



An ISO 9001  
Company

## Bharat Heavy Electricals Limited

(High Pressure Boiler Plant)

Tiruchirappalli – 620014, TAMIL NADU, INDIA

MM / RM / PURCHASE / TUBES

TITLE : Seamless Alloy Steel Tubes ( SA213 T91)	Phone: +91 431 2577421 /2575730 Fax : +91 431 252 0719 Email : vkaruna@bheltry.co.in
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Reference Number: Enquiry 1501500018	Enquiry Date: <del>22.05.2015</del> /25.05.2015	Due date for submission of quotation: 01.07.2015
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You are requested to quote the Enquiry number and due date in all your correspondences. This is only a request for quotation and not an order.

Please note that under any circumstance both **delayed offer** and **late offers** will not be considered. Hence vendors are requested to ensure that the offer is reaching physically our office before 14.00 hrs on the date tender opening.

### Sub: Seamless Alloy Steel tubes ( SA213 T91)

Supply of Seamless Alloy Steel tubes with Specn SA213 T91 and TDC: 126 Rev 00.

BHEL commercial terms & conditions with Price Bid formats and all annexures can be downloaded from BHEL web site <http://www.bhel.com> or from the Government tender website <http://tenders.gov.in> (public sector units) Bharath Heavy Electricals Limited) under enquiry reference "1501500018"

Tenders should reach us before 14:00 hours on the due date  
Technical bid will be opened at 14:30 hours on the due date  
Tenders would be opened in presence of the tenderers who have submitted their offers and who may like to be present.

Yours faithfully,  
For Bharath Heavy Electricals Limited

DGM/ PURCHASE/TUBES

**V. KARUNAKARAN**  
Deputy General Manager  
MM / Tubes / Purchase  
BHEL, TIRUCHY - 620 014.



429-002/A

**BHARAT HEAVY ELECTRICALS LIMITED**

( A Government of India Undertaking )  
HIGH PRESSURE BOILER PLANT  
PURCHASE DEPARTMENT - FOSSIL BOILERS  
THIRUCHIRAPALLI - 620014  
TAMILNADU (INDIA)

PHONE :2577447  
GRAMS : BHARATELEC  
FAX NO: 2520719  
E-mail: agk@bheltry.co.in  
Web:

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	<b>Enquiry No</b> 1501500018	<b>Enquiry Date</b> <u>25.05.2015</u> <del>22.05.2015</del>	<b>Due Date for Quotation</b> 01.07.2015
Please quote Enquiry No, Date and due date in all correspondences. This is only a request for quotation and not an order. <u>Bid should be submitted in Two Parts. 1. Techno-commercial Bid (Part-I) and 2. Price Bid (Part-II) in a separate sealed cover and both the covers must be placed in a Third Cover and Sealed. Our Enquiry No., Eng. date &amp; Eng. Due date must be written on all Three covers.</u>			

Item	Description	Unit	Quantity	Delivery Quantity	Schedule Date
10	154923050001 TUBE-41.3X8.2X10000-SA213T91	M	3500.000	3,500.00	17.08.15
20	154923060001 TUBE-38.1X9X10000-SA213T91	M	2000.000	2,000.00	17.08.15

**General Note:**

- 1) All the tubes are to be supplied fully meeting the TDC 126 Rev 00.
- 2) All the enquiry terms & conditions are given in Annexure I. Supplier to submit the duly filled "Annexure-I" along with the offer.
- 3) All other relevant documents enclosed.

All the tenders may be addressed to the following address:

**The Tender Opening Cell / MM  
Room No: 26, Building 24, Ground Floor  
Bharat Heavy Electricals Limited  
TIRUCHIRAPALLI 620014**

In case personal delivery of the offer, it shall be dropped into the respective box kept in Room No: 26, after duly entering the data in the system.

Offers will be accepted only up to 14.00 Hrs on the due date. Therefore, vendors shall ensure to submit the offers well before this time. All due date extension requirements should be addressed to the respective Purchase mail IDs. All the due date extension requests from vendors will be considered only up to 48 hours before the due date and time.

Vendors are requested to avoid submission of offers through e mail / fax. In case of any unavoidable situation, offers shall be sent through e mail to the following mail ID only tender\_cell@bheltry.co.in.

As tenders are being opened by Common Tender Opening Cell, offer covers should be sealed with tenderer's distinctive seal and super scribed with correct Tender No. item of supply and due date of opening.

The offers will be opened at 14.30 hrs on the due date of the tender in the presence of tenderers who have submitted their offer and who may like to be present for the tender opening. Late and delayed offers are liable to be rejected.

The offers should reach us 30 minutes before the time of opening of tenders. The offers will be opened at 14.30 hrs on the due date of tender in the presence of tenderers who have submitted their offer and who may like to be present for the tender opening. Late and delayed offers are liable to be rejected.

**V. KARUNAKARAN**  
Deputy General Manager  
MM / Tubes / Purchase  
BHEL, TIRUCHY - 620 014.

Yours faithfully,  
For **BHARAT HEAVY ELECTRICALS LIMITED**

MANAGER / PURCHASE  
(FOSSIL BOILERS)  
Yours faithfully,



# BHARAT HEAVY ELECTRICALS LIMITED

( A Government of India Undertaking )  
HIGH PRESSURE BOILER PLANT  
PURCHASE DEPARTMENT - FOSSIL BOILERS  
THIRUCHIRAPALLI - 620014  
TAMILNADU (INDIA)

PHONE :2577447  
GRAMS : BHARATELEC  
FAX NO: 2520719  
E-mail: agk@bheltry.co.in  
Web:

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1501500018 / 22.05.2015

23505

Enclosures:

"LD clause has to be confirmed without fail."

The offers should reach us 30 minutes before the time of opening of tenders.  
The offers will be opened at 14.30 hrs on the due date of tender in the presence of tenderers who have submitted their offer and who may like to be present for the tender opening. Late and delayed offers are liable to be rejected.

