BHARAT HEAVY ELECTRICALS LIMITED
Tiruchirappalli – 620014

Valves Division

EXPRESSION OF INTEREST (EOI) For Supply of PTFE (Xylan) Coated Fasteners for Oil Field Equipment (OFE)

GeM Bid ref: GEM/2026/B/7422900 dtd 13.04.2026

1. Introduction

Bharat Heavy Electricals Limited (BHEL) is India's premier engineering and manufacturing enterprise, catering to core sectors such as Power, Oil & Gas, Defence, Aerospace, Transportation, and Heavy Engineering. With a strong commitment to quality, innovation, and self-reliance, BHEL has established itself as a trusted supplier of critical equipment both in domestic and international markets.

The Valves Division, of **High Pressure Boiler Plant (HPBP), Tiruchirappalli** - one of BHEL's key manufacturing units, is engaged in the production of Industrial Valves, Soot Blowers and **Oil Field Equipment (OFE)** such as Wellheads and Christmas Tree assemblies, which are designed and manufactured in compliance with API specifications.

2. Objective of EOI

BHEL, Trichy invites **Expression of Interest (EOI)** from prospective and capable **Bolting Manufacturers,** herein referred to as supplier, for the **supply of PTFE (Xylan®) coated fasteners** required for OFE applications.
The fasteners pertain to **BSL Level 1** (Bolting Specification Level 1) as per API requirements.

3. Scope of Supply

The scope includes manufacturing and supply of PTFE (Xylan) coated fasteners (as Sets of DE/FT Stud with 1 or 2 Nuts) intended for use in Oil Field Equipment (OFE), conforming to **API 20E specification (Second Edition – Errata 2).**

The scope of supply of fasteners shall be in full compliance to the below listed technical documents

1. Drawings
   - **i.** 2-V-0000-20198/05
   - **ii.** 2-V-0000-20199/04
   - **iii.** 2-V-0000-20200/04
   - **iv.** 2-V-0000-20201/04

2. Technical Delivery Conditions Ref: TDC: 5:164/12

4. Minimum Qualification Criteria

Interested suppliers shall meet **any one** of the following criteria:

4.1 Licensed Manufacturers
- Possession of valid:
  - API 20E License, or
  - API Spec Q1 License

4.2 Non-Licensed Manufacturers
Suppliers not possessing API license shall have a **Quality Management System (QMS)** compliant with **API Q1 requirements.**

5. Submission Requirements (fill-in Annexed Checklist)

Interested parties shall submit the following details (in the same order – neatly indexed):

1. Company profile and manufacturing capabilities
2. Valid API licenses 20E/Q1/both (if available)
3. QMS documentation (applicable for non-licensed suppliers)
4. Supplier evaluation procedure and sample records such as supplier evaluation forms.
5. Past experience in supply of similar fasteners - Copies of purchase orders (POs) for identical or similar items issued within the last 5 years from the date of this EOI, along with evidence of PO completion. Redacted versions are acceptable
6. List of major clients (preferably in Oil & Gas sector)
7. Quality and NDE certifications and testing facilities
8. Details of coating process (Zinc Plating/Zinc Phosphating and Xylan)
    - in-house or out-sourced. If out-sourced, details of service provider
    - Procedure and validation record for coating of manufacturer/service provider, as applicable.
9. Self-declaration from Supplier
    i. To submit MPS and corresponding qualification record in compliance to API 20E for BHEL's review, when sought.
    ii. To maintain validity of applicable certifications, procedures and records throughout the execution of the order.
    iii. To maintain all the procedures and records pertaining to order and its execution for a period of minimum 10 years from date of creation.
    iv. Non-disclosure certificate
        - To maintain confidentiality of documents & information which shall be used during the execution of the Contract.
        - The documents & information shall not be revealed to or shared with third party which shall not be in the business interest of BHEL-HPBP, Trichy.

6. Evaluation Process

- Submitted documents shall be reviewed by BHEL.
- In case of Non-Licensed Manufacturers, their QMS documents will be reviewed, if found complying to Spec Q1, and approved. Such approvals obtained shall be submitted as a credential for consideration only in subsequent tenders floated by BHEL, Trichy for the same items.
- BHEL reserves the right to:
    - Conduct **on-site evaluation/audit** of manufacturing facilities before/after placement of Purchase Order.
    - Seek clarifications or additional documents.
- Only those suppliers meeting BHEL requirements will be considered for further participation.

7. Placement of Orders

- **Procurement Mode**
  Actual procurement shall be carried out through tenders on GeM Portal from time to time (or) as one tender for finalisation of Annual Rate Contracts (ARC).

- **Future Regulatory Condition**
  In case API mandates exclusive use of 3rd Edition in future, any ongoing tenders /finalized Rate Contracts shall be cancelled, as deemed appropriate by BHEL.

8. Pre-Supply Requirements

After placement of order, prior to commencement of supply, the selected supplier shall:

- Submit Manufacturing Procedure Specification (MPS) and corresponding Bolting Qualification Records (BQR) for BHEL's review.

9. General Conditions

- BHEL reserves the right to accept or reject any or all EOI applications without assigning any reason.
- Participation in EOI does not guarantee qualification or award of contract.
- All future communications, tenders, and procurement activities will be strictly through **GeM portal or other informed platforms**.

10. Submission Details

Interested suppliers are requested to submit their EOI along with all supporting documents within **10 days** from the date of this EOI on the **GeM portal** against GeM Bid ref: **GEM/2026/B/7422900** dtd 13.04.2026.

In case of queries, below mentioned BHEL executives may be contacted for clarifications

Mr Navaneetha Krishnan V Engineer/Purchase/Valves BHEL, Trichy – 620014 nvkrishnan@bhel.in 0431 – 257 7230 +91 9894182079	**Mr M Balamurugan** Senior Manager/Purchase/Valves BHEL, Trichy – 620014 mbn@bhel.in 0431 – 257 6757 +91 9385401978

Checklist for submission of documents against EOI

Sl.	Parameter	Requirement	Supplier response	Reference of Corresponding document submitted
1	Nature of business	Manufacturer only	Yes/No	
2	Company profile, capabilities and Client list	Relevant to Oil & Gas applications	Available/ Not available	
3	Certifications	i. API Spec Q1 license	Available/ Not available	
		ii. API 20E	Available/ Not available	
4	QMS	QMS complying to Spec Q1	Available/ Not available	
5	Supplier evaluation	i. Procedure	Available/ Not available	
		ii. Record	Available/ Not available	
6	Past experience	Copies of purchase orders (POs) for identical or similar items issued within the last 5 years from the date of this EOI, along with evidence of PO completion.	Available/ Not available	
7	Testing facility	i. Chemical	Available/ Not available	
		ii. Mechanical	Available/ Not available	
		iii. NDE	Available/ Not available	
8	Zinc plating/phosphating	i. Facility	In-house/out-sourced	
		ii. Procedure	Available/ Not available	
		iii. validation record	Available/ Not available	
9	PTFE coating	i. Facility	In-house/out-sourced	
		ii. Procedure	Available/ Not available	
		iii. validation record	Available/ Not available	
10	Self-declaration	i. Submission of MPS & qualification record	Available/ Not available	
		ii. Maintain validity of certifications	Available/ Not available	
		iii. Maintain records for 10 years	Available/ Not available	
		iv. Non-disclosure statement	Available/ Not available	

बिड संख्या/Bid Number: GEM/2026/B/7422900

दिनांक /Dated: 13-04-2026

बिड दस्तावेज़ / Bid Document

बिड विवरण/Bid Details	
बिड बंद होने की तारीख/समय /Bid End Date/Time	23-04-2026 16:00:00
बिड खुलने की तारीख/समय /Bid Opening Date/Time	23-04-2026 16:30:00
बिड पेशकश वैधता (बंद होने की तारीख से)/Bid Offer Validity (From End Date)	30 (Days)
मंत्रालय/राज्य का नाम/Ministry/State Name	Ministry Of Heavy Industries And Public Enterprises
विभाग का नाम/Department Name	Department Of Heavy Industry
संगठन का नाम/Organisation Name	Bharat Heavy Electricals Limited (bhel)
कार्यालय का नाम/Office Name	10140027-hpbp Trichy
कुल मात्रा/Total Quantity	176000
वस्तु श्रेणी /Item Category	Expression of Interest for Supply of Xylan coated Stud with Nuts
GeMARPTS में खोजी गई स्ट्रिंग्स / Searched Strings used in GeMARPTS	PTFE COATED STUD WITH NUTS
GeMARPTS में खोजा गया परिणाम / Searched Result generated in GeMARPTS	Stud with Nuts, Automated tissue processor, Studs-IS:1862, Guidewires (V2), Stud Remover & Installer with Screwdriver tool Set(ONGC), Mechanically Woven, Double - Twisted, Hexagonal Wire Mesh Gabions, Revet Mattresses and Rock Fall Netting as per IS 16014, PTFE / Graphite yarn reinforced with Synthetic fibre Gland rope, Prevailing Torque Type Hexagon Nuts (With Non-Metallic Insert), Style 1 - IS 7002, Asbestos Cement Pressure Pipe and Joints (V2) as per IS 1592, PTFE Non Metalic Gasket
अधिसूचना के लिए चयनित प्रासंगिक श्रेणियाँ / Relevant Categories selected for notification	• Stud with Nuts
एमएसएमई के लिए अनुभव के वर्षों और टर्नओवर से छूट प्रदान की गई है/MSE Relaxation for Years of Experience and Turnover	No
स्टार्टअप के लिए अनुभव के वर्षों और टर्नओवर से छूट प्रदान की गई है /Startup Relaxation for Years of Experience and Turnover	No
विक्रेता से मांगे गए दस्तावेज़/Document required from seller	Additional Doc 1 (Requested in ATC),Compliance of BoQ specification and supporting document *In case any bidder is seeking exemption from Experience / Turnover Criteria, the supporting documents to prove his eligibility for exemption must be uploaded for evaluation by the buyer

बिड विवरण/Bid Details	
क्या आप निविदाकारों द्वारा अपलोड किए गए दस्तावेज़ों को निविदा में भाग लेने वाले सभी निविदाकारों को दिखाना चाहते हैं? संदर्भ मेनू है/Do you want to show documents uploaded by bidders to all bidders participated in bid?	No
बिड लगाने की समय सीमा स्वतः नहीं बढ़ाने के लिए आवश्यक बिड की संख्या। / Minimum number of bids required to disable automatic bid extension	1
दिनों की संख्या, जिनके लिए बिड लगाने की समय-सीमा बढ़ाई जाएगी। / Number of days for which Bid would be auto-extended	4
ऑटो एक्सटेंशन अधिकतम कितनी बार किया जाना है। / Number of Auto Extension count	1
बिड से रिवर्स नीलामी सक्रिय किया/Bid to RA enabled	No
बिड का प्रकार/Type of Bid	Single Packet Bid
तकनीकी मूल्यांकन के दौरान तकनीकी स्पष्टीकरण हेतु अनुमत समय /Time allowed for Technical Clarifications during technical evaluation	2 Days
निरीक्षण आवश्यक (सूचीबद्ध निरीक्षण प्राधिकरण /जेम के साथ पूर्व पंजीकृत एजेंसियों द्वारा)/Inspection Required (By Empanelled Inspection Authority / Agencies pre-registered with GeM)	No
Payment Timelines	Payments shall be made to the Seller within **90** days of issue of consignee receipt-cum-acceptance certificate (CRAC) and on-line submission of bills (This is in supersession of 10 days time as provided in clause 12 of GeM GTC)
मूल्यांकन पद्धति/Evaluation Method	Total value wise evaluation
मध्यस्थता खंड/Arbitration Clause	No
सुलह खंड/Mediation Clause	No

ईएमडी विवरण/EMD Detail

आवश्यकता/Required	No

ईपीबीजी विवरण /ePBG Detail

आवश्यकता/Required	No

बोली विभाजन लागू नहीं किया गया/ Bid splitting not applied.

