



enhanced
by Omya

Direct Addition

Technology to increase Calcium
Carbonate content in PVC



THINKING OF TOMORROW



About Omya

Omya is a leading global producer of industrial minerals – mainly mineral modifiers derived from Calcium Carbonate and dolomite – and a worldwide distributor of specialty chemicals.

Founded in 1884 in Switzerland, Omya has a global presence extending to more than 175 locations in over 50 countries with 8,000 employees.

The company provides a wealth of product solutions that contribute to its customers' competitiveness and productivity in multiple industries such as Construction, Printing & Writing, Technical Polymers, Packaging, Food, Personal & Home Care, Pharmaceuticals, Agriculture, Forestry, Water and Energy.

Adding Customized Value to the Polymer Industry

For our customers we are continuously developing and implementing innovative solutions to enhance processes and improve properties of numerous polymer applications.

As a consequence, Omya is now presenting a novel technology called "Direct Addition" to allow higher Calcium Carbonate addition levels in applications such as pipes, technical profiles and foam applications.

Omya Calcium Carbonates allow manufacturers to substantially reduce raw material costs and improve the quality of their products.

Pushing boundaries in rigid PVC applications

Calcium Carbonates are commonly used in rigid PVC formulations to produce non-pressure sewerage pipes, window profiles, sheets and technical profiles like fences or sidings. Depending on the addition level they provide substantial cost benefits.

Today, the content of mineral additives in rigid PVC applications are quite often limited by mechanical or optical properties of the end product.

*Our range of coated products offer
an excellent dispersion in the polymer
and allow for high mineral loadings.*



Another limiting factor to the addition level could be processing issues like segregation and deposits that sometimes occur when more than 20 phr of Calcium Carbonate are added to the formulation. To overcome these issues, Omya developed the Direct Addition Technology which has been successfully introduced to the European market since 2006.

Overcoming technical challenges with Direct Addition technology

One of the main challenges in today's production limiting the use of Calcium Carbonate is the segregation of the mineral and PVC particles during the pneumatic conveying to the daily dry-blend silo after the hot-cold mixing process.

The fine Calcium Carbonate particles stick to the wall of the daily dry-blend silo to form agglomerates which collapse from time to time. This leads to high process fluctua-

tions and makes a smooth extrusion process difficult or sometimes even impossible to achieve.

As a consequence, Calcium Carbonate content in PVC formulations is sometimes limited to approx. 20 phr.

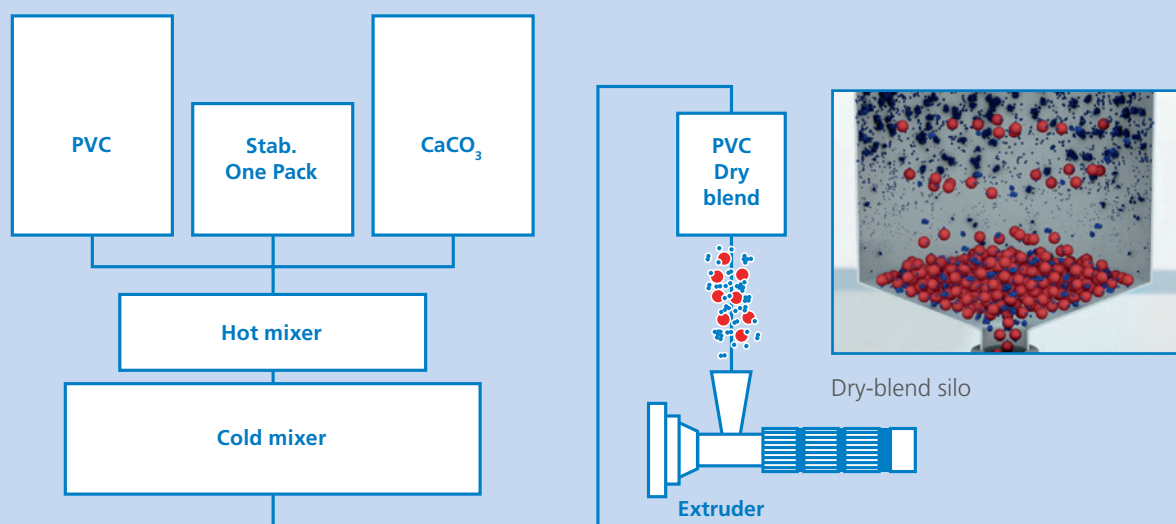
Advantages in quality, processing & economics

The Direct Addition Technology of Omya is an innovative improvement of the existing process.

As shown in picture 2, a special mixer is added on top of the extruder. Calcium Carbonate is fed after the dry-blend silo into the mixer via a separate feeder. The innovative mixing technology generates a homogeneous blend of PVC and Calcium Carbonate.

This direct addition stream of Calcium Carbonate can be used exclusively or in combination with a reduced conventional stream to

