

## Provisional Product Data Sheet

### Mirel™ P4001 Cast Sheet Grade

Mirel P4001 is a general purpose, high melt strength grade suitable for cast sheet extrusion. Mirel is designed for a wide range of sheet applications including gift cards, promotional materials, indoor/outdoor signage, plant pots and plant tags.

Mirel P4001 can be processed on conventional extrusion equipment with either an up-stack or down-stack roll configuration.

#### Provisional Material Properties\*

	Method	P4001
<b>General Description</b>		General Purpose
<i>Physical Properties</i>		
Apparent Melt Viscosity (180°C, 100 sec <sup>-1</sup> )	ASTM D3835	1200 Pa-s
Specific Gravity	ASTM D792	1.4
<i>Mechanical Properties</i>		
Tensile Strength at Yield	ASTM D638	20 MPa (2900 psi)
Tensile Elongation at Break	ASTM D638	5%
Flexural Modulus	ASTM D790 A	1.9 GPa (275 kpsi)
Notched Izod	ASTM D256 A	37 J/m (0.7 ft-lbs/in)
<i>Thermal Properties</i>		
Heat Distortion Temperature	ASTM D648 B ASTM D648 B	110°C (230°F)@0.45 MPa (66 psi) 57°C (135°F)@1.82 MPa (264 psi)
Vicat Softening Point	ASTM D1525 B10	133°C (273°F)

\*Properties are not to be regarded as specifications.

### Processing Recommendations\*

<i>Equipment Recommendations</i>	
Screw Profile	Low compression ratio (<3). Any mixing sections should be low shear design.

<i>Material Preparation</i>	
Moisture Content	<0.1%
Drying Conditions	4 hours @ 80°C (176°F)
<i>Processing Temperatures</i>	
Melt	165°C-170°C (330°F-340°F)
Extruder Temperature Profile	Reverse Temperature Profile
Rear	175°C (350°F)
Middle	170°C (340°F)
Front	165°C (330°F)
Die – Center Zone	165°C (330°F)
Die – Edge Zones	165°C (330°F)
A-roll (Top roll of a down-stack)	<32°C (90°F)
B-roll (Middle roll)	50°C-65°C (120°F-150°F)
C-roll (Bottom roll of a down-stack)	65°C (150°F)

\* Typical conditions are not to be regarded as specifications.

### About Mirel Bioplastics

Mirel is a family of bioplastic materials that have physical properties comparable to petroleum-based resins, yet are both biobased and biodegradable in natural soil and water environments, home composting systems, and industrial composting facilities, where these facilities are available. The rate and extent of Mirel's biodegradability will depend on the size and shape of the articles made from it. However, like nearly all bioplastics and organic matter, Mirel is not designed to biodegrade in conventional landfills.

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innovative bioplastics solutions to the world