



PRESENT AFFILIATION	TRL KROSAKI REFRACTORIES LIMITED
AREAS OF INTEREST	Flow control, tundish refractories & mechanisms
Education	B.Tech in Mechanical Engineering

Experience

- 13 Years
- Area – Flow control refractories & mechanisms, Tundish refractories & associated mechanisms, Refractories application systems, Supply chain management, Mechanical maintenance at plant

Projects:

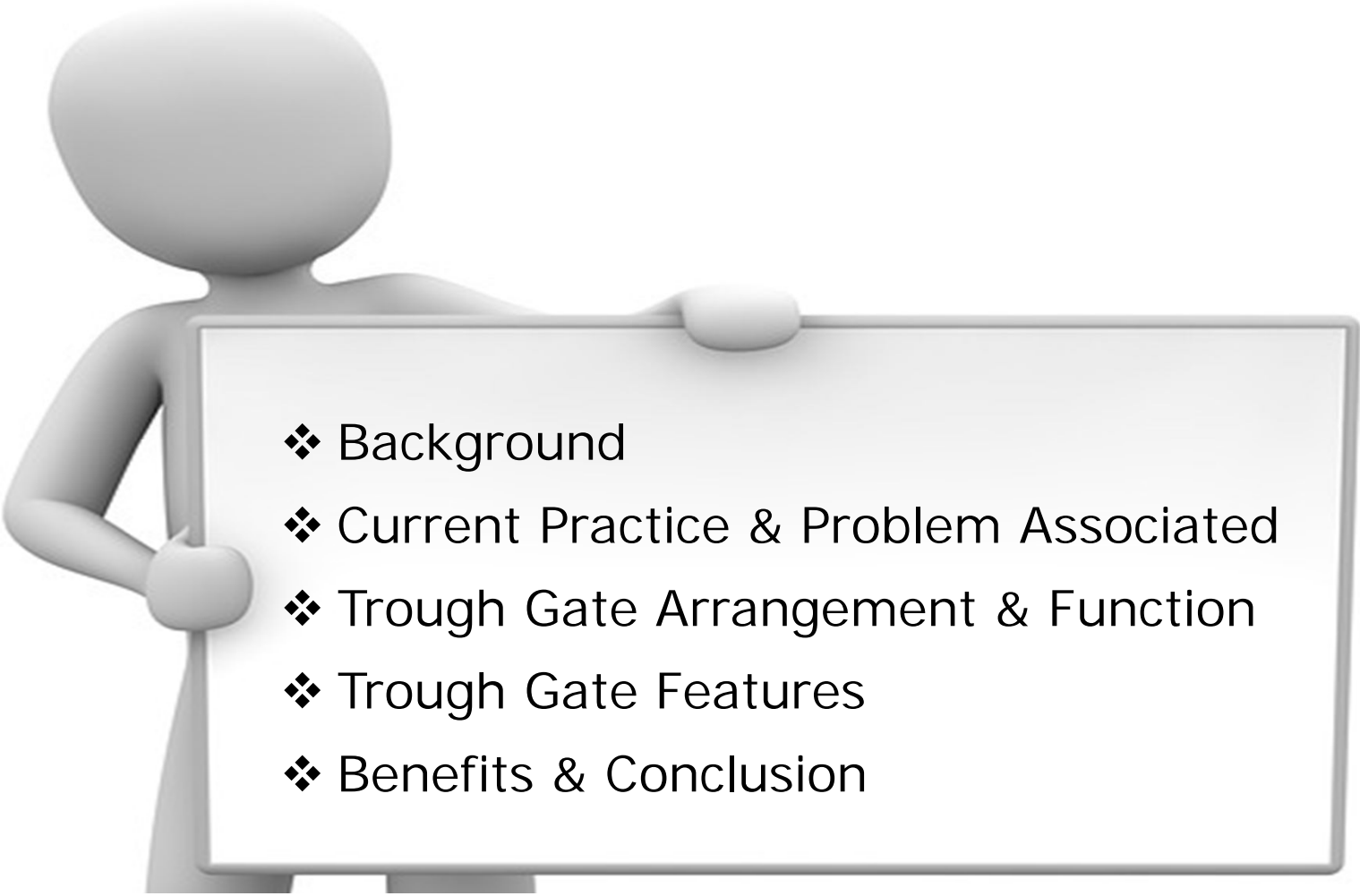
- POKA YOKE in TRLK Slide Gate System, for ensuring SG close during Tapping operation
- Development of Backsplash protection cover for safe operation in TRLK Slide Gate
- Mechanization to improve the productivity by 28% of Central maintenance shop at Dalmia Bharat Refractories Ltd.

