

Zircar Zirconia ZYF-50 Zirconia Felt Insulation

Category : Ceramic , Machinable Ceramic , Oxide , Zirconium Oxide

Material Notes:

Zirconia Felt is a true ceramic textile formed by the unique ZIRCAR process for replicating organic structures in inorganic materials. The zirconia felt structure is a 'needled felt' which retains its fibrous nature to 2480°C. The stabilized zirconia composition permits the advantages of fibrous insulations to be extended into temperature regions well above the melting temperatures of siliceous and alumina insulation materials. Zirconia Felt Types ZYF-50, ZYF-100, and ZYF-150 are composed of 100%, 4-6 micron diameter, yttria-stabilized zirconia fibers which are mechanically interlocked. Designed for use in extremely corrosive environments and high temperatures, these felts are 100% inorganic fibers and contain no binders. They undergo no phase transitions on temperature cycling and are very effective thermal insulators, capable of use at temperatures in excess of 1930°C. These materials are equally useful in strong oxidizing and reducing environments, are not reactive to alkali vapors, salts or strong hot solutions. The felts are not wet by most molten metals and have low adsorption surface area and vapor pressure, resulting in low outgassing and contamination in ultra high temperature uses. Zirconia felts are light weight and very porous. They can be surface coated with polymers, filled with inorganic powders or treated with inorganic colloids to achieve special properties. Features: Low Thermal Conductivity High Porosity High Purity Extreme High Temperature Stability Fibers Stabilized with ~10 wt% Yttria Custom Fillers and Coatings Available Can be Cemented with Zircar Zirconia Cement Type ZR-CEM Can be Rigidized with Zircar Zirconia Rigidizer Type ZIR-RIGEasily Cut to Size Available "Off the Shelf" Application Information: Zirconia Felt Type ZYF is widely used in crystal growing applications. In the Czochralski method of oxide crystal growing, an iridium crucible is often used to contain the melt. Iridium, a precious metal in the platinum group, vaporizes at high temperature. ZYF acts as thermal insulation and a cushioning barrier as well as a platform for iridium recovery. A layer of ZYF wrapped around the iridium crucible creates a physical barrier between the fragile crucible and the back up insulation. The steep thermal gradient across the ZYF causes condensation of the iridium into the felt from which it can then be easily segregated and recovered. Zirconia Felt Type ZYF is used as an electrolytic cell separators in batteries and fuel cells using alkali electrolytes. Type ZYF is unaffected by long term exposure to KOH. ZYF Felts are used as setter material for powder metal sintering in both vacuum and hydrogen atmospheres. ZYF Felts are used as setter material in contact with quartz glass in melting and hotworking operations. Vacuum furnace and hot isostatic press makers have used ZYF-50 and ZYF-100 as insulation between layers of refractory metal heat shields to improve their insulation package performance. Information provided by Zircar Zirconia.

Order this product through the following link:

http://www.lookpolymers.com/polymer_Zircar-Zirconia-ZYF-50-Zirconia-Felt-Insulation.php

| Physical Properties | Metric | English | Comments |
|---------------------|--------------------------------------|---------------------------------------|----------|
| Bulk Density | 0.2403 g/cc | 0.008681 lb/in ³ | |
| Porosity | 96 % | 96 % | Bulk |
| Thickness | 889 - 1650 microns | 35.0 - 65.0 mil | |
| Vapor Pressure | 1.07e-14 bar @Temperature 1370 °C | 8.00e-12 torr @Temperature 2500 °F | |

| Mechanical Properties | Metric | English | Comments |
|----------------------------|------------|----------|--------------------|
| Compressive Yield Strength | 0.0207 MPa | 3.00 psi | At 10% compression |

| Mechanical Properties | Metric | English | Comments |
|------------------------|--|---|----------------------------------|
| Specific Heat Capacity | 0.544 J/g-°C | 0.130 BTU/lb-°F | |
| | @Temperature 93.3 °C | @Temperature 200 °F | |
| | 0.753 J/g-°C | 0.180 BTU/lb-°F | |
| | @Temperature 2370 °C | @Temperature 4300 °F | |
| Melting Point | 2590 °C | 4700 °F | |
| Shrinkage | 5.00 % | 5.00 % | 1 hour isothermal soak at 3000°F |
| | @Temperature 1650 °C, Time 3600 sec | @Temperature 3000 °F, Time 1.00 hour | |

| Component Elements Properties | Metric | English | Comments |
|-------------------------------|-------------|-------------|----------|
| Al2O3 | <= 0.010 % | <= 0.010 % | |
| HfO2 | 1.0 - 2.0 % | 1.0 - 2.0 % | |
| SiO2 | <= 0.020 % | <= 0.020 % | |
| ZrO2+Y2O3 | >= 99 % | >= 99 % | |

| Descriptive Properties | Value | Comments |
|-----------------------------------|-----------------|----------|
| Tensile Strength per Unit Width | 0.6 lb/in width | |
| Weight Per Area | 0.7 lb/ft2 | |
| Wrapping Diameter Before Breaking | >0.25 in | |

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