

PHACT™ MA1250P-2

MA1250P-2 is a general purpose masterbatch that is composed of polylactic acid(PLA) and an amorphous polyhydroxyalkanoate (aPHA). Specifically, the aPHA used is PHACT A1000P grade from CJ Biomaterials(CJBMS). and the PLA used is Ingeo 4043D from NatureWorks. The PLA/aPHA composition of MA1250P-2 is 55/45 by weight. This product is designed to facilitate the inclusion of aPHA at desired levels by the converter, with final performance dictating the relative amount of MA1250P-2 blended-in.

This masterbatch product may be used in general applications such as sheet/thermoforming, injection molding and film applications. MA1250P-2 may be added (dry-blended with PLA) during the conversion of PLA based products to add the following performance features:

- Faster composting rate (*potential for home composting; ask CJ Biomaterials technical team for details*)
- Improved flexibility and film handling capability
- Significant impact toughening
- Enhanced tear propagation resistance
- Maintain the bio-based carbon content and clarity of PLA

MA1250P-2 may also be included, by itself, in the core layers of multi-layered film structures.

PROPERTIES OF PHACT MA1250P-2

Properties	Units	ASTM No	MA1250P-2
Forms	-		Pellet
Specific Gravity	-	D792	1.22
Melting Point ¹⁾	°C	D3418	150 ~ 170
Glass Transition Temperature ¹⁾	°C	D3418	-17, 60
Melt Flow Rate (190 °C, 2.16 kg)	g/10 min	D1238	5 ~ 8
Biobased Carbon content	%	D6866	100

1) Differential Scanning Calorimeter (DSC), peak of endotherm. Heating rate 10 °C/min.

Drying Process Condition and Moisture Management

MA1250P will be supplied in pellet form in aluminum foil-lined packaging with a moisture content of 400 ppm or less when packed. A moisture content of less than 0.04 % (400 ppm) is highly recommended to prevent viscosity degradation during processing.

Typical drying conditions are 4 hours at 75 °C (167 °F) or to a dew point of -35 °C (-31 °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.

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Safety Precautions

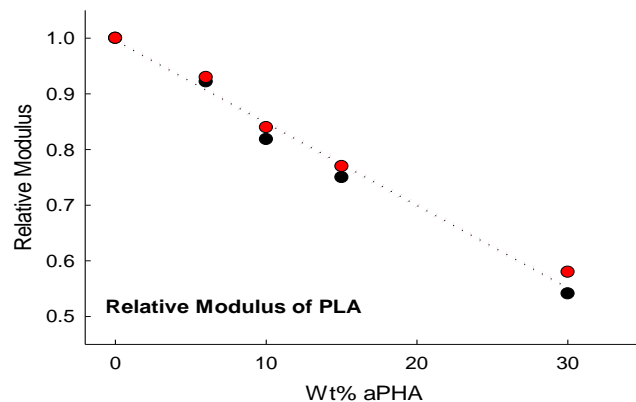
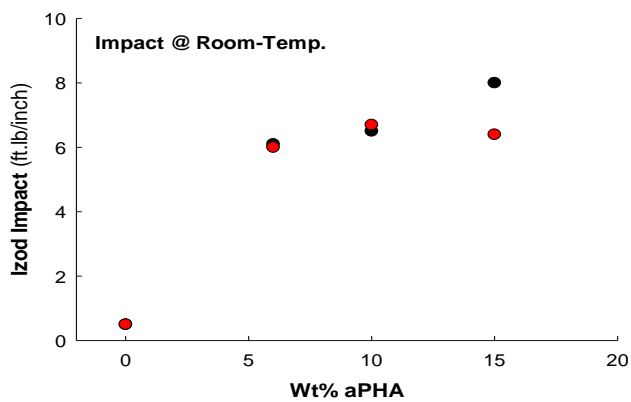
MA1250P-2 must be handled and processed with adequate ventilation and proper personal protective equipment. Temperatures above 200 °C (392 °F) can result in considerable polymer degradation. Therefore, adequate ventilation should be provided where hot polymer may reside for long periods such as in leak areas, above the die, in screen changers, in vent ports, etc.

PROCESSING CONDITION

MA1250P-2 is not compatible with polyolefins and special 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. MA1250P-2 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 are as follows starting from the feed throat to the die:

Feed throat	20 ~ 40 °C (68 ~ 104 °F)	Metering Sections	170 ~ 180 °C (338 ~ 356 °F)
Solids-Conveying	165 ~ 170 °C (329 ~ 338 °F)	Adapters	175 ~ 185 °C (347 ~ 365 °F)
Melting	170 ~ 180 °C (329 ~ 356 °F)	Nozzle(Die)	170 ~ 180 °C (338 ~ 356 °F)

The charts below display the enhancement of impact toughness and reduction in modulus of PLA as a function of aPHA in the product; aPHA was introduced using the M1250P-2 product.



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