The generation of active entries in a specialised, bilingual, corpus-based dictionary of the ceramics industry: what to include, why and how

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Abstract

The generation of useful dictionary entries is a complex task since it is normally complicated to decide what to include, and how to include it. Accordingly, this research presents as its main goal to show how "active entries" have been generated in the specific case of the elaboration of a specialised, bilingual, corpus-based dictionary in the field of industrial ceramics. Thus, this article illustrates how final entries have been designed and how decisions have been adopted depending on the prospective users of the dictionary –specialists and translators in the ceramic industrial field. It proceeds reflecting on how active entries complement previous terminological creations with the inclusion of additional, pertinent information and on the intricate decision-making processes involved in the generation of this kind of entries. On the first part of the article, the theoretical considerations adopted are posed whereas the second part deals with the active entries as such and the way their different fields have been filled in; that is, how different pieces of information regarding contexts of use, pragmatic implications, semantic classification and definitions, among others, have been included in the entries to meet the users' needs.

Keywords: active entry, specialised lexicography, corpus-based dictionary, collocation, context.

Resumen

La elaboración de entradas activas en un diccionario especializado bilingüe basado en corpus de la industria cerámica: qué incluir, por qué y cómo

La elaboración de entradas de diccionario útiles es siempre una labor ardua por lo complicado de decidir qué incluir y cómo incluirlo. Así pues, esta investigación

tiene como principal objetivo mostrar cómo se han generado "entradas activas" en el caso concreto de la elaboración de un diccionario especializado bilingüe basado en corpus en el campo específico de la cerámica industrial. De este modo, el presente artículo ilustra cómo se han diseñado las entradas finales y cómo se han tomado decisiones teniendo a los usuarios potenciales del diccionario –especialistas y traductores en el sector cerámico industrial– como referencia. Este artículo reflexiona además sobre cómo las entradas activas complementan creaciones terminológicas previas con la inclusión de información adicional pertinente y sobre los intrincados procesos de toma de decisiones necesarios para la elaboración de este tipo de entradas. En la primera parte del artículo, se exponen las consideraciones teóricas adoptadas mientras que la segunda parte muestra las entradas teóricas propiamente dichas y la manera en que se han completado los distintos campos; es decir, cómo las diferentes informaciones sobre contextos de uso, implicaciones pragmáticas, clasificación semántica y definiciones, entre muchos otros, han sido incluidos en las entradas con el fin de satisfacer las necesidades del usuario.

Palabras clave: entrada activa, lexicografía especializada, diccionario basado en corpus, colocación, contexto.

1. New trends in terminography: "specialised lexicography" and "active entries"

The type of research presented here undoubtedly has a terminographical basis implicit in the very same ceramics industry dictionary entry development. However, its aim goes much further than just a compilation of terms. The active nature of the dictionary-making process leads to the inclusion of a wide range of data that previous LSP resources may not have considered. In this light, it must be 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 acknowledgement of the need to renew the concept of speciality language dictionaries. In the case of the ceramics industry, this acknowledgement has given way to the creation of an active dictionary in the field with a marked emphasis on context, use and production.[1]

Nowadays, the latest trend for this kind of specialised lexicographical undertakings, as detected by Nida (1997) (and especially among the work of terminologists within the European Union) is to pay more attention to context. In the field of Professional and Academic Language (PAL), 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 (Spain) have elaborated, are good representatives of this trend in the area of specialised lexicography. However, this pragmatic perspective is not to be considered a specific novelty in lexicographical work. The importance of context had already been emphasised by Malinowski in 1935 for the specific task of translating in his article on "The translation of untranslatable words":

> Words (…) 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. (Malinowski, 1935: 258-259)

In spite of this, which may seem rather obvious nowadays, 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. Not so long ago, 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. Consequently, things started to change and the fact that lexical units (LUs) can only achieve its full significance and be fully characterised for lexicographical purposes by means of context observation started to be widely accepted. This is so since, as Cabré (2008) concedes, inferences about the features that the terminological units representing concepts in specialised discourse presumably possess and the conditions they accomplish can only be made by closely observing them. 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) in the Communicative Theory of Terminology (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*, not *in vitro*. 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, more active than passive. The study of terminological units (UTs) *in vivo* –that is, observed and analysed in real and reliable contexts of use– is also the basis for the "Principle of the Terminological Value" (*Principio del Valor Terminológico*) (Cabré, 2008). According to this principle, LUs are not words or terms *per se* but units that activate (or not) their terminological value depending on their use in a particular communicative context.

