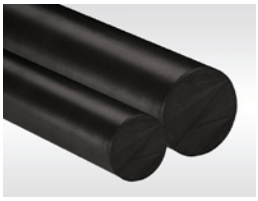
DuPont™ Vespel® Polyimide SCP Family

Extremely high temperature creep resistant plastic with excellent friction and wear characteristics



DuPont™ Vespel® Polyimide is an extremely high temperature, creep resistant plastic material that is often used in high heat environments where thermoplastic materials lose their mechanical properties. Vespel®, a lightweight alternative to metal, is available in a variety of formulations including unfilled grades and several low friction and wear grades.

DuPont™ Vespel® Polyimide Material Options

The Vespel® SCP Family exhibits enhanced mechanical properties and superior thermal stability.

SCP-5000 – Unfilled grade with enhanced mechanical properties and thermal stability.

SCP-5009 – Bearing and wear grade with enhanced mechanical properties and thermal stability.

SCP-50094 – Highest tensile strength bearing and wear grade with enhanced thermal stability.

SCP-5050 – Bearing and wear grade with extremely low COF, low CTE, and enhanced thermal stability.

DuPont™ Vespel® is widely used for:

- Semiconductor and material handling machinery
- Chip test sockets
- Wafer clamping rings
- Valve seats and sealing applications
- Spline couplings
- High performance bearings and bushings
- Locking fasteners for aerospace
- Pivot bushings on unison ring

Performance characteristics:

- Long term performance at temperatures up to 260°C (500°F)
- Outstanding sealing characteristics when mated against metals
- Excellent unlubricated bearing and wear properties (bearing grades)
- Good electrical insulating properties (unfilled grades)

Available in:

Rod

DUPONT™
Authorized Distributor

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TYPICAL PROPERTIES OF DUPONT™ VESPEL® POLYIMIDE SCP

	ASTM Method	Units	SCP-5000 Unfilled	SCP-5009 Graphite Filled	SCP-50094 Graphite Bearing Grade–Low Fill	SCP-5050 Graphite Bearing Grade–High Fill
Mechanical						
Tensile strength 23°C (73°F)	D1708 / D638	MPa (kpsi)	163 (23.6)	116 (16.9)	124 (18.0)	72 (10.5)
Tensile strength 260°C (500°F)	D1708 / D638	MPa (kpsi)	62 (9)	57 (8.4)	55 (8.0)	39 (5.6)
Elongation at break 23°C (73°F)	D1708 / D638	%	7.5	3.0	4.3	2.5
Elongation at break 260°C (500°F)	D1708 / D638	%	49.0	9.7	13.0	5.3
Flexural modulus 23°C (73°F)	D790	MPa (kpsi)	5,760 (836)	6,231 (903)	6,360 (923)	7,790 (1130)
Flexural modulus 260°C (500°F)	D790	MPa (kpsi)	3,010 (436)	3,560 (516)	3,540 (514)	5,100 (740)
Compressive stress at 10% strain, 23°C (73°F)	D695	MPa (kpsi)	230 (33.4)	222 (32.2)	220 (31.9)	172 (25)
Deformation under 13.8 MPa (2,000 psi) load	D621	%	0.05	0.03	0.05	0.03
Friction						
Coefficient of friction at PV = .875 MPa m/s (25,000 psi-ft/min)*			0.26	0.22	0.25	0.12
Coefficient of friction at PV = 3.5 MPa m/s (25,000 psi-ft/min)*			0.15	0.14	0.07	0.08
Static coefficient of friction in air*						
PV limit (unlubricated)**		MPa-m/s (kpsi ft/min)		25K/0.22 100K/0.14	17.5 (500)	
Other Properties						
Coefficient of thermal expansion 23-300°C (73-572°F)	E831	µm/m/K (10^{-6} in/in-°F)	47 (26)	44 (24)	43 (24)	29 (16)
Hardness	D785	Rockwell E	95	91	91	63
Water absorption 24 hr at 23°C (73°F)	D570	%	0.08	0.14	0.06	0.04

*Versus carbon steel, steady state, unlubricated, in air, thrust bearing. **PV limits for any material vary with different combinations of pressure and velocity as well as other conditions.

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