ARCHITECTS AND TECHNICAL ARCHITECTS IN THE CERAMIC INDUSTRY. WHAT AM I DOING HERE?

Pitarch Roig, Ángel M.; Sáez Riquelme, Beatriz

Ceramics classroom, Higher School of Technology and Experimental Sciences, Technical Architecture

Universitat Jaume I – Spain

1. ABSTRACT

This paper analyses the Spanish ceramic industry and the part that architects and technical architects can play in the ceramic tile manufacturing and distribution process.

Most Spanish ceramic tile production is concentrated in the Castellón, Vila-real, Onda and l'Alcora area. This geographic area houses a network of companies that provide all the necessary services for ceramic tile manufacture and distribution.

The present study describes the current make-up of these companies that service the industry and their interrelationships, as well as the levels of production with relation to other global producers, and some of the interrelationships that there may be among them.

Secondly, some of the commercial and business strategies that companies use are analysed, such as cost cutting, exports, opening new markets, product differentiation, and customer service. Initiatives of the Spanish Ceramic Tile Manufacturers' Association (ASCER) are also highlighted, such as the initiatives of the ceramics studies departments and the Ceramics and Architecture Awards.

Thirdly, the study addresses the competencies and training skills of technicians that may take part in the manufacturing, marketing and sales, and ceramic tile installation process, particularly focusing on architects and technical architects.

Finally, the possible advantages of closer cooperation of these technicians with ceramic companies are analysed.

2. INTRODUCTION

This study seeks to establish the relationship that exists between the technicians involved in the building construction process and ceramic sector companies, and to put forward possible strategies for ameliorating both the employability of these technicians and the quality of the end products provided by the ceramic companies.

Understanding this relationship requires analysing and understanding the characteristics of the parties involved. This involves, on the one hand, examining the make-up of the industry with the network of existing companies and their commercial strategies and, on the other, the training of the technicians involved in the process, in order to understand their possibilities and in particular the mentality of each of these groups with relation to coverings and the ceramic industry.

Analysis of both issues will allow the current situation and future trends to be understood and improvement strategies for the ceramic industry to be proposed.

3. THE SPANISH CERAMIC INDUSTRY

For those unacquainted with the make-up of the ceramic industry, this consists of large ceramic companies that apparently manufacture and provide ceramic products. However, the industry is much more complex, there being a network of companies that perform different parts of the process, interrelating closely with each other to achieve the final result.

3.1. IDENTIFICATION OF THE STAKEHOLDERS

The ceramic tile **manufacturers** are the most important actors in the ceramic tile manufacturing and marketing and sales process. However, there are also numerous companies that supply raw materials, equipment and services, together making up the so-called ceramic cluster.

These companies include **mining** companies, raw materials suppliers of domestic or imported clays, and clay processing companies, generally involving **spray-dried powder** processes.

Similarly, there are also **glaze** processing companies, "colour producers", which design products and supply manufacturers with the materials they need for fabrication, in certain cases providing technical assistance services in starting up the manufacturing process.

Occasionally some products require further, post-firing processing, such as cutting, edge-grinding, bending, subsequent decorations or assembly of mosaics, for which specialised **ancillary companies** are called upon.

Once the production process has ended, there are various distribution channels through which either companies themselves or **distributors** supply the product to the builders or end-users.

In addition to tiles, ceramic floorings or claddings require ceramic adhesives, grouts and profiles or functional sheets or membranes, among other items, which again require the contribution of further **ancillary companies**.

All these in turn require specialised **machinery** builders and suppliers to provide the machinery and maintenance of the facilities for proper operation.

In building construction, products are selected by **project planners**; however, in the case of finishes, the **developer**, **builder**, and in particular building end **users** are usually involved.

Once the ceramic product has been selected, the installation of the flooring or cladding is usually performed by a **builder** or **tile fixer**, under the supervision or direction of the technicians in charge of **executive management**.

All the actors involved, according to current Spanish law, only require **regulated training** to perform executive management and project planning and design functions. According to the law regulating building construction (Act 38/1999), when the building is intended for office, healthcare, religious, residential (in all its forms), educational, or cultural use, the academic and professional qualifications that enable a project to be drafted and the construction to be directed shall be an architect's degree, while directing the building's material execution requires holding a technical architect's degree.

