



SERVING THE METALS INDUSTRY FOR 30 YEARS



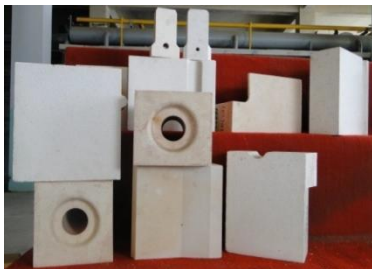
STEELMAKING

ENGINEERED PRODUCTS AND SERVICES



INTRODUCTION

The McKeown Group is a series of multi-national, multi-disciplined companies that has been servicing the International Metals Industries for over 30 years. As a supplier of engineered products, McKeown International, Inc. provides a wide range of Consumables and services to ferrous, non-ferrous, foundry, glass, and cement industries.



McKeown's product line includes Mag-Carbon brick for BOF, electric furnace and ladle applications, Mag Dolomite for AOD linings, and ladle slagline, High Alumina brick for steel mills and foundries, furnace and ladle electrodes, silica brick for the glass and coke oven batteries and insulating brick for most every metal and furnace applications.

In addition to other engineered products, we provide a wide variety of raw materials, all proven quality products at very competitive pricing.

McKeown also provides engineering, manufacturing/fabrication and construction services. Our engineering capabilities range from feasibility studies to computer-aided design of light structures. Our new manufacturing facility has state of the art capabilities to fabricate a wide variety of products, such as light structural steel, roll formed sheet metal products, brakepressing, etc.

As an international supplier of engineered products, McKeown conforms to ISO 9002 Quality Assurance Standards. In support of this commitment to quality, we have a USA based Quality Assurance Administrator and 8 full time inspection personnel in our three China Quality Control facilities.



ARGON OXYGEN DECARBURIZATION (AOD) REFRACTORIES



AOD BLOWING A HEAT

McKeown's Mag-Dolomite bricks are manufactured with high purity, and naturally occurring magnesite and dolomite.

It offers the excellent high temperature stability and resistance to slag.



TUYERE BRICK



ULTRADOL 75



MAGNESIA DOLOMITE INSPECTION



MAG-DOLOMITE PACKAGING

PRODUCT DESCRIPTION	MAGNESIA DOLOMITE	
PRODUCT NAME	Ultradol 63T	Ultradol 75
APPLICATION	AOD Vessel Tuyere Brick, tuyere pad area	AOD Vessel Sidewall, cone
Bulk Density, g/cm ³	3.08 +/- 0.04	3.00 +/- 0.02
Apparent Porosity, %	≤ 5.0 % after wax dipping	9 % - 12 %
Cold Crushing Strength, MPa	90	80
Refractoriness under load	1700 ° C	1700 ° C
MgO, %	61.0 % - 65.0 %	72.0 % - 80.0 %
CaO, %	31.0 % - 35.0 %	18.0 % - 22.0 %
Al ₂ O ₃ + Fe ₂ O ₃ + SiO ₂	≤ 2.8 %	≤ 3.0 %

THE ABOVE DATA ARE TYPICAL PROPERTIES. THE DATA IS SUBJECT TO REASONABLE VARIATIONS AND SHOULD NOT BE USED FOR SPECIFICATION

DOLOMITE REFRACTORY



RAW MATERIAL

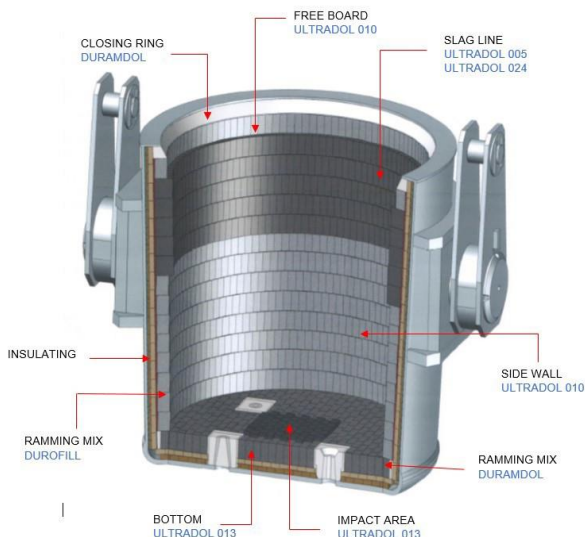
McKeown's Resin Bonded Dolomite Bricks are manufactured with naturally occurring high purity dolomite ore. It offers the high refractoriness, inertness to steel and low cost to make clean steel.



