



PSR-993

DENSE BONDED ALUMINA for the forehearth and distributor

PSR-993 is the bonded refractory alternative to fused-cast α - β alumina for use as glass contact refractory in the forehearth and distributor.

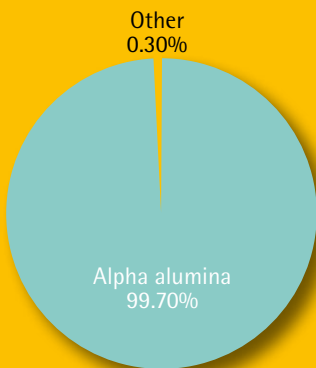
The result of a 5-year research and development programme at PSR this new material is a radical step forward in the manufacture of bonded glass contact refractories.

Composed almost entirely of alpha alumina, PSR-993 exhibits equivalent corrosion characteristics to fused-cast α - β alumina.

It differs from other high-alumina bonded refractory products by virtue of the fact that it is a single phase material manufactured entirely from alumina grains and powders.

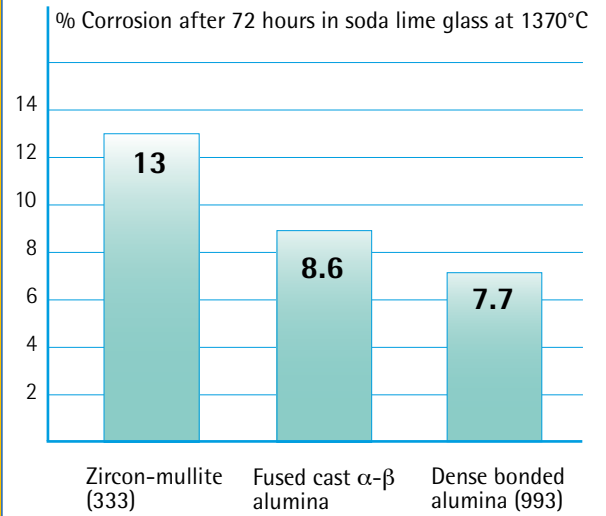
Sintering takes place at extreme temperatures in purpose built kilns.

Principal crystal phase of PSR-993



PSR-993 has virtually no glassy phase and therefore exhibits no exudation either on heatup or during service.

Static corrosion test conducted by Glass Technology Services in soda lime glass for 72 hours. PSR-993 lost 7.7% to corrosion compared with 8.6% corrosion from fused cast α - β alumina.



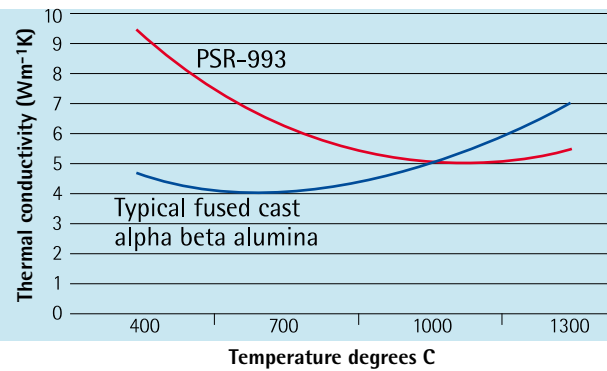
Pre-assembly of distributor glass contact blocks in PSR-993

With its high density and low porosity, PSR-993 is more thermally conductive than most bonded refractories yet compares well with fused cast α - β alumina. Lower substructure interface temperatures will contribute to lower penetration of glass at the refractory joints and heat-losses from the forehearth and distributor substructure will be reduced.

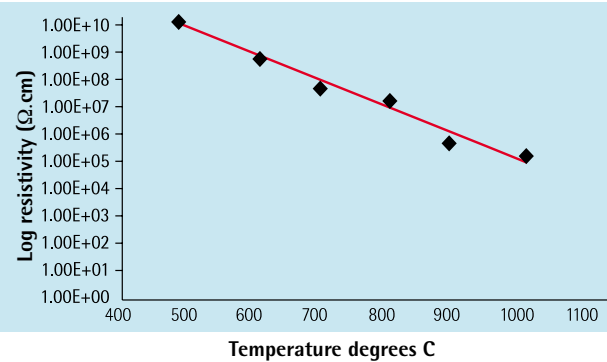
The electrical resistivity of PSR-993 is approximately 10 times that of fused cast α - β alumina. This is especially relevant for electrically heated forehearths, or for those forehearths with additional electrode heating for side-to-side trim control.

Thermal expansion is linear. Permanent linear change (PLC) is zero.

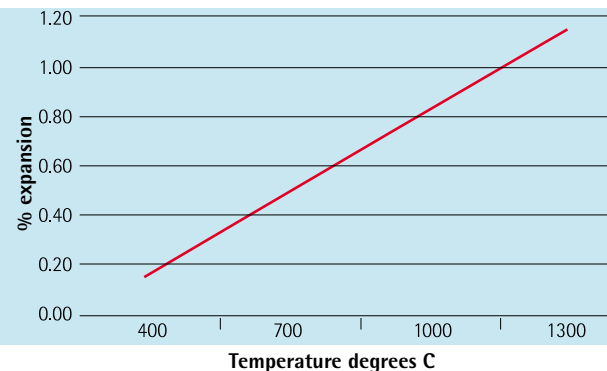
Thermal conductivity of PSR-993



Electrical resistivity of PSR-993



Linear expansion of PSR-993



Typical chemical & physical properties

	PSR-993 (dense bonded alumina)
Al ₂ O ₃	99.7%
SiO ₂	nil
ZrO ₂	nil
Vitreous phase	nil
Bulk Density	3400 kg m ⁻³
Cold crushing strength	474 M Pa
Modulus of Rupture	55 M Pa
Apparent solid density	3750 kg m ⁻³
Apparent Porosity	11%

All values are average and subject to change without notice.

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Cross-section of bubble & stone test samples of fused cast α - β alumina (left) and PSR-993 (right). Each sample had a 20mm diameter hole filled with soda lime glass at 1370°C for 72 hours.

Bubble & stone tests

Samples of PSR-993 and PSR-333 were submitted to Glass Technology Services for comparison against standard fused cast α - β alumina samples. Their comments were as follows.

"993 looks to be comparable to the fused cast α - β alumina sample and better than 333. There are a few sub 1mm bubbles, but no bubbles at the base of the sample itself. The glass colour is also good. The GTS value for this would be 6, just slightly better than the fused cast α - β alumina sample."

