



NEW PRODUCTS

FOR

COPPER INDUSTRY



SEPTEMBER 2017

TRL CRAL 25 P and TRL CRAL 30P

Newly developed Alumina Chrome bricks for the copper industry

Furnace availability and long lasting refractory linings are a key to the profitability of copper smelters. At the same time smelting conditions are intensified and the raw material quality is deteriorating.

In order to have balanced refractory linings that can withstand corrosive slags under turbulent conditions new refractory products are needed.

Top grade raw material mixture – No compromise

TRL Krosaki has searched for the best available raw materials and production procedures in order to achieve outstanding refractory properties. The new qualities are combining low porosity, high volume stability and good thermal shock resistance along with high bulk density and excellent corrosion resistance towards acidic slags.

Slag resistance testing

In the performed standardized slag corrosion tests in a rotary kiln the newly designed brick qualities TRL CRAL 25 P and TRL CRAL 30P showed after 6 hours at 1.500°C in contact with an acidic slag almost no corrosion. At the same time, a standard DBMC brick experienced already 16% wear under these conditions.



Figure 1:
Furnace for standardized slag
Corrosion tests



Figure 2:
DBMC brick
after the test



Figure 3:
TRL CRAL 30P
after the test

TRL CRAL 25 P and TRL CRAL 30P

"The key corner stone to balance a refractory lining"

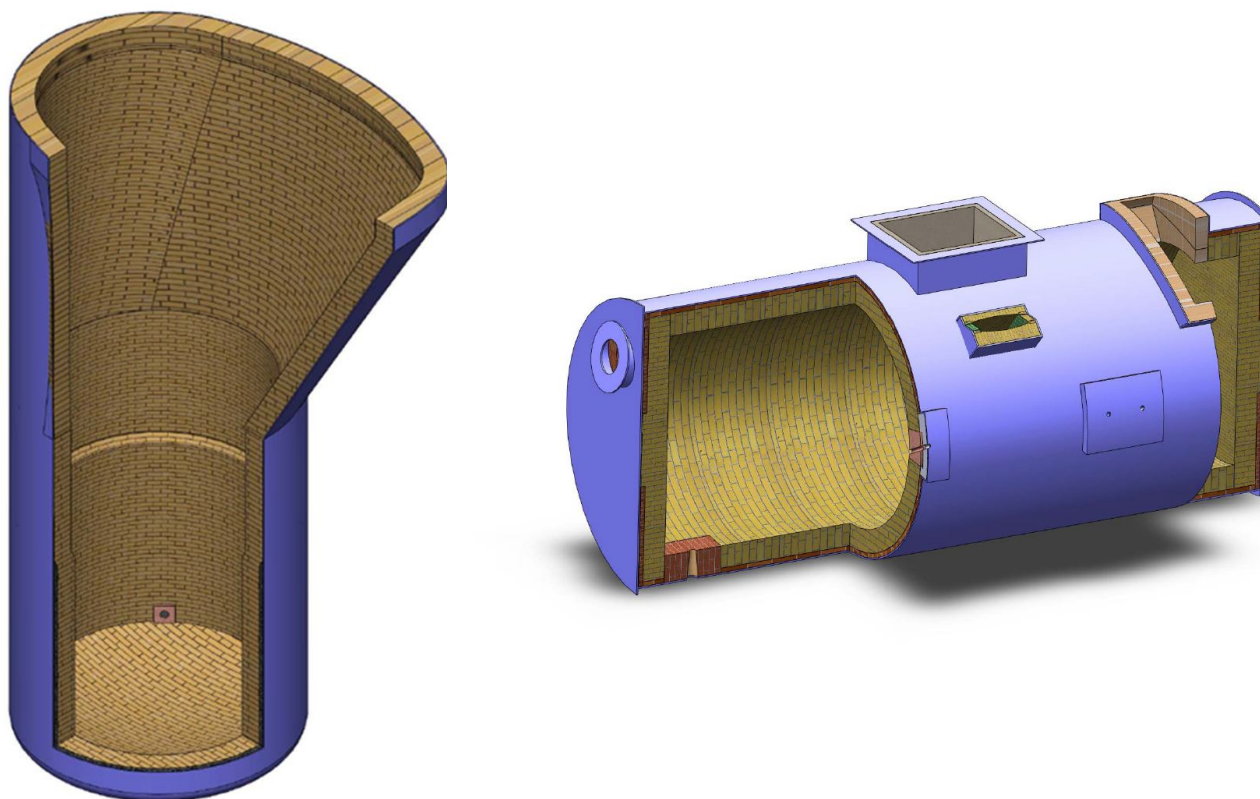
Special Features:

- Excellent slag corrosion resistance
- Good hydration resistance
- Good thermal shock resistance
- High refractoriness under Load
- High volume stability


Recommendation for use in high wear areas:

TSL Furnace - Slag zone & Tap Holes

Anode Furnace - Tuyere blocks



TECH/FRM/03

 (Formerly Tata Refractories Limited) Product Definition Sheet		TRL CRAL 25P (F310072)		
Revision No. : 00		Date: 15.07.2017		
Product Name	TRL CRAL 25P			
Product Description	Fired Alumina – Chrome Brick			
Application	Copper, Nickel, Lead, Zinc, Ferro Alloy, Incinerators, Glass tank furnace Regenerator Checkers etc.			
CONTROL PROPERTIES				
Chemical Analysis (Calcined Basis)	Unit By wt	Value		Test Method
		Typical	Limit	
Al ₂ O ₃	%	63.5	≥ 62.0	By XRF
Fe ₂ O ₃	%	0.66	≤ 0.70	
CaO+MgO	%	1.37	≤ 1.45	
SiO ₂	%	8.70	≤ 10.0	
Cr ₂ O ₃	%	26.20	≥ 25.0	
Physical Properties	Unit			
Bulk Density	Kg/m ³	3220	≥ 3200	ISO 5017 : 1998
Apparent porosity	Vol. %	18.8	≤ 20.0	ISO 5017 : 1998
CCS	N/mm ²	65.0	≥ 60	ISO 10059-2 : 2003
SUPPLEMENTARY PROPERTIES				
PLC, 1600°C/2hrs, Min/Max	%	+ 0.22	± 0.35	ISO 2478 : 1987 (Volumetric Method)
RUL(t _a)	°C	1740	≥ 1700	IS 1528 (Part 2) : 2003
MOR at 1500°C	N/mm ²	8.5	≥ 8.0	ISO 5013 : 1985
Thermal Shock resistance	Cycles	+05	≥ 05	DIN 51068
PCE	OC	+37	≥ 37	ISO 528 : 1983
Control Dimension	AQL 6.5% for critical dimensions (ISO 5022 Table – 3)			
Sampling/Acceptance	ISO 5022, Table 4 or Table 10(AQL4%)			
Shelf Life	36 months from the date of manufacture when stored under shed & free from moisture.		Signature:	
Prepared and Issued by	Technology Manager			
Contact Address	TRL Krosaki Refractories Limited P.O – Belpahar, Dist.- Jharsuguda Odisha, Pin-768218 ,India Phone: 91-6645-250286 Information department: Technology Division			

Note: 1) The typical technical data shown are based on average results on production samples and are subjected to normal variation on individual tests. Hence, it cannot be taken as specification.

2) The above specification is valid for solid pressed standard items only.

TECH/FRM/03



(Formerly Tata Refractories Limited)
Product Definition Sheet

TRL CRAL 30P
 (F310071)

Revision No. : 00

Date: 15.07.2017

Product Name	TRL CRAL 30P
Product Description	Fired Alumina – Chrome Brick
Application	Copper, Nickel, Lead, Zinc, Ferro Alloy, Incinerators, Glass tank furnace Regenerator Checkers etc.

CONTROL PROPERTIES

Chemical Analysis (Calcined Basis)	Unit By wt	Value		Test Method
		Typical	Limit	
Al ₂ O ₃	%	54.5	≥ 52.0	By XRF
Fe ₂ O ₃	%	0.64	≤ 0.70	
CaO+MgO	%	1.32	≤ 1.40	
SiO ₂	%	7.20	≤ 8.0	
Cr ₂ O ₃	%	30.40	≥ 30.0	
Physical Properties	Unit			
Bulk Density	Kg/m ³	3120	≥ 3050	ISO 5017 : 1998
Apparent porosity	Vol. %	20.5	≤ 22.0	ISO 5017 : 1998
CCS	N/mm ²	60.0	≥ 55	ISO 10059-2 : 2003

SUPPLEMENTARY PROPERTIES

PLC, 1600°C/2hrs, Min/Max	%	+ 0.17	± 0.35	ISO 2478 : 1987 (Volumetric Method)
RUL(t _a)	°C	1740	≥ 1700	IS 1528 (Part 2) : 2003
MOR at 1500°C	N/mm ²	4.5	≥ 4.0	ISO 5013 : 1985
Thermal Shock resistance	Cycles	+03	≥ 03	DIN 51068
PCE	OC	+38	≥ 38	ISO 528 : 1983

Control Dimension	AQL 6.5% for critical dimensions (ISO 5022 Table – 3)			
Sampling/Acceptance	ISO 5022, Table 4 or Table 10(AQL4%)			
Shelf Life	36 months from the date of manufacture when stored under shed & free from moisture.			Signature:
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