

**BHARAT HEAVY ELECTRICALS LIMITED**  
**HEEP HARIDWAR INDIA-PIN 249403**  
**FAX NO: 0091 1334 226462/223948**  
**PHONE NO: 0091 1334 284144**

**Sub: Requirement of Forgings**

The Heavy Electricals Equipment Plant (HEEP) located in Haridwar, India is one of the major manufacturing plants of Bharat Heavy Electricals Ltd. The core business of HEEP includes design and manufacture of large steam turbines, turbo generators and so on.

Bids are invited for following items through GeM Portal- <https://gem.gov.in>

Item Sl. No.	Item Description	Mat. Code	Drawing No.	Qty. (No)	Delivery
1	Forging for Joint Flange DRG: 41074258998 Rev-00 <b>Specification- AA19341 Rev:08</b>	W95310742093	41074258998	Lot 1- 16 No. Lot 2- 16 No.	Lot 1-30/11/2024 Lot 2-28/02/2025

**Remarks-**

1. Delivery period mentioned in enquiry is indicative, bidders to quote their best possible delivery.
2. Forging to be supplied as per drawing (drawings attached).

**3. Breach of Contract:**

In case of breach of contract, wherever the value of security instruments like performance bank guarantee available with BHEL against the said contract is atleast 10% of the contract value, the same be encashed. In case the value of the security instruments available is less than 10% of the contract value, the balance amount be recovered from other financial remedies (i.e. available bills of the contractor, retention amount, etc. with BHEL) or legal remedies be pursued. The balance scope shall be got done independently without Risk & Cost of the failed supplier/ contractor. Further, levy of liquidated damages, debarment, termination, de-scoping, short-closure, etc., shall be applied as per provisions of the contract. Accordingly, recovery of an amount equivalent to 10% of the contract value may be made in case of breach of contract.

**4. Payment terms shall be as follows:**

Type of Bidder	Payment Terms (Number of days)
Micro & Small Enterprises (MSEs)	45 days

Medium Enterprises	60 days
Non MSME	90 days

**Note: Benefits of MSE (such as EMD Waiver, Tender fee exemption, Price preference, Payment preference etc.) will be given only to those MSE Vendors who are manufacturers of offered items against the NIT. No MSE benefits shall be provided to Agents / Stockists / Dealers / Traders etc. for the items offered but not manufactured by themselves.**

5. “A bidder shall not have conflict of interest with other bidders. Such conflict of interest can lead to anti-competitive practices to the detriment of Procuring Entity’s interests. **The bidder found to have a conflict of interest shall be disqualified.** A bidder may be considered to have a conflict of interest with one or more parties in the bidding process, if”
- a. They have controlling partner (s) in common; **or**
  - b. They receive or have received any direct or indirect subsidy/financial state from any of them; **or**
  - c. They have the same legal representative/ agent for purposes of this bid; **or**
  - d. They have relationship with each other, directly or through common third parties, that puts them in a position to have access to information about or influence on the bid of another Bidder; **or**
  - e. Bidder participates in more than one bid in this bidding process. Participation by a Bidder in more than one Bid will result in the disqualification of all bids in which the parties are involved. However, this does not limit the inclusion of the components / sub-assembly/ Assemblies from one bidding manufacturer in more than one bid; **or**
  - f. In cases of agents quoting in offshore procurements, on behalf of their principal manufacturers, one agent cannot represent two manufacturers or quote on their behalf in a particular tender enquiry. One manufacturer can also authorize only one agent / dealer. There can be only one bid from the following:
    1. The principal manufacturer directly or through one Indian agent on his behalf; and
    2. Indian/ foreign agent on behalf of only one principal;

**or**
  - g. A Bidder or any of its affiliates participated as a consultant in the preparation of the design or technical specifications of the contract that is the subject of the Bid; **or**
  - h. In case of a holding company having more than one independently manufacturing units, or more than one unit having common business ownership/management, only one unit should quote. Similar restrictions would apply to closely related sister companies. Bidder must proactively declare such sister/ common business/ management units in same/ similar line of business.”

