

Decorative Tile-Work in Architecture of Al-Andalus

Origins and Evolution from Mudejar and Renaissance
Styles to the Spanish Contemporary Ceramic Industry

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Abstract

Ceramics and tile-work across the Iberian Peninsula have played a key and distinctive role in architectural decoration and in the quality of spatial interiors since Roman and Visigoth times. This paper considers the style and technical evolution of tile-work as a decorative art in buildings and architectural spaces in Al-Andalus in Spain during the period of Islamic rule from the 8th to the 15th centuries. It thus addresses the foundations from which this form of decoration developed a significant and distinctive influence over the following centuries. The study mentions the peculiar evolution of the Islamic artwork during the Renaissance period, highlighting how certain influences led to exotic styles such as the “mudejar”. The final section of this paper outlines the use of decorative tiles through illustrative examples from the 19th and 20th centuries in Spain and refers to current trends in the industry and in contemporary design.

Keywords: *Tile-work; ceramics; interior design; Al-Andalus, Islamic, architecture, Nasrid, cuerda seca.*

INTRODUCTION

During the long period of Islamic rule in the Iberian Peninsula from the 8th to the 15th centuries, the arts and, in particular, decoration and crafts related to architecture evolved significantly in the region to reach a high standard of execution and design. Drawing on the trends and methods previously developed in the area - mainly Visigoth and Roman building techniques - the minor arts of tile-work, carved plaster and carved wood were the key techniques used to embellish buildings.

This study starts by describing the pre-Islamic context and background where tile-work originated. Several factors influenced the design and appearance of this art, including the regional style developed by the previous occupants, some technical

drivers such as the type of natural materials available, and other external influences resulting from the political and social environment of the time.

In the second section, this paper outlines chronologically the three main styles that developed during the Islamic period of Al-Andalus: the Umayyad emirate and caliphate periods from the 8th to 11th centuries, the Almohad and Almoravid styles which developed in the 11th and 12th centuries, and finally the varieties that arose during the rule of the Nasrid dynasty in the 13th and 14th centuries in Andalusia and along the Mediterranean coast.

Also considered is the distinctive evolution of tile-work starting during the Middle Ages in Spain and overlapping with Islamic rule, resulting in the mudejar style, which is generally considered as being essentially Islamic. However, a change of direction due to Christian influences started to define a Renaissance style of tile-work in re-conquered Spain during the 15th and 16th centuries.

During the 19th century the work of recognized architects like Antoni Gaudí and his disciples made extensive and original use of tiles and ceramics that were incorporated in Modernist style buildings and aligned with the Art Nouveau movements developing elsewhere in Europe. Finally this paper refers to recent techniques and design trends in the ceramic and tile industries related to Spanish architecture and design, which have their foundations in the strong and distinctive tradition that has developed over centuries in Spain.

TILE-WORK IN SPAIN BEFORE THE ISLAMIC PERIOD: ROMAN AND VISIGOTH TECHNIQUES AND STYLES

At the end of the Roman and Visigoth period, common architectural techniques included the use of roof tiles, which were at that time lead-glazed using a combination of baked brick and stone as voussoirs, integrated with the distinctive horseshoe arches used along the Iberian peninsula.

Not many examples of Visigoth decorations or finishes have survived, with little related to secular or civil buildings. The best-preserved archeological remains belong to funerary pottery (Mañanes, 1980). However, one of the characteristics of this art is the re-use of existing architectural elements taken from one building to another, which in Spanish is called *materiales de acarreo*, Roman remains and other pieces with clear Byzantine influence were commonly integrated in the buildings of this period.

Visigoths would have been familiar with the mosaic techniques developed during the Roman times, following certain figurative and portrait themes. This included a clear preference for geometric and regular vegetal patterns that were used in build-

ing decorations. Surviving motifs found in stone carvings, for example, would most likely have been used in tile-work.

