

... La terminographie est une de ces applications qui a bénéficié du traitement automatique de données, cette rencontre de la terminologie appliquée et de l'informatique a créé un champ nouveau de travail qu'on a dénommé la terminotique... La terminotique peut ainsi être considérée comme un concept de recherche particulier de l'informatique linguistique appliquée, celui du traitement automatique du terme, mais surtout un concept pragmatique étroitement relié à ce qu'on appelle aujourd'hui l'industrialisation de la langue, un concept générateur de produits performants de traitement de l'écrit dont les applications sont faciles à dégager: -constitution automatique de bases de données terminologiques; -élaboration automatique de dictionnaires terminologiques; -préparation de dictionnaires spécialisés pour assister les systèmes de T.A.O (traduction assistée par ordinateur) ; -mise au point de bases de connaissances pour les systèmes-experts "intelligents", etc. -accès multilingue aux banques de données -génération automatique de textes, etc. (Auger, 1989: 485).

In general, the crucial role terminotics and its tools play nowadays in terminographical tasks – and, consequently, in this study in particular – can be summarised in the following contributions (IULA, 2007 d):

- The automatic selection of the corpus and the information regarding a given topic;
- The selection and extraction of the terms of a field of work from a corpus;
- The morphological analysis of terms with the object of offering neological proposals;
- The attribution of terms to one or more speciality fields depending on their frequency of appearance in the texts;
- The automatic elaboration of definitions starting out from the analysis of the text the term has been extracted from;
- The automatic elaboration of the conceptual structure of a speciality field.

As is analysed in more detail in subsequent sections dealing with the method of work, the contributions of terminotics have been especially useful for some activities in this methodology, especially those regarding the compilation of terminology and in organising the work. Terminotics makes it possible to work on previously automated textual corpora and extract relevant information from them (also automatically). Likewise, it allows textual and terminological databanks to be exploited.

To conclude with this section, it is important to highlight that there are at least five activities that are carried out in the course of the terminographical process in

which terminotics becomes especially important (for a more detailed explanation of the way in which these activities have been undertaken in this specific work with the help of terminotic tools, see section II.2 in the Method). These activities are:

- Documentary research prior to the work, since this facilitates access to the information given about a speciality field through terminological, documentary and textual databanks;
- Elaboration of the working corpus and extraction of terminological data: if these documents are in an electronic or digital format, terminotics facilitates their automatic incorporation into the textual database. If they are in a printed format, terminotics allows them to be digitised through optical character recognition (OCR) software using a scanner and the keyboard. This allows the text to be analysed in order to extract prospective terms, contexts and so on;
- Elaboration of card indexes, that is to say, the terminologist may use terminotics for the elaboration of terminological cards by transferring some data directly from their reference text, for instance, the entry, the source, the context, etc.
- Verification and completion of information;
- Edition of the terminology. The information can be offered in electronic (CD-ROM, Internet) or paper format.

### **5.3 Lexicography and terminography: blurred boundaries to be clarified**

As happens with lexicology and terminology (see section I.4.3), their applied branches (lexicography and terminography) also present aspects that nowadays, and given the communicative approach adopted in this study, make the boundary between them somewhat blurred or fuzzy. With the aim of placing this work within a coherent framework for its goals, methods and theoretical foundations, in the following sections I have provided an account of some of the most significant factors involved in

distinguishing (or not) between terminography and (specialised) lexicography, and thus in choosing the most adequate “label” for this work.

### **5.3.1 Lexicographical methodology versus terminographical methodology**

The different working methods adopted in lexicographical and terminographical works are another argument used by the supporters of the notion of considering lexicography and terminography as different disciplines, since, for them, the two kinds of practice are distinguished by the method they use, i.e. the semasiological one (lexicology/lexicography) and the onomasiological one (terminology/terminography).

Traditionally it has been postulated that terminography works with an onomasiological methodology. In this kind of methodology the terminographer “denominates” concepts, that is to say, he/she attributes to each concept of the speciality a given form or denomination that represents it (the term). However, one may wonder whether the working method of terminography is always an onomasiological one, which raises two further questions: Who plays the role of terminographer? and, Who is the user (the consumer) of terminographical products?

On the one hand, and regarding the first question, given the interdisciplinary character of terminology, there are different people or collectives that can play the role of terminographers: the terminographer may be a specialist in a subject matter who adopts the role of terminographer in order to contribute to the development of his/her speciality area, or a translator undertaking a terminological work linked to his/her translational task or perhaps a professional terminographer who compiles and illustrates the terminological units that will form part of terminographical products as a routine part of his/her daily work. On the other hand, and regarding the second question posed, in the same way as occurs with the professional profile of the terminographer, there are also many different kinds of prospective or potential users of terminographical products.

According to all the factors mentioned up to the moment, once it is admitted that the role of the terminographer is not always played by the same kind of professional, the question of whether the method used in terminography is always the same one presents multiple shades of meaning. In fact, two different answers or options can be provided, each of them with its own methodological consequences:

If the person responsible for (undertaking) the terminographical work is a specialist-expert in the domain/subject matter, he/she controls the conceptual scheme of the field in which he/she works on a daily basis. Consequently, he/she already has prior knowledge of the concepts of his/her speciality domain and they are taken as the starting point in the terminographical work. The terminographer later looks for the linguistic forms responsible for their representation, thus using an onomasiological method of working.

However, if the terminologist is not a specialist (as in my case), but a linguistic professional who progressively acquires (and does not possess beforehand) the information related with the speciality field on which the work is being carried out, the terminographer will have to document himself/herself in order to acquire the necessary cognitive competence. At the same time, this documentation (translated into texts) will be useful as a source (corpus) for the extraction of the terms that are to be included in the terminographical work itself. Hence, the method of work used here is partially different because the point of departure are the linguistic forms and the target is to reach or discover the corresponding concepts or meanings, which thus makes it a semasiological method.

In spite of this, in current conceptions of terminology this distinction between the lexicographical and terminographical methods of work is not so widely used, since in the descriptive work aimed at the compilation of terms (be it lexicographical or terminographical) the working method normally used is semasiological: the starting point is the identification of the term in the texts in which it is used (normally through the compilation and exploitation of a corpus). As has been explained, only in those specialised terminographical works undertaken by the specialists within a field with a normalising orientation (for fixing a term) is the usual method onomasiological.

In the specific case of this research, the method is clearly semasiological since the corpus was the tool used for term extraction (I set out from the identification of terms in those texts in which they are naturally used), so that the traditional and presumably clear distinction between terminography and lexicography is not so clear if the method of work is considered.

### 5.3.2 Is terminography specialised lexicography?

At this point and in accordance with all the aspects mentioned so far, the final question to be posed is whether terminography can be considered a synonym of “not plain” lexicography but what has been called “specialised lexicography”. For Bergenholtz and Tarp (1995), some of the features that are accepted within the more traditional framework, such as trying to differentiate terminology and lexicography by identifying experts as the target group for terminology and having laymen as the target group for lexicography, are a mistake. In the same way, they are against the view that states that lexicography deals with the description of general-language words, whereas terminology focuses on the description of LSP terms, because this would therefore establish a too clear-out boundary between the language used in the transmission of specialised knowledge and general language, and hence between term and word. Neither do they agree with the belief that terminology is prescriptive whereas lexicography is descriptive, since this conception places terminography within the classical prescriptive model adopted by the GTT. What they propose, then, is to use the term *specialised lexicography* (Bergenholtz and Tarp, 1995) instead of terminography.

So what is specialised lexicography for these two authors? “Specialised lexicography is the branch of lexicography which is practised by LSP lexicographers who prepare specialised dictionaries” (Bergenholtz and Tarp, 1995: 28). For them, starting out from an specialised knowledge domain with its corresponding specialised language, terminographical/terminological research is undertaken in order to compile and describe its terminology (understood here as the terms that characterise a given specialised activity). Terminology is thus the “mere” study of terms (which is made possible thanks to the activity of compiling and describing them, called terminography) which, at the same time, may be complemented by the wider projection of specialised lexicography for the compilation and elaboration of LSP, user-oriented dictionaries.

Following Bergenholtz and Tarp (1995), terminology and lexicography are disciplines that must cooperate with each other when it comes to compiling specialised dictionaries and, in fact, these authors consider terminology as an integrating part of specialised lexicography:

[...] In our opinion LSP lexicography and terminology/terminography have a great deal in common.

[...]We consider serious terminological work an absolute prerequisite for high-quality specialised dictionaries. In this respect, specialised lexicography may benefit from terminology, and it is in this light that we view terminology, or at least areas of terminology, as an integral part of specialised lexicography in a wider sense. Correspondingly, terminography has much to learn from the long lexicographical tradition in terms of preparing user-friendly quality products. (Bergenholtz and Tarp, 1995: 11)

Bergenholtz and Tarp (1995) understand specialised lexicography (in a wider sense) as being part of general lexicographical theory and practice. According to these authors, specialised lexicography may benefit from terminology as an integrating part of it. Terminography would then be used to designate that part of terminology concerned with the production of terminological dictionaries in their most basic, purely linguistic sense, but again “terminography has much to learn from the long lexicographical tradition in terms of preparing user-friendly quality products” (Bergenholtz and Tarp, 1995: 11).

For them, there is a close relation between terminology and lexicography because specialised lexicography (or *Language for Special Purposes – LSP – Lexicography*), or what most linguists would call terminography, is characterised as:

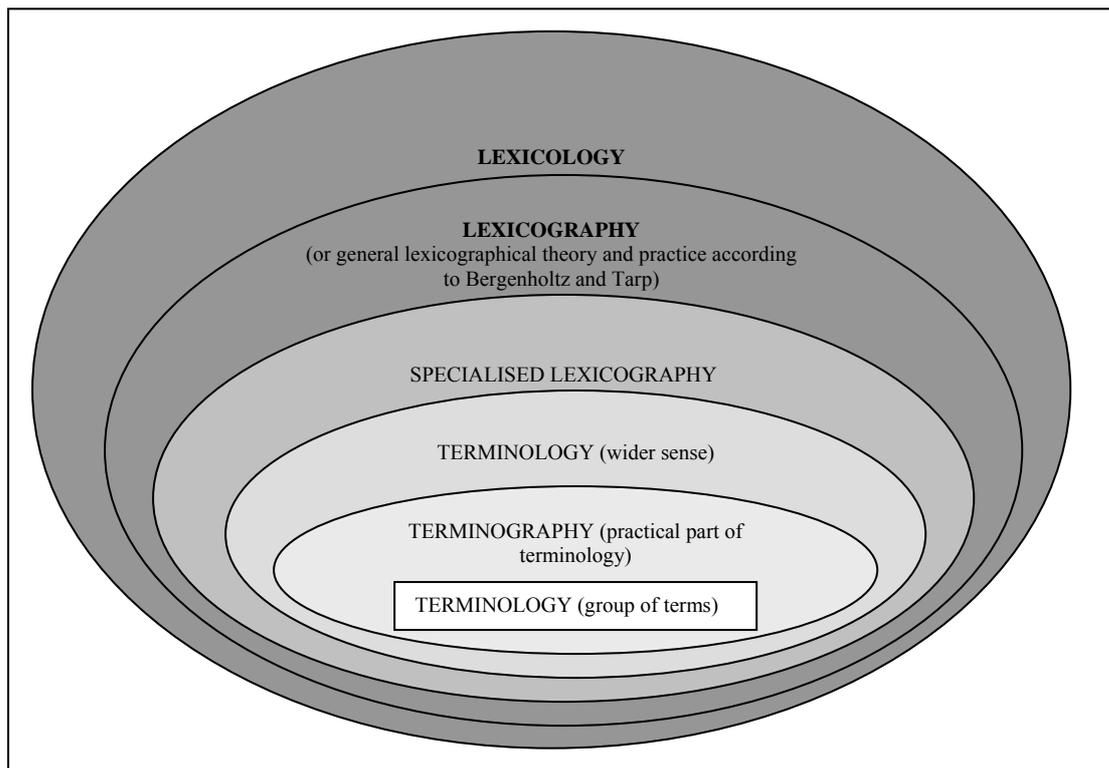
- A special part of lexicography in general, LSP lexicography certainly does work with LSP terms.
- LSP lexicography works with both systematic and alphabetic macrostructures, deciding in each individual case which is the more appropriate.
- LSP lexicography must necessarily, to a greater or lesser degree, be both descriptive and prescriptive.
- LSP lexicography addresses itself to laypeople and experts alike.
- LSP lexicography prepares dictionaries for both encoding and decoding purposes.

(Bergenholtz and Tarp, 1995: 11)

According to Bergenholtz and Tarp (1995) specialised lexicography conceives terminography as a special part of lexicography in general. In this sense, Knowles (in Martínez de Sousa, 1995) defines terminography as “*parte de la lexicología que estudia la actividad lexicográfica de la terminología*”, so that the inclusive terminology-terminography relationship also extends to lexicology-lexicography. In this same trend, Martínez de Sousa (1995) also proposes the term “terminological lexicography” (*lexicografía terminológica*) as a synonym for terminography. Martínez de Sousa (1995) also proposes the term “applied lexicology” (*lexicología aplicada*) to refer to lexicography, thereby again showing the close interconnection of all these disciplines

and how the names of some of them may be used to name others, thus supporting the inclusion criteria.

Therefore, in accordance with Bergenholtz and Tarp (1995), all these disciplines present an inclusive relationship which makes each of them a conforming dimension of another, which progressively increases their general character, as shown in figure I.17:



**Figure I.17:** Schematic representation of Bergenholtz and Tarp's (1995) conception of specialised lexicography and terminography.

Another possible way of dealing with this issue is the one proposed by the IULA (2007 c). As they explain, initially the label “specialised lexicography” was proposed as an alternative to the label “terminography”, which was exclusively associated by many scholars to the methodology and practice of the prescriptive classical model, that is to say, Wüster's GTT. However, although this label of specialised lexicography, as a synonym for terminography, has been adopted to describe the kind of work presented here, this alternative also presents a series of problems directly related with the polysemic character of the term “specialised lexicography”, since in many meta-lexicographical studies, the denomination “specialised lexicography” is used without distinction to refer to different realities:

1) Specialised lexicography is the kind of lexicography which contributes to the elaboration of thematically specialised works with its methodology and techniques. Hence, it would be a specialisation of lexicographical work in terms of content.

2) Specialised lexicography deals with those inventories that are differentiated for some reason from the most prototypical of all lexicographical works, i.e. monolingual dictionaries of general language. The kinds of specialised works that could be included within this kind of lexicography would be the following.

- Dictionaries of verbs, idioms, formants, etc. The reason would be the kind of linguistic units they introduce;
- Visual dictionaries, encyclopaedic dictionaries, etc. because of the way in which contents are represented;
- Learning dictionaries, children's dictionaries, etc. because of the kind of users.

3) Specialised lexicography is that part of lexicography which studies the thematically specialised units (the terms) that can be found in dictionaries of the general language.

To sum up and following again the IULA (2007 c), the fact that this denomination has been used before with other meanings seems to be a strong reason to support the idea that the practical part of terminology (responsible for the elaboration of lexical inventories) is called terminography. However, the label "terminography" may also carry connotations which, in spite of not being valid nowadays, may suggest that terminography makes exclusive reference to works with a prescriptive character – although currently it can also be used for all those works conceived from other terminological orientations.

#### **5.4 The specific case of this study: how terminography and specialised lexicography have been approached**

To sum up the different views regarding specialised lexicography and terminography and to justify the view and nomenclature adopted throughout this study, there are different attitudes towards the question of whether terminography is

specialised lexicography, depending on the field of application in which the question is posed (terminography and lexicography), on other aspects related to the theoretical disciplines (terminology and lexicology) and on the different objects of study (term and word). Therefore, as the IULA (2007 c) advises, the best way to answer this question is in the form of trends that account for two possible options:

- Terminography is not specialised lexicography if terminology is conceived as an independent discipline differentiated from lexicology and with a particular object of study (the concepts of a speciality). For those defending this option, the two disciplines would not relate at a theoretical level or at a practical or methodological one.

- However, terminography is specialised lexicography if we consider that:

- Terminology can be explained from linguistics, and more specifically from lexicology;
- The condition of term can be explained starting out from the activation of a series of semantic features or traits of the lexical units when these are used in speciality contexts. In this sense, as Cabré points out and still following the CTT:

El carácter de término se activa en función de su uso en un contexto y situación adecuados. Esta activación consiste en una selección de los módulos de rasgos apropiados, que incluyen los rasgos morfosintácticos generales de la unidad y una serie de semánticos y pragmáticos específicos que describen su carácter de término de un determinado ámbito. (Cabré, 2001 a: 132)

- The methodology used in the elaboration of different terminographical and lexicographical works does not allow a clear, perfectly delimited boundary to be traced between the two disciplines.

Therefore, according to these considerations this study has mainly considered or preferred to refer to terminography as specialised lexicography, a view that is also supported by the concept and features of an “active dictionary” as a specialised lexicographical tool, which is explained in the next section. Nevertheless, the more generalised denomination “terminography” has also been used because of its wide social acceptance to refer, in general, to works of this kind, which has made this term also acceptable – although not so accurate – in the context of this work.



*Words – so innocent and powerless as they are,  
as standing in a dictionary,  
how potent for good and evil they become  
in the hands of one who knows how to combine them*

**Nathaniel Hawthorne**

## **6. THE SPECIALISED DICTIONARY OF THE CERAMICS INDUSTRY**

### **6.1 Methods in lexicology: dictionaries vs. thesauruses**

Halliday (2004) mentions two principal methods for describing words (understood in the sense of lexical items), which can, in addition, be combined in different ways. These two methods are writing a dictionary and/or writing a thesaurus. But what are the differences between a dictionary and a thesaurus? The main difference is that in a thesaurus words that are similar in meaning are grouped together (as would be the case, for instance, with all the words referring to farming, emotions or species of insects). In contrast, in a dictionary, words are arranged in such a way – usually in alphabetical order – that the place in which a word is found tells you nothing about its meaning. Hence, in a dictionary, each entry stands by itself as an independent piece of work (Halliday, 2004: 4) while also allowing, however, some cross-referencing in order to avoid repetition.

In Halliday's (2004) views entries are organised, in general, with the following structure, variations being common and perfectly acceptable:

1. Headword or lemma, often in bold or some other special font. The lemma is the base form under which the word is entered and assigned its place, that is to say, the stem or simplest form. For instance, the lemma of the chain *take*, *takes*, *took*, *taking* or *taken* would be the infinitive form *take*. In the same way and due to reasons concerning space (economy principle), certain forms may not be entered if predictable, which is normally the case of, for instance, plural forms. However, the irregular past form of the verbs is given and some irregular phenomena, such as the doubling of certain letters in the spelling of

some inflected forms, may be made explicit. In this sense, an irregular form may also appear as a separate lemma with a cross-reference.

2. Pronunciation (in some sort of alphabetic notation).
3. Word class ('part of speech'). With respect to word class, in the case of English words we may find verbs, nouns, adjectives, pronouns, prepositions, conjunctions and determiners/articles. At the same time, some indication of a subclass – such as count or mass noun, transitive or intransitive verb – can also be added to class specification.
4. Etymology (historical origin and derivation).
5. Definition, which, broadly speaking may take one of two forms, description and synonymy:

The description may obviously need to include words that are 'harder' (less frequently used) than the lemmatised word [...] With synonymy, a word or little set of words of similar meaning is brought in, often giving slightly more specific senses. All definition is ultimately circular; but compilers try to avoid very small circles, such as defining *sad* as *sorrowful*, and then *sorrowful* as *sad*. (Halliday, 2004: 7)

6. Citations (examples of use). With respect to citations, Halliday defines them as numbers referring back to definitions or senses which show how the word is used in context. Such citations may illustrate the earliest recorded instances of the word, a typical usage and/or more "special" usage in well-known literary texts. In the same way, there might also be "set expressions" (idioms and clichés), where the expression functions like a single, composite lexical item (e.g. *bear in mind*).

In the cases of common words, like *bear* or the verb *cut*, there is a good chance of finding subdivisions in the entry corresponding to different meanings of the word. With respect to compound words and derivatives, these are often entered under the same lemma – compounds appearing under the first word (*cutthroat* under *cut*) and derivatives under the stem (*cutting* under *cut*). However, this is not a hard and fast rule and in certain dictionaries compounds are given separate lemmata and even in certain instances a derivational affix (such as *anti-*) is used as a lemma under which derivatives are grouped (*antibody*, *anticlimax*, *antidote*, etc.).

Thesauruses, which, as stated above, constitute the other method used in lexicology mentioned by Halliday, do not contain separate entries for each word. In a

thesaurus a word is placed and occurs as part of a list and it is precisely the place occupied by this word in the whole construction of the book that gives its meaning to the user. Thus, as Halliday (2004) states, if we look for *cut* in Roget's *Thesaurus of English Words and Phrases*, we will find it – among other places – in the middle of paragraphs such as the one below, in which, although not much organisation seems to have been applied, it is the final layer in a comprehensive lexical taxonomy:

**v. cultivate**; till (the soil); farm, garden; sow, plant; reap, mow, cut; manure, dress the ground, dig, delve, dibble, hoe, plough, harrow, rake, weed, lap and top, force, transplant, thin out, bed out, prune, graft.

Thus, a thesaurus takes all the lexical items it contains and arranges them in a single comprehensive taxonomy, a lexical taxonomy, which is an organisation of words into classes and sub-classes and sub-sub-classes on the basis of meaning, that is, semantic classes rather than grammatical ones. In a taxonomy, the main semantic relationships involved are those of hyponymy ('*x* is a kind of *y*') and meronymy ('is a part of'), this latter being used mainly for classification purposes.

It is interesting at this point to introduce the concept of collocation (which is analysed in more depth in subsequent sections), a key element in this study and a necessary reference for Halliday (2004: 11) when proceeding with analysis/reflection on thesauruses:

Another way of thinking about this shared privilege of occurrence that unites the words in one paragraph of the thesaurus is in terms of collocation. Collocation is the tendency of words to keep company with each other: like *fork* goes with *knife*, *lend* goes with *money*, *theatre* goes with *play*. Of course, if words do regularly collocate in this way, we shall expect to find some semantic relationship among them; but this may be quite complex and indirect. Collocation is a purely lexical relationship; that is, it is an association between one word and another, irrespective of what they mean. It can be defined quantitatively as the degree to which the probability of a word *y* occurring is increased by the presence of another word *x*.

To illustrate this, Halliday gives the word *injure* as an example, explaining that when it appears the probability of the word *pain* also occurring is much higher than that determined by its overall, general frequency in the English language as a whole. Hence, those words that appear grouped together inside the same paragraph in a

thesaurus usually have a strong collocational bond, either with each other or, even more powerfully, each of them with a third party.

A dictionary is a linguistic product within which words (or other units of language) are compiled and illustrated with the corresponding information. The prototypical kind of dictionary is the monolingual dictionary of general language, whose main characteristics, as specified by the IULA (2007 c), are the following:

- Es un inventario cerrado, con un principio y un final.
- Las unidades (lemas) que se introducen en el inventario están ordenadas de manera alfabética.
- Cada lema está asociado a una serie de descripciones lingüísticas. El conjunto del lema o entrada y la información correspondiente constituye lo que se denomina el artículo del diccionario, que suele organizarse en acepciones y subacepciones. Las informaciones más comunes de un artículo lexicográfico son las siguientes: categoría gramatical, definición, acepciones semánticas, ejemplos ilustrativos del uso de las unidades.
- La finalidad principal de un diccionario es que los hablantes de una lengua o de otras lenguas puedan, al consultarlo, adquirir información (fonética, morfológica, semántica y sintáctica) sobre las unidades de esa lengua.

However, together with monolingual dictionaries there are also other kinds of dictionaries whose typologies are always designed according to the degree of deviation a dictionary presents with respect to the monolingual dictionary of general language. Some of the more common kinds of dictionaries, according to the IULA (2007 c), are:

- Encyclopaedic dictionaries
- Specialised dictionaries
- Dialectal dictionaries
- Historical or etymological dictionaries
- Bilingual or multilingual dictionaries
- Dictionaries of synonyms and antonyms
- School dictionaries
- Basic dictionaries
- Ideological and/or visual dictionaries
- Idioms dictionaries

To finally focus our attention on the specific theoretical features characterising the results of this study –mainly, the 4,000 final entries of the prospective specialised

dictionary of ceramics terminology- the next two sections of this theoretical framework outline the traits of this specialised lexicographical tool.

## **6.2 Description versus prescription in the specialised dictionary of the ceramic industry**

As is explained in detail in the section devoted to considerations involving the definition of the work (I.6.4.1), it is important to establish the thematic delimitation of a dictionary from the very beginning. In this sense, two types of terminological activity should be considered: the prescriptive or normalising terminology and the descriptive one (for further information, see section I.4.3.2). In the same way, the prescriptive and descriptive interests of the GTT and CTT have already been introduced in sections I.4.1.1 and I.4.2, respectively.

On the one hand, descriptive terminology (terminography) is mainly undertaken by translation professionals, editors of technical texts and researchers in social sciences because it is their job to document and compile terminologies, but they are not in charge of determining the use to be made of a term in a specialised domain (Wright and Budin, 1997). On the other hand, and according to these same authors, the normalisation bodies (both national and international), the governmental regulating bodies, the specialists in the creation of nomenclatures and the bodies devoted to linguistic planning will be the ones in charge of normalising terminology (Wright and Budin, *ibid.*), and thus of undertaking prescriptive terminology (terminography).

According to the definition of descriptive terminology proposed by Wright and Budin (1997), translation professionals, editors of technical texts and researchers in social sciences who undertake such work are only responsible for documenting and compiling new terminological data and, therefore, their decisions or opinions are not decisive in the specialised context of their work. Therefore, one may consider that “the most authorised terminological activity, so to speak (prescriptive terminology), can only be undertaken within a normalising body and that other kinds of terminological activity are consigned to solutions *ad hoc*” (Wright and Budin, 1997: 329 in Pérez, 2002).

However, other authors, like Sager (1990: 3 in Pérez, 2002), do not explicitly refer to the normalising activity in their definition of terminology and, like Cabré

(1993: 35-36 in Pérez, 2002), emphasise the determining task undertaken by terminology as a vehicle of communication between specialists and professionals. Indeed, mention is only made of those cases in which terminology resolves communicative needs quickly and effectively (for example in the translation of technical texts).

The theoretical conception of this PhD thesis and of the prospective dictionary under development here is grounded in a more recent text by Cabré (1999 a) in which she states that every terminological work has to be, at least initially, descriptive because this kind of work implies the compilation of terms used in the specialised community. Only after description does it become possible to reduce the possible variants to just one, which must be considered as preferable or recommendable (Pérez, 2002). In the same way, Sager (1990: 212 in Pérez, 2002) also considers descriptive work as a preliminary work that is compulsory for normalisation:

Earlier terminologists attempted to record only accepted or approved usage, thereby establishing something like a recommended form of a term. It is increasingly being recognised that fixation of usage, e.g. by means of prescription or standardisation, follows established usage and does not precede it. This attitude points to a more realistic appreciation of the uses of language whereby the communicative use is given the primary position before the classificatory and ideational uses which we observe in action during term formation. This fundamental shift in emphasis places considerable stress on the observation and recording of usage which in turn can positively influence term formation. (Sager, 1990: 212)

Taking up again the controversial distinction between terminology and lexicography regarding description and prescription, another important aspect is the traditional normative character of the former as opposed to the descriptive character of the latter. Although this distinction is true in terms of theory (at least according to GTT), it is a fact that in lexicography there is also a long tradition of normative dictionaries (*Diccionario de Autoridades de la Real Academia de la Lengua Española*, *Dictionary of the English Language*, and many others). Currently, most of the dictionaries that are published, whether they are specialised or not, have a descriptive character (like the one presented here), and are merely intended to describe a linguistic use. In spite of this, no-one can deny that depending on their scope and dissemination, they can exert an indirect fixing or normative influence upon language and its use. This is due to the fact that, although they were designed with a descriptive intention, almost

any dictionary user tends to regard a word or a meaning as normative simply because it is included in a dictionary.

### **6.3 Specialised lexicography in the elaboration of an active bilingual specialised dictionary**

To coherently conclude the theoretical framework of the study and given the objectives posed in this doctoral thesis, in this section I have introduced the specific aspects relative to the creation of an **active** specialised dictionary. Firstly, however, I have presented some brief hints on the creation of a bilingual specialised dictionary instead of a monolingual one. In general, leaving aside the specialised character of the dictionary under development here, although “monolingual dictionaries for foreign-language learners tend to be unquestioningly regarded as better than bilingual dictionaries” (Thompson, 1987: 283) it is also true that “compared with monolingual dictionaries, bilingual ones have clear (and acknowledged) advantages from the point of view of the translator” (Kromann, Riiber and Rosbach, 1991: 2117). If we bear in mind the fact that the dictionary on ceramics terminology is intended to become a translational tool, is being created from a user-friendly perspective that takes very much into consideration the prospective user of the specialised lexicographical (or terminographical) tool, and given that its prospective users are, in this case, specialists and translators, it seems logical and sensible to produce a bilingual work.

Kromann, Riiber and Rosbach (1991) go further into this topic and present the reasons that, in their opinion, make a bilingual dictionary a more useful tool for the translator. They mention the possibility of having direct access to equivalents that are immediately insertable. In the same way, they also consider the orientation towards a specific language pair, the scope for an adequate meta-language and the non-inclusion of superfluous material in the form of etymology, lexical definitions and encyclopaedic information to be advantages.

Likewise, Kromann, Riiber and Rosbach (1991) put forward the major objections they observe from the point of view of the user who translates with just a monolingual dictionary. The following are all considered to be handicaps: the fact of not having direct access to equivalents, the fact (also mentioned by Thompson (1987)) of being presented with explanations of the unfamiliar in a foreign language as well as the

inclusion of irrelevant etymological information or superfluous lexical definitions and encyclopaedic information. In spite of this, it is also acknowledged the considerable progress that has been made regarding information about patterns of use, collocational behaviour or phraseology “aimed precisely at fostering the active use of language, and specifically at helping the foreign learner to construct sentences...” (Cowie, 1981 in Kromann, Riiber and Rosbach, 1991: 2121). In this sense, Desmet (1994: 46, in Vargas, 2005: 227) points out that the necessity to study the phraseological component in speciality languages carries with it two theoretical-methodological consequences:

- Tomar como base de análisis los contextos, el texto, dicho de otro modo, el discurso profesional y académico, de donde se extraen los datos fraseológicos;
- La necesidad de definir el concepto mismo de fraseología y analizar las relaciones que se dan en los enunciados especializados entre los términos y sus coocurrentes.

However, there are also voices pointing out the lacks and inferiority of bilingual dictionaries with respect to monolingual ones: Harrell (1967: 51), for instance, states that “it is clearly impossible to pay equal attention to both X-speakers and Y-speakers in one and the same work”, so that the deficiencies of these bilingual dictionaries have also been highlighted and discussed by many authors.

In spite of his acknowledgment of the several advantages that monolingual dictionaries present, Thompson (1987: 284) also draws attention to a series of disadvantages that, in spite of being focused on language teaching situations, can be extrapolated to any dictionary-related context. This author talks about the difficulty in knowing which word to look up and in understanding the definitions in the foreign language when conducting a search in a monolingual dictionary. In this sense, Thompson (1987: 284) claims “that bilingual dictionaries are potentially more efficient and more motivating sources of information for language learners. However, new kinds of bilingual dictionaries are needed [...]” and this is what an active dictionary aims at becoming, i.e. the missing part required to turn bilingual dictionaries into completely effective lexicographical tools.

Specialised lexicography is based on the development of bilingual user-friendly technical dictionaries like the one presented here. Looking back a few years into the history of this field, it is significant to mention that the dictionaries written four thousand years ago to explain religions in the Middle East can be considered the very first instances of specialised lexicography. Nowadays, the latest trend for these

lexicographical undertakings, as detected by Nida (1997), especially among the work of terminologists within the European Union, is to pay more attention to context, a view that fully coincides with the principles of the CTT. Longman's *Language Activator* (1993), the *Word Selector* (1995) by Cambridge Press or the *Collins Cobuild Series* are examples of this new tendency in lexicography. More specifically, Alcaraz and Hughes' (2004) English-Spanish, Spanish-English *Diccionario de términos económicos, financieros y comerciales*, and other similar specialised dictionaries which Alcaraz, Vargas and other relevant authors at the Universidad de Alicante have elaborated (mentioned in section I.7.3) are also good representatives of this trend in the area of specialised lexicography.

However, this pragmatic perspective is not to be considered a specific novelty in translation or lexicographical work. The importance of context, supported by pragmatic linguists (Alcaraz, 1990) in the description of language, had already been emphasised by Malinowski in 1935 for the specific task of translating in his article on "The translation of untranslatable words":

Words do not live in a sort of super-dictionary, nor in the ethnographer's notebook. They are used in free speech, they are linked into utterances and these utterances are linked up with the other human activities and the social and material environment. The whole manner which I have adopted for the presentation of my linguistic and ethnographic material brings the concept of context to the fore. Not only have I tried in the definition of technical terms to show how these terms form groups of kindred entities, not only have I tried, by placing the linguistic account against an outline of real activities, to give them life and body; but the division of the linguistic material under headings which closely correspond to the chapters of the descriptive account keeps every word, every phrase and every text within its proper context of culture. (Malinowski, 1935: 154)

In spite of this, the general feeling was that Malinowski's words had been forgotten until pragmatists and specialised lexicographers brought them back to life in the last decades. When terminographers and linguists started to check specialised dictionaries, they noticed a lack of entries dealing with categories other than nouns, as well as a lack of contexts that helped to illustrate the use of terms.

As Nida (1997: 265) puts it, nowadays, in all these general or specialised dictionaries "more attention is paid to words in phrases" than to words by themselves, this being also one of the grounding principles of corpus linguistics and explaining its close and even necessary connection with lexicography.

The terminological perspective defined by Cabré (1999 a) in the CTT fosters this view as well, emphasising the need to provide the field of terminology with materials that satisfy the communicative necessities that arise in speciality areas and that are the result of studying terms *in vivo*. These materials should respond to the expectations of a society in constant evolution that calls (often out of pure necessity) for approaches that are more pragmatic and applicable than theoretical.

La terminología, en cuanto materia que concierne a la recopilación, descripción, tratamiento y presentación de los términos propios de los campos especializados en una o más lenguas, no es una actividad práctica que se justifique por sí sola, sino que está destinada a resolver necesidades sociales vinculadas a la optimización de la comunicación entre especialistas y profesionales-ya sea directamente o mediante la traducción-, o relacionados con el proceso de normalización de una lengua. Esa concepción más pragmática y aplicada de la terminología conecta mejor con el espíritu de la sociedad actual: las reflexiones epistemológicas han cedido terreno a actitudes más pragmáticas, y la resolución de necesidades comunicativas reales de la forma más rápida y eficaz posible ha sustituido la reflexión sobre los principios en que se asientan las cuestiones terminológicas, así como la forma de resolverlas. (Cabré, 1993: 35-36)

Hence, the public image offered by dictionaries has been changing from a more authoritarian position on the part of lexicographers to the elaboration of dictionaries that are more aware of the prospective user of the product. Accordingly, Welte (1985: 349) defines lexicography as:

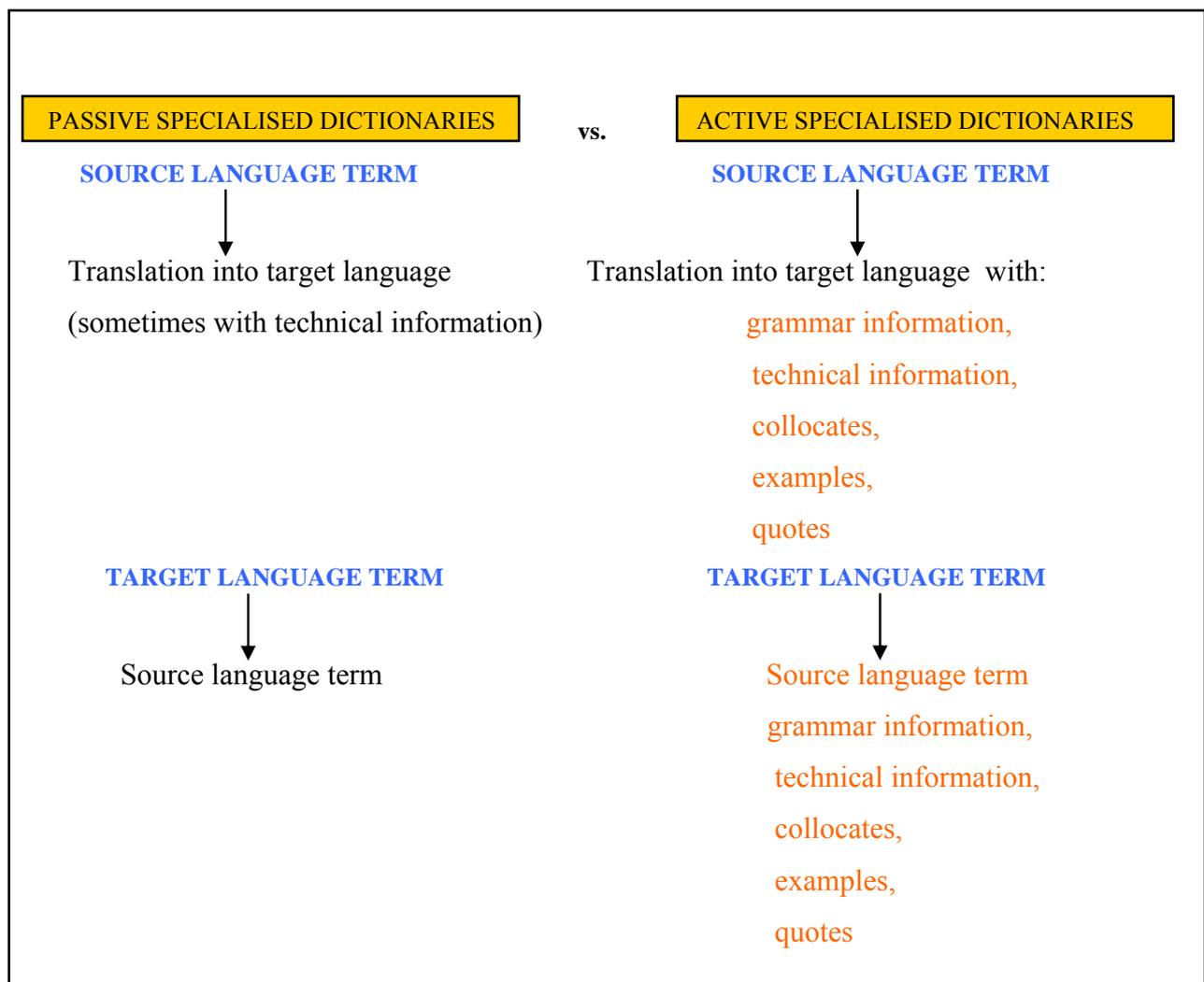
(...) un dominio de investigación con una orientación fuertemente pragmática en cuanto que (al aplicar principios y métodos lexicológicos) siempre ha de tener presentes las necesidades y las expectativas del círculo potencial del destinatarios (los usuarios del diccionario) y tiene que tomar en consideración, además, diversos factores no lingüísticos, como por ejemplo la presentación tipográfica (la más económica posible).

Therefore, nowadays a comprehensive needs study, which includes a typology of the users to whom the dictionary may be addressed (Hartmann, 1987, 1989) is necessary. In the same way, it becomes necessary to analyse the specific needs of each type of user (Cowie, 1987).

Another issue that must be taken into account is the fact that the adequate and effective use of a dictionary depends on the capacity to use it both at a macrostructural and microstructural level (Hatherall, 1984) and that the format of the dictionary is crucial to determine its satisfactory use.

Having taken all these factors that define modern specialised lexicography into consideration for the elaboration of the English/Spanish-Spanish/English technical

dictionary on ceramics terminology, a pragmatic, user-oriented perspective that is far more context-centred and aimed at solving communicative needs has been adopted. All these features will be shaped in the form of an active dictionary capable of making up for the shortcomings posed by passive dictionaries (as entries in appendix VI.4 illustrate). In this sense, figure I.18 shows the differences in content and structure per entry between *active* and *passive* dictionaries, as remarked by Posteguillo and Piqué-Angordans (2005: 460-461).



**Figure I.18:** *Passive versus active dictionaries in specialised contexts* (Posteguillo and Piqué-Angordans, 2005: 460).

Accordingly, in the entries from the prospective active specialised dictionary presented here, each entry may include up to eight distinct items of technical, grammatical or pragmatic information, namely, part of speech (adj., adv., n., v., etc.),

gender (m/f), translation, semantic field, collocations/collocates, acronyms, examples, quotations and definitions/technical information.

It has thus been a central issue throughout the development of the dictionary to bear in mind considerations like Picht's (1991: 103), who again refers to the need to incorporate phraseology that shows the use of terms in context, because the terminological unit activates a specific knowledge depending on the context in which it is found: "El lenguaje para fines específicos no puede reducirse en modo alguno a los denominados *tecnicismos* que aparecen en los diccionarios, una idea que está muy extendida."

Thus, an active dictionary takes into account the fact that every term is always accompanied by other words or terms with which it may appear more frequently than with others. In this way and considering all the factors above, I have tried to somehow complement and reorient previous lexicographical work in the area of specialised industrial ceramic terminology in English and Spanish, the result being the dictionary entries presented in this work (see section VI.4). My proposal has aimed at improving and complementing previous lexicographical undertakings and at obtaining a linguistic tool that fits the perspectives of modern specialised lexicography through corpus linguistics and the CTT.

#### **6.4 General-theoretical considerations for the method of working in the elaboration of the specialised dictionary of ceramics terminology**

Before the method of working used for this study is described from a practical, applied point of view throughout section II of this thesis, the following subsections have tried to provide a reflection on the different theoretical aspects related with and considered for the different stages involved in the elaboration of the prospective dictionary on industrial ceramics.

Regardless of the way terminology is conceived from a theoretical point of view, its practice (terminography or what I have preferred to call specialised lexicography) in every case follows a process which can be subdivided into stages. As has already been explained in previous sections, terminographical/specialised lexicographical work is the applied version of a field of knowledge (terminology) that we have characterised as

interdisciplinary and communicative in nature, but which accepts and has accepted many different conceptions throughout history.

However, before presenting the working method adopted throughout this work for the elaboration of the dictionary entries (and thus the stages in which the working process has been subdivided together with the relevant questions that have arisen in each of these stages) Cabré's (1993) classification of the kinds of terminological work may be useful:

There are basically two general criteria for characterising the work in terminology: the number of languages of/at work (in which the work is undertaken) and the systematic character of the work. As regards the first criterion, the terminological work can be monolingual or plurilingual and the second one means it can be systematic or restricted (what Cabré calls *puntual*). On the one hand, a work is said to be monolingual if it is based on a single language, whereas it is plurilingual if it comprises more than one language. On the other hand, a given terminological work is systematic if it intends to deal with every single term of an area, or if a group of terms from the same area or sub-area is wide enough to make it necessary to establish the conceptual system of this area. A work is restricted, however, if it only affects a single term or a small group of terms of a given area, or if it is about a group of terms that belong to different terminological fields<sup>28</sup>. Hence, as has already been explained, a work is considered to be systematic if it comprises all the terms from a thematic area or sub-area or if a group of terms (from the same area or sub-area) is wide enough to make it advisable to construct the conceptual system of the area beforehand. Although the working methodology of the monolingual systematic work constitutes the basis of plurilingual systematic work, I have focused on the second as the one this work represents. These classificatory criteria (number of languages and systematic character of the work) are combined with each other to produce four kinds of terminological work, each with their own methodology, process and working criteria, but methodologically coherent with one another:

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<sup>28</sup> As Cabré (1993: 290) points out: *el número exacto de términos de una misma área que nos permite delimitar cuando un trabajo pasa de ser sistemático a puntual no está establecido internacional ni oficialmente. A título sólo indicativo (y basándonos en los criterios que utilizan algunos organismos) esta frontera se situaría en torno a los 60 términos de la misma área.*

- Monolingual systematic work
- Plurilingual systematic work
- Monolingual restricted work
- Plurilingual restricted work

Accordingly, the kind of work presented here would correspond to the second category, that is to say, a plurilingual (more specifically bilingual: English and Spanish) systematic work.

What follows is a detailed account on the most important theoretical aspects to be considered regarding the 8 stages of the method of work and has thus been intended at completing and complementing somehow section II.2 in the method, accounting for the applied version (elaboration process as such) of these stages.

#### **6.4.1 Considerations for definition of the work**

The launch of a systematic terminological work like the one presented here has involved, first of all, the consideration of 4 previous basic determining factors that condition the rigour of the work once it is finished and the accomplishment of the goals that were initially set:

1. The topic of the work
2. The addressees of the work
3. The function the work is aimed at accomplishing
4. The work dimensions/scope

1) A crucial issue to be considered before starting to elaborate a terminology (understood as the group of terms characteristic of a speciality area) is the subject matter of the work, which must be clearly and neatly delimited by its authors since, as reality reveals, many works start without taking into account and hence without solving such an elemental question. As Cabré (1999 a: 293) indicates:

Los autores de un trabajo, en efecto, suelen definir previamente y de forma global el tema que quieren estudiar. Pero muy a menudo no valoran suficientemente el alcance conceptual y terminológico que la obra debe tener, ni la diversidad de perspectivas con que una misma temática puede enfocarse. En consecuencia, muchos trabajos deben reorientarse durante su realización,

limitando su alcance conceptual o redefiniendo la perspectiva de análisis, con los costes añadidos que suponen todos esos cambios.

2) Secondly, it is fundamental that every terminological work about a given topic takes into account the public to whom it is addressed (Cabré, 1993). Although it is obvious that the group of terms of a specialised discipline is basically the same regardless of the terminological work, it is also true that the precise selection of terms, the corpus to be prioritised as a source for term extraction, the way of presenting the data and even the kind of work that must be edited will differ depending on the features of each situation and its addressees. A semi-expert tenor usually demands an agile work which allows easy reading and searching or consultation whereas, on the contrary, a highly specialised public would reject a work containing information which is too basic or redundant (Cabré, 1993).

3) Thirdly, Cabré (1993) highlights the fact that the functions aimed at by terminological works do not always coincide. Hence, a distinction can be made between descriptive and prescriptive works (see section I.4.3.2, among others): descriptive works compile the terms of a speciality field with no normalising aspiration whereas the goal of the latter, that is to say, prescriptive ones, is to prioritise the use of the terms they consider recommendable (that is, normative or normalised) in opposition to those marked as rejectable. The final aim of this prescriptive work is to orient the speakers about the correct use of terminology. As this author goes on to explain, within prescriptive works we can make a further distinction between those works which prescribe directly on the form of the term and those which prescribe directly on the concept (and also indirectly on the denomination).

4) Finally, once the topic and the addressees and functions of the work have been established, the people responsible for a terminology will have to consider the reach or scope of a work, not only according to the factors put forward but also taking into consideration other more pragmatic reasons such as the material and economic resources available, the deadlines established for finishing the work, the number of authors to take part in the work, the terminological necessities of the working area and so on.

In order to illustrate these considerations, the figure below (I.19) summarises all these aspects in the specific case of the work presented here:

<b>(PROSPECTIVE) BILINGUAL DICTIONARY OF THE CERAMICS INDUSTRY</b>		
<b>TOPIC OF THE WORK</b>	Subject matter	The specialised language of the ceramic industrial district (focus on its terminology).
	Languages	English-Spanish, Spanish-English.
	Data included	Mainly, entry, equivalent, grammatical category, synonym(s), cross reference(s), context of use, phraseology, quotations, data source, semantic field and definition.
<b>ADDRESSEES OF THE WORK</b>	Addressees	Translators and specialists in the ceramic industrial field.
<b>FUNCTIONS OF THE WORK</b>	Finality/objective	<ul style="list-style-type: none"> <li>▪ To become a useful specialised lexicographical tool for those professionals working in the area.</li> <li>▪ To analyse, describe and present the terminology characteristic of the specialised language of the ceramic industrial district systematically and coherently from a communicative, pragmatic and corpus-based approach.</li> </ul>
<b>WORK DIMENSIONS</b>	Dimensions	A prospective total of 26,000 terms (4,000 terms presented in this study in the form of final entries).

**Figure I.19:** considerations for definition of the work in the specific case of the prospective bilingual dictionary of the ceramics industry.

#### **6.4.2 Considerations for work preparation and corpus compilation**

Once all the considerations regarding the definition of the work have been posed and discussed from a theoretical point of view, the reflection on the preparation of the work has comprised, broadly speaking, 5 main activities, in accordance with Cabré (1993):

1. The acquisition of the necessary information about all the aspects of the work and about the material, professional, conceptual and scientific framework of the topic
2. The selection of work assessors
3. The conceptual structuring of the field
4. The proposal of a definitive working plan
5. The selection of the information and the fixation of the corpus for subsequent term extraction and analysis

1) Prior to the compilation of the corpus as such there are a series of preliminary questions to be posed and considered, that is, the acquisition of the necessary information about all the aspects of the work and about the material, professional, conceptual and scientific framework of the topic. In this respect and in Cabré's (1993) opinion, any specialist or linguist who is about to start a systematic terminological work must have certain knowledge about four aspects of the topic of his/her work:

- a) The contents of the topic/subject matter
- b) The documentation available
- c) The professional setting in which the topic is developed
- d) The sociolinguistic situation of the domain

a) Regarding the first item from the list, as has already been mentioned, the reference bibliography constitutes the best means to acquire a general idea about the contents of the topic/subject matter dealt with for a terminologist who is not a specialist in a scientific-technical topic (or any other specific/specialised activity). If the terminological work is undertaken directly by a specialist, this first step is obviously much simpler since this knowledge about his/her speciality field has already been acquired as a basic requisite to become such a specialist. However, this training is absolutely crucial for the terminologist-linguist who is not an expert (as in this case), since it allows greater agility, adequacy and rigour when structuring the speciality domain, when selecting the most adequate material and in the term extraction stage.

A thorough knowledge of the contents of the subject matter to work with and of its conceptual system then makes it possible to structure the notional field of the discipline. This conceptual system can be schematically represented with a field

diagram (see sections I.6.4.2 and I.6.4.3), which, in this case was tentatively initiated in the stage of “definition of the work” and completed in the stage of “elaboration of the field diagram”), thus allowing the complex conceptual system of relationships shaping the subject matter to be visualised in a simple way.

b) However, this information about the content of the field of work is not enough to make up the previous knowledge a terminologist should have in order to undertake a specific work about the terms of a speciality area. He/she must also have information about the documentation available for use. This documentation refers to other terminological works edited in the same or related fields, to representative works that can be used (and have in fact been used) as information sources of the contents to be dealt with and to the documentation considered appropriate for term extraction.

In spite of this, as has been the case in this study, a linguistic terminologist must rely on a specialist in the discipline in order to obtain useful and reliable information about the documentation available for his/her purposes, as well as being able to count on the help of specialists in documentation who are aware of how to gain access to and consult the information sources. In this sense, a good previous documentary work has greatly facilitated the tasks to be undertaken in subsequent stages.

Moreover, apart from the information on the topic area as such and adequate documentary research, the authors of a systematic terminological work must also have pragmatic data about the organisational and linguistic reality of the professional setting in which this topic area is created, developed and used.

It was thus necessary to be aware of the “poles” around which the structures of work of the professional or speciality area of industrial ceramics are organised. The knowledge of these poles and the detection of the most significant diffusion points facilitated the terminological work a lot since they made it possible to gather the information with the greatest prestige or authority in each field and may also help to organise the subsequent implantation of the elaborated terminology in a more effective way in future stages (Cabr , 1993). Accordingly, the systematic terminological work here presented was grounded on the aspects summarised in figure I.20, following Cabr ’s (1993) considerations:

<b>ASPECTS FOR WORK PREPARATION IN SYSTEMATIC TERMINOLOGICAL WORK (CABRÉ, 1993)</b>	<b>ASPECTS FOR WORK PREPARATION IN THE SYSTEMATIC TERMINOLOGICAL WORK PRESENTED HERE</b>
Contents of the topic	See sections II.2.1, II.2.3 (and III.2)
Documentation available	See sections II.1 and V
Professional means	See section II.2.1
Sociolinguistic situation of the domain	See section I.7

**Figure I.20:** Summary of the aspects of work preparation in systematic terminological work in general and remissions in this respect for the specific case of this study.

2) The selection of work assessors, which is important because of the aforementioned reliability of their contributions regarding the validation of results, suggestions and their global understanding of the domain, is highly enlightening for the non-specialist, especially in the early stages of the work.

3) The conceptual structuring of the field. In this stage, “the conceptual structuring of the field” refers to the consideration of the more theoretical preliminary steps for the actual “elaboration of a field diagram” in the next stage. Generally speaking, with all the information gathered so far, the terminologist (preferably with the help of a specialist) can start to elaborate a conceptual structure of the field he/she is working in and to represent it graphically. In this work, this representation of the conceptual structure of a thematic domain has been illustrated in the form of a “field diagram” which, in spite of not being exactly a conceptual map, allows every concept to be placed within an ordered, coherent structure of the different areas forming part of a domain. In this way, this coherent and significant placing of every concept of a speciality domain within a general structure representing the structure of the whole domain, can be said to share many features with pure conceptual systems.

As Cabré (1993) points out, every speciality area transmits a determined view of reality that is represented in the form of a system of concepts. A conceptual system is formed by a structured group of concepts organised in conceptual classes. The big conceptual classes and the subclasses, as well as the concepts of the same class, are related to each other by the features they share or in the way they are used in the real world.

Los tesauros especializados (o la parte correspondiente al tema específico de los tesauros generales) y las clasificaciones temáticas son herramientas muy útiles para orientar la estructuración de un campo, tarea que consiste en representar las grandes ramas o apartados en que se organiza cada especialidad. (Cabré1993: 300)

Although structuring a specialised field is no easy task because of the different factors involved in it, a well-elaborated conceptual structuring must have the following characteristics, according to Cabré (1993):

- it must cover all the field of work (and, if possible, it must frame it within the field that is immediately above it so that the specific field of work is one of the components of the more general field);
- it must contain or include all the structured branches of the sector dealt with;
- it must present or represent the relationships given between the different branches and inside them;
- it must not include non-pertinent conceptual blocks;
- it must be structured in such a way that the same concept is not repeated in different branches;
- it must not include non-productive conceptual blocks, that is to say, those which do not lead to a group of concepts (and denominations referring to them).

These conceptual structurings are usually represented by means of diagrams that are very often (although not necessarily) tree-like (like the one used and presented here).

In conclusion, it is important for the terminologist to devote the time and effort necessary to establish the notional field of a thematic area, since the more detailed and rigorous this conceptual structure is, the easier the subsequent work about terms will be; at the same, other aspects regarding the conceptual aspect of the work will automatically be improved too (Cabré, 1993), for example:

- The delimitation of the subject matter and its scope
- The control of term extraction
- The selection of terms
- The attribution of a thematic sub-area to the terms
- The elaboration of definitions
- The control of key descriptors
- The incorporation of the terms into a database
- The subsequent automatic retrieval of information
- The establishment of new related conceptual fields

4) The proposal of a definitive working plan: the data and the information gathered up to the moment make it possible to reorganise (when necessary) the working process that was broadly designed during the work preparation, as well as to design a definitive execution plan. A working plan like the one used here normally includes all the features mentioned up till now (also in the stage of “definition of the work”) apart from other aspects concerning subsequent stages. According to Cabré (1993: 301: 302) these are:

- El título del trabajo
- La delimitación del campo de trabajo
- Los objetivos que se propone cubrir
- Los destinatarios de la obra
- La información sobre la situación terminológica y bibliográfica del área
- La información sobre la organización profesional del medio
- La información sobre la situación lingüística del medio
- La estructuración del área de trabajo
- El establecimiento del corpus de vaciado
- La propuesta de organización del trabajo:
  - Los agentes del trabajo: autores, colaboradores, informadores: nombres y distribución de responsabilidades
  - La metodología: fases generales, operaciones específicas para cada fase

- El calendario
- Los recursos: presupuesto, material, infraestructura

In the specific case of this study, the working plan that was designed can be summarised as follows (see figure I.21):

<b>WORKING PLAN</b>	
Title of the work	<i>The Communicative Theory of Terminology (CTT) applied to the development of a corpus-based English-Spanish dictionary of the ceramic industry</i>
Delimitation of the field of work	The ceramic industrial field and its allied industries
Objectives to be covered	See section I.1
Addressees of the work	Translators and specialists in the ceramic industrial field
Information about the terminological and bibliographical situation of the field	See sections I.7, II.1
Information about the professional organisation of the field	See section I.7
Information about the linguistic situation of the field	See section I.7
The structuring of the working area	See the outline of the field diagram and its final version in sections II.2.3 and III.2 respectively
The compilation of the extraction corpus	See sections II.2.2 and III.1
The proposal of work organisation:	
Working agents	See section II.2.1
Methodology	See section II
Working plan	<ul style="list-style-type: none"> <li>• Final dictionary intended for October 2008</li> <li>• Working plan adapted to the premise of “work in progress”</li> </ul>
Resources	See sections II.1, II.2.1 and III.1.1

**Figure I.21:** Working plan established for this project in the work preparation stage.

5) The selection of the information and the fixation of the corpus for term extraction. In this stage, in which the corpus has already been compiled, a series of actions have to be undertaken with the aim of successfully selecting the necessary information for accomplishing two basic objectives: term extraction (documentation for term extraction) and reference (reference documentation).

The documentation for term extraction constitutes the material basis for the detection, extraction and analysis of the terms of the discipline, whereas the reference documentation provides information about different aspects of the subject matter.

The corpus for term extraction (*corpus de vaciado*) is the group of documents that allows the list of terms of the work to be established and has to be carefully compiled since it constitutes the basis for the detection of the terminological units; the final results are therefore highly conditioned by this corpus.

Accordingly, a series of criteria were followed for the elaboration of the corpus, that is to say, a number of parameters were taken into account in order to guarantee the quality of the textual samples and their adequacy to the objectives established (for more information on this, see section I.6.4.2.1)

In general, the information contained in the documentation and included in the corpus must be relevant or representative of the field of knowledge, and complete, which means it includes all the aspects directly related with the subject matter. In the same way, updating is another basic requisite because the lists of terms obtained must reflect the current linguistic reality existing in the area under study (in the case of technological/scientific branches it is quite liable to change). These criteria thus determined that the texts were suitable for constituting and being called a “corpus” and, more particularly, for being compiled and forming part of the bilingual corpus of this study, given the linguistic objectives established. Other corpus-related issues, such as the actual corpus composition in terms of the specific documents included in it, are also explained in detail in section III.1.1. However, the more theoretical criteria taken into account for the selection of the documents (that is, those to be used for term extraction or reference) and their inclusion in the corpus are specified below as a key issue in this work preparation stage.

Hence, Rondeau (1984) puts forward a series of criteria in order to evaluate the documentation that might be used as a source for terminological work but making a further distinction between the criteria regarding lexicographical works and the criteria

to be taken into account for the rest of the sources. In each of his lists, Rondeau establishes the elements that positively determine the documental evaluation, which are the ones that have been taken into account, among others, for the selection of the documentation in this work (mainly used to verify term extraction):

Positive criteria for lexicographical works:

- Specification of the method for data compilation
- Presence of cross references
- Presence of an alphabetic index
- Ease of consultations
- Presence of illustrations
- Presence of definitions or contexts
- Indication of the sources of terms
- Authority of the author
- Indication of the thematic domain for each term

Criteria that must be taken into account for the evaluation of non-lexicographical works:

- Language in which the work is written (original/translation)
- Authority of the author
- Date of publication
- Public to whom the work is addressed (general/specialised)
- Level of the language in relation to the addressees of the work (specialised/popularising)
- Geographic area to which it is addressed
- Importance of the editor (if there is one)

#### **6.4.2.1 Criteria for corpus compilation: general considerations for text selection in corpus design**

Corpus-based specialised lexicography can be easily justified if we consider that the language used by the different members of a scientific community is materialised both in oral and written communication. These written forms are the ones that are electronically kept and stored as text card indexes (Gómez and Vargas, 2002) and are thus the ones forming part of the corpora compiled for different studies and with different objectives.

Therefore, the group of texts created by the specialists in a given domain are the “raw material” from which to extract the different kinds of linguistic data (terms, definitions, contexts, and so forth), since these texts contain most of the terminology of the field being dealt with and report the knowledge shared by the professionals from this field (Gómez and Vargas, 2002). However, these texts must be in agreement with the aims posed for the terminological extraction process and not every text will be valid for such purposes or show the quality level required for specific terminographical purposes. This is the reason why there are many different factors to be taken into account when compiling a specialised corpus (Gómez and Vargas, 2002), namely:

- its final size before starting with the extraction of terminological units;
- the languages of the texts;
- the original reproduction mode (oral or written);
- the original reproduction format (printed or electronic);
- the sample size;
- copyright considerations, and so on.

To better understand the specific criteria followed for the compilation of the texts forming part of the corpus used in this study, in the following subsections a complete account of the corpus-related issues considered here regarding its design and compilation are provided.

According to Ahmad and Davies (1992: 22) “A corpus-based approach enables the terminologist to identify, study and record terms in their natural habitat, and

translators, as users of the termbank, to have customised access to a full set of information about all the terms and related terminological data of a domain”. However, before starting to use any corpus, it is fundamental that linguists are aware of the importance of a good corpus design.

As has already been mentioned, if one intends to work with a corpus, two possibilities are presented: to work with one that has already been elaborated or to elaborate it so that it can be designed in the way that best fits the objectives and necessities posed (a tailored corpus). In both cases, the quality of the corpus will determine the results of the linguistic research so that it is worth taking into account a series of parameters that may, to a certain extent, guarantee this quality (and that may also guarantee that a corpus is actually that and not just a collection of texts gathered at random). The accomplishment of these parameters is easier if, as in the case of this study, corpus composition and design depends on the same linguist undertaking the linguistic investigation afterwards. No-one can better determine the accomplishment of the criteria to be adopted than the person in charge of compiling the corpus and, thus, the one who chooses what to include and what to dismiss. According to this, there are certain issues that must be and in fact have already been considered for the design of the corpus and, as such, they are regarded here as forming part of the theoretical considerations behind the methodology used for corpus compilation.

When designing a corpus the first step is to clearly determine the intended purposes of the research in order to try to construct a corpus that fits these purposes. Departing from the fact that a corpus is not just the aforementioned collection of randomly selected texts but a collection of texts that has been compiled according to a series of given criteria with the aim of being used for specific purposes, then the appropriateness of this corpus will be mainly determined by its representativeness in terms of the area under study. “The appropriate design for a corpus therefore depends upon what it is meant to represent” (Biber, Conrad and Reppen, 1998: 246).

What seems obvious, whatever the topic area or the research objectives of a given corpus may be, is that the representativeness criterion is crucial when designing it since it will determine the kind of research questions to be posed as well as the level of generalisability and reliability that can be given to the results obtained in the research.

However, representing a language or a part of it is not at all an easy issue because it is impossible to know “the full extent of variation in language or all the contextual

variables that need to be covered in order to capture all variation in texts” (Biber, Conrad and Reppen, 1998: 246).

In spite of this, taking into account a series of methodological issues can and has helped me to attain what I think is a satisfactory corpus design. In this specific case, I have taken into account and combined the criteria of corpus composition and design proposed by various authors. What follows is an account of the main methodological proposals in this respect and, in fact, the ones that have been considered in this specific project.

Firstly, I have made use of the guidelines proposed by Biber, Conrad and Reppen (1998) for selecting the textual samples of the corpus. Broadly speaking, these authors suggest that for a good corpus design, apart from representativeness, two additional parameters (diversity and size) must also be considered when undertaking text selection and compilation:

a) Diversity is important and several aspects are of crucial importance as regards diversity, mainly:

- Register variation and dialect: a well-designed corpus must represent the different registers of the language. However, in the analysis of PAL or a specific specialised language these factors tend not to be very significant.
- Subject matter: it is especially important in lexicographical studies like this one since, as the results of this study show, the frequency of many words varies depending on the subject matter. For all studies, a variety of subject matters, understood as sub-areas of the main area under analysis, need to be included within the corpus (the field diagram has been the most useful tool in this respect).

b) Size: the issues of size in corpus design do not only refer to the number of total words in the corpus but also to the number of texts from different categories, the number of samples from each text, and the number of words in each sample.

Obviously, if the total number of texts included is very low (although a single text is very long and includes a large number of words), this can have an undue influence on the results of an analysis. The personal linguistic features of a given author or

expert on the topic may then be taken for granted as a characteristic of the language or register analysed when, in reality, it is just the reflection of the way of speaking or writing of an individual. According to Biber (1990), enough texts must be included in each category to encompass variation across speakers or authors. More specifically, Biber (1990) investigated how many texts were needed for a category and concluded that ten texts represented the categories of the LOB corpus well for many grammatical features.

In the same way, the number of samples from each text can make the characteristics of a text vary dramatically internally. The example that Biber (1990) proposes to clarify this issue is the following: experimental research articles follow a structured scheme in which the Introduction, Method, Results and Discussion sections have quite different patterns of language use. Thus, if all these sections are not included in the sampling, then the results obtained from the corpus would misrepresent the real language patterns of the research article as a genre.

Finally, the number of words in each sample is also important in order to provide a reliable count of features in a text. Biber (1990) states that counts are relatively stable across 1000-word samples from a text, although some other features which are rarer in nature would require larger samples for quantitative studies.

One important conclusion to mention here is that, usually, lexicographical studies are thought to require particularly large corpora<sup>29</sup>. It can be deduced from the results section in this study that many words and collocations occur with low frequencies (some of them because they are highly specialised) and a corpus must be really large and shaped by many different texts coming from different sources and authors to enable reliable investigations and results regarding use. In spite of this, size cannot act as a substitute for diversity because both features are necessary for good and reliable corpus design.

Following Sinclair (1996, in Vargas, 2005: 339), a corpus must accomplish four basic criteria to be considered as such. If any of these criteria are not accomplished the corpus would be called a *special corpus*. These characteristics, closely related to those mentioned earlier, are the following:

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<sup>29</sup> There is no general agreement in this respect either. For more information regarding size and to be able to analyse discordant opinions, see section I.6.4.2.1 B

- a) Quantity: “el valor por defecto de esta característica es grande” (Vargas, 2005: 339). It may not be stated explicitly but it is commonly assumed that a corpus must contain a great number of words.
- b) Quality: “el valor por defecto es auténtico” (Vargas, 2005: 339). All the material compiled in a corpus must come from genuine communication developed in normal situations (the term “normal” would vary if the corpus is a rather specialised one like the one used here because what is a normal situation in the context of the ceramic tile industry may not be so, for instance, in the context of a hospital).
- c) Simplicity: “el valor por defecto es texto plano” (Vargas, 2005: 339).
- d) Documentation: “el valor por defecto es documentado” (Vargas, 2005: 339). The complete details and documentation of the texts must be kept separately from these.

Taking these features into consideration, the parameters I have focused on for the elaboration of the English and the Spanish corpora could be summarised in two big groups (Vargas, 2005), namely, representativeness and equilibrium, on the one hand, and size, on the other. Moreover, Vargas (2005) also proposes to take into account the channel of production of the texts, the period of time, and so on. In this study these other parameters have not been analysed in depth (although they have been taken into account for the composition of the corpus) but sections I.6.4.2.1 A, I.6.4.2.1 B and I.6.4.2.1 C provide a more detailed account of the factors that have been most widely considered for the specific compilation of the corpus of industrial ceramics: representativeness and equilibrium, size and reliability of Internet documents respectively.

#### **a) Representativeness and equilibrium in the corpus compiled for this study**

Tognini-Bonelli (2001) explains that the determination of the function of a corpus is inherent to the methodology chosen for the compilation of textual samples.

Therefore, for a study like the one presented here, which aims to cover the terminology of a very specific industrial district like the ceramic one, it has been necessary to elaborate a specialised corpus by compiling textual samples that coherently represent and characterise the specialised language under study. However, “es un hecho asumido entre los lingüistas de corpus la imposibilidad de definir y crear un corpus totalmente representativo” (Clear, 1992, 1997; Kennedy, 1998; Torruella and Llisterra, 1999).

From the quotation above it can be deduced that the notion of representativeness is not an easy issue to define or delimit. As Gómez and Vargas state (2004), the notions of equilibrium and representativeness have been widely debated and dealt with by corpus linguistics (Atkins *et al.*, 1992; Biber, 1993, among others).

The controversy it generates is an “old friend” of linguists, who have just approximate ideas of what a representative corpus could be. In addition to this, there is no way of guaranteeing this feature of representativeness and neither can it be subject to objective evaluation (Tognini-Bonelli, 2001; Berber, 2000).

What seems clear is that, although a corpus may vary depending on its design, its size, its nature (Kennedy, 1998) and its intended purposes (they may be used for general or specific description), it must always be representative. This notion of representativeness is close to that of diversity introduced by Biber, Conrad and Reppen (1998) in many senses because, in Summers’ (1993: 186) words, the term “representative” refers to:

Representative of the standard language in a very general sense, not restricted to a regional variety (e.g. British English or a local dialect) or a narrow range of text types (e.g. scientific texts, newspaper writing, language of a particular social class).

Tognini-Bonelli (2001: 57) summarises this issue of the representativeness of the corpus as follows:

Thus there seems to be general agreement among scholars who choose to work on a corpus that this should be representative of a certain population and that the statements derived from the analysis of the corpus will be largely applicable to a larger sample or to the language as a whole.

The main problem presented by the notion of representativeness is that, given that a corpus is a finite sample from an infinite population, the linguistic samples that

can be compiled never reach an end because “there are always new ones coming along that we haven’t seen yet” (Leech, 2002: 4). For this reason, complete, perfect representativeness will never be reached because, according to Leech’s (2002) views, this will never be possible. However, in spite of all the difficulties, there are a series of guidelines that facilitate the creation of representative (and also balanced) corpora. For a corpus to be balanced and representative, the field diagram plays a fundamental role, since it allows the balanced inclusion of the necessary number and kind of texts dealing with each specific area or sub-area that go to make up the domain as determined by this diagrammatic representation. This is crucial since the notion of representativeness refers, mainly, to the texts normally given in the specialised area in question. Thus, in the stage of corpus design or compilation it is necessary to include the different situations (whether they are academic or professional) in which specialists in the field normally produce their discourse, so that the different kinds of texts representing the professional field in question can be covered. Following Bowker’s views (1996: 45), a representative corpus must include, broadly speaking, the same number of samples of four different kinds of texts that represent or account for the level of specialisation (Gómez and Vargas, 2004):

- Very specialised
- Specialised
- Didactic
- Popularising

At the same time, this classification is closely related with, on the one hand, the author’s level of specialisation (expert, semi-expert and professor) and, on the other hand, the addressees (specialist, semi-specialist, student and general public) (Gómez and Vargas, 2004). In order to illustrate this, the textual types that can be compiled according to the category of “level of specialisation” (*nivel de especialización*) have been classified by Gómez and Vargas (2004: 17), on the basis of Bowker’s (1996) views, as shown in figure I.22, most of which have been included in the corpus used in this study.

Nivel de especialización	Tipos textuales
<b>Muy especializado</b>	art. revista especializada
	art. revista académica
	documento normativo
<b>Especializado</b>	art. revista especializada
	art. revista académica
	manual técnico
<b>Divulgativo</b>	art. revista general
	art. periódico
	obra de referencia
	folletos publicitarios
<b>Didáctico</b>	art. revista especializada
	art. revista académica
	manual técnico
	obra de referencia
	art. enciclopédico
	libros de texto

**Figure I.22:** Levels of specialisation and kinds of texts (textual types) included in each level (Gómez and Vargas, 2004: 17).

Each textual type will contain different conceptual and linguistic information, and terms and concepts will vary depending on whether a text has been written by a specialist or a layman. However, if the quality of the text is adequate, every textual type can accomplish a function in the different phases of the terminographical process depending on the level of specialisation it shows and, therefore, on the communicative purpose it aims at. For instance, manuals turn out to be very effective in the early stages of terminographical work in order to become familiar with the speciality field, whereas norms provide highly specialised and technical normative information so that their use is (and has been) more advisable in subsequent and more advanced stages of the work.

As has already been mentioned, equilibrium is another key issue for those corpora designed to represent the specific language of a specialised field, but also for the representation of the language in general terms (Kennedy, 1998; Tognini-Bonelli, 2001). However, it is not difficult to deduce that this feature is not taken into account,

for instance, in those corpora referring to the complete works of an author (Kennedy, 1998) even though this has not been the case in this study, in which the equilibrium of the textual samples gathered and compiled for the corpus has necessarily been considered.

Regarding equilibrium, or what some authors prefer to call balance, Atkins *et al.* (1992) define a balanced corpus as a corpus that is so finely tuned that it offers a manageably small-scale model of the linguistic material which the corpus builder wishes to study. In this sense, in the context of specialised corpora and with the aim of achieving the aforementioned equilibrium, Gómez and Vargas (2004) consider it more appropriate to talk about conceptual balance. This notion, introduced by Bowker (1996: 45-46) develops on the already mentioned convenience of gathering within the corpus every subfield into which a field of knowledge is divided, as well as every professional or academic area related with it. In this sense, the already-mentioned field diagram becomes the perfect tool for achieving this conceptual balance, since it comprises the different aspects involved in a knowledge field and may help to represent it thoroughly.

#### **b) Size in the corpus compiled for this study**

In general terms, and as will be explained in the section devoted to results, Sinclair (1991) recommends, from a lexicographical point of view, that the corpus should be as large as possible and always allow the inclusion of new samples (the corpus is a linguistic tool that is constantly growing). He grounds this view in the so-called Zipf's law (see section I.6.4.5.2) about lexical distribution (Zipf, 1935; Sinclair, 1991), according to which the majority of words are used with a very low frequency and a small number of the most common words (*the, of, to*, and so on) constitute the biggest part of any text because they appear with a high frequency.

Therefore, the terminographer needs to have quite a large number of occurrences available in order to study the behaviour of words inside texts. Vargas (2005: 345) explains, however, that size may be dependent on the objectives for which the corpus is compiled:

Recientemente se ha considerado necesario construir córpora más pequeños, centrados en áreas específicas de la lengua, especialmente destinados a ámbitos como la docencia de la traducción (Bowker, 1998, Zanettin, 1998), de idiomas

(Ghadessy, Henry and Rosberry, 2001) y la terminología (Ahmad and Rogers, 2001). Podemos realizar, por tanto, una división de los corpóra según el tamaño. A un lado se sitúan los grandes corpóra, que se utilizan para analizar la lengua general y que, además, tienen en su mayoría un fin lexicográfico. Al otro lado se sitúan los corpóra utilizados para examinar áreas más específicas del uso lingüístico, de menor tamaño y con fines más variados y concretos.

Berber (2000: 346) suggests a classification of the size of corpóra in terms of the number of words based on the observation of certain corpóra used in different studies and investigations over a four-year period. According to Berber's (2000) classification (figure I.23), the corpus presented in this study can be considered to be a medium-sized / big corpus, since nearly 1,500,000 words have been compiled (see section III.1 makes reference to the exact size of the corpus):

Size	Number of words
Big corpus	10 millions or more
Medium-sized / big corpus	1 million to 10 million
Medium-sized corpus	250,000 to 1 million
Small / medium-sized corpus	80,000 to 250,000
Small corpus	Less than 80,000

**Figure I.23:** Classification of corpóra size according to the number of words.

A special mention must be made of the Internet, as a “megasource”, which is a universal supplier of documents of any kind. However, this “universality” also makes it a dangerous source to resort to if adequate selection criteria are not followed. Anyone can contribute to the Net's megacorporus and that is the reason why, in the next section, a series of specific guidelines in the methodology used for corpus compilation have been included in order to avoid possible issues derived from a bad selection of documents.

As Gómez and Vargas (2004) point out for some of their own terminographical works and their corresponding corpus-based studies, the volume in terms of size of the corpus used for this study may seem modest or even insufficient if compared with the number of words (normally millions) traditionally used in corpus linguistics. However, in general, this is due to a basic difference between specialised and non-specialised corpóra: specialised texts are much denser from the point of view of lexical terms than texts from general language (Ahmad and Rogers, 2001). This implies that texts with a high degree of technicality like the ones normally included in specialised corpóra

present what is known as “terminological density”, that is to say, a large number of words that transmit specialised knowledge. In addition to this, in spite of presenting a number of words that is generally inferior to the figure for general language corpora, truly revealing and satisfactory results can be obtained from specialised corpora if equilibrium and representativeness are achieved and if the texts compiled present a high degree of technicality.

**c) Reliability of Internet documents in corpus design**

As can be observed in section III.1.1, one of the main sources for corpus compilation and composition in this study has been the Internet. The Internet constitutes a worldwide forum in which everyone’s opinions can be expressed and included. The Net is nowadays the most important and easiest distributing medium for authors who want their work and studies to be known worldwide. However, there is a fundamental difference between having an article published, for instance, in a specialised journal and having it published on a personal homepage on the Internet: anyone can contribute to the Internet’s megacorporus whereas the criteria for publishing in more traditional media (books, manuals, specialised journals) are normally much more difficult to comply with. Consequently, this may be a dangerous fact for those who use the Internet as a source for their daily work or research, and a factor to be widely considered.

In the specific case of this study, the Net has been a main source for corpus compilation because it has been regarded as an essential part of real language use and transmission both in specialised or general fields of knowledge. However, many documents that can be found during a search on the Net are neither edited nor checked by organisations, institutions or any other mechanism that could at least to a certain extent guarantee the quality of the information contained therein. This is why the Internet, in spite of being a very useful tool, is still not a completely reliable source if the appropriate criteria are not used to distinguish between reliable and non-reliable materials. In general terms, as this study reflects, the Internet may be considered a reliable means or resource for many kinds of research if we are aware of the factors to be taken into account for accepting a document as valid or disregarding it.

Codina (2000) enumerates a series of factors to be considered when attempting to establish the adequacy and quality of digital resources. He proposes a series of

parameters and tries to justify and reason them out, although there is no general agreement regarding the criteria or the indicators to be followed in order to evaluate the adequacy of these digital resources. In general terms, however, there is some agreement on the following: content, authorship, ergonomics and representation of the information. In the author's opinion, this list can even be reduced to the first two parameters, content and authorship, which are analysed in depth below:

The **content** criterion must include, in Codina's (2000) views, indicators both on the quality and quantity of the information. The indicators on quality are mainly:

- The rigour or care with which the information has been treated. Some indicators of this rigour, which is usually not easily perceived by non-specialists, are: mention of other sources, mention of specific data (dates, authors, statistics), the non-inclusion of factual mistakes, the absence of orthographic mistakes, the separation between opinion and information, and so forth.
- The exhaustivity or degree to which the information is presented in a more or less complete manner. For example: a bibliographical datum may be just a title and a name of an author or incorporate, as a positive indicator, the date of edition, the place, the publisher's name, the number of pages or the ISBN number.
- Updating: the inclusion of the date of the last update is also a positive indicator, since the more up-to-date information is, the more valuable it is. Updating has been important in this study because, for its purposes and given that the speciality domain is a highly technical one and thus constantly evolving, the information needed to be up-to-date. Especially in fields like industrial ceramics (involving new technologies, engineering and sciences in general), knowledge is in constant evolution and consequently its terminology is as well. The indicators observed for including only up-to-date information are: looking for the date of the last update (if it is included, it is usually worded as "last updated") and for the date of the author's rights, if he/she has them (usually worded as "copyright").

- Edition, or the degree to which the information has been treated, revised and completed before being published.
- Systematisation: a directory is systematised if each web is defined in the same way.
- Intrinsic interest: the intrinsic interest of the information provided by websites must always be taken into account more than other more superficial considerations. Consequently, websites on trivial topics and lacking research or documentary interest must be avoided.
- Originality or the degree to which a resource offers information which is unique or exclusive in any sense. For instance, many websites offer digital resources but perhaps only a couple of them offer an evaluation of these resources.

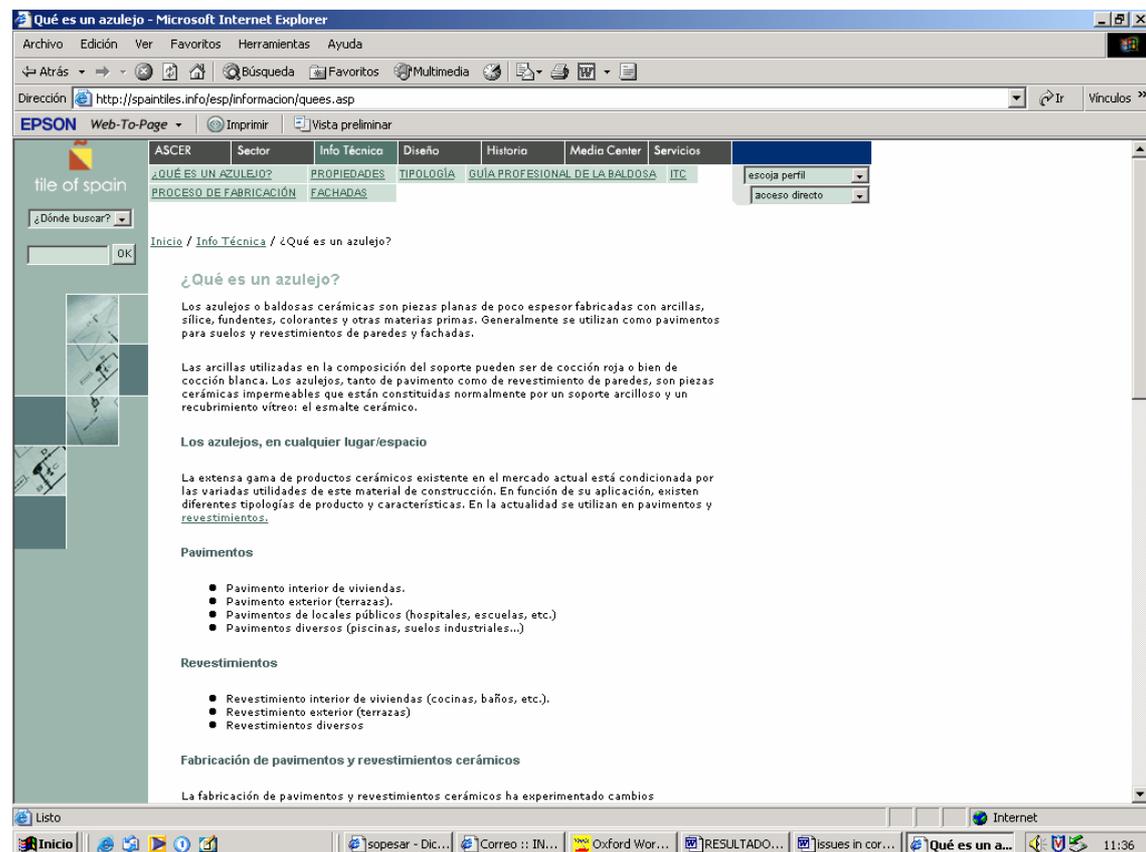
Among the indicators of quantity, it is important to pay attention to the degree to which the information is covered, or the exhaustiveness with which it is done, with respect to the field under study. However, this refers to the amount of useful, valuable information, not to indiscriminate quantities of information.

The **authorship** criterion can be measured or evaluated by three aspects or indicators:

- The reliability or competence of the author and/or the institution that has created, produced or edited the resource.
- The existence of explicit declarations of authorship. A well-conceived website must have a section which states without any kind of ambiguity and in detail to whom the authorship of the resource must be attributed and who is or are its distributor(s) and editor(s). Apart from this, it should be complemented with information about the author(s) and the editor(s), the institution they work for, their address, and so forth.

- The life span of the resource. It seems much more reasonable to resort to resources supported by some sort of institution or company than to personal websites, which usually present many more irregularities, in general, both in their life span and in their quality and reliability. This is why in this study these pages have been avoided. However, an author of recognised prestige can also be considered a guarantee of the quality of a given material.

Figure I.24 would constitute an example of a reliable Internet document because it accomplishes the criteria proposed throughout this section and, as such, it has been included in the corpus together with many others of the same sort.



**Figure I.24:** Example of a reliable website included in the Spanish corpus which meets the quality and quantity criteria proposed by Codina (2000) (ASCER's website in <http://spaintiles.info/esp/informacion/quees.asp>).

The example in figure I.24 meets the content reliability requirements of rigour, exhaustivity and edition among others, as well as the authorship reliability requirement by

identifying, for instance, the institution which created it, in this case the *Asociación Española de Fabricantes de Azulejos y Pavimentos Cerámicos (ASCER – Association of Ceramic Tile Manufacturers of Spain)*, among many other data.

### **6.4.3 Considerations for the elaboration of the field diagram**

A *field diagram* constitutes, as has already been introduced, an organising/organised structure of the concepts that integrate a speciality domain and the ones that are, to different extents, directly related to it. This kind of diagram is a graphic representation in diagrammatic form of the fields and subfields that are comprised in a given subject/activity. It is a useful tool due to its associative and classificatory nature. The relationships it shows make of the field diagram a coherent whole determined by the notion of *semantic field*. According to Auger and Rousseau (1987), a semantic field is a group of notions that can be grouped under the heading of a key notion. Each terminological unit of a semantic field is conditioned by the others and its value is determined by the position it occupies in the structure. In the same way, every terminological unit has as a function establishing the relationship between a linguistic form (word or term) and a reality (abstract or specific) through a notion. The elaboration of this field diagram has also been useful in order to select the terms to be included in the dictionary and to establish the first element of definition of the different terminological units by means of abbreviations that indicate the semantic field the term belongs to (Vargas, 2005). The *field diagram* is thus a tool to establish an ontological system, that is, a structured list inside which the different activities belonging to the sector under analysis can be included and classified and the mental structure of the terminographer can be organised in a meaningful way. For more information on the elaboration of the field diagram and its final version see sections II.2.3 and II.2 respectively.

### **6.4.4 Considerations for documentary corpus management**

The general-theoretical considerations dealt with in this study regarding documentary corpus management have been covered in an integrated way in section II.2.4, that is, jointly with their practical application in the method, because of the clearly applied nature of this stage of the work.

### 6.4.5 Considerations for term extraction

From a theoretical<sup>30</sup> point of view, there are a series of aspects that must be widely considered when undertaking the term extraction process if accurate and adequate results are to be obtained.

The stage of term extraction deals with extracting from the corpus all the segments that can be considered to be terms belonging to the speciality field being dealt with.

Broadly speaking, in order to undertake this technical operation one must, according to Cabré (1993):

- locate the terms in the texts and delimit the segment representing them, and
- determine their relevance to the work.

Term extraction consists in selecting those segments of text belonging to the specialised area that, according to the topic and objectives posed, must be extracted from the corpus and subsequently included to form part of the work as the prototypical terminology of the subject area. However, as Cabré points (1993: 303) out:

No todos los términos que aparecen en los textos especializados de una disciplina deben figurar en la terminología que se quiere abordar. A veces, porque aunque aparezcan en un texto especializado, no pertenecen propiamente a la disciplina en cuestión, en otros casos, porque son propios del léxico general. La pertinencia de los términos no es una cuestión tan objetiva ni matemática como podría parecer de entrada. Los objetivos y los destinatarios de un trabajo son factores que pueden modificar la selección de las unidades terminológicas del trabajo en curso.

In this case, the extraction (understood as recognition/detection, delimitation and retrieval of these terms or candidates for terms) has been undertaken on the basis of a series of lists elaborated with the software concordance program *WordSmith Tools 4.0*. (*WST*).

Following Estopà (1999: 39, in Vargas, 2005: 651), the mechanisms for term extraction used by automatic term detectors or concordance programs are of three kinds:

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<sup>30</sup> See section I.2.5 for the applied aspects of this stage.

- A) mayoritariamente estadísticos: utilizan información estadística y, en consecuencia, independiente de la lengua, esto es, hacen uso de criterios de frecuencia y miden el grado de asociación entre las palabras de un término potencial;
- B) mayoritariamente lingüísticos: utilizan información lingüística y, por tanto, dependiente de una lengua, para determinar la probabilidad de que una palabra sea un término potencial;
- C) híbridos: combinan información diversa, como estadística, morfológica, sintáctica y semántica.

A key aspect in terminological extraction is the detection of not only single terms but also phraseological units or collocations. This issue, closely related to segmentation (see section I.6.4.5.1), can be easily illustrated throughout section II.2.5 of the method, but requires the theoretical consideration of certain factors like the Mutual Information score (MI). In layman's terms, the polylexical listings have been designed to detect the "strength" or the degree of mutual dependence of the words forming collocations, the ruling principle being that the word that appears more frequently with another word than in any other way or position within the corpus is viewed as being a significant combination and therefore deserves special consideration. These "mutually dependent" LUs can be said to "collocate". Thus, from all the parameters offered by Wordlist in these polylexical lists, I have focused on the MI score in order to detect the "strength of the bond" among collocates and thus the "strength" of collocations. Following the definition and explanation provided by the Wikipedia ([http://en.wikipedia.org/wiki/Mutual\\_information](http://en.wikipedia.org/wiki/Mutual_information)) on probability and information theory, the mutual information of two random variables is a quantity that measures, in bits, the independence of the two variables. However, more informally speaking, mutual information measures the information of X that is shared by Y. If X and Y are independent, then X contains no information about Y and vice versa, so their mutual information is zero. If X and Y are identical then all the information conveyed by X is shared with Y: knowing X reveals nothing new about Y and vice versa, and therefore the mutual information is the same as the information conveyed by X (or Y) alone. In a specific sense, mutual information quantifies the distance between the joint distribution of X and Y and the product of their marginal distributions.

### 6.4.5.1 Segmentation

Regarding the factors considered in term segmentation, Halliday's (2004) reflections on what is a word point out as being potentially difficult in some cases the decision as to where a word begins and ends, and even more deciding whether two forms are instances of the same word or not or whether variants like *take*, *takes*, *took*, *taking* or *taken* are different words or just a single word, in this case *take*, with many forms. In this respect, this same author explains that different decisions can be adopted depending on the dictionary, despite the fact that, most probably, there is no single right answer to these questions.

If the detection or extraction of a term as such is not at all easy due to the fact that a deep knowledge of the subject matter is necessary, the delimitation of the segment, statement or utterance representing a TU – especially in those cases in which it has a syntagmatic structure – is an especially complicated and delicate task.

In Cabré's (1993: 303-304) words:

Para formar nuevos términos, los especialistas (y también los lingüistas) recurren a menudo a procedimientos léxicos que permiten transcribir las unidades formales del lenguaje de la forma más transparente posible. La sintagmación es uno de los recursos más utilizados para crear nuevas unidades terminológicas transparentes<sup>31</sup>. Sin embargo, este tipo estructural, aunque representa uno de los recursos con mayores posibilidades de éxito en cuanto a la aceptación social inmediata del término, plantea dos grandes problemas al terminólogo: la dificultad de reconocer formalmente el término, y la de delimitar con exactitud el segmento que lo representa<sup>32</sup>.

As this author goes on to explain, when we face a terminological syntagma that corresponds to the description of the content of a term, it is certainly difficult to decide

<sup>31</sup> Un término puede presentar distintos grados de opacidad semántica, según los recursos formales y estructurales utilizados para construirlo. El primer grado está constituido por aquellas unidades que, si no son conocidas de antemano por el hablante, su significado no es deducible a partir de la forma (ácido, átomo, planta). En un segundo grado hallamos los términos formados por morfemas (radicales y derivativos), cuyo significado contribuye al significado del conjunto (almacenar, vaciado, pelapatatas). El tercer grado de opacidad está ocupado por unidades transparentes, como es el caso de los sintagmas descriptivos: bote salvavidas, reloj de pared, guía de teléfonos. (Cabré, 1993, 303-304)

<sup>32</sup> Comunicativamente, los sintagmas terminológicos excesivamente largos se suelen utilizar de forma abreviada en el discurso, y, a la larga, se suelen resolver fijando las formas reducidas respectivas como términos de uso corriente:

“Unidad central de proceso”: “unidad central”

“Hoja de cálculo electrónico”: “hoja de cálculo”

“Red de área local”: “red local” (Cabré, 1993: 304)

without any additional proof whether we are before a term or a combination of terms since, apparently, there is no observable difference between a free combination and a fixed structure.

That is why starting out from the analysis of a representative number of syntagmatic terms, practice has established a series of proofs whose application altogether helps (and has helped here) to determine whether an expression corresponds to a term, and even indicates where the denominative segment representing it starts and finishes. Although not all these proofs are equally productive, and although they are not relevant to the same degree either, certain proofs applied to a lexical combination indicate to the terminologist whether he/she is before a combination of terms or dealing with a single terminological unit. These proofs which were applied for the segmentation of dubious-to-delimit units in this study are, in Cabré's (1993, 304-305) words:

- El hecho de que un conjunto se organice léxicamente en torno a una base única: unidad central de proceso, contrato de trabajo en prácticas, etc.
- La imposibilidad de insertar otros elementos lingüísticos en el interior del sintagma terminológico: \*enfermedad muy mortal, \*angina grave de pecho, etc.
- El hecho de no poder complementar separadamente ninguna de las partes del conjunto: \*ataque de corazón enfermo
- El hecho de poder sustituir el conjunto por un sinónimo: coste de enlace /coste de conexión.
- El hecho de poseer un antónimo en la misma especialidad: lenguas vivas vs lenguas muertas.
- La frecuencia de aparición del mismo sintagma terminológico en los textos de una determinada especialidad.
- El hecho de que en otras lenguas el sintagma en cuestión sea una sola unidad lexemática: soporte lógico (ESP)-software (EN)
- El hecho de que el significado del conjunto no se deduzca del significado de los elementos que lo forman (cuando el significado de un sintagma no es igual a la suma de significados de sus partes, suele tratarse de un conjunto lexicalizado): pelota de partido (no se trata de una pelota como tal).
- Complementariamente, la presencia de determinadas unidades lingüísticas en el interior del sintagma revela que muy probablemente se trata de una combinación libre.

Consequently, what can be deduced from all the ideas mentioned in this respect is that recognising whether a segment corresponds or not to a terminological unit and the

delimitation of its “boundaries” are not easy-to-solve questions, especially due to the problems generated, above all, by phraseology or descriptive syntagmas.

#### **6.4.5.2 Quantitative techniques for term extraction in a corpus**

Although not all the statistical tests and quantitative techniques enumerated and explained here have been used for term extraction in this specific study, I have considered it positive to provide a brief analysis of the quantitative tools that linguists and terminologists may resort to nowadays in order to make the most of term extraction in a corpus. At the same time this also makes it possible to evaluate what would constitute a good term extraction system.

For this, before extracting a term it is necessary to know what a term is. According to ISO standard 1087 (1990), a term is *la designación de un concepto definido en un lenguaje especializado mediante una expresión lingüística*, the term being composed by a single word, two words or more.

Despite the benefits that automatic term extraction has brought with it, it is also true that there are two main “problems” that this kind of extraction has to face:

- Automatic extraction does not provide operational criteria
- World and domain knowledge are needed

In this section it can be observed how the best possible solution nowadays to solve this kind of problem posed by automatic extraction is to combine techniques and measures with the terminologist's observation and intuition. Such a combined approach leads to the semi-automatic term extraction process implemented in this study (and explained from the point of view of its application here in section II.2.5.1). That is why, as a final step for term extraction – and after segmentation issues have been considered from a theoretical point of view (see section I.6.4.5.1) – a series of additional quantitative techniques have also been observed in this study to determine the adequacy and accuracy of the term extraction process. The theoretical

explanation of these quantitative techniques has been set out in the paragraphs that follow.

The already mentioned Zipf's law, for example, refers to word distribution in a corpus and according to this law, if we order the words in a text from the commonest to the rarest, frequency decreases or diminishes exponentially. Zipf's law is represented by the formula  $f=k/r$ , in which  $f$  stands for the frequency of a word and  $r$  stands for its position in the rank (Ferrer, 2003). On consulting the Wikipedia (2007), we find that:

Originally, Zipf's law stated that, in a corpus of natural language utterances, the frequency of any word is roughly inversely proportional to its rank in the frequency table. So, the most frequent word will occur approximately twice as often as the second most frequent word, which occurs twice as often as the fourth most frequent word, etc. The term has come to be used to refer to any of a family of related power law probability distributions.

For example, in the Brown Corpus "the" is the most frequently-occurring word, and all by itself accounts for nearly 7% of all word occurrences (69971 out of slightly over 1 million). True to Zipf's Law, the second-place word "of" accounts for slightly over 3.5% of words (36411 occurrences), followed by "and" (28852). Only 135 vocabulary items are needed to account for half the Brown Corpus.

Confusion matrixes are also used to measure the predictions of a system. Hence, the comparison of the predictions of a system with the real classes results in four different groups:

- True positives (TP): terms which have been successfully recognised by the system.
- False negatives (FN): terms which the system does not recognise and consequently does not consider to be terms.
- False positives (FP): non-terms that are considered as terms by the system.
- True negatives (TN): non-terms which have been recognised as such, that is, as non-terms.

These four classes are highly useful when it comes to evaluating the results obtained after term extraction and can be easily and meaningfully grouped in what has been called a confusion matrix:

		Predicted class	
		Term	Non-term
Real class	Term	<b>TRUE POSITIVES (TP)</b>	<b>FALSE NEGATIVES (FN)</b>
	Non-term	<b>FALSE POSITIVES (FP)</b>	<b>TRUE NEGATIVES (TN)</b>

**Figure I.25:** Example of how to create a confusion matrix.

These nomenclatures are thus useful in order to group terms in a coherent manner and measure the quality of the term extraction process and the “good choice”/“error” rates through mathematic formulae. This is, of course, especially useful if we want to empirically prove the efficacy of a term extractor and, obviously, if we have the “correct answer” beforehand, so that we can check that the system presents more or less the same results.

The “good choice” rate is the percentage of examples that are well or successfully classified and is calculated with the formula:

$$\text{Good choice rate} = (\text{TP} + \text{TN}) / \text{N}$$

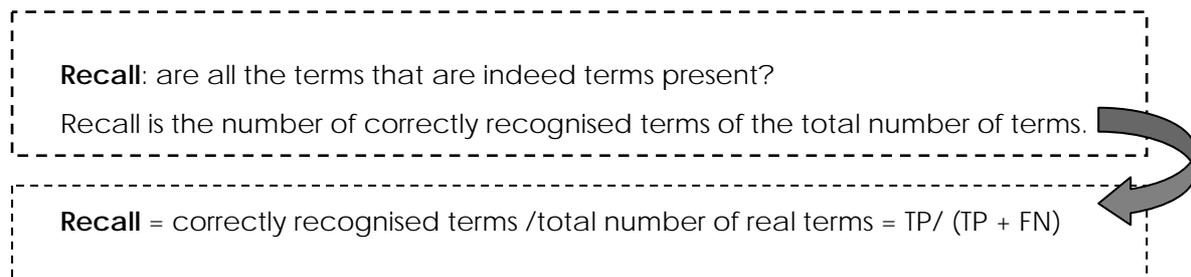
The error rate is the percentage of ill-classified examples and is calculated with the formula:

$$\text{Error rate} = (\text{FP} + \text{FN}) / \text{N}$$

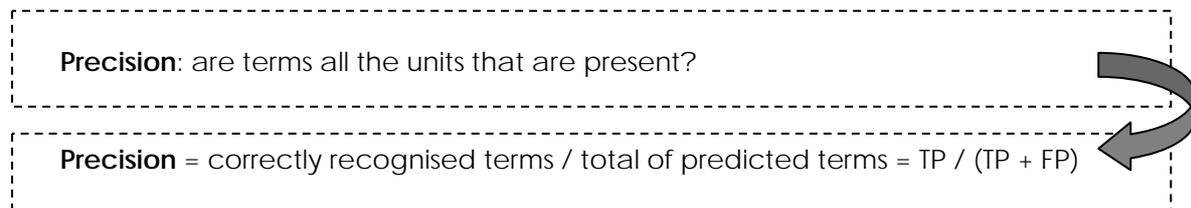
In both formulae:  $\text{N} = \text{TP} + \text{FN} + \text{FP} + \text{TN}$

The way to interpret the numeric result of such formulae is simple: if the resulting value is close to 1 the “good choice” rate is high. Obviously we can multiply the result by 100 in order to obtain a percentage – for instance, a term extractor may have a “good choice” rate of 89%.

There are two other very useful parameters that can be measured arithmetically by again resorting to formulae. These are *coverage* – which is commonly known as *recall* – and *precision*. Both parameters share an inverse relationship as is explained in figures I.26 and I.27:



**Figure I.26:** Representation of recall (coverage).



**Figure I.27:** Representation of precision.

There is also another measure that combines both recall (understood as coverage) and precision in a single formula, the F-measure:

$$F = (2 \times \text{recall} \times \text{precision}) / \text{recall} + \text{precision}$$

As has been already mentioned, recall and precision share, in general, an inverse relationship which can be summarised as follows:

If recall increases → precision diminishes

- More terms are recognised
- But “things” which are not terms are also recognised

If precision increases → recall diminishes

- False terms diminish
- Some proper terms are not recognised

Total recall (coverage) → no precision

- Every single “term” is recognised
- But also those which are not

There are two other measures: sensitivity and specificity.

Sensitivity is responsible for determining how many terms are recognised as such and, accordingly, it is another name for or another way to refer to recall (coverage):

$$\text{Sensitivity} = \text{terms correctly recognised} / \text{total of real terms} = TP / (TP + FN)$$

Specificity, however, introduces a new aspect to be calculated, i.e. the coverage or recall of non-terms. It aims at calculating how many non-terms have been classified as if they were terms:

$$\text{Specificity} = \text{correctly recognised “non-terms”} / \text{total of real “non-terms”} = TN / (TN + FP) = 1 - FP / (FP + TN)$$

Finally, two of the most common and widely used measures for evaluating the adequacy of a term extractor and, in general, for the extraction of terminology, are the parameters of “noise” and “silence”.

Noise refers to the number of false terms included among predicted terms. As happened with recall and precision, noise and silence also share an inverse relationship, since diminishing silence implies provoking more noise and

diminishing noise implies increasing silence. Noise and silence are calculated with the following formulae:

$$\text{Noise (= 1 - precision)} \rightarrow \text{noise} = \text{false terms} / \text{predicted terms} = \text{FP} / (\text{TP} + \text{FP})$$

$$\text{Silence (= 1 - recall)} \rightarrow \text{silence} = \text{no recognised terms} / \text{real terms} = \text{FN} / (\text{TP} + \text{FN})$$

Of all the measures and rates explained here, “noise” and “silence” are the ones that have received the greatest attention in this study.

#### **6.4.5.3 Theoretical considerations on collocations and concordance lines: Concord application in the method**

A correct and natural-sounding use of language has many implications and involves many factors that must be accurately and proficiently combined. As Pedersen (1995) states, paraphrases and non-conventional wording tend to make a text unnecessarily long and wordy. In addition, if we focus on specialised texts, their lack of appropriateness becomes even more acute given the precise and concise nature of this kind of texts and the economical wording they use as one of the most distinctive features of technical writing.

Among the different issues analysed throughout this doctoral thesis, the study of collocates giving way to collocations or polylexical terms and the concordance lines in which they are contained has been one of the mainstays of this work. As the CTT states, technical terms do not occur in isolation but in combination with other LUs and they must also be studied and presented in accordance with this fact in a technical or specialised dictionary. Conceiving and presenting LUs in another way would lead to an artificial view of language, whether specialised or not.

The term *collocation* was first introduced by Firth (1957: 14), and was defined as “actual words in habitual company”. As Pedersen (1995: 63) explains “by analysing the language used in poems, Firth (1957) demonstrated the expediency of operating

with several modes of meaning, one of them being meaning by collocation”. However, as Pedersen (1995) goes on to explain, over the years, Firth’s collocation theory underwent further development. Already in 1991, Sinclair (1991: 170) defined collocation as “the occurrence of two or more words within a short space of each other in a text [...] Collocations can be dramatic and interesting because unexpected, or they can be important in the lexical structure of the language because of being frequently repeated”. Following Alcaraz and Martínez Linares’ (1997: 117-118) definition of collocation:

En la tradición SEMÁNTICA inglesa (Halliday, 1973: 32) se emplea el término ‘colocación’ para aludir a la CONCURRENCIA, o tendencia que tienen nombres y verbos, y determinados nombres y adjetivos a “co-aparecer” en construcciones sintácticas, como ladrar y perro, relinchar y caballo, talar y árbol, etc. Estas estructuras forman conjuntos de palabras, que Halliday llamó CONJUNTOS LÉXICOS.

Other definitions of collocations, although coming from less academic sources, also concede that:

Within the area of corpus linguistics, collocation is defined as a pair of words (the node and the collocates) which co-occur more often than would be expected by chance, that is to say, a collocation can be defined as a sequence of two or more consecutive words that has characteristics of a syntactic and a semantic unit, and whose meaning cannot be derived compositionally, i.e. it cannot be derived directly from the meaning of its components. (Wikipedia, 2007)

In Manning and Schütze’s words (1999: 151) “a collocation is an expression consisting of two or more words that correspond to some conventional way of saying things”. Accordingly, the study of collocations and their correct usage in discourse, whatever the degree of specialisation of such discourse may be, constitutes the difference between comprehensible and natural-sounding language and language that is artificial and does not sound natural. Accordingly, technical dictionaries should help their users to form grammatically and lexically correct word combinations since an infelicitous combination may cause discordance and even irritate the receiver (Cop, 1988).

The object of our analysis of collocations in this terminographical study is clear if we consider the theory on which it has been based (CTT). But it is also important to know that collocations present many and varied applications apart from terminology

or lexicography, among which we find:

- Machine translation (multi-word translation pairs)
- Text simplification
- Word sense disambiguation (“one sense per collocation” principle)
- Parsing (symbolic, statistical)
- Information retrieval

Thanks to the concept of collocation, it is possible to determine empirically which pairs or groups of words can be said to have a substantial amount of “glue”<sup>33</sup> between them. Before going any further, however, it is interesting to notice Khellmer’s (1991) views in this respect, according to which our mental lexicon is made up not only of single words but also of larger phraseological units, both fixed and more variable – what has also been called “collocation” and even more consistently “polylexematic term” in this study. However, as McEnery and Wilson (1996) point out, it is not as easy as it may seem at first sight to distinguish which word groups are collocations and which are not: “it is not easy to determine which co-occurrences are significant collocations, especially if one is not a native speaker of a language or language variety”. Yet, a number of methods and formulae have been developed with this aim in mind. Subsequent sections offer an analysis of such approaches by explaining a series of formulae and processes that have helped to detect the “glue” of collocations in this study.

Nevertheless, apart from mathematical formulae, the study of collocations must necessarily be conducted in context, and thus the role played by concordances in terminological data retrieval is fundamental. According to Martínez de Sousa (1995: 65) a concordance is an “índice de palabras en su contexto, en el cual la palabra analizada figura en el centro de una línea rodeada a derecha e izquierda de otras con las que aparece en un contexto determinado”. Following this same author, in computerised lexicography concordances are fundamental for the analysis of language and this is why, although quantitative techniques definitively have been used in this

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<sup>33</sup> This “glue” can be measured, for instance, by means of the aforementioned Mutual Information Score (MI) (see section I.6.4.5)

study, the observation and the intuition of the terminographer when observing these concordance lines have played a fundamental role.

With this aim in mind, I decided to use Concord, the pure concordance application of WordSmith Tools. This tool generates concordance lines, also known as Key Word in Context (KWIC), both for a sequence or group of words (clusters) or for a word, a part of it, a phrase, and so on. A concordance is, according to another definition by Sinclair (1995), a collection of all the occurrences of a word-form, each in its own textual environment, that is to say, it is the list of all the occurrences of a given word in a corpus together with its contexts, and Concord highlights the search word in the centre, thus allowing rapid detection and analysis of its collocates or words that appear around it.

The point of a concordance is to be able to see lots of examples of a word or phrase, in their contexts. You get a much better idea of the use of a word by seeing lots of examples of it, and it's by seeing or hearing new words in context lots of times that you come to grasp the meaning of most of the words in your native language. It's by seeing the contexts that you get a better idea about how to use the new word yourself. A dictionary can tell you the meanings but it's not much good at showing you how to use the word (...). (Scott, 1998: 55)

One of the main (and final) goals of this project has been to avoid what Scott (1998) states in the last sentence from the quotation above. Since the role of context in the definition, characterisation and understanding of any word or term is playing an increasingly important role in current lexicographical/terminographical studies, Concord and all its complementary applications have facilitated a realistic approach to the pragmatic aspects involved in this research. This tool has made it possible to identify the linguistic patterns that most frequently appear in the corpus and which, as such, determine and characterise the phraseology of the speciality field of industrial ceramics. Basically, what Concord does through its application Concordance is to produce the concordances of terms, that is to say, lists of a given term called a search word (or key word or node) together with its surrounding text or co-text. The most common concordance is the aforementioned *Key Word in Context* (KWIC), presented in the form of KWIC lists that gather every appearance of a search word or node (highlighted in the middle) and allow the terminographer to detect and analyse its collocates or words that appear in their textual environments with a significant

frequency. The analysis of these recurrent linguistic patterns reflects the behaviour of the speciality language under analysis in a given context.

#### **6.4.6 Considerations for data processing**

As is explained in detail – and from the applied point of view – for the specific case of this study in section II.2.6, in databases the traditional concept of a terminological card on which to store all the data about the terms extracted is usually called a register, and this is a fundamental concept in the data processing stage of any kind of terminological work:

Una ficha terminologica es una pauta estructurada que permite consignar de forma ordenada las informaciones sobre cada término que serán necesarias para llevar a cabo el trabajo. La ficha terminológica se elabora a partir de las informaciones que contienen las distintas fases de vaciado sobre un mismo término. (Cabré, 1993: 308)

A terminological card can be designed or produced on paper – thus constituting a manual index card – or with a computerised medium using terminotic tools and thus creating an automatic index card or database, which is the most advisable. The latter offers a series of search and information retrieval facilities which are clearly superior to manual ones and which facilitate enormously the treatment and organisation of information along the different stages of the work.

Terminological cards may follow different designs depending on the particular features of each kind of work, but, generally speaking, there are a series of basic data or information which are usually present in every case (Cabré, 1993):

- i. The entry
- ii. The reference of the term
- iii. The grammatical category of the term
- iv. The thematic area to which the term belongs
- v. The definition or context
- vi. The equivalents in other languages (if it is a plurilingual work)
- vii. The remissions or cross references

- viii. The management data of the terminological index card: author of the card, elaboration date, etc.
- ix. Different notes
  - x. The weighting mark or the reliability code of the term or the card

It is important, however, to bear in mind that each piece of information must be represented on the terminological card following a series of normalised, systematic and coherent conventions without which it would be very difficult to retrieve and interchange information afterwards. Normally, the document containing the instructions on how to fill in a card is called the protocol of use or writing guide (*guía de redacción*), which is crucial because only by respecting the instructions can a certain degree of systematicity and internal coherence be guaranteed in the elaboration of the work. To complement this information, see section II.2.6.2 for the applied aspects of this stage in the method of work, and figure II.10 for an example of a standard terminological card).

#### **6.4.7 Considerations for revision and normalisation and for edition**

Finally, as happened with the considerations for documentary corpus management in section I.6.4.4, the general-theoretical considerations concerning, on the one hand, revision and normalisation and, on the other, edition, have been covered in sections II.2.7 and II.2.8 respectively, that is, jointly or in an integrated way with their practical application in the method in order to avoid repetition and because of the clearly applied nature of these stages of the work.

*Language is only in part an individual instrument. It is in the main a community instrument used for community purposes. As such it tends to launch out on a career of its own, to which individuals contribute very much as the coral insect contributes to the growth of a coral reef or island.*

L.S. Amery

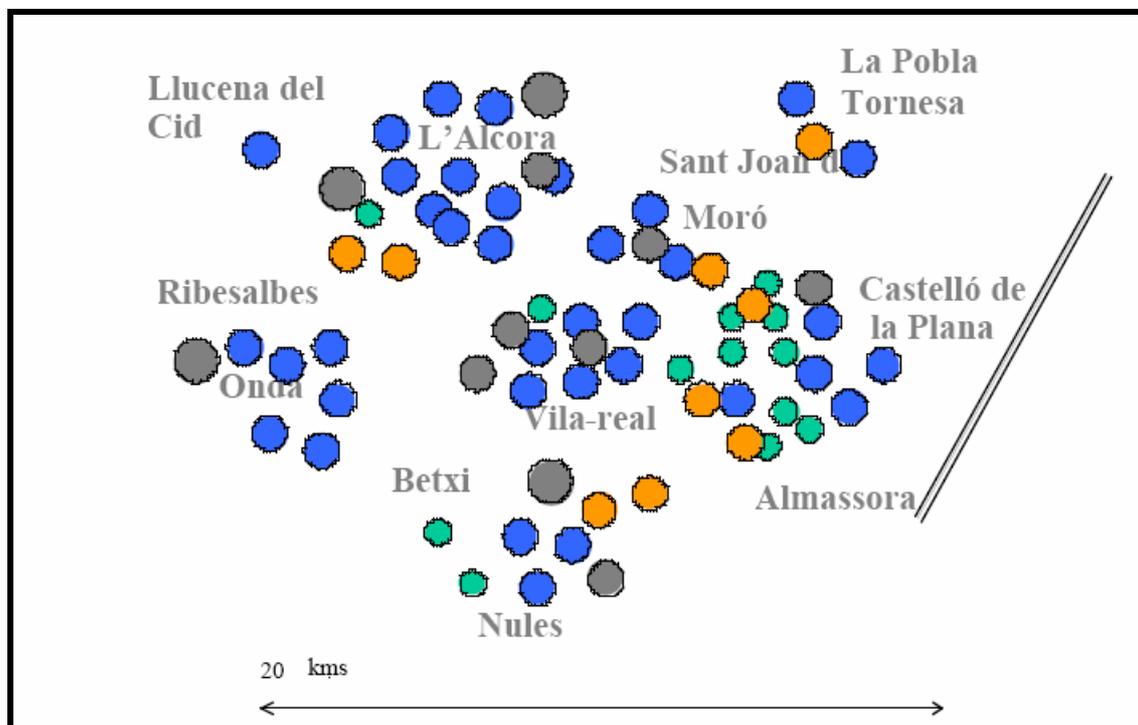
## **7. SOCIO-ECONOMIC CONTEXT FOR THE RESEARCH**

### **7.1 An economic overview of the ceramic industrial district**

The concept of “industrial district”, originally developed by A. Marshall (1925), is traditionally defined as a “socio-economic entity which is characterised by the active presence of both a community of people and a population of firms in one naturally and historically bounded area” (Becattini, 1990: 39). The concept of industrial district has also reinforced its position thanks to the success observed in economic activities that are geographically concentrated (Foss and Eriksen, 1995). In broad terms, these views have been the grounding principle for considering that it is preferable, at least throughout this study, to adopt the term “industrial district” to refer to the socio-economic reality of the tile industry in Spain than that of the more widely used denomination of “industrial sector”. In Molina Morales’ (2005: 74) words, “territorial agglomerations of firms, such as the industrial district, can be identified as dense strong-tie networks and are thus suitable for exploiting activities.” This organisational structure fits into the traditional perspective of social capital (Coleman, 1990), which stressed the positive effect of the cohesive structure of networks on the production of social norms and sanctions that facilitate trust and cooperative exchanges, something also closely related to the concept of discourse community analysed in section I.7.2.

The role played by the ceramic tile industry in the Valencian Region, and especially in the province of Castellón, is so significant for the economy of the region that the figures speak for themselves: in an area of 800 km<sup>2</sup> (district boundaries are within a 20km radius of the town of Castellón de la Plana), 90% of the Spanish ceramic industry is concentrated in Castellón. In the industrial area that is limited to the north by Alcora, to the south by Nules, to the west by Onda and to the east by

Castellón de la Plana, one may find 80% of the Spanish companies working in this district, which results in more than 265 companies devoted to this industrial field. These 265 companies are called “final firms”, that is to say, they undertake the last phase of the ceramic process and obtain the final ceramic product. However, altogether there are about 700 firms in the province related in one way or another to the ceramic tile industry; in addition to “final firms”, there are also glaze and frit firms, machinery, special pieces and atomised clay firms. These figures therefore show the high concentration and importance of the ceramics industry and ceramic-related activities in the province of Castellón. This situation is illustrated in figure I.28, representing both final firms and the aforementioned related companies in the region.



**Figure I.28:** Map of the ceramic industrial district in the province of Castellón (Molina-Morales, 2002).

The ceramic industry in Spain represents millions of euros in investments, production and profits both in national and international markets. Around 80% of this production is generated and concentrated in the province of Castellón. The reasons that make Castellón the most important industrial area in terms of the ceramic industry are manifold. First of all, it must be pointed out that Castellón is a region that is limited to the east by the Mediterranean Sea. This proximity to the sea constitutes a great competitive advantage because transport is one of the most important strategic

elements for this industry given the fact that more than 50% of the total production is exported. Although 40% of the distribution is done by sea and the rest by plane or by road, the costs of the former are notably lower, and this increases competitiveness. These reasons support the claim made by the ASCER, an institution which, in an attempt to guarantee the competitiveness of the industry, strives to improve both the infrastructures of the commercial ports and railway connections in Castellón and Valencia and the accesses to the province. In addition to this, the industrial area devoted to the ceramic industry in Castellón can be said to constitute a dense and strong network, thus reinforcing its “district values”. This network is characterised by redundant and frequent relationships, and common values and norms which give rise to competitive leverage, high quality information and tacit knowledge transmission, all of which is translated into an exploiting advantage for firms. The main industry of the province of Castellón is, thus, the ceramic one, along with furniture and chemical industries, tourism and agriculture.

At the beginning of June 2002, Nágér (2002) highlighted that more than 100 firms work at an international level. In this way, both the firms that produce ceramic floor and wall tiles and the ones producing glazes, frits and ceramic colours are the companies that are most widely and firmly established abroad with subsidiaries, warehouses, warehouse centres and shops. In the same way, some firms in Castellón obtain investments from large multinationals. The data published by the *Instituto Valenciano de la Exportación* (IVEX) on its web site reflect how the province of Castellón represented 22% of the foreign sales of the Valencian Region in 2001-2002. More specific data offered by the *Cámara de Comercio de Castellón* in 2001 show how, in that year, the ceramic district (ceramic floor and wall tiles companies mainly) was the leading source of export activities in the economy of Castellón (51.72% of the total).

According to the data provided by ASCER and as shown in figures I.29 and I.30, the Spanish ceramic industry is very productive, although it has undergone some uncertainty in recent years due to the increasing competition mainly from Asian countries. This decreasing but not alarming trend started, as can be seen in figures I.29 and I.30, in 2002-2003, but in 2004, 2005, 2006 (and 2007, although the data have not yet been officially published by ASCER) it seems to be slowly changing towards

increasingly positive figures again and recovering – although with greater difficulty than desired – its former tendency towards growth (see figure I.31).

Production and sales of the ceramic tile industry in 2001 and 2002		
	2000	2001
Production	621	638
Sales national market	1428.9	1484.6
Exports	1872.1	1987.8
Total sales	3301.0	3472.4
Sales in millions of EUR and production in millions m <sup>2</sup>		

**Figure I.29:** Basic economic data of the Spanish ceramic tile industry in the period between 2000 and 2001 (ASCER, 2005).

Production and sales of the ceramic tile industry (2002-2006)					
	2002	2003	2004	2005	2006
Production	605.7	583.4	595.5	609.2	608.4
Domestic sales	1361	1379	1500	1609	1802
Exports	2059	1939	1977	2041	2183
Total sales	3420	3318	3477	3650	3985

Sales in million EUR and production in million m<sup>2</sup>

**Figure I.30:** Basic economic data of the Spanish ceramic tile industry in the period between 2002 and 2006 (ASCER, 2007).

The Spanish ceramic sector in 2006	
<b>Production</b>	<b>Exports</b>
<ul style="list-style-type: none"> <li>· 608.4 million m<sup>2</sup></li> <li>· Quota of the EU-27: 38.5%</li> </ul>	<ul style="list-style-type: none"> <li>· To 181 countries</li> <li>· 2183 million euros</li> <li>· Quota of world trade: 19%</li> </ul>
<b>Employment</b>	<b>Total sales</b>
<ul style="list-style-type: none"> <li>· 26 400 direct and over 7000 indirect jobs</li> </ul>	<ul style="list-style-type: none"> <li>· Estimated: 3985 million euros</li> </ul>

**Figure I.31:** Employment and total sales of the Spanish ceramic district in 2006 (ASCER, 2006).

The exports of the district in 2006, for instance, came to 2,183 million euros, a promising figure even though the competition coming from Asian and South American countries is fierce and constitutes an important problem that must be dealt with.

However, if even more recent reports (from year 2007) on the production and sales of the Spanish ceramic district are consulted, the situation seems to be under control and figures, together with expectations, are encouraging:

Las ventas totales de la industria cerámica española durante el ejercicio 2007 se elevaron a 4.120 millones de euros, lo que representó un crecimiento del 3,5 por ciento en relación al año anterior, según explicó hoy el presidente de ASCER, Fernando Diago, durante la presentación del balance anual de este sector. La evolución de la industria española de azulejos y pavimentos cerámicos ha sido positiva. Las ventas totales, dentro y fuera de España, han llegado a la cifra de 4.120 millones de Euros, cifra que representa un crecimiento del 3,5% en relación al anterior ejercicio 2006. (Urbanoticias.com, 2008)

Nevertheless, it cannot be forgotten that, nowadays, the ceramic sector is experiencing impressive growth all over the world. Many countries, some of which are still not fully developed, have become new producers constituting a serious menace to European production. Although Europe is still the main ceramic-producing area, it is losing the battle against Asian countries in terms of amounts produced. However, even if we agree with the experts that it will be difficult for the Spanish ceramic industry to maintain the impressive rate of growth obtained over the last few years, an important growth is still foreseen due to the tendency towards technological innovation, both in processes (from the single to the double firing process<sup>34</sup>) and products (porcelain stoneware, larger sizes, more variety, greater resistance, and so forth). In addition to this, the quality of the Spanish and Italian products is, generally, higher than that of the emerging countries, although the competition is becoming increasingly harder because these producers from developing countries are acquiring the new technologies offered, paradoxically, by Italian manufacturers and the products and designs offered by manufacturers of glazes and colours.

Thus, one of the main challenges of the district is to increase internationalisation, both in production and commercialisation. This fierce competition and struggle to maintain the leadership of the district is forcing countries like Spain to enhance its competitiveness by fostering all the areas involved in the production and commercialisation of the ceramic industry products. The international ceramic fair

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<sup>34</sup> See appendix VI.3 showing diagrams of basic processes in industrial ceramics.

CEVISAMA, a yearly event that takes place in Valencia and which attracts thousands of people involved in the ceramic industry and particularly prospective clients, is a good example of the initiatives that the Spanish ceramic tile district undertakes in order to enhance its potential, become aware of the latest advances and trends in the sector, advertise its products and, what seems even more significant to me, open up new markets and consolidate those that are already established. CEVISAMA 2005, for instance, increased the number of visitors, of firms exhibiting their products, and the metres devoted to the exhibition, which is a clear sign of the importance assigned to the worldwide diffusion of the novelties in the district and a successful attempt to establish commercial relations between professionals and their companies. The number of display stands in the fair held in 2005 was 1,124, apart from more than 86,000 net square metres of exhibition space and over 140 foreign firms also exhibiting their products. Just to refer to data of another nature, in the fair held in 2004, CEVISAMA received a total of 86,566 visitors and the number of foreign prospective buyers/visitors exceeded 10,000.

What can be deduced from this data is that the importance of the district in Spain and especially in the Valencian Region is undeniable, that this industry generates huge amounts of profits and mobilises people from all over the world. It is also clear that the tendency is to continue to grow and to extend internationalisation in spite of the difficulties. This expectation of progressively reaching more international markets is reflected in the specific objective of placing the generic brand name “Azulejos de España” (“*Tile of Spain*”) in other markets with the aim of achieving the recognition of the Spanish product among importers and distributors. ASCER and ICEX (Instituto Español de Comercio Exterior – Spanish Institute of Foreign Trade) are working hard in this respect and that is the main reason why the number of professionals from foreign countries invited to CEVISAMA increases every year. In the same trend, according to the news provided by the newspaper *El Mundo/Castellón al día*, the current data and the expected figures for the immediate future of the district are positive for the Spanish ceramic industry:

El azulejo se muestra optimista ante el futuro por el anuncio de la patronal del incremento del 2% en las exportaciones en 2004 y la elevada participación que registró el certamen (CEVISAMA 2005) en su segunda jornada. Las ventas nacionales también aumentan.

(...)

Desde el sector cerámico provincial aseguran que, ante el incesante goteo de profesionales que está registrando el certamen, se cumplirán las previsiones que sitúan la cifra de negocio que genere CEVISAMA 2005 en 600 millones de euros. (*El Mundo/Castellón al día: Especial Cevisama* (10<sup>th</sup> February 2005))

However, the Spanish ceramic industry has to innovate and raise its level of competitiveness because the situation does not offer any security and is being seriously threatened, especially by China. As has been already mentioned, the main potential of the Spanish ceramic industry to maintain its profitable situation is to reinforce and strengthen internationalisation, while China supplies its own needs – a situation that will not last forever:

China es otro de los países que están presionando a la industria azulejera de la provincia de Castellón con sus bajos precios. El crecimiento del gigante asiático se mantiene en unos índices anuales superiores al 6 por ciento, un porcentaje que confirma el liderazgo chino. Pese a todo, la clasificación en las exportaciones continúa estando liderada por Italia y España, debido a que el 90 por ciento de los más de 2.000 millones de metros cuadrados de azulejos que se fabrican en China se destina, todavía al consumo interno. (*El Mundo/Castellón al día: Especial Cevisama* (10<sup>th</sup> February 2005))

All these data and this overview of the situation that the industrial ceramic district is going through can give us a hint to the importance of being as competitive and efficient as possible in every single aspect or process involved in the ceramic industrial activity. As mentioned before, the importance of a good, solid distribution net all over the world that allows good sales results to be obtained is undeniable. Especially at this point, once the production chain is closed and the product must be distributed and sold, a convincing and well-constructed sales discourse and marketing strategy on the part of the people in charge of commercialising the product becomes fundamental. A perfect and accurate knowledge of the terms involved in a specific area such as ceramics, both in Spanish (mainly because of the importance of this district in Spain and more specifically in this region where a dense and strong network is established) and in English (basically because of the importance of English as a *Lingua Franca* world-wide, as dealt with in section I.7.4), will make the dictionary on ceramics terminology a tool that meets and fits the terminological needs of this ceramic industry and its professionals.

## 7.2 The discourse community of the ceramic tile industry and its representation in digital genres or cybergenres

A high percentage of the total presence of the ceramic tile industry in Spain is concentrated in Castellón, thus establishing in this industrial area a dense and strong network. This network is characterised by redundant and frequent relationships and common values and norms which originate competitive leverage, high quality information and tacit knowledge transmission, which is translated into a “competitive advantage” for firms and into the creation of a community with common values and objectives that, in spite of variety and competition, shares a series of common features and interests.

I have taken for granted so far that the ceramic industrial community is just that – a community – and more specifically a linguistic or discourse community which communicates and is represented through a series of genres that characterise it and which, like every community, evolves and adapts to its new necessities. In general, communities take advantage of the wide range of possibilities the new technologies are opening up in every field, and this is also true from the point of view of genre.

Use of the term ‘discourse community’ testifies to the increasingly common assumption that discourse operates within conventions defined by communities, be they academic disciplines or social groups [...] use the notion of ‘discourse communities’ to signify a cluster of ideas: that language use in a group is a form of social behaviour, that discourse is a means of maintaining and extending the group’s knowledge and of initiating new members into the group, and that discourse is epistemic or constitutive of the group’s knowledge. (Hezberg, 1986: 1 in Swales 1990: 21)

In Agre’s (1997) view, a “community” is a set of people who occupy analogous locations in social or institutional structures. Locations correspond, according to Agre, to relatively stable universes of structural relationships. According to this view, everyone belongs in one sense or another, to many different communities, which can be defined in broader or narrower terms. Community members have certain interests in common as well as certain interests that diverge and which can therefore conflict. However, these sharing and conflicting interests are “objective” inasmuch that they are imposed by the institutions.

In the specific case of the Spanish ceramic industrial community what seems clear is that, in broad terms, all the industries forming part of this community share a common objective, i.e. that of maximising profits/sales and minimising losses. Likewise, the Spanish ceramic industry shares a common will to survive the competition from foreign countries. However, there is also an internal conflict inside the community itself: each firm, within its assumed limitations and possibilities, wants to be better and to obtain more profits than the other companies. Thus, there is a solidarity-rivalry sense of community imposed by the very demands and nature of the community.

Communication is frequent among the members of a community. Following Agre (1997) again, although a community might have a stronger or weaker sense of itself as such, most communities have a certain degree of collective cognition. In the specific case of the ceramic industrial community, through interactions, the different industries learn from each other's experiences, set out common strategies against competitors, build up a shared vocabulary (specialised terminology on the discipline) and develop a distinctive way of thinking and acting – what could be called “the politics of the firm”.

These communities present a series of features that make them so. In Swales' (1990) view, the conceptualisation of discourse communities can be summarised in the identification of six defining characteristics which will be necessary and sufficient to identify a group of individuals as a discourse community:

1) “A discourse community has a broadly agreed set of common public goals” (Swales, 1990: 24-25).

In the case of the ceramic industrial community these public goals are rather tacit, because as in any industrial, business-related activity the objectives are, in general terms: to become leaders in the sector; to maximise profits and minimise losses; to compete as effectively as possible in the market; to gain leadership with regard to infrastructures and technology; and to stand at the forefront of innovation. Obviously, however, the ceramic industrial community as such is made up of individual industries which, broadly speaking, share common objectives like those we have just mentioned, but which, after all is said and done, also have to compete amongst themselves.

2) “A discourse community has mechanisms of intercommunication among its members” (Swales, 1990: 25).

These mechanisms vary from one community to another, but in the specific case of the ceramic industrial community include international fairs (Cevisama, Cersaie, and so on), journals and periodicals (*Tile and Brick International*, *Ziegelindustrie International*, *Técnica Cerámica*, *Ceramica Informazine*, *Industrial Ceramics*, *Boletín de la Sociedad Española de Cerámica y Vidrio*, etc.), conversations, e-mails, faxes, correspondence, and so forth.

3) “A discourse community uses its participatory mechanisms primarily to provide information and feedback” (Swales, 1990: 26).

According to Swales (1990: 26) “membership implies uptake of the informational opportunities”, which in a way is the result of having mechanisms of intercommunication, and “the secondary purposes of the information exchange will vary according to the common goals” that I have mentioned earlier.

In the ceramic industrial community, ASCER would be the prototypical example of a participatory mechanism together with the use of related websites to find out about other companies’ philosophies, products, innovations, trends, techniques, procedures, weaknesses, etc. Informational opportunities can be used to take advantage of competitors’ weaknesses, simply for informational purposes or even to satisfy the curiosity of other members of the community.

4) “A discourse community utilises and hence possesses one or more genres in the communicative furtherance of its aims” (Swales, 1990: 26).

Starting out from the fact that “genres are how things get done, when language is used to accomplish them” (Martin, 1985: 250 in Swales, 1990: 26) these discursal expectations are created by the *genres* that articulate the operations of the discourse community (Swales, 1990: 26). Each kind of discourse community favours certain genres more than others because its goals are better accomplished through them and the community as such is better represented by them.

In the specific case of the ceramic industrial community, what seems clear is that new digital genres such as websites fit perfectly well into the “philosophy” of the community because they allow firms to achieve rapid communication, greater visual

potential, a wider reach or scope, and increased advertising (see figure I.34 for a typology).

5) “In addition to owning genres, a discourse community has acquired some specific lexis” (Swales, 1990: 26-27).

The use of highly technical vocabulary is a clear feature of this industrial field – and a crucial one provided the field of work of this thesis. The specialisation represented by the ceramic industry as a professional and academic field of knowledge or discipline is also coherently expressed by its terminology. Community membership is strongly determined by the efficient communication exchange between its members or experts and proper communication within a community involves using the vocabulary specific to that community.

6) “A discourse community has a threshold level of members with a suitable degree of relevant content and discursal expertise” (Swales, 1990: 27).

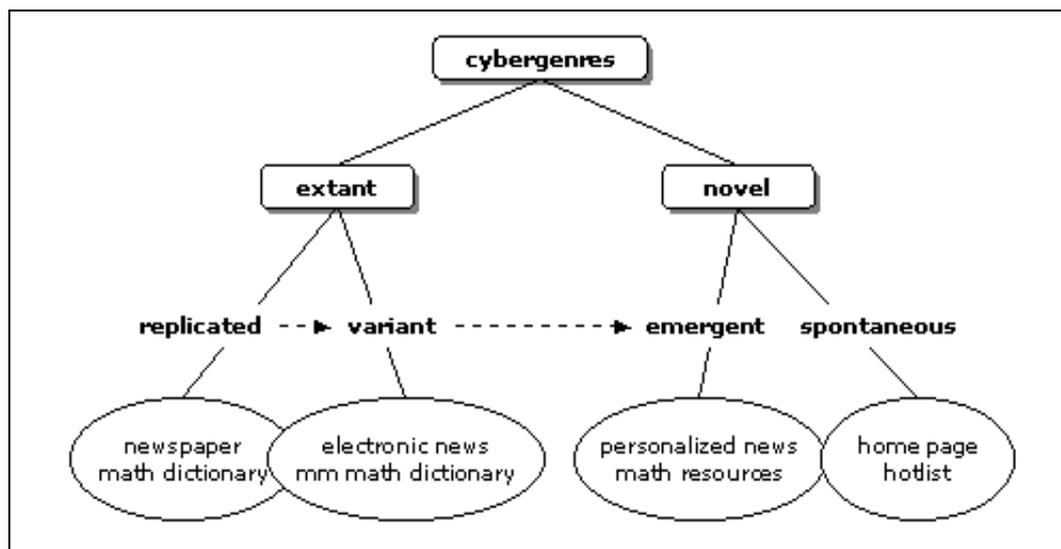
Discourse communities have changing memberships; individuals enter as apprentices and leave by death or in other less involuntary ways. However, survival of the community depends on a reasonable ratio between novices and experts (Swales, 1990: 27).

Usually, the member belonging to a community like the one under analysis has a degree of expertise on the subject (procedures, materials, transformation, final product, etc.) that the layman does not possess.

To elaborate on this, this discourse community, which interacts through genres, can nowadays rely on both traditional and new digital genres – especially the “broad” and rather blurred cybergenre of websites. According to Agre (1997), genres in general are relatively stable, expectable forms of communication which are addressed to particular communities and fit into particular activities in the lives of that community’s members. Obviously, a genre might be addressed to several different purposes simultaneously, or even to several different communities. In the specific case of the ceramic industrial community, with the evolution of the traditional concept of genre into that of cybergenre or digital genre, what seems clear is that a website will probably not mean the same thing to each of the people using it. For a person who belongs to the community, it can be a helpful tool to get an idea about the novelties and

products offered by other companies, for prospective consumers it can be a guide that helps them to decide whether to purchase some products from the company or not, for a terminographer it can be a helpful tool in order to observe how PAL and, more specifically, terms work in context, and so forth.

The concept of genre has therefore adapted to the new technologies by developing into new concepts such as that of the digital genre or cybergenre, which is defined by Watters and Shepherd (1997: 54) as follows: “Digital genres extend the concept of a literary or rhetorical genre by incorporating the notions of user interactions and processing”. Shepherd and Watters (1998) coined the term *cybergenre* to denote the new digital genres I have mentioned in earlier paragraphs and divided them into two subgenres: extant and novel (see figure I.32).



**Figure I.32:** The evolution of cybergenres (according to Shepherd and Watters, 1998).

1. *Extant* subgenres are based on already existing genres which can be found in other media, such as newspapers and video, and that have been recast in a digital form. When an already existing genre (in its most traditional sense) migrates to a computer environment, it will initially be faithfully *replicated*, without taking full advantage of the capabilities of the new medium. Content and form are preserved. Typical examples are digitised documents such as PDF documents. At

a later stage in the evolution, *variant* genres are created – a process originated and driven by the technical capabilities of the new medium. The basic feature of these variant cybergenres and the way they are created is the addition of multimedia features and interactivity. The evolution from newspapers to digital or electronic news is an example of this variant, which has been created to fit in with the new medium.

2. *Novel* subgenres are wholly dependent on the new medium and were created because the technical capabilities of digital media made it possible to do so. They may originate from extant genres through replication and variants (*emergent cybergenres*), e.g. providing news through agents and personalised interfaces, or they may not have any counterpart in other media (*spontaneous cybergenres*) as occurs with hotlists and FAQ.

According to Shepherd and Watters' (1998) dynamic classification of cybergenres, websites in the ceramic industrial community can constitute what these authors call "extant replicated cybergenres" (those webs that are exact reproductions of traditional genres such as their own leaflets) and more frequently "extant variant cybergenres", because websites are not usually exact replicas of leaflets or other traditional genres since, among other differentiating features, they contain links, versions in different languages, more visual aids, "interactivity", and so forth. This is quite closely related to Yates and Orlikowski's (1992, 1994) views, according to which communications in a new media, such as the World-Wide Web, will show both reproduction or adaptation of existing communicative genres as well as the emergence of new genres. Following these authors, many genres are being or have already been adapted to take advantage of the linking and interactivity of the medium and the ceramic industrial community has been no exception. That is why the websites of this industry are mainly "extant variant cybergenres".

Therefore, in the specific case of how the ceramic industrial community is represented by its genres, it can be said that many of them are being reproduced or adapted to the new media at the same time as there are examples of *spontaneous* cybergenres, such as home pages. Although they are not specifically characteristic of

this community, these home pages can also be considered a new genre which members of the community use in order to be known by other members, thus gaining the opportunity to interact, to provide feedback and to keep in contact.

When designing genres for new media, the slogan or motto for the designer should be: "do more". The main advantage that the new digital genres generally offer with respect to traditional genres (and this is especially so in the specific case of the ceramic industrial community) is the possibility to pick a community, explore how existing genres fit into existing activities and relationships, and then consider how a new genre might "do more" for the people than the ones they already use. The new genre might, for example, be designed to ease certain functions (like searching or sorting or comparing).

The study of genre in professional (and disciplinary) communication reflects or provides important information about how discourse communities are organised and about their textual dynamics. When Berkenkotter and Huckin (1995) refer to genre knowledge in disciplinary or professional cultures, as is the case with the ceramic industrial community, they are referring to the knowledge that professionals need to communicate within their communities. Given the fact that the genre repertoire is both a product and a shaper of the communicative practices of a community (Orlikowski and Yates, 1994) it seems logical that new digital genres are created according to the demands of the community, that is to say, that genres fit into the type of communication that is expected. Therefore, genre has implications for website design. Designers may want to draw on accepted genres where appropriate and should be aware of the user's expectations of a genre. Although they should feel free to reject old forms that do not fit in with the new technology, they must be aware that new genres are often misunderstood or rejected (Crowston and Williams, 1999). The effect of genre on user expectations is also confirmed by Dillon and Gushrowski (2000), who, after examining more than 100 personal homepages, asked subjects to select those elements that they thought should be included in any good personal home page. Results largely agreed on what a home page should contain.

In the specific case of the ceramic industrial community, a wide range of genres are used by its members. Many of these most commonly used genres can be considered to be what I have called traditional genres, which include leaflets from the different

industries, commercial letters, textbooks on the topic, catalogues, journals and periodicals, UNE and EN norms, and so on.

However, the introduction of new technologies is also affecting the concept of genre in this discourse community and has led to the appearance and use of digital genres or cybergenres. Among these digital genres, the most outstanding and widely used is the website because it allows a wide variety of other genres to be included within itself. What seems obvious is that the ceramic industrial community has evolved with the times and it is therefore also using the resources that the Internet has to offer in terms of genre. This evolution is translated into the adoption of digital genres that, in a way, reproduce the traditional ones usually employed by this community, each of them displaying a different degree of evolution within Shepherd and Watter's (1998) aforementioned classification.

The presence of the ceramic industrial community on the Internet is a fact, and mainly takes the form of websites which open up a range of possibilities that are more restricted in traditional genres. Hence, the most representative, profitable and widely-used digital genre within the ceramic community is the website, understood as a "genre of genres", meaning that it includes a wide number of other genres that shape the communicative practices of this community. Crowston and Williams (1997) were among the first to realise the importance of the genre concept for analysing communication on the Internet – an unavoidable condition for the creation and shaping of the term cybergenre. They noted that the Web was an excellent place to study the development of genres, because of its easy access and its inherent capabilities of experimentation, freedom of structuring, and interactions among many communities. They documented the range of genres in use on the Web by sampling and classifying 1,000 randomly selected websites. Distinction was based on purpose, rather than on physical form. They identified 48 different genres (figure I.33).

Archive item	Filmography	Problem set
Article	Genealogy	Product information
Book	Government program description	Product reviews
Box score	Guide	Publication list
Chronicle	Home page	Ratings
Column	Hot list	Regulation or rule
Computer documentation	Index	Report
Concert review	Library acquisition list	Script
Demographic data	List of research projects	Server statistics
Directory	Meeting minutes	Source code
Discography	Memorial	Submission instruction
E-mail directory listing	Newsletter	Table of contents
Essay	News wire article	Testimonial
Faculty information	Order form	Univ. course listing
FAQ	Pamphlet	Users' manual
File directory listing	Political party platform	Vitae

**Figure I.33:** Web genres ( $n = 48$ ) or cybergenres identified by Crowston and Williams (1997); sample size: 1000.

From these digital genres the ones most frequently used by the industrial ceramic community are those indicated in figure I.34.

Product reviews	Description and evaluation of products to advise potential purchasers
Product information	A description of the features and/or benefits of a product, written by manufacturer for potential purchasers
Order form	A form for recording information needed to order some product
E-mail directory	A list of e-mail messages
FAQ	Edited collection of questions and answers on some topic; often labelled as such
Users' manual	Instructions on the use of a product
Hotlist	A list of Websites not controlled by the list's author, often organised by topic
Home page	A presentation of personal information, often with links to other information or a hotlist
Report	A formal statement of the results of an investigation or of any matter on which definite information is required, made by some person or body instructed or required to do so (OED)
Article	A literary composition forming materially part of a journal, magazine, encyclopædia, or other collection, but treating a specific topic distinctly and independently (OED)
Ratings	Numeric evaluations of products or services
Regulation or rule	A rule prescribed for the management of some matter, or for the regulating of conduct; a governing precept or direction; a standing rule (OED)

**Figure I.34:** Main genres used by the ceramic industry discourse community, following Crowston and Williams' classification (1997).

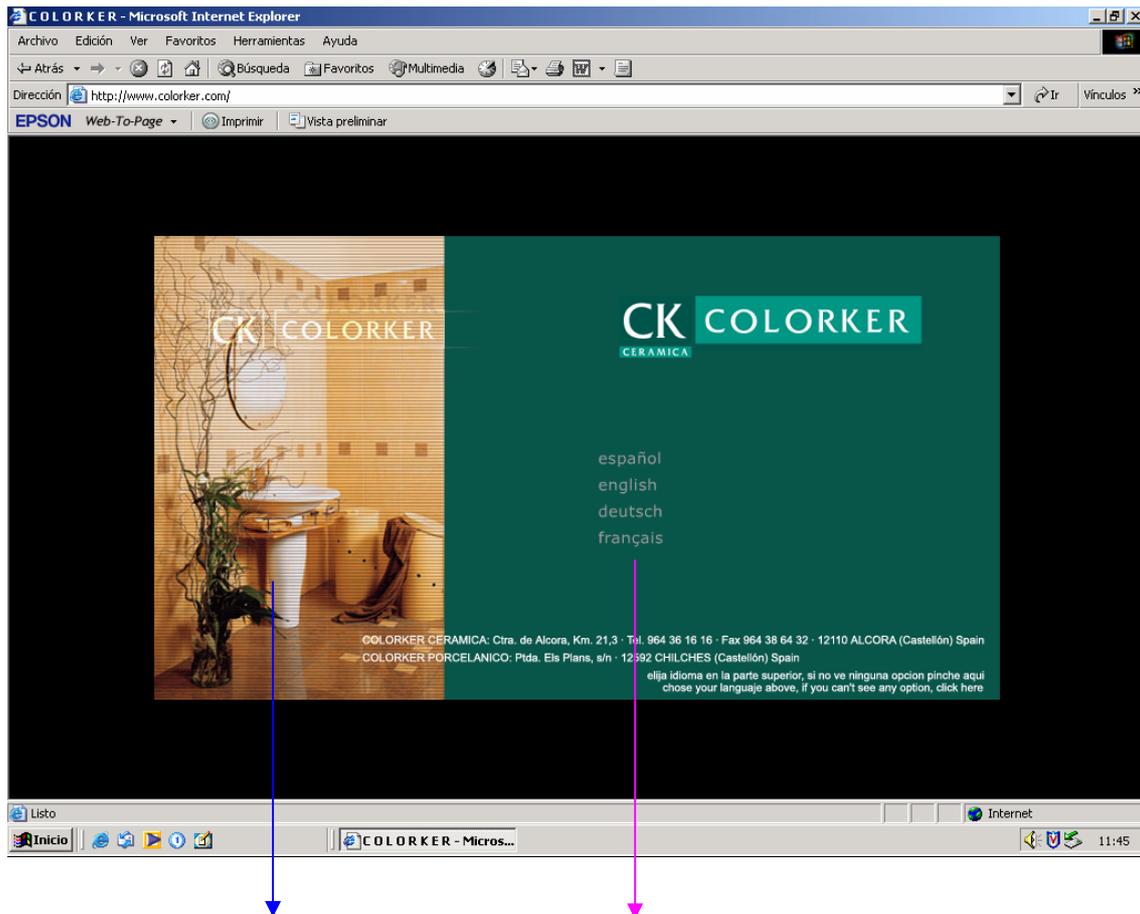
However, these discourse community's websites are not limited to the websites of the industries or companies forming part of it. The websites of lecturers teaching a related subject at university or the websites of specialists working at home or the websites of specialists devoted to the more artistic branch of handmade ceramics, among many others, are also included as websites from the discourse community. In general, most of the sites analysed can be broadly said to reproduce (with the differences that the change of medium implies) genres or combinations of genres that are quite similar to the traditional ones. However, the Internet makes it possible to make the most of these traditional genres and in a sense they represent a step forward and offer possibilities that no-one wants to disregard.

Watters and Shepherd (1997) also emphasised the role of genre in the evolution of the user interface for the Internet, thus shifting the attention to the technical functionality of electronic documents. While genres in non-digital media are determined by content and form, cybergenres are also characterised by content and form as well as by functionality. Normally, a user interface is designed with a specific group of users in mind and with regard to specific goals and tasks. However, Web usage is a fuzzier area. The actual goals and tasks may vary considerably, as has already been explained in previous sections.

Tile companies in general look for international markets and therefore seek to expand their sales world-wide and this is the main reason for offering the version of the websites in different languages, something that is almost impossible to achieve with traditional genres, in which space is far more limited due to purely economic and comfort reasons. In addition, we live in the society of the image. Traditional genres cannot include huge numbers of images, especially coloured ones, because of the money and space required to do so. However, the ceramic industry relies heavily on images, which allow them to display and advertise their products world-wide. Bad habits, rushing and stressing timetables make digital genres the quickest and easiest way to become aware of whatever you may be interested in anywhere in the world and with the highest visual potential. One image is worth more than a thousand words.

Accordingly, this ruling position of the image means that the information included in a website is usually presented in a different way than that of, for instance, specialised journals. One mistake to be avoided in websites is the inclusion of too much information, especially in the form of long paragraphs with a dense content,

because numerous studies show that the information in websites is, normally, just scanned. Therefore it is important to attract the reader's attention through visual aids and to keep it through a clear design, distribution and information. It is important that the first impression is that of a neat and clear layout in which the user feels comfortable and capable of finding the information needed, as in figure I.35.



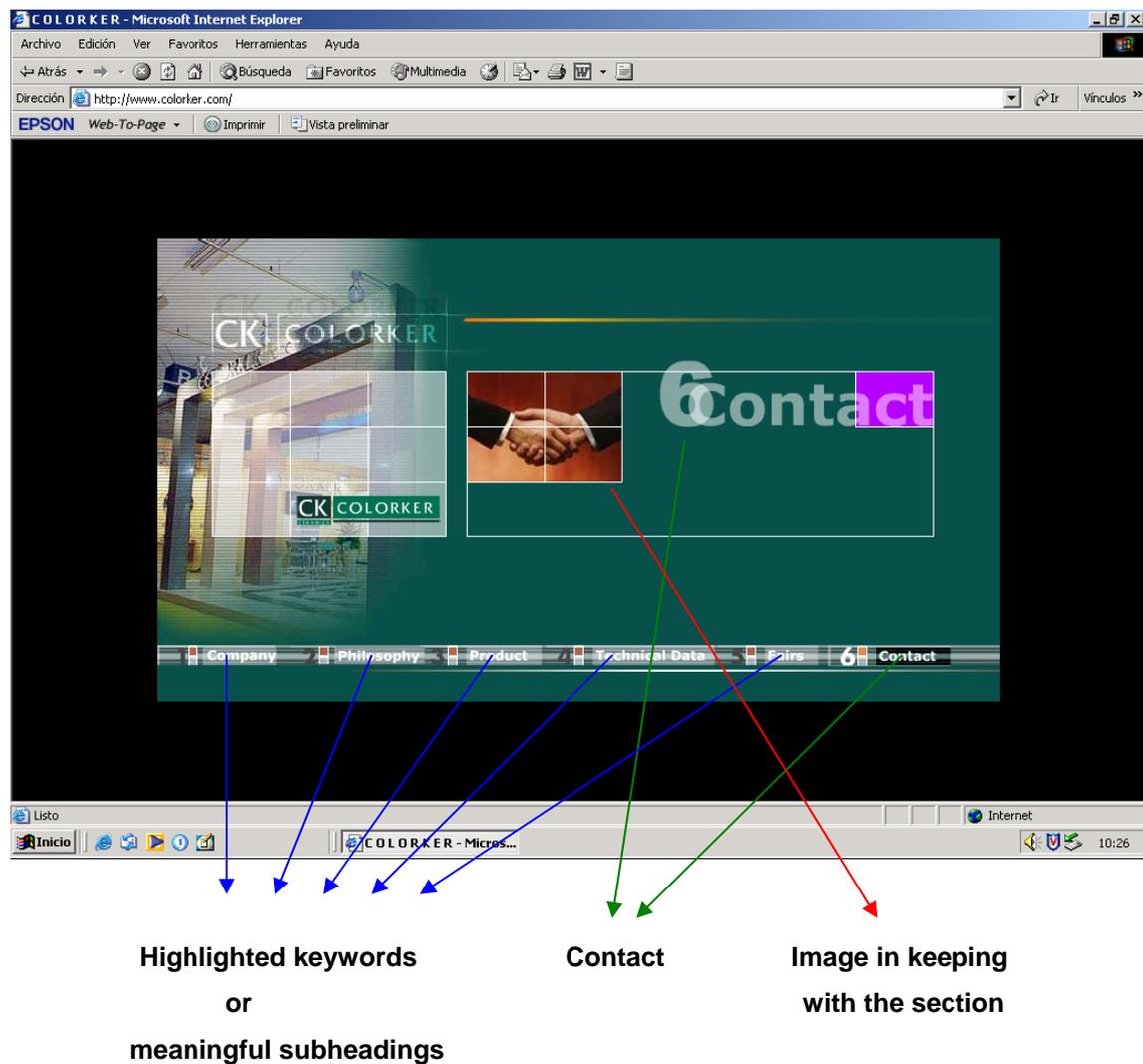
**Visual aids in a neat layout      Versions offered in different languages**

**Figure I.35:** Home page of a website from the ceramic industrial community.

Moreover, as websites have to employ scannable text, according to Nielsen (1999) it is important to use (figure I.36):

- highlighted keywords
- meaningful sub-headings
- bulleted lists

Websites also allow direct communication with the industry if the user is interested in purchasing some product or getting more information about different topics or interests. Usually this communication is done via e-mail, a relatively new digital genre which is becoming essential in our increasingly globalised world.



FigureI.36: Website from the ceramic industrial community.

New digital genres also offer the possibility of moving around within the information, whereas navigation in printed material consists mainly of turning pages. According to Nielsen’s (1999) words when analysing the “look and feel” of a website, the *feel* completely dominates the user experience. After all, *doing* is more memorable and makes a stronger emotional impact than *seeing*. In this sense, a neat layout in

which access to information is clear and easy becomes fundamental and necessary because this advantage may turn into a disadvantage if the user gets fed up with a “messy” website and decides to go to another one. In traditional genres, however, the easiest way to find information is to look for it in the index but, in general, it is a mere approximation to the text structure, which, more often than not, does not allow information to be found quickly. There is also the opportunity to use search engines in order to find the exact information you are looking for as quickly as possible. This is something that is unthinkable in traditional genres, where the information must be sought through the pages with the help of the table of contents.

Websites, as in figure I.37, also offer the possibility of deciding the profile of the user, so that the information can be presented, for instance, in a way that is more easily understandable for the layman or a version that is addressed more to the expert or member of the community.

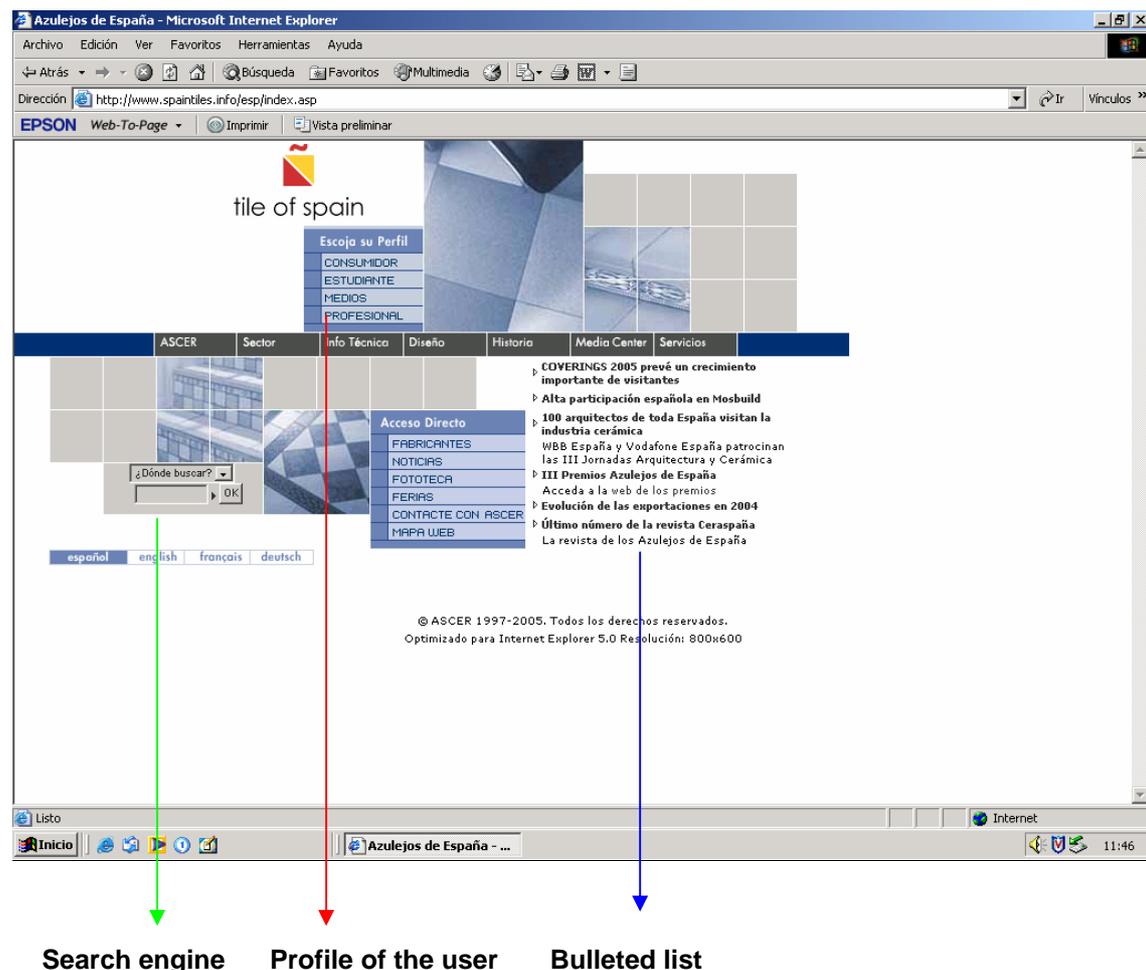


Figure I.37: Home page of the ASCER web site.

As can be observed by simply surfing the Net for a while, some traditional genres, such as the book or academic article, have been moved to the Web intact. In these cases in which mere reproductions of traditional genres (*extant replicated cybergenres*) are being transferred, these reproductions may be accepted at once or there may be a period of transition in which the limits of genre are reconsidered.

In spite of all the advantages that cybergenres suppose, the Internet constitutes a world-level forum in which everyone's opinions can be expressed and included – something which may be considered both positive or negative. The Net is nowadays the most important and easiest means of communication for authors who want their work and studies to be known world-wide. There is a fundamental difference between having a paper published in, for instance, a specialised journal or on the Internet: everyone can express themselves on the latter, whereas the criteria for publishing in more traditional media (books, manuals, specialised journals) are much more difficult to satisfy. Many digital documents that can be found during a search on the Net are not edited by organisations or institutions and do not have any other mechanism that can somehow guarantee the quality of the information contained therein. That is why the Internet, in spite of being a very useful tool, will not be considered a completely trustworthy source unless the appropriate criteria are employed to distinguish between reliable and unreliable material. Accordingly, I agree with Codina (2000) when he proposes a series of parameters to be taken into account when trying to establish the adequacy and quality of digital resources, i.e. content, authorship, ergonomics, and representation of the information, which have been explained in more detail in section I.6.4.2.1 C.

Therefore, the new technologies have led to the use and development of new digital genres and genre repertoires, thus opening up new possibilities in communication for discourse communities. At first sight, the concept of genre has not changed much following its application to digital communication, although its emphasis has shifted from “author and work” to “work and reader”, that is, from production to reception. Within the triplet made up of content, form and function, this last element has received far more attention with the advances in interactive digital documents.

As observed throughout this section, transformation is always shaped by the interplay between technological and social forces. Digital genres are rooted in the

social practices of a discourse community and, in the specific case of the ceramic industrial community, the prototypical example is that of ceramic companies or industries announcing new products, publishing catalogues and providing online information about themselves. This has also opened up the possibility for non-members of the community to gain easier access to certain kinds of information, which makes the boundaries of a community more blurred.

It may be argued that the ceramic industrial community is represented by both traditional and digital genres. Among traditional genres within this industrial community one may find: leaflets from the different companies, business letters, reference books, catalogues, periodicals, journals or UNE norms. All these traditional genres are being increasingly substituted by or combined with digital genres because the dynamic nature of genres is even more acute in certain disciplines, such as all computer-related areas of development (Posteguillo, 1996, 1999, 2000 in Posteguillo, 2003: 31). However, the general trend is for these genres to reproduce (to a greater or lesser extent) the traditional genres of this community, each of them displaying a different degree of evolution in Shepherd and Watter's (1998) classification.

Nowadays, it is increasingly common for companies to present themselves on the Internet by means of websites that allow them to advertise their products and services, display their catalogues, establish and maintain contact with others and be known by other similar communities world-wide. In a way, the evolution from traditional to digital genres and the increasing presence of the latter in our lives is a way of responding to the globalising trends that govern 21<sup>st</sup> century societies and knowledge/discourse communities.

These digital genres allow the "here and now effect" that traditional genres cannot achieve so easily. In this way, the use of digital genres by the ceramic industrial community can be considered a step forward in innovation and adaptation to current market trends and an essential condition for increasing profits.

In conclusion to this section, more attention should be paid to clearly define the genres that make more sense in a given community and, taking this into account, thus have the freedom to modify or reject genres whenever necessary. It may be hard for new genres to be accepted, but if their introduction is progressive and the defining genres that people usually associate to a given community are not abruptly disregarded

and substituted, the new ones may also be incorporated into the communication of the discourse community, as occurs with the ceramic industrial district.

### **7.3 The *Instituto interUniversitario de Lenguas Modernas Aplicadas* (IULMA)**

The elaboration of the bilingual dictionary of ceramics terminology is part of a wider mega-project which involves a complementary subset of undertakings. This project is being carried out within the framework of the IULMA (*Instituto interUniversitario de Lenguas Modernas Aplicadas*). This institute is a coordinated project developed by both the Universidad de Alicante and the Universitat Jaume I in Castellón. The Institute is being designed as a major research centre for terminological analysis and a lexicographical, linguistic and cultural resource for businesses and industries in the Valencian Region. Accordingly, several specific undertakings have already been undertaken, namely:

- a) a Master's degree in Applied Languages for Business,
- b) a dictionary on textile terminology,
- c) a dictionary on the shoe industry terminology,
- d) a dictionary on stone and marble terminology,
- e) and a dictionary on ceramics terminology.

Most of the terminological and corresponding lexicographical work is being carried out at the Universidad de Alicante, while the Master in Applied Languages for Business has been launched at the Universitat Jaume I. However, the Institute is an inter-university project and, accordingly, the Master's degree is also to be introduced in Universidad de Alicante, while at the same time lexicographical research (through the elaboration of the prospective dictionary of ceramic terminology) has also been started and is under development in Castellón. In this way, both universities may provide each other with relevant feedback so that the various activities they undertake can be constantly improved.

#### **7.4 Previous work in the area: the need for this study from a socio-economic point of view**

Although several dictionaries and glossaries on the suggested topic already exist, the years and the lexicographical framework in which they were undertaken (the 80s and early 90s) must be taken into account in order to understand how necessary a renewal in the approach of specialised dictionaries applied to the ceramic industry is. Some of these dictionaries published during the 80s and 90s are: *Dictionary of Ceramics* by Arthur Dodd, revised and edited by David Murfin (1994); *Porcelana, cerámica y cristal* by Ángel Escárzaga (1986); *Ceramic Glossary*, edited by Walter W. Perkins (1984) and *Ceramic Dictionary* (Schmid, 1997). These works lack, in general, examples, collocations, technical and grammatical information, thus constituting what I have called *passive* dictionaries, as opposed to the active one under development here (to illustrate this see figure III.84 containing entries from previous lexicographical works). This concept of active dictionary, which was explained in detail in section I.6.3, is fundamental when it comes to understanding or completely grasping the meaning of a word, and the same is true of the semantic shades of meaning of a term or collocation.

As mentioned in the section devoted to IULMA, similar studies also exist in other sectors that constitute instances of previous work in the area of industrial activities that are important for the Valencian Region. Dr. Enrique Alcaraz Varó (Universidad de Alicante) is promoting and directing the elaboration of different specialised dictionaries related with different industrial sectors in the province of Alicante. Thus, the IULMA lexicographers have already undertaken the aforementioned English-Spanish dictionary on stone and allied industries and an English-Spanish dictionary on the shoe industry, for example. These dictionaries have been elaborated with the advisory participation of firms in each sector and the dictionary of ceramics terminology aims at doing the same with the support and collaboration of different companies and experts from the ceramic industry in the Valencian Region.

Several industrial sectors in Spain and, more specifically, within the Valencian Region, demand extensive work in specialised lexicography and in-depth linguistic research on many specific fields or areas of knowledge that are not directly related

with linguistic issues. Like every discipline, they need to use language and, more specifically, accurate terminology to be able to develop and maximise their potential. These linguistic needs give rise to the emergence of specialised dictionaries aimed at fulfilling the terminological shortcomings, pressures and innovations posed on these industrial sectors, and the ceramic tile industry is no exception.

The importance of language in every stage and dimension of our lives is undeniable, and even when the subject matter has nothing directly to do with linguistic issues, there is an intrinsic need to make use of language in order to refer to the concepts of that field. In this specific case I have dealt and will be dealing with very specialised terms that only experts in these areas of knowledge are usually aware of, but these terms constitute a reality and a necessity in communication for those people, who may find it very hard to express these concepts in a language other than their mother tongue without the help of a “terminological aid”. These communicative needs are fulfilled by the referential function of language and a hard terminological research in order to successfully establish the relationship concept-term in the different languages under study and can then be materialised in the form of specialised dictionaries, such as the one introduced in this study. In this specific case, the final dictionary will be a bilingual one (English-Spanish, Spanish-English) because the project intends to organise the lexical units of the ceramic tile industry systematically in both languages so that it will be easier to manage for both the Spanish and English (whether native or not) ceramic specialists/professionals, as well as translators.

As has been mentioned already, the main ceramic exporting countries in the world are Italy and Spain, although on an international level the presence of countries like Turkey, Brazil and Mexico is becoming increasingly more significant and it is foreseen that soon other countries will start to have an important production surplus. Accordingly, the Valencian Region and more specifically Castellón, whose economy is deeply grounded on the ceramic tile industry, has to improve and develop in every aspect involved in this industrial activity so that it can successfully withstand the threats from other countries.

Hence, the reason for undertaking this project is quite easily understandable if the economic overview in section I.7.1 is taken into account: in view of the huge profits and production obtained by this district in Spain, and especially in the area of Castellón, the aim of the dictionary is to respond to the linguistic requirements

stemming from the socio-economic demands of this activity. And such needs make it necessary to establish a perfectly organised and systematic inventory of all the terms involved in the ceramic industrial district. Sometimes, it is also difficult for specialists in a given field to be aware of all the terminology (especially neologisms) used in their speciality areas of knowledge even in their own mother tongue. For this reason, this dictionary is not merely intended at providing a translation into Spanish or English of the different terms but at explaining and clarifying them by means of examples, collocates, quotations and technical explanations. This information will make this dictionary an active one – a relatively new and practical approach to understanding terminography and lexicography in the area of ceramics – as is explained in section I.6.3.

In general terms, the analyses performed in the ceramic industry seem to indicate that this is a business in which the high level of cost-effectiveness obtained in former periods may tend to reduce, although this business will remain profitable for the companies that are able to adapt better to the new market conditions, which includes internationalisation, among other factors. Within this internationalisation, especially in commercial terms, English is the key language. However, the need to know the English language is not just limited to its oral component. The world of mass media we live in, the technological advances that our society is undergoing, and the increasing use of computers and the Internet all make it essential to be efficient in written as well as spoken competence.

Marketing is another basic aspect to be developed in order to increase competitiveness. The large number of possibilities offered by the new digital genres (section I.7.2) in the form of websites for advertising the different companies must be taken into account and the possibility of reaching markets anywhere in the world must be exploited by including versions of websites in as many languages as possible. Among these versions in different languages what is becoming a constant feature is the inclusion of an English one, and if just one version can be offered in a foreign language (due to the reasons that I explain below and as experience shows), then the chosen language would most likely be English. Opening up to new markets is necessary in order to raise competitiveness.

In this respect, Cabré's (1993: 43) words summarise the importance of this kind of lexicographical and terminological studies as follows:

(...) no podemos olvidar que la terminología nace de la necesidad manifestada por los especialistas de ordenar las denominaciones de sus sistemas de conceptos, con la finalidad de conseguir una comunicación profesional más fiable.

Therefore, there are many reasons that explain the benefits that a bilingual specialised dictionary on this topic both in Spanish and in English may offer: the importance of this industrial district in Spain and, more particularly, in Castellón; the need to expand to other markets and adapt to current trends in international commerce and transactions, marketing, specialised professional translation and business written communication; and the terminological pressures stemming from rapid technological and scientific developments.

Nowadays, it is widely accepted that the term “globalisation”, first used to describe an economic phenomenon, affects many other aspects and disciplines. This globalisation, mainly in economy, commerce and media, makes English assume a highly significant role as a *lingua franca* that allows wider communication and enhances mutual understanding, while also introducing regulations and conventions and solving conflicts. In addition to this, the technological developments used in the world of business, especially the new means of communication (fax, e-mail), make it necessary for the user to have a good, accurate knowledge of the English language because it is what society demands in order to succeed in international fields.

The areas of technology and trade have undergone a rapid evolution, not only in the English-speaking countries but all over the world, and English has become, as mentioned above, the *lingua franca* for communication in scientific and enterprise districts (Graddol, 1997; Alcaraz Varó, 2000; Kindelán Echevarría, 2001; Broca Fernández and Escobar Montero, 2002). It is a fact that English is considered a *lingua franca* world-wide; it is clearly the language that is most widely used to communicate between speakers with different mother tongues and no other common language (and not only in specialised contexts). The rapid technological development of the English-speaking countries has also played an important role in its condition as an international means of communication or *lingua franca* (Graddol, 1997).

This consideration of English as the most internationally used language is closely related to these globalising trends that demonstrate how (while international relations exist) there will be a need to communicate, which will be favoured by the use of a

common language. Therefore, the importance acquired by current globalising trends is the main cause behind the internationalisation of commercial transactions and communication. The expansion of the English language as an international language, whatever the view on it may be, forces us to admit that English and globalisation are intrinsically linked and that the English language is the key for international communication (Johnson and Bartlett, 1999). According to Alcaraz Varó (2000), English is essential in order to establish commercial relations with Asia, the rest of Europe, the USA or almost all the continent of Oceania.

Punnett and Ricks (1998: 6-10) claim that “international business is the reality of the business world today (...) business students need to understand the factors that affect business activities that are international in scope”; and continue by stating that “firms need to understand these influences and be able to use this understanding to their advantage”. This shows the importance of the use of English in the world of international business.

As Crystal (1999) suggests, the current status of the English language started with the expansion of colonial power (which finished in the 19<sup>th</sup> century) and with the emergence of the USA as the world economic leader in the 20<sup>th</sup> century. As a result, the ruling position of English in communication around the world was therefore accepted in spite of its not being the most widely spoken language. This position is held by Chinese, basically due to the overpopulation of the country, and English occupies the second position according to the figures. Hasman (2000) comments that the English language has still not stopped spreading and mentions three factors that make English a useful language for citizens all over the world:

- a) The majority use of English in science, technology and commerce.
- b) Its capacity to assimilate vocabulary from other languages.
- c) The acceptance of the dialectal variety.

As English is the *lingua franca* all around the world, a terminological tool like the bilingual dictionary can represent an aid for business export activities for a large variety of companies. The crucial role played by a “good understanding” in international business transactions cannot be denied, especially in these moments in which the “globalising mood” makes it even more significant and important to

communicate properly and accurately around the world in a widely-known language, even when this language is not the mother tongue of any of the interlocutors.

In my opinion, Warschauer's (2000) views on this topic are also coherent and sensible. He believes that there is a need to use the English language as the language for international communication, but at the same time he also promotes the use of local languages, whether national or regional, and basically this is the main reason for the dichotomy English/Spanish in the ceramics dictionary. These two views are not mutually exclusive but complementary, and their use is determined by the socio-cultural context that will make one or the other more appropriate for the situation.

Focusing now on the situation of the Spanish language in this respect, English has influenced and is influencing the Spanish lexicon. In the same way, Filipovic (1996) is convinced that English has changed its status from a "receiver language" of the influence of at least 135 languages to a "donor language" to many other languages in the world, including Spanish. However, he foresees that English will not leave native European languages aside, not even in business fields. In the worst case, he says, English will continue with its influence over national languages with the incorporation of lexical loans for technical and scientific reasons. According to Filipovic (1996), this is not wrong, but just a way to include new lexical and semantic dimensions in areas that are insufficiently developed in the Spanish language.

Consequently, this study applies a theoretical and practical approach to some specialised areas of both the English and Spanish language that have been considered to be especially relevant for application to scientific and industrial areas, as is the case of ceramics.

To sum up, the reasons for undertaking this project and which make it necessary are:

- the need to renew the conception of specialised language dictionaries applied to the ceramic industry (resulting in an active dictionary);
- the need to enhance competitiveness in terms of linguistic competence both in Spanish and English ceramic terminology by responding to the linguistic pressures originated by the socio-economic demands of the ceramic industrial district;

- the need to adapt to linguistic demands at both a national and an international level;
- and the need to create an ordered and systematic repertoire of ceramic terms and equivalences in Spanish and English in order to clarify concepts, become aware of neologisms and help both professionals from the ceramic district and translators.

The reasons for choosing these two languages, Spanish and English, for the dictionary on ceramics terminology may be summarised as follows. The dictionary is in Spanish because:

- Spain is one of the world leaders of the ceramic industry, especially the province of Castellón, and the economy of this area depends strongly on this industrial activity;
- the ceramic district is essential for maintaining the level of profits, which are translated into economic growth and high employment rates in Spain and especially in the province of Castellón;
- Spanish can help to strengthen the ties between the different industries that make up the dense industrial network of the ceramic tile industry in Castellón and other areas in Spain;
- English loans will always exist because English develops and spreads quicker than any other language, but given the fact that Spain is one of the world's leaders in the ceramic industry, that the ceramic industry is an activity with a long history in the country, and that many ceramic terms have originated and were first coined in Spanish, it is only fair to defend the linguistic and terminological identity of this activity in Spanish;
- Spanish is the third most widely spoken language in the world.

English has been chosen because:

- English is the second most important language as regards the number of speakers in the world and the most significant in terms of use. English is nowadays a *lingua franca*.

- English is the language of the globalised world and it allows intercultural understanding and successful international transactions. English is an international language for global communication;
- the export activity in the ceramic district is essential for maintaining and increasing the level of profits, which are translated into economic growth and high employment rates. Relationships with overseas markets are usually established in English;
- the marketing devices used to advertise a product or a company by means of new digital genres (websites) essentially use their English versions to reach prospective customers around the world. If a website cannot be translated into more than 1 language, English is usually chosen;
- written communication with export markets is usually established in English by means of faxes, e-mails and letters;
- specialised journals and publications on the topic with an international scope are usually written in English;
- in international fairs devoted to the ceramic industry, such as CEVISAMA, English is the preferred language used by professionals from all over the world to communicate with one another. Thus, it favours communication and therefore trade;
- English has a potential and a scope as a language which often makes it necessary to adopt lexical loans from it;
- English is, whether we like it or not, the language of innovation and development.



*Every other author may aspire to praise;  
the lexicographer can only hope to escape reproach,  
and even this negative recompense has been yet granted to very few.*

**Samuel Johnson**

## **8. THEORETICAL FRAMEWORK CONCLUSIONS**

At this point, after having put forward the theoretical assumptions which have led me to elaborate 4,000 entries of what, in less than a year, is intended to be the specialised bilingual dictionary of the ceramic industry, a series of concluding remarks<sup>35</sup> can be made. What follows is thus a reflection that gathers the general assumptions which have constituted (from a theoretical angle) the starting point for the elaboration of this work. In other words it deals with issues which have, either explicitly or implicitly, been considered and which have shaped the practical aspects of this doctoral thesis. Accordingly, many of these concluding remarks are reformulations of a series of principles and reflections for terminological work originally formulated by Doctor Teresa Cabré, whose work constitutes the foundation on which a large part of this research is based. These principles have allowed me to place this work within the huge spectrum of views and theories regarding specialised languages, terminology, specialised lexicography and so on. Having framed a specialised lexicographical work like this within Cabré's CTT has allowed me to gain a better understanding of the kind of terminographical tool to be created. At the same time it has provided me with a reasoned, systematic, communicative, natural and realistic understanding of PAL and terminology, which has enabled me to harmonise a series of aspects that are fundamental in modern terminology. Thus, in this work, from a theoretical point of view, the following conclusions focused on terminology and corpus linguistics can be extracted:

- 1) The interdisciplinary character of terminology has been assumed from the very beginning since it is a subject made up of elements from language sciences, cognition sciences and social sciences. Consequently, this feature is the basis of the multifaceted nature of the terminological unit which is at the same time a linguistic,

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<sup>35</sup> For a complete account on the conclusions drawn from this thesis see section IV "Conclusion".

cognitive and socio-cultural unit. Apart from its interdisciplinary character, terminology has also been considered as being a cross-disciplinary subject, since there is no structured discipline that does not make use of terminology, basically because there is no way of transmitting, expressing or transferring scientific knowledge without terminology.

2) The aforementioned interdisciplinary character of a field of knowledge such as terminology is only explained and justified when, apart from including elements from other varied disciplines within its foundations, it also integrates them inside its own specific field. This results in a conceptual reorganisation of them, rather than just an addition of the elements from the integrating disciplines.

3) Together with its interdisciplinarity, terminology is also characterised by its multifunctionality, which makes it possible to aim at diverse objectives and to update its multifaceted nature, depending on the objective that is pursued.

4) As is the case of this doctoral thesis, terminological application for the compilation and elaboration of dictionaries (from the point of view of terminography/specialised lexicography) is the most prototypical and widely known application of terminology.

5) Every terminological activity is socially and pragmatically generated and justified because of its usefulness in relation to the solving of problems related with information and communication.

6) The social importance of terminology is determined by the features presented by current societies, which are increasingly technological and dependent on specialised knowledge and plurilingualism.

7) Terminology, and more specifically terminography, is not practised and should not be practised in the same way in every country nor in every user group. It must vary depending on the contexts, goals, resources and subject it is aimed at

covering. This specificity is what will condition the updating of a predominant conception or theoretical orientation.

8) Terms are better observed *in vivo*, that is to say, as they appear in different communicative situations and, therefore, subject to change.

Likewise, regarding the use of a corpus-based approach in the study of specialised languages and in the elaboration of active dictionaries:

1) The use of electronic corpora has become an essential means for investigating the structure of the language in use, for proving linguistic hypotheses, for knowing the different meanings that words acquire in context, for developing technologies for the processing of natural language, and for the possibility of objectively verifying the results. All this makes them a central approach today in the study of PAL and its specific terminology.

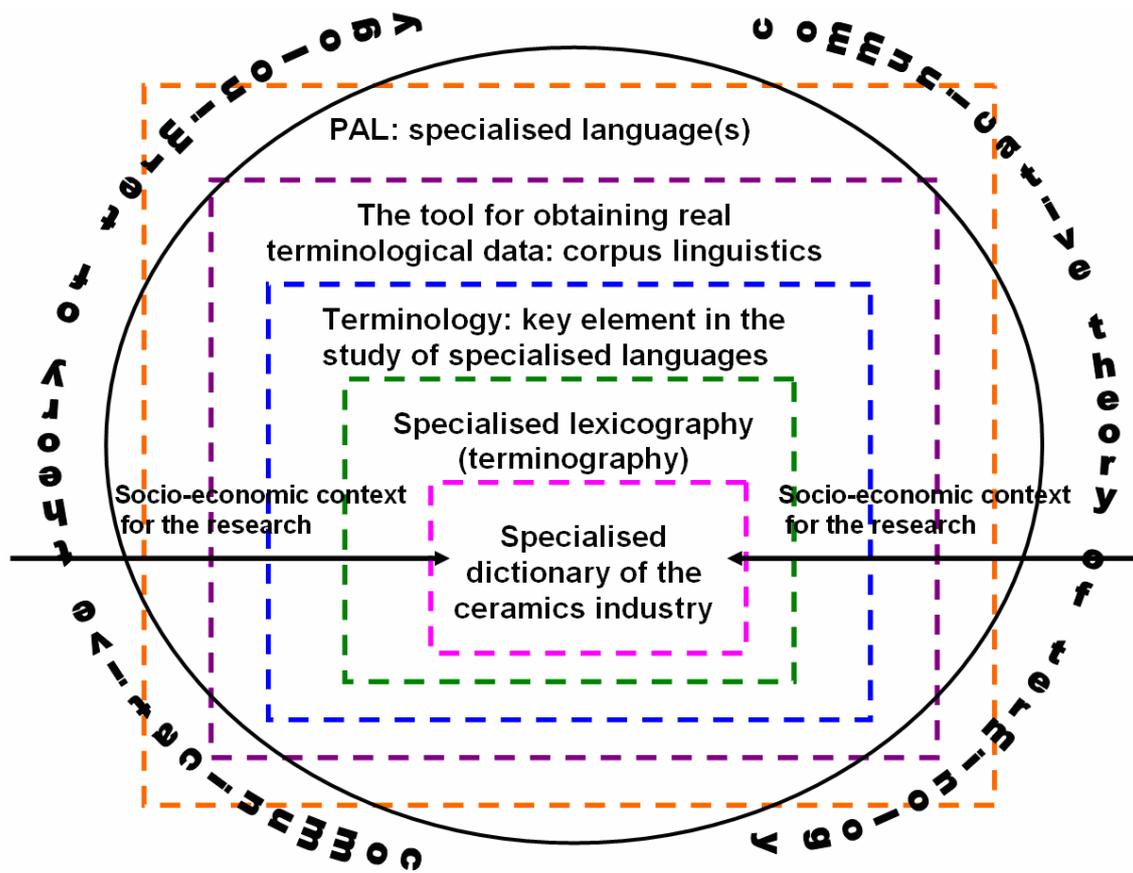
2) The complete meaning of a lexical unit is always contextual, and no study of meaning that fails to include a complete context can be taken seriously; hence, language in general must be studied in actual, authentic instances of use, not in the form of intuitive, invented sentences.

3) For a text to be considered specialised, together with the lexicon criterion, other pragmatic, functional, thematic, textual-linguistic and cognitive criteria must also be present, which makes the difference between what is general and what is specialised in language only a matter of degree.

4) An active dictionary is intended to provide the prospective user with all the information necessary in real-world communication. The emphasis is not so much on other more theoretical aspects but on those that are more directly related with real and true users' demands. This has made it necessary to examine the linguistic and non-linguistic associations of a given word as well as to include information about the frequency of related words, the most common uses,

collocates and the contexts in which words and meanings are most commonly found.

Hence, with the CTT constituting the theoretical framework of this work, and surrounding and influencing the adoption of any other theoretical assumptions or viewpoints, I have grounded my work on a “teoría de base lingüística que de cuenta de la terminología como conjunto de unidades denominativo-conceptuales del lenguaje natural, representantes del conocimiento especializado dentro de un área temática precisa y vehiculadoras de comunicación profesional natural” (Cabré 1999 a: 87). Accordingly, this doctoral thesis has aimed to start developing a specialised bilingual dictionary of the ceramics industry according to the principles of the CTT and in compliance with the theoretical structuring illustrated by the diagram below (figure I.38), in which I have attempted to coherently integrate all the areas dealt with throughout this section I (Theoretical framework) into the framework guiding this work. The sections and subsections have also been arranged and presented all through this theoretical framework following this structure:



**Figure I.38:** Structure of the theoretical approach of this thesis, which is aimed at the creation of the specialised dictionary of ceramic terminology according to the CTT.



*Though this be madness, yet there is method.*

**William Shakespeare**

## **II. METHOD**

The method used in the development of the prospective dictionary of industrial ceramics terminology has comprised 8 broad stages (see section II.2) based on Auger and Rosseau's (1987) study *Méthodologie de la recherche terminologique* and the adaptation made of it by Gómez and Vargas (2002, 2003 a, b) so that it fits into current methodological trends and technological innovation in the field of corpus linguistics applied to specialised lexicographical research.

In spite of the rapid development of terminology (in its wide sense) in the last ten years, Auger and Rosseau's (1987) approaches, principles and methodology, constitute, in broad terms, a perfectly valid tool for terminological research even 20 years later. However, most of the developments achieved in the computer and technological field in general in the last years of the 20<sup>th</sup> century and the beginning of the 21<sup>st</sup> century are not yet contained in their study due to a purely chronological matter (their research was previous to the "boom" of computer technology). Therefore, it lacks references to computer devices, programs and tools that, although not yet known at the time, have been included and used in this study. Their inclusion here has been almost mandatory and a matter of need since the amount of work and time these computer resources may save and the reliability of the results they offer make them absolutely fundamental for any corpus-based study like this. Disregarding the multiple advantages offered by new technologies and their application to terminological research (see section I.5.2 devoted to terminotics) would imply to turn one's back to reality and to the natural (and rapid) evolution terminology is undergoing. Accordingly, computer resources have played a fundamental role in this research, especially for the application of the method and for obtaining the results presented in sections III and VI.4.

Thus, as previously stated, the method of work adopted in this research has followed the steps proposed by Auger and Rousseau (1987) through Gómez and Vargas' (2002, 2003 a, b) adaptation of this methodology to new technological advancements and possibilities with our complementary modification. However,

before dealing with the stages of the method as such, an account on the role played by documentation in this study has been provided. The importance of documentation in any corpus-based study is beyond question but I have regarded as necessary and revealing to include in a section (II.1) the specific aspects considered in the documentation process adopted for this work. In this sense, documentation has affected almost every stage of the method of work, especially initial ones, and has allowed us to familiarise with the field of industrial ceramics, becoming then a fundamental pillar for the compilation of the corpus.

*When it comes to getting things done,  
we need fewer architects and more bricklayers.*

Colleen C. Barrett

## 1. THE ROLE OF DOCUMENTATION IN THIS STUDY: DOCUMENTATION PROCESS FOR SUBSEQUENT CORPUS COMPILATION

Documentation has been crucial for the method in almost every stage of this research, something which, in general, can be made extensive to any study of the sort. Figure II.1 summarises the stages of the terminographical practice in which, according to the IULA (2007, a), documentation plays a prominent role. The information displayed in the figure has been adapted to the specific case of this study.