Hence, the way of conceiving the terminographical/lexicographical task and the public image offered by dictionaries have been changing from a more authoritarian position on the part of lexicographers to the elaboration of dictionaries that are more aware of the prospective users of the product, of their needs (Hatherall, 1984; Cowie, 1987; Hartmann, 1987 & 1989) and of the importance of studying and characterising terms from their natural habitat.

Having taken all these factors that define modern specialised lexicography into consideration for the elaboration of the English/Spanish-Spanish/English specialised dictionary on ceramics terminology, a pragmatic, user-oriented perspective that is far more context-centred and aimed at solving communicative needs has been adopted in the generation of the specific "active" dictionary entries presented herein.

1.1 An active dictionary: a step further

According to all the features mentioned in the previous section, an active dictionary is deeply grounded on the fact that every term must be analysed in context and is always accompanied by other lexical units with which it may appear more frequently. The consideration of these factors in a specialised lexicographical work becomes fundamental for production and is thus one of the key aspects of the "active" perspective emphasised in specialised lexicography. Thus, an active dictionary (with its corresponding active entries) constitutes a step further in the approach to the terminology of specialised languages and is the result of the considerable progress experimented in the area regarding information about patterns of use and

collocational behaviour. Consequently, the information provided by active dictionaries is "aimed precisely at fostering the active use of language, and specifically at helping the foreign learner to construct sentences" (Cowie (1981) –in Kromann, Riiber & Rosbach, 1991: 2721).

Traditionally, active dictionaries have been associated with production. However, I assume that active knowledge inherently implies and needs passive knowledge since correct production implies, somehow, correct understanding. Therefore, the information included in the active entries presented aims at enhancing and improving both production and comprehension, that is, both encoding and decoding, even when the communicative approach adopted has made it necessary to emphasise the active feature from the point of view of production.

In this sense, figure 1 shows the differences in content and structure per entry between "active" and merely "passive" dictionaries as remarked by Posteguillo and Piqué-Angordans (2005), showing how the information to be included in the entries benefits undoubtedly the production on the part of the speaker and also the understanding of terms.

Each entry from the prospective active specialised dictionary presented may include up to eight distinct items of technical, grammatical or pragmatic information. These are: part of speech (adj., adv., n., v., etc.), gender (m/f), translation, semantic field, collocations/collocates, acronyms, examples, quotations and definitions/technical information. From an active perspective, the correct characterisation of TUs in dictionary entries like the ones presented here is not only a matter of providing users with a definition and an equivalent; it is a matter of providing relevant information, useful for an accurate use in real life/professional situations.

As Picht (1991) states, LSP and more specifically its terminology cannot be reduced to the study of highly technical terms in isolation. TUs are much more complex since they activate specific knowledge when context triggers off this activation, they also present different degrees of specialisation (as specialised discourse does), they combine with other units, they may refer to various concepts at the same time, they may be more or less "opaque" in meaning and they may present pragmatic particularities. Passive approaches are thus not the best option since they do not pay enough attention to these issues. However, an active dictionary does reflect on these aspects. It shows, for instance, the fact that every term is always accompanied by other words or terms with which it may appear more frequently. In this way, the active

entries here presented have tried to somehow complement and reorient previous lexicographical work in the area of specialised industrial ceramic terminology in English and Spanish. In this respect, 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 (Cabré, 1999).
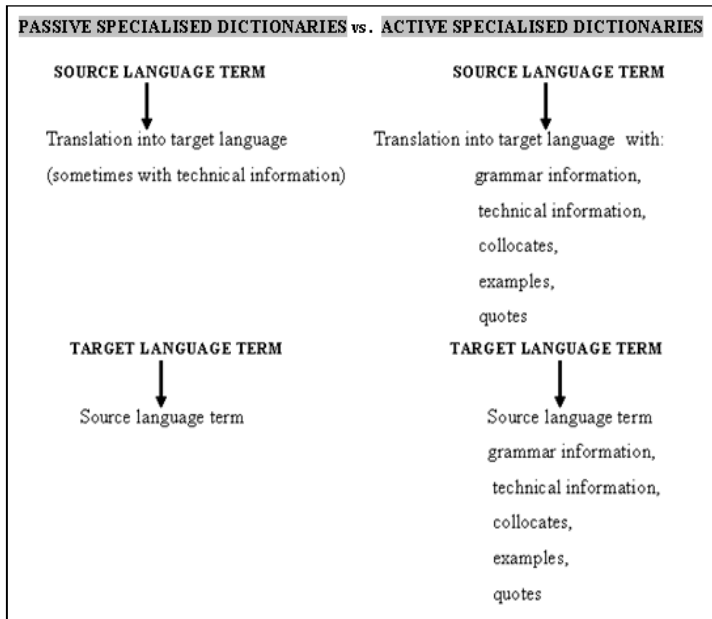

Figure 1. "Passive " versus "active" dictionaries in specialised contexts
(Posteguillo & Piqué-Angordans, 2005: 460).