## Pre- Qualification Requirements

PQR Clause	PQR	Vendor's response																																
<b>1</b>	<p><b>Experience Requirement</b></p> <p>Vendor must have experience of manufacturing and supplying forgings of carbon steel or alloy steel grades in heat treated condition. Vendor must have manufactured and supplied at least 3 ring forgings in above material grade in last seven years as on date of issue of enquiry.</p> <p>In support of above, the vendor has to furnish details of 3 ring supplies in the following format.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th rowspan="2" style="text-align: center;">PO number</th> <th rowspan="2" style="text-align: center;">Material Grade</th> <th colspan="3" style="text-align: center;">Dimension (in mm)</th> <th rowspan="2" style="text-align: center;">Date of Supply</th> </tr> <tr> <th style="text-align: center;">OD</th> <th style="text-align: center;">ID</th> <th style="text-align: center;">Height</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table> <p>In support of experience, vendor to submit following document for at least one forging from the above table:</p> <ul style="list-style-type: none"> <li>- Copy of purchase order and its correlated test certificates (duly signed by Third party inspection agency / Customer). Test certificates shall cover chemical composition, heat treatment, mechanical properties, dimensional report, non-destructive test report etc.</li> <li>- Invoice / dispatch document.</li> </ul>	PO number	Material Grade	Dimension (in mm)			Date of Supply	OD	ID	Height																								
PO number	Material Grade			Dimension (in mm)				Date of Supply																										
		OD	ID	Height																														
<b>2</b>	<p><b>Manufacturing &amp; Testing facility</b></p> <p><b>a</b> Vendor should have in-house forging and heat treatment facility to manufacture forgings of above material grade and enquiry drawing dimension. Outsourcing of forging and heat treatment is not acceptable. Vendor to confirm. Details of in-house manufacturing facilities for forging and heat treatment are to be submitted with offer.</p> <p><b>b</b> <b>Raw material source:</b> Vendor to submit confirmation and details as per Option 1 or Option 2, as applicable: <b>Option 1:</b> Raw material for forging shall be sourced from BHEL approved source listed below. Vendor to confirm (tick mark applicable).</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tbody> <tr> <td style="text-align: center;">CFFP, BHEL, Haridwar</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;">Mahindra Sanyo</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;">Arcvac Forge Cast Ltd.</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;">MIDHANI</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;">BGH GmbH</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;">Laxcon</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;">Goradia</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;">RMG Alloy</td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> <tr> <td style="text-align: center;">Saarloha Special Steel</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;">Starwire India</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;">SAIL</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;">Metal Ravne</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;">BOHLER</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;">Sunflag Iron</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;">ISMT</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;">Saurabh Metal</td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> </tbody> </table> <p><b>Option 2:</b> Raw material from other than above listed vendor can also be considered with following condition:</p> <ul style="list-style-type: none"> <li>- Vendor to submit details of their source for carbon steel with details of their steel melting and refining facility.</li> <li>- At least one mill test certificate of ingot/billet/bloom of carbon steel supplied by this source.</li> </ul> <p><b>c</b> Vendor to confirm that they have all testing facility (in-house / outsourced) to carry out testing as per enquiry drawing and specification. In case of outsourcing of any test, vendor to agree for testing at NABL accredited labs only.</p>	CFFP, BHEL, Haridwar	<input type="checkbox"/>	Mahindra Sanyo	<input type="checkbox"/>	Arcvac Forge Cast Ltd.	<input type="checkbox"/>	MIDHANI	<input type="checkbox"/>	BGH GmbH	<input type="checkbox"/>	Laxcon	<input type="checkbox"/>	Goradia	<input type="checkbox"/>	RMG Alloy	<input type="checkbox"/>	Saarloha Special Steel	<input type="checkbox"/>	Starwire India	<input type="checkbox"/>	SAIL	<input type="checkbox"/>	Metal Ravne	<input type="checkbox"/>	BOHLER	<input type="checkbox"/>	Sunflag Iron	<input type="checkbox"/>	ISMT	<input type="checkbox"/>	Saurabh Metal	<input type="checkbox"/>	
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**(Quality Requirements)**

<b>Sl. No.</b>	<b>Quality Requirement</b>	<b>Vendor's confirmation (Y/N)</b>
<b>1</b>	Vendor to accept and endorse attached BHEL Quality Plan (QA/CF/QP/319 Rev-01).	
<b>2</b>	Inspection by BHEL nominated agency 'QUEST' as per above mentioned BHEL Quality Plan.	

