Alumina
Type ZAL-15AA

General Information

ZIRCAR Ceramics' Alumina Type ZAL-15AA is an engineered low-density rigid refractory structure composed of high-alpha polycrystalline alumina fibers and high-purity inorganic alumina binders. ZAL-15AA's uniformly-bound fine open-pore structure makes it an excellent thermal insulator with good machinability. ZAL-15AA exhibits good hot strength and dimensional stability in industrial applications with continuous operating temperatures to 1500°C (2732°F) and withstands intermittent use to 1600°C (2912°F). The high-purity alumina binder gives this low-density fiber body a very high degree of chemical inertness and it is therefore useful in reducing atmospheres. ZAL-15AA exhibits high electrical resistivity at elevated temperatures and is also transparent in microwave and RF energy fields. ZAL-15AA is pure white and exhibits high reflectance.

ZAL-15AA is pre-fired, contains no organic binders and will produce no smoke or odors when heated. ZAL-15AA shows excellent resistance to chemical attack and is not affected by oil or water. It is, however, affected by hydrofluoric acid, phosphoric acid and strong alkalis. For more information see "Effects of Hydrogen Gas at 1450°C on Select Fibrous Alumina Insulation Products".

Characteristics & Properties

Nominal Composition, wt.%	
Al_2O_3	97
SiO_2	3
Organic Content	0
Density, g/cc (pcf)	0.24 (15)
Maximum Use Temperature*, °C (°F)	
Continuous	1500 (2732)
Intermittent	1600 (2912)
Linear Shrinkage‡, %	
1 hr. at 1550°C (2822°F)	2
1 hr. at 1650°C (3002°F)	6
Thermal Expansion Coefficient Room temperature to 1000°C (1832°F)	7.5 x 10-6/°C (4.2 x 10-6/°F)
Melting Point, °C (°F)	1870 (3392)
Open Porosity, %	93
Specific Heat, J/kg°K (BTU/lb°F)	1047 (0.25)

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Characteristics & Properties Continued

Compressive Strength**, MPa (psi) at 10% Compression	0.34 (50)
Flexural Strength**, MPa (psi) at 10% Strain	2.1 (300)
Thermal Conductivity**, (ASTM C177-76) W/m°K (BTU/hr ft°F/in.)	
250°C (482°F)	0.06 (0.40)
525°C (977°F)	0.08 (0.60)
800°C (1472°F)	0.12 (0.90)
1075°C (1967°F)	0.16 (1.30)
1250°C (2282°F)	0.22 (1.70)
1350°C (2462°F)	0.25 (1.80)

The data presented herein is intended to help the user to determine the appropriateness of this material for their application.
This data is a nominal representation of this product's properties and characteristics and therefore should not be used in preparing specifications.
* Maximum use temperature is dependent on variables such as stresses, both thermal and mechanical, and the chemical environment that the material experiences. ** Properties expressed parallel to thickness. ‡ Properties expressed perpendicular to thickness.

Suggested Applications

Primary thermal insulation in bright annealing furnaces and other thermal process systems with hydrogen gas atmospheres operating to 1550°C (2822°F).
Thermal insulation, supports and fixtures Solid Oxide Fuel Cells operating to 1550°C (2822°F).
Backup thermal insulation in furnaces and thermal process systems operating at high temperatures.
High-temperature setters, supports and process fixtures for use in reducing atmospheres.
Precision-machined thermal insulation in scientific analytical instruments.
Electrical insulation in high-temperature systems operating to 1550°C (2822°F).

Availability of Standard Boards

ITEM #	DESCRIPTION
A13011	ZAL-15AA, 18”W x 24”L x 1.00”T

To Order

Standard boards: order online or specify quantity, item # and description.
Standard boards are available for immediate shipment from stock.

Standard tolerances for boards are +/- 1/8” on length and width and +/- 1/16” on thickness.

Custom boards as large as 24”W x 36”L x 3”T have been manufactured.

Custom shapes: our state-of-the-art tight-tolerance machining techniques allow a wide variety of sizes and shapes to be made.

Cylinders of this body are known as **Alumina Type ALC-AA** See ALC Technical Bulletin for additional information.

Surface treatments including rigidization with colloidal alumina (AL-R/H) or colloidal silica (SI-RIG) or coating with alumina cement (AL-CEM) are all available.

Zircar® CERAMICS

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