Publication/ Patent

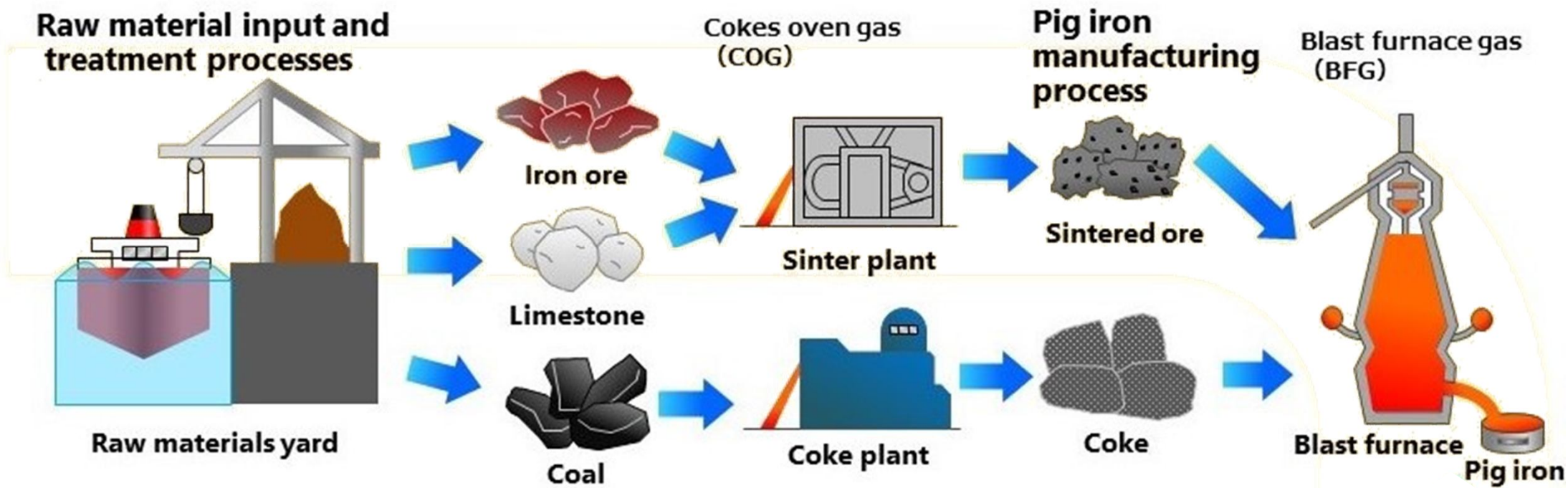
02-nos. patent (*Applied*)

Introduction of Slide Gate System for drainage of Hot Metal from Trough in Iron Making

