

DUPONT Delrin® 111P

Delrin® 111P is a high viscosity acetal homopolymer with improved thermal stability and modifications for more precise molding (reduced warpage, fewer voids). It has higher tensile strength and modulus than Delrin® 100P.

Physical Properties	Metric	English	Comments
Specific Gravity	1.42 g/cc	1.42 g/cc	ASTM D792
Density	1.42 g/cc	0.0513 lb/in ³	ISO 1183
Water Absorption	0.30 % @Temperature 23.0 °C	0.30 % @Temperature 73.4 °F	Immersion 24h; ASTM D570
Water Absorption at Saturation	1.0 % @Temperature 23.0 °C	1.0 % @Temperature 73.4 °F	By immersion; ISO 62, Similar to
Linear Mold Shrinkage	0.017 - 0.020 cm/cm @Thickness 3.20 mm	0.017 - 0.020 in/in @Thickness 0.126 in	Transverse, 24h; ASTM D955
Linear Mold Shrinkage, Flow	0.018 - 0.021 cm/cm @Thickness 3.20 mm	0.018 - 0.021 in/in @Thickness 0.126 in	Flow, 24h; ASTM D955
	0.018 - 0.021 cm/cm @Thickness 4.00 mm	0.018 - 0.021 in/in @Thickness 0.157 in	Parallel, 24h; ISO 294-4
	0.021 cm/cm @Thickness 2.00 mm	0.021 in/in @Thickness 0.0787 in	ISO 294-4
Linear Mold Shrinkage, Transverse	0.019 cm/cm @Thickness 2.00 mm	0.019 in/in @Thickness 0.0787 in	ISO 294-4
	0.018 - 0.021 cm/cm @Thickness 4.00 mm	0.018 - 0.021 in/in @Thickness 0.157 in	Normal, 24h; ISO 294-4
Melt Flow	1.0 g/10 min @Load 1.05 kg, Temperature 190 °C	1.0 g/10 min @Load 2.31 lb, Temperature 374 °F	ASTM D1238
	2.4 g/10 min @Load 2.16 kg, Temperature 190 °C	2.4 g/10 min @Load 4.76 lb, Temperature 374 °F	ISO 1133
Melt Index of Compound	1.9 g/10 min @Load 2.16 kg, Temperature 190 °C	1.9 g/10 min @Load 4.76 lb, Temperature 374 °F	cm ³ /10 min; ISO 1133
Mechanical Properties	Metric	English	Comments
Hardness, Rockwell M	92	92	ISO 2039/2
Hardness, Rockwell R	120	120	ISO 2039/2
	121	121	ASTM D785
Tensile Strength	72.0 MPa @Temperature 23.0 °C	10400 psi @Temperature 73.4 °F	5mm/min (0.2in/min); ASTM D638
Tensile Strength, Yield	72.0 MPa @Temperature 23.0 °C	10400 psi @Temperature 73.4 °F	5mm/min (0.2in/min); ASTM D638
	72.0 MPa @Temperature 23.0 °C	10400 psi @Temperature 73.4 °F	ISO 527
Tensile Stress at Strain	60.799 MPa @Strain 2.8574 %, Temperature -40.0 °C	8818.2 psi @Strain 2.8574 %, Temperature -40.0 °F	ISO 527
	87.176 MPa @Strain 5.7149 %, Temperature -40.0 °C	12644 psi @Strain 5.7149 %, Temperature -40.0 °F	ISO 527

