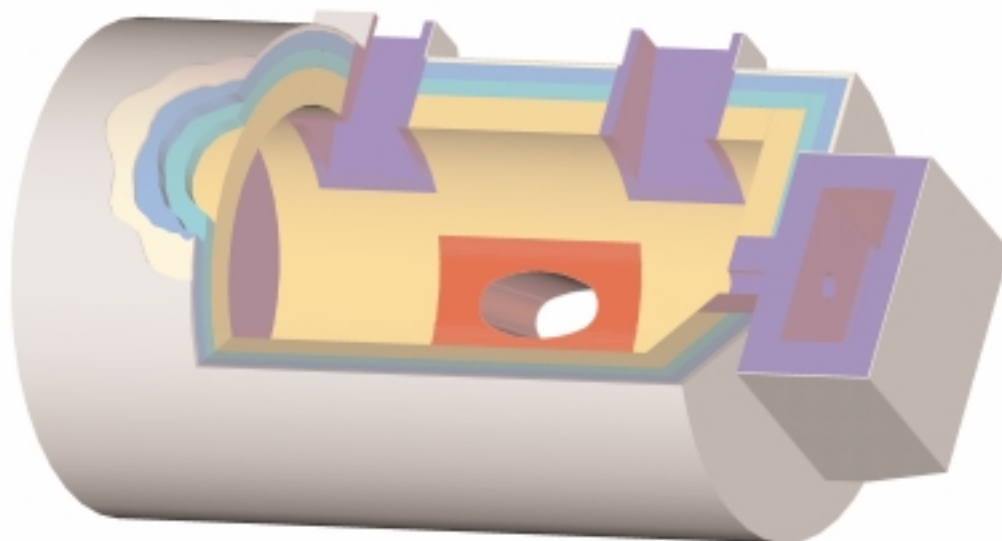


Channel Induction Refractories

For Industrial Foundries



HORIZONTAL CHANNEL INDUCTION FURNACES



Service Conditions

- Gray & Malleable Iron:
 - Temperatures of 2750°F +
 - Slag Buildup
- Ductile Iron:
 - Temperatures of 2800°F +
 - CaC₂ & MgO Attack
 - Slag Line Erosion
 - More Use of Chrome Containing Brick

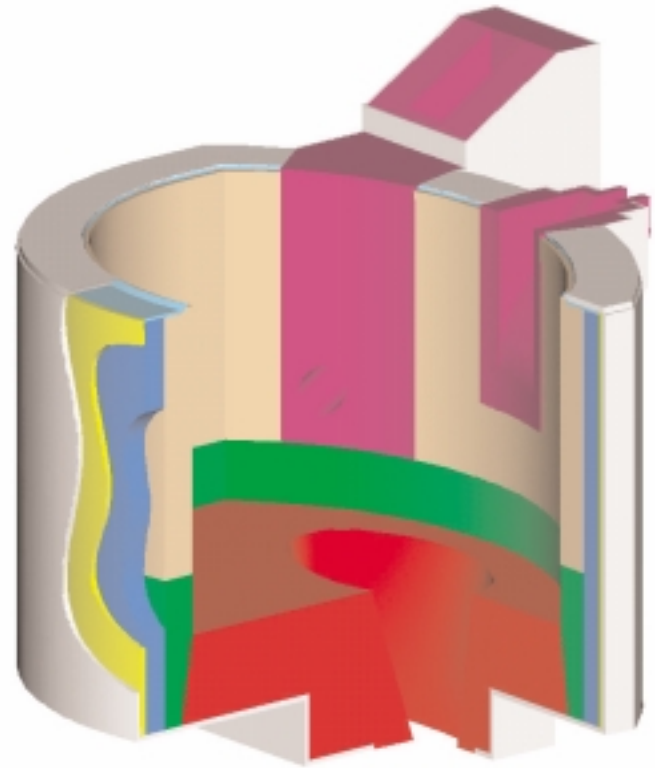
Horizontal Channel Induction Furnace Refractory Selection