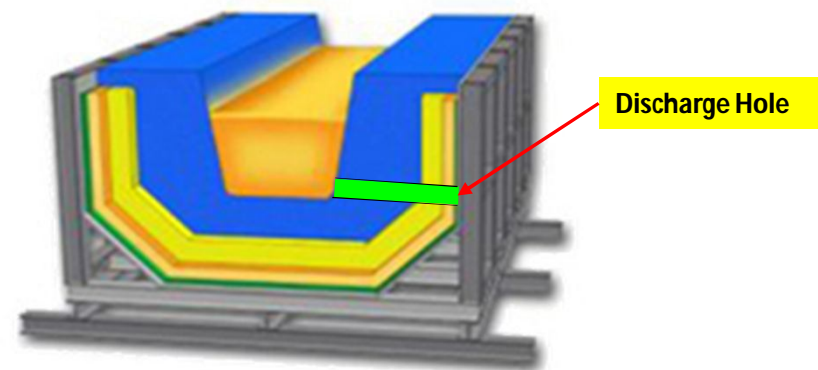
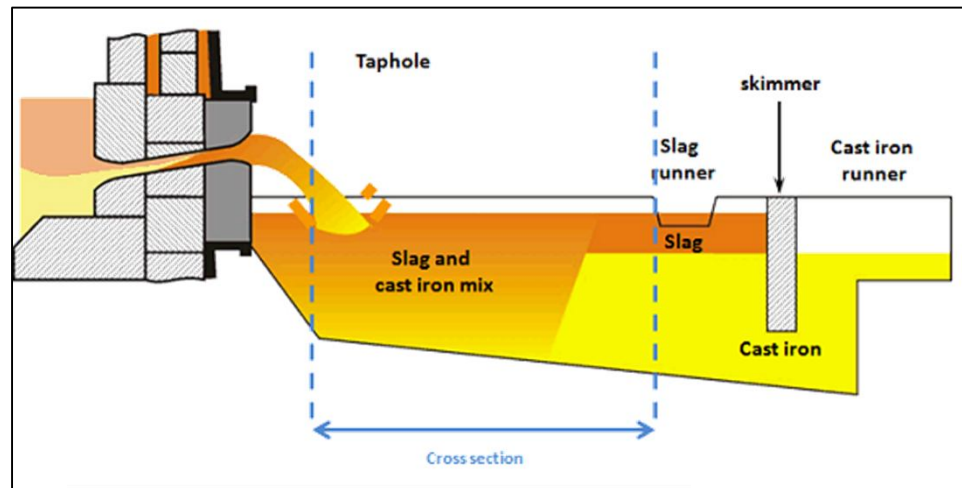
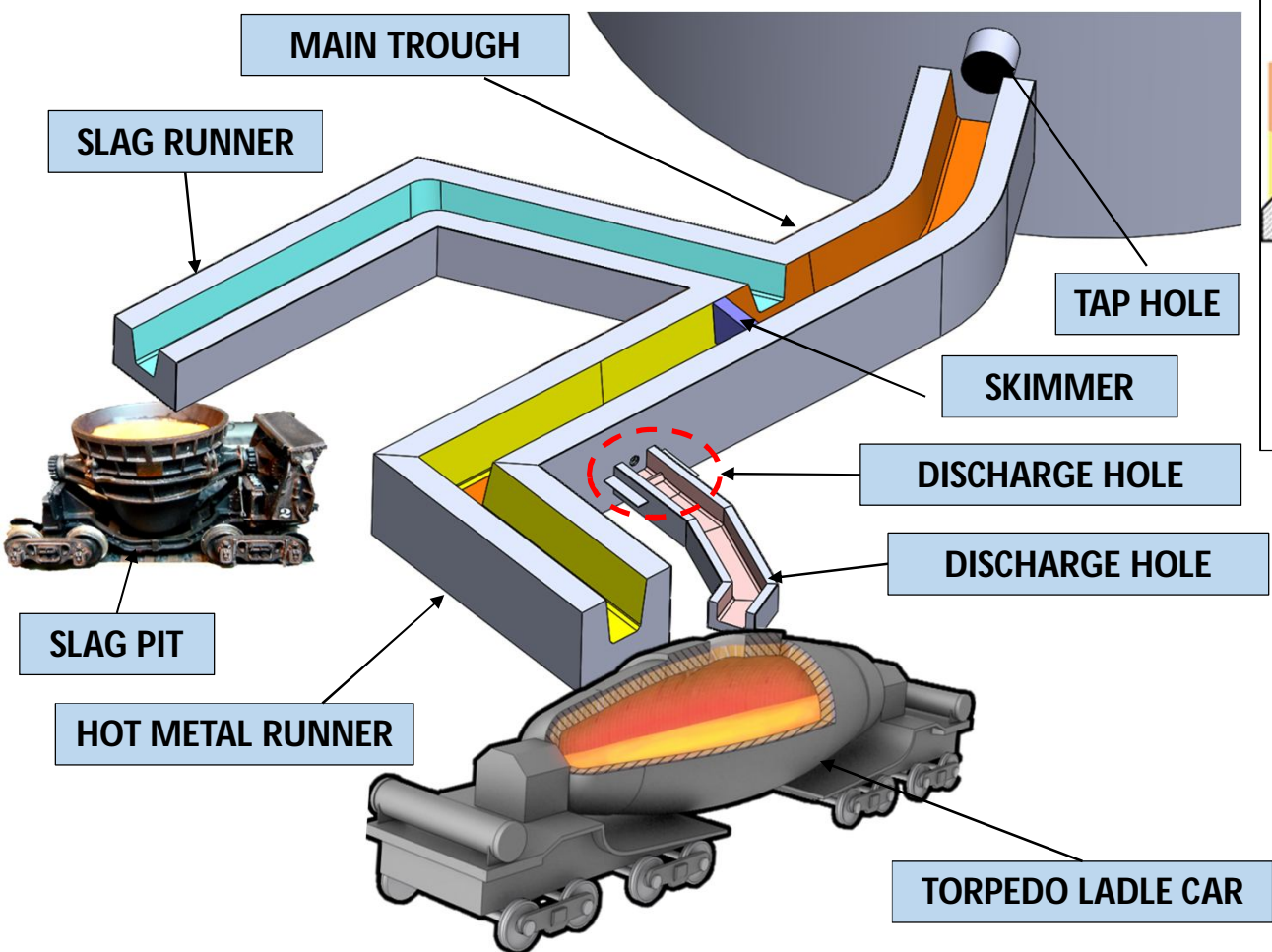
Presented by:
Suchit Kumar Mahanta
TRL Krosaki Refractories Ltd