एमआईआई खरीद वरीयता / MII Purchase Preference

एमआईआई खरीद वरीयता / MII Purchase Preference	Yes
मेक इन इंडिया विक्रेताओं को खरीद में प्राथमिकता, यदि उनका मूल्य L1+X% तक की सीमा में है / Purchase Preference to MII sellers availabele upto price within L1+X%	20
मेक इन इंडिया खरीद में प्राथमिकता के लिए बिड की मात्रा का अधिकतम प्रतिशत / Maximum Percentage of Bid quantity for MII purchase preference	50
सार्वजनिक खरीद (मेक-इन-इंडिया को प्राथमिकता) आदेश 2017 के अनुसार केवल क्लास 1/क्लास 2 के स्थानीय आपूर्तिकर्ताओं को ही भागीदारी की अनुमति है दिनांक 16.09.2020 (समय-समय पर संशोधित एवं लागू) / Allow participation only from Class 1/Class 2 local suppliers as per the Public procurement(Preference to Make-in-india) order 2017 date 16.09.2020(as amended and applicable time to time)	Yes, in compliance with the MII ORDER : DPIIT Order(as amended and applicable time to time)

एमएसई खरीद वरीयता/MSE Purchase Preference

एमएसई खरीद वरीयता/MSE Purchase Preference	Yes
सूक्ष्म और लघु उद्यम मूल उपकरण निर्माताओं को खरीद में प्राथमिकता, यदि उनका मूल्य L1+X% तक की सीमा में हो / Purchase Preference to MSE OEMs available upto price within L1+X%	15
सूक्ष्म और लघु उद्यम को खरीद में प्राथमिकता के लिए बिड की मात्रा का अधिकतम प्रतिशत / Maximum Percentage of Bid quantity for MSE purchase preference	25

1. Preference to Make In India products (For bids < 200 Crore):Preference shall be given to Class 1 local supplier as defined in public procurement (Preference to Make in India), Order 2017 as amended from time to time and its subsequent Orders/Notifications issued by concerned Nodal Ministry for specific Goods/Products. The minimum local content to qualify as a Class 1 local supplier is denoted in the bid document. If the bidder wants to avail the Purchase preference, the bidder must upload a certificate from the OEM regarding the percentage of the local content and the details of locations at which the local value addition is made along with their bid, failing which no purchase preference shall be granted. In case the bid value is more than Rs 10 Crore, the declaration relating to percentage of local content shall be certified by the statutory auditor or cost auditor, if the OEM is a company and by a practicing cost accountant or a chartered accountant for OEMs other than companies as per the Public Procurement (preference to Make-in -India) order 2017 dated 04.06.2020. Only Class-I and Class-II Local suppliers as per MII order dated 4.6.2020 will be eligible to bid. Non - Local suppliers as per MII order dated 04.06.2020 are not eligible to participate. However, eligible micro and small enterprises will be allowed to participate .The buyers are advised to refer the OM No.F.1/4/2021-PPD dated 18.05.2023. OM_No.1_4_2021_PPD_dated_18.05.2023 for compliance of Concurrent application of Public Procurement Policy for Micro and Small Enterprises Order, 2012 and Public Procurement (Preference to Make in India) Order, 2017.

2. Purchase preference will be given to MSEs having valid Udyam Registration and whose credentials are validated online through Udyam Registration portal as defined in Public Procurement Policy for Micro and Small

Enterprises (MSEs) Order, 2012 dated 23.03.2012 issued by Ministry of Micro, Small and Medium Enterprises and its subsequent Orders/Notifications issued by concerned Ministry. If the bidder wants to avail themselves of the Purchase preference, the bidder must be the manufacturer / OEM of the offered product on GeM. Traders are excluded from the purview of Public Procurement Policy for Micro and Small Enterprises and hence resellers offering products manufactured by some other OEM are not eligible for any purchase preference. In respect of bid for Services, the bidder must be the Service provider of the offered Service. Relevant documentary evidence in this regard shall be uploaded along with the bid in respect of the offered product or service and Buyer will decide eligibility for purchase preference based on documentary evidence submitted, while evaluating the bid. If L-1 is not an MSE and MSE Seller (s) has / have quoted price within L-1+ 15% (Selected by Buyer) of margin of purchase preference /price band defined in relevant policy, such MSE Seller shall be given opportunity to match L-1 price and contract will be awarded for 25% (selected by Buyer) percentage of total quantity. The buyers are advised to refer the OM No. F.1/4/2021-PPD dated 18.05.2023 OM_No.1_4_2021_PPD_dated_18.05.2023 for compliance of Concurrent application of Public Procurement Policy for Micro and Small Enterprises Order, 2012 and Public Procurement (Preference to Make in India) Order, 2017. Benefits of MSE will be allowed only if seller is validated on-line in GeM profile as well as validated and approved by Buyer after evaluation of documents submitted.

Expression Of Interest For Supply Of Xylan Coated Stud With Nuts (176000 pieces)

(क्रमशः श्रेणी 1 और श्रेणी 2 के स्थानीय आपूर्तिकर्ता के रूप में अर्हता प्राप्त करने के लिए आवश्यक/Minimum 50% and 20% Local Content required for qualifying as Class 1 and Class 2 Local Supplier respectively)

तकनीकी विशिष्टियाँ /Technical Specifications

क्रेता विशिष्टि दस्तावेज़ /Buyer Specification Document	Download

परेषिती/रिपोर्टिंग अधिकारी तथा मात्रा/Consignees/Reporting Officer and Quantity

क्र.सं./S.No.	परेषिती/रिपोर्टिंग अधिकारी /Consignee Reporting/Officer	पता/Address	मात्रा /Quantity	डिलीवरी के दिन/Delivery Days
1	Navaneetha Krishnan V	620014,HIGH PRESSURE BOILER PLANT, BHARAT HEAVY ELECTRICALS LIMITED, TIRUCHIRAPPALLI - 620014. TAMILNADU. INDIA.	176000	70

क्रेता द्वारा जोड़ी गई बिड की विशेष शर्तें/Buyer Added Bid Specific Terms and Conditions

1. **Generic**

   OPTION CLAUSE: The Purchaser reserves the right to increase or decrease the quantity to be ordered up to 25 percent of bid quantity at the time of placement of contract. The purchaser also reserves the right to increase the ordered quantity up to 25% of the contracted quantity during the currency of the contract at the contracted rates. The delivery period of quantity shall commence from the last date of original delivery order and in cases where option clause is exercised during the extended delivery period the additional time shall commence from the last date of extended delivery period. The additional delivery time shall be (Increased quantity ÷ Original quantity) × Original delivery period (in days), subject to minimum of 30 days. If the original delivery period is less than 30 days, the additional time equals the original delivery period. The Purchaser may extend this calculated delivery duration up to the original delivery period while exercising the option clause. Bidders must comply with these terms.

2. **Scope of Supply**

   Scope of supply (Bid price to include all cost components) : Only supply of Goods

3. **Inspection**

   Nominated Inspection Agency: On behalf of the Buyer organization, any one of the following Inspection Agency would be conducting inspection of stores before acceptance:
   Pre-dispatch Inspection at Seller Premises (applicable only if pre-dispatch inspection clause has been selected in ATC):

   By Supplier's QC at their works

   Post Receipt Inspection at consignee site before acceptance of stores:
   By BHEL QC at BHEL Stores

4. **Buyer Added Bid Specific ATC**

   Buyer Added text based ATC clauses

   1. **This is only an Expression Of Interest (EOI) seeking response from interested eligible suppliers for floating actual tenders and hence does not assure any order.**
   2. **The quantities mentioned are only indicative.**
   3. **Commercial terms and conditions for the tenders to be floated will be published in the respective tender documents.**
   4.

GENERAL NOTICE:

Interested Suppliers may register themselves by applying through our Online Supplier Registration Portal https://supplier.bhel.in

The list of Material groups offered by Trichy Materials Management Dept. for enlistment is given in the following link https://supplier.bhel.in/mat_search1.jsp → Material Search → Select Plant as Trichy (Materials Management)".

The applicable "item code "/" material group" for PTFE coated fasteners is "**CPFOF**".

Steps for filling the online supplier application form is given in the following link, https://supplier.bhel.in/menu_help.pdf

Micro and Small Enterprises (MSE) and SC/ST vendors, Women Entrepreneurs under MSE category are encouraged to apply for vendor registration for availing the benefits being accorded as per the guidelines of MSME Ministry.

For clarifications / assistance required w.r.t. Vendor enlistment, anyone of the following persons in Supplier Development Cell (SDC) can be contacted

S.no	Name and Designation	E-Mail	Phone no
1	Smt. Tharanyaa K Manager/SDC/MM	tharanyaa@bhel.in	0431-257-4324

2	Shri. E Suresh Engineer/SDC/MM	esuresh@bhel.in	0431-257-4706
3	Shri Satish Chandra Singh Addl. Engineer/SDC/MM	satishchandra@bhel.in	0431-257-7992

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5. **Buyer Added Bid Specific ATC**

   Buyer uploaded ATC document Click here to view the file.

अस्वीकरण/Disclaimer

The Additional Terms and Conditions (ATC) have been incorporated by the Buyer after approval of their Competent Authority. The Buyer ,is solely responsible for the impact of these clauses on the bidding process, its outcome, and consequences thereof including any restriction arising in the bidding process due to these ATCs and including the modification of technical specifications and / or terms and conditions governing the bid.All representations / grievances pertaining to the ATC clauses shall be raised with the buyer organization directly and not with GeM.If any of the clause(s) is/are incorporated by the Buyer regarding the following, the bid & resultant contract shall be treated as null & void. Further, GeM reserves the right, at its sole discretion, to cancel the bid forthwith, without issuance of any prior notice or intimation :-

1. Publishing Custom / BOQ bids for items for which regular GeM categories are available (unless such Custom / BOQ item is bunched with the major regular product Category Item).
2. Mandating procurement of / from specific Brand / Make / Model / Manufacturer / Dealer except in case of Single Bid / Proprietary Article Certificate (PAC) Buying.
3. Inclusion of disqualification criteria related to suspension of seller / service provider, where such suspension period has already expired.
4. Mandating submission of documents in physical form as a pre-requisite to qualify bidders.
5. Publishing bids on GeM for procurement of works.
6. Procurement of Goods by creating a Service bid on GeM & vice-versa.
7. Seeking sample with bid or approval of samples during bid evaluation process. However, trial / sample, as the case may be, shall be permitted in cases where trial / sample are allowed as per approved and published procurement policy of the Buyers' controlling Ministry / Department / State / Public Sector Enterprises Headquarters. If there is any violation of trial / sample clause with regard to approved policy of the Buyers' Ministry / Department / State / Public Sector Enterprises Headquarters, then this is to be determined and redressed by the concerned Buyer Organisation only.
8. Seeking experience from specific organization / department / institute only or from foreign / export experience.
9. Creating bid for items from incorrect categories.
10. Reference of conditions published on any external site or reference to external documents/clauses.
11. Asking for any Tender fee / Bid Participation fee, as the case may be.
12. Buyer added ATC Clauses which are in contravention of clauses defined in bid detail section, including specifications, EMD Detail, ePBG Detail and MII and MSE Purchase Preference sections of the bid, unless otherwise allowed by the applicable GeM GTC.
13. Any ATC clause in contravention with GeM GTC Clause 4 (xiii) (h) will be invalid. In case of multiple L1 bidders against a service bid, the buyer shall place the Contract by selection of a bidder amongst the L-1 bidders through a Random Algorithm executed by GeM system.
14. In a category based bid, adding additional items, through buyer added, additional scope of work/ additional terms and conditions/or any other document. If buyer needs more items along with the main item, the same must be added through bunching category based items or by bunching custom catalogues or bunching a BoQ with the main category based item, the same must not be done through ATC or Scope of Work.

