

### **Bharat Heavy Electricals Limited**

Industrial Valves Plant Goindwal Sahib (Punjab) **Enquiry No. 2223-063E** 

Date: 26.11.2022

# **NOTICE INVITING TENDER (NIT)**

Dear Sir / Madam,

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

Tender enquiry no. & date	2223-063E dated 26.11.2022			
Form of contract	Supply			
Tender / Item description	Procurement of castings from NPCIL vetted BHEL approved foundries			
Material standard / Drawings	As per attached TDC(s) & Sample Drawings			
Location(s) of Supply / Work	BHEL, Industrial Valve Plant, Goindwal Sahib, Dist. Tarn Taran -143422 (Punjab)			
Earnest Money Deposit (EMD)	Not Applicable			
Quotation parts	Two Part Bid			
Tender download / Bid submission start date	26.11.2022 (13:00 Hrs. IST)			
Tender download / Bid submission end date	07.12.2022 (12:00 Hrs. IST)			
Tender / Bid opening date	07.12.2022 (15:30 Hrs. IST)			
Make in India local content	20 %			
Validity of offer (In days)	75 days from the actual date of techno commercial bid opening(Part I)			
Reverse auction	Applicable			
Non-disclosure agreement	Applicable			
Contact person details	Sumeet Bansal, Sr. Manager 01859-224 628, sbansal@bhel.in Sahil Malhotra, Dy. Manager 01859-224 603, sahil@bhel.in			



#### SPECIAL TERMS AND CONDITIONS

**Tender enquiry no.** 2223-063E Dated 26.11.2022 **Due date 07.12.2022** 

Tender Description: Procurement of castings from NPCIL vetted BHEL approved foundries

This tender is through e-procurement mode. Tender documents can be downloaded from https://eprocurebhel.co.in

#### S1 SCOPE OF SUPPLY

Material shall be supplied as per the applicable latest Technical Delivery Conditions (TDC)/ Material Standard requirements/Drawings/RT Shooting sketch and other requirements as given in the Purchase Order. The applicable TDC for 1) Indian vendors is TDC:0412 Rev27 (or latest applicable), 2) Wherever tolerances are not specified in drawing, for untoleranced dimensions in castings VL:STDC:023 Rev 00

TDC(s) and drawings are attached herewith. Item wise rate schedule details are as following:

Description	Qty (Kg)
WCB Casting UPTO 500 Class	5184

The tender quantity may vary by  $\pm 10\%$  (weight wise).

Following are technical requirements in the tender enquiry:

- 1. Castings shall be procured from NPCIL vetted BHEL approved foundries
- 2. First heat/lot of pouring shall be witnessed by BHEL/BHEL TPIA
- 3. Chemical and mechanical tests on the material shall be performed in laboratories approved by NPCIL. For approved labs the NABL certificate validity to be ensured by foundries as on date as applicable. *List of NPCIL approved labs is enclosed.*
- 4. TDC 412/Rev 27 shall be applicable for the castings and RT shall be required as per the TDC.
- 5. List of approved brands penetrant testing material and approved brands of welding consumables is enclosed.

# Rate schedule given above represents all castings under respective class range. This rate schedule is for tendering purpose only. Actual PO will be released as per material codes and unit weights given in [TABLE I] given below. List of items is a probable list. New material codes can be added from time to time for similar type of castings in this list. For the new material codes, purchase order shall be released on the successful L1 bidder on mutual consent basis.



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#### [TABLE I]

Material Code	DESCRIPTION	UNIT	QTY	Weight (Kg)	Qty
922060440000	ARM_2_C150_FV_WCB-M958	NO	12	0.750	9.00
922060420000	BODY_2_C150_FV_FL_WCB_M958	NO	12	20.800	249.60
922060450000	COVER_2_C150_FV_WCB-M958	NO	12	8.200	98.40
922060470000	BODY_2_C150_GV_FL_WCB_M959	NO	10	15.100	151.00
922060500000	YOKE-BONNET_2_C150_GV_WCB- M959	NO	10	9.200	92.00
922060510000	BODY_2_C300_GV_FL_WCB_M960	NO	12	22.700	272.40
922060490000	WEDGE_2_C150/C300_WCB_M959	NO	22	1.700	37.40
922060520000	YOKE-BONNET_2_C300_GV_WCB- M960	NO	12	12.000	144.00
922060530000	BODY_4_C300_GV_FL_WCB_M961	NO	34	65.600	2230.40
922060550000	WEDGE_4_C300_WCB_M961	NO	34	6.300	214.20
922060560000	YOKE CUM BONNET-4-C300-GV-WCB-	NO	34	24.400	829.60
922060570000	BODY_8_C300_GV_FL_WCB_M962	NO	4	149.000	596.00
922060590000	WEDGE_8_C300_WCB_M962	NO	4	17.800	71.20
922060600000	YOKE CUM BONNET-8-C300-GV-WCB-	NO	4	47.200	188.80
					5184.00

#### **Pre-Qualification terms for participating in the Rate Contract:**

1. Bidder shall submit "Well Known Foundry" recognition certificate under the Indian Boiler Regulations 1950 for manufacture of Boiler Quality Castings which shall be valid as on date of tender opening and bidder has to submit undertaking that they shall renew it from time to time. Well Known Foundries, which have applied for renewal on the date of tender opening, shall submit the expired "Well Known Foundry" certificate and documentary evidence/undertaking for renewal of the same.

However, in case the bidder is not having "Well Known Foundry" certificate, then he can supply castings after inspection from IBR approved inspection authorities for IBR items. Foundries which are not recognized as "Well Known Foundry" should have experience of supplying Boiler Quality Castings under Indian Boiler Regulations 1950 and shall have to submit purchase order and corresponding proof of Witness pouring by IBR approved inspecting authorities. Date of such purchase order shall be on or after 01.11.2019.

- 2. Bidder should have experience of supplying Radiography Tested (RT) castings and shall have to submit purchase order and corresponding proof of RT reports. Date of such purchase order shall be on or after 01.11.2019.
- 3. Bidder should have successfully manufactured and supplied castings. Bidder shall submit customer Purchase Orders and their invoices for supply of Steel Castings with minimum cumulative value of Rs. 7,00,000 (Rs. Seven lakh only) as proof. For MSEs, the required cumulative value of POs and invoices shall be Rs. 3,50,000.00 (Rs. Three lakh fifty thousand only). Date of Purchase Order/s date & corresponding invoices should be 01.11.2019 or afterwards and upto the date of actual bid opening. All mentioned values are net of taxes.

# BHEL IVP GOINDWAL SAHIB

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

# S2 <u>PART-I: TECHNO-COMMERCIAL BID</u> should contain all the documents/confirmations as per following details:

a) Acceptance of Techno-Commercial terms and conditions shall be attached along with bid document. This can be attached either by signing each page of terms and conditions or a confirmation statement.

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

- b) MSE vendors should submit **Udyam Registration Certificate/UAM** for availing applicable benefits for MSE vendors as per tender terms. Validity of document shall be considered as on date of Part I opening as per the latest available notification from Govt.
- c) Documents as per pre-qualification terms.
- d) Duly filled Annexure-A (Non-Disclosure Agreement)
- e) Duly filled Annexure B MII Declaration content format

#### **S3** Bid Evaluation

Procurement in the tender enquiry is to be done from NPCIL vetted BHEL approved foundries. Bids received from only NPCIL vetted BHEL approved foundries (as on date of Part I opening) shall be accepted.

#### S4 LOADING

100% loading shall be done on the L1 bidder for the all material codes and corresponding quantity as mentioned on clause S1.

#### S5 PRICE BASIS

- a) Rates shall be quoted on rate INR per kg basis & on FOR GOINDWAL basis Comparison shall be made on landed rate per kg to BHEL Goindwal for deciding L1 offer. Evaluation shall be done line item wise.
- b) Rates shall be inclusive of pattern and development cost. The pattern cost shall be borne by the vendor.
- c) Unloading of material at Main Stores of BHEL shall be arranged by BHEL.
- d) Order of enquiry item sl. no. shall be maintained in the quotation.

#### **S6** REVERSE AUCTION

Reverse auction will be conducted in this tender enquiry.

# BHEL IVP GOINDWAL SAHIB

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#### S7 <u>SUBMISSION OF SUPPLIER REGISTRATION FORM (SRF)</u>

Bidders, who are not currently on registered list of BHEL IVP Goindwal and BHEL Trichy, may submit their application for vendor registration through online system on <a href="www.bhel.com">www.bhel.com</a> in IVP Goindwal material category 'GVCST'. Direct link for online supplier registration is <a href="https://supplier.bhel.in/">https://supplier.bhel.in/</a>. This application submission can be done separately/immediately without waiting for the tender opening and finalization.

#### S8 <u>DELIVERY SCHEDULE</u>

Delivery shall be within 120 days from date of Purchase Order.

In case of special requirements, BHEL may ask vendor/s to supply with lesser delivery schedule, which shall be mentioned in the purchase orders. In such cases, delivery extension may be given to vendor for equal load in other pending purchase orders.

#### S9 TEST CERTIFICATE

It is the responsibility of successful vendor to ensure that all the castings are supplied with IBR TC or MTC as applicable.

#### S10 <u>CASTING WEIGHTS</u>

Rate of any item shall be derived by multiplying unit weight with rate per kg for the period when PO is being released. For the unit weights please refer the [TABLE I] in clause S1

#### S11 MSE and MII purchase preference

MSE and MII purchase preference shall not be provided in this tender enquiry.

#### S12 Bid Validity

75 days from the actual date techno commercial bid opening (Part I).

#### S13 RADIOGRAPHY

Consistent radiography quality is to be ensured and to be maintained uniformly in bulk supply with adequate process and method controls. Since the required castings are of radiographic quality, BHEL reserves the right to conduct radiographic testing of sample pieces at its own arrangement and derive conclusion of soundness of casting supplied against the said lot/heat based on the results of such testing.

- Standard requirement of radiography of castings shall be as applicable TDC.
- Any additional requirement shall be specifically called for in PO.
- BHEL intends to get delivery of castings along with radiographed sets as ordered. The claim of vendor for payment of supplies against any PO can be put on hold if the requisite no. of radiographed sets has not been delivered. BHEL shall reserve the right to select any sample from a lot offered and get it radiographed at vendor's works.

# BHEL IVP GOINDWAL SAHIB

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Vendor will be required to submit radiographic films and test reports. BHEL will review and evaluate radiography films and RT reports and reserves the discretion to do so at the premises of the vendor.

Radiography procedure shall be as per ASME B 16.34 and as mentioned in BHEL's TDCs. All the radiography films shall be dispatched to BHEL without delay either before the castings are being dispatched or along with the castings. Vendor shall undertake radiography on new development as per applicable TDC.

RT charges: Fixed RT charges @ Ir<sub>192</sub>: Rs 0.99 & Co<sub>60</sub>: Rs 1.50 per sq. cm shall be paid on actual verified film area.

#### S14 INSPECTION REQUIREMENTS FOR CASTINGS

1. For RT as well as non-RT castings, the seller shall give advance notice of minimum 03 working days for inspection to the purchaser. Inspection will be carried out within 03 working days from the proposed date of inspection.

In case of time taken by BHEL is more than 03 working days, delivery extension on account of delay may be provided to seller for number of days beyond 03 working days for the delayed portion only.

- 2. All required tests (Physical properties, Chemical properties, Heat Treatment, NDE, Visual, Surface finish etc.) as called in referred material standard/BHEL/TDC/drawing etc shall be carried out by vendor at no extra cost. BHEL may decide to inspect itself/arrange third party at vendors' works itself as and when necessary with prior intimation to the vendor. No additional charges shall be claimed for such inspections. Third party inspection charges will be borne by BHEL.
- 3. Sample castings are to be identified by vendor in the delivery challan as "Sample" and the dimensional reports and RT reports are to be provided to BHEL along with supply. Also mention "Sample" on castings with white paint.
- 4. RT castings have to be mentioned "RT" on castings with white paint.
- 5. Material code as mentioned in PO is to be mentioned on all casting with paint.

#### S15 REPAIR OF CASTINGS

- a) All castings shall be supplied free of defects like shrinkage, hot tears and process variable defects like sand inclusion, slag inclusion, gas entrapment etc. If any casting is found containing defects more than allowable limit, the same shall be upgraded at foundry itself before dispatch to BHEL with necessary documentation, enabling BHEL to make use of such castings immediately for production.
- b) If castings are found defective at different stages of manufacturing, the same shall be repaired at the defective area and the repaired castings shall be accepted after performing requisite NDT at vendor's cost. BHEL shall decide about the areas to be repaired in all such cases.
- c) Castings, that are found defective after receipt at BHEL, necessary repair of the castings will be carried out by BHEL and repair charges @ Rs. 19.10 per cc for Carbon Steel grades shall be deducted from any of the running bills of the vendor.
- d) In case of rejection of casting after machining/ assembly/testing due to defects more than allowable limits or major variation in dimensions etc. then the entire cost incurred till that stage shall be deducted from any of the running bills of the vendor.



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#### **S16** Payment Terms:

1. Due payment against supplies shall be made after receipt and acceptance of material as per table below:

Type of bidder	Payment Terms (Number of days)
Micro & Small Enterprises (MSEs)	45
Medium Enterprises	60
Non MSME	90

In case of any deviation from standard payment term mentioned, BHEL at its discretion may load on the item price at 'Base rate of SBI (as applicable on the date of bid opening; Techno-commercial bid opening) + 6% shall be considered for loading for the period of relaxation sought by bidders.

- 2. Documents to be submitted (if applicable)
  - a. Tax invoice (Invoice shall be GST compliant and should contains all the required information such as GST No, HSN code etc.)
  - b. Transporter copy along with material/consignment.
  - c. Material Test Certificates (MTC) and
  - d. Compliance Certificate.
- 3. GST registration number is to be submitted by qualified vendor as per GST law.
- 4. It is mandatory to mention proper material codes in the invoices and separate invoices to be raised for different POs.
- 5. BHEL releases payment through EFT mode ONLY. Necessary details may please be submitted by filling required format before release of payment.

These Special terms & conditions and GCC collectively are the part of tender terms and conditions. Any term in special terms and conditions will supersede the GCC.

# बीएच ईएल सिक्षा

# **General Contract Conditions (GCC) of MM Tenders**

### BHARAT HEAVY ELECTRICALS LIMITED

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

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# बीएचईएल BHEL

#### **General Contract Conditions (GCC) of MM Tenders**

#### BHARAT HEAVY ELECTRICALS LIMITED

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

#### 1. INSTRUCTION TO BIDDER

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

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

# 1.1 Instruction to Bidder (In case of Non-E-Procurement / Paper/ Manual/ Hard Copy based tenders)

Sealed Tenders can be dropped in the tender box labeled as 'Tender box for MM contracts'. This tender box is located at the entrance of Admin block BHEL Goindwal. Quotations can also be submitted through e-mail at **tendermm\_ivp@bhel.in**. Offers received in time shall be considered only when offers are complete in all respects. In case of bulky tenders, please handover quotation to Sh. Rakesh Kumar/ SDGM - Head-MM or Sh. Sumeet Bansal / Sr. Manager - MM [Contact: 01859 224 615 / 628]. Bid can be sent to following address:

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

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

- 1. Interested bidders / suppliers shall submit their offer through e-procurement mode at <a href="https://eprocurebhel.co.in/">https://eprocurebhel.co.in/</a>.
- 2. Offers in any other mode will not be accepted.
- 3. Procedure for submission of tender is available in the "Bidder Manual Kit" at e-tender portal <a href="https://eprocurebhel.co.in/">https://eprocurebhel.co.in/</a>.
- 4. In case of any difficulty faced while registering on BHEL's e-Procurement portal developed by NIC, queries may be addressed to 0120-4001002, 0120-4001005 and 0120-6277787; email: <a href="mailto:support-eproc@nic.in">support-eproc@nic.in</a>. These details are also available on 'Contact Us' page of the portal.
- 5. Before uploading scanned documents if any, the bidders shall sign on all the statements, documents, certificates uploaded by him, owning responsibility for their correctness / authenticity.
- 6. Disclaimer clause: Neither the Organization (Bharat Heavy Electricals Ltd.) nor the service provider is responsible for any failure of submission of bids due to failure of internet or other connectivity problems or reasons thereof.

#### 2. SCOPE OF SUPPLY

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



#### BHARAT HEAVY ELECTRICALS LIMITED

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

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

#### 3. PRICE BASIS

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

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

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

#### 4. DISCREPANCY IN WORDS AND FIGURES

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

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

In the course of evaluation, if more than one bidder happens to occupy L1 status, effective L1 will be decided by soliciting discounts from the respective L1 bidders.



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In case more than one bidder happens to occupy the L1 status even after soliciting discounts, the L1 bidder shall be decided by a toss / draw of lots, in the presence of the respective L1 bidder(s) or their representative(s).

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

#### 6. REVERSE AUCTION

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

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

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

#### 7. VALIDITY OF OFFERS

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

#### 8. SUPPLIED MATERIAL ADJUSTMENT

Item/s pending in previous PO has to be billed in previous PO only. Otherwise, BHEL will be free to adjust the supplies in previous PO. Any implication of tax will be on supplier's account. For this it is desirable that vendor should reconcile the pending PO statement every month/frequently with BHEL. Vendor can also view these details at Portal (https://trichy.bhel.com/mm/index.jsp).

#### 9. DELIVERY SCHEDULE

Supplies shall be affected and completed as per schedule mentioned in special terms and conditions. Further, BHEL may release delivery schedule from time to time based upon our requirement with mutual understanding. Vendor shall be required to complete the order as per the BHEL schedule requested. Commencement of delivery period shall be reckoned from the date of PO / LOI or any other agreed milestone.

#### 10. LIQUIDATED DAMAGES (LD) FOR LATE DELIVERY

Time is the essence of the contract'. As such, delivery of goods specified in the Purchase Orders released under the scope of this contract shall be made within the time limit prescribed therein. Penalty for late delivery will be applicable @0.5% of the undelivered portion per week of the delay or part thereof subject to a maximum of 10% of the undelivered potion.



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

If any vendor does not accept LD  $\frac{1}{2}$ % of the supply for each week of delay subject to a maximum of 5%, their offer is likely to be rejected by BHEL and the price bid shall not be opened. Bidders accepting for 10% LD shall not be loaded on account of LD. However, bidders who offer any other % LD [between 5% to 10%] shall be loaded @ % deviation from 10% and their accepted %. e.g. If a bidder accepts for a max of 7% LD only, their offer would be loaded @ 3% (10 – 7 = 3).

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

#### 11. PAYMENT TERMS

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

#### 12. TAXES & DUTIES

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

- a) Vendor declaring such invoice in his GSTR-1 and
- b) Receipt of goods and Tax invoice by BHEL and
- c) Confirmation of payment of GST thereon by vendor on GSTN portal.
- d) Above is subject to receipt of goods/service and tax invoice thereof along with vendor declaring invoice in his return and paying GST within timeline prescribed for availing ITC by BHEL.

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



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- 1. Since ITC can be availed only when BHEL is in possession of GST Tax invoice and after receipt of goods. Thus, vendor to ensure timely dispatch of goods and Tax invoice. It may be noted that in case of any delay in receipt of Tax Invoice and/or receipt of goods, the ITC availment by BHEL will get delayed thus entailing additional cash outflow & may even get denied if ITC availment timelines are breached.
- 2. Further ITC can be availed only when vendor has declared such invoice in his outward supply Return GSTR-1 and after GST thereon has been paid by him at the time of filing of monthly Return.
- 3. If GST credit is delayed/denied to BHEL due to non/delayed receipt of goods and/or tax invoice or expiry of timeline prescribed in GST law for availing such ITC, or any other reasons not attributable to BHEL, GST amount shall be recoverable from vendor along with interest levied/leviable on BHEL.
- 4. Further, in case vendor delays declaring such invoice in his return and GST credit availed by BHEL is denied or reversed subsequently as per GST law, GST amount paid by BHEL towards such ITC reversal as per GST law shall be recoverable from vendor/contractor along with interest levied/leviable on BHEL.

#### 13. LIABILITY UNDER REVERSE CHARGE (RCM)

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

#### 14. ACCESS TO MANUFACTURING PREMISES

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

#### 15. INSPECTION

- 1. The seller shall give adequate notice, of 1 week or as mutually agreed period, in writing to the Purchaser about the date and place at which the goods will be ready for inspection/ testing, as provided for in the contract.
- 2. Purchaser or his authorized representative shall be entitled to carry out inspection of material and workmanship/Surveillance Audit at Seller's premises or at his sub-contractor's premises at all reasonable times during execution of contract; Such inspection, examination and testing, if made, shall not absolve the Seller from his obligations under the contract. No additional charges shall be claimed for such inspections. Moreover, all required infrastructure (testing, tools etc) have to be arranged by supplier.
- 3. Any inspection carried out before supply by vendor/incoming stage at BHEL notwithstanding, if any defect/non-conformity is noted during processing, the same shall be attended/replaced by vendor at no extra cost.
- 4. BHEL representative from unit or CQ is authorized to carry out audits along with TPIA at vendor's works before clearing the items for dispatch.



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5. Necessary tooling including thread gauges etc. have to be arranged by vendor. Only in exceptional cases, based on BHEL discretions item/nature, BHEL may consider request to provide gauges if available with BHEL. But in no case this shall be linked with delivery of material.