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- ❖ Background
 - ❖ Current Practice & Problem Associated
 - ❖ Trough Gate Arrangement & Function
 - ❖ Trough Gate Features
 - ❖ Benefits & Conclusion

Overview of Iron Making Process

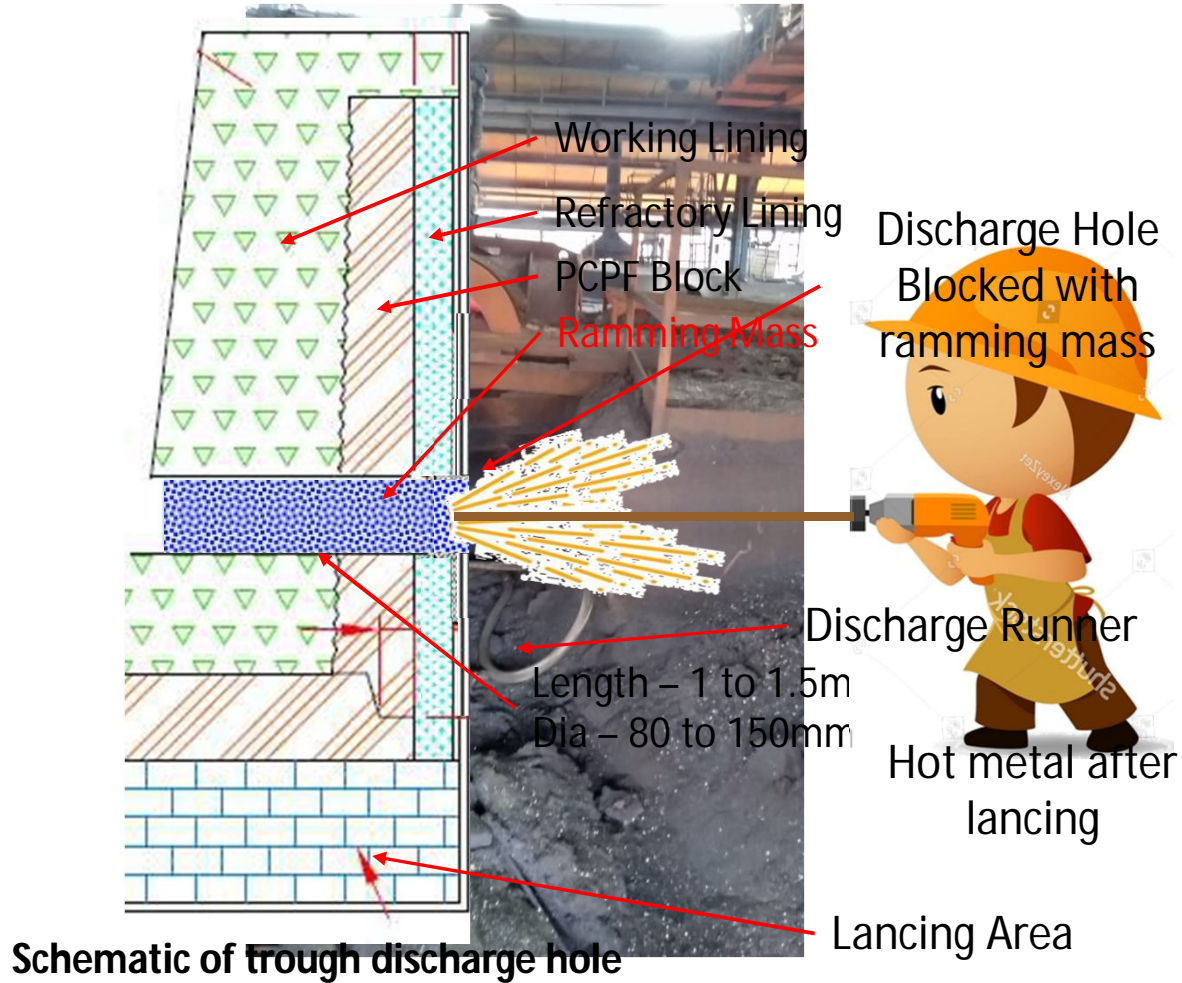


Trough & Its Function



This Discharge hole helps in draining the remaining Hot Metal from trough

Current practice of Hot Metal Discharge



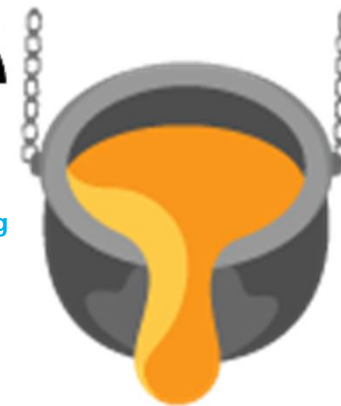
Problems....



Operator Fatigue



Operator Safety At Cast House

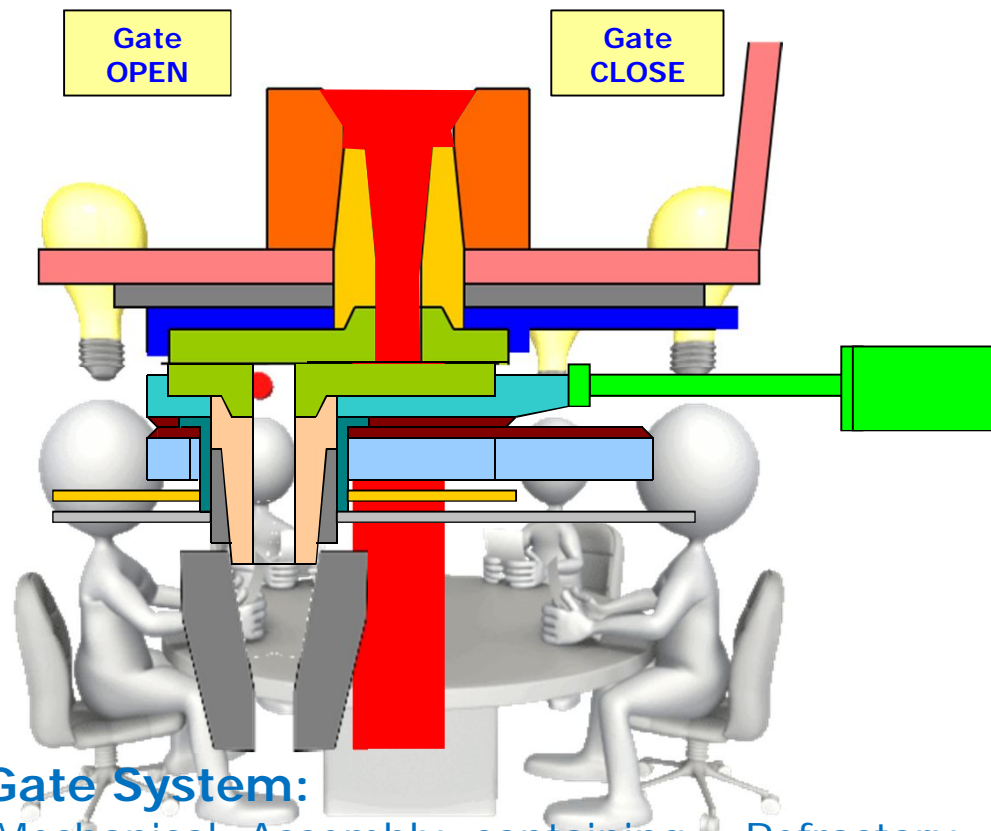


Production Loss

Innovation of Trough Gate



Refractory Lined container used to transfer Hot Liquid steel to various stations.



Slide Gate System:

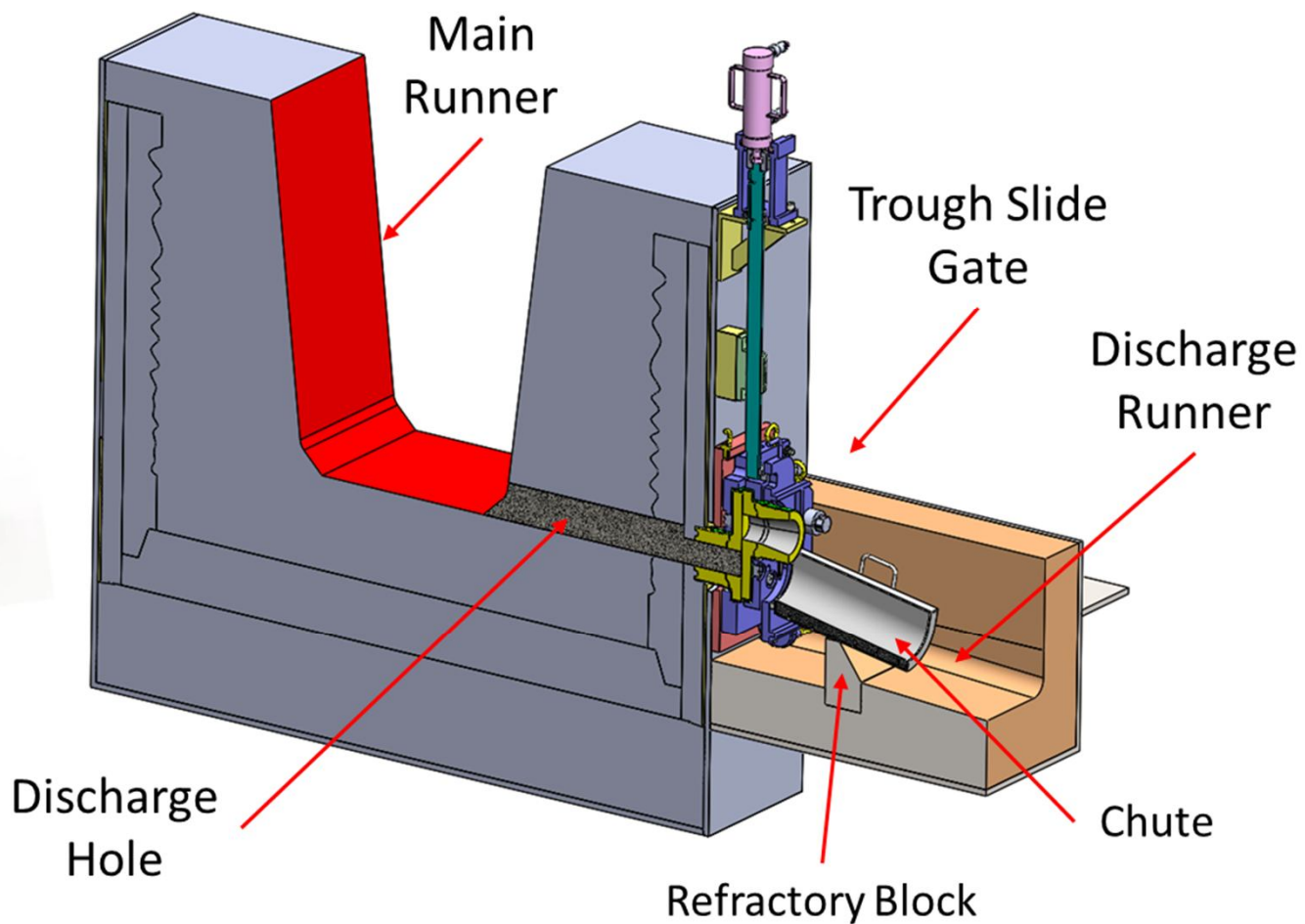
It's a Mechanical Assembly containing Refractory Components Fixed at Ladle Bottom

Basic function: The control of Metal flow

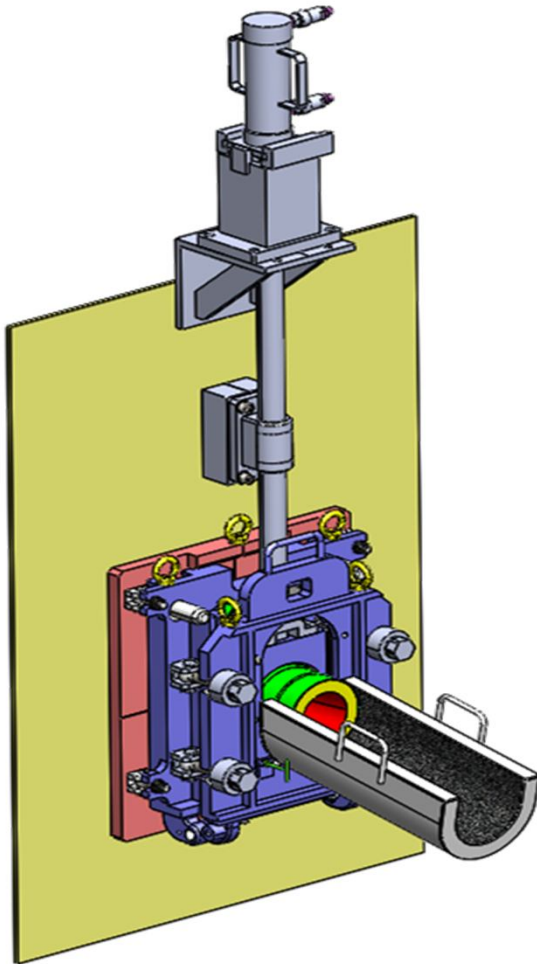


Discharge hole area

- Space constraint
- Heat and Dust
- Preparation of Slide gate
- Machine design & ergonomics
- Limited energy source