Further, if any seller has any objection/grievance against these additional clauses or otherwise on any aspect of

this bid, they can raise their representation against the same by using the Representation window provided in the bid details field in Seller dashboard after logging in as a seller. Buyer is duty bound to reply to all such representations and would not be allowed to open bids if he fails to reply to such representations.

All GeM Sellers/Service Providers shall ensure full compliance with all applicable labour laws, including the provisions, rules, schemes and guidelines under the four Labour Codes i.e. the Code on Wages, 2019; the Industrial Relations Code, 2020; the Occupational Safety, Health and Working Conditions Code, 2020; and the Code on Social Security, 2020 as and when notified and brought into force by the Government of India.

For all provisions of the Labour Codes that are pending operationalisation through rules, schemes or notifications, the corresponding provisions of the pre-existing labour enactments (such as The Minimum Wages Act, 1948, The Payment of Wages Act, 1936, The Payment of Bonus Act, 1965, The Equal Remuneration Act, 1976, The Payment of Gratuity Act, 1972, etc. and relevant State Rules) shall continue to remain applicable.

The Seller/ Service Providers shall, therefore, be responsible for ensuring compliance under:

- **All notified and enforceable provisions of the new Labour Codes as mentioned hereinabove; and**
- **All operative provisions of the erstwhile Labour Laws until their complete substitution.**

All obligations relating to wages, social security, safety, working conditions, industrial relations etc. and any other statutory requirements shall be strictly met by the Seller/ Service Provider. Any non-compliance shall constitute a breach of the contract and shall entitle the Buyer to take appropriate action in accordance with the contract and applicable law.

This Bid is governed by the General Terms and Conditions, conditions stipulated in Bid and Service Level Agreement specific to the Service, as the case may be, as provided in the Marketplace.

However, in case of Service, if any condition specified in General Terms and Conditions is contradicted by the conditions stipulated in Service Level Agreement specific to said Service, then it will over-ride the conditions in the General Terms and Conditions.

यह बिड सामान्य शर्तों के अंतर्गत भी शासित है /This Bid is also governed by the General Terms and Conditions

जेम की सामान्य शर्तों के खंड 26 के संदर्भ में भारत के साथ भूमि सीमा साझा करने वाले देश के बिडर से खरीद पर प्रतिबंध के संबंध में भारत के साथ भूमि सीमा साझा करने वाले देश का कोई भी बिडर इस निविदा में बिड देने के लिए तभी पात्र होगा जब वह बिड देने वाला सक्षम प्राधिकारी के पास पंजीकृत हो।बिड में भाग लेते समय बिडर को इसका अनुपालन करना होगा और कोई भी गलत घोषणा किए जाने व इसका अनुपालन न करने पर अनुबंध को तत्काल समाप्त करने और कानून के अनुसार आगे की कानूनी कार्रवाई का आधार होगा।/In terms of GeM GTC clause 26 regarding Restrictions on procurement from a bidder of a country which shares a land border with India, any bidder from a country which shares a land border with India will be eligible to bid in this tender only if the bidder is registered with the Competent Authority. While participating in bid, Bidder has to undertake compliance of this and any false declaration and non-compliance of this would be a ground for immediate termination of the contract and further legal action in accordance with the laws.

---धन्यवाद/Thank You---

List of items and tentative annual consumption

Sl	Material	Material Description	DRG No/Rev No	TDC No/Rev No	Industry Std Desc.	Approx. Annual Consumption (Nos.)
1	964693260000	STUD,FT,W/2NUTS,5/8"X5",GEN(125)	2V4Z0020198/02	TDC:5:164/12	B7,2H,ZINC,XYLAN	3000
2	964693270000	STUD,FT,W/2NUTS,3/4"X5.5",GEN(140)	2V4Z0120198/02	TDC:5:164/12	B7,2H,ZINC,XYLAN	7700
3	964693280000	STUD,FT,W/2NUTS,7/8"X6.5",GEN(165)	2V4Z0220198/02	TDC:5:164/12	B7,2H,ZINC,XYLAN	39600
4	964693290000	STUD,FT,W/2NUTS,1"X7",GEN(180)	2V4Z0320198/02	TDC:5:164/12	B7,2H,ZINC,XYLAN	7500
5	964693300000	STUD,FT,W/2NUTS,1"X7.25",GEN(185)	2V4Z0420198/02	TDC:5:164/12	B7,2H,ZINC,XYLAN	800
6	964693320000	STUD,FT,W/2NUTS,1-1/8"X7.75",GEN(195)	2V4Z0620198/02	TDC:5:164/12	B7,2H,ZINC,XYLAN	10300
7	964693330000	STUD,FT,W/2NUTS,1-1/8"X8.5",GEN(215)	2V4Z0720198/02	TDC:5:164/12	B7,2H,ZINC,XYLAN	100
8	964693340000	STUD,FT,W/2NUTS,1-1/4"X8.5",GEN(215)	2V4Z0820198/02	TDC:5:164/12	B7,2H,ZINC,XYLAN	1100
9	964693380000	STUD,FT,W/2NUTS,1-3/8"X10.75",GEN(275)	2V4Z1220198/02	TDC:5:164/12	B7,2H,ZINC,XYLAN	2500
10	964693390000	STUD,FT,W/2NUTS,1-3/8"X11.25",GEN(285)	2V4Z1320198/02	TDC:5:164/12	B7,2H,ZINC,XYLAN	6100
11	964693410000	STUD,FT,W/2NUTS,1-1/2"X11.75",GEN(300)	2V4Z1520198/02	TDC:5:164/12	B7,2H,ZINC,XYLAN	1400
12	964693420000	STUD,FT,W/2NUTS,1-5/8"X12.25",GEN(310)	2V4Z1620198/02	TDC:5:164/12	B7,2H,ZINC,XYLAN	4800
13	964693430000	STUD,FT,W/2NUTS,1-5/8"X12.75",GEN(325)	2V4Z1720198/02	TDC:5:164/12	B7,2H,ZINC,XYLAN	4400
14	964693440000	STUD,FT,W/2NUTS,1-3/4"X15.25",GEN(385)	2V4Z1820198/02	TDC:5:164/12	B7,2H,ZINC,XYLAN	2100
15	964693450000	STUD,FT,W/2NUTS,1-7/8"X14.25",GEN(360)	2V4Z1920198/03	TDC:5:164/12	B7,2H,ZINC,XYLAN	7900
16	964693460000	STUD,FT,W/2NUTS,1-7/8"X17.75",GEN(450)	2V4Z2020198/02	TDC:5:164/12	B7,2H,ZINC,XYLAN	100
17	964693470000	STUD,FT,W/2NUTS,2"X15",GEN(380)	2V4Z2120198/02	TDC:5:164/12	B7,2H,ZINC,XYLAN	100
18	964693490000	STUD,FT,W/2NUTS,3/4"X5.5",SOUR(140)	2V4Z0120200/02	TDC:5:164/12	B7M,2HM,ZINC,XYLAN	100
19	964693500000	STUD,FT,W/2NUTS,7/8"X6.5",SOUR(165)	2V4Z0220200/02	TDC:5:164/12	B7M,2HM,ZINC,XYLAN	2400
20	964693510000	STUD,FT,W/2NUTS,1"X7",SOUR(180)	2V4Z0320200/02	TDC:5:164/12	B7M,2HM,ZINC,XYLAN	200
21	964693540000	STUD,FT,W/2NUTS,1-1/8"X7.75",SOUR(195)	2V4Z0620200/02	TDC:5:164/12	B7M,2HM,ZINC,XYLAN	1200
22	964693780000	STUD,DE,W/NUT,5/8"X75mm,GEN,NS	2V4Z0020199/02	TDC:5:164/12	B7,2H,ZINC,XYLAN	2700
23	964693790000	STUD,DE,W/NUT,5/8"X3.625",GEN(90),STD	2V4Z0120199/02	TDC:5:164/12	B7,2H,ZINC,XYLAN	2400
24	964693800000	STUD,DE,W/NUT,3/4"X3.875",GEN(100),STD	2V4Z0220199/02	TDC:5:164/12	B7,2H,ZINC,XYLAN	3700
25	964693820000	STUD,DE,W/NUT,7/8"X4.625",GEN(115),STD	2V4Z0420199/02	TDC:5:164/12	B7,2H,ZINC,XYLAN	25200
26	964693850000	STUD,DE,W/NUT,1"X5",GEN(125),STD	2V4Z0720199/02	TDC:5:164/12	B7,2H,ZINC,XYLAN	100
27	964693860000	STUD,DE,W/NUT,1"X5.125",GEN(130),STD	2V4Z0820199/02	TDC:5:164/12	B7,2H,ZINC,XYLAN	17400
28	964693870000	STUD,DE,W/NUT,1"X125mm,GEN,NS	2V4Z0920199/02	TDC:5:164/12	B7,2H,ZINC,XYLAN	100
29	964693890000	STUD,DE,W/NUT,1-1/8"X131mm,GEN,NS	2V4Z1120199/02	TDC:5:164/12	B7,2H,ZINC,XYLAN	7700
30	964693900000	STUD,DE,W/NUT,1-1/8"X5.625",GEN(145),STD	2V4Z1220199/02	TDC:5:164/12	B7,2H,ZINC,XYLAN	7000
31	964693910000	STUD,DE,W/NUT,1-1/4"X6.125",GEN(155),STD	2V4Z1320199/02	TDC:5:164/12	B7,2H,ZINC,XYLAN	800
32	964694170000	STUD,DE,W/NUT,1"X5",SOUR(125),STD	2V4Z0720201/02	TDC:5:164/12	B7M,2HM,ZINC,XYLAN	100
33	964693600000	STUD,FT,W/2NUTS,1-3/8"X10.75",SOUR(275)	2V4Z1220200/02	TDC:5:164/12	B7M,2HM,ZINC,XYLAN	100
34	964693610000	STUD,FT,W/2NUTS,1-3/8"X11.25",SOUR(285)	2V4Z1320200/02	TDC:5:164/12	B7M,2HM,ZINC,XYLAN	100
35	964693650000	STUD,FT,W/2NUTS,1-5/8"X12.75",SOUR(325)	2V4Z1720200/02	TDC:5:164/12	B7M,2HM,ZINC,XYLAN	300
36	964693660000	STUD,FT,W/2NUTS,1-3/4"X15.25",SOUR(385)	2V4Z1820200/02	TDC:5:164/12	B7M,2HM,ZINC,XYLAN	100
37	964693670000	STUD,FT,W/2NUTS,1-7/8"X14.25",SOUR(360)	2V4Z1920200/02	TDC:5:164/12	B7M,2HM,ZINC,XYLAN	400
38	964694030000	STUD,DE,W/NUT,1-5/8"X8.375",GEN(215),STD	2V4Z2520199/02	TDC:5:164/12	B7,2H,ZINC,XYLAN	100
39	964694050000	STUD,DE,W/NUT,1-3/4"X9.75",GEN(250),STD	2V4Z2720199/02	TDC:5:164/12	B7,2H,ZINC,XYLAN	100
40	964694060000	STUD,DE,W/NUT,1-7/8"X9.625",GEN(245),STD	2V4Z2820199/02	TDC:5:164/12	B7,2H,ZINC,XYLAN	100
41	964694070000	STUD,DE,W/NUT,1-7/8"X9.5",GEN(240),STD	2V4Z2920199/02	TDC:5:164/12	B7,2H,ZINC,XYLAN	100
42	964694080000	STUD,DE,W/NUT,1-7/8"X11",GEN(280),STD	2V4Z3020199/02	TDC:5:164/12	B7,2H,ZINC,XYLAN	100
43	964694090000	STUD,DE,W/NUT,2"X10.125",GEN(255),STD	2V4Z3120199/02	TDC:5:164/12	B7,2H,ZINC,XYLAN	100
44	964694110000	STUD,DE,W/NUT,5/8"X3.625",SOUR(90),STD	2V4Z0120201/02	TDC:5:164/12	B7M,2HM,ZINC,XYLAN	100
45	964694120000	STUD,DE,W/NUT,3/4"X3.875",SOUR(100),STD	2V4Z0220201/02	TDC:5:164/12	B7M,2HM,ZINC,XYLAN	100
46	964694130000	STUD,DE,W/NUT,7/8"X95mm,SOUR,NS	2V4Z0320201/02	TDC:5:164/12	B7M,2HM,ZINC,XYLAN	100
47	964694140000	STUD,DE,W/NUT,7/8"X4.625",SOUR(115),STD	2V4Z0420201/02	TDC:5:164/12	B7M,2HM,ZINC,XYLAN	600
48	964694150000	STUD,DE,W/NUT,1"X100mm,SOUR,NS	2V4Z0520201/02	TDC:5:164/12	B7M,2HM,ZINC,XYLAN	100
49	964694190000	STUD,DE,W/NUT,1"X5.125",SOUR(130),STD	2V4Z0920201/02	TDC:5:164/12	B7M,2HM,ZINC,XYLAN	300
50	964694210000	STUD,DE,W/NUT,1-1/8"X131mm,SOUR,NS	2V4Z1120201/02	TDC:5:164/12	B7M,2HM,ZINC,XYLAN	1700
51	964694220000	STUD,DE,W/NUT,1-1/8"X5.625",SOUR(145),ST	2V4Z1220201/02	TDC:5:164/12	B7M,2HM,ZINC,XYLAN	1200
52	964694230000	STUD,DE,W/NUT,1-1/4"X6.125",SOUR(155),ST	2V4Z1320201/02	TDC:5:164/12	B7M,2HM,ZINC,XYLAN	100
53	964694320000	STUD,DE,W/NUT,1-1/2"X7.375",SOUR(185),ST	2V4Z2220201/02	TDC:5:164/12	B7M,2HM,ZINC,XYLAN	100
54	964694350000	STUD,DE,W/NUT,1-5/8"X8.375",SOUR(215),ST	2V4Z2520201/02	TDC:5:164/12	B7M,2HM,ZINC,XYLAN	100
55	964694360000	STUD,DE,W/NUT,1-3/4"X165mm,SOUR,NS	2V4Z2620201/02	TDC:5:164/12	B7M,2HM,ZINC,XYLAN	100
56	964694380000	STUD,DE,W/NUT,1-7/8"X9.625",SOUR(245),ST	2V4Z2820201/02	TDC:5:164/12	B7M,2HM,ZINC,XYLAN	100