STAGES OF THE TERMINOGRAPHICAL PRACTICE	IMPORTANCE OF DOCUMENTATION IN THE DIFFERENT STAGES
Preparation	<p>Documentation has constituted the information source from which to obtain the necessary cognitive competence for the development of the work:</p> <p><i>La documentación es útil para tareas como las siguientes: conocer el tema y su estructuración, conocer los recursos terminológicos de que dispone una lengua y su nivel de normalización u obtener información sobre la organización y alcance profesional de la materia (IULA, 2007, a)</i></p>
Detection, delimitation and extraction of terms	<p>Documents have been the source from which to extract the units that, after a rigorous selection, form part of the dictionary. Documents constitute the corpus from which terms are retrieved.</p>
Verification of the quality of the data compiled	<p>Documentation has been a key aspect for determining the pertinence to the field of a terminological unit since it has allowed us to detect the frequency of appearance of a term within its contexts of use. In this stage, thanks to</p>

	documentation, some units have been rejected because of being too general and some others because of their belonging to “remote” thematic areas. Those terms whose pertinence has been verified have been included in a next step in terminological cards
Analysis of terms and “filling in” of terminological cards/registers for the compilation of linguistic, interlinguistic and pragmatic data	Documentation has thus been used in this stage for detecting and extracting from the corpus information regarding terms definitions, contexts and synonyms among other data or to verify again the information selected in previous stages

**Figure II.1:** IULA’s (2007, a) summary on the importance of documentation in the different stages of the terminographical practice (adapted to this study).

Documentation has been used throughout this study as the source and tool of the “corpus-based” approach adopted since it has favoured knowledge acquisition and the compilation of documents in the form of a corpus, the basic tool for the research.

### 1.1 Working materials used in this study

For the elaboration of a specialised lexicographical work like the one under development in this research, 3 broad kinds of materials are normally used:

- Search materials: these materials provide information about the different aspects of the terminological subject or about a specialised field (Cabr , 1993). Search materials are especially useful during the preparation stage, before undertaking the terminographical work as such (strictly speaking), in order to form a general idea about the most convenient and accurate structuring of the domain and about the different aspects to be developed and dealt with during the work.
- Specific working materials: these are the material basis of the terminographical work (Cabr , 1993), what in this study constitutes the corpus as such.
- Help or supporting materials: these materials facilitate and complement the development of dictionaries and glossaries (Cabr , 1993). In this work, the

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prototypical example of material for terminographical work support has been the terminological card.

In order to better understand these issues and to present the corpus as a coherent, motivated and well-sustained compilation of documents, these three kinds of working materials and their use in this specific research have been analysed in depth in subsequent paragraphs. As is explained in subsections II.1.1.1, II.1.1.2 and II.1.1.3, these materials have been used here either as materials forming part of the corpus as such (materials for term extraction), as materials used for acquiring a first and general idea on the specialised area to be dealt with and on the aspects underlying terminographical practice, or as materials for work support in the terminographical process under development.

### **1.1.1 Search materials**

In this work, those documents which have been used in order to obtain theoretical, methodological, practical or documentary information on the different aspects involved in the subject area analysed or the kind of (terminological) work to be undertaken have been regarded as search materials. As Cabré (1993: 270) points out:

Estos materiales pueden referirse al sistema nocional de un área temática, a su sistema denominativo o a aspectos complementarios de la actividad profesional o científica relacionada con el tema en cuestión. El terminólogo puede buscar esta información directamente, o bien puede recurrir a los servicios de documentalistas y a los conocimientos de especialistas en la materia.

As this author concedes, there are 4 main types of search materials depending on the thematic area dealt with. What follows is an account of the specific kinds of documents used in this work for each of the 4 kinds of search materials specified below:

1. Documentation about documentation
2. Documentation about the speciality field
3. Documentation about the terms
4. Documentation about the method of work and the way of presenting terms

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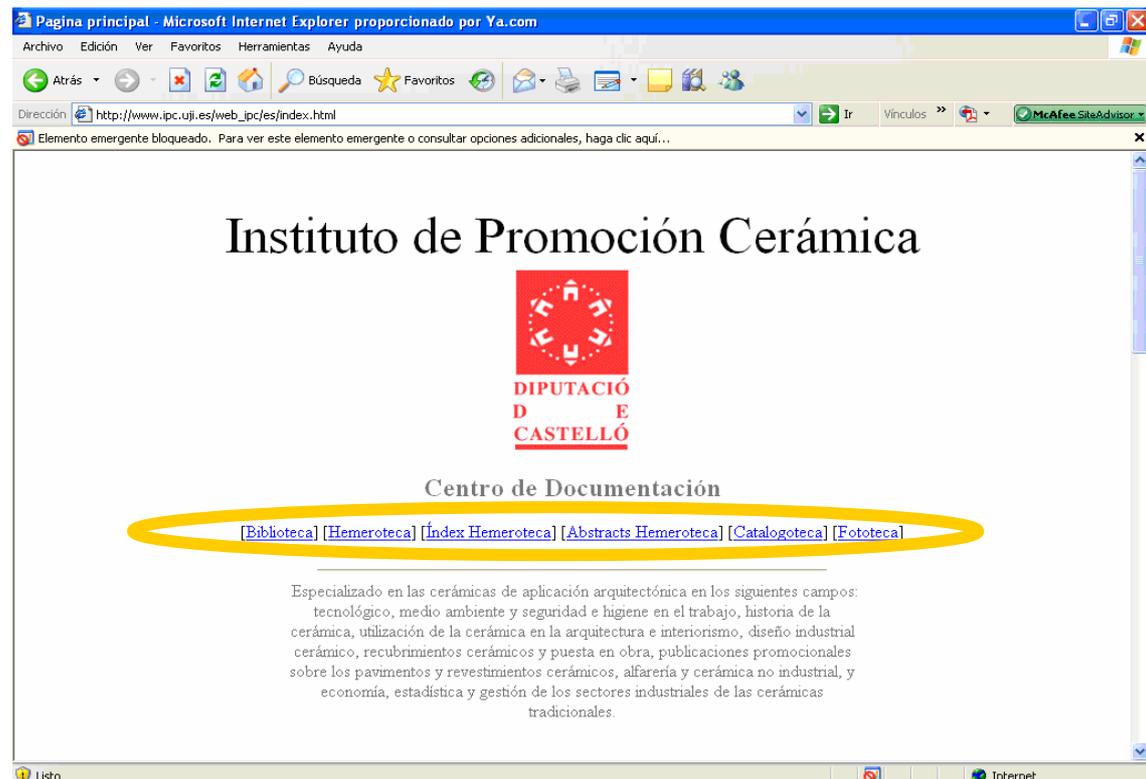
## 1. Documentation about documentation

Cabré (1993) contends that the most common sources for obtaining information about the terminological work to be undertaken and about the documentation available in this speciality field are three: secondary and tertiary publications providing bibliography and bibliography about bibliography respectively, documentary databases, and terminological management centres/bodies and specialists.

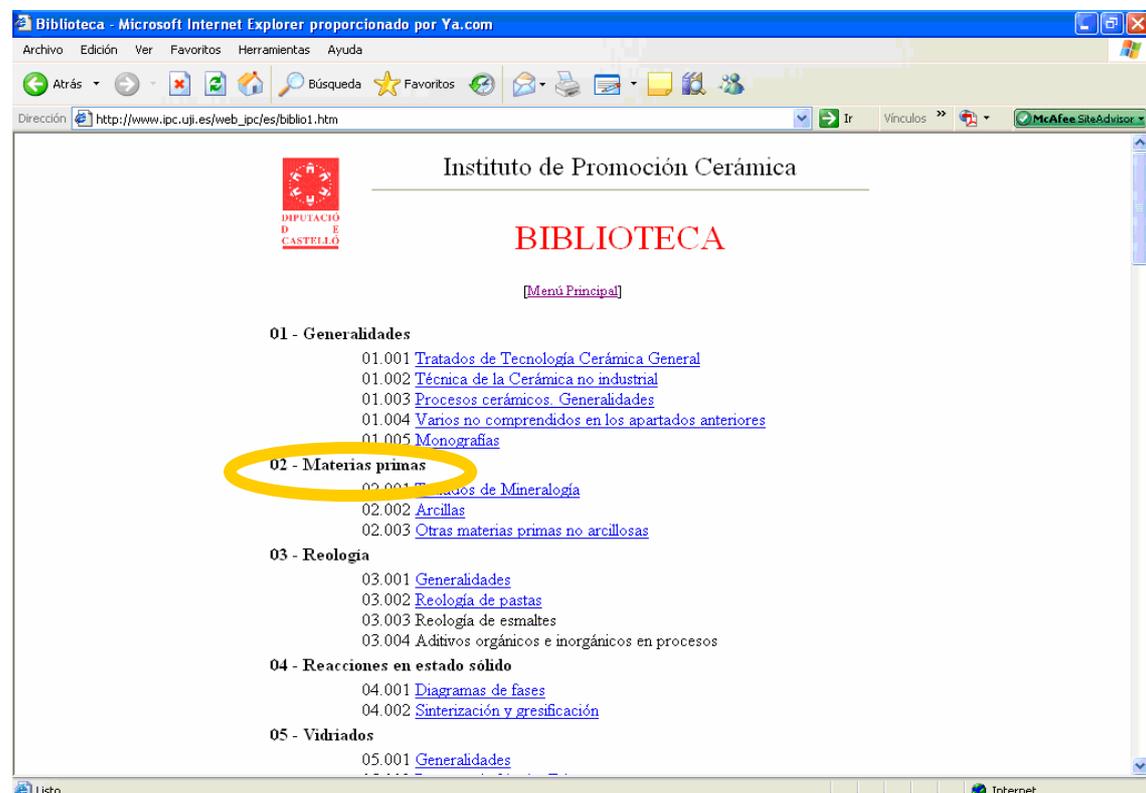
a) The search of secondary publications – providing information about bibliography – and tertiary publications – providing information about bibliography containing more bibliography – has been of great importance in this work. In this sense, many webpages in the field hosted by official institutions, organisations and institutes have been especially useful because of the big amount of information and links contained regarding publications in the domain. For instance, in the web page of the “Instituto de Promoción Cerámica”, the institute is presented from the very first page as a *Centro de documentación* (Documentation centre) in which library, newspaper library and catalogue resources among others are offered to the user (see figure II.2). If the “library” (*biblioteca*) option is chosen, a structuring/organisation of the domain<sup>36</sup> in different subareas and subsubareas is provided (figure II.3), each of them containing links to thorough lists of related bibliography mainly in English, Spanish and French. If, for instance, the option *materias primas* (“raw materials”) is chosen (see figure II.3), a list like the one shown in figure II.4 containing bibliography on the subfield of “raw materials” and “clays” (*materias primas y arcillas*) is displayed. Hence, the information provided by the “Instituto de Promoción Cerámica” has been used as a first approximation to the field in order to obtain “documentation about documentation”. However, this has not been the only way these documents in the list have been used since many of them have also been included as actual textual samples forming part of the corpus.

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<sup>36</sup> This structuring of the field provided by the “Instituto de Tecnología Cerámica” was also resorted to in the third stage of the method for the elaboration of the field diagram.



**Figure II.2:** Webpage of the “Instituto de Promoción Cerámica” with library (*biblioteca*), newspaper library (*hemeroteca*), and catalogue resources (*catalogoteca*) offered, among others.



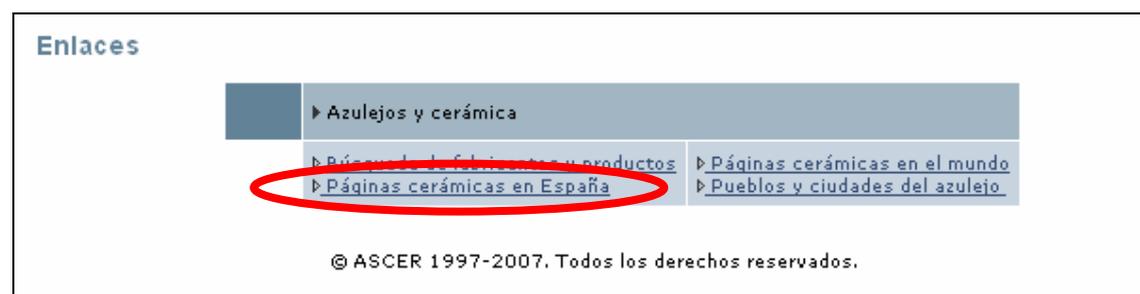
**Figure II.3:** Partial view of the way in which the ceramics domain has been structured in the website of the “Instituto de Promoción Cerámica”.

Título	Autor	I.S.B.N.	Edic.	Código
CHEMISTRY OF CLAYS AND CLAY MINERALS	A. C. D. NEWMAN	0582301149	1987	K2-32-006
CLAY MINERALOGY AND CERAMIC PROCESSES AND PRODUCTS	F. VENIALE, C. PALMONARI	-	1ª 1974	L1-22-014
CLAY MINERALOGY (FOTOCOPIA)	RALPH E. GRIM	07-024836-2	2ª 1969	L1-22-012
CLAYS AND CERAMIC RAW MATERIALS (FOTOCOPIA)	W. E. WORRALL, M.SC., PH.D. A.R.I.C.	0-85334-631-3	1975	L1-22-017
CONTRIBUCIÓN AL ESTUDIO DE LOS CAOLINES DE LA REGIÓN VALENCIANA	LUIS FERRER OLMOS	-	1965	L1-44-004
EL CAOLÍN EN ESPAÑA	E. GALÁN HUERTOS, J. ESPINOSA DE LOS MONTEROS	84-400-7912-5	1974	L1-22-020
ENSAYOS TECNOLÓGICOS DE LAS ARCILLAS EXTRAÍDAS EN LOS CENTROS ALFAREROS DE GALICIA	JOSÉ MARÍA CASAL DORADO	-	2000	J2-12-021
GIACIMENTI DI ARGILLE CERAMICHE IN ITALIA	F. VENIALE, C. PALMONARI	-	1ª 1974	L1-22-015
I ENCUENTRO ENTRE LA INDUSTRIA DE PAVIMENTOS Y REVESTIMIENTOS CERÁMICOS Y LA MINERÍA DE ARCILLAS Y CAOLINES EN LA COMUNIDAD VALENCIANA. PONENCIAS	-	-	1988	K2-13-027
I JORNADAS SOBRE MATERIAS PRIMAS DE LA INDUSTRIA CERÁMICA. 1ª PARTE. PASTA BLANCA CERÁMICA. PASTA ROJA CERÁMICA.	-	-	1996	K1-21-005
KAOLIN CLAYS AND THEIR INDUSTRIAL USES (FOTOCOPIA)	J. M. HUBER CORPORATION	-	2ª 1955	L1-22-022
LES ARGILES	S CAILLERE, S HENIN, M RAUTUREAU	-	1989	L1-34-026
LOCALIZACIÓN Y SELECCIÓN DE ARCILLAS, UTILIZADAS COMO MATERIA PRIMA POR LA INDUSTRIA AZULEJERA, EN LAS COMARCAS PRÓXIMAS AL ASENTAMIENTO DE ESTA INDUSTRIA EN LAS PROVINCIAS DE CASTELLÓN Y VALENCIA. VOLS I, II, III Y IV	-	-	1977	L1-31-030
MANUAL PARA EL CONTROL DE LA CALIDAD DE MATERIAS PRIMAS ARCILLOSAS	-	84-923176-1-2	1998	K1-44-016
MATERIAS PRIMAS PARA LA FABRICACIÓN DE SOPORTES DE	VV.AA.	8492317604	1ª 1997	K1-43-020

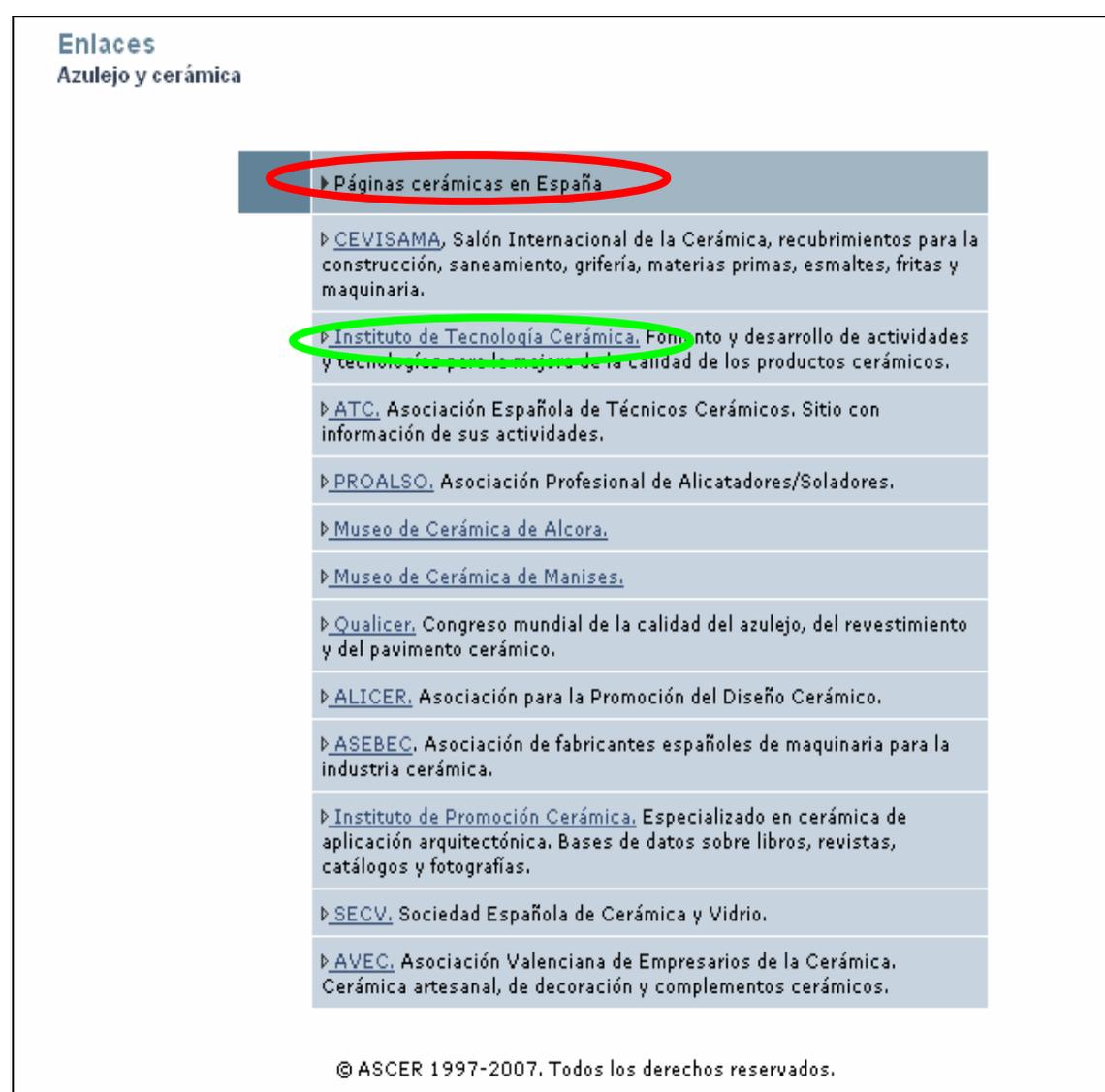
BALDOSAS CERÁMICAS				
MATERIE PRIME	SOCIET· CERAMICA ITALIANA	-	1992	K2-43-048
MATERIE PRIME CERAMICHE. 1 - I MATERIALI ARGILLOSI	ANTONIO RAVAGLIOLI, G. GALEAZZO POLLIFRONE	-	1ª 1979	L1-22-016
MATERIE PRIME CERAMICHE. ARGILLE, MATERIALI NON ARGILLOSI E SOTTOPRODOTTI INDUSTRIALI. VOL. III	A. RAVAGLIOLI, C. FIORI, B. FABBRI	-	1989	K1-32-052
MINERALOGÍA DE ARCILLAS TERCIARIAS CERÁMICAS DE CASTELLÓN	TEÓFILO F. SANFELIU MONTOLIO	8486895294	1ª 1991	K2-23-012
MINÉRALOGIE DES ARGILES. VOL 1. STRUCTURE ET PROPRIÉTÉS PHYSICO- CHIMIQUES	S. CAILLERE, S. HENIN, M. RAUTUREAU	2-225-76550-2	2ª 1982	L1-22-018
MINÉRALOGIE DES ARGILES. VOL 2. CLASSIFICATION ET NOMENCLATURE	S. CAILLERE, S. HENIN, M. RAUTUREAU	2-225-76560-X	2ª 1982	L1-22-018
NORMATIVAS DE ENSAYOS PARA LOS CAOLINES CERÁMICOS, PROPUESTAS POR EL GRUPO DE TRABAJO DE LOS CAOLINES ESPAÑOLES	-	-	1974	L1-22-021
PASTA BLANCA CERÁMICA. PASTA ROJA CERÁMICA	-	-	1996	K1-11-041
PASTAS Y VIDRIADOS EN LA FABRICACIÓN DE PAVIMENTOS Y REVESTIMIENTOS CERÁMICOS	RAFAEL GALINDO RENU	8487683080	1994	K2-42-033
WHITE GOLD FROM CORNWALL & DEVON. AN ILLUSTRATED ACCOUNT OF THE MODERN CHINA CLAY INDUSTRY	CHARLES THURLOW	0951941909	1ª 1992	K2-14-029

**Figure II.4:** List containing bibliography on the subfields “raw materials” and “clays” (*materias primas y arcillas*) provided by the webpage of the “Instituto de Promoción Cerámica”.

Another useful and central resource for the search of secondary and tertiary publications has been ASCER’s website, which offers links to a wide variety of services and information regarding bibliography or bibliographical sources, related links containing more information, as well as articles, reports, general information, news, etc. In the example provided below (see figure II.5), ASCER’s website has led me to what I have considered one of the most complete and comprehensive collections of works on industrial ceramics, the library and documentation centre of the ITC (Instituto de Tecnología Cerámica) (see figure II.6), which can also be directly accessed through its webpage <http://www.itc.uji.es/biblioteca.php>.



**Figure II.5:** Access to a list of links provided by ASCER in its webpage to other websites related to the ceramics industry in Spain.



**Figure II.6:** List of links provided by ASCER to other websites related to the ceramics industry in Spain (focus on the link of the *Instituto de Tecnología Cerámica ITC*).

As a result, the ITC is another example (among many others resorted to) of a reliable source from which first-hand data regarding bibliographical information – in

this case also in English and Spanish – of the industrial ceramic sector (see figure II.7) has been obtained.



**Figure II.7:** Webpage from the *Instituto de Tecnología Cerámica ITC* in which the documentation resources available have been highlighted.

If figure II.7 is observed again, the documentation resources offered by the ITC may be easily noticed, among which we find (in yellow) a documentation centre, (*centro de documentación*), a library and newspaper library (*biblioteca y hemeroteca*), and a section of publications (*publicaciones*).

b) The search of documentary databases. In this study, the documentary databases used – especially in the stages of matching (see section II.2.5.2) and data processing (see section II.2.6) – have been the following ones:

- British national Corpus
- Columbia Encyclopedia
- Encyclopaedia Britannica
- Eurodicautom
- Euro Glossary
- FAO Terminology
- ILOTERM (International Labour Organization)
- Inter Active Terminology for Europe (IATE)

- Terminological Information System (EU)
  - UNTERM. United Nations Multilingual Terminology Database
  - WTOTERM: World Trade Organization Terminology Database
- c) Finally, the search in terminological management centres and through specialists on the topic has been another key source for obtaining documentation about documentation (see sections I.4.3.2.3 “Terminological normalisation bodies” and I.4.3.2.4 “Cooperation bodies, associations and terminology networks” for a complete account on the sources of this kind consulted in this study).

Therefore, in this research, through the “search materials” containing “documentation about documentation”, a first and sound approach to the speciality field has been possible thanks to the retrieval of thorough lists of bibliography containing potential textual samples for corpus compilation.

## 2. Documentation about the speciality field

There are two possible ways of approaching and initiating a terminographical work: it may be undertaken by a specialist or by a terminologist/terminographer. However, as Cabré (1993: 271) states “parece evidente que un trabajo práctico de terminología dentro de un determinado campo de especialidad sólo puede llevarse a cabo si el terminógrafo que lo realiza posee un dominio suficiente de los contenidos de la materia en cuestión”. Unless a terminologist is also a specialist in the field to be dealt with – something which may happen but which is not so common – both terminologists and specialists will lack a fundamental part of the knowledge required for the terminographical work: either the in depth knowledge of the speciality domain in the case of the terminologist, or the knowledge of the terminological principles and methodology to be used in the case of the specialist. Going a little bit deeper into this topic, Cabré (1993) explains that, on the one hand, specialists do acquire in a progressive way throughout their training the knowledge for becoming so.

Consequently, when elaborating a terminographical work, the specialist has a very productive and useful basis with regards to the precise knowledge about the conceptual content of the work. However, in his/her training, the principles and

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methods of terminology and other linguistic knowledge fundamental for the terminographical practice will, most probably, not have been included. On the other hand, however, if the terminographical work is undertaken by a terminologist exclusively trained in linguistics, he/she will need – in addition to this linguistic knowledge – other kinds of knowledge regarding the content of the specialised domain he/she intends to work with, and without which this terminographical work could not be initiated.

Hence, when undertaking a terminological work, the interdisciplinary character or nature of the very same matter places us unavoidably in the need of combining three main blocks of knowledge (Cabr , 1993):

- o A first block regarding the knowledge of terminology in its widest sense: theoretical principles, methodology, practical experience, etc. In order to acquire information about this, monographical and general works on the topic are usually consulted. Although the complete list of this kind of materials used in this study can be obtained in section V (bibliography), I have based the acquisition of the necessary knowledge for the management and analysis of terminology both as a discipline and as a group of terms mainly (although not exclusively) on the works of: Auger, P. and Rousseau, L.J. (1987); Bergenholtz, H. and Tarp, S. (1995); Cabr , M.T. (1993); Cabr , M.T. (1999 a) Cabr , M.T. (2000 b); Cabr , M.T. (2001 a and b); Rey, A. (1995); Sager, J.C. (1993); Sinclair, J.M. (1991) and Vargas Sierra, Ch. (2005).
- o A second block of knowledge which comprehends the content of the specialised discipline and is usually embodied in the specialist. In order to obtain information and knowledge about the working field or area as such, monographies, classifications, thesauruses, conferences, thematic dossiers – compilations of materials about a topic area usually including newspapers, specialised journals, articles, etc. – and oral searches have been used. In addition to this, Cabr  (1993: 272) concedes:

Para la resolución de dudas específicas y la recopilación de informaciones puntuales, las consultas a los especialistas son de gran utilidad. Las respuestas que estos proporcionan suelen tener un valor informativo muy importante [...]

The specialists consulted in this study and their role have been specified in detail in section II.2.1.

- A third block of knowledge about the language or languages of work (linguists do usually have this knowledge). For the issues regarding the different denominations in the different languages, dictionaries, glossaries and lexicons are usually resorted to. Figure II.8 below shows a comprehensive list from the “Instituto de Promoción Cerámica” with technical dictionaries in general and specialised dictionaries and glossaries containing information/documentation about the speciality field of ceramics in particular. Regarding documentation about terms in particular see the next subsection on “documentation about terms”.

Título	Autor	I.S.B.N.	Edic.	Código
A DICTIONARY OF SYMBOLS	J. E. CIRLOT	0880297026	1993	D-035
A PRACTICAL ENGLISH GRAMMAR	A J THOMSON, A V MARTINET	0194313476	4ª 1986	D-030
AN ILLUSTRATED DICTIONARY OF CERAMICS	GEORGE SAVAGE AND HAROLD NEWMAN	-	1992	D-029
CALIDAD INDUSTRIAL. GLOSARIO TERMINOLÓGICO. CASTELLANO/ INGLÉS/ FRANCÉS/ ALEMÁN/ ITALIANO/ PORTUGUÉS	-	8474743508	1986	D-049
CEC DICCIONARIO DE AZULEJOS CERÁMICOS	-	-	1970	D-015
CERAMIC DICTIONARY ( CD- ROM )	VERLAG SCHMID GMBH	3980601102	1997	CD-002
CERAMIC GLOSSARY 1984	WALTER W PERKINS	-	2ª 1984	D-013
COLLIN'S INGLÉS DICCIONARIO ESPAÑOL-INGLÉS INGLÉS-ESPAÑOL	COLIN SMITH	-	1979	D-006
CONSTRUCTION GLOSSARY. AN ENCYCLOPEDIA REFERENCE AND MANUAL	J. STEWART STEIN	047156933X	2ª 1993	D-051

CORRESPONDENCIA COMERCIAL I PRIVADA EN CATALÀ	MANEL RIERA	-	1985	D-025
DICCIONARI DE SINONIMS I ANTONIMS	S PEY	-	1990	D-023
DICCIONARIO ALEMÁN-ESPAÑOL ESPAÑOL-ALEMÁN VOX	MICHAEL SCHMIDT	-	3ª 1986	D-003
DICCIONARIO BÁSICO DE LA CONSTRUCCIÓN	JOSÉ ZURITA RUIZ	84-329-2905-0	1999	D-057
DICCIONARIO CERAMICO CIENTIFICO-PRACTICO (ESPAÑOL-INGLÉS-ALEMÁN-FRANCÉS)	CLAUDIO GUILLEM MONZONÍS, Mª CARMEN GUILLEM VILLAR	8439887450	1987	D-016
DICCIONARIO DE ARQUITECTURA, CONSTRUCCIÓN Y OBRAS PÚBLICAS	R. E. PUTMAN, G.E. CARLSON	8428315604	4ª 1996	D-050
DICCIONARIO DE CERÁMICA. TOMO 1: LETRAS A HASTA D	JORGE FERNÁNDEZ CHITI	-	1984	D-017
DICCIONARIO DE CERÁMICA. TOMO 2: LETRAS E HASTA M	JORGE FERNÁNDEZ CHITI	-	1985	D-017
DICCIONARIO DE CERÁMICA. TOMO 3: LETRAS N HASTA Z	JORGE FERNÁNDEZ CHITI	-	1985	D-017
DICCIONARIO DE LA CONSTRUCCIÓN	-	8432926086	3ª 1984	D-052
DICCIONARIO DE LA LENGUA ESPAÑOLA	-	8423943992	21ª 1992	D-032
DICCIONARIO DE LAS LENGUAS ESPAÑOLA Y ALEMANA (2 TOMOS)	SLABY, GROSSMANN, ILLIG	-	1991	D-027
DICCIONARIO DE SÍMBOLOS	JEAN CHEVALIER, ALAIN GHEERBRANT	8425415144	1993	D-037
DICCIONARIO DE TÉRMINOS DE ARTE	LUIS MONREAL Y TEJADA, R J HAGGAR	-	1992	D-028
DICCIONARIO DE USO DEL ESPAÑOL. 2 TOMOS. A-G H-Z	MARÍA MOLINER	-	1985	D-001
DICCIONARIO DEL ESPAÑOL ACTUAL, VOLUMEN I Y II.	MANUEL SECO, OLIMPIA ANDRÉS, GABINO RAMOS	84-294-6472-7	1999	D-054
DICCIONARIO ENCICLOPÉDICO DE TÉRMINOS TÉCNICOS INGLÉS-ESPAÑOL ESPAÑOL-INGLÉS (3 VOLS)	JAVIER L COLLAZO	-	1980	D-008
DICCIONARIO ILUSTRADO DE ALFARERÍA PRÁCTICA	ROBERT FOURNIER	-	1981	D-011
DICCIONARIO ITALIANO-ESPAÑOL ESPAÑOL ITALIANO (2 TOMOS)	EMILIO M MARTÍNEZ AMADOR	-	1983	D-010
DICCIONARIO PLURILINGÜE DE TÉRMINOS DE ARQUITECTURA Y CONSTRUCCIÓN	CHRIS GRECH (ED.)	8425217628	1998	D-056

DICCIONARIO TÉCNICO-COMERCIAL ITALIANO-ESPAÑOL ESPAÑOL-ITALIANO (2 VOLS)	PIERO PELLIZARI DEMESSE	-	1990	D-009
DICCIONARIO TECNOLÓGICO INGLÉS-ESPAÑOL	F FRANCO IBEAS	-	1980	D-007
DICTIONARY OF CERAMIC SCIENCE AND ENGINEERING	IAN J MCCOLM	0306445425	2ª 1994	D-034
DICTIONARY OF CERAMIC SCIENCE AND ENGINEERING	LORAN S O'BANNON	-	1984	D-014
DICTIONARY OF CERAMICS	ARTHUR DODD, DAVID MURFIN	0901716561	3ª 1994	D-043
DICTIONARY OF ENVIRONMENTAL SCIENCE AND TECHNOLOGY	ANDREW PORTEOUS	0 471 63470 0	2000	J2-12-024
DICTIONNAIRE FRANÇAIS-ESPAGNOL ESPAGNOL-FRANÇAIS LAROUSSE	RAMÓN GARCÍA-PELAYO Y CROSS Y OTROS	-	1967	D-004
ELSEVIER'S DICTIONARY OF BUILDING TOOLS AND MATERIALS	L Y CHABALLE, J P VANDENBERGUE	-	1982	D-012
EUROPÄISCHE UNION DER FLIESENFACHVERBÄNDE DICTIONARY	-	-	1994	D-038
GLOSARIO EUROPEO DE LA CERÁMICA	-	-	1992	D-046
GLOSSARIO CERAMICO ITALIANO-FRANCESE FRANCESE-ITALIANO	-	-	1984	D-020
GLOSSARIO CERAMICO ITALIANO-INGLESE INGLESE ITALIANO	-	-	1983	D-019
GLOSSARIO CERAMICO ITALIANO-SPAGNOLO SPAGNOLO-ITALIANO	-	-	-	D-018
GLOSSARIO CERAMICO ITALIANO-TEDESCO TEDESCO-ITALIANO	-	-	1983	D-021
GLOSSARY OF ARCHITECTURE (2 VOLS.) VOL. 1- TEXT; VOL. 2- PLATES	-	-	1840	D-041
GRAN DICCIONARIO DE SINÓNIMOS Y ANTÓNIMOS ESPASA	-	-	1991	D-002
GRAN DICCIONARIO LAROUSSE ESPAÑOL-INGLÉS ENGLISH-SPANISH	RAMÓN GARCÍA-PELAYO Y GROSS	8480160551	1993	D-033
ILLUSTRATED DICTIONARY OF SYMBOLS IN EASTERN AND WESTERN ART	JAMES HALL	0064309827	1994	D-053
LOOKING AT EUROPEAN CERAMICS. A GUIDE TO TECHNICAL TERMS	DAVID HARRIS, CATHERINE HESS	0892362162	1993	D-031
MANUAL DE ORNAMENTACIÓN	F.S. MEYER	9688872458	5ª 1994	D-044
MERRIAN WEBSTER'S COLLEGIATE DICTIONARY	-	0-87779-708-0	10ª 1994	D-042

NUEVO DICCIONARIO POLITÉCNICO DE LAS LENGUAS ESPAÑOLA E INGLESA (2 VOL)	FEDERICO BEIGBEDER ATIENZA	-	1988	D-005
TECHNISCHES FACHWÖRTERBUCH - DICCIONARIO TÉCNICO . DEUTSCH-SPANISCH / ESPAÑOL-ALEMÁN	H. MINK	8425407044	1991	D-036
TECHNISCHES WÖRTERBUCH DER KERAMISCHEN FLIESEN- UND PLATTENINDUSTRIE	-	-	1995	D-047
THE ITALIAN CERAMIC TILE. DICTIONARY.	-	-	1999	D-055
VOCABULARI CASTELLÀ-VALENCIÀ VALENCIÀ-CASTELLÀ	FRANCESC FERRER PASTOR	-	1987	D-022
VOCABULARI DEL FANG	PERE D'A. ESCAFÍ I TOUS	-	1994	D-040
VOCABULARI VALENCIÀ DE CERÀMICA	ALBERT PÉREZ I MARCO	-	1995	D-039
VOCABULARIO DE LA CERÁMICA DE MANISES	FRANCISCO ALMELA Y VIVES	-	1933	D-045
WEDGWOOD. THE NEW ILLUSTRATED DICTIONARY	ROBIN REILLY	1851492097	1995	K1-13-032

**Figure II.8:** Complete list of technical dictionaries and specialised dictionaries and glossaries on ceramics in the webpage of the “Instituto de Promoción Cerámica”.

### 3. Documentation about the terms

The most frequent search sources used by the professionals undertaking a terminographical activity are – apart from the already mentioned documents about the speciality field – the dictionaries, glossaries and other specialised lexicographical works on the topic together with terminological databases. Cabré (1993) gives 6 main reasons, based on different necessities, according to which dictionaries and databases are consulted for the terminographical work:

- to solve doubts about the existence of a term in a language;
- to know how a term is grammatically used, what its meaning is or how it is written;
- to know the equivalent of a term in other functional or historical languages;
- to know how objects are denominated;
- to find alternatives to a denomination;

- and to know the amount of terms compiled or gathered in a given domain.

Previous lexicographical works, whether general or specialised, are a good source for information and knowledge verification in a given area and, more specifically, they have proved really useful in this research in the stage of term extraction and data processing and, in the case of bilingual/plurilingual lexicographical works, for matching. The more focused these works are on the topic the user is interested in, the more useful they will turn out to be. Following Cabré (1993: 274), 7 different kinds of lexicographical works to be resorted to may be distinguished according to their different terminological interest:

- a) los diccionarios de la lengua general, que incluyen los términos básicos de la terminología especializada conocidos presumiblemente por el público en general.
- b) Las enciclopedias, que ofrecen una gran cantidad de información sobre los contenidos de las disciplinas, puesto que, además de incluir terminología, presentan datos conceptuales muy variados a través de clasificaciones, esquemas, ilustraciones, etc.
- c) Los diccionarios generales de la ciencia y de la técnica, que, en teoría, solo incluyen terminología especializada.
- d) Los diccionarios especializados, que incluyen información sobre los términos de una determinada materia (forma, equivalencias y definiciones, explicaciones o clasificaciones). Suelen ser más precisos que las enciclopedias y los diccionarios científico-técnicos de carácter general.
- e) Los diccionarios visuales especializados, que permiten hallar las denominaciones de una temática a partir del concepto, representado a través de una ilustración.
- f) Los léxicos o vocabularios sin definición ordenados temáticamente, que, a través de esa ordenación, ofrecen informaciones sobre la estructura conceptual del dominio de especialidad que tratan.<sup>37</sup> En este grupo incluimos también los tesauros y las clasificaciones.
- g) Las bases de datos terminológicos, que son la fuente de consulta más completa, normalmente la más actualizada y también la más orientativa sobre los términos, ya que el soporte automatizado permite no solo mantener la información permanentemente al día (con un coste razonable) sino también recuperar multidimensionalmente esa información de acuerdo con los intereses de cada trabajo.
- h) Otras obras más precisas, como los diccionarios de neologismos científicos y técnicos o los boletines de términos normalizados, son también herramientas de consulta básicas del terminólogo.

Some examples of this documentation about the terms in the specific case of the ceramics industry – and which, accordingly, have been used in this study – are:

<sup>37</sup> Following Cabré (1993: 274): *Los vocabularios y léxicos ordenados alfabéticamente y sin definición no sirven de documento de referencia sobre los contenidos de una materia porque no contienen información conceptual. Sí pueden utilizarse, en cambio, para la verificación de informaciones.*

- “Ceramic glossary”:  
<http://www.digitalfire.ab.ca/ceremat/glossary/index.php?goto=A>
- Fernández Chiti, J. (ed.) (1984): *Diccionario de cerámica*. Tomo 1, Condorhuasi.
- Fernández Chiti, J. (ed.) (1985): *Diccionario de cerámica*. Tomo 2, Condorhuasi.
- Fernández Chiti, J. (ed.) (1985): *Diccionario de cerámica*. Tomo 3, Condorhuasi.
- *Glossario ceramico italiano-spagnolo/spagnolo-italiano. Glosario cerámico italiano-español/español-italiano*. Faenza Editrice (1983).
- *Glossario ceramico italiano-inglese/inglese-italiano. Ceramic glossary Italian-English/English-Italian*. Faenza Editrice (1983).
- Glosario cerámico Geocities:  
<http://www.geocities.com/SoHo/Café/6895/glosario.htm>
- Guillem, C. and Guillem Villar, M. C. (1987): *Diccionario cerámico científico-práctico*. Sociedad española de cerámica y Vidrio.
- *Diccionario de azulejos cerámicos CEC (Deutsch-English-Español-Français-Italiano-Svenska)*
- Murfin, D. (ed.) (1994): *Dictionary of Ceramics Arthur Dodd*, London. The Institute of Materials.
- Perkins, W.W. (ed.) (1984): *Ceramic Glossary*, Westerville, Ohio. The American Ceramic Society.
- Schmid, V. (1997): *Ceramic Dictionary*, Freiburg.
- “Super-tek” glossary: <http://www.super-tek.com/doi1.htm>
- “The Collector’s Guide” glossary:  
<http://www.collectorsguide.com/fa/fa060.shtml>

#### 4. Documentation about the method of work and the way of presenting terms

The necessary knowledge about the general principles underlying terminology (in its wide sense) is usually acquired through specific formation courses oriented

depending on the addressees and the finality of the work<sup>38</sup>. However, apart from the basic and necessary knowledge of the working methodologies, articles and publications dealing with partial aspects of the discipline or its practice, the terminographer must be aware as well of the decisions adopted in the field by international consensus and published in the form of norms. As has already been mentioned throughout section I. 4.3.2, a norm is a compilation of criteria and guidelines about certain aspects of the work with or about terms. The norms about terminology of the Comité Técnico 37 of ISO deal with the following 5 aspects (Cabr , 1993):

- The assumptions that must be taken into account in terminology:

ISO 704 (1987) *Principes et methods de la terminologie*

- The vocabulary of the very same terminology

ISO/R 1087 (1969) *Vocabulaire de la terminologie* [Norm revised in 1990]

- The process of work in terminology :

ISO/R 860 (1968) *Unification internationale des notions et des termes*

ISO/R 919 (1969) *Guide pour l' laboration des vocabulaires syst matiques*

- The general presentation of the vocabularies and the pieces of information about terms:

ISO/R 1149 (1969) *Pr sentation des vocabularies syst matiques multilingues*

ISO/DP 4466 (1974) *Pr sentation des vocabularies syst matiques unilingues*

ISO 1951 (1973) *Symboles lexicographiques particuli rement pour l'emploi dans les vocabularies syst matiques   d finitions*

ISO/R 639 (1967) *Indicatifs de langue, de pays, d'autorit *

- The format of exchange of terminological data:

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<sup>38</sup> In this specific case, this knowledge has mainly been acquired by means of the “M ster online de terminolog a” organised by the Instituto Universitario de Ling stica Aplicada (IULA) at Universitat Pompeu Fabra, Doctor Chelo Vargas constant support and teaching for the applied part of this research, and my own research work.

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ISO 6156 (1987) *Format d'échange sur bande magnétique des données terminologiques et/ou lexicographiques (MATER)*.

Basic aspects of these norms have also been considered in this study although their date may make them be considered a bit outdated for current terminology. Nonetheless, the documents previously enumerated when referring to “documentation about the speciality field” and, more specifically, to the “first block” regarding the knowledge of terminology in its widest sense, could also have been included here.

As a final remark in this respect Cabré (1993: 277) adds:

[...] los terminólogos deben conocer las líneas de política terminológica que establecen los organismos normativos y administrativos, competentes en cada ámbito de influencia, de cara a la resolución de los neologismos de su dominio de especialidad. Estas orientaciones suelen materializarse en documentos específicos, que deben ser ampliamente difundidos entre especialistas y terminólogos, a fin de mantener un control efectivo sobre las nuevas unidades que aparecen en el léxico especializado.

Additionally, as may be observed in the next section and in section II.1.1, most of the materials used as search materials have also been included in the corpus and thus form part of the “specific working materials”.

### **1.1.2 Specific working materials**

As Cabré (1993) concedes, terms are not usually creations of the very same terminologist but creations of the authors of the concepts that, together with each new notion, introduce the denomination that makes possible to designate it. In specialised communication, terms are used for accurately transmitting information regarding the technical, scientific or professional aspects of specialised disciplines. Accordingly, if a terminologist’s task is to compile the terms of a given speciality field, firstly he/she will have to look for those terminological units effectively used by experts in specialised communication and only afterwards – and only in those cases in which it is absolutely a need – propose an alternative, spare form for certain denominations.

La comunicación especializada entre los profesionales de una materia [...] se materializa en forma de comunicaciones orales (conferencias, clases, diálogos, entrevistas, presentaciones, etc.) o escritas (artículos científicos, informes técnicos, catálogos, programas, libros especializados, planes de trabajo, etc.).

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Estas comunicaciones, evidentemente especializadas a distintos niveles, constituyen las fuentes de los términos especializados. (Cabré, 1993: 277)

As is explained in subsequent sections, the selection of sources and documents for their inclusion as textual samples in the corpus has had as a departure point the previous selection and classification of search materials. In a further step, the documents which constitute the actual, specific working materials (the corpus) of this study have been selected taking into account a series of considerations which are briefly put forward in the next paragraph (for more information see section I.6.4.2.1).

However, these working materials have been specified in section III.1.1 “actual corpus composition”, the present subsection being only a brief preliminary reflection on the importance of making a good selection of textual samples for the corpus since they constitute the source for terminological extraction and for obtaining the linguistic data about terms to be included in the entries.

For the specific case of this study, the documentary sources selected as specific working materials have had to accomplish a series of features/conditions in order to be considered adequate for the terminological work under development. These features have been determined, basically, by the objectives posed and the prospective users for whom the terminological work is intended. The achievement of these objectives has made it necessary an in depth analysis of the documents to be included by means of a process of “evaluation of the sources”.

More specifically, following Cabré (1993), the most important conditions to be accomplished by documents so that they can, in general, be considered adequate working materials, could be summarised into three basic points:

- They must be sufficiently representative of the subject matter according to the objectives of the work and to the delimitation of the topic in order to permit the user to elaborate a first and meaningful list of units of the contents of the domain.
- They must be up-to-date so that the resulting list of terms is illustrative of the current terminological situation of the subject matter. Hence, the working materials must be updated regarding both the denominations used by experts and the information about the contents, so rapidly evolving and changing.

- They must be explicit enough in order to allow the user to identify and retrieve the information contained in a document in any moment during the compilation or diffusion of the terminological data.

Consequently, the specific “working materials” refer to the documents that form part of the corpus as such and hence to those documents used as a source for terminological extraction. As has already been mentioned, this section has dealt with the role and kind of work documentation gathered in the corpus and not with the specific documents compiled, which have been included in section III.1.1 “actual corpus composition”.

### **1.1.3 Supporting material: the terminological card**

This section presents what is considered to be the paradigmatic example of materials for terminological work support: the terminological card. Conceptually speaking, a card is a structured support which allows us to classify the information gathered about a term. However, the notion “card” is not only referred to paper cards but also to registers in a database (see section II.2.6), and it is this kind of terminological card the one that has been used in this work as a supporting material. The importance of terminological cards in works like the one here presented is out of question since, as Cabré (1993: 278) points out:

Si la documentación es la fuente donde aparecen, se localizan y se extraen los términos, las fichas son los materiales donde esos términos se almacenan, se clasifican y se ilustran con sus informaciones correspondientes. En un trabajo de recopilación terminológica, las fichas son el punto de partida de la organización de la información.

In general, Cabré (1993) distinguishes three basic types of cards used as help or supporting materials in the systematic terminological work depending on the objectives of each stage of the work: cards for terminological extraction (*fichas de vaciado*), terminological cards, and correspondence cards. In the development of this research, however, only terminological cards have played a supporting role so that this section has been entirely focused on them.

In the work here presented, the terminological electronic cards (registers) used have been designed by doctor Chelo Vargas at Universidad de Alicante and contain all the fields necessary for the correct and complete characterisation of terms according to the CTT and to the IULMA's terminological criteria, as is illustrated in the screenshot in figure II.9 from the database TermStar<sup>39</sup> XV (the one used in this research). This figure shows the TermStar terminological card of one of the 4,000 final entries presented as final results in this thesis (see section VI.4).

Letter	English (ENG)	Spanish (ESP)	Metadata
A	<b>buff clays</b>	<b>arcillas color ante</b>	Número de ficha: 30071
B	Part of speech: n: [f]	Cat. gramatical: [f]	Proyecto: Cerámica (IndustrialCeramics)
C	Subject: RAWMAT [f]	Campo conceptual: [f]	Gráfico:
D	Abbreviation:	Abreviación:	Estado:
E	Context: The buff clay is de-aired and packaged in a 12-1/2-lb. cylinder, four pugs to a 50-lb. carton	Contexto:	Creado por: Nuria Edo
F	Context Reference: corpus	Fuente contexto:	Creado el: lunes, 04 de junio de 2007 12:23
G	Data Source:	Fuente de datos:	Área temática:
H	Cross Reference:	Remisión:	Nota:
I	Definition: 'Buff' is a term used to describe the color of a non-vitreous or semi-vitreous fired clay that has enough iron to take away its claim to being white yet not enough to make it a brown or red burning ceramic. Buff coloration is generally a straw color or yellowish white. Grey-white firing bodies are not usually referred to as 'buff' firing because the grey coloration is associated with vitrification, especially in reduction	Definición: arcillas numerosas que incluyen baro y arcilla refractaria y cuyos colores ya quemados son de varios tonos de ante natural o de ocre	<b>ENG:</b>
J	Definition source: L		<b>Term: buff clays</b>
K	Synonym: buff ceramic clays		Subject: RAWMAT
L	Headword: buff		Geographic alt.:
M	Category: 2x [f]		Part of speech: n:
N			Syn.: buff ceramic clays
O			Cross Reference:
P			Data Source:
Q			Definition: 'Buff' is a term used to describe the color of a non-vitreous or semi-vitreous fired clay that has enough iron to take away its claim to being white yet not enough to make it a brown or red burning ceramic. Buff coloration is generally a straw color or yellowish white. Grey-white firing bodies are not usually referred to as 'buff' firing because the grey coloration is associated with vitrification, especially in reduction
R			Definition source: L
S			Context: <b>The buff clay is de-aired and packaged in a 12-1/2-lb. cylinder, four pugs to a 50-lb. carton</b>
T			Context Reference: corpus
U			Dianormative Mark:
V			Reliability:
W			Notes:
X			Headword: buff
Y			Category: 2x
Z			Frequency:
			Diacronic Alt.:

**Figure II.9:** Terminological card of the term “buff clays” in TermStar XV created for the prospective dictionary of industrial ceramics.

However, there are many models of terminological cards according to the objectives of each work and to the necessities posed by each organism. Cabré (1993) distinguishes between monolingual cards, monolingual cards with equivalents and bilingual or plurilingual cards. Monolingual cards are those containing information about a specialised term in a single language, whereas if the equivalents of this term in other languages are included what we have are monolingual cards with equivalents. Bilingual or plurilingual cards strictly speaking are those containing complete

<sup>39</sup> For more detail on the use of TermStar and the specific design of terminological cards in this study see section II.2.6.

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information (not just the equivalents) in two languages – as is the case in this study – or more.

In Cabré's (1993: 282) opinion, a standard terminological card will usually contain the following information:

- *Identificación del término*
- *Término de entrada*
- *Fuente del término*
- *Categoría gramatical*
- *Área(s) temática(s)*
- *Definición*
- *Fuente de la definición*
- *Contexto(s)*
- *Fuente del contexto*
- *Remisión a términos sinónimos*
- *Concepto de la remisión*
- *Otros tipos de remisión*
- *Concepto de cada tipo de remisión*
- *Autor de la ficha y fecha de redacción*
- *Notas para informaciones no previstas*
- *Equivalencias en otras lenguas, con indicación de la lengua*
- *Fuente de cada equivalencia*

In addition to these data, a terminological card may also include other kinds of information depending on the specific objectives of the terminological work. On this basis, an example of a standard terminological card for terminological (systematic<sup>40</sup>) work could be the one presented in figure II.10. As may be observed, this terminological card shows, in general, the same kind of fields as the ones used in this study and illustrated in figure II.9, but the electronic format of the TermStar terminological card/register makes of it a much more functional and helpful material, adapted as well to the requirements of this specific project.

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<sup>40</sup> For more information about systematic work (in opposition to restricted work) see section I.6.4.

<b>ADMINISTRATIVE INFORMATION</b>	Card number:				
	Project number:				
	Thematic field:				
	Person in charge: <i>NURIA EDO MARZÁ</i>				
	Entry data:				
	Supervisor:				
<b>INFORMATION TERM SL<sup>41</sup> /L1</b>	<b>Term (SL):</b>				
	Term source:				
	Grammatical information → gram. cat: ( gender: number: )				
	Context(s):				
	Source of the context(s):				
	Variant (s):				
	Source of the variant(s):				
	Abbreviated form/symbol:				
	Source of the abbreviated form/symbol:				
	Observations/comments:				
<b>INFORMATION CONCEPT</b>	Definition:				
	Definition source:				
	Related concepts: <ul style="list-style-type: none"> <li>• synonyms:</li> <li>• antonyms:</li> <li>• cross references:</li> <li>• others:</li> </ul>				
	Observations/comments:				
<b>INFORMATION TERM TL<sup>42</sup> /L2</b>	<b>Equivalent term (TL)</b>				
	Term source:				
	Grammatical information → gram. cat: ( gender: number: )				
	Context(s):				
	Source of the context(s):				
	Variant (s):				
	Source of the variant(s):				
	Abbreviated form/symbol:				
	Source of the abbreviated form/symbol:				
	Observations/comments:				
Reliability:	100%	75%	50%	25%	0%

**Figure II.10:** Example of what could be considered a standard terminological bilingual card.

<sup>41</sup> SL stands for Source Language

<sup>42</sup> TL stands for Target Language

Terminological cards are normally accompanied by a protocol (see section II.2.6.2 for the specific protocol adopted in this study) in which a series of conventions and criteria for systematically and coherently filling them up with linguistic data are specified.



*Methods and means cannot be separated from the ultimate aim.*

**Emma Goldman**

## **2. STAGES IN THE METHODOLOGY USED FOR THE DEVELOPMENT OF THE DICTIONARY OF INDUSTRIAL CERAMICS TERMINOLOGY**

Once the important role of documentation in the development of this study has been put forward, the practical application of this documentation process together with the method underlying the development of the different stages involved in the elaboration of the prospective specialised dictionary have been explained in this section. In this way, the stages of the working methodology adopted in this study have been presented in subsequent sections following the natural order in which they have been performed. As has already been mentioned, the methodology adopted has comprised 8 broad stages following Auger and Rousseau's (1987) steps and Gómez and Vargas' (2002) adaptation of them to new technological possibilities together with our complementary modifications when necessary. Hence, the 8 stages of the method of work have been:

1. Definition of the work
2. Work preparation and corpus compilation
3. Elaboration of the field diagram
4. Documentary corpus management
5. Term extraction
6. Data processing
7. Revision and normalisation
8. Edition

Hence, the following sections deal with the purely applied aspect of the stages comprised in the method of working, so that section I.6.4 must be resorted to if a more theoretical description of these stages is considered necessary.

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## 2.1 Definition of the work

In the first stage of the working method, that of definition of the work, the main aspects to be defined before the development of the terminological work as such, have had to be established (see section I.6.4.1 for a theoretical account on these aspects). This definition of the work has comprised the description of a series of fundamental aspects involved in the creation of the dictionary and necessary for its successful elaboration. These factors will determine both form and content so that the final design of the prospective dictionary depends very much on them. These aspects of the work to be defined and established first than any other consideration have been, for the specific case of this study, the following ones:

- Addressees: the corpus compiled and used, the term selection undertaken and the way of presenting the information in a dictionary may vary depending on whom the prospective users of the dictionary are. In this case, the addressees of the prospective industrial ceramics dictionary are mainly translators and specialists in the ceramic industrial field.
- Delimitation of the linguistic functions: in this respect, it has been necessary to make a first distinction between descriptive and prescriptive work and to decide which approach would be more appropriate for the kind of work to be done. In the case of the prospective dictionary, the function adopted has been descriptive (see section I.4.3.2) because the final specialised lexicographical tool to be obtained is aimed at compiling the terms of a speciality field such as the ceramic industry and the final product – the dictionary – is intended to become a referential tool, not a prescriptive one with normalising objectives. In spite of this, the prescriptive character of this kind of linguistic tool may be considered, in some extent at least, inherent to its very same nature and unconsciously assumed by those who use it.
- Thematic delimitation: it has implied establishing the conceptual and terminological scope of the work and of its related fields. This stage had much to do with the preliminary work undertaken in order to become familiar with

the field of work and start delimiting it and has been thus closely related to the role played by documentation. Consequently, in this first stage the previously acquired knowledge on the field obtained through documentation has made it possible to coherently structure the domain to be dealt with in a way that fitted the objectives posed and the very same nature of the field. This thematic delimitation has originated the exclusion *a priori* of all those sectors non relevant for the purposes of the work. Obviously, in a speciality field like industrial ceramics many other specialised fields do interact or share terminological units (remember the interdisciplinary and transdisciplinary nature of terminology): geology, chemistry, mineralogy, refractories and glass industries among others. However, certain boundaries are always necessary. Sometimes these terminological “boundaries” among related disciplines are blurred, overlap or simply do not exist because the terminological character of a unit may be activated in more than a single domain. Many terminological units belonging to these areas have been included as prospective dictionary entries because they do also form part of industrial ceramics and shape its cognitive specificity<sup>43</sup>. Accordingly, this thematic delimitation has been definitively shaped in the third stage of the terminological work with the development of the field diagram (see sections II.2.3 and III.2). However, previous to this thematic delimitation provided by the field diagram – which is a kind of conceptual system in which the information to be included is coherently organised in a sort of “skeleton” of the area under study – a series of preliminary analyses of the domain regarding the conceptual areas to be dealt with and those to be left apart have been carried out in order to start working and realistically delimiting the field of work from a thematic point of view. Hence, a series of preliminary conceptual areas forming part of the domain have been broadly selected during the pre-stage of familiarisation with the field of work (through documentation) and organised so as to constitute the basis for the design of the proper field diagram in a subsequent stage. These areas detected in the initial stages of the work for thematic delimitation have been the

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<sup>43</sup> Accordingly, in the final field diagram (see section III.2), a subfield called “ALLIED INDUSTRIES” [ALLIEDIND]/“INDUSTRIAS AFINES” [INDAFIN] has been included.

ones shown in figure II.11 below, which has constituted the initial outline for the final field diagram presented in section III.2:

CHARACTERISATION OF RAW MATERIALS	PRODUCTIVE PROCESSES	CHARACTERISATION OF THE FINISHED PRODUCT	APPLICATIONS	OTHERS
Raw materials in ceramics	Extraction of raw materials	Tests on the product	Interior applications	Organisms and institutions
Properties of raw materials	Transformation of raw materials		Exterior applications	General
	Productive processes for obtaining the product		Decorative applications	
	commercialization		Maintenance	
	Security measures			
	Environmental policies			

**Figure II.11:** Preliminary thematic delimitation elaborated in the stage of “work preparation” previous to the definitive delimitation provided by the final version of the field diagram.

Therefore, this first delimitation of the conceptual areas that thematically articulate or constitute the domain under study has gathered all the subfields preliminarily detected as forming part of the industrial ceramic district (raw materials, extraction, transformation processes, final products, etc.) together with “adjacent” or closely related fields such as industrial engineering, chemistry, chemical engineering, and industrial design among others, which do also characterise and enrich industrial ceramics from a terminological point of view. According to the thematic delimitation established – focused on the purely industrial branch of ceramics – the more artistic branch of ceramics, that dealing with pottery or other artistic forms, has not been taken into consideration here.

- The selection of a work team and advisors or consultants: it is necessary for the authors of any work of the sort here presented to select a group of people who will act as assessors during the elaboration process. Two possible situations may be given: in this respect, if the work is to be done by a specialist, he/she will rely on the constant advising of a terminologist or group of terminologists

whereas if it is a terminologist the one in charge of the terminological work he/she will have to resort to and rely on the advice of one or more specialists (as has been the case in this study) to balance the knowledge in these two aspects. For the specific case of normalising terminology, Cabré (1993: 298) makes the following reflection regarding the contribution of experts, a reflection which, in a way, could be made extensive to descriptive works:

La implicación de los representantes de los medios profesionales –que son a fin de cuentas los verdaderos agentes terminológicos-, en alguna de las fases del trabajo facilita que la terminología normalizada pueda ser implantada con mayores posibilidades de éxito.

A study like this, in which two activities of a very different nature (linguistic and industrial/technological) are so closely linked, has thus relied on the involvement and supervision of experts from both areas. In this case, the experts in charge of supervising the linguistic issues approached have been: Dr Santiago Posteguillo and Dr María José Esteve, supervisors of this study, as well as Professor Enrique Alcaraz Varó (Director of the *Instituto interUniversitario de Lenguas Modernas Aplicadas*, IULMA) and Dr Chelo Vargas, both of them well-known authors of ESP dictionaries on shoe industry and stone and marble industries among others – also launched by the IULMA – and whose methodology of work is the basis for this study. In the same way, this research has also benefited from Dr Xavier Molina Morales' (Director of the Graduate Studies Center at *Universitat Jaume I*) knowledge and expertise on the ceramic industrial district in Castellón and from Professor Vicente Esteve's knowledge of chemistry, geology, mineralogy and industrial transformation processes in industrial ceramics.

- Finally, the resources available have been defined: computer equipment (PC, scanner, photocopier, Internet access, etc.) and programs have been absolutely essential for the development of a work like this, so influenced and based on terminotics. The computer programs used in this study have been: *OmniPage Pro 12.0*, *WordSmith Tools 4.0*, *TermStar XV*, *Gendic*, *Excel* and *Word*. In the same way, economical resources for the acquisition of program licences and the possibility to travel to the Universidad de Alicante in order to have the

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evolution of the work assessed and supervised by the aforementioned specialists in dictionary making have also been fundamental.

## **2.2 Work preparation and corpus compilation**

The second stage of the terminographical work has consisted of gathering documentation about the speciality field (what has been called specific working materials; see section II.1.1.2) with the aim of compiling an adequate corpus for the terminographical purposes targeted and starting to undertake the applied work strictly speaking. Although certain aspects of work preparation may seem to overlap with those put forward in “definition of the work”, the basic difference lies in the more theoretical consideration of the latter in contrast with the more practical and action-oriented nature of “work preparation”. Hence, once the theoretical aspects taken into account for this stage of the method have been put forward in section I.6.4.2 and once the considerations taken into account regarding the role of documentation in this study have been presented throughout section II.1, the compilation of the corpus as such has been dealt with in this second stage of the working method.

The actual compilation of the corpus has involved corpus selection and compilation through an institutional and documentary search at the same time that the elaboration of the field diagram<sup>44</sup> proceeded from the stage shown in figure II.11.

The documentary search has been both terminological and textual. On the one hand, the terminological documentary search has been based on already existing dictionaries on the subject matter, making it unnecessary to compile them in the actual corpus for subsequent term extraction because term extraction is directly offered to the terminographer in these works in the form of dictionary entries. Nonetheless, these documents have been highly useful for matching (see section II.2.5.2) and for the data processing stage (see section II.2.6), main reason for having gathered them at this stage. On the other hand, the textual documentary search has comprised the compilation of speciality books, research articles, journals, dossiers and so on, that is, what in section II.1.1.2 has been referred to as “specific working materials”.

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<sup>44</sup> The stage of elaboration of the field diagram is, strictly speaking, the third one in the working methodology but, since, as expected, different versions of it have had to be developed before achieving a final and satisfactory result, this field diagram started to be outlined from the very first stage of the method.

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The institutional search has dealt with the compilation of documents directly coming from authority sources, institutionalised, and thus with a specific and agreed weight within the area of knowledge. In this case, the institutional search has been shaped in the compilation of UNE and EN norms, these materials constituting the second fundamental part of “specific working materials” in the corpus. Being aware of the way in which the ceramic industrial district is organised, together with the knowledge of the different bodies involved in this speciality field have positively contributed to the terminological work, allowing us to gather the most relevant and prestigious information directly coming from sources with institutional recognition.

Together with this, two types of “subcorpora<sup>45</sup>” have been given a special prominence in this study: parallel corpora and comparable corpora. Parallel corpora comprise a series of texts originally worded whether in Spanish or English and including their translation, whereas comparable corpora include a group of texts (originally in English or Spanish) that treat similar aspects, thus making possible or facilitating comparison and terminological analysis. From these two, the parallel one has constituted the most desirable kind of corpus because it has made the terminological work much easier and quicker, especially when having to match a source term with its equivalent(s). As a result, in the bilingual corpus of ceramics, the role played by parallel documents has been fundamental together with that of UNE norms (in Spanish) and their corresponding English versions (EN norms), which account for a highly representative and enlightening part of the corpus because of both their normative and institutional character.

The compilation of textual samples both in English and Spanish for the bilingual corpus in this study has been determined by the factors put forward in sections I.6.4.2.1 and II.1.1.2. and, as a result, the corpus includes documents from different sources and origins keeping, however, two factors as a constant:

- They are real, actual instances of specialised communication on the part of specialist in the ceramic industrial sector.
- They show different levels of specialisation aiming at a textual balance.

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<sup>45</sup> These kinds of corpora have been called “subcorpora” because they both form part of the two bigger corpora, one in English and one in Spanish, that, as whole, constitute the bilingual corpus for the research.

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Therefore, the structure of the kind of documents compiled for the corpus can be organised as follows:

A) UNE /EN norms

Spanish Corpus

UNE norms (with a Spanish version only)

UNE norms (parallel norms in their Spanish version)

English Corpus

EN norms (Just the title translated of the Spanish norms with the same name)

EN norms (parallel norms in their English version.)

B) Internet documents

English Corpus

Spanish Corpus

Parallel Internet documents

C) Books/research articles/journals

Spanish Corpus

English Corpus

For more information on the internal organisation and management of corpus documents, that is to say, on the way corpus texts have been encoded when compiled and then saved and organised once incorporated to the computer in the stage of documentary corpus management, see sections II.2.4 and VI.1, as well as section III.1.1 on “actual corpus composition”. This actual composition of the corpus – that is, the documents forming part of it and resulting from a well cared for composition – has constituted a fundamental part of the method of work since it has represented the departure point, the means, and the tool for the specialised lexicographical study under development.

### **2.3 Elaboration of the field diagram**

On the basis of what has been said in sections II.2.1 and II.2.2, once all the information regarding documentation has been gathered, the next step has been to

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elaborate a definitive graphic representation of the field under study illustrating the conceptual system of the area.

This graphic representation has been the aforementioned field diagram, which allows the terminographer to:

- Delimit the field of work by means of specifying its parts and their relationship within the whole. As a result, this kind of structure has shown the hierarchical relationships established among the terminological units and has helped to coherently organise and present the information in subsequent stages.
- Elaborate and determine a list of notion categories which have been used as a guide for selecting the terms during term extraction.
- Place the terms inside a structured group, which has helped in the correct classification and treatment of the terminological units. This placing has a semantic value and has constituted the first defining element<sup>46</sup> of the terminological units, as shown in the 4,000 final entries presented in section VI.4.

However, the elaboration process of this field diagram has been open and subject to change from the very beginning up to nearly the end of the study. This has been so since this study has adopted an approach based on the premise of “work in progress”, in which previous considerations or hypotheses may be refuted or validated with the empirical data obtained as the work proceeds. That is the reason why, until the whole terminological panorama of the ceramic district was not established and characterised for and through the research, the graphical representation of this skeleton by means of the field diagram was prone to change in some respect as in fact happened.

It was in this light that the detailed field diagrams shown in figures II.12 and II.13 – one in English and one in Spanish – were designed. These field diagrams, which have not been yet the final versions adopted, have constituted an detailed characterisation of the field under study in which the different subfields of the area have been put forward.

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<sup>46</sup> In the form of, for instance, RAWMAT, standing for “raw materials” and referring to one of the areas of the field diagram a term may belong to.

- 
1. CHARACTERISATION OF RAW MATERIALS
    - 1.1 Raw materials
      - 1.1.1 Clays and kaolins [CLAYKAOL]
      - 1.1.2 Feldspars [FELDSPARS]
      - 1.1.3 Quartz [QUARTZ]
      - 1.1.4 Other raw materials [OTHERRAWMAT]
    - 1.2 Properties of the raw materials [PROPRAWMAT]
  2. PRODUCTIVE PROCESSES
    - 2.1 Extraction of raw materials
      - 2.1.1 Geology/  
Mineralogy/  
Cristalography [GEO-MIN-CRIST]
      - 2.1.2 Exploitation techniques [EXPLOTECH]
      - 2.1.3 Extraction and exploitation  
machinery [EXTRACTMACH]
      - 2.1.4 Reception of raw materials [RECEP]
    - 2.2 Transformation process of raw materials
      - 2.2.1 Grinding [GRIND]
      - 2.2.2 Atomising [ATOM]
    - 2.3 Productive processes for the obtention of the product
      - 2.3.1 Pressing into shape [PRESSING]
      - 2.3.2 Drying [DRYING]
      - 2.3.3 Preparation of engobes  
and glazes [ENG/GLAZ]
      - 2.3.4 Glazing [GLAZING]
      - 2.3.5 Decoration/ Design [DEC-DESIGN]
      - 2.3.6 Firing [FIRING]
      - 2.3.7 Classification [CLASSIF]
      - 2.3.8 End products [ENDPROD]
      - 2.3.9 By-products [BYPROD]
    - 2.4 Commercialisation
      - 2.4.1 Management/storage [MNGMNT-  
STRG]
      - 2.4.2 Marketing [MKTING]
      - 2.4.3 Distribution [DISTRIB]
    - 2.5 Security measures/occupational health [SEC]
    - 2.6 Environmental management [ENVIRONMNT]
  3. END PRODUCT TESTING [CHARENDPROD]
  4. APPLICATIONS
    - 4.1 Indoors applications [INAPPLI]
    - 4.2 Outdoors applications [OUTAPPLI]
    - 4.3 Decorative applications [DECAPPLI]
    - 4.4 Maintenance [MNTNCE]
  5. ORGANISMS AND INSTITUTIONS [ORG-INST]
  6. GENERAL [GRAL]

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**Figure II.12:** Second version (detailed one) of the English field diagram with a first version of subject abbreviations for prospective dictionary entries.

- 
1. CARACTERIZACIÓN DE LAS MATERIAS PRIMAS
    - 1.1 Materias primas
      - 1.1.1 Arcillas y Caolines [ARCCAOL]
      - 1.1.2 Feldespatos [FELDS]
      - 1.1.3 Cuarzo [CUARZO]
      - 1.1.4 Otras materias primas [OTRMATPRIM]
    - 1.2 Propiedades de las materias primas [PROPMATPRIM]
  2. PROCESOS PRODUCTIVOS
    - 2.1 Extracción de las materias primas
      - 2.1.1 Geología/Mineralogía/Cristalografía [GEO-MIN-CRIST]
      - 2.1.2 Técnicas de explotación [TECEXPLOT]
      - 2.1.3 Maquinaria de extracción y explotación [MAQEXTRAC]
      - 2.1.4 Recepción de las materias primas [RECEP]
    - 2.2 Proceso de transformación de las materias primas
      - 2.2.1 Molienda [MOLIEND]
      - 2.2.2 Atomizado [ATOMIZ]
    - 2.3 Procesos productivos para la obtención del producto
      - 2.3.1 Conformado [CONFORM]
      - 2.3.2 Secado [SECADO]
      - 2.3.3 Preparación de engobes y esmaltes [PREPENGESM]
      - 2.3.4 Esmaltado [ESMALT]
      - 2.3.5 Decoración/diseño [DEC/DIS]
      - 2.3.6 Cocción [COCCN]
      - 2.3.7 Clasificación [CLASIF]
      - 2.3.8 Productos resultantes/finales [PRODFIN]
      - 2.3.9 Productos relacionados [PRODREL]
    - 2.4 Comercialización
      - 2.4.1 Gestión/Almacenaje [GST/ALM]
      - 2.4.2 Marketing [MKTING]
      - 2.4.3 Distribución [DISTRIB]
    - 2.5 Medidas de seguridad y salud laboral [SEG]
    - 2.6 Gestión medioambiental [MEDAMB]
  3. ENSAYOS SOBRE EL PRODUCTO TERMINADO: [CARPRODFIN]
  4. APLICACIONES
    - 4.1 Aplicaciones de interior [APLINT]
    - 4.2 Aplicaciones de exterior [APLEXT]
    - 4.3 Aplicaciones decorativas [APLDEC]
    - 4.4 Mantenimiento [MANTNMO]
  5. ORGANISMOS E INSTITUCIONES [ORG-INST]
  6. GENERAL [GRAL]
- 

**Figure II.13:** Second version (detailed one) of the Spanish field diagram with a first version of subject abbreviations for prospective dictionary entries.

These field diagrams have represented the evolution from the initial diagram shown in figure II.11. A first version of the abbreviations of the different subfields associated with industrial ceramics at this point have already been included between brackets. Nonetheless, the field diagrams in figures II.12 and II.13 do not constitute the final version of the bilingual field diagram since the development of subsequent stages in the method has put forward the need of restructuring the “skeleton” of the field a bit and the convenience of making some categories broader or not so specific. As a result, section III.2 and, more specifically, figures III.3 and III.4, show the final version of the bilingual field diagram, that is, the one containing the subject categories or subfields (and their abbreviations) used in the final entries presented in this study and in the ones to be developed yet for the prospective dictionary.

#### **2.4 Documentary corpus management**

In this fourth stage of the method, in order to process the textual samples that form part of the corpus previously compiled, these samples have had to be “stored” as a collection of files in the computer. With this aim, the texts with an electronic format, have been quickly incorporated to the computer by means of “optical reading” or the keyboard. On the contrary, those texts in paper format have been incorporated through digitalisation by means of a scanning process using *Omnipage Pro.12*. Afterwards, using the same program, the sections of text to which the OCR (Optical Character Recognition) process wanted to be applied have been manually selected. At this point, it has been important to bear in mind that the lists of terms that have appeared later on when applying the terminological extraction programs or concordance software programs have greatly depended on the quality and appropriateness of the bits of text selected and recognised in the OCR process – and, consequently, on the quality of the corpus as a whole. Due to this, the sections of text to which this process has to be applied have been manually selected. If possible and advisable, any information that could be considered irrelevant to the goals of the study such as formulae, graphics, bibliographic references, figures, page numbers and any other visual material has been avoided and thus ignored during the OCR. Through OCR, the program has optically recognised the characters of the textual samples manually selected so that the terminographer may transfer what the program has recognised and export it to other

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programs and formats compatible to their method of work (Word, Excel, etc.), rendering it machine-processable.

The mistakes a text may contain after the stage of optical character recognition have been corrected afterwards using the text processor Word, and therefore, once the OCR process has finished and texts have been saved as files, they have had to be saved in *txt* format. In this way, texts have allowed their importation to Word for their subsequent and aforementioned revision and correction phases. The way in which these texts have been named for coherently saving them has maintained the nomenclature (codes) with which they were compiled in their original formats (explained in section VI.1 of the appendix).

Thus, the next step has been to correct orthographic errors and reconstruct the text format that has been lost at certain points in the OCR process (reshaping empty lines, paragraphs, avoiding tabulations etc). The resulting corrected text has been saved again in *.txt* since it is a compatible format with the database to be used in subsequent stages of the method.

However, there have been a series of preliminary operations to be done before simply saving the documents as files. A note of the data of the selected samples had to be made in a control document (shown in figure II.14). In this respect, the concept of sample may result rather confusing since a text (even a whole book) may represent just one sample or many samples: for example, if a complete book on ceramics is included in the corpus and the book is divided into chapters, each chapter can be considered a sample. A document can also be divided into samples according to the topic it deals with.

Complementarily, a copy of the document had to be printed – in case of having electronic format – and photocopied – in case of having paper format – with the aim of obtaining “material” evidence of the documents used.

## CONTROL OF DOCUMENTS

Title of the work:

Author:

Number/Identifier of the document:

Classifying characteristic in the field diagram:

Paper format/ Electronic format

Normative text/Belonging to the area/Reference material

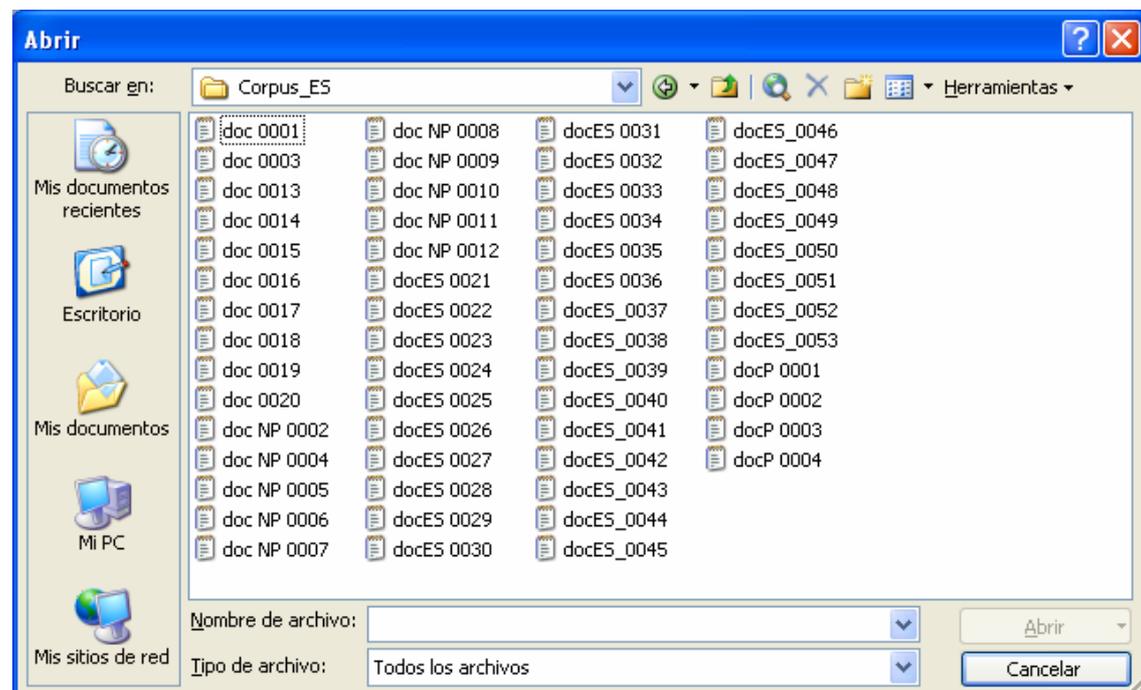
Paralel Document? YES/NO

<u>Sample 01</u>	
Number of words:	
Initial page:	Final page:

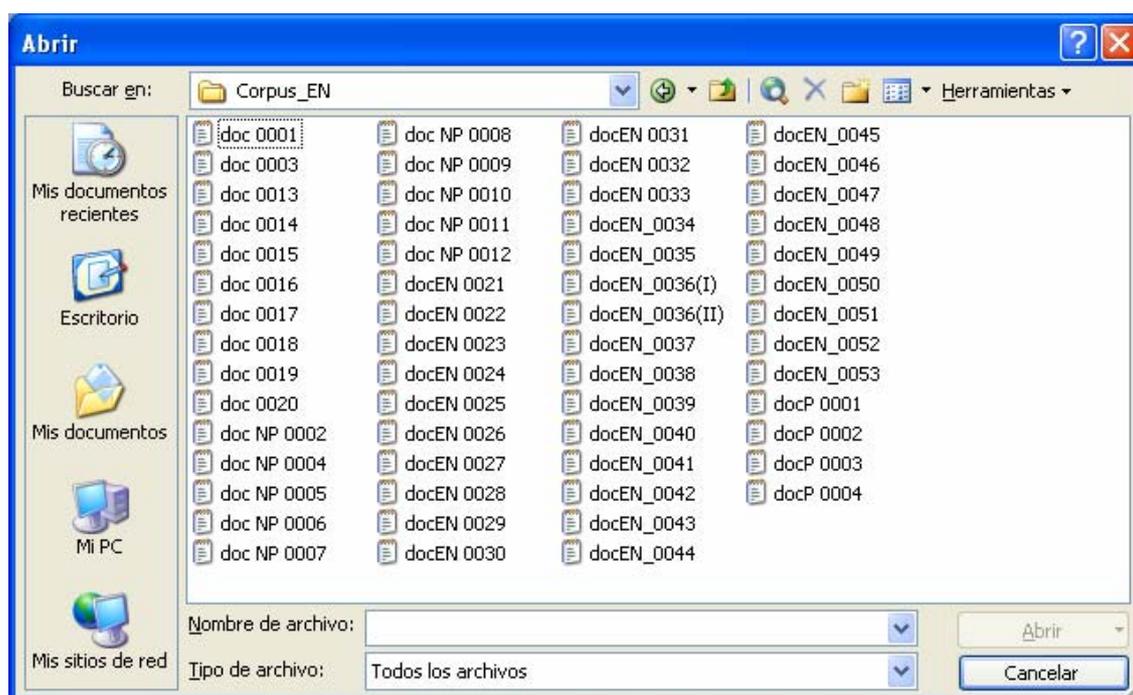
<u>Sample 02</u>	
Number of words:	
Initial page:	Final page:

**Figure II.14:** Sample of a control document for the texts in the corpus.

The distribution and encoded organisation of the files as they appear in the computer once they have been rendered machine-processable, that is, ready for working with them in subsequent stages of the working method, is shown in figures II.15 and II.16.



**Figure II.15:** Files from the Spanish corpus (Corpus\_ES) as they have been saved in the computer during documentary corpus management.



**Figure II.16:** Files from the English corpus (Corpus\_EN) as they have been saved in the computer during documentary corpus management.

## 2.5 Term extraction

In the fifth stage of the working method, that of term extraction, the computer concordance program WordSmith Tools 4.0 (WST 4.0) has performed the processing of the texts in the corpus with the aim of identifying characters or chains of characters that could be potential terms and the subsequent analysis of such terms in context in order to verify or revoke their “term status” in real use.

The term extraction process has dealt with the retrieval and delimitation of the linguistic segments belonging to concepts of the speciality field of industrial ceramics. Obviously, this kind of task could have been more easily developed by specialists in the subject matter as they are much more aware of the terminological segments representing the concepts of their own knowledge domain. However, with a series of well-designed steps for carrying out such process (see section II.2.5.1), this term extraction has been systematically approached and completed. As a guide for undertaking this stage of work, the field diagram has been used as a first indicator of the pertinence of prospective terms to the field.

The tools employed for the first part of terminological extraction (the one undertaken with Wordlist) have been mainly frequency and statistical-like (see section

II.2.5.1.1). These mechanisms have made probabilistic calculations that have measured, for instance and amongst others, the frequency – either absolute or relative – of a given LU or group of LUs in a corpus and the degree of association between two units (through the statistical test called Mutual Information (MI)) (Vargas, 2005). However, the systems employing statistical methods produce big amounts of useless data or ‘noise’ and therefore require even a higher human dedication afterwards for the selection of only those LUs from the lists that may have an interest for the study. In contrast, those systems that resort to linguistic methods are at danger of losing valid data. In other words, they generate ‘silence’.

In a second part of the term extraction process (the one carried out with Concord), however, a more textual-oriented approach has been adopted. For this, the prospective TUs obtained with Wordlist have been analysed together with their context(s) of appearance to see their behaviour and functioning in real instances of specialised communication with the final objective of corroborating or revoking their terminological nature.

However, before dealing in depth with these two broad parts of the term extraction process, it is important to bear in mind that the software concordance program WordSmith Tools is a collection of three programmes: Wordlist, Concord and KeyWords. Accordingly, the tasks a terminographer can undertake with this WST program are basically 3:

- Create a list of words, either based on frequency, on alphabetical order or in both of them
- Produce concordance lines, also known as *Key Word in Context* (KWIC). A KWIC list gathers all the occurrences of a given word, that appears highlighted in the middle, allowing the user to analyse and rapidly detect its collocates or words that normally appear surrounding it. This option permits the analysis of linguistic patterns that appear with certain frequency in the corpus and reflect the behaviour of a given speciality language in a context.
- Obtain statistical data

Regarding bilingual terminography – as in the case of this study – a double term extraction process has been needed – both in English and then in Spanish – together

with a subsequent matching stage in which equivalents have been assigned to terminological units in the other language of work. This stage can be considered, together with the stage of “data processing” (see section II.2.6), one of the hardest ones, especially for terminographers with a much wider linguistic than scientific or technical training, since, at this point, the terminographical and technical knowledge starts to merge and work together. Consequently, terminological extraction has been approached by following a series of methodological substages intended at progressively analysing prospective terms until determining whether they are really so or not. This progressive succession of substages or steps – carried out with WST – is what has been called in this research “methodology for semi-automatic term extraction”.

For a more theoretical account on the aspects concerning term extraction, see section I.6.4.5.

### **2.5.1 Methodology for semi-automatic term extraction: WST 4.0**

Regarding the methodology employed for determining which terms could be considered so – and thus deserved a closer analysis in the following stages of this study – two of the three “tools” offered by WST, namely Wordlist and Concord, whose functioning and applications for the aims of this study have been explained in detail in sections II.2.5.1.1 and II.2.5.1.2, have been used. This methodology, together with previous stages of the method explained so far, have led me to a semi-automatic (involving human and technological means) extraction process in both corpora, the English and the Spanish one.

In this respect and broadly speaking, the first approximation to this semi-automatic term extraction process has been to generate a monolexical list of the words in the corpus through Wordlist in order to select the prospective or potential terms that, most likely, could deserve afterwards the label of “proper terms”. This first analysis has been carried out taking into account mainly frequency criteria, proceeding then, through Concord, to analyse the contexts of these yet potential terms in order to provide real, actual data that illustrates their use and corroborates their “term status”. Hence, in this study, and as Vargas (2005) proposes, term extraction from the bilingual corpus of the ceramics and tile industry has been approached through the progressive analysis of Wordlist firstly and Concord results secondly, being the methodology

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followed for obtaining them and corroborating their “term status” the one explained in more detail in subsequent sections. However, it is also worth pointing out that both applications, Wordlist and Concord, have been resorted to simultaneously whenever it has been considered necessary throughout the process.

### **2.5.1.1 Wordlist**

The semi-automatic term extraction process with WST – and most specifically with its application Wordlist – has been initiated with a preselection process intended at getting rid of useless data.

#### **2.5.1.1.1 Preselection**

In the first approximation to semi-automatic term extraction, the one carried out with Wordlist, potential terms have been obtained on the basis of the analysis of frequencies provided by this application in the form of lists of LUs from the corpus arranged according to their frequency of appearance. This first frequency analysis, in which only monolexical LUs have been retrieved and analysed, has been complemented when necessary with the rest of statistical data that Wordlist offers.

However, even prior to this, the first substage of term extraction has been called “preselection” because, even before elaborating the aforementioned frequency lists, a series of grammatical/functional words useless for frequency analysis but very common and frequent in any kind of text have been preselected and removed from the corpus texts under analysis. With this aim, two lexical filters – one in English and one in Spanish – have been used for removing the “noise” or useless data generated by these functional words (pronouns, demonstratives, articles, prepositions...). These lexical filters applied to Wordlist and known as *stopwordlists* were aimed at getting rid of these grammatical words which do not have a specific content and are useless for a terminographical study like this. In section VI.2 in the appendix, the *stopwordlists* used for preselection in this research have been included, but there are hundreds of them on the Internet that can be personalised for a specific goal if desired. In this case, the *stopwordlists* used have been the same as the ones used by the IULMA for previous works of the sort.

Apart from the preselection of grammatical words, this stage has also been called “preselection” because, once these lexical filters were applied to the corpora for the subsequent generation of clean-from-grammatical-words frequency lists, and once these lists were generated, other lexical units which, a priori, could be said not to be terms were also removed. In this sense, another preselection of those words with a clearly non-specialised content and therefore useless for the purposes of this study had to be made.

However, in this first stage in which context has not been analysed yet, it has been crucial to notice that a LU that may be considered at first sight as non-specialised (and therefore not a terminological unit), may be so depending on its immediate co-text or on the communicative situation in which it is given, so that its meaning becomes specialised constituting thus a TU<sup>47</sup>. For a closer observation of these contextual aspects, WST has significantly facilitated the analysis of the contexts of use of potential terms through Concord, used in the second big substage of the methodology of work for semi-automatic term extraction. However, although certain words could be excluded *a priori* as no terms (or viceversa), through Concord analysis first impressions proved to be also contradictory at times. In this sense, a close analysis has been undertaken in which no dubious LU from the frequency lists has been disregarded *aprioristically* without further analysis or, at least, a grounded conviction.

#### 2.5.1.1.2 Monolexical frequency lists

After the preselection phase, the already mentioned monolexical frequency lists free from grammatical words (and other clearly non-terminological units) have been generated by Wordlist. In the case of this study, these monolexical lists of LUs in English and Spanish arranged according to the frequency<sup>48</sup> of the prospective terms (not in alphabetical order), have been used as a first approximation to proper term extraction.

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<sup>47</sup> It is worth remembering here that, according to the Communicative Theory of Terminology (Cabr , 1999), lexical units activate or not their specialised character depending on the context, on the communicative situation in which they are given, so that, at this point, only those lexical units that clearly had a non-specialised character were ignored. Those which raised any doubt were left for further contextual analysis in order to definitively determine whether they could constitute terminological units (TUs) or not.

<sup>48</sup> Terms with a higher frequency occupied initial positions in the lists.

Hence, the procedure for term extraction has started with the preselection of clearly “useless” LUs followed by the close observation of the monolexical frequency lists generated by Wordlist, in which all the prospective monolexical terms of the corpus have been displayed according to their frequency (from the most frequent – number 1 in the list – to the least). Then, starting out from the logical hypothesis that the most common terms of a given field appear with a certain frequency in their corresponding specific discourse, the criterion of frequency has been adopted as a valid departure point in the “term extraction” stage. Hence, presumably, the lexical units with the highest probability of being terms are characterised, due to their representativeness of the field under study, by a high frequency of appearance in the discourse. Nonetheless, at this stage it is worth pointing out that frequency is also a relative criterion as it depends very much on the nature of the texts included in the corpus, and on the amount of texts on specific subfields included in it, that is to say, on the equilibrium or balance regarding the amount of texts included on each subarea. In this sense, it may be the case that a highly significant word appears just once or a couple of times because it belongs to a very specific domain of which the corpus has few textual samples. Hence, some terms which are interesting for and representative of the field of study may appear with a frequency of 1, and this phenomenon may be understood as provoked by a series of circumstances such as the nature of the corpus, its equilibrium or its size. This phenomenon is known as *hapax legomenon*, which in corpus linguistics is defined as the word, expression or form that appears just once in a given corpus. That is the reason why the forms appearing just once have been analysed without dismissing them a priori for they could be instances of this phenomenon.

Therefore, frequency lists do also provide data which, if correctly interpreted, indicate whether the corpus has been correctly designed with respect to the field under study and if it is comprehensive, representative, and balanced enough regarding the subfields of the speciality. Hence, with the information provided by these lists, the adequacy and accuracy of the field diagram given the field of study could also be indirectly analysed and measured.

Consequently, at this point, it has also been useful to resort again to the field diagram in order to quantify if the textual samples from the corpus presented a balance according to the structuring of the area established in this diagram.

Therefore, a basic, general premise in this study has been that if the first words of a monolexical list generated by Wordlist are observed, broadly speaking, the central terms of a speciality field may be identified. In addition to this, it has been important to notice the combinatorial aspect of terms by observing how these highly-frequent, central units may also act as the “bases”/nodes/search words of polylexical terms (collocations) or as collocates of other nodes. Following Ahmad and Rogers (2001: 742 in Vargas, 2005: 685):

Se podría decir que estas unidades son los “términos madre” de una especialidad concreta. Como “madres” engendran otros términos a través de los procesos de formación y combinación que sean válidos en la lengua que está siendo objeto de estudio.

Accordingly, the top-frequent prospective TUs appearing in the monolexical lists generated at this stage (presented in more detail in section III.4.1.2) have been a series of units that, presumably at least, would be considered not only by experts but also by laymen as prototypical of the ceramic industrial domain in both languages, that is to say, the words that, most likely, would come first to any person’s mind when industrial ceramics is suggested (see figure II.17 below).

	<b>ENGLISH</b>	<b>SPANISH</b>
<b>1</b>	Ceramic	Esmalte
<b>2</b>	Glass	Cerámica
<b>3</b>	Temperature	Esmaltes
<b>4</b>	High	Agua
<b>5</b>	Materials	Horno
<b>6</b>	Surface	Arcilla
<b>7</b>	Material	Temperatura
<b>8</b>	Ceramics	Pastas
<b>9</b>	Tiles	Óxido
<b>10</b>	Tile	Cocción
<b>11</b>	Glaze	Pasta
<b>12</b>	Process	Forma
<b>13</b>	Clay	Color
<b>14</b>	Properties	Baldosas
<b>15</b>	Size	Pieza

**Figure II.17:** 15 top-frequent lexical units (prospective TUs) in the English and Spanish corpora.

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From the lexical units observed in figure II.17, no LU could be refuted at first sight as a non-term so that all of them were subjected to further analysis before their final consideration (or not) as terminological units.

### **2.5.1.1.3 Polylexical frequency lists: Mutual Information (MI) scores**

Apart from monolexical lists accounting for individual frequency of prospective terms and providing a first and approximative step for definitive term selection, Wordlist has also offered the possibility of resorting to polylexical listings which can range from 2 to 8 words and can “measure” the strength or degree of mutual dependence of the LUs forming collocations.

Provided the fact that the corpus of this study is bilingual, two lists have been elaborated, one of them with all the texts in Corpus EN (the English one) and the other one with the whole Corpus ES (the Spanish one). In this case, once the texts have been chosen, instead of using the option “Make a word list now”, the prototypical application of Wordlist for the generation of monolexical frequency lists, the option “Make/Add to index” has been used. In the case of this study, these polylexical lists have been employed for the detection of collocates and thus of prospective collocations/polylexical terms that characterise the real functioning of the specialised language of industrial ceramics. In figure II.18, a small section of the English polylexical list<sup>49</sup> can be observed in its Excel version, showing part of the information regarding the top frequency term “glass” and its “relationship” with the LUs appearing in its immediate context:

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<sup>49</sup> Not all the parameters offered by *Wordlist* in its polylexical listings have been included in figure II.18 because they have not been used in the analysis of prospective terms. Among these other parameters not included we find: Z, MI3, LOG L.

	Word 1	Freq.	Word 2	Freq.	Texts	Gap	Joint	MI
151	GLASS	2202	CERAMIC	2698	8	1	123	3,80410218
152	GLASS	2202	SYSTEMS	326	4	2	18	4,08045912
153	GLASS	2202	DRAWING	57	1	4	8	5,42637205
154	GLASS	2202	CF	224	1	2	10	3,77383542
155	GLASS	2202	USUALLY	602	4	1	18	3,19556761
156	GLASS	2202	FROST	71	1	1	5	4,43144321
157	GLASS	2202	MADE	986	5	3	50	3,9576745
158	GLASS	2202	SEE	1847	5	1	49	3,02300382
159	GLASS	2202	WOULD	171	5	1	5	3,16333771
160	GLASS	2202	CO	216	2	1	7	3,31172967
161	GLASS	2202	CONTAINING	356	3	2	24	4,36849117
162	GLASS	2202	SHEETS	106	2	1	6	4,1163044
163	GLASS	2202	MOSAIC	58	2	1	9	5,57120609
164	GLASS	2202	WHOSE	90	1	1	6	4,35237169
165	GLASS	2202	LIGHT	207	1	2	6	3,15073776
166	GLASS	2202	V	1370	1	2	40	3,16123009
167	GLASS	2202	DRAWN	61	2	2	10	5,65045309
168	GLASS	2202	INTO	1013	4	1	27	3,02973127
169	GLASS	2202	DOUBLE	133	2	1	5	3,52590799
170	GLASS	2202	CHARACTERIZED	90	2	1	5	4,08933735
171	GLASS	2202	SHAPED	209	2	2	6	3,13686562
172	GLASS	2202	GLASS	2202	8	2	199	4,7912879
173	GLASS	2202	COMPOSITION	507	5	1	24	3,8583827
174	GLASS	2202	MAKING	204	1	1	18	4,75676203
175	GLASS	2202	FIBRE	108	1	1	23	6,02793646
176	GLASS	2202	WAS	707	4	1	28	3,60105085
177	GLASS	2202	ALKALI	142	2	4	6	3,69447756
178	GLASS	2202	COMPOSITIONS	170	4	1	7	3,65722632
179	GLASS	2202	OPTICAL	143	2	2	7	3,90674591
180	GLASS	2202	PROPOSED	98	1	1	7	4,45190716
181	GLASS	2202	REFRACTIVE	44	3	2	5	5,12175846
182	GLASS	2202	MACHINE	256	1	2	7	3,06661725
183	GLASS	2202	PHASE	1058	4	1	31	3,16633463
184	GLASS	2202	TERM	515	2	2	14	3,05818844

**Figure II.18:** Part of the English polylexical list elaborated by Wordlist and containing part of the information regarding the top frequency term *glass*.

From these polylexical lists, the terminographer may start to determine if the co-occurrence of a node and a collocate(s), that is to say, a potential collocation, is purely by chance or statistically significant. Therefore, these polylexical lists have favoured the detection of prospective polylexical terms and hence their selection for further analysis and data processing.

According to the process or steps adopted for carrying out term extraction, the data provided by Wordlist in the form of monolexical and polylexical frequency lists have been used for determining in a first “filter” which LUs are liable to be considered terminological units and therefore included in the prospective dictionary. Nonetheless, further analysis has been necessary for the elaboration of the definitive list of TUs to be included.

To sum up, the information obtained up to the moment with Wordlist has been revealing and useful for semi-automatic term extraction since monolexical frequency lists have provided a departure point for further analysis of the prospective TUs there obtained and considered as potentially significant. Subsequently, these potentially significant prospective terms have been submitted to further analysis in order to determine their behaviour in combination with other LUs with the help of polylexical frequency lists and, specifically, of MI scores. These scores have offered a first and revealing approach to the combinatorial aspect of terms, giving way to collocations or polylexical terms. Additionally, as is explained in section II.2.5.1.2, Concord results will provide the complementary analysis for definitely identifying collocations, their behaviour in context and thus their “term status” for term extraction. Therefore, in the next general substage for semi-automatic term extraction, and starting out from the lists created in the previous stage, I have proceeded to identify whether the lexical units/potential terms extracted through Wordlist are real TUs. For this, and according to the principles of the CTT, the in depth examination through Concord of the real contexts in which they appear has been necessary.

However, before dealing with Concord analysis, it may be worth pointing out that the use of Wordlist can also provide additional and relevant information in the form of statistical data of the corpus under analysis.

#### **2.5.1.1.4 Statistical analysis**

In addition to monolexical and polylexical lists, the observation of statistical data has also been highly revealing as is shown in the results section III.4.1.4. However, the statistical analysis provided by Wordlist has contributed to term extraction only in an indirect way since, in this study, statistics have been mainly used for measuring different aspects of the corpus such as size or degree of specialisation amongst others.

In order to understand Wordlist statistical results in section III.4.1.4 and the way they have been used and interpreted in this study, it is necessary to understand some basic concepts that Mike Scott (1998) summarises as follows in its manual on WST:

If a text is 1,000 words long, it is said to have 1,000 "tokens". But a lot of these words will be repeated, and there may be only say 400 different words in the text. "Types", therefore, are the different words.

The ratio between types and tokens in this example would be 40% ( $400 : 1000 = 0.4$ ;  $0.4 * 100 = 40$ ).

But this type/token ratio (TTR) varies very widely in accordance with the length of the text -- or corpus of texts -- which is being studied. A 1,000 word article might have a TTR of 40%; a shorter one might reach 70%; 4 million words will probably give a type/token ratio of about 2%, and so on. ( Scott 1998: 92)

The aforementioned section III.4.1.4 has thus provided statistical results in the form of TTR values, standardised TTR values and corpus size among other parameters, together with their interpretation for measuring the adequacy of the corpus.

### **2.5.1.2 Concord**

Starting out from the list of prospective terms – both monolexical and polylexical – obtained with Wordlist, Concord allows the terminographer to observe, for instance, the concordance lines in which these prospective terms appear and analyse from a different perspective the way potential TUs are used in real contexts and hence in real communication among specialists. It is in this light that the behaviour of the units in context can start to be analysed at the same time that their segmentation is approached from an empirical point of view. Thanks to this observation and analysis of terms in context, it has been easier to understand why do terms and their collocates appear with a given frequency and whether this frequency is really an indicator of their terminological character and of their importance within the speciality field. In the same way, as has already been mentioned, Concord provides real data about the use made of these terms on the part of specialists and displays the information in different ways which may provide complementary views to the analysis.

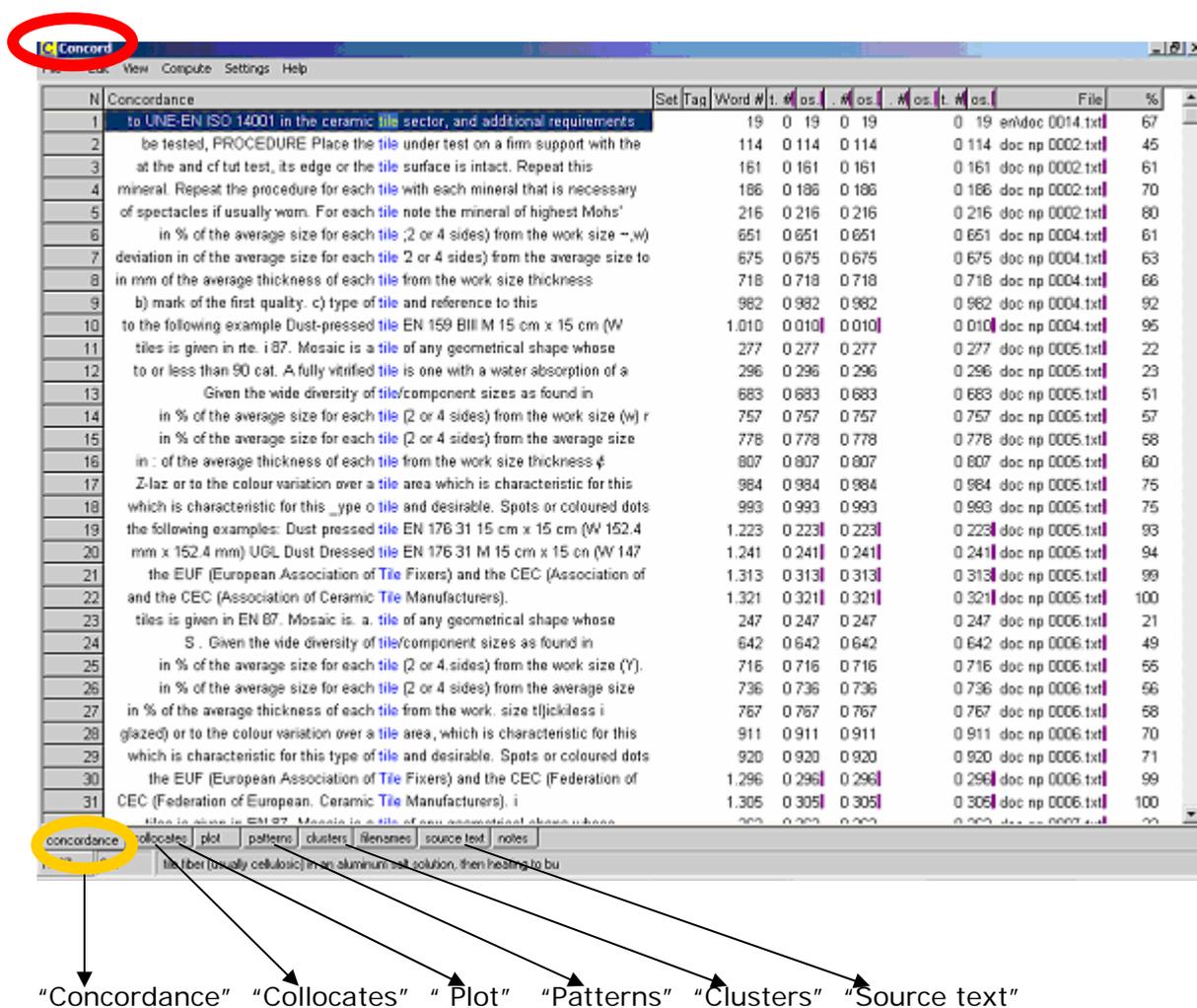
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### 2.5.1.2.1 The application of Concord in the method

Concord is the pure concordance application of WST and has been the one in charge of generating lists of concordance lines (also known as *Key Word in Context* (KWIC)), collocates, patterns and clusters of the terms preselected in the previous Wordlist stage.

Concord and all its complementary applications have made it possible the identification of the linguistic patterns that most frequently appear in the corpus and which, as such, determine the behaviour in context of the TUs shaping industrial ceramics. As a result, the use of Concord in this study has allowed me to analyse the (recurrent) lexical combinations and single/monolexical units that faithfully reflect the terminological dimension of industrial ceramics in real communicative situations. However, as is explained throughout this section, KWIC lists have not been the only option offered by Concord and used here in order to analyse the corpus. The following paragraphs present the possibilities offered by Concord applications and how they have been resorted to systematically through the development of this research in order to definitively perform term extraction and start obtaining and gathering information about terms for the subsequent elaboration of the entries.

Figure II.19 illustrates in a screenshot directly obtained from WST the different applications offered by Concord and specifies which ones have been used in the working method even when in different extents.



**Figure II.19:** Top-31 concordance lines of the term *tile* provided by the application “Concordance” in Concord (with Concord applications highlighted).

From Concord applications, “Concordance”, “Collocates”, “Plot”, “Patterns”, “Clusters” and “Source text” have been the ones used in this study for prospective TUs analysis in context:

“**Concordance**”: as may be observed in figure II.19, this application has provided lists containing the prospective TUs to be analysed (in the case of the figure, the TU is “tile”) together with its co-text or surrounding text, thus retrieving concordance lines from the corpus. Accordingly, with this application, the KWIC lists of prospective terms have been generated – the prospective term highlighted in blue in the middle of the concordance line. The close observation of these concordance lines has constituted, together with polylexical lists in Wordlist, another effective method for detecting polylexical terms departing from a search word or base word (prospective term). By observing, for instance, the word *agua* in a “Concordance” list, compound

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terms and phraseology generated from this LU have been retrieved: *agua regia*, *agua adsorbida*, *agua de esponjado*, etc.

From a more theoretical point of view it may be useful to note here that Concord identifies the terminological combinations in which terms appear, but these combinations are called both collocations and compound terms depending on the authors' view adopted. As Heid (1996) states, the relationship and the borderline between collocations and 'multiword terms' or compound terms is not easy to establish or define and there is no doubt that the delimitation of what constitutes a terminological unit is one of the hardest tasks to undertake by the terminographer. In my opinion, the way they are named is not so important for this study as to precisely identify their function and how they work in context. Consequently, here both denominations have been used as synonyms with a preference, however, for the term collocation (and even polylexical terms<sup>50</sup>, or syntagmatic terms). The objective of this study has been not so much the differentiation of these linguistic concepts in case it exists but the correct identification of significant lexical combinations constituting TUs which, consequently, may be useful for the prospective user of the final dictionary.

**“Collocates”**: this application has provided a list of the LUs that appear in specific positions surrounding the search word under analysis. As may be observed in figure II.20, the first word on the right of the search word<sup>51</sup> is represented in column R1, the first one on the left is represented in column L1 and so forth. “Collocates” also highlights in red significant frequency on the part of the collocates of the term analysed arranging them in their most frequent position.

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<sup>50</sup> In fact, they have been called “polylexical terms” quite consistently all through the study.

<sup>51</sup> In this case the search word or node is “temperature”, which occupies the position named “centre” with a total of 1,950 occurrences.

The screenshot shows the Concord software interface with the 'collocates' tab selected. The main window displays a table of collocates for the search term 'TEMPERATURE'. The table has columns for 'N', 'Word', 'Total', 'Total Left', 'Total Right', and various L- and R-units (L5, L4, L3, L2, L1, Centre, R1, R2, R3, R4, R5). The 'Word' column lists various terms, and the 'Total' column shows their frequency. The 'Total Left' and 'Total Right' columns show the frequency of words to the left and right of the search term, respectively. The L- and R-unit columns show the frequency of words at specific distances from the search term. The 'Centre' column shows the frequency of the search term itself. The 'R1' through 'R5' columns show the frequency of words at specific distances to the right of the search term. The 'L1' through 'L5' columns show the frequency of words at specific distances to the left of the search term. The 'Total' column is highlighted in red. The 'collocates' tab is highlighted in yellow.

N	Word	Total	Total Left	Total Right	L5	L4	L3	L2	L1	Centre	R1	R2	R3	R4	R5
1	TEMPERATURE	2,100	75	75	26	22	17	10	0	1,950	0	10	17	22	26
2	THE	1,565	698	667	128	81	101	322	266	0	101	156	177	110	123
3	OF	661	271	390	73	51	56	38	53	0	101	104	45	66	74
4	A	626	397	231	49	43	84	144	77	0	18	53	62	43	55
5	AND	535	235	300	50	44	38	59	44	0	128	51	36	46	39
6	AT	509	360	129	18	38	105	208	11	0	59	13	21	21	15
7	TO	439	227	212	46	39	67	57	18	0	45	33	40	54	40
8	IS	430	145	285	47	56	29	9	4	0	90	49	40	57	49
9	IN	382	204	178	45	31	40	65	23	0	37	49	34	30	26
10	HIGH	346	303	43	11	8	6	12	266	0	7	14	6	9	7
11	FOR	186	90	96	22	18	14	30	6	0	32	16	13	17	18
12	WITH	163	111	52	12	16	16	39	28	0	9	13	8	9	13
13	WHICH	156	38	118	15	12	2	7	2	0	12	61	20	17	8
14	AS	137	74	63	15	21	13	21	4	0	13	8	12	18	12
15	ROOM	134	126	8	0	4	3	0	119	0	1	1	0	3	3
16	ARE	130	51	79	17	17	7	4	6	0	14	14	16	20	15
17	BE	122	42	80	23	16	2	1	0	0	1	20	22	13	24
18	LOW	119	100	19	7	4	4	12	73	0	0	5	5	6	3
19	BY	117	58	59	11	22	11	10	4	0	4	8	21	13	13
20	C	116	23	93	4	7	7	4	1	0	4	10	34	31	14
21	ON	111	73	38	15	12	8	23	15	0	5	10	5	7	11

Figure II.20: Collocates of the term *temperature* provided by “Concordance” in Concord.

This “Collocates” application has accomplished, in general terms, the same function as the tool “Patterns” (see figure II.21), which is a kind of summary of collocates grouped in their most frequent positions. Thus, both collocates and patterns show the LUs that appear with a highest frequency in the immediate co-text of the term (search word) or group of words analysed, but the data are arranged differently.

The screenshot shows the Concord software interface with the 'patterns' tab selected. The main window displays a table of patterns for the search term 'TEMPERATURE'. The table has columns for 'N', 'L3', 'L2', 'L1', 'Centre', 'R1', 'R2', and 'R3'. The 'N' column lists various terms, and the 'L3', 'L2', 'L1', 'Centre', 'R1', 'R2', and 'R3' columns show the frequency of words at specific distances from the search term. The 'Centre' column is highlighted in blue. The 'patterns' tab is highlighted in yellow.

N	L3	L2	L1	Centre	R1	R2	R3
1	AT	THE	THE	TEMPERATURE	AND	THE	THE
2	THE	AT	HIGH		THE	OF	A
3	A	A	ROOM		OF	WHICH	OF
4	TO	IN	A		IS	A	IS
5	OF	AND	LOW		RANGE	AND	TO
6	IN	TO	OF		AT	IN	AND
7	AND	WITH	FIRING		TO	IS	C
8	IS	OF	AND		IN	TO	IN
9	TEMPERATURE	FOR	CURIE		COEFFICIENT	THAT	BE
10	WITH	FROM	MELTING		FOR	BE	BY
11	FOR	ON	THIS		DEPENDENCE	FOR	AT
12	OVER	AS	WITH		GRADIENT	PRESSURE	WHICH
13	AS	FUNCTION	ELEVATED		T	BETWEEN	MPERATURE
14	STRENGTH	OR	IN		A	THIS	ARE
15	EXPANSION	LOW	INCREASING		CHANGES	ARE	RESISTANCE
16	MATERIAL	ITS	TRANSITION		ARE	CAN	THIS
17	OR	HIGH	HIGHER		AS	HIGH	THAT
18	INCREASES	TIME	POSITIVE		SEE	AT	IT
19	BY	TEMPERATURE	AMBIENT		BELOW	WITH	FOR
20	FROM	GLASS	TO		OR	TIME	AS

Figure II.21: Patterns of the term *temperature* provided by “Patterns” in Concord.

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“Collocates” and “Patterns” have represented two different ways of obtaining the same kind of information. Therefore, in general, I have chosen to proceed to the analysis of collocates using “Collocates” for considering it more visual, illustrative and explicit because of the inclusion of frequencies. However, “Patterns” has also been complementarily resorted to, which has favoured the observation of how a simple, yet prospective, terminological unit may be at the same time the base/node (in capital letters) of a polylexical term: “deep ABRASION”, or a collocate of another base/node: “abrasion resistance TEST”

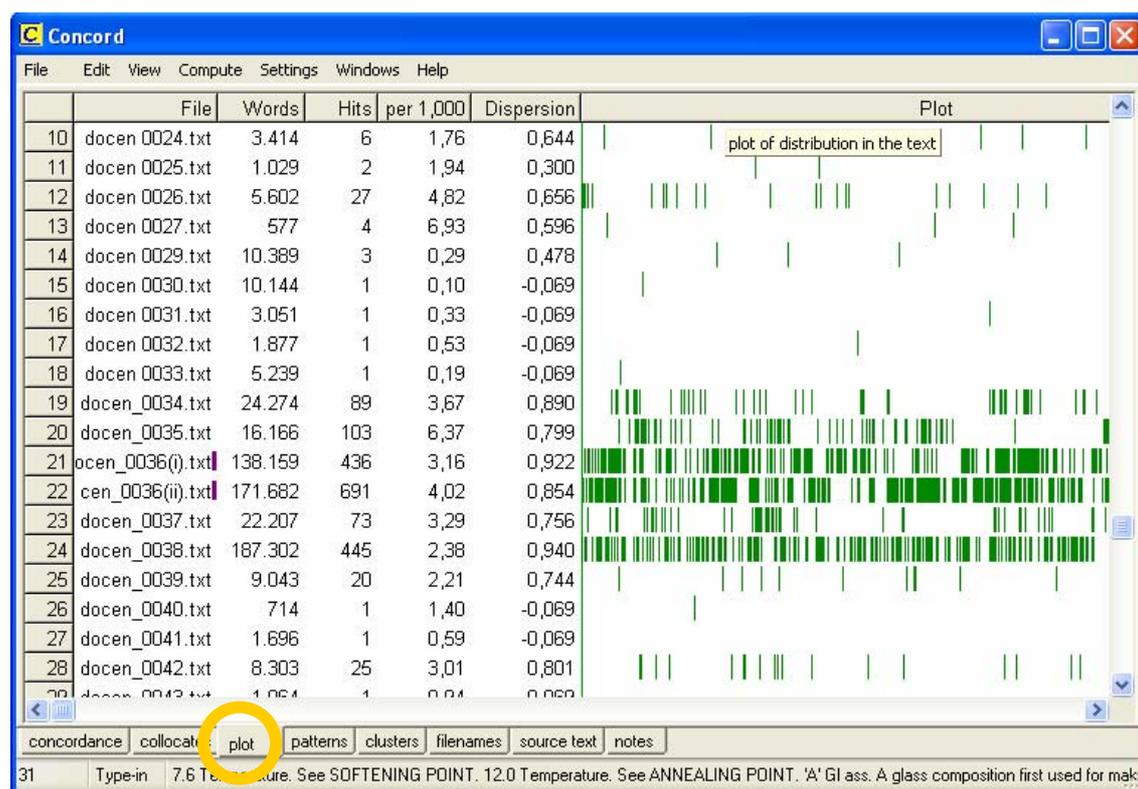
“**Clusters**”: this option (see figure II.22) displays a list of fix sequences of recurrent words in the concordance (understood as the whole list of concordance lines). However, one must be careful because the program looks for the items repeated in the concordance not limiting itself to the bits containing the search word, so that it may be the case that these clusters contain the search word or not. Therefore, “Clusters” takes into account recurrent groupings in the concordance although they do not contain the search word, for instance “of the, in the...”. Nonetheless, some of these lexical groupings, useless from the terminological point of view, may form part of larger units that do contain the search word. This will depend on the predetermined number of words these units have (usually this number ranges from 2 to 5), its minimum frequency of appearance, and the distance or horizons of the word (for instance, 5 words to the right and 5 words to the left). What seems clear is that some of these lexical groupings, especially those of two or three words, may not contain the search word but form part of larger units that do contain it.

N	Cluster	Freq
1	AT ROOM TEMPERATURE	77
2	TEMPERATURE OF THE	46
3	AT HIGH TEMPERATURE	44
4	TEMPERATURE AT WHICH	43
5	THE TEMPERATURE OF	37
6	THE TEMPERATURE RANGE	35
7	THE CURIE TEMPERATURE	34
8	THE HIGH TEMPERATURE	33
9	THE TEMPERATURE AT	32
10	IN THE TEMPERATURE	28
11	AT A TEMPERATURE	27
12	A HIGH TEMPERATURE	26
13	THE TEMPERATURE IS	25
14	ROOM TEMPERATURE THE	21
15	WITH INCREASING TEMPERATURE	21
16	TEMPERATURE DEPENDENCE OF	21
17	FOR HIGH TEMPERATURE	19
18	THE FIRING TEMPERATURE	19
19	AT WHICH THE	19
20	ON THE TEMPERATURE	18
21	AND THE TEMPERATURE	17

**Figure II.22:** Clusters of the term *temperature* provided by “Clusters” in Concord.

Given that these three tools (“Clusters”, “Patterns” and “Collocates”) have been designed to accomplish a very similar function, one of them has been chosen in order to simplify the working method and follow a systematic method of analysis for term extraction. In this case, as has already been mentioned, the choice has been “Collocates” with a complementary view on “Patterns” and “clusters” when necessary.

**“Plot”:** this option has provided the graphic of distribution of the search word. This tool, although not really used in this study, allows the terminographer to visually analyse the position of the search word throughout the text (figure II.23)



**Figure II.23:** Plot distribution of the term *temperature* provided by “Plot” in Concord.

Finally, the option “**Filenames**”, as its own name indicates, has provided the name of the textual sample in the corpus containing the collocation, pattern or concordance line analysed, whereas the option “**Source text**” has shown the actual text in which the search word is given, offering then the complete context in which it occurs. This option has been of much use in order to extend the concordance lines analysed for term extraction and also in subsequent data processing.

To sum up, with Concord I have proceeded to the in-depth analysis and study of the LUs regarded as prospective terms in previous steps and to the analysis of their combinatorial aspect and behaviour in context. The objective of this stage has been to verify and validate the terminological character of the data obtained in the previous stages and, with this aim, as many textual evidences as possible have been looked up in the corpus. The results of Concord application for semi-automatic term extraction have shown practical evidence on the use of terms. Section II.2.5.1.2.1.1 illustrates the exact practical steps which have been followed with Concord in the working method in order to complete the term extraction stage.

### 2.5.1.2.1.1 Concord work for semi-automatic term extraction

After having explained the usefulness of the applications that the terminographer may find in Concord and thus their general use in the development of this study, this section deals in more detail with the Concord work undertaken for obtaining the results presented in section III.4.2.

First of all, on the basis of monolexical frequency lists and the data obtained in polylexical ones regarding possible collocates, further research has been provided by a close observation of “Collocates” results. For this, the most significant collocates in terms of frequency (mainly in positions L3, L2, L1, R1, R2, R3) of the terms preselected as potential terms in the Wordlist phase have been retrieved. For doing so, the prospective terms obtained with Wordlist monolexical analysis have been individually introduced in Concord as search words in order to generate in “Collocates” the whole lists of all their possible collocates. Consequently, collocates have been presented by the program in the order in which they most frequently appear, in a different but complementary display to the one offered by polylexical lists. For instance, one of the most frequent collocates of the term *horno* in the corpus is *atmósfera*, as can be appreciated in figure II.24 (extracted from “Collocates”):

word	total	Total left	Total right	L3	<b>L2</b>	L1	Centre ( <i>horno</i> )	R1	R2	R3
ATMÓSFERA	45	30	15	2	<b>18</b>	0	0	1	6	3

**Figure II.24:** “Collocates” results for *atmósfera*, a collocate of the prospective terminological unit *horno*.

*Atmósfera* is a collocate of the term *horno* and as such, they appear together or in a close position a total of 45 times. The word *atmósfera* appears with a frequency of 6 in position R2 (second on the right), giving way to concordance lines such as:

“en un horno de atmósfera templada...”  
 ↓     ↓     ↓  
 centre R1 R2

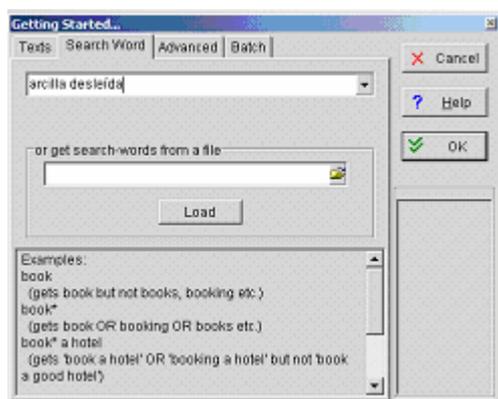
However, the preferred position of the collocate *atmósfera* with respect to the node “horno” in the Spanish corpus is L2 (second on the left), with a total of 18 instances, which gives way to concordance lines such as:

“*dependiendo de la atmósfera del horno, la pieza...*”

↓      ↓      ↓  
L2    L1 centre

What can be deduced then is that the collocation *atmósfera del horno* is highly common for the search word *horno* and, in this way, it has been signalled in the results section as significant and characteristic of the field of knowledge.

Accordingly, at this stage of the study, those collocations which, considering the analysis undertaken so far, have been empirically regarded as significant in terms of frequency, have been introduced, one by one, in Concord’s search window (as shown in figure II.25). In the example shown in figure II.25, *arcilla* is the node or search word and *desleída* is one of the significant collocates selected from the huge list provided by “Collocates” in the previous step. By introducing the prospective collocation *arcilla desleída* in the search window, whole lists of information regarding the use of this polylexical term have been obtained (see figure II.26).



**Figure II.25:** Concord’s search window for introducing the search word (and its collocate(s), if desired) to be retrieved and analysed, in this case, *arcilla desleída*.

As may be observed in figure II.26, all the concordance lines or instances of the collocation *arcilla desleída* in the corpus have appeared in the form of a KWIC list. At this point, also collocates, patterns and clusters can be resorted to and this has been especially useful in order to detect polylexical terms with more than 2 units such as “abrasion resistance test”. Moreover, in order to observe a concordance line in more detail, a double click on it (or the option “source text”) displays the whole text in which the term appears (see figure II.27 for observing the source text for *arcilla desleída* in line 3 (figure II.26)).

N	Concordance	Set	Tag	Word #	t.	# os.	# os.
1	de baldosas, etc. se "atomiza" la <b>arcilla desleída</b> en agua mediante una	35.677	1.676	1.676			
2	tradicional llámase así a la barbotina o <b>arcilla desleída</b> en agua, que sirve para	86.923	0.923	0.923			
3	o puntos negros. El tamizado de la <b>arcilla desleída</b> con 100 % de agua,	29.575	0.575	0.575			
4	a mano, el lavado en agua de una <b>arcilla desleída</b> , el tamizado y el filtrado,	62.644	0.644	0.644			
5	no disuelta sino insoluble. P. ej., la <b>arcilla desleída</b> en agua forma una	19.514	0.514	0.514			

Figure II.26: KWIC list or concordance of the collocation *arcilla desleída*.

duras pastas de colada. Aumenta la ción de los moldes en comparación con los desfloculantes orgánicos tradicionales, ya que, no ataca la superficie del yeso. Es un líquido incoloro, con olor a amoníaco. Impide la resinificación de aceites.  
 PIPETA (graduada): Utensilio de laboratorio químico, que puede servir al ceramista para efectuar pruebas de materiales; adicionar gotas de ácidos; medir pequeñas cantidades de desfloculantes, adhesivos, gomas, etc. Algunos denominan así a la pipa o pipeta de goma o plástico (Ver) para decorar con esmaltes, barbotinas, etcétera.  
 PIQUERA: Pico largo del canchil de terracota, adonde está la macha y por donde surge la llama del alumbrado. Abundaron durante los califatos en España.  
 PIRA: Denominación de la hornalla o construcción trapezoidal que sirve para la cocción de ladrillos comunes de obra. Ver "ladrillo".  
 PRAMDE DE DIAMANTE: Ver artículos "dureza", "indentación", "indentador".  
 PRARGILITA: Es un mineral que consiste en un silicato hidratado de alúmina, con hierro y magnesio. PILARGIRITA: Mineral consistente en un sulfuro de plata, con antimonio. Llámase también "plata roja" dado su color.  
 PRIDINA: Desfloculante orgánico para barbotinas de colada. Es un líquido incoloro, de característico olor.  
 PRIFORME: Dícese de, las vasijas con forma, de pera. Término usado en cerámica arqueológica para descripciones tipológicas.  
 PRITA: (FeS<sub>2</sub>). Mineral consistente en un sulfuro de hierro, compuesto por un 46,50,10 de hierro y un 53,4 de azufre, si bien generalmente se presenta con diversas impurezas en forma de minúsculas inclusiones. Su color es desde amarillento hasta negro, generalmente marrón oscuro. En cerámica interesa este mineral dada que, con mucha frecuencia se presenta como impureza de las arcillas, dando puntos negros que aminan las piezas -después de la cocción. Estos nódulos de pirita-en algunas variedades son atraídos por un electroimán, pero por lo general son débilmente magnéticos, aunque por calentamiento de la arcilla aumenta su capacidad de ser atraídos magnéticamente para separarlos de la arcilla que deba carecer de nódulos o puntos negros. El tamizado de la **arcilla desleída** con 100 % de agua, haciéndola pasar por una malla N° 100, es el método más seguro para eliminarlos. Se conocen unas sesenta variedades de piritas, entre las cuales la "pírotita nW" es magnética (separable por electroimán). Hacia los 1200° las piritas comienzan a fundir en las pastas cerámicas, dejando unos puntos negros oscuros, que son considerados in t e r s a n t e s texturas en pastas de gres para escultura, pero que, son la desesperación de los fabricantes de loza y porcelana, cuyos productos se espera sean blancos y uniformes en, su co

Figure II.27: One of the source texts in which the collocation *arcilla desleída* is found, more specifically that of concordance line 3 in figure II.26.

Taking into account the *Hapax legomenon* phenomenon, I have also considered those collocates that, in spite of not being included in "Collocates" lists for presenting a frequency inferior to 5, appear as low frequency terms after the close analysis of KWIC lists and that, therefore, could also represent an interesting point in the research. This is the case of, for instance, those collocations which do only appear in enumerations in the documents of the corpus but which are not really contextualised.

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These low frequency LUs have also been analysed because the close observation of their concordance lines also showed a remarkable use or behaviour in context.

To sum up, the whole process for semi-automatic term extraction with WST has comprised the following steps:

1. With Wordlist, creation of free-from-grammatical-words monolexical frequency lists, observation, and preliminary selection of prospective TUs for further analysis.
2. With Wordlist, individual analysis of monolexical prospective terms through polylexical frequency lists showing a first approximation to the combinatorial aspect of TUs by measuring the strength of the bond between the search word and its collocates through MI scores.
3. With Concord, complementary analysis to that offered by polylexical lists by resorting to Concord application “Collocates”, in which prospective monolexical terms previously obtained are introduced again and complete lists of collocates are generated showing their position and frequency with respect to the node.
4. Once potential significant collocations (polylexical terms) have been detected, corroborate (or not) the “term status” of each of them by introducing the whole unit (e.g. the aforementioned *arcilla desleída*) in Concord. By observing their behaviour in context through concordance lines, their “term status” should be corroborated or revoked, their corroboration implying their inclusion as dictionary entries in subsequent stages.

In the same way, lists of already “extracted” terms have been obtained from previous lexicographical works compiled for this study and used in order to facilitate the work and corroborate the information obtained.

Additionally, some considerations regarding segmentation have had to be adopted for specific, dubious cases in which the “limits” of TUs were confusing.

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#### **2.5.1.2.1.2 Segmentation: delimitation of the units in term extraction**

A key aspect both when carrying out terminological extraction and when analysing the collocational behaviour of TUs has been segmentation or the way TUs, especially syntagmatic or polylexical ones, are delimited.

In section I.6.4.5.1 in the theoretical framework, a series of theoretical considerations regarding this step of segmentation have been provided. Accordingly, the criteria applied for the segmentation of “dubious to delimit” units obeys Cabré’s (1993) views in this respect. In spite of the fact that most of the TUs selected during term extraction have been “automatically” segmented by the analyses applied, the criteria in the aforementioned section have been highly revealing for a series of difficult-to-delimit TUs

However, very often only specialists are proficient enough for determining whether a LU is a term or not and as such, throughout the method, the contribution on the part of these specialists has been a constant.

For additional information on the way segmentation has been carried out and practical examples of it, see in section II.2.6.2 the point making reference to “the signs for determining syntagmatic TUs”.

#### **2.5.2 Matching**

Matching has been another fundamental step to be performed in this study since a translational tool like the prospective dictionary under development makes it necessary to assign at least one equivalent in the other language of work to the TUs extracted. For matching, a series of procedures and tools have been followed (for specific results regarding matching see section III.4.3):

- The comparison of parallel documents in English and Spanish (see figure III.39 in the results section illustrating matching in parallel documents).
- The comparison of frequency lists in English and Spanish (see figure III.18 in the results section showing how a first, preliminary matching has been

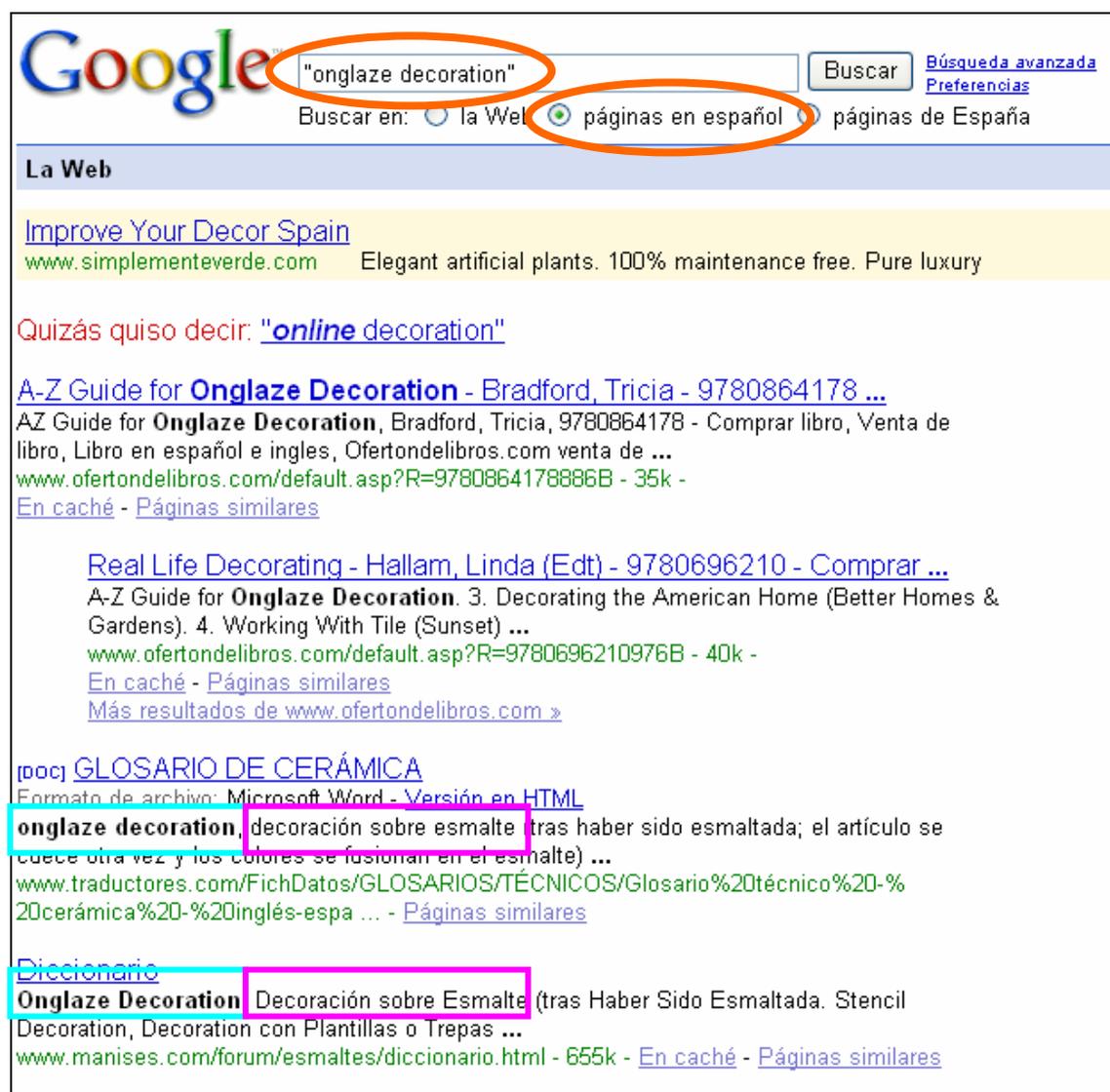
undertaken, for instance, with the top-frequent units of monolexical frequency terms).

- Resorting to previously elaborated bilingual (or plurilingual) lexicographical works.

English	Deutsch	Español
Non-destructive testing	Zerstörungsfreie Prüfung	Ensayo no destructivo
Non-slip	Trittsicher	Antideslizante
Noodle machine	Nudelmaschine	Macarronera
Notched trowel	Zahnkelle, Kammkelle	Rasqueta a dientes (para chapado con cola, mortero delgado)

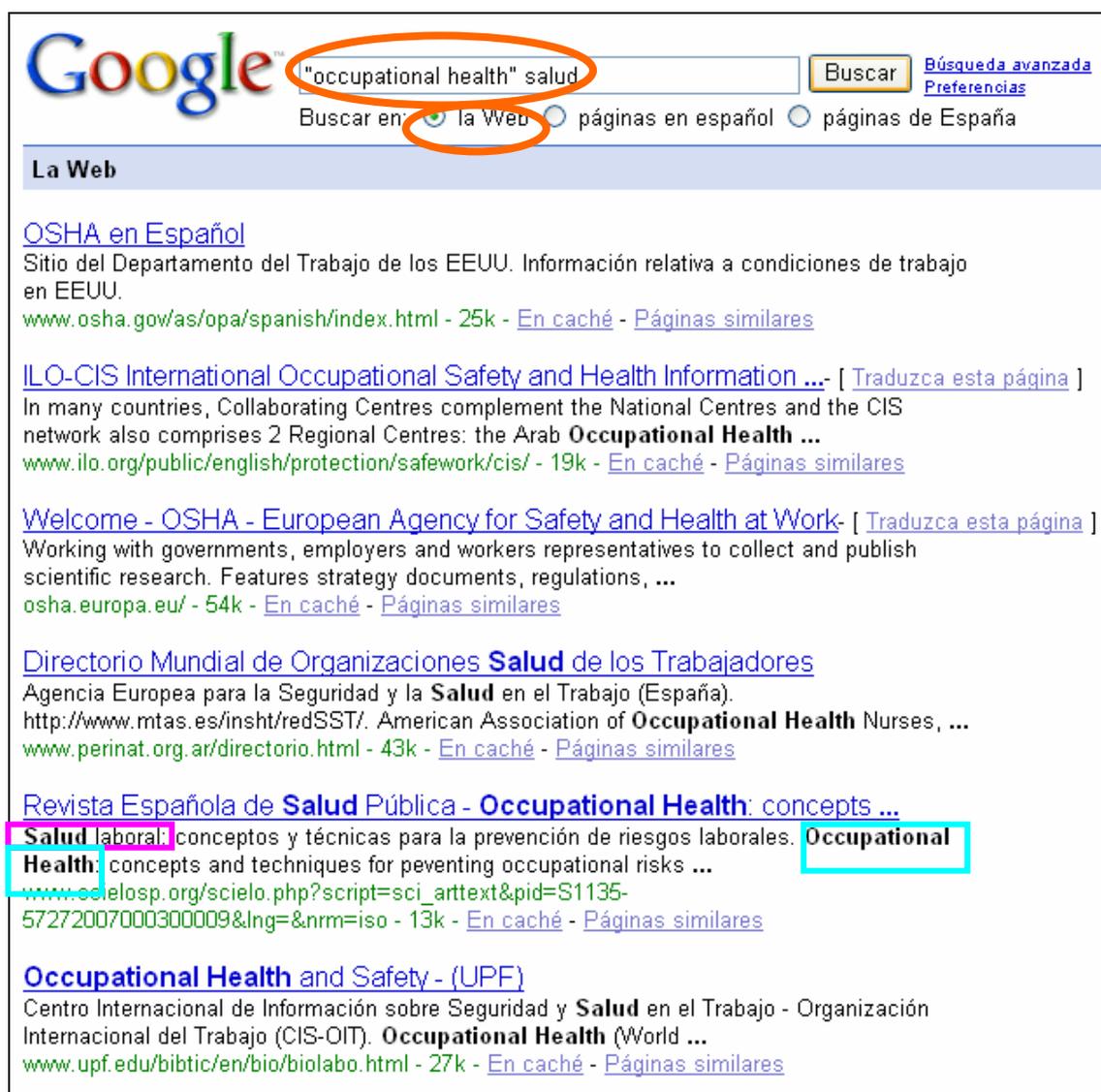
**Figure II.28:** Extract from a lexicographical plurilingual work on industrial ceramics used for term matching.

- The search in Google: the Internet searcher Google has generated significant matching results by means of three main searching techniques or procedures. Firstly, as figure II.29 shows, the initial step/technique used for finding the Spanish equivalent of an English TU has been to write the TU between inverted commas (“”) and activate the search in Google only for *páginas en español* (“pages/sites in Spanish”). Figure II.29 shows the first results generated in Google for the search parameters introduced, among which we find two possible Spanish equivalents for the search term “onglaze decoration”.



**Figure II.29:** Screenshot from Google in which Spanish equivalents are searched with the option *páginas en español* (“pages in Spanish”).

Another search technique used, as shown in figure II.30, has consisted in writing again the source TU between inverted commas but incorporating as well in the search a lexical unit in the target language that, *a priori* at least, may be thought as highly likely to appear as forming part of the equivalent TU. The search is now not restricted to pages in Spanish but to the whole World-Wide Web. Matching results retrieved with this technique have also been highlighted



**Figure II.30:** Screenshot from Google showing the procedure and results of the target language equivalent technique.

Finally, in those cases in which TUs may belong to diverse thematic fields or suggest other more general meanings, the TU between inverted commas has been accompanied in the search by a word that restricts in a way the webpages to be retrieved by the searcher to those related to or significant for the field of work. For instance, the inclusion of the word “ceramics” when searching for the TU “orange peel” makes the searcher retrieve only – or at least mainly – websites related with ceramics and not with other fields such as agriculture in which the “orange peel” is also significant but irrelevant for our purposes. In a way, with this technique we are also trying to avoid “noise” in Internet searches. In this case, the search has also been focused on the pages in Spanish.



**Figure II.31:** Screenshot from Google showing the matching technique of delimiting the area.

- The search in terminological databases: this kind of search has been mainly carried out with the multilingual terminological database from the EU IATE (Inter-Active Terminology in Europe). As figure II.32 shows, this database allows the user to establish from the very beginning a series of search criteria; in this case, the TU selected has been “glaze”, the source language has been English and the target language, Spanish.

**Criterios de búsqueda**

Buscar término:

Lengua de partida:

Lenguas de llegada:

<input type="checkbox"/> bg	<input type="checkbox"/> cs	<input type="checkbox"/> da	<input type="checkbox"/> de	<input type="checkbox"/> el	<input type="checkbox"/> en	<input checked="" type="checkbox"/> es	<input type="checkbox"/> et	<input type="checkbox"/> fi	<input type="checkbox"/> fr	<input type="checkbox"/> ga	<input type="checkbox"/> hu
<input type="checkbox"/> it	<input type="checkbox"/> la	<input type="checkbox"/> lt	<input type="checkbox"/> lv	<input type="checkbox"/> mt	<input type="checkbox"/> nl	<input type="checkbox"/> pl	<input type="checkbox"/> pt	<input type="checkbox"/> ro	<input type="checkbox"/> sk	<input type="checkbox"/> sl	<input type="checkbox"/> sv

Todas

\* Los campos marcados con un asterisco son obligatorios

**Criterios facultativos**

Elija una área temática para su consulta:

Tipo de búsqueda:  Término  Abreviación  Cualquiera

Figure II.32: Search screen from IATE.

Figure II.33 shows part of the list retrieved by IATE containing, apart from equivalents, other relevant terminological information such as definitions and reliability marks.

**Resultado 1- 10 de 58 para glaze**

**MEDIO AMBIENTE [CdT]** [Ficha completa](#)

EN	glaze	★★★★ +@	<input type="button" value="F"/>
ES	esmalte	★★★★ +@	

**Compuesto químico [COM]** [Ficha completa](#)

EN	enamel	★★★★ +@	<input type="button" value="F"/>
	glaze	★★★★ +@	<input type="button" value="F"/>
ES	esmalte	★★★★ +@	

**Electrónica y electrotécnica [COM]** [Ficha completa](#)

EN	glaze	★★★★ +@	<input type="button" value="F"/>
ES	esmalte	★★★★ +@	

**Metalurgia y siderurgia, Compuesto químico [COM]** [Ficha completa](#)

EN	glaze	★★★★ +@	
ES	esmaltado transparente	★★★★ +@	

Figure II.33: Part of the list retrieved by IATE for the search term “glaze”.

Equivalents found during the matching stage have been incorporated to TermStar in the data processing stage.

## **2.6 Data processing: TermStar XV**

The stage following term extraction in this study has dealt with the characterisation of TUs and their storage in an ordered and systematised repertoire together with their relevant terminological data (equivalent, subject, part of speech, definition etc.). This stage has been called data processing. Once the analysis of specialised texts for term extraction – frequency of appearance, collocates, concordance lines and contexts in general – has been undertaken, the resulting bilingual lists of terms have been stored in the database TermStar XV. Consequently, two terminological repertoires, one in English and the other one in Spanish, in which to store the specific knowledge of the domain have been created. TermStar XV has made the generation of terminographical repertoires possible so that, once prospective TUs have been analysed by WST through Wordlist and Concord and subsequently “extracted” as proper terms, the terminological information for each TU has started to be gathered in the form of terminological cards/registers in TermStar XV, which is a system created for multilingual terminological management and oriented to the concept.

In a broad sense, a terminological database is a computerised storage system of lexical elements that are structured according to a series of criteria (alphabetical order, conceptual hierarchy...), according to the users, and according to the finality of the terminological compilation, which must be flexible and accurately reflect the relationships between the hierarchies of information, making the loading of all the pertinent data and their rapid retrieval with varied possibilities of presentation feasible (Gómez and Vargas, 2003 a).

In databases, the traditional concept of terminological card (see sections II.1.1.3 and II.2.6.2) is usually called *register*, which is a structured material containing all the relevant information about a term. Registers are made up of different sections called *fields*. In subsequent sections, a more detailed account on TemStar features and use in this stage of the method has been provided.

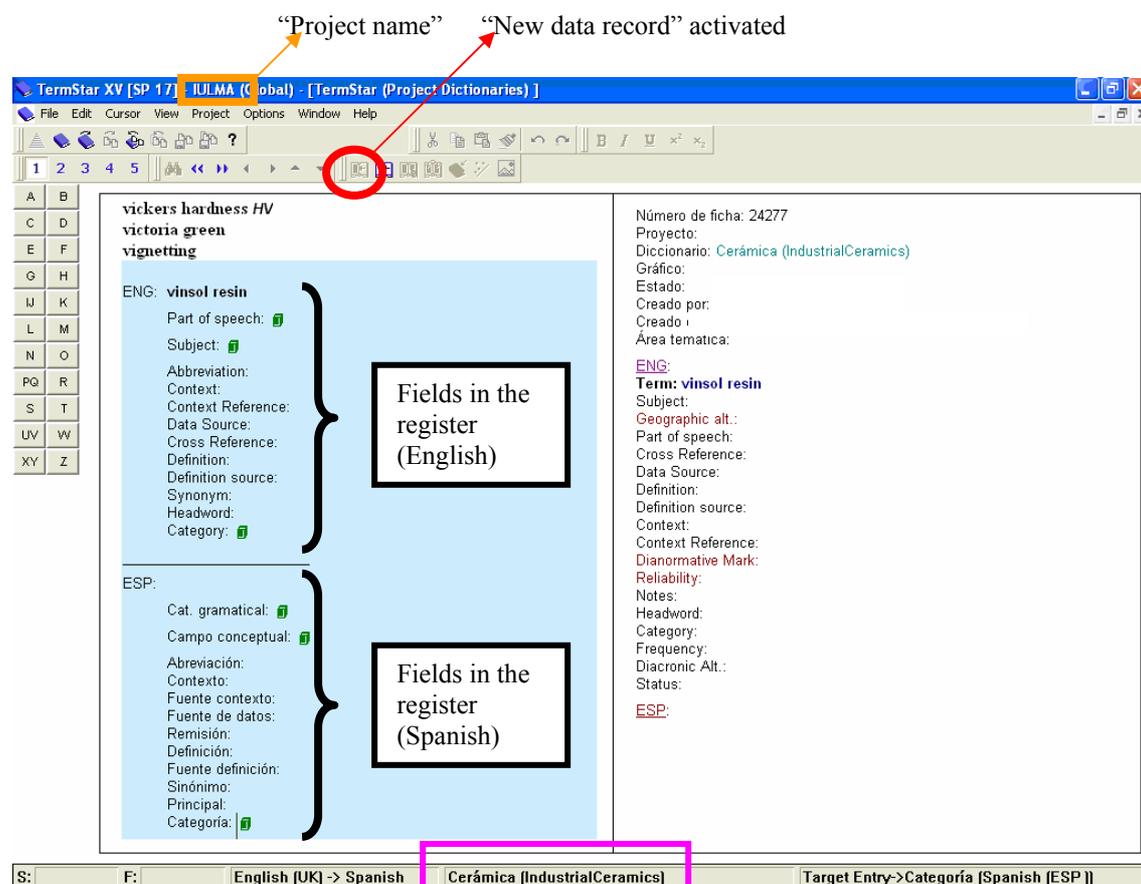
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### 2.6.1 The use of TermStar XV in the method

In the stage of data processing, the sixth of the whole process and the most time-consuming one (together with term extraction), TermStar XV has been used for the management and processing of terminology.

TermStar XV has allowed the aforementioned creation, compilation and storage of the terminographical data cards or registers of the terms extracted in the previous stage of the method. Therefore, at this point of the study, a database has been created with TermStar XV with the aim of gathering in the form of registers all the necessary linguistic information of the terms previously selected as shaping the field of industrial ceramics.

In this stage, the information coming from the term extraction process together with other linguistic data extracted from the corpus and necessary for the correct characterisation of the terms in an active dictionary, have been incorporated to TermStar XV. With this objective, a database has been created for the elaboration of the dictionary and named *IndustrialCeramics*. This database has been included at the same time within the project IULMA (see figure II.34). In TermStar XV, a project is bigger than a database since a single project may contain many databases. In the same way, the creation of a project for containing a database is a prerequisite before creating any database. For instance, the project IULMA may include further databases for other dictionaries on representative industrial sectors in the *Comunidad Valenciana*. Figure II.34 illustrates as well the most significant parts of the kind of database register in TermStar XV used for this study, that is, the different fields to be filled in with the terminological information retrieved from the corpus.



**Figure II.34:** Empty register from the database “Industrial ceramics”.

Therefore, it has been at this point of the method when the information concerning the terms has been organised in the different fields of the registers elaborated according to the protocol explained in section II.2.6.2.

With TermStar XV, a user-defined format, personalised according to the necessities detected, has been created, this favouring a specific, user-oriented structuring of the data.

In section II.2.6.1.1, a more detailed account on some of the technical characteristics and possibilities offered by TermStar has been provided so that the processing of the data carried out in this stage can be more easily understood.

### 2.6.1.1 Technical characteristics of TermStar XV

TermStar XV, the terminological database used in the sixth stage of the method, is a system of multilingual terminological management oriented to the concept. This

implies that TermStar is completely focused on meaning and not on the terms of each language. It allows the user to open a new register (terminological card) for each concept, not for each term, since a concept may contain different terms and linguistic variants for a single object, characteristic or action:

Por ejemplo, un "ratón" puede ser un dispositivo periférico de un ordenador o un animal. Aunque el término sea igual, los conceptos son totalmente distintos. Con TermStar, tendrá dos registros distintos para estos dos conceptos. La presentación clara y distintiva de la terminología le permite identificar entradas terminológicas incoherentes, duplicadas, etc. Esto simplifica el mantenimiento de su bases de datos, incluso en el caso en el que las bases de datos estén separadas físicamente.

(<http://www.star-spain.com/es/tecnologia/term.html>)

Likewise, an example from the ceramic industry included among the 4,000 dictionary entries presented in this study could be, for instance, the term “adamantine”, which in English makes reference to at least 2 different concepts (see figures II.35 and II.36):

ENG: <b>adamantine</b>	
Part of speech: n/a: 	
Subject: TRANSMTRLS/ELABPROC 	
Abbreviation:	
Context:	
Context Reference: corpus	
Data Source:	
Cross Reference:	
Definition:	
Definition source:	
Synonym:	
Headword: adamantine	
Category: 1x 	
<hr/>	
ESP: <b>granalla de acero</b>	
Cat. gramatical: 	
Campo conceptual: TRANSMTRLS/ELABPROC 	
Abreviación:	
Contexto: La granalla de acero con partículas angulares es utilizada para limpiar con un acabado de superficie excelente, para el tratamiento previo antes del esmaltado, pintura u otros recubrimientos	
Fuente contexto:	
Fuente de datos:	
Remisión:	
Definición: <b>abrasivo fabricado por trituración de acero duro y utilizado en numerosas aplicaciones como el tratamiento de superficies y el aserrado de bloques de granito</b>	
Fuente definición: corpus	
Sinónimo:	
Principal:	

**Figure II.35:** Register belonging to the first concept assigned to the TU “adamantine”.

ENG: <b>adamantine</b>
Part of speech: a
Subject: CHEM-PHYSPROP
Abbreviation:
Context: The mineral occurs as sharp, vitreous to adamantine, transparent to translucent, orange-yellow, orange, reddish brown, and black crystals, up to 5 mm in diameter
Context Reference: corpus
Data Source:
Cross Reference:
Definition:
Definition source:
Synonym:
Headword: adamantine
Category: 2x
ESP: <b>diamantino</b>
Cat. gramatical:
Campo conceptual: PROPQUIM-FIS
Abreviación:
Contexto:
Fuente contexto:
Fuente de datos:
Remisión:
Definición: que tiene una dureza y un brillo que recuerdan a los del diamante
Fuente definición: corpus
Sinónimo: adamantino
Principal:
Categoría:

**Figure II.36:** Register belonging to the second concept assigned to the TU “adamantine”.

Accordingly, with TermStar XV, different registers have been created for different concepts denominated by the same TU. As has already been mentioned, in databases, a *register* makes reference to the more traditional concept of *terminological card*<sup>52</sup>, that is, a structured material in which to include or including the relevant data about each term. Registers or cards are made up of different sections called fields. TermStar has more than 50 different fields for each register, some of them assigned by defect by the program and some others which can be defined according to the users of the database, to their needs, and to the final objective(s) of the work. In this way, a personalised distribution model of the fields (layout<sup>53</sup>) has been enhanced so that the terminographer can optimise his/her work and find it easier to focus on the target aimed at.

TermStar proporciona una serie de campos predeterminados para cada registro especialmente pensados para el trabajo terminológico. Para ello, se han tomado

<sup>52</sup> Throughout this study both concepts, *register* and *terminological card*, have been used as synonyms implicitly assuming the electronic character of both of them.

<sup>53</sup> In this case, the layout has been created by doctor Chelo Vargas.

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en cuenta las conclusiones más recientes en el ámbito de la investigación terminológica llevada a cabo por las universidades más importantes. El resultado es un trabajo terminológico más fácil y que cuenta con una mayor funcionalidad de la que es posible obtener con otros sistemas que utilizan campos de base de datos completamente definibles. Entre los usuarios figuran secretarías, traductores y terminólogos profesionales quienes requieren un nivel de prestaciones distinto al que TermStar se adapta perfectamente. ([http://www.star-spain.com/es/tecnologia/term\\_estruct.html](http://www.star-spain.com/es/tecnologia/term_estruct.html))

TermStar does also offer the possibility of quickly creating registers and having immediate access to them:

TermStar es una base de datos relacional que está estructurada según un estándar común de la Unión Europea y que facilita la compatibilidad con otros recursos existentes. Asimismo, la gestión que lleva a cabo el SGBD tiene como resultado que podamos acceder rápida y fácilmente a los datos, que los ordene según unos determinados criterios, que relacione estos datos entre sí, etc. (Gómez, 2005: 553)

As signalled by Gómez (2005), some of the technical characteristics of this system for the management of terminologies (and from which this study has benefited) are:

- The number of databases which can be created with TermStar is unlimited, incorporating as well the possibility of opening them all at the same time if desired.
- The number of registers/terminological cards in each database is also unlimited.
- The structure of registers/terminological cards is fixed but dynamic.
- The register/terminological card contains more than 50 fields, some of them predetermined, with administrative information (for instance the number of the concept, graphics, images, entry date, etc.) and some others of terminological nature that can be repeated in the card/register in each one of the languages of work.
- Each of the fields aforementioned admits a maximum number of characters ranging from 3 to 16,384 depending on the field.
- The number of languages of work is also unlimited.
- It is possible to make searches of truncated words with the character asterisk, as well as specify the fields to search (term, abbreviation, synonyms, etc.).
- In addition to the search function, the program provides, by means of filters, another way of searching terms.

- Cross references in the form of hyperlinks can be created in manual or automatic form. This option allows the terminographer to go from a card to another instantly.
- It allows the user to include non-linguistic fields (such as graphics or images) which, in spite of having no direct correspondence with the kind of information to be contained by the lexical entries of conventional dictionaries may be useful and enlightening.

To sum up, among the main advantages offered by TermStar one may find (<http://www.star-spain.com/es/tecnologia/term.html>):

- Recopilar diccionarios multilingües simultáneamente utilizando todas las lenguas compatibles con Transit y TermStar .
- Importar el contenido de otros diccionarios electrónicos, bases de datos y archivos disponibles en diferentes formatos.
- Personalizar el diccionario según sus necesidades.
- Buscar, filtrar y ordenar la información que figura en el diccionario, según sus preferencias.
- Crear una lista de valores asociados al campo. La lista se puede jerarquizar hasta en 8 niveles.

TermStar XV also offers the possibility of providing adequate responses to the user's questions, reducing to the minimum the amount of noise. Terminological databases are used by a wide range of users with very different profiles so that their needs of information are, normally, also diverse. In this sense, TermStar provides a high degree of flexibility that allows the adaptation to the needs of each user.

Finally, in order to provide a complete view of what this stage has implied, the protocol for the processing of the data during the creation of the registers in the database has been explained.

### **2.6.2 The protocol of elaboration of the terminological cards/registers in this study: *Guía de redacción para la ficha terminológica*<sup>54</sup>**

It is necessary to commence this section by attributing the protocol for the elaboration of the registers in this study to Doctor Chelo Vargas, from the consolidated research group *El Inglés Profesional y Académico* at Universidad de Alicante. This

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<sup>54</sup> Writing guide for the terminological card.

guide, written in 2002, is an internal working document used by the aforementioned research group for lexicographical projects like the one here presented.

It has been crucial at this point of the study in which data processing has been carried out and in which all the linguistic information regarding the TUs has had to be compiled, to adopt the aforementioned protocol created by Dr Vargas (2002 b) in order to add systematicity and internal coherence to the elaboration of the different registers in TermStar XV. In subsequent paragraphs the information usually contained by terminological cards has been explained indicating for each field its most frequent representation forms and thus the criteria followed when creating these registers.

Since this study belongs to the macro-project *Creación de una base de datos terminológica de algunos sectores de la Comunidad Valenciana* awarded to the IULMA, the protocol of use here adopted has been common to the rest of studies of the sort already undertaken within the wider frame of this project. Consequently, the protocol has been the same one in every study forming part of this wide project. In the next paragraphs, the most relevant parts of this protocol (adapted to the English language) used in this study have been explained, starting out from the fact that:

Las fichas terminológicas son materiales estructurados que deben contener toda la información relevante sobre cada término. Las informaciones que se presentan se extraen de la documentación de referencia, y se presentan siguiendo unos criterios fijados previamente en un documento, llamado *guía de redacción*. Es en la ficha donde se sintetizan y sistematizan los datos de un término dado. Los principales criterios para prepararla son: la validez, la concisión, la actualidad y la complementariedad de los datos. (Vargas, 2002 b: 1)

To put it in a nutshell, a terminological card is a group of fields, each of them containing specific information about a term. A field may thus contain a term, a source, a context, a definition, etc. and in the case of works of “compared terminology” or bilingual terminology – like the one here presented – the card is formed by at least two linguistic modules, each of them made up of the same number and kind of fields.

In the specific case of this study, the main data<sup>55</sup> (*pruebas textuales*) to be contained in a terminological card have been:

- A. definitions
- B. contexts
- C. observations
- D. phraseological units

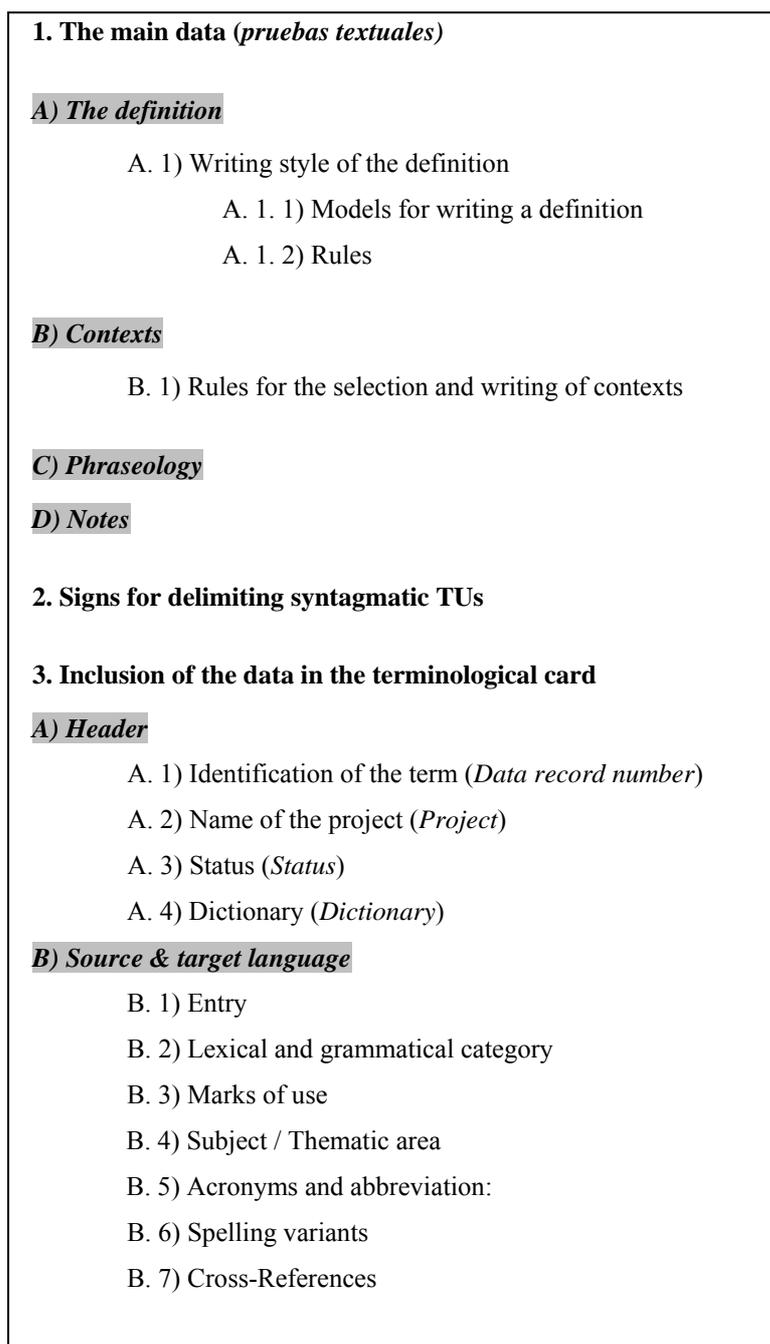
<sup>55</sup> What Vargas (2002) calls “los tipos principales de pruebas textuales”

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The terminographer is the person in charge of selecting the information to be included in the card, that is to say, the one in charge of deciding, for instance, which context will be included or how to define a term. In this specific case, I have been the person in charge of deciding which definition or context defines better the concept and shows textual equivalence in a more accurate way. The terminographer must also avoid repetition in the main data (*pruebas textuales*) trying to make them complementary rather than repetitive and facilitating as well the fact that the user of the terminological card (the prospective dictionary entry) forms an image of the concept as a whole. Thus, by adopting the norms and protocols of Vargas' (2002 b) writing guide (*guía de redacción*) and, consequently, the IULMA's criteria for the elaboration of specialised dictionaries, this study has followed the rules and conventions established in it regarding the information to be included and the way of including it in TermStar XV. According to the "*Guía de redacción para la ficha terminológica*", it is fundamental to consider 3 main aspects:

- 1) the main data (*pruebas textuales*);
- 2) the signs for determining syntagmatic TUs (closely related to segmentation issues already considered in sections I.6.4.5.1 and II.2.5.1.2.1.2);
- 3) the inclusion of the data in the terminological card.

What follows is an account on the way information has been included and thus processed in the dictionary according to the guidelines provided by the guide. In order to clearly present these guidelines, figure II.37 is a schematic representation of the way information has been structured in the following paragraphs according to the *Guía de redacción para la ficha terminologica* (Vargas, 2002 b):



**FigureII.37:** Structure of the information presented for filling in the terminological cards in the *Guía de redacción para la ficha terminologica* (Vargas, 2002 b).

## 1. The main data (*pruebas textuales*)

### A) *The definition*

Definir es explicar por medio del lenguaje algún elemento del mismo. Lo anterior da como resultado que la relación entre el lexema y su definición sea de **sinonimia** o equivalencia. Al establecerse una sinonimia, la definición ha de cumplir la

prueba de sustitubilidad; por ejemplo, *mueble para dormir* sustituye en cualquier contexto a *cama*. (Vargas, 2002 b: 2)

Three kinds of definitions are normally distinguished depending on the kind of information they contain: lexicographical, encyclopaedic (also called “hyperspecific”) and terminological. If a closer look is paid to the terminological definition, one may observe that it is a brief lexicographical formula that describes the semantic traits<sup>56</sup> which differentiate a concept from another.

Regarding the definition as a whole, Vargas (2002 b: 3) highlights the fact that:

En los campos técnicos y científicos las terminologías fundamentales se validan mediante las definiciones citadas en obras de fuentes fidedignas. Sin embargo, y puesto que nuestro producto va a ser comercializado, **la ley de propiedad intelectual nos obliga a reformular la mayoría de las definiciones**. Es necesario pues utilizar un estilo de redacción uniforme entre todos los terminólogos.

### A. 1) Writing style of the definition

The terminological definition is a brief statement in which the meaning of a specialised concept is put forward in a clear way. It normally starts with a word that identifies the widest class (hyperonym) or “gender”<sup>57</sup> to which a concept belongs, specifying next the essential distinctive traits that clearly differentiate the concept analysed from the rest of related concepts of this very same class. These distinctive traits or features may be:

- intrinsic features such as nature, material or topic dealt with;
- extrinsic features such as function, mode, origin, target and referent.

This is illustrated in the guide with the following example (Vargas, 2002 b: 4):

**Intrapreneur: gerente asalariado** (nature) **que aplica a su trabajo** (topic) **la motivación y la iniciativa** (mode) **del dueño de una empresa** (referent)

Accessorial or secondary features of a concept inform about the form of an object, its inventor or the moment, place or way of using it.

<sup>56</sup> *Semantic trait*: unit of meaning or minimal property that forms the representation of a concept.

<sup>57</sup> *Género*: clase o especie constituida por un conjunto de conceptos que presentan rasgos semánticos comunes, pudiendo dividirse en clases subordinadas. (Vargas, 2002 b: 2)

### A. 1. 1) Models for writing a definition

In order to formulate the definition of a concept different writing models can be adopted, among which deserve a special mention:

- **definition by near gender (*género próximo*)<sup>58</sup> and specific difference<sup>59</sup>:**

The guide illustrates this in the following example (Vargas, 2002 b: 4):

***periférico:** en un sistema de procesamiento de datos, todo lo que no es el microprocesador y sus satélites inmediatos (memorias, etc.) y que permite la comunicación en línea o en diferido del sistema con el exterior. Los hay de tres tipos: periféricos de entrada, periféricos de salida y periféricos de almacenamiento.*

***periféricos de salida:** periférico que permite al usuario acceder a los datos contenidos en el sistema. Algunos periféricos de salida son la pantalla, la impresora, los altavoces, etc.*

***impresora:** periférico de salida que plasma la información codificada del sistema en forma legible sobre papel. Según su calidad y velocidad de impresión, la naturaleza de los caracteres, el soporte de papel y otros factores, es posible distinguir varios tipos de impresoras, entre ellos: impresoras matriciales, impresoras de caracteres, impresoras de páginas, impresoras gráficas.*

This can also be illustrated, in the specific case of this study, with the examples, among others, of “kiln-horno”, “annular kiln-horno anular” and “basic furnace-horno básico” from our database (see figure II.38):

<sup>58</sup> *Género próximo:* Concepto que comparte sus rasgos semánticos con los conceptos inmediatamente subordinados a él. (Vargas, 2002 b: 4)

<sup>59</sup> *Diferencia específica:* Propiedad o rasgo semántico que distingue un concepto específico de otros conceptos del mismo género. (Vargas, 2002 b: 4)

<p><b>kiln</b> <i>n</i>: ELABMCHN <i>In the case of ceramic tiles, they are fired in a kiln under very high (2000 degrees F.) heat to harden the tile body and to create the surface glaze, if any</i> <b>horno</b> <i>horno de materiales, kiln, cámara térmicamente aislada construida con tabiques refractarios y provista de un equipo de calentamiento alimentado por diferentes combustibles que permite un régimen de control de temperatura que, al alcanzar temperaturas muy altas, hace posible el horneado o quema de las piezas</i></p>
<p><b>annular kiln</b> <i>n</i>: ELABMCHN <i>continuous kiln; longitudinal-arch kiln; transverse-arch kiln; Danneberg kiln; Halls kiln; moving fire kiln; Ooms-Iltner kiln; simplex kiln; Belgian kiln</i> <i>There are two principal types of annular kilns: longitudinal-arch kiln and transverse arch-kiln</i> <b>horno anular</b> <i>horno circular, horno continuo con compartimentos que, debido a la poca capacidad de control de la temperatura de cocción, ha sido sustituido por el horno túnel</i></p>
<p><b>basic furnace</b> <i>n</i>: ELABMCHN <b>horno básico</b> <i>horno en el que el material refractario -refractory material- se compone de dolomita -dolomite- y magnesita -magnesite-</i></p>

Figure II.38: Example of definitions by near gender in the DB of this study.

- **Definition by function**

This is illustrated by Vargas (2002 b: 5) in the guide with the following example:

*impresora matricial: impresora con la que es posible producir imágenes a partir de puntos.*

This can also be illustrated by the following example from this study (see figure II.39):

**air elutriator** *n*: TRANSMCHN *air classification; air classifier* *Air elutriator is a simple device which can separate particles into two or more groups* **elutriador** *hidroseparator, aparato que, mediante corrientes de aire, separa las partículas de material por tamaño y densidad*

Figure II.39: Example of a definition by function in the DB of this study.

- **Definition by description of an action, enumerating its parts or stages**

This is illustrated by Vargas (2002 b: 5) in the guide with the following example:

*impresora láser: impresora que funciona por el mismo principio que las fotocopiadoras. La imagen de la página que ha de imprimirse se transfiere a un tambor magnético. La tinta se deposita en este tambor y después sobre la página de impresión.*

This can also be illustrated by the following example from this study (see figure II.40):

**autosieve** *n*: ELABMCHN *Autosieve is used wherever particle-size distribution is determined by sieving* **tamiz automático** sistema automático para el análisis del tamaño de las partículas en el que cuatro tamices con diferentes medidas de paso oscilan de manera mecánica (el tamiz con menor apertura se encuentra en el fondo), siendo los finos automáticamente pesados en cada oscilación

**Figure II.40:** Example of a definition by description of an action, enumerating its parts or stages in the DB of this study.

- **Definition by synonymic paraphrasis**

This is illustrated in the guide with the following example (Vargas, 2002 b: 5):

*cuadrado: que tiene forma cuadrangular*

This can also be illustrated by the following example from this research (see figure II.41):

**abrasive** *a*: CHEM-PHYSPROP *Abrasive materials used in blasting can generally be classified as sand, slag, metallic shot or grit, synthetic, or other* **abrasivo** capaz de provocar abrasión

**Figure II.41:** Example of a definition by synonymic paraphrasis in the DB of this study.

Choosing a kind of definition or another will thus depend on various factors: the term as such, a previous definition, etc. What is important to take into consideration at this point is that the kind of definition chosen must adapt to the profile of the user to whom the terminological product (in this case the prospective specialised dictionary) is mainly addressed. Consequently, at this stage it has been necessary to bear in mind the communicative necessities of the user and their level of knowledge. For instance, a definition that accounts for the intrinsic traits of a concept (analytical) has, in general been preferred over a descriptive definition that enunciates the extrinsic traits; in the same way, a definition by description of an action that enumerates the parts of an object may be preferable to a definition by synonymic paraphrasis. However, what is clear is that, in every case, the kind of definition chosen will depend on the term as such and on its intended purpose.

Additionally, according to Vargas (2002 b: 5), when writing terminological definitions a series of principles must be considered and respected:

- **previsibilidad:** la definición inserta el concepto en el árbol conceptual o de campo. La definición ha de situarse obligatoriamente dentro de un campo de actividades (dentro de un campo nocional o de uso), es decir, corresponderá a una única realidad bien determinada.
- **brevedad:** la definición es concisa y clara, y está constituida, siempre que sea posible, por no más de una frase
- **enunciado afirmativo:** la frase dice lo que es el concepto, y no lo que no es
- **no circularidad:** la definición no remite a otra definición que, a su vez, remite de nuevo a la primera
- **no ambigüedad**
- **precisión** (a veces la máxima de precisión hace que la definición no sea clara)
- **ausencia de tautología:** la definición no es una paráfrasis del término sino una descripción de los rasgos semánticos del concepto. Las definiciones no han de repetir la entrada, ni los campos, ni los indicativos gramaticales, ni los rasgos fonéticos.
- **Información suficiente y necesaria:** no se pueden agotar todas las posibilidades; se tendrá que seleccionar la información pertinente en cada caso. Hay que limitar la extensión de la definición a los elementos necesarios para la comprensión del sentido del término por parte de los usuarios que, en la mayoría de los casos, conocerán las nociones propias del campo tratado.

### A. 1. 2) Rules

A series of general rules (summarised in 12 main items) regarding the layout and the way of presenting the information in the definition have also been considered at this stage:

1. Definitions must start in lower-case letter, without full stop and without articles and, when possible, must be introduced by a hyperonym or descriptor conceptually more generic than the term which is being defined. This hyperonym or descriptor will also be of the same grammatical category than the term defined. This rule or principle obeys the need that the definition may substitute the term defined in a given context since they both – definition and term – are verbalisations of the very same notion. See section VI.4 in the appendix for final results (final entries) showing this.
2. The descriptor indicates, in the majority of the cases, the thematic section of the tree in which the term is classified. This fact implies that the definitions of a series of terms of the same thematic subsection must have, when possible, a common descriptor. This is illustrated in the guide with the following example (Vargas, 2002 b: 7):

***parador** establecimiento de hostelería de alta categoría que depende de organismos oficiales*

***posada** establecimiento antiguo de hostelería*

***pensión** establecimiento de hostelería que no llega a la categoría de hotel*

In the specific case of this study, an example illustrating this could be the one in figure II.42:

The screenshot shows the TermStar XV software interface. The main window displays a term entry for 'American National Standards Institute' (ANSI). The entry includes a definition in Spanish, a cross-reference to 'American Society for Quality' (ASQ), and a detailed definition in English. The term is classified under 'Cerámica (IndustrialCeramics)' and 'American National Standards Institute'. The interface also shows a menu bar, a toolbar, and a status bar at the bottom.

Foundrymen's Society has issued standard methods for testing foundry sands **Sociedad Americana de Fundidores**

**American National Standards Institute ANSI** *n*: ORG-INST **AESC**. **ASA**; **USASI** *The American National Standards Institute (ANSI) together with the American Society for Testing and Materials (ASTM) has established a method for testing ceramic tiles which is found in ANSI 137.1 1988 **Instituto Nacional Americano/Estadounidense de Estándares** organismo de normalización que supervisa el desarrollo de estándares para productos, servicios, procesos y sistemas en los Estados Unidos a la vez que coordina estándares de este país con estándares internacionales, de manera que los productos estadounidenses puedan usarse en todo el mundo*

**American Society for Quality ASQ** *n*: ORG-INST *The American Society for Quality (ASQ) is the world's leading authority on quality which advances learning, quality improvement, and knowledge exchange to improve business results, and to create better workplaces and communities worldwide* **Sociedad Americana para la Calidad**

**American Society of Mechanical Engineers ASME** *n*: ORG-INST *The ASME vision for mechanical engineering is to be the premier organization for promoting the art, science and practice throughout the world* **Asociación Americana de Ingenieros Mecánicos**

**American Standards Association ASA** *n*: ORG-INST **AESC**; **USASI**; **ANSI** **Asociación Americana de Estándares**

**Art and Creative Materials Institute ACMI** *n*: ORG-INST *The ACMI certifies that products are nontoxic and meet standards of quality and performance* **Instituto de Arte y Materiales Creativos**

**Association Française de Normalisation AFNOR** *n*: ORG-INST **Asociación Francesa de Normalización** organismo encargado de coordinar todo el sistema francés de normalización, esto es, de animar, coordinar y homologar la elaboración de las normas francesas (y del desarrollo de la marca NF)

Número de ficha: 29024  
 Proyecto:  
 Diccionario: Cerámica (IndustrialCeramics)  
 Gráfico:  
 Estado:  
 Creado por: Nuria Edo  
 Creado el: miércoles, 24 de enero de 2007 15:28  
 Área temática:  
 Nota:  
**ENG:**  
**Term: American National Standards Institute**  
 Subject: **ORG-INST**  
 Geographic alt.:  
 Part of speech: *n*:  
 Abbr.: **ANSI**  
 Cross Reference: **AESC; ASA; USASI**  
 Data Source:  
 Definition: **American National Standards Institute, responsible for establishing standards and testing methods for ceramic tiles in the United States. (see Standards)**

**REPETIDO** In 1928 the American Engineering Standards Committee (AESC) became the American Standards Association. ASA was reorganized in 1966 and became the United States of American Standards Institute (USASI). The name ANSI was adopted in 1969  
 Definition source: google y google  
 Context: **The American National Standards Institute (ANSI) together with the American Society for Testing and Materials (ASTM) has established a method for testing ceramic tiles which is found in ANSI 137.1 1988**  
 Context Reference: corpus y M  
 Dianormative Mark:  
 Reliability:  
 Notes:  
 Headword: American

S: associa F: organisms English (UK) -> Spanish Cerámica (IndustrialCeramics) American National Standards Institute

**Figure II.42:** Example from the DB of this study showing how the descriptor indicates the thematic section of the tree (field diagram) in which the term is classified.

3. With regards to the preferred formula for the category “grammatical category of the descriptors”, the following options are provided by Vargas (2002 b: 7) in the guide:
  - la definición de los conceptos de estado ha de comenzar por la fórmula “se aplica a...”, “condición de...”;
  - la de los conceptos de acción por “acción de...”, “arte de...”, “técnica de...”;
  - la fórmula de los conceptos adjetivales puede ser “de...”, “relativo a...”, “se dice de...”, “se aplica a...”.
  - Para las locuciones:
    - La definición puede consistir en un segmento de frase con la que se pueda sustituir la locución en un contexto determinado (**a bordo** -> situado dentro de la embarcación)
    - También se pueden utilizar las expresiones “manera de...”, “se dice de...”.
    - En el caso de las locuciones latinas se pueden utilizar descriptores metalingüísticos (“locución latina que significa «...»”)

4. It is highly likely that, while the definition is being written or created, other terms that are included or may be included in the database appear; it is then advisable to offer the equivalent of such terms in the other language of work, written in italics, and between hyphens. This is illustrated by the guide with the following example:

**above** *adv/prep*: GRAL encima; (...) en publicidad, *above-the-line advertising* es la publicidad, o los gastos de publicidad, en medios de difusión *-mass media-*, como la radio, la televisión, la publicidad exterior *-outdoor-* y la prensa y las revistas *-journals, magazines-*; *above-the-line media* son medios de publicidad directa o de masas, como la televisión, la radio, la publicidad exterior; V. *below-the-line*).

In the specific case of this study, an example of this would be the one in figure II.43:

**ablating material** *n.*: ELABPROC *Ablating materials absorb heat by increasing in temperature and changing in chemical or physical state*  
**material ablativo** material, especialmente de recubrimiento *-coating material-* utilizado para proporcionar protección térmica *-thermal protection-* a un cuerpo mediante la pérdida de masa *-loss of mass*.

**Figure II.43:** Example from this research showing in italics the equivalents of some terms appearing in the definition.

5. For the definition of compound terms<sup>60</sup> (syntagmas), the base of the syntagma must be previously defined if the terminographer wants to use it for the definition of the compound term. This is illustrated by Vargas (2002 b: 8) with the following example:

*cinturón de lastre m cinturón provisto de unas piezas calibradas de plomo que el submarinista se coloca en la cintura para pesar menos.*

In the specific case of this study, the already mentioned example of *horno anular* (“anular kiln”) in figure II.38 could constitute a good example of this since the unit *horno* (“kiln”) has also been defined.

<sup>60</sup> See section “signs for determining syntagmatic TUs”

However, in some cases this rule or principle cannot be obeyed:

a) *Extension of the meaning:*

This is illustrated in the guide with the following example (Vargas, 2002 b: 8):

***pelota de partido*** *m jugada que da el último punto del partido a uno de los dos equipos.*

The same happens with terms from this study such as *orange peel*, referring to a defect in the glaze similar in appearance and texture to an orange peel.

b) *Plurality idea:*

This is illustrated by Vargas (2002 b: 8) with the following example<sup>61</sup>:

***línea de delimitación*** *cada una de las cuatro líneas de 5 cm ....*

6. The degree of complexity and technicality must be adapted to the objectives of the terminological work and the user to whom it is addressed.
7. The defined term must not be part – at least not in a complete way – of the definition.
8. A logical syntactical order must be maintained when possible.

This is illustrated by the following example (Vargas, 2002 b: 9) containing two definitions of the same term – the second definition being considered as preferable:

***rodillera*** *f pieza que se pone a los pantalones isotérmicos para proteger la rodilla, de material elástico*

***rodillera*** *f pieza de material elástico que se pone en los pantalones isotérmicos para proteger la rodilla.*

9. When possible, it is convenient to elaborate definitions of a single sentence. If there is more than one sentence or statement, the separation of the different segments forming part of the definition will be done by means of a semicolon

<sup>61</sup> This term has also been retrieved in this study during term extraction and will thus be included in the prospective dictionary.

(;) and not a full stop. An example of this is illustrated in figure II.44 from this research:

**once-fired ware** *n*: FINALPRODUCT *Once-fired ware is much more prone to crawling and pinholing because the glaze-body bond is more fragile after application* **pieza de monococción** piezas de cerámica blanca a las que se les aplica el esmalte antes de ser cocidas, combinándose así en una sola operación la cocción del bizcocho y del vidriado; los sanitarios son un claro ejemplo de piezas de monococción

**Figure II.44:** Register from TermStar in this study showing the use of semi colon (;) in the definition.

10. The definition should not include, if possible, any bracket. Instead, a long hyphen can be used.
11. To refer to the field object of work with the intention of indicating a different sense from the general language or another thematic area must be avoided.

This is illustrated by Vargas (2002 b: 9) with the following example, in which the second option is more recommendable:

*composición f en pintura, ordenación de los elementos constituyentes de una obra*

*composición f ordenación de los elementos constituyentes de una obra pictórica.*

12. circular definitions – those which reciprocally refer to another definition – must be avoided.

This is shown in the following example (Vargas, 2002 b: 9):

*expulsar v tr castigar a un jugador con la expulsión*

*expulsión f acción y efecto de expulsar*

In order to avoid this circularity, one of the two definitions must be developed:

*expulsión f castigo que impone el árbitro por conducta ofensiva, consistente en hacer salir al jugador de la pista durante todo un juego.*

To sum up, and taking into account all the principles and rules considered up to the moment, when writing the definitions of the prospective dictionary, the following aspects have been and must be considered:

- The distinctive features that make the identification of the concept possible, for instance, near gender (*género próximo*) and “specific difference”.
- The kind of definition that better adapts to the profile of the user to whom the terminological product is addressed.
- The category of the descriptors and the preferred formula, depending on each case.

### B) Contexts

Contexts can be of three kinds: definitory, explicative and associative:

- Definitory contexts contain the essential traits of the concept under study. An example extracted from this study is the one in figure II.45:

**nu-value** *n*: MEASURE *abbe value* *The nu value is an indicator of the optical non-dispersiveness of glass and similar transparent materials, quantitatively defined* **valor nu**

**Figure II.45:** Example of a definitory context from the DB in this study.

- Explicative contexts offer information about some of the essential traits of the concept. An example from this study is the one in figure II.46:

**occupational health** *n*: SFTY *The company is an occupational health provider supplying a wide range of services relating to employee health, well-being and workplace management* **salud laboral** estado de normalidad en el ejercicio de las funciones laborales; integridad de los trabajadores desde el punto de vista físico y mental y mantenimiento de la misma en el ámbito laboral

**Figure II.46:** Example of an explicative context from the DB in this study.

- Associative contexts show the use of the context in the field under study but do not help to illustrate the textual equivalence through semantic traits. An example from this study is the one shown in figure II.47:

**olivine** *n*: GEOL-MIN-CRYST *The resulting sintered ceramic particles have a residual olivine content not exceeding 3-5%* **olivino peridoto**, silicato de hierro y magnesio con apariencia de mineral verde parduzco y hallado en rocas de origen volcánico, especialmente en basaltos

**Figure II.47:** Example of fan associative context from the DB in this study.

## B. 1) Rules for the selection and writing of contexts

For the selection of contexts from the corpus to be included in the terminological cards a series of rules have been observed:

1. Contexts will be, when feasible, quotations, so that authorship criteria must be respected and sent to the code of the corresponding source. This datum will be included in the field created with such purpose (*context source*).
2. If a reformulation of the context is preferred, mainly if it is too long, it will not be necessary to include the datum indicated in the previous point. Instead, the terminologist will introduce his/her name. In the same way, the sentence can be shortened in case of being too long or in case of considering some of its parts as superfluous. In case of omitting this part of the sentence it will be indicated by the inclusion of brackets: ‘(...)
3. A statement of sentence where the term under study appears will try to be selected.
4. Preferably, definitory or explicative contexts will be selected in which the term appears surrounded by other lexical elements which normally are part of its environment (collocations).
5. Contexts will be transcribed in low-case except the initial setter. In the same way, low-case will be used when the beginning of the sentence has been omitted. Never end the inclusion of a context with full stop.
6. In the context, the term must belong to the same lexical category (noun, verb, adjective...) than the entry. However, the grammatical category (gender and number) can be different: the context will be valid even if the term that appears in the text carries the plural mark, except if it is a lexicalised plural.

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For more examples referring to these issues, sections III.5 and VI.4 show instances of registers in TermStar and final entries for the prospective dictionary respectively illustrating the observance of these criteria in the inclusion of contexts.

### ***C) Phraseology***

Phraseology will have to be introduced in a way that the layout or arrangement of cooccurrences<sup>62</sup> is reflected. For instance:

- term + verb
- verb + term
- term + adjective
- adjective + term
- term + noun
- noun + term

### ***D) Notes***

Notes offer information on the shades of meaning of the concept or about the use of the term they designate. The contexts in which the term functions normally in the linguistic level will also be selected with the aim of reflecting its use. Metalinguistic contexts are in reality a linguistic comment about the term and must be considered as elements of the definition or linguistic notes.

