

Monofrax® CS-4 Alumina-Zirconia-Silica (AZS) Fused Cast Refractory

Product Description

Monofrax® CS-4 is the intermediate chemistry, 36.4% zirconia, of the three Monofrax AZS compositions. This material's properties, performance and cost are a compromise between CS-3 and CS-5. Superior resistance to high temperature corrosion by molten slags and glasses, structural stability, and high abrasion resistance result from the intergrowth of the zirconia and alumina crystalline phases and low open porosity.

Manufacturing Description

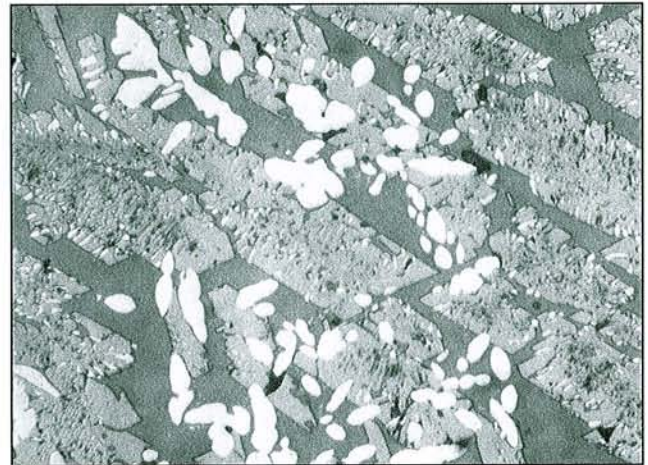
Monofrax CS-4 is melted and oxidized using a patented process in an electric arc furnace and poured into sand molds. It is typically produced using a void-free casting technique, although a limited amount of blocks are also made with regular cast technique. State-of-the-art grinding equipment is used to provide excellent joint quality and surface finish.

Typical Chemistry

ZrO ₂	36.4%
Al ₂ O ₃48%
SiO ₂	13.3%
Na ₂ O.....	<2%
Other.....	<1%

Typical Applications

- Glass furnace
 - Sidewalls and pavers
 - Superstructure
 - Electrode blocks
 - Throat
- Burner blocks
- Sodium silicate furnace linings



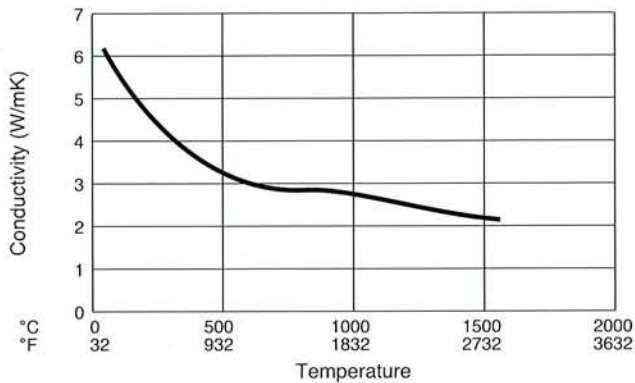
Micrograph Description

This photomicrograph shows the alumina, zirconia and silica phases present in CS-4. The light gray alumina forms flecked with white zirconia crystal-lites comprise the composite crystal phase. The larger white granules of zirconia are distributed throughout the microstructure. These crystalline phases, solidified from the melt, are fixed in a silica glassy matrix (dark gray areas).

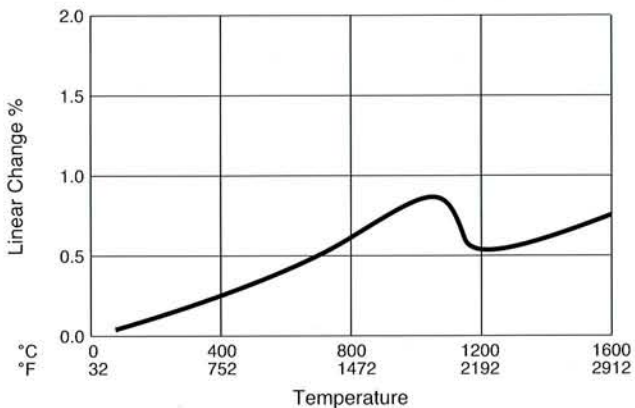


RHI Monofrax LTD
1870 New York Avenue
Falconer, New York 14733-1797
Telephone: 716-483-7200
Fax: 716-483-7273
www.rhi-ag.com
www.monofrax.com

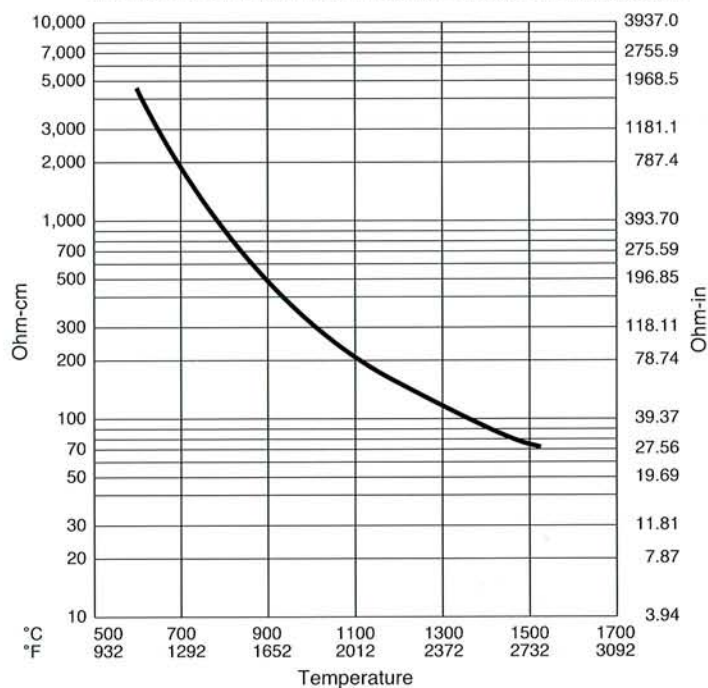
Typical Thermal Conductivity



Typical Thermal Expansion¹ (Refractoriness Under Load)



Typical Electrical Resistivity



Monofrax[®] CS-4 Alumina-Zirconia-Silica (AZS) Fused Cast Refractory

Typical Physical Properties:

Bulk Density lb/ft ³ (g/cm ³).....	236 (3.78)
(excluding shrinkage cavity)	
Apparent Porosity %.....	<1
Linear Change Under Load % ²	<1
Modulus of Rupture	
Cold psi (kg/cm ²) ³	8,600 (605)
Hot psi (kg/cm ²) ⁴	990 (70)
Cold Crushing Strength psi (kg/cm ²) ³	47,000 (3300)

Available Casting Techniques

- EPIC (Essentially void-free)
- DCL tile (Essentially void-free)
- EPIC-3 (Void-free)

1 ASTM C-832, 29psi
 2 DIN-51053, 29psi, 100 hours
 3 ASTM C-133
 4 ASTM C-583, 2750F, 3 hours

The information, recommendations and opinions set forth herein are offered solely for your consideration, inquiry and verification and are not, in part or total, to be construed as constituting a warranty or representation for which we assume legal responsibility. Nothing contained herein is to be interpreted as authorization to practice a patented invention without a license.

Monofrax[®] is a registered trademark of RHI Monofrax LTD.