



Alumina Type CRYSTAL-18

General Information

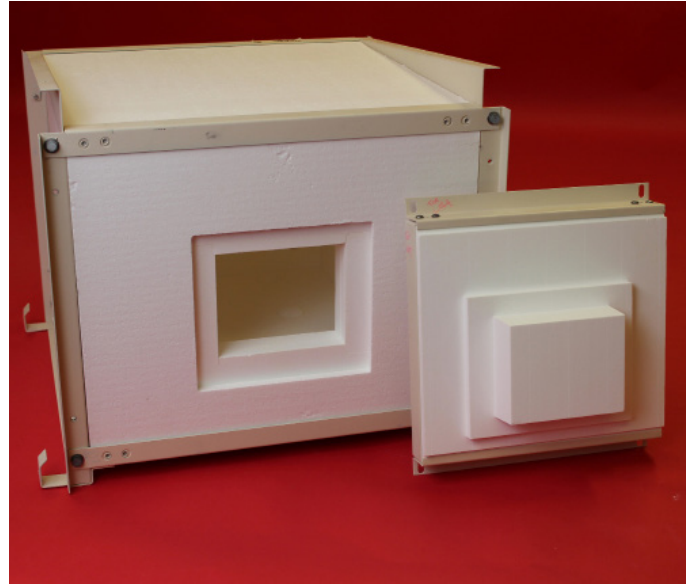
ZIRCAR Ceramics' Alumina Type CRYSTAL-18 insulating boards, cylinders and custom shapes are vacuum-formed combinations of polycrystalline (PCW) alumina fiber, high-purity Refractory Ceramic Fiber (RCF) and refractory binders. CRYSTAL-18 exhibits low thermal conductivity, good strength, superior thermal shock resistance and high dimensional stability in applications with continuous temperatures to 1550°C (2822°F).

CRYSTAL-18A is dried and contains a few wt% organic binder.

CRYSTAL-18B has been pre-fired and is organic-free.

CRYSTAL-18 exhibits an open-pore structure which readily accepts surface rigidizations or coating with ceramic adhesives. Such surface treatments enhance CRYSTAL-18's strength and handleability for use in MoSi₂ Heating Element Assemblies and other advanced systems.

CRYSTAL-18 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	65
SiO ₂	35
Density, g/cc (pcf)	0.29 (18)
Linear Shrinkage [‡] , %	
24 hrs at 1300°C (2372°F)	0.75
24 hrs at 1400°C (2552°F)	0.88
24 hrs at 1500°C (2732°F)	1.20
Compressive Strength** at 10% Compression, MPa (psi)	0.37 (54)
Cold Bending Strength (MOR), MPa (psi)	1.60 (232)
Specific Heat, J/kg K (BTU/lb °F)	920 (0.22)
Thermal Conductivity**, W/m K (BTU · in/ft ² · h · °F)	
400°C (752°F)	0.12 (0.83)
800°C (1472°F)	0.17 (1.2)
1200°C (2192°F)	0.3 (2.1)
1600°C (2912°F)	0.5 (3.5)

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.

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Technical Data Bulletin

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Page 1 of 2

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Suggested Applications

Primary thermal insulation in low mass furnaces and thermal process systems operating to continuous temperatures of 1550°C (2822°F) with intermittent use to 1600°C (2912°F).

Backup thermal insulation in furnaces and thermal process systems operating to temperatures exceeding 2000°C (3632°F). Reflector tiles in infrared paper drying equipment.

Launders, distribution boxes, pouring spouts, hot tops and others involving molten metal contact.

High temperature setters, supports and process fixtures.

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

Availability of Standard CRYSTAL-18

ITEM #	DESCRIPTION
A91A-01*	CRYSTAL-18A, 24"W x 36"L x 1" T
A91A-02*	CRYSTAL-18A, 24"W x 36"L x 2" T
A91A-03*	CRYSTAL-18A, 24"W x 36"L x 3" T
A91B-01	CRYSTAL-18B, 24"W x 36"L x 1" T
A91B-02	CRYSTAL-18B, 24"W x 36"L x 2" T
A91B-03	CRYSTAL-18B, 24"W x 36"L x 3" T
A65B-01	CRYSTAL-18B, 2"ID x 4"OD x 6"L
A65B-02	CRYSTAL-18B, 2"ID x 4"OD x 12"L
A65B-03	CRYSTAL-18B, 4"ID x 6"OD x 6"L
A65B-04	CRYSTAL-18B, 4"ID x 6"OD x 12"L
A65B-05	CRYSTAL-18B, 6"ID x 8"OD x 6"L
A65B-06	CRYSTAL-18B, 6"ID x 8"OD x 12"L

* Denotes standard stocked items.

To Order

Standard boards and cylinders: order online or specify quantity, item # and description.

Standard boards and cylinders 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 48"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.

Custom cylinders can be manufactured with IDs from 1" to 18" with 1/2" to 2" wall thickness and length up to 36"

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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