



TENDER TERMS & CONDITIONS OF BARSTOCK

[Address: BHEL Industrial Valve Plant: 433, Industrial Complex, Goindwal Sahib,
Distt Tarn Taran, Punjab-143422]

THIS TENDER IS THROUGH E-PROCUREMENT MODE.

Online bids in two parts are invited for the Procurement of BARSTOCK. The relevant documents can be downloaded from <https://bhel.abccprocure.com>.

Tender Enquiry No.	1920-063E
Enquiry date	31-Aug-19
Last time and date of tender submission	1400 Hrs 13-Sep-19
Tender opening time and date	1530 Hrs 13-Sep-19
Quotation Parts	Two-part Bid
Item Description	Supply of Barstock
Item Specification	As mentioned below in tender term S2
Delivery schedule	Within 04 months from the date of placement of PO / LOI
Validity of offer	60 days
Quantity Variation	+/- 10% of tender quantity

Documents required along with supply of material	
1. Test Certificate	<u>Required</u>
2. Guarantee certificate	<u>Required</u>

PRE-QUALIFICATION CRITERIA

- P1.** Bidders should primarily be engaged in manufacturing and supply of any of the Barstock material grade as required by BHEL in this tender. Supplier not engaged in manufacturing of barstocks will not be considered. Supplier has to give undertaking that he is manufacturer of barstocks. Supplier need to submit Purchase Order(s) copy/ies for any type of barstock material grades which are covered in tender items. PO date should not be older than 01.04.2016 and cumulative value of POs should not be less than Rs **60,00,000.00**. For MSEs the cumulative value of POs to be submitted should not be less than Rs **30,00,000.00**. The Purchase order criteria in pre-Qualification terms shall not be applicable to Start-Up Firms with absolutely no relaxation in technical delivery conditions or Quality Standards. The relaxations and exemptions in PO value are in line with D.O. No. 5(4)/2016-BE-I dated 15.02.2017. However for claiming the Start-Up exemption, the bidders have to submit documentary evidence or undertaking of their business being a start-up firm (as certified/recognized by DIPP- Department for Industrial Policy and Promotion or DPIIT- Department for Promotion of Industry and Internal Trade)
- P2.** Bidder should have average minimum annual turnover of Rs. **2.0** Crore of the last 3 (three) years, ending on 31.03.2018. Audited balance sheet and profit & loss account of the company need to be submitted for last 3 (three) financial years, ending on 31.03.2018 in support of this requirement. In case audited financial statements have not been submitted for all the three years as indicated above, then the applicable audited statements submitted by the bidders against above 3 (three) years, will be averaged for 3 (three) years.

 BHEL GOINDWAL SAHIB	TENDER TERMS & CONDITIONS OF BARSTOCK [Address: BHEL Industrial Valve Plant: 433, Industrial Complex, Goindwal Sahib, Distt Tarn Taran, Punjab-143422]
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BHEL may carry out evaluation of bidder's capability. BHEL reserves the right to accept/reject any offer based on evaluation of bidder's capability. For verification of data presented for pre-qualification bid, BHEL may decide to visit the bidder(s) works. Any fact found deviating from bids during evaluation shall make the bidder liable to be dis-qualified.

SPECIAL TERMS

S1. QUOTATION SUBMISSION

This tender is through e-procurement mode for supply of "Barstock" as per specifications mentioned in below tender terms.

S2. SCOPE OF SUPPLY

In addition to the clause no. G5 in "General Contract Conditions of tender", All the items are to be supplied as per below mentioned drawing/TSB /standards:

Sl. No.	Material Code	Material Description	Specification no.	Total tender quantity, Kg
10	150271420000	DIA 50 - IS157013NI3CR80	IS157013NI3CR80	3000
20	150241150000	DIA 80 - A276-410	TDC:0:307/03	2000
30	150243610000	DIA 63 - A582-416	TDC:0:307/03	2000
40	150041160000	Rod dia 80 mm - IS 1875 CL IV	IS 1875 CL IV	2000
50	150041060000	Dia 16 MM- IS2062E250GRA/SAE1010/SAE1018	IS2062E250GRA/S AE1010/SAE1018	2000
60	150390870000	DIA 32MM-SA193B7	TDC:0:309/12	2000
70	150391970000	DIA 50.0 MM - SA193B7	TDC:0:309/12	5000
80	150241920000	DIA 16.0 MM - SA479TY304(CERT)	TDC:0:309/12	4000
90	150244830000	DIA 100-Otharon- 5 mtr long	TDC:0:308/02	2000
100	150244780100	DIA 56-Otharon	TDC:0:308/02	3000
110	153391940000	DIA 80.0 MM - SA182F22CL3	TDC:0:309/12	1000



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120	153392380000	DIA 150 -SA182F22CL3- 1.5 mtr to 3 mtr long	TDC:0:404/19	1000
130	153392390000	DIA 200 SA182F22CL3- 1.5 mtr to 3 mtr long	TDC:0:404/19	12000
140	153393790000	DIA 75 - SA182F22CL3	TDC:0:309/12	1000
150	153391420000	DIA 50.0 MM - SA105	TDC:0:309/12	5000
160	153393930000	DIA 100mm-SA105	TDC:0:309/12	5000
170	153392810000	DIA 125mm - SA105- 1.5 mtr to 3 mtr long	TDC:0:404/19	6000
180	153391450000	DIA 140 - SA105- 2 mtr to 4 mtr long	TDC:0:404/19	3000
190	153392820000	DIA 165mm - SA105- 1.5 mtr to 3 mtr long	TDC:0:404/19	6000
200	153392830000	DIA 200 MM - SA105- 1.5 mtr to 3 mtr long	TDC:0:404/19	3000
210	153391390000	DIA 25mm-SA105	TDC:0:309/12	5000
220	153394330000	DIA 300mm-SA105- 1.5 mtr to 3 mtr long	TDC:0:404/19	4000
230	153391410000	DIA 40mm-SA105	TDC:0:309/12	2000
240	153391430000	DIA 63mm-SA105	TDC:0:309/12	3000
250	153393810000	DIA 75mm-SA105	TDC:0:309/12	4000
260	159242460000	DIA 100mm-SA182F316	TDC:0:309/12	2000
270	159244250000	DIA 125mm-SA182 F316	TDC:0:404/19	5000
280	159244260000	DIA 155 SA182-F316- 1.5 mtr to 3 mtr long	TDC:0:404/19	5000
290	159244270000	DIA 180 SA182-F316- 1.5 mtr to 3 mtr long	TDC:0:404/19	3000
300	153242420000	DIA 32mm-SA182 F316	TDC:0:309/12	3000
310	153242770000	DIA 40mm-SA182 F316	TDC:0:309/12	2000
320	153243850000	DIA 56mm-SA182 F316	TDC:0:309/12	3000
330	159242430000	DIA 63mm-SA182 F316	TDC:0:309/12	2000
340	150242440000	DIA 70mm-SA182-F316	TDC:0:309/12	1000
350	159242450000	DIA 90mm-SA182 F316	TDC:0:309/12	2000
360	150243740000	DIA 125-F6acl3- 1.5 mtr to 3 mtr long	TDC:0:307/03	5000
370	150242570000	DIA 32mm-SA182 F6acl3	TDC:0:307/03	3000
380	150242590000	DIA 40mm-SA182 F6acl3 (CERT)	TDC:0:307/03	4000
390	150243680000	DIA 45mm-SA182 F6acl3 (CERT)	TDC:0:307/03	8000
400	153242600000	DIA 50mm-SA182F6A CL3	TDC:0:307/03	6000
410	150243780000	DIA 55mm-SA182F6A CL3	TDC:0:307/03	6000
420	150242620000	DIA 63mm-SA182 F6acl3	TDC:0:307/03	5000
430	150242630000	DIA 80mm-SA182 F6acl3	TDC:0:307/03	10000
440	150242640000	DIA 100mm-SA182 F6acl3	TDC:0:307/03	10000



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Wherever not mentioned in item description, barstocks shall be supplied in the length of 3 to 6 meter.

S3. LOADING CRITERIA

No Counter offer will be given for any item, only MSE benefit will be given as mentioned below:

1. Tender quantity shall be divided in the proportion 75:25 (75% for L1 and 25% for MSE's) in case the L1 vendor is not a MSE subject to following conditions:

- a) In tender, participating Micro and Small Enterprises quoting price within price band of L1+15 per cent shall also be offered 25% quantity of tender quantity at L1 price in a situation where L1 price is from someone other than a Micro and Small Enterprise. In case of more than one such Micro and Small Enterprise, the supply shall be shared equally. If there are more than one MSE in the price band of L1+ 15% to whom the offer has been sent and some of them reject the offer, then the remaining quantity shall be distributed equally to the MSEs accepting L1 prices.
- b) 25% of the 25% quantity (i.e. 6.25% of the tender quantity) offered to the MSE's shall be reserved for MSE's owned by SC/STs. In case of more than one such Micro and Small Enterprise, the supply shall be shared equally. In event of failure of such Micro and Small Enterprises to participate in tender process or meet tender requirements and L1 price, 6.25 per cent quantity for Micro and Small Enterprises owned by SC/ST entrepreneurs shall be met from other Micro and Small Enterprises.
- c) 3% from within the 25% quantity offered to the MSE's shall be reserved for women owned MSE's. In case of more than one such Micro and Small Enterprise, the supply shall be shared equally. In event of failure of such Micro and Small Enterprises to participate in tender process or meet tender requirements and L1 price, 3 per cent quantity for Micro and Small Enterprises owned by women entrepreneurs shall be met from other Micro and Small Enterprises.
- d) In case any MSE vendor does not accept the counter offer, the above mentioned 25% quantity shall be given to L1.
- e) If there is no MSE in the Price band of L1+15% then the 25% quantity shall be given to L1 vendor.
- f) If other suppliers (other than L1) are not under MSE then 100% quantity shall be given to L1 supplier.