**V. KARUNAKARAN**  
Deputy General Manager  
MM / Tubes / Purchase  
BHEL, TIRUCHY - 620 014.

Yours faithfully,  
For **BHARAT HEAVY ELECTRICALS LIMITED**

MANAGER / PURCHASE  
(FOSSIL BOILERS)  
Yours faithfully,

**BHARAT HEAVY ELECTRICALS LIMITED  
MM/RM/PURCHASE/TUBES  
BHEL / TRICHY-620 014.**

**ANNEXURE- I**

**Enquiry Terms & Conditions for Open tender**

**Note:** This Annexure has to be mandatorily filled & signed by the manufacturer (or) mill and submitted along with Technical bid.

SI No	BHEL Requirements	Supplier Comments (Acceptance or otherwise for each point to be given )
01	<p><b>Material specification:</b> Material specification, OD, wall thickness &amp; Length should be strictly as per enquiry.</p>	
02	<p><b>Specification, Size &amp; Quantity:</b></p> <ol style="list-style-type: none"> <li>1) All materials are to be supplied fully meeting the material specification &amp; Technical Delivery condition TDC: 126 Rev 00. Point-by-Point confirmations is required for TDC. If there is any deviation, the same should be mentioned clearly in the offer itself.</li> <li>2) Packing &amp; preservation shall be strictly as per the TDC.</li> <li>3) All tubes are to be supplied to the specific length detailed in the description. Any deviation in length has to be indicated in the offer itself.</li> </ol>	
03	<p><b>Offer Submission:</b></p> <ul style="list-style-type: none"> <li>➤ Please submit your offer in TWO part bid (technical cum commercial bid in one cover and price bid in another cover) in single cover. The Covers should be duly super scribed with the ENQUIRY NO and DUE DATE in BOLD letter without fail.</li> <li>➤ The OFFER, sealed and Super scribed as "Parts 1 &amp; II inside" indicating Enquiry No., Due Date, Address &amp; Reference of the Bidder should reach this office on or before the due date by 14:00 hrs (IST). OFFERS RECEIVED AFTER 14:0hrs is (IST) WILL NOT BE CONSIDERED FOR EVALUATION.</li> <li>➤ Bidders shall submit the OFFER in English language (a single envelope containing two inner envelopes) as indicated below: Envelope 1: This sealed envelope should contain <ul style="list-style-type: none"> <li>(a) technical bid</li> <li>(b) un-priced commercial bid (copy of the Priced Bid without the price details)</li> </ul> </li> <li>➤ This envelope should be clearly marked "Part 1 - Technical and Un-priced commercial bid, indicating Enquiry No., Due Date, Address &amp; Reference of the Bidder.</li> <li>➤ Envelope II: This sealed envelope should contain price details. This envelope should be clearly marked "Part II - Price bid", indicating enquiry No., Due Date, Address &amp; Reference of the Bidder.</li> </ul> <p><b>Note:</b> Bidders are requested to submit their offers only through sealed bids. As the part II (priced bid) will not be opened before the technical evaluation is completed, bidders are requested to avoid submission of offers through email/fax etc. In case of any unavoidable situation, offers shall be sent only through the email ID : <b>tender_cell@bheltry.co.in</b>.</p> <ul style="list-style-type: none"> <li>➤ <b>Tender should not be addressed to any individual's name but only to the following address:</b>   <p align="center"><b>Tender Opening Cell/MM Room No.26, 24 Building (Ground Floor), Bharat Heavy Electricals Limited, Tiruchirappalli - 620 014.</b></p> </li> </ul> <p>If any clarification related to the enquiry should be sent to Mail IDs :vkaruna@bheltry.co.in &amp; dhanabals@bheltry.co.in</p>	
04	<p><b>Terms of Delivery :</b></p> <p><b>A. Indigenous:</b></p> <ol style="list-style-type: none"> <li>a) For Indigenous vendors, offers with "FOR" incoterm only will be considered. However, freight breakup is to be given in the offer.</li> <li>b) Any other extra charges like ED, CST/VAT etc. are to be indicated clearly. The offer will be evaluated on total landed cost to BHEL Trichy.</li> <li>c) MODVAT CREDIT: If any excise Duty is payable, the chapter head / sub-head reference and the rate of the duty should be quoted. If the tenderer is availing MODVAT credit for this input material, the effect of preformed credit should be passed on to the purchaser. Tenderer under MODVAT shall be preferred.</li> </ol> <p><b>B. Imports:</b></p> <ol style="list-style-type: none"> <li>a) Suppliers to quote their rates on FOB/Load Port basis/Containerised Cargo only. Stuffing of materials has to be done by Supplier in empty container provided by BHELs freight forwarder. We also request you to submit your quotations for the destination port of Karaikkal &amp; Tuticorin in your offer without fail. The quote should be all inclusive of all charges, including testing packing, inspection etc.</li> <li>b) CFR rates will not be considered for evaluation.</li> </ol>	

