



**Bharat Heavy Electricals Limited**  
Industrial Valves Plant  
Goindwal Sahib (Punjab)

**Enquiry No.**  
**2223-035E**

**Date:**  
**03.09.2022**

**NOTICE INVITING TENDER (NIT)**

Dear Sir / Madam,

BHEL Goindwal Sahib (Punjab) invites offers from interested bidders / suppliers for submission of their offer through e-procurement mode at <https://eprocurebhel.co.in/>. Offers in any other mode will not be accepted. In case of any difficulty faced while registering on BHEL's e-Procurement portal developed by NIC, queries may be addressed to 0120-4001002, 0120-4001005 and 0120-6277787; email: [support-eproc@nic.in](mailto:support-eproc@nic.in). These details are also available on 'Contact Us' page of the portal.

<b>Tender enquiry no. &amp; date</b>	2223-035E dated 03.09.2022
<b>Form of contract</b>	Supply
<b>Tender / Item description</b>	Eyebolts and Nuts
<b>Material standard / Drawings</b>	As per attached TDC(s) and Drawings.
<b>Location(s) of Supply / Work</b>	BHEL, IVP Goindwal, Punjab – 143422, India.
<b>Earnest Money Deposit (EMD)</b>	Not Applicable
<b>Quotation parts</b>	Two Part Bid
<b>Tender download / Bid submission start date</b>	<b>03.09.2022 (17:00 Hrs. IST)</b>
<b>Tender download / Bid submission end date</b>	<b>14.09.2022 (14:00 Hrs. IST)</b>
<b>Tender / Bid opening date</b>	<b>14.09.2022 (15:30 Hrs. IST)</b>
<b>Validity of offer (In days)</b>	70 days from techno commercial bid opening (Part I)
<b>Quantity variation</b>	+/- 10% of tender quantity
<b>Delivery schedule</b>	Within 90 days from the date of PO placement / LOI
<b>Tender evaluation</b>	Item Wise
<b>Reverse auction</b>	Not Applicable
<b>MSE reserved</b>	Yes, Items are reserved for MSE Manufactures
<b>Contact person details</b>	Sumeet Bansal, Sr. Manager 01859-224 628, <a href="mailto:sbansal@bhel.in">sbansal@bhel.in</a>  Pranshu, Dy. Manager 01859-224 685, <a href="mailto:pranshu@bhel.in">pranshu@bhel.in</a>



## SPECIAL TERMS AND CONDITIONS

Tender Enquiry No. 2223-035E Dated 03.09.2022 **Due date 14.09.2022**

**Tender Description:** Supply of Eyebolts and Nuts

### S1. SCOPE OF SUPPLY

Material shall be supplied as per the applicable TDC/drawing as mentioned in the Table - 1. National & International material standards shall have to be arranged by bidders themselves.

**Table 1 : List of Items along with Applicable TDC (Technical Delivery Condition) and Drawing Number.**

Sl. No.	Material Code	Description	Quantity (Nos.)	Drawing No.	TDC No.	L1 Comparison will be done as (A)
10	964562300000	EYE BOLT-5/8"x130 - B7-N224	1000.000	3VN22406880/03	--	SET
20	964562800000	NUT -5/8" - 2H-N025	1000.000	3VN02506876/03	TDC:5:164/09	
30	964562640000	EYE BOLT-5/8"x75 -B7-N033	2000.000	3VN03306880/04	--	SET
40	964562800000	NUT -5/8" - 2H-N025	2000.000	3VN02506876/03	TDC:5:164/09	
50	964562650000	EYE BOLT-5/8"x90 -B7-N001	2000.000	3VN00106880/04	--	SET
60	964562800000	NUT -5/8" - 2H-N025	2000.000	3VN02506876/03	TDC:5:164/09	
70	921513120000	EYEBOLT-W001	100.000	3VW00120548F/02	TDC:0:309/12	Number

**Quality Assurance Plan Applicable is BHE:QP:FAS:02 dt. 15.03.2019.**

***SPECIAL NOTE:***

- Bidder has to submit Unit rate for Each item in the Price Bid/BOQ (Part-II), However evaluation of rates shall be done as per column A (L1 Comparison will be done as). Wherever unit of comparison is set, the quotation where bidders have quoted for both Studs and nuts (i.e. both items of set) shall only be considered. The material should be supply in assembled condition wherever unit of L1 Comparison is set. Wherever unit of L1 Comparison is no (number), the comparison will be done no (number) wise only.*
- The L1 evaluation will be done as per Set wise or number wise as per unit of L1 Comparison mentioned in column A of above table, so please take special attention while quoting prices in Part-II (BOQ).*

**ALL THESE ABOVE ITEMS ARE RESERVED FOR MSE MANUFACTURERS ONLY.**



## SPECIAL TERMS AND CONDITIONS

Tender Enquiry No. 2223-035E Dated 03.09.2022 **Due date 14.09.2022**

**Tender Description:** Supply of Eyebolts and Nuts

### **S2. PRE-QUALIFICATION CRITERIA (PQC)**

Bidder has to submit following documents to fulfil PQC:

1. Supplier shall be manufacturer of Fasteners. Offers from Traders/Dealers/Stockists/agents will summarily be rejected. Submission of UAM/Udyam Certificate or any valid Certificate from bidder for proof as MSE manufacturer is mandatory.
2. Bidder has to submit one or more purchase order/s of Fasteners from any customer with minimum cumulative value of Rs. 1,00,000 (One Lac) as proof. PO date should be 01.09.2019 or afterwards". The invoice copies w.r.t. submitted PO are also required as proof of order completion.

Start-ups shall be exempted from this criterion of Purchase order and invoice submission without any relaxation in quality standards or technical parameters as per D.O. No. 5(4)/2016-BE-I dated 15.02.2017. For claiming Start-Up exemption, vendors have to submit DPIIT (Dept. of Promotion of Industry and Internal Trade)/DIPP (Department for Industrial Policy and Promotion) recognition certificates.

### **S3. PART-I: TECHNO-COMMERCIAL BID**

**This tender is through e-procurement mode** for supply of "Eyebolts and Nuts" as per specifications mentioned in below tender terms. Bidder has to submit their offer on BHEL e-Procurement portal at <https://eprocurebhel.co.in/>. **Offer in any other mode will not be accepted.** Please refer clause no. 1.2 of General Contract Conditions of MM Tenders (GCC), regarding instructions to bidder for submission of offer on BHEL e-procurement portal.

Tenders shall be submitted in Two parts on or before the due date and time indicated in the NIT

#### **Part-I: Techno-Commercial Bid**

Bid should contain all the documents/confirmations as per following details:

- a) Acceptance of Techno-Commercial terms and conditions shall be attached along with bid document (Duly filled Part-I Techno-Commercial Bid Questionnaire)

*IF THE OFFER IS NOT ACCOMPANIED WITH ACCEPTANCE OF TERMS AND CONDITIONS, IT SHALL BE CONCLUDED THAT ALL THE TERMS AND CONDITIONS ARE ACCEPTABLE AND NO CLAIM WHATSOEVER SHALL BE ENTERTAINED LATER ON.*

- b) Documents as per Pre-Qualification Criteria (PQC).
- c) Duly filled Annexure-A (Declaration for RESTRICTIONS UNDER RULE 144(XI))
- d) Any other document (if any)

#### **Part-II: Price Bid**

Price Bid as per the attached format.

### **S4. REVERSE AUCTION**



## SPECIAL TERMS AND CONDITIONS

Tender Enquiry No. 2223-035E Dated 03.09.2022 **Due date 14.09.2022**

**Tender Description:** Supply of Eyebolts and Nuts

Reverse auction will not be conducted in this tender enquiry.

### **S5. DELIVERY SCHEDULE**

Delivery shall be within 90 days from date of Purchase Order/ Letter of Intent.

### **S6. LOADING CRITERIA CUM COUNTER OFFER**

No counter-offer will be given in this Tender Enquiry.

**These Special terms & conditions along with NIT and General Contract Conditions (GCC) collectively are the part of tender terms and conditions.**



## General Contract Conditions (GCC) of MM Tenders

### BHARAT HEAVY ELECTRICALS LIMITED

Industrial Valve Plant: 433, Industrial Complex,  
Goindwal Sahib, Dist. Tarn Taran,  
Punjab-143422 (INDIA)

## TABLE OF CONTENTS

1. INSTRUCTION TO BIDDER.....	2
2. SCOPE OF SUPPLY .....	2
3. PRICE BASIS .....	3
4. DISCREPANCY IN WORDS AND FIGURES.....	3
5. EVALUATION IN CASE OF MORE THAN ONE L-1 BIDDER.....	3
6. REVERSE AUCTION .....	4
7. VALIDITY OF OFFERS .....	4
8. SUPPLIED MATERIAL ADJUSTMENT.....	4
9. DELIVERY SCHEDULE .....	4
10. LIQUIDATED DAMAGES (LD) FOR LATE DELIVERY .....	4
11. PAYMENT TERMS .....	5
12. TAXES & DUTIES.....	5
13. LIABILITY UNDER REVERSE CHARGE (RCM) .....	6
14. ACCESS TO MANUFACTURING PREMISES .....	6
15. INSPECTION .....	6
16. GUARANTEE / WARRANTEE AND CORRESPONDING REPAIR / REPLACEMENT OF GOODS.....	7
17. LOI (LETTER OF INTENT).....	7
18. SUB-CONTRACT .....	7
19. RISK PURCHASE.....	7
20. FORCE MAJEURE .....	8
21. NON-DISCLOSURE AGREEMENT.....	9
22. CLARIFICATIONS .....	9
23. PREFERENCES FOR MICRO AND SMALL ENTERPRISES (MSEs).....	9
24. PREFERENCE TO MAKE IN INDIA .....	10
25. RESTRICTIONS UNDER RULE 144(XI) OF THE GENERAL FINANCIAL RULES (GFRs), 2017 .....	10
26. DISPUTES.....	11
27. JURISDICTION.....	11
28. BANNED FIRMS .....	11
29. FRAUD PREVENTION POLICY.....	11
30. PREVENTIVE CHECKS TO ELIMINATE SUSPECTED CARTEL FORMATION .	11
31. SUSPENSION OF BUSINESS DEALINGS WITH DEFAULTERS.....	11
32. GENERAL.....	12





