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Paper name: Challenges & Opportunities for Refractory Industry

PRESENT AFFILIATION	Managing Director, Zircar Refractories Ltd., Gujarat
AREAS OF INTEREST	Business Management
Education	B.Tech.(Ceramic Engg.) – 1975, M.Tech.(Ceramic Engg.) – 1977, Gold Medalist
Experience	• Working since 45 years in Super Refractories
Projects:	• Started own company in the year 1996
Publication/ Patent	-

Challenges & Opportunities for Refractory Industry

H.L.Rai
Managing Director
Zircar Refractories Ltd.
Gujarat

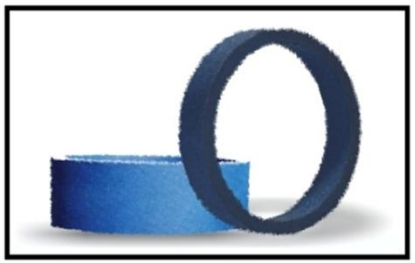
A Product With Cutting Edge

Product Range-1

Silicon Carbide Crucibles
Crucibles in shape of AC, BUC, TPC and Cylindrical are available for melting of metal like Aluminium, Brass, Copper, Gold, Silver, Zinc, Cast Iron etc.

Isostatic Clay Graphite Crucibles
Crucibles in shape of AI, BPI, TPI and Cylindrical are available for melting of metal like Aluminium, Brass, Copper, Gold, Silver, Zinc, Cast Iron etc

Stand
Stands are available in different size suitable to Crucible size. This ensures uniform expansion and shrinkage of both equipments and protects the Crucible from getting cracked.



Muffle Rings
Muffle Rings are available in different heights for all type and size of crucibles. Muffle ring increase fuel efficiency by providing additional space for the heating charge

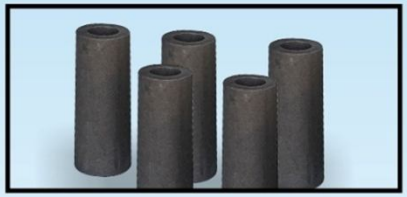
Product Range-2

Stopper Head

Stopper Head for controlling of flow of molten steel through nozzle of bottom pour ladles.

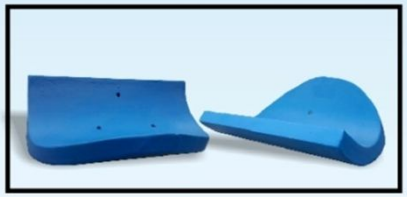
Clay Graphite Stoppers

Stoppers are manufactured and supplied to Rail Wheel factory, Banglore and Rail Wheel Plant, Bela (Indian Railway)



Ingate Sleeves

Ingate Sleeves are manufactured and supplied to Rail Wheel factory, Banglore and Rail Wheel Plant, Bela (Indian Railway).



Clay Graphite Segment

Iclay Graphite Converter segment is used in George Fischer converter for converting cast Iron to ductile Iron.

Clay Graphite Liner

Liner is used for D.I. pipe manufacturing in spinning process.

CCR Products

Continuous Casting Refractories

1. Ladle Shroud (LS)

Ladle shroud is an Isostatically pressed refractory tube used to control flow of liquid steel from Ladle to Tundish. Ladle Shroud offers maximum protection to steel stream from re-oxidation and minimizes steel splashes.

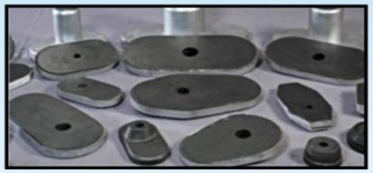
2. Mono Block Stopper (MBS) / Stopper Rod

Mono Block Stopper is an Isostatically pressed refractory rod used to control the flow of steel.

3. Sub-merged Entry Nozzle (SEN)

Sub-merged Entry Nozzle is an Isostatically pressed refractory tube used to control flow of liquid steel from undish to Mould. It prevents re-oxidation of steel.