## **2. Signs for delimiting syntagmatic TUs**

The signs for delimiting syntagmatic TUs are closely related to the segmentation issues explained in section I.6.4.5.1. Although segmentation issues have been mainly considered during terminological extraction, at this point, a second look at the decisions adopted has helped to corroborate their adequacy. Hence, the signs for detecting syntagmatic TUs proposed in the guide are the ones signalled by Cabré (1993) and already introduced in the aforementioned section, but in this case these criteria have been illustrated by real examples from the author:

---

<sup>62</sup> *Cooccurrence*: phenomenon in which an element of the discourse often appears combined with a given term in a specific thematic field.

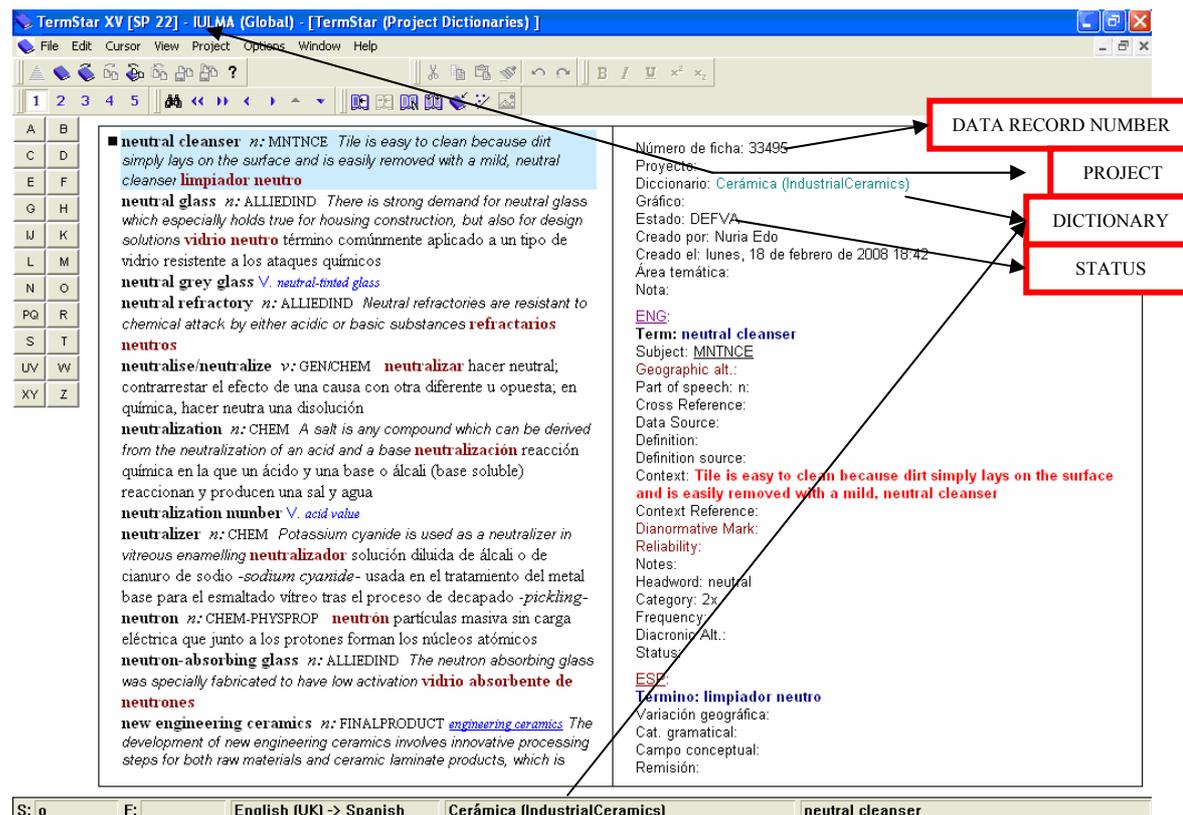
1. El conjunto se organiza en torno a una base única: *unidad central de proceso, contrato de trabajo en prácticas, hoja de cálculo electrónico*
  2. Imposibilidad de insertar otros elementos lingüísticos en el interior del sintagma terminológico: *\*enfermedad muy mortal, \*angina grave de pecho*
  3. No se puede complementar ninguna de las partes del conjunto de forma separada: *\*ataque de corazón muy enfermo*
  4. Se puede sustituir el conjunto por un sinónimo: *trazador de curvas (trazador; plóter)*
  5. Poseer un antónimo en la misma especialidad: *tumor benigno vs. tumor maligno; lengua viva vs. lengua muerta*
  6. Frecuencia de aparición del mismo sintagma terminológico en los textos de una determinada especialidad
  7. En otras lenguas ese sintagma corresponde a una sola unidad lexemática: *soporte lógico (software); memoria intermedia (buffer)*
  8. El significado del conjunto no se deduce de la suma del significado de los componentes: *carta blanca, agujero negro*
  9. La presencia de ciertas unidades (pronombres, conjunciones) indica que se trata de combinaciones libres: *sello manual o mecanizado*
- (Vargas, 2002 b, in Cabré, 1993: 304-305)

### 3. Inclusion of the data in the terminological card

In this subsection, the way data have been processed, arranged and stored in the terminological cards according to the criteria in the writing guide has been specified:

#### A) Header

Figure II.48 below illustrates in a real register from TermStar XV the categories of data record number, project, dictionary and status explained in the following paragraphs.



**Figure II.48:** Register from this study in TermStar XV showing data record number, project, dictionary and status.

### A. 1) Identification of the term (*Data record number*)

- It is the number of register of the terminological card automatically assigned in a correlative way by the database.

### A. 2) Name of the project (*Project*)

- A project is a file containing other smaller files as dictionaries or databases. This file keeps the configuration parameters previously established for both dictionaries and the *layout*. In our database the name of the assigned project has been IULMA.

### A. 3) Status (*Status*)

- The *status* is a list of values indicating the state in which the process of elaboration of the card is. The established values are:

XREV: Not revised yet.

REV: Revised.

DEFVA: Definitive card (this value has been given once the supervisors have expressed their approval of the card).

#### A. 4) Dictionary (*Dictionary*)

- The mark *dictionary* is automatically assigned by the database.

#### B) *Source and target language*

##### B.1) Entry

The typographical and format criteria established for introducing the data in TermStar XV have been systematically observed and respected in this research, these being:

- Type of font: Times New Roman, bold, 12.
- Entries are written in lower-case with the exception of proper names and acronyms.
- Adjectives:

Adjectives are always introduced in singular masculine form (in Spanish)

- Verbs:

Verbs are introduced in infinitive form.

For English verbs, entries have the following form: *dump* (not *dump, to*)

- Nouns:

a) Nouns are introduced as terms in singular, except in the case of lexicalised plurals.

An example of a lexicalised plural provided by Vargas (2002 b) in the guide is:

**facies** *n pl*: Conjunto de caracteres presentes en cualquier entidad geológica (roca, estrato, formación), que reflejan...

The entry will then be: **facies**.

An example from this study could be “bacteria” – included among the 4,000 entries presented.

b) The entry will always be written following the natural order of the sequence.

Example provided by Vargas (2002 b) in the guide:

«les *machines de flottation* sont constituées de trois parties principales... »

The entry will be then: *machine de flotation*, and not *flottation*, *machine de*

- Prefixes and suffixes:

There are specialised prefixes and suffixes that will have their own register, for instance *bio-*; *-fels*. In this cases, a hyphen before or after the prefix or suffix will have to be included depending on the case and the adequate lexical category will have to be chosen (*pref.* or *suf.* respectively).

- Idioms:

The entries containing idioms will have to be elaborated by including firstly the name or adjective of the unit under analysis, for instance *destajo, a*. Figure II.49 is an example from the industrial ceramics database.

**naked eye, with the** *phr*: GEN Often the nonhomogeneous elements can be distinguished with the naked eye (grain, inclusions, pores) **vista, a simple**

**Figure II.49:** Example of a register (from the database in this study) with an idiom.

- Subentries:

Entries do usually contain subentries as may be observed next:

**Gratuitous** *a*: gratuito, gracioso. [Exp: **gratuitous contract** (contrato a título gratuito), **gratuity** (gratificación, propina; V. *bribe, gift*)].

These subentries would correspond to linguistic units made up of more than one lexeme (also called polylexematic/polylexical/complex/phraseological/syntagmatic units) and derived words alphabetically ordered depending on their occurrence after the base term. See section VI.4 for results in this study showing how entries and subentries have been arranged.

In the database there are two fields that must be necessarily filled in: the headword and the category

Headword:

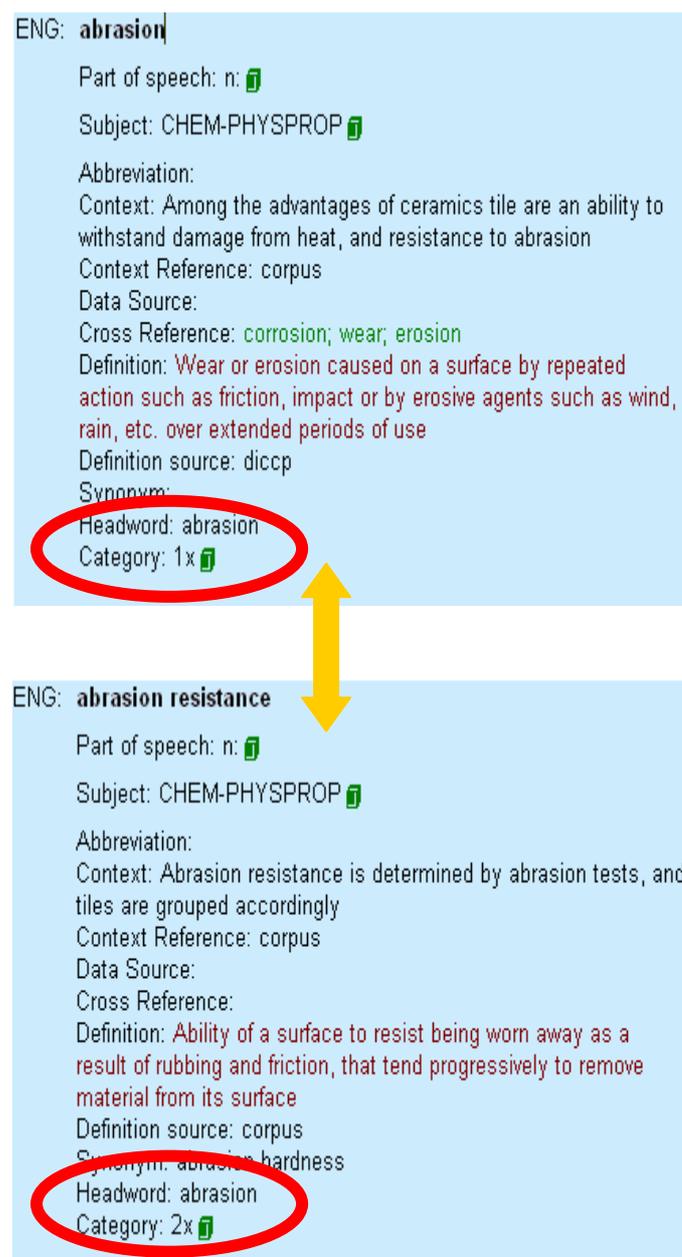
Servirá como nexo de unión entre la entrada principal y subentradas, por lo que deberá ser el mismo en ambas, de forma que en la entrada principal (p.ej. *abrasion*) escribiremos la misma palabra en este campo, mientras que sus subentradas (p.ej. *abrasion resistance*) contendrán el denominado término

principal (*abrasion*). Haremos el mismo proceso para los derivados que ocurran alfabéticamente detrás de la entrada principal (*abrasiveness*). (Vargas, 2002 b: 16)

Category:

Este campo junto con el anterior servirá como criterio de ordenación a la hora de exportar las fichas para la elaboración del documento en Word y de cada uno de los artículos lexicográficos. Sólo tendremos que elegir de la lista de valores los campos 1, 1x, 2, y 2x. El número uno indica que se trata de un término principal o base; el 1x indica lo mismo que el uno, y que el campo “abreviatura” está vacío; el dos indicará que es una subentrada de otro término; y el 2x lo mismo que el dos y que el campo “abreviatura” está vacío. (Vargas, 2002 b: 16-17)

An example from TermStar illustrating this is provided by the term “abrasion” and the collocation “abrasion resistance” in figure II.50:



**Figure II.50:** Screenshots from the database in this study showing the fields “headword” and “category”.

## B. 2) Lexical and grammatical category

The font used in this field is Times New Roman, italics, 12. For the grammatical or lexical category – what the program calls part of speech – a series of abbreviations are selected from a list of values:

*a: adjetivo, adjective*

*n: sustantivo, noun*

*v*: *verbo*, verb

*n/v*: *sustantivo/verbo*, noun/verb

*a/n*: *adjetivo/sustantivo*, adjective/noun

*adv*: *adverbio*, adverb

*n pl*: *sustantivo plural lexicalizado*, plural lexicalised noun

*prep*: *preposición*, preposition

*pref*: *prefijo*, prefix

*suf*: *sufijo*, suffix

*fr [phr]*: *frases o locuciones*, phraseology

*inv*: *invariable*, invariable

Regarding lexical categories, for the aims of this research, the abbreviation *pl.* will only be used for lexicalised plurals.

In the case of complex units, the lexical category belonging to the kind of syntagm will be indicated: for example, a nominal syntagm like *flottation collective* will be annotated as *n*.

### **B. 3) Marks of use**

Among the marks of use, that may be included or not in the entries, we find:

*Frequency mark*:

- frequent
- less frequent
- little frequent)

*Temporal mark*:

- obsolete
- neologism

*Ponderation mark*:

- normalised
- normative

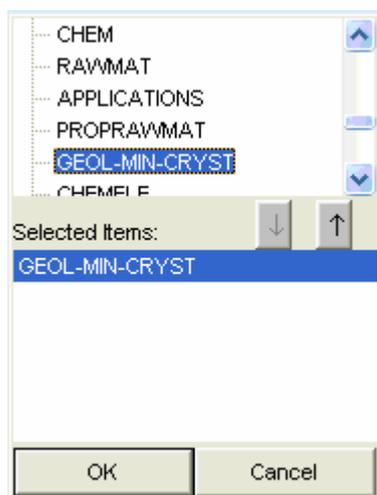
- documented in text
- documented in dictionary
- proposal of the specialist
- proposal of the translator
- professional use (preferred synonyms in certain fields or by certain companies because of reasons of originality in front of commercial competitors)

*Geographical mark*

*Sociolinguistic mark. (e.g. col)*

#### **B. 4) Subject / Thematic area**

The subject is chosen from a list created for such purpose in TermStar XV on the basis of the field diagram and the abbreviations chosen for each thematic category (see section III.2). These categories are useful in order to determine which subsection/subarea of the field diagram a term belongs to. However, this field has only been filled up when the certainty existed that a term really belonged to a given subsection of the field diagram. Figure II.51 shows a section of the list of categories displayed by TermStar in order to fill in the field of subject/*campo conceptual* in the registers:



**Figure II.51:** List of subjects (abbreviated) created in TermStar XV for this study according to the field diagram categories.

## B. 5) Acronyms and abbreviations

Acronyms and abbreviations are included in the field created for such purpose and named “abbreviation”. The program TermStar XV creates then an automatic cross-reference to the main concept. Figure II.52 illustrates how the field “abbreviation” has been filled in this study. Figures II.53 and II.54 show the way in which the acronym dealt with in the example appears in the final register and the automatic cross-reference to the main concept generated by the program for the acronym respectively.

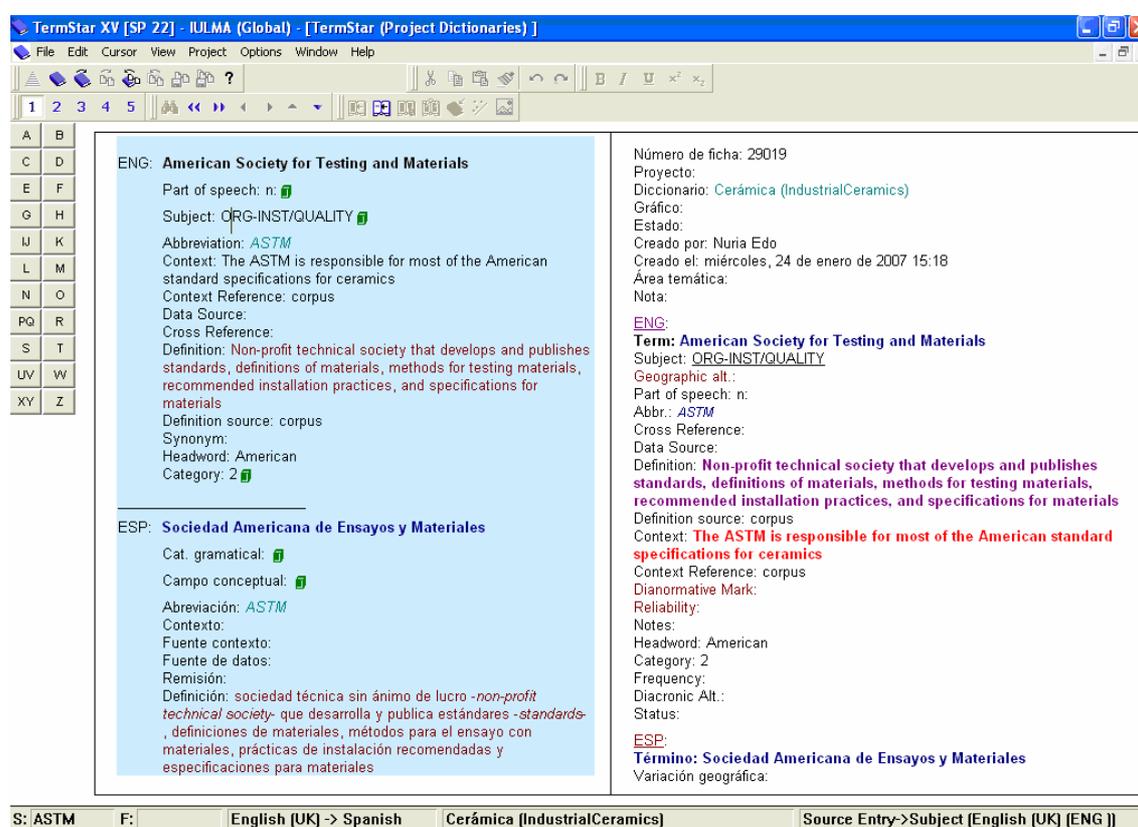


Figure II.52: Screenshot from TermStar showing the field “abbreviation”.

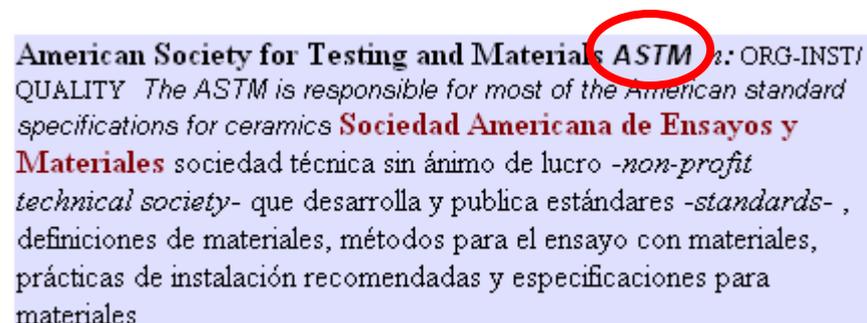


Figure II.53: Final register of the term “American Society for Testing and Material” showing the way acronyms are arranged by TermStar.

ASTM *V. American Society for Testing and Materials*

**Figure II.54:** Automatic cross-reference to the main concept in the acronym of the term “American Society for Testing and Material”.

## B.6) Spelling variants

In the English language and regarding the use (or not) of hyphens, it is advisable to include every single possibility in the field “term” separated by commas, that is to say, as independent/separated words (*back up*), as words linked by a hyphen (*back-up*) or as words merged in a single unit (*backup*). Figure II.55 illustrates how these variants have been included in this study. In Spanish, however, we find more often vocalic variants.

**under-glaze/underglaze base** *n*: GLAZEREL *The 1050 Underglaze Base has some frit in it, which acts as a flux to help the stain be a compatible fit with either greenware or bisque* **esmalte base**

**Figure II.55:** Example of/with spelling variants from the database in this study.

## B. 7) Cross-References

In this field, all those terms related to the entry form must be included. At this point, we can include those terms belonging to the same semantic field or helping to the comprehension of the term as such. Figure II.56 shows a final register from this study containing cross-references:

**air plasma spraying APS** *n*: ELABPROC *plasma spraying; vacuum plasma spraying* *Silicon coatings were deposited using air plasma spraying technology* **pulverización por plasma en aire** *air plasma spraying, proyección por plasma en el aire, proceso para recubrimiento de proyección por plasma producido en condiciones atmosféricas ambientales*

**Figure II.56:** Final register from this study containing cross-references.

## 2.7 Revision and normalisation

Stage 7 has been that of revision and normalisation of the information gathered and any possible neologism. In the case of this study, the revision and normalisation stage has been carried out in Access, where TermStar XV data have been exported with the aim of checking, correcting and appropriately arranging the information there contained for then exporting the data again to an *rtf*. document in the final stage of the method. Figure II.57 shows a section of the Access board generated. In this board, information has been checked column by column, making sure, for instance, of the following issues:

- that every term has the mandatory categories “principal” and “tipo” (called “headword” and “category” in TermStar) completed and correctly assigned;
- that no context starts with lower-case setter and ends with a full stop;
- that every definition starts with lower-case setter;
- that no definition ends with a full stop;
- that every term has the correct grammatical category;
- that contexts and definitions have been correctly stated and contain no spelling mistakes;
- that synonyms and cross-references are well-written and spaced out;
- that the category semantic field is complete and correct for every term;
- that there are no typos
- ...

A general and detailed revision of every single piece of information included in the fields and thus appearing in the Access board has been necessary in this stage for correcting in it all the mistakes detected. Figure II.57 shows, for instance, how, after the exportation of the table, the context of “anchor wire” lacks a capital letter at the beginning (in red) which has to be added yet, how the terms AMT and ANC (in pink) need to be assigned the grammatical category *abbrev*: instead of *n*., and how the fields “categoría” y “tipo” are empty in some cases even when constituting mandatory categories. This last “correction” is not, however, a mistake strictly speaking, since TermStar XV does not allow the terminographer to include in its database any

information in the case of abbreviations and hyperlinks in general (as is reflected in the figure, showing data directly exported from TermStar XV) so that it is necessary to do it in Access.

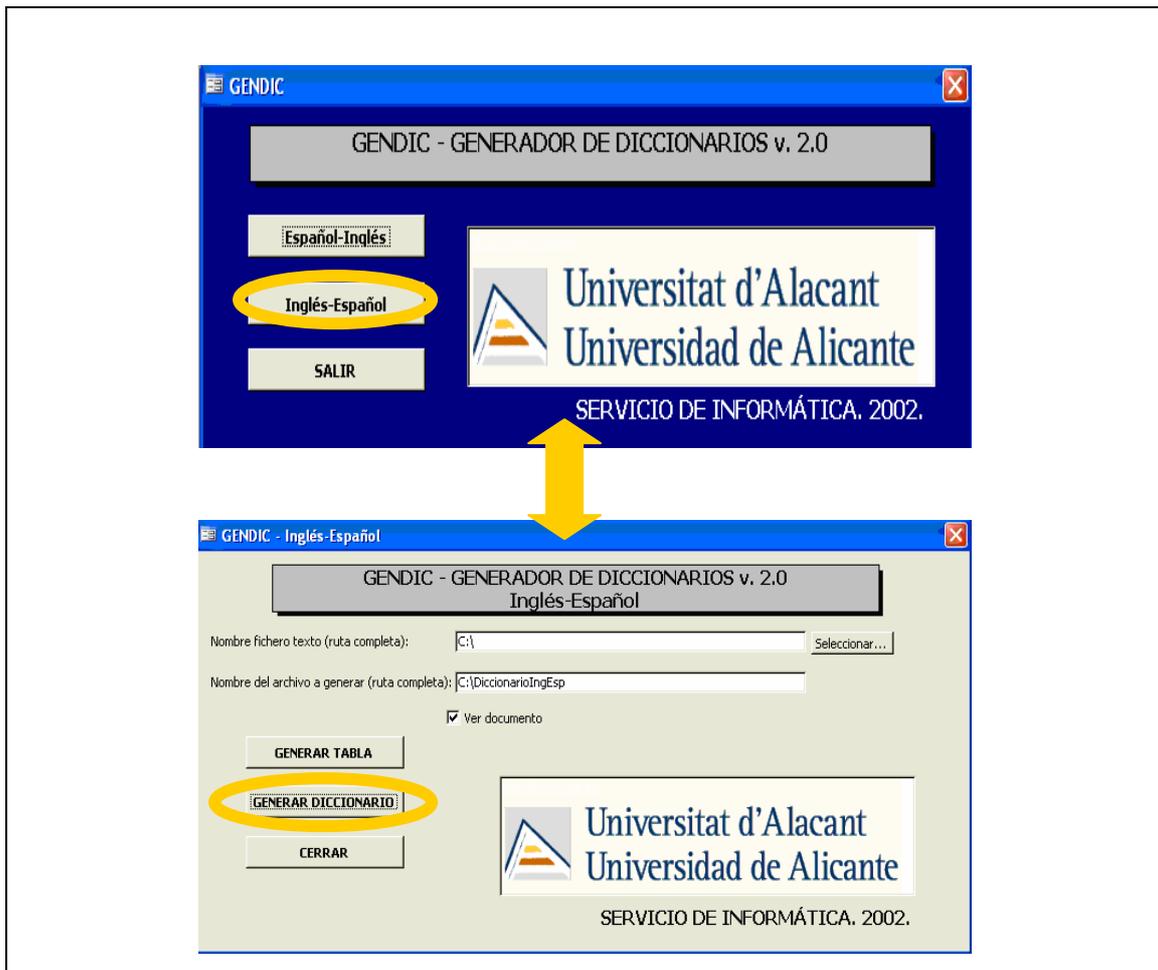
Diccionario_ingles	Termino	Categori	Marc	Contexto	Referencias_cruzadas	Principal	Tipd	abbrev	Diccionario_español	Termino	C
	amply	adv.		The instrument is amply powered, a		amplitude	2		ampliamente		C
	ampoule	n.		When working with ceramic materia		ampoule	1		ampolla		C
	Amsler (mercury) volumeter	n.		The porosity was determined by me	volumeter	Amsler (merc	1		volumenómetro (de mercurio)		It
	AMT	n.			advanced manufacturing t						
	AN	n.			ambient noise						
	anagama	n.		The anagama or cellar kiln was one		anagama	1		anagama		It
	analogous	a.		This type of energy dissipation is an		analogous	1		análogo		C
	analogous harmony	n.		Analogous harmony describes the n		analogous	2		armonía análoga		C
	analyse	v.		It is important, in learning to underst		analyse	1		analizar		C
	analysis	n.		Analysis of failure from surface crac	surface analysis; stress a	analysis	2		análisis		C
	analysis of failure	n.			failure analysis						
	analytical	a.		These methods are often coupled wi		analytical	1		analítico		C
	analytical balance	n.		An analytical balance is capable of i		analytical	2		balanza de precisión		It
	analytical methods	n.		Analytical methods generally includ		analytical	2		métodos analíticos		E
	analytical portion	n.			analytical sample				porción analítica		T
	analytical sample	n.		The analytical sample is then transfi	analytical portion				muestra analítica		T
	analytical solution	n.			test solution						
	analyze	v.			analyse						
	anatase	n.		Octahedrite is also an obsolete syn		anatase	1		anataza		C
	ANC	n.			acid neutralizing capacity						
	anchor	w/n.		V-Stud is a V-shaped stud or ancho	fixing; peg; bolt; claw, hoo	anchor	1		anclaje		It
	anchor	n.		Slurries of moderate viscosity are al		anchor	2		ancla		It
	anchor	v.				anchor	2		anclar		C
	anchor bolt	n.		The metal pin maintaining in positio		anchor	2		bulón de anclaje		It
	anchor brick	n.		An anchor brick is noted for its high		anchor	2		ladrillo de anclaje		It
	anchor drilling machine	n.		An anchor drilling machine is a drilli		anchor	2		máquina taladradora para anc		It
	anchor hole	n.		The anchor hole should be filled con		anchor	2		agujero de anclaje		It
	anchor rod	n.			anchor bolt						
	anchor slot	n.				anchor	2		ranura de anclaje		It
	anchor wire	n.		the anchor wires were pushed up th		anchor	2		cable de anclaje		It
	anchor/anchorage point	n.		when the attempt to improve the ad		anchor	2		punto de anclaje		It
	anchorage	n.		These tiles offer quick assembly and fixin	anchor				anclaje		It

**Figure II.57:** Access board where TermStar data has been exported for the stage of revision and normalisation.

Therefore, this kind of irregularities have been detected and corrected in this stage of the method.

## 2.8 Edition

In the last stage of the working method, that of edition, an *rtf*. (rich text format) document with the final version of the entries has been created with the dictionary generator GENDIC, developed by doctor Chelo Vargas. Figures II.58 and II.59 illustrate how GENDIC generates from the Access board, thanks to a complex Visual Basic programming, the English-Spanish *rtf*. version of the 4,000 entries presented in this study. See the final *rtf*. document created with the entries in section VI.4 in the appendix.



**Figure II.58:** GENDIC screens used for generating the English-Spanish version of the 4,000 entries presented in this study.

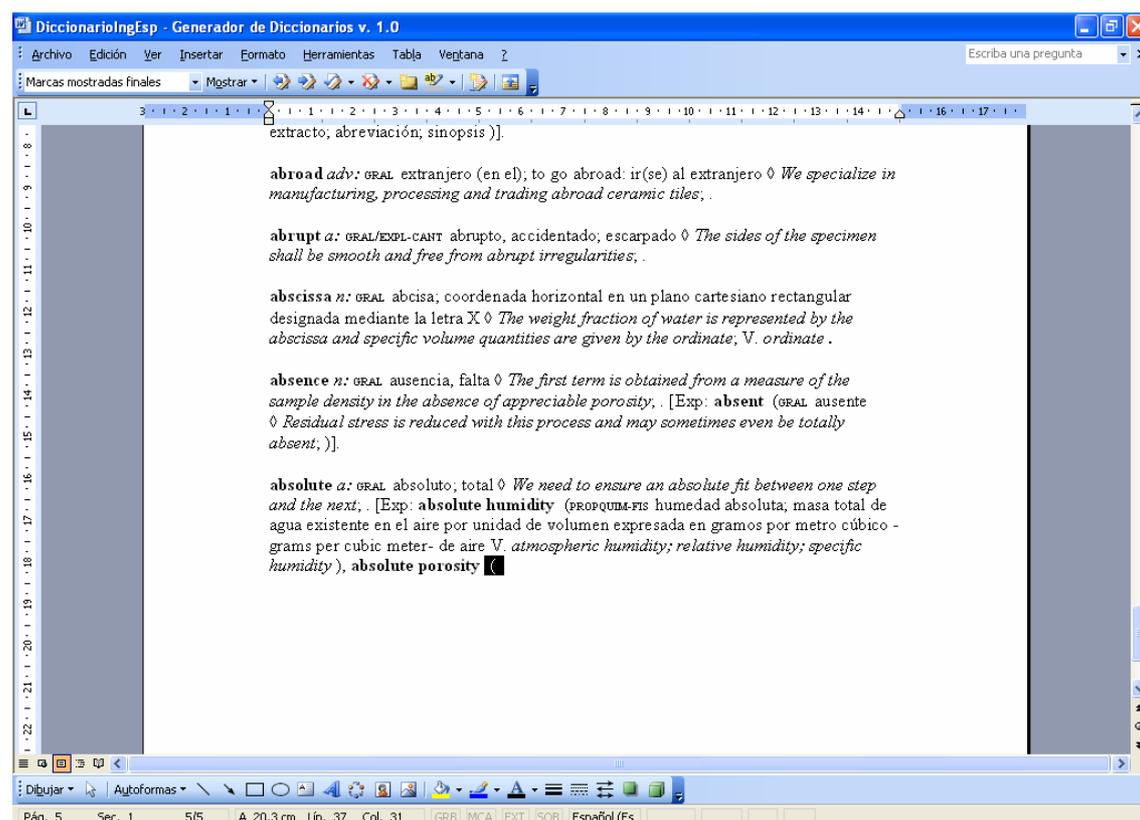


Figure II.59: GENDIC generating in *rtf*. the 4,000 entries presented in this study.

In this stage and thanks to GENDIC, the format characteristics desired have been applied to fit the format of the IULMA's dictionaries. However, superindexes (indicating different senses or meanings of the same term) such as the ones in grey in the example from this study below, have had to be incorporated at this final stage of the method. In the same way, English equivalents included in the definitions (in italics and in grey in the example), have also had to be converted into the desired format (italics) at this stage.

**art**<sup>1</sup> *n*: GRAL arte, destreza; habilidad, virtud para hacer algo *◇ Like many human endeavors, ceramics is an art whose beginnings are shrouded in the misty past, probably before invention of the written word.* [Exp: **art**<sup>2</sup> (GRAL arte; manifestación y forma de expresión de la actividad humana por la que se abstrae, conceptualiza y comunica con recursos plásticos, lingüísticos o sonoros), **Art and Creative Materials Institute, ACMI** (ORG-INST Instituto de Arte y Materiales Creativos *◇ The ACMI certifies that products are nontoxic and meet standards of quality and performance*), [...] **art-ware, artware** (PRODFIN utensilios/productos (cerámicos) artísticos; cualquier utensilio de cerámica blanca *-whiteware-*, esmaltado o no, usado para fines no técnicos, como por ejemplo la vajillería, los sanitarios, etc. (siempre y cuando estén vidriados)), **artwork** (GRAL obra de arte)]

Therefore, in this edition stage it has also been necessary to check again the information contained in the entries in order to include the information aforementioned –which could only be incorporated at this stage – and to correct any mistake that may have gone unnoticed in the previous stage. The results of this stage have been 4,000 final entries for the prospective dictionary included in section VI.4.

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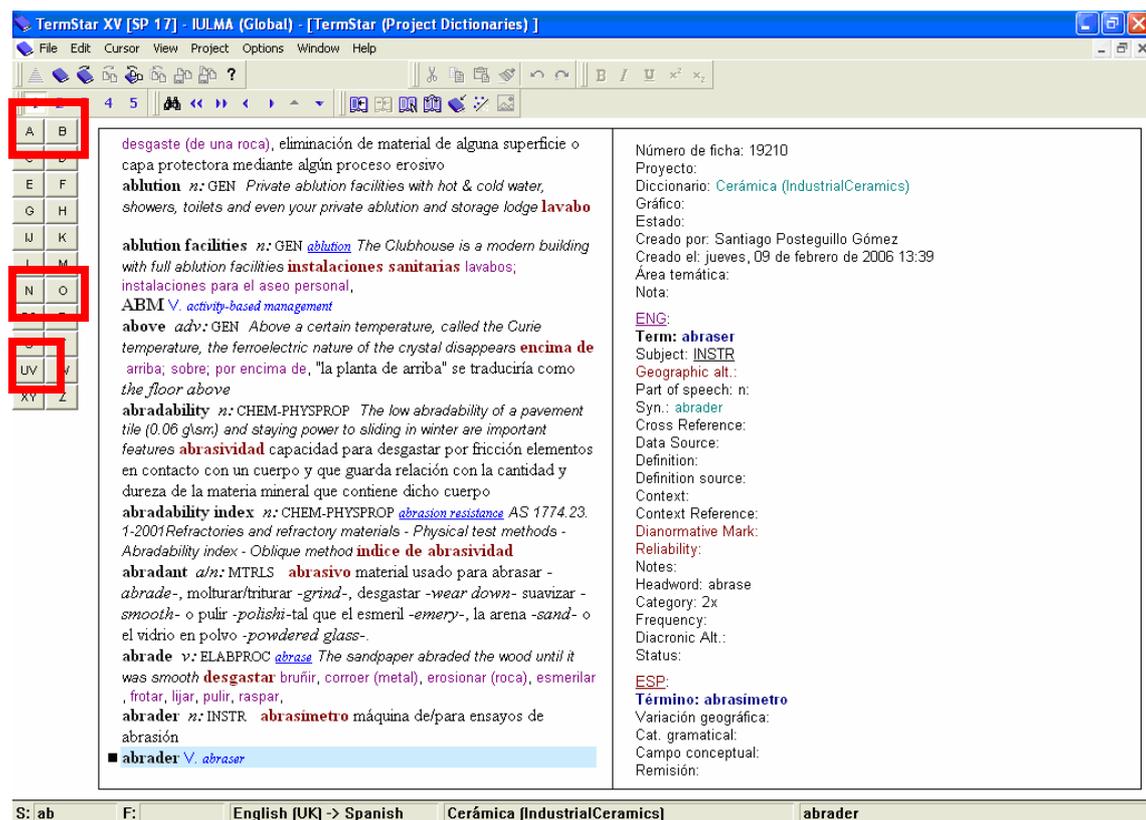
*It is quite possible to work without results,  
but there will never be results without work.*

**Source unknown**

### **III. RESULTS**

Broadly speaking, the results presented in this section have been subdivided into 7 subsections which summarise the results progressively obtained as the various stages in the method were completed. However, more specifically, this results section can be said to present 2 main types of results: those obtained through work in progress in the different stages of the method and final ones. Accordingly, on the one hand, the first type or big block of results presented is a compilation of the results progressively obtained during the development of the stages signalled in the method of work, and corresponds to sections III.1, III.2, III.3, III.4, III.5, III.6 and part of section III.7. On the other hand, part of section III.7 and appendix VI.4 contain what can be considered the most representative final results of this research: 4,000 English-Spanish dictionary entries in their final format, that is, presented as they will appear in the prospective dictionary – once the rest of entries are completed. The entries belong to the letters A, B, N, O, U and V. This selection of letters for presenting their entries, which may look rather arbitrary at first sight, has, however, a motivation: since this research does not yet show the complete specialised lexicographical work whose development it explains – that is, the complete bilingual dictionary of the ceramic industry – and provided the fact (experienced by many lexicographers) that normally the initial letters of a dictionary are the ones which are devoted a greater effort and interest because of a simple human trait like tiredness at the end of long processes, the selection of these specific letters for the presentation of their entries responds to the simple convenience of balancing efforts and thus the quality of final results. Consequently, in order to avoid an unbalanced treatment of lexical units originated by the position they occupy, I have chosen to work with two letters from the beginning (A and B), two from the middle (N and O) and two from the end of the prospective dictionary (U and V), so that the content of these three broad parts and the effort devoted to them is more balanced at the end of the process. Even when A is, in this specific case and after term

extraction (together with C and S) the letter which gathers a greater number of terms, it shows the same “letter status” as, for instance, letter Z and, accordingly, them both deserve, proportionally, the same effort and diligence. Figure III.1 illustrates, as shown in TermStar XV, the selection of letters whose entries have been presented in this study as final results.



**Figure III.1:** Screenshot from TermStar XV illustrating (on the left) the selection of letters whose entries have been presented as final results.

Therefore, in order to clarify what kind of results are to be found in this results section, it may be said that, as a whole, term extraction has been undertaken in both directions, English-Spanish and Spanish English, so that approximately 13,000 terms in each language of work (26,000 in total) are already included in the database of the dictionary in TermStar XV. From these, 4,000 English-Spanish final entries – with all the data included – have been presented in order to illustrate how the final dictionary will actually be. The next sections illustrate how these results have been achieved.

Thus, the way results have been presented follows, in broad terms, the same structure of the working method used. However, no results as such have been included as obtained in the “definition of the work” stage. This is so since, in spite of being a

fundamental phase for the specialised lexicographical work here presented, it has been conceived as a procedural part of the research more oriented to laying the ground for the provision of subsequent sound and systematic results than to the provision of immediate results in itself.



*Let us watch well our beginnings,  
and results will manage themselves.*

**Alexander Clark**

## 1. CORPUS COMPILATION RESULTS

Something similar to what happens in the stage of “definition of the work” occurs with the stage of “work preparation and corpus compilation”, that is to say, “work preparation” has been conceived more as a procedural part than as a stage for the provision of results as such. However, the corpus as such or the actual corpus composition can be considered as a crucial result obtained at this point. In this respect, section III.1.1 includes the list of documents forming part of the corpus and thus constituting corpus compilation results. Likewise, results regarding the adequacy of corpus design and its degree of specialisation have also been achieved in subsequent stages with the help of WST frequency and statistical data. Results in this respect have thus been included in section III.4.1.4 since, strictly speaking, they have been obtained in the stage of term extraction, once WST has been employed. However, probably, the most relevant and revealing result regarding corpus compilation is corpus size. In the specific case of this study – and thanks to WST statistical analysis again – corpus counts give the following overall results (see figure III.2):

<b>CORPUS</b>	<b>TOKENS (total number of words)</b>
<i>ENGLISH CORPUS</i>	706,931
<i>SPANISH CORPUS</i>	791,870
<b>TOTAL</b>	<b>1,498,801</b>

**Figure III.2:** Corpus size.

### 1.1 Actual corpus composition

This section devoted to actual corpus composition makes reference to the exact list of documents forming part of the corpus used in this study and has been

approached by providing the name of the documents compiled, the codes assigned to them for a correct management and identification, and, in some cases, a brief description of their content. Hence, the information here included about actual corpus composition has been firstly arranged regarding the exact kind of source of the documents (norms, books, Internet documents, etc.). Then, these documents have been grouped depending on whether they belonged to the Spanish or the English corpus.

When necessary, also the peculiarities of the documents within their respective groups have been indicated as well as some samples of the documents aimed at illustrating the kind of texts compiled. For more information on the way documents have been named (assigned a code in the corpus) and the way they have been organised, see section VI.1 in the appendix.

Actual corpus composition in this study could be summarised as follows:

#### **UNE /EN norms:**

##### **Spanish Corpus:**

##### **UNE norms (with a Spanish version only):**

###### **doc 0001**

*Baldosas cerámicas para suelos y paredes: definiciones, clasificación, características y marcado.*

###### **doc 0003**

*Baldosas cerámicas extruídas con baja absorción de agua ( $E < 3\%$ ) – Grupo AI*

###### **doc 0013**

*Adhesivos para baldosas cerámicas. Determinación de la resistencia a la cizalladura de los adhesivos de dispersión.*

###### **doc 0014**

*Sistemas de gestión medioambiental . Guía para la implantación de sistemas de gestión medioambiental conforme a UNE-EN ISO 14001 en el sector de baldosas cerámicas, y requisitos adicionales para el registro en el Reglamento EMAS.*

###### **doc 0015**

*Adhesivos para baldosas cerámicas. Determinación del deslizamiento. (Mayo 1999)*

###### **doc 0016**

*Adhesivos para baldosas cerámicas. Determinación del deslizamiento.(Julio 1997)*

###### **doc 0017**

*Adhesivos para baldosas cerámicas. Placas de hormigón para ensayos. (Mayo 1999)*

###### **doc 0018**

*Adhesivos para baldosas cerámicas. Definiciones y especificaciones.*

###### **doc 0019**

*Adhesivos para baldosas cerámicas. Placas de hormigón para ensayos. (Julio 1997)*

###### **doc 0020**

*Adhesivos para baldosas cerámicas. Determinación de la capacidad humectante.*

**Spanish Corpus:****UNE norms (parallel norms in their Spanish version):****doc NP 0002**

*Baldosas cerámicas: determinación de la dureza al rayado de la superficie según Mohs*

**doc NP 0005**

*Baldosas cerámicas prensadas en seco con baja absorción de agua ( $E < 3\%$ ) – Grupo BI*

**doc NP 0006**

*Baldosas cerámicas prensadas en seco con absorción de agua de  $3\% < E < 6\%$  (grupo B II a)*

**doc NP 0007**

*Baldosas cerámicas prensadas en seco con absorción de agua de  $6\% < E < 10\%$  (grupo B II b)*

**doc NP 0008**

*Baldosas cerámicas extruídas con absorción de agua de  $3\% < E < 6\%$  (Grupo A II a) parte 1*

**doc NP 0009**

*Baldosas cerámicas extruídas con absorción de agua de  $3\% < E < 6\%$  (Grupo A II a) parte 2*

**doc NP 0010**

*Baldosas cerámicas extruídas con absorción de agua de  $6\% < E < 10\%$  (grupo AIIb) parte 1*

**doc NP 0011**

*Baldosas cerámicas extruídas con absorción de agua de  $6\% < E < 10\%$  (grupo AIIb) parte 2*

**doc NP 0012**

*Baldosas cerámicas extruídas con absorción de agua  $E > 10\%$  (grupo AIII)*

**English Corpus:****EN norms (just the title translated from the Spanish norms named in the same way):****doc 0001**

*Ceramic floor and wall tiles. Definitions, classification, characteristics and marking.*

**doc 0003**

*Extruded ceramic tiles with low water absorption ( $E < 3\%$ ) Group AI.*

**doc 0013**

*Adhesives for tiles. Determination of shear adhesion strength of dispersion adhesives.*

**doc 0014**

*Environmental Management Systems. Guide for the implementation of Environmental Management Systems according to UNE-EN ISO 14001 in the ceramic tile sector, and additional requirements for EMAS related purposes.*

**doc 0015**

*Adhesives for tiles. Determination of slip. (May 1999)*

**doc 0016**

*Adhesives for tiles. Determination of slip. (July 1997)*

**doc 0017**

*Adhesives for tiles. Concrete slab for test.*

**doc 0018**

*Adhesive for files. Definitions and specifications.*

**doc 0019**

*Adhesives for tiles. Concrete slab for test.*

**doc 0020**

*Adhesives for tiles. Determination of wetting capability.*

**English Corpus:****EN norms: parallel norms in their English version:****doc NP 0002**

*Ceramic tiles. Determination of scratch hardness of surface according to Mohs.*

**doc NP 0004**

*Dust pressed ceramic tiles with water absorption  $E > 10\%$  - Group BIII.*

**doc NP 0005**

*Dust pressed ceramic tiles with a low water absorption ( $E < 3\%$ ) - Group BI.*

**doc NP 0006**

*Ceramic tiles. Dust-pressed ceramic tiles with a water absorption of  $3\% < E < 6\%$  (group BIIa).*

**doc NP 0007**

*Ceramic tiles. Dust-pressed ceramic tiles with a water absorption  $6 < E < 10\%$  (Group BIIb).*

**doc NP 0008**

*Ceramic tiles. Extruded ceramic tiles with a water absorption of  $3\% < E < 6\%$  (Group AIIa) Part 1.*

**doc NP 0009**

*Ceramic tiles. Extruded ceramic tiles with a water absorption of  $3\% < E < 6\%$  (Group AIIa). Part 2.*

**doc NP 0010**

*Ceramic tiles. Extruded ceramic tiles with a water absorption of  $6\% < E < 10\%$  (Group AIIb). Part 1*

**doc NP 0011**

*Ceramic tiles. Extruded ceramic tiles with a water absorption of  $6\% < E < 10\%$  (Group AIIb). Part 2*

**doc NP 0012**

*Ceramic tiles. Extruded ceramic tiles with a water absorption of  $E > 10\%$  (Group AIII).*

What follows is an example of a parallel document, more specifically a UNE and an EN norm, included in the corpus:

**Corpus ES / doc NP 0004 (UNE norm):**

*Descriptoros: Baldosa de revestimiento, Revestimiento cerámico, Especificación de materiales, Dimensión, Tolerancia de dimensión, Propiedad física, Aspecto, Propiedad química, Propiedad mecánica, Designación, Marcado*

**BALDOSAS CERAMICAS PRENSADAS EN SECO CON ABSORCION DE AGUA  $E > 10\%$ -GRUPO B II. OBJETO Y CAMPO DE APLICACION**

*La presente norma europea especifica las dimensiones, tolerancias dimensionales, características mecánicas, físicas y químicas, características de aspecto superficial y marcado de las baldosas cerámicas.*

*Esta norma se aplica exclusivamente a las baldosas cerámicas prensadas en seco de primera calidad, con una absorción de agua ( $E > 10\%$ ) según el grupo BII de la norma EN 87 (UNE 67-087), destinadas a revestimientos de paredes y suelos. Las baldosas de este grupo se utilizan principalmente en zonas no sometidas a cargas mecánicas elevadas. No deben utilizarse cuando se requiera asistencia a la helada.*

*Hay una pequeña producción de baldosas cerámicas prensadas en seco, no esmaltadas, con absorción de agua superior al 10 %, que no están incluidos en la presente norma.*

**REFERENCIAS**

*Baldosas cerámicas. Definiciones, clasificación, características y marcado.*

*Baldosas cerámicas. Determinación de características dimensionales y aspecto superficial.*

*Baldosas cerámicas. Determinación de la absorción de agua. Baldosas cerámicas. Determinación de la resistencia a la flexión.*

*Baldosas cerámicas. Determinación de la dureza al rayado de la superficie según Mohs.*  
*Baldosas cerámicas. Determinación de la dilatación térmica lineal.*

### **Corpus EN / doc NP 0004 (EN norm):**

*Keywords :Tiles, coating slabs, ceramic coatings, equipment specifications, dimensions, dimensional tolerances, physical properties, appearance, chemical properties, mechanical properties, designation, marking.*

*English version*

**DUST PRESSED CERAMIC TILES WITH WATER ABSORPTION  $E > 10\%$  - GROUP BIII. SCOPE AND FIELD OF APPLICATION**

*This European Standard specifies sizes, dimensional tolerances, mechanical physical and chemical requirements, surface quality requirements and marking of ceramic tiles.*

*It is applicable only to dust-pressed ceramic glazed tiles of first quality, with a water absorption according to group Billof MET 87 for use as both wall and floor coverings. Tiles in this group are mainly used in areas not subject to severe mechanical load. They are not intended for applications where conditions of frost may apply.*

*There is a small production of dust-pressed ceramic unglazed tiles with a water absorption greater than 10 per cent that is not covered by this standard.*

#### **REFERENCES**

*"Ceramic tiles - Definitions, Classification, Characteristics"*

*"Ceramic tiles - Determination of dimensions and surface quality"*

*"Ceramic tiles - Determination of water absorption"*

*"Ceramic tiles - Determination of modulus of rupture"*

*"Ceramic tiles - Determination of scratch hardness of surface according to Mohs" I*

*"Ceramic tiles - Determination of linear thermal expansion"*

In addition to norms, a series of texts from the Internet – accomplishing the criteria put forward in section I.6.4.2 C for being considered reliable texts – have been compiled in the corpus. They have been found in the addresses indicated and a brief description of them has been included.

### **Internet documents:**

#### **English Corpus:**

##### **docEN 0021:**

[http://www.jenmc.com/en\\_user.htm](http://www.jenmc.com/en_user.htm)

Short report about the using of abrasion-resistant Linling board.

##### **docEN 0022:**

<http://www.wkap.nl/prod/b/0-412-13191-9>

Abstract about phase diagrams and ceramic processes issued by Kluwer Academic Publishers.

##### **docEN 0023:**

[http://msewww.engin.umich.edu/programs/graduate/course\\_offerings/syllabus/mse542sample.pdf](http://msewww.engin.umich.edu/programs/graduate/course_offerings/syllabus/mse542sample.pdf)

Fundamental and practical aspects of ceramic processing, with primary emphasis on powder processing.

**docEN 0024:**

<http://www.spectrumglazes.com/helpfullhints.htm>

Official website of Spectrum glazes where texts in English dealing with glaze products and their applications have been obtained: dry glaze mixing instructions, raku firing and guidelines to adjusting glaze viscosity and density.

**docEN 0025:**

<http://www.peceramics.com>

Websites with interesting texts in English dealing with precision engineered ceramics, traditional ceramics, fabrication techniques, material properties for alumina ceramics, ceramic applications and ceramic applications for ceramic materials.

**docEN 0026:**

<http://www.spectrumglazes.com/ourproducts.htm>

The company Spectrum Glazes provides here in its website with a list (its product guide), containing detailed information about all sorts of glazes: low fire glazes, high fire glazes, underglazes and decorating colours, ceramic stains and crystals and miscellaneous products.

**docEN 0027**

<http://www.icv.csic.es/ceramica/ceramica.htm>

This address belongs to the web page of the ICV (Instituto de Cerámica y Vidrio). Texts explaining the lines of investigation, the projects, the work groups (and their function) and the equipment used in the ceramic department of the ICV have been obtained from this website. Certain parts of this document are in Spanish and some others in English (it is not, however, a parallel document). The parts in Spanish of this document have been named docEs 0035

**docEN 0028:**

<http://www.k-tclay.com/ceramictile.asp>

This is the website of the Kentucky-Tennessee Clay Company, which contains highly informative parallel documents both in English and Spanish dealing with many fields and subfields concerning ceramics and tile industry: ceramic tiles, glazes, engobes, enamel, ball clays (ceramic and filler grades), ceramic grade kaolins, ceramic grades feldspars, rubber industry, feldspar, plastics, dinnerware ceramics, art and hobby ceramics, adhesive, caulk and sealant industries.

**docEN 0029:**

[http://www.hometime.com/Howto/projects/ctile/tile\\_1.htm](http://www.hometime.com/Howto/projects/ctile/tile_1.htm)

Website addressed to the layman or semi-expert and devoted to help homeowners to achieve professional-looking results from their home-improvement projects.

**docEN 0030:**

<http://www.floorbiz.com/tile/tile-floors.htm>

Website on every kind of tiles: ceramic tile, clay tile, cork tile, custom tile...

**docEN 0031**

[http://www.thetiledoctor.com/tile\\_manufac.cfm](http://www.thetiledoctor.com/tile_manufac.cfm)

Website on the manufacturing of ceramic and cement tiles with explanations on what is a ceramic tile and the most common means of forming the tile bodies together with a brief and non-technical on line tour to provide some general insights on how a tile is made and a final section on the most common stone tiles produced today as well as stone slab fabrication and quarry methods.

**docEN 0032**

<http://www.floorfacts.com/flooring-guide/default.asp?topic=4&p=4>

Website dealing with: classifications of ceramic tile, types of tile, common tile terms, tile density and moisture absorption, tile production methods, white body tile versus red body tile, wall tile trims and glazed ceramic tile.

**docEN 0033**

<http://www.oldhouseweb.com/oldhouse/content/npsbriefs/ceramicfloors/3.asp>

Website with a good description of ceramic floor tile types, an explanation on tile-making process or how to lay ceramic tile floors and containing a guide on flooring techniques. It also includes an account on historic ceramic floor tile: damage and deterioration problems, repair and replacement, and so on. Finally it includes a brief list with some sources for replacement tiles.

## Spanish Corpus

### docES 0021:

<http://www.segemar.gov.ar/noticias/noticiassegemar/nota.asp?bol=13&nota=224>

In this electronic address it can be found the blurb of the book *Introducción a los esmaltes cerámicos* (*Introduction to ceramic glazes*).

### docES 0022:

<http://pato2.fi.mdp.edu.ar/academica/prceramicaindustrial.htm>

Schedule in modules on the topic of industrial ceramics.

### DocES 0023:

<http://www.iaf.es/sectores/ceramica/materia.htm>

This text is a simple but useful list with all the raw materials employed in the ceramic industry.

### DocES 0024:

<http://www2.gratisweb.com/wilben/cap0701.html>

This document contains highly valuable information clearly explained and well posed about the properties of the ceramic materials, their basic composition, state of the art question, technological advances, innovation on ceramics and conclusions.

### docES 0025:

<http://www.segemar.gov.ar/noticias/noticiassegemar/nota.asp?bol=11&nota=192>

In this text it can be found useful information about the technology employed in the fabrication of advanced ceramic materials.

### docES 0026:

<http://www.segemar.gov.ar/noticias/noticiassegemar/nota.asp?bol=9&nota=158>

this is A text in Spanish about the preparation (divided in stages) of ceramic, glassy or vitreous and fireproof materials.

### docES 0027:

<http://www.unavarra.es/info/not143.htm>

Information and latest news about conferences and general information regarding ceramics and tile industry.

### docES 0028:

[http://www.mec.es/mecd/atencion/educacion/hojas/A\\_Profesorado/a-5-2-22.htm](http://www.mec.es/mecd/atencion/educacion/hojas/A_Profesorado/a-5-2-22.htm)

List of topics to be examined in public competition for secondary education teachers: titles of texts in Spanish about processes and glass and ceramics products.

### docES 0029:

<http://www.cab.cnea.gov.ar/tecnologia/ceravan.htm>

Website of the group “Cerámicos Especiales” with an account of their fields of research, means, techniques and areas of application among other issues.

### DocES 0030:

<http://spaintiles.info/esp/informacion/quees.asp>

General and specific information about what is a tile and the fabrication processes involved, properties, typology, design processes and technical information. These texts are offered in Spanish and come from the association Tile of Spain.

### docES 0031:

<http://www.vdiez.com/>

Website of Viso ceramic supplies including information about ovens, ceramic pastes, the preparation for the glazing process and its stages.

### docES 0032

<http://www.lagogarcia.com/viso/ceramica/soyer/soyerfabrica.htm>

Brief text on the stages involved in the elaboration of glazes.

### docES 0033

<http://www.lagogarcia.com/viso/ceramica/soyer.htm>

Website dealing with glaze and its properties.

### docES 0034

<http://www.lagogarcia.com/viso/ceramica/ceramica.htm>

Website deling with products in the ceramic industry.

**DocES 0035**

<http://www.icv.csic.es/ceramica/ceramica.htm>

Website of the ICV (Instituto de Cerámica y Vidrio) containing texts in which the lines of investigation, the projects, the work groups (and their function) and the equipment employed in the ceramic department of the ICV are put forward. Certain parts of this document are in Spanish and some others in English (but it is not a parallel document). The parts in English of this document have been saved with the code docEN 0027.

**docES 0036**

<http://spaintiles.info/documentos/gbc.pdf>

Extense document entitled “Guía de la baldosa cerámica” (Guide of the ceramic tile) elaborated, among others, by ASCER and CEMARKSA and providing a detailed account on the processes involved in the elaboration of this product.

The following group of documents from the corpus are parallel Internet documents, that is, documents with two versions of the same content, one in English and one in Spanish, which have been named the same in both corpora.

**English corpus and Spanish corpus:****docP 0001**

<http://www.spaintiles.info/esp/informacion/quees.asp>

Website of ASCER containing information about what is a tile, its properties, the typology of the ceramic tile etc. It is a detailed and exhaustive account on ceramic related issues.

**docP 0002**

[www.k-tclay.com/espanolceramictile.asp](http://www.k-tclay.com/espanolceramictile.asp)

Website of the Kentucky-Tennessee Clay Company with an overview of its products and production centres.

**docP 0003 (originally in paper format but including a CD-Rom)**

General catalogue of the company FORO with its products and transformation machinery.

**docP 0004**

[http://www.tauceramic.net/productos/catalogo/busq\\_prof.asp](http://www.tauceramic.net/productos/catalogo/busq_prof.asp)

Website of Tau Ceramics containing a parallel document with the title: “The latest contributions by Tau in ceramic wall tiling and benefits when applied to façades” and a parallel chart with the main materials, colours and formats this firm works with.

The actual corpus composition regarding books, research articles and journals is the following one:

**Spanish Corpus:****docES\_0037**

*El color de la cerámica: Nuevos mecanismos en pigmentos para los nuevos procesados de la industria cerámica.*(2003)

**docES\_0038**

*Gestión medioambiental en las empresas cerámicas de Castellón.*(2003)

**docES\_0039**

*Tecnología de los materiales cerámicos* (2005)

**docES\_0040**

*Enciclopedia de técnicas de cerámica* (1992)

**docES\_0041**

*Esmaltes y pigmentos cerámicos* (2001)

**docES\_0042***Tóxicos cerámicos (2001)***docES\_0043***Defectos de fabricación de pavimentos y revestimientos cerámicos (1991)***docES\_0044***La cerámica y los hornos modernos para su cocción y decoración (1992)***docES\_0045***Introducción a la tecnología de la cerámica (1992)***docES\_0046***Vidriados cerámicos: fundamentos, propiedades, recetas, métodos (1990)***docES\_0047***Introducción a la tecnología de la cerámica (1990)***docES\_0048***Ciencia y tecnología de los materiales cerámicos y vítreos (1990)***docES\_0049***Cerámica industrial. Vol I (1976)***docES\_0050***Cerámica industrial. Vol II (1976)***docES\_0051***Cerámica industrial. Vol III (1976)***docES\_0052***Pastas y vidriados en la fabricación de pavimentos y revestimientos cerámicos (1994)***docES\_0053***Mineralogía de arcillas terciarias cerámicas de castellón (1991)***English Corpus:****docEN\_0034***What Every Engineer Should Know About Ceramics.(1990)***docEN\_0035***Glass-Ceramic Materials. Liquid Phase Separation, Nucleation and Crystallization in Glasses.(1986)***docEN\_0036 (I) / docEN\_0036 (II)***Concise Encyclopedia of Advanced Ceramic Materials (1991)***docEN\_0037***The Ceramic Glaze Handbook. Materials.Techniques. Formulas (2003)***docEN\_0038***Characterization of Porous Solids and Powders: Surface Area, Pore Size, and Density (2004)***docEN\_0039***Introduction to Ceramics (1976)***docEN\_0040***Physical Ceramics: Principles for Ceramic Science and Engineering (1995)***docEN\_0041***Glass-Ceramic Technology (2001)***docEN\_0042***Environmental Issues and Waste Management Technologies in the Ceramic and Nuclear Industries II (1996)***docEN\_0043***Ceramics as a Global Enterprise (2000)***docEN\_0044***Ceramic Processing and Sintering (1995)***docEN\_0045***Modern Ceramic Engineering: Properties, Processing, and Use in Design revised and expanded (1995)***docEN\_0046***Challenges in Ceramic Product Development, Manufacture, and Commercialization (1996)***docEN\_0047***Ceramics: Mechanical Properties, Failure Behaviour, Materials Selection (1999)*

**docEN\_0048***Ceramics: applications in manufacturing (1988)***docEN\_0049***Ceramic materials: processes, properties and applications (2007)***docEN\_0050***Ceramic production and distribution: an integrated approach (1992)***docEN\_0051***Ceramic films and coatings (1995)***docEN\_0052***Ceramic processing science and technology (1995)***docEN\_0053***Ceramic raw materials (1982)*

What follows are two examples, one in English and the other one in Spanish, of the kind of documents from books, journals and research articles that have been included in the corpus:

**Sample from docEN\_0034: *What Every Engineer Should Know about Ceramics* (1990):**

*This volume reviews the evolution of the ceramic technology and the early influences leading to today's worldwide interest in this arena. Although not intended to be a design manual, property tabulations and discussions of the major issues leading to successful applications are provided. The subjects covered include traditional ceramics, the new ceramics, ceramic processing, structural design considerations, the concept of fracture toughness (a central issue in ceramics), joining of ceramics, nondestructive testing and its importance, ceramic cutting tools and their implications, superconductive ceramics, advanced automotive ceramics, and carbon-carbon composites.*

*The structure of the ceramic crystal is complex and leads to many different forms. When one considers the number of atom types and arrangements that can be synthesized into ceramic bodies, it is easy to appreciate the fact that there is an infinite number of possibilities for the properties of such structures. That is why the developments in ceramics are leading to astounding discoveries and accomplishments. In the future, more and more variables will be discovered, studied, and applied, making possible even more revolutionary and useful applications.*

**Sample from docES\_0041: *Esmaltes y pigmentos cerámicos* (2001):**

*El proceso discontinuo de fabricación de fritas se lleva a cabo cuando se quieren obtener menores cantidades de frita que en el proceso continuo, es decir, para fritas con menor demanda.*

*Por la tipología del proceso, es muy difícil mantener constantes las propiedades de las fritas producidas, por lo que es recomendable, a la hora de comercializarlas, mezclar diferentes partidas de una misma frita, de forma que se consiga minimizar la variación de las propiedades y se mantenga una continuidad en sus características<sup>20</sup>.*

*La principal diferencia de este proceso con respecto del proceso continuo es el tipo de horno utilizado. Para estos procesos se utiliza un horno tipo rotatorio, como se muestra en la figura 1.9.*

*El horno rotatorio consiste en un cilindro de acero revestido interiormente de un material refractario y provisto de un sistema mecánico de movimiento. Este sistema se utiliza para hacer girar el horno y conseguir la homogeneización del fundido que se encuentra en su interior.*

*Aparte del cilindro principal, el horno consta de un quemador, situado en la entrada y de una campana extractora, conectada a una chimenea y que está situada en el otro extremo del horno rotatorio.*

*The order of ideas must follow the order of things.*

**Giambattista Vico**

## **2. RESULTS OBTAINED IN THE STAGE OF ELABORATION OF THE FIELD DIAGRAM**

The results obtained in this stage of elaboration of the field diagram are two field diagrams – one in English and one in Spanish – of the speciality domain under study (see figures III.3 and III.4).

1.CHARACTERISATION	1.1 Raw materials [RAWMAT] 1.2 Properties of the raw materials [PROPRAWMAT] 1.3 Geology/ Mineralogy/ Crystallography [GEOL-MIN-CRYST] 1.4 Chemistry [CHEM]	
2. PPRODUCTIVE PROCESSES	2.1 Extraction of raw materials	2.1.1 Exploitation and quarrying [EXPL-QUARR] 2.1.2 Extraction and exploitation machinery [EXTRACTMCHN]
	2.2 Transformation of raw materials	2.2.1 Transformation processes of raw materials [TRANSPROC] 2.2.2 Transformation materials [TRANSMTRLS] 2.2.3 Transformation machinery [TRANSMCHN]
	2.3 Transformations for obtaining the product	2.3.1 Productive processes for the elaboration of the product [ELABPROC] 2.3.2 Glazes and related products [GLAZEREL] 2.3.3 Materials [MTRLS] 2.3.4 Elaboration machinery [ELABMCHN] 2.3.5 Elaboration instruments [INSTR] 2.3.6 Final product [FINALPRODUCT] 2.3.7 By-products [BYPROD] 2.3.8 Testing [TESTING] 2.3.9 Chemical and physical properties [CHEM-PHYSPROP] 2.3.10 Quality [QUALITY] 2.3.11 Design [DESIGN]
	2.4 Commercialisation	2.4.1 Management [MNGMNT] 2.4.2 Trade [TRADE] 2.4.3 Distribution [DISTRIB]
	2.5 Security measures/occupational health [SFTY]	
	2.6 Environmental management [ENVRMENT]	
3. APPLICATIONS	3.1 Maintenance [MNTNCE] 3.2 Installation [INSTAL] 3.3 Construction [CONST]	
4. RELATED SUBJECTS	4.1 Allied industries [ALLIEDIND] 4.2 Measures [MEASURE] 4.3 Organisations and institutions [ORG-INST] 4.4 General [GEN]	

**Figure III.3:** Final English field diagram.

1. CARACTERIZACIÓN	1.1 Materias primas [MATPRI] 1.2 Propiedades de las materias primas [PROPMATPRI] 1.3 Geología/ Mineralogía/ Cristalografía [GEO-MIN-CRIST] 1.4 Química [QUIM]	
2. PROCESOS PRODUCTIVOS	2.1 Extracción de las materias primas	2.1.1 Explotación y cantería [EXPL-CANT] 2.1.2 Maquinaria de extracción y explotación [MAQEXTRAC]
	2.2 Transformación de las materias primas	2.2.1 Procesos de transformación de las materias primas [TRANSPROC] 2.2.2 Materiales para la transformación [TRANSMTRLS] 2.2.3 Maquinaria de transformación [MAQTRANS]
	2.3 Transformación para la obtención del producto	2.3.1 Procesos productivos para la elaboración del producto [ELABPROC] 2.3.2 Esmaltes y productos relacionados [ESMREL] 2.3.3 Materiales [MTRLS] 2.3.4 Maquinaria de elaboración [MAQELAB] 2.3.5 Instrumentos de elaboración [INSTR] 2.3.6 Productos resultantes/finales [PRODFIN] 2.3.7 Subproductos [SUBPROD] 2.3.8 Ensayos [ENSAYO] 2.3.9 Propiedades químicas y físicas [PROPQUIM-FIS] 2.3.10 Calidad [CALIDAD] 2.3.11 Diseño [DISEÑO]
	2.4 Comercialización	2.4.1 Gestión [GESTIÓN] 2.4.2 Comercio [COM] 2.4.3 Distribución [DISTRIB]
	2.5 Medidas de seguridad y salud laboral [SEG]	
	2.6 Gestión medioambiental [MEDAMB]	
3. APLICACIONES	3.1 Mantenimiento [MANTNMO] 3.2 Instalación [INSTAL] 3.3 Construcción [CONST]	
4. TEMAS RELACIONADOS	4.1 Industrias afines [INDAFIN] 4.2 Medidas [MEDIDA] 4.3 Organismos e instituciones [ORG-INST] 4.4 General [GRAL]	

**Figure III.4:** Final Spanish field diagram.

Additionally, the different subfields in the English field diagram have been filled in with some of the terms extracted all through this work and whose final entries are presented in this thesis (see figure III.5). Although these terms have been obtained in subsequent stages of the method and are not, therefore, proper field diagrams results, they have been included here in order to illustrate the usefulness of this organisational structure/ontological representation, its adequacy provided the field of work (every category has terms in it, although in different proportions), the mutual dependence of the stages of the method, and the complementary nature of the information to be obtained through these different stages.

<b>1. CHARACTERISATION OF RAW MATERIALS</b>
<b>1.1 Raw materials [RAWMAT]:</b> <i>acid clay, agalmatolite, airfloated kaolin, Albany clay, albite, alkali feldspar, allophane, anorthite, ball clay, bauxitic clay, etc.</i>
<b>1.2 Properties of the raw materials [PROPRAWMAT]:</b> <i>argillaceous, montmorillonitic, etc.</i>
<b>1.3 Geology/ Mineralogy/ Crystallography [GEO-MIN-CRIST]:</b> <i>accidental mineral, adamellite, alkali soil, alluvial, amphibolite, andalusite, applied geology, argillaceous schist, asbolite, ballast, etc.</i>
<b>1.4 Chemistry [CHEM]:</b> <i>acetate, acetic acid, additive, adjuvant, alcohol, alkali, anion, base exchange, Bayer method/process, brownian movement/motion, etc</i>
<b>2. PPRODUCTIVE PROCESSES</b>
<b>2.1 Extraction of raw materials</b>
<b>2.1.1 Exploitation and quarrying [EXPL-QUARR]:</b> <i>adamantine drill, attle, axhammer, backbreak, bank stabilization, batter, benching, berm, blast, blasting charge, blasting gelatine, bore sample, open pit, vertical cut, etc.</i>
<b>2.1.2 Extraction and exploitation machinery [EXTRACTMCHN]:</b> <i>angledozer, auger stem, back digger, backhoe, blaster, bucket excavator, bull-dozer, etc.</i>
<b>2.2 Transformation process of raw materials</b>
<b>2.2.1 Transformation processes of raw materials [TRANSPROC]:</b> <i>abrasive cleaning, air classification, air separation, atomization, ball milling, balling, blending, beneficiation, blunging, vibratory milling, etc.</i>
<b>2.2.2 Transformation materials [TRANSMTRLS]:</b> <i>abrasive agent, abrasive bead, abrasive charge, alumina grinding balls, ball bearings, balls, bars, etc.</i>
<b>2.2.3 Transformation machinery [TRANSMCHN]:</b> <i>air classifier, air elutriator, air-swept ball mill, alligator crusher, apron conveyer, atomizer, attrition mill, ball mill, etc.</i>

<b>2.3 Transformations for obtaining the product</b>
<b>2.3.1 Productive processes for the elaboration of the product [ELABPROC]:</b> <i>abrasion finish, abrasive blasting, Acheson process, acid scaling, acid wash, ageing, air dry, ashing, batching, binder removal, etc.</i>
<b>2.3.2 Glazes and related products [GLAZEREL]:</b> <i>acrylic emulsion, acrylic top-coat, aerography, alligator hide, aluminium enamel, antique green, ash-glazed, base glaze, bath, blown enamel, Bondaroy's yellow, bone ash, borax, etc.</i>
<b>2.3.3 Materials [MTRLS]:</b> <i>abradant, aerogel, arid, black ash, organic binder, organic matter, etc.</i>
<b>2.3.4 Elaboration machinery [ELABMCHN]:</b> <i>Aberson machine, abrasive collector, acid furnace, afterburner, annular kiln, atmospheric kiln, auger machine, basic open-hearth furnace, etc.</i>
<b>2.3.5 Elaboration instruments [INSTR]:</b> <i>abrader, abraser, airbrush, analytical balance, Andreasen pipette, Bercovich indenter, Bingham plastometer, etc.</i>
<b>2.3.6 Final product [FINALPRODUCT]:</b> <i>abaciscus, abaculus, acid-resisting tile, acoustic tile, agglomerate tile, aluminium ceramics, angle tile, apron tile, border tile, etc.</i>
<b>2.3.7 By-products[BYPROD]:</b> <i>air-cooled slag, off-cut, uprisings</i>
<b>2.3.8 Testing [TESTING]:</b> <i>abrasion resistance test, absorption test, accelerated exposure test, American test, autoclave test, ball test, Blaine test, etc.</i>
<b>2.3.9 Chemical and physical properties [CHEM-PHYSPROP]:</b> <i>abradability, abrasiveness, absolute porosity, absorptivity, acid and alkali resistance, bituminous, brittle fracture, bulking, nominal density etc.</i>
<b>2.3.10 Quality [QUALITY]:</b> <i>acceptance criteria, acceptance/acceptable quality level, basic grade, British standard, undamaged, etc.</i>
<b>2.3.11 Design [DESIGN]:</b> <i>accent colour, aesthetic effect, analogous harmony, background, outline, etc.</i>
<b>2.4 Commercialisation</b>
<b>2.4.1 Management [MNGMNT]:</b> <i>accountant, account-based management, activity-based costing, assets, attendance record, balance sheet, branch company, book-keeping, etc.</i>
<b>2.4.2 Trade [TRADE]:</b> <i>acceptance conditions, actual market value, agreed price, Brussels nomenclature, national demand, etc.</i>
<b>2.4.3 Distribution [DISTRIB]:</b> <i>additional freight, advance freight, air consignment note, airway bill of lading, articulated vehicle, baling, banding, etc.</i>
<b>2.5 Security measures/occupational health [SFTY]:</b> <i>accident at work, accident insurance, accident prevention, Approved Code of Practice, bellows, occupational exposure limits, occupational health, etc.</i>
<b>2.6 Environmental management [ENVRMENT]:</b> <i>acid deposition, acid dust, acid fog, air pollution, airborne contaminants, atmospheric aggression, etc.</i>
<b>3. APPLICATIONS</b>
<b>3.1 Maintenance [MNTNCE]:</b> <i>alkaline cleaner, ammonia-based cleaner, bacterial corrosion, biodeterioration, buffer, neutral cleanser, upkeep, etc.</i>
<b>3.2 Installation [INSTAL] :</b> <i>abutting joint, acouplement, air drilling machine, aligning tool, anchorage, angle float, angle paddle, angle planner, etc.</i>

<b>3.3 Construction [CONST]</b> : <i>abacement, base course, beam, brace, busckstay, building code, biuilding official, etc.</i>
<b>4. RELATED SUBJECTS</b>
<b>4.1 Allied industries [ALLIEDIND]</b> : <i>acid brick, acid refractories, adhesive cement, aerated concrete, neutral refractory, etc.</i>
<b>4.2 Measures [MEASURE]</b> : <i>ampere, angstrom, atmosphere, bar, nanometer, newton, etc.</i>
<b>4.3 Organisations and institutions [ORG-INST]</b> : <i>American Ceramic Society, American Society for Quality, American Satndards Association, National Institute of Standards and Technology, etc.</i>
<b>4.4 General [GEN]</b> : <i>ablution facilities, abroad, abscissa, accelerate, acute angle, adhesive tape, area, arris, etc.</i>

**Figure III.5:** English field diagram filled in with some of the terms included as final entries in this study.

As figure III.6 shows, the filters that may be applied to TermStar<sup>63</sup> XV (activated filter button highlighted in green) have made the retrieval of data according to different criteria possible. In this specific case, and in order to illustrate in figure III.5 how terms have been arranged on the basis of “subject” in the field diagram, different filters have been applied for retrieving only the entries included in the specified subfield/subject. Figure III.6 shows, for instance, a part of the terms included in the DB and filtered by TermStar XV as belonging to the subject “raw materials” (RAWMAT), and the same has been done for the rest of thematic areas in the field diagram.

<sup>63</sup> See section III.5 for TermStar results

TermStar XV [SP 17] - IULMA (Global) - [TermStar (Project Dictionaries) ]

File Edit Cursor View Project Options Window Help

1 2 3 4 5

A	B
C	D
E	F
G	H
I	K
L	M
N	O
PQ	R
S	T
UV	W
XY	Z

■ **acid clay** *n*: RAWMAT *By the acid treatment of acid clay, decolorization performance also changes following the change of specific surface and surface acidity* **arcilla ácida** tipo de arcilla de la que se desprenden iones de hidrógeno cuando es disuelta en agua

**agalmatolite** *n*: RAWMAT *Typical raw materials for ceramic tiles used in building purposes include clay, agalmatolite, silica sand and feldspar* **agalmatolita** mineral aluminosilicato, también conocido como pagodita -*pagodite*-, muy similar a la pirofilita -*pyrophyllite*- que se torna sumamente dura al ser sometido a calcinación

**airfloated kaolin** *n*: RAWMAT *an intermediate-grained airfloated kaolin like this is suitable for use as a filler and pigment* **caolin aeroflotado**

**Albany clay** *n*: RAWMAT *When Albany clay is used as a glaze it produces a series of rich yellows* **arcilla de Albany** *barbotina de Albany* , arcilla natural y fina con suficientes fundentes para actuar como un esmalte

**albite** *n*: RAWMAT *plagioclase* *Typical Applications of albite are Ceramic tiles, whiteware, glazes, glass, porcelain enamel frits, ceramics, filler, welding electrodes, and abrasives* **albita** **feldespato sódico**, mineral feldespato ordinario usado en la fabricación de vidrio y cerámica que se encuentra fundamentalmente en las pegmatitas y las rocas ígneas ácidas como los granitos y que forma cristales quebradizos y traslúcidos que pueden ser incoloros, blancos, amarillos, rosas, verdes o negros

**alkali feldspar** *n*: RAWMAT *feldspar: microcline: orthoclase* *Orthoclase is the alkali feldspar that typically crystallizes at intermediate temperature* **feldespato alcalino** serie de minerales aluminosilicados que se encuentran muy a menudo en cristales vitreos de color constituidos por potasio o sodio (o ambos) y que se usan en la fabricación de vidrio y cerámica

**allophane** *n*: RAWMAT *Allophane is a weathering or hydrothermal*

Número de ficha: 24579  
 Proyecto:  
 Diccionario: Cerámica (IndustrialCeramics)  
 Gráfico:  
 Estado:  
 Creado por: Santiago Posteguillo Gómez  
 Creado el: viernes, 17 de marzo de 2006 9:39  
 Área temática:  
 Nota:  
**ENG:**  
**Term:** acid clay  
 Subject: RAWMAT  
 Geographic alt.:  
 Part of speech: n  
 Syn.: montmorillonite clay ????  
 Cross Reference:  
 Data Source:  
 Definition: (geology) A type of clay that gives off hydrogen ions when it dissolves in water  
 Definition source: google  
 Context: By the acid treatment of acid clay, decolorization performance also changes following the change of specific surface and surface acidity  
 Context Reference: google  
 Dianormative Mark:  
 Reliability:  
 Notes:  
 Headword: acid  
 Category: 2x  
 Frequency:  
 Diacronic Alt.:  
 Status:  
**ESP:**  
**Término:** arcilla ácida  
 Variación geográfica:

S: ab F: RAWMAT English [UK] -> Spanish Cerámica [IndustrialCeramics] acid clay

Figure III.6: Part of the terms filtered by TermStar included in the DB within the subject “raw materials”

Only the English field diagram has been filled in with illustrative terms (figure III.5) since final, complete entries in this research are, for the time being, only available from English to Spanish.



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*You can't expect to hit the jackpot  
if you don't put a few nickels in the machine.*

**Flip Wilson**

### **3. RESULTS OBTAINED IN THE STAGE OF DOCUMENTARY CORPUS MANAGEMENT**

Documentary corpus management corresponds to the fourth stage signalled in the method of work. As has already been explained in the method (see section II.2.4), at this point, the textual samples compiled in the corpus have been stored as a collection of files in the computer for further analysis. For this, however, texts have had to be processed so as to make their original format compatible with the programs used in subsequent stages (WST 4.0 and TermStar XV).

Accordingly, the results obtained in this stage correspond to the corpus texts with electronic format and to those scanned with *Omnipage Pro.12*, subsequently subjected to an OCR (Optical Character Recognition) process and finally stored in *.txt* extension, the whole process converting them into a format compatible with WST. Hence, as a result of the stage of documentary corpus management, corpus texts have been rendered machine-processable by converting the data they contain to a machine-readable form: in this case, and broadly speaking, from a scanned image to character codes.

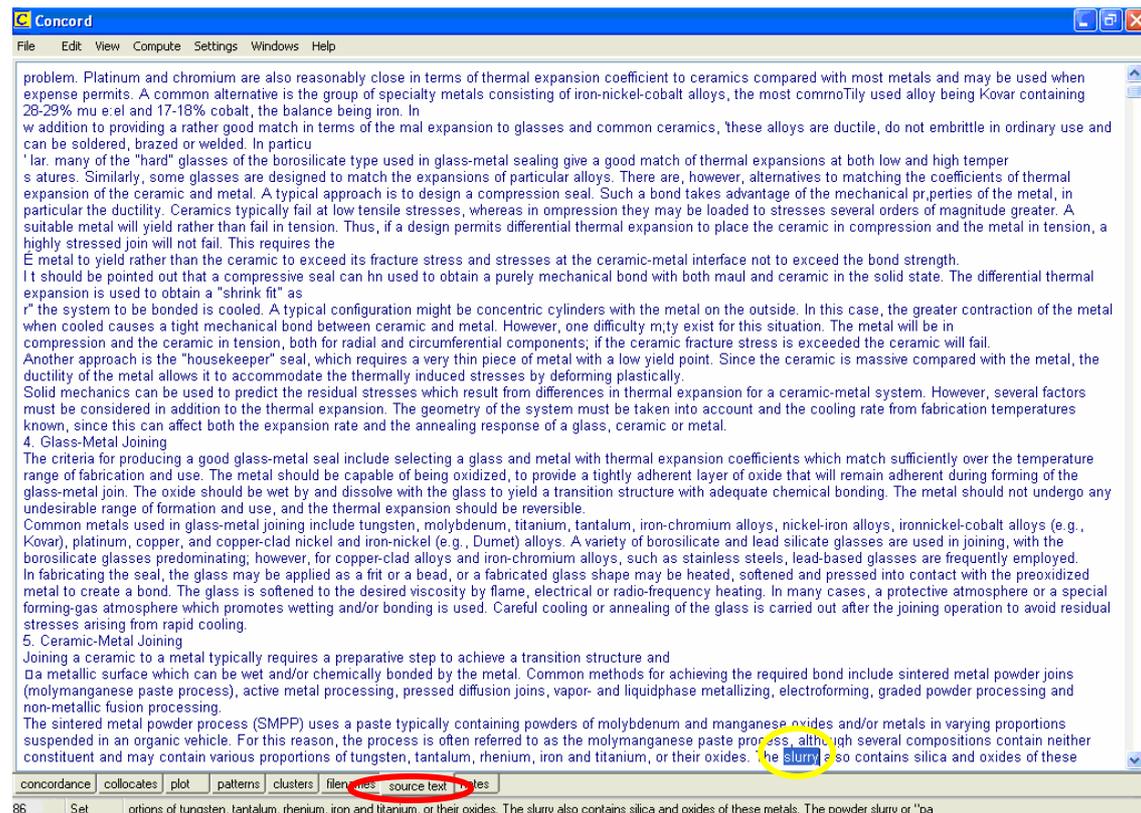
Figures III.7 and III.8 are examples of the kind of results obtained in the documentary corpus management stage since they show, already in WST, how the corpus (both in English and in Spanish) has been managed and processed so as to make it susceptible to be exploited with concordance software programs. Thus, the whole corpus converted, thanks to an OCR process, into a format compatible with WST constitutes the results obtained at this point. The unfeasibility of showing here all the texts in the corpus which have become machine-processable in this stage has originated the decision of including just a representative sample of them. Thus, this representative sample has the form of the two aforementioned figures, two screenshots showing 30 concordance lines of the term “slurry” (figure III.7) and the source text of one of these concordance lines, specifically number 35 (see figure III.8), illustrating

the way textual samples look in WST after documentary corpus management and hence how original samples have been converted into compatible character codes.

The results obtained during documentary corpus management in the form of texts susceptible to be analysed by WST have constituted the basis for the subsequent stage of term extraction. Hence, at this point, the corpus has acquired a compatible format with forthcoming stages.

	Concordance	Set	Tag	Word #	t. #	os. #	. #	os. #	t. #	os. #	File	%
5	fractory and fast-firing applications. RBS Slurry An intermediate to fine-grained slu			722	44	0%		0	1%		\docen_0028.txt	40%
6	S Slurry An intermediate to fine-grained slurry consisting of all Basic Properties T			727	44	8%		0	1%		\docen_0028.txt	41%
7	nessee Clays and is our finest-grained slurry for use in both ceiling tile and asph			739	44	9%		0	2%		\docen_0028.txt	41%
8	ements of the fiberglass industry. Kaolin Slurry A carefully controlled Kaolin-water			1,314	78	8%		0	4%		\docen_0028.txt	73%
9	ster casting rate is desired. Also sold in slurry form. optiKasT Slurry A carefully c			1,440	84	3%		0	2%		\docen_0028.txt	81%
10	sired. Also sold in slurry form. optiKasT Slurry A carefully controlled kaolin-water			1,443	84	6%		0	2%		\docen_0028.txt	82%
11	or tile, dinnerware and artware. Supreme Slurry A carefully controlled Kaolin-water			1,548	92	0%		0	8%		\docen_0028.txt	88%
12	n the stone in the desired cut location, a slurry of water and abrasives is applied t			2,156	104	4%		0	0%		\docen_0031.txt	69%
13	controlled by a doctor blade; the slip or slurry is dried; this results in a thin tape t			9,248	459	8%		0	8%		\docen_0034.txt	39%
14	lied to the ceramic surface by painting a slurry of titanium hydride followed by dryi			15,334	776	8%		0	3%		\docen_0034.txt	63%
15	te, hydroxide or aluminate. The resultant slurry can contain the components in			17,959	738	9%		0	3%		\docen_0036(i).txt	13%
16	several hours. After milling, the resultant slurry is drawn off to be dehydrated and			40,214	738	3%		0	9%		\docen_0036(i).txt	29%
17	ng followed by spray drying of the milled slurry. A typical process scheme is sho			40,652	764	0%		0	9%		\docen_0036(i).txt	30%
18	, such as chemical vapor infiltration and slurry or multiple sol-gel infiltration of por			67,058	884	2%		0	9%		\docen_0036(i).txt	49%
19	lass systems produced by a solid-state slurry impregnation route followed by hot			82,125	513	2%		0	9%		\docen_0036(i).txt	60%
20	most successfully manufactured by a slurry impregnation route (Phillips 1983,			82,576	529	2%		0	0%		\docen_0036(i).txt	60%
21	nt continuous tow, are passed through a slurry of finely powdered matrix material i			82,594	530	4%		0	0%		\docen_0036(i).txt	60%
22	nd binder. As the tow passes out of the slurry, the solvent evaporates and the res			82,614	531	3%		0	0%		\docen_0036(i).txt	60%
23	tallizes. The principal advantages of the slurry impregnation manufacturing proce			82,659	540	8%		0	0%		\docen_0036(i).txt	60%
24	powder. The resulting thick suspension (slurry) is processed to a crystallographic			09,386	676	3%		0	9%		\docen_0036(i).txt	79%
25	factorily by having small particles in the slurry and by using sinter additives such			09,486	682	9%		0	9%		\docen_0036(i).txt	79%
26	the pressed product, the particles in the slurry should be single crystals and mobi			09,509	683	3%		0	9%		\docen_0036(i).txt	79%
27	a relic. Of the methods investigated, the slurry-extrusion and solution- ? spinning			25,201	349	8%		0	1%		\docen_0036(i).txt	91%
28	developed to commercial scale. 2.1 The Slurry Process In the slurry process, an			25,214	351	2%		0	1%		\docen_0036(i).txt	91%
29	cial scale. 2.1 The Slurry Process In the slurry process, an aqueous suspension			25,218	351	4%		0	1%		\docen_0036(i).txt	91%
30	densification at the sintering stage. The slurry is then extruded into air, collecte			25,278	354	4%		0	1%		\docen_0036(i).txt	91%
31	e continuous filaments produced by the slurry process is about 20 un and these			25,326	356	4%		0	1%		\docen_0036(i).txt	91%
32	lution Spinning An alternative process to slurry spinning is the spinning of viscous,			25,356	358	9%		0	1%		\docen_0036(i).txt	91%
33	ations of High-Alumina Fibers Generally, slurry-spun fibers are produced in contin			25,860	381	8%		0	1%		\docen_0036(i).txt	91%
34	plasticity) for dry pressing. The blended slurry is then spray dried, creating a dry f			30,352	592	5%		0	4%		\docen_0036(i).txt	94%
35	iron and titanium, or their oxides. The slurry also contains silica and oxides of t			1,561	71	7%		0	1%		\docen_0036(i).txt	1%

Figure III.7: Screenshot from WST “Concordance” showing 30 concordance lines of the term “slurry”



**Figure III.8:** Screenshot from WST “Source text” showing the source text of one of the concordance lines of the term “slurry”, specifically number 35 (see figure III.7).

The stage of “documentary corpus management” has made it feasible that WST analyses the texts in the corpus by making them compatible with the formats accepted by the program. This has permitted the retrieval of any textual sample from the corpus (as shown below in figure III.9, extracted again from WST) in a format which is compatible with most programs of the sort and which allows the user to process and even the modify the texts if necessary –something unfeasible with scanned texts.

*The sintered metal powder process (SMPP) uses a paste typically containing powders of molybdenum and manganese oxides and/or metals in varying proportions suspended in an organic vehicle. For this reason, the process is often referred to as the moly manganese paste process, although several compositions contain neither constituent and may contain various proportions of tungsten, tantalum, rhenium, iron and titanium, or their oxides. The slurry also contains silica and oxides of these metals. The powder slurry or "paint" may be applied by brushing, spraying, roll coating, transfer tape, silk screening or dipping. The coated material is then dried in air under heat lamps and subsequently sintered in a wet hydrogen atmosphere at temperatures ranging from 1000°C to 1600°C for about 30 min. This yields a transition coating with a glassy-crystalline bridging phase of ceramic to metal which is then metallized to facilitate braze wetting, usually by electroplating or reducing oxide powders of nickel or copper. This yields a metallic surface suitable for conventional metal brazing methods. Although this process involves several steps, the procedures are relatively straightforward and yield reliable results. It is the most common method for producing ceramic-metal joins practised in industry.*

*Active metal techniques use an active constituent such as titanium, zirconium or hafnium which reacts with the ceramic. This active metal promotes wetting and bonding of the braze metal to the ceramic when included in the braze composition. The active metal is alloyed with a metal such as nickel or copper to reduce its reactivity and provide a lower brazing temperature (800-1200°C). The braze materials containing the active metal are used in the form of shims, wires or powders. The active metal can also be applied in the form of a hydride as a separate layer on the ceramic, in which case it has some similarity to the moly manganese process [...]*

**Figure III.9:** Excerpt of a text from the corpus rendered compatible with WST thanks to documentary corpus management.

As may be observed, what at the beginning was a scanned text from a book has been converted into a compatible format and thus into a machine-processable text.

*Where there is the necessary technical skill to move mountains,  
there is no need for the faith that moves mountains.*

**Eric Hoffer**

#### **4. RESULTS OBTAINED IN THE STAGE OF TERM EXTRACTION**

The stage of term extraction, the fourth one regarding results, corresponds to the fifth stage of the working methodology (see section II.2.5). At this point, the computer concordance program WordSmith Tools 4.0 (WST 4.0) has generated a first set of results in which it has recognised, analysed, delimited and retrieved potential terms (and their associated information). However, an in depth analysis and treatment on the part of the terminographer has been necessary for every single prospective term, thus originating the label semi-automatic.

Semi-automatic term extraction with WST has been subdivided into two main analyses: the one of the data/results offered by Wordlist and the one of the data/results offered by Concord; the combination of the two – very frequently in a non-linear way – together with the aforementioned individual treatment of potential terms on the part of the terminographer have originated the results shown in the following subsections and have lead to final term extraction with a total of approximately 26,000 terms extracted in both languages, 4,000 of which are presented as final entries in section VI.4.

##### **4.1 Wordlist results for semi-automatic term extraction with WST 4.0**

Regarding Wordlist results, even before the preselection stage for term extraction, a fact that could be empirically corroborated through corpus analysis was that, as already mentioned, the most frequent words in any corpus are grammatical/functional words, that is to say, a series of words useless for frequency analysis or other terminographical purposes but very common and frequent in any kind of text.

Accordingly, the first, “rough” results obtained with Wordlist before preselection comprehended the lists of frequencies of the lexical units in the corpus including grammatical words, these occupying (as expected) the top-frequent positions in the corpus. Figures III.10 and III.11 obtained with Wordlist show that the top-frequent positions in the corpus (specifically the 23 top-frequent words in English and the 27 top-frequent words in Spanish) correspond to grammatical words, whereas the next positions are occupied by a mixture of grammatical words and prospective terms.

N	Word	Freq.	%	Texts	%
1	THE	42206	5,9657	38	81
2	#	32260	4,5598	38	81
3	OF	25813	3,6486	42	89
4	A	17824	2,5194	36	76
5	AND	16500	2,3322	40	85
6	IN	13904	1,9653	38	81
7	TO	13019	1,8402	37	79
8	IS	11849	1,6748	34	72
9	FOR	7401	1,0461	45	96
10	ARE	6091	0,8609	34	72
11	BY	5445	0,7696	35	74
12	OR	5101	0,721	34	72
13	AS	4892	0,6915	34	72
14	BE	4702	0,6646	34	72
15	WITH	4679	0,6614	37	79
16	THAT	3681	0,5203	34	72
17	ON	3260	0,4608	37	79
18	AT	3093	0,4372	25	53
19	THIS	3029	0,4281	33	70
20	FROM	2912	0,4116	35	74
21	WHICH	2912	0,4116	35	74
22	IT	2901	0,41	32	68
23	CAN	2770	0,3915	31	66
24	CERAMIC	2698	0,3814	39	83
25	AN	2564	0,3624	33	70
26	USED	2416	0,3415	28	59
27	GLASS	2202	0,3112	17	36
28	C	2119	0,2995	27	57
29	TEMPERATURE	1951	0,2758	30	64
30	HIGH	1903	0,269	24	51
31	SEE	1847	0,2611	28	59
32	MATERIALS	1799	0,2543	25	53
33	HAS	1737	0,2455	21	45
34	SURFACE	1719	0,243	34	72
35	MATERIAL	1690	0,2389	22	47
36	HAVE	1613	0,228	33	70
37	CERAMICS	1568	0,2216	16	34
38	ALSO	1556	0,2199	24	51
39	TILES	1478	0,2089	34	72
40	TILE	1465	0,2071	30	64
41	BEEN	1436	0,203	20	42
42	GLAZE	1435	0,2028	20	42
43	PROCESS	1408	0,199	19	40
44	SUCH	1390	0,1965	30	64
45	THESE	1381	0,1952	30	64
46	V	1371	0,1938	19	40
47	CLAY	1357	0,1918	22	47
48	PROPERTIES	1244	0,1758	26	55
49	NOT	1238	0,175	32	68
50	Q	1224	0,173	4	8,5

**Figure III.10:** 50 top-frequent LUs from the English corpus. List of frequencies in English with grammatical/functional words included.

N	Word	Freq.	%	Texts	%
1	DE	59862	7,5587	50	100
2	LA	28164	3,5563	49	98
3	EN	20432	2,5799	49	98
4	EL	17805	2,2482	46	92
5	Y	17298	2,1842	50	100
6	#	16840	2,1264	49	98
7	QUE	16787	2,1197	46	92
8	SE	14824	1,8718	45	90
9	A	14081	1,778	50	100
10	LOS	11188	1,4127	48	96
11	LAS	9321	1,177	47	94
12	O	9114	1,1508	44	88
13	CON	8687	1,0969	44	88
14	DEL	8466	1,069	48	96
15	PARA	8178	1,0326	50	100
16	UN	7117	0,8987	43	86
17	POR	6899	0,8711	47	94
18	ES	6196	0,7824	41	82
19	UNA	6186	0,7811	45	90
20	AL	4856	0,6132	45	90
21	NO	4432	0,5596	47	94
22	COMO	4272	0,5394	42	84
23	SU	3328	0,4202	43	86
24	MÁS	3203	0,4044	30	60
25	LO	2718	0,3432	33	66
26	VER	2716	0,3429	18	36
27	SON	2296	0,2899	36	72
28	ESMALTE	2071	0,2615	23	46
29	SOBRE	2020	0,2551	29	58
30	MUY	1860	0,2349	21	42
31	PUEDE	1831	0,2312	34	68
32	CERÁMICA	1809	0,2284	31	62
33	ESMALTES	1795	0,2267	21	42
34	TAMBIÉN	1779	0,2246	28	56
35	AGUA	1752	0,2212	38	76
36	HORNO	1687	0,213	16	32
37	SER	1639	0,207	37	74
38	ARCILLA	1591	0,2009	17	34
39	YA	1578	0,1993	19	38
40	SI	1575	0,1989	23	46
41	TEMPERATURA	1448	0,1828	31	62
42	PASTAS	1410	0,178	21	42
43	SIN	1391	0,1756	27	54
44	ÓXIDO	1387	0,1751	12	24
45	COCCIÓN	1365	0,1724	30	60
46	CUANDO	1352	0,1707	31	62
47	ESTE	1347	0,1701	36	72
48	ETC	1333	0,1683	25	50
49	PASTA	1304	0,1647	27	54
50	ENTRE	1294	0,1634	39	78

**Figure III.11:** 50 top-frequent LUs from the Spanish corpus. List of frequencies in English with grammatical/functional words included.

These results showed that a preselection of useless units was necessary in order to make work easier and final results more reliable in subsequent stages.

#### 4.1.1 Preselection results

The results without grammatical/functional words are the ones a specialised lexicographer is normally interested in. In every specialised lexicographical work, the removal of grammatical words (generating noise<sup>64</sup>) saves time, energy, and adds reliability to the results because fewer factors distract the attention of the terminographer.

As has been explained in the corresponding section of the method (II.2.5.1.1.1), preselection for term extraction has consisted in getting rid of those elements that from the very beginning and without the need of further analysis can be said not to be terms or elements of terminological interest. Preselection has thus contributed to make the whole process of dictionary elaboration a “little bit less time-consuming” and has been feasible thanks to the possibilities offered by WST of getting rid of or preselecting those lexical units which do only contribute with noise to the final results.

Hence, preselection results include the lists of terms obtained after having applied to Wordlist the already mentioned stopwordlists<sup>65</sup>: lexical filters used for avoiding the noise or useless data generated by these functional words (pronouns, demonstratives, articles, prepositions...).

The results obtained in the preselection stage – in the form of frequency lists free from functional words – have been important since these lexical units could affect or alter final results if not removed, the same as hinder and even impede the correct functioning of the work process. These results (and the comparison of the lists obtained with and without grammatical words) should make the lexicographer reflect on the concepts of “noise” and “silence” and on the importance of taking them into consideration for making work easier and more reliable.

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<sup>64</sup> “Silence” is the contrary to “noise”, that is to say, useful data which is not detected or considered.

<sup>65</sup> See the stopwordlists used in section VI.2 of the appendix.

As figures III.12 and III.13 show, after the preselection of functional words through the application of stopwordslists, the results showing the top frequent potential terms obtained with Wordlist are “purer” and much more relevant.

N	Word	Freq.	%	Texts	%
1	CERAMIC	2698	0,3816497	39	83
2	GLASS	2202	0,31148726	17	36
3	TEMPERATURE	1951	0,27598166	30	64
4	HIGH	1903	0,26919177	24	51
5	MATERIALS	1799	0,25448027	25	53
6	SURFACE	1719	0,24316376	34	72
7	MATERIAL	1690	0,23906152	22	47
8	CERAMICS	1568	0,22180383	16	34
9	TILES	1478	0,20907274	34	72
10	TILE	1465	0,2072338	30	64
11	GLAZE	1435	0,20299011	20	42
12	PROCESS	1408	0,19917078	19	40
13	CLAY	1357	0,19195651	22	47
14	PROPERTIES	1244	0,17597191	26	55
15	SIZE	1157	0,16366519	32	68
16	THERMAL	1119	0,15828985	23	49
17	METAL	1087	0,15376323	19	40
18	PHASE	1058	0,149661	13	28
19	MADE	986	0,13947614	29	62
20	FIRING	966	0,136647	29	62
21	POWDER	910	0,12872544	17	36
22	REFRACTORY	909	0,12858398	11	23
23	KILN	901	0,12745233	14	30
24	OXIDE	893	0,12632068	15	32
25	FORM	877	0,12405737	23	49
26	LOW	863	0,12207698	26	55
27	WATER	847	0,11981367	31	66
28	TEST	840	0,11882348	25	53
29	STRENGTH	817	0,11556998	17	36
30	APPLICATIONS	805	0,1138725	18	38
31	TEMPERATURES	772	0,10920443	15	32
32	SMALL	735	0,10397054	19	40
33	SOLID	720	0,10184869	13	28
34	RESISTANCE	719	0,10170724	25	53
35	CRACK	718	0,10156579	12	25
36	SILICON	718	0,10156579	12	25
37	ALUMINA	701	0,09916102	10	21
38	TYPE	701	0,09916102	26	55
39	CHEMICAL	695	0,09831228	25	53
40	STRUCTURE	685	0,09689771	15	32
41	SINTERING	667	0,0943515	9	19

42	LIQUID	651	0,09208819	19	40
43	APPLIED	637	0,09010781	21	45
44	WARE	634	0,08968344	9	19
45	RANGE	633	0,08954198	18	38
46	STRESS	627	0,08869324	7	15
47	GRAIN	619	0,08756159	10	21
48	PARTICLES	608	0,08600557	15	32
49	PRESSURE	593	0,08388372	17	36
50	FIRE	589	0,08331789	18	38

**Figure III.12:** 50 top-frequent English LUs from the corpus. List of frequencies in English free from grammatical words.

N	Word	Freq.	%	Texts	%
1	ESMALTE	2071	0,26153281	23	46
2	CERÁMICA	1809	0,22844659	31	62
3	ESMALTES	1795	0,22667862	21	42
4	AGUA	1752	0,22124843	38	76
5	HORNO	1687	0,21304002	16	32
6	ARCILLA	1591	0,20091681	17	34
7	TEMPERATURA	1448	0,1828583	31	62
8	PASTAS	1410	0,17805953	21	42
9	ÓXIDO	1387	0,17515501	12	24
10	COCCIÓN	1365	0,17237678	30	60
11	PASTA	1304	0,16467349	27	54
12	FORMA	1278	0,16139013	34	68
13	COLOR	1258	0,15886445	29	58
14	BALDOSAS	1231	0,15545481	31	62
15	PIEZA	1170	0,14775153	20	40
16	TIPO	1102	0,13916425	35	70
17	PIEZAS	1025	0,12944044	24	48
18	MATERIALES	882	0,11138192	34	68
19	RESISTENCIA	881	0,11125564	36	72
20	SUPERFICIE	854	0,10784598	34	68
21	MATERIAL	839	0,10595173	29	58
22	ÓXIDOS	821	0,10367864	14	28
23	CALOR	779	0,09837473	14	28
24	P	776	0,09799588	17	34
25	CERÁMICAS	763	0,0963542	42	84
26	TEMPERATURAS	747	0,09433366	14	28
27	PLOMO	737	0,09307083	10	20
28	USO	737	0,09307083	23	46
29	HORNOS	716	0,09041888	18	36
30	PROCESO	708	0,08940861	23	46
31	MEDIOAMBIENTAL	688	0,08688295	5	10
32	CASO	682	0,08612525	30	60
33	HIERRO	679	0,0857464	13	26
34	C	665	0,08397843	42	84

35	AIRE	654	0,08258931	17	34
36	ARCILLAS	642	0,08107391	21	42
37	SISTEMA	624	0,07880081	19	38
38	MEDIO	616	0,07779054	32	64
39	GAS	615	0,07766426	13	26
40	BASE	606	0,07652771	22	44
41	CERÁMICOS	557	0,07033983	27	54
42	PIGMENTOS	557	0,07033983	11	22
43	COLORES	553	0,06983469	16	32
44	PARTÍCULAS	545	0,06882443	20	40
45	PORCELANA	544	0,06869815	14	28
46	FABRICACIÓN	540	0,06819301	36	72
47	CAPA	536	0,06768788	18	36
48	ALÚMINA	525	0,06629876	10	20
49	CALCIO	492	0,06213141	7	14
50	CERÁMICO	485	0,06124743	31	62

**Figure III.13:** 50 top-frequent Spanish LUs from the corpus. List of frequencies in English free from grammatical words.

If the display of information in these frequency monolexical lists is analysed in more detail, the data provided may be broken down into the following sections:

- a) The first column (N) indicates the numeric position regarding frequency of a given word. Therefore, number 1 indicates that the word appearing on the right of the number is the one most frequently appearing all through the corpus, number 2 indicates the second position and so on.
- b) The second column (WORD) provides a list of the different LUs contained in the corpus and named “types” by WST.
- c) The third column (FREQ) is that of frequency and indicates the times that the LU on the left appears in the corpus.
- d) The fourth column (%) shows the percentage of appearance of a word in the corpus calculated from the total number of words in it (figures in this column have been rounded up).
- e) The fifth column (TEXTS) indicates the number of texts in which the word appears.
- f) The sixth column (%) indicates the percentage of appearance of a word in the corpus calculated from the total number of texts.

In the following subsections, however, frequency lists results as such (after preselection) are explained in more detail together with statistical results. Figures III.16 and III.17 in the next section contain the 100 top-frequent terms in each language.

#### 4.1.2 Monolexical frequency lists results

Frequency monolexical lists results (both before and after preselection) have been provided by WST in the screen called “frequency”. LUs could also have been displayed alphabetically but for the aims of this work frequency lists were considered more revealing and practical.

After the preselection stage giving as a result the monolexical frequency lists free from grammatical words shown in figures III.12 and III.13, the most immediate conclusion drawn was that the top-frequent terms from the corpus were coherent and expectable in both languages provided the field of work (see figures III.14 and III.15 below, extracted from figures III.12 and III.13):

N	Word	Freq.	%	Texts	%
1	CERAMIC	2698	0,3816497	39	83
2	GLASS	2202	0,31148726	17	36
3	TEMPERATURE	1951	0,27598166	30	64
4	HIGH	1903	0,26919177	24	51
5	MATERIALS	1799	0,25448027	25	53
6	SURFACE	1719	0,24316376	34	72
7	MATERIAL	1690	0,23906152	22	47
8	CERAMICS	1568	0,22180383	16	34
9	TILES	1478	0,20907274	34	72
10	TILE	1465	0,2072338	30	64

**Figure III.14:** 10 top-frequent LUs (prospective TUs) from the English corpus free from grammatical words.

N	Word	Freq.	%	Texts	%
1	ESMALTE	2071	0,26153281	23	46
2	CERÁMICA	1809	0,22844659	31	62
3	ESMALTES	1795	0,22667862	21	42
4	AGUA	1752	0,22124843	38	76
5	HORNO	1687	0,21304002	16	32
6	ARCILLA	1591	0,20091681	17	34
7	TEMPERATURA	1448	0,1828583	31	62
8	PASTAS	1410	0,17805953	21	42
9	ÓXIDO	1387	0,17515501	12	24
10	COCCIÓN	1365	0,17237678	30	60

**Figure III.15:** 10 top-frequent LUs (prospective TUs) from the Spanish corpus free from grammatical words.

Monolexical frequency lists results have been so important all through the elaboration process of the dictionary because they have been used as the first approximation to the analysis of industrial ceramics terminology. This has been so since, in general, it is assumed that if the first words of a frequency monolexical list are observed, the central terms of a speciality field may be identified. Quoting Ahmad and Rogers' words (2001: 742 in Vargas, 2005: 685): *se podría decir que estas unidades son los "términos madre" de una especialidad concreta*, and figures III.14 and III.15 seem to corroborate this view. As has already been introduced in the method and to put it in a simple way, looking at the frequency results presented up to the moment in both languages – English and Spanish – and focusing on the 10 top-frequent terms obtained in each monolexical list, one could state that these LUs would be included among the first words to come to any person's mind (even in the case of the layman) when thinking about the ceramics industry.

Likewise, from the figures showing the 50 LUs with the highest frequency rate in the corpus, the most obvious conclusion to draw is that these are, very likely, the most usual LUs in the specific field of industrial ceramics, and probably also the words that better define and most prototypically characterise this domain.

Another fact already signalled in the theoretical framework section and which has also been corroborated by the actual results provided by WST is that the elaboration of frequency lists allows the terminographer to observe and analyse the most common grammatical categories in specialised languages. As Vargas (2005) points out, the lexical units of the general language are materialised in all the possible categories but present what has been called "preference categories". The most common grammatical category in which terms are given is, by far, that of the noun, followed by adjectives and then, although in a much smaller proportion, by verbs. Finally the trend is to find some, although not many, adverbs. In this sense, the stressed nominal character of specialised languages seems to be out of question (Sager *et al.*, 1980; Cabré 1993; Lerat, 1995 among many others) and if current results are used to corroborate this view we find that the specialised language of industrial ceramics is not an exception in this respect. If we observe again the first (top-frequent) 100 lexical units (potential TUs) in the monolexical frequency lists free from functional words obtained with Wordlist, it can be easily noticed that most of them belong to a single nominal category: the noun. Therefore, the statement considering that PAL (in this case the specialised language of

industrial ceramics) has the noun as its ruling category seems to be confirmed and, according to the results obtained in this research, this is even more noticeable in top-frequent terms. To illustrate this, in table III.16 – containing the 100 top-frequent terms in English (without grammatical words) – nouns have been highlighted in yellow<sup>66</sup> whereas the rest of categories have been highlighted in green (these including, mainly, adjectives and verbs). From the potential TUs signalled in yellow, those which may have other grammatical categories apart from the noun have been signalled with the symbol . The dominance of the yellow colour is obvious, this illustrating the dominance of nouns also in industrial ceramics terminology.

Other cat.	Position	Word	Freq.	%	Texts	%
	1	CERAMIC	2698	0,3816497	39	82,9787216
	2	GLASS	2202	0,31148726	17	36,1702118
	3	TEMPERATURE	1951	0,27598166	30	63,8297882
	4	HIGH	1903	0,26919177	24	51,0638313
	5	MATERIALS	1799	0,25448027	25	53,1914902
	6	SURFACE	1719	0,24316376	34	72,3404236
	7	MATERIAL	1690	0,23906152	22	46,8085098
	8	CERAMICS	1568	0,22180383	16	34,0425529
	9	TILES	1478	0,20907274	34	72,3404236
	10	TILE	1465	0,2072338	30	63,8297882
	11	GLAZE	1435	0,20299011	20	42,5531921
	12	PROCESS	1408	0,19917078	19	40,4255333
	13	CLAY	1357	0,19195651	22	46,8085098
	14	PROPERTIES	1244	0,17597191	26	55,319149
	15	SIZE	1157	0,16366519	32	68,0851059
	16	THERMAL	1119	0,15828985	23	48,9361687
	17	METAL	1087	0,15376323	19	40,4255333
	18	PHASE	1058	0,149661	13	27,6595745
	19	MADE	986	0,13947614	29	61,7021294
	20	FIRING	966	0,136647	29	61,7021294
	21	POWDER	910	0,12872544	17	36,1702118
	22	REFRACTORY	909	0,12858398	11	23,4042549
	23	KILN	901	0,12745233	14	29,7872334
	24	OXIDE	893	0,12632068	15	31,9148941
	25	FORM	877	0,12405737	23	48,9361687
	26	LOW	863	0,12207698	26	55,319149
	27	WATER	847	0,11981367	31	65,9574432
	28	TEST	840	0,11882348	25	53,1914902
	29	STRENGTH	817	0,11556998	17	36,1702118
	30	APPLICATIONS	805	0,1138725	18	38,2978706

<sup>66</sup> Some lexical units like *crystal*, *solid* and *sintering* (among others) can be considered to have more than one potential grammatical category so that they could also admit a different consideration apart from the noun. In these cases, however, a single category (the nominal one) has been assigned to each of them since the idea was to show in a simple and graphic way through the use of colours the dominance of nominal category in PAL.

	31	TEMPERATURES	772	0,10920443	15	31,9148941
	32	SMALL	735	0,10397054	19	40,4255333
🚩	33	SOLID	720	0,10184869	13	27,6595745
	34	RESISTANCE	719	0,10170724	25	53,1914902
🚩	35	CRACK	718	0,10156579	12	25,5319157
	36	SILICON	718	0,10156579	12	25,5319157
🚩	37	ALUMINA	701	0,09916102	10	21,2765961
	38	TYPE	701	0,09916102	26	55,319149
	39	CHEMICAL	695	0,09831228	25	53,1914902
	40	STRUCTURE	685	0,09689771	15	31,9148941
🚩	41	SINTERING	667	0,0943515	9	19,1489353
🚩	42	LIQUID	651	0,09208819	19	40,4255333
	43	APPLIED	637	0,09010781	21	44,680851
	44	WARE	634	0,08968344	9	19,1489353
	45	RANGE	633	0,08954198	18	38,2978706
🚩	46	STRESS	627	0,08869324	7	14,8936167
	47	GRAIN	619	0,08756159	10	21,2765961
	48	PARTICLES	608	0,08600557	15	31,9148941
	49	PRESSURE	593	0,08388372	17	36,1702118
	50	FIRED	589	0,08331789	18	38,2978706
	51	FURNACE	587	0,08303498	9	19,1489353
	52	BRICK	585	0,08275206	9	19,1489353
	53	FRACTURE	583	0,08246915	8	17,0212765
🚩	54	HEAT	574	0,08119604	17	36,1702118
🚩	55	PRESSING	571	0,08077168	13	27,6595745
	56	LARGE	567	0,08020585	16	34,0425529
	57	GAS	563	0,07964002	14	29,7872334
	58	OXIDES	556	0,07864983	13	27,6595745
	59	HOT	546	0,07723526	13	27,6595745
	60	EXPANSION	543	0,07681089	21	44,680851
	61	BODY	542	0,07666943	19	40,4255333
	62	GROWTH	539	0,07624506	9	19,1489353
🚩	63	GLAZES	538	0,07610361	17	36,1702118
	64	FIG	533	0,07539633	4	8,51063824
	65	DENSITY	524	0,07412322	13	27,6595745
	66	METHOD	523	0,07398176	16	34,0425529
🚩	67	CRYSTAL	516	0,07299156	11	23,4042549
	68	TERM	515	0,07285011	15	31,9148941
	69	REACTION	513	0,07256719	10	21,2765961
	70	COMPOSITION	507	0,07171845	15	31,9148941
	71	PRODUCT	497	0,07030389	22	46,8085098
	72	CARBON	491	0,06945515	11	23,4042549
	73	RATE	488	0,06903078	11	23,4042549
🚩	74	SILICA	487	0,06888933	12	25,5319157
	75	SYSTEM	486	0,06874787	18	38,2978706
	76	IMPORTANT	476	0,06733333	20	42,5531921
	77	ENERGY	470	0,06648456	8	17,0212765
	78	VOLUME	470	0,06648456	19	40,4255333
	79	WALL	463	0,06549437	24	51,0638313
	80	HIGHER	454	0,06422126	14	29,7872334
	81	TIME	454	0,06422126	18	38,2978706
	82	OXYGEN	453	0,06407981	12	25,5319157

	83	VITREOUS	451	0,06379689	12	25,5319157
	84	PARTICLE	442	0,06252378	14	29,7872334
	85	PRODUCTS	436	0,06167504	23	48,9361687
	86	CEMENT	433	0,06125068	13	27,6595745
	87	DIFFUSION	433	0,06125068	7	14,8936167
	88	REFRACTORIES	428	0,06054339	8	17,0212765
	89	MECHANICAL	425	0,06011902	22	46,8085098
	90	PRODUCTION	424	0,05997756	18	38,2978706
	91	AIR	420	0,05941174	16	34,0425529
	92	NUMBER	420	0,05941174	17	36,1702118
	93	STATE	415	0,05870445	15	31,9148941
	94	ELECTRICAL	407	0,0575728	15	31,9148941
	95	FORMED	406	0,05743135	14	29,7872334
	96	APPLICATION	405	0,05728989	27	57,4468079
	97	POINT	404	0,05714843	16	34,0425529
	98	POWDERS	398	0,05629969	8	17,0212765
	99	BASED	395	0,05587533	23	48,9361687
	100	PRODUCED	392	0,05545096	23	48,9361687

**Figure III.16:** 100 top-frequent prospective terms in English (without grammatical words), yellow colour comprising nominal category units and green comprising other grammatical categories.

If the same process is done with the lists obtained in the Spanish corpus, results do not differ substantially and yellow also dominates the top-100 most frequent terms (the same happens if the same kind of analysis is undertaken from term 100 onwards). As previously stated, I am aware that LUs like *cerámica*, *ácido* and *base*, among other units highlighted in yellow, may belong to other grammatical categories apart from the noun. However, also in these cases, they have been highlighted in yellow in order to make the figure more visual. Nonetheless, those units which may have other grammatical categories apart from the noun have been assigned again the symbol 🚩 on the left-hand side of the figure in order to make this feature noticeable.

Other cat.	Position	Word	Freq.	%	Texts	%
	1	ESMALTE	2071	0,26153281	23	46
🚩	2	CERÁMICA	1809	0,22844659	31	62
	3	ESMALTES	1795	0,22667862	21	42
	4	AGUA	1752	0,22124843	38	76
	5	HORNO	1687	0,21304002	16	32
	6	ARCILLA	1591	0,20091681	17	34
	7	TEMPERATURA	1448	0,1828583	31	62
	8	PASTAS	1410	0,17805953	21	42
	9	ÓXIDO	1387	0,17515501	12	24
	10	COCCIÓN	1365	0,17237678	30	60
	11	PASTA	1304	0,16467349	27	54
🚩	12	FORMA	1278	0,16139013	34	68
	13	COLOR	1258	0,15886445	29	58

	14	BALDOSAS	1231	0,15545481	31	62
	15	PIEZA	1170	0,14775153	20	40
	16	TIPO	1102	0,13916425	35	70
	17	PIEZAS	1025	0,12944044	24	48
	18	MATERIALES	882	0,11138192	34	68
	19	RESISTENCIA	881	0,11125564	36	72
	20	SUPERFICIE	854	0,10784598	34	68
	21	MATERIAL	839	0,10595173	29	58
	22	ÓXIDOS	821	0,10367864	14	28
	23	CALOR	779	0,09837473	14	28
	24	P	776	0,09799588	17	34
	25	CERÁMICAS	763	0,0963542	42	84
	26	TEMPERATURAS	747	0,09433366	14	28
	27	PLOMO	737	0,09307083	10	20
	28	USO	737	0,09307083	23	46
	29	HORNOS	716	0,09041888	18	36
	30	PROCESO	708	0,08940861	23	46
	31	MEDIOAMBIENTAL	688	0,08688295	5	10
	32	CASO	682	0,08612525	30	60
	33	HIERRO	679	0,0857464	13	26
	34	C	665	0,08397843	42	84
	35	AIRE	654	0,08258931	17	34
	36	ARCILLAS	642	0,08107391	21	42
	37	SISTEMA	624	0,07880081	19	38
	38	MEDIO	616	0,07779054	32	64
	39	GAS	615	0,07766426	13	26
	40	BASE	606	0,07652771	22	44
	41	CERÁMICOS	557	0,07033983	27	54
	42	PIGMENTOS	557	0,07033983	11	22
	43	COLORES	553	0,06983469	16	32
	44	PARTÍCULAS	545	0,06882443	20	40
	45	PORCELANA	544	0,06869815	14	28
	46	FABRICACIÓN	540	0,06819301	36	72
	47	CAPA	536	0,06768788	18	36
	48	ALÚMINA	525	0,06629876	10	20
	49	CALCIO	492	0,06213141	7	14
	50	CERÁMICO	485	0,06124743	31	62
	51	SODIO	485	0,06124743	7	14
	52	SÍLICE	477	0,06023716	16	32
	53	MINERAL	476	0,06011088	13	26
	54	CUARZO	475	0,05998459	10	20
	55	BAJA	457	0,05771149	29	58
	56	GESTIÓN	451	0,05695379	7	14
	57	OBTENER	450	0,05682751	23	46
	58	CARACTERÍSTICAS	438	0,05531211	35	70
	59	ESTRUCTURA	436	0,05505954	18	36
	60	EMPRESA	435	0,05493326	9	18
	61	INTERIOR	428	0,05404928	26	52
	62	INFORMACIÓN	421	0,05316529	19	38
	63	TIEMPO	420	0,05303901	22	44
	64	TÉCNICA	419	0,05291273	20	40
	65	SUSTANCIA	417	0,05266016	7	14

66	TAMAÑO	417	0,05266016	22	44
67	CARBONATO	416	0,05253388	8	16
68	CM	413	0,05215503	21	42
69	ALTA	404	0,05101848	25	50
70	GRES	404	0,05101848	15	30
71	ATMÓSFERA	399	0,05038706	14	28
72	USADO	397	0,05013449	13	26
73	ÁCIDO	394	0,04975564	18	36
74	COBRE	392	0,04950308	9	18
75	MEDIDA	392	0,04950308	28	56
76	TRABAJO	392	0,04950308	22	44
77	PRODUCCIÓN	387	0,04887166	21	42
78	PROPIEDADES	387	0,04887166	32	64
79	APLICACIÓN	386	0,04874538	29	58
80	PORCENTAJES	383	0,04836652	6	12
81	ESTADO	380	0,04798767	21	42
82	QUÍMICA	379	0,04786139	28	56
83	DÍCESE	378	0,04773511	3	6
84	BALDOSA	377	0,04760883	24	48
85	PERMITE	376	0,04748254	20	40
86	PRODUCTO	376	0,04748254	28	56
87	COMPOSICIÓN	374	0,04722998	21	42
88	GENERAL	372	0,04697741	17	34
89	CUBIERTA	371	0,04685112	12	24
90	MENOR	371	0,04685112	21	42
91	PRODUCTOS	371	0,04685112	35	70
92	VIDRIO	370	0,04672484	19	38
93	MÉTODO	364	0,04596714	16	32
94	PUNTO	364	0,04596714	21	42
95	REDUCCIÓN	364	0,04596714	13	26
96	MEDIOAMBIENTALES	361	0,04558829	4	8
97	SECADO	353	0,04457802	20	40
98	DIMENSIONES	350	0,04419917	23	46
99	CONSISTENTE	349	0,04407289	9	18
100	MUESTRA	349	0,04407289	19	38

**Figure III.17:** 100 top-frequent prospective terms in Spanish (without grammatical words), yellow colour comprising nominal category units and green comprising other grammatical categories.

In spite of what has just been put forward, the results obtained through the development of the prospective dictionary have shown that the specialised language of industrial ceramics does also make use of a big number of adjectives and verbs that, likewise, have been retrieved in term extraction. This fact – even when nouns constitute by far the commonest category – is not strange at all if we consider, broadly speaking, the important role played by design and elaboration/production processes in this industry. For instance, if the bilingual field diagram is observed (see figures III.12

and III.13), it can easily be deduced that a field or subject like “DESIGN” will need the use of adjectives for the formation of TUs as common as the following ones:

<i>Hand-made</i>		<i>tile (s)</i>
<i>Hand-molded</i>		
<i>Hand-painted</i>		

If others subjects or fields like “EXPL-QUARR” (exploitation and quarrying), “TRANSPROC” (transformation processes of raw materials) or “ELABPROC” (elaboration processes for obtaining the final product) are observed, the presence of verbs for describing common processes in the field such as *to glaze*, *to extrude*, *to blast*, *to fire* and so on is predictable and necessary. Obviously, almost every subject category does present examples of terms with different grammatical categories, but these 4 seemed to be the most prototypical ones for illustrating the presence and inclusion of adjectives and verbs.

In order to provide further examples in this respect, aimed at not dismissing the important role played by other grammatical categories apart from the noun, a series of adjectives and verbs gathered during term extraction both in English and Spanish have been included below<sup>67</sup>:

#### ADJECTIVES:

**English:** *vulnerable, brazen, needle-shaped, uniform, infra-red, infusible, non-hazardous, vitreous, adhesive, clayey, encapsulated, dense, quiescent, dendritic, exothermic, inelastic, irregular, erosion-resistant, conductive, opaque, transparent, coarse-grained, fine-grained, intermediate-grained, enamelled, glazed, even, high-end, flush, incised, newly developed, patented, ferroelectric, ferromagnetic, monochrome, monomolecular, non-vitreous, non-vitrified, etc.*

**Spanish:** *abrasivo, abrupto, absorbente, acromático, acicular, ácido, acústico, actínico, adhesivo, hermético, alcalino, aluvial, aluminoso, amorfo, anhidro, anhídrido, aniónico, anisótropo, anódico, antiestático, basal, bórico, vítreo, vitrificado, gresificado, viscoelástico, vibratorio, volátil, etc.*

<sup>67</sup> As may be deduced, these terms were obtained after the term extraction process was completed, but I have considered their inclusion here appropriate to illustrate the non-unique presence of nouns in PAL.

**VERBS:**

**English:** *nullify, attach, cast, stack, nail, staple, kibble, remove, skim over, comb out, knuckling, key in, cure, trim, align, quarry, ignite, wipe away, butter, wipe off, offset, , extrude, overlap, glaze, enamel, emboss, elutriate, comply with, jolley, sieve, stack, exit (the kiln), unload, mix, etc.*

**Spanish:** *absorber, ensamblar, adherir, fletar, airear, cocer, hornear, secar, anodizar, evaluar, atomizar, untar, embalar, facturar, barrenar, ampollarse, esmaltar, barnizar, sondear, arriostrar, tamponar, pulir, pulimentar, enlechar, opacificar, paletizar, estibar, vitrificar, fritar, gresificar, etc.*

In addition to its fundamental role in term extraction for the elaboration of the dictionary entries, the observation of the most frequent LUs in the corpus has contributed to measure the aforementioned adequacy of the corpus regarding the field of study and, therefore, the adequacy of the documents that form part of it. As has already been mentioned, the results obtained in this respect at this point have been the expected ones as far as, in general terms, they seem to be coherent provided the area dealt with. If among the most frequent lexical units there had appeared many instances of words not related with the speciality field, the criteria for the selection of the texts that form part of the corpus would have had to be reconsidered and checked. If results had shown, already at this point, the inappropriate character of the criteria, redefinition and modification of these criteria and, consequently, of the very initial stages of the work (definition of the work and corpus compilation) would have been necessary. What seems obvious is that a good textual selection is fundamental in order to obtain satisfactory results in the subsequent stages of the specialised lexicographical work and that this is crucial as far as it constitutes the grounds or pillars of the whole study.

In accordance with the complementary character of the results obtained in the different stages of the work, the observation of the lexical units that are given in the corpus with the highest frequency has also been significant because of other factors: these data have provided important information not only about corpus composition but also about the most relevant lexical areas in the speciality field and have thus contributed to verify the adequacy of the field diagram, helping to improve and complete it. Accordingly, the lexical areas that can be deduced from monolexical Wordlist results are a valuable tool for measuring the adequacy and coherence of the

conceptual areas proposed in the field diagram. If the lexical units fit into the categories proposed in the field diagram as in this case, the work can be said to, initially at least, be grounded on the adequate basis. In this sense, the results have not been surprising and show the specialised character of the corpus and the discipline. Hence, frequency lists results have proved at this stage that the texts included in the corpus seem to be suitable, in general terms, for the aims of the study so that the adequacy of the corpus and therefore of the criteria for selecting the texts seems to be corroborated.

Another aspect that can suggest the adequacy and equilibrium of the corpus selected is the fact that from the top-50 words from both corpora (the English and the Spanish ones) many (yet intuitive) matches could already be done. Matching consists of grouping a source language term with its corresponding target language term(s) and is a fundamental part of any translational tool like the prospective industrial ceramics dictionary. This matching is illustrated in figure III.18, in which the prospective TUs in both languages and their equivalents have been highlighted in the same colour<sup>68</sup> (the numbers on the right of the units indicating the total number of times they appear in the corpus). Although at this stage this has been a basic intuitive approximation needing further research, it has shown how the texts forming part of both corpora present a general balance regarding textual typology and subject matter in both languages. This is so since, as shown, many of the highest frequency words coincide, in general terms, in both corpora and can, intuitively at least, start to be matched.

---

<sup>68</sup> Black indicates no matching in the table.

	ENGLISH	SPANISH
1	<b>Ceramic 2,698</b>	<b>Esmalte 2,071</b>
2	<b>Glass 2,202</b>	<b>Cerámica 1,809</b>
3	<b>Temperature 1,915</b>	<b>Esmaltes 1,795</b>
4	<b>High 1,903</b>	Agua 1,752
5	<b>Materials 1799</b>	<b>Horno 1,687</b>
6	<b>Surface 1719</b>	<b>Arcilla 1,591</b>
7	<b>Material 1690</b>	<b>Temperatura 1,448</b>
8	<b>Ceramics 1568</b>	<b>Pastas 1,410</b>
9	<b>Tiles 1478</b>	<b>Óxido 1,387</b>
10	<b>Tile 1465</b>	<b>Cocción 1,365</b>
11	<b>Glaze 1435</b>	<b>Pasta 1,304</b>
12	<b>Process 1408</b>	<b>Forma 1,278</b>
13	<b>Clay 1357</b>	<b>Color 1,258</b>
14	<b>Properties 1244</b>	<b>Baldosas 1,231</b>
15	<b>Size 1157</b>	<b>Pieza 1,170</b>
16	<b>Thermal 1119</b>	<b>Tipo 1,102</b>
17	<b>Metal 1087</b>	<b>Piezas 1,025</b>
18	<b>Phase 1058</b>	<b>Materiales 882</b>
19	<b>Made 986</b>	<b>Resistencia 881</b>
20	<b>Firing 966</b>	<b>Superficie 854</b>
21	<b>Powder 910</b>	<b>Material 839</b>
22	<b>Refractory 909</b>	<b>Óxidos 821</b>
23	<b>Kiln 901</b>	<b>Calor 779</b>
24	<b>Oxide 893</b>	<b>P 776</b>
25	<b>Form 877</b>	<b>Cerámicas 763</b>
26	<b>Low 863</b>	<b>Temperaturas 747</b>
27	<b>Water 847</b>	<b>Plomo 737</b>
28	<b>Test 840</b>	<b>Uso 737</b>
29	<b>Strength 817</b>	<b>Hornos 716</b>
30	<b>Applications 805</b>	<b>Proceso 708</b>
31	<b>Temperatures 772</b>	<b>Medioambiental 688</b>
32	<b>Small 735</b>	<b>Caso 682</b>
33	<b>Solid 720</b>	<b>Hierro 679</b>
34	<b>Resistance 719</b>	<b>C 665</b>
35	<b>Crack 718</b>	<b>Aire 654</b>
36	<b>Silicon 718</b>	<b>Arcillas 642</b>
37	<b>Alumina 701</b>	<b>Sistema 624</b>
38	<b>Type 701</b>	<b>Medio 616</b>
39	<b>Chemical 695</b>	<b>Gas 615</b>
40	<b>Structure 685</b>	<b>Base 606</b>
41	<b>Sintering 667</b>	<b>Cerámicos 557</b>
42	<b>Liquid 651</b>	<b>Pigmentos 557</b>
43	<b>Applied 637</b>	<b>Colores 553</b>
44	<b>Ware 634</b>	<b>Partículas 545</b>
45	<b>Range 633</b>	<b>Porcelana 612</b>
46	<b>Stress 627</b>	<b>Fabricación 540</b>
47	<b>Grain 619</b>	<b>Capa 536</b>
48	<b>Particles 608</b>	<b>Alúmina 525</b>
49	<b>Pressure 593</b>	<b>Calcio 492</b>
50	<b>Fired 589</b>	<b>Cerámico 485</b>

**Figure III.18:** Intuitive approximation to matchings of English-Spanish prospective terms in top-50 most frequent words from the corpus.

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### 4.1.3 Polylexical frequency lists: Mutual Information (MI) results

Polylexical lists have also played a fundamental role in the provision of results for this study as they have allowed the detection and “term status” corroboration of polylexical terms on the part of the terminographer. The results obtained with monolexical frequency lists, even when necessary to start with, provide an unrealistic panorama of the terminology of any field, which is not just made up of the monolexical (yet prospective) TUs provided by these lists. In this sense, MI results have been the first results showing the combinatorial aspect of lexical units in the corpus and as such have been used, in combination with Concord results, in order to detect the strength of the bond between the nodes (or base/search words) and the lexical units that normally appear surrounding them (their collocates). Term extraction has not solely been carried out with monolexical term extraction and as such, this kind of analysis has been necessary.

As has been explained in the method (section 2.5.1.1.3), Mutual Information values are calculated on the basis of word co-occurrence statistics and used as a measure to calculate the correlation between words, being then a great indicator of collocations. In this sense, figure III.19 illustrates in a screenshot directly obtained from WST during this research the strength of this co-occurrence between the lexical unit “temperature” (the node) and some of the words more normally appearing in its immediate environment (its collocates).

N	Word 1	Freq	Word 2	Freq	Texts	Gap	Joint	MI	Z	MG	Log L	Set
597	TEMPERATURE	1.951	STRENGTH	817	4	1	19	3,01	-0,96	-5,03	478,54	
598	TEMPERATURE	1.951	ACCORDING	161	2	1	5	3,42	0,15	-10,81	1.789,63	
599	TEMPERATURE	1.951	SCALE	159	2	1	9	4,29	2,04	-8,27	1.797,17	
600	TEMPERATURE	1.951	AT	3.093	9	1	114	3,67	2,57	2,72	260,81	
601	TEMPERATURE	1.951	APPLICATIONS	605	3	1	20	3,10	-0,69	-4,81	491,31	
602	TEMPERATURE	1.951	THERE	571	5	3	14	3,08	-0,63	-6,36	796,20	
603	TEMPERATURE	1.951	GREATER	249	5	3	7	3,28	-0,08	-9,36	1.496,14	
604	TEMPERATURE	1.951	THAN	1.026	8	1	25	3,07	-0,87	-3,85	292,22	
605	TEMPERATURE	1.951	RESISTANCE	719	4	3	24	3,53	0,69	-4,02	590,59	
606	TEMPERATURE	1.951	SHOCK	231	3	2	6	3,17	-0,27	-10,02	1.550,80	
607	TEMPERATURE	1.951	WITHIN	299	3	2	11	3,67	0,79	-7,40	1.355,87	
608	TEMPERATURE	1.951	ABOVE	339	4	1	21	4,42	3,95	-4,60	1.254,29	
609	TEMPERATURE	1.951	WHICH	2.912	8	2	110	3,71	2,79	2,57	191,16	
610	TEMPERATURE	1.951	ALONG	166	3	2	6	3,64	0,54	-10,02	1.770,96	
611	TEMPERATURE	1.951	WITHOUT	274	4	2	11	3,80	1,08	-7,40	1.424,00	
612	TEMPERATURE	1.951	MAXIMUM	189	4	3	5	3,19	-0,21	-10,81	1.688,54	
613	TEMPERATURE	1.951	TEMPERATURE	1.951	8	4	49	3,12	-1,01	-0,93	0,00	
614	TEMPERATURE	1.951	C	1.708	10	3	79	4,00	4,19	1,13	16,15	
615	TEMPERATURE	1.951	T	418	5	1	35	4,86	6,57	-2,39	1.076,41	
616	TEMPERATURE	1.951	BELOW	251	5	1	24	5,05	6,20	-4,02	1.490,21	
617	TEMPERATURE	1.951	FIRING	966	8	3	27	3,27	-0,19	-3,51	339,24	
618	TEMPERATURE	1.951	OFTEN	291	4	2	7	3,06	-0,50	-9,36	1.377,26	
619	TEMPERATURE	1.951	FORM	877	4	1	22	3,12	-0,68	-4,40	418,30	
620	TEMPERATURE	1.951	K	523	4	3	19	3,65	0,98	-5,03	877,50	
621	TEMPERATURE	1.951	SOFTENING	51	3	2	7	5,57	4,54	-9,36	2.300,32	
622	TEMPERATURE	1.951	POINT	404	3	3	15	3,68	0,95	-6,06	1.105,96	
623	TEMPERATURE	1.951	COMPOSITION	507	4	2	12	3,03	-0,71	-7,02	905,43	
624	TEMPERATURE	1.951	COEFFICIENT	215	3	1	38	5,93	12,72	-2,03	1.601,50	
625	TEMPERATURE	1.951	ATMOSPHERE	217	4	2	12	4,26	2,28	-7,02	1.595,05	
626	TEMPERATURE	1.951	ENGINEERING	192	4	1	7	3,66	0,61	-9,36	1.678,18	
627	TEMPERATURE	1.951	MEASURED	172	2	6	3	3,59	0,45	-10,02	1.748,93	

**Figure III.19:** Screen illustrating the MI scores (in green) of the term “*temperature*” and some of the words more normally appearing in its immediate environment (its collocates).

Most prospective polylexical terms have been checked through this method in order to decide about their inclusion or not as dictionary entries. The results obtained in this stage proved fundamental in order to evaluate if the co-occurrence of a node and a collocate<sup>69</sup>, that is to say, a potential collocation or polylexical term, was purely by chance or statistically significant and thus deserved its “extraction” as a terminological unit.

Figure III.20 is an extract of the MI obtained with WST in its Excel format. In this figure, it can be observed how the co-occurrence of the node “material” with some of the lexical units with which it has appeared in the corpus has been analysed in order to determine whether this association was statistically significant, and the strength of the “bond” in case it existed. Figure III.20 is the kind of result which has been obtained with polylexical lists, and its close observation and analysis, although highly time-consuming, are, together and simultaneously with Concord results, highly enlightening

<sup>69</sup> More than 1 collocate is possible since polylexical terms may consist of 2 or more units.

and revealing for term extraction and for understanding the combinatorial nature of terminology.

	Word 1	Freq.	Word 2	Freq	Texts	Gap	Joint	MI
35710	MATERIAL	1690	DOES	173	3	3	5	3,52835321
35711	MATERIAL	1690	G	825	4	2	23	3,47636509
35712	MATERIAL	1690	MUST	426	4	1	10	3,22827196
35713	MATERIAL	1690	SHOULD	392	4	1	8	3,02634358
35714	MATERIAL	1690	INTO	1013	6	1	22	3,11606669
35715	MATERIAL	1690	PRODUCED	392	4	1	12	3,61130619
35716	MATERIAL	1690	AFTER	527	3	1	11	3,05882597
35717	MATERIAL	1690	OFTEN	291	3	2	7	3,26353312
35718	MATERIAL	1690	MIXING	199	3	3	4	3,00442886
35719	MATERIAL	1690	TECHNICAL	92	1	3	3	3,70245409
35720	MATERIAL	1690	REMOVAL	113	4	1	19	6,06880188
35721	MATERIAL	1690	HAS	1737	6	1	45	3,37052441
35722	MATERIAL	1690	RESIST	49	2	2	3	4,61130619
35723	MATERIAL	1690	PROPERTY	108	2	1	4	3,88616586
35724	MATERIAL	1690	REFRACTORIES	428	2	3	9	3,06951141
35725	MATERIAL	1690	FED	47	1	3	3	4,67142725
35726	MATERIAL	1690	GRAIN	619	5	4	16	3,36725783
35727	MATERIAL	1690	SIC	312	3	2	7	3,16300607
35728	MATERIAL	1690	ADDED	228	3	3	7	3,61551833
35729	MATERIAL	1690	THROUGH	613	4	1	13	3,08174992
35730	MATERIAL	1690	RAPID	143	2	2	3	3,0661447
35731	MATERIAL	1690	BEST	132	2	3	3	3,18162179
35732	MATERIAL	1690	GROUND	177	3	3	10	4,49537611
35733	MATERIAL	1690	PROVIDES	100	3	1	3	3,58215976
35734	MATERIAL	1690	RAW	278	3	3	7	3,3294673
35735	MATERIAL	1690	SUBJECTED	82	3	2	4	4,28350163
35736	MATERIAL	1690	BUILDING	188	2	1	5	3,40839267
35737	MATERIAL	1690	SIMILAR	289	3	4	6	3,05109024
35738	MATERIAL	1690	OBTAINED	233	3	2	5	3,09879541
35739	MATERIAL	1690	MELTING	277	4	3	8	3,52731133
35740	MATERIAL	1690	FLUX	143	3	4	4	3,4811821
35741	MATERIAL	1690	NOW	180	3	1	4	3,14920044
35742	MATERIAL	1690	CONTAIN	190	2	2	4	3,07119775

**Figure III.20:** MI scores for the node “material”.

According to MI results in figure III.20, by observing the possible combinations we have appreciated the significant co-occurrence between, for instance, the node *material* and the collocate *raw* and thus the strength of their bond, giving way to a polylexical term such as “raw material”, so important in this study that it has been

included as a subfield of the field diagram. The same happens with, for instance, *building material*, *material removal* and many others.

Concordance lines obtained with WST application Concord in subsequent stages of the method have been used to corroborate or dismiss the importance or significant presence of these lexical combinations suggested by MI scores. The figures below (III.21, III.22 and III.23) indicate how MI results are coherent with the results showing real use contexts that may be obtained with Concord, and illustrate the usefulness of combining different results for guaranteeing the quality of the term extraction process.

17	of composition than clay minerals). The <b>raw material</b> is melted and made into fibre
18	signed composition the remainder of the <b>raw material</b> forms a glassy bond which r
19	ss on firing. The balance of the quartzite <b>raw material</b> is converted to tridymite and
20	alumina. Bauxite is a naturally occurring <b>raw material</b> consisting mainly of the min
21	gCO <sub>3</sub> ) which was calcined provided the <b>raw material</b> for this brick but, with the in
22	The natural mineral is used mainly as a <b>raw material</b> in fusion cast refractories or
23	mpound in nature and serves as a basic <b>raw material</b> for silicate ceramics and sili

**Figure III.21:** Selection of meaningful concordance lines from the corpus containing the prospective polylexical term *raw material*.

10	re is generally considered to be an ideal <b>building material</b> mainly for exterior and i
11	ave turned them into a high specification <b>building material</b> . What we are talking ab

**Figure III.22:** Selection of meaningful concordance lines from the corpus containing the prospective polylexical term *building material*.

2	commonly used technique for ceramic <b>material removal</b> is chemical machining
3	workpiece material by the fluid, so that <b>material removal</b> by the grains is facilitat
4	pping is a surface treatment with guided <b>material removal</b> that employs hard grain
5	y of shape, or to reduce surface stress. <b>Material removal</b> can be effected in sever
6	prevent damage to the workpiece. The <b>material removal</b> rate substantially decre

**Figure III.23:** Selection of meaningful concordance lines from the corpus containing the prospective polylexical term *material removal*.

Polylexical lists have proved highly enlightening in term extraction for cases such as the one posed with the lexical unit *agua*, present in both the 50 top-frequent words of the Spanish and English corpora (as “water”). Should *agua* have been considered a term? In terms of general language, since *agua* is a lexical unit commonly used in every day life and in general conversations, it is a lexical word that may not show a high degree of specialisation in the continuum of language. However, its use in

specialised instances of language (especially those from the scientific field) is also a fact. In these cases, the best way to determine its status as a terminological unit has been through the observation of its behaviour in company or combined with other units (as shown in polylexical lists) and in context (by means of Concord). In this specific case, results have revealed that *agua* should be considered a term especially if surrounded by certain lexical units or collocates that frequently appear with it and which make its meaning more specific, as in the following examples: *agua higroscópica*, *agua acidulada*, *agua regia*, *agua adsorbida*, etc. This phenomenon – given mainly with sub-technical vocabulary – has thus been studied through the close analysis of the results obtained regarding Mutual Information (MI) scores, and complemented with the results produced by Concord, as is illustrated in subsection III.4.2.

#### 4.1.4 Statistical results

Wordlist results have also offered significant statistical data about the corpus. The amount of data, especially statistical data, that can be provided by Wordlist may be overwhelming for the medium user but highly enlightening and revealing as well if correctly interpreted.

Figures III.24 and III.25 show the screen (from top to bottom) in which Wordlist displays all the general statistical information about the English industrial ceramics corpus composition and size. Some of these statistical data may not be significant by themselves but they must be taken into consideration for they can influence the result of other mathematical operations that depend on corpus size or composition.

Figures III.24 and III.25 show general statistics regarding, among others, the number of types, number of tokens, number of sentences, paragraphs and the length of the words that constitute, in this case, the English part of the corpus:

N	0	1	2	3	4	5	6	7	8	9	10	11
text file	overall	c 0001.txt	c 0003.txt	c 0013.txt	c 0014.txt	c 0015.txt	c 0016.txt	c 0017.txt	c 0018.txt	c 0019.txt	c 0020.txt	p 0002.txt
file size	4,205,491	89	67	88	215	44	44	46	52	46	58	1,644
tokens (running words) in text	706,931	10	12	11	30	6	6	7	6	7	7	278
tokens used for word list	674,688	10	11	11	29	6	6	7	6	7	7	273
types (distinct words)	22,420	9	11	9	24	6	6	6	6	6	7	133
type/token ratio (TTR)	3,32	90,00	100,00	81,82	82,76	100,00	100,00	85,71	100,00	85,71	100,00	48,72
standardised TTR	40,92	*	*	*	*	*	*	*	*	*	*	*
standardised TTR std.dev.	57,62	*	*	*	*	*	*	*	*	*	*	*
standardised TTR basis	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
mean word length (in characters)	5,02	7,40	4,55	6,73	6,21	6,00	6,00	5,14	7,33	5,14	7,00	4,78
word length std.dev.	2,95	4,43	2,70	3,58	3,77	4,20	4,20	2,41	4,50	2,41	3,96	2,55
sentences	47	1	1	1	1	1	1	1	1	1	1	1
mean (in words)	14,355,06	10,00	11,00	11,00	29,00	6,00	6,00	7,00	6,00	7,00	7,00	273,00
std.dev.	42,100,40	*	*	*	*	*	*	*	*	*	*	*
paragraphs	47	1	1	1	1	1	1	1	1	1	1	1
mean (in words)	14,355,06	10,00	11,00	11,00	29,00	6,00	6,00	7,00	6,00	7,00	7,00	273,00
std.dev.	42,100,40	*	*	*	*	*	*	*	*	*	*	*
headings												
mean (in words)	*	*	*	*	*	*	*	*	*	*	*	*
std.dev.	*	*	*	*	*	*	*	*	*	*	*	*
sections	47	1	1	1	1	1	1	1	1	1	1	1
mean (in words)	14,355,06	10,00	11,00	11,00	29,00	6,00	6,00	7,00	6,00	7,00	7,00	273,00
std.dev.	42,100,40	*	*	*	*	*	*	*	*	*	*	*
numbers removed	32,243		1		1							5

Figure III.24: Statistical data of the English corpus: Corpus\_EN. (Part I).

N	0	1	2	3	4	5	6	7	8	9	10	11
stoplist tokens removed	297,599											
stoplist types removed	487											
1-letter words	41,568								2			
2-letter words	112,140	1	1		1				1	2	4	18
3-letter words	112,283	1	1	2	1	2	2	2	1	1	7	30
4-letter words	85,334	1	1			2	2	1	1		2	10
5-letter words	68,363	1	1	1	1	1	1	2	3	2	2	12
6-letter words	53,182										1	8
7-letter words	59,750				1			2	1		4	14
8-letter words	46,494			1		1	1		1	2	1	8
9-letter words	35,371	1	1		1	1	1		1	2	1	16
10-letter words	25,914				1					1	3	13
11-letter words	15,743			1				1				6
12-letter words	9,595										1	7
13-letter words	4,775	1	1		1					1	2	9
14-letter words	2,080			1					1		1	3
15-letter words	1,369							1				1
16-letter words	329											
17-letter words	247											
18-letter words	59											
19-letter words	25											
20-letter words	27											
21-letter words	8											
22-letter words	17											

Figure III.25: Statistical data of the English corpus: Corpus\_EN. (Part II). The list follows up to “50-letter words”.

The data given by these figures, if correctly interpreted, can also provide general information about corpus composition, its adequacy and size and also about general aspects of the speciality domain.

From all the statistical data offered, I have considered it especially significant for the elaboration of the prospective dictionary the concepts of token and type (see figure III.26). Tokens are the total number of words in the corpus – in this example, the English one – (figure in the blue circle) whereas types are the number of distinct words in it (figure in the purple circle). The figure in the red circle refers to the actual number of words used for elaborating the wordlist – that is, without grammatical words. The first two parameters have been necessary for measuring the degree of specialisation of the corpus as a whole – or of individual texts if desired – through two ratios, the Type/Token ratio or TTR (figure in the green rectangle) and the Standardised Type/Token ratio (figure in the orange rectangle), which are analysed in the following sections as a reflection on corpus compilation and composition results.

	N	0	1	2	3	4	5	6	7
text file	overall	p.0004.txt	p.0003.txt	p.0002.txt	p.0001.txt	gl.0004.txt	gl.0003.txt	gl.0002.txt	
file size	4.205.491	4.650	27.648	20.303	71.148	52.875	10.792	4.248	
tokens (running words) in text	706.931	738	4.701	3.196	11.207	8.484	1.785	737	
tokens used for word list	674.688	730	4.563	3.147	11.100	8.396	1.751	733	
types (distinct words)	22.420	382	1.089	901	2.175	1.992	556	347	
type/token ratio (TTR)	3,32	52,33	23,87	28,63	19,59	23,73	31,75	47,34	
standardised TTR	40,92	*	39,53	43,97	42,40	46,39	39,30	*	
standardised TTR std.dev.	59,42	*	48,18	43,45	52,60	46,62	*	*	
standardised TTR basis	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	
mean word length (in characters)	5,02	5,05	4,86	5,31	5,18	5,09	4,94	4,65	
word length std.dev.	2,95	2,93	2,82	2,89	2,78	2,66	2,72	2,41	
sentences	47	1	1	1	1	1	1	1	
mean (in words)	14.355,06	730,00	4.563,00	3.147,00	11.100,00	8.396,00	1.751,00	733,00	
std.dev.	42.100,40	*	*	*	*	*	*	*	
paragraphs	47	1	1	1	1	1	1	1	
mean (in words)	14.355,06	730,00	4.563,00	3.147,00	11.100,00	8.396,00	1.751,00	733,00	

**Figure III.26:** Information provided by “Statistics” in Wordlist for the English corpus with a special focus on tokens, tokens used for wordlist, types, TTR and standardise TTR.

It must be noticed, however, that the corpus, in this case the English one, has tried to achieve a balanced inclusion of textual samples regarding their typology and

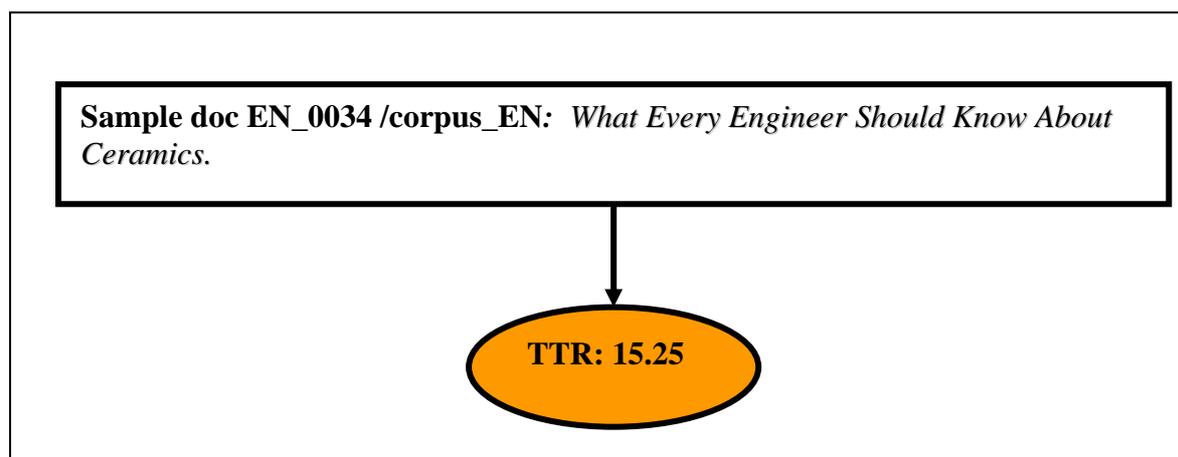
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degree of specialisation, which has been translated into the compilation of not only highly specialised texts but also of more popularising documents addressed to semi-expert tenors. Consequently, the final TTR value reflects this consideration.

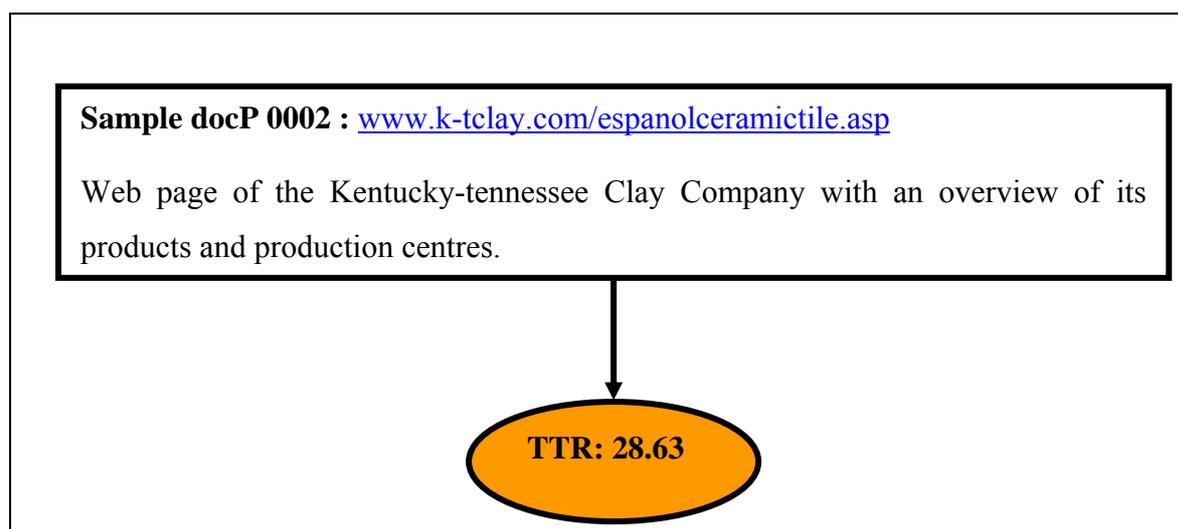
#### **4.1.4.1 Type/Token Ratio (TTR)**

This ratio is expressed by means of percentages and is obtained, by dividing the total number of types by the total number of tokens. In a text, the higher the resulting value, the greater the number of different words contained in it, so that a low figure would indicate a high degree of repetitions or little variation in terms of vocabulary and therefore, could be interpreted as an indicator of the high level of specialisation of a given text. However, a low figure would indicate a high degree of repetitions, which at the same time could be interpreted as a text less rich or with little variation in terms of vocabulary (Vargas, 2005). Therefore, this ratio can be considered an indicator of the level of specialisation of a given text or the corpus as a whole.

Focusing on the TTR values of specific documents forming part of the corpus, it is interesting to notice and corroborate how the degree of specialisation showed by the TTR increases (that is to say, the figure is lower) in those texts addressed to expert tenors, as for instance in UNE or EN norms, and decreases (that is to say, the TTR resulting values are higher) in those texts addressed to semi-expert tenors. In figures III.27 and III.28, the TTR for both a text addressed to an expert tenor (doc EN\_0034) – that is to say, highly specialised – and a text addressed to a semi-expert tenor (docP 0002) – more popularising –, corroborate this view according to which, the more specialised a text is, the lower the figure it will show as TTR value.



**Figure III.27:** TTR of a text (doc EN\_0034) addressed to an expert tenor, in this case, as the title indicates, an engineer.



**Figure III.28:** TTR of a text addressed to a semi-expert tenor (docP 0002).

In order to provide the TTR values of some documents forming part of the corpus, figure III.29 offers the resulting TTR and standardised TTR<sup>70</sup> (explained in section III.4.1.4.2) figures of some textual samples contained in the English corpus. These textual samples have been considered as addressed to semi-expert tenors<sup>71</sup> and TTR values seem to corroborate this view:

<sup>70</sup> In their Excel version.

<sup>71</sup> See section III.1.1 for more information about the title and content of these textual samples and thus for better understanding the criteria for considering a text as more or less specialised and thus addressed to expert or semi-expert tenors.

text file	File size	tokens	types	TTR	Std. TTR
overall	4.205.491	706.931	22.420	3,32	40,92
e:\nuria diccionario cerámica\corpus_en\doc np 0004.txt	6.776	1.123	315	29,38	30,10
e:\nuria diccionario cerámica\corpus_en\doc np 0005.txt	8.102	1.414	391	29,62	31,30
e:\nuria diccionario cerámica\corpus_en\doc np 0006.txt	8.330	1.389	414	31,48	33,20
e:\nuria diccionario cerámica\corpus_en\doc np 0007.txt	8.473	1.433	402	29,60	31,80
e:\nuria diccionario cerámica\corpus_en\doc np 0008.txt	8.945	1.495	384	26,91	27,80
e:\nuria diccionario cerámica\corpus_en\doc np 0009.txt	9.164	1.562	395	26,76	27,80
e:\nuria diccionario cerámica\corpus_en\doc np 0010.txt	9.165	1.558	420	28,42	30,50
e:\nuria diccionario cerámica\corpus_en\doc np 0011.txt	8.993	1.497	392	27,37	28,00
e:\nuria diccionario cerámica\corpus_en\doc np 0012.txt	8.709	1.456	374	26,96	27,70

**Figure III.29:** TTR and standardised TTR of the English corpus documents.

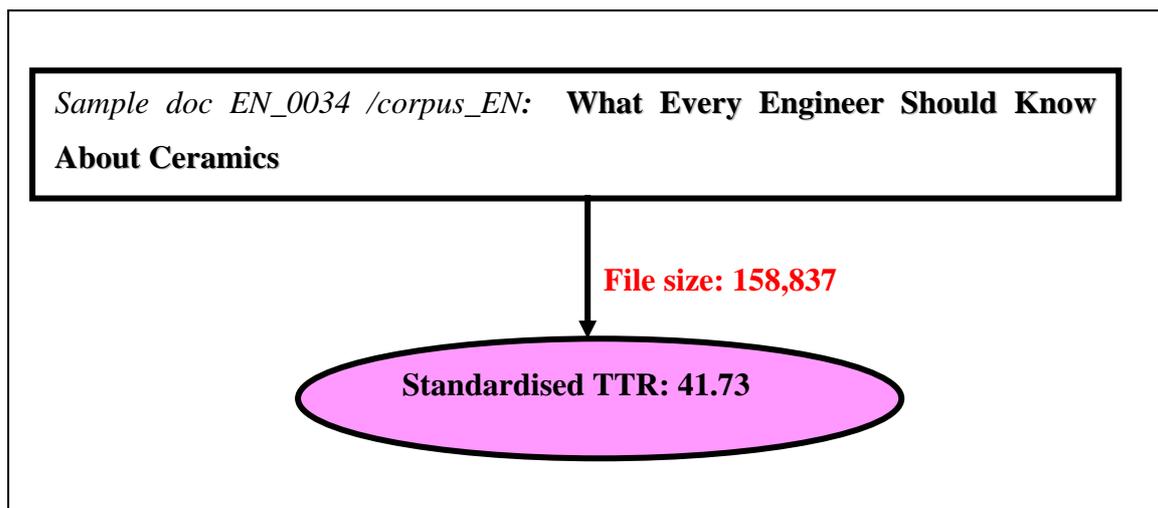
However, these data provided by the TTR do not constitute concluding remarks *per se* and they might be understood as approximative but not decisive data. A greater number of texts would need to be compared in order to obtain a more rigorous generalisation, apart from taking into account how sample size affects these TTR values: given that longer texts present more repetition, they appear with lower values than shorter texts. Thus, the TTR is sensitive to the extension of the textual samples, which makes this tool not completely reliable for comparing texts with different sizes (Vargas, 2005), as in this case (compare the first and second rows of figure III.29 to corroborate these views).

The standardised TTR aims at diluting as much as possible this influence exerted by extension.

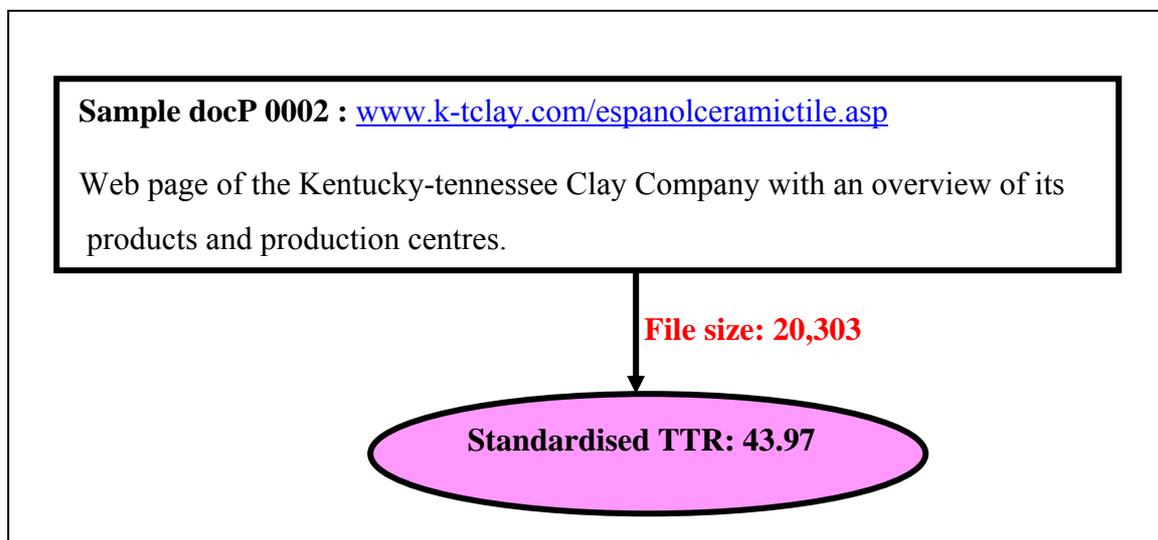
#### 4.1.4.2 Standardised Type/Token Ratio (std. TTR)

The standardised TTR dilutes the aforementioned influence exerted by extension by calculating the TTR in regular intervals. This is highly useful since, as has been previously shown, the diverging size of the different samples of the corpus affects the values of the TTR in such a way that a longer text is prone to repetitions and its TTR value will be lower. The standardised TTR neutralises this size influence because it

does not allow the final figure to take into account the repetition of the words that appear in other parts of the text, resulting then in a higher middle value. The examples in figures III.30 and III.31 show how, when being compared, the values of the standardised TTR (in contrast with the ones of the TTR), remain coherent to the specialisation criterion – the first textual sample is still regarded as more specialised than the second one – but are not so diverging or different because size influence has been taken into account and hence neutralised.



**Figure III.30:** Stnd.TTR of a text addressed to an expert tenor (doc EN\_0034).



**Figure III.31:** Stnd. TTR of a text addressed to a semi-expert tenor (docP 0002).

However, if the length of two texts is very different, standardised TTR values may not be reliable either as happens with “plain” TTR, so that these values should be taken into account just for the comparison of texts with a similar size. This is also the

reason why Wordlist has not calculated the standardised TTR of those texts with a number of tokens inferior to 1,000 and has replaced this figure by an asterisk as has happened, for instance, in the extreme case from the corpus shown in figure III.32. In this case, the size of the textual sample is so small that also the TTR value is 100.0, this indicating that no repetition occurs within the text. Hence, according to these values and in general terms, this text could be said to be not much adequate for a corpus.

TEXT FILE	FILE SIZE	TTR	Std. TTR
Corpus_en\doc 0016.txt	44	100.0	*

**Figure III.32:** Standardised TTR of a textual sample with a number of tokens inferior to 1,000.

Therefore, the results obtained in this respect have been useful for measuring the adequacy of the corpus as a whole, the pertinence of the individual textual samples forming part of it as well as their degree of specialisation.

#### 4.2 Concord results for semi-automatic term extraction with WST 4.0

Concord data analysis has been fundamental for successfully accomplishing and completing the stage of term extraction from a more textual-oriented perspective. The results obtained at this point with Concord have made it possible to complement Wordlist results and combine the information obtained with both applications, allowing the frequency-statistical data previously obtained to acquire a textual dimension in which, according to the CTT, real contexts have been the mainstay.

Concord is the pure concordance application of WST and as such the one in charge of producing concordance lines, also known as *Key Word in Context* (KWIC). As the theoretical framework (section I) and method (section II) of this work have shown throughout various of their sections, a concordance is a collection of all the instances of a LU in its own textual environment, and each individual instance within a concordance is a concordance line, which allows the terminographer to closely observe terms in context.

#### 4.2.1 Concord results: observation of terms in context

Regarding the results obtained with Concord and the way they have contributed to semi-automatic term extraction, firstly, it can be stated that a close observation of the most significant collocates of TU provides key information about the real and appropriate use of these TUs on the part of their real users, which is fundamental in any lexicographical work aimed at coherently and realistically representing the linguistic reality described. This work has not been focused on the analysis of only monolexical units since this is not what reality demands or shows in real communication. Polylexical terms are a reality in communication, be it specialised or not, and the analysis of collocates has turned out to be fundamental for the identification of these units and thus for sound term extraction. Starting out from the results obtained in previous stages, especially those in the form of monolexical and polylexical frequency lists, this section shows how Concord results go a step forward showing not only the specific collocates of the words under study but also complete contexts in the form of concordance lines. Bearing always in mind the ruling position of the CTT all through this work, the results obtained with Concord by means of concordance lines and collocates close observation have proved to be crucial in order to include as terms in the prospective dictionary those natural, polylexical associations.

Hence, the results obtained through Concord for semi-automatic term extraction are presented here mainly in the form of extended concordance lines which, as has been explained in the method, have resulted from the following procedure applied to prospective terms:

From Wordlist previous results:

- 1) Selecting a prospective term from the monolexical frequency lists.
- 2) Undertaking the individual analysis of the monolexical prospective term by firstly trying to gather its potentially significant collocates through polylexical lists with MI scores.

From Concord results:

- 3) Further analysis of the collocational behaviour of the term through Concord application “Collocates” so that all the possible collocates of the monolexical term are analysed with a different display giving a different viewpoint of collocates.

- 4) Once potential collocations have been detected, introducing them individually in Concord in order to analyse the structures in figure III.33 and corroborate in real contexts that such combinations are significant and could deserve a dictionary entry.

MONOLEXICAL TERM (NODE) + COLLOCATE(S)
COLLOCATE(S) + MONOLEXICAL TERM (NODE)
COLLOCATE(S) + MONOLEXICAL TERM (NODE) + COLLOCATE(S)

**Figure III.33:** Main structures to analyse in Concord.

A representative account of the results obtained with Concord in this respect has been presented below in the following way: 10 monolexical high-frequency terms (or search words) have been selected, 5 in English, 5 in Spanish. For each of these terms (a, b, c...) one may find the node (the monolexical term as such) together with all the collocates that previous analyses have shown as potentially significant.

These collocates, together with the search word – forming thus collocations or polylexical terms – have been written in capital letters, presented within extended concordance lines with the aim of providing a context wide enough for illustrating their use and behaviour in such collocations, and highlighted in their extended concordance lines. Together with the terms and its collocates a number appears which indicates, according to “Collocates” in Concord, the total number of times that the search word appears together with or close to the collocate analysed in each case: For instance, “*ARCILLA DESLEÍDA* 5” means that the term “arcilla” appears with the term “desleída” a total of 5 times. In cases like “*PASTA 59 (S) 19 DE ARCILLA*”, the result presented in such a way implies that “pasta” (singular form) and “arcilla” appear together or in a close position 59 times whereas “pastas” (plural form indicated by (S)) and “arcilla” occur 19 times together or in a close position. The plural forms of the collocates have been included in those cases in which they have been significant enough as to appear in “Collocates”, that is to say, in those cases in which they presented a frequency of appearance superior to 5, since the significant frequency of a collocate is the sum of its frequencies both in singular and plural. Therefore after the sum of the figures indicated above, in the case of “*PASTA(S)*” and “*ARCILLA*”, they

appear a total of 78 times in a close or joint position, which makes this collocation significant enough for being included.

However, it is important to point out that in this section of results the collocates have been presented just in their most frequent position with respect to the node, that is to say, “Collocates” indicates the most frequent position of the collocates of a given LU in red as can be seen in figure III.34, and this has been the one considered and included because of space limitations. For instance, in figure III.34 some collocates of the term “*horno*” appear. If we focus on the collocate “*quemador*” we find that its most frequent position is Left 2 (L2) – with a frequency of 5 highlighted in red – that is to say, the collocation “*quemador de horno*” is the most significant one in the corpus and as such, the one analysed and taken into account for this section. However, also the collocation “*horno de quemador*” exists, but in this case, the collocate “*quemador*”, which occupies the position Right 1 (R1) has a frequency of 1 so that the other collocation has been the preferred one for being illustrated in context in this section. In this sense, the number 16 that appears beside the collocation “*QUEMADOR DE HORNO*” in this section does not indicate the total number of times that this collocation appears as such, which is 5, but the total number of times that the search word and the collocate appear together or in a close position, whatever it is. Likewise, the number aside the collocate indicates the total number of times the node and the collocate co-occur as possible collocations as detected by Collocates. The number is given by the column total (highlighted in red) in figure III.34.

N	Word	relation	Total	L1	L2	L3	L4	L5	Centre	R1	R2
102	PASTAS	0,000	19	5	14	2	3	0	0	3	2
103	SON	0,000	19	7	12	5	1	1	0	0	2
104	CADA	0,000	18	9	9	1	1	1	1	5	2
105	PLACA	0,000	18	12	6	3	0	0	9	0	1
106	ROTATORIO	0,000	18	2	16	0	1	0	0	1	11
107	ZONA	0,000	18	13	5	3	3	4	3	0	3
108	LENTAMIENTO	0,000	17	14	3	4	2	3	5	0	0
109	CUAL	0,000	17	2	15	0	1	1	0	0	3
110	HACER	0,000	17	8	9	2	2	3	1	0	1
111	MISMO	0,000	17	12	5	0	1	0	1	10	2
112	PUEDEN	0,000	17	5	12	2	3	0	0	0	4
113	REDUCIR	0,000	17	11	6	1	3	6	1	0	0
114	SAUDA	0,000	17	16	1	1	0	2	13	0	0
115	TAMAÑO	0,000	17	11	6	1	2	1	6	1	0
116	PUERTA	0,000	16	13	3	0	4	2	7	0	0
117	QUEMADOR	0,000	16	9	7	2	2	0	5	0	1
118	EFRACTARIOS	0,000	16	11	5	1	1	2	6	1	0
119	SUPERIOR	0,000	16	14	2	1	1	1	11	0	0
120	BUENA	0,000	15	8	7	2	6	0	0	0	0
121	CALIENTE	0,000	15	4	11	2	0	0	2	0	6

Figure III.34: Some collocates of the search word “horno” as offered by “Collocates” in Concord.

Concord results have been presented in alphabetical order, and additional information extracted from Concord’s analysis has been provided at the end of the extended concordance lines. Hence, the TUs chosen for presenting here their most significant collocations within extended concordance lines from the corpus have been 5 top-frequent prospective monolexical terms in each language, specifically the ones shown in figure III.35:

ENGLISH CORPUS		SPANISH CORPUS	
Position in the frequency list provided by <i>Wordlist</i> (free from grammatical words)	Terms analysed	Position in the frequency list provided by <i>Wordlist</i> (free from grammatical words)	Terms analysed
3	A) <i>Glass</i>	2 / 4	F) <i>Esmalte / Esmaltes</i>
4	B) <i>Temperature</i>	3	G) <i>Cerámica</i>
6 / 8	C) <i>Materials / Material</i>	5	H) <i>Agua</i>
7	D) <i>Surface</i>	6	I) <i>Horno</i>
9	E) <i>Ceramics</i>	7	J) <i>Arcilla</i>

Figure III.35: Terms chosen for presenting their collocations within extended concordance lines from the corpus.

The terminological units presented in this section have been included in the database TermStar XV as proper terms resulting from the term extraction process. Taking into consideration the letters whose final entries have been presented in this

study (English-Spanish A, B, N, O, U and V), those TUs with an arrow indicate that they have already been included as final entries for the prospective dictionary and, consequently, that they can be found among the 4,000 terms presented as final results in section VI.4.

### A) *Glass*

The most frequent collocations of the LU *glass* in the corpus are:

#### GLASS BATCH 15 (ES) 7

Potassium carbonate (K<sub>2</sub>CO<sub>3</sub>) is sometimes used in **glass** and glaze **batches**.

#### GLASS BEAD 5

Ductile metal seals to glass. For example, a **glass bead** can be applied to the thinned end of a copper tube, and then sealed to a glass tube, the ductile thinned copper yielding to stresses from thermal expansion differences, and preventing cracking.

#### GLASS BONDED 9

The resulting grain is used as an ABRASIVE (q.v.) or to manufacture refractory shapes. The abrasive products may be resin or **glass bonded**.

#### GLASS BONDING 10

An important technique applied in the electrical and electronics industries is **glass bonding** for joining ceramics to ceramics, or ceramics to metals. An example is the application of **glass bonding** in so-called gap technology for the production of magnetic heads.

#### GLASS-CERAMIC 180 MATERIAL 42 (S) 76

The characteristics of **glass-ceramic materials** basically depend on the properties of the finely separated crystalline phase and the residual glass phase which make up the glass-ceramic material.

#### GLASS CERAMICS 148

Nevertheless, many dilatometric studies of **glass ceramics** and sintered cordierites give mean coefficients of less than  $2 \times 10^{-6} \text{ K}^{-1}$  in the temperature range 25-900°C, in general agreement with the X-ray data.

#### GLASS ENCAPSULATED 8

A variation of **glass encapsulated** hot isostatic pressing, in which a compact made by cold isostatic pressing is sealed under vacuum in a glass capsule heated to the glass softening point.

#### GLASS FIBRE 36 FIBERS 12 FIBRES 13

For some purposes the interlayer may be made of **glass fibre**. Other laminated glassware is made by simultaneously forming two glasses with similar viscosities at the forming temperature.

#### GLASS 18 MATRIX

A machineable glass-ceramic based on fluormica crystals dispersed in a **glass matrix**. The tiny mica flakes break away during machining processes.

#### GLASS – TO – METAL 71 SEAL 12

Ceramic-to-metal seals are used in electrically insulated and vacuum-tight 'lead-throughs', especially for high-power h.f. devices; components so made are more rugged and resist higher

temperatures than those having a **glass-to-metal seal**, thus permitting a higher bake-out temperature and use in a nuclear environment.

#### GLASS TUBING 20

A method for the production of **glass tubing**; molten glass flows vertically through an annular orifice; the central refractory pipe within the orifice is hollow and rotates.

#### GLASS (-) WARE 102

**Glass-ware** that has received its final surface gloss by heating the ware, usually in a flame.

#### ALABASTER 7 GLASS

**Alabaster glass** contains small inclusions of different diffractive indexes and shows no color.

#### ALKALI 15 GLASS

A low **alkali glass** composition for glass fibres, used for specialised applications in which its higher (than 'E' glass) strength and elastic modulus are important.

#### BOROSILICATE 36 GLASS

Of all the potential second-generation improved alternatives to **borosilicate glass** for HLW solidification, storage and ultimate disposal, Synroc (synthetic rock) (Ringwood et al. 1979, 1988, Reeve 1988) is the most advanced in its stage of development.

#### CROWN 17 GLASS

Standard borosilicate **crown glass**, for example, has  $n_D = 1.510$  and  $v = 64.4$ ; its classification by this system is 510644 or 510/644.

#### (CROWN 17 OF A ) GLASS TANK 94 FURNACE 131 (ES) 11

General term for the central part of a furnace roof, particularly used as a synonym of the **crown of a glass-tank furnace**.

#### DEVITRIFIED 10 GLASS

Glac ceramic. A term that has been used in USA for **devitrified glass** products of the type exemplified by PYROCERAM (q.v.)

#### FL- 6 SPODUMENE 16 GLASS CERAMICS 148

Other methods for strengthening **fl-spodumene glass ceramics** involve producing compression in the outer surface by postcrystallization ion-exchange treatments such as Na' or K' for Li'.

#### FLAT 54 GLASS

The section of a **flat-glass** tank furnace through which molten glass flows to the drawing chamber.

#### FLINT 15 GLASS

The introduction of lead oxide into the batch to produce the original **flint glass**, in the 17th century was an English contribution to glassmaking; silica was introduced into the batch in the form of crushed flints.

#### FOAM 9 GLASS

Cellular glass, in the form of blocks, usually made by mixing powdered glass with a gasifying agent (e.g. carbon or a carbon compound) the mixture then being heated for a short time to fuse the glass and trap the evolving gas bubbles. **Foam glass** is used as a structural heat-insulating material.

### GOBS 5 OF GLASS

A method of making hollow glass-ware, **gobs of glass** being delivered automatically to a forming machine.

### LAMINATED 8 GLASS

**Laminated Glass**: Safety glass made from alternating and adherent layers of glass and organic plastics, the glass layers being outermost; if broken, the fragments of glass are held in position by the plastics interlayer.

### LEAD 26 GLASS

The usual basis for the selection of such a glass is matching its thermal expansion and contraction with that of the metal over the range of temperature from that at which the seal is made to room temperature; however, a glass that is sufficiently soft (e.g. a **lead glass**) can accommodate considerable stress at a glass-metal seal by slowly yielding.

### LEAD 26 CRYSTAL 28 GLASS

A fault on **lead crystal glass** resulting from inadequate control during acid polishing and revealed as crystallites on the surface of the glass.

### (LITHIUM 11/ SODIUM 7 / CALCIUM 5-) SILICATE 20 GLASS

Glass coatings are deposited from the vapor or liquid solution, sometimes with chemical reactions. Thus **sodium-silicate glass** can be made by evaporating an aqueous solution of sodium silicate (water glass) and baking the deposit to remove water.

### LOW 26 -MELTING 33 GLASS

The decal comprises three layers: the colour, or image, layer which comprises the decorative design; the covercoat, a clear protective layer, which may incorporate a **low-melting glass**.

### MICA 19 GLASS

Dielectric constants are higher and loss tangents lower than in most commonly used glasses. Chemical durabilities are better than for most glasses, except for the **mica glass** ceramic.

### MOLTEN 95 GLASS

The flux line is the surface level of the **molten glass** and attack on the refractories is more severe at this level than beneath the molten glass.

### OPAL 19 GLASS

**Opal glass** is often made from batches containing about 10% cryolite; a similar preparation is sometimes used in white cover-coat enamels.

### OPAQUE 10 GLASS

It is a cryptocrystalline variety of silica that has the appearance of a hard, **opaque glass**; it usually contains coloured liesegang rings.

### OPTICAL 46 GLASS

Used in the polishing of **optical glass**; it is also effective both as a decoloriser and as a colouring agent for glass.

### PHOSPHATE 5 GLASS

A vitreous enamel compounded for application to aluminium. There are three main types: containing lead, **phosphate glass**, or barium. Lithium compounds have also been used in these enamels.

### PHOTOSENSITIVE 13 GLASS

A special **photosensitive glass** (q.v.) which when activated by ultraviolet light and heat, can produce within the same glass, in 2 and 3 dimensions, patterns of white or coloured opacity, or transparent colours of all hues.

### PLATE 21 GLASS 21

The reciprocal of the thickness that a layer of glass, or other transparent material, must have for the intensity of transmitted light to be decreased to one-tenth of its intensity as it falls on the layer. Burgee. Contaminated sand resulting from the grinding of **plate glass**.

### POROUS 24 GLASS

The affinity of **porous glass** for moisture makes it a useful non-dusting drying agent, used in various shapes in scientific instruments.

### POROUS 24 GLASS MEMBRANES 5

The use of **porous glass membranes** is more recent while the uses of porous ceramic and especially modified porous ceramic membranes are just becoming apparent (Catalytica Studies Division 1988, Zaspalis et al. 1989a, Burggraaf and Keizer 1990).

### QUARTZ 13 GLASS

However, experience has shown that far slower cooling permits formation of **quartz glass** without apparent crystallization (see also Tab. 1-2).

### RESIDUAL 12 GLASS

Controlled crystallization not only permits control of the actual phase conversion (i. e. the kind and morphology of the crystalline phase) but also allows treatment with maintenance of the apparent viscosity of the polycrystalline material during the conversion, containing **residual glass**, within limits that ensure that the original glass shape is not deformed.

### RUBY 16 GLASS

The most common **ruby glass** today is selenium ruby; a recommended batch contains 2% Se, 1% CdS, 1% As<sub>2</sub>O<sub>3</sub> and 0.5% C; the furnace atmosphere must be reducing.

### SEALING 9 GLASS

**Sealing glass** is suitable for use in sealing a glass envelope of an electronic valve, for example, to metal

### SHEET 31 GLASS

A process for making **sheet glass** was introduced in 1959 by Pilkington Bros. Ltd, at St. Helen's, England.

### SILICA GLASS 31

L. W. Tilton described the structure of **silica glass** as being composed of five-membered rings and pentagonal dodecahedral units of composition.

### SINTERED 11 GLASS

A sintered filter is a filter made from **sintered glass**, sintered silica or unglazed ceramic.

### TOUGHENED 9 GLASS

Dice: The small, roughly cubical, fragments produced when **toughened glass** is shattered.

### VISCOSITY 20 OF THE GLASS

Rheology is the science of the deformation and flow of materials, e.g. the study of the **viscosity of a glass**, glaze or enamel; the study of the plasticity of clay.

**WIRED 10 GLASS**

One use is as a 'fire-stop': whereas, in a fire, ordinary window panes crack, fall out and allow flames to spread, **wired glass** will crack but hold together.

“*Crystallization*”, with a total of 17 times appearing in close or joint position, is a highly significant collocate of the term “*glass*”, showing significant collocations such as “*bulk crystallization of glass*”: *the utilization of structural similarity between the heterogeneity and the separating phase also frequently depends on selectivity in the effect of the nucleating agent, that can frequently be observed in the **bulk crystallization of glass** ceramic materials for crystalline phases with identical or similar crystal structures.*

Other collocations with significant frequency but with a rather transparent meaning are: *glass surface* 68, *glass forming* 56, *glass industry* 53, *optical glass* 46, *glass composition* 34, *glass manufacture* 34, *glass melting* 33, *glass formation* 32, *glass structure* 31, *glass container* 27, *transparent glass* 17, *blown glass* 13 and *coloured glass* 13.

Other collocations with not so highly significant features in terms of frequency but which appear in the KWIC lists provided by Concordance are: *etching of glass*, *agate glass*, *milky-white glass*, *amber glass*, *glass filaments*, *glass fibre reinforcement*, *polychromatic glass*, *non fibrous glass*, *thirsty glass*, *oxynitride glass*, *siliceous residual glass*, *nonalkali glass*, *fluorophlogopite glass*, *siliceous glass* and *glass softening point*.

**B) Temperature**

The most frequent polylexical terms with the node *temperature* are:

**TEMPERATURE COEFFICIENT 43 COEFFICIENTS 17**

Thermistors (thermally sensitive resistors) are semiconducting ceramic oxide resistors specially formulated to achieve a very large **temperature coefficient** of electrical resistance.

**TEMPERATURE CURVE 12**

In fast-firing kilns, the **temperature curve** is optimized to provide a short duration for the fired goods in the kiln.

**TEMPERATURE GRADIENT 32 GRADIENTS 11**

The displacement gradient across the defect thus differs from that across the matrix and a thermal strain develops. This strain superimposes on that generally computed from the **temperature gradient**.

## TEMPERATURE LAGS 10

**Temperature lags** within the product are, consequently, also limited, which makes shorter firing times possible.

## TEMPERATURE MEASUREMENT 22

However the world of high **temperature measurement** and thermocouples is a complex one.

## TEMPERATURE OXIDATION 12

Several compounds exist.  $Ti_5Si_3$ ; m.p.  $2120^\circ C$ ; sp. gr. 4.3; has good resistance to high-**temperature oxidation** but not to thermal shock.

## TEMPERATURE RESISTANCE 57, RESISTANCE TEMPERATURE

In the aluminosilicate fibers, the usual limit to **temperature resistance** is the devitrification of the glass with, for example, the nucleation and growth of mullite ( $3Al_2O_3 \cdot 2SiO_2$ ), which reduces mechanical strength drastically.

## TEMPERATURE SENSOR 6 / SENSORS 5

One of the most common uses of an NTC thermistor is as a sensitive **temperature sensor** for temperature measurement, control or compensation.

