Zircar

Advanced Fibrous Ceramics

Buster

High Temperature Alumina Insulation

The Cost Effective Option for High Temperature Insulation

Board Sizes up to 13"x 13" and 9"x 18"

Cylinders up to 18" OD

Custom Machining to Tight Tolerances to Suit Your Application Requirements

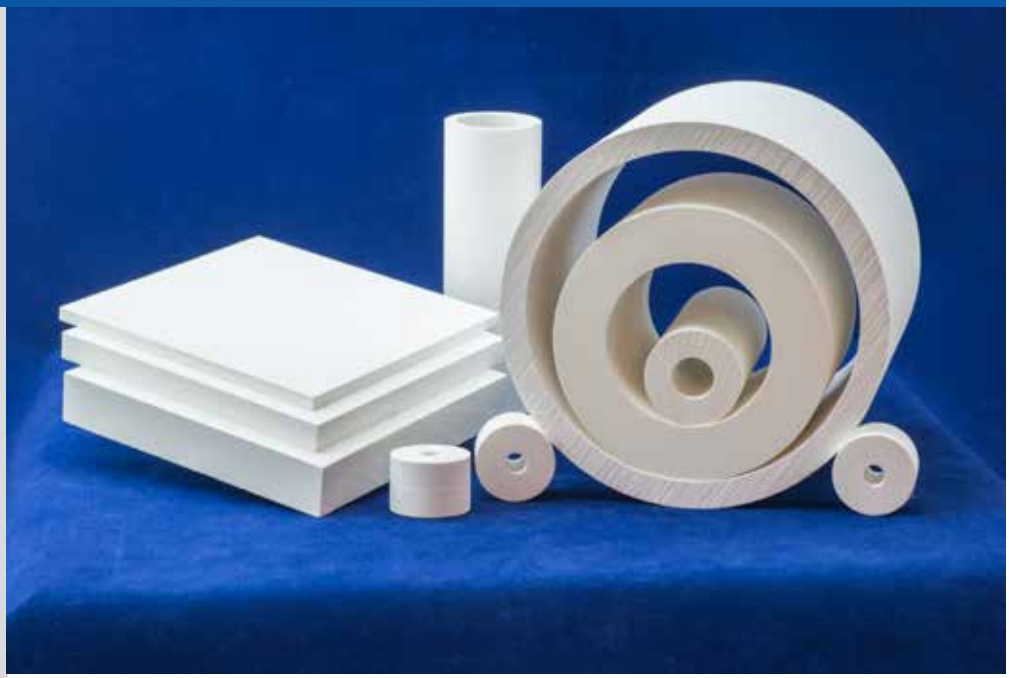
1600 °C to 1800 °C Rated Options

Buster Features

- High Alpha Alumina Fibers
- Low Thermal Conductivity (K)
- Excellent Thermal Shock Resistance
- Designed for Rapid Cycling
- Extreme High Temperature Stability
- Alumina or Mullite Bonded
- Non-RCF Composition
- Usable in Multiple Atmospheres

The Zircar Fibrous Ceramics Advantage

Low Mass,
Low Heat Storage &
Low Thermoconductivity
means
High Thermal Shock Resistance,
High Insulation Performance,
Higher System Efficiency &
Lower Energy Costs



Low Thermal Shock... Low Shrinkage... High Purity...

Alumina fiber boards and cylinders with a choice of alumina or mullite bonds and densities from 15 PCF to 45 PCF.

Product Information

Zircar Aluminum Oxide Fibrous Ceramic Insulation Type Buster is a rigid, fibrous ceramic material produced by vacuum forming alumina fibers with either a high purity alumina binder, Buster A, or silica binders, Buster M, that form a more thermal shock resistant mullite bond. Buster M2 is a mullite bonded 1800 °C version that exhibits complete dimensional stability to 1700 °C. Both Buster A and Buster M chemistries are offered in a range of densities. Standard board densities are 15, 35 and 45 pounds per cubic foot. Standard cylinder densities are 15 and 30 pounds per cubic foot.

All Buster boards and cylinders are pre-fired for immediate use with no off-gassing. Their fine grain quality and uniform binder distribution enables precision machining. All these features make Buster an ideal insulation material for hot face insulation, setters and trays in rapid heat electric furnaces and other types of thermal process systems.