## General Contract Conditions (GCC) of MM Tenders

### BHARAT HEAVY ELECTRICALS LIMITED

Industrial Valve Plant: 433, Industrial Complex,  
Goindwal Sahib, Dist. Tarn Taran,  
Punjab-143422 (INDIA)

## 1. 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.**

### 1.1 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. Quotations can also be submitted through e-mail at [tendermm\\_ivp@bhel.in](mailto:tendermm_ivp@bhel.in). Offers received in time shall be considered only when offers are complete in all respects. In case of bulky tenders, please handover quotation to Sh. Rakesh Kumar/ SDGM - Head-MM or Sh. Sumeet Bansal / Sr. Manager - MM [Contact: 01859 224 615 / 628]. Bid can be sent to following address:

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

### 1.2 Instruction to bidder (In case of E-Procurement)

- Interested bidders / suppliers shall submit their offer through e-procurement mode at <https://eprocurebhel.co.in/>.
- Offers in any other mode will not be accepted.**
- Procedure for submission of tender is available in the "Bidder Manual Kit" at e-tender portal <https://eprocurebhel.co.in/>.
- In case of any difficulty faced while registering on BHEL's e-Procurement portal developed by NIC, queries may be addressed to 0120-4001002, 0120-4001005 and 0120-6277787; email: [support-eproc@nic.in](mailto:support-eproc@nic.in). These details are also available on 'Contact Us' page of the portal.
- 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.
- Disclaimer clause:** Neither the Organization (Bharat Heavy Electricals Ltd.) nor the service provider is responsible for any failure of submission of bids due to failure of internet or other connectivity problems or reasons thereof.

## 2. 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 Enquiry. National





## General Contract Conditions (GCC) of MM Tenders

### BHARAT HEAVY ELECTRICALS LIMITED

Industrial Valve Plant: 433, Industrial Complex,  
Goindwal Sahib, Dist. Tarn Taran,  
Punjab-143422 (INDIA)

& International material Standards shall have to be arranged by vendors themselves. Latest applicable revisions of standards/procedures to be referred.

All required tests as called in referred material standard/BHEL/TDC/drawing etc. shall be carried out by vendor at no extra cost. Material Test Certificates (MTC), inspection reports and Compliance/Guarantee Certificate are to be provided along with the supplies.

### 3. PRICE BASIS

1. Order of enquiry item sl. no. shall be maintained in the quotation.
2. The rates quoted shall be firm and fixed. No price variation is proposed and allowed.
3. Rates quoted should be FOR BHEL Goindwal basis. The offers quoted on other than FOR Goindwal basis are liable to be rejected.

In case bidder has quoted Ex-works prices, then he/she will be given an opportunity to accept price basis as FOR Goindwal either by accepting delivery as FOR Goindwal in same quoted price or by providing loading factor on his/her quoted ex-works prices to make them FOR prices.

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

### 4. DISCREPANCY IN WORDS AND FIGURES

1. 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.
2. 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
3. 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.
4. 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.
5. 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.
6. All overwriting/cutting, etc will be numbered by bid opening officials and announced during bid opening.

### 5. EVALUATION IN CASE OF MORE THAN ONE L-1 BIDDER

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.





## General Contract Conditions (GCC) of MM Tenders

### BHARAT HEAVY ELECTRICALS LIMITED

Industrial Valve Plant: 433, Industrial Complex,  
Goindwal Sahib, Dist. Tarn Taran,  
Punjab-143422 (INDIA)

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 bidder(s) or their representative(s).

Ranking will be done accordingly. BHEL's decision in such situations shall be final and binding.

#### 6. REVERSE AUCTION

In case, it is declared in special terms & conditions of tender enquiry that RA is applicable for the NIT, then RA will be conducted as per following clause:

BHEL shall be resorting to Reverse Auction (RA) (Guidelines as available on <https://www.bhel.com/>) for this tender. RA shall be conducted among the techno-commercially qualified bidders as per RA guidelines.

Price bids of all techno-commercially qualified bidders shall be opened and same shall be considered for RA. In case any bidder(s) do(es) not participate in online Reverse Auction, their sealed envelope price bid along with applicable loading, if any, shall be considered for ranking.

#### 7. 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 tender extension, the bid validity shall be considered from the date of tender opening.

#### 8. 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 that vendor should reconcile the pending PO statement every month/frequently with BHEL. Vendor can also view these details at Portal (<https://trichy.bhel.com/mm/index.jsp>).

#### 9. 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. Commencement of delivery period shall be reckoned from the date of PO / LOI or any other agreed milestone.

#### 10. LIQUIDATED DAMAGES (LD) 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% of the undelivered portion per week of the delay or part thereof subject to a maximum of 10% of the undelivered portion.





## General Contract Conditions (GCC) of MM Tenders

### BHARAT HEAVY ELECTRICALS LIMITED

Industrial Valve Plant: 433, Industrial Complex,  
Goindwal Sahib, Dist. Tarn Taran,  
Punjab-143422 (INDIA)

In case of Ex-works delivery terms for indigenous supplies, the document date (Invoice/Challan date) in Goods Receipt (GR) document shall be reckoned for LD deduction. In case of FOR Delivery terms for Indigenous supplies, the posting date in GR document shall be reckoned for LD deduction.

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.

## 11. PAYMENT TERMS

1. 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.
2. 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.
3. GST registration number is to be submitted by qualified vendor as per GST law.
4. It is mandatory to mention proper material codes in the invoices and separate invoices to be raised for different POs.
5. **BHEL releases payment through EFT mode ONLY. Necessary details may please be submitted by filling required format before release of payment.**

## 12. TAXES & DUTIES

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

- a) Vendor declaring such invoice in his GSTR-1 and
- b) Receipt of goods and Tax invoice by BHEL and
- c) Confirmation of payment of GST thereon by vendor on GSTN portal.
- d) 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.

Following may please be noted for availing Input Tax Credit (ITC) by BHEL:





## General Contract Conditions (GCC) of MM Tenders

### BHARAT HEAVY ELECTRICALS LIMITED

Industrial Valve Plant: 433, Industrial Complex,  
Goindwal Sahib, Dist. Tarn Taran,  
Punjab-143422 (INDIA)

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.

### 13. 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.

### 14. 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.

### 15. INSPECTION

1. The seller shall give adequate notice, of 1 week or as mutually agreed period, in writing to the Purchaser about the date and place at which the goods will be ready for inspection/ testing, as provided for in the contract.
2. Purchaser or his authorized representative shall be entitled to carry out inspection of material and workmanship/Surveillance Audit at Seller's premises or at his sub-contractor's premises at all reasonable times during execution of contract; Such inspection, examination and testing, if made, shall not absolve the Seller from his obligations under the contract. No additional charges shall be claimed for such inspections. Moreover, all required infrastructure (testing, tools etc) have to be arranged by supplier.
3. 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.
4. 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.





## General Contract Conditions (GCC) of MM Tenders

### BHARAT HEAVY ELECTRICALS LIMITED

Industrial Valve Plant: 433, Industrial Complex,  
Goindwal Sahib, Dist. Tarn Taran,  
Punjab-143422 (INDIA)

5. 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.

#### **16. GUARANTEE / WARRANTEE AND CORRESPONDING REPAIR / REPLACEMENT OF GOODS**

Goods shall comply with the specifications for material, workmanship and performance. Unless otherwise specified, vendor shall give a guarantee / warrantee for a period of 18 months from the date of receipt. In case of non-acceptance of this term, bid shall be liable for rejection.

If the delivery is found non-compliant during the warranty period, leading to rejection, the Seller shall arrange free replacement / repair of goods, within one month from the date of intimation or any mutually agreed period. Corresponding quantity shall be treated as unsupplied against respective purchase order till replacement is received at BHEL.. In the event of the Seller's failure to comply, Purchaser may take action as appropriate, including repair / replenish rejected goods, at the risk & cost of the Seller.

Lifting of rejected material is under Supplier's scope. BHEL will inform related invoice, quantity etc. to supplier. Supplier has to give advance intimation / plan (Transporter, Vehicle details) for the lifting of material. Further supplier has to provide requisite documents (such as Credit Note, e-Way Bill etc.) to lift the rejected material. Material should be lifted within one month from date of intimation. After one-month, BHEL will not be responsible for rejected material and BHEL shall have the right to dispose off such rejected material.

#### **17. 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.

#### **18. 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.

#### **19. RISK PURCHASE**

Risk & Cost Clause, in line with Conditions of PO may be invoked in any of the following cases:

- i) Supplier's poor progress of the supply vis-à-vis delivery/execution timeline as stipulated in the Contract, backlog attributable to supplier including unexecuted portion of supply that does not appear to be executable within balance available period
- ii) Withdrawal from or abandonment of the supply by contractor before completion as per contract.
- iii) Non-supply by the Supplier within scheduled completion/delivery period as per Contract or as extended from time to time, for the reasons attributable to the supplier.





