



Mirel P2001 Extrusion Coating 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™ P2001 is a high performance, semi-crystalline natural polyester specifically engineered for extrusion coating of paperboard. Mirel resins are innovative and versatile solutions suitable for a wide variety of product applications.

Product Attributes

- Heat sealable
- Good printability
- Good barrier properties
- Adhesion to substrates

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

- Cups and containers
- Food cartons
- Single serve disposables

Food storage

- Freezer cartons
- Beverage or food storage boxes

| Physical Properties | ASTM Typical Value | ASTM Test Method | ISO Typical Value | ISO Test Method |
|---|------------------------|------------------|-------------------|-----------------|
| Water Absorption @ 24 hrs (73° F) | 0.10% | ASTM D570 | | |
| Apparent Melt Viscosity (180° C, 100 sec-1) | 750 Pa-s | ASTM 3835 | | |
| Specific Gravity | 1.24 g/cm ³ | ASTM D792 | | |
| Mechanical Properties | | | | |
| Tensile strength @ yield | 4300 psi | ASTM D638 | 28 MPa | ISO 527-1, -2 |
| Tensile elongation @ break | 7% | ASTM D638 | 7% | ISO 527-1, -2 |
| Flexural modulus | 230,000 psi | ASTM D790 A | 1700 MPa | ISO 178 |
| Flexural strength | 6200 psi | ASTM D790 A | 36 MPa | ISO 178 |
| Thermal | | | | |
| DTUL @66 psi / 0.45 MPa | 270° F | ASTM D648 B | 123° C | ISO 75-1 B |
| DTUL @264 psi / 1.80 MPa | 147° F | ASTM D648 B | 62° C | ISO 75-1 A |
| Vicat Softening Point | 278° F | ASTM D1525 A10 | 137° C | ISO 306 A50 |

All physical properties are measured after 21 day aging.



Extrusion Coating Processing Information

Start-up

Before processing Mirel, the extruder barrel 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 melt curtain. Adjustments to the die or other downstream equipment should be completed prior to start up.

Shut down

After processing Mirel, the extruder and all melt train components should be purged with high-flow LDPE.

Safety information

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

| Material Recommendations | |
|------------------------------------|-----------------------------|
| Drying Recommendations (Dessicant) | 2 to 4 hours @ 80° C |
| Melt Temperature | 160° C to 175° C |
| Equipment Recommendations | |
| Screw Profile (Low Shear GP) | 2.2:1 to 2.6:1 |
| Screen Pack Density | 20/40/20 |
| Chill Roll Surface | Plasma Treated |
| Processing Conditions | |
| Barrel Zone Settings | Reverse Temperature Profile |
| Rear | 175° C to 180° C |
| Middle | 175° C to 180° C |
| Front | 170° C to 175° C |
| Adapter/Die | 165° C to 170° C |
| Draw Ratio | <10:1 |



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.telles-mirel.com

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