

Building Value for Society

Sustainability of Gypsum:
our Assets



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The “**Magic**” Mineral, Indefinitely Recyclable, Transformed into Plaster

Gypsum ($\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$) is a rock-like mineral commonly found in the earth's crust. It is usually white, colourless or grey. In Europe, the principal gypsum deposits are located in Germany, UK, France, Spain, Italy, Poland, Russia and the Ukraine.

Gypsum has been used by Man in construction or decoration in the form of plaster and alabaster since 9000 B.C. Plaster was discovered in Catal-Huyuk in Asia in an underground fresco and in Israel gypsum floor screeds have been found from 7000 B.C. During the time of the Pharaohs, gypsum was used as mortar in the construction of the Cheops Pyramid (3000 B.C). In the Middle Ages and the Renaissance, decorations and artistic creations were made of plaster. Since then, the range of construction-related uses has continued to expand.

The process to obtain plaster is simple: the mineral is extracted from the earth's crust (open or underground quarries), it is then exposed to certain thermal processes whereby it is partially dehydrated and after grinding becomes a fine white powder – commonly known as Plaster of Paris – which hardens when moistened and allowed to dry.

Gypsum is furthermore a raw material which can be eternally recycled to manufacture gypsum based products (closed-loop recycling). We could say that gypsum is in that case close to being a “totally renewable natural resource”.

The substitute to natural gypsum is FGD Gypsum (Flue Gas Desulphurisation Gypsum). It is generated by coal-fired power stations during the process designed to clean SO_2 from the exhaust gases. Gypsum produced by this means is equivalent to extracted gypsum and satisfies the same performance and quality standards. The rise in FGD production is consequently slowing down the rate at which natural gypsum reserves are exploited.



DID YOU KNOW?

In the EU, The Gypsum Industry represents around:

- **160** quarries
- **100** plasterboards plants
- **65** plaster powder plants
- **15** plaster blocks plants
- **8** gypsum fibre boards plants
- **30** gypsum ceiling tiles plants

In Europe, the production of FGD Gypsum was **15 million tons** in 2006.

An **Eco-Efficient Product** for any and all Styles, from the Classical to the Modern

Who of us does not live surrounded by gypsum? What home does not have plaster on the walls or plasterboards for its ceilings and interior lining? Who has not been impressed by offices, hotels and public institutions whose interiors are shaped into intricate arches and curves, which are made possible by the use of plasterboards to create an aesthetically pleasing environment?

Those products and solutions used every day are designed to:

- Be manufactured using by-products and recycled materials;
- Be manufactured with low energy intensity;
- Be manufactured with low emissions. The main emission of the production process is steam;
- Use little packaging;
- Be recycled at the end of their life cycle;
- Promote indoor air quality;
- Be sound insulation efficient;
- Be impact and fire resistant;
- Be energy-efficient in its use – thereby playing an important role in the reduction of carbon emissions in the built environment;
- Extend the lifetime of a building, thus enhancing overall sustainability.

Gypsum building materials are used in all construction types (residential, non-residential, new or refurbished), ranging from complex high-tech systems to easy to install products adapted for use by the great public. Its environmental benefits linked to its safety and usability credentials greatly help to create a pleasant, warm, cosy, healthy and comfortable built environment.

Gypsum plasterboards, fibreboards and plaster blocks are manufactured in hundreds of variations, satisfying a vast number of technical and aesthetic requirements. In order to assist architects, contractors and engineers in choosing the right solution for any given situation, manufacturers offer a wide range of systems. An architect no longer has to research and put together different components and then have the system tested. He uses approved solutions which include the appropriate product and the relevant accessories, such as framing components and finishing products, along with any necessary technical information. Thus, gypsum systems enable the architect to create sublime, divine, practical and money-saving design solutions.

DID YOU KNOW?