Ornamented bricks made of yellowish or dun clay with semi gloss varnish constitute the main material that has been documented from this period. No remains of glazed or vitreous varnish have been found. The techniques applied did not use paints in a broad sense, but pressing and embossed motifs were used instead for decoration. The location and exact period of the Visigoth ceramics can be identified according to the color ranges between greys and oranges found in the material.

TILES AS ARCHITECTURAL DECORATION IN ISLAMIC SPAIN, AND THE TRANSFER OF DESIGNS AND TECHNIQUES

During the expansion of the Ummayyad dynasty, in 711 A.D. Arab troops crossed the strait of Gibraltar conquering the south of the Iberian Peninsula. In a short period of around ten years the whole Visigoth kingdom was invaded. The rapid conquest was due to the Berbers tribes who had been studying the terrain and negotiating local alliances, rather than the direct influence of the groups from Arabia (Read, 1974).

As pointed out by Barry (1995) the worldview and symbolism of Islam, its aesthetic tradition and the influences of certain knowledge and skills, such as geometry and mathematics developed in the Arab world, determined key characteristics of the Islamic decorative arts.

Blurred distinction between background and foreground, the horror-vacui principle, symmetry, geometric linear growth in all directions (infinite) and rotations along two or more axis are some of the key principles of the Islamic decorative compositions. These are all clearly manifested in most of the tile-work designs.

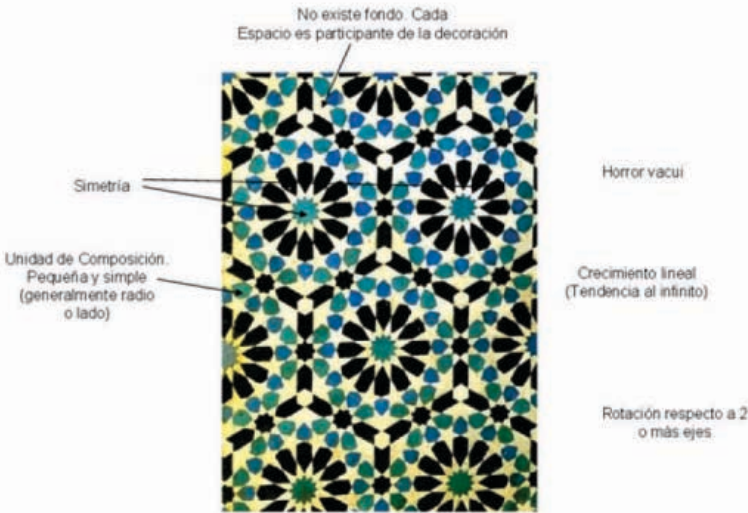


Figure 1: Basic principles of the Islamic geometric decoration Image text translation anticlockwise: There is not background, each element is part of the decoration/ Symmetry/ Unity in the composition. Small and simple (generally radius or side)/ Rotation along one or more axis/ linear growth (infinity direction)/ Horror vacui.

(Source: *La Decoración en el Arte Islámico*. Elena Sarnago.)

The transferring of geometric patterns and motifs among different crafts is also apparent in Islamic art. The designs found in plaster carvings can be found in metal or wood examples, as well as in tiles or paints. The well-kept plaster panels found in residential remains in Madina Siyassa in the Murcia region have been related to tile designs found in Andalusia.

Skills and techniques were also transferred and spread geographically around the Islamic empire. The different ruling dynasties managed their resources and craftsmen with the intention of spreading a message of power and distinctiveness in the new conquered territories. The flows of skilled artisans and the exchange of materials and ways of production explain the use in tile-work in Islamic Spain of specific glazing techniques that originated in the Levant region.

The methods to fix the decorative tiles to the architectural elements have been very similar throughout the period and across locations. Calcium, cement and sand mortar have all been successful in bonding tiles to a brick basis. It is only in the Modern period when the construction methods evolved from brick base to concrete or precast systems and the sizes of tiles increased, that other bonding solutions based on adhesives have been used. More recently mechanical fixing methods have been developed.

It is therefore in both the designs themselves and in the manufacturing techniques that the Islamic art of tile-work has played a key role in the Spanish decorative art tradition.