## General Contract Conditions (GCC) of MM Tenders

### BHARAT HEAVY ELECTRICALS LIMITED

Industrial Valve Plant: 433, Industrial Complex,  
Goindwal Sahib, Dist. Tarn Taran,  
Punjab-143422 (INDIA)

- iv) Termination of Contract on account of any other reason (s) attributable to Supplier.
- v) Assignment, transfer, subletting of Contract without BHEL's written permission resulting in termination of Contract or part thereof by BHEL.
- vi) Non-compliance to any contractual condition or any other default attributable to Supplier.

The value shall be calculated as follows:

$$\text{Risk \& Cost Amount} = [(A-B) + (A \times H/100)]$$

Where,

A= Value of Balance scope of Supply (\*) as per rates of new contract

B= Value of Balance scope of Supply (\*) as per rates of old contract being paid to the supplier at the time of termination of contract i.e. inclusive of PVC, if any.

H = Overhead Factor shall be taken as 5

In case (A-B) is less than 0 (zero), value of (A-B) shall be taken as 0 (zero).

**\* Balance Scope of Supply:** Difference of Contract Quantities and Executed Quantities as on the date of issue of Letter for 'Termination of Contract', shall be taken as balance scope of Supply for calculating risk & cost amount.

Contract quantities are the quantities as per original contract. If, Contract has been amended, quantities as per amended Contract shall be considered as Contract Quantities.

Recoveries from the supplier on whom Risk & Cost has been invoked shall be made from following:

- (i) Dues available in the form of Bills payable to supplier, SD, BGs against the same contract.
- (ii) Dues payable to supplier against other contracts in the same Unit of BHEL.
- (iii) Dues payable to supplier against other contracts in the different Regions / Units of BHEL.
- (iv) Legal options for recovery of dues payable by the supplier.

## 20. 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.





## General Contract Conditions (GCC) of MM Tenders

### BHARAT HEAVY ELECTRICALS LIMITED

Industrial Valve Plant: 433, Industrial Complex,  
Goindwal Sahib, Dist. Tarn Taran,  
Punjab-143422 (INDIA)

## 21. NON-DISCLOSURE AGREEMENT

All Drawing and technical documents relating to the product or it's manufacture submitted by one party to the other, prior or subsequent to the formation of contract, shall remain property of the submitting party. Drawing, technical documents or other technical information received by one party, shall not without the consent of the other party, be used for any other purpose than that, for which they were provided. Such technical information shall not without the consent of the submitting party, otherwise be used or copied, reproduced, transmitted or communicated to a third party. Patterns supplied by BHEL will remain BHEL's property which shall be returned by the bidder on demand to BHEL. Bidder shall in no way share or use such intellectual property of BHEL to promote his own business with others. ***BHEL reserves the right to claim damages from the bidder, or take appropriate penal action as deemed fit against the bidder, for any infringement of the provisions contained herein.***

## 22. 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.

## 23. PREFERENCES FOR MICRO AND SMALL ENTERPRISES (MSEs)

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”, or as per latest guidelines issued by government 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





## General Contract Conditions (GCC) of MM Tenders

### BHARAT HEAVY ELECTRICALS LIMITED

Industrial Valve Plant: 433, Industrial Complex,  
Goindwal Sahib, Dist. Tarn Taran,  
Punjab-143422 (INDIA)

- 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 **Udyam Registration Certificate** along with the offer. No other document shall be considered for availing MSE benefits. Non-submission of such document 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 cleared before price bid opening. If the tender is to be submitted through e-procurement portal, then the above required document is to be uploaded on the portal.

*Note: It may however be noted that MSE guidelines as on date (Date of Technical Bid Opening Part-I) shall prevail.*

#### 24. PREFERENCE TO MAKE IN INDIA

This procurement shall be governed by notification no. P-45021/2/2017-PP (BE-II) dated 16.09.2020 of Government of India issued by DPIIT and subsequent circulars issued afterwards. Accordingly, the minimum local content, the margin of purchase preference and the procedure for purchase preference to make in India shall be adhered.

#### 25. RESTRICTIONS UNDER RULE 144(XI) OF THE GENERAL FINANCIAL RULES (GFRs), 2017

All provisions of Order No. F.No.6/18/2019-PPD of Department of Expenditure (DoE) shall be applicable for this tender enquiry (Order copy is available at <https://doe.gov.in/procurementpolicy-divisions>). Accordingly, any bidder from a country which shares a land border with India (except the countries to which the Govt. of India has extended lines of credit or in which the Govt. of India is engaged in development projects for which list is available at <https://www.mea.gov.in/>) will be eligible to bid in this tender only if the bidder is registered with the Competent Authority as specified in Annex I of the said Order of DoE.

Updated list of the countries to which lines of credit have been extended or in which development projects are undertaken are available on the Ministry of External affairs website (<https://www.mea.gov.in/>)

For the purpose of this order, definition of Bidder from a country which shares a land border with India shall be same as defined in the Annex III of the said order.

Registration with the competent authority as stipulated in the said order is responsibility of bidder. **Bidder has to submit a certificate certifying following along with offer:**

"I have read the clause regarding restrictions on procurement from a bidder of a country which shares a land border with India; I certify that this bidder is not from such a country or, if from such a country,





## General Contract Conditions (GCC) of MM Tenders

### BHARAT HEAVY ELECTRICALS LIMITED

Industrial Valve Plant: 433, Industrial Complex,  
Goindwal Sahib, Dist. Tarn Taran,  
Punjab-143422 (INDIA)

has been registered with the Competent Authority. I hereby certify that this bidder fulfils all requirements in this regard and is eligible to be considered. [*Where applicable, evidence of valid registration by the Competent Authority shall be Attached*].”

#### 26. 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.

#### 27. JURISDICTION

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

#### 28. 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 <https://www.bhel.com/>.

#### 29. 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 <https://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.

#### 30. PREVENTIVE CHECKS TO ELIMINATE SUSPECTED CARTEL FORMATION

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.

#### 31. 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 <https://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

### BHARAT HEAVY ELECTRICALS LIMITED

Industrial Valve Plant: 433, Industrial Complex,  
Goindwal Sahib, Dist. Tarn Taran,  
Punjab-143422 (INDIA)

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 commits 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 <https://www.bhel.com/> and/or under applicable legal provisions

## 32. GENERAL

1. 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.
2. 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.
3. 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.
4. 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.
5. BHEL may increase/decrease item/s based on BHEL requirement before price bid opening. Suitable price implication may be asked from suppliers.
6. 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.





## General Contract Conditions (GCC) of MM Tenders

### BHARAT HEAVY ELECTRICALS LIMITED

Industrial Valve Plant: 433, Industrial Complex,  
Goindwal Sahib, Dist. Tarn Taran,  
Punjab-143422 (INDIA)

7. 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.
8. In case of unscheduled holiday on opening day of tender, the next working day will be treated as scheduled prescribed day of opening of tender.
9. 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.
10. 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.
11. 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.
12. 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.
13. The bidder has to keep track of any changes by viewing the addendum(s) / 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.
14. Unregistered suppliers, who are techno-commercially qualified against the open tender, are requested to register with BHEL as permanent supplier by submitting the Supplier Registration Form (SRF). SRF is available at <https://www.bhel.com/supplier-registration>.
15. Any term in special tender terms and conditions will supersede the GCC.



## **ANNEXURE - A**

### **RESTRICTIONS UNDER RULE 144(XI) OF THE GENERAL FINANCIAL RULES (GFRs), 2017**

**(The bidders are required to print this on their company's letterhead & sign, stamp and submit with offer documents)**

I have read the clause regarding restrictions on procurement from a bidder of a country which shares a land border with India; I certify that bidder (... Name of Bidder) is not from such a country or, if from such a country, has been registered with the Competent Authority. I hereby certify that bidder (.....Name of bidder) fulfils all requirements in this regard and is eligible to be considered.

If the bidder is from such country which shares a land border with India evidence of valid registration by the Competent Authority shall also be attached along with offer.”

With regards

Signature with company seal

Name –

Company / Organization

Designation within Company / Organization

Address of Company / Organization

**PART-I (TECHNO-COMMERCIAL BID)**

(To be filled by bidder &amp; submit with offer as pdf file only)

**Tender Enquiry No. & Date****2223-035E, Dt. 03.09.2022****Tender Description****Supply of Eyebolts and Nuts**

Bidder must note following points:

1. This workbook is protected, except for cells where comments / confirmation is to be given by bidder.
2. Bidder is advised not to unprotect / tamper the sheet / alter the terms mentioned in the sheet.
3. Any alteration to terms mentioned by BHEL will be considered as tampering and bidder's offer shall be liable for rejection.
4. Bidders are advised to only fill the unprotected cells (shaded cells) by dropdown or writing the comments as applicable as their confirmation. Bidders are advised to submit duly filled & signed 'PDF' file as techno-commercial (Part-I) bid'. Failure on the part of bidder in not returning this duly filled-up techno-commercial bid and / or submitting incomplete replies may lead to rejection of bidder's quotation.
5. All the commercial terms and conditions shall be indicated by vendor in this format only and nowhere else in his quotation. However, in case the space for vendor's reply is not sufficient against a particular question, the vendor shall furnish same by way of separate annexure / sheet attached to this questionnaire, indicating cross-reference of respective clauses.

**BIDDER'S DETAILS**

Sr. No.	Elements	Remarks
1	Bidder's Name	
2	Quotation reference no. & date	
3	Contact Person's Name (s):	
4	Email ID (s)	
5	Mobile No. (s)	
6	Tel. No. (s)	
7	Fax No.	
8	Office Address	
9	Works Address	
10	GST No.	
11	PAN No.	

