



VTEC™ BG21 Polyimide Parts & Shapes

Strength, stability and ultra low wear at elevated temperatures

- High temperature resistance
- Superior mechanical properties
- Excellent chemical resistance
- Outstanding electrical properties
- Non-abrasive to mating parts
- Radiation resistant
- Very low outgassing
- Extremely dimensionally stable
- Strength at elevated temperature
- High compressive strength and creep resistance
- Superior resistance to plasma etching
- Wear resistance, low friction, self-lubricating
- Extremely low moisture absorption
- Compliant without deforming under load and temperature
- Zero metal and mineral extractables
- Equal CTE in X, Y and Z directions

VTEC BG21 PHYSICAL PROPERTIES AND COMPARISON TO VESPEL

VTEC — THE CERAMIC PLASTIC™	Test Method*	Unit	GE A50TF146	P&W CPW411	MIL 46198	Vespe [®] SP-21	VTEC™ BG21
Specific Gravity	D792	—	1.41 min.	1.41 min.	1.41 min.	1.43	1.47
Hardness	D785	Rockwell E	—	—	—	—	86
Tensile Strength	D638	psi	8,000	8,000	8,000	9,000	10,290
Tensile Strength (500°F, 15 Min. Soak)	D638	psi	4,000	4,000	4,000	—	8,490
Elongation	D638	%	3.5	3.5	3.5	5.6	5.5
Elongation (500°F, (15 Min. Soak)	D638	%	2.5	2.5	2.5	—	3.7
Compressive Strength (Ultimate)	D695	psi	25,000	25,000	25,000	—	29,500
Compressive Strength (500°F)	D695	psi	no req.	no req.	no req.	—	20,610
Compressive Modulus	D695	psi	—	—	—	330,000	408,000
Flexural Strength	D790	psi	11,000	11,000	11,000	12,000	14,000
Flexural Strength (15 Min. Soak, Ultimate)	D790	psi	5,500	no req.	no req.	7,000	8,500
Flexural Modulus	D790	psi	—	—	—	460,000	457,000
Volume Resistivity	D257	ohms-m	—	—	—	10 ¹² -10 ¹³	10¹⁰-10¹¹
Surface Resistivity	D257	ohms-m	—	—	—	—	10¹⁰-10¹¹
Water Absorption	D570	%	—	—	—	1.26	<0.1
Coefficient Of Thermal Expansion	D696	in/in °F 10 ⁻⁶	—	—	—	27	22
Dimensional Stability (% change, 24 hrs@ 500°F)	—	%	0.5% max	no req.	no req.	—	0.00

JET ENGINE SIMULATION TESTING, BEARING†

Total Wear At Temperature	Vespe [®] SP-21	VTEC BG21
260°C	—	0.010"
345°C	0.030"	0.018"
400°C	0.120"	0.024"

VTEC 'CERAMIC PLASTIC' AVAILABILITIES & CAPABILITIES

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

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*All testing performed on direct formed parts and generated at an FAA approved laboratory. — †Test Conditions: 25 hours, 15° rotation @ 2000 cycle/min & 55 lb. force. All test parts direct-formed.

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