

## Zircar Zirconia ZYBF-2 Zirconia Bulk Fiber Insulation

Category : Ceramic , Machinable Ceramic , Oxide , Zirconium Oxide

### Material Notes:

Zirconia Bulk Fibers Type ZYBF are yttria stabilized zirconia fibers available in five different forms, all having useful properties up to 2200°C. These polycrystalline fibers can be vacuum formed into rigid shapes, placed into cavities as loose fill insulation, or added to ceramic bodies and coatings for reinforcement. They are differentiated by fiber length, surface area, crystallite size and porosity. However, they all share the same fiber diameter and calcined chemical composition. All five forms of ZYBF are made using the "Zircar Process" which replicates the gross physical structure of an organic precursor fiber with a ceramic. Typically these fibers are 6 to 10 microns in diameter and have a serrated outside surface. All of our Zirconia Bulk Fibers are phase stabilized with ~10% yttria (yttrium oxide - Y<sub>2</sub>O<sub>3</sub>) to maintain a stable tetragonal / cubic structure. The yttria, in a solid solution within the zirconia, stabilizes the tetragonal / cubic structure by preventing the monoclinic to tetragonal crystal transformation that occurs at 1170°C in pure un-stabilized or insufficiently stabilized zirconia. This undesirable transformation causes an 11% volume change in the crystal unit cell size that can cause micro-cracking and reduced physical strength in the bulk solid. Yttria stabilized zirconia is an electrical semiconductor at elevated temperatures. This conductivity arises from the different valences of ionic Zr<sup>+4</sup> and Y<sup>+3</sup>. Electricity is conducted at elevated temperatures (~700-800°C) as oxygen ions are induced to flow through the stabilized zirconia structure. This phenomenon forms the basis of zirconia oxygen sensors.

**Features:** Available in Five Different Forms Low Thermal Conductivity Highly Refractory Low Heat Storage Extreme High Temperature Stability Fibers Stabilized with ~10 wt% Yttria Lightweight Available "Off the Shelf" Information provided by Zircar Zirconia.

Order this product through the following link:

[http://www.lookpolymers.com/polymer\\_Zircar-Zirconia-ZYBF-2-Zirconia-Bulk-Fiber-Insulation.php](http://www.lookpolymers.com/polymer_Zircar-Zirconia-ZYBF-2-Zirconia-Bulk-Fiber-Insulation.php)

Physical Properties	Metric	English	Comments
Bulk Density	0.340 g/cc	0.0123 lb/in <sup>3</sup>	
Loss On Ignition	0.100 - 0.400 % @Temperature 950 °C, Time 1800 sec	0.100 - 0.400 % @Temperature 1740 °F, Time 0.500 hour	
Specific Surface Area	4.0 m <sup>2</sup> /g	4.0 m <sup>2</sup> /g	
Pore Size	0.00270 microns	0.000106 mil	Median Pierce adsorption mesopore, based on surface area
	0.00280 microns	0.000110 mil	Median Pierce desorption mesopore, based on surface area
	0.110 microns	0.00433 mil	Median Pierce desorption mesopore, based on pore volume
	0.130 microns	0.00512 mil	Median Pierce adsorption mesopore, based on pore volume

Component Elements Properties	Metric	English	Comments
Chlorine, Cl	<= 0.10 %	<= 0.10 %	
H <sub>2</sub> O	0.050 - 0.20 %	0.050 - 0.20 %	

Component Elements Properties	Metric 0 %	English 0 %	Comments
Y2O3	10 %	10 %	
ZrO2	88 - 89 %	88 - 89 %	

Descriptive Properties	Value	Comments
Trace Impurities	<1%	

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