## TEMPERATURE STABILITY 22

In general, they have greater **temperature stability** than many other commercially available stains.

## HIGH 346 - TEMPERATURE SUPERCONDUCTIVITY 10

During processing, conditions are maintained to ensure maximum saturation of the orthorhombic lattice with oxygen ions ( $O_x = 0.61$ ) which causes maximum distortion of the orthorhombic lattice and leads to **high-temperature superconductivity**, as discovered empirically.

## HIGH 346 - TEMPERATURE STRENGTH 43

Residual chlorine in the product can reduce **high-temperature strength**, but exceptionally pure silicon nitride has been made by utilizing thermodynamic equilibria in the Si-S-N system whereby silicon disulfide ( $SiS_2$ ) is reacted with gaseous ammonia.

## ABSOLUTE TEMPERATURE 13

If there is no change in mechanism over the temperature range of interest, then the temperature dependence of the rate constant  $k$  is given by the Arrhenius relationship: where  $E$ , is the activation energy for the rate-controlling process ( $J \text{ mol}^{-1}$  or  $\text{cal mol}^{-1}$ ),  $R$  is the gas constant and  $T$  is the **absolute temperature**.

## ANNEALING TEMPERATURE 11

However, by carefully controlling the **annealing temperature** and cooling rate, reducing the particle size and eliminating impurities, it is possible to produce material that is 99% pure superconducting  $YBa_2Cu_3O_7$  having 99% of grain boundaries atomically sharp and with no traces of impurities.

## BISQUE TEMPERATURE 8

There are several factors that affect the thickness of glaze deposited on a piece. The first is the **bisque temperature** of the piece.

## FURNACE 15 TEMPERATURE

The microstructure can be controlled by manipulation of the **furnace temperature** and firing rate of the tubes, a uniform grain size of  $1-2 \mu m$  and density close to theoretical being developed.

### CALCINATION TEMPERATURE 9

There is an optimum **calcination temperature** for attaining high density (other manufacturing conditions may result in different optimum conditions) which does not correspond to the maximum bulk density of the compact prior to firing.

### CONE TEMPERATURE 35

In other words, the cones below cone 1 are numbered so that the lower the **cone temperature**, the larger the number (022 is lower than 018).

### CRITICAL 25 TEMPERATURE RANGE 104

The **critical temperature range** in which growth takes place is determined by the threshold temperature for the formation of spinel (800-900°C) or for the nucleation of alumina, and by a reduced reaction rate at temperatures greater than 1400 °C.

### CURIE TEMPERATURE 54

Because of its high dielectric constant (1350-1600 at 1 MHz and 25°C) and its piezoelectric and ferroelectric properties, it finds use in electronic components; its **Curie temperature** is 120-140°C.

### DEFORMATION TEMPERATURE 9

In defining the term, absence of nucleation after 4 h heating at the **deformation temperature** is taken as an arbitrary criterion for distinguishing between neo-ceramic glasses and stable glasses.

### DEPOSITION TEMPERATURE

The mechanical properties are little influenced by the **deposition temperature** and crystal growth conditions used during preparation, although difficulties have been found in preventing damaging strains in thick coatings.: chemical-vapor-deposited silicon carbide is of high purity and shows the lowest of oxidation rates.

### EQUILIBRIUM 18 CONVERSION 8 TEMPERATURE

As mentioned, the glass-transformation temperature is not the **equilibrium conversion temperature**.

### EQUILIBRIUM TEMPERATURE 18

Attaining of the **equilibrium temperature** below the transformation temperature is complicated by the long relaxation time, so that it is difficult to experimentally verify this hypothesis.

### EUTECTIC TEMPERATURE 5

In the Al<sub>2</sub>O<sub>3</sub>-SiO<sub>2</sub> system (see Fig. 5) there is a eutectic between silica and mullite and a eutectic between alumina and mullite. The **eutectic temperature** is that at which a eutectic composition solidifies when cooled from the liquid state.

### FERROELECTRIC 16 TEMPERATURE

In doped pure barium titanate, the temperature at which the PTC region commences during heating is rigidly fixed by a change in the crystallographic structure from tetragonal to cubic and corresponds to the **ferroelectric temperature** of the material.

### FIRING TEMPERATURE 107

Continuous Kiln. A kiln in which the full **firing temperature** is continuously maintained in one or other zone of the kiln.

### FUSION TEMPERATURE 6

The fault may be due to the enamel having become saturated with iron oxide; to prevent this, the **fusion temperature** of the ground-coat should be raised by altering its composition. Other causes are too thin a coat, wetness of the metal before dipping, or shaking the dipped metal too vigorously.

## GLASS 47 – TRANSITION 30 TEMPERATURE

Glasses have finite viscosity above the **glass-transition temperature** and are then capable of viscous flow. In materials of this type, vitrification is not pushed to its limit so that the desired residual porosity is left.

## MELTING TEMPERATURE 50

In a-PbSnF<sub>4</sub>, the high apparent A at room temperature may be assumed to signal that the smooth transition of isostructural PbF<sub>2</sub> has been shifted to lower temperatures along with the **melting temperature** of the solid.

## OPERATING TEMPERATURE 22

The lower vapor pressure would suggest that Y<sub>2</sub>O<sub>3</sub> could be operated at higher wall temperatures, but nonstoichiometric reactions tend to limit the upper **operating temperature** to near that of Al<sub>2</sub>O<sub>3</sub>.

## PEAK 10 TEMPERATURE

The Al<sub>2</sub>O<sub>3</sub> envelope stabilizes the plasma and reaches a **peak temperature** of 200 °C. The oxygen pressure in the lamp must be kept low to prevent the oxidation of sodium and niobium, and the formation of NaAlO<sub>2</sub>.

## PROCESSING TEMPERATURE 10

If a liquid has been used at the **processing temperature** to permit the deformation which leads to densification, this same liquid may be expected to allow high-temperature deformation during the use of the resulting material.

## REACTION TEMPERATURE 25

Reactions involving solids in the presence of a small quantity of liquid phase are also considered as solidstate reactions as long as the reaction mixture at the **reaction temperature** does not show apparent fluid properties.

## SINTERING TEMPERATURE 40

Owing to a higher and more uniform density before sintering compared with that of dry-pressed compacts, the **sintering temperature** can be lower and the microstructure after sintering more homogeneous.

## SOAKING TEMPERATURE 9

For optimal properties, complete homogenization must be avoided; this is achieved by optimizing the particle size, heating rate, **soaking temperature** and firing time.

## TRANSFORMATION TEMPERATURE 23

Turnbull states that the glass-forming ability is directly proportional to the cooling rate, **transformation temperature**, the value of the energy of the interface between the liquid and the nuclei and inversely proportional to the melting point  $T_m$ , the nucleation rate and possibly also the volume of the cooled melt.

## TRANSITION TEMPERATURE 30

These examples demonstrate that Eqn. (9) may be satisfied in stoichiometric compounds above a **transition temperature**  $T$ , below the melting point, provided that the following crystallographic conditions are met.

Other collocates with a significant, expectable high frequency (appear in “Collocates”), are: *maximum* 22, *negative* 9, *positive* 21, *kiln* 27, *constant* 34, *increasing* 35, *elevated* 26, *ambient* 24, *high* 346, *low* 119, *lower* 36, *below* 52,

*interval 11, increase 40, stable 22, increasing 35, increase 19, increases 40, increased 18, raised 9, scale 13 and temperature behaviour 11.*

Other collocations with not so highly significant features in terms of frequency but which appear after closely observing the KWIC lists provided by “Concordance” are: *temperature equalization, bake out temperature, isothermal pressing temperature, immiscibility temperature, dry-bulb temperature, tip temperature, solidus temperature, quench temperature, pre-firing temperature, parabolic temperature profile, parabolic temperature distribution, reactant temperature and sinter temperature.*

### C) *Material*\*<sup>72</sup>

The most frequent collocations of the word *material*\* are the following ones:

#### ABRASIVE 28 MATERIAL \*

The tools are quite tough and wear resistant and work well on all hard, **abrasive materials** except ferrous- or nickel-based alloys.

#### CARBON 36 or GRAPHITE 19 MATERIAL \*

Owing to the range of compositions used for carbon and graphite precursor materials, and because of the possible diversity of subsequent process steps, **carbon and graphite materials** display a wide variety of properties.

#### COLOURING 7 MATERIAL \*

A roasted mixture of cobalt ore and sand, formerly used as a blue **colouring material** for pottery and glass (Cf. SMALT).

#### CERAMIC 390 MATERIAL \*

Typical ranges of values for some **ceramic materials** are: fireclay and silica refractories: 14-35 MN m-2, Common building bricks: 14-42 MN rn-2 Engineering bricks Class 'A': 70 MN m-2 Sintered Alumina: 350 MN m-2.

#### (COARSE- 11 /LARGE- 35 /FINE- 28) GRAINED 18 MATERIAL \*

Extremely **fine-grained materials** may usefully be examined by electron microscopy and diffraction, which are typically used to reveal features occurring on a scale below the limits of resolution of the optical microscope; for example, extended structural defects within a phase may be viewed directly by high-resolution electron microscopy.

#### COMPOSITE 18 MATERIAL \*

In a recent innovation, **composite materials** have been prepared using the Lanxide process which involves the oxidation of molten metal (e.g., aluminum) containing fibrous filler, whereby the ceramic matrix is grown directly through the fibers.

#### CONDUCTING 7 MATERIAL \*

The heating of an electrically **conducting material** by the effect of induced electric currents, which may be set up by a high-frequency field in a small object or a low-frequency field in a large object (as in a large induction furnace for steel melting).

<sup>72</sup> As shown in figure II.35, the asterisk represents that both the singular and plural forms of the term have been considered.

### COVALENTLY 5 BONDED 19 MATERIAL\*

However, it is only recently that there has been an appreciation of the wide range of implantation-induced effects which result in modifications to the properties of these ionically/covalently bonded materials.

### CRUCIBLE 8 MATERIAL\*

Stabilized zirconia ceramics are resistant to attack by most molten metals (with titanium and the alkali metals being the principal exceptions) and are therefore used as crucible materials.

### CRUSHED 18 MATERIAL

A screen formed by piano wires stretched tightly, lengthwise, on a frame 2-3 ft (0.6-1 m) wide and 4-8 ft (1.3-2.6 m) high. The screen is set up at an angle of about 45° and crushed material is fed to it from above. The mesh size varies from about 4 to 16.

### CRYSTALLINE 36 MATERIAL\*

Molecular structures of crystalline materials can be precisely defined by diffraction or scattering of radiation, as a result of the long-range ordering of atoms characteristic of crystalline materials.

### DIELECTRIC 37 MATERIAL\*

At present, the electroding material may represent up to 80% of the total material cost for a multilayer capacitor and considerable efforts are being devoted to decreasing the sintering temperature of such dielectric materials (which would allow less expensive electrodes) or to developing a process that would allow the use of base metal (nickel, copper, iron) electrodes.

### DUCTILE 8 MATERIAL\*

Stress raisers, such as built-in notches or inadvertent internal flaws, are much more dangerous in a brittle material than in a ductile one because, in a ductile material, high stresses can cause local material yield with redistribution of stress rather than the cracking that occurs in a nonyielding brittle material.

### ELECTRODE 5 MATERIAL\*

Alternatively referred to as intercalation compounds or solid-solution electrode materials, insertion compounds consist of a host matrix capable of internal oxidation-reduction into or from which guest atoms may be topotactically inserted or withdrawn.

### FERROELECTRIC 52 MATERIAL\*

Other uses exploit the specific ferroelectric properties: the dimensional changes, which accompany polarization in ferroelectric materials (- 1% in BaTiO<sub>3</sub> at room temperature), give rise, for example, to piezoelectric phenomena, which are used in piezoceramics (see Piezoelectric Materials).

### FERROMAGNETIC 7 MATERIAL\*

Ferromagnetic material may be regarded as a paramagnetic material in which the atomic magnetic moments are aligned by an internal interaction the 'Weiss field' (P. Weiss, 1907) proportional to the magnetization.

### FEED 8 MATERIAL

After milling, the resultant slurry is drawn off to be dehydrated and dried. Other methods, for example attritor milling, only perform milling, so mixed powders are required as feed materials.

### FILLER 9 MATERIAL\*

In this technique for making multiphase ceramic matrix composites, an active filler material (a transition metal or compound thereof which will yield a carbide or other ceramic) is mixed with an organometallic polymer and pyrolysed.

**FOUNDATION 7 MATERIAL\***

There were some differences, such as using hollow clay tile as a **foundation material** and heavy tar paper when laying tile over a wooden floor to protect the floor boards from the moisture of the mortar mix.

**GLASSY 18 MATERIAL\***

For many ceramic and **glassy materials**, the maximum tensile stress is roughly 100 times smaller than the permissible compressive stress.

**GLAZE 52 MATERIAL\***

The application of ceramics to the fields of industry, technology, and science during the 20<sup>th</sup> century contributed to the refinement of **glaze materials** for specific uses and encouraged experimentation with new materials.

**GRANULAR 20 MATERIAL\***

Granules here signify a **granular material** in which the grain size is as nearly uniform as possible. Granulation can be achieved either by agglomeration or by comminution.

**HEAT 42-INSULATING 20 MATERIAL\***

Usually made by mixing powdered glass with a gasifying agent (e.g. carbon or a carbon compound) the mixture then being heated for a short time to fuse the glass and trap the evolving gas bubbles. Foam glass is used as a structural **heat-insulating material**.

**HOT 25 -PRESSED 15 MATERIAL\***

These are primarily for the reaction-bonded form, although there are also a number of applications for **hot-pressed material**.

**INSULATION 14 MATERIAL\***

The term thermal shock implies a sequence of transient events as opposed to more steady-state conditions as, for example, the temperature gradient in a refractory **insulation material** in a furnace wall.

**ISOTROPIC 5 MATERIAL\***

Anisotropic materials are used when high magnetic quality is essential, whereas the cheaper **isotropic material** is preferred when low magnetic quality is acceptable or when the properties have to be isotropic.

**LOW 39 -LOSS 13 MATERIAL\***

As with **low-loss materials** (see Sect. 4.1), losses are reduced by minimizing hysteresis losses and magnetostriction at the operating temperature, adding calcium and impurities to provide high-resistivity grain boundaries, and controlling microstructure.

**MAGNETIC 26 MATERIAL\***

The oxide ferrites are **magnetic materials**. Semiconducting materials which can be used under oxidizing atmospheres at high temperatures include lanthanum chromite (which serves as heating elements), stannic oxide (as flammable gas sensors) and the transition metal oxides (as thermistors).

**MATRIX 14 MATERIAL\***

The reaction product that, in the case where it "infiltrates" a porous filler, represents the **matrix material** is itself a ceramic-metal composite where both phases are three-dimensionally interconnected.

**METALLIC 14 / NON-METALLIC 9 MATERIAL\***

The production of articles or coatings from essentially inorganic, **non-metallic materials**, the article or coating being made permanent and suitable for utilitarian and decorative purposes by the

action of heat at temperatures sufficient to cause sintering, solid-state reactions, bonding or conversion partially or wholly to the glassy state.

#### MOLTEN 15 MATERIAL\*

The other procedure is the melting process, in which initially molten materials may be shaped during cooling or solidification.

#### (NON-) POROUS 31 MATERIAL\*

The test is applicable to non-porous materials at ambient temperature, and can give K1C as a function of crack growth rate. Slow loading rates are used.

#### OPAQUE 7 MATERIAL\*

Sintering to transparency requires the rate for filling in the pores (densification) to be equilibrated with the grain-growth rate. Figure 2 illustrates two microstructures for A1203: an opaque material with entrapped porosity, and a transparent 'cro-porosity lamp-envelope-grade material.

#### ORGANIC 25 / INORGANIC 21 MATERIAL\*

Normally ware is heated in a kiln until the glaze is melted to the desired degree then it is removed with tongs and put into a container of organic material (i.e. sawdust) where it is cooled.

#### OXIDE 68 MATERIAL\*

The sintering of oxide materials requires that all ionic species of the bulk material participate in the diffusion process, because the pores have to be filled with material of the same composition

#### PIEZOELECTRIC 47 MATERIAL\*

However, care must be taken to avoid deoxidation of the piezoelectric material if it is pressed uncanned in argon. One method is glass encapsulation.

#### PLASTIC 30 MATERIAL\*

Shaft Mixer; a continuous mixer for wet or plastic material which is fed into an open trough along which it is propelled and mixed by one or two rotating shafts carrying blades.

#### POLYCRYSTALLINE 40 MATERIAL\*

Each of these factors contributes to the net expansion characteristics in a polycrystalline material, weighted according to volume fraction and elastic moduli of the respective phases and/or crystallographic orientations.

#### RAMMING 11 MATERIAL\*

The runner is usually lined with fireclay refractories which are then covered with a layer of refractory ramming material, e.g. a mixture of fireclay, grog and carbon. Refractory concrete has also been used to line runners.

#### RAW 250 MATERIAL\*

A substance added to a ceramic raw material of low plasticity to facilitate its shaping and to give the shaped ware sufficient strength to be handled; materials commonly used for this purpose include sulphite lye, sodium silicate, molasses, dextrin, starch, gelatine, etc.

#### REFRACTORY 204 MATERIAL\*

An electric arc furnace for the fusion of refractory materials, e.g. alumina.

#### RUBBER 5-LIKE 17 MATERIAL\*

This is a thin rubber-like material that will protect the tile from the movements of the floor.

#### SEMICONDUCTOR 9 MATERIAL\*

Although silicon remains the most widely used of the basic **semiconductor materials**, more recently the use of III-V compounds has also become widespread and GaAs, GaP, InP and other binary analogues of silicon are ground, sliced, diced and otherwise processed on a daily basis.

#### SENSOR 19 MATERIAL \*

This **sensor material** is a solid electrolyte in which the electrode reactions are  $2O_2 = 4e^- + O_2$ .

#### SILICEOUS 7 MATERIAL \*

Because of the free lime present calcined dolomite rapidly 'perishes' in contact with the air; it may be tar-bonded to give it partial protection, or it can be stabilized by firing it, mixed with steatite or other **siliceous material**, so that the lime becomes combined as one or more of the calcium silicates.

#### SILICON 49 CARBIDE 25 MATERIAL \*

The 25°C thermal conductivity is very high at a value of around 200 W m<sup>-1</sup> K<sup>-1</sup>, which, taken in conjunction with the low thermal expansivity value, accounts for the exceptionally good resistance to thermal shock of **silicon carbide materials**.

#### SINGLE 34 –CRYSTAL 30 MATERIAL \*

Another increasingly important application of titanate ceramics makes use of the positive temperature coefficient (PTC) of resistivity, which is caused by the existence of barrier layers at the grain boundaries in polycrystalline ferroelectric semiconductors and which is not found in **single-crystal material**.

#### SINTERED 23 MATERIAL \*

Thick films of **sintered material** are, however, used commercially as heat-sink substrates for electronic components because of its low electrical (< 10<sup>-9</sup> Ω<sup>-1</sup> m<sup>-1</sup>) but good thermal (- 150 W m<sup>-1</sup> K<sup>-1</sup>) conductivity.

#### SOLUBLE 7 MATERIAL \*

It was made by rubbing together gold leaf, sugar (or honey) and salt; the paste was then washed free from **soluble material** and, traditionally, stored in mussel shells.

#### STRUCTURAL 30 MATERIAL \*

The ceramics silicon nitride (Si<sub>3</sub>N<sub>4</sub>) and silicon carbide (SiC) are becoming important **structural materials** for applications such as turbine blades, ball bearings, heat-exchanger tubing and combustion engine piston caps.

#### SUBSTRATE 15 MATERIAL \*

When compared with other potential **substrate materials**, AlN is the only one that combines high thermal conductivity, excellent electrical insulation and nontoxicity.

#### SUPERCONDUCTING 14 MATERIAL \*

T<sub>c</sub> - Critical Temperature, below which a **superconducting material** is a superconductor.

#### SYNTHETIC 9 MATERIAL \*

The gradual incorporation into the body, by a natural process, of a **synthetic material** mimicking a natural material.

#### TRANSLUCENT 5 MATERIAL

This fully dense, **translucent material** is widely used as the envelope tube in high-pressure sodium-vapor lamps, because of its high-temperature strength and resistance to attack by the sodium vapor.

**VOLATILE 7 MATERIAL \***

A tarred dolomite block that has been preheated at about 400-500°C to eliminate **volatile material** from the tar; this prevents the blocks from slumping while they are being heated up to the operating temperature of the furnace or steel converter in which they are being used.

**WHISKER 10-REINFORCED 12 MATERIAL \***

Hardened steels, however, represent an area where ceramic materials, especially mixed ceramics and **whisker-reinforced ceramics**, show a good performance due to a high hot hardness and a relatively good thermal-shock resistance.

**WHISKER 10-TOUGHENED 8 MATERIAL \***

Advantages of whisker toughening over zirconia toughening include the lower densities of **whisker-toughened materials** and the retention of the toughening mechanisms to high temperatures—a major disadvantage of zirconia toughening is that the contribution to toughness from the martensitic transformation decreases as temperature increases.

**ZINC 5 OXIDE 68 VARISTOR 6 MATERIAL \***

Examples of these ceramics include the silicon nitride alloys, the zinc **oxide varistor** materials, and alumina substrate materials.

Other collocates with significant frequency and which therefore appear in “Collocates”, are: *material\* properties* 127, *glass material\** 117, *building material\** 28, *resistant material\** 24, *(hot-25) pressed material\** 15 and *packing material\** 8.

Other collocations not so significant in terms of frequency but which appear in the KWIC lists provided by “Concordance” are: *wide-gap material*, *glazeforming material*, *feldspathic material*, *gravity of a material*, *fluorescent material*, *photovoltaic material*, *radioactive material*, *amorphized material*, *superconductor material*, *brazing material*, *slag material*, *slagceram material*, *earthen material*, *machinable material*, *joint-replacement material*, *cathode material*, *neutron-absorbing material*, *intergranular material*, *absorbant material*, *jamming of material*, *igneous material*, *bedding material*, *iron/titanium –bearing material*, *bone material*, *non-ferrous material*, *thermoelectric material*, *compressible material*, *strained material*, *dehydrated / hydrated material*, *equiaxed material*, *flammable material*, *magnesia-pressed material*, *yttria-pressed material*, *thermoplastic material*, *square-loop material*, *decomposable material*, *gangue material*, *intergranular material*, *anisotropic material*, *vapourised material*, *patching material*, *heat-insulating material*, *impervious material*, *lining material*, *spinel material*, *photomagnetic material*, *ferrimagnetic material*, *prosthetic material*, *ionically-bonded material*, *lithium aluminosilicate material*, *cutting-tool tip materials* and *aluminum oxide-metal carbide composite materials*.

## D) Surface

The most frequent collocations for the node *surface* are:

### SURFACE ABRASION 29 RESISTANCE 24

The technical aspects such as **surface abrasion resistance** will be considered and must be achieved first before aesthetic effects are incorporated.

### SURFACE ACOUSTIC 12 WAVE 5 (S) 10

A widely used variation of this idea is the **surface acoustic wave** (SAW) delay line. In this case the fact that the mechanical wave induced in the surface of the piezoelectric crystal travels much more slowly than the electric signal would travel in a conductor permits a predetermined delay in signal propagation.

### SURFACE BLEMISH 6

A **surface blemish** on rolled glass resulting from a mechanical defect in the drive actuating the forming roller.

### SURFACE COATING 17 (S) 9

It can be used either as a **surface coating** for porous silicon carbide materials, or as a means of decreasing the creep of such materials by the impregnation of pores to limit oxygen ingress and attack.

### SURFACE CRACK 34 (S) 52

In this method a fluorescent dye is painted on the part and then dried. Wherever there is a **surface crack** or pore, the penetrant is trapped and observed.

### SURFACE CRYSTALLIZATION 6

The positions of the nucleation and growth curves on the temperature scale indicate that the  $V_c/V$  values for a given cooling rate will be relatively the smallest for glass with 60% SiO<sub>2</sub> for the **surface crystallization** (IHET) as well as for crystallization in the bulk of the sample (IHOM) and will increase for glasses with 57.5 and 55% SiO<sub>2</sub>.

### SURFACE DIFFUSION 43

It is agreed that MgO plays two important roles: one is to increase **surface diffusion** by a factor of four, which aids in keeping the pores mobile enough to remain in contact with the grain boundary, and the other is to lower the grainboundary mobility by a factor of 34, which is far and away the more dominant and important role for MgO.

### SURFACE FILM 12

A silicon oxynitride **surface film** greatly increases the fatigue resistance of silica fibres.

### SURFACE FINISH 33

A glazed **surface finish** produced by the application of a powdered inorganic glass, dry or suspended in water, to metal parts, and its subsequent fusion.' Iron is the usual metal so treated, but aluminium, copper and other metals can be enamelled with glasses with appropriate properties.

### SURFACE FLAW 5 (S) 21

**Surface flaws** on a ceramic component can be reduced by various manufacturing techniques. One class of treatments induces a compressive stress in the surface

### SURFACE FLUX 5

As it accumulates, the adsorbed component diffuses faster than the other nonadsorbed component and an additional **surface flux** parallel to the flux through the gas phase causes a difference in the permeability and consequently in the separation.

### SURFACE GLOSS 5

Fire Finished: Glass-ware that has received its final **surface gloss** by heating the ware, usually in a flame

### SURFACE LAYER 48 (S) 16

Besides the fact that residual stresses affect physical properties, they also limit the minimum thickness of a lapped specimen, because the compressive force in the **surface layer** must be compensated for by tensile forces inside the workpiece.

### SURFACE MOISTURE 9

Problems in the use of alumina as insulation usually arise from environmental **surface moisture** acting as a short circuit and bypassing the excellent bulk resistance.

### SURFACE OXIDATION 11

It is understandable that the important powder characteristics can be different for singlephase oxides and for nonoxidic materials which are prone to **surface oxidation** and which contain special sinter additives.

### SURFACE ROUGHNESS 15

In shear, **surface roughness** provides a friction stress which must be overcome to separate the parts..

### SURFACE TEXTURE 18

Coloring oxide that is used to bring color to a glaze. Some colorants may also change the opacity, fluidity, and **surface texture** of a glaze.

### SURFACE TREATMENT 31

Lapping and polishing are finishing techniques for hard materials. In ceramics machining, these techniques are used as a **surface treatment** when high precision is required.

### SURFACE VARIATION 5

All of these base glazes are alkaline fluxed and therefore demonstrate only a small number of possibilities for color and **surface variation**.

### CLAY 56 SURFACE

Subtleties in the **clay surface** are revealed as the glaze color darkens and lightens over textural areas. More opaque glazes coat and cover the clay and, consequently, hold light at the surface.

### CRACK 34 - FREE 15 SURFACE

The die consequently has the following functions: (a) it guarantees the desired extrudate cross section; (b) it ensures a smooth and **crack-free surface**; and spirals because of these two types of flow.

### CRYSTAL SURFACE

Schottky realized the important role of the **crystal surface**, where vacancies could be created or annihilated in order that the equilibrium concentration was maintained.

### CURVED SURFACE 7

This is on a panel hinged to superimpose it on to the **curved surface** of the ware, where it is forced down by compressed air to transfer the decoration.

### ENAMEL SURFACE 10

A fault sometimes occurring in vitreous enamelware, the 'fuzziness' resulting from minute graters and bubbles in and near the **enamel surface**.

### FRACTURE 47 SURFACE

Each source produces a crack or crack network having distinct characteristics visible on the **fracture surface** adjacent to the fracture origin..

### GLASS 68 SURFACE

Residual stresses due to lapping can be determined by a technique involving etching. If a thin plate is lapped, the surface exhibits a curvature which can be measured by optical interference against a flat **glass surface**.

### GLAZED 52 SURFACE

Sodium is a very strong flux, and can add additional fluidity to a **glazed surface** during firing. For this reason, glazed surfaces should be tested before being introduced into salt and soda kilns..

### INNER 10 SURFACE

In the course of heating, some of the heat supplied to the **inner surface** of the wall accumulates in the wall and the remainder is lost to the exterior.

### LAPPING 10 SURFACE

The workpiece will then touch the lapping surface, and a large fraction of the energy will be lost in friction between the workpiece and the **lapping surface**.

### MATTE 10 SURFACE

It also lends a satin surface to high-fire glazes and a **matte surface** to low-fire glazes. It adds brilliance to most coloring oxides, even when fired at higher temperatures.

### MOULD 8 SURFACE

Such **mould release** depends partly on good mould design, but can be aided by lubricating the mould surface prior to use with a mould release agent.

### PLANE 9 SURFACE

A wooden straightedge used for floating a **plane surface**, by moving it, with a sawing motion, with its ends resting on screed battens or guides at the correct thickness.

### RESISTANCE 24 TO SURFACE ABRASION 29

Glazed tiles" "Ceramic tiles - Determination of resistance to **surface abrasion-**

### SCRATCH 24 HARDNESS 29 OF SURFACE

"Ceramic tiles - Determination of **scratch hardness of surface** according to Mohs".

### SHEET 6 – GLASS 68 SURFACE

The **sheet-glass surface** has a fine fire-polished finish, but shows some surface distortion because of variations in processing conditions as the glass is drawn from the melt.

### WORKPIECE 8 SURFACE

During the final lapping stage, the force on the **workpiece surface** must be decreased. This makes the scratches in the workpiece surface less deep and after some time they become invisible..

### HARDNESS 29

EN 101: 'Ceramic tiles - Determination of scratch **hardness** of surface according to Mohs'

Other collocates with significant frequency are: *rough surface* 11, *smooth surface* 26, *tile surface* 48, *tiles surface* 20, *surface defects* 19, *surface layers* 16, *top surface* 9, *upper surface* 8 and *polished surface* 8.

Other collocations which appear in the KWIC lists provided by Concordance but which are not so highly significant in terms of frequency are: *surface contact induced deformations*, *iridescent surface*, *surface devitrification*, *surface ridges*, *surface cracking / crazing*, *crazed / cracked surface*, *vitreous enamelled surface*, *bonded surface*, *wet-surface smoothing*, *riffling surface*, *bisque surface*, *tiling surface*, *vessel surface*, *radiating surface*, *wear-resistant surface*, *particle surface topography / surface topography of the particle* and *extrudate surface*.

## E) Ceramics

The most frequent polylexical terms with the node *ceramics* are:

### ALUMINA 45 CERAMICS

The most common additives are titanium carbide and titanium nitride at a level of 20-40wt% as these both give improved thermal conductivity, strength, hardness and toughness compared with pure alumina ceramics.

### CARBIDE 14 (S) 14 CERAMICS

In silicon carbide ceramics, which exhibit a much lower crack resistance than silicon nitride, the difference between the cyclic- and static-fatigue limits is expected to be small or nonexistent.

### CERAMICS INDUSTRY 22

Common practices in the ceramics industry include addition of components, elongated milling and/or blending with other batches.

### CERAMICS PROCESSING 27

The powders needed for ceramics processing should have:

- (a) fine particle size (less than 1 [Lm]),
- (b) narrow particle size distribution,
- (c) little or no macroscopic agglomeration, (d) homogeneity,
- (e) controllable composition and purity, (f) controlled microstructure, and (g) controlled mechanical properties.

### CLAY 18-BASED 30 CERAMICS

Although superior to traditional clay-based ceramics, it is surpassed in thermal-shock resistance by beryllia, and by carbides and nitrides.

### CLAY 18 CERAMICS

It is usual, at least in structural clay ceramics, to make the input cross section of the die somewhat smaller than the output cross section of the extrusion head [...]

### CORDIERITE 18 CERAMICS

Prolonged soak times at a slightly lower temperature can result in the same or lower thermal expansion as short soaks at somewhat higher firing temperatures. With the very short firing range of cordierite ceramics, this can be a distinct advantage.

## CRUSHABLE 5 CERAMICS

**Crushable ceramics** are used to insulate metalsheathed thermocouples and heating elements in many areas including the missile, atomic energy and petroleum industries.

## CRYSTALLINE 10 CERAMICS

For other ceramic materials, studies using transmission electron microscopy have shown crack tips in **crystalline ceramics** to be devoid of dislocations, suggesting that plastic deformation plays no role in the growth of cracks in these materials.

## DISPERSION 7 – TOUGHENED 37 CERAMICS

The **dispersion-toughened ceramics** encompass a variety of two-phase materials containing intergranular ZrO<sub>2</sub> particles.

## ELECTRICAL 20 CONDUCTIVITY 19 OF CERAMICS

ASTM D1829 is a test for the **electrical conductivity of ceramics** at elevated temperatures.

## ELECTRONIC 28 CERAMICS

Electronics firms have been particularly concerned with the application of the hot isostatic pressing techniques to the production of high-performance **electronic ceramics** such as BaTiO<sub>3</sub>, SrTiO<sub>3</sub>, Pb(Zr, Ti)O<sub>3</sub>, Y<sub>3</sub>Fe<sub>5</sub>O<sub>12</sub>(YIG) and various ferrites.

## ENGINEERING 88 CERAMICS

Remember, refined metallurgical processes have been in development for at least a century, but the **engineering ceramics** refinements required for the extreme applications now being contemplated really started in the 1950s.

## FERROELECTRIC 9 CERAMICS

An important property of **ferroelectric ceramics** is their piezoelectric (q.v.) nature.

## FIBER 53-REINFORCED 61 CERAMICS

The development of **fiber-reinforced ceramics** has been prompted by the need for materials which have the advantages of ceramics combined with increased toughness and strength, and a reduced variability of strength.

## FL – SPODUMENE 14 GLASS 148 CERAMICS

Other methods for strengthening **fl-spodumene glass ceramics** involve producing compression in the outer surface by postcrystallization ion-exchange treatments such as Na<sup>+</sup> or K<sup>+</sup> for Li<sup>+</sup>, or in the case of #-quartz glass ceramics 2Li<sup>+</sup> for Mg<sup>2+</sup>.

## GLASS-CERAMICS 148

.Some sealing glasses are crystallized during processing to form **glass-ceramics** with improved properties.

## GLASSY 50 CERAMICS

A special technique applicable to a wide range of **glassy ceramics** is flame polishing. In this process the workpiece surface is brought into direct contact with a very hot flame or a plasma.

## GLAZED 5 CERAMICS

A surface blemish, adequately described by its name, sometimes occurring on vitreous enamelware, glass-ware and **glazed ceramics**.

## LARGE 15-GRAINED 13 CERAMICS

The corresponding analysis for **large-grained** ceramics, especially those ceramics with elastic and thermal-expansion anisotropy (such as alumina) is appreciably more difficult.

## LIQUID 9-PHASE 28 SINTERED 15 CERAMICS

In the lamp envelope application, total hemispherical transmittance is more critical than inline transmittance. Most **liquid-phase sintered ceramics** have retained grain-boundary eutectic phase and are translucent.

## MACHINEABLE 5 CERAMICS

**Machineable ceramics** are those which can be shaped when fired, to engineering tolerances with ordinary high speed metal cutting tools.

## MULTIPHASE CERAMICS 11

In some cases, homogeneous **multiphase ceramics** can be made from double alkoxides

## NITRIDE 23 CERAMICS

Crystallisation processes in them yield polycrystalline **nitride ceramics** with good hightemperature properties. (The strength and creep-resistance of nitrogen ceramics depend markedly on the amount and properties of the intergranular glasses).

## NITROGEN 7 CERAMICS

The intrinsic properties of **nitrogen ceramics** are approached only in fully dense materials.

## OXIDE 61 / NONOXIDE 24 CERAMICS

The susceptibility to cracking of glasses and many **oxide ceramics** is greatly increased by chemical reaction between stressed cracks, especially small surface cracks, and environmental agents, especially water.

## POLYCRYSTALLINE 13 CERAMICS

SCCG of glasses is explained by the thermally activated cracking of bonds at the crack tip and the same is assumed to occur in **polycrystalline ceramics** containing a glassy grain-boundary phase.

## POROUS 6 CERAMICS

The thermal conductivity of crystalline ceramics of low porosity decreases with increasing temperature; that of **porous ceramics** having a glassy bond generally increases with temperature.

## PZT 5 CERAMICS

The important advantage of the **PZT ceramics** is their high Curie temperature typically 360 °C.

## SEMICONDUCTING 6 CERAMICS

These insulating layers may be found either at the surface of **semiconducting ceramics** (barrier-layer capacitors) or on the grain boundaries in sintered ceramics (grain-boundary barrier-layer capacitors).

## SILICATE 9 CERAMICS

Silica (SiO<sub>2</sub>) is a commonly occurring compound in nature and serves as a basic raw material for **silicate ceramics** and silicate glasses.

## SINGLE 17 PHASE 28 CERAMICS

To metallize **single-phase ceramics**, oxide compositions that melt at the metallizing temperature are added to the metal powder.

## SINTERED 15 CERAMICS

In the lamp envelope application, total hemispherical transmittance is more critical than inline transmittance. Most liquid-phase **sintered ceramics** have retained grain-boundary eutectic phase and are translucent.

### STEATITE 6 CERAMICS

Proto-enstatite 10 x 10<sup>-6</sup> clino-enstatite 13.5 x 1", Proto and/or clino-enstatite are major constituents of **steatite ceramics**: clinoenstatite is found in magnesite refractories that have been attacked by siliceous slags.

### STRUCTURAL 45 CERAMICS

Many projected applications of **structural ceramics** are characterized by cyclic loading conditions.

### SUPERCONDUCTING 15 CERAMICS

A variety of processes are in development to produce **superconducting ceramics** by means other than conventional sintering..

### THERMAL 54 CONDUCTIVITY 19 OF CERAMICS

From a technological viewpoint, the **thermal conductivity of ceramics** is of primary interest at high temperatures (> 300 K).

### TITANATE 20 CERAMICS

The pyroelectric properties of titanates offer a potential basis for uses in infrared detection and for thermal imaging. Transparent **titanate ceramics**, which have been developed recently, have found uses in optoelectronics.

### TRANSFORMATION 13 -TOUGHENED 46 CERAMICS

Throughout this article, ZrO<sub>2</sub>-toughened ceramics is used synonymously with **transformation-toughened ceramics**, as virtually all work reported to date has focused on ZrO<sub>2</sub> (or W<sub>2</sub>O<sub>3</sub>-alloyed ZrO<sub>2</sub>) as the "toughening" agent.

### WHISKER 20 -TOUGHENED 46 CERAMICS

The development of **whisker-toughened ceramics** has occurred at the same time as the development and exploitation of a completely different but very important competing method of toughening ceramics, which employs the martensitic transformation of zirconia (Butler 1985).

### WHISKER 20 TOUGHENING 13 OF CERAMICS

Serious concerns have been expressed about the possible toxicity of whiskers with diameters less than 1 μm. It is unclear whether this will be confirmed as a serious problem for the **whisker toughening of ceramics**.

### ZIRCONIA 19 CERAMICS

The versatility of **zirconia ceramics** is evidenced by the wide variety of applications where they have found acceptance.

*Fine ceramics* (21) is a frequent collocate of the node ceramics and its meaning is rather transparent. Other collocations with not so highly significant features in terms of frequency but which appear in the KWIC lists provided by Concordance if closely observed are: *poled ferroelectric ceramics, stoichiometric ceramics, nonstoichiometric ceramics, hydroxilated ceramics, hot-pressed ceramics, powdered ceramics, beryllia ceramics, metallizing ceramics, polyphase ceramics, polycrystalline ceramics, phosphide ceramics, zirconate ceramics, pyroelectric ceramics, constructional ceramics, non-vitreous ceramics, crystalline ceramics, abrasion-*

*resistant ceramics, Zr O<sub>2</sub>-toughened ceramics, thermally etched ceramics, PLZT ceramics, alumina layered ceramics, silicon layered ceramics, reaction-formed ceramics and coarse-strained ceramics.*

## F) Esmalte \*<sup>73</sup>

*Esmalte\** presents among its most frequent collocations the following ones:

### ESMALTE\* ALCALINO 29 (S) 40

Permite obtener colores rojos y naranjas con esmaltes de plomo crudo y en **esmaltes alcalinos** da verdes de cromo (opacos).

### ESMALTE\* BORÁCICO 7 (S) 14

Los **esmaltes borácicos** (o sea no puramente alcalinos) dan un aturquesado o verdoso turquesoide sucio.

### ESMALTE\* CERÁMICO 43 (S) 36

Defecto muy común que suelen presentar los **esmaltes cerámicos** cuando se ha producido alguna falla en cualquier etapa de la fabricación de la pieza, y que puede deberse a diversas causas, las que pueden ser reducidas a tres [...].

### ESMALTE \* DE COBRE 42

Flor de durazno: **Esmalte de cobre** en reducción, del mismo tipo y técnica que los "sangre de buey" (Ver), con la diferencia de que contiene menor porcentaje de óxido de cobre y de que la reducción es menos intensa.

### ESMALTES CONDUCTORES 9 (only the plural form appears in "Collocates" because the singular one presented a frequency inferior to 5 in "Collocates")

Cuando se trata de preparar un vidrio o **esmalte conductor** de la electricidad, precisamente deberá incluir óxidos alcalinos como el de sodio. En los esmaltes el óxido de sodio cumple una función esencial, ya que no existirían esmaltes alcalinos sin dicho óxido.

### ESMALTE\* CRISTALINO 12 (S) 38

Durante el enfriamiento del **esmalte cristalino**, se promoverá la formación de pocos cristales pero grandes, lo cual se logra regulando y controlando el enfriamiento, de manera que sea muy lento en los periodos o rangos térmicos dentro de los cuales los cristales crecen y se desarrollan.

### ESMALTE\* CRUDO 56 (S) 37

Grietas en la superficie del esmalte horneado se rellenarán con un poco del mismo **esmalte crudo**, eventualmente cargado con un 10 % de arcilla o caolín (crudos) y se volverá a hornear.

### ESMALTE\* CUARTEADO 13

Por otra parte, toda pieza con el **esmalte cuarteado** se halla en estado de debilidad desde el punto de vista de la resistencia mecánica, carece de resistencia al impacto y se quebrará al menor golpe.

### ESMALTE\* FELDESPÁTICO 9

El vapor de agua, por otra parte, influye positivamente en la fluidificación de los **esmaltes feldespaticos**, al igual que también hace más fluido el vidrio de feldespato fundido en las pastas de porcelana, rebajando su viscosidad y aumentando la vitrificación y, con ello, la contracción, [...].

<sup>73</sup> As shown in figure III.35, the asterisk represents that both the singular and plural forms of the term have been considered.

**ESMALTE\* FRITADO 19 (S) 19**

El tamizado previo por una zaranda de malla N° 100 es recomendable a fin de eliminar gramos o partículas gruesas del **esmalte fritado**, los que podrían obturar el orificio de salida y provocar fallas diversas, como el salpicado, chorro torcido o escaso, etc.

**ESMALTE\* LÍQUIDO 29 (S) 10**

Fermentaciones en el adhesivo o gomas; burbujas de aire atrapadas en la pinceleta con que se esmalta y depositadas en la capa del esmalte; el "revolver" el **esmalte líquido** demasiado agitadamente [...].

**ESMALTE\* MATE 42 (S) 24**

Debe ser algo menor de 1 milímetro para esmaltes transparentes, y de 1 a 1,2 mm para **esmaltes mates** y engobes. Los colores bajo y sobre cubierta, por el contrario, se aplicarán con un espesor exiguo, apenas para colorear lo suficiente.

**ESMALTE\* NEGRO 6 (S) 10**

En el esmaltado industrial de chapas metálicas se llama "capa de fondo" a un primer **esmalte negro** que se aplica antes que el blanco brillante posterior.

**ESMALTE\* OPACO 26 (S) 29**

Todo esmalte mate es opaco; pero no todo **esmalte opaco** será mate. El efecto mate se debe a la acción de materiales opacificadores capaces de producir textura áspera o levemente rugosa en la superficie del esmalte, por lo que no brilla (óxidos de titanio, bario, cinc en presencia de plomo).

**ESMALTE\* DE PLOMO 157**

Un esmalte mate se forma con sustancia líquida o vítrea, saturada con sustancia sólida o cristalina. P. ej.: adiciones de un 30 de opacificantes añadidos a un **esmalte de plomo** (15 % de óxido de cinc y 15 % de titanio) darán una superficie mate a 1040°.

**ESMALTE\* PLÚMBICO 15 (S) 29**

La textura suavemente áspera que da al esmalte lo hace apto especialmente para cerámica artística. Resulta muy bien combinado con óxido de cinc e incluidos en **esmaltes plúmbicos**, aunque usado solo opacifica todo tipo de esmalte (blanco mate añadido a un esmalte alcalino).

**ESMALTE\* ROJO 13 (S) 33**

Flambe (rojo): Denominación de un color de **esmalte rojo** con iridiscencias, que en realidad es un rojo reductivo de cobre en humo.

**ESMALTE\* (ROJO) SANGRE 14**

Es frecuente usar la técnica del esmalte sobre esmalte, o sea aplicar una buena capa de **esmalte rojo sangre** sobre la cual se deposita en seguida una capa de otro esmalte transparente e incoloro, el que protege al rojo.

**ESMALTES SEMICONDUCTORES 5** (only the plural form appears in "Collocates" because the singular one presented a frequency inferior to 5 in "Collocates")

**Esmaltes semiconductores:** se aplican sobre aisladores de porcelana para alta tensión y \_ deben comportarse como semiconductores de la electricidad a fin de evitar las cargas eléctricas y la formación de chispas, distribuyendo el voltaje de manera uniforme en una cadena de aisladores, y para eliminar interferencias con la radio.

**ESMALTE\* TRANSPARENTE 70 (S) 18**

En la industria de baldosas se emplea en la actualidad el método de dar un esmalte de fondo (blanco opaco) sobre el bizcocho; luego se aplican decorados, dibujos o texturas con pigmentos bajo cubierta; y sobre toda la aplicación se da luego una capa de **esmalte transparente**.

ESMALTES TURQUESAS 11 (only the plural form appears in “Collocates” because the singular one presented a frequency inferior to 5 in “Collocates”)

Los esmaltes turquesas también deben llevar grandes adiciones de óxido de sodio, incluido como carbonato sódico, el cual desarrolla ese característico color cerámico en presencia de adiciones de óxido de cobre (3-4 %). No se desarrolla el verdadero turquesa con otros fundentes, como p. ej. el plomo.

ESMALTES VITROCERÁMICOS 23 (only the plural form appears in “Collocates” because the singular one presented a frequency inferior to 5 in “Collocates”)

Para la preparación de los esmaltes vitrocerámicos se ha seguido el procedimiento indicado en la figura 4.30

ESMALTES VITROCRISTALINOS 17 (only the plural form appears in “Collocates” because the singular one presented a frequency inferior to 5 in “Collocates”)

En el caso de los esmaltes vitrocristalinos de corindón, después del tratamiento térmico, se observa mediante DRX la presencia de fases cristalinas de corindón y casiterita.

ADHERENCIA 26 DEL ESMALTE\*

Otros adhesivos también pueden usarse a fin de facilitar la adherencia del esmalte a la pasta cruda.

AMPOLLAR EL ESMALTE 9

Diversos compuestos del flúor han sido empleados como opacificadores y texturantes de esmaltes, pero su inclusión debe regularse cuidadosamente pues suelen burbujear o ampollar los esmaltes.

BURBUJEAR EL ESMALTE 12

En la calcinación se eliminan sustancias volátiles, que harían burbujear el esmalte, como compuestos de azufre y carbonatos.

CAPA 107 (S) 15 DE ESMALTE\*

Con respecto al esmalte en sí, un calentamiento rápido no los perjudica en general, a condición de que la capa de esmalte se halle completa mente seca antes de entrar al horno (de lo contrario se descascararía).

CHORREADURAS DE ESMALTE\* 16

Volatilizaciones, chorreaduras de esmalte, y otros daños deben subsanarse a fin de lograr durabilidad. Todo horno nuevo (y los usados una o dos veces por año) deberían ser protegidos por una mano de "baño de horno", consistente sencillamente en la aplicación a pincel o compresor de caolín disuelto en agua (sin ningún otro elemento extraño, salvo alúmina si se trabaja a más de 1300°).

COCHURA DEL ESMALTE\*

Se puede usar trípodes de distintos tamaños para colocar las piezas durante la cochura del esmalte, necesarios sobre todo cuando éste cubre la base.

CUARTEO 45 DEL ESMALTE \*

La regulación de las cantidades del cuarzo-feldespatos es el factor que permite controlar el cuarteo del esmalte en las pastas de loza.

FRITA 26 (S) 54 DE ESMALTE\*

La introducción de cloruro de sodio (sal común) en las fritas de esmaltes que deban resultar muy blancos hará volatilizarse el óxido férrico eliminándolo cuando hay trazas.

### OPACIFICADOR 17 (ES) 7 DE ESMALTE\*

Muchas marcas comerciales preparan el silicato finísimamente molido a diversas mallas (200 a 500), para incluirlo como muy buen opacificador de esmaltes de todo tipo (plúmbicos y alcalinos, de baja y alta temperatura), en porcentajes desde el 10 hasta el 20 %.

### OPACIFICANTE 25 (S) 24 DE ESMALTE\*

Este mineral de estaño, de color oscuro, constituido por el óxido de ese metal es la fuente del estaño metálico y de su óxido, tan usado en cerámica como opacificante de esmaltes.

### SOPLETEAR ESMALTE\* 15

Prevención del saturnismo: ceramistas que esmaltan jamás deben sopletear esmaltes preparados con compuestos de plomo crudo, ni tampoco con fritas solubles (que desprenden plomo en el estómago).

### SUSPENSIÓN 65 (ES) 54 DEL ESMALTE

Es preciso adecuar la densidad de la suspensión del esmalte que se aplica con esta técnica a la porosidad del bizcocho, el que, si es de baja temperatura, requerirá una preparación del esmalte más acuosa (peso específico: 1,4).

### VISCOSIDAD DEL ESMALTE\* 27

Por el contrario, por sobre los 1200°, los esmaltes de alta temperatura escurren raramente. Inclusiones de arcilla o caolín al esmalte (5 a 10 %/e) permiten remediar la falla, ya que la sustancia arcillosa contiene alúmina, óxido que eleva la viscosidad del esmalte, permitiendo que a su temperatura de madurez se halle fundido pero viscoso, o sea sin tendencia a chorrear.

As may be observed in the text below, the presence in the immediate context of the term *esmalte* of LUs related with colour and colouring processes together with firing and mineral related words is very dense and coherently fitted the expectations of the study for the Spanish equivalent of “glaze”.

*Un esmalte de plomo 157, al ser coloreado 7 (S) 9 con óxido de cobre 42, dará color 88 verde típico; pero si ese esmalte en vez de plúmbico 15 (S) 29 es alcalino 29 (S) 40, con el mismo colorante 19 (s) 34 habrá de dar un turquesa característico. Ello nos indica que la coloración 13 del átomo de cobre 42 dependerá del medio en que se dispersa. Modificadores de los colores 56 influyen también cuando se hallan presentes, si bien por sí mismos no producen coloración 13: son los óxidos 74 y materiales de cinc 22, titanio 12, estaño 29, calcio 31, etc. El óxido 112 de cobalto 12, p. ej., que siempre da azules 6, se textura y vira desde el azulado hasta el verdoso 5 o grisáceo en presencia de adiciones de óxido 112 de titanio 12 superiores al 10 %. El óxido 112 de hierro 20, por su parte, se aclara mucho en presencia de calcio 31, tanto en pastas 230 como en esmaltes. En suma: el material o átomo vecino a un óxido 112 metálico pigmentante altera o modifica su color 88 (es) 56, al igual que la fase sólida o líquida a través de la cual dicho óxido 112 se dispersa en forma de finas partículas. La temperatura 128 (s) de cocción 97 influye también en la coloración 13, ya sea acentuándola o bien atenuándola, según los casos. A más bajas temperaturas 46, el esmalte no tiene la misma capacidad disolvente del pigmento 27 (S) 52 que en altas. Ello significa que a mayor temperatura mayor será también la disolución del color 88, hasta llegar a su saturación plena.*

Other collocations with not so highly significant features in terms of frequency but which appear in the KWIC lists provided by “Concordance”, especially in the form

of enumerations in the textual samples, are: *esmaltes para artículos sanitarios, esmaltes de pavimentos y revestimientos, esmaltes semi-mate, texturantes de esmaltes, esmaltes porcelánicos, esmaltes fundentes, esmaltes duros, esmaltes de / tipo mayólica, esmaltes de loza, esmaltes satinados, esmaltes de loza, esmaltes de gres, esmaltes vítreos, esmaltes vitrocrystalinos, esmaltes vitrocerámicos and esmaltes compuestos*

### G) Cerámica

The most frequent polylexical terms with the node *cerámica* are:

#### CERÁMICA BLANCA 14 / ROJA 11

Panorama actual de la industria de la cerámica y el vidrio. Clasificación: **cerámica** pesada o roja, **cerámica blanca**, refractarios, vidrios y cerámica avanzada

#### CERÁMICA COCIDA 6

Bizcocho: Pieza de **cerámica cocida** sin esmalte y a baja temperatura, por lo general como preparación para la aplicación de éste. Equivale a sancocho.

#### CERÁMICA POROSA 5

Raku: **Cerámica porosa** de baja temperatura y aspecto rústico debido al agregado de chamote y a que son modeladas a mano. Se usa en el Japón para las teteras y cuencos destinados a la ceremonia del té.

#### CERÁMICA ELÉCTRICA 8

Su cálculo es de suma importancia en **cerámica eléctrica**, especialmente para los aisladores que trabajan en altas frecuencias.

#### CERÁMICA ELECTRÓNICA 134

Pastas de rutilo: conglutinado con bajos porcentajes de arcilla, se han usado variedades muy duras de este mineral calcinado, para componer pastas especiales de **cerámica electrónica**, semiconductores, y la llamada "porcelana de rutilo", de excelente resistencia mecánica a la abrasión, por lo que es usada para fabricar guías de telares para hilados de nylon, seda, rayón, lino, fibra de vidrio, etc.

#### CERÁMICA ESMALTADA 12

Las primeras muestras de **cerámica esmaltada** aplicadas a la arquitectura no van más allá de finales del siglo XII.

#### CERÁMICA DEL FELDESPATO 7

Es el fundente esencial para la cerámica de altas temperaturas, por lo que nosotros la llamamos "la **cerámica del feldespato**" (cocciones a más de 1190°).

#### CERÁMICA FERROELÉCTRICA 11

Sustancia usada en la **cerámica ferroeléctrica**, cuya fórmula es: Cd,Nb,O<sub>2</sub>.

#### CERÁMICA HORNEADA 9

Un poro es el intersticio, glóbulo o pequeña cavidad existente en una pasta **cerámica horneada**, en un mineral, etc.

## CERÁMICA INDUSTRIAL 39

Tanto el óxido puro, como el silicato de circonio, y muchos compuestos del mismo en combinación con calcio, bario, cinc, magnesia, alúmina, etc., se utilizan ampliamente en la actualidad para **cerámica industrial**.

## CERÁMICA – METAL 25 (“CERMET”)

La palabra "**cermet**" es una contracción de "**cerámica-metal**", de allí que a veces se los llame también cerametales.

## ALTA CERÁMICA 22

Los cambios en la estructura cristalina de las sustancias horneadas, especialmente cuando se hallan en presencia de adecuadas cantidades estequiométricas de otras, son la base de la **alta cerámica** (electrónica, etc.).

## BALDOSA 51 (S) 5 CERÁMICA

Estos compuestos, debido a la solubilidad que presentan, penetran en el primero estrato de la pasta constituyente de la **baldosa cerámica** y, sucesivamente por repetidas aplicaciones o por la aplicación de pequeñas cantidades de agua, penetran a capas más internas del sustrato cerámico.

## FIBRA CERÁMICA 15

Ciertos esmaltes que deberían ser blancos opacos también se agrisan en reducción, por hallarse los quemadores mal regulados (en hornos a gas, etc.), por deficiencia de oxígeno dentro del horno (falta de tiraje), por existir sustancias reductoras que se queman dentro del horno durante la cocción alterando la atmósfera (hornos nuevos, pastas carbonosas, hornos de **fibra cerámica** en su primera cocción).

## FOTOGRAFÍA CERÁMICA 9

Es fotosensible, por lo que es usado en los procesos de fabricación de calcos y serigrafía, así como en **fotografía cerámica**, mezclándolo con goma, cola o gelatina.

## INDUSTRIA 66 CERÁMICA

En la situación actual de la **industria cerámica**, cuyo objetivo es lograr la mayor eficiencia con el menor costo, utilizando materias primas más controladas y minimizando el uso energético, el esmalte cerámico se ha convertido en un factor de competencia importante por las características que confiere al soporte (diseño, textura, etc.), como así también por su indispensable adaptación a ciclos de cocción cada vez más cortos.

## MAQUINARIA 6 CERÁMICA

**Maquinaria cerámica**: En el proceso de fabricación industrial se utilizan máquinas capaces de maximizar la producción a menor costo.

## MOLDES DE CERÁMICA 5

El yeso sin agua se denomina "anhidrita", y su fórmula es:  $\text{CaSO}_4$ . El yeso semihidratado, especialmente elaborado para **moldes de cerámica**, al ser arrojado en polvo seco al agua, la absorbe fácilmente y se rehidrata, recuperando el agua que perdió en la calcinación, con lo que recristaliza y fragua.

## PASTA 63 CERÁMICA

Se forma espontáneamente por sobre los 1200° en toda **pasta cerámica** que contenga cuarzo, por cambio en la estructura del cristal de sílice, no en su composición química.

## PIEZA CERÁMICA 65

La **pieza cerámica** una vez conformada se somete a una etapa de secado, con el fin de reducir el contenido en humedad de las piezas tras su conformado hasta niveles lo suficientemente bajos (0,2-0,5 %), para que las fases de cocción y, en su caso, esmaltado se desarrollen adecuadamente.

## QUÍMICA CERÁMICA 16

Saber **química cerámica** consiste en profundizar en todos los aspectos de la Tabla de Mendeléiev, la que debería hallarse presente en todo lugar de enseñanza. Las relaciones ocultas a una primera mirada son infinitas e inagotables, pues nos hallamos en presencia de una clave o secreto capaz de revelar la realidad.

Although this study is framed within the branch of industrial ceramics – so that its more artistic applications like pottery have not been considered – it is also a fact that some documents included in the corpus made reference to it and, consequently, some collocations belonging to a more artistic branch of ceramics have also been identified: *terracota, indígena, mexicana, tradicional/popular española, primitiva, tradicional, popular, griega, precolombina, arqueológica, folklórica, inca, quechua, negra and morisca, cerámica española, cerámica popular, cerámica tradicional, cocción cerámica, cerámica griega, producción cerámica, cerámica comercial, coloración cerámica, horno(s) de cerámica, decoración cerámica, cerámica morisca, cerámica artesanal, cerámica inca, cerámica árabe, coloración cerámica, horno(s) de cerámica* and others like *vasija, loza, plato* and *vaso*.

Other collocations with not so highly significant features in terms of frequency but which appear in the KWIC lists provided by “Concordance are”: *cerámica dieléctrica, coloración cerámica, tinta cerámica, máquina industrial cerámica mezcladora o trafiladora, fibra cerámica refractaria, cerámica avanzada, matriz cerámica, cerámica piezoeléctrica, soldadura metal – cerámica, soldadura cerámica – cerámica* and *cerámica compacta*.

## H) Agua

The most significant collocations detected for the term *agua* and their selected contexts of use in the form of extended concordance lines have been:

### AGUA ABSORBIDA 5

El haberlo dejado con agua por demasiado tiempo antes de aplicarlo si contiene sustancias solubles que reaccionan entre sí; exceso de **agua absorbida** por el bizcocho al esmaltar; el hornear la pieza con el esmalte todavía húmedo; descompensaciones en la fórmula del mismo esmalte mal compuesto, por deficiencia de cuarzo [...] son otras de las posibles causas del defecto.

### AGUA ACIDULADA 8

Después de calcinados los pigmentos, se lavarán en agua caliente (a veces con **agua acidulada**, otras con un poco de bórax) [...]

### AGUA ADSORBIDA 22

Durante el calentamiento de la arcilla, el **agua adsorbida** se elimina totalmente hacia los 150

## AGUA DE LA BARBOTINA 14 (S) 5

La colada consiste en una reacción química cuyo equilibrio se logra entre un correcto ajuste causado por la acción floculadora o espesante del yeso con que están hechos los moldes (sulfato de calcio: floculador) y la acción desfloculadora del carbonato o silicato de sodio añadidos al agua de la barbotina.

## AGUA DE COMBINACIÓN 15

El agua química o agua de combinación (o de composición), es la naturalmente incluida en la molécula de arcilla, formando parte del retículo (por seca que se halle una arcilla, siempre contiene agua química: 10 a 14 % de su peso).

## AGUA DE COMPOSICIÓN 18

Ocre quemado: es el ocre común hidratado, el que, al ser calcinado en un horno cerámico, pierde el agua de composición, convirtiéndose en óxido de hierro rojo o férrico (rojizo)

## AGUA DE CONSTITUCIÓN 24

La estructura cristalina es débil, funden a bajas temperaturas y liberan sílice durante la cocción. Eliminan el agua de constitución a los 600' con menor consumo de calor que las caolinitas típicas.

## AGUA DE CONTRACCIÓN 11

Con relación al secado de la arcilla, podemos hablar del agua de contracción (15 a 20 %), que es la misma agua de mezcla o de trabajo agregada, y que separa las partículas entre sí permitiendo la contracción de secado cuando se evapora.

## AGUA DE CRISTALIZACIÓN 14

El agua de cristalización es aquella que algunas sales retienen en su masa, en proporción determinada, cuando cristalizan.

## AGUA DESTILADA 12

El ensayo se realiza siguiendo el método descrito en la norma ISO 10545-7 "Baldosas cerámicas. Determinación de la resistencia a la abrasión. Baldosas esmaltadas", que consiste en someter la superficie vista de 11 probetas de 100 mm x 100 mm, cortadas de las baldosas, a la acción de una carga abrasiva, compuesta de bolas de acero, corindón y agua destilada, en un abrasímetro normalizado.

## AGUA DE HIDRATACIÓN 10

En su forma natural es el mineral "mirabilita", con diez moléculas de agua de hidratación ( $\text{NE}\cdot, \cdot 10\text{H}_2\text{O}$ ), también llamada "sal de Glauber".

## AGUA HIGROSCÓPICA 18

En la cocción, hacia los 150° ya se elimina prácticamente toda el agua higroscópica adsorbida de la atmósfera. Ciertos materiales son débilmente higroscópicos, tales como el óxido de cinc, el carbonato de calcio, etc.

## AGUA OXIGENADA 17

El agua común, p. ej., es un óxido de hidrógeno ( $\text{H}_2\text{O}$ ), pero el agua oxigenada o peróxido de hidrógeno ( $\text{H}_2\text{O}_2$ ) es el compuesto de ese tipo de máxima oxidación.

## AGUA DE POROSIDAD 12

Tanto el agua de contracción como el agua de porosidad se eliminan por secado al aire o en atmósfera tibia. Hacia los 150°, durante la cocción, ya casi no existirá agua de porosidad entre los capilares y poros.

### AGUA POTABLE 11

Es dificultoso purificar aguas, de manera que si el agua es impura (de lagunas saladas) lo más práctico será ubicar la planta en lugares donde exista **agua potable**.

### AGUA QUÍMICA 43

A simple vista no se distingue de la caolinita, pero puede diagnosticarse gracias a la gran pérdida de **agua química** en la cocción y a su característica de dejarse pulimentar fácilmente con la uña (en crudo).

### AGUA QUÍMICAMENTE 15 COMBINADA 23

Entre los 430 y los 650 ó 700° dicha molécula se "abre", dejando escapar el **agua químicamente combinada** en la misma, la que se elimina en forma de vapor, quedando la pieza con elevada porosidad, la que crece y alcanza su máximo hacia los 800-850° con leve dilatación de la pasta.

### AGUA REGIA 7

El más fino púrpura se prepara a partir de oro: 1° Tomar 3 lotes de la mejor **agua regia** y disolver medio ducado de oro en ella, el líquido se volverá amarillo [...].

### AGUA DE TRABAJO 36

El amasado y batido de la pasta también aumenta la cohesión. Elevados porcentajes de **agua de trabajo** la disminuyen, al igual que el calor. La cohesión es necesaria para que la pasta posea compacidad y trabajabilidad.

### ABSORCIÓN DE AGUA 159

Hay una pequeña producción de baldosas cerámicas prensadas en seco, no esmaltadas, con **absorción de agua** superior al 10 % , que no están incluidos en la presente norma.

### DIPOLOS DE AGUA 5

Sabemos que el cristal de arcilla posee carga eléctrica negativa, y que los **dipolos de agua** dirigidos (moléculas polares) son fuertemente atraídos hacia ella, originando pastas compactas y consistentes.

### MOLÉCULA 8 (S) 26 DE AGUA

Bayerita: Forma mineral de la alúmina hidratada (Al<sub>2</sub>O<sub>3</sub> · 3H<sub>2</sub>O). Calcinada a 200° pierde dos **moléculas de agua** pasando a "bohernita".

By closely observing the KWIC lists it has been detected that there are many collocates for the term “*agua*”, although their frequency is not high. Most of these collocates appear again in enumerations so that their context of use is not clearly determined. However, I have considered they deserve a mention: *agua hidratada, agua del retículo o de la red cristalina, agua del esponjado , agua de lavandina, agua estructural, agua fuerte, agua zeolítica, agua acidificada, agua coloidal, agua intersticial, agua residual, agua de interposición, agua de plasticidad, agua subterránea, agua de mezcla, agua ablandada, agua de amasado and agua dura.*

Other more common collocates easily deductible and also found in the corpus with a high frequency are: *caliente 37, fría 17, tibia 12, hirviendo 13, pura 11, corriente 7, de mar, de lluvia 26, mineral 9, natural 9, de río 5, dulce 11, ebullición 8, evaporarse 8, litro 19 (s) 6 and vapor 77 (es) 5.*

## D) *Horno*

The most frequent collocations of the term *horno* detected in term extraction are the following ones:

### HORNO DE CAMPANA 6

El **horno de campana** suele llamarse también "horno con elevador".

### HORNO CERÁMICO 37

Es el peso perdido por una cantidad dada de material, p. ej., arcilla o caolín, al ser calcinado 1000° en un **horno cerámico** dentro de un ciclo normal de cocción

### HORNO CIRCULAR 7

Hacia mediados del siglo pasado comenzó a utilizarse para producción industrial, tanto en Alemania como en Inglaterra, el **horno circular** de tiro descendente, en grandes versiones de hasta 10 ó 12 metros de diámetro

### HORNO CONTINUO 32

El **horno continuo** de Hoffmann fue usado desde la misma época para la producción de ladrillos. Este horno (precursor de la producción cerámica en gran escala y del horno túnel) consiste en una especie de rectángulo redondeado en sus dos extremos, y se halla dividido en sucesivas cámaras.

### HORNO ELÉCTRICO 96

Las atmósferas pueden también clasificarse en estáticas y dinámicas. Es estática la atmósfera del **horno eléctrico**, cuyo comportamiento es de carácter pasivo

### HORNO DE FRITADO 6

Los parámetros que caracterizan la corriente gaseosa, en la chimenea del **horno de fritado** son su caudal y su temperatura.

### HORNO DE/A GAS 103

Es un hidrocarburo de gran poder reductor, cuando es arrojado al interior de un **horno de gas** o leña, para lograr esmaltes de atmósfera reductora, lustres de humo, cerámica negra, etc.

### HORNO INTERMITENTE 13

Como vemos, el **horno intermitente** (al que nos referimos) es un aparato que derrocha calor en grado sumo. Este derroche se reduce bastante en los modernos hornos de túnel, pero ello se efectúa a costa de las cualidades estéticas de la producción (preferimos los intermitentes).

### HORNO DE/A LEÑA 64

En los **hornos a leña** el aire secundario es el que penetra por el hogar u otras aberturas especiales. Poco aire secundario hará que el horno "no suba"

### HORNO DE REVERBERO 12

Denominose "**de reverbero**" a un tipo de **horno** que ha sido usado especialmente para fritar, pues en él la carga recibe el calor desde arriba, al calentarse la bóveda del horno, fundiendo la frita por irradiación calórica o calor reverberante (reflejado hacia abajo, hacia el hogar de fusión donde la frita se halla).

### HORNO ROTATORIO 18

El **horno rotatorio** consiste en un cilindro de acero revestido interiormente con refractario y dotado de un sistema de movimentación que permite la homogeneización de la masa fundida.

## HORNO DE RODILLOS 7

La concepción de los secaderos horizontales es del tipo **horno de rodillos**. Las piezas se introducen en diversos planos en el interior del secadero y se mueven horizontalmente en su interior por encima de los rodillos.

## HORNO DE TIRAJE 22

Sabemos que en todo **horno de tiraje** ascendente, la parte más próxima a la chimenea resulta siempre más fría que el resto del horno.

## HORNO DE TIRO 8 ASCENDENTE 10 / DESCENDENTE 16

Al respecto son factores esenciales el saber calcular la cantidad de calorías que requerirá el horno de acuerdo con su capacidad o volumen y servicio que prestará; [...] y, algo esencial, el formato del horno y régimen de circulación de los gases calientes, ya sea que el **horno** sea **de tiro ascendente** o **descendente**.

## ALTO HORNO 31

Recipiente o cuba para fundición de **alto horno**.

## ATMÓSFERA 45 (S) 5 DEL HORNO

La **atmósfera del horno** es también causa frecuente de burbujeo, pues los esmaltes son fácilmente atacables por los gases presentes dentro del horno durante la cocción, en especial aquellos esmaltes delicados o sensibles, como los de plomo.

## BOCA DEL HORNO 11

La regulación del tiraje y el modo de alimentación del combustible que se introducía a la **boca del horno** permitían controlar la cocción.

## BÓVEDA DE HORNO 28

Denominose "de reverbero" a un tipo de horno que ha sido usado especialmente para fritar, pues en él la carga recibe el calor desde arriba, al calentarse la **bóveda del horno**, fundiendo la frita por irradiación calórica o calor reverberante (reflejado hacia abajo, hacia el hogar de fusión donde la frita se halla).

## CARGA DEL HORNO 42

Así, la **carga del horno** es una tarea muy delicada que se ha de efectuar con mucho cuidado y paciencia, porque de la correcta colocación depende una buena cocción.

## COCHURA EN HORNO 12

Las dos piezas son de gres con **cochura en horno** de leña. Las variaciones del color se deben al contacto directo con las llamas.

## COMBUSTIBLE 14 (S) 5 PARA HORNOS

Si bien su poder calórico es inferior al GLP, puede emplearse perfectamente como **combustible para hornos** a gas con ahorro de costos.

## COMBUSTIÓN DEL HORNO 13

En cerámica es empleado en estado de combinación, formando la esencia de nuestro arte: los óxidos; o como ingrediente del aire para hacer posible la **combustión del horno** a leña o gas.

## GASES DEL HORNO 26

La inestabilidad del color en vidriados se interpreta ahora fácilmente ya que el cromóforo está en la superficie de las partículas y por tanto accesible al ataque del vidriado fundido y de los **gases del horno**.

**PARED 49 (ES) 22 DEL HORNO**

Se debe dejar espacio entre la carga y la **pared del horno**; entre placa y placa; entre placas y paredes; la cumbreira debe quedar despejada ya que ella induce la recirculación del aire y del calor.

**PLACA(S) 33 DE HORNO**

Porcentajes de alúmina se incluyen también en refractarios comunes (**placas de horno**), a fin de elevar su refractariedad y resistencia mecánica bajo carga.

**QUEMADOR 16 (ES) 12 DE HORNO**

Gas que, unido a un hidrocarburo en presencia de calor, permite la combustión de un **quemador de horno** a gas, mechero de laboratorio, etc. P. ej.: un sencillo soplete a gas con aire como carburante puede alcanzar temperaturas de llama de 17000; con oxígeno puro 2000°; con hidrógeno 2500°.

**REFRACTARIO 14 (S) 16 DE HORNO**

Cuidado de los **refractarios de horno**: los porosos deben protegerse cada tanto aplicándoles una delgada capa de un caolín de la mejor calidad, ya sea por sopleteo o a pincel.

**REVESTIMIENTO 15 DE / PARA ALTOS HORNOS**

Los refractarios de magnesita (básicos) son resistentes a las escorias de su mismo carácter, por lo que son usados como **revestimiento para altos hornos** de fundir metales, cemento, etc.

**TECHO 25 DEL HORNO**

P. ej., los ladrillos de horno, los que, si encogen a cada cocción aunque sólo sea décimas de milímetro, al poco tiempo ocasionarán la formación de grietas o el derrumbamiento del **techo del horno** construido con ellos.

**TOBERA 24 (S) 5 DEL HORNO**

Cuanto más intensa es la reducción, tanto más grande y enérgica será la llama de ese cono, y tanto más se alejará de la **tobera**.

Other significant collocates of the search word “horno” but with a lower frequency in “Collocates” and a less remarkable presence in textual samples are: *horno con quemador (es) frontal, horno continuo de cámara (s), horno continuo de fuego móvil, horno de acrisolado, horno de arco directo, horno de crisol, horno de fuego continuo, horno de fuego móvil, horno de fundir, horno de cuba, horno de fusión de reverbero, horno de inducción, horno de laboratorio, horno para tratamiento térmico (siderurgia), horno para vidrio, horno redondo, horno de botella, horno túnel, horno túnel de llama libre, horno túnel eléctrico, horno vertical, horno de cuba vertical, horno de tratamiento, horno para el proceso de temple, horno de acrisolado, horno de calcinación, horno de recocción, horno eléctrico de arco, horno de arco, horno eléctrico de resistencias, horno intermitente a vagoneta, horno de tiro cruzado, horno de tiraje invertido o descendente, horno de talud simple, hornos de bandas transportadoras, horno de losa móvil o de paso peregrino, horno con elevador, horno monoestrato de rodillos, horno con quemadores transversales, horno con sistema de empuje por propulsión a émbolo, horno con atmósfera controlada, horno con placas*

*deslizantes, horno con travesaños móviles, horno de arco indirecto, horno de ciclo diario, horno de cinta transportadora, horno de esmaltación, horno de galerías paralelas, horno de gasificación discontinua, horno de llama abierta directa, horno de llama abierta invertida (industria de productos refractarios), horno rotativo, horno semimufado, horno subterráneo, horno vertical de destilación continua, horno con sistema de empuje por propulsión a émbolo, horno de zigzag, horno de solera giratoria, horno de solera móvil, horno de sangría continua, horno de parrillado, horno de normalización, horno de coque and horno de tiraje invertido o descendente.*

Other collocates with a very high frequency rate that corroborates the general and rather simplistic view of an oven as a very hot place used for baking things and that, accordingly, are expectable in the immediate context of the term “*horno*” are: *temperatura* 78, *temperaturas* 13, *cocción* 76, *calor* 73, *llama* 28, *chimenea* 23, *fuego* 23, *calentamiento* 17, *caliente* 15, *calcinación* 13, *fusión* 12, *térmica* 10, *recocción* 8, *fundir* 8, *calientes* 7, *calórica* 7, *térmico* 7 and *calentar* 6. However, it is also common and normal that after the heating of the oven comes its cooling, giving way then to collocations like “*enfriamiento del horno*” 21, or collocates like “*frío*” 7.

## **J) Arcilla**

The most significant collocates detected for the term *arcilla* and their exemplifying contexts of use have been the following ones:

### **ARCILLA ALUMINOSA 17**

Material de arcilla refractaria calcinado a elevadas temperaturas, compuesto de **arcilla aluminosa** o caolín, sin antiplásticos.

### **ARCILLA ARENOSA 5**

Así, la arena es magra, al igual que una **arcilla arenosa**. La falta de plasticidad en un material cerámico se debe a [...].

### **ARCILLA BLANCA 75**

Porcentajes de óxido de hierro se hallan presentes en toda **arcilla blanca**, pero cuando ellos sobrepasan el 1 % ya colorean las pastas de rosado.

### **ARCILLA DE BOLA 5**

Existen muchas formas de clasificar la arcilla: según su origen, en primaria o secundaria; según su plasticidad, en grasa o magra; también podemos oír sobre arcilla refractarias, arcilla de cerámica compacta, **arcilla de bola**, u otras.

### **ARCILLA CALCÁREA 5**

Se habla también de "burbujeo" cuando una **arcilla calcárea** "hierve" intensamente al adicionarle p. ej. unas gotas de cualquier ácido, precisamente para comprobar si contiene cal.

**ARCILLA CALCINADA 25**

Pastas secas pero crudas podrán pegarse mediante silicato de sodio y dejando secar, cargando el silicato con **arcilla calcinada** cuando la grieta es gruesa.

**ARCILLA CRUDA 30**

La **arcilla cruda** es un compuesto de 1 molécula de alúmina, 2 de sílice y 2 de agua. Ello nos indica que los compuestos se forman según definidas proporciones moleculares.

**ARCILLA DESLEÍDA 5**

El tamizado de la **arcilla desleída** con 100 % de agua, haciéndola pasar por una malla N° 100, es el método más seguro para eliminarlos.

**ARCILLA DE GRANO 20 (MUY FINO, FINO, MEDIO, GRUESO)**

Ello se debe muchas veces al uso de un solo tipo de **arcilla de grano muy fino**, al preparar la pasta. Con frecuencia las arcillas más puras y finas (y más caras) no son las mejores para trabajo manual, [...].

**ARCILLA GRASA 12**

Así una "**arcilla grasa**" será la más plástica, en oposición a otra "magra" o de baja plasticidad.

**ARCILLA HÚMEDA 19**

Método industrial consistente en hacer pasar **arcilla húmeda** a través de una matriz, la que da al producto una sección transversal uniforme y constante, especial para la fabricación de ladrillos huecos, [...].

**ARCILLA MAGRA 19**

Pequeñas adiciones de bentonita (2 a 3 %) vuelven plástica cualquier **arcilla magra** o mezcla con alto porcentaje de antiplástico (pastas de porcelana).

**ARCILLA MALEABLE 11**

La utilización de imágenes grabadas, hechas de un material fuerte o percedero, para imprimirlas sobre la superficie de la **arcilla maleable** es un tratamiento sencillo pero eficaz (ver impresión).

**ARCILLA MONTMORILLONÍTICA 9**

Bentonita: Variedad de **arcilla montmorillonítica**, cuya fórmula teórica sería:  $A_{12}O_3 \cdot 4SiO_2 \cdot H_2O$ . Como vemos, contiene más sílice y menos agua que la caolinita o arcilla típica.

**ARCILLA PLÁSTICA 49**

Tanto el agua como la acción bacteriana provocan la formación de coloides protectores, como el ácido húmico, presente en toda buena **arcilla plástica**, y el ácido tánico.

**ARCILLA PURA 23**

Como vemos, si bien es cierto que la **arcilla pura** es un mineral y no una roca, ya que tiene su propia estructura cristalina, ello sucede en teoría, y sólo con arcillas y caolines muy puros, que son las variedades que menos abundan.

**ARCILLA REFRACTARIA 8**

El grafito puro funde hacia los 3600°. Pastas de grafito: se las mezcla y congutina con elevados porcentajes de **arcilla refractaria** (30 al 50 %, a veces más), para la fabricación de crisoles refractarios para la industria metalúrgica y muchos otros usos industriales.

**ARCILLA ROJA 37**

Es posible lograr pastas marrones (para escultura y mural, gres, baldosas, etc.) adicionando óxido de manganeso (15 %) más óxido de hierro (5 %) a una **arcilla roja** (1020-1040°).

**ARCILLA SECA 24**

Proceso mediante el cual una **arcilla seca** pero no transformada químicamente al calor puede recuperar la humedad propia del estado plástico y ser trabajada nuevamente como si fuera virgen

**CHAMOTE 22 DE ARCILLA**

El material menos peligroso es el **chamote de arcilla** pura en polvo calcinado, no el de pastas, puesto que este último al contener antiplásticos (p. ej., cuarzo), elevará el coeficiente de dilatación térmica de la pasta en que se incluya, haciéndola propensa al agrietamiento.

**LIGANTE 12 DE LA ARCILLA**

El feldespato, por su parte, es **ligante de la arcilla**, caolín y cuarzo al fundirse por sobre los 1200° para dar vitrificación a la porcelana.

**PASTA 59 (S) 19 DE ARCILLA**

Los esmaltes ofrecen menos riesgos, y tanto pastas como esmaltes resultan mucho más baratos, ya que los hace el mismo ceramista a partir de materias primas de muy bajo precio: **pastas de arcilla**, caolín, cuarzo y feldespato.

**SUSPENSIÓN 13 (ES) 8 DE ARCILLA**

La "floculación" de las **suspensiones de arcilla** es el proceso contrario a la "desfloculación" o fluidificación de ellas.

The term “*caolín*” appears as a collocates of “*arcilla*” 111 times because it is often used as a synonym of the latter, more specifically of “*arcilla blanca*”. In this sense, it appears in the immediate context of the search word usually separated from it by the Spanish conjunction “o”:

*La elasticidad de un engobe, de manera que no se cuartee durante la cocción sobre la pasta que recubre, se halla en dependencia del porcentaje de **arcilla o caolín** que contenga, y se reduce al aumentar el vitrificarte. Lo mismo sucede con las pastas muy vítreas (porcelana): son elásticas y resistentes cuando son muy aluminosas, y frágiles y quebradizas cuando contienen fundentes blandos introducidos como fritas.*

The fact that among the most frequent collocates of the word *arcilla* are found words such as *cuarzo* 63, *feldespato* 37, *carbonato* 17, etc. is due to the fact that the textual samples of the corpus include a huge number of processes in which all these components are involved, for instance, as showed in the text below, in the elaboration of glazes:

*Todo ello se refiere al esmalte una vez horneado, puesto que antes de la cocción, y durante su aplicación, todavía no es posible hablar de esmaltes, sino de una suspensión acuosa de polvos finos mezclados, consistentes en **cuarzo 63, feldespato 37, arcilla, caolín, minio 5, carbonato 17 de calcio 14, bórax, óxido 18 de cinc 6, de titanio** y muchos otros óxidos 7, como los*

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*metálicos colorantes. Una vez fundidos en el horno, estos compuestos forman una mezcla de silicatos, boratos, aluminatos, etc., los que conforman juntos el cuerpo vítreo, ya sea una fase vítrea pura (en los transparentes) o bien mixta (en los opacos y mates).*

Other significant collocates of the search word “*arcilla*” but with a lower frequency in “Collocates” and a less remarkable presence in textual samples are: *arcilla ácida, arcilla cociendo blanco, arcilla cociendo negro, arcilla cociendo amarillo, arcilla que cuece rojo, arcilla para colaje , arcilla para crisol, arcilla bituminosa, arcilla expandida, arcilla pizarrosa, arcilla roja abisal, arcilla salina, arcilla salitrosa, arcilla desfloculable, arcilla explotada a cielo abierto, arcilla inflante, arcilla dilatada, arcilla esquistosa, arcilla extrusa, arcilla ferruginosa, arcilla fibrosa, arcilla limonítica, arcilla manganesífera, arcilla margosa, arcilla micacea, arcilla para taponar* and *arcilla para loza*.

As may be observed, term extraction has been a process going beyond the extraction of monolexical terms on the basis of mere frequency criteria. In accordance with the CTT, the object of this project was based on the study of the true nature of terminology, in this case of the ceramics industry, and as such an in-depth research has been necessary in order to detect terminological units that go beyond single, monolexical units to form lexical combinations, collocations or polylexical terms.

The results obtained in term extraction after having observed and considered monolexical frequency lists results, statistical results, MI results, and Concord results – with the analysis of concordance lines and collocates – have made it possible the detection, retrieval and “extraction” (for becoming prospective dictionary entries) of not only terms of the “abrasive” (monolexical) type but also of collocations such as the ones shown in the screenshot from TermStar in figure III.36: *abrasive belt band, abrasive blade, abrasive blasting, abrasive charge*, and so on.

The screenshot shows the TermStar interface with a dictionary entry for 'abrasive finish'. The entry includes English and Spanish definitions, a subject code (FINALPRODUCT), and various metadata fields like 'Número de ficha: 28597' and 'Proyecto: Cerámica (IndustrialCeramics)'. The interface also shows a grid of letters on the left and a status bar at the bottom indicating the source language (English [UK]) and target language (Spanish).

S: ab	F:	English [UK] -> Spanish	Cerámica (IndustrialCeramics)	abrasive finish
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**Figure III.36:** Screenshot from TermStar showing final registers and thus illustrating polylexical terminological units (collocations) after term extraction.

As may be observed, the delimitation or segmentation of terminological units has been done in an integrated way, that is, simultaneously to the observation of Wordlist and Concord results

The complete results on term extraction presented in this thesis are the 4,000 terms presented as dictionary entries in section VI.4. However, this stage of the method has already been finished in both languages and as such, according to the term extraction undertaken and to the number of terms obtained, it may already be stated that the dictionary will have an approximate total of 26,000 entries once finished.

### 4.3 Matching results

Matching – or the already mentioned grouping of a source language term with its corresponding target language term(s) – has been, obviously, a crucial part in a work with a fundamental translational component as the one here developed. A good example of preliminary (yet intuitive) matching may be found in figure III.18.

The analysis of parallel documents has constituted, together with the use of previous bilingual lexicographical works, a fundamental tool for matching, as figures III.37, III.38 – constituting excerpts from a corpus document – and figure III.39 – with illustrative matching results – show.

Los colores cerámicos son preparados de fritas (fundentes), pigmentos cerámicos y varias materias primas inorgánicas. La mezcla de estos componentes se tritura hasta obtener polvo muy fino. A menudo la mezcla ya molida se vuelve a calcinar hasta su punto de reblandecimiento y se vuelve a moler. En cualquier caso los colores cerámicos se comercializan con una distribución de tamaño de grano definida con el fin de lograr efectos decorativos reproducibles.

**Figure III.37:** Spanish version of a parallel text from the corpus (docP 0001).

Ceramics colours are preparations of frits (fluxes), ceramic stains and various inorganic raw materials. The mixture of those is milled to obtain a finely divided powder. Frequently the finely milled mixture is calcined again to its softening point and then milled again. In any case ceramic colours are marketed with a defined grain size distribution to achieve reproducible decoration effects.

**Figure III.38:** English version of a parallel text from the corpus (docP 0001).

<b>MATCHINGS FROM PARALLEL TEXT EXCERPTS in figures III.37 and III.38</b>	
<b>Spanish text</b>	<b>English text</b>
Colores cerámicos	Ceramic colours
Fritas	Frits
Fundentes	Fundents
Pigmentos cerámicos	Ceramic stains
Materias primas inorgánicas	Inorganic raw materials
Triturar/moler	Mill
Calcinar	Calcine
Punto de reblandecimiento	Softening point
Distribución de tamaño de grano	Grain size distribution
Efectos decorativos reproducibles	Reproducible decoration effects

**Figure III.39:** Matching results from text excerpts in figures III.37 and III.38.

For a complete account on matching results, however, see sections III.5 and VI.4; in the former, matchings are integrated in the registers from TermStar XV there illustrated as one of the fields to be filled in, whereas in the latter, matchings are already shown in the form of equivalents within actual final entries.

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*Man is the principal syllable in management.*

C. T. Mckenzie

## 5. DATA PROCESSING RESULTS: TERMSTAR XV

In this section, a brief but illustrative representation of the results obtained with Termstar XV has been put forward. In order to show the outcome of the data processing stage, I have considered it appropriate to show 10 of the registers (in their final versions) processed and managed with this terminological database so that the final layout, elaboration process and selection criteria of the information there included can be better understood (these registers have been included as final entries among the 4,000 entries presented as final results). Hence, the registers selected in order to illustrate data processing results have been the following ones:

- 1) abrasion (and the collocations included with this node)
- 2) absorption test
- 3) American Society for Testing and Materials (ASTM)
- 4) atmospheric pollution index (API)
- 5) back butter/backbutter
- 6) biscuit and bisque (and the collocations included with this node)
- 7) occupational health
- 8) with the naked eye (included as “naked eye, with the”)
- 9) unders
- 10) ventilated facade/façade

In cases 1 and 6, although these units are terminological *per se* and they have been included as such, they are also nodes of polylexical terms, that is, nodes of collocations which have also been included. Accordingly, the registers containing collocations of “abrasion” and “biscuit” (and “bisque”) have also been presented to show the importance assigned to the combinatorial aspect of terms in this study. In the case of entry number 8, “with the naked eye”, (included in the final entry as “naked eye, with the”), we have also aimed at showing the importance of phraseology.

The way of presenting the results of this stage has followed the same structure in every case: for instance, figure III.40 shows the fields to be filled in a Termstar XV terminological card. It illustrates how “abrasion” has been considered a headword without abbreviation, as indicated by the fields “headword” and “category” (in this case, “abrasion” and 1x respectively). Category 1x, shows that the term in the entry has no abbreviation and has to be included as a main entry in the final dictionary layout, whereas category 1 would indicate the same main entry status but referred to a terminological unit with abbreviation, as may be the case with “abrasion/abrasive hardness *HA*” (see figure III.49). On the other hand the “subentries” in the dictionary have been assigned categories 2 or 2x depending on whether they have an abbreviation or not. In the case of 2 or 2x category terms, the headword to which these subentries belong must also be specified for a correct subsequent arrangement of final dictionary entries. For instance, within the headword “abrasion” (category 1x), the polylexical terms with “abrasion” as the node have been included – as illustrated in figures III.42, III.43, III.44, III.45, III.46, III.47 and III.48 – these showing the category “2x” except for “abrasion/abrasive hardness *HA*” (figure III.49) which has been assigned category “2” because of its abbreviated form. The correct filling of these fields has favoured the processing and the display of the data in a systematic, sound way in the final, printed dictionary entries.

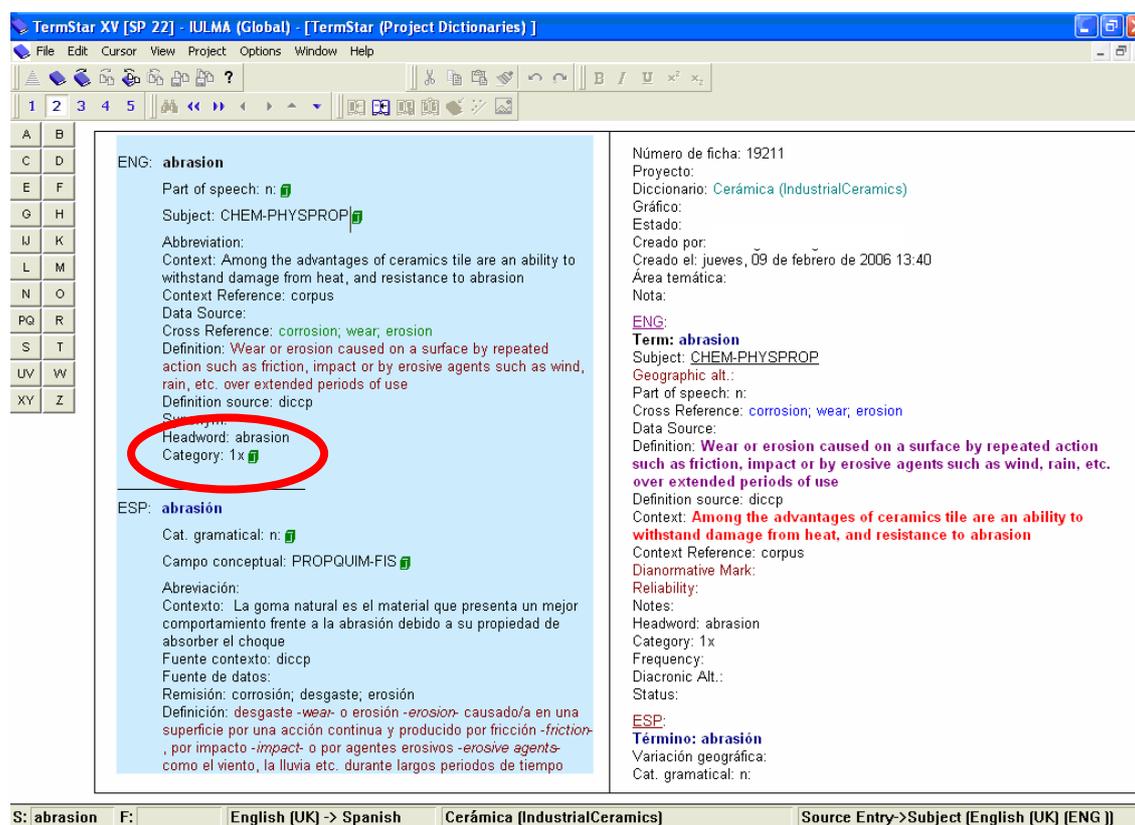
The screenshots shown in figures III.40, III.50, III.52, III.55, III.57, III.59, III.66, III.74, III.76, III.78 and III.80 have been included in order to show how this categorisation of terms obeys a systematic logic and how it has been undertaken. At the same time these figures illustrate how the rest of fields in the terminological card have been filled in for obtaining the 4,000 entries presented<sup>74</sup>.

Together with these screenshots, enlarged figures with the aspect of the registers/entries in TermStar XV when the edition mode is not activated (that is, as shown on the left hand side of figure III.36) have been included, which constitute the most faithful approximation to the way final dictionary entries look once GENDIC<sup>75</sup> has generated them.

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<sup>74</sup> Remember that these 4,000 entries present a single English-Spanish direction so that most of the information included in the entries will need to be completed yet for the Spanish-English version.

<sup>75</sup> Dictionary generator designed by doctor Chelo Vargas at Universidad de Alicante and used in the last stage of the method in order to obtain the final format of the dictionary entries.

1) A<sup>76</sup>: ABRASION

**Figure III.40:** Screenshot from TermStar XV showing the fields to be filled in a terminological card of this database (specifically for the term “abrasion”) and highlighting the field allowing final categorisation into main entries or subentries.

**abrasion** *n*: CHEM-PHYSPROP *corrosion; wear; erosion* Among the advantages of ceramics tile are an ability to withstand damage from heat, and resistance to abrasion **abrasión** desgaste por fricción/rozamiento, desgaste -wear- o erosión -erosion- causado/a en una superficie por una acción continua y producido por fricción -friction-, por impacto -impact- o por agentes erosivos -erosive agents- como el viento, la lluvia etc. durante largos periodos de tiempo

**Figure III.41:** Final entry for “abrasion” as shown in TermStar XV (non-editing mode).

**abrasion by sandblast/sand-blast** *n*: CHEM-PHYSPROP *sand-blast* Physical properties were determined on specimens prepared under laboratory conditions using applicable ASTM procedures and showed, for instance, an excellent resistance to abrasion by sandblast and a maximum service temperature of 150°C **abrasión mediante chorro de arena**

**Figure III.42:** Final entry for “abrasion by sandblast/sand-blast” as shown in TermStar XV (non-editing mode).

<sup>76</sup> Main letter in which the entries are gathered.

**abrasion finish** *n*: ELABPROC *surface finish; sand blasted finish* **acabado con abrasivos** proceso de eliminación de las rebabas de los objetos moldeados y/o deslustrado de sus superficies, sometiéndolas al impacto de materias como huesos de albaricoque machacados, cáscaras de nuez o gránulos de plástico, con suficiente fuerza como para fracturar la rebaba

Figure III.43: Final entry for “abrasion finish” as shown in TermStar XV (non-editing mode).

**abrasion hardness** *v.* *abrasion resistance*

Figure III.44: Final entry for “abrasion hardness” as shown in TermStar XV (non-editing mode).

**abrasion resistance** *n*: CHEM-PHYSPROP *Abrasion resistance is determined by abrasion tests, and tiles are grouped accordingly* **resistencia a la abrasión** dureza a la abrasión; resistencia al desgaste [por rozamiento], propiedad que presenta una superficie a la hora de resistir el desgaste *-wearing-* producido por frotamiento *-rubbing-* con un material extraño que puede producir la erosión de dicha superficie

Figure III.45: Final entry for “abrasion resistance” as shown in TermStar XV (non-editing mode).

**abrasion resistance classification** *n*: TESTING/QUALITY *PEI rating; resistance to surface abrasion* **clasificación de resistencia a la abrasión** Clasificación en la que se determina la resistencia a la abrasión *-abrasion resistance-* de un producto/material. La clasificación de baldosas esmaltadas para piso según su resistencia a la abrasión es:  
CLASE 1 (PEI I) Uso individual ligero como cuartos de baño doméstico y cuartos de dormir sin acceso directo desde el exterior.  
CLASE 2: (PEI II) Uso individual normal como cualquier zona de vivienda particular a excepción de cocinas y entradas.  
CLASE 3: (PEI III) Uso individual elevado o uso colectivo moderado como todas las zonas de una vivienda privada. CLASE 4: (PEI IV) Uso colectivo normal como cocinas, restaurantes, exposiciones, boutiques, peluquerías. CLASE 5: (PEI V) Uso colectivo elevado como centros comerciales, bares, tiendas con mucho tránsito, zonas peatonales, aplicaciones industriales

Figure III.46: Final entry for “abrasion resistance classification” as shown in TermStar XV (non-editing mode).

**abrasion resistance test** *n*: TESTING *abrasion resistance classification; PEI rating; resistance to surface abrasion* **ensayo de resistencia a la abrasión**  
*ensayo de abrasión; test de resistencia al desgaste*, ensayo consistente en someter a la loseta cerámica sobre la parte vidriada a una acción abrasiva compuesta de una mezcla de esferas de acero, arena de Corindón y agua destilada. A este tipo de prueba se le conoce también como prueba de P.E.I. y da lugar a una clasificación de las losetas en 5 grupos

Figure III.47: Final entry for “abrasion resistance test” as shown in TermStar XV (non-editing mode).

**abrasion test** *n*: TESTING *abrasion resistance test* **ensayo de abrasión**

Figure III.48: Final entry for “abrasion test” as shown in TermStar XV (non-editing mode).

**abrasion/abrasive hardness HA** *n*: CHEM-PHYSPROP *Granite is a well known building stone and has high abrasion hardness, with very high resistance to weathering and extreme resistance to chemical attack.*  
**duresa a la abrasión** *resistencia al desgaste [por rozamiento]*, propiedad o grado de resistencia que presenta un material al desgaste por abrasión

Figure III.49: Final entry for “abrasion/abrasive hardness HA” as shown in TermStar XV (non-editing mode).

## 2) A: ABSORPTION TEST

The screenshot shows the TermStar XV interface with a terminological card for the term "absorption test". The card is divided into two main sections: English (ENG) and Spanish (ESP). The English section includes fields for part of speech (n), subject (TESTING), abbreviation, context, definition, and source. The Spanish section includes fields for grammatical category (n), conceptual field (ENSAYO), abbreviation, context, source, and definition. The card also includes a right-hand panel with additional metadata such as project name, creation date, and target entry.

**ENG: absorption test**  
 Part of speech: n  
 Subject: TESTING  
 Abbreviation:  
 Context: Absorption test is valuable as a fairly reliable indication of the ability of tile to resist frost action  
 Context Reference: google  
 Data Source:  
 Cross Reference:  
 Definition: a method to determine the liquid uptake of a material. It is time and temperature dependent  
 Definition source: EURO  
 Synonym:  
 Headword: absorb  
 Category: 2x

**ESP: ensayo de absorción**  
 Cat. gramatical:  
 Campo conceptual: ENSAYO  
 Abreviación:  
 Contexto:  
 Fuente contexto:  
 Fuente de datos:  
 Remisión:  
 Definición: método para determinar la absorción-retención -uptake- de un líquido por parte de un material en el que el tiempo y la temperatura son considerados  
 Fuente definición: EURO  
 Sinónimo: prueba de absorción  
 Principal:  
 Categoría:

**ENG: Term: absorption test**  
 Subject: TESTING  
 Geographic alt.:  
 Part of speech: n  
 Cross Reference:  
 Data Source:  
 Definition: a method to determine the liquid uptake of a material. It is time and temperature dependent  
 Definition source: EURO  
 Context: Absorption test is valuable as a fairly reliable indication of the ability of tile to resist frost action  
 Context Reference: google  
 Dianormative Mark:  
 Reliability:  
 Notes:  
 Headword: absorb  
 Category: 2x  
 Frequency:  
 Diacronic Alt.:  
 Status:  
 ESP:  
 Término: ensayo de absorción  
 Variación geográfica:  
 Cat. gramatical:  
 Campo conceptual: ENSAYO

S: absorption F: English (UK) -> Spanish Cerámica (IndustrialCeramics) Target Entry->Categoría (Spanish (ESP))

Figure III.50: Screenshot from TermStar XV showing the fields filled in the terminological card of the term “absorption test”.

**absorption test** *n.*: TESTING *Absorption test is valuable as a fairly reliable indication of the ability of tile to resist frost action* **ensayo de absorción** *prueba de absorción*, método para determinar la absorción-retención -uptake- de un líquido por parte de un material en el que el tiempo y la temperatura son considerados

Figure III.51: Final entry for “absorption test” as shown in TermStar XV (non-editing mode).

## 3) A: AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

TermStar XV [SP 22] - IULMA (Global) - [TermStar (Project Dictionaries) ]

File Edit Cursor View Project Options Window Help

1 2 3 4 5

A B  
C D  
E F  
G H  
I K  
L M  
N O  
PQ R  
S T  
UV W  
XY Z

**ENG: American Society for Testing and Materials**  
Part of speech: n.  
Subject: ORG-INST/QUALITY  
Abbreviation: *ASTM*  
Context: The ASTM is responsible for most of the American standard specifications for ceramics  
Context Reference: corpus  
Data Source:  
Cross Reference:  
Definition: Non-profit technical society that develops and publishes standards, definitions of materials, methods for testing materials, recommended installation practices, and specifications for materials  
Definition source: corpus  
Synonym:  
Headword: American  
Category: 2

**ESP: Sociedad Americana de Ensayos y Materiales**  
Cat. gramatical:  
Campo conceptual: ORG-INST  
Abreviación: *ASTM*  
Contexto:  
Fuente contexto:  
Fuente de datos:  
Remisión:  
Definición: sociedad técnica sin ánimo de lucro -non-profit technical society- que desarrolla y publica estándares -standards-, definiciones de materiales, métodos para el ensayo con materiales, prácticas de instalación recomendadas y especificaciones para materiales  
Fuente definición: corpus

Número de ficha: 29019  
Proyecto:  
Diccionario: Cerámica (IndustrialCeramics)  
Gráfico:  
Estado:  
Creado por: Nuria Edo  
Creado el: miércoles, 24 de enero de 2007 15:18  
Área temática:  
Nota:  
**ENG:**  
**Term: American Society for Testing and Materials**  
Subject: ORG-INST/QUALITY  
Geographic alt.:  
Part of speech: n.  
Abbr.: *ASTM*  
Cross Reference:  
Data Source:  
Definition: Non-profit technical society that develops and publishes standards, definitions of materials, methods for testing materials, recommended installation practices, and specifications for materials  
Definition source: corpus  
Context: The ASTM is responsible for most of the American standard specifications for ceramics  
Context Reference: corpus  
Dianormative Mark:  
Reliability:  
Notes:  
Headword: American  
Category: 2  
Frequency:  
Diacronic Alt.:  
Status:  
**ESP:**  
**Término: Sociedad Americana de Ensayos y Materiales**  
Variación geográfica:

S: american s F: English [UK] -> Spanish Cerámica [IndustrialCeramics] Source Entry->Term (English [UK] [ENG ])

Figure III.52: Screenshot from TermStar XV showing the fields filled in the terminological card of the term “American Society for Testing and Materials *ASTM*”.

**American Society for Testing and Materials *ASTM*** n.: ORG-INST/QUALITY *The ASTM is responsible for most of the American standard specifications for ceramics* **Sociedad Americana de Ensayos y Materiales** sociedad técnica sin ánimo de lucro -non-profit technical society- que desarrolla y publica estándares -standards-, definiciones de materiales, métodos para el ensayo con materiales, prácticas de instalación recomendadas y especificaciones para materiales

Figure III.53: Final entry for “American Society for Testing and Materials *ASTM*” as shown in TermStar XV (non-editing mode).

**ASTM** √. *American Society for Testing and Materials*

Figure III.54: Final entry for “*ASTM*” as shown in TermStar XV (non-editing mode).

## 4) A: ATMOSPHERIC POLLUTION INDEX (API)

The screenshot shows the TermStar XV interface with a terminological card for the term "atmospheric pollution index API". The card is divided into two main sections: English (ENG) and Spanish (ESP). The English section includes fields for Part of speech (n), Subject (ENVRMENT), Abbreviation (API), Context (The Atmospheric Pollution Index (API) represents an overall value of the pollution level based upon the gas composition of air samples taken at 3 ft above the ground surface), Context Reference (corpus), Data Source, Cross Reference, Definition, Definition source, Synonym, Headword (atmosphere), and Category (2). The Spanish section includes fields for Cat. gramatical, Campo conceptual (MEDAMB), Abreviación, Contexto (Las poblaciones de la zona afirmaron que sufrían un elevado índice de contaminación atmosférica causada por algunos procesos de la industria azulejera), Fuente contexto (google), Fuente de datos, Remisión, Definición, Fuente definición, Sinónimo (índice de contaminación/polución del aire), Principal, and Categoría (2). To the right of the card, there is a metadata section with fields for Número de ficha (32274), Proyecto (Cerámica (IndustrialCeramics)), Gráfico, Estado, Creado por (Nuria Edo), Creado el (sábado, 22 de septiembre de 2007 17:40), Área temática, and Nota. Below the card, there is a status bar showing the source (S: atmospheri F:), the direction (English (UK) -> Spanish), the dictionary (Cerámica (IndustrialCeramics)), and the target entry (Target Entry->Categoría (Spanish (ESP))).

Figure III.55: Screenshot from TermStar XV showing the fields filled in the terminological card of the term “atmospheric pollution index API”.

**atmospheric pollution index API** n: ENVRMENT *The Atmospheric Pollution Index (API) represents an overall value of the pollution level based upon the gas composition of air samples taken at 3 ft above the ground surface* **índice de contaminación atmosférica** índice de contaminación/polución del aire,

Figure III.56: Final entry for “atmospheric pollution index API” as shown in TermStar XV (non-editing mode).

## 5) B: BACK BUTTER/BACKBUTTER

The screenshot shows the TermStar XV interface with a terminological card for the term "back butter/backbutter". The card is divided into two main sections: English (ENG) and Spanish (ESP). The English section includes fields for Part of speech (v), Subject (INSTAL), Abbreviation, Context, Context Reference (corpus), Data Source, Cross Reference (butter), Definition, Definition source (corpus), Synonym, Headword (back), and Category (2x). The Spanish section includes fields for Cat. gramatical, Campo conceptual (INSTAL), Abreviación, Contexto, Fuente contexto (google), Fuente de datos, Remisión, Definición, and Fuente definición (corpus). A right-hand panel contains metadata such as Número de ficha (29383), Proyecto, Diccionario (Cerámica (IndustrialCeramics)), Gráfico, Estado, Creado por (Nuria Edo), Creado el (domingo, 04 de febrero de 2007 15:14), Área temática, and Nota. Below the card, the status bar shows the source entry and definition in English (UK).

**ENG: back butter/backbutter**  
 Part of speech: v  
 Subject: INSTAL  
 Abbreviation:  
 Context: In order to backbutter the tile, spread some thinset on the back of the tile and then use your notched trowel to spread the thinset out evenly  
 Context Reference: corpus  
 Data Source:  
 Cross Reference: butter  
 Definition: The application of a bond coat to the back of ceramic tile just before the tile is placed. Back buttering is usually a secondary procedure, the main method of applying the bond coat being the spreading of it on the floor with the notched trowel.  
 Definition source: corpus  
 Synonym:  
 Headword: back  
 Category: 2x

**ESP: untar por detrás/el reverso (del azulejo)**  
 Cat. gramatical:  
 Campo conceptual: INSTAL  
 Abreviación:  
 Contexto:  
 Fuente contexto: google  
 Fuente de datos:  
 Remisión:  
 Definición: untar por la parte posterior y de manera uniforme las piezas de revestimiento antes de colocarlas, asegurando una cobertura completa del reverso con el mortero  
 Fuente definición: corpus

Número de ficha: 29383  
 Proyecto:  
 Diccionario: Cerámica (IndustrialCeramics)  
 Gráfico:  
 Estado:  
 Creado por: Nuria Edo  
 Creado el: domingo, 04 de febrero de 2007 15:14  
 Área temática:  
 Nota:  
**ENG:**  
**Term: back butter/backbutter**  
 Subject: INSTAL  
 Geographic alt.:  
 Part of speech: v  
 Cross Reference: butter  
 Data Source:  
 Definition: **The application of a bond coat to the back of ceramic tile just before the tile is placed. Back buttering is usually a secondary procedure, the main method of applying the bond coat being the spreading of it on the floor with the notched trowel.**  
 Definition source: corpus  
 Context: **In order to backbutter the tile, spread some thinset on the back of the tile and then use your notched trowel to spread the thinset out evenly**  
 Context Reference: corpus  
 Dianormative Mark:  
 Reliability:  
 Notes:  
 Headword: back  
 Category: 2x  
 Frequency:  
 Diacronic Alt.:  
 Status:  
**ESP:**  
**Término: untar por detrás/el reverso (del azulejo)**

S: back butter F: English (UK) -> Spanish Cerámica (IndustrialCeramics) Source Entry->Definition (English (UK) [ENG ])

Figure III.57: Screenshot from TermStar XV showing the fields filled in the terminological card of the term “back butter/backbutter”.

**back butter/backbutter** v: INSTAL *butter* *In order to backbutter the tile, spread some thinset on the back of the tile and then use your notched trowel to spread the thinset out evenly* **untar por detrás/el reverso (del azulejo)** *untar el reverso, untar por la parte posterior y de manera uniforme las piezas de revestimiento antes de colocarlas, asegurando una cobertura completa del reverso con el mortero*

Figure III.58: Final entry for “back butter/backbutter” as shown in TermStar XV (non-editing mode).

## 6) B: BISCUIT

With the spelling “biscuit”, the term appears in the corpus 62 times.

TermStar XV [SP 22] - IULMA (Global) - [TermStar (Project Dictionaries)]

File Edit Cursor View Project Options Window Help

1 2 3 4 5

A B  
C D  
E F  
G H  
I K  
L M  
N O  
PQ R  
S T  
UV W  
XY Z

ENG: **biscuit**  
Part of speech: n.   
Subject: ELABPROC   
Abbreviation:  
Context: Glazing is the process of applying a glaze to ceramic ware; the latter may be unfired or in the biscuit state  
Context Reference: corpus  
Data Source:  
Cross Reference: [bisque](#)  
Definition: the fired tile body on which layers of engobe, glaze, and the required applications or effects (piece design) have not been applied yet. Also named [bisque](#)  
Definition source: corpus  
Synonym: biscuit body  
Headword: biscuit  
Category: 1x

ESP: **bizcocho**  
Cat. gramatical: n.   
Campo conceptual: ELABPROC   
Abreviación:  
Contexto: Estudio y análisis de la decoración cerámica sobre bizcocho  
Fuente contexto: corpus  
Fuente de datos:  
Remisión:  
Definición: pieza cerámica -*ceramic ware*- cocida pero en la que todavía no se han aplicado engobes -*engobes*- o esmaltes/barnices -*glazes/enamels*  
Fuente definición: corpus  
Sinónimo: biscuit  
Sinónimo: bizcochado

Número de ficha: 19454  
Proyecto: Cerámica (IndustrialCeramics)  
Gráfico:  
Estado: DEFVA  
Creado por:  
Creado el: jueves, 16 de febrero de 2006 12:58  
Área temática:  
Nota:  
ENG:  
**Term: biscuit**  
Subject: ELABPROC  
Geographic alt.:  
Part of speech: n.  
Syn.: [biscuit body](#)  
Cross Reference: [bisque](#)  
Data Source:  
Definition: **the fired tile body on which layers of engobe, glaze, and the required applications or effects (piece design) have not been applied yet. Also named [bisque](#)**  
Definition source: corpus  
Context: **Glazing is the process of applying a glaze to ceramic ware; the latter may be unfired or in the biscuit state**  
Context Reference: corpus  
Dianormative Mark:  
Reliability:  
Notes:  
Headword: biscuit  
Category: 1x  
Frequency:  
Diacronic Alt.:  
Status:  
ESP:  
**Término: bizcocho**  
Variación geográfica:

S: biscuit F: English (UK) -> Spanish Cerámica [IndustrialCeramics] Target Entry->Cat. gramatical (Spanish [ESP])

Figure III.59: Screenshot from TermStar XV showing the fields filled in the terminological card of the term “biscuit”.

**biscuit** *n.*: ELABPROC [bisque](#) *Glazing is the process of applying a glaze to ceramic ware; the latter may be unfired or in the biscuit state* **bizcocho** *biscuit, bizcochado, tiesto, cerámica bizcochada, pieza cerámica - ceramic ware- cocida pero en la que todavía no se han aplicado engobes -engobes- o esmaltes/barnices -glazes/enamels*

Figure III.60: Final entry for “biscuit” as shown in TermStar XV (non-editing mode).

**biscuit body** *v.* [biscuit](#)

Figure III.61: Final entry for “biscuit body” as shown in TermStar XV (non-editing mode).

**biscuit kiln** *n.*: ELABMCHN *The glost kiln and biscuit kiln are close to the green ware drying zone* **horno de bizcochar** *horno donde se realiza la cocción del bizcochado*

Figure III.62: Final entry for “biscuit kiln” as shown in TermStar XV (non-editing mode).

**biscuit pitchers** *n*: ELABPROC *Biscuit pitchers are crushed, ground and reused, either in the same factory or elsewhere* **desecho de bizcocho** residuo que queda después de haber escogido la parte mejor/útil del bizcocho

Figure III.63: Final entry for “biscuit pitchers” as shown in TermStar XV (non-editing mode).

**biscuit ware** *n*: ELABPROC/FINALPRODUCT **bizcocho** pieza de bizcocho; objeto cocido *-fired ware-* desprovisto de esmalte

Figure III.64: Final entry for “biscuit ware” as shown in TermStar XV (non-editing mode).

**biscuit/bisque fire/firing** *n*: ELABPROC *Brushing is the removal of bedding material from pottery-ware after the biscuit firing* **cocción de bizcocho** **cocer el bizcocho**, cocción de las piezas cerámicas antes de la aplicación del barniz o esmalte

Figure III.65: Final entry for “biscuit/bisque fire/firing” as shown in TermStar XV (non-editing mode).

With the spelling “bisque”, the concept appears in the corpus 65 times and acquires also the category of verb:

The screenshot shows the TermStar XV interface with a terminological card for the term "bisque". The card is divided into two main sections: English (ENG) and Spanish (ESP). The English section includes fields for part of speech (n/v), subject (ELABPROC), abbreviation, context, definition, and synonyms. The Spanish section includes fields for grammatical category (n/v), conceptual field (ELABPROC), abbreviation, context, source, and definition. The card also includes a right-hand panel with metadata such as file number, project, dictionary, and creation date.

ENG: <b>bisque</b>	Número de ficha: 30789
Part of speech: n/v	Proyecto:
Subject: ELABPROC	Diccionario: Cerámica (IndustrialCeramics)
Abbreviation:	Gráfico:
Context: Some factories still fire the basic clay without glaze and create a "Bisque" or unglazed body for later selling the bisque to another company who may only glaze in their factory for specialized reasons	Estado:
Context Reference: corpus	Creado por: Nuria Edo
Data Source:	Creado el: jueves, 26 de julio de 2007 13:49
Cross Reference: biscuit	Area temática:
Definition: The older form, still preferred in USA, of the term BISCUIT, used to refer to the body of the tile that has been fired but not glazed	Nota:
Definition source: corpus	ENG:
Synonym:	<b>Term: bisque</b>
Headword: bisque	Subject: ELABPROC
Category: 1x	Geographic alt.:
	Part of speech: n/v
	Cross Reference: biscuit
	Data Source:
	Definition: <b>The older form, still preferred in USA, of the term BISCUIT, used to refer to the body of the tile that has been fired but not glazed</b>
	Definition source: yo
	Context: <b>Some factories still fire the basic clay without glaze and create a "Bisque" or unglazed body for later selling the bisque to another company who may only glaze in their factory for specialized reasons</b>
	Context Reference: corpus
	Dianormative Mark:
	Reliability:
	Notes:
	Headword: bisque
	Category: 1x
	Frequency:
	Diacronic Alt.:
	Status:
	ESP:
	<b>Término: bizcocho</b>
	Variación geográfica:

S: bisque F: English (UK) -> Spanish Cerámica (IndustrialCeramics) Syn.->Sinónimo (Spanish (ESP))

Figure III.66: Screenshot from TermStar XV showing the fields filled in the terminological card of the term “bisque”.

**bisque** *n/v*: ELABPROC [biscuit](#) *Some factories still fire the basic clay without glaze and create a "Bisque" or unglazed body for later selling the bisque to another company who may only glaze in their factory for specialized reasons* **bizcocho** **sancocho**, parte de la pieza cerámica cocida a baja temperatura y sin esmalte, por lo general como preparación para la aplicación de éste; forma empleada antes que *biscuit* y preferida en EEUU

Figure III.67: Final entry for “bisque” as shown in TermStar XV (non-editing mode).

**bisque** *n*: ELABPROC [biscuit](#) *In low fire, the bisque temperature is usually hotter than the firing temperature* **bizcochado** primera cocción a la que es sometida una pieza cerámica cruda

Figure III.68: Final entry for “bisque” (second sense) as shown in TermStar XV (non-editing mode).

**bisque** *v*: ELABPROC [bisque fire](#) *The hotter a piece is bisqued, the tighter the body becomes and the less glaze is picked up by the piece* **bizcochar** cocer piezas no vidriadas o esmaltadas

Figure III.69: Final entry for “bisque” (third sense, as verb) as shown in TermStar XV (non-editing mode).

**bisque fire** *v*: ELABPROC *Before an object is glazed, it is often bisque fired* **bizcochar** cocer el bizcocho,

Figure III.70: Final entry for “bisque fire” as shown in TermStar XV (non-editing mode).

**bisque firing** *n*: ELABPROC *The purpose of bisque firing is to render the object more durable, while leaving it porous enough to absorb glaze* **cocción del bizcocho**

Figure III.71: Final entry for “bisque firing” as shown in TermStar XV (non-editing mode).

**bisque ware** *v.* [biscuit ware](#)

Figure III.72: Final entry for “bisque ware” as shown in TermStar XV (non-editing mode).

**bisquit** *v.* [bisque](#)

Figure III.73: Final entry for “bisquit” as shown in TermStar XV (non-editing mode).

## 7) O: OCCUPATIONAL HEALTH

TermStar XV [SP 22] - IULMA (Global) - [TermStar (Project Dictionaries) ]

File Edit Cursor View Project Options Window Help

1 2 3 4 5

A	B
C	D
E	F
G	H
I	K
L	M
N	O
PQ	R
S	T
UV	W
XY	Z

**ENG: occupational health**  
 Part of speech: n  
 Subject: SFTY  
 Abbreviation:  
 Context: The company is an occupational health provider supplying a wide range of services relating to employee health, well-being and workplace management  
 Context Reference: corpus  
 Data Source:  
 Cross Reference:  
 Definition:  
 Definition source:  
 Synonym: health at work  
 Headword: occupation  
 Category: 2x

**ESP: salud laboral**  
 Cat. gramatical:  
 Campo conceptual: SEG  
 Abreviación:  
 Contexto: La salud laboral se construye en un medio ambiente de trabajo adecuado, con condiciones de trabajo justas, donde los trabajadores y trabajadoras puedan desarrollar una actividad con dignidad y donde sea posible su participación para la mejora de las condiciones de salud y seguridad  
 Fuente contexto: corpus  
 Fuente de datos:  
 Remisión:  
 Definición: estado de normalidad en el ejercicio de las funciones laborales; integridad de los trabajadores desde el punto de vista físico y mental y mantenimiento de la misma en el ámbito laboral  
 Fuente definición: corpus

Número de ficha: 32965  
 Proyecto: Cerámica (IndustrialCeramics)  
 Gráfico:  
 Estado:  
 Creado por: Nuria Edo  
 Creado el: jueves, 10 de enero de 2008 11:10  
 Área temática:  
 Nota:  
**ENG:**  
**Term: occupational health**  
 Subject: SFTY  
 Geographic alt.:  
 Part of speech: n  
 Syn.: health at work  
 Cross Reference:  
 Data Source:  
 Definition:  
 Definition source:  
 Context: **The company is an occupational health provider supplying a wide range of services relating to employee health, well-being and workplace management**  
 Context Reference: corpus  
 Diagnostics Mark:  
 Reliability:  
 Notes:  
 Headword: occupation  
 Category: 2x  
 Frequency:  
 Diacronic Alt.:  
 Status:  
**ESP:**  
**Término: salud laboral**  
 Variación geográfica:  
 Cat. gramatical:

S: ocupatioa F: English [UK] -> Spanish Cerámica [IndustrialCeramics] Target Entry->Fuente definición [Spanish [ESP]]

**Figure III.74:** Screenshot from TermStar XV showing the fields filled in the terminological card of the term “occupational health”.

**occupational health** *n*: SFTY *The company is an occupational health provider supplying a wide range of services relating to employee health, well-being and workplace management* **salud laboral** estado de normalidad en el ejercicio de las funciones laborales; integridad de los trabajadores desde el punto de vista físico y mental y mantenimiento de la misma en el ámbito laboral

**Figure III.75:** Final entry for “occupational health” as shown in TermStar XV (non-editing mode).

## 8) N: WITH THE NAKED EYE (INCLUDED AS: NAKED EYE, WITH THE)

TermStar XV [SP 22] - IULMA (Global) - [TermStar (Project Dictionaries)]

File Edit Cursor View Project Options Window Help

1 2 3 4 5

A	B
C	D
E	F
G	H
I	K
L	M
N	O
PQ	R
S	T
UV	W
XY	Z

ENG: **naked eye, with the**  
 Part of speech: *phr*  
 Subject: *GEN*  
 Abbreviation:  
 Context: Often the nonhomogeneous elements can be distinguished with the naked eye (grain, inclusions, pores)  
 Context Reference: corpus  
 Data Source:  
 Cross Reference:  
 Definition:  
 Definition source:  
 Synonym:  
 Headword: naked eye, with the  
 Category: 1x

ESP: **vista, a simple**  
 Cat. gramatical:  
 Campo conceptual: *GRAL*  
 Abreviación:  
 Contexto: Bastaría cortar una sección de la pieza en bizcocho y podríamos apreciar su tamaño aún a simple vista  
 Fuente contexto: corpus  
 Fuente de datos:  
 Remisión:  
 Definición:  
 Fuente definición:  
 Sinónimo:  
 Principal:  
 Categoría: *1*

**Nalfloc** *n*: MTRLS *coloidal silice* **Nalfloc** marca comercial de sílice coloidal

Número de ficha: 30429  
 Proyecto:  
 Diccionario: *Cerámica (IndustrialCeramics)*  
 Gráfico:  
 Estado:  
 Creado por: Nuria Edo  
 Creado el: Lunes, 02 de julio de 2007 16:12  
 Área temática:  
 Nota:  
 ENG:  
**Término: naked eye, with the**  
 Subject: *GEN*  
 Geographic alt.:  
 Part of speech: *phr*:  
 Cross Reference:  
 Data Source:  
 Definition:  
 Definition source:  
 Context: **Often the nonhomogeneous elements can be distinguished with the naked eye (grain, inclusions, pores)**  
 Context Reference: corpus  
 Dianormative Mark:  
 Reliability:  
 Notes:  
 Headword: naked eye, with the  
 Category: 1x  
 Frequency:  
 Diacronic Alt.:  
 Status:  
 ESP:  
**Término: vista, a simple**  
 Variación geográfica:  
 Cat. gramatical:  
 Campo conceptual: *GRAL*  
 Remisión:

S: naked F: English [UK] -> Spanish Cerámica [IndustrialCeramics] Source Entry->Part of speech [English [UK] [ENC

Figure III.76: Screenshot from TermStar XV showing the fields filled in the terminological card of the phrase “naked eye, with the”.

**naked eye, with the** *phr*: *GEN* *Often the nonhomogeneous elements can be distinguished with the naked eye (grain, inclusions, pores)* **vista, a simple**

Figure III.77: Final entry for “naked eye, with the” as shown in TermStar XV (non-editing mode).

## 9) U: UNDERS

TermStar XV [SP 22] - IULMA (Global) - [TermStar (Project Dictionaries)]

File Edit Cursor View Project Options Window Help

1 2 3 4 5

A	B
C	D
E	F
G	H
I	K
L	M
N	O
PQ	R
S	T
UV	W
XY	Z

**ENG: unders**  
 Part of speech: n  
 Subject: TRANSMTRLS  
 Abbreviation:  
 Context: Sieve analysis results indicate an excessively high overs and unders content for use as a manufacturing feedstock  
 Context Reference: google  
 Data Source:  
 Cross Reference: overs; screening; sieving  
 Definition: "Overs" refers to particulates that do not pass through the sieve 208 (and may also be referred to as "oversize product"), and "unders" refers to particulates that do pass through the sieve 208 (and may be referred to as "undersized product")  
 Definition source: corpus  
 Synonym: undersized product  
 Headword: unders  
 Category: 1x

**ESP: finos**  
 Cat. gramatical:  
 Campo conceptual: TRANSMTRLS  
 Abreviación:  
 Contexto: Tamiz abierto con tolva de recogida de finos  
 Fuente contexto: corpus  
 Fuente de datos:  
 Remisión: residuo de tamizado  
 Definición: granos finos; partículas que pasan a través del tamiz o criba -sieve- de límite inferior  
 Fuente definición: corpus  
 Sinónimo:  
 Principal:

Número de ficha: 30356  
 Proyecto:  
 Diccionario: Cerámica (IndustrialCeramics)  
 Gráfico:  
 Estado:  
 Creado por: Nuria Edo  
 Creado el: jueves, 28 de junio de 2007 15:16  
 Área temática:  
 Nota:  
**ENG:**  
**Term: unders**  
 Subject: TRANSMTRLS  
 Geographic alt.:  
 Part of speech: n  
 Syn.: undersized product  
 Cross Reference: overs; screening; sieving  
 Data Source:  
 Definition: "Overs" refers to particulates that do not pass through the sieve 208 (and may also be referred to as "oversize product"), and "unders" refers to particulates that do pass through the sieve 208 (and may be referred to as "undersized product")  
 Screening/Sieving: A small batch may be classified by adding the material to the screen and then shaking the screen to produce an "overs" and an "unders". The overs are the particles that remain on the screen and the unders are the particles that pass through the screen. In a continuous process, the particles are continuously added to a screen and the overs continuously removed so as to avoid blinding or plugging the screen. When particles are smaller than 100 microns, it is usually difficult to screen the material at high rates. In those cases, the particles are separated using air classifiers  
 Definition source: corpus  
 Context: Sieve analysis results indicate an excessively high overs and unders content for use as a manufacturing feedstock

S: unders F: English [UK] -> Spanish Cerámica [IndustrialCeramics] Source Entry->Definition [English [UK] [ENG ]]

**Figure III.78:** Screenshot from TermStar XV showing the fields filled in the terminological card of the term "unders".

**unders** n: TRANSMTRLS overs; screening; sieving Sieve analysis results indicate an excessively high overs and unders content for use as a manufacturing feedstock **finos** granos finos; partículas que pasan a través del tamiz o criba -sieve- de límite inferior

**Figure III.79:** Final entry for "unders" as shown in TermStar XV (non-editing mode).

## 10) V: VENTILATED FACADE/FAÇADE

The screenshot shows the TermStar XV interface with a terminological card for the term "ventilated facade/façade". The card is divided into two main sections: English (ENG) and Spanish (ESP). The English section includes fields for Part of speech (n), Subject (CONST), Abbreviation, Context (The collections made specifically to be used for the ventilated facade are essentially produced in formats larger than 40 x 40 cm, and especially 60 x 60 cm, and 60 x 120cm), Context Reference (corpus), Data Source, Cross Reference, Definition, Definition source, Synonym, Headword (ventilate), and Category (2x). The Spanish section includes Cat. gramatical, Campo conceptual (CONST), Abreviación, Contexto (Las colecciones de Tau que permiten esta aplicación para fachada ventilada están realizadas esencialmente en formatos superiores a 40 x 40 cm. y especialmente 60 x 0 cm. y 60 x 120 cm), Fuente contexto, Fuente de datos, Remisión, and Definición (sistema de revestimiento -veneering- y protección del muro exterior de un edificio caracterizado por crear una cámara de aire -air space/gap- en movimiento entre la pared revestida -veneered wall- y el paramento exterior de revestimiento garantizando así una una ventilación continuada a lo largo de toda la superficie de la fachada y ofreciendo una mejor protección térmica, estanqueidad -watertightness-, estabilidad, etc.; también, fachada revestida mediante este sistema). To the right of the card, there are additional fields: Número de ficha (33340), Proyecto, Diccionario (Cerámica (IndustrialCeramics)), Gráfico, Estado, Creado por (Nuria Edo), Creado el (sábado, 16 de febrero de 2008 17:05), Área temática, and Nota. Below the card, there are tabs for the source language (S: ventilated), target language (F: English (UK) -> Spanish), dictionary (Cerámica (IndustrialCeramics)), and target entry (Target Entry->Definición (Spanish (ESP))).

**Figure III.80:** Screenshot from TermStar XV showing the fields filled in the terminological card of the term “ventilated façade/façade”.

**ventilated facade/façade** *n*: CONST *The collections made specifically to be used for the ventilated facade are essentially produced in formats larger than 40 x 40 cm, and especially 60 x 60 cm, and 60 x 120cm* **fachada ventilada** sistema de revestimiento -veneering- y protección del muro exterior de un edificio caracterizado por crear una cámara de aire -air space/gap- en movimiento entre la pared revestida -veneered wall- y el paramento exterior de revestimiento garantizando así una una ventilación continuada a lo largo de toda la superficie de la fachada y ofreciendo una mejor protección térmica, estanqueidad -watertightness-, estabilidad, etc.; también, fachada revestida mediante este sistema

**Figure III.81:** Final entry for “ventilated facade/façade” in TermStar XV (non-editing).

As may be observed, TermStar XV results show the importance of correct data processing and management in order to obtain a systematic final work in which adequate information is correctly arranged and provided to the prospective user in actual entries.



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*A man who has committed a mistake  
and doesn't correct it  
is committing another mistake.*

**Confucius**

## **6. REVISION AND NORMALISATION RESULTS**

Basically, the results obtained in the revision and normalisation stage have been shaped in an Access board generated with the terminological data exported from TermStar XV and whose final, free-from-mistakes<sup>77</sup> version is the result of an in-depth revision process. In order to illustrate the kind of results obtained at this stage, figure II.57 in the method can be compared with figure III.82 below (they both show the same section of the board), in order to observe how all the inconsistencies and mistakes regarding empty (compulsory) fields, badly assigned grammatical categories, and spelling or format mistakes among others have been corrected, giving way to a revised and normalised final version of the Access board.

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<sup>77</sup> In spite of the in-depth revision process undertaken at this point it has also been necessary to observe and revise in detail the results obtained in the last stage of the method for definitively correcting anything that may have not been noticed in Access. In addition to this, as has already been stated in the method, there have been certain formats in the entries that could only be added or corrected from the *rtf* version of the entries, that is, in the last stage of the method.

Diccionario_inglesTermino	Categoría	Marca	Contexto	Referencias_cruzadas	Principal	TipoEr	Abbre	Diccionario_esp	Campos_Semanti
amply	adv.		The instrument i		amplitude	2		ampliamente	GRAL
ampoule	n.		When working w		ampoule	1		ampolla	GRAL
Amsler (mercury) volumeter	n.		The porosity was	volumeter	Amsler	1		volumenómetro (	INSTR
AMT	abbr.			advanced manufacturing t	AMT	1			ELABPROC
AN	abbr.			ambient noise	AN	1			GRAL
anagama	n.		The anagama or		anagama	1		anagama	MAQELAB
analogous	a.		This type of ene		analogous	1		análogo	GRAL
analogous harmony	n.		Analogous harm		analogous	2		armonía análoga	DISEÑO
analyse	v.		It is important, ir		analyse	1		analizar	GRAL
analysis	n.		Analysis of failur	surface analysis; stress	analyse	2		análisis	GRAL
analysis of failure	n.			failure analysis	analysis	2			ENSAYO/CALIDAD
analytical	a.		These methods		analytical	1		analítico	GRAL
analytical portion	n.			analytical sample	analytical	2		porción analítica	TRANSPROC/ELAE
analytical sample	n.		The analytical sa	analytical portion	analytical	2		muestra analítica	TRANSPROC/ELAE
analytical methods	n.		Analytical metho		analytical	2		métodos analític	ELABPROC
analytical balance	n.		An analytical ba		analytical	2		balanza de preci	INSTR
analytical solution	n.			test solution	analytical	2			MTRLS
analyze	v.			analyse	analyze	1			GRAL
anatase	n.		Octahedrite is al		anatase	1		anatasa	QUIM/ESMREL
ANC	abbr.			acid neutralizing capacity	ANC	1			PROPQUIM-FIS
anchor	w/n.		V-Stud is a V-sh	fixing; peg; bolt; claw; ho	anchor	1		anclaje	INSTAL
anchor	n.		Sturries of mode		anchor	2		ancla	INSTR
anchorage/anchoring system	n.		The patent show		anchor	2		sistema de ancla	INSTAL
anchorage/anchoring device	n.		Anchorage devic		anchor	2		dispositivo de an	INSTAL
anchorage testing	n.		For anchorage te		anchor	2		pruebas de ancla	INSTAL
anchorage	n.		These tiles offer	fixing; anchor	anchor	2		anclaje	INSTAL
anchor/anchorage point	n.		When the attem		anchor	2		punto de anclaje	INSTAL
anchor wire	n.		The anchor wires		anchor	2		cable de anclaje	INSTAL/CONST/EXF
anchor slot	n.				anchor	2		ranura de anclaje	INSTAL
anchor rod	n.			anchor bolt	anchor	2			INSTR
anchor hole	n.		The anchor hole		anchor	2		agujero de ancla	INSTAL
anchor drilling machine	n.		An anchor drillin		anchor	2		máquina taladrac	INSTAL

Figure III.82: Part of the final version of the Access board in its already revised, final version.

Once generated, this “clean” board containing all the terminographical data compiled and exported from TermStar has been the basis for obtaining the final results of this study with GENDIC in the last stage of the method.

*No sabré hacerlo, no ha producido jamás buen resultado.  
Probaré a hacerlo, ha obrado casi siempre maravillas.  
Lo haré, ha conseguido milagros.*

Source unknown

## 7. EDITION RESULTS (FINAL RESULTS): DICTIONARY ENTRIES

The kind of results obtained in the last stage of the method, that of edition, can be summarised in the view of a final dictionary entry (see figure III.83) created in this study:

**oven** *n*: MAQELAB horno; término un tanto obsoleto para referirse a horno; compartimento cerrado utilizado para calentar, cocer o secar cuya energía calorífica puede ser proporcionada por la combustión de algún combustible o por otros medios (electricidad, etc.) ◇ *ASTM C484 is a test for ceramic tiles, which are removed from an oven at 145°C and placed on a sheet of aluminium at room temperature.* [Exp: **oven drying** (ELABPROC secado en el horno (proceso de)), **oven roof** (MAQELAB techo de la cámara (del horno) ◇ *The uppermost layer of the oven roof is formed by common red brick*), **ovenware** (PRODFIN utensilios para horno, utensilios termorresistentes ◇ *Ceramic whiteware or glassware (casseroles etc.) of good thermal shock resistance for use in cooking is called ovenware*)].

**Figure III.83:** Final dictionary entry generated in the last stage of the method.

Figures III.83 and III.84 may be employed for comparing the illustrative entry presented in this section with entries, both in English and Spanish, from previous lexicographical works on the topic (all of them consulted and used, however, in this research), highlighting thus what is to be expected from an active bilingual dictionary like the one under development in this study in comparison with previous works of the sort.

<p><b>Oven.</b> Obsolete term for a kiln, more particularly the old type of BOTTLE-OVEN (q.v.).</p> <p><i>From: Murfin, D. (ed.) (1994): Dictionary of Ceramics Arthur Dodd, London. The Institute of Materials.</i></p>		
<p><b>FRITAR:</b> Someter al fritado a un esmalte, es decir, hacer una "frita" con él (<i>Ver</i>).</p> <p><b>EXFOLIACIÓN:</b> Carácter diagnóstico que permite identificar minerales, según el modo de romperse al golpe, ya sea en láminas (exfoliación basal), en cubos o romboedros, etc. Cuando la rotura es irregular (sin formas fijas), se la denomina "fractura" (<i>Ver</i>).</p> <p><i>From: Fernández Chiti, J. (ed.) (1985): Diccionario de cerámica. Tomo 2, Condorhuasi.</i></p>		
<b>English</b>	<b>Deutsch</b>	<b>Español</b>
Tunnel dryer	Tunneltrockner, Kanal-trockner	Secadero túnel
Tunnel kiln	Tunnelofen	Horno túnel
<p><i>From: Diccionario de azulejos cerámicos CEC (Deutsch-English-Español-Français-Italiano-Svenska).</i></p>		

**Figure III.84:** Entries from previous lexicographical works.

Finally, section VI.4 in the appendix offers the complete final results obtained in this research: 4,000<sup>78</sup> final entries of the prospective dictionary of industrial ceramics belonging to the English-Spanish version of letters A, B, N, O, V and U.

<sup>78</sup> From a prospective total of about 26,000.

*Todos los pozos profundos  
viven con lentitud sus experiencias:  
tienen que esperar largo tiempo  
hasta saber qué fue lo que cayó en su profundidad.*

**Friedrich Nietzsche**

## **IV. CONCLUSION**

### **1. CONCLUDING REMARKS**

It is commonplace and necessary in any kind of research to “end up” by offering a series of concluding remarks which summarise ideas and account for the accomplishment of the objectives established at the outset. However, at times it may be difficult to write these closing lines, especially if you feel that the work done has been only a drop in the ocean, that you have only just started out along the path because in the years devoted to this study many lines of research that opened up in front of you and that could have enriched your work have had to be left, to a certain extent, to one side. These things are not forgotten but put in safekeeping for their future development since, as I understand it, this thesis, like any other, is only the point of departure for further research on an interesting and profitable field.

However, some boundaries are always necessary in any kind of work. A beginning and an end are necessary, even though this end remains open for further research to again take up issues that could not be paid the attention they deserved. Throughout this doctoral thesis, I have focused on the development of a corpus-based bilingual (English-Spanish, Spanish-English) dictionary, with the Communicative Theory of Terminology as its base. This study is, at the same time, included within a wider project being undertaken by the IULMA that is aimed at characterising the most relevant industrial sectors of the Valencian Region from a terminological point of view. Hence, a representative number of terms have been presented to illustrate the final results that have been obtained up to the moment, and which reflect the kind of lexicographical work that is expected at the end of the whole process of elaboration. In this regard, many aspects have been considered, both from a theoretical and practical

point of view, in order to achieve a coherent, systematic and logical approach to specialised lexicography and, more particularly, to the specific dictionary of the ceramic tile industry. Among other aspects, this doctoral dissertation has tried to highlight the fact that terminology is of key importance for specialised languages (even though its terminology is not the only feature identifying specialised languages or PAL) and that specialisation in language and linguistic disciplines are not “watertight compartments” within language but, instead, aspects forming a continuum. In the same way, right from the very beginning the work has stressed the need to approach terminology from a communicative, not artificial, dimension which conceives it as an interdisciplinary field of work stemming from the pure necessity of professionals working in specialised domains. Likewise, it has also underlined the multifaceted nature of terms. Accordingly, the corpus has enabled us to observe and analyse the discourse in which ceramics terminology is naturally given and the use of, consequently, real texts has allowed us to retrieve not only single terms but also phraseological units that characterise the terminology used in the field and, thus, deserve a dictionary entry. Hence, the specialised lexicographical approach adopted (which goes beyond terminography) and the observance of the principles of the CTT have made it possible to develop a significant part of a user-friendly, active, bilingual specialised dictionary on ceramics industry. This theory was chosen because of the sound, realistic conception of terminology it presents, which has made it widely accepted nowadays. This realistic conception takes the text as the natural starting point for the analysis of terminological units in real use. This view fitted and made it necessary to use a corpus-based approach and to describe not only monolexical terminological units but also other polylexical specialised units which explain the phraseological character of specialised terminology.

In the following paragraphs, I have dealt with the main conclusions that can be extracted from the whole study in more depth and I have presented them according to the different aspects analysed in the research in the form of chapters.

**Chapter I.2 “professional and academic language (PAL)/specialised languages”** examined the constant interchange between common and specialised language, their characterisation as differentiated phenomena or a continuum (depending on the

author), and the stated need for conscious mediation between them. In this regard, then, the main conclusions reached in this chapter were:

1. The only way to facilitate effective communication between experts and the layman and between experts from different areas is to make efforts from a linguistic point of view to achieve it by identifying, analysing and solving the linguistic questions and needs posed, especially from a terminological perspective.
2. There is no universal agreement regarding the way of conceiving the general and the specialised in language but, after having analysed the way different authors approach the topic, the viewpoint adopted has been to consider that between the specialised and the non-specialised there is a continuum and so the difference between general and specialised is only a matter of degree. Thus, there is a set of rules and units (which may be phonological, morphological, lexical, semantic and discursive) that are common and necessary for every speaker of a language no matter what communicative situation they are in. This group of rules, units and restrictions that form part of the knowledge of the majority of the speakers of a language constitutes the so-called common or general language. The units of this common language are used in situations that can be described as “unmarked”, as opposed to “marked” situations (which may be marked to a greater or lesser extent) in which specialised languages are necessary. This is so because specialised languages are used to refer to a group of subcodes, which partially coincide with the subcode of general or common language and are characterised by a series of peculiarities that make them “special”. These peculiarities are specific to each specialised language and refer to the topic, the communicative situation, the kind of interlocutor, the speaker’s intention and the medium in which the communicative interchange takes place, for example. Consequently, specialised languages make use of part of this assumed general language but also draw on special technical terms and, in some cases, register-specific structures. Therefore, no clear-cut division can be made between the general and the specialised, which leads us to the continuum view as being the most realistic one.

3. It has been analysed how, within the continuum, specialised languages are functional varieties of general language that are differentiated from it by a group of characteristics that are activated when a series of specific communicative circumstances converge. Such conditions include: the topic is specialised, the speakers are specialists (a subgroup of a community of speakers defined by their profession or by the knowledge acquired after a learning process), the situation is formal and professional, attempts are being made to transmit some information from a discursive point of view, and so forth. Thus, it is more accurate and convenient to talk about specialised discourse. However, the term *language* has traditionally been used even when it would be more accurate to use *discourse*, that is, even when dealing with a linguistic situation developed in a context with a given communicative goal.
  
4. The notion of “specialised” in a text involves not only a lexical consideration and, in spite of being its paradigmatic aspect, other pragmatic, functional, thematic, textual-linguistic and cognitive criteria must also be present. The reason for this is that, even though specialised languages are born within natural common language, they differ from it in that their ultimate goal is to solve specific communicative needs, both from the formal and functional point of view, that arise in the professional world of the different scientific and technical fields. Accordingly, the term “specialised language” refers to the kind of language used by specialists and professionals in order to transmit information and negotiate the terms, concepts and knowledge of a given field of knowledge.
  
5. The denomination PAL (understood as an umbrella term covering the different specialised languages that arise in the academic world and during the practice of the corresponding professions) has been preferred to that of LSP since any use of language is always specific because it is targeted towards accomplishing a given goal. As a result, throughout this work the term “specialised language” has been the denomination adopted in order to refer to a single specific specialised language – in this case, that of industrial ceramics – whereas PAL

has been the preferred denomination for referring to specialised languages as a whole.

6. Terminological units can be considered as the communication units of specialised discourse and PAL, since they are the units that best concentrate specialised knowledge and the only ones capable of correctly representing and transferring the concepts (the content) of a speciality. They are created to satisfy the need to refer to and hence name things properly and accurately. From a semantic and conceptual point of view, terms guarantee the precision necessary in every specialised communication and also the interchange of knowledge among the members of a professional community.
  
7. In order to gain a correct understanding of the cognitive structure of a specialised language or the functioning of its terminology, the isolated artificial study of terms is not enough. The conceptual relations existing between the terminological units are therefore fundamental to be able to realistically account for a phenomenon like PAL and the terminology of specialised languages in general. The combinatorial syntactic aspect of terminological units is a reality that cannot be ignored, no matter what field we are dealing with.

All the factors underlined in previous paragraphs regarding the true nature of specialised languages and their conception inevitably lead to the implementation of an approach that allows PAL to be studied from a realistic, coherent point of view. In this light, corpus linguistics emerges as the best option to be considered, and the most relevant conclusions that can be drawn from **chapter I.3 “corpus linguistics”** in this respect can be summarised as follows:

1. The rejection/corroborations of hypotheses for explaining certain aspects of reality, including any linguistic phenomenon, must be strongly based on the data that this very same reality offers. Accordingly, linguistics in general needs elements of true reference as much as natural sciences do in order to analyse real language use and therefore real behaviour in context. Specialised languages are no exception in this respect and also need a “tool” that makes it possible to

identify and characterise the terms that form part of and shape a given speciality field. It is in this light that the use of corpora becomes fundamental for observing the communicative dimension of use (pragmatic aspects and real contexts) of terminology and thus the real nature of PAL.

2. One of the greatest potentials of corpora is that they offer naturalistic data for analysis, that is, unmonitored data that are the product of real social interactions which are always given in context. A corpus (with the help of concordance software programs) allows terminological units to be identified but it can also be used to detect their frequencies of use, their collocates and thus the collocations they form, as well as the strength of the bond between these collocates and, in sum, the way in which these (specialised) linguistic units group together in order to form phraseological units which deserve the terminographer's attention. For "specialised dictionary makers", this approach also allows the researcher to examine the linguistic and non-linguistic associations a given word may have.
  
3. Although the discipline of corpus linguistics as such is rather recent, it has had its opponents since it began. The most important of these detractors was Chomsky, for whom a corpus could never be a useful tool for the linguist since language must seek to model language competence rather than performance. For this author, because a corpus is performance it is therefore a poor guide on which to model linguistic competence. He also claimed that the number of sentences in a language is potentially infinite because of the number of combinatorial choices that can be made when producing a sentence. Accordingly, for Chomsky, if the number of statements of a language is non-finite, then the existence of a finite data repertoire that is adequate for explaining all the mechanisms of linguistic production was not possible. He elaborated on the fact that the object of study of linguistic research is the "underlying mental reality" and thus observation must not be considered, thereby invalidating the usefulness of corpora as sources of true data in linguistic investigation.

4. In spite of Chomsky's efforts to invalidate the action and value of corpus linguistics as a reliable source for extracting linguistic evidence and making linguistic enquiries, from the point of view of scientific method, a corpus has proved to be a powerful methodology since it is open to objective verification of results and allows language to be studied in actual, proven, authentic instances of use produced by specialists, in opposition to intuitive, invented, isolated sentences.
  
5. Using (good quality) samples of the actual language employed by specialists in naturally occurring texts is also important, in general, for identifying the kind of linguistic-terminological needs the prospective users of the specialised dictionary may have. Once these needs are known, they can be used as the basis on which to select the terms to be analysed and included in terminographical works and to make decisions on how they are to be presented. In the specific case of this thesis, this has also been associated with the aim of creating an active dictionary intended at providing the user with all the information necessary to successfully cope in real-world specialised communication, with a special emphasis on those aspects that are more directly related with real users' demands (which are reflected in the corpus).
  
6. Corpora allow the complete meaning of a word to be analysed by examining large numbers of language instances collected from varied sources, which also emphasises the view that every study of meaning needs to set out from a complete context.
  
7. Most of the flaws that corpus linguistics had in its beginnings were dismissed when computer technology spurred its revival and offered new, reliable possibilities. The wider availability of institutional and private computing facilities resulted in computerised/electronic corpora that allowed corpora to increase their size exponentially. Hence, the possibility of storing and analysing huge amounts of data and complex patterns of language use, as well as the possibility of retrieving all the examples of a given word in just a second or examining thousands or millions of words easily, quickly and accurately are

capabilities that must be taken advantage of. Apart from all the aforementioned factors, the use of modern corpora has also enhanced the conception and management of terminological work by using computer science to make the most repetitive tasks much easier, quicker and even more accurate and reliable, since human “weaknesses” like changing one’s mind or getting tired are ruled out. The advancement and rapid evolution of computer science have given rise to powerful computer aids and software applications that are capable of carrying out work with no errors and processing large corpora almost instantly.

8. The “marriage of machine and corpus” means that, today, the term *corpus* is nearly a synonym for the terms “electronic corpus” or “computer-readable corpus”. Electronic corpora have proved to be essential nowadays in order to shed light on the corroboration/dismissal of linguistic hypotheses, to know the different meanings that words acquire depending on the context in which they appear, and to develop technologies for processing natural language. These technological advances in the field of corpora analysis allow data to be exploited effectively; at the same time, meaningful results can also be obtained by performing difficult calculations and the data be displayed in different forms that can be adapted to the user’s needs, according to different parameters or filters. Data may therefore be arranged, for instance, alphabetically or on a frequency basis.
  
9. The benefits a corpus presents are always determined by the quality of the documents it is made up of, which is determined by a series of criteria to be observed while the corpus is being designed and compiled. The importance of designing a good corpus is fundamental if we consider the fact that it is to constitute a smaller but representative sample of the linguistic phenomenon or language under study. A corpus must be varied in its composition so that no conclusions are wrongly based on just a few speakers’ idiosyncrasies. Hence, taking into account and measuring the representativeness of the linguistic samples compiled for the corpus is the only way to obtain a linguistic tool that realistically describes a linguistic variety or a language.

10. Apart from the advantages mentioned above, this thesis has tried to show the benefits resulting from ease of access to corpora, that is to say, current technological advancements in the field of terminotics for the exploitation of corpora make it easy and fast to access, manage and analyse the data contained in a corpus, thanks to the development and use of concordance programs. This ability to call up and retrieve word combinations (and not just single individual words) and to carry out frequency and statistical analyses of different kinds makes it possible to treat and analyse phrases and collocations more systematically and from different aspects of the terminological reality. Sampling is another positive aspect of working with corpora since a corpus is compiled bearing representativeness in mind as a major goal for ensuring that any findings extracted from it can be generalised to the larger population.

In the light of the conclusions presented so far, the following paragraphs gather the most relevant concluding remarks reached with regard to the importance **of terminology as a key element in the study of specialised languages (chapter I.4)**. These conclusions attempt to summarise the fundamental relationship that exists between PAL and terminology, as well as the relevance of the role played by corpus linguistics as an instrument for its analysis and characterisation. Terminology is the most prototypical (although not the only) “feature” of specialised language/discourse, which originates in the real world due to the real communication needs of experts in different technical fields. As such, it is advisable and realistic to approach it from a corpus-based approach.

Furthermore, this work has underlined the need to approach terminology from a coherent, well-sustained theoretical conception. It is important to define the way terminology is conceived since this determines the way it can be analysed as well as the way terminologies can be presented in terminographical (specialised lexicographical) works. Throughout this doctoral thesis the Communicative Theory of Terminology has played the aforementioned “satellite role” over the rest of the theoretical aspects addressed, and has thus shaped the whole research and influenced every single approach that was chosen. Therefore, the conclusions that can be drawn regarding the conception of terminology and the theory of terminology adopted may be summarised as follows:

1. This research considers that terminology arises from practice and from the explicit necessity of specialists to order the denominations of their conceptual systems. Professional communication and effective knowledge transmission are fundamental for scientists and technicians and can only be guaranteed by normalising their disciplines both from a conceptual and denominative perspective. Accordingly, from a strictly terminological point of view, terms should be approached as elements from natural language to be found in specialised texts produced by experts/specialists in the field.
2. This chapter has described how no universal agreement has been reached about the way of conceiving terminology or a theory of terms, and has illustrated this by tracing back its evolution. The first meaningful look at the topic was provided by Wüster with his General Theory of Terminology, the principles of which, however, do not take into account the communicative and pragmatic aspects inherent to the lexicon of different specialised languages. The GTT is grounded on the view that concepts exist independently of the term that designates them, that the nature of terms is bi-univocal (there is a single form for each concept and a concept for each form), and that terms are independent of context. Therefore, because of its lack of interest in any pragmatic and communicative aspect of terms, the GTT has been considered a reductionist theory which reduces the terminological unit to its denominative condition. The GTT assumes a uniformity in communication which reality shows is not so and it ignores the communicative dimension every interaction has, whether it is specialised or not. The goals attributed to the GTT are limited to ensuring the univocity of professional communication, something which contradicts the complexity and the intrinsic interdisciplinary character of speciality areas and the wide range of socio-professional necessities that require suitable terminological activity, as was proved through the needs analysis carried out for this research. Most of the criticism that the GTT has received over the years basically refers to its unrealistic idealisation of reality, knowledge and communication, as well as its limited scope, which is reduced to standardisation. The Classical Theory is grounded on the principles of univocity and monosemy and advocates a method of work with a prescriptive

basis as being valid for every kind of investigation – no matter what the topic or subject of the work may be. This thesis has tried to show that this way of approaching reality does not fit the reality of specialised communication.

3. The belief that the GTT could not accurately and completely account for the complex nature of terminology and the terminological object gave rise to the appearance of a new theory that displayed a more “sensitive” approach to terminology and its implications, namely, the Communicative Theory of Terminology (Cabré, 1999 b). This theory is the one adopted for this research because it rests firmly on the corroboration of its principles by contrasting them with empirical data that allow them to be maintained, qualified or revoked. It is also in this light that the use of corpora takes on its meaning.
  
4. There are a series of basic principles which account for the way the CTT conceives terminology, namely, the principle of the multifaceted nature of terms; the principle of the communicative character of terminology (every terminological unit pursues, in either an immediate or a remote way, a communicative goal); the principle of variation; the condition of natural language (terminologies are given within a specific area of knowledge where its object is defined); and the specialisation condition. The intention of this thesis has been to show how all these principles are necessary in order to understand the true nature of terminology.
  
5. The essentially *representational* terminology defended by the GTT can (although not necessarily *must*) be artificial and arbitrary and can control variation, thus preserving the principles of univocity and monosemy it defends. However, the essentially *communicational* natural terminology, like that defended by the CTT and targeted in this research, must be real, show actual usage and, accordingly, present variation. This fact determines the dichotomy between representational and communicational terminology, that is, between “*in vitro*” knowledge and “*in vivo*” knowledge, the latter being the one adopted here. If terms are analysed *in vitro*, they are studied from outside their natural context and in an isolated way, whereas if they are analysed *in vivo*, they are

characterised from the natural habitat in which they are given in specialised communication/discourse (the text being the point of departure). Accordingly, the fundamental pillar upholding the CTT is the specialised text and its observation, leading to the *in vivo* analysis of terms that this thesis defends as the most consistent and advisable way of addressing the matter.

6. In accordance with the CTT, this thesis has emphasised the understanding of terminological production from a descriptive point of view, since specialised lexical units are real linguistic items and not ideal homogeneous entities that are free of any kind of conceptual ambiguity. However, this more modern conception of terminology does not imply the complete rejection of terminological standardisation, but rather its understanding as a way of intervention whose adoption will be regarded as positive or not dependent on each situation and on each communicative context.
  
7. The CTT explains the interdisciplinarity of terminology. Thus, it conceives terminological units as multifaceted units made up of the three disciplinary aspects that describe them, namely, linguistic, cognitive and pragmatic, and as such these units have been presented in the entries. The essentially communicational terminology defended by this theory highlights the multifaceted linguistic-cognitive-social character of all the units of language, including terminological ones. Accordingly, in this research, terminology (understood as the group of terms from a speciality) has been approached as a group of denominative-conceptual units from natural language which represent specialised knowledge within a precise subject area and which, therefore, act as a vehicle conveying natural professional communication. Terminology has been understood as an interdisciplinary and multi-entry field of knowledge in which terms cannot be explained in an autonomous way that ignores other denominative signs with which they share the “space” of specialised communication. Neither can it be accounted for independently from them or isolated from the rest of the signs of natural language made up of a form and a meaning.

8. In accordance with the previous item, every object of study is interdisciplinary *per se* and as such it can be tackled or approached from different subject matters. This has given rise to the “Theory of Doors” (*La Teoría de las Puertas*), a theory which allows terms to be treated in a multidimensional manner and, according to which, a term is a unit made up of three different aspects: a semiotic-linguistic aspect, a cognitive aspect and a communicative aspect.
9. The CTT has originated new and more appropriate ways of carrying out the terminographical task since it assumes linguistic diversification, which depends on various factors such as the kind of situation, the level of specialisation of texts, the addresser, the degree of formality, the final goal of the discourse and the topic, among others.
10. The CTT designates the specialised text as the base unit for the analysis of specialised lexical units so that terminological research takes on a textual dimension that allows the terminologist to observe terms in context. At the same time this leads to the adoption of a phraseological dimension. Due to this, the results presented in this research do not only show single terms but also polylexical specialised units that work as complete wholes within the specialised text.
11. Terminology has been approached as having two main objectives: to formally, semantically and functionally describe the lexical units that may acquire a terminological value and thus become terminological units, and to account for the way in which this terminological value is activated.
12. Regarding the “distinction” between term and word, the CTT supports the hypothesis that the lexical unit is not a term or a word *per se* but a lexical form that, according to the communicative situation in which it is given, activates a specialised value or not. Thus, the selective activation of information, either through formally specialised units (units used exclusively in specialised contexts although with a potential general value) or through units that are

specialised in meaning (lexical units used with a specific sense in specialised contexts and with an open sense in non-specialised ones), is determined by the features and the discursive-communicative situations in which lexical units occur within specialised discourse. Likewise, the lexical competence of a speaker is not made up of words or terms but of lexical units and semantic traits that may activate (or not) specialised values according to the contexts in which they are found. The lexical unit is therefore an abstract unit which is not *per se* a word or a term and which goes beyond them because it is a form associated to a great amount of (more abstract) semantic information and because it gathers, under a single notion, both the values that constitute a non-specialised use (potential words) and those which constitute a specialised use (term).

13. According to the aforementioned conception of the terminological unit, terms do not differ much from words from a formal and semantic point of view, but the differences between the two become more apparent whenever pragmatic and/or communicative criteria are adopted. Consequently, terminology, in contrast to common lexicon, is used to designate the concepts belonging to specialised disciplines and activities; terms are seen as units of a lexical system forming part of the wider general grammatical system, which includes the common/general lexicon and the diverse specialised lexicons.
14. Terms, like any other significant unit of a linguistic system, belong to natural language and form part of a structured system in which they occupy a particular level (the level of lexical units). Thus, on the one hand, they relate to the rest of the units on the same level and, on the other hand, to the units on the rest of the levels, together shaping and participating in the construction of discourse. Hence, the way terms relate with both the lexicon in general and the rest of the grammatical components does not make it possible to observe any specificity that makes them systematically different from the relationships that, at the same time, words maintain with their grammatical environment. However, within the lexical component of language, it has also been observed and acknowledged that terms relate more and more closely with the other terms from the same discipline (with which they constitute specific structured subsystems) than with

terms from other thematic areas. Consequently, from a functional perspective, terms are units that occur in a very specific or determined linguistic environment and which, most frequently, appear in combination with other specific lexical units or terms within discourse, thus giving rise to phraseology.

15. It has been repeatedly noted that the terminological character of a unit is a pragmatic value that is conferred or activated by the discursive conditions in which it is given. In other words, this specific value activation depends on its use in a given, specific expressive and situational context. Consequently, a lexical unit is made up of a group of semantic parameters, some of which will be activated while others are not, depending on the use made of them in a specific domain. However, the word-term distinction is sustained on a more traditional conception which also deserves some consideration. Given the fact that any discipline is distinguished from others by the specificity of its object of study, in order to be considered a discipline, terminology needed to distinguish its object from that of linguistics and drew a distinction between “term” and “word”. This traditional (and rather abrupt) distinction, not adopted in this research, has also been the reason why the denomination “field of work” has been used throughout this study rather than “discipline”.
  
16. Even though any unit with a reference has the potential of being either a term or a word, it is also possible that some highly specialised units in very specific subjects are only given as terms, since they are always used to denominate special concepts. This would be technical vocabulary in the strictest sense, in opposition to the more sub-technical one, which may be found in less specialised contexts or even in contexts showing no specialisation at all (let us think about the words *water*, *oven* or *adhere*, for instance, and even polylexical formations like *orange peel*). Despite this, purely technical vocabulary may eventually become part of the general language due to the spread of specialised knowledge.
  
17. In the light of the previous item, this thesis has tried to show that terminology is an interdisciplinary field of work which is best described by a linguistic theory,

like the CTT, which includes linguistic aspects as well as cognitive and pragmatic ones. The CTT also provides an explanation for the fact that a term may be used in the field of a speciality area and transferred from one speciality to another or from the general language to a specialised language. This theory therefore accounts for the possibility of specialised units' losing that specialised character in a given moment, as well as the possibility of the continuous "terminologising" of units from the general language or the constant and observed entry of terms from one speciality field to another ("pluri-terminologising").

18. On analysing terms *in vivo* (that is, as they appear in different communicative situations and, therefore, subject to change), close observation of specialised knowledge in specialised texts shows that these specialised lexical units or terminological units may occur at different levels of specialisation and can be described at different levels of representation. This is the only way to account for the whole reality of these units, both from a communicative and representational point of view.
19. In accordance with the CTT and with the reality shown by the results obtained, the existence of synonymy as a real phenomenon within natural specialised communication seems to have been confirmed.

To sum up, terminology has experienced a necessary evolution with the CTT, in which the former privileged position of the conceptual schemata in the scientific-technological fields defended by the GTT has given way to the pre-eminent role of observing specialised lexical units in real specialised texts. Therefore, terminology has been conceived throughout this research as a "theory of terms" (understood as units of the lexicon) and not as a "theory of concepts".

At this point I am going to summarise how **specialised lexicography (terminography)** (see section I.5) may be understood as the applied aspect of terminology and that responsible for elaborating specialised dictionaries like the one under development here. Thus, a series of reflections on terminology-related

disciplines and the adequacy of their theoretical conceptions for this work have been presented and the overall conclusions that can be drawn are the following:

1. In general, it has been assumed that the word *terminology* designates at least three different concepts: when referring to the discipline, it is the conceptual basis and the group of principles governing the study of the terms; regarding methodology, it refers to the guidelines used during terminographical work; and, finally, it is used to designate the group of terms in a given speciality area.
2. When the question of whether terminology is linguistics has been posed, this work has assumed that whereas linguistics is in charge of the study of a grammatical and/or social system consisting of components on different levels (phonology, morphology, lexicon, syntax and discourse) and known as language, terminology only deals with one of these component aspects of language – the lexical one. Hence, terms/terminology, as an integrating part of this lexical component, form part of language and can thus be studied by linguistics, and more specifically by lexicology and terminology.
3. Terminology is language (it deals with one of the aspects/perspectives of linguistics: the lexicon, and more specifically specialised lexicon) but, as an intersection discipline, it can be considered from different perspectives. From the linguistic perspective, terminology is a part of the lexicon which becomes specialised due to thematic and pragmatic criteria; from the users' perspective, terminology is a group of communication units to be used and evaluated in terms of economy, precision and accuracy criteria; and from the perspective of the scientific-technical disciplines, terminology is the formal reflection of their conceptual organisation and an unavoidable means of expression and communication within discourse communities.
4. According to the CTT, terms are not isolated units forming an individual, perfectly delimited system but units that are incorporated into the speakers' lexicon as soon as they acquire the role of specialists (after a process of learning specialised knowledge). This is also the main reason behind the need

to use real texts produced by specialists (as the only true knowers of terms) to analyse terminology.

5. Terminology has been approached as an interdisciplinary field of work, since it is determined by the characteristics of the terminological units that are at the same time language units (linguistics), cognition elements (cognitive science) and communication “vehicles” (communication theory). In addition to this, these specialised lexical units appear in specialised communication (documentation) and are usually treated by a computer in the terminographical activity (computer science).
6. Throughout this research it has been stressed that terminological theory must develop in close relation to practice with the ultimate goal of solving actual communicative linguistic problems, as the CTT postulates. However, terminology is not just a practical activity that can be justified in itself, but must be considered within a wider scope in which it acquires its full significance. In this wider view, terminology is understood as a subject concerned with the compilation, description, management and presentation of the terms that belong to speciality fields and as such it has to establish as a priority the solving of social needs by optimising and guaranteeing effective communication between specialists and professionals. As an activity closely linked to real, socio-communicative needs and which reflects the state of the art in the different speciality fields, terminology is and must be constantly developing parallel to the evolution of science and technology, since knowledge cannot develop independently from language and hence from the lexical units used to refer to new concepts.
7. In order to refer to the practical aspect of terminology dealing with the elaboration of dictionaries, vocabularies, glossaries, databases and any other kind of terminological application in a given specialised field, the term “terminography” has traditionally been used. It has also been noted how “terminology” and “terminography” have often been utilised without distinction, and how even more frequently the word “terminology” has been

assumed to entail or include both a theoretical (terminology) and practical/applied (terminography) dimension (apart from being the actual group of terms forming part of a speciality field). Therefore, at times *terminology* is used when referring exclusively to terminography simply because it may be understood as an integral part of it (in its widest sense). However, throughout this study (and even though I consider the term “terminographical work” to be perfectly valid in order to describe this study) a different nomenclature has been adopted because it is considered to be preferable and more coherent with the theoretical approaches adopted and hence more accurate to define the kind of work developed, i.e. specialised lexicography. From a linguistic perspective, and to be coherent with the way terminology has been approached, it can be stated that the terminographical work presented here is more appropriately included within specialised lexicology or a lexicology of specialised units.

8. There are many different kinds of prospective or potential users of terminographical/specialised lexicographical products and the same occurs with the professional profile of the terminographer. Nevertheless, the question of whether the method used in terminography is always the same presents multiple shades of meaning and has also been addressed in this study. It has been stated that two different answers or options can be provided, each with its corresponding methodological implications: if specialists in the field (who are familiar with the conceptual scheme of the domain in which they work on a daily basis) are the ones in charge of the terminographical work, it has to be assumed that they know the concepts of their speciality beforehand. This allows them to take concepts as their starting point in order to later look for the linguistic forms representing them, using what has been called an onomasiological method of work (i.e. going from the concept to the form). However, the terminographer may not be a specialist in a scientific-technical area but a linguist who must progressively acquire the knowledge related to the speciality field being dealt with. In this case the terminographer will have to document himself/herself in order to acquire the necessary cognitive competence, and this documentation (in the form of texts) will become the source for the subsequent extraction of the terms that are to be included in the

actual terminographical work. Accordingly, the method of work used here has started out from the linguistic forms and the target has been to discover their corresponding concepts; this has been called a semasiological method of work, going from the form to the concept. In this light, traditionally, if the clear-cut distinction between lexicology and terminology and thus between lexicography and terminography were accepted, then the onomasiological method of work would be the one assigned to terminography and the semasiological method would be the one attributed to lexicography. However, in this study and following the current conceptions of terminology, this distinction between the lexicographical and terminographical methods of work has not been of much use for two fundamental reasons. The first reason is that here I have adopted a view of language as being a continuum. The other reason is that terminology is a part of linguistics that deals with the lexicon, in the same way as lexicology does, but it does so more specifically, with the lexical units that become specialised in context. This is so because in the descriptive works aimed at the compilation of lexical units, whether they are specialised or not, the method of work normally used nowadays is also semasiological: the departure point is the identification of the terms in the texts in which they are used (this is usually done by means of a corpus). The onomasiological method is only used in those specialised terminographical works carried out by real specialists in the field. Therefore, due to all the reasons mentioned above, this research has adopted a semasiological method. I was not an expert in the field when the project commenced and so a corpus was compiled for the extraction of terms. Terms were thus identified from the texts in which real experts use them (the corpus) and this natural use was employed to characterise and define them in the entries by means of contexts of use, collocates, definitions, etc. As a result, in general, semasiology is the most common and probably the most reliable process for decoding information (because of its empirical basis provided by the corpus): the user selects a term (denomination) and afterwards pays attention to the information associated to it (definition, contexts of use, notes, etc.).

9. In this doctoral thesis, the view according to which terminology is prescriptive whereas lexicography is descriptive has not been adopted either because it was

considered to be an excessively sharp division between disciplines or fields of work. It was also deemed to place terminography too close to the classical prescriptive model adopted by the GTT. It is here again that the term “specialised lexicography” rather than “terminography” also seemed to be more appropriate for a work like this.

10. Specialised lexicography as such can thus be understood as the branch of lexicography which is practised by PAL lexicographers responsible for preparing and developing specialised dictionaries. Terminology can then be more associated with the mere study of terms, which may be complemented by the wider projection of specialised lexicography for the compilation and elaboration of specialised, user-oriented and user-friendly quality products in the form of dictionaries. Consequently, terminography has been understood as that part of terminology concerned with the production of terminological dictionaries in their most basic, purely linguistic sense (and thus this way of naming the word presented here is not incorrect either). But again, specialised lexicography has been considered as a more accurate label because of the theoretical approaches adopted and the active, user-friendly feature that I have sought to emphasise in the ceramics industry dictionary. Thus, specialised lexicography goes beyond pure terminography even when most linguists would identify it with terminography.
11. Throughout this research, as a specialised lexicographical work, attention has been drawn several times to the importance of phraseology and collocations, understood as the natural tendency of words to group together in a meaningful way. Thus, the study of collocations has been taken very much into account for the elaboration of the different entries. The identification of collocational patterns indicates semantic relationships among terms, which is always important for achieving natural, accurate and effective communication among experts. “Sounding natural” may not sound very scientific, but it is a real need which can only be achieved by taking these factors into account.

Following a logical structure, the conclusions that can be drawn regarding **the specialised dictionary of the ceramics industry** (see section I.6), that is, specifically concerning the kind of specialised lexicographical work I have aimed to achieve in this study (4,000 entries of which have been presented here), could be summarised as follows:

1. In accordance with the principles of the CTT, it has been assumed that every terminological work has to be descriptive, at least initially. This option has been the preferred one because the terminological work has implied the compilation (through the corpus) of the terms used in the specialised community, that is, the linguistic and communicative reality found in the ceramics industry has been “described”. Descriptive work has been conceived as a preliminary task that must be carried out in every terminological undertaking and is necessary even for subsequent normalisation; only after such a description has been accomplished is it possible to reduce the possible variants to a single (preferred and recommended) one. In this sense, there is a growing tendency to recognise that the fixation of usage through prescription or standardisation always follows established, observed and real usage and never precedes it.
2. In accordance with the previous point, most of the dictionaries that are published today (whether specialised or not) have a descriptive character “merely” intended at describing and reproducing linguistic use in a way that makes the prospective user of the dictionary aware of the kind of linguistic units that discourse communities use in real communication. In spite of this, and this is a purely personal conclusion, descriptive works may, depending on their scope and dissemination, exert an indirect fixing or normalising influence upon language and its use simply because of the fact they are dictionaries.
3. Traditionally, monolingual dictionaries for foreign-language learners have been regarded as unquestioningly better than bilingual ones (Thompson, 1987), in spite of the fact that it is easy to show that, compared with monolingual dictionaries, bilingual ones have more advantages from the translator's point of

view (Kromann, Riiber and Rosbach, 1991). Monolingual dictionaries are advisable in many contexts and for many needs, but if a detailed needs study is performed, bilingual dictionaries may turn out to be more convenient in certain contexts for a series of reasons. Typically, in a monolingual dictionary the user does not have direct access to equivalents – it provides explanations of the unfamiliar terms in a foreign language and includes irrelevant etymological information, superfluous lexical definitions and encyclopaedic information, among other aspects (Kromann, Riiber and Rosbach, 1991). Hence, the dictionary on ceramic terminology has been created from a user-friendly perspective that considers the prospective user and his/her needs to be the key element on which decisions regarding dictionary content and design are adopted. Furthermore, these prospective users are, in this case, specialists and translators. As a result, it seems at least logical and convenient to produce a bilingual work capable of covering the needs posed by an industry that is spread all over the world and works increasingly more often in international markets.

4. Current specialised dictionaries like the one under development in this study are reflecting a considerable degree of progress regarding the information provided on patterns of use and collocational behaviour or phraseology. The aim of including this data is, as this thesis has tried to convey, to foster the active use of language, to help to construct specialised discourse in an appropriate manner, and to sound natural. In this way, acknowledging the need to study the phraseological component in ceramics terminology has made it necessary to set out from professional and academic discourse in order to extract the required phraseological data from the analysis of contexts.
5. Specialised lexicography is based on the development of bilingual user-friendly technical dictionaries like the one presented here. Nowadays, as Nida (1997) has detected, the latest trend in lexicographical undertakings is to pay more attention to context, a view that coincides completely with the principles of the CTT and which I have attempted to reflect in the entries in the dictionary. Throughout the history of terminology, terminographers and linguists have

constantly reviewed specialised dictionaries. However, it was not until pragmatists and specialised lexicographers made their contributions that anyone noticed that there was a lack of entries dealing with categories other than nouns and a lack of contexts that helped to illustrate the use of terms. In consequence, as the prospective specialised dictionary on ceramics industry shows in the form of individual entries and as Nida (1997) puts it, there is now a tendency to pay more attention to words in phrases than to words by themselves. Accordingly, the terminological perspective defined by Cabré (1999) in the CTT emphasises the need to provide the field of terminology with materials that satisfy the communicative demands that arise in speciality areas as a result of studying terms *in vivo*.

6. An active dictionary like the one intended in this study goes beyond other dictionaries of the sort in many senses, for instance, by giving the context the importance due to it in order to determine meanings and by paying greater attention to the word inside the sentence, and not as an isolated element. Active dictionaries show far more complementary contextual information in accordance with the pragmatic principles by offering grammatical and technical information, possible collocations and examples both in the source term and in the target language. In this respect, this study has been considered necessary in order to go a step forward in lexicographical and terminological work and to better meet and solve the current needs in the sector. Basically, from the linguistic point of view, it is necessary to renew the conception of speciality language dictionaries applied to the ceramic industry by introducing the benefits of an active dictionary that may become a source of information for professionals. This renewal is achieved here through the use of a corpus-based approach which fits within the pragmatic emphasis on context that the lexicographical concept of active dictionary implies (Salerno, 1990).
7. As this thesis aims to show, PAL cannot be reduced to the technical terms that have traditionally formed part of specialised dictionaries. It is also necessary to incorporate phraseology that illustrates the use of terms in context because the terminological unit activates specific knowledge depending on the context in

which it is found. Hence, an active dictionary like the one presented here sets out from the premise that every term is always accompanied by certain words or terms more frequently than with others and this will determine the activation of certain traits and thus the activation of a particular knowledge rather than another.

From a **socio-economic point of view** (see section I.7), both regarding the benefits that a study like this may imply and the state of the art in the ceramic industrial district, the conclusions that can be drawn from this research are the following:

1. Globalisation is imposing a real need for communication and for interaction with other discourse communities in society and all around the world. As a result it has become necessary to have an adequate knowledge of the language that, in general terms, most frequently allows this global understanding to take place, i.e. English (Johnson and Bartlett, 1999; Alcaraz Varó, 2000). It could, however, be any other language which effectively acts as a vehicle to convey (specialised) communication among communities. Hence, due to the great number of advancements in the ceramic field that take place in Spain (as a leader country in the sector) and owing to the importance of the sector in the country, an ordered repertoire of ceramic terms should also be created in Spanish as has been done in English, because of its being a *lingua franca*.
2. The fact that this doctoral thesis is part of a project which in turn belongs to much wider macroproject that aims to elaborate different specialised lexicographical tools (dictionaries) for the main industrial sectors in the Valencian Region means that this work presents and is centred upon an immediate application and is anchored in a real-world need. Thus, one of the main grounding beliefs for undertaking a work like this was the real conviction that this study can be a good linguistic tool that is both necessary and beneficial for the economy of this area. Why? Because it can help to establish a neat, ordered and contextualised repertoire of English and Spanish terms showing actual, appropriate use which could provide firms with the capability to become

more competitive worldwide. Hence, this study has been conceived as a step forward in the field of dictionaries by constituting a linguistic tool designed to enhance the production of adequate specialised discourse and to “fight” against communicative pressures that professionals may find difficult to solve in their everyday life.

3. The ceramic tile industry is a district with a huge potential and importance worldwide and more especially within the Spanish area of the Valencian Region. Therefore, rather than dealing with an abstract phenomenon that cannot easily be accounted for, shaped or represented, this study has considered a phenomenon that shows a linguistic dimension and a real-world application and which must be dealt with and analysed as such. The need for a good knowledge of ceramics industry terminology, understood as the group of terms used for communication in this very specific domain, is a real fact that takes place in a real socio-economic context and for real people who have to use it on a daily basis while performing their professional activities.
4. The final active dictionary for which this bilingual corpus constitutes the basis is being designed with the intention of its becoming a useful and complete linguistic tool; and including the definition and the real contexts in which the terms are used ensures the reliability of the information. At the same time, other information of a linguistic, conceptual and pragmatic character, such as synonyms, significant variations imposed by the context of use, grammatical category, conceptual relationships, etc., is also included to help the user to employ these terms properly.

With respect to the **method of work** (see sections **I.6** and **II**), the main conclusion to be drawn is that, broadly speaking, it has proved to be effective and adequate for the kind of specialised lexicographical work I have intended to carry out here. The method has been useful and effective for the objectives established at the beginning of the thesis and has helped to accomplish the specific goals that were posed. From a more detailed point of view, the items below constitute a brief summary

regarding the effectiveness of the method of work adopted and its contributions to the study as a whole:

1. It has been observed that, if one intends to work with a corpus, there are two possibilities open to us: either we can work with one that has already been elaborated or a new one can be created. The second possibility allows us to design a corpus that better fits the objectives and necessities posed but, in both cases, the quality of the corpus will determine the results of the linguistic research. This has made it advisable, in the specific case of this study, to take into account a series of parameters that guarantee (at least up to a certain extent) the quality of the corpus and thus the quality of the results that can be extracted from it. Hence, it was crucial to determine the intended purpose of the research from the very beginning in order to try to construct a corpus that fitted these purposes. Thus, the appropriateness of the corpus was mainly determined by how well it represented the domain it characterises, which means that most of the statements obtained from the analysis of the corpus can be applicable to a larger sample or to the language as a whole. In addition to this, diversity and size were also considered when text selection and compilation were undertaken to ensure that enough text has been included in each category to cover the range of variation across speakers or authors. Thus, in the stage of corpus compilation, different text genres (specialised journals, articles, magazines, books, etc.) representing the professional field in question were included. However, it was also assumed throughout the study that it is impossible to create a completely representative corpus and that it is unfeasible to give an absolute guarantee of this representativeness, which cannot be subject to objective evaluation. In the same way, it had to be assumed that a corpus is a finite sample from an infinite population, and therefore new linguistic samples are always appearing and could be included.
2. It seems to have been proved that specialised texts are much denser from the point of view of lexical terms than texts from general language (Ahmad and Rogers, 2001). This implies that the texts compiled in the corpus used for the study presented (and, because of the goals aimed at, had to present) what is

called “terminological density”, that is, a high degree of technicality or words that transmit specialised knowledge. This terminological density, which at the same time gives clues about the adequacy and degree of specialisation of the corpus, was easily analysed using the concordance software program WST by means of ratios such as the TTR and the standardised TTR.

3. The value of the field diagram in corpus compilation can be seen by the fundamental role it played in achieving a balanced inclusion of the necessary number and kinds of documents comprising the different areas or subareas the domain is made up of, as determined by this diagrammatic representation. Furthermore, this field diagram was, on the one hand, a key element in carrying out the terminological extraction, that is, in selecting the terminological units to be included as dictionary entries and in establishing the first element of their definition, as is explained in more detail below. The *field diagram* was used as an ontological system that represents the different areas and subareas of the field graphically. That is to say, it consisted of a structured list in the form of a diagram inside which the different activities belonging to the sector under analysis were included and classified in such a way as to allow me to internalise a clear and meaningful system of the area to work with. On the other hand, regarding other more tangible benefits of this diagram, this system provided the first element of definition of the terminological units in the dictionary by means of abbreviations that indicate the semantic field the term belongs to so that the dictionary user can coherently place the term within the professional area/subarea to which it belongs right from the very beginning. The “bare skeleton” of the field offered by this diagrammatic representation of reality is in direct contact with this reality and can be filled with the terms extracted from the linguistic data of the corpus. The key aspect in a field diagram is that it is determined by the notion of *semantic field* (Auger and Rousseau, 1987), which represents a group of notions that can be grouped under the heading of a key notion. This was a useful tool for delimiting the field of the work, for coherently organising and presenting the information, and for placing the terms inside a structured group which will be a valuable aid when it comes to classifying and treating them.

4. With the aim of identifying the most frequent terms both in English and Spanish, a process of semi-automatic term extraction and data analysis was employed, in which both human and technological means were necessarily involved. Therefore, one of the main aims throughout this study has been to offer a methodological proposal based on a solid theoretical basis and grounded on a very particular conception of terminology sustained on the corpus as the means for obtaining a comprehensive terminological representation of the field under study.
5. In the semi-automatic term extraction process, collocational behaviour and the general relationships between words inside texts, that is, in context, were widely considered. The analysis of phraseology in this study was considered a fundamental part aimed at facilitating the acquisition of a good level of competence on the part of prospective users of the dictionary. The terminology of specialised languages is not correctly analysed by simply extracting the terms that form part of the specialised field (Scott, 1998) and this would have not been logical either within a study like this.
6. Apart from the (purely human) work done “by hand” that I have mentioned earlier, the use of a concordance software program like WordSmith Tools 4.0 benefited the whole work presented here by allowing close observation and analysis of corpus data as well as their retrieval. Nowadays, terminographical or specialised lexicographical works owe most of their development not only to advances from the point of view of the evolution of terminological theories, but also to the technological advances in the field which allow much quicker and more reliable analyses to be conducted. In addition to this, displaying the data in different formats, taking into account different parameters depending on the necessities of each terminographer or each stage of the work, contributed positively by allowing terminological units to be analysed according to different parameters (frequency, MI, etc.). This possibility is always enriching in order to gain a more complete view of the terminological unit as a whole, as well as within the wider dimension of the text in which it is found. In the same line and also within terminotics, the use of TermStar XV also benefited the

working method and the results obtained enormously by allowing the logical management of the ordered repertoire of terms, which would have been almost impossible to achieve otherwise. Likewise, without GENDIC, final entries could have never been generated in the desired format

To sum up, this thesis has tried to show a proposal aimed at the development of a specialised lexicographical tool and the results obtained from it seem to illustrate that the dictionaries developed following the theoretical approach and method of work adopted may well help to fulfil specific terminological necessities. In this case, the ceramics industry called for a renewal of the conception of specialised dictionaries on the topic, mainly because of the need to respond to the linguistic pressures stemming from the socio-economic demands of a globalised society and an international market. Establishing a systematised, structured, coherent and contextualised inventory of terms is a necessity in most industrial sectors, especially if the rapid development these fields undergo is taken into account. The relationship between socio-economic context and specialised lexicography is therefore reciprocal and mutually beneficial and leads to a highly applied conception of terminology.

Thus, according to the aforementioned concluding remarks and to the objectives posed at the beginning of the research, my final conclusions may be summarised as follows:

- This thesis has tried to analyse in depth the socio-economic context of use of the specialised lexicographical tool that was to be designed. A needs analysis was undertaken in an attempt to establish the **need to create a dictionary that satisfies the specific communicative demands of the ceramic industrial district** from a bilingual (English-Spanish, Spanish-English) point of view, as well as the features this work should offer the prospective user.
- The 4,000 terms presented as final results in this thesis seem to illustrate, on a smaller scale, what the final, user-friendly, active dictionary is aimed to be like, i.e. a specialised lexicographical tool in which **the terminological reality analysed is presented and reflected without artificial occurrences** and which fulfils the expectations and needs of prospective users. This active, user-

friendly perspective is what has mainly determined the use of the label “specialised lexicography” to define a work like this, but other reasons for considering it more appropriate than just the label “terminographical” have also been stated. These reasons include the conception of terminology and terminography (and lexicology and lexicography) as disciplines or fields of work with fuzzy boundaries which do not allow clear-cut, artificial distinctions to be made. Instead, language is conceived as a continuum and these disciplines are thus seen as forming part of linguistics. Following on from what has just been commented, rather than **understanding terms and words** as completely differentiated units belonging to different systems (terms and words are not *per se* and compulsorily so), they are seen **as lexical units which may or may not activate** (in the case of terminological units) **specialised traits, depending on the specific contexts in which they are given.**

- This study has attempted to show the importance of terminology, in general, for the study of Professional and Academic Language and more specifically for the correct characterisation of the different specialised languages from a discursive perspective. In the same way, this discursive perspective has led to the need to analyse terminology from discourse, that is, always starting out from real specialised texts in which terminological units are used naturally by experts. At the same time, **this way of conceiving specialised languages (together with the theory of terminology adopted) has made it necessary to use a corpus for the extraction and observation of these real, natural terminological data.**
- The study seems to have justified the choice of the CTT as the most suitable and closest-to-reality way of approaching terminology because of all the factors mentioned so far in previous items, which could be summarised in the discursive, communicative dimension of terminology and in the need to always analyse terms in real contexts from real texts. **This research has defended the benefits and convenience of using the CTT in a study like this by analysing its internal coherence, in opposition to other theories like the General Terminology Theory.** To do so, it has compared the two and highlighted the

shortcomings and flaws that, in my opinion, previous terminographical works may have had because of the way they conceive terminology and work with it.