Trough Gate Features



SIMPLE & ROBUST DESIGN WITH LESS MACHINE PARTS

LESS TIME REQUIRED TO PREPARE/MAINTENANCE OF THE GATE

OPERATOR & REFRACTORY FRIENDLY DESIGN

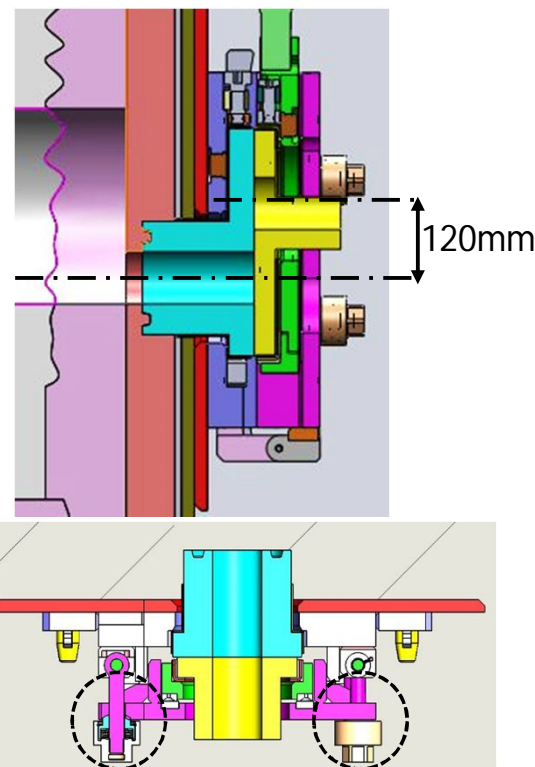
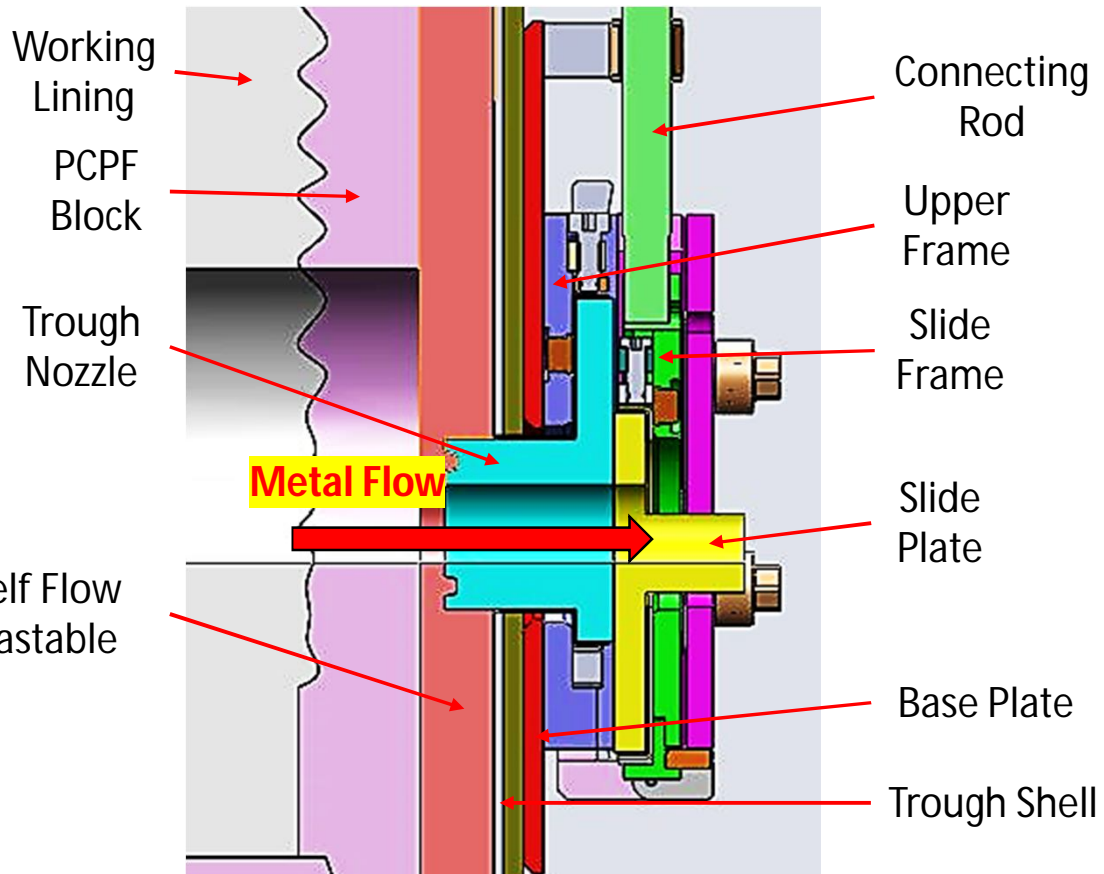
SECURE & EASY FACE PRESSURE LOADING SYSTEM