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

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

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

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

#### 17. LOI (LETTER OF INTENT)

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

#### 18. SUB-CONTRACT

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

#### 19. RISK PURCHASE

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

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



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

The value shall be calculated as follows:

Risk & Cost Amount=  $[(A-B) + (A \times H/100)]$ Where,

- A= Value of Balance scope of Supply (\*) as per rates of new contract
- **B**= Value of Balance scope of Supply (\*) as per rates of old contract being paid to the supplier at the time of termination of contract i.e. inclusive of PVC, if any.
- **H** = Overhead Factor shall be taken as 5

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

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

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

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

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

#### 20. FORCE MAJEURE

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



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#### 21. NON-DISCLOSURE AGREEMENT

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

#### 22. CLARIFICATIONS

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

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

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

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

- 25% Procurement of the tender value shall be made from MSE (Micro, Small Enterprises) firms.
- 25% of the 25% quantity (i.e. 6.25% of the tender quantity) offered to the MSE's shall be reserved for MSE's owned by SC/STs. Failure to participate by any MSE owned by SC/ST's; this 6.25% quantity shall be procured from other MSEs.
- 3% from within the 25% quantity offered to the MSE's shall be reserved for women owned MSE's. Failure to participate by any MSE owned by women; this 3% quantity shall be procured from other MSEs.
- EMD shall be exempted for MSE's. All these benefits are subject to production of all statutory documents



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• In tender, participating Micro and Small Enterprises quoting price within price band of L1+15 per cent shall also be allowed to supply a portion of requirement by bringing down their price to L1 price in a situation where L1 price is from someone other than a Micro and Small Enterprise and such Micro and Small Enterprise shall be allowed to supply up to 25 per cent of total tendered value. In case of more than one such Micro and Small Enterprise, the supply shall be shared proportionately (to tendered quantity).

MSE suppliers can avail the intended benefits only if they submit **Udyam Registration Certificate** along with the offer. No other document shall be considered for availing MSE benefits. Non-submission of such document will lead to consideration of their bid at par with other bidders. No benefit shall be applicable for this enquiry if any deficiency in the above required documents is not cleared before price bid opening. If the tender is to be submitted through e-procurement portal, then the above required document is to be uploaded on the portal.

Note: It may however be noted that MSE guidelines as on date (Date of Technical Bid Opening Part-1) shall prevail.

#### 24. PREFERENCE TO MAKE IN INDIA

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

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

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

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

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

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

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



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

#### 26. DISPUTES

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

#### 27. JURISDICTION

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

#### 28. BANNED FIRMS

The offers of the bidders who are on the banned list as also the offer of the bidders, who engage in the services of the banned firms, shall be rejected. The list of banned firms is available on BHEL website <a href="https://www.bhel.com/">https://www.bhel.com/</a>.

#### 29. FRAUD PREVENTION POLICY

The Bidder along with its associate / collaborators / sub-contractors / sub-vendors / consultants / service providers shall strictly adhere to BHEL Fraud Prevention Policy displayed on BHEL website <a href="https://www.bhel.com/">https://www.bhel.com/</a> and shall immediately bring to the notice of BHEL management about any fraud or suspected fraud as soon as it comes to their notice.

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

The Bidder declares that they will not enter into any illegal or undisclosed agreement or understanding, whether formal or informal with other Bidder(s). This applies in particular to prices, specifications, certifications, subsidiary contracts, submission or non-submission of bids or any other actions to restrict competitiveness or to introduce cartelization in the bidding process. In case, the Bidder is found having indulged in above activities, suitable action shall be taken by BHEL as per extant policies/ guidelines.

#### 31. SUSPENSION OF BUSINESS DEALINGS WITH DEFAULTERS

The offers of the bidders who are under suspension as also the offers of the bidders, who engage the services of the banned firms, shall be rejected. The list of banned firms is available on BHEL web site <a href="https://www.bhel.com/">https://www.bhel.com/</a>.

- 1.0 Integrity commitment, performance of the contract and punitive action thereof:
- 1.1. Commitment by BHEL:



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BHEL commits to take all measures necessary to prevent corruption in connection with the tender process and execution of the contract. BHEL will during the tender process treat all Bidder(s) in a transparent and fair manner, and with equity.

- 1.2. Commitment by Bidder/ Supplier/ Contractor:
- 1.2.1. The bidder/ supplier/ contractor commits to take all measures to prevent corruption and will not directly or indirectly influence any decision or benefit which he is not legally entitled to nor will act or omit in any manner which tantamount to an offence punishable under any provision of the Indian Penal Code, 1860 or any other law in force in India.
- 1.2.2. The bidder/ supplier/ contractor will, when presenting his bid, disclose any and all payments he has made, and is committed to or intends to make to agents, brokers or any other intermediaries in connection with the award of the contract and shall adhere to relevant guidelines issued from time to time by Govt. of India/ BHEL.
- 1.2.3. The bidder/ supplier/ contractor will perform/ execute the contract as per the contract terms & conditions and will not default without any reasonable cause, which causes loss of business/ money/ reputation, to BHEL.

If any bidder/ supplier/ contractor during pre-tendering/ tendering/ post tendering/ award/ execution/ post-execution stage indulges in mal-practices, cheating, bribery, fraud or and other misconduct or formation of cartel so as to influence the bidding process or influence the price or acts or omits in any manner which tantamount to an offence punishable under any provision of the Indian Penal Code, 1860 or any other law in force in India, then, action may be taken against such bidder/ supplier/ contractor as per extant guidelines of the company available on <a href="https://www.bhel.com/">https://www.bhel.com/</a> and/or under applicable legal provisions

#### 32. GENERAL

- BHEL will not be bound by any power of attorney granted by the vendors or by changes in the
  composition of the firm made subsequent to the execution of the contract. They may, however,
  recognize such power of attorney and changes after obtaining proper legal advice, the cost of
  which will be chargeable to the vendor concerned.
- 2. BHEL reserves the right to extend the due date of opening, which shall be informed. Validity of offer shall be deemed to be revised accordingly.
- 3. BHEL reserves the right to accept or reject any part or whole of the tender of a bidder by assigning a valid reason thereof. BHEL reserves the right to cancel the tender without assigning any reason thereof and without any obligation before any commitment.
- 4. Acceptance of all terms and conditions, in the form of signed copy of T&C or confirmation separately written, shall be submitted along with quotation. If nothing is mentioned, it shall be concluded that terms and conditions are acceptable.
- 5. BHEL may increase/decrease item/s based on BHEL requirement before price bid opening. Suitable price implication may be asked from suppliers.
- 6. BHEL may drop item/items from tender at any stage of tender before placing PO. BHEL may also delete PO with consent with supplier within delivery date of PO.



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- 7. After releasing PO, it is assumed that supplier has accepted PO if we do not receive acknowledgement from supplier within 5 days of date of PO.
- 8. In case of unscheduled holiday on opening day of tender, the next working day will be treated as scheduled prescribed day of opening of tender.
- 9. On the due date of tender opening, only technical bids will be opened. The opened technical bids will be evaluated by us and clarifications required, if any, will be called for from the bidders on technical and commercial points. If no reply is received from the vendor for the clarification raised by BHEL with in the final cut-off date, those vendors offer will be processed with the documents available / submitted against this tender. Offers not meeting the required specification and technical condition will be summarily rejected. The price bids of technically suitable bidders will be opened on a later date with prior intimation to techno-commercially suitable bidders.
- 10. Ranking L-1, L-2 etc. shall be done for individual item for the techno-commercially acceptable offers on landed cost to BHEL, IVP Goindwal basis and BHEL reserves the right to place order for individual items with different vendors.
- 11. BHEL reserves the right to negotiate with L1 vendor or re-float the tender for items where, L1 price is not the lowest acceptable price; BHEL reserves the right to increase or decrease the tender quantity.
- 12. If supplier is mentioning delivery destination within state/ outside state depending upon his location of factory, Free on Road etc. these are assumed as on FOR Goindwal. If supplier is wishing to give delivery on Ex works basis, then he has to clearly mention about it.
- 13. The bidder has to keep track of any changes by viewing the addendum(s) / Corrigendum(s) issued by the Purchaser on time-to- time basis in the E-Procurement platform. The Company calling for tenders shall not be responsible for any claims/problems arising out of this.
- 14. Unregistered suppliers, who are techno-commercially qualified against the open tender, are requested to register with BHEL as permanent supplier by submitting the Supplier Registration Form (SRF). SRF is available at <a href="https://www.bhel.com/supplier-registration">https://www.bhel.com/supplier-registration</a>.
- 15. Any term in special tender terms and conditions will supersede the GCC.



# THIRD PARTY NON-DISCLOSURE AGREEMENT

(Tender enquiry no. 2223-063E dated 26.11.2022)

# THIRD PARTY NON-DISCLOSURE AGREEMENT

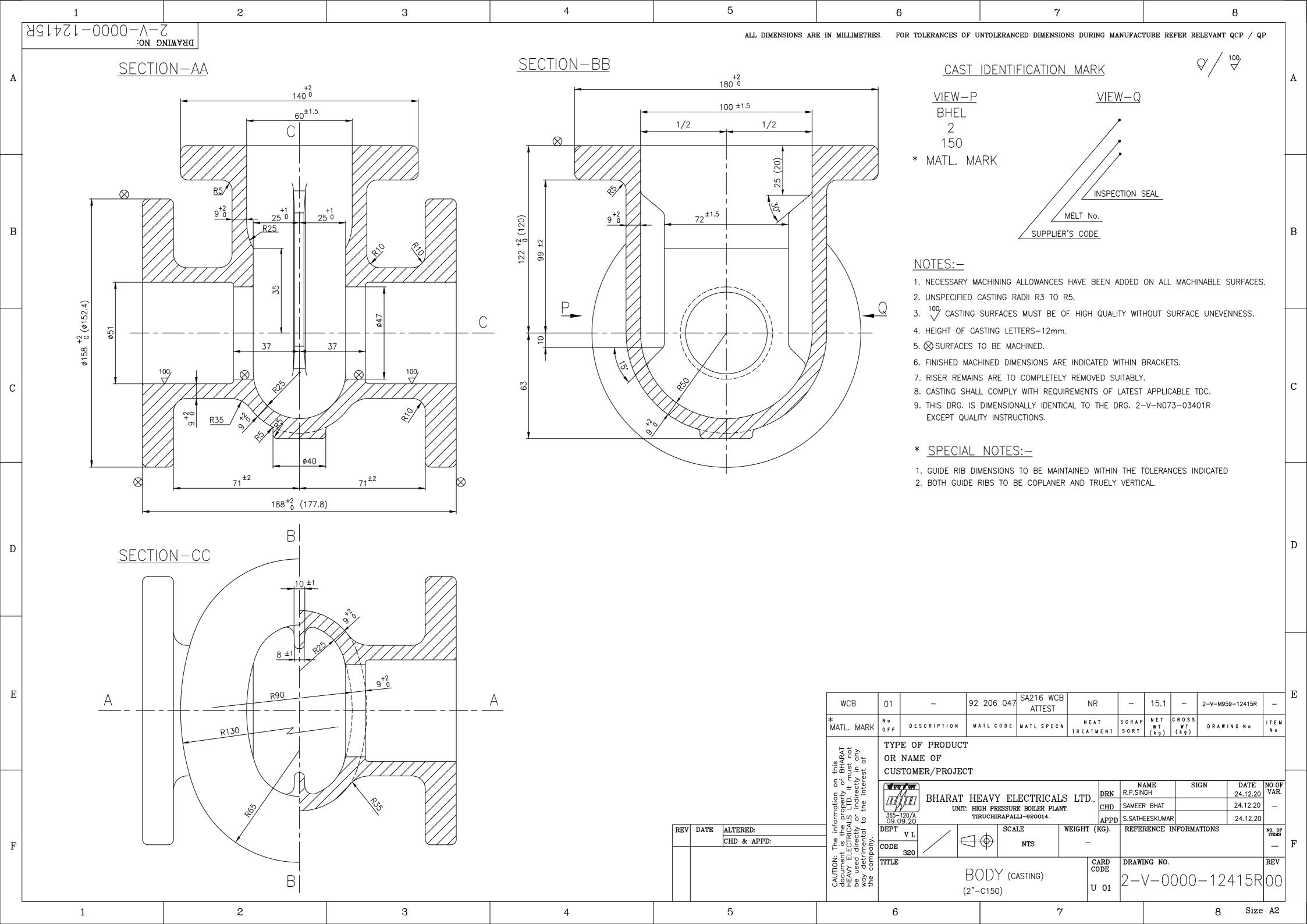
I,	, on behalf of the	(Name of Company), acknowledge
	mation received or generated, directly or indire	
on contract is	s confidential and that the nature of the busine	ess of the BHEL, Goindwal is such that the
following cor	nditions are reasonable, and therefore:	
I warrant and	agree as follows:	
	er personnel employed or engaged by our c	
•	y information related to the BHEL, Goindwa	
	is agreed that we will not disclose such inform	nation consisting but not necessarily limited
to:		
<ul> <li>Techni</li> </ul>	cal information: Methods, drawings, proc	passas farmulas compositions systems
	ques, inventions, computer programs / data / c	
teeming	ques, inventions, computer programs / data / c	configuration and research projects.
Busine	ess information: Customer lists, project sche	dules pricing data estimates financial or
	ing data,	dures, priesing dura, estimates, initalierar of
	8	
On conclusion	n of contract, I, or any other personnel employ	yed or engaged by our company shall return
to BHEL, Go	indwal all documents and property of BHEL,	Goindwal, including: drawings, blueprints,
reports, manu	uals, computer programs/data/configuration, a	and all other materials and all copies thereof
relating in an	y way to BHEL Goindwal's business, or in ar	ny way obtained by me during the course of
contract. I fu	rther agree that I, or any others employed or	r engaged by our company shall not retain
copies, notes	or abstracts of the foregoing.	
This obligation	on of confidence shall continue after the conc	lusion of the contract also.
T11 - 1 -		
_	ge that the aforesaid restrictions are necessardwal and are reasonable given the nature	
	agree that this agreement shall be governed by	<del>_</del>
of country.	agree that this agreement shall be governed by	y and construct in accordance with the laws
or country.		
I enter into th	is agreement totally voluntarily, with full kno	owledge of its meaning, and without duress.
	,	
Dated at	, this day of, 20_	<b>→</b>
Name		
C		
Company		
G: .		
Signature		

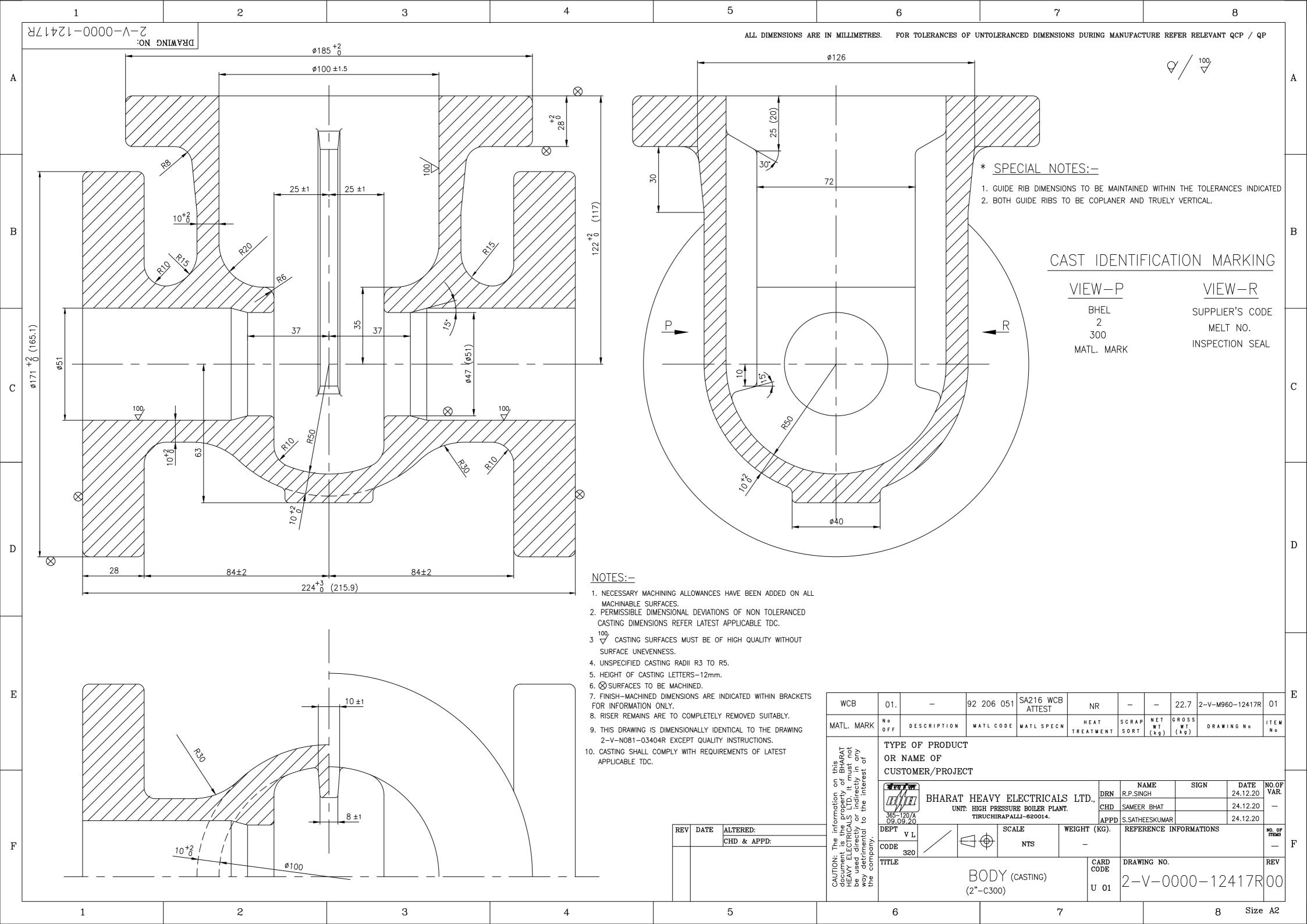
# ON COMPANY (OEM) LETTER HEAD

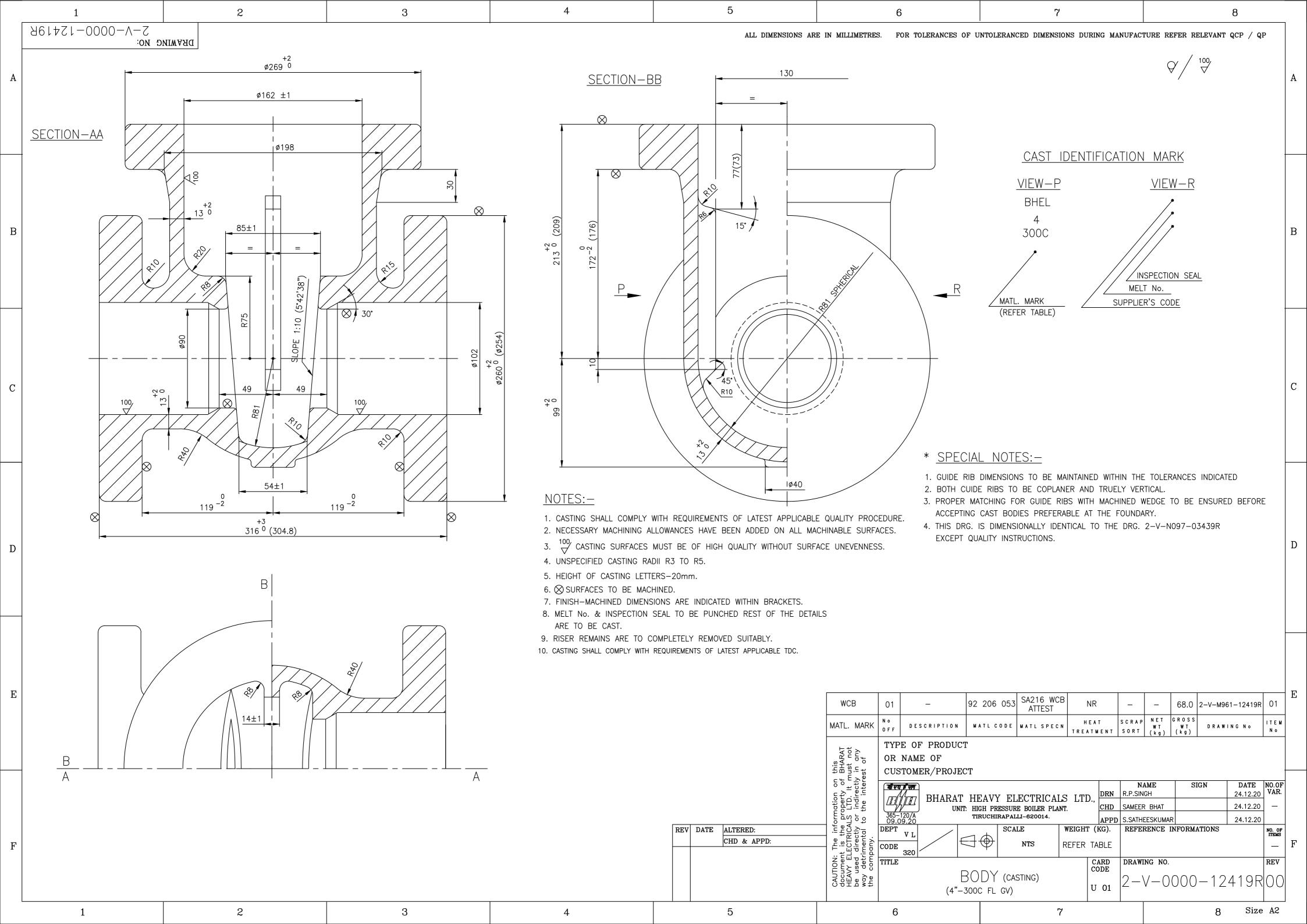
### Make in India (MII) and Local Content Declaration