2. In case if the L1 vendor is MSE then quantity shall be provided as 90.75 % for L1, 6.25% tender quantity shall be offered to the MSEs owned by SC/ST's and 3% tender quantity shall be offered to the



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MSEs owned by women in the price band of L1+15%. In event of failure of such Micro and Small Enterprises to participate in tender process or meet tender requirements and L1 price, 6.25 per cent sub-target for procurement earmarked for Micro and Small Enterprises owned by SC/ST entrepreneurs and 3 per cent sub-target for procurement earmarked for Micro and Small Enterprises owned by women entrepreneurs shall be met from L1 vendor.

3. In case the L1 vendor is a MSE owned by a SC/ST & women entrepreneur then the 100 % quantity shall be loaded on L1 bidder. In case of non- acceptance of counter offer by any vendor after above applicable provisions the whole quantity shall be given to L1 vendor. This ratio can be altered in case of any failure on part of L1 regarding delivery commitment/quantity/quality of material.

All above mentioned preferences shall be given to MSEs and SC/STs only on the submission of documentary evidence.

BHEL will not give counter offer to highest bidder in any case (except MSE Vendors whose rates falling in the range of L1 +15%).

If there are more than one L1 bidders, quantity shall be equally divided, except MSE portion (if any).

S4. OTHER CONTRACT CONDITIONS

These Special terms & conditions and GCC collectively are the part of tender terms and conditions.

Documents submitted with the offer shall be signed and stamped in each page by authorized representative of the bidder.

G1. INSTRUCTION TO BIDDER

Quotations shall be submitted before due date and time. Late offers are liable to be rejected, so please ensure to submit bid well within due date and time. Techno-commercial part will be opened on due date.

Based on evaluation of techno-commercial offers, Price bids of bidders who qualify from techno-commercial evaluation shall be opened. BHEL may decide to open the Price bid same day at 1700 hrs. If not opened on the same day, all qualifying bidders shall be notified for date of opening of Price bids by email/fax/post/courier/E-procurement system generated email.

G1.1 INSTRUCTION TO BIDDER (In case of Non-E-Procurement / Paper/ Manual/ Hard Copy based tenders)

Sealed Tenders can be dropped in the tender box labeled as 'Tender box for MM contracts'. This tender box is located at the entrance of Admin block BHEL Goindwal. Fax (01859-222061) / E-Mail (tendermm_ivp@bhel.in) offers received in time shall be considered only when such offers are complete in all respects. In case of bulky tender please handover quotation to Sh Rakesh Kumar/ SDGM/Head-MM or Sh Gurcharan Singh / AGM-Operations & MM. [Contact: 01859 224 615/631]. Bid can be send to following address:

**BHEL, Industrial Valve Plant,
#433, Industrial Complex,
Goindwal Sahib, Distt. Tarn Taran,
Punjab-143422.**

G1.2 INSTRUCTION TO BIDDER (In case of E-Procurement)

Interested bidders/Suppliers shall submit their offer through e-Procurement mode at <https://bhel.abcprocure.com>. Offers in any other mode will not be accepted.

For Enterprise Procurement System (EPS) Bidders/Suppliers are requested to follow these steps:

a. Requirements

1. Computer with good Internet Connection.
2. Operating System should be Windows Vista / Windows 7 and above.
3. Web Browsers: Internet Explorer 9.0 (32-bit Browser only) & above

b. Mandatory Requirements:

Suppliers interested for registration for BHEL Open Tenders should have a valid DSC (Digital Signature Certificate) before Proceeding forward for Registration. Herein a Valid DSC refers to a Class-II/III Digital Signature Certificate (DSC) for Signing & Encryption (Required both digital signature certificate: Signing & Encryption) of bids issued by any of the valid Certifying Authorities (approved by Controller of Certifying Authorities) in India. Valid Digital Signature Certificate (DSC) must be installed in a computer system from where you want to access the website.

For Unregistered Suppliers in EPS:

Procedure for Online Registration in EPS for Open Tender Suppliers for BHEL. Please follow the below steps for registration: -

1. Click Register Button (Top of the Screen).

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2. Please input your organization PAN No (in case of Indian supplier) or select your "country" in case you are an overseas Supplier.
3. Select Units to participate in.
4. Fill up Company details.
4. Key in your desired login id If you have registered by keying in PAN No. then your desired login id will be prefixed by "OTI", In case of overseas suppliers it will be also prefixed with "OTI".
5. Fill in the Captcha code & agree to the terms & conditions and privacy policy of this website and click SUBMIT.

Once the above steps are completed, contact to M/s eProcurement Technologies Limited for ID Activation. M/s e Procurement Technologies limited, Ahmedabad will activate your ID within 2 business hours. After registering, follow the steps provided in "For Registered Supplier" to view RFQ.

NB: - 1 BHEL Administrator or user will have no role for approving Registration and Open Tenders and DSC for any supplier who has registered himself from the front END which is in case of OT.

For Registered Supplier in EPS:

1. Supplier visits EPS home page
2. Supplier Login in with their user id and password
3. Search the RFQ ID and views it.
4. Attaches themselves to the RFQ by clicking the "I/We wish to participate".
5. Supplier fills the bid template and makes necessary attachments
6. Supplier submits their bid by clicking Sign, Encryption & Save button.

In any problem is faced by supplier while login/registration in EPS (<https://bhel.abcpocure.com>) and any other assistance, please contact the support team of M/s e Procurement Technologies limited, Ahmedabad as per details mentioned in table below: -

Name	Contact Nos.	e-mail ID	Role	Location
Mukunthan	+91 6353215001	Trichy.bhel@eptl.in	Support Executive	Trichy
Swapnil Hamilton	+91 7940270549	swapnil.h@eptl.in	Support Executive	HO – Ahmedabad
Hardik Oza	+91 7940270560	Hardik.oza@eptl.in	Support Executive	HO – Ahmedabad
Ankur Bhatt	+91 7940270590	ankur.bhatt@eptl.in	Support Executive	HO – Ahmedabad
Prashant Rajyaguru	+91 7940270545	prashant@eptl.in	Asst. Manager – Implementation & Support	HO – Ahmedabad
Dharam Rathod	+91 7940270596	dharam@eptl.in	Manager – Implementation & Support	HO – Ahmedabad
Pradip Parmar	+91 7940270532	pradip@eptl.in	Sr Mgr – Implementation & Support	HO – Ahmedabad
Devang Patel	+91 7940270576	devang@eptl.in	Sr Manager – Implementation & Support	HO – Ahmedabad

G2 OTHER IMPORTANT INFORMATION RELATED TO E-PROCUREMENT TENDERS

1. The bidder has to keep track of any changes by viewing the addendum / Corrigendum's issued by the Purchaser on time-to- time basis in the E-Procurement platform. The Company calling for tenders shall not be responsible for any claims/problems arising out of this.
2. The user should complete all the processes and steps required for bid submission. The successful bid submission can be ascertained once acknowledgement is given by the system through bid submission number after completing all the processes and steps. BHEL and M/s e Procurement Technologies limited will not be responsible for incomplete bid submission by users. Users may also note that the incomplete bids will not be saved by the system and are not available for the Purchaser for processing.
3. Before uploading scanned documents if any, the bidders shall sign on all the statements, documents, certificates uploaded by him, owning responsibility for their correctness / authenticity.
4. On the due date of tender opening, only technical bids will be opened. The opened technical bids will be evaluated by us and clarifications required, if any, will be called for from the bidders on technical and commercial points. If no reply is received from the vendor for the clarification raised by BHEL with in the final cut-off date, those vendors offer will be processed with the documents available / submitted against this tender. Offers not meeting the required specification and technical condition will be summarily rejected. The price bids of technically suitable bidders will be opened on a later date with prior intimation to techno-commercially suitable bidders.
5. Ranking L-1, L-2 etc. shall be done for individual item for the techno-commercially acceptable offers on landed cost to BHEL, IVP Goindwal basis and BHEL reserves the right to place order for individual items with different vendors. In the event of more than one vendor becoming L1 for the item, the enquiry quantity will be shared equally among all the L1 vendors.
6. BHEL reserves the right to negotiate with L1 vendor or re-float the tender for items where, L1 price is not the lowest acceptable price; BHEL reserves the right to increase or decrease the tender quantity.
7. If supplier is mentioning delivery destination within state/ outside state depending upon his location of factory, Free On Road etc these are assumed as on FOR Goindwal. If supplier is wishing to give delivery on Ex works basis, then he has to clearly mention about it.

G3 PRICE BASIS

- a. Order of enquiry item sl. No. shall be maintained in the quotation.
- b. The rates quoted shall be firm and fixed. No price variation is proposed and allowed.
- c. Rates quoted should be F.O.R Goindwal basis. If bidder has quoted Ex Works, loading shall be done as per BHEL discretion for tender evaluation.

Variation in GST or any other statutory levies during contractual delivery period shall be to BHEL's account

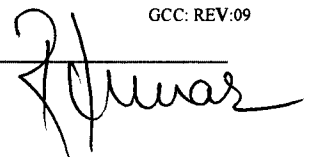
G4 VALIDITY OF OFFERS:

The offers shall be kept open for acceptance 'for number of days mentioned in special terms and conditions' from the date of opening of the tender. In case of extension of tender opening date, the validity shall be suitably revised.

G5 SCOPE OF SUPPLY

Material shall be supplied as per the applicable latest Technical Delivery Conditions (TDC)/ Material Standard requirements/BPS/Drawing and other requirement as given in the Tender

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Enquiry. National & International material Standards shall have to be arranged by vendors themselves.

G6 REPLACEMENT OF REJECTION

If the material is rejected due to defective workmanship during inspection or at the time of actual use, within the guarantee period (i.e. as per clause 13), the rejected material shall be replaced by the supplier. Corresponding quantity shall be treated as unsupplied against respective purchase order till replacement is received at BHEL. If the material is found defective and rejected during use for which payment has already been released the rejected quantity shall be supplied free of cost by the vendor within a month of intimation of the rejection by BHEL.

Lifting of rejected material is under Supplier's scope. BHEL will inform related invoice, qty etc to supplier. Supplier is expected to give the plan to lift and advance intimation when visiting to lift the material. Material should be lifted within one month from date of intimation. After one month BHEL will not be responsible for rejected material. BHEL may decide to send the rejected material on to Pay basis to supplier. Any leniency/ unresponsiveness/delay on part of supplier may lead to appropriate action by BHEL. Any request to postpone in written may be considered but replacement should not be linked with lifting of material.

