

環球物源有限公司

Sino-Global Sourcing & Supply Limited

3705, Bank of America Tower, Suite 603, 12 Harcourt Road, Central Hongkong

Ceramic Cup

“New Refractory Strategy for Improved BF Campaign Life”

SPECIFICATIONS			
Properties	Index	Category	
		HEARTHSTONE	HEARTHSTONE Plus
Chemical compositions (%)	$Al_2O_3 \geq$	80	85
	$Fe_2O_3 \leq$	1.00	0.8
Bulk density (g/cm^3)	\geq	3.10	3.20
Apparent porosity (%)	\leq	16	14
Cold crushing strength (MPa)	\geq	140	160
Permiability (mDa)	\leq	1.00	0.50
Corrosion index to hot metal (%)	\leq	1.50	1.00
Corrosion resistance to slag (%)	\leq	8.00	6.00
Average pore size (μm)	\leq	0.50	0.30
< 1 μm Pore volume (%)	\geq	70	75
TC (600°C) W/m.k	\leq	5	5
Corrosion resistance to alkaline		Excellent, no cracks	Excellent, no cracks

In a Blast Furnace, Hearth life is a major aspect of economic hot metal production. In spite of the achievement of Hearth life of 10 to 15 years, and upto 21 years in Japan, further investigation of measures to increase life and to improve it in practice is need of the hour. The increase in use of high capacity Blast Furnaces has increased the plant productivity, nevertheless, it has impaired plant flexibility.

The development of appropriate repair techniques means the area above the tuyeres no longer determines the length of a furnace campaign. Hearth life now becomes the decisive factor. For this reason, extending the service life of this area and reducing maintenance times by improved relining methods, is imperative.

Apart from the Thermal solution, Ceramic solution has been gaining importance in the Hearth lining. Wear, as result of the dissolution of Carbon by unsaturated hot metal, can be prevented by using Carbon qualities with good thermal conductivity, coupled with intensified Hearth cooling. To displace the dissolution isotherm of Carbon from **1150° C** as far as possible to the hot side, an attempt was made to build up a solidified protective layer in front of the Carbon and thus control heat flow.

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Since a high level of heat flow is an undesirable outcome from the energy viewpoint, the installation of a ceramic bottom layer on the upper carbon stratum is a measure being taken. This terminates the premature wear in the bottom and reduces heat loss as a result of bottom cooling. This type of relining, using the Ceramic Solution emerged partly as a result of good experiences in Hearth life with these ceramic bottom layers. Ceramic bottom supplemented with ceramic material sidewall lining is the origin of CERAMIC CUP. Ceramic bricks used to protect the bottom coupled with their use to clad sidewalls, make the **CERAMIC CUP**.

A study made by **Thyssen Krupp Stahl AG Germany**, suggested that use of Ceramic Cup of "**corundum with Sialon bonding**" completely eliminated the Hearth breakouts being experienced by them. Sialon bonding is a solid solution combination of silicon nitride and aluminium oxide

