



### EcoPLAS™ Series - A Biodegradable and Compostable<sup>1</sup> Limestone based Plastic Alternative

#### Product Description

ecoPLAS™ is a biodegradable and compostable limestone (CaCO<sub>3</sub>) based material series that conforms to the FDA food contact safe (G.R.A.S.) specification. Limestone is a sustainable and abundant resource with recent studies showing that while it is scientifically known to naturally sequester CO<sub>2</sub> during formation, it continues to capture and sequester ambient CO<sub>2</sub> from the environment when produced in alternate forms.

Our patent-pending formula was designed to address sustainability objectives of lowering overall carbon footprint, minimizing the impact on CO<sub>2</sub> production while taking advantage of alternative materials requiring no manufacturing changes.

- Drop in ready; No manufacturing equipment or processing changes required
- Food contact safe (G.R.A.S.)
- Off white pellets in their natural, un-dyed processed form, ±0.015" in size
- Regular pre drying of pellets is necessary for material performance
- DSC melting point 113.30 °C (271.94 °F), ASTM D 1238 Melt Index 7.5g / 10 min

#### Applications

- Suitable for 3D printing, Thermoforming, Sheet, Film and Injection Molding<sup>2</sup>

#### Methods Performed

ecoPLAS™ BIO201 material is suitable for 3D Print monofilament production and printing, Sheet film, Injection Molding, Thermoforming and other similar processing applications.<sup>3</sup>

- Tensile properties per ASTM D638 with a rate of crosshead of 2 in/min and Type I bars
- Flex Properties per ASTM D790 with a rate of 0.05 in/min, support span of 2.00 in.
- Specific Gravity per ASTM D792 Method A
- Notched Charpy per ASTM D6110 with a pendulum capacity of 24.553 in-lbf
- Izod Impact per ASTM D256-Method A with a pendulum capacity of 24.553 in-lbf
- Shore D Hardness per ASTM D2240
- DSC per ASTM D3418 with a heating rate of 10 °C/minute and a cooling rate of 10°C/minute in a nitrogen atmosphere with gas flow of 50 mL/minute
- Bars were molded at 100% LDR and conditioned at 50±5% relative humidity and 23±2°C for at least 40 hours prior to testing mechanical properties

#### Form / Storage

ecoPLAS™ is supplied in pellet form in bulk containers and require pre drying guidelines for less than 2% moisture content prior to processing. The material can be stored at ambient room temperature for up to 12 months in a sealed container.

#### Intellectual Property

It is the responsibility of those to whom we supply our products to ensure that any proprietary rights and existing laws and legislation are observed. All ecoPLAS™ uses and product obtained are subject to and protected by intellectual property rights. Purchase of ecoPLAS™ does not entitle the buyer or any third to produce, offer or use ecoPLAS™ or any blends thereof.

1. Anaerobic Biodegradable (ASTM D5511) and Aerobic Compostable (ASTM D5338) testing is currently underway via 3rd Party validation.
2. Third party lab samples validated the noted manufacturing processes. We assume no liability as to the success of final material runs.
3. Third party lab scale equipment validated results for these processes. Results may vary.

## Typical Properties of ecoPLAS™ Series Material

Test	Physical Properties	Result
ASTM D638 (Strain rate 2.0 in/min)	Average Tensile Stress at Yield (psi)	3,360 ± 63
	Average Tensile Stress at Break (psi)	2,600 ± 240
	Average Tensile Modulus (psi)	237,000 ± 14,000
	Average Tensile Elongation at Yield (%)	3.7 ± 0.22
	Average Tensile Elongation at Break (%)	16 ± 5.8
ASTM D790 (Procedure A)	Average Flexural Strength (psi)	5,500 ± 130
	Average Flexural Modulus (psi)	228,000 ± 7,150
ASTM D792 (Method A)	Specific Gravity	1.46
ASTM D2240	Average Shore D Hardness	71.00
ASTM D6110	Average Notched Charpy (J/m)	84 ± 5
	Average Notched Charpy (ft-lbs/in)	1.57
	Break Type (C- Complete, H - Hinge, P - Partial, NB - No Break)	5/5 Complete
ASTM D256 Method A	Average Notched Izod (J/m)	77 ± 7
	Average Notched Izod impact (ft-lbs/in)	1.45
	Break Type (C- Complete, H - Hinge, P - Partial, NB - No Break)	2 Complete / 3 Hinge
ASTM D3418 - DSC	Glass Transition (°C)	58.60
	Melting Temperature (°C)	153.30
	Normalized Integral (J/g)	5.70
	Crystallinity (%)	2.80
ASTM D1238	Melt Index 210C/2.16kg	7.5g/10 min

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### Note / Disclaimer:

The information supplied is based on our current knowledge as the values presented herein are typical laboratory values and may vary within ranges.

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