Operating Conditions	Slag & Metal Contact	Slag & Metal Backup	Crown	Receivers & Pour Spouts	Repair & Maintenance
Gray Iron	CORAL® BP KORUNDAL® XD	CLIPPER® DP	CORAL® BP	KORUNDAL® PLASTIC D-CAST 85TMCC GREENCAST®-94	KORUNDAL® PLASTIC
Malleable Iron	TUFLINE® 90 KORUNDAL® XD KORUNDAL XD® DM	KRUZITE® 70 CORAL® BP	CORAL® BP UFALA® XCR KORUNDAL XD®	KORUNDAL® PLASTIC D-CAST TRC-SR-CC FUSECRETE® C, C6, C10	GREENPAK-90-P
Ductile Iron	KORUNDAL XD® KORUNDAL XD® DM RUBY® RUBU® DM	KRUZITE®-70 DV-38	UFALA® XCR TUFLINE® 90 KORUNDAL XD®	RUBY® PLASTIC AMC RUBY® PLASTIC 10 FUSECRETE® C, C6, C10	RUBY® PLASTIC 10

VERTICAL CHANNEL INDUCTION FURNACES

Service Conditions

- Gray & Malleable Iron:
 - Temperatures of 2750°F +
 - Slag Buildup
- Ductile Iron:
 - Temperatures of 2800°F +
 - CaC₂ & MgO Attack
 - Slag Line Erosion
- Thermal Shock a Concern for Furnaces Without a Receiver.



Vertical Channel Induction Furnace Refractory Selection

Operating Conditions	Slag & Metal Contact Brick	Slag & Metal Contact Monolithic	Slag & Metal Backup	Roof	Receivers & Pour Spouts	Repair & Maintenance
Gray Iron	CORAL® BP KORUNDAL® XD	NARPHOS 85R RAM D-CAST 85TMCC	CLIPPER® DP	KAST-O-LITE® 97-L EXPRESS®-30 MIZZOU CASTABLE®	KORUNDAL® PLASTIC D-CAST 85TMCC GREENCAST®-94	KORUNDAL® PLASTIC GREFCOTE® 50
Malleable Iron	TUFLINE® 90 KORUNDAL XD® KORUNDAL XD® DM	HP CAST ULTRA D-CAST TRC-SR-CC	KRUZITE®-70 CORAL® BP	KAST-O-LITE® 97-L EXPRESS®-30 MIZZOU® CASTABLE®	KORUNDAL® PLASTIC D-CAST TRC-SR-CC FUSECRETE® C, C6, C10	GREENPAK-90-P GREFCOTE® 70
Ductile Iron	KORUNDAL XD® KORUNDAL XD® DM RUBY® RUBY® DM	RUBY® RAMMING MIX FUSECRETE C, C6, C10	KRUZITE®-70 DV-38	KAST-O-LITE® 97-L EXPRESS®-30 MIZZOU CASTABLE®	RUBY® PLASTIC AMC RUBY® PLASTIC 10 FUSECRETE® C, C6, C10	RUBY® PLASTIC 10 KORUNDAL® HOT GUN



RUBY® RAMMING MIX lining the upper case and KORUNDAL XD® forming the jack arch and floor.