G7 SUPPLIED MATERIAL ADJUSTMENT

Item/s pending in previous PO has to be billed in previous PO only. Otherwise BHEL will be free to adjust the supplies in previous PO. Any implication of tax will be on supplier's account. For this it is desirable to reconcile the pending PO statement every month/frequently. BHEL will give pending PO statement every month. This can also be viewed at Portal (<http://vis.bheltry.co.in/mm/index.jsp>).

G8 DELIVERY SCHEDULE

Supplies shall be affected and completed as per schedule mentioned in special terms and conditions. **Further, BHEL may release delivery schedule from time to time based upon our requirement with mutual understanding.** Vendor shall be required to complete the order as per the BHEL schedule requested.

G9 ACCESS TO MANUFACTURING PREMISES:

While Purchase Orders placed on the vendor are under execution, authorized representatives of BHEL shall be allowed free access to the manufacturing facilities for the purpose of inspection or monitoring the progress of purchase orders. This access will also be extended to representatives of BHEL's customers accompanying the authorized representative/s of BHEL (which shall be intimated in advance), if our contractual requirements with our customers call for the same.

G10 TERMS OF PAYMENT:

- a. Due payment against supplies received shall be due after 30 days of receipt and acceptance of material and shall be paid within next 15 days' period. In case of any deviation from standard payment term mentioned, BHEL at its discretion may load on the item price at "Base rate of SBI (as applicable on the date of bid opening; Techno-commercial bid opening) + 6% shall be considered for loading for the period of relaxation sought by bidders.
- b. Documents to be submitted (if applicable)
 - i. Tax invoice (Invoice shall be GST compliant and should contains all the required information such as GST No, HSN code etc.)
 - ii. Transporter copy along with material/consignment.
 - iii. Material Test Certificates (MTC) and
 - iv. Compliance Certificate.
- c. GST registration number is to be submitted by qualified vendor as per GST law.
- d. It is mandatory to mention proper material codes in the invoices and separate invoices to be raised for different POs.

e. **BHEL releases payment through EFT mode ONLY. Necessary details may please be submitted by filling required format before release of payment.**

f. **Conditions relating to release of GST portion:**

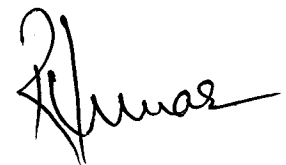
Payment of GST portion will be released to vendor only upon completion of statutory requirement and further subject to following:

The reimbursement of GST portion of invoice shall be released only upon: -

1. vendor declaring such invoice in his GSTR-1 and
 2. receipt of goods and Tax invoice by BHEL and
 3. Confirmation of payment of GST thereon by vendor on GSTN portal.
 4. Above is subject to receipt of goods/service and tax invoice thereof along with vendor declaring invoice in his return and paying GST within timeline prescribed for availing ITC by BHEL.
- In case GST credit is delayed/denied to BHEL due to non/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 shall be recoverable from vendor along with interest levied / leviable on BHEL.
 - In case vendor delays declaring such invoice in his return and GST credit availed by BHEL is denied or reversed subsequently as per GST law, GST amount paid by BHEL towards such ITC reversal as per GST law shall be recoverable from vendor/contractor alongwith interest levied / leviable on BHEL.

G11 AVAILING INPUT TAX CREDIT (ITC) BY BHEL:

1. Since ITC can be availed only when BHEL is in possession of GST Tax invoice and after receipt of goods. Thus, vendor to ensure timely dispatch of goods and Tax invoice. It may be noted that in case of any delay in receipt of Tax Invoice and/or receipt of goods, the ITC availment by BHEL will get delayed thus entailing additional cash outflow & may even get denied if ITC availment timelines are breached.
2. Further ITC can be availed only when vendor has declared such invoice in his outward supply Return GSTR-1 and after GST thereon has been paid by him at the time of filing of monthly Return.
3. If GST credit is delayed/denied to BHEL due to non/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 shall be recoverable from vendor along with interest levied/leviable on BHEL.
4. Further, in case vendor delays declaring such invoice in his return and GST credit availed by BHEL is denied or reversed subsequently as per GST law, GST amount paid by BHEL towards such ITC reversal as per GST law shall be recoverable from vendor/contractor along with interest levied/leviable on BHEL.



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G12 LIABILITY UNDER REVERSE CHARGE (RCM)

Any GST liability arising on BHEL under Reverse Charge (RCM) before actual receipt of goods and/ or Invoice thereof would be subject to recovery of Interest leviable for the period between the date of such liability and actual date of eligibility of ITC based on receipt of goods, receipt of Invoices and other conditions specified in GST Law as applicable.

G13 INSPECTION

- a. All required tests as called in referred material standard/BHEL/TDC/drawing etc shall be carried out by vendor at no extra cost. **BHEL may decide to inspect itself/arrange third party at vendors' works itself as and when necessary with prior intimation to the vendor.** No additional charges shall be claimed for such inspections.
- b. Third party inspection charges will be borne by BHEL. Moreover, all required infrastructure (testing, tools etc) have to be arranged by supplier.
- c. **Vendor will give inspection call sufficiently in advance considering the delivery period stipulated in the purchase order.**
- d. Material Test Certificates (MTC), Inspection reports and Compliance/Guarantee Certificate are to be provided along with the supplies.
- e. Latest applicable revisions of standards/procedures to be referred. International/National standards are to be arranged by vendor.
- f. Any inspection carried out before supply by vendor/incoming stage at BHEL notwithstanding, if any defect/non-conformity is noted during processing, the same shall be attended/replaced by vendor at no extra cost.
- g. Necessary tooling including thread gauges etc. have to be arranged by vendor. Only in exceptional cases, based on BHEL discretions item/nature, BHEL may consider request to provide gauges if available with BHEL. But in no case this shall be linked with delivery of material.
- h. BHEL representative from unit or CQ is authorized to carry out audits along with TPIA at vendor's works before clearing the items for dispatch.

G14 PREFERENCES FOR MSE's

Preferences as mentioned in "Public Procurement Policy for Micro and Small Enterprises (MSEs) Order, 2012" & "Public Procurement Policy for Micro and Small Enterprises (MSEs) Amendment Order, 2018", shall be given to Micro and Small enterprises.

Main points which are mentioned in the above orders are as follows:

- 25% Procurement of the tender value shall be made from MSE (Micro, Small Enterprises) firms.
- 25% of the 25% quantity (i.e. 6.25% of the tender quantity) offered to the MSE's shall be reserved for MSE's owned by SC/STs. Failure to participate by any MSE owned by SC/ST's; this 6.25% quantity shall be procured from other MSEs.
- 3% from within the 25% quantity offered to the MSE's shall be reserved for women owned MSE's. Failure to participate by any MSE owned by women; this 3% quantity shall be procured from other MSEs.
- EMD shall be exempted for MSE's. All these benefits are subject to production of all statutory documents
- In tender, participating Micro and Small Enterprises quoting price within price band of L1+15 per cent shall also be allowed to supply a portion of requirement by bringing down their price to L1 price in a situation where L1 price is from someone other than a Micro and Small Enterprise and

such Micro and Small Enterprise shall be allowed to supply up to 25 per cent of total tendered value. In case of more than one such Micro and Small Enterprise, the supply shall be shared proportionately (to tendered quantity).

“MSE suppliers can avail the intended benefits only if they submit along with the offer UAM (Udyog Aadhaar Memorandum), attested copies of either EM II certificate having deemed validity (five years from the date of issue of acknowledgement in EM II) or valid NSIC certificate or EM II certificate along with attested copy of a CA certificate (Format enclosed at Annexure -1 where deemed validity of EM II certificate of five years has expired) applicable for the relevant financial year (latest audited). Date to be reckoned for determining the deemed validity will be the date of bid opening (Part 1 in case of two part bid). Non submission of such documents 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 is not submitted before price bid opening. If the tender is to be submitted through e-procurement portal, then the above required documents are to be uploaded on the portal. Documents should be notarized or attested by a Gazetted officer.

G15 GUARANTEE/WARRANTEE

Vendor shall give a guarantee of 18 months from the date of dispatch or 12 months from date of receipt, against manufacturing defects, whichever is earlier. In case of non-acceptance of this term bid will be rejected.

G16 PENALTY FOR LATE DELIVERY

‘Time is the essence of the contract’. As such, delivery of goods specified in the Purchase Orders released under the scope of this contract shall be made within the time limit prescribed therein. Penalty for late delivery will be applicable @ 0.5% per week or part thereof subject to a maximum of 10.0 %.

If any vendor does not accept LD ½% of the supply for each week of delay subject to a maximum of 5%, their offer is likely to be rejected by BHEL and the price bid shall not be opened. Bidders accepting for 10% LD shall not be loaded on account of LD. However, bidders who offer any other % LD [between 5% to 10%] shall be loaded @ % deviation from 10% and their accepted %. e.g. If a bidder accepts for a max of 7% LD only, their offer would be loaded @ 3% (10 – 7 = 3).

BHEL reserves the right to receive or not receive the material after the due date of PO. Applicable GST shall also be recovered from suppliers/contractors on LD amount. For this Debit note will be issued by BHEL indicating the respective supply invoice number.

G17 RISK PURCHASE

BHEL shall be entitled to terminate the contract/pending POs at any stage and to purchase elsewhere at the risk and cost of the vendor, either the whole of the goods or any part thereof which the supplier has failed to deliver or dispatch within the time stipulated as aforesaid. Vendor shall be liable for the losses, which BHEL may sustain by way of such risk purchase.

G18 SUB-CONTRACT

The purchase order or any part thereof shall not be sub-contracted, assigned or otherwise transferred without previously obtaining the BHEL's consent in writing.

