



Injection Molding Process Guide For Cereplast Hybrid Resins®

Cereplast Hybrid Resins® broadens the application of Bio-based plastics, and are ideal product line for nearly all brand owners and converters looking to enhance sustainability in their processes by replacing traditional petroleum-based plastics.

There are applications for Cereplast Hybrid Resins® products in a variety of markets including: automotive, consumer goods, consumer electronics, toys, medical, packaging, furniture, cosmetic packaging, and construction.

PROCESSING INFORMATION

Cereplast Hybrid Resins® resin can be processed on conventional injection molding equipment. The material is stable in the molten state, provided that the drying procedures are followed.

Processing Parameters	Fahrenheit	Celsius
Feed Throat	60-80	15-25
Feed Zone	340-360	170-180
Middle Zone	350-380	175-195
Front Zone	360-380	180-195
Nozzle	360-380	180 -195
Melt Temperature	350-390	175-200
Material Drying Temp. (Time: 4 hours)	140-160	70-80
Mold Temperature	50 - 75	10-25
Screw Speed	50-100 RPM's	

(These are recommended starting parameters and may need to be optimized)

Start with “clean machine” – using either general purpose polystyrene or polyethylene as purge compound – before and after processing

DRYING

Drying is critical to a successful process. Cereplast Hybrid Resins® contain starch and are hygroscopic and will absorb a small amount of moisture from the atmosphere. The amount absorbed will depend on the environmental conditions, and the temperature and humidity of the storage area. In-line drying is recommended with Cereplast®. Standard closed loop desiccant based column driers work best. A moisture content of less than (400 ppm) is recommended. The dew point of the air at the input of the hopper should be -40 °F/-40 °C or lower.

STARTUP and SHUTDOWN

1. Purge with standard material like PP.
2. **Always** completely purge all unused material from hopper, barrel, and nozzle immediately after molding. Do not leave molten resin in machine at temperature for an extended period of time.

MACHINE CONFIGURATION:

Cereplast Hybrid Resins® will process on conventional molding equipment. A general purpose screw with sliding check ring designed to minimize residence time and shear works well. Low shear or general purpose screws are recommended. Compression ratios of 2.2-2.8 should work well.

MOLD SHRINKAGE:

Shrinkage is about 1 to 1.6%. Actual mold shrinkage may vary and is dependent on wall thickness, flow length and a combination of many other process conditions such as injection pressure, injection speed, melt temperature, mold temperature and cycle time.

REGRIND:

25-30% regrind can be used if it is kept clean and dry.

MOLD DESIGN CONSIDERATIONS:

Most all considerations for mold design fall into the category for designing a tool for a filled polypropylene. Runners should be full round wherever practical. For small components a gate size of .025 inch (6.35mm) should be adequate. Vents should be .0020-0.025 inch (0.05-0.064mm) in depth. Break all sharp corners where possible. Ribs and bosses should be half to two thirds of the nominal wall thickness if possible to prevent sink. Hot runner systems designed for heat sensitive materials work best. Since starch is heat sensitive externally heated systems with no dead spots are best for manifolds and drops. These considerations are only general guidelines and will vary depending on the specific design requirements for each application.

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