**Signature with stamp**

**Name:**

**Name of Firm:**

**Designation:**

**Date:**

**Self-Certification for local content**

In line with Government Public Procurement Order 2017 dated 16.09.2020, we hereby certify that we

.....  
(supplier name) inform that local content is .....% (indicate percentage of local content) and are

**Class- I local supplier** (meeting requirement of)-

**Minimum Local content 50%**

or

**Class- II local supplier** (meeting requirement of)-

**Minimum Local content 20%**

(mark wherever applicable)

defined by Nodal Ministries/ Departments as per above order for the material against Enquiry No.

.....  
Details of location at which local value addition will be made is as follows:

.....  
.....  
.....

We also understand, false declarations will be in breach of the Code of Integrity under Rule 175(1)(i)(h) of the General Financial Rules for which a bidder or its successors can be debarred for up to two years as per Rule 151 (iii) of the General Financial Rules along with such other actions as may be permissible under law.

Seal and Signature of Supplier

**(Specification)**

**AA19341 Rev:08**



## CORPORATE PURCHASE SPECIFICATION

AA 193 41

Rev. No. 08

PREFACE SHEET

## 1.5% MANGANESE STEEL FORGINGS – (Gr: 20C15)

FOR INTERNAL USE ONLY  
REMOVE THIS PREFACE BEFORE ISSUE TO SUPPLIERS

## Comparable Standards:

## Suggested/Probable Suppliers and Grades:

Refer plant vendors list.

## User Plant References:

- |                  |   |            |
|------------------|---|------------|
| 1. HEEP, HARDWAR | : | --         |
| 2. HYDERABAD     | : | CSN 411523 |
| 3. BHOPAL        | : | --         |

## Revisions :

CI: 31.713 of MOM of FCF+HTM

## APPROVED :

INTERPLANT MATERIAL RATIONALISATION  
COMMITTEE-MRC (FCF+HTM)

Rev. No. 08

Amd.No.

Reaffirmed

Prepared  
HEEP  
HARDWARIssued  
Corp. R&DDt. of 1st Issue  
MARCH, 1978

Dt.:22.11.2011

Dt :

Year :



## CORPORATE PURCHASE SPECIFICATION

AA 193 41

Rev. No. 08

PAGE 1 OF 6

**1.5% MANGANESE STEEL FORGINGS – (Gr:20C15)****1.0 GENERAL:**

This specification governs the quality requirements of 1.5% Manganese Steel Forgings, Material Grade 20C15.

**2.0 APPLICATION:**

Suitable for components requiring high strength and weldability.

**3.0 CONDITION OF DELIVERY:**

Forgings shall be suitably heat treated to achieve mechanical properties as specified in clause 12.0 of this specification.

Rough machining of the forgings shall be carried out, unless otherwise specified on BHEL order/drawing.

**4.0 COMPLIANCE WITH NATIONAL STANDARDS:**

There is no national standard covering this material and mechanical properties.

**5.0 DIMENSIONS AND TOLERANCES:**

The dimensions and tolerances shall be as specified in BHEL order/drawing. Wherever these are not specified, the machining allowances and tolerances shall be as specified below.

For finish machined drawings :  $3 \pm 1$  mm

For rough machined drawings :  $\pm 1$  mm

**6.0 MANUFACTURE:**

Forgings shall be manufactured from steel produced by the open hearth, electric or such other process as may be agreed to between BHEL and the manufacturer. Steel shall be fully killed.

Sufficient discard shall be made from each ingot to ensure freedom from pipe, segregation and other defects.

The amount of hot working and finishing temperature shall be such as to ensure complete soundness and adequate uniformity of structure and mechanical properties after heat treatment. The forgings shall not be over heated.

The minimum reduction ratio when forgings are made out of ingots shall be 4:1.

For sizes above 250mm ruling section the minimum reduction ratio shall be 3.5 : 1

Revisions :

Cl: 31.713 of MOM of FCF+HTM

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Dt :

Year :

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## CORPORATE PURCHASE SPECIFICATION



**Note:** Raw material like Ingots/Blooms/Billets required for forgings should be procured from BHEL approved sources along with test certificate."

