ABOUT US

Brothers International Industry has specialized for 10 years in supplying the metallurgical industry a variety of consumable products. Our talented and devoted team have years of extensive experience in providing customers with reliable quality products at Industry low pricing. Based on the Principles of mutual growth and partnerships, Brothers International Industry has successfully served both domestic and worldwide customers.

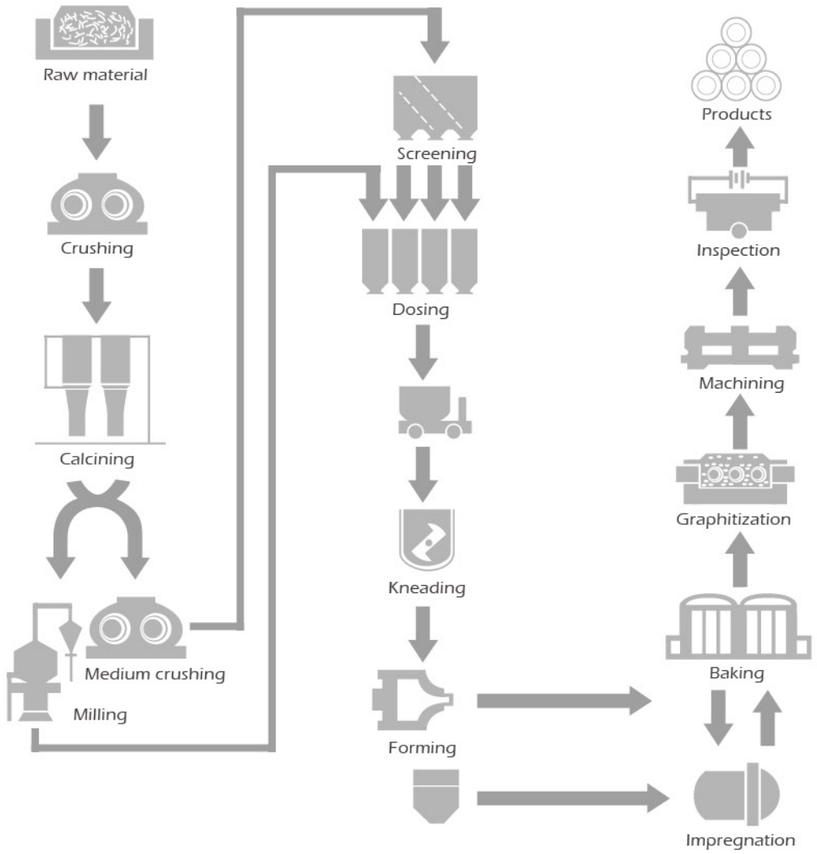
Brothers International Industry has a network of high performance Graphite & Refractory plants along with responsible trading services which extend the quality beyond the product itself. Brothers International Industry is committed to managing all aspects of production from raw material selection, engineering, manufacturing, to the final product delivery. We maintain a high quality process with reliable services to consistently provide total satisfaction to our customers.

The principle products of Brothers International Industry include: Graphite electrodes, Foundry sand, Copper mould tube and Refractory products. We also pay close attention to any specific customer needs in optimizing their supply projects.

Our products are distributed worldwide and our partners have found success in continued partnerships with our company. We plan to keep expanding our business scope, strengthening the connections with our customers, building our talented team and to continue our growth as an International company and an Industry leader.

Brothers International Industry
Metallurgical and Refractory Resources Supplier

GRAPHITE ELECTRODES



TECHNICAL SPECIFICATION OF GRAPHITE ELECTRODES

	PHYSICAL PROPERTIES	Unit	Item	RP	HP	UHP
1	Resistivity ≤	uΩm	Electrode	8.0	6.2	5.8
			Nipple	7.0	5.5	5.5
2	Bending Strength ≥	Mpa	Electrode	9.8	10.5	11.5
			Nipple	13.0	14.0	16.0
3	Elastic Modulus ≤	Gpa	Electrode	9.3	12.0	14.0
			Nipple	14.0	16.0	18.0
4	Bulk Density≥	g/cm^3	Electrode	1.55	1.65	1.7
			Nipple	1.70	1.75	1.8
5	CET (Thermal Expansivity)	10^{-6}/°C 100~600°C	Electrode	2.9	2.4	1.5
			Nipple	2.8	2.2	1.4
6	ASH	%	ASH	0.4	0.3	0.3