The Umayyad Emirate and Caliphal Periods

The use of tile-work as architectural decoration during the Caliphal period was limited, or at least not many cases have been kept. One example is the first vault that covers the maqsura in the great mosque of Córdoba (an extension done during the ruling of Al-Hakam II), as well as the decoration of the horseshoe arch of the mihrab. The Byzantine influence is clearly identified in use of the small vitreous tesserae (mosaic pieces) that cover the surface, combined with green and manganese semi-circular section tiles following a technique known centuries ago in the Mesopotamian area, and probably well-known by the Umayyad court. The high level of conservation is apparent in the bright color of the engobe (Degeorge, 2002)



Figure 2: Maqsura vault of the grand mosque, showing the line of semi-circular tiles. Córdoba

(Source: *Cerámica hispanomusulmana*, Martínez Caviro)

Tile-work Evolution During the Taifa Kingdoms, Almohads and Almoravids Dynasties

The 11th, 12th and beginning of the 13th centuries are confusing years regarding ceramic and tile-work in Al-Andalus. There are many remains of buildings and ceramic ovens of this period but the chronology and origins of the pieces are difficult to track and specify due to the interchange, pillage and re-use of the architectural elements, which is characteristic of ongoing warfare and a politically unstable situation.

It was under the Almohad rule in the 12th and 13th Centuries that the tile-work or so-called *alicatado* covering entire architectural surfaces developed. This technique requires the manufacturing of monochrome vitreous tiles that, cut in smaller pieces following a pre-set design, are combined to form the complete scene. Later on geometric forms evolved in more complicated designs like vegetable and calligraphic motifs (Fierro, 2006).

Examples found in Marrakesh, like the minaret of the Kutubiyya mosque, are directly related to earlier remains found in the Spanish cities of Seville and Cordoba. White, pale green, pale blue and black pieces in square, rectangular, polygonal and circular shapes are integrated within architectural elements in the facades, or combined with other baked mud pieces in floors or on whole architectural surfaces like water features (Navarro Moreno, 2010)



Figure 3: Renovated green and white *rhomboid* tiles adapted to the geometry of the architectural elements, Torre del Oro, Seville, circa 1220
(Source: Diccionarios y Enciclopedias sobre el Académico)

The austerity of the later dynasties did not align well with the rich and complex Baroque-style developed in Seville, therefore a more austere and simple style was developed. The geometry of the designs was simplified but the decoration spread to wider surfaces of the buildings. The *sebka* feature (rhombus and diamond patterns) belongs to this period.

The Peak of Tile-work in Islamic Spain: the Nasrid Dynasty Examples

Due to their high state of conservation, various examples from the Granada province are well known and provide a focus. However the manufacture and production of ceramic tiles from other locations such as Malaga, Toledo, Teruel and Valencia is also well documented. The manufactured materials were transported to many different locations from the main ovens located in these sites.

In the late 13th century and during the 14th and 15th centuries, in Al-Andalus, tile-work associated with architectural decoration reached its highest level. It is in Granada and in particular in the Alhambra Palace where the best examples of this period can be found. The strong contrast between the calm monochrome exteriors, where only some features like the gates were decorated and the rich colorful interiors is a distinctive characteristic of the architecture of the Nasrid period. The colorful

spaces were achieved by the use of bright tile-work on floors and walls (pavement, skirting, dados and sometimes the whole wall) combined with colored plaster panels in addition to fabrics and banners hanging from the upper levels.

The four main tile-work techniques employed during the Nasrid ruling were: *alicatado*, *cuerda seca*, *relieve* and *dorados*. The *alicatado* consisted in the manufacturing of panels by assembling small interlocking tile pieces. It requires a highly skilled craftsman and is the most prevalent one (Domínguez Caballero, 1998)

Cuerda seca (dry cord) is a technique employed to simplify the production of polychrome tiles by outlining with black wax the areas of different colour enamels within the piece.