	<p>c) The available load ports for FCL (Full Container Load) Cargo in Freight Contract are Antwerp, Hamburg, Genoa, Rotterdam, Bilbao, Gothenberg, Felixstowe, St.Petersberg, Busan, Dalian, Shanghai, Kobe, Osaka, Yokohama.</p> <p>d) The available load ports for LCL (Less than Container Load) Cargo in Freight Contract are Antwerp, Hamburg, Genoa, Rotterdam, Bilbao, Gothenberg, Felixstowe, Thamesport, Tilbury, Le Harve, St.Petersberg, Busan, Masan, Dalian, Shanghai, Tianjin, Kobe, Osaka, Yokohama, Singapore, Durban.</p> <p>e) The available load ports for BB (Break Bulk) Cargo in Freight Contract are Antwerp, Hamburg, Genoa.</p> <p>f) In case if the suppliers are unable to execute through the above ports with the available types of cargo loading (Reasons for the same to be mentioned), FOB rate along with ocean freight (LIFO basis) applicable upto Chennai to be quoted.</p>	
05	<p><b>Payment terms:</b></p> <p><b>A. Indigenous:</b></p> <p>i) BHEL Payment term is 100% direct EFT payment after 45 days from the date of receipt and acceptance of materials.</p> <p>ii) The duplicate copy of the invoice meant for the transporters should accompany the material as stipulated under C.E. rules 52a and 173c (or) 57gg. A Photostat copy of the above invoice for each Delivery Challan should be submitted along with the original bills routed through bank or submitted directly to BHEL finance department.</p> <p>iii) Any deviation in the above payment term will attract loading as mentioned below. "Base rate of SBI (as applicable on the date of bid opening. Techno-commercial bid opening in case of two part bids) + 6% shall be considered for loading for the period of relaxation sought by bidders.</p> <p>iv) Payment through bank is not preferred. In case of payment through bank is opted by supplier, BHEL prefers documents submission through bank with copy of LR and door delivery of goods to site/stores with consignee copy attached. In this case loading will be 3% on the offered value.</p> <p>v) Offers of indigenous Suppliers with payment terms as LC / Advance Payment are liable for rejection.</p> <p><b>B. Imports:</b></p> <p>i) BHEL Payment term is 100% payment on CAD basis after 45 days from the date of receipt of documents, specified in PO, at BHEL bank. Respective bank charges to respective account.</p> <p>ii) Any deviation in the above payment term will attract loading as mentioned below. "Base rate of SBI (as applicable on the date of bid opening. Techno-commercial bid opening in case of two part bids) + 6% shall be considered for loading for the period of relaxation sought by bidders.</p> <p>iii) If the LC payment is insisted, <b>TWO</b> sets of original TCs to be submitted prior to dispatch and a certificate to that effect from BHEL should form a part of the documents to be negotiated. If this condition is not complied by the vendor, the offer is liable for rejection.</p> <ul style="list-style-type: none"> <li>➤ In the case of Usance LCs the loading will be considered @ 1.5% on the offered Value.</li> <li>➤ For LC at sight the loading will be considered @ 3.5% on the offered Value.</li> <li>➤ Normally CAD at sight and Confirmed LCs are liable for rejection.</li> </ul>	
06	<p><b>Delivery:</b> The offer shall clearly indicate delivery period in fixed number of weeks/Months from the date of Purchase Order.</p>	
07	<p><b>Liquidated Damage (Indigenous &amp; Imports):</b></p> <ol style="list-style-type: none"> <li>1. Liquidated damages shall be 0.5% of the total order value per week or part thereof subject to a maximum of 10% of the total order value.</li> <li>2. Any deviation from the above LD clause, loading will be applied to the extent to which it is not agreed by the bidder (at offered value).</li> <li>3. a) IMPORT: For CFR / CIF terms, LD will be calculated from the B/L date. For FOB terms, LD will be calculated from final inspection agency's signed date in the TC. b) INDIGENOUS: For "FOR Delivery terms", Lorry way bill date and for "Ex-work delivery terms" final inspection certificate date / intimation of readiness whichever is later will be taken for LD calculation.</li> </ol>	
08	<p><b>Risk Purchase clause :</b> BHEL at its option will be entitled to terminate the contract and to purchase elsewhere at the risk and cost of the seller either the whole of the goods or any part which the supplier has failed to deliver or despatch within the time stipulated as aforesaid or if the same were not available, the best and the nearest available substitute thereof. The supplier shall be liable for any loss which BHEL may sustain by reason of such risk purchases in addition to LD at the maximum rate mentioned in the LD clause above. Confirm your acceptance.</p>	
09	<p><b>Performance Bank Guarantee :</b> The Bidder, in the event of an order, should furnish a bank Guarantee from BHEL's consortium banks (List attached) or counter – guaranty by vendor's bank to BHEL's consortium banks, at no extra cost to BHEL, in a proforma prescribed by BHEL, provided along with the order, for an amount equivalent to 10% of the contract value. The BG shall be valid for period of 18 months from the date of last shipment or 12 months from the date of receipt / acceptance at BHEL, Trichy whichever is later, with a claim period of two months.</p>	
10	<p><b>Validity:</b> Offer/Price validity of <b>60 days</b> is required after the price bid opening in case you are technically and commercially qualified.</p>	
11	<p><b>Agency Commission :</b></p> <ul style="list-style-type: none"> <li>➤ In respect of offers from overseas suppliers, agency commission, if any, payable to their agents in India, shall invariably be shown separately in the Performa invoice and this will be paid by us in India, in Indian rupees, on</li> </ul>	