1.2 A corpus-based study: the empirical dimension of the information included in the entries

Given the importance assigned to context and correct production in the dictionary on industrial ceramics, the use of a corpus has been mandatory. A corpus provides evidence about the way terms are used in real situations and the different meanings a lexical unit may acquire depending on the context in which it is given. Figure 2, for instance, shows in a very straightforward way how the term "belly" does not have the same meaning or sense in an everyday context as in an industrial context. Each lexical unit refers to a different concept and only context may discriminate the specialised from the non-specialised use of the unit.

SPECIALISED USE:
> *The furnace is then lowered to 250°-270° to position the slag in the middle of the **belly**.*

NON-SPECIALISED USE:
> *The immediately recognisable colouring of these cats is black with a white head and **belly**, though 5 per cent are red rather than black*

Figure 2. Specialised use vs. non-specialised use of the lexical unit "belly".

Therefore, apart from providing real contexts of use from which to obtain real and reliable data, corpora contain evidence on common associations between words, real examples of use, natural sounding patterns of use, data that can be statistically analysed and empirically verified and many other pieces of information that the lexicographer would not be likely to obtain without a corpus.

2. The generation of active entries

The final dictionary entry presented in figure 3 is an illustrative example of the kind of entries generated for the active dictionary on industrial ceramics. It shows the main entry "abrasion" together with eight subentries in the form of polylexical terms: "abrasion by sandblast/sand-blast", "abrasion finish", "abrasion hardness", "abrasion resistance", "abrasion resistance classification", "abrasion resistance test", "abrasion test" and "abrasion/abrasive hardness, HA".

- It can be observed that, according to the communicative and productive features intended for the entries and as an active dictionary requires, this entry includes:

- the part of the speech;

- the semantic field for the entry and subentries;

- the equivalent(s), so necessary for a translational bilingual tool;

- the definition, including notes on the use;

- real contexts illustrating the way terms are used and the collocational nature of terms;

- cross-references;

- synonyms;

- abbreviations;

- subentries showing also the collocational nature of terms.

> **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. *sand-blast*), **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 como 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*)].

Figure 3. Active entry "abrasion" together with its subentries.

The sections below present in a more detailed manner the considerations, viewpoints and decisions adopted for the inclusion of the different pieces of information in the entries and the way they have been included, delving thus into the reflection on what is more convenient and useful for the user of the specialised lexicographical tool.

2.1 The semantic field in the generation of entries

The convenience of including the semantic field[2] as part of the information contained in the entries makes it necessary to provide a previous organisation of the domain in a classificatory structure called "field diagram". A "field

diagram" constitutes an organising and organised structure of the concepts that integrate a speciality domain and the ones that are, to different extents, directly related to it. This graphic representation in the form of a diagram of the fields and subfields that are comprised in a given domain is useful mainly due to its associative and classificatory nature. 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 domain under analysis can be included and classified and the mental structure of the terminographer can be organised in a meaningful way. The relationships established in a field diagram make of it a coherent whole determined by the notion of "semantic field" –that is, a group of notions that can be grouped under the heading of a key notion (Auger & Rousseau, 1987).

The elaboration of this field diagram is also 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 value of the field diagram in corpus compilation can be observed in the fundamental role it plays in achieving a balanced inclusion of textual samples in the corpus, covering the different areas or subareas the domain is made up of, as determined by this diagrammatic representation.

It must be noticed, however, that designing a good, representative and comprehensive field diagram is not an easy task, especially for the non-expert. Following Cabré (1993), for instance, a well-elaborated conceptual structuring must have the following characteristics:

- it must cover all the field of work;

- 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).

In the elaboration of the prospective dictionary on industrial ceramics, this system has provided the first element of definition of the terminological units contained in it. This has been done by means of abbreviations that indicate the semantic field the term belongs to so that from the first moment the dictionary user can meaningfully place the term (and thus the concept it represents) within the area/subarea it belongs to in the domain. Thus, when the user of the dictionary is looking for the term "abrasion resistance" and the abbreviation PROPQUIM-FIS appears as the first piece of information of the entry –standing for *Propiedades químicas y físicas* ("Chemical and physical properties")– the user automatically has a more accurate idea of the key semantic trait this unit has and shares with others of the like in the domain. Figures 4 and 5 show the field diagrams (in English and Spanish, respectively) designed for this specific study on industrial ceramics and the abbreviations adopted for each subdomain.

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. PRODUCTIVE 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 4. 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 5. Spanish field diagram.