This structure, with the multiple companies and people that take part in the manufacturing, distribution, selection, and installation process, gives rise to an important **scatter of responsibilities**. Consequently, except for strictly contractual liability, the responsibility generally falls to those who legally have a civil liability for the construction process, or to companies of greater standing or prestige, which might find their image damaged if they did not attend to their clients' claims.

3.2. ORIGIN AND CONCENTRATION OF THE CERAMIC SECTOR

As has also occurred in other countries, an important geographic concentration of ceramic companies took place in Castellón province in Spain, as reported by Budi (2008), between the towns of l'Alcora, Vila-real, and Onda.

The concentration led to an optimisation of the necessary resources for the interrelationship between all the actors, in many cases sharing transport logistics and creating synergies in technology and process innovation. Fig. 1

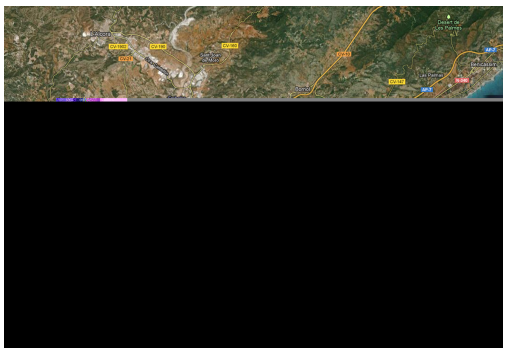

Fig 1. *Ceramic cluster of l'Alcora, Vila-real, and Onda.*

The origin of this concentration of ceramic tile manufacturers may be ascribed to the **Royal Factory founded by the Count of Aranda** (*Fábrica del Conde Aranda*) in l'Alcora in 1726. Initially established for the manufacture of earthenware and artistic porcelain, it subsequently changed over to the industrial production of earthenware tiles (Cabrera 2012). Fig. 2

With the passage of time, artists from the *Fábrica del Conde Aranda* created their own proprietary workshops. This led to a ceramic culture that, in the course of the 20th century, through various industrialising processes, gave rise to the current ceramic cluster. (Juste Carrión 1996).

According to "Word Production and consumption of ceramic tiles", second edition, 2014, **ceramic tile production in Spain** ranks fifth worldwide behind China and other emerging nations such as Brazil, India, and Iran, Spain at present being the largest European producer together with Italy.

Fig 2. *Historic photograph of the Factory founded by the Count of Aranda. Source: Cabrera 2012).*

TOP MANUFACTURING COUNTRIES							
COUNTRY	2009 (Sq.m Mill.)	2010 (Sq.m Mill.)	2011 (Sq.m Mill.)	2012 (Sq.m Mill.)	2013 (Sq.m Mill.)	% on 2013 world production	% var. 13/12
1. CHINA	3,600	4,200	4,800	5,200	5,700	47.8%	9.6%
2. BRAZIL	715	754	844	866	871	7.3%	0.6%
3. INDIA	490	550	617	691	750	6.3%	8.5%
4. IRAN	350	400	475	500	500	4.2%	0.0%
5. SPAIN	324	366	392	404	420	3.5%	4.0%
6. INDONESIA	278	287	320	360	390	3.3%	8.3%
7. ITALY	368	387	400	367	363	3.0%	-1.1%
8. TURKEY	205	245	260	280	340	2.9%	21.4%
9. VIETNAM	295	375	380	290	300	2.5%	3.4%
10. MEXICO	204	210	219	229	228	1.9%	-0.4%
TOTAL	6,829	7,774	8,707	9,187	9,862	82.8%	7.3%
WORLD TOTAL	8,581	9,619	10,599	11,194	11,913	100.0%	6.4%

Source / Fonte: Acimac Survey dept. "World Production and consumption of ceramic tiles", 2nd edition 2014

Fig 3. *Top ceramic tile manufacturing countries. Source: Tile Today #85 2014.*

However, it may be noted that, according to this report, in 2013 Spain was already the second-largest ceramic tile **exporter** after China, a situation to which the crisis in the building sector in Spain and the need to sell ceramic tile production contributed significantly, as may be observed in Fig 4.