- On the basis of the CTT and the simple observation of reality and more specifically of the reality of the speciality field being dealt with, this thesis has tried to provide a detailed account of the communicative nature of terminology and its interdisciplinary nature, which makes the terminological unit a multifaceted one and which integrates the theoretical aspects of terminology with a coherent practice of it. In this context, **the analysis of the combinatorial aspect or collocational behaviour of terminological units has been a fundamental factor that has been widely considered in this research.**
- **The thesis has attempted to provide a detailed account of the theoretical framework and method of work adopted,** which may provide a coherent explanation for understanding their adequacy and appropriateness when applied to a work like this compared to other conceptions, and which is reflected in the results. Accordingly, this approach seems to have been effective in order to meet the expectations and needs of the prospective users for whom the final lexicographical tool was designed.

*We are all something  
but none of us are everything.*

**Blaise Pascal**

## **2. LIMITATIONS OF THIS STUDY**

This doctoral thesis has attempted to present, first, a well-defined objective (showing the elaboration of a specialised bilingual dictionary on ceramics terminology). It has then progressively approached it from a theoretical position that is as sound and as comprehensible as possible and, finally, it has offered a clearly applied piece of work (an illustrative account of 4,000 entries of the prospective dictionary) as its result. Things have been done in the way that I considered to be the most appropriate but, when one looks back and reflects, there are always things that could have been added or dealt with in a different way. Hence, the concluding remarks regarding the limitations of this doctoral thesis could be summarised in the following items:

- First and foremost, the main “limitation” this prospective dictionary may be said to have is the absence of pronunciation in the entries, something which could also be considered as being incongruous given the purely communicative approach adopted. In fact the only reason I can offer for this omission is that it is to comply with the publisher’s policy. In this sense, none of the dictionaries<sup>79</sup> that have already been published in the series devoted to the most relevant industries of the Valencian Region (and undertaken within the IULMA’s macroproject) have included this item in their entries for the same reason: the publishing house, due to space restraints and, consequently, for economic reasons, does not allow authors to include pronunciation in their dictionaries.

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<sup>79</sup> *Diccionario de términos de la piedra natural e industrias afines; Diccionario de términos de la industria del calzado e industrias afines* and *Diccionario terminológico de las ciencias farmacéuticas*.

- The corpus-based approach used in this study was chosen because it was considered to be the soundest and most coherent one for the objectives posed and the kind of work aimed at. In general, and after its exploitation for the elaboration of the entries, such a choice can be seen as being appropriate, but it must be acknowledged that a corpus is a finite sample of a linguistic reality which, as such, is infinite. In this regard, a corpus is not an infallible tool since it is completely impossible to compile a corpus that is 100% representative; there will always exist the possibility that a term which should have appeared in the dictionary has not been included. In this light, the “problem with corpora” can be easily understood with a quote by Ralph Waldo Emerson: *a drop of water has the properties of the sea, but cannot exhibit a storm.*
- It must also be noted that this study could have been approached from many other perspectives, emphasising different aspects, such as genre and genre typologies in corpus compilation, or the analysis of general and specialised dictionaries in general compared to encyclopaedias, glossaries and thesauruses. In addition to this, other aspects such as ontologies, the analysis of the conceptualisation of reality or lexical description from cognitive aspects could also have been addressed.
- Another limitation to be mentioned is the difficulty encountered at times to establish the barrier between the terms to be included and those to be disregarded and the frontier (if it can be called so) between disciplines and areas of knowledge. This has been mainly due to the huge number of terms belonging to allied industries or fields that are related in one way or another to industrial ceramics, such as the refractory and cement industries, glass science, crystal chemistry, microscopy, microstructure, bioceramics science, powder processing, colloidal science, ceramic-based composites, and general chemistry and physics.

After fully acknowledging these limitations, I have tried to reflect on the things that may be complemented in the future – something which leads us directly on to the last section of this doctoral thesis devoted to the further research to be undertaken.



*Leave no stone unturned.*

**Euripides**

### **3. FURTHER RESEARCH**

As has already been mentioned, this thesis represents applied research, contextualised in a very specific socio-economic reality and shaped in the form of a very specific result: the dictionary. Nonetheless, there are many things that have come to the fore over the years which I would like to deal with in further research. Obviously, the work that is to follow immediately on from here is the completion of the dictionary as such but, apart from this, I consider it could also be highly enlightening and positive to approach this research from a different perspective and analyse the pedagogical implications and applications it may have for the teaching of terminology at university level and for the global understanding of specialised languages. Furthermore, a more detailed reflection on the language industries, the benefits of terminotics and the needs and questions posed in this respect from a terminological point of view would be of great interest to me.

To be more precise, all the aspects mentioned in the limitations section of this study would be interesting lines to be followed in further research:

- a comprehensive study on textual typologies in order to improve corpus compilation, balanced design and representativeness;
- comparative studies with previous dictionaries on this or other related fields;
- comparative studies that attempt to go deeper into the notions and differences between the general and the specialised;
- specific research (comparative or not) on glossaries and thesauruses and also on the diachronic aspects of specialised languages and how they are reflected in dictionaries, and thus on their evolution through time.

In addition to this, a further reflection on description and prescription in terminographical works would be very interesting, as well as entering the field of

ontologies. The in-depth study of linguistic phenomena like homonymy, synonymy and polysemy in specialised languages, like the notions of productive and interactive dictionaries (apart from the active one), and the bilingual-monolingual dichotomy in specialised dictionaries are also extremely relevant lines of research which could complement the work carried out up to now. To this one may add the aforementioned conceptualisation of reality and lexical description from cognitive aspects.

In addition to this, an in-depth study of the possibilities of the Internet as a mega-corpus in combination (or not – who knows?) with other more academic corpora could be quite revealing. Throughout this work I have reflected a lot on what the result could have been (apart from saving time) if instead of a tailored corpus like the one I created for this research I had used only the Internet. Obviously one cannot analyse the whole World-Wide Web with WST and thus, in general, the possibilities for exploitation, analysis and data retrieval and display are far more limited. These are, however, aspects that at this point are only reflections with no scientific basis and need further research and thought.

Finally, from a purely applied point of view, I have thought about the possibility of extending the dictionary to other languages or digitising it but, obviously, this will depend on the publisher's decision. In the same way, there are many other (industrial) areas (textile industry, agriculture, food industry, wood industry and so on) that would benefit from an ordered repertoire of the terms that characterise them and, thus, from a dictionary like the one under development here, but from now until October 2008 finishing the ceramics dictionary is my priority and more than enough work. However, whatever direction I finally take for further research, I am aware this research is only a humble contribution to the world of specialised terminography and a drop in the ocean, but, once again, as Emerson said: *the near explains the far. The drop is a small ocean.*

***What we call the beginning is often the end.  
And to make an end is to make a beginning.  
The end is where we start from.***

**TS Eliot**

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*The greatest part of a writer's time  
is spent in reading, in order to write;  
a man will turn over half a library to make one book.*

**Samuel Johnson**

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<http://en.wikipedia.org/wiki/Collocation> [Last search date: July, 2007]

[http://en.wikipedia.org/wiki/Mutaul\\_information](http://en.wikipedia.org/wiki/Mutaul_information) [Last search date: July, 2007]

<http://www.el-mundo.es/nuevaeconomia/2002/152/1039171430.html> [Last search date: January, 2007]

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[http://www.urbanoticias.com/noticias/hemeroteca/10113\\_la-industria-ceramica-espanola-incremento.shtml](http://www.urbanoticias.com/noticias/hemeroteca/10113_la-industria-ceramica-espanola-incremento.shtml) [Last search date: November, 2007]

<http://www.spaintiles.info/documentos/proceso.pdf> [Last search date: March, 2008]

<http://www.eurofound.europa.eu/pubdocs/1998/32/en/1/ef9832en.pdf> [Last search date: March, 2008]

**Online terminological databases:**

[British national Corpus](#)

[Columbia Encyclopedia](#)

[Encyclopaedia Britannica](#)

[Eurodicautom](#)

[Euro Glosary](#)

[FAO Terminology](#)

[ILOTERM \(International Labour Organization\)](#)

[Inter Active Terminology for Europe \(IATE\)](#)

[Terminological Information System \(EU\)](#)

[UNTERM. United Nations Multilingual Terminology Database](#)

[WTOTERM: World Trade Organization Terminology Database](#)

**Previous dictionaries and glossaries on the language of the ceramics industry:**

- “Ceramic glossary”:  
<http://www.digitalfire.ab.ca/ceramat/glossary/index.php?goto=A>
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- “The Collector’s Guide” glossary:  
<http://www.collectorsguide.com/fa/fa060.shtml>

*If you add a little to a little and do this often,  
soon the little will become great.*

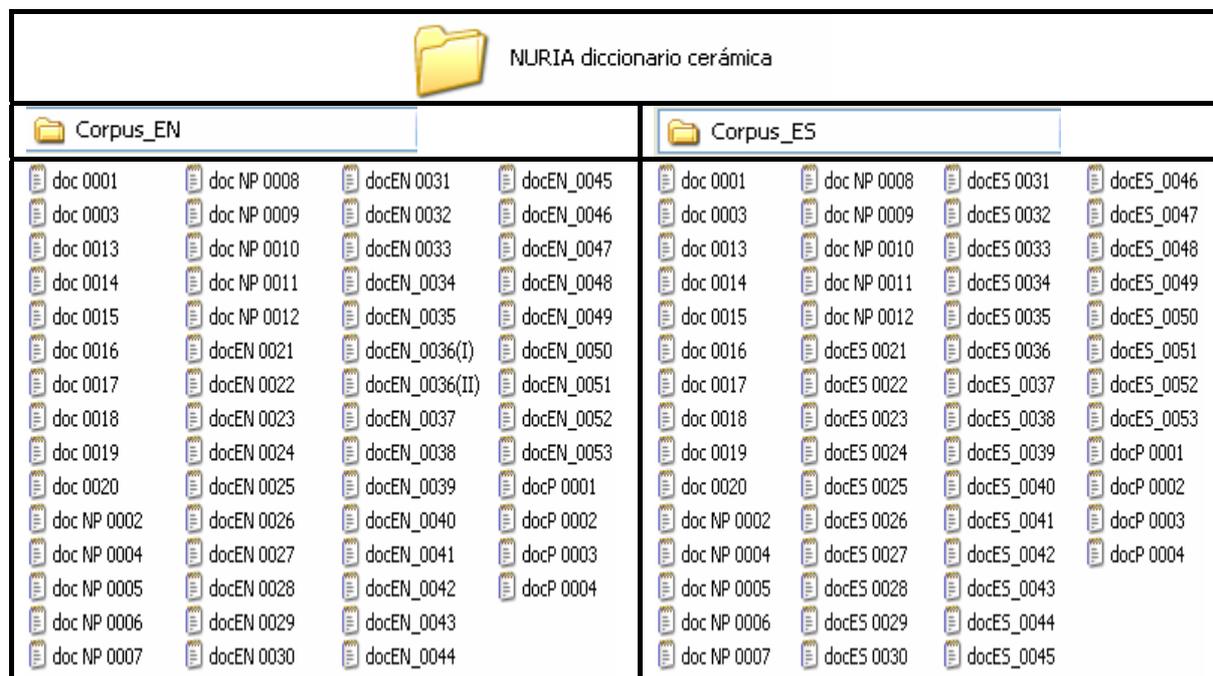
**Hesiod**

## VI. APPENDIX

### 1. INTERNAL ENCODED ORGANISATION AND MANAGEMENT OF CORPUS DOCUMENTS

For the internal encoded organisation and management of corpus documents, firstly, two files/corpora have been created, one in English (Corpus\_EN) and the other one in Spanish (Corpus\_ES), both of them contained in a bigger file named “NURIA diccionario cerámica”.

The texts compiled in the corpus have been saved with the structure and nomenclature (codes) indicated in figure VI.1:



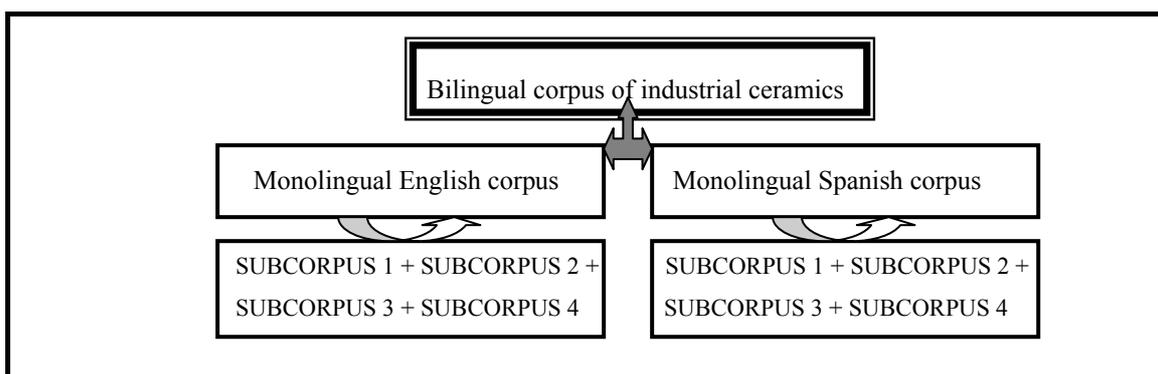
**Figure VI.1:** Documents in Corpus\_EN and Corpus\_ES as they have been arranged in the computer.

Section III.1.1 “actual corpus composition” contains the correspondences between the codes shown in the figure above and the titles of the documents they

identify, for instance, **doc 0001** identifies the document entitled *Ceramic floor and wall tiles. Definitions, classification, characteristics and marking*.

It has been important for the correct development of the work to have the corpus documents coherently kept and stored both in their printed and electronic versions; consequently, a unified nomenclature/encoded organisation for both versions has been used.

The way of saving and naming the documents forming part of the corpus has been based on the idea that the texts compiled have come from different sources and this source should be easily identifiable by the code. With this aim, I have considered the corpus as structured according to the following hierarchy (see figure VI.2), in which the label “subcorpus” gathers groups of documents coming from a common source (the composition of the different subcorpora is explained below):



**Figure VI.2:** Hierarchy of the corpus for the naming of documents on the basis of their source.

Each “subcorpus” has been differentiated from the others, apart from the source, by some characteristic trait in the nomenclature of the texts/documents it contains. This encoded organisation of documents is explained below (see also section III.1.1 “actual corpus composition” for the correspondences between codes and documents):

### ***Subcorpus 1: UNE/EN norms***

The documents in this subcorpus have been named in a way or another depending on whether they were parallel or not:

On the one hand, norms named with the format doc XXXX (for instance, doc 0001, doc 0003, etc.) are non-parallel documents. In all these textual samples, the norms have been originally written in Spanish but they include the English translations

of the titles. Accordingly, the norms as such have been saved in the Spanish corpus file (Corpus\_ES) with the code type indicated above indicated, and the norms titles in English, in spite of their reduced size, have been included in the English corpus file (Corpus\_EN) with the same code.

On the other hand, norms named with the format docNP XXXX (for instance, docNP 0002, docNP 0004, etc.) are parallel norms, NP standing for “norma paralela”. These documents have exactly the same content and have been written both in English and Spanish. Accordingly, they have also been named the same but, once again, the English version of the norm has been stored in Corpus\_EN and the Spanish version in Corpus\_ES.

Norms, both parallel and non-parallel, have started the numeration indicated by the codes.

### ***Subcorpus 2: Internet documents***

Subcorpus 2, that of Internet documents, has used the format docEN XXXX or DocES XXXX for encoding the documents included in this category.

In order to distinguish these documents, which are not parallel, from the kind of code assigned to UNE/EN norms – and in order to continue with the numeric series started with the norms – in the codes of the documents forming part of this subcorpus 2 a language indicator has been added in the form of EN (in the case of English) or ES (in the case of *Español*-Spanish). In this way, DocES 0031 may be differentiated from DocEN 0031, since, contrary to what happens with parallel norms named the same both in Corpus\_ES and Corpus\_EN, these documents in subcorpus 2 do not contain the same kind of text. As has already been mentioned, the assignation of codes to these documents has followed the numeration started with norms.

### ***Subcorpus 3: parallel Internet documents***

This subcorpus has been the one including parallel Internet texts (the most significant ones for this research, especially for matching (see section II.2.5.2)). These texts have been named with the format docP XXXX, the P standing for “parallel” and the numeration starting from 1 again, for instance, docP 0001 or docP 0002. Following the same criterion as with UNE/EN norms, parallel documents in their English and

Spanish versions have been named the same (without further reference to the language in the code) but kept in Corpus\_ES (in the case of the Spanish version) or in Corpus\_EN (in the case of the English one).

Parallel Internet documents have been the only ones not to follow the numeration started with the norms.

***Subcorpus 4: printed books, research articles and journals***

The documents from subcorpus 3 correspond to printed books, articles and journals. Since they are non-parallel, they have been stored indicating again in each code the language in which they have been originally created, following the format DocEN\_XXXX or DocES\_XXXX. Once again, the documents in this subcorpus 3 are not parallel texts and the fact of adding the language to the name of each document has been intended at differentiating, for instance, DocES\_0039 from DocEN\_0039 since they do not identify the same text. The encoding of these documents has followed the numeration started with norms and non-parallel internet documents.

## 2. STOPWORDLISTS

English stopwordlist used from <http://www.unine.ch/info/clef/englishST.txt>

a	a's	able	about
above	according	accordingly	across
actually	after	afterwards	again
against	ain't	all	allow
allows	almost	alone	along
already	also	although	always
am	among	amongst	an
and	another	any	anybody
anyhow	anyone	anything	anyway
anyways	anywhere	apart	appear
appreciate	appropriate	are	aren't
around	as	aside	ask
asking	associated	at	available
away	awfully	b	be
became	because	become	becomes
becoming	been	before	beforehand
behind	being	believe	below
beside	besides	best	better
between	beyond	both	brief
but	by	c	c'mon
c's	came	can	can't
cannot	cant	cause	causes
certain	certainly	changes	clearly
co	com	come	comes
concerning	consequently	consider	considering
contain	containing	contains	corresponding
could	couldn't	course	currently
d	definitely	described	despite
did	didn't	different	do
does	doesn't	doing	don't
done	down	downwards	during
e	each	edu	eg
eight	either	else	elsewhere
enough	entirely	especially	et
etc	even	ever	every

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everybody	everyone	everything	everywhere
ex	exactly	example	except
f	far	few	fifth
first	five	followed	following
follows	for	former	formerly
forth	four	from	further
furthermore	g	get	gets
getting	given	gives	go
goes	going	gone	got
gotten	greetings	h	had
hadn't	happens	hardly	has
hasn't	have	haven't	having
he	he's	hello	help
hence	her	here	here's
hereafter	hereby	herein	hereupon
hers	herself	hi	him
himself	his	hither	hopefully
how	howbeit	however	i
i'd	i'll	i'm	i've
ie	if	ignored	immediate
in	inasmuch	inc	indeed
indicate	indicated	indicates	inner
insofar	instead	into	inward
is	isn't	it	it'd
it'll	it's	its	itself
j	just	k	keep
keeps	kept	know	knows
known	l	last	lately
later	latter	latterly	least
less	lest	let	let's
like	liked	likely	little
look	looking	looks	ltd
m	mainly	many	may
maybe	me	mean	meanwhile
merely	might	more	moreover
most	mostly	much	must
my	myself	n	name
namely	nd	near	nearly
necessary	need	needs	neither

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never	nevertheless	new	next
nine	no	nobody	non
none	noone	nor	normally
not	nothing	novel	now
nowhere	o	obviously	of
off	often	oh	ok
okay	old	on	once
one	ones	only	onto
or	other	others	otherwise
ought	our	ours	ourselves
out	outside	over	overall
own	p	particular	particularly
per	perhaps	placed	please
plus	possible	presumably	probably
provides	q	que	quite
qv	r	rather	rd
re	really	reasonably	regarding
regardless	regards	relatively	respectively
right	s	said	same
saw	say	saying	says
second	secondly	see	seeing
seem	seemed	seeming	seems
seen	self	selves	sensible
sent	serious	seriously	seven
several	shall	she	should
shouldn't	since	six	so
some	somebody	somehow	someone
something	sometime	sometimes	somewhat
somewhere	soon	sorry	specified
specify	specifying	still	sub
such	sup	sure	t
t's	take	taken	tell
tends	th	than	thank
thanks	thanx	that	that's
thats	the	their	theirs
them	themselves	then	thence
there	there's	thereafter	thereby
therefore	therein	theres	thereupon
these	they	they'd	they'll

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they're	they've	think	third
this	thorough	thoroughly	those
though	three	through	throughout
thru	thus	to	together
too	took	toward	towards
tried	tries	truly	try
trying	twice	two	u
un	under	unfortunately	unless
unlikely	until	unto	up
upon	us	use	used
useful	uses	using	usually
uucp	v	value	various
very	via	viz	vs
w	want	wants	was
wasn't	way	we	we'd
we'll	we're	we've	welcome
well	went	were	weren't
what	what's	whatever	when
whence	whenever	where	where's
whereafter	whereas	whereby	wherein
whereupon	wherever	whether	which
while	whither	who	who's
whoever	whole	whom	whose
why	will	willing	wish
with	within	without	won't
wonder	would	would	wouldn't
x	y	yes	yet
you	you'd	you'll	you're
you've	your	yours	yourself
yourselves	z	zero	#

Spanish stopwordlist used from <http://www.unine.ch/info/clef/spanishST.txt>

a	acuerdo	adelante	ademas
además	adrede	ahi	ahí
ahora	al	alli	allí
alrededor	antano	antaño	ante
antes	apenas	aproximadamente	aquel
aquél	aquella	aquélla	aquellas
aquéllas	aquello	aquellos	aquéllos
aqui	aquí	arribaabajo	asi
así	aun	aún	aunque
b	bajo	bastante	bien
breve	c	casi	cerca
claro	como	cómo	con
conmigo	contigo	contra	cual
cuál	cuales	cuáles	cuando
cuándo	cuanta	cuánta	cuantas
cuántas	cuanto	cuánto	cuantos
cuántos	d	de	debajo
del	delante	demasiado	dentro
deprisa	desde	despacio	despues
después	detras	detrás	dia
día	dias	días	donde
dónde	dos	durante	e
el	él	ella	ellas
ellos	en	encima	enfrente
enseguida	entre	es	esa
ésa	esas	ésas	ese
ése	eso	esos	ésos
esta	está	ésta	estado
estados	estan	están	estar
estas	éstas	este	éste
esto	estos	éstos	ex
excepto	f	final	fue
fuera	fueron	g	general
gran	h	ha	habia
había	habla	hablan	hace
hacia	han	hasta	hay
horas	hoy	i	incluso
informo	informó	j	junto

k	l	la	lado
las	le	lejos	lo
los	luego	m	mal
mas	más	mayor	me
medio	mejor	menos	menudo
mi	mí	mia	mía
mias	mías	mientras	mio
mío	mios	míos	mis
mismo	mucho	muy	n
nada	nadie	ninguna	no
nos	nosotras	nosotros	nuestra
nuestras	nuestro	nuestros	nueva
nuevo	nunca	o	os
otra	otros	p	pais
país	para	parte	pasado
peor	pero	poco	por
porque	pronto	proximo	próximo
puede	q	que	que
qué	quien	quién	quienes
quiénes	quiza	quizá	quizas
quizás	r	raras	repente
s	salvo	se	sé
segun	según	ser	sera
será	si	sí	sidó
siempre	sin	sobre	solamente
solo	sólo	son	soyos
su	supuesto	sus	suya
suyas	suyo	t	tal
tambien	también	tampoco	tarde
te	temprano	ti	tiene
todavía	todavía	todo	todos
tras	tu	tú	tus
tuya	tuyas	tuyo	tuyos
u	un	una	unas
uno	unos	usted	ustedes
v	veces	vez	vosotras
vosotros	vuestra	vuestras	vuestro
vuestros	w	x	y
ya	yo	z	#

### 3. DIAGRAMS OF BASIC PROCESSES IN INDUSTRIAL CERAMICS

Figures VI.3, VI.4, VI.5 and VI.6: basic processes involved in ceramic tiles elaboration/fabrication/production as illustrated in

<http://www.spaintiles.info/documentos/proceso.pdf>

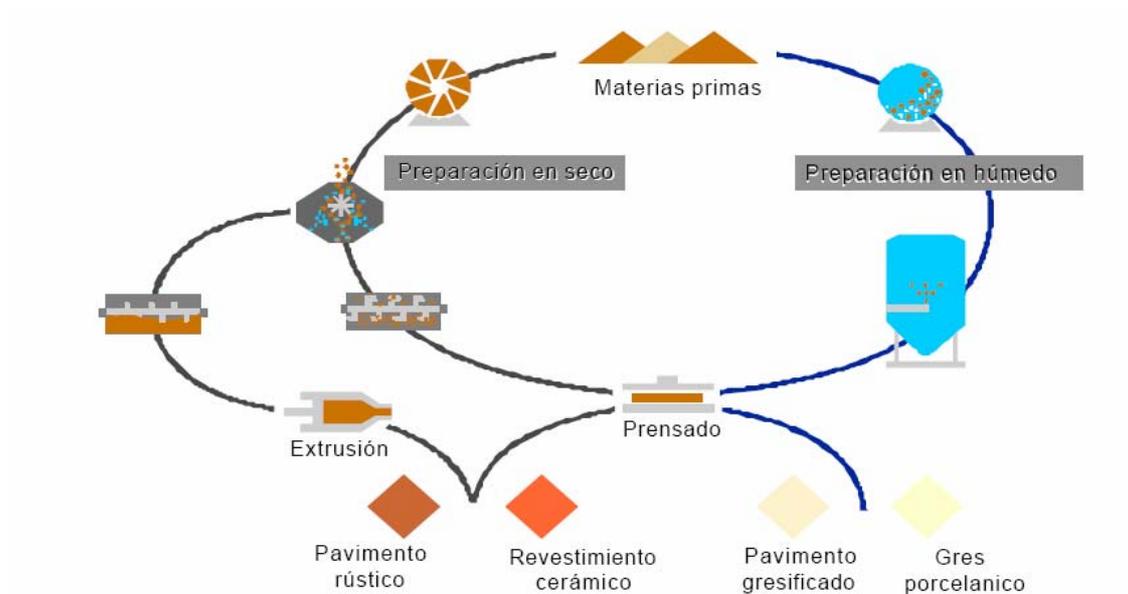


Figure VI. 3: Basic processes involved in ceramic tiles elaboration.

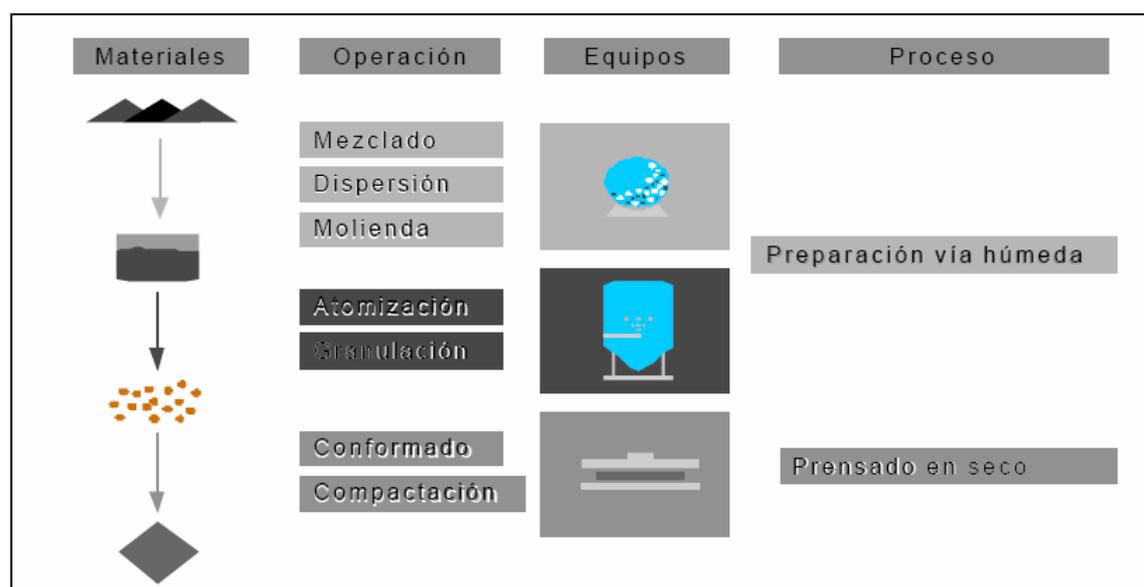


Figure VI. 4: Fabrication process of ceramic tiles.

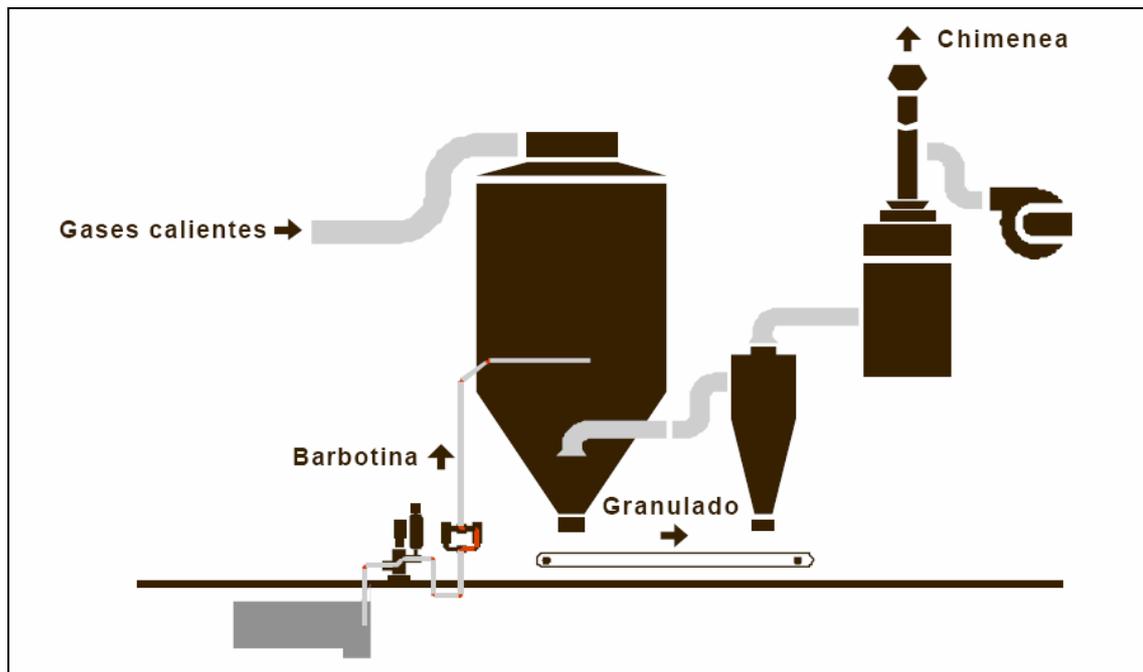


Figure VI. 5: Drying by atomization/atomisation.

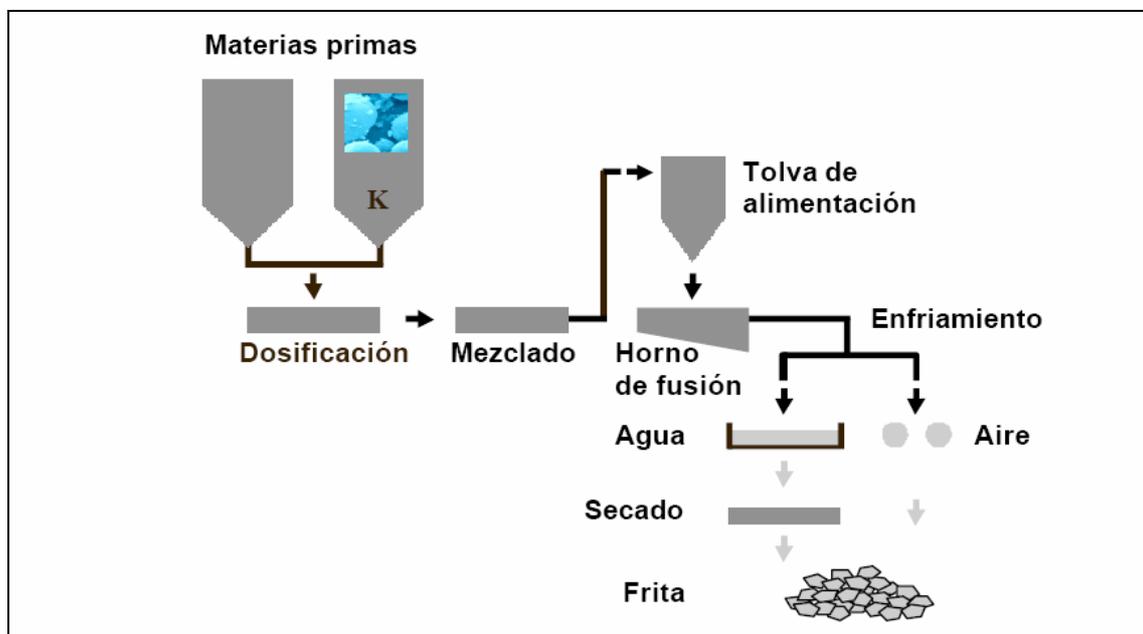


Figure VI. 6: Fritting process.

Figures VI.7, VI.8, VI.9, VI.10, VI.11, VI.12, VI.13 and VI.14: factors of environmental impact in the process of production of ceramic tiles as illustrated in <http://www.eurofound.europa.eu/pubdocs/1998/32/en/1/ef9832en.pdf>

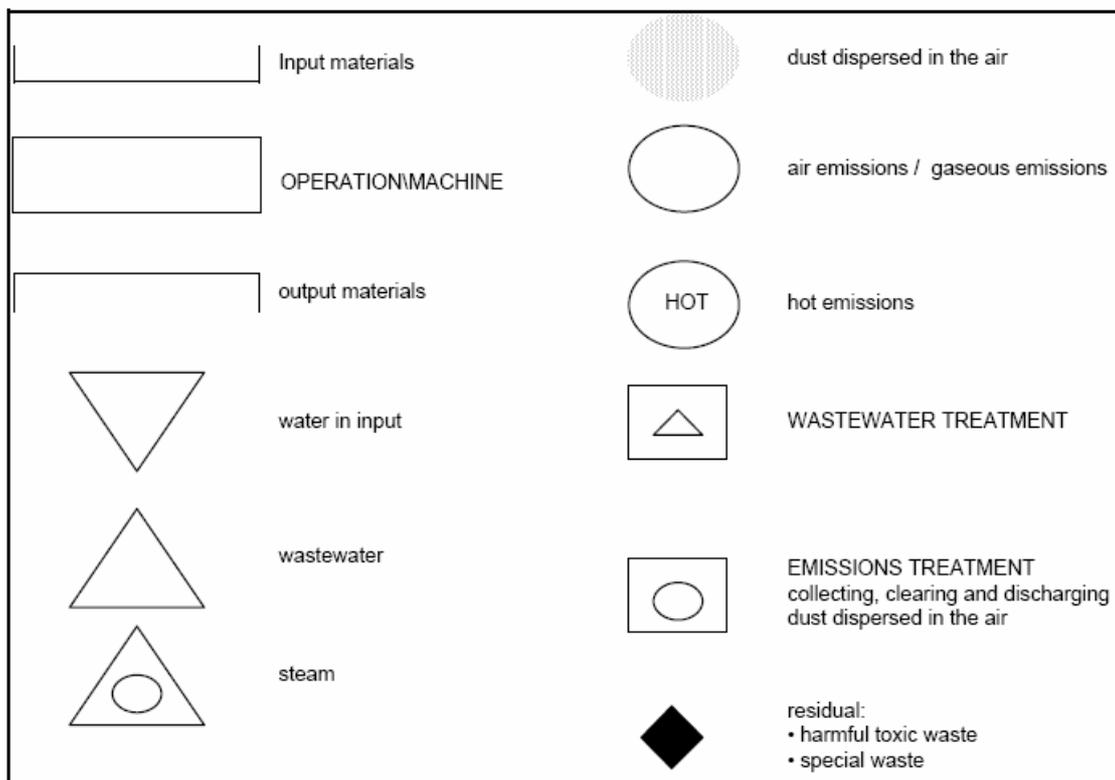


Figure VI. 7: Legend.

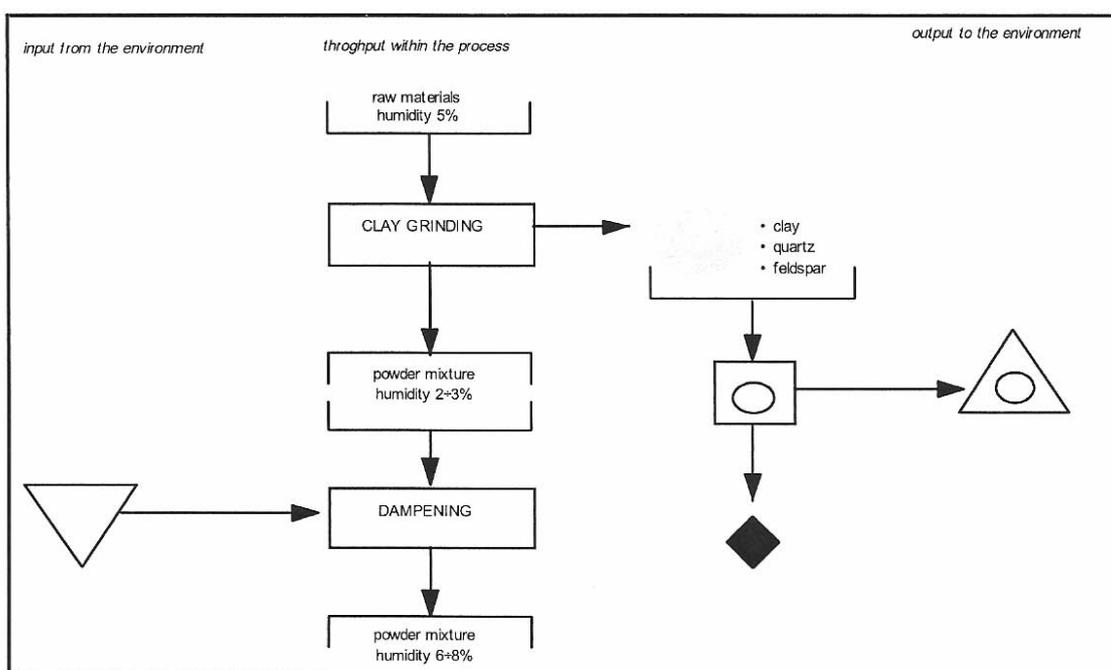


Figure VI. 8: Raw materials grinding: dry method.

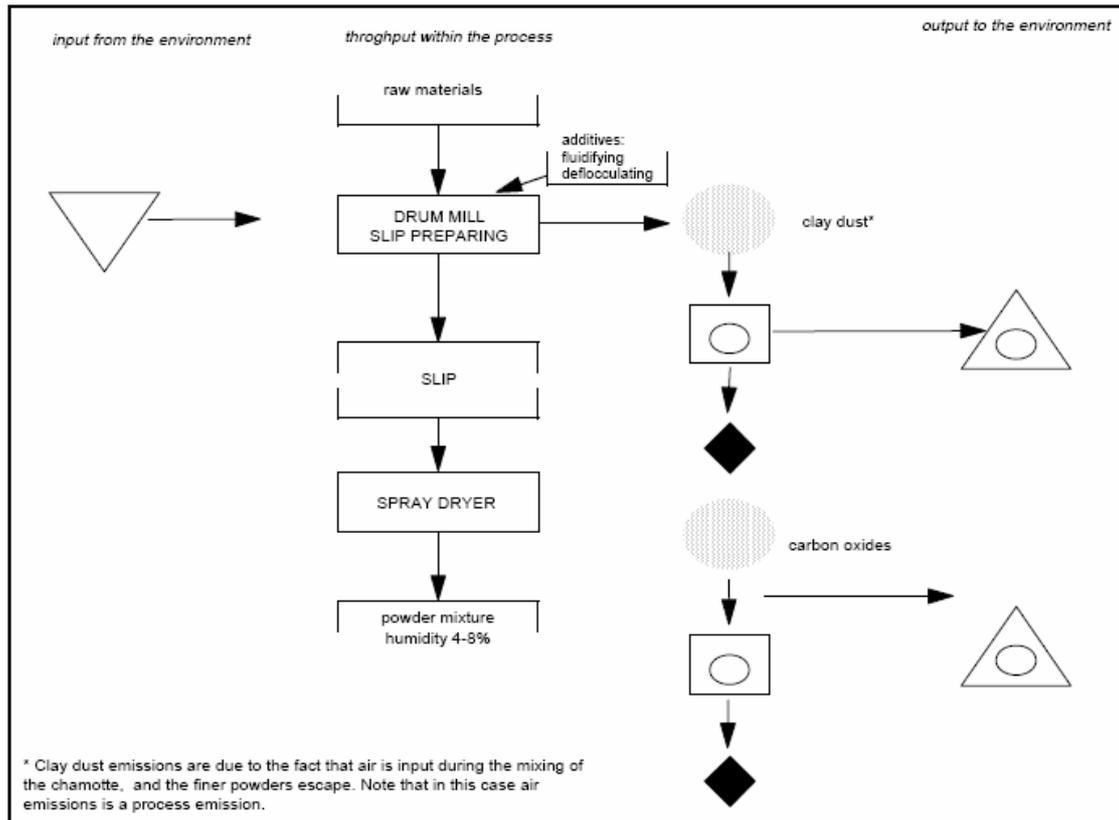


Figure VI. 9: Raw materials grinding: wet method.

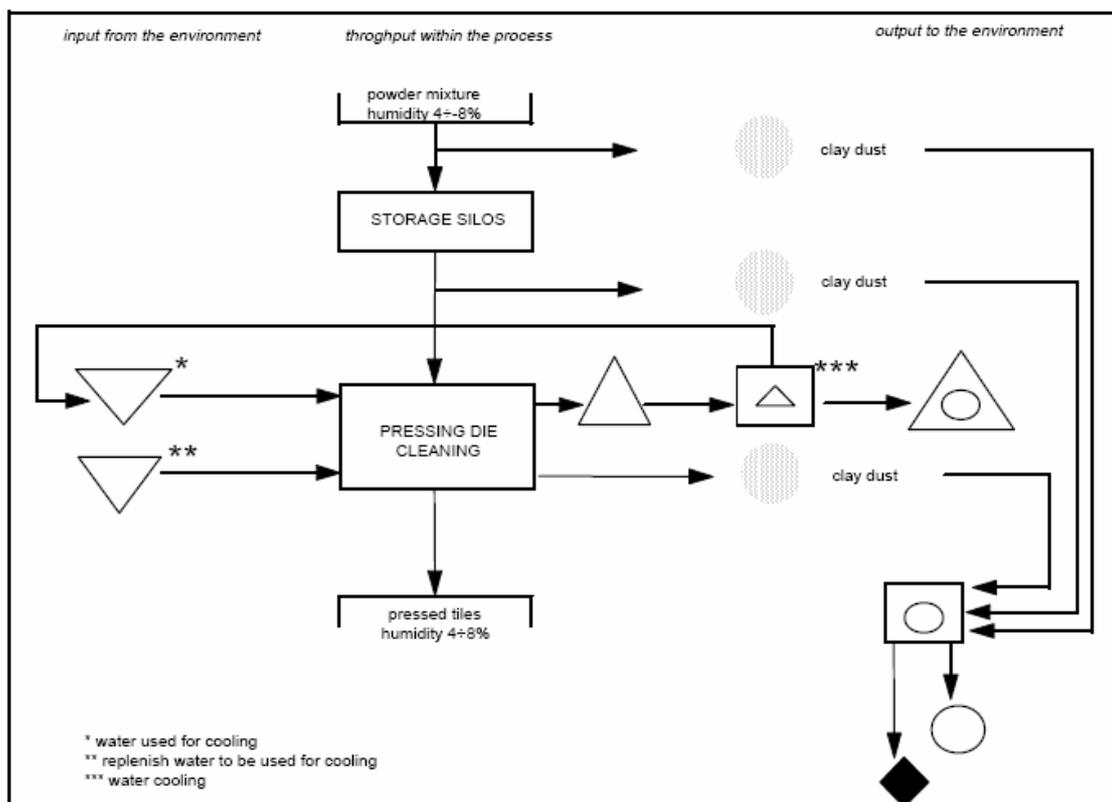


Figure VI. 10: Pressing.

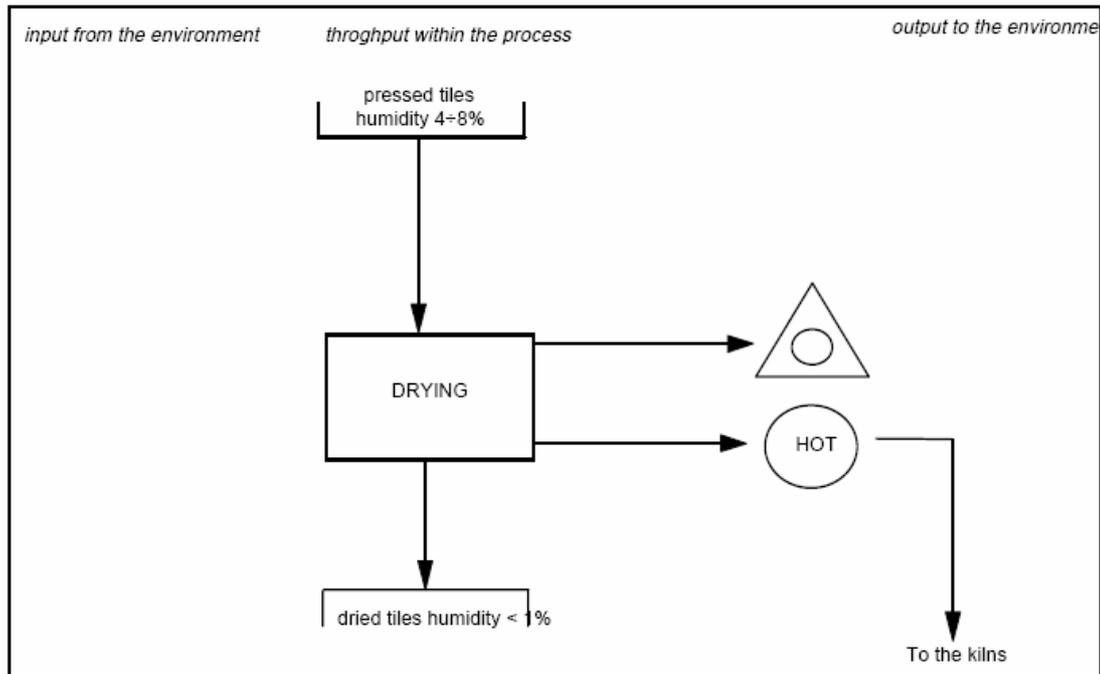


Figure VI. 11: Drying.

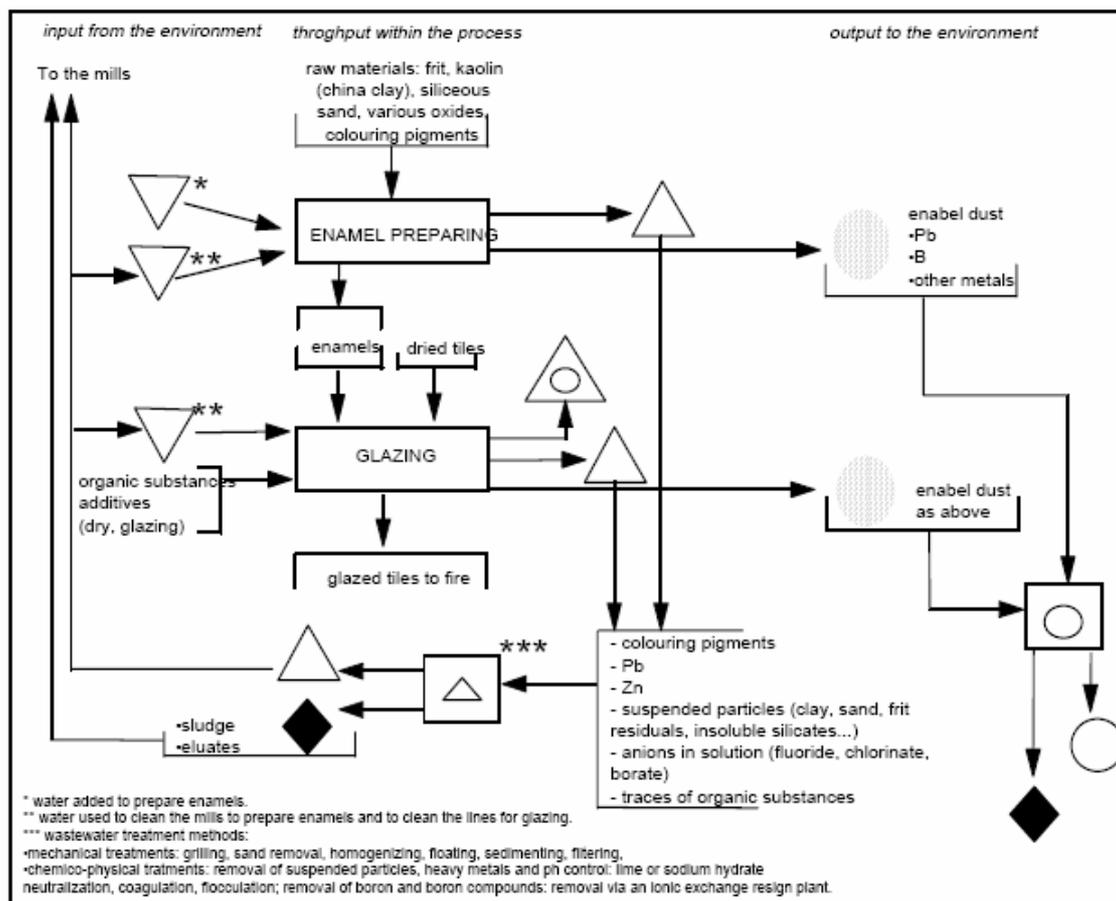


Figure VI. 12: Enamel preparation and glazing.

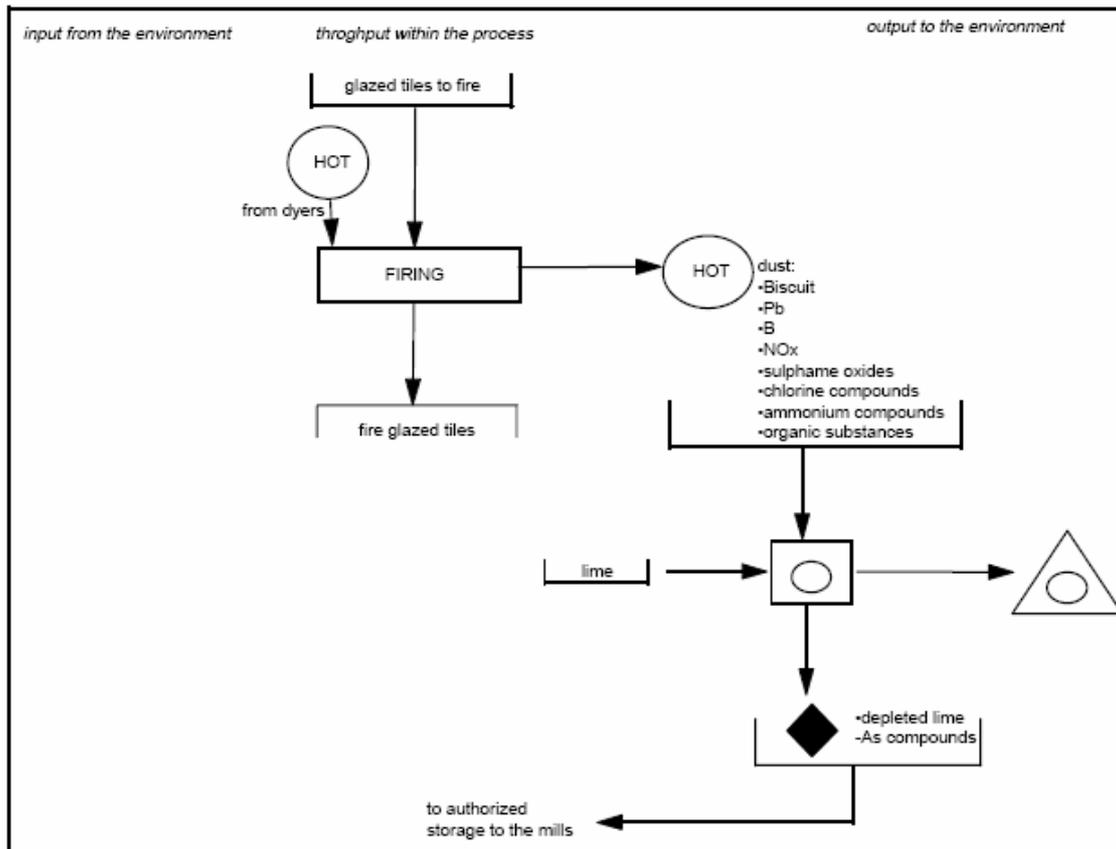


Figure VI. 13: Firing.

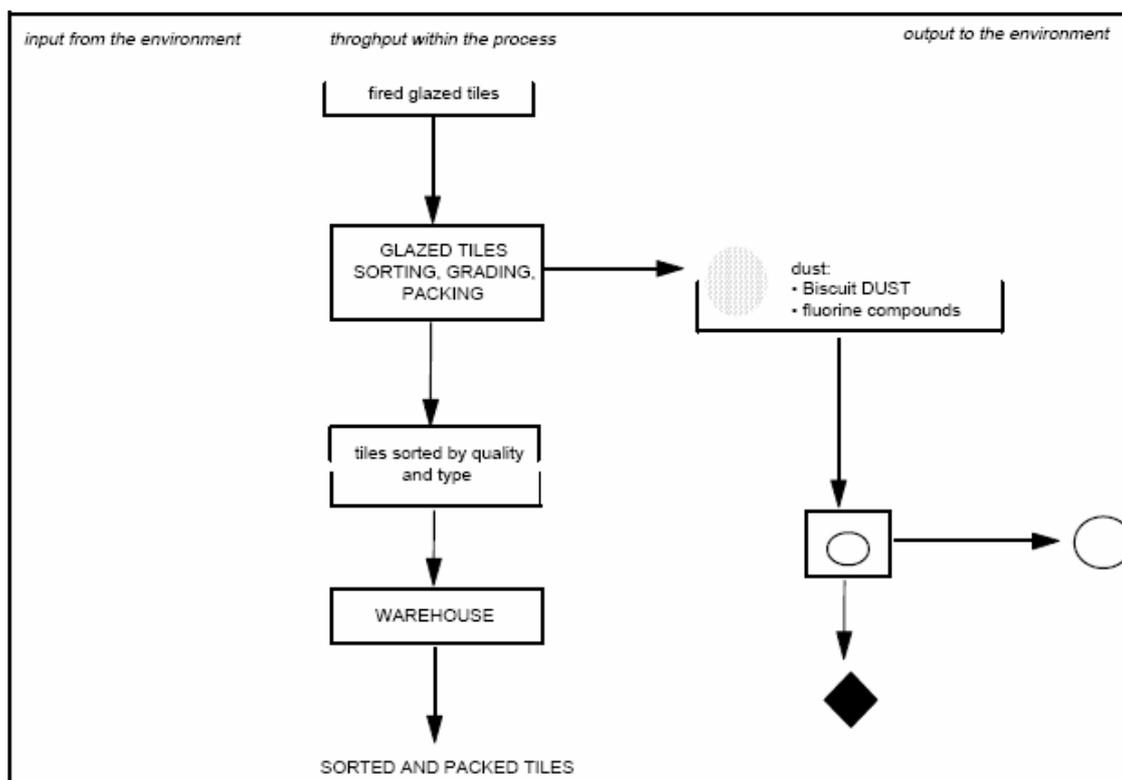
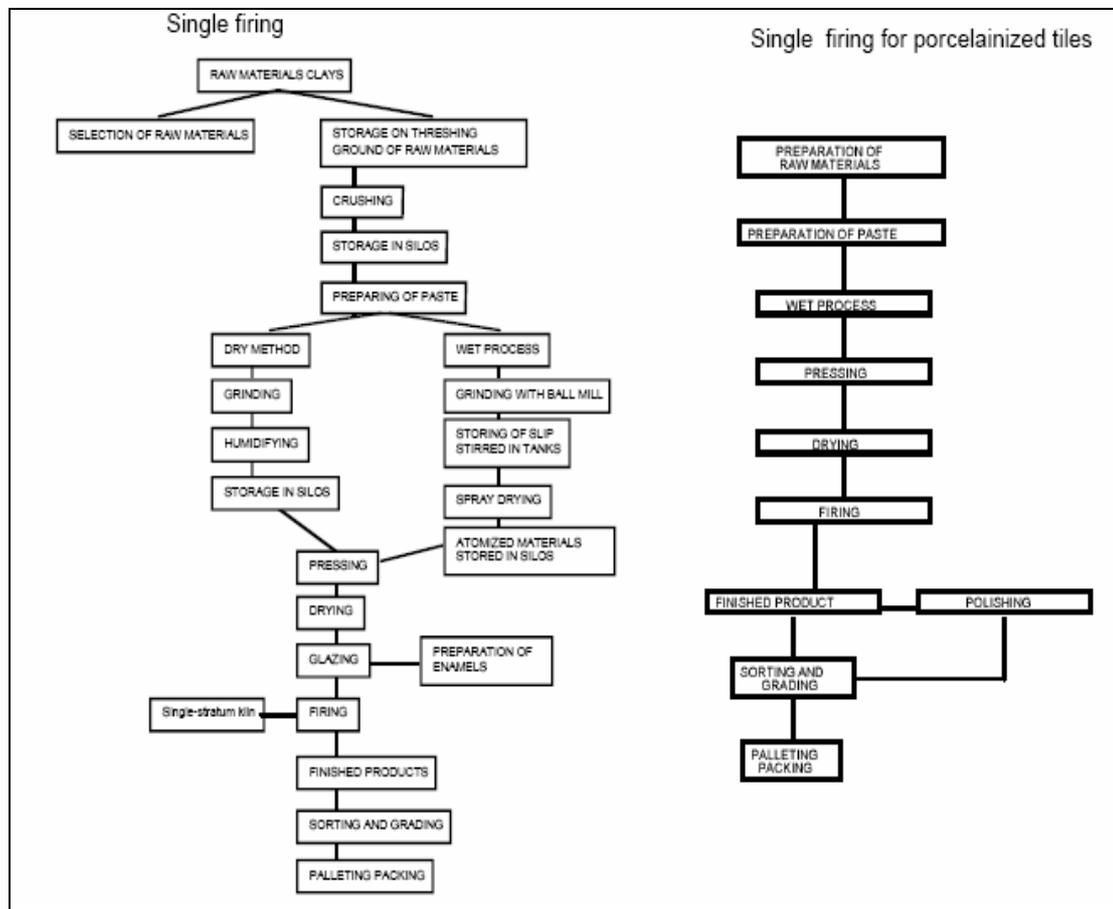


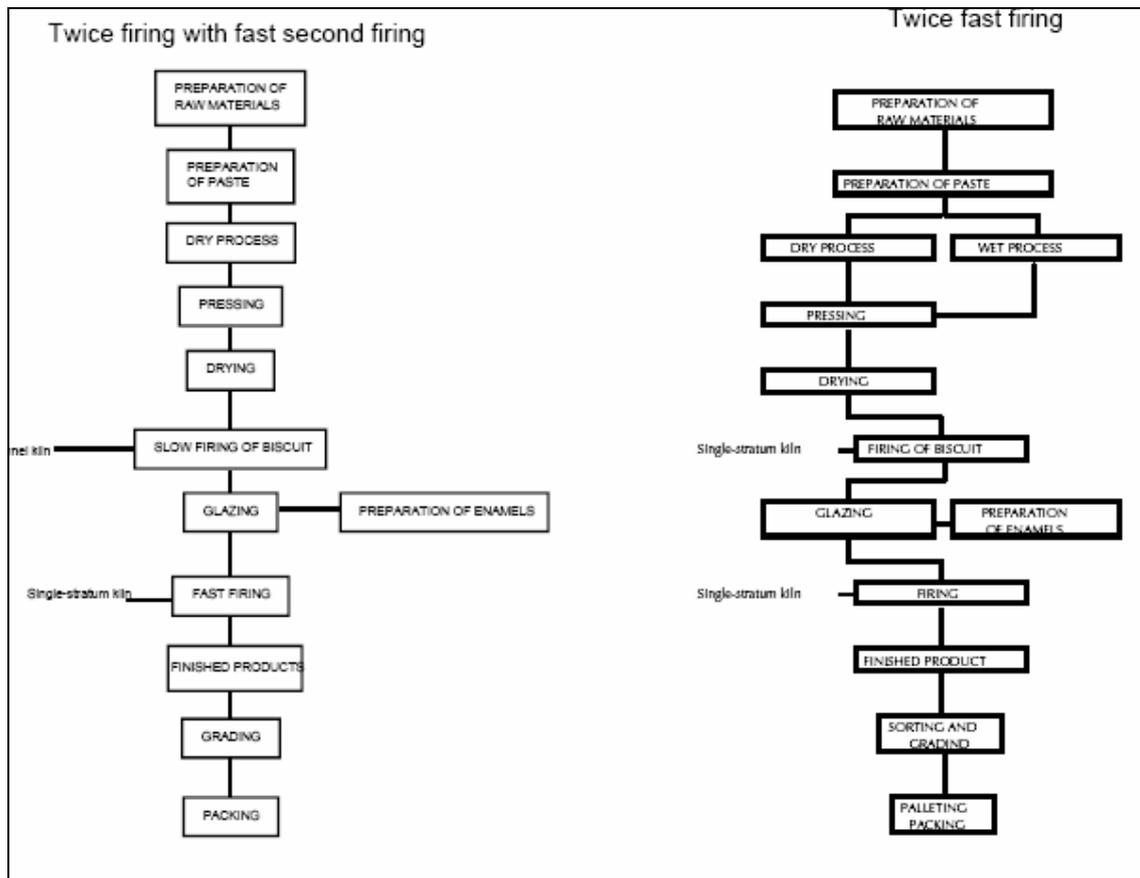
Figure VI. 14: Glazed tiles selection.

**Figures VI.15 and VI.16: Diagrams showing the production process of ceramic tiles as illustrated in**

<http://www.eurofound.europa.eu/pubdocs/1998/32/en/1/ef9832en.pdf>



**Figure VI. 15:** Single firing and single firing for porcelainized tiles processes.



**Figure VI. 16:** Twice firing with fast second firing and twice fast firing processes.

#### 4. 4,000 DICTIONARY ENTRIES FROM A PROSPECTIVE TOTAL OF ABOUT 26,000

## A

**A** *abbr:* MEDIDA V. *amp, ampere.*

**a/c** *abbr:* GESTIÓN V. *account.*

**A/F** *abbr:* DISTRIB V. *advance freight.*

**AAC** *abbr:* INDAFIN V. *autoclaved aerated concrete.*

**AAS** *abbr:* ELABPPROC/ENSAYO V. *atomic absorption spectroscopy (liquid solution).*

**AAS** *abbr:* ELABPROC/ENSAYO V. *atomic absorption spectrometry.*

**abac** *n:* GRAL V. *nomogram.*

**abaciscus** *n:* PRODFIN abacisco; piedra/baldosa pequeña, generalmente cuadrada, que se emplea para formar pavimentos de mosaico *-tessellated pavement-* V. *abaculus; tessera, tessella.*

**abaculus** *n:* PRODFIN abáculo, loseta; abaculus; pequeña baldosa de mármol *-marble-*, cristal, o cualquier otro material utilizada para hacer pavimentos de mosaico V. *tessera; tessella.*

**abacus** *n:* PRODFIN loseta rectangular.

**abacement** *n:* CONST asiento; referido a muros, terreno, cimentación, etc.

**abatement** *n:* MEDAMB reducción, disminución, recorte  $\diamond$  *Examples of applications of ceramics in the automobile include their use in safety and tempered glass for windows and catalysts and catalyst supports for emission abatement.*

**Abbe number, V number** *n:* PROPQUIM-FIS número de Abbe, constringencia; valor utilizado para caracterizar el poder de dispersión de una materia  $\diamond$  *The Abbe number of a glass mixture is carefully monitored and controlled by manufacturers to achieve target dispersion values, which usually range between 20 and 60;* V. *Abbe value.*

**Abbe value** *n:* PROPQUIM-FIS V. *Abbe number.*

**ABC** *abbr:* GESTIÓN V. *activity-based costing.*

**Aberson machine** *n:* MAQELAB máquina (de) Aberson V. *soft-mud process.*

**ablate** *v*: PROPQUIM-FIS erosionar-se, destruir-se ◇ *Whereas the carbon composites ablate during reentry, the ceramic tiles merely get hot, with no material loss at all.* [Exp: **ablating** (PROPMATPRI/PROPQUIM-FIS ablativo, erosionable; erosivo), **ablating agents** (ELABPROC agentes erosivos/ablativos o de erosión/ablación), **ablating body** (PROPQUIM-FIS materia/cuerpo erosionable), **ablating material** (ELABPROC material ablativo; material, especialmente de recubrimiento *-coating material-* utilizado para proporcionar protección térmica *-thermal protection-* a un cuerpo mediante la pérdida de masa *-loss of mass-* ◇ *Ablating materials absorb heat by increasing in temperature and changing in chemical or physical state*), **ablation** (ELABPROC ablación; eliminación de material de alguna superficie o capa protectora mediante algún proceso erosivo ◇ *The picture shows a tile with two clean areas where laser ablation has been used*; V. *zircon ablation*; *laser ablation*)].

**ablution** *n*: GRAL lavabo ◇ *Private ablution facilities with hot & cold water, showers, toilets and even your private ablution and storage lodge.* [Exp: **ablution facilities** (GRAL instalaciones sanitarias, lavabos; instalaciones para el aseo personal ◇ *The Clubhouse is a modern building with full ablution facilities*; V. *ablution*)].

**ABM** *abbr*: GESTIÓN V. *activity-based management.*

**above** *adv*: GRAL encima de, arriba; sobre; por encima de; "la planta de arriba" se traduciría como *"the floor above"* ◇ *Above a certain temperature, called the Curie temperature, the ferroelectric nature of the crystal disappears.*

**abrade** *v*: ELABPROC desgastar, bruñir, corroer (metal), erosionar (roca), esmerilar, frotar, lijar, pulir, raspar ◇ *The sandpaper abraded the wood until it was smooth*; V. *abrase*. [Exp: **abradability** (PROPQUIM-FIS abrasividad; capacidad para desgastar por fricción elementos en contacto con un cuerpo y que guarda relación con la cantidad y dureza de la materia mineral que contiene dicho cuerpo ◇ *The low abrasability of a pavement tile (0.06 g\sm) and staying power to sliding in winter are important features*), **abradability index** (PROPQUIM-FIS índice de abrasividad ◇ *AS 1774.23.1-2001 Refractories and refractory materials - Physical test methods - Abradability index - Oblique method*; V. *abrasion resistance*), **abradant** (MTRLS abrasivo; material usado para abrasar *-abrade-*, molturar/triturar *-grind-*, desgastar *-wear down-* suavizar *-smooth-* o pulir *-polish-* tal que el esmeril *-emery-*, la arena *-sand-* o el vidrio en polvo *-powdered glass-*), **abrader** (INSTR V. *abraser*), **abrader** (INSTR abrasímetro; máquina de/para ensayos de abrasión), **abrading tool** (MAQTRANS/MAQELAB V. *abrasive tool*)].

**Abrams' law** *n*: PROPQUIM-FIS ley de Abrams; ley que establece la relación entre la resistencia del concreto *-concrete-* y la relación agua/cemento ◇ *According to Abram's law, low water-to-cement ratios produce high strengths.*

**abrase** *v*: ELABPROC desgastar V. *abrade*. [Exp: **abraser** (INSTR abrasímetro; máquina de/para ensayos de abrasión)].

**abrasion** *n*: PROPQUIM-FIS abrasión, desgaste por fricción/rozamiento; desgaste *-wear-* o erosión *-erosion-* causado/a en una superficie por una acción continua y producido por fricción *-friction-*, por impacto *-impact-* o por agentes erosivos *-erosive agents-* como

el viento, la lluvia etc. durante largos periodos de tiempo ◇ *Among the advantages of ceramics tile are an ability to withstand damage from heat, and resistance to abrasion; V. corrosion; wear; erosion.* [Exp: **abrasion by sandblast/sand-blast** (PROPQUIM-FIS abrasión mediante chorro de arena ◇ *Physical properties were determined on specimens prepared under laboratory conditions using applicable ASTM procedures and showed, for instance, an excellent resistance to abrasion by sandblast; V. sandblast*), **abrasion finish** (ELABPROC acabado con abrasivos; proceso de eliminación de las rebabas de los objetos moldeados y/o deslustrado de sus superficies, sometiéndolas al impacto de materias como huesos de albaricoque machacados, cáscaras de nuez o gránulos de plástico, con suficiente fuerza como para fracturar la rebaba V. *surface finish; sand blasted finish*), **abrasion hardness** (PROPQUIM-FIS V. *abrasion resistance*), **abrasion resistance** (PROPQUIM-FIS resistencia a la abrasión, dureza a la abrasión; resistencia al desgaste [por rozamiento]; propiedad que presenta una superficie a la hora de resistir el desgaste -*wearing*- producido por frotamiento -*rubbing*- con un material extraño que puede producir la erosión de dicha superficie ◇ *Abrasion resistance is determined by abrasion tests, and tiles are grouped accordingly*), **abrasion resistance classification** (ENSAYO/CALIDAD clasificación de resistencia a la abrasión; clasificación en la que se determina la resistencia a la abrasión -*abrasion resistance*- de un producto/material; la clasificación de baldosas esmaltadas para piso según su resistencia a la abrasión es: CLASE 1 (PEI I): uso individual ligero como cuartos de baño doméstico y dormitorios sin acceso directo desde el exterior; CLASE 2 (PEI II): uso individual normal como cualquier zona de vivienda particular a excepción de cocinas y entradas; CLASE 3 (PEI III): uso individual elevado o uso colectivo moderado como todas las zonas de una vivienda privada; CLASE 4 (PEI IV): uso colectivo normal como cocinas, restaurantes, exposiciones, boutiques, peluquerías; CLASE 5 (PEI V): uso colectivo elevado como centros comerciales, bares, tiendas con mucho tránsito, zonas peatonales y aplicaciones industriales V. *PEI rating; resistance to surface abrasion; abrasion resistance test*), **abrasion resistance test** (ENSAYO ensayo de resistencia a la abrasión, ensayo de abrasión; test de resistencia al desgaste; ensayo consistente en someter a la loseta cerámica sobre la parte vidriada a una acción abrasiva compuesta de una mezcla de esferas de acero, arena de Corindón y agua destilada; a este tipo de prueba se le conoce también como prueba de P.E.I. y da lugar a una clasificación de los azulejos en 5 grupos V. *abrasion resistance classification; PEI rating; resistance to surface abrasion*), **abrasion test** (ENSAYO ensayo de abrasión V. *abrasion resistance test*), **abrasion/abrasive hardness, HA** (PROPQUIM-FIS dureza a la abrasión, resistencia al desgaste [por rozamiento]; propiedad o grado de resistencia que presenta un material al desgaste por abrasión ◇ *Granite is a well known building stone and has high abrasion hardness, with very high resistance to weathering and extreme resistance to chemical attack*)].

**abrasive**<sup>1</sup> *n/a*: MTRLS/TRANSMTRLS abrasivo; material usado para lijar -*sand*-, alisar -*smooth*-, cortar -*cut*- o pulir -*polish*- otra sustancia; entre los abrasivos más utilizados se encuentran la arena -*sand*-, la piedra pómez -*pumice*-, el corindón -*corundum*- , el cuarzo -*quartz*- , la alúmina -*alumina*-, el carborundo -*carborundum*-y el diamante -*diamond*- ◇ *The one major area in which conventional abrasives still play the primary role is polishing.* [Exp: **abrasive**<sup>2</sup> (PROPQUIM-FIS abrasivo; capaz de provocar abrasión ◇ *Abrasive materials used in blasting can generally be classified as sand, slag, metallic shot or grit, synthetic, or other*), **abrasive action** (PROPQUIM-FIS acción abrasiva; acción producida por la abrasión ◇ *Mechanical wear can be caused by the abrasive action of*

*hard inclusions in the workpiece on the tool*), **abrasive agent** (TRANSMTRLs agente abrasivo ◊ *Baking soda is a gentle abrasive agent; V. abrasive*), **abrasive bead** (TRANSMTRLs perla abrasiva ◊ *If the abrasive bead started to penetrate the substrate, coating delamination started, and the coating was going to be removed*), **abrasive belt/band** (MTRLs cinta abrasiva, banda abrasiva; cinta cubierta con abrasivo utilizada para esmerilar ◊ *The sharp corners are removed by an abrasive belt to form a semirounded edge*), **abrasive blade** (INSTAL cuchilla abrasiva ◊ *You can use an abrasive blade to cut tile, but it throws an immense amount of dust and chips the edge of the tile; V. grinding disk*), **abrasive blasting** (ELABPROC limpieza por chorro abrasivo; proceso caracterizado por el uso de materiales abrasivos (arena, abrasivos minerales, metálicos y sintéticos) para limpiar u otorgar una determinada textura a un material o a una superficie ◊ *Industries that use abrasive blasting include the shipbuilding industry, automotive industry, and other industries that involve surface preparation and painting*), **abrasive charge** (TRANSMTRLs carga abrasiva ◊ *An abrasive charge consisting of steel balls, alumina grit and deionized or distilled water is rotated on the surface whose abrasion resistance is to be assessed*), **abrasive cleaning** (TRANSPROC limpieza abrasiva, limpieza con abrasivos ◊ *The use of water in combination with grit may also be classified as abrasive cleaning*), **abrasive cloth** (ELABPROC/MTRLs tela abrasiva, lija, tela para pulir; tela dura a cuya superficie se ha ligado un abrasivo tal que arena -sand- o esmeril -emery- para su uso), **abrasive collector** (MAQELAB depósito colector de abrasivo ◊ *Place the abrasive collector beneath the wide abrasion wheel*), **abrasive disk** (MAQELAB V. grinding disk), **abrasive finish** (PRODFIN acabado abrasivo/mate; acabado con una cierta textura, no reflectante -non-reflective- y plano -flat- de una superficie; normalmente se recomienda para exteriores debido, entre otras, a sus características antideslizantes -non-slip features- ◊ *Unglazed tile or tiles that have an abrasive finish or textured surface are less slippery than bright glazed tile or tiles with a very smooth surface*), **abrasive flow** (ELABPROC/TRANSPROC flujo abrasivo/de abrasión ◊ *The material removal through abrasive flow takes place by flowing the media, mixed with abrasives, across the surface to be machined*), **abrasive grain** (MTRLs/TRANSMTRLs grano abrasivo; partícula pequeña y dura usada con fines abrasivos, por ejemplo para eliminar el material sobrante de una pieza, y que incluye, por ejemplo, gravilla -grit-, granalla metálica -metal shot- o perlas de vidrio -glass beads- ◊ *Sandpaper is made by bonding an abrasive grain like aluminum oxide, garnet or silicon carbide to a backing material; V. abrasive powder*), **abrasive grinder** (TRANSPROC/MAQTRANS muela abrasiva ◊ *The machines employed in the honing process normally comprise a series of arms carrying heads equipped with abrasive grinders; V. grinding disk*), **abrasive machining** (TRANSPROC/ELABPPROD mecanizado con abrasivos; procesos de molienda/molturación -grinding-, perforación -drilling-, conformado -shaping- o pulido -polishing- mediante abrasión utilizando maquinaria especial ◊ *Abrasive machining can achieve the highest qualities of surface finish*), **abrasive material** (TRANSMTRLs/MTRLs material abrasivo ◊ *The general cleaning of metal castings is normally done by placing them in a revolving drum, or barrel, together with coarsely crushed abrasive material such as broken biscuit-fired ceramic ware; V. abrasive*), **abrasive method** (GRAL método abrasivo ◊ *Shot blasting is an abrasive method of removing floor tile mastic*), **abrasive paper** (MTRLs papel de lija, papel abrasivo), **abrasive paste** (MTRLs pasta abrasiva), **abrasive powder** (TRANSMTRLs/MTRLs polvo abrasivo ◊ *In this machine, used to define the quality of tile, tile is subjected under revolution with abrasive powder at the rate of 30 cycles/min. and it is revolved 100*

*times from both sides; V. abrasive grain*), **abrasive product** (MTRLS/TRANSMTRLS producto abrasivo ◊ *A method of abrading a work surface includes applying an abrasive product to it in an abrading motion to remove a portion of the work surface; V. abrasive*), **abrasive rock** (EXPL-CANT toca abrasiva ◊ *To cut particularly abrasive rocks, the wire is completely immersed in plastic*), **abrasive sand** (TRANSMTRLS/MTRLS arena abrasiva; gravilla/arenilla -grit- usada como abrasivo ◊ *Abrasive sand is particularly applicable for the removal of heavy rust, epoxy paints, concrete, and paint from steel surfaces*), **abrasive slurry** (MTRLS/TRANSMTRLS mezcla abrasiva, lodo abrasivo; compuesto acuoso de materiales abrasivos empleado en el proceso de corte ◊ *This tool combines with abrasive slurry to microscopically grind the workpiece*), **abrasive strength** (PROPQUIM-FIS V. abrasion/abrasive hardness), **abrasive substance** (MTRLS/TRANSMTRLS sustancia abrasiva, abrasivo V. abrasive), **abrasive tool** (MAQTRANS/MAQELAB herramientas abrasivas, herramientas para abrasión; instrumento utilizado para erosionar, lijar, esmerilar, etc.), **abrasive wear** (PROPQUIM-FIS desgaste por abrasión; desgaste producido por partículas abrasivas que se deslizan sobre una superficie causando el desprendimiento de material -material detachment- y rayaduras profundas -deep scratch- ◊ *When material is removed by contact with hard particles, abrasive wear occurs; V. Taber abrasive test*), **abrasive wheel** (MAQTRANS rueda abrasiva, muela abrasiva; rueda consistente en partículas abrasivas adheridas mediante el uso de sustancias orgánicas e inorgánicas como la resina ◊ *The risk of breakage is inherent in every abrasive wheel*), **abrasiveness** (PROPQUIM-FIS abrasividad; propiedad de un material para producir desgaste -wear- sobre una superficie por fricción ◊ *Abrasiveness is the property of a material to remove matter when scratching or grinding another material; V. abrasion*)].

**abridge** v: GRAL reducir, abreviar; acto de acortar o condensar, especialmente referido a reducir documentos escritos. [Exp: **abridged** (GRAL abreviado ◊ *The present document is an abridged version of the comprehensive document submitted to the Board*), **abridged specification** (GRAL especificación abreviada), **abridgement** (GRAL resumen, extracto; abreviación; sinopsis)].

**abroad** adv: GRAL extranjero (en el); to go abroad: ir-se al extranjero ◊ *We specialize in manufacturing, processing and trading abroad ceramic tiles.*

**abrupt** a: GRAL/EXPL-CANT abrupto, accidentado; escarpado ◊ *The sides of the specimen shall be smooth and free from abrupt irregularities.*

**abscissa** n: GRAL abcisa; coordenada horizontal en un plano cartesiano rectangular designada mediante la letra X ◊ *The weight fraction of water is represented by the abscissa and specific volume quantities are given by the ordinate; V. ordinate.*

**absence** n: GRAL ausencia, falta ◊ *The first term is obtained from a measure of the sample density in the absence of appreciable porosity.* [Exp: **absent** (GRAL ausente ◊ *Residual stress is reduced with this process and may sometimes even be totally absent*)].

**absolute** a: GRAL absoluto; total ◊ *We need to ensure an absolute fit between one step and the next.* [Exp: **absolute humidity** (PROPQUIM-FIS humedad absoluta; masa total de agua existente en el aire por unidad de volumen expresada en gramos por metro cúbico

-grams per cubic meter- de aire V. *atmospheric humidity; relative humidity; specific humidity*), **absolute porosity** (PROPQUIM-FIS porosidad absoluta; diferencia entre volumen aparente y volumen real (término aplicado generalmente a rocas)), **absolute temperature, T** (PROPQUIM-FIS temperatura absoluta; uno de los parámetros principales empleados en termodinámica y mecánica estadística y que indica el valor de la temperatura medida con respecto a una escala iniciada en el cero absoluto (-273,15 °C); se representa generalmente en kelvin), **absolute temperature scale** (MEDIDA escala de temperatura absoluta  $\diamond$  *The absolute temperature scale is a scale with which temperatures are measured relative to absolute zero*), **absolute value** (GRAL valor absoluto; en un número real, su valor después de quitarle su signo negativo: si el número es positivo, su valor absoluto es él mismo mientras que si es negativo, el valor absoluto es el número opuesto  $\diamond$  *El valor absoluto de un número "n" siempre es positivo o cero, y se escribe como |n|*), **absolute volume** (PROPQUIM-FIS volumen absoluto; volumen total de las partículas en un material granular -granular material- incluyendo los huecos permeables e impermeables -permeable and impermeable voids- pero no tomando en consideración los espacios entre las partículas; en un fluido, volumen total ocupado por éste; volumen de desplazamiento -displacement volume- de un ingrediente del concreto o mortero)].

**absorb** V: GRAL absorber  $\diamond$  *The factors include whether the piece to be dipped is greenware or bisque, the bisque temperature, and anything else that affects the ability of the piece to absorb glaze.* [Exp: **absorbed moisture** (PROPQUIM-FIS humedad absorbida; humedad que ha penetrado en un sólido por absorción y que cuenta con propiedades físicas que no difieren de las del agua común a la misma temperatura y presión  $\diamond$  *If you are in a freeze area some tiles could crack or crumble due to freezing absorbed moisture; V. absorption*), **absorbent** (PROPQUIM-FIS/MTRLS absorbente; sustancia/material con la capacidad de extraer otras sustancias de otro medio con el cual está en contacto; que posee la capacidad de absorber/extraer sustancias  $\diamond$  *The absorbent plaster pulls water from the slurry*), **absorbing** (PROPQUIM-FIS absorbente; que posee la capacidad de absorber o empapar -soak up- algo  $\diamond$  *Clay green is the most absorbing clay, generally used for face masks in cases of acne, oily and neglected skin*), **absorbing filter** (INSTR filtro de absorción), **absorption** (PROPQUIM-FIS absorción; proceso de absorber o ser absorbido, esto es, retención de un gas o vapor por un líquido, o de un líquido por un sólido; aumento de masa de un sólido poroso -porous solid- producida como resultado de la penetración de un líquido en sus poros permeables -permeable pores-  $\diamond$  *Absorption is the relationship of the weight of the water absorbed by a ceramic specimen subjected to prescribed immersion procedure, to the weight of the dry specimen, expressed in percent (ASTM C 242); V. absorbed moisture; adsorption*), **absorption by capillary action/by capillarity** (PROPQUIM-FIS absorción por capilaridad, absorción capilar; propiedad de sorción entre un material poroso y un fluido y consecuencia de estar el material en contacto con el líquido por una de sus caras, y resultante de la penetración y ascensión de éste por la red capilar del cuerpo debido a la tensión superficial del líquido, dependiendo la velocidad de penetración de la intensidad de dicha tensión y del valor del radio medio de la red capilar; la propiedad de absorción por capilaridad, tiene una extraordinaria importancia en las arcillas, piedras, ladrillos, etc  $\diamond$  *The addition of this product to Portland cement prevents water absorption by capillary action*), **absorption by immersion** (PROPQUIM-FIS absorción por inmersión; propiedad de sorción entre un material poroso y un fluido y resultante de la absorción de un líquido por un cuerpo poroso inmerso en él),

**absorption coefficient** (PROPQUIM-FIS coeficiente de absorción, coeficiente de atenuación; cociente (normalmente expresado en Sabines dentro de una escala de 0 a 1) entre la energía incidente y la energía absorbida por una superficie o sustancia ◇ *White Glass has a uniform low absorption coefficient over the whole visible spectral range*), **absorption rate** (PROPQUIM-FIS tasa de absorción, velocidad de absorción ◇ *The absorption rate of a tile measures the relationship of the weight of the water absorbed by that tile to the weight of the dry tile, expressed in percentages*), **absorption resistance** (PROPQUIM-FIS resistencia a la absorción ◇ *Reinforced tiles are tiles of two layers, the face layer containing chemical or mineral materials to improve its water absorption resistance and abrasion resistance*), **absorption spectrum** (PROPQUIM-FIS espectro de absorción; espectro de los fotones absorbidos por una sustancia, clasificados según su longitud de onda ◇ *An absorption spectrum is, in a sense, the opposite of an emission spectrum*), **absorption test** (ENSAYO ensayo de absorción, prueba de absorción; método para determinar la absorción-retención *-uptake-* de un líquido por parte de un material en el que el tiempo y la temperatura son considerados ◇ *Absorption test is valuable as a fairly reliable indication of the ability of tile to resist frost action*), **absorptive** (PROPQUIM-FIS/MTRLs V. *absorbent*), **absorptive power** (PROPQUIM-FIS V. *absorptivity*), **absorptivity** (PROPQUIM-FIS poder absorbente; factor que determina la capacidad de una sustancia de absorber otra sustancia o forma de energía ◇ *Grout compositions may be used in any width joint with tile of any absorptivity, including nonabsorptive tile*)].

**abstract**<sup>1</sup> *n/a*: GRAL/DISEÑO abstracto; estilo artístico en el que se enfatizan los aspectos cromáticos, formales y estructurales sin tratar de representar *-depict-* modelos o formas naturales ◇ *This funky abstract tile is full of colors and designs that cause the eye to bounce around in a visual feast*. [Exp: **abstract**<sup>2</sup> (GRAL extracto, resumen; síntesis, compendio, sinopsis)].

**abuilding** *a*: CONST en construcción; en proceso de ser construido o en construcción ◇ *He supervises motels and restaurants abuilding*.

**abundance** *n*: GRAL abundancia ◇ *The price of the oxides is markedly dependent on natural abundance and on product purity*. [Exp: **abundant** (GRAL abundante ◇ *Crystalline silica in the form of quartz sand is an abundant raw material*)].

**abut**<sup>1</sup> *v*: GRAL lindar, colindar ◇ *In property law, when two parcels abut it means they are adjacent to each other and up against each others' borders*. [Exp: **abut**<sup>2</sup> (INSTAL/CONST unir a tope, empalmar; colocar a tope dos piezas de construcción ◇ *Abut the tile to the integrated joint spacer to ensure a uniform joint of 1.5 mm*), **abutment** (CONST contrafuerte, estribo, machón; parte de una estructura o pilar que soporta el peso o la presión de un arco V. *buttress*), **abutting** (CONST contiguo, colindante; en contacto V. *adjoining, adjacent*), **abutting joint** (INSTAL junta a tope ◇ *It is very difficult to lay the tiles without the abutting joint of adjacent tiles being seen to the naked eye by a casual observer*), **abutting surface** (INSTAL superficie de contacto ◇ *On residential floor installations, movement joints should be located anywhere the tiles meet an abutting surface like a wall, a post or column*)].

**acc abbr**: GRAL/CALIDAD V. *accepted*.

**acc abbr:** GESTIÓN V. *accounting*.

**accelerate** v: GRAL acelerar ◇ *Some of the additives accelerate the reaction, others have no influence and some retard it.* [Exp: **accelerated ageing test** (ENSAYO ensayo de envejecimiento acelerado; ensayo destinado a estimar la resistencia de un material y/o producto al deterioro ocasionado por el paso del tiempo -*passage of time*- ◇ *To verify the stability of material surface characteristics after lengthy periods of exposure to sunlight, the specimens were subjected to the accelerated ageing test*), **accelerated exposure test, AET** (ENSAYO prueba de exposición acelerada ◇ *The accelerated exposure test corresponds to approximately 10 years of outdoor exposure in Tokyo, Japan*), **accelerated tests** (ENSAYO prueba acelerada; método de ensayo que determina de manera acelerada el efecto producido en los materiales por la acción de cambios lentos mediante la adopción de técnicas que permiten reducir ostensiblemente el tiempo necesario para observar esos efectos. Para ser válidas, este tipo de pruebas no deben alterar el comportamiento en servicio -*behaviour in service*- del material ◇ *Examples of accelerated tests are tests for weathering, wear, moisture expansion*), **accelerating admixture** (MTRLS aditivo acelerante ◇ *Accelerating admixture are added to concrete to reduce setting time*), **acceleration** (PROPQUIM-FIS aceleración ◇ *Acceleration of the drying in this stage is limited by the tendency for skin formation, if air flow is increased excessively, and by solvent vapour bubble formation, if heating is excessive*), **accelerator** (MTRLS acelerador, catalizador; acelerante; acelerador de fraguado; producto químico compuesto de silicatos, hidróxidos y carbonatos, que se incorporan proporcionalmente a la mezcla de hormigón, mortero, cemento o yeso con la finalidad de acortar su tiempo de fraguado y acelerar la velocidad del desarrollo de resistencia inicial y final de éste ◇ *For plaster, the best accelerator is finely-ground gypsum, which provides nuclei for crystallization*)].

**accent color** n: DISEÑO realce de color; color de pared brillante, fuerte y luminoso ◇ *The comfortable rooms are decorated in pastel shade with brighter accent colors.*

**accept** v: GRAL aceptar; asumir, oralmente o por escrito, el compromiso de pagar un efecto comercial o documento. [Exp: **accept cash payments** (GESTION cobrar al contado/en efectivo ◇ *Bennet&C. does not accept cash payments for amounts totalling more than 12,500 euro*), **acceptability** (GRAL/CALIDAD aceptabilidad; estado por el que un producto es considerado capaz o merecedor de ser aceptado y es, por tanto, recibido favorablemente ◇ *Before applying epoxy grout test a small area for acceptability of color and staining of tile*), **acceptable** (GRAL/CALIDAD aceptable, admisible; de calidad suficiente ◇ *The practice of tile manufacturers shows that acceptable tiles must vary by less than 0.4Z from the reference sample*), **acceptance** (GRAL/GESTION aceptación, recepción; el acto de ser aceptado o aceptable; asunción del compromiso de pagar un efecto comercial o documento ◇ *We have 14 years experience in the field and we have been enjoying broad acceptance from our clients as a result of our reliable service, quality, financial standing and business integrity*), **acceptance against documents** (COM aceptación contra documentos; entrega de los documentos de embarque tras la firma de aceptación de la letra del comprador), **acceptance agreement** (GESTION/COM contrato de aceptación ◇ *By signing this Acceptance Agreement, I understand and agree to the aforementioned conditions*), **acceptance conditions** (COM condiciones de aceptación, condiciones de recepción ◇ *This part of ISO 6305 defines the specifications regarding product quality and gives manufacturing and acceptance conditions*),

**acceptance credit** (GESTION/COM crédito de aceptación; método por el cual las letras giradas por una empresa son aceptadas por una financiera o banco de aceptación (abonando una pequeña comisión *-fee-*) y utilizadas como garantía para un anticipo o crédito bancario, corriendo los gastos de descuento por cuenta del exportador; forma de financiación de importaciones en la que el banco sustituye con su crédito al del cliente), **acceptance criteria** (CALIDAD criterios de aceptación; conjunto de requisitos que un producto o material debe cumplir para superar una fase de prueba o satisfacer otra serie de requisitos previamente establecidos  $\diamond$  *Acceptance Criteria are the standards required to satisfy the customer's quality expectations and gain the customer's acceptance of the final product; V. receiving inspection*), **acceptance inspection** (COM/CALIDAD control de aceptación, inspección de aceptación; inspección final realizada a un artículo o sistema para determinar si cumple con los estándares *-conform to the standards-* requeridos por su cliente potencial  $\diamond$  *The acceptance inspection includes the simulation of all functions, as well as checking for completeness and workmanship; V. receiving inspection/acceptance*), **acceptance of goods** (DISTRIB aceptación de mercancías; implica "disposición a abonar su importe"  $\diamond$  *Acceptance of goods occurs when the buyer, after a reasonable opportunity to inspect the goods, signifies to the seller that the goods are conforming or that he will take or retain them; V. brand acceptance*), **acceptance test** (ENSAYO/CALIDAD prueba/ensayo de aceptación, encuesta/test de aceptación; prueba utilizada para determinar la conformidad de un producto con respecto a sus especificaciones como base para su aceptación  $\diamond$  *The acceptance test is the last opportunity customers have to make sure that the system is what they asked for; V. user acceptance test*), **acceptance testing** (ENSAYO testing de aceptación  $\diamond$  *Then the acceptance testing is carried out, where only client authority is included; V. acceptance test*), **acceptance/acceptable quality level, AQL** (CALIDAD nivel de calidad aceptable; término estadístico que define el máximo porcentaje de no conformidad (o el número máximo de defectos por cien unidades) que puede ser considerado satisfactorio para efecto del muestreo de aceptación  $\diamond$  *The acceptance quality level, which is the percentage which is acceptable to the buyer, is usually specified, and compliance checked by testing and statistical analysis of the results*), **acceptation** (GRAL/GESTIÓN V. *acceptance*), **accepted, acc** (GRAL/CALIDAD aceptado  $\diamond$  *A series of acceptance criteria leads to a rating of each tile (accepted, not accepted or questionable)*)).

**access**<sup>1</sup> *n/v*: GRAL acceso, entrada  $\diamond$  *Today, information about and access to ceramic materials are available worldwide due to global communication, marketing, and commerce.* [Exp: **access**<sup>2</sup> (GRAL acceder V. *gain access*), **access balcony** (GRAL galería de acceso), **access door** (GRAL puerta de acceso)].

**accessorial** *a*: GRAL complementario, accesorio  $\diamond$  *In the composition other accessorial elements may be present, up to a maximum of 5% by weight of the composition.* [Exp: **accessorial service** (DISTRIB servicio complementario; servicio adicional prestado por el transportista, como almacenaje *-storage-*, envasado *-packing-*, clasificación *-assorting-*, etc. de la mercancía), **accessory**<sup>1</sup> (PRODFIN accesorio; enseres fijos *-fixtures-*, cerámicos o no, tales que toalleros *-towel bars-*, jaboneros *-soap holders-*, portarrollos de papel higiénico *-toilet paper holders-* y objetos similares  $\diamond$  *Our bath accessory lines offer that finishing touch in your favorite style*), **accessory**<sup>2</sup> (GRAL accesorio; de importancia secundaria; no esencial por sí mismo pero que añade belleza o efectividad a algo), **accessory equipment** (GRAL equipo auxiliar, equipo accesorio  $\diamond$  *The use of*

*accessory equipment not recommended by Sure-Lites may cause an unsafe condition; V. fittings; facilities), accessory mineral(s)* (GEO-MIN-CRIST mineral(es) accesorio(s); mineral presente en la roca en una proporción menor al 1% y cuya presencia no es esencial para la clasificación de la roca  $\diamond$  *Mica is usually found as an accessory mineral in china clay; V. secondary minerals; accidental mineral*)].

**accident** *n.*: SEG accidente, siniestro V. *accident at work, industrial accident, occupational accident.* [Exp: **accident at work** (SEG accidente de trabajo/laboral  $\diamond$  *If you have been injured in an accident at work you may have a right to claim accident compensation; V. industrial accident*), **accident benefit** (SEG indemnización por accidente  $\diamond$  *The injured person is not entitled to accident benefit if during this period of disability he/she is eligible for payment under another legislation, such as sick pay; V. indemnity; compensation*), **accident insurance** (SEG seguro de/contra accidentes  $\diamond$  *Accident insurance pays benefits when you become injured as the result of an accident*), **accident occurring in the course of occupational activities** (SEG V. *accident at work*), **accident prevention** (SEG prevención de accidentes, prevención de accidentes laborales; conjunto de medidas y decisiones adoptadas sistemáticamente para prevenir accidentes y paliar sus efectos  $\diamond$  *Accident prevention is also accomplished by conducting work safety inspections, reporting unsafe conditions, providing training and performing regular "check ups" on equipment and tool; V. occupational risk prevention*), **accident proneness** (SEG propensión a sufrir accidentes; concepto que hace referencia a la característica que predispone a una persona a sufrir accidentes con una asiduidad mucho mayor de la habitual; entre los factores que pueden ocasionar esta propensión encontramos la torpeza *-clumsiness-*, el descuido *-carelessness-* la impulsividad *-impulsivity-* la predisposición a asumir riesgos *-predisposition to risk-taking-*, y el deseo inconsciente de provocar accidentes como forma de obtener ganancias secundarias  $\diamond$  *There seems to be strong evidence that accident-proneness exists, but its exact nature and causes are still the subject of study*), **accident repeater** (SEG dado/a a sufrir accidentes, propenso/a a sufrir accidentes  $\diamond$  *So-called accident repeater phenomenon accounts for a sizable percentage of workers' compensation losses in the United States; V. accident-prone/accident prone*), **accident report** (SEG parte de accidente, informe del accidente; notificación del accidente  $\diamond$  *Immediate filing of an industrial accident report is crucial to the case and the settlement of any damages caused by the accident*), **accident risk** (SEG riesgo de accidente  $\diamond$  *It is important to consider accident risk and safety protection in automated production*), **accidental** (GRAL/SEG accidental, casual, contingente, fortuito, imprevisto; cualidad de no ser susceptible de planear o predecir  $\diamond$  *For safety purposes it may be recommendable to wrap the backsides of the porcelain pieces to be supplied with fiber netting so that separation of fragments is avoided in the case of accidental breakage*), **accidental damage** (SEG/MANTNMO daño accidental/por accidente/fortuito, deterioro accidental  $\diamond$  *When applied to hardwood flooring, the multi-layered, ceramic-based finish is durable and reduces wear from ordinary usage and accidental damage*), **accidental injury** (SEG/MANTNMO V. *accidental damage*), **accidental mineral** (GEO-MIN-CRIST mineral accidental; mineral que puede estar o no presente en una roca, a veces en cantidades significativas, pero que no interviene en la definición de la roca V. *accessory mineral*), **accidentated (terrain)** (EXPL-CANT accidentado (terreno)  $\diamond$  *In this accidentated terrain soil formation is hindered by low temperatures or erosion*), **accident-prone/accident prone** (SEG propenso a sufrir accidentes; persona proclive a

sufrir accidentes ◇ *Young workers must be taken care of as they are more accident prone; V. accident proneness*]).

**acclivity** *n*: EXPL-CANT pendiente ascendente, cuesta arriba ◇ *The quarry stands on an acclivity, near the Leeds and Liverpool canal.*

**accommodation**<sup>1</sup> *n*: GRAL alojamiento ◇ *In Cevisama's webpage we also offer a list of hotels and hostels in case you want to search for accomodation by your own.* [Exp: **accommodation**<sup>2</sup> (EXPL-CANT acomodación; espacio disponible para una potencial acumulación de sedimentos), **accommodation**<sup>3</sup> (GRAL acuerdo ◇ *In the event that accommodation cannot be achieved at any particular level, the appropriate officer will provide the reasons with supporting documentation*), **acomodate** (GRAL/INSTAL acomodar, adaptar; alojar; contener; tener espacio para ◇ *To accommodate tiles of various widths, the distance between rails 24a and 24b is variable*)].

**accord** *n/v*: GRAL acuerdo, convenio; concierto; tratado; conformidad; conceder; otorgar; aplicar. [Exp: **accord with, in** (GRAL de acuerdo con ◇ *Its grain size distribution is in accord with joint size*), **accordance** (GRAL acuerdo, concordancia V. *accord*), **accordance with, in** (GRAL de acuerdo con ◇ *Install tile in accordance with manufacturer's printed instructions and the applicable requirements of ANSI A108 Series for the materials being used*), **according to** (GRAL según, de acuerdo con V. *accordance with, in*), **accordingly** (GRAL por consiguiente, teniendo en cuenta lo anterior; consecuentemente)].

**account**<sup>1</sup>, **a/c** *n/v*: GESTIÓN cuenta, informe; descripción, relación V. *bill; invoice*. [Exp: **account**<sup>2</sup> (GESTIÓN contabilizar; anotar una partida o cantidad en los libros de contabilidad -*account books*-), **account books** (GESTIÓN libros de contabilidad), **account for** (GESTIÓN dar cuenta de; rendir cuentas; dar a conocer; informar ◇ *Wall tiles will account for 55% of the total volume of the UK market for ceramic tiles in 2004*), **account manager** (GESTIÓN gestor de cuentas), **account number** (GESTIÓN número de cuenta), **account, settle an** (GESTIÓN liquidar una cuenta), **accountancy** (GESTIÓN contaduría, técnica contable; contabilidad; teneduría de libros; medio cuyo objetivo principal es proporcionar información útil en la toma de decisiones económicas; aunque *accounting* y *accountancy* se utilizan a menudo indistintamente, la primera hace referencia a la metodología y la segunda a la profesión ◇ *Accounting/accountancy attempts to create accurate financial reports that are useful to managers, shareholders, creditors, or owners; V. accounting*), **accountant** (GESTIÓN contable ◇ *Practitioners of accountancy are known as accountants*), **accountant general** (GESTIÓN jefe de contabilidad), **accounting, acc** (GESTIÓN contabilidad; estado de cuentas, contabilidad de costes, rendición o preparación de cuentas; en función atributiva, *accounting* significa "contable" V. *accountancy*), **accounting division/department** (GESTIÓN departamento/división de contabilidad), **accounts** (GESTIÓN contabilidad; cuentas, situación contable V. *accounting*), **accounts department** (GESTIÓN departamento de contabilidad), **accounts receivable, AR** (GESTIÓN cuentas a recibir, cuentas deudoras; importe a cuenta a recibir; dinero que un cliente debe a un compañía en concepto de productos y servicios proporcionados bajo crédito ◇ *You should periodically prepare an accounts receivable aging report*), **accounts, keep the** (GESTIÓN llevar las cuentas)].

**accouple** *v*: INSTAL ensamblar; unir, juntar, especialmente piezas de madera. [Exp: **accouplement** (INSTAL acoplamiento, ensambladura)].

**accumulate** *v*: GRAL acumular; agrupar, juntar o amontonar algo en cantidad ◇ *Be careful the glaze does not accumulate too thickly in certain areas.* [Exp: **accumulation** (GRAL acumulación; acción y efecto de acumular ◇ *Polished finish is not recommended for exterior or interior floors subject to water or grease accumulation*)].

**accuracy** *n*: GRAL precisión, exactitud; exactitud rigurosa en la que no se aprecia ningún tipo de error o desviación ◇ *Electrical conductivity of insulators can be measured with extreme accuracy.* [Exp: **accurate** (GRAL exacto, preciso, fiel ◇ *Mathematical models have been developed that enable accurate prediction of the fracture toughness of covalently bonded ceramics*)].

**ACD** *abbr*: QUIM *V. anode-cathode distance.*

**ACerS** *abbr*: ORG-INST *V. American Ceramic Society.*

**acetate** *n*: QUIM acetato; sal o éster del ácido acético *-acetic acid-*. [Exp: **acetic acid** (QUIM ácido acético; líquido higroscópico *-hygroscopic liquid-* muy utilizado en la síntesis de productos químicos que se produce por oxidación del alcohol etílico y que solidifica a 16,6 °C, es incoloro y tiene un olor punzante, similar al del vinagre ◇ *The American test (ASTM - C555) exposes the glazed ware to acetic acid ( 1 : 20) at 60°C for 30 min*)].

**acetylene** *n*: QUIM acetileno; gas, altamente inflamable, algo más ligero que el aire e incoloro, capaz de producir una llama de hasta 3.000° C ◇ *Approximately 80 percent of the acetylene produced annually in the United States is used in chemical synthesis; V. (oxy-)acetylene torch.*

**Acheson furnace** *n*: MAQELAB horno Acheson ◇ *In the Acheson furnace the stock is arranged in blocks within a horizontal bed, usually perpendicular to the axis of the furnace.*

**Acheson process** *n*: ELABPROC proceso Acheson; proceso industrial para la manufactura del grafito en el que una mezcla de coque *-coke-* y silicio *-silicon-* es sometida a elevadas temperaturas en un horno eléctrico, originando la producción de carburo de silicio *-silicon carbide-* que a los 4150°C pierde todo el silicio dando lugar al grafito ◇ *The Acheson process has by far produced most of the SiC material throughout the ages; V. silicon carbide ceramics.*

**achievement** *n*: GRAL logro, éxito; ejecución; realización ◇ *In the advanced ceramic technologies, materials as obtained in nature are not sufficiently pure to permit the achievement of the properties needed.*

**achromate** *a*: GRAL/GEO-MIN-CRIST *V. achromatic.*

**achromatic** *a*: GRAL/GEO-MIN-CRIST acromático; sin color; en óptica, cristal o instrumento óptico que deja pasar la luz blanca sin descomponerla en sus colores constituyentes -

*constituent colours-* ◇ *When the transmittance of light is needed to be kept at a high level, it is preferable to use an achromatic transparent ceramic glaze.*

**ACI** *abbr:* ORG-INST V. *American Concrete Institute.*

**acicular** *a:* GEO-MIN-CRIST acicular; con/en forma de aguja; dicho de la textura de algunos minerales que se presenta en fibras delgadas que se asemejan a agujas ◇ *The ceramic reinforcing filler is most preferably selected from the group consisting of alumina, silicon carbide, silica and acicular mullite; V. morphology.*

**acid**<sup>1</sup> *n/a:* QUIM ácido; sustancia química, normalmente corrosiva con los metales comunes, que, disuelta en agua, aumenta la concentración de iones de hidrógeno y que se combina con las bases para formar las sales ◇ *After grinding, soluble salts from the raw materials or from the reaction products are removed by washing either in water or acid; V. acid/acidic.* [Exp: **acid**<sup>2</sup> (PROPQUIM-FIS ácido; que tiene las características o propiedades de un ácido; material cuyo índice de basicidad -basicity index- es menor que 1), **acid and alkali resistance** (PROPQUIM-FIS resistencia los ácidos y a los álcalis; hace referencia a la resistencia potencial de un producto a una serie de agentes químicos perjudiciales con los cuales puede entrar en contacto en el día a día ◇ *These characteristics, together with their acid and alkali resistance, and extremely low porosity, give porcelain tiles remarkable qualities that are ideal for major shopping centers, residential and service areas etc.*), **acid brick** (INDAFIN ladrillo ácido ◇ *Acid brick is a special adaptation which withstands repeated exposures to acid, and is used in laboratories and chemical plants*), **acid clay** (MATPRI arcilla ácida; tipo de arcilla de la que se desprenden iones de hidrógeno cuando es disuelta en agua ◇ *By the acid treatment of acid clay, decolorization performance also changes following the change of specific surface and surface acidity*), **acid cleaning** (ELABPROC/MANTNMO limpieza del solado; proceso de limpieza normalmente utilizado para eliminar películas de óxido sobrantes -*excess oxide films*- de la superficie de un producto o lugar ◇ *Acid cleaning involves the circulation of acid at low concentration and can be used for the removal of unwanted oxides and deposited scales from pipe surfaces*), **acid converter (Bessemer)** (MAQELAB convertidor ácido/básico (de Bessemer) V. *Bessemer converter*), **acid deposition** (MEDAMB deposición ácida ◇ *Acid deposition is a type of pollution which washes out of the atmosphere as dilute sulphuric and nitric acids*), **acid descaling** (ELABPROC desescamado con ácido, decapado con ácido; nombre alternativo para "decapar" -*pickling*-, un proceso en el que se utiliza ácido para disolver el óxido y la costra ◇ *The acid descaling is a spray process that removes oxides left on parts from laser cutting process; V. descaling*), **acid dust** (MEDAMB polvo ácido; acumulación de partículas de polvo de gran acidez que se acumulan en la atmósfera y son responsables de gran parte de la contaminación que afecta a las grandes zonas industriales y metropolitanas ◇ *The acid then falls as acid rain or even as dry deposition, known as acid dust*), **acid embossing** (INDAFIN/ELABPROC esmerilado al ácido, mateado al ácido; ataque al ácido; técnica que consiste en la corrosión del cristal usando ácido fluorhídrico -*hydrofluoric acid*- lo cual produce una amplia variedad de tonos, texturas y decoraciones en él ◇ *Acid embossing is one of the most expensive ways of working on glass due to the time taken and the price of the materials used*), **acid etch** (ELABPROC/INSTAL tratar al ácido, grabar al ácido ◇ *The concrete was too smooth and we had to "acid etch" the entire slab before installation of the tile*), **acid etching** (ELABPROC tratado al ácido, ataque ácido profundo; tratado/tratamiento al ácido ◇ *Acid etching is a*

*method of deep etching with acids or other reagents in order to reveal the macrostructure and the presence of defects*), **acid fog** (MEDAMB niebla ácida; niebla cuyas gotas forman una suspensión ácida formada por la mezcla y reacción del agua con contaminantes atmosféricos  $\diamond$  *This product is inflammable and it can be inflammable in contact with acid or acid fog*), **acid frosting / acid-frosting** (ELABPROC mateado al ácido, esmerilado al ácido; técnica que permite deslustrar la superficie de un vidrio o similar con suavidad  $\diamond$  *Glass frosting is the practice of making clear glass have a matte appearance by putting the glass in contact with the fluoride-based acid material*), **acid furnace** (MAQELAB horno ácido; horno revestido *-lined-* de ladrillo ácido, como el ladrillo de sílice *-silica brick-* o el ladrillo de mineral de cromo *-chrome brick-*), **acid gas** (MEDAMB gas ácido; gas natural o cualquier otra mezcla de gases que contiene cantidades significantes de ácido sulfhídrico *-hydrogen sulphide/sulfide-* y dióxido de carbono *-carbon dioxide-* u otros contaminantes similares y que puede formar soluciones ácidas al mezclarse con agua  $\diamond$  *Acid gas emissions from the kiln are important because of the potential of pollutants like hydrogen chloride and sulfur dioxide to irritate the lung; V. sour gas*), **acid gold** (ESMREL OTO ácido (decorativo); forma de decoración en la que el diseño es grabado al ácido primero y luego pintado con oro líquido para su posterior cocción  $\diamond$  *Acid-gold is when a pattern is etched into the ware with hydrofluoric acid and then covered with gold to produce a pattern in relief*), **acid neutralizing capacity, ANC** (PROPQUIM-FIS capacidad ácidoneutralizante; medida de la habilidad/capacidad de una base (agua, suelo, etc.) para neutralizar ácidos añadidos  $\diamond$  *Alkalinity is closely related to the acid neutralizing capacity (ANC) of a solution and ANC is often incorrectly used to refer to alkalinity*), **acid number** (PROPQUIM-FIS/MEDIDA V. *acid value*), **acid O.H. furnace** (MAQELAB V. *acid open-hearth furnace*), **acid open-hearth furnace, acid O.H. furnace** (MAQELAB horno Martin ácido; horno de uso muy limitado hoy en día y cuya solera *-hearth-* está hecha de refractarios ácidos  $\diamond$  *They were constructed of refractory bricks covered with fritted sand (Acid O.H. Furnace) or burned-in magnesite or dolomite (Basic O.H. Furnace); V. open-hearth furnace*), **acid oxide** (QUIM V. *acidic oxide*), **acid rain/rainwater/precipitation** (MEDAMB lluvia ácida; precipitación acuosa con pH inferior a 5,6 y que contiene en disolución los ácidos sulfúrico y nítrico producidos por la combinación de los óxidos de azufre y nitrógeno y otros componentes  $\diamond$  *Some agencies are particularly concerned about the impact of acid rain in historic buildings and monuments*), **acid refractories** (INDAFIN refractarios ácidos; refractarios compuesto esencialmente de sílice y que a temperaturas elevadas reaccionan con bases como los álcalis, la cal y los óxidos básicos; los refractarios ácidos incluyen las arcilla de sílice, de alúmina y refractarios de arcilla  $\diamond$  *Acid refractories, for example, contain a substantial amount of silica which will react chemically with basic refractories, basic slags or basic fluxes*), **acid refractory material** (INDAFIN material refractario ácido  $\diamond$  *For the melting of cast iron the hearth is lined with an acid refractory material*), **acid resistance** (PROPQUIM-FIS resistencia a los ácidos; habilidad de un material a resistir el ataque de los ácidos; en cerámica, el grado más elevado de resistencia a los ácidos se suele obtener sacrificando otras propiedades como la resistencia a los álcalis  $\diamond$  *The acid resistance of vitreous enamelled ware at (nominal) room temperature is determined by exposing the enamelled surface to 10% citric acid for 15 min at  $26 \pm 1^\circ\text{C}$ ; V. chemical resistance*), **acid resistance test, ART** (ENSAYO ensayo de resistencia a los ácidos; ensayo cuyo objetivo es comprobar/analizar el comportamiento de ciertos materiales frente a los ácidos  $\diamond$  *For the acid resistance test (ART), treated enamel samples were exposed to 0.1M lactic acid solution (pH : 4.5) for 1, 3, and 7 days, and the dissolved calcium*

(Ca) and the mineral loss values were measured with atomic absorption spectrometry and transversal microradiography, respectively), **acid resistant** (PROPQUIM-FIS resistente a los ácidos ◊ Use cleansers that contain acids such as vinegar and lemon juice only if you have selected an acid resistant glaze), **acid scaling** (ELABPROC desincrustación ácida ◊ Acid scaling is the process of dipping or spraying metal with acid and then annealing at red heat, to remove oil, rust and dirt before vitreous enamelling), **acid snow** (MEDAMB nieve ácida; precipitación ácida en forma de lluvia ácida congelada ◊ The burning of coal and other fossil fuels leads to the creation of acid rain and in colder temperatures - acid snow, which can have a long-lasting harmful effect on the environment), **acid value, AV** (PROPQUIM-FIS/MEDIDA valor de acidez, índice de acidez; número de acidez; valor del pH ◊ The acid value is the measure of free acid content of a substance and is expressed as the number of milligrams of potassium hydroxide necessary to neutralize the free acids in 1 gram of sample; V. pH value; acidity), **acid wash** (ELABPROC baño ácido, lavar al ácido; proceso químico mediante el cual se acelera el envejecimiento del material y que lo dota de un color agradable, ligeramente rugoso, matizado y sin brillo ◊ Experience has proved that a single light acid wash will usually remove the majority of the scum or staining materials on unglazed ceramic and quarry tiles), **acid washed** (PROPQUIM-FIS lavado al ácido ◊ If you don't like your terrazzo floors it is not difficult to make it look acid washed), **acid-and alkali-resistant grout** (INSTAL mezcla para juntas resistente al ácido y al álcali, lechada resistente al ácido y al álcali; mezcla para juntas que se resiste el contacto prolongado con ácidos y álcalis ◊ The grouting used between the ceramic tiles is resistant to clean water flooding only if it has acid and alkali-resistant grout), **acidic oxide** (QUIM óxido ácido, anhídrido; óxido que o bien reacciona con el agua para formar un ácido o bien reacciona con una base para formar una sal ◊ In some glazes which melt at comparatively high temperatures the only acidic acid used is silica, but for glazes maturing at lower temperatures boric oxide is an essential component), **acidic/acid** (PROPQUIM-FIS ácido; material cuyo índice de basicidad es menor a 1 ◊ Avoid storing food, especially acidic items like tomato juice, wine and vinegar, in ceramics), **acidify** (ELABPROC acidificar-se; hacer-se o converter-se en ácido ◊ Prior to bonding, apply a liquid phosphoric acid solution to remove any biofilm and acidify the glazed procelain surface), **acidity** (PROPQUIM-FIS acidez; grado en el que una sustancia es ácida y que tiene como concepto complementario la basicidad ◊ Some ceramic tiles can be sensitive to high acidity; V. basicity; alkalinity), **acid-proof** (PROPQUIM-FIS a prueba de ácidos, acidorresistente; resistente a los ácidos; cualidad de los materiales que resisten la acción corrosiva de los ácidos ◊ Resinous cement is a term used in chemical engineering for an acid-proof cement based on synthetic resin; V. acid-resisting; acid-resistant), **acid-resistant** (PROPQUIM-FIS V. acid-resisting), **acid-resistant mortar** (INDAFIN mortero antiácido ◊ Koster Silicate Mortar is a two component acid resistant mortar which when applied achieves a seamless layer which can withstand acid attack up to a pH of 1), **acid-resistant product** (PRODFIN producto resistente a los ácidos), **acid-resisting, AR** (PROPQUIM-FIS resistente al ácido, acidorresistente; a prueba de ácidos ◊ Sodium Aluminate is used as a mill addition in the preparation of acid-resisting vitreous enamel slips; V. acid-proof), **acid-resisting brick** (INDAFIN ladrillo resistente a los ácidos; ladrillo refractario de baja porosidad y alta resistencia a gran cantidad de sustancias químicas), **acid-resisting cement** (INDAFIN cemento resistente a los ácidos ◊ The principal types of acid-resisting cements are: silicate, rubber latex, synthetic resin, sulphur cements and bituminous cements), **acid-resisting tile** (PRODFIN azulejo resistente a los ácidos)].

**acknowledge, ack** *v*: GRAL reconocer; certificar, admitir. [Exp: **ackgt** (COM/DISTRIB *V. acknowledgement*), **acknowledge receipt** (COM/DISTRIB acusar recibo, dar por recibido *◇ Please acknowledge receipt of goods*), **acknowledgement, ackgt** (COM/DISTRIB acuse de recibo, confirmación; reconocimiento *◇ On goods receipts, we are planning to send a confirmation to the vendor; it's like an acknowledgement for goods receipts*), **acknowledgement of order** (COM/DISTRIB acuse de recibo del pedido, confirmación del recibo del pedido *◇ The acknowledgement of order is naturally important to your customer, if only to assure him that you have received and accepted the order, and intend to comply with it*)].

**ACM abbr**: QUIM/SEG *V. asbestos containing material.*

**ACMI abbr**: ORG-INST *V. Art and Creative Materials Institute.*

**ACOP abbr**: SEG *V. Approved Code of Practice.*

**acoustic a**: GRAL acústico. [Exp: **acoustic attenuation** (PROPQUIM-FIS atenuación acústica; transformación en calor de la energía contenida en las ondas acústicas *◇ Knowledge of acoustic attenuation in ceramics is also needed to calibrate acoustic techniques used for defect detection and characterization*), **acoustic barrier** (PROPQUIM-FIS barrera acústica *◇ Acoustic ceiling tiles make a great acoustic barrier for noisy upstairs guests*), **acoustic behaviour/performance** (PROPQUIM-FIS comportamiento acústico *◇ Due to their extremely low density and high acoustic performance, our tiles are eminently suitable for installation into existing buildings*), **acoustic emission, AE** (ENSAYO/PROPQUIM-FIS emisión acústica; fenómeno que genera ondas elásticas transitorias debido a la liberación rápida de energía a partir de fuentes localizadas, o las ondas transitorias generadas de este modo; todos los materiales producen EA durante la creación y propagación de fisuras y durante la deformación *◇ The project seeks to increase confidence in the acoustic emission technique for monitoring the progress of cracking, integrating it into the wider quantitative non-destructive evaluation (NDE) toolbox*), **acoustic emission technique, AE** (ENSAYO técnica de emisión acústica; técnica no destructiva que permite monitorizar la formación de defectos en materiales estructurales *◇ Above all, acoustic emission was found to be an effective way of detecting fatigue and fracture behaviors of materials*), **acoustic insulation** (INSTAL/PROPQUIM-FIS aislamiento acústico; conjunto de materiales, tecnologías y técnicas desarrolladas con el fin de aislar o atenuar el nivel sonoro en un determinado espacio *◇ Acoustic insulation material used for underfloor impact sound reduction*), **acoustic microscopy** (ENSAYO microscopía acústica; método no destructivo utilizado para detectar y localizar defectos/imperfecciones superficiales o subsuperficiales - *subsuperficial*- así como cavidades *◇ Acoustic microscopy provides non-destructive investigation of opaque devices; V. scanning laser acoustic microscopy*), **acoustic tile** (PRODFIN placa acústica *◇ Sound-absorbing surfaces, in the form of acoustic tile, have been applied to the ceilings of all rooms*), **acoustic velocity** (MEDIDA velocidad acústica, velocidad de propagación; velocidad de transmisión de la energía sonora a través de un medio *◇ In ceramics, because the acoustic velocity is very large and small defects are of interest, frequencies of the order of 50 MHz and 100 MHz have to be used*), **acoustic wave** (PROPQUIM-FIS onda acústica, onda sonora; fenómeno físico originado por la vibración de partículas de aire liberadas en el espacio desde una fuente sonora produciendo oscilaciones *◇ The speed or velocity of an acoustic wave through a*

*medium is related to the porosity of the medium*), **acoustical sealant** (INSTAL aislante acústico, sellador acústico), **acoustics** (GRAL acústica ◊ *Acoustics is the science concerned with the production, control, transmission, reception, and effects of sound*), **acoustic-velocity measurement** (ENSAYO medición de la velocidad de propagación; prueba no destructiva para la detección de daños o desperfectos -*damage detection*- ◊ *Acoustic-velocity and propagation-loss measurements should be used to characterize ceramics and correct the manufacturing process until the desired material strength is obtained*), **acousto-optic effect, AO effect** (PROPQUIM-FIS efecto acusto-óptico ◊ *An acousto-optic effect is a variation of the refractive index of a material caused by interaction with acoustic energy in the form of a wave or pulse*)].

**across** *adv*: GRAL transversalmente, a través de; a través; de un extremo a otro ◊ *Measure this section, then draw a grid of lines across your wall based on these measurements.*

**acrylic** *n/a*: MTRLS acrílico; fibra o material plástico obtenido por polimerización del ácido acrílico o de sus derivados ◊ *Apply an acrylic top-coat on the tile surface.* [Exp: **acrylic acid** (ESMREL ácido acrílico; líquido incoloro, de olor picante y soluble en agua que forma polímeros con facilidad y se emplea en la fabricación de materiales plásticos y pinturas), **acrylic emulsion** (ESMREL emulsión acrílica ◊ *Acrylic emulsions are commercial glaze additives that can be used for a variety of applications including suspending glaze in the bucket, extending brushability, and hardening the unfired glaze surface*), **acrylic fibre** (MTRLS fibra acrílica ◊ *Care must be taken to remove the acrylic fiber from the tile surface*), **acrylic plastic glaze** (INDAFIN/ESMREL vidrio plástico acrílico), **acrylic plastics** (INDAFIN plásticos acrílicos; familia de materiales plásticos sintéticos basados en resinas y obtenidos por la polimerización -*polymerization*- de monómeros acrílicos -*acrylic monomers*-; contienen uno o más derivados del ácido acrílico ◊ *Like all plastics, acrylic plastics are polymers*), **acrylic resin** (ESMREL resina acrílica; resina obtenida del ácido acrílico ◊ *Experience will show you that water-based glazes work best over paints that have a large acrylic resin content; V. polyester resin*), **acrylic top-coat** (ESMREL acabado acrílico, última mano acrílica; capa de acabado acrílica ◊ *Apply an acrylic top-coat on the tile surface*)].

**ACS** *abbr*: ORG-INST V. *American Ceramic Society.*

**actinic** *a*: PROPQUIM-FIS actínico; radiaciones que tienen la propiedad de ejercer una acción química sobre determinadas sustancias ◊ *The actinic darkening of the colors of certain glazes and bodies is described in the article.* [Exp: **actinic glass** (INDAFIN vidrio actínico; vidrio que reduce la transmisión de rayos infrarrojos y ultravioletas -*infrared and ultraviolet rays*- ◊ *It is made from low actinic glass to protect light sensitive materials and is useful for condensing materials with boiling points above 150°C*), **actinic-green glass** (INDAFIN vidrio actínico verde ◊ *Most bottles were made of colourless glass, but cobalt blue was sometimes used, particularly for syrups, and actinic green glass was popular for poisons*)].

**action** *n*: GRAL acción; fuerza con la que los cuerpos físicos o los agentes químicos actúan unos sobre otros ◊ *Ceramics may refer to ceramic, inorganic non-metallic materials whose formation is due to the action of heat.* [Exp: **action level** (CALIDAD V. *action limit*), **action limit** (CALIDAD límite de control; límite representado por el valor

más alto o más bajo en un gráfico de control de calidad *-quality control chart-* y por el que si los valores obtenidos están fuera de este límite se requerirá algún tipo de acción el límite de alerta suele ser 1 test de cada 40 con un artículo defectuoso  $\diamond$  *The samples analyzed did not have levels that exceeded the corresponding action limit; V. quality control, quality management*].

**activate** *v.*: GRAL activar, accionar; poner en funcionamiento o hacer que algo (por ejemplo, un proceso) sea o parezca más vivo  $\diamond$  *Likewise, it will be understood that computer logic may also be used to evaluate the readings and activate kiln control equipment, i.e., valves.* [Exp: **activated alumina** (QUIM alúmina activada; compuesto químico que se usa como desecante; forma porosa y adsorbente que se produce calentando los hidratos a temperatura superficie para expulsar la mayor parte del agua combinada  $\diamond$  *A transparent glass is dipped in a bath of a 10 weight percent colloidal alumina dispersion in water to provide a coating thereon, which is dried at 100.degree. C. for 20 minutes and then sintered at 550.degree. C. for one hour so that the glass is coated with a transparent activated alumina layer*), **activated carbon** (MTRLS carbón activado/activo; término que designa un carbón amorfo (granular o en polvo) caracterizado por su elevada superficie específica, consecuencia de su gran porosidad y que es utilizado principalmente como absorbente  $\diamond$  *Activated carbon can be manufactured in powder, granular, pellet, spherical and block forms*), **activated clay** (TRANSMTRLS arcilla activada; arcilla coloidal activada por medio de un agente alcalino o ácido  $\diamond$  *The layered structure of activated clay attracts and adsorbs moisture onto its surface and between its layers*), **activated mine** (EXPL-CANT mina en explotación *V. operational mine*), **activation** (ELABPROC activación  $\diamond$  *When the firing temperature is increased to 1000°C, a certain activation of the interaction process takes place in the glaze-ceramics contact zone*), **activation energy** (QUIM energía de activación; energía mínima requerida para que tenga lugar una reacción; energía que necesitan los reactivos para formar el compuesto activado, esto es, la barrera de energía que han de salvar las moléculas para que se produzca la reacción química  $\diamond$  *You can think of the activation energy as a barrier to the reaction*), **activation energy for diffusion, AGD** (QUIM energía de activación para la difusión; energía proporcionada por el calor y necesaria para que un átomo que se difunde y que, por tanto, debe moverse entre los átomos circundantes para ocupar su nueva posición, atravesase una barrera de energía potencial  $\diamond$  *The activation energy for diffusion AGD was calculated from the growth rate and the equilibrium immiscibility data*), **active** (QUIM activo  $\diamond$  *In the sintering of power compacts, the grain boundaries play a very active role*), **active agent** (QUIM agente activo; sustancia catalítica que produce la aceleración de la reacción química  $\diamond$  *Alumina also serves as the raw material for a broad range of advanced ceramic products and as an active agent in chemical processing; V. surface active agent, surfactant*), **active brazing** (INSTAL soldadura activa  $\diamond$  *The active brazing process is frequently employed for the deposition of metals on nonmetallic materials, including ceramics, and for joining nonmetallic materials to metals; V. brazing*), **active metal** (QUIM metal activo; cualquier elemento de los grupos I-A y II-A (a excepción del magnesio) los cuales son fácilmente oxidables y reaccionan enérgicamente con el agua dando como productos el hidróxido o base correspondiente acompañado de desprendimiento de hidrógeno en forma de gas  $\diamond$  *This active metal promotes wetting and bonding of the braze metal to the ceramic when included in the braze compositio; V. noble metal*), **active mine** (EXPL-CANT *V. operational mine*), **active solids** (QUIM sólidos activos; sólido poroso con propiedades adsorbentes y usado en las separaciones

cromatográficas -*chromatographic separations*- ◇ *Active solids are usually measured as a weight percent of the total*].

**activity** *n*: GRAL actividad ◇ *Their common denominator is the intense activity that goes on in them and thus, high or very high exposure to mechanical, physical and chemical action and agents. [Exp: **activity-based costing, ABC** (GESTION método de costes ABC (Activity Based Costing), método ABC; costes basados en actividades; asignación de costes por actividades; herramienta de gestión para la planificación y el control que permite conocer el flujo de las actividades (y por lo tanto de su coste) a lo largo de la organización ◇ *The Activity Based Costing is a managerial costing approach for the local manager to measure the historical cost of resources consumed and output produced at the activity level*), **activity-based management, ABM** (GESTIÓN gestión de costes basada en las actividades ◇ *Activity-Based Management (ABM) uses detailed economic analyses of important business activities to improve strategic and operational decisions*)]].*

**actual** *a*: GRAL real, efectivo, verdadero, visible; se dice de lo que existe, sucede o se usa en el tiempo de que se habla; "actual" referido al tiempo en que actualmente está alguien se traduce por *current* o *present* ◇ *Dictionary definitions must reflect the actual use of words, without straying too far from what is precisely and technically correct. [Exp: **actual cost** (COM/GESTIÓN coste real, coste efectivo ◇ *The actual cost to manufacture a product is the total of direct material, direct labor, and factory overhead*), **actual damages** (GESTIÓN daños efectivos/reales ◇ *Basic is the rule that to recover actual damages, the amount of loss must not only be capable of proof but must actually be proven with reasonable degree of certainty*), **actual delivery** (DISTRIB entrega efectiva; entrega efectiva de las materias primas o productos, normalmente dos o tres días después del aviso de entrega -*delivery notice*- ◇ *The Company may store the goods until actual delivery and charge the buyer for the reasonable costs (including insurance) of delivery and storage*), **actual market** (COM mercado real; mercado compuesto por un grupo de personas que necesita un determinado producto o servicio, está interesado en adquirirlos y posee los medios financieros necesarios para ello ◇ *Assure yourself of using a professional with knowledge of costs and values in the actual market*), **actual market value** (COM valor actual de mercado ◇ *The closer your price is to actual market value -what a knowledgeable seller will accept and a knowledgeable buyer will pay- the sooner it will sell*), **actual notice** (GESTIÓN notificación efectiva ◇ *Actual knowledge is notice delivered in such a way as to give legally sufficient assurance that actual knowledge of the matter has been conveyed to the recipient; V. constructive notice*), **actual price** (COM/GESTIÓN precio efectivo/real ◇ *The actual price depends on factors which include pick-up location and items of unusually heavy weight*), **actual production** (COM/GESTIÓN producción real/verdadera ◇ *Actual production, however, increased from 32 million square meters in 1993*), **actual stock** (COM/GESTIÓN existencias reales, actual stock; abastecimientos reales, mercancía almacenada ◇ *Please note that actual stock levels may differ from what is currently listed on the web*), **actual time** (GRAL/ELABPROC tiempo real, tiempo empleado ◇ *The weighted average drying time listed above is based on the actual time in the dry kiln*)]].*

**acute** *a*: SEG agudo, grave, profundo, intenso ◇ *Infection caused by inhalation of fine dust results in respiratory disease in an acute form from short concentrated exposures or in a chronic form from long continued exposure.* [Exp: **acute angle** (GRAL ángulo agudo; ángulo positivo que mide menos de 90° ◇ *Forking makes reference to the separation of a propagating fracture into two or more new fractures at acute angles; V. obtuse angle*)].

**ad** *n*: GESTIÓN V. *advert, ad.* [Exp: **ad** (GESTIÓN V. *advertisement*)].

**A-D** *abbr*: ELABPROC V. *Anderson Darling test.*

**adamantine**<sup>1</sup> *n/a*: TRANSMTRLS/ELABPROC granalla de acero; abrasivo fabricado por trituración de acero duro y utilizado en numerosas aplicaciones como el tratamiento de superficies y el aserrado de bloques de granito [Exp: **adamantine**<sup>2</sup> (PROPQUIM-FIS diamantino, adamantino; que tiene una dureza y un brillo que recuerdan a los del diamante ◇ *The mineral occurs as sharp, vitreous to adamantine, transparent to translucent, orange-yellow, orange, reddish brown, and black crystals, up to 5 mm in diameter*), **adamantine drill** (EXPL-CANT barrena adamantina; taladro diamantino; sonda de granalla de acero; útil de granalla de acero ◇ *An adamantine drill is a core drill with hardened steel shot pellets that revolve under the rim of the rotating tube, employed in rotary drilling in very hard ground*), **adamantine lustre** (PROPQUIM-FIS brillo diamantino, brillo adamantino; lustre brillante y centelleante -*sparkling*-, como de diamante, que ocurre en minerales transparentes con un elevado índice de refracción -*refractive index*- ◇ *Diamond is the best known material to be described as having adamantine lustre, although anglesite, cerussite and corundum in some of its forms are also described in this way*)].

**adamellite** *n*: GEO-MIN-CRIST adamellita ◇ *Adamellite is an intrusive igneous rock (solidified from a liquid state) that contains plagioclase feldspar, orthoclase feldspar, and quartz.*

**Adams chromatic value system** *n*: ESMREL sistema de valor cromático de Adams; sistema empleado en el examen/análisis/control de los colores cerámicos y basado en la designación cuantitativa del color en base a la claridad, la cantidad de rojo o verde y la cantidad de amarillo o azul ◇ *Among the color coordinate systems that might be used, the Adams chromatic value system is the most advisable.*

**adapt** *v*: GRAL adaptar-se; acomodar o ajustar algo a otra cosa; hacer que un objeto o mecanismo desempeñe funciones distintas de aquellas para las que fue creado ◇ *They must adapt their ceramic products to the values and cultural patterns of the society, and then find a way in which these products can be placed.* [Exp: **adaptable** (GRAL adaptable, capaz de ser adaptado o adaptarse ◇ *The new, modern and adaptable range of porcelain floor tiles can be seen in the latest Aspects 30-page colour brochure*), **adaptation** (GRAL adaptación ◇ *Uncertainty factors are also involved in the adaptation of fauna to the effects of mining operations*), **adapter/adaptor** (GRAL adaptador; dispositivo intermedio utilizado para conectar dos objetos de diferente tamaño, como tubos o mangueras de pasos de rosca no coincidentes; dispositivo que, montado sobre una herramienta o un equipo, permite que éstos sean utilizados para fines distintos de

aquellos para los que se crearon ◊ *Voltage & amperage adaptors allow you to operate a 240 volt oven using a 120 volt temperature controller*).

**add** v: GRAL añadir, sumar, agregar ◊ *Be careful not to add too much water as glazes that are too thin can settle in the bottom of the container.* [Exp: **added** (GRAL añadido, adicional; suplementario), **addition** (GRAL adición, agregación; añadido; aditivación; suma ◊ *With the addition of the oxides of manganese and iron a black colour can be produced*), **additional** (GRAL adicional ◊ *'Insulating firebricks' have the additional advantage of acting as good insulators due to the large pockets of air in the matrix of the brick*), **additional requirement** (GRAL exigencia adicional ◊ *Assessors manual does not establish additional requirement for special tools*), **additive** (QUIM aditivo; sustancia que se agrega a otras para modificar sus propiedades físicas y químicas y por tanto para darles cualidades de que carecen o para mejorar las que poseen ◊ *The exact function of this additive, which inhibits discontinuous grain growth and permits complete elimination of porosity during the final stages of sintering, has long been in dispute*), **additives for processing** (QUIM V. *processing additives*), **additional freight** (DISTRIB flete adicional)].

**address**<sup>1</sup> v/n: GRAL dirección; señas, domicilio. [Exp: **address**<sup>2</sup> (GRAL dirigir-se, consignar), **addressee** (DISTRIB consignatario, destinatario ◊ *When the addressee of the pallet of goods receives it, he or she will note the condition of the devices, and any damage to the goods occurring in shipment can be more readily attributed to the shipper*)].

**adhere** v: GRAL/ELABPROC adherir; unir, ligar, aglutinar o pegar dos elementos entre sí ◊ *The figures are pressed in a biscuit pottery mould separately from the ware and are made to adhere to the ware by means of clay slip.* [Exp: **adhered** (GRAL adherido; ligado, aglutinado ◊ *Although tiles have a visible surface and usually a surface which is intended to be adhered and bears a back panel, they may have identical surfaces without a 'panel or marking'; V. *adhere**), **adherence** (PROPQUIM-FIS adherencia; fuerza de la unión entre dos materiales, especialmente entre el revestimiento o capa de recubrimiento y el sustrato ◊ *ASTM C313 specifies a test for the 'Adherence of Porcelain Enamel and Ceramic Coatings to Metal'*), **adhesion** (PROPQUIM-FIS adhesión, adherencia, poder adherente; fuerza de atracción intermolecular entre las superficies de dos cuerpos distintos que están en contacto; propiedad de un recubrimiento o sellante para pegarse a la superficie en la que se aplica ◊ *The same forces (the London-van der Waals forces) cause adhesion of solids to solid surfaces; V. *adherence**), **adhesion failure** (PROPQUIM-FIS/INSTAL defecto de adherencia; en el ámbito cerámico, término que indica el despegado del azulejo del muro o pared ◊ *This is usually a result of adhesion failure between the ceramic tiles and the bedding adhesive, or between the cementitious render and the concrete*), **adhesion force** (PROPQUIM-FIS fuerza adherente, fuerza de adhesión ◊ *The adhesion forces between nonconductors are smaller than between conductors*), **adhesion test** (ENSAYO ensayo de adherencia, prueba de adherencia; método de ensayo usado para determinar la adecuación de la adhesión de un recubrimiento a un sustrato ◊ *A layer of tile grout is applied on tile adhesive for tensile adhesion test*), **adhesional** (PROPQUIM-FIS adhesivo ◊ *There exists the physical problem of adhesional and frictional interaction between the grains*), **adhesive** (INSTAL adhesivo, cola, pegamento; sustancia utilizada para pegar entre sí materiales sólidos al

ser interpuesta entre ellos, por ejemplo, un azulejo y una superficie ◇ *The grid is fixed to the base to be tiled, using a little tile adhesive; V. bonding material*), **adhesive cement** (INDAFIN/INSTAL cemento adhesivo; sustancia sintética capaz de unir entre sí materiales sólidos ◇ *Apply adhesive cement to floor or wall material to join and adhere foundation material*), **adhesive insulating tape** (INSTAL cinta aislante adhesiva V. *adhesive tape*), **adhesive layer** (INSTAL capa de unión, capa adhesiva ◇ *The adhesive layer must be between 3 and 5 millimeters thick; V. bonding layer*), **adhesive medium** (MTRLS/ESMREL V. *vehicle*), **adhesive tape** (GRAL/INSTAL cinta adhesiva ◇ *This invention relates to adhesive tape, specifically to an adhesive tape useful for applying caulk or grout in ceramic tile corners*), **adhesive-backed tiles** (PRODFIN loseta con adhesivo al dorso ◇ *Adhesive-backed tiles, in 9 - 12 inch squares, are easy for a do-it-yourselfer to and provide decorative flexibility*), **adhesivity** (PROPQUIM-FIS adhesividad, adherencia, adherencia; propiedad que mide la fuerza interna de un adhesivo en el mismo plano de la adherencia ◇ *Thanks to its quick (only 10 minutes) and high adhesivity it is suitable for joining frames*), **adhesive** (INSTAL V. *adhesive*).

**adiabatic** *a*: INDAFIN adiabático; indica un proceso de transformación termodinámica experimentada por un sistema sin que haya intercambio de calor con otros sistemas ◇ *The development of adiabatic engines is still ongoing using a variety of ceramic components and insulation strategies*. [Exp: **adiabatic diesel engine** (INDAFIN motor diesel adiabático ◇ *The adiabatic diesel engine, whose main material of fabrication is ceramics, is an insulated engine that does not require a liquid coolant for prevention of overheating of the engine components*)].

**adit** *n*: EXPL-CANT galería, entrada; acceso; bocamina; socavón; tipo de entrada horizontal o casi horizontal a una mina subterránea ◇ *The picture shows the tunnel or adit leading to an underground working*. [Exp: **adit end** (EXPL-CANT frente de mina; frente de socavón ◇ *The adit end is the furthest end from the surface, ie, the location where miners work*)].

**adjacent** *a*: GRAL/EXPL-CANT adyacente, colindante; contiguo ◇ *The ware is pushed in opposite directions in adjacent passages; V. abutting; adjoining*.

**adjoining** *a*: GRAL colindante, contiguo ◇ *First, at such thicknesses the molecular configurations will be influenced by the surface forces from the adjoining crystalline grains; V. adjacent-, abutting*. [Exp: **adjoining owner** (GRAL propietario colindante), **adjoining parts** (GRAL partes adyacentes)].

**adjust** *v*: GRAL ajustar, acoplar; conformar, acomodar, apretar algo a otra cosa de manera que no haya discrepancia entre ellas y concuerden ◇ *If the additional water is not needed hold it back to the end and add it gradually to adjust the viscosity and density*. [Exp: **adjustable** (GRAL ajustable; graduable, regulable ◇ *It is vertical and horizontally adjustable; V. adjust*), **adjustable speed** (MAQELAB velocidad regulable/ajustable/variable ◇ *The kiln rotates with an adjustable speed of approximately 1 rpm*), **adjustable speed drive, ASD** (GRAL V. *variable speed drive*), **adjustment** (MAQELAB ajuste, adaptación; verificación; relación mecánica que existe entre dos piezas que pertenecen a una máquina o equipo industrial al encajar o acoplarse

una de ellas en la otra; acción de efecto de ajustar o ajustarse, de concordar  $\diamond$  *After moisture adjustment, the tiles are loaded in saggars and fired in the shuttle kiln*].

**adjuvant** *n*: QUIM adjuvante  $\diamond$  *Adjuvants are agents which modify or facilitate the effect of other agents while having few if any direct effects when given by themselves; V. admixture.*

**ADM** *abbr*: ELABPROC V. *aerosol deposition method.*

**admissible** *a*: GRAL/CALIDAD V. *acceptable.*

**admit** *v*: GRAL admitir  $\diamond$  *Design methods for ceramic components must admit size dependence.*

**admix** *v*: ELABPROC mezclar, dosificar  $\diamond$  *A standardised methylene blue solution is admixed incrementally in a dilute suspension of the clay.*

**admixture** *n*: QUIM coadyuvante, aditivo; producto químico que, añadido a otra sustancia, aumenta el valor de ciertas de sus características como el color, la impermeabilización, la resistencia, etc. sin alterar su naturaleza  $\diamond$  *This admixture determines the conductivity value of solid solutions.*

**adobe** *n*: CONST adobe; masa de barro que se mezcla en ocasiones con paja, moldeada en forma de ladrillo y secada al aire, generalmente empleada en la construcción de paredes o muros. [Exp: **adobe brick** (CONST adobe, ladrillo sin cocer  $\diamond$  *An adobe brick is made of clay mixed with water and an organic material such as straw or animal dung*)].

**adopt** *v*: GRAL adoptar  $\diamond$  *ABO3 oxides which adopt the perovskite structure form an important group of compounds possessing many useful and interesting physical properties.* [Exp: **adoption** (GRAL adopción  $\diamond$  *Since its adoption in the 1890s, new designs, improved processing equipment and better materials technology have met the increasing demands of actual market*)].

**adsorb** *v*: QUIM adsorber; acción de atraer y retener en la superficie de un cuerpo moléculas o iones de otro cuerpo  $\diamond$  *It may reduce the degree to which your bisque body adsorbs water when glaze is applied over your underglaze decoration.* [Exp: **adsorbed** (PROPQUIM-FIS adsorbido  $\diamond$  *The difference in behavior between these two materials appeared to be due to the thickness of the adsorbed layer of the lubricant*), **adsorbed water** (QUIM agua adsorbida; agua que es retenida en las superficies de un material por fuerzas electroquímicas *-electrochemical forces-* y poseedora de propiedades físicas sustancialmente diferentes a las del agua absorbida o el agua combinada químicamente a la misma temperatura y presión  $\diamond$  *The present study concerns the nature of adsorbed water and its effect on the interaction between two surfaces*), **adsorption** (PROPQUIM-FIS adsorción; proceso por el cual átomos, iones o moléculas son atrapadas o retenidas en la superficie de un material; en contraposición, la absorción es un fenómeno de volumen  $\diamond$  *Finally, the pores are blocked either by multilayer adsorption or by capillary condensation*)].

**ADU abbr:** ESMREL V. *ammonium diuranate*.

**advance** *n/v*: GRAL avance, progreso, avanzar, adelantar ◇ *Japan expects that its advance in the ceramic area will help it move forward in these lagging technologies*. [Exp: **advance freight, A/F** (DISTRIB flete prepago/abonado por anticipado, anticipo sobre flete; anticipos que se efectúan para hacer frente a los gastos generales ◇ *Advance freight will be received and stored for up to 30 days prior to the show at no additional charge*), **advance of fire (in chamber kiln)** (MAQELAB avance de fuego), **advance purchase** (COM compra con pago anticipado ◇ *Advance purchase is required*), **advanced** (GRAL avanzado ◇ *This effect may be decisive for the applicability of ceramics in advanced components*), **advanced ceramics** (PRODFIN cerámica avanzada, cerámica técnica; cerámica fina; composiciones con alto grado de pureza, constituidas por partículas ultrafinas, sinterizadas y tratadas bajo condiciones perfectamente controladas cuya diferencia fundamental con la cerámica tradicional es que ésta se basa principalmente en silicatos y arcillas, mientras que la cerámica avanzada incluye nitruros, carburos, óxidos, carbonatos, etc.; los materiales cerámicos avanzados poseen propiedades especiales, como su alta resistencia a la temperatura, a la corrosión y al uso, así como propiedades eléctricas y ópticas que los hacen muy útiles para un gran número de aplicaciones ◇ *Advanced ceramics for structural applications are present in engineering parts subjected to complex solicitations; V. traditional ceramics*), **advanced manufacturing technology, AMT** (ELABPROC tecnología de fabricación avanzada; conjunto de procesos productivos en los que se aplica un enfoque integrador de los sistemas más modernos, tanto de equipos y soportes físicos *-hardware-*, como de programación *-software-*, y de optimización del empleo de recursos humanos ◇ *However, advanced manufacturing technologies such as HIP produce near net-shape components requiring very little grinding and polishing*), **advanced structural ceramics** (PRODFIN cerámica estructural avanzada; productos/materiales cerámicos, a menudo utilizados como miembros estructurales (de ahí su nombre) que demuestran propiedades mecánicas mejoradas en condiciones de máxima exigencia ◇ *Advanced structural ceramics have an especially high potential to resolve a wide number of today's material challenges in process industries, power generation, aerospace, transportation and military applications*), **advanced technology** (GRAL tecnología punta, tecnología avanzada ◇ *All our products are manufactured using excellent materials and advanced technology, ensuring that the quality is reliable and stable*)].

**advantage** *n*: GRAL ventaja ◇ *The intended purpose may well require some porosity to gain another more important advantage (i.e. stability in the kiln, resistance to blistering)*.

**adverse** *a*: GRAL adverso, desfavorable; hostil; contrario ◇ *One of the current thrusts in ceramic development is the radical improvement in the ability of ceramics to withstand such stresses for long periods of time, at high temperatures, and in adverse environments*. [Exp: **adverse climatic conditions** (GRAL condiciones climáticas adversas), **adverse effect** (GRAL efecto negativo, efecto negativo ◇ *These normally cannot be used in glazes because they have adverse effects on the slurry's fluidity, viscosity, thixotropy, or make it difficult to achieve or maintain the desired specific gravity*)].

**advert, ad** *n*: GESTIÓN anuncio; forma abreviada de advertisement ◇ *The Tile Association will not publish adverts which misuse trademarks, make false claims or contravene UK legislation; V. advertisement.* [Exp: **advertise** (GESTIÓN anunciar-se; dar(se)/hacer(se)publicidad/propaganda, poner un anuncio ◇ *Many tile manufacturers advertise their tiles with a lifetime guarantee*), **advertise a post** (GESTIÓN anunciar una vacante/puesto de trabajo), **advertise for** (GESTIÓN ofrecer con un anuncio un puesto de trabajo; en general, buscar mediante un anuncio ◇ *The company has advertised for a sales manager*), **advertisement** (GESTIÓN anuncio, propaganda; publicidad; transmisión de un mensaje publicitario mediante un soporte visual o auditivo V. *advert, ad*), **advertiser** (GESTIÓN anunciante ◇ *No other company or person should contact this advertiser for solicitation for any product or service*), **advertising** (GESTIÓN publicidad, propaganda; técnica del marketing mix que tiene como objetivo fundamental la creación de una imagen de marca así como recordar, informar o persuadir al público para mantener o incrementar las ventas de los bienes o servicios ofertados ◇ *The advertising industry is large and growing; V. publicity*), **advertising agency/agent** (GESTIÓN agencia/agente de publicidad), **advertising appeal** (GESTIÓN reclamo publicitario ◇ *The advertising appeal is something that moves people, speaks to their wants or need, and excites their interest*), **advertising blitz** (GESTIÓN campaña publicitaria intensiva), **advertising campaign/drive** (GESTIÓN campaña publicitaria; conjunto de mensajes publicitarios que comparten una idea central y una temática y que aparecen en distintos medios de comunicación a lo largo de un periodo de tiempo ◇ *There are a series of tips on how to launch an effective advertising campaign*), **advertising outlay** (GESTIÓN gasto publicitario ◇ *It is generally supposed that there is a relation between advertising outlay and sales*), **advertising survey** (GESTIÓN encuesta de mercado con fines publicitarios)].

**advice** *n*: GRAL recomendación; consejo, asesoramiento ◇ *If you are unsure, get complimentary professional advice from a design consultant.* [Exp: **advice note** (COM albarán, nota de consignación/expedición, aviso de remesa; nota de aviso que el remitente de las mercancías envía al destinatario comunicándole la salida de la expedición ◇ *Advice note must be forwarded on the day the goods are despatched; V. arrival notice; dispatch note*), **advice, as per** (DISTRIB nota de expedición, según, según aviso), **advisable** (GRAL aconsejable ◇ *It is advisable therefore to select tiles with the highest level of resistance to this type of product; V. advise*), **advise** (GRAL aconsejar ◇ *Talleres FORO SA. has got a Technical Department whose aims are to advise our clients, as well as to design and supervise their plants*)].

**AE abbr**: ENSAYO/PROPQUIM-FIS V. *acoustic emission.*

**AE abbr**: ENSAYO V. *acoustic emission technique.*

**AEA abbr**: INDAFIN V. *air-entraining agent, air entraining agent.*

**AEA abbr**: INDAFIN V. *air-entraining admixture, air entraining admixture.*

**Aebi kiln** *n*: MAQELAB horno Aebi.

**AENOR abbr**: ORG-INST V. *Spanish Association of Normalisation and Certification.*

**aerate** *v*: ELABPROC/GRAL airear, ventilar; hacer que el aire o el gas pasen a través de algo  
 ◇ *Other materials can be added, including grog that helps aerate the clay and prevents warping and speeds firing.* [Exp: **aerage** (GRAL ventilación), **aerated** (GRAL/PROPQUIM-FIS ventilado, aireado *V. aerate*), **aerated concrete** (INDAFIN hormigón aireado, hormigón aerocluso; hormigón ligero que contiene multitud de pequeñas burbujas por efecto de la adición de un producto aireante y que se coloca debajo de los suelos ◇ *Aerated concrete is strong, lightweight, energy efficient, fire resistant and has good sound insulation; V. air-entrained concrete; occluded air cement*), **aeration** (ELABPROC aireación, insuflación de aire, aeración; proceso por el cual se hace circular, se mezcla y se disuelve el aire en un líquido o sustancia ◇ *Aeration will help break up the clay and improve the overall health of your soil*), **aeration of cement** (INDAFIN aireación del cemento ◇ *The aeration of cement can be described as the effect of the atmosphere on portland cement during storage*)].

**aerogel** *n*: MTRLS aerogel; sustancia coloidal *-colloidal substance-* formada por la sustitución del líquido contenido en un gel por un gas, obteniendo como resultado un sólido de muy baja densidad y altamente poroso, con destacadas propiedades como su enorme capacidad aislante ◇ *Aerogel is the lightest and lowest-density solid known to exist.*

**aerograph** *n*: INSTR aerógrafo, cup gun; pistola de aire comprimido, cargada con pintura, que emplea aire a presión para dispersar un pigmento en partículas muy finas  
 ◇ *This aerograph has been designed to create flaming effects with liquid glazes.* [Exp: **aerographer** (INSTR *V. aerograph*), **aerographic** (ESMREL aerográfico ◇ *High content of lead in them is harmful to the workers handling aerographic and coloring equipment*), **aerography** (ESMREL aerografía ◇ *The glaze prepared for aerography had a density of 1.75-1.80 g/cm*)].

**aerosol** *n*: QUIM aerosol; conjunto heterogéneo de partículas microscópicas, sólidas o líquidas, que se encuentran en suspensión en un gas; el término se refiere tanto a las partículas como al gas en el que las partículas están suspendidas ◇ *The stain removers come in the form of liquids, paste and aerosol.* [Exp: **aerosol deposition method, ADM** (ELABPROC método de deposición por aerosol ◇ *Aerosol deposition method (ADM) is a high performance technique for fabricating of piezoelectric 1-100- micron- thick film on various kinds of substrate*)].

**aerospace industry** *n*: INDAFIN industria aeroespacial; industria que se encarga del diseño y construcción de aeronaves y naves espaciales y del equipamiento que requieren y en la que las aplicaciones cerámicas son pieza fundamental ◇ *Ceramic applications for the aerospace industry include thermal protection systems in rocket exhaust cones, insulating tiles for the space shuttle, engine components, and ceramic coatings.*

**AESC** *abbr*: ORG-INST *V. American engineering standards committee.*

**aesthetic** *a*: DISEÑO estético; de aspecto bello, elegante, armonioso y agradable a la vista  
 ◇ *Ceramics has once again become a favourite flooring material, with both single and twice-fired tiles offering aesthetic and technical benefits.* [Exp: **aesthetic appeal** (DISEÑO atractivo estético ◇ *These imperfections only add to the aesthetic appeal and*

*will not devalue your new floor*), **aesthetic appearance** (DISEÑO apariencia estética, aspecto estético), **aesthetic characteristic/feature** (DISEÑO cualidad estética, característica estética ◇ *Gloss is strictly an aesthetic characteristic indicating the form in which visible light is being reflected*), **aesthetic defect** (DISEÑO/CALIDAD defecto estético ◇ *First Quality: Tiles free of aesthetic defect*), **aesthetic effect** (DISEÑO efecto estético ◇ *The technical aspects such as surface abrasion resistance will be considered and must be achieved first before aesthetic effects are incorporated*), **aesthetic factor** (DISEÑO factor estético ◇ *The glazed tiles are the most popular of the two essentially due to the aesthetic factor*), **aesthetic result** (DISEÑO resultado estético ◇ *Thanks to the uniformity of colour, excellent aesthetic results can be achieved*), **aesthetic value** (DISEÑO valor estético ◇ *Colour is important in the ceramics industry because of its aesthetic value*), **aesthetics** (DISEÑO estética; consideraciones y valoraciones de la experiencia perceptual humana -vista, oído, etc.- evocadas por los componentes del entorno y relativas a la belleza, el refinamiento y el buen gusto ◇ *The design is based mainly on aesthetics*)].

**AET abbr:** ENSAYO V. *accelerated exposure test*.

**AET abbr:** ORG-INST V. *Spanish Association of Toxicology*.

**AETOX abbr:** ORG-INST V. *Spanish Association of Toxicology*.

**AFA abbr:** ORG-INST V. *American Foundrymen's Association*.

**affect** v: GRAL afectar; influir en, tener un efecto en algo ◇ *There are several factors that affect the thickness of glaze deposited on a piece*.

**affreight** v: DISTRIB fletar ◇ *Affreight means to hire a ship for the transportation of goods or freight; V. freight*. [Exp: **affreighted** (DISTRIB fletado ◇ *The pieces had to be taken to Genoa port and then loaded on a vessel specifically affreighted on the purpose and finally transported to Mexico by sea*), **affreighter** (DISTRIB fletador, fletante; el que fleta una embarcación y, por extension, otro vehículo terrestre o aéreo V. *freighter; shipper*), **affreightment** (DISTRIB fletamento, fletamiento; acto de alquilar un barco para el transporte de mercancías V. *freight, contract of affreightment, freightment contract*)].

**AFM abbr:** PROPQUIM-FIS V. *antiferromagnetic*.

**AFNOR abbr:** ORG-INST V. *Association Française de Normalisation*.

**AFS abbr:** ORG-INST V. *American Foundrymen's Society*.

**after**<sup>1</sup> adv: GRAL después. [Exp: **after**<sup>2</sup> (GRAL después de ◇ *After dipping a test piece and letting it dry, scratch through the glaze down to the bisque with the tip of a knife*), **after contraction/after-contraction** (PROPQUIM-FIS postcontracción; diferencia entre las dimensiones de la pieza una vez expulsada del molde y enfriada a temperatura ambiente y las dimensiones de la misma transcurridas 24 horas después de la inyección; contracción permanente que puede darse si un producto refractario cocido o aglomerado químicamente *-chemically bonded-* es recocido bajo condiciones de

ensayo específicas ◇ *Fireclay refractories are liable to show after contraction if exposed to a temperature above that at which they were originally fired*), **after expansion/after-expansion** (PROPQUIM-FIS postdilatación; expansión permanente que puede ocurrir cuando un producto refractario que ha sido previamente conformado y cocido o aglomerado químicamente *-chemically bonded-* es recocido bajo condiciones de ensayo específicas ◇ *The influence of the firing temperature on the after-expansion is connected to the content in the mix of the argillaceous component*), **afterburner** (MAQELAB cámara de postcombustión, quemador de postcombustión; cámara adaptada al horno de combustión y que asegura el quemado de los gases y productos volátiles secundarios generados en el horno de combustión a altas temperaturas), **after-effect/aftereffect** (PROPQUIM-FIS efecto resultante, consecuencia; efecto que sigue a la causa después de un intervalo (la forma con guión es la habitual en el inglés americano) ◇ *For the piezoelectric ceramics studied in this work, the aftereffect follows very accurately a logarithmic relation*), **after-glow** (PROPQUIM-FIS V. *jump*), **after-shrinkage** (PROPQUIM-FIS V. *after contraction/after-contraction*)].

**afwillite** *n*: INDAFIN afwillita ◇ *Afwillite is one of the calcium silicates that form when Portland cement sets to form concrete.*

**agalmatolite** *n*: MATPRI agalmatolita; mineral aluminosilicato, también conocido como pagodita -pagodite-, muy similar a la pirofilita -*pyrophyllite*- que se torna sumamente duro al ser sometido a calcinación ◇ *Typical raw materials for ceramic tiles used in building purposes include clay, agalmatolite, silica sand and feldspar.*

**agate** *n*: GEO-MIN-CRIST/MATPRI ágata; conjunto de variedades microcristalinas del cuarzo (sílice) ◇ *Agate is used in the ceramic industry for burnishing gold decoration on pottery and for making small mortars and pestles for preparing samples for chemical analysis.* [Exp: **agate glass** (INDAFIN cristal de ágata ◇ *Agate glass is a decorative glassware, simulating agate, made by blending molten glasses of two or more colours, or rolling glasses of several colours together in the plastic state*)].

**agcy** *n*: GESTIÓN V. *agency.*

**AGD** *abbr*: QUIM V. *activation energy for diffusion.*

**age**<sup>1</sup> *n*: GEO-MIN-CRIST era (geológica) ◇ *Clay minerals in deep-sea sediments of early Cenozoic age.* [Exp: **age**<sup>2</sup> (ELABPROC envejecer, madurar ◇ *The slip is then allowed to age until its characteristics are relatively constant*), **aged** (PROPQUIM-FIS envejecido, madurado ◇ *The slip is aged and blended in storage wells before being screened to remove coarse material*), **ageing** (ELABPROC envejecimiento, desecado; maduración/maceración (de la pasta o barbotina); putrición (de la pasta o barbotina); proceso de acondicionar o madurar una pasta o barbotina con el fin de mejorar sus propiedades reológicas ◇ *Accelerated ageing makes tiles more brittle; V. tempering*)].

**agency, agcy** *n*: GESTIÓN agencia; ente/organismo administrativo destinado a la gestión o a la prestación de determinados servicios ◇ *In order for a product to be approved, it must be evaluated by an approved laboratory and then classified, and test results must be reported periodically to an evaluation agency.*

**agent** *n.*: GRAL agente; fuerza o energía con capacidad para actuar y producir un efecto  
 ◇ *A flux is an agent that melts and encourages the glaze to fuse with the clay body.*

**agglomerate** *v/n.*: PROPQUIM-FIS aglomerar; formar ensamblajes *-assemblages-* de partículas más pequeñas fuertemente unidas electrostáticamente o mediante intercrecimiento *-intergrowth-* ◇ *Powders suspended in a liquid spontaneously agglomerate unless they are suitably deflocculated.* [Exp: **agglomerate** (QUIM aglomerado; ensamblaje, formación de una masa sólida ◇ *Groups of particles that are weakly bonded together may behave as a fragile, larger pseudoparticle called an agglomerate*), **agglomerate marble** (INDAFIN mármol aglomerado; producto sintético obtenido de pequeños fragmentos de mármol/piedra unidos con resinas de poliéster y que se asemeja a la piedra de mármol ◇ *Agglomerate marble can be used for floors, (external and internal), stairs, window sills, panels and other finishings*), **agglomerate marble tile** (PRODFIN azulejo/baldosa de mármol aglomerado ◇ *Agglomerate marble tiles can be used for paving terraces, garden paths and outside areas in general*), **agglomerate tile** (INDAFIN baldosa aglomerada (de cemento); elemento prefabricado de hormigón, monocapa o bicapa, compactado adecuadamente y capaz de soportar un tratamiento secundario de acabado superficial (pulido, granallado, etc.) ◇ *Agglomerate tiles are manufactured by mixing graded marble or granite chips of various sizes with portland cement, polyester resin or epoxy*), **agglomerated powder** (ELABPROC/MTRLS polvo aglomerado ◇ *An agglomerated powder is charged into a mixing tank containing water at 20°C*), **agglomerated product** (INDAFIN producto aglomerado ◇ *An agglomerated product is a man-made stone product generally consisting of either crushed natural marble, natural granite, or quartz chips with a matrix of resins and mineral pigments*), **agglomeration** (QUIM aglomeración; aglutinación de materiales como en un terrón ◇ *Agglomeration may occur in a well-dispersed suspension if a slow analysis technique is used*)].

**aggregate** *n.*: INDAFIN árido, agregado (arena en el mortero); material inerte (hormigón); material granular, bien procesado a partir de materiales naturales como rocas, gravas o arenas o bien manufacturado como escombros, que se utiliza en la confección de hormigones *-concrete-* y morteros *-mortar-* por su gran estabilidad química y su resistencia mecánica ◇ *Concrete means 1 part cement, 2 parts fine aggregate and 5 parts coarse aggregate.* [Exp: **aggregate batcher** (INDAFIN dosificador de agregados/áridos), **aggregate stripping** (INDAFIN desprendimiento de agregados, desprendimiento del árido; fenómeno que ocurre cuando la humedad debilita la unión entre el árido/agregado y el ligante asfáltico *-asphalt binder-* ◇ *The quality of an aggregate and the selection of an adhesion agent is of major importance to minimise the risk of aggregate stripping*), **aggregation** (GEO-MIN-CRIST agregación (de partículas); en física, término que define colectivamente la forma o estados en que se presenta la materia; los tres estados/formas de agregación *-states of aggregation-* son el sólido, el líquido y el gaseoso ◇ *A pellet is a small aggregation of sedimentary material; V. particle aggregation*)].

**aggression** *n.*: MANTNMTO agresión, ataque ◇ *The tiles are resistant to the aggression of atmospheric substances (eg: smog, salinity, industrial atmospheric pollutants, etc.).* [Exp: **aggressive** (GRAL/PROPQUIM-FIS agresivo, hostil ◇ *Generally, all defects are weak spots under high mechanical and/or electrical loads and in aggressive environments*),

**aggressive treatment** (MANTNMTO tratamiento agresivo ◇ *Particularly aggressive treatment can even strip away a section of these tiles*).

**aging** *n*: ELABPROC *V. ageing*.

**agitate** *v*: GRAL agitar. [Exp: **agitated ball mill** (MAQTRANS molino de bolas agitado ◇ *In addition to ball mills, agitated ball mills are also suitable for comminuting ceramic materials*), **agitated tank** (MAQELAB tanque agitado ◇ *Slurries are commonly stored in agitated tanks and pumped through pipes using using a positive displacement or centrifugal pump to motivate flow*; *V. agitator*), **agitator** (MAQTRANS/MAQELAB agitador; aparato o mecanismo que causa un movimiento turbulento en el interior de un tanque ◇ *These designs have been developed with a view to minimising the agitator power consumption for a given slurry agitation duty*)].

**agree** *v*: GRAL acordar, estar/ponerse de acuerdo; convenir, acceder, aceptar, aprobar, concertar, concordar, consentir, pactar; el verbo agree puede ser transitivo *-the two companies have agreed terms-*, preposicional con *on -they agreed on the price and a bargain was struck-*, preposicional con *to -the company agreed to pay Paul 500-*, preposicional con *with -he agrees with the sales manager*. [Exp: **agreed** (COM/GESTIÓN acordado, concertado, conforme, convenido ◇ *When an order is placed, items such as size, thickness, type of surface, colour relief, abrasion class for glazed tiles and any special properties such as chemical resistance shall be agreed by the parties concerned*), **agreed price** (COM precio acordado/concertado ◇ *Unless otherwise agreed in writing, the agreed price shall be fixed and not index-adjusted and shall also include packaging of goods*), **agreed upon, as may be** (COM según se convenga ◇ *After the expiry of twelve months, any balances outstanding will be settled in such a way as may be agreed upon between the two parties*), **agreement** (GRAL/GESTIÓN acuerdo; contrato), **agreement with, in** (GRAL/GESTIÓN conforme a; de acuerdo con ◇ *Each arrangement shall be made in agreement with the Agency*), **agreement, by** (COM a convenir ◇ *The setting of prices by agreement among producers and distributors*; *V. negotiable*)].

**Ah** *abbr*: MEDIDA *V. ampere hour*.

**A-h** *abbr*: MEDIDA *V. ampere hour*.

**aheap** *a/adv*: COM/MEDIDA *a granel*.

**AHJ** *abbr*: ORG-INST *V. authority having jurisdiction*.

**AHM** *abbr*: INSTR *V. ampere hour meter*.

**AHU** *abbr*: SEG/GRAL *V. air handling unit*.

**AI** *n*: MEDIDA *V. aridity index*.

**aid**<sup>1</sup> *v/n*: GRAL ayuda, auxilio ◇ *The heat balance is an aid in the design of kilns*; *V. sintering aid; grinding aid*. [Exp: **aid**<sup>2</sup> (GRAL ayudar, auxiliar ◇ *Mould release depends partly on good mould design, but can be aided by lubricating the mould surface prior*)]

to use with a mould release agent), **aid of, with the** (GRAL con la ayuda de  $\diamond$  *The consistency is judged with the aid of photographs*).

**aiguille** *n*: EXPL-CANT barrena para roca.

**AIN** *abbr*: MTRLS/QUIM/PRODFIN *V. aluminium nitride*.

**AION** *abbr*: PRODFIN/QUIM *V. aluminium oxynitride*.

**AIP** *abbr*: ELABPROC *V. arc ion plating*.

**air**<sup>1</sup> *v/n*: GRAL aire, atmósfera; viento (aire atmosférico); mezcla gaseosa que forma la atmósfera de la tierra compuesta aproximadamente de 21 partes de oxígeno -*oxygen-*, 78 de nitrógeno -*nitrogen-* y una de argón -*argon-* y otros gases semejantes a éste, al que se añaden algunas centésimas de dióxido de carbono  $\diamond$  *Air is evacuated from the press by the vacuum pumping system*. [Exp: **air**<sup>2</sup> (GRAL airear), **air bell** (ESMREL/CALIDAD burbuja de aire; defecto con forma de burbuja irregular  $\diamond$  *One edge of the base is first brought into contact with the film and the contact is gradually extended to prevent formation of an air bell*), **air bill of lading** (DISTRIB conocimiento de embarque aéreo; documento de consignación de flete aéreo relleno por el propio expedidor o en su nombre  $\diamond$  *A universal air bill of lading has been adapted by international air carriers and should now be in use by all air carriers*; *V. bill of lading*), **air blast** (ELABPROC chorro de aire  $\diamond$  *Test pieces 114 x 64 x 64 mm are cycled between 950°C and a cold air blast for 5 min followed by a bend test under a load of 0-3MN/m<sup>2</sup>*), **air blister** (ESMREL/CALIDAD burbuja de aire; pequeños espacios/huecos de los materiales o productos cerámicos en los que hay aire ocluido -*occluded air-*  $\diamond$  *Defects such as air blister, cavity, uneven parts or missing joint should be repaired immediately*), **air borne, airborne** (GRAL/SEG transportado por el aire, aerotransportado; que se dispersa o expande por el aire  $\diamond$  *The consensus is that whiskers and fibers in the 0.1-1.0  $\mu$ m range are of the most hazardous size because they become airborne and are easily ingested into the lungs*), **air brick** (INDAFIN ladrillo de ventilación, ladrillo hueco  $\diamond$  *Air bricks are most frequently used at the base of walls to ventilate areas beneath joist and boarded ground floors*), **air brush, airbrush** (ESMREL pulverizador para esmalte, aerógrafo; pulverizador de aire comprimido  $\diamond$  *The detail coloration may preferably be applied using an air brush*), **air bubble** (ESMREL/CALIDAD burbuja de aire *V. air bell*), **air bump** (ELABPROC primer golpe, golpe para eliminar el aire al prensar), **air circulation** (ELABPROC circulación del/de aire, aireación, ventilación; método para eliminar la humedad y llevar el calor a todas las partes de una carga (por ejemplo, en un horno)  $\diamond$  *Kiln-drying is a process using heat and steam with air circulation*), **air classification** (TRANSPROC clasificación por aire  $\diamond$  *Air classification is used to separate coarse and fine fractions of dry ceramic powders into groups or grades at cutpoints ranging from 10 mesh to sub-mesh sizes*; *V. air separation*), **air classifier** (MAQTRANS separador por aire, ciclón; clasificador neumático; clasificador por aire  $\diamond$  *The basic elements in an air classifier consist of a rotating plate and air circulation fan, installed in a special chamber*; *V. air separator*), **air compressor** (MAQELAB compresor de aire; máquina destinada a elevar la presión del aire para lo cual aspira -*draws in-* el aire a la presión atmosférica, lo comprime y lo expelle -*delivers-* a una presión más elevada  $\diamond$  *You will need a fine-mesh sieve with a mesh count of 100 or greater, a glaze additive, an air compressor, and a spray gun for glaze application or airbrush for special decorative effects*), **air**

**conditioning** (GRAL aire acondicionado), **air consignment note** (DISTRIB guía de carga aérea, conocimiento/carta de porte/transporte aéreo; contrato de transporte utilizado por las aerolíneas para el flete aéreo y que incluye las condiciones de dicho transporte y otras disposiciones (procedimiento de reclamación, etc.) *◇ Every carrier of goods has the right to require the consignor to make out and hand over to him an air consignment note*), **air content** (INDAFIN/PROPQUIM-FIS aire oclusivo, porosidad; volumen de huecos/vacios de aire *-air voids-* en la pasta de cemento, mortero u hormigón excluyendo el espacio ocupado por los poros en el agregado *◇ Construction practices have a significant effect on the air content of concrete*), **air cooled slag** (SUBPROD escoria enfriada al aire *◇ The air cooled slag is suitable as an aggregate in concrete*), **air course** (GRAL conducto de ventilación), **air curtain** (GRAL cortina de aire; barrera invisible que separa dos espacios mediante una corriente continua de aire creando un muro invisible que impide que el aire caliente salga y que el aire frío entre o viceversa *◇ An air curtain is used to keep cold air from escaping when the doors to the cold section of the building are opened*), **air diffuser** (GRAL difusor de aire; aparato utilizado para la distribución del aire, normalmente ubicado en el techo y que mezcla el aire acondicionado con el aire a temperatura ambiente), **air drain** (GRAL V. *air course*), **air dried** (ELABPROC secado al aire *◇ Changes in humidity change the amount of surface absorbed water as is evident in the slight fluctuation of the air dried tile weight with fluctuations in humidity*), **air drill** (INSTAL taladro neumático, martillo de aire; martillo neumático; perforadora en seco; perforadora por aire; perforadora/taladro que emplea el aire comprimido para su movimiento alternativo y para evacuar el escombros del agujero, de lo que se deduce el sentido de la expresión "perforación en seco" *-dry drilling-*), **air drilling machine** (INSTAL máquina perforadora por aire *◇ Stationary air drilling machine is capable of making vertical, horizontal and inclined holes; V. air drill*), **air dry** (ELABPROC secar al aire *◇ These tiles are then left to air dry slowly, taking sometimes upto 3 weeks*), **air-dry**, **air-dried** (ELABPROC secado/seco al aire *◇ Ceramic clay was used for the example but air-dry clay can be used as well*), **air duct** (GRAL conducto de aire), **air elutriator** (MAQTRANS elutriador, hidroseparador; aparato que, mediante corrientes de aire, separa las partículas de material por tamaño y densidad *◇ Air elutriator is a simple device which can separate particles into two or more groups; V. air classification; air classifier*), **air entrained** (INDAFIN aire ocluido, porosidad; burbujas de aire en el interior de la masa del hormigón para aumentar su resistencia a las heladas y a las sales fundentes *◇ The air entrained in the freshly molded concrete mix is in the form of bubbles; V. air entraining, eir-entraining*), **air entrainer** (INDAFIN aireante; sustancia que introduce burbujas de aire en el interior de la masa del hormigón, haciéndolo más manejable impermeable y resistente *◇ When added to concrete and then mixed, the air entrainer creates tiny air bubbles in the mix which allow expansion and contraction when freezing*), **air entraining cement**, **air-entraining cement** (INDAFIN cemento celular, cemento aeroceloso; mezcla de cemento, agua y espumante que, una vez fraguado, contiene burbujas de aire distribuidas de manera uniforme *◇ Air-entraining cements are less common now that there are air-entraining admixtures that we can use instead*), **air entrainment** (INDAFIN inclusión de aire (en el hormigón), incorporación/oclusión de aire, insuflación; creación intencionada de pequeñas burbujas de aire en el hormigón mediante la utilización de un agente aireante *◇ Air entrainment improves the workability of a mix and so decreases the required free water content of a mix*), **air filter** (MEDAMB filtro de aire *◇ The dusty air is blown into the air filter from which, in the clean state, it is ejected into the atmosphere*), **air flow** (GRAL corriente de aire), **air flue** (GRAL conducto de aire), **air**

**freight** (DISTRIB flete aéreo, carga aérea V. *freight rate; sea freight*), **air freight container** (DISTRIB contenedor/envase para carga aérea ◊ *You can see whether a certain air freight container is suitable to protect and to hold your cargo*), **air gap** (CONST cámara de aire ◊ *Movements between the two walls have to be considered and flexible joints must be provided across the air gap*), **air grating** (SEG rejilla de ventilación), **air hammer** (INSTAL martillo neumático, martillo hidráulico; taladro percutor portátil cuyo funcionamiento se basa en mecanismos de aire comprimido ◊ *Use an air hammer to remove old tiling*), **air handling unit, AHU** (SEG/GRAL unidad climatizadora, equipo para la circulación del aire ◊ *The air handling unit (AHU) is a ventilation system consisting of the following major components: air intakes, filters, fans, electric heating coils, connected ductwork and components, fire and control dampers, electric reheat boxes, air diffusion equipment, electrical connections, power supplies, distribution boards and control systems*), **air heater** (GRAL generador de aire caliente, aerotermo; recalentador (de aire); aparato de calefacción autónomo con un dispositivo de soplado que incluye ventilador, turbina e impulsor y que permite repartir u orientar el aire caliente hacia diferentes lugares ◊ *An electric air heater heats the surrounding air with the heat generated by supplying electric current for the heating wires; V. ducted aire heater*), **air hose** (INSTR manguera de/para aire comprimido ◊ *You can get the air hose further down into the mold and release the clay little by little since usually there is a point where it comes out quite nicely*), **air humidifier** (SEG humidificador de aire, humectador de aire; aparato utilizado para añadir humedad al aire con el fin de prevenir la piel reseca o mitigar los efectos de las alergias ◊ *Improve your indoor air quality with air humidifier*), **air inleakage** (SEG aire parásito, infiltración de aire ◊ *Seals are provided at both ends of the rotating kiln shell to minimise air inleakage*), **air inlet** (GRAL entrada de aire, toma de aire; mecanismo/aparato que permite el suministro de aire a un sistema ◊ *For the second stage the thermostat is reset at 50°C, the air inlet reduced to quarter open, and the smoke flow rebalanced*), **air line** (ESMREL/CALIDAD burbuja capilar; defecto en forma de burbuja alargada V. *hair line*), **air lock (kiln exit and entrance)** (MAQELAB compuertas de aislamiento en entrada y salida del horno túnel), **air penetration** (PROPQUIM-FIS penetración de aire; "air infiltration" es la forma preferida en EE.UU. ◊ *Cover the entire surface with a seamless membrane preventing water or air penetration; V. air infiltration*), **air permeability** (PROPQUIM-FIS permeabilidad al aire ◊ *The air permeability of tile roofing systems is a critical factor in determining the wind resistance of tile roofing as applied to a roof; V. permeability*), **air permeability tester** (INSTR/ENSAYO V. *air-permeability apparatus*), **air plasma spraying, APS** (ELABPROC pulverización por plasma en aire, air plasma spraying; proyección por plasma en el aire; proceso para recubrimiento de proyección por plasma producido en condiciones atmosféricas ambientales ◊ *Silicon coatings were deposited using air plasma spraying technology; V. plasma spraying; vacuum plasma spraying*), **air pocket** (CALIDAD burbuja de aire, bolsa de aire ocluido; burbuja de aire ocluido ◊ *Air pockets, found under tiles in conventional systems, are weak points*), **air pollution** (MEDAMB contaminación/polución del aire, contaminación atmosférica; alteración de la atmósfera terrestre por la incorporación de gases o partículas en suspensión, tanto sólidas como líquidas, en proporciones distintas a las naturales y que produce efectos nocivos sobre el entorno ◊ *The manual is intended for industry and government professionals directly involved in the choice of air pollution control technologies*), **air pressure** (ELABPROC/GRAL presión del aire; fuerza ejercida por el peso de una columna de aire sobre una localización concreta ◊ *Reducing the air pressure over ware being dried*

*speeds up moisture removal*), **air ramming** (INDAFIN apisonado mecánico ◊ *Air ramming is a method of forming refractory shapes, furnace hearths, or other furnace parts by means of pneumatic hammers*), **air seal** (ELABPROC/SEG junta de estanqueidad; sistema/método de aislamiento que previene el escape de gases calientes de la entrada/salida de un horno continuo u horno túnel y que mantiene el aire presurizado - *pressurized air*- dentro o fuera de un área, en este caso el horno ◊ *The air seal at the kiln discharge end should also be maintained*), **air separation** (TRANSPROC separación neumática, clasificación por corriente de aire; separación por aire; tecnología consistente en la aplicación de un fluido (normalmente un gas pero también un líquido) en forma ascendente a través de un lecho de partículas con el fin de seleccionar/clasificar dichas partículas por tamaños ◊ *The granular material and the fines are separated by an air separation device*; V. *air-separator, air separator*), **air separator** (MAQTRANS separador de/por aire, separador neumático; aparato utilizado para clasificar productos en una amplia gama de tamaños y de pesos, separándolos en dos grupos en una columna uniforme de aire ◊ *The air separator allows powder-formed product to be separated into coarse and fine particles with an adjustable screen size limit*; V. *air classifier*), **air setting** (PROPQUIM-FIS endurecimiento/endurecido al aire, fraguado al aire; (cualidad por la cual se origina un) endurecimiento irreversible producido por la reacción entre un ligante y el oxígeno del aire frío y/o una pérdida de agua ◊ *This air setting ceramic cement is inorganic and contains sodium silicate binders*), **air space** (CONST/INSTAL cámara de aire ◊ *Most roofing tiles create an air space between the tile and the roof deck which acts as an insulator*), **air suction** (ELABPROC aspiración/succión de aire ◊ *In the kiln, the hot air after heating exchange can be exhausted by hot air suction system*), **air transport** (DISTRIB transporte aéreo ◊ *Here road, rail or even sea and air transport is being used to transport goods to its final destination*), **air vapour** (GRAL vapor de aire ◊ *If the air vapour is saturated, evaporation ceases*), **air vent** (MAQELAB/SEG respiradero, orificio de ventilación; abertura por donde entra y sale el aire ◊ *In all types of kiln, there must be an air vent as well as a damper*), **air viscosity** (GRAL viscosidad del aire ◊ *The coefficient contains the effects of air viscosity and compressibility*), **air way** (GRAL V. *air course*), **air, by** (DISTRIB avión, por, por vía aérea V. *rail, by*), **airborne agents** (SEG/MEDAMB agentes transportados/arrastrados por el aire/volantes ◊ *Airborne agents are not the only chemical threat*), **airborne contaminants** (MEDAMB contaminantes atmosféricos; sustancia física, química o biológica que poluciona el aire y se propaga por él y que es emitida por una fuente, natural (volcanes, incendios, etc) o antropogénica (industria, tráfico, etc.)), **airborne dust** (MEDAMB/SEG polvo aerotransportado, polvo volante ◊ *Airborne dusts and fumes can be harmful if they come into contact with your skin or mucous membranes*), **airborne fumes** (MEDAMB/SEG humos transportados por el aire, humos en el aire), **airborne particles** (MEDAMB/SEG partículas aerotransportadas, partículas transportadas por el aire ◊ *The size and/or concentration of airborne particles can be measured directly using specialised equipment*), **airborne residual** (MEDAMB/SEG residuos transportados por el aire ◊ *In this manner, dust and other debris generated as a result of the brushing activity described are removed from the site with a minimal amount of airborne residual*), **air-borne sealing** (INDAFIN obturación mediante pulverización de mortero; proceso para la reparación de una retorta de gas - *gas retort*- mediante el soplado de polvo refractario en ésta mientras está caliente de manera que el polvo se asienta en las fisuras y las sella/obtura para prevenir cualquier fuga/escape -*leakage*- V. *spray welding*), **airborne toxins** (SEG toxinas

aerotransportadas; toxinas arrastradas, transportadas por el aire ◇ *If you are working in the presence of other people, they should wear masks to protect them from airborne toxins*), **airbrush** (INSTR aerógrafo; instrumento operado mediante un compresor de aire que utiliza aire a presión para dispersar un pigmento en partículas muy finas ◇ *You'll need a fine-mesh sieve with a mesh count of 100 or greater, a glaze additive, an air compressor, and a spray gun for glaze application or airbrush for special decorative effects*), **air-circulation** (GRAL-SEG V. ventilation), **air-cooling** (ELABPROC refrigeración por aire, enfriamiento al aire; método para disipar el calor que funciona haciendo que el objeto a enfriar tenga un área de superficie mayor, un flujo de aire incrementado sobre su superficie o ambos ◇ *The fritting process can be run non-stop with continuous kilns followed by quenching in water or air-cooling*), **aircraft** (DISTRIB aeronave, avión), **air-dried** (ELABPROC secado al aire ◇ *When the clay is completely air-dried, the pieces are bisque-fired in the tile kiln at 1940 degrees F to 2035 degrees F for 10 to 15 hours*), **air-entrained concrete, air entrained concrete** (INDAFIN hormigón aireado, concreto aireado, hormigón aerocluso, hormigón/concreto celular; producto cementante de peso ligero formado por cemento, arena y otros materiales sílicos y que se elabora mediante un proceso físico o químico durante el cual se introduce aire o gas a la mezcla ◇ *Air-entrained concrete contains billions of microscopic air cells per cubic foot*), **air-entraining admixture, air entraining admixture, AEA** (INDAFIN aditivo aireante; aditivo que permite a una cantidad controlada de pequeñas burbujas uniformemente distribuidas ser incorporadas en un mortero ◇ *An air-entraining admixture causes the development of air bubbles in concrete or mortar during its mixture*), **air-entraining agent, air entraining agent, AEA** (INDAFIN agente aireante, aireante; capturador de aire; material que no permite el escape de aire; sustancia química que añadida al hormigón, mortero o cemento causa la incorporación a éstos durante el amasado de aire en forma de minúsculas burbujas, lo que aumenta su trabajabilidad *-workability-* y su resistencia a la helada ◇ *The use of air-entraining agents also reduces bleeding and segregation of fresh concrete*), **air-entraining, air entraining** (INDAFIN aireante; capacidad de un producto empleado en la industria hormigonera de originar durante el amasado, multitud de pequeñas burbujas de aire o gas, en general de tamaño comprendido entre diez y mil micras, que quedan en el interior de la masa una vez endurecida. también, capacidad de producir dichas burbujas), **airfloated kaolin** (MATPRI caolín aeroflotado ◇ *An intermediate-grained airfloated kaolin like this is suitable for use as a filler and pigment*), **airing** (GRAL ventilación, airear, respiradero; ventilar ◇ *Decree 84-1093 defines the obligations of the employer in the airing and ventilating of work premises depending on local conditions; V. ventilation*), **airing holes** (GRAL oficios de ventilación), **air-jet mill, air jet mill** (MAQTRANS molino de chorro; molino utilizado para la producción de materiales superfinos y que emplea un chorro de aire o gas comprimido y un movimiento en espiral en la molienda ◇ *This air jet mill is particularly effective for the ultra-fine milling of laminar or non-regular crystal, filler minerals such as talc, mica, graphite, and kaolin, and for low density materials; V. fluid energy mill*), **airless** (SEG sin aire, mal ventilado), **airless cleaning** (ELABPROC/MANTNMO limpieza con agua a alta presión ◇ *Airless cleaning implies cleaning with high pressure (water) jet*), **airless spraying** (TRANSPROC pulverización sin aire, atomización sin aire; método de atomización de la pintura mediante presión hidráulica ◇ *The biggest advantage to airless spraying is that since no air is used to force the paint out, there is very little overspray and the air in the room is not filled with paint laden mist*), **air-lock, air lock** (ELABPROC barrera/bolsa de aire, barrera de presión; burbuja de aire; aire atrapado en una sección de un

conducto o circuito, que impide el flujo de líquido por el mismo  $\diamond$  *Slip should be pumped into the filter in an upward direction initially, in order to prevent air-lock blockage by bubbles in the advancing front surface of slip*; V. *air lock (kiln exit and entrance)*), **airmail**, **AM** (DISTRIB correo aéreo), **air-permeability apparatus** (INSTR/ENSAYO aparato de permeabilidad, aparato para ensayos de permeabilidad del aire  $\diamond$  *The Blaine air permeability apparatus is used to determine the fineness of Portland cement in terms of the specific surface*; V. *Blaine apparatus*), **air-setting refractory cement** (INDAFIN cemento refractario de fraguado al aire; en EE.UU., el cemento refractario de fraguado al aire se conoce como “*air-setting refractory mortar*”  $\diamond$  *An air setting refractory cement was mixed with water to yield a paste which was formed into a 1-inch cube*; V. *chemically-bonded refractory cement*), **air-setting refractory mortar** (INDAFIN V. *air-setting refractory cement*), **air-swept ball mill** (MAQTRANS molino de bolas con clasificación neumática  $\diamond$  *Air-swept ball mills are used in dry closed circuit grinding and allow fines to be extracted from mill as soon as produced*; V. *ball mill*), **airtight** (PROPQUIM-FIS hermético; impenetrable, cerrado de tal modo que no deja pasar el aire ni los fluidos  $\diamond$  *The drying chamber is surrounded by an airtight inner shell and an insulated outer shell*), **airtight case/package** (DISTRIB paquete hermético), **airway bill**, **AWB** (DISTRIB talón de porte aéreo, carta/resguardo de porte aéreo V. *air bill of lading*), **airway bill of lading** (DISTRIB conocimiento de embarque aéreo V. *air consignment note*), **airy** (GRAL bien ventilado; también referido a aéreo, etéreo  $\diamond$  *Working in an airy, dust-free environment, spray or brush each container with two or three coats of paint*]).