The "bare skeleton" offered by these diagrams representing the structural reality of the domain can be filled in with the terms extracted from the linguistic data of the corpus. If correctly designed, all the terms selected as being part of the domain will find a meaningful place in it. Thus, this is a useful tool for delimiting the field of 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 their classification and identification.

2.2 The definition in the generation of entries

2.2.1 A brief introduction to the art of defining

Very briefly and in a very simple way, Vargas (2002) describes the art of defining as explaining by means of language some of its elements. This statement gives as a result that the relationship between the lexeme and its definition is one of synonymy or equivalence. When synonymy is established, the definition must accomplish the substitutability test; for instance, "piece of furniture to sleep" substitutes for "bed" in any context.

In the same way, it is widely accepted that the traditional rules of lexical definition, based on Aristotle's analysis, demand that the word defined (the *definiendum*) be identified by *genus* and *differentia*; that is to say, the word must be first defined according to the class of things to which it belongs, and then distinguished from all other things within that class. For instance, a "child" is a person (*genus*) who is young or whose relation to another person is that of a son or a daughter (*differentia*) (Landau, 2001).

Other basic rules and principles that tend to be implicitly assumed when correctly defining concepts are, for instance, that the definition should be positive rather than negative and that the *definiendum* must not be included in any form among the words used to define it (*definiens*) –that is, the defined word may not be used in its definition, nor may derivations or combinations of the defined word. Likewise, the definition must be equivalent to or capture the essence of the thing defined, it must correspond to the part-of-speech of the word defined and circularity must be avoided. In addition to this, a good defining practice is determined by the priority of essence: the most essential elements of meaning come first, the more incidental elements later; by substitutability: for many words, the definition should be substitutable for the word in context; by the reflection of grammatical function; and by simplicity, brevity and avoidance of ambiguity (Landau, 2001).

Additionally, following Vargas (2002), when writing terminological definitions a series of principles must be considered and respected:

- previsibility: the definition inserts the concept in the conceptual or tree (field) diagram;

- brevity: the definition is concise and clear and, if possible, is made up of no more than one sentence:

- affirmative statement: the statement states what the concept is and not what it is not;

- no circularity: the definition does not send the user to another definition that, at the same time, refers back to the first one;

- no ambiguity;

- precision (sometimes, the maxim of precision makes the definition not so clear);

- absence of tautology: the definition is not a paraphrase of the term but a description of the semantic features of the concept;

- sufficient and necessary information: not all possible options must be exhausted; the relevant information in each case will have to be selected.

However, when making a dictionary and being involved in the process of defining the entry terms, things tend to complicate for there are so many possible ways to define concepts that the perfect definition does not exist and there is always the possibility to create a better one. In this sense, as Landau (2001) notes, the definition of a door as wooden is not wrong; it just leaves out too many doors. This is so because all definitions of things are compromises between specific accuracy and breadth of inclusiveness (Landau, 2001) and depend on many external factors as well as on the lexicographer's tenacity and professionalism. There is also the highly likely possibility that the publishing house restricts the size of the entries due to economic-marketing-space reasons. What seems clear in spite of the lexicographer's efforts is that no definition can take in all of the particular things and shades of meaning referred to by the word being defined. There will always be marginal cases that are not covered by any definition.

These facts should be part of the mental training of any lexicographer if s/he wants to avoid the "anxiety" that may be provoked by trying to perfectly and comprehensively define and include every shade of meaning in a definition. This anxiety, which is originated by the fact of being aware of leaving aside data that could be useful and the frustration derived from it, can only be avoided by acknowledging the shortcomings every definition may have if examined in too much detail. We are writing definitions for the concepts in the entries, nor encyclopaedic articles nor monographies on each single concept. In order to avoid this feeling of incapability or

incompleteness one must not assume that the uses of a word not covered by its dictionary definition are wrong, but be aware that definitions merely abstract meaning from a preponderance of usage and must contain operative information that allows users to correctly and quickly gain general, not universal, understanding of every single shade of meaning the concept has. Accordingly, we must assume that it is possible to improve almost any definition, but likewise, elaboration processes need a beginning and an end. As Landau (2001) states, if a lexicographer begins to have the feeling that s/he cannot improve existing definitions, it is time to think about taking up another line of work. Deciding what to include in a definition and what to disregard is always hard work and inexhaustible possibilities exist. However, decisions must be made.