GRAPHITE ELECTRODES DIMENSIONS

NOMINAL DIAMETER		ACTUAL DIAMETER (D)		NOMINAL LENGTH (mm)
Inch	mm	Max	Min	
3"	75	78	73	1500/1600/1750
4"	100	103	98	1500/1600/1750
6"	150	154	149	1500/1600/1750
8"	200	205	200	1500/1600/1800
9"	225	230	225	1500/1600/1800
10"	250	256	251	1500/1600/1800
12"	300	307	302	1600/1800/1900/2000
14"	350	357	352	1600/1800/1900/2000/2200
16"	400	409	403	1600/1800/1900/2000/2200/2400
18"	450	460	454	1600/1800/1900/2000/2200/2400
20"	500	511	505	1800/1900/2000/2200/2400
22"	550	562	556	1800/2000/2200/2400
24"	600	613	607	2000/2200/2400/2700
26"	650	663	657	2400/2700/3000
28"	700	714	708	2400/2700/3000

SUGGESTED CURRENT-CARRYING CAPACITIES OF ELECTRODES

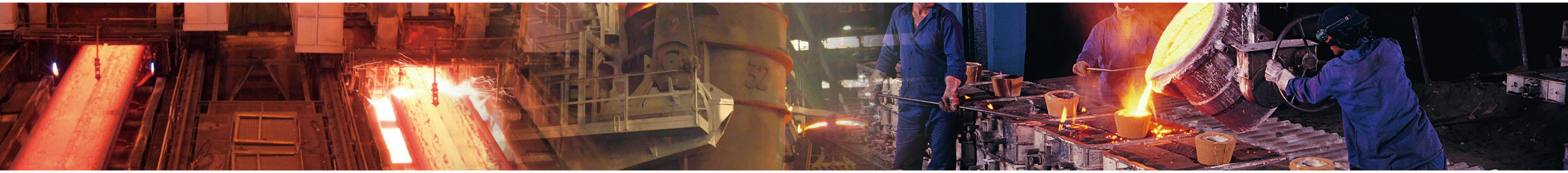
NOMINAL DIAMETER		SUGGESTED CURRENT-CARRYING CAPACITIES (A)		
mm	inch	RP	HP	UHP
75	3	1000~1400	1300~2000	
100	4	1500~3000	1800~3000	
130	5	2200~3400	2800~4200	
150	6	3500~4900	4000~5000	
200	8	5000~6900	5000~10000	
225	9	6000~10000	10000~12000	
250	10	7000~10000	10000~13000	
300	12	10000~13000	13000~17400	
350	14	13000~18000	17400~24000	22000~28000
400	16	18000~23500	24000~32000	28000~35000
450	18	22000~27000	32000~40000	35000~45000
500	20	25000~32000	40000~48000	45000~55000
550	22	32000-40000	37000-57000	48000-60000
600	24	38000-47000	44000-67000	52000-72000
700	28	45000-54000	54000-73000	62000-95000

DIMENSION OF 3 TPI TRUNCATED CONE NIPPLES

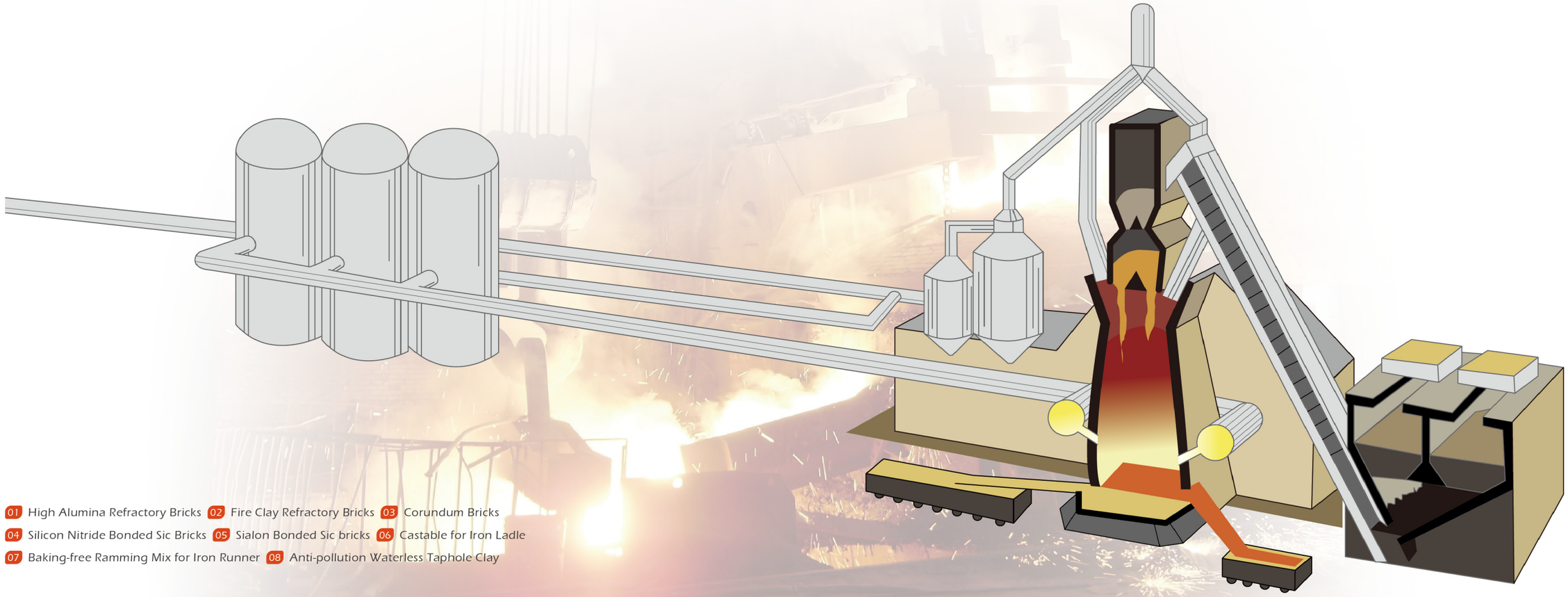
NOMINAL DIAMETER		SIZE OF NIPPLE (mm)		SIZE OF SOCKET (mm)		THREAD PITCH (mm)
mm	inch	D	L	d1	H	
225	9	139.70	203.20	131.27	107.60	
250	10	155.57	220.00	147.14	116.00	
300	12	177.16	270.90	168.73	141.50	
350	14	215.90	304.80	207.47	158.40	
400	16	215.90	304.80	207.47	158.40	
400	16	241.30	338.70	232.87	175.30	8.47 (3TPI)
450	18	241.30	338.70	232.87	175.30	
450	18	273.05	338.70	264.62	183.80	
500	20	273.05	355.60	264.62	183.80	
500	20	298.45	372.60	290.02	192.20	
550	22	298.45	457.2	290.02	234.60	

