



## 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 <sub>2</sub> O <sub>3</sub>	85
SiO <sub>2</sub>	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)

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## Characteristics & Properties Continued

Flexural Strength**, MPa (psi) at 0.025" Load Deformation	1.6 (225)
Thermal Conductivity**, (ASTM C177-76) W/m <sup>2</sup> K (BTU/hr ft <sup>2</sup> 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. Three point bending sample size: 0.5"W x 0.5"T x 4.0"span. ‡ 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 1/2" 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.



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