

TECHNICAL SPECIFICATION & DETAIL SCOPE OF SUPPLY

TECHNICAL SPECIFICATION & DETAIL SCOPE OF SUPPLY FOR SUPPLY OF 25 NOS. RADIANT TUBES (SIZE 1.5” IN FULL VERTICAL LENGTH, JOINT NO-CB TO CC)

1. INTRODUCTION:

- 1.1 Brahmaputra Cracker & Polymers Limited, Lepetkata, ASSAM (INDIA) is operating **4 nos. of SRT VI C2+/Naphtha Cracker Furnaces having a capacity of 220 KTA ethylene & 60 KTA Propylene productions** at ETHYLENE CRACKER PLANT.
- 1.2 This Specification along with Material Requisition and its attachments as listed, outlined the minimum requirement for preparation of fabrication drawing, procurement of material, manufacture / fabrication, assembly, inspection & testing at shop, supply transportation from shop to site of Radiant Tube for Naphtha Cracker Furnaces of Ethylene cracking unit of Brahmaputra Petrochemical Complex, Assam.
- 1.3 These Naphtha Cracker furnaces are designed and licensed by M/s Lummus Technology Heat Transfer (LHT).

2. BRIEF SCOPE OF SUPPLY:

- 2.1 BCPL, Lepetkata intends to procure **25 Nos.** of SRT VI Radiant Tubes (Size 1.5” In Full Vertical Length, Joint No-CB to CC (Approx. Length 12.1 meter) as per Annexure-1.
- 2.2 Vendor’s scope of supply under this requisition shall include all material required for completion of work for Radiant tubes as per M/s LHT drawing (The drawings and specification issued along with this requisition are for quotation purpose only).
- 2.3 Brief Scope of supply shall include design, manufacturing, third party inspection and supply of 25 Nos. Radiant Tubes (Size 1.5” In Full Vertical Length, Joint No-CB to CC of attached drawings) for Naphtha Cracker Furnaces, BCPL, Lepetkata, ASSAM (INDIA).

Sr	Description	Qty.	REMARKS
1	Design, manufacturing, testing, third party inspection, packing and supply of 25 Nos. Radiant Tubes (Item No. 120001 & 120002 of drawing no. BE62559DWG1200) for C2+/Naphtha Cracker Furnaces designed by M/s Lummus Technology Heat Transfer (LUMMUS). The scope of supply of tubes shall be as per Annexure-1. The scope of supply of above 25 Nos. also includes the supply of Enough quantity of welding consumables (for 50 nos. field joint) for welding 25 Nos. new Radiant tube with old Radiant tube assemblies along with required test pieces.	25 Nos.	Drawings as per Annexure-1 is enclosed for reference, dimensional & material Specification details.

- 2.4 The bidder must be an approved vendor of M/s Lummus Technology Heat Transfer, USA for RADIANT COIL ASSEMBLIES for cracking pyrolysis furnaces.
- 2.5 There is no free issue material from Owner and Vendor’s scope shall include all the material as indicated on Drawing **Annexure-1.**
- 2.6 The material of construction of the different components as depicted in Drawing **Annexure-1.**
- 2.7 The metallurgy of tubes of Radiant coils shall be in accordance with details mentioned in **Annexure-1.**

- 2.8 The tubes shall be manufactured, assembled, inspected/ tested & supplied in accordance with the enclosed Drawing (**Annexure-1**) and **Annexure-2**.
- 2.9 All the welding planned to be done by Purchaser as “field weld” is defined in these requisition drawings. All other welding connecting various parts to be performed by vendor as the same is in vendor’s scope of work/supply.
- 2.10 Radiant tubes shall be supplied only from the Plant approved by Owner and where the enquiry has been sent.
- 2.11 The sequence of manufacturing including inspection, testing etc. shall be as per Inspection Test Plan (Annexure-2) recommended inspection attribute list enclosed as **Annexure-2**.
- 2.12 Except for chemical composition, the tube of the radiant coil assemblies shall comply the requirements of ASTM A608 & fittings will comply with requirements of ASTM A351.
- 2.13 Bidder shall submit the documents as mentioned in VDR (Vendor data requirement- **Annexure-4** including drawings, QAP etc.) for review/approval from BCPL, before start of the job. Normally, approval / comments of BCPL shall be forwarded to vendor within two weeks upon receipt of drawings/documents etc. The delivery period should be inclusive of such time/durations.