The European Parliament Building in Strasbourg was lined and covered with more than 400,000 m² of plasterboard, 10,000 m² plaster blocks and 420 tonnes of stucco, this to comply with the regulatory requirements in terms of acoustics, fire protection and resistance to earthquakes, and to enhance the decorative aspects

The Reichstag in Berlin is covered by 8,500 m² acoustic ceiling tiles in the plenary room and by 6,000 m² acoustic and refrigerant ceiling tiles in the Parliamentary group meeting rooms

The Guggenheim museum in Bilbao was lined with 180,000 m² of plasterboard. The plasterboard work lasted 20 months with a maximum height of 65 meters in the central hall, and with curves of up to 60 cm. Some plasterboard had curves in three different directions



Gypsum Excellence and **Incomparable Features**

Gypsum is virtually indispensable for the interiors of homes and offices and all types of building where people congregate, such as schools, shops, airports, etc. Its superior performance in providing everyday comfort, in fire resistance and in insulation, heralds an ever greater role for it in buildings of the future. In fact, the safety and protection of people and property against fire, and effective thermal and acoustic insulation of buildings depends, more often than not, on the unique properties of gypsum. And many of the attractive features of the modern interior would be impossible without gypsum as a building material.

Gypsum is fire protective

Gypsum is non-combustible and able to delay a fire's spread up to 4 hours. Gypsum acts, in that case, as a fire barrier and thus reduces home or business fire damage.

Gypsum regulates sound and solutions

Gypsum walls, ceilings and floors together with insulation materials create quiet zones in the house or business environment. They are designed to provide a physical barrier to sound, incorporate a sound break and minimize reverberation. These solutions are virtually indispensable for the interiors of homes and offices and indeed all types of building where people congregate such as schools, shops, cinemas, airports, etc.

Gypsum acts as a thermal insulator when combined with insulation materials

Thanks to its low thermal conductivity, gypsum plasterboards contribute together with the insulating material to the insulation of external walls and linings.

Gypsum equilibrates humidity and heat peaks

Gypsum is capable of storing humidity when a room is humid and automatically releasing this humidity if the indoor air becomes too dry. Plasterboards have also a "heat-storing" ability. Small temperature increases are absorbed and radiated back later when the temperature in the room decreases.





Gypsum is impact resistant

The Gypsum Industry provides plasterboards, gypsum fibreboards and plaster blocks with a degree of hardness equivalent to a thick wall heavy masonry construction.

Gypsum is easy to install and to dismantle

To construct an internal wall, for example, a frame is erected, plasterboard is fitted to it, joints are filled, and the wall is created. The operation is fast, clean, dry and uncomplicated.

Gypsum is multifaceted, multipurpose, supple and aesthetic

A richness of forms can be created in plasterboard or stucco. For architects, building with gypsum products allows them to unleash their creativity thus allowing them to answer, even more dramatically, to the demands of their customer while remaining within an affordable budget. In short, gypsum allows the creation of stunning interiors in any and all styles, from the Classical to the Modern.

Speed and ease of assembly and finishing mean that constructing with gypsum products is economical and fast. The magic properties of gypsum and the products' eternal recyclability improve the overall eco-efficiency and sustainability of buildings.

DID YOU KNOW?

More than 1,600 million m² of European interior surfaces are covered with plasterboards every year

More than 5 million tons of plaster are used in Europe for interior lining

More than 20 million m² of European interior walls are separated using plaster blocks



Generating a Prosperous and **Sustainable Environment**

The Gypsum Industry prides itself on its deep commitment to the interests of the community. An established tradition in the responsible use of natural resources and in the rehabilitation of depleted gypsum quarries is now matched by an active stance in the recovery and reprocessing of gypsum waste.

Extracted gypsum is a natural resource: we consider it our duty to adopt a responsible attitude to the management of this resource. Over many years, the gypsum producers have striven to restore depleted gypsum quarries by creating a natural landscape and by re-cultivation measures on one part of the quarry, whilst the extraction process is in full activity in other parts.

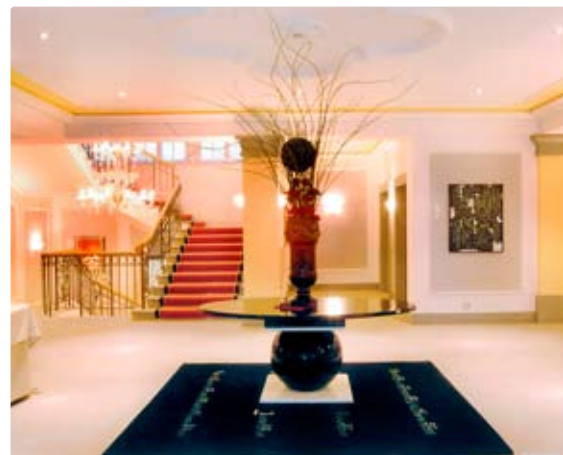
Although the long-term future of the industry will always be based on the traditional mineral form of gypsum, the industry is increasingly using FGD Gypsum which provides an alternative raw material source to extracted gypsum.

