

Monofrax® CS-5 Alumina-Zirconia-Silica (AZS) Fused Cast Refractory

Product Description

Monofrax® CS-5 has the highest zirconia to silica ratio of three Monofrax AZS compositions. Owing to a higher concentration of the ZrO_2 phase and lower concentration of the glassy phase, CS-5 offers the highest corrosion resistance to molten glass among the AZS refractories.

Manufacturing Description

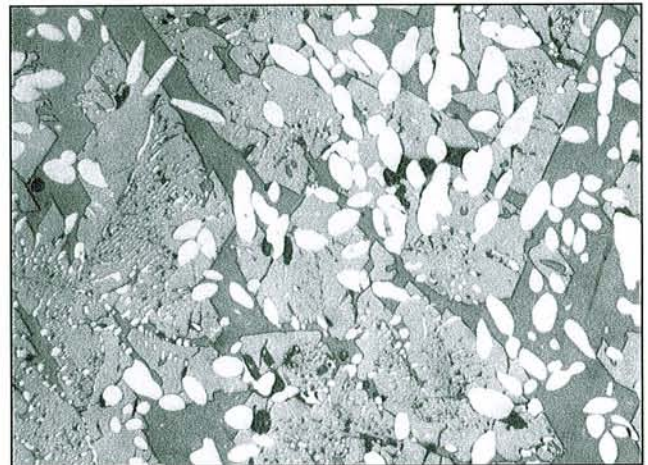
Monofrax CS-5 is melted and oxidized using a patented process in an electric arc furnace and poured into sand molds. This composition is typically produced using a void-free casting technique to provide maximum corrosion resistance. The annealing process is carefully optimized to achieve superior surface quality and overall physical and chemical properties. State-of-the-art grinding equipment is used to provide excellent joint quality.

Typical Chemistry

ZrO ₂	39.5%
Al ₂ O ₃	46%
SiO ₂	13%
Na ₂ O.....	1.1%
Other.....	<1%

Typical Applications

- Throats
- Electrode sidewall and bottom blocks
- Doghouse and hot zone sidewall blocks



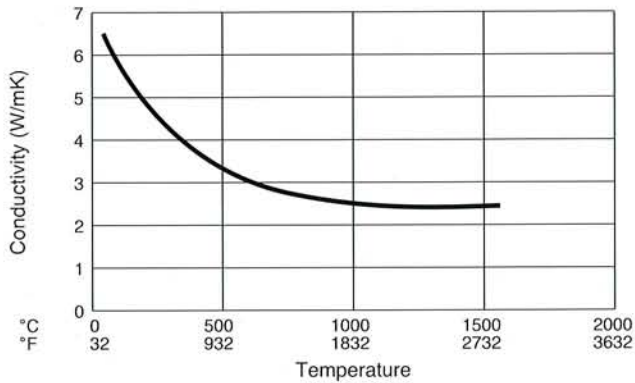
Micrograph Description

This photomicrograph shows the alumina, zirconia and silica phases present in CS-5. The light gray alumina contains the white, coprecipitated zirconia crystallites resulting in a composite crystal phase. The white rounded granules represent the high concentration of zirconia enriching this material. These crystalline phases, solidified from the melt, are fixed in a silica glassy matrix (dark gray areas).

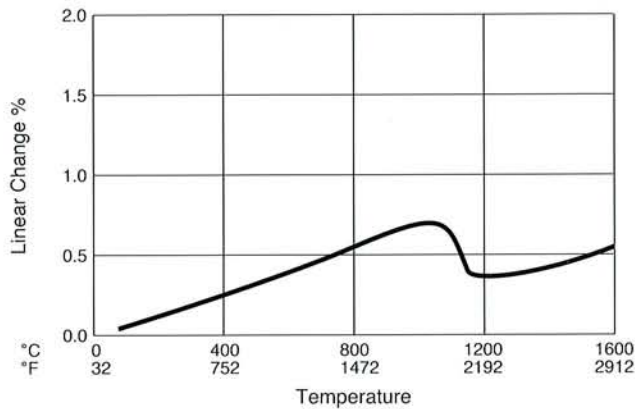


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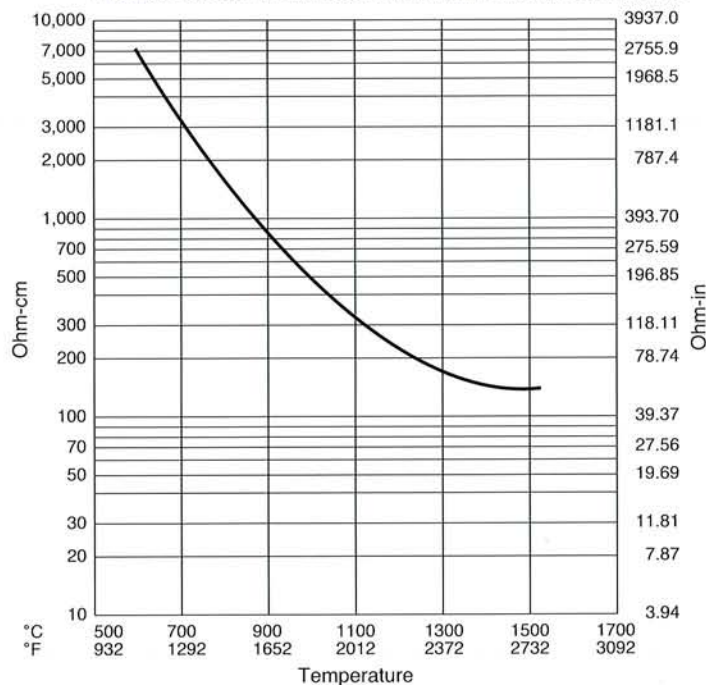
Typical Thermal Conductivity



Typical Thermal Expansion¹ (Refractoriness Under Load)



Typical Electrical Resistivity



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Typical Physical Properties:

Bulk Density lb/ft ³ (g/cm ³).....	245 (3.93)
(excluding shrinkage cavity)	
Apparent Porosity %.....	<1
Linear Change Under Load % ²	<1
Modulus of Rupture	
Cold psi (kg/cm ²) ³	10,200 (720)
Hot psi (kg/cm ²) ⁴	1,120 (79)
Cold Crushing Strength psi (kg/cm ²) ³	49,000 (3450)

Available Casting Techniques

- EPIC (Essentially void-free)
- DCL (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

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