DIMENSION OF 4 TPI TRUNCATED CONE NIPPLES

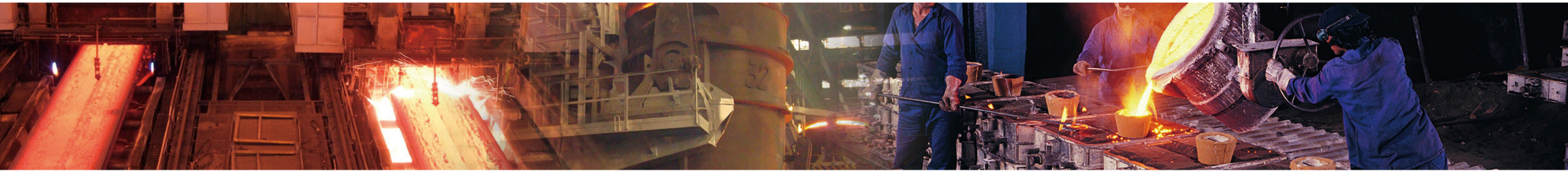
NOMINAL DIAMETER		SIZE OF NIPPLE (mm)		SIZE OF SOCKET(mm)		THREAD PITCH(mm)
mm	inch	D	L	d1	H	
75	3	46.04	76.20	39.72	44.10	
100	4	69.85	101.60	63.53	56.80	
130	5	79.38	127.00	73.06	69.50	
150	6	92.08	139.70	85.76	75.90	
175	7	107.95	165.10	101.63	85.55	
200	8	122.24	177.80	115.92	94.90	
225	9	139.70	177.80	133.38	94.90	
250	10	152.40	190.50	146.08	101.30	
300	12	177.80	215.90	171.48	114.00	
350	14	203.20	254.00	196.88	133.00	
400	16	222.25	304.80	215.93	158.40	
400	16	222.25	355.60	215.93	183.80	
450	18	241.30	304.80	234.98	158.40	
450	18	241.30	355.60	234.98	183.80	6.35 (4TPI)
500	20	269.88	355.60	263.56	183.80	
500	20	269.88	457.20	263.56	234.60	
550	22	298.45	457.20	234.60	292.13	
550	22	298.45	355.60	183.80	292.13	
600	24	317.50	457.20	234.60	311.18	
600	24	317.50	355.60	183.80	311.18	
650	26	358.60	558.80	285.40	352.28	
650	26	358.60	457.20	234.60	352.28	
700	28	374.65	558.80	285.40	368.33	
700	28	374.65	457.20	234.60	368.33	
750	30	406.40	609.60	310.80	400.08	
750	30	406.40	584.20	298.10	400.08	
800	32	431.80	635.00	323.50	425.48	