Slide Gate Refractories & Monolithics

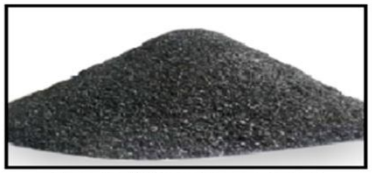

Slide Gate Plates


Tundish Nozzle with Zirconia Insert


Collector Nozzle

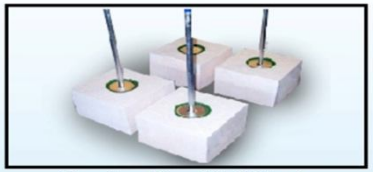

Tundish Nozzle Well Block

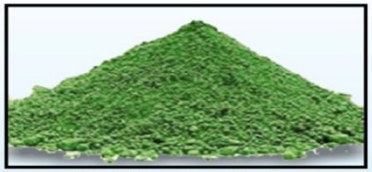

Ladle Nozzle


Nozzle Filling Compound

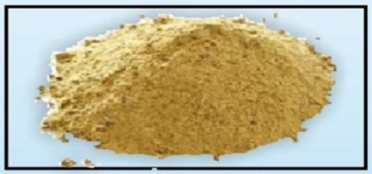

Purging Plug


Refractory Castable


Purging Plug Well Block


90% Alumina Mortar


Ladle Well Block


Basic Spray Mass

Material Storage Facilities

AC Mix Storage Facility

Temperature & Humidity Controllers

