

# REFRACTORIES FOR CONTINUOUS CASTING



**Continuous Casting Refractories**  
**Slide Gate Refractories**  
**Monolithics**



**Zircar Refractories Ltd.**

Formerly Zircar Crucibles Private Limited

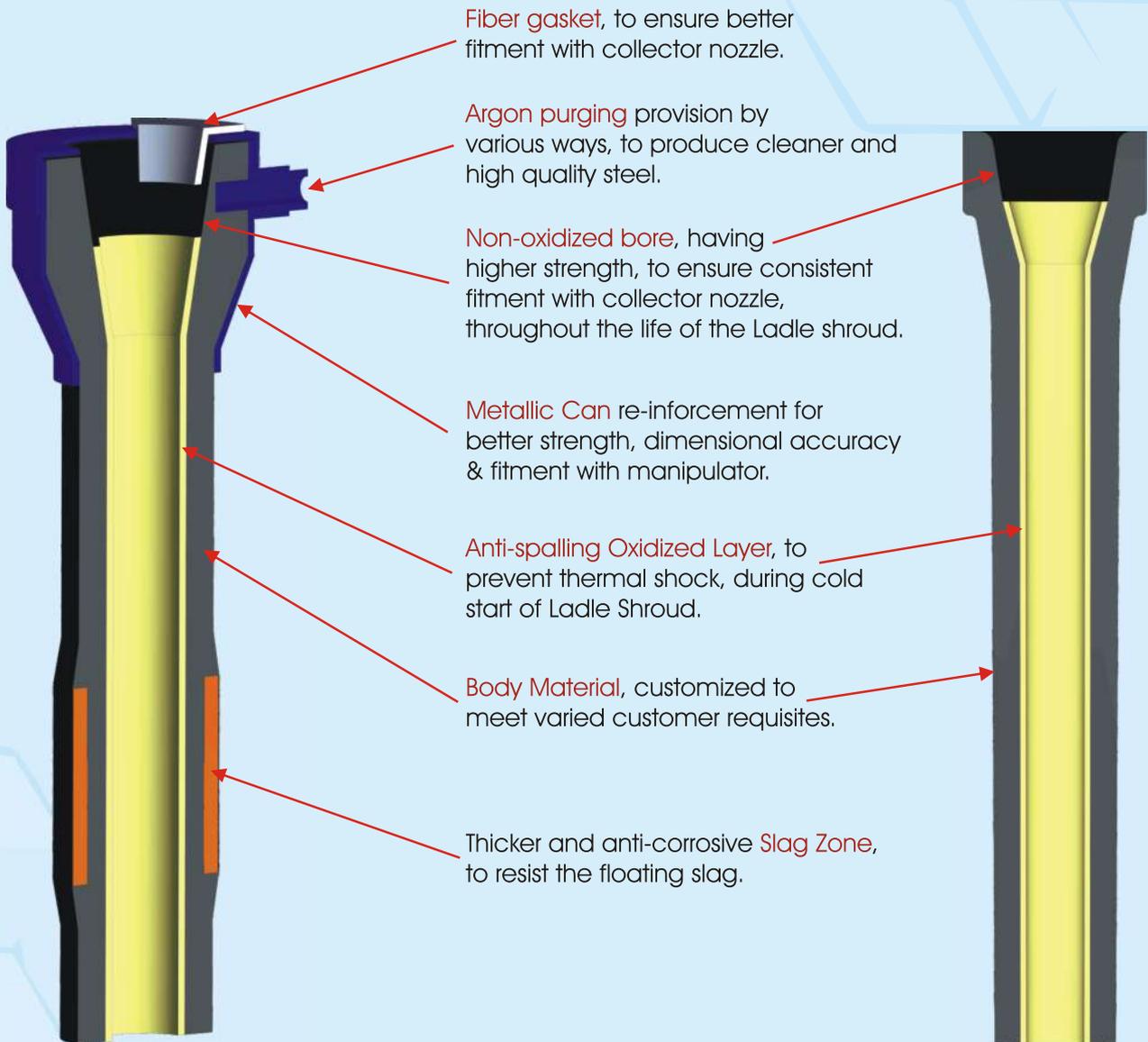
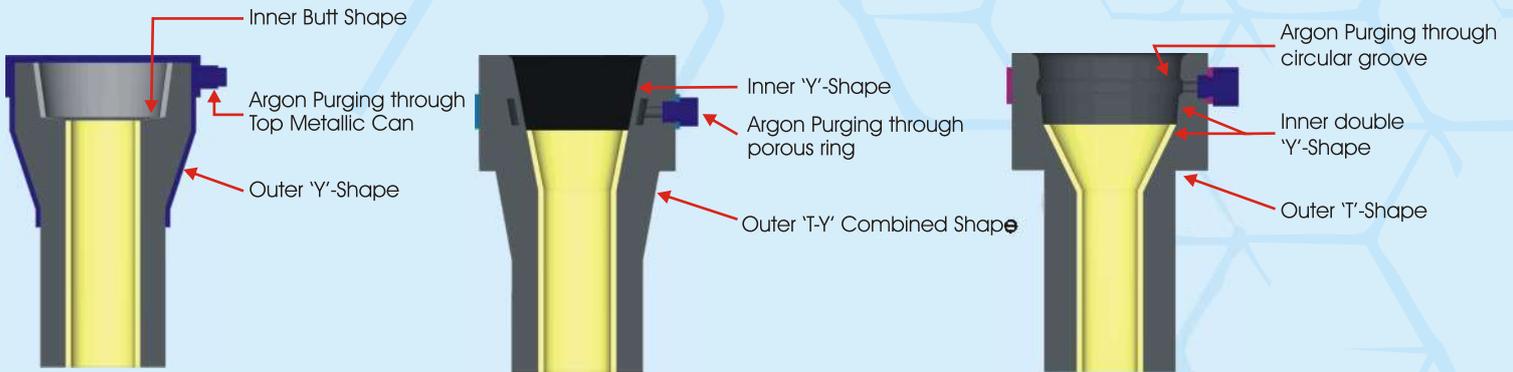
PRODUCT WITH A CUTTING EDGE