DITACHABLE HYDRAULIC CYLINDER & PUMP

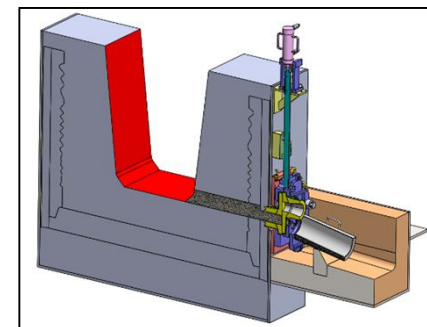
Arrangement & Function of Trough Gate

Open Position

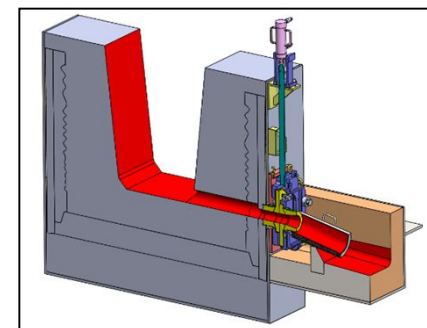
Close Position



Face pressure loading mechanism with multiple dish spring



Trough gate in Closed Condition

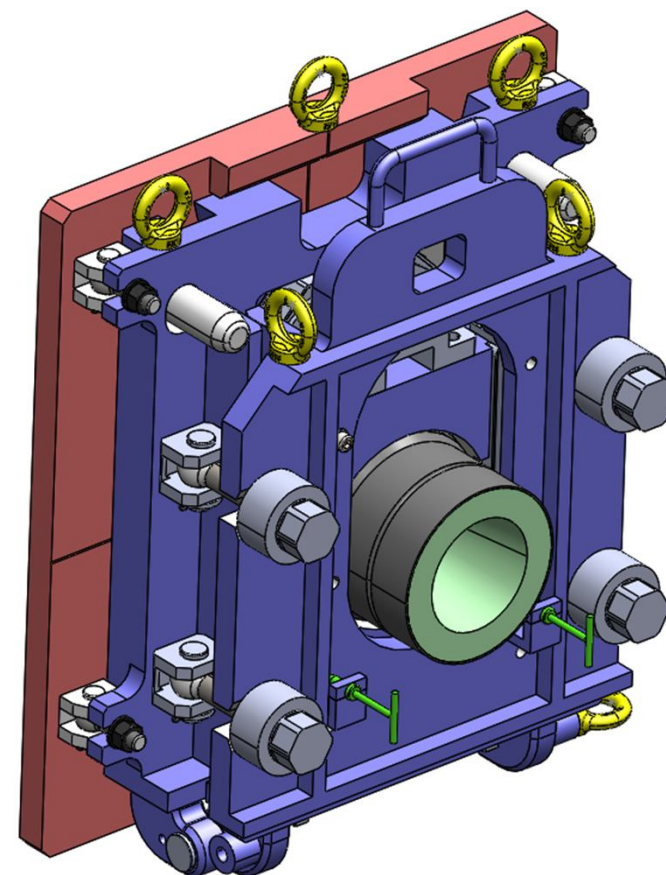


Trough gate in Open Condition

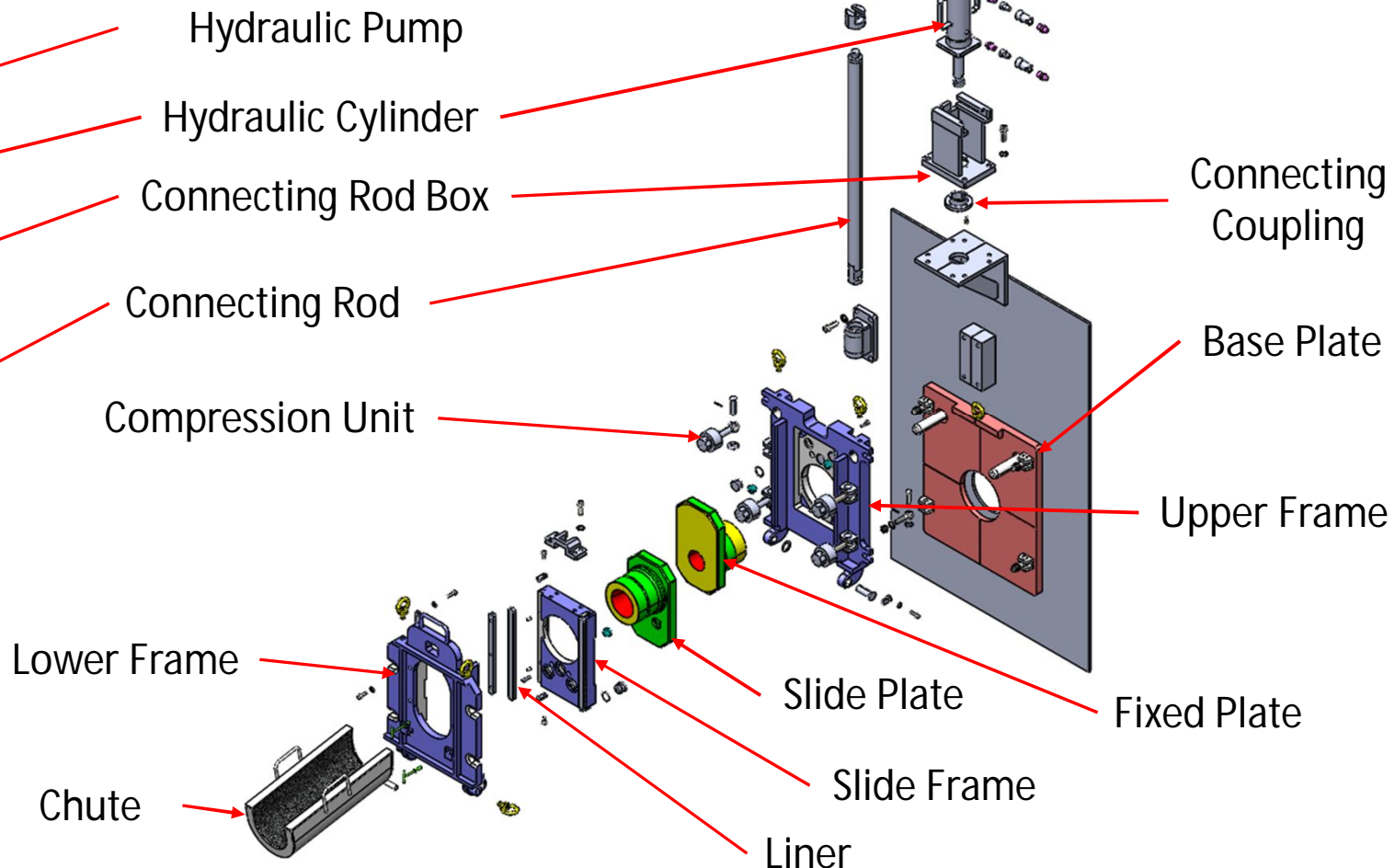
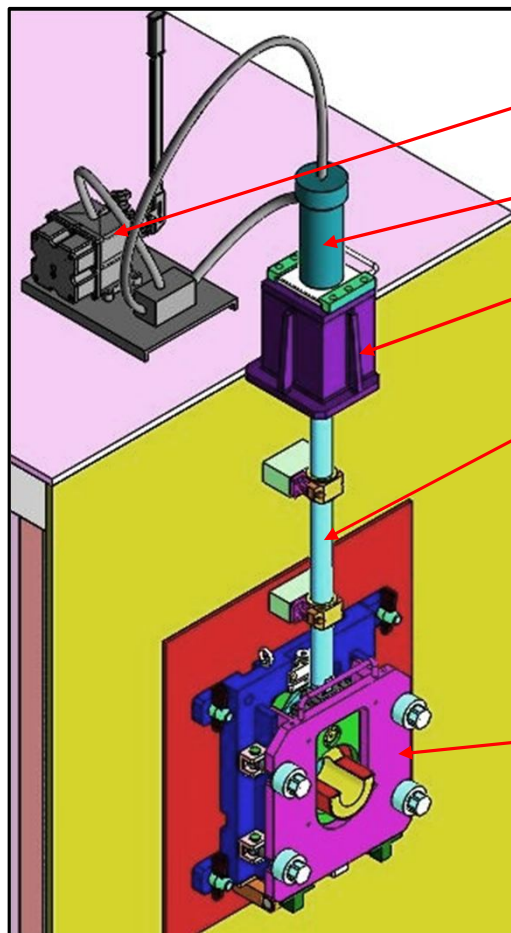
Specification of Trough Gate