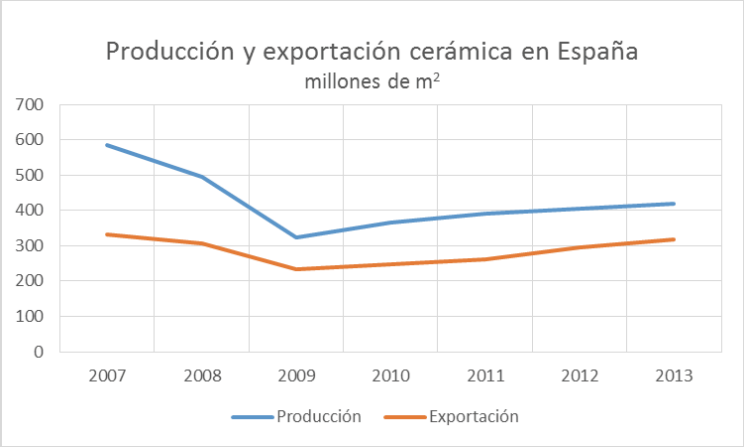

Fig 4. *Evolution of ceramic tile production and exports in Spain.*
Own graph, information source: Tile Today #85 2014.

4. MANUFACTURERS' STRATEGIES

"The supreme art of war is subjecting the enemy without fighting." The Art of War - Sun Tzu

In this sense, the ceramic industry has adopted various strategies to assure the sale of its production, strategies which of course embody no exclusive, single truth, but which each exhibit identifiable advantages and disadvantages. The five most common approaches are briefly discussed below.

4.1. COST CUTTING

The first and most elementary strategy is: "If I can cut costs, I'll be more competitive, and have more possibilities to sell my product". Although this strategy is usually necessary, it is insufficient just by itself, as competitors will also use it and the manufacturer will certainly not be able to compete against emerging countries, whose labour and environmental costs will be much lower. Consequently, most producers are emerging countries, against which developed countries have a hard time competing on price alone.

4.2. EXPORTS

The second strategy to be considered is: "If I can sell beyond my boundaries, I'll be able to sell more". The ratification of this strategy is reflected in the export numbers shown in Fig 4.

For further information, please see the sectoral report published by IVACE (2015).

However, for this strategy to be successful, manufacturers must adapt their production to the demands of the new buyers, as was observed at the last CEVISAMA trade fair where, in addition to the usual models marketed in Spain, products with a greater decorative charge, with gilded and marble-like finishes for Russian and Middle East markets were presented. Fig. 5

Fig 5. *Product with imitation onyx, presented in 2014 in the sector.*

4.3. NEW MARKETS

The third strategy is defined as: "If I can make other products, I'll be able to reach new markets". The demand for such new products will not be saturated by classic producers.

In this sense, the market for ventilated façades and technical floorings has already been fully developed for years, and the manufacture of large sizes with different thicknesses has recently commenced, which enable new applications to be tapped, such as worktops, cupboard linings, and false ceilings.

However, it will be necessary to start up the marketing and sales of these new products, for which traditional manufacturers lack the necessary distribution channels. Moreover, manufacturers from other fields can also begin to fabricate these new products, as has already occurred with some natural stone or agglomerate stone manufacturers, who have begun to manufacture large-sized porcelain tile.

4.4. DIFFERENTIATION

The fourth point is differentiation from the competition: "If I can do what nobody else does, I will be the only one offering that product". I will therefore have to invent or make something unique and keep my competitors from copying me.

It is very hard for any product offered by a manufacturer to be different from that of the competition. However, there are various possible ways of differentiating it, such as: selling the brand, providing clients with a special service that enables innovation.

Just as with other consumer products, and particularly in those relating to fashion, many manufacturers **sell a product by its brand** and not necessarily by better performance than that of competing products.

Using this strategy, some manufacturers have created a brand with a strong societal presence, entailing the association of this brand with a series of qualities relating to the home, bathroom, and kitchen claddings.

On the other hand, the need to provide ever more complex products requires technical assistance. Some manufacturers therefore provide a **customer service** that

consisted of family businesses, in
with unskilled work, which provided
vely gained until they reached senior

are involved in the manufacturing,
coverings, as was already analysed
iversity graduates.

elated to the ceramic [redacted] ovides
f a technical nature, [redacted] es, of
es are directly relate[redacted] ramics

ontain various traini[redacted] encies
ation of ceramic cove[redacted]

materials	Manufacturing processes	Product design	[redacted]	Tile selection & installation
			[redacted]	
			[redacted]	
			[redacted]	
			[redacted]	

[redacted]

[redacted]

As may be observed, from a theoretical viewpoint, there are numerous relationships between the higher education competencies and the functions of the stakeholders in the process. In reality, however, these relationships are not really always effective.