2.2.2 Definitions in the generation of active entries in the industrial ceramics dictionary

Dictionary definitions are usually confined to information that the reader must have to understand an unfamiliar word (Landau, 2001). In the specific case of studies of the sort here presented, it is highly likely that, while the definition is being written or created, "obscure" terms from the point of view of comprehension are included in the definition. It is then advisable to offer the equivalent of such terms in the other language of work, written in italics, and between hyphens in order to facilitate understanding. This may be illustrated in figure 6, showing its hyphenated equivalent terms in grey.

> **ablating material** (ELABPROC material ablativo; material, especialmente de recubrimiento *-coating material-* utilizado para proporcinar 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*)

Figure 6. Active entry "ablating material" with equivalents included in the definition in grey.

It is also advisable to have a protocol for the elaboration of the prospective entries which guides us through the process of completing the different fields of the registers in our electronic database developed with "TermStar XV".[3] According to the protocol adopted in this specific study, definitions must start in lower-case setter, 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. In the same way, the descriptor indicates, in the majority of the cases, the thematic section of the "tree" or field diagram in which the term is classified. This implies that the definitions of a series of terms of the same thematic subdomain must have, when possible, a common descriptor.

For the definition of polylexical/polylexematic terms (syntagma) the base of the syntagma must be previously defined. For instance, the correct understanding of the term "annular kiln" makes it necessary the previous definition and understanding of the monolexical term "kiln". In the same way, when defining, the degree of complexity and technicality must be adapted to the objectives of the terminological work and the user to whom it is addressed. In this case, and since the work is a specialised dictionary whose prospective user is intended to be a person with a solid knowledge on the domain (more specifically specialists and translators), definitions should contain a considerable (and expectable) degree of technicality and a coherent level of complexity.

Additionally, 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 being part of the definition are normally to be done by means of a semicolon (;) and not a full stop. In the same way, the definition should not include, if possible, any bracket. Instead, long hyphens can be used.

2.3 The context in the generation of active entries in the industrial ceramics dictionary

As has already been commented in previous sections, it is a fallacy tending to disappear nowadays to think that usage plays no part in the description of scientific vocabulary. As Landau (2001: 33) concedes, "when a dozen or so terms are used to describe exactly the same concept –a common circumstance in medicine– usage is the most important criterion for determining what the preferred term should be". The role of context is thus fundamental in order to show whether terms are actually terms and how they are used in real situations by specialists, the corpus being the tool from which these real data can be reliably obtained.

Hence, once the important role paid by context in language has been acknowledged, the way dictionary terms are used in these real contexts is explained in the paragraphs below. To start from the very beginning and as

illustrated in the entries below, the contexts to be included in the entries may be of three main kinds: definitory, explicative and associative.

• "Definitory contexts" contain the essential traits of the concept under study and may be considered a good way of integrating the defining practice with the inclusion of texts produced by real experts in the domain. Definitions are not normally included if definitory contexts are used (see figure 7).

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.*

Figure 7. Active entry "nu-value" showing a definitory context.

• "Explanatory contexts" offer information about some of the essential traits of the concept in order to provide a better understanding of it (see figure 8).

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*)

Figure 8. Active entry "occupational health" showing an explanatory context.

• "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 the prospective dictionary is shown in figure 9.

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%.*

Figure 9. Active entry "olivine" showing an associative context.

Apart from deciding –depending on the necessities detected for the correct understanding of each term– which kind of context would be more beneficial, the choice of contexts has been ruled by a series of parameters which have guaranteed, up to a certain extent, their pertinence and adequacy. For contexts, the same as for the rest of fields in the electronic registers created for the entries, it has been necessary to rely on a protocol.[4] Some basic rules for the selection, inclusion and writing of adequate contexts in the entries according to this protocol have been the following.

Obviously, the first and basic rule is that the term under study must appear in the sentence or statement of sentence. In the context, the term must belong to the same lexical category (noun, verb, adjective, etc.) as the entry. Nonetheless, 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. Contexts must be, when feasible, quotations, so that authorship criteria must be respected and this datum will be included in the field created for such purpose ("context source"), even when this field is not normally included in the printed version of the dictionary. If the context is too long, a reformulation is possible if respecting the essence of the sentence. In the same way, the sentence can be shortened in case of considering some of its parts as superfluous. In case of omitting a part of the sentence it will be indicated by the inclusion of brackets. In the same way, preferably, definitory or explicative contexts will be selected in which the term appears surrounded by other lexical elements which are normally part of its co-text (collocations).