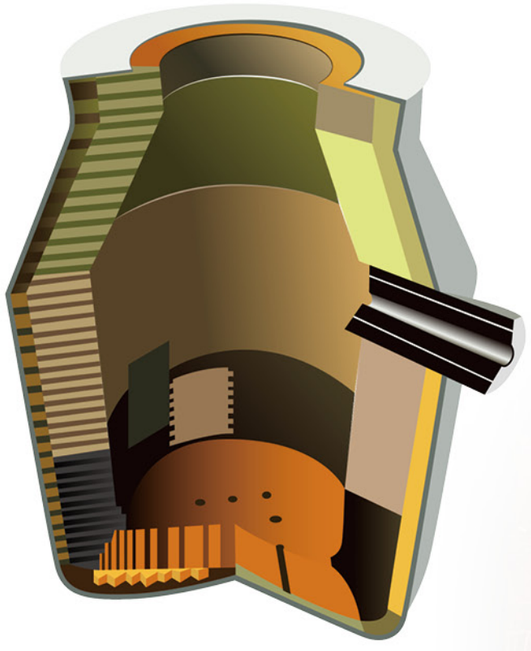
REFRACTORY PRODUCTS FOR BLAST FURNACE



01 High Alumina Refractory Bricks 02 Fire Clay Refractory Bricks 03 Corundum Bricks
04 Silicon Nitride Bonded Sic Bricks 05 Sialon Bonded Sic bricks 06 Castable for Iron Ladle
07 Baking-free Ramming Mix for Iron Runner 08 Anti-pollution Waterless Taphole Clay

