Omya in Polymers

Calcium Carbonate
in nature, in life
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Omya Group

Omya is a leading global producer of industrial minerals – mainly fillers and pigments derived from calcium carbonate and dolomite – and a worldwide distributor of specialty chemicals. The company’s major markets are forest products (fiber based products such as paper, board and tissue), polymers, building materials (paints, coatings, sealants, adhesives and construction) as well as life sciences (food, feed, pharmaceuticals, cosmetics, environment and agriculture).

Founded in 1884 in Switzerland, Omya has a global presence extending to more than 180 locations in over 50 countries with 8,000 employees.
Company History

Omya’s roots date back to 1884 when the company was founded by Gottfried Plüss-Staufer in Oftringen, Switzerland. In the beginning the company engaged in the production of glazier’s putty by combining fine chalk with linseed oil.

In 1891, Plüss-Staufer acquired a chalk quarry in France and decided to build a plant in Oftringen to produce chalk powder. After completion of the Oftringen plant in 1894, the business expanded quickly. The putty sales increased significantly as did the sales of chalk powder. These successes led Plüss-Staufer to acquire a second chalk quarry, at Omey, France, in 1894. A chalk plant was built in the port of Omey in 1900.

At the turn of the 20th century Plüss-Staufer created the Omya brand name. High quality products and excellent customer relationships quickly established Omya as a highly regarded brand beyond the borders of Switzerland.

Major Steps:

1884 Plüss-Staufer founded in Oftringen, Switzerland
1891 Chalk quarry in Châlons-sur-Marne, France
1894 Plant in Oftringen, Switzerland
1900 Plant in Omey, France
1912 Plant in Strassbourg, part of Germany at that time
1925 SA du Blanc Omya in Paris, France
1932 Omya GmbH in Cologne, Germany
1946 Pluess-Staufer Co. in the United States
1949 General representation for Hoechst in Switzerland
1952 Surface treated chalk for the PVC plastics industry
1965 Calcium carbonate pigment for the paper industry
1968 Calcium carbonate slurry for the paper industry
1976 Quarry and plants in the United States
1981 Quarry and plants in Australia
1992 Quarry and plants in Asia Pacific
1995 Quarry and plants in Latin America
1997 Precipitated calcium carbonate plant in Austria
2000 Plüss-Staufer renamed to Omya
2004 Quarry and plants in China, Russia and the Near and Middle East
2006 Plant in Brazil
2007 Quarries and plants in India, Vietnam and Romania. Acquisitions of Huber precipitated calcium carbonate plants
2008 Plants in Jordan, Malaysia and Indonesia. Joint Venture Shiraishi-Omya GmbH with Plant in Golling
2009 New PCC plant in Três Lagoas, Brazil
2010 Acquisition of chemical distributors in Asia and USA
2013 First pilot plant for re-mineralization of desalinated water
Sustainability in Polymers

Sustainable development is defined as a form of progress that meets present needs without compromising the ability of future generations to meet their needs. Quality, safety and corporate accountability are the principles upon which Omya conducts its business. For us sustainability includes:

**Economic growth**
- Needs, rights and values of our customers
- Continuous improvement of our products and services

**Ecological balance**
- Compliance with applicable laws, rules and regulations and constant efforts to reduce our impact
- Environmental responsibility

**Social progress**
- Omya’s facilities operate safely and are considerate of the community in which they operate
- We are good local citizens and respect our fellow human beings and the environment
- We are guided by ethical principles

**Carbon Footprint & Calcium Carbonate**

For natural ground calcium carbonate the IMA carbon footprint figure is **63.5 kg of CO₂ emitted per ton of calcium carbonate (CaCO₃)** produced (source: IMA, EU27 energymix; Energymix based on production capacity mix). In comparison to other raw materials used within the plastics industry, the results for calcium carbonate are very positive.

However, there are still possibilities to improve this favorable position and the challenge is to optimize our production process regarding the use of energy and transportation. We believe that the success of our products will depend increasingly upon optimising our carbon footprint for the future.
Omya in Polymers

Mineral modifiers such as the calcium carbonate and dolomite produced by Omya significantly enhance processes and improve mechanical properties in numerous plastics applications.