However, I do consider that the most difficult aspect when including contexts is not the fact of finding a representative context as such but the fact of choosing a context with an adequate degree of specialisation or, in plain words, difficulty. Thus, as happens when trying to write the "perfect definition", choosing the most adequate context for each entry is not an easy task at all because perfection in this respect does not exist either. Most probably, we could always find a better context than the one we have finally included in the entry. However, making decisions in this respect is one of the most necessary tasks on the part of the lexicographer in order to proceed working. In Sinclair's (in Landau, 2001: 306) view: "the selection of suitable examples (…) requires only a sufficiently large number of instances to choose from". In my opinion, however, nowadays the fact of being able to gather a large number of texts to choose from –that is, a large corpus from which to extract real samples of use– is not as problematic as to choose

"something" which can "ring a bell" in the users' mind so as to make them understand the term and the way it should be used.

Some other authors are more cautious when showing their views on the possibility of finding any good examples at all. Landau (2001: 306), for instance, states: "no matter how big the corpus, I am sceptical that simple enough examples could be found for every level of learner". This is especially meaningful if we consider that every person is a whole world and believing that a single context in an entry will help every single dictionary user in the same way is rather pretentious and unrealistic. Once again, we must choose the context of use that as a whole better represents what we are trying to transmit to the average prospective user for the correct understanding of the term. Therefore, the degree of difficulty that contexts may have is the main problem when selecting them to be part of a dictionary entry. Nonetheless, this does not imply or mean that reality must be oversimplified by the inclusion of a context that does not reflect the implicit difficulty of scientific and technical knowledge. In the case here analysed, the specialised dictionary of the ceramics industry has specialists in the field and translators as its prospective users. Obviously, these two kinds of users share features with respect to their necessities and kind of knowledge but they do also differ in certain aspects that make the fact of choosing a context a difficult task, especially if a balance wants to be achieved.

As Fox (in Landau, 2001: 306) concedes:

> Learners, and unfortunately some teachers, often feel that they should be provided with language that is as simple as possible (…) [but] If a word typically occurs in a sentence which is grammatically complex or alongside vocabulary items that are infrequent, it would be misleading of a dictionary to present that word in a very simple clause or sentence with easy vocabulary.

Landau (2001) agrees with Fox's argument that many words do not occur in simple, self-explanatory contexts. In my research, common sense indicates that, for instance, it is not likely to find terms like "organostannic compound" or "outside vapour-phase oxidation" in what could be considered "simple" contexts and, if found in too simple ones, they would be rather useless, non representative and even the authenticity and quality of the corpus from which contexts have been obtained could be questioned. This is so because most authentic specialised language is highly specific and users know and expect a realistic level of difficulty in the same way as they expect contexts to contain useful information that helps them to better

understand and use a term. That is the reason why many sentences in which specialised lexical units occur cannot usually be shortened to fit the limits of a dictionary example without becoming totally obscure, and an in-depth search in the corpus is necessary and time-consuming, as well as the only way to do things well.

Hence, in specialised lexicography a conflict may be said to exist between providing information that is understandable for decoding purposes and giving accurate information for encoding purposes. Non-corpus-based specialised dictionaries often give improbable, made-up examples using simple language in the illustration of difficult words. As Landau (2001) concedes, the availability of corpora can now enable us, for the first time, to reject such juvenile and improbable formulations and replace them with more credible examples. In this sense, Sinclair (in Landau, 2001: 308) and his colleagues argue that:

> To simplify the examples of complex words is to misrepresent how they are used. However, if the reader cannot understand the authentic example given –that is, cannot decode it– he or she will not be able to use it. To the extent that we can provide a level of difficulty to the example that is realistic without sacrificing understandability, we should. We should at all costs avoid ridiculously simple, childish examples for difficult words. What a corpus can do above all else is to give examples at the right level of complexity and in a framework that is typical so that the lexicographer can devise examples that are not silly, stilted or clearly artificial.

To put it in a simple way, I have included below three entries from the industrial ceramics dictionary each of which contains a context which has been classified in a straightforward way as "relatively simple", with "average difficulty" or "highly specialised" provided the intended user of the dictionary.

A "relatively simple" context has been understood as a context which in spite of containing the term under study and illustrating its use in specialised fields could be understood by the layman (see figure 10).

> **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*),

Figure 10. Active entry "abrasion resistance" with a "relatively simple" context.

A context with "average difficulty" is normally the one that would be prototypically understood/produced by a semi-expert and addressed to an equal (see figure 11).

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*),

Figure 11. Active entry "abrasive grinder" showing a context with "average difficulty".

Contexts with a high degree of specialisation are those in which the specialist feature of the user is implicitly assumed because it contains reference to other highly specialised terms and notions (see figure 12).

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 resitance is to be assessed*),

Figure 12. Active entry "abrasive entry" showing a "highly specialised" context.

To sum up, and according to the contexts shown all through this section, contexts should be neither too long nor too short, nor too complicated nor too simple, always real, coming from a corpus in which the real nature and adequacy of the samples is guaranteed, and having the prototypical user and his/her necessities always in mind.

