ME Mishra Enterprise

Sino-Global Refractories

Aarya Metallurgicals

REFRACTORIES *for*
PRIMARY STEEL MAKING

Sino-Global
Delivering Value

AARYA
METALLURGICALS INDIA PRIVATE LIMITED

About us

Over decades of operational experience gained in sourcing industrial goods and raw materials from China a global manufacturing hub, is the hallmark of Sino-Global Sourcing & Supply Limited (SGSSL). With prudent knowledge of material sources in China, SGSSL is a competent partner in endeavours towards making your operations more and more cost-effective, in this increasingly difficult business environment.

SGSSL came into the existence in the year 2005, largely to cater to the needs of sourcing from China. Today, there are three full-fledged divisions working at SGSSL, namely:

- Refractories Division
- 'Minerals & Metal' Division
- Manufacturing Division

Refractory has been a very important input material for steel making. While in constant contact with molten iron & steel; other metals and non-metals in the manufacturing processes it greatly impacts the cleanliness of the end-products. Refractory performance also affects the equipment availability and the overall productivity of the plant. Chinese Magnesite (in Laioning Province) was discovered in early nineties for making high-end basic refractories including Magnesia-Carbon and Direct-Bonded & Re-bonded Magnesia Chrome grades. SGSSL being based there, having access to best sources coupled with experienced sales-service team, offers a good bet in terms of 'Total Cost of Ownership (TCO)'.

At 'Minerals & Metal' division, forging long-term strategic alliances and price contracts with reputed producers, we are hedged against price escalations and short supplies of the materials. Constant technical improvements have been brought about through our active interfacing with the manufacturers and our esteemed clients. It has yielded optimum results with respect to material usage effectiveness. At SGSSL, we are proud of every family member of their entrepreneurial penchant for exploring more viable sources.

The group company Aarya-Metallurgicals has forayed into manufacturing with setting up a green-field refractories making plant at Raigarh in the state of Chhattisgarh; in India.

Contents

Primary Steel Making	2
Chinese Magnesia Carbon | History	3
Basic Oxygen Furnace	4
Electric Arc Furnace	6
Twin Shell Conarc Furnace	8
Customer Testimonial	9

ME

Sino-Global Delivering Value

Primary Steel Making

Steelmaking is the second step in producing steel from iron ore. Modern steelmaking processes are broken in two categories: primary and secondary steelmaking. Primary steelmaking includes the Basic Oxygen Steelmaking; Electric Arc Furnace; or combination of the two i.e. Conarc routes.

Basic Oxygen Steelmaking (BOS, BOP, BOF or OSM) is a method of conversion of carbon-rich molten pig iron obtained from blast furnaces into steel. Blowing oxygen through molten pig iron under a basic slag lowers the carbon content of the bath which is referred as low-carbon steel. It is also known as Linz-Donawitz steelmaking process. Pig iron of about 94 percent iron and 6 percent combined impurities such as carbon, manganese, silicon and phosphorus; is converted into steel with as little as 1 percent combined impurities. The furnace or converter needs no heating because the oxygen combines exothermically with the impurity elements. The process is known as basic because fluxes of burnt lime or dolomite, which are chemical bases, are added to promote the removal of impurities. Steel is made in discrete batches called heats. The furnace or converter is a barrel shaped, open topped, refractory lined vessel that can rotate on a horizontal trunion axis.