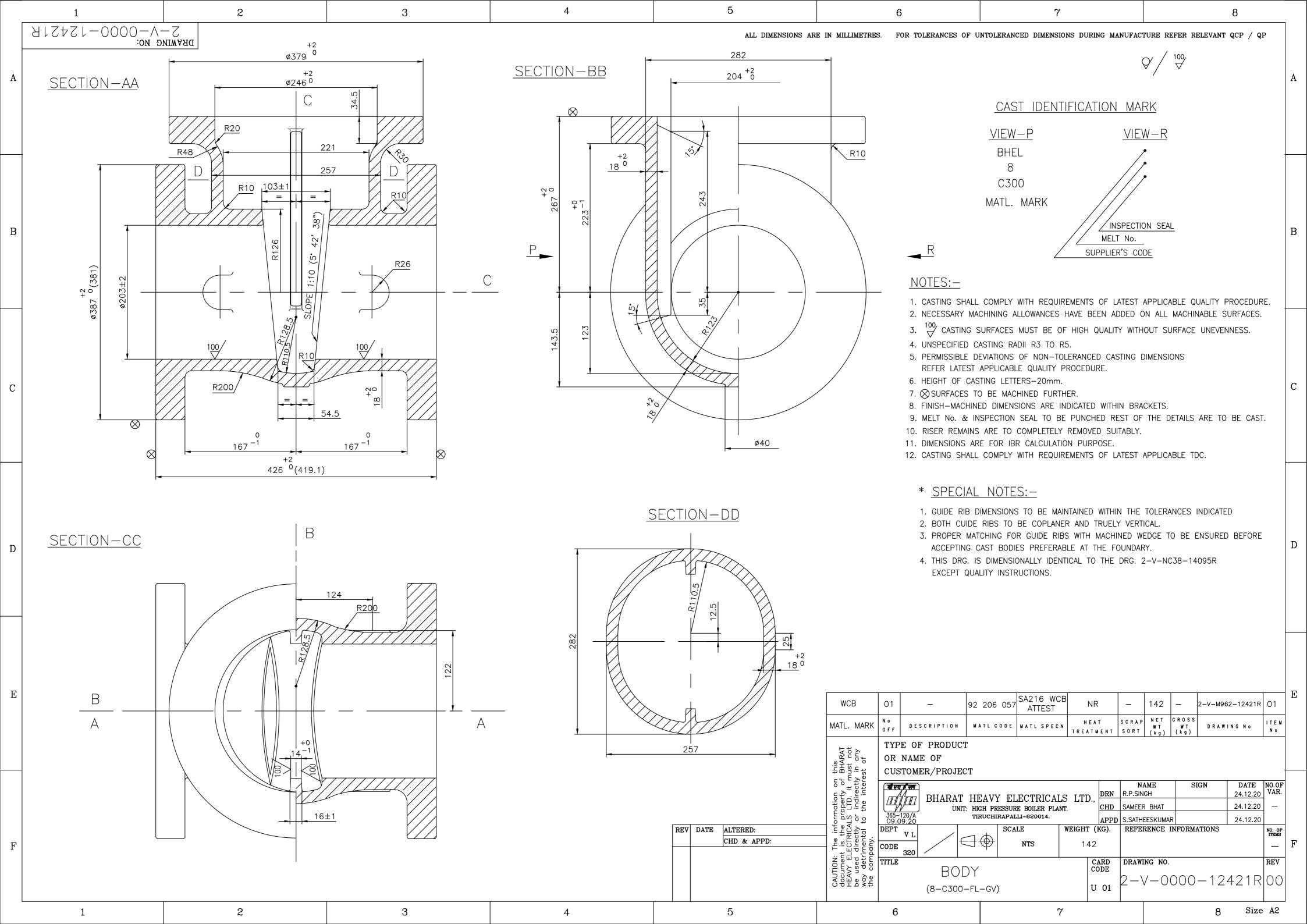
To whom it may concern

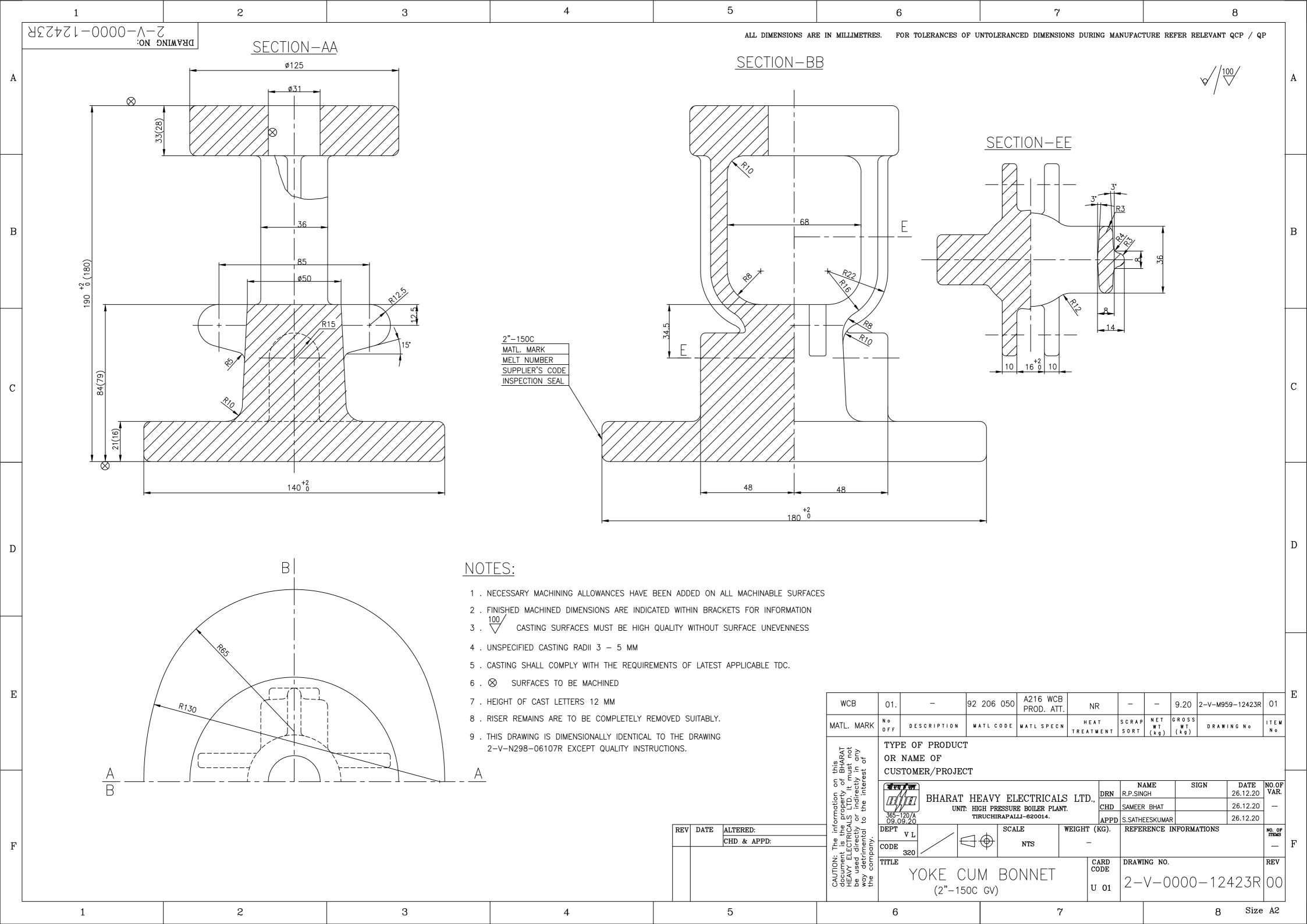
In line with Government Public Procurement Order No. P-45021/2/2017-BE-II dt. 15.06.2017, as amended from time to time and as applicable on the date of submission of tender, we hereby certify that we M/s (supplier name) are (tick whichever is applicable as below)
"Class-I local supplier" meeting the requirement of minimum local content equal to 50% or more defined in above mentioned government notification for the goods & services
(or)
"Class-II local supplier" meeting the requirement of minimum local content 20 % to less than 50% defined in above mentioned government notification for the goods & services
(or)
Non-local supplier (if not belonging to Class-I & Class-II)
against Tender Enquiry No
Product:
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 Rule for which for which a bidder or its successors can be debarred for up two years as per Rule 151 (iii) of the General Financial Rules along with such other actions as may be permissible under law.
Authorized Signatory
Place: Date:

