

Powder Loaded ZYF High Temperature Filled Zirconia Felts

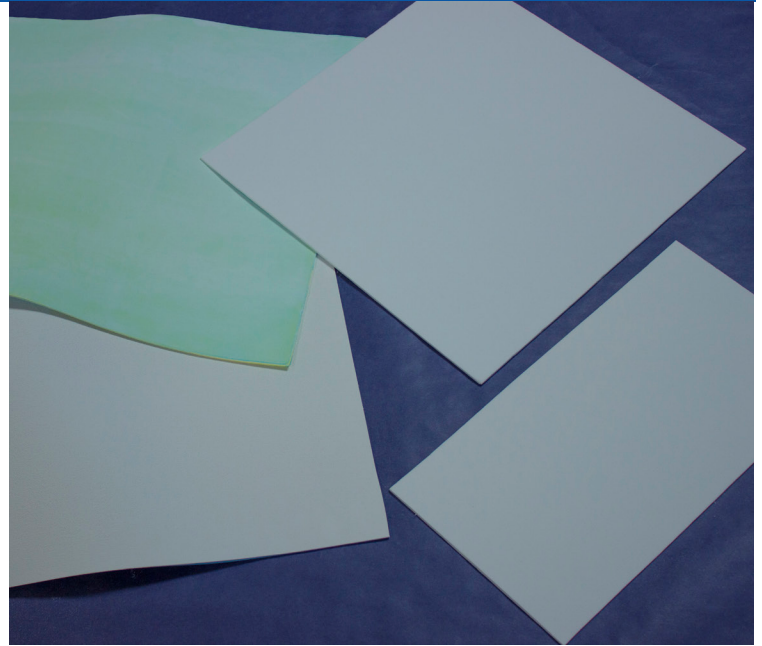
Zircar Felt Type ZYF is an excellent all-purpose high temperature insulation that can be used as a separator, wrapper, fixture, gasket, cushion, pillow, pad, barrier, cover, layering or packing material in high temperature applications. Fibrous zirconium oxide felts are filled with various inorganic powders to different loading concentrations to modify felt performance. ZYF is a ceramic textile made using the original ZIRCAR Process at our plant in Florida, NY, USA. It is a flexible, light weight, porous, needled felt comprised of 4 to 6 micron diameter fibers and is nearly 100% zirconia phase stabilized with yttria. The fibers are mechanically interlocked and retain their flexible nature up to 1350 °C. The properties of ZYF are modified by filling the open porosity.

The high purity fillers can be customized to your needs making the ZYF more rigid and dense structures than non-treated ZYF. Our standard chemistry offerings are 100% inorganic and there are no binders to burn out prior to use. As with all ZYF products, the products are designed for uses in extremely corrosive, high temperature environments, are easy to cut by custom machining or die cut.

ZYF-A2.13 is filled with alumina powder and high fired to a rigid board.

ZYF-S.75G is filled with 0.75g of silica powder per 1g of ZYF, remaining pliable.

ZYF-Z1.5G is filled with 1.5g of zirconia powder per 1g of ZYF and dyed green for identification.



Properties & Characteristics

Properties (Nominal)	ZYF-A2.13	ZYF-S.75G	ZYF-Z1.5G
Thickness, inch	0.160 +/- 0.035	0.10 +/- 0.03	0.10 +/- 0.03
Bulk Porosity, %	94	88	89
Bulk Density, lb/ft ³ (g/cm ³)	20 (0.32)	30 (0.48)	40 (0.64)
Tensile Strength, lb/in width	6.1	1.1	3.7
Weight/Area, lb/ft ²	0.21	0.22	0.31
Maximum Use Temperature, °C (°F) ⁽¹⁾	1600 (2912)	1600 (2912)	2000 (3632)
Minimum Wrapping Diameter Before Breaking	3 Feet	2 Inches	1 Foot
Linear Shrinkage, 1 hr. @ 1300 °C Isothermal Soak, %	.3	4.0	11.2
Chemical Composition (Nominal)			
Oxide	Wt%		
ZrO ₂ ⁽²⁾	87+	51+	89+
Y ₂ O ₃	10	5	10
Al ₂ O ₃	2 +/- 1	<0.01	<0.01
SiO ₂	<0.02	43	<0.01

⁽¹⁾ Maximum use temperature is dependent on variables such as the chemical environment and stresses; both thermal and mechanical.

⁽²⁾ 1-2 wt% hafnia occurs naturally with zirconia and does not affect performance.

Applications

ZYF-A

This thicker, rigidized felt was developed for use as a diffusion burner membrane for fuel fired heaters installed in long-haul trucks and high end passenger cars. In this application the liquid fuel, gasoline or diesel, is pumped onto one surface of a disk of felt. The fuel then wicks through to the opposite surface which is located in a combustion chamber and evaporates. The evaporated fuel is mixed with air and ignited providing an 'instant-on' heat in the vehicle which is independent of the engine heat.

ZYF-A2.13 is also used as a setter plate for vacuum sintering flat sheets of powdered metal materials. The felt remains flat during sintering because of its rigid structure.

ZYF-S & ZYF-Z

These heavy, loaded felts are used as gasket material in fuel cells. When compressed between the sealing surfaces of the fuel cell container they form a barrier that resists attack from the highly corrosive electrolyte. Although the two can be used in similar applications, ZYF-Z is used where a higher compressive strength may be needed.

Since ZYF-S and ZYF-Z are flexible, they can also be laminated to a form or shaped into large cylinders.

Product Micrograph

Filling the ZYF porosity with inorganic powders will modify properties such as strength, rigidity, maximum operating temperature and density.

In the micrograph on the right, ZYF-S shows serrated ZYF fibers with silica powder filling the spaces between.



To Place an Order

Call: 845-651-3040

email: sales@zircarzirconia.com

store: www.zircarzirconia.com/store

Size	Item Number		
	ZYF-A2.13	ZYF-S.75G	ZYF-Z.1.5G
8.5"x 16"x 0.165"Tk	CB061		
16"x 16"x 0.16"Tk	CB050		
18"x 24"x 0.10"Tk		CB008	CB036
16"x 24"x 0.16"Tk	CB069		
18"x 24"x 0.16"Tk	CB072		



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