**7.0 HEAT TREATMENT:**

Forgings shall be suitably heat treated to achieve mechanical properties as specified in clause 12.0. Test pieces shall also be heat treated along with the forgings they represent.

**8.0 FINISH:**

As mentioned in the drawing.

**9.0 FREEDOM FROM DEFECTS;**

Forgings shall be free from defects such as cracks, flakes, seams, segregation, harmful non-metallic inclusions and other defects which may affect the utility of the forgings.

**10.0 CHEMICAL COMPOSITION:**

The melt analysis of steel and permissible variation in the composition of the forgings from the melt analysis shall be as specified below:

Element	Melt analysis, percent		Permissible variation, percent.
	min.	max	
Carbon	0.16	0.24	± 0.02
Silicon	0.10	0.35	± 0.03
Manganese	1.30	1.70	± 0.05
Sulphur	--	0.035	+ 0.005
Phosphorus	--	0.035	+ 0.005

**Note:**

1) Elements not quoted above shall not be added to the steel, other than for the purpose of finishing the heat and shall not exceed the following limits:

Element	Percent, max.
Nickel	0.30
Chromium	0.30
Copper	0.25
Molybdenum	0.15
Vanadium	0.05
Tin	0.05

2) Carbon equivalent (melt analysis) value : C.E. = 0.48%, max.

$$\text{C.E.} = \text{C} + \frac{\text{Mn}}{6} + \frac{\text{Cr}+\text{Mo}+\text{V}}{5} + \frac{\text{Ni}+\text{Cu}}{15}$$

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## CORPORATE PURCHASE SPECIFICATION

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**11.0 TEST SAMPLES:**

11.1 Unless otherwise specified in the order/drawing, test samples shall be taken from each melt and each heat treatment batch. Test samples should be cut from the heat treated forgings by cold process only and shall receive no further heat treatment.

Test samples shall be taken from locations indicated on the drawing, leaving enough material, if required, for testing at BHEL's end, integral with the forging.

Test samples shall be cylindrical or rectangular in shape and cut at a distance of 12.5 mm below the heat treated surface.

11.2 When integral test pieces are not called for, a test sample equivalent to the ruling section or 65 mm diameter, whichever is less and 610 mm long, having similar reduction ratio and heat treatment, as the forgings it represents shall be provided per heat, per heat treatment batch for check testing at BHEL along with the forgings. The sample shall be properly identified and correlated with the heat/heat treatment Batch No/Test certificate No. Test samples shall be taken at a distance of 12.5 mm below the heat treated surface.

11.3 Test samples shall generally be taken in the longitudinal direction. However, for economic reasons or where the size/configuration does not permit the same. Test samples may be taken in the transverse or radial direction. The test sample orientation shall be mentioned in the test certificate.

**12.0 MECHANICAL PROPERTIES:**

The test pieces, after being heat treated as per clause 7.0 above, shall show the following properties upto a limiting section of 800mm. Properties for thicker sections shall be subject to agreement between BHEL and the manufacturer. Test methods are specified below:

- 12.1 Tensile test : As per IS:1608
- 12.2 Hardness test (Brinell) : As per IS:1500
- 12.3 Charpy Impact Value (2mm U-Notch) : As per IS :1499

This test applicable for forgings of sizes above 16mm only.

Property	Sample (See cl.11.3)	Limiting ruling section, mm	
		Upto & incl.400	> 400 & upto 800
Tensile strength N/mm <sup>2</sup>	Longitudinal/ Transverse/ Radial/Tangential	510	490

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## CORPORATE PURCHASE SPECIFICATION



Yield strength min, N/mm <sup>2</sup>	Longitudinal/ Transverse/ Radial/Tangential	295	275
Elongation on 5.65 √So gauge length percent, min	Longitudinal Transverse Radial Tangential	17 9 11 13	15 7 9 11
*Hardness, Brinell, HB	—	143 -197	143 - 197
Charpy Impact Value (2mm, U-Notch) min., Joules	Longitudinal Transverse Radial Tangential	31 16 19 24	25 13 16 20

\* **Note:** Hardness test can be conducted only, when tensile test can not be performed.

### 13.0 ULTRASONIC TEST:

Each forging shall be tested ultrasonically in accordance with BHEL standard AA 085 01 18 to ensure freedom from internal defects. The norms of acceptance shall be as per Category 2 of the above standard.

