

→ Sr. Engr (PED/ASP)

Revised spec. no. updated in online sys. of material
code generation / updation.

3/10/17



BHARAT HEAVY ELECTRICALS LIMITED

CENTRAL FOUNDRY FORGE PLANT

FF4220216545

SPECIFICATION FOR 3 PLATE SLIDE GATE SYSTEM

Specification no. : SMS/SP/29 Rev 02

1. General:

This specification covers the requirements of 3 plate slide gate system to be placed at the bottom of pony ladle and will be used during vacuum teeming of liquid steel for manufacturing of Ingot in Vacuum degassing tank at Pit side of Steel Melting Shop.

The sliding gate system should ensure:

- Nozzle opening under vacuum for teeming of liquid steel.
- Control on flow of liquid steel from pony ladle to Ingot mould in Vacuum pit.
- Stationary Ladle Nozzle and collector nozzle at fixed location.
- No leakage of Liquid metal.
- Porous Plug of Middle plate should provide facility of Argon Purging under vacuum
- Leak proof environment in vacuum to avoid any air aspiration.

3-Plate slide gate system should be a complete unit in itself with all attachments needed for vacuum Teeming of Ingots.

2. Scope of supply:

- Scope of supply is Design, Engineering, Manufacture, Erection and Commissioning of 3 plate slide gate system.
- Slide gate system should fit into Pony Ladle (Drg No. SMS/02/3PSG/01).

If any modification in Pony Ladle is required for installation of 3-Plate Slide gate system, then it will be done by BHEL under supervision of the vendor.

- The supplier has to supply spares, tools & Refractory as per clause 6 of Specification.
- The supplier should furnish technical information of the equipment along with general arrangement drawings, list of spare and tools.
- The equipment shall be dispatched with identification and packing, to avoid any damage to the equipment.

Prepared by		Checked by		Approved by
RAHUL KUMAR Sr. ENGINEER (SMS)	SUNIL KUMAR Sr. MANAGER (SMS)	M K SAHU Sr. ENGINEER (SMS)	B.K. BEDI DGM (SMS)	P.K. ROY AGM(SMS)

3. Drawing Document & Manual:

Following documents (in English) as below shall be supplied:-

I) At the time of technical offer

- a. General Arrangement drawing of position of slide gate system and location of nozzle on pony ladle
- b. Modification required (If any), in Pony ladle for fitment of slide gate system in pony ladle.
Agreement will be done between BHEL and vendor during evaluation of technical suitability regarding necessary modifications to be made in Pony Ladle for fitment of slide gate system. (Modification in Pony Ladle (if required) is required for installation of 3-Plate Slide gate system, then it will be done by BHEL under supervision of the vendor.)
- c. Assembly drawings/diagrams showing the placement of components/parts.
- d. Complete list of spares required for the smooth operation of equipment.

II) After placement of Purchase Order

- a. Vendor has to provide General Arrangement drawing as per Agreement during evaluation of Technical suitability.

III) Along with equipment

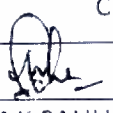
- a. Operation and maintenance manual.
- b. Drawing & data sheet of Refractories supplied.

4. Vendor's Qualification criteria

- Vendor should be a Manufacturer/ Manufacturer's Authorized Agent of the product.

Authorization letter (for Indian manufacturers)/ Agency agreement (for foreign manufacturers) has to be provided by the manufacturer's authorized agents. Purchase order will be placed to the manufacturing company.

- Vendor should have supplied at least one 3-Plate slide gate system supplied to a steel industry within last ten years.
- Vendor has to provide PO/Invoice copy in support of point (1).
- Offer should include the names and addresses of customers to whom same system have been Supplied by the supplier

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5. Operational parameters

Sl No	Category	Parameters
a	Steel Melting Process	Primary Melting: EAF Secondary Refining: VAD/VOD
b	Route of Liquid Steel	Liquid steel from VAD/VOD Ladle transferred to Pony Ladle then transferred to Ingot Mould in Vacuum Pit.
c	Liquid steel temperature at Pony Ladle	1500 to 1600 °C
d	Pony Ladle Capacity	35 MT
e	Nozzle bore diameter	55 mm
f	Cylinder stroke length	180 mm
g	Cylinder Operating pressure	180 bar min.
h	Teeming Time/Casting time	7 minutes to 25 minutes depending on the size of Ingot (weight of Ingot 25T to 110T)
h	Liquid Steel grade	Plain Carbon steel Alloy steel, Stainless steel and Supercritical steel
i	Pony ladle drawing	As per Drawing No.SMS/02/3PSG/02

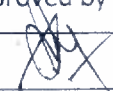
6. Technical parameters

6.1 For Slide Gate System:

- | | |
|---|-----------------------------|
| a) Location of 3 plate slide gate system: | At the bottom of Pony Ladle |
| b) Minimum Nozzle bore diameter required : | 55 mm |
| c) Cylinder stroke length : | 180 mm |
| d) Cylinder Operating pressure: | 180 bar min. |
| e) It should not fail during pouring operation. | |

6.2 Spares for Erection and Commissioning:

- Complete set of spares to be provided by the vendor for Erection & Commissioning.
- Vendor has to provide list of spares for Erection & Commissioning along with the offer.