	<p>satisfactory completion of the contract.</p> <ul style="list-style-type: none"> <li>➤ It overseas principal has any tie-up with any third party in respect of agency commission it should be declared while submitting offers.</li> <li>➤ Copies of current agency agreement / authorization letter in respect of agency commission shall be furnished along with offer, if not made available earlier.</li> <li>➤ For calculation of rupee equivalent agency commission, exchange rate as prevailing on the date of order will be taken.</li> </ul>	
12	<p><b>General condition:</b></p> <ol style="list-style-type: none"> <li>1. In addition to TCs in relevant IBR forms corresponding mill TCs should also be provided along with dispatch of tubes. <b>Three</b> sets of original and one copy of all such TCs are to be provided to BHEL, trichy.</li> <li>2. Acceptance of TC by BHEL before dispatch is must.</li> <li>3. Material is to be inspected by third party inspection agency as approved by respective Inspection agency in case the Mill is not approved by IBR.</li> <li>4. While despatching tubes, in addition to bundling with metal straps, we require for easy handling at loading and unloading points.</li> <li>5. Transparent Rust preventive coating and packing should be such that the coating withstands atleast one year of storage at open yard on receipt of material.</li> <li>6. We require the shipment of the tubes to be as per the dates mentioned against the individual items in the enquiry.</li> <li>7. BHEL will consider the ranking after the loading is applied as referred above wherever deviations are observed.</li> <li>8. Lowest price received against BHEL tenders need not be the technically acceptable one and in that case, BHEL reserves the right not to consider the same.</li> <li>9. BHEL reserves the right to negotiate L1 rate or re-float the tender opened if L1 price is not the lowest acceptable price to them inter-alia other reasons.</li> <li>10. Vendor should physically weigh the materials before stuffing them into Container and incorporate the same in BL and packing Slip.</li> <li>11. Date of price bid opening will be informed later after acceptance of offer on technical ground.</li> <li>12. No revision of prices will be entertained after the tenders are opened.</li> <li>13. Supplier shall indicate the place of manufacture and mill name in the offer.</li> <li>14. The Import supplier which is going to supply first time to BHEL (not supplied any materials earlier), the Payment will be made after 45 days of receipt &amp; acceptance of materials at BHEL store.</li> <li>15. Offer will be evaluated based on Landed cost to BHEL Trichy.</li> <li>16. Tenders should be free from CORRECTION AND ERASURES, Corrections if any, must be attested. <ul style="list-style-type: none"> <li>A) If, in the price structure quoted for the required goods, there is discrepancy between the unit price and the total price (which is obtained by multiplying the unit price by quantity), the unit price shall prevail and the total price corrected accordingly, unless in the opinion of the purchaser there is an obvious misplacement of the decimal point in the unit price, in which case the total price as quoted shall govern and the unit price corrected accordingly.</li> <li>B) If there is an error in a total corresponding to the addition or subtraction of subtotals, the subtotals shall prevail and the total shall be corrected.</li> <li>C) If there is a discrepancy between words and figures, the amount in words shall prevail, unless the amount expressed in words is related to an arithmetic error, in which case the amount in figures shall prevail subject to (A) and (B) above.</li> </ul> <p><b>Note:</b> Bidders are requested to submit their offers only through sealed bids. As the part II (priced bid) will not be opened before the technical evaluation is completed, bidders are requested not to submit their bids through email/fax etc.</p> </li> <li>17. <b>Fixed Price :</b> All items should be quoted on "Per unit basis". Prices quoted by the bidder shall be fixed and not subject to any escalation whatsoever during the period of bid validity and execution of the Purchase Order. A bid submitted with an adjustable price will be liable or rejection. Prices shall be written in words and figures. In the event of any discrepancy with regard to total price and unit price Whichever is less shall be considered correct. All rates should include the third party inspection charges. RATES QUOTED SHALL BE INCLUSIVE OF ALL CHARGES INCLUDING PACKING, INSPECTION ETC. NO EXTRA PAYMENT WILL BE MADE IN ANY CASE.</li> <li>18. <b>Bid currency:</b> Indian bidders should submit the prices only in Indian Rupees. Foreign bidders may submit their bid in their preferred currency. For the evaluation purposes the exchange rate (TT - Selling Rate of SBI) on technical bid opening date will be considered.</li> <li>19. The offer is to be signed and sealed in original by the bidder without fail.</li> </ol>	

20. BHEL prefers the manufacturers to quote directly. In case this is not possible and the offer is being submitted by an Indian agent, the following details are to be furnished along with the offer:
- The letter from their Principal authorizing the Indian agent to submit the offer on their Principal's behalf. In case the Indian agent submits offer on their own letter head then a covering letter (in original) from the Principal should be enclosed, clearly mentioning that they are bound by the offer submitted by the Indian agent on their behalf.
  - Precise relationship between foreign suppliers and their Indian agents and their mutual interest in business, should be clearly spelt out
  - Any payment, which the agent receives in India or abroad, from the foreign supplier, whether as a commission or as a general retainer fee is to be mentioned in the offer.
  - All services to be rendered by the agent, whether of general nature or in relation to the particular contract, must be clearly stated by the foreign supplier and the Indian agent.
  - The amount of agency commission agreed to between the foreign principal and the Indian agent should be specifically disclosed and the agency commission will be paid in Indian Rupees only on satisfactory completion of the contract.
  - For calculation of rupee equivalent of agency commission, exchange rate as prevailing on the date of order will be taken.
  - Copy of current agency agreement is to be enclosed. Offers with non-compliance to any of the above will be liable for rejection.
21. OFFER FROM TRADERS, RE-ROLLERS (only cold drawing of pipes/tubes), FABRICATORS, BORING/MACHINE SHOPS (only have lathe and machining facility), expanding process AND STOCKISTS ARE NOT ACCEPTABLE AND WILL NOT BE CONSIDERED FOR EVALUATION.
22. BIDDERS WHO ARE NOT REGISTERED VENDOR OF BHEL TRICHY HAVE TO SUBMIT THE FILLED IN SUPPLIER REGISTRATION FORMS (SRF) AVAILABLE IN THE BHEL WEBSITE - [www.bhel.com](http://www.bhel.com) AND THE OTHER REQUIRED DOCUMENTS CALLED FOR IN THE SRF (INCLUDING D&B REPORTS FOR IMPORT VENDORS. ALONG WITH THE TECHNICAL BID WITHOUT FAIL. The same shall be scrutinized as per BHEL evaluation procedures. **OFFERS SUBMITTED WITHOUT THIS WILL BE REJECTED**
23. ALL VENDORS ( BHEL REGISTERED VENDORS OR NEW VENDORS) SHOULD SUBMIT AN EXPERIENCE CERTIFICATE DETAILING THE QUANTITY SUPPLIED SPEC WISE YEAR WISE ALONG WITH THE UNPRICED PO COPIES AND PROOF OF SUPPLY (SUCH AS INVOICE & BILL OF LADING COPIES) ALONG WITH THE OFFER FOR INCONEL MATERIAL/TENDERED SPECIFICATIONS AND TEST CERTIFICATES FOR THE SAME.
- ALL VENDORS ( BHEL REGISTERED VENDORS OR NEW VENDORS) SHALL SUBMIT - THE FACILITIES AVAILABLE AT THE MILL - STARTING MATERIAL TO FINISHED PRODUCT, MANUFACTURING QUALITY PLAN, INSPECTION & TEST PLAN TO MEET THE TDC REQUIREMENTS) ALONG WITH THE TECHNICAL BID SHOULD BE SUBMITTED WITHOUT FAIL SPECIFIC TO INCONEL. The same shall be scrutinized as per BHEL evaluation procedures.
24. If supplier is not a steel maker then source of raw material for the manufacturing of tubes shall be submitted.
25. The manufacturer shall submit filled in tubes supplier facility report respectively. Offers submitted without this will be rejected. Suppliers without basic manufacturing facilities in-house, shall not be considered for evaluation.
26. In house test facilities for mechanical, chemical & non - destructive testing are mandatory requirements for consideration of this offer.
27. BHEL/End customer reserve the right to inspect the item ordered at any stage at vendor's works and if found not to meet the stipulated conditions, material is liable for rejection.
28. Bidders are to confirm all the above points in their "Technical and unpriced commercial bid". Incomplete offers will not be considered. The technical documents submitted for consideration of offer is to be signed and sealed in original by mill without fail.
29. Any other conditions which might have been quoted by the seller and are in contravention to the terms prescribed in the order and which have not been specifically accepted in by purchaser will not be applicable to the contract.
30. The offers of the bidders who are on the banned list as also the offer of bidders who engage the services of the banned firms, shall be rejected. The list of banned firms is available on the BHEL website -[www.bhel.com](http://www.bhel.com).