# Ladle Shroud (LS)

- 1 It is used between the Ladle and Tundish.
- 2 Shrouds the molten steel from reacting with Oxygen and Nitrogen of air.
- 3 Prevents temperature loss during flow of steel from Ladle to Tundish.
- 4 Prevents material loss caused due to splashing of steel.
- 5 Ensures safety of humans and other equipments.
- 6 Streamlines the flow of steel.



# Ladle Shroud (LS)



**Fiber gasket**, to ensure better fitment with collector nozzle.

**Argon purging** provision by various ways, to produce cleaner and high quality steel.

**Non-oxidized bore**, having higher strength, to ensure consistent fitment with collector nozzle, throughout the life of the Ladle shroud.

**Metallic Can** re-inforcement for better strength, dimensional accuracy & fitment with manipulator.

**Anti-spalling Oxidized Layer**, to prevent thermal shock, during cold start of Ladle Shroud.

**Body Material**, customized to meet varied customer requisites.

Thicker and anti-corrosive **Slag Zone**, to resist the floating slag.

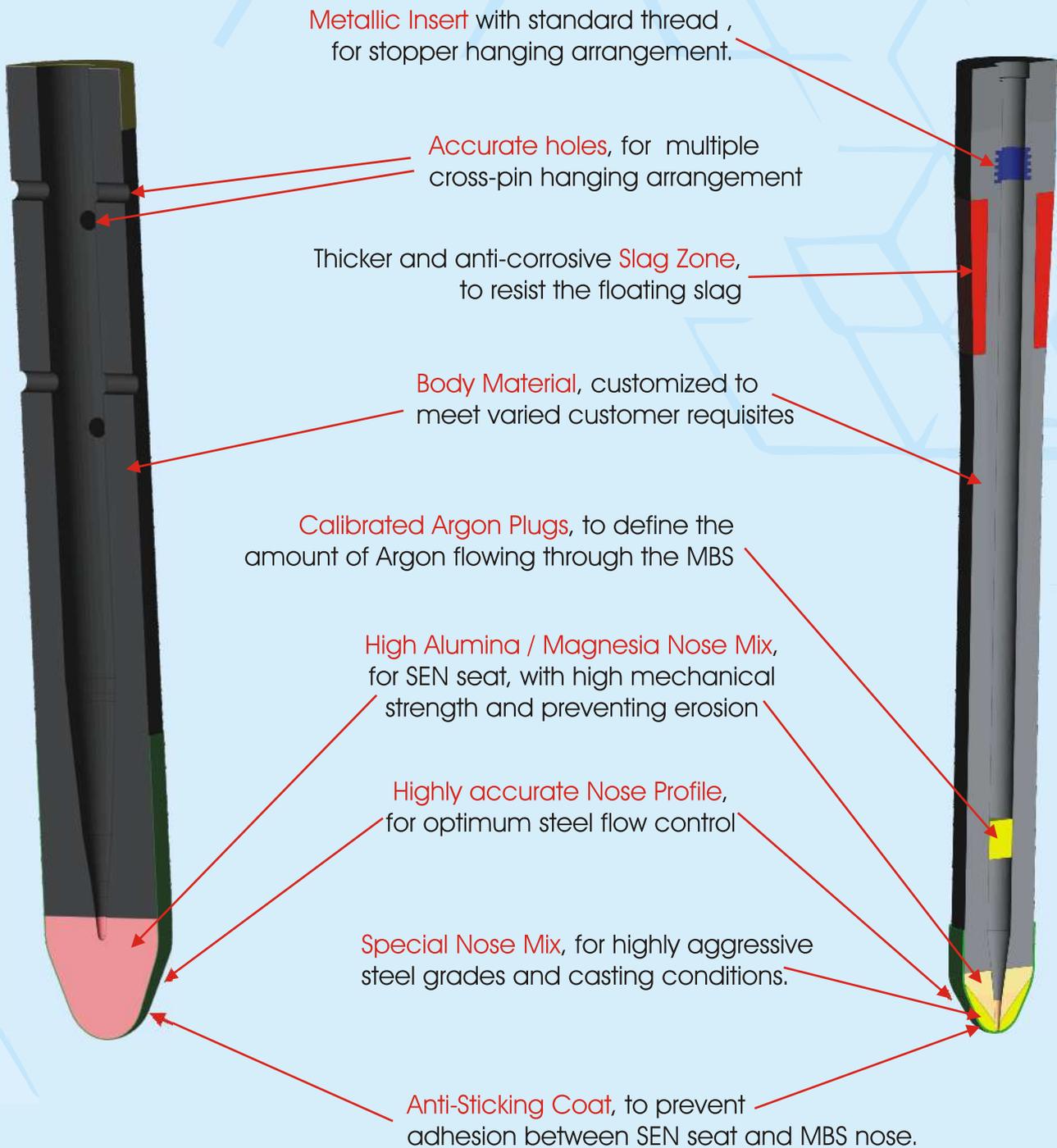
# Mono Block Stopper (MBS)