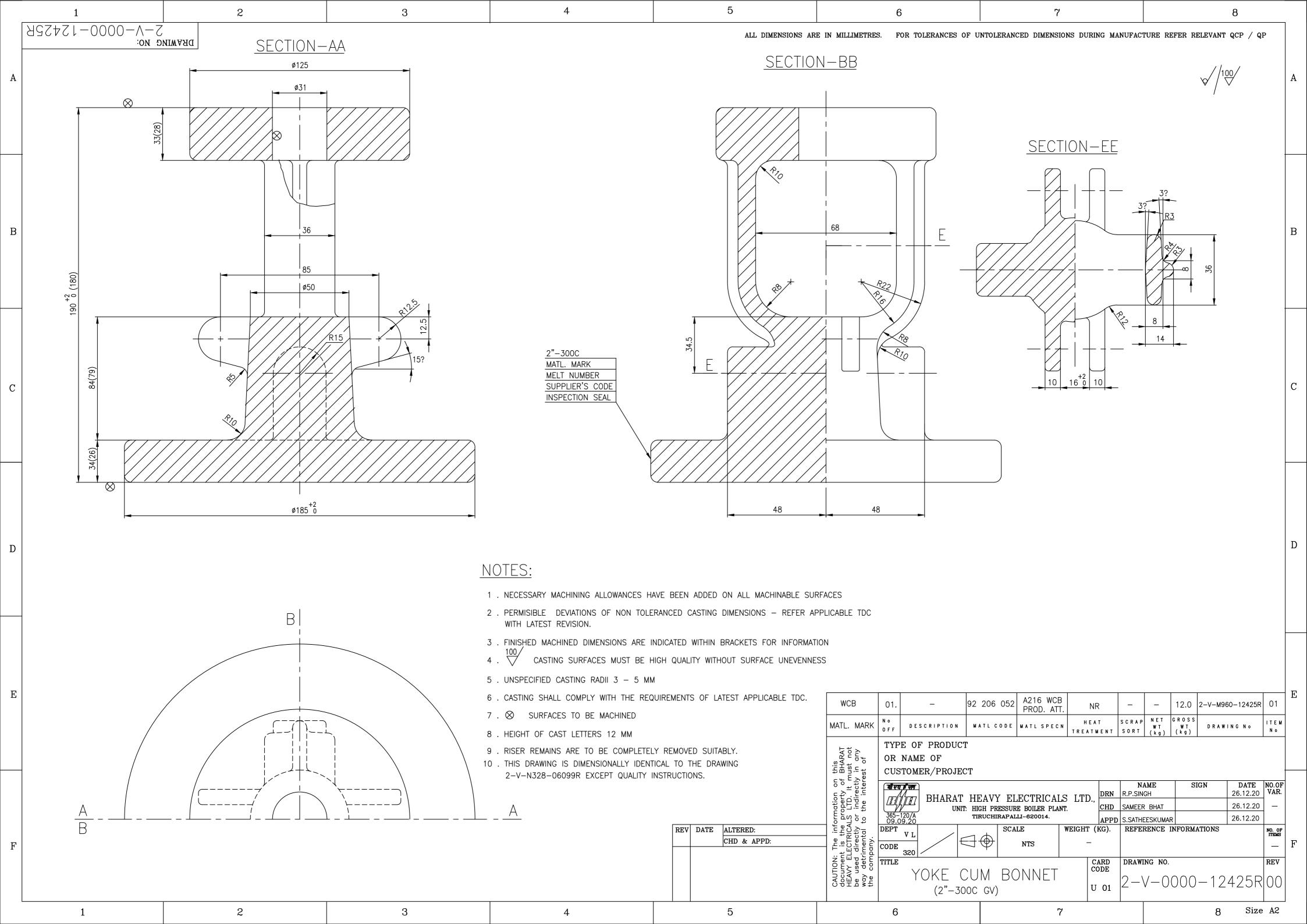


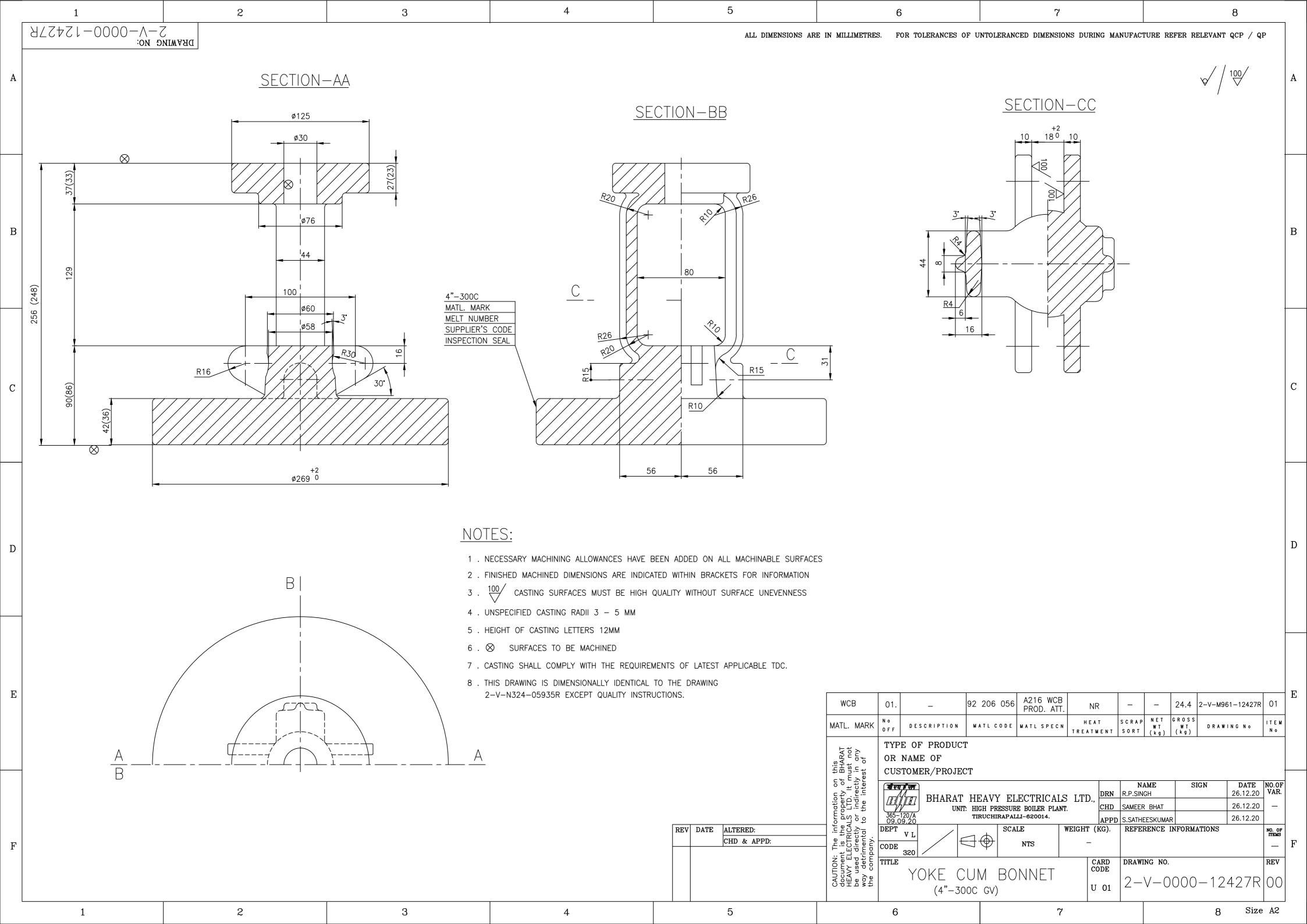


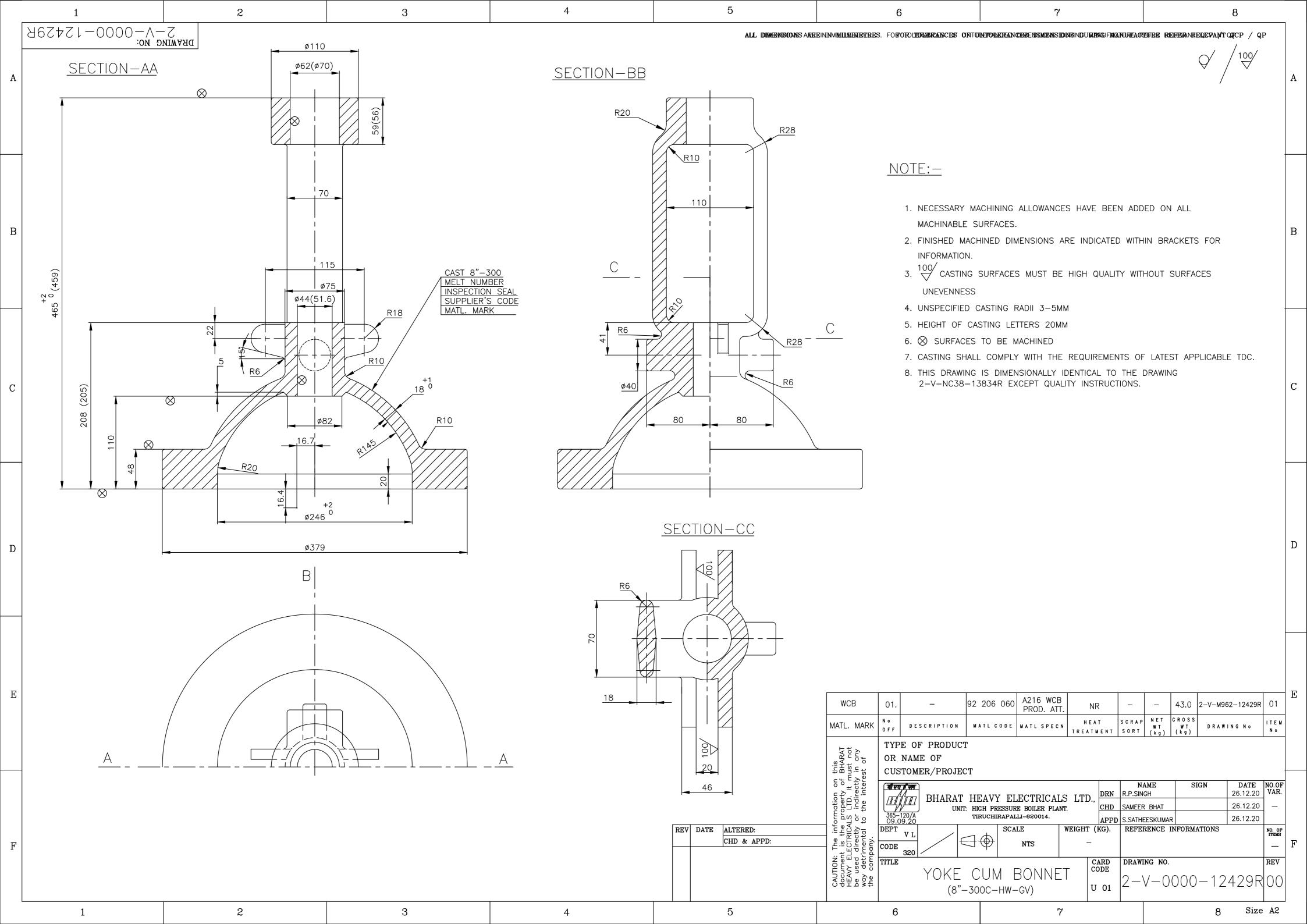


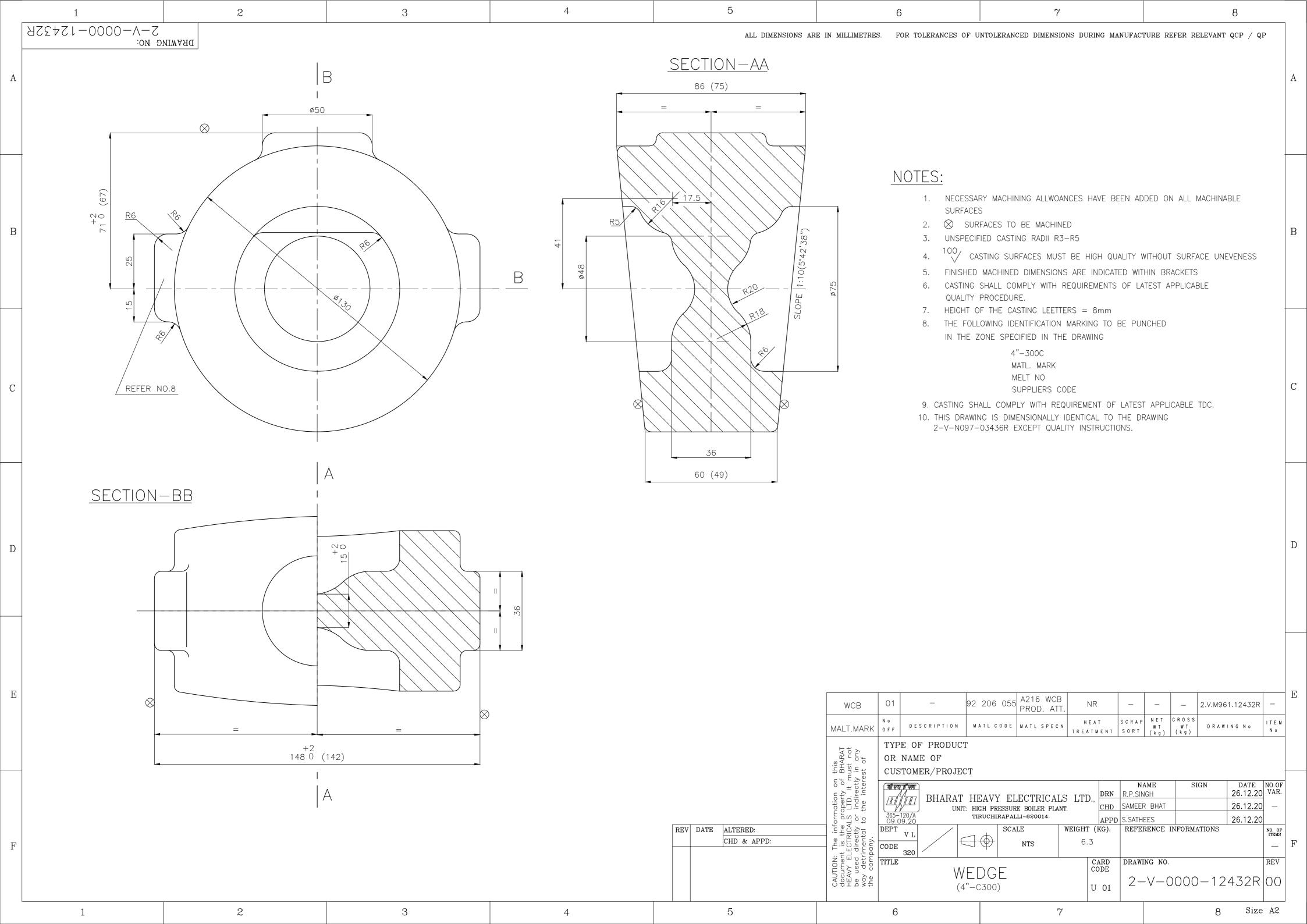


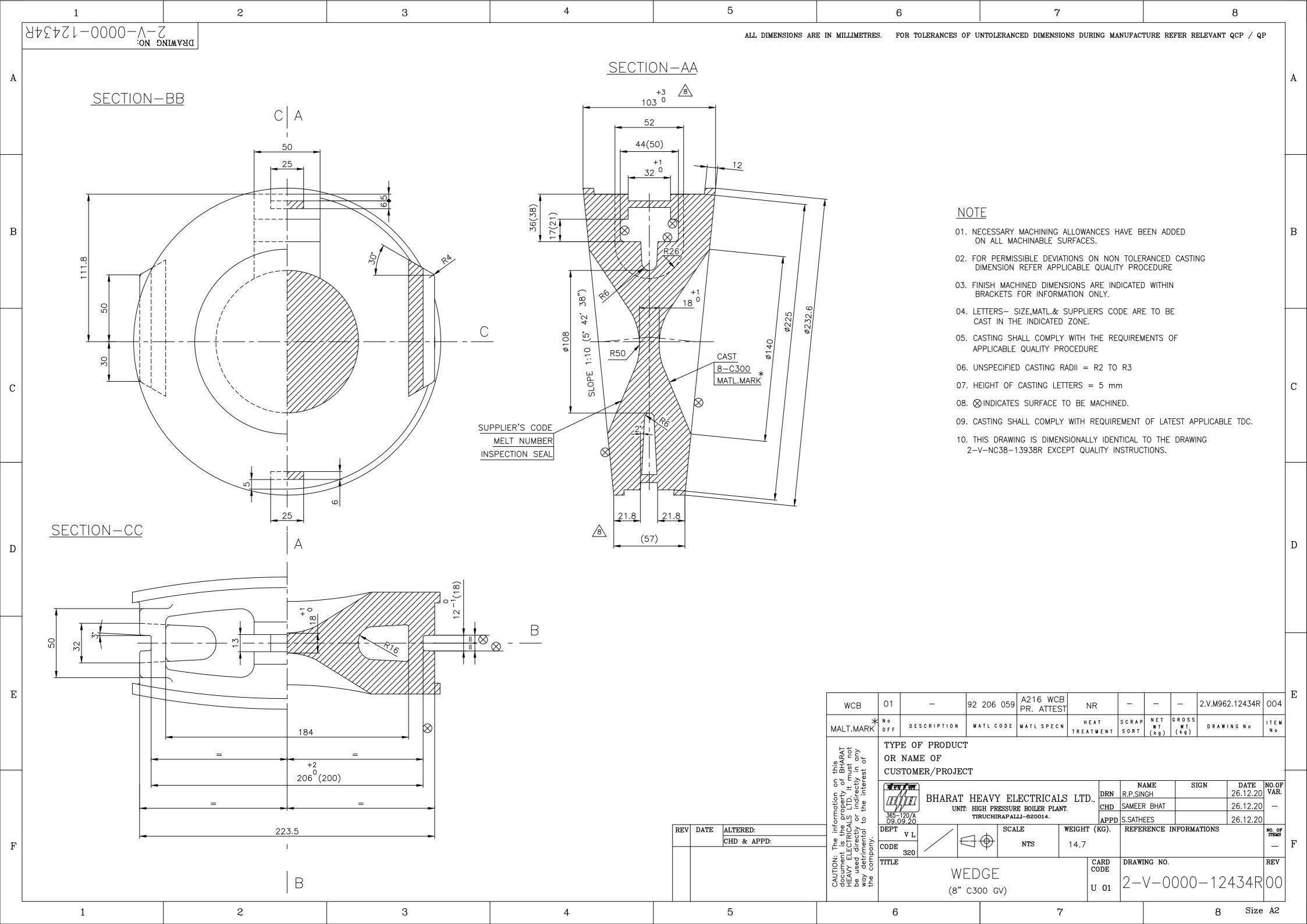


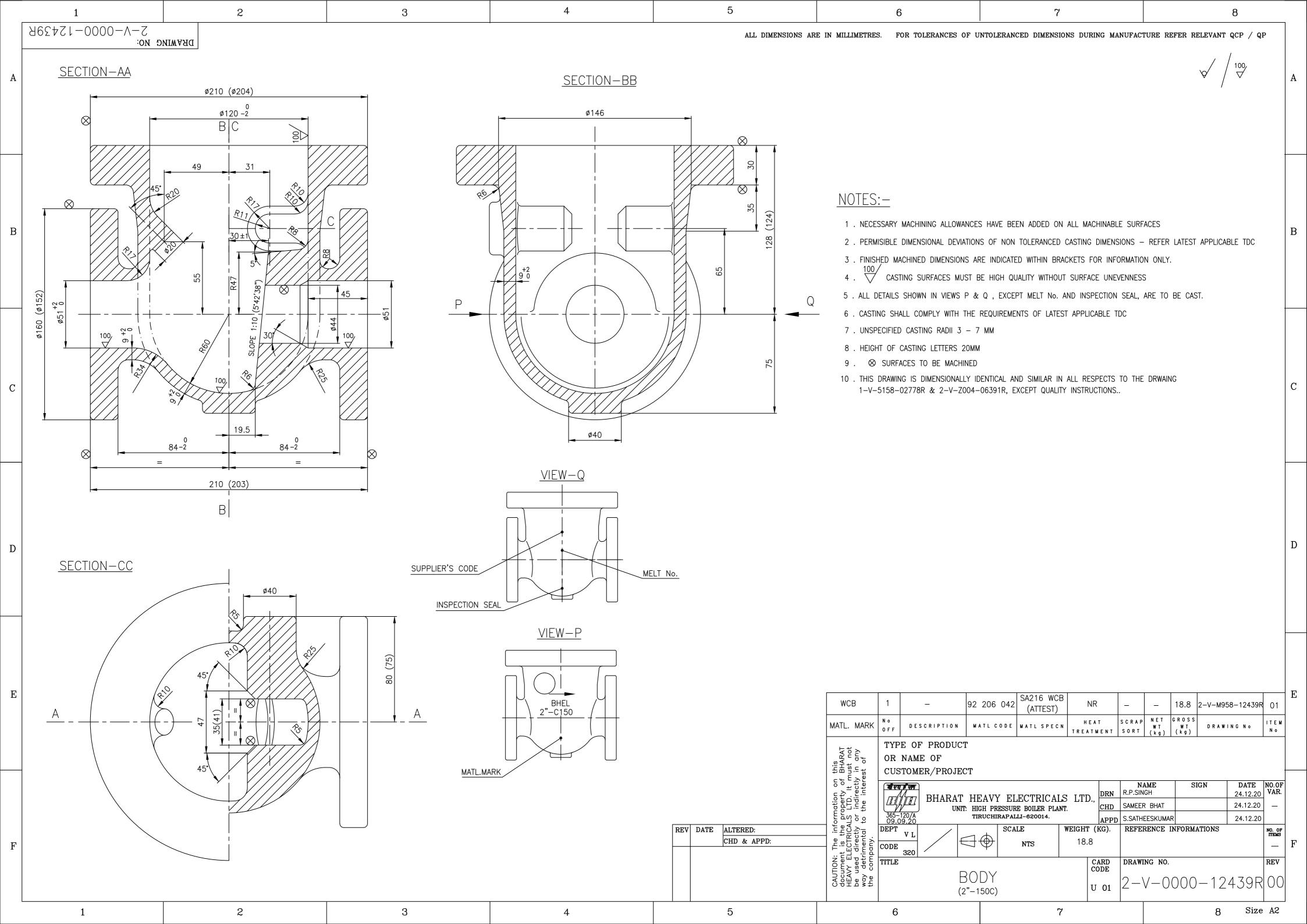


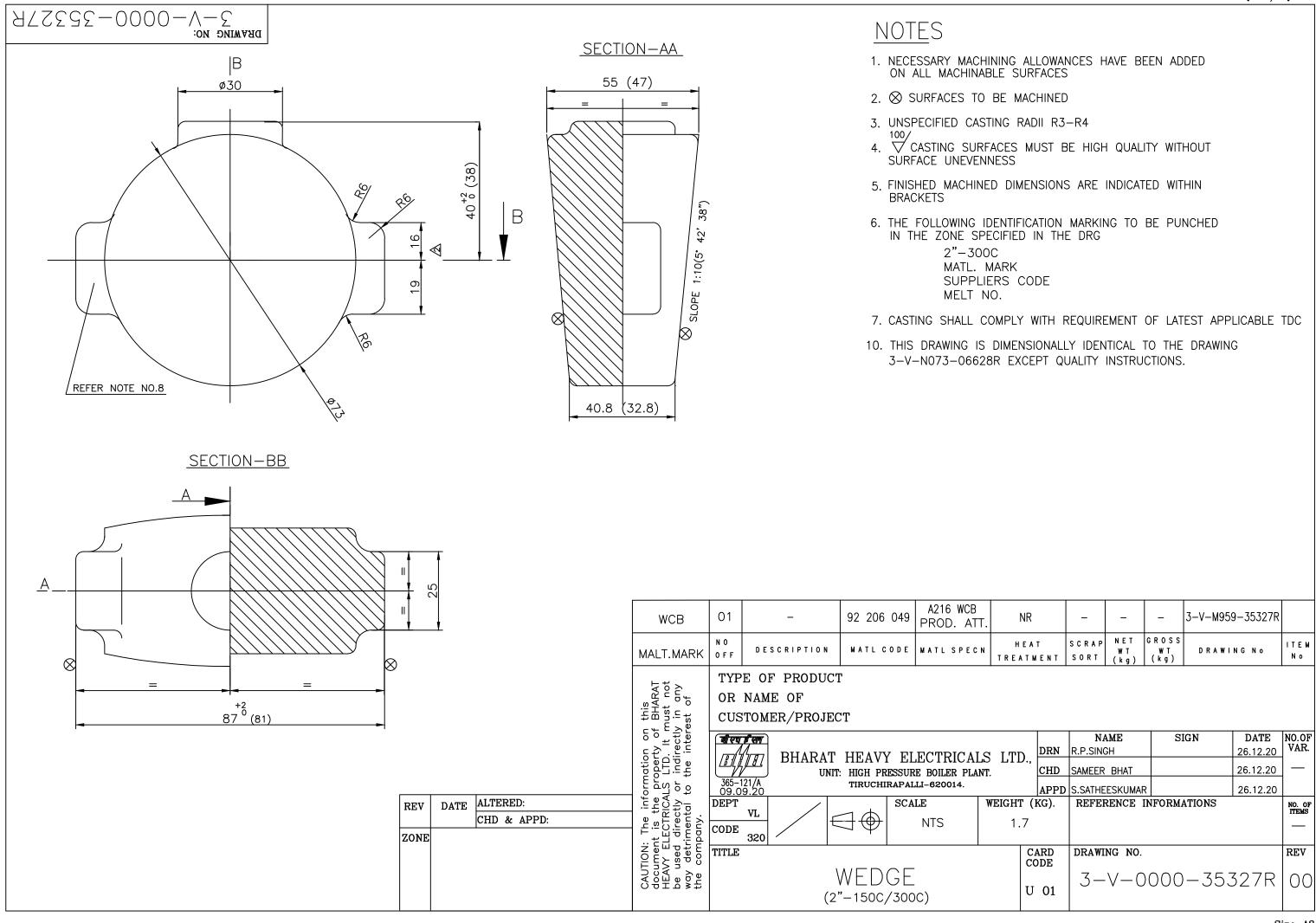












APPD: SSK

**DT**: 18.05.22

ALTD: TS

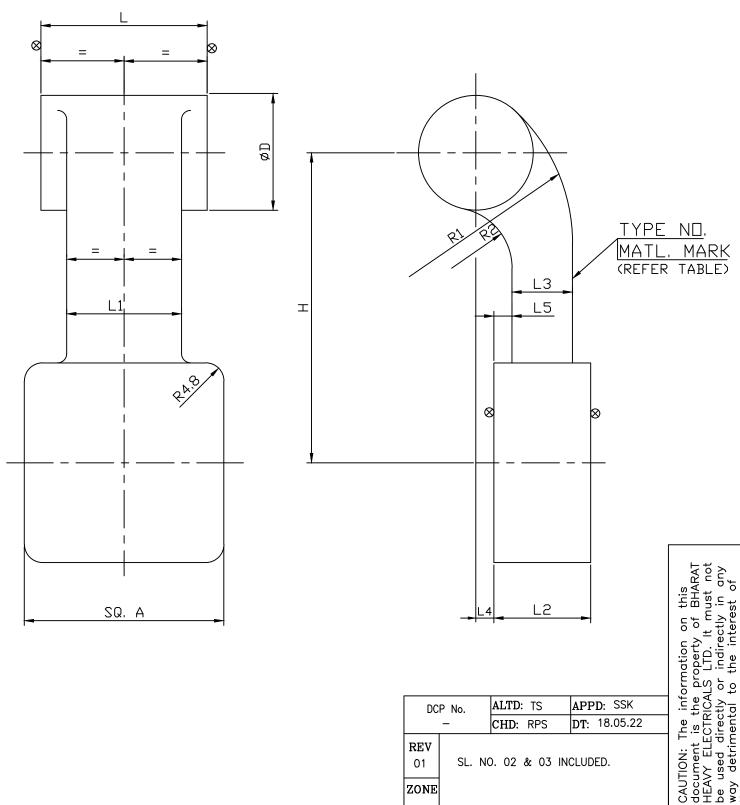
CHD: RPS

SL. NO. 02 & 03 INCLUDED.

DCP No.

REV

01 ZONE



# NOTES:-

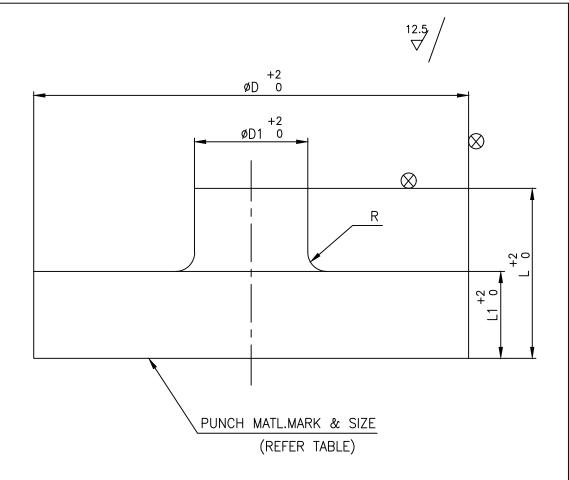
- 1 . NECESSARY MACHINING ALLOWANCES HAVE BEEN ADDED ON ALL MACHINABLE SURFACES.
- 2 . PERMISIBLE DIMENSIONAL DEVIATIONS OF NON TOLERANCED CASTING DIMENSIONS REFER LATEST APPLICABLE QUALITY PROCEDURE.
- 3 . CASTING SHALL COMPLY WITH THE REQUIREMENTS OF LATEST APPLICABLE TDC.
- 4 . UNSPECIFIED CASTING RADII 3 5 MM.
- 5 . HEIGHT OF CASTING LETTERS 5MM.
- 6 . ⊗ SURFACES TO BE MACHINED FURTHER.
- 7 . # MARKED ITEMS IGC TEST SHALL BE CONDUCTED.

N 0 0 F F	DESCRIPTION	MATL CODE	MATL SPECN	H E A T T R E A T M E N T	S C R A P S O R T	NET WT (kg)	GROSS WT (kg)	DRAWING No.	I T E M N o

TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT

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e				. ELECTRICAI ESSURE BOILER PLA			SAMEER BHAT		28.12.20	] —
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SL.No.	DRAWING No.	MATL.SPECN.	WATE.SPECIN.	MATE.SPECIN.	MATL.SPECN.	MATL.CODE.	(kg)	TO BE PUNCHED *	ØD	øD1	L	L1	R	VALVES
01	3-V-M958-35343P/1	SA216 WCB NR, ATTEST	92 206 045	8.4	WCB - 2-C150	210	40	54	30	15	2"-150C FV			
02	3-V-M967-35343P	SA351 CF3M SH, ATTEST	92 206 186	10.11	CF3M - 3-C150	258	40	50	24	15	3"-150C FV			
03	3-V-M968-35343P	SA351 CF3M SH, ATTEST	92 206 187	27.02	CF3M - 6-C150	368	40	62	32	15	6"-150C FV			



# NOTES:-

- 1. CASTING SHALL BE MADE AND PROOF MACHINED TO THE DIMENSION SHOWN IN TABULATION.
- 2. UNSPECIFIED CASTING RADII-R3
- 3. NDICATES THE SURFACES WHICH ARE TO BE MACHINED FURTHER.
- 4. CASTING SHALL COMPLY WITH REQUIREMENT OF LATEST APPLICABLE TDC.

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0 F F	DESCRIPTION	MAIL CODE	MAIL SPECN	TREATMENT	SORT	W T ( k g )	( k g )	COMP. CODE	No

TYPE OF PRODUCT
OR NAME OF
CUSTOMER/PROJECT

	CUSTOM	CUSTOMER/PROJECT									
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### Revisions record:

Rev. 21 – 1) Cl 8 – requirements of test bar added. 2) Cl 7 Table 1 – SV, SRV and QC NRV RT quantum for body casting modified. 3) Isolating valve, product name modified. 4) Cl 8 a) clarity on need for re qualification of castings added. 5) Cl 12 modified to include drawing details, 6) Cl 13.4 A – clarity to submit IBR certificate and MTC added. Rev. 22- Dt: 26/06/2014 1) Cl 7.0 Table 1 –RT area of QCNRV body revised. 2) Cl.8.0 a) Modified. 3) Sketch of Zones of RT –RT zones of SV and SRV base castings modified based on Engineering review.

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Rev. 23 Dt: 06/10/2015: Cl. 2, 4, 5, 6, 7, 8, 13, 15 modified to incorporate API 6D 24<sup>th</sup> Edition requirements.

Rev 24 Dt: 23/12/2015: Cl 1, 2, 3,5, 6, 7, 8, 9, 10, 13, 14 & 15 modified.

