

# Sustainable Biopolymers for Film (Flexible Packaging)

Masterbatch: PHACT™ MA1250P, MA1250P-A, MA1250P-2

Compound: PHACT™ CA1270P, CA1240PF and CA8270P-B1

## Target Applications



### Markets

- Flexible packaging
  - Cast film, BO film, Blown film
  - White film for labels and stickers



### End Products

- Mono and multi-layer film for F&B
- Compost bags and bin liners
- Produce labels and bags
- Shrinkwrap

Bring a New Wave

# PHACT

## MASTERBATCH

**PHACT MA1250P grades** are masterbatch products that are composed of polylactide (PLA) and amorphous PHA (aPHA) branded as PHACT A1000P. PHACT MA1250P grades contain 45% aPHA and are easier to handle than aPHA neat resin. It can be added as a component during the conversion of PLA-based products. PHACT MA1250P grades are designed to facilitate the inclusion of aPHA at desired levels by the converter, with final performance dictating the relative amount of masterbatch blended in. CJ Biomaterial offers three masterbatch grades.

All **PHACT Masterbatch Grades** are composed of PLA and aPHA with a composition of 55% PLA and 45% aPHA by weight. Specifically, the aPHA used is PHACT A1000P grade from CJ Biomaterials and the PLA used is Ingeo 4032D from NatureWorks.

- **PHACT MA1250P** is particularly suited for film applications including biaxial orientation and blown film processing. It may also be included, by itself, in the core layers of multi-layered film structures.
- **PHACT MA1250P-A** is ideally used in skin/seal layers of multi-layered film products.
- **PHACT MA1250P-2** is a general-purpose masterbatch product that may be used in general plastic converting processes such as sheet/ thermoforming, injection molding, and film applications. It may also be included, by itself, in the core layers of multi-layered film structures.

## PHACT MA1250P, MA1250P-A and MA1250P-2 Features

- 100% bio content
- Addable as dry blending, easy to customize
- Significant impact toughening
- Enhanced tear propagation resistance,
- Faster composting rate (*potential for home composting*)
- Improves flexibility and film handling capability of PLA
- Maintains the bio-based carbon content and clarity of PLA
- FDA-approved for food contact<sup>(1)</sup>

1) US FDA FCN2281

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### Mechanical Properties

Masterbatch					
Properties	Units	ASTM	MA1250P	MA1250P-A	MA1250P-2
Forms	-	-	Pellet	Pellet	Pellet
Biobased Carbon Content	%	D6866	100	100	100
Specific Gravity	-	D792	1.22	1.22	1.22
Melt Flow Rate (190 ° C, 2.16 kg)	g/10 min	D1238	5 ~ 8	5 ~ 8	5 ~ 8
Melting Point <sup>(1)</sup>	° C	D3418	150 ~ 170	-	150 ~ 170
Glass Transition Temperature <sup>(1)</sup>	° C	D3418	-17, 60	-17, 57	-17, 60

1) PLA and aPHA are not miscible and the masterbatch will reveal two distinct glass transition temperatures. The values reported are based on DSC re-heat scan at 10 ° C/min after cooling from 200 ° C at 10 ° C/min.



For further technical information, please access the TDS documents. [\[DOWNLO AD\]](#)

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Compound: PHACT™ CA1270P, CA1240PF and CA8270P-B1

## COMPOUND

PHACT film compounds are environmentally friendly biopolymer compounds that improve functional performance and enable faster composting relative to polylactic acid (PLA). These grades are compounded resins based on PLA and amorphous PHA (aPHA) known as PHACT™ A1000P. These grades are ideally suited for film applications with conventional film processes. Films made with PHACT compounds have superior sealability, flexibility, and less noise compared to PLA-only films.

- **PHACT CA1270P** is an un-filled compound grade designed for blown and cast film applications where transparency is required. It may also be used in biaxially and MDO oriented films.
- **PHACT CA1240PF** is a filled compound grade that contains calcium carbonate. It is designed for blown and cast film applications and may also be used in oriented films.
- **PHACT CA8270P-B1** is designed for blown film and is suitable for transparent and thin-blown film applications. *(Currently available only for APAC Region)*

## PHACT CA1270P and CA1240PF Features

- 100% bio content
- Industrial compostable
- Good drawdown stability
- Excellent balance between stiffness, strength, tear propagation resistance and puncture toughness
- FDA-approved for food contact
- Relative to PLA:
  - Increased flexibility and significant impact toughening
  - Less noisy
  - Ease of processing
    - : Ease of extrusion and higher specific output rate

## PHACT CA8270P-B1 Features \*Currently available only for APAC Region

- 100% bio content
- Industrial compostable
- Accelerates PLA degradation
- Colorable and printable
- FDA-approved for food contact
- Relative to PLA:
  - Increased flexibility and softness
  - Less noisy
  - Enhanced oil and water resistance
  - Increased heat-sealing strength

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## Mechanical Properties

### Compound Grades for Film

Properties	Units	ASTM	CA1270P	CA1240PF	CA8270P-B1
Forms	-	-	Pellet	Pellet	Pellet
Biobased Carbon Content	%	D6866	100	100	100
Density	-	D1505	~1.22	~1.65	~1.23
Melt Index (190 ° C, 2.16 kg)	g/10 min	D1238	~3 - 5	~3 - 5	~3 - 5
Melting Temperature (of PLA) <sup>1)</sup>	° C		150 ~ 170	150 ~ 170	150 ~ 170
Glass Transition Temperature <sup>2)</sup>	° C		~-17 ° C (aPHA), ~60 ° C (PLA)	~-17 ° C (aPHA), ~60 ° C (PLA)	~-17 ° C (aPHA), ~60 ° C (PLA)

Properties obtained from blown films<sup>3)</sup>

Tensile Modulus	MD	MPa (psi)	D882	980 (142,000)	740 (107,300)	-
	TD			720 (105,000)	550 (79,750)	-
Tensile Elongation at Break	MD	%		450	350	300
	TD			350	250	300
Tensile Stress at Break	MD	MPa (psi)		45 (6,500)	33 (4,500)	42
	TD			33 (4,500)	25 (3,625)	39
Haze		%	D1003	3	> 50	-
Elmendorf Tear	MD	grams/mil <sup>4)</sup>	D1922	30	45	-
	TD		40	35	-	
Dart Impact Strength		grams/mil <sup>4)</sup>	D1709	40	70	-

1) Depending on the thermal/process history

2) PLA and aPHA are not miscible and this product will reveal two distinct glass transition temperatures. The values reported are based on DSC re-heat scan at 10 ° C/min after cooling from 200 ° C at 10 ° C/min.

3) Film thickness: 30 μm. Crosshead speed 200 mm/min for mechanical properties.

4) 1 mil = 25 microns

For further technical information, please access the TDS documents. [\[DOWNLOAD\]](#)

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

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