2.4 The main entry ("headword") and its subentries in the industrial ceramics dictionary: the collocational nature of terms

Following Landau (2001), the entry term, also called "alphabetised headword" or "main entry", is the element by which the lexical unit is identified. Most headwords, except cross references and names, are canonical forms, sometimes called lemmas. As this author proceeds, the users of bilingual and ESL/ESP dictionaries may not know the canonical forms used as headwords, so it is particularly important in dictionaries that inflected forms that differ markedly from the canonical ones (for instance, "is" or "went"), be listed as headwords in their own alphabetical positions with cross references to canonical forms.

In a bilingual specialised dictionary like the one here presented, the headword of an entry is normally a terminological unit which comprehends

the polylexematic variants of the term, all of them including, as the headword, their equivalent in the target language and the rest of data necessary for their correct understanding as being part of an active entry. In the same way, a TU with various meanings is represented by repeating such polysemic or homonymic unit as many times as different concepts are expressed, distinguishing each meaning by the inclusion of superindexes as shown in figure 13.

Figure 13. Active entry "bank" with its four meanings highlighted in grey.

Regarding alphabetisation, many technical dictionaries are arranged by entry and subentry and are therefore not in exact alphabetical order; they are alphabetised by the governing noun as happens in my dictionary. These dictionary entries do usually contain subentries as may be observed in figure 14, where the headword "alluvial" presents as subentries the polylexical terms "alluvial basin", "alluvial clay", "alluvial deposit", "alluvial fan" and the monolexical terms "alluvion" and "alluvium".

Figure 14. Active entry "alluvial" with its subentries.

These subentries correspond thus to TUs made up of more than one lexeme –the already mentioned polylexical units, also called "polylexematic units", "complex units", "phraseological units", "syntagmatic units" and even "collocations" (in its widest sense)– and derived words alphabetically ordered depending on their occurrence with the headword.

The treatment of collocations is very complex and has led to abundant literature trying to explain or clarify what they really are. Collocations are important in corpus lexicography because they can only be reliably discovered through the use of corpora but there is not absolute agreement regarding their definition. What seems clear, however, is that collocations are of great importance in ESL/ESP and bilingual lexicography, where readers are unfamiliar with the common associative patterns of the language they are trying to learn. To put it simply and provided the fact that the final aim of this article is not so much to get to clarify what a collocation really is but to show how to treat the collocational nature of terms in the generation of active entries, collocations have been considered in their simplest and widest conception: a collocation is any two or more words that are found together (that "co-occur") at a significant higher frequency in natural speech or writing in comparison with other words. This wide view of understanding collocations arises from its original sense, since the term "collocation" was first introduced by Firth (1968: 182) and defined as "actual words in habitual company". This is the original, simplest and widest sense of collocation. Although there are different and even contradictory views in this respect, this simple, straightforward consideration is the way collocations have been conceived in this research, leaving aside whether they have a compositional nature or not, their nomenclature and even their distinction, in case it exists, with phraseological units.

Moreover, apart from the subentries included in the form of collocations –normally with the structures N+N, A+N, N+A, A+N+N, etc.– I find that contexts show how terms collocate, mainly with the structures N+V, V+N, Adv.+V and A+N+V. For instance, the collocations included in the contexts shown in figures 15 and 16 illustrate how "ban" tends to appear in the specialised domain of industrial ceramics with "use". In the same way, it can be observed that "banded" is commonly found in company with "clay layers", etc.

> **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*)].

Figure 15. Active entry "ban" whose context shows the collocational nature of the term.

> **banded** (PROPMATPRI/GEO-MIN-CRIST bandeado; dicese 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*)

Figure 16. Active entry "banded" whose context shows the collocational nature of the term.

2.5 Other fields in the generation of active entries in the industrial ceramics dictionary: cross references, acronyms and abbreviations, equivalents, part of speech, spelling variants, and synonyms

The field "cross-references" must contain all the relevant terms related somehow to the entry and which may help to better understand the concept, relate it with other concepts or widen the knowledge of the user with respect to the term analysed. Thus, we can include as cross-references those terms belonging to the same semantic field or helping to the comprehension of the term as such.

Regarding acronyms and abbreviations, when correctly included in the field created in the data base register for such purpose and named "abbreviation", "TermStar XV" creates an automatic cross-reference to the main concept. Figure 17 shows the way in which the acronym for the term "American Society for Testing and Materials" appears in the final entry and figure 18 shows the automatic cross-reference to the main concept generated by "TermStar XV" for the abbreviation "ASTM".