	94.877 MPa @Strain 8.5723 %, Temperature -40.0 °C	13761 psi @Strain 8.5723 %, Temperature -40.0 °F	ISO 527
	96.84 MPa @Strain 11.43 %, Temperature -40.0 °C	14050 psi @Strain 11.43 %, Temperature -40.0 °F	ISO 527
	97.432 MPa @Strain 14.287 %, Temperature -40.0 °C	14131 psi @Strain 14.287 %, Temperature -40.0 °F	ISO 527
	97.672 MPa @Strain 17.145 %, Temperature -40.0 °C	14166 psi @Strain 17.145 %, Temperature -40.0 °F	ISO 527
	98.055 MPa @Strain 20.002 %, Temperature -40.0 °C	14222 psi @Strain 20.002 %, Temperature -40.0 °F	ISO 527
	98.733 MPa @Strain 22.86 %, Temperature -40.0 °C	14320 psi @Strain 22.86 %, Temperature -40.0 °F	ISO 527
	99.053 MPa @Strain 25.717 %, Temperature -40.0 °C	14366 psi @Strain 25.717 %, Temperature -40.0 °F	ISO 527
	99.549 MPa @Strain 28.574 %, Temperature -40.0 °C	14438 psi @Strain 28.574 %, Temperature -40.0 °F	ISO 527
Elongation at Break	40 % @Temperature 23.0 °C	40 % @Temperature 73.4 °F	nominal; ISO 527
	50 % @Temperature 23.0 °C	50 % @Temperature 73.4 °F	ISO 527
Elongation at Yield	73 % @Temperature 23.0 °C	73 % @Temperature 73.4 °F	5mm/min (0.2in/min); ASTM D638
	20 % @Temperature 23.0 °C	20 % @Temperature 73.4 °F	ISO 527
Tensile Modulus	21 % @Temperature 23.0 °C	21 % @Temperature 73.4 °F	5mm/min (0.2in/min); ASTM D638
	3.00 GPa @Temperature 23.0 °C	435 ksi @Temperature 73.4 °F	5mm/min (0.2in/min); ASTM D638
Flexural Strength	3.20 GPa @Temperature 23.0 °C	464 ksi @Temperature 73.4 °F	ISO 527
	80.0 MPa @Strain 3.5 %, Temperature 23.0 °C	11600 psi @Strain 3.5 %, Temperature 73.4 °F	ISO 178
Flexural Modulus	92.0 MPa @Strain 5.0 %, Temperature 23.0 °C	13300 psi @Strain 5.0 %, Temperature 73.4 °F	ASTM D790
	2.90 GPa @Temperature 23.0 °C	421 ksi @Temperature 73.4 °F	ISO 178
Izod Impact, Notched	2.97 GPa @Temperature 23.0 °C	431 ksi @Temperature 73.4 °F	ASTM D790
	0.960 J/cm @Temperature 23.0 °C	1.80 ft-lb/in @Temperature 73.4 °F	ASTM D256

Izod Impact, Unnotched	NB @Temperature 23.0 °C	NB @Temperature 73.4 °F	ASTM D4812
Izod Impact, Notched (ISO)	11.0 kJ/m ² @Temperature -40.0 °C	5.23 ft-lb/in ² @Temperature -40.0 °F	ISO 180/1A
	11.0 kJ/m ² @Temperature 23.0 °C	5.23 ft-lb/in ² @Temperature 73.4 °F	ISO 180/1A
Charpy Impact Unnotched	27.0 J/cm ² @Temperature -30.0 °C	128 ft-lb/in ² @Temperature -22.0 °F	ISO 179/1eU
	30.0 J/cm ² @Temperature 23.0 °C	143 ft-lb/in ² @Temperature 73.4 °F	ISO 179/1eU
Charpy Impact, Notched	0.900 J/cm ² @Temperature -30.0 °C	4.28 ft-lb/in ² @Temperature -22.0 °F	ISO 179/1eA
	1.10 J/cm ² @Temperature 23.0 °C	5.23 ft-lb/in ² @Temperature 73.4 °F	ISO 179/1eA
Tensile Creep Modulus, 1 hour	3000 MPa @Temperature 23.0 °C	435000 psi @Temperature 73.4 °F	ISO 899
Tensile Creep Modulus, 1000 hours	1700 MPa @Temperature 23.0 °C	247000 psi @Temperature 73.4 °F	ISO 899

Electrical Properties	Metric	English	Comments
Volume Resistivity	8.00e+14 ohm-cm @Temperature 23.0 °C	8.00e+14 ohm-cm @Temperature 73.4 °F	ASTM D257
Surface Resistance	6.00e+14 ohm @Temperature 23.0 °C	6.00e+14 ohm @Temperature 73.4 °F	ASTM D257
Dielectric Constant	3.7 @Frequency 1e+6 Hz, Temperature 23.0 °C	3.7 @Frequency 1e+6 Hz, Temperature 73.4 °F	ASTM D150
Dielectric Strength	18.0 kV/mm @Thickness 3.20 mm, Temperature 23.0 °C	457 kV/in @Thickness 0.126 in, Temperature 73.4 °F	Short Time; ASTM D149
Dissipation Factor	0.0050 @Frequency 1e+6 Hz, Temperature 23.0 °C	0.0050 @Frequency 1e+6 Hz, Temperature 73.4 °F	ASTM D150
Comparative Tracking Index	600 V @Temperature 23.0 °C	600 V @Temperature 73.4 °F	IEC 60112
	600 V @Thickness 3.00 mm, Temperature 23.0 °C	600 V @Thickness 0.118 in, Temperature 73.4 °F	UL 746A

