

NatureWorks® 3052D

NatureWorks® PLA polymer 2003D is a thermoplastic resin derived from annually renewable resources. It is designed for injection molding applications where the requirements are clarity with heat deflection temperatures below 120°F (49°C). Sample uses include food service products.

Physical Properties	Metric	English	Comments
Specific Gravity	1.24 g/cc	1.24 g/cc	ASTM D792
Viscosity Measurement	3.3 @Temperature 30.0 °C	3.3 @Temperature 86.0 °F	1.0 g/dl in chloroform; Relative Viscosity
Linear Mold Shrinkage	0.003 - 0.005 cm/cm	0.003 - 0.005 in/in	
Melt Flow	14 g/10 min @Load 2.16 kg, Temperature 210 °C	14 g/10 min @Load 4.76 lb, Temperature 410 °F	ASTM D1238

Mechanical Properties	Metric	English	Comments
Tensile Strength at Break	54.0 MPa	7830 psi	ASTM D882
Tensile Strength, Yield	62.0 MPa	8990 psi	ASTM D882
Elongation at Break	3.5 %	3.5 %	ASTM D882
Tensile Modulus	3.72 GPa	540 ksi	ASTM D882
Flexural Strength	108 MPa	15700 psi	ASTM D790
Flexural Modulus	3.55 GPa	515 ksi	ASTM D790
Izod Impact, Notched	0.1600 J/cm	0.2997 ft-lb/in	ASTM D256

Thermal Properties	Metric	English	Comments
Melting Point	145 - 160 °C	293 - 320 °F	Peak; ASTM D3418
Deflection Temperature at 0.46 MPa (66 psi)	55.0 °C	131 °F	ASTM E2092
Glass Transition Temp, Tg	55.0 - 60.0 °C	131 - 140 °F	ASTM D3418

Optical Properties	Metric	English	Comments
Transmission, Visible	90 %	90 %	Thickness Unknown

Processing Properties	Metric	English	Comments
Feed Temperature	165 °C	329 °F	
Nozzle Temperature	205 °C	401 °F	
Melt Temperature	200 °C	392 °F	
Mold Temperature	25.0 °C	77.0 °F	
Moisture Content	<= 0.025 %	<= 0.025 %	
Back Pressure	0.345 - 0.689 MPa	50.0 - 100 psi	
Screw Speed	100 - 175 rpm	100 - 175 rpm	