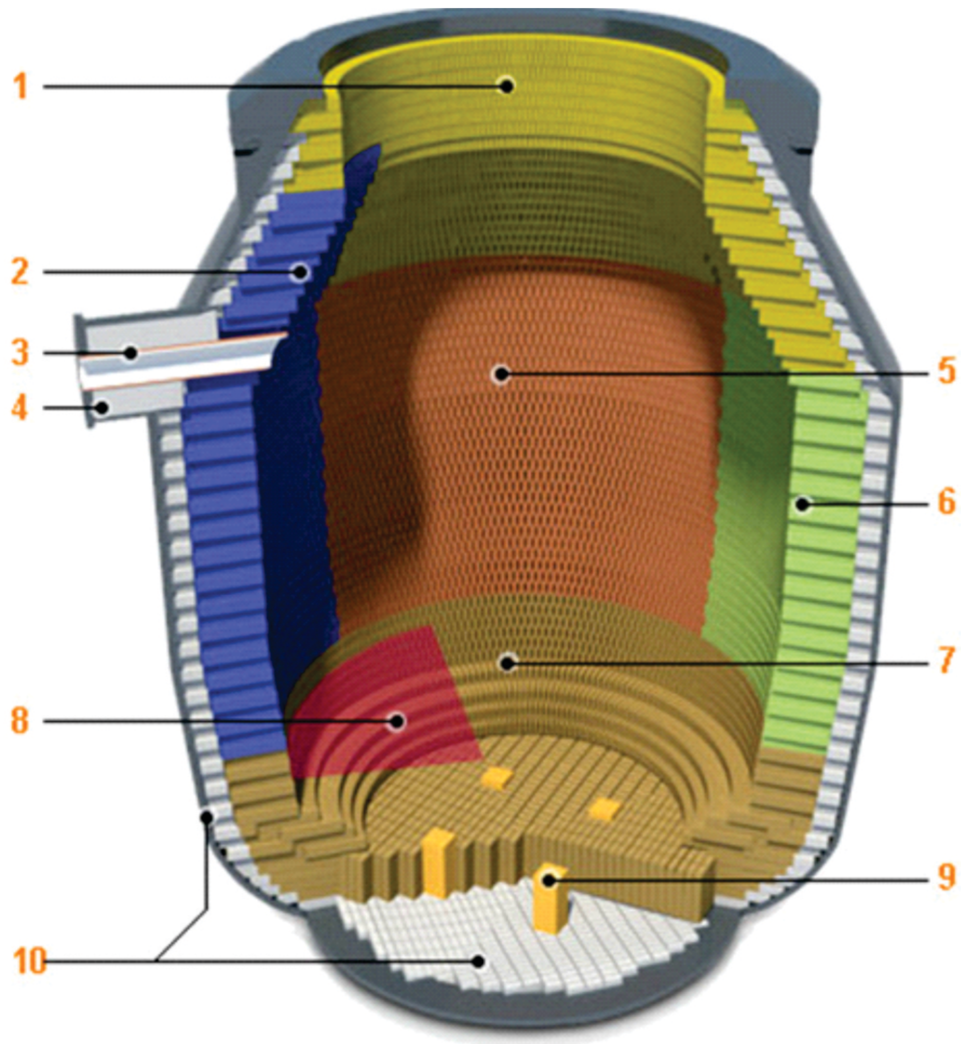
Electric arc furnaces (or arc furnaces) are high-temperature furnaces that use high-voltage electric currents as their primary heating element. Electric arc furnaces melt steel by applying AC or DC current to a steel-scrap or Direct Reduced Iron (DRI) charge through graphite electrodes. EAFs range in capacity from a few tons to as high as 400 tons. Environmental consideration is a major advantage of adopting this route of steelmaking, as it helps in recycling steel-scraps and saves on primary resources and energy, while lowering greenhouse gas emissions. Essentially, the furnace is a squat cylindrical vessel, refractory lined, having a movable domed refractory roof. It has a dish-shaped refractory hearth.

Liaoning Province in China contains significant magnesite deposits and thus has become the world's largest production and export base for the magnesia raw materials and refractories. China has dominated world magnesia supply for decades, accounting for 70% of world magnesia production capacity and 60% of world production.

Electrically fused magnesia has gradually won a place in the special refractories group, owing to its physical superiority over the ordinary grades of dead-burned magnesite. The crystalline material obtained from various grades of raw material differs somewhat in its physical characteristics, and there is a decided difference in the physical properties between dead-burned magnesite and electrically fused magnesia.