**TECHNICAL CONDITION DETAIL**

Sr. No.	Elements	Response	Remarks
1	Technical : Supply of Eyebolts and Nuts as per tender documents (if selected 'Accepted with deviation', please mention the deviation clearly)		

**COMMERCIAL CONDITIONS & DETAILS**

Sr. No.	Elements	Response	Remarks (if any)
1	Delivery term: FOR BHEL IVP Goindwal (refer tender terms & conditions)	Select from the drop down list	
2	IGST supply (%)	Select from drop down list	
3	SGST supply (%)	Select from drop down list	
4	CGST supply (%)	Select from drop down list	
5	Payment term: As per Clause 11 of the General Contract Conditions (GCC).	Select from the drop down list	
6	Delivery period: Within 90 days from placement of PO / LOI. (refer tender terms & conditions)	Select from the drop down list	
7	Validity: 70 days from techno commercial bid opening. (refer tender terms & conditions)	Select from the drop down list	
8	LD clause: Penalty for late delivery will be applicable @ 0.5% per week or part thereof subject to a maximum of 10.0 %. (refer tender terms & conditions)	Select from the drop down list	
9	Risk purchase: If the supplier fails to deliver the goods within the delivery specified in the Purchase Order, BHEL will be entitled to terminate the contract and to Purchase elsewhere at the risk and cost of the seller either the whole of the goods or any part which the supplier has failed to deliver or despatch within the delivery period mentioned in the Purchase Order. (Refer Cl. 19 of GCC in Tender Terms & Conditions)	Select from the drop down list	
10	Firm Price: The quoted / finalised rates shall be firm till execution of the supplies.	Select from the drop down list	
11	<b>Guarantee / Warranty Period:</b> Supplier shall give a warrantee for a period of 18 months from the date of receipt. In case of non-acceptance of this term bid will be rejected. (Refer clause no. 16 of GCC)	Select from the drop down list	
12	Please attach valid MSE certificate latest MSME Guidelines	Select from drop down list	

13	Compliance to RESTRICTIONS UNDER RULE 144(XI) OF THE GENERAL FINANCIAL RULES (GFRs), 2017. Bidder has to attach the undertaking along with offer as per <b>Annexure-A</b> (refer tender terms & conditions)	Select from drop down list	
14	I have thoroughly gone through the attached tender terms & conditions and understood the above techno-commercial requirements	Select from the drop down list	

**Item detail**

Item Sl. no.	Material Code	Description	Qty in no	Quoted / not quoted
10	964562300000	EYE BOLT-5/8"x130 -B7-N224	1000	Select from the drop down list
20	964562800000	NUT -5/8" -2H-N025	1000	Select from the drop down list
30	964562640000	EYE BOLT-5/8"x75 -B7-N033	2000	Select from the drop down list
40	964562800000	NUT -5/8" -2H-N025	2000	Select from the drop down list
50	964562650000	EYE BOLT-5/8"x90 -B7-N001	2000	Select from the drop down list
60	964562800000	NUT -5/8" -2H-N025	2000	Select from the drop down list
70	921513120000	EYEBOLT-W001	100	Select from the drop down list

We further, confirm that we have quoted the rates in the tender considering Inter-alia the

1. Tender Document(s)
2. Additional Document(s) (if any)
3. BOQ Document (Price Bid Format-Part-II)
4. Corrigendum (if any)
5. Pre Bid Meeting Minutes (if any)

We hereby certify that we have fully read and thoroughly understood the tender requirements and accept all terms and conditions of the tender including all corrigendum/addendum issued (if any). Our offer is in confirmation to all the terms and conditions of the tender including all corrigendum/addendum (if any) and minutes of the pre-bid meeting (if any). In the event our offer is found acceptable and Order is placed /Contract is awarded to us, the complete tender document shall be considered for constitution of Order / Contract Agreement.

[Validate](#)[Print](#)[Help](#)

### Item Wise BoQ

Tender Inviting Authority: BHEL IVP Goindwal Sahib

Name of Work: Supply of Eyebolts and Nuts

Contract No: 2223-035E Dated 03.09.2022.

Name of the Bidder/ Bidding Firm / Company :	
--	--

#### PRICE SCHEDULE

(This BOQ template must not be modified/replaced by the bidder and the same should be uploaded after filling the relevant columns, else the bidder is liable to be rejected for this tender. Bidders are allowed to enter the Bidder Name and Values only )

NUMBER #	TEXT #	TEXT #	NUMBER #	TEXT #	NUMBER #	NUMBER #
Sl. No.	Item Description	Item Code / Make	Quantity	Units	BASIC RATE In Figures To be entered by the Bidder in Rs. P	TOTAL AMOUNT excluding taxes in Rs. P
10	EYE BOLT-5/8"x130 -B7-N224	964562300000	1000	No.		0.00
20	NUT -5/8" -2H-N025	964562800000	1000	No.		0.00
30	EYE BOLT-5/8"x75 -B7-N033	964562640000	2000	No.		0.00
40	NUT -5/8" -2H-N025	Same as Sr. no. 20	2000	No.		0.00
50	EYE BOLT-5/8"x90 -B7-N001	964562650000	2000	No.		0.00
60	NUT -5/8" -2H-N025	Same as Sr. no.40	2000	No.		0.00
70	EYEBOLT-W001	921513120000	100	No.		0.00
<b>Total in Figures</b>						<b>0.000</b>

11 / 08890-0000-A-Σ  
DRAWING NO. ON REVERSE

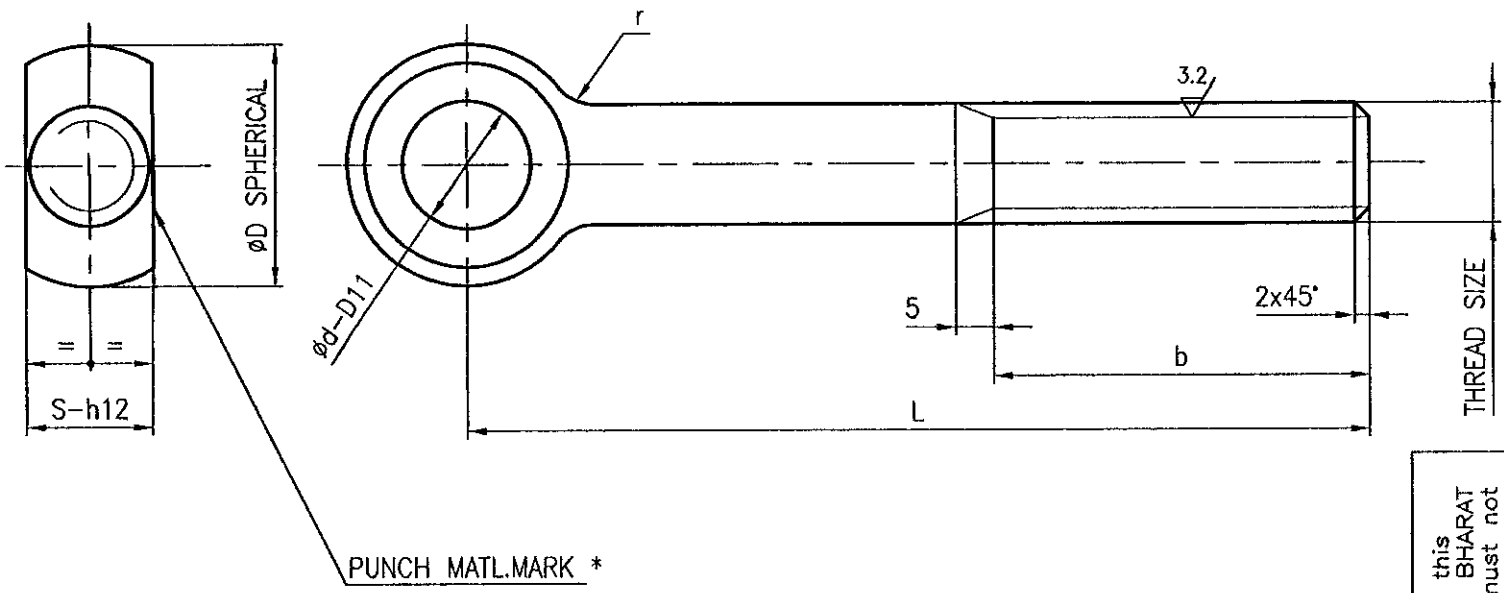
12.5 3.2

SL. No.	DRAWING NUMBER	MATERIAL CODE	MATL.SPECN.	THREAD SIZE	NET Wt.(kg)	DIMENSIONS						* MATL. MARK	APPLICABLE VALAVES
						L	b	r	S-h12	ød-D11	øD		
01	3-V-N073-06880/04	96 456 263 0000	ASTM A193-B7, HT, CERTIFY	1/2"-13UNC-2A	0.07	60	30	6	14	13.5	25	B7	2" & 3"/150C 3"/300C
02	3-V-N033-06880/04	96 456 264 0000		5/8"-11UNC-2A	0.16	75	38	6	17	17	32	B7	4"/150C 4"/300C
03	3-V-N001-06880/04	96 456 265 0000		5/8"-11UNC-2A	0.18	90	38	6	17	17	32	B7	6",8" & 12"/150C 6" & 8"-300C
04	3-V-N057-06880/04	96 456 266 0000		5/8"-11UNC-2A	0.23	120	38	6	17	17	32	B7	10"/150C
05	3-V-N206-06880/03	96 456 397 0000		5/8"-11UNC-2A	0.20	100	38	6	17	17	32	B7	10"/150C & 10"/300C
06	3-V-N224-06880/03	96 456 230 0000		5/8"-11UNC-2A	0.26	130	50	6	17	17	32	B7	14",16" & 20"/150C
07	3-V-C329-06880/03	96 456 432 0000		5/8"-11UNC-2A	0.22	110	40	6	17	17	32	B7	4"-900C
08	3-V-F503-06880/01	96 456 679 0000		1/2"-13UNC-2A	0.08	75	40	6	14	13.5	25	B7	3" & 4"-600C
09	3-V-N361-06880/01	96 456 690 0000		5/8"-11UNC-2A	0.31	160	50	6	17	17	32	B7	24"/150C
10	3-V-N201-06880/01	96 456 818 0000		1/2"-13UNC-2A	0.061	50	30	6	14	13.5	25	B7	2"-150C
11	3-V-M768-06880/01	96 456 853 0000	A320-Gr.L7 HT,CERTIFY	1/2"-13UNC-2A	0.07	60	30	6	14	13.5	25	L7	2" & 3"/300C 3"/150C
12	3-V-M769-06880/01	96 456 854 0000		5/8"-11UNC-2A	0.16	75	38	6	17	17	32	L7	4"/150C 4"/300C
13	3-V-M770-06880/01	96 456 855 0000		5/8"-11UNC-2A	0.18	90	38	6	17	17	35	L7	6" & 8"-300C 6" & 8"-150C
14	3-V-F501-06880	96 465 083 0000	A193-B7 HT,CERTIFY	1/2"-13UNC-2A	0.09	90	30	6	14	13.5	25	B7	2"-600C