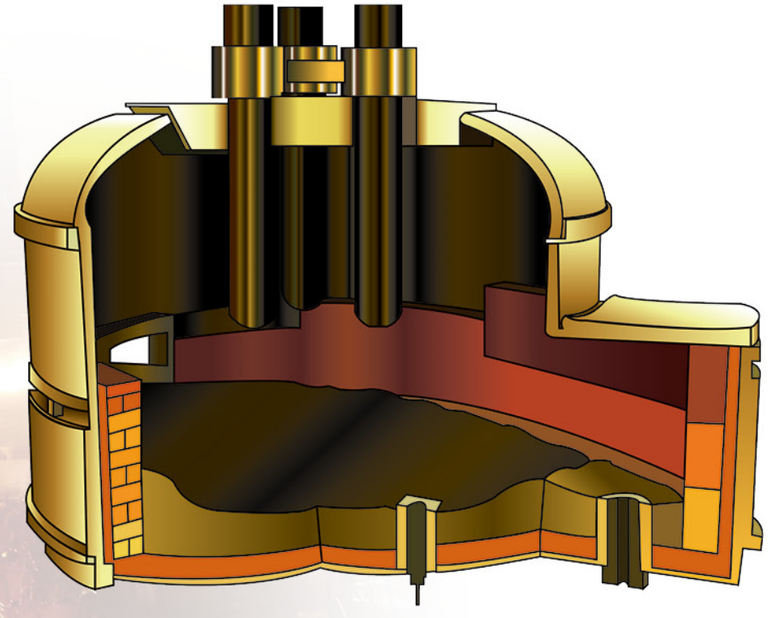


REFRACTORY PRODUCTS FOR CONVERTER

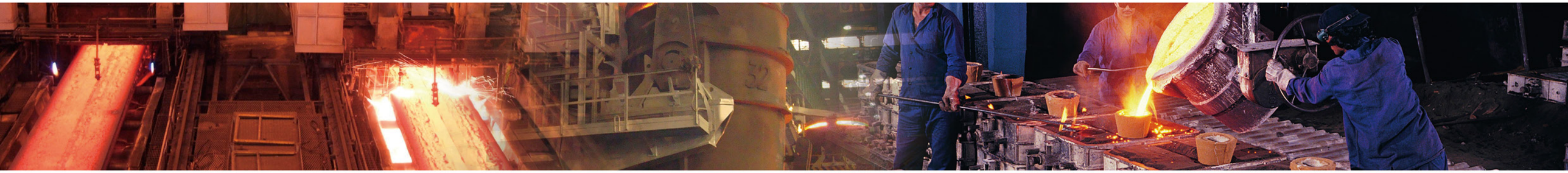


01 Magnesia-Carbon Bricks 02 Taphole Block 03 Purging Plug 04 Mgo-Based Ramming Mixs
05 Repair Mixes

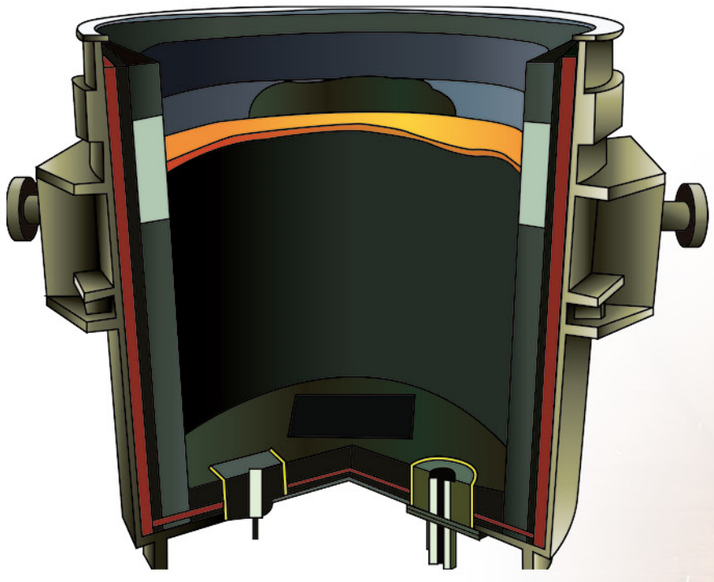
REFRACTORY PRODUCTS FOR EAF



01 EAF Magnesia-Carbon Bricks 02 Taphole Blocks for EAF 03 Delta Sections 04 EAF Gunning Mix
05 EBT Filling Mass 06 Dry Ramming Mixes for EAF Bottom

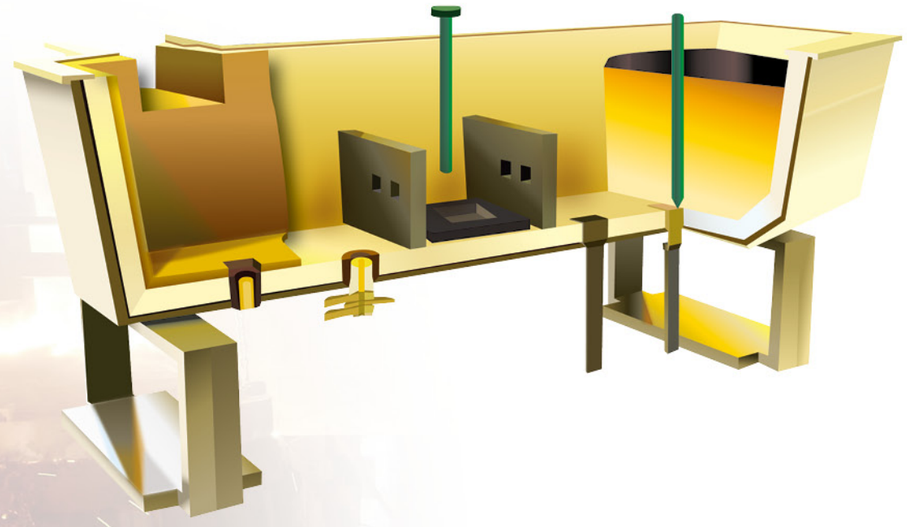


REFRACTORY PRODUCTS FOR LADLE



01 Magnesia-Carbon Bricks 02 Mgo-Al_2O_3-C Bricks 03 MgO-Chrome Bricks 04 Magnesia Dolomite Bricks
05 Resin Bonded Magnesia Dolomite Bricks 06 Bottom Pouring Bricks 07 Unburned Compounded Slide Plates
08 High Performance Slide Plates 09 High Temperatures Fired Slide Plates 10 Lower Nozzles 11 Upper Nozzles
12 Well Block for Nozzles 13 Purging Plugs 14 Seating Block for Purging Plug 15 Castable for Ladle
16 Gunning Mixes for Ladle 17 Self-flow Castable

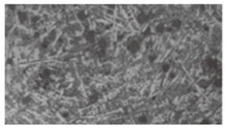
REFRACTORY PRODUCTS FOR TUNDISH



01 Stopper Rods; Ladle Shroud 02 Submerged Entry Nozzle 03 Slide Plates for Tundish
04 Tundish Upper Nozzle 05 Tundish Porous Upper Nozzle 06 Metering Nozzle 07 Skimmer Block
08 Impact Pad 09 Well Block 10 Self-flow Castables 11 Tundish Dry Vibration Mixes 12 Tundish Spray Mixes

ROLLS

CENTRIFUGAL AND STATIC CASTING SPHERICAL GRAPHITE CAST IRON ROLL



The rolls are mainly used for roughing and intermediate stands of various types of continuous rolling mill, finishing stands of bar mill, section mill, finishing stands and back up rolls of strip mill, also suitable for stainless-steel strip hot mill.