DRAWING NO: 2-V-0000-20198

ALL DIMENSIONS ARE IN MILLIMETRES.

ASSEMBLY DETAILS

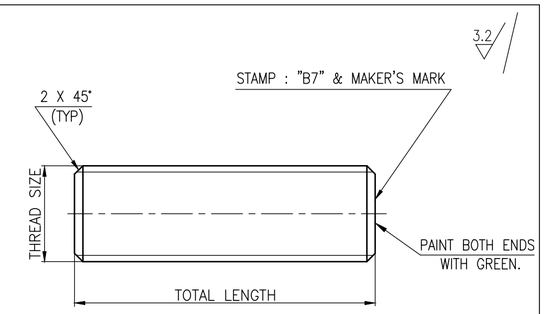
SL. No.	DRAWING NUMBER	MATERIAL CODE	API DESIGNATION	FLANGE RATINGS	ASSY wt./kg
01	2-V-4Z00-20198 /02	96 469 326 0000	5/8" x 5"	2-1/16"-2000	0.26
02	2-V-4Z01-20198 /02	96 469 327 0000	3/4" x 5.5"	2-1/16"-10000	0.46
03	2-V-4Z02-20198 /02	96 469 328 0000	7/8" x 6.5"	2-1/16"-5000	0.71
04	2-V-4Z03-20198 /02	96 469 329 0000	1" x 7"	2-9/16"-5000	1.05
05	2-V-4Z04-20198 /02	96 469 330 0000	1" x 7.25"	3-1/16"-10000	1.01
06	2-V-4Z05-20198 /02	96 469 331 0000	1-1/8" x 7.5"	4-1/16"-3000	1.49
07	2-V-4Z06-20198 /02	96 469 332 0000	1-1/8" x 7.75"	3-1/8"-5000	1.52
08	2-V-4Z07-20198 /02	96 469 333 0000	1-1/8" x 8.5"	7-1/16"-3000	1.59
09	2-V-4Z08-20198 /02	96 469 334 0000	1-1/4" x 8.5"	4-1/16"-5000	2
10	2-V-4Z09-20198 /02	96 469 335 0000	1-1/4" x 9.5"	13-5/8"-2000	2.15
11	2-V-4Z10-20198 /02	96 469 336 0000	1-3/8" x 9.5"	9"-3000	2.52
12	2-V-4Z11-20198 /02	96 469 337 0000	1-3/8" x 10"	11"-3000	2.63
13	2-V-4Z12-20198 /02	96 469 338 0000	1-3/8" x 10.75"	13-5/8"-3000	2.78
14	2-V-4Z13-20198 /02	96 469 339 0000	1-3/8" x 11.25"	7-1/16"-5000	2.85
15	2-V-4Z14-20198 /02	96 469 340 0000	1-1/2" x 10.5"	5-1/8"-5000	3.3
16	2-V-4Z15-20198 /02	96 469 341 0000	1-1/2" x 11.75"	7-1/16"-10000	3.64
17	2-V-4Z16-20198 /02	96 469 342 0000	1-5/8" x 12.25"	21-1/4"-2000	4.18
18	2-V-4Z17-20198 /02	96 469 343 0000	1-5/8" x 12.75"	13-5/8"-5000	4.37
19	2-V-4Z18-20198 /02	96 469 344 0000	1-3/4" x 15.25"	11"-10000	6.39
20	2-V-4Z19-20198 /03	96 469 345 0000	1-7/8" x 14.25" (05)	11"-5000	7.2
21	2-V-4Z20-20198 /02	96 469 346 0000	1-7/8" x 17.75	13-5/8"-10000	8.55
22	2-V-4Z21-20198 /02	96 469 347 0000	2" x 15"	20-3/4"-3000	8.67

DETAILS OF ITEM No. 001

MATL. SPECN.	THREAD SIZE	TOTAL LENGTH	UNIT Wt (kg)
REFER NOTES 1 AND 3	5/8"-11UNC-2A	125 +3 0	0.19
	3/4"-10UNC-2A	140 +3 0	0.30
	7/8"-9UNC-2A	165 +3 0	0.48
	1"-8UNC-2A	180 +3 0	0.70
		185 +3 0	0.72
	1-1/8"-8UN-2A	190 +3 0	0.95
		195 +3 0	1.01
		215 +3 0	1.05
	1-1/4"-8UN-2A	215 +3 0	1.33
		240 +3 0	1.48
	1-3/8"-8UN-2A	240 +3 0	1.82
		255 +3 0	1.90
		275 +3 0	2.05
		285 +3 0	2.15
	1-1/2"-8UN-2A	265 +3 0	2.40
		300 +3 0	2.67
	1-5/8"-8UN-2A	310 +6 0	3.26
		325 +6 0	3.44
	1-3/4"-8UN-2A	385 +6 0	4.70
	1-7/8"-8UN-2A	360 +6 0	4.95
		450 +6 0	6.30
	2"-8UN-2A	380 +6 0	6.10

DETAILS OF ITEM No. 002

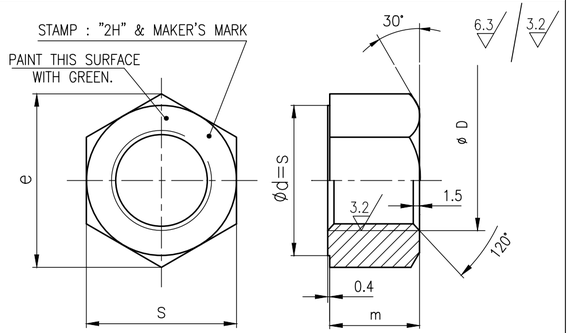
ø D	MATL. SPECN.	s MAX	s MIN	e MAX	e MIN	m MAX	m MIN	UNIT Wt (kg)
5/8"-11UNC-2B	REFER NOTES 1 AND 2	26.97	26.19	31.36	29.85	16.02	14.91	0.033
3/4"-10UNC-2B		31.75	30.79	36.65	35.11	19.25	18.04	0.076
7/8"-9UNC-2B		36.52	35.41	42.16	40.37	22.47	21.16	0.108
1"-8UNC-2B		41.27	40.01	47.65	45.62	25.70	24.29	0.165
1-1/8"-8UN-2B		46.02	44.61	53.16	50.86	28.93	27.41	0.266
1-1/4"-8UN-2B		50.80	49.23	58.64	56.11	31.77	30.15	0.35
1-3/8"-8UN-2B		55.57	53.83	64.16	61.37	35.00	33.28	0.364
1-1/2"-8UN-2B		60.32	58.42	69.64	66.60	38.22	36.40	0.485
1-5/8"-8UN-2B		65.07	63.02	75.15	71.84	41.45	39.53	0.50
1-3/4"-8UN-2B		69.85	67.62	80.64	77.09	44.67	42.65	0.93
1-7/8"-8UN-2B		74.62	72.24	86.15	82.35	47.90	45.78	1.18
2"-8UN-2B		79.37	76.84	91.64	87.61	51.13	48.90	1.37



ITEM No. 001

NOTES:-

1. MATERIAL : ASTM A193-GR.B7 AS PER LATEST APPLICABLE QUALITY PROCEDURE.
2. 45° CHAMFER FIRST THREAD
3. STUD BOLTS SHALL BE HARDNESS TESTED FOR AN ACCEPTABLE HARDNESS AS PER LATEST APPLICABLE QUALITY PROCEDURE.