3 DETAILS OF RADIANT TUBES :

- 3.1 Dimensional details, of the RADIANT TUBES shall be in accordance with enclosed drawings **Annexure-1** for installed Radiant coil assemblies.
- 3.2 The material of Construction of the Radiant tube as mentioned in Drawing Annexure-1 will be as furnished here-under:

Item No.	Dimension (in mm unless otherwise specified)			Material	Remarks
	ID (mm)	OD (mm)	Length		
1	ø 38	50.8	9290±8	Alloy 25 Cr-35 Ni+Nb Micro alloyed Cost tube	Tubes Construction: Size 1.5” in full vertical length from joint No: CB to CC (Approx. length 12.1 meter)
2	ø 38	50.8	2800±2	Alloy 35 Cr-45 Ni+Nb Micro alloyed Cost tube	

- 3.3 25 Nos. of Radiant tubes (Size 1.5” in full vertical length i.e. we intent to replace the complete tube from joint No: CB to CC. The bidder shall submit the welding procedure specification (WPS) for the same.

4 METALLURGY OF REQUIRED RADIANT TUBES:

- 4.1 The inlet of the radiant tube of Drawing Annexure-1 will be of the Material with Niobium & Micro alloying elements having composition as furnished below:
- 4.2 Material:

HP MODIFIED with NIOBIUM & MICRO ALLOYING ELEMENTS (HP Micro) having composition as furnished in **Annexure-1**.

5 Applicable Codes and Standard

- 5.1 Lummus Technology specification Doc No.: BA62559SPC1200 for Centrifugally Cast Tubes for Radiant Coils in Naphtha Cracking Furnaces & Codes and Standards Refereed Therein.
- 5.2 Above are annexed as Annexure-2.

6 INSPECTION & TESTING:

- 6.1 All items under scope of supply shall be subject to stage wise inspection by BCPL authorized representative (if required) and Third Party Inspection (under bidder's scope) by Third party's inspector. Bidder may also suggest reputed third party inspection agency at the time of pre-bid meeting/ un-priced bid and BCPL shall check the credential of the same and may approve for the Third party Inspection before award.
- 6.2 Each 12 meter length tube shall be pneumatically tested at 1.5 Kg/cm² (g) for minimum 5 minutes using form frothing agents and clean water containing no more than 25 ppm chlorides. This pressure shall be maintained until testing is completed. Any leakage shall be cause of rejection. No repairs are allowed. Test and inspection plan and testing procures (including Hydro test procure) shall also be submitted.
- 6.3 After matching of the bore of tubes, but before the tubes are welded together, a liquid penetration test shall be carried out of the inner surface up to twice the nominal diameter of the tube from the end of the tube.
- 6.4 BCPL at its discretion may carry out stage wise/final inspection without hampering progress of work over and above approved third party inspection. The bidder is to provide with all reasonable & necessary facilities at their works to Purchaser's Inspecting Engineer (s)/designated representative (if required) and Third party Inspector to satisfy them that the assemblies are manufactured and tested in accordance with specifications of M/S Lummus Technology Heat Transfer.
- 6.5 The scope of supply shall be inclusive of all charges related to above.
- 6.6 The material supplied by the bidder from their own manufacturing plant shall be preferred; however, material supplied from their subsidiary /joint venture/ group company shall also be acceptable subject to quality control supervision being directly under bidder's control.

7 GUARANTEE:

- 7.1 Vender shall guarantee all material supplied by him are new and of finest quality according to the specification and are free from defects, faults and deficiency in design (as applicable) material and / or workmanship. The vendor shall stand guarantee against "any defect due to material, manufacturing and fabrication/poor workmanship" for a minimum period of **12** (Twelve) months from the date of installation or **18** (Eighteen) months from the date of dispatch whichever is earlier. The vendor shall repair or replace free of cost without any delay such defective parts found during the guarantee period. This guarantee shall also include sub-ordered / bought out items forming total supply. The extent of Vendor liability shall be as per GPC.
- 7.2 The bidder shall stand guarantee for thermal & structural stability, creep resistance of the coil in the operating condition of the furnace in line with specifications of M/s Lummus Technology Heat Transfer.
- 7.3 The bidder shall stand guarantee against dimensional requirements for one to one replacement of old Tube without altering the existing supporting system of the radiant tube.