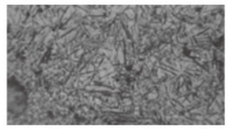
GRADE	HARDNESS (HSD)	C	Si	Mn	Ni	Cr	Mo	Mg
SGP I	50-65	2.9/3.4	1.2/1.8	0.4/1.0	0.5/1.0	0.2/0.6	0.2/0.6	≥0.04
SGP II	50-70	2.9/3.4	1.2/1.8	0.4/1.0	1.0/3.0	0.2/1.2	0.2/0.6	≥0.04
SGA III	60-80	3.0/3.5	1.2/1.8	0.4/1.0	3.0/4.5	0.2/1.2	0.6/1.0	≥0.04

CENTRIFUGAL CASTING ALLOY INDEFINITE CHILL

Centrifugal casting alloy indefinite chill, the rolls are mainly used for the finishing stands of continuous rolling mill of strip and bar, the pre-finshing stands of high speed wire, the intermediate and the front of finishing stands of small section, also utilized in thin plate and straightening roll.

GRADE	HARDNESS (HSD)	C	Si	Mn	Ni	Cr	Mo
Indefinite I	60-70	3.0/3.5	0.5/1.0	0.5/1.0	0.5/1.0	0.5/1.0	0.2/0.6
Indefinite II	62-72	3.0/3.5	0.5/1.0	0.5/1.0	1.0/2.0	0.5/1.2	0.2/0.6
Indefinite III	65-75	3.0/3.5	0.5/1.0	0.5/1.0	2.0/3.0	0.7/1.2	0.2/0.6
Indefinite IV	70-85	3.0/3.5	0.5/1.0	0.5/1.0	3.0/5.0	1.0/2.0	0.2/0.6

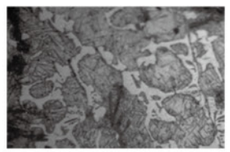
CENTRIFUGAL CASTING SPHERICAL GRAPHITE ACICULAR



Centrifugal casting spherical graphite acicular, the rolls are mainly used for roughing rod /bar mills.

C	Si	Mn	Ni	Cr	Mo
3.0/3.4	1.5/2.5	0.8/1.0	2.5/4.5	≤0.20	0.7/1.0

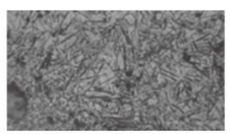
CENTRIFUGAL AND STATIC CASTING ADAMITE ROLL



The rolls are mainly used for the front finishing stands of section mill and hot strip mill, the roughing and intermediate stands of bar and wire mill.

C	Si	Mn	Ni	Cr	Mo
1.3/2.3	0.3/0.6	0.6/1.2	≥0.2	0.8/1.6	0.2/0.6

CENTRIFUGAL CASTING HIGH SPEED STEEL



Centrifugal casting high speed steel, the rolls are widely used as the F5 and F6 work rolls for hot strip mills, the pre-finishing stands of high-speed wire mills and the finishing stands of bar mills.

C	Si	Mn	Cr	Mo	W	V	Nb
1.6/2.3	0.3/0.9	0.2/0.8	3.0/6.0	3.0/6.0	1.0/4.0	2.0/6.0	1.0/3.0

FORGED ROLL

COLD ROLLING MILL WORK ROLL

The work roll is widely used in a variety of applications, such as anti hydrogen-attack roll, ultra-deep hardened roll, anti-roll mark roll, anti-roll accident roll and the high wear resistance roll and so on.

NAME	TYPE OF MATERIAL	HARDNESS	DEPTH OF HARDNESS	HARDNESS DEVIATION
Work roll	2%Cr, 3%Cr, 5%Cr&HSS	85-102 HSD	8~50mm	Within 2HSD

COLD ROLLING MILL INTERMEDIATE ROLL

Cold rolling mill intermediate Roll applies to high precision 6-Hi (as well as a few 8-Hi) mill, named from working location between work roll and back-up roll, mainly used to control the shape of strip.

NAME	TYPE OF MATERIAL	HARDNESS	DEPTH OF HARDNESS	HARDNESS DEVIATION
Intermediate roll	2%Cr, 3%Cr, 5%Cr SHSS	70-85 HSD	8~50mm	Within 2HSD

FORGED STEEL BACK-UP ROLL

Forged steel back-up roll is mainly used in 4-Hi mill and 6-Hi mill.

NAME	TYPE OF MATERIAL	HARDNESS	HARDNESS DEVIATION
Back-up roll	60CrMo, 9Cr2Mo, 86CrMoV7, 70Cr3Mo	60~80HSD	2-3HSD

SENDZIMIR WORK ROLL

Sendzimir work roll is used for rolling mills, Ron-type multi-roll mill and other multi-roll mill which can roll silicon steel, stainless steel, alloy steel, copper and other metals.

NAME	TYPE OF MATERIAL	HARDNESS
Sendzimir work roll	tool steel, die steel and high-speed steel	60-66HRC
Sendzimir intermediate roll	tool steel, die steel and high-speed steel	55-60HRC

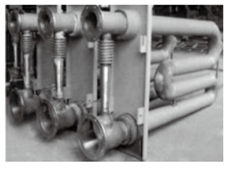
CERAMIC ROLLER AND RADIANT TUBE

CERAMIC ROLLER

Fused silica rollers are widely used for glass manufacturing, glass transformation, steel processing and non-ferrous metal processing.