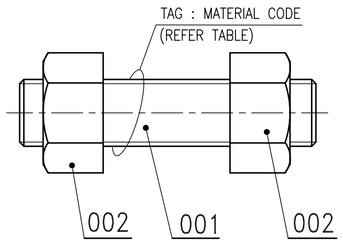
ITEM No. 002

NOTES:-

1. MATERIAL : ASTM A194-GR.2H AS PER LATEST APPLICABLE QUALITY PROCEDURE
2. NUTS SHALL BE HARDNESS TESTED FOR AN ACCEPTABLE HARDNESS AS PER LATEST APPLICABLE QUALITY PROCEDURE.
3. FOR OTHER DIMENSIONS REFER ANSI B18.2.2 (HEAVY HEX.NUT)

COMMON NOTES FOR STUD & NUT:-

1. BOTH STUD & NUTS ARE TO BE ZINC COATED FOR A DEPTH OF 0.005 TO 0.01MM, BEFORE XYLAN COATING.
2. FOR ZINC COATING, USE ELECTRODEPOSITING/ ELECTROPLATING METHOD AS PER IS:1573-1986/LATEST TO BE REFERRED.
3. AFTER ZINC COATING, COMPONENTS TO BE BAKED. THE ELAPSED TIME BETWEEN PLATING AND BAKING SHALL NOT EXCEED 8 HOURS.
4. BOTH STUD & NUTS ARE TO BE TO BE XYLAN COATED AFTER ZINC COATING :
   - 4.1. GRADE OF TEFLON ON : XYLAN 1070
   - 4.2. MAX. SERVICE TEMPERATURE : 285°C
   - 4.3. COATING THICKINESS : 25 TO 30 MICRONS.
   - 4.4. COLOUR : BLUE
5. TWO COATS OF XYLAN COATING WITH DEPTH OF 10-15 MICRONS MINIMUM FOR EACH COAT.
6. AFTER EACH COAT OF XYLAN, COMPONENTS SHALL BE BAKED AT 240 DEG C FOR 20 MINUTES MINIMUM.
7. ALL STUDS SHOULD BE PACKED SUITABLY TO AVOID THREAD DAMAGE AND SHOULD ASSEMBLED WITH TWO NUTS.
8. THREADING & GAUGING SHALL BE DONE AS PER ASME B1.1



STUD BOLT WITH 2 NUTS

PSL	3
TEMP. RATING	P,U
MATL. CLASS	–

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: FOR GENERAL SERVICE (WITH ZINC COATING & XYLAN COATING-BLUE COLOUR)

365-120/A 09.09.20

BHARAT HEAVY ELECTRICALS LTD., UNIT: HIGH PRESSURE BOILER PLANT. TIRUCHIRAPALLI-620014.

	NAME	SIGN	DATE	NO.OF VAR.
DRN	R.NATARAJAN		28.03.2015	–
CHD	P.ARUNKUMAR		28.03.2015	
APPD	R.ELAYARAAJA		28.03.2015	

DEPT	SCALE	WEIGHT (KG).	REFERENCE INFORMATIONS	NO. OF ITEMS
V L	NTS	—	—	—
CODE 340				

TITLE: STUD-FULL THREADED WITH 2 NUTS

CARD CODE: U 01

DRAWING NO.: 2-V-0000-20198

REV: 05

DCP No.	ALTD: V.P.S	APPD: A.K.P.
802821	CHD: D.L.K	DT: 16.07.24

REV 05 — DESCRIPTION CORRECTED FOR SL.NO.-20

ZONE (05)

Size A2

DRAWING NO: 2-V-0000-20199

ALL DIMENSIONS ARE IN MILLIMETRES.

ASSEMBLY DETAILS

SL. No.	DRAWING NUMBER	MATERIAL CODE	FLANGE RATINGS	ASSY wt./kg
01	2-V-4Z00-20199 /02	96 469 378 0000	2-1/16" – 2000(NS)*	0.16
02	2-V-4Z01-20199 /02	96 469 379 0000	2-1/16" – 2000	0.18
03	2-V-4Z02-20199 /02	96 469 380 0000	2-1/16" – 10000	0.30
04	2-V-4Z03-20199 /02	96 469 381 0000	(NS)*	0.38
05	2-V-4Z04-20199 /02	96 469 382 0000	2-1/16" – 5000	0.46
06	2-V-4Z05-20199 /02	96 469 383 0000	(NS)*	0.48
07	2-V-4Z06-20199 /02	96 469 384 0000	3-1/8"-5000(WKM)(NS)*	0.59
08	2-V-4Z07-20199 /02	96 469 385 0000	3-1/16" – 10000	0.67
09	2-V-4Z08-20199 /02	96 469 386 0000	2-9/16" – 5000	0.7
10	2-V-4Z09-20199 /02	96 469 387 0000	2-9/16" – 5000(NS)*	0.67
11	2-V-4Z10-20199 /02	96 469 388 0000	3-1/8" – 5000(NS)*	0.70
12	2-V-4Z11-20199 /02	96 469 389 0000	3-1/8" – 5000(FBV)(NS)*	0.88
13	2-V-4Z12-20199 /02	96 469 390 0000	3-1/8" – 5000	0.93
14	2-V-4Z13-20199 /02	96 469 391 0000	4-1/16" – 5000(FBV)	1.25
15	2-V-4Z14-20199 /02	96 469 392 0000	13-5/8" – 2000	1.4
16	2-V-4Z15-20199 /02	96 469 393 0000	4-1/16" – 5000 (NS)*	1.70
17	2-V-4Z16-20199 /02	96 469 394 0000	9" – 3000	1.61
18	2-V-4Z17-20199 /02	96 469 395 0000	11" – 3000	1.71
19	2-V-4Z18-20199 /02	96 469 396 0000	13-5/8" – 3000	1.75
20	2-V-4Z19-20199 /02	96 469 397 0000	7-1/16" – 5000	1.73
21	2-V-4Z20-20199 /02	96 469 398 0000	5-1/8" – 5000(FBV)(NS)*	1.96
22	2-V-4Z21-20199 /02	96 469 399 0000	3-1/16" – 10000(FBV)(NS)*	2.10
23	2-V-4Z22-20199 /02	96 469 400 0000	5-1/8" – 5000	2.09
24	2-V-4Z23-20199 /02	96 469 401 0000	7-1/16" – 10000	2.15
25	2-V-4Z24-20199 /02	96 469 402 0000	9" – 10000	2.36
26	2-V-4Z25-20199 /02	96 469 403 0000	13-5/8" – 5000	2.75
27	2-V-4Z26-20199 /02	96 469 404 0000	(NS)*	2.83
28	2-V-4Z27-20199 /02	96 469 405 0000	11" – 10000	3.93
29	2-V-4Z28-20199 /02	96 469 406 0000	11" – 5000	4.6
30	2-V-4Z29-20199 /02	96 469 407 0000	16-3/4" – 5000	4.53
31	2-V-4Z30-20199 /02	96 469 408 0000	13-5/8" – 10000	4.98
32	2-V-4Z31-20199 /02	96 469 409 0000	20-3/4" – 3000	5.33

* (NS) – NON-STANDARD

DETAILS OF ITEM No. 001

REFER NOTES 1 AND 3

MATL. SPECN.	THREAD SIZE	A +1 0	B +1 0	TOTAL LENGTH +3 0	UNIT Wt (kg)
	5/8" – 11UNC	20	45	75	0.12
		20	40	90	0.14
	3/4" – 10UNC	23	48	100	0.22
	7/8" – 9UNC	34	42	95	0.27
		27	56	115	0.35
	1" – 8UNC	31	45	100	0.3
		31	46	106	0.42
		31	64	125	0.5
		31	64	130	0.53
		31	64	125	0.50
		31	70	133	0.53
	1-1/8" – 8UN	34	72	131	0.61
		34	72	145	0.66
	1-1/4" – 8UN	37	80	155	0.9
		37	80	170	1.05
		37	83	230	1.35
	1-3/8" – 8UN	40	88	170	1.25
		40	88	180	1.34
		40	88	185	1.38
		40	88	190	1.42
	1-1/2" – 8UN	43	96	177	1.47
		43	96	181	1.61
		43	96	185	1.6
		43	96	195	1.66
		43	96	215	1.87
	1-5/8" – 8UN	47	104	215	2.25
	1-3/4" – 8UN	50	70	165	1.90
		50	112	250	3.00
	1-7/8" – 8UN	53	120	245	3.42
		53	120	240	3.35
		53	120	280	3.8
	2" – 8UN	56	127	255	3.96

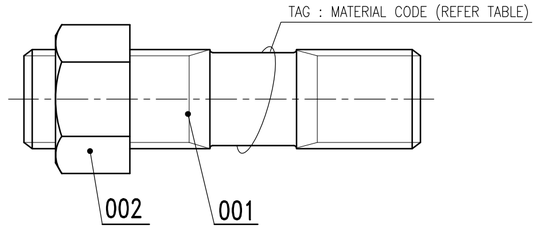
DETAILS OF ITEM No. 002

REFER NOTES 1 AND 3

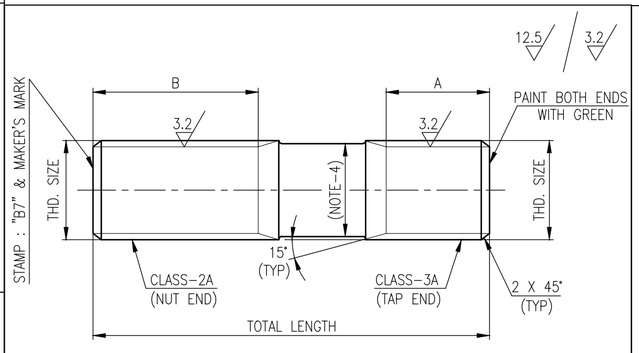
ø D	MATL. SPECN.	s MAX	s MIN	e MAX	e MIN	m MAX	m MIN	UNIT Wt (kg)
5/8"–11UNC–2B		26.97	26.19	31.36	29.85	16.02	14.91	0.033
3/4"–10UNC–2B		31.75	30.79	36.65	35.11	19.25	18.04	0.076
7/8"–9UNC–2B		36.52	35.41	42.16	40.37	22.47	21.16	0.108
1"–8UNC–2B		41.27	40.01	47.65	45.62	25.70	24.29	0.165
1-1/8"–8UN–2B		46.02	44.61	53.16	50.86	28.93	27.41	0.266
1-1/4"–8UN–2B		50.80	49.23	58.64	56.11	31.77	30.15	0.35
1-3/8"–8UN–2B		55.57	53.83	64.16	61.37	35.00	33.28	0.364
1-1/2"–8UN–2B		60.32	58.42	69.64	66.60	38.22	36.40	0.485
1-5/8"–8UN–2B		65.07	63.02	75.15	71.84	41.45	39.53	0.50
1-3/4"–8UN–2B		69.85	67.62	80.64	77.09	44.67	42.65	0.93
1-7/8"–8UN–2B		74.62	72.24	86.15	82.35	47.90	45.78	1.18
2"–8UN–2B		79.37	76.84	91.64	87.61	51.13	48.90	1.37

COMMON NOTES FOR STUD & NUT:–

1. BOTH STUD & NUTS ARE TO BE ZINC COATED FOR A DEPTH OF 0.005 TO 0.01MM, BEFORE XYLAN COATING.
2. FOR ZINC COATING, USE ELECTRODEPOSITING/ ELECTROPLATING METHOD AS PER IS:1573–1986/LATEST TO BE REFERRED.
3. AFTER ZINC COATING, COMPONENTS TO BE BAKED. THE ELAPSED TIME BETWEEN PLATING AND BAKING SHALL NOT EXCEED 8 HOURS.
4. BOTH STUD & NUTS ARE TO BE TO BE XYLAN COATED AFTER ZINC COATING :
   - 4.1. GRADE OF TEFLON ON : XYLAN 1070
   - 4.2. MAX. SERVICE TEMPERATURE : 285°C
   - 4.3. COATING THICKINESS : 25 TO 30 MICRONS.
   - 4.4. COLOUR : BLUE
5. TWO COATS OF XYLAN COATING WITH DEPTH OF 10–15 MICRONS MINIMUM FOR EACH COAT.
6. AFTER EACH COAT OF XYLAN, COMPONENTS SHALL BE BAKED AT 240 DEG C FOR 20 MINUTES MINIMUM.
7. ALL STUDS SHOULD BE PACKED SUITABLY TO AVOID THREAD DAMAGE AND SHOULD ASSEMBLED WITH ONE NUT IN NUT END.
8. THREADING & GAUGING SHALL BE DONE AS PER ASME B1.1
9. MINIMUM UNTHREADED PORTION EQUAL TO ONE THREAD PITCH BETWEEN TAP END AND NUT END THREADS.



