

# 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 <sup>†</sup>	MPa (kpsi)	58.5 (8.5) —
Strain at Break	23 °C (73 °F) 260 °C (500 °F)	D-1708 or E8 <sup>†</sup>	%	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 <sup>3</sup> cycles at 10 <sup>7</sup> 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 <sup>3</sup> cycles at 10 <sup>7</sup> 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)	—	—	—
<b>Wear and Friction</b>				
Wear Rate <sup>††</sup>	—	—	m/s x 10 <sup>-10</sup>	17–23
Friction Coefficient <sup>**</sup> 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 <sup>2</sup> Hz at 10 <sup>4</sup> Hz at 10 <sup>6</sup> Hz	23 °C (73 °F)	D150	—	—
Dissipation Factor at 10 <sup>2</sup> Hz at 10 <sup>4</sup> Hz at 10 <sup>6</sup> 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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