



Zytel®

nylon resin



Responsible Care®
A Public Commitment

Product Stewardship

Zytel® nylon resins are thermoplastic polyamides having properties that place them high on the list of engineering plastics. Zytel® nylon resins are tough and withstand repeated impact. They are highly resistant to abrasion and have good chemical resistance to oils, greases, aliphatic and aromatic hydrocarbons, etc. Molded articles retain their shape at elevated temperatures, are strong in thin sections, and have low coefficients of friction. Zytel® nylon resins may be reinforced with glass fibers and a variety of additives for enhanced property performance. For detailed molding information, refer to the Zytel® nylon resin molding guide. For additional information on safety, health, and environmental concerns, refer to the MSDS or call Dial DuPont First at (800) 441-0575. For automotive inquiries, call (800) 533-1313.

Drying Considerations

Zytel® nylon resins are supplied ready to mold directly from the shipping containers. However, if exposed to moisture, hopper dryers or tray ovens sized to afford the following conditions are strongly recommended:

- Moisture content must be below 0.2 wt%.
- Moisture content for extrusion grades must be below 0.02 wt%.
- Dryer dew point must remain below -18°C (0°F).
- Drying temperature of 80°C (175°F).
- Drying time of 20 hours on bag opened for several days.

Note: Air temperature in excess of 95°C (200°F) for longer than 3 hours will discolor nylon.

Melt Temperatures

Resin	Typical Cylinder Temperatures for Screw Machines						Preferred Melt Temperature	
	Rear °C	°F	Center °C	°F	Front °C	°F	°C	°F
Nylon 66: Zytel® 101, 101L, 103HSL, 105 BK010, 122L, 132F Zytel® 42A	280	540	275	525	270	520	280–305	535–580
Modified Nylon 66: Zytel® 408L, 408HS, 450HSL, ST801, ST801W, 3189	295	560	280	535	275	525	290–295	550–560
Nylon 612: Zytel® 151L, 158L, 153HSL, 157HSL BK010	240	460	230	445	225	440	230–290	450–550
Amorphous Nylons: Zytel® ST901L	300	570	285	545	280	535	255–295	490–560

Mold Temperatures

Zytel® nylon resins can be successfully molded over a broad range of mold temperatures:

- 0–95°C (30–200°F)
- 70°C (160°F) is the optimum mold temperature

Mold surface temperature depends upon:

- cycle time
- melt temperature
- mold design (size and location of cooling channel)
- temperature and mold heat exchange rate

Note: Mold surface temperature determines part quality aspects such as shrinkage, surface appearance, and post-molding shrinkage.

Operating Conditions

- Faster injection speeds of <1.5 sec, especially in thin sections.
- Slower injection speeds of 1.5 to 5 sec, especially in thicker sections.
- Screw speeds should be adjusted so that the screw retraction time is at least 90% of the mold closed time.
- The minimum amount of back pressure should be used consistently with uniform screw recovery times.

Note: Fast injection speed also improves knitline strength and surface appearance.

Shrinkage Considerations

Shrinkage in nylon resins such as Zytel® is from:

- Thermal contraction of the part as it cools to room temperature.
- Poor mold temperature uniformity.
- Large changes in wall thickness of the part.

Mold shrinkage of Zytel® (based upon a 3"x5"x1/8" end gated plaque, flow direction, at standard processing conditions)

Zytel® ST901L	0.6%
Zytel® 151L, 158L, 153HSL, 157HSL BK010	1.1%
Zytel® 132F	1.2%
Zytel® 101, 101L, 103HSL, 105 BK010, 408L, 408HS, 42A	1.5%
Zytel® 122L	1.6%
Zytel® 450HSL, ST801	1.8%
Zytel® ST801W, 3189	2.1%

Note: Mold shrinkage also depends upon processing conditions.

Safety Considerations

While processing Zytel®, all of the potential hazards associated with molding thermoplastic polyamide resins must be anticipated and either eliminated or guarded against by following established industry procedures. Hazards include:

- Thermal burns resulting from exposure to hot molten polymer
- Fumes generated during drying, processing, and regrind operations
- Formation of gaseous and liquid degradation products

MSDSs include such information as hazardous components, health hazards, emergency and first aid procedures, disposal procedures, and storage information.

Note: Adequate ventilation and proper protective equipment should be used during all aspects of the molding process. Refer to the DuPont Ventilation Guide for more detailed information.

Start with DuPont

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CAUTION: Do not use in medical applications involving permanent implantation in the human body. For other medical applications, see "DuPont Medical Caution Statement," H-50102.

