



Zircar Zirconia, Inc.  
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## LOW MASS ZIRCONIA GROG TYPE ZG



Zirconia Grog Type ZG.

### FEATURES

- High Temperature Stability to 2200°C
- Low Thermal Conductivity
- Highly Refractory
- Excellent Thermal Shock Resistance
- No Outgassing
- Two Particle Size Ranges are Offered
- Available 'Off the Shelf'

Zircar Zirconia Low Mass Grog Type **ZG** is high fired, fibrous yttria-stabilized zirconia particles, ideally suited for thermal insulation under conditions of ultra high temperatures. Type **ZG** exhibits exceptional resistance to oxidizing and reducing atmospheres at high temperatures. Zirconia, however, loses a small amount of oxygen in inert and reducing atmospheres and in vacuum at very high temperatures. This results in a color change from white to gray; while most other properties remain essentially unchanged and the insulation effectiveness is not impaired. Type **ZG** Grog offers lower thermal conductivity and specific heat than conventional dense grogs. This makes it useful for crystal growth and glass melting furnace insulation applications.

Type **ZG** contains no organic binders and will produce no smoke or odor when heated. **ZG** Grog will conduct electricity at elevated temperatures. Type **ZG** Grog is available in two standard particle size ranges.

- Type **ZG-1** has a Tyler mesh size of -3 1/2 to +8 (5.7mm to 2.4mm)
- Type **ZG-2** has a Tyler mesh size of -8 to +14 (2.4mm to 1.2mm).

### APPLICATION INFORMATION

- **ZG** Grog is used as insulation and crucible support in crystal growing furnaces.
- **ZG** Grog is used as insulation for glass melting furnaces.
- **ZG** Grog is used as bulk fill insulation.

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## LOW MASS ZIRCONIA GROG TYPE ZG

### CHEMICAL COMPOSITION

Zircar Zirconia's Type **ZG** is nominally 90 wt%  $ZrO_2 + HfO_2$  and 10 wt%  $Y_2O_3$ . 1 - 2 wt% hafnia ( $HfO_2$ ) occurs naturally with zirconia ( $ZrO_2$ ) and does not affect performance. Only the highest purity starting materials are used to make Type **ZG** minimizing trace oxides.

Trace Oxide	Typical Wt%
$SiO_2$	0.12
$TiO_2$	0.14
CaO	0.09
MgO	0.03
$Fe_2O_3$	0.04

Trace Oxide	Typical Wt%
$Al_2O_3$	0.01
$Na_2O$	0.01
$SnO_2$	0.001
$Cr_2O_3$	0.0005
$Ag_2O$	0.0005

### PROPERTIES & CHARACTERISTICS

Melting Point, °C (°F)	2590 (4694)
Maximum Use Temperature*, °C (°F)	2200 (3992)
Porosity of Particles, %	70
Bulk Density, g/cc (pcf)	0.88 (55)
Outgassing	Nil
% Shrinkage 1 hour at 1700°C(3092°F)	0
% Shrinkage 1/2 hour at 2000°C(3632°F)	2

\* Maximum use temperature is dependent on variables such as stresses, both thermal and chemical, and the chemical environment that the material experiences

### ORDERING INFORMATION

Standard Sizes	Item Number
ZG-1, -3 1/2 to +8 Tyler, 1 pound	BD001
ZG-1, -3 1/2 to +8 Tyler, 10 pounds	BD002
ZG-2, -8 to +14 Tyler, 1 pound	BE001
ZG-2, -8 to +14 Tyler, 10 pounds	BE002

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