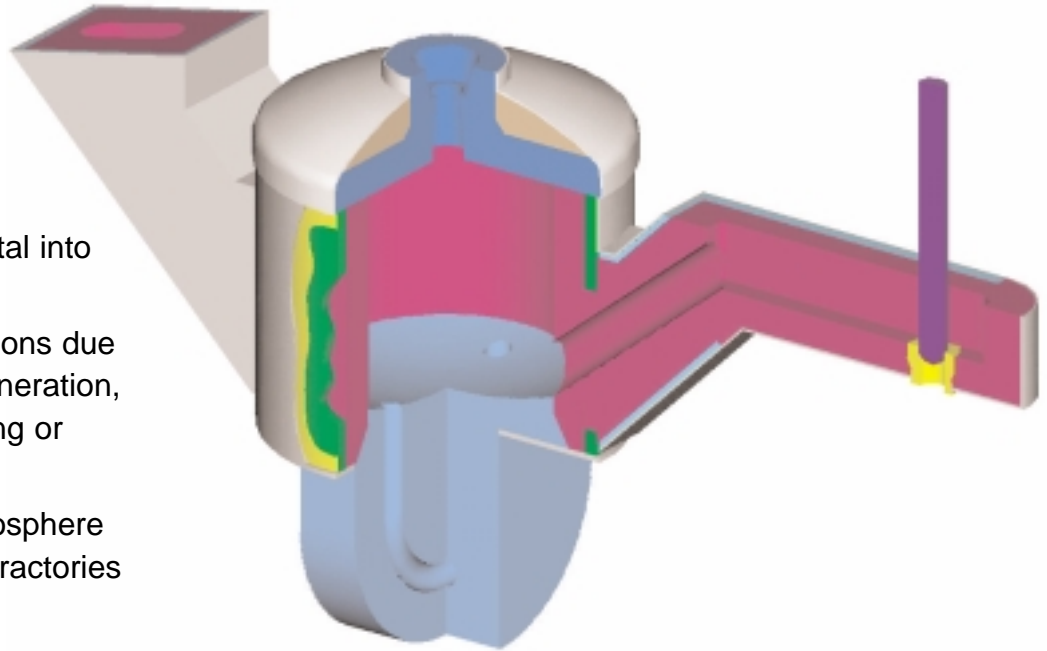


D-CAST TRC-SR-CC being pump cast into the pour spout and receiver.

PRESSURE POUR CHANNEL INDUCTION FURNACES

Service Conditions

- Narrow Inlet & Outlets
Prone to Choking
- Pressure Can Force Metal into
Open Cracks & Porosity
- Milder Operating Conditions due
to Reduction in Slag Generation,
and the Absence of Tilting or
Rolling Movements
- Potential Reducing Atmosphere
Can Reduce SiO₂ in Refractories



Pressure Pour Channel Induction Refractory Selection

Operating Conditions	Slag & Metal Contact	Slag & Metal Backup	Roof	Receivers & Pour Spouts	Repair & Maintenance
Gray Iron	NARPHOS 90R RAM D-CAST 85TMCC	KAST-O-LITE® 23 ES	KAST-O-LITE® 97-L	KORUNDAL® PLASTIC D-CAST 85TMCC GREENCAST®-94	KORUNDAL® PLASTIC
Malleable Iron	HP CAST ULTRA D-CAST TRC-SR-CC	KAST-O-LITE® 26 LI	KAST-O-LITE® 97-L	KORUNDAL® PLASTIC D-CAST TRC-SR-CC FUSECRETE® C, C6, C10	GREENPAK-90-P
Ductile Iron	RUBY® RAMMING MIX FUSECRETE® C, C6, C10	KAST-O-LITE® 26 LI	KAST-O-LITE® 97-L	RUBY® PLASTIC AMC RUBY® PLASTIC 10 FUSECRETE® C, C6, C10	RUBY® PLASTIC 10



D-CAST TRC-SR-CC showing little signs of wear after 1 plus years of service in a pouring arm.