**airport** *n*: DISTRIB aeropuerto.

**akermanite** *n*: GEO-MIN-CRIST akermanita; mineral del grupo de las melilitas  $\diamond$  *Akermanite (Ca<sub>2</sub>MgSi<sub>2</sub>O<sub>7</sub>) ceramics are prepared by sintering akermanite powder compacts at 1370°C for 6 h.*

**alabaster** *n*: GEO-MIN-CRIST alabastro, piedra de Gibraltar; variedad de la piedra de yeso de grano muy fino que se presenta bajo forma compacta, generalmente translúcida y de colores suaves y que suele emplearse como piedra decorativa  $\diamond$  *Alabaster tile costs about the same as conventional ceramic tile.* [Exp: **alabaster glass** (INDAFIN vidrio mate, vidrio alabastrino  $\diamond$  *Alabaster glass contains small inclusions of different diffractive indexes and shows no color reaction to light*)].

**Albany clay** *n*: MATPRI arcilla de Albany, barbotina de Albany; arcilla natural y fina con suficientes fundentes para actuar como un esmalte  $\diamond$  *When Albany clay is used as a glaze it produces a series of rich yellows.* [Exp: **Albany slip** (MATPRI/ESMREL Albany slip  $\diamond$  *Albany slip is a slip clay mined near Albany, New York, that can produce a very dark brown glaze*), **Albany slip glaze** (ESMREL esmalte de colado de Albany; suspensión de esmalte hecha de arcilla de Albany que produce ricos amarillos, negros y marrones en un amplio intervalo de temperaturas)].

**Alberta slip** *n*: ESMREL Alberta slip  $\diamond$  *Alberta Slip is an excellent substitute for the very popular Albany Slip, which has not been mined for over a decade*; V. *Albany slip*.

**albite** *n*: MATPRI albita, feldespató sódico; mineral feldespató ordinario usado en la fabricación de vidrio y cerámica que se encuentra fundamentalmente en las pegmatitas

y las rocas ígneas ácidas como los granitos y que forma cristales quebradizos y traslúcidos que pueden ser incoloros, blancos, amarillos, rosas, verdes o negros  
 ◇ *Typical applications of albite are ceramic tiles, whiteware, glazes, glass, porcelain enamel frits, ceramics, filler, welding electrodes, and abrasives; V. plagioclase.*

**albolite** *n*: INDAFIN/GEO-MIN-CRIST albolita; especie de cemento plástico o piedra artificial formado principalmente por magnesia y sílice. [Exp: **albolith** (INDAFIN/GEO-MIN-CRIST V. *albolite*)].

**alcohol** *n*: QUIM alcohol ◇ *Alcohol can be used as a beverage (ethanol only), as fuel and for many scientific, medical, and industrial utilities; V. ethyl alcohol.*

**alginates** *n*: ELABPROC/QUIM alginatos; ligantes de carácter orgánico *-organic binders-* y agentes de suspensión *-suspending agents-* obtenidos de las algas y utilizados en pastas cerámicas, esmaltes y barros similares ◇ *Alginates are naturally occurring polysaccharides frequently used as temporary binders in ceramic processing.*

**align** *v*: GRAL/PROPQUIM-FIS alinear; en general, colocar tres o más cosas en línea recta  
 ◇ *Antiferromagnetic is a term applied to materials in which the atomic magnetic moments are aligned antiparallel.* [Exp: **aligning** (GRAL alineación V. *re-aligning*), **aligning tool** (INSTAL alineador ◇ *Once alignment is finished remove the aligning tool*), **alignment** (GRAL/INSTAL alineación, calibración; trazado; acción y efecto de alinear ◇ *During the compression stage of the cake, the degree of alignment decreases somewhat*), **alignment with, in** (INSTAL alineado con ◇ *Lay the tiles row by row, making sure the rows are in alignment with the previous ones*), **alignment with, out of** (INSTAL mal alineado con ◇ *The area of tile where she tripped was 1/16 of an inch out of alignment with surrounding tiles*)].

**aliquot** *n/a*: GRAL/MEDIDA alícuota, parte alícuota; volumen/cantidad de masa que se va a emplear en una prueba de plataforma o de laboratorio y que suele medirse en mililitros (mL) o gramos diluidos (gr.); dícese de aquello que está contenido un número exacto de veces en otra cosa ◇ *To determine the boron in ceramic frits, an aliquot of 50 ml of the sample in solution was used.*

**alite** *n/a*: INDAFIN alita; nombre dado a uno de los consituyentes cristalinos del clinker de cemento portland *-portland cement clinker-* ◇ *Alite is the mineral in Portland cement responsible for setting and development of "early" strength.*

**alkali**<sup>1</sup> *n/a*: QUIM álcali, alcali, álcalis; sustancia química de tacto jabonoso como la cal, la potasa o la sosa que, al ser soluble en agua, puede actuar como base y que se usa principalmente como fundente en composiciones cerámicas; los álcalis neutralizan el material ácido para formar sales neutras ◇ *Any increase in free alkali is taken as a measure of lack of durability.* [Exp: **alkali**<sup>2</sup> (PROPQUIM-FIS alcalino; de álcali o que tiene álcali ◇ *Alkali glazes may contain up to 20-30% alkali elements such as soda and potash*), **alkali attack** (QUIM ataque alcalino, ataque de álcalis ◇ *C676 is a related test for glass tableware, C675 for alkali attack on ceramic decorations in bottles; V. durability og onglaze decoration*), **alkali carbonate** (QUIM carbonato alcalino ◇ *In general, alkali carbonates are strong accelerators for portland cement*), **alkali compound** (QUIM compuesto alcalino), **alkali feldspar** (MATPRI feldespató alcalino; serie

de minerales aluminosilicatados que se encuentran muy a menudo en cristales vítreos de color constituidos por potasio o sodio (o ambos) y que se usan en la fabricación de vidrio y cerámica  $\diamond$  *Orthoclase is the alkali feldspar that typically crystallizes at intermediate temperature; V. feldspar; microcline; orthoclase*), **alkali halide** (QUIM haluro alcalino  $\diamond$  *Alkali halide materials have had a long history of use as infrared-transparent optical components*), **alkali neutraliser/neutralizer** (QUIM neutralizador alcalino V. *neutraliser*), **alkali resistance** (PROPQUIM-FIS resistencia a los álcalis  $\diamond$  *Formula additives of acidic nature (e.g., silica) can improve the acid resistance at the expense of alkali resistance; V. chemical resistance*), **alkali resistance test** (ENSAYO ensayo de resistencia a los álcalis), **alkali silicate** (QUIM silicato alcalino; silicato de sodio, potasio o litio, soluble en agua y que se usa como ligante en la pintura de silicatos  $\diamond$  *Concrete treated with a sodium silicate solution helps to significantly reduce porosity in most masonry products such as concrete, stucco, plasters; V. silicate; ethyl silicate; sodium silicate*), **alkali soil** (GEO-MIN-CRIST suelo alcalino; suelo que presenta bien un alto grado de alcalinidad -*degree of alkalinity*- (pH superior o igual a 8,5), bien un porcentaje de sodio intercambiable -*exchangeable sodium*- tan elevado (15 por ciento o más), o ambos, que dificulta el crecimiento de la mayoría de las plantas de cultivo), **alkali-aggregate reaction** (QUIM reacción alcali-agregado, reacción alcali-árido; reacción química entre determinados agregados llamados "reactivos" y los álcalis normalmente presentes en el hormigón o transportados por medio de agentes químicos externos y que provoca su fisuración así como la pérdida de resistencia  $\diamond$  *Alkali-aggregate reaction is a common cause of concrete cracking that results in significant damage to concrete structures worldwide*), **alkali-earth** (PROPQUIM-FIS alcalinotérreo/alcalino-térreo, metal alcalinotérreo; dicese de los metales del grupo IIa del sistema periódico de los elementos: berilio, magnesio, calcio, estroncio, bario y radio), **alkali-earth compound** (QUIM compuesto alcalinotérreo/alcalino-térreo  $\diamond$  *Bentonite is usually obtained initially as an alkali earth compound, for instance a calcium and/or magnesium form of bentonite*), **alkaline** (PROPQUIM-FIS alcalino, alkali; cualidad de una sustancia química que contiene álcali y que puede por ello contrarrestar los ácidos  $\diamond$  *The point of neutrality is pH7; a solution with a pH below 7 is acid, above 7 is alkaline*), **alkaline cleaner** (MANTNMTO limpiador alcalino  $\diamond$  *Concentrated, alkaline cleaner for all ceramic, porcelain and quarry tiles*), **alkaline glaze** (ESMREL esmalte alcalino, barniz alcalino  $\diamond$  *A typical composition for an alkaline glaze is: alumina (10-15%), silica (30-70%), potash (up to 15%), lime (up to 15%) with variable small quantities of iron oxide, magnesia, and phosphates*), **alkaline water** (QUIM agua alcalina; agua con más iones OH<sup>-</sup> que iones H<sup>+</sup>  $\diamond$  *Alkaline water helps to neutralize stored acids and toxins*), **alkaline-earth compound** (QUIM V. *alkali-earth compound*), **alkaline-earth fluoride** (QUIM fluoruro alcalinotérreo  $\diamond$  *The alkaline-earth fluorides have properties between those of ZnSe and those of the forged halides*), **alkalinity** (PROPQUIM-FIS alcalinidad; medida de la capacidad para neutralizar ácidos de una sustancia química en una solución acuosa  $\diamond$  *The high alkalinity and porous nature of this tile necessitates sealing and/or finishing; V. acidity; basicity*), **alkali-proof** (PROPQUIM-FIS a prueba de álcalis  $\diamond$  *We manufacture all type of acid and alkali proof materials for brick/ tile lining*), **alkali-proof coating** (PROPQUIM-FIS/ELABPROC recubrimiento a prueba de álcalis  $\diamond$  *Alkali-proof coating such as electroplating, plasma flame spray with nickel, rubber-lining and the like may also be employed*), **alkali-resisting product** (PRODFIN producto resistente a los álcalis), **alkoxide** (QUIM alcóxido, alcoholato; compuesto formado por la reacción de un alcohol con un metal alcalino -*alkali metal*- y utilizado en los procesos sol-gel para la preparación de productos

cerámicos ◇ *Polymerization of the alkoxide is induced chemically by the addition of water*)].

**all** *a/adv*: GRAL todo, totalmente. [Exp: **all around** (GRAL por todas partes, alrededor de ◇ *Position the organic material (newspaper, sawdust, etc.) and the piece so that the flames can get all around the piece*), **all in/all-in aggregate** (INDAFIN árido "todo uno"; mezcla continua de áridos finos y gruesos ◇ *All-in aggregate shall consist of a mixture of coarse and fine aggregates*), **all risk** (GESTIÓN/SEG a todo riesgo ◇ *"All Risk" insurance covers direct physical loss to property insured unless the policy specifically excludes or limits the coverage*), **all risks, at** (GESTIÓN/SEG riesgo/trance, a todo ◇ *UK stock market is famous for its high rate of return; with its sound financial system and high credibility, investors can be well secured in their investments at all risks*; V. *all risk*), **all-basic furnace** (MAQELAB V. *all-basic open-hearth furnace*), **all-basic open-hearth furnace, all-basic furnace** (MAQELAB horno Martin (completamente) básico, horno de solera básica ◇ *All-basic open-hearth furnaces were introduced in Europe in about 1935, the object being to make it possible to operate at a higher temperature than that possible with basic O.H. furnaces having a silica roof*; V. *basic open-hearth furnace*)].

**allen head** *n*: INSTAL cabeza allen/con cavidad hexagonal ◇ *An Allen bolt is a bolt or screw with an Allen head*.

**alligator** *n*: GRAL caimán. [Exp: **alligator crusher** (MAQTRANS machacadora de mandíbulas; machacadora en la cual el material se introduce por la parte superior y entra en una cámara que contiene la mandíbula encargada de presionarlo contra la pared de dicha cámara con una fuerza extrema, triturándolo en trozos más pequeños), **alligator hide** (ESMREL piel de caimán, piel de naranja; defecto en la superficie del esmalte que constituye un caso severo de la piel de naranja *-orange peel-* y que puede ser debido a un secado demasiado rápido o a una aplicación demasiado gruesa de esmalte; puede tener también fines decorativos ◇ *Alligator hide appears when the glaze does not flow uniformly over the surface of the ware*; V. *orange peel*), **alligators' teeth** (CALIDAD dientes de cocodrilo (en la pieza extruída))].

**allocate** *v*: GESTIÓN destinar, asignar ◇ *3% of the budget has been allocated to technological development*.

**allophane** *n*: MATPRI alofana; arcilla amorfa inestable (muy reactiva) formada a partir de cenizas volcánicas y materiales volcánicos en meteorización ◇ *Allophane is a weathering or hydrothermal alteration product of feldspars and other primary minerals and has a composition similar to kaolinite*. [Exp: **allophanoid** (MATPRI alofanoide; nombre de grupo dado a las arcillas de los grupos de la alofana, la halloysita *-halloysite-* y la montmorillonita *-montmorillonite-* ◇ *Allophanoids are the product of chlorite and partially montmorillonite destruction*)].

**allotrope** *n*: QUIM alótropo; elementos químicos con capacidad de presentarse bajo estructuras moleculares distintas, como el oxígeno (oxígeno atmosférico O<sub>2</sub> y ozono O<sub>3</sub>), o con características físicas diferentes como el carbono (grafito y diamante) ◇ *Allotropes of the same element can typically exhibit quite different physical properties and chemical behaviour, even though they contain nothing else but atoms of that element*. [Exp: **allotropy** (PROPQUIM-FIS alotropía; propiedad que poseen los

alótropos  $\diamond$  *Allotropy is a behavior exhibited by certain chemical elements which can exist in two or more different forms, known as allotropes of that element*].

**allow** v: GRAL permitir, dejar  $\diamond$  *The simplest method is to allow the stream of molten frit to fall into water, but this does not give uniform quenching and fracture. [Exp: **allow for** (GRAL tener en cuenta; dejar un margen para  $\diamond$  *The green finished shape must allow for the shrinkage that occurs during densification as the 60% dense or so green body converts to a 92% dense or so fired body*), **allowable stress** (PROPQUIM-FIS tensión admisible, tensión tolerable; máxima tensión a la que un material puede trabajar; en la construcción y el diseño, tensión máxima permitida, calculada según el material utilizado, el tipo de estructura, el uso previsto y el grado de deterioro  $\diamond$  *The working stresses were generally below the limit of the allowable composite steel stress, and in the few cases in which they were above the allowable stress, the amount was usually less than 10 percent*), **allowable stress design, ASD** (DISEÑO/PROPQUIM-FIS tensión admisible de diseño, diseño de tensión permisible  $\diamond$  *Through allowable stress design the designer ensures that the stresses developed in a structure due to service loads do not exceed the elastic limit, which is usually determined by ensuring that stresses remain within the limits through the use of factors of safety*), **allowance** (GRAL concesión, tolerancia  $\diamond$  *Porcelain and vitrified tiles, unlike porous bodied tiles, shrink in the firing process; therefore certain allowances have to be made to dimensional accuracy in the manufacturing process; V. tolerance*), **allowance** (GRAL permiso, autorización; concesión)].*

**alloy** n: MTRLS aleación; unión íntima de dos o más elementos, siendo al menos uno de ellos un metal, de la cual resulta un producto homogéneo, de propiedades metálicas  $\diamond$  *A ferrite is a support, made of heat-resisting alloy, designed to carry vitreous enamelware through an enamelling furnace; V. brazing alloy. [Exp: **alloy steel** (INDAFIN acero aleado  $\diamond$  *An iron-based mixture is considered to be an alloy steel when manganese is greater than 1.65%, silicon over 0.5%, copper above 0.6%, or other minimum quantities of alloying elements such as chromium, nickel, molybdenum, vanadium, or tungsten are present*), **alloyed steel** (INDAFIN V. alloy steel)].*

**alluvial** a: GEO-MIN-CRIST aluvial; propiedad del material detrítico, que puede estar compuesto por arena, grava, arcilla o limo, transportado y depositado transitoria o permanentemente por una corriente de agua. [Exp: **alluvial basin** (GEO-MIN-CRIST depósito aluvial, aluvión; yacimiento aluvionar; masa de sedimentos detríticos que ha sido transportada y sedimentada por un flujo (lluvias, corrientes, etc.)), **alluvial clay** (MATPRI/INDAFIN arcilla aluvial; arcilla para la fabricación de ladrillos -*brickmaking clay*-de alta calidad con una gran capacidad para contener agua  $\diamond$  *Alluvial clay and shale makes some of the best bricks*), **alluvial deposit** (GEO-MIN-CRIST V. *alluvial basin*), **alluvial fan** (GEO-MIN-CRIST cono de deyección, abanico aluvial; cono aluvial; forma de modelado fluvial generada al final de los valles torrenciales, en las zonas de pie de monte y caracterizada por tener una silueta cónica o en abanico y una suave pendiente), **alluvion** (GEO-MIN-CRIST V. *alluvial basin*), **alluvium** (GEO-MIN-CRIST V. *alluvial basin*)].

**ALON** abbr: QUIM/MTRLS ALON; nombre comercial del oxinitruro de aluminio, que es un material cerámico transparente policristalino muy resistente a los impactos, con una fuerza de 380 MPa y una dureza de 1950 kg/mm<sup>2</sup>  $\diamond$  *Aluminium oxynitride, known*

*commercially as ALON, could replace the existing bullet-proof glass on military vehicles, which is heavier and less tough; V. Aluminium Oxy-Nitride.*

**Aloxite** *n*: MTRLS Aloxite ◇ *Aloxite is the trade-name for fused alumina abrasives and abrasive products made by the Carborundum Co., Ltd.*

**alpha-quartz** *n*: GEO-MIN-CRIST cuarzo alfa; en la cocción del vidriado a 573° se produce la primera inversión del cuarzo por la que el cuarzo alfa se convierte en cuarzo beta V. *beta-quartz.*

**Alsing mill** *n*: MAQTRANS V. *ball mill/ball-mill.*

**alter** *v*: GRAL alterar; cambiar la esencia o forma de algo ◇ *Using higher percentages of alumina will further alter the characteristics of a glaze.* [Exp: **alterability** (GRAL alterabilidad, degradabilidad; meteorabilidad; concepto inverso al de la durabilidad y que refleja la tendencia de un material a alterarse ◇ *Ceramics with a hollandite structure have a very low solubility and alterability in water*), **alteration**<sup>1</sup> (GRAL/CONST cambio, modificación; en plural (*alterations*) significa proyecto que suponga algún tipo de cambio en un edificio existente, esto es, reformas), **alteration**<sup>2</sup> (GRAL/INDAFIN descomposición, descascarillamiento estructural ◇ *Alteration or structural spalling results from the reaction of other materials or slag with the brick to produce crystalline phases which have different thermal expansion characteristics from those of the base brick*), **alteration**<sup>3</sup> (GRAL/QUIM alteración; cambio o modificación de la composición química o mineralógica de un material por los agentes atmosféricos ◇ *In vitreous enamelling, the fault can usually be prevented by an alteration in the spraying process and/or in the specific gravity of the enamel slip; V. metamorphism*), **alteration of test specimen** (ENSAYO alteración de la muestra de ensayo; efectos visibles o invisibles producidos en la muestra a raíz del ensayo realizado), **alternate** (GRAL/DISEÑO alternar ◇ *There is also a tendency to alternate tiles with relief effect, to which you can add a playful combination of colours with different textures*), **alternate** (GRAL/DISEÑO alterno ◇ *These materials have a crystalline ground mass composed of alternate bands of crystals, varying in colour*), **alternate bid** (GRAL oferta alternativa ◇ *Alternate bids may incorporate advances in technology and can result in substantial savings, not only in monetary terms but in operation efficiencies*), **alternative** (GRAL alternativo; aquello que se contrapone a los modelos oficiales comúnmente aceptados ◇ *However, the economics of hot pressing are such that there is strong commercial pressure on any firm mass-producing ceramics to find a less expensive alternative*), **alternative** (GRAL alternativa; opción entre dos o más cosas o cada una de las cosas entre las cuales se opta)].

**alum** *n*: QUIM alumbre, sulfato de aluminio; sulfato de aluminio y potasio resultante de la cristalización *-crystallization-* de una disolución acuosa de sulfato de aluminio y sulfato potásico ◇ *In the preparation of alum from clays or from bauxite, the material is gently calcined, then mixed with sulfuric acid and heated gradually to boiling.*

**alumina** *n*: MATPRI alúmina, óxido de aluminio; óxido existente en la naturaleza en forma de corindón y de esmeril que, junto con la sílice, es el ingrediente más importante en la constitución de las arcillas y los barnices, confiriéndoles resistencia y aumentando su temperatura de maduración *-soaking temperature-*, lo que lo hace un

material cerámico muy versátil y especialmente apto para aplicaciones en donde la temperatura es un factor crítico ◇ *The most common industrial ceramic is aluminum oxide, also know as alumina; V. corundum; fused alumina; single crystal alumina; sintered alumina; tabular alumina; alumina calcined.* [Exp: **alumina cement** (INDAFIN cemento aluminoso, cemento fundido; material inorgánico que adquiere una textura muy densa al reaccionar con agua y que se produce principalmente a partir de la bauxita con impurezas de óxido de hierro, óxido de titanio y óxido de silicio ◇ *Alumina cement is known for its refractoriness, rapid hardening, resistance to chemical attack*), **alumina ceramics** (PRODFIN cerámica de alúmina; material cerámico que contiene al menos un 80% de óxido de aluminio caracterizado por su elevada resistencia a la abrasión, la corrosión y a la erosión así como por su resistencia eléctrica y química, por sus excelentes propiedades de aislamiento eléctrico *-electrical insulation-*, su gran dureza y resistencia mecánica y su excelente resistencia al desgaste ◇ *Alumina ceramics are finding increasing use in applications such as pump seals, wear plates for industrial components, sand blast nozzles, extrusion dies, etc.*), **alumina grinding balls** (TRANSMTRLs bolas de alúmina para la molienda ◇ *Alumina grinding balls are used in ball mill, vibrating mill and other fine grinding plants, and have advantages such as high hardness, high volumetric density and anticorrosion*), **alumina porcelain** (PRODFIN porcelana aluminosa, porcelana de alúmina; cerámica fina vidriada *-vitreous ceramic whiteware-* para aplicaciones técnicas en las cuales la alumina es la fase cristalina esencial ◇ *This led to today's alumina porcelain, which exhibited noticeably greater strength and reliability even under extreme thermal stress or sudden temperature changes, and was clearly superior to quartz porcelain*), **alumina whiteware** (PRODFIN cerámica fina de alúmina ◇ *Any ceramic whiteware in which alumina is the essential crystalline phase is referred to as alumina whiteware; V. alumina porcelain*), **aluminate** (QUIM aluminato; compuesto que contiene aluminio y oxígeno junto con mas elementos electropositivos *-electropositive elements-* pero que es mucho menos común que los aluminosilicatos *-aluminosilicates-* ◇ *Magnesium aluminate, Sodium aluminate, Potassium aluminate, and Zinc aluminate are some of the categories aluminates include*), **aluminatitania coating**, **alumina-titania coating** (ELABPROC recubrimiento de alúmina-titania ◇ *To enhance surface characteristics, an alumina-titania coating has been applied*), **alumina-titania** (ELABPROC/QUIM V. *aluminatitania, alumina-titania*), **alumina-titania coating** (ELABPROC V. *aluminatitania coating, alumina-titania coating*), **aluminatitania**, **alumina-titania** (ELABPROC/QUIM alúmina-titania; el sistema alúmina-titania permite el diseño de materiales basado en el desarrollo de tensiones residuales durante el enfriamiento desde la temperatura de sinterización debido a la anisotropía de expansión térmica tanto de la alúmina como del titanato de aluminio y a las diferencias entre la expansión térmica de estos compuestos ◇ *Response of plasma-sprayed alumina-titania ceramic composite to high-frequency impact loading*), **aluminium alloy** (QUIM aleación de aluminio ◇ *Pure aluminium has a low tensile strength, but when combined with thermo-mechanical processing, aluminium alloys display a marked improvement in mechanical properties, especially when tempered; V. alloy*)].

**aluminium, aluminum** *n.*: MTRLs aluminio; metal no ferroso muy útil en ingeniería mecánica por su baja densidad y su alta resistencia a la corrosión que, en estado natural, se encuentra en muchos silicatos (feldespatos, plagioclasas y micas) y que como metal se extrae de la bauxita ◇ *ASTM C484 is a test for ceramic tiles, which are removed from an oven at 145°C and placed on a sheet of aluminium at room*

*temperature.* [Exp: **aluminium borate** (QUIM/MTRLS borato de aluminio, boroaluminato  $\diamond$  *Aluminium borate (Al<sub>2</sub>O<sub>3</sub> B<sub>2</sub>O<sub>3</sub>) is used in the production of glass and ceramic; V. boroaluminato), **aluminium boride** (MTRLS boruro de aluminio; compuesto preparado en horno eléctrico, que se presenta en masas cristalinas y que se emplea en cristalería o como sustituto del diamante por su dureza), **aluminium bronze** (MTRLS bronce de aluminio, cuproaluminio; aleación constituida esencialmente por cobre y aluminio y que se utiliza, por sus propiedades mecánicas y su resistencia a la corrosión, en ciertas construcciones mecánicas, siendo también muy apreciada para los trabajos artísticos por su parecido con el oro V. *bronze*), **aluminium carbide** (MTRLS carburo de aluminio; compuesto frágil e higroscópico que degrada química y mecánicamente al material compuesto y que se utiliza como catalizador, agente secante y reductor, y en metalurgia  $\diamond$  *Carbon fibers have poor wetting and react with molten aluminium producing aluminium carbide*), **aluminium ceramics** (PRODFIN cerámica de aluminio  $\diamond$  *This article deals with the fabrication and properties of commercially produced aluminum ceramics*), **aluminium conduit** (CONST conducto de aluminio, conducción de aluminio), **aluminium enamel** (ESMREL esmalte de aluminio; esmalte vítreo para aplicación sobre aluminio  $\diamond$  *There are three main types of aluminium enamel: containing lead, phosphate glass, or barium, although lithium compounds have also been used in these enamels; V. enamel*), **aluminium foil** (GRAL papel de aluminio), **aluminium foil insulation** (CONST/INSTAL lámina de aluminio para aislamiento; aislamiento mediante lámina/papel de aluminio  $\diamond$  *The aluminium foil insulation protects roofs and walls from radiant heat*), **aluminium hydroxide** (QUIM hidróxido de aluminio  $\diamond$  *Aluminium hydroxide has a wide range of uses, such as flame retardants in plastics and rubber, paper fillers and extenders, toothpaste filler, antacids, titania coating and as a feedstock for the manufacture of aluminium chemicals, e.g. aluminium sulfate, aluminium chlorides, poly aluminium chloride, and aluminium nitrate*), **aluminium nitride, AlN** (MTRLS/QUIM/PRODFIN nitruro de aluminio; en el campo de los materiales cerámicos avanzados, material aislante eléctrico con una conductividad térmica un orden de magnitud mayor que la de la alúmina  $\diamond$  *The following characteristics are typical for Aluminum Nitride ceramics: very high thermal conductivity, thermal expansion similar to silicon, good dielectric properties, good corrosion resistance, stability in semiconductor processing atmospheres*), **aluminium oxide** (MATPRI V. *alumina*), **aluminium oxynitride, AlON** (PRODFIN/QUIM oxinitruro de aluminio  $\diamond$  *Aluminium oxynitride (AlON) is a transparent ceramic composed of aluminium, oxygen and nitrogen marketed under the name ALON; V. ALON*), **aluminium phosphate** (MTRLS/QUIM fosfato de aluminio  $\diamond$  *The bonding action of aluminium phosphate has been attributed to reaction between the phosphate and basic oxides or Al<sub>2</sub>O<sub>3</sub> in the refractory*), **aluminium silicate** (MTRLS/QUIM silicato de aluminio V. *kaolin; hydrated aluminium silicate*), **aluminium stearate, AS** (ESMREL estearato de aluminio  $\diamond$  *Aluminium stearate is used as a thickening agent in the production of varnishes and lacquers*), **aluminium titanate** (MTRLS titanato de aluminio; material cerámico consistente en una mezcla de alumina y titania y que se caracteriza por su bajo coeficiente de expansión térmica, elevada refractariedad y baja mojabilidad por metales no ferrosos fundidos  $\diamond$  *The effect of aluminium titanate content and grain size in the mechanical behaviour of structural alumina materials has been studied*), **aluminium titanate ceramics** (PRODFIN cerámica de titanato de aluminio  $\diamond$  *The distinctive property of Aluminum Titanate ceramics is their high thermal shock resistance which is a result of very low coefficient of thermal expansion*), **aluminosilicate refractory** (INDAFIN V. *alumino-silicate refractory*), **alumino-silicate***

**refractory** (INDAFIN refractario aluminosilicato ◊ *Aluminosilicate refractories include all refractories of the fireclay, sillimanite, mullite, diaspore and bauxite types*), **aluminosilicate**, **aluminosilicate** (GEO-MIN-CRIST aluminosilicato; minerales compuestos de aluminio, silicio y oxígeno, forman parte de las arcillas y son la base de muchas cerámicas y vidrios ◊ *Feldspar is also an aluminosilicate with other elements, such as potassium, sodium, or calcium, included in its structure*), **aluminothermy** (INDAFIN aluminotermia; proceso para obtener metales muy puros a partir de sus óxidos, por reducción de éstos con aluminio ◊ *The aluminothermy is the high temperatures produced by the exothermic reaction of aluminum powder on various metallic oxydes*), **aluminous** (PROPQUIM-FIS aluminoso; que tiene calidad o mezcla de alúmina), **aluminous cement** (INDAFIN cemento aluminoso, cemento fundido; cemento producido a partir principalmente de la bauxita con impurezas de óxido de hierro, óxido de titanio y óxido de silicio ◊ *The beams in my flat are made of aluminous cement; V. ciment fondu*), **aluminous porcelain** (PRODFIN porcelana aluminosa ◊ *Aluminous porcelain was superior to feldspathic porcelain in transverse strength and the transverse strength of both types of porcelain was affected adversely by environmental moisture*), **aluminous refractory** (INDAFIN refractario aluminoso ◊ *Calcined kyanite is used in making aluminous refractories*)].

**alumstone** *n*: GEO-MIN-CRIST *V. alunite*.

**alundum** *n*: MTRLS alundum; forma artificial del corindón obtenida por fusión de bauxita a alta temperatura y empleada en la fabricación de ladrillos refractarios ◊ *Charles B. Jacobs discovered how to produce artificial corundum "alundum"; V. corundum; Alundum*. [Exp: **Alundum** (INDAFIN Alundum; marca registrada de material refractario silicoaluminoso prensado en semiseco para cuya fabricación se utilizan arcillas aluminosas, chamotas y bauxitas, previamente seleccionadas y cocidas hasta 1.350° C de temperatura máxima; corindón artificial usado como abrasivo ◊ *Alundum is fused alumina made by Norton Co. Alunite; V. corundum*)].

**alunite** *n*: GEO-MIN-CRIST alunite, piedra de alumbre ◊ *Alunite may be present as a main mineral in the deposits, making these clay materials unsuitable for ceramic applications*.

**AM** *abbr*: DISTRIB *V. airmail*.

**amateurish** *a/adv*: GRAL hecho a la ligera; dícese de aquello que está hecho con poca habilidad/destreza, de forma chapucera, como de aficionado ◊ *The paving looked amateurish*.

**amber** *n/a*: ESMREL ámbar ◊ *The amber colour is imparted by iron and sulphur*. [Exp: **amber glass** (INDAFIN vidrio ámbar ◊ *Whilst other colours of container glass are selected for aesthetic reasons the amber or brown glass is designed to absorb ultraviolet light to protect some foods and pharmaceutical products sensitive to UV*), **amber-coloured** (ESMREL/DISEÑO de color ámbar)].

**ambient** *n/a*: GRAL ambiente, ambiental; aire o atmósfera; condiciones o circunstancias físicas, sociales, económicas, etc., de un lugar, una colectividad, etc. [Exp: **ambient conditions** (GRAL condiciones ambientales; las condiciones alrededor de algo ( presión,

temperatura, etc.) ◇ *Since absorbed water plays a large part in determining the friction behavior of many ceramics under ambient conditions, such changes in the susceptibility of surfaces to water absorption are of critical importance*), **ambient moisture** (GRAL/PROPQUIM-FIS humedad ambiente/ambiental ◇ *Subcritical crack growth is usually the result of a stress-enhanced reaction between the ceramic and ambient moisture, and has been observed in a wide variety of ceramic materials: glasses, porcelains, oxides, silicate minerals and titanates*), **ambient noise, AN** (GRAL ruido ambiental/ambiente; ruido que se produce en un área o entorno y que es el conjunto de varios sonidos procedentes de diversas fuentes, tanto lejanas como cercanas ◇ *A customised earpiece reduces ambient noise levels in industries by approximately 26dB*), **ambient noise level** (GRAL nivel de ruido ambiental ◇ *We understand ambient noise level as the noise level in the area surrounding the machine or component to be tested with machine being tested not operating*), **ambient pressure** (GRAL presión ambiente, presión ambiental; presión del medio ambiente, tal como un gas o un líquido, que se pone en contacto con un aparato o con una reacción), **ambient temperature** (GRAL/ENSAYO temperatura ambiente; temperatura promedio del medio ambiente inmediato que se pone en contacto con el instrumento o producto sometido a prueba ◇ *Test standard developed for determining the slow crack growth of advanced ceramics at ambient temperature*)].

**amblygonite** *n*: MTRLS/GEO-MIN-CRIST amblygonita; mineral de litio de composición variable ◇ *Amblygonite is used in ceramic bodies as an active flux in combination with most feldspathic materials in the formation of low-temperature bodies.*

**Amboy clay** *n*: MATPRI arcilla Amboy.

**amend** *v*: GRAL revisar; enmendar, modificar, rectificar, reformar, corregir ◇ *The Member States shall, if necessary, amend their national laws to comply with this Directive; V. correct.* [Exp: **amendment** (GRAL modificación; enmienda, rectificación, reforma ◇ *Revisions apply to this European standard only when incorporated in it by amendment or revision*)].

**American** *n/a*: GRAL americano. [Exp: **American bond** (CONST/INSTAL aparejo americano ◇ *In masonry, an American bond is a form of bond in which every sixth course is a header course and the intervening courses are stretcher courses; V. bond; common bond; header; stretcher; brickwork; masonry*), **American Ceramic Society, ACerS; ACS** (ORG-INST Sociedad Americana de Cerámica; mayor organización mundial dedicada al avance de la cerámica y que, como tal, publica numerosas revistas relacionadas con la cerámica ◇ *In 1920 the American Ceramic Society extended the scope of the word ceramics to include all the silicate industries, bringing in glass, vitreous enamel and hydraulic cement*), **American Concrete Institute, ACI** (ORG-INST Instituto Americano del Concreto, Instituto Americano del Hormigón; sociedad técnica dedicada al avance de la educación técnica y de la ingeniería, así como a estimular la investigación científica y el desarrollo de estándares para el diseño, construcción, mantenimiento y reparación de estructuras de concreto/hormigón o materiales afines), **American engineering standards committee, AESC** (ORG-INST Comité americano de estándares de ingeniería ◇ *In 1928 the American Engineering Standards Committee (AESC) became the American Standards Association (ASA), which in 1966 became the United States of America Standards Institute (USASI) and finally the ANSI; V. ASA;*

*USASI; ANSI*), **American Foundrymen's Association, AFA** (ORG-INST Asociación Americana de Fundidores; asociación que en 1948 cambió su nombre por el de Sociedad Americana de Fundidores ◇ *The A.F.A. Rammer is an apparatus designed by the American Foundrymen's Association for the preparation of test-pieces of foundry sand*; V. *A.F.S; sand rammer*), **American Foundrymen's Society, AFS** (ORG-INST Sociedad Americana de Fundidores ◇ *American Foundrymen's Society has issued standard methods for testing foundry sands*; V. *AFA*), **American National Standards Institute, ANSI** (ORG-INST Instituto Nacional Americano/Estadounidense de Estándares; organismo de normalización que supervisa el desarrollo de estándares para productos, servicios, procesos y sistemas en los Estados Unidos a la vez que coordina estándares de este país con estándares internacionales, de manera que los productos estadounidenses puedan usarse en todo el mundo ◇ *The American National Standards Institute (ANSI) together with the American Society for Testing and Materials (ASTM) has established a method for testing ceramic tiles which is found in ANSI 137.1 1988*; V. *AESC; ASA; USASI*), **American Society for Quality, ASQ** (ORG-INST Sociedad Americana para la Calidad ◇ *The American Society for Quality (ASQ) is the world's leading authority on quality which advances learning, quality improvement, and knowledge exchange to improve business results, and to create better workplaces and communities worldwide*), **American Society for Testing and Materials, ASTM** (ORG-INST Sociedad Americana de Ensayos y Materiales; sociedad técnica sin ánimo de lucro -*non-profit technical society*- que desarrolla y publica estándares -*standards*- , definiciones de materiales, métodos para el ensayo con materiales, prácticas de instalación recomendadas y especificaciones para materiales ◇ *The ASTM is responsible for most of the American standard specifications for ceramics*), **American Society of Mechanical Engineers, ASME** (ORG-INST Asociación Americana de Ingenieros Mecánicos ◇ *The ASME vision for mechanical engineering is to be the premier organization for promoting the art, science and practice throughout the world*), **American Standards Association, ASA** (ORG-INST Asociación Americana de Estándares V. *AESC, USASI, ANSI*), **American test** (ENSAYO test americano, ensayo americano; ensayo en el que se expone la pieza esmaltada a ácido acético (1 : 20) a 60 °C durante 30 minutos V. *low-solubility test*)].

**amiantus** *n.*: QUIM V. *asbestos*.

**ammeter** *n.*: INSTR V. *amperemeter*.

**ammonia** *n.*: QUIM amoníaco, hidrato amónico; compuesto químico alcalino e incoloro, compuesto de nitrógeno e hidrógeno, con un olor muy fuerte y característico, altamente soluble en agua y muy utilizado en la limpieza y desinfección del hogar ◇ *Do not use any cleaners with ammonia on the tile because it will strip the sealer off*. [Exp: **ammonia-based cleaner** (MANTNMTO limpiador a base de amoniaco ◇ *Avoid ammonia-based cleaners since they may discolor some types of colored grout*)].

**ammonium** *n.*: QUIM amonio; ion monovalente positivo derivado del amoníaco por adición de un ion hidrógeno. [Exp: **ammonium acetate** (QUIM acetato amónico; compuesto químico que se presenta en forma de sólido blanco y que puede derivarse de la reacción entre el amoniaco y el ácido acético ◇ *Ammonium acetate is preferred as the hardening agent/gelation accelerator and is preferably sprayed onto the coated pattern*)], **ammonium bifluoride** (QUIM/MTRLS bifluoruro de amonio, bifluoruro amónico;

compuesto químico usado principalmente en el tratamiento de las superficies de vidrio, a las que corroe y hace opacas ◇ *The method for removing a ceramic coating generally entails subjecting the coating to an aqueous solution of ammonium bifluoride, optionally containing a wetting agent, such as by immersing the component in the solution while maintained at an elevated temperature*), **ammonium carbonate** (QUIM carbonato de amonio, carbonato amónico ◇ *Ammonium carbonate is used in smelling salts, baking powder, fire extinguishers, ammonium casein glue, ceramics, and textile dyeing*), **ammonium chloride** (QUIM cloruro amónico, cloruro de amonio; sal de amonio cuya síntesis se produce a partir de vapores de cloruro de hidrógeno y de amoniaco ◇ *At fire temperatures ammonium chloride begins to corrode metals and may dissociate into ammonia and hydrogen chloride*), **ammonium diuranate**, **ADU** (ESMREL diuranato de amonio ◇ *Ammonium diuranate is used to produce colored glazes in ceramics*), **ammonium hydroxide** (QUIM hidróxido de amonio; solución química incolora y líquida que se forma cuando el amoniaco es disuelto en agua ◇ *Ammonium hydroxide, also known as ammonia water, aqua ammonia, or aqueous ammonia, is a solution of ammonia in water but technically, the use of the term "ammonium hydroxide" is incorrect because such a chemical compound is not isolatable*), **ammonium molybdate** (QUIM/MTRLS molibdato amónico ◇ *Ammonium molybdenum is used in in the production of molybdenum metal and ceramics*), **ammonium nitrate** (QUIM nitrato de amonio, nitrato amónico; sal formada por iones de nitrato y de amonio; compuesto incoloro e higroscópico *-hygroscopic-*, altamente soluble en agua ◇ *Ammonium nitrate is used in the treatment of some titanium ores*), **ammonium nitrate and fuel-oil**, **ANFO** (EXPL-CANT nitrato-fuel, ANFO; agente de voladuras resultante de la mezcla de nitrato de amonio y gasoil, utilizado como agente explosivo en muchas canteras ◇ *ANFO under most conditions is considered a high explosive: it decomposes through detonation rather than deflagration and with a high velocity*), **ammonium oxalate** (QUIM/MTRLS oxalato de amonio, oxalato amónico ◇ *The pellets using ammonium oxalate exhibited no cracking, connected porosity or inhomogeneity when processed under the same conditions*), **ammonium persulphate**, **APS** (QUIM persulfato de amonio, persulfato amónico ◇ *The polymerisation may be initiated by a suitable initiator such as ammonium persulphate or the like*), **ammonium sulphate** (QUIM sulfato de amonio, sulfato amónico ◇ *When strongly heated, ammonium sulphate decomposes without melting, releasing ammonia or amines, oxides of nitrogen*), **ammonium vanadate** (GEO-MIN-CRIST vandato de amonio, vanadato amónico ◇ *Ammonium vanadate occurs as white crystals or as a white-very pale yellow crystalline powder*)].

**amorphous** *a*: GRAL/PROPQUIM-FIS amorfo; en general, sin forma regular o bien determinada; también un mineral, roca, o líquido que carece de estructura cristalina ◇ *Although we have included glass in the definition of ceramic, the major distinction is that glass is an amorphous material, whereas ceramics are primarily crystalline in nature*. [Exp: **amorphous phase** (GEO-MIN-CRIST fase amorfa; fase desprovista de cristalinidad (no cristalina) ◇ *The coating can include a wide range of compounds and normally at least a portion of the coating corresponds to an amorphous phase*; V. *phase*), **amorphous residue** (ELABPROC residuo amorfo ◇ *During the heat treatment, the clays progressively lose their lattice water and their degree of crystallinity, giving rise to an amorphous residue*), **amorphous silica** (MATPRI/ELABPROC sílice amorfa; carga /extendedor *-extender pigment-* caracterizado por la ausencia de una estructura cristalina pronunciada y que también puede usarse como agente deslustrador *-flattening*)]

*agent- o secante -dessicant- ◇ Silicon nitride is protected against spontaneous oxidation by films of crystalline or amorphous silica*), **amorphous silicon nitride** (MTRLs nitruro de silicio amorfo; material refractario cuya forma cristalina es estable a temperaturas muy elevadas y tiene una dureza extrema ◇ *The amorphous silicon nitride powders can be processed to dense ceramics in different ways*)].

**amount** *v/n*: GRAL cantidad, importesuma; cuota, cantidad, cuantía, amplitud, suma, proporción ◇ *The formulation of the clay body being used can also affect the tightness or porosity of the piece and therefore the amount of glaze deposited. [Exp: amount to (GRAL ascender a ◇ The total value of the imported ceramics objects traded on the local market amounted to almost 60 million EUR)]*.

**amp, ampere, A** *n*: MEDIDA amperio, ampere; unidad básica de intensidad de corriente eléctrica del Sistema Internacional de Unidades cuya medida se efectúa mediante el amperímetro; si bien "ampere" es la denominación oficial, el Real Decreto admite la denominación castellana de uso habitual "amperio" aceptada por la RAE ◇ *Because it is a base unit, the definition of the ampere is not tied to any other electrical unit. [Exp: amperage (MEDIDA amperaje, intensidad de corriente; fuerza/potencia en una corriente eléctrica circulando entre dos puntos, el negativo y el positivo, a través de un conductor o cable eléctrico ◇ This chart estimates the output amperage of known generator size and voltage), ampere hour, A-h (MEDIDA amperio hora; unidad de carga eléctrica que indica la cantidad de carga eléctrica transportada en 1h por una corriente de 1A ◇ For example, a 400 ampere-hour battery will deliver 400 amperes for 1 hour or 100 amperes for 4 hours), ampere hour meter, AHM (INSTR amperihorímetro, contador de amperio-hora; aparato que mide una magnitud de electricidad por integración de una corriente en función del tiempo ◇ The ampere-hour meter registers ampere-hours and is an integrating meter similar to the watt-hour meter used to measure electricity usage in a home), amperemeter (INSTR amperímetro; aparato utilizado para medir el número de amperios de una corriente eléctrica ◇ The best option is to measure it physically on the workstation using an amperometer), amperometer (INSTR V. amperemeter)]*.

**ampelite** *n*: GEO-MIN-CRIST ampelita; roca esquistosa, de color gris o negro, compacta, sin vetas y con lustre grasiento, derivada de arcillas ricas en materia orgánica y en pirita ◇ *Ampelite, in natural history, is a black, bituminous substance that dissolves in oil.*

**Amperit** *n*: MTRLs Amperit ◇ *Amperit is the tradename of mixed aluminatitania powders supplied by Hoechst AG.*

**amphibole** *n*: MTRLs anfíbol; silicato de calcio, sodio, potasio, hierro, magnesio y otros materiales; componente esencial de la anfíbolita ◇ *Five types of compound ceramics are manufactured by using serpentinite and magnesia as main agents, by mixing with proper materials chosen from amphibole, zeolite, titanium, silica, tourmaline, and Oya-ishi in proper ratio, and by firing at at 200 - 500.DEG.C. [Exp: amphibole asbestos (GEO-MIN-CRIST amianto anfíbol ◇ Natural asbestos, a variety of the silicate mineral actinolite, is found in two varieties: serpentine asbestos and amphibole asbestos; V. serpentine asbestos)]*.

**amphibolite** *n*: GEO-MIN-CRIST anfibolita; roca metamórfica que presenta un color verde oscuro, compuesta principalmente por anfíbol y plagioclasa ◇ *Amphibolite is a common dimension stone used in construction, paving, facing of buildings, etcetera especially because of its attractive textures, dark colour, hardness and polishability and its ready availability.*

**amphoteric** *n*: PROPQUIM-FIS anfótero; propiedad de los compuestos químicos capaces de reaccionar como ácidos o como bases y que por tanto que tienen propiedades tanto ácidas como básicas ◇ *Because of the amphoteric nature of ceramic material, depending on the pH of the feed mixture, the negative or the positive ions are held back.* [Exp: **amphoteric oxide** (QUIM óxido anfótero; óxido que presenta tanto propiedades ácidas como básicas ◇ *The amphoteric oxide is usually alumina, and the acidic oxides are usually silica and boric oxide*)].

**amplifier** *n*: GRAL amplificador ◇ *To obtain amplification of voltage, current or power an amplifier may be used.* [Exp: **amplify** (GRAL amplificar; aumentar ◇ *When glass tiles, translucent by definition, are exposed to light, they amplify, reflect and diffuse it*)].

**amplitude** *n*: GRAL amplitud ◇ *A vibrating mill is designed to oscillate both horizontally and vertically, the vertical motion being of small but sufficient amplitude to prevent the charge from becoming tightly packed.* [Exp: **amply** (GRAL ampliamente; abundantemente; con potencia más que suficiente ◇ *The instrument is amply powered, and the display is legible, even in dim light*)].

**ampoule** *n*: GRAL ampolla ◇ *When working with ceramic materials having open porosity, the ampoule is sealed after evacuation and filling it with the flotation liquid.*

**Amsler (mercury) volumeter** *n*: INSTR volumenómetro (de mercurio) Amsler; aparato para medir la densidad aparente de materiales en polvo o granulados ◇ *The porosity was determined by means of an Amsler mercury volumeter measuring the volume of mercury displaced by a specimen of known weight; V. volumeter.*

**AMT** *abbr*: ELABPROC V. *advanced manufacturing technology.*

**AN** *abbr*: GRAL V. *ambient noise.*

**anagama** *n*: MAQELAB anagama; tipo de horno ya obsoleto de origen japonés ◇ *The anagama or cellar kiln was one continuous chamber.*

**analogous** *a*: GRAL análogo; que tiene analogía, está relacionado con algo ◇ *This type of energy dissipation is analogous to that associated with crack tip plasticity in ductile metals.* [Exp: **analogous harmony** (DISEÑO armonía análoga; combinación de colores que se encuentran juntos en el círculo cromático y que, en cierta medida, se contienen unos a otros ◇ *Analogous harmony describes the relatedness or compatibility of colors adjacent to each other on the color wheel*)].

**analyse** *v*: GRAL analizar; hacer análisis de algo; "analyse" es la forma preferida en el Reino Unido mientras que "analyze" es la forma usada en EE.UU. ◇ *It is important, in learning to understand and correct glaze defects, to analyse the procedure used for*

*making glazes, making note of changes in materials available, different kilns or atmospheres, and any other things that may have been different from batch to batch.* [Exp: **analysis** (GRAL análisis; en general, distinción, separación y observación detallada de las partes de un todo hasta llegar a conocer sus principios, elementos, causas, etc.; en química, prueba realizada a una sustancia de composición química principalmente para detectar su grado de pureza ◇ *Analysis of failure from surface cracks must, in general, recognize the continuing existence of the residual stress that created the crack*; V. *surface analysis; stress analysis; failure analysis; statistical analysis; thermal analysis; particle-size analysis*), **analysis of failure** (ENSAYO/CALIDAD V. *failure analysis*)].

**analytical a:** GRAL analítico ◇ *These methods are often coupled with other analytical techniques and computer analyses.* [Exp: **analytical balance** (INSTR balanza de precisión, balanza analítica ◇ *An analytical balance is capable of measuring to nearest 0.0001 gram*), **analytical methods** (ELABPROC métodos analíticos; procedimiento utilizado para analizar una muestra con el fin de determinar la identidad y concentración de un componente específico de la misma ◇ *Analytical methods generally include information on the collection, transport, and storage of samples; define procedures to concentrate, separate, identify, and quantify components contained in samples; specify quality control criteria the analytical data must meet; and, designate how to report the results of the analyses*), **analytical portion** (TRANSPROC/ELABPROC porción analítica; cantidad representativa de material extraído de la muestra analítica para cuya extracción podrá utilizarse un instrumento de muestreo V. *analytical sample*), **analytical sample** (TRANSPROC/ELABPROC muestra analítica; muestra de material destinada al análisis y que se prepara a partir de la muestra de laboratorio separando la porción del producto que ha de analizarse y luego mezclando, triturando, cortando finamente, etc., con el fin de poder prescindir de porciones analíticas con el mínimo error de muestro ◇ *The analytical sample is then transferred to a laboratory*; V. *analytical portion*), **analytical solution** (MTRLS V. *test solution*)].

**analyze v:** GRAL V. *analyse*.

**anatase n:** QUIM/ESMREL anatasa ◇ *Octahedrite is also an obsolete synonym for anatase, one of the three known titanium dioxide minerals, which is used as a pigment.*

**ANC abbr:** PROPQUIM-FIS V. *acid neutralizing capacity*.

**anchor<sup>1</sup>** v/n: INSTAL anclaje, pieza de cimentación; zapata; sujeción, dispositivo o elemento destinado a fijar algo firmemente ◇ *V-Stud is a V-shaped stud or anchor for a refractory lining*; V. *fixing; peg; bolt; claw; hook*. [Exp: **anchor<sup>2</sup>** (GRAL anclar; sujetar algo firmemente al suelo o a otro lugar), **anchor<sup>3</sup>** (INSTR ancla ◇ *Slurries of moderate viscosity are also mixed using anchors, paddles and planetary impellers*), **anchor bolt** (INSTR bulón de anclaje, perno de anclaje ◇ *The metal pin maintaining in position an assembly of separately fabricated cores or parts of moulds is called an anchor bolt*), **anchor brick** (INDAFIN ladrillo de anclaje ◇ *An anchor brick is noted for its high strength, good erosion resistance*), **anchor drilling machine** (INSTAL máquina taladradora para anclajes ◇ *An anchor drilling machine is a drilling machine for tiles transportable from jobsite to another one*), **anchor hole** (INSTAL agujero de anclaje, orificio de anclaje ◇ *The anchor hole should be filled completely with adhesive prior to*

*inserting the anchor rod*), **anchor rod** (INSTR V. *anchor bolt*), **anchor slot** (INSTAL ranura de anclaje), **anchor wire** (INSTAL/CONST/EXPL-CANT cable de anclaje ◊ *The anchor wires were pushed up through the holes*), **anchor/anchorage point** (INSTAL punto de anclaje ◊ *When the attempt to improve the adherence strength between the ceramic material and the electrode is made by forming the anchor point on the surface of the ceramic material by a chemical treatment, problems may arise*), **anchorage** (INSTAL anclaje; acción/resultado de fijar algo firmemente al suelo; también conjunto de elementos destinados a este fin ◊ *These tiles offer quick assembly and anchorage without necessity of using cement or any other element for its fixation (except for fixation in the base and edges of the roof)*; V. *fixing; anchor*), **anchorage testing** (INSTAL pruebas de anclaje ◊ *For anchorage testing, both load and displacement were recorded during each test*), **anchorage/anchoring device** (INSTAL dispositivo de anclaje ◊ *Anchorage device for use in sand or sandy soils*), **anchorage/anchoring system** (INSTAL sistema de anclaje ◊ *The patent shows an anchorage system for attaching ceramic refractory materials to a metallic substrate, or casing*).

**andalusite** *n*: GEO-MIN-CRIST andalucita; mineral de color carnosos más o menos violáceo, que puede cambiar a gris cuando existen alteraciones externas, la mayoría del cual se destina a producir materiales refractarios para industrias siderúrgicas y metalúrgicas, cementeras, hornos y crisoles ◊ *Andalusite finds some use as a refractory raw material*.

**Anderson Darling test, A-D** *n*: ENSAYO test Anderson Darling, prueba de Anderson Darling; prueba que determina si una muestra de datos viene de una determinada distribución específica.

**Andreasen pipette** *n*: INSTR pipeta de Andreasen; instrumento usado para determinar el tamaño de las partículas de arcilla mediante el método de sedimentación - *sedimentation method*- ◊ *Determination of the particle size distribution of paint fillers by the Andreasen pipette method*.

**anelastic deformation** *n*: PROPQUIM-FIS deformación anelástica; proceso de deformación por el cual, después de un cierto tiempo, el material recupera su forma original tras haberle sido aplicada una carga ◊ *Particles exhibiting anelastic deformation are tougher particles*.

**anemometer** *n*: INSTR anemómetro; aparato para medir la velocidad del viento ◊ *Use anemometer to measure air through floor tile and cumulative air through all equipment mounted in cabinet*.

**ANFFECC** *abbr*: ORG-INST V. *Spanish Association of Frit, Glaze, and Ceramic Colour*.

**ANFO** *abbr*: EXPL-CANT V. *ammonium nitrate and fuel-oil*.

**angle** *n*: GRAL ángulo, escuadra; en geometría, figura formada en una superficie por dos líneas que parten de un mismo punto; también la formada en el espacio por dos superficies que parten de una misma línea ◊ *Angle tiles are used in an angle in vertical exterior tiling*. [Exp: **angle bead** (PRODFIN cantonera ◊ *An angle bead is a bead worked on or fixed to the angle of any architectural work, usually for protecting an angle of a wall*), **angle brace** (INSTAL/CONST V. *angle tie*), **angle bracket** (INSTAL ménsula en

escuadra, escuadra de unión), **angle clip/corbel** (INSTAL ángulo sujetador  $\diamond$  *An angle clip is a short strip of angle iron used to secure structural elements at right angles*), **angle closer** (CONST ladrillo de cierre, ladrillo angular; parte del ladrillo, bloque, elemento pétreo, etc., que cierra la hilada *-course-* en una esquina), **angle divider** (INSTAL divisor de ángulos  $\diamond$  *The angle divider is used by the tile setter to determine the degree of an angle to cut and is used for fitting trim, moldings, and floors into corners*), **angle float** (INSTAL llana de ángulo; herramienta compuesta de una plancha de madera, plástico, hierro o acero y un asa cuyos bordes forman un ángulo que permite llegar mejor a las esquinas interiores con mezclas convencionales tipo hormigón), **angle gauge** (INSTR V. goniometer), **angle hole** (INSTAL agujero en ángulo  $\diamond$  *This drill is also capable of making angle holes*), **angle of contact** (GRAL ángulo de contacto; ángulo que forma la superficie de un líquido al entrar en contacto con un sólido  $\diamond$  *With the water repellents the aim is that the angle of contact between the drop of water and the surface be the greatest possible*), **angle of friction** (PROPQUIM-FIS ángulo de fricción  $\diamond$  *For two surfaces in contact, the angle of repose, also referred to as angle of friction, is an engineering property of granular materials defined as the angle that the maximum contact force makes with the direction of normal force; V. angle of repose*), **angle of incidence** (PROPQUIM-FIS ángulo de incidencia; ángulo formado por el rayo incidente y la normal a la superficie  $\diamond$  *The angle of incidence of the ion beam upon the ceramic substrate was either 0° (i.e. normal incidence) or 45°; V. angle of reflection*), **angle of inclination** (ENSAYO ángulo de inclinación  $\diamond$  *This test measures the angle of inclination at which a test person slips and falls on a test surface and on the basis of this test the tiles are arranged in anti-slip classes*), **angle of nip** (MAQTRANS ángulo de cogida, ángulo de agarre; ángulo de pellizco; el mayor ángulo capaz de agarrar un bulto entre los rodillos, mordazas, o entre el aro y el recubrimiento de una máquina trituradora  $\diamond$  *The angle of nip is important in the design of crushing rolls for clay and it should not exceed about 18°*), **angle of reflection** (PROPQUIM-FIS ángulo de reflexión; ángulo formado por el rayo reflejado y la normal  $\diamond$  *The angle of incidence is equal to the angle of reflection for any reflecting surface and any incident angle; V. angle of incidence*), **angle of repose** (TRANSMTRLS/PROPMATPRI ángulo del cono de apilado (materias primas); propiedad de los materiales granulados que determina el máximo ángulo de una pendiente estable; cuando algún material granular es vertido en masa sobre una superficie horizontal se forma una pila cónica cuyo ángulo interno entre la superficie de la pila y la superficie horizontal es el ángulo del cono de apilado  $\diamond$  *Material with a low angle of repose forms flatter piles than material with a high angle of repose, in other words, the angle of repose is the angle a pile forms with the ground; V. angle of friction*), **angle of repose** (TRANSMTRLS/PROPMATPRI ángulo de resbalamiento  $\diamond$  *When a dry granular material is poured on a surface, the slope of the resulting pile cannot exceed some critical value: the angle of repose*), **angle of repose** (EXPL-CANT ángulo de reposo/de talud natural; grado máximo de una pendiente *-gradient-* en el que el suelo o las rocas sueltas permanecen estables), **angle of slip** (PROPMATPRI/PROPQUIM-FIS ángulo de deslizamiento; ángulo formado por la superficie de la pieza y el plano de deslizamiento  $\diamond$  *Coulomb (1776) was the first to relate the angle of slip to the friction properties of the material*), **angle paddle** (INSTAL paleta de acabado de esquinas  $\diamond$  *An angle paddle is normally made from lightweight aluminum with sharp corners and edges*), **angle runner brick** (INDAFIN ladrillo en forma de tubo acodado), **angle shaft** (CONST guardaesquina  $\diamond$  *An angle shaft is an enriched angle bead, often having a capital or base, or both*), **angle tie** (INSTAL/CONST escuadra de esquina, riostra diagonal  $\diamond$  *An angle tie is a bar fixed across a frame at an angle to stiffen it*), **angle tile** (PRODFIN apoyo de

rejilla simple; tipo de pieza especial cerámica  $\diamond$  *The cut angle tile will require an additional fixing to maintain security*), **angled** (GRAL angular, anguloso; en forma de ángulo; *right-angled*: de/en ángulo recto  $\diamond$  *A smooth curved edge is safer than a right-angled tile edge*; V. *angular*), **angledozer** (MAQEXTRAC tractor con cuchilla frontal regulable, angledozer; niveladora de ángulo; topadora angular  $\diamond$  *Bulldozers that are equipped with an angle blade are often referred to as angledozers*), **angular** (GRAL angular; perteneciente o relativo al ángulo o con forma de ángulo; también anguloso: que tiene ángulos/esquinas  $\diamond$  *Sol-gel powders have good flow properties compared with angular-shaped material produced in conventional syntheses and this is an advantage when they are used in thermal-spraying processes for the deposition of ceramic coatings*; V. *morphology*), **angular contour** (GRAL contorno anguloso  $\diamond$  *Molded concrete blocks of an angular contour are widely known, popular in commerce under the name of "L blocks" or angle bricks*), **angular fragment** (GRAL fragmento anguloso/angular), **angular velocity** (MEDIDA velocidad angular, frecuencia angular; pulsación; la velocidad angular ( $\omega$ ) es una medida de la velocidad de rotación  $\diamond$  *The units of angular velocity are most conveniently given in rads/sec*).

**angstrom, ångström, Å** *n*: MEDIDA angstrom, ångström; unidad de longitud equivalente a la diez mil millonésima parte del metro y empleada principalmente para expresar longitudes de onda, distancias moleculares y atómicas  $\diamond$  *Today, the use of the ångström as a unit is less popular than it used to be and the nanometre (nm) is often used instead*.

**anhydrite** *n*: QUIM anhidrita; sulfato anhidro de calcio que se utiliza en la fabricación del ácido sulfúrico y de ciertas clases de yeso calcinado  $\diamond$  *The mixing of fly ash or red mud with the anhydrite works not only as filler but add colour to the anhydrite matrix or tile*.

**anhydrous** *a*: PROPQUIM-FIS anhidro/a, anhídrico, seco; se dice de los cuerpos en cuya composición no entra el agua o que han perdido la que tenían  $\diamond$  *Solvents are commonly rendered anhydrous by boiling them in the presence of a hygroscopic substance*. [Exp: **anhydrous borax** (ESMREL bórax anhidro; fuente altamente concentrada de ácido bórico para esmaltes obtenido por combustión o fusión de bórax hidratado *-hydrated borax-*  $\diamond$  *Anhydrous borax is an excellent glass former since it does not puff or swell during melting thus fewer production problems result*)].

**anion** *n*: QUIM anión; ion con carga negativa [Exp: **anionic** (PROPQUIM-FIS aniónico; perteneciente o relativo al anión; según indica el término, los agente tensoactivos *-surfactants-* que se disocian en agua liberando cationes, aniones (o iones dipolares *-zwitterions-*) se llaman agentes tensoactivos iónicos (catiónicos, aniónicos), mientras que los agentes tensoactivos que no se disocian se conocen como agentes tensoactivos no iónicos V. *anion*; *anionic surfactant*), **anionic exchange** (QUIM intercambio aniónico  $\diamond$  *Anionic exchange is a physical/chemical process by which ions are exchanged between a resin bed and the water passing through*), **anionic surfactant** (ESMREL tensoactivo aniónico, agente de superficie aniónico; un tensoactivo es de tipo aniónico si la carga eléctrica presente en el grupo hidrófilo es negativa  $\diamond$  *The concave form at low adsorbed amounts reflects the lower affinity of the anionic surfactant for the surface of the glaze particles*; V. *anionic*)].

**anisotropic** *a*: PROPQUIM-FIS anisótropo, anisotrópico; dicho de una materia que no es isotrópica, esto es, que presenta propiedades físicas distintas en direcciones distintas  
 ◇ *The anisotropic structure of the aligned suspension gives rise to a similar anisotropic structure of the filter cake*; V. *isotropic*. [Exp: **anisotropic conductivity** (GEO-MIN-CRIST conductividad anisótropa/anisotrópica; conductividad eléctrica dependiente de la dirección de la corriente en un cristal ◇ *However, crystals with a unique axis may support a highly anisotropic conductivity*), **anisotropic thermal expansion** (PROPQUIM-FIS expansión térmica anisotrópica ◇ *Useful ceramic products can be developed from these solid solution compositions by controlling stresses and stress-relief mechanisms caused by the anisotropic thermal expansion*), **anisotropy** (PROPQUIM-FIS anisotropía; propiedad de la materia opuesta a la isotropía según la cual determinadas propiedades físicas tales como elasticidad, temperatura, conductividad, velocidad de propagación de la luz, etc. muestran un comportamiento diferente según la dirección en que son examinadas ◇ *These microcracks form during application of stress by virtue of the existence of very large, localized residual stresses resulting from thermal contraction mismatch or inherent anisotropy of the material*; V. *isotropy*)].

**anneal** *v*: ELABPROC recocer, atemperar; templar; endurecer por calor y sucesivo enfriado  
 ◇ *A second method, based on the assumption of a temperature-dependent wetting, is to anneal the material at a temperature below which retraction of the liquid phase is energetically favored*. [Exp: **Adams-Williamson annealing schedule** (INDAFIN programa de recocido Adams-Williamson; procedimiento para determinar las condiciones óptimas de recocido de un vidrio particular), **annealed** (PROPQUIM-FIS recocido ◇ *Each tile was annealed over 48 hours from 95 °C to ambient and then from ambient to 4 °C*), **annealed glass** (INDAFIN vidrio templado, vidrio recocido ◇ *Annealed glass is strong, has enhanced thermal resistance, and breaks into small cuboid fragments rather than irregular shards of glass*), **annealed wire** (INSTAL alambre recocido; conductor recocido, alambre templado ◇ *Annealed wire is obtained by means of thermal annealing, endowing it with the properties it needs for its main use - setting*), **annealing** (ELABPROC recocido, endurecido; temple; tratamiento de calentamiento de un sólido, seguido por un enfriamiento controlado hasta alcanzar una estructura cristalina perfecta con el fin de eliminar tensiones internas en materiales como el vidrio y el acero ◇ *Annealing, in metallurgy and materials science, is a heat treatment wherein a material is altered, causing changes in its properties such as strength and hardness*), **annealing furnace** (MAQELAB horno de recocido, horno de recocer), **annealing point, AP** (ELABPROC/PROPQUIM-FIS punto (superior) de recocido, temperatura de recocido; temperatura superior de recocido; temperatura a la cual las presiones internas en el material disminuyen ◇ *The glass is placed onto a roller table, taking it through a furnace which heats it to above its annealing point of 600 °C*; V. *annealing temperature*), **annealing range** (ELABPROC intervalo de recocido; intervalo de temperatura en el que las tensiones pueden ser eliminadas de un vidrio en un tiempo razonable y por debajo del cual los cambios rápidos de temperatura no causan tensiones internas permanentes en dicho vidrio; intervalo comprendido entre el punto (superior) de recocido -*annealing point*- y el punto inferior de recocido -*strain point*- ◇ *The annealing range of the glaze, and glaze thickness and its strength and elasticity have modifying influences on glaze fit*; V. *annealing point*; *strain point*), **annealing schedule** (ELABPROC programa de recocido ◇ *Your annealing schedule can help ease the fit of glasses*; V. *Adams-Williamson annealing schedule*; *Redston-Stanworth annealing schedule*; *Trebuchonkiewfer annealing schedule*), **annealing temperature** (ELABPROC

emperatura de recocido ◇ *As the annealing temperature increased, the mean pore size increased and the pore size distribution broadened; V. annealing point*].

**annex**<sup>1</sup> *a/n/v*: GRAL anexar; incorporar como anexo. [Exp: **annex**<sup>2</sup> (GRAL anexo, anejo; dícese de algo que está unido o agregado a otra cosa), **annex**<sup>3</sup> (GRAL anexo; adyacente, contiguo, adosado, adherido, adjunto; propio, inherente, concerniente)].

**annual**<sup>1</sup> *a/n*: GRAL anual ◇ *Annual world production of silicon carbide is today in the region of 500 000 t.* [Exp: **annual**<sup>2</sup> (GESTIÓN anuario; libro de publicación anual usado como guía para determinadas profesiones, con información, direcciones y otros datos de utilidad), **annual basis, on an** (GRAL/GESTIÓN anualmente ◇ *This report is updated on an annual basis*), **annual book of ASTM standards** (CALIDAD libro anual de normas ASTM; anuario de estándares de la ASTM ◇ *The Annual Book of ASTM standards contains the authoritative ASTM documents and should be the final authority for all questions and research*)].

**annular** *a*: GRAL anular; de forma de anillo. [Exp: **annular chamber kiln** (MAQELAB horno anular de cámaras ◇ *It has only been possible to carry out the firing process of such large-size products in the annular chamber kiln or in the single kiln*), **annular joint gap** (GRAL/INSTAL hueco/oquedad anular), **annular kiln** (MAQELAB horno anular, horno circular; horno continuo con compartimentos que, debido a la poca capacidad de control de la temperatura de cocción, ha sido sustituido por el horno túnel ◇ *There are two principal types of annular kilns: longitudinal-arch kiln and transverse arch-kiln; V. continuous kiln; longitudinal-arch kiln; transverse-arch kiln; Danneberg kiln; Halls kiln; moving-fire kiln; Ooms-Ittner kiln; simplex kiln; Belgian kiln*), **annulus** (GRAL corona circular, anillo; región entre dos círculos concéntricos ◇ *An annulus is a two-dimensional shape which can be thought of as a disc with a smaller disc removed from its center*)].

**annunciator** *n*: INSTR indicador; dispositivo de alocución grabada, anunciador, advertidor, cuadro indicador ◇ *The digital annunciator unit SACO 16D3 is used in a variety of applications requiring supervision of alarm and signalling contacts.* [Exp: **annunciator wire** (INSTAL cable guía, alambre guía)].

**anode** *n*: QUIM ánodo; electrodo positivo de una célula electrolítica hacia el que se dirigen los iones negativos dentro del electrolito ◇ *At the anode, anions (negative ions) are forced by the electrical potential to react chemically and give off electrons (oxidation) which then flow up and into the driving circuit; V. cathode.* [Exp: **anode-cathode distance, ACD** (QUIM distancia ánodo-cátodo ◇ *Control of temperature requires careful thermal management, and to reduce heat generation would require either operation at lower current (economically unfavorable) or reducing the anode-cathode distance (technically challenging)*), **anodic** (PROPQUIM-FIS anódico; perteneciente o relativo al ánodo ◇ *The thermal conductivity of the anodic film is much less than of metals*), **anodic coating** (ELABPROC revestimiento anódico ◇ *Because the anodic coating can be produced in a variety of colors, painted anodized parts are used in architectural applications*), **anodic treatment** (ELABPROC V. anodising/anodizing), **anodise/anodize** (QUIM/ELABPROC anodizar; recubrir la superficie de un material sólido con una capa metálica mediante electrolisis para que adquiera mayor dureza y resistencia a la corrosión ◇ *To anodize a metal means to oxidize or coat its surface with*

*an electrolyte such as sodium phosphate; V. electrolysis*), **anodised/anodized** (PROPQUIM-FIS **anodizado** ◇ *Anodized parts can be used to maintain uniform distribution of temperature and resist thermal shock*), **anodising/anodizing** (ELABPROC **anodización**, **anodizado**, oxidación anódica; técnica utilizada para modificar la superficie de un material; se conoce como anodizado a la capa de protección artificial generada sobre el aluminio mediante el óxido protector del aluminio, conocido como alúmina ◇ *The anodizing process converts its inner and outer surface to ceramic*)].

**anomalous** *a*: GRAL anómalo; extraño, irregular ◇ *Anomalous behavior of ferroelectric ceramics on paraelectric phase*. [Exp: **anomaly** (GRAL/CALIDAD anomalía; irregularidad, indicación de un posible fallo, discrepancia de una regla o de un uso ◇ *Often the temperature is an anomaly, that is, it is much lower than the melting temperatures of only slightly different mixtures*)].

**anorthite** *n/a*: MATPRI anortita, feldespato cálcico; mineral feldespato de plagioclasa usado en la fabricación de vidrio y cerámica que se encuentra en forma de cristales de color blanco o grisáceo, algo frágiles y vítreos *-white or grayish, brittle and glassy crystals-* siendo principalmente un mineral componente de otro tipo de rocas ◇ *Anorthite is an end member and one of the rarer members of the plagioclase series and anorthite ceramic materials have not been thoroughly investigated; V. feldspar; calcium feldspar; anorthic feldspar*.

**anorthoclase** *n*: MATPRI anortoclasa; mineral rico en sodio del grupo de los feldespatos alcalinos V. *feldspar; microcline; plagioclase; orthoclase*.

**anorthosite** *n*: MATPRI anortosita ◇ *Anorthosite is an igneous rock that consists of 90 or more percent of plagioclase feldspar*.

**ANOVA** *abbr*: GRAL/ENSAYO V. *variance (analysis of)*.

**ANSI** *abbr*: ORG-INST V. *American National Standards Institute*. [Exp: **ANSI norms** (CALIDAD normas ANSI V. ANSI)].

**ANSIA** *abbr*: ORG-INST V. *National Syndical Group of Tile Industries*.

**antesolarium** *n*: CONST balcón expuesto al sol.

**anthracite** *n*: GEO-MIN-CRIST antracita; tipo de carbón mineral que presenta hasta un 95% de contenido en carbono y que tiene un gran poder calorífico ◇ *The bigger the amount of ground glass in a mix and the smaller the amount of anthracite and peat, the bigger is the compressive strength of ceramic*.

**anti-** *pref*: GRAL anti; opuesto o con propiedades contrarias. [Exp: **anti-bacterial/antibacterial** (PROPQUIM-FIS antibacteriano ◇ *Warden says that his company has already produced an antibacterial tile that kills the germs you can't see; V. bacterial*), **anticorrosive** (PROPQUIM-FIS anticorrosivo; sustancia que se añade a otra para evitar que se corra o corra aquellas con las que se pone en contacto; se dice de algo que impide la corrosión ◇ *Surface rust is treated with a rust neutralizer and coated with an anti corrosive primer*), **antiferroelectric** (PROPQUIM-FIS antiferroeléctrico ◇ *An*

*antiferroelectric is a crystalline substance characterized by a state of lower symmetry consisting of two interpenetrating sublattices with equal but opposite electric polarization, and a state of higher symmetry in which the sublattices are unpolarized and indistinguishable*), **antiferroelectric material** (MTRLS/QUIM material antiferroeléctrico ◊ *Antiferroelectric material is characterized by antiparallel alignment of elementary dipoles and because it does not require a poling operation as needed by piezoelectric materials*), **antiferromagnetic, AFM** (PROPQUIM-FIS antiferromagnético ◊ *Antiparallel ordering gives rise to an antiferromagnetic or to a ferrimagnetic depending on the crystal structure; V. ferromagnetic; antiferromagnetism*), **antiferromagnetism** (PROPQUIM-FIS antiferromagnetismo; ordenamiento magnético de todos los momentos magnéticos de una muestra, en la misma dirección pero en sentido inverso), **antifoam** (PROPQUIM-FIS antiespuma ◊ *An effective antifoam is a surfactant of low surface tension; V. anti-foaming/antifoaming agent*), **anti-foaming/antifoaming agent** (ELABPROC agente antiespuma ◊ *An additive which reduces the surface tension of a solution or emulsion, thus inhibiting or modifying the formation of a foam, is an antifoaming agent*), **antifreeze** (ESMREL anticongelante; compuesto químico que, añadido a un líquido, reduce su punto de solidificación logrando que la mezcla resultante se congele a una temperatura más baja; se dice de algo que impide la congelación ◊ *Antifreeze is made of either ethylene glycol or propylene glycol; either works as a glaze additive*), **anti-fungal/antifungal** (PROPQUIM-FIS fungicida; sustancia tóxica empleada para matar/impedir el crecimiento de hongos que resultan perjudiciales; dicho de un agente: que destruye los hongos ◊ *Since these tiles are antifungal and weather proof in nature they seldom need replacement in one lifetime*), **antigraffiti** (MANTNMTO antigraffiti; emulsión de polímeros orgánicos para proteger superficies de hormigón, mortero, mármol, ladrillo, etc. de los grafitis pintados ◊ *Antigraffiti is used as a removal first coat*), **antiparallel** (QUIM antiparalelo; disposición en la que determinadas moléculas están situadas paralelamente pero se dirigen en direcciones opuestas ◊ *antiparallel alignment between neighbors leaves a resultant magnetic moment*), **anti-rust/antirust** (PROPQUIM-FIS antioxidante; se dice de aquello que evita la oxidación ◊ *Aluminum is a lightweight metal with superb non-corrosive and anti-rust properties*), **anti-slip** (PROPQUIM-FIS antideslizante; que impide que algo se deslice o patine ◊ *Ship-and-Galley Tile is a US term for a special floor quarry with an indented anti-slip pattern on its face*), **anti-slip finish** (PRODFIN acabado antideslizante ◊ *This tile has an anti-slip finish with a mottled effect*), **anti-slippage** (PROPQUIM-FIS antideslizamiento ◊ *The tile has a dimpled surface for anti-slippage*), **anti-static, antistatic** (PROPQUIM-FIS antiestático; dicho de aquello que impide la formación de electricidad estática), **anti-static/antistatic agent** (GRAL agente antiestático; compuesto que confiere conductividad/hace conductoras superficies que no lo eran; se emplea como medio de precaución para impedir la acumulación de electricidad estática -*static electricity*- ◊ *Antistatic agent helps reduce dust build-up*), **anti-static/antistatic tile** (PRODFIN baldosa antiestática ◊ *The building is structural steel frame with concrete floors covered with anti-static tile; V. Conductive tiles*), **anti-thixotropy** (PROPQUIM-FIS/PROPMATPRI V. *negative thixotropy*), **antivibration mounting** (MAQTRANS/MAQELAB soporte antivibratorio ◊ *The installation of anti-vibration mounting on vibrating equipment will reduce noise*)].

**antimony** *n/a*: QUIM antimonio; elemento químico empleado principalmente en aleaciones metálicas y algunos de sus compuestos para dar resistencia contra el fuego,

en pinturas, cerámicas, esmaltes, etc. ◇ *Colors included blue derived from cobalt, green from copper, purple from manganese, yellow from antimony and lead, and reds and browns from iron.* [Exp: **antimony oxide** (ESMREL/ELABPROC óxido de antimonio ◇ *Antimony oxide is used as an opacifier in enamels and as a decolorizing and fining agent in glass manufacture, particularly in pot melting*), **antimony yellow** (ESMREL amarillo de antimonio; color de esmalte ampliamente utilizado en cerámica ◇ *Naples yellow, also called antimony yellow, can range from a somewhat muted, or earthy, reddish yellow pigment to a bright light yellow, and is the chemical compound lead(II)-antimonate; V. lead antimonate*)].

**Antioch process** *n*: INDAFIN proceso Antioch ◇ *Antioch process is a plaster molding process comprising 50% sand, 40% gypsum, and 8% fibrous talc mixed with water in the ratio of 100 parts material to 50 parts water.*

**antiperthite** *n*: MATPRI antipertita; feldespato que contiene lamelas *-lamellae-* de intercrecimiento *-intergrowth-* de ortoclasa *-orthoclase-* en albita *-albite-* ◇ *If the dominant feldspar is K-feldspar the resulting mixture is termed perthite, and if it is albite, the mixture is termed antiperthite; V. feldspar; perthite.*

**antique**<sup>1</sup> *a/n/v*: GRAL antigüedad; objeto cuyo valor reside en prolongada existencia. [Exp: **antique**<sup>2</sup> (GRAL antiguo ◇ *Ceramics have developed over a very long period of time, from the antique art and technique of pottery to a wide range of different materials associated with modern and sophisticated technologies*), **antique**<sup>3</sup> (DISEÑO anticuar, añejar; dar apariencia de viejo a una pieza de cerámica aplicando color y luego eliminándolo con esponja o tela de las partes sobresalientes *-crevices-* de dicha pieza ◇ *Antiquing glaze creates the soft glow of slightly tarnished silver*), **antique green** (ESMREL verde antiguo ◇ *Antique Green is a mottled glaze of green with brown or olive highlights, also known as Verde Antique or Verde Green*)].

**AO effect** *abbr*: PROPQUIM-FIS V. *acousto-optic effect.*

**AoC** *abbr*: ENSAYO V. *attestation of conformity.*

**AP** *abbr*: SEG V. *approved product.*

**AP** *abbr*: ELABPROC/PROPQUIM-FIS V. *annealing point.*

**apartment** *n*: GRAL apartamento, piso; en general, el inglés no diferencia entre piso y apartamento si bien en EE.UU. no se usa la palabra "flat", "piso" en inglés británico ◇ *Circuits have been specifically designed to use these components as upper and lower level indicators in house and apartment fuel storage tanks.* [Exp: **apartment block** (GRAL V. *apartment building*), **apartment building** (GRAL bloque de pisos, edificio de pisos ◇ *An undulating tile roof arches over the cream and blue ceramic tiles on the facade of this apartment building*)].

**apatite** *n*: MATPRI apatito, apatita; fosfato natural de calcio que contiene generalmente flúor o cloro y que forma parte de los huesos y del esmalte dentario ◇ *Apatite and hydroxyapatite (containing the OH- ion) are used in bioceramics, particularly if it is desired to achieve bone intergrowth with the artificial component or prosthesis.*

**aperture** *n*: GRAL abertura, orificio; ranura; rendija ◊ *A nozzle with a 1/2 inch aperture.*

**API** *abbr*: MEDAMB V. *atmospheric pollution index.*

**apical angle** *n*: GRAL ángulo apical; ángulo que forman las tangentes de la curva -*tangents to the curve*- que describe el proyectil al girar su punta; ángulo entre dos superficies planas de un prisma -*prism*- ◊ *The apical angle of this triangle is about 100 degrees.*

**aplite** *n*: GEO-MIN-CRIST aplita; roca intrusiva -*intrusive rock*-, de grano muy fino -*fine-grained*-, en la que el cuarzo y el feldespato son los materiales predominantes ◊ *Aplite is a rock mined in Virginia for use in glass manufacture; V. salt-horse.* [Exp: **aplitic texture** (GEO-MIN-CRIST textura aplítica; textura de grano muy fino (menor de 1mm) pero visible, de cristales anhedrales -*anhedral crystals*- ◊ *Aplitic texture results when both quartz and feldspars exhibit an extremely high rate of nucleation in relation to growth rates; V. aplite*)].

**apparatus** *n*: GRAL aparato, equipo; instrumento; conjunto organizado de piezas que cumple una función determinada ◊ *Brémond porosimeter is an apparatus for the evaluation of pore size distribution by the expulsion of water from a saturated testpiece; V. equipment (laboratory).*

**apparent** *a*: GRAL aparente. [Exp: **apparent bulk** (PROPQUIM-FIS V. *apparent mass*), **apparent density** (PROPQUIM-FIS densidad aparente, densidad global; peso específico aparente; relación entre el peso del material y el volumen que ocupan las partículas de ese material incluidos todos los huecos -*holes*- poros -*pores*- y el material contenido en estos ◊ *The apparent density determines the entity of the dimensional shrinkage of the ceramic body during the firing of tiles, and it is proportional to the final mechanical resistance; V. bulk density*), **apparent density (by immersion)** (PROPQUIM-FIS densidad aparente; relación entre la masa en el aire de un volumen dado de agregado, incluyendo la masa del agua dentro de los poros saturables, (después de la inmersión en agua durante aproximadamente 24 horas), pero sin incluir los vacíos entre las partículas, comparado con la masa de un volumen igual de agua destilada libre de gas a una temperatura establecida), **apparent joint** (INSTAL junta aparente ◊ *An apparent joint is a decorative feature that simulates grout lines or joints on a single tile, so that a large tile, for example, may appear to be four smaller tiles*), **apparent mass** (PROPQUIM-FIS masa aparente, masa relativista; masa de un cuerpo en el medio ambiente, bajo las condiciones en las que se halla en el momento de estudio ◊ *The apparent mass of a building may be reduced by such techniques as variations in roof form*), **apparent porosity** (PROPQUIM-FIS porosidad aparente, porosidad abierta; relación entre el volumen de una masa y el volumen del agua absorbida cuando la masa es sumergida; mide los poros interconectados y determina la permeabilidad de los componentes cerámicos ◊ *As vitrification proceeds the proportion of glassy bond increases and the apparent porosity of the fired product becomes progressively lower; V. porosity*), **apparent specific weight** (PROPQUIM-FIS peso específico aparente; peso de una unidad de volumen de sólido en forma de partícula y que incluye el volumen resultante de la suma de los volúmenes de cada una de las partículas y el volumen de todos los espacios libres que quedan entre las partículas y los límites físicos impuestos a la unidad de volumen),

**apparent viscosity** (PROPQUIM-FIS viscosidad aparente; viscosidad de un fluido en unas determinadas condiciones de temperatura y agitación (no normalizadas) *◇ Strictly speaking therefore, the measured viscosity of a clay suspension is only an apparent one and should be called 'apparent viscosity'*), **apparent volume** (PROPQUIM-FIS volumen aparente; volumen limitado por la superficie externa de la probeta, incluyendo cualquier hueco *◇ European standard NBN EN 1936 indicates what percentage of the total volume (apparent volume) is made up by pores*]).

**appearance** *n*: GRAL apariencia, aspecto *◇ Satin clear glazes are not as translucent as clear gloss glazes and will tend to mute the appearance of underglaze decoration somewhat*. [Exp: **appearance of cones** (ELABPROC aspecto de las muestras pirométricas V. cone; pyrometric cone)].

**appliance** *n*: GRAL dispositivo, electrodoméstico; aparato, mecanismo, herramienta.

**applicability** *n*: GRAL aplicabilidad *◇ Corrosive attack can seriously limit the applicability of ceramics at high temperatures*. [Exp: **applicable** (GRAL aplicable; de aplicación, pertinente *◇ The technique is applicable to porous materials at ambient temperature with slow loading rates, and can measure critical fracture toughness as a function of crack growth rate*), **applicant** (GESTIÓN candidato, aspirante; solicitante), **application** (GESTIÓN solicitud; *application for something*: solicitud de algo, por ejemplo una beca, un trabajo, etc.), **application** (GRAL aplicación *◇ Causes include too-rapid drying and too heavy application of enamel*), **application for commencement of work** (CONST solicitud de comienzo de obras), **application form** (GESTIÓN solicitud (impreso de)), **application of (a) load** (ENSAYO aplicación de una carga *◇ The application of load to the specimen is constant*), **application of colour** (ESMREL/ELABPROC aplicación de color *◇ After application of colour and while colour is still damp use a sgraffito tool to etch the design through the colour to the clay body*), **application weight** (ESMREL peso de aplicación; peso de la capa de esmalte vítreo aplicada por unidad de área cubierta *◇ Having established the appropriate application weight, the applied unfired thickness of the glaze can be measured for future production control purposes*), **applicator** (INSTR aplicador, brocha; se dice del que/lo que aplica; mecanismo/aparato para aplicar una sustancia *◇ With a rotating glaze brush applicator, the glaze is applied and then brushed to create a "Faux" effect in some cases*)].

**applied** *a*: GRAL aplicado. [Exp: **applied finish** (CONST revoque, estuco; capa/mezcla de cal y arena u otro material análogo con que se revoca *◇ The applied finish is controlled in thickness by the pre-graded aggregate*), **applied geology** (GEO-MIN-CRIST geología aplicada *◇ Applied geology deals with industrial relations of geological structure; and with the nature, occurrence, and uses of substances derived from geological sources; V. engineering geology*), **applied research** (GRAL investigación aplicada; actividad cuya finalidad es la búsqueda y consolidación del saber y la aplicación/utilización de los conocimientos en la práctica en provecho de la sociedad *◇ The International Journal of Applied Ceramic Technology publishes cutting edge applied research and development work focused on commercialization of engineered ceramics, products and processes*), **apply** (GRAL aplicar; poner, colocar *◇ It is designed to give an appearance just like plain terra cotta bisque when applied on top of a white clay body*), **apply a force** (GRAL ejercer una fuerza *◇ To stop an object, we have to apply a force over a period of time*),

**apply for** (GRAL/GESTIÓN solicitar ◊ *How to apply for a job and how to complete a job application*), **apply to** (GRAL referirse a; ser aplicable a, ajustarse a, atañer, comprender a ◊ *This does not apply to intentional irregularities of colour variation of the face of extruded tiles (which can be unglazed, glazed or partly glazed)*).

**appraisal** *n*: GRAL evaluación, estimación; tasación (de una propiedad); valoración (de una propiedad) ◊ *Frost resistance tests are based on (i) indirect appraisal from properties such as strength and/or porosity; (ii) long-term exposure tests or experience; (iii) accelerated simulation*. [Exp: **appraise** (GRAL evaluar, estimar, tasar (una propiedad), valorar (una propiedad)), **appraiser's stores** (COM almacenes aduaneros ◊ *The warehouse or public stores to which samples of imported goods are taken to be inspected, analyzed, weighed, etc. by examiners or appraisers are called appraiser's stores*)].

**apprenticeship** *n*: GRAL aprendizaje; adquisición por la práctica continuada de los conocimientos necesarios para desarrollar una actividad, etc. ◊ *Unlike traditional apprenticeships, the current scheme extends beyond 'craft' and skilled trades to areas of the service sector with no apprenticeship tradition*.

**approach**<sup>1</sup> *n/v*: GRAL acercarse; aproximar(se), abordar ◊ *A ratio of diameters of 20/1 is required to approach the theoretical level*. [Exp: **approach**<sup>2</sup> (GRAL enfoque; propuesta ◊ *A promising approach to powder preparation in this context is hydrothermal processing*)].

**appropriate**<sup>1</sup> *a/v*: GRAL apropiado; adecuado, indicado, conveniente ◊ *Proper specification of appropriate adhesives and fixing methods, and a high standard of workmanship are essential to the success of tiling*. [Exp: **appropriate**<sup>2</sup> (GRAL destinar, asignar ◊ *The ceramics firm appropriated a large sum of money to research and development*)].

**approval** *n*: GRAL aprobación, visto bueno ◊ *ETL approval is only granted to products after rigorous inspections and testing of both US and Canadian regulations*. [Exp: **approve** (GRAL aprobar ◊ *All damage must be inspected and approved by the architect and/or engineer prior to repair*), **approved body** (GRAL/CALIDAD cuerpo/organismo/entidad acreditado, organización reconocida ◊ *For particular products or upon request an approved body may be involved in assessment and surveillance of the production control*), **Approved Code of Practice, ACOP** (SEG Código de Práctica Aprobado; hoja de datos de seguridad para sustancias y preparados ◊ *The Health & Safety Commission's Approved Code of Practice for management of health and safety at work; V. Approved Code of Practice*), **approved product, AP** (SEG producto aprobado; sello indicativo de que el producto no contiene materiales en cantidades suficiente para resultar tóxico; sustituye los sellos de productos no tóxicos "Producto Certificado" –*"Certified Product, CP"*- y "Etiqueta sobre la Salud" –*"Health Label, HL"*- ◊ *AMACO® products are properly labeled in conformance to the American Society for Testing and Materials\_ Chronic Hazard Labeling Standard (ASTM D-4236) and bear the AP Seal (Approved Product, Non-Toxic)*)].

**approximate**<sup>1</sup> *a/v*: GRAL aproximado; que se acerca más o menos a lo exacto ◊ *The following are some typical examples of the amount of water that is required to mix*

*dipping glazes and the approximate amount of glaze that will be made.* [Exp: **approximate**<sup>2</sup> (GRAL aproximar-se; acercarse a algo ◇ *A structural ceramic having a strength of 850 MPa, a Weibull modulus of 13, and a fracture toughness of 7 MPa.m<sup>0.5</sup> would approximate such reliability*)].

**apron**<sup>1</sup> *n*: CONST antepecho; pretil o baranda que cierra inferiormente un hueco en altura (una ventana, etc) y que se coloca para poder asomarse sin peligro de caer *V. ledge; stool; sill; windowsill; threshold.* [Exp: **apron**<sup>2</sup> (GRAL zona/pista de estacionamiento (de aeronaves); en un aeropuerto, zona pavimentada adyacente al área de terminales donde las aeronaves se estacionan, se realiza la carga/descarga, se reposta combustible - *refuel-* y se las revisa), **apron conveyor** (MAQTRANS cinta transportadora elevadora, aparato transportador con rampa rodante; transportador utilizado para transportar materiales en forma de grano o de terrones consistente en una cinta movida por una o más cadenas sin fin a la cual se le han incorporado unas placas debidamente espaciadas que forman la superficie transportadora móvil ◇ *Apron conveyors are used to handle various bulk load and pieces horizontally and inclined; V. slat conveyor*), **apron dryer** (MAQTRANS/MAQELAB secador de banda (transportadora), secador de cinta transportadora ◇ *Both the zone temperatures and the apron speed may be varied to adjust the drying conditions within the apron dryer*), **apron tile** (PRODFIN ladrillo de antepecho)].

**APS** *abbr*: QUIM *V. ammonium persulphate.*

**APS** *abbr*: ELABPROC *V. air plasma spraying.*

**AQL** *abbr*: CALIDAD *V. acceptance/acceptable quality level.*

**aqueous** *a*: PROPQUIM-FIS acuoso; se dice de una solución o suspensión basada en agua o abundante en ella; parecido al agua; de agua o relativo a ella ◇ *Fritting allows oxides to be used in aqueous suspensions that by themselves would exhibit extreme solubility.* [Exp: **aqueous phase** (QUIM fase acuosa; porción de agua contenida en un sistema consistente en dos fases líquidas, siendo una de ellas esencialmente agua y la otra un líquido inmiscible con agua ◇ *The aqueous phase may contain dissolved organic polymers to increase viscosity and stabilize the suspension, together with additives to control grain growth at the sintering stage*), **aqueous solution** (QUIM solución acuosa, disolución acuosa; solución/disolución en la que el disolvente es agua ◇ *A kit for detecting the presence of excessive lead in a glaze or enamel coating will comprise a stable aqueous solution of a chromogen which visibly changes colors when excessive lead is in said coating*), **aqueous suspension** (QUIM suspensión acuosa; compuesto que resulta de disolver agua en un fluido ◇ *Fritting allows oxides to be used in aqueous suspensions that by themselves would exhibit extreme solubility; V. suspension*)].

**AR** *abbr*: PROPQUIM-FIS *V. acid-resisting.*

**AR** *abbr*: GESTIÓN *V. accounts receivable.*

**arabesque** *n/a*: DISEÑO arabesco; decoración empleada comúnmente en frisos, zócalos y cenefas, a base de dibujos geométricos, que imita formas de hojas, flores, frutos, cintas y follaje que van entrelazados, incluyendo también figuras de hombres y animales. [Exp: **arabesque (wall) tile** (PRODFIN azulejo arabesco ◇ *Arabesque wall tiles are typical*)].

for their combination of infinite geometric and Moorish designs and the use of vivid colors)].

**Arabian lustre** *n*: ESMREL lustre árabe ◊ *Arabian lustre is the original type of onglaze lustre used by the Moors from the 9th century onwards for the decoration of pottery.*

**arbitration** *n*: GESTIÓN arbitraje; forma de resolver un litigio por la que las partes, de mutuo acuerdo, deciden nombrar a un tercero independiente, denominado árbitro, y que será el encargado de resolver el conflicto ◊ *Either party may demand arbitration by sending to the other party by certified mail a written notice of demand for arbitration, setting forth the matters to be arbitrated.*

**arbor** *n*: GRAL eje ◊ *Mounting is putting a grinding wheel or the arbor or spindle of a grinding machine, and getting it ready to go to work.*

**arc** *n*: GRAL arco de circunferencia; línea perteneciente a la circunferencia que une dos puntos de ella. [Exp: **arc (electric)** (QUIM arco (eléctrico); descarga eléctrica luminosa entre dos electrodos en el seno de un gas que se ioniza), **arc furnace** (ELABPROC horno (eléctrico) de arco; horno en el que el calor es generado por un arco eléctrico que salta entre dos electrodos o entre un electrodo y la propia materia ◊ *Fused alumina made in the electric arc furnace is usually crushed, and sieved into a range of grit sizes for use as an abrasive; V. electric furnace; Heroult electric arc furnace; direct-arc air furnace*), **arc ion plating, AIP** (ELABPROC recubrimiento iónico por arco ◊ *Some characteristics of the arc ion plating technology are high ionization and high deposit rate since the coatings deposited by this method are characterized by high combination, adhesion, density and coherency etc.*), **arcade** (CONST arcada, soportal/soportales; pórtico, a veces con arcos, que tienen algunos edificios/casas en sus fachadas y delante de las puertas y tiendas que hay en ellas), **arcaded** (CONST arcos, formado por, arcos, decorado con), **arc-furnace roof brick** (INDAFIN ladrillo de bóveda de horno eléctrico), **arc-image furnace** (MAQELAB horno de arco de imagen ◊ *An Arc-Image furnace can heat any samples rapidly to a very high temperature in a clean condition, without containers or crucibles, in any oxidizing, inert or reducing atmospheres; V. image furnace*), **arc-spraying** (ELABPROC proyección arco ◊ *Arc spraying is the highest productivity thermal spraying process; V. plasma spraying*)].

**Arch**<sup>1</sup> *n/v*: GRAL arco, bóveda, cimbra; en geometría, porción continua de una curva V. *key-stone; soffit; springer; voussoir*. [Exp: **arch**<sup>2</sup> (CONST arco; estructura de piedra empleada para sostener peso o techar un espacio abierto que tiene forma curva y que descansa sobre soportes en ambas extremidades), **arch**<sup>3</sup> (MAQELAB puerta/abertura del horno), **arch**<sup>4</sup> (GRAL arquear, abovedar; dar o tomar (voluntaria o involuntariamente) forma de arco), **arch**<sup>5</sup> (MAQELAB bóveda; techo de una cámara calorífica), **arch brick** (INDAFIN/CONST ladrillo de bóveda, ladrillo abovedado/de cuña; ladrillo, de construcción o refractario, en forma de cuña y empleado en la construcción de un arco/bóveda ◊ *Arch bricks are used in the construction of culverts, furnace roofs, etc.*), **arch pattern, in** (CONST arco, en; patrón, modelo, distribución en forma de arco o abanico), **arched** (CONST arqueado, arco, en; en forma de arco ◊ *A drop arch is an auxiliary brick arch projecting below the general inner surface of the arched roof of a furnace, brick conduit or like structure*), **arched beam** (CONST viga en arco; viga en forma de arco de medio punto), **arched roof** (MAQELAB techo en arco, bóveda (de horno) ◊ *Arched roof*

structures for kilns were used by the Romans and are still common today), **arched tile** (PRODFIN teja árabe), **arching** (INSTAL arqueado, arqueamiento ◊ *Traditionally, a layer of asphalt was inserted to separate the base and the bedding underneath; it was intended to prevent the ceramic tile floor from arching or ridging, a condition in which single or entire rows of tiles can pop up to relieve tension and separate completely from the bed*), **arching effect** (INSTAL arqueamiento; efecto de arco)].

**archaic** *a*: GRAL arcaico; muy antiguo, anticuado ◊ *The earliest finds of roof tiles in archaic Greece are documented from a very restricted area around Corinth (Greece)*.

**architect** *n*: GRAL arquitecto; persona que profesa o ejerce la arquitectura, por lo que diseña las edificaciones o espacios urbanos y vela por el adecuado desarrollo de su construcción; la forma masculina es la utilizada para designar el femenino, por ejemplo, "Laura es arquitecto" V. *technical architect*. [Exp: **architectonic** (GRAL arquitectónico ◊ *Architectonic makes reference to architectural qualities observed in subjects which are not typically architectural ones, for instance, "architectonic" is used as the name of the second style of classical Roman fresco painting; V. architectonic*), **architect's approval** (GRAL/CONST visto bueno del arquitecto ◊ *The Architect's approval of a specific item shall not indicate approval of an assembly of which the item is a component*), **architect's scale** (CONST escalímetro, escala de arquitecto; regla o juego de reglas especializadas que contiene simultáneamente varias escalas diferentes para medir en dibujos que contienen también diferentes escalas), **architectural** (GRAL arquitectónico; perteneciente o relativo a la arquitectura V. *architectonic*), **architectural concrete** (INDAFIN hormigón hornamental, hormigón decorativo ◊ *Architectural concrete is conventional concrete that has been colored, stained, stamped, saw-cut, or sandblasted to create a creative effect or to simulate tile, stone or brick*), **Architectural Graphic Standards** (DISEÑO/CONST Normas Gráficas de Arquitectura ◊ *Architectural Graphic Standards - A must have for every building or design professional*), **architectural model** (GRAL modelo arquitectónico), **architecture** (GRAL arquitectura; arte de proyectar y construir edificios/espacios habitables ◊ *Tiling in architecture is a very common sight: you see them everywhere, from floor tiles, to brick laying to curtain wall facades of buildings*)].

**archiway** *n*: CONST arcada, pasaje abovedado, vano arqueado. [Exp: **archway** (CONST arco, corredor abovedado; pasaje abovedado ◊ *For tiles that are going in archway openings or on tabletops, the grouting and installation can be completed in our factory and the tile will ship out installed in the archway or as a completed tabletop; V. arcade*)].

**area**<sup>1</sup> *n*: GRAL área, superficie; el término área, en geometría, puede hacer referencia a los siguientes conceptos: bien a la superficie comprendida dentro de un perímetro o bien a la extensión de dicha superficie expresada en una determinada unidad de medida ◊ *To estimate how many field tiles your project requires, you must first determine the total square feet of the tiling area*. [Exp: **area**<sup>2</sup> (MEDIDA área; unidad de superficie que equivale a 100 metros cuadrados), **area**<sup>3</sup> (GRAL ámbito, área ◊ *Throughout the course students are encouraged to pursue a unique personal line of inquiry within their chosen area of ceramics*), **area**<sup>4</sup> (GRAL zona, área), **area of contact** (INSTAL superficie de contacto ◊ *Regarding tile fixing, in a dry area a minimum area of contact of 75% should be achieved*)].

**argil** *n*: MATPRI arcilla de alfarero, arcilla cerámica. [Exp: **argillaceous** (PROPMATPRI arcilloso; que tiene arcilla, es abundante en ella o se asemeja a ella  $\diamond$  *Siliceous and argillaceous sandstones both find some use in the refractories industry*; V. *clayey*), **argillaceous schist** (GEO-MIN-CRIST esquisto arcilloso  $\diamond$  *Argillaceous schist is metamorphic rock which exhibits fine laminations of clay materials*; V. *underclay*), **argillaceous shale** (GEO-MIN-CRIST V. *argillaceous schist*), **argillite** (GEO-MIN-CRIST argilita; roca compacta, de grano fino, compuesta principalmente de cuarzo, feldespatos, clorita y algunos minerales de arcilla, principalmente illíticos)].

**arid**<sup>1</sup> *a/n*: MTRLS árido; conjunto de granos rocosos como las arenas o las gravas, y que se destinan principalmente a la construcción, por ejemplo en la elaboración de argamasas. [Exp: **arid**<sup>2</sup> (PROPQUIM-FIS árido; seco, estéril, con poca humedad), **aridity** (GEO-MIN-CRIST aridez; sequedad  $\diamond$  *Aridity, the characteristic nature of arid climates, may thus depend on the use of the land*), **aridity index**, **AI** (MEDIDA índice de aridez  $\diamond$  *Attempts to quantitatively describe the degree of aridity of a place has often led to the development of aridity indexes*)].

**arise** *v*: GRAL surgir; presenter-se, plantear-se  $\diamond$  *Problems might arise during the firing*.

**arithmetic** *n/a*: GRAL aritmética, aritmético; rama de las matemáticas que estudia los números y las operaciones realizadas con ellos. [Exp: **arithmetic difference** (GRAL diferencia aritmética  $\diamond$  *An arithmetic difference is a simple numeric subtraction between the two rates*), **arithmetic mean (average) (statistics)** (GRAL media aritmética (estadística), promedio; cociente resultante de dividir la suma de varias cantidades por el número de ellas)].

**ark** *n*: TRANSPROC/MAQTRANS cuba, silo, tanque; depósito/contenedor de grandes dimensiones para el almacenamiento o mezclado de sustancias (esmaltes, barbotinas, etc.) V. *tank*.

**arkose** *n*: MATPRI arcosa, arenisca feldespática; arenisca que proviene de una rápida desintegración de granito o gneis, de grano mal redondeado y con un mínimo de 25% de feldespato V. *arcose*. [Exp: **arkosic** (PROPQUIM-FIS arcósico V. *arkose*), **arkosic limestone** (GEO-MIN-CRIST piedra caliza arcósica; piedra caliza clástica impura -*impure clastic limestone*- que contiene una proporción relativamente elevada de granos y/o cristales de feldespato)].

**arm** *n*: INSTR brazo, palanca; pieza alargada y móvil uno de cuyos extremos está fijo y el otro es móvil  $\diamond$  *The other arm ends in a funnel with a sintered-glass base on which is placed a weighed sample of clay*; V. *mechanical arm*. [Exp: **arm milling cutter** (MAQTRANS fresadora de brazo V. *milling cutter*), **arm polisher** (INSTR pulidora de brazo  $\diamond$  *Arm polisher is mainly used for grinding and polishing granite, marble and terrazzo*), **arm slotting machine** (INSTR máquina ranuradora de brazo V. *slotting machine*)].

**armor, armour** *n*: GRAL blindaje, armadura ( personas)  $\diamond$  *The relevant properties of some of the ceramics that have been proposed for armor applications are listed below*; V. *ceramic armor*. [Exp: **armor/armour ceramics** (PRODFIN cerámica de blindaje

◇ *Armor ceramics are used for body and vehicle armor systems*), **armored** (PROPQUIM-FIS blindado, acorazado), **armored cable** (GRAL cable blindado ◇ *Armored cables are provided with a wrapping of metal, usually steel wires or tapes, primarily for the purpose of mechanical protection*), **armored concrete** (INDAFIN hormigón armado ◇ *The buildings solid construction of armored concrete rests on a thick base also constructed of armored concrete*)].

**aromatic** *a*: GRAL aromático. [Exp: **aromatic hydrocarbon** (MANTNMTO/QUIM hidrocarburo aromático ◇ *Aromatic hydrocarbons are often used in the removal of oil, grease, and other bituminous materials*), **aromatic solvent** (QUIM disolvente aromático)].

**arrange** *v*: GRAL/INSTAL colocar, arreglar (colocar); disponer ◇ *Arrange tile layout so cuts are made in the least noticeable places*. [Exp: **arrangement**<sup>1</sup> (INSTAL/GRAL colocación, disposición (colocación) ◇ *They are compatible with many readily available standard tiles, colored trim pieces and moldings; you can use the arrangement ideas to spur your creativity*), **arrangement**<sup>2</sup> (GESTIÓN acuerdo, convenio V. *agreement; accord*), **arrangement plan** (GRAL plano de planta; plano general en el que se indican a escala reducida todos los elementos de un proyecto y que nos permite situar sus partes dentro de un todo), **arrangements** (GRAL planes; también "preparativos")].

**arrasways** *n*: GRAL V. *arris-wise*. [Exp: **arraswise** (GRAL V. *arris-wise*)].

**array** *n*: DISEÑO gama, colección, selección, variedad ◇ *As well, stains that come in an array of colours can be used during installation to give your new floor that truly custom look*.

**arrest** *v*: GRAL frenar; detener ◇ *This dissipates energy from the crack and may even arrest crack growth*.

**Arrhenius' Law** *n*: QUIM Ley de Arrhenius; ley que expresa la relación de dependencia de la constante de velocidad de una reacción  $K$ , con la temperatura ◇ *A relationship between the activation energy,  $E_a$ , and the rate constant,  $k$ , was proposed by Arrhenius in 1889 with the name of Arrhenius' law*.

**arris** *n*: GRAL arista (viva), ángulo externo; esquina; canto afilado que resulta de la intersección de dos planos ◇ *An arris is the sharp edge of a building brick or ridge-tile; V. bevel; border; chamfer; corner; edge; margin; rabbet; splay*. [Exp: **arris edge** (INDAFIN canto matado ◇ *The arris edge on glass is a bevel up to 1/16 in. (1.5 mm) wide and at an angle of 45°*), **arris tile** (PRODFIN teja de limatesa ◇ *Arris tile is a specially shaped tile for use in the ridge or hip of a roof*), **arris-wise** (GRAL angularmente)].

**arrival** *n*: GRAL llegada. [Exp: **arrival notice** (DISTRIB aviso de llegada (de mercancía); aviso de llegada de mercancía que el transportista envía al consignatario V. *advice note*), **arrival, on** (DISTRIB llegada, a su; al llegar, nada más llegar ◇ *A responsible person will be required to sign for and inspect the goods on arrival*)].

**arrive**<sup>1</sup> *v*: DISTRIB llegar ◇ *The trays, when filled, are moved vertically through the hot air current in the dryer until they arrive at a second opening where the moulds and dried ware are removed.* [Exp: **arrive**<sup>2</sup> (DISTRIB fondear (buques))].

**arsenic** *n*: QUIM arsénico; elemento semimetálico extremadamente venenoso que se presenta principalmente en forma de sulfuros ◇ *Uses for inorganic arsenic include glass and ceramics manufacture.*

**art**<sup>1</sup> *n*: GRAL arte, destreza; habilidad, virtud para hacer algo ◇ *Like many human endeavors, ceramics is an art whose beginnings are shrouded in the misty past, probably before invention of the written word.* [Exp: **art**<sup>2</sup> (GRAL arte; manifestación y forma de expresión de la actividad humana por la que se abstrae, conceptualiza y comunica con recursos plásticos, lingüísticos o sonoros), **Art and Creative Materials Institute, ACMI** (ORG-INST Instituto de Arte y Materiales Creativos ◇ *The ACMI certifies that products are nontoxic and meet standards of quality and performance*), **Art deco** (DISEÑO Art decó; movimiento de diseño popular a partir de 1920 hasta 1939 y cuya influencia se extiende a las artes decorativas tales como arquitectura, diseño interior, y diseño gráfico e industrial y a las artes visuales como la moda, pintura, escultura, etc. ◇ *Art Deco tiles show an imaginative use of geometrical form in combination with strong high gloss colours, black being one of the most used colours of the time*), **Art Nouveau** (DISEÑO Art Nouveau, Modernismo; corriente de renovación artística desarrollada a finales del siglo XIX y principios del XX, inspirada en la naturaleza y el uso de elementos de origen natural y caracterizada por el uso de la línea curva y la asimetría ◇ *Dazzling in their bold use of color and wide range of designs, Art Nouveau tiles are enjoying a resurgence in popularity*), **artist** (GRAL artista), **artistic** (GRAL artístico ◇ *The flexibility of the system allows a greater variety of more artistic tiles to be fired*), **arts and crafts** (GRAL artes y oficios), **Arts and Crafts** (DISEÑO Arts and Crafts (movimiento); movimiento artístico surgido en Inglaterra a finales del siglo XIX, caracterizado por el uso de líneas serpenteadas y asimétricas y que oponía la creatividad y el arte a la producción en serie), **art-ware, artware** (PRODFIN utensilios/productos (cerámicos) artísticos; cualquier utensilio de cerámica blanca - *whiteware*-, esmaltado o no, usado para fines no técnicos, como por ejemplo la vajillería, los sanitarios, etc. (siempre y cuando estén vidriados)), **artwork** (GRAL obra de arte)].

**ART** *abbr*: ENSAYO V. *acid resistance test*.

**articulated** *a*: GRAL articulado. [Exp: **articulated arm** (MAQTRANS/MAQELAB brazo articulado ◇ *The articulated arm permits swiveling at three points*), **articulated joint** (MAQTRANS/MAQELAB junta articulada ◇ *It provides an articulated joint having a device for movably coupling a first movement element to a second movement element*), **articulated lorry** (DISTRIB camión articulado), **articulated vehicle** (DISTRIB vehículo articulado; vehículo constituido por varias unidades de vehículo de gálibo normal que se unen entre sí mediante un sistema giratorio que les permite operar en curvas de radios más reducidos o adaptarse mejor a ellas ◇ *An articulated vehicle is needed to collect 28 pallets urgently*)].

**artificial** *a*: GRAL artificial; no natural, imitado, falso ◇ *In artificial reduction, a reducing agent is introduced into the glaze itself.* [Exp: **artificial abrasive** (MTRLS

abrasivo artificial; abrasivo compuesto de sustancias no naturales ◇ *The two principal artificial abrasives are silicon carbide and aluminium oxide; V. carborundum*), **artificial drying** (ELABPROC secado artificial ◇ *Artificial drying (as in large mechanized plants) is done in special drying chambers, which make use of heat recovered from the kilns or cooling zones*), **artificial porcelain** (PRODFIN porcelana artificial ◇ *In artificial porcelain powdered glass (or frit) replaces the fusible natural stone, and it is fired at a lower (or softer) 1200°C*]).

**artisan** *n/a*: GRAL artesano; dicese de aquello perteneciente o relativo a la artesanía; también persona que ejercita un arte/oficio manualmente y con poca intervención de maquinaria.

**AS** *abbr*: ESMREL *V. aluminium stearate*.

**as** *adv*: GRAL como; puede tener sentido comparativo, pero también concesivo (no obstante, aunque) y causal (como, ya que): también puede significar "de la misma manera" o indicar resultado (para); *the same as*: igual que. [Exp: **as for** (GRAL en cuanto a ◇ *As for metals, it may then be asked whether fatigue processes can precede crack extension*), **as of** (GRAL a partir de; con fecha de ◇ *Cooling is by air (no water system), and 5000 km of road testing has been completed as of late 1989*), **as per** (GRAL según, conforme a ◇ *Clean and provide general maintenance of all machinery as per company standards*), **as per invoice** (GESTIÓN/COM factura, de acuerdo con/según (la) ◇ *Cost as per invoice: Replacement Ceiling Tile £25.00*), **as per sample** (ENSAYO muestra, conforme a la; según muestra ◇ *Natural stone slate tile as per sample provided on patio*), **as regards** (GRAL en cuanto a/por lo que se refiere a ◇ *As regards borders and complementary pieces, anything goes: glass, natural stone, metal, ceramic borders, with most German customers tending to opt for the latter*), **as well as** (GRAL además de; así como ◇ *Tennessee #5 ball clay is particularly known for its fast casting properties, making it ideal for sanitaryware, dinnerware, artware and refractory casting applications, as well as plastic formed bodies*), **as-built/as-constructed drawing** (CONST plano según construcción, dibujo según ejecución; dibujo que representa la configuración final ya instalada (física o funcional) ◇ *Company will submit an as-built drawing for tile Commissioner s approval*), **as-struck concrete** (INDAFIN hormigón en bruto)].

**ASA** *abbr*: ORG-INST *V. American Standards Association*. [Exp: **ASA** (CALIDAD ASA; prefijo que se antepone a las especificaciones de la Asociación Americana de Estándares- *American Standards Association*-)].

**asbestine** *n*: MTRLS asbestina; extendedor natural *-natural extender-* mezcla de talco y asbestos tremolita con una composición aproximada de 85% silicato de magnesio hidratado *-hydrated magnesium silicate-*, 10% de silicato de calcio y una variedad de porcentajes de carbonato de calcio ◇ *Asbestine has outstanding heat resistance property and very good water resistance as well as excellent suspension properties*.

**asbestos** *n*: QUIM asbesto, amianto; material de fibras minerales de silicato ferromagnésico, blancas y flexibles, de aspecto sedoso, conocidas por su resistencia al fuego y por ser un buen aislante térmico en general pero cuyos efectos nocivos han motivado su prohibición ◇ *Heat-resistant boards, sheets and pipes can be made,*

containing about 10% asbestos. [Exp: **asbestos board** (QUIM cartón de amianto/asbesto; cartón caracterizado por su elevado grado de incombustibilidad), **asbestos cement sheeting** (INSTAL láminas de asbesto-cemento), **asbestos containing material, ACM** (QUIM/SEG asbesto, material que contiene; cualquier material que contiene más de un 1% de asbesto  $\diamond$  *Until asbestos containing materials (ACM's) were banned in 1978, they were used in a variety of materials including acoustical tiles, caulking, tile adhesives, shingles, roofing felt and tiles, pipe and boiler insulation and wall board*), **asbestos fibre/fiber** (QUIM fibra de amianto  $\diamond$  *Some older resilient flooring may contain asbestos fibers*), **asbestos roofing** (CONST cubierta de asbesto; cubierta de tejado -roofing-compuesta de cemento Portland y asbesto en láminas o en grava), **asbestos rope** (MAQELAB cordón de amianto  $\diamond$  *Asbestos rope is extensively used as a heat insulation material on thermal installations and heat conduction systems*), **asbestosis** (SEG asbestosis; enfermedad pulmonar -lung disorder/disease- grave causada por la inhalación de fibras de asbesto  $\diamond$  *Amphiboles (e.g. tremolite, a hydrated calcium magnesium silicate, or crocidolite, a hydrated sodium iron silicate) also known as blue asbestos, cause asbestosis*), **asbestos cement** (INSTAL asbesto-cemento, amianto-cemento, cemento de amianto, cemento de asbesto  $\diamond$  *Asbestos cement is a hardened mixture of asbestos fibers, Portland cement and water used in relatively thin slabs for shingles, wallboard and siding*]).

**asbolite** *n*: GEO-MIN-CRIST asbolita  $\diamond$  *Asbolite is a cobalt oxide-laden manganese earth, occasionally found in large deposits, as was the case in China where it was used as a blue pigment.*

**ASCER** *abbr*: ORG-INST V. *Association of Ceramic Tile Manufacturers of Spain.*

**ASD** *abbr*: DISEÑO/PROPQUIM-FIS V. *allowable stress design.*

**ash**<sup>1</sup> *n/v*: SUBPROD/ESMREL ceniza, residuos de combustión; residuos inquemados; residuo incombustible resultante tras la combustión/calcinación de una sustancia  $\diamond$  *Ash may be used in combination with coloring oxides and other glaze materials to produce a wide range of surface effects and colors in glaze; V. volcanic ash.* [Exp: **ash**<sup>2</sup> (ELABPROC calcinar, incinerar; reducir a cenizas), **ash cump** (MAQELAB depósito de cenizas), **ash glaze** (ESMREL esmalte de ceniza; esmalte que utiliza ceniza orgánica (papel, madera) como fuente de óxidos (sílice, aluminio, oda, etc.) y que a menudo presenta una textura moteada -mottled- o entreverada -streaky- dependiente de la cantidad de ceniza empleada  $\diamond$  *A normal glaze application fired at cone 10 results in a glaze similar to an ash glaze, with streaks*), **ash-glazed** (ESMREL esmalte/esmaltado de ceniza  $\diamond$  *A typical ash-glazed surface is characterized by rich, fluid streaks of texture on the surface that are left as the ash melts; V. ash glaze*), **ashing** (ELABPROC calcinación, incineración; combustión  $\diamond$  *Minerals lose water upon ashing*), **ash-pan** (MAQELAB V. *ash-pit*), **ash-pit** (MAQELAB cenicero, cenizal (caldera); parte del horno en la que cae la ceniza  $\diamond$  *As the firing progressed the ash pit began to fill and eventually filled almost to the point of obstructing the arch into the ware area of the kiln*), **ashtray** (GRAL cenicero; sitio donde se recoge o echa la ceniza)].

**Ashfield clay** *n*: MATPRI arcilla Ashfield  $\diamond$  *The raw Ashfield clay contains about 57% SiO<sub>2</sub>, 27% Al<sub>2</sub>O<sub>3</sub>, 11.7% Fe<sub>2</sub>O<sub>3</sub> and 1.5% alkalis.*

**ashlar**<sup>1</sup> *a/n/v*: CONST sillar, piedra labrada; piedra labrada por varias de sus caras ◇ *We offer beautiful custom tile flooring ashlar stone.* [Exp: **ashlar**<sup>2</sup> (CONST revestir con sillares; paramentar de sillería), **ashlar brick** (CONST/INDAFIN ladrillo tipo sillar), **ashlaring** (CONST chapado de sillería)].

**ASME** *abbr*: ORG-INST V. *American Society of Mechanical Engineers.*

**aspect** *n*: GRAL aspecto; apariencia a la vista de las personas/objetos. [Exp: **aspect** (GRAL aspecto; elemento, matiz, faceta, factor ◇ *The most important aspect is that the characterization and assessment of ceramic powders requires attention to a variety of parameters*), **aspect ratio** (DISEÑO razón de proporcionalidad, relación de aspecto; relación entre dimensiones; en una imagen, la proporción entre su anchura y su altura ◇ *A parameter for the description of textured ceramics is being developed from the behaviour of aspect ratio values*)].

**asperity** *n*: CALIDAD rugosidad, aspereza ◇ *Asperities are protrusions and depressions on the surface that wedge against each other during sliding contact and cause stress concentrations so high that microfracture occurs.*

**asphalt** *n*: MTRLS asfalto; material viscoso, pegajoso y de color negro, mezcla de bitumen y agregado, utilizado para la pavimentación de caminos, carreteras o autopistas ◇ *Coatings on metal surfaces for protection from corrosion and for stress relief may be an asphalt compound or an organic polymer.* [Exp: **asphalt emulsion** (MTRLS emulsión de asfalto/asfáltica; suspensión estable de asfalto en agua), **asphalt tile** (INDAFIN capa asfáltica, colchón asfáltico ◇ *Another disadvantage is that asphalt tile is more rigid than the newer tiles, so it cracks more readily*), **asphaltic** (PROPQUIM-FIS asfáltico, bituminoso ◇ *Stress prediction and low temperature fracture susceptibility of asphaltic concrete pavements; V. asphalt*)].

**aspirail** *n*: EXPL-CANT abertura de ventilación (en minas).

**ASQ** *abbr*: ORG-INST V. *American Society for Quality.*

**assay**<sup>1</sup> *n/v*: ENSAYO prueba, ensayo; experimento que se hace de algo para examinar/valorar sus propiedades y saber cómo resultará en su forma definitiva ◇ *Ceramic Materials in Fire Assay Practices; V. test.* [Exp: **assay**<sup>2</sup> (ENSAYO ensayar; realizar ensayos, verificar, experimentar, analizar, examinar ◇ *All enzymes were assayed on material that had been frozen in liquid nitrogen*), **assay by the dry way** (ENSAYO ensayo por vía seca), **assay by the wet way** (ENSAYO ensayo por vía húmeda), **assay sample** (ENSAYO muestra de ensayo ◇ *The difficulty is increased when the assay sample has a high viscosity*)].

**assemblage** *n*: QUIM/INSTAL ensamblaje; asociación, unión ◇ *The prevailing picture of the microstructure of polycrystalline ceramics is thus changed from one simply consisting of an assemblage of grains joined by crystalline grain boundaries to one consisting of crystalline grains with a continuous glass phase threading between them.* [Exp: **assemble** (INSTAL ensamblar, montar; unir juntando y ajustando ◇ *Mosaics of differently coloured and patterned pieces have been assembled since ancient times*), **assembly** (GRAL/GESTIÓN asamblea; reunión), **assembly** (INSTAL montaje; ensamblaje ◇ *A pregrouted*

*tile is a surfacing unit consisting of an assembly of ceramic tile, bonded together at the edges by a material which completely fills the joints)].*

**assess** v: GRAL/ENSAYO evaluar, calcular; en general, señalar el valor de algo; también referido a gravar, tasar, valorar  $\diamond$  *It is rotated over a 4ft x 4ft (1.23 x 1.23 m) test panel of floor tiles to assess resistance to wear or damage by smallwheeled vehicles such as fork-lift trucks.* [Exp: **assessment** (GRAL valoración; evaluación, cálculo (de una cantidad); también valoración, tasación, estimación (del valor de algo)  $\diamond$  *The assessment of ceramic powders by way of the various measured parameters will be discussed using ZrO<sub>2</sub> Y<sub>2</sub>O<sub>3</sub> (Y-TZP) powders as an example), **assessment procedure** (MEDAMB procedimiento de evaluación  $\diamond$  *The assessment procedure is a fundamental instrument of environmental policy as defined in Article 130r in relation to the environment and sustainable development)]].**

**asset** n: GRAL ventaja; recurso, cualidad  $\diamond$  *These bands should not be considered flaws but assets.* [Exp: **assets** (GESTIÓN activo; conjunto de todos los valores, créditos, derechos, bienes y efectos con valor monetario que posee una empresa/institución/individuo a su favor en una entidad financiera V. *assets and liabilities; liabilites*), **assets and liabilities** (GESTIÓN activo y pasivo; riqueza de una empresa y valor monetario total de las deudas que pesan sobre sus bienes  $\diamond$  *Financial assets and liabilities should in principle be valued at current prices; V. assets; liability)]].*

**assign** v: GRAL asignar; señalar, fijar; establecer aquello que corresponde a alguien o algo; también designar, nombrar (a una persona)  $\diamond$  *Weibull Distribution is used to assign mechanical properties to brittle materials in probabilistic terms, and to define design requirements in terms of strength and reliability.*

**assist** v: GRAL ayudar  $\diamond$  *Flocculants prevent settling and assist in glazes that are mixed for pouring or dipping.* [Exp: **assistance** (GRAL ayuda, asistencia  $\diamond$  *We provide assistance at the design and material selection stage to specify the best ceramic materials for your application)]].*

**associated** a: GRAL asociado. [Exp: **associated mineral** (GEO-MIN-CRIST mineral asociado; minerales que constituyen una parte integral del cuerpo mineralizado que se busca  $\diamond$  *Calcite, which is quite common, occurs either alone or as an associated mineral pleasingly perched upon the earlier fluorite)]].*

**association**<sup>1</sup> n: GRAL asociación; conexión, relación  $\diamond$  *Allophane is often found in association with halloysite; V. partnership.* [Exp: **association**<sup>2</sup> (ORG-INST sociedad, empresa), **Association Française de Normalisation, AFNOR** (ORG-INST Asociación Francesa de Normalización; organismo encargado de coordinar todo el sistema francés de normalización, esto es, de animar, sistematizar y homologar la elaboración de las normas francesas (y del desarrollo de la marca NF)), **Association of Ceramic Tile Manufacturers of Spain, ASCER** (ORG-INST Asociación Española de Fabricantes de Azulejos y Pavimentos Cerámicos; asociación creada en sustitución de la Agrupación Nacional Sindical de Industriales Azulejeros (ANSIA) y que, en la actualidad, cuenta con 210 empresas asociadas, siendo la cuarta asociación exportadora reconocida de España en cuanto a representatividad en las exportaciones del sector)].

**assort** *n/v*: ELABPROC clasificar ◇ *There are 144 tiles that measure 3 cm x 2.2 cm x 1.2 cm; these tiles assort themselves as follows: 4 x 9 circle 4 x 9 crack and 4 x 9 bamboo; V. assortment.* [Exp: **assorted** (GRAL variado, surtido; heterogéneo ◇ *Vinyl Composition tiles offer moderate pricing, durability, easy installation, and assorted colors and patterns*), **assorting** (ELABPROC clasificación ◇ *A sorting process that consists of building an assortment of products for use in association with each other is called assorting*), **assortment** (GRAL surtido; colección, grupo variopinto, variedad; conjunto de elementos asociados para un mismo fin ◇ *The infinite variability of glass compositions leads to a great assortment of possible properties which are only beginning to be exploited; V. assort*)].

**assurance**<sup>1</sup> *n*: GRAL garantía ◇ *The first and fundamental design issue is the assurance of structural reliability of the ceramic components; V. guarantee.* [Exp: **assurance**<sup>2</sup> (SEG/GESTIÓN V. *insurance*), **assure** (GRAL asegurar; garantizar ◇ *One of the critical problems in the development and improvement of these ceramics is to assure their resistance to damage by the nuclear environment; V. guarantee*)].

**Astbury model** *n*: PROPMATPRI modelo Astbury; modelo teórico para describir la plasticidad de las arcillas, en particular su bucle de histéresis *-hysteresis loop-* no elíptico.

**ASTM abbr**: ORG-INST/CALIDAD V. *American Society for Testing and Materials.*

**ASTM standard abbr**: CALIDAD norma ASTM ◇ *ASTM C 126 Standard Specification for Ceramic Glazed Structural Clay Facing Tile, Facing Brick, and Solid Masonry Units; V. ASTM; standard; British standard; European norm/standard; Spanish standard.*

**astylar** *a*: CONST astilar; sin columnas o pilastras ◇ *Astylar is a term used to describe a facade that has no columns pilasters, or similar vertical features.*

**asymmetric, asymmetrical** *a*: GRAL asimétrico; carente de simetría *-symmetry-* ◇ *The electric field produces an asymmetric concentration profile in the ceramic sample.*

**at. wt. abbr**: PROPQUIM-FIS V. *atomic weight.*

**atal** *n*: EXPL-CANT escombros (minas).

**ATC abbr**: ORG-INST V. *Spanish Association of Manufacturers of Machinery for the Ceramics Industry.*

**atelier** *n*: GRAL taller ◇ *Atelier is a French word literally translated as "workshop" which is used in English to refer to a working studio, typically an artist's studio; V. studio.*

**atm, atmos** *n*: MEDIDA V. *atmosphere.*

**atmosphere** *n.*: GRAL atmósfera; capa gaseosa que rodea a la tierra compuesta por nitrógeno y oxígeno junto con con pequeñas cantidades de argón, dióxido de carbono, vapor de agua, neón, helio, criptón, hidrógeno y ozono ◇ *The crazing of cement and concrete is due partly to natural shrinkage and partly to volume changes following surface reaction with CO<sub>2</sub> present in the atmosphere.* [Exp: **atmosphere**, **atm**, **atmos** (MEDIDA atmósfera; unidad de presión utilizada para medir presiones elevadas como la de los gases comprimidos y que equivale a 101,325 KPa ◇ *The cubic form is as hard as diamond and was originally made by the simultaneous application of very high pressure (85 000 atm.) and temperature (1800°C)*), **atmosphere (kiln)** (ELABPROC/MAQELAB atmósfera (del horno); en cerámica, tipo de ambiente existente dentro del horno en el momento de la cocción; puede ser oxidante cuando es rica o abundante en oxígeno, y reductora cuando el oxígeno es escaso y por lo tanto la combustión es incompleta y humeante ◇ *The deposit may also be formed during kiln firing, either from soluble salts in the clay or by reaction between the sulphur gases in the kiln atmosphere and minerals in the clay bricks; V. kiln atmosphere; reducing atmosphere; oxidising atmosphere*), **atmospheric** (GRAL atmosférico; relativo a la atmósfera ◇ *Nitrogen oxides, carbon and sulphur are the main atmospheric contaminants*), **atmospheric agents** (GRAL agentes atmosféricos; el viento, la temperatura, los rayos, los meteoritos y los agentes contaminantes, entre otros, son agentes atmosféricos ◇ *It describes a process for protecting stony materials, marble, tiles, and cement from atmospheric agents and pollutants*), **atmospheric aggression** (MEDAMB agresión atmosférica), **atmospheric alteration** (MEDAMB alteración atmosférica; alteración natural debida a procesos químicos o mecánicos en los que participan los agentes de la atmósfera), **atmospheric attack** (GRAL/MANTNMO V. *atmospheric corrosion*), **atmospheric corrosion** (GRAL/MANTNMO corrosión atmosférica; corrosión originada por los componentes del aire o sustancias contaminantes del mismo ◇ *Components exposed to the elements will inevitably experience damage due to atmospheric corrosion*), **atmospheric emissions** (MEDAMB emisiones atmosféricas; vertido de determinadas sustancias a la atmósfera), **atmospheric humidity** (GRAL humedad atmosférica; cantidad de vapor de agua existente en el aire medida mediante un aparato denominado higrómetro y expresada mediante los conceptos de humedad absoluta, específica o relativa del aire V. *absolute humidity; atmospheric humidity; relative humidity; specific humidity*), **atmospheric kiln** (MAQELAB horno atmosférico ◇ *Clay can be fired in an atmospheric kiln with or without a previously applied glaze*), **atmospheric natural gas burner** (MAQELAB quemador atmosférico de gas natural ◇ *Atmospheric natural gas burners are used successfully on ceramic kilns*), **atmospheric pollution** (MEDAMB contaminación atmosférica, contaminación del aire; polución atmosférica ◇ *Although atmospheric pollution can have natural sources, for example volcanic eruptions, the term is usually used to refer to the gaseous by-products of man-made processes such as energy production, waste incineration, transport, deforestation and agriculture*), **atmospheric pollution index, API** (MEDAMB índice de contaminación atmosférica, índice de contaminación/polución del aire ◇ *The Atmospheric Pollution Index (API) represents an overall value of the pollution level based upon the gas composition of air samples taken at 3 ft above the ground surface*), **atmospheric pressure** (GRAL presión atmosférica; presión que ejerce la atmósfera sobre cualquier superficie en virtud de su peso ◇ *Such changes in atmospheric pressure can, in extreme cases, result in damage to the kiln*)].

**atom** *n*: QUIM átomo; una de las partículas minúsculas en que puede descomponerse la materia sin perder sus propiedades químicas y que está compuesta de partículas subatómicas: protones *-protons-*, electrones *-electrons-* y neutrones *-neutrons-* ◇ *Most molecules are made up of multiple atoms; V. subatomic particles.* [Exp: **atomic absorption spectrometry, AAS** (ELABPROC/ENSAYO espectrometría de absorción atómica; herramienta/técnica analítica llevada a cabo mediante la absorción de la luz por medio de átomos y que es aplicable al análisis de trazas de elementos metálicos en minerales, muestras biológicas, metalúrgicas, farmacéuticas, etc. ◇ *AAS is an instrumental analytical method used for the determination of very small amounts of e.g. hazardous compounds in coatings and coating films (f.inst.lead,mercury,cadmium etc.)*), **atomic absorption spectroscopy (liquid solution), AAS** (ELABPROC/ENSAYO espectroscopia de absorción atómica (soluciones líquidas); método de análisis comúnmente usado para ciertos elementos traza en muestras acuosas (y otros líquidos) ◇ *Atomic absorption spectroscopy (AAS) determines the presence of metals in liquid samples*), **atomic polarization** (QUIM polarización atómica ◇ *Atomic polarization involves displacement of atoms or ions within a crystal structure when an electric field is applied; V. ionic polarization*), **atomic weight, at. wt.** (PROPQUIM-FIS masa atómica, peso atómico; masa total de los protones, neutrones y electrones en un átomo único en estado de reposo; la masa atómica también se suele denominar peso atómico, si bien esta denominación no es la más conveniente ya que la masa es propiedad del cuerpo y el peso depende de la gravedad ◇ *The atomic weight of aluminum is 27.0 and the atomic weight of oxygen is 16.0*)].

**atomisation** *n*: TRANSPROC V. *atomization.* [Exp: **atomise** (TRANSPROC V. *atomize*), **atomised** (TRANSPROC V. *atomized*), **atomiser** (MAQTRANS V. *atomizer*), **atomising/atomisation air** (TRANSPROC V. *atomizing/atomization air*)].

**atomization** *n*: TRANSPROC atomización, pulverización; proceso de secado por el cual una suspensión pulverizada en finas gotas entra en contacto con aire caliente para producir un producto sólido de bajo contenido en agua ◇ *Ceramic powders are particulates, usually with a micron or mesh size distribution, fabricated through atomization, crushing, milling, precipitation or other processes; V. spraying.* [Exp: **atomize** (TRANSPROC atomizar; dividir en partes sumamente pequeñas, pulverizar; en la industria cerámica, secar mediante una suspensión pulverizada en finas gotas que al entrar en contacto con aire caliente da como resultado un producto sólido de bajo contenido en agua), **atomized** (TRANSPROC atomizado, pulverizado; que ha sido sometido al proceso de atomización ◇ *The atomized powder is characterized by a heterogeneity in the shape and size of the granules*), **atomizer** (MAQTRANS atomizador, nebulizador; pulverizador (para esmalte); dispositivo de pulverización y secado en el que la barbotina *-slip/slurry-* es finamente nebulizada y dividida, secándose a continuación al ponerla en contacto con una corriente de gases calientes ◇ *If wet milling is first used, the excess water is usually removed via spray drying; this involves pumping the slurry to an atomizer consisting of a rapidly rotating disk or nozzle; V. air brush*), **atomizing/atomization air** (TRANSPROC aire de pulverización ◇ *The ratio of atomising air to fuel was adjusted to give a stable flame*)].

**atrium** *n*: CONST atrio, patio interior; espacio descubierto, generalmente cercado de pórticos, que hay en algunos edificios ◇ *It is an atrium model that has rather unattractive and worn terra cotta style tiles throughout the atrium.*

**attach**<sup>1</sup> v: GRAL adherir-se, pegar-se, unir-se ◊ *The powder and the plastic must be mixed well to allow the plastic polymer chains to attach themselves to the powder particles.* [Exp: **attach**<sup>2</sup> (GRAL sujetar; enganchar, amarrar, atar, conectar, acoplar, unir, juntar ◊ *To attach tiles to non-porous surface such as glass or metal, spread glue on both tile and surface*), **attached** (GRAL unido; pegado, fijado ◊ *A controller is an electronic device attached to a kiln*), **attached column** (CONST columna adosada), **attached to net** (INSTAL encolado; pegado con red, encolado con red V. *mounted tiles*), **attachment** (INSTAL sujeción, colocación, enganche, fijación ◊ *Similarly in other structures involving attachment of tiles in vertical or inclined structures or to the lower side of horizontal surfaces, the locating member can readily be inserted to the best angle for attachment to the appropriate support surface*)].

**attack**<sup>1</sup> n/v: GRAL ataque ◊ *The glass must resist attack by drugs and chemicals, but must be readily shaped by mass-production methods; V. chemical attack.* [Exp: **attack**<sup>2</sup> (GRAL atacar; actuar contra algo, perjudicar, dañar o destruir ◊ *This refractory carbide is slowly attacked by water at room temperature and by O<sub>2</sub> and N<sub>2</sub> at 1000°C*)].

**Attaclay** n: MATPRI Attaclay ◊ *Attapulgitic clay is commercially available under the tradename Attaclay from Engelhard Corporation in Iselin, N.J. V. attapulgitic.*

**attain** v: GRAL lograr; conseguir, alcanzar ◊ *According to general thermodynamic criteria, every closed system at constant temperature and pressure tries to attain the more stable state.*

**attapulgitic** n: MATPRI atapulgita, atapulguita ◊ *Sepiolite and attapulgitic are clay minerals that provide aqueous suspensions with viscosity.*

**attendance record** n: GESTIÓN registro de asistencia V. *time sheet.*

**Atterberg limits** n: PROPMATPRI límites de Atterberg, límites de consistencia; medida básica utilizada para caracterizar el comportamiento y la naturaleza de los suelos/tierras finos *-fine-grained soils-* basada en el concepto de que estos suelos pueden encontrarse en cinco estados diferentes, dependiendo del contenido de agua: sólido, semisólido, plástico, semilíquido y líquido ◊ *The Atterberg limits can be used to distinguish between silt and clay, and it can distinguish between different types of silts and clays.* [Exp: **Atterberg test** (PROPMATPRI ensayo de Atterberg; método para determinar la plasticidad de los suelos en general y de la arcilla en particular ◊ *The Atterberg test results of the natural clays were obtained using the Casagrande cup according to NF P94-051; V. Casagrande cup*)].

**attestation of conformity, AoC** n: ENSAYO certificado de conformidad; acción por la cual un laboratorio que actúa como tercera parte manifiesta que una muestra específica sometida a ensayo cumple con un estándar específico u otro documento normativo ◊ *The attestation of conformity can be issued by a recognised Certification Body or by the manufacturer and it is based on the results of the initial type testing of the product and on the Factory Production Control.*

**attic** *n*: GRAL ático, desván ◇ *I have a converted attic with acoustical tiles attached to the ceiling.*

**attle** *n*: EXPL-CANT ganga (minas); materia de poco valor, dura, en la que pueden presentarse encastrados algunos minerales y a la que cuesta separar de ellos; al mineral con su ganga, esto es, lo que generalmente se extrae de la mina, se le denomina mena.

**attractive** *a*: GRAL atractivo; atrayente ◇ *Most countertops have a buildup on the front edge to give them a thicker, more attractive look.* [Exp: **attractive force** (PROPQUIM-FIS fuerza de atracción; fuerza por las cuales un objeto atrae a otro ◇ *The ionic bond arises from the electrostatic attractive force between positively charged cations and negatively charged oxide anions which are formed by the transfer of electrons*)].

**attributable** *a*: GRAL atribuible; achacable ◇ *The chipping of vitreous enamelware is often attributable to the enamel coating being too thick, or to the curvature of enamelled edges being too sharp.*

**attribute**<sup>1</sup> *n/v*: GRAL atributo; cualidad o propiedad de algo o alguien ◇ *Translucency is an important attribute, enhancing the appearance of certain types of high quality tableware.* [Exp: **attribute**<sup>2</sup> (GRAL atribuir; otorgar, asignar algo a alguien o algo como de su competencia ◇ *The decorative elements as the pavements, the stained glasses, gypsum, stone carved and, above all, the ceramic coverings, are determinant to attribute this art nouveau character to a building*), **attribute (statistics)** (GRAL atributo, propiedad (estadística))].

**attrition** *n*: TRANSPROC atrición; proceso de reducción del tamaño de las partículas basado principalmente en el impacto y/o en la fricción/frotamiento *-rubbing action-* ◇ *Attrition is produced by frictional stresses; V. wear.* [Exp: **attrition mill** (MAQTRANS molino de atrición; desfibrador por fricción ◇ *Attrition mills can reduce 1,000-micron (20-mesh) particles of friable materials -such as chemicals and minerals- down to less than 1 micron; V. attritor; attritor mill*), **attrition milling/grinding** (TRANSPROC molienda de/por atrición; molienda en la que agentes molturantes no degradables *-non-degradable grinding media-* entran en contacto continuo con el material molturándolo progresivamente ◇ *The smaller ball sizes, in turn, give increased contact points that allow for a higher grinding efficiency for attrition grinding, which demands a fine particle size end-product*), **attrition test** (ENSAYO ensayo de desgaste; prueba realizada para determinar hasta qué punto puede un material verse afectado por el desgaste por fricción ◇ *Commercial alumina particles exhibit a wide range of behavior when submitted to the conventional attrition test*), **attrition wear** (TRANSPROC desgaste por atrición; pérdida de volumen del grano como resultado de la atrición ◇ *Localized wear on the trailing edge is critical under such circumstances and the better attrition wear of mixed ceramics compared with pure ceramics makes it perform better under these conditions*), **attritor, attritor mill** (MAQTRANS molino de atrición; sistema/equipo de molienda/molturación y mezclado, rápido, potente y eficaz, consistente en un cilindro vertical en el que todos los elementos triturantes *-grinding media-* están en acción a la vez ◇ *Attritor mills are used to break up lumps of solid material into finer sizes; V. attrition mill*)].

**aubergine purple** *n*: ESMREL morado berenjena ◊ *The aubergine purple glaze color was first introduced during the reign of emperor Kangxi.*

**auditorium** *n*: GRAL auditorio; sala destinada a la celebración de audiencias, así como de conciertos, recitales, conferencias, coloquios, lecturas públicas, etc.

**auger**<sup>1</sup> *a/n*: MAQELAB galletera de hélice; aparato en el que la arcilla/cuerpos de arcilla son forzados a través de una boquilla extrusora como consecuencia de la rotación de una hélice en el eje central ◊ *The processes specifically used for ceramic tile manufacture include 1) dry (dust) pressing, 2) auger extrusion, and in some cases, 3) plastic molding; V. auger machine; pug-mill.* [Exp: **auger**<sup>2</sup> (MAQEXTRAC sonda, barrena; sondeadora para terrenos blandos ◊ *An auger is like a large “corkscrew” operated by hand or by machine to take samples of soft material, e.g. clay, during prospecting; V. auger machine (borehole)*), **auger machine** (MAQELAB prensa de extrusión helicoidal ◊ *The picture shows an Auger machine for extruding clay into moulds before pressing them into tiles; V. auger*), **auger machine (borehole)** (MAQEXTRAC perforadora para tomar muestras de sondeo ◊ *After the machine alignment is checked, the auger machine starts to penetrate downwardly through the soil*), **auger stem** (MAQEXTRAC vástago de perforación; barra de acero tipo sacacorchos que gira y actúa como columna de perforación ◊ *As the depth of the hole increases, segments of auger stem (shaped like a big screw) are added*)].

**austere** *a*: GRAL/DISEÑO austero; sobrio, sencillo ◊ *Ceramic tiles' response to this colder, less ostentatious and austere trend is to offer single colour bases.* [Exp: **austerity** (GRAL/DISEÑO austeridad ◊ *These solutions offer an audience avid for new ideas an alternative to the austerity of minimalist aesthetics by bringing solutions that are more decorative both graphically and colour-wise; V. austere*)].

**authigenic (mineral)** *a*: PROPMATPRI/GEO-MIN-CRIST autógeno (mineral); se aplica a todo mineral que se ha originado en la roca donde se encuentra ◊ *Authigenic K-feldspar is heterogeneously distributed in samples of every depth.* [Exp: **authigenous (mineral)** (PROPMATPRI/GEO-MIN-CRIST V. *authigenic (mineral)*)].

**authority having jurisdiction, AHJ** *n*: ORG-INST autoridad con jurisdicción; organización, agencia o persona responsable de aprobar un equipo, instalación o procedimiento ◊ *The authority having jurisdiction shall determine compliance with this standard and authorize equivalent deviations from it in all applications.*

**authorization** *n*: GESTIÓN autorización; legalización, acción y efecto de autorizar ◊ *It is expressly forbidden to reproduce any image published in this site without prior authorization by SIR-TILES S.p.A.*

**autochthonous** *a*: GRAL/GEO-MIN-CRIST autóctono; nacido u originado en el mismo lugar donde se encuentra V. *authigenic*. [Exp: **autochthonous clay** (MATPRI arcilla autóctona ◊ *Autochthonous clay is a clay originating in the soft sediment or sedimentary rock where it is identified and where it formed*)].

**autoclave** *n*: MAQELAB/INDAFIN autoclave; dispositivo tipo contenedor que utiliza vapor de agua a alta presión y temperatura para curar -cure- productos de hormigón, hacer

ensayos con cemento hidráulico u otros materiales y esterilizar material de laboratorio o médico ◇ *The rapid curing of pre-cast concrete units can be done at high pressure in an autoclave or at atmospheric pressure in chambers or tunnels.* [Exp: **autoclave curing** (ELABPROC/INDAFIN curado en autoclave; proceso de curar el hormigón y sus derivados por medio de vapor a alta presión y temperatura ◇ *Autoclave curing at temperatures lower than 104°F is not recommended*), **autoclave test** (ENSAYO ensayo de autoclave; someter a un material/producto (azulejo, cemento) a presión en autoclave para determinar propiedades como la expansión ◇ *Autoclave test results on crazing of sanitary ware and wall tile*), **autoclaved aerated concrete, AAC** (INDAFIN hormigón celular curado en autoclave ◇ *Autoclaved aerated concrete (AAC) is well known as an environmentally friendly construction material*)].

**autocombustion system** *n*: MAQELAB sistema de autocombustión ◇ *An autocombustion system is an electronically controlled impulse system for the oil firing (from the top or side) of ceramic kilns.*

**autogenous** *a*: PROPQUIM-FIS autógeno; auto-producido. [Exp: **autogenous grinding mill** (MAQTRANS *V. autogenous mill*), **autogenous healing** (ELABPROC curado autógeno ◇ *If hairline cracks do occur, they tend to seal themselves through a process known as autogenous healing*), **autogenous mill** (MAQTRANS molino autógeno ◇ *Autogenous Mills use large particles of ore instead of steel or other balls for grinding media; V. autogenous tumbling mill*), **autogenous tumbling mill** (MAQTRANS molino autógeno de volteo; molino de bolas en el que se utiliza como medio molidor el propio material basto que entra; también se conoce simplemente como molino autógeno)].

**automate** *v*: GRAL automatizar; aplicar máquinas o procedimientos automáticos a una industria ◇ *Our current processes are being renewed so that recommendations on how we can automate them have been made.*

**automatic** *a*: GRAL automático; referido a un mecanismo: que funciona en todo o en parte por sí solo ◇ *The dried powder does not have the good flow properties required for automatic pressing.* [Exp: **automatic control system** (GRAL sistema de control automático), **automatic door** (GRAL puerta automática), **automatic gripper** (MAQELAB garra (robótica/automática), brazo robótico; pinza (robótica/automática) ◇ *Once the tiles have exited the tunnel kiln and quality control has taken place, automatic grippers unload the kiln cars, group the finished products and form small packs of up to eight pieces*), **automatic grouter** (MAQELAB inyector automático), **automatic loading** (ELABPROC carga automática), **automatic shutoff device** (GRAL mecanismo automático de cierre/parada/corte ◇ *An automatic shutoff device can be expected to save an estimated 5-10% of water*), **automatic sprinkler head** (MAQELAB cabeza rociadora automática ◇ *Storage of any combustibles must be a minimum of 18" below the level of any automatic sprinkler head*), **automatic stop/stopping device** (GRAL dispositivo de parada automática ◇ *Automatic stop device shall be provided when door reaches the fully open or closed position*), **automatic tensioning device** (GRAL tensor automático; mecanismo para conseguir una tensión uniforme y constante ◇ *This machine can be supplied with an automatic tensioning device to give the most efficient use of the motor*), **automatic time switch** (GRAL interruptor automático; mecanismo que permite poner en marcha -turn on- o apagar -turn off- un aparato a unas horas predeterminadas ◇ *This means that the automatic time switch has to be equipped with an input element through which*

*selected functions and function modes of the oven can be converted from purely manual operation to time controlled operation*), **automatic weight-mixer** (MAQTRANS/MAQELAB pesador-mezclador automático), **automation** (GRAL automatización) ◇ *Automation for the loading and unloading of all kind of dryers; V. automate*), **automatization** (GRAL V. automation)].

**autosieve** *n*: MAQELAB tamiz automático; sistema automático para el análisis del tamaño de las partículas en el que cuatro tamices con diferentes medidas de paso oscilan de manera mecánica (el tamiz con menor apertura se encuentra en el fondo), siendo los finos automáticamente pesados en cada oscilación ◇ *Autosieve is used wherever particle-size distribution is determined by sieving*.

**auxiliary** *a*: GRAL auxiliar; adicional, suplementario ◇ *The pressure vessel is also penetrated, normally through the end closures, to provide power, instrumentation and auxiliary services to the furnace*. [Exp: **auxiliary equipment/machinery** (GRAL maquinaria auxiliar) ◇ *It necessitates auxiliary equipment to supply the cooling water*), **auxiliary switch** (GRAL interruptor auxiliar) ◇ *An auxiliary switch is actuated by the main device (such as a circuit breaker) for signaling, interlocking, or other purposes*]].

**AV** *abbr*: PROPQUIM-FIS/MEDIDA V. acid value.

**availability** *n*: GRAL disponibilidad ◇ *Since the frit market changes with time, so does the availability of frit types*. [Exp: **available** (GRAL disponible; referido a una cosa: que está lista para usarse o utilizarse, que se puede disponer de ella) ◇ *All of our stoneware glazes are available wet in pints and gallons*]].

**aventurine** *n/a*: MATPRI aventurina, cuarzo aventurina; venturina; forma de cuarzo de color predominantemente verde oscuro con irisaciones metálicas ◇ *Aventurine glass tile is characterized by its rich, earth-to-sky toned colors and the gold-hued dust that shimmers and weaves randomly throughout each tile*. [Exp: **aventurine quartz** (MATPRI V. aventurine)].

**average**<sup>1</sup> *a/n/v*: GRAL promedio, media aritmética; referido a números, la suma de todos ellos dividida entre el número de sumandos; superior/inferior a la media: *above/ below average*; por término medio: *on (the) average*. [Exp: **average**<sup>2</sup> (GRAL medio; que presenta las características o condiciones generales de un grupo) ◇ *Studies of such systems have shown that where crystallite growth is the predominant process, the average pore size increases*), **average**<sup>3</sup> (GRAL promediar; calcular la media de algo), **average consumer** (GRAL/COM consumidor medio) ◇ *The average consumer has an idea that they want to use a tile or stone product.*), **average dip** (GEO-MIN-CRIST/EXPL-CANT buzamiento medio (geología); inclinación media de un filón o capa del terreno) ◇ *The quarrying operations are carried out taking advantage of the layering of the stone, almost flat and horizontal (average dip of 2° toward south)*), **average hade** (GEO-MIN-CRIST/EXPL-CANT pendiente media (geología); inclinación media) ◇ *The fault has an average hade to the west of about 30 degrees; V. average dip*), **average sample** (CALIDAD muestra media, muestra promedio) ◇ *An "average" sample is taken, rather than looking at still samples, which may vary from one sample to the other*), **average value** (GRAL valor medio/promedio V. average), **awash** (GRAL inundado por; cubierto de agua

o, en sentido figurado, de algo que recuerda al agua  $\diamond$  *The bath is awash in aquamarine tile on both the floor and the walls*).

**avoid** v: GRAL evitar; omitir, anular  $\diamond$  *Avoid spreading the glaze too thin with the action of the brush*.

**AWB** abbr: DISTRIB V. *airway bill*.

**ax, axe**<sup>1</sup> v/n: EXPL-CANT hacha, destal; martillo de peña doble (cantería) V. *bushhammer*. [Exp: **ax, axe**<sup>2</sup> (EXPL-CANT golpear con un hacha; dar golpes con un martillo/hacha para obtener una superficie tosca  $\diamond$  *Before the introduction of pneumatic tools quarry workers would axe or pick the roughly cleft faces to flatten them*), **axe for bursting stones** (EXPL-CANT pica de minero), **axhammer** (EXPL-CANT martillo de cantería, hacha con cabeza de martillo; hacha con un borde cortante en un lado y un martillo en el otro)].

**axial** a: GRAL axial; perteneciente o relativo al eje. [Exp: **axial compression** (GRAL compresión axial; compresión aplicada de forma paralela al eje), **axial compression test** (ENSAYO ensayo/prueba de compresión axial  $\diamond$  *During the axial compression tests tile longitudinal strain was measured by means of dial gauges with 0.01-null graduations*), **axial contraction** (PROPQUIM-FIS contracción axial), **axial expansion** (PROPQUIM-FIS expansión axial, dilatación axial), **axial flow** (QUIM flujo axial; flujo de un fluido por un dispositivo axialmente simétrico, de manera que la dirección del flujo es a lo largo del eje de simetría), **axial flow compressor** (MAQTRANS/MAQELAB compresor de flujo axial; compresor que actúa acelerando el fluido en una dirección más o menos paralela al eje de rotación), **axial flow fan** (GRAL ventilador axial  $\diamond$  *Axial flow fan has been specially designed for removal of dust*), **axial flow turbine** (GRAL turbina axial  $\diamond$  *In an axial flow turbine water flows parallel to the axis*), **axial force** (PROPQUIM-FIS fuerza axial; causa que modifica o tiende a modificar el estado, bien sea de reposo o movimiento, de un cuerpo y que provoca efectos en su interior), **axial load** (PROPQUIM-FIS carga axial; tensión o carga de compresión aplicada a lo largo, o paralela a , y concéntrica al eje primario  $\diamond$  *In the case of an ideal column under an axial load, the column remains straight until the critical load is reached*; V. *axial rigidity*), **axial load-carrying capacity** (PROPQUIM-FIS capacidad de carga axial  $\diamond$  *Although the walls were damaged, the axial load-carrying capacity was maintained and collapse was avoided*), **axial modulus** (PROPQUIM-FIS módulo axial; razón del esfuerzo longitudinal y la deformación longitudinal cuando no hay deformación lateral), **axial pressure** (PROPQUIM-FIS presión axial  $\diamond$  *Springback is greater at higher compaction pressures and it may be prevented by applying axial pressure (hold-down) to the compact during ejection*), **axial rigidity** (PROPQUIM-FIS rigidez axial  $\diamond$  *Axial rigidity directly measures the resistance to compressive forces*; V. *axial load*), **axial thrust** (PROPQUIM-FIS empuje axial; fuerza en la dirección del eje  $\diamond$  *The wear develops when support rollers are over-skewed to control the axial thrust of the kiln*), **axis** (GRAL eje; referido a maquinaria, elemento que se emplea como soporte de piezas giratorias pero que no transmite ningún esfuerzo de torsión; en matemáticas, línea recta con respecto a la cual una figura geométrica puede rotar; también se utiliza para los ejes de una función: X e Y  $\diamond$  *Each item is fired separately, and is mounted on an alloy support, coated with alumina, which rotates the ware on its own axis as it passes through the kiln, thus ensuring uniform temperature distribution*), **axis of abscissa** (pl. *abscissae*) (GRAL eje de abscisas; recta horizontal de los ejes de coordenadas representada por OX), **axis of**

**ordinate** (GRAL eje de ordenadas; recta vertical de los ejes de coordenadas representada por OY), **axis of symmetry** (GRAL eje de simetría; línea imaginaria que divide una forma cualquiera en dos partes cuyos puntos opuestos son equidistantes entre sí, esto es, quedan simétricos ◊ *The axis of symmetry is a tile diagonal when the degree is odd; V. symmetry*), **axis of tilt** (GRAL/ELABPROC eje de inclinación ◊ *As a result of the rocking motion of the melt, which takes place in an elongated furnace about an axis of tilt perpendicular to the furnace axis, the melt sloshes back and forth in the direction of the longitudinal axis, an intensive mixing of the melt resulting*)].

**axle** *n*: GRAL eje (giratorio); barra o pieza similar que atraviesa un cuerpo giratorio y le sirve de sostén a la hora de realizar el movimiento ◊ *In some cases the axle may be fixed in position with a bearing or bushing sitting inside the hole in the wheel or gear to allow the wheel or gear to rotate around the axle.*

**axonometric projection** *n*: ELABPROC/DISEÑO proyección axonométrica; dibujo geométrico tridimensional que muestra un edificio u otro objeto ◊ *The axonometric projection is best suited to show the interior of rooms.*

**Ayrshire bauxitic clay** *n*: MATPRI arcilla bauxítica de Ayrshire; tipo de arcilla refractaria no plástica dada en Ayrshire, condado de Escocia, situado en la zona suroeste del país ◊ *Charp is made from Ayrshire bauxitic clay.*

**AZS (alumina-zirconia-silica) refractories** *n*: INDAFIN refractarios AZS (alúmina-zirconia-sílice); refractarios usados en contacto con el vidrio fundido *-molten glass-* en la elaboración del vidrio y que son colados por fusión *-fusion-cast-* para lograr una alta densidad, baja porosidad y resistencia a la corrosión ◊ *ASTM C1223 tests for glass exudation from AZS refractories, on heating to 1510 °C.*

## B

**B** *abbr*: MEDIDA V. *brewster.*

**B/D** *abbr*: GESTIÓN V. *bank draft.*

**B/E** *abbr*: DISTRIB/COM V. *bill of exchange.*

**B/L** *abbr*: DISTRIB V. *bill of lading.*

**babic's mortar** *n*: INSTAL mortero de babic; mortero de cemento que se hace repelente al agua incorporándole un siliconato acuoso *-aqueous silicate-*.

**Babosil** *n*: ESMREL Babosil; marca comercial de frita para alfarería u objetos cerámicos en general llamada así por contener bario, boro y sílice.

**back**<sup>1</sup> *a/n/v*: GRAL parte posterior/de atrás, dorso, revés ◊ *Apply the bonding cement to the back of the tile.* [Exp: **back**<sup>2</sup> (GRAL apoyar, respaldar ◊ *Tiles are backed by a 10-year warranty*), **back arch** (CONST arco interior), **back band** (CONST/INSTAL listón interior ◊ *A back band is primarily utilized as a door casing or around the outer edge of a*

*rectangular window*), **back butter/backbutter** (INSTAL untar por detrás/el reverso (del azulejo), untar el reverso; untar por la parte posterior y de manera uniforme las piezas de revestimiento antes de colocarlas, asegurando una cobertura completa del reverso con el mortero ◊ *In order to backbutter the tile, spread some thinset on the back of the tile and then use your notched trowel to spread the thinset out evenly*; V. *butter*), **back buttering/backbuttering** (INSTAL untado del reverso (del azulejo) ◊ *Back buttering is usually a secondary procedure, the main method of applying adhesive being the spreading of it on the floor with the notched trowel*; V. *buttering*), **back digger** (MAQEXTRAC pala retroexcavadora, excavadora retromóvil ◊ *A back digger operator is urgently needed*; V. *backhoe*), **back hearth** (GRAL solera de chimenea; suelo de la chimenea (hogar), plaza del hogar ◊ *Because the back hearth must withstand intense heat, it is built of heat-resistant materials, such as firebrick*; V. *chimney*; *flue*; *fireplace*; *hearth*; *mantel*), **back heat** (MAQELAB calor posterior; en un horno anular, calor (temperatura) en el extremo posterior de las cámaras en uso ◊ *Mount the pilot and/or safety probe well away from the furnace back heat*), **back of an arch** (CONST/GRAL extradós (de un arco)), **back pressure** (MAQELAB presión interior ◊ *A reducing atmosphere is accomplished in gas kilns by increasing back-pressure or reducing the amount of primary air available to each burner*), **back puttying** (INSTAL/CONST enmasillado ◊ *Back puttying is then used to force putty into spaces that may have been left between the frame and the glass*; V. *putty*), **back ring** (INSTR V. *holding ring*), **back side of slab** (INSTAL cara posterior de la placa/baldosa/losa), **back stamp, back-stamp** (PRODFIN marca (de fábrica); nombre del fabricante y/o marca estampado/a en la parte posterior de una pieza o en la base ◊ *This piece can be imprinted on the back with a back stamp up to 2 1/2" square*; V. *trade-mark*), **back wall** (GRAL/MAQELAB pared del fondo ◊ *Since the furnace was generally placed against a hillside the hill itself formed the back wall of the structure*), **back wall ( O.H. furnace)** (MAQELAB estribo posterior (horno Martin) ◊ *The furnace shows large exhaust fans on the back wall*), **backacter** (MAQEXTRAC V. *backloader*), **backbone** (GRAL columna vertebral (fig); la parte fuerte de algo, el eje central o vertebrador ◊ *Ceramics industry is the backbone of the economy in the area*), **backbreak** (EXPL-CANT sobreexcavación ◊ *The presence of such discontinuities complicates the designs of rock blasting in open pit mines and makes backbreak control difficult*), **backdigger** (MAQEXTRAC excavadora retromóvil, pala de arrastre V. *backhoe*), **backer** (GESTIÓN patrocinador V. *financial backer*), **Backer Rod** (INSTAL Backer Rod; empresa fabricante de materiales de relleno de juntas V. *backing rod*), **backer rod/backing rod** (INSTAL tiras de polietileno esponjado; material de relleno de juntas compresible, no absorbente e inerte que rellena el espacio de la ranura debajo del sellador de juntas ◊ *This backing rod provides the support to fill deep joints or cracks and establishes a flat, continuous surface for applying caulking and sealants*), **backfill** (EXPL-CANT/CONST rellenar, relleno; llenar de nuevo, por ejemplo, una excavación con material excavado: *to backfill an excavation* ◊ *Gravel is used behind the wall as backfill to allow for drainage*), **backfiller** (EXPL-CANT/MAQEXTRAC rellenadora), **backfilling** (EXPL-CANT/CONST relleno, terraplenado; acción de llenado llevada a cabo en los espacios vacíos de las canteras, por lo general con tierra o gravas), **backfilling** (EXPL-CANT/CONST terraplén/terraplenado; material grueso empleado para rellenar un hueco, o que se levanta para construir un camino, una defensa u otra obra similar), **backfilling** (EXPL-CANT/CONST fondo de relleno; relleno de material grueso entre los dos paramentos de una pared compuesta ◊ *The backfilling of the foundation wall*), **background** (GRAL/DISEÑO fondo, entorno; color/dibujo que cubre una superficie y sobre el cual resaltan otros aspectos como adornos, dibujos o manchas

de otro u otros colores ◇ *The black background is raw clay which turns black*), **background noise** (GRAL ruido de fondo ◇ *Background noise commonly disrupts the concentration of office employees, negatively affecting motivation*), **backhoe** (MAQEXTRAC retroexcavadora ◇ *Quarries or pits in the chert can be opened easily, and production generally can begin using only a backhoe or bulldozer*; V. *back digger*), **backhole** (MAQEXTRAC barreno de techo ◇ *A heavy-duty vehicle used with a shovel loader, like backhole, is used*), **backing** (INSTAL soporte, base; material usado como base sobre la cual se instala el azulejo o producto acabado ◇ *Mortar is the oldest and sometimes best backing or substrate to receive a tiled surface*), **backing brick** (CONST ladrillo de relleno ◇ *Backing brick is intended for interior usage in thick brick load-bearing walls or on the less-visible portions of buildings*), **backing material** (INSTAL tablero soporte ◇ *Aquapanel solves the problems experienced when traditional backing materials get wet*), **backing paper** (ELABPROC/DISEÑO papel protector, tira de protección ◇ *There are various methods of transferring the design while removing the backing-paper, some of which are suited to machine application*), **backing plate** (GRAL placa soporte/de apoyo ◇ *Such damage can to some extent be reduced by increasing the rigidity of the backing plate, in order to limit the bending stresses generated during impact*), **backing reinforcement** (INSTAL red metálica para sujetar alicatados ◇ *Dry mortarless construction and assembling construction (e.g., wall and ceiling construction and their cladding) including the installation of supporting structures and backing reinforcement*), **backing rod** (INSTAL/CONST cordón de respaldo; material de polietileno de celdas cerradas *-closed cell foam polyethylene-*, extruido en forma redonda, de baja densidad, resiliente y usado como material de respaldo para el sellado de juntas de construcción V. *Backer Rod*), **backing strip** (ESMREL soporte de refuerzo; tira metálica soldada *-welded-* a la parte posterior de un panel de metal que va a ser esmaltado con el fin de evitar el alabeo *-warping-*), **backloader** (MAQEXTRAC retrocargadora, pala retroexcavadora, retro pala, retroexcavadora, cuchara retroexcavadora), **back-pressure control piston** (GRAL pistón de contrapresión), **backsplash** (PRODFIN placa para salpicaduras ◇ *Most people associate custom tile with wall applications such as a backsplash in a kitchen or bathroom wall*; V. *tile backsplash*), **backup structure** (CONST estructura de reserva, estructura de refuerzo; construcción diseñada para soportar las cargas en caso de que se produzca el colapso de una estructura portante), **backup wall** (EXPL-CANT muro de contención; pared gruesa construida para contener tierra u otro material sólido)].

**bacor** *n*: INDAFIN V. *bakor*.

**bacteria** *n pl*: GRAL bacterias; (forma plural del sustantivo) microorganismo unicelular procariota causante de las fermentaciones, enfermedades o putrefacción en los seres vivos o en las materias orgánicas ◇ *Although they are lead-free and non-toxic, they are not dinnerware safe because the rough surface may tend to trap bacteria*. [Exp: **bacterial** (GRAL bacteriano, bacterial, bacteriológico ◇ *For the tile, washing and rinsing reduced the bacterial counts by about 900 to 1*; V. *anti-bacterial/antibacterial*), **bacterial corrosion** (MANTNMTO corrosión bacteriana; en un material, destrucción producida por los procesos químicos originados por la actividad de ciertas bacterias que generan sustancias como el sulfuro de hidrógeno, amoníaco y ácido sulfúrico), **bacterial leaching** (GEO-MIN-CRIST lixiviación bacteriana, biolixiviación; proceso consistente en la acción de bacterias sobre los minerales para acelerar la reacción de los minerales sulfurados)].

**bad vitrification** *n*: ELABPROC/CALIDAD V. *poor vitrification*.

**baddeleyite** *n*: GEO-MIN-CRIST baddeleyita ◇ *Zirconia forms in nature as the mineral baddeleyite*.

**badging** *n*: ELABPROC/PRODFIN marcado; proceso por el cual se superimpone una pequeña imagen o distintivo a un producto, generalmente la referida a la marca o fabricante ◇ *Use badging to convey status information in an unobtrusive manner*; V. *back stamp*.

**badigeon** *n*: INSTAL masilla tapadefectos; pasta que se utiliza para cubrir agujeros, generalmente en la piedra o en la madera.

**baffle** *n/a*: MAQTRANS deflector; dispositivo mecánico que modifica la dirección/trayectoria de un fluido ◇ *Baffles can be useful so that the slurry mass stays well mixed*. [Exp: **baffle hole** (ELABPROC orificio de llenado del molde; agujero por el que la barbotina accede al canal de colada), **baffle plate** (INSTR plato deflector, placa de dispersión; plato utilizado para el contacto de gases con líquidos que contienen sólidos con el fin de desviar el flujo de un líquido o un gas ◇ *A prall mill is an impact mill consisting of an impeller rotating clockwise at 1000 rev/min, a baffle plate moving anticlockwise at 1500 rev/min, and a second baffle plate that is stationary*), **baffle wall** (MAQELAB muro pantalla ◇ *A baffle wall has been built in the combustion chamber, which compels the gases to pass downward and to divide through two openings*; V. *shadow wall*; *curtain wall*)].

**bag** *n*: GRAL SACO, bolsa ◇ *When preparing to mix either 10 lb. or 50 lb. bags of dry glaze be aware that the components will tend to segregate as they are shaken about in shipping*. [Exp: **bag wall (kiln)** (MAQELAB muro transversal, pared transversal, altar (horno cerámico), pared transversal; en ciertos tipos de horno, muro pantalla/pared refractaria que separa la cámara de la zona de combustión ◇ *The bag wall deflects heat and flames from direct contact with the wares*), **bagged** (DISTRIB ensacado, envasado; embalado; colocado en sacos ◇ *Bulk and bagged products are loaded into trucks, containers or railcars for shipment*), **bagging** (TRANSPROC ensacar, ensacado (proceso de) ◇ *Dried cake or calcined materials may be pulverized or ground and then sized or air-elutriated before bagging or loading in hopper cars*)].

**bake** *n*: ELABPROC cocer; cocer al horno una pieza; por lo general, tiene connotaciones más artesanales que industriales ◇ *Bake the carved tile according to the manufacturer's directions for clay*; V. *fire*; *firing*. [Exp: **baked finish** (ELABPROC/PRODFIN acabado estufado ◇ *Enamel may be used for a baked finish of the surface*)].

**bakor** *n*: INDAFIN bakor; refractario de zirconia y corindón ◇ *The magnetic separation of crushed bakor made it possible to improve the quality of the finished products*.

**bal** *n*: EXPL-CANT mina; término utilizado en Cornualles para referirse a las minas.

**balance**<sup>1</sup> *n/v*: INSTR báscula, balanza ◇ *A balance capable of weighing the specimen with an accuracy of 0.01% of the mass of the specimen*; V. *scales*. [Exp: **balance**<sup>2</sup> (GRAL equilibrio V. *static balance*; *dynamic balance*), **balance**<sup>3</sup> (GRAL equilibrar, cuadrar (las

cuentas); ajustar, mantener el equilibrio), **balance pan** (INSTR platillo de balanza), **balance sheet** (GESTIÓN balance; documento que refleja la situación del patrimonio de una entidad en un momento determinado y que se obtiene básicamente confrontando el activo y el pasivo), **balanced** (GRAL equilibrado  $\diamond$  *Only with a precisely balanced air-fuel mixture can all three contaminants be minimized*), **balanced load** (GRAL carga equilibrada), **balancing** (GRAL equilibrado; acción de conducir a un estado de equilibrio  $\diamond$  *Balancing deals with the compensation of the existing unbalance in a rotating body by adding to, or subtracting from, the unbalanced mass, down to an acceptable limit of unbalance*), **balancing valve** (MAQTRANS/MAQELAB válvula compensadora; válvula usada en un conducto para controlar el flujo de fluido; no suele usarse para cortar dicho flujo)].

**balcony** *n*: GRAL balcón; plataforma saliente con barandilla *-handrail-* que se proyecta desde la pared de un edificio  $\diamond$  *Due to the popularity of outdoor living we have a comprehensive range of frost-resistant tiles suitable for patio or balcony.*

**bale**<sup>1</sup> *n/v*: DISTRIB fardo, bala; paca  $\diamond$  *Stack bales on pallets, add spaces between pallets if necessary to match size of bales.* [Exp: **bale**<sup>2</sup> (DISTRIB embalar, empaquetar), **baling** (DISTRIB embalaje), **baling band** (DISTRIB chapa para embalar, fleje de embalar)].

**ball** *n*: GRAL bola. [Exp: **ball bearings** (TRANSMTRLS rodamientos de bolas, rodamiento; medio de molturación que, si bien no pertenece propiamente a la industria cerámica, puede ser utilizado como elemento molturante o abrasivo  $\diamond$  *The surface is abraded by ball bearings, and the volume removed is calculated from the measured loss in mass*), **ball clay** (MATPRI arcilla de bola, arcilla grasa; ball clay; arcilla sedimentaria plástica de grano extraordinariamente fino que sufre un encogimiento de hasta el 20% en el proceso de secado, lo que no la hace muy útil por sí sola pero sí mezclada con otros tipos de arcilla que carecen de plasticidad; es un ingrediente esencial de la porcelana, pero no se usa sola  $\diamond$  *A typical batch composition is 18% ball clay, 22% china clay, 30% quartz, 15% china stone, 15% feldspar*), **ball indentation hardness** (ENSAYO dureza a la penetración de la bola  $\diamond$  *The ball indentation hardness is the quotient of the applied load and the surface area of the impression that is present underneath a ball after 30s at a given load*), **ball mill**<sup>1</sup> (MAQTRANS moler/triturar en un molino de bolas  $\diamond$  *The raw materials are ball milled for 20h and then fired at 1000°C to produce a greater than 90% dense product*), **ball mill**<sup>2</sup>/**ball-mill** (MAQTRANS molino de bolas, bombo; unidad utilizada para la molienda de materiales en la industria cerámica consistente en un cilindro hueco revestido, parcialmente cargado con elementos molturantes de gran dureza y resistencia al desgaste -bolas de metal, guijarros y material granular entre otros- y con el material a molturar; la molturación se produce por fricción e impacto al rotar el cilindro a gran velocidad  $\diamond$  *The grinding of glazes is usually done nowadays in ball mills, which are either lined with porcelain or constructed of hard rubber*), **ball milling** (TRANSPROC molienda/molturación en molino de bolas  $\diamond$  *A particle size reduction (comminution) step is required and ball milling is one of the most widely used; V. ball mill*), **ball peen hammer** (INSTAL martillo de bola; martillo de cara plana con un extremo redondo -la bola- que se usa para golpear cinceles y punzones), **ball penetration (hardness) test, BPT** (ENSAYO ensayo/método de prueba de dureza por penetración de la bola estática; método por el cual un peso metálico con forma hemisférica se sitúa sobre una superficie lisa y nivelada del hormigón fresco, siendo la profundidad a la que el peso se hunde la medida de la

dureza por penetración ◇ *The ball penetration (hardness) test is an ASTM test method used as a measure of the consistency of concrete*), **ball test** (ENSAYO ensayo de bola; ensayo para determinar la consistencia del hormigón fresco midiendo la profundidad de penetración de una pieza cilíndrica de metal cuya parte inferior es semiesférica V. *ball penetration (hardness) test*), **balling** (TRANSPROC aglomeración de granos; tendencia de algunos materiales cerámicos cuando están húmedos y son mezclados en una máquina a aglomerarse en pequeñas bolas), **ball-in-hand test** (ENSAYO prueba de la bola en mano, prueba de la consistencia; ensayo indicativo de la consistencia del mortero refractario que, en forma de bolas, es lanzado al aire y cogido de nuevo con los dedos de la mano abiertos: si la bola se amolda a los dedos sin romperse ni chorrear, la mezcla se considera adecuada ◇ *ASTM C 860 Standard Practice for Determining the Consistency of Refractory Castable Using the Ball-In-Hand Test*), **balls** (TRANSMTRLS elementos triturantes, bolas para triturar ◇ *Large drums are used with aluminum balls varying in size from 6" around in some cases to 1/2"; V. grinding media*)].

**ballast** *n*: GEO-MIN-CRIST balasto, cascajo; capa de piedra machacada o grava que se extiende sobre una superficie para colocar sobre ella el pavimento.

**baluster** *n*: GRAL balaustre/balaústre; columnas pequeñas que suelen presentar formas modeladas con una forma bulbosa sobre otra invertida o bien en forma de vasija y que junto con los barandales forman las barandillas de balcones, escaleras, etc. [Exp: **balustered column** (GRAL columna abalaustrada; se dice de la que tiene forma de balaustre V. *column*), **balustrade** (GRAL balaustrada; conjunto de balaustres *-balusters-* que forman una barandilla *-handrail-* ◇ *A marble balustrade surrounds the south, west, and north sides of the building*)].

**bamboo tile** *n*: PRODFIN teja árabe ◇ *Spanish tiles are also called bamboo tiles because of their resemblance, when placed in position, to a roof of split bamboo; V. bamboo tile*.

**ban** *v/n*: GRAL prohibir; especialmente empleado cuando se prohíbe algo por vía legal ◇ *Arizona banned the use of lead-based glaze in nursing homes*. [Exp: **ban** (GRAL prohibición ◇ *The Federal Asbestos Ban did not go into effect until 1989*)].

**band** *n*: GEO-MIN-CRIST banda; capa delgada *-thin layer-* con una composición mineralógica, contenido de fósiles *-fossil content-* o color característicos. [Exp: **band saw** (INSTAL sierra de banda/de cinta ◇ *Designed for the shop setting, this band saw makes precision cuts through marble, granite and tile with ease*), **band saw blade** (INSTAL hoja de sierra de cinta), **band theory (of solids)** (QUIM teoría de bandas; teoría que da cuenta del fenómeno de la conducción eléctrica en los sólidos V. *electrical conductivity*), **banded** (PROPMATPRI/GEO-MIN-CRIST bandeado; dícese de algo con capas alternas casi paralelas que se diferencian en el color o la composición mineral *-mineral composition-*, por lo que muestran una alternancia de bandas *-alternate bands-* en la sección transversal *-cross section-* ◇ *Banded clay layers are suggestive of distinct pulses of rapid mud deposition*), **banded structure** (GEO-MIN-CRIST estructura bandeada ◇ *A banded structure is an outcrop feature in igneous and metamorphic rocks due to alternation of layers, stripes, flat lenses, or streaks that obviously differ in mineral composition or texture*), **banded vein** (GEO-MIN-CRIST veta/vena bandeada ◇ *A vein made up of layers of different minerals parallel with the walls is called a banded vein; V.*

*vein*), **banding** (DISTRIB precintar/precintado con fleje, atado; estructura bandeada; flejado zunchado ◊ *Packaging equipment for banding products*), **banding film** (DISTRIB cinta de precintar, cinta de embalar/embalaje ◊ *Choose our 80 gauge banding film for general purpose use and our 115 gauge film for heavier banding and bundling applications*), **banding machine** (DISTRIB precintadora para embalajes), **bandy** (GRAL torcido, arqueado)].

**bander** *n*: DISTRIB *V. banding machine*.

**banister** *n*: GRAL barandilla, pasamanos.

**bank**<sup>1</sup> *n/v*: EXPL-CANT terraplén; macizo de tierra que sirve para rellenar un hueco, o que se levanta para hacer una defensa, un camino u otra obra similar. [Exp: **bank**<sup>2</sup> (GRAL/GESTIÓN banco, entidad bancaria/de crédito), **bank**<sup>3</sup> (EXPL-CANT cantera de arena/grava ◊ *The operator was digging in the sand bank which was situated under a bank of clay, and when the cave in took place he was buried completely*), **bank**<sup>4</sup> (GRAL/GESTIÓN depositar, ingresar (en banco/cuenta)), **bank account** (GESTIÓN cuenta bancaria), **bank book** (GESTIÓN cartilla, libreta de ahorros), **bank charges** (GESTIÓN gastos bancarios/de gestión bancaria, comisiones), **bank draft, B/D** (GESTIÓN giro bancario, talón bancario ◊ *An official bank draft is the only acceptable cheque, no personal or company cheques are accepted; V. banker's draft*), **bank failure** (EXPL-CANT desprendimiento de rocas, hundimiento (de rocas) ◊ *Progressive bank failure is likely unless erosion of the toe of the slope is mitigated*), **bank gravel** (EXPL-CANT grava de cantera), **bank head** (EXPL-CANT boca del socavón), **bank kiln** (MAQELAB horno de banco ◊ *Bank kilns were built on a bank, or slope, which served as a chimney*), **bank rate** (GESTIÓN tasa bancaria, tipo de interés (bancario); tasa de interés impuesta por un banco sobre los préstamos y anticipos que realiza ◊ *Changes in the bank rate are often used by central banks to control the money supply*), **bank stabilization** (EXPL-CANT compactación de terraplenes ◊ *The bank stabilization includes traditional quarry stone slope protection of the bank, with an additional planting area created waterward of the slope protection*), **banker** (CONST plano para amasar el mortero), **banker's cheque** (GESTIÓN *V. banker's draft*), **banker's draft** (GESTIÓN giro bancario, letra; orden de pago; cheque expedido por un banco contra sus fondos), **banking fees** (GESTIÓN gastos bancarios), **bankrupt**<sup>1</sup> (GESTIÓN quebrado, insolvente; en situación de quiebra ◊ *A bankrupt company almost always finds itself with an unmanageable debt burden*), **bankrupt**<sup>2</sup> (GESTIÓN arruinar; llevar a la quiebra, llevar a la bancarrota), **bankruptcy** (GESTIÓN quiebra, bancarrota; insolvencia ◊ *The company is facing bankruptcy; V. default*), **banks (O.H. furnace)** (MAQELAB zapata (horno Martin))].

**bar**<sup>1</sup> *n*: GRAL barra; pieza de metal u otra materia, recta, de mucha más longitud que grosor y de forma generalmente prismática o cilíndrica ◊ *Failure mechanisms in ceramics are investigated by means of bar impact experiments and numerical simulations of the wave propagation event*. [Exp: **bar**<sup>2</sup> (CONST armadura; conjunto ensamblado de elementos de madera o hierro que sirve de soporte a la cubierta de un edificio), **bar**<sup>3</sup> (MEDIDA bar; unidad de presión equivalente a un millón de barias (próxima a la atmósfera normal) ◊ *The extrusion pressure during difficult molding processes (e.g., the production of honeycomb elements with very thin walls) can reach 80 bar*), **bar joist** (CONST vigueta de celosía; pequeña viga de enrejado de barras o

varillas que se usa en suelos y techos para su soporte), **bar top** (GRAL mostrador, barra de un bar, barra (de un bar) ◇ *It was decided to add a mosaic bar top using glass tile*).