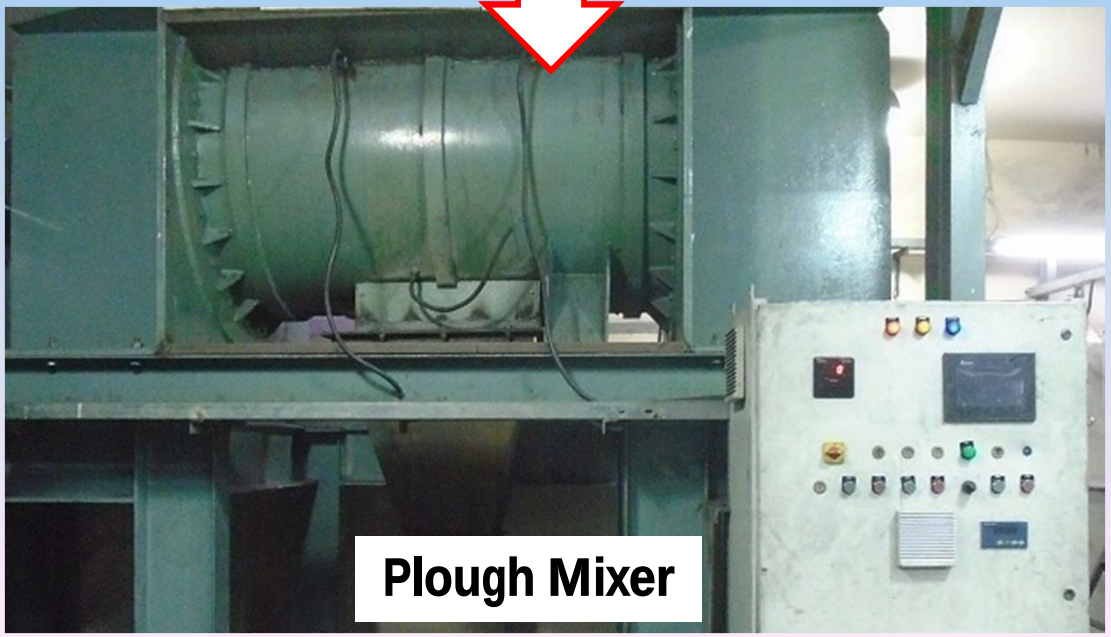
Raw Material Yard

Auto Batching Plant & High Intensive Mixers

Auto Batching & Weighment System-1

Auto Batching & Weighment System-2

Eirich Mixer



Plough Mixer

Various Mixers

Sigma Mixer

Octagonal Blender

Pan Mill & Muller Mixer

Ribbon Blender

Cone Blender

High Engineered Infrastructure

Forced Draft Oven

Automized Moulding Facility

Auto Carousal for Crucibles & CCR

Temp & Humidity Controlled Moulding Facility

Isostatic Press

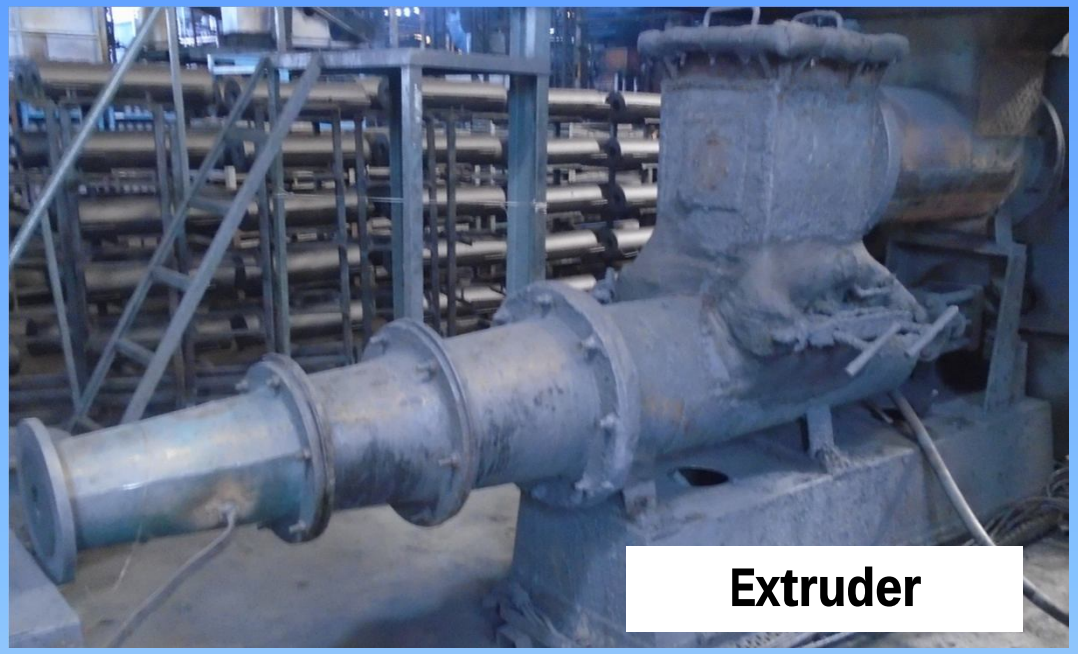
Cold Isostatic Press (CIP)