BRICK TEMPERING



ULTRADOL 10 SU SHAPE



LADLE APPLICATION



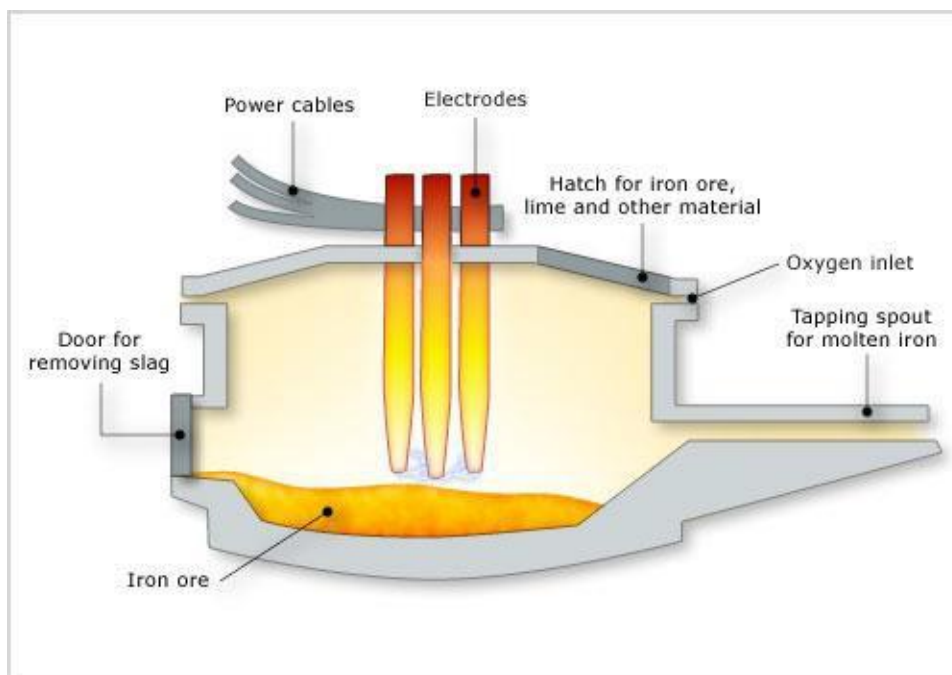
PACKAGING

PRODUC DESCRIPTION	RESIN BONDED DOLOMITE BRICK		
PRODUCT NAME	Ultradol 05	Ultradol 10	Ultradol 13
APPLICATON	Ladle Slagline	Ladle Barrel/AOD	Ladle Barrel/Bottom Impact Zone
MgO %	37	37	37
CaO %	61	61	61
SiO ₂ %	0.5	0.5	0.5
Fe ₂ O ₃ %	0.5	0.5	0.5
Al ₂ O ₃ %	0.5	0.5	0.5
C %	8.0	5.0	6.0
Bulk Density, g/cm ³	2.75	2.8	2.85
Apparent Porosity, %	10.5	9.7	9.8
Cold Crushing Strength, Mpa	65.0	75.0	70.0

**** Additional qualities are available to meet specific ladle operation and problematic zones in the ladle**

The above data are typical properties. The data is subject to reasonable variations and should not be used for specification purposes

ELECTRIC ARC FURNACE (EAF) REFRACTORIES



McKeown's resin bonded magnesia-carbon bricks are made with high purity fused grain magnesite for very high erosion and slag resistance. They offer good oxidation resistance due to use of high purity flake graphite and metallic antioxidants as needed.

PRODUCT DESCRIPTION	Magnesia Carbon Brick			
PRODUCT NAME	MA-153	MC-150	MC-50	ME-153
APPLICATION	High wear areas of EAF	High wear areas of EAF	EAF Sidewalls	High Wear areas of EAF
Bulk Density, g/cm ³	2.97	2.96	3.10	2.95
Apparent Porosity, %	4.00	4.0	6.00	4.00
Cold Crushing Strength, MPa	40	40	60	40
Carbon, %	15.0	15.0	5.0	15.0
Al ₂ O ₃ , %	0.12	0.18	.018	0.40
MgO, %	97.83	97.02	97.02	96.00
SiO ₂ , %	0.42	.60	0.61	1.20
Fe ₂ O ₃ , %	0.49	.68	0.68	1.20
CaO, %	1.01	1.26	1.26	1.20

Upon request, specifications for Magnesia Carbon Brick with other carbon levels can be provided.

