

DuPont™ Vespel® SCP-5000

Polyimide Isostatic Shapes

Description

DuPont™ Vespel® SCP-5000 is an unfilled polyimide polymer that offers high modulus and surfacehardness and improved dimensional stability. Compared to traditional polyimides, it offers better strength and stiffness at high temperatures.

The typical values presented below are preliminary results and are subject to revision.

Typical ISO Properties

Mechanical Property	Temperature	Test Method	Units	Typical Values
Tensile Strength	23 °C (73 °F) 260 °C (500 °F)	ASTM D-638 D-1708 Specimen	MPa (ksi)	163 (23.6) 62 (9.0)
Tensile Elongation	23 °C (73 °F) 260 °C (500 °F)	ASTM D-638 D-1708 Specimen	%	7.5 4.9
Young's Modulus	23 °C (73 °F) 260 °C (500 °F)	ASTM D-638 D-1708 Specimen	MPa (kpsi)	3,990 (580) 2,370 (340)
Flexural Strength	23 °C (73 °F) 260 °C (500 °F)	ASTM D-790	MPa (kpsi)	254 (36.8) 96.5 (14.0)
Flexural Modulus	23 °C (73 °F) 260 °C (500 °F)	ASTM D-790	MPa (kpsi)	5,760 (836) 3,007 (436)
Compressive Strength	23 °C (73 °F) 260 °C (500 °F)	ASTM D-695	MPa (kpsi)	640 (92.9) 549 (79.6)
Compressive Modulus	23 °C (73 °F) 260 °C (500 °F)	ASTM D-695	MPa (kpsi)	9,060 (1,314) 3,698 (536)
Compressive Stress at 10% Strain	23 °C (73 °F) 260 °C (500 °F)	ASTM D-695	MPa (kpsi)	230 (33.4) 73.6 (10.7)
Deformation Under Load 24 hr, 14 MPa (2 kpsi)	23 °C (73 °F)	ASTM D-621	% deformation	0.05
Rockwell "E" Hardness	–	ASTM D-785	–	95
Thermal Properties				
Coefficient of Thermal Expansion	23 °C–300 °C (73 °F–572 °F)	ASTM E-831	m/m·°C or m/m·K (in/in·°F)	45 x 10 ⁻⁶ (26 x 10 ⁻⁶)
Specific Heat	60 °C (140 °F)	ASTM E-1269	J/kg °C (Btu/lb °F)	9.2 x 10 ⁵ (0.22)

(continued)

Electrical Properties	Temperature	Test Method	Units	Typical Values
Dielectric Constant, 10 ⁴ Hz 10 ⁶ Hz	23 °C (73 °F)	ASTM D-150	-	3.3 3.3
Dielectric Factor, 10 ⁴ Hz 10 ⁶ Hz	23 °C (73 °F)	ASTM D-150	-	0.001 0.001
Volume Resistivity	23 °C (73 °F)	ASTM D-257	Ohm-m	10 ¹⁴
Surface Resistivity	23 °C (73 °F)	ASTM D-257	Ohm-m	10 ¹⁵
Wear Properties				
Coefficient of Friction, Unlubricated, Air	0.7 m/s (134 fpm)	1.3 MPa (187 psi)	Falex	0.26
	2.0 m/s (400 fpm)	1.7 MPa (250 psi)		0.15
Other Properties				
Specific Gravity	-	ASTM D-792	-	1.46
Water Absorption after 24 hr	23 °C (73 °F)	ASTM D-570	% weight change	0.08

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