To meet the exacting demands of its customers, Omya focuses on top-quality advice and a wide selection of both mineral and chemical raw materials. Together, we discuss the desired property profile and look for a suitable combination of components, always with the objective of finding the best possible solution.

Omya’s experience and wealth of knowledge benefit those who choose to work with us. Omya’s technical support staff and technical facilities will help you find the optimal solution to suit your needs.

We promote the use of calcium carbonate in both existing and new applications. Investigating new derivatives of calcium carbonate as well as processing technologies allow Omya to “push the boundaries” of existing application areas.

As the largest global manufacturer of calcium carbonate, we have a vested interest in ensuring that the benefits of calcium carbonate are communicated to all stakeholders in the supply chain – especially to brand owners and retail communities.

Complementing our calcium carbonate range is our wide and diverse specialty chemicals business, which represents many multinational chemical and resin manufacturers.
Calcium carbonate is currently used to enhance mechanical properties and improve productivity in a wide variety of applications, from thin films to thicker sheets. Calcium carbonate can boost the output of processing lines while achieving improved impact strength and higher stiffness. With reduced top cut, low impurities and excellent coating properties, Omyafilm® is a dedicated product for the film industry and is becoming increasingly recognized as a reference product in the global film market.

**PE Film**
The main benefits in production include:
- Increased specific output
- Faster heating and cooling
- Increased line speed
- Better homogeneity
- Enhanced machine uptime

**Breathable Film**
Specially developed Omyafilm® offers:
- Exceptional hydrophobicity
- Excellent dispersion
- Improved thermal stability during processing

**BOPP Film**
Benefits include:
- Reduced film density
- Improved printability for label stock
- Increased opacity

**Extrusion Coating**
The main benefits of using Omyafilm® in extrusion coating include:
- Improved adhesion
- Faster line speed
- Reduction in minimum seal temperature
- Lower processing temperatures
- Lower melt temperatures
- Reduced neck-in
Sheet

Filling polypropylene with up to 60 % calcium carbonate is a proven solution for running polypropylene on existing polystyrene thermoforming machinery with a comparable line performance and end-product quality.

The use of calcium carbonate in PS products is also very popular, modifying both the mechanical performance and processing output.

The main benefits of using Omya calcium carbonate in thermoforming include:

- Higher extruder output and faster cooling on chill roll
- Reduced cooling time in mold and faster cycles
- Higher stiffness
- Lower shrinkage
- Processing on existing PS thermoforming machinery
- More isotropic physical properties
- Improved forming accuracy
Tape in the raffia market also benefits from the use of sophisticated, fine-treated calcium carbonate, which provides outstanding mechanical properties and superior quality at ever-increasing mineral loadings.

**Woven Tape**

The main benefits in production include:

- Reduced splitting propensity of oriented polypropylene
- Increased stiffness
- Controlled water carry-over
Fiber

Omyafiber® is an innovative mineral modifier developed for the polyester nonwoven market intended for both disposable and durable applications. This specialized calcium carbonate is a great opportunity to cut raw material costs and improve the quality of nonwoven fabrics.

**Benefits of Omyafiber®**
- Increased rigidity with possibility to reduce fabric thickness
- Enhanced impact properties
- Higher breakage strength
- Reduced shrinkage and greater dimensional stability
- Antiblocking effect
- Higher opacity
- Reduction of CO₂ emissions (carbon footprint)

**Benefits for the Nonwoven Fabric**
- Softer touch
- Improved adhesion
- Antiblocking effect
- Improved barrier properties
- Reduced flotation in farming applications because of higher density
- More efficient filtration and absorption of oil on wet towels and in industrial applications
**Molding**

The higher thermal conductivity and lower specific heat of calcium carbonate are key advantages in molding applications.

The cycle time, stiffness and impact resistance will be favorably improved in injection molding and blow molding applications, which then leads to cost savings.

