

Sustainable Biopolymers for Injection Molding

Masterbatch: MA1250P-2

Compound: IM PHACT™ CA1180P / ISBM: PHACT™ CA1670P, CA1680P

Target Applications

<p>Markets</p> <ul style="list-style-type: none"> • Food Serviceware • Consumer Goods • Personal Care/Home Care 	<p>End Products</p> <ul style="list-style-type: none"> • Cutlery and Kitchen utensil • Hotel amenities and Stationery • Cosmetic jars and Containers 	<p>Bring a New Wave</p> <h1>PHACT</h1>
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MASTERBATCH

PHACT MA1250P-2 is the masterbatch product that is composed of polylactic acid (PLA) and amorphous PHA (aPHA) known as PHACT A1000P. PHACT MA 1250P-2 grade contains 45% aPHA and is easier to handle than aPHA neat resin. Specifically, the aPHA used is PHACT A1000P grade from CJ Biomaterials and the PLA used is Ingeo 4032D from NatureWorks. It can be added as a dry blend during the conversion of PLA-based products. PHACT MA1250P-2 grade is designed to facilitate the inclusion of aPHA at desired levels by the converter, with final performance dictating the relative amount of masterbatch blended in.

- **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-2 Features

- 100% bio content
- Addable as dry blending, easy to customize
- Significant impact toughening
- FDA-approved for food contact⁽¹⁾
- 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

1) US FDA FCN2281



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Mechanical Properties

Masterbatch			
Properties	Units	ASTM	MA1250P-2
Forms	-	-	Pellet
Biobased Carbon Content	%	D6866	100
Specific Gravity	-	D792	1.22
Melt Flow Rate (190 ° C, 2.16 kg)	g/10 min	D1238	5 ~ 8
Melting Point ⁽¹⁾	° C	D3418	150 ~ 170
Glass Transition Temperature ⁽¹⁾	° C	D3418	-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. [\[DOWNLOAD\]](#)

Sustainable Biopolymers for Injection Molding

Masterbatch: MA1250P-2

Compound: IM PHACT™ CA1180P / ISBM: PHACT™ CA1670P, CA1680P

COMPOUND – IM

PHACT CA1180P has good processability during injection molding, allowing greater design flexibility. It can be an ideal alternative solution to a product produced through ABS injection molding in some specific applications such as cosmetic packaging. It is compatible with existing molds for ABS that have similar mold shrinkage, which can provide benefits to the customer in saving switching costs. It is appropriate for injection molding to produce cosmetic packaging and food and beverage packaging applications.

PHACT CA1180P Features *Currently available only for APAC Region

- 100% bio content
- Industrial compostable
- Good processability, allowing various design shapes
 - Dimensional stability
 - Moldability (Lubricated & Easy release)
- FDA-approved for food contact⁽¹⁾
- Colorable and printable
- Compatible with ABS molds
- Relative to PLA product:
 - Increased flexibility and impact strength
 - Enhanced oil and water resistance

1) US FDA FCN2281

COMPOUND – ISBM

PHACT CA1670P and **PHACT CA1680P** are environmentally friendly semi-crystalline 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. The addition of aPHA to PLA increases flexibility and impact strength and enhances water/oil resistance. It also improves processability during blow molding, allowing greater design flexibility. PHACT CA1670P is an opaque grade, and PHACT CA1680P is suitable for semi-transparent applications.

PHACT CA1670P & CA1680P Features *Currently available only for APAC Region

- 100% bio content
- Industrial compostable
- High surface gloss
- Colorable and printable
- Relative to PLA:
 - Increased flexibility and impact strength
 - Improved processability
 - Enhanced oil and water resistance

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Masterbatch: MA1250P-2

Compound: IM PHACT™ CA1180P / ISBM: PHACT™ CA1670P, CA1680P

Mechanical Properties

Compound Grades for Injection Molding			
Properties	Units	ASTM	CA1180P
Forms	-	-	Pellet
Specific Gravity	-	D792	1.26
Hardness (Max / 15s)	Shore D	D2240	78 / 75
Tensile Strength at Peak ⁽¹⁾	MPa	D638	52
Elongation at Break ⁽¹⁾	%	D638	23
IZOD Impact Strength (Unnotched, RT)	kJ/m ²	D256	63
Heat Deflection Temperature / 0.455 MPa	°C	D648	51
Melting Point ⁽²⁾	°C	D3418	162
Glass Transition Temperature ⁽²⁾	°C	D3418	-15, 60
Melt Flow Rate (190 °C, 2.16 kg)	g/10 min	D1238	7
Mold Shrinkage ⁽³⁾	%	-	0.2

1) Injection specimens conform to ASTM D638. Crosshead speed 50 mm/min for tensile strength.

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

3) Injection mold temperature was 25 °C.

Sustainable Biopolymers for Injection Molding

Masterbatch: MA1250P-2

Compound: IM PHACT™ CA1180P / ISBM: PHACT™ CA1670P, CA1680P

Mechanical Properties

Compound Grades for Blow Molding				
Properties	Units	ASTM	CA1670P	CA1680P
Forms	-	-	Pellet	Pellet
Specific Gravity	-	D792	1.26	1.23
Hardness (Max /15s)	Shore D	D2240	76 / 73	81 / 79
Tensile Strength at Peak ⁽¹⁾	MPa	D638	44	57
Elongation at Break ⁽¹⁾	%	D638	70	25
Flexural Strength	MPa	D790	28	-
IZOD Impact Strength (Unnotched, RT)	kJ/m ²	D256	Non-Break	29
IZOD Impact Strength (Unnotched, -20 ° C)	kJ/m ²	D256	45	-
Heat Deflection Temperature / 0.455 MPa	° C	D648	50	53
Melting Point ⁽²⁾	° C	D3418	150	150
Glass Transition Temperature ⁽²⁾	° C	D3418	-17, 57	-15, 57
Melt Flow Rate (190 ° C, 2.16 kg)	g/10 min	D1238	5 ~ 8	4 ~ 5
Mold Shrinkage ⁽³⁾	%	-	0.3	0.3

1) Injection specimens conform to ASTM D638. Crosshead speed 50 mm/min for tensile strength.

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

3) Injection mold temperature was 25 °C.

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

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

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

Website: <https://cjbmaterials.com> Email: cj.biomaterials@cj.net

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