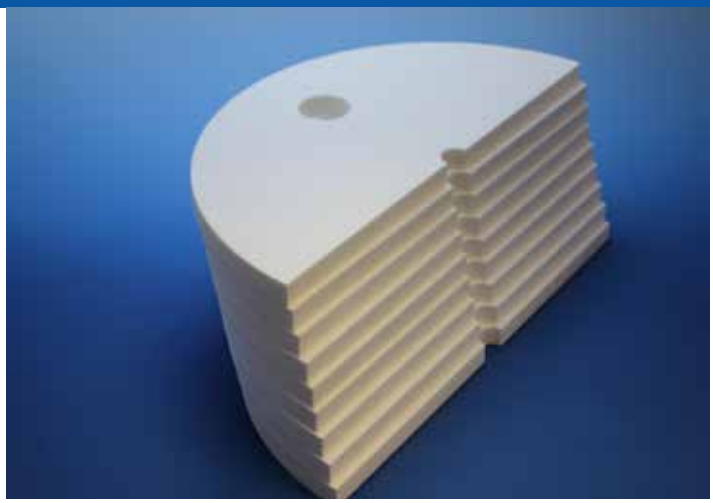
High purity silica is the binder in Buster M. Silica's strong bond gives Buster M excellent high temperature strength and dimensional stability. Buster A has a high purity alumina bond making it well suited to use in high vacuum and reducing atmosphere applications where silica cannot be tolerated, such as in bright annealing furnaces with H2 atmospheres. They both have high electrical resistivity at elevated temperatures allowing them to be used in direct contact with many different resistance heating elements.

For more information,
phone: (845) 651-3040
email: sales@zircarzirconia.com
website: www.zircarzirconia.com

Buster A

Buster A can be formed into a wide range of boards and cylinders in various densities. Vacuum formed boards have fibers arranged parallel to the vacuum formed board face creating anisotropic behavior. Vacuum formed ceramic fiber boards exhibit lower compressive strength and thermal conductivity perpendicular to the fiber plane while shrinkage is greater. Boards have the fiber plane parallel to their faces, cylinders have their fibers aligned perpendicular to the radius of the cylinder. Custom cylinders and boards can be manufactured with fiber orientation as required for your application.

Buster A can be used in applications where continuous working temperatures of up to 1650 °C are achieved. Buster A2-30 is used in Zircar's hot zones where the application is incompatible with silica.



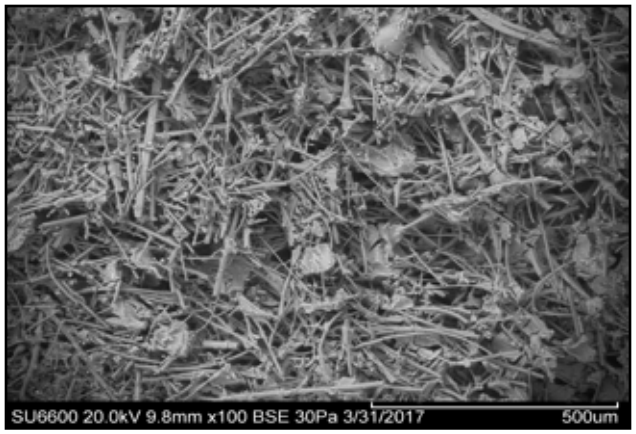
Buster M

Buster M products are used where higher continuous working temperature is necessary. Buster M2-35 has a continuous working temperature of up to 1800 °C. Buster M-45 is our strongest alumina insulation option, with a tensile strength of 1300 PSI.

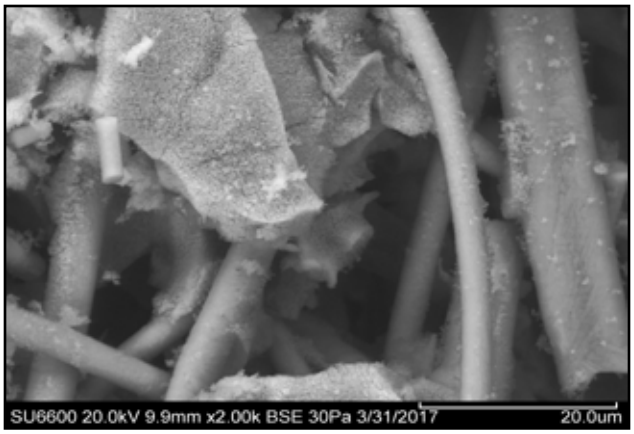
Buster M is a great choice for custom machining needs. It can be used where tight tolerances and thin walls are neccessary.

