

BHARAT HEAVY ELECTRICALS LIMITED

MM/RM/PURCHASE/TUBES

BHEL / TRICHY-620 014.

ANNEXURE-B

150210000x

Enquiry Terms & Conditions for Supply of Seamless Tubes

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

Any deviation to the below mentioned terms shall be stated specifically in the comments column for each term and also in case of acceptance to our terms, it will be construed that the whole term is understood and agreed in totality without any deviation. (If otherwise mentioned).

Sl No	BHEL Requirements	Supplier Confirmation /Comments
01.	<u>Restrictions for Procurement from a country sharing its land border with India</u> For this procurement, Public procurement order dated 23.07.2020 regarding restrictions under rule 144 (xi) of general financial rules 2017 and clarification dt 08.02.2021 from DoE is applicable. In case of subsequent Orders issued, the same shall be applicable even if issued after issue of this NIT.	
02.	<u>Preference to Make in India:</u> For this procurement, the local content to categorize a supplier as a class I local supplier/class II local supplier /Non-local supplier and purchase preference to class I local supplier, is as defined in Public Procurement (Preference to Make in India), Order 2017 dated 04.06.2020 issued by DPIIT. In case of subsequent Orders issued by the respective Nodal Ministry, changing the definition of local content for the items of the NIT, the same shall be applicable even if issued after issue of this NIT, but before opening of part II bids against this NIT.	
03.	<u>Special Provisions for Micro and Small Enterprises (MSE) bidders registered as per MSME act:</u> (Subject to participating MSE vendors meeting the tender requirements of BHEL) ➤ As per Gazette Notification no. S.O. 2119(E) dated 26.06.2020 issued by Ministry of MSME applicable/existing Micro and small suppliers are requested to get registered with Udyam Registration portal and share us the Udyam registration no along with Udyam registration certificate. MSE suppliers can avail the intended benefits only if they submit Udyam registration certificate or UAM with CA certificate or NSIC certificate or EM-II with CA certificate, along with the offer. ➤ 25% of the tendered quantity is earmarked for MSE suppliers in this tender, subject to participating MSE Vendors should meet the tender requirements of BHEL. In case MSE vendor participating in the tender quotes within the price band of L1 + 15%, they will be allowed to supply the portion of the requirement subject to acceptance of L1 price by MSE vendor. In case of more than one such MSE vendor within the "L1+15% price band", the supply shall be shared proportionately. ➤ In the event of Non MSE supplier becoming L1 and MSE supplier quotes within the price band of L1+15% and it is not possible to split the tendered quantity on account of reasons like customer contract requirement/technical requirements, then 100% of the quantity will be offered to MSE suppliers subject to acceptance of L1 price by MSE supplier. ➤ Counter offering of L1 rate will not be made with any MSE vendor whose quoted rate is more than the price band of L1+15%. ➤ Payment to MSE vendor will be as per the applicable provisions of the MSMED Act 2006. ➤ If L1 offer is from a Micro / Small enterprise, the 25% earmarking provision is not applicable. ➤ Out of the 25% tendered quantity reserved for MSE suppliers, 6.25% shall be earmarked for procurement from MSE owned by SC/ST entrepreneurs. Apart from this 3% shall be earmarked for procurement from MSE owned by Women entrepreneurs. ➤ In case of any change in the MSE status of the bidder, it shall be the responsibility of the bidder to notify the change as a part of the bid document. If at a later date it comes to the knowledge of BHEL, that the change in the status has not been intimated by the bidder and the order is obtained under the premise of an MSE then BHEL would cancel the pending order against this tender and take necessary steps for suspension of the business dealing with the bidder as per the procurement policy of BHEL. ➤ Non submission of Udyam registration certificate will lead to consideration of their bid at par with other bidders. No benefit shall be applicable for this enquiry if any deficiency in the above required documents are not submitted before price bid opening. However, credentials of all MSE suppliers will be verified before	

	considering the intended benefits for MSE suppliers at the time of tender evaluation. Non submission of Udyam registration certificate will lead to consideration of their bids at par with other bidders and MSE status of such suppliers shall be shifted to Non MSE supplier.	
04.	<u>Specification, Size & Quantity:</u> a) Specification, size and quantity shall be as given in enquiry. b) Tender BOQ item No. 1 & 2 are to be supplied fully meeting TDC 101 Rev 20, c) Tender BOQ item No. 3, 4, 6 & 7 are to be supplied fully meeting TDC 102 Rev 18 and d) Tender BOQ item No. 5 is to be supplied fully meeting TDC 105 Rev 04. e) If there is any deviation, the same should be mentioned clearly with the specific clause no. of the TDC and the deviation against it in the e- procurement offer itself. f) SP:RM01: Rev 01(creep testing requirement as per IBR) is applicable to the tender. g) Drawing No. 3-06-651-03853 will be applicable along with TDC 105 Rev 04 h) All tubes are to be stenciled and colour coded, longitudinally and continuously throughout the length of the tubes with specific details as listed out in the above respective TDCs and the SIPPP 21 Rev 07. 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. Supplier shall indicate the place of manufacture & mill name in the offer.	
05	<u>Pre-Qualification Requirement (PQR)</u> In addition to the TDC requirements, suppliers shall meet the Pre-Qualification Requirements as per a) Ref:MM:Pur:Pipes:FB:Rev00 dt.15.02.2021 for Tender BOQ item No. 1 & 2 b) Ref:MM:Pur:Tubes:Rev03 for Tender BOQ item No. 3, 4, 6 & 7 and c) Ref:MM:PUR:RIF-TUBES:REV01 for Tender BOQ item No. 5 The offers of the suppliers who fail to do so will be liable for rejection.	
06	<u>Offer Submission:</u> a) This Tender is hosted in EPS portal & offer to be submitted through EPS portal only. You are requested to submit your 2 parts offer before due date & time of the enquiry through NIC (https://eprocurebhel.co.in) only. b) Offer is to be submitted in TWO part bids system (Technical bid + Price bid) in the E-Procurement NIC PORTAL (https://eprocurebhel.co.in) ONLY. c) Scanned copy of the filled Annexure-B, Tender documents etc., shall be uploaded in the EPS portal. d) At its option, BHEL may consider extending the due date/s for the tender openings. Sufficient notice would be given by BHEL for such extensions and it will be published as corrigendum in following websites, https://eprocurebhel.co.in http://www.bhel.com/tender/ e) Acceptance of offer will be subject to existing customer approval.	
07.	Authorization for participation in EPS portal through DSC: E-Tender. Participation requirements: Either Principal or authorized agent shall register their Digital Signature Certificate (DSC) (Class 3- SHA2- 2048 BIT-SIGNING & ENCRYPTION). Suppliers are advised to go through the FAQ available in the web portal (https://eprocurebhel.co.in). DSC shall be registered for the authorized person and all transaction done using that DSC against our tenders shall be taken as valid communication and shall be binding on principal/agent and is valid legally. For foreign Principal In case of Principal (being foreigner), they may apply for DSC through Indian embassy at their country and can register with us for participating in E-tenders. Details of the applicable procedure is available in the webpage http://www.cca.gov.in/cca/. For Indian agent In case of agents participating/registering their DSC (of authorized person), it will be at the sole authorization of principal to their agents to participate on their behalf and all transactions done using that DSC against our tenders shall be known as valid communication and shall binding on principal and is legally valid.	

08.	Validity: Offer/Price validity of 60 days is required from the Price bid opening date.	
09.	Delivery: The offer shall clearly indicate delivery period in fixed number of weeks/Months from the date of Purchase Order.	
10.	IMPORT Vendors - Terms of Delivery: • Import vendors to submit offers on CFR (Cost & Freight), Chennai port (LILO – Liner in Liner Out) basis. • Port of loading should be indicated without fail. • Port of discharge should be Chennai. • The preferred shipment mode “Containerized Cargo or Break Bulk” shall be specified clearly in the offer. FOR CFR INCO TERMS – CONTAINERIZED CARGO a) For CFR terms, moved through CONTAINERS (Suppliers should clearly specify this in their offer) it would be presumed by BHEL that the freight charges quoted is on LILO (LINER IN LINER OUT) basis including extra charges, if any, like Container Imbalance Charges, Trade Imbalance charges or any other charges payable to the Liner. No other charges other than the quoted Freight rate will be paid by BHEL excepting applicable Terminal Handling Charges, Container cleaning Charges, DO charges to Shipping Liner at Discharge Port. 14 FREE DAYS FOR Container detention shall be provided. b) In case of shipment through Containers on CFR basis, the BL should bear the endorsement that “14 free days for Container Detention is applicable”. BREAKBULK CARGO: a) For CFR terms, moved through BREAK BULK BASIS (Suppliers should clearly specify this in their offer) it would be presumed by BHEL that the freight charges quoted is on LILO (LINER IN LINER OUT) basis. b) The materials will be Custom cleared from Port itself. INFORMATION TO IMPORT SUPPLIERS: A) Indian Customs imposed a penalty on late filing of Bill of Entries (Air/Sea Shipments) by the importer. Bill of Entry is Required to be Filed Latest by the End of Day Preceding the Day (including Holidays) of Arrival of the Vessel for sea shipments and by the end of same day on arrival of air shipment. Penalty for not filing Bill of Entry within the specified time period is Rs.5000/- per day (for Initial 03 days) & Rs.10000/- per day (thereafter). a) The vendor should furnish the Non-Negotiable Documents (Air Way Bill/Bill of Lading, Commercial Invoice, Packing List, and Certificate of Origin) either by email or post/courier to BHEL well before the landing of cargo at final port of discharge. b) Vendor will be held responsible for the penalty arises against the late filing of Bill Of entry due to: - Non availability of Non-Negotiable Documents (NNDs) before the cargo arrival - Discrepancy in documents - Short landing of Consignments (For shipments on CFR/CPT/CIF/CIP – Chennai Port) B) All the shipments for the contracts (POs) finalized on CFR -Chennai Port basis - Delivery Orders involving multiple agencies like liners/freight forwarders are not allowed. There must be a single agency office at the final discharge Port (Chennai) for issuing the Delivery Order to BHEL. - The detention/demurrage charges arising due to the nomination of containers under single BL to different/multiple CFS by the liner will be deducted from Vendor’s bills only. - The detention/demurrage charges arise due to the delay in collection of Delivery Orders from multiple agencies of liner/freight forwarder also whose offices are not at available Chennai, the same amount will be deducted from Vendor’s bills only. - Apart from the normal charges like Terminal Handling Charges, Container cleaning Charges, Delivery Order Charges at final port of discharge no other charges will be borne by BHEL. - The liner/freight forwarders should be properly communicated by the Vendor for not to claim such charges for issuing Delivery Order. If the liner/freight forwarder claims such charges in their invoices, the same amount will be deducted from the Vendor bills without any prior intimation in order to avoid the delay in Customs clearance. The likely additional/hidden costs or charges are: - CIC - Container Imbalance Charges/Surcharges - EIC - Equipment Imbalance Charge/Surcharges - CAF - Container/Currency Adjustment Factor - BAF - Bunker adjustment Factor - RDS - Rupee Depreciation Surcharge	

	f. CDS - Currency Depreciation Surcharge g. PCS - Port Congestion Surcharge h. LSS - Low Sulphur Surcharge i. Devanning Charges	
11.	<u>Transport Conditions for Import:</u> The Original Documents (Bill of Lading, Invoice, Packing List, Certificate of Origin & Test Certificate) shall reach BHEL well in advance before the vessel arrival. The soft copies of the above shall be forwarded to BHEL immediately after shipment. a) 14 FREE DAYS for Container detention at final port of destination shall be provided and the same to be endorsed in the Bill of Lading. If there is no free day or less than 14 free days provided by the supplier, the actual cost incurred towards detention charges due to non-availability of above said free days will be recovered from the supplier Invoice. b) In the event of delayed submission of documents/ non-submission of documents by the supplier as per the mutually agreed terms, an amount up to 5% of the invoice value will be retained towards detention/ demurrage & other charges and the difference if any between actual charges and recovery will be settled separately through supplementary invoice. c) In such cases, the Supplier shall authorize the Steamer / Shipping agent / transporter to freely release the consignment to BHEL by providing a "Surrender Bill of Lading". d) Otherwise, No-objection Certificate shall be issued to the Liner, authorizing BHEL to get the Delivery Order without producing the Original Bill of Lading. e) This is required to ensure avoidance of detention/ demurrage at Chennai Sea-port that may arise in case of delayed presentation of documents by the Seller.	
12.	<u>Indigenous vendors – Terms of delivery:</u> - Bidders should submit their offer on FOR Destination -BHEL Stores, Trichy basis. The quote should be inclusive of all charges, including testing, packing & forwarding, inspection, Insurance etc. (Ex-Works offers will not be considered). - The soft copies of the Invoice, LR copy & Test certificates shall be forwarded to BHEL immediately after dispatch.	
13.	<u>Goods and Service Tax (GST)</u> <u>Indigenous suppliers:</u> - Response to Tenders for Indigenous supplier will be entertained only if the vendor has a valid GST registration No (GSTIN) which should be clearly mentioned in the offer. If the dealer is exempted from GST registration, a declaration with due supporting documents need to be furnished for considering the offer. Dealers under composition scheme should declare that he is a composition dealer supported by the screen shot taken from GST portal. The dealer has to submit necessary documents if there is any change in status under GST. - Supplier shall mention their GSTIN in all their invoices (incl. credit Notes, Debit Notes) and invoices shall be in the format as specified/prescribed under GST laws. Invoices shall necessarily contain Invoice number (in case of multiple numbering system is being followed for billing like SAP invoice no, commercial invoice no etc., then the Invoice No. which is linked/uploaded in GSTN network shall be clearly indicated), Billed to party (with GSTIN) & Shipped to party details, item description as per PO, Quantity, Rate, Value, applicable taxes with nomenclature (like IGST, SGST, CGST & UTGST) separately, HSN/ SAC Code, Place of Supply etc. - All invoices shall bear the HSN Code for each item separately (Harmonized System of Nomenclature)/ SAC code (Services Accounting Code). - Invoices will be processed only upon completion of statutory requirement and further subject to following: - Vendor declaring such invoice in Form GST ANX-1 - Receipt of Goods or Services and Tax invoice by BHEL - As the continuous uploading of tax invoices in GSTN portal (in GST ANX-1) is available for all (i.e. both Small & Large) tax payers under proposed new GST Return System, all invoices raised on BHEL may be uploaded immediately in GST portal on despatch of material /rendering of services. The supplier shall ensure availability of Invoice in GST portal before submission of invoice to BHEL. Invoices will be admitted by BHEL only if the invoices are available in GSTN portal (in BHEL's GST ANX-2).	

