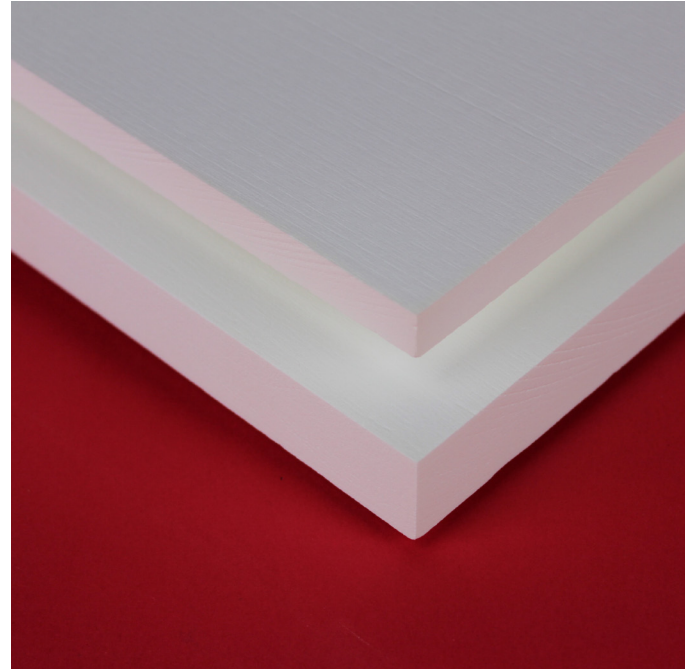




Alumina Type ZAL-45AA

General Information

ZIRCAR Ceramics' Alumina Type ZAL-45AA is a high-density high-strength, uniformly rigid refractory structure composed of high-alpha polycrystalline alumina fibers and high purity alumina binders. ZAL-45AA exhibits a fine open-pore structure and is made to a high bulk density of 0.72g/cc (45pcf) which gives it a unique combination of high strength and low thermal conductivity at elevated temperatures. ZAL-45AA exhibits a very high Al₂O₃ content giving it superior resistance to chemical attack and dimensional stability in industrial applications with continuous temperatures of 1550°C(2822°F) with intermittent use to 1600°C (2912°F). ZAL-45AA is manufactured with a high fiber-to-binder ratio making it highly machinable to precise dimensional tolerances. It exhibits high electrical resistivity with high microwave and RF transparency at elevated temperatures. ZAL-45AA is pure white and exhibits high reflectance. ZAL-45AA is pre-fired contains no organic binders and will produce no smoke or odors when heated. ZAL-45AA 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

Typical Composition, %	
Al ₂ O ₃	97
SiO ₂	3
Organic Content	0
Density, g/cc (pcf)	0.72 (45)
Maximum Use Temperature*, °C (°F)	
Continuous	1550 (2822)
Intermittent	1600* (2880)
Melting Point, °C (°F)	1870 (3392)
Open Porosity, %	70
Compressive Strength**, MPa (psi) at 10% Compression	3.4 (500)
Flexural Strength**, MPa (psi) at 10% Strain	2.1 (300)
Linear Shrinkage †, %	
1 hr. at 1500°C (2732°F)	2
1 hr. at 1600°C (2912°F)	6
Thermal Expansion Coefficient, RT to 1000°C (1832°F)	7.5x10 ⁻⁶ /°C (4.2x10 ⁻⁶ /°F)

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Characteristics & Properties Continued

Thermal Conductivity**, (ASTM C177-76) W/m ² K (BTU/hr ft ² °F/in)	
250°C (482°F)	0.16 (1.10)
525°C (977°F)	0.20 (1.40)
800°C (1472°F)	0.23 (1.60)
1075°C (1967°F)	0.29 (2.00)
1350°C (2462°F)	0.36 (2.50)
1650°C (3002°F)	0.43 (3.00)

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

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 in hot Solid Oxide Fuel Cells.

Backup thermal insulation in furnaces and thermal process systems operating to temperatures exceeding 2000°C (3632°F). Launderers, distribution boxes, pouring spouts, hot tops and others involving molten non ferrous metal contact where SiO₂ must be avoided.

Veneers, fixtures and setters for MIM sintering.

Electrical insulation in high-temperature systems operating to 1550°C (2822°F).

Availability of Standard Boards

ITEM #	DESCRIPTION
A13509	ZAL-45AA, 18"W x 24"L x 0.25"T
A13510	ZAL-45AA, 18"W x 24"L x 0.50"T
A13511	ZAL-45AA, 18"W x 24"L x 0.75"T
A13512	ZAL-45AA, 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 2"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.

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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