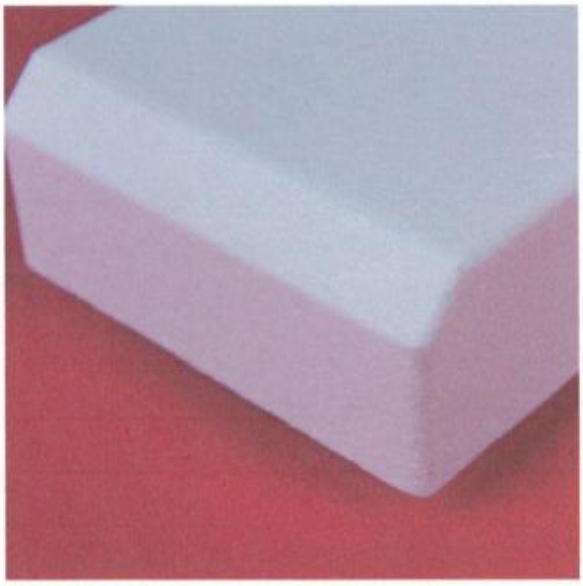
Alumina
Type ZAL-15



General Information

ZIRCAR Ceramics' Alumina Type ZAL-15 is an engineered low-density, rigid refractory structure composed of high-alpha polycrystalline alumina fibers and high-purity inorganic binders. ZAL-15's uniformly-bound, fine, open-pore structure makes it an excellent thermal insulator with precision machinability. ZAL-15 exhibits very good hot strength and dimensional stability in industrial applications with continuous operating temperatures to 1550°C (2822°F) and withstands intermittent use to 1650°C (3002°F). High-purity silica is the binder in ZAL-15 - which makes it one of the strongest low-density fiber bodies manufactured today. ZAL-15 exhibits high electrical resistivity at elevated temperatures and is also transparent in microwave and RF energy fields. ZAL-15 is pure white and exhibits high reflectance.

ZAL-15 is pre-fired contains no organic binders and will produce no smoke or odors when heated. ZAL-15 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.

Characteristics & Properties

Nominal Composition, wt.%	
Al_2O_3	85
SiO_2	15
Organic Content	0
Density, g/cc (pcf)	0.24 (15)
Maximum Use Temperature*, °C (°F)	
Continuous	1550 (2822)
Intermittent	1650 (3002)
Linear Shrinkage‡, %	
1 hr. at 1550°C (2822°F)	1
1 hr. at 1650°C (3002°F)	3
Thermal Expansion Coefficient Room temperature to 1000°C (1832°F)	5.0 x 10-6/°C (2.8 x 10-6/°F)
Melting Point, °C (°F)	1870 (3392)
Open Porosity, %	93
Specific Heat, J/kg°K (BTU/lb°F)	1047 (0.25)
Compressive Strength**, MPa (psi) at 10% Compression	1.1 (160)

Alumina Type ZAL-15

Characteristics & Properties Continued

Flexural Strength**, MPa (psi) at 25% Strain	1.6 (225)
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, intermediate and backup thermal insulation in low-mass furnaces and thermal process systems operating to 1650°C (3002°F).
Precision-machined thermal insulation in scientific analytical instruments.
Reflector tiles in infrared paper-drying equipment.
High-temperature setters, supports and process fixtures.
Electrical insulation in high-temperature systems operating to 1650°C (3002°F).

Availability of Standard Boards

ITEM #	DESCRIPTION
A10009	ZAL-15, 18"W x 24"L x 0.50"T
A10010	ZAL-15, 18"W x 24"L x 0.75"T
A10011	ZAL-15, 18"W x 24"L x 1.00"T
A10012	ZAL-15, 18"W x 24"L x 1.50"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 16"W x 22"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** and can be manufactured with IDs from 1" to 10" with ½" to 2" wall thickness and length up to 12" 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.