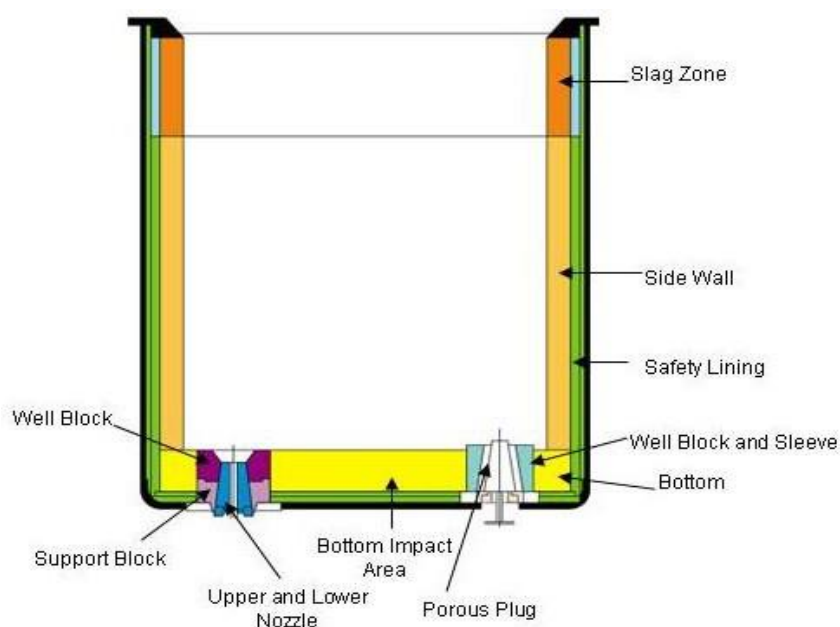
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McKeown offers a wide range of refractory and other engineered products, such as purging plugs and precast shapes, for ladle applications.

A well balanced ladle lining can be designed with these products to accommodate the different operating and slag practices for an optimal ladle performance.

LADLE REFRACTORIES

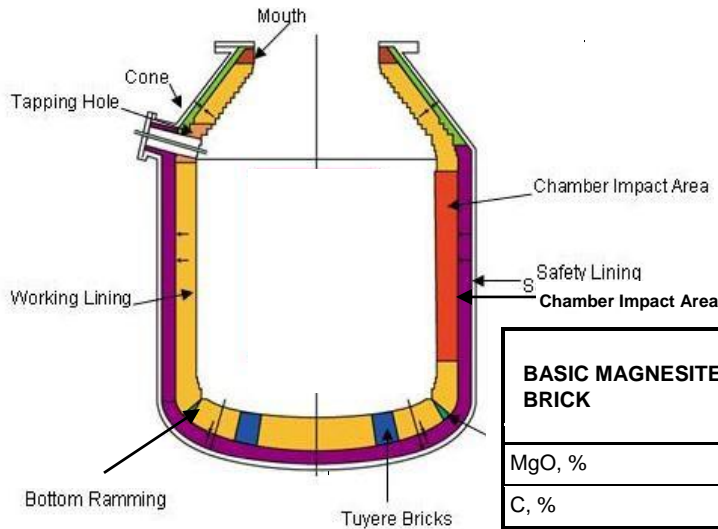


PRODUCT DESCRIPTION	MAGNESIA DOLOMITE	HIGH ALUMINA BRICK			MAGNESIA CARBON BRICK			ALUMINA MAGNESIA CARBON BRICK		
Product name	Ultradol 75	MH 70	MH 80	MH 85	MA 103	MC 153	ME 50	AMC-60S	AMC-75S	AMC-80B
APPLICATION	Slagline	Sidewall	Sidewall	Sidewall	Slaglines	Slaglines	Slaglines	Side wall and bottom	bottom impact pad	Sidewall
Bulk Density, g/cm ³	3.00 +/- 0.02	2.63	2.65	2.70	3.07	2.96	3.10	≥2.95 g/cm ³	≥ 3.3 g/cm ³	≥3.3 g/cm ³
Apparent Porosity, %	9 % - 12 %	20	20	20	5	4	6	≤7%	8	≤ 8 %
Cold Crushing Strength, MPa	80	68	70	70	50	40	60	≥55Mpa	≥50Mpa	≥60Mpa
Carbon, %					10	15	5	5~7	9	6.50%
Al ₂ O ₃ , %		58	≥ 80	83	0.12	0.18	0.4	69~72%	72.5~75%	80 ~ 82%
MgO, %	72 % - 80 %				97.83	97.02	96.00	9~11%	9~10%	9.60%
SiO ₂ , %				12	0.42	0.61	1.21	≤6%		
Fe ₂ O ₃ , %		2.0	1.8	2.0	0.49	0.68	1.2	≤3%		
CaO, %	18 % - 22 %	0.8			1.01	1.26	1.21			
Al ₂ O ₃ + Fe ₂ O ₃ + SiO ₂	< 3.0 %									

UPON REQUEST, SPECIFICATIONS FOR MAGNESIA CARBON BRICK WITH OTHER CARBON LEVELS CAN BE PROVIDED.