	- In case of discrepancy in the data uploaded by the supplier in the GSTN portal or in case of any shortages or rejection in the supply, then BHEL will not be able to avail the tax credit and will notify the supplier of the same. Supplier has to rectify the data discrepancy in the GSTN portal or issue credit note or debit note (details also to be uploaded in GSTN portal) for the shortages or rejections in the supplies or additional claims, within the calendar month informed by BHEL. - In cases where invoice details have been uploaded by the vendor but failed to remit the GST amount to GST Department (Form PMT-08 or Form GST RET-01 to be submitted) within stipulated time, then GST paid on the invoices pertaining to the month for which GST return not filed by the vendor will be recovered from the vendor along with the applicable interest (currently 24% p.a) and all subsequent bills of the vendor will not be processed till filing of the GST return by the vendor - In case GST credit is denied to BHEL due to non-receipt or delayed receipt of goods and/ or tax invoice or expiry of timeline prescribed in GST law for availing such ITC, or any other reasons not attributable to BHEL, GST amount claimed in the invoice shall be disallowed to the vendor. - Where any GST liability arising on BHEL under Reverse Charge (RCM), the vendor has to submit the invoices to BHEL well within the timeline prescribed in GST Law, to enable BHEL to discharge the GST liability. If there is a delay in submission of invoice by the vendor resulting in delayed payment of GST by BHEL along with Interest, then such Interest payable or paid shall be recovered from the vendor. - Under GST regime, BHEL has to discharge GST liability on LD recovered from suppliers/contracts. Hence applicable GST shall also be recoverable from suppliers/contractors on LD amount. For this Tax Invoice will be issued by BHEL indicating the respective supply invoice number. - GST TDS will be deducted as per Section 51 of CGST Act 2017 and in line with Notification 50/2018 – Central Tax dated 13.09.2018. GST TDS certificate which will be generated in GST portal subsequent to vendor accepting the TDS deduction in the GST portal, will be issued to the vendor. - GST CREDIT: Suppliers are advised to get registered to GSTN portal. Tenderer under "GST credit" shall be preferred. Import Suppliers: Supplier shall mention the HSN code of each item quoted by them in the offer. The HSN shall be mentioned in the Invoice also for each item without fail. Since GST is implemented, the taxes & duties will prevail as per the government notification/ guidelines. Our Provisional GST registration no. is 33AAACB4146P2ZL. However, it will be mandatory to confirm from BHEL for this mentioned GST no. Suppliers may quote their GST no with valid proof in the quotation. Also before quoting of tender it is suggested to consider all the factors in line with GST guidelines for input tax credit to arrive ranking of quoted suppliers.	
14	<u>Acceptance of materials supplied:</u> The supply shall strictly as per the specifications in the tender /purchase order. Delivery of the ordered items as per the delivery terms in the Purchase Order does not automatically constitute acceptance of the delivered items. The acceptance or otherwise of the delivered items will be separately communicated to the supplier by BHEL either through B2B portal or through e mail within 120 days from the delivery of items or delivery of the required test certificates /other documents whichever is later. In case of rejection of the delivered items, either part or full, the vendor shall replace the rejected items as per the specification in the Purchase order/tender at their cost within specified days/months of communication of rejection to the supplier. In case of rejection of the delivered items, either part or full, if the supplier fails to replace the rejected items within the specified days/months of communication of the rejection, the same shall be treated as failure to execute the contract and actions as per the Guidelines for Suspension of Business Dealings with Suppliers /Contractors available in the webpage: http://www.bhel.com/vender_registration/vender.php. would be taken against such supplier.	
15	<u>Payment terms:</u> <u>Indigenous:</u>	

	BHEL Payment term is 100% direct EFT payment after 60 days from the date of receipt and acceptance of materials. Import: BHEL Payment term is 100% payment on CAD basis after 60 days from the date of receipt of documents, specified in PO, at BHEL bank. Respective bank charges to respective account. If supplier insists for LC, only Usance LC with 60 days' credit will be opened one month prior to material readiness, further loading @ 1.5% on the offered value will be considered. Hence supplier shall intimate the material readiness accordingly along with MTC copies for opening of L.C. LC validity period will be 90 days and for any extension, applicable charges will be to supplier's account. New Suppliers: For new suppliers not registered with BHEL, Trichy for the product, Payment shall be made 60 days after acceptance of materials. In case of foreign supplier, first lot of mutually agreed quantity shall be supplied with payment as CAD basis after 60 days from the date of receipt & acceptance of material. If insisted for LC, after acceptance of first lot, only Usance LC with 60 days' credit will be opened one month prior to material readiness.	
16.	<u>Liquidated Damage (Indigenous & Imports):</u> 1. Time is the essence of the contract. 2. The ordered items shall be delivered as per the delivery period mentioned in the Purchase Order. 3. In case the supplier supplies the ordered items beyond the delivery period specified, Liquidated Damages -LD - as detailed below shall be levied from the supplier without prejudice to any other relief /compensation available to BHEL, Tiruchirapalli under any other condition of the contract/applicable legal provisions. 1. LD shall be 0.5% of the undelivered portion per week or part thereof subject to a maximum of 10% of the total order value. 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). 3. Indigenous: For "FOR Delivery terms", Lorry way bill date will be taken for LD calculation. Import: For CFR terms, BL date will be considered for LD calculation.	
17.	<u>Warrantee / Guarantee:</u> Supplier to accept guarantee/warrantee of "18 months from dispatch or 12 months from commissioning, whichever is earlier". Supplier shall replace defective material free of cost (inclusive of all Testing, Inspection, TPI, Service charges etc.) up to destination within two months from defect notification date.	
18.	<u>Risk Purchase clause:</u> a) In the event of any successful Tenderer's failure to fulfil any of the tender / Contract obligations including supply of whole or any part of the ordered items as per Contract / Agreement, BHEL has the right to terminate the contract and purchase from elsewhere ,at the risk and cost of the defaulted supplier, either the whole of the goods or any part which the supplier has failed to deliver or dispatch within the time stipulated in the contract or if the same were not available, the best and nearest available substitute thereof. The supplier shall be liable for the additional expenditure/difference in Cost, if any, including consequential losses which BHEL may sustain by reason of risk purchase in addition to the applicable LD as per the Purchase order/contract. b) The decision of BHEL with regard to the additional expenditure / difference in cost and consequential losses incurred by BHEL shall be final and binding on the supplier. c) The amount recoverable under risk purchase shall be recovered from the defaulted supplier in all or any of the following manners: i) from dues available in the form of Bills payable to defaulted supplier, SD, BGs against the same contract. ii) from the dues payable to defaulted supplier against other contracts in the same Region/Unit /any other region/unit iii) In-case recoveries are not possible with any of the above available options, Legal action shall be initiated for recovery against defaulted supplier.	
19.	<u>Non-Disclosure Agreement(NDA):</u> The bidders shall enter into the Non-disclosure agreement totally voluntarily, with full knowledge of its meaning and without duress. (Format attached).	

20.	Patent Right The supplier shall, at all times, indemnify and keep indemnified the purchaser, free of cost, against all claims which may arise in respect of goods & services to be provided by the supplier under the contract for infringement of any intellectual property rights or any other right protected by patent, registration of designs or trademarks. In the event of any such claim in respect of alleged breach of patent, registered designs, trademarks etc. being made against the purchaser, the purchaser shall notify the supplier of the same and the supplier shall, at his own expenses take care of the same for settlement without any liability to the purchaser.	
21.	PARTICULARS TO BE FURNISHED BY FOREIGN VENDORS FOR EVALUATION OF BIDS WITH CUSTOMS DUTY BENEFIT A. Whether PTA/ CEPA or any other agreement/treaty between respective Governments/Countries exists and the same is applicable for your supplies w.r.t this Enquired Items/tender. B. If yes, mention the Concessional Customs Duty (Such Duty Benefits) C. Documentary proof for the applicable Concessional Customs Duty (eg. PTA/ CEPA or other agreement) shall be submitted along with the Part-1 bid. D. Relevant documents and details to avail the above concessional duty benefits by BHEL shall be submitted by the supplier along with dispatch documents E. In the event of seller failing to provide appropriate documents along with dispatch documents for purchasers to avail disclosed concessional duty benefits in India, financial loss, so incurred, will be to the seller's account. Note: Evaluation of the Price bids will be based on the above details only and unless mentioned/furnished by the vendor, Customs Duty benefit will not be applied for evaluation purposes.	VENDOR COMMENTS YES / NO % SUBMITTED/ NOT SUBMITTED CONFIRMED/ NOT CONFIRMED CONFIRMED/ NOT CONFIRMED
22.	Role of Agents a. BHEL strongly discourages the engagement of Agents by foreign principals, to deal with BHEL, in BHEL's tenders. b. In case of foreign suppliers representing through their Indian/foreign agents, agency agreement should be submitted, else offer is liable for rejection. Agency agreement requirements attached as separate file and full compliance to it shall be ensured while submitting the same. c. BHEL, due to business reasons would ban, would have banned Indian agents from dealing with BHEL. Any foreign principal who engages such a banned agent, or an employee of the banned agency, or any other person connected with the banned agency, at any time during the tender proceedings, would be disqualified from the tender proceedings. The decision of BHEL in this regard shall be final and be binding on the OEM. Hence in their own interests, prospective tenderers may check with BHEL. The list of banned firms is available on BHEL website www.bhel.com . Vendors/ principals proposing to deal with BHEL by engaging and through an Indian Agent does so at their own risk. BHEL shall in no way be responsible for any consequences that may arise to the foreign principal on account of the antecedents / actions of their Indian agent.	
23.	Agency Commission: ➤ If overseas principal has any tie-up with any third party/ agents, it should be declared while submitting offers. ➤ 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 BHEL in India, in Indian rupees, on satisfactory completion of the contract. ➤ Copies of current agency agreement / authorization letter in respect of agency commission shall be furnished along with offer. ➤ For calculation of rupee equivalent agency commission, exchange rate as prevailing on the date of order will be taken.	
24.	Evaluation Criteria: The Evaluation Currency for this tender shall be "INR". The offers of vendors will be evaluated on total landed cost to BHEL, Trichy. The evaluation process is as detailed below: Indigenous: Total Landed cost = FOR Rate in INR (A) + Applicable Taxes (B) + Loading for payment term & LD (C) – Applicable input tax credit (D) A. Indigenous vendors submit offers on Free on Road (FOR), Trichy in INR. B. GST and any other charges quoted by indigenous vendors will be added to the base price. C. Loading for payment terms & non-acceptance of Liquidated Damages (LD) will be added to the FOR value for arriving the landed rate.	

	D. However, input credit is availed for GST (SGST, CGST/IGST), hence the same is excluded for arriving at the landed cost. <u>Import:</u> Total Landed cost = CFR Rate in INR (A) + Applicable Duties (B) + Incidental Charges (C) + Loading for payment term & LD (D) A. Import vendors to submit offers on CFR (Cost & Freight), Chennai port (LILO – Liner In Liner Out) basis in foreign currency, which will be converted to INR by multiplying with the Exchange rate (SBI TT Selling rate) as on the technical bid opening date. B. Customs duty, Safe guard duty and antidumping duty as applicable will be added to the INR price. C. Incidental charges of 2.805% will be added to the CFR Value. The incidental charge is inclusive of Insurance, port handling charges, & freight charges for movement from Chennai port to BHEL, Trichy. D. Loading for payment terms & Non-acceptance of Liquidated Damages (LD) will be added to the CFR value for arriving at the landed cost. Note: “In the course of evaluation, if more than one bidder happens to occupy L1 status, effective L1 will be decided by soliciting discounts from the respective L1 bidders. In case more than one bidder happens to occupy the L1 status even after soliciting discounts, the L1 bidder shall be decided by a toss/draw of lots, in the presence of the respective L1 bidders or their representatives. Ranking will be done accordingly. BHEL decision in such situations shall be final and binding”.	
25.	<u>General condition:</u> - Bids including all enclosures and supporting documents like catalogues, pamphlets, etc., shall be submitted / uploaded in ENGLISH language only. If the documents submitted have other than English language, translation of the same shall be provided for evaluation. - In addition to TCs in relevant IBR forms corresponding mill TCs should also be provided along with dispatch of tubes & pipes. Two sets of original of all such TCs are to be provided to BHEL, Trichy. - Material is to be inspected by third party inspection agency as approved by IBR and test certificate are to be countersigned by respective Inspection agency in case the Mill is not approved by IBR. - While dispatching the tubes & pipes, in addition to bundling with metal straps, we require slinging arrangement with nylon belt (not rope) for easy handling at loading and unloading points. - Multiple PO may also be placed considering the applicable duty structure of the respective requirement/Qty. - No revision of prices will be entertained after the tenders are opened. - For the evaluation purposes, exchange rate (TT selling rate of SBI) as on schedule date of tender opening (Part I, i.e technical bid, in case of two part bid) shall be considered. - BHEL will consider the ranking after the loading is applied wherever deviations are observed. - 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. - In the event of our customer order covering this tender being cancelled / placed on hold / otherwise modified, BHEL would be constrained to accordingly cancel / hold / modify the tender / your purchase order at any stage of execution. - Offer will be evaluated based on Landed cost to BHEL- Trichy on individual line item basis only. - Vendor should physically weigh the materials before stuffing them into container and incorporate the same in BL and packing slip - Offers for partial quantities of a given item are not acceptable to BHEL. While tenderers can quote for some or all the tendered items, no supplier shall quote for partial quantity of any given enquiry item. Such partial offer would not be considered in the enquiry for that item. - No payment will be made for the excess quantity / length. - Offer should be submitted only as per the Unit of Measurement (UOM) specified in the enquiry. - All documents submitted with the offer shall be signed and stamped in each page by authorized representative of the bidder.	

	q) This Tender is hosted in EPS portal & offer to be submitted through EPS portal only. You are requested to submit your 2 parts offer before due date & time of the enquiry through NIC (https://eprocurebhel.co.in) only. SEALED COVER BIDS / E-MAILS / FAX / MANUAL OFFERS WILL NOT BE ACCEPTED.	
26.	<u>Fraud Prevention Policy</u> “The bidder along with its associate/collaborators/sub-contractors /consultants/service providers shall strictly adhere to BHEL Fraud prevention policy displayed on BHEL website http://www.bhel.com and shall immediately bring to the notice of BHEL Management about fraud or suspected fraud as soon as it comes to their notice.”	
27.	<u>Suspension of Business Dealings with Suppliers/Contractors:</u> The offers of the bidders who are under suspension as also the offers of the bidders, who engage the services of the suspended vendors /principals/agents, shall be rejected. The list of suspended vendors is available on BHEL web site www.bhel.com. Integrity commitment, performance of the contract and punitive action thereof: Commitment by BHEL BHEL commits to take all measures necessary to prevent corruption in connection with the tender process and execution of the contract. BHEL will during the tender process treat all Bidder(s) in a transparent and fair manner, and with equity. Commitment by Bidder/ Supplier/ Contractor - The bidder/ supplier/ contractor commit to take all measures to prevent corruption and will not directly or indirectly influence any decision or benefit which he is not legally entitled to nor will act or omit in any manner which tantamount to an offence punishable under any provision of the Indian Penal Code, 1860 or any other law in force in India. - The bidder/ supplier/ contractor will, when presenting his bid, disclose any and all payments he has made, and is committed to or intends to make to agents, brokers or any other intermediaries in connection with the award of the contract and shall adhere to relevant guidelines issued from time to time by Govt. of India/ BHEL. - The bidder/ supplier/ contractor will perform/ execute the contract as per the contract terms & conditions and will not default without any reasonable cause, which causes loss of business/ money/ reputation, to BHEL. If any bidder/ supplier/ contractor during pre-tendering/ tendering/ post tendering/ award/ execution/ post-execution stage indulges in any act, including but not limited to, mal-practices, cheating, bribery, fraud or and other misconduct or formation of cartel so as to influence the bidding process or influence the price or tampers the tendering process or acts or omits in any manner which tantamount to an offence punishable under any provision of the Indian Penal Code, 1860 or any other law in force in India, then, action may be taken against such bidder/ supplier/ contractor as per the Guidelines for suspension of business dealings available in the webpage: http://www.bhel.com/vender_registration/vender.php. and/or under applicable legal provisions.	
28.	<u>Cartel Formation:</u> The Bidder declares that they will not enter into any illegal or undisclosed agreement or understanding, whether formal or informal with other Bidder(s). This applies in particular to prices, specifications, certifications, subsidiary contracts, submission or non-submission of bids or any other actions to restrict competitiveness or to introduce cartelization in the bidding process. In case, the Bidder is found having indulged in above activities, suitable action shall be taken by BHEL as per extant policies/ guidelines.	
29.	<u>Resolution of Disputes:</u> The Parties agree that if at any time (whether before, during or after the arbitral or judicial proceedings), any Disputes (which term shall mean and include any dispute, difference, question or disagreement arising in connection with construction, meaning, operation, effect, interpretation or breach of the contract/tender which the Parties are unable to settle mutually), arise inter-se the Parties, the same may, be referred by either party to Conciliation to be conducted through Independent Experts Committee to be appointed by competent authority of BHEL from the BHEL Panel of Conciliators. The proceedings of Conciliation shall broadly be governed by Part-III of the Arbitration and Conciliation Act 1996 or any statutory modification thereof. Notes: 1. No serving or a retired employee of BHEL/Administrative Ministry of BHEL shall be included in the BHEL Panel of Conciliators. 2. Any other person(s) can be appointed as Conciliator(s) who is/are mutually agreeable to both the parties from outside the BHEL Panel of Conciliators. The proceedings of Conciliation shall broadly be governed by Part-III of the Arbitration and Conciliation Act 1996 or any statutory modification thereof and as provided in Annexure-1 to this Enquiry Terms and conditions for supply of seamless Tubes.	

	The Annexure-1 together with its appendices will be treated as if the same is part and parcel hereof and shall be as effectual as if set out herein in these Enquiry Terms and conditions for supply of seamless Tubes. . Except as provided elsewhere in this Contract, in case amicable settlement is not reached between the parties, in respect of any dispute or difference; arising out of the formation, breach, termination, validity or execution of the Contract; or, the respective rights and liabilities of the Parties; or, in relation to interpretation of any provision of the Contract ; or , in any manner touching upon the Contract, then, either Party may , by a notice in writing to other Party refer such dispute or difference to sole arbitration of an arbitrator appointed as per the Arbitration and Conciliation Act, 1996 (India) or statutory modification or re-enactment thereof and the rules made thereunder and for the time being in force . The Arbitrator shall pass a reasoned award and the award of the Arbitrator shall be final and binding upon the parties. Subject as aforesaid, the provision of Arbitration & Conciliation Act 1996 (India) or statutory modification or re-enactment thereof and the rules made thereunder and for the time being in force shall apply to the arbitration proceeding under this clause. The seat of arbitration shall be Trichy, Tamil Nadu, India The cost of arbitration shall be borne as per the award of the Arbitrator. Subject to arbitration in terms of clause above, the Courts at Trichy, Tamil Nadu, India shall have exclusive jurisdiction over any matter arising out of or in connection with this Contract. Notwithstanding the existence or any dispute or difference and/or reference for the arbitration, the vendor shall proceed with and continue without hindrance the performance of its obligation under this Contract with due diligence and expedition in a professional manner except where the Contract has been terminated by either Party in terms of this Contract. <u>In Case of Contract with Public Sector Enterprise (PSE) or a Government Department, the following shall be applicable:</u> In the event of any dispute or difference relating to the interpretation and application of the provisions of commercial contract(s) between Central Public Sector Enterprises (CPSEs)/Port Trusts <i>inter se</i> and also between CPSEs and Government Departments/Organizations (Excluding disputes concerning Railways, Income Tax, Customs & Excise Departments, such dispute or difference shall be taken up by either party for resolution through AMRCD as mentioned in DPE OM No. 4(1)/2013 –DPE (GM)/FTS-1835 dated 22-05-2018.
30.	<u>In the event of Force Majeure:</u> - Notwithstanding the provisions contained in other clauses, the supplier shall not be liable for imposition of any such sanction so long the delay and/or failure of the supplier in fulfilling its obligations under the contract is the result of an event of Force Majeure. For purposes of this clause, Force Majeure means an event beyond the control of the supplier and not involving the supplier's fault or negligence and which is not foreseeable and not brought about at the instance of the party claiming to be affected by such event and which has caused the non – performance or delay in performance. Such events may include, but are not restricted to, wars or revolutions, hostility, acts of public enemy, civil commotion, sabotage, fires, floods, explosions, epidemics, quarantine restrictions, strikes excluding by its employees, lockouts excluding by its management, freight embargoes and Acts of GOD. - If a Force Majeure situation arises, the supplier shall promptly notify the Purchaser/Consignee in writing of such conditions and the cause thereof within twenty-one days of occurrence of such event. Unless otherwise directed by the Purchaser/Consignee in writing, the supplier shall continue to perform its obligations under the contract as far as reasonably practical, and shall seek all reasonable alternative means for performance not prevented by the Force Majeure event. - If the performance in whole or in part or any obligation under this contract is prevented or delayed by any reason of Force Majeure for a period exceeding sixty days, either party may at its option terminate the contract without any financial repercussion on either side. - In case due to a Force Majeure event the Purchaser/Consignee is unable to fulfil its contractual commitment and responsibility, the Purchaser/Consignee will notify the supplier accordingly and subsequent actions taken on similar lines described in above sub-paragraphs.
31.	<u>Execution of the order:</u> - BHEL will have the option to pre-inspect the materials at Supplier's works by BHEL's own inspector or by third party agency appointed by BHEL or BHEL's end customer/s. - If the inspection fails, the vendor shall offer the material again as per ordered terms and specifications for further inspection. - The mere act of the pre-dispatch inspection (PDI) does not absolve the Supplier from giving the specifications as agreed upon in the Purchase Order. - In the case of overseas suppliers Inspection call for carrying out the inspection shall be given 30 days before the scheduled contract delivery date. The Inspection date/s given by the Supplier shall be on firm basis. For local Suppliers the Notice period of Inspection shall be 10 working days. - In the event of any short supply, it shall be the responsibility of the supplier to deliver such short supplied/ missing items on Free-of-Cost basis at BHEL stores, including customs clearances at Indian Ports in the case of foreign suppliers.

32.	Caution: - The suppliers are severely cautioned to note that the price bid document accepts the price in figures only. It does not allow the supplier to write the value by words. Therefore, all care shall be exercised by the supplier while filling in the figures. Once the price bid is opened no option is available for the supplier to retract the offer under any grounds. If a supplier, for any reason whatsoever approaches BHEL with a request for change in the price, it would be treated as going back on the offer submitted. In such cases, action would be initiated by BHEL for suspending further business dealings with such suppliers as per policy of BHEL which prevails at that point of time. - The language in the tender documents downloaded by the Bidders shall at no point of time be changed, altered or modified in any manner by the Tenderer. If such changes are made by any tenderer, it shall be considered as tampering with BHEL's terms and the offer shall be summarily rejected, whenever it is noticed by BHEL. Such Bidders would be disqualified from the Bidding Process and their offers would be forfeited / Bank Guarantees invoked. They would also not be allowed to participate in future tenders of BHEL.	
33.	Enclosures: (a) TDC 102 Rev 18, (b) TDC 101 Rev 20 (c) TDC 105 Rev 04 (d) PQR PIPE FB Dt 15.02.2021 (e) PQR-MM:Pur:Tubes: Rev 03, (f) PQR: MM: PUR: RIF-TUBES: REV-01 (g) SIPPP21_07 Colour Codes, (h) SIP RM 01 Rev01 (i) Non-Disclosure agreement, (j) Annexure-1 to Enquiry terms and conditions	
(On behalf of BHEL)		<u>SIGNED BY MANUFACTURER / MILL</u> Name of Mill: Designation / Department: Seal & Signature

 BHEL - TRICHY	THIRD PARTY NON-DISCLOSURE AGREEMENT		Doc.No. : ISMS-04/TP/011
			Ver. No: 3.0 Rev. No: 00
	Date : 27 - 10 - 14		

THIRD PARTY NON-DISCLOSURE AGREEMENT

I, _____, on behalf of the _____ (Name of Company), acknowledge that the information received or generated, directly or indirectly, while working with BHEL, Trichy on contract is confidential and that the nature of the business of the BHEL, Trichy is such that the following conditions are reasonable, and therefore:

I warrant and agree as follows:

I, or any other personnel employed or engaged by our company, agree not to disclose, directly or indirectly, any information related to the BHEL, Trichy Without restricting the generality of the foregoing, it is agreed that we will not disclose such information consisting but not necessarily limited to:

- Technical information: Methods, drawings, processes, formulae, compositions, systems, techniques, inventions, computer programs/data/configuration and research projects.
- Business information: Customer lists, project schedules, pricing data, estimates, financial or marketing data,

On conclusion of contract, I, or any other personnel employed or engaged by our company shall return to BHEL, Trichy all documents and property of BHEL, Trichy, including: drawings, blueprints, reports, manuals, computer programs/data/configuration, and all other materials and all copies thereof relating in any way to BHEL, Trichy 's business, or in any way obtained by me during the course of contract. I further agree that I, or any others employed or engaged by our company shall not retain copies, notes or abstracts of the foregoing.

This obligation of confidence shall continue after the conclusion of the contract also.

I acknowledge that the aforesaid restrictions are necessary and fundamental to the business of the BHEL, Trichy and are reasonable given the nature of the business carried on by the BHEL, Trichy I agree that this agreement shall be governed by and construed in accordance with the laws of country.

I enter into this agreement totally voluntarily, with full knowledge of its meaning, and without duress.

Dated at _____, this ____ day of _____, 20__.

Name

Company

Signature

BHARAT HEAVY ELECTRICALS LIMITED

MM/RM/PURCHASE/PIPES

Ref: MM: Pur:Pipe:FB: Rev 00

Dt:15.02.2021

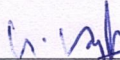
Pre-Qualification requirements (POR) for the procurement of Seamless Carbon Steel/Alloy Steel/Stainless Steel Pipes through Open Tender (As per TDC: 0:101 Rev 20)

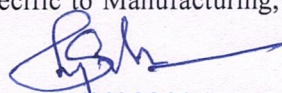
A) Organizational Capability:

1. Manufacturers having Pipe mill are only eligible to participate. Offers from traders, re-rollers (Suppliers having only cold finishing facility), fabricators and stockists are not acceptable and will not be considered for evaluation.
2. Source of raw material (Billets or blooms) for the manufacturing of Pipes shall be from **IBR** approved well known steel maker or certified by **IBR** approved inspecting authority (Form-IV to be attached in all cases). If the Raw material is sourced from different sources, all the sources should be indicated in the offer, and the supplies should be restricted to the indicated list of raw material sources.
3. As per the Steel and Steel Products (Quality Control) Order-2020 dt 27.05.2020 issued by Ministry of Steel, Government of India, all stainless steel Pipes shall be made from the stainless steel products (billets/blooms) conforming to equivalent IS standards. IS marked raw material MTC (billets/blooms) shall be submitted along with product test certificate/s
4. Vendor to indicate the nature of the firm. Product catalogue shall be submitted.
5. Suppliers shall submit filled in supplier facility report for Pipe mill (Format enclosed). Suppliers without basic manufacturing facilities in-house, shall not be considered for evaluation. In house facilities for Heat treatment & Non-Destructive Testing (On-line UT & Online Thickness Measurement facility for Pipes) are mandatory requirements for consideration of the offer.
6. Chemical, Mechanical testing shall be done in house or at Labs certified as per ISO 17025 or Government approved labs.
7. Suppliers shall submit a valid ISO 9001 certificate or Quality Assurance Manual or Written down procedure.
8. BHEL/End customer reserve the right to inspect the item ordered at any stage at vendor's works and if found not meeting the stipulated conditions, material is liable for rejection.
9. BHEL/End customer reserves the right to inspect the first lot of materials at vendor's works for giving clearance before bulk production.
10. BHEL reserves the right to visit supplier's works to audit and inspect to ensure the capability for technical evaluation.
11. BHEL reserves the right to carry out audit checks at BHEL on the materials supplied at the time of receipt.

B) Technical Competence:

1. Point by point confirmation to the TDC requirements is mandatory for consideration of offer and signed TDC shall be submitted.
2. Suppliers shall submit manufacturing process flow chart from Raw material (Billets or Blooms) to finished product to meet the TDC requirements along with technical bid.
3. Suppliers shall submit the experienced manpower details specific to Manufacturing, Quality and NDE requirements.


UDAYA KUMAR
Deputy Manager
MM / RM / Planning (Pipes)
Materials Management / FB
BHEL, TRICHY - 620 014.


SHYAMALADEVI S
Deputy Manager
Quality Assurance
BHEL, TRICHY - 620 014

Pre-Qualification requirements (POR) for the procurement of Seamless Carbon Steel/Alloy Steel/Stainless Steel Pipes through Open Tender (As per TDC: 0:101 Rev 20)

C) Past Experience/ Performance:

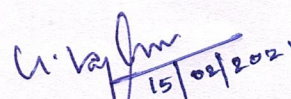
1. Suppliers shall indicate their annual installed capacity for the tendered specifications & it shall be more than the tendered quantity for each specification.
2. **Suppliers shall have supplied Pipes as per the specification given below.**
 - i. For Carbon Steel Pipes: Either in SA106GRB/ SA106GRC or any alloy steel Grades.
 - ii. For Alloy Steel Pipes: Either in SA335P12 / SA335P22 or any higher alloy steel grades.
 - iii. For Alloy Steel Pipes (SA335P91): Either in SA335P91/ SA335P92 Grades
 - iv. For Alloy Steel Pipes (SA335P92): In respective grade SA335P92.
 - v. For Stainless Steel Pipes: Either in SA312TP316, SA312TP316L or any higher Stainless Steel grades
3. Details of supplies made in past 5 years indicating the Quantity, Size, Specification & Customer details shall be submitted year wise.
4. Unpriced PO copies & Proof of supply (such as invoice / bill of lading copies and sample test certificates) against the tendered specification shall be submitted as mentioned above in Clause C2.
5. Unpriced PO copies & Proof of supply (such as invoice / bill of lading copies and sample test certificates) covering minimum and maximum sizes meeting the tendered size requirements shall be submitted as mentioned above in Clause C2.
6. The manufacturing size range shall be indicated in the offer. However, if credential is not available for any specific tendered size, then specific declaration shall be submitted by mill stating the capability to produce that quoted size/s.

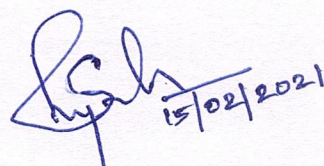
D) Financial Soundness:

1. Indigenous suppliers shall submit Audited copies of annual reports (Balance Sheets), Profit & Loss statement for the last four years (or from date of incorporation whichever is less).
2. Import suppliers shall submit latest report from a reputed third party business rating agency like Dun & Bradstreet, Credit reform etc.

Necessary supporting documents shall be submitted for meeting each of the above Pre-Qualification Criteria for evaluation of the offers.

BHEL shall consider/Not-consider the offers based on the evaluation of documents submitted for the above Pre-Qualification Criteria. If required, BHEL shall make on-site assessment of the facilities at supplier's works during the bid evaluation.


K. UDAYA KUMAR
Deputy Manager
MM / RM / Planning (Pipes)
Materials Management / FB
BHEL, TRICHY - 620 014.


SHYAMAL
Deputy Manager
Quality Assurance
BHEL, TRICHY - 620 014

SHYAMAL
Deputy Manager
Quality Assurance
BHEL, TRICHY

BHARAT HEAVY ELECTRICALS LIMITED
MM/RM/PURCHASE/TUBES

Ref: MM: Pur:Tubes:Rev 03

Dt:01.03.2021

Pre-Qualification requirements (POR) for the procurement of Seamless Carbon Steel/Alloy Steel/Stainless Steel Tubes through Open Tender (As per TDC: 102 Rev 18)

A) Organizational Capability:

1. Manufacturers having tube mill are only eligible to participate. Offer from traders, fabricators and stockists are not acceptable and will not be considered for evaluation.
2. If the supplier is having only cold mill facility for conversion of mother hollows to finished tubes, the raw material mother hollows shall be sourced from BHEL approved tube suppliers only. (List attached). The source of mother hollow shall be declared along with the offer for BHEL approval. For the submitted mother hollow sources, the supplier shall submit original test certificate/s of mother hollow along with product test certificate/s.
3. If the supplier is not having steel making facility, then source of raw material for the manufacturing shall be from **IBR** approved well known steel maker or certified by **IBR** approved inspecting authority (Form-IV to be attached). If the supplier is dependent on more than one source for steel making, all the sources should be indicated, and the supplies should be restricted to the indicated list of raw material sources.
4. As per the Steel and Steel Products (Quality Control) Order-2020 dt 27.05.2020 issued by Ministry of Steel, Government of India, all stainless steel tubes shall be made from the stainless steel products (billets/blooms) confirming to equivalent IS standards. IS marked raw material MTC (billets/blooms) shall be submitted along with product test certificate/s
5. Vendor to indicate the nature of the firm. Product catalogue shall be submitted.
6. Suppliers shall submit filled in supplier facility report for Tube mill (Format enclosed). Suppliers without basic manufacturing facilities in-house, shall not be considered for evaluation. In house facilities for Heat treatment & Non-Destructive Testing (On-line UT & Online Thickness Measurement facility for Tubes) are mandatory requirements for consideration of the offer.
7. Chemical, Mechanical testing shall be done in house or at Labs certified as per ISO 17025 or Government approved labs.
8. Suppliers shall submit a valid ISO 9001 certificate or Quality Assurance Manual or Written down procedure.
9. BHEL/End customer reserve the right to inspect the item ordered at any stage at vendor's works and if found not meeting the stipulated conditions, material is liable for rejection.
10. BHEL/End customer reserves the right to inspect the first lot of materials at vendor's works for giving clearance before bulk production.
11. BHEL reserves the right to visit supplier's works to audit and inspect to ensure the capability for technical evaluation.

B) Technical Competence:

1. Point by point confirmation to the TDC requirements is mandatory for consideration of offer and signed TDC shall be submitted.

Akhil
01/03/2021
AKHIL. K. DAS
Sr. Engineer
Materials Management / BHEL
BHEL, TRICHY - 620 014.

Shyam
01/03/2021
SHYAMALADEVI.S
Deputy Manager
Quality Assurance
BHEL, TRICHY - 620 014

Pre-Qualification requirements (POR) for the procurement of Seamless Carbon Steel/Alloy Steel/Stainless Steel Tubes through Open Tender (As per TDC: 102 Rev 18)

2. Suppliers shall submit manufacturing process flow chart from Raw material (Billets or Blooms) to finished product to meet the TDC requirements along with technical bid.
3. Suppliers shall submit the experienced manpower details specific to Manufacturing, Quality and NDE requirements.

C) Past Experience/ Performance:

1. Suppliers shall indicate their annual installed capacity for the tendered specifications & it shall be more than the tendered quantity for each specification.
2. Suppliers shall have supplied tubes as per the specification given below.
 - a. For Carbon Steel Tubes: Either in SA192/SA210GRA1 /SA210GRC or any alloy steel Grades.
 - b. For Alloy Steel Tubes (SA213T23): Either in SA213T23/SA213T91/SA213T92 Grades.
 - c. For Alloy Steel Tubes (SA213T91): Either in SA213T91/ SA213T92 Grades
 - d. For Alloy Steel Tubes (SA213T92): In respective grade SA213T92
 - e. For other Alloy Steel Tubes: Either in SA213T11/SA213T12/SA213T22 or any higher alloy steel grades
 - f. For Stainless Steel Tubes (SA213TP347H): Either in SA213TP347H or SUPER 304 (UNS No. S30432).
 - g. For Stainless Steel Tubes (SUPER 304 - UNS No. S30432): In respective grade SUPER 304 (UNS No. S30432)
 - h. For other Stainless Steel Tubes: Either in SA213TP304H, SA213TP316, SA213TP321, SA213TP321H or any higher Stainless steel grades
3. Details of supplies made in past 5 years indicating the Quantity, Size, Specification & Customer details shall be submitted year wise.
4. Unpriced PO copies & Proof of supply (such as invoice / bill of lading copies and sample test certificates) against the tendered specification shall be submitted as mentioned above in Clause C2.
5. Unpriced PO copies & Proof of supply (such as invoice / bill of lading copies and sample test certificates) covering minimum and maximum sizes meeting the tendered size requirements shall be submitted as mentioned above in Clause C2.
6. The manufacturing size range shall be indicated in the offer. However, if credential is not available for any specific tendered size, then specific declaration shall be submitted by mill stating the capability to produce that quoted size/s.

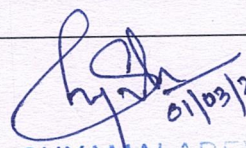
D) Financial Soundness:

1. Indigenous suppliers shall submit Audited copies of annual reports (Balance Sheets), Profit & Loss statement for the last four years (or from date of incorporation whichever is less).
2. Import suppliers shall submit latest report from a reputed third party business rating agency like Dun & Bradstreet, Credit reform etc.

Necessary supporting documents shall be submitted for meeting each of the above Pre-Qualification Criteria for evaluation of the offers.

BHEL shall consider/Not-consider the offers based on the evaluation of documents submitted for the above Pre-Qualification Criteria. If required, BHEL shall make on-site assessment of the facilities at supplier's works during the bid evaluation.


01/03/2021
AKHIL. K. DAS
Sr. Engineer
Materials Management / 201
BHEL, TRICHY - 620 014.


01/03/2021
SHYAMALADEVI. S
Deputy Manager
Quality Assurance
BHEL, TRICHY - 620 014

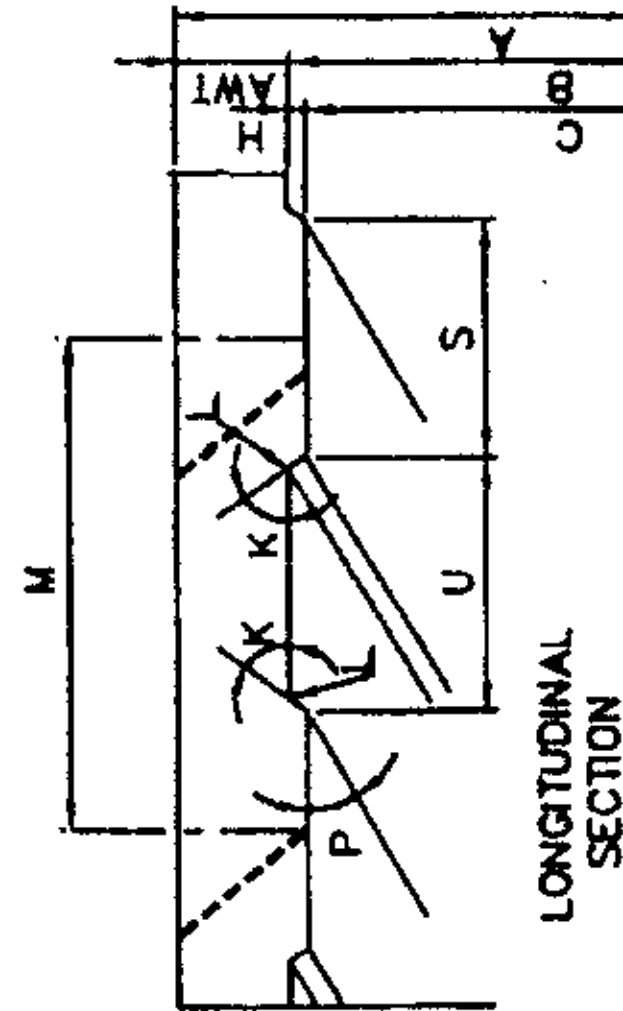
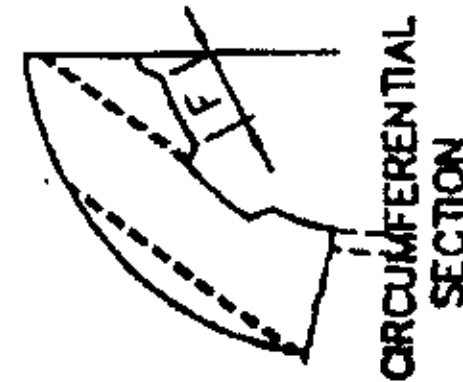
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DIMENSIONAL SPECIFICATION FOR MULTI-RIFFLED TUBING

MATERIAL SPECIFICATION : SA 210 GrC

FOR TOLERANCES OF UNTOLERANCED
DIMENSIONS DURING MANUFACTURE
REFER PLANT STANDARD TP 023 0299

↓ PARAMETERS	TUBE SIZE →	TUBE #51x5.6	TUBE #51x6.0	TUBE #51x7.1	TUBE #63.5x7.1	TUBE #63.5x11	TUBE #63.5x12
A	TUBE OUTSIDE DIAMETER	51.00 ±0.25	51.00 ±0.25	51.00 ±0.25	63.50 ±0.30	63.50 ±0.30	63.50 ±0.30
B	MAJOR INSIDE DIAMETER	38.57 ±0.25	37.68 ±0.25	35.24 ±0.25	47.74 ±0.30	39.08 ±0.30	36.86 ±0.30
C	MINIMUM INSIDE DIAMETER	35.57	34.71	32.30	44.53	36.03	33.85
D	MINIMUM WALL THICKNESS	5.6	6.0	7.1	7.1	11	12
E	NUMBER OF RIBS	8	8	8	8	8	8
F	RIP WIDTH AT TOP (NOMINAL) (CIRCUMFERENTIAL)	4.78	4.78	4.78	4.78	4.78	4.78
H	RIB HEIGHT	1.07 ±0.30	1.06 ±0.30	1.04 ±0.30	1.15 ±0.30	1.07 ±0.30	1.05 ±0.30
K	RIB-SIDE ANGLE	55° ±15°	55° ±15°	55° ±15°	55° ±15°	55° ±15°	55° ±15°
L	RIB RADIUS	0.13-1.27	0.13-1.27	0.13-1.27	0.13-1.27	0.13-1.27	0.13-1.27
M	RIB PITCH	26.23 ±3.18	25.62 ±3.18	23.97 ±3.18	32.46 ±3.18	26.57 ±3.18	25.06 ±3.18
N	LEAD LENGTH (360°)	209.8 ±25.4	205.0 ±25.4	191.8 ±25.4	259.7 ±25.4	212.6 ±25.4	200.5 ±25.4
P	LEAD ANGLE (NOMINAL)	30°	30°	30°	30°	30°	30°
S	RIB WIDTH AT TOP (LONGITUDINAL)	8.28 ±1.27	8.28 ±1.27	8.28 ±1.27	8.28 ±1.27	8.28 ±1.27	8.28 ±1.27
U	GROOVE WIDTH AT TOP (LONGITUDINAL)	17.95 ±1.90	17.34 ±1.90	15.69 ±1.90	24.18 ±1.90	18.29 ±1.90	16.78 ±1.90



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99				
100				

TYPE OF PRODUCT
OR NAME OF
CUSTOMER/PROJECT



Bharat Heavy Electricals Ltd
UNIT: HIGH PRESSURE BOILER PLANT
TIRUCHIRAPALLI - 620014

ITEM NO
VAR NO

DATE

SIGNATURE

DATE

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TITLE
DIM. SPEC. FOR
MULTI-RIFFLED TUBING

DRAWING NO :

3-06-651-03853

REV

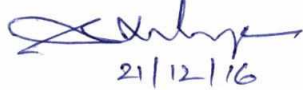
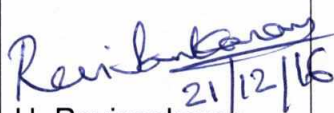
**BHARAT HEAVY ELECTRICALS LIMITED
TIRUCHIRAPALLI 620 014**

QUALITY ASSURANCE

SIP: PP: 21 Rev. 07

Page 1 of 4

**COLOUR CODES FOR TUBES AND PIPES
(FOR BOILERS, PRESSURE VESSELS & HEAT EXCHANGERS)**

REVISION	DATE	PREPARED	REVIEWED	APPROVED
01	05-02-1999	R. Sasikumar	A. R. Reddy	K. Rengachari
02	22-07-2004	K. Ganesan	U. Revisankaran	C. R. Raju
03	20-01-2009	V. Kalyanaraman	S.Selvarajan	U. Revisankaran
04	13-05-2011	C. Haritha	V. Kalyanaraman	S. Selvarajan
05	27-05-2015	Vaibhav Saxena	S. Selvarajan	U. Revisankaran
06	28-10-2015	Vaibhav Saxena	Manu Shankar. H	S. Selvarajan
07	21-12-2016	 21-12-2016 Vaibhav Saxena	 21/12/16 S. Selvarajan	 21/12/16 U. Revisankaran

RECORD OF REVISIONS

Rev. No	Clause No.	Details of Revision	Remarks
01		New Specifications included based on TDC revision.	--
02		Amendment A1 dt. 26.04.01 issued for Rev. 01 incorporated. Colour code for SA 213 Gr. T23 added.	--
03		1) Colour code for SA 213 Gr. T92, P23, P92, SA178 Gr. D added. 2) Colour code for SA 210 Gr. C modified to BLUE only.(From BLUE & GREEN)	--
04		Colour code for super 304H added	--
05		1) First para modified for clarity for colour codes containing more than one colours. 2) UNS number for Super 304H added.	--
06		Colour code for super 304H corrected in line with Revision 04.	--
07		1) First paragraph modified to include Instructions for sequence for colour code bands. 2) Sl. No. column added in table. 3) Colour code for SA 312 Gr. TP 304H added.	--

Following Colour codes are to be applied as longitudinal bands (if not specified in other documents) on tubes & pipes to identify them to specification during receipt, storage, issue and processing. For heat exchanger tubes circumferential colour code can be provided at both ends of tubes (300 mm away from end). If the Colour code contains more than one Colour then bands of Colours shall be applied adjacent to each other without any overlap. ***In case of multiple colour bands, the sequence shall be maintained as indicated in the table.***

Sl. No.	Specification	Colour 1	Colour 2	Colour 3
1.	12 X 1 MØ	RED	YELLOW	
2.	13 Cr Mo 44	ALUMINIUM	BLACK	
3.	A 200 Gr. T5	ALUMINIUM	RED	YELLOW
4.	A 200 Gr. T9	ALUMINIUM	GREEN	YELLOW
5.	AISI 602	WHITE	YELLOW	
6.	API 5L Gr. B	ALUMINIUM		
7.	BS 3059 PART2 CDS/HFS 360	ALUMINIUM	BLACK	BROWN
8.	BS 3059 P2 S2 440	ALUMINIUM	BLACK	RED
9.	BS 3059 P2 S2 622 Gr. 490	ALUMINIUM	BLACK	GREEN
10.	BS 3602 PART1 CDS 360	ALUMINIUM	BLACK	BLUE
11.	NFA49-213 42C	ALUMINIUM	BLUE	BROWN
12.	NFA49-213 TU 10CD9.10	ALUMINIUM	BLUE	RED
13.	NFA49-213 TU 15CD2.05	ALUMINIUM	BLUE	GREEN
14.	NFA49-213 TU Z10CD9	ALUMINIUM	BLUE	YELLOW
15.	NFA49-213 TU Z10CDVNB09.01	ALUMINIUM	GREEN	RED
16.	SA 106 Gr. B	RED		
17.	SA 106 Gr. C	BLUE		
18.	SA 178 Gr. D	ORANGE		
19.	SA 179	BLACK	BLUE	GREEN
20.	SA 192	WHITE		
21.	SA 199 T5	BLUE	BROWN	RED
22.	SA 209 Gr. T1	ALUMINIUM	RED	
23.	SA 210 Gr. A1	YELLOW		
24.	SA 210 Gr. C	BLUE		
25.	SA 213 Gr. T11	ALUMINIUM	YELLOW	
26.	SA 213 Gr. T12	BROWN	YELLOW	
27.	SA 213 Gr. T2	BROWN	GREEN	
28.	SA 213 Gr. T22	GREEN	RED	
29.	SA 213 Gr. T23	RED	WHITE	
30.	SA 213 Gr. T5	BLACK	BROWN	GREEN
31.	SA 213 Gr. T9	BROWN	WHITE	
32.	SA 213 Gr. T91	GREEN	YELLOW	
33.	SA 213 Gr. T92	BROWN	BLUE	
34.	SA 213 Gr. TP 304	BLUE	GREEN	YELLOW
35.	SA 213 Gr. TP 304H	BLACK	BLUE	YELLOW
36.	SA 213 Gr. TP 304L	BLUE	WHITE	YELLOW
37.	SA 213 Gr. TP 309H	BLACK	BROWN	YELLOW
38.	SA 213 Gr. TP 316	BROWN		
39.	SA 213 Gr. TP 316 Ti	BLACK	BLUE	
40.	SA 213 Gr. TP 316L	BLUE	BROWN	YELLOW
41.	SA 213 Gr. TP 321	BLUE	WHITE	
42.	SA 213 Gr. TP 321H	BLACK	WHITE	
43.	SA 213 Gr. TP 347H	BLACK	YELLOW	

Sl. No.	Specification	Colour 1	Colour 2	Colour 3
44.	SA 268 Gr. TP 405	ALUMINIUM	GREEN	
45.	SA 268 Gr. TP 410	BROWN	RED	YELLOW
46.	SA 268 Gr. TP 443	BLUE	GREEN	WHITE
47.	SA 269 TP 316	GREEN	RED	YELLOW
48.	SA 312 Gr. TP 304	BLUE	YELLOW	
49.	SA 312 Gr. TP 304L	BLUE	RED	YELLOW
50.	SA 312 Gr. TP 304H	BLACK	BLUE	YELLOW
51.	SA 312 Gr. TP 316	BLACK	GREEN	
52.	SA 312 Gr. TP 316L	BLACK	BLUE	BROWN
53.	SA 312 Gr. TP 321	BLUE	BROWN	
54.	SA 312 Gr. TP 347	BLUE	RED	WHITE
55.	SA 333 Gr. 1	BLACK	BROWN	RED
56.	SA 333 Gr. 3	BLACK	GREEN	RED
57.	SA 333 Gr. 6	BLUE	GREEN	RED
58.	SA 334 Gr. 1	BROWN	GREEN	RED
59.	SA 334 Gr. 3	BLACK	RED	YELLOW
60.	SA 334 Gr. 6	BLACK	BLUE	RED
61.	SA 335 Gr. P1	BROWN	GREEN	YELLOW
62.	SA 335 Gr. P11	GREEN	WHITE	
63.	SA 335 Gr. P12	BLACK	RED	
64.	SA 335 Gr. P2	BLUE	BROWN	GREEN
65.	SA 335 Gr. P22	BLUE	RED	
66.	SA 335 Gr. P23	RED	WHITE	
67.	SA 335 Gr. P5	BLACK	BROWN	
68.	SA 335 Gr. P9	ALUMINIUM	BROWN	
69.	SA 335 Gr. P91	BROWN	RED	
70.	SA 335 Gr. P92	BROWN	BLUE	
71.	SB 163 Inconel	BLACK	GREEN	YELLOW
72.	ST 35.4	ALUMINIUM	BLUE	
73.	Steel 20	GREEN		
74.	Structural Tubes & Pipes	BLUE	BROWN	WHITE
75.	X20 Cr Mo V 121	BLACK		
76.	SA 213 UNS S30432(Super 304)	BLACK	RED	GREEN

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BHARAT HEAVY ELECTRICALS LIMITED
TIRUCHIRAPPALLI - 620 014, INDIA

QUALITY ASSURANCE

CREEP TESTING (STRESS RUPTURE) REQUIREMENTS AS PER IBR

Prepared by

Quality Assurance

03/09/2018

Abdur Rahman Sultan

Reviewed by	Signature
Product Engineering – Fossil Boilers (S. ANAND KUMAR)	31/9/18
Quality Assurance (G. PANNEERSELVAM)	03/09/18
Approved by	Signature
AGM/QA& BE (AMIT ROY)	03/09/18

RECORD OF REVISIONS

Rev. No.	DATE	Clause No.	Details of Revision
00	20/11/2017	---	Fresh issue
01	03/09/2018	1.0	Scope modified to bring more clarity
		2.0	Cl. 2 modified to bring creep requirements for all suppliers, additional labs are listed and Table 2 modified inline with the changes proposed in the new IBR draft.

1.0 SCOPE

- a) Creep testing is required as per IBR for all alloy & stainless steels materials *which are to be used in furnace or in super heater zone of boilers being erected in India.*
Hence, for our current boiler design, creep testing is required for tubes & forged finned elbows only.
- b) *If the creep properties are established either by the mill on the starting raw material or by supplier on the finished product, then creep test reports shall meet the requirements of Clause 2.*
- c) *If the starting material is sourced from any mill which has not established creep properties, then creep testing shall be done as per Clause 2 on the product. If the Test results are meeting the requirements, then it can be treated as an approval of the creep values for the Mill which has supplied the starting material.*

2.0 CREEP TESTING REQUIREMENTS

Creep testing shall be done in line with the following:

For the starting raw material (Ingot, billet, bloom, etc.), supplier/s shall produce the Creep (stress rupture) test report for each material grade being supplied by them as per the Table 1 given below:

Table 1. Creep Stress rupture testing Requirements

Sl. No	Steel Type and Grade	Testing hours – min. (hrs.)	Testing Temperature (°C)	Stress Value (MPa)	No. of tests & Specimen Size
1	Alloy Steels (AS) – Grade 11, 12 and Grade 22	1000	550	100	Two no. of tests with preferably M10 round sample
2	Alloy Steels (AS) – Grade 91, 92 and 23	1000	600	120	Two no. of tests with preferably M10 round sample
3	All Stainless Steels (SS) grades	1000	600	110	Two no. of tests with preferably M10 round sample

- a) *For steels produced indigenously, creep testing shall be carried out at National Metallurgical Laboratory, Jamshedpur, Corporate Research & Development Laboratory of Bharat Heavy Electricals Limited, Hyderabad, Well Known Steel Makers or any other Material Testing Laboratory recognized by the Central Boilers Board.*
- b) *For steels produced outside India, creep testing shall be carried out at Well Known Steel Makers, Nationally recognized / accredited testing laboratory in the country of manufacture. Alternatively, the testing can also be done in any other laboratory if the tests are witnessed by a Competent Person working with IBR Authorized Inspection Agencies.*
- c) Creep testing shall be done as per ASTM E139 (latest) or BS EN ISO 204 (latest).
- d) *Two Test specimens shall be prepared from the test bar.*
- e) **Acceptance Criteria:** The samples tested shall not rupture and shall meet the *creep requirements at 1,000 hours of testing at indicated temperatures & stress values as per Table 1.*
- f) Reporting: As per Table 2.

Table 2. Suggested/Recommended Format for Reporting the Creep Testing Data:

SI No	Description	Details/Results
1	Report No. Date:	
2	Name and Address of the <i>Tube/ Forged Finned Elbow</i> Manufacturer	
3	Name and Address of the Raw Material Supplier	
4	Material Specification & Grade (Code Case, if applicable)	
5	Heat/Melt No, SI No (if applicable)	
6	Heat treatment details (Type & Temperature)	
7	Name and Address of Testing Laboratory	
8	Testing method/ Standard (ASTM E139 or BS EN ISO 204) & Revision/Edition	
9	Test Sample Size	
10	No. of test samples	
11	Temperature at which test is conducted (°C)	
12	Stress value observed (MPa)	
13	Test Start Date & Time	
14	Test End/Reporting Date & Time	
15	Test duration (hours of creep testing)	
16	Test witnessed by (Name of Inspector & Agency)	
17	Test Result (Accepted/Not Accepted)	

Technical: Seamless Tubes & Pipes Suppliers (Carbon / Alloy / Stainless Steel) Supplier Facility Report

1. Name of the Company

2. Address of the Registered Office
(Telephone, E-Mail, Fax)

3. Factory Location and Address
(Telephone, E-Mail, Fax)

4. Installed Capacity (Tonnes / Year)

4.1) Carbon Steel

a) SA 192

b) SA 210 Gr. A1, C

c) SA 106 Gr. B, C

d) Riffled Tube / SA 210 Gr. C

4.2) Alloy Steel

a) SA 335 P11, P12, P22

b) SA 213 T11, T22

c) SA 335 P91, SA 213 T91

d) SA 335 P23, P92

e) SA 213 T23, T92

f) Riffled Tube /
SA 213 T12, T22, T23

4.3) Stainless Steel

a) SA 213 TP 304H

b) SA 213 TP 347H

c) SA TP 347HFG

d) Super 304H

5. Are you making your own steel
(Bloom) for making Tubes / Pipes ?

YES

☐

NO

☐

6. If yes, for Sl. No. 5

a) Type of Furnace

b) Capacity of furnaces
(Metric Tonnes / Melt)

c) Facility for manufacture
of Blooms

7. If No, for Sl. No. 5

a) Source of Raw Material (Blooms)

8. Tube / Pipe Manufacturing Facility details

8.1 Capacity of the rolling mill with respect to
Diameter (Minimum and Maximum),
Thickness (Minimum and Maximum) and
Length (Maximum)

a) Through Hot Finishing

b) Through Cold Finishing

8.2 Type & Make of Hot Mill along with the details
of the Individual Equipments

8.3 Type & Make of Cold Mill along with the details
of the Individual Equipments

9. Heat Treatment Facility Details

a) Capacity of the Furnaces

b) Type of Heat Treatment Carried out
(Batch or Continuous)

10. In House Testing Equipments Details

a) Online UT Facilities

b) Online Eddy Current (EC) Facility

c) Hydro Test Facilities
(Indicate the Maximum Pressure)

d) Chemical and Mechanical Testing Facilities

**11. Details of Accreditation for Quality Systems
(Like ISO, ASME, API etc.,)**

12. Are you Approved by any
Third Party / Statutory Agency ?

If so, specify the Agency (**Attach details in ENGLISH**)

13. Have you manufactured the following
Size / Specification / Length to

BHEL or any other well-known Boiler Manufacturer for Boiler Application

Please provide the details of to whom, when and how much supplied.



a) TUBES:

TUBES REQUIREMENT- LENGTH : 6500 mm to 13800 mm			
SL. NO.	OUTER DIAMETER	WALL THICKNESS	SPECIFICATION
1	21.3 to 73.01 mm	2.11 to 14.02 mm	SA 106 Gr B / Gr C (Carbon Steel) SA 335 P12, P22, P23, P91, P92 (Alloy Steel)
2	28.6 to 76.1 mm	3.2 to 12.5 mm	SA 192 / SA 210 Gr A1 / Gr C (Carbon Steel) SA 210 Gr. C (Rifle Tubes) SA 213 T12, T22, T23 (Alloy Rifle Tubes)
3	14 to 76.1 mm	3.2 to 12.5 mm	SA 213 T11, T22, T23, T91, T92 (Alloy Steel) SA 213 TP 304 H, TP 347 H, TP 347 HFG, Super 304 H (SS)

b) PIPES:

PIPES REQUIREMENT – LENGTH 3000 mm to 9000 mm			
SL. NO.	OUTER DIAMETER	WALL THICKNESS	SPECIFICATION
1	88.9 to 864.00 mm	3.96 to 148.0 mm	SA106 Gr B / Gr C (Carbon Steel)
2	88.9 to 965.00 mm	3.96 to 130.0 mm	SA335 P11, P12, P22, P23 (Alloy Steel)
3	127.0 to 812.8 mm	11.50 to 100.00 mm	SA335 P91, P92 (Alloy Steel)
4	88.9 to 323.9 mm	3.05 to 12.5 mm	SA312 TP304H, 321 H, 316 (SS)

14. Please go thro the attached **Technical Delivery Condition (TDC)** and give point-by-point confirmation.

a) For Tubes: TDC: 0:102, 0:105, 0:119

b) For Pipes: TDC: 0:101, TDG: 32, TDG: 100, TDG: 101, TDG: 26, TDG: 6876

PLACE :

DATE :

SIGNATURE WITH SEAL

NOTE: Enclose Additional Sheets / Annexures wherever required referring the Sl. No. of this format.

	BHEL – Tiruchirappalli - 620014, India. Quality Assurance Department TECHNICAL DELIVERY CONDITIONS	Doc No: TDC:0:101 Rev No: 20 Effective Date: 26/09/2019 Page: 1 of 4
Product: Seamless Steel Pipes (for Boiler And Piping)		

Record of Revision:

Rev 10: 27/01/04 Cl.8 Hydraulic test removed, further clauses renumbered. Annexures introduced for Cl.11. In Cl.2 limits for carbon in Gr C modified. In Cl. 4 normalizing made mandatory for all pipes of Gr C& Gr B meant for fitting. In Cl.5.0 test coupon for pipes meant for fittings removed.

Rev 11: 29/12/07 Cl 1, P92 included. P2, P5, P9, 304L, 321 Deleted.Cl.4, 10, 11, modified.

Rev 12: 29/07/10 Cl 1, P91, P92 Deleted and included in TDC 0123; Cl: 4, 5, 7, 8, 10, 11 modified.

Rev 13: 26/10/12 Cl 2, 6 & 11 modified for SS material

Rev 14: 29/12/12 Cl 4 – Heat treatment for CS modified. Cl 6 – corrected.

Rev 15: 28/11/13 TDC 123 Rev 00 and TDG 32 Rev 03 merged with TDC 101 Rev 15 & Product description modified. Cl 3 added. Cl 5, Cl 8, Cl12 modified. SA335 Gr 91, 92 included (Cl 1) and subsequent dimensional tolerance (Cl 3), heat treatment (Cl 5), mechanical testing (Cl 6), and photomicrograph (Cl 7 iii) added. SA335 Gr 23 removed from TDC 123 Rev 00

Rev 16: Cl 3– OD & ID tolerance revised, Cl 5– temperature for Gr 91, 92 modified, Cl 6 – mechanical test values changed in-line with ALSTOM purchase specification, Cl 7 – PMI magnification & frequency clarified, Cl 9&11 – modified, Cl 12-changed as per latest IBR.

Rev 17: Dt: 13/10/2017: Cl 1 modified; Cl 4 modified to include finishing process and polygonization requirements for pipes of OD ≤ 76.1; Cl 5 modified; Cl 6(c) added to include creep requirements; Cl 8 & 9 modified; Cl 12-changed as per latest IBR to include MAWP requirements and IBR Form IV.

Rev. 18: Dt: 11/11/2017: Cl. 6(c), Cl.12.3 (vii)-creep requirements removed.

Rev. 19: Dt: 03/05/2018: Cl 2 added to include Billet/Bloom Requirements, Cl. 13.3 (vii) added to include mill TC certification

Rev. 20: Dt: 26/09/2019: Cl 2 modified based on feedback from user departments, suppliers and internal discussions, Cl 14 added

1. MATERIAL:

Specification	:	ASME (Latest as on the date of Enquiry/PO, whichever is earlier):
Carbon Steel (CS)	:	SA106 Gr B & C
Alloy Steel (AS)	:	SA 335 Gr P11, P12, P22, P91 & P92 (Code Case: 2179)
Stainless Steel (SS)	:	SA 312 Gr TP 316, TP 316L
Additional requirement	:	As listed below (Supplementary to above material specifications).
Pipe Size and Qty	:	As per Purchase Order

2. BILLET/BLOOM REQUIREMENTS:

The billets/blooms shall be fully killed.

For carbon steel and alloy steel, billets/blooms shall be made by vacuum degassing. For Stainless steel, billets/blooms shall be made by vacuum degassing or argon oxygen decarburization (AOD).

Chemistry shall be controlled as given below for below specified grades. For all other grades, it shall be as per applicable material specifications:

Ladle Analysis:	SA 106 Gr B:	Carbon: 0.25% Max.
	SA 106 Gr C:	Thickness ≤ 20mm Carbon: 0.25 Max. Thickness > 20mm Carbon: 0.30 Max.
	SA335 P92 :	Si: 0.10-0.50%; Ni: 0.30max and Cu: 0.25max

The billet/bloom shall conform to the chemical and process requirements of respective pipe specifications. The billet/bloom shall be sourced from IBR well-known steel makers or with inspection and certification by IBR authorized Inspecting Authority in case the mill is not approved by IBR. Mill test certificate shall be submitted to BHEL.

3. CHEMICAL COMPOSITION:

3.1 Product analysis on pipes is required for all steels. Chemistry shall be controlled as per applicable material specifications and the elements including Carbon (for SA 106 Gr B & C), Si, Ni & Cu (for SA335 GrP92) as indicated in Clause 2 shall also be reported in the product analysis.

3.2 All raw materials used in steel making including incoming scrap shall be checked by supplier to ensure freedom from radioactivity (Applicable for SS material only).

	BHEL – Tiruchirappalli - 620014, India. Quality Assurance Department TECHNICAL DELIVERY CONDITIONS	Doc No: TDC:0:101 Rev No: 20 Effective Date: 26/09/2019 Page: 2 of 4
Product: Seamless Steel Pipes (for Boiler And Piping)		

4. DIMENSIONAL TOLERANCES:

- 4.1 SA335 Gr P91, P92: For outside diameter (OD) controlled Pipes the tolerance on OD shall be: $\pm 1\%$ (Max: 4mm) of Nominal OD.
- 4.2 Other than SA335 Gr P91, P92: For outside diameter (OD) controlled Pipes the tolerance on OD shall be: $\pm 1\%$ (Max: 6 mm) of nominal OD.
- 4.3 ID specified pipes are specified by the maximum internal diameter and minimum wall thickness. The tolerance if not specified in the PO shall be ID: +0.0mm, -3.2mm & Thickness: +6.4mm, -0.0mm
Weight per metre: +10%, -5% on nominal weight **
** Nominal weight of ID pipe per metre shall be calculated as follows,
Weight_{nom} = (ID_{nom} + t_{nom}) * t_{nom} * 0.02466 kg/metre, where
ID_{nom} = ID_{max} - 1.6mm; t_{nom} = t_{min} + 3.2mm

5. STRAIGHTNESS & POLYGONIZATION:

The Pipes shall not deviate from straightness by more than 1mm in any one meter and shall not be more than 6mm over the entire length for Pipes of OD > 76.1mm. A sharp bend at the end or kink and twist are not acceptable. These limitations are applicable for any given plane.

Also, for Pipes with OD ≤ 76.1 mm, the pipes shall be made by process specified below:

1. All pipes shall be cold formed in case of "t/D" ratios > 0.15, where "t" is the specified nominal wall thickness and "D" is the specified nominal OD of the pipe.
2. Pipes may be cold formed or hot formed in case of "t/D" ratios upto and including 0.15.
3. The degree of polygonization (P), measured as indicated in Fig.1 & calculated using the below formula, shall not exceed 15% in both the above cases:

$$P = \{[\sum SB - \sum SA] / [0.135 * (3D - \sum SA)]\} * 100$$

Where, P is the degree of polygonization in %

D is the specified nominal OD of the pipe

$\sum SB$ is the sum of maximum pipe wall thicknesses measured at 6 locations 60 degrees apart and

$\sum SA$ is the sum of minimum pipe wall thicknesses measured at 6 locations 60 degrees apart.

Wall thickness shall be measured using profile projector/shadowgraph/digital scanner/any other suitable instrument meant for this purpose.

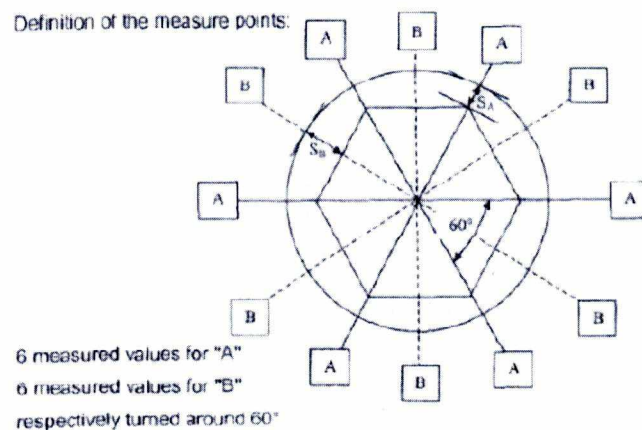


Fig. 1

	BHEL – Tiruchirappalli - 620014, India. Quality Assurance Department TECHNICAL DELIVERY CONDITIONS	Doc No: TDC:0:101 Rev No: 20 Effective Date: 26/09/2019 Page: 3 of 4
Product: Seamless Steel Pipes (for Boiler And Piping)		

6. HEAT TREATMENT:

The heat treatment temperatures and soaking time shall be reported in the test certificate.

6.1 CS: Hot Finished: OD $\leq$ 76.1mm no heat treatment required. OD > 76.1mm shall be in Normalized condition.

CS: Cold Finished: All sizes – In sub critical annealed, fully annealed or in Normalised condition.

6.2 AS: All sizes – SA335 Gr P11, P12 & P22 – Either in Normalised and tempered or Isothermal Annealed condition.

6.3 AS: All sizes – SA335 Gr P91 & P92: All pipes Normalised as per material specification and Tempered at 750-780 °C.

6.4 SS: All sizes – Solution Annealed condition as per material specification.

7. MECHANICAL TESTS:

a) As per specification. Quantum of test: As per specification – For each nominal size per heat per heat treatment batch. (Minimum 2 pipes for first 100 pipes and 1 per 100 or part thereof for pipes over 100 numbers, as per IBR).

b) For alloy steel pipes meant for fitting (As indicated in the Purchase order), test coupon shall be in normalised and tempered condition.

P91- TS: Min: 630MPa, Max: 850MPa; YS: (0.2% offset):450MPa Min; Hardness (HB): Min: 195 Max: 250

P92- TS: Min: 630MPa, Max: 850MPa; Hardness (HB): Min: 190 Max: 250

P91, P92 hardness shall be checked on each pipe and values reported in MTC.

8. NON DESTRUCTIVE TEST:

8.1 ULTRASONIC TEST : ASTM E213

Calibration: Axial 50 mm long V or Square notch, one in OD and the other in ID. Notch Depth: 5% of Max.Thickness.(Min. 0.3 mm, Max. 1.5mm).

For ID<16mm one notch in OD is enough. Scanning:Clockwise and Anti clockwise.

8.2 SS: Finished pipes shall be checked for radioactive contamination and reported. Survey meter shall be used to measure at 5cm near the surface.

Acceptance limits: Shall be less than 0.1 milli Rontgen (mR) per hour or 1 micro Sievert per hour.

8.3 Photomicrograph test for P91 & P92 pipes - Photomicrograph test shall be carried out from a specimen of pipe in the as finished condition for individual size (OD and wall thickness) per heat per heat treatment batch . Acceptance norms - The Material shall be free from any micro fissures. Microstructure shall show tempered martensite and also to be examined for any grain growth and delta ferrite (to be maintained within 3% for Gr92 and within 2% for Gr91 when measured as per VD TUV 1272). Photomicrograph with 400x (Min) magnification along with Photomicrograph report to be provided. The actual magnification and structure shall be indicated in the report.

9. FINISH AND REPAIR:

The Inside & outside surfaces of the pipes shall be free from any imperfections & defects like laps, seams, folds, cracks, pitting etc;. Localised imperfections, if any, may be removed by grinding or skin machining only, ensuring the wall thickness, inside and outside diameter to provide workmanship like finish. Local depressions or ground spots are not acceptable. Loose scales shall be removed by blast cleaning in both inside and outside surface. Repair by welding is prohibited.

10. **MARKING:** (In English only): All mandatory marking shall be done as per material specification (latest).

10.1 **Details to be identified:** On Each Pipe (1) PO Number (2) Maker's emblem/code (3) Specification & grade (4) Code case, if applicable (5) Heat number (6) Size (OD x Thickness x Length, in mm), (7) No. of pipes (8) Inspector's seal

- Upto OD 31.8 (Excl.) – Sl.No: 1 to 8 to be stamped on metal or plastic tag attached to bundle.
- OD 31.8 to OD 76.1 (Incl.) – Sl.No:1 to 6, 8 to be paint stenciled on each pipe, 1 to 8 to be stamped on metal or plastic tag attached to bundle.
- OD > 76.1- Sl.No: 2 to 6 & 8 to be hard stamped with round edged stamp at 100mm from an end of each pipe and 1 to 6 to be paint stenciled on each pipe.

10.2 **Colour Coding:** Continuous longitudinal colour coding shall be done on the entire length of all pipes, without masking stencilling. Colour coding scheme shall be as per Procedure SIP: PP: 21 (latest).

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Product: Seamless Steel Pipes (for Boiler And Piping)		

11. PRESERVATION:

All pipes except SS shall be applied with resin type rust preventive coating with visibility to stencilled details on outside and either with rust preventive coating or rust inhibitor inside. Thick black coating which camouflages the surface of the pipes is not permitted. SS pipes to be surface treated as per ASTM A380 both inside and outside. Ends to be closed with end caps for secured storage.

12. PACKING:

- 1) Thickness $\leq$ 2.5mm in boxes.
- 2) OD $\leq$ 159 mm in bundles. Others in loose condition.
Pipe bundles to be < 4 tons of equal no. of pipes, fastened with galvanised strap/ anti-rust coated (1x25mm.min.) for Carbon Steel & Alloy Steel and by Nylon strap for Stainless Steel at 2 ends & at 1m interval. Wooden pallets to cover pipes are not permitted.

13. INSPECTION AND CERTIFICATION (In English Only):

- 13.1 Products shall be inspected at works and the applicable IBR Form must be countersigned 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 PO).

Indigenously Supplied items: Director of Boilers/Chief Inspector of Boilers/Inspecting Authority approved by IBR, for the respective state.

- 13.2 Certification in IBR Form III-A for finished pipes from “IBR-Well Known Pipe Maker” or “Inspecting Authority”, as applicable, shall be submitted to BHEL.

Also, certification in IBR Form IV for the raw material signed by “IBR-Well Known Steel Maker” or “Inspecting Authority”, as applicable, shall be submitted to BHEL.

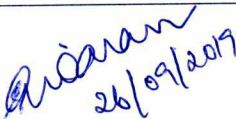
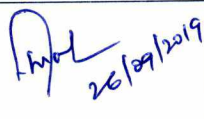
Refer to BHEL Engineering Drawing: 4-03-000-00062 (Latest Rev) for MAWP values for various material grades & sizes at various temperatures.

- 13.3 Additionally, Manufacturer’s Test certificate (MTC) (ORIGINAL in ENGLISH) with following details shall be submitted:

- i) Purchase Order No. (BHEL), TDC No. and its Rev No, Test certificate No. & TC Date, Size and Quantity-Melt wise.
- ii) Specification and Grade with year of code, Code case number (if applicable), Heat Number, Steel & Pipe making process, chemistry including incidental Elements-Ladle and product Analysis.
- iii) Heat Treatment details with actual temperature and soaking time
- iv) Mechanical test Results.
- v) For P91, P92 supplies – the Photomicrograph test report along with photomicrograph with 400X (min) magnification shall be furnished.
- vi) Detailed N.D.E. report with reference norms, Acceptance standards and test results.
- vii) Mill test certificate of the raw material (billets/blooms) as per Cl. 2.

- 13.4 For SS: Measured Radioactivity levels shall be reported in the Mill Test Certificate and shall be submitted to BHEL (Not to be recorded in IBR Form).

- 14 *End use: These pipes are meant for use in subcritical and supercritical Boilers. These pipes shall be capable of undergoing forming, bending and welding operations necessary for the application without developing defects.*

 26/09/2019	 26/09/2019	 26/09/2019	 26/09/19	 26/09/2019
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Product: SEAMLESS STEEL TUBES (for BOILERS)		

Revision record:

Rev 08: 21.09.04: UT as per BS EN 10246-7, in lieu of ASTM E 213

Rev 09: 31/12/05: Cl 5.0 - mention of shape and size of tensile test specimen on TC introduces

Rev 10: 29/12/07: Cl 1.0, 3.0, 6.0, 7.0, 11.0 and 12.0 modified.

Rev 11: 19/05/09: Cl 8.0 – Modified. Cl 9.0 – Marking details included in line with material specification.

Rev 12: 08/06/11: Cl 1.0- SA 213 T12, T92 and T23 removed from this TDC. Cl 2.0 Process of Manufacture – Clarified. Cl 9.0- Stenciling and colour coding modified. Cl 12.0- Modified.

Rev 13: 04/07/11: Cl 6.0: Modified, Cl 9.0 – Marking: Correction made in the “Details to be identified”

Rev 14: 26/10/12: Cl 2.0, 6.0 and 12.0 modified

Rev 15: 19/02/2016: TDC: 0:124 requirements merged in this TDC. And Cl 1 modified; Cl 2 modified to include polygonization requirements; Cl 4– heat treatment temperature added for Gr 91; Cl 5– lot size for mechanical tests defined & additional requirements of Gr 23, 91 & 92 added; Cl 6, 7, 9 – modified; Cl 10 –Preservation requirements modified; Cl 11 – modified; Cl 12-changed as per latest IBR including MAWP requirements.

Rev 16: 13/10/2017: Clause 1 & 12 modified to include raw material requirements and certification in IBR Form IV. Clause 5 (f) added to include creep requirements.

Rev 17: Dt: 20/04/2018 - Cl 2 added to include Billet/Bloom Requirements, Cl. 3 modified, Cl. 6(f) modified, Cl. 13.3 (k) added to include mill TC certification

Rev 18: Dt: 05/08/2019 – Cl 2 modified based on feedback from user departments, suppliers and internal discussions, Cl 5 modified, Cl 6 added to include shot peening requirements, subsequent clauses renumbered, Cl 7 (f) & Cl 9 modified, Cl 14.3 (l) & Cl 15 added.

1. MATERIALS

Specification: ASME (Latest as on the date of Enquiry/PO, whichever is earlier):

Carbon Steel (CS) : SA 192; SA 210 Gr. A1 & Gr. C

Alloy Steel (AS) : SA 209 Gr.T1, SA 213 Gr. T11, T12, T22, T23 (Code case: 2199), T91 and T92 (Code Case: 2179).

Stainless Steel (SS) : SA 213 TP 304H, 316, 321, 321H, 347H; UNS No: S30432 (Code Case: 2328, Super 304).

Additional Requirement : As listed below (Supplementary to above material specifications)

Size and Quantity : As per Purchase order

2. BILLET/BLOOM REQUIREMENTS:

The billets/blooms shall be fully killed.

For carbon steel and alloy steel, billets/blooms shall be made by vacuum degassing. For Stainless steel, billets/blooms shall be made by vacuum degassing or argon oxygen decarburization (AOD).

Ladle analysis is required for all steels. Chemistry shall be controlled as given below for below specified grades.

For all other grades, it shall be as per applicable material specifications:

- Carbon Steel: Max. Carbon: SA 210 Gr.A1: 0.25%, SA 210 Gr.C: 0.30%
- For SA 213 T12: Aluminum: 0.025% max; Silicon: 0.20%min. on product analysis and the values shall be reported in the test certificate.
- Stainless Steel (SS): Boron: 0.01% max., Vanadium: 0.10% max.

The billet/bloom shall conform to the chemical and process requirements of respective tube specifications. The billet/bloom shall be sourced from IBR well known steel makers or with inspection and certification by IBR authorized Inspecting Authority in case the mill is not approved by IBR. Mill test certificate shall be submitted to BHEL.

3. CHEMICAL COMPOSITION AND PROCESS OF MANUFACTURE OF TUBES

a) **Carbon Steel & Alloy Steel:** Tubes shall be seamless and made by processes specified below:

- All tubes shall be cold formed in case of “t/D” ratios > 0.15, where “t” is the specified nominal wall thickness and “D” is the specified nominal OD of the tube.

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Product: SEAMLESS STEEL TUBES (for BOILERS)		

2. Tubes may be cold formed or hot formed in case of “t/D” ratios upto and including 0.15.
3. The degree of polygonization (P), measured as indicated in Fig.1 & calculated using the below formula, shall not exceed 15% in both the above cases:

$$P = \{[\sum S_B - \sum S_A] / [0.135 \cdot (3D - \sum S_A)]\} \cdot 100$$

where, P is the degree of polygonization in %

D is the specified nominal OD of the tube

$\sum S_B$ is the sum of maximum tube wall thicknesses measured at 6 locations 60 degrees apart and

$\sum S_A$ is the sum of minimum tube wall thicknesses measured at 6 locations 60 degrees apart.

Wall thickness shall be measured using profile projector/shadowgraph/digital scanner/any other suitable instrument meant for this purpose.

Definition of the measure points:

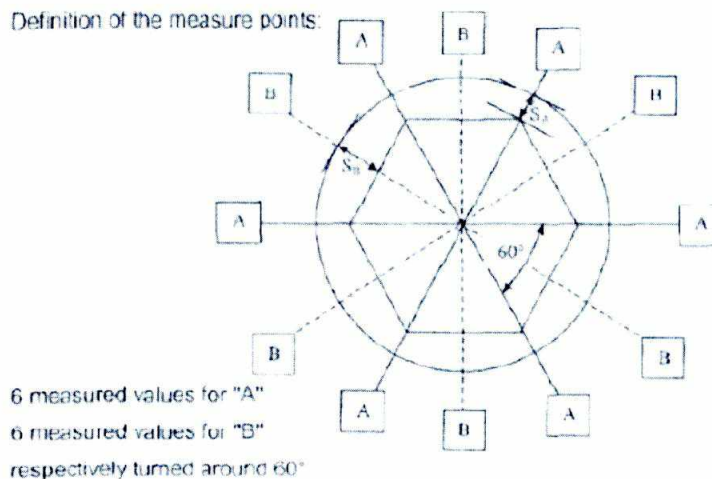


Fig. 1

Stainless Steel: Tubes shall be seamless and cold finished. All raw materials used in steel making including incoming scrap shall be checked by supplier to ensure freedom from radioactivity (Applicable for SS materials only).

- b) **Product analysis** on tubes is required for all steels. Chemistry shall be controlled as per applicable material specifications and the elements including carbon for carbon steel, Aluminium (for T12), Boron & Vanadium (for Stainless steel) as indicated in Clause 2 shall also be reported in the product analysis.

4. DIMENSIONAL TOLERANCES

- a) For Cold finished tubes: CS: as per SA 450; for AS & SS shall be as per SA 1016.
Tolerance on thickness shall be: For OD ≤ 38.1 mm: -0% to +20% and For OD > 38.1 mm: -0% to +22%
- b) For hot finished tubes the tolerance shall be as follows:
For Outside Diameter: ± 0.4mm.
For Thickness:
-0% to +22% t > 4.5 mm
-0% to +24% t between 3.6 and 4.5 mm (both inclusive)
-0% to +28% t < 3.6mm

5. HEAT TREATMENT

CS Hot finished: No Heat Treatment required.

CS Cold finished: Subcritical annealed (temperature ≥ 650°C), fully annealed or normalized.

AS: Normalized and Tempered. For SA213 T91 & T92: Normalizing: 1050-1080°C & Tempering: 750-780°C.

For SA213 T23: Normalizing: 1050-1080°C & Tempering: 750-775°C.

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(The total thickness of the decarburized material (Both on ID & OD of the tube together) shall be measured once per Heat treatment lot. The measurement shall be determined from a representative sample that has been sectioned, polished, etched and examined at 100X. The total decarburization thickness shall not exceed 7% of the specified minimum wall thickness and shall be reported in the test certificate.)

SS: Solution Annealed condition as per material specification.

6. INSIDE SHOT PEENING FOR ALL STAINLESS STEEL TUBES OF SA213 TP347H and SA213 UNS No: S30432 (Code Case: 2328, Super 304):

6.1 Shot peening shall be carried out inside the stainless steel tubes after solution annealing, unless specified otherwise in Enquiry/Purchase order

6.2 Qualification:

- a) The qualification for tube inside shot peening shall be performed according to the below described test steps. The range of qualification covers tube internal diameters (Di) in the range of $Di \pm 2\text{mm}$ as well as the specific material grade and qualifies the shot peening process based on the used machine settings (peening parameters). Stainless Steel shots shall be used.
- b) Qualification evaluations (hardness test and microstructure) shall be performed on at least one (1) sample tube, with evaluations at sections cut from the beginning, middle and end of the tube.
 - i) Metallographic examination for proof of thickness of cold worked microstructure across the entire tube circumference and a minimum depth of $70\text{ }\mu\text{m}$ from the inner surface shall be carried out and documentation of representative shot peened conditions at 500X magnification shall be submitted.
 - ii) Hardness test shall be carried out at a distance of $40\text{ }\mu\text{m}$ from the inner surface at quarter points ($4 \times 90^\circ$) spread around the tube circumference. Acceptance criteria: hardness values of the shot peened zone shall be a minimum of 100 HV0.1 above the average hardness of the unaffected base material (2mm from outer surface).
 - iii) Almen strips representing acceptable shot peening conditions shall be produced during the qualification.

General requirements- Almen testing shall be in conformance with SAE J442 – Almen testing reading tolerances shall be in conformance with SAE AMS 2430 § 3.7.
For SS tube shot peening, where SS shots shall be used, C type Almen strip in conformance with SAE AMS 2431/4C shall be used.

6.3 In-process tests – Quantum of test shall be one test per heat no. and tube internal diameter

- i) Hardness test shall be executed in accordance with the prior performed qualification at the beginning or end of tube {see point 6.1 (b) (ii)}.
- ii) The Almen test (alternative test instead of the hardness test) shall be executed in accordance with the previously performed qualification {see point 6.1 (b) (iii)}. Almen test readings shall not be lower than the established "Minimum" shot peening intensity.

6.4 Marking & Certification:

- a) After shot peening treatment, all tubes shall be marked with the letters "SP" for "shot peened".
- b) Certification for Shot peening shall be done in Material Test Certificate (MTC).
- c) Results of qualification shall be submitted as one time exercise for each internal diameter and material grade which shall include Almen test, Metallographic examination and Hardness test.
- d) Results of In-process tests shall also be submitted for each heat and tube internal diameter.

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7. MECHANICAL TESTS

- a) As per specification. Quantum of test: As per specification – For each nominal size per heat per heat treatment batch (Minimum 2 tubes for first 100 tubes and 1 per 100 or part thereof for tubes over 100 numbers, as per IBR).
- b) Tension test required for SA 192. **Acceptance:** explanatory note in Specification. Hardness for SA 192: 120 HBW (max).
- c) For tension tests the shape and size of the specimen shall be mentioned on the Test Certificate (viz., Full tube tensile or strip tensile or round tensile).
- d) Additionally, the material supplied shall meet the requirements as below:
T91-Tensile strength:Min: 630MPa, Max: 850MPa; Yield Strength: Min: 450MPa; Hardness (HBW): Min: 195/Max: 250
T92-Tensile strength: Min: 620 MPa, Max: 850 MPa; Hardness (HBW): Min: 190 / Max:250
T23-Tensile strength: Min: 510 MPa, Max: 730 MPa; Hardness (HBW): Min: 150 / Max:220
- e) **Charpy Impact V-Notch Test at the mill as per SA 370 for SA 213 T23:**
 - **Impact testing frequency** - minimum of two tubes per each heat treatment lot produced.
 - **V-Notch Impact test procedure & specimen size as per ASME SA 370.**
 - **Test temperature:** 20°C.
 - **Acceptance:** All specimens shall absorb energies at or above 40 ft-lb (55Joules) for a full size specimen (10mm thickness). The energy requirement is proportionally reduced for sub-size specimens as specified in ASME SA 370, Table 9.
 - The fracture surfaces on all specimens must exhibit 100% ductile appearance regardless of the absorbed energy values obtained.
 - Any specimen exhibiting an absorbed energy less than 40 ft-lb (55Joules) or less than 100% ductile behavior shall constitute permanent rejection of the entire lot of tubing.
- f) Creep testing shall be carried *for all alloy steel and stainless steel tubes* out as per SIP:RM:01 (latest revision).

8. NON DESTRUCTIVE TEST (In-house Automated Online Testing Only)

- a) Each tube shall be examined full section over its entire length.
Ultrasonic Testing: For thickness ≥ 3.6 mm to be conducted as per ASTM E213. Calibration: 2 axial 50mm long notches, one in outer surface and the other in inside surface. For OD < 30 mm, one notch in outer surface only. Notch depth: 5% of wall thickness (Min. 0.3 mm, Max: 1.5 mm). Scanning: clockwise & anti-clockwise.

Eddy current Test: For thickness < 3.6 mm, as per ASTM E309 /E426 as applicable, Calibration: Longitudinal notch depth: 5% of wall thickness (Min. of 0.3 mm) or drilled hole as per SA 106.
- b) SS: Finished tubes shall be checked for radioactive contamination and reported. Survey meter shall be used to measure at 5cm near the surface. **Acceptance limits:** Shall be less than 0.1 milli Rontgen (mR) per hour or 1 micro Sievert per hour.
- c) The residual magnetism in all finished tubes, measured with field indicator, shall be limited to 5 gauss maximum.

9. HYDROSTATIC TEST

Extent of test: On all tubes of thickness < 3.6 mm. *Hydrostatic pressure for all grades shall be calculated as per SA 450 Cl 23.3* with $S=80\%$ of specified min. yield strength at room temperature. For others if specified in Purchase Order. Acceptance: No leak shall be permitted.

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10. FINISH AND REPAIR

Inside and outside surfaces 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. MARKING: (in English only)

- a) **Details to be identified:** Tubes shall be marked repeatedly & continuously along its entire length with the following details as indicated below:
- (1) PO Number, (2) Maker's emblem/code, (3) Specification & grade, (4) Code case (if applicable) (5) Heat number, (6) Size (OD x Thickness x Length, in mm), (7) No. of tubes, (8) Inspector's seal, (9) Condition: Hot finished or Cold Finished, (10) Tube Minimum Wall Thickness Designation (For SA 213 Spec only).
- Below OD 31.8mm. (Excl.) – SI Nos:1 to 10 to be stamped on metal/plastic tag attached to bundle.
 - OD 31.8-76.1mm. (Incl.) - SI Nos: 1 to 6, 9 and 10 to be paint stenciled, repeatedly through the entire length of each tube. Also SI.No:1 to 10 to be stamped on Metal/Plastic tag attached to bundle.
 - OD>76.1 mm- SI Nos: 2 to 6 & 8 to be hard stamped with round edge stamp at 100mm from both ends and SI No:1 to 6, 9 and 10 to be paint stenciled on each tube.
- b) **Colour Coding:** Continuous longitudinal colour coding shall be done on the entire length of all tubes, without masking stenciling. If more than one color is to be applied on the tubes then, colour bands shall be adjacent. Colour coding scheme as per Procedure SIP: PP: 21 (latest).

12. PRESERVATION:

All tubes, except SS, shall have Rust Preventive Fluid (RPF) coating on the external surface as follows: The Tubes shall be coated with suitable RPF with minimum DFT of 50 microns. RPF coated steel surfaces shall be capable of withstanding salt spray corrosion test for minimum 1000 hours. The RPF coating should be seaworthy, ensuring freedom from corrosion when transported through sea voyage. The RPF coating shall get dried and shall be a transparent coating, so that it is possible to see the tube surface clearly as well as read any stenciled matter on tube surface. The inside surface of the tube shall be protected with volatile corrosive rust inhibitor. Rust preventive coating shall withstand at least one year storage at open yard from receipt of materials. The supplier shall stand guarantee for this. SS tubes to be surface treated as per ASTM A380 both inside and outside. Tube ends shall be closed with push type plastic end caps/plugs secured tightly to avoid entry of water during transportation and storage.

13. PACKING:

Tubes of thickness $\leq 2.5\text{mm}$, shall be packed in boxes and others in bundles. Tubes of thickness $\geq 6.5\text{ mm}$ and OD ≥ 88.9 can be shipped loose. Bundles to be ≤ 4 tons of equal no. of tubes, fastened with galvanized strap (1x25mm.min.) or annealed wire for CS & AS and by Nylon strap for SS at both ends & at 1m interval in between. Wooden pallets/cardboard to cover tubes are not permitted.

14. INSPECTION AND CERTIFICATION:

- 14.1 Products shall be inspected at works and the applicable IBR Form must be Countersigned 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 PO.)

Indigenously Supply: Director of Boilers/Chief Inspector of Boilers/Inspecting Authority approved by IBR, for the respective state.

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Product: SEAMLESS STEEL TUBES (for BOILERS)		

14.2 Certification in IBR Form III-B for finished tubes from “IBR-Well Known Tube Maker” or “Inspecting Authority”, as applicable, shall be submitted to BHEL.

Also, certification in IBR Form IV for the raw material signed by “IBR-Well Known Steel Maker” or “Inspecting Authority”, as applicable, shall be submitted to BHEL.

Refer to BHEL Engineering Drawing: 4-03-000-00061 (Latest Rev) for MAWP values for various material grades & sizes at various temperatures.

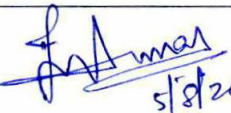
14.3 **Additionally, Manufacturer's Test certificate(MTC)** (ORIGINAL in ENGLISH) with following details shall be submitted to BHEL:

- Purchase Order No. (BHEL), TDC No and its Rev No, Test certificate No., Size and Quantity-Melt wise.
- Specification and Grade with year of code, Code case number (if applicable), Heat Number, Steel & Tube making process, chemistry including incidental elements-Ladle and product Analysis.
- Heat Treatment details with actual temperature and soaking time
- Mechanical test results
- Detailed NDE report with reference norms, acceptance standards and test results.
- Grain size, as applicable.
- Decarburization layer thickness
- Certification for compliance to residual magnetism
- Certification for minimum DFT of rust preventive coating
- Creep test report for minimum of 1,000 hours as per Cl. 5(f) (only for IBR applications).
- Mill test certificate of the raw material (billets/blooms) as per Cl. 2.
- Certification for Shot peening, as applicable. Also, results of Almen test, metallographic examination and hardness shall be reported along with acceptance norms on shot peened SS tubes as per Cl 6.4.*

In the MTC a clause for Certificate of Compliance (as per SA 1016) shall be added stating that: All materials/components supplied to Purchase Order meet all requirements contained in the PO, this Technical delivery conditions and applicable ASME specifications.

14.4 For SS: Measured Radioactivity levels shall be reported in the Mill Test Certificate and shall be submitted to BHEL.

15. *End use: These tubes are meant for use in subcritical and supercritical Boilers. These tubes shall be capable of undergoing forming, bending and welding operations necessary for the application without developing defects.*

 05/08/2019	 05/08/2019	 5/8/19	 05/08/19	 5/8/2019
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	BHEL – Tiruchirappalli - 620014, India. Quality Assurance Department TECHNICAL DELIVERY CONDITIONS	DOC No: TDC:0:105 Rev: 04 Effective Date: 05/08/2019 Page: 1 of 3
Product: COLD DRAWN SEAMLESS MULTIRIFLED TUBES TO SPEC. SA210 Gr A1 & Gr C (for BOILERS)		

Revision record:

Rev 01: Dated 20/12/03: Totally revised. Major changes include Gr.A1,UT before rifling and equipment details removed. Annexure introduced in Cl.11.

Rev 02: Dated 25/06/04: Cl.6.0 revised

Rev 03: Dated 29/12/07:Cl 1.0-A1 included. Cl.2.0,4.0,6.0,8.0 modified. & Cl.11.0 modified for clarity

Rev 04: Dated 05/08/2019: *Cl 1 & 2 modified, Cl. 3 added to include billet/ bloom requirements, Subsequent clauses renumbered; Cl 6, 8 & 9 modified, Cl. 10 preservation requirements modified; Cl 11 modified, Cl 12 modified to bring inline with the latest IBR form and certification requirements; Cl 12.3 (g), (h) & Cl 13 added.*

1. MATERIALS

Specification: ASME (Latest as on the date of *Enquiry/PO, whichever is earlier*):

Material : SA 210 Gr. A1 & Gr. C

Additional Requirement : As listed below (Supplementary to *above material* specifications)

Size and Quantity : As per Purchase order

2. CHEMICAL COMPOSITION AND PROCESS OF MANUFACTURE OF TUBES:

Tubes shall be Cold Drawn. Ladle and Product analysis is required.

Maximum Carbon: 0.25% for SA210 GrA1 and 0.30 % for SA210 GrC.

3. BILLET/BLOOM REQUIREMENTS:

(a) The billets/blooms shall be fully killed and vacuum degassed.

Ladle analysis is required for all steels

(b) The billet/bloom shall conform to the chemical and process requirements of respective tube specifications. The billet/bloom shall be sourced from IBR well known steel makers or with inspection and certification by IBR authorized Inspecting Authority in case the mill is not approved by IBR.

Mill test certificate shall be submitted to BHEL.

4. DIMENSIONAL TOLERANCES

Dimensional tolerance shall be as per SA 450. The number of ribs, its configuration, width and lead angle shall be as per the drawing.

5. HEAT TREATMENT - Normalized condition

6. MECHANICAL TESTS

As per specification. Quantum of test:– *For each nominal size per heat per heat treatment batch* - Minimum 2 tubes for first 100 tubes and 1 per 100 or part thereof for tubes over 100 numbers, as per IBR. Full cross section of the tube shall be taken for tensile test and the area shall be computed by dividing the specific weight in kg/m by 7840.

7. NON DESTRUCTIVE TEST

Ultrasonic testing as per ASTM E213 on all tubes after rifling.

Calibration: Longitudinal notch 50mm long in OD. ID longitudinal notch shall be in between ribs and on top of rib. Depth of notch shall be 5% max. of specified wall thickness or 0.3 mm whichever is maximum. Scanning shall be in clockwise & anti clockwise direction. The smallest reflection echo obtained from the notches shall be calibrated not less than 50% of full screen height.

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Product: COLD DRAWN SEAMLESS MULTIRIFLED TUBES TO SPEC. SA210 Gr A1 & Gr C (for BOILERS)		

8. FINISH AND REPAIR

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

9. MARKING: (in English only)

a) **Details to be identified:** *Tubes shall be marked repeatedly & continuously along its entire length with the following details as indicated below:*

(1) PO Number, (2) Maker's emblem/code, (3) Specification & grade, (4) Heat number, (5) Size (OD x Thickness x Length, in mm), (6) No. of tubes, (7) Inspector's seal

Sl Nos: 1 to 5 to be paint stenciled, *repeatedly through the entire length* of each tube. Also Sl.No:1 to 7 to be stamped on Metal/Plastic tag attached to bundle. In addition, each tube shall be paint stenciled as rifled/ribbed.

b) **Colour Coding:** *Continuous longitudinal colour coding shall be done on the entire length of all tubes, without masking stenciling.* Colour coding scheme as per Procedure SIP: PP: 21 (latest).

10. PRESERVATION:

All tubes, shall have Rust Preventive Fluid (RPF) coating on the external surface as follows: *The Tubes shall be coated with suitable RPF with minimum DFT of 50 microns. RPF coated steel surfaces shall be capable of withstanding salt spray corrosion test for minimum 1000 hours. The RPF coating should be sea worthy, ensuring freedom from corrosion when transported through sea voyage. The RPF coating shall get dried and shall be a transparent coating, so that it is possible to see the tube surface clearly as well as read any stenciled matter on tube surface. The inside surface of the tube shall be protected with volatile corrosive rust inhibitor. Rust preventive coating shall withstand at least one year storage at open yard from receipt of materials. The supplier shall stand guarantee for this. Tube ends shall be closed with push type plastic end caps/plugs secured tightly to avoid entry of water during transportation and storage.*

11. PACKING:

Bundles to be ≤ 4 tons of equal no. of tubes, fastened with galvanized strap (1x25mm.min.) at both ends & at 1m interval in between. *Covering of tube bundles is not permitted.*

12. INSPECTION AND CERTIFICATION:

12.1 *Products shall be inspected at works and the applicable IBR Form must be Countersigned by the Inspecting Authority as indicated below:*

Imported Items: Inspecting Authority approved by IBR for the Country of origin (*Vendor shall obtain BHEL's concurrence for inspecting authority.*)

Indigenously Supply: Director of Boilers/Chief Inspector of Boilers/Inspecting Authority approved by IBR, for the respective state.

12.2 *Certification in IBR Form III-B for finished tubes from "IBR-Well Known Tube Maker" or "Inspecting Authority", as applicable, shall be submitted to BHEL. Also, certification in IBR Form IV for the raw material signed by "IBR-Well Known Steel Maker" or "Inspecting Authority", as applicable, shall be submitted to BHEL. Refer to BHEL Engineering Drawing: 4-03-000-00061 (Latest Rev) for MAWP values for various material grades & sizes at various temperatures.*

12.3 **Additionally, Manufacturer's Test certificate(MTC)** (ORIGINAL in ENGLISH) with following details shall be submitted to BHEL:

	BHEL – Tiruchirappalli - 620014, India. Quality Assurance Department TECHNICAL DELIVERY CONDITIONS	DOC No: TDC:0:105 Rev: 04 Effective Date: 05/08/2019 Page: 3 of 3
	Product: COLD DRAWN SEAMLESS MULTIRIFLED TUBES TO SPEC. SA210 Gr A1 & Gr C (for BOILERS)	

- Purchase Order No. (BHEL), TDC No *and its Rev No*, Test certificate No., Size and Quantity-Melt wise.
- Specification and Grade with year of code, Heat Number, Steel & Tube making process, chemistry including incidental elements-Ladle and product Analysis.
- Heat Treatment details *with actual temperature and soaking time*
- Mechanical test results
- Detailed NDE report *with reference norms, acceptance standards and test results.*
- Grain size, as applicable.
- Certification for minimum DFT of rust preventive coating*
- Mill test certificate of the raw material (billets/blooms) as per Cl. 3.*

In the MTC a clause for Certificate of Compliance (as per SA 1016) shall be added stating that: All materials/components supplied to Purchase Order meet all requirements contained in the PO, this Technical delivery conditions and applicable ASME specifications.

13. These tubes are meant for use in Boilers. These tubes shall be capable of undergoing forming, bending and welding operations necessary for the application without developing defects.

 05/08/2019	 05/08/2019	 5/8/19	 05/08/19	 05/09/2019
Abdur Rahman Sultan	M. Nadanakumar	S. Anand Kumar	R. Dharmar	JVV Aruna Kumar
Sr. Engr/QA	AGM/MM	SDGM/PE/FB	AGM/QC	SDGM/QA
Prepared By	Reviewed by			Approved By



BHEL

Tenders

EMD Fee Type	fixed	EMD Percentage	NA
EMD Payable To	Nil	EMD Payable At	Nil

[Click to view modification history](#)
Foreign Currency BOQ Details

S.No	Currency	Conversion rate in ₹
1	US Dollar	NA
2	European Euro	NA
3	Japanese Yen	NA

Work /Item(s)

Title	Seamless alloy steel and Carbon steel tubes				
Work Description	Seamless alloy steel and Carbon steel tubes				
Pre Qualification Details	Please refer Tender documents.				
Independent External Monitor/Remarks	NA				
Show Tender Value in Public Domain	No				
Tender Value in ₹		Product Category	Metals - Ferrous	Sub category	NA
Contract Type	Tender	Bid Validity(Days)	90	Period Of Work(Days)	180
Location	BHEL Trichy Tube Stores Ward 30	Pincode	620014	Pre Bid Meeting Place	NA
Pre Bid Meeting Address	NA	Pre Bid Meeting Date	NA	Bid Opening Place	NIC portal
Should Allow NDA Tender	No	Allow Preferential Bidder	No		

Critical Dates

Publish Date	19-Jul-2021 04:00 PM	Bid Opening Date	16-Aug-2021 04:00 PM
Document Download / Sale Start Date	19-Jul-2021 04:00 PM	Document Download / Sale End Date	16-Aug-2021 11:00 AM
Clarification Start Date	NA	Clarification End Date	NA
Bid Submission Start Date	19-Jul-2021 04:00 PM	Bid Submission End Date	16-Aug-2021 11:00 AM

Tender Documents

NIT Document	S.No	Document Name	Description	Document Size (in KB)
	1	Tendernotice_1.pdf	Annexure-1-to-Enquiry-terms-and-conditions-for-supply-of-Seamless-Tubes	321.14
	2	Tendernotice_2.pdf	Annexure-to-PQR-Approved-Mother-Hollow-Suppliers	92.97
	3	Tendernotice_3.pdf	Enquiry-Terms-and-Conditions-ANNEXURE-B	820.92
	4	Tendernotice_4.pdf	Non-Disclosure-Agreement	53.25
	5	Tendernotice_5.pdf	PQR-PIPE	2189.94
	6	Tendernotice_6.pdf	PQR-RIF-TUBES	2043.92
	7	Tendernotice_7.pdf	PQR-TUBES	2451.39
	8	Tendernotice_8.pdf	RIFLE-TUBE-drawing-3-06-651-03853	96.97
	9	Tendernotice_9.pdf	SIPPP21-07-Colour-Codes	1049.84
	10	Tendernotice_10.pdf	SIPRM01-Rev01	798.42
	11	Tendernotice_11.pdf	Supplier-Facility-Report	154.16
	12	Tendernotice_12.pdf	TDC-101-Rev-20	2002.83

BHEL Tenders		Government eProcurement System	
		Tender Details	
		Date : 19-Jul-2021 03:52 PM	
		Print	
Basic Details			
Organisation Chain	Bharat Heavy Electricals Limited BHEL Trichy MM/RM		
Tender Reference Number	1502100023		
Tender ID	2021_BHEL_4576_1		
Tender Type	Open Tender	Form of contract	Supply
Tender Category	Goods	No. of Covers	2
General Technical Evaluation Allowed	No	ItemWise Technical Evaluation Allowed	Yes
Payment Mode	Not Applicable	Is Multi Currency Allowed For BOQ	Yes
Is Multi Currency Allowed For Fee	No	Allow Two Stage Bidding	No
Cover Details, No. Of Covers - 2			
Cover No	Cover	Document Type	Description
1	Fee/PreQual/Technical	.pdf	Annexure-1-to-Enquiry-terms-and-conditions-for-supply-of-Seamless-Tubes
		.pdf	Annexure-to-PQR-Approved-Mother-Hollow-Suppliers
		.pdf	Enquiry-Terms-and-Conditions-ANNEXURE-B
		.pdf	Non-Disclosure-Agreement
		.pdf	PQR-PIPE
		.pdf	PQR-RIF-TUBES
		.pdf	PQR-TUBES
		.pdf	RIFLE-TUBE-drawing-3-06-651-03853
		.pdf	SIPPP21-07-Colour-Codes
		.pdf	SIPRM01-Rev01
		.pdf	Supplier-Facility-Report-Tubes
		.pdf	TDC-101-Rev-20
		.pdf	TDC-102-Rev-18
		.pdf	TDC-105-Rev-04
2	Finance	.xls	Price Bid
Tender Fee Details, [Total Fee in ₹ * - 0.00]			
Tender Fee in ₹	0.00		
Fee Payable To	Nil	Fee Payable At	Nil
Tender Fee	No		
EMD Fee Details			
EMD Amount in ₹	0.00	EMD through BG/ST or EMD Exemption Allowed	No

Work Item Documents	13	Tendernotice_13.pdf	TDC-102-Rev-18	1963.93
	14	Tendernotice_14.pdf	TDC-105-Rev-04	864.37
	Tenders			
S.No	Document Type	Document Name	Description	Document Size (in KB)
1	BOQ	BOQ_4750.xls	Price Bid	317.00

Bid Openers List

S.No	Bid Opener Login Id	Bid Opener Name	Certificate Name
1.	bhaskarnath@bhel.in	Bhaskarnath Biswas	BHASKARNATH BISWAS
2.	dhanabals@bhel.in	S Dhanabal	S DHANABAL
3.	visvanathan@bhel.in	Visvanathan S	S VISVANATHAN
4.	ramk@bhel.in	Ramanathan K	RAMANATHAN K

GeMARPTS Details

GeMARPTS ID	KXO4PBHETK7R
Description	Seamless CS And AS Tubes To BHEL TDC
Report Initiated On	19-Jul-2021
Valid Until	18-Aug-2021

Tender Properties

Auto Tendering Process allowed	No	Show Technical bid status	Yes
Show Finance bid status	Yes	Show Bids Details	Yes
BoQ Comparative Chart model	Normal	BoQ Compative chart decimal places	2
BoQ Comparative Chart Rank Type	L	Form Based BoQ	No

Tender Inviting Authority

Name	Dy Manager Purchase Tubes
Address	BHEL Trichy

Tender Creator Details

Created By	Bhaskarnath Biswas
Designation	DY. ENGINEER
Created Date	19-Jul-2021 02:47 PM