**SIGNED BY MANUFACTURER / MILL**

(On behalf of BHEL)

Name of Mill:  
Designation / Department:  
Seal & Signature

Revision record:  
Rev: 00 dt 02/03/2015: Fresh issue

1. **SCOPE:** The specification prescribes the requirements for T91 grade tubes (WT≥3.6mm) conforming in general to ASME SA-213. The tubes are meant for use in Advanced Ultra Super Critical boilers.

2. **MATERIAL**  
 Specification : ASME {Latest on date of Purchase Order (PO)}  
 Alloy Steel (AS) : SA 213 Gr.T91  
 Size and Qty. : As per Purchase order

3. **CHEMICAL REQUIREMENTS AND MANUFACTURING PROCESS**

The chemical composition, as determined by product analysis, shall comply with the requirements given in table below:

Element	C	Cr	Mo	Si	Mn	S	N	Al	V	Nb	Ni
Wt.%	0.08- 0.12	8.45- 9.50	0.85- 1.05	0.25- 0.40	0.30- 0.60	0.01 max	0.045- 0.060	0.01 max	0.18- 0.25	0.06- 0.10	0.2 max
Element	P	Ti	Zr	Cu							
Wt.%	0.02 max	0.010 max	0.010 max	0.25 max							

The composition of Sn, As, Sb, Pb, Ca and Mg shall be reported. Deviations in N and Al content is acceptable provided the N/Al ratio is not lesser than 4.5. Tubes shall be made by seamless process and shall be cold finished, or hot finished (if meeting the indicated dimensional tolerances can be met). Tubes shall be delivered straight and with the inside of the tube uniformly circular.

4. **DIMENSIONAL CHECKS AND TOLERANCES**

Permissible outside diameter variation is +/- 0.4 mm.  
 Permissible wall thickness variations: - 0% to + 10% of the specified minimum wall thickness.

5. **HEAT TREATMENT**

The tubes shall be supplied in normalized and tempered condition. Normalizing treatment shall be carried out at 1060 ± 10 °C for soaking period of minimum 30 minutes followed by air cooling to ambient temperature. This will be followed (preferably immediate) by tempering at 760 ± 10°C with a holding time of 1 hour. The total thickness of the decarburized material (both on ID and OD of the tube) shall be measured once per heat treatment lot. The measurement shall be determined from a representative sample that has been sectioned, polished and examined at 100x magnification. The total de-carburisation thickness shall not exceed 7% of the specified minimum wall thickness and shall be reported in the Test Certificate.

6. **INCLUSION CONTENT**

The inclusion content shall be determined on both surface and middle of forged bar for each heat in accordance with ASTM E 45 method D. The acceptance criteria shall be as follows:

Field Number	Thin inclusion maximum acceptable value	Thick inclusion maximum acceptable value
A (sulfide type)	1	0.5
B (Alumina type)	1.5	1
C (Silicate type)	1.5	1
D (Globular oxide type)	2	1.5

7. **MECHANICAL PROPERTIES:**

- 7.1 Extent of Test: for each size/heat/HT batch; on final heat treated condition samples.  
 Quantum of Tests: (as per IBR): Minimum two tubes for first 100 tubes and one per 100 or part thereof for tubes over 100 numbers. For tension tests, the shape and size of the specimen shall be mentioned in the Test Certificate (full tube tensile or strip tensile or round tensile).
- 7.2 Tension test at room temperature Test Procedure shall be as per ASTM E8. Tests are required for each lot (representing same heat subjected to same manufacturing cycle). The results obtained shall meet the following requirements.
- |                                  |   |                 |
|----------------------------------|---|-----------------|
| Yield stress, E <sub>0.2</sub> % | : | 415 MPa minimum |
| Ultimate tensile strength        | : | 620 - 760 MPa   |
| Elongation L = 5.65 √A           | : | 20% minimum     |
- 7.3 Hardness test: The hardness value shall be in the range 210 to 240 HV.

8. **NON-DESTRUCTIVE EXAMINATION & HYDROSTATIC TEST**

Surface examination – surface condition: The finished tubes shall be free of scale and suitable for inspection of defects likely to affect their use. The internal and external surfaces of tubes shall be clean, smooth and free of any cracks, tears, blister, scratches, handling damage and should show no trace of oxidation or carburization. Surface defects can be removed mechanically, ensuring smooth curved surface and maintaining specified minimum thickness without affecting the workman-like finish.

**Ultrasonic Examination:** Each tube (thickness equal to or greater than 3.6 mm) shall be ultrasonically examined for circumferential and axial scans in accordance with ASME E-213, both clockwise and anti-clockwise, for full section over its entire length. Products with defects that produce indications in excess of the indications produced by the standard defects in the reference specimen are unacceptable. The depth of the notch shall not exceed 5% of the specified wall thickness (with minimum of 0.3 mm and max 1.5mm). Calibration: Two axial 50 mm long notches, one in outer surface and the other on the inside surface. For OD less than 30 mm, one notch in outer surface only.

