Omya Polymers
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Omya Smartfill®

Boosting the Performance of Biopolymers with functionalized Calcium Carbonate

THINKING OF TOMORROW

Omya Smartfill improves the performance of biopolymers, eliminating detrimental hydrolysis in extrusion

Polylactic Acid (PLA) and Polyhydroxyalkanoate polymers (PHAs) will degrade in extrusion if the moisture content is too high. Mineral fillers are usually hygroscopic and carry some moisture, causing polymer chain degradation in the extrusion of hydrolysis-sensitive polymers.

To prevent this reaction, Omya has developed an innovative surface modification for Calcium Carbonate that reduces polymer degradation to an insignificant level.

Using Omya Smartfill in PLA at filler loads up to 40% significantly increases stiffness as expected, while unusually and dramatically improving toughness, elongation, and impact resistance. Omya Smartfill also reduces formulation cost and improves heat transfer for a faster cooling process.

Various bioplastics blends are common. For example, often PLA and PHA are blended with Polybutylene Adipate Terephthalate (PBAT) or thermoplastic starch. In such cases, Omya Smartfill is also the right choice when conventional Calcium Carbonate will lead to hydrolyses in production.

Omya Smartfill is supplied as a powder and needs to be pre-dispersed in a compound before being used on conventional single screw extrusion lines. Omya Smartfill fulfills the most common regulations for Ecotoxicity and can be used for compostable products with filler loads up to 40%. Natural Calcium Carbonate like Omya Smartfill is considered a renewable material because the replenishment rate of Calcium Carbonate from natural processes far exceeds the consumption, making it a renewable material according to ISO 14021.

Benefits

10 – 40% Omya Smartfill in PLA

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

Omya Smartfill		0%	10%	20%	40%
Tensile Modulus	N/mm²	3200	3600	4100	4900
Tensile Strength at Yield	N/mm²	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

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