Rev: 25 Dt: 11/02/2017: Cl 1 changed to indicate the use of latest revisions of referred codes, standards, specifications, drawings, procedures, etc; Requirements of API 6D removed from Cl 2, 4, 5, 7, 13 & 15 since the API 6D certificate license was not applied for; Definitions for relevant, linear and rounded indications provided in Cl 7; Cl 2 to 10, 12, 13 & 15 revised to bring better clarity; Type 3.2 certification updated as per BS EN 10204-2004 in Cl 13.2.

Rev: 26 : Dt: 21/02/2018 - SA/ASTM A 995 Gr 4A (CD3MN) added in Cl 1 & 5 based on Engineering/Valves input; Creep testing requirements removed and referred to SIP:RM:01.

Rev: 27: Dt: 01/04/2022 - CA15 added in Cl 1; Cl.5a updated; Table 2: Spring loaded Bypass Valves & Knife Edge Gate Valve –NDE requirements added; Cl 7.2 modified to include NDE requirements for machined casting; Cl.13.3 added for Machined castings; Cl.13.4 added for Certification of Product Attest Items; Cl.13.5 added for Certification of Certified Items; Cl.15- updated; Shooting Sketch added for Spring Loaded Bypass Valves.

### 1. MATERIAL SPECIFICATIONS:

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

Carbon Steel (CS) : SA / ASTM A216 WCB, WCC & 352 LCB, LCC

Alloy Steel (AS) : SA / ASTM A217 WC6, WC9, C12A

Stainless Steel (SS) : SA / ASTM A217 CA15

SA / ASTM A351 CF3M, CF8, CF8C & CF8M;

SA / ASTM 995 Gr. 4A(CD3MN)

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

Size, Quantity, Grade/Class: As per Purchase Order & Drawing / Pattern.

### 2. CHEMICAL COMPOSITION AND PROCESS:

a) Melting: As per the Specification, Fully Killed.

Carbon= 0.25% maximum: for SA / ASTM A216 WCB only.

Carbon= 0.15% maximum: for SA / ASTM A217 WC6 & WC9 (For the castings used in QCNRV, CRHNRV, TOA Valves & Conventional valves having contours for welding).

Product Analysis on test bar for each melt including residual elements shall be carried out.

- b) All raw materials used in steel making including incoming scrap shall be checked by supplier to ensure freedom from radioactivity. (Applicable for SS material only)
- Tolerance for chemistry shall be as per the above applicable material specifications/standards specified in Cl 1.

### 3. DIMENSIONS AND TOLERANCES:

Dimensions & their tolerances shall be as per applicable drawings. For untoleranced dimensions: VL: STDC: 023.

### 4. HEAT TREATMENT (HT):

CS – Castings of High Pressure Valve. (*Cl.900*, Cl.1500 & above), QCNRV & CRHNRV: Shall be in Annealed Condition.

AS - Castings: Normalized and Tempered.

Normalizing Temperature: SA/ASTM A217 WC6, WC9: 920-950°C and for C12A: 1050-1080°C. Tempering Temperature: SA/ASTM A217 WC6: 680°C min.; WC9: 720°C min.; C12A: 750-780°C. All other materials: Heat treatment shall be as per the applicable material specification & grade.

### 5. MECHANICAL TESTS:

a) Test bars to be cast integral with the casting or separately. If cast separately, they shall be cast at the same time as the castings and from the same ladle. A metal strip with heat number stamped shall be fused with the test bar during casting, to maintain traceability.



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If one (1) casting is made from more than one heat, separate test bars for each cast to be poured and all test bars shall satisfy the requirements. Tests mentioned in Table 1 shall be conducted per heat *per* Heat treatment batch, as per ASTM A370.

Perform tensile tests at room temperature in accordance with the procedures specified in ASTM A370. Perform a minimum of one tensile test. All yield strengths shall be determined using 0.2 % offset method of ASTM A370. The results of the tensile test(s) shall satisfy the applicable material specification requirements. Hardness testing shall be as per ASTM E10 or E18.

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

Table 1

		MATER	RIAL SPECIFICATIONS			
No	TEST	SA/ASTM A216, 217	SA/ASTM A352	SA/ASTM A351	SA/ASTM A995	
1	Tension Test	As per th	ne Material Spe	cification		
2	Hardness Test	As per the Specification	225 HBW max.	Not applicable	Not Applicable	
3	Bend Test Specimen 1" x ¾ "	Bend   Dia of Angle   Pin	Not applicable	S3 of SA703	Not applicable	
4	Charpy- U Impact for all QCNRV, CRHNRV bodies for IBR.	As per IBR. At Room temperature. Acceptance: Avg /Single=36J/32J min.	Not applicable	Not applicable	Not applicable	
5	Charpy- V Impact for CE Marking- Pressure Equipment Directive (PED) items as Specified in the Purchase Order.	At 20 Deg.C temperature. Acceptance:Avg/Single=40J/2 7J min.	As per Specification	Not applicable	Not applicable	
6	Charpy- V Impact for LPBP bodies	At 20 Deg.C temperature. Acceptance: Avg/Single=27J/21J min.	Not applicable	Not applicable	Not applicable	

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

# 6. FETTLING, DRESSING & CLEANING:

- Dressing of castings-Free from risers, in gates, notches, undercuts, deep marks etc.
- Fused wires, parting line fins, chills etc. shall be removed by grinding.
- Gas cutting if employed shall be done before Heat treatment.
- Preheat the material to 200°C before gas cutting the Alloy steels.
- Castings shall be blast cleaned both inside and outside for the removal of fused sand, scales etc.
- Visual inspection: 100% as per MSS-SP:55. Acceptance: Type 1: none accepted; Type 2-12: A & B only accepted.

### 7. NON DESTRUCTIVE TESTING (NDT) AFTER HEAT TREATMENT

The NDE requirements for the castings shall meet the following as shown in Table-2 below. Castings shall be free from surface and internal defects like porosity, shrinkage, sand inclusion, crack, cold shut and other harmful defects. All castings shall be of Radiographic Quality.



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Radiographic Testing Procedure (RT)
 As per ASME B16.34
 Magnetic Particle Inspection (MPI)
 Liquid Penetrant Inspection (LPI)
 As per ASTM E709
 As per ASTM E165

Table: 2

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	T	T	Tabl				
Product	Components	Characteristics	RT	Type of RT Area	NDE Check RT Acc. Std	MT\$	MT Area
	Body, Bonnet Pr.part yoke, Cover,	< 600 Class	10%#		TIT Acc. Old		WII Alea
Conventional Valves (Gate, Globe &	Body, Bonnet, Cover	600 Class & above	100%	ASME B 16.34 / On critical area as indicated in the Drawing.	As per Table: 3		
Check)	Body, Bonnet, Cover	1500 Class & above All Special	100%	Drawing.		100%	All accessible surfaces including
	Wedge	Class Valves				100%	belly.
Knife Edge Gate Valve	Body	All	LPI sh	all be performed in all r	machined surfa	aces	
Spring Loaded Bypass Valves	Body, Bonnet, Cap	All	100%	Area shown in the sketch (Annexure-1). The areas where RT cannot be carried out MPI shall be done.	As per Table: 3	100%	All accessible surfaces including belly.
Safety Valve	Base	Flanged ends of All Castings	100%	Critical Zones as given in the Drawing/ area	Class 2 of ASTM	100%	All accessible surfaces
·		Weld ends of All Castings	100%	shown in the sketch ( <i>Annexure-1</i> ). The	E446 / E186. For		
	Base		100%	areas where RT	Butt weld		
Safety Relief	Bonnet	All	10%#	cannot be carried out MPI shall be done.	ends as per Table- 3		
Valve	SRV Nozzle	All	100%	All area	Class-2 of ASTM E446 / E186.		
	Body	150 & 300 Class	100%	Butt Weld Ends	As per Table: 3	100%	All accessible surfaces
	Войу	600 Class & above		Critical Zones as given in the			including belly.
QC NRV, CRH NRV	Body (Special)	All	100%	Drawing/ area shown in the sketch (Annexure-1). The areas where RT cannot be carried out MPI shall be done.	As per Table: 3	100%	
Soot Blower Valve	Body	All	10%#	Critical Zones as given in the Drawing/ area shown in the sketch (Annexure-1).The areas where RT cannot be carried out MPI shall be done.	As per Table: 3		1
Isolating Valve/ device	Body	< 600 Class 600 Class & above	100%	Critical Zones as given in the Drawing/ area	As per Table: 3		All accessible surfaces



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		1500 Class & above		shown in the sketch Annexure-1). The areas where RT cannot be carried out MPI shall be done.		100%	including belly.
LP Bypass Valve	Body	All	100%	Critical Zones as given in the Drawing/ area shown in the sketch <i>Annexure-1)</i> . The areas where RT cannot be carried out MPI shall be done.	As per Table: 3		

\$ LPI can be substituted for MPI in all inaccessible area and for stainless steel castings # Refer Cl 7.1

Table:	3
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Type Of	Acceptance	< 600	CLASS	≥ 600 CLASS	
Discontinuity	Level Category	Thickness ≤2"	Thickness >2"	Thickness ≤2"	Thickness >2"
Gas Porosity	Α	A2	A3	A1	A2
Sand/Slag inclusion	В	B3	B3	B2	B2
Shrink Type-1	С	CA2	CA3	CA1	CA2
Shrink Type-2	С	CB3	CB3	CB2	CB2
Shrink Type-3	С	CC3	CC3	CC2	CC2
Crack	D	NONE	NONE	NONE	NONE
Hot Tear	E	NONE	NONE	NONE	NONE
Un-fused Inserts (Chills/Chaplets)	F	NONE	NONE	NONE	NONE

- a. Butt welding ends shall be free of shrinkage, crack & hot tear.
- b. For butt weld ends Gas hole/Porosity and sand inclusions to be within level A1 &B1 respectively

<u>NDE for SS material:</u> Castings shall be checked for radioactive contamination and reported. Survey meter shall be used to measure near the surface. Acceptance limits: Shall be less than 0.1 milli Rontgen (MR) per hour or 1 micro Sievert per hour.

7.1 # 10% Sampling shall be done as follows: (Wherever specified): The vendor shall select 10% of the Casting from the lot consisting of same size and type, (along with melt number / Sl.nos of the castings covered in the lot) for Radiography. A lot to be specified as the total number of castings as above, supplied in 4 months period (Jan-Apr, May-Aug, Sep-Dec). The vendor shall radiograph these specified castings and incorporate the lot size and meltno and Sl.no in the RT reports along with the other Sl.nos of the other castings covered in the lot. If the identified casting is defective then 2 more castings shall be radiographed. If these 2 castings are defect free then the lot is acceptable. If any one of these castings is defective then all the remaining castings shall be radiographed and all defective areas shall be repaired. BHEL will carry out audit on the lots at th vendor works at any time.

### 7.2 a) Raw Casting: Valve Body (Conventional Valves & Spring Loaded Bypass Valves):

Surface NDE (MPI & LPI)-: Testing as per ASME B16.34.

- 1. Relevant indication: Surface-rupture NDE indication with major dimensions > 1.6 mm (1/16 in).
- 2. Linear indication: Surface NDE indication whose length is ≥ three times its width.
- 3. Rounded indication: Surface NDE indication whose length is < three times its width.

### Acceptance for MPI & LPI: As per TOA ST-E 0006 & ST-E-0005

- 4. Cracks are not permitted.
- 5. For linear indications other than cracks, indications must be separated by a distance greater than the length of an acceptable indication. Maximum allowable length of the indication shall be:
  - a) 1.6 mm for thickness upto 16.0 mm
  - b) 3.1 mm for thickness over 16.0 mm and below 50.8 mm

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- c) 4.7 mm for thickness over 50.8 mm
- 6. For rounded indications, 4 or more indications in a line separated by 1.5 mm or less edge to edge are unacceptable. Maximum allowable diameter of the indication shall be:
  - a) 3.1 mm for thickness less than 16.0 mm
  - b) 4.7 mm for thickness 16.0 mm and above
  - c) Four or more indications in a straight line, and the distance between adjacent indications is 1.6mm and less edge to edge
  - d) More than ten indications in the area 38.7 cm<sup>2</sup> selected so as to include as many as possible. However, the longest side of the area should be less than 152.4mm

# b) Raw Casting: Components other than Valve Body(Conventional Valves & Spring Loaded Bypass Valves):

Surface NDE (MPI & LPI)-: Testing and acceptance as per ASME B16.34

- 1. Relevant indication: Surface-rupture NDE indication with major dimensions > 1.6 mm (1/16 in).
- 2. Linear indication: Surface NDE indication whose length is ≥ three times its width.
- 3. Rounded indication: Surface NDE indication whose length is < three times its width. Acceptance for MPI & LPI:
- 4. Cracks are not permitted.
- 5. For linear indications other than cracks, indications must be separated by a distance greater than the length of an acceptable indication. Maximum allowable length of the indication shall be:
  - a) For thickness(t) up to 13mm= 8mm,
  - b) For thickness from 13 to 25mm = 13mm
  - c) For thickness above 25mm=18mm.
- 6. For rounded indications, 4 or more indications in a line separated by 1.5 mm or less edge to edge are unacceptable. Maximum allowable diameter of the indication shall be:
  - a) For thickness up to 13mm =8mm
  - b) For thickness above 13mm =13mm

# c) <u>Machined Casting: Valve Body(Conventional Valves & Spring Loaded Bypass Valves):</u>

Surface NDE (LPI): Testing as per ASME B16.34 on all accessible machined area

Acceptance for LPI: As per TOA ST-E-0005. Following relevant indications are unacceptable.

### 1. Butt Weld ends

- a) Rounded indications of dia > 1.5 mm.
- b) Linear indications of length > 0.5 mm.
- c) Four or more indications in a line separated by 1.5 mm or less edge to edge.
- d) Ten or more acceptable indications in an area of 38.7 cm<sup>2</sup> with one side not exceeding 152.4 mm.

### 2. Self-Sealing Bore Area

- a) Any Linear indication
- b) Rounded indications of dia > 1.5 mm.
- c) Ten or more acceptable indications in an area of 38.7 cm<sup>2</sup> with one side exceeding 25 mm.

### d) Machined Casting: Knife Edge Gate Valve Body:

Surface NDE ( LPI): Testing as per ASME B16.34 on all accessible machined area

Acceptance for LPI: As per TOA ST-E-0005. Following relevant indications are unacceptable.

- a) Rounded indications of dia > 1.5 mm.
- b) Linear indications of length > 0.5 mm.
- e) RT Films shall be reviewed and RT reports shall be verified by BHEL approved TPI. MPI for Special bodies shall be witnessed by BHEL approved TPI

### 8. DEVELOPMENT STAGE OF CASTING:

 During developmental stage, of new castings or change to an existing casting on account of change in dimension which warrants pattern correction, Foundry to ensure, first sample pieces meet dimensional,

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NDE & Quality requiremnets in this TDC, before starting bulk production. Sample castings, 3 castings with nominal bore (NB) ≤ 100mm. & 1 casting with NB > 100 mm for each type shall be inspected for dimension and RT requirements at BHEL/Vendor works by BHEL personnel. One Test bar for each melt/heat treatment batch shall be supplied along with casting for test at BHEL. RT shall be carried out on entire area of the casting to the acceptance requirement of Table-2 & 3. In addition 100% MPI on all critical areas like change of sections, riser & in gate portions shall be carried out. Casting to be inspected for dimensions after proof machining wherever necessary. If machining operation is invloved the same shall be done and defect free condition shall be ensured. If any defect noticed in RT and machining, the type of defect shall be analyzed and accordingly size of gate, runner, riser and pouring methodolgy to be modified to get defect free casting. Sampling shall be continued till achieving sound casting. After satisfactory development of sampling bulk production shall be started. However weld repaired areas identified in visual examination for doubtful indications to be probed by MPI. Accepted sample castings may be considered for fixing the nominal weight of the castings.

- b) During developmental stage RT on sample castings of Yoke, Yoke Clamp & Wedge/Disc shall meet Level-3 of ASTM E446/E186/E280.
- c) Radiography not required after satisfactory development of casting & production based on established method for following parts: SRV Bonnet, Disc Holder, Upper and Lower adjusting rings, Packed cap, Cover Plate, Yoke and SRV guide flanges.

### 9. REPAIR:

Castings with unacceptable cracks, hot tears, shrinkage, etc. to be rectified by grinding & if required by welding. Welding to be done by qualified welder and qualified procedure as per ASME Section IX. For IBR items welders shall be qualified as per IBR.

Guidelines for repair of steel castings shall be as per SIP:VS:17 for activities like defects require/ not require weld repair, welding, Post Weld Heat Treatment, NDE and surface treatment. All repaired areas after PWHT shall be NDE tested and Hardness tested. Hardness shall meet material specification.

For PED (CE-Marking) castings, permanent joining (welding and weld repair) of components must be carried out by suitably qualified personnel according to suitable operating procedures. Also Non-Destructive tests of permanent joints must be carried out by suitable qualified personnel.

The procedures and personnel must be approved by a competent third party which at the manufacturer's discretion, may be - A notified body, - A third party organization recognized by a Member State of European Community.

### 10. SURFACE TREATMENT:

SS castings to be pickled & passivated (after repair & HT if any) as per ASTM A380. Satisfactory passivity of the surface to be checked using SS passivity test kit (Free iron test). After passivation, rinsing & test, the rinsed demineralised water to be checked for chloride with 1% Silver nitride, which shall not exceed 0.5 PPM.

### 11. DIMENSIONAL CHECK:

For all QCNRV & CRHNRV Body Castings: Thickness of the body shall be checked throughout the surface on a grid of 100mm x 100mm and recorded & submitted to BHEL.

### 12. MARKING AND PACKING:

Representation of Marking and identification shall be as per drawing. Also following details to be marked on each casting, on a raised pad using low stress stamps and Castings shall be suitably packed to avoid damage during transit.

1. Foundry code, 2. Material specification, grade & Heat/melt number, 3. Size and 4. Class rating.



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### 13. INSPECTION AND CERTIFICATION:

### 13.1 For Attested Items (As per Engg material code/Drawing): For IBR items,

Products shall be inspected at works and the applicable IBR Form must be countersigned by the Inspecting Authority as indicated below in case the shop/mill/foundry is not recognised as a "Well known Foundry" under IBR:

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

Certification in IBR Form III-F for IBR items from "IBR-Well Known Foundry" or "Inspecting Authority", as applicable, to be submitted. IBR Form III-F & a separate Test certificate of type 3.1 or 3.2 as per BS EN 10204 in English language with following details, shall accompany the product:

- 1. Purchase Order No. (BHEL), TDC No & its revision no, Test certificate no & date.
- 2. Material Specification, Grade & Class with applicable year of code, Heat Number, Quantity & Size
- Steel making process, Chemistry including incidental elements Heat wise, Product analysis, Carbon Equivalent (CE).
- 4. Heat treatment details of the material and test bars.
- 5. Mechanical test results-Tensile (UTS, YTS **(0.2% offset)**, % elongation, % reduction in area), Impact & Hardness and NDE test results with reference & acceptance standard.
- 6. Repair details including HT, if any, Cleaning & Surface treatment details.
- 7. Any other information like clearance of sample casting.
- 8. Dimensional Inspection Report, where applicable.
- For SS: Measured Radioactivity levels at 5cm from the surface of the castings shall be reported in the Test Certificate stating the measured value at the specified distance (not to be recorded in IBR Form).
- 10. Creep test report as per the format suggested in Cl 5 of this TDC (applicable only for IBR application).
- 13.2 For PED 2014/68/EU (CE-marking), test certificates of type 3.1 or 3.2, with details specified in Cl 13.1 for separate test certificate, shall be submitted as per BS EN 10204.
  - □ Type 3.1 Suppliers shall have ISO 9001:2015 certification certified by Notified Body recognized by European community and test certificate certified by suppliers authorized inspection representative.
  - □ Type 3.2 Components inspected and test certificates certified by both the supplier's authorized inspection representative and Notified Body recognized by European community.
- 13.3 **Machined Casting:** In addtion to Cl.13.1 (or) Cl.13.2, as applicable, the following test reports shall be furnished.
  - 1. Dimensional Report
  - 2. LPI Report Signed by NDE Level II qualified Personnel

### 13.4 For Product Attested Items (as per Engg material code/Drawing):

All tests specified have to be carried out by foundry and test results to be furnished in the test certificate of type 3.1 or 3.2 as per BS EN 10204 and shall contain the following information in English language only:

- 1. Purchase Order No. (BHEL). TDC No & its revision no. Test certificate no & date.
- 2. Material Specification, Grade & Class with applicable year of code, Heat Number, Quantity & Size
- 3. Steel making process, Chemistry including incidental elements Heat wise, Product analysis, Carbon Equivalent (CE).
- 4. Heat treatment details of the material and test bars.
- 5. Mechanical test results-Tensile (UTS, YTS (0.2% offset), % elongation, % reduction in area), Impact & Hardness and NDE test results with reference & acceptance standard.
- 6. Repair details including HT, if any, Cleaning & Surface treatment details.
- 7. Any other information like clearance of sample casting.
- 8. Dimensional Inspection Report, where applicable.
- 9. For SS: Measured Radioactivity levels at 5cm from the surface of the castings shall be reported in the Test Certificate stating the measured value at the specified distance.