> **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*)

Figure 17. Active entry "American Society for Testing and Material" showing the way acronyms are arranged by TermStar XV.

ASTM *abbr:* ORG-INST/CALIDAD V. *American Society for Testing and Materials.*

Figure 18. Automatic cross-reference generated to the main concept for the term
"American Society for Testing and Material".

In this work, the need to include equivalents and the part of speech in entries is quite self-explanatory given the bilingual nature of the work. A basic distinction when dealing with this kind of topic is that bilingual dictionaries may be "unidirectional" ("monodirectional") or "bidirectional". "Unidirectional dictionaries" work in one direction only regarding the language of work whereas "bidirectional dictionaries" are unidirectional dictionaries combined with other dictionaries in the same languages but in opposite direction; they consist of two dictionaries L1→L2, L2→L1. This is the case of my prospective dictionary.

The advantages and disadvantages of monolingual and bilingual dictionaries are a controversial issue in lexicography. 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 & Rosbach, 1991: 2711). If we bear in mind the fact that the dictionary on ceramics terminology is intended to become a translational tool, it 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 specialists and translators, it seems logical and sensible to produce a bilingual tool. Kromann, Riiber and Rosbach (1991) go further into this issue 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, and encyclopaedic information to be advantages.

For the field "grammatical or lexical category" –what "TermStar XV" calls "part of speech"– a series of abbreviations can be selected from a list of values. These are the following (in *Spanish* and English):

- 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 syntagma will be indicated –for example, a nominal syntagma like "flottation collective" will be annotated as "n".

The way spelling variants are included is another factor to be considered. It is important to notice the way spelling variants have been dealt with and ordered in the lemma or headword. Regarding the use (or not) of hyphens and the way of presenting variants, for certain English terms it has been advisable to include every single possibility in the field "term" separated by commas. For instance, many TUs accept up to three variants:

(i) words linked by a hyphen ("back-up");

(ii) words merged in a single unit ("backup"); or

(iii) independent/separated words ("back up").

Figure 19 illustrates how these variants have been included in this study. In Spanish, however, vocalic variants are more often found.

> 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*)].

Figure 19. Example of an active entry with spelling variants from the database in this study.

3. Conclusion

No matter whether a dictionary has descriptive or normalising purposes since, as Landau (2001) states, once a term is in a dictionary it acquires the quiet authority of print in what I would call the "dictionary effect". This is why the quality of what is contained in a dictionary entry is a responsibility for the lexicographer that goes beyond the here and now. The choice and inclusion of the data that are part of dictionary entries make decision-making, rule observation and deep reflection necessary in order to guarantee the quality and adequacy of what they contain, but these decisions are not easy and require in depth consideration and common sense on the part of the lexicographer.

As I have tried to show in this article, the generation of active entries prioritises, as a necessary departure point, the consideration of the kind of users for whom the dictionary is being designed and their specific needs. Hence, entries must include the information necessary for the active use of English –that is, for a correct understanding on the part of the user (decoding) but mainly, for enhancing correct production (encoding). Accordingly, the generation of active entries implies, first of all, the empirical study of language through a corpus and the correct delimitation of the domain with a field diagram from which to establish the semantic field of the terms. Apart from the semantic field, active entries should include definitions with an adequate and realistic size and comprehensiveness, real contexts of use with a suitable degree of difficulty, and other data such as

collocations (whether in the form of subentries or included in the very same contexts), part of speech, acronyms and abbreviations, equivalents in the other language of work, spelling variants, cross references and synonyms, and in fact, everything that –fitting within the size limits of what can be considered a dictionary entry– may be useful for the prospective user of the dictionary when actively using the specialised language under study.

Be it as it may, and even when things can and must be well done, one of the most universal conclusions dictionary makers can reach when making a dictionary was already acknowledged by Samuel Johnson more than three centuries ago: "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" (Johnson, 1755: 182-183).

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NOTES

[1] The specialised, bilingual dictionary of the ceramics industry is currently in its final stage, that of revision and normalisation of the information included. The dictionary will be published in printed format during the first quarter of 2010.

[2] Included in each entry (as shown in figure 3) in capital letters in the form of abbreviations, for instance, PROPQUIM-FIS stands for *Propiedades físicas y químicas* (in English, CHEM-PHYSPROP, *Chemical and physical properties*).

[3] TermStar XV is a system of multilingual terminological management oriented to the concept developed by Star Linguistic Services. For further details visit the site http://www.star-spain.com/es/tecnologia/term.html

[4] The protocol used in this study has been elaborated by Vargas (2002), from the research group *El Inglés Profesional y Académico* at Universidad de Alicante (Spain), and is entitled "Guía de redacción para la ficha terminológica".