Large crystalline fused magnesia is made by melting natural magnesite A or high purity light burnt magnesia particles in an electric arc furnace at temperatures above 2750℃. The product has high purity, large grain size, compact structure, strong slag resistance and good thermal shock stability... This had made fused magnesia most preferred choice as raw material for making high-grade magnesia-carbon bricks.

Magnesia Carbon Bricks are Fused Magnesite based, resin-bonded bricks having very high erosion and slag resistance bricks. It offers good oxidation resistance due to use of high purity flake graphite. It is supplemented by use of Anti-oxidants. Today, they are extensively used in BOF, EAF and Ladle Furnaces for improved lining life and desired cleanliness in steel. The use of large crystal size Fused Magnesite may go up to 100% of Magnesia used for the formulations for the high wear areas of the furnaces.



Lining zones:

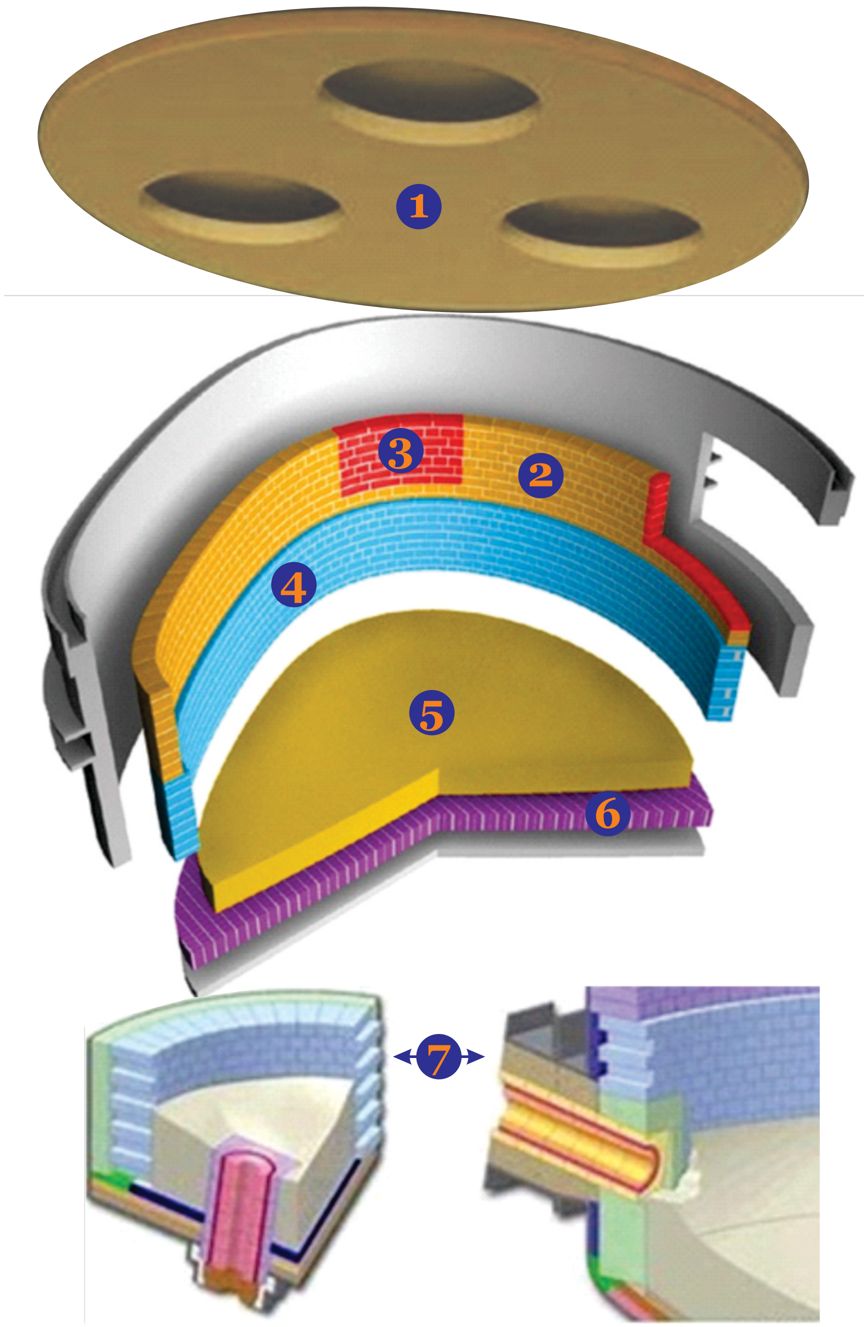
1.	Mouth – Upper Cone	: Oxidation; Metal Build-up; Thermal Spalling
2.	Tapping Side	: Corrosion; Thermo-mechanical stress
3.	Taphole Sleeves	: Abrasion; Corrosion ; Oxidation
4.	Taphole Surrounding Blocks	: Abrasion
5.	Trunion	: Abrasion; Vibration
6.	Impact Zone	: Scrap/Heavy metal – Impact; Spalling; Erosion
7.	Bottom Including Joint and Cone	: Erosion; Thermo-mechanical stress
8.	Metal Zone / Slagzone crossover	: Corrosion; Erosion; Thermal stress
9.	Purging Element (Fused MgO base with 14-18% C): Localized Erosion; Thermal stress	
10.	Permanent Lining	: Structural Load