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BASIC OXYGEN FURNACE (BOF) REFRACTORIES



McKeown's magnesia carbon BOF lining consists of various qualities designed to achieve the maximum life span and cost effectiveness. The brick for the critical areas are made predominately with large crystal grain size magnesite and high purity flake graphite. They offer excellent resistance to erosion and wearing. Anti-oxidants are added as needed to provide better oxidation.

BASIC MAGNESITE BRICK	MZC- 14A	MZS- 17A	MZT- 16A	MZE-16A	MZR-17A	MZB- 14A
	Cone	Slagline	Tapping Side	Trunnion	Bath Area	Bottom
MgO, %	73	74	72	72	73	76
C, %	14	17	16	16	17	14
Apparent Porosity, %	4	4	4	4	4	4
Bulk Density, kg/m ³	2.9	2.92	2.9	2.9	2.92	2.95
Cold Crushing Strength, MPa	30	30	30	30	30	35

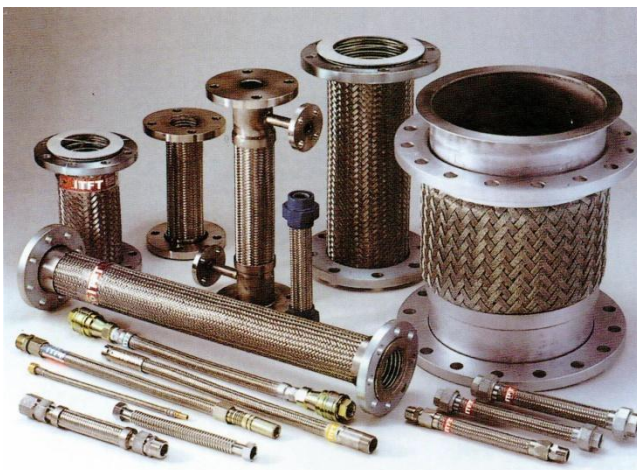
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SECONDARY STEELMAKING CORED WIRE APPLICATION

McKeown offers cored wire technology for treatment in secondary steel making.

Cored wire is fabricated into a tubular wire with a calculated mixture of alloys uniquely blended together; such as CaSi,

Carbon, etc. Alloy Cored Wire can purify the molten steel, change the inclusion form, improves the capability, increases the yield of alloy and cut down the cost and consumption.



FLEX HOSE

McKeown's Stainless Steel Flexible Hoses with various sizes and types of end connection help in transmitting a wide range of media such as Oxygen, Steam, Hot Air, Hot Water besides other solid, liquids and gases.

The most demanding environments, in which these flexible corrugated SS Hoses & Hose Assemblies are installed, include:

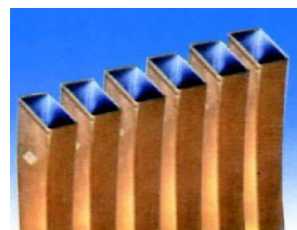
- High / Sub Zero Temperatures
- High Pressure
- Continuous Movement of SS Hose Link requiring high degree of flexibility.

CONTINUOUS CASTING

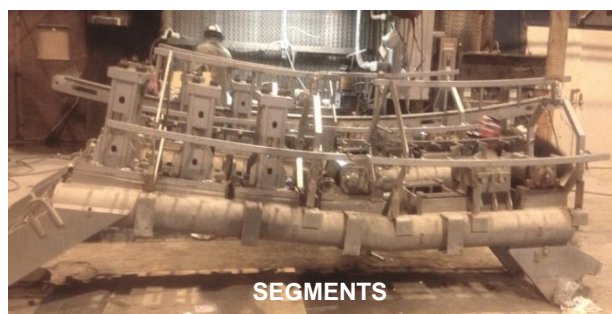


HOUSING ASSEMBLY

McKeown offers engineering, design and manufacturing of casting machine and its components such as mould housing, copper mould, segment, dummy bar and withdrawal straightened etc. Maintenance and repair are also available upon request.