Fused silica rollers are produced with high-quality, high-purity fused silica, and advanced production technology. Horizontal glass tempering furnace is a key component to support and transfer glass. Fused silica rollers have excellent physical properties to ensure that work at ambient temperature and high temperature performance and stability.

RADIANT TUBE

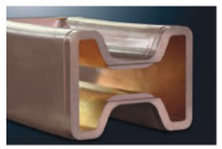


Radiant Tubes transfer heat from combustion gases to the radiant tube and then radiate the energy to the load, and are used in specific heating processes where combustion products cannot come in contact with the load or material. Radiant tube burners are an indirect heating burner, which means the heat is transferred without any direct flame or combustion exhaust. Radiant tube burner systems are designed to reduce nitrous oxide in the burner process. Radiant tube burners include a flue gas recirculation assembly designed to reduce NOx emissions. Typical applications include batch annealing, continuous annealing, continuous galvanizing, heat treating, liquid bath and roller hearth.

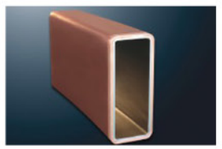
COPPER MOULD TUBE

The continuous casting of molten steel into billets, blooms and slab products, has been highly refined over the years into an extremely sophisticated system. Their function is to receive the molten steel and to allow rapid heat transfer from the steel to the cooling water to enable quick solidification. The mould must exhibit excellent thermal conductivity, be resistant for thermal erosion, and be resistant to distortion from thermal stress. So far only copper and a few copper alloys meet the above conditions, both economically and technically.

TUBULAR MOULDS



Beam Blank Copper Mould Tubes



Rectangular Copper Mould Tubes

Square Copper Mould Tubes

Round Copper Mould Tubes

At present, Deoxidized phosphorus copper (TP2), Silver-bearing Copper (CuAg 0.1) and Cu-Cr-Zr are normally selected as the material to produce copper mould tubes.

NAME	SIZE (mm)	CAMBER RADIUS (mm)	THICKNESS (mm)	LENGTH (mm)
Square & Rectangular Copper Tube	Square 50x50-500x500 Rectangular (100-500)x650	4000-17000 Also Straight	6-50	700-1000
Round Copper Tube	Φ110-Φ1200	5000-17000 Also Straight	10-50	700-1000
Non-Standard Copper Mould Tubes. Beam Blank Copper Mould Tubes		6000-17000	12-50	780-1016

MOULD COATINGS

Copper has lower hardness which leads to lower anti-abrasive property. Therefore, the area at the lower part of the moulds, where the stress increased drastically due to shells, will be more severely worn. To increase the life time of copper moulds, Horton provides uniform mould interior surface plating with suitable hardness. We use hard chrome plating which provides efficient anti-wearing protection on the interior surface of the mould tubes and increase the life of mould tubes. The plating thickness recommended by Horton will be controlled in the best range. As for the coating of copper mould plates, based on our years of experience, we are able to provide Chrome coating, Ni-Cr coating, Ni-Fe coating and Ni-Co coating to meet the demand of various customers both at home and abroad.

METAL MOULD1- CuCrZr

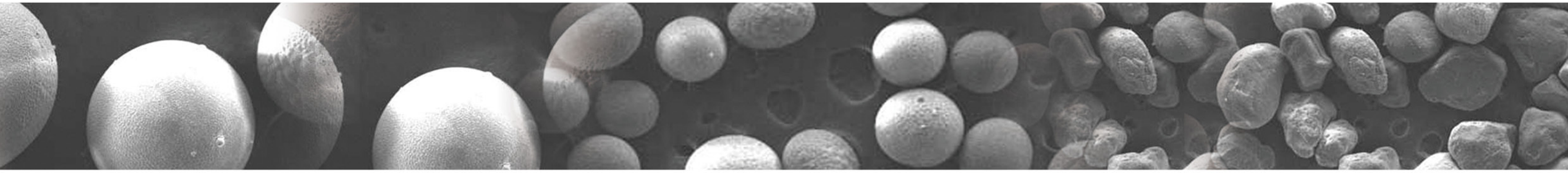
Cu-Cr-Zr is a kind of copper alloys which can be normalized by time. It has excellent mechanical property under both room temperature and high temperature. It has high heat conductivity, melting point, anti-fatigue and anti heat stress properties. These outstanding features make it different from the previous copper alloys. It combines all good properties together. But compared with other copper alloys, Cu-Cr-Zr is difficult to be formed with higher products costs.

METAL MOULD2- TP2

This kind of material is selected by most of steel plants. It shows excellent heat-proof and anti-fatigue property under high temperature and it has good processing property.