Roller Formed Crucibles

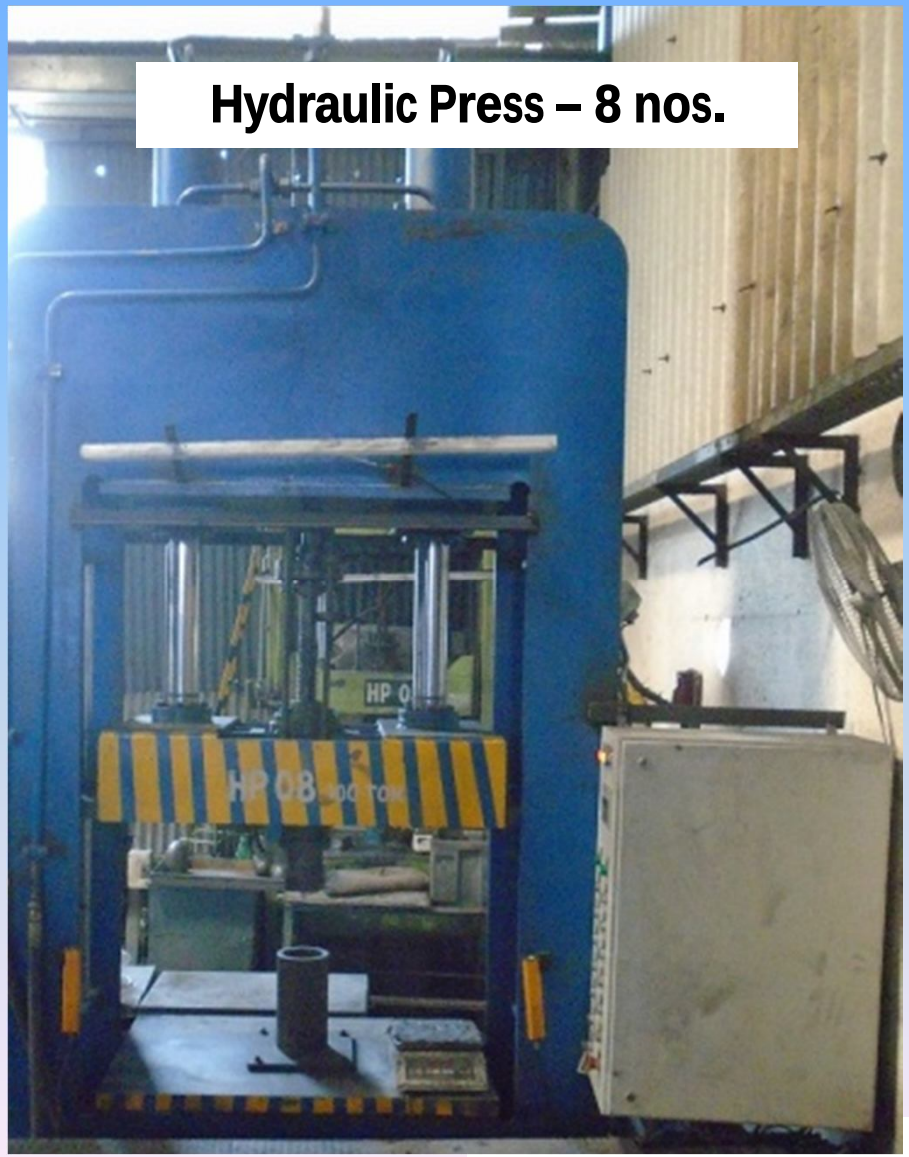
Storage Racks

Styling Machine - 3

Various Facilities



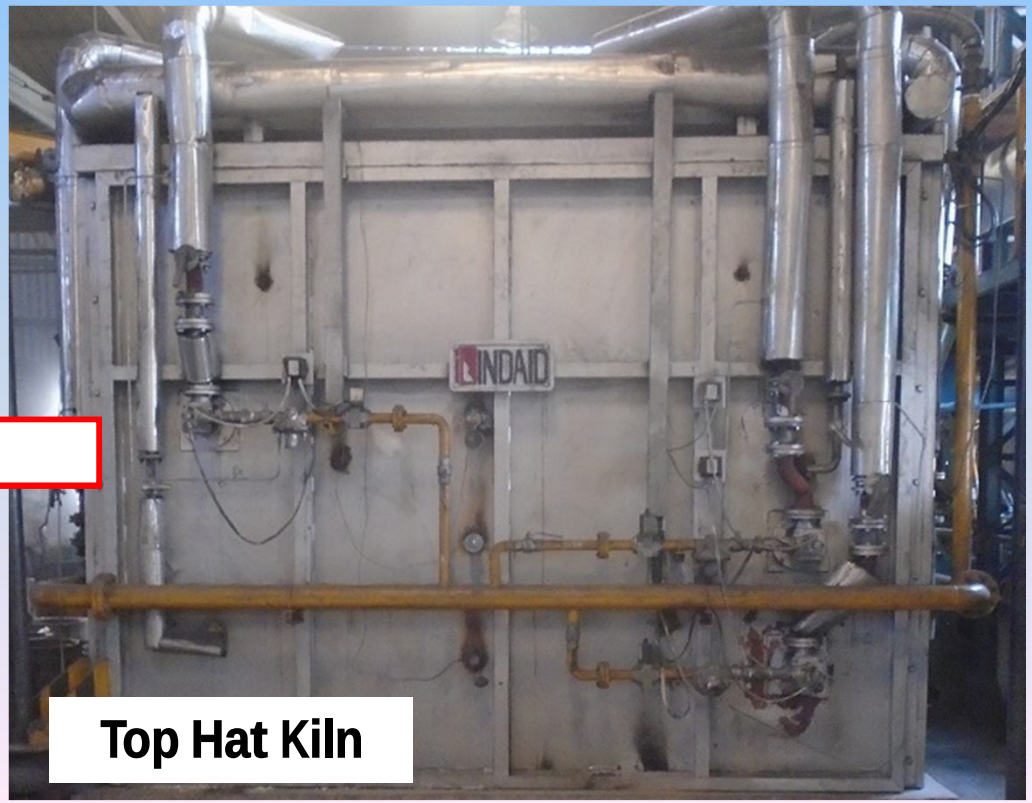
Extruder



Hydraulic Press – 8 nos.

