3 The Clay Life Cycle - Design and Construction

The importance of incorporating sustainability into buildings is now an accepted fact. What is still required is to ensure that participants in the building process understand their role in managing sustainability. This requires that:

- Industry produces the highest quality products,
- Architects create innovative and sustainable buildings,
- Contractors work to established codes of practice.

A weak link anywhere in this partnership can undermine the effectiveness of any sustainable strategy. That is why our industry is communicating with architects, builders, tilers and bricklayers to ensure that the development of innovative techniques and clay products is suited to the needs of the construction industry.

By examining the context of European building and by understanding and accepting its various regional differences, the European clay brick and tile industry is creating products of technical excellence that can lead to sustainable architecture.

More than ever, sustainability remains our driving principle.

3.1 Social Progress

Clay building products have made a major contribution to the built environment which is so much a symbol of the European cultural heritage of the past, and which will continue to be in the future.

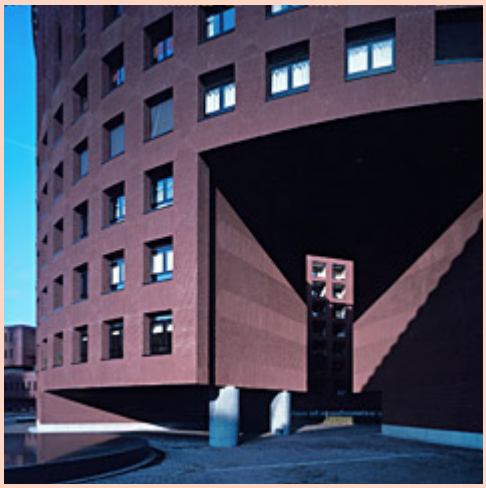
3.1.1 What is the context of European building?

It would be wrong to attribute European architecture to one material and one method of construction. Nevertheless, we can justly maintain that throughout Europe, bricks and tiles have shaped the built environment for centuries. Generations of European architects, builders, bricklayers and tilers have used them to build villages, towns and cities.

Such widespread use is not accidental; Europeans have been aware of the technical and aesthetic qualities of clay building products for centuries. The versatility of clay building products has allowed their adaptation to new techniques and methods of construction, while the constant introduction of new colours and sizes and the improvement of technical performance has challenged designers.

As the European building context is constantly evolving, so clay building products are being continuously reconfigured. Innovation allows them to meet the requirements of the 21st century whilst preserving our built heritage.

BRICKS AND TILES FORM THE BASIS OF THE EUROPEAN BUILDING TRADITION! They are the link between our architectural heritage and our future!



3.1.2 Local influences

The European building context is more than historical, cultural and aesthetic. Construction methods vary greatly throughout Europe and are heavily influenced by factors such as climate, earthquakes and local traditions.

The different European's requirements of indoor comfort also constitute an important factor. Whatever the climate, our industry develops clay building products that meet these requirements and lay the foundations for a quality indoor climate.

We can find a variety of examples throughout Europe:

Walls

- Cavity wall: vertically perforated unit / cavity / solid unit (facing brick)
- Monolithic wall: monolithic horizontally or vertically perforated unit
- Wall with external or internal insulation

from left to right:
monolithic wall (vertically perforated)
cavity wall
cavity wall with facing bricks
wall (horizontally perforated) with external insulation
wall (vertically perforated) with external insulation

There have also been special masonry constructions devised to overcome seismic considerations.

Roofs

Roof design is dependent on both local tradition and climate and will therefore differ from one area to the next.

- Tiles: Southern Europe tends to use interlocking tiles while in Northern and Eastern Europe the preference is for plain tiles.
- Roof slope: This is determined by climate: generally speaking, the greater the snowfall, the steeper the slope.
- Use of flexible or rigid underlay: in Northern and Central Europe, where snow is common, underlays are used to assure the roof is watertight.
- Tile colour: Natural colours have always been used. The industry has responded to the demands of architects and designers and developed coloured products.

plain tiles

glazed interlocking tiles

roman tiles

In some areas, roof design is determined by seismic considerations.

The clay brick and tile industry exploits this diverse range of design influences to create innovative products and techniques that will be acclaimed by all parties in the design and construction process.

3.2 Environmental aspects

The careful design of clay blocks and roofing tiles and their high quality minimise the environmental impact of building sites and contribute to a high safety level.

3.2.1 Technical excellence of our building products

For generations, brick and tile manufacturers have continually improved the technical properties of their products. Today, this process is achieved in accordance with European Standards.

The characteristics and performance requirements for masonry units manufactured from clay for use in masonry construction are specified in the European standard EN 771-1.

This Standard is linked with test methods for masonry units: EN 772.

The product definitions and specifications for clay roofing tiles for discontinuous laying are specified in the European standard EN 1304.

The European standard EN 1344 specifies the requirements for pavers.

