

DuPont™ Vespel® SP-3

POLYIMIDE ISOSTATIC SHAPES

Typical ISO Properties

DuPont™ Vespel® SP-3 parts and shapes are specified for seals and bearings in vacuum or dry environments. SP-3 is a filled polymer.

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	ASTM	Units	Typical Values
Tensile Strength	23 °C (73 °F) 260 °C (500 °F)	D-1708 or E8 [†]	MPa (kpsi)	58.5 (8.5) —
Strain at Break	23 °C (73 °F) 260 °C (500 °F)	D-1708 or E8 [†]	%	4.0 —
Flexural Strength	23 °C (73 °F) 260 °C (500 °F)	D-790	MPa (kpsi)	75.8 (11.0) 39.9 (5.8)
Flexural Modulus	23 °C (73 °F) 260 °C (500 °F)	D-790	MPa (kpsi)	3275 (475) 1862 (270)
Compressive Stress at 1% strain at 10% strain at 0.1% offset	23 °C (73 °F) 23 °C (73 °F) 23 °C (73 °F)	D-695	MPa (kpsi)	34.5 (5.0) 127.6 (18.5) —
Compressive Modulus	23 °C (73 °F)	D-695	MPa (kpsi)	2413 (350)
Axial Fatigue, Endurance Limit at 10 ³ cycles at 10 ⁷ cycles	23 °C (73 °F) 260 °C (500 °F) 23 °C (73 °F) 260 °C (500 °F)	—	MPa (kpsi)	—
Flexural Fatigue, Endurance Limit at 10 ³ cycles at 10 ⁷ cycles	23 °C (73 °F) 23 °C (73 °F)	—	MPa (kpsi)	—
Shear Strength	23 °C (73 °F)	D-732	MPa (kpsi)	—
Izod Notched Impact Strength	23 °C (73 °F)	D-256	J/m	21.3
Izod Unnotched Impact Strength	23 °C (73 °F)	D-256	J/m	112
Poisson's Ratio	23 °C (73 °F)	—	—	—
Wear and Friction				
Wear Rate ^{††}	—	—	m/s x 10 ⁻¹⁰	17–23
Friction Coefficient ^{**} PV = 0.875 MPa·m/s PV = 3.5 MPa·m/s	—	—	—	0.25 0.17
In Vacuum	—	—	—	0.03
Static in Air	—	—	—	—



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DuPont™ Vespel® SP-3 Typical ISO Properties (continued)

Thermal Property	Temperature	ASTM	Units	Typical Values
Coefficient of Linear Expansion	23 °C (73 °F) to 260 °C (500 °F)	D-696	μm/m/°C (in/in/°F)	52 (29)
Thermal Conductivity	40 °C (104 °F)	—	W/m·°C	0.47
Specific Heat	—	—	J/kg/°C	—
Deformation Under 14 MPa Load	50 °C (122 °F)	D-621	%	0.12
Deflection Temperature at 2 MPa	—	D-648	°C	—
Electrical Property				
Dielectric Constant at 10 ² Hz at 10 ⁴ Hz at 10 ⁶ Hz	23 °C (73 °F)	D150	—	—
Dissipation Factor at 10 ² Hz at 10 ⁴ Hz at 10 ⁶ Hz	23 °C (73 °F)	D150	—	—
Dielectric Strength, Short Time 2 mm Thick	23 °C (73 °F)	D149	MV/m	—
Volume Resistivity	23 °C (73 °F)	D257	Ω·m	—
Surface Resistivity	23 °C (73 °F)	D257	Ω	—
Other Properties				
Water Absorption 24 h 48 h Equilibrium, 50% RH	23 °C (73 °F) 50 °C (122 °F)	D570	%	0.23 0.65 —
Specific Gravity	—	D792	—	1.60
Oxygen Index	—	D2863	%	—

† Machined isotstic tensile specimens made per D1708

†† Unlubricated in air (PV 0.875 MPa·m/s).

** Steady state, unlubricated in air.

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Contact DuPont at the following regional locations:

North America
800-222-8377

Latin America
+0800 17 17 15

Europe, Middle East, Africa
+41 22 717 51 11

Greater China
+86-400-8851-888

ASEAN
+65-6586-3688

Japan
+81-3-5521-8484

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