**Hydrostatic test:** Each tube shall be subjected to hydrostatic testing with de-mineralised water conforming to ASME SA-213 and ASME SA-1016 requirements. The pressure shall not be less than 600 kg/cm<sup>2</sup>.

**9. MARKING**

Each tube shall be marked continuously and repeatedly along its entire length with the following:

1. P O Number 2. Maker's Emblem / Code 3. Specification and Grade 4. Code case (If Applicable) 5. TDC Number 6. Heat Number 7. Size 8. Number of Tubes 9. Inspector's Seal 10. Condition: Hot Finished / Cold Finished 11. Tube minimum wall thickness designation

- Below OD 31.6 mm (exclusive): Sl. No. 1 to 11 to be stamped on metal / plastic tag attached to the bundle.
- OD 31.8 to 76.1 mm (inclusive): Sl. No. 1 to 7, 10 and 11 to be paint stenciled, repeatedly through the entire length of the tube. Also, Sl. 1 to 11 to be stamped on metal / plastic tag attached to the bundle.
- OD greater than 76.1 mm: Sl. No. 2, 3, 4, 6, 7 and 9 to be hard stamped with round edge stamp at 100 mm from both the ends and Sl. No. 1 to 7, 10 and 11 to be paint stenciled on each tube.

**Colour Coding:** Continuous longitudinal colour coding shall be done on the entire length of all tubes. Colour coding scheme shall be as per BHEL Procedure SIP: PP: 21 (latest).

**10. FINISH AND REPAIRS**

Repair by welding is prohibited. Inside and outside surfaces are shall be free from scales and defects like laps, seams, folds, cracks, pitting etc. Repairs by welding are prohibited. Surface defects can be removed mechanically, ensuring smooth curved surface and maintaining specified minimum thickness without affecting the workmanlike finish

**11. PRESERVATION AND PACKING:**

All the tubes shall be applied with Resin Type Rust Preventive Coating with visibility for the stenciled details on the outside, and with Rust Inhibitor on the inside. The ends are to be closed with plastic end caps / plugs secured for storage. Packing shall ensure safe delivery of tubes in good condition. Thickness less than or equal to 2.5 mm in boxes and others in bundles. Bundles to be less than or equal to 4 MT of equal number of tubes, fastened with galvanized strap (1/25 mm minimum) or annealed wire. Wooden pallets to cover the tubes are not permitted

**12. INSPECTION AND CERTIFICATION**

Products shall be inspected at works and the applicable IBR Form must be counter-signed by the Inspecting Authority as indicated below.

Imported Items: Inspecting Authority approved by IBR for the country of origin (to be concurred by BHEL before placing P.O.)  
 Indigenous Supplied Items: Boiler Inspectorate / Directorate of the respective State Certification IBR Form – IIIIE for IBR items from "IBR- Well Known Tube Maker" and for others IBR Form – IIIB as per enclosed format to be submitted.

Manufacturer's Test Certificate (MTC) (Original in English with the following details:

- a) P.O. Number (BHEL); TDC Number & Test Certificate Number: Size & Quantity -Melt wise
- b) Specification and Grade with year of Code, Code Case number, Heat Number, Steel & Tube Making Process, Chemistry including incidental elements – ladle & product analysis
- c) Heat Treatment details with actual temperature and soaking time,
- d) Mechanical test results, microscopic examination including grain size, inclusion rating, surface examination results, and dimensional check reports.
- e) Detailed NDE Report with reference norms, acceptance standards and test results.

In the MTC, a clause for Certificate of Compliance (as per SA 1016) shall be added stating that – all material components supplied in every P.O. shall meet all the requirements contained in the P.O., this Technical Delivery Condition and Applicable ASME Specification.

**13. AUDIT CHECKS & REJECTION**

BHEL reserves the right to carry out audit checks for chemistry, HT condition, mechanical test and NDT on representative test samples or job. Supplies found defective during check or subsequent processing at BHEL are liable for rejection. Materials that fail to conform to the requirements of this specification will be rejected and the supplier has to replace the materials.

Haritha.C/ QA	Kalyanaraman.V/ QA	Selvarajan.S/QA	Ravibharath.R/WRI	U.Revisankaran/QA
Prepared By	Reviewed By		Approved By	

(TO BE STAMPED IN ACCORDANCE WITH STAMP ACT AND THE EXPIRY DATE OF BG MUST BE AFTER 60 DAYS FROM THE DATE OF COMPLETION OF WARRANTY PERIOD)

**PERFORMANCE BANK GUARANTEE**

In accordance of M/s. Bharat Heavy Electricals Limited (A Government of India undertaking, a company incorporated under the Companies Act 1956 having its Registered Office at "BHEL House", SIRI Fort, New Delhi 110 049) through its High Pressure Boiler Plant Division located at Tiruverumbur, Tiruchirapalli- 620 014 (hereinafter called 'the Company') having entered into a contract with .....hereinafter called ' the said contractor ' which term includes 'suppliers' for the purpose of this Bond and under the terms and conditions of the contract No..... Dt ..... Between BHEL, Trichy and as per the contract, the contractor / supplier is to furnish a performance Bank guarantee for Rs. .... for the due performance of the equipment to be supplied under the above referred contract and for the fulfillment of all the terms and conditions of the contract, We .....(indicate the name of the bank) (herein after referred to as the bank) at the request of ..... (Contractor(s) ) do here by undertake to pay the company an amount not exceeding Rs.....against any loss or damage caused to or suffered or would be caused to or suffered by the company by reason of any breach by the said contractor (s) of any of the terms and conditions contained in the said agreement.

2. We .....(indicate the name of the bank with full address), do hereby undertake to pay the amounts due and payable under this guarantee without any demur, merely on a demand from the Company stating that the amount claimed is due by way of loss or damage caused to or would be caused to or suffered by the Company by reason of breach by the said Contractor(s) of any of the terms and conditions contained in the said Agreement or by the reason of the contractor(s) 'failure to perform' the said agreement. Any such demand made on the Bank shall be conclusive as regards the amount due and payable by the Bank under this guarantee. However, our liability under this guarantee shall be restricted to an amount not exceeding Rs. ....