Buster M-35 and M-15 are used in Zircar's HotSpot 110 as the hot face and backup insulation, withstanding years of rapid cycling with little degregation.

Product Micrographs



Buster A2-30 at 100x magnification

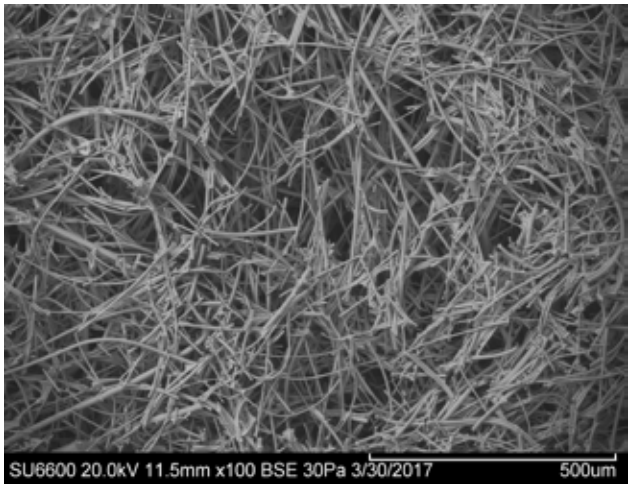


Buster A2-30 at 2000x magnification

Zircar Zirconia, Inc.
87 Meadow Road
P.O. Box 287
Florida, New York 10921

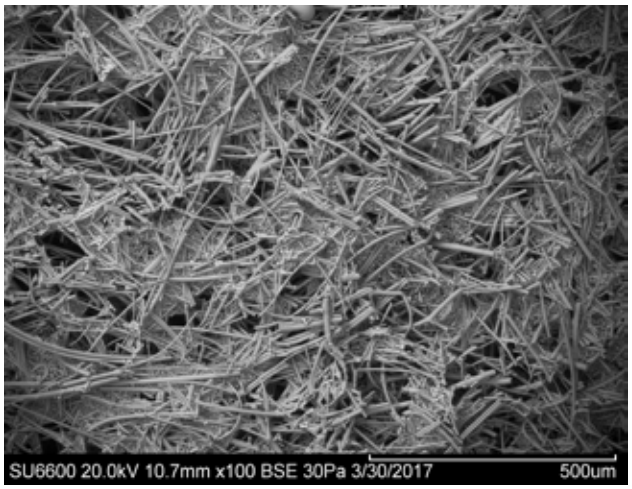
Phone: (845) 651-3040
Fax: (845) 651-0074
Email: sales@zircarzirconia.com
www.zircarzirconia.com

Product Micrographs (cont.)



