

**NTPC DADRI – 2X490 MW
FLUE GAS DESULFURIZATION SYSTEM**

TECHNICAL SPECIFICATION

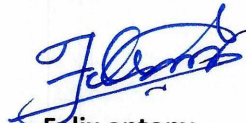
FOR

FRP Grating

CUSTOMER : NATIONAL THERMAL POWER CORPORATION LIMITED



NTPC:DADRI: GRATING: REV-00

Prepared	Checked	Approved
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R00 dated 02-03-2019		

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1.0 PROJECT INFORMATION	
a) Owner	NTPC
b) Buyer	BHEL, Ranipet
c) Process / application	Wet Lime Stone FGD system
1.1 SITE CONDITIONS	
a) Ambient temperature (Guarantee)	27 Deg C
b) Ambient temperature (Design)	45 Deg C
c) Relative Humidity	60 %
1.2 LOCATION AND APPROACH	
Project location	
a) Place	Dadri
b) District	Gautam Buddha Nagar
c) State	UP

2.0 INTENT OF SPECIFICATION

- 1 There are two units of Dadri each of 490 MW. Each unit of Dadri is envisaged with one Absorber for Flue Gas Desulphurization (FGD) system.
- 2 Recirculation pumps are located in the absorber bottom and it will recirculate the Gypsum Slurry to the absorber. Suction screens (i.e. gratings made of FRP) is installed inside the absorber to protect the recirculation pumps. Drawing of the absorber bottom is enclosed with this specification indicating the arrangement of the suction screen/FRP Gratings.
- 3 Design, Manufacturing, Inspection and Testing of the gratings shall comply with all the currently applicable statutes, regulation and safety codes in the locality where the equipment are to be installed. The item shall also conform to the latest applicable Indian/British/American Standards. Nothing in this specification shall construe to relieve the contractor of the required statutory responsibility.
- 4 Vendor shall guarantee that the FRP grating will withstand the slurry conditions inside the absorber as given in CI 4.3.
- 5 Compliance to this specification shall not relieve the vendor of responsibility of furnishing the item of proper design, materials and workmanship to meet the specified requirements.
- 6 In case of any deviation taken by the vendor, it shall be listed in the proposal under separate section titled as " list of deviations/exceptions" from the enquiry document (Annexure I)

3.0 SCOPE OF SUPPLY

1. Design, manufacture, testing and supply gratings made of best Quality FRP suitable for the duty condition as specified in respective clauses.
2. Supply of fixing fasteners and washer (made of UNS S31254) as given in the drawing.
3. Part items of the equipment shall be identified by Tag Nos and have to be packed in order to minimize the possibility of damage during storage or transit. The equipment shall be protected for storage of 12 months at site, any extra precaution to be taken by the Purchaser for storage beyond 12 months shall be explicitly indicated in the operation and maintenance manuals.
4. Ten copies containing all details of reference drawings and technical data shall be furnished by the Bidder.

4.0 BASIC DESIGN

This section covers the manufacturing and performance requirement of the FRP Grating

4.1 Material of construction of the grating :

Gratings shall be of Fibre-reinforced plastic (FRP). The material shall be made of best quality resin material . Raw material (Resin/Glass material) imported from China is not acceptable. Proper resin material shall be selected to prevent any damage or blister.

Grating should have ant-slip surface, high impact resistant, UV resistant and abrasion/corrosion resistant .

4.2 Dimensions of FRP

Dimension of the each element in the grating shall be 24.8 X 24.8 X 25 (all in mm). Bidder shall refer to the Annexure -III for details of the grating element.

4.3 SLURRY ANALYSIS:

The grating material has to be chosen to withstand the below slurry condition.

S.No	Constituents	Parameters
1.	Slurry to be handled	Gypsum Slurry
2.	Chloride Content	<20,000 ppm
3.	Specific Gravity at pump suction	1.215
4.	Vapor Pressure at Pump	20.3 KPa
5.	Viscosity at Pump	0.01 Pa.S
6.	Concentration of Solid	30% wt.
7.	SiO2 Content	4 to 6 g/l
8.	pH	4-8
9.	Slurry Temperature	55 - 65 deg C

Grating is installed inside the absorber tank bottom containing gypsum slurry. Maximum level Of gypsum slurry in the tank is 6m. Grating shall be able to withstand the liquid pressure prevailing inside the tank (refer Annexure –IV for the sketch).

4.4 Fasteners :

Bidder to provide fasteners made of UNS S 31254 material for the gratings as called in the drawing. These fasteners shall be packed along with the individual grating material.