RY CONDITIONS Page: 8 of 11

DOC No: **TDC:0:412** Rev: *27* 

Effective Date: *01/04/2022* 

Product: Steel Castings for Boilers & Valves

### 13.5 For Certified Items (as per Engg material code/Drawing):

In addition to Cl.8 requirements, all tests specified in the material specification have to be carried out by foundry and test results to be furnished in the test certificate of type 3.1 as per BS EN 10204 and information in English language only

### 14. AUDIT CHECKS AT BHEL:

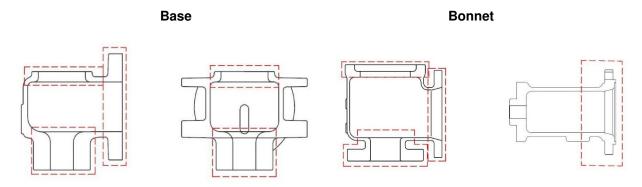
BHEL reserves the right to carry out audit checks for chemistry, HT condition, mechanical test and NDT on representative test bars or job. Items found defective during check or subsequent processing at BHEL will be rejected.

### 15. END USE:

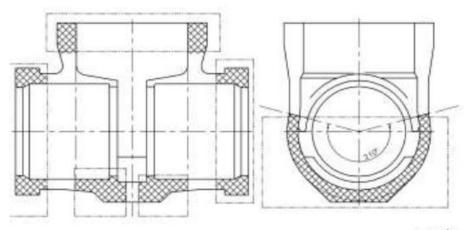
For use in valves and other components like flanges, fittings etc. for high temperature & high pressure applications meeting IBR, ASME Section I, ASME VIII Div 1, ASME B16.34 and PED 2014/68/EU (CEmarking).

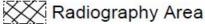
### Annexure-1: Sketch of zones for RT

### SV and SRV Base castings



### Reheater Isolating Device Body

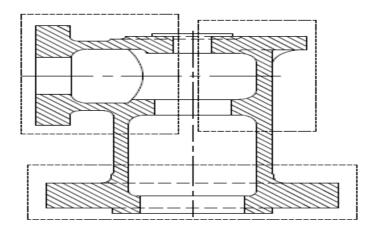




DOC No: **TDC:0:412** Rev: *27* Effective Date: *01/04/2022* 

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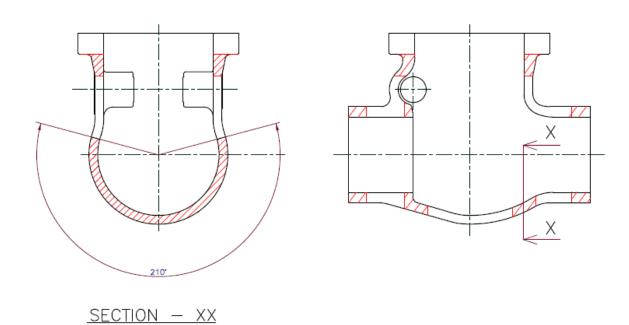
# **Soot Blower Valve Body**



PART CODES : 920243870000, 920131810000, 920243870100, 920131810100 LRD IE, LRD IE & WB IE - 2.5" 600#

- RADIOGRAPHY AREA

# **Quick Closing Non Return Valve Body**



RADIOGRAPHY REQUIREMENT

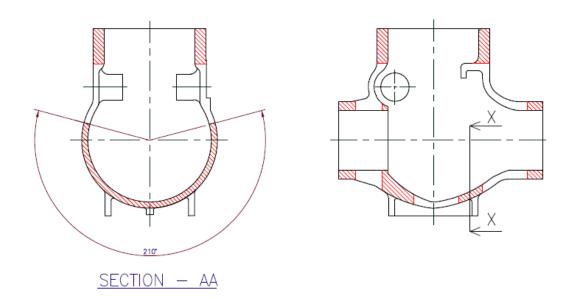


BHEL – Tiruchirappalli - 620014, India. Quality Assurance Department

TECHNICAL DELIVERY CONDITIONS

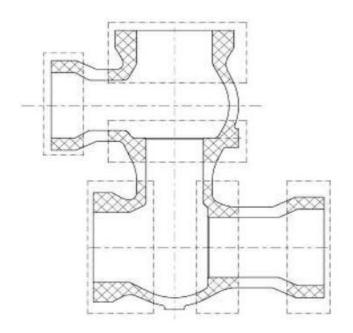
Product: Steel Castings for Boilers & Valves

# Cold Reheat Non Return Valve Body



# RADIOGRAPHY REQUIREMENT

# **LP Bypass Stop cum Control Valve Body**





DOC No: **TDC:0:412** Rev: *27* 

Effective Date: *01/04/2022* 

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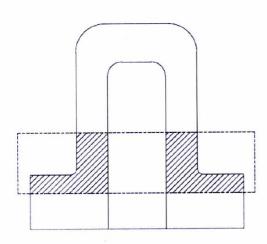
DOC No: **TDC:0:412** Rev: *27* Effective Date: *01/04/2022* 

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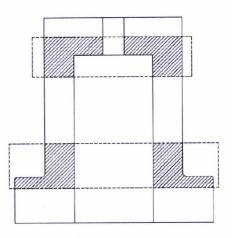
Product: Steel Castings for Boilers & Valves

# Spring Loaded Bypass Valve

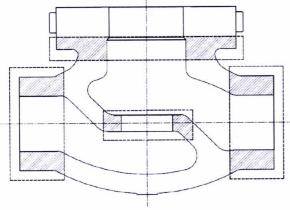




**Bonnet** 









Prepared By		Reviewed By		Approved By
Manager/QA	DGM/Valves/Engg	SDGM/QA	AGM/Valves/Purchase	AGM/QA
N Nagamuthu Pandian	K. Rajasekaran	S. Lakshmi	Ajay Kumar Gupta	J.V.V. Aruna Kuntar
30   03   2022	th 130/3/22	5. Lakshy- 30/3/22	13013/22	3 33/20



# न्यूक्लियर पावर कॉर्पोरेशन ऑफ इंडिया लिमिटेड (भारत सरकार का उद्यम) NUCLEAR POWER CORPORATION OF INDIA LTD.

(A Government of India Enterprise) गुणवत्ता आश्वासन निदेशालय

**Directorate of Quality Assurance** नाभिकीय ऊर्जा भवन, अणुशक्तिनगर, मुंबई - 400 094

Nabhikiya Urja Bhavan, Anushaktinagar, Mumbai - 400 094.

Tel: 022 25993100

Fax: 022 25993150



Ref: NPCIL/QAD/Appr.Labs/2015/M/ 9

January 16, 2015.

# Sub: Display of list of approved test laboratories in Mumbai.

Enclosed herewith please find Annexure-I, the updated list of approved test laboratories in Mumbai for the purpose of testing of materials. The approved list of labs at Mumbai is displayed on QA Directorate Intranet web page for information to all concerned.

Group Head(QMS) & MR

Encl: Annexure-I

ED (QA) & Chief Executive ..... For approval

Approved 16.1.2015

# List of approved laboratories in Mumbai for carrying out testing of materials

No.	Laboratory & address	Phone No.		Approved for	
1-A	Elca Laboratories, Plot No. A-444, Road No. 37 (Off Road No. 28), Near Rubber Products,	25824499 25822047 25823142 25833410	1.0 Physical Testing 1.1 Tensile testing at room temp with extensometer.	2.0 Chemical Testing 2.1 Wet analysis 2.2 Spectrometer analysis	3.0 Corrosion Test & Micro Examination 3.1 IGC practice A & E, Micro, Macro
	Wagle Estate, Thane 400 604.	Fax No. 25825394 E mail-info@elcalabs.com www.elcalabs.com	1.2 Hardness test (Brinell, Vickers, Rockwell, Microhardness 50 to 1000 gm 1.3 Bend test, Flattening, Flaring, Proof load for nuts, Pull out load, Fillet test.		3.2 Mass of zinc coating
1-B	Elca Laboratories, Unit-II, W-361, TTC Industrial Area, MIDC, Rabale, Navi Mumbi- 400701	25824499 25822047 25823142 25833410 Fax No. 25825394 E mail- rabale@elcalabs.com	1.0 Physical Testing 1.1 Tensile testing at room temp with extensometer 1.2 Impact testing 1.3 Hardness test (Brinell, Vickess, Rockwell, Microhardness. 1.4 Bend test, Flattening, Flaring, Proof load for nuts, Pull out load. Fillet test.	2.0 Chemical Testing 2.1 Spectrometer analysis	3.0 Corrosion Test & Micro Examination 3.1 IGC practice A

		*
	'n	i
	Jewel Metallochem, A/118, Ghatkopar Industrial Estate, L.B.S. Marg, Ghatkopar, Mumbai-400 086.	Pvt.Ltd.,36/37, Raja Industrial Estate, Mulund (West), Mumbai-400 080.
into@jeweimetallochem.com  jewelmetal@rediffmail.com  www.jewelmetallochem.com	25007745 25007724 25008988 Fax No. 25001263 E mail-	67974999 Fax no 67974616 Email- laboratory@geochemgroup. com
ASTM E-23 Standard.  1.3 Hardness test (Brinell, Vickers, Rockwell, Microhardness 50 to 100 grams.  1.4 Bend test, Flattening, Flaring, Proof load, Pull out load, Butt weld Fillet test, Reverse bend test	1.0 Physical Testing 1.1 Tensile testing at room temp with extensometer. 1.2 Impact test as per	1.0 Physical Testing 1.1 Tensile testing at room temp with extensometer. 1.2 Hardness test (Brinell, Vickers, Rockwell) 1.3 Bend Test, Flattening, Flarring, Proof Load for nuts
	2.0 Chemical Testing 2.1 Wet analysis 2.1 Spectrometer analysis	2.0 Chemical Testing 2.1 Wet analysis 2.1 Spectrometer analysis
depth measurement. 3.2 Mass of zinc coating	3.0 Corrosion Test & Micro Examination 3.1 IGC practice A &E, Micro, Macro, Inclusion rating Con-	3.0 Corrosion Test & Micro Examination 3.1 IGC practice A &E, Case depth Measurement, Micro, Macro 3.2 Mass of zinc coating

	4
T.C.R. Engg. Services, Plot No.EL-182,MIDC- TTC, Electronic Zone, Mahape. Navi-Mumbai-400 705	Metallurgical Services, Mehta House, Ashok Silk Mills Lane, L.B.S. Marg, Ghatkopar, Mumbai-400 086.
27610921 27610923 27612324 27612044 Fax no 2761 2044 Email- <u>sales@tcreng.com</u>	25000240 25000241 25001107 Fax No. 25001740 E mail- info@metallurgicallab.com metallurgicalservices@gmail .com www.metallurgicallab.com
1.0 Physical Testing 1.1 Tensile testing at room temp with extensometer. 1.2 Impact test as per ASTM E-23 Standard. 1.3 Hardness test (Brinell, Vickers, Rockwell, Microhardness upto 100 grams. 1.4 Bend test, Flattening, Flaring, Proof load, Pull out load, Butt weld ,Fillet test, Reverse bend test	1.0 Physicaf Testing 1.1 Tensile testing at room & elevated temp with extensometer. 1.2 Impact test as per ASTM E-23 Standard. 1.3 Hardness test (Brinell, Vickers, Rockwell, Microhardness 50 to 1000 gm 1.4 Bend test, Flattening, Flaring, Proof load, Pull out load, Butt weld Fillet test, Creep test, Fracture toughness and stress rupture test, Reverse bend test, Fatigue test
2.0 Chemical Testing 2.1 Wet analysis 2.2 Spectrometer analysis	2.0 Chemical Testing 2.1 Wet analysis 2.1 Spectrometer analysis
Micro Examination 3.1 IGC practice A &E, Micro, Macro, Inclusion rating, Case depth Measurement, ferrite content measurement 3.2 Mass of zinc coating	Micro Examination 3.1 IGC practice A &E, Micro, Macro, Inclusion rating, Case depth measurement, ferrite content measurement 3.2 Mass of zinc coating

		Fillet test			
3.0 Corrosion Test & Micro Examination 3.1 IGC practice A & E	<ul><li>2.0 Chemical Testing</li><li>2.1 Wet analysis</li><li>2.2 Spectrometer analysis</li></ul>	1.0 Physical Testing 1.1 Tensile testing at room temp with extensometer. 1.2 Impact test as per ASTM E-23 Standard. 1.3 Hardness test (Brinell, Vickers, Rockwell) 1.4 Bend test, Flattening, Flaring, Proof load, Pull out load, Butt weld	upto 41411499 Fax: 022 27633982 /25560401	Ltd., wane, ad,	
		1.3 Bend test, Flattening, Flaring, Proof load, Pull out load, Butt weld Fillet test.		Offichore Testing &	
3.0 Corrosion Test & Micro Examination 3.1 IGC practice A &E, Micro, Macro, Inclusion rating, 3.2 Mass of zinc coating	2.0 Chemical Testing 2.1 Spectrometer analysis	1.0 Physical Testing 1.1 Tensile testing at room temp with extensometer. 1.2 Hardness test (Brinell, Vickers, Rockwell, Microhardness up to 1 Kg	27690817 27697312 30989715 Fax no 27690817 Email- sudhakar@subodhlabs.com	R-874, M.I.D.C.,Rabale. Navi-Mumbai- 400701	
		Microhardness upto 100 grams.  1.3 Bend test, Flattening, Flaring, Proof load, Pull out load, Butt weld Fillet test, Reverse bend test	J. C. Control of the Principle of the Pr		
3.0 Corrosion Test & Micro Examination 3.1 IGC practice A &E, Micro, Macro 3.2 Mass of zinc coating	<ul><li>2.0 Chemical Testing</li><li>2.1 Wet analysis</li><li>2.2 Spectrometer</li><li>analysis</li></ul>	1.0 Physical Testing 1.1 Tensile testing at room temp with extensometer. 1.2 Hardness test (Brinell,	24131160 24130813 24148369 Fax No. 66624514 E mail-	(P) Ltd., 219, Bussa Udyog Bhavan, Tokersey Jivraj Road, Sewree, Mumbai 400 015.	

	9
B33/35, Amargian Industrial Estate, Pokhran Road No.1, Khopoli, Thane (W), Maharashtra.	Reliable Testing Services Unit Number 59,Bindal Indl.Estate,Kurla Andheri Road, Sakinaka, Mumbai-400 072  M/s. Soham Analytical Services, A-121/101,
Email: lab_support@sohmanalyti cal.com	28516406 66760131 9833901629 9833901630 Fax No. 42154942 E mail- reliable1983@rediffmail.co m www.reliabletestingservices. com Tel. 022-25471297/93/94 Fax: 022 25471295
room temp with extensometer. 1.2 Impact test as per ASTM E-23 Standard. 1.3 Hardness test (Brinell, Vickess, Rockwell, Microhardness 1.4 Bend test, Flattening, Flaring, Proof load, Pull out load, Butt weld, Fillet test, Reverse bend test, Through thickness tensile test, Nick break test (pipes), Compression test	1.0 Physical Testing at room temp with extensometer.  1.1 Tensile testing at room temp with extensometer.
2.2 Spectrometer analysis	2.0 Chemical Testing 2.1 Spectrometer analysis  2.0 Chemical Testing 2.1 Wet analysis
E, Micro, Macro, Inclusion rating, Case depth Measurement, Ferrite content 3.2 Mass of zinc coating 3.3 Hydrogen Induced corrosion test, Ferrite Chloride pitting & crevice corrosion test	3.0 Corrosion Test & Micro Examination 3.1 Mass of zinc coating 3.2 IGC practice A &E 3.0 Corrosion Test & Micro Examination

Date: 16/1/15

(R.B.BHARDWAJ)
GROUP HEAD(QMS)&MR

# **Annexure- I**

Sr.	QA unit	Test Lab.	Suitable for material testing		
No.			Physical	Chemical	Micro
1	Noida	M/s R.K. Inspection & Testing Services C-42, Manak Vihar Ext.(Tihar), Subhash Nagar, New Delhi-110018. Phone no. 011 -28122201 Fax No. 011-25122517 E mail-info@rkits.co.in	1.0 Physical Testing  1.1 Tensile testing at room temp. with extensometer  1.2 Impact testing as per ASTM E-23 standard  1.3 Hardness test (Brinell, Vickess, Rockwell, Microhardness up to 1000 grams)  1.4 Bend test, Flattening, Flaring, Proof load, Pull out load, Fillet test.	2.0 Chemical Testing - *2.1 Spectrometer analysis	3.0 Corrosion Test & Micro Examination  3.1 IGC practice A &E, Micro, Macro, Inclusion rating, Case depth measurement.
2	Noida	M/s SPECTRO E-41, Okhla Indl. Area, Phase-II, New Delhi-110020 Phone no. 011 -40522000 Fax No. 011-40503150 E mail-kd@spectro.in	1.0 Physical Testing  1.1 Tensile testing at room temp.  1.2 Tensile testing at elevated temp. subject to availability of extensometer for 0.2% yield stress measurement.  1.3 Impact testing testing as per ASTM E-23 standard  1.4 Hardness test (Brinell, Vickess, Rockwell, Microhardness up to 1000 grams)  1.5 Bend test, Flattening, Flaring, Proof load, Pull out load, Fillet test.	2.0 Chemical Testing 2.1 Wet Analysis 2.2 Spectrometer analysis	3.0 Corrosion Test & Micro Examination  3.1 IGC practice A &E, Micro, Macro, Inclusion rating, Case depth measurement.  3.2 Mass of zinc coating  3.3 Paint thickness mesurement

3	Noida	M/s IRC Engg. Services.India (P) Ltd. A-53,Sector-63, Noida, District: G.B.Nagar Phone no. 0120 -3352706 Fax No. 0120-4227940 E mail-	*1.1 Tensile testing at room & elevated temp subject to availability of extensometer for 0.2% yield stress measurement.  1.2 Impact testing as per ASTM-E-23 standard  1.3 Hardness test (Brinell, Vickess, Rockwell, Microhardness up to 1000 grams)  1.4 Bend test, Flattening, Flaring, Proof load, Creep test, Stress rupture test, Pull out load, Fillet test.	2.0 Chemical Testing - ** 2.1 Spectrometer analysis	3.0 Corrosion Test & Micro Examination  3.1 IGC practice A &E, Micro, Macro, Inclusion rating, Case depth measurement.
4	Noida	M/s Inspection & Testing Engg., D-155,Sector-49. Noida, District :G.B.Nagar (UP), Pin-201 307 Phone no. 0120 -2500065 Fax No. 0120-4310675 E mail-	1.0 Physical Testing  1.1 Hardness test (Brinell, Vickess, Rockwell, Microhardness up to 1000 grams)  1.2 Bend test, Flattening	* 2.1 Spectrometer analysis	3.0 Corrosion Test & Micro Examination - Nil

5	Kolkata	M/s Metals& Minerals Testing Laboratories 30/A, Naraasingha Dutta Road, Howrah-711101 Kolkata-26 Phone no. 033 26673185 Fax No. 033 26779422 E mail-	<ol> <li>1. 0 Physical Testing</li> <li>1.1 Tensile testing at room temp with extensometer.</li> <li>1.2 Hardness test (Brinell, Vickess, Rockwell, Microhardness)</li> <li>1.3 Bend test, Flattening, Flaring, Proof load, Pull out load, Butt &amp; Fillet test.</li> </ol>	* 2.1 Spectrometer analysis	3.0 Corrosion Test & Micro Examination  3.1 IGC practice A , Micro, Macro, Inclusion rating, Case depth measurement.  3.2 Mass of zinc coating  3.3 Paint thickness measurement
6	Kolkata	M/s Aglow Quality Control Laboratories Pvt.Ltd. P 47,Kasba Industrial Estate,Kolkatta-107 Phone no. 033 40089633 Fax No. 033 40625177 E mail-	1.0 Physical Testing  1.1 For Rubber Testing: Tensile, Hardness, elongation, adhesion, Tension & compression, abrasion, flexing, load deflection, hydro testing, aging.	2.0 Chemical Testing  2.1 For Rubber Testing: Rubber polymer content, hydrocarbon Content, neoprene rubber, identification of rubber, resistance to oil, density, analysis of ash.  2.2 Painting related tests(Abrasion, cohesion, adhesion, impact resistance, % elongation, etc.)	3.0 Corrosion Test & Micro Examination 3.1 Not Application

7	Kolkata	M/s ID & RL Pvt. Ltd. 33/2A,atish Mukherjee Road, Kolkatta-26 Phone no. 033 24644527 Fax No. 033 24644812 E mail-	1. 0 Physical Testing  1.1 Tensile testing at room temp with extensometer.  1.2 Hardness test (Brinell, Vickess, Rockwell, Microhardness up to 1000 grams)  1.3 Bend test, Flattening, Flaring, Proof load, Pull out load, Butt & Fillet test.	<ul><li>2.0 Chemical Testing</li><li>2.1 Wet Analysis</li><li>* 2.2 Spectrometer analysis</li></ul>	3.0 Corrosion Test & Micro Examination  3.1 IGC practice A &E, Micro, Macro, Inclusion rating, Case depth measurement.  3.2 Mass of zinc coating  3.3 Paint thickness measurement
8	Kolkata	M/s Inspection Survey & Surveillance (India) Pvt. Ltd. 26D/27,Park Lane, Kolkatta-16 Phone no. 033 65454984 Fax No. 033 22297658 E mailinsurveylab@yahoo.com	1.0 Physical Testing  1.1 Tensile testing at room temp with extensometer.  1.2 Hardness test (Brinell, Vickess, Rockwell, Microhardness up to 1000 grams)  1.3 Bend test, Flattening, Flaring, Proof load, Pull out load, Butt weld Fillet test.,	* 2.1 Spectrometer analysis	3.0 Corrosion Test & Micro Examination  3.1 IGC practice A &E, Micro, Macro, Inclusion rating, Case depth measurement.  3.2 Mass of zinc coating  3.3 Paint thickness measurement
9	Kolkata	M/s TREATS, 14,Ramnath Pal Road, Kidderpore Kolkata-23 Phone no. 033 24584142 Fax No. 033 2495818 E mail-	1.0 Physical Testing  1.1 Tensile testing at room temp with extensometer.  1.2 Hardness test (Brinell, Rockwell, Microhardness up to 1000 grams)	<ul><li>2.0 Chemical Testing</li><li>2.1 Wet analysis</li><li>* 2.2 Spectrometer analysis.</li></ul>	3.0 Corrosion Test & Micro Examination  3.1 IGC practice A &E, Micro, Macro, Inclusion rating, Case depth measurement.