The *azulejos en relieve* or relief tiles are non-flat pieces that slightly project from the background.

The *azulejos dorados* (golden tiles) incorporate gold coloured pigments from metal oxides in a three-firing process.

In terms of colours and geometry, the dados in the Cuarto Real de Santo Domingo in Granada illustrates the evolution from the Almohad style to what will become the rich Nasrid one: green and blue strips on stanniferous background developed in octagonal and 12 pointed stars in white. In the wall-elevation composition calligraphic strips are combined with the ceramic tiles.



Figure 4: The *qubba* of Santo Domingo, the only room remaining of the 13th century retreat complex in Granada (Source: Escuela de Estudios Árabes, CSIC)

Another Nasrid palace, the *Generalife*, has relevant examples. Restorations of the original complex are dated to 1319, and the cold blue and green range of colors is predominant.

The Alhambra palace is the example where the next step in the evolution of the Nasrid style developed. A honey color tone is now incorporated into the *alicatado* panels. This color is applied not only on the walls but also on the floors and even in the lower part of the twin windows, unifying the perception of the room interiors. Distinctive features of the later Nasrid evolutionary stage are the wider chromatic palette and the incorporation of family emblems in the designs, the later ones having a clear Christian influence.



Figure 5: Salón del Trono, Alhambra Palace, Granada
(Source: Patronato de la Alhambra y Generalife, Junta de Andalucía)

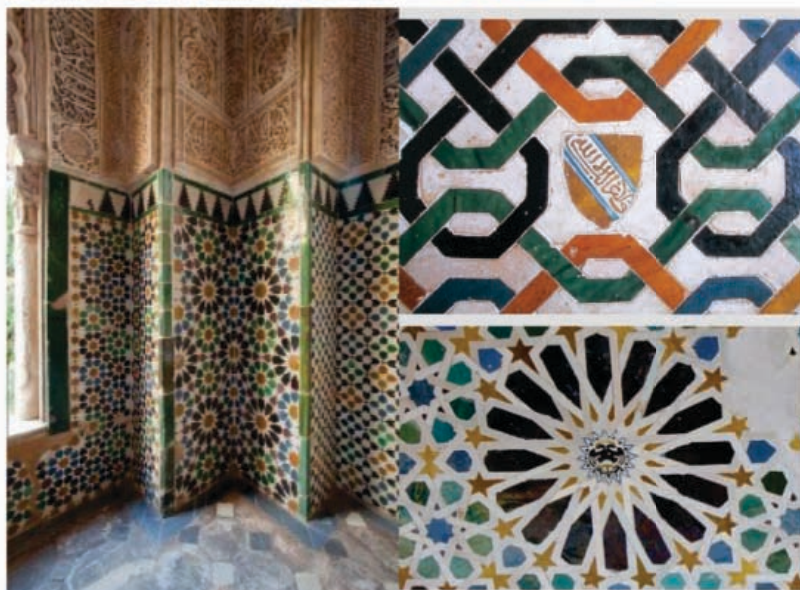


Figure 6: Sala de las Dos Hermanas, Alhambra Palace, Granada.
Details of the Nasrid emblem 14th Century and Charles V emblem, 16th Century
(Source: Patronato de la Alhambra y Generalife, Junta de Andalucía)

The three main *azulejos* techniques mentioned above – *cuerda seca*, *relieve* and *dorados*, were also extensively used during the Nasrid period. The Puerta del Vino, one of the gates of the Alhambra complex, is decorated with monochrome tiles of Almohad reminiscence. The Puerta de la Justicia example illustrates the embossed type of tiles for exterior decoration.