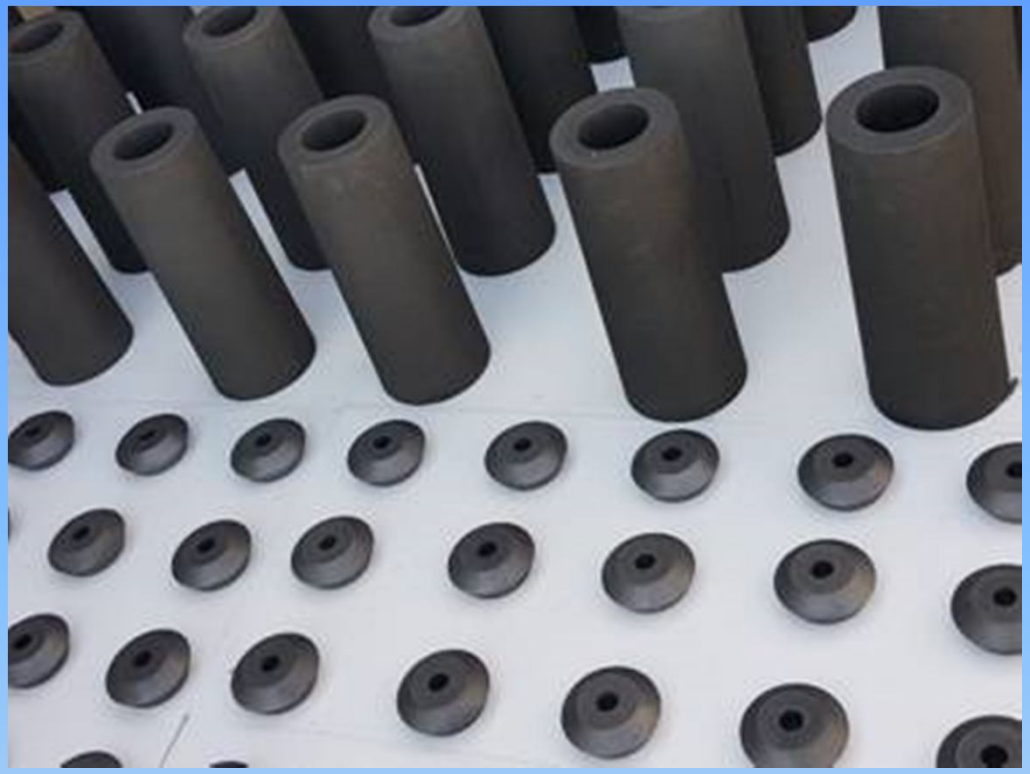
Lathe Machines – 10 nos.

Shuttle Kiln - 3



Top Hat Kiln

In-house Laboratory Facilities



Various Shaped Items

Expo Participations

1. GIFA – Germany
2. ANKIROS – Turkey
3. EFRS - Turkey
4. Iran Metafo – Iran
5. ICRJ – Jamshedpur, India
6. IFEX – India
7. Alucast – India
8. Founderex – India
9. GDC Tech-India.
10. Global Tradeshow- India.

International Presence

OUR GLOBAL PRESENCE

International Presence

- Exporting to more than 35 Countries… Expanding Further
- Wide & Strong overseas dealers networks.
- Awarded with SME Export Excellence Award 2013
- Countries, we are exporting to
  - Argentina, Brazil, Canada, China, Colombia, Czech Republic, Egypt, Eritrea, France, Indonesia, Iran, Israel, Italy, Kenya, Kuwait, Lebanon, Malaysia, Morocco, Nepal, Nigeria, Oman, Peru, Poland, Qatar, Saudi Arabia, Singapore, South Africa, South Korea, Spain, Sri Lanka, Sudan, Syria, Taiwan,Turkey, UAE, Bulgaria,Russia Uganda, USA etc.

Wide Coverage to Indian Market.

- NORTH:
  - Delhi, Uttar Pradesh. , Haryana, Punjab & Rajasthan.
- EAST :
  - Jharkhand & Bihar, Chhattisgarh, West Bengal
- WEST :
  - Gujarat , Maharashtra ,Madhya Pradesh, Goa & Daman.
- SOUTH :
  - Tamilnadu ,Karnataka ,Andhra Pradesh & Kerala.
- Branches :
  - Bhilai, Bangalore, Chennai, Delhi, Hyderabad, Kolkata, Mumbai, & Pune.

A. Opportunities:

For any economy to grow, Infrastructure is of prime importance. Infrastructure can't grow without proportional growth in Steel and Cement manufacturing sector.

Both of these industries consume high volume of Refractories. If these industries have to grow, growth in Refractory is bound to come.