**Blow Molding**

Calcium carbonate offers substantial benefits in blow molding applications for producing bottles or containers, such as:

- Increased flexural modulus
- Sustained top load and drop impact
- Improved ESCR
- Reduced cycle time
- Lower melt temperature
- Reduced titanium dioxide content
- Improved printability

**Injection Molding**

The main benefits of using Omya calcium carbonate include:

- Higher stiffness
- Improved impact strength
- Less shrinkage
- Improved dimensional stability
- Higher heat distortion temperature under load
- Cycle time reduction
Calcium carbonate is used in numerous rigid PVC applications, the most significant of which are pipes and profiles. Omya is continuously updating its product range for these applications. Most recently, Omya has developed an innovative solution for adding calcium carbonate directly at the extruder, thus allowing higher loadings.

**Pipes & Fitting (PVC and Polyolefin)**
Omya’s range of calcium carbonates (Omyalite® and Omyacarb®) is unparalleled, covers the entire spectrum of applications for pipes and fittings and has the following benefits:
- Improved processing (reduced cooling time)
- Reduced cycle time (fittings)
- Higher ring stiffness
- Mechanical requirements for PVC pressure pipes
- Homogeneous foam structure (structured wall pipes)
- Higher modulus

**Profile & Siding**
Adding more Hydrocarb® to PVC profiles and sidding can yield substantial benefits. By choosing the right calcium carbonate, the process can benefit from:
- Higher impact strength
- Better gloss
- Superior surface finish
- Good processing at high loadings
Flexible PVC products can generally handle very high loadings of calcium carbonate.

In addition to cost savings, several properties can be enhanced depending on the applications and the selection of calcium carbonate:

- Better electrical properties (cable)
- Higher gloss
- Lower plasticizer and stabilizer absorption
- Higher HDT
- Better printability
- Controlled rheology (automotive underbody sealing)
Rubber & Elastomer

By choosing the right calcium carbonate grade (controlled top cut), customers can achieve cost-effective solutions that allow high filler loading with no impairment to processing and the final properties.

The main benefits in production include:

- Better mixing effect
- Easier mold release
- Increased processing
The use of calcium carbonate in thermoset resins reduces costs and improves the mechanical and optical properties.

Calcium carbonate is used for controlling viscosity, the thermal expansion coefficient and shrinkage. With the appropriate choice and combination of calcium carbonate grade, you can achieve the following:

- Class “A” surface on molded parts
- High loading (optimum packing density)
- Good dimensional stability
Distribution in Polymers

Omya represents world-class suppliers of chemicals to the plastics and rubber industries. Products like impact modifiers, rubber predispersions, kaolin, flame retardants and other additives in combination with advice from our sales technicians enable us to supply our customers with a solution tailored to their specific market needs.

Thanks to our top position as suppliers to the leading compounders and extruders in each market also makes us the suppliers of choice for important local players who might be difficult to reach otherwise.

This fact, paired with excellent geographic coverage, makes Omya the ideal marketing partner for our principals.

Distributed products are selected to reinforce each others efficiency in formulations.

The portfolios span from agents for UV stabilizers and antiblockers to pigments and flame-retardants and a host of others based on local needs. Availability is ensured by Omya’s logistical capabilities and financial strength.
Omya produces and provides expertise and innovation in the fields of profiles and pipes, films and plates, wire and cable, foams, fibers and tapes, corrosion protection and reactive molded compounds.

Our range focuses on everything connected to use of calcium carbonate in plastics applications. We develop know-how and provide services.

Omya conducts research and development for its own purposes and under contract to customers. We seek new solutions and deliver the associated expertise. There are three areas of focus in these efforts:

- Development of new products based on natural ground, precipitated and modified calcium carbonate.
- Customer oriented applied technology service for new formulations and for optimizing products.
- Basic and continuing training courses for employees and customers.

Omya solves problems and assists with processes. We are just the people to turn to for anyone encountering formulation problems with calcium carbonates. Omya offers service and support to customers across the globe and provides the most modern expertise on product and formulation optimization.

Omya maintains a state-of-the-art laboratory for technical services located at its company headquarters in Oftringen, Switzerland and is staffed regionally in response to global customers requirements.

On request, we recommend steps for optimizing products and formulations. We provide our customers worldwide with on-site advice and conduct basic and continuing training courses individually designed for their employees.