



NEW PRODUCTS

FOR

COPPER INDUSTRY

AUGUST 2017

Newly Developed Semi Re-bonded Magnesia-chrome brick for Copper Furnaces

TRL SW HSR 1 and **TRL SW HSR 2** are two new generation semi re-bonded magnesia chrome bricks developed recently by TRL Krosaki. The specialty of this newly developed products are explained below.

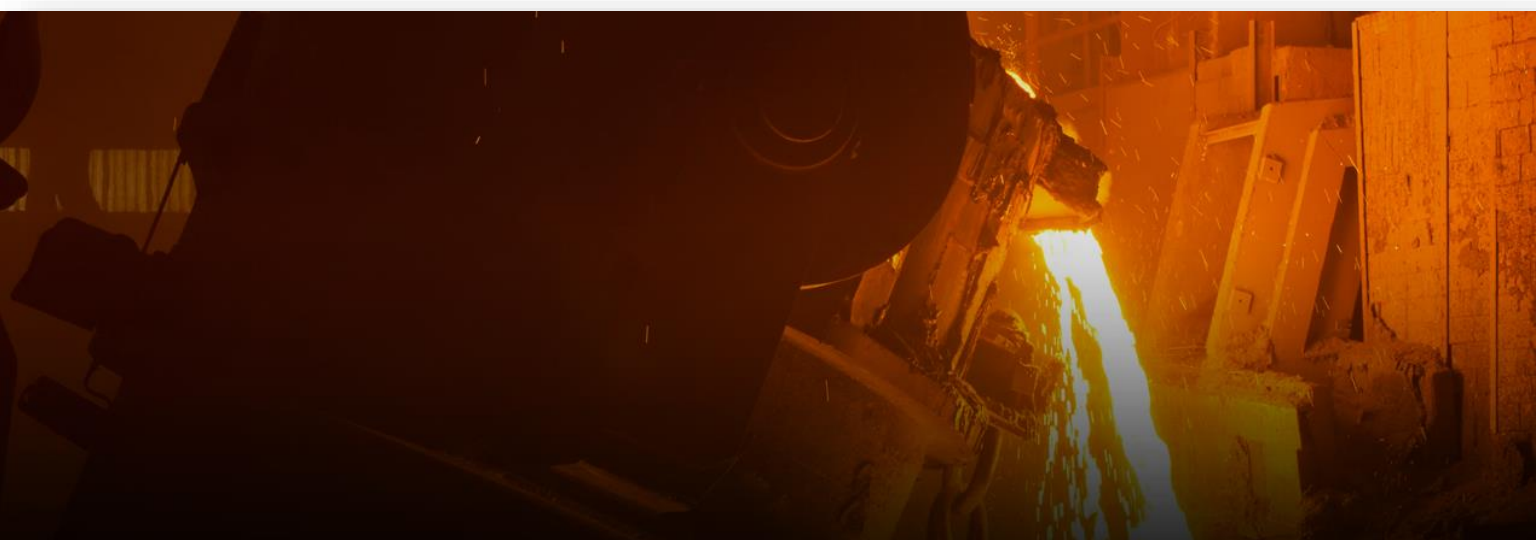
Raw Material Base: These two products are based exclusively on top grade Magnesia, Chrome Ore and a specially designed mag-chrome Co-clinker. Chemically, this Co-clinker is very pure, having very low SiO_2 and Fe_2O_3 and at the same time a high Cr_2O_3 content. The matrix is very dense (BD: 3.75 gm/cc) with a low porosity. The lower Fe_2O_3 content makes the grain very stable under redox conditions and minimizes the risk of bursting of Chrome ore under the said environment. The low content of minor phases leads to an excellent slag corrosion resistance.

Slag corrosion test

The slag corrosion test performed under standardized conditions showed an outstanding corrosion resistance in comparison with other products.

Test 5 and 6 are showing the results of the 2 newly developed products:

	Thickness Before Corrosion (mm)	Thickness after Corrosion (mm)	Corrosion (%)
Trial-1	38.79	32.5	16.2
Trial-2	38.94	32.27	17.1
Trial-3	38.84	35.47	8.7
Trial-4	38.71	37.78	3.7
Trial-5	39.07	38.5	1.5
Trial-6	38.54	37.82	1.8

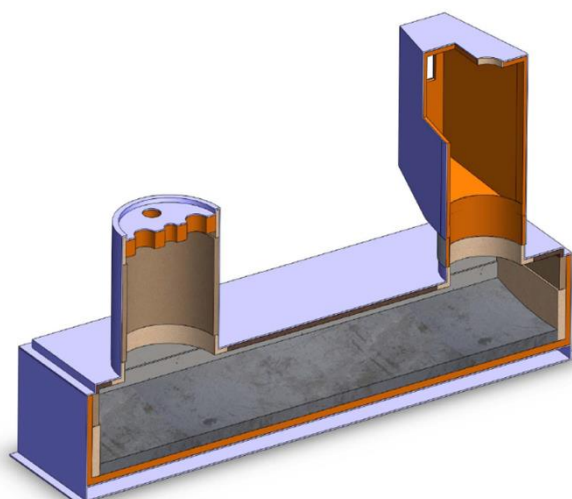
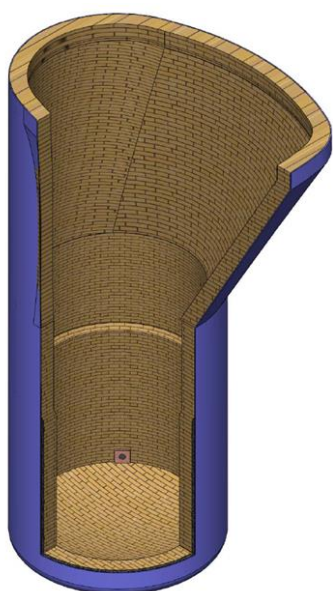