CHANNEL INDUCTION REFRACTORIES for Industrial Foundries

Technical Data Brick

Brand	KRUZITE® -70	DV-38	UFALA® XCR	TUFLINE® 90	KORUNDAL XD®	KORUNDAL XD® DM	RUBY®	RUBY® DM
Density, pcf	165	179	159	182	186	195	198	213
Apparent Porosity, %	18.7	14.0	14.1	17.6	16.1	12.4	17.8	12.6
Crushing Strength, psi At 70°F	8,500	18,000	7,400	11,500	11,350	16,000	12,500	19,450
Modulus of Rupture, psi At 70°F At 2700°F	1,700 --	3,400 --	2,200 --	1,730 1,050	2,330 1,320	3,840 1,930	4,500 1,890	7,150 4,000
Chemical Analysis, % (Approximate)								
Alumina (Al ₂ O ₃)	71.0	80.4	60.3	89.1	90.1	90.3	89.7	89.6
Silica (SiO ₂)	23.0	11.0	36.8	9.7	9.5	9.2	0.5	0.3
Titania (TiO ₂)	3.4	2.5	1.3	0.6	Trace	Trace	0.1	Trace
Iron Oxide (Fe ₂ O ₃)	1.6	1.3	1.1	0.3	0.1	0.1	0.2	0.1
Lime (CaO)	0.2	0.1	0.1	0.1	0.1	0.1	0.3	0.1
Magnesia (MgO)	0.2	0.1	0.1	Trace	Trace	0.1	0.1	Trace
Alkalies (Na ₂ O+K ₂ O)	0.6	0.2	0.3	0.2	0.2	0.2	0.1	0.1
Chromic Oxide (Cr ₂ O ₃)	--	--	--	--	--	--	9.0	9.8
Phosphorus Pentoxide (P ₂ O ₅)	--	4.4	--	--	--	--	--	--

Technical Data Monolithic Products

Brand	KORUNDAL® PLASTIC	KORUNDAL® HOT GUN	GREENCAST® 94	HP-CAST ULTRA	D-CAST 85TMCC	RUBY® PLASTIC AMC	FUSECRETE® C10	D-CAST TRC-SR-CC	RUBY® RAM MIX
Density, pcf After Drying,	175	146	172	195	182	167	192	194	203
Crushing Strength, psi After 230°F After 1500°F	-- --	680 980	9,000 9,500	7,000 9,500	9,200 13,200	-- --	3,225 2,580	6,500 --	12,500 14,800
Modulus of Rupture, psi After 230°F After 1500°F	-- 2,180	340 340	1,700 1,750	2,000 2,500	1,400 2,600	(500°F) 1,160 1,400	1,040 720	1,900 --	3,000 3,700
Chemical Analysis, % (Approximate)									
Alumina (Al ₂ O ₃)	87.1	88.8	94.1	96.3	83.1	61.0	85.6	72.5	83.8
Silica (SiO ₂)	8.5	8.4	0.2	0.1	11.0	18.1	0.6	6.1	1.8
Titania (TiO ₂)	0.1	0.5	0.1	--	2.8	1.7	1.7	1.6	Trace
Iron Oxide (Fe ₂ O ₃)	0.2	0.4	0.2	0.1	1.0	0.7	0.2	0.1	0.1
Lime (CaO)	0.1	1.6	5.1	2.5	1.4	0.1	1.7	1.2	0.1
Magnesia (MgO)	0.1	0.1	0.1	0.8	0.1	0.2	0.2	0.1	0.1
Alkalies (Na ₂ O+K ₂ O)	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.2
Phosphorous Pentoxide (P ₂ O ₅)	3.7	--	--	--	--	3.7	--	--	3.8
Chromic Oxide (Cr ₂ O ₃)	--	--	--	--	--	14.3	9.9	--	10.1
Silicon Carbide + Carbon (SiC + C)	--	--	--	--	--	--	--	18.0	--

The data given above are based on averages of tests results on samples selected from routine plant production by standard A.S.T.M. procedures where applicable. Variation from the above data may occur in individual tests. These results cannot be taken as minima or maxima for specification purposes. All statements, information, and data given herein are believed to be accurate and reliable but are presented without guarantee, warranty, or responsibility of any kind, expressed or implied. Statements or suggestions concerning possible use of our products are made without representation or warranty that any such product is fit for such use or that such use is free of patent infringement of a third party. The suggested use assumes that all safety measures are taken by the user.



Harbison-Walker Refractories Company
400 Fairway Drive
Moon Township, PA 15108

www.hwr.com

Phone: (412) 375-6600 - Fax: (412) 375-6783