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6.3 Tools for Maintenance of the slide Gate:

- a) Complete set of tools to be provided by the vendor for maintenance of Slide gate system.
- b) Vendor has to provide list of tools for Maintenance of Slide gate system along with the offer.

6.4 Tools for Slide Gate Preparation:

- a) Hydraulic Power Pack & Hydraulic hoses will be provided by BHEL.
- b) Except above items, complete set of tools including Hydraulic cylinder is to be provided by the vendor for Preparation of Slide gate system.
- c) Vendor has to provide list of tools for Slide gate preparation along with the offer.

6.5 Tools for Casting :

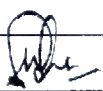
- a) Hydraulic Power pack, Hydraulic hoses and Argon hoses will be provided by BHEL.
- b) Complete set of tools including Hydraulic Cylinder required in casting area except above items is to be provided by the vendor.
- c) Vendor has to provide list of tools for casting area along with the offer.

6.6 Refractory Required in Slide Gate System for successful erection and commissioning:

- a) Well Block : 3 nos.
- b) Inner nozzle : 3 nos.
- c) Top plate Assembly : 20 nos.
- d) Middle plate Assembly : 20 nos.
- e) Bottom plate Assembly : 20 nos.
- f) Collector Nozzle : 20 nos.
- g) Supplier should mention the approximate life of above refractories with respect to number of heats.

7. Utilities to be Provided by BHEL

- a) Hydraulic Powerpack & Control system – 180 bar pressure min.
- b) Hydraulic Hose & Argon hose
- c) Ramming mass & other castables.
- d) Fabrication work in pony ladle (if required)
Fabrication work will be done by CFFP and will be carried out under supervision of vendor's representative.

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8. ERECTION AND COMMISSIONING

- a) Supplier shall take responsibility for carrying out the erection, testing and commissioning of equipment.
- b) If any modification in Pony Ladle is required for installation of 3-Plate Slide gate system, then it will be done by BHEL provided manpower under supervision of the vendor.
- c) Erection & Commissioning spares and tools, required for commissioning of the equipment, shall be brought by the Supplier.
- d) Lump sum Charges, duration, terms & conditions for Erection & Commissioning should be furnished in detail separately by vendor along with offer. No extra payment will be made by BHEL to the vendor above the lump sum amount.

9. Performance guarantee / warranty:

The supplier shall provide guarantee for trouble free performance for at least one year from the date of commissioning. If any manufacturing defect is noticed during guarantee period, it will be rectified/ replaced free of cost.

10. Site visit at CFFP, BHEL:

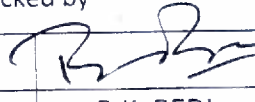
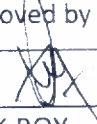
Supplier may visit the site before submitting the offer.

11. Confirmation on spares & services

- a) Vendor has to confirm the availability period in years for the service/ maintenance & spares of equipment for smooth running of equipment.
- b) The availability period must not be less than 12 years.

12. Training

The supplier shall train CFFP staff & engineers for operation, calibration and maintenance of the system at CFFP.

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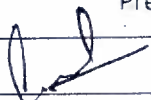
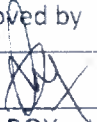
13. Price bid:

In the price bid following category has to be quoted separately:

S.No.	Category	Quantity	Price
1.1	3-Plate Slide Gate System (Main Equipment)	3	
1.2	Tools for Maintenance of the slide Gate:		
1.3	Tools for Slide Gate Preparation		
1.4	Tools for Casting :		
2.0	Spares for Erection and Commissioning		
3.0	Refractory set charge:		
	Well Block	3	
	Inner nozzle	3	
	Top plate Assembly	20	
	Middle plate Assembly	20	
	Bottom plate Assembly	20	
	Collector Nozzle	20	
4.0	Engineering, Documentation, Technical Assistance including Erection & Commissioning (Lump sum amount to be quoted)		
5.0	Packing & delivery charges (lump sum amount to be quoted)		

Note:

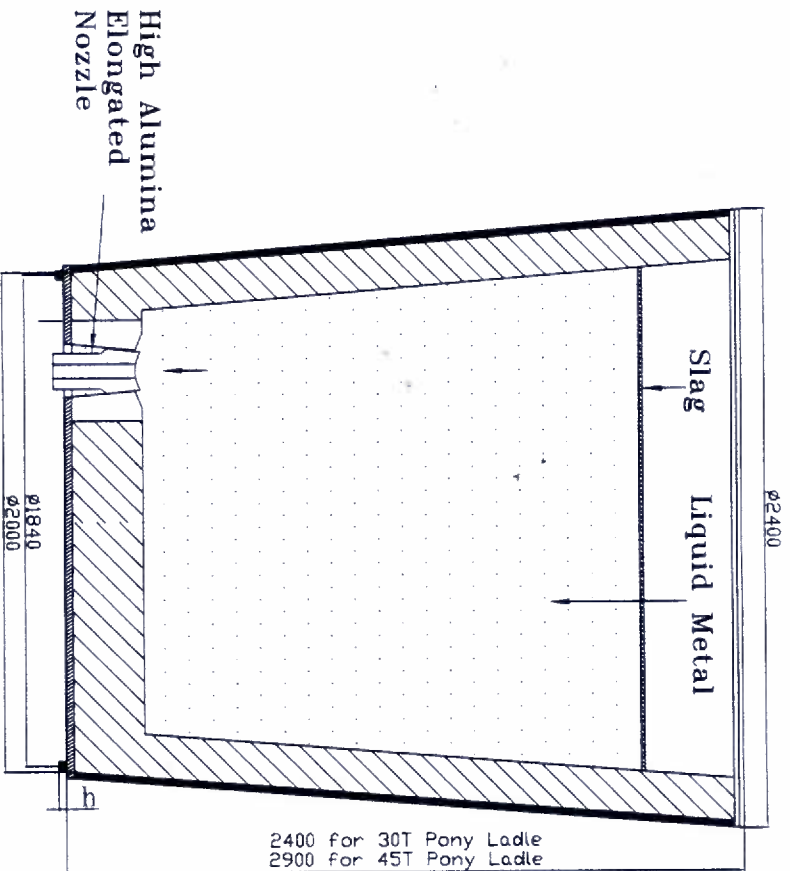
- a) Taxes extra

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FIRST ANGLE PROJECTION (ALL DIMENSIONS ARE IN M.M.)

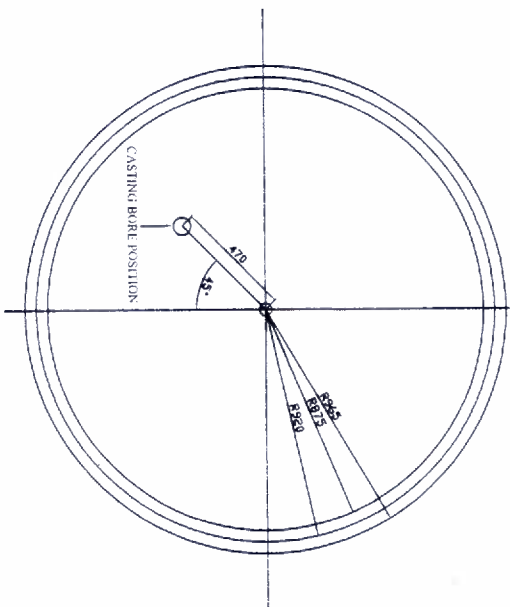
DRAWING NUMBER

PONY LADLE (SCHEMATIC)



Here "h", height of pony of the ladle can be increased to accommodate 3 Plate Slide Gate System

SCHEMATIC DRAWING OF CASTING BORE POSITION AND LADLE BOTTOM



		BHARAT HEAVY ELECTRICALS, LTD. CENTRAL FOUNDRY FORCE PLANT BANPUR BARDWAN	
DEPT. SMS		SCALE N.T.S.	WEIGHT
TITLE	SCHEMATIC DRG OF PONY LADLE		
DRN	SUNIL KUMAR	NAME	SIGN
CHKD	P.K. ROY	DATE	
DEPARTMENT	SMS		
DRG NO.	SMS/02/2PSC/01		

DRAWING NUMBER

[illegible]

		BHARAT HEAVY ELECTRICALS. LTD. CENTRAL FOUNDRY FORCE PLANT RANPUR HARDWARE			
DEPTT.	SMS		SCALE N.T.S.	WEIGHT	NAME
TITLE				DRN	STN/L KILN/AG
SCHEMATIC DRG OF PONY LADLE				C/D	
WITH VACUUM TANK COVER				APD	P.K.ROY
SIGNATURE				DATE	
DEPARTMENT	SMS	DRG NO.	SMS/02/PS/C/02		