Thermal Properties	Metric	English	Comments
CTE, linear, Parallel to Flow	500 µm/m-°C @Temperature 23.0 - 55.0 °C	278 µin/in-°F @Temperature 73.4 - 131 °F	ASTM E 831
	500 µm/m-°C @Temperature -40.0 - 23.0 °C	278 µin/in-°F @Temperature -40.0 - 73.4 °F	ISO 11359-1/-2
	500 µm/m-°C @Temperature 23.0 - 55.0 °C	278 µin/in-°F @Temperature 73.4 - 131 °F	ISO 11359-1/-2
	500 µm/m-°C @Temperature 55.0 - 100 °C	278 µin/in-°F @Temperature 131 - 212 °F	ISO 11359-1/-2
CTE, linear, Transverse to Flow	94.0 µm/m-°C @Temperature -40.0 - 23.0 °C	52.2 µin/in-°F @Temperature -40.0 - 73.4 °F	ISO 11359-1/-2

	110 µm/m-°C @Temperature 23.0 - 55.0 °C	61.1 µin/in-°F @Temperature 73.4 - 131 °F	ASTM E 831
	110 µm/m-°C @Temperature 23.0 - 55.0 °C	61.1 µin/in-°F @Temperature 73.4 - 131 °F	ISO 11359-1/-2
	140 µm/m-°C @Temperature 55.0 - 100 °C	77.8 µin/in-°F @Temperature 131 - 212 °F	ISO 11359-1/-2
Melting Point	178 °C	352 °F	10°C/min; ISO 11357-1/-3
	178 °C	352 °F	ASTM D3418
Deflection Temperature at 0.46 MPa (66 psi)	165 °C	329 °F	ISO 75-1/-2
	169 °C	336 °F	Not Annealed; ASTM D648
Deflection Temperature at 1.8 MPa (264 psi)	100 °C	212 °F	ISO 75-1/-2
	110 °C	230 °F	Not Annealed; ASTM D648
	115 °C	239 °F	Annealed; ISO 75-1/-2
UL RTI, Electrical	110 °C @Thickness 3.00 mm	230 °F @Thickness 0.118 in	UL 746B
	110 °C @Thickness 1.50 mm	230 °F @Thickness 0.0591 in	UL 746B
UL RTI, Mechanical with Impact	85.0 °C @Thickness 1.50 mm	185 °F @Thickness 0.0591 in	UL 746B
	90.0 °C @Thickness 3.00 mm	194 °F @Thickness 0.118 in	UL 746B
UL RTI, Mechanical without Impact	90.0 °C @Thickness 1.50 mm	194 °F @Thickness 0.0591 in	UL 746B
	95.0 °C @Thickness 3.00 mm	203 °F @Thickness 0.118 in	UL 746B
Flammability, UL94	HB @Thickness 1.50 mm	HB @Thickness 0.0591 in	IEC 60695-11-10
	HB @Thickness 3.00 mm	HB @Thickness 0.118 in	IEC 60695-11-10
	HB @Thickness 3.00 mm	HB @Thickness 0.118 in	UL94
	HB @Thickness 1.50 mm	HB @Thickness 0.0591 in	UL94
Oxygen Index	17 %	17 %	ISO 4589-1/-2
Processing Properties	Metric	English	Comments
Melt Temperature	215 °C	419 °F	Optimum; Injection Molding

	210 - 220 °C	410 - 428 °F	Injection Molding
Mold Temperature	90.0 °C	194 °F	optimum; Injection Molding
	80.0 - 100 °C	176 - 212 °F	Injection Molding
Drying Temperature	80.0 °C	176 °F	Injection Molding
Dry Time	2.00 - 4.00 hour	2.00 - 4.00 hour	Injection Molding
Moisture Content	<= 0.20 %	<= 0.20 %	Injection Molding