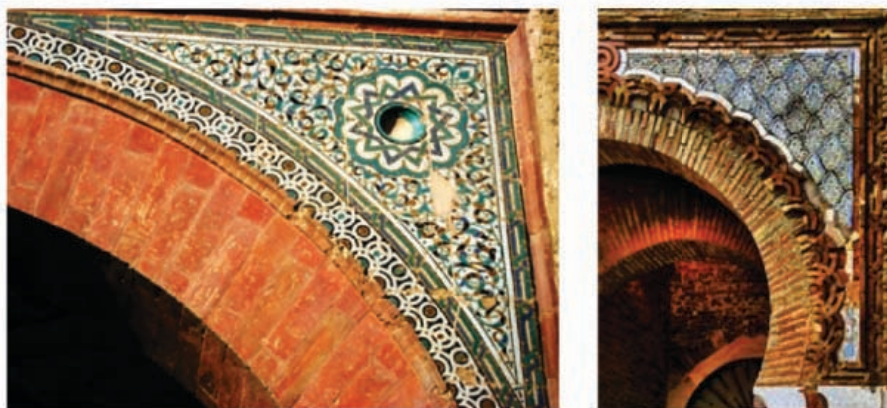


Figure 7: Exterior decoration in the Puerta del Vino and Puerta de la Justicia
Alhambra palace, Granada
(Source: Patronato de la Alhambra y Generalife, Junta de Andalucía)

Many of the *cuerda seca* examples of this period follow almost identical designs developed with the *alicatado* techniques. The appreciation for the quality and luxury of the *alicatado* explains why this different system incorporated subtle thin lines between the different colors, which give the appearance of being the edges of the *alicatado* small pieces. The time and craftsmanship skills required for the cut-tiles panel system became too difficult to make, which is the reason for the growth of the *cuerda seca* type of production where geometric tiles with multicolored designs were combined according to symmetrical rules to produce the effect of individual cut pieces.

Regarding the *dorado* type, he documented examples of golden tiles found in the Iberian Peninsula belonging to this period were mostly manufactured or at least exported from the Malaga region. The characteristic color of this type does not always survive, making the dating and documenting of such pieces more difficult.

A further feature were new elements molded in corner shapes which were installed in stairs and windows sills, thus extending the area of decoration within the architectural space.



Figure 8: Golden ceramic window-sill element found in the Albaicín
Granada, 15th Century
(Source: Cerámica hispanomusulmana, Martínez)

MUDEJAR TILE-WORK STYLE: A HYBRID BETWEEN CHRISTIAN AND ISLAMIC AESTHETIC TASTES

During the years of the Nasrid rule in Al-Andalus, a balance between the Islamic tradition and stronger Christian symbols and influences characterized the production of arts and decorations. The hybrid art style of this time is known as *mudejar*. The complex process of the *Reconquista* by the Christian kings was characterized by a pragmatic and utilitarian re-use of the Muslim structures, proper of war scarcity periods. The maintenance of these buildings implied the endurance of previous techniques and trades. Islamic elements were integrated into everyday buildings contributing to the creation of a built environment with a clear Islamic influence (Rodríguez Estévez, 2012)

From 1492, when the last ruler of the Nasrid dynasty surrendered to the Spanish Christian monarchs, the Islamic tradition weakened and a new Renaissance Spanish style developed. Although technically less sophisticated, there are several features from the Islamic period that can be recognized. According to Martínez Caviro (1991) these designs evolved from the strong geometric Islamic tradition to vegetable (*atauriques*) and animal motifs. Muslim symbols such as the hand of Fatima, the paradise keys or the tree of life gave way or coexisted with Christian texts, family crests and human figures dressed in the fashion of the Christian courts. Examples manufactured in the regions of Andalusia and Valencia, in the towns of Seville and Manises respectively, illustrate these design trends. Following the European preference for Chinese porcelain, the samples from Valencia used fewer colors with the combination of gold and cobalt blue on white being a distinctive feature.

However, it is not only in the decorative motifs of the tile-work where the transition from one style to another is notable. The main interior design elements in the Islamic tradition in Al-Andalus – that is, tiled dados and carved plaster for walls, tiles for flooring and wooden decorated ceilings - were adapted and used for buildings of Classic and Renaissance style in their rounded arches, flat ceilings and large stair volumes.



