TECHNICAL DATA SHEET

PHACT™ MA1250P-3

MA1250P-3 is a masterbatch that is composed of an amorphous polyhydroxyalkanoate (aPHA) and a polylactide (PLA). Specifically, the aPHA used is PHACT™ A1000P from CJ Biomaterials. This compound is designed for fiber and nonwoven (spunbond) applications. The PLA/aPHA composition of MA1250P-3 is 55% PLA/45% aPHA by weight. This product is designed to facilitate the inclusion of amorphous PHA at desired levels by the converter, with final performance dictating the relative amount of MA1250P-3 blended into PLA. MA1250P-3 may be used directly or added (dry-blended with PLA) during the conversion of PLA based nonwovens to add the following performance features (relative to pure PLA):

- Faster composting rate (potential for home composting; ask CJBMS team for details)
- Improved flexibility
- Improved softness and strength (almost twice the strength of pure PLA)
- Maintains the biobased carbon content

PROPERTIES OF PHACT™ MA1250P-3

Properties	Units	ASTM No	PHACT™ MA1250P-3
Forms	-		Pellet
Density	g/cc	D1505	1.22
Melting Temperature[1)]	℃	D3418	150 to 170
Glass Transition Temperature[1)]	℃	D3418	~ -17 (aPHA), ~60 (PLA)
Melt Flow Rate (190 ℃, 2.16 kg)	g/10 min	D1238	10-20
Biobased Carbon content	%	D6866	100

1) Differential Scanning Calorimeter (DSC) at 10 ℃/min. heating rate after cooling from 200 °C at 10 °C/min.

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Safety Precautions

MA1250P-3 must be handled and processed with adequate ventilation and proper personal protective equipment. Temperatures above 200°C (392°F) can result in considerable polymer degradation. Therefore, adequate ventilation should be provided where hot polymer may reside for prolonged periods such as in leak areas, above the die, in screen changers, in vent ports, etc.

Drying & Moisture Management

MA1250P-3 will be supplied in pellet form in aluminum foil-lined packaging with a moisture content of 0.04-wt% (400 ppm) or less when packed. A moisture content of less than 0.04-wt% (400 ppm) is highly recommended to prevent viscosity degradation during processing. A moisture content of less than 0.015-wt% (150 ppm) is preferred. Typical drying conditions are 4 hours at 75 °C (167 °F) to a dew point of -35 °C (-30 °F), with an airflow rate greater than 0.5 cfm/lb of resin throughput. The resin should not be exposed to atmospheric conditions after drying. Keep the package sealed until ready to use and promptly reseal any unused material.

Processing/Extrusion Details

MA1250P-3 is not compatible with polyolefins and particular care must be given to purging and cleaning the line (including feeders to avoid contamination) prior to the introduction of this product. In-line drying is recommended.

When MA1250P-3 is blended with PLA, processing conditions employed must be consistent with those recommended for the PLA grade used, keeping the upper temperature limit of 200 °C for MA1250P-3 in consideration. MA1250P-3 may be processed easily on conventional extruders with either smooth-bore feed sections or grooved-feed sections. A low shear screw with a low compression ratio (CR) is ideal for processing and performance. Recommended extrusion temperatures for processing MA1250P-3 alone are as follows starting from the feed throat to the die:

Zone 1 (Feed)	50 °C (122 °F)	**Zone 5**	175 °C (347 °F)
Zone 2	175 °C (347 °F)	**Zone 6**	175 °C (347 °F)
Zone 3	175 °C (347 °F)	**Adapters**	185 °C (365 °F)
Zone 4	175 °C (347 °F)	**Die**	200 °C (392 °F)

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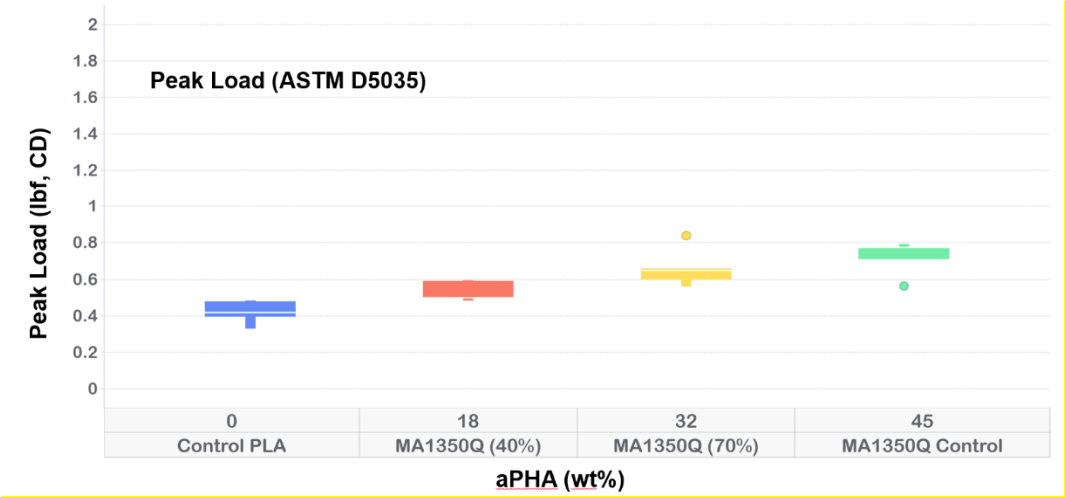
The charts below display the enhancement of peak load and elongation at break of PLA as a function of aPHA in a spundbond product; aPHA was introduced using the MA1250P-3 product.
EDITING NOTE: Please change charts below to replace all MA1350Q with MA1250P-3 and then delete this comment.



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