



Omya Smartfill®

Boosting the Performance of
Biopolymers with functionalized
Calcium Carbonate



THINKING OF TOMORROW

Omya Smartfill improves the performance of biopolymers, eliminating hydrolysis during the extrusion

Mineral fillers are often hygroscopic, absorbing moisture and causing polymer chain degradation during the hydrolysis-sensitive polymer extrusion process. Significant polymer degradation is seen while extruding polylactic acid (PLA) and polyhydroxyalkanoate polymers (PHAs) if the moisture level is too high or when standard hydrophobization technologies are employed to lower the moisture content on the calcium carbonate.

Omya has developed an innovative surface modification solution for Calcium Carbonate that avoids hydrolysis reaction and reduces polymer degradation to a negligible level.

Omya Smartfill in PLA with filler loads of up to 40% greatly increases stiffness and elongation, which is a unique property when employing minerals in PLA. Omya Smartfill on top of that, boosts impact resistance and delivers outstanding white coloring. Omya Smartfill also reduces formulation cost and improves heat transfer to expedite the heating and cooling process.

There are numerous bioplastics blends available. PLA and PHA, for example, are frequently blended with polybutylene adipate terephthalate (PBAT) or thermoplastic starch. Omya Smartfill is the best option in these cases when compared to conventional calcium carbonates, causing hydrolyzes during the manufacturing process.

Omya Smartfill is supplied as a powder and needs to be predispersed in a compound before being used on conventional single screw extrusion lines. Omya Smartfill meets the most common ecotoxicity regulations and can be applied to compostable products containing filler loads up to 40%. Natural Calcium Carbonate like Omya Smartfill is considered a renewable material since the rate of replenishment of calcium carbonate from natural processes greatly exceeds consumption, making it a renewable resource according to ISO 14021.

Benefits

10 – 40% Omya Smartfill in PLA

- *Increases stiffness and elongation*
- *Increases impact resistance*
- *Increases opacity*
- *Reduces formulation costs*
- *Improves heat transfer (heating / cooling)*

Omya Smartfill		0%	10%	20%	40%
Tensile Modulus	N/mm ²	3200	3600	4100	4900
Tensile Strength at Yield	N/mm ²	68	57	48	38
Elongation at Break	%	5,5	50	90	28
Melt Flow Rate 210 C° / 2.16kg	g/10 min	23	21	20	23
Opacity	%	13	75	89	98

Functionality



Profitability



Sustainability



Omya Smartfill is a registered trademark of Omya AG in the European Union and multiple other countries.

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