			1.3 Bend test, Flattening, Flaring, Proof load, Pull out load, Butt weld Fillet test.		3.2 Mass of zinc coating 3.3 Paint thickness measurement
10	Mumbai	M/s. TCR Engg. Services Pvt.Ltd., EL-182,TTC Ind.Area,Mahape, Vashi, Navi-Mumbai - 400 705, (India). Phone no- 27610921/22/23 Fax no 2761 2044 Email- sales@tcreng.com	1.0 Physical Testing  1.1 Tensile testing at room temp with extensometer.  1.2 Impact test as per ASTM E-23 Standard.  1.3 Hardness test (Brinell, Vickess, Rockwell, Microhardness upto 1000 grams.  1.4 Bend test, Flattening, Flaring, Proof load, Pull out load, Butt weld ,Fillet test, Reverse bend test	2.0 Chemical Testing 2.1 Wet analysis * 2.2 Spectrometer analysis	3.0 Corrosion Test & Micro Examination  3.1 IGC practice A &E, Micro, Macro, Inclusion rating, Case depth Measurement, ferrite content measurement  3.2 Mass of zinc coating
11	Mumbai	M/s. Subodh Technologiests R-874, M.I.D.C.,Rabale , Navi Mumbai - 400 701. Phone no- 27690817 Fax no 27690817 Email- sudhakar@subodhlabs.com	1.0 Physical Testing  1.1 Tensile testing at room temp with extensometer.  1.2 Hardness test (Brinell, Vickess, Rockwell, Microhardness up to 1000 grams  1.3 Bend test, Flattening, Flaring, Proof load, Pull out load, Butt weld Fillet test.	* 2.1 Spectrometer analysis	3.0 Corrosion Test & Micro Examination  3.1 IGC practice A &E, Micro, Macro, Inclusion rating,  3.2 Mass of zinc coating
12	Mumbai	M/s Geo Chem Laboratories Pvt Ltd., (Mumbai) 36, Raja Industrial Estate, Purushottam Kheraj Marg, Mulund (W), Mumbai 400 080. Phone no- 67974999 Fax no 67974616 Email-	1.0 Physical Testing  1.1 Tensile testing at room temp with extensometer.  1.2 Hardness test (Brinell, Vickess, Rockwell)  1.3 Bend Test, Flattening, Flarring,	<ul><li>2.0 Chemical Testing</li><li>2.1 Wet analysis</li><li>* 2.2 Spectrometer analysis</li></ul>	3.0 Corrosion Test & Micro Examination  3.1 IGC practice A &E, Case depth Measurement, Micro, Macro  3.2 Mass of zinc coating

		laboratory@geochemgroup.com	Proof Load for nuts		
13	Mumbai	M/s. Jewel Metallochem Laboratory Pvt. Ltd., A-12, Ghatkopar Indl. Estate, Ghatkopar (W), Mumbai 400 086. Phone no. 25007745 Fax No. 25001263 E mail- info@jewelmetallochem.co m jewelmetal@rediffmail.com www.jewelmetallochem.co m	1.0 Physical Testing  1.1 Tensile testing at room temp with extensometer.  1.2 Impact test as per ASTM E-23 Standard.  1.3 Hardness test (Brinell, Vickers, Rockwell, Microhardness 50 to 1000 grams.  1.4 Bend test, Flattening, Flaring, Proof load, Pull out load, Butt weld Fillet test, Reverse bend test	2.0 Chemical Testing 2.1 Wet analysis * 2.2 Spectrometer analysis	3.0 Corrosion Test & Micro Examination  3.1 IGC practice A &E, Micro, Macro, Inclusion rating, Case depth measurement.  3.2 Mass of zinc coating
14	Mumbai	M/s. Metallurgical Services, Mehta House, Ashok Silk Mills Lane, L.B.S. Marg, Ghatkopar (W), Mumbai 400 086. Phone no. 25000240 Fax No. 25001740 E mail- info@metallurgicallab.com metallurgicalservices@gmai l.com www.metallurgicallab.com	1.0 Physical Testing  1.1 Tensile testing at room & elevated temp with extensometer.  1.2 Impact test as per ASTM E-23 Standard.  1.3 Hardness test (Brinell, Vickess, Rockwell, Microhardness 50 to 1000 gm  1.4 Bend test, Flattening, Flaring, Proof load, Pull out load, Butt weld Fillet test, Creep test, Fracture toughness and stress rupture test, Reverse bend test, Fatigue test	2.0 Chemical Testing  2.1 Wet analysis  * 2.2 Spectrometer analysis	3.0 Corrosion Test & Micro Examination  3.1 IGC practice A &E, Micro, Macro, Inclusion rating, Case depth measurement, ferrite content measurement  3.2 Mass of zinc coating

15-A	Mumbai	M/s Elca Laboratories Plot No.A-444, Road No.37, (Off Road No.28) Near Rubber Products, Wagle Estate, Thane – 400 094. Phone no. 25824499 Fax No. 25825394 E mail-info@elcalabs.com www.elcalabs.com	1.0 Physical Testing  1.1 Tensile testing at room temp with extensometer.  1.2 Hardness test (Brinell, Vickess, Rockwell, Microhardness 50 to 1000 grams.  1.3 Bend test, Flattening, Flaring, Proof load for nuts, Pull out load, Fillet test.	2.0 Chemical Testing 2.1 Wet analysis * 2.2 Spectrometer analysis	3.0 Corrosion Test & Micro Examination  3.1 IGC practice A & E, Micro, Macro  3.2 Mass of zinc coating
15-B	Mumbai	Elca Laboratories, Unit-II, W-361, TTC Industrial Area, MIDC, Rabale, Navi Mumbi- 400701 25824499 25822047 25823142 25833410 Fax No. 25825394 E mail- rabale@elcalabs.com	1.0 Physical Testing  1.1 Tensile testing at room temp with extensometer  1.2 Impact testing  1.3 Hardness test (Brinell, Vickess, Rockwell, Microhardness.  1.4 Bend test, Flattening, Flaring, Proof load for nuts, Pull out load, Fillet test.	2.0 Chemical Testing 2.1 Spectrometer analysis	3.0 Corrosion Test & Micro Examination  3.1 IGC practice A
16	Mumbai	M/s Metal Analysis & Services Pvt.Ltd., 219, Bussa Udyog Bhavan, Tokersey Jivraj Road, Sewree (W), Mumbai 400 015. Phone no. 24131160 Fax No. 66624514 E mailhmj@bom7.vsnl.net.in	1.0 Physical Testing  1.1 Tensile testing at room temp with extensometer.  1.2 Hardness test (Brinell, Vickess, Rockwell, Microhardness upto 1000 grams.  1.3 Bend test, Flattening, Flaring, Proof load, Pull out load, Butt weld Fillet test, Reverse bend test	2.0 Chemical Testing 2.1 Wet analysis * 2.2 Spectrometer analysis	3.0 Corrosion Test & Micro Examination  3.1 IGC practice A &E, Micro, Macro  3.2 Mass of zinc coating
17	Mumbai	M/s Offshore Testing &	1.0 Physical Testing	2.0 Chemical Testing	3.0 Corrosion Test & Micro

		Inspection Services (India) Pvt .Ltd., W-147, M.I.D.C., Pawane, Thane Belapur Road, Navi- Mumbai 400 710. Tel. 022 4144414 /15/16/17 Fax: 022 27633982 /25560401	1.1 Tensile testing at room temp with extensometer.  1.2 Impact test as per ASTM E-23 Standard.  1.3 Hardness test (Brinell, Vickess, Rockwell)  1.4 Bend test, Flattening, Flaring, Proof load, Pull out load, Butt weld Fillet test	2.1 Wet analysis  * 2.2 Spectrometer analysis	Examination 3.1 IGC practice A & E
18	Mumbai	M/s Reliable Testing Services, Unit Number 59, 2 <sup>nd</sup> floor, Bindal Industrial Estate,Kurla Andheri Road, Sakinaka, Mumbai 400 072. Phone no. 28516406 Fax No. 42154942 E mail- reliable1983@rediffmail.co m www.reliabletestingservices. com	1.0 Physical Testing  1.1 Tensile testing at room temp with extensometer.	2.0 Chemical Testing  2.1 Spectrometer analysis	3.0 Corrosion Test & Micro Examination 3.1 Mass of zinc coating 3.2 IGC practice A &E

19	Mumbai	M/s. Soham Analytical Services, A-121/101,	1.0 Physical Testing	2.0 Chemical Testing	3.0 Corrosion Test & Micro Examination
		B33/35, Amargian Industrial Estate.	1.1 Tensile testing at room temp with extensometer.	2.1 Wet analysis	2.1 ICC practice A & E Migra
		Pokhran Estate, Pokhran Road No.1, Khopoli, Thane (W), Maharashtra. Tel. 022-25471297/93/94 Fax: 022 25471295 Email: lab_support@sohmanalytica l.com	1.2 Impact test as per ASTM E-23 Standard.  1.3 Hardness test (Brinell, Vickess, Rockwell, Microhardness  1.4 Bend test, Flattening, Flaring, Proof load, Pull out load, Butt weld, Fillet test, Reverse bend test,	2.2 Spectrometer analysis	3.1 IGC practice A & E, Micro, Macro, Inclusion rating, Case depth Measurement, Ferrite content  3.2 Mass of zinc coating  3.3 Hydrogen Induced corrosion test, Ferrite Chloride pitting & crevice corrosion test
20	GI .	Mi di Lina di	Through thickness tensile test, Nick break test (pipes), Compression test		
20	Chennai	M/s Chennai Mettex Lab P.Ltd.	1. 0 Physical Testing	2.0 Chemical Testing	3.0 Corrosion Test & Micro Examination
		Jyothi Complex, No.83,	1.1 Tensile testing at room temp with	* 2.1 Spectrometer analysis	Examination
		M .K.N.Road, Guindy,	and without extensometer.		3.1 Micro, Macro, Inclusion rating,
		Chennai – 600 032		2.2 Polymer identification	Case depth measurement.
		Ph. 044-22323163,	** 1.2 Impact test as per ASTM E-23	(rubber)	
		42179490/91 Fax :044- 43534270	Standard.		3.2 Mass of zinc
		email address test@mettexlab.com	1.3 Hardness test (Brinell, Vickess, Rockwell) and Microhardness		coating
			1.4 Bend test, Flattening, Flaring, Proof load, Pull out load, Butt weld Fillet test, Reverse bend test		
			1.5 Tensile testing of rubber material		

21	Chennai	M/s Micro Lab, SP.101, 2 nd Main Road, Ambattur Industrial Estate, Chennai – 600 058 Ph. 044-26242525, Fax :044-26244872 E mail: cre@micrilabchennai.com	1. 0 Physical Testing 1.1 Tensile testing at room temp with and without extensometer. 1.2 Tensile testing at elevated temp with and without extensometer. 1.3 Impact test as per ASTM E-23 Standard. 1.4 Hardness test (Brinell, Vickess, Rockwell) and Microhardness 1.5 Bend test, Flattening, Flaring, Proof load, Pull out load, Reverse bend test	2.0 Chemical Testing 2.1 Spectrometer analysis (OES)	3.0 Corrosion Test & Micro Examination  3.1 IGC practice A &E, Micro, Macro, Inclusion rating, Case depth measurement.  3.2 Mass of zinc coating
22	Chennai	M/s. Commando Lab No. 3A 5 <sup>th</sup> South Street, Avarampalayam, Coimbatore 641 006 Phone: 0422 2560907	1.0 Physical Testing  1.1 Tensile testing at room temp with extensometer as applicable. 1.2 Hardness test (Brinell,, Vickers, Rockwell) 1.3 Bend test, Reverse bend test, Flattening test, Flaring test, Proof load test, Pull out load test.		

23	Bangaluru	M/s Geological and Metallurgical Laboratories (GML) 105X, 3rd Main, 3rd Cross, II Stage, Yeshwanthpur Indl. Suburb, Goraguntepalya, BANGALORE - 560 022 Ph. 2347 1065, 2347 2020 Fax 2347 1011	1.0 Physical Testing  1.1 Tensile testing at room temp with extensometer.  1.2 Hardness test (Brinell, Vickess, Rockwell, Microhardness upto 1000 grams.  1.3 Bend test, Flattening, Flaring, Proof load, Pull out load, Butt weld Fillet test, Reverse bend test	<ul><li>2.0 Chemical Testing</li><li>2.1 Wet analysis</li><li>* 2.2 Spectrometer analysis.</li></ul>	3.0 Corrosion Test & Micro Examination  3.1 IGC practice A &E, Micro, Macro, Inclusion rating, Case depth measurement.  3.2 Mass of zinc coating  3.3 Paint thickness measurement
24	Baroda	M/s Met Heat Engineers Pvt. Ltd, Vadodara 857/2,G.I.D.C. Industrial Estate, Makarpura , Vadodara -390 010 Ph. (0265)2643655, 3046493, 6548715-16 Fax email address: info@metheat.com	1.0 Physical Testing  1.1 Tensile testing at room temp with extensometer.  1.2 Impact test as per ASTM E-23 Standard.  1.3 Hardness test (Brinell, Vickess, Rockwell, Microhardness upto 1000 grams.  1.4 Bend test, Flattening, Flaring, Proof load, Pull out load, Butt weld Fillet test, Reverse bend test	<ul><li>2.0 Chemical Testing</li><li>2.1 Wet analysis</li><li>* 2.2 Spectrometer analysis</li></ul>	3.0 Corrosion Test & Micro Examination  3.1 IGC practice A &E, Micro, Macro, Inclusion rating, Case depth measurement.  3.2 Mass of zinc coating  3.3 Paint thickness measurement

25	Baroda	M/s TCR Advanced Engineering Pvt. Ltd., 36/2/9, First Floor, Abhishek Complex, GIDC Estate, Makarpura, Vadodara-390 010 Ph. 0265 2657233, 2634375 Fax 0265 2643024 email address	1.0 Physical Testing  1.1 Tensile testing at room temp with extensometer.  1.2 Impact test as per ASTM E-23 Standard.  1.3 Hardness test (Brinell, Vickess, Rockwell, Microhardness upto 1000 grams.  1.4 Bend test, Flattening, Flaring, Proof load, Pull out load, Butt weld Fillet test, Reverse bend test	2.0 Chemical Testing 2.1 Wet analysis * 2.2 Spectrometer analysis	3.0 Corrosion Test & Micro Examination  3.1 IGC practice A &E, Micro, Macro, Inclusion rating, Case depth measurement.  3.2 Mass of zinc coating  3.3 Paint thickness measurement
26	Pune	M/s Elca Quality Systems & Calibration Pvt.Ltd. S.Np. 232/2, Pune Nasik Road, Bhosari, Pune 411 039. Phone no020 27129194, 27125024 e-mail- qc@elcalabs.com	1. 0 Physical Testing  1.1 Cold/Hot tensile  1.2 Impact test as per ASTM E-23 Standard.  1.3 Hardness/Bend/Flattening etc.	2.0 Chemical Testing 2.1 Spectro 2.2 Wet	3.0 Corrosion Test & Micro Examination  3.1 IGC  3.2 Micro/Macro  3.3 Coating thickness etc.
27	Pune	M/s Perfect Laboratory Services, 58,59/13,14/Unit 2 DII Blolck, MIDC, Chinchwad, Pune 411 019. Phone no020 27458150, 27454716 e-mail- trust_perfectlab@yahoo.com	1. 0 Physical Testing  1.1 Room temperature Tensile testing  1.2 Impact test as per ASTM E-23 Standard.  1.3 Hardness/Bend/Flattening etc.	2.0 Chemical Testing 2.1 Spectro 2.2 Wet	3.0 Corrosion Test & Micro Examination  3.1 IGC  3.2 Micro/Macro  3.3 Coating thickness etc.

28	Hyderabad	M/s. Jyothi Spectro Analysis (P) Ltd., A-30, APIE, Balanagar, Hyderabad 500 037.  Tel. No. 040- 23771193 23771194 23773676 23778042 E-mail: sdsingh@jyothispectro.co m	1.0 Physical Testing:  1.1 Hardness test (Brinell, Vickers, Rockwell)  1.2 Bend test, Flattening, Flaring, Pull out load, Proof load test and Fillet test.	2.0 Chemical testing 2.1 Spectrometer analysis for low carbon, alloy steels, ASS and aluminium bronze.	3.0 Corrosion Test & Micro Examination  3.1 IGC Practice A&E, Micro, macro, Inclusion rating.  3.2 Mass of zinc coating.
29	Hyderabad	M/s. Lucid Laboratories (P) Ltd., B-1/A, TIE, Phase II, B alanagar, Hyderabad 500 037.  Te. No. 040-23720678 23720680 23720681 23720406 E-mail: info@lucidlabsindia.com lucidlabs@rediffmail.co m	1.0 Physical Testing:  1.1 Hardness test (Vickers, Rockwell)  1.2 Bend test, Flattening and Fillet test.	2.0 Chemical testing 2.1 Spectrometer analysis for low carbon, alloy steels and ASS	3.0 Corrosion Test & Micro Examination  3.1 Mass of zinc coating.

Sl.No.	Laboratory Name	Work
1	Bureau Vertias, Chennai	Chemical, NDT & Mechanical
2	National Test House, Chennai	Chemical, NDT, electrical & mechanical
3	ICOMAT, Perungudi, Chennai-96	Chemical, NDT & mechanical
4	Geecy Vincotte India Pvt.Ltd, Mumbai	NDTesting services
5	Microlab, Chennai	Mechanical and chemical related testing
6	Omega Inspection and analytical laboratory, Chennai	Mechanical, metallurgical and chemical testing as per ASTM/ IS in line with NABL accreditation
7	Chennai Mettex Lab Pvt. Ltd, Chennai	Mechanical, metallurgical and chemical testing as per ASTM/ IS in line with NABL accreditation
8	i) Structwel Designer & Consultants Pvt. Ltd, Bangalore.	Testing: Chemical, Mechanical & NDE
O .	ii) Geological and Metallurgical Laboratories.	Testing: Chemical & Mechanical

Note: NABL certificate validity to be ensured for the LABs as on date as applicable.

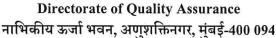
# न्यूक्लियर पावर कॉर्पोरेशन ऑफ इंडिया लिमिटेड

(भारत सरकार का उद्यम)



### NUCLEAR POWER CORPORATION OF INDIA LTD.

(A Government of India Enterprise) गुणवत्ता आश्वासन निदेशालय Directorate of Quality Assurance



Nabhikiya Urja Bhavan, Anushaktinagar, Mumbai - 400 094.

Corporate Identification No. U40104MH1987GOI149458

आर.के. गुप्ता R.K. Gupta अधिशासी निदेशक (गु.आ.) Executive Director (QA) GOI149458 Phone: 022- 25995030/25558487

Fax.No.: 022-25565354 e-mail: rk gupta@npcil.co.in

सं. No. एनपीसीआईएलNPCIL/02500/क्यूएडीQAD/ईडीED(क्यूएQA)/एमM/2019/ibo

December 17, 2019

विषय : वेधी पदार्थों के अनुमोदित ब्रांड की सूची। Sub: <u>List of approved brands of penetrant materials</u>

17-12-2019 की स्थिति में एनपीसीआईएल के उपयोग हेतु वेधी पदार्थों के अनुमोदित ब्रांड की सूची इसके साथ संलग्न है। यह अनुमोदन हमारी प्रक्रिया संख्या QAD/NDT-PROC-PT-05 (तरल वेधी परीक्षण के लिए उपयोग में आने वाले रसायन परिवार के अनुमोदन हेतु प्रक्रिया) के अनसार आवश्यकताओं के अनुरूप प्रदान किया जाता है।

The list of approved brands of penetrant materials for use on NPCIL jobs as on 17-12-2019 is enclosed herewith. The approvals are granted in conformance to the requirements as per our procedure no. QAD/NDT-PROC-PT-05 (Procedure for approval of Family of Chemicals used for Liquid Penetrant Examination).