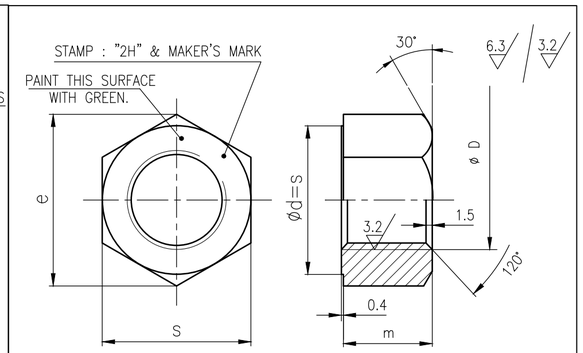
STUD WITH 1 NUT



ITEM No. 001

NOTES:–

1. MATERIAL : ASTM A193–GR.B7 AS PER LATEST APPLICABLE QUALITY PROCEDURE.
2. STUD BOLTS SHALL BE HARDNESS TESTED FOR AN ACCEPTABLE HARDNESS AS PER LATEST APPLICABLE QUALITY PROCEDURE.
3. SHANK DIA NOT LESS THAN PITCH DIA.



ITEM No. 002

NOTES:–

1. MATERIAL : ASTM A194–GR.2H AS PER LATEST APPLICABLE QUALITY PROCEDURE
2. NUTS SHALL BE HARDNESS TESTED FOR AN ACCEPTABLE HARDNESS AS PER LATEST APPLICABLE QUALITY PROCEDURE.
3. FOR OTHER DIMENSIONS REFER ANSI B18.2.2 (HEAVY HEX.NUT)

PSL	3
TEMP. RATING	P.U

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

DCP No.	ALTD: D.L.K.	APPD: A.K.P.
802758	CHD: A.K.P.	DT: 23.03.23

REV	
04	REVIEWED FOR LATEST API–6A REQUIREMENTS.

ZONE 04

TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT

FOR GENERAL SERVICE

(WITH ZINC COATING & XYLAN COATING–BLUE COLOUR)

365–120/A 09.09.20

BHARAT HEAVY ELECTRICALS LTD.,
UNIT: HIGH PRESSURE BOILER PLANT.
TIRUCHIRAPALLI–620014.

	NAME	SIGN	DATE	NO.OF VAR.
DRN	R.NATARAJAN		28.03.2015	–
CHD	P.ARUNKUMAR		28.03.2015	
APPD	R.ELAYARAAJA		28.03.2015	

DEPT	SCALE	WEIGHT (KG).	REFERENCE INFORMATIONS	NO. OF ITEMS
V L	NTS	—	——	—
CODE 340	OFE			

TITLE	CARD CODE	DRAWING NO.	REV
STUD–DOUBLE ENDED WITH 1 NUT	U 01	2-V-0000-20199	04

Size A2

DRAWING NO: 2-V-0000-20200

ALL DIMENSIONS ARE IN MILLIMETRES.

ASSEMBLY DETAILS

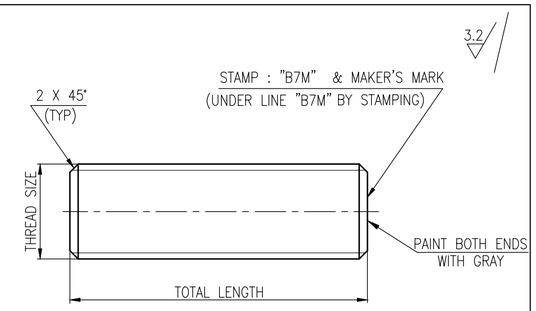
SL. No.	DRAWING NUMBER	MATERIAL CODE	API DESIGNATION	FLANGE RATINGS	ASSY wt./kg
01	2-V-4Z00-20200 /02	96 469 348 0000	5/8" x 5"	2-1/16"-2000	0.26
02	2-V-4Z01-20200 /02	96 469 349 0000	3/4" x 5.5"	2-1/16"-10000	0.46
03	2-V-4Z02-20200 /02	96 469 350 0000	7/8" x 6.5"	2-1/16"-5000	0.7
04	2-V-4Z03-20200 /02	96 469 351 0000	1" x 7"	2-9/16"-5000	1.05
05	2-V-4Z04-20200 /02	96 469 352 0000	1" x 7.25"	3-1/16"-10000	1.07
06	2-V-4Z05-20200 /02	96 469 353 0000	1-1/8" x 7.5"	4-1/16"-3000	1.49
07	2-V-4Z06-20200 /02	96 469 354 0000	1-1/8" x 7.75"	3-1/8"-5000	1.52
08	2-V-4Z07-20200 /02	96 469 355 0000	1-1/8" x 8.5"	7-1/16"-3000	1.59
09	2-V-4Z08-20200 /02	96 469 356 0000	1-1/4" x 8.5"	4-1/16"-5000	2
10	2-V-4Z09-20200 /02	96 469 357 0000	1-1/4" x 9.5"	13-5/8"-2000	2.15
11	2-V-4Z10-20200 /02	96 469 358 0000	1-3/8" x 9.5"	9"-3000	2.52
12	2-V-4Z11-20200 /02	96 469 359 0000	1-3/8" x 10"	11"-3000	2.63
13	2-V-4Z12-20200 /02	96 469 360 0000	1-3/8" x 10.75"	13-5/8"-3000	2.78
14	2-V-4Z13-20200 /02	96 469 361 0000	1-3/8" x 11.25"	7-1/16"-5000	2.85
15	2-V-4Z14-20200 /02	96 469 362 0000	1-1/2" x 10.5"	5-1/8"-5000	3.3
16	2-V-4Z15-20200 /02	96 469 363 0000	1-1/2" x 11.75"	7-1/16"-10000	3.64
17	2-V-4Z16-20200 /02	96 469 364 0000	1-5/8" x 12.25"	21-1/4"-2000	4.18
18	2-V-4Z17-20200 /02	96 469 365 0000	1-5/8" x 12.75"	13-5/8"-5000	4.37
19	2-V-4Z18-20200 /02	96 469 366 0000	1-3/4" x 15.25"	11"-10000	6.39
20	2-V-4Z19-20200 /02	96 469 367 0000	1-7/8" x 14.25"	11"-5000	7.2
21	2-V-4Z20-20200 /02	96 469 368 0000	1-7/8" x 17.75"	13-5/8"-10000	8.55
22	2-V-4Z21-20200 /02	96 469 369 0000	2" x 15"	20-3/4"-3000	8.67

DETAILS OF ITEM No. 001

MATL. SPECN.	THREAD SIZE	TOTAL LENGTH	UNIT Wt (kg)
REFER NOTES 1 AND 3	5/8"-11UNC-2A	125 $^{+3}_{0}$	0.19
	3/4"-10UNC-2A	140 $^{+3}_{0}$	0.30
	7/8"-9UNC-2A	165 $^{+3}_{0}$	0.49
	1"-8UNC-2A	180 $^{+3}_{0}$	0.72
		185 $^{+3}_{0}$	0.74
	1-1/8"-8UN-2A	190 $^{+3}_{0}$	0.95
		195 $^{+3}_{0}$	0.98
		215 $^{+3}_{0}$	1.05
	1-1/4"-8UN-2A	215 $^{+3}_{0}$	1.3
		240 $^{+3}_{0}$	1.45
	1-3/8"-8UN-2A	240 $^{+3}_{0}$	1.79
		255 $^{+3}_{0}$	1.90
		275 $^{+3}_{0}$	2.05
		285 $^{+3}_{0}$	2.12
	1-1/2"-8UN-2A	265 $^{+3}_{0}$	2.33
		300 $^{+3}_{0}$	2.67
	1-5/8"-8UN-2A	310 $^{+6}_{0}$	3.18
		325 $^{+6}_{0}$	3.37
	1-3/4"-8UN-2A	385 $^{+6}_{0}$	4.53
	1-7/8"-8UN-2A	360 $^{+6}_{0}$	4.85
		450 $^{+6}_{0}$	6.19
	2"-8UN-2A	380 $^{+6}_{0}$	5.93

DETAILS OF ITEM No. 002

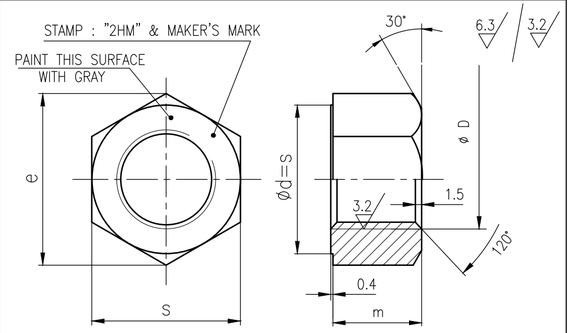
ø D	MATL. SPECN.	s MAX	s MIN	e MAX	e MIN	m MAX	m MIN	UNIT Wt (kg)
5/8"-11UNC-2B	REFER NOTES 1 AND 2	26.97	26.19	31.36	29.85	16.02	14.91	0.033
3/4"-10UNC-2B		31.75	30.79	36.65	35.11	19.25	18.04	0.076
7/8"-9UNC-2B		36.52	35.41	42.16	40.37	22.47	21.16	0.108
1"-8UNC-2B		41.27	40.01	47.65	45.62	25.70	24.29	0.165
1-1/8"-8UN-2B		46.02	44.61	53.16	50.86	28.93	27.41	0.266
1-1/4"-8UN-2B		50.80	49.23	58.64	56.11	31.77	30.15	0.35
1-3/8"-8UN-2B		55.57	53.83	64.16	61.37	35.00	33.28	0.364
1-1/2"-8UN-2B		60.32	58.42	69.64	66.60	38.22	36.40	0.485
1-5/8"-8UN-2B		65.07	63.02	75.15	71.84	41.45	39.53	0.50
1-3/4"-8UN-2B		69.85	67.62	80.64	77.09	44.67	42.65	0.93
1-7/8"-8UN-2B		74.62	72.24	86.15	82.35	47.90	45.78	1.18
2"-8UN-2B		79.37	76.84	91.64	87.61	51.13	48.90	1.37



ITEM No. 001

NOTES:-

1. MATERIAL : ASTM A193-GR.B7M AS PER LATEST APPLICABLE QUALITY PROCEDURE.
2. STUD BOLTS SHALL BE HARDNESS TESTED FOR AN ACCEPTABLE HARDNESS AS PER LATEST APPLICABLE QUALITY PROCEDURE.



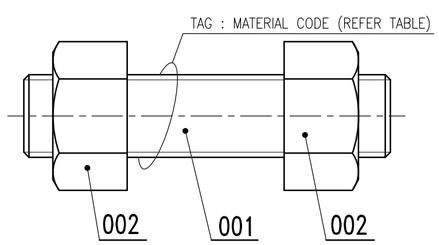
ITEM No. 002

NOTES:-

1. MATERIAL : ASTM A194-GR.2HM AS PER LATEST APPLICABLE QUALITY PROCEDURE
2. NUTS SHALL BE HARDNESS TESTED FOR AN ACCEPTABLE HARDNESS AS PER LATEST APPLICABLE QUALITY PROCEDURE.
3. FOR OTHER DIMENSIONS REFER ANSI B18.2.2 (HEAVY HEX.NUT)

COMMON NOTES FOR STUD & NUT:-

1. BOTH STUD & NUTS ARE TO BE ZINC COATED FOR A DEPTH OF 0.005 TO 0.01MM, BEFORE XYLAN COATING.
2. FOR ZINC COATING, USE ELECTRODEPOSITING/ ELECTROPLATING METHOD AS PER IS:1573-1986/LATEST TO BE REFERRED.
3. AFTER ZINC COATING, COMPONENTS TO BE BAKED. THE ELAPSED TIME BETWEEN PLATING AND BAKING SHALL NOT EXCEED 8 HOURS.
4. BOTH STUD & NUTS ARE TO BE TO BE XYLAN COATED AFTER ZINC COATING :
   - 4.1. GRADE OF TEFLON ON : XYLAN 1070
   - 4.2. MAX. SERVICE TEMPERATURE : 285°C
   - 4.3. COATING THICKINESS : 25 TO 30 MICRONS.
   - 4.4. COLOUR : BLUE
5. TWO COATS OF XYLAN COATING WITH DEPTH OF 10-15 MICRONS MINIMUM FOR EACH COAT.
6. AFTER EACH COAT OF XYLAN, COMPONENTS SHALL BE BAKED AT 240 DEG C FOR 20 MINUTES MINIMUM.
7. ALL STUDS SHOULD BE PACKED SUITABLY TO AVOID THREAD DAMAGE AND SHOULD ASSEMBLED WITH TWO NUTS.
8. THREADING & GAUGING SHALL BE DONE AS PER ASME B1.1



STUD BOLT WITH 2 NUTS

NACE MR-01-75 CL-II

PSL	3
TEMP. RATING	P.U

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: FOR SOUR SERVICE (WITH ZINC COATING & XYLAN COATING-BLUE COLOUR)

BHARAT HEAVY ELECTRICALS LTD., UNIT: HIGH PRESSURE BOILER PLANT. TIRUCHIRAPALLI-620014.