GCC: REV:09



General Contract Conditions (GCC) of MM Tenders

[Address: BHEL Industrial Valve Plant: 433, Industrial Complex, Goindwal Sahib, Distt Tarn Taran, Punjab-143422]

G19 FORCE MAJEURE

If at any time during the continuance of the contract, the performance in which or in any part by either party of any obligations under the contract are prevented or delayed by reason of any war, hostilities, acts of public enemy, civil commotion, sabotage, fires, explosions, epidemics, quarantine restrictions, or acts of God (hereinafter referred to "an events" then provided the notice of happening of any such event is given by either party to the other within 21 days of the occurrence thereof, neither party shall by reason of such event be entitled to terminate the contract nor shall either party have any claim for damages against the other in respect of such non-performance and delay in performance and delivery under the contract shall be resumed as soon as practicable after such event has come to an end or ceased to exist. If the performance in whole or part of any obligation under the contract is prevented or delayed by reason of any such event, claims of extension of time shall be granted for periods considered reasonable by BHEL subject to prior notification by the vendor to BHEL of the particulars of the event and supply to BHEL, if required, of any supporting evidence. Any waiver of time in respect of partial installment shall not be deemed a waiver of time in respect of remaining deliveries.

G20 DISPUTES

In the event of any dispute and/or difference arising between the Vendor and BHEL as to interpretation and/or execution of the contract and/or the respective rights and liabilities of the parties, such disputes and/or differences shall be referred to the sole arbitrator nominated by BHEL. The provisions of the Indian Arbitration Act and the rules there under shall apply to such arbitration. The award passed by the arbitrator shall be final and conclusively binding on all the parties.

G21 JURISDICTION

The court of the place from where the purchase order is issued during the contractual period shall alone have jurisdiction to decide any dispute arising out of or in connection with the purchase order.

G22 CLARIFICATIONS

The correspondence exchanged against the tender from both tenderer and BHEL through email/e-procurement are considered as valid document legally though it is not signed. It is treated as valid confirmations made on behalf of the respective company and very much comes under the legal ambit of the business transaction and hence it is binding on both the parties to the business. Any transaction pertaining to the tender from both the parties of business done round the clock irrespective of the office or business hours of the companies, are valid legally and binding on both the parties. This applies to the extent only in such cases where deadline time for transaction is not specifically declared by either or both the parties to the business.

G23 LOI (Letter of Intent)

BHEL may issue LOI prior to the PO for any reason whatsoever. The LOI in such cases is to be treated as PO for all practical purposes and all the Terms & Conditions of the tender shall be applicable from the date of issue of LOI.

G24 WORDS AND FIGURES

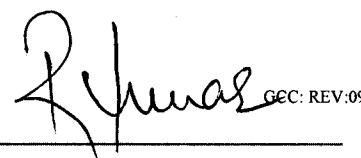
- a. If, in the price structure quoted for the required goods/ services/ works, there is discrepancy between the unit price and the total price (which is obtained by multiplying the unit price by the quantity), the unit price shall prevail and the total price corrected accordingly, unless in the opinion of the purchaser there is an obvious misplacement of the decimal point in the unit price, in which case the total price as quoted shall govern and the unit price corrected accordingly.
- b. If there is an error in a total corresponding to the addition or subtraction of subtotals, the subtotals shall prevail and the total shall be corrected; and
- c. If there is a discrepancy between words and figures, the amount in words shall prevail, unless the amount expressed in words is related to an arithmetic error, in which case the amount in figures shall prevail subject of (a) and (b) above.
- d. If there is such discrepancy in an offer, the same shall be conveyed to the bidder with target date upto which the bidder has to send his acceptance on the above lines and if the bidder does not agree to the decision of the purchaser, the bid is liable to be ignored.
- e. Bids should be free from correction, overwriting, using corrective fluid, etc. Any interlineation, cutting, erasure or overwriting shall be valid only if they are attested under full signature(s) of person(s) signing the bid else shall be liable for rejection.
- f. All overwriting/cutting, etc will be numbered by bid opening officials and announced during bid opening.

G25 GENERAL

- a. BHEL will not be bound by any power of attorney granted by the vendors or by changes in the composition of the firm made subsequent to the execution of the contract. They may, however, recognize such power of attorney and changes after obtaining proper legal advice, the cost of which will be chargeable to the vendor concerned.
- b. BHEL reserves the right to extend the due date of opening, which shall be informed. Validity of offer shall be deemed to be revised accordingly.
- c. BHEL reserves the right to accept or reject any part or whole of the tender of a bidder by assigning a valid reason thereof. BHEL reserves the right to cancel the tender without assigning any reason thereof and without any obligation before any commitment.
- d. If possible, please submit soft copy of price quotation [copied on a blank CD of standard make] put in the sealed offer.
- e. Acceptance of all terms and conditions, in the form of signed copy of T&C or confirmation separately written, shall be submitted along with quotation. If nothing is mentioned, it shall be concluded that terms and conditions are acceptable.
- f. BHEL may increase/decrease item/s based on BHEL requirement before price bid opening. Suitable price implication may be asked from suppliers.
- g. BHEL may drop item/items from tender at any stage of tender before placing PO. BHEL may also delete PO with consent with supplier within delivery date of PO.
- h. After releasing PO, it is assumed that supplier has accepted PO if we do not receive acknowledgement from supplier within 5 days of date of PO.
- i. Any term is special tender terms and conditions will supersede the GCC.
- j. BHEL reserves the right to negotiate with L1 bidder/s.

G26 BANNED FIRMS

The offers of the bidders who are on the banned list as also the offer of the bidders, who engage in the services of the banned firms, shall be rejected. The list of banned firms is available on BHEL website www.bhel.com.



GCC: REV:09



General Contract Conditions (GCC) of MM Tenders

[Address: BHEL Industrial Valve Plant: 433, Industrial Complex, Goindwal Sahib, Distt Tarn Taran, Punjab-143422]

G27 DISCLAIMER CLAUSE: (Only for E procurement)

Neither the Organization (Bharat Heavy Electricals Ltd.) nor the service provider (M/s e Procurement Technologies limited) is responsible for any failure of submission of bids due to failure of internet or other connectivity problems or reasons thereof.

G28 FRAUD PREVENTION POLICY

The Bidder along with its associate / collaborators / sub-contractors / sub-vendors / 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 any fraud or suspected fraud as soon as it comes to their notice.

G29 REVERSE AUCTION

BHEL reserves the right to go for Reverse Auction (RA) (Guidelines as available on www.bhel.com) instead of opening the sealed envelope price bid, submitted by the bidder. This will be decided after techno-commercial evaluation. Bidders to give their acceptance with the offer for participation in RA. Non-acceptance to participate in RA may result in non-consideration of their bids, in case BHEL decides to go for RA.

Those bidders who have given their acceptance to participate in Reverse Auction will have to necessarily submit 'Process compliance form' (to the designated service provider) as well as 'Online sealed bid' in the Reverse Auction. Non-submission of 'Process compliance form' or 'Online sealed bid' by the agreed bidder(s) will be considered as tampering of the tender process and will invite action by BHEL as per extant guidelines for suspension of business dealings with suppliers/ contractors (as available on www.bhel.com).

The bidders have to necessarily submit online sealed bid less than or equal to their envelope sealed price bid already submitted to BHEL along with the offer. The envelope sealed price bid of successful L1 bidder in RA, if conducted, shall also be opened after RA and the order will be placed on lower of the two bids (RA closing price & envelope sealed price) thus obtained. The bidder having submitted this offer specifically agrees to this condition and undertakes to execute the contract on thus awarded rates.

If it is found that L1 bidder has quoted higher in online sealed bid in comparison to envelope sealed bid for any item(s), the bidder will be issued a warning letter to this effect. However, if the same bidder again defaults on this count in any subsequent tender in the unit, it will be considered as fraud and will invite action by BHEL as per extant guidelines for suspension of business dealings with suppliers/ contractors (as available on www.bhel.com).

G30 SUSPENSION OF BUSINESS DEALINGS WITH DEFAULTERS

The offers of the bidders who are under suspension as also the offers of the bidders, who engage the services of the banned firms, shall be rejected. The list of banned firms is available on BHEL web site www.bhel.com.

1.0 Integrity commitment, performance of the contract and punitive action thereof:

1.1. Commitment by BHEL:

General Contract Conditions (GCC) of MM Tenders

[Address: BHEL Industrial Valve Plant: 433, Industrial Complex, Goindwal Sahib, Distt Tarn Taran, Punjab-143422]

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.

1.2. Commitment by Bidder/ Supplier/ Contractor:

1.2.1. 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.

1.2.2. 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.

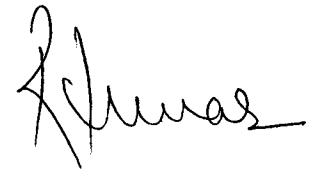
1.2.3. The bidder/ supplier/ contractor will perform/ execute the contract as per the contract terms & conditions and will not default without any reasonable cause, which causes loss of business/ money/ reputation, to BHEL.

If any bidder/ supplier/ contractor during pre-tendering/ tendering/ post tendering/ award/ execution/ post-execution stage indulges in 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 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 extant guidelines of the company available on [www. bhel.com](http://www.bhel.com) and/or under applicable legal provisions

G31 PREFERENCE TO MAKE IN INDIA

For this procurement, Public Procurement (Preference to Make in India), Order 2017 dated 15.06.2017, 28.05.2018 & 29.05.2019 and subsequent Orders issued by the respective Nodal Ministry shall be applicable even if issued after issue of this NIT before finalization of contract/PO/WO against this NIT.

In the event of any Nodal Ministry prescribing higher or lower percentage of purchase preference and / or local content in respect of this procurement, same shall be applicable.



Certificate by Chartered Accountant on letter head

This is to Certify that M/S,
(hereinafter referred to as 'company') having its registered office at
..... is registered under MSMED Act 2006, (Entrepreneur
Memorandum No (Part-11) dtd:.....,
Category:..... (Micro/Small)). (Copy enclosed).

Further verified from the Books of Accounts that the investment of the company as per the
latest audited financial year as per MSMED Act 2006 is as follows:

1. **For Manufacturing Enterprises:** Investment in plant and machinery (i.e. original cost
excluding land and building and the items specified by the Ministry of Small Scale Industries vide its
notification No.S.O.1722(E) dated October 5, 2006 :
Rs.....Lacs
2. **For Service Enterprises:** Investment in equipment (original cost excluding land and building and
furniture, fittings and other items not directly related to the service rendered or as may be notified under the MSMED
Act, 2006:
Rs.....Lacs

(Strike off whichever is not applicable)

The above investment of Rs.....Lacs is within permissible limit of
Rs.....Lacs forMicro / Small (Strike off which is not applicable)
Category under MSMED Act 2006.