Standard Recommendation

SECTION	BRICK
BOTTOM	
Moderately Severe	MELINE 12A
Most Severe	MELINE 12AXF
KNUCKLE & BARREL	
Moderately Severe	MELINE 12XWB
Most Severe	MELINE 12AXF / 14A
CONE	
Moderately Severe	MELINE 12A
Most Severe	MELINE 12AXF / 1A2XWB
LIP AREA	

Magnesia Carbon Brick | Typical Test Data

Brand	Bulk Density (gm/cc)		Modulus of Rupture (kg/cm²)	Coked Porosity (%)	Total Carbon (%)	Typical Chemical Analysis (%) *On* Calcined Basis				
	As received	After Coking	At Room Temperature	After Coking	After Coking	MgO	SiO_2	Al_2O_3	CaO	Fe_2O_3
MELINE 12A	2.77	2.69	133	13.0	12.4	90.0	1.2	6.5	1.6	0.7
MELINE 14A	2.95	2.90	133	10.5	14	90.6	0.8	6.9	1.1	0.6
MELINE 12 AXF	2.96	2.92	168	10.7	13.8	90.5	0.8	6.5	1.6	0.6
MELINE 12AX	2.88	2.80	126	11.5	13.3	90.5	0.8	6.9	1.2	0.6



Lining Zones:

1.Roof of the Furnace	: Metal Build-up; Spalling
2.Side Wall - Slag Line	: Corrosion; Spalling
3.Side Wall - Slag Line (Hot Spot)	: Corrosion; Thermo-mechanical stress
4.Side Wall	: Impact; Spalling; Erosion
5.Bottom and banks	: Impact; Spalling; Erosion
6.Permanent Lining	: Structural Support
7.Tap hole (EBT and Spout)	: Abrasion; Corrosion; Oxidation

Standard Recommendation

Area	Lower Side-Walls	Slag Line	Upper Side-Walls
Non-Severe	MELINE 10	MELINE 10A	Cold Spot: MELINE 10A Hot Spot: MELINE 13AX
Moderately Severe	MELINE 10A	MELINE 10A / 13A	Cold Spot: MELINE 10A Hot Spot: MELINE 16AX
Most Severe	MELINE 10A / 13A	MELINE 13A / 16	Cold Spot: MELINE 16 Hot Spot: MELINE 16 AX

We offer Dry Ramming Mass for hearth and fired Mag-Chorme for Safety Lining from our Indian Manufacturing Unit Aarya Metallurgicals.