365-120/A 09.09.20

	NAME	SIGN	DATE	NO.OF VAR.
DRN	R.NATARAJAN		28.03.2015	—
CHD	P.ARUNKUMAR		28.03.2015	
APPD	R.ELAYARAAJA		28.03.2015	

DEPT	SCALE	WEIGHT (KG).	REFERENCE INFORMATIONS	NO. OF ITEMS
V L	NTS	—	—	—
CODE 340				

TITLE: STUD-FULL THREADED WITH 2 NUTS

CARD CODE: U 01

DRAWING NO.: 2-V-0000-20200

REV: 04

DCP No.	ALTD: D.L.K.	APPD: A.K.P.
802758	CHD: A.K.P.	DT: 23.03.23

REV 04: REVIEWED FOR LATEST API-6A REQUIREMENTS.

ZONE 04

Size A2

DRAWING NO: 2-V-0000-20201

ALL DIMENSIONS ARE IN MILLIMETRES.

ASSEMBLY DETAILS

SL. No.	DRAWING NUMBER	MATERIAL CODE	FLANGE RATINGS	ASSY wt./kg
01	2-V-4Z00-20201 /02	96 469 410 0000	2-1/16" – 2000 (NS)*	0.16
02	2-V-4Z01-20201 /02	96 469 411 0000	2-1/16" – 2000	0.17
03	2-V-4Z02-20201 /02	96 469 412 0000	2-1/16" – 10000	0.30
04	2-V-4Z03-20201 /02	96 469 413 0000	(NS)*	0.36
05	2-V-4Z04-20201 /02	96 469 414 0000	2-1/16" – 5000	0.46
06	2-V-4Z05-20201 /02	96 469 415 0000	(NS)*	0.47
07	2-V-4Z06-20201 /02	96 469 416 0000	3-1/8"-5000(WKM)(NS)*	0.59
08	2-V-4Z07-20201 /02	96 469 417 0000	3-1/16" – 10000	0.67
09	2-V-4Z08-20201 /02	96 469 418 0000	2-9/16" – 5000 (NS)*	0.68
10	2-V-4Z09-20201 /02	96 469 419 0000	2-9/16" – 5000	0.69
11	2-V-4Z10-20201 /02	96 469 420 0000	3-1/8" – 5000 (NS)*	0.70
12	2-V-4Z11-20201 /02	96 469 421 0000	3-1/8" – 5000(FBV) (NS)*	0.88
13	2-V-4Z12-20201 /02	96 469 422 0000	3-1/8" – 5000	0.93
14	2-V-4Z13-20201 /02	96 469 423 0000	4-1/16" – 5000(FBV)(NS)*	1.25
15	2-V-4Z14-20201 /02	96 469 424 0000	13-5/8" – 2000	1.4
16	2-V-4Z15-20201 /02	96 469 425 0000	4-1/16" – 5000 (NS)*	1.70
17	2-V-4Z16-20201 /02	96 469 426 0000	9" – 3000	1.61
18	2-V-4Z17-20201 /02	96 469 427 0000	11" – 3000	1.71
19	2-V-4Z18-20201 /02	96 469 428 0000	13-5/8" – 3000	1.75
20	2-V-4Z19-20201 /02	96 469 429 0000	7-1/16" – 5000	1.73
21	2-V-4Z20-20201 /02	96 469 430 0000	5-1/8" – 5000(FBV) (NS)*	1.96
22	2-V-4Z21-20201 /02	96 469 431 0000	3-1/16" – 10000(FBV)(NS)*	2.10
23	2-V-4Z22-20201 /02	96 469 432 0000	5-1/8" – 5000	2.09
24	2-V-4Z23-20201 /02	96 469 433 0000	7-1/16" – 10000	2.15
25	2-V-4Z24-20201 /02	96 469 434 0000	9" – 10000	2.36
26	2-V-4Z25-20201 /02	96 469 435 0000	13-5/8" – 5000	2.75
27	2-V-4Z26-20201 /02	96 469 436 0000	(NS)*	2.83
28	2-V-4Z27-20201 /02	96 469 437 0000	11" – 10000	3.93
29	2-V-4Z28-20201 /02	96 469 438 0000	11" – 5000	4.6
30	2-V-4Z29-20201 /02	96 469 439 0000	16-3/4" – 5000	4.53
31	2-V-4Z30-20201 /02	96 469 440 0000	13-5/8" – 10000	4.98
32	2-V-4Z31-20201 /02	96 469 441 0000	20-3/4" – 3000	5.33

DETAILS OF ITEM No. 001

MATL. SPECN.	THREAD SIZE	A +1 0	B +1 0	TOTAL +3 0 LENGTH	UNIT Wt (kg)
REFER NOTES 1 AND 3	5/8" – 11UNC	20	45	75	0.12
		20	40	90	0.14
	3/4" – 10UNC	23	48	100	0.22
	7/8" – 9UNC	27	56	95	0.27
		27	56	115	0.35
	1" – 8UNC	31	45	100	0.3
		31	46	106	0.42
		31	64	125	0.5
		31	64	125	0.51
		31	64	130	0.52
		31	70	133	0.53
	1-1/8" – 8UN	34	72	131	0.61
		34	72	145	0.66
	1-1/4" – 8UN	37	80	155	0.9
		37	80	170	1.05
		37	83	230	1.35
	1-3/8" – 8UN	40	88	170	1.25
		40	88	180	1.34
		40	88	185	1.38
		40	88	190	1.36
	1-1/2" – 8UN	43	96	177	1.47
		43	96	181	1.61
		43	96	185	1.6
		43	96	195	1.66
		43	96	215	1.87
	1-5/8" – 8UN	47	104	215	2.25
	1-3/4" – 8UN	50	70	165	1.90
		50	112	250	3.00
	1-7/8" – 8UN	53	120	245	3.42
		53	120	240	3.35
		53	120	280	3.8
	2" – 8UN	56	127	255	3.96

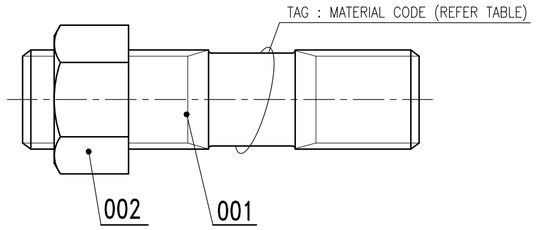
DETAILS OF ITEM No. 002

ø D	MATL. SPECN.	s MAX	s MIN	e MAX	e MIN	m MAX	m MIN	UNIT Wt (kg)
5/8"-11UNC-2B	REFER NOTES 1 AND 3	26.97	26.19	31.36	29.85	16.02	14.91	0.033
3/4"-10UNC-2B		31.75	30.79	36.65	35.11	19.25	18.04	0.076
7/8"-9UNC-2B		36.52	35.41	42.16	40.37	22.47	21.16	0.108
1"-8UNC-2B		41.27	40.01	47.65	45.62	25.70	24.29	0.165
1-1/8"-8UN-2B		46.02	44.61	53.16	50.86	28.93	27.41	0.266
1-1/4"-8UN-2B		50.80	49.23	58.64	56.11	31.77	30.15	0.35
1-3/8"-8UN-2B		55.57	53.83	64.16	61.37	35.00	33.28	0.364
1-1/2"-8UN-2B		60.32	58.42	69.64	66.60	38.22	36.40	0.485
1-5/8"-8UN-2B		65.07	63.02	75.15	71.84	41.45	39.53	0.50
1-3/4"-8UN-2B		69.85	67.62	80.64	77.09	44.67	42.65	0.93
1-7/8"-8UN-2B		74.62	72.24	86.15	82.35	47.90	45.78	1.18
2"-8UN-2B		79.37	76.84	91.64	87.61	51.13	48.90	1.37

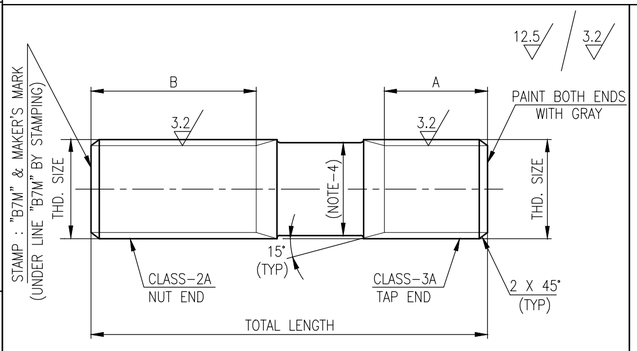
* (NS) – NON-STANDARD

COMMON NOTES FOR STUD & NUT:-

1. BOTH STUD & NUTS ARE TO BE ZINC COATED FOR A DEPTH OF 0.005 TO 0.01MM, BEFORE XYLAN COATING.
2. FOR ZINC COATING, USE ELECTRODEPOSITING/ ELECTROPLATING METHOD AS PER IS:1573-1986/LATEST TO BE REFERRED.
3. AFTER ZINC COATING, COMPONENTS TO BE BAKED. THE ELAPSED TIME BETWEEN PLATING AND BAKING SHALL NOT EXCEED 8 HOURS.
4. BOTH STUD & NUTS ARE TO BE TO BE XYLAN COATED AFTER ZINC COATING :
   - 4.1. GRADE OF TEFLON ON : XYLAN 1070
   - 4.2. MAX. SERVICE TEMPERATURE : 285°C
   - 4.3. COATING THICKINESS : 25 TO 30 MICRONS.
   - 4.4. COLOUR : BLUE
5. TWO COATS OF XYLAN COATING WITH DEPTH OF 10-15 MICRONS MINIMUM FOR EACH COAT.
6. AFTER EACH COAT OF XYLAN, COMPONENTS SHALL BE BAKED AT 240 DEG C FOR 20 MINUTES MINIMUM.
7. ALL STUDS SHOULD BE PACKED SUITABLY TO AVOID THREAD DAMAGE AND SHOULD ASSEMBLED WITH ONE NUT IN NUT END.
8. THREADING & GAUGING SHALL BE DONE AS PER ASME B1.1
9. MINIMUM UNTHREADED PORTION EQUAL TO ONE THREAD PITCH BETWEEN TAP END AND NUT END THREADS.