Special Features:

- Lower Apparent Porosity, higher Bulk Density and higher Cold Crushing strength.
- Low Fe_2O_3 content in spite of higher Cr_2O_3 content which is beneficial in redox environment.
- From Pore Size Distribution we can see a higher percentage of finer pores and as a result an improved slag corrosion resistance in comparison to standard DBMC qualities. Also the slag corrosion resistance is improved due to the low content of minor phases
- Hydration Resistance is better than existing DBMC bricks because of a special anti-hydrating additive used in the brick composition during post firing treatment.

Recommendation for use:

- TSL (Top Submerged Lance) Furnace - [Cylinder lower part](#)
- Rotary Holding Furnace - [Bath area](#)
- Flash Smelting Furnace – [Settler side wall](#)
- Slag Cleaning Furnace (EAF): [Lower side wall](#)
- PS Converter - [Tuyere area](#)
- Anode Furnace - [Slag Zone](#)



Revision No.: 00			Date: 30.06.2017	
Product Name:	TRL SW HSR1			
Product Description:	Semi Re-bonded Magnesia Chrome Brick based on high purity Magnesia, Chrome Ore & magnesia chrome co-clinker. This is a newly developed brick having better hydration and slag corrosion resistance			
Application:	Different furnaces in Non-ferrous industries – Area of High Corrosion & Erosion			
CONTROL PROPERTIES:				
Chemical Analysis (Calcined Basis)	Unit by wt	Value		Test Method
		Typical	Limit	
MgO	%	54.8	≥ 53.0	By XRF
Cr ₂ O ₃	%	23.7	≥ 22.0	
SiO ₂	%	0.8	≤ 1.0	
Fe ₂ O ₃	%	8.7	-	
Al ₂ O ₃	%	6.7	-	
CaO	%	1.0	-	
Physical Properties	Unit			
App. porosity	Vol. %	12.4	≤ 14.0	ISO 5017: 1998
Bulk Density	gm/cc	3.32	≥ 3.30	ISO 5017: 1998
CCS	Kg/cm ²	685	≥ 600	ISO 10059-2:2003
RUL (t _a) at 2 kg/cm ²	°C	1740	≥ 1720	IS 1528- Part 2
Supplementary Properties (for information only)				
PLC at 1500°C/2 hrs	%	+ 0.31		ISO 2478:1987
Thermal Expansion at 1200°C	%	1.18		IS 1528 (Part 19) : 1991
Control Dimensions:	AQL 6.5% for critical dimensions (ISO 5022)			
Shelf Life	12 months from the date of manufacture when stored under shed and free from moisture			
Technology Manager				Signature:
Contact Address	TRL Krosaki Refractories Limited P.O.- Belpahar, Dist.- Jharsuguda, Odisha, Pin- 768 218, INDIA Phone: 91-6645-250286 Information department: Technology Division			



TRL SW HSR-1

(Formerly Tata Refractories Limited)
Product Definition Sheet

Revision No.: 00			Date: 30.06.2017	
Product Name:	TRL SW HSR2			
Product Description:	Semi Re-bonded Magnesia Chrome Brick based on high purity Magnesia, Chrome Ore & magnesia chrome co-clinker. This is a newly developed brick having better hydration and slag corrosion resistance			
Application:	Different furnaces in Non-ferrous industries – Area of High Corrosion & Erosion			
CONTROL PROPERTIES:				
Chemical Analysis (Calcined Basis)	Unit by wt	Value		Test Method
		Typical	Limit	
MgO	%	53.6	≥ 52.0	By XRF
Cr ₂ O ₃	%	23.9	≥ 22.0	
SiO ₂	%	0.8	≤ 1.0	
Fe ₂ O ₃	%	8.9	-	
Al ₂ O ₃	%	6.9	-	
CaO	%	1.1	-	
Physical Properties	Unit			
App. porosity	Vol. %	12.2	≤ 14.0	ISO 5017: 1998
Bulk Density	gm/cc	3.34	≥ 3.32	ISO 5017: 1998
CCS	Kg/cm ²	735	≥ 650	ISO 10059-2:2003
RUL (t _a) at 2 kg/cm ²	°C	+ 1750	≥ 1750	IS 1528- Part 2
Supplementary Properties (for information only)				
PLC at 1500°C/2 hrs	%	+ 0.27		ISO 2478:1987
Thermal Expansion at 1200°C	%	1.28		IS 1528 (Part 19) : 1991
Control Dimensions:	AQL 6.5% for critical dimensions (ISO 5022)			
Shelf Life	12 months from the date of manufacture when stored under shed and free from moisture			
Technology Manager				Signature:
Contact Address	TRL Krosaki Refractories Limited P.O.- Belpahar, Dist.- Jharsuguda, Odisha, Pin- 768 218, INDIA Phone: 91-6645-250286 Information department: Technology Division			



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