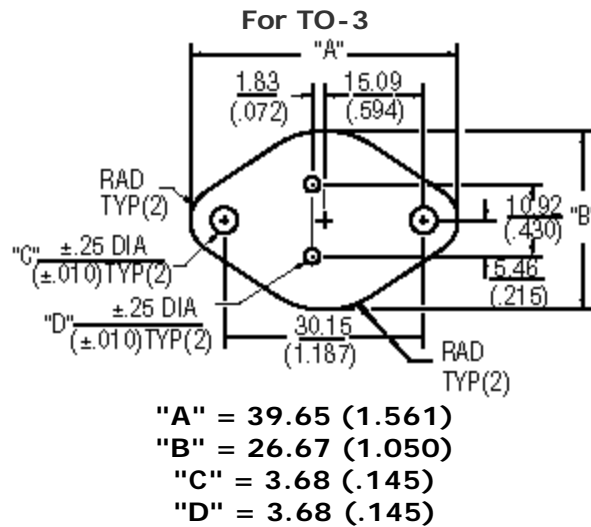


## Beryllium Oxide Ceramic

Beryllium oxide insulators have a high dielectric strength, which allows safe operating voltages of 1500 volts or more. For applications involving high frequency or high pulse rate circuitry, the inherent low electrical capacitance of these insulators prevents circuit detuning and loss of signal power. Beryllium oxide insulators have a dielectric strength of approximately  $22.8 \times 10^3$  volts/mm for .81mm material (580 volts/mil for .032" material), and  $17.7 \times 10^3$  volts/mm for 1.57mm material (450 volts/mil for .062" material). The thermal conductivity of beryllium oxide is  $221.94 \text{ Wm}^{-1} \text{ } ^\circ\text{C}^{-1}$  ( $128.2 \text{ Btu/hr.ft.}^\circ\text{F}$ ).

Beryllium oxide is chemically inert and completely safe to use in its fired state. Handling of finished parts presents absolutely no health hazards. Beryllium oxide, however, is toxic when dust, mist or fumes containing particles small enough to enter the lungs are inhaled. Therefore, grindings, sanding, and pulverizing the material should be avoided.



Part No. 4003, Thickness .062 (1.57)

## Beryllium Oxide

PROPERTY	TYPICAL VALUE 25°C	TEST METHOD
<b>CHEMICAL</b>		
BeO content	99.5% minimum	Spectograph Analysis (100%-% by wt. of total metallic impurity).
<b>ELECTRICAL</b>		
Dielectric Constant 25°C (77°F)	6.5 (1MHz) 6.6 (10GHz)	ASTM D150-70 ASTM D2520-70
Dissipation Factor 25°C (77°F)	.0004 (1MHz) .0004 (10GHz)	ASTM D150 ASTM D2520
Electrical Resistivity 25°C (77°F)	>10 <sup>15</sup> ohm-cm	ASTM D150 ASTM D257-61
Dielectric Strength (AC)	22.8 x 10 <sup>3</sup> volts/mm (.81mm) [580 volts/mil (0.32")]	ASTM D149-84
<b>PHYSICAL</b>		
Density	2.85 g/cm <sup>3</sup> (min) 177.93 Lb/ft <sup>3</sup>	ASTM C373-66 ASTM F77-671
Hardness	60 minimum (Rockwel 45N)	ASTM E18-67
<b>MECHANICAL</b>		
Flexural Strength 25°C (77°F)	2.27 x 10 <sup>8</sup> Pa (min.) (33,000 psi min.)	ASTM Microbar 8025 ASTM D2442-70A3
Modules of Elasticity	3.45 x 10 <sup>11</sup> Pa (50 x 10 <sup>6</sup> psi)	ASTM D2442-70A4
Poisson's Ratio	0.26	ASTM D2442-70A4
Tensile Strength 25°C (77°F)	1.52 x 10 <sup>8</sup> Pa (22,000 psi )	ASTM 565-66T
Compressive Strength 25°C (77°F)	1.55 x 10 <sup>9</sup> Pa (25,000 psi)	ASTM C528
<b>THERMAL</b>		
Coefficient of Thermal Expansion	9.0 x 10 <sup>-6</sup> /°C 5.0 x 10 <sup>-6</sup> /°F	ASTM E-228 ASTM C372-56 ASTM C327-56 ASTM C408-82
Thermal Conductivity	251.28 Wm <sup>-1</sup> °C <sup>-1</sup> (25°F) [145.14 Btu/hr.ft °F] (77°F) 186.44 Wm <sup>-1</sup> °C <sup>-1</sup> (100°F) [106.86 Btu/hr.ft °F] (212°F)	ASTM C408-82

	146.57 Wm <sup>-1</sup> °C <sup>-1</sup> (150°F) [84.67 Btu/hr.ft °F] (302°F)	
Specific Heat (180°C)	1.0 x 10 <sup>-3</sup> KJ/Kg°C [2.5 x 10 <sup>-4</sup> Btu/Lb °F]	ASTM C351-81
Melting Point	2552°C (4625°F)	
Maximum Temperature for Continuous Use	2149°C (3900°F)	