(आर.के. गुप्ता R. K. पिकृर्ध) 2'19

अधिशासी निदेशक (गु.आ.) Executive Director (QA)

# न्यूक्लियर पावर कॉर्पोरेशन ऑफ इंडिया लिमिटेड

(भारत सरकार का उद्यम)





(A Government of India Enterprise) गुणवत्ता आश्वासन निदेशालय

Directorate of Quality Assurance नाभिकीय ऊर्जा भवन, अणुशक्तिनगर, मुंबई-400 094

Nabhikiya Urja Bhavan, Anushaktinagar, Mumbai - 400 094.



# LIST OF APPROVED PENETRANT TESTING MATERIAL

(As on 17-12-2019)

Sr. No.	Manufacturers	Brand name	Description	Valid up to
1.	DYEGLO PVT. LTD, PUNE	RP-81	Red Coloured Solvent Removable	DEC2023
			Penetrant	
2.	DYEGLO PVT. LTD, PUNE	RP-90	Red Coloured Water Washable	DEC2023
	D)/50/ 0 D)/5 / DD D//5		Penetrant	
3.	DYEGLO PVT. LTD, PUNE	CL-01	Solvent Cleaner	DEC2023
4.	DYEGLO PVT. LTD, PUNE	RD-01	Solvent Base Developer suitable for RP-81 & RP-90	DEC2023
5.	DYEGLO PVT. LTD, PUNE	FP-01	Fluorescent Solvent Removable Penetrant	DEC2023
6.	DYEGLO PVT. LTD, PUNE	WD-01	Solvent Base Developer suitable for FP-01.	DEC2023
7.	FERROCHEM NDT SYSTEM PVT. LTD. PUNE	FC-911, FC-811 FC- 711	Solvent Removable (Visible)	FEB2022
8.	FERROCHEM NDT SYSTEM	FC-931, FC-811	Water Washable (Visible)	FEB2022
	PVT. LTD. PUNE	10001,10011	Water Washable (Visible)	LDZ0ZZ
9.	FERROCHEM NDT SYSTEM PVT. LTD. PUNE	FC-941, FC-821	Water washable (Fluorescent)	FEB2022
10.	FERROCHEM NDT SYSTEM PVT. LTD. PUNE	FC-921, FC-821, FC- 721	Solvent removable (Fluorescent)	FEB2022
11.	MAGNAFLUX ITW INDIA PVT.LTD.SECUNDERABAD	SKL-SP 1	Red Coloured Solvent Removable Penetrant	JUL2024
12.	MAGNAFLUX ITW INDIA PVT.LTD.SECUNDERABAD	SKC-1	Solvent Cleaner	JUL2024
13.	MAGNAFLUX ITW INDIA PVT.LTD.SECUNDERABAD	SKD-S2	Solvent Base Developer	JUL2024
14.	MAGNAFLUX ITW INDIA PVT.LTD.SECUNDERABAD	SKL-WP2	Red Coloured Water Washable Penetrant	JUL2024
15.	MAGNAFLUX ITW INDIA PVT.LTD.SECUNDERABAD	SKL-SP2	Red Coloured Solvent Removable Penetrant.	JUL2024
16.	MR CHEMIE INDIA PVT. LTD., HYDERABAD.	MR <sup>(R)</sup> 62	Solvent Removable Penetrant– Red	JAN2021
17.	MR CHEMIE INDIA PVT. LTD., HYDERABAD.	MR <sup>(R)</sup> 68 NF	Solvent Removable and Water Washable Penetrant–Red	JAN2021
18.	MR CHEMIE INDIA PVT. LTD., HYDERABAD.	MR <sup>(R)</sup> 67	Solvent Removable and Water Washable Penetrant–Red	JAN2021
19.	MR CHEMIE INDIA PVT. LTD., HYDERABAD.	MR <sup>(R)</sup> 672 F	Solvent Removable and Water Washable Penetrant–Fluorescent	JAN2021
20.	MR CHEMIE INDIA PVT. LTD., HYDERABAD.	MR <sup>(R)</sup> 85	Solvent Remover suitable for MR <sup>(R)</sup> 68NF, MR <sup>(R)</sup> 67, MR <sup>(R)</sup> 672F and MR <sup>(R)</sup> 62.	JAN2021
21.	MR CHEMIE INDIA PVT. LTD., HYDERABAD.	MR <sup>(R)</sup> 70	Non-Aqueous Developer suitable for MR <sup>(R)</sup> 68 NF, MR <sup>(R)</sup> 67 and MR <sup>(R)</sup> 672F	JAN2021

Jul

Sr. No.	Manufacturers	Brand name	Description	Valid up to
22.	MR CHEMIE INDIA PVT. LTD., HYDERABAD.	MR <sup>(R)</sup> 70 I	Non-Aqueous Developer suitable for MR <sup>(R)</sup> 62.	JAN2021
23.	P-MET HIGH TECH CO. PVT. LTD., VADODARA	PP-15/PP-15B	Red Goloured Solvent Removable Penetrant	SEPT2021
24.	P-MET HIGH TECH CO. PVT. LTD., VADODARA	PP-19/PP-19B	Red Coloured Water Washable Penetrant	SEPT2021
25.	P-MET HIGH TECH CO. PVT. LTD., VADODARA	PC-21/PC-21B	Solvent Cleaner	SEPT2021
26.	P-MET HIGH TECH CO. PVT. LTD., VADODARA	PD-31/PD-31B	Solvent Base Developer	SEPT2021
27.	P-MET HIGH TECH CO. PVT. LTD., VADODARA	PP-110/ PP110B	Red Coloured Solvent Removable Penetrant	SEPT2021
28.	P-MET HIGH TECH CO. PVT. LTD., VADODARA	PC 120/ PC-120B	Solvent Cleaner	SEPT2021
29.	P-MET HIGH TECH CO. PVT. LTD., VADODARA	PD 130 /PD-130B	Solvent Base Developer	SEPT2021
30.	P-MET HIGH TECH CO. PVT. LTD., VADODARA	FPS46/FPS46B	Solvent Removable Fluorescent Penetrant	SEPT2021
31.	P-MET HIGH TECH CO. PVT. LTD., VADODARA	FPS49/FPS49B	Water Washable Fluorescent Penetrant	SEPT2021
32.	PRADEEP METAL TREATMENT CHEMICALS PVT. LTD., THANE	Flaw Guide Penetrant (NP Grade)	Red Coloured Solvent Removable Penetrant.	OCT2024
33.	PRADEEP METAL TREATMENT CHEMICALS PVT. LTD., THANE	Flaw Guide Cleaner (NP Grade)	Solvent Cleaner	OCT2024
34.	PRADEEP METAL TREATMENT CHEMICALS PVT. LTD., THANE	Flaw Guide Developer (NP Grade)	Solvent Base Developer	OCT2024
35.	PRADEEP METAL TREATMENT CHEMICALS PVT. LTD., THANE	Flaw Guide Red Dye Penetrant-W	Water Washable Dye Penetrant	OCT2024

### Note:-

1. Halogen content in Penetrant, Cleaner and Developer is 25ppm (max) and Sulphur content is 500ppm (max). However when using penetrant materials for Austenitic Stainless Steel, Titanium, Nickel base or other high temperature alloys, Halogen and Sulphur content shall not exceed 25ppm. Manufacture has to mention for each batch, the Sulphur and Halogen content in the label of each container for selection of Penetrant materials for the stated application.

2. Developer is to be used in Aerosol can to get the best results.

(Anoop Singh) ACE & Head QA (M-6)

Through: Shri A.K. Singh, AD (QA-Opns. & Group-1)

Executive Director (QA)

17.12.19

# न्यूक्लियरपॉवरकॉर्पोरेशनऑफइंडियालिमिटेड NUCLEAR POWER CORPORATION OF INDIA LIMITED

(भारतसरकारकाउद्यमA Govt. of India Enterprise)

कुडनकुलमन्यूक्लियरपाँवरप्रोजेक्टKUDANKULAM NUCLEAR POWER PROJECT- 3&4



# दस्तावेजस्वीकृतिसूचनाDOCUMENT ACCEPTANCE NOTE

Document No	1046	KK34	0	0	QA	QP	WD007
दस्तावेजशीर्षक Document Title		cturing Qual					nge of valves
संविदाकारContractor	M/S BH	ARAT HEA	VY ELE	CTRIC	ALS LIMI	TED	
कार्यआदेशसं. Work Order No.	400442	dated 05.08.2	019				
कार्यकानाम Name of Work	Sea Wa Insulation	ater System	Equip prrosive	ment's Coating	and piping and str	ng includ uctural st	ndary cycle & ing Painting, eel works in

उपर्युक्तदस्तावेजकीसमीक्षाकीगईहैऔरलागूडब्लूडी, कोडऔरविनिर्देशोंकीआवश्यकताओंकीपृष्टिपाईगईहै। Above document has been reviewed and found conforming to the requirements of applicable WDs, codes and specifications.

गतिविधिActivity	अनुभागSection	नामएवंपदनाम Name & Designation	हस्ताक्षरएवंदिनांक Signature & Date
समीक्षित Reviewed by	Mechanical	K.KANNADHASAN EOLE L. Math 2010	Semilar FU
सहमत	QA Formed	SVUlvekon sole  10 A Porrand  ed Weak (QA)	1. 108/2.
Concurred by	Engg-LWR/FE	R.Gurnule, DCE (EnggLWR)  Rounds Penymeska	amle
स्वीकृत Accepted by	8-A	Kead (AA)	14 Parm 25 24 25 24

# NUCLEAR POWER CORPORATION OF INDIA LIMITED PRD-PROC-14 (Rev-02)

MAIN CO	P.O. NO: (MAIN CONTRACTOR/SUB-	1	QUALITY ASSURANCE PLAN	URANCE PLAN		2AP NO: NPC 046/KK34/00	IUPROJECT	QAP NO: NPCIUPROJECT/USIITEM/SL. NO. 1046/KK34/00/QA/QP/WD007
MC: 4004	VENDOR AS APPLICABLE) DATE: MC: 400442 / 05.08.2019 SV: 3200852 / 04 02 2021		NVENTIONAL V	ALVES AS PER A	B13.34	REV. NO.0	DAT	DATE:07.06.2021
		מאו ביו ימ		ds GRADE:				
PROJECT: KKNPP 3&4	r: &4	NAME OF F KUDANKUL PO NO : (N	NAME OF PACKAGE: NPCIL - ERECT KUDANKULAM POWER PROJECT PO NO : (NPCIL) 400442 / 05.08.2019	- ERECTION WORK AT JECT .08.2019		NPCIL QA REF. NO.: 2210175	F. NO.: 22101	75
NAME OF ADDRESS	NAME OF PACKAGE CONTRACTOR / MAIN VENDOR AND	OR / MAIN VENDOR	AND	NAME OF VEND	NAME OF VENDOR / SUB-VENDOR AND ADDRESS	AND ADDR	ESS	
BHARAT I NUCLEAR Sector-16 Gautam B	BHARAT HEAVY ELECTRICALS LIMITED (POWER SECT NUCLEAR BUSINESS GROUP(Mktg), Plot No. 25, PPEI Sector-16A, NOIDA Gautam Budh Nagar (Uttar Pradesh)-201301	IMITED (POWER S lktg), Plot No. 25, idesh)-201301	PPEI Building,	BHARAT HEAVY 433, INDUSTRIA PUNJAB, INDIA.	BHARAT HEAVY ELECTRICALS LIMITED 433, INDUSTRIAL COMPLEX, GOINDWAL SAHIB, TARN TARAN- 143422, PUNJAB, INDIA.	MITED INDWAL SAI	HIB, TARN T.	ARAN- 143422,
SR.NO.	DATA SHEETNSS NO./DRG NO.	BRIEF DESCRIPTION OF ITEM	DESIGN CODE/ SPEC. NO.	FOR MAIN C	FOR MAIN CONTRACTOR'S VENDOR			STAMP OF VENDOR / SUBNOR / SUB
1 7	CON: CT:28258 CON: CT:28257	2-C150-FV-FL- WCB 2-C150-GV-FL-			PREPARED BY		CHECKED/ REVIEWED BY	APPROVED BY
m	CON: CT: 28256	HO-WCB 2-C300-GV-FL-	ASME B16.34	SIGNATURE		0/0	h	Men
		HO-WCB 4-C300-GV-FL-		NAME	VIKAS KUHBA	1-	Manjir Smith	S.R. Kenny
		HO-WCB 8-C300-GV-FL- HO-WCB		DATE	D3.07.2021		03/07/21	<del> </del>
FOR PA	FOR PACKAGE / MAIN CONTRACTOR		AFFIX STAMP OF PACKAGE CONTRACTOR			FOR		
	CHECKED	REVIEWED BY	APPROVED BY &		CHECKED BY	REVIEWED BY		ACEROPETERSY
SIGNATURE	1	200	icultura).	SIGNATURE	Semilary.			CASA-
NAME	Sumit Ship	Sumit Shylla Sumit Shull	2	NAME	KAKNAD HASANY			Les A Roman
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# BHARAT HEAVY ELECTRICALS LTD. Kudankulam Nuclear Power Project – 3&4

Doc No : BHEL/KKNPP-3&4/CQP: 6359

Rev. No :

Page 3 of 8

Manufacturing Quality plan for BHEL IVP Goindwal range of valves- KKNPP TG Secondary cycle & Sea Water system

## **Revision Status**

Rev. No.	Date of 1st Issue/Rev.	Description
00	30.12.2020	First Issue
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# BHARAT HEAVY ELECTRICALS LTD. Kudankulam Nuclear Power Project – 3&4

Doc No : BHEL/KKNPP-384/CQP: 6359

Rev. No:

Page 4 <u>of 8</u>

Manufacturing Quality plan for BHEL IVP Goindwal range of valves-KKNPP-TG Secondary cycle & Sea Water system Date:

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### BHARAT HEAVY ELECTRICALS LTD. Kudankulam Nuclear Power Project – 3&4

Doc No: BHEL/KKNPP-3&4/CQP: 6359

Rev. No:

Page 5 of 8

Manufacturing Quality plan for BHEL IVP Goindwal range of valves-KKNPP-TG Secondary cycle & Sea Water system

Date:

#### 1.0 SCOPE:

This Document is Manufacturing Quality Plan for Gate & Check Valves for KKNPP- TG Secondary Cycle & Sea Water System

#### 2.0 PURPOSE:

This Quality plan explains statement of Quality checks and requirements of NPCIL Witness/hold-points during the manufacturing of Gate and Check Valves.

### 3.0 APPLICABILITY:

This procedure is only applicable for NPCIL KKNPP Unit 3 & 4 TG Secondary Cycle & Sea Water System.

### 4.0 REFERENCES:

Please refer the column Reference Document in the CQP:6359

					C 71 85 85.4	THE THUMBS	!	THE . KK	JPP. TG Secondar	DROTECT - KKNPP. TG Secondary Cycle & Sea Water
	MANDEACIL	JANUFACTURER'S NAME	MA	NUFACI	OKUNGO	ACTURING QUALITY FLAN	1,	305 508	Suction	
E	AND ADDRE	COINDWAL/APPD.	ITEM: C	JATE & CHECK	. 4 0 0.	OP NO: CQP: 6359	8	NTRACT NO	CONTRACT NO. KKNPP/CTC/2019/S/1189	6811/8/610
	SUB-CONTR	ACTORS	·	ंद्रुं भार	Y SEV	CEVETNUE DO COMO SA VITTO DE COMO SA VIT	MA	MAIN SUPPLIER: BHEL	R. BHEL	
		,		<b>-</b> ,	1	03:08:5023	BH	BHEL CUST NO: 3200852	: 3200852	
			SUB-SYSTEM	TEM:-	PAGE	PAGE: 6 of 8	Ź	CIL WO NUN	4PCIL. WO NUMBER: 400442 dated 05.08.2019	ed 05.08.2019
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1.0	MATERIAL	Material shall be us per the drawing.	or the dr	swing.							ATTENDED TO A STATE OF THE STAT
1.1	Castings:Pr.Parts	Chemical Properties	₹*	TC Verification	One test	PO/As per Material Specification/	J.C		Δ,	<b>⇒</b>	V Note 1 & 4
	& Cover	Mechanical	. <b>⋖</b> (	TC	One test	PO/As per Material Specification/	IC.	<u>_</u>	ı.	<u>^</u>	* First heat/for pouring
		Properties Visual	<	Verification Visuel	5ar/6cat 100%	TDC MSS'SP 55	T.	,	<u>.</u>	<u>&gt;</u>	es mechanical rest
<u> </u> 2	Castings:	Chemical &	<	TC	One test	PO/As per Material Specification	Ω		Δ,	<u>&gt;</u>	Note 1
<u> </u>	Non-Pr. Parts	Mechanical		Verification	bar/heat		•				
·	Wedge, Scal ring, Flap	Properties					<u> </u>				
		· · · · · ·									
1.3	Forgings/ Rolled Bar: Non Pr. Parts	Chemical & Mechanical	¥.	TC Verification	One test bar/heat	PO/As per Material Specification	្សា		<u></u>	<u>&gt;</u> >-	Note 1
<u></u>	Stem, Seat ring, Flan	Properties									-
4.1	Plates: Non Pr.Parts	Chemical &	٧	ΤC	One test	PO/As per Material Specification/	ដ		<u> </u>	<u>^</u> ^	Note 1
	Seafring	Mechanical Properties		Verification			,. <u> </u>			:	
1:5	Fasteners	Chemical &	٧	T <sub>L</sub>	One test	PO/As per Material Specification/	TC.		4	A	Note 1
<u> </u>		Mechanical		Verification	par/licat	100	,				
		Properties						_		$\frac{1}{1}$	

FOH CUSTOMER USE - DOC: NO: 1046-KK34-0-0-0A-QP-WDU07									NAME & SIGN, OF APPHOVING AUTHORITY & SEAL	
FOR CUSTOMER USE	}	- Track	a a						REVIEWED BY	
CNHCHI	FACTURE	B. BHEL / BHEL NOMINATED INSPECTION AGENCY	NEWPOIL ACCRITICAL BEWATOR CHAINOR	WPS - WELDING PROCEDURE SPECIFICATION,	J WOR - WELDER QUALIFICATION RECORDS	TC - TEST CERTIFICATES/REPORTS R: RECORDS,	P. PERFORM, W. WITNESS,	DA COUALITY DOCUMENTATION	V. VERIEIGATION OF RECORDS FOR WITNESSED ITEMS  AT THE TIME OF INSPECTION	
	· · ·	S. Karth	•	S.Lakshmi			REVIEWED &	APPROVED BY	SIGNATURE	
		The sand It	>	NNagamuthu	Pandlan		PREPARED BY		NAME & SIGNAT	

П

PROJECT : KKNPP-TG Secondary Cycle & Sea Water excluding threaded area \*On machined surfaces @ 10 %/Type of valve REMARKS NPCIL WO NUMBER: 400442 dated 05:08:2019 11. CONTRACT NO. KKNPP/CTC/2019/8/1189 NO: 1046-KK34-0-0-QA-QP-WD007 Note 2 Note-3 Ø.W Ļ AGENCY > > 13 > 9 BHEL CUST NO: 3200852 MAIN SUPPLIER: BITEI o, ρ, Ъ p. Σ p, Α, System FORMAT'OF RECORD Ä FOR CUSTOMER USE - DOC WPOR ű WPS H r. 샏 召 \* 23 2 ينم 74 Ţ PO/As per Material Specification/ Drawing/API 598/ ASME B16.34 ACCEPTANCE SESSION SES Drawing/Purclinse Specification ळ Drawings / As per Material MANUFACTURING OUALITY PLAN RHE:NDT:VV:PT02 BHE:NDT:VV:PT02 WPS, Process slinet ASME Section IX RESERVENCE Specification QP-NO: CQP-6359 DATE: 03,08,2021 ŧ÷' Drawings Drawing PAGE: 7 of 8 REV. NO: 00 OUANTUM OF CHECK Random 100% 100% 100% 100% 100% 300% 3000 100% %001 %001 냽 ITEM: GATE & CHECK TC Verification TYPE OF Measurement Measurement Measurement VALVES Documents Hydro test HT charts/ Log books Review of Review of ່ເຄື SUB-SYSTEM: Visual Visual LPI H H SSVTO ⋖ ≺ ₹ ব ⋖ ď, ď mm Þ pg. ۲ BHIE: IVY-GOINDWAL/APPD. SUB-CONTRACTORS Roughness-on flango Time & Temperature control Welder qualification CHARACTERISTICS Procedure qualification Critical dimensions Compliance to PO MANUFACTURER'S NAME Surface NDE\* Completeness m Hard facing a) Shell test Direction Fillet wold Visual & Hardness INPROCESS CONTROL Tare AND ADDRESS COMPONENT & OPERATIONS Hydrostatic Test Wedge, Spindle/ Wedge, Spindle/ Weld Inspection Suatring, Plap, Body, Bonnet, Spindle/Stern, Heat treatment Slem, Cover Machining ٠i Hinge pin Assembly Welding Gasket 2,4,1 3.5 2.0 9 22 23 2,4 2.6

NAME & SIGN, OF APPROVING AUTHORITY & SEAL REVIEWED BY A ROBERT OF THE PARTY OF THE PA M: MANUFACTURER/ SUB CONTRACTOR
B: BHEE / BHEL NOMINATED INSPECTION AGENCY
N: NPGL\_ A:GRITICAL B:MAJOR C:MINOR
NPS.—WELDING PROCEDURE SPECIFICATION,
WOR.\