Model : TG80/TG 100

▪ Type	: Double Plate Reciprocating
▪ Bore Diameter	: 80-100 mm
▪ Slide Stroke	: 120-140 mm
▪ Spring (Disc Spring)	: 4 Set/Gate
▪ Weight	: 250 kg approx.
▪ Designed Face Pressure	: 20KN approx.
▪ Plate fixing	: Magnetic Type
▪ Cylinder installation	: Detachable
▪ Preparation of Gate	: Offline
▪ Drive	: Hydraulic Operated

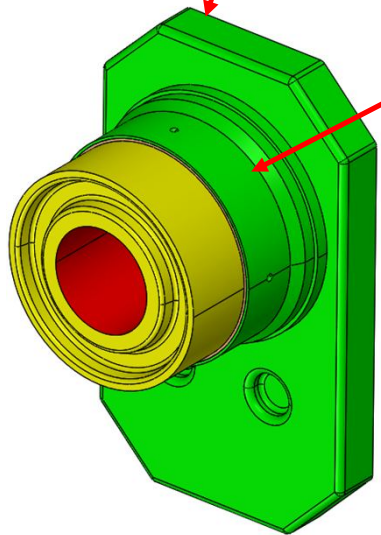


Trough Gate Components



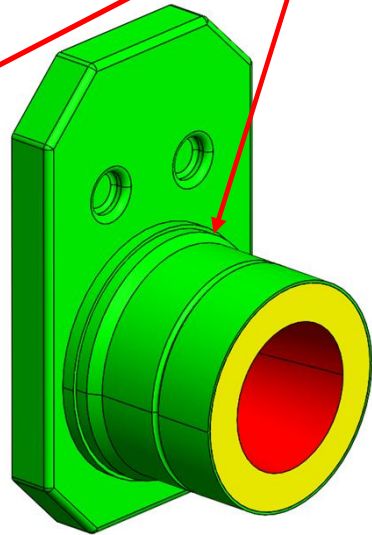
Refractories of Trough Gate

Metal can provided for better location and clamping of plates in frames

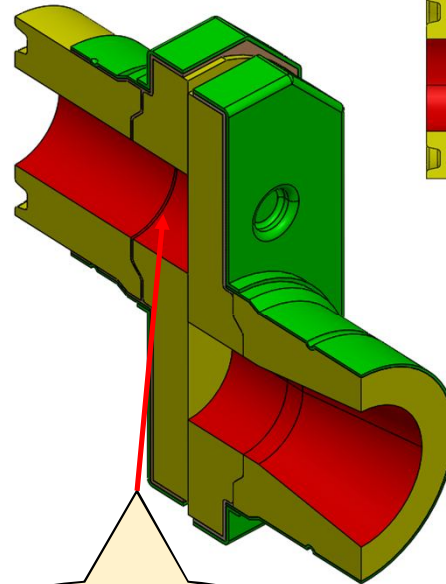


Fixed Plate

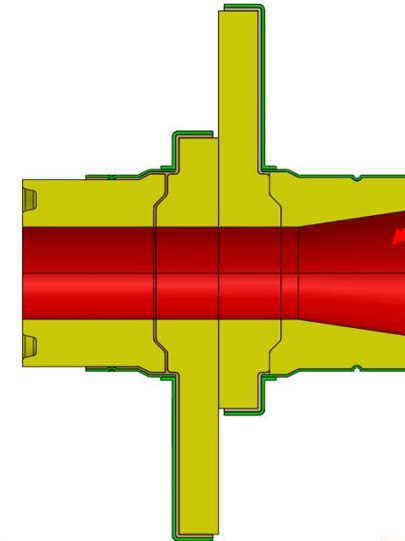
Integrated Nozzle with Slide Plate to Reduce the joints between refractories



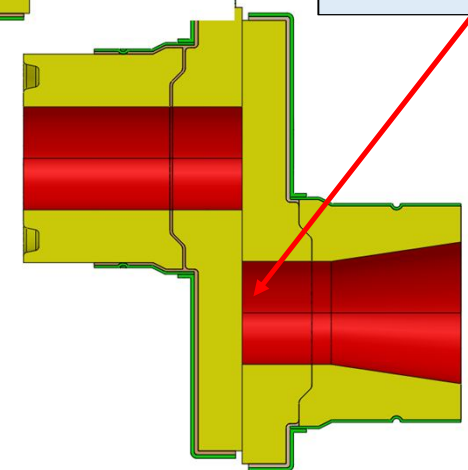
Slide Plate



Deep Grooves Provided in Trough Nozzle Part to ensure better locking of Nozzle with Castable



Plates in Open Condition



Plates in Close Condition

Advantages





Thank you