**barbotine** *n*: TRANSPROC barbotina; suspensión/pasta líquida -a partir de la cual se realizan hoy en día la mayoría de azulejos, revestimientos y pavimentos- formada por una mezcla de arcillas -*clays*-, caolín -*kaolin*-, filitas -*phyllites*-, feldespato -*feldspar*- y cuarzo -*quartz*- que se deposita en unas balsas con agitadores para mantener la suspensión y de la que después se evapora el agua que contiene por atomización -*spray drying*- para proceder al llenado de los moldes con la pasta resultante ◇ *The barbotine is a liquid paste used in the pouring process into a mould*; V. *deflocculant* /*deffloculent*; *slip*.

**bare** *a*: GRAL desnudo, sin revestir; sin ornamento, descubierto, escueto ◇ *Three tiles coated with blank wax containing no silver particles and three bare tiles were included in the testing*. [Exp: **barefoot test** (ENSAYO ensayo de pie desnudo ◇ *Barefoot Test Results [DIN 51097], as follows: A = person slips between 12 - 18°, B = person slips between 18 - 24°, C = person slips between 24°; Failure to achieve 12° means "no rating" can be given*), **bare-foot traffic areas** (PRODFIN zonas de tránsito con pie desnudo ◇ *For use in bare foot traffic areas to help provide slip resistant footing*), **barelattograph** (INSTR barelatógrafo; instrumento para el registro automático -*automatic recording*- de la contracción -*contraction*- y pérdida de peso de un cuerpo de arcilla durante su secado bajo condiciones controladas ◇ *Investigation of the drying process of clays and ceramic bodies with a barelattograph*)].

**barite** *n*: GEO-MIN-CRIST barita, espato pesado, sulfato de bario; mineral principal de bario, sulfato de bario natural -*natural barium sulfate*-; combinado con el ácido sulfúrico, se encuentra generalmente en la naturaleza formando la baritina -*baritine*-; fuente del carbonato de bario ◇ *Possibly one reason for the discoloration of glaze A under certain conditions might be the assimilation by barytes*; V. *barium carbonate*; *barium sulphate*.

**barium** *n*: QUIM/ESMREL bario; elemento químico y metal abundante en la corteza terrestre, que se halla en minerales como la barita y la baritina, es altamente reactivo y se oxida con rapidez ◇ *Barium gives unique color responses with certain oxides (e.g. with copper it will give a marked blue compared to glazes fluxed with MgO, SrO)*. [Exp: **barium blue glaze** (ESMREL esmalte azul de bario ◇ *Barium blue glaze is best if used on porcelain*), **barium carbonate** (ESMREL/ELABPROC carbonato de bario; compuesto empleado en los fundentes usados para esmaltes -*glaze fluxes*-, los vidriados y los cuerpos de cerámica, los esmaltes sin plomo, en la elaboración de artículos sanitarios -*sanitaryware*- y en la alfarería -*pottery*- por ser muy activo como fundente ◇ *Barium carbonate lends a satin surface to high-fire glazes and a matte surface to low-fire glazes*), **barium chloride** (QUIM/TRANSPROC cloruro de bario ◇ *Barium chloride, apart from helping to prevent scumming, is sometimes used to replace CaC12 as a mill-addition in the manufacture of acid-resisting vitreous enamels*), **barium chromate** (QUIM/ESMREL cromato de bario, amarillo cromo; cromo limón ◇ *Barium Chromate is used in anti-corrosive agent and is a pigment used by the paint industry*), **barium feldspar** (ESMREL/QUIM feldespato bórico ◇ *Ideally, barium normally reacts with excess alumina and silica to form celsian (barium feldspar) in glazes, which is its most stable form*), **barium ferrite** (QUIM ferrita de bario ◇ *Barium ferrites are robust ceramics that*

are generally stable to moisture and corrosion-resistant), **barium nitrate** (QUIM nitrato bórico ◊ *Barium nitrate is not combustible, but is a strong oxidizer and helps other things explode or burn*), **barium oxide** (QUIM/ELABPROC óxido de bario ◊ *If available in sufficient amount, barium oxide will promote crystallization of a melt during cooling, thus imparting a measure of opacity*), **barium stannate** (ELABPROC/QUIM estannato de bario ◊ *Barium Stannate is sometimes added to barium titanate bodies to decrease the Curie temperature*), **barium sulphate** (ELABPROC/ESMREL sulfato bórico ◊ *Josiah Wedgwood perfected the use of Barytes as a body and glaze constituent in his Jasper ware; V. barite*), **barium sulphide** (MTRLS V. black ash), **barium titanate** (QUIM/ELABPROC titanato de bario ◊ *Barium titanate is used as a dielectric material for ceramic capacitors, and as a piezoelectric material for microphones and other transducers*), **barium titanate ceramics** (PRODFIN cerámica de titanato de bario ◊ *Barium titanate ceramics, usually made by calcination of titanium dioxide and barium carbonate, can have exceptionally high dielectric constants*), **barium zirconate** (QUIM/ELABPROC zirconato de bario ◊ *Barium zirconate is used as an addition (generally 8-10%) to barium titanate bodies to obtain high dielectric constant and other special properties*]).

**Barker-Truog process** *n*: ELABPROC proceso (de) Barker-Truog; proceso para el tratamiento con álcali *-alkali-* de la arcilla destinada a la industria del ladrillo que facilita el conformado y reduce la cantidad de agua necesaria para obtener una plasticidad óptima ◊ *In the Barker-Truog process the clay is mixed with alkali to give pH 7-9 if it was originally acid, or pH 8-10 if originally non-acid.*

**barometric pressure** *n*: GRAL V. *atmospheric pressure.*

**baroque** *n/a*: GRAL/DISEÑO barroco; estilo ornamental caracterizado por la profusión de las líneas curvas, adornos y detalles; se dice también de algo excesivamente recargado de adornos.

**barrel**<sup>1</sup> *n*: CONST cañón de un arco. [Exp: **barrel**<sup>2</sup> (GRAL barril, tonel ◊ *It required about a barrel of glaze to cover from six to eight tons of terra cotta*), **barrel arch** (CONST arco de cañón/de medio punto ◊ *A Simplex Kiln is a type of annular kiln in which two barrel-arch galleries are each divided by transverse walls into eight or nine chambers*), **barrel roof** (CONST techo abovedado), **barrel vault** (CONST bóveda de cañón/de medio punto ◊ *The barrel vault is the simplest form of a vault: a series of arches placed side by side, i.e., one after another*), **barrelling** (INDAFIN bariladura; proceso para la eliminación *-removal-* de las rebabas *-burrs-* o excrescencias *-excrescences-* y para limpieza general de los recubrimientos metálicos situándolos en un tambor giratorio *-revolving drum-* o barril junto con material abrasivo basto y grueso como pueden ser fragmentos quebrados de cerámica cocida V. *rumbling*)].

**barren** *a*: EXPL-CANT/GEO-MIN-CRIST árido, estéril; inhóspito; *barren land*: tierra estéril. [Exp: **barren rock** (EXPL-CANT/GEO-MIN-CRIST tepetate, terrenos muertos; substrato no fértil *-non fertile substrate-* formado principalmente por rocas porosas volcánicas *-porous volcanic rocks-* ◊ *Although blasting will likely occur until the end of the year, the mineralized zone has now been removed, leaving behind barren rock; V. waste rock*)].

**barrier** *n*: GRAL barrera ◇ *The barrier must be perm-selective, which means that it restricts the movement of molecules within it in a specific way; V. thermal barrier.* [Exp: **barrier height** (QUIM altura de la barrera de potencial; altura máxima de una superficie de energía potencial a lo largo de un proceso ◇ *As the material is cooled towards and below the Curie temperature, ferroelectric domains reform and interact with the barrier layer to reduce the barrier height*), **barrier layer**<sup>1</sup> (QUIM barrera de potencial; superficie de energía potencial que impide que sigan pasando los electrones de un lado a otro a lo largo de un proceso ◇ *As the material is cooled towards and below the Curie temperature, ferroelectric domains reform and interact with the barrier layer to reduce the barrier height*), **barrier layer**<sup>2</sup> (QUIM/ELABPROC capa protectora; capa de protección que se deposita sobre un semiconductor o una fibra óptica con el fin de crear una barrera que impida la difusión de impurezas), **barrier to radiant heat** (QUIM barrera a la/de/contra la radiación térmica, barrera al/de/contra el calor radiante ◇ *This product is not intended for use in locations requiring a barrier to radiant heat*)].

**barrow** *n*: GRAL carretilla.

**bars** *n*: TRANSMTRLS elementos triturantes; materiales muy duros, generalmente metálicos, en forma de barras o varillas y usados, junto con otros elementos similares, para molturar/triturar ◇ *A ball mill consists of a horizontal slowly rotating cylinder that is partly filled with grinding media (grinding balls, cylpeps or bars).*

**barye** *n*: MEDIDA baria; unidad de presión equivalente a una dina por centímetro cuadrado.

**barytes** *n*: GEO-MIN-CRIST *V. barite.*

**basal** *a*: GRAL basal; dícese de algo situado en la base de una construcción o una formación orgánica; relativo a la fundación, base o esencia de algo; fundamental, básico. [Exp: **basal cleavage** (GEO-MIN-CRIST exfoliación basal ◇ *Mica is characterised by very perfect basal cleavage; V. cleavage*), **basal crystal** (GEO-MIN-CRIST cristal basal ◇ *The basal crystal consisted of 7920 atoms, while the prism crystal consisted of 8640 atoms*), **basal growth** (PROPQUIM-FIS crecimiento basal ◇ *In basal growth, the atoms of growth migrate to the base of the whisker and extrude the whisker from the substrate*), **basal plane** (QUIM plano basal ◇ *The carbon atoms in the basal plane are covalently bonded, but the layers are held together by the weak van der Waals forces*)].

**basalt** *n*: GEO-MIN-CRIST basalto; roca ígnea compacta, de grano fino *-fine-grained-*, compuesta esencialmente de feldespato y piroxenos *-pyroxenes-* con o sin olivino *-olivine-*; es, por lo general, negra, pero puede presentarse también en colores grises, verdosos *-greenish-* y rojizos *-reddish-* ◇ *This hydraulic cement has been made by mixing portland cement consisting only of particles <30gm with 16-50% of an inert extender, e.g. limestone, basalt or flint; V. fusion-cast basalt.* [Exp: **basaltic** (GEO-MIN-CRIST basáltico ◇ *The weathering of a basaltic rock*), **basaltic pumice** (MTRLS piedra pómez basáltica ◇ *Experiments were carried out to determine abrasion resistance and the compressive strengths of concrete with crushed ceramic waste and basaltic pumice fine aggregates*)].

**base**<sup>1</sup> *n*: GRAL base; fundamento o apoyo principal de algo ◇ *Unlike many other brands of underglaze we use a frit base rather than a slip (clay) base for our underglazes structure.* [Exp: **base**<sup>2</sup> (PRODFIN/INSTAL zócalo; rodapié de una pared: banda horizontal de madera, azulejos, etc. con que se adorna o protege la parte inferior de una pared y que suele elevarse unos pocos centímetros del suelo pudiendo incluso llegar a media altura V. *skirting*), **base**<sup>3</sup> (QUIM base; sustancia que puede aceptar protones; las bases son los opuestos químicos de los ácidos y se combinan con ellos para formar sales ◇ *Examples of simple bases are sodium hydroxide and ammonia*), **base**<sup>4</sup> (GEO-MIN-CRIST V. *bedrock*), **base**<sup>5</sup> (CONST friso; capa de mezcla con cemento que se da a una pared o muro como acabado V. *screed; levelling screed*), **base (for fixing)** (INSTAL soporte del chapado (muro o piso)), **base beads** (INSTAL plantilla de base, armazón para revestimientos; plantilla de metal prefabricada empleada para colocar sobre ella el enlucido y separar áreas de diferentes materiales), **base bid** (GESTIÓN oferta base ◇ *Roman Mosaic & Tile Co. of West Chester, Pa., submitted the only bid for the ceramic tile and Terrazzo contract; Its base bid is approximately \$175,000*), **base coat/basecoat** (ESMREL capa (de) base, color base; capa cocida de color plano aplicada inicialmente a una zona concreta sobre la que se aplican otras capas que pueden incorporar además decoraciones ◇ *When the basecoat is dry, apply the glaze evenly over the surface; V. underlayment; groundcoat; engobe*), **base course** (CONST capa de asiento; hilada -course- inferior de un muro o pilar -wall or pier-), **base exchange** (QUIM intercambio de bases; sustitución química de cationes -cations- en un suelo; reacción química consistente en que un elemento mineral que forma parte de un compuesto se libere de éste al entrar en contacto con el agua (se disuelve en el líquido) V. *ionic base exchange; ion exchange; base-exchange capacity*), **base glaze** (ESMREL esmalte base; esmalte transparente incoloro que sirve para proteger, como base para esmaltes transparentes de colores y como base para diferentes técnicas; también puede ser usado como esmalte final ◇ *This chart of tiles shows a range of colors produced by adding various percentages of chrome oxide to base glazes before firing the tiles to different temperatures*), **base metal** (ESMREL/INDAFIN metal base; metal predominante en una aleación ◇ *Crazing of vitreous enamelware (particularly cast dry-process enamel) may also occur, the system of fine cracks penetrating through the enamel to the base-metal*), **base metal** (GRAL metal común ◇ *A base metal is a metal such as copper, zinc, tin, or lead that is not a precious metal*), **base moulding** (PRODFIN/INSTAL moldura de zócalo, zócalo de arquitrabe ◇ *Base moulding serves as a finish between the finished wall and floor*), **base plate/baseplate** (GRAL/MAQELAB placa de asiento, placa de anclaje; placa inferior; placa/chapa metálica usada como base para una máquina ◇ *The base plate is strong steel and the kiln has a heavy steel lid hinge, brace and back clamps*), **base screed** (INSTAL V. *base beads*), **base shoe** (INSTAL pie de moldura; moldura, normalmente de madera, que se coloca en la base del rodapié para darle un acabado adecuado al la intersección de éste y el suelo ◇ *When laying the tile, do not grout around the edges; leave a gap, and cover it with base shoe or quarter round*), **base shoe molding** (INSTAL V. *base shoe*), **base slab** (INSTAL/CONST losa de base), **base tile** (INSTAL/PRODFIN azulejo base; hilera inferior de azulejos en una pared revestida ◇ *When installing wall tile, you usually want to finish off the bottom row with special base tiles which are flared at the bottom and make a nice transition to the floor*), **baseboard (US)** (INSTAL rodapié; placa, normalmente de pocos centímetros, que se coloca en la unión entre la pared y el suelo y se emplea para cubrirla y disimularla ◇ *The baseboards around the house will be tile instead of the usual wood; V. skirting board; skirting (UK)*), **based in** (GRAL sede en, con, radicado en; se usa también en expresiones

como *Barcelona-based*, *London-based*, etc.: con sede en Barcelona, con sede en Londres, etc. ◇ *The company, founded in 1998 and whose headquarters are based in Castellón, produces 60.000 tons of feldspar per year*), **base-exchange capacity** (PROPQUIM-FIS capacidad de cambio de bases; capacidad para la sustitución química de cationes *-cations-* en un suelo ◇ *The clay appears to have an appreciable base-exchange capacity*; V. *base exchange*), **basement**<sup>1</sup> (GRAL sótano ◇ *Tile is a nice addition to any basement: here it protects against moisture and provides a visual contrast to the rest of the house*), **basement**<sup>2</sup> (GEO-MIN-CRIST basamento; masa de rocas ígneas *-igneous rocks-*, metamórficas *-metamorphic-* y no diferenciadas en una área concreta bajo la que se halla una capa de rocas sedimentarias *-sedimentary rocks-*), **basement rocks** (GEO-MIN-CRIST rocas de basamento ◇ *The basement rocks are often highly metamorphosed and complex*), **basement wall** (CONST muro de cimentación ◇ *A thin layer of cement mortar was applied as a damp-proofing measure for basement walls*)].

**basic**<sup>1</sup> *a.*: GRAL básico; fundamental, sencillo, esencial. [Exp: **basic**<sup>2</sup> (PROPQUIM-FIS básico; propiedad opuesta a ácido ◇ *When the pH is below 7, the solution is acidic When the pH is 7, the solution is neutral When the pH is above 7, the solution is basic (alkaline)*; V. *acidic*), **basic Bessemer converter** (INDAFIN V. *Bessemer converter*), **basic brick** (INDAFIN ladrillo básico; ladrillo hecho de un material que es un anhídrido básico *-basic anhydride-*), **basic converter** (INDAFIN V. *Bessemer converter*), **basic fibre** (MTRLs fibra de base ◇ *The unprocessed filaments of glass fibre are known as Basic Fibre*), **basic furnace** (MAQELAB horno básico; horno en el que el material refractario *-refractory material-* se compone de dolomita *-dolomite-* y magnesita *-magnesite-*), **basic grade** (CALIDAD calidad estándar/normal ◇ *Interior description: Basic grade materials with few finishes and little-to-no ornamentation*), **basic O.H. furnace** (MAQELAB V. *basic open-hearth furnace*), **basic open-hearth furnace**, **basic O.H. furnace** (MAQELAB horno Martin básico ◇ *The basic open-hearth furnace is used in the refining of basic pig-iron and is built of basic refractory bricks covered with burned dolomite or magnesite*), **basic oxides** (QUIM óxidos básicos; compuestos químicos formados por un metal y oxígeno; cuando un óxido básico reacciona con el agua se forma una base o hidróxido, mientras que al reaccionar con un ácido forma una sal ◇ *In general, it may be stated that an increase in the number of basic oxides in a formula lowers the firing temperature of a glaze*), **basic oxygen converter**, **BOC** (INDAFIN convertidor básico a oxígeno ◇ *Slag is a residue from the basic oxygen converter in steel-making operations*), **basic oxygen furnace**, **BOF** (INDAFIN horno básico de oxígeno; horno al que se le inyecta oxígeno a presión por lo que se eleva mucho su temperatura en un tiempo muy reducido, lo que hace que esté considerado como el sistema más eficiente para la producción de acero de alta calidad ◇ *Tar impregnated refractories are used to line basic oxygen furnaces*), **basic product** (MATPRI producto básico; producto o materia prima bruta, proporcionada por la explotación minera, la agricultura, etc. y que se utiliza tal y como se obtiene en la naturaleza ◇ *The analysis of ceramic materials from the basic products to the end-products is a very diversified area*), **basic refractory** (INDAFIN/MAQELAB refractario básico; materiales resistentes al calor *-heat-resistant materials-*, como por ejemplo la dolomita *-dolomite-* y la magnesita *-magnesite-*, usados para revestimientos básicos), **basic refractory lining** (MAQELAB revestimiento refractario básico; revestimiento *-lining-* para hornos compuesto de material bajo en minerales ácidos, como el sílice, y con un elevado contenido de minerales básicos ◇ *Sponge iron, as raw material, is melted in a vessel or converter with a basic refractory lining*), **Basic Research in Industrial Technologies in Europe**, **BRITE**

(ORG-INST Investigación Básica en Tecnologías Industriales para Europa (la Unión Europea) ◇ *Basic Research in Industrial Technologies in Europe (BRITE) aspires to revitalise traditional industries in the EU*), **Basic Research in Industrial Technologies in Europe/European Research on Advanced Materials programme, BRITE/EURAM programme** (ORG-INST programa de Investigación Básica en Tecnologías industriales para Europa (Unión Europea)/programa Europeo de Investigación sobre Materiales Avanzados ◇ *This BRITE/EURAM program promotes collaboration between industrial firms, universities, and other research centers*), **basic rock** (GEO-MIN-CRIST roca básica; roca ígnea -*igneous rock*- con una composición de más del 45% y menos del 52% de sílice), **basic stress** (PROPQUIM-FIS/CONST tensión básica, esfuerzo; tensión que puede ser soportada de manera permanente en condiciones de seguridad por un miembro estructural ideal -*ideal structural member*-, sin características que mermen su potencial a este respecto y sujeto a condiciones de uso también ideales -*ideal service conditions*-), **basicity** (PROPQUIM-FIS basicidad; capacidad acidoneutralizante -*acid-neutralising capacity*-de una sustancia química en una solución acuosa V. *acidity; alkalinity*), **basin**<sup>1</sup> (PRODFIN lavabo; pila con grifos y otros accesorios empleada para el aseo personal, especialmente de manos y cara ◇ *Material: wood cabinet, ceramic basin, silver mirror*), **basin**<sup>2</sup> (GEO-MIN-CRIST cuenca; depresión en la corteza terrestre -*earth's crust*- rellena de sedimentos)].

**basis** *n*: GRAL base. [Exp: **basis for acceptance** (CALIDAD/ENSAYO base para aceptación (de productos); método para determinar si un lote de azulejos cerámicos es aceptable bajo una determinadas especificaciones ◇ *I.S. EN ISO 10545-1 Ceramic Tiles - Sampling And Basis For Acceptance 1998*)].

**basket** *n*: GRAL cesta, canasta. [Exp: **basket bond** (INSTAL/DISEÑO encestado, en canastilla; patrón decorativo -*decorative pattern*- que imita la manera en que se entreteje una cesta), **basketweave** (INSTAL en canastilla; disposición ajedrezada -*checker-board pattern*- en que se colocan los adoquines -*paving*- ◇ *It shows a basketweave pattern in marble on the floor of the bathroom*), **basketweave bond** (CONST aparejo en canastilla; conjunto de módulos de ladrillo o mampuestos que se disponen en ángulos rectos con respecto a los adyacentes), **basketweave bond** (INSTAL/DISEÑO V. *basket bond*), **basse-taille** (ESMREL esmalte sobre relieve, *basse-taille*; esmalte translúcido; técnica de esmaltado en la que una superficie metálica, generalmente plata u oro -*silver or gold*- se graba o cincela -*is engraved or carved*- a diferente profundidad según el diseño que se quiere conseguir, rellenándose los surcos de esmalte translúcido que permite ver el diseño)].

**bastard granite** *n*: GEO-MIN-CRIST granito gneísico; término que en el argot de la minería comprende todos los granitos gneísicos, esto es, los no considerados granitos verdaderos.

**bat**<sup>1</sup> *n*: CONST pedazo de ladrillo ◇ *A bat is a short building brick, either made as such or cut from a whole brick but in USA it is a piece of brick that has been broken off*. [Exp: **bat**<sup>2</sup> (ESMREL placa de goma/gelatina ◇ *Bats are used in bat printing, which is a mode of printing on glazed ware*), **bat**<sup>3</sup> (INDAFIN bloque de material aislante ◇ *A bat is a refractory tile or slab as used, for example, to support pottery-ware while it is being fired*; V. *batt*), **bat**<sup>4</sup> (MAQELAB/ELABPROC placa de ahornado; placa de enhornado, soporte (de cocción) ◇ *Many people in Europe use the term 'bat' to refer to kiln shelves (i.e.*

UK); V. *batt*), **bat (for jiggering)** (ELABPROC costra, moldeado por estampación; capa que se echa en el molde de yeso para moldear), **bat printing** (ESMREL impresión por paletas; tipo de impresión por calco *-transfer-printing-* empleado en el siglo XIX por el que el diseño era calcado de una lámina grabada a una superficie vidriada a través de placas (*slabs*) de goma o gelatina *-bats-*)].

**batch**<sup>1</sup> *n/v*: PRODFIN lote, partida, remesa, serie, tanda; cada una de las partes en que se divide un todo que ha de ser distribuido; en general, también puede referirse a un montón, un grupo, una cantidad o un compendio ◊ *Tile batches can vary in colour so purchase 10% extra tile to cover accidental breakages and repairs.* [Exp: **batch**<sup>2</sup> (ELABPROC pasta (cerámica), composición, masa (cerámica), mezcla; en general, conjunto de materias utilizadas y mezcladas para la fabricación de un producto, después de haber sido mezcladas; en cerámica, material crudo constituido por la mezcla de arcilla y otros materiales; en la industria del vidrio hace referencia la mezcla de materiales que se cargan en un horno ◊ *Such ceramics are made from a batch consisting of pre-fired ceramic, quartz or alumina together with a bond that, during firing, will vitrify and bind the surfaces of the grains together;* V. *body*), **batch**<sup>3</sup> (ELABPROC procesar pot/en lotes, agrupar; crear lotes ◊ *Tiles, adhesives and grout are batched according to instructions and specific work requirements*), **batch**<sup>4</sup> (ELABPROC hornada), **batch additive** (MTRLS/QUIM aditivo para la pasta/mezcla, aditivo cerámico ◊ *Batch additives may be in the form of a granular material, a powder, a liquid, a chemical solution, an emulsion, or a slurry*), **batch calculations** (ELABPROC cálculos de dosificación (para la mezcla); cálculos usados para determinar la cantidad de cada materia prima necesaria para obtener una composición específica ◊ *The calculation of the proportions of ingredients is commonly called batch calculations*), **batch composition** (ELABPROC composición de la mezcla, fórmula de carga; tipos y proporciones de los componentes de los materiales primarios *-primary material components-* y los aditivos en una mezcla, normalmente presentados en forma de tabla ◊ *A typical batch composition is 18% ball clay, 22% china clay, 30% quartz, 15% china stone, 15% feldspar*), **batch mixer** (ELABMCHN mezcladora tipo Eirich ◊ *A batch mixer is generally equipped with a means of adding dry and liquid chemicals, an agitation or circulation system and a manifold system to deliver the prepared fluid to storage tanks or treating pumps*), **batch number** (PRODFIN número de serie ◊ *It is important to buy enough tile, all with the same batch number before you start to ensure that you will have enough to complete the project*), **batch plant** (ELABPROC/INDAFIN planta de dosificación ◊ *A batch plan is an operating installation of equipment including batchers and mixers as required for batching or for batching and mixing concrete materials*), **batch process/processing** (ELABPROC proceso de producción por lotes/paquetes; tipo de producción que contrasta con la producción en serie o en cadena ◊ *Ceramics manufacturing is generally a batch process;* V. *large-scale production*), **batch recipe** (ELABPROC receta de carga ◊ *The glaze batch recipe is created from powdered ceramic minerals measured to a specific relationship in order to get the mixture to melt into a glassy coating when the desired temperature in the kiln has been achieved*), **batcher** (MAQTRANS/MAQELAB dosificador; que dosifica o sirve para dosificar V. *weigh batcher; water batcher; aggregate batcher*), **batching** (ELABPROC loteo, clasificación por lotes ◊ *Despite advances in process control, batching is a common practice in many process industries for various economic or technological reasons*), **batching** (ELABPROC dosificación; proceso de calcular proporciones de materiales antes de mezclarlos ◊ *Individual ingredients are weighed so that accurate batching of ingredients can take place*), **batch-proportioning balance**

(INSTR balanza dosificadora), **batch-to-batch variations** (PRODFIN variación de un lote a otro  $\diamond$  *Batch to batch variations in shade may occur within commercial tolerances*), **batch-type mixer** (ELABPROC/INDAFIN mezclador discontinuo; mezclador empleado en la industria de los productos refractarios  $\diamond$  *Batch-type mixer operates by rotating arms; V. mixer; bat*)].

**Batdorf theory** *n*: ENSAYO teoría de Batdorf  $\diamond$  *Batdorf theory is used to predict the fracture reliability of isotropic ceramic components.*

**bath** *n*: ESMREL baño; capa de materia con que queda cubierta la cosa bañada; acción y resultado de aplicar dicha capa  $\diamond$  *Each piece is then hand dipped into a bath of enamel.* [Exp: **bathroom** (GRAL cuarto de baño; por lo general, para referirse al lavabo en el sentido de cuarto de baño también suele usarse el término “washroom”, mientras que “toilet” hace referencia al baño en un lugar público  $\diamond$  *Things dropped on tile flooring are more likely to break, and in the bathroom, tile flooring can be slippery; V. washroom; lavatory*), **bathroom (tile) floor** (PRODFIN suelo de cuarto de baño  $\diamond$  *One way to create an eye-catching kitchen tile floor or bathroom tile floor is to use subtle gradations in color across the entire floor*), **bathroom accessories** (GRAL accesorios para cuarto de baño  $\diamond$  *Bathroom accessories include: bathroom mirrors, bathroom sinks, faucets, soap dispensers, wall fixtures, towel warmers, bathroom storage, trash and sanitary receptacles, caddy and pole storage systems, irons and steam presses, benches and seating and bathroom safety items*), **bathroom fittings** (GRAL grifería y accesorios de baño, aparatos sanitarios), **bathroom mirror** (GRAL espejo de/para el baño), **bathroom sink** (GRAL lavabo; cuando es de pila se dice *washbasin*), **bathroom tile** (PRODFIN azulejo/baldosa de cuarto de baño), **bathtub** (GRAL bañera)].

**batt** *n*: MAQELAB/ELABPROC placa de ahornado, placa de enhornado; soporte (de cocción)  $\diamond$  *In this tunnel kiln of small cross-section batts take the place of kiln cars; V. setter.* [Exp: **batt (for jiggering)** (ELABPROC torta de pasta (para tornear)  $\diamond$  *The batt or bisque is made of majolica coloured white or clear or ochre to buff or dark red, without the colour affecting the characteristics of the product*), **batt (refractory)** (INDAFIN placa refractaria  $\diamond$  *The patent shows a refractory batt for supporting green ceramic or refractory ware during firing*), **batt setter** (MAQELAB/ELABPROC soporte de cocción), **batt wash** (MAQELAB/INDAFIN baño de material refractario; mezcla refractaria, normalmente caolín o sílex, que se mezcla con agua y con el que se baña/pinta el interior del horno, especialmente las placas de enhornado, para evitar que las piezas se adhieran; lo que en general se conoce como “kiln wash” en el Reino Unido se llama “bat/batt wash” porque una placa de enhornado también se conoce como “bat/batt”  $\diamond$  *Batt Wash may be applied to kiln batts to prevent ware sticking or to aid in cleaning glaze contamination etc. V. refractory coating*)].

**batten**<sup>1</sup> *n*: INSTAL listón  $\diamond$  *Work along the batten to establish the base row of tiles.* [Exp: **batten**<sup>2</sup> (MAQTRANS/MAQELAB palas (en molino, mezcladora))].

**batter** *n*: EXPL-CANT talud, desplome; inclinación; pendiente; inclinación con respecto a la vertical o la horizontal  $\diamond$  *Wall batter refers to the degree of slope the wall face will have, which is extremely important when constructing a large, freestanding wall.* [Exp: **battered face** (CONST paramento inclinado), **battered kerb** (CONST bordillo biselado, borde achaflanado), **battered wall** (CONST muro ataludado)].

**battery (coke-oven)** *n*: INDAFIN batería de horno de coque; estructura refractaria de gran tamaño en la que el coque es producido en una serie de hornos adyacentes ◊ *Coke is produced in batches of many tons at a facility called a coke battery, which is often located at or near an integrated steel mill.*

**battiscopa** *n*: PRODFIN zócalo V. *cove base; curved skirting.*

**Baudran expansion apparatus** *n*: INSTR aparato de expansión Baudran; aparato utilizado para medir la expansión térmica de la cerámica hasta los 1500°C ◊ *With the Baudran expansion apparatus, the expansion of the test-piece is directly transmitted by a lever system to an inductive displacement detector.*

**Baumé degrees** *n*: MEDIDA grados Baumé; grados pertenecientes a la escala de unidades de gravedad específica para la graduación de hidrómetros creada por Baumé ◊ *The surfaces of samples 1 and 2 were coated with a coating material of 80 Baume degrees, and the surface of sample 3 was coated with a coating material of 70 Baume degrees.*

**bauxite** *n*: MATPRI bauxita; agregado de varios minerales de aluminio, de color pardo con manchas rojas; importante mena del aluminio compuesta por óxido de aluminio con varios grados de hidratación ◊ *The calcination of bauxite, for example, eliminates water and yields a product that is relatively free from further firing shrinkage.* [Exp: **bauxitic clay** (MATPRI arcilla bauxítica; arcilla que engloba a todas aquellas que contienen principalmente minerales de bauxita, que corresponden a óxidos de aluminio hidratados (gibbsita, bohemitita, diáspora); mezcla natural de bauxita y arcilla que contiene no menos del 47% ni más del 65% de alúmina al ser calcinada), **bauxitland (cement)** (INDAFIN Bauxitland (cemento) ◊ *A high alumina cement, known as "Kuhl" or "Bauxitland" cement is produced in Europe by substituting the clay or shale used in producing portland clinker with bauxite (hydrated aluminum oxide))].*

**Bayer method/process** *n*: QUIM método Bayer; método empleado para la purificación de bauxitas; proceso químico de disgregación con sosa cáustica para la obtención de óxido de aluminio a partir de la bauxita ◊ *The Bayer process is used for chemically refining bauxite into alumina.*

**bayerite** *n*: QUIM bayerita; hidróxido sintético de aluminio ◊ *These results suggest that it is preferable to use the green body without bayerite in preparing the porous alumina ceramics.*

**BC** *abbr*: MTRLS/INSTAL V. *bond coat.*

**BCPMMA** *abbr*: ORG-INST V. *British Ceramic Plant and Machinery Manufacturers Association.*

**BCRA** *abbr*: ORG-INST V. *British Ceramic Research Association.*

**BDT** *abbr*: PROPQUIM-FIS V. *brittle to ductile transition.*

**beach** *n*: GRAL playa. [Exp: **beach gravel** (GEO-MIN-CRIST grava de playa), **beach sand** (GEO-MIN-CRIST arena de playa  $\diamond$  Typically, sand consists of discrete particles of quartz: some beach sands contain a concentration of heavy minerals, e.g. rutile, ilmenite and zircon)].

**bead**<sup>1</sup> *n*: INSTAL cubrecanto; pieza que se utiliza para cubrir cantos  $\diamond$  Seal joint with a bead of flexible silicone caulk where tiles meet another surface at an angle. [Exp: **bead**<sup>2</sup> (INSTAL moldura; forma de un sellante -sealant- en una junta -joint- después de su aplicación -after application-), **bead (abrasive)** (TRANSMTRLS perla (abrasiva), perlina  $\diamond$  The most common abrasive used is glass beads; V. abrasive bead), **bead mill** (INDAFIN molino de vidrio), **bead test** (ENSAYO ensayo a la perla (de bórax)  $\diamond$  A borax bead test is a rather old-fashioned qualitative test for the presence of first-row transition metals in solid samples), **bead/beading** (ESMREL acumular/acumulación de pintura por deslizamiento al borde inferior  $\diamond$  A coating is said to bead when it shows heavy excessive flowing to the lower edge of a vertical surface), **beading**<sup>1</sup> (ESMREL reborde/rebordeado, apestañado  $\diamond$  You may clean excess beading glaze with sponge), **beading**<sup>2</sup> (ESMREL aplicación (de esmalte); aplicación de esmalte, normalmente de color, en los bordes de la pieza a esmaltar  $\diamond$  For good beading, apply this glaze thickly)].

**beak** *n*: GRAL pico. [Exp: **beak moulding** (CONST moldura de pico; parte saliente cuyo perfil se asemeja al pico de un pájaro y que se elabora en la parte final de una losa -slab- u otro elemento pétreo -stone element- V. bird's beak moulding), **beaking joint** (CONST junta a pico)].

**beam**<sup>1</sup> *n*: CONST viga; madero largo y grueso que sirve, por lo regular, para formar, sostener y asegurar los techos en los edificios; en la construcción moderna, se usa para referirse al hierro de doble T destinado a los mismos usos que la viga de madera  $\diamond$  A beam ceiling is a ceiling having the beams exposed to view. [Exp: **beam**<sup>2</sup> (GRAL rayo, haz  $\diamond$  The beam must be modulated to produce a series of points rather than a continuous melted line, which would lead to cracking; V. laser beam machining), **beam anchor** (CONST anclaje de viga), **beam-and-slab floor** (CONST forjado nervado, viga y losa  $\diamond$  The traditional beam-and-slab floor is a floor system in which a concrete floor slab is supported by reinforced concrete beams)].

**beans (size)** *n*: GRAL avellana (tamaño).

**bear**<sup>1</sup> *v*: GRAL soportar, aguantar, resistir, sostener  $\diamond$  Tile flooring is heavy, so make sure that the subflooring in the area where you plan to install it is strong enough to bear its weight. [Exp: **bear**<sup>2</sup> (GRAL llevar; incorporar, especificar  $\diamond$  Tiles and/or their packaging shall bear the following marking: a) manufacturer's mark and/or trade mark and the country of origin; b) mark of the first quality; c) type of tile, etc.), **bear (blast furnace)** (MAQELAB V. salamander (blast furnace)), **bearer arch** (CONST arco de soporte V. rider bricks), **bearing**<sup>1</sup> (CONST/INSTAL plano de colocación), **bearing**<sup>2</sup> (GRAL soporte; apoyo, aguante; también se dice de aquello que soporta, que resiste, que aguanta; de soporte), **bearing**<sup>3</sup> (GRAL relación; conexión; to have a bearing on sth: tener relación con algo  $\diamond$  The distribution of the impurity, its solubility, the details of the chemistry of the ceramic, all have a bearing on the level of impurity permissible load-bearing capacity; V. load-bearing capacity), **bearing anchor** (CONST anclaje de carga  $\diamond$  Bearing anchors are positioned at the lowest horizontal edge), **bearing capacity** (PROPQUIM-FIS capacidad

portante, capacidad de carga; capacidad de resistencia; en general, capacidad de una estructura para soportar las cargas que se aplican sobre ella; carga por unidad de superficie con la que se produce la rotura de un suelo o de un elemento estructural; capacidad del terreno para soportar las cargas aplicadas sobre él  $\diamond$  *An average two storey house has a bearing capacity of approximately 75 KN/m<sup>2</sup>*), **bearing length** (PROPQUIM-FIS longitud de apoyo  $\diamond$  *This increased bearing length imparts greater structural strength to the tile, yet results in a lighter tile having a thinner cross section*), **bearing material** (MTRLS material portante  $\diamond$  *In the search for improved bearing materials to withstand higher temperatures, faster operating speeds and/or corrosive environments, attention has been directed towards the modern high performance structural ceramics*), **bearing structure** (CONST estructura portante; estructura de soporte de una construcción  $\diamond$  *The installation of raised floors requires absolutely precise assembly of the metal components of the bearing structure*), **bearing wall** (CONST muro de carga/de contención, pared portante; muro que soporta una carga vertical -vertical load- además de la carga debida a su propio peso -deadweight load-)].

**beat** v/n: GRAL/INSTAL golpear; golpeo. [Exp: **beater (board)** (INSTAL taco golpeador/de madera; tablilla que se pone sobre las piezas para golpearlas al chapar  $\diamond$  *Beating in the tile is accomplished with a rather large, flat block of wood called a beater*), **beating block** (INSTAL bloque para golpear, taco golpeador/de madera; bloque o taco de madera usado para incrustar -embed- azulejos en una superficie plana; puede usarse como sinónimo de *beater* o hacer referencia al elemento que golpea el taco o tablilla (y que cumple la misma función que, por ejemplo, un mazo de goma -rubber mallet-)  $\diamond$  *Beating in with your float or beating block across the joint between adjacent sheets will achieve a level field across the entire area*), **beating/beating in** (INSTAL golpeo; método para incrustar -embed- los azulejos en una superficie plana  $\diamond$  *Properly beating in and levelling will also prevent air bubbles from being trapped between the thinset and tile*)].

**bed<sup>1</sup>** n/v: GEO-MIN-CRIST lecho, depósito, yacimiento; capa de los terrenos sedimentarios  $\diamond$  *Individual organic-rich layers occur after a silt bed in the basal parts of a clay bed; V. seam; stratum; layer*. [Exp: **bed<sup>2</sup>** (GEO-MIN-CRIST estrato; masa mineral en forma de capa de espesor más o menos uniforme, que constituye los terrenos sedimentarios), **bed (press)** (MAQELAB V. *bolster plate*), **bed joint** (INSTAL junta horizontal, junta de asiento  $\diamond$  *A bed joint is a horizontal mortar joint between two bricks*), **bed plate/bedplate** (MAQTRANS/MAQELAB placa de asiento, placa base; solera; placa metálica usada como base de/para una máquina V. *bolster plate*), **bed reinforcement** (MAQTRANS/MAQELAB refuerzo en/de la base), **bed/bed in** (INSTAL asentar  $\diamond$  *It has to be remembered that the pressure required to bed in a 600 x 600mm tile is 16 times greater than that required for a 150 x 150mm tile*), **bed/bedding** (INSTAL soporte (en general); bedding of mortar: soporte de mortero  $\diamond$  *Traditionally, a layer of asphalt was inserted to separate the base and the bedding underneath*), **bedded<sup>1</sup>** (INSTAL embebido  $\diamond$  *Mortar should always be bedded as work proceeds rather than pointed after the tiles have been laid; V. embedded*), **bedded<sup>2</sup>** (GEO-MIN-CRIST estratificado  $\diamond$  *In the case of marble, the orientation is generally due to a bedded texture typical of many sedimentary rocks*), **bedded sandstone** (GEO-MIN-CRIST arenisca estratificada), **bedding<sup>1</sup>** (MTRLS contacto/de contacto  $\diamond$  *sorting is the removal, from pottery taken from the glost kiln, of adhering bedding material and/or particles that have become detached from the kiln furniture; V. contact bedding*), **bedding<sup>2</sup>** (GEO-MIN-CRIST estratificación,

intercalado; en general, acción y efecto de estratificar; en geología, disposición que presentan las capas o estratos *-strata-* de un terreno), **bedding mortar** (INSTAL mortero de junta  $\diamond$  *Aggregate for bedding mortar with a thickness of 40-50 mm; V. joint mortar*), **bedding plane** (GEO-MIN-CRIST plano de estratificación, junta de estratificación; superficie que separa dos lechos, capas o estratos *-beds, layers or strata-* especialmente en las rocas sedimentarias  $\diamond$  *Bedding plane of clay; V. fissility*), **bedface** (PRODFIN cara inferior  $\diamond$  *The thickness is the distance between the upper face and the bedface of the slab*), **bedrock** (GEO-MIN-CRIST lecho rocoso, roca firme; roca madre; roca que se halla bajo la superficie de sedimentación; formación estéril que yace bajo la capa explotable de un depósito mineral  $\diamond$  *Above the bedrock is usually an area of broken and weathered unconsolidated rock in the basal subsoil*), **bedroom** (GRAL dormitorio; referido a un colegio/residencia mejor emplear *dormitory*)].

**beehive kiln** *n*: MAQELAB *V. round kiln*.

**Beer-Lambert law** *n*: MTRLS ley de Beer-Lambert, ley de Beerley de Beer-Lambert-Bouguer; relación empírica del campo de la óptica que relaciona la absorción de luz con las propiedades del material atravesado  $\diamond$  *The specific internal spectral transmission of a glass sheet is governed solely by the absorption of the glass and can be expressed by the Beer-Lambert law*.

**Beer-Lambert-Bouguer law** *n*: PROPQUIM-FIS *V. Beer-Lambert law*.

**Beer's law** *n*: PROPQUIM-FIS *V. Beer-Lambert law*.

**behaviour** *n*: GRAL comportamiento, funcionamiento (de una máquina)  $\diamond$  *Most clay minerals have this structure, which imparts plasticity and determines their behaviour in slips*. [Exp: **behaviour in flexure** (PROPQUIM-FIS comportamiento frente a la flexión, resistencia a la flexión  $\diamond$  *Behaviour in flexure of concrete beams containing tensioned and non-tensioned reinforcement*), **behaviour in service** (PRODFIN comportamiento en servicio  $\diamond$  *The behaviour in service of porous building materials must be predictable, and prediction can be based only on prior experience with identical material in similar applications or on understanding of the processes that bring about changes*)].

**beidellite** *n*: GEO-MIN-CRIST beidellita; mineral muy parecido a la montmorillonita -*montmorillonite-* aunque con menos magnesio *-magnesium-* y parte del silicio *-silica-* reemplazado por aluminio y que con ésta y la nontronita forman las bentonitas -*bentonites-*, caracterizadas por su capacidad de absorber agua, su plasticidad, impermeabilidad y propiedades coloidales.

**beige** *n/a*: ESMREL/DISEÑO beige/beis; color claro entre marrón y amarillo; castaño claro  $\diamond$  *It has a milky brownish-beige crackle glaze with a geometric or possibly a flower design*.

**Belfast sink** *n*: GRAL fregadero belfast  $\diamond$  *A Belfast sink is a domestic or industrial sink with an overflow and with its top edge plain*.

**Belgian kiln** *n*: MAQELAB horno belga; tipo de horno anular de arco longitudinal - *annular longitudinal-arch kiln*- ◇ *Belgian kilns have been popular for the firing of fireclay refractories at 1200-1300°C*; V. *annular kiln*.

**belite** *n*: INDAFIN/MATPRI belita; mineral compuesto básicamente de sílice y calcio ◇ *Belite is one of the crystalline constituents of portland cement clinker*.

**bell** *n*: GRAL tubo abocardado, acoplamiento de manguito; manguito; extremo agrandado de un tubo -*enlarged end of a pipe*- en el cual puede acoplarse -*fit*- el extremo de otro tubo del mismo diámetro para formar una junta entre ambas piezas V. *socket*; *socket joint*. [Exp: **bell (blast furnace)** (INDAFIN alambique (alto horno) ◇ *When the bell was closed the blast furnace gas was taken through two downcomers to a dust catcher*), **bell curve** (PROPQUIM-FIS/ENSAYO V. *normal distribution curve*), **bell kiln** (MAQELAB V. *top hat kiln*), **bell pipe** (INSTR V. *socket pipe*), **bell-shaped spreader for dipping machine** (MAQELAB/ESMREL tolva de máquina de barnizar), **bell-type furnace** (MAQELAB V. *top hat kiln*)].

**bellows**<sup>1</sup> *n*: SEG manguitos protectores antipolvo, manguetas ◇ *Unison can design and build custom bellows with smooth contours, uniform wall thickness, and greater strength for any application, in any industry*. [Exp: **bellows**<sup>2</sup> (MAQELAB fuelle; mecanismo que se expande y contrae -*expands and contracts*- para recoger aire y lanzarlo en una dirección determinada ◇ *Water wheels were used to operate the bellows before steam engines were installed*)].

**belly (blast furnace)** *n*: INDAFIN vientre (alto horno) ◇ *The furnace is then lowered to 250°-270° to position the slag in the middle of the belly*; V. *waist*.

**belt**<sup>1</sup> *n/v*: GRAL/DISTRIB cinta, correa V. *belt conveyor*. [Exp: **belt**<sup>2</sup> (GRAL zona; área ◇ *Dolomite occurs abundantly in many countries: in England it extends as a belt of rock from Durham to Nottinghamshire*), **belt**<sup>3</sup> (DISTRIB atar; fajar, ceñir, sujetar, apretar con correas), **belt conveyor** (MAQTRANS/MAQELAB cinta transportadora, banda transportadora; cadena transportadora; transportador de cinta/correa; dispositivo mecánico formado por una banda móvil sin fin utilizada para transportar mercancías o materiales ◇ *The clay arrives from the quarry and is treated in a clay-cutting machine; it is then sent along the belt conveyor to the drying drum and the elevator*), **belt conveyor kiln** (MAQELAB horno de cinta transportadora ◇ *Belt conveyor kiln ideal for ceramic glazing decals or firing*), **belt conveyor with pallets** (MAQTRANS/MAQELAB transportador de banda y de placas), **belt conveyor with spikes or studs** (MAQTRANS correa de dientes, cinta de clavos V. *spiked belt conveyor*), **belt feeder** (MAQTRANS alimentador de banda/cinta/correa, cinta alimentadora; distribuidor de cinta; transportador de correa -*belt conveyor*- empleado en trayectos cortos para transportar materiales sólidos granulados o en polvo desde, por ejemplo, un almacén, hasta el lugar de utilización ◇ *The belt feeder is composed of a conveyor belt which is supported by rollers*), **belt kiln** (MAQELAB horno de cinta (transportadora) ◇ *In a tunnel kiln, ware is carried on an endless belt made of a wire-mesh woven from heatresisting alloy*), **belt polisher** (INSTAL/INDAFIN pulidora de cinta/de banda ◇ *Continuous belt polisher for marble and stone tiles*)].

**bench**<sup>1</sup> *n*: GRAL banco; banco de trabajo; mesa o silla muy robusta; escalón o madero horizontal sobre cuatro pies y sobre el que se desarrollan muchas labores, especialmente de tipo artesanal. [Exp: **bench**<sup>2</sup> (GEO-MIN-CRIST/EXPL-CANT banco (de arcilla) *◇ A clay pit, if beyond a certain depth, may be worked in a series of horizontal layers, known as benches which may coincide with different strata in the working face*), **bench digging** (EXPL-CANT excavación por escalones, terracería en gradas, terracería por bancos; método de trabajo en una cantera que es excavada por escalones), **bench height** (EXPL-CANT altura de banco; distancia vertical entre dos niveles, o desde el pie del banco hasta la parte más alta o cabeza del mismo *◇ In open pit operations, the bench height varies within relatively narrow limits*), **benching** (EXPL-CANT banqueo; forma de realizar una excavación en la superficie o subterránea mediante bancos o escalones *-benches or steps-*), **benchmark/bench mark** (CALIDAD punto de referencia, valor de referencia; estándar de desempeño reconocido, derivado de un análisis de las mejores prácticas y contra el cual se miden y comparan los procesos *◇ The company sets high standards and gives a benchmark of quality and success*)].

**bend**<sup>1</sup> *n/v*: GRAL codo (de tubería); curva. [Exp: **bend**<sup>2</sup> (GRAL doblar-se; flexionar, plegar, pandear, ceder, combar, curvar, torcer, doblar *◇ When a kiln reaches temperature, the cones bend to indicate that enough heatwork has been achieved inside the chamber*), **bend strength** (PROPQUIM-FIS fuerza de flexión; fuerza a la que está sometida cualquier estructura sobre la que se deposita una carga y que tiende a deformarla *◇ These ceramics have bend strengths greater than 2000 MPa and, thus, represent the strongest class of ceramic materials*), **bend test** (ENSAYO ensayo de flexión, ensayo de doblado; test cualitativo empleado para evaluar tanto la ductilidad *-ductility-* como la solidez *-soundness-* de un material *◇ Bend tests are best used for the ranking of materials; V. modulus of rupture; bending test*), **bending** (PROPQUIM-FIS flexión, alabeo, curvado, pliegue; comba, pandeo; tipo de deformación que presenta un elemento estructural alargado o tipo placa/lámina en una dirección perpendicular a su eje longitudinal *-perpendicular to the axis-* *◇ The test describes a procedure for assessing the ability of vitreous enamelware to suffer a small degree of bending without the enamel cracking; V. buckling*), **bending force** (PROPQUIM-FIS *V. flexural strength*), **bending moment/momentum** (PROPQUIM-FIS momento flector *◇ A bending moment exists in a structural element when a moment is applied to the element so that the element bends*), **bending strength** (PROPQUIM-FIS *V. flexural strength*), **bending stress** (PROPQUIM-FIS esfuerzo de flexión; combinación de los esfuerzos de tracción y compresión que deforma los elementos de manera que se comban *◇ Due to its great compressive strength, a material such as granite has to be used in compression as much as possible, while minimizing tensile and bending stresses*), **bending temperature** (PROPQUIM-FIS temperatura de flexión, temperatura de doblado *◇ When the material is heated up to this bending temperature, the material is "softened", which simplifies the bending operation*), **bending temperature of pyroscopic cone** (ELABPROC/PROPQUIM-FIS temperatura de caída del cono pirométrico), **bending test** (ENSAYO ensayo de flexión, ensayo de resistencia de flexión/de doblado; en cerámica, ensayo por el que el bizcocho o los paneles esmaltados cocidos se distorsionan por flexión para determinar la resistencia de la cubierta al agrietamiento y la fractura *◇ In order to apply ceramic materials for cryogenic components, the bending test method at cryogenic temperatures was developed; V. bend test*)].

**Bender abrasion method** *n*: ENSAYO método de abrasión Bender; método que determina la resistencia a la abrasión.

**beneficial** *a*: GRAL beneficioso; provechoso, útil, ventajoso ◊ *A larger grain in the ceramic would be beneficial for better adherence of the metalizationl.* [Exp: **beneficiary** (GESTIÓN beneficiario ◊ *The beneficiary of a life insurance policy, for example, is the person who receives the payment of the amount of insurance after the death of the insured*), **beneficiary trade** (COM comercio en régimen de preferencia), **beneficiation** (TRANSPROC beneficio/beneficiación (de minerales); variedad de procesos por los cuales las menas *-ores-* se reducen a partículas que pueden ser separadas en minerales *-minerals-* y desechos *-waste-*, pudiendo someterse los primeros a procesamientos adicionales o ser utilizados para el uso directo ◊ *The beneficiation of industrial minerals begins with crushing and grinding to a small enough size to liberate undesired mineral phases*), **benefit** (GRAL beneficio; bien, prestación, privilegio, provecho, ventaja, interés ◊ *One potential benefit is the ability to control the growth process, which should permit greater control of final microstructure and properties*), **benefit** (GRAL beneficiar-se; sacar provecho)].

**bentonite** *n*: MATPRI bentonita; término general para referirse a la arcilla montmorillonítica; material arcilloso coloidal altamente plástico caracterizado por su elevada absorción y por ser un excelente floculante *-flocculant-* y ligante *-binder-* ◊ *Bentonites are exceedingly plastic, with a high cation-exchange capacity.*

**Berkeley clay** *n*: MATPRI arcilla Berkeley; arcilla plástica refractaria procedente de Carolina del Sur.

**Berkovich indenter** *n*: INSTR indentador Berkovich; indentador con forma de pirámide de diamante de 3 caras usado en los ensayos de dureza ◊ *It is well known that a Berkovich indenter shape which is used for Nano indentation test, significantly affects the results.*

**Berlin porcelain** *n*: PRODFIN porcelana de Berlín ◊ *A quoted body composition of Berlin porcelain is 77% purified Halle clay and 23% Norwegian feldspar, all finer than 10mm.*

**berm** *n*: EXPL-CANT berma, andén; banco de seguridad; zona horizontal entre los bancos de una cantera diseñada para romper la altura total y mejorar así la estabilidad ◊ *In open-pit mining, a berm refers to dirt and rock piled alongside a haul road or along the edge of a dump point; V. bench; quarry; slope.*

**berth charter** *n*: DISTRIB póliza de muelle, contrato de muelle; póliza de fletamento en la que se expresa el muelle de atraque V. *port charter.*

**beryl** *n*: GEO-MIN-CRIST berilo ◊ *The mineral Beryl is the only economic source of beryllium oxide and other beryllium compounds.* [Exp: **beryllia** (MTRLS/GEO-MIN-CRIST berilia, óxido de berilio; mineral aislante térmico a alta temperatura; polvo blanco amorfo insoluble al agua que se utiliza como aditivo para vidrio o como constituyente de porcelanas especiales ◊ *Beryllia is a ceramic material having very high heat conductivity, good thermal shock resistance and high strength*), **berylliosis** (SEG

beriliosis; afección pulmonar *-lung disease-* causada por la exposición por inhalación *-exposure by inhalation-* al polvo de berilio y catalogada como enfermedad profesional ◇ *Berylliosis occurs in both acute and chronic forms; V. chronic beryllium disorder*), **beryllium** (QUIM berilio; elemento químico empleado principalmente como endurecedor en aleaciones, especialmente de cobre; se emplea cuando son necesarias una elevada conductividad térmica y propiedades mecánicas, un punto de fusión elevado y aislamiento eléctrico ◇ *At standard temperature and pressures beryllium resists oxidation when exposed to air*), **beryllium carbide** (QUIM carburo de berilio ◇ *Beryllium carbide is a refractory carbide which is slowly attacked by water at room temperature and by O<sub>2</sub> and N<sub>2</sub> at 1000°C*), **beryllium nitride** (QUIM nitruro de berilio ◇ *Beryllium nitride is an alternative material to beryllium for extreme ultraviolet and soft X-ray uses*), **beryllium oxide** (MTRLS/GEO-MIN-CRIST V. *beryllia*).

**Bessemer converter** *n*: INDAFIN convertidor Bessemer/Thomas-Bessemer, convertidor básico; convertidor Thomas; recipiente de acero con forma de pera o conicocilíndrica con un revestimiento interior refractario de composición básica ◇ *The Bessemer process is carried on in a large ovoid steel container lined with clay or dolomite called the Bessemer converter. V. converter. [Exp: Bessemer process (INDAFIN proceso/procedimiento Bessemer; proceso industrial para la fabricación de acero en serie ◇ The Bessemer process revolutionized steel manufacture by decreasing its cost, and greatly increasing the scale and speed, while also decreasing the labour requirements)]*.

**best gold** *n*: DISEÑO/ESMREL oro mate, oro para bruñir/pulir ◇ *Best gold decoration is dull as taken from the kiln, hence the need for subsequent burnishing*.

**BET method** *abbr*: TRANSPROC/TRANSMTRLS V. *Brunauer, Emmett and Teller method*.

**beta** *n*: GRAL beta. [Exp: **beta-alumina** (QUIM beta-alúmina; familia de compuestos conductores iónicos rápidos ◇ *Beta-alumina (a compound of 1 part sodium oxide with 11 parts aluminum oxide) has been traditionally used as a refractory material*), **beta-quartz** (MATPRI cuarzo beta; en la cocción del vidriado a 573° se produce la segunda inversión del cuarzo, por la que el cuarzo beta se convierte en cuarzo alfa ◇ *The glass-ceramic has as its primary crystal phase a beta-quartz solid solution; V. alpha-quartz*)].

**bevel**<sup>1</sup> *n/v*: INSTAL/DISEÑO bisel; corte que se realiza oblicuamente en el borde de una pieza de material diverso (madera, metal, cristal etc.) y que hace que el borde sea más delgado que la parte central de dicha pieza; borde rematado en ángulo ◇ *The top bevel of the tile should align with the string line; V. arris; chamfer; corner; edge; margin; rabbet; splay. [Exp: bevel<sup>2</sup> (INSTAL/DISEÑO biselar; abiselar, cortar al sesgo ◇ *You might have to bevel the tile that is in the front in order to slide it in; V. edge; chamfer*), **bevel**<sup>3</sup> (INSTAL/CONST chaflán, baivel; falsa escuadra; cara, por lo común larga y estrecha, que resulta de cortar la esquina que forman dos superficies planas en ángulo), **bevel brick** (CONST ladrillo de imposta (de un arco) ◇ *A bevel brick has having one edge replaced by a bevel*), **bevel edged** (DISEÑO biselado ◇ *This elegant, bevel edged, brick shaped tile, the Metro Tile, allows the use of plain colour while retaining a charming profile*), **bevel square** (INSTAL escuadra biselada; escuadra de forma triangular; un ángulo recto y dos de 45° ◇ *A bevel square is used for marking angles in carpentry and**

*stonework*), **bevelled/beveled** (INSTAL biselado, con canto matado; cortado en ángulo ◊ *When partially dry, the tiles are placed on a wooden block of the correct curvature and beaten to that contour by means of a bevelled block of wood*), **bevelled/beveled brick** (CONST/INDAFIN ladrillo biselado; ladrillo especialmente modelado con una o más esquinas cortadas en diagonal ◊ *Bevelled bricks are so made to fit corners, or to enhance the appearance of the top of a wall*), **bevelled/beveled edge** (DISEÑO/INSTAL borde biselado, canto achaflanado; canto biselado ◊ *Flat glass is given bevelled edges for aesthetic effect, especially on mirrors; V. chamfered edge; rabbet*), **bevelled/beveled pipe** (GRAL tubo biselado ◊ *Bevelled pipes have angled ends to fit complementary ends or other components at an angle*), **bevelled/beveled tile** (PRODFIN/DISEÑO azulejo biselado; baldosa cerámica con las aristas vistas matadas en bisel (ángulo menor de 45° respecto a la superficie de la baldosa), con fines decorativos ◊ *The beveled edge tile creates a classic look with a traditional appeal*), **bevelling/beveling machine** (MAQELAB/INSTAL biseladora)].

**BF** *abbr:* INDAFIN *V. blast furnace.*

**BFS** *abbr:* SUBPROD/INDAFIN *V. blast furnace slag.*

**BHN** *abbr:* MEDIDA/PROPQUIM-FIS *V. Brinell hardness number.*

**Bi** *abbr:* MEDIDA *V. Biot number.*

**bias** *n:* GRAL sesgo, desvío; error sistemático; propensión; efecto que priva a un resultado estadístico de representatividad distorsionándolo de manera sistemática; seguido de *towards* indica predisposición, tendencia a/hacia algo, mientras que seguido de *against* indica prejuicio contra algo; *without bias:* imparcial ◊ *There is no accepted standard for determining bias in this test method; V. systematic error.*

**Bicheroux process** *n:* INDAFIN/ESMREL procedimiento/proceso Bicheroux ◊ *Bicheroux process was created for casting, grinding and polishing of plate glass.*

**bicottura** *n:* ELABPROC bicocción; procedimiento de cochura que divide el proceso de cochura en dos fases: primero se somete la pieza a una primera cocción para obtener el soporte, posteriormente se le aplica el esmalte y finalmente se cuece de nuevo; puede ocurrir que en algunos materiales decorados se aplique una tercera cocción a menor temperatura ◊ *Bicottura tiles should only be applied to indoor locations, mostly as wall tiles and backsplashes because of their softer body and their glaze; V. monocottura.*

**bid** *n/v:* GESTIÓN oferta; propuesta; *to make a bid:* hacer una oferta ◊ *The Spanish firm could make a bid for the company.* [Exp: **bid** (GESTIÓN ofertar; ofrecer), **bidder** (GRAL/GESTIÓN postor; licitador, persona que ofrece dinero por algo en una subasta)].

**bidet** *n:* GRAL bidé/bidet; recipiente bajo, generalmente fabricado de porcelana o loza, que cuenta con agua corriente y desagüe y que se emplea para la higiene íntima ◊ *Despite appearing similar to a toilet, it would be more accurate to compare the bidet to the washbasin or bathtub.*

**Bierbaum scratch hardness test** *n*: ENSAYO ensayo de resistencia al rayado Bierbaum; ensayo en el cual una punta de diamante *-diamond point-* es arrastrada a una presión determinada a través de la superficie a ensayar, midiéndose la anchura del arañazo con un microscopio ◇ *D1526- Method of Test for Determination of Bierbaum Scratch Hardness of Plastic Materials (Discontinued 1963)*.

**Bigot curve** *n*: ELABPROC curva de Bigot; en la materia prima cerámica, curva que representa la evolución de la contracción de secado en función de la pérdida de humedad ◇ *To characterize the drying process, the Bigot curves were drawn with an Adamel barelattograph*.

**bill**<sup>1</sup> *n/v*: COM/DISTRIB factura, cuenta, recibo; cuenta detallada de una relación de objetos o artículos comprendidos en una venta u otra operación de comercio en la que se especifica el número, peso o medida, calidad y valor o precio de los mismos; cuenta que los factores dan del coste y costas de las mercancías que compran y remiten a sus corresponsales. [Exp: **bill**<sup>2</sup> (DISTRIB/COM facturar; *to bill somebody for something*: pasarle la factura a alguien (por algo)), **bill of exchange, B/E** (DISTRIB/COM letra de cambio; documento mercantil que contiene la orden incondicional por la que una persona (librador) ordena a otra (librado) el pago de una determinada cantidad de dinero en una determinada fecha ◇ *A Bill of Exchange is one of the key financial instruments in International Trade*), **bill of lading, B/L** (DISTRIB conocimiento de embarque; documento que el transportador expide a modo de certificación de que ha tomado a su cargo la mercancía; se usa para transporte oceánico de carga, mientras que *air bill of lading* se usa para transporte aéreo de la misma ◇ *The shipment must include the bill of lading and all job specifications; V. air bill of lading*), **bill of materials, BOM** (COM lista de materiales, nomenclatura de materiales; lista formalmente estructurada o estructura de datos de un producto, tanto semiacabado como final, que enumera todas sus piezas componentes con el nombre, el número de referencia, la cantidad, y la unidad de medida de cada componente), **billed weight** (DISTRIB peso facturado)].

**billet** *n*: ELABPROC tocho laminado; barra corta de acero obtenida por laminado en caliente de un lingote de sección transversal rectangular ◇ *Complex, accurately dimensioned shapes can be produced in a single stage from a shaped billet of silicon powder*.

**bimetallic strip thermometer** *n*: INSTR termómetro bimetalico; termómetro que consta de dos barras metálicas de diferentes metales (por lo que tendrán diferentes coeficientes de dilatación lineal) unidas rígidamente ◇ *Bimetallic strip thermometers are widely used in industry for temperature control because of their robustness temperature range and simplicity*.

**bin**<sup>1</sup> *n*: MAQTRANS depósito, silo; construcción alta usada para el almacenaje de materiales pulverulentos y/o de productos de la explotación minera ◇ *Bins or silos are commonly used for storing incoming dry materials and to provide 'surge capacity' when there is a change in the input and output rates; V. silo*. [Exp: **bin**<sup>2</sup> (MAQTRANS cuba/cubeta; recipiente para contener líquidos ◇ *The lid should be put on in the bin to keep oxygen from entering the container*), **bin**<sup>3</sup> (MAQTRANS tolva; dispositivo en forma de cono invertido y abierta por debajo destinado al depósito y la canalización de

materiales granulares o pulverulentos V. *hopper*), **bin level indicator** (MAQTRANS indicador de nivel del silo)].

**bind** v: GRAL/QUIM ligar; amarrar, atar, consolidar ◊ *Such ceramics are made from a batch consisting of pre-fired ceramic, quartz or alumina together with a bond that, during firing, will vitrify and bind the surfaces of the grains together.* [Exp: **binder** (QUIM/MTRLS ligante, agente ligante; aglomerante; apelmazante (añadido a la mezcla); conglomerante; material capaz de unir *-bind together-* fragmentos de sustancias y dar cohesión al conjunto por efecto de transformaciones químicas; sustancia que se añade a un material cerámico de poca plasticidad para facilitar su moldeado ◊ *The binder must hold the ceramic particles together as spraydried agglomerates; V. vehicle*), **binder clay** (MATPRI arcilla ligante ◊ *Common brick is made by firing a mixture of binder clay, shales, and other fillers*), **binder removal** (ELABPROC eliminación del ligante ◊ *Binder removal is a major step in the injection-molding process*), **binding agent** (QUIM/MTRLS V. *binder*), **binding clamp** (GRAL abrazadera de fijación V. *clamp*), **binding force** (PROPQUIM-FIS fuerza ligante, poder ligante ◊ *Adhesion is the binding force of a body to another body, e.g. a lubricant to a surface*), **binding power** (PROPQUIM-FIS V. *binding force*)].

**Bingham body/material** n: PROPQUIM-FIS/MTRLS cuerpo de Bingham, material de Bingham; material que no comienza a fluir hasta que el esfuerzo de cizallamiento aplicado no supera su valor crítico y por debajo del cual la sustancia se comporta como un cuerpo elástico ◊ *It is shown how to determine the yield value  $f$  and the plastic viscosity of a Bingham body by means of a parallel-plate plastometer.* [Exp: **Bingham plastometer** (INSTR plastómetro de Bingham)].

**bio-** pref: GRAL bio-; significa "vida". [Exp: **bioceramics** (PRODFIN biocerámica; materiales cerámicos especialmente desarrollados para su uso como implantes dentarios y/o médicos ◊ *Bioceramics include alumina and zirconia, bioactive glasses, glass-ceramics, coatings and composites, hydroxyapatite and resorbable calcium phosphates, and radiotherapy glasses; V. bioglass*), **biochemical** (PROPQUIM-FIS bioquímico; perteneciente o relativo a la bioquímica y a los fenómenos que estudia V. *biochemistry*), **biochemistry** (GRAL/QUIM bioquímica; estudio químico tanto de la estructura como de las funciones de los seres vivos), **biodegradation** (MANTNMO V. *biodeterioration*), **biodeterioration** (MANTNMTO biodeterioro/biodeteriorización, biodegradación; deterioro resultante de la acción biológica ◊ *It protects surfaces against biodeterioration by inhibiting microbial growth*), **biodiversity** (GRAL biodiversidad; diversidad biológica *-biological diversity-* o variedad de seres vivos y los sistemas ecológicos a los que pertenecen), **biofilm** (MANTNMTO biofilm, biopelícula; habitat de las bacterias; comunidades de microorganismos incluidos en una matriz producida por ellos para unirse entre sí y a sustratos vivos o inertes ◊ *Biofilms secrete a slimy substance that can adhere to all types of materials, especially metals, plastics, and ceramic materials used in the manufacture of medical devices*), **bioglass** (INDAFIN/PRODFIN biovidrio; vidrio bioactivo ◊ *Bioglass is one of the important modern materials, which are applied in medicine to reduce disability and thus to improve the level of human life; V. bioceramics*), **bioglass-ceramics** (PRODFIN cerámica de biovidrio; cerámica de vidrio, normalmente basada en fosfatos de calcio y usada en aplicaciones biomédicas ◊ *With the growing need for better implant materials bioglass ceramics have aroused interest because of their ability to bond with tissues*), **biological**

(PROPQUIM-FIS biológico), **biological attack** (MANTNMTO/MEDAMB ataque biológico), **biological corrosion** (MANTNMTO corrosión biológica; corrosión provocada por la actividad metabólica de organismos vivos), **biological life** (MANTNMTO/MEDAMB vida biológica ◊ *The inert nature of ceramic, in other words the fact that it repels biological life, avoids damage to the environment as once earth and clay have been fired they acquire the same properties as stone and similar natural materials*), **biology** (GRAL biología; ciencia que estudia los seres vivos), **biomimetic process** (ELABPROC PROCESO biomimético; incorporación gradual en el cuerpo o pieza, mediante un proceso natural, de un material sintético que imita a un material natural ◊ *The invention relates to a biomimetic process for coating a substrate, particularly a medical device*)].

**Biot number, Bi n:** MEDIDA número de Biot; coeficiente adimensional de transferencia de calor ◊ *The lower thermal conductivity of the structural ceramics at high temperature increases the Biot number.*

**biotite n:** GEO-MIN-CRIST biotita, mica negra; filosilicato de hierro y magnesio del grupo de las micas ◊ *Biotite sometimes occurs as an impurity in such ceramic raw materials as feldspar and nepheline syenite; V. mica; muscovite.* [Exp: **biotitic** (PROPQUIM-FIS biotítico; relativo o concerniente a la biotita)].

**bird n:** GRAL pájaro. [Exp: **bird droppings** (MANTNMTO excrementos de pájaro ◊ *Uric acid in bird droppings destroys roofing material and shortens the life of roof tile*), **bird's beak moulding** (CONST moldura de pico; moldura de forma similar al pico de un pájaro que permite vaciar el agua en los aleros sin que se mojen las paredes V. *beak moulding*)].

**birefringence n:** PROPQUIM-FIS birrefringencia, doble refracción; fenómeno óptico observable cuando una radiación luminosa incide sobre un medio no isótropo; propiedad de ciertos cuerpos, cuando su estructura es anisótropa, de desdoblar un rayo de luz *-split a light beam-* en dos rayos linealmente polarizados de manera perpendicular entre sí como si el material tuviera dos índices de refracción distintos ◊ *A rapid method of determining the stress in porcelain glaze was developed, in which birefringence caused by the stress in the glaze was measured.*

**biscuit n:** ELABPROC bizcocho, biscuit, bizcochado, tiesto, cerámica bizcochada; pieza cerámica *-ceramic ware-* cocida pero en la que todavía no se han aplicado engobes *-engobes-* o esmaltes/barnices *-glazes/enamels-* ◊ *Glazing is the process of applying a glaze to ceramic ware; the latter may be unfired or in the biscuit state; V. bisque.* [Exp: **biscuit body** (ELABPROC V. *biscuit*), **biscuit kiln** (MAQELAB horno de bizcochar; horno donde se realiza la cocción del bizcochado ◊ *The glost kiln and biscuit kiln are close to the green ware drying zone*), **biscuit pitchers** (ELABPROC desecho de bizcocho; residuo que queda después de haber escogido la parte mejor/útil del bizcocho ◊ *Biscuit pitchers are crushed, ground and reused, either in the same factory or elsewhere*), **biscuit ware** (ELABPROC/FINALPRODUCT bizcocho; pieza de bizcocho; objeto cocido *-fired ware-* desprovisto de esmalte), **biscuit/bisque fire/firing** (ELABPROC cocción de bizcocho, cocer el bizcocho; cocción de las piezas cerámicas antes de la aplicación del barniz o esmalte ◊ *Brushing is the removal of bedding material from pottery-ware after the biscuit firing*)].

**bismuth** *n*: QUIM bismuto. [Exp: **bismuth oxide** (QUIM óxido de bismuto  $\diamond$  *Other applications for bismuth oxide include ceramic additives for varistors that are used for electrical surge protectors, and additives to reduce processing temperatures for high-temperature ceramics that are used in gas and fluid detectors to improve automotive fuel efficiency and reduce smog*), **bismuth stannate** (QUIM estan(n)ato de bismuto  $\diamond$  *Sometimes bismuth stannate added to barium titanate bodies to modify their dielectric properties*), **bismuth strontium calcium copper oxide, BSCCO** (QUIM bismuto, estroncio, calcio, cobre y oxígeno; familia de superconductores de alta temperatura; aleación, resumida con las siglas BSCCO, de bismuto, estroncio, calcio, cobre y oxígeno  $\diamond$  *Commonly referred to in current literature as BSCCO, this ceramic has shown critical temperatures as high as 110 K*), **bismuth telluride** (QUIM telururo de bismuto  $\diamond$  *Bismuth telluride is a semiconductor that has found some use as a thermoelectric material*)].

**bisque**<sup>1</sup> *n/v*: ELABPROC bizcocho, sancocho; parte de la pieza cerámica cocida a baja temperatura y sin esmalte, por lo general como preparación para la aplicación de éste; forma empleada antes que *biscuit* y preferida en EE.UU.  $\diamond$  *Some factories still fire the basic clay without glaze and create a "Bisque" or unglazed body for later selling the bisque to another company who may only glaze in their factory for specialized reasons*; V. *biscuit*. [Exp: **bisque**<sup>2</sup> (ELABPROC bizcochado; primera cocción a la que es sometida una pieza cerámica cruda  $\diamond$  *In low fire, the bisque temperature is usually hotter than the firing temperature*; V. *biscuit*), **bisque**<sup>3</sup> (ELABPROC bizcochar; cocer piezas no vidriadas o esmaltadas  $\diamond$  *The hotter a piece is bisqued, the tighter the body becomes and the less glaze is picked up by the piece*; V. *bisque fire*), **bisque fire** (ELABPROC bizcochar, cocer el bizcocho  $\diamond$  *Before an object is glazed, it is often bisque fired*), **bisque firing** (ELABPROC cocción del bizcocho  $\diamond$  *The purpose of bisque firing is to render the object more durable, while leaving it porous enough to absorb glaze*), **bisque ware** (ELABPROC/PRODFIN V. *biscuit ware*), **bisquit** (ELABPROC V. *bisque*)].

**bit** *n*: EXPL-CANT/INSTAL broca, trépano; barrena de boca cónica utilizado en conjunción con un taladro (o similar), formado por insertos de carburo, tungsteno o diamante y utilizado para perforar o hacer agujeros en cualquier material  $\diamond$  *Hollow diamond bits can cut columns*; V. *drill bit*. [Exp: **bit brace** (INSTAL berbiquí; herramienta manual antecesora del taladro solamente utilizada para materiales blandos y prácticamente en desuso hoy en día V. *auger bits*)].

**bitumen** *n*: INDAFIN/QUIM bitumen, asfalto; betumen; betún; término genérico para las sustancias petrolíferas (petróleo, alquitranes minerales, asfalto, etc.); mezcla de líquidos orgánicos altamente viscosa, negra, pegajosa y que tiene propiedades impermeabilizantes, por lo que suele ser utilizado para proteger los tejados  $\diamond$  *Bitumen can now be made from non-petroleum based renewable resources such as sugar, molasses and rice, corn and potato starches etc.* [Exp: **bituminous** (PROPQUIM-FIS bituminoso; perteneciente o relativo al bitumen  $\diamond$  *In marble varieties, black originates from bituminous substances*; V. *bitumen*), **bituminous cement** (INDAFIN/INSTAL cemento bituminoso; material con cualidades cementantes dependientes de su carácter bituminoso empleado como aglutinante/aglomerante *-binder-* por ligar entre sí las partículas de agregado y que impermeabiliza el pavimento), **bituminous clay** (MATPRI arcilla bituminosa; arcilla de grano fino con arenilla abrasiva *-grit-* y bitumen), **bituminous coal** (GEO-MIN-CRIST carbón bituminoso, carbón graso; carbón blando

ordinario ◇ *These organic deposits are now found associated with clay seams -lignite with the ball clays, bituminous coal and anthracite with the fireclays*), **bituminous felt** (CONST tela asfáltica, lámina asfáltica; recubrimiento bituminoso impermeabilizante utilizado para aislar las terrazas, tejados, patios, etc.), **bituminous seal** (INSTAL sellado bituminoso ◇ *Spraying a bituminous seal on the surface of fresh concrete, to prevent moisture loss*)].

**black** *n/a*: ESMREL/DISEÑO negro ◇ *Iron oxide is used in combination with cobalt and copper to produce black*. [Exp: **black ash** (MTRLS ceniza negra; término que hace referencia al sulfuro de bario en bruto que sustituye al carbonato de bario como aditivo para la arcilla con el fin de prevenir la formación de escoria/espuma sucia -*scumming*- V. *white ash*), **black body** (MTRLS/PROPQUIM-FIS cuerpo negro; en física, objeto/cuerpo en equilibrio termodinámico que absorbe toda la radiación electromagnética que recae sobre él; cuerpo en el que la radiación emitida es la misma que la absorbida; se usa *black-body* (con guión) cuando es adjetivo ◇ *At this temperature the spectrum of the black-body as seen in the spectroscope is continuous*), **black core** (CALIDAD corazón negro, núcleo negro (defecto de cocción) ◇ *It is important that all the carbon is removed before the next stage of the firing process (the vitrification period) begins, otherwise a black core may result*), **black coring** (CALIDAD formación del corazón negro ◇ *Bloating, black coring, pin holing, blisters, poor color development in low fire reds, etc. are all the result of insufficient carbon burnout*), **black granites** (GEO-MIN-CRIST granitos negros; término comercial referido a las rocas ígneas que son oscuras o negras V. *gabbro*), **black heart** (CALIDAD V. *black core*), **black mica** (GEO-MIN-CRIST V. *biotite*), **black silica** (MATPRI sílice negro ◇ *Black silica makes reference to a carbonaceous silica ash produced by the controlled incineration of rice husks*), **black specks** (CALIDAD/ESMREL motas negras; defecto en forma de pequeños puntos oscuros que se da en el vidrio particularmente como pequeñas inclusiones de cromo; en los esmaltes vitrificados el defecto viene causado por contaminación ◇ *Lid has a few black specks within the glaze and some light brown specking in the unglazed/thinner glazed edge*), **blackboard enamel** (ESMREL esmalte para pizarras ◇ *A slightly rough, matt vitreous enamel which will accept writing in chalk is called a blackboard enamel*; V. *enamel*), **black-burning clay (manganese bearing)** (MATPRI arcilla cociendo negro ◇ *Where a secondary clay is added to the main clay it may be a red burning marl, a yellow burning marl, or alternatively an almost black burning clay*), **blacken** (ESMREL/CALIDAD ennegrecer-se; teñir-se de negro, poner-se negro ◇ *The pieces that make it through the firing intact have a distinctive look: the clay is blackened, the glazes are crackled, and the atmospheres affect the colorants in the glazes*), **blackened** (ESMREL/CALIDAD ennegrecido ◇ *Carbon atoms from the combusting material, which become incorporated into the glaze, provide areas of blackened surface*), **blackening** (ESMREL/CALIDAD ennegrecimiento ◇ *Too high a lead content causes blackening of the glaze by reduction*)].

**blade** *n*: GRAL cuchilla, hoja; hoja de cuchilla. [Exp: **blade edge** (INSTAL filo de la cuchilla/hoja ◇ *Insert the blade edge of the tile remover behind the next tile you want to take out, tap it gently with a hammer and out will come the tile*)].

**blading** *n*: DISTRIB V. *bill of lading*.

**Blaine air permeability apparatus** *n*: MAQTRANS V. *Blaine apparatus*.

**Blaine apparatus** *n*: MAQTRANS aparato Blaine; aparato de permeabilidad al aire *-air-permeability apparatus-* usado para medir la superficie específica *-surface area-* de un cemento, materia prima u otro producto finamente molido *-finely ground-* V. *Blaine fineness; Blaine test*. [Exp: **Blaine fineness** (PROPQUIM-FIS fineza Blaine; fineza de los materiales en polvo como, por ejemplo, los cementos y puzolanas *-pozzolans-* expresada como superficie específica (normalmente, en metros cuadrados por kilogramo) y determinada mediante el aparato Blaine *-Blaine apparatus-* ◇ *Cement had a Blaine fineness of 310 m<sup>2</sup> /kg*), **Blaine test** (ENSAYO ensayo de Blaine; ensayo para determinar la fineza *-fineness-* de un cemento (u otro material fino) en base a la permeabilidad al aire *-permeability to air-* de una muestra preparada bajo condiciones especificadas *-specified conditions-* ◇ *Blaine test is chiefly used in testing the fineness of portland cement*; V. *Blaine apparatus; Blaine fineness*)].

**Blake-type jaw crusher** *n*: MAQTRANS machacadora de mandíbulas tipo Blake, machacadora de mandíbula de doble efecto; machacadora de mandíbulas *-jaw crusher-* en la cual una de las mandíbulas se mueve respecto a otra fija para triturar la materia ◇ *The Blake type jaw crusher is today the standard by which all jaw crushers are judged, and the leading machine of the class for heavy-duty primary crushing service.*

**blanc fixe** *n*: MTRLS/ESMREL blanco de bario, blanco fijo; tipo de extendedor sintético *-synthetic extender-* ◇ *Blanc fixe is precipitated barium sulphate made from solutions of barium salts & sodium sulphate*; V. *barytes*.

**blanc-de-chine (porcelain)** *n*: PRODFIN blanco de china (porcelana); porcelana china blanca y esmaltada.

**blank**<sup>1</sup> *n*: INDAFIN vidrio bruto, vidrio no decorado ◇ *A piece of glass that has received preliminary shaping is called a blank*. [Exp: **blank**<sup>2</sup> (INDAFIN V. *optical blank*), **blank**<sup>3</sup> (**mould**) (ELABPROC/ESMREL molde formador, molde preliminar; molde preparador ◇ *In the vitreous-enamel industry, blanks are pieces cut from metal sheet ready for the shaping of ware*)].

**blast**<sup>1</sup> *n/v*: EXPL-CANT voladura, detonación, disparo, explosión, pega ◇ *Open pit blast design; open-pit blast vibration prediction*. [Exp: **blast**<sup>2</sup> (EXPL-CANT barrenar, explosionar/explotar; volar (hacer saltar), hacer explotar/estallar; abrir con carga explosiva ◇ *Explosives are then used to blast apart the ore bed itself*), **blast clean** (ELABPROC limpiar/limpieza al chorro de arena ◇ *To blast clean a solid surface with at least two abrasives having a different Mohs hardness*), **blast furnace, BF** (INDAFIN alto horno; horno en forma de torre usado para refinar mineral, sobre todo en siderurgia, y que consta de una parte superior o cuba/vientre *-belly-*, forrada con un material resistente al calor (asbesto o ladrillos refractarios *-refractory bricks-*) y de una parte inferior con aberturas tubulares llamadas toberas *-nozzles-*, por donde se fuerza el paso del aire que enciende el coque ◇ *The slag from a blast furnace can be recycled for a variety of industrial applications including glass, ceramics and cements*), **blast furnace coke** (INDAFIN V. *coke for blast furnace*), **blast furnace slag, BFS** (SUBPROD/INDAFIN escoria de alto horno ◇ *Development of ceramic tiles from common clay and blast furnace slag*), **blast hole drill** (MAQEXTRAC barrena para perforaciones de voladura; en general, perforadora rotativa *-rotary drill-* que utiliza una corriente de aire

comprimido para la evacuación de los detritos *-cuttings-*; taladro para realizar los barrenos *-blast holes-* ◇ *Blast hole drill cuttings are successfully used by many mining companies; V. drill hole*), **blast hole**, **blasthole** (EXPL-CANT barreno, hoyo de voladura/disparo ◇ *A 15-Inch diameter blast hole, 40 feet deep, produces over four tons of cuttings*), **blaster**<sup>1</sup> (MAQEXTRAC detonador, explosor; sistema utilizado para provocar la detonación de una carga de explosivo rompedor y constituido, generalmente, por una cápsula que contiene un explosivo iniciador), **blaster**<sup>2</sup> (EXPL-CANT artillero-barrenista), **blast-furnace linings** (INDAFIN revestimiento de alto horno ◇ *The principal uses of fireclay refractories are in blast-furnace linings*), **blasting** (EXPL-CANT voladura, pega de mina; extracción con dinamita, explotación de canteras con dinamita, tiro, voladura con pólvora; poner barrenos ◇ *Dimension stone quarries avoid blasting to prevent unnecessary shattering and microfracturing; V. blast mining*), **blasting cap** (EXPL-CANT detonador, cápsula detonadora ◇ *A blasting cap contains an easy-to-ignite explosive that provides the initial activation energy to start a detonation in a more stable explosive*), **blasting charge** (EXPL-CANT carga de barreno V. charge; explosive charge), **blasting design** (EXPL-CANT diseño de voladura, plan de pega ◇ *Field conditions and their relationships to blasting design*), **blasting fuse** (EXPL-CANT mecha (de barreno)), **blasting gelatine** (EXPL-CANT gelatina explosiva, dinamita goma; explosivo compuesto de nitrocelulosa o nitroglicerina que tiene el aspecto de la gelatina), **blasting line** (EXPL-CANT línea de tiro ◇ *When everything is ready to blast, the lead wire from the tie-in wires is strung to the blasting line*), **blasting machine** (EXPL-CANT disparador, explosor V. blaster), **blasting pattern/plan** (EXPL-CANT plan de voladura V. blasting design), **blasting plug** (EXPL-CANT tapón del barreno), **blasting point** (EXPL-CANT lugar de pega ◇ *The blasting point has been determined with an high accuracy (less than 500m) at a height of about 11.5 km.*), **blasting slurry** (EXPL-CANT explosivo en pasta), **blasting wire** (EXPL-CANT detonador)].

**bleach**<sup>1</sup> *n/v*: GRAL decolorar, aclarar, blanquear ◇ *Calcium oxide and magnesium oxide are said to bleach the colour, and organic matter may lighten the colour by maintaining the iron in the ferrous state.* [Exp: **bleach**<sup>2</sup> (MANTNMTO/QUIM lejía ◇ *Ceramic ware is easily and simply cleaned with a damp cloth and if the surface is dirty or greasy, cleaning agents such as detergents or bleach may be used*), **bleached** (PROPQUIM-FIS descolorido ◇ *Biotite was bleached by the loss of iron changes to a mixed layer clay*), **bleaching clay** (MATPRI arcilla blanqueadora ◇ *Bleaching clay is capable of chemically adsorbing oils, insecticides, alkaloids, vitamins, carbohydrates and other materials so that it is used for refining and decolorizing mineral and vegetable oils*)].

**bleb** *n*: CALIDAD/ESMREL burbuja; defecto en forma de ampolla/burbuja de pequeño tamaño que aparece en la superficie del cuerpo cerámico V. blister; bubble. [Exp: **blebbing (of the glaze)** (CALIDAD/ESMREL formación de burbujas; también puede referirse a "aumento de volumen" ◇ *Blistering and Blebbing often affect lead glazes; V. bubbling (of the glaze); blistering*)].

**bleed**<sup>1</sup> *n/v*: CALIDAD/ESMREL sangrado, corrimiento (de color); migración *-migration-* de un componente de la tinta o colorante a una zona no deseada; corrimiento de un pigmento de color por acción del disolvente *-solvent-*. [Exp: **bleed**<sup>2</sup> (CALIDAD/ESMREL sangrar, correrse (un color) ◇ *Most water based inks will bleed*), **bleeding**<sup>1</sup> (CALIDAD/ESMREL sangrado, corrimiento de un color sobre otro; exudación del color; antemigración del colorante ◇ *This improves workability and frost resistance and*

*decreases segregation and bleeding; V. bleed*), **bleeding**<sup>2</sup> (MANTNMTO/CALIDAD corrosión; deterioro gradual de un material debido a la acción de agentes químicos V. *staining; discolouration*)].

**blemish** *n*: CALIDAD imperfección, imperfección ◇ *Orange peel is a surface blemish, adequately described by its name; V. defect; flaw; failure; imperfection.*

**blend**<sup>1</sup> *n/v*: ELABPROC/MTRLS mezcla; agregación o incorporación de varias sustancias o cuerpos que carecen de acción química entre sí ◇ *The blend exhibits very good green strength while maintaining excellent casting properties.* [Exp: **blend**<sup>2</sup> (TRANSPROC/ELABPROC mezclar, homogeneizar/homogenizar ◇ *In practice, several different varieties may be blended in order to give the body a suitable range of fusion; V. mix*), **blend**<sup>3</sup> (DISEÑO combinar, armonizar; componer), **blend pattern** (INSTAL disposición mezclada/al azar; la que se obtiene colocando las losas de la misma variedad sin seguir un patrón determinado V. *book match pattern; diamond match pattern; end match pattern*), **blender** (INSTR mezclador), **blending**<sup>1</sup> (TRANSPROC homogeneización; acción y efecto de mezclar en cantidades controladas y predeterminadas con el fin de obtener un producto uniforme), **blending**<sup>2</sup> (INSTAL igualación; acto de colocar adecuadamente los paneles del paramento *-vener panels-*, las baldosas *-floor slabs-* o las losas adyacentes en razón del color predominante con el fin de lograr la uniformidad del conjunto), **blending**<sup>3</sup> (MTRLS/TRANSPROC mezcla/mezclado; reunión de materias que se encuentran en la misma fase o en fases diferentes, de manera que la distribución de sus características sea la misma en todas las partes del producto ◇ *After a proper blending and drying the clay runs to the press area where the clay is flowed into a mold and pressed under many hundreds of tons of pressure to form a "Greenware" tile body*), **blending batch** (INDAFIN/ELABPROC cambio escalonado de la composición ◇ *A blending batch is a batch charged to a glass furnace during a changeover in composition of the finished glass*)].

**blib** *n*: CALIDAD V. *blibe*.

**blibe** *n*: CALIDAD bullón alargado; punto alargado/estirado de entre 1 y 5 mm de largo ◇ *A blibe is a fault in the form of an elongated bubble intermediate in size between a seed and a blister.*

**blind** *n*: GRAL persiana; especie de celosía compuesta por tablillas fijas o móviles que sirve principalmente para graduar la entrada de luz en las habitaciones. [Exp: **blind floor** (INSTAL entarimado falso; suelo entarimado que sirve como base para colocar encima otro de acabado visto), **blinding**<sup>1</sup> (MAQTRANS colmateo, obstrucción; obturación/atasco, progresivo o no, de una capa porosa o fibrosa o de un aparato debido al depósito de partículas sólidas o líquidas; obstrucción/atasco en un filtro producido por depósito de materias sólidas V. *clogging*), **blinding**<sup>2</sup> (INSTAL capa de regularización/de acabado; capa de material granular y/o de arena utilizada para evitar la rugosidad e irregularidad superficial del soporte y lograr una uniformidad que permita una mejor aplicación de materiales), **blinding**<sup>3</sup> (DISEÑO deslumbrante, cegador (fig.); profundamente brillante ◇ *The tiles in the building look a nice vermilion, but fail to reach the blinding red hue achieved by other creations of the sort*), **blinding**<sup>4</sup> (SEG empañamiento ◇ *Risk of blinding and injury*)].

**blister**<sup>1</sup> *n/v*: CALIDAD/ESMREL ampolla, sopladura; zona levantada sobre la superficie de un cuerpo cerámico producida generalmente por gas procedente del interior de la masa  
 ◇ *A blister is a large bubble sometimes present as a fault in ceramic wares; V. bubble; bleb.* [Exp: **blister**<sup>2</sup> (CALIDAD/ESMREL ampollarse, burbujear; formar ampollas/burbujas  
 ◇ *The basic problem is that the glaze blistered where thickest and this happened on both bodies and with both glazes*), **blister test** (ENSAYO *V. bead test*), **blistering** (CALIDAD/ESMREL ampollado, burbujeadado/burbujamiento; formación de ampollas/burbujas; rehervido; vesiculación; defecto del esmalte (u otro recubrimiento) o del tiesto caracterizado por la aparición de burbujas/ampollas en su superficie durante la cocción que pueden romperse y dejar cráteres en dicha superficie ◇ *Blistering in glaze is most often attributed to over firing and or too thin of a glaze application.* *V. bubbling (of the glaze); blebbing (of the glaze); cracking; delamination; exfoliation; flaking; scaling; spalling; swelling*)].

**bloach** *n*: INDAFIN/ESMREL moaré, mal desbaste ◇ *A bloach is a depression in the surface of ground glass where rough cast surface or roller marks still show.*

**bloat** *v*: MTRLS/PROPQUIM-FIS hinchar-se, inflar-se ◇ *If the glaze crawled off, or the clay bloated, or the object cracked, we can say with fair certainty that something went wrong.* [Exp: **bloated** (MTRLS/PROPQUIM-FIS hinchado, inflado ◇ *The property of expansion upon firing is desired because bloated material, when used as an aggregate in concrete, reduces the weight of the final product*), **bloating**<sup>1</sup> (CALIDAD/ELABPROC hinchado/hinchazón, aumento de volumen; expansión o hinchamiento *-expansion or swelling-* permanente de un material cerámico durante el calentamiento; aumento de volumen por emisión/desprendimiento de gases en el bizcocho ◇ *Very fusible clays often evolve gases at the temperature of firing, causing local expansion known as bloating, which will obviously reduce the overall contraction*), **bloating**<sup>2</sup> (CALIDAD/ELABPROC hinchado; aumento de volumen/hinchazón del tiesto producida por desprendimiento de gases, originando la formación de burbujas y ampollas, lo que hace que sea considerado un defecto ◇ *In bloating, bubbles appear inside the clay walls, making a dimpled appearance on the surface, or in extreme cases, large blister like bumps*), **bloating clay** (MATPRI arcilla inflante, arcilla dilatada; arcilla que aumenta de volumen ◇ *Any fine-grained clayey material which, upon firing, expands or bloats into a frothy mass with closed cellular texture within a limited temperature range may be defined as a bloating clay*)].

**blob of mortar** *n*: INSTAL torta de mortero; aplicada al reverso del azulejo, ladrillo, etc.  
 ◇ *Place a blob of mortar on the back of each tile, then place it.*

**block**<sup>1</sup> *n/v*: GEO-MIN-CRIST bloque; agregado compacto de mineral *V. aggregate.* [Exp: **block**<sup>2</sup> (GRAL manzana; espacio urbano, en general cuadrangular, delimitado por calles por todos sus lados), **block**<sup>3</sup> (GRAL obstruir ◇ *The presence of a fine particle fraction, which can block the pores in the cake or in the filter medium*), **block**<sup>4</sup> (DISTRIB bloquear, calzar; rellenar el espacio en un camión de transporte *-shipping truck-* o contenedor con maderas para evitar el movimiento de la carga), **block (of multistorey flats)** (GRAL/CONST bloque (de pisos)), **block angle** (PRODFIN/INSTAL), **block car** (MAQELAB vagoneta), **block caving** (EXPL-CANT explotación por hundimiento, hundimiento en bloque/de bloques ◇ *Block caving methods result in the lowest cost per tonne*), **block cutting frame** (MAQEXTR cortabloques/ cortadora de bloques), **block mould** (ELABPROC

molde de bloque ◊ *A block mould is a one-piece mould, especially a glassmaking mould*), **block paving** (GRAL adoquinado; suelo empedrado con adoquines, pavimento/solado hecho a base de adoquines; conjunto de adoquines que forman el suelo de un lugar; acción de adoquinar V. *paving stone; cobble*), **block rake** (CALIDAD/INSTAL raya de pulido, cadena/cadeneta; arañazo curvo *-curved scratch-* e intermitente en forma de cadena normalmente ocasionado por un grano de abrasivo dejado en la superficie después de la molienda o por un cuerpo duro en la cabeza pulidora *-polishing head-*), **block rake/block reek** (GRAL V. *cullet cut*), **block random mosaic** (PRODFIN mosaicos para combinar (de tamaños diversos)), **blocking** (ELABPROC/MTRLS pegado; adhesión involuntaria entre capas de material en contacto bajo una presión y/o temperatura moderadas durante el almacenamiento o uso ◊ *Blocking usually occurs when stacked prior to thorough drying*), **blocking course** (CONST hilada de coronación; última hilada de piedras situada en la parte superior de una cornisa, coronando el muro)].

**bloom** *n*: ESMREL/CALIDAD velo, floreado; paño; pérdida de brillo; exudación visible o eflorescencia *-visible exudation or efflorescence-* en la superficie de los esmaltes vítreos considerada un defecto ◊ *The 'bloom' results from incipient devitrification of the glaze surface.*

**blot**<sup>1</sup> *v*: MANTNMTO secar; acción de secar, absorber con algún material secante ◊ *If liquid is spilled on your floor, first blot liquids with a dry, white, absorbent cloth.* [Exp: **blot**<sup>2</sup> (GRAL/CALIDAD emborronar, ensuciar), **blot**<sup>3</sup> (CALIDAD/MANTNMO mancha; defectos, marcas de color verde en la cara del azulejo ◊ *Finally clean up all the blots, and apply the product to the surface of the tiles*)].

**blotch**<sup>1</sup> *n/v*: MANTNMTO manchar-se, cubrir-se de manchas ◊ *The manufacturer guarantees their tiles will not fade, streak, blotch or effloresce.* [Exp: **blotch**<sup>2</sup> (MANTNMTO/CALIDAD borrón, mancha)].

**blotter** *n*: MAQTRANS arandela para sujetar la muela abrasiva ◊ *A blotter is used between a grinding wheel and its mounting flanges to cushion their contact.*

**blow**<sup>1</sup> *n/v*: GRAL/INSTAL golpe (de martillo) ◊ *Several times stronger than standard tiles and is so durable it can easily take a hammer blow without cracking.* [Exp: **blow**<sup>2</sup> (INDAFIN soplar ◊ *A slag containing nearly 90% Al2O3 is formed, and dispersed into bubbles by blowing air or steam into the molten slag*), **blowing** (INDAFIN soplado; acción y efecto de soplar la pasta de vidrio), **blown enamel** (ESMREL esmalte soplado ◊ *In blown enamel surface ridges form during wet-spraying with too thick or too fluid a coating, or too high an air pressure*), **blowpipe** (GRAL V. *blowtorch*), **blowtorch** (GRAL soplete)].

**blue** *a*: DISEÑO/ESMREL azul. [Exp: **blue brick** (INDAFIN V. *engineering brick*), **blue celadon** (ESMREL azul celadón ◊ *The glaze known as blue celadon should be applied fairly thickly*), **blueing (of white glaze)** (ESMREL esmalte blanco con viraje a azul), **bluestone** (GEO-MIN-CRIST arenisca feldespática; nombre comercial para una arenisca feldespática), **bluish** (ESMREL/DISEÑO azulado)].

**blunger**<sup>1</sup> *n*: MAQTRANS agitador, agitador mecánico; mezclador; máquina para el mezclado de la arcilla y/u otros materiales para formar la barbotina ◊ *The blunger washes the clay and converts it to slip*. [Exp: **blunger**<sup>2</sup> (QUIM disolvente), **blunger**<sup>3</sup> (MAQTRANS agitador diluidor), **blunger**<sup>4</sup> (MAQTRANS/QUIM diluidor), **blunging** (TRANSPROC mezclado; proceso de mezclar o suspender *-blending or suspending-* material cerámico en un líquido mediante agitación; proceso de producción de la barbotina *-slip-* en una máquina llamada agitador *-blunger-* ◊ *During blunging the kaolin is mixed with water and chemical dispersants to create milk-shake-like slurry*)].

**blunt** *a*: GRAL despuntado, desafilado, romo.

**blurred** *a*: ESMREL difuminado; borroso ◊ *The colour tended to flow into the glaze, giving a blurred effect*.

**blushing** *n*: ESMREL blanqueamiento, opalescencia; aspecto blancuzco y turbio; defecto que aparece en las capas o películas como reflejos suaves de ópalo o como decoloración ◊ *Blushing may be caused by too quickly evaporating solvents which cool the surface, giving fogging; by incomplete compatibility of binders resulting in separation during drying, by the action of e.g. water on a dry film, or by incomplete solvent balance*.

**BN** *abbr*: MTRLS/QUIM V. *boron nitride*.

**BO** *abbr*: QUIM V. *bridging oxygen*.

**board**<sup>1</sup> *n/v*: GRAL tabla, tableto; tablón. [Exp: **board**<sup>2</sup> (DISTRIB embarcar-se, abordar; subir a bordo), **board**<sup>3</sup> (GESTIÓN junta, consejo ◊ *The board of the Company consists of eight members*), **board**<sup>4</sup> (CONST encofrar, entarimar; formar un encofrado, esto es, una especie de molde formado con tableros o chapas de metal, en el que se vacía el hormigón hasta que fragua, desmontándolo después), **board floor** (CONST/INSTAL entarimado)].

**BOC** *abbr*: INDAFIN V. *basic oxygen converter*.

**body**<sup>1</sup> *n*: ELABPROC/MTRLS pasta (cerámica), amasijo de pasta, bollo de pasta, masa, tiesto; porción estructural *-structural portion-* de un producto cerámico y mezcla o material del que está hecho; más concretamente, mezcla de tres tipos de materiales: arcillas, desengrasantes, y fundentes; también, en una pieza cerámica, hace referencia a la parte que no es esmalte ◊ *Preparation of the ceramic paste (or body) involves measuring and mixing the various constituents and sieving the resulting mixture, stiffening, maturing where necessary, and de-airing the body*; V. *batch; clay body*. [Exp: **body**<sup>2</sup> (ELABPROC/MTRLS bolas de pasta), **body**<sup>3</sup> (GRAL cuerpo; en general, aquello que tiene extensión limitada, perceptible por los sentidos), **body (converter)** (INDAFIN cuerpo (de convertidor)), **body clot** (ELABPROC/MTRLS V. *body*), **body spar/feldspar** (MATPRI feldespatos para pasta)].

**Boehme hammer** *n*: INDAFIN martillo Boehme ◊ *The Boehme hammer is used for the compaction of test-pieces of cement or mortar prior to the determination of mechanical strength*.

**boehmite** *n*: MATPRI boemita; monohidrato de alúmina que a menudo forma parte de la bauxita o la arcilla bauxítica y que, por calentamiento prolongado, se transforma en corindón (forma más estable y por ello menos reactiva del óxido de aluminio)  $\diamond$  *Free alumina is usually found in a hydrated form as bauxite rock, which is actually a mixture of the minerals gibbsite, diaspora and boehmite.*

**Boetius furnace** *n*: MAQELAB horno de Boetius; horno belga antiguo calentado por gas.

**BOF** *abbr*: INDAFIN *V. basic oxygen furnace*. [Exp: **bogie kiln/furnace** (MAQELAB horno de vagoneta; horno intermitente utilizado para grandes volúmenes desplazable sobre carriles hasta la solera cargada  $\diamond$  *In a bogie kiln the ware to be fired is set on a bogie which is then pushed into the kiln; V. bogie-hearth furnace*)].

**bogie-hearth furnace** *n*: MAQELAB horno de solera móvil; horno de solera desplazable sobre ruedas que una vez cargado se conduce al interior del horno *V. bogie kiln/furnace*.

**Bohemian glass** *n*: INDAFIN cristal de Bohemia; vidrio fabricado en la actual región checa de Bohemia y Silesia y caracterizado por su increíble transparencia y por el grabado o tallado profundo en las mejores piezas  $\diamond$  *Bohemian glass is generally characterized by hardness and brilliance.*

**boil** *v*: ELABPROC hervir. [Exp: **boil (glaze)** (ESMREL formar-se burbujas/ampollas (en el esmalte/barniz); ampollar-se  $\diamond$  *The oxidation process creates trapped CO or CO2 gases that erupt through the liquid coating thus boiling the enamel and creating a blister type defect*), **boiler** (GRAL caldera; recipiente cerrado y sólidamente remachado destinado a la transformación de agua en vapor y que se usa en máquinas de vapor, turbinas, máquinas auxiliares etc.  $\diamond$  *A seating block is a block of fireclay refractory, shaped to support a boiler*), **boiling (in body)** (ELABPROC/CALIDAD formación de burbujas (en el tiesto)), **boiling (of glaze)** (ESMREL burbujeado (del esmalte), hervido (del esmalte); formación de burbujas/ampollas en el barniz/esmalte  $\diamond$  *Finished pieces have beautiful colors and patterns of luster and, usually, a small number of pinholes or craters that are a physical record of the boiling of the glaze*), **boiling point** (PROPQUIM-FIS punto de ebullición; en general, en un compuesto químico, temperatura que debe alcanzar éste para pasar del estado líquido al estado gaseoso; más exactamente, temperatura a la cual la presión de vapor iguala a la presión atmosférica; la temperatura para el proceso inverso se denomina punto de condensación  $\diamond$  *Below its boiling point, oxygen is a pale blue liquid slightly heavier than water*), **boiling test (absorption)** (ENSAYO ensayo absorción de agua determinada por ebullición  $\diamond$  *C1203 a boiling test for the resistance to alkalis of glassware decorated with fired enamels*)].

**bole** *n*: MATPRI bole; cualquiera de las distintas variedades de arcilla terrosa friable - *friable earthy clay-*, coloreadas, generalmente, más o menos fuertemente en rojo por el óxido del hierro -*iron oxide-*, y usadas para colorear (como pigmento) y adulterar varias sustancias; también puede hacer referencia a una mezcla de arcilla fina con cola  $\diamond$  *Bole is a clay used to make reds and reddish browns.*

**bolster plate** *n*: MAQELAB placa travesaño, placa base, placa de sujeción, placa portamatriz ◇ *"Bolster plate" means the plate attached to the top of the bed of the press; having drilled holes or T-slots for attaching the lower die or die shoe.*

**bolt**<sup>1</sup> *n*: GRAL/INSTAL tornillo. [Exp: **bolt**<sup>2</sup> (INSTAL perno; pieza de hierro u otro metal, larga, cilíndrica, con cabeza redonda por un extremo y asegurada con una tuerca o un remache por el otro, empleada para afirmar piezas de gran volumen V. *anchor; peg*), **bolting** (INSTAL bulonado, atornillado ◇ *The tiles are attached to adjoining tiles by bolting, welding or any other suitable means*)].

**bolus alba** *n*: MATPRI arcilla blanca pura, bolus alba ◇ *The white clay (bolus alba) was kaolinite derived from various unspecified sources from German regions.*

**BOM** *abbr*: COM V. *bill of materials.*

**bond**<sup>1</sup> *n/v*: INSTAL/CONST aparejo; combinación de las piezas en el solado o el chapado; modo en que quedan colocados los materiales en una construcción ◇ *The bond is usually such that any cross joint in a course is at least one quarter the length of a brick from joints in adjacent courses; V. stretcher bond; Flemish bond; English bond; American bond.* [Exp: **bond**<sup>2</sup> (PROPQUIM-FIS enlazar-se, adherir-se; aglutinar-se; ligar-se; pegar-se; unir-se ◇ *Materials having the same chemical composition tend to bond more strongly when in contact*), **bond**<sup>3</sup> (INSTAL/CONST aparejar; unir varias partes de un muro de mampostería *-masonry wall-*, ya sea solapando unas sobre otras o uniéndolas con pernos *-bolts-* de metal), **bond**<sup>4</sup> (QUIM enlace; en química, unión entre dos o más átomos de un compuesto químico debida a la existencia de fuerzas de atracción entre ellos y cuyo fin es formar una entidad de orden superior como una molécula o una estructura cristalina ◇ *The atoms in ceramic materials are held together by a chemical bond*), **bond**<sup>5</sup> (MTRLS ligante, aglutinante; sustancia que permite que una mezcla suelta permanezca junta; material intergranular que confiere fuerza a una pieza cerámica cocida), **bond**<sup>6</sup> (INSTAL/PROPQUIM-FIS adherencia/adhesión, fijación, ligadura, ligazón, sujeción, unión; agarre de un material a otro ◇ *Mounting the tiles directly in the cement resulted in a very strong bond*), **bond**<sup>7</sup> (MTRLS aglutinante; material que mantiene juntos los granos abrasivos en una herramienta de amolar ◇ *Bonds are critical component of grinding wheels that helps to distinguish one manufacturer from another*), **Bond and Wang theory** (PROPQUIM-FIS teoría de Bond y Wang; teoría de trituración y molido *-theory of crushing and grinding-* por la cual se deduce la cantidad de energía necesaria en caballos-hora *-horsepower-hours-* para triturar una tonelada corta de material), **bond area** (INSTAL superficie de adherencia; superficie nominal de la interfase entre dos elementos a través de la cual se desarrolla adherencia, por ejemplo entre el hormigón y las armaduras), **bond breaker** (MTRLS interruptor de la adherencia, antiadherente; material/compuesto impermeable *-waterproofing compound-* empleado para impedir la adherencia entre el hormigón fresco y el sustrato), **bond coat, BC** (MTRLS/INSTAL capa enlazante, capa de fraguado; capa de unión; en cerámica, material usado (o capa formada por él) entre el reverso de un azulejo y una superficie preparada; también, capa intermetálica que sirve de unión entre la capa de barrera térmica (TBC) *-thermal barrier coating-* y el sustrato ◇ *Suitable bond coats include pure portland cement, dry-set portland cement mortar, latex-type portland cement mortar, organic adhesive, and the like.*), **bond forces** (QUIM fuerzas de ligazón, fuerza de enlace; fuerzas que provocan que los átomos se unan entre sí para formar moléculas ◇ *When a ceramic is brought*

into contact with a ceramic, a polymer, or a metal, strong bond forces can develop between the materials), **bond hardness grade** (PROPQUIM-FIS grado de dureza del ligante), **bond strength** (PROPQUIM-FIS/INSTAL adherencia, cohesión fuerza de adherencia/de unión; intensidad de ligazón; *good bond strength*: buena adherencia/capacidad o solidez de adhesión o unión; adhesión entre un mortero y un elemento de albañilería *-masonry unit-* ◇ *The study measures the bond strength of coatings to ceramic components*; V. *bonding strength*), **bond stress** (PROPQUIM-FIS esfuerzo de adhesión), **bondable** (PROPQUIM-FIS/INSTAL adherible; que se puede adherir, unir, pegar ◇ *These surfaces, even if properly prepared, will not provide a bondable or stable surface for tile installations*), **bonded goods** (DISTRIB mercancías en depósito/almacenadas ◇ *Bonded goods are placed in a bonded warehouse until all duties are paid*), **bonded roof** (MAQELAB bóveda con juntas desviadas o en posición alterna ◇ *A bonded roof makes reference to the roof of a furnace when the transverse joints in the roof are staggered*), **bonder** (CONST tizón; mampuesto que une entre sí dos o más paños de un muro por solapado ◇ *A bonder is any stone or brick which is so laid that it increases the strength of a wall, either in thickness or in length*), **bonder (brick)** (INSTAL/INDAFIN empalme, ladrillo de unión), **bonding** (PROPQUIM-FIS/ELABPROC ligazón, adherencia; encolado; enlace; pegado; unión ◇ *Bonding of body and glaze*; V. *ionic bond(ing)*; *covalent bond(ing)*), **bonding agent** (INSTAL/MTRLS ligante, agente adherente; agente de ligazón; aglomerante; aglutinante; sustancia adhesiva; sustancia que, aplicada a un sustrato adecuado, crea una adherencia *-bond-* entre dicho sustrato y una capa subsiguiente *-succeeding layer-*, como ocurre en un acabado tipo terrazzo o una capa de yeso aplicados sobre un sustrato ◇ *When certain types of insulator require aluminum hardware, sulfur cement can replace the Portland cement as the bonding agent*), **bonding layer** (PROPQUIM-FIS/ELABPROC capa de unión, capa de adherencia ◇ *The research work focused on developing and implementing a well-formed bonding layer between the body and glaze*; V. *adhesive layer*), **bonding layer (mortar)** (CONST capa de pega (mortero); capa de mortero que se dispone sobre una superficie de hormigón endurecido, humedecida y preparada, antes de colocar hormigón fresco), **bonding strength** (PROPQUIM-FIS fuerza de cohesión, fuerza de adherencia; fuerza de unión; solidez de unión ◇ *Bonding strength of dental ceramics to resin cements*; V. *bond strength*), **Bond's law** (PROPQUIM-FIS ley de Bond, tercera teoría de Bond ◇ *According to Bond's theory, the grinding rate of a solid is proportional to the crack propagation speed in the solid*)].

**Bondaroy's yellow n:** ESMREL amarillo Bondaroy; tipo de amarillo de antimonio.

**bone n:** GRAL hueso. [Exp: **bone ash** (ESMREL ceniza de huesos; polvo blanquecino con tonalidades grisáceas compuesto principalmente por fosfato y carbonato de calcio y obtenido al quemar restos óseos de distintos orígenes a una temperatura no inferior a 600° C durante un período no menor de una hora ◇ *Bone ash acts as a flux in and adds opacity to higher-fire glazes*; V. *bone china*), **bone china** (PRODFIN porcelana de hueso, bone china; porcelana fosfática; porcelana blanda translúcida cuya pasta, de color marfil o blanco, está hecha con cenizas de huesos de animales y es muy dura y resistente al impacto; se usa principalmente en Inglaterra para la fabricación de vajillas ◇ *Bone china has the following approximate composition (per cent): calcined bone, 45-50; china clay, 20-25, china stone, 25-30*; V. *bone ash*), **bone dry** (ELABPROC/PROPQUIM-FIS completamente seco; totalmente seco ◇ *Items that are bone dry are called greenware*)].

**bonnet hip tile** *n*: PRODFIN teja de caballete/de lima ◇ *The hip which is the sloping surface between two roof surfaces can either be covered with a half-round tile or, by using the bonnet hip tile, which looks very much like an old-fashioned lady's bonnet; V. hip tile.*

**Bonnybridge fireclay** *n*: MATPRI arcilla refractaria Bonnybridge ◇ *Bonnybridge fireclay is a fireclay occurring in the Millstone Grit in the Bonnybridge district of Scotland.*

**book** *n*: GRAL libro. [Exp: **book-keeping** (GESTIÓN contabilidad ◇ *Book keeping is an activity concerned with the recording of financial data relating to business operation in a significant and orderly manner*), **booklet** (COM folleto, cuadernillo ◇ *Instruction booklet included*)].

**boost melting** *n*: INDAFIN fusión asistida, fusión ayudada.

**borates** *n*: MATPRI boratos; forma en la que se presenta el boro en el medio ambiente; los boratos son sales o ésteres de ácido bórico y entre los comercialmente importantes se encuentran el bórax, el ácido bórico, el perborato sódico o los minerales ulexita y colemanita ◇ *Modern glazes are mixtures of complex silicates and borates.*

**borax** *n*: ESMREL bórax, borato de sodio; tetraborato de sodio/sódico; nombre comercial de la sal de boro, material soluble que facilita la fusión porque baja el punto de fusión y hace más fluida la mezcla; se suele expender en forma pentahidratada o decahidratada; el bórax comercial se utiliza en la fabricación de esmaltes, cristal, cerámica, detergentes y cosméticos y se convierte con facilidad en ácido bórico o en borato ◇ *Borax is the most common compound used for introducing B<sub>2</sub>O<sub>3</sub> into glaze formulations and because of its solubility it is normally fritted; V. boron.* [Exp: **borax bead test** (ENSAYO *V. bead test*), **borax crystals** (ESMREL borax decahidratado, cristales de bórax ◇ *The water borax mixture is poured off and cooled, borax crystals form and are collected*), **borax frit** (ESMREL/ELABPROC frita de bórax; material obtenido de manera artificial y que contiene sílice y algo de fundente alcalino ◇ *Adding 5% Borax Frit to these glazes will greatly improve their maturity and clarity, and has the added advantage of broadening the maturation range; V. frit*), **borax glass** (INDAFIN vidrio de bórax, bórax fundido; bórax refinado; vidrio que contiene óxido bórico ◇ *Borax glass is a glassy, transparent solid formed by fusing borax*), **borazon** (QUIM borazón, nitruro de boro; forma cúbica del nitruro de boro; sustancia sintética extraordinariamente dura; material muy utilizado como herramienta de corte en la actualidad por las industrias automotriz, aeronáutica y siderúrgica ◇ *Borazon is used in industrial applications to shape tools, as it can withstand temperatures greater than 2000 °C*)].

**border** *n*: PRODFIN borde; cenefa. [Exp: **border tile** (PRODFIN cenefa; dibujo con fines ornamentales que se pone a lo largo de los muros, pavimentos y techos y que suele consistir en elementos repetidos de un mismo adorno ◇ *We take great care to ensure that our border tiles, such as, kitchen border tiles, bathroom border tiles, porcelain border tiles and so on, are a unique and one-of-a-kind work of art*)].

**bore**<sup>1</sup> *n/v*: MAQEXTRAC taladro, barreno *V. blast*. [Exp: **bore**<sup>2</sup> (EXPL-CANT barrenar, perforar; taladrar ◇ *They bored a hole into the rock*), **bore**<sup>3</sup> (EXPL-CANT sondear), **bore**<sup>4</sup> (EXPL-CANT sondeo; también acción de realizar un sondeo *V. core boring*), **bore core**

(MAQEXTRAC testigo de sondeo), **bore hole** (EXPL-CANT agujero; hecho con un barreno - bore-), **bore sample** (EXPL-CANT muestra de tierra obtenida por perforación  $\diamond$  *Every bore sample was divided into four subsamples in situ using quartering methods*), **borehole exploration** (EXPL-CANT sondeo  $\diamond$  *Previous borehole exploration revealed a clay layer*), **borehole exploration (clay)** (EXPL-CANT V. clay drilling), **boring** (EXPL-CANT barrenado, perforación; taladrado), **boring bar** (MAQEXTRAC barra taladradora), **boring rod** (MAQEXTRAC varilla de sondeo), **boring tower** (MAQEXTRAC torre de perforación)].

**boric** *a*: PROPQUIM-FIS bórico; relativo o perteneciente al boro. [Exp: **boric acid** (QUIM/ELABPROC ácido bórico; compuesto químico, levemente ácido empleado en la fabricación de esmaltes y vidrios especiales; el ácido bórico se puede convertir en óxido bórico  $\diamond$  *Boric acid markedly raises the solubility of lead frits*; V. boric oxide), **boric oxide** (QUIM/INDAFIN óxido bórico  $\diamond$  *Heat-resistant glass is made using boric oxide (B<sub>2</sub>O<sub>3</sub>) instead of lime and soda*; V. boric acid)].

**boride(s)** *n/a*: QUIM/ELABPROC boruro(s); combinaciones del boro con metales que se encuentran entre las sustancias más duras y resistentes al calor conocidas  $\diamond$  *Boride ceramics are of great technological importance primarily because of their hardness and wear resistance*.

**boroaluminate** *n*: MTRLS borato de aluminio, boroaluminato  $\diamond$  *Boroaluminate is also used in glass and ceramics*; V. aluminium borate.

**borocalcite** *n*: ESMREL borocalcita, colmanita; frita natural de óxidos bórico y de calcio  $\diamond$  *Other boron compounds such as borocalcite and boron frits appear to be less erratic in their performance, but they are usually considerably more expensive*; V. colemanite.

**boron** *n*: ESMREL/QUIM boro; elemento químico cuyo compuesto de mayor importancia económica es el bórax  $\diamond$  *High temperature glazes do not require boron, in fact, it is detrimental to hardness and stability. However, at middle and lower temperature, boron is a necessary glaze component to achieve necessary melting*; V. borax. [Exp: **boron (oxide) anomaly** (PROPQUIM-FIS anomalía del boro; anomalía presentada por el óxido de boro y por la que a altas temperaturas éste disminuye la viscosidad de manera importante, pero a menores temperaturas la aumenta si el contenido de B<sub>2</sub>O<sub>3</sub> es inferior al 15%), **boron carbide** (MTRLS carburo de boro, borocarbono; sólido cristalino negro casi tan duro como el diamante, preparado por reacción de ácido bórico con grafito a 2600 °C y empleado para tallar y como material para la construcción de objetos resistentes  $\diamond$  *Of light weight compared to metal armour, ceramics such as boron carbide and alumina are useful as body armour*), **boron nitride, BN** (MTRLS/QUIM nitruro de boro; compuesto binario del boro consistente en proporciones iguales de boro y nitrógeno  $\diamond$  *Addition of boron nitride to silicon nitride ceramics improves the thermal shock resistance of the resulting material*), **boron oxide** (ESMREL/QUIM óxido de boro; sólido inodoro, incoloro o blanco, también conocido como trióxido de diboro - diboron trioxide- y usado como material iniciador de la síntesis de otros compuestos de boro, como el carburo de boro  $\diamond$  *Boron oxide is used as a fluxing agent for glass and enamels*; V. boric oxide), **boron phosphate** (MTRLS/ELABPROC fosfato de boro  $\diamond$  *Boron phosphate has been used as a constituent of a ceramic body that fires to a translucent porcelain at 1000°C.*), **boron phosphide, BP** (MTRLS/QUIM fosfuro de boro; compuesto químico de boro y fósforo  $\diamond$  *The ceramic powder is selected from the group of ceramic*

*powders consisting of boron carbide, boron nitride, boron phosphide, aluminum boride, etc.*), **boron-free leadless glaze** (ESMREL barniz sin plomo ni boro, esmalte sin plomo ni boro), **borosilicate**<sup>1</sup> (INDAFIN borosilicato; material componente de vidrios ampliamente usado en componentes ópticos tanto por sus buenas propiedades ópticas, como por las mecánicas (baja dilatación)), **borosilicate**<sup>2</sup> (ESMREL borosilicato, silicato de boro; término genérico referido a los esmaltes o vidrios que contienen una cantidad significativa de boro V. *boron*), **borosilicate**<sup>3</sup> (ESMREL borosilicatado, borosilicato; que exhibe cualidades de borosilicato ◇ *The borosilicate glaze is comprised of a borosilicate glass containing at least one metal oxide selected from aluminum, scandium, yttrium, and the rare earth elements*), **borosilicate glass** (INDAFIN vidrio (de) borosilicato; vidrio que contiene bórax entre sus ingredientes fundamentales así como sílice y álcali y que se caracteriza por una resistencia química máxima, una dilatación térmica mínima y, en consecuencia, una elevada resistencia al choque térmico ◇ *Borosilicate glass is created by adding boron to the traditional glassmaker's "frit" of silicate sand, soda, and ground lime*)].

**borrow** v: GRAL pedir prestado. [Exp: **borrow pit** (EXPL-CANT cantera de préstamo)].

**bort** n: TRANSMTRLS/MTRLS bort, polvo de diamante para pulir; diamante industrial de gran tamaño del tipo utilizado para cortar y moler.

**bosh (blast furnace)** n: INDAFIN etalaje (de alto horno); parte del alto horno de forma troncocónica donde los gases del combustible completan la reducción de la mena ◇ *The bosh is the hottest part of the furnace because of its close proximity to the reaction between air and coke.*

**boss** n/a: GESTIÓN jefe, capataz, encargado.

**bottle kiln** n: MAQELAB V. *bottle oven*.

**bottle oven** n: MAQELAB horno de botella, horno redondo ◇ *Bottle oven are a type of intermittent kiln, usually coal-fired, formerly used in the firing of pottery and surrounded by a tall brick hovel or cone, of typical bottle shape.*

**bottom**<sup>1</sup> v: CONST cimentar. [Exp: **bottom**<sup>2</sup> (GRAL/CONST pie de muro; en general, parte inferior de algo), **bottom casting** (INDAFIN V. *uphill teeming*), **bottom of glasstank furnace** (INDAFIN fondo de cuba (industria del vidrio)), **bottom plate** (GRAL/MAQELAB V. *base plate/baseplate*), **bottom pouring** (INDAFIN V. *uphill teeming*), **bottom, at the** (GRAL abajo, en la parte de ◇ *A jawcrusher with one jaw fixed, the other jaw being pivoted at the bottom and oscillating at the top;*; V. *top, at the*)].

**Boudouard reaction** n: PROPQUIM-FIS reacción (de) Boudouard ◇ *Boudouard reaction is the redox reaction of chemical equilibrium mixture of carbon monoxide and carbon dioxide in a given temperature.*

**boulder clay** n: MATPRI/INDAFIN arcilla pedregosa, tilita ◇ *Of glacial origin, boulder clays are used in making building bricks, particularly in the northern counties of England.*

**bound water (adsorbed water and combined water)** *n*: GEO-MIN-CRIST agua fijada, agua coloidal; agua de absorción; agua ligada; agua que forma una película fina en los suelos *-soils-* (sobre todo en los que contienen grandes proporciones de materias coloidales *-large proportions of colloidal material-* y partículas finas de arcillas *-fine clay particles-*) y que está retenida tan enérgicamente por las fuerzas químicas y físicas que no puede moverse ni ser absorbida por las raíces de las plantas.

**boundary** *n*: GRAL linde/lindero, límite, línea divisoria. [Exp: **boundary conditions** (PROPQUIM-FIS condiciones límite; condiciones físicas necesarias para determinar la evolución de un sistema también físico, teniendo en cuenta las leyes de la naturaleza *◇ The boundary conditions such as conductivity, radiation and conduction are formulated*), **boundary lubricant** (QUIM/INSTAL lubricante de capa límite *◇ Effective boundary lubricants must have a high adhesion strength but a low shear strength*)].

**Bourry diagram** *n*: ELABPROC diagrama de Bourry; diagrama que relaciona la pérdida de agua *-water-loss-* y la contracción *-shrinkage-* de una pasta de arcilla con el tiempo de secado *-drying time-* (ambas curvas se muestran en el diagrama) *◇ Directly connected with the fabrication of ceramics, the processes during drying (air humidity, Bourry-diagram) and firing of ceramics (furnaces and heat recovery) are to be regarded.*

**Bouyoucos hydrometer** *n*: INSTR hidrómetro de Bouyoucos, densímetro de Bouyoucos; instrumento empleado para medir la densidad de las suspensiones: cuanto más flota el hidrómetro, mayor densidad tiene la suspensión; se usa también para el análisis granulométrico *◇ The Bouyoucos hydrometer is widely used in routine work, where quick measurements are necessary and extreme accuracy is not required.*

**bow**<sup>1</sup> *n/v*: GRAL curvatura, arco *◇ Bow of the ducts (from both temperature gradients and flux gradients) is also of concern.* [Exp: **bow**<sup>2</sup> (GRAL curvar, alabearse, encorvarse *◇ Shrinkage may bow the tile*), **bowing** (GRAL/PROPQUIM-FIS combamiento, alabeamiento; flexión; encorvamiento *◇ Provided the glaze is strong enough and the body thin enough, a disparity in expansion and contraction can lead to bowing of the glazed article*)].

**bowl** *n*: MAQEXTRAC cuchara/cucharón; pieza cóncava, de gran tamaño y movable de algunas máquinas utilizada para el arranque, transporte y descarga de materiales disgregados.

**box**<sup>1</sup> *n/v*: DISTRIB caja, cajón (caja grande). [Exp: **box**<sup>2</sup> (DISTRIB embalar, encajar, encajonar; poner en cajas; meter y guardar algo en un embalaje, generalmente una caja o similar), **box feeder** (MAQTRANS alimentador de caja, caja de distribución; depósito de distribución; dosificador lineal; aparato utilizado para regular y colocar una cantidad específica de arcilla molida dentro de la mezcladora *◇ The box feeder regulates, proportionates and mixes the lean clay, plastic clay and sand in its exact ratio, irrespective of the proportion or bulk of the clay at which you load the feeder; V. bucket conveyor*), **box kiln** (MAQELAB horno de caja; horno industrial intermitente *- industrial intermittent kiln-* con forma de caja, específicamente de cámara rectangular horizontal, con una o dos puertas de acceso, a través de las cuales se cargan las piezas *◇ A typical box kiln would be about 4m long, 2.5m wide and 1.5m high*), **boxing** (DISTRIB embalado, encajonado/encajonamiento, envasado; acto de poner dentro de cajas

◇ *Prior to designing and building the present boxing machine, the boxing process required manual lifting of the product and cushion to place them in a box*), **boxing machine** (DISTRIB máquina encajadora, encajonadora, encartonadora ◇ *A conveyor feeds two or more empty boxes to the boxing machine*), **box-type roof** (CONST bóveda artesonada)].

**Boyd press** *n*: MAQELAB prensa Boyd ◇ *The Boyd press was introduced in 1888 and has since been widely used for the dry-pressing of building bricks and refractories.*

**BP** *abbr*: MTRLS/QUIM *V. boron phosphide*. [Exp: **body thickness** (ELABPROC espesor del tiesto; grosor de la pared del cuerpo cerámico ◇ *Tile strength is determined by the body's thickness, composition, and by the duration of firing*)].

**BPT** *abbr*: ENSAYO *V. ball penetration (hardness) test*.

**Brabender plasticorder/plasti-corder** ® *n*: INSTR Brabender plasticorder/plasti-corder ®; aparato utilizado para estudiar la plasticidad de las arcillas, mezclas, polímeros y el comportamiento reológico de éstos últimos ◇ *In order to have better control of the interaction between the functional groups and the clay, samples were mixed in a Brabender plasticorder; V. plasticorder*.

**Brabender plastograph**® *n*: INSTR/ENSAYO Brabender plastograph®, plastógrafo Brabender; reómetro de par de torsión para el examen de la calidad y procesabilidad de termoplásticos, elastómeros, cerámicas moldeables, cargas, pigmentos y otros materiales plásticos o plastificables ◇ *The granules are also used to determine the flow characteristics of these polymers by means of the Brabender plastograph*.

**brace**<sup>1</sup> *n/v*: CONST/INSTAL riostra; pieza que, colocada oblicuamente, asegura la invariabilidad de forma de un armazón o estructura ◇ *When leveling tile around a bathtub, an adjustable brace is affixed onto each of the support legs*. [Exp: **brace**<sup>2</sup> (INSTAL/CONST berbiquí; herramienta manual antecesora del taladro y prácticamente en desuso que comprende un manubrio semicircular giratorio que lleva encajada en un extremo la espiga de una broca), **brace**<sup>3</sup> (CONST arristrar; apuntalar o sostener con riostras)].

**Brackelsberg furnace** *n*: INDAFIN horno Brackelsberg ◇ *Brackelsberg furnace is a rotary furnace, originally fired by pulverized coal, for the melting of cast iron*.

**bracket**<sup>1</sup> *n*: CONST ménsula; miembro de arquitectura perfilado con diversas molduras, que sobresale horizontalmente de un plano vertical y sirve para recibir o sostener algo. [Exp: **bracket**<sup>2</sup> (INSTAL soporte ◇ *The aluminum bracket should be mounted to the tile backer board and into studs or blocking, in the wall behind it using stainless steel screws*)].

**Bracklesham beds** *n*: GEO-MIN-CRIST lechos de Bracklesham ◇ *Bracklesham Beds, in geology, are a series pale-coloured clay and marls, in the Middle Eocene of the Hampshire Basin, England*.

**Bragg angle** *n*: GEO-MIN-CRIST ángulo de Bragg; ángulo que forma el haz incidente con el plano del cristal y que interviene en la ley de Bragg. [Exp: **Bragg law**, **Bragg's law** (GEO-MIN-CRIST/PROPQUIM-FIS ley de Bragg; ley que describe la dirección en la que los átomos regularmente espaciados en una estructura cristalina difractarán un haz de rayos X  $\diamond$  *The directions in which X-rays are scattered depends on several factors, expressed in Bragg's Law*; V. *X-ray crystallography*)].

**brake** *n*: SEG V. *safety lock*.

**branch**<sup>1</sup> *n/v*: GRAL rama/ramal, bifurcación; desviación. [Exp: **branch**<sup>2</sup> (GRAL rama, sector), **branch**<sup>3</sup> (GESTIÓN sucursal, delegación comercial; dependencia  $\diamond$  *The opening of the Bulgarian branch of the company*), **branch (out)** (GESTIÓN extender-se, ampliar-se; ramificar-se  $\diamond$  *As the business proved its viability, the company branched out*), **branch air pipe** (MAQELAB tubería en derivación  $\diamond$  *To make the tile body cool fastly in the kiln, natural air can blow into kiln through branch air pipe*), **branch company** (GESTIÓN filial; dicho de una entidad: que depende de otra principal), **branch network** (GESTIÓN red de sucursales)].

**brand**<sup>1</sup> *n*: GESTIÓN/COM marca  $\diamond$  *Shop for building supplies from top brands like Acudor*; V. *trade mark*. [Exp: **brand**<sup>2</sup> (GESTIÓN/COM etiquetar, calificar), **brand leader** (GESTIÓN/COM marca líder en el mercado; hace alusión al artículo considerado mejor en su campo), **brand name** (GESTIÓN/COM nombre de marca, marca de fábrica), **brand name product** (GESTIÓN/COM producto de marca registrada  $\diamond$  *If it is comparable in quality and lower in price, consumers may come to prefer it to the brand name product in some instances*), **brand/branding** (GRAL de marca  $\diamond$  *This business sells name brand tile, carpet, hardwood, marble and granite flooring and granite countertops to residential owners*)].

**Bravais lattice(s)** *n*: GEO-MIN-CRIST redes de Bravais, celdas unitarias; en geometría y cristalografía, paralelepípedos que constituyen la menor subdivisión de una red cristalina que conserva las características generales de toda la retícula, de modo que, por simple traslación, el sólido cristalino completo puede ser reconstruido  $\diamond$  *Each of these lattices can be classified into one of the six crystal systems, and all crystal structures currently recognized fit in one Bravais lattice and one crystal system*; V. *crystal structure*.

**bravaisite** *n*: MATPRI bravaisita; nombre usado en un principio para denominar un tipo de arcilla micácea *-micaceous clay-* que finalmente resultó ser una mezcla de montmorillonita e illita *-montmorillonite and illite-*.

**braze**<sup>1</sup> *n/v*: ELABPROC soldadura fuerte, cobresoldadura; soldadura con una aleación relativamente infusible comparada con una soldadura común  $\diamond$  *Figure 7.2 illustrates several conditions under which brazes are utilized: (a) braze in contact with unmetallized ceramic; (b) braze in contact with metallized ceramic, etc.* V. *brazing*. [Exp: **braze**<sup>2</sup> (GRAL/INSTAL soldar; soldar con latón), **braze alloy** (ELABPROC aleación de soldadura  $\diamond$  *The nonoxide ceramics are mainly joined by metal fillers and braze alloys or reactive glasses or ceramics*)].

**Brazilian test (splitting tension)** *n*: ENSAYO ensayo brasileño, ensayo de tracción indirecta ◊ *The Brazilian test determines the tensile strength of concrete, ceramic, or other material by applying a load vertically at the highest point of a test cylinder or disk (the axis of which is horizontal), which is itself supported on a horizontal plane.*

**brazing** *n*: ELABPROC soldadura (fuerte/dura), soldadura de latón; soldeo fuerte; proceso de unión térmica *-thermal joining process-* en el que el metal de aporte (u otro material) es calentado hasta su fusión fluyendo por capilaridad entre los materiales a soldar y uniendo sus superficies por atracción atómica y mediante difusión ◊ *Due to their brittleness, assembling of ceramics pieces is generally achieved through brazing but thermal stresses during cooling frequently induce cracking of the material used for brazing; V. active brazing. [Exp: brazing alloy (MTRLS material de aporte; en las aleaciones, material que funde por encima de los 450°C pero por debajo de los metales que van a ser unidos ◊ The active metal can be applied as metal hydride on the ceramic area to be joined or by the use of a brazing alloy containing an active metal)].*

**BRE** *abbr*: ORG-INST V. *Building Research Establishment.*

**break**<sup>1</sup> *n/v*: GRAL ruptura, grieta, rotura. [Exp: **break**<sup>2</sup> (GRAL pausa, descanso ◊ *To have a break*), **break**<sup>3</sup> (GRAL romper-se; "to break" se aplica normalmente a materiales duros (cristal, plástico, hueso, etc.), mientras que con materiales blandos (papel, tela, etc.) se utiliza preferentemente el verbo "to tear"), **break bulk** (DISTRIB comenzar la descarga), **break bulk (cargo)** (DISTRIB carga fraccionada ◊ *Break bulk refers to cargoes which are of odd dimensions and cannot be containerised*), **break into the market** (GESTIÓN abrir mercado; penetrar en el mercado), **break strength** (PROPQUIM-FIS V. *breaking stress*), **breakage** (GRAL/CALIDAD roturas, fracturas ◊ *In the shipping of clay tile roofing products some chipping and breakage should be expected*), **break-bulk** (DISTRIB fraccionamiento de carga, desconsolidación; acto de fraccionar cargas que por sus medidas, peso y/o volumen no pueden transportarse en contenedores; separación de una sola carga a granel en embarques individuales más pequeños para entrega a los últimos consignatarios), **breakdown** (GRAL avería, desperfecto ◊ *Every part is inspected and tested routinely to avoid machine breakdown*), **breakdown insurance** (GESTIÓN seguro de averías), **breaking** (GRAL/PROPQUIM-FIS rotura, flexión axial por compresión, quebrantado, ruptura; en general, acción y efecto de romperse; raja o quiebra de un cuerpo sólido), **breaking down** (CONST/EXPL-CANT derumbe), **breaking down point** (PROPQUIM-FIS punto de deformación permanente), **breaking force** (PROPQUIM-FIS V. *breaking load*), **breaking load, R** (PROPQUIM-FIS carga de rotura, carga final; carga mecánica; fuerza de rotura; límite de rotura; carga máxima por unidad de sección que resiste el material antes de romperse ◊ *The 'Bending Strength' of a tile, also referred to as the 'Modulus of Rupture', determines the breaking load in order to prove its ultimate capacity to withstand dynamic and static loads once installed*), **breaking load index** (PROPQUIM-FIS índice de carga de rotura ◊ *The 'Breaking Load Index' indicates the maximum stress that the tile body can withstand, and results are shown in either Newton 's (N) or Kilogram's (Kg)*), **breaking machine** (MAQEXTRAC rompedora), **breaking point** (DISTRIB punto límite/de inflexión; alude en transporte marítimo, al punto en que es más económico pasar al tipo de tarifa superior que pagar el suplemento de la tarifa inferior), **breaking point** (QUIM/PROPQUIM-FIS límite de rotura, punto de rotura ◊ *Break Strength is the force applied to the unsupported portion of the tile until it reaches its breaking point*), **breaking strength** (PROPQUIM-FIS resistencia a la rotura,

resistencia a la flexión axial por compresión; en general, mayor carga estática *-greatest static loading-* que una pieza o estructura puede soportar, tal y como se determina mediante ensayos conducentes a la destrucción bajo condiciones normales de ensayo; grado hasta el cual un azulejo puede soportar la tensión de rotura *-breaking stress-*  $\diamond$  *Creep is the plastic deformation that occurs as a function of time when a material is subjected to a stress lower than the breaking strength at the imposed temperature*), **breaking strength test** (ENSAYO ensayo de resistencia a la rotura  $\diamond$  *The breaking strength test is a good indicator of the chip resistance of a tile because it tests the strength and density of the bisque*; V. *breaking strength*), **breaking stress** (PROPQUIM-FIS tensión de rotura, carga de rotura; esfuerzo de flexión axial por compresión; esfuerzo de rotura; tensión requerida para producir la rotura de un material, ya sea por compresión, tensión o cizallamiento  $\diamond$  *The stress on the material at the time of rupture is known as the breaking stress*), **breaking test** (ENSAYO ensayo de rotura por tracción V. *Brazilian test*)].

**breast** *n*: EXPL-CANT testero; frente de una mina o cantera. [Exp: **breast wall** (MAQELAB V. *jamb wall*)].

**BRECEM** *n*: INDAFIN/INSTAL BRECEM  $\diamond$  *The Building Research Establishment (BRE) has developed a blended cement based on high alumina cement (HAC) with ground granulated blast furnace slag durability called BRECEM.*

**bredigite** *n*: GEO-MIN-CRIST bredigita; forma del ortosilicato de calcio que se da naturalmente en Irlanda del Norte; se da también en las escorias y el cemento pórtland.

**breazing** *n*: INDAFIN ceniza, lecho de arena para asiento del crisol; término arcaico para referirse al polvo de carbón de antracita o arena gruesa *-coarse sand-* disperso sobre el piso del tanque antes de ubicar los crisoles *-setting the pots-* V. *crucible*.

**Brémond porosimeter** *n*: INSTR/ENSAYO porosímetro Brémond  $\diamond$  *Brémond porosimeter evaluates pore size distribution by the expulsion of water from a saturated testpiece*; V. *porosimeter*.

**Brenner gauge** *n*: ESMREL/INSTR calibre/galga Brenner; instrumento para la determinación no destructiva del grosor de una capa de esmalte vítreo *-the thickness of a coating of vitreous enamel-*  $\diamond$  *The Brenner gauge depends on the measurement of the force needed to pull a pin from contact with the enamel surface against a known magnetic force acting behind the base metal.*

**breunnerite** *n*: GEO-MIN-CRIST breunnerita; variedad de magnesita  $\diamond$  *Breunnerite is usually coarse in texture, and characterized by a considerable percentage of ferrous carbonate isomorphously mixed with the magnesium carbonate.*

**brewster, B** *n*: MEDIDA unidad de fotoelasticidad  $\diamond$  *The brewster is a non-SI unit used to measure the susceptibility of a material to photoelasticity, or the value of the Stress Optic Coefficient of the material*; V. *photoelasticity*.

**brick** *n*: INDAFIN/PRODFIN ladrillo; elemento cocido de construcción normalmente hecho de arcilla, moldeado en forma de bloque rectangular y que sirve para construir muros,

solar habitaciones, etc. ◇ *Ceramic or enameled glazed finishes are also a common addition to bricks.* [Exp: **brick clay**, **brick-clay**, **brick clay** (INDAFIN/MATPRI arcilla para ladrillos ◇ *The chief chemical composition of brick clays is silica, alumina, iron oxide, magnesia, lime and alkalis*), **brick course** (CONST hilada de ladrillos), **brick earths**, **brick-earths** (INDAFIN/MATPRI arcilla para ladrillería ◇ *Certain common ingredients of clays or brick-earths are desirable, such as iron oxides which are responsible for the colour of the fired clay products*), **brick facing** (CONST V. *brick veneer*), **brick for electrode opening** (INDAFIN/PRODFIN ladrillo con orificio para electrodo), **brick for suspended roof** (INDAFIN/PRODFIN ladrillo de bóveda suspendida), **brick on edge** (CONST/INSTAL ladrillo colocado a sardinel; ladrillo sentado de canto y colocado de modo que coincida en toda su extensión la cara de éste con la del otro), **brick size** (GRAL V. *size (of brick)*), **brick slip**<sup>1</sup> (PRODFIN plaqueta; pequeña pieza de cerámica rectangular usada para revestir paredes y suelos), **brick slip**<sup>2</sup> (CONST revestimiento de ladrillo ◇ *Brick slip is used to simulate brickwork construction either for prefabrication or in facing in situ concrete members*), **brick trowel** (INSTAL llana, paleta; trulla; herramienta de albañilería compuesta de una plancha de hierro/acero y una asa, usada por los albañiles para extender y allanar el yeso, el cemento, etc. ◇ *Some tile setters use brick trowels for quarry and terra cotta tilework*), **brick veneer** (CONST revestimiento/paramento de ladrillo; cubierta de ladrillo, normalmente para paredes exteriores pero también usada en interiores ◇ *The entire exterior of the home has a brick veneer*), **brick veneer construction** (CONST chapado de ladrillo), **bricklayer** (INSTAL/CONST albañil; persona que realiza trabajos básicos de construcción, a saber, alzado de muros, paredes y tapias, colocación de cubiertas, apertura de zanjas, llenado y nivelado de encofrados con hormigón, preparación de cemento y otras tareas de obra; también se emplea el término para referirse a aquel que se dedica a trabajos de reparación o reforma con materiales de obra ◇ *Bricklayers lay building materials such as brick, structural tile, concrete cinder, glass, gypsum, etc*), **bricklaying**<sup>1</sup> (CONST/INSTAL albañilería; arte de construir edificios u otras obras en que se emplean diversos materiales como pueden ser ladrillos, piedra, cal, arena, yeso, cemento y otros materiales semejantes), **bricklaying**<sup>2</sup> (INSTAL/CONST colocación de ladrillos (albañilería); *bricklaying work*: trabajo de albañilería ◇ *Bricklaying basically consists in laying or disposing regular and similar rectangular pieces of baked clay one upon another, layer upon layer, until a certain height is reached, spreading a composition of lime and sand called mortar between each layer, which hardens and connects the bricks together in a tolerably solid mass.*), **brick-shaped** (GRAL en/con forma de ladrillo), **brickwork** (CONST/INSTAL mampostería (de ladrillo), albañilería (trabajo de); enladrillado; obra de ladrillo ◇ *The most common type of brickwork seen these days is the simple stretcher bond, showing only the long side-surface of the brick*)].

**bridge**<sup>1</sup> *n*: MAQELAB marco de boca (de una galletera). [Exp: **bridge**<sup>2</sup> (MAQTRANS/TRANSMTRLS puente; concentración de material en forma de arco en el cono de un silo o tolva que impide el libre paso de los materiales allí contenidos V. *bridging*), **bridge crack** (MAQELAB grieta puente, fisura puente ◇ *A bridge crack is a defect sometimes found in the clay column from an extruder*), **bridge wall** (MAQELAB altar, puente; pared baja o partición vertical en la cámara de cocción de un horno para desviar la llama, etc.), **bridging (in hopper outlet)** (MAQTRANS/TRANSMTRLS formación de puentes, aglomeración de granos; pegado en los bordes; fenómeno que limita el flujo libre *-free flow-* de materiales por el cono de los silos *-silos-* o tolvas *-hoppers-* por efecto de las partículas en forma de "arcos/puentes" que se pegan y apelmazan en él

temporalmente ◇ *When bridging occurs the result is a stoppage of flow which can only be restarted by collapsing the arch of material; V. crack bridging; tile bridging*), **bridging oxygen, BO** (QUIM oxígeno puente, oxígeno de conexión/puente; ion de oxígeno que se encuentra entre dos iones de silicio)].

**brief** *n*: GESTIÓN informe, resumen; instrucciones.

**bright** *a*: GRAL/ESMREL brillante; claro, luminoso V. *pale*. [Exp: **bright annealing** (ESMREL/INDAFIN recocido brillante/blanco; recocido llevado a cabo en un horno de atmósfera controlada para reducir al mínimo la oxidación superficial, conservándose así una superficie limpia y brillante V. *annealing*), **bright enamel** (ESMREL barniz brillante ◇ *The tiles, painted in bright enamel, bear fabulous and realistic images of animals and birds, human figures and diverse genre scenes; V. glossy glaze*), **bright glaze** (ESMREL esmalte brillante ◇ *In ASTM C 242, a bright glaze is a colorless or colored ceramic glaze having high gloss*), **bright yellow** (ESMREL/DISEÑO amarillo fuerte/vivo/brillante), **brightness** (GRAL/ESMREL luminosidad, brillo ◇ *Fine texture and brightness of glaze surface*)].

**Brinell hardness, HB** *n*: ENSAYO/PROPQUIM-FIS dureza Brinell; medición de la dureza de un material por el método de indentación mediante una bola de acero (indentador), midiendo la penetración de la misma en el material a estudiar ◇ *Brinell hardness determination is used as a quality control test under conditions of mass production*.

**Brinell test** *n*: ENSAYO/CALIDAD V. *Brinell hardness test*. [Exp: **Brinell hardness number, BHN** (MEDIDA/PROPQUIM-FIS número (de dureza) Brinell; número obtenido dividiendo la carga usada en el ensayo de dureza Brinell -*Brinell hardness test*-, en kilos, por la superficie real del área de indentación en milímetros cuadrados ◇ *The size of the permanent impression on the specimen surface is converted into a Brinell Hardness Number (HB); V. Brinell hardness test*), **Brinell hardness test, HB** (ENSAYO/CALIDAD ensayo de dureza Brinell; ensayo para determinar la dureza de un material consistente en aplicar una carga conocida sobre la superficie del material a ensayar a través de una bola de acero endurecida (penetrador) de diámetro conocido bajo una presión de carga fija; el ensayo mide el diámetro de la impresión permanente sobre la superficie del material ◇ *The Brinell test makes a large impression on the surface of the piece tested; V. Brinell hardness number*)].

**briquette** *n*: MAQELAB briqueta, aglomerado; conglomerado de carbón u otra materia inflamable con adición de un material aglomerante (o sin ella) fabricado por compresión en una prensa y con forma de ladrillo ◇ *Briquettes are typically dried to 12-18% moisture, and are primarily used in household and industry; V. briquetting pres*. [Exp: **briquetting-press** (INDAFIN prensa de briquetas; aparato mecánico o eléctrico que se usa en la manufactura de briquetas ◇ *The briquetting press comprises two basic parts: the press and the mini silo; V. briquette*)].

**Bristol glaze** *n*: ESMREL esmalte Bristol; esmalte de tipo feldespático, generalmente opaco ◇ *Bristol Glaze is a mid-range temperature glaze, cone 1 and you find it on the kitchen stonewares replacing salt glaze*.

**BRITE** *abbr:* ORG-INST V. *Basic Research in Industrial Technologies in Europe*. [Exp: **BRITE/EURAM programme** (ORG-INST V. *Basic Research in Industrial Technologies in Europe/European Research on Advanced Materials programme*)].

**British** *a:* GRAL británico. [Exp: **British Ceramic Plant and Machinery Manufacturers Association, BCPMMA** (ORG-INST Asociación Británica de Plantas Cerámicas y Fabricantes de Maquinaria), **British Ceramic Research Association, BCRA** (ORG-INST Asociación Inglesa de Investigación de Cerámicas  $\diamond$  *All glazes used on our tableware are 100% non-toxic; they have been tested by the British Ceramic Research Association and meet all international safety standards*), **British Standard, BS** (CALIDAD norma británica; versión de normas y estándares de calidad del Reino Unido, cada una de las cuales aparecerá precedida por el prefijo BS ("*British Standard*")), para su identificación  $\diamond$  *BS 5416 defines ceramics as 'materials generally made from a mixture of clays and other materials, distinguished from glass and glass ceramics by the fact that they are first shaped and then rendered permanent by firing at a temperature generally well in excess of 1000°C*. V. *standard; European standard/norm*), **British Standards Institution, BSI** (ORG-INST Institución Británica de Estándares, Oficina de Normalización Británica; organización británica de normas y servicios de calidad)].

**brittle** *a:* GRAL/PROPQUIM-FIS frágil, quebradizo; en general, cualidad de algo que se hace pedazos con facilidad; técnicamente, dicese de un material propenso a la fractura cuando es sujeto a tensiones  $\diamond$  *Many ceramic materials are hard, porous and brittle; V. elastic; plastic; malleable*. [Exp: **brittle fracture** (PROPQUIM-FIS rotura frágil, fractura fácil; fractura que se da por la formación y rápida propagación de grietas  $\diamond$  *Brittle fracture is characterized by rapid crack propagation with low energy release and without significant plastic deformation*), **brittle fracture materials** (MTRLs/PROPQUIM-FIS materiales de rotura frágil; materiales en los que, cuando la tensión a la que están sometidos supera el límite de fluencia, se produce la rotura de forma repentina, por lo que no suelen ser utilizados como materiales estructurales -por ejemplo, el vidrio-), **brittle to ductile transition, BDT** (PROPQUIM-FIS transición frágil-dúctil  $\diamond$  *The brittle-to-ductile transition (BDT) exhibited by most crystalline materials is a strain rate dependent phenomenon marked by a rapid increase of dislocation activity at the crack tip concomitant with a sharp increase of the fracture toughness*), **brittleness** (PROPQUIM-FIS fragilidad; ausencia de ductilidad -*absence of ductility*-: capacidad de un material de fracturarse con escasa deformación; en general, cualidad de los objetos y materiales de romperse con facilidad  $\diamond$  *Grain boundaries, pores, interface boundaries all act as good crack paths in ceramics, making ceramics very prone to brittleness; V. fragility*)].

**brochure** *n:* GESTIÓN folleto publicitario  $\diamond$  *A full colour tile brochure, showing individual tiles and room sets*.

**broken** *a:* GRAL roto, quebrado. [Exp: **broken blister** (ESMREL/CALIDAD V. *broken seed*), **broken joint** (INSTAL junta transversal  $\diamond$  *Broken joint implies ceramic tile installation featuring each row offset for half its length; V. vertical broken joint*), **broken seed** (ESMREL/CALIDAD burbuja abierta, bullón abierto; bullón reventado V. *seed*), **broken stone** (GEO-MIN-CRIST grava)].

**Brongniart's formula** *n*: ELABPROC/ESMREL fórmula de Brongniart; fórmula que determina cuánto material seco *-dry material-* hay en una suspensión acuosa *-liquid slip-* o un esmalte ◊ *Brongniart's formula allows you to add colour to glazes and slips in slop form.*

**bronze**<sup>1</sup> *n*: GRAL/ELABPROC bronce; se conocen como bronce a las aleaciones *-alloys-* de cobre *-copper-* y estaño *-tin-* donde predomina el cobre; también pueden llamarse bronce las aleaciones con otros metales, siempre que predomine notablemente el cobre, como ocurre, por ejemplo, en el bronce de aluminio ◊ *The usual causes of green spots are the presence of chalcopyrite in the raw clay or accidental contamination by a particle of copper or copper alloy, e.g. a chip of a bronze bearing.* [Exp: **bronze**<sup>2</sup> (ESMREL bronce; tipo de esmalte que ha de ser aplicado en cantidad y que necesita ser cocido a una temperatura superior a la normal ◊ *Bronze is a more sensitive glaze which provides a beautiful golden bronze finish if the thickness and firing temperature are correct*)].

**Brookfield viscometer** *n*: INSTR viscosímetro de Brookfield; instrumento que mide la viscosidad de un líquido aplicando distintos esfuerzos de cizalla a una temperatura dada ◊ *The set of the slips was determined by means of the Irwin slump test and the Brookfield viscometer.* [Exp: **Brookfield viscosity** (PROPQUIM-FIS viscosidad Brookfield; viscosidad aparente determinada por el viscosímetro Brookfield *-Brookfield viscometer-*)].

**brookite** *n*: GEO-MIN-CRIST brookita; mineral perteneciente al grupo de los óxidos que cristaliza en sistema rómbico; es una de las tres formas minerales del dióxido de titanio junto con la anastasa *-anatase-* y el rutilo *-rutile-* ◊ *Anatase can be present as part of the crystalline material present in ceramic glazes and brookite has also been spotted in glazes.*

**broom finish** *n*: CONST/INSTAL acabado con escobilla/escobillones; textura superficial obtenida al pasar *-stroking-* una escobilla sobre el hormigón fresco *-freshly placed concrete-* V. *brushed surface.*

**brown** *n/a*: ESMREL/DISEÑO marrón; de color marrón. [Exp: **brown coat** (INSTAL/CONST capa de enfoscado; capa de revoque que suele aplicarse con yeso negro antes de dar la capa de enlucido; en caso de que se den tres capas, la de enfoscado es la segunda ◊ *Before the plaster sets, plasterers scratch its surface with a rake-like tool to produce ridges, so that the subsequent brown coat will bond tightly; they then apply the brown coat and the finish, white coat; V. white coat; scratch coat*), **brown ochre** (GEO-MIN-CRIST/ESMREL ochre marrón; mineral natural consistente en sílice y arcilla y que debe su color al óxido de hierro; puede ser la base para pigmentos de ese mismo color)].

**brownian movement/motion** *n*: QUIM movimiento browniano; movimiento aleatorio *-random movement-* que se observa en algunas partículas nanoscópicas que se hallan en un medio fluido debido a que su superficie es bombardeada de manera incesante por las moléculas del fluido sometidas a una agitación térmica ◊ *The effect of the Brownian movement has been observed in all types of colloidal suspensions: solid-in-liquid, liquid-in-liquid, gas-in-liquid, solid-in-gas, and liquid-in-gas.*

**brownies** *n*: ESMREL/CALIDAD V. *copperheads*.

**brownmillerite** *n*: INDAFIN brownmillerita; compuesto ternario que se da en el cemento pórtland y el cemento de aluminato de calcio.

**brownstone** *n*: GEO-MIN-CRIST arenisca ferruginosa.

**brucite** *n*: GEO-MIN-CRIST brucita; forma mineral del hidróxido de magnesio *-magnesium hydroxide-* que contiene además pequeñas cantidades de manganeso y hierro *◇ Brucite has some important industrial uses and as such it is used as an additive in certain refractories*.

**bruise** *n*: CALIDAD rotura en estrella *◇ A bruise is a concentration of cracks in the surface of glass-ware caused by localized impact*.

**Brunauer, Emmett and Teller method, BET method** *n*: TRANSPROC/TRANSMTRLS método de Brunauer, Emmett y Teller; método para la determinación del área superficial total de un material granular o un sólido poroso a partir de la medida de la adsorción de un gas a baja temperatura *◇ Porous inorganic materials such as mesoporous silica and layer clay minerals have high surface areas of several hundred m<sup>2</sup> g<sup>-1</sup> calculated by the BET method*.

**brush**<sup>1</sup> *n/v*: GRAL/ESMREL cepillo, brocha; escobilla; frotador; pincel *◇ Using a clean, dry, soft brush, apply Delta Air Dry PermEnamel Surface Conditioner to the tile surface*. [Exp: **brush**<sup>2</sup> (ESMREL/MANTNMO cepillar *◇ Unfortunately, liquid cleaners or brushing the tile will not remove the ugly white scale or calcium line from your tile and possibly cause damage*), **brush marks** (ESMREL marcas de pincel *◇ This additive makes the paint flow smoother, thus helping to eliminate brush marks*; V. *brush*), **brushed effect (decoration)** (ESMREL pintado a brocha), **brushed surface** (CONST superficie acabada con cepillo; textura arenosa *-sandy texture-* obtenida mediante el cepillado *-brushing-* con un cepillo rígido *-stiff brush-* de una superficie de hormigón fresco o ligeramente endurecido *-freshly placed or slightly hardened concrete-* *◇ A brushed surface increases skid resistance*; V. *broom finish*), **brushing**<sup>1</sup> (ESMREL aplicación a brocha/pincel *◇ All the glazes on our price list are available in dry form in 50 lbs. bags and can be prepared for brushing, dipping or spraying application*), **brushing**<sup>2</sup> (MANTNMTMO cepillado *◇ Unfortunately, liquid cleaners or brushing the tile will not remove the ugly white scale or calcium line from your tile and possibly cause damage*), **brushing glazes** (ESMREL esmalte/barniz aplicado a pincel/brocha *◇ Althoughv the fired results of dipping and brushing glazes are comparable in beauty, the two glazes should neverbe mixed together in their liquid state*)].

**Brussels nomenclature** *n*: COM nomenclatura de Bruselas; convenio en el que se detallan todos los productos importables y exportables junto con los aranceles de aduana aplicables a cada uno de ellos.

**BS** *abbr*: CALIDAD V. *British Standard*.

**BSCCO** *abbr*: QUIM V. *bismuth strontium calcium copper oxide*.

**BSI abbr:** ORG-INST V. *British Standards Institution.*

**bubble**<sup>1</sup> *n/v:* CALIDAD/ESMREL burbuja, ampollar; hervor; sopladura (pieza fundida); glóbulo de aire u otro gas formado en el interior de algún líquido y que sale a la superficie; abultamiento producido en una superficie por la expansión de un gas contenido en ella ◇ *All glazed tiles presumably contain some bubbles in their glaze and interfacial layers, which if sufficiently numerous, can influence their properties; V. blister; bleb.* [Exp: **bubble**<sup>2</sup> (CALIDAD/ESMREL burbujear, ampollar; hervir ◇ *If glaze bubbles, bubbles will reach the surface and burst, leaving craters*), **bubble cap** (INSTR/ESMREL campana de borboteo, campana de burbujeo; platillo de borboteo ◇ *The bubble cap causes the vapour to be distributed through the liquid*), **bubble glass** (INDAFIN cristal de burbujas ◇ *Bubble glass is glass-ware containing gas bubbles sized and arranged to produce a decorative effect*), **bubble of air** (ESMREL/CALIDAD V. *air bubble*), **bubble point** (PROPQUIM-FIS punto de burbujeo), **bubble structure** (ESMREL estructura de burbujas; abundancia, tamaño y distribución relativa de burbujas de gas en un esmalte cerámico o vítreo ◇ *Regarding their bubble structure, the dull enamels contain most bubbles, glossy enamels being relatively bubble-free*), **bubbled glaze** (ESMREL esmalte burbujeado ◇ *Bubbled glaze can be caused by immature bisque, too heavy an application of glaze or by not firing the piece hot enough*), **bubble-pressure method** (ELABPROC método de presión de burbuja; en general, técnica empleada para determinar la tensión dinámica superficial *-dynamic surface tension-*; en cerámica se emplea para determinar el tamaño máximo de los poros en un producto cerámico ◇ *With the bubble-pressure method the size of pore in a ceramic product is calculated from the pressure needed to force the first bubble of air through the ceramic when it is wetted with a liquid of known surface tension. V. maximum bubble pressure method*), **bubbling (of the glaze)** (ESMREL burbujeado (del esmalte), borboteo; burbujeo; formación de burbujas; también referido a aumento de volumen ◇ *A glaze application that is not thick enough can also cause bubbling; V. blebbing (of the glaze); blistering*), **bubbly clay** (ESMREL/MATPRI arcilla que contiene materia orgánica ◇ *Bubbly clay causes bubbles if used in vitreous enamels*), **bubble paper** (DISTRIB plástico de burbujas ◇ *Packaging: bubble paper packed*)].

**buck** *n:* MAQELAB placa de enfriamiento ◇ *A buck is used in the firing of heavy vitreous enamel-ware.*

**bucket** *n:* MAQTRANS cangilón; cada una de las divisiones de una cinta transportadora V. *bucket conveyor.* [Exp: **bucket carrier** (MAQTRANS V. *bucket conveyor*), **bucket conveyor** (MAQTRANS transportador de cangilones; módulo transportador continuo, dotado con varios cangilones *-buckets-* ◇ *In a bucket conveyor, a series of buckets are attached to one or two strands of endless chain or in some instances to a belt*), **bucket elevator** (MAQTRANS elevador de cangilones ◇ *Bucket elevators are designed to elevate loose bulk materials through the use of moving buckets, attached to chain or belt, vertically through an enclosed easing*), **bucket excavator** (MAQEXTRAC pala excavadora, excavadora de cuchara, excavadora de cangilones ◇ *From the warehouse the clay mass is dug using a bucket excavator and transporters move it to small grinding rollers*)].

**buckling** *n:* PROPQUIM-FIS pandeo, alabeo, flexión, plegamiento; fenómeno (considerado un fallo) de inestabilidad elástica manifestado en la aparición de desplazamientos importantes transversales a la dirección principal de compresión; deformación lateral

de miembros bajo compresión ◊ *Buckling is also a failure mode in pavement materials, primarily with concrete, since asphalt is more flexible; V. bending; bulging.*

**buckstave** *n*: CONST *V. buckstay.*

**buckstay**<sup>1</sup> *n*: CONST estructura metálica, viga de cimentación ◊ *The walls will be stayed with a series of horizontal buckstays fitted to tie bars located at predetermined intervals.* [Exp: **buckstay**<sup>2</sup> (MAQELAB armadura, anclaje de horno; columna de anclaje; montante; viga de anclaje; viga de atirantar; miembro vertical de hierro o acero interconstruido en las paredes de una inslatación de caldera u horno con el fin de soportar la obra de labrillo; las vigas de anclaje se usan como armadura en los hornos mientras que las vigas de atirantar son montantes colocados contra los muros laterales en las calderas ◊ *A buckstay reinforces the side walls of an arched masonry furnace or flue to take the thrust of an arch; V. stay; tie rod*)].

**buckyball** *n*: QUIM buckyball, fulerenos/fullerenos; nano-estructura compuesta de 60 átomos de carbono estructurados en un espacio cerrado y perfectamente simétrico con grandes propiedades, especialmente como superconductores ◊ *Named after R. Buckminster Fuller, "BuckyBall" is the nickname for a Carbon 60 molecule.*

**budget** *n*: GESTIÓN presupuesto.

**buff**<sup>1</sup> *a/n/v*: ESMREL/DISEÑO beige/beis, amarillo crema; color de ante; color amarillo pálido, amarillo-marrónáceo, color intermedio entre el rojo y el crema; cualidad de aquello que presenta este tipo de coloración ◊ *TiO2 Titanium dioxide is an oxide that is used as an opacifier in glazes to produce white and buff colors.* [Exp: **buff**<sup>2</sup> (QUIM tamponar; mantener constante el pH de una solución), **buff**<sup>3</sup> (MANTNMTO dar brillo a, pulir; sacar brillo a algo ◊ *Wax and buff tile floors to maintain a high gloss appearance condition*), **buff ceramic clays** (MATPRI *V. buff clays*), **buff clays** (MATPRI arcillas color ante; arcillas numerosas que incluyen baro y arcilla refractaria y cuyos colores ya quemados son de varios tonos de ante natural o de ocre ◊ *The buff clay is de-aired and packaged in a 12-1/2-lb. cylinder, four pugs to a 50-lb. carton*), **buffable** (MANTNMTO/PROPQUIM-FIS pulimentable; que admite pulido), **buffer**<sup>1</sup> (MANTNMTO pulidor), **buffer**<sup>2</sup> (QUIM regulador; sustancia que, añadida a una solución electrolítica, evita cambios rápidos en la concentración de un ion dado), **buffer**<sup>3</sup> (QUIM amortiguador; en química, reactivo compensador), **buffer**<sup>4</sup> (QUIM tampón químico; sistema constituido por un ácido débil y su base conjugada o por una base y su ácido conjugado que tiene capacidad "tamponante", esto es, que puede oponerse a grandes cambios de pH en una disolución acuosa), **buffer course** (MAQELAB hilada de separación/separadora/de protección, hilada tampón; hilada de ladrillo refractario instalada para separar dos materiales y prevenir la reacción química entre ellos ◊ *This buffer course was finished with a 3 mm thick, abrasion and chemical resistant top coat, made of light grey, two part, epoxy base system with balanced chemical resistance*), **buffer layer** (MTRLS/PROPQUIM-FIS subcapa de transición, capa de transición; subcapa intermedia; capa encajonada entre dos materiales monocristalinos *-single-crystal-materials-* con el fin de acomodar la diferencia entre sus estructuras cristalográficas *-crystallographic structures-*; en cerámica, capa con una composición y propiedades intermedias entre el esmalte y la pasta cerámica que se encuentra en la interficie pasta/esmalte *-body/glaze interface-* ◊ *The formation of a good buffer layer tends to improve crazing resistance*)].

**bugholes** *n*: INDAFIN/CONST nidos de abeja, nidos; poros de aire *-air voids-*, cavidades/agujeros/huecos de forma regular o irregular y unos 15 milímetros de diámetro que se forman en la superficie del hormigón endurecido  $\diamond$  *Bugholes as surface defects are not detrimental to structural concrete from a durability standpoint.*

**Bührer kiln** *n*: MAQELAB horno Bührer.

**build** *v*: CONST construir, edificar. [Exp: **build up** (GESTIÓN crear; montar, desarrollar, fomentar, organizar  $\diamond$  *To build up a business*), **builder** (CONST constructor V. *constructor*), **building** (CONST edificio; construcción, edificación), **building area** (CONST zona de construcción), **building block** (CONST bloque), **building brick** (CONST/INDAFIN ladrillo de construcción; en el pasado se le conocía como "ladrillo común" V. *See clay building brick; concrete brick; sand-lime brick*), **building clays** (MATPRI/INDAFIN arcillas de/para (la) construcción  $\diamond$  *A careful study of the lithology of local rock strata can indicate the sources of ceramic and building clays, chert and other lithic materials*; V. *brick clays*), **building code** (CONST reglamento de construcción  $\diamond$  *The Building Code requires tile roofs to feature a slope of 2 1/2:12 or greater*), **building components** (CONST elementos de construcción), **building contract** (CONST contrato de obra), **building contractor** (CONST contratista), **building failure** (CONST fallo constructivo), **building materials** (CONST materiales de construcción; materias primas o manufacturas empleadas en la construcción de una obra de ingeniería civil o arquitectónica y que abarcan una amplia gama de productos clasificados según su uso y características físicas  $\diamond$  *Rock structures have existed for as long as history can recall and it is the longest lasting building material available, and is usually readily available*; V. *structural material*), **building official** (CONST autoridad responsable; persona encargada por el municipio *-municipality-* correspondiente, o su representante debidamente autorizado, de administrar y vigilar el cumplimiento del código de construcción aplicable), **building permit/licence** (CONST licencia de obra), **Building Research Establishment, BRE** (ORG-INST Instituto para la Investigación en la Construcción, Centro de Investigación en Construcción; Instituto Británico de Investigación para la Construcción), **building site** (CONST obra, tajo), **building society** (CONST empresa constructora), **building-plan** (CONST/INSTAL diseño para la construcción/instalación, plan de construcción  $\diamond$  *To trace the building-plan*), **build-up** (CONST gunitado por capas, proyección por capas; aplicación de hormigón proyectado en capas sucesivas con el objeto de formar una masa de mayor espesor), **build-up** (INDAFIN acumulación, acumulación residual; en la industria hormigonera, acumulación de hormigón residual endurecido dentro de una mezcladora  $\diamond$  *Nozzles for secondary steelmaking ladles can become blocked by build-up of dense products*), **build-up** (GRAL aumento  $\diamond$  *The source of this defect is always the ground-coat and the ultimate cause is release of hydrogen followed by a build-up of pressure*), **build-up (on a converter mouth)** (INDAFIN depósito de escoria sobre la boca (del convertidor)), **built-up** (CONST ensamblado, montado), **built-up area** (CONST zona edificada), **built-up roof** (CONST tejado compuesto)].

**bulb edge** *n*: INDAFIN engrosamiento del borde, burlete  $\diamond$  *The rounded edge of sheetdrawn glass is known as bulb edge.*

**bulging** *n*: PROPQUIM-FIS pandeo, alabeo; acción y efecto de combarse en un material  
 ◇ *Ceramic and stone tile installations can be subjected to a variety of stresses leading to the bulging or cracking of tiles; V. buckling; arching.*

**bulk**<sup>1</sup> *n/a*: GRAL masa, grosor, volumen; *bulk* también puede tener el sentido de "cantidad grande" o "la mayor parte de"; igualmente puede ser traducido en ocasiones como "mole" ◇ *The bulk mixture of selected clay and minerals is mixed with water and pumped into large, rotating cylindrical mills.* [Exp: **bulk**<sup>2</sup> (PROPQUIM-FIS aparente V. *apparent*), **bulk bin storage** (TRANSPROC/TRANSMTRLs almacenamiento en silo), **bulk buying** (COM compra al por mayor/en grandes cantidades ◇ *Bulk-buying discounts were negotiated*), **bulk cargo** (DISTRIB carga a granel ◇ *Examples of dry bulk cargos are: coal, grain (wheat, maize, rice, etc.) iron ore (ferrous & non-ferrous ores, ferroalloys, pig iron, scrap metal, etc.), bulk mine (sand & gravel, copper, iron) etc.*), **bulk density** (PROPQUIM-FIS densidad aparente, densidad en masa; densidad por unidad de volumen; densidad total; densidad volumétrica aparente; masa de un material -incluyendo sus partículas sólidas y cualquier agua que contenga- por unidad de volumen, incluyendo vacíos ◇ *The raw-material storage capacities are directly dependent on the bulk density of the material; V. apparent density; specific gravity*), **bulk density (with units)** (PROPQUIM-FIS peso específico aparente, densidad aparente; cualidad del suelo (u otra muestra) que cuantifica la relación y distribución de material sólido y huecos), **bulk flow** (PROPQUIM-FIS flujo (neto) global ◇ *The helical screw 407 and the filter 403 form a narrow slot for removal of the filter cake and bulk flow of the slurry*), **bulk order** (DISTRIB pedido de grandes cantidades), **bulk production** (GESTIÓN producción a granel/en grandes cantidades ◇ *Certain chemical methods have not been found cost effective and suitable for bulk production*), **bulk purchase** (COM V. *bulk buying*), **bulk sample** (ENSAYO muestra global, muestra compuesta; muestra obtenida por la combinación de varias muestras simples que se reúnen y mezclan en un recipiente V. *laboratory sample*), **bulk specific gravity** (PROPQUIM-FIS peso específico aparente, densidad aparente; peso real de una muestra (partículas sólidas + agua) dividido entre volumen total de la misma ◇ *This test method is suitable for determining the bulk specific gravity or bulk density by immersion of the entire item or a representative cross section in water; V. specific gravity; bulk density*), **bulk storage** (TRANSMTRLs almacenamiento a granel; método para almacenar mercancías que no están organizadas en bultos, cajas o unidades de carga y por el que se suelen formar montones de estos graneles adosados a las paredes o en el centro del almacén), **bulk strength** (PROPQUIM-FIS V. *compressive strength*), **bulk volume** (PROPQUIM-FIS volumen aparente ◇ *The volume per unit mass of a dry material plus the volume of the air between its particles is the bulk volume*), **bulk, in** (DISTRIB granel, a, al por mayor; en bruto; en grandes cantidades; sin envase; suelto ◇ *Shipments may be in bulk, for example, several thousand tons of crude barite*), **bulking** (PROPQUIM-FIS hinchamiento, abundamiento; bufamiento; esponjamiento; aumento del volumen aparente -*bulk volume*- de una cantidad de arena en condición húmeda -*in a moist condition*- con respecto al volumen de la misma cantidad seca o completamente inundada; tendencia de las partículas finas tipo arena de ocupar un volumen mayor al estar ligeramente húmedas -*slightly moist*- ◇ *The cohesion generally goes to zero and there is often a swelling or bulking of the natural clay*), **bulking curve** (PROPQUIM-FIS curva de hinchamiento; gráfica -*graph*- que representa la variación del volumen -*change in volume*- de una cantidad de arena provocada por un cambio en su contenido de humedad -*moisture content*-), **bulking factor** (PROPQUIM-FIS coeficiente de hinchamiento, coeficiente de esponjamiento;

coeficiente de abundamiento; factor de hinchamiento; relación entre el volumen de la arena húmeda y el volumen de la arena seca ◇ *In quarrying, the bulking factor is the net expansion of overburden material resulting from excavation and subsequent backfilling*), **bulky** (GRAL voluminoso, pesado), **bulky goods** (DISTRIB mercancías voluminosas/pesadas ◇ *Bulky goods are defined as durable goods which, by means of their size, weight or shape require vehicular transport*), **bulky powder** (TRANSMTRLS/MTRLS polvo voluminoso ◇ *Barium sulfate occurs as a fine, white, odorless, tasteless, bulky powder*)].

**bull float** *n*: INSTAL aplanadora de mango largo; herramienta que consiste en una gran pieza rectangular y plana *-flat-*, de madera, aluminio o magnesio, usada para alisar *-smooth-* superficies de hormigón fresco no encofradas *-unformed surfaces of freshly placed concrete-*.

**bull-dozer, bulldozer, bull dozer** *n*: MAQEXTRAC bulldozer, motoexcavadora; niveladora; topadora; tractor con pala mecánica; tractor nivelador; tractor de arrastre *-crawler tractor-* muy potente montado sobre orugas que incorpora una plancha fuerte de acero *-strong steel blade-* en la parte delantera para el empuje de materiales, remover obstáculos, escombros *-debris-* o tierra y para nivelar superficies desiguales ◇ *For open-pit working, the overburden of soil is removed by mechanical excavators or bulldozers, and then the underlying clay is dug out by means of pneumatic shovels*. [Exp: **bull-dozer with angling blade** (MAQEXTRAC *V. angledozer*)].

**Buller's rings** *n*: ELABPROC anillos de Wedgwood, anillos Buller; anillos cerámicos crudos obtenidos al prensar una mezcla *-blend-* de materiales cerámicos y fundentes *-fluxes-* tan bien proporcionada que la contracción *-contraction-* de estos anillos durante la cocción puede tomarse como medida de la temperatura a la que han sido expuestos en el horno ◇ *Small, random problem areas on glazes can easily be the result of temperature non-uniformity and/or setting arrangements; this can be checked by placing lots of pyrometric cones or Buller's rings at various locations around the ware*.

**bullhead** *n*: INDAFIN *V. keybrick*.

**bullnose** *n/a*: CONST romo; redondeado, obtuso, sin punta; se dice de un canto trabajado en forma de semicírculo y también de una moldura *-moulding-* con ese perfil ◇ *Bullnose is a term used in building construction for rounded convex trim, particularly in ceramic tile*. [Exp: **bullnose (tile)** (PRODFIN zócalo, bullnose; tipo de azulejo con un acabado redondeado de los bordes; *"bullnose for floor"* se refiere específicamente a rodapié, zócalo; si no se especifica *"for floor"*, *bullnose* puede referirse, además de al zócalo, a un azulejo con un radio convexo en uno de sus lados empleado también en el acabado de paredes; un *double-out bullnose* se empleará en el acabado de esquinas ◇ *A bullnose is a tile having an edge rounded and glazed, used as an end piece on walls and skirtings; V. rounded-edge tile*)].

**Bull's kiln** *n*: MAQELAB horno de Bull ◇ *Clay may be mixed with fly ash (to the extent of 10%-40%) and made into bricks, which can then be fired in conventional Bull's kiln, or intermittent type kilns at a temperature of 950 to 1050° C*.

**bump**<sup>1</sup> *n/v*: ELABPROC golpe de prensa. [Exp: **bump**<sup>2</sup> (EXPL-CANT explotar, volar), **bump**<sup>3</sup> (EXPL-CANT desprendimiento), **bump**<sup>4</sup> (GRAL golpear)].

**bundle** *n*: DISTRIB caja de tablas, fardo; paquete; marco de madera -*wooden framework*- donde las planchas los azulejos se embalan para su transporte ◊ *Tiles per bundle: 24; Weight per bundle: lbs. 37; Bundles per pallet: 36; Weight per pallet. lbs. 1332.* [Exp: **bundled bars** (CONST paquete de barras; grupo de (a lo sumo) cuatro barras de armadura paralelas en contacto entre sí, generalmente atadas unas a otras ◊ *Bundled bars are used as reinforcement in reinforced concrete*)].

**bung** *n*: QUIM tapón; pieza empleada para sellar un contenedor insertándose (al menos en parte) dentro de éste en el acto de sellado, evitando así pérdidas y contaminaciones del contenido ◊ *In chemistry, bungs are usually made of hardened rubber.* [Exp: **bung (of saggars)** (ELABPROC/MAQELAB pila de ahornado ◊ *Inside the oven, the saggars were stacked from floor to ceiling, in bungs*)].

**bungalow** *n*: GRAL/CONST bungalow; casa pequeña de una única planta que se suele construir en parajes destinados al descanso.

**bunging-up** *n/v*: TRANSPROC/TRANSMTRLS/DISTRIB apilar, apilado V. *placing*.

**Bunsen's extinction coefficient** *n*: PROPQUIM-FIS coeficiente de extinción de Bunsen ◊ *The reciprocal of the thickness that a layer of glass, or other transparent material, must have for the intensity of transmitted light to be decreased to one-tenth of its intensity as it falls on the layer is known as the Bunsen's extinction coefficient.*

**burden**<sup>1</sup> *n*: INDAFIN/GESTIÓN carga, peso; estrictamente, materiales distintos del coque empleados en la carga de un alto horno; en la práctica, sinónimo de *stock*, pero éste suele referirse a los materiales de carga en el horno mientras que *burden* puede aplicarse a cargas (y pesos) tanto dentro como fuera del horno ◊ *Unlike wall tiles, floor tiles bear the extra burden of foot traffic; V. charge.* [Exp: **burden**<sup>2</sup> (EXPL-CANT escombros; material que se extrae del frente de cantera ◊ *Depending on the burden to be removed, a fast break may be obtained*)].

**burgee** *n*: TRANSMTRLS/INDAFIN arena usada ◊ *Burgee includes grinding and polishing agents for cold working of glass.*

**Burger's vector** *n*: GEO-MIN-CRIST vector de Burger; medida de la distorsión que produce la dislocación y que, además, aporta la dirección y el sentido en el que ésta mueve ◊ *The Burger's vector is normal to an edge dislocation, parallel to a screw dislocation; V. crystal structure.*

**burlap** *n*: CONST arpillera, hessian; tejido tosco y basto usado como cubierta para retener el agua durante el curado del hormigón y en la fabricación de sacos y piezas de embalaje; se usa también para crear texturas y efectos decorativos en piezas que requieren un proceso de secado ◊ *To create unique textures a wire screen can be used, or cloth, burlap, anything that has texture itself.*

**burley clay** *n*: MATPRI arcilla burley; tipo de arcilla refractaria con un contenido intermedio de alúmina entre la arcilla con pedernal *-flint clay-* y la arcilla de diásporo *-diaspore clay-*.

**burn** *v*: GRAL quemar. [Exp: **burn off**<sup>1</sup> (ELABPROC/ESMREL calcinar, reducir a cenizas; abrasar por completo, eliminar algo quemándolo; someter al calor intenso cuerpos de cualquier clase con el fin de eliminar las sustancias; también quitar con soplete, decapar al soplete  $\diamond$  *A low-temperature firing of underglaze decoration, to burn off the organic media used in applying the colours, before glazing, is called "hardening-on fire"; V. calcine*), **burn off**<sup>2</sup> (ESMREL/CALIDAD fallo (en el esmalte); defecto en el esmalte vidriado producido por la desaparición del recubrimiento base durante la cocción y que puede deberse a que el esmalte se satura de óxido de hierro  $\diamond$  *A burn off is a fault in vitreous enamelling resulting from the apparent burningaway of the ground coat*), **burn out, burnout** (ELABPROC/ESMREL quemar-se (de forma destructiva), abrasar; destruir por el fuego; quemar algo para destruir alguna de sus partes o el todo; eliminar algo quemándolo; calcinar  $\diamond$  *All glaze additives burn out of the glaze and have no effect on the fired glaze unless they are used improperly; V. burn off*), **burner** (MAQELAB quemador, soplete (oxiacetilénico); aparato que efectúa la mezcla aire-gas y asegura la combustión del gas  $\diamond$  *A reducing atmosphere is achieved in gas kilns by reducing the amount of primary air available to each burner*), **burner block** (INDAFIN V. *quarl block*), **burner jet** (MAQELAB boquilla del quemador), **burner nozzle** (MAQELAB cabeza/cuerpo del quemador), **burning** (ELABPROC cocción, calcinación; cochura, combustión; término alternativo pero menos apropiado para referirse a la cocción en inglés V. *firing*), **burning off** (ELABPROC/INDAFIN quema/quemado; acción de quemar/consumir en el fuego, destruir algo quemándolo  $\diamond$  *When the scurf is periodically removed, by burning off, there is a danger that the refractory brickwork of the retort or oven may be damaged by overheating; V. burn off*), **burning out of carbonates** (ELABPROC eliminación de residuos ácidos), **burning point** (PROPQUIM-FIS punto de combustión, punto de inflamación  $\diamond$  *The burning point is the lowest temperature of a liquid at which the liquid burns upon being ignited*), **burning zone (cement)** (INDAFIN V. *clinkering zone*), **burnt** (GRAL quemado; cocido)].

**burnish** *v*: MANTNMTO bruñir, pulir/pulimentar; procedimiento por el cual se da lustre o brillo a una superficie por frotado  $\diamond$  *A 1500 R.P.M. polisher can be used on a periodical basis to remove heavy scratches by burnishing the tile*. [Exp: **burnish gold** (DISEÑO/ESMREL V. *best gold*), **burnished gold** (DISEÑO/ELABPROC oro bruñido, dorado bruñido; efecto del dorado que se ha convertido en oscuro y opaco a través de distintos procedimientos de cochura; también, brillo natural que adquiere una pieza cerámica al frotarla con un objeto de madera en la fase de "cuero"  $\diamond$  *Embellished with burnished gold*), **burnishing** (MANTNMTO bruñido, abrillantado; técnica consistente en suavizar, frotar y pulir para conseguir brillo en la cerámica  $\diamond$  *Burnishing improves the surface finish, surface hardness, wear-resistance, fatigue and corrosion resistance; V. burnish*)].

**burnout** *n*: ELABPROC/ESMREL abrasamiento  $\diamond$  *Many glaze and clay faults in ceramic wares are caused by insufficient burnout of carbon*. [Exp: **burnout/ burn-out** (ELABPROC quemado destructivo  $\diamond$  *During burnout you heat a green ceramic shape to remove the (usually organic) binder*)].

**burnover (brick)** *n*: INDAFIN ladrillo semicocido. [Exp: **burnt clay** (MATPRI arcilla cocida  $\diamond$  *The manufacture of burnt- clay building products is energy intensive*), **burnt umber** (ESMREL tierra de sombra quemada; pigmento marrón oscuro; color marrón oscuro, color chocolate, café  $\diamond$  *Burnt umber is deep reddish chocolate brown*)].