### 14.0 ADDITIONAL TESTS:

If specified in the drawing/order, the following tests shall be conducted:

- i) Magnetic particle test.
- ii) Any other tests.

Norms and acceptance shall be as specified in the drawing/order.

### 15.0 SCOPE OF THIRD PARTY INSPECTION:

Wherever, separate quality plan is not attached, the scope of third party inspection shall be as follows:

1. Review of supplier's declared chemical composition.
2. Selection of test samples for mechanical tests and witness of mechanical tests.
3. Witness of Non-destructive tests as applicable.
4. Review of HT charts.
5. Dimensional inspection.

### 16.0 TEST CERTIFICATES:

Three copies of test certificates shall be supplied unless otherwise stated in the order, preferably in the test certificate format annexed to this specification (Annexure-1).

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## CORPORATE PURCHASE SPECIFICATION

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In addition, the supplier shall ensure to enclose one copy of the test certificate along with their despatch documents to facilitate quick clearance of the material.

The test certificate shall bear the following Information.

- Dimensional Inspection.
- Details of heat treatment.
- Reduction ratio
- Chemical composition including trace elements.
- Results of mechanical tests.
- Results of ultrasonic test.
- Results of additional tests called for in the order/drawing.

**17.0 PACKING AND MARKING:**

Forgings shall be suitably packed to prevent corrosion and damage during transit. Machined surfaces shall be properly protected with anti-corrosive compounds. Each package or forging (when supplied separately) shall be legibly marked with the following Information:

- AA 19341 : 1.5% Manganese Steel Forgings, Material Grade.:20C15
- BHEL Order No.
- Consignment/Identification No.
- Weight.
- Batch No.
- Supplier/s name

**18.0 REFERRED STANDARDS (Latest Publications Including Amendments):**

- 1. AA 085 01 18
- 2. IS: 1499
- 3. IS: 1500
- 4 IS: 1608

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CORPORATE PURCHASE SPECIFICATION



ANNEXURE - 1: RECOMMENDED TEST CERTIFICATE FORMAT FOR FORGINGS

SUPPLIER'S NAME AND ADDRESS											
TEST CERTIFICATE FOR FORGINGS											
1. Customer:						9. Reduction Ratio } Ingot to Bloom Bloom to Blank					
2. TC No. & Date:						10. Batch No.:					
3. PO No.:						11. Heat/Melt No.:					
4. Process of Melting Ingot:						12. Spec. No.:					
5. Decarburisation Process:						13. Test Bar Size & Nos.:					
6. Forging Method:						14. Supplier of the Ingot/billet/ Bloom and TC reference.					
7. BHEL's Reference for Approval of Bloom											
8. Discard: Top _____ % Bottom _____ %											
15. FORGINGS COVERED BY TEST CERTIFICATE											
S.No.		Drawing No. & Item No.				Description				Quantity & Weight	
16. CHEMICAL COMPOSITION (PERCENT)											
Element		C	Si	Mn	S	P					
As Per Specn.		Min.									
		Max.									
Actual Values											
17. HEAT TREATMENT (To be accompanied by Recorder Chart, Whenever called for)											
Condition		Heating Rate, °C/hr.		Temp. °C		Soaking Time, Hrs.		Cooling Rate, °C/hr		Cooling Medium	
18. MECHANICAL PROPERTIES											
		T.S. N/mm <sup>2</sup>	Y.S. 0.5/0.2% Proof N/mm <sup>2</sup>	% Elongation 5.65 <sub>5</sub> /50 GL	% F.A. Min.	Hardness BHN (Min. 3 values)	Impact Value Joules	Bend Test			
As Per Specn.		Min.						Angle of bend	Die of mandrel	Result	
		Max.									
Actual Values											
19. SURFACE FINISH (When called for in the order/drg.)											
20. DIMENSIONAL INSPECTION											
21. NON-DESTRUCTIVE TESTS											
Nature of Test		Acceptance level			Instrument used		Range	Results	Any other detail		
Ultrasonic											
Radiographic											
Dye penetrant/ Magnetic Particle											
22. METALLOGRAPHIC EXAMINATION (To be conducted if called for and photo micrographs to be attached along with a report)											
Location of Sample		Etchant used		Magnification		Constituent observed		Relative %			
Microstructure		Macroetch		Inclusion Rating							
23. OTHER TESTS IF ANY (MICROSCOPIC, SULPHUR PRINTS, ETC)											
24. IDENTIFICATION OF FORGINGS AS PER PURCHASE SPEC.											
We hereby certify that the items mentioned above have been tested and inspected in our presence and are found to be in accordance with drawings, specifications and purchase order.											
SIGNATURE, NAME & SEAL OF THE INSPECTING OFFICER DATE:						SIGNATURE, NAME & SEAL OF THE CHIEF OF QUALITY CONTROL/ CHIEF METALLURGIST OF THE SUPPLIER DATE:					
INSTRUCTIONS											
a) Details of all heat treatment processes carried out should be furnished sequentially in 17.											
b) Test certificates are to be furnished as per Purchase order and specification, in A4 size preferably in transparent paper.											
c) All the entries including signature should be in block colour ink.											
d) If testing is done by outside agencies, the original TCs shall be furnished.											
e) The actual TC may run into more than one A4 size paper, if needed, to facilitate filling up of details.											