- 7.4 The Bidder shall stand guarantee for welding compatibility of the new Tubes with the Old Radiant Tube of M/S Manoir Industries, France.

8 GENERAL REQUIREMENTS:

- 8.1 For successful bidder any deviation at the execution stage, which becomes unavoidable, shall be submitted for Owner approval and bidder shall not proceed with such deviation till acceptance of deviation by Owner. Time taken/delay, if any, in processing of the deviation permit or its rejection shall be solely to Vendor's account.
- 8.2 In order to conflict, the following order of precedence shall generally govern:
- a) Licensor's documents
 - b) Technical specifications.

In the event of conflict, Clint's decision shall be final and binding. It is contractor's responsibility to resolve all conflicts with Clint prior to taking up the job. However, as a rule most stringent requirement shall govern.

9 PRICE VARIATION FORMULA (PVF):

- 9.1 The following PRICE VARIATION FORMULA shall be applicable only for placement of order:

$$P_{\text{final}} = P_o + W (P_{\text{Ni f}} - P_{\text{Ni o}})$$

- P_{final} = Final Price of 25 nos. radiant tube on the date of Price Bid Opening.
 P_o = Offered Price of 25 nos. radiant tube by the bidder.
 $P_{\text{Ni f}}$ = Rate of Nickel (Per Kg) on the date of Price Bid Opening.
 $P_{\text{Ni o}}$ = Rate of Nickel (Per Kg) on the date of Technical Bid Opening.
 W = Total weight of Nickel in 25 nos. radiant tube.

LME Cash Price for buyers

LME Cash Price for buyers will be considered for Nickel Prices as available on the website of www.lme.com.

In case LME Cash Prices for buyers are not available on Price Bid Opening and Technical Bid Opening Date, then the rates available on the website on the last published day shall be considered.

9.2 EXCHANGE RATE FOR EVALUATION:

For evaluating the bids, the Bill selling exchange rate declared by State Bank of India prevailing one day prior to price bid opening date will be taken into account for conversion of foreign currency into Indian Rupees. If the same falls on a Sunday or Holiday or is not available, the rate as on the last available day shall be considered.

- 9.3 If bidders do not accept "Price Variation Formula" (PVF), their bid shall be summarily rejected and non-acceptance of PVF shall be included under "Rejection Criteria" of the tender.

10 SUBMISSION OF DOCUMENTS:

- 10.1 Bidder must fill-up and submit the documents/information as required in Vendor Data requirement & Technical Check-List enclosed, failing which their offer may not be considered for further evaluation.
- 10.2 Bidder must submit the details of weight (in Kg) of 25 nos. radiant tube along with weight of Nickel as per below table for price variation formula, failing which their offer may not be considered for further evaluation:-

Sr. No.	Description	Total weight (Kg)	Nickel weight (Kg)
1	25 nos. radiant tube		

11 PACKING

- 11.1 All materials shall be supplied with proper wrapping & packing, so that they shall be preserved in as new condition during transportation, handling and outside condition of storage at site. Complete "Preservation Specification" shall be supplied by the bidder along with the tubes.
- 11.2 The packing shall be sea-worthy and openable for dockside inspection.
- 11.3 All welding consumables, mandatory Spares, test pieces for welding procedure qualification shall be packed separately.

12 DELIVERY PERIOD

The material shall be delivered as per schedule given below.

For Domestic Bidders: Within 04 Months from the Date of FOA (On Ex- works Basis)

For Foreign Bidders: Within 04 Months from the Date of FOA (On FOB Port of exist Basis)

Offered Delivery period by the bidder longer than the delivery period specified above or offered delivery period by the bidder with any stipulated shall render the offer liable for rejection.

In case order is awarded on "FOB" basis date of bill of lading shall be considered as date of delivery. However, in case order is awarded on "FOB" basis, where in the sea shipment is arranged by BCPL Nominated freight forwarder and there is inordinate delays attributable to freight forwarder mainly due to non availability of designated ship/vessel or delay in preparation of BOL etc, the date of intimation of readiness of the material for dispatch by the SELLER along with documentary evidence to BCPL /their nominated freight forwarder shall be reckoned as date of delivery, for the purpose of calculation of PRS.