1 It is used inside the tundish to control the flow of steel into the mould.

2 It's highly accurate nose profile calibrates the amount of steel going into the mould.



# Mono Block Stopper



# Sub-merged Entry Nozzle (SEN) Sub-merged Entry Shroud (SES)

- 1 It is used between the Tundish and the Mould.
- 2 Prevents the molten steel from reacting with Oxygen and Nitrogen of air.
- 3 Prevents temperature loss during flow of steel from Tundish to the Mould.
- 4 Prevents material loss caused due to splashing of steel.
- 5 Ensures safety of humans and other equipments.
- 6 Streamlines the flow of steel.
- 7 The SES can be used to prolong the life of other refractories and the casting duration. This can highly improve productivity and resource utilization.



# Slide Gate Refractories

The Slide gate system has been established the world over as a safe, reliable and economical operation for teeming of quality steel and refractories are the most important components of any slide gate system.

## There are three types of slide gate system used in steel casting

- 1 Ladle Slide gate system
- 2 Tundish Slide gate system
- 3 Furnace Slide gate system



## Special features of Slide gate plate

- 1 High resistance against slag and metal attack
- 2 Good abrasion resistance
- 3 Excellent surface finishing
- 4 No fuming of tar or pitch hence better working environment
- 5 Excellent thermal shock resistance

## Ladle Nozzle & Collector Nozzle

Ladle nozzle and Collector nozzle are used in Ladles for flow control to tundish. These advanced nozzles control the flow of molten steel in an efficient manner.



# Slide Gate Refractories

## Purging System

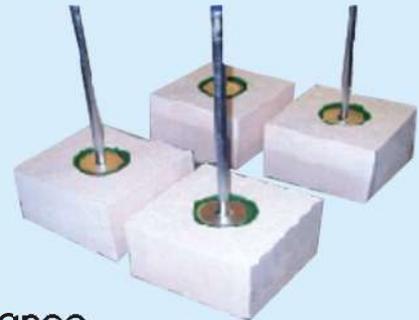
Inert gas is injected in the molten metal steel through bottom mounted Porous plug. This is the most cost effective and efficient method of gas stirring in ladle for a number of important metallurgical reasons in steel making process.

### The purging refractories includes

- 1 Porous Plug
- 2 Porous Plug well block

### Special features of Porous Plug

- 1 Better plug life
- 2 Smooth bore capillary holes
- 3 Easily adjustable gas flow
- 4 Optimum strength to ensure thermal shock resistance



## Tundish Nozzle

We manufacture a very wide range of high quality Tundish Nozzle or Tundish Metering Nozzle. Tundish Nozzles are basically used for controlling the flow of steel from the tundish to the continuous casting machine.

Different kinds of Tundish Nozzle include, Alumina nozzle, Alumina Carbon nozzle, Zirconia Alumina carbon Nozzle, which are manufactured for single to multiple casting application.

