Sustainable Biopolymers for Paper Coating

Compound: PHACT™ CA8570P

Target Applications

Markets
- Food packaging
- Flexible Packaging

End Products
- Paper cups for beverage
- Multilayer paper cups for food
- Flexible packaging: 1st & 2nd PKG

Bring a New Wave
PHACT

PLA/PHA COMPOUND

PHACT CA8570P is a compounded resin based on PLA and amorphous PHA (aPHA) known as PHACT A1000P. PHACT CA8570 has 100% bio-content and is an environmentally friendly semi-crystalline biopolymer compound that improves functional performance and has excellent biodegradability in home and soil compost conditions. It allows the production of compostable paper products depending on the grade of paper used. PHACT CA8570P has good temperature stability from cold storage to microwave systems and offers very high production efficiency.

PHACT CA8570P Features

- 100% bio content
- Enables home compostability
- Good temperature stability (-15 ℃ to 100 ℃)
- Good water resistance
- FDA-approved for food contact(1)
- Relative to PLA:
  - Increased flexibility and impact strength
  - Increased production efficiency
    ; works at lower temperatures/fast line speeds

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

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Mechanical Properties

Compound Grade for Paper Coating			
Properties	**Units**	**ASTM**	**CA8570P**
Forms	-		Pellet
Specific Gravity	-	D792	1.22
Seal Strength	kgf/15mm	F88	≥ 0.8
Melting Point(1)	℃	D3418	168
Glass Transition Temperature(1)	℃	D3418	-15, 57
Degradation Temperature(2)	℃	E2550	292
Melt Flow Rate (190°C, 2.16 kg)	%	D1238	12 ~ 14
Water Resistance (Cobb value)	g/m^2	TAPPI T441	< 1

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

2) Thermogravimetric Analysis (TGA), heating rate 20 ℃/min.

Recommended Processing Conditions

Compound Grades for Paper Coating			
Dry Zone Temperature(1)	95 ℃	Melt Temperature	180 ~ 210 ℃
Feed Throat	20 ~ 40 ℃	Compression Section	160 ~ 210 ℃
Feed Temperature	140 ~ 190 ℃	Nozzle	190 ~ 210 ℃

1) Dry zone temperature when using primer

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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 exposal, and store at a dry, well-ventilated condition/place/location. Avoid long-term storing.
- PHACT Compounds must be dried under 60 ℃ for over 5 hrs. or caking can happen because the Tg of this compound is around 60 ℃.
- PHACT Compounds are preferable to dry with air below -40 ℃ 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.

*Notes: 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.

CJ Biomaterials Inc., 19 Presidential Way – Suite 301, Woburn MA 01801

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

cj.biomaterials@cj.net or 339-999-2693