DIMENSIONS	h12	D11
10 TO 18	0	+0.160
	-0.180	+0.050

**NOTES:**

1. EYE BOLT TO BE MADE OUT OF FORGING.



DRAWING RETRACED WITH REVISION 11 ON 12.06.01 (REFER DCN.HM:393)

NO OFF	DESCRIPTION	MATL CODE	MATL SPECN	HEAT TREATMENT	SCRAP SORT	NET WT (kg)	GROSS WT (kg)	DRAWING No	ITEM No
--------	-------------	-----------	------------	----------------	------------	-------------	---------------	------------	---------

TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT: **CS**



BHARAT HEAVY ELECTRICALS LTD. UNIT: HIGH PRESSURE BOILER PLANT. TIRUCHIRAPALLI 620014.	DRN	K.P.LEON	SIGN	DATE	NO.OF VAR.
	CHD	T.R.R.MURTHY	T.R.R.	12.06.01	-
	APPD	P.Boomnathan	P.B.	12.06.01	-

REV	DATE	ALTERED
11	02.07.97	CHD & APPD

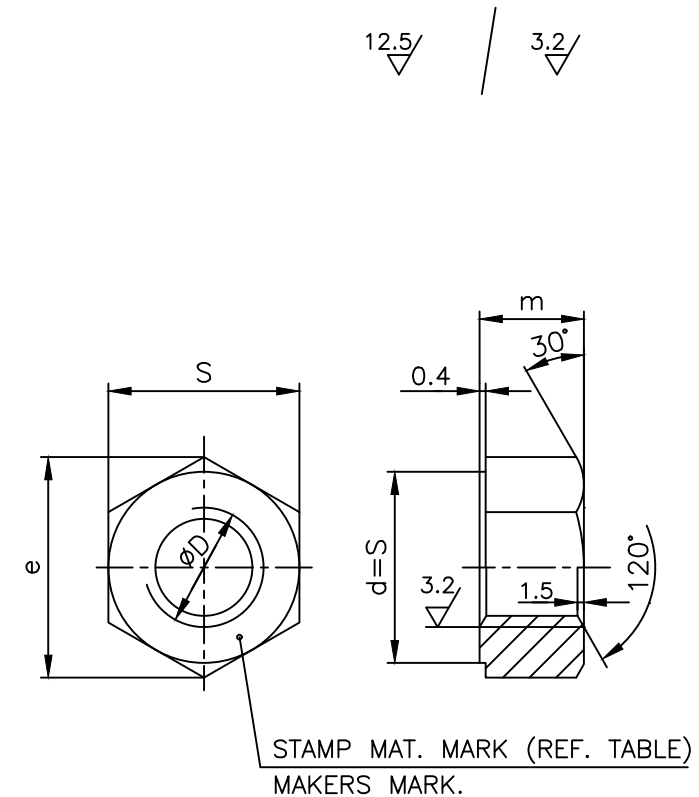
SL.NO.14 INCLUDED

CAUTION: The information on this document is the property of BHARAT HEAVY ELECTRICALS LTD. It must not be used directly or indirectly in any way detrimental to the interest of the company.

DEPT VL	SCALE	WEIGHT (KG).	REFERENCE INFORMATION	NO. OF ITEMS
CODE 320	NTS.	-	CAD:C306880	-
TITLE	CARD CODE	DRAWING NO.	REV	
EYE BOLT	U 01	3-V-0000-06880	11	

9/890-0000-Λ-Σ  
DRAWING NO.

SL. No.	DRAWING No.	COMP. CODE	MATL. SPECN.	S		e		m		øD	MATL. MARK	NET WT. (Kg.)
				MAX.	MIN.	MAX.	MIN.	MAX.	MIN.			
01	3.V.N073.06876/03	96 456 279	ASTM A194 - 2H, CERTIFY	22.22	21.59	25.65	24.61	12.80	11.79	1/2"-13 UNC -2B	2H	0.02
02	3.V.N025.06876/03	96 456 280		26.97	26.19	31.17	29.85	16.03	14.91	5/8"-11 UNC -2B	2H	0.03
03	3.V.N057.06876/03	96 456 281		31.75	30.78	36.65	35.10	19.25	18.03	3/4"-10 UNC -2B	2H	0.08
04	3.V.N065.06876/03	96 456 282		41.28	40.01	47.65	45.62	25.70	24.28	1"-8 UNC -2B	2H	0.17
05	3.V.N105.06876/03	96 456 283		46.02	44.60	53.16	50.85	29.93	27.41	1.1/8"-8 UN -2B	2H	0.27
06	3.V.N206.06876/02	96 456 431		36.52	35.41	42.16	40.37	22.47	21.16	7/8"-9 UNC -2B	2H	0.11
07	3.V.N204.06876/02	96 456 453	SA 307 Gr.B CERTIFY	31.75	30.78	36.65	35.10	19.25	18.03	3/4"-10 UNC -2B	307 B	0.08
08	3.V.N207.06876/02	96 456 454		36.52	35.41	42.16	40.37	22.47	21.16	7/8"-9 UNC -2B	307 B	0.11
09	3.V.F505.06876/01	96 456 683	ASTM A194 - 2H, CERTIFY	50.8	49.23	58.65	56.11	31.78	30.15	1.1/4"-8 UN -2B	2H	0.22
10	3.V.N848.06876	96 453 667		55.57	53.8	64.16	61.37	35.0	33.27	1.3/8"-8 UN -2B	2H	0.42
11	3.V.N827.06876	96 453 668		60.33	58.42	69.65	66.59	38.23	36.40	1.1/2"-8 UN -2B	2H	0.52
12	3.V.N846.06876/01	96 453 669		69.85	67.61	80.65	77.09	44.68	42.65	1.3/4"-8 UN -2B	2H	0.81
13	3.V.NK44.06876	96 465 904		65.07	63.02	75.15	71.84	41.45	39.53	1.5/8"-8 UN -2B	2H	0.68
14	3.V.NK45.06876	96 465 906		79.37	76.84	91.64	87.61	51.13	48.90	2"-8 UN -2B	2H	1.36



RETRACED WITH REV. 09 ON 26.11.18

**NOTE:**

1. FOR QUALITY REQUIREMENTS REFER LATEST APPLICABLE STANDARD(TDC:5:164).

NO OFF	DESCRIPTION	MATL CODE	MATL SPECN	HEAT TREATMENT	SCRAP SORT	NET WT (kg)	GROSS WT (kg)	DRAWING No	ITEM No
-	-	-	-	-	-	-	-	-	-

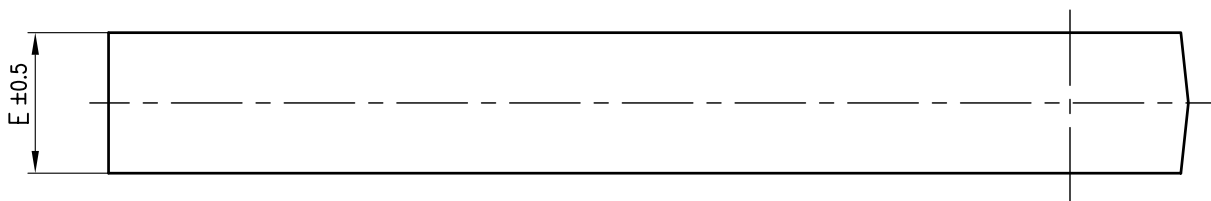
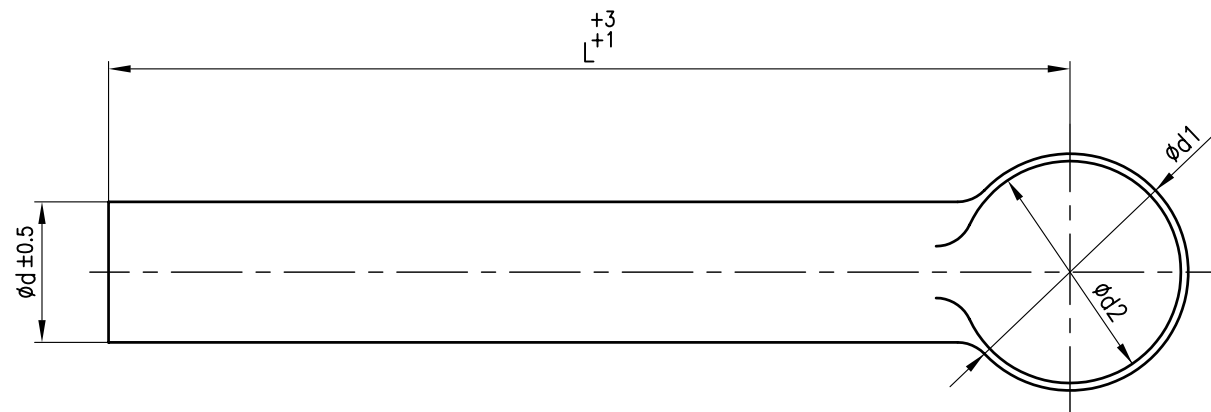
CAUTION: The information on this document is the property of BHARAT HEAVY ELECTRICALS LTD. It must not be used directly or indirectly in any way detrimental to the interest of the company.

TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT				
		BHARAT HEAVY ELECTRICALS LTD., UNIT: HIGH PRESSURE BOILER PLANT. TIRUCHIRAPALLI-620014.		
DRN	M.SRINIVASAN	SIGN	DATE	NO.OF VAR.
CHD	N.DHANAPAL		22.04.96	
APPD	A.VISWANATHAN		22.04.96	
DEPT	VL	SCALE	WEIGHT (KG).	REFERENCE INFORMATIONS
CODE	320	NTS	REF. TABLE	CAD: C306876
TITLE			CARD CODE	DRAWING NO.
HEX NUT			U 01	3-V-0000-06876
				NO. OF ITEMS
				REV
				09

REV	DATE	ALTERED	R.P.SINGH
09	26.11.18	CHD & APPD SSK & KRS	
		SL. No.13 & 14 INCLUDED.	

DRAWING NO. 3-V-0000-20548F/2

SL.NO.	DRAWING NO.	COMPONENT CODE	MATERIAL SPECIFICATION	DIMENSIONS					WT. (KG)
				$\phi d \pm 0.5$	$\phi d1$	$\phi d2$	$E \pm 0.5$	$L \begin{smallmatrix} +3 \\ +1 \end{smallmatrix}$	
01.	3-V-W049-20548F/2	92 151 311 0000	A193-B7, H&T, CERTIFY	19	32	30	19	130	0.37
02.	3-V-W001-20548F/2	92 151 312 0000		23	38	36	23	160	0.66
03.	3-V-W002-20548F/2	92 151 313 0000		25	45	42	25	163	0.85
04.	3-V-W057-20548F/2	92 151 314 0000		27	53	50	27	173	1.12
05.	3-V-W065-20548F/2	92 151 315 0000		33	60	56	33	194	1.83
06.	3-V-W069-20548F/2	92 151 316 0000		39	75	70	39	234	3.12
07.	3-V-W073-20548F/2	92 151 317 0000		45	88	82	45	265	4.90



**NOTES:**

- HARDNESS : 26 TO 34 HRC.
- FORGINGS SHALL COMPLY WITH THE REQUIREMENTS OF LATEST APPLICABLE QUALITY WORK INSTRUCTION.

REDRAWN WITH REV.2 ON 12.04.08

NO OFF	DESCRIPTION	MATL CODE	MATL SPECN	HEAT TREATMENT	SCRAP SORT	NET WT (kg)	GROSS WT (kg)	DRAWING No	ITEM No

TYPE OF PRODUCT  
OR NAME OF  
CUSTOMER/PROJECT

	<b>BHARAT HEAVY ELECTRICALS LTD.,</b>		DRN	V.BAIRAVAN	SIGN	DATE	NO. OF VAR.
	UNIT: HIGH PRESSURE BOILER PLANT.		CHD	K.RAJASEKARAN		12.04.08	
	TIRUCHIRAPALLI-620014.		APPD	M.RAJAKUMAR		12.04.08	

DEPT VL		SCALE N T S	WEIGHT (KG).	REFERENCE INFORMATION	NO. OF ITEMS
CODE 320					

TITLE <b>EYE BOLT</b>	CARD CODE U 01	DRAWING NO. <b>3-V-0000-20548F/2</b>	REV
--------------------------	-------------------	---	-----

REV	DATE	ALTERED/VB
2	12.04.08	CHD & APPD KRS&MRK

DRAWING CONVERTED INTO SOFT COPY

DCP No.800813

CAUTION: The information on this document is the property of BHARAT HEAVY ELECTRICALS LTD. It must not be used directly or indirectly in any way detrimental to the interest of the company.



**Product: CARBON & ALLOY STEEL FASTENERS (STUDS, BOLTS & NUTS) FOR VALVES, OIL FIELD EQUIPMENT (OFE) AND OTHER APPLICATIONS**

Revision Record: 00: 17.01.90: First issue. Rev: 01:21.06.90 Editorial corrections. Rev 02:21.04.91 TC for studs/bolts added. Rev 03: 04.04.96: Annexure I amended. CI 3.3.3 & 5.3 modified. Rev 04:20.10.96: NDT, Acid pickling added & re-written. Rev 05: 28.04.98: CI 3 modified to include MPI, certificate modified & CI 7.4 deleted. Rev 06:15.06.99: Title, CI 1 to 5 & 7.1 modified. CI 7.2 changed to CI 7.3. CI 7.3 changed to 7.4 and modified. CI 7.2 Galvanizing added. Test certificate sample format modified.  
Rev 07: 15/06/2017: TDC: 5:166 for CS & AS Nuts has been merged with this TDC. Totally revised in line with changed requirements and Xylan coating requirements added.  
Rev 08: 14/09/2019: CI 1.0, 2.0, 3.0, 4.0, 5.0 modified in line with API 6A 21<sup>st</sup> Ed 2018 Errata 1 and for better clarity.  
Rev.09: 19/02/2021: Latest version of the referred Standards/Specifications indicated throughout TDC; Cl.2.0 iid added; Cl.4.1 added; Annexure-1 modified;

## 1.0 MATERIAL SPECIFICATIONS:

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

Studs/Bolts - Alloy Steel	:	ASME SA 193-19 /ASTM A 193-20 Gr B7, B7M & B16.
Nuts - Carbon Steel	:	ASME SA 194-19 /ASTM A 194-20A Gr 2H & 2HM
Alloy Steel	:	ASME SA 194-19 /ASTM A 194-20A Gr 4 & 7
Additional Requirements	:	As listed below (Supplementary to the above material specifications)
Size and Quantity	:	As per Purchase Order (PO) & Applicable Drawing

## 2.0 GENERAL REQUIREMENTS:

- i. This TDC is applicable for Valves, OFE (API 6A 21<sup>st</sup> Ed 2018 Errata 3 Addendum 1 & API 16C 2<sup>nd</sup> Ed 2015 Addendum 1 Errata 4) and other applications including NACE MR0175 / ISO 15156:2015 Parts 1, 2 & 3. The products shall be manufactured to the relevant requirements specified in the applicable drawings, specifications, PO & this TDC.
- ii. Studs / Bolts / Nuts used for OFE application:
  - a. Studs / Bolts / Nuts shall be qualified and manufactured in accordance with BSL 1 of API 20E. The qualification & requalification records as per API 20E Ed 2017 Addendum 2 shall be maintained by the Supplier. The supplier shall prepare Manufacturing Process Specification(MPS) to include as a minimum allowable levels for all Studs/Bolts/Nuts manufacturing parameters including process control variables and heat treatment parameters as per API 20E Ed 2017 Addendum 2 and this TDC.
  - b. Raw material shall be fully wrought. Reduction ratio based on starting material diameter shall be a minimum of 4:1. The steel shall conform to the respective material specifications. Intentional addition of Boron is not allowed. All elements intentionally added to the heat shall be reported in the Test Certificate.
  - c. Furnace calibration shall be in accordance with API 6A 21<sup>st</sup> Ed 2018 Annex M; SAE AMS 2750 Rev.F; or SAE AMS H6875 Rev.C. For induction or direct resistant heat treatment, calibration shall be in accordance with manufacturer's written procedure. For forging furnaces, calibration shall be in accordance with manufacturer's written procedure
  - d. Heat lot:
    - Batch furnace: bolting or raw material of a single heat and diameter, heat treated together as a single austenitizing, quenching, tempering, and stress-relieving charge.
    - Continuous furnace: bolting or raw material of a single heat and diameter heat treated without interruption in a continuous charge
- iii. Nuts shall be hot/cold forged or manufactured from hot rolled/cold drawn bars. If made from



**Product: CARBON & ALLOY STEEL FASTENERS (STUDS, BOLTS & NUTS) FOR VALVES, OIL FIELD EQUIPMENT (OFE) AND OTHER APPLICATIONS**

hexagonal bars, 100% MT is to be done on bars as per ASTM E709-15 to ensure freedom from surface/sub-surface defects.

- iv. Hot rolled & cold drawn bars, if used (for studs/bolts or nuts), shall be machined at least 2 mm (minimum) in radius (i.e. 4 mm in diameter) to remove the seams completely. After machining, at least 10% of the bars shall be tested by MPI as per ASTM E709-15 to ensure freedom from surface/sub-surface defects.
- v. Heat treatment of finished studs/bolts shall be carried as per the material specification requirements for corresponding grades. For heat treatment of finished components, salt bath or controlled atmosphere furnace shall be used. After heat treatment, the threads shall be thoroughly cleaned to remove all deposits. If acid pickling is done for cleaning, it shall be as per Cl. 6 (v) of this TDC.
- vi. Cadmium Plating (Cl 6 (i) of this TDC), Electroplating (Cl 6 (ii) of this TDC) and/or Xylan Coating (Cl 6 (iii) of this TDC) shall be done on the fasteners if specified in Drawing/PO. For all other cases, rust preventive coating (Cl 6 (iv) of this TDC) shall be done.