Zirconia Nozzles are manufactured using 65 % to 95% Zirconia. It can be used where application demands pouring time up to 40 hours for single to multiple casting.



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## Tundish Basic Spray Mass

Magnesia based Spray Mass which protects the permanent lining of continuous casting tundishes. Since spray mass is sprayed and not gunned, the rebound loss is eliminated. After drying spray mass it gives good mechanical resistance and high insulation values together with excellent erosion resistance deskulling properties.

The composition of MgO based spray mass also provides reduced hydrogen pick-up in first of cast section. Spray mass is equally suited both hot and cold tundish practice.

### Advantage of Basic Spray Mass

- 1 Faster tundish turn-round times
- 2 No rebound
- 3 Increase life of safety line
- 4 High level of insulation
- 5 Improved deskulling
- 6 Increased tundish capacity
- 7 Reduced hydrogen pick-up
- 8 Suitable for both hot and cold practice



## Nozzle Filling Compound (NFC)

Nozzle filling compound is a free flowing refractory material used in the Ladle or Tundish sliding gate to prevent steel freeze to ensure easy opening at the start of casting.

NFC is a high refractory granular product with selected particle size and distribution which remains flowable at the high temperature and ensuring consistent and trouble free ladle slide gate operation.

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## Application of the Nozzle Filling Compound

For achieving the best result , NFC should be pre-heated at around 100°C for about an hour to drive out any physical moisture .The Nozzle cavity should be cleaned of slag and any refractory particles before application.

The quantity of NFC to be applied should be carefully determined, so that nozzle cavity is entirely filled ,with a slight mound at the nozzle top NFC should be applied with a suitable applicator to ensure that the product is applied at the proper place.

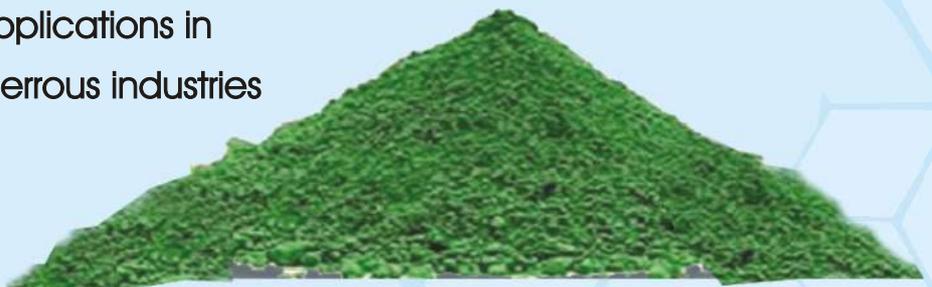


## High Alumina Mortar

90A Green Mortar having 90% Alumina ,chemically bonded with excellent bonding strength and resistance to metal penetration.

### Properties of 90A Mortar

- 1 High strength at higher temperature
- 2 Superior performance in corrosive environments
- 3 We can use it in critical applications in Steel, Cement and Non-Ferrous industries



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## Refractory Castable

Refractory Castables have extremely high strengths and volume stability at all temperatures up to their maximum operating temperature.

Designed with proportions of alumina cements and carefully controlled grains and micro fine sized aggregates. These are hydraulic setting castables which need to be installed under controlled condition.

### Categories of Castables

- 1 Medium Cement Castable
- 2 Low Cement Castable
- 3 Ultra Low Cement Castable
- 4 No Cement Castable
- 5 Conventional Castable



# REFRACTORIES FOR CONTINUOUS CASTING

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## Our Branches in India:

### Bengaluru

Phone: +91-7574887688

E-mail: bangalore@zircarrefractories.com

### Chennai

Phone: +91-7574887685

E-mail: chennai@zircarrefractories.com

### Delhi

Phone: +91-9711633901, +91-9711633902

E-mail: delhi@zircarrefractories.com, delhibdm@zircarrefractories.com

### Hyderabad

Phone: +91-9510226729

E-mail: hyderabad@zircarrefractories.com

### Kolkata

Phone: +91-7574887690

E-mail: kolkata@zircarrefractories.com

### Mumbai

Phone: +91-7574887683, +91-7574887684

E-mail: mumbai@zircarrefractories.com

### Pune

Phone: +91-7574887681

E-mail: pune@zircarrefractories.com

## Zircar Refractories Ltd.

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### Correspondence

402, 4th Floor, Campus Corner  
Nr.St.Xavier's College Cross Road,  
Navrangpura, Ahmedabad - 380009  
(Gujarat), INDIA.

Phone: +91-79-26400538

E-mail (For Indian Market) : dsales@zircarrefractories.com

E-mail (For Overseas Market): esales@zircarrefractories.com

**Works** Mehsana, North Gujarat, INDIA