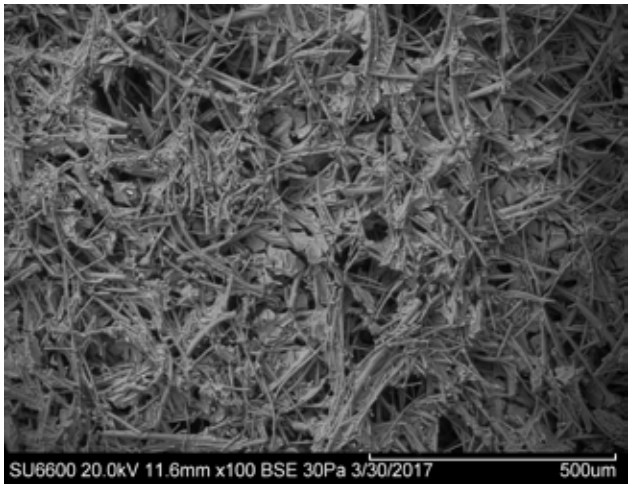
Buster M-15 at 100x magnification

Buster M-15 at 2000x magnification

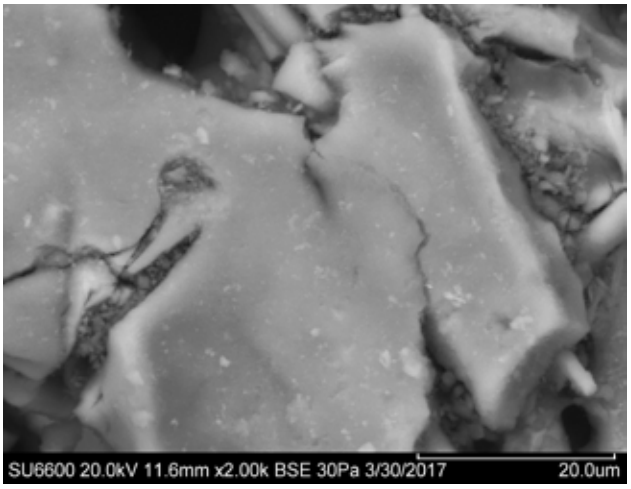


Buster M-35 at 100x magnification

Buster M-35 at 2000x magnification



Buster M-45 at 100x magnification



Buster M-45 at 2000x magnification

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Properties & Characteristics

Properties (Nominal)	A-15	A-30	A2-30	M-15	M-35	M2-35	M-45
Bulk Density, lb/ft^3	15	30	30	15	35	39	45
Bulk Porosity, %	93	85	85	93	83	80	70
Melting Point, °C (°F)	1870 (3340)						
Continuous Maximum Use Temperature, °C (°F) [1]	1600 (2912)	1600 (2912)	1650 (3002)	1650 (3002)	1725 (3137)	1800 (3272)	1650 (3002)
Flexural Strength, PSI Normal to Fiber Plane	50	250	280	210	600	650	1300
Specific Heat, J/kgK (BTU/lb-°F) @93 °C (200 °F)	1047 (0.25)						
Linear Shrinkage, % 1 hr. @ 1700 °C (3092 °F) Perpendicular to Fiber Plane	2	1.4	1.2	1	0.6	-0.1	2
Thermal Expansion/ °C	7.8 x10^{-6}	7.8 x10^{-6}	7.8 x10^{-6}	7.2 x10^{-6}	7.2 x10^{-6}	7.2 x10^{-6}	7.2 x10^{-6}
Compressive Strength, PSI @ 10% compression Normal to Fiber Plane	18	80	120	30	90	120	600
Alumina Content, %	97+	97+	97+	80	80	80	85

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

Applications

FURNACE INSULATION
Buster is used as a hot face insulation in rapid cycle furnaces. It can also be used in conjunction with other rigid insulation as backup insulation for furnaces operating at ultra high temperatures. The silica free option makes Buster A useful in reducing atmospheres. It is also structurally strong enough to be used as combustion chambers and burner liners.

SETTER AND FIXTURE MATERIAL
Buster is used for setters or fixturing material where furnace lining can sustain damage due to material contact during firing. Alumina insulation is used as annealing fixtures in specialty metal production processes, and is used in crystal growing.

It is an excellent electrical insulator as well as thermal barrier and an IR source insulation.

Cutting & Machining Instructions

For manual cutting, place the part on a smooth clean surface and hold it in place with gentle pressure. Small holes can be drilled in lighter density Buster by hand with a standard high speed steel twist drill rotated between the fingers. Boards can be cut with a backsaw. If close tolerances are needed, use a drill press and a radial arm saw. Table saws are not recommended without a carrier board since the motion of the material over the saw bed will tend to abrade away the material. For very close tolerances and large amounts of cutting, CNC machining with solid carbide, carbide tipped or diamond tipped tooling is recommended. Slow feeds and high tool rotation rates are best. It should be noted that the material is very abrasive and will cause rapid wear of high speed steel tooling which could result in an out of tolerance condition in a short period of time. Vacuum hold down is best. Small amounts of hot glue can be used.

Zircar welcomes our customers to take advantage of our expertise for all your custom machining needs.