**burr** *n/v*: ELABPROC rebaba, buril; protuberancia; porción de materia sobrante que se acumula de manera irregular en los bordes o en la superficie de una pieza  $\diamond$  *Surface texture treatment by tumbling is used for burr removal, the extent of surface cleaning or polishing depending on the time and loading conditions*; V. *overpress*.

**burst**<sup>1</sup> *n/v*: EXPL-CANT desprendimiento V. *rock burst*. [Exp: **burst**<sup>2</sup> (GRAL/EXPL-CANT explotar, estallar; reventar), **bursting** (INDAFIN/MAQELAB descascarillamiento, aumento de volumen y resquebrajamiento; hinchazón *-swelling-* y aumento de tamaño de los refractarios a temperaturas elevadas que tiene como resultado final la rotura)].

**bushing** *n*: INDAFIN V. *orifice ring (glass)*.

**business** *n*: GESTIÓN negocio, empresa. [Exp: **business accounting** (GESTIÓN contabilidad comercial), **business administration** (GESTIÓN administración/gestión de la empresa), **businessman**, **-woman**, **businessperson** (GESTIÓN empresario,-a; hombre o mujer de negocios; persona de negocios)].

**bustle pipe (blast furnace)** *n*: INDAFIN tofo (alto horno); tubo metálico de gran diámetro revestido de material refractario que rodea un alto horno a un nivel algo superior al de las toberas  $\diamond$  *The hot blast main enters into a doughnut shaped pipe that encircles the furnace, called the "bustle pipe"*; V. *hot-blast circulating duct*.

**butt** *v*: INSTAL ensamblar, juntar a tope, poner en contacto; estar en contacto  $\diamond$  *A butt joint is a joinery technique in which two members are joined by simply butting them together*. [Exp: **butt joint** (INSTAL junta cerrada/a tope/estanca, unión a tope; unión por cubrejunta; unión simple y recta entre dos miembros; unión/junta en la que la distancia entre las piezas se reduce al mínimo y es prácticamente imperceptible visualmente  $\diamond$  *The butt joint is a very simple joint to construct: members are simply docked at the required angle (usually 90°) and required length*; V. *open joint*; *hidden joint*)].

**butter** *v*: INSTAL enlechar, untar; esparcir el mortero sobre una superficie, generalmente la posterior, del azulejo o pieza a colocar  $\diamond$  *Butter the mortar onto the back of the tile just as you would a piece of bread*; V. *back butter*. [Exp: **buttered joint** (INSTAL/CONST junta abierta, junta hueca; junta de mortero muy fina hecha a base de poner una pequeña cantidad de mortero con la paleta *-buttering trowel-* en todos los bordes de junta del azulejo/ladrillo y colocarlo sin el lecho de mortero *-mortar bed-* habitual  $\diamond$  *The bricks were laid with a thin "buttered" joint using red mortar*; V. *tooled joint*), **buttering** (INSTAL untado, embadurnado; acto de embadurnar/untar el reverso del azulejo de mortero para su posterior instalación), **buttering trowel** (INSTAL paleta; herramienta consistente en una placa, normalmente de acero, con un asa empleada para untar/espacir el mortero en el reverso de un azulejo antes de colocarlo  $\diamond$  *If you find voids, spread additional thin set on the back of the piece with your buttering trowel*; V. *back buttering/backbuttering; buttering*)].

**butterfly bruise** *n*: MTRLS/ELABPROC V. *percussion cone*.

**button** *n*: INSTAL botones/prominencias; pequeños elementos salientes en forma de botón que solían incorporarse a la parte posterior (no vista) de una baldosa pero que ya no se utilizan. [Exp: **button test** (ENSAYO V. *fusion-flow test*), **buttonback/button-back tile** (PRODFIN baldosa con prominencias/botones en el dorso/reverso/la parte posterior; baldosa con pequeños elementos salientes en forma de botón en el reverso  $\diamond$  *Unless completely backed with mortar, button-back tile may crack under concentrated force such as the spiked heel of a woman's shoe*), **button-backed** (INSTAL/PRODFIN con botones/prominencias en el dorso/reverso/parte posterior  $\diamond$  *Single fired products are produced with a flat back, which makes installation much easier than the old fashion button-backed or lug-backed pieces*)].

**buttress** *n*: CONST contrafuerte. [Exp: **buttress wall** (INDAFIN cabecera de la batería (hornos de coque))].

**butyl stearate** *n*: QUIM/ESMREL estearato de butilo; líquido usado como lubricante común, en lustres, como plastificante y como disolvente de colorantes  $\diamond$  *The binder is then slowly milled into the dry ceramic materials until good wetting is obtained; the lubricant such as butyl stearate is then added*.

**buy** *v*: GRAL/COM comprar, adquirir. [Exp: **buyer** (COM comprador  $\diamond$  *The prospective buyer of the product*)].

**buzz** *n*: GRAL zumbido; ruido confuso, vibración.

**byproduct** *n*: SUBPROD subproducto, derivado (producto); producto secundario  $\diamond$  *A by-product is a secondary or incidental product deriving from a manufacturing process, a chemical reaction or a biochemical pathway, and is not the primary product or service being produced*.

## N

**n** *abbr*: QUIM/MEDIDA V. *nano-*.

**N** *abbr*: PROPQUIM-FIS V. *nominal size*.

**N** *abbr*: MEDIDA V. *newton*.

**NA** *abbr*: PROPQUIM-FIS V. *numerical aperture*.

**Nabarro-Herring creep** *n*: PROPQUIM-FIS fluencia Nabarro-Herring  $\diamond$  *Nabarro-Herring creep is a form of diffusion controlled creep with a weak stress dependence and a moderate grain size dependence, with the creep rate decreasing as grain size is increased; V. creep; Coble creep*.

**nacre** *n/a*: ESMREL nácar  $\diamond$  *Nacre is a translucent pigment which, when added to transparent coating material creates a deep lustrous and pearlescent*

*finishmicrometres, which is comparable to the wavelength of visible light. [Exp: **nacreous pigment** (ESMREL pigmento nacarado  $\diamond$  When coated on a white surface, the nacreous pigment provides a two-tone metallic effect)].*

**nacrite** *n:* MATPRI nacrita; mineral de arcilla del grupo de la caolinita  $\diamond$  *Kaolinite shares the same chemistry as the minerals halloysite, dickite and nacrite and is important to the production of ceramics and porcelain.*

**Naftoflex** *n:* MTRLS Naftoflex; marca comercial de pastas para moldeo empleadas en la industria cerámica y de la porcelana  $\diamond$  *Failure of Naftoflex to harden is caused either by insufficient stirring of the mixed components or by use of wrong proportions.*

**nail** *v:* GRAL/INSTAL clavar  $\diamond$  *When the substructure accepts nails without trouble, it is preferred to nail the tile panels to the substructure. [Exp: **nailable concrete** (INDAFIN/CONST hormigón clavable; hormigón generalmente preparado con agregados livianos -lightweight aggregates-, con o sin aserrín -sawdust-, y en el que pueden clavarse clavos), **nailing** (INSTAL claveteado  $\diamond$  *The nailing patterns are critical to maximise joint strength*), **nailing gun** (INSTAL pistola para clavar; pistola que, al disparar una pequeña carga de pólvora, introduce clavos en superficies de madera, hormigón clavable -nailable concrete-, ladrillo, etc.), **nailing machine** (GRAL/INSTAL máquina para clavar  $\diamond$  *A nailing machine for pallets, comprises nailing grippers supported by a beam which is controllably movable in a vertical plane*)].*

**naked eye, with the** *phr:* GRAL vista, a simple  $\diamond$  *Often the nonhomogeneous elements can be distinguished with the naked eye (grain, inclusions, pores).*

**Nalfloc** *n:* MTRLS Nalfloc; marca comercial de sílice coloidal V. *colloidal silica.*

**name** *v/n:* GRAL nombre, denominación. [Exp: **name** (GRAL nombrar, denominar  $\diamond$  *Every named colour in the register is placed in the RAL Colour List, a set of cards with the original colour shade on their left-hand side*)].

**nano-, n** *pref:* QUIM/MEDIDA nano-. [Exp: **nano-hardness, nano hardness, nanohardness** (PROPQUIM-FIS nanodureza; propiedad mecánica de los materiales utilizada para caracterizar la resistencia al desgaste de éstos o su resistencia a la deformación plástica o permanente en el nivel nano  $\diamond$  *The measurements showed that the nano-hardness of both ceramics is substantially higher compared to macro-hardness; V. nano-hardness test; macro-hardness*), **nano-hardness/nano hardness/nanohardness test** (ENSAYO ensayo de nanodureza; ensayo/test que usa cargas mínimas (en torno a 1 nanonewton) para luego medir de forma precisa la profundidad de la indentación  $\diamond$  *The nano-hardness test and the micro-scale abrasive wear test, have been developed to measure thin, hard, wear resistant layers*), **nano-indentation, nano indentation, nanoindentation** (ELABPROC/ENSAYO nanoindentación; técnica empleada para obtener del valor de dureza de un material y para inducir modificaciones en las propiedades de las superficies, basado en el registro continuo de la profundidad de la indentación y de la carga aplicada), **nanometer, nm** (MEDIDA nanómetro; una millonésima de milímetro  $\diamond$  *The particle sizes of most conventional materials fall in the range of 50 nm to 1.0 cm*), **nanoperm, nPm** (MEDIDA nanoperm; unidad que mide la permeabilidad de un cuerpo: 1 Pm = 10. 9. nPm  $\diamond$  *The nanoperm is used when c.g.s. units are applied to the*

*permeability of ceramic materials; V. perm*), **nanopowder** (MTRLS nanopolvo  $\diamond$  *The microstructure of these materials provides a route towards preparing nanopowder-based ceramics with a 25-30% increase in strength in comparison to ceramics of the same density prepared from conventional powders*), **nano-scratch, nano scratch, nanoscratch** (ELABPROC/ENSAYO nanorayado  $\diamond$  *Surface characterisation by nano indentation and nano scratch method to determine hardness and adhesion of coating*), **nanostucture** (PROPQUIM-FIS nanoestructura; estructura de tamaño intermedio entre las estructuras moleculares y microscópicas (de tamaño micrométrico)  $\diamond$  *It enables a very efficient path towards ordered non-oxide ceramic nanostructures*), **nanostuctured ceramics** (PRODFIN cerámica nanoestructurada  $\diamond$  *Nanostructured ceramics may find use in medical applications since it presents peculiar mechanical and physical properties which cannot be obtained by using conventional ceramics*), **nanostuctured material** (MTRLS material nanoestructurado; sistema macroscópico formado a partir de unidades fundamentales de dimensiones nanométricas), **nanostuctured material ceramics, NsMC** (PRODFIN cerámica de material nanoestructurado  $\diamond$  *The hardness of bulk NsMC at room temperature is independent of grain size; V. nanostructured material*), **nanotechnology** (GRAL nanotecnología; campo de las ciencias aplicadas dedicado al control y manipulación de la materia a un nivel de nanoescala, es decir, a una escala menor que un micrómetro (nivel de átomos y moléculas); también técnicas desarrolladas en dicho campo  $\diamond$  *Nature has demonstrated that through nanotechnology, ceramic materials can be made more durable*)].

**Naples yellow n:** ESMREL amarillo de Nápoles V. *antimony yellow*.

**NASICON abbr:** PROPQUIM-FIS V. *sodium super-ionic conductor*.

**national a:** GRAL nacional. [Exp: **National Bureau of Standards, NBS** (ORG-INST Agencia Nacional de Normalización  $\diamond$  *The NBS became the National Institute of Standards and Technology, or NIST, in 1988; V. NIST; British Standard Institution*), **national demand** (COM demanda interior/nacional), **National Electrical Manufacturers Association, NEMA** (ORG-INST Asociación Nacional de Fabricantes de Equipo Eléctrico; asociación estadounidense encargada de establecer estándares para la manufactura de productos eléctricos), **National Enterprise Board, NEB** (ORG-INST Junta Nacional para el Fomento de la Industria; Instituto Nacional de Industria), **National Fire Protection Association, NFPA** (ORG-INST Asociación Nacional de Protección contra Incendios  $\diamond$  *The National Fire Protection Association stipulates that the resistance of a conductive floor shall be less than 1 megohm as measured between two points 3 ft (1 m) apart*), **National Institute of Building Sciences, NIBS** (ORG-INST Instituto Nacional de la Construcción  $\diamond$  *NIBS has provided the opportunity for free and open discussion of issues and problems where there was once conflict and misunderstanding between government and the private sector construction industries*), **National Institute of Standards and Technology, NIST** (ORG-INST Instituto Nacional de Normalización y Tecnología  $\diamond$  *NIST site provides chemical and physical property data on over 40000 compounds*), **National Physical Laboratory, NPL** (ORG-INST Laboratorio Nacional de Física  $\diamond$  *NPL is the UK's national measurement laboratory*), **national standards** (CALIDAD/ENSAYO normas nacionales  $\diamond$  *Manufactured and tested according to national standards*), **National Syndical Group of Tile Industries, ANSIA** (ORG-INST Agrupación Nacional Sindical de Industriales Azulejeros; asociación predecesora de ASCER y a la que ésta sustituyó en 1977, ampliando además sus

funciones V. *ASCER*), **nationalised/nationalized industry** (GRAL/GESTIÓN industria estatal), **nationwide** (GRAL de ámbito nacional, a escala nacional ◊ *A nationwide industry leader in the sector*), **native metal** (QUIM metal en estado nativo ◊ *A native metal is any of twenty-one metals that can be found freely in nature*)].

**natural a:** GRAL/PROPMATPRI natural. [Exp: **natural abrasive** (TRANSMTRLS/TRANSPROC abrasivo natural ◊ *Flint is a natural abrasive not commonly used today*), **natural aggregates** (TRANSMTRLS áridos naturales), **natural anisotropy** (PROPQUIM-FIS anisotropía natural V. *anisotropy*), **natural appearance** (DISEÑO apariencia/aspecto natural ◊ *Natural Wave Tiles allow you to enjoy the natural appearance of marble, onyx and black pumice with a completely flat surface*), **natural bed** (EXPL-CANT/GEO-MIN-CRIST lecho natural/de cantera), **natural bedding** (GEO-MIN-CRIST/EXPL-CANT estratificación natural V. *bedding*), **natural drying** (ELABPROC secado natural ◊ *There are two drying methods, natural drying and artificial drying, the former using the sun's heat, which is an economic source of energy, but needing a large area for its drying yards*), **natural gas, NG** (GRAL gas natural; mezcla de gases cuya composición varía dependiendo del yacimiento del que se extrae pero que contiene principalmente metano junto con otros gases como nitrógeno, etano, butano, propano, mercaptanos y trazas de hidrocarburos más pesados ◊ *A reduction atmosphere requires a consumable fuel source, such as natural gas, propane, or wood*), **natural stratification** (GEO-MIN-CRIST/EXPL-CANT V. *natural bedding*), **natural/matt finish** (PRODFIN acabado natural ◊ *A natural finish is a generally smooth, ranging to slightly textured surface finish*), **naturally occurring** (GRAL natural ◊ *Pigments based on naturally occurring clay minerals*)].

**nature n:** GRAL/MEDAMB naturaleza.

**nautralisation n:** QUIM V. *neutralization*.

**NBS abbr:** ORG-INST V. *National Bureau of Standards*.

**NBSC ceramics abbr:** PRODFIN V. *nitride bonded silicon carbide ceramics*.

**NCC abbr:** INDAFIN V. *no-cement castable*.

**NCV abbr:** PROPQUIM-FIS V. *net calorific value*.

**NDE abbr:** ENSAYO V. *non-destructive/nondestructive evaluation*.

**NDI abbr:** ENSAYO V. *non-destructive/nondestructive inspection*.

**NDT abbr:** ENSAYO V. *non-destructive/nondestructive testing*.

**near-net shaping, NNS n:** ELABPROC proceso(s) de conformado neto; proceso por el que se obtiene un producto casi acabado en un reducido número de operaciones ◊ *For green ceramics, near-net shaping provides a close approximation to the final fired shape, minimising the need for expensive diamond grinding of the fired shape to achieve the required shapes and size tolerances*.

**neat** *a*: GRAL puro; claro. [Exp: **neat cement** (INDAFIN cemento puro; cemento y agua  $\diamond$  *Neat cement is hydraulic cement in the unhydrated state*), **neat cement grout** (INDAFIN/CONST mortero de cemento puro; mezcla fluida de cemento hidráulico y agua, con o sin aditivos; también el equivalente ya endurecido de dicha mezcla), **neat cement paste** (CONST pasta cementicia pura), **neat heating value, NHV USA, Canada** (PROPQUIM-FIS V. *net calorific value*)].

**NEB** *abbr*: ORG-INST V. *National Enterprise Board*.

**neck** *n*: GRAL cuello; parte superior y más estrecha de una vasija/botella  $\diamond$  *Both bands are used to compress the clay and thus reduce the size of the neck*. [Exp: **neck brick** (DISEÑO V. *feather-end*), **neck mould** (INDAFIN boquillera; molde que da forma al cuello de una botella de cristal), **neck ring** (INDAFIN V. *neck mould*)].

**needle** *n*: INSTR/ESMREL aguja  $\diamond$  *To check the thickness, use a needle tool to penetrate the glaze, and mark the point where the glaze stops with the tip of your finger or thumb*. [Exp: **needle (glass)** (INDAFIN punzón (industria del vidrio) V. *plunger*), **needle-shaped** (QUIM/PROPQUIM-FIS en forma de aguja, acicular  $\diamond$  *The small residual needle-shaped crystals are mullite*)].

**negative thixotropy** *n*: PROPQUIM-FIS/PROPMATPRI tixotropía negativa; aumento de la viscosidad dependiente del tiempo a deformación constante  $\diamond$  *A phenomenon, displayed by suspensions of some clay minerals, in which fluidity increases with resting time, and the hysteresis loops are clockwise; V. thixotropy*.

**negotiable** *a*: GESTIÓN negociable; a convenir, transmisible, transferible. [Exp: **negotiate** (GESTIÓN negociar; discutir, gestionar, tratar), **negotiation** (GESTIÓN negociación), **negotiable order/bill of lading** (DISTRIB conocimiento de embarque negociable/al portador V. *deal*)].

**NEMA** *abbr*: ORG-INST V. *National Electrical Manufacturers Association*.

**neo-ceramic glass** *n*: PRODFIN cristal neocerámico, vidrio neocerámico  $\diamond$  *Thick neo-ceramic glass is used to provide the best in safety and heat retention*.

**neodymia** *n*: QUIM/INDAFIN V. *neodymium oxide*.

**neodymium** *n*: QUIM neodimio; elemento químico que, a temperatura ambiente, se encuentra en estado sólido  $\diamond$  *Neodymium colors glass in delicate shades ranging from pure violet through wine-red and warm grey*. [Exp: **neodymium oxide** (QUIM/INDAFIN óxido de neodimio  $\diamond$  *Neodymium Oxide is mainly used for glass and capacitors*), **neodymium salts** (QUIM/ESMREL sales de neodimio  $\diamond$  *Neodymium salts are used as a colourant for enamels*)].

**neoprene** *n*: MTRLS neopreno; tipo de goma sintética -*synthetic rubber*- con excelente resistencia a la intemperie -*weather resistance*- y que en industria se utiliza en recubrimientos resistentes a la corrosión y como base para adhesivos  $\diamond$  *Isostatic fluid is usually a solution of water and soluble oil, and for this reason a bag and closure made of an oil-resistant synthetic rubbersuch as neoprene is advisable*.

**nepheline** *n*: MATPRI nefelina; ortosilicato de aluminio y sodio utilizado como fundente en la industria cerámica ◊ *The glass and ceramics industries use nepheline as a raw material.* [Exp: **nepheline syenite** (MATPRI/ESMREL/ELABPROC nefelina sienita; feldespató sódico-potásico; roca ígnea compuesta principalmente de nefelina y feldespató empleada como constituyente de algunos esmaltes para evitar el cuarteado *-crazing-* y como fundente *-flux-* en algunas pastas ◊ *Because nepheline syenite lacks quartz and is rich in feldspar and nepheline, it is used in the manufacture of glass and ceramics; sometimes it is used instead of feldspar*)].

**Nernst-Einstein equation** *n*: PROPQUIM-FIS ecuación de Nernst-Einstein; ecuación que establece la relación entre difusividad y conductividad ◊ *Through the Nernst-Einstein relationship, electrical conductivity measurements prior to diffusion can be used to predict the diffusion coefficient.*

**nest of screens** *n*: TRANSPROC/TRANSMTRLs gradiómetro, columna de tamices ◊ *A nest of screens will, therefore, separate the sediment sample into groups of grains that range in size between the larger sieve through which they just passed and the sieve on which they were caught.*

**nesting** *n*: ELABPROC acomodo de piezas (en el horno), colocación de piezas (en el horno) ◊ *The procedure of stacking greenware in a kiln during the bisque firing is called nesting; V. stacking.*

**net** *a*: GRAL neto; global; limpio, puro, claro, bien definido; que resulta líquido en cuenta o en el precio después de deducir los gastos. [Exp: **net calorific value, NCV** (PROPQUIM-FIS poder calorífico neto, poder calorífico inferior; potencia calorífica neta; calor desprendido en la combustión de 1 Kg de combustible cuando el vapor de agua originado en la combustión no condensa ◊ *In general, clinker manufacturers try to incorporate into their kiln, so as to reduce the production costs, fuels which have the property of burning relatively poorly, as well as products of low combustibility which have a low net calorific value (NCV); V. heating value*), **net price** (COM/GESTIÓN precio neto), **net salary** (GESTIÓN sueldo neto), **net weight** (PROPQUIM-FIS peso neto; peso de la mercancía/bienes sin embalajes ◊ *The net weight of the shipment shall be determined; V. weight; net weight*)].

**network**<sup>1</sup> *n*: GRAL/QUIM/GESTIÓN red, cadena. [Exp: **network**<sup>2</sup> (COM/GESTIÓN red de distribución, cadena de distribución/ventas; sistema para difundir/transmitir un producto/servicio a través de una cadena o red), **network former** (QUIM formador de red, formador de retículo ◊ *The bonding dental ceramic material includes at least one network former*), **network modifier, NWM** (QUIM modificador de red, modificador de retículo ◊ *The network modifier is an important ingredient, since it opens up the glass structure and lowers the glass temperature*), **network-forming ion** (QUIM ion formador de red ◊ *One of the ions in a glass that form the network in the glass structure as postulated by Zachariasen is called network-forming ion*), **network-modifying ion** (QUIM ión modificador de red; en un cristal, ion que no participa en la red ◊ *It is accepted by those skilled in the art of ceramics that the Sn IV state represents a network modifying ion, having a Field Strength of 7.9*)].

**Neuberg blue** *n*: ESMREL azul de Neuberg  $\diamond$  *Neuberg blue is a pigment made up of a mixture of copper blue and iron blue.*

**Neumann-Kopp rule** *n*: PROPQUIM-FIS regla de Neumann-Kopp  $\diamond$  *The specific heat capacity of all alloys was calculated using the Neumann-Kopp rule.*

**neumatic separation** *n*: TRANSPROC V. *air separation.*

**neutral** *a*: GRAL neutro, neutral. [Exp: **neutral atmosphere** (MAQELAB atmósfera neutra; en un horno, atmósfera controlada y equilibrada, en la que no hay ni exceso ni falta de oxígeno, esto es, una atmósfera que no es ni oxidante -oxidizing- ni reductora -reducing-  $\diamond$  *There is no significant bond breaking in the neutral atmosphere of an electric kiln, so no oxidation takes place*), **neutral cleanser** (MANTNMTO limpiador neutro  $\diamond$  *Tile is easy to clean because dirt simply lays on the surface and is easily removed with a mild, neutral cleanser*), **neutral glass** (INDAFIN vidrio neutro; término comúnmente aplicado a un tipo de vidrio resistente a los ataques químicos  $\diamond$  *There is strong demand for neutral glass which especially holds true for housing construction, but also for design solutions*), **neutral grey glass** (INDAFIN/ESMREL V. *neutral-tinted glass*), **neutral refractory** (INDAFIN refractarios neutros  $\diamond$  *Neutral refractories are resistant to chemical attack by either acidic or basic substances*), **neutralise/neutralize** (GRAL/QUIM neutralizar; hacer neutral; contrarrestar el efecto de una causa con otra diferente u opuesta; en química, hacer neutra una disolución), **neutralisation/neutralization** (QUIM neutralización; reacción química en la que un ácido y una base o álcali (base soluble) reaccionan y producen una sal y agua  $\diamond$  *A salt is any compound which can be derived from the neutralization of an acid and a base*), **neutralisation/neutralization number** (PROPQUIM-FIS/MEDIDA V. *acid value*), **neutraliser/neutralizer** (QUIM neutralizador; solución diluida de álcali o de cianuro de sodio -sodium cyanide- usada en el tratamiento del metal base para el esmaltado vítreo tras el proceso de decapado -pickling-  $\diamond$  *Potassium cyanide is used as a neutralizer in vitreous enamelling*), **neutral-tinted glass** (INDAFIN/ESMREL vidrio gris  $\diamond$  *The batch materials are conveniently melted together in a conventional glass making furnace to form a neutral-tinted glass*)].

**neutron** *n*: PROPQUIM-FIS neutrón; partícula masiva sin carga eléctrica que junto a los protones forman los núcleos atómicos. [Exp: **neutron-absorbing glass** (INDAFIN vidrio absorbente de neutrones  $\diamond$  *The neutron absorbing glass was specially fabricated to have low activation*)].

**new engineering ceramics** *n*: PRODFIN nueva ingeniería cerámica; productos de nueva ingeniería cerámica  $\diamond$  *The development of new engineering ceramics involves innovative processing steps for both raw materials and ceramic laminate products, which is focussed on the resolution of a persistent problem in the substitution of the metallic engineering components by ceramics concerning a lack of toughness; V. engineering ceramics.*

**Newcastle kiln** *n*: MAQELAB horno Newcastle; tipo de horno intermitente, rectangular en origen pero cuyo diseño ha variado con el tiempo  $\diamond$  *The Newcastle kiln found particular use in the firing of refractories and salt-glazed ware.*

**newlydeveloped** *a*: GRAL recientemente desarrollado ◇ *The technological highlight must without doubt be the newlydeveloped and patented dryer pallet.*

**newton, N** *n*: MEDIDA newton; unidad de fuerza en el Sistema Internacional de Unidades (1 N es la fuerza que, aplicada a una masa de 1 kg, desplaza la misma con una aceleración de 1 m/s<sup>2</sup>); debido a que el peso es la fuerza que ejerce la gravedad en la superficie terrestre, el newton es también una unidad de peso. [Exp: **Newtonian flow** (PROPQUIM-FIS flujo Newtoniano ◇ *Water and thin mineral oils are examples of fluids that possess Newtonian flow as distinguished from plastic flow which occurs only when a finite minimum force is exceeded*; V. *newtonian fluid*), **Newtonian fluid** (PROPQUIM-FIS fluido newtoniano; sustancia que muestra una deformación continua bajo la acción de un esfuerzo cortante *-shear stress-* pero que, en ausencia de éste, no experimenta deformación ◇ *Water is a Newtonian fluid because it continues to exemplify fluid properties no matter how fast it is stirred or mixed, it has a viscosity that is always independent of the rate of shear*; V. *non-newtonian fluid*)].

**NFPA** *abbr*: ORG-INST V. *National Fire Protection Association.*

**NG** *abbr*: GRAL V. *natural gas.*

**nib** *n*: CONST/INSTAL extremidad pico (de teja plana) ◇ *A nib serves to hook the tile on the laths in the roof.*

**NIBS** *abbr*: ORG-INST V. *National Institute of Building Sciences.*

**Nicalon** *n*: MTRLS/ESMREL Nicalon, fibras de carburo de silicio; marca común de fibras de carburo de silicio ◇ *When incorporated into a borosilicate or high silica glass matrix, Nicalon provides high flexural strength, high crack-growth resistance, and toughness.*

**nickel** *n*: QUIM níquel; elemento químico usado en el recubrimiento de superficies o niquelado entre otras aplicaciones. [Exp: **nickel oxide** (QUIM/ESMREL óxido de níquel ◇ *Nickel oxide has a range of applications such as making electrical ceramics (thermistors and varistors), pigments for ceramic, glasses and glazes*)].

**niobate** *n*: QUIM niobato; sal de los ácido nióbcicos V. *cadmium niobate; lead niobate; lithium niobate; lead iron niobate; potassium niobate; sodium niobate; lead magnesium niobate; lead nickel niobate.*

**niobium** *n*: QUIM/MTRLS niobio; elemento químico empleado fundamentalmente como elemento de aleación y que, en la industria cerámica, suele formar parte de cerámicas electrónicas ◇ *Niobium is found in niobite and used in alloys.* [Exp: **niobium boride** (QUIM/ESMREL boruro de niobio ◇ *Wear behavior of niobium boride coatings*), **niobium carbide** (MTRLS/QUIM carburo de niobio; material cerámico refractario de extrema dureza utilizado, por ejemplo, como recubrimiento en algunos cermets combinados ◇ *A layer of niobium carbide can be created by chemical vapor deposition*), **niobium nitride** (MTRLS/QUIM nitruro de niobio ◇ *Niobium nitrides are very interesting materials because of their high hardness and high wear resistance, and are used in absorbing anti-reflective coatings*), **niobium oxide** (MTRLS/QUIM óxido de niobio ◇ *Niobium Oxide is a*

*refractory oxide used in making niobium metal, high temperature niobium master alloys, special glasses, piezoelectric and opto-electric devices)].*

**niopside** *n*: QUIM niópsido ◇ *A complete solid-solution series exists between diopside and its nickel analogue, "niopside".*

**nip**<sup>1</sup> *v/n*: GRAL/INSTAL pellizcar, pellizado; cortar ◇ *A tile nipper tool can be used to nip the excess tile from a cut. [Exp: **nip**<sup>2</sup> (GRAL pellizco ◇ *The result of biting something lightly or pressing something between two fingers, edges, or surfaces is called nip*), **nip off** (GRAL/INSTAL pellizcar; cortar o quitar mediante una acción similar a un pellizco ◇ *Nip off smaller chips to avoid taking off more than you need*), **nipped corner** (PRODFIN/INSTAL esquina matada; esquina exterior de una pieza de la que se ha eliminado o suavizado el vértice), **nipped edge** (PRODFIN/ELABPROC borde despuntado; borde suavizado ◇ *The finishing saw also creates the same nipped edge*)].*

**NIST** *abbr*: ORG-INST V. *National Institute of Standards and Technology.*

**nitre** *n*: QUIM V. *potassium nitrate.*

**nitric acid** *n*: QUIM ácido nítrico; compuesto químico muy tóxico y corrosivo comúnmente empleado como reactivo de laboratorio, para fabricar explosivos y fertilizantes; en metalurgia y en refinado es utilizado por reaccionar con la mayoría de los metales ◇ *Seeger's Solution is a solution for testing the acid resistance of ceramics consisting of 262 ml of sulphuric acid and 108 ml of nitric acid added to 1 litre of distilled water.*

**nitride** *n*: QUIM nitruro; compuesto químico que se obtiene por combinación del nitrógeno con otro elemento, especialmente con un metal. [Exp: **nitride bonded silicon carbide ceramics, NBSC ceramics** (PRODFIN cerámica de carburo de silicio ligado por nitruro ◇ *Nitride-bonded silicon carbide ceramics have lower processing costs than many other SiC-based ceramics and adequate properties for use as high-temperature heat exchangers in oxidizing environments*), **nitride ceramics** (PRODFIN cerámica de nitruro; cerámica elaborada a base de nitruros de diferentes tipos (nitruro de silicio, de aluminio, de boro, etc) ◇ *Nitride ceramics are gaining importance in advanced technology applications*; V. *non-oxide ceramics; silicon nitride; gas pressure sintered silicon carbide (GPSSN); low pressure sintered silicon carbide (SSN); hot pressed silicon nitride (HPSN); reaction bonded silicon nitride (RBSN); aluminum nitride; silicon aluminum oxynitride (SIALON)*), **nitriding** (INDAFIN nitruración; introducción de nitrógeno en la superficie de las piezas de acero para darles una corteza extremadamente dura y resistente al desgaste ◇ *The principal reasons for nitriding are: to obtain high surface hardness, to increase wear resistance, to improve fatigue life and corrosion resistance, etc.*)].

**nitrogen** *n*: QUIM nitrógeno. [Exp: **nitrogen atmosphere** (MAQELAB/ELABPROC atmósfera de nitrógeno ◇ *Fusing these powder mixtures with the appropriate metal oxide at 1600-1700°C in a nitrogen atmosphere followed by furnace cooling produces glasses containing up to 15 at.% nitrogen*), **nitrogen ceramics** (PRODFIN cerámica de nitrógeno; cerámica a base de nitruros, oxinitruros, sialones y demás compuestos relacionados que

contienen nitrógeno  $\diamond$  *The strength and creep-resistance of nitrogen ceramics depend markedly on the amount and properties of the intergranular glasses*].

**nm** *abbr*: MEDIDA V. *nanometer*.

**NNS** *abbr*: ELABPROC V. *near-net shaping*.

**no-** *pref*: GRAL sin; prefijo negativo que denota carencia o falta de algo. [Exp: **no-cement castable**, **NCC** (INDAFIN hormigón/concreto refractario sin cemento  $\diamond$  *No cement castable has general applications in the refractory field*; V. *castable*), **no-fines concrete** (INDAFIN hormigón sin finos; hormigón en el que se omite el agregado de finos, por lo que hay un gran número de vacíos intersticiales que lo hacen poroso  $\diamond$  *No-Fines concrete is less able to absorb and store heat than conventional pavement*)].

**noble metal** *n*: QUIM metal noble; metal que no se disuelve ni oxidiza con facilidad y que difícilmente se combina con otros elementos para formar compuestos, por ejemplo el oro, la plata o el platino V. *active metal*.

**noborigama** *n*: MAQELAB noborigama, horno colgante; tipo de horno de origen japonés y obsoleto pero que puede ser utilizado todavía hoy en las técnicas tradicionales  $\diamond$  *The noborigama or "climbing kiln" consisted of many chambers up to fifty feet long*.

**nodular** *n*: PROPMATPRI nodular; perteneciente o relativo a un nódulo o en forma de éste  $\diamond$  *Chert is a general term for a cryptocrystalline siliceous rock that may occur in either nodular or tabular form*; V. *morphology*. [Exp: **nodular fireclay** (MATPRI V. *burley clay*), **nodule** (GRAL nódulo; grumo, concreción de poco volumen)].

**noise** *n*: GRAL ruido. [Exp: **noise control** (SEG/MEDAMB control de ruido  $\diamond$  *Industry should take noise control measures*), **noise emission level** (SEG/MEDAMB nivel de emisión de ruido), **noise level** (SEG/MEDAMB nivel sonoro/acústico/de ruido)].

**nominal** *a*: GRAL nominal. [Exp: **nominal chemical characterization** (PROPQUIM-FIS caracterización química nominal  $\diamond$  *Nominal chemical characterization includes the major chemical composition and the impurity analysis*), **nominal density** (PROPQUIM-FIS densidad nominal; relación entre la masa en el aire de un volumen dado de agregado (poros no saturables incluidos) y la masa de un volumen igual de agua destilada libre de gas a temperatura establecida), **nominal dimension** (PROPQUIM-FIS dimensión nominal; dimensión, normalmente establecida mediante números, establecida para una baldosa (u otra pieza) que incluye una estimación de la dimensión de las juntas; el orden a seguir suele ser: espesor, altura y longitud  $\diamond$  *Most manufacturing people will refer to the nominal dimension as the closest common value to the dimension specified*; V. *nominal size*), **nominal purity** (PROPQUIM-FIS pureza nominal  $\diamond$  *The powders had a nominal purity level of 99.999%*), **nominal size**, **N** (PROPQUIM-FIS dimensión nominal  $\diamond$  *The most common sizes are: Nominal size (N) cm, understood as the facial size or thickness of tile, Work size (W) mm, Length and Width*; V. *nominal dimension*), **nominal thickness** (PROPQUIM-FIS grosor nominal)].

**nomogram** *n*: GRAL nomograma, ábaco; nomógrafo; representación gráfica empedada como instrumento de cálculo que permite el cómputo gráfico y aproximado de una

función de cualquier número de variables, por lo que contribuye a realizar cálculos numéricos aproximados con rapidez ◇ *A nomograph has been devised to aid in the computation of certain underground geologic-structure problems.* [Exp: **nomograph** (GRAL V. *nomogram*)].

**non- pref:** GRAL no-, dis-; *non* actúa como prefijo negativo al igual que no; se suele traducir por "in", "falta de", "no-"; no obstante, a veces es preferible recurrir a un antónimo o a una perífrasis para evitar, en la medida de lo posible, una traducción forzada o extranjerizante. [Exp: **non-adhesive, nonadhesive** (PROPQUIM-FIS no adhesivo ◇ *It is non-adhesive, can be repositioned, and is so easy to install;* V. *adhesive*), **non-aqueous, nonaqueous** (PROPQUIM-FIS no acuoso ◇ *Ceramics such as silicon carbide and silicon nitride are also slip cast from nonaqueous slurries*), **non-availability, non availability** (GRAL/COM V. *unavailability*), **non-conductor, nonconductor** (PROPQUIM-FIS no conductor ◇ *For particles that are nonconductors, charge mobility is limited to the surface*), **non-destructive/nondestructive analysis** (ENSAYO análisis no destructivo V. *non-destructive evaluation*), **non-destructive/nondestructive analysis techniques** (ENSAYO técnicas de análisis no destructivo ◇ *This lens allows for the use of non-destructive analysis techniques;* V. *non-destructive analysis*), **non-destructive/nondestructive evaluation, NDE** (ENSAYO evaluación no destructiva ◇ *In ceramic tile industry, delamination is one of the more important and difficult problems to detect and among all the general non-destructive evaluation methods, optical inspection techniques seem to be particularly suitable*), **non-destructive/nondestructive inspection, NDI** (ENSAYO inspección no destructiva V. *non-destructive/non destructive/nondestructive evaluation*), **non-destructive/nondestructive testing, NDT** (ENSAYO ensayo no destructivo; ensayo realizado para comprobar las propiedades, calidad o solidez de materiales o equipos y que puede llevarse a cabo sin causar en ellos daños irreparables ◇ *Because of the brittleness of structural ceramics far greater demands are made on the ability of non-destructive testing devices to detect defects*), **non-destructive/nondestructive testing method** (ENSAYO método de ensayo/prueba no destructivo ◇ *Non-destructive testing method for the detection of the internal defects inside concrete;* V. *non-destructive testing; non-destructive evaluation*), **non-ferrous/nonferrous metal** (QUIM metales no ferrosos; metal o aleación libre de hierro o comparativamente libre, por ejemplo el aluminio, cobre, plomo, zinc, etc. ◇ *Hessian crucible is a type of refractory crucible for use in the small-scale melting of non-ferrous metals*), **non-hazardous, nonhazardous** (PROPQUIM-FIS no peligroso ◇ *Recyclable materials means nonhazardous, materials, that would otherwise be considered or become municipal waste*), **nonionic** (QUIM no iónico V. *anionic*), **nonionic surfactant** (QUIM/MTRLS tensoactivo no iónico, agente de superficie no iónico V. *anionic; anionic surfactant*), **non-loadbearing, nonloadbearing** (PROPQUIM-FIS no portante, no sustentante; que no soporta carga), **non-loadbearing/nonloadbearing exterior wall** (CONST pared externa libre de carga, pared externa no portante ◇ *The fire resistance rating of non-loadbearing exterior walls may be reduced by one hour in buildings equipped throughout with an automatic sprinkler system*), **non-loadbearing/nonloadbearing facade/front** (CONST fachada no portante ◇ *Basically it is a new steel framed building using the original stone walls as a non load bearing facade*), **non-loadbearing/nonloadbearing partition** (CONST tabique no sustentante ◇ *The Ceramic Tile Institute recommends that the steel studs used for tile backing be at least 3 1/4 inch wide prefabricated stud as used in non-load bearing partitions*), **non-metallic/nonmetallic inclusion** (INDAFIN inclusión no metálica ◇ *Thus*

*each non-metallic inclusion in the plastic zone effectively represents a crack in the ferrite matrix*), **non-newtonian fluid** (PROPQUIM-FIS fluido no newtoniano; fluidos donde el esfuerzo cortante no es directamente proporcional a la rapidez de deformación, por ejemplo la crema dental V. *Newtonian fluid*), **non-oxide/nonoxide ceramics** (PRODFIN cerámica sin óxido; término general para un tipo de cerámica (boruros, carburos, nitruros) en cuya estructura no interviene el oxígeno ◇ *The use of non-oxide ceramics has enabled extreme wear and corrosion problems to be overcome, even when there is high temperature and perhaps severe thermal shock involved*; V. *carbide ceramics*; *nitride ceramics*), **non-slip, nonslip** (PROPQUIM-FIS antideslizante; calidad del material de revestimiento empleado en ciertas cubiertas, especialmente las expuestas a la intemperie, con objeto de aumentar la fricción y reducir el riesgo de resbalar durante las operaciones sobre el mismo ◇ *Low cost non-slip surface prevents slips and falls on stairs, decks and ramps*), **non-slip/nonslip tile** (PRODFIN azulejo antideslizante ◇ *On the front porch, a non-slip tile is being installed*), **non-standard, nonstandard** (CALIDAD no estándar ◇ *A non-standard tile does not comply with internal specifications but remains fit for purpose*), **nonstick** (PROPQUIM-FIS antiadherente), **non-stoichiometric(al)/nonstoichiometric(al) compound** (QUIM compuesto no estequiométrico; compuestos químicos en los cuáles los elementos formantes no mantienen proporciones simples y enteras, sino mixtas y variables, en contraposición a los compuestos estequiométricos, que sí lo hacen ◇ *Of some interest in the field of special ceramics are non-stoichiometric compounds*), **non-stoichiometric, nonstoichiometric** (PROPQUIM-FIS no estequiométrico V. *stoichiometric*), **non-stoichiometric/nonstoichiometric ceramics** (PRODFIN cerámica no estequiométrica ◇ *A non-stoichiometric ceramic is one that has a deficiency of one type of atoms*), **nontilting mixer** (MAQTRANS mezcladora no basculante; mezcladora de tambor giratorio horizontal -*horizontally rotating drum mixer*- que carga, mezcla y descarga sin bascular), **non-vitreous, nonvitreous** (PROPQUIM-FIS no vidriado ◇ *It refers to pin-holes or craters sometimes occurring in glazed non-vitreous ceramics while they are in the decorating kiln*; V. *vitrified*), **non-vitrified, nonvitrified** (PROPQUIM-FIS V. *non-vitreous, nonvitreous*)].

**nontronite** *n*: MATPRI nontronita ◇ *Nontronite generally does not exist in economic deposits like montmorillonite, although it is not an uncommon clay mineral*; V. *beidellite*.

**noodle machine** *n*: MAQELAB macarronera; máquina para producir fideos/macarrones de pasta cerámica.

**norflot/norfloat** *n*: MATPRI norflot/norfloat; feldespato de origen noruego.

**normal** *a*: GRAL normal. [Exp: **normal distribution (statistics)** (ENSAYO distribución normal (estadística), distribución de Gauss/gausiana; distribución de probabilidad más empleada debido principalmente a la gran cantidad de variables asociadas a fenómenos naturales que siguen el modelo de la normal y a que su función de densidad es simétrica y con forma de campana, lo que favorece su aplicación como modelo a gran número de variables estadísticas ◇ *Test results show that the notch strength of ceramics follows the normal distribution and the flexure strength of ceramics also follows the normal distribution*; V. *normal distribution curve*), **normal distribution curve** (PROPQUIM-FIS/ENSAYO curva de Gauss, campana de Gauss; curva de distribución normal;

curva en forma de campana; en estadística, curva teórica, simétrica y en forma de campana, que muestra la frecuencia con que un experimento producirá un resultado específico, siendo la anchura de la "campana" el indicador de la credibilidad a otorgar a los resultados de dicho experimento (cuanto más estrecha, más fiable) ◇ *The normal distribution curve is one of the most commonly observed and is the starting point for modeling many natural processes*), **normalising/normalizing furnace** (MAQELAB horno de normalización/ de normalizado ◇ *The normalizing furnace is controllably heated to provide a furnace atmosphere at a temperature of approximately 1400 degree F*).

**norman brick** *n*: INDAFIN ladrillo normando ◇ *A concrete block simulating a Norman brick is formed with two large cores separated by a central web*.

**normative analysis** *n*: GEO-MIN-CRIST análisis normativo; mineralogía calculada y determinada por técnicas analíticas ◇ *Quantitative mineralogy of sandstones by X-ray diffractometry and normative analysis*.

**nose** *n*: INDAFIN boquilla de colada, boca (del convertidor) V. *converter nose*. [Exp: **nose-ring block** (INDAFIN V. *nose-ring brick (cement)*), **nose-ring brick (cement)** (INDAFIN ladrillo terminal de descarga (industria del cemento) ◇ *A nose-ring brick is a block of refractory material specially shaped for building into the discharge end of a rotary cement kiln*)].

**nostril** *n*: MAQELAB orificio; orificio de entrada de gas o aire a la cámara de combustion V. *port*. [Exp: **nostril blocks** (ELABPROC V. *rider brick*)].

**notch** *v/n*: ENSAYO/CALIDAD entalla, entalladura, muesca; modificación producida por una muesca en el borde de una pieza ◇ *A notch is made in a transverse-strength test-piece and the effect of this on the strength at 800°C is determined*. [Exp: **notch resistance** (ENSAYO/CALIDAD resistencia a la entalladura ◇ *Notch resistance is the ability of a material to resist fracture with the presence of a surface imperfection such as a notch, section, crack, or scratch*), **notch test** (ENSAYO ensayo de entalla/entalladura ◇ *The notch test can measure the energy to break a material using a pendulum*), **notch, notching** (INSTAL estriar el mortero, estriado del mortero ◇ *Begin applying thin-set mortar to the floor, notching it with your trowel, and applying the tiles*), **notched** (CALIDAD/ENSAYO con entalla/entalladura, con muesca ◇ *An axe or other blade may become notched when it hits something harder*), **notched beam** (CONST viga entallada, viga con entalladura ◇ *A similar difference also is observed between the fracture toughness values determined either by an indentation technique or by the notched beam (or chevron-notched beam) breakage technique; V. single-edge V-notched beam*), **notched trowel** (INSTAL rasqueta a dientes; para chapado con cola o mortero delgado ◇ *If the mix is too stiff, it will be very difficult to spread with the notched trowel*), **notched wheel** (INSTAL rueda dentada), **notching** (INSTAL corte de los bordes de una pieza; corte, según diferentes formas, de los extremos o bordes de una pieza ◇ *Tiling is fun, but some tasks, such as those requiring intricate tile cutting and notching, can be very difficult*), **notching** (ENSAYO entalla, entalladura; muesca ◇ *Se introdujeron entallas con una longitud nominal del 50% del canto de la probeta mediante el método single edge V notched beam (SEVNB)*), **notching machine** (MAQELAB máquina de rebajar lentamente, muescadora), **noticeable** (GRAL notable, perceptible ◇ *The anchorage used to support the porcelain tiles to the sections is scarcely noticeable from the outside*)].

**novorotor mill** *n*: MAQTRANS molino novorrotor ◊ *A novorotor mill is a double-rotor hammer mill for clay preparation.*

**nozzle**<sup>1</sup> *n*: MAQTRANS/MAQELAB boquilla, tobera de extrusión; pieza por la que se fuerza el paso de material, por ejemplo para la conformación final del extrudado ◊ *Slurry screened to remove coarse particles is commonly atomized using either a nozzle or a rotary atomizer*; V. *outlet nozzle*. [Exp: **nozzle**<sup>2</sup> (MAQELAB tobera; boquilla/orificio tubular a través del cual se inyecta el aire (u otro gas) necesarios para la combustión en los hornos metalúrgicos o cerámicos ◊ *The means for introducing combustion air into the rotary kiln between the feed and discharge ends is a nozzle*), **nozzle (dust extraction)** (SEG mangueta de aspiración; artefacto empleado para la eliminación de polvo, especialmente en ambientes industriales)].

**NPL** *abbr*: ORG-INST V. *National Physical Laboratory.*

**nPm** *abbr*: MEDIDA V. *nanoperm.*

**NPP** *abbr*: QUIM V. *nuclear power plant.*

**NSC ceramics** *abbr*: PRODFIN V. *nitride bonded silicon carbide ceramics.*

**NsMC** *abbr*: PRODFIN V. *nanostructured material ceramics.*

**nucerite** *n*: PRODFIN/INDAFIN nucerite; combinación de cerámica y metal ◊ *Nucerite is a crystallized glass-ceramic lining whose high thermal stability is based on a high content of microcrystals.*

**nuclear** *a*: PROPQUIM-FIS nuclear; perteneciente o relativo al núcleo. [Exp: **nuclear energy** (QUIM V. *nuclear power*), **nuclear physics** (GRAL física nuclear; rama de la física encargada del estudio de las propiedades y el comportamiento de los núcleos atómicos; también física que estudia la estructura fundamental de la materia y las interacciones entre partículas subatómicas), **nuclear power** (QUIM energía nuclear; energía resultante del aprovechamiento de la capacidad que tienen algunos isótopos de ciertos elementos químicos para experimentar reacciones nucleares y emitir energía en la transformación ◊ *Nuclear power provides electricity for a significant percentage of the population*), **nuclear power plant**, **NPP** (QUIM planta de energía nuclear V. *nuclear power station*), **nuclear power station** (QUIM central nuclear ◊ *A thermal power station in which the thermal energy is obtained by a nuclear reaction is called a nuclear power station*; V. *nuclear power plant*), **nuclear reaction** (QUIM reacción nuclear; modificación de la composición del núcleo atómico de un elemento, que muta y pasa a ser otro elemento como consecuencia del proceso), **nucleating agent** (QUIM/MTRLS agente de nucleación; material añadido a o presente en un sistema y que induce a la nucleación tanto homogénea como heterogénea ◊ *In systems where homogeneous nucleation of the required phase does not occur or occurs at slow rates, a small addition of a given substance (nucleating agent) can lead to bulk crystallization at a high nucleation rate*; V. *nucleation*), **nucleation** (PROPQUIM-FIS nucleación; inicio de un cambio de estado, por ejemplo la formación de gas o cristal a partir de un líquido, en una región pequeña pero estable ◊ *Nucleation is a key concept in polymer, alloy, and ceramic systems because*

*all natural and artificial crystallization processes start with a nucleation event; V. homogeneous nucleation, heterogeneous nucleation), **nucleus** (QUIM núcleo; parte central del átomo, constituida por protones y neutrones, que contiene la mayor porción de su masa ◊ *Nuclei are more numerous when the liquid is introduced as a fine mist and the powder is agitated vigorously*)].*

**nullify** *v*: GRAL anular, rescindir; invalidar, incapacitar, dejar sin fuerza; *to nullify a contract*: rescindir un contrato ◊ *Thermal shock can be controlled in vitreous ware by limiting the amount of free silica and supplying the body with sufficient flux to attach and nullify cristobalite.*

**numerical aperture, NA** *n*: PROPQUIM-FIS apertura numérica; en general, para un sistema óptico, número adimensional *-dimensionless number-* que caracteriza el rango de ángulos para los cuales el sistema acepta o emite luz ◊ *The formula for the calculation of numerical aperture, does not take into account striae, surface irregularities, and diffraction; V. acceptance angle.*

**nut (size)** *n/a*: GRAL nuez (tamaño); de nuez, con tamaño de nuez, del tamaño de una nuez; referido al carbón, también significa “en pedazos” o “granos gruesos” ◊ *Most sizes of bituminous coal will work in the furnace but for best results we recommend large nut coal to small egg coal.*

**nu-value** *n*: MEDIDA valor nu ◊ *The nu value is an indicator of the optical non-dispersiveness of glass and similar transparent materials, quantitatively defined; V. abbe value.*

**NWM** *abbr*: QUIM *V. network modifier.*

**NZP** *abbr*: QUIM *V. sodium zirconium phosphate.*



**O** *abbr*: QUIM *V. oxygen.*

**OA** *abbr*: GESTIÓN *V. order acceptance.*

**oblique** *a*: GRAL oblicuo; inclinado al través, sesgado o desviado de la horizontal; en geometría, al referirnos a un plano o una línea: que corta a otro u otra, formando un ángulo que no es recto. [Exp: **oblique saddle junction piece** (PRODFIN pieza sesgada con brida inclinada)].

**obscure glass** *n*: INDAFIN vidrio oscuro ◊ *Obscure glass can be chosen if more privacy is desired for certain parts of the building.*

**observation** *n*: GRAL observación. [Exp: observe (GRAL observar; examinar con atención ◊ *Any observed anisotropy shall be marked on all samples*), **observed value** (PROPQUIM-FIS valor observado; valor de una característica determinado por el resultado de una única observación ◊ *In practice, the calcium to phosphorus ratio was determined*]

*within the limits of accuracy of about +- 0.05, i.e having an observed value in the approximate range 1.62-1.72)].*

**obsidian** *n*: GEO-MIN-CRIST obsidiana (roca volcánica); roca del tipo ígneo volcánica extrusiva perteneciente al grupo de los silicatos y que sirve fundamentalmente como ornamento.

**obstruct** *v*: GRAL *V. block.*

**obtain** *v*: GRAL obtener ◇ *The production to be obtained are tiles of 30 x 30 cm and 1 cm thickness.*

**obtuse** *a*: GRAL obtuso, romo; sin punta. [Exp: **obtuse angle** (GRAL ángulo obtuso; ángulo que mide más de 90° y menos de 180° *V. acute angle*)].

**OC** abbr: GRAL *V. center, on.*

**occlude** *v*: GRAL ocluir; cerrar obstruyendo. [Exp: **occluded air** (ELABPROC/CALIDAD/INSTAL aire ocluido ◇ *The densification process involves removing occluded air by agitation; V. occlusion*), **occluded air cement** (INDAFIN hormigón aerocluso *V. air-entrained concrete; aerated concrete*), **occlusion** (ELABPROC/CALIDAD oclusión; acto por el cual un gas o un líquido es atrapado en el interior de un sólido ◇ *This welding can cause occlusion of differentiated quantities of gas bubbles in the coating of the tile*)].

**occupation** *n*: GRAL ocupación; actividad, empleo, profesión. [Exp: **occupational** (GRAL ocupacional, laboral; profesional), **occupational accident** (SEG *V. accident at work*), **occupational exposure limit, OEL** (SEG límite de exposición ocupacional; límite de exposición *-exposure limit-* en la industria basado en cálculos científicos de concentraciones de una sustancia suspendidas en el aire y que se consideran aceptables para trabajadores sanos), **occupational exposure standard, OES** (SEG estándar de exposición ocupacional, estándar de exposición ambiental; criterio/código para el control del nivel de exposición a sustancias y/o radiación mediante un diseño adecuado de la planta, los controles técnicos y el uso de ropa protectora entre otros; en Gran Bretaña, límite de exposición definido como la concentración de una sustancia en el aire cuya inhalación diaria no hay evidencia de que pueda producir un daño a los trabajadores ◇ *Document title: Silicosis compensation in Western Australian gold miners since the introduction of an occupational exposure standard for crystalline silica*), **occupational footwear** (SEG calzado de trabajo), **occupational hazard** (SEG riesgo laboral; daño y/o riesgo en el trabajo; accidentes y enfermedades a los que están expuestos los trabajadores por el desempeño de su labor), **occupational health** (SEG salud laboral; estado de normalidad en el ejercicio de las funciones laborales; integridad de los trabajadores desde el punto de vista físico y mental y mantenimiento de la misma en el ámbito laboral ◇ *The company is an occupational health provider supplying a wide range of services relating to employee health, well-being and workplace management*), **occupational noise exposure** (SEG exposición al ruido en el trabajo), **occupational risk prevention** (SEG prevención de riesgos laborales ◇ *At the company, occupational risk prevention demands more than just complying with regulations or correcting situations which led to work injuries*), **occupational training** (GRAL/GESTIÓN formación profesional, capacitación profesional)].

**occur** *v*: GRAL ocurrir; aparecer, suceder, tener lugar. [Exp: **occurrence** (GEO-MIN-CRIST índice; concentración local de un mineral detectada en la superficie  $\diamond$  *The best known occurrence of clays at this horizon is, perhaps, in the Mt. Holly Springs region*)].

**ocean** *n*: GRAL océano. [Exp: **ocean bill of lading** (DISTRIB conocimiento de embarque marítimo; recibo dado al embarcador *-shipper-* por las mercancías entregadas y por el que se demuestra la existencia de un contrato de transporte a la vez que se otorgan derechos sobre las mercancías), **ocean freight** (DISTRIB carga marítima , flete marítimo)].

**ochre, ocher** *n/a*: GEO-MIN-CRIST/ESMREL ocre; de color ocre; cualquier mineral terroso de color amarillo o similar; tierra colorante/variedad de arcilla rica en hematites, lo que le da ese color característico  $\diamond$  *Red and yellow ochre pigments abound at the surface in Minas Gerais, Brazil; V. red ochre; yellow ochre; brown ochre.*

**octa-comb system** *n*: INSTAL sistema octa-comb  $\diamond$  *The octa-comb system for installing ceramic fibre panels requires no pre-anchoring plan, but uses studwelding of octagonal packs.*

**octahedrite** *n*: QUIM/ESMREL *V. anatase.*

**oddment** *n*: GRAL artículo suelto; resto  $\diamond$  *The artifacts, which include buckles, buttons, flints, cannonballs, rifle parts, glassware, ceramics and the oddments of everyday life, are not on display; V. fittings.*

**Oden balance** *n*: INSTR balanza de Oden; aparato para el análisis granulométrico *-particle size analysis-* y para medir la curva de distribución acumulativa *-cumulative distribution curve-* de una dispersión midiendo la masa total de sedimento acumulado en el plato de la balanza suspendido en la dispersión  $\diamond$  *Pipette analysis and Oden balance techniques at constant temperature were used to measure the degree of dispersion.*

**OEL** *abbr*: SEG *V. occupational exposure limit.*

**OES** *abbr*: SEG *V. occupational exposure standard.*

**off** *a/adv/pref*: GRAL lejos; desconexión, fuera. [Exp: **off day** (GESTIÓN día inhábil), **off-centre** (GRAL descentrado), **off-contact** (ELABPROC fuera de contacto, área fuera de contacto; distancia fuera de contacto  $\diamond$  *The off-contact is the preset distance between the screen and the substrate to be printed*), **off-cut** (SUBPROD recorte de material  $\diamond$  *Reprocess clay off-cuts into usable material*), **offgassing** (ELABPROC *V. outgassing*), **off-gauge material** (CALIDAD material defectuoso por medidas erróneas), **off-white** (DISEÑO/ESMREL blanco sucio  $\diamond$  *View of off white and grey ceramic wall tiles with a random pattern*)].

**office** *n*: GESTIÓN oficina. [Exp: **office building** (GESTIÓN edificio de oficinas)].

**offset** *v*: GRAL contrarrestar ◇ *The advantages of structural ceramics are somewhat offset by the fact that they are brittle and, consequently, very small defects can lead to a dramatic decrease in their strength.* [Exp: **offset pipe** (GRAL tubería de doble curvatura ◇ *Use a piece of flex pipe for connecting your offset pipe together*), **offset punt** (INDAFIN fondo descentrado, fondo desviado ◇ *Offset punt is a term applied to the bottom of a bottle if it is asymmetric to the axis*), **offset/offset printing** (ELABPROC impresión (en) offset; sistema de impresión basado en el principio de que agua y aceite no se mezclan y que usa placas de superficie plana sobre las que se aplica una tinta -ink- generalmente oleosa; la imagen en la plancha toma la tinta mientras que el resto de la plancha se moja con agua para que la repela ◇ *The invention relates to a process for making ceramic transfer images by offset printing*)].

**O.H. furnace** *abbr*: INDAFIN *V. open-hearth/open hearth furnace.*

**OHF** *abbr*: INDAFIN *V. open-hearth/open hearth furnace.*

**ohm** *n*: MEDIDA ohmio; unidad de resistencia eléctrica del Sistema Internacional. [Exp: **ohmic contact** (ESMREL/PROPQUIM-FIS contacto óhmico; contacto metal semiconductor, terminal del dispositivo ◇ *A coating material is then prepared for use in forming ohmic contact layers on selected limited surface areas of the ceramic bodies, the coating material incorporating a bonding composition*), **ohm-meter** (INSTR ohmímetro, óhmetro; instrumento que mide la resistencia eléctrica)].

**oil** *n*: GRAL aceite, petróleo. [Exp: **oil spot (glaze)** (ESMREL gota de aceite (esmalte), esmalte de (gota de) aceite; piel de liebre; temmoku; tessha; yuketi; vidriados/esmaltes formados por inmiscibilidad de compuestos de hierro en el vidriado ya fundido, a temperaturas entre 1230 a 1300°C ◇ *The two most important factors in the production of oil-spot glazes are the thickness of the glaze and a full oxidation firing*), **oleic acid** (QUIM/MTRLS ácido oleico; ácido graso insaturado -insaturated fatty acid-, incoloro, cuya forma saturada es el ácido esteárico y que se usa comunmente como lubricante ◇ *The addition of copper particles and oleic acid in ethanol caused the wear rates of both ceramics to decrease considerably; V. stearic acid*)].

**old** *a*: GRAL viejo, antiguo. [Exp: **old English bond** (INSTAL/CONST *V. English bond*), **old Roman tile** (PRODFIN *V. Roman tile*)].

**oligoclase** *n*: MATPRI oligoclasa; variedad más común del feldespató mineral plagioclasa ◇ *Oligoclase is industrially important in the manufacture of ceramics.*

**olivine** *n*: GEO-MIN-CRIST olivino, peridoto; silicato de hierro y magnesio con apariencia de mineral verde parduzco y hallado en rocas de origen volcánico, especialmente en basaltos ◇ *The resulting sintered ceramic particles have a residual olivine content not exceeding 3-5%.*

**Omnicon®** *n*: MAQTRANS Omnicon® ◇ *Omnicon is linescan computerised image analyser for measuring particle size and shape.*

**on prep**: GRAL sobre; encima de. [Exp: **on-** (GRAL sobre), **on edge** (ELABPROC de canto (apilado) ◇ *Rearing is the setting of pottery flatware on edge for the firing process*), **on**

**rail car (US)** (DISTRIB sobre vagón ◊ *There is a receiving inspection as it arrives on rail car, to detect any anomalies that may have occurred during shipment*), **on truck (UK)** (DISTRIB V. *on rail car (US)*), **on-glaze, onglaze, on glaze** (ESMREL sobre barniz, sobre cubierta V. *under-glaze, underglaze, under glaze*), **on-glaze/onglaze/on glaze colour/color** (ESMREL color sobre barniz ◊ *Further additions of cobalt had little affect on glaze colour*), **on-glaze/onglaze/on glaze decoration** (ESMREL decoración sobre barniz; decoración de color aplicada sobre el barniz, crudo o ya horneado, en cuyo caso la pieza se horneará por tercera vez, a temperatura más baja ◊ *In the case of on-glaze decoration, the decoration is baked in during normal firing at approximately 780 to 900° C., or in a high-temperature quick firing, at above 900° C;* V. *in(-)glaze decoration*), **on-glaze/onglaze/on glaze firing** (ESMREL/ELABPROC cocción de decoración a baja temperatura ◊ *It is considered that a tensile stress occurring in the glaze layer on-glaze firing, hardly remains in the glaze layer, resulting in marked improvement in impact strength*).

**once-fire** n: ELABPROC monococción ◊ *The once-fire process requires control of slip shrinkage, adherence, and melting properties in order to avoid problems with crawling and blistering; V. once firing; single firing, single fire.* [Exp: **once firing** (ELABPROC V. *single firing, single fire*), **once-fired** (PROPQUIM-FIS monococido, de un único fuego), **once-fired ware** (PRODFIN pieza de monococción; piezas de cerámica blanca a las que se les aplica el esmalte antes de ser cocidas, combinándose así en una sola operación la cocción del bizcocho y del vidriado; los sanitarios son un claro ejemplo de piezas de monococción ◊ *Once-fired ware is much more prone to crawling and pinholing because the glaze-body bond is more fragile after application*)].

**one** n/a: GRAL uno. [Exp: **one piece mold/mould** (ELABPROC molde de una sola pieza), **one round edge** (PRODFIN azulejo canto romo), **one-coat application** (ESMREL aplicación de una capa ◊ *White Ground-coat is a term sometimes used for a white vitreous enamel of high opacity used for one-coat application*), **one-coat ware** (ESMREL cerámica de una sola capa ◊ *One-coat ware refers to articles with a single coat of vitreous enamel, though the term is sometimes used as a contraction of one-cover coat ware, in which case a single cover coat is applied over a ground coat*), **one-component system** (GRAL/QUIM sistema de un único componente ◊ *In a one component system, the critical pressure is the unique pressure at which the liquid and vapor phases become identical*), **one-course pavement** (CONST pavimento de una sola capa), **one-layer rendering** (CONST mortero monocapa), **one-side finish** (PRODFIN acabado por una sola cara)].

**onglaze decoration** n: ESMREL V. *on-glaze/onglaze/on glaze decoration*.

**onset of setting** n: INSTAL iniciación del fraguado ◊ *The cellulose ethers used in the compositions of the present invention also accelerate the onset of setting of the tile adhesives.*

**Ooms Ittner kiln** n: MAQELAB horno Ooms Ittner; marca registrada; horno anular de arco longitudinal dividido en cámaras desarrollado por la compañía Ooms-Ittner V. *annular kiln*.

**OP** abbr: ELABPROC V. *optical pyrometry*.

**op art** *n*: DISEÑO V. *optical art*.

**opacification** *n*: ESMREL opacificación; proceso de volverse opaco ◊ *The purpose of opacification is to make the glaze nontransparent in order to hide the color of the body*. [Exp: **opacified glaze** (ESMREL V. *opaque glaze*), **opacifier** (ESMREL/MTRLS opacificante, opacificador; materia que, introducida en un barniz, lo vuelve opaco; el óxido de estaño es el mejor opacificante, junto con el de circonio y de titanio ◊ *Zircon is also used as an opacifier in vitreous enamels and glazes, and as a constituent of special electrical porcelains*), **opacify** (ESMREL/ELABPROC opacificar; volver opaco), **opacifying agent** (ESMREL/MTRLS agente opacificante/opacificador ◊ *Of the very large tonnages which are used in ceramic applications, perhaps one-third of zircon is used as an opacifying agent in the preparation of glaze frits*), **opacifying effect** (PROPQUIM-FIS efecto opacificante ◊ *Zinc fluxes can also have an opacifying effect on glazes when used in larger amounts*), **opacimeter** (INSTR opacímetro; instrumento/sensor que mide la visibilidad o el grado de opacidad mediante la luz dispersada por las partículas V. *translucency apparatus*), **opacity** (ESMREL/PROPQUIM-FIS opacidad; cualidad de opaco ◊ *Opacity is produced in glazes by the addition of some substances to scatter and reflect some of the incident light*; V. *opaque*)].

**opal** *n*: MATPRI ópalo; sílice hidratada amorfa de lustre resinoso, translúcido u opaco, dura aunque quebradiza y de colores diversos ◊ *Synthetic Opal is material which has essentially the same chemical composition and physical structure as natural opal but has been made by laboratory or industrial process*; V. *opal glass*. [Exp: **opal glass** (INDAFIN vidrio opal/opalino; vidrio translúcido obtenido al añadir a la masa de vidrio espato de flúor o cenizas de huesos, materias éstas que producen la cristalización parcial durante el enfriamiento o el recocido ◊ *Opal glasses are usually made creamy white, and used for dinnerware*), **opalescence** (ESMREL/CALIDAD opalescencia; reflejos de ópalo; aspecto iriscente lechoso de un vidrio o un mineral ◊ *The tile previously coated with underglaze decorations was then examined visually for stability of the decorations and absence of opalescence*), **opalizer** (ESMREL opalizador; sustancia que produce opalescencia en un vidrio/vidriado ◊ *An opaque glaze refers to a glaze composition, containing an opalizer, which devitrifies the glass phase to give it an opaque or matted form*)].

**opaque** *a*: ESMREL/PROPQUIM-FIS opaco; impenetrable por la luz, que impide su paso ◊ *Underglazes are a full palette of rich, vibrant colors that are opaque with 3 coats, semi-opaque with 2 coats and semi-transparent with 1 coat*. [Exp: **opaque glaze** (ESMREL barniz opaco, barniz mate; esmalte mate; esmalte opaco; esmalte no transparente, bien sea coloreado o sin colorear ◊ *An opaque glaze will require a thicker coating of glaze to provide consistent color and finish over the whole piece*)].

**Opatowski process** *n*: TRANSPROC proceso Opatowski; proceso para la extracción de BeO de minerales silíceos.

**OPC** *abbr*: CONST/INDAFIN V. *ordinary portland cement*.

**open**<sup>1</sup> *a/v*: GRAL abrir. [Exp: **open**<sup>2</sup> (GRAL abierto), **open adit** (EXPL-CANT socavón), **open burning** (PROPQUIM-FIS poroso a la cocción ◊ *The excess alumina and low alkalis make*

*these clays open burning*), **open firing** (ELABPROC cocción abierta, cocción en hoguera/en montón; cocción en la que las piezas entran en contacto directo y se amontonan sobre el suelo o en un hoyo excavado en el terreno para su cocción ◊ *Fritted lead glazes show very little vaporisation and this is important in the modern practice of open firing*), **open flame tunnel kiln** (MAQELAB horno túnel de llama libre ◊ *Open-flame tunnel kiln for firing glazed building ceramics*), **open grading** (TRANSMTRLS granulometría abierta), **open joint** (INSTAL junta abierta; junta que se da al ser la distancia entre las piezas alrededor de 1mm y por tanto al volverse visible V. *butt joint*), **open pit, open-pit** (EXPL-CANT cantera, mina a cielo abierto; tajo abierto; en general, excavación que resulta de una explotación a cielo abierto de la que se extraen rocas, áridos, arcillas, etc. ◊ *Fireclays are extracted by open-pit methods, as described for brick-clays*), **open pit/open-pit mine** (EXPL-CANT mina a cielo abierto), **open pit/open-pit quarry** (EXPL-CANT V. *open-cast/open cast quarry*), **open quarry** (EXPL-CANT cantera a cielo abierto), **open setting** (ELABPROC apilado separado ◊ *The lags in temperature within the batch as a whole can be limited by making use of an open setting and limiting the dimensions of the kiln batch in the main direction of heat transfer*), **open up** (EXPL-CANT explotar una cantera ◊ *Open up mine site for investigation*), **open up** (GESTIÓN desarrollar (un mercado), abrir (un mercado); establecer ◊ *Open up the market of 44 million consumers to U.S. businesses; V. market*), **open-cast working** (EXPL-CANT cantera a cielo abierto ◊ *A quarry is an open-cast working of rock*), **open-cast/open cast quarry** (EXPL-CANT cantera a cielo abierto; cantera en la que los trabajos de extracción se realizan en la superficie ◊ *An underground mine may have less implications for the environment than an open cast quarry*), **open-cut/open cut quarry** (EXPL-CANT V. *open-cast/open cast quarry*), **open-faced/open faced quarry** (EXPL-CANT V. *open-cast/open cast quarry*), **open-flame** (MAQELAB llama libre, llama abierta ◊ *Staffordshire potteries were of the large open-flame type*), **open-flame up-draught kiln** (MAQELAB horno de llama abierta directa, horno de tiro ascendente y llama directa), **open-flame/open flame kiln** (MAQELAB horno de llama libre; horno en el que las piezas que se cuecen son expuestas de forma directa a los gases de combustión de la llama ◊ *It is a very big mistake to assume that an open-flame kiln suitable for firing of facing ceramics must be also suitable for firing of sanitary stoneware*), **open-hearth/open hearth furnace, O.H. furnace** (INDAFIN horno Martin, horno de solera (abierta); horno Martin-Siemens ◊ *In the early 1900s, the development of the open hearth furnace (OHF) made it possible for companies to produce higher quality steel and to use scrap metal in the production process; V. acid open-hearth furnace; basic open-hearth furnace*), **opening** (GRAL apertura, inauguración), **opening a clay pit** (EXPL-CANT quitar la capa inservible de una cantera de arcilla; abrir una cantera para su explotación), **opening material** (MTRLS desengrasante; material no plástico añadido a la arcilla plástica en la elaboración de piezas cerámicas para acelerar el secado y reducir la contracción *-shrinking-* ◊ *Opening materials include grog, chamotte, sand and pitchers*), **open-top mixer** (MAQTRANS mezcladora abierta V. *horizontal-shaft mixer*)].

**operate**<sup>1</sup> v: GRAL funcionar, manejar; operar; accionar. [Exp: **operate**<sup>2</sup> (EXPL-CANT explotar una mina), **operating** (GRAL en funcionamiento), **operating area** (EXPL-CANT área de/en explotación), **operating characteristic (statistics)** (PROPQUIM-FIS característica operativa/de funcionamiento, curva de eficacia/operatividad (estadística); descripción del comportamiento de un plan de inspección de muestreo normalmente representado por una curva ◊ *All the piezoelectric/electrostrictive elements exhibit excellent*

*operating characteristics with high stability*), **operating speed** (MAQTRANS/ELABPROD velocidad operativa  $\diamond$  *This unique blender has a tachometer showing operating speed*), **operating system** (GRAL/GESTIÓN sistema operativo; programa/conjunto de programas que realizan la gestión de los procesos básicos de un sistema informático y que permite la normal ejecución del resto de las operaciones), **operating temperature** (PROPQUIM-FIS/ELABPROC temperatura de funcionamiento; temperatura/intervalo de temperatura a la que algo opera de forma satisfactoria; puede referirse también a la temperatura de cocción  $\diamond$  *Use of PSZ in adiabatic engines would require either structural design modifications to reduce thermal gradients or surface coatings to maintain low coefficients of friction throughout the operating temperature range; V. maximum operating temperature*), **operation** (GRAL operación; explotación, maniobra), **operational** (GRAL operativo, en servicio), **operational research, OR** (GESTIÓN investigación operativa; método de investigación matemática destinado a proporcionar una base cuantitativa para las decisiones de gestión  $\diamond$  *It is known as "operational research" in the United Kingdom ("operational analysis" within the UK military and UK Ministry of Defence, where OR stands for "Operational Requirement") and as "operations research" in most other English-speaking countries, though OR is a common abbreviation everywhere*), **operator** (GRAL operario  $\diamond$  *Some operations can be handled by a single operator*), **operational mine** (EXPL-CANT mina operativa)].

**Op-po mill** *n*: MAQTRANS molino Op-po; marca registrada; aparato para la molienda por vibración de partículas y polvos finos.

**optical** *a*: GRAL óptico. [Exp: **optical absorption** (PROPQUIM-FIS absorción óptica; relación entre el coeficiente de absorción y la densidad óptica  $\diamond$  *Such glass undergoes a change in some property, usually optical absorption, on exposure to light and simultaneous or subsequent heat treatment*), **optical art, op art** (DISEÑO arte óptico; movimiento pictórico nacido en EE.UU. en 1958 basado en la abstracción geométrica y/o perceptual y en el que predominan los colores blanco y negro  $\diamond$  *Very schematic, geometric designs that draw upon those of the 1960's and 70's and are occasionally inspired by "Op Art" are also appearing*), **optical blank** (INDAFIN pieza bruta prensada, vidrio bruto; vidrio no decorado; pieza de vidrio óptico que ha sido prensada hasta alcanzar casi la forma final requerida  $\diamond$  *An apparatus and method is disclosed for producing a finished optical blank which may be used for an eyeglass lens, or the like*), **optical crown** (INDAFIN V. *optical crown glass*), **optical crown glass** (INDAFIN vidrio crown óptico; cualquier vidrio de baja dispersión usado para equipos ópticos (por ejemplo el vidrio óptico flint -*flint glass*-)  $\diamond$  *In optical crown glass, a low-index commercial-grade glass, the index of refraction, transmittance, and homogeneity are not controlled as carefully as they are in optical-grade glasses such as BK7*), **optical fiber** (INDAFIN V. *optical fibre*), **optical fibre** (INDAFIN fibra óptica; filamento -*filament*-transparente, generalmente de vidrio o materiales plásticos capaz de dirigir la luz a lo largo de su longitud usando la reflexión total interna  $\diamond$  *Although it is envisaged that the principle application of this invention will be the securing of optical fibre to (ceramic) packages, it would also be possible to employ the present technique to solder or braze glass to metal seals*), **optical flint** (INDAFIN V. *flint glass*), **optical flint glass** (INDAFIN V. *flint glass*), **optical glass classification** (INDAFIN clasificación del vidrio óptico  $\diamond$  *The optical glass classification is a system by which an optical glass is classified according to its refractive index,  $n_D$  and its Abbe Value,  $u$* ), **optical microscope** (INSTR microscopio óptico; microscopio basado en lentes ópticas  $\diamond$  *The full range of particle*

sizes can be examined using optical and electron microscopes; V. microscope), **optical microscopy** (ELABPROC microscopía óptica ◊ *The new technique is very different from other forms of optical microscopy because it does not involve the detection of photons from the object being imaged*; V. microscopy), **optical monitoring** (ELABPROC monitorización óptica; sistema óptico que utiliza lentes y espejos para aumentar la imagen de un elemento y la muestran en una pantalla de cristal), **optical properties** (PROPQUIM-FIS propiedades ópticas ◊ *The optical properties of a material include absorption, transparency, index of refraction, color, and phosphorescence*), **optical pyrometer** (INSTR pirómetro óptico, pirómetro de radiación selectiva; aparato para controlar y medir la temperatura del azulejo utilizado normalmente a la salida del secadero; también se usa para medir la temperatura del horno ◊ *An optical pyrometer is a device which allows contactless temperature measuring by using the incandescence color*; V. *disappearing filament pyrometer*), **optical pyrometry, OP** (ELABPROC medida óptica de la temperatura; método para medir la temperatura sin contacto, mediante la comparación del color y la intensidad de la superficie luminosa del artículo u horno con los de un filamento calibrado ◊ *Laser amorphization of glass-ceramics (LAGC) is investigated by optical pyrometry and video recording*), **optical sorting equipment** (ELABPROC/INSTR equipo óptico de clasificación), **optical temperature measurement** (ELABPROC medida de la temperatura por métodos ópticos), **optics** (GRAL óptica ◊ *Optics is a branch of physics that describes the behavior and properties of light and the interaction of light with matter*)].

**optimum a:** GRAL óptimo. [Exp: **optimum boring direction** (EXPL-CANT dirección óptima de sondeo), **optimum output** (GRAL producción óptima ◊ *It provides up to 8 continuous hours at optimum output and 50 hours on low power*), **optimum quarry layout** (EXPL-CANT diseño óptimo de la cantera/de los cortes de la cantera), **optoelectronics** (GRAL optoelectrónica; campo de la tecnología que combina la física de la luz con la de la electricidad ◊ *Any device that operates as an electrical-to-optical or optical-to-electrical transducer is considered an optoelectronic device*)].

**OR abbr:** GESTIÓN V. *operational research*.

**orange n/a:** ESMREL/DISEÑO naranja; de color naranja. [Exp: **orange peel/orangepeel** (CALIDAD piel de naranja, piel de sapo; superficie rugosa, ligeramente granulada e irregular en un esmalte que, por lo general, suele ser considerada un defecto pero que también puede ser una textura creada de manera premeditada ◊ *Ceramic tiles are treated to prevent slipping either by adding an abrasive grit to the glaze or texture to the surface such as ribs, studs or orange peel finish*; V. *alligator hide*), **orangy** (ESMREL/DISEÑO anaranjado)].

**order<sup>1</sup> n/v:** GESTIÓN/DISTRIB pedido ◊ *Your order of 5th April is receiving our attention*. [Exp: **order<sup>2</sup>** (GRAL pedir, encargar, solicitar), **order acceptance, OA** (GESTIÓN aceptación del pedido ◊ *Order acceptance is one of the main functions in business control*), **order amount** (GESTIÓN cantidad de pedido), **order bill of lading** (DISTRIB albarán al portador, conocimiento negociable/ a la orden ◊ *The purpose of an order bill of lading is to protect the interest of the shipper or the named party to the title to the goods*), **order quantity** (GESTIÓN V. *order amount*)].

**ordinary** *a*: GRAL común, corriente; normal. [Exp: **ordinary hazard** (SEG riesgo profesional sin negligencia; riesgos normales), **ordinary portland cement, OPC** (CONST/INDAFIN cemento portland normal)].

**ore** *n*: GEO-MIN-CRIST mena, mineral; masa de roca *-rock mass-* que contiene una cantidad suficiente de sustancias/componentes aprovechables (minerales o metales) para ser considerada económicamente explotable ◊ *A ceramic mixture for production of ceramic articles includes, in % weight, clay 1-64, ore selected from the group consisting of iron ore and manganese ore 30-98, and at least one metal oxide 0.1 -12.* [Exp: **ore body/deposit** (GEO-MIN-CRIST yacimiento, masa mineral explotable), **ore extraction** (EXPL-CANT extracción de menas/minerales ◊ *To improve the quality indices of ore extraction it is necessary to improve drilling and blasting methods*), **ore mining** (EXPL-CANT V. *ore extraction*), **ore recovery** (GEO-MIN-CRIST recuperación de menas/minerales)].

**organic** *a*: GRAL/PROPQUIM-FIS orgánico. [Exp: **organic adhesive** (INSTAL adhesivo orgánico; material orgánico preparado que se utiliza sin necesidad de añadirle ningún líquido o polvo y que se endurece por evaporación ◊ *Organic adhesive is used for bonding tile to a surface*), **organic binder** (MTRLS ligante orgánico ◊ *Organic binders need to burn away in such a fashion that the particles of mineral and frit are drawn into contact with each other to encourage reaction and prevent crawling; V. binder*), **organic bond** (MTRLS adherente orgánico ◊ *The organic bond burns away during the firing process, which develops a ceramic bond or causes sintering*), **organic compounds** (MTRLS compuestos orgánicos ◊ *A method for fabricating a green ceramic article containing organic compounds*), **organic fibre** (MTRLS/ELABPROC fibra orgánica ◊ *The hole is made by inserting an organic fibre in the green ceramic and firing to destroy the fibre or element and leave a hole in its place*), **organic material** (MTRLS material orgánico ◊ *A minority component of organic material in ceramics could also play a toughening role in brittle microstructures*), **organic matter** (MTRLS materia orgánica; material procedente de lo que era un organismo vivo y que, por tanto, puede descomponerse y pasar a formar parte, por ejemplo, del suelo ◊ *Organic matter is sometimes added to clays to improve the thermal insulation capacity of the structural ceramics and to reduce the energy consumption*), **organic modified silicate, ORMOSIL** (MTRLS silicato modificado orgánicamente ◊ *The Ormosil composite coating here presented is entrapped with a plurality of inorganic particles of a size greater than 1 micron to produce a coating of a sufficient, desired thickness*), **organic mud** (MTRLS V. *organic sludge*), **organic sludge** (MTRLS fango orgánico, limo ◊ *Colorimetric Characteristics of Decorated Glass Based on Organic Sludge Wastes; V. inorganic sludge*)].

**organism** *n*: GRAL/ORG-INST organismo.

**organization** *n*: GRAL/ORG-INST organización, asociación. [Exp: **organization diagram** (GESTIÓN organigrama; esquema de la organización de una empresa o una tarea; en tecnología, representación gráfica de las sucesivas operaciones de un proceso industrial, etc. ◊ *An approval sheet is created according to the staff organization diagram*), **organizational** (GESTIÓN organizativo), **organizational structure** (GESTIÓN estructura organizativa ◊ *Organizational structure of the company; organizational structure of the board of directors*), **organize, organise** (GRAL organizar)].

**organostannic compound** *n*: QUIM *V. organotin compound.*

**organotin compound** *n*: QUIM compuesto organoestánnico  $\diamond$  *Organotin compounds are defined as compounds that contain one or more organic functional groups attached to the tin atom with a relatively stable tin-carbon bond.*

**oribe** *n*: ESMREL oribe; esmalte verde de cobre.

**orientation polarization** *n*: QUIM polarización de orientación  $\diamond$  *Orientation polarization involves nonsymmetrical molecules that contain permanent electric dipoles.*

**orifice** *n*: GRAL orificio; boca, abertura, agujero. [Exp: **orifice ring (glass)**<sup>1</sup> (INDAFIN disco de vertido (industria del vidrio), virola de vertido  $\diamond$  *The glass stream flows out of the feeder through the replaceable orifice ring, which is heated and is in the optimum condition for the subsequent processing operation*), **orifice ring (glass)**<sup>2</sup> (INDAFIN cubeta (industria del vidrio), cubeta de colada *V. bushing*)].

**origin** *n*: GRAL origen  $\diamond$  *Origin of the clay deposits.* [Exp: **originate** (GRAL originar-se  $\diamond$  *China clay originated as granite which decomposed to clay, quartz, mica and feldspar*)].

**ORMOSIL** *abbr*: MTRLS *V. organic modified silicate.*

**ornament** *n*: GRAL adorno, ornamento; atavío que hace vistosa una cosa. [Exp: **ornamental purposes, for** (GRAL para uso ornamental), **ornamental ware** (PRODFIN cerámica decorativa, cerámica ornamental  $\diamond$  *Ornamental ware includes decorative items such as statuettes, figures, flowers and ornamental plates*), **ornamentation** (GRAL ornamentación)].

**orogeny** *n*: GEO-MIN-CRIST orogenia; rama de la geología que estudia la formación de las montañas.

**ortho-** *pref*: GRAL/GEO-MIN-CRIST orto-; tiene el sentido de "recto" o "correcto"; referido a las rocas metamórficas, indica que la roca original era ígnea. [Exp: **orthoclase** (MATPRI ortoclase/ortoclase, espato potásico, feldespatos ortosa, ortosa; feldespatos potásico empleado en la manufactura de porcelana y vidrio y que se convierte en caolín por meteorización; el término "feldespatos ortosa" no es del todo correcto para referirse a la ortoclase ya que no define al mineral sino a un grupo de minerales del que la ortoclase forma parte  $\diamond$  *Orthoclase melts incongruently at about 1170°C to form leucite and a liquid that is richer in silica; V. feldspar*), **orthogonal** (GRAL ortogonal; dicho de algo que está en ángulo recto), **orthosilicate** (GEO-MIN-CRIST ortosilicato  $\diamond$  *In these structures the tetrahedra are linked to each other through additional non-silicon cations - the orthosilicates, which include zircon and the aluminosilicates; V. silicate structures; nesosilicates*)].

**Orton cone** *n*: ELABPROC cono Orton; tipo de cono pirométrico *-pyrometric cone*  $\diamond$  *Orton cones are made in two sizes: 2'h in. (63.5 mm) high for industrial kiln control, and 1 1/8th in. (29 mm) high for P.C.E. testing.* [Exp: **Orton pyrometric cone chart**

(ELABPROC tabla de interpretación del cono Orton ◊ *The melting point of each pyrometric cone is shown in the Orton Pyrometric Cone Chart*).

**Osborn-Shaw process** *n*: ELABPROC V. *Shaw process*.

**oscillating screen** *n*: MAQTRANS criba oscilante, tamiz de sacudidas ◊ *At the outfeed of the oscillating screen, the acceptable material is separated from the fines and oversize material*.

**osmosis** *n*: QUIM osmosis, ósmosis; fenómeno físico-químico que explica el paso de disolvente pero no de soluto entre dos disoluciones de distinta concentración separadas por una membrana semipermeable ◊ *Osmosis provides the primary means by which water is transported into and out of cells*; V. *reverse osmosis*; *electro-osmosis*.

**ostentatious** *a*: GRAL/DISEÑO ostentoso; aparatoso, suntuoso V. *austere*.

**Ostwald ripening** *n*: PROPQUIM-FIS maduración de Ostwald ◊ *Ostwald ripening is an observed phenomenon in solid solutions which explains grain growth due to differential dissolution between particles of different sizes and shapes*.

**osumilite** *n*: GEO-MIN-CRIST osumilita ◊ *Solid-state reactions of ultrafine particles of magnesium hydroxide and barium carbonate with kaolin were investigated to obtain dense osumilite ceramics*; V. *barium osumilite*.

**ounce, oz** *n*: MEDIDA ONZA; unidad de masa.

**out prep/adv/pref**: GRAL fuera. [Exp: **out corner** (CONST esquina exterior), **outcome** (GRAL resultado ◊ *A successful outcome*), **outcrop** (GEO-MIN-CRIST afloramiento, afloración rocosa ◊ *Outcrop is a geological term referring to the appearance of bedrock or superficial deposits exposed at the surface of the Earth*), **outdoor** (GRAL de exterior), **outdoor pavement** (PRODFIN pavimento de exterior), **outer** (GRAL exterior), **outer face** (PRODFIN cara externa; parte exterior, visible de un producto, por ejemplo de un azulejo V. *inner face*), **outer face (arch brick)** (CONST extradós; superficie exterior de un arco, bóveda o ladrillo), **outer layer** (PRODFIN capa exterior ◊ *The outer layer forms the functional waterproof surface*), **outer measurements** (PRODFIN medidas externas ◊ *Please check the actual outer measurements below before buying*; V. *inner measurements*), **outfit** (GESTIÓN organización, empresa; negocio; término coloquial), **outgassing** (ELABPROC desgasificación (en cochura); liberación lenta y progresiva de gas atrapado, congelado, absorbido o adsorbido en algunos materiales ◊ *During the bisque firing, the clay goes through several critical chemical reactions in which chemicals are released into the atmosphere of the kiln in a process called outgassing*), **outgassing chamber** (MAQELAB cámara de desgasificación (en cochura) ◊ *A single representative tile was tested in the outgassing chamber*), **outlet** (GRAL desagüe), **outlet nozzle** (MAQTRANS cono (de una tolva o un silo)), **outline**<sup>1</sup> (DISEÑO delinear, esbozar; perfilar ◊ *The tile pattern is first outlined with the black colour and then the rest of the colors are hand painted on the tile*), **outline**<sup>2</sup> (DISEÑO contorno ◊ *Each tile is handmade from stoneware clay, carved into a plaster master mold, and hand-pressed to create an image that has a raised outline*; V. *border*), **outline**<sup>3</sup> (DISEÑO esbozo; bosquejo aún sin perfilar y no acabado), **outline**<sup>4</sup> (DISEÑO V. *sketch*), **outline proposal** (GESTIÓN estudio

previo), **out-of-centre** (GRAL descentrado), **out-of-sequence** (DISTRIB fuera de plazo ◊ *Packet out-of-sequence delivery*), **out-of-square** (CONST/INSTAL descuadrado; que no está en escuadra ◊ *A wall that is out of square*), **out-of-true** (INSTAL desalineado ◊ *The join line is not at right angles to the wall, so whole tiles are not used, as this would put the tile line out of true*), **output** (GESTIÓN producción, rendimiento ◊ *The annual output of chinaclay in USA is 2,500,000 tons*), **outrigger** (CONST viga de andamio, saliente; voladizo), **outside** (GRAL externo, de fuera, exterior), **outside lining** (GRAL/MAQELAB revestimiento externo), **outside of a roof** (CONST V. *cold face of a roof*), **outside pressure** (GRAL presión externa ◊ *It counteracts further outside pressure on the wall, taking the tension force (or tensile load) that the wall cannot support*), **outside vapour deposition process** (INDAFIN V. *outside vapour-phase oxidation*), **outside vapour-phase oxidation, OVPO** (INDAFIN proceso de oxidación en fase de vapor externo, oxidación exterior de la fase del vapor; proceso OVPO; proceso para la formación de fibras ópticas ◊ *In OVPO (outside vapour-phase oxidation) and VAD (vapour phase axial deposition) the hydrolyzed reactants are deposited on the side of a rotating starting rod (OVPO) or on the end of a rotating rod which is gradually raised from the flame as the deposit grows (VAD); V. optical fibres; vapour phase axial deposition*), **outside work facing** (INSTAL/CONST revestimiento de fachada), **outwall** (CONST muro de fachada, pared exterior ◊ *Our tiles include: floor tile, wall tile, exterior wall tile, decoration tile, bathroom tile, kitchen tile, outwall tiles, etc.*), **outward** (GRAL hacia fuera, exterior, externo; outward como adverbio también suele encontrarse como *outwards* ◊ *Place your first tile on the center point, and work your way outward*), **outside vapour phase oxidation process** (INDAFIN V. *outside vapour-phase oxidation*)].

**oval cross section** *n*: INSTAL sección oval/ovoide ◊ *With an oval cross-section, the contact surface between the hollow section and the ceramic tile is larger than with a circular cross-section.*

**oven** *n*: MAQELAB horno; término un tanto obsoleto para referirse a horno; compartimento cerrado utilizado para calentar, cocer o secar cuya energía calorífica puede ser proporcionada por la combustión de algún combustible o por otros medios (electricidad, etc.) ◊ *ASTM C484 is a test for ceramic tiles, which are removed from an oven at 145°C and placed on a sheet of aluminium at room temperature.* [Exp: **oven drying** (ELABPROC secado en el horno (proceso de)), **oven roof** (MAQELAB techo de la cámara (del horno) ◊ *The uppermost layer of the oven roof is formed by common red brick*), **ovenware** (PRODFIN utensilios para horno, utensilios termorresistentes ◊ *Ceramic whiteware or glassware (casseroles etc.) of good thermal shock resistance for use in cooking is called ovenware*)].

**over prep/pref**: GRAL sobre, de más; por exceso; *over* puede actuar como prefijo con el sentido de "exceso", "sobre", convirtiéndose en antónimo de *under*. [Exp: **over grinding** (TRANSPROC/CALIDAD sobremoler ◊ *Over grinding can cause crawling of a glaze*), **overall** (GRAL total, global; en conjunto, general ◊ *A visit to the museum is indispensable to obtain an overall view of Spanish ceramics*), **overall dimension** (GRAL dimensión total), **overalls** (SEG pantalón de protección ◊ *Where an employee is required to wear overalls or an agreed alternative, the employer will reimburse the employee for the cost of up to two pairs of overalls*), **overbreak** (EXPL-CANT exceso de excavación ◊ *In large excavations there is a greater possibility of overbreak*), **overburden** (EXPL-CANT recubrimiento, encape; montera; material inservible que debe extraerse antes de

poder descubrir y extraer la arcilla o roca (material aprovechable) en una cantera a cielo abierto  $\diamond$  *Overburden is removed during mining operations and generally stored in piles near the mine*), **overdone** (PROPQUIM-FIS recocado  $\diamond$  *If the addition is overdone fluxing oxides can behave as refractory materials*), **overdose** (SEG sobredosis; exceso, dosis excesiva de un medicamento o droga y que puede provocar efectos graves como la intoxicación), **overdrilling** (EXPL-CANT sobreperforación), **overfired** (PROPQUIM-FIS/CALIDAD pasado de cocción; demasiado cocido V. *underfired*), **overfired biscuit** (ELABPROC/CALIDAD bizcocho pasado de cocción  $\diamond$  *Overfired biscuit is especially difficult to glaze, as it will not absorb water*), **overfiring** (ELABPROC sobrecocción; cocción de los refractarios a una temperatura que puede ocasionar una vitrificación pronunciada (exagerada), deformación o hinchamiento –*swelling-*  $\diamond$  *Overfiring is one of the more common sintering problems with ceramics; V. underfiring*), **overflush** (CALIDAD V. *overpress*), **overglaze**<sup>1</sup> (ESMREL sobre esmalte, overglaze; esmalte que actúa como “abrillantador” final; vidrio pulverizado aplicado mediante pistola o aerógrafo  $\diamond$  *Overglazes are low temperature paints that are painted on top of a previously glazed and fired surface before being fired a second time at a very low temperature of cone 022 to 015; V. luster; enamel*), **overglaze**<sup>2</sup> (ESMREL/ELABPROC sobreesaltar; esaltar de nuevo o esaltar en exceso, lo cual puede dar lugar al cuarteo –*crazing-*  $\diamond$  *The overglaze fuses to the base glaze and becomes one with the glazed tile; it can be overglazed in black, blue or brown*), **overglaze decoration** (ESMREL/DISEÑO decoración sobre barniz; decoración cerámica o metálica aplicada y cocida en la superficie previamente esmaltada de la pieza cerámica V. *on(-)glaze decoration*), **overglaze enamel** (ESMREL esmalte sobre vidriado), **overgrind** (TRANSPROC/ELABPROC V. *overmill*), **overgrinding** (TRANSPROC/ELABPROC V. *overmill/overmilling*), **overhang** (CONST alero, saliente  $\diamond$  *When the walls are plastered, an overhang aids to avoid water infiltration*), **overhanging** (CONST voladizo, en ménsula; saliente), **overhanging roof** (CONST techo en voladizo), **overlap** (GRAL montarse, solapar-se; superponer-se  $\diamond$  *To overlap the two glazes as shown in this work, apply the ocean green glaze first*), **overlap**<sup>1</sup> (GRAL solapamiento  $\diamond$  *Outside of the overlap region, in the outboard areas, all of the ceramic layers possess a polarization of similar direction*), **overlap**<sup>2</sup> (INSTAL borde tapajuntas), **overload** (GRAL/MAQELAB sobrecargar; cargar en exceso  $\diamond$  *The movement is caused by the passage of an excess of hot vaporized solvent over the ware as a result of overloading the kiln or inadequate draughting*), **overload, overloading** (GRAL/MAQELAB sobrecarga; exceso de carga), **overmelting** (ELABPROC/CALIDAD sobrefusión  $\diamond$  *The short distance that the spraying material has to cross in the combustion chamber prevents overheating of the material or its overmelting and prevents an undesirable oxidation and phase change*), **overmill** (TRANSPROC/ELABPROC sobremoler; moler de nuevo; también moler un material hasta convertirlo en prácticamente impalpable), **overmill/overmilling** (TRANSPROC/ELABPROC molienda impalpable, sobremolienda  $\diamond$  *A warning against overmilling of the glaze is included*), **over-pickling**<sup>1</sup> (ESMREL/CALIDAD sobredecapado, decapado excesivo  $\diamond$  *General overall roughness is a symptom of over pickling or of excess zinc bath temperature and/or immersion time; V. pickling*), **over-pickling**<sup>2</sup> (ESMREL/CALIDAD V. *acid descaling*), **overpress**<sup>1</sup> (ELABPROC/INSTAL sobrepresionar; acción de presionar excesivamente y por la que se forman rebabas), **overpress**<sup>2</sup> (CALIDAD rebaba; porción de materia sobrante acumulada en los bordes o en la superficie de un objeto cualquiera, que sobresale irregularmente y que por tanto se considera un defecto; *overpress* y *overflush* se aplican normalmente más al vidrio que al metal, *burr*, sin embargo, suele referirse al metal si bien puede usarse en todos los contextos  $\diamond$  *An overpress defect placed over 2,000 cases of 15 ounce amber sauce bottles on hold; V. burr*), **overs** (TRANSMTRLS

residuo de tamizado ◊ *Most screens are moved by vibration or regular motion to facilitate passage and to remove overs*), **overs** (GRAL residuo, desecho; en general, lo que queda de un todo; lo que resulta de la descomposición/destrucción de algo; también material considerado inservible después de haber realizado un trabajo u operación), **oversailing** (CONST hilada volada; hilada de ladrillos/sillares que sobresalen del paramento de la fachada ◊ *Oversailing is not permitted by a planning permission as such*), **overseas** (DISTRIB internacional, en el extranjero; exterior; foráneo; ultramar ◊ *The overseas buyers also demand machine cut tiles*), **overseas market** (COM mercado exterior), **overside** (DISTRIB costado (del buque)), **overside delivery** (DISTRIB entrega al/sobre el costado (del buque) ◊ *In the case of overside delivery, each parcel of cargo has to be sorted on the deck before it can be delivered*), **oversize** (TRANSMTRLS residuo sobre tamiz; material residual que no ha pasado por el tamiz debido a su tamaño y que por tanto queda sobre él ◊ *A variance between the pre-firing and post firing dimensions over the pre-firing dimensions defines the oversize percent for that material*; V. *undersize*), **oversizing** (ELABPROC sobredimensionamiento ◊ *The oversizing is required to compensate for final shrinkage during the final sintering operation*), **overspray** (ESMREL neblina de pulverización, overspray; material aplicado por pulverización (esmalte) que no se deposita/adhiere a la pieza objeto de la pulverización y que normalmente es recogido para su reutilización ◊ *It is an overspray (enamel or glaze) that, after being reconditioned, is suitable for re-use and that in vitreous enamelling is generally used only in first-coats*), **overstock** (PRODFIN existencias excedentarias, exceso de existencias ◊ *Due to overstock of tiles when tiling the kitchen, we have 250 tiles (4x4) for sale*), **overswing** (PROPQUIM-FIS curvatura/oscilación/inclinación/ondulación excesiva ◊ *The overswing (past zero) gives a measure of viscosity; comparison of this degree of overswing with that after a specified lapse of time provides a measure of the thixotropy of the slip*; V. *torsion viscometer*), **overtrowelled (compo)** (CONST mortero demasiado pulido ◊ *If it is overtrowelled or water flashed it will require light wire brushing to remove the weak surface film prior to fixing*), **overworked (compo)** (CONST mortero excesivamente amasado)].

**OVPO** abbr: INDAFIN V. *outside vapour-phase oxidation*.

**ox gall** n: ESMREL/MTRLS hiel de buey/toro; producto utilizado para desengrasar superficies con el fin de aplicar mejor y de manera más uniforme una capa de barniz, para aumentar su fluidez y aceptación en dicha superficie y para prevenir el despegado del mismo -*crawling*- ◊ *For help the gloss and release the glazed print use a glazing solution; A popular one is a 1% solution of ox gall in distilled water*.

**oxalic acid** n: QUIM/ENSAYO ácido oxálico; compuesto químico orgánico que puede usarse para ensayos de control de calidad; también se emplea como agente de pulido -*polishing agent*- ◊ *Oxalic acid and its salts (oxalates) are used in many chemical processes*.

**Oxford clay** n: MAQ/MATPRI arcilla (de) Oxford ◊ *The Oxford Clay is a shaly mudstone mostly composed of the clay mineral illite*.

**oxidant** n: QUIM V. *oxidizing/oxidising agent*.

**oxidation** *n*: QUIM/ELABPROC oxidación; reacción química del oxígeno con una sustancia mineral en la cual, en general, se forman óxidos ◊ *Rapid oxidation, especially at temperatures above 1300°C, can quickly seal the surface with coherent oxide layers and protect the interior from oxidation*; V. *oxidizing/oxidising (process)*. [Exp: **oxidation firing** (ELABPROC cocción por oxidación; cocción de piezas cerámicas en un horno en el que la cámara tiene un amplio suministro de oxígeno de manera que la combustión es completa, facilitando la liberación de gases volátiles y originando que los metales de la arcilla y el esmalte muestren sus colores de óxido ◊ *In oxidation firing the atmosphere inside the kiln has sufficient supplies of oxygen to satisfy chemical reactions in the glaze and clay which use it*), **oxidation period** (ELABPROC periodo de oxidación ◊ *The stage in the firing of clayware during which any carbonaceous matter is burned out, i.e. the temperature range 400-850°C, is called oxidation period*)].

**oxide** *n*: QUIM óxido; compuesto químico binario *-binary chemical compound* - resultante de combinar oxígeno generalmente con un metal, o a veces con un metaloide ◊ *The most common stain is iron oxide (rust)*. [Exp: **oxide ceramics** (PRODFIN cerámica de óxido; cerámica especial elaborada a partir de óxidos sustancialmente puros, normalmente por medio de prensado en seco *-dry-pressing-* o slip casting y mediante sinterización a temperaturas elevadas ◊ *Oxide ceramics include alumina, zirconia, silica, aluminum silicate, magnesia and other metal oxide based materials*; V. *alumina ceramics; magnesia ceramics; zirconia ceramics; aluminium titanate ceramics; non-oxide ceramics*), **oxide-free salt** (QUIM sal no oxigenada), **oxidize, oxidise** (QUIM/ELABPROC oxidar-se; referido al oxígeno o a otro agente oxidante: producir óxido al reaccionar con una sustancia), **oxidizer, oxidiser** (QUIM V. *oxidizing/oxidising agent*), **oxidizing atmosphere** (ELABPROC/MAQELAB atmósfera oxidante; atmósfera con oxígeno (con un excedente de componentes oxidantes) para la producción de un proceso oxidante ◊ *Differences between oxidizing and reducing atmospheres depend on the composition of the surface and atmospheric gases*; V. *oxidizing; reducing atmosphere*), **oxidizing/oxidising** (PROPQUIM-FIS oxidante; que oxida o sirve para oxidar), **oxidizing/oxidising (process)** (QUIM/ELABPROC oxidación (proceso de); reacción química por la cual un metal o un no metal cede electrones, aumentando su estado de oxidación; la reacción química opuesta a la oxidación es la reducción, en la que se aceptan electrones, dándose estas dos reacciones siempre de forma conjunta: cuando una sustancia se oxida es por la acción de otra que se reduce V. *oxidation*), **oxidizing/oxidising agent** (QUIM oxidante, agente oxidante; compuesto químico que oxida a otra sustancia en reacciones electroquímicas mediante un proceso por el que el oxidante se reduce y el reductor se oxida ◊ *The decolorizer may be an oxidizing agent, removing the colour by chemical action*)].

**oxygen, O** *n*: QUIM oxígeno; elemento químico que, a temperatura ambiente, es un gas incoloro *-colourless-*, inodoro *-odourless-* e insípido *-insipid-*, muy reactivo y esencial para los procesos de combustión; forma parte del agua, los óxidos, casi todos los ácidos y las sustancias orgánicas y está presente en todos los seres vivos. ◊ *Fuel gas and oxygen are fed into the combustion chamber of a spray gun, and there mixed with powder carried by an inert gas*. [Exp: **oxygen converter** (INDAFIN convertidor con inyección de oxígeno V. *basic oxygen converter*), **oxygen converter process** (INDAFIN proceso (de tratamiento del acero) en el convertidor de inyección de oxígeno ◊ *Since 1993 the open hearth furnaces at NTMK have gradually been replaced by the oxygen*

converter process, which is more cost efficient and environmentally cleaner), **oxygen sensor** (INSTR sensor de oxígeno; aplicación para la industria cerámica cuya conductividad eléctrica es sensible a los cambios en la presión parcial del oxígeno de la atmósfera que lo rodea), **oxygen-free atmosphere** (MAQELAB atmósfera libre de oxígeno  $\diamond$  *The joining operation has to be carried out under careful temperature control in an oxygen-free atmosphere, for instance under vacuum ( $10^{-3}$  Pa) or in a pure neutral gas such as argon*]).

**oxynitride glasses** *n*: INDAFIN vidrios de oxinitruro  $\diamond$  *Oxynitride glasses have increased resistance to devitrification, higher refractive index, higher dielectric constant and greater viscosity and glass-transition temperatures.*

**oxy-salt** *n*: QUIM sal oxigenada, oxisal; sal derivada de un ácido oxigenado -oxygen acid-  $\diamond$  *The method involving thermal decomposition of an oxy salt is especially preferred when a grain growth inhibiting oxide is to be present, apparently because the secondary support oxide and inhibiting oxide are deposited together.*

**oya-ishi** *n*: GEO-MIN-CRIST oya-ishi; variedad de piedra volcánica que forma capas  $\diamond$  *It is also advantageous to knead into the above resin a powder of inorganic substances such as Oya-ishi (a kind of tuff) and porous ceramics as an effective additive for absorbing ethylene gas and preserving the freshness.*

**oz** *abbr*: MEDIDA V. ounce.

## U

**UAT** *abbr*: ENSAYO V. user acceptance test.

**U-bend** *n*: GRAL codo (tubería); tubería en forma de U o de codo  $\diamond$  *A U-shaped section of water pipe was inserted in the waste system.*

**UCS** *abbr*: PROPQUIM-FIS V. ultimate compressive strength.

**Udden-Wentworth scale** *n*: GEO-MIN-CRIST escala (de) Udden-Wentworth; escala de tamaños de las partículas de una roca sedimentaria clástica/grano de sedimento y que sirve para clasificarlos de acuerdo con el diámetro; esta escala sitúa, por ejemplo, los límites de los limos con las arcillas en 4 micras y en 62 micras el de los limos con las arenas V. *Udden (grade) scale*. [Exp: **Udden (grade) scale** (TRANSMTRLs escala (de) Udden; muchos sedimentólogos han adoptado la escala de Udden con las modificaciones de Wentworth  $\diamond$  *The Udden scale is a scale of sieve sizes devised by J. A. Udden whose basic opening is 1 mm, the scale above and below being a geometrical series with a ratio of 2 (above 1 mm) and 1/2 (below 1 mm); V. Wentworth grade scale; Udden-Wentworth scale*]).

**U-factor/value** *n*: MEDIDA valor U, coeficiente de transmisión térmica/de calor K; coeficiente/valor K; coeficiente de transmisión/conducción total de calor; medida normalizada de la velocidad con que el calor atraviesa una unidad de superficie de un

material de espesor conocido ◊ *The lower the U-value, the better insulated a home remains*; V. *thermal transmittance*.

**ulexite** *n*: GEO-MIN-CRIST ulexita; mineral no metálico de color blanco con una estructura interna fibrosa perteneciente a la familia de los boratos y compuesto de hidroborato hidratado de sodio y calcio ◊ *Ulexite is mined in Chile for the production of boric acid, synthetic colemanite, and refined ulexite for use in ceramics, insulating and reinforcing fiberglass, and agriculture*.

**ult abbr**: GRAL V. *ultimate*.

**ultimate, ult** *a*: GRAL final; decisivo, fundamental, esencial. [Exp: **ultimate analysis** (ENSAYO análisis elemental; técnica instrumental destructiva empleada para la determinación en muestras en estado sólido y líquido, estables e inestables, de los porcentajes, entre otros, de carbono, hidrógeno, nitrógeno, así como de ceniza después de la combustión completa de la materia orgánica de dicha muestra ◊ *Traces of magnesia are sometimes revealed by ultimate analysis*; V. *rational analysis*), **ultimate bending strength** (PROPQUIM-FIS resistencia (máxima) a la rotura por flexión, resistencia máxima a la flexión; esfuerzo de flexión máximo soportado o soportable ◊ *The ultimate bending strength of ceramic granite tiles is >400 kg/cm<sup>2</sup>, shrinkage: 7.0 - 9.0 g/m<sup>2</sup> and water absorption <0.5%*), **ultimate compressive strength, UCS** (PROPQUIM-FIS resistencia última a la compresión; resistencia a la compresión de una pieza de ensayo con una superficie de carga plana y lisa que es sometida a ensayo sin materiales de embalaje ◊ *For the mechanical properties, the use of a glass significantly improved the ultimate compressive strength (UCS) as did the use of a second coating*; V. *compressive strength*), **ultimate consumer** (GRAL usuario final), **ultimate load** (PROPQUIM-FIS carga de rotura ◊ *During a test until rupture, the load immediately before the very rupture is the ultimate load, although it is not necessarily the maximum load*), **ultimate shear strength** (PROPQUIM-FIS resistencia última al corte, fuerza límite de cizallamiento; resistencia máxima al esfuerzo cortante; carga límite en una sección antes de que se produzca el fallo del miembro por corte ◊ *The ultimate shear strength of the section is increased by 56% when adding steel fibers*; V. *shear strength*), **ultimate strength** (PROPQUIM-FIS resistencia a la rotura, esfuerzo de rotura máximo; fatiga de roturalímite de rotura; carga máxima requerida o valor máximo de deformación alcanzado justo antes de la rotura/fractura de un material ◊ *Ultimate strength is the highest stress which a material can withstand*), **ultimate stress** (PROPQUIM-FIS tensión de rotura, breaking stress; carga (unitaria) de rotura; tensión requerida para producir la rotura de un material, bien sea por compresión, tensión o cizallamiento), **ultimate stress** (PROPQUIM-FIS V. *breaking load*), **ultimate tensile strength, UTS** (PROPQUIM-FIS carga máxima unitaria a la tracción, resistencia a la rotura traccional ◊ *The peak stress on the engineering stress-strain curve is known as the ultimate tensile strength*)].

**ultra-** *pref*: GRAL ultra-; 'super-', 'extra-', al anteponerse a algunos adjetivos expresa idea de exceso. [Exp: **ultracoarse** (GRAL extragrueso), **ultrafine** (GRAL extrafino), **ultrafine powders** (MTRLS polvos ultrafinos; partículas cuyo diámetro es inferior a 100 nm ◊ *The dispersion of ultrafine powders is very important in ceramic processing technique*), **Ultragres** (ELABPROC/PRODFIN Ultragres; método de producción patentado con ese mismo nombre por la empresa holandesa Royal Mosa y por el cual dos capas de arcilla

atomizada son prensadas juntas y cocidas a altas temperaturas, dando como resultado la fusión de ambas en una sola pieza sólida de gres; también se conoce como Ultragres el producto obtenido mediante este proceso  $\diamond$  *Ultragres system, requires 70% less color additives to achieve spectacular colors*), **ultrahazardous activities** (SEG actividades altamente peligrosas; aquellas actividades que entrañan un riesgo excepcional V. *occupational hazard*), **ultramicroscope** (INSTR ultramicroscopio; microscopio especial de campo oscuro empleado para el examen de partículas de dimensión coloidal), **ultrasonic** (PROPQUIM-FIS ultrasónico; perteneciente o relativo al ultrasonido V. *ultrasound*), **ultrasonic equipment** (INSTR equipo/equipamiento ultrasónico  $\diamond$  *Channel Industries Inc. produces piezoelectric ceramics for ultrasonic equipment & underwater sound*), **ultrasonic impact grinding** (TRANSPROC/ELABPROC V. *ultrasonic machining*), **ultrasonic inspection** (ENSAYO V. *ultrasonic testing (method)*), **ultrasonic machining, USM** (TRANSPROC/ELABPROC mecanizado ultrasónico, mecanizado por ultrasonidos; tipo de mecanizado abrasivo en el que las partículas abrasivas se hacen vibrar a frecuencias ultrasónicas con el fin de eliminar material sobrante en alguna superficie  $\diamond$  *The method of abrasive ultrasonic machining of fired ceramics is widely employed since it can shape hard materials by erosion; V. rotary ultrasonic machining*), **ultrasonic NDE** (ENSAYO V. *ultrasonic non destructive evaluation*), **ultrasonic NDI** (ENSAYO V. *ultrasonic non-destructive inspection*), **ultrasonic non destructive evaluation, ultrasonic NDE** (ENSAYO evaluación no destructiva por ultrasonidos  $\diamond$  *Ultrasonic nondestructive evaluation (NDE) methods are reliable in the inspection and certification of composite structures*), **ultrasonic non-destructive inspection, ultrasonic NDI** (ENSAYO inspección no destructiva por ultrasonidos  $\diamond$  *Ultrasonic NDI is another important technique for detecting subsurface flaws in ceramics*), **ultrasonic speed** (GRAL velocidad ultrasónica  $\diamond$  *Flame spray coating at ultrasonic speed is the latest technique in hot spraying field*), **ultrasonic testing (method), UT** (ENSAYO ensayo de/por ultrasonidos, control con/por ultrasonidos; ensayo por ultrasonido; inspección por ultrasonido; metodo de inspección no destructivo de tipo mecánico, en el cual un haz sónico de alta frecuencia (125 KHz a 20 MHz) es introducido en el material objeto de la inspección con el objetivo de detectar discontinuidades internas y superficiales y subsuperficiales  $\diamond$  *In ultrasonic testing, a transducer connected to a diagnostic machine is passed over the object being inspected*), **ultrasound** (ENSAYO ultrasonido; onda acústica cuya frecuencia es superior a la que puede captar el oído humano (aproximadamente 20 KHz) y que, en aplicaciones industriales, se usa para la medición de distancias, caracterización interna de materiales y ensayos no destructivos entre otros), **ultrasound wave** (ENSAYO onda ultrasónica  $\diamond$  *These systems detect the time required by the ultrasound wave in order to cross the thickness of the tile*), **ultraviolet** (QUIM ultravioleta; radiación electromagnética que se halla entre el extremo violado del espectro visible y los rayos X), **ultraviolet curing, UV-curing** (ELABPROC curado ultravioleta, endurecimiento por rayos ultravioleta; curado/endurecimiento rápido de materiales por exposición a radiación ultravioleta; proceso de polimerización; uso de radiación ultravioleta para convertir una capa húmeda en una película sólida  $\diamond$  *Montec's coating process combines thermal spraying and ultraviolet curing to coat a wide range of substrates including paper, wood, glass, polymers and metals*), **ultraviolet light** (GRAL V. *ultraviolet/ultra-violet ray*), **ultraviolet/ultra-violet radiation, UR** (GRAL radiación ultravioleta; radiación electromagnética, que puede ser de origen natural cuando proviene del sol o producirse de forma artificial, con longitudes de onda que van aproximadamente desde los 400 nm, el límite de la luz violeta, hasta los 15 nm, donde empiezan los rayos X

◇ *Discoloration in sintered alumina ceramics from colorless to brownish yellow by ultraviolet radiation was found and its mechanism was examined*), **ultraviolet/ultraviolet ray, UV ray** (GRAL rayo ultravioleta ◇ *Therefore, it is important for the ceramic color layer to have a function as an opaque colored layer and not to transmit visible light rays, particularly ultraviolet rays; V. ultraviolet*)].

**umber** *n*: MATPRI/ESMREL tierra de sombra, umbra ◇ *Umber is a natural brown clay pigment which contains iron and manganese oxides; V. burnt umber*.

**un-** *pref*: GRAL in-, des-; prefijo inglés que confiere un sentido negativo a la palabra de la que forma parte: negación, oposición, privación; puede equivaler también a "sin", "no" y otros. [Exp: **unacceptable** (GRAL/CALIDAD inaceptable ◇ *Clay tile manufacturers produce tiles of different quality; some have superior and durable tile features while others are made of even unacceptable quality*), **unavailability** (GRAL/COM no disponibilidad, indisponibilidad), **unavailable** (GRAL/COM agotado; no disponible), **unbroken joint** (INSTAL junta longitudinal), **unburned** (CALIDAD cocción, corto de; no cocido del todo ◇ *The article to be reproduced was placed on the surface of the lightly shaped and unburned tile and was forced into the clay by a screw press; V. unfired*), **unburnt** (CALIDAD V. unburned), **uncoated area** (CALIDAD V. starvation), **unconfined compression test** (ENSAYO ensayo de compresión no confinada/inconfinada; ensayo cuyo objetivo es obtener rápidamente un valor aproximado de la resistencia a la compresión de los suelos que cuentan con una cohesión suficiente para ser sometidos a dicho ensayo ◇ *A variety of empirical tests for determining indices of plasticity have been devised and are discussed in the ceramics literature, among them the unconfined compression tests*), **unconfined compressive strength** (PROPQUIM-FIS V. uniaxial compressive strength), **uncrushed** (TRANSMTRLs sin triturar/machacar), **undamaged** (CALIDAD indemne, intacto ◇ *A precise cutting technique is required to ensure the finished product is accurate and undamaged*), **undue** (GRAL excesivo, indebido ◇ *Do not apply undue pressure to the tile surface by i.e. use of rubber mallet to level the tiles*), **uneconomical** (GESTIÓN no rentable, antieconómico; caro ◇ *Sadly this makes international shipping of tiles uneconomical for all concerned*), **uneven** (GRAL irregular, desigual ◇ *A rustic finish is a rough or uneven tile surface designed for a non-mechanical or artisan effect*), **unevenness** (GRAL irregularidad, desnivel ◇ *No wall is perfectly straight and at times you will have to cut some tile to allow for the unevenness*), **unfired** (PROPQUIM-FIS/ELABPROC/CALIDAD cocción, corto de; poco cocido ◇ *Scraps are excess body removed during the shaping of potteryware, together with any broken, unfired, pieces; V. unburned*), **unfired brick** (INDAFIN ladrillo crudo (sin cocer) V. green brick; adobe), **unfused material** (MTRLs materiales no fundidos ◇ *Only part of the flux is fused during welding and the unfused material is picked up, usually by a suction hose and returned to a hopper for further use*), **unglazed** (PROPQUIM-FIS/PRODFIN no esmaltado/barnizado; sin esmaltar o barnizar ◇ *Unglazed tile is fire-hardened clay tile with color running throughout and a matte-type surface finish*), **unload** (DISTRIB descargar ◇ *Any damage must be noted on the supplier's bill of lading before the material is unloaded*), **unloaded weight** (PROPQUIM-FIS V. tare), **unloading** (DISTRIB descarga de mercancías ◇ *This unique levelling table positions the pallet at exactly the right height for safe and easy unloading or loading*), **unloading charges** (DISTRIB gastos de descarga), **unloading equipment** (DISTRIB equipo de descarga ◇ *Project: Loading and unloading equipment for containers at inland harbors*),

**unloading platform** (DISTRIB plataforma de descarga, andén, muelle), **unloading system** (DISTRIB sistema de descarga V. *loading system*), **unmixing** (TRANSPROC V. *segregation*), **unnoticeable** (GRAL imperceptible ◊ *These differences can be as subtle as tone variation or patterning, and virtually unnoticeable when on a shelf, but will stand out when set in place next to a floor of non-batched tiles*), **unpolished slip resistance value, USRV** (PROPQUIM-FIS/ENSAYO valor de la resistencia al deslizamiento sin pulido ◊ *The producer is required to declare a minimum unpolished slip resistance value (USRV) expected for individual specimens*), **unsealed joint** (INSTAL junta sin sellar ◊ *Water can also enter the well through unsealed tile joints and cracks*), **unshaped** (ELABPROC no conformado, sin forma; irregular ◊ *The glaze-forming composition may be applied to an unshaped ceramic clay body and then pressed thereon to form a shaped body*), **unskilled** (GRAL no cualificado), **unsound** (CALIDAD defectuoso ◊ *For re-grouting of old joints you must remove all dead or unsound grout*), **unsoundness** (CALIDAD/PROPQUIM-FIS porosidad ◊ *Unsoundness is revealed by distortion or cracking*), **unstable** (GRAL inestable), **unstable state of equilibrium** (PROPQUIM-FIS estado de equilibrio inestable; estado que difiere levemente del equilibrio y que termina por evolucionar rápidamente a un estado ampliamente diferente; por ejemplo, un lápiz en estado vertical, cae de forma casi inmediata mientras que caído (en horizontal) está en un estado diferente V. *stable state of equilibrium*), **untreated china clay** (MATPRI caolín natural, caolín bruto, caolín bruto; caolín sin procesar ◊ *These grades of calcined china clay are often recommended as they have a better water resistance and also a better hiding power than untreated china clay*), **unwarped** (GRAL/INSTAL desalabeado ◊ *You must have a flat, unwarped surface to work on*), **unworked surface** (PRODFIN superficie sin acabado)].

**under prep/adv:** GRAL debajo de, bajo; infra-; sub-. [Exp: **under contract** (GESTIÓN con contrato, según los términos del contrato), **under controlled conditions** (ENSAYO condiciones controladas, en/bajo ◊ *Tests were conducted indoors under controlled conditions*), **under instructions from** (GESTIÓN orden de, por), **under stress** (PROPQUIM-FIS sometido a tensión, en condiciones de tensión/esfuerzo ◊ *There is a tendency to buckle under stress*), **under the provisions of** (GESTIÓN conforme a lo dispuesto/establecido en ◊ *Warning under the provisions of Article 140, sub-paragraph 5*)].

**under- pref:** GRAL sub-, infra-. [Exp: **underclay** (MATPRI esquisto arcilloso, pizarra arcillosa; sotoarcilla; arcilla refractaria, si bien también puede ser una roca silícica, subyacente a un manto/veta de carbón -*coal seam*- ◊ *Underclay contains substantial amounts of the mineral kaolinite, form which temperature-resistant ceramic ware can be made; V. argillaceous schist; argillaceous shale*), **undercoat** (ESMREL capa base), **undercooling** (ELABPROC sobrefusión, subenfriamiento, subenfriamiento; superenfriamiento; proceso de enfriar un líquido por debajo de su punto de congelación manteniendo éste su forma líquida, esto es, sin que se haga sólido ◊ *To achieve the undercooling phase required, the powder must be fully molten*), **undercover** (ELABPROC bajo cubierta; técnica de decoración en que los colorantes cerámicos o los óxidos colorantes son aplicados a la pieza antes de esmaltar por lo que cuando el esmalte se cuece la decoración está debajo de él), **undercut** (INSTAL rebajado ◊ *Door jambs may be undercut for tile to slip under*), **undercutting** (CALIDAD undercutting; rotura de la textura de un esmalte o vidrio ◊ *The result can be a slight change in the kerf line and an undercutting of the ceramic beneath the metallization*), **undercutting** (EXPL-CANT descalzamiento; operación por la que se extraen los materiales de la parte inferior de

un frente dejando la parte superior en voladizo), **underfired** (PROPQUIM-FIS/CALIDAD semicocido; no completamente cocido, cocido por debajo de los parámetros normales ◊ *Blistering can be caused by over-application or under-application of the glaze, overfired or underfired glaze or a poorly ventilated kiln; V. overfired*), **underfired brick** (INDAFIN ladrillo semicocido; ladrillo insuficientemente cocido y que como consecuencia presenta poca resistencia al desgaste -wear- y a la helada -frost- ◊ *Underfired brick will shrink excessively, and inferior clay will swell*), **underfiring** (ELABPROC/CALIDAD V. *under-firing*), **under-firing** (ELABPROC/CALIDAD cocción insuficiente; cocción a temperatura indebida (demasiado baja), durante un tiempo insuficiente o ambas ◊ *Under-firing gives rise to interconnected open pores; V. over firing*), **under-glaze, underglaze** (ESMREL bajo barniz, bajo cubierta ◊ *Mazarine Blue or Royal Blue is a ceramic colour for on-glaze or under-glaze, based on the use of cobalt oxide (4060%) together with a flux; V. hardening on; on(-)glaze*), **under-glaze/underglaze base** (ESMREL esmalte base ◊ *The 1050 Underglaze Base has some frit in it, which acts as a flux to help the stain be a compatible fit with either greenware or bisque*), **under-glaze/underglaze colour/color** (ESMREL color bajo barniz ◊ *Apply a base coat of opaque underglaze color to greenware; V. under-glaze/underglaze decoration*), **under-glaze/underglaze decoration** (ESMREL decoración bajo barniz/esmalte, color bajo barniz; decoración de color que se aplica a la pieza ya bizcochada y que a continuación se cubre con un barniz transparente ◊ *Because the decorating fire can be at a lower temperature with on-glaze decoration, a more varied palette of colours is available than with under-glaze decoration; V. under-glaze/underglaze color/color*), **underground water** (GEO-MIN-CRIST aguas freáticas; aguas que, por filtración, discurren por el interior de un terreno (subsuelo) sobre una capa impermeable), **underlayment** (INSTAL contrapiso, primera capa ◊ *A ceramic tile underlayment consists of a material that withstands heat and moisture*), **underloading** (MAQTRANS subcarga; carga insuficiente en un molino de bolas -ball mill- para realizar una molienda adecuada; también reducir deliberadamente dicha carga para acelerar la molturación ◊ *Feed variations such as this, as well as over or underloading in a mill, can result in less-than-optimum performance and make it difficult to achieve satisfactory mill control; V. overloading*), **undermount sink hole** (INSTAL orificio bajo lavabo), **underside** (GRAL superficie inferior/de abajo ◊ *During re-entry, the shuttle depends on the smooth flow of air over the underside tiles to maintain vehicle temperatures within safety limits*), **undersize** (TRANSMTRLS pasante, paso de/por tamiz, tamiz (que pasa por); productos finos, pequeños o medios, que van a pasar a través del tamiz o criba; porcentaje de partículas recogidas al pasar por el tamiz ◊ *Undersize is the percentage which falls through the lower limit screen/sieve whereas oversize is the percentage which during screening/sieving remains on the upper limit screen/sieve; V. oversize*), **undersized product** (TRANSMTRLS V. *unders*), **underworks** (INSTAL V. *bed/bedding*).

**unders** *n.*: TRANSMTRLS finos; granos finos; partículas que pasan a través del tamiz o criba -sieve- de límite inferior ◊ *Sieve analysis results indicate an excessively high overs and unders content for use as a manufacturing feedstock; V. overs; screening; sieving.*

**undulating** *a.*: GRAL ondulante ◊ *Type of tile gives an undulating effect to the roof.*

**UNE abbr.**: CALIDAD V. *Spanish standard.*

**UNI** *n*: CALIDAD/ORG-INST UNI; prefijo para las especificaciones del organismo nacional italiano de unificación (UNI) ◇ *UNI EN ISO 9001 - Norma que especifica los requisitos de un modelo de sistema de gestión de calidad para todas las organizaciones, emitida por UNI (organismo nacional italiano de unificación).*

**UNI** *abbr*: CALIDAD/ORG-INST *V. Italian Organization for Standardization.*

**uniaxial** *a*: GRAL uniaxial. [Exp: **uniaxial cold pressing** (ELABPROC prensado uniaxial en frío *V. uniaxial pressing*), **uniaxial compression** (ENSAYO/PROPQUIM-FIS compresión uniaxial *V. uniaxial compression test*), **uniaxial compression test** (ENSAYO test de compresión uniaxial ◇ *The uniaxial compression test is used to define the pressure at which soil begins to fail at a given water content*), **uniaxial compressive strength** (PROPQUIM-FIS resistencia a la compresión uniaxial), **uniaxial die-pressing/die pressing** (ELABPROC prensado uniaxial ◇ *Uniaxial die-pressing is widely used in industry as the preferred, cost-effective production process for large numbers of simply shaped ceramic components; V. uniaxial pressing*), **uniaxial hot pressing, HP** (ELABPROC prensado uniaxial en caliente ◇ *Uniaxial hot pressing is a method of forming densified objects by heating and applying uniaxial pressure against a material such as a powder preform or compact; V. uniaxial pressing*), **uniaxial pressing** (ELABPROC prensado uniaxial; proceso de conformado de los polvos que puede realizarse en caliente o en frío y consistente en la aplicación de presión en una única dirección hasta conseguir la compactación de los polvos cerámicos de modo que la pieza que así se conforma tiene la forma de la matriz y las superficies con las que la presión ha sido aplicada ◇ *Uniaxial pressing involves the compaction of powder into a rigid die by applying pressure along a single axial direction through a rigid punch, plunger, or piston*)].

**unicoloured** *a*: GRAL/DISEÑO monocolorado ◇ *The term "pattern" designates a single closed surface area shown by the hatched lines in the drawing which is preferably unicoloured and differs from the colour of the remaining part of the surface.*

**uniform** *a*: GRAL uniforme, constante; igual, conforme, semejante, homogéneo ◇ *Each item is fired separately, and is mounted on an alloy support, coated with alumina, which rotates the ware on its own axis as it passes through the kiln, thus ensuring uniform temperature distribution.* [Exp: **uniform grain size** (TRANSMTRLs granulometría uniforme; tamaño semejante de las partículas cerámicas ◇ *A fine grain size and uniform grain size distribution are preferred as well, since these characteristics translate to greater strength for single oxide ceramics*), **uniformity** (GRAL uniformidad ◇ *Such systems are finding application in the tile and sanitary ware industries, where uniformity of color with other materials and products is a necessity*), **uniformly distributed load** (ENSAYO carga uniforme ◇ *A uniformly distributed load is applied and increased continuously until failure occurs*)].

**union**<sup>1</sup> *n*: GRAL unión, conexión. [Exp: **union**<sup>2</sup> (GESTIÓN sindicato; asociación, gremio; unión)].

**unit**<sup>1</sup> *n*: GRAL unidad; elemento, pieza manufacturada. [Exp: **unit**<sup>2</sup> (GRAL *V. unity (number)*), **unit cell** (GEO-MIN-CRIST célula elemental; elemento de una red cristalina - *lattice*- cuya repetición forma dicha red cristalina ◇ *The lines along the edges of the unit cell are the lattice vectors*), **unit of measurement** (MEDIDA unidad de medida; valor

de una cantidad elegida por convención como referencia para medir cantidades del mismo tipo ◇ *The metric unit of measurement of mass is the kilogram (kg), which is 1000 grams*), **unit price** (COM precio unitario ◇ *Items smaller than a certain size will command a lower unit price*), **United States National Bureau of Standards, USNBS** (ORG-INST Oficina Nacional de Normas de los Estados Unidos V. *National Bureau of Standards*), **United States of America Standards Institute, USASI** (ORG-INST Instituto de estándares de los Estados Unidos de America V. *AESC, ASA, ANSI*), **unity (number)** (MEDIDA unidad; cantidad tomada como medida o término de comparación de las demás de su especie), **unity formula** (QUIM fórmula unitaria ◇ *A unity formula is just a formula that has been retotalled so that the RO group of oxides totals one (unity)*), **unpolished** (PROPQUIM-FIS/PRODFIN sin pulir ◇ *The working surface of polished tile is weaker, from the mechanical point of view, as compared with that of the corresponding unpolished tile; V. polished*).

**universal punch** *n*: MAQTRANS punzonadora universal ◇ *Arriving in the plant after preparation and a storage time of six weeks, the extruded clay columns are cut by a universal punch -with sizes of up to 500 mm long and an output of 60 punches per minute.*

**up** *a/adv*: GRAL arriba; hacia arriba, para arriba, ascendente. [Exp: **updraft kiln** (MAQELAB V. *up-draught kiln*), **uphill casting** (INDAFIN V. *uphill teeming*), **uprunning** (INDAFIN V. *uphill teeming*)].

**up-** *pref*: GRAL ascendente; prefijo que indica la condición ascendente de algo, que algo sube. [Exp: **updraft** (MAQELAB corriente ascendente, succión ascendente, succión de tiro ascendente), **up-draught** (MAQELAB tiro (ascendente); diferencia de presión entre la entrada y la salida de un aparato por el que circulan gases (horno, etc), especialmente aire y gases de combustión; también corriente de fluido que esa diferencia de presión provoca V. *updraft*), **up-draught kiln** (MAQELAB horno de tiro ascendente ◇ *A scove or Scotch kiln is an early type of up-draught intermittent kiln for the firing of bricks, etc.*), **uphill teeming** (INDAFIN colada en sifón ◇ *In order to improve the quality of castings where molten metal is simply poured into an ingot mould, the technique of bottom pouring or uphill teeming has been developed, where a number of ingot moulds are placed on a base plate having a plurality of channels to distribute incoming molten metal to the base of the ingot moulds*), **upkeep** (MANTNMTO mantenimiento; conservación ◇ *The texture of the tile you choose will make a huge difference as to how much upkeep the tile will need to retain its original look*), **upright**<sup>1</sup> (GRAL vertical, derecho; erguido, del derecho ◇ *Add texture to the upright surface of the tile (for example, ridges) that emulates the work you plan to produce*), **upright**<sup>2</sup> (GRAL soporte, pie), **uprisings** (SUBPROD desechos reutilizables; material o pedazos del mismo desechados y recuperados para su reutilización), **uptake** (GRAL/MAQELAB absorción, consumo ◇ *The identical passages at the two ends of the furnace alternately served as downtime for the waste gases leaving the furnace and uptake for the hot air for combustion and (in gas-fired furnaces) the fuel gas; V. downtime*), **upward drilling** (INDAFIN cortosión ascendente, ataque ascendente; desgaste por debajo del nivel del vidrio en un horno de cuba/de fundir producido por burbujas de gas atrapadas ◇ *Undercutting immediately below the melt line has also been a common experience, associated with a liquid-corrosion phenomenon called upward drilling*)].

**UPEC classification** *n*: CALIDAD clasificación UPEC ◇ *The UPEC classification is a quality label used for floor tiles looking at four characteristics: the wear of the material due to walking, the crushing of the material due to furniture, the behaviour with water and humidity, and the resistance to chemical agents.* [Exp: **UPEC classification system** (CALIDAD sistema de clasificación UPEC ◇ *For example the UPEC classification system for floor coverings measures 4 characteristics U= Resistance to wear; P= R to punching; E= R to water; C= R to chemicals*)].

**upper** *a*: GRAL superior. [Exp: **upper face** (PRODFIN/INSTAL cara superior; superficie de un elemento destinada a ser la cara visible del mismo tras su colocación)].

**UR abbr**: GRAL V. *ultraviolet/ultra-violet radiation.*

**uranium** *n*: QUIM uranio; elemento químico radiactivo; metal usado como combustible nuclear, y cuyas sales se emplean en fotografía y en la industria del vidrio entre otras aplicaciones. [Exp: **uranium borides** (QUIM boruro de uranio), **uranium carbide** (QUIM carburo de uranio ◇ *Uranium carbide, a carbide of uranium, is a hard refractive ceramic material*), **uranium nitride** (QUIM nitruro de uranio ◇ *Uranium nitride (U<sub>2</sub>N<sub>3</sub>) is a ceramic compound used as nuclear fuel in nuclear test reactors, because it has properties similar to uranium dioxide or uranium carbide*), **uranium oxide** (QUIM/ESMREL óxido de uranio ◇ *Uranium oxide has been used to produce red and yellow glazes and ceramic colours*), **uranium red** (ESMREL rojo de uranio ◇ *Exposed to air this mixture is oxidized to the pigment uranium red, U<sub>6</sub>(NH<sub>4</sub>)<sub>2</sub>SO<sub>9</sub>, which is a fine blood-coloured amorphous powder*), **uranium silicides** (QUIM siliciuros de uranio ◇ *Uranium silicides exhibit excellent oxidation resistance at temperatures up to 1,800 degree C. due to the formation of a protective layer of silicon dioxide*)].

**urban** *a*: GRAL urbano; perteneciente o relativo a la ciudad. [Exp: **urban area** (GRAL zona urbana), **urban development** (CONST desarrollo urbanístico V. *town planning*)].

**usable** *a*: GRAL utilizable. [Exp: **usable floor area** (CONST/INSTAL superficie útil ◇ *Measurement of usable floor area shall be the sum of the horizontal areas of the several floors of the building, measured from the interior faces of the exterior walls*)].

**USASI abbr**: ORG-INST V. *United States of America Standards Institute.*

**use**<sup>1</sup> *n/v*: GRAL USO; empleo ◇ *It is applicable only to extruded ceramic tiles with a water absorption of 3% < 9 < 6% according to Group Alla of EN 87, for interior and exterior use on floors and on walls.* [Exp: **use**<sup>2</sup> (GRAL usar; emplear, utilizar), **useful** (GRAL útil; práctico, de provecho ◇ *Ferrites are useful because of their strong spontaneous magnetic induction, high electrical resistivity, and low loss factors*), **useful heat input** (GRAL calor útil; calor producido en un proceso de cogeneración con el fin de satisfacer una demanda de calor y/o refrigeración que se justifica económicamente ◇ *This rating assumes all heat released from the boiler, including jacket heat loss, becomes useful heat input to the load*), **useless** (GRAL inútil, inservible ◇ *They had set up a routine of sorting waste in order to recycle their "useless" ceramics by grinding it to small pieces and mixing it with clay*), **user** (GRAL usuario), **user acceptance test, UAT** (ENSAYO test de aceptación por el usuario)].

**USM** *abbr:* TRANSPROC/ELABPROC **V.** *ultrasonic machining.*

**USNBS** *abbr:* ORG-INST **V.** *United States National Bureau of Standards.*

**USRV** *abbr:* PROPQUIM-FIS/ENSAYO **V.** *unpolished slip resistance value.*

**UT** *abbr:* ENSAYO **V.** *ultrasonic testing (method).*

**utilisation,utilization** *n:* GRAL utilización; empleo, uso  $\diamond$  *A method is proposed for the production of raw porcelain glazes based on the utilisation of this waste nonalkaline glass.*

**UTS** *abbr:* PROPQUIM-FIS **V.** *ultimate tensile strength.*

**U-type furnace** *n:* MAQELAB horno tipo U; horno para la cocción de piezas cerámicas esmaltadas cuyo funcionamiento se basa en arrastrar dichas piezas por un trayecto en forma de U de manera que éstas entran y salen del horno en puntos adyacentes  $\diamond$  *The design combines the thermal efficiency of a U-type furnace with advantages of in-line firing for processing of large enameled plumbing ware.*

**UV ray** *abbr:* GRAL **V.** *ultraviolet/ultra-violet ray.*

**U-value** *n:* PROPQUIM-FIS **V.** *thermal transmittance.*

**uvarovite** *n:* GEO-MIN-CRIST/ESMREL uvarovita; granito cálcico-crómico de color verde esmeralda; agente colorante en el verde Victoria  $\diamond$  *Uvarovite has a fine green color that grows in crystal clusters.*

**UV-curing** *abbr:* ELABPROC **V.** *ultraviolet curing.*

**uviol glass** *n:* INDAFIN vidrio uviol; vidrio altamente transparente para las radiaciones ultravioletas, a las que el común de los vidrios es opaco  $\diamond$  *"Uviol glass" has a higher electric resistance than ordinary glass.*

**UVR** *abbr:* GRAL **V.** *ultraviolet/ultra-violet radiation.*

## V

**V** *abbr:* MEDIDA **V.** *volt.*

**V number** *abbr:* PROPQUIM-FIS **V.** *Abbe number.* [Exp: **V value** (PROPQUIM-FIS **V.** *Abbe number*)].

**vacancy** *n:* GEO-MIN-CRIST vacante cristalina; en cristalografía, defecto tipo punto en un cristal; espacio/lugar en una red cristalina no ocupado por un átomo  $\diamond$  *Adding vacancies to the material increases the entropy, which tends to reduce the total energy required to create the vacancy; V. crystal structure; lattice vacancy.*

**vacuforming** *n.*: ELABPROC V. *vacuum forming*.

**vacuity** *n.*: GRAL vacuidad ◊ *The expansion space left above the liquid in a closed glass container is called vacuity*.

**vacupress** *n.*: MAQTRANS vacupress; máquina utilizada para desaerear -*deaerating*- y compactar/densificar polvos ligeros de grano fino y que logra una reducción de volumen de hasta el 75% ◊ *Vacupress machines are used for all dry, fine powdered bulk materials for which deaeration and densification is necessary or beneficial because of their low bulk weights; V. deaerate*.

**vacuum** *n.*: PROPQUIM-FIS vacío, hueco, oquedad; espacio en el cual el aire u otro gas se hallan a presiones muy inferiores a la atmosférica ◊ *In vacuum casting the casting rate is increased by applying a vacuum to the outside of a porous mould*. [Exp: **vacuum arc** (ELABPROC arco en vacío; arco muy empleado como interruptor de circuito en dispositivos eléctricos de alta potencia y para producir recubrimientos V. *arc*), **vacuum arc deposition, VAD** (ELABPROC/ESMREL deposición física en vacío con arco eléctrico, deposición filtrada por arco en vacío; descarga tipo arco en vacío (DAV); técnica empleada para la deposición de recubrimientos ◊ *Vacuum arc deposition of decorative coatings on flat and three-dimensional glass and steel substrates*), **vacuum casting, VC** (INDAFIN colada en vacío ◊ *Similar to traditional casting processes, the process in which the casting rate is increased by applying a vacuum to the outside of a porous mould is called vacuum casting; V. slip casting*), **vacuum degassing** (INDAFIN desgasificación por vacío ◊ *Steel companies are increasingly adopting the practice called vacuum degassing -subjecting molten metal to a vacuum to remove hydrogen or carbon- to improve the quality of their products and shorten processing cycles*), **vacuum deposition** (ELABPROC/ESMREL deposición al vacío; técnica para la deposición de películas muy finas, especialmente sobre sustratos metálicos ◊ *Vacuum deposition is the most popular thin film deposition technique*), **vacuum drying** (ELABPROC secado al vacío, desecación al vacío; eliminación de la humedad/líquido de una pieza o una solución mediante la reducción de la presión del aire, lo que resulta en un proceso de secado a una temperatura más baja de la requerida con presión normal ◊ *Vacuum drying can be applied in a range of processes in several industries, including chemical, pharmaceutical, food, plastics, and metal powders*), **vacuum extrusion** (ELABPROC extrusión al vacío ◊ *Ceramic bodies were formed by vacuum extrusion and fired at 950° C*), **vacuum filter** (MAQELAB filtro de/a vacío ◊ *The rotary vacuum filter is the workhorse of the chemical process industries*), **vacuum firing** (ELABPROC cocción al vacío; proceso para la cocción de tipos especiales de cerámica, por ejemplo, porcelana dental, y destinado a prevenir la oxidación o a reducir su porosidad ◊ *In comparison of the effect of firing temperature on the shrinkage and porosity, shrinkage increased and porosity decreased significantly in vacuum-firing, as the firing temperature increased above 900 °C*), **vacuum forming** (ELABPROC conformación al/en vacío ◊ *A variety of rigid shapes are made from ceramic fibre blankets with suitable binders, using vacuum forming*), **vacuum mixer** (MAQTRANS/MAQELAB mezclador(a) al/de vacío ◊ *A vacuum mixer was used for the homogenisation of the components*), **vacuum plasma spraying, VPS** (ELABPROC/ESMREL pulverización por plasma al/en vacío, proyección por plasma en vacío; método de recubrimiento de proyección por plasma (empleado cuando se demanda de las capas depositadas requisitos exigentes en lo referente a densidad,

pureza, ausencia de óxidos y adherencia, en cuyo caso la proyección se debe realizar en una cámara con atmósfera inerte; el resultado son capas de mayor densidad, mejor adherencia y cohesión y estructura óptima. V. *plasma spraying; air plasma spraying*), **vacuum pressing** (ELABPROC prensado al/en vacío  $\diamond$  *An investigation made by the NIIStroikeramika of the process of vacuum pressing of different ceramic powders showed that the effectiveness is largely determined by the properties of these powders*), **vacuum pressure casting, VPC** (INDAFIN colado por inyección al vacío  $\diamond$  *In vacuum pressure casting or VPC vacuum is used in combination with various gases under pressure to improve the quality of the casting and minimize porosity in the metal*), **vacuum pug mill** (MAQELAB prensa con vacío  $\diamond$  *This dry body is extruded to a cylindrical shape by the vacuum pug mill and is then cut and developed to a planer form; V. de-airing pug mill*), **vacuum pump** (GRAL bomba de vacío, bomba para hacer el vacío; bomba utilizada para reducir la presión y crear un vacío parcial en un espacio cerrado), **vacuum refining** (INDAFIN V. *vacuum degassing*), **vacuum treatment** (ELABPROC tratamiento en vacío  $\diamond$  *Vacuum treatment of these samples at 2000°C leads to decomposition of the boron nitride phase*), **vacuum-assisted casting** (ELABPROC fundición al vacío  $\diamond$  *Pressure applied to the slurry (pressure casting), a vacuum applied to the mold (vacuum-assisted casting), or centrifuging (centrifugal casting) may be used to increase the casting rate*), **vacuum-assisted drying** (ELABPROC secado al vacío  $\diamond$  *Vacuum-assisted drying reduces the partial pressure of vapors*)].

**VAD abbr:** ELABPROC V. *vapor/vapour-phase axial deposition*.

**VAD abbr:** ELABPROC/ESMREL V. *vacuum arc deposition*.

**valence band** *n:* QUIM banda de valencia; banda de menor energía que se encuentra ocupada o semiocupada por electrones de valencia -*valence electrons*-  $\diamond$  *If there is a relatively large gap between the highest filled band, known as the valence band, and the lowest empty band, known as the conduction band, then the material is an insulator; V. band theory; conduction band*.

**valley tiles** *n:* PRODFIN teja de limahoya/acanalada; teja de forma especial que se usa para el ángulo ("valle") que forman las dos vertientes del tejado en el punto en el que convergen.

**value<sup>1</sup>** *n/v:* GRAL valor, valoración. [Exp: **value<sup>2</sup>** (GRAL valorar; dar valor a algo), **value added tax, VAT** (COM impuesto sobre el valor añadido; impuesto general sobre el consumo que recae sobre todos los bienes y servicios, sean nacionales o extranjeros, utilizados en un país)].

**valve** *n:* GRAL válvula, llave de paso  $\diamond$  *Many valves are controlled manually with a handle attached to the valve stem*.

**VAMAS programme abbr:** ORG-INST V. *Versailles Project on Advanced Materials and Standards*.

**Van der Waal's forces** *n:* QUIM fuerzas de Van der Waal; fuerzas intermoleculares de atracción relativamente débiles, que hacen que las moléculas neutras se atraigan en casi todos los sólidos, líquidos y gases  $\diamond$  *Van der Waals forces are important in producing*

*aggregates of particles in dense suspensions, and spontaneous agglomeration in dry powders of very small (sub-micron) particle sizes.*

**vanadium** *n*: QUIM vanadio; elemento químico; metal de color gris claro, dúctil y resistente a la corrosión, empleado como catalizador y que aleado con aluminio o con hierro, mejora las propiedades mecánicas del hierro, el acero y el titanio. [Exp: **vanadium borides, VB** (QUIM/MTRLS boruro(s) de vanadio  $\diamond$  *The presence of free carbon and vanadium boride in the ceramic makes it possible to activate the sintering process*), **vanadium carbide, VC** (QUIM/MTRLS carburo de vanadio  $\diamond$  *Preferably vanadium carbide is used as a grain growth inhibitor*), **vanadium nitrides, VN** (QUIM nitruro de vanadio  $\diamond$  *Zirconium is generally miscible into vanadium nitride at concentrations of up to approximately 6 atomic percent*), **vanadium oxide** (QUIM/MTRLS óxido de vanadio  $\diamond$  *Vanadium Oxide is a highly insoluble thermally stable Vanadium source suitable for glass, optic and ceramic applications*), **vanadium yellow** (ESMREL amarillo de vanadio  $\diamond$  *Vanadium yellow is a ceramic colour produced by the calcination, at about 1000°C, of a mixture of 10-20% V2O5 (as ammonium metavanadate) and 80-90% SnO*), **vanadium-tin yellow** (ESMREL amarillo de vanadio estaño V. *vanadium yellow*), **vanadium-zirconium blue** (ESMREL azul de vanadio-circón V. *turquoise; zirconium-vanadium blue*)].

**vane feeder** *n*: MAQTRANS alimentador de paletas  $\diamond$  *A vane feeder is a device for feeding dry ground clay from a hopper to a tempering machine or mixer; V. rotary vane feeder.*

**vanity top** *n*: PRODFIN encimera de baño  $\diamond$  *For busy modern living, granite vanity top products delivers on a high-level of functionality; V. top.*

**vapor/vapour** *n*: GRAL vapor; fluido gaseoso de temperatura inferior a su temperatura crítica y cuya presión no aumenta al ser comprimido, sino que se transforma parcialmente en líquido. [Exp: **vapor/vapour barrier** (GRAL barrera de vapor, barrera antihumedad; película impermeable al vapor; material en forma de lámina con una elevada estanqueidad al vapor de agua, y empleado para evitar el paso de humedad a través del suelo o la pared y para curar el hormigón fresco), **vapor/vapour deposition, VD** (ELABPROC/ESMREL deposición de vapor  $\diamond$  *Vapor deposition refers to any process in which materials in a vapor state are condensed through condensation, chemical reaction, or conversion to form a solid material*), **vapor/vapour phase powder synthesis** (ELABPROC síntesis de polvo en fase (de) vapor  $\diamond$  *Vapor-phase powder synthesis techniques, include vapor condensation, vapor decomposition, and vapor-vapor, vapor-liquid, and vapor-solid reactions*), **vapor/vapour processing (system)** (ELABPROC procesamiento de vapores (sistema de)  $\diamond$  *Vapor processing involves heating a solid substance to a temperature that transforms the solid into vapor, which is then deposited onto a surface*), **vapor/vapour-phase axial deposition, VAD** (ELABPROC deposición axial en fase de vapor  $\diamond$  *In OVPO (outside vapour-phase oxidation) and VAD (vapour phase axial deposition) the hydrolyzed reactants are deposited on the side of a rotating starting rod (OVPO) or on the end of a rotating rod which is gradually raised from the flame as the deposit grows (VAD); V. optical fibres; outside vapour-phase oxidation*), **vaporisation under vacuum** (ELABPROC/ESMREL vaporización al/en vacío; técnica para generar películas/recubrimientos, especialmente para metales

◊ *The latter is usually formed by a thin metal layer applied by vaporization under vacuum to a glass plate*]).

**variable** *a*: GRAL variable; dícese de algo que varía o puede variar, inestable, inconstante y mudable. [Exp: **variability** (GRAL variabilidad; cualidad de inestable, variable ◊ *These minerals are of little use as materials because of their mechanical weakness and variability in properties*), **variable speed drive, VSD** (GRAL variador de velocidad, accionador de velocidad variable (ASD); dispositivo o conjunto de dispositivos empleados para controlar y regular la velocidad y fuerza giratoria -*speed and rotational force*- de maquinaria, especialmente de motores ◊ *The purpose of this variable speed drive is to allow for tolerances in tile thickness, thereby enabling a reasonably "tight" stack to be achieved by increasing the speed for consistently thick tiles or decreasing the speed for consistently thin tiles*), **variable-length slabs** (PRODFIN baldosa de longitud variable ◊ *Floors with variable-length slabs can be observed*), **variable-speed rotating cylinder viscometer** (INSTR viscosímetro rotacional/rotatorio de cilindros de velocidad variable ◊ *The most widely used viscometer for ceramic suspensions and slurries is the variable-speed rotating cylinder viscometer; V. rotating cylinder viscometer*)].

**variance** *n*: GRAL varianza; medida de dispersión de una variable con respecto a su media aritmética. [Exp: **variance (analysis of), ANOVA** (GRAL/ENSAYO varianza (análisis de); colección de modelos estadísticos y sus procedimientos asociados utilizado para comparar si los valores de un conjunto de datos numéricos son significativamente distintos a los valores de otro o más conjuntos de datos ◊ *All results were analyzed using response surfaces with data obtained by analysis of variance (ANOVA)*), **variance of sample preparation** (ENSAYO varianza de preparación de la muestra), **variance of sampling** (ENSAYO varianza muestral ◊ *The sampling variance of a statistic is the square of its standard error*)].

**variation** *n*: GRAL variación; cambio ◊ *Clear stipulation must be made towards the possible variation in length, width, thickness and surface*. [Exp: **vary** (GRAL variar ◊ *The actual quantities required may vary*)].

**variegated** *a*: GRAL variegado, abigarrado; multicolor; de diversos colores ◊ *Variegated or mottled glazes are those that do not have a homogeneous solid color or character*.

**varistor** *n*: GRAL varistor (variable resistor); componente electrónico empleado para proteger a los otros componentes más sensibles de los circuitos contra variaciones bruscas de voltaje o picos de corriente ◊ *The most common type of varistor is the Metal Oxide Varistor (MOV), which contains a ceramic mass of zinc oxide grains*.

**varnish** *n*: ESMREL barniz ◊ *The ceramic colours cannot be printed directly and the actual printing is done in varnish and the colour then dusted on; V. polisher*.

**varve** *n*: GEO-MIN-CRIST varve; capa anual de sedimento o roca sedimentaria V. *varved clay*. [Exp: **varve(d) clay** (MATPRI arcilla varved ◊ *Varve (or varved clay) is clay with visible annual layers, formed by seasonal differences in erosion and organic content*)].

**VAT** *abbr*: COM V. *value added tax*.

**VB abbr:** QUIM/MTRLS V. *vanadium borides*.

**VC abbr:** INDAFIN V. *vacuum casting*.

**VC abbr:** QUIM/MTRLS V. *vanadium carbide*.

**VCT abbr:** PRODFIN V. *vinyl composition tile*.

**VD abbr:** ELABPROC/ESMREL V. *vapor/vapour deposition*.

**V-draining abbr:** TRANSPROC V. *double draining*.

**VE abbr:** ESMREL V. *vitreous enamel*.

**Vebe apparatus n:** INDAFIN aparato Vebe  $\diamond$  *For aggregate particles, this can be done simply by measuring the packing density of each size fraction using the Vebe apparatus.*

**vee-joint, V-joint n:** INSTAL junta en V  $\diamond$  *A 90° vee joint should be used when joining heavy sections.*

**Vegard's law n:** PROPQUIM-FIS ley de Vegard; regla empírica aproximada que propone la existencia de una relación lineal, a temperatura constante, entre la constante de red de una aleación -*lattice constant of an alloy*- y las concentraciones de los elementos que la forman.

**vehicle n:** MTRLS/ESMREL vehículo fijo, aglomerante; aglutinante; medio; en una pintura, parte sólida que junto con el pigmento permanece en la película una vez seca, esto es, el formador de película  $\diamond$  *Glycerine is a vehicle used as a base for glaze or in addition to water that will assist in achieving fluidity for brushing; V. binder.*

**veil n:** INDAFIN velo de vidrio  $\diamond$  *A veil is a metallic coating applied to hot glass and then covered with more clear glass so as to trap the color. [Exp: **veiling** (INDAFIN veiling  $\diamond$  *Veiling is a US term for gold and organic colours sprayed on glass in a thread-like texture*)].*

**vein<sup>1</sup> n:** GEO-MIN-CRIST/EXPL-CANT vena; faja de tierra o piedra que se distingue de la masa en que se halla interpuesta por su calidad o color  $\diamond$  *A hole was excavated, a barreiro was dug to find the vein of clay. [Exp: **vein<sup>2</sup>** (CALIDAD V. *striae*), **vein<sup>3</sup>** (GEO-MIN-CRIST filón; relleno mineral de una fractura), **vein<sup>4</sup>** (GEO-MIN-CRIST veta, vena; raya ondulada, estrecha y de colores diversos que presentan ciertas piedras), **vein quartz** (MATPRI cuarzo venular; variedad de cuarzo de grano muy grueso  $\diamond$  *Vein quartz usually contains occluded gas bubbles and is unsuitable as a raw material for silica refractories*)].*

**Vello process n:** INDAFIN proceso Vello; proceso para la formación de tubos de vidrio  $\diamond$  *In the Vello process, glass flows downward through a defined orifice and is gently turned horizontal.*

**vellum glaze** *n*: ESMREL V. *satin glaze*.

**veneer**<sup>1</sup> *n*: CONST revestimiento, aplacado; chapa; enchapado; lámina; en general, capa delgada de material de mejor calidad que aquel que recubre, generalmente de apariencia y superficie fina y agradable; to place a veneer of: dar la apariencia de ◇ *The floor of the cistern was sealed with a veneer of tiles*. [Exp: **veneer**<sup>2</sup> (PRODFIN carilla dental), **veneer**<sup>3</sup> (ESMREL barniz, capa de barniz ◇ *The veneer of the tile is often shattered*), **veneered wall** (CONST pared revestida ◇ *Any wall having a facing which is attached, but not bonded, to the wall is a veneered wall*), **veneering** (CONST revestimiento; chapado)].

**Venetian red** *n*: ESMREL/DISEÑO rojo veneciano ◇ *Venetian Red is a permanent red pigment composed of ferric oxide and obtained by igniting ferrous sulphate*.

**vent**<sup>1</sup> *n*: MAQELAB toma de aire, respiradero; salida de aire; salida de ventilación ◇ *A kiln vent ensures that an adequate flow of air is passing through the kiln while it is being fired and cooled*. [Exp: **vent**<sup>2</sup> (CALIDAD corte superficial, petado; cuarteado, salteado, grieta, rajadura), **vent hole** (GRAL/MAQELAB respiradero, orificio ventilador ◇ *A vent hole may refer to the peep holes in the side of the kiln*), **vent hole** (ELABPROC calado ◇ *Vent holes are small holes made by puncturing the wet greenware with a needle tool when two pieces of ware have been attached and they allow the air and gases to escape during firing*)].

**ventilate** *v*: GRAL ventilar; renovar el aire y hacerlo correr. [Exp: **ventilated air gap** (GRAL cámara de aire ventilada ◇ *A ventilated air gap may also contribute in the drying out of the concrete*), **ventilated facade technique** (CONST técnica de la fachada ventilada ◇ *Tau has already used its materials for the ventilated facade technique on a diverse number of hugely successful projects*), **ventilated facade/façade** (CONST fachada ventilada; sistema de revestimiento -*veneering*- y protección del muro exterior de un edificio caracterizado por crear una cámara de aire -*air space/gap*- en movimiento entre la pared revestida -*veneered wall*- y el paramento exterior de revestimiento garantizando así una ventilación continuada a lo largo de toda la superficie de la fachada y ofreciendo una mejor protección térmica, estanqueidad -*watertightness*-, estabilidad, etc. también, fachada revestida mediante este sistema ◇ *The collections made specifically to be used for the ventilated facade are essentially produced in formats larger than 40 x 40 cm, and especially 60 x 60 cm, and 60 x 120cm*), **ventilated oven** (MAQELAB horno ventilado), **ventilated wall** (CONST pared ventilada ◇ *Installation, design, anchoring systems and advantages of a ventilated wall system made with porcelain tile*), **ventilation** (GRAL/SEG ventilación, instalación de ventilación; en general, sistema para dirigir el movimiento del aire con el fin de renovarlo y mantener un ambiente puro; en industria, conjunto de sistemas empleados para neutralizar y eliminar la presencia de calor, polvo, humo, gases, condensaciones, olores, etc. en los lugares de trabajo, que puedan resultar nocivos para la salud de los trabajadores ◇ *Never scrape, sand, or scratch the surface of greenware (unfired clay), bisque-fired clay, or unfired glaze without wearing a respirator and having adequate ventilation*), **ventilation** (GRAL V. *aerage*)].

**veranda** *n*: GRAL galería, mirador.

**verdigris** *n/a*: ESMREL cardenillo, verde claro; color verde claro; también acetato de cobre usado en la pintura.

**verge** *n*: CONST visera del tejado ◇ *At the verge, the roofing tiles are edgebedded, preferably on a single or double undercloak of plain tiles.*

**vermiculite** *n*: MTRLS/ESMREL vermiculita; mineral formado por silicatos de hierro o magnesio, del grupo de las micas, que al elevar rápidamente su temperatura genera una expansión llamada exfoliación ◇ *When vermiculite is ground into a fine powder, it is used as a filler in inks, paints, plastics, and other materials; V. exfoliation.* [Exp: **vermiculite brick** (INDAFIN ladrillo de vermiculita ◇ *Vermiculite brick is used for Fireproofing and Soundproofing applications in fireplace lining, furnace lining, stove lining, etc.*)].

**vermilion** *n/a*: ESMREL/DISEÑO bermellón; color rojo vivo.

**Verneuil process** *n*: INDAFIN proceso Verneuil, fusión a la llama ◇ *Crystals produced by the Verneuil process are chemically and physically equivalent to their naturally occurring counterparts, and strong magnification is usually required to distinguish between the two.*

**Versailles Project on Advanced Materials and Standards, VAMAS programme** *n*: ORG-INST Proyecto Versalles sobre materiales y normas avanzadas ◇ *The Versailles Project on Advanced Materials and Standards is a European Community initiative to develop standard test methods for the evaluation of advanced ceramics.*

**vertex** *n*: GRAL vértice, ápice.

**vertical** *a*: GRAL vertical; referido a una recta o de un plano: que es perpendicular a otra recta o plano horizontal. [Exp: **vertical bedding** (GEO-MIN-CRIST estratificación vertical), **vertical cracks in the exterior region** (CALIDAD fisuras verticales en la región exterior ◇ *Vertical cracks in the exterior region are often caused by differential springback from compressed air and may be concentrated in the center of the compact*), **vertical cut** (EXPL-CANT corte vertical), **vertical hole** (EXPL-CANT barreno vertical), **vertical joint** (INSTAL junta vertical ◇ *Every effort should be made to maintain half bond by laying tiles to horizontal courses with each vertical joint located over the centre of the tile below*), **vertical mixer** (MAQTRANS amasadora vertical ◇ *A vertical mixer has a mixing chamber with a vertical auger rotatably mounted therein*), **vertical shaft mixer** (MAQTRANS amasadora de eje vertical; compartimento para mezclado de forma cilíndrica o anular y que contiene uno o más ejes giratorios con paletas o cuchillas V. *horizontal shaft-mixer*), **vertical support tile** (PRODFIN apoyo de rejilla completo; tipo de pieza cerámica especial), **vertical-type vibratory mill** (MAQELAB molino vibratorio tipo vertical ◇ *The vertical-type vibratory mill is nearly completely filled with cylindrical media and the feed slurry*)].

**vesicular** *a*: PROPMATPRI vesicular; sólido que contiene gran cantidad de pequeñas burbujas ◇ *A bloated clay may be vesicular.*

**vessel** *n*: GRAL recipiente, cubeta; vasija V. *pressure vessel*.

**vestibule** *n*: GRAL vestíbulo V. *corridor; hall; lobby*.

**VHN** *abbr*: PROPQUIM-FIS V. *Vickers hardness number*.

**vibrating** *a*: GRAL vibratorio; dícese de algo que produce vibración o es capaz de vibrar. [Exp: **vibrating ball mill** (MAQELAB molino de bolas vibratorio  $\diamond$  *The vibrating ball mill operates in open or closed circuit for wet or dry continuous grinding*), **vibrating channel** (MAQTRANS canal vibrante/vibratorio  $\diamond$  *It is a requirement of such combinatorial weighing apparatus that the vibrating channel can be easily dismantled for cleaning purposes*), **vibrating conveyor** (MAQTRANS transportador vibratorio, dosificador vibratorio  $\diamond$  *The vibrating conveyor consists of a two mass oscillating system, driven at its natural frequency of oscillation to minimize power consumption and vibrational stress; V. vibrating screen*), **vibrating grate** (MAQTRANS parrilla a sacudidas V. *vibrating mill*), **vibrating grate dryer** (MAQELAB secadero de parrilla a sacudidas  $\diamond$  *Vibrating grate dryers are used for drying clay materials*), **vibrating mill** (MAQTRANS molino vibratorio (laboratorio), bombo  $\diamond$  *The above-mentioned cordierite powder to be used may be obtained from commercially available one which is pulverized to an average particle diameter of 10.mu.m or below by means of a vibrating mill*), **vibrating screen** (MAQTRANS tamiz a sacudidas  $\diamond$  *Vibrating screen is placed at the outlet of ball mill, refraining the coarse particle materials from flowing through the 80-100 mesh screen down to the ground tanks; V. vibrating sieve*), **vibrating screen** (MAQTRANS transportador vibratorio, dosificador vibratorio), **vibrating screen** (MAQTRANS criba con percusión), **vibrating table** (INDAFIN mesa de sacudidas, mesa vibratoria  $\diamond$  *A vibrating table will reduce the number of bubbles in your castings dramatically by oscillating rapidly to remove air; V. vibration table*)].

**vibration** *n*: GRAL vibración  $\diamond$  *Vibration helps to consolidate the mortar mix and removes air bubbles, which would otherwise cause weak spots in the hardened tile*. [Exp: **vibration moulding** (ELABPROC prensado por vibración  $\diamond$  *Tiles are cast by vibration moulding of moist mixture containing gypsum anhydrite plaster, pigments, polymers, fibres etc*), **vibration table** (INDAFIN mesa vibratoria, tabla vibratoria; parte de la máquina vibratoria sobre el cual se coloca el elemento que vaya a ser sometido a vibración  $\diamond$  *A vibration table or vibration probe(s) can be used to impart the vibration energy to the mixture under a specific vibration amplitude and time interval; V. vibrating table*)].

**vibrator** *n/a*: GRAL/MAQELAB vibrador, que vibra; aparato que transmite vibraciones eléctricas  $\diamond$  *After vibration, the tile is removed carefully from the vibrator, still on its plastic sheet, and positioned on the mould which forms its shape*. [Exp: **vibratory conveyor** (MAQTRANS transportador vibrante/vibratorio, alimentación por vibración  $\diamond$  *A vibratory conveyor consists of a horizontal or slightly sloping channel subjected to a vibration of small amplitude, which moves the material forward in a continuous manner*), **vibratory feed** (MAQTRANS V. *vibratory conveyor*), **vibratory mill** (MAQTRANS molino vibratorio  $\diamond$  *Industrial vibratory mills are either of the horizontal tube type or the vertical torus type*), **vibratory milling** (TRANSPROC molienda vibratoria  $\diamond$  *Vibratory milling is relatively fast and efficient and yields a finer powder than is usually achieved by ball milling*)].

**vibro-** *pref:* GRAL vibro-. [Exp: **vibro-cast(ing)** (INDAFIN/ELABPROC moldeo por vibración *◇ This range of bricks has been entirely developed through indigenous research and is formed by the vibro-casting method*), **vibro-compaction** (TRANSPROC/ELABPROC vibrocompactación; vibración y presión aplicadas de manera simultánea para densificar mezclas en polvo *◇ Further compaction to increase the density of this mixture is possible by using vibro-compaction techniques as used in road construction*), **Vibro-energy mill** (MAQTRANS molino Vibro-energy; marca comercial para un molino de bolas vibratorio diseñado para oscilar horizontal y verticalmente *◇ The wet grinding is carried out in a pebble or ball mill, a vertical or horizontal bead mill, or in an attritor or in a Vibro-energy mill made from or lined with porcelain, ceramic, stainless steel, polyurethane or other acid-resistant material*)].

**Vicat apparatus** *n:* ENSAYO aparato de Vicat; dispositivo de penetración empleado para ensayar cementos hidráulicos y otros materiales similares V. *Vicat needle*. [Exp: **Vicat needle** (ENSAYO/INDAFIN aguja de Vicat; aparato empleado para obtener el tiempo de fraguado de un mortero por medio de la penetración de una aguja *◇ With cement, the penetration is usually measured using the Vicat needle*)].

**Vickers hardness, HV** *n:* PROPQUIM-FIS dureza Vickers; cociente de la fuerza de la prueba por el área de la huella *◇ The Vickers Hardness of vitreous enamels is approx. 500 kg/mm<sup>2</sup>*. [Exp: **Vickers hardness number, VHN** (PROPQUIM-FIS número de dureza Vickers *◇ Typically PSZ has a Vickers hardness number (VHN) of 11 GPa, which is low compared with other advanced ceramics but is higher than that of quartz, an environmentally encountered natural abrasive*), **Vickers hardness test, HV** (ENSAYO ensayo de dureza Vickers; ensayo que mide la dureza de materiales cuya sección transversal es muy delgada, o bien materiales que tienen tratamiento térmico solamente en la superficie, y cuyo valor numérico de dureza es igual a la carga aplicada en kg dividida entre el área de la huella del penetrador *◇ The Vickers hardness test uses a diamond, with the shape of square-based pyramid with an angle of 136° between opposite faces as an indenter (22° between the indenter face and surface)*), **Vickers hardness-testing machine** (ENSAYO/INSTR durómetro Vickers V. *durometer; hardness tester*)].

**Victoria green** *n:* ESMREL/DISEÑO verde Victoria *◇ Uvarovite is the colouring agent in Victoria green*.

**Vinsol resin** *n:* INDAFIN resina Vinsol *◇ Vinsol resin is a trade-name referring to a thermoplastic powder used as an airetraining agent in the mixing of concrete*.

**vinyl** *n:* QUIM vinilo; sustancia, generalmente un polímero, que contiene un grupo funcional monovalente no saturado. [Exp: **vinyl composition tile, VCT** (PRODFIN loseta vinílica *◇ Vinyl composition tile ( VCT) is a mix of thermoplastic binder, fillers and pigments offering moderate pricing, durability, easy installation, and assorted colors and patterns*)].

**violet** *n/a:* ESMREL/DISEÑO violeta; color morado claro, parecido al de la flor del mismo nombre.

**viscoelasticity** *n*: PROPQUIM-FIS viscoelasticidad; comportamiento reológico de un material (por ejemplo un polímero) que se comporta como un líquido y como un sólido elástico ◊ *Viscoelasticity of the bond material sharply reduces tensile stresses*. [Exp: **viscoelastic** (PROPQUIM-FIS viscoelástico ◊ *A viscoelastic material poured onto a flat surface will not smoothly cover the surface and will retain part of its shape before pouring*)].

**viscometer** *n*: INSTR viscosímetro, viscómetro; instrumento para medir la viscosidad y algunos otros parámetros de flujo de un fluido ◊ *The VM-10A laboratory viscometer is a torsion-balanced, oscillation type viscometer driven by piezoelectric ceramics; V. flow cup; Stormer viscometer; torsion viscometer; brookfield viscometer; cone and plate viscometer; MacMichael viscometer*.

**Viscone** *n*: MTRLS Viscone ◊ *Viscone is a trade-name for silicone rubber for pads and membranes for ceramic printing*.

**viscosity** *n*: PROPQUIM-FIS viscosidad, coeficiente de viscosidad; propiedad de los fluidos que mide su resistencia a fluir, debida al rozamiento interno entre sus moléculas y que resulta de gran importancia en la mayor parte de los procesos industriales ◊ *The number of seconds is a reliable measure of the viscosity of the glaze*. [Exp: **viscosity grade** (PROPQUIM-FIS grado de viscosidad; medida del espesor de una sustancia y su capacidad para fluir a determinadas temperaturas ◊ *The viscosity grade of a binder is its apparent viscosity at some standard concentration in solution*)].

**viscous** *a*: PROPQUIM-FIS viscoso; denso y pegajoso ◊ *Vitreous silica is a highly viscous melt*. [Exp: **viscous behaviour** (PROPQUIM-FIS comportamiento viscoso; comportamiento mecánico en el cual la velocidad de deformación es proporcional a la fuerza empleada, independientemente de la deformación originada), **viscous plastic processing, VPP** (ELABPROC procesamiento viscoplástico; técnica para el conformado de la pieza cruda que mejora las cualidades de ésta y minimiza el tamaño y el número de defectos en la microestructura ◊ *Viscous plastic processing (VPP) has been applied to an extensive range of materials including advanced refractory ceramics and tile bodies*)].

**visible** *a*: GRAL visible. [Exp: **visible edge** (GRAL canto visible), **visible face** (GRAL cara vista ◊ *Enamelling of the visible face of the tile*), **visible to the naked eye** (GRAL visible a simple vista)].

**visual** *a*: GRAL visual. [Exp: **visual inspection** (ELABPROC examen visual, inspección visual ◊ *The ceramic tiles manufacturing process has now been completely automated with the exception of the final stage of production concerned with visual inspection*)].

**vitreous** *a*: PROPQUIM-FIS vítreo; materia mineral que no tiene estructura cristalina; aplicado a la cerámica, significa vítreo -glassy-, que tiene una porosidad muy baja o inexistente ◊ *The term vitreous, meaning 'glassy', is applied to ceramic ware that, as a result of a high degree of vitrification (as distinct from sintering) has an extremely low porosity; V. impervious; nonvitreous; semivitreous*. [Exp: **vitreous carbon** (MTRLS carbón vítreo ◊ *Glassy carbon, also called vitreous carbon, is an advanced material of pure carbon combining glassy and ceramic properties with these of graphite*), **vitreous enamel, VE** (ESMREL esmalte vítreo, esmalte porcelánico; esmalte vidriado;

recubrimiento inorgánico obtenido por fundición de cristal en polvo con un sustrato a través de un proceso de calentamiento, normalmente entre 750 y 850 °C  $\diamond$  *A vitreous enamel surface finish is achieved by fusing glass particles to sheet metal or cast iron by firing it at a temperature in excess of 800°C*), **vitreous phase** (ESMREL fase vítrea, fase vitrosa  $\diamond$  *Enamel is a vitreous phase, applied to the surface of the ceramic body, to protect it by making it tight; V. glass phase*), **vitreous sanitaryware/sanitary ware** (PRODFIN gres sanitario  $\diamond$  *Vitreous sanitary ware in general includes such materials as bathroom fixtures, closets, tanks, lavatories, bathtubs, kitchen sinks, etc.*), **vitreous silica** (MTRLS sílice vítrea; sílice con una gran viscosidad al ser fundida a alta temperatura y que enfriándola mantiene su naturaleza amorfa, dando el vidrio de sílice  $\diamond$  *Fused or vitreous silica has the lowest expansion of all the refractory materials commonly used; V. translucent/transparent vitreous silica*), **vitreous slip** (MTRLS/ESMREL esmaltina; material de recubrimiento intermedio entre un engobe y un esmalte que se obtiene agregándole a un engobe un 30 ó 50% más de esmalte transparente y que produce una superficie vitrificada al madurar sobre un cuerpo cerámico  $\diamond$  *The glaze is a vitreous slip fired to 1040 degrees C*), **vitreous state** (PROPQUIM-FIS estado vítreo; estado sólido en el que los átomos o las moléculas no están colocados en un orden regular como sucede en un cristal y que cristaliza sólo después de un largo periodo de tiempo  $\diamond$  *Solid B2O3 is commonly available only in the vitreous state*), **vitreous tile** (PRODFIN azulejo vítreo; azulejo cerámico de baja porosidad, usado tanto en exteriores como en interiores y en ubicaciones húmedas o secas  $\diamond$  *The low absorption rate makes porcelain up to 6 times more frost resistant than a vitreous tile; V. non-vitreous tile; semi-vitreous tile*), **vitreous ware** (PRODFIN productos vítreos  $\diamond$  *Porcelain is vitreous ware which requires special preparation by mixing kaolin with ball clay, feldspar and flint*), **vitreous-china sanitaryware** (PRODFIN sanitarios de loza vítrea  $\diamond$  *Our high vitreous china sanitaryware is manufactured in compliance with BS 3402 British Standard Specification of Quality of Vitreous China Appliance*)).

**vitriifiability** *n.*: PROPQUIM-FIS aptitud para la gresificación, vitrificabilidad  $\diamond$  *Feldspathic presence is often the principal manufactural factor determining vitriifiability.*

**vitriification** *n.*: ELABPROC gresificación, vitriificación; proceso en el que se produce una fusión parcial progresiva de los componentes de la arcilla así como una contracción y relleno de sus intersticios resultado de su cocción a una temperatura elevada, obteniéndose un producto de una porosidad extraordinariamente baja  $\diamond$  *In a clay product, vitriification results when kiln temperatures are sufficient to fuse grains and close the surface pores, making the mass impervious.* [Exp: **vitriification temperature** (PROPQUIM-FIS/ELABPROC temperatura de vitriificación  $\diamond$  *The lower the glass transition point, the lower is the sintering temperature or a vitriification temperature for the corresponding glass ceramic mass*), **vitriification point** (PROPQUIM-FIS/ELABPROC punto de sinterización, punto de gresificación; temperatura a la que un material se convierte en vítreo  $\diamond$  *The green ceramic pieces are fired to a temperature of at least about 100 degrees above the vitriification point*), **vitriification range** (PROPQUIM-FIS/ELABPROC intervalo de vitriificación/gresificación; intervalo de temperaturas comprendido entre el inicio de la densificación debida a la formación de la fase líquida y el desmoronamiento de la pieza debido a contenidos excesivos de líquido  $\diamond$  *To be commercially feasible, translucent, ceramic whiteware products must be fired within a reasonable vitriification range*), **vitriification zone** (MAQELAB zona de

vitrificación/gresificación (en el horno) ◇ *The silicates in the clay are vitrified in a vitrification zone of the kiln to produce aggregates which are crushed and screened*].

**vitrify** *v*: ELABPROC vitrificar, fritar; gresificar; en general, convertir en vidrio una sustancia o hacer que algo adquiera la apariencia de éste; fundir completamente un material cerámico que alcance un estado de casi vítreo de manera que resulte no poroso e impermeable aún sin esmaltar ◇ *Without significant additions of expensive frits it is impossible to vitrify a body at these temperatures; V. devitrify*. [Exp: **vitrified** (PROPQUIM-FIS vitrificado, gresificado ◇ *Sanitary ware is actually heated high enough to become vitrified (made glassy), to be completely nonabsorbent; V. vitreous; vitrify*), **vitrified brick** (INDAFIN ladrillo vitrificado ◇ *A thoroughly vitrified brick has no visible pores and breaks with a smooth fracture*), **vitrified wheel** (MAQTRANS muela vitrificada; muela abrasiva con un aglomerante vítreo o porcelánico ◇ *Because the bond material is stronger, a vitrified wheel can incorporate more abrasive*), **vitrifying agent** (MTRLS agente vitrificador)].

**vitrite** *n*: QUIM vitrita ◇ *Vitrite is generally used for insulating electrical parts (e.g. contact terminals for electric lamp caps)*.

**vitroceramic** *a*: PROPQUIM-FIS vitrocerámico; tipo de producto cerámico formado por la devitrificación controlada del vidrio; materiales formados por vidrio y óxidos de titanio o circonio a temperaturas elevadas que muestran una gran estabilidad y resistencia térmica ◇ *The adherence of the vitroceramic layers onto metallic supports was tested by microhardness trials at the interface; V. glass ceramic; devitrification*.

**V-joint** *abbr*: INSTAL V. vee-joint.

**VN** *abbr*: QUIM V. vanadium nitrides.

**void** *n*: PROPQUIM-FIS/CALIDAD poro, hueco, oquedad, vacío; espacios entre los granos u otras cavidades en piezas cerámicas generalmente ya conformadas y prensadas ◇ *Aerogels can have void volumes as large as 98% and densities as low as 80kgm-3; V. pore*. [Exp: **void ratio** (PROPQUIM-FIS/CALIDAD índice de huecos/poros; relación del volumen de vacíos al volumen de materia sólida)].

**volatile** *a*: PROPQUIM-FIS volátil; sujeto a evaporación a una temperatura relativamente baja. [Exp: **volatiles** (GRAL materias volátiles de los combustibles ◇ *Some units are designed to turn the volatiles into useful energy for noncritical parts of the heating cycle*), **volatility** (PROPQUIM-FIS volatilidad; capacidad de una sustancia para evaporarse con una presión y una temperatura determinadas ◇ *The high melting point of reactants, together with their volatility, limits the versatility of the fusion method*)].

**volcanic** *a*: GEO-MIN-CRIST volcánico. [Exp: **volcanic ash** (GEO-MIN-CRIST ceniza volcánica; material fragmentado suelto compuesto de partículas de roca y mineral muy finas (diámetro inferior a 4 mm) generadas en un volcán y arrastradas por corrientes de aire ◇ *Volcanic ash has been used as an abrasive, particularly in scouring compounds and soaps; as an important ingredient of ceramic glazes and in ceramic bodies*), **volcanic clay** (MATPRI moya), **volcanic rock** (GEO-MIN-CRIST roca volcánica, roca eruptiva

◇ *Crystallization kinetics concerning the conversion of a glass coating layer made from natural basalt volcanic rock to glass-ceramic have been investigated*]).

**Volclay** *n*: MATPRI Volclay; marca comercial para una arcilla ( bentonita de sodio natural) de alta expansión al entrar en contacto con el agua y producida exclusivamente en EE.UU.; al mantenerse comprimida y humedecerse después se transforma en un gel que repele el paso del agua.

**volt, V** *n*: MEDIDA voltio; unidad de potencial eléctrico, fuerza electromotriz y voltaje del Sistema Internacional. [Exp: **voltmeter** (INSTR voltímetro)].

**volume** *n*: GRAL volumen; magnitud física que expresa la extensión de un cuerpo en tres dimensiones (largo, ancho y alto) y por tanto cantidad de espacio que ocupa su materia y que no puede ser ocupado por otro cuerpo por la condición de impenetrabilidad de éstos; se mide en metros cúbicos (m<sup>3</sup>). [Exp: **volume expansion** (PROPQUIM-FIS dilatación, expansión de volumen; incremento de volumen ◇ *When fired, kyanite breaks down at 1300°C into mullite and cristobalite with a volume expansion of about 10%*), **volume stability** (PROPQUIM-FIS estabilidad volumétrica; constancia/estabilidad en el volumen de un cuerpo y que impide la deformación de éste por factores externos como por ejemplo la humedad ◇ *The product presents excellent volume stability throughout temperature use range*), **volumenometer** (INSTR V. volumeter), **volumeter** (INSTR volumenómetro; instrumento que sirve para determinar el volumen de un cuerpo, especialmente cuando no conviene sumergirlo en un líquido y que permite determinar la densidad de sólidos a los que difícilmente puede aplicarse métodos corrientes: polvo, cuerpos porosos, etc. ◇ *Gas flow at the permeate side of the membrane was measured with a volumeter*), **volumeter** (SEG volúmetro; aparato utilizado para medir el volumen sonoro), **volumetric strain** (PROPQUIM-FIS deformación volumétrica ◇ *Volumetric strain due to uniaxial force*), **volumetric weight** (PROPQUIM-FIS masa volúmica)].

**von Kobell's scale** *n*: GEO-MIN-CRIST escala de von Kobell, escala de fusibilidad de von Kobell; escala empírica relativa a la fusibilidad *-fusibility-* de los minerales que incluye la estilbina; natrolita; almandino; actinolita; ortosa y broncita y a partir de la cual se concluye que la estilbina (1) funde fácilmente y la broncita (6) es infusible al soplete.

**VPC** *abbr*: INDAFIN V. *vacuum pressure casting*.

**VPP** *abbr*: ELABPROC V. *viscous plastic processing*.

**VPS** *abbr*: ELABPROC/ESMREL V. *vacuum plasma spraying*.

**VSD** *abbr*: GRAL V. *variable speed drive*.

**vulnerable** *a*: GRAL vulnerable; delicado ◇ *Powder coated aluminium strips 104mm wide by 2mm thick were fixed to the outer edge of the panels, to protect the vulnerable tile edges*.

**Vycor glass** *n*: INDAFIN vidrio Vycor; marca registrada para un vidrio con alta resistencia al choque térmico y a las elevadas temperaturas y que contiene un 95% de sílice, 4%

de óxido de boro y un 1% de óxido de sodio ◊ *A good temperature resistance allows the use of Vycor glass at high continuous operating temperatures of up to 900°C.*