



Mirel P1001 Injection Molding Grade

Environmental Innovation

Environmental responsibility is a major trend among industry leading brand owners and OEMs. Mirel is a new family of biobased resin providing the industry with sustainable alternatives to conventional plastics. Mirel meets the demands of environmentally-conscious companies and consumers making a positive impact on global climate change. Mirel starts with nature and ends with nature. It harmlessly biodegrades in all of these environments:

- Industrial and home composting
- Soil
- Municipal waste treatment facilities, septic systems
- Wetlands, streams, and oceans

Mirel™ P1001 is a high performance, semi-crystalline natural polyester specifically engineered for high modulus injection molding applications. Mirel resins are innovative and versatile solutions suitable for a wide variety of applications.

Product Attributes

- High modulus
- Heat resistance
- High gloss
- Easy Processing

Biodegradation Certifications and Testing

Mirel resins are certified to ASTM D6400 / EN 13432 for compostable plastics, and D7081 / EN 17556 for non-floating biodegradable plastics in marine environment.

Test results from ASTM D5988-96 / ISO 17556 for aerobic biodegradation in soil of plastics or residual plastics materials show that Mirel fully biodegrades - fungal/bacterial under ambient conditions.

Test results from ASTM D5209 / ISO 14852 / ASTM D5271 / ISO 14851 for aerobic biodegradation of plastic materials in an activated-sludge wastewater-treatment system show that Mirel fully biodegrades - bacterial under ambient conditions.

Potential Applications

Food service ware

- Single serve containers, caps, lids and trays

Consumer and packaging

- Cosmetic cases and lipsticks

Physical Properties	ASTM Typical Value	ASTM Test Method	ISO Typical Value	ISO Test Method
Mold Shrinkage	0.012 - 0.014 in/in	ASTM D955		
Water Absorption @ 24 hrs (73° F)	0.10%	ASTM D570		
Apparent Melt Viscosity (180° C, 100 sec-1)	1200 Pa-s	ASTM 3835		
Specific Gravity	1.39 g/cm ³	ASTM D792		
Mechanical Properties				
Tensile strength @ yield	4300 psi	ASTM D638	28 MPa	ISO 527-1, -2
Tensile elongation @ break	5%	ASTM D638	6%	ISO 527-1, -2
Flexural modulus	450,000 psi	ASTM D790 A	3200 MPa	ISO 178
Flexural strength	7300 psi	ASTM D790 A	46 MPa	ISO 178
Impact				
Notched Izod	0.4 ft-lbs/in	ASTM D256 A	2.6 kJ/m ²	ISO 180 A
Thermal				
DTUL @66 psi / 0.45 MPa	276° F	ASTM D648 B	130° C	ISO 75-1 B
DTUL @264 psi / 1.80 MPa	181° F	ASTM D648 B	73° C	ISO 75-1 A
Vicat Softening Point	294° F	ASTM D1525 A10	148° C	ISO 306 A50

All physical properties are measured after 21 day aging.



Injection Molding Processing Information

Start-up

Before processing Mirel, the injection unit and all melt train components should first be purged with high-flow LDPE compound. Starting with a barrel temperature of 170° C, the material should be kept moving during start-up and purged until there are no visual contaminants in the purge material. This suggests a minimum of 20 purge shots be taken prior to sampling. All adjustments to the mold or other auxiliary equipment should be completed prior to start up.

Shut down

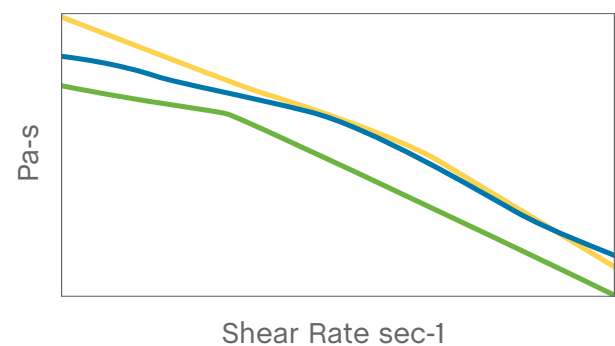
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Safety information

Please refer to the MSDS sheet for safety, health and proper disposal recommendations.

Material Recommendations	
Drying Conditions (Dessicant)	2 to 4 hours @ 80° C
Melt Temperature	160° C to 165° C
Equipment Recommendations	
Screw Profile (Low Shear GP)	2.2:1 to 2.6:1
Non-Return Valve	Std Check Ring
Processing Conditions	
Barrel Zone Settings	Reverse Temperature Profile
Rear	175° C to 180° C
Middle	170° C to 175° C
Front	165° C to 170° C
Nozzle	165° C to 170° C
Mold Temperature (A/B)	55° C to 65° C
Screw Speed (Slow)	< 200 RPM
Back Pressure (Low)	< 500 PSI (Melt)
2nd Stage Pressure (Low)	< 30% of 1st Stage Pressure

Viscosity versus Shear Rate



- Mirel P1001, 180° C
- Profax 6323 (PP), 200° C
- Cylolac GPM 5500 (ABS), 230° C

For further information please contact: 1.866.916.4735 (1.866.91MIREL)

By combining bioscience and nature we bring a clean solution to the world with Mirel.

www.mirelplastics.com

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