The quantity of grating along with fasteners required is given as per the below list :

S.No	Type As per Drawing no 3-FW000-00846	Size of the Grating (mm)	Qty per absorber(Nos)	Qty for both the units
1	Type A with 4 sets of Hook Bolt Nut	949X501	1	2
2	Type B with 4 sets of Hook Bolt Nut	949X501	1	2
3	Type C with 4 sets of Hook Bolt Nut	949X501	1	2
4	Type D with 4 sets of Hook Bolt Nut	949X501	1	2
5	Type E with 4 sets of Hook Bolt Nut	949X999	12	24
6	Type F with 4 sets of Hook Bolt Nut	949X999	6	12
7	Type G with 4 sets of Hook Bolt Nut	949X999	6	12
8	Type H with 4 sets of Hook Bolt Nut	949X999	6	12
9	Type I with 4 sets of Hook Bolt Nut	949X999	6	12

Each of Set of Hook Bolt and Nut shall consist of the following items : a) M8 U-Bolt as per drawing – 1 No ; b) Square Washer 50 X 50 with dia 9mm hole (t= 1 mm) - 2 Nos ; c) Rubber Sleeve (chloroprene Rubber) for Hook Bolt – 1 No; d) M8 Nut – 4 Nos.

5. WARRANTY

The warranty period shall be 24 months from the date of supply or 18 months from the date of commissioning whichever occurs first.

6. INSPECTION & TESTING

The General inspection requirements to be considered are as below:

1. Bidder shall furnish written copies of shop production, fabrication , quality test procedures and drawings for review by BHEL/NTPC prior to manufacture. Inspection of above mentioned tests by BHEL representative at bidder's works is envisaged.
2. The test procedure will be reviewed and approved by the BHEL/NTPC. Inspection and testing requirement shall be as per approved Quality plan.
3. Sample shall be offered to BHEL for approval and inspection.
4. Final inspection and release by the BHEL/NTPC is a mandatory requirement unless specially waived.
5. BHEL/NTPC shall witness the test at Bidder's works and a notice of minimum three (3) weeks shall be given for attending the inspection.
6. Bidder to arrange all calibrated gauges, Instruments during inspection.
7. Bidder to arrange Instruments and all accessories for the measurement at site using Impact method.

7.0 SPECIAL TOOLS & TACKLES

Any special tools & tackles required for the entire equipment to disassemble, assemble or maintain the units, they shall be included in the quotation and furnished as part of the initial supply. List of special tools & tackles shall be decided by bidder as per his proven practice. When special tools are provided, they shall be packaged in separate, boxes with lugs and marked as "Special Tools for (tag / item number)." Each tool shall be stamped or tagged to indicate its intended usage. Levers and eye bolts for the removal of parts to be serviced shall be submitted with special tools.

8.0 COLOR SHADE:

The surface has to be painted with acrylic urethane paint . Color shade will be intimated during contract stage

9.0 DOCUMENTATION

9.1 INFORMATION TO BE FURNISH ALONG WITH THE OFFER

- a) Compliance to the specification
- b) Data sheet of the FRP grating indicating the composition and mechanical properties.
- c) FRP grating profile with dimensions
- d) Datasheet of the resin and the glass fiber
- e) Reference list where similar grating has been installed and the application
- f) For bought out items vendor has to provide the subvendor list
- g) Quality plan
- h) Total weight including individual weight of the gratings.

9.2. DOCUMENTATION TO BE FURNISHED AFTER PURCHASE ORDER

- a) Datasheet of the resin and glass fiber to be furnished for review and approval.
- b) Drawing to be furnished for review and approval.
- c) Quality plan to be submitted for approval, Inspection and Testing.