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Tender No. F/F219/24/0294/K1

**(Drawing)**

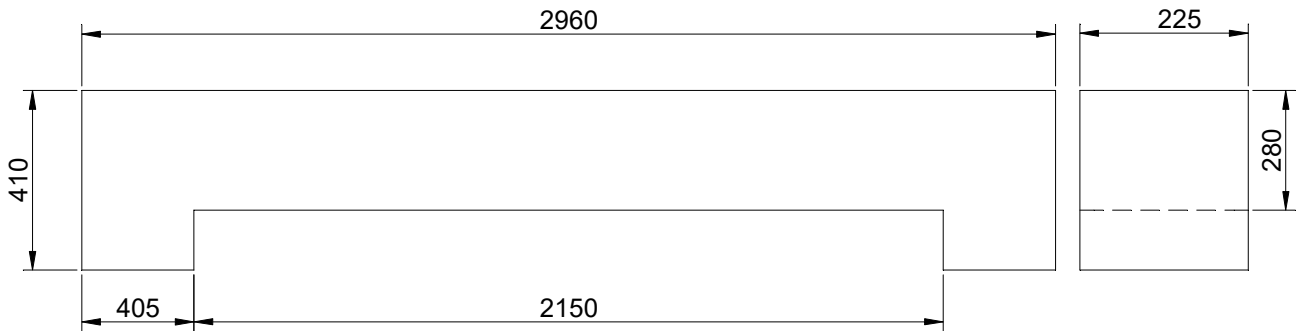
**(41074258998)**

**FIRST ANGLE PROJECTION**

(ALL DIMENSIONS ARE IN mm ) FORM DG 39(B)

REV	DATE	ALTERED	REV	DATE	ALTERED	GMS No./ C.B.O.M.- NO. 0-10742-58000	STATUS OF DRG U	
		CHECKED			CHECKED			
ZONE					AGREED DEPT	NAME	SIGN	DATE
					WTX	SUSHANT	sd/-	12.08.23
					STE TTX	DINESH GOND SS. ORAON	sd/- sd/-	14.08.23 16.08.23
GRADE OF UNTOL.DIM M/CG. C/M/A -AA0230208					WELDING A/B/C/D AA0621104		GAS CUTTING-T3 AA0621101	

12.5/ALL OVER EXCEPT OTHERWISE STATED



1. FORGING SHALL BE SUPPLIED IN CONFORMITY WITH THE PURCHASING SPECIFICATION NO. AA19341.
2. TOLERANCES ON ALL DIMENSIONS : ±2mm.
3. IDENTIFICATION MARKING SHALL BE DONE AT THE PLACE MARKED ██████.

3-10742-58102  
Ref. Drawing No.

W95310742093

AA19341

Sign & Date



**BHARAT HEAVY ELECTRICALS LTD.**  
RANIPUR, HARDWAR

	NAME	SIGN	DATE	NO. OF VAR
DRN	RAJPAL	sd/-	01.08.23	
CHD	SUBODH RANA	sd/-	01.08.23	
APPD	ASHISH RANJAN	sd/-	14.08.23	-

DEPT	MTE		SCALE	WEIGHT (KG)	REF. TO ASSY. DRG.	ITEM No.	NO. OF ITEMS
CODE	4300		NTS	1649	-----		-

Inventory No.

