

Sustainable Biopolymers for Extrusion

Compound: PHACT™ CA8470P-S2

Target Applications

 <p>Markets</p> <ul style="list-style-type: none"> • Food Serveware 	 <p>End Products</p> <ul style="list-style-type: none"> • Straw 	<p>Bring a New Wave</p> <p>PHACT</p>
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PLA/PHA COMPOUND

PHACT CA8470P-S2 is an environmentally friendly semi-crystalline biopolymer compound that improves functional performance and enables faster composting relative to polylactic acid (PLA). This grade is a compounded resin based on PLA and amorphous PHA (aPHA) known as PHACT A1000P. The addition of aPHA to PLA increases flexibility and impact strength and is ideal for straw applications.

PHACT CA8470P Features

- 100% bio content
- Industrial compostable
- FDA-approved for food contact⁽¹⁾
- Enhanced properties relative to PLA straws:
 - Increased processability into diverse shapes and functions ; shape like T&P straws
 - Increased flexibility and resilience

1) US FDA FCN2281, Korea FDA authorized substances (hydroxybutyl polyester (HBP), polylactic acid (PLA))



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Mechanical Properties

Compound Grade for Extrusion				
Properties		Units	ASTM	CA8470P-S2
Forms		-	-	Pellet
Specific Gravity		-	D792	1.23
Tensile Strength at Break ⁽¹⁾	MD	MPa	D882	44
	TD			29
Elongation at Break ⁽¹⁾	MD	%		340
	TD			350
Melting Point ⁽²⁾		°C	D3418	149
Glass Transition Temperature ⁽²⁾		°C	D3418	-15, 52
Melt Flow Rate (190°C, 2.16 kg)		%	D1238	6

1) Film specimens conforms to ASTM D882. Crosshead speed 200 mm/min for mechanical properties.

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

Recommended Processing Conditions

Compound Grade for Extrusion			
Dry zone Temperature ⁽¹⁾	60 °C X 8 hrs.	Feed Throat	20 ~ 40 °C
Feed Temperature	100 ~ 120 °C	Compression section	160 ~ 165 °C
Melt Temperature	150 ~ 160 °C	Nozzle	160 ~ 165 °C

1) It is preferable to dry with air below -40 °C dew point.

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Drying Process Conditions

- Biodegradable materials are highly hygroscopic. Store in a dry condition.
- Recommended to use all once opened. If an opened bag must be stored for reuse, seal completely, avoid air exposure, and store at a dry, well-ventilated condition/place/location. Avoid long-term storing.
- PHACT Compounds must be dried under 60 °C for over 5 hrs. or caking can happen because the T_g of this compound is around 60 °C.
- PHACT Compounds are preferable to dry with air below -40 °C dew point.
- When exposed to moisture, completely dry in a dehumidifying dryer before use.

Purging Process Conditions (*Following PET, PA, HDPE)

It is critical to clean the material handling systems of PET, nylon, and high molecular weight HDPE to assure that these materials do not inadvertently feed into the extruder during or after the purging process.

- 1) Purge with low MFR (e.g., <1) transition resin at normal PET operating temperatures. PET and PHACT are temperature incompatible, so the transition resin is one that can be processed at the high temperatures of PET and the low temperatures of PHACT.
Suggested transition resins include PP, crystal PS, and PETG. Purge for at least 7x average residence time, much of the time at the typical PET production rate (~30 minutes).
- 2) Let the system empty as much as possible. Clean out the hopper as much as possible.
- 3) Introduce higher melt flow transition resin (PP, PS, PETG) and change to normal PHACT operating temperatures.
- 4) Let the system empty as much as possible. Then transition to pure PLA resin or PHACT and purge, again, for a minimum 7x average residence time. Change the screen pack when it becomes obvious that primarily PLA (or PHACT) is exiting the die.
- 5) At the completion of run, purge all PHACT from the extrusion system, using low melt index PP or PS.

*Note: It is critical that all drying and conveying/receiving systems be free of all PET and vacuumed to ensure there is no remaining polymer dust before adding PHACT. PET will not melt at PHACT operating temperatures and will block screens if it is present in the system.

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For additional information or specific recommendations for your intended applications, please contact us at:

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