

TECHNICAL DATA SHEET

PHACT™ CB0500A & CB0504A

PHACT™ CB0500A and CB0504A are commercial compounds designed for extrusion coating onto paper substrates. CB0500A is composed of a semi-crystalline polyhydroxyalkanoate (PHA) and an amorphous PHA while CB0504A is composed of a semi-crystalline PHA, an amorphous PHA and calcium carbonate. Specifically, the amorphous PHA used is PHACT™ A1000P from CJ Biomaterials and the semicrystalline PHA used is PHACT™ S1000P also from CJ Biomaterials.

Both products are 100% bio-based and food contact compliant (conditions of use C through G) in the USA. They are also designed to be compostable under industrial and home compost conditions and in the marine environment. TÜV certifications in all environments are available, and the appropriate BPI certifications have been initiated.

Both products, CB0500A and CB0504A, are designed to have an excellent balance between flow and melt strength. Excellent adhesion to paper substrates, good sealing characteristics, stable melt curtain and low neck-in are noted for these products at appropriate extrusion conditions. The amorphous PHA in these products provides excellent toughness and flexibility to the coated paper. The coated paper is also re-pulpable and broadly biodegradable.

PROPERTIES OF PHACT™ CB0500A and CB0504A

Properties	Units	ASTM No	PHACT™ CB0500A and CB0504A
Forms	-	-	Pellet
Specific Gravity	-	D792	1.22 / 1.45
Elongation at Break ¹	%	D638	100 / 80
Ultimate Tensile Strength ¹	MPa	D638	27 / 25
Melting Point ²	°C	D3418	160 / 160
Heat Deflection Temperature/0.455MPa	°C	D648	> 120
Glass Transition Temperature ²	°C	D3418	-3
Melt Flow Rate (175 °C, 2.16 kg)	g/10 min	D1238	2.0 / 2.5

- 1) Injection specimens conform to ASTM D638. Crosshead speed 50 mm/min for tensile strength.
- 2) Differential Scanning Calorimeter (DSC), peak of endotherm. Heating rate 10 °C/min

PROCESSING CONDITION

We strongly recommend the use of low-shear screws for extrusion coating these PHA products; recommend barrier screw designs for better melt temperature control. Melt temperature, at die exit, needs to be below 185 °C. For extrusion, we suggest the following temperature set points:

Feed Throat	25 - 40 °C	Solids Conveying	155 - 160 °C
Melting/Compression	160 - 165 °C	Metering Section	165 - 170 °C
Adapter and Die Zones	175 - 180 °C		

Other Processing Considerations:

- A fume/vent hood over the die is recommended. Excessive fuming indicates degradation.
- Suggest an output rate of \approx 7-11 lbs./hr. per linear inch of die width.
- Recommend a short distance (air gap) between die exit and paper to improve adhesion.
- It is critical for the chill roll to be warm to promote faster crystallization of the PHA; ideal temperature is 65-75 °C. Also, low friction chill roll surface will help minimize sticking.
- Lower die gaps are preferred for lower coat weights (thinner coatings).
- Edge pinners or edge-encapsulating dies are always helpful to minimize neck-in.
- Pre-treatment of the paper source using corona or flame treatment is very helpful to promote adhesion.

Drying and Moisture Management

CB0500A and CB0504A 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% (400ppm) is recommended to prevent viscosity degradation during processing. Typical drying conditions are 4 hours at 75 °C (167 °F) with a dew point of -40 °C (-40 °F). 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.

Safety Precautions

CB0500A and CB0504A must be handled and processed with adequate ventilation and proper personal protective equipment. Temperatures above 190°C (374°F) can result in considerable polymer degradation. Therefore, adequate ventilation should be provided where hot polymer may reside for long periods.

NOTICE

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