In the first group, made up of **industrial, mechanical, and electrical engineers**, there is indeed a clear relationship with the manufacturing processes, their participation being required in the assembly and maintenance processes of ceramic industrial companies.

Chemists, chemical engineers and holders of master's degrees in ceramic materials science, technology, and applications have a clear place in product manufacturing processes and particularly in research for manufacturing new materials and products. Indeed, they have driven the technology development of the ceramic industry for the last 25 years.

Design engineers, as well as graduates in Fine Arts and other design professionals have enabled design departments to evolve, developing new materials, finishes, and decorations.

Architects and technical architects are the legally qualified technicians for drawing up project designs and directing the building work in office, healthcare, religious, residential, educational, and cultural buildings, so that their involvement in selecting and installing ceramic materials is clearly defined.

However, in recent years, they have also been performing new functions in ceramic companies, in the development of new products or construction systems with ceramics and in the commercialisation of these products, by providing direct consultancy services to specifications writers and tile fixers.

The, as yet, few companies that have technicians trained in architecture and construction on their staff enjoy the advantage of having direct interlocutors with architects and technical architects, product specifications writers, and people in charge of tile installation. They use the same language and can readily understand the concerns of a project planner in the product design and selection process for the realisation of a work of architecture.

7. CONCLUSIONS

The analysis performed of the complex network making up the ceramic industry in its various design, product manufacture, flooring or cladding design and installation aspects and the understanding acquired of the competencies of the different technicians available in the market enable the following conclusions to be drawn:

- To maintain the sector's competitiveness, various strategies need to be combined: price, exports, new markets, differentiation, etc., for many of which a highly qualified workforce is required in the different fields involved.
- In the course of the 20th century, the ceramic sector became a highly technologised sector, with increasingly complex processes, so that its survival in the 21st century will require specialised technicians both in production and in product selection and installation.
- Ongoing innovation in new products will require the contribution of different technicians that can contribute knowledge of the material and ideas for new products and applications.
- The incorporation of architects and technical architects in the technical departments of ceramic companies contributes added value to their products, facilitating the understanding between manufacturers and specifications writers.

REFERENCES

[1] ASCER. *ASCER architecture and interior design awards* www.premiosceramica.com/

[2] ASCER. *Network of ceramics studies departments* www.catedraceramica.es/

[3] Budi, Vicent (2008) *El distrito de la cerámica de Castellón,* published in no. 13 of Colección Mediterráneo Económico: "Los distritos industriales" Coordinator: Vicent Soler - ISBN: 978-84-95531-40-7 - Depósito Legal: AL-728-2008 Published by: CAJAMAR Caja Rural, Sociedad Cooperativa de Crédito – Produced by: Fundación Cajamar

[4] CABRERA BACHERO, J. (2012) *Aspectos Sostenibles de la Real Fábrica de Loza y Porcelana del Conde de Aranda de Alcora (1726 – 1944).* Castellón, Qualicer 2012

[5] IVACE (2015) *Productos cerámicos de la Comunitat Valenciana. Abril 2015*. In IVACE Información Sectorial de la Comunitat Valenciana. http://internacional.ivace.es/dms/estudios/informacion_sectorial_CV/ceramico-feb/CERAMICO%20mat.construccionWEB%202015.pdf

[6] JUSTE CARRIÓN, J. J. (1996) *La industria cerámica el sistema productivo local de Castellón*, in Anales de estudios económicos y empresariales, ISSN 0213-7569, Nº 11, 1996, págs. 491-

[7] Law 38/1999, 5 November, *Ordenación de la Edificación*.

[8] MONFORT SALVADOR, R. Y PRIOR Y LLOMBART, J (2014) *Premios ASCER cerámica y Arquitectura e interiorismo: doce años de recorrido.* Castellón, Qualicer 2014

[9] PITARCH ROIG, A. M., SÁEZ RIQUELME B. (2006) *Enseñanzas Universitarias y Técnicos del Sector Cerámico.* Castellón, Qualicer 2006

[10] SECV. Spanish Society of Ceramics and Glass. *Alfa de Oro Awards* http://www.secv.es/es/generic/alfa-de-oro-2014/

[11] *World production and consumption of ceramic tile Tile Today* #85 http://www.infotile.com/pdfFile/Product/ProductFile/212201414050.pdf

[12] UJI Universitat Jaume I. University e-book. e-ujier.uji.es