3. We undertake to pay unconditionally to the Company any money so demanded notwithstanding any dispute(s) raised by the Contractor in any suit, or proceedings pending before any Court or Tribunal or Arbitration or before any other authority relating thereto our liability under this present being absolute and unequivocal. The payment under this guarantee would not wait till the disputes have been decided by any Court or Tribunal or in the arbitration proceedings or by any other authority. The payment so made by us under this Bond shall be a valid discharge of liability for payment thereunder and the Contractor(s) shall have no claim against us for making such payment.

4. We.....( indicate the name of Bank), further agree that the guarantee herein contained shall remain in full force and effect during the period that would be taken for the performance of the said Agreement and that it shall continue to be enforceable till all the dues of the Company under or by virtue of the said Agreement have been fully paid and its claims satisfied or discharged or till \_\_\_\_\_Office / Department/ Division of the Company certifies that the terms and conditions of the said Agreement have been fully and properly carried out by the said Contractor(s) and accordingly discharges this guarantee.

5. (I) Unless a demand or claim under this guarantee is made on us in writing on or before the \_\_\_\_\_ we shall be discharged from all the liability under this guarantee thereafter. But where such claim or demand has been preferred by the Company with the Bank before the expiry of the said date, the claim shall be enforceable notwithstanding the fact that the said enforcement is effected after the said date.

(ii) For the purpose of this clause, any letter making demand on the Bank by M/s. BHEL dispatched by Registered Post with Ack.Due or by Telegram or by any Electronic media addressed to the above mentioned address of the Bank shall be deemed to be the claim / demand in writing referred to above irrespective of the fact as to whether and when the said letter reaches the Bank, as also any letter containing the said demand or claim is lodged with the bank personally.

6. We .....(indicate the name of Bank), further agree with the company that the Company shall have the fullest liberty without our consent and without affecting in any manner our obligations hereunder to vary any of the terms and conditions of the said agreement or to extend time of performance by the said Contractor (s) from time to time or to postpone for any time or from time to time any of the powers exercisable by the Company against the said Contractor(s) and to forbear or enforce any of the terms and conditions relating to the said Agreement and we shall not be relieved from our liability by any reason of any such variation or extension being granted to the said Contractor(s) or for any forbearance, act or omission on the part of the company or any indulgence by the company to the said Contractor(s) or by any such matter or thing whatsoever which under the law relating would, but for this provision, have effect of not so relieving us.

7. This guarantee will not be discharged due to the change in the constitution of the Bank or the Contractor(s).

8. It shall not be necessary for the company to proceed against the contractor before proceeding against the guarantor-bank and the guarantee herein contained shall be enforceable against them notwithstanding any security, which the company may have obtained or obtain from the Contractor shall, at the time when proceedings are taken against the guarantor hereunder be outstanding or unrealised.

9. Any claim or dispute arising under the terms of this document shall only be enforced or settled in the Courts at Tiruchirapalli.

10. The guarantor hereby declare that it has power to execute this guarantee and the executant has full powers to do so on its behalf under the proper authorities granted to him/them by the guarantor.

11. We .....(indicate the name of Bank) lastly undertake not to revoke this guarantee during its currency except with the previous consent of the company in writing.

In witness whereof we....., (indicate the name of Bank) have hereunto set out  
Bank Seal the \_\_\_\_\_ day \_\_\_\_\_ month 200  
BANK E-MAIL ID:  
BANK PHONE NO.  
BANK FAX NO:

<b>List of Consortium Bank</b>	
<b>Nationalised Bank</b>	<b>Nationalised Bank</b>
1 Allahabad bank	19 Vijaya Bank
2 Andhra bank	<b>Public Sector Banks</b>
3 Bank of Baroda	20 IDBI
4 Canara Bank	<b>Foreign bank</b>
5 Corporation bank	21 CITI Bank N.A
6 Central bank	22 Deutsche Bank AG
7 Indian Bank	23 The Hongkong and Shanghai Banking Corporation Limited
8 Indian Oversea Bank	24 Standard Chartered Bank
9 Oriental bank of Commerce	25 The Royal Bank of Scotland N.V.
10 Punjab National Bank	26 J P Morgan
11 Punjab & Sindh Bank	<b>Private bank</b>
12 State Bank of India	27 Axis Bank
13 State Bank of Hyderabad	28 The Federal Bank Limited
14 Syndicate Bank	29 HDFC
15 State Bank of Travancore	30 Kotak Mahindra Bank
16 UCO Bank	31 ICICI
17 Union Bank of India	32 Indusind Bank
18 United Bank of India	33 Yes Bank

Sl.No	Sequence		
1.0		Name of the Company	
		Address of the Registered Office ( Telephone, E-Mail, Fax )	
1.1		Factory Location and Address ( Telephone, E-Mail, Fax )	
1.2		Installed Capacity (Tonnes / Year )	
		4.1) Carbon Steel	
		SA 192	
		SA 210 Gr. A1, C	
		SA 106 Gr. B, C	
		Riffled Tube / SA 210 Gr. C	
		4.2) Alloy Steel	
		SA 335 P11, P12, P22	
		SA 213 T11, T22	
		SA 335 P91, SA 213 T91	
		SA 335 P23, P92	
		SA 213 T23, T92	
		Riffled Tube /	
		SA 213 T12, T22, T23	
		3) Stainless Steel	
		ASME & ASTM A 213 TP 304, 304L, 316, 316L, 316LN, 317, 317L, 321, 310S	
		SA 213 TP 347H, 347HFG, Super 304H	
		Inconel – (mill to mention standard & grade)	
1.0	<b>Steel</b>		
1.1		Whether the firm has Integral Steel making facility?	
		If yes,	
		IBR APPROVAL FOR Steel	
1.1.1		Type of Furnace	
		Refining Facility: AOD/VOD	
1.1.2		Capacity of furnaces ( Metric Tonnes / Melt )	
		Other refining,	
1.1.3		Facility for manufacture of Blooms	
		Testing Facilities	
		Mechanical,	
		Chemical	
		NDE if any	
		Identification Co Relation with TC.	
		If No,	