Figure 9: Fatima's hand and Paradise keys symbols. Trellised pinecones, both from Manises, Valencia, 15th Century (Source: Cerámica hispanomusulmana, Martínez Caviro)

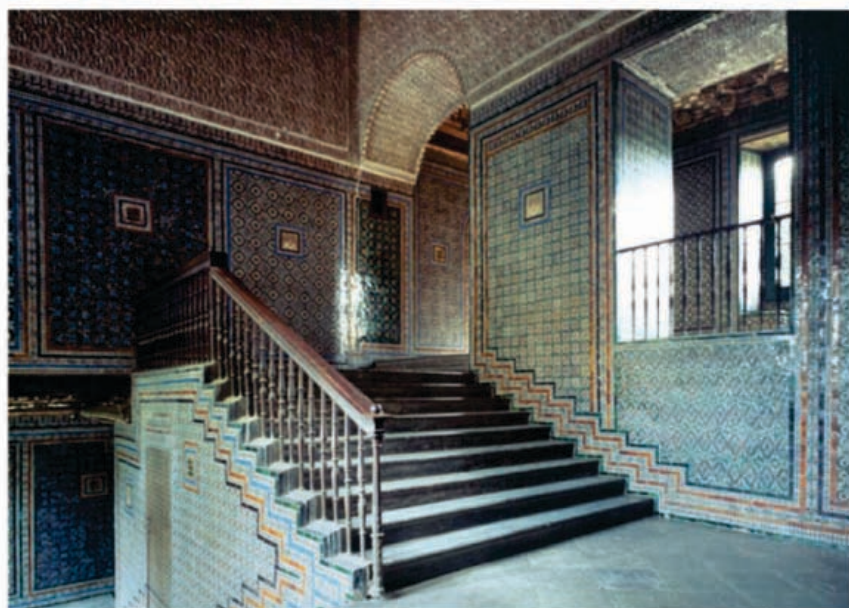


Figure 10: Interior of the Renaissance Palace Casa de Pilatos, Seville
Beginning of the 16th Century
(Source: Fundación Casa Ducal de Medinaceli)

THE MODERN AND PRE-INDUSTRIAL PERIODS: CONTEMPORARY TECHNIQUES AND DESIGN TRENDS

During the 17th and 18th centuries when many geo-political changes affected Spain, the tile industry suffered severe fluctuations. However exports to the new colonies in the Americas as well as to Europe ensured the survival of the main factories. Strong competition though from other European cities weakened many of the existing production centers.

In the 19th century an industrial approach to production was incorporated in the south and east coasts following developments in countries such as Portugal. Public elements like fountains or benches, or full building façades were decorated with figurative scenes. Regions such as Cataluña played a key role not only in the technical development of ceramic manufacturing but also in the innovative concepts and designs where these decorations were used. In the Art Nouveau or Modernist style developed by architects like Gaudí and his followers, ceramic tiles played a key role in their architectural designs.

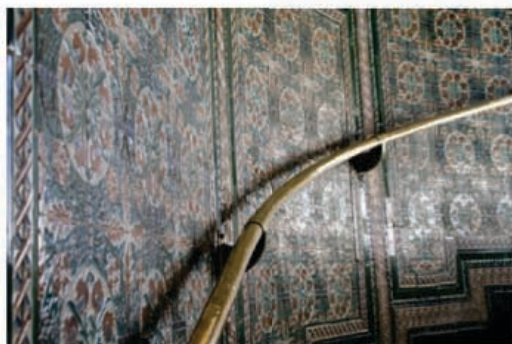


Figure 11: Casa de los Azulejos, Ciudad de Mexico, 16th Century and Staircase of the Palacio de Cibeles, Madrid, 1907 (Sources: Turiguide de Mexico and Ayuntamiento de Madrid respectively)



Figure 12: Public bench made in *trencadís* technique and internal courtyard of the Batlló apartments, Gaudí, 20th Century, Barcelona (Source: Casa Batlló Gaudí Barcelona)