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Product Samples

FREE SAMPLES

Call: 845-651-3040
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Product Type	Item #
Buster A-15	SAMPLE-GJ
Buster A-30	SAMPLE-GA
Buster A2-30	SAMPLE-GAA
Buster M-15	SAMPLE-GD
Buster M-35	SAMPLE-GB
Buster M2-35	SAMPLE-GBA
Buster M-45	SAMPLE-GG

Samples are 1.8"x 2.8"x 1/2" Tk

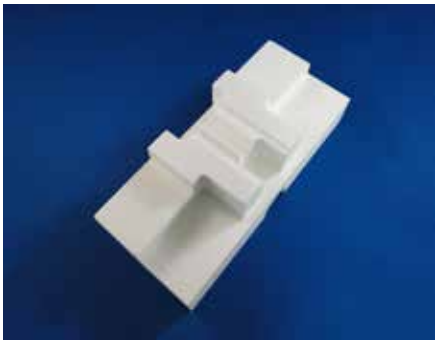
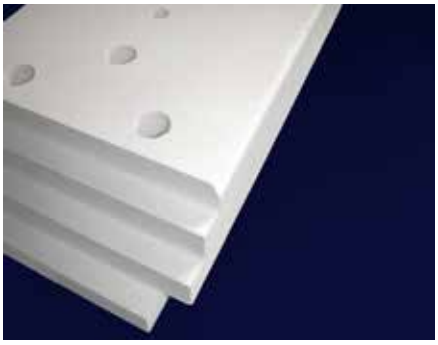
Custom Design Quotations

Contact Us For A Quotation For Your Custom Part

Call: 845-651-3040
email: sales@zircarzirconia.com

Zircar machines custom shapes to your design specifications.
Our capabilities include:

- 3D CNC Machining
- Layered Configurations
- Lap Joined Boards and Cylinders
- Diamond Wire Splitting of Cylinders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Standard Product Sizes & Ordering

Buster boards are available in the standard sizes shown below.

Buster cylinders are also available on a custom basis.

Please contact our Sales Department for pricing and availability.

To Place an Order

Call: 845-651-3040
email: sales@zircarzirconia.com

Buster Boards

Size	Item Number						
	A-15	A-30	A2-30	M-15	M-35	M2-35	M-45
13″W x 13″L x 0.25″Tk	GJ0001	GA0001	GAA0001	GD0001	GB0001	GBA0001	GG0001
13″W x 13″L x 0.50″Tk	GJ0002	GA0002	GAA0002	GD0002	GB0002	GBA0002	GG0002
13″W x 13″L x 0.75″Tk	GJ0003	GA0003	GAA0003	GD0003	GB0003	GBA0003	GG0003
13″W x 13″L x 1.00″Tk	GJ0004	GA0004	GAA0004	GD0004	GB0004	GBA0004	GG0004
13″W x 13″L x 1.25″Tk	GJ0005	GA0005	GAA0005	GD0005	GB0005	GBA0005	
13″W x 13″L x 1.50″Tk	GJ0006	GA0006	GAA0006	GD0006	GB0006	GBA0006	
13″W x 13″L x 1.75″Tk	GJ0007	GA0007	GAA0007	GD0007	GB0007	GBA0007	
13″W x 13″L x 2.00″Tk	GJ0008	GA0008	GAA0008	GD0008	GB0008	GBA0008	
9″W x 18″L x 0.25″Tk	GJ0009	GA0009	GAA0009	GD0009	GB0009	GBA0009	GG0009
9″W x 18″L x 0.50″Tk	GJ0010	GA0010	GAA0010	GD0010	GB0010	GBA0010	GG0010
9″W x 18″L x 0.75″Tk	GJ0011	GA0011	GAA0011	GD0011	GB0011	GBA0011	GG0011
9″W x 18″L x 1.00″Tk	GJ0012	GA0012	GAA0012	GD0012	GB0012	GBA0012	GG0012
9″W x 18″L x 1.25″Tk	GJ0013	GA0013	GAA0013	GD0013	GB0013	GBA0013	
9″W x 18″L x 1.50″Tk	GJ0014	GA0014	GAA0014	GD0014	GB0014	GBA0014	
9″W x 18″L x 1.75″Tk	GJ0015	GA0015	GAA0015	GD0015	GB0015	GBA0015	
9″W x 18″L x 2.00″Tk	GJ0016	GA0016	GAA0016	GD0016	GB0016	GBA0016	

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