Annexure I**LIST OF DEVIATIONS/EXCEPTIONS TO THE ENQUIRY DOCUMENT**

Sl No	Clause No	Page No	Description of Deviation

Bidder sign & seal:**Designation:****Date:**

Annexure II

BHEL drawing no : 3-FW-000-00846

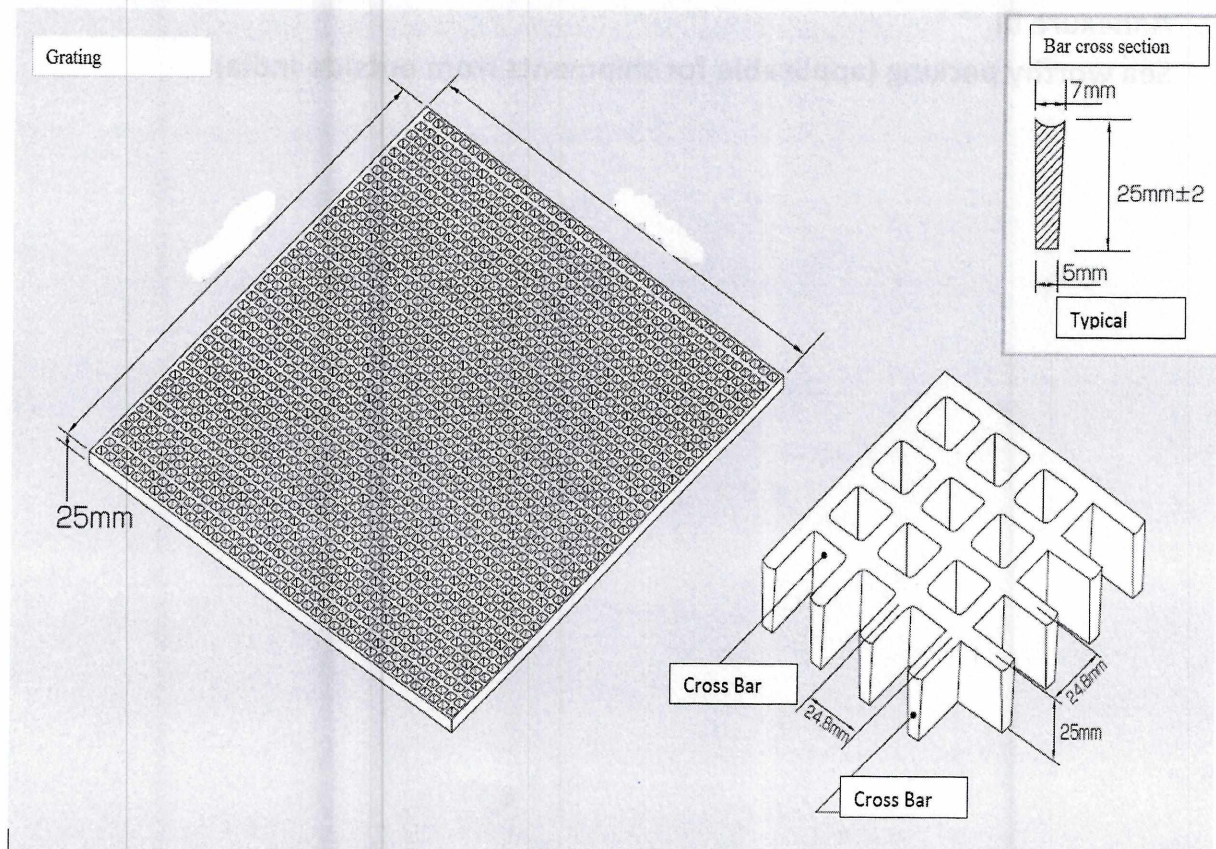
Bidder sign & seal:

Designation:

Date:

Anexure III

Grating profile



The size of the grating shall be as per the drawing 3-FW-000-00846. Each tiny element has to be as 24.8 X 24.8 X 25 (all in mm) . Bar cross section has to be as per the drawing above.

Bidder sign & seal:

Designation:

Date:

Annexure III

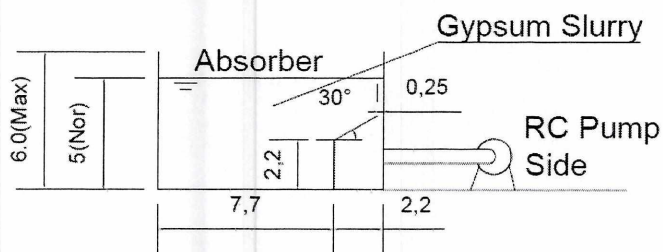
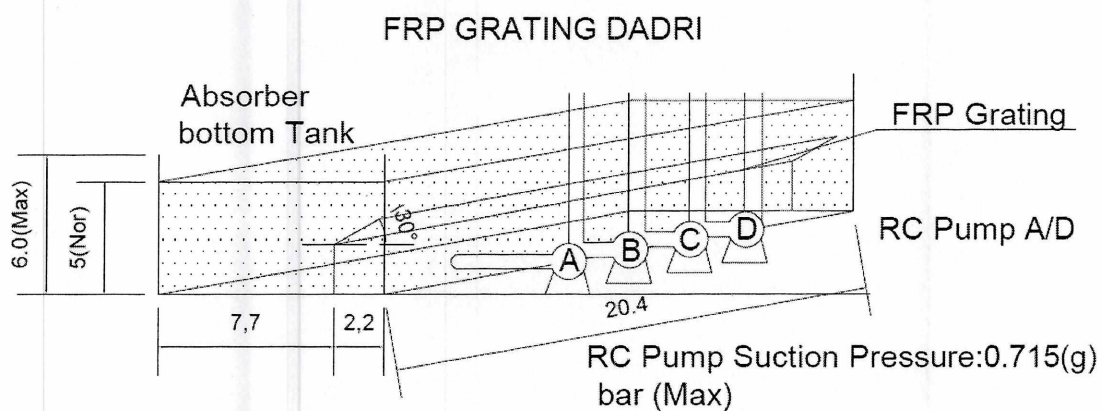
Sea worthy packing (applicable for shipments from outside India)

Bidder sign & seal:

Designation:

Date:

Annexure –IV



All units are in m