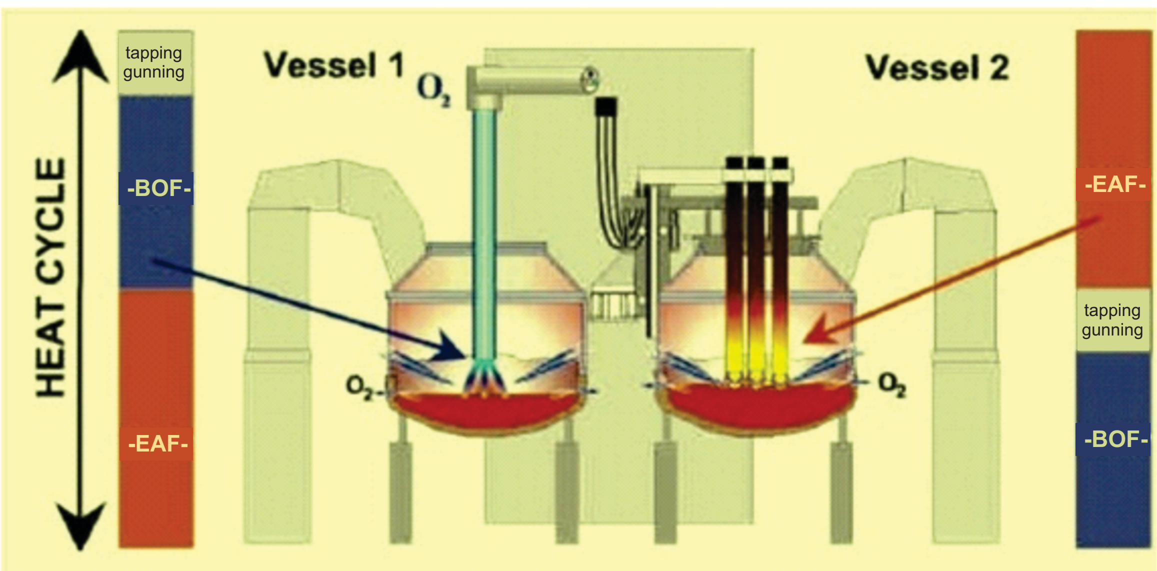
Magnesia Carbon Brick | Typical Test Data

Brand	Bulk Density (gm/cc)		Modulus of Rupture (kg/cm^2)	Coked Porosity (%)	Total Carbon (%)	Typical Chemical Analysis (%) *On* Calcined Basis				
	As received	After Coking	At Room Temperature	After Coking	After Coking	MgO	SiO_2	Al_2O_3	CaO	Fe_2O_3
MELINE 10	2.90	2.82	140	12.0	12.0	90.3	4.4	3.2	1.5	0.6
MELINE 10 A	2.8	2.72	128	14.5	10.4	89.0	4.5	4.2	1.6	0.7
MELINE 13A	2.95	2.90	133	10.1	13.8	88.2	2.6	7.2	1.5	0.5
MELINE 13 AX	2.93	2.87	143	10.5	15.3	89.3	2.9	6.1	1.3	0.4
MELINE R 16	2.80	2.72	135	13.0	17.6	95.6	1.4	0.3	2.0	0.7
MELINE 16 AX	2.95	2.90	144	13.5	17.6	91.3	1.4	4.7	1.9	0.7

The CONARC furnace combines the conventional CONverter process with Electric ARC steelmaking in a furnace with two identical shells.

The process provides flexibilities with respect to input materials and energy sources. The furnace is equipped with one set of electrodes which are connected to a transformer and can be slewed alternately to each of the two shells. Oxygen is injected through a water cooled top lance which can also be slewed from one shell to other. The process is split in two stages:

1. The converter process, during which the liquid iron is decarburized by injection of oxygen from top lance.
2. The electric arc process, during which the electric energy is used for melting of the solid charge and superheating of the bath to tapping temperature.