Through its products and solutions, the Gypsum Industry is striving to create a world that is aesthetically pleasing, biologically stable and economically productive. The Gypsum Industry's overriding objective is to contribute to shaping its customers' total quality of life – not merely in the products that it supplies, but also in ensuring that it does not in the process degrade other aspects of the customer's life experience.

DID YOU KNOW?

Gypsum quarries can compensate for the disappearance of their original habitats, generating diversified biotopes for rare species of amphibians, reptiles, insects, birds, flowers and plants

An important programme of restoration for the Vaujours-Caubry disused open-pit gypsum quarry (135 ha) in France started in 1995 and was successfully completed in 2005 creating an aesthetically pleasing and biologically sound environment



Promoting Industrial Growth and **Economic Stability**

Thirty years ago, the Gypsum Industry was made up of many SMEs mainly producing building plaster and stucco for local markets. The emergence and growth of the plasterboard and the plasterboard solutions market in the 1980s – requiring high capital investments, equipment, R&D and securing access to natural resources – led to a consolidation process within the European Gypsum Industry. We currently have three main operators covering 80% of the gypsum product market. SMEs are very active in Spain in plaster powder manufacturing, with a direct employment of more than 2,300 employees, operating 26 quarries and 33 plants (powder plant, plaster blocks and ceiling tiles). There are also SMEs active in plaster block and plaster powder markets in other European countries.

So, we have global and small operators of European origin and know-how with national markets to serve with local resources and production. As the costs of transporting plasterboard overseas are prohibitive, the production is done in Europe, with each Member State meeting the needs and legal requirements of local customers. We can say that the Gypsum Industry is “here to stay and to grow” boosted by the European Lisbon Strategy policies.

The Gypsum Industry Wealth is focused on the fact that:

- We operate in a global economy and respond to local communities meeting their economic, technical, environmental, architectural and cultural needs;
- We produce locally with high technical and environmental standards and with great respect for our local communities.



DID YOU KNOW?

The European Gypsum Industry's growth is around 5% a year

It has an annual turnover of around 10 billion Euro

Caring for **People**

The European Gypsum Industry considers the needs and well-being of:

- Colleagues by ensuring health and safety at work (zero injuries), specific professional training, career paths as well as a comfortable working environment and stable employment;
- Local communities by ensuring that the operation of factories and quarries are at minimal environmental impact on the local community. Quarries are restored after closing;
- Customers by providing product training, technical support, products composition advice, manual handling guidelines, lifetime system support, etc.

DID YOU KNOW?

In each country, you can find company training academies staffed by experienced instructors, all of whom have a wealth of experience in the construction industry and specialised in either plastering or drywall work

Core Values guide the Gypsum Industry daily business:

- Integrity
- Openness
- Mutual Growth
- Sustainability
- Team Work, Respect for Employees
- Continuous Improvement
- Customer Satisfaction
- Accountability for our actions



Playing a **Beneficial and Helpful Function** in the Construction Sector

Eurogypsum is the European Federation of Plaster and Plaster Products Manufacturers, organised in national associations across Europe. The Industry plays a **vital role** in the construction field as over 80% of all interior surfaces in European housing are either made from, or lined with, gypsum based products. Furthermore, offices, shops and public buildings of all kinds make substantial use of gypsum products, chosen by architects for their excellent performance in acoustic and thermal insulation, fire protection and interior design and decoration.

The Gypsum Industry contributes to shaping its customers' total quality of life, not merely in the products that it supplies, but also by ensuring that it does not, in the process, degrade other aspects of the customers' life experiences. Through its products, systems and solutions, it helps to create a world that is aesthetically pleasing (including comfort and well-being), biologically stable and economically productive.

Finally, we should not forget the many uses of gypsum outside the construction industry. For example, it is used in the making of ceramic moulds and surgical and dental casts, as a water conditioner for beer-brewing and sugar-refining, as ingredients in flour, bread, ice-cream and pet food and as an agent in pharmaceutical products.

DID YOU KNOW?

Our industry employs more than 28,000 people directly and another 85,000 people indirectly (plasterers and plasterboard erectors)



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