SR. No.	Present Steel Production / year (Million Tons)	App. Refractory Business / year (Crores)	Financial Year
1	125	10,000	2022 - 23
2	250	20,000	2028 - 29
3	300	24,000	2030 - 31
4	500	40,000	2046 – 47
5	Effect of price rise	60,000	2046 - 47

If this really becomes true, there is abundant opportunities for Refractory Industry to show our worth to our Country particularly at the auspicious time of Centenary celebrations in the year **2047.**

I see this as opportunity for all of us.

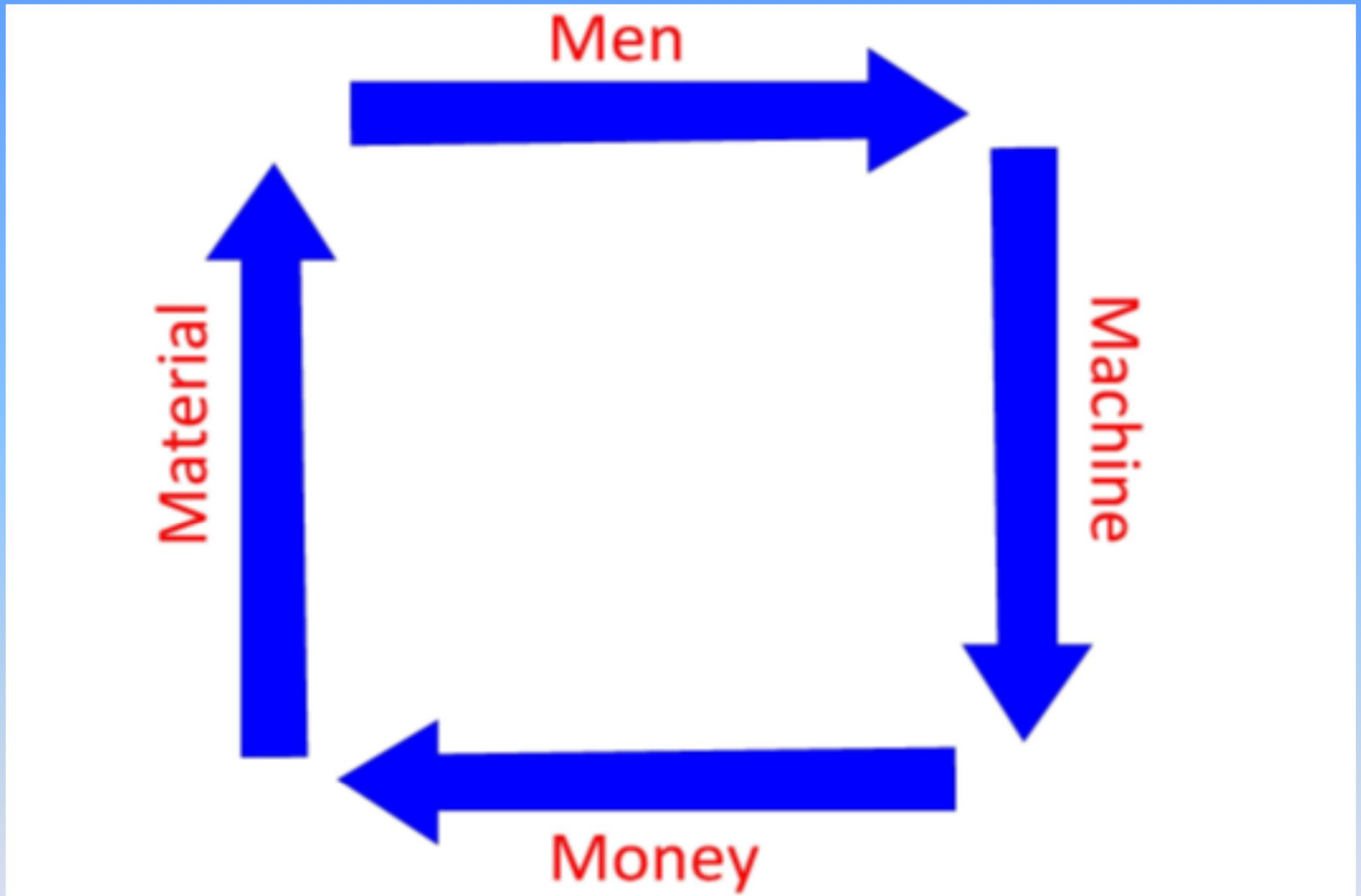


Fig. 1

B. Challenges:

If you see Fig. 1, as shown in previous slide, 4 important aspects are to take care ie Men, Machines, Money and Materials.

a. Machines: Country is very well developed in machine design / manufacturing with full / semi automation. Even if a machine is to be imported, it will be once in a way.