Principle of CONARC process

Customer Testimonial

STEEL AUTHORITY OF INDIA LIMITED
ROURKELA STEEL PLANT

SHOP NAME : SMS - II

MONTHLY CERTIFICATE TO BE ISSUED BY THE SHOP INCHARGE FOR FACILITATING PAYMENT FOR LADLE

MONTH : MAY - 2019

1) CERTIFICATE SL.NO : 06/SGL-AMI/1772000053 DATED : 01/ 04/ 2019
2) P.O. NO.: 1800500053 DATED 05/07/2018 –M/s. SGSSL
   1800500054 DATED 05/07/2018- M/s. AMI
3) NAME OF THE SUPPLIER : M/s. SINO GLOBAL SOURCING & SUPPLY LTD.
   M/s. AARYA METALLURGICALS (INDIA).
4) MINIMUM GUARANTEE LIFE/ THRESHOLD LIFE : 120 / 85
5) OTHER DETAILS TO BE FURNISHED : Order Qty.- 22 Sets

MATURED CAMPAIGN LIFE MEETING MIN. GUARANTEE / BELOW MIN. GUARANTEE.

SL. NO.	LADLE NO.	DATE OF START OF CAMPAIGN	DATE OF COMPLETION OF CAMPAIGN	CAMPAIGN LIFE	REMARKS : REASONS FOR TERMINATION OF CAMPAIGN, IF ANY.
1	1	21.03.2019	21.05.2019	191	POOR OVERALL LINING.

INITIATED BY :
SIGNATURE :
NAME : J. GHOSH
DESIGNATION : D.G.M. (REFYS.)
DATE :( )

SIGNATURE :
NAME : L.MURMU 10.6.19
DESIGNATION : D.G.M., SMS - II (O)
DATE :( )

CC TO :
1) FINANCE (PAYMENT COPY)
2) PURCHASE
3) SUPPLIER COPIES
4) PERF.FILE

APPROVED BY :
SIGNATURE :
NAME : ONKAR NATH 11/06/19
DESIGNATION : G.M.,(REFYS.)
DATE :( )

Rourkela Steel Plant creates new record in Steel Ladle life

PBD BUREAU
ROURKELA, OCT 12

ROURKELA Steel Plant (RSP) has created a new record in Steel Ladle Life in Steel Melting Shop-II department. The ladle life is not only highest in SAIL but also the best ever life achieved in India with Magnesia Carbon Bricks. The plant scripted this record by clocking the highest ever Steel Ladle Life of 192 heats in a single campaign surpassing the earlier best Steel Ladle Life of 191 heats achieved in May 2019. The steel ladle management set was supplied by Sino-Global Sourcing & Supply Ltd. The Ladle was taken down for relining on Friday. The significant achievement was made possible because of the dedicated and coordinated Refractory efforts of Engineering (Services) and Steel Melting Shop-II (Operation).

Notably, the Steel Ladle was due for slag zone repair on September 16, 2019 at 152 life. During inspection of the Ladle by Refractory Department it was found that the metal zone condition of the ladle was in good shape and the metal zone left over thickness was found to be in excess of 130 millimetres. Considering the potential of the Ladle, the team of Refractory Engineering decided to continue the ladle in service with slag-zone repair. The ladle had a guaranteed life of 120 heats. Under the guidance of Onkar Nath, CGM (Refractory), the Refractory collective carried out the slag zone repair and monitored the ladle with utmost care to achieve the record lining life of the Steel ladle.

The endeavor ensured benefits of intangible enhanced Ladle availability and improved productivity. The effort is one amongst many such initiatives being undertaken by the enterprising RSP collective to reduce cost of production and further improve techno-economics of the steel plant.

www.sgssl.com

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