



Hytrel®

polyester elastomer



Responsible Care®
A Public Commitment

Product Stewardship

Hytrel® polyester elastomers combine many of the most desirable characteristics of high-performance elastomers and flexible plastics. Hytrel® features exceptional toughness and resilience, high resistance to creep, impact and flex fatigue, flexibility at low temperatures, and good retention of properties at elevated temperatures. In addition, Hytrel® resists deterioration from many industrial chemicals, oils, and solvents. For detailed molding information, refer to the Hytrel® polyester elastomer 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

Hytrel® polyester elastomer must be dried prior to and during processing to produce quality parts that will perform properly. Drying considerations are as follows:

- Resin moisture content must be below 0.1%.
- Dehumidified air ovens are recommended with effective drying for 2–3 hr at 100°C (210°F) or overnight at 70°C (160°F).
- Drying without the use of a dehumidified air oven will require an additional 4–6 hr at 100°C (210°F) in dry weather.

Notes:

- Degradation due to moisture will result in poor physical properties and brittleness, but no visual defects may be apparent.
- Already dried resin that has been exposed to moisture must be re-dried prior to molding.

Melt Temperatures

Recommended Optimum Melt Temperatures and Injection Molding Set-up Conditions for Hytrel®

Grade	Recommended Optimum		Melt (Stock)	Typical Cylinder Temperatures			
	Melt Temperature		Temperature Range	Nozzle	Front	Center	Rear
Hytrel®							
G3548W	190°C (375°F)	}	180–205°C	180°C	190°C	190°C	165–190°C
4056	180°C (355°F)		(355–400°F)	(355°F)	(375°F)	(375°F)	(330–375°F)
G4074	200°C (390°F)	}	190–220°C	190°C	205°C	205°C	180–205°C
G4078W	200°C (390°F)		(375–425°F)	(375°F)	(400°F)	(400°F)	(355–400°F)
4069,	230°C (445°F)	}	220–250°C	220°C	235°C	235°C	205–235°C
4556, 5526	230°C (445°F)		(430–480°F)	(430°F)	(455°F)	(455°F)	(400–455°F)
5556	230°C (445°F)						
G4774, G4778	240°C (465°F)	}	235–260°C	235°C	245°C	245°C	220–245°C
G5544	240°C (465°F)		(455–500°F)	(455°F)	(475°F)	(475°F)	(430–475°F)
6356	240°C (465°F)						
7246	245°C (475°F)	}	240–260°C	240°C	245°C	245°C	220–245°C
8238	245°C (475°F)		(465–500°F)	(465°F)	(475°F)	(475°F)	(430–475°F)
Specialty							
3078	205°C (400°F)	}	190–210°C	190°C	205°C	205°C	180–205°C
HTR6108	205°C (400°F)		(375–410°F)	(375°F)	(400°F)	(400°F)	(355–400°F)
HTR8068	205°C (400°F)						
5555HS	230°C (445°F)		220–250°C	220°C	235°C	235°C	205–235°C
			(430–480°F)	(430°F)	(455°F)	(455°F)	(400–455°F)

Mold Temperatures

A surface temperature of 45°C (115°F) is recommended for all grades of Hytrel® resin.

Notes:

- Mold temperature has little effect on mechanical properties, but the main effect is on shrinkage.
- Mold temperature should be measured with a thermocouple directly on the cavity's surface.
- Lower mold temperatures will reduce cycle time and improve ejection, particularly when using the softer resin grades.
- Higher mold temperatures will improve surface appearance.

Operating Conditions

- **Injection speed** varies with part thickness and geometry.
- Normal **injection pressures** should be set to the minimum pressure required for filling the cavity.
- **Hold pressure** should be set equal to the injection pressure for grades above 55D and should be set to follow a decreasing profile for grades below 47D.
- **Screw forward time** has a strong influence on shrinkage, and, in general, is shorter for the harder grades of Hytrel®.
- **Screw rotation speed** of 100 rpm is adequate for a resin grade with no additives, but should be increased (along with back pressure) with the use of additives, to improve mixing.
- **Back pressure** of 0.34–0.55 MPa (50–80 psi) can be used to improve melt homogeneity.
- **Proper venting** is useful due to fast cavity fill rates.

Shrinkage Considerations

The mold shrinkage of Hytrel® is dependent upon such factors as:

- Resin grade
- Part geometry and thickness
- Mold design
- Gate size
- Mold temperature
- Melt temperature
- Screw forward time
- Injection pressure

Shrinkage of Hytrel® (ASTM D955) (Measured on standard test specimen, in flow direction 3.2 mm [0.125 in] thick, molded at recommended conditions)

Resin Grade	Shrinkage, %	Resin Grade	Shrinkage, %
Standard		High-Performance	
G3548W	0.5	4056	0.5
G4074	0.8	4069	0.8
G4078W	0.8	4556	1.1
G4774	1.4	5526	1.4
G4778	1.4	5556	1.4
G5544	1.6	6356	1.5
		7246	1.6
		8238	1.6
Specialty			
5555HS	1.4		

Safety Considerations

While processing Hytrel®, all of the potential hazards associated with molding thermoplastic elastomer 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.

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