PARABOLIC TUBES



SEGMENTS

TYPICAL CHEMISTRY		MOLD SIZE RANGE (MM)	
Cu + Ag	99.50%	Square	90 x 90 -
Ag	0.08 % - 0.12 %		220 x 220
Bi	0.00%	Rectangle	100 x 170 -
Sb	0.01%		235 x 265
As	0.01%	Round	130 - 360

Chemical Analysis	
Cu-DHP	P 0.015 ~ 0.040
Cu-Ag	Ag 0.08 ~ 0.12 P 0.004 ~ 0.012
CuCrZr	Cr 0.30 ~ 1.20 Zr 0.03 ~ 0.30

ELECTRODES

Electrodes are designed to meet the specific working parameters of our customers. Special attention is paid to operating practices and melting conditions to assure an optimal electrodes consumption .

ELECTRODES	ITEM	UNIT	HP GRADE		SHP GRADE		UHP GRADE	
			12" - 14"	16" - 18"	12" - 14"	16" - 18"	12" - 16"	18" - 24"
Resistivity	Electrode	$\mu\Omega m$	6.0	6.0	5.9	5.9	5.2	5.2
	Nipple		5.2	5.2	4.2	4.2	4.2	4.2
Bending Strength	Electrode	MPa	10.5	10.3	10.5	10.3	10.5	11.0
	Nipple		16.0	16.0	18.0	18.0	18.0	20.0
Elastic Modulus	Electrode	Gpa	12.0	12.0	13.0	13.0	14.0	14.0
	Nipple		16.0	16.0	18.0	18.0	18.0	22.0
Bulk Density	Electrode	g/cm3	1.65	1.65	1.66	1.66	1.70	1.72
	Nipple		1.73	1.73	1.76	1.76	1.76	1.78
CTE	Electrode	10-6/° C	2.4	2.4	2.2	2.2	1.5	1.4
	Nipple		1.4	1.4	1.4	1.40	1.4	1.2
Ash	Electrode	%	0.2	0.2	0.2	0.2	0.2	0.2
	Nipple							

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UNITROBE

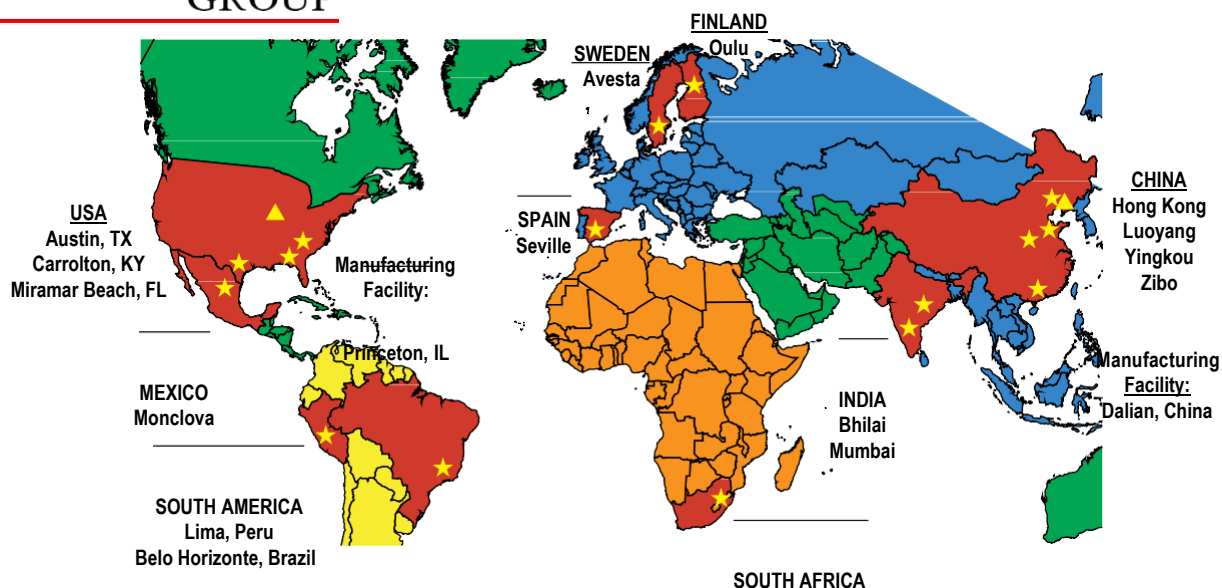


ELECTRODE



INSPECTION

WORLDWIDE LOCATIONS



China Office Staff



Dashiqiao China Office Staff



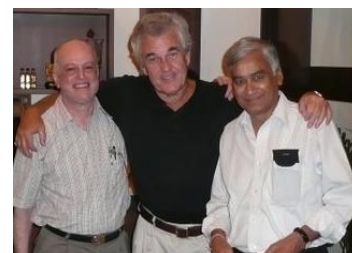
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