

DuPont™ Vespel® SCP-5050

POLYIMIDE DIRECT FORMED PARTS

TYPICAL DF PROPERTIES

DuPont™ Vespel® SCP-5050 is a proprietary polymer. It offers excellent wear characteristics at elevated temperatures combined with low Coefficient of Thermal Expansion (CTE) and well balanced mechanical properties.

Some data presented below are based on limited production runs and are subject to revision as new knowledge and experience become available.

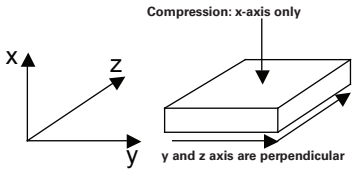
Mechanical Property	Temperature	Pressure	ASTM Method	SI (English) Units	Typical Values
Tensile Strength	23°C/73°F 260°C/500°F	—	D-638 Method/ E-8 Specimen	MPa (kpsi)	79 (11.5) 41 (6.0)
Tensile Elongation	23°C/73°F 260°C/500°F	—	D-638 Method/ E-8 Specimen	%	2.3 3.1
Young's Modulus	23°C/73°F 260°C/500°F	—	D-638 Method/ E-8 Specimen	MPa (kpsi)	9590 (1390) 3860 (561)
Flexural Strength	23°C/73°F 260°C/500°F	—	D-790	MPa (kpsi)	97 (14) 60 (9)
Flexural Modulus	23°C/73°F 260°C/500°F	—	D-790	MPa (kpsi)	7460 (1080) 4670 (678)
Compressive Strength	23°C/73°F 260°C/500°F	—	D-695	MPa (kpsi)	154 (22) 106 (15)
Compressive Stress at 10% Strain	23°C/73°F 260°C/500°F	—	D-695	MPa (kpsi)	156 (23) 73 (11)
Compressive Strain, Ultimate	23°C/73°F 260°C/500°F	—	D-695	%	13 27
Deformation Under Load, 10 minutes 24 hours	23°C/73°F	14 MPa (2 kpsi)	D-621	% deformation	0.03 0.08
Rockwell "E" Hardness	23°C/73°F	—	D-785	—	11.5
Poisson's Ratio	23°C/73°F 190°C/374°F	—	D-638	—	0.22 0.23
Compressive Creep, 10 hours 100 hours 1000 hours	23°C/73°F	10 MPa (1.50 kpsi)	D-2990	%	0.02 0.03 0.05
Compressive Creep, 10 hours 100 hours 1000 hours	23°C/73°F	17 MPa (2.50 kpsi)	D-2990	%	0.05 0.07 0.09

continued



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DuPont™ Vespel® SCP-5050 Typical DF Properties *continued*

Thermal Property	Temperature	Pressure	ASTM Method	SI (English) Units	Typical Values
Coefficient of Thermal Expansion, parallel perpendicular 	23–300°C/ 73–572°F	—	E-831	m/m·°C (in/in·°F)	51 × 10 ⁻⁶ (29 × 10 ⁻⁶) 16 × 10 ⁻⁶ (9 × 10 ⁻⁶)
Thermal Conductivity	50°C/122°F 100°C/212°F 300°C/572°F	—	F-433	W/mK (Btu/hr in °F)	1.65 (0.08) 1.78 (0.09) 1.38 (0.07)
Specific Heat	60°C/140°F	—	E-1269	J/kg°C (Btu/lb°F)	2 × 51 × 10 ⁵ (60)
Electrical Property	Temperature	Pressure	ASTM Method	SI (English) Units	Typical Values
Surface Resistivity	23°C/73°F	—	D-257	Ohm/sq	4.1 × 10 ⁵
Volume Resistivity				Ohm·cm (Ohm·in)	9.4 × 10 ⁷ (3.7 × 10 ⁷)
Dielectric Strength				Volt/m (Volt/in)	Too Conductive
Dielectric Constant, 10 ² Hz	23°C/73°F	—	D-150		21.1
10 ⁴ Hz					20.6
10 ⁶ Hz					19.1
Dissipation Factor, 10 ² Hz	23°C/73°F	—	D-150		0.0075
10 ⁴ Hz					0.0112
10 ⁶ Hz					0.0165
Wear Property	Velocity	Pressure	ASTM Method	SI (English) Units	Typical Values
Coefficient of Friction, Unlubricated, Air	0.7 m/s (134 fpm)	1.3 MPa (187 psi)	Falex		0.20
	2.0 m/s (400 fpm)	1.7 MPa (250 psi)			0.08
Wear Factor, Unlubricated, Air	0.7 m/s (134 fpm)	1.3 MPa (187 psi)	Falex	mm-sec/MPa-m-hr (in ³ -min/ft-lb-hr)	4.0 × 10 ⁻³ (55 × 10 ⁻¹⁰)
	2.0 m/s (400 fpm)	1.7 MPa (250 psi)			1.9 × 10 ⁻³ (26 × 10 ⁻¹⁰)
Specific Gravity	—	—	D-792	—	1.68
Water Absorption	—	—	D-570	% weight change	0.07

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