I don't see this as big challenge.

b. Money: Big volume of production needs bigger capacity plants. Country will need big investments for expansion, modernisation and R & D.

We have large business groups with deep pockets to take care. Smaller and medium size companies could also share some capacity enhancement responsibilities.

I don't see this also as big challenge.

C. Men: Higher Production needs higher strength in skilled man power to take care of various activities related to Projects, Planning, Production, Quality, R & D, Maintenance, Workshop, Laboratory, Administration, Purchase, Sales, Accounts, Logistics, and ERP etc I am just trying to find out requirement of skilled / qualified / experienced man power as per my company's experience.

Sr. No.	Yearly Turnover (Crores)	Skilled Man Power
1	100	75
2	1000	750
3	10000	7500
4	40000	30000

Assuming that manpower requirement will not be proportional to turn over, let us consider this fig @ 50 % of calculated fig of 30000 skilled men. It comes out at a level of 15000 skilled men to handle all aspects of plant operations.

This is very big challenge visualised by me. We need to focus on .....

1. To talk to all kinds of educational institutions, with Government guidance / participation so that enough infrastructure is in place to educate future employees as per future demands.
2. To talk to Government / educational institutions to redesign syllabus of various courses to take care of Refractory Industry changing needs. There has to be 2 way regular communication between Educational Institutions and our Industry to be agile and to come up to expectations.
3. **Skill Development Programme**: We should also focus on skill development of already employed people through proper training / education.

This is big challenge to handle and Industry associations and top business groups are expected to take lead.

d. Materials :

List of Imported Raw Materials	
Sr. No.	**Raw Materials**
1	Natural Graphite
2	Silicon Carbide
3	Silicon Metal
4	Ferro Silicon
5	Aluminium Powder
6	Brown Fused Alumina
7	White Fused Alumina
8	Borax
9	Anhydrous Borax
10	Zircon Sand
11	Monoclinic Zirconia
12	Stabilized Zirconia
13	Fused Mullite
14	Dead Burnt Magnesite
15	Fused Magnesia
16	Fused Zirmul
17	Fused Silica
18	Tabular Alumina
19	Mag - Al
20	Al-Mag
21	Fused Alumina Chrome
22	Fused Chrome-Mag
23	Fused Mag-Chrome
24	Boron Carbide
25	Olivine Sand
26	Chromite Sand
27	GG Bauxite
28	LF Bauxite
29	Furfuryl Alcohol
30	Carbores P
31	Fluorspar (CaF2)

High quality refractory could only be made through high quality raw materials over and above other aspects of plant operations.

Barring cheaper, generalised category of refractory, we need synthetic or well processed refractory raw materials. Unfortunately, our country is almost totally dependent on Imports. If you go through name of raw materials as shown in above Table, practically all these are imported.

Availability and ever increasing Cost are big challenge to Refractory Industry. Our Prime Minister is very well focussing on making our Country **Atmanirbhar** in all our needs. How come refractory Industry will be Atmanirbhar when majority of raw materials are imported?

Geopolitical aberrations are playing negative role and most of company's profitability's are getting squeezed. Our Industry needs continuous generation of enough margins to invest further in technology, modernisations and expansions.

If you see at prices of raw materials, Gas, Furnace Oil, Packing materials and shipping, refractory Industry had to accept rise of few hundred %.Unfortunately, refractory industry did not get due price rise from the market for one reason or other.

We have to seriously think to start producing these raw materials in our Country sooner than later.

My suggestion: All stake holding associations should join hands to formulate suitable plan of action taking Government of India in confidence, to start manufacturing most of raw materials, if not all.

Country has enough resources in terms of mines, technology and capability. Government could be requested for some kind of subsidy, incentives, relaxations in various taxations, allotment of logistically suitable land etc.

Bigger business groups could take lead and involve all refractory manufacturers to participate.

Target should be to start manufacturing all raw materials one by one in India.

Conclusion: If we work methodically with time bound programmes, we can get over all these challenges and Refractory Industry can create desired goodwill in Nation building. Our Industry needs wide recognitions.

THANK YOU