1.1.4		Source of Raw Material ( Blooms )	
1.1.5		(If there is a requirement for steel of non-China source, is there some way of segregating and ensuring)?	
1.1.6		For C.S the Sources of Procurement - are they IBR approved?	
1.2.1		Type of Steel bought Concast or Rolled Bloom or both etc	
1.2.2		For Alloy Steels the Sources of Procurement - are they IBR approved?	
1.2.3		Sources of procurement for Inconel -	
1.2.4		What are the controls on steel suppliers? What is the type of NDE done on the Raw material?	
1.2.5		What is the surface condition of Raw Materials?	
1.2.6		What is the Incoming Inspection methodology	
1.2.7		How are the Raw Materials identified?	
1.2.8		What is the certification for the Raw Materials? Review a typical Test Certificate.	
1.2.9		What is the identification and traceability scheme followed?	
1.3		Any other Aspect of Storage? Space, chances of mixing up etc	
1..4		How are the blooms cut? Shear or gas cut? Surface freedom from cracks?	
		Source of Raw Material (HOLLOWS )	
		For S.S the Sources of Procurement - are they IBR approved?	
		What is the surface condition of Raw Materials?	
		What is the certification for the Raw Materials? Review a typical Test Certificate.	
		What is the Incoming Inspection methodology	
		What is the identification and traceability scheme followed?	
		Any other Aspect of Storage? Space, chances of mixing up etc	
2.0	<b>Manufacturing facility</b>		
2.1.1		Diameter ( Minimum and Maximum ),	
2.1.2		Thickness (Minimum and Maximum ) and Length ( Maximum )	
2.1.3		Through Hot Finishing	
2.1.4		Through Cold Finishing	
2.1.5		Type & Make of rolling mill along with the details of the Individual Equipments	
2.1.6		Type & Make of Cold Mill along with the details of the Individual Equipments	
2.2		Type and capacity of furnace for Heating and reheating of material	
2.3		Dimension Control especially w.r.t eccentricity in	

		each WC	
2.4		Method of maintenance of traceability, including in the case of drop out billets in process? 1). The process materials should have clear bundle tags as in SSTP.                    2). The chances of mixing of bundles any where in the plant to be noted. 3). The method of handling the bundle from raw material stage to Despatch stage to be assessed to identify any change for missing traceability. 4). The availability of Grade Test equipments and its working condition.	
2.5		Extent of cropping of thickened ends? Practice followed?	
2.6		Temperature gauge calibration and the temp correlation as it travels through the Furnace	
2.7		Atmosphere maintenance in furnace (oxygen levels)	
2.8		Type of descaling facility at rolling mill and finishing mill	
2.9		Straightening facility at the end of mill	
2.10		Finishing temperature measurement at the end of Reducing and sizing mill ... The length of the cooling bed?	
3.0	<b>Heat Treatment</b>		
3.1		Size and capacity of furnace	
3.2		Type of Heat Treatment Carried out (batch or continuous)	
3.3		Temp measuring equipment availability and their calibration	
3.4		Maintenance of Furnace atmosphere to avoid scaling	
3.5		Heat treatment records and their verification and maintenance	
3.6		Surface appearance of finished pipes/tubes	
3.7		Straightening facility after Heat Treatment	
3.8		Identification of pipes after Heat Treatment	
4.0	<b>Testing Facility</b>	Online UT Facilities (Kraut Kramer) Type of scanning, defect identification and defect segregation	
4.1		On line eddy current test facility.	
4.2		Calibration Pipes and Tubes	
4.3		Procedure and Calibration procedure, Rework and retesting procedure	
4.4		Qualification of NDE operator	
		Removal of residual magnetism	
4.5		Hydraulic Test Facility (Indicate the Maximum Pressure, Auto or manual,)	

4.6		Calibration of instruments for Hydraulic Testing,	
4.7.		Inspection: 1). Method of Inspection: Visual, Dimension, Operator Qualification, Inspn. Procedure . 2). Grade Checking method and its effectiveness. 3). Type of defects and frequently or mostly occurring defects. 4). % acceptance level. 5) Sorting, Identification of defect, Traceability of rejected material.	
4.7.1		1). List of measuring Instruments. 2). Calibrations Status of measuring Instruments. Gauss meter	
4.7		Chemical Testing Details of Equipment availability and their calibration	
4.8	<b>Instruments</b>	Mechanical Testing and the calibration	
4.8.1		Capacity of UTM	
4.8.2		Capacity of Flaring machine and flattening machine	
4.8.3		Correlation with test specimen and product	
4.8.4		Knowledge on Codes and job	
4.8.5		Hardness Testing facility and calibration	
4.8.6		Micro-examination facility	
5.0		Descaling facility	
5.1.1	<b>Final Cleaning &amp; Identification</b>	Type	
5.1.2		Finish	
5.2		System of Maintenance of Correlation	
5.3		The type of removal of shallow surface defects in the case of pipes (local grinding is not permitted. The surface should be skin turned)	
5.4		Facility for Hard stamping and Correlation with Certificates	
5.5		Facility for Longitudinal Colour Coding all the tubes (a mandatory requirement)	
5.6		Quality of end capping?	
5.7	<b>Final Cleaning &amp; Identification</b>	Dimensional checks and uniformity in length	
		Facility for rust preventive oil coating	
		Quality of RPF	
		Method of stenciling ( Size of the letter)	
6.0	Certification	System of Certification & correlation of materials	
6.1		Readiness to supply TC in soft form .... In case a uniform format is prescribed by BHEL ... when BHEL goes in for a data capture system for auto-generating TC Extracts?	
6.2		Feasibility for third party inspection at the time of critical tests like NDE?	
7.0		<b>Details of Accreditation for Quality Systems</b>	