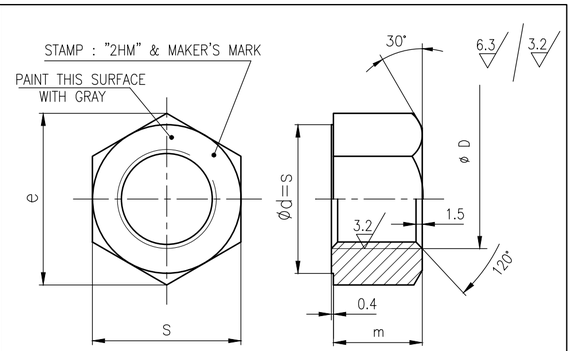
STUD WITH 1 NUT



ITEM No. 001

NOTES:-

1. MATERIAL : ASTM A193-GR.B7M AS PER LATEST APPLICABLE QUALITY PROCEDURE.
2. STUD BOLTS SHALL BE HARDNESS TESTED FOR AN ACCEPTABLE HARDNESS AS PER LATEST APPLICABLE QUALITY PROCEDURE.
3. SHANK DIA NOT LESS THAN PITCH DIA.



ITEM No. 002

NOTES:-

1. MATERIAL : ASTM A194-GR.2HM AS PER LATEST APPLICABLE QUALITY PROCEDURE
2. NUTS SHALL BE HARDNESS TESTED FOR AN ACCEPTABLE HARDNESS AS PER LATEST APPLICABLE QUALITY PROCEDURE.
3. FOR OTHER DIMENSIONS REFER ANSI B18.2.2 (HEAVY HEX.NUT)

DCP No. 802758	ALTD: D.L.K.	APPD: A.K.P.	
	CHD: A.K.P.	DT: 23.03.23	
REV 04	REVIEWED FOR LATEST API-6A REQUIREMENTS.		
ZONE 04			

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.

NACE MR-01-75 CL-II

PSL	3
TEMP. RATING	P.U

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

FOR SOUR SERVICE

(WITH ZINC COATING & XYLAN COATING-BLUE COLOUR)

365-120/A 09.09.20

BHARAT HEAVY ELECTRICALS LTD.,
UNIT: HIGH PRESSURE BOILER PLANT.
TIRUCHIRAPALLI-620014.

	NAME	SIGN	DATE	NO.OF VAR.
DRN	R.NATARAJAN		28.03.2015	–
CHD	P.ARUNKUMAR		28.03.2015	
APPD	R.ELAYARAAJA		28.03.2015	

DEPT	SCALE	WEIGHT (KG).	REFERENCE INFORMATIONS	NO. OF ITEMS
V L	NTS	—	—	—
CODE 340				

TITLE: STUD-DOUBLE ENDED WITH 1 NUT

CARD CODE: U 01

DRAWING NO.: 2-V-0000-20201

REV: 04

Size A2

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. Cl 3.3.3 & 5.3 modified. Rev 04:20.10.96: NDT, Acid pickling added & re-written. Rev 05: 28.04.98: Cl 3 modified to include MPI, certificate modified & Cl 7.4 deleted. Rev 06:15.06.99: Title, Cl 1 to 5 & 7.1 modified. Cl 7.2 changed to Cl 7.3. Cl 7.3 changed to 7.4 and modified. Cl 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: Cl 1.0, 2.0, 3.0, 4.0, 5.0 modified in line with API 6A 21st Ed 2018 Errata 1 and for better clarity.
Rev.09: 19/02/2021: Latest version of the referred Standards/Specifications indicated thoughtout TDC; Cl.2.0 iid added; Cl.4.1 added; Annexure-1 modified;
Rev.10: 25/08/2023: Latest version of the referred Standards/Specifications indicated though out TDC;
Rev.11: 23/07/2024: Latest version of the referred Standards/Specifications indicated though out TDC;
Rev.12: 31/07/2025: Latest version of the referred Standards/Specifications indicated though out TDC; Cl.1.0,2.0i,3.0ii &ve, 4.1,6ii&iv, 7.0 & Annexure 1 revised. 6iii added.

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 193-23 /ASTM A 193-*25* Gr B7, B7M & B16.
Nuts - Carbon Steel	:	ASME SA 194-23 /ASTM A 194-24 Gr 2H & 2HM
Alloy Steel	:	ASME SA 194-23 /ASTM A 194-24 Gr 4 & 7
Additional Requirements	:	As listed below (Supplementary to the above material specifications)
Size and Quantity	:	As per Purchase Order (PO) & Applicable Drawing

Bolting Qualification (OFE application): BSL 1 of API 20E Ed 2017 Addendum 2 Errata 2

2.0 GENERAL REQUIREMENTS:

i. This TDC is applicable for Valves, OFE (API 6A 21st Ed 2018 *Errata 6 Addendum 4* & API 16C 3rd Ed 2021 Errata 2 *Addendum 1*) and other applications including NACE MR0175 Ed.2021 / ISO 15156 Ed.2020 Parts 1, 2 & 3. The products shall be manufactured to the relevant requirements specified in the applicable drawings, specifications, PO & this TDC. *Wherever the drawing mention Bolting Specification Level (BSL), the requirements of OFE application as stipulated in this TDC shall also apply.*

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 Errata 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 Errata 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 21st Ed 2018 *Errata 6 Addendum 4* Annex M; SAE AMS 2750 Rev.*H*; 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 hexagonal bars, 100% MT is to be done on bars as per ASTM E709-21 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 E709-21 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 751-21.

ii. The microstructure and macrostructure shall conform to the requirements of the respective material specifications, *as applicable*.

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-*24a* including Annex A3, except that testing shall also be in conformance with ASTM E10-23 or ASTM E18-24.

a) For ASME SA 193-23 / ASTM A 193-*25* Gr B7 & B16: Hardness check shall be carried out on finished stud/ bolt as per ASME SA 193-23 / ASTM A 193-*25*, 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 193-23 / ASTM A 193-*25* 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 194-23 / ASTM A 194-24 Gr 2H, Gr 4, & Gr 7:
Hardness check on finished nuts shall be as per ASME SA 194-23 / ASTM A 194-24 (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) <u>For ASME SA 194-23 / ASTM A 194-24 Gr 2HM:</u>
Hardness check on 100% of finished nuts shall be carried out as per ASME SA 194-23 / ASTM A 194-24.
Gr 2HM: Hardness: 159 to 235 HBW.

c) **Proof load test shall be done as per ASME SA 194-23 / ASTM A 194-24 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 (ºC)	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 *Proof Load* Test:** This test shall be performed as per ASME SA 194-23 / ASTM A 194-24 in case of visible surface discontinuities. On such cases Proof load shall be as per ASME SA 194-23 / ASTM A 194-24.

vi. <u>NDE:</u>
Magnetic particle inspection shall be carried out as per ASTM E709-21 in at least 10% of the finished studs/bolts of all grades. Cracks, linear indications (length ≥ 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 193-23 / ASTM A 193-*25* for studs/bolts and ASME SA 194-23 / ASTM A 194-24 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 193-23 / ASTM A 193-*25* for studs/bolts & ASME SA 194-23 / ASTM A 194-24 for nuts.

4.1 Gauging Requirements for Xylan along with Zinc *Corrosion-Resistant* Coated Fasteners

i. Studs
   a. No under sizing is allowed
   b. Prior to Xylan and Zinc *Corrosion-Resistant* Coating, Class 2A Gauge to be used for inspection
   c. After coating, No Gauge inspection is required

ii. Nut
   a. Over sizing is allowed to maximum of 0.2mm in the internal diameter of threads
   b. Prior to Over sizing, Class 2B Gauge to be used for inspection
   c. After Over sizing, a gauge having an allowance as per Class 2B along with 0.2mm Over sizing allowance to be made and inspected thereof

iii. Assembly of Stud and Nut
   a. Free run of nut over stud to be ensured
   b. No play is allowed
   c. After free run of nut over stud, Xylan coating should not get peeled off.

5.0 MARKING & PACKING:

i. 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.

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

iii. Marking for OFE applications: In addition to the above, studs / Bolts / Nuts shall have marked with unique heat lot identification and followed by "20E1" for BSL 1. 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 Errata 2.

6.0 SPECIAL REQUIREMENTS:

i. Cadmium Plating:

a) 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.
b) Apply Cadmium Plating to the specified thickness on specified areas. Thickness shall be measured on 5% of the PO quantity of fasteners.
c) 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.
d) Apply a Chromate Conversion coating after plating and baking.

ii. *Zinc Plating (*Electroplating *or Electro Deposition* of Zinc Chromate):

a) Clean the fasteners to make them free from rust, grease, oil, scale, etc., by suitable organic solvents/ hand tool methods/ *blast cleaning to Sa2.5* before electroplating. Then, pickling shall be done as per Cl 6 (vi) of this TDC.
b) The fasteners shall then be electroplated as per *IS 1573 - 1986 (Reaffirmed 2021)* and to the minimum coating thickness specified in the applicable drawing. Thickness shall be measured on 5% of the PO quantity of fasteners.
c) All electroplated parts (regardless of strength level), *except parts of grades B7M & 2HM, shall* be baked within 2 hours after plating at 191°C–218°C for 8 hours minimum at temperature

iii. Zinc Phosphating (Phosphate conversion coating):

a) Clean the fasteners to make them free from rust, grease, oil, scale, etc., by suitable organic solvents/ hand tool methods before phosphating
b) Phosphating to be done as per IS 3618 - 1966 (Reaffirmed 2021)

iv. Xylan Coating:

a) Either one of the two Zinc corrosion-resistant coatings to be performed on the fasteners before Xylan Coating
  i) Zinc Plating (electroplating or electrodeposition of zinc)
  ii) Zinc Phosphating (Heavy weight phosphate conversion coating)
b) If Zinc Plating is used as corrosion resistant coating, then suitable surface preparation to be carried out before xylan coating for better adhesion.
c) The fasteners shall then be xylan coated as per the requirements and to the minimum coating thickness specified in the applicable drawing.

d) 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 D7091-22. 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:
Test as per ASTM D3359-23 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.

v. 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

Sl 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 IInd 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.

vi. 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, *Zinc corrosion-resistant coatings*, 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.

31/07/25	31/7/25	31/07/25	31/7/2025	31/07/2025
N Nagamuthu Pandian	P Arun Kumar	Venkateswarlu Ala	M Balamurugan	Dr. V Deepesh
SM/QA	MGR / Valves Engg	SM/QC/RM&SD	SM / Valves/Purchase	DGM / QA
Prepared By	**Reviewed By**			**Approved By**

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 : Records/ Observation
Size of bar - Before machining :
- After machining :
Type of furnace used for hardening :

TDC Clause no.	Raw Material mill TC No: TC Date: Melt/Heat Number: Reduction Ratio:									
2.0 & 3.0	**a) Heat Treatment Details:** Hardening Temperature: °C; Soaking time: Cooling Medium: Tempering Temperature: °C; Soaking time: Cooling Medium: **b) Additional Tempering for Nuts (after final tempering):** Temperature: ^{0}C; Soaking time: Cooling Medium:									
3.0	**a) Product analysis for chemistry**								**Report No & Date:**	
	Spec	C	Mn	P	S	Si	Cr	Mo	V	Ni	Others
	Min.										
	Max.										
	Actual										
	b) Tensile test after H & T and final drying (Finished heat treated condition) **– For Studs/Bolts**									
		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 *Proof load* test for nuts									
	g) NDE Result for Studs/Bolts:									
4.0	Visual and dimensional checking as per applicable drawing for studs/bolts & nuts:									
5.0	Punching details (identification): End cap for threaded portion:									
6.0	**a) Type of coating:** Cadmium Plating / Chromate Conversion / *Zinc Plating* / *Zinc Phosphating*/ Xylan /Rust preventive coating **(Tick applicable coating)** **Coating thickness/DFT:**									
	b) Tests for Xylan Coating					**Results**				
	c) Pickling Acid: **Concentration:** 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.