A product standard for beam-and-blocks floor systems exists as draft prEN 15037.

These standards will ensure the high level quality control in the manufacture of the clay building products will be maintained. The introduction of CE marking will confirm that these product fulfil the essential requirements of the European Building Product Directive.

3.2.2 Building in a safe environment

Our industry is dedicated to creating products that will help rationalise the building process.

Construction of a building begins with the transport of materials to the building site. Traditionally, bricks and tiles were produced in rural areas and were linked closely with the life of the local community. Bricks and tiles took on the characteristics of the region from which they came.

Today, our industry tailors its operations around two key developments. The first, is the greater diversity in building products demanded by the market. The second is that it is uneconomic to transport bricks and tiles over long distances.

In dealing with these factors, our industry has been enlarging its range of products in order to ensure availability at local and regional levels. Transport logistics is one of the factors that define the market for bricks and tiles – everything is done to minimise environmental impact.

Storing bricks and tiles on-site

No special measures are required for the safe storage of bricks and tiles on-site. Buildings comprising clay products do not generally impose any risk to the workforce on-site or to people living in the vicinity.

The installation of bricks and tiles requires high standards of manual skill but does not require additional chemicals.

This means that compared to other building sites, such sites tend to have less hazards and are also quieter, less dusty, odourless and less wasteful. Buildings made of bricks and tiles do not cause ground or atmospheric pollution.

The clay brick and tile industry is also striving to improve health and safety on site. Clay blocks, for example, sometimes have been ergonomically designed with a griphole to allow safe and comfortable handling.

Also, the very nature of clay building products does away with the need for special protection measures such as masks and gloves, except when cutting.

3.3 Economical aspects

From an economic point of view, it is necessary to stress the requirements of each participant in the creation of sustainable buildings:

- European brick and tile industry: excellence in the products we put on the market, devising innovative clay products and building methods, disseminating the information to all parties involved in the building process;
- architects: design buildings in an innovative and sustainable way;
- bricklayers, roofers and other construction workers: execute their work according to the prevailing codes of practice.

Each party must understand that its role in this philosophy forms part of a total quality concept that takes into account criteria such as context, transport, resource consumption, indoor environment, economics and architectural quality.

3.3.1 Involvement of our industry in sustainability

Innovation - Information - Training

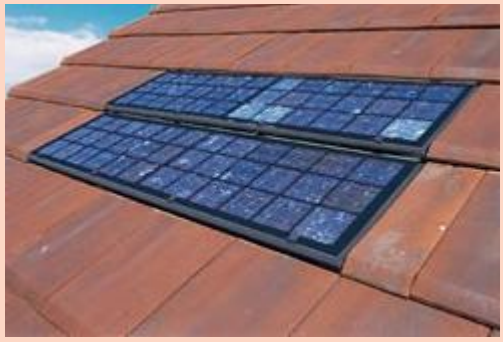
Our industry wants to create products that are in accordance with the needs of architects and builders. These new products and techniques are designed to improve the quality of the building process at different levels:

- Foster innovation in architectural design
- Allow variety in dimension and colour
- Initiate new techniques and processes

New techniques developed within the European brick industry (glued masonry, pre-assembly process, …) must be accompanied by the continuous re-training of architects and bricklayers. This requires an involvement at every level (manufacturers, workers, technical advisers, …) in order to achieve maximum progress.

From an economic point of view, innovation can improve on-site efficiency, reduce build times and as a consequence, reduce costs.

European roof tile manufacturers are also developing more sustainable products, for example, new solar tiles that can be integrated in roofs: hidden completely or well-integrated into the roof.



Industry is also developing new roof tile panels with a cellular structure that can provide thermal insulation and reduce air conditioning needs.

3.3.2 Involvement of architects in sustainability

How to maximise the benefits of high quality bricks and tiles

Many architects and builders are aware that they have to understand the sustainable issues associated with construction. These concepts must be analysed and incorporated at the design stage.

In the first instance, they must take into account “general criteria” such as the orientation of the building, the climate, etc.

Then, they must design the building and choose the materials with which they hope to achieve a sustainable construction.

Building with bricks and tiles asserts our European identity and at the same time, makes for durable and high quality construction.

With clay building products, builders can be sure that they will be using environmentally friendly products that will give them freedom to create diversity of form, colour and texture. This can lead to new forms of building that integrate cultural values in a sustainable way.

Architects must take advantage of the possibilities that clay building materials can offer! They can lead to the creation of an innovative and flexible architecture that can also provide a sustainable option for our present and future needs.

3.3.3 Importance of craftmanship

The durability of clay materials renders them suitable for every type of buildings. Nevertheless an important point that will determine the durability of the construction is skilled craftsmanship. Despite the highest quality European bricks and tiles, bricklayers and roofers must also possess the highest possible skills to enable the successful completion of the project.