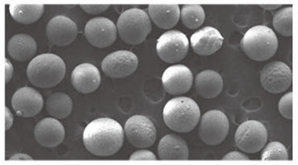
METAL MOULD3- CuAg

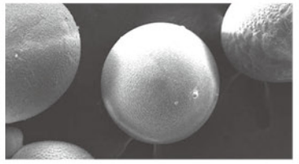
Adding 0.08%-0.12% silver during copper ingots melting will increase the re-crystallization temperature of copper by 100℃ , which will increase the heat stress and anti abrasive property of copper mould tube interior surface, showing better heat resistant property than TP2.



CERAMSITE

The name"Ceramsite" is another name of "Cermasite", "Ceramic Foundry Sand" and "Super Sand" by users in a lot of countries. It's a new artificial foundry sand, which originally coming from China only. With better comprehensive property and price comparison, it is now regarded as the right substitute for chromite sand, zircon sand, fused silica sand. It is well regarded as a revolution for new foundry sand.





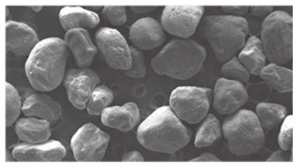
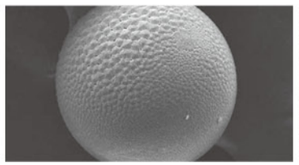
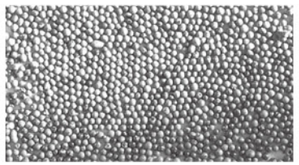
PRODUCTION AND FOUNDRY SAVINGS

The calcined bauxite is used as the raw material that is re-melted and blown into solid ball shape by high temperature spray. It has a highly smooth surface, good air permeability and excellent dispersibility. It can obviously reduce the binder addition for resin coated sand and self-hardening sand. It can greatly save the sand consumption because it can be reclaimed for many times and always in low breakage rate during crushing. Experience has demonstrated around 40-50 times versus 5-10 times for chromite based sands. Ceramsite is used as single sand, no need to mix with other sands. Some foundries can even reclaim them up to 100 times. It is widely used as core sand and facing sand.

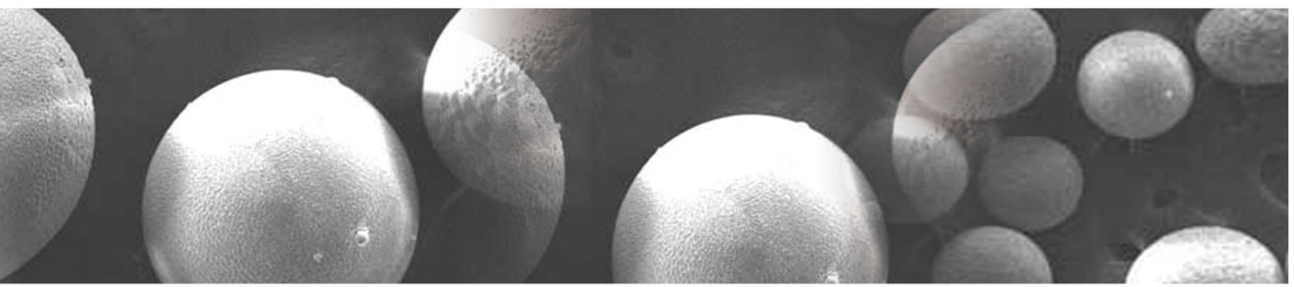
APPLICATIONS

1. Foundry sand, substitute for chromite sand, cerabeads and other foundry sands.
2. The substitute of zircon sand, size-325mesh or 200mesh for foundry coating material.
3. The raw material for ceramic filter.
4. Ladle filler sand, partial substitude of chrome sand, size from 0.5-2mm;
5. As ceramic proppant for oilfield, size of 30/60, 40/70, etc.;
6. For sand blasting, sizes of 1.0mm, 1.2mm, 1.4mm, 1.7mm, 2.0mm&2.5mm
7. For precision casting, the #30-#70 is efficient and serviceable.

PHOTOGRAPH OF THE MATERIAL

1. AMOUNT OF CERAMSITE 2. SPECIAL AMPLIFICATION FOR ONE PIECE



FEATURES AND ADVANTAGES

1. Round solid ball shape of particle.
2. High refractoriness and service temperature
3. Good air permeability and excellent dispersibility
4. Lower thermal expansion rate and thermal conductivity
5. Lower bulk density, lower true specific gravity and lower specific surface area
6. Standard particle sizes
7. Easily reclaimed by dry method
8. Lower breakage rate during dry crushing
9. Single application, no need to mix with other sands
10. Reduce pollution and lessen environmental impact and related dumping costs.