**3.0 CHEMICAL, MECHANICAL PROPERTIES & NDE:**

- i. Mill certificate from steel manufacturer for conformance to chemistry heat-wise shall be submitted. Additionally, product analysis shall be done on one sample/heat by the stud/bolt/nut manufacturer. Methods and practices for chemical analysis shall be in accordance with ASTM A 751-20.
- ii. The microstructure and macrostructure shall conform to the requirements of the respective material specifications.
- iii. **Tensile Testing for Studs/Bolts:** One tensile test/heat/size/ HT batch shall be carried out in the finished heat treated condition as per SA / A 193 and shall meet the material specification requirements for corresponding grades.
- iv. **Hardness Testing for Studs/Bolts:**

Hardness testing, including specimen preparation, shall be performed in accordance with ASTM A 370-20 including Annex A3, except that testing shall also be in conformance with ASTM E10-18 or ASTM E18-20.

- a) **For ASME SA 193-19 / ASTM A 193-20 Gr B7 & B16:** Hardness check shall be carried out on finished stud/ bolt as per ASME SA 193-19 / ASTM A 193-20, at least on 10% of the finished studs/bolts.  
Gr B7: Hardness: 25 to 34 HRC or 253 to 319 HBW.  
Gr B16: Hardness: 25 to 35 HRC or 253 to 321 HBW.
- b) **For ASME SA 193-19 / ASTM A 193-20 Gr B7M:**  
Hardness check on 100% of studs/bolts as per SA193.  
Gr B7M: Hardness: 94 to 99 HRB or 201 to 235 HBW.

v. **Mechanical Testing for Nuts:**

- a) **For ASME SA 194-19 / ASTM A 194-20A Gr 2H, Gr 4, & Gr 7:**  
Hardness check on finished nuts shall be as per ASME SA 194-19 / ASTM A 194-20A (including quantum of testing).  
Gr 4: Hardness: 24 to 35 HRC or 248 to 327 HBW.  
Gr 2H & Gr 7: Hardness: 24 to 34 HRC or 248 to 319 HBW.
- b) **For ASME SA 194-19 / ASTM A 194-20A Gr 2HM:**  
Hardness check on 100% of finished nuts shall be carried out as per ASME SA 194-19 /



**Product: CARBON & ALLOY STEEL FASTENERS (STUDS, BOLTS & NUTS) FOR VALVES, OIL FIELD EQUIPMENT (OFE) AND OTHER APPLICATIONS**

ASTM A 194-20A.

Gr 2HM: Hardness: 159 to 235 HBW.

- c) **Proof load test shall be done as per ASME SA 194-19 / ASTM A 194-20A for all grades of nuts** and shall meet the requirements of corresponding grades of the material specification.
- d) After final heat treatment, sample nuts shall be heat treated as per Table 1 and meet the corresponding hardness requirements.

**Table 1.**

Grade	Temperature (°C)	Soaking Time (Hr)	Cooling	Minimum Hardness (HBW) at room temperature
2H	540	24	Slow Cool	179
2HM	540	24	Slow Cool	159
4, 7	590	24	Slow Cool	201

- e) **Cone Stripping Test:** This test shall be performed as per ASME SA 194-19 / ASTM A 194-20A in case of visible surface discontinuities. On such cases Proof load shall be as per ASME SA 194-19 / ASTM A 194-20A.
- vi. **NDE:**  
Magnetic particle inspection shall be carried out as per ASTM E709-15 in at least 10% of the finished studs/bolts of all grades. Cracks, linear indications (length  $\geq$  3 times its width) are unacceptable.

#### 4.0 SAMPLING INSPECTION:

All inspection shall be in accordance with relevant drawing or BPS (Boiler Plant Standard), PO, this TDC and ASME SA 193-19 / ASTM A 193-20 for studs/bolts and ASME SA 194-20 / ASTM A 194-20A for nuts. The threads shall be checked with calibrated ring gauges for studs/bolts & plug gauges for nuts in the final heat treated condition for black variety and *prior to* final plated/coated condition for the cadmium plated/electroplated/ xylan coated items.


Visual, dimensional checks and their acceptance shall be as per applicable drawing and ASME SA 193-19 / ASTM A 193-20 for studs/bolts & ASME SA 194-20 / ASTM A 194-20A for nuts.

#### 4.1 Gauging Requirements for Xylan along with Zinc Coated Fasteners

- i. **Studs**
- No under sizing is allowed
  - Prior to Xylan and Zinc Coating, Class 2A Gauge to be used for inspection
  - After coating, No Gauge inspection is required
- ii. **Nut**
- Under sizing is allowed to maximum of 0.2mm in the internal diameter of threads
  - Prior to under sizing, Class 2B Gauge to be used for inspection
  - After under sizing, a gauge having an allowance as per Class 2B along with 0.2mm under sizing allowance to be made and inspected thereof
- iii. **Assembly of Stud and Nut**
- Free run of nut over stud to be ensured
  - No play is allowed
  - After free run of nut over stud, Xylan coating should not get peeled off.

#### 5.0 MARKING & PACKING:

- Punch/emboss each finished component with applicable material grade (B7/ B7M/ B16 for studs/bolts; 2H/2HM/4/7 for nuts) and supplier's emblem. Studs/bolts of grade B7M and nuts of Gr 2HM shall have a line under the grade symbol.
- Punch/emboss serial number also in B7M studs/bolts and Gr 2HM nuts in addition to the above, to correlate with hardness. Protect the threaded ends with plastic end caps. Pack in wooden

	<b>BHEL – Tiruchirappalli - 620014, India.</b> <b>Quality Assurance Department</b> <b>TECHNICAL DELIVERY CONDITIONS</b>	DOC No: <b>TDC:5:164 Rev: 09</b> Effective Date: <b>19/02/2021</b> Page: <b>4 of 7</b>
<b>Product: CARBON &amp; ALLOY STEEL FASTENERS (STUDS, BOLTS &amp; NUTS) FOR VALVES, OIL FIELD EQUIPMENT (OFE) AND OTHER APPLICATIONS</b>		

box/ gunny bag of convenient size for easy handling and transportation. Mark quantity in each box/gunny bag.

- iii. In addition to the above, studs / Bolts / Nuts for OFE applications shall marked with unique heat lot identification and followed by "20E1". Each piece 1 in. nominal diameter and larger shall be marked. For studs / Bolts / Nuts less than 1 in. nominal diameter, the studs / Bolts / Nuts shall be securely containerized to maintain heat lot identification and traceability. Multiple heat lots shall not be mixed in a single container. Containers used in the processing, storing, and shipping of studs / Bolts / Nuts not individually marked shall be clearly labeled with all marking information required by the relevant material specifications and API 20E *Ed 2017 Addendum 2*.

## 6.0 SPECIAL REQUIREMENTS:

### i. CADMIUM PLATING:

- Clean the fasteners to make them free from rust, grease, oil, scale, etc., before plating. When pickling is considered essential, it shall be done as per Cl 6 (v) of this TDC.
- Apply Cadmium Plating to the specified thickness on specified areas. Thickness shall be measured on 5% of the PO quantity of fasteners.
- After plating, bake the parts at 175°C to 205°C for a minimum period of 3 hours. The elapsed time between plating and baking shall not exceed 8 hours.
- Apply a Chromate Conversion coating after plating and baking.

### ii. ELECTROPLATING OF ZINC CHROMATE:

- Clean the fasteners to make them free from rust, grease, oil, scale, etc., by suitable organic solvents/ hand tool methods before electroplating. Then, pickling shall be done as per Cl 6 (v) of this TDC.
- The fasteners shall then be electroplated as per the method and to the minimum coating thickness specified in the applicable drawing. Thickness shall be measured on 5% of the PO quantity of fasteners.
- All electroplated parts (regardless of strength level) shall be baked within 2 hours after plating at 375 °F–425 °F (191 °C–218 °C ) for 8 hours minimum at temperature

### iii. XYLAN COATING:

- Clean the fasteners by blast cleaning to Sa2.5 to make them free from rust, grease, oil, scales, etc., before xylan coating.
- The fasteners shall then be xylan coated as per the requirements and to the minimum coating thickness specified in the applicable drawing.
- Tests for Xylan Coating:**

The following test shall be carried out on Xylan coated fasteners and results to be reported in the Test certificate (in addition to the Test Certificate for the fastener material and other inspections requirements):

#### i) Thickness measurement:

Dry film thickness of Xylan coating to be measured using a magnetic induction or Eddy current type electronic gauge and the reading shall meet the drawing/PO requirement for thickness of coating of Xylan 1070. The thickness measurements shall be made in accordance with ASTM D7091-20. Thickness shall be measured on 5% of the PO quantity of fasteners.

#### ii) Cure Test:

This test method is for ensuring the completeness of cure of Xylan 1070 coating by evaluating the resistance of the cured coating to a solvent known to attack uncured film. The testing method shall be as per Whitford test method 115B (as recommended by the Xylan coating supplier).

**Acceptance criteria:** No white precipitate or stain shall be available after the test.

#### iii) Adhesion Test using Cross-hatch and Cello Tape:



Product: CARBON & ALLOY STEEL FASTENERS (STUDS, BOLTS & NUTS) FOR VALVES, OIL FIELD EQUIPMENT (OFE) AND OTHER APPLICATIONS

Test as per ASTM D3359-17 Method B for measuring Adhesion by Tape Test.  
**Acceptance Criteria:** No loss of adhesion (5B Classification).

**iv) Salt Spray Test:**

Xylan coated fasteners should pass a minimum requirement of 500 hours of salt spray test as per ASTM B117-19. Certificate of compliance for meeting the salt spray test requirements shall be provided.