During the later part of the 20th century the ceramic manufacturing industry in Spain grew at a steady pace. In the last few decades the wider international construction sector has recognized Spain's leading role in this industry. Institutions such as the Spanish Ceramic Tile Manufacturers' Association (ASCER), the Institute for Ceramic Technology (ITC), and the Architecture and Design Area Institute for Ceramic Technology (ALICER) are promoting not just the commercial side of the tile business but are also focusing on innovation in design and technology in order to use this material in contemporary architectural projects (Tardiveau, 2006)

One of the innovations in the modern manufacturing process is the use of single-firing techniques for glazing tiles, instead of firing them twice. This has the benefit of lower cost while also providing environmental and sustainability benefits by reducing CO2 and waste gas emissions.

Regarding the use of ceramics within the building, extensive usage of clay tiles for ventilated façade systems has spread over Europe. Applications related to structural architectural elements have also been tested, either improving the fire resistance of other structural materials - such as steel - or to shape self-supported elements to create vertical partitions.

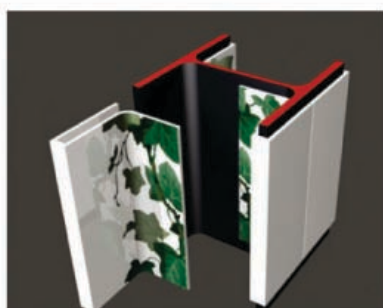


Figure 13: Fireproof ceramic element glued to steel column and clay façade elements in the Convention centre of Peñíscola

(Sources: Lacaton & Vassal and SACER respectively)



Figure 14: Two large-scale ceramic tiles projects: Santa Catalina market restoration in Barcelona, and Spanish pavilion for the International Expo 2005 in Aichi, Japan

(Sources: Urbarama and SACER respectively)

Modern developments have resulted in improved fixing techniques, including new groups of polymers and mechanical fixtures that replace the traditional sand and cement mortar used in previous centuries. These new systems provide more flexibility and durability, and allow designers to consider a wide range of tile types and sizes. New industrial approaches and techniques also allow for customized designs with a clear move to *a la carte* solutions.

As a result of these new developments, the range of tiles available in Spain and internationally has expanded significantly in recent years. Today more than 55% of Spanish production of tiles is exported to almost 200 countries according to Tardiveau (2006). The tile manufacturing companies are key players in the construction industry in contemporary Spain, making a important innovation and research contribution. The balance between the design and the actual procurement of the product is a decisive driver that explains their leading international position in the sector.

Spanish architects are rediscovering their rich historical tradition, aided by the full range of decorative options provided by modern ceramics and tiles. This rediscovery is illustrated by a number of large-scale iconic projects, including the Spanish pavilion for the 2005 Expo in Aichi, Japan and the roof of the Santa Catalina market restoration in Barcelona. Both examples draw on both geometrical as well as vegetal motifs, showing the full-scale use of tiles across the large-scale external spaces, which is reminiscent of the end-to-end interior decoration within the Seville Palace Casa de Pilatos.

CONCLUSION

The mention of the Alhambra or the Alcazar at Seville summons a vision of vivid tile-work with intricately enlaced geometrical patterns. Islamic Spain's architecture derived its distinctiveness from covering bare walls with decoration in the form of glazed tiles. The export of these and other ceramics was a major industry during the period of Islamic rule and for some centuries afterwards.

In the history of architecture, there are periods where the description of representative buildings require a constant reference to the use of ceramics. In the case of Spain this applies to two key historic periods: during the existence of Al-Andalus, in particular from the 13th century when the works started in the Alhambra Palace; and at the end of the 19th and in the early 20th centuries when the Art Nouveau style helped drive the production trends of ceramics in the country.

Modern Spanish architects are drawing on the ceramic and tile-work heritage of Islamic and post-Islamic periods, and, combined with modern manufacturing

and fixing techniques, are applying this heritage to prominent large-scale interior as well exterior applications. The colors and patterns may be different, but the overall concept and link to Spain's rich earlier traditions are clearly identifiable.

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