



# VTEC™ PI Polyimide Parts & Shapes

*A superior polyimide polymer that performs like a ceramic*

- High temperature resistance
- Superior mechanical properties
- Excellent chemical resistance
- Extremely dimensionally stable
- Easy machining and tolerance control
- Outstanding electrical properties
- Non-abrasive to mating parts
- Very low outgassing
- Strength at elevated temperature
- Very low thermal expansion coefficient
- Extremely low moisture absorption – 1/16th of Vespel SP-1
- Equal thermal expansion in X, Y and Z directions
- Compliant without deforming under load and temperature
- Wear resistance, low friction, self-lubricating
- High compressive strength and creep resistance
- Zero metal and mineral extractables

## VTEC PI PHYSICAL PROPERTIES & COMPARISON TO VESPEL

VTEC PI — THE CERAMIC PLASTIC™	Test Method	Unit	Vespel® SP-1	VTEC™ PI
Specific Gravity	D792	—	1.43	<b>1.41</b>
Hardness	D785	Durometer D	80	<b>86</b>
Tensile Strength	D638	psi	12,500	<b>12,950</b>
Elongation	D638	%	7	<b>6.5</b>
Compressive Stress (10% strain)	D695	psi	19,300	<b>36,400</b>
Compressive Modulus	D695	psi	343,200	<b>369,800</b>
Compressive Creep	D621	%	0.14	<b>0.20</b>
Flexural Strength	D790	psi	16,000	<b>29,675</b>
Flexural Modulus	D790	psi	450,025	<b>442,850</b>
Impact Strength, Izod Notched	D256	ft lb/in	0.8	<b>1.26</b>
Coefficient Of Thermal Expansion	D696	in/in °F 10 <sup>-6</sup>	30	<b>25</b>
Dimensional Stability (% change, 24 hrs @ 500°F/260°C)	—	%	—	<b>0.00</b>
Thermal Conductivity	Cence Fitch	btu in/hr ft <sup>2</sup> °F	0.24	<b>0.27</b>
Dielectric Constant (73°F/23°C, 10 <sup>6</sup> Hz)	D150	—	3.55	<b>3.02</b>
Dielectric Constant (73°F/23°C, 10 <sup>12</sup> GHz)	D150	—	—	<b>2.90</b>
Dissipation Factor (73°F/23°C, 10 <sup>6</sup> Hz)	D150	—	.0034	<b>.003</b>
Dissipation Factor (73°F/23°C, 10 <sup>12</sup> GHz)	D150	—	—	<b>.001</b>
Dielectric Strength (Short Time, 80 mils thick)	D149	volts/mil	560	<b>590</b>
Volume Resistivity	D257	ohms-m	10 <sup>14</sup> -10 <sup>15</sup>	<b>10<sup>14</sup>-10<sup>15</sup></b>
Surface Resistivity	D257	ohms	10 <sup>15</sup> -10 <sup>16</sup>	<b>10<sup>15</sup>-10<sup>16</sup></b>
Water Absorption	D570	%	1.6	<b>&lt;0.1</b>
Abrasion Coefficient	Matsubara Method	$\frac{\text{cm}^3 \text{ sec} \times 10^5}{\text{kg/m/hr}}$	—	<b>2.46</b>
Dynamic Friction Coefficient	—	µm	—	<b>0.35</b>

## VTEC ‘CERAMIC PLASTIC’ AVAILABILITIES & CAPABILITIES

• <b>STOCK SHAPES</b>	Rod, sheet, tube and custom shapes for machined parts
• <b>DIRECT FORMING</b>	Net and near-net blanks (higher volume applications)
• <b>MACHINING</b>	RBI offers complete CNC machining of finished VTEC parts and components
• <b>CUSTOM COMPOUNDS</b>	VTEC grades can be engineered based on individual service and application needs. Fillers include glass, carbon, graphite, Teflon, MoS <sub>2</sub> , minerals, etc.

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