Or

The company has been graduated from its original category {Micro/ Small} (Strike off which is not
applicable) and the date of graduation of such enterprise from its original category is
(dd/mm/yyyy) which is within the period of 3 years from the date of graduation of such
enterprise from its original category as notified vide S.O. No. 3322(E) dated 01.11.2013 published
in the gazette notification dated 04.11.2013 by Ministry of MSME.

Date:

(Signature)

Name-

Membership number-

Seal of Chartered Accountant

Revision Record: Rev:00:15.05.94: Fresh

Rev:01:Text re-written, Specifications altered to suit ASTM.,UT reqmt. altered.

Rev:02:Dt 07.07.03:Details of material AISI 410 added in CL 1.0, 2.0, 4.0, 5.0. Stamping requirements added in CL.9.0.

Rev 03: Double tempering for AISI 410 removed.For sizes > or =140 is coverage shifted to TDC 0: 404 as it is procured as forged components..

1.0 MATERIAL

Specification:ASME{Latest on date of Purchase Order (PO)}:

ASTM A182 F6a Cl. 3, A276 Type 410 & 420, A565 Grade 616 - condition HT

ASTM A582 Type 416, ASTM A 479 Type 410 - condition 2

AISI 410 for TOA Gland and bushings.

Additional Requirement: As listed below (supplementary to Specification)

Size and Qty.: As per Purchase order & Drawing.

2.0 CHEMICAL COMPOSITION & PROCESS

Process: Steel shall be of fully killed quality & Bars shall be hot finished.

Chemistry: Product analysis per heat.

A276 Type 420: C = 0.3 to 0.4%

AISI-410: C = 0.15% max, Mn = 1.00% max, Si = 1.0% max, P
= 0.040 max, S = 0.030 max, Cr - 11.5 to 13.5.**3.0 DIMENSIONS AND TOLERANCES**

Tolerances as per ASTM A484.

4.0 HEAT TREATMENT (HT)

A182 F6a Cl.3: supply: Normalised(N) & tempered(T) to produce hardness as per specification.

A276 Type 410: supply: Hardened(H) and tempered condition to produce a hardness of 24 - 30 HRC (247 - 286 BHN). Minimum tempering temperature: 565 deg.C.

1 test bar per size/melt/HT batch to be oil quenched(Q) at 980-1010 deg.C & tempered at 400-510 deg.C to produce a hardness of 37 HRC (344 BHN) minimum.

A second test bar per size/melt to be annealed(A) and used for mechanical testing.

A276 Type 420: supply: Annealed condition to produce a hardness as per specification.

1 test bar per size/melt/HT batch to be oil quenched at 1010 deg.C and tempered at 455 deg.C to produce a hardness of 50 - 53 HRC (482 - 525 BHN).

A565 Grade 616 condition HT: supply: Annealed condition to produce hardness as per specification.

1 test bar per size/melt/HT batch to be oil quenched and tempered as per specification. to produce hardness as per specification.

A582 Type 416: supply: Annealed condition to produce a hardness as per specification.

1 test bar per size/melt/HT batch to be oil quenched at 980-1010 deg.C and tempered to produce hardness as per specification (Condition T).

A479 Type 410 Condition 2: supply: Normalised & tempered or quenched & tempered as per specification to produce hardness as per specification. Tempering temperature: 600-760 deg.C.

AISI 410 - Supply in Quenched & Tempered condition as below to produce a hardness of 197 - 235 BHN.

Quenching at 955-1010 degC in air or water or oil or polymer/ soaking 30 mts/inch max thick

Tempering at 663 degC. min/ soak 60 mts/inch max. thick/ Air cool

5.0 MECHANICAL TESTS in HT conditions as above.

Extent of test: for each size/heat/HT batch from sample product or identical test coupon.

Mechanical test as per Specification in HT condition as above wherever indicated in specification.

Hardness test as per cl. 4.0.

Impact test : SA 370: for SA 182 F6a Cl.3 (N&T condn): 2mm. Charpy U-notch, at Room temperature:

Acceptance: Average: 4 Kg.M / sq.cm.

for A565 Gr. 616 condition HT(Q&T): Charpy V-notch, at Room temperature: Acceptance: Min: 11J

Mechanical properties for AISI 410 :

Y.S = 75 ksi min. T.S = 95 ksi min, % E (on 2" G.L) = 18 min, % R.A = 35 min

6.0 NON DESTRUCTIVE TEST

Extent of test: for each product. Stage of test: After heat treatment.

UT: Diameter $\geq$ 50mm: 100% : SA 388. Acceptance: AM 203.2, ASME Sec.VIII Div. 2.

7.0 WORKMANSHIP AND FINISH

As per ASTM A 484. Items to be free of scales & defects like laps, seams, folds, cracks etc.

8.0 REPAIR

Repairs by fusion welding are prohibited. Surface defects can be removed by mechanical means and defective areas smoothly dressed up with the adjacent surface. Minimum thickness after repair to meet drawing / Specification.

9.0 MARKING AND PACKING

Details of stamping on each item with low stress stamps and border by paint: Heat number, Specification & grade, Maker's emblem/code & Inspection Authority's seal. Items to be Paint stenciled with above details and UT number where applicable.

The material specification and grade may be stamped/punched with the following abbreviated specification on bars/rounds.

A182 F6a CL3	-	F6aCL3
A276 Type 410	-	A410
A276 Type 420	-	A420
A565 Grade 616	-	A616
A582 Type 416	-	A416
A479 Type 410 condition 2	-	A410 CN2
AISI 410	-	410

Items to be bundled for safe transit using metal strap in weights < 2 tonnes. Metal / Plastic tag with above detail to be fixed to each bundle.

10.0 INSPECTION AND CERTIFICATION

For IBR items: inspection & tests to be witnessed by an IBR approved inspecting agency, in case the mill is not recognised as a "Well known Steel maker" under IBR.

Test certificate countersigned by applicable inspection agency for each product with following details shall accompany the product (in format approved by Boiler inspectorate for IBR items).

1. Purchase Order No.(BHEL),TDC No. & Test certificate number
2. Specification, Grade with applicable year of code, Heat Number, Drawing No.,Quantity & Size
3. Steel making & finishing process,Chemistry including incidental elements - Heat wise.
4. Heat treatment details of the material and test bars.

5. Mechanical test results, NDE test results with reference & acceptance standard.

11.0 END USE

High pressure Valves and Pressure parts in boilers working at high temperature & pressure meeting IBR, ASME Section I, ANSI B16.34 requirements.

K.Ganesan
Prepared

Amit Roy
Reveiwed (QA)

P. .Loganathan
eveiwed (Engg)

K.Rengachari
Approved

BHEL, Tiruchirappalli – 620014.	Quality Assurance	Technical Delivery Conditions
Product: MARTENSITIC SS BARS: OHTARON (Modified ASTM A182-F430)		
Document No.: TDC:0:308	Rev. No.: 02	Effective date: 26/05/2003 Page 1 of 2

Revision Record: Rev:00:10.5.94: Fresh. Rev.:01: Text re-written. UT size limit changed.Rev.:02: Cl. 4.0 Tempering temperature altered.

- 1.0 MATERIAL Specification:ASME{Latest on date of Purchase Order (PO)}:
OHTARON (Modified ASTM A182-F430)
Additional Requirement: As listed below (supplementary to Specification)
Size and Qty.: As per Purchase order & Drawing.
- 2.0 CHEMICAL COMPOSITION & PROCESS
Melting: Fully killed. Hot finished. Product analysis per heat (%):

Carbon	0.13 - 0.18
Silicon	0.50 max.
Manganese	0.50 max.
Phosphorus	0.03 max.
Sulphur	0.03 max.
Nickel	1.00 - 2.00
Chromium	15.00 - 17.00
Molybdenum	0.30 - 0.50
- 3.0 DIMENSIONS AND TOLERANCES
Dimensional Tolerances: as per SA 484.
- 4.0 HEAT TREATMENT(HT)
Quenched at 990 +/- 10 deg.C, Quenched in oil.
Tempered at 580 - 650 deg.C, Soaking 1 hr / inch dia. Oil or Water quenched (Actual tempering temperature shall be selected based on the bar diameter / chemistry of the steel to achieve required mechanical properties).
- 5.0 MECHANICAL TESTS
As per ASTM A370, Extent of test: for each size/heat/HT batch. Additional requirements of tests:
Tensile strength: 85 Kg/sq.mm min., Yield strength: 65 Kg/sq.mm min.
% Elongation: 15 min., % Reduction in area: 40 min.
Hardness: 241 - 321 BHN (minimum 3 values)
Charpy impact test (with 2mm U-notch): Strength for each of 3 specimens: 6 Kg/sq.cm min.
- 6.0 NON DESTRUCTIVE TEST
Extent of test: for each product. Stage of test : After heat treatment.
UT: Dia >= 50mm.: 100% : SA 388. Acceptance: AM 203.2, ASME Sec.VIII Div. 2.
- 7.0 WORKMANSHIP AND FINISH
Items to be free from scales & defects like laps, seams, folds, cracks, etc.
Workmanship as per ASTM A484.
- 8.0 REPAIR
Repairs by fusion welding are prohibited. Surface defects can be removed by mechanical means and defective areas smoothly dressed up with the adjacent surface. Minimum dimension after repair to meet drawing / Specification.
- 9.0 MARKING AND PACKING
Details of stamping on each item with low stress stamps and bordered by paint:

TENDER: 1920-063E DATED: 31.08.2019 ITEM: BARSTOCK

BHEL, Tiruchirappalli – 620014.	Quality Assurance	Technical Delivery Conditions	
Product: MARTENSITIC SS BARS: OHTARON (Modified ASTM A182-F430)			
Document No.: TDC:0:308	Rev. No.: 02	Effective date: 26/05/2003	Page 2 of 2

Heat number, Specification, grade(OTR-1), Size, Maker's emblem/code & Inspection Authority's seal

Bars to be supplied in bundles < 1 ton, secured suitably for rough handling. Metal tags with details of specification, melt number and maker's emblem to be secured to the bundles.