TITLE **FORGING FOR JOINT FLANGE**

CARD CODE

DRAWING NO.  
**4-10742-58998**  
22 23 24

SHEET No. 01 | No. OF SHEETS 01

COPYRIGHT AND CONFIDENTIAL

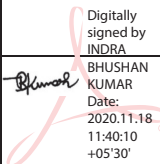
THE INFORMATION ON THIS DOCUMENT IS THE PROPERTY OF BHARAT HEAVY ELECTRICALS LIMITED. IT MUST NOT BE USED DIRECTLY OR INDIRECTLY IN ANY WAY DETERIMENTAL TO THE INTEREST OF THE COMPANY.

**(Quality Plan)**

**(QA/CF/QP/319 Rev-01)**

MANUFACTURER'S NAME AND ADDRESS		STANDARD QUALITY PLAN				TO BE FILLED BY BHEL		TO BE FILLED BY BHEL				
BHEL	VENDOR'S NAME	ITEM	CARBON STEEL FORGING		QP NO.	QA/CF/QP/319						
					REV	01						
		DRG. NO.	AS PER PO									
		SPEC.	AS PER PO									
	REV					Page 1 of 1						
SL. NO.	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORDS	AGENCY			REMARKS
									M	B	N	
1	2	3	4	5	6	7	8	9	D	10		11

1.	MELTING	CHEMICAL COMPOSITION	CRITICAL	CHEMICAL	100%	BHEL SPEC.	BHEL SPEC.	TC	P	V		RAW MATERIAL SHALL BE PROCURED FROM BHEL APPROVE D SOURCES ALONG WITH TEST CERTIFICATE
2.	FORGING	FORGING STEPS	MAJOR	VISUAL	100%	INTERNAL TECHNOLOGY	INTERNAL TECHNOLOGY		P	V		
3.	QUALITY HEAT TREATMENT	TIME TEMP CONTROL	MAJOR	MEASURE	100%	BHEL SPEC	BHEL SPEC	TC	P	V		
4.	TEST PIECE IDENTIFICATION	STAMPING	MAJOR	VISUAL	BHEL SPEC	BHEL SPEC. & DRG.	BHEL SPEC & DRG.		P	W		
5.	MECHANICAL TESTING	MECHANICAL PROPERTIES	MAJOR	MECHANICAL	PER HEAT PER HT BATCH	BHEL SPEC.	BHEL SPEC.	TC	P	W		
6.	CHEMICAL TESTING	CHEMICAL COMPOSITION	MAJOR	CHEMICAL		BHEL SPEC.	BHEL SPEC.	TC	P	V		
7.	UT	ULTRASONIC TEST	MAJOR	UT	100%	BHEL SPEC.	BHEL SPEC.	TC	P	W		
8.	ANY OTHER TEST IF CALLED IN DRG. INCLUDING IBR CERTIFICATE	AS PER DRAWING	MAJOR	AS PER DRG.	100%	BHEL SPEC.& DRG.	BHEL SPEC.& DRG.	TC	P	W		
9.	MACHINING	DIMENSIONS	MAJOR	MEASURE	100%	DRAWING	DRAWING	TC	P	W		
10.	MARKING PRESERVATION & PACKING	MARKING PRESERVATION & PACKING	MAJOR	VISUAL	100%	BHEL DRAWING & SPEC	BHEL DRAWING & SPEC		P	V		

MANUFACTURER/SUBCONTRACTOR	 Digitally signed by INDRA BHUSHAN KUMAR Date: 2020.11.18 11:40:10 +05'30'	LEGEND: ! RECORDS IDENTIFIED WITH 'TICK' SHALL BE ESSENTIALLY INCLUDED BY CONTRACTOR IN QA DOCUMENTATION. M: MANUFACTURER / SUBCONTRACTOR B: BHEL / NOM. INSPECTION AGENCY N: CUSTOMER INDICATE 'P' PERFORM 'W' WITNESS AND 'V' VERIFICATION	FOR CUSTOMER USE	APPROVED BY
		ALL 'W' INDICATED IN COLUMN 'N' SHALL BE 'CHP' OF CUSTOMER		