Pic. 1: PVC-u extrusion site – standard solution **without Direct Addition**





Direct Addition Technology

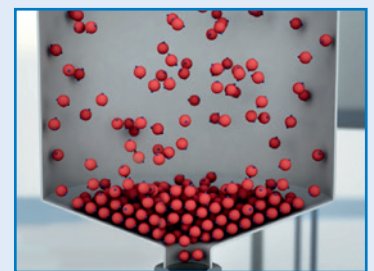
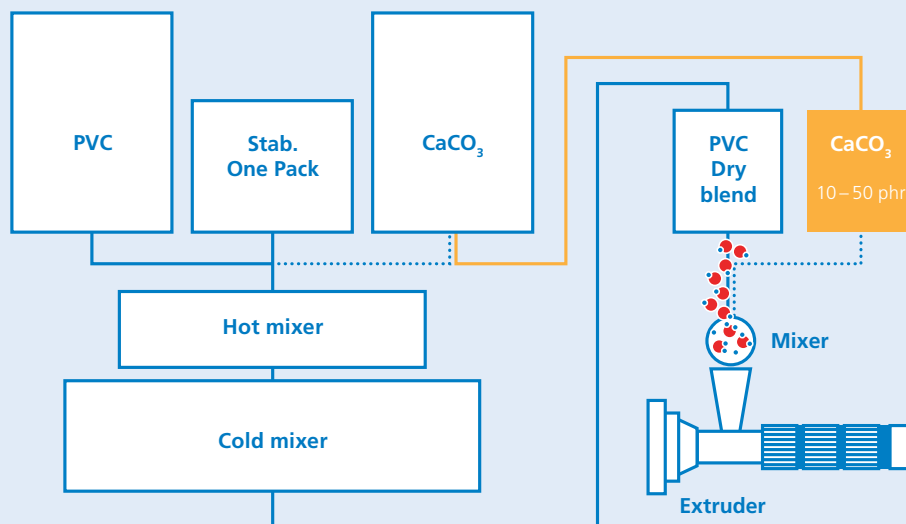
achieve maximum addition levels and stable, clean processing.

The use of high quality Omya Calcium Carbonates in combination with Direct Addition Technology lead to higher mineral levels, greater process flexibility and output stability while realizing substantial formulation cost savings.

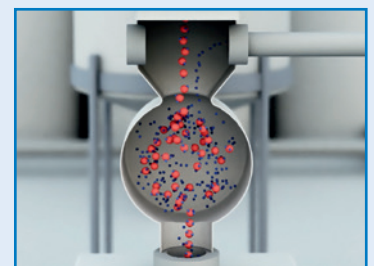
Key benefits for Direct Addition

- Higher mineral level
- Higher quality
- Less variations in output, wall thickness, power consumption
- Improved dispersion of foaming agent
- Increased hot-cold mixing volume
- No caking inside the hot-cold mixers
- Lower energy consumption during hot-cold mixing
- No segregation during pneumatic transportation
- No deposits in the dry-blend silo
- ROI below 1 year is realistic (depends on extruder output and mineral level)

Pic. 2: PVC-u extrusion site – **with integrated Direct Addition**



Dry-blend silo



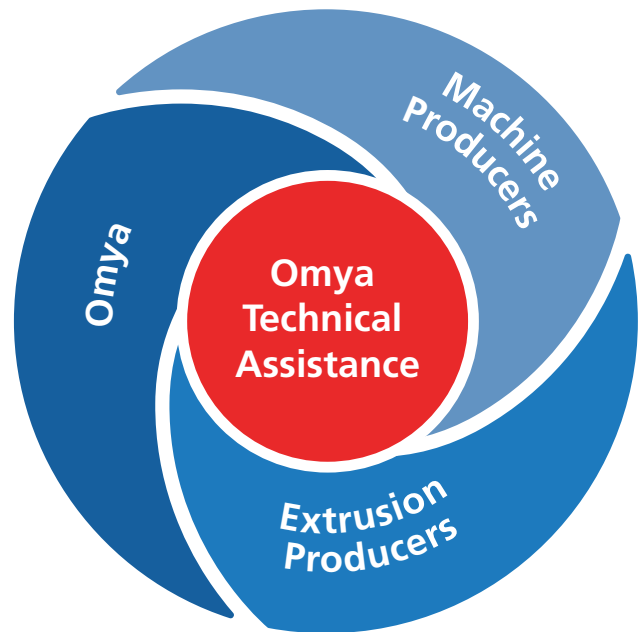
Mixer

Omya Technical Assistance

Advice on Implementation & Cost Optimization

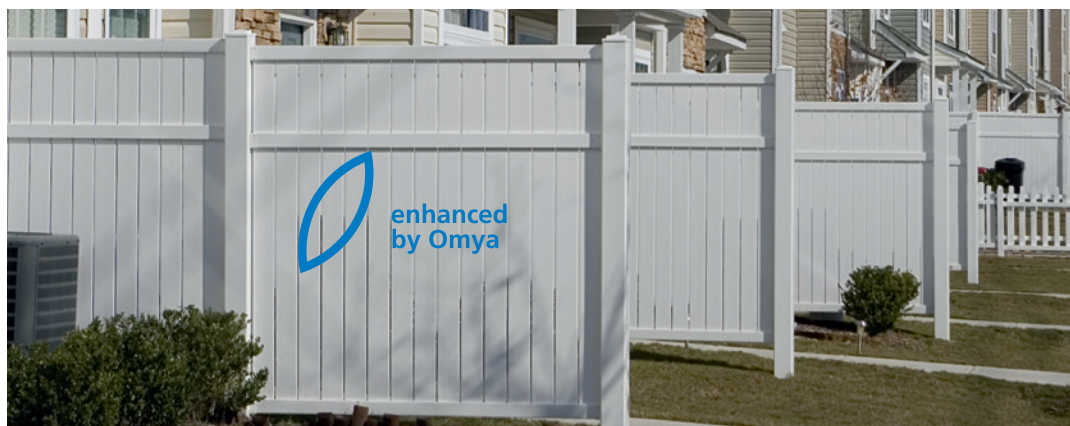
With our state-of-the-art technical center and sound technical expertise, Omya is able to provide competent Technical Services to PVC-related applications.

Our experts can assist you in every step of your manufacturing process, from application-related and analytic tests in our laboratories to hands-on support in your own production site.





We partner with
the entire value
chain to differ-
entiate end
products.



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