**iv. RUST PREVENTIVE FLUIDS/COATING REQUIREMENTS:**

- a) Clean the fasteners to make them free from rust, grease, oil, scale, etc., by hand tool/ manual cleaning method.
- b) Apply one coat of rust preventive fluid, of any of the following brands of the suppliers (Table 2), to obtain dry film thickness of 20 microns minimum:

**Table 2. Rust Preventive Fluid/Coatings Brands**

SI No	Brand/Chemical	Supplier Name and Address
1	BONITA-RPF	M/s Bonita Chemicals, 64, Industrial Estate, Nunhai, Agra-282 006
2	CHAMPION-RPF	M/s Guardian Chemicals, 8, Rajaji Ind st, West Lake Area, Nungambakkam, Madras-600 034
3	ECONOL RPF (non-drying type)	M/s Process Aids, Bangalore
4	TECTYL 506	M/s Plastipeel Chemicals and Plastics (P) Ltd, Thane-400 604
5	TRPF	M/s Sundaram Paints Pvt. Ltd., Thanjavur-613 004
6	TRPF	M/s Solar Paints, Pudukkotai.
7	WICOR-P	M/s Western India Paint and Color Co P. Ltd, Madras-600 017

Use of any other brand/chemical shall be done with the prior approval of BHEL.

**v. ACID PICKLING:**

- a) Wherever pickling done, it shall be done using Hydrochloric acid of 5-10% concentration for a period of 5 to 10 minutes at room temperature with suitable inhibitor.
- b) After pickling thorough rinsing shall be carried out with water to remove acid residues & further DM water rinsing. After thorough rinsing with DM water, the rinsing shall not show any red color (free acidity) when tested with methyl orange indicator.

**7.0 CERTIFICATION:**

The manufacturer shall provide Test Certificates (TC) duly countersigned by the Authorized Inspecting Authority nominated by BHEL in P.O. (if specified) along with raw material TC from Steel Maker. *The applicable versions of the referred Codes, Standards and Specifications shall be reported in the Test Certificates and NDE reports.* Manufacturer's TC shall contain the following details as per the sample format attached as Annexure-1 to this TDC:

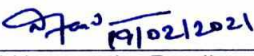
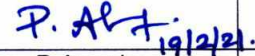
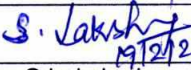
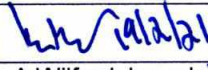
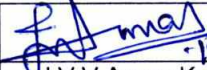
- i. BHEL PO No & PO Date
- ii. Technical Delivery Condition (TDC) No & its Revision No, Drawing & its revision no
- iii. Melt/Heat No, Serial No (if applicable)
- iv. Raw Material TC Number and Date
- v. Chemical and Mechanical properties for Studs/Bolts and Nuts *including the location and orientation of test specimens*
- vi. Heat treatment details (temperature, time, cooling medium, etc.)
- vii. *NDE reports with NDE Personnel qualification records, all relevant NDE operating parameters and NDE Results with reference and acceptance criteria*
- viii. Type of Surface coating & its coating thickness – Cadmium Plating, Chromate conversion coating, Electroplating, Xylan Coating, Rust preventive coating, etc.
- ix. Test methods and results on Xylan Coating
- x. Baking details for cadmium plating, electroplating & Xylan coating
- xi. Manufacturers' identification mark
- xii. Certify soundness & confirmation to PO requirements.



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

DOC No: TDC:5:164 Rev: 09  
Effective Date: 19/02/2021  
Page: 6 of 7

Product: CARBON & ALLOY STEEL FASTENERS (STUDS, BOLTS & NUTS) FOR VALVES, OIL FIELD EQUIPMENT (OFE) AND OTHER APPLICATIONS

 19/02/2021	 19/2/21	 19/2/21		 19/02/2021
N Nagamuthu Pandian	P Arun kumar	S Lakshmi	A Wilfred Joseph	J V V Aruna Kumar
Manager/QA	DM / Valves Engg	DGM/QA	AGM / Valves/MM	SDGM / QA
Prepared By	Reviewed By			Approved By



Product: CARBON & ALLOY STEEL FASTENERS (STUDS, BOLTS & NUTS) FOR VALVES, OIL FIELD EQUIPMENT (OFE) AND OTHER APPLICATIONS

**Annexure-1. Test certificate for Studs/Bolts & Nuts– Sample format**

TC No:	Date:
Customer :	PO No./ Amd :
TDC No./Rev.:	DC No. :
Product :	Drg. No./Rev :
Description : (Spec, dia, pitch, length)	Thread Spec. :
Quantity :	
Requirement :	<u>Records/ Observation</u>
Size of bar - Before machining :	
- After machining :	
Type of furnace used for hardening :	

<b>TDC Clause no.</b>	Raw Material mill TC No: Melt/Heat Number:	TC Date: Reduction Ratio:
<b>2.0 &amp; 3.0</b>	<b>a) Heat Treatment Details:</b> Hardening Temperature: °C; Soaking time: Cooling Medium: Tempering Temperature: °C; Soaking time: Cooling Medium: <b>b) Additional Tempering for Nuts (after final tempering):</b> Temperature: °C; Soaking time: Cooling Medium:	
<b>3.0</b>	<b>a) Product analysis for chemistry</b>	
	<b>Report No &amp; Date:</b>	
	Spec	C Mn P S Si Cr Mo V Ni Others
	Min.	
	Max.	
	Actual	
	<b>b) Tensile test after H &amp; T and final drying (Finished heat treated condition) – For Studs/Bolts</b>	
		UTS (MPa) YS (MPa) %Elongation %Red in Area
	Reqd/Spec Value	
	Test result	
	Spec Value Test result Remarks	
	c) Hardness Test Result (for Studs/Bolts, Nuts):	
	d) Hardness Test Result (for Nuts after 24 hrs of tempering):	
	e) Proof load (kN) for nuts & result	
	f) Result of Cone Stripping test for nuts	
	g) NDE Result for Studs/Bolts:	
<b>4.0</b>	Visual and dimensional checking as per applicable drawing for studs/bolts & nuts:	
<b>5.0</b>	Punching details (identification): End cap for threaded portion:	
<b>6.0</b>	<b>a) Type of coating:</b> Cadmium Plating /Chromate Conversion / Electroplating/ Xylan /Rust preventive coating (Tick applicable coating) <b>Coating thickness/DFT:</b>	
	<b>b) Tests for Xylan Coating</b>	<b>Results</b>
	<b>c) Pickling Acid: Concentration:</b> Drying after pickling. Temperature: °C; Soaking time:	

This is to certify that the above results are correct and the parts meet specification and PO requirements.

Signature with date  
Supplier: In-charge of Quality

Signature with date  
BHEL / Authorized Inspection Agency

Note: Additional Sheets may be attached, if required.



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  $\geq 25$  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.



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



# भारत हेवी इलेक्ट्रिकल्स लिमिटेड

(भारत सरकार का उपक्रम)

इंडस्ट्रियल वाल्वस प्लांट

## Bharat Heavy Electricals Limited

(A Govt. of India Undertaking)

### Industrial Valves Plant

#### Quality Assurance Plan for Fasteners\*:

NUT, BOLT (INCL EYE BOLT, LIFTING EYE BOLT), STUD

BHE:QAP:FAS:02

Dt:15.03.2019

SN	Stage of inspection	Inspection type		Ref doc	Quantum of check	Format of Record	Agency	
							M	BHEL/TPIA
1	Raw material	Chemical/Mechanical properties		Material test certificate	100%	MTC report	V	V
2	Finished product	Chemical Analysis	Chemical composition	Material specification in drg	one sample per heat	Annex 1 of TDC	P	W
		Mechanical Properties	Tensile strength	Material specification in drg	one sample per heat	Annex 1 of TDC	P	W
			Mechanical testing for nut		10% or 20 nos hardness check at manufacturer end, one sample each type per heat for TPIA or BHEL**			
			Hardness					
		Dimension	As per drawing, Thread with GO/ NO GO Gauge	Material drg/BPS	10% or 20 nos/type.	Inspection report	P	P
		Visual	Free from burrs, physical damages		100%	Annex 1 of TDC	P	P
		MPI	ASTM E709	As per procedure	10% or 20 nos/type.	MPI report	P	W
Marking/Identification	Material grade/supplier name or symbol	As per PO/Drawing/TDC	10%	Annex 1 of TDC	P	W		

*Vid*  
15/03/19  
(MKS/WH)

*S. R. Kanungo*  
15/03/19  
(S. R. Kanungo)

*S. R. Kanungo*  
15/03/19  
S. R. Kanungo



# भारत हैवी इलेक्ट्रिकल्स लिमिटेड

(भारत सरकार का उपक्रम)

इंडस्ट्रियल वाल्वस प्लांट

## Bharat Heavy Electricals Limited




(A Govt. of India Undertaking)

### Industrial Valves Plant

3	Rust preventive oil		As per TDC:5:164	100%	Annex 1 of TDC	P	W
	Packing	Packed in wooden/cardboard box with layer to layer cushioning material.		10%	Annex 1 of TDC	P	W
	Test certificate	MTC			Annex 1 of TDC	P	V

M-Manufacturer, V-Verification, W-Witness, P-Perform

- \* QAP IS PREPARED TO MEET REQUIREMENT OF TDC:5:164 (latest),.PLS REFER IT, IN CASE OF AMBIGUITY ARISES.
- \*\* TPIA/BHEL MAY INCREASE SAMPLE QTY UP TO 10%.

 Vikas Kumar Sr. Engr / QM Prepared	 Samir Shandilya Sr Mgr/ QM &HSE Reviewed	 S R Kenny AGM/QM, HSE, Engg, TEC & SM) Approved
---	---	--