10.0 INSPECTION AND CERTIFICATION

Test certificate in English language with following details shall accompany the product.

1. Purchase Order No.(BHEL),TDC No. & Test certificate number
2. Specification, grade, class, applicable year of code, Heat Number, Quantity & Size
3. Melting & forging/rolling process, Chemistry including incidental elements - Heat wise.
4. Heat treatment details of the material and test bars.
5. Mechanical test results, NDE test results with reference & acceptance standard.
6. Certified copy of TC for starting material if applicable.

11.0 END USE

These bars are for use in non-IBR Valves as spindles for high pressure applications.

Selvarajan.S Prepared	Sasikumar.R Loganathan.P Reviewed	Rengachari.K Approved
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Product: Carbon, Alloy & Stainless Steel Rolled Bars (for Boilers & Valves)

Revisions Record:

Rev: 01: Source of supply for AS included.

Rev: 02: Text re-written, Class Nos introduced for Alloy steel. High temperature test removed. TDC: 03: 306/00 merged into this.

Rev: 03: Cl. 4, 6, 9 modified.

Rev: 04: Cl 5 revised to include Impact test for bars used for valves purchase orders, clarity brought in Cl 4.

Rev: 05: Heading modified. Cl 1 size restriction for CS and AS SA182 rolled bars added as per ASME. SA182 Gr 91&Gr 92 added and subsequent clauses modified for chemistry, Heat treatment, mechanical properties, photomicrograph and NDE. Cl 2 – Steel makers names removed and requirement for creep testing added as per IBR Reg 4. Cl 2, 6 & 10 modified for SS. Cl 4 – SA 182 F91, F92 & F23 Tempering temperature and soaking time modified. Cl 5 – Bend test Clarified, Cl 6 – MPI added. Cl 11 added. Cl 10 – IBR Forms indicated. CS: SA675 Gr 70 added and its requirements added in Cl 1, 2, 4 in line with collaborator practise.

Rev 06: Dt: 25/11/2014 Cl 2, 4, 5, 6, 10 modified

Rev 07: Dt: 06/10/2015: Cl 2.5, 4.3, 5.6, 10.9 added; Cl 1.0, Cl 2.3, 4.2, 5.2, 6.1, 9.0, 10, 12.0 modified.

Rev 08: Dt: 24/12/2015: Cl 1, 2, 3, 5, 6, 7, 10, 11 & 12 modified.

Rev: 09 Dt: 25/07/2016 – Cl 1 modified to add SA 182 F304L, Cl 5 modified to add impact requirement for SA 479 TP 410 Condition 2

Rev 10: Dt: 06/02/2017: Cl 1 changed to indicate the use of latest revisions of referred codes, standards, specifications, drawings, procedures, etc; Tempering temperature added for F12 material in Cl 4; Requirements of API 6D removed from Cl 1, 2, 4, 5, 10, 12 since the API 6D certificate license was not applied for; Definitions for relevant, linear and rounded indications provided in Cl 6; Type 3.2 certification updated as per BS EN 10204-2004 in Cl 10 (b).

Rev 11: Dt: 27/11/2017: Cl 2 modified; Cl 5 modified to include 100% hardness testing and Creep testing requirements; Cl 6 changed to include UT for forgings above 40 mm; Cl 10 modified suitably.

Rev12: Dt: 05/12/2018: Tolerance in Cl 3 modified based on guidance from corporate standard AA 102 08 Rev07, Cl 4 modified to include F11.

1. MATERIAL SPECIFICATIONS:

All the codes, standards, specifications, drawings & procedures, etc., referred in this TDC shall be of latest revision as on the date of Enquiry/Purchase Order, whichever is earlier, unless specified otherwise.

Carbon Steels (CS)	:	SA 105, SA 675 Gr 70
Low Alloy Steels (AS)	:	SA 182 F11 Class 2, F12 Class 2 & F22 Class 3, SA182 F91 & SA182 F92 (Code case 2179); SA 193 B7 & B16
Stainless Steels (SS)	:	Austenitic: SA 182 F304, F304L, F316, SA 479 TP 304; Martensitic: SA 479 TP 410 Condition 2
Additional Requirements	:	As listed below (Supplementary to above material specifications)
Size and Quantity	:	As per Purchase Order & Drawing.

SA 105 and SA 182 rolled bars shall be restricted to dia $\leq$ 114.3mm.

2. CHEMICAL COMPOSITION & PROCESS

- Melting:** CS & AS: Fully killed. CS : SA 675 – Silicon and Aluminium killed. Product analysis per heat: CS: C $\leq$ 0.25%. SA182 F92: Si: 0.10-0.50%, Ni: 0.30 max & Cu:0.25% max.
- CS, AS:** Rolled bars shall be processed by hot forging/rolling and subsequently finished by cold rolling (if required) to final size. **SS:** hot finished.
- Raw material Steel to be inspected at Mill & IBR form IV shall be submitted.
- SS:** All raw materials used in steel making including incoming scrap shall be checked by supplier to ensure freedom from radioactivity.
- Tolerance for chemistry shall be as per the applicable material specifications/standards specified in Cl 1.

3. DIMENSIONS AND TOLERANCES

CS & AS: as per SA 29 for diameters upto 114.3mm. For diameters above 114.3mm and upto 300mm, tolerances shall be minus 0 plus 8 mm; **SS:** as per SA 484

4. HEAT TREATMENT(HT)

- CS: SA 105 Normalised at 880-920°C, SA 675 Normalised at 880-920°C and Tempered at 600-650°C
AS (SA 182): Normalised and tempered. For F11, F12: Tempering at 650°C (min).
For SA 182 F91, F92 Normalising at 1040-1080°C & Tempering at 750-780°C.



Product: Carbon, Alloy & Stainless Steel Rolled Bars (for Boilers & Valves)

SA 193: Quenched and tempered as per material specification & grades.

SS: As per applicable material specification & grade.

- 2) Photomicrograph test for F91 & F92 bars - one per heat treatment lot per size and reported in test certificate.

Acceptance – The material shall be free from any micro fissures. Microstructure shall show lathe tempered martensite and also to be examined for grain growth. Photomicrograph with 400x (Min) magnification along with Photomicrograph report to be provided. The actual magnification and result of actual microstructure shall be certified/indicated.

5. MECHANICAL TESTS

- 1) Extent of test: One Specimen for each size/heat/HT batch.

- 2) **Tensile test:** The test specimens shall be removed from a test coupon (TC) after the final heat-treatment cycle.

Perform tensile tests at room temperature in accordance with the procedures specified in ASTM A370. Perform a minimum of one tensile test. All yield strengths shall be determined using 0.2 % offset method of ASTM A370. The results of the tensile test(s) shall satisfy the applicable material specification requirements.

If the results of the tensile test(s) do not satisfy the applicable requirements, two additional tests on two additional test specimens (removed from the same TC with no additional heat treatment) may be performed in an effort to qualify the material. The results of each of these tests shall satisfy the applicable requirements.

- 3) **Additional requirements for SA182 F91 & F92:**

F91: Yield: (0.2% offset): Min 450 MPa; Tensile: Min 630 MPa, Max 850 MPa; Hardness (HBW): Min 195, Max 248.

F92: Tensile: Min 630 MPa, Max 850 MPa; Hardness (HBW): Min 191, Max 269.

Hardness testing shall be 100% as per ASTM E10 or E18.

- 4) Additional tests: **Bend test:**

CS: 1 Sample 19mm thick(t)x25.4mm width to be bent 180 deg around mandrel of radius 6.35mm.

AS (SA 182 only), SS: 1 Sample 19mm thick(t) x 25.4mm width to be bent 180 deg around mandrel of radius 1.5 x t.

- 5) Bars meant for Valves purchase orders of SA105 and SA182 F22 Cl3 materials shall be impact tested.

1/HT batch: ASTM A370, 2mm. Charpy-U Notch at room temperature.

Acceptance: Avg of 3 specimens: 36 Joules, Min. single value: 24 Joules.

- 6) For PED 2014/68/EU (CE-marking) items: Charpy- V impact test at 20°C as per ASTM A 370.

Acceptance: Avg of 3 specimens : 40 Joules, Min. single value: 27 Joules.

- 7) Creep testing shall be carried out as per SIP:RM:01 (latest revision) whenever indicated in the Enquiry/Purchase Order/Engineering Drawing.

6. NON DESTRUCTIVE TEST

- 1) **Extent of test:** for each product. Stage of test: After heat treatment.

- a) **Volumetric NDT - UT:** 100% for dia/thickness > 40mm and for all bars of SA 182 F91& F92 as per ASTM A388. **Acceptance:** ASME Sec.VIII Div. 2 Cl.3.3.4.

- b) **Surface NDT –**

i. **Relevant indication:** Surface-rupture NDE indication with major dimensions > 1.6 mm (1/16 in).

ii. **Linear indication:** Surface NDE indication whose length is $\geq$ three times its width.

iii. **Rounded indication:** Surface NDE indication whose length is < three times its width.

iv. **MPI for CS & AS (other than SA182 F91, F92):** As per ASTM A275. Dry MPI:100%;

For SA182 F91, F92: 100% Wet MPI.

Acceptance: ASME B16.34 Mandatory Appendix II. Linear indications (like cracks, laps, folds & other injurious defects) are unacceptable.

- v. **LPI for SS:** 100%: ASTM E165. **Acceptance:** No linear indications acceptable.

- 2) **SS:** Finished bars 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 hr or 1 micro Sievert per hr.

7. WORKMANSHIP AND FINISH

Items to be proof machined as per drawing or shot blasted for CS/AS; Pickled & passivated as per ASTM A380 for SS & be free from scales & defects like laps, seams, folds, cracks, etc. Machined items (except SS) to be coated with a layer of transparent rust preventive before despatch.



Product: Carbon, Alloy & Stainless Steel Rolled Bars (for Boilers & Valves)

8. REPAIR

Repairs by fusion welding are prohibited. Surface defects can be removed by mechanical means and defective areas smoothly dressed up with the adjacent surface. Minimum thickness after repair to meet drawing / Specification.

9. MARKING AND PACKING

- 1) Details of stamping on each item with dia ≥ 25 mm: with low stress stamps and bordered by paint: Heat/melt number; material specification, grade & class; Size; Code case number (for Gr 92); Maker's emblem/code & Inspection Authority's seal.
- 2) For items with dia < 25 mm: All above details to be painted.
- 3) Bars to be supplied in bundles < 1 ton, secured suitably for rough handling. Metal tags with details of specification, melt number and maker's emblem to be secured to the bundles.

10. INSPECTION AND CERTIFICATION

- a) **For IBR Items:** Products shall be inspected at supplier's works/mill and the applicable IBR Form must be countersigned by the Inspecting Authority as indicated below in case the supplier's works/mill is not recognised as a "Well known Forger/Steel maker" under IBR:

- ☐ **Imported Items:** Inspecting Authority approved by IBR for the Country of origin.
- ☐ **Indigenously Supplied items:** Director of Boilers/Chief Inspector of Boilers/Inspecting Authority approved by IBR, for the respective state in India.

Certification in IBR Form IV for IBR items from "IBR-Well Known Forger/Steel Maker" or "Inspecting Authority", as applicable, to be submitted. IBR Form IV & a separate manufacturer test certificate in English language with following details, shall accompany the product (including proof machined):

1. Purchase Order No.(BHEL), TDC No & its revision no, Test certificate no & date.
 2. Specification, Grade & class with applicable year of code, Code case number (for Gr 92), Heat Number, Drawing No, Quantity & Size.
 3. Supplier of the steel used in making the finished product (well known and others in IBR Form IV).
 4. Melting & rolling process, Chemistry including incidental elements - Heat wise, Product analysis, Carbon Equivalent (CE).
 5. Heat treatment details of the material and test bars. For F91, F92 supplies – Photomicrograph at 400x resolution.
 6. Mechanical test results- Tensile (UTS, YTS (0.2 offset), % elongation, % reduction in area), Bend, Impact, Hardness and NDE test results with reference & acceptance standards.
 7. Repair details if any, Certified copy of TC for starting material.
 8. **For SS:** Measured Radioactivity levels shall be reported in the Mill Test Certificate (not to be recorded in IBR Form).
 9. Creep test report as per SIP:RM:01 (latest revision) whenever indicated in the Enquiry/Purchase Order/Engineering Drawing.
- b) For PED 2014/68/EU (CE-marking) items, the test certificates with details specified in Cl 10 (a) shall be submitted as per BS EN 10204.
1. **For pressure parts,** test certificates of type 3.1 or 3.2 are acceptable.
Type 3.1 – Suppliers shall have ISO 9001-2008/2015 certification certified by Notified Body recognized by European Community and test certificate certified by supplier's authorized inspection representative.
Type 3.2 – Components inspected and test certificates certified by both the supplier's authorized inspection representative and Notified Body recognized by European Community.
 2. **For non-pressure parts,** test certificates of type 2.2 are acceptable.
Type 2.2 – suppliers test certificates signed by suppliers authorized inspection representative with test results as required by this TDC.

11. AUDIT CHECKS AT BHEL

BHEL reserves the right to carry out audit checks for chemistry, HT condition, mechanical test and NDT on representative test bars or job. Supplies found defective during check or subsequent processing at BHEL will be rejected.



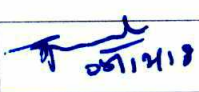
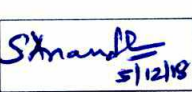
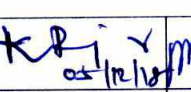
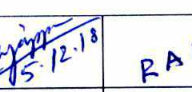
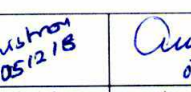
BHEL – Tiruchirappalli - 620014, India.
Quality Assurance Department
TECHNICAL DELIVERY CONDITIONS

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Product: Carbon, Alloy & Stainless Steel Rolled Bars (for Boilers & Valves)

12. END USE

SA 105, SA 182 & SA 479 are for Pressure part components in Boilers & Valves of high temperature service meeting IBR, ASME Section I and PED 2014/68/EU. SA 193 is for high temperature bolting and for drive shafts.

 05/12/2018	 05/12/18	 5/12/18	 05/12/18	 05.12.18	 05/12/18	 05/12/18
Abdur Rahman	G. Panneer Selvam	S. Anand Kumar	K. Rajasekaran	R. Rajappan	R. Ananthakrishnan	Amit Roy
Sr.Engineer/ QA	DGM/QA	SDGM/PE/ FB	DGM/Valves/ Engg	SDGM/MM	AGM/Valves/ Purchase	AGM/QA& BE
Prepared By	Reviewed By					Approved By



Product: Carbon, Alloy & Stainless Steel Forgings (Boilers And Valves)

Revisions Record:

Rev 09: New materials F23, F91 & F92 requirements added in Cl.1.0, Cl.2.0, and Cl.4.0 to Cl.6.0. CE marking certification clarity included in Cl.10.

Rev 10: Cl 1:F6a Class 2 added, Code case corrected. Cl 2: Steel makers names removed and requirement for creep testing added as per IBR Reg 4, Cl 4: Tempering temperature and soaking time modified for SA 182 F91, F92 & F23. Cl 4 & 10: Photomicrograph requirement added for F91 & F92 forgings, Cl 2, 6 & 10: modified for SS, Cl 5: Bend test Clarified, Cl 6: Wet MPI added.

Rev 11: Cl 2 Pt 3, 4, 5 modified. Cl 6 – Wet MPI for CS, AS added, Cl 10.1 – IBR Forms indicated

Rev 12: Cl 1, 2, 4, 6 and 7 – requirements for grades SA 182 F1, SA 336 F1, F12, F22 Cl 3 and F91 added (for Neyveli Project). Creep test criteria in-line with BHEL R&D included. Cl 2 Pt 8 modified. Cl 6 Pt 1 – SA388 changed to ASTM A 388 based on ASME Sec II Ed 2013.

Rev 13: Dt: 17/11/2014: Cl 2 Cl 4 Cl 10 Cl 12 modified.

Rev 14: Dt: 06/10/2015: Cl.4.3, 5.2, 5.8, 10.1.b.9 added; Cl 1.0, 2.1, 2.2, 2.3, 4.1, 4.2, 5.3, 6.2, 9.0, 10 modified.

Rev 15: Dt: 23/12/2015: Cl 1, 2, 3, 5, 6, 7, 10, 11 & 12 modified.

Rev 16: Dt: 06/02/2017: Cl 1 changed to indicate the use of latest revisions of referred codes, standards, specifications, drawings, procedures, etc; Tempering temperature added for F12 material in Cl 4, Requirements of API 6D removed from Cl 1, 2, 4, 5, 10, 12 since the API 6D certificate license was not applied for; Definitions for relevant, linear and rounded indications provided in Cl 6; Type 3.2 certification changed as per BS EN 10204-2004 in Cl 10.2.

Rev 17: Dt: 27/11/2017: Cl 1, 4 modified to include SA 266 & SA 336 F92 materials; Cl 5 modified to include 100% hardness testing & Creep testing requirements; Cl 6 changed to include UT for forgings above 40 mm; Cl 10 modified suitably.

Rev 18: Dt: 21/02/2018 – Material SA182 F51 added in Cl 1 based on Engineering/Valves input and minor corrections made in Cl 4 & 5.

Rev 19: Dt: 05/12/2018 – Material SA182 F11 Class 3 & SA182 F60 added in Cl 1 based on Engineering/Valves input, Tolerance in Cl 3 modified based on guidance from corporate standard AA 102 08 Rev07, Cl 4 modified to include F11.

1. MATERIAL SPECIFICATIONS:

All the codes, standards, specifications, drawings & procedures, etc., referred in this TDC shall be of latest revision as on the date of Enquiry/Purchase Order, whichever is earlier, unless specified otherwise.

Carbon Steel (CS)	:	SA 105, SA 266, SA 350 LF 2
Alloy Steel (AS)	:	SA 182 F12 Class 2, F22 Class 3, SA 182 F23 (Code case: 2199), <i>SA182 F11 Class 3</i> SA 182 F91 & SA182 F92 (Code Case: 2179), SA 182 F1, SA 336 F1, SA 336 F12, SA 336 F22 Cl 3, SA 336 F91, SA 336 F92 (Code Case: 2179)
Stainless Steel (SS)	:	SA 182 F6a Class 2, F6a Class 3, SA 182 Gr. F 304, 304L, 316, 316L, 316H, 321, 321H, 347 & 347H; F51; <i>F60</i> AISI 410 for TOA Gland and bushings.
Additional Requirement	:	As listed below (Supplementary to above material specifications)
Size and Quantity	:	As per Purchase order & Drawing.

2. CHEMICAL COMPOSITION & PROCESS

- Melting: fully killed.
Product analysis per heat: CS: C ≤ 0.25% , AS: SA182 F23: Si: 0.25-0.50% & Cu: 0.25max
SA182 F92: Si: 0.10-0.50%, Ni: 0.30 max & Cu:0.25% max
- Raw material Steel for IBR forging items to be inspected at Mill & test certificate countersigned by IBR approved inspecting authority, if the mill is not approved under IBR as well known steel maker.
- Forging: Hot working to ensure uniformity of structure & strength with reduction ratio in area 4:1 min from ingot to final forging, close to final size & shape. Flow lines to be parallel to axis of openings. Forged Items ordered to this TDC shall be forged to the nearest shape before machining to final dimensions as per respective drawing.
- Blooms / Billets used for forgings (Side Length or Dia ≥ 50mm) shall be UT tested. For Acceptance criteria refer Cl.6.0. For finished bars, this can be done at final stage.
- SS: All raw materials used in steel making including incoming scrap shall be checked by supplier to ensure freedom from radioactivity.
- Tolerance for chemistry shall be as per the applicable material specifications/standards specified in Cl 1.

3. DIMENSIONS AND TOLERANCES

Dimensions & their tolerances shall be as per drawing.

For untoleranced dimensions: **CS & AS:** as per SA 29 *for diameters upto 114.3mm. For diameters above 114.3mm and upto 300mm, tolerances shall be minus 0 plus 8 mm*; **SS:** as per SA 484

4. HEAT TREATMENT(HT)

- Heat treatment shall be as per applicable drawing. Unless otherwise specified, the following heat treatment shall be following:

CS: SA 105: Normalised; SA 266: As per material specification;

SA 350 LF 2: Normalised at 880-900°C & Tempered at 620-640°C.

AS: Normalised and Tempered. For *F11*, F12: Tempering at 650°C (min).

For SA 182 F91, F92 & F23, SA336 F91, SA 336 F92: Normalising at 1050-1080°C & Tempering at 750-780°C.

SS: As per applicable material specification & grade.



Product: Carbon, Alloy & Stainless Steel Forgings (Boilers And Valves)

AISI 410: Supply in Quenched & Tempered condition as below.

Quenching at 955-1010°C in air or water or oil or Polymer. Soaking 30 mts/inch maximum thk. Tempering at 663°C.min. Soaking :60 mts/inch maximum thickness and air cool.

- 2) Photomicrograph test for F91 & F92 forgings - one per heat treatment lot per size and shall be reported in test certificate. Acceptance – The material shall be free from any micro fissures. Microstructure shall show lathe tempered martensite and also to be examined for grain growth. Photomicrograph with 400x (Min) magnification along with Photomicrograph report to be provided. The actual magnification and result of actual microstructure shall be certified/indicated.

5. MECHANICAL TESTS

- 1) Extent of test: One Specimen for each size/heat/HT batch from sample product or identical test coupon.
- 2) **Tensile test:** The test specimens shall be removed from a test coupon (TC) after the final heat-treatment cycle. Perform tensile tests at room temperature in accordance with the procedures specified in ASTM A370. Perform a minimum of one tensile test. All yield strengths shall be determined using 0.2 % offset method of ASTM A370. The results of the tensile test(s) shall satisfy the applicable material specification requirements.

If the results of the tensile test(s) do not satisfy the applicable requirements, two additional tests on two additional test specimens (removed from the same TC with no additional heat treatment) may be performed in an effort to qualify the material. The results of each of these tests shall satisfy the applicable requirements.

- 3) **Additional requirements for SA182 F23, F91 & F92:**
F91: Yield: (0.2% offset): Min 450 MPa; Tensile: Min 630 MPa, Max 850 MPa; Hardness (HBW): Min 195, Max 248.
F92: Tensile: Min 630 MPa, Max 850 MPa; Hardness (HBW): Min 191, Max 269
F23: Tensile: Min 510 MPa, Max 730 MPa; Hardness (HBW): Min 150, Max 220
Hardness testing shall be **100%** as per ASTM E10 or E18.
- 4) AISI 410: Hardness (**100%** testing shall be as per ASTM E10 or E18): 197-235 HBW. No other mechanical test required.

Additional requirements of tests: (Other than AISI 410 Only)

- 5) **Bend test: Acceptance as per IBR**
CS: Sample 19mm.Thick(t) x 25.4mm width to be bent 180 deg. around mandrel of radius 6.35 mm.
AS, SS: Sample 19mm.Thick(t) x 25.4mm width to be bent 180 deg. Around mandrel of radius =1.5 x t.
- 6) **Impact test for QCNR Valves & CRHNR Valves:** CS, AS and SS: 1 / HT batch. As per ASTM A370, 2mm Charpy-U notch, at Room temperature. Acceptance: Avg of 3 specimens: 36 Joules, Min Single value: 24 Joules
- 7) **For PED 2014/68/EU (CE-marking) items:** Charpy- V impact test at 20°C as per ASTM A370, Acceptance: Avg of 3 specimens: 40 Joules, Min. single value: 27 Joules.
- 8) Creep testing & reporting shall be carried out as per SIP:RM:01 (latest revision) whenever indicated in the Enquiry/Purchase Order/Engineering Drawing.

6. NON DESTRUCTIVE TEST

- 1) Extent of test: for each product. Stage of test : After heat treatment.
- 2) **Volumetric NDE - UT:** As per ASTM A388. All finished forgings of dia/wall thickness **> 40 mm**; All Body & yoke of special class valves & all forgings of SA 182 F91, F92 & F23, SA 336 F91.
Acceptance: ASME Sec.VIII Div. 2 Cl.3.3.4.
- 3) **Surface NDT -**
 - a) **Relevant indication:** Surface-rupture NDE indication with major dimensions > 1.6 mm (1/16 in).
 - b) **Linear indication:** Surface NDE indication whose length is $\geq$ three times its width.
 - c) **Rounded indication:** Surface NDE indication whose length is < three times its width.
 - d) **MPI for CS & AS :** 100% : As per ASTM A275.
Dry MPI: CS, AS (other than SA 182 F91, F92, F23, SA 336 F91) : all sizes.
Wet MPI : SA 182 F91, F92, F23; SA 336 F91: all sizes.
Acceptance: ASME B16.34 Appendix II. Linear Indications like cracks, folds & other injurious defects are unacceptable.
 - e) **LPI for SS:** 100%: ASTM E165. **Acceptance:** No linear indications acceptable.
- 4) **SS:** Finished forgings shall be checked for radioactive contamination and reported. Survey meter shall be used to measure at 5 cm near the surface. Acceptance limits: Shall be less than 0.1 milli Rontgen (MR) per hr or 1 micro Sievert per hr.

7. WORKMANSHIP AND FINISH

Forged items to spec SA336 shall be machined in the inside surface as it is meant for steam application. Items to be proof machined as per drawing or shot blasted for CS/AS; Pickled & passivated as per ASTM A380 for SS, & be free from scales & defects like laps, seams, folds, cracks, etc. Machined items (except SS) to be coated with a layer of transparent rust preventive before despatch.

	BHEL – Tiruchirappalli - 620014, India. Quality Assurance Department TECHNICAL DELIVERY CONDITIONS	DOC No: TDC:0:404 Rev: 19 Effective Date: 05/12/2018 Page: 3 of 3
Product: Carbon, Alloy & Stainless Steel Forgings (Boilers And Valves)		

8. REPAIR

Repairs by fusion welding are prohibited. Surface defects can be removed by mechanical means and defective areas smoothly dressed up with the adjacent surface. Minimum thickness after repair to meet drawing / Specification.

9. MARKING AND PACKING

Details of stamping on each item with low stress stamps: Heat/melt number; material specification, grade & class; Code case number (for Gr 92 & 23); Maker's emblem/code & Inspection Authority's seal. Forgings to be properly packed and dispatched to avoid damage during transit.

10. INSPECTION AND CERTIFICATION

10.1 For IBR Items:

- Products shall be inspected at supplier's works/mill and the applicable IBR Form must be countersigned by the Inspecting Authority as indicated below in case the supplier's works/mill is not recognised as a "Well known Forger/Steel maker" under IBR:
 - ☐ **Imported Items:** Inspecting Authority approved by IBR for the Country of origin.
 - ☐ **Indigenously Supplied items:** Director of Boilers/Chief Inspector of Boilers/Inspecting Authority approved by IBR, for the respective state in India.
- Certification in IBR Form III-G for IBR items from "IBR-Well Known Forger" or "Inspecting Authority", as applicable, to be submitted. IBR Form III-G and a separate **manufacturer** Test certificate in English language with following details, shall accompany the product (including proof machined):
 - Purchase Order No.(BHEL), TDC No & its revision no, Test certificate no & date.
 - Specification, Grade & Class with applicable year of code, Code case number (for Gr 92 & 23), Heat Number, Drawing No., Quantity & Size.
 - Supplier of the steel used in making the finished product (well known and others in IBR Form IV).
 - Melting & forging process, Chemistry with incidental elements-Heat wise, Product analysis, Carbon Equivalent (CE).
 - Heat treatment details of the material and test bars. For F91, F92 supplies – Photomicrograph at 400x resolution.
 - Mechanical test results- Tensile (UTS, YTS (0.2% offset), % elongation, % reduction in area), Bend, Impact, Hardness and NDE test results with reference & acceptance standards.
- Repair details if any, Certified copy of TC for starting material.
- For SS:** Measured Radioactivity levels shall be reported in the Mill Test Certificate (not to be recorded in IBR Form).
- Creep test report as per SIP:RM:01 (latest revision) whenever indicated in the Enquiry/Purchase Order/Engineering Drawing.

10.2 For PED 2014/68/EU (CE-marking) items, the test certificates with details specified in Cl 10 (b) shall be submitted as per BS EN 10204.

- For pressure parts**, test certificates of type 3.1 or 3.2 are acceptable.
Type 3.1 – Suppliers shall have ISO 9001-2008/2015 certification certified by Notified Body recognized by European Community and test certificate certified by supplier's authorized inspection representative.
Type 3.2 – Components inspected and test certificates certified by both the supplier's authorized inspection representative and Notified Body recognized by European Community.
- For non-pressure parts**, test certificates of type 2.2 are acceptable.
Type 2.2 – suppliers test certificates signed by suppliers authorized inspection representative with test results as required by this TDC.

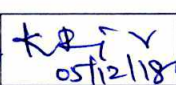
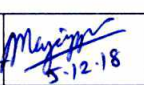
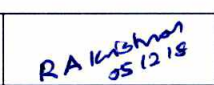
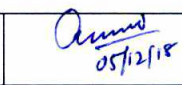
11. AUDIT CHECKS AT BHEL

BHEL reserves the right to carry out audit checks for chemistry, HT condition, mechanical test and NDT on representative test bars or job. Supplies found defective during check or subsequent processing at BHEL will be rejected.

12. END USE

Valve bodies, bonnets, discs, socket ends, body guides, etc., Pressure part fittings in boilers & low, high temperature service like discs, socket weld tees, elbows, weld neck flanges & stubs (except drum nozzles) meeting IBR, ASME Section I, ASME B16.34 and PED 2014/68/EU.

Non pressure part items in boilers and valves: For these, requirements on starting material, bend test and inspection by IBR are not required.

						
Abdur Rahman	G. Panneer Selvam	S. Anand Kumar	K. Rajasekaran	R. Rajappan	R. Ananthakrishnan	Amit Roy
Sr.Engineer/ QA	DGM/QA	SDGM/PE/ FB	DGM/Valves/ Engg	SDGM/MM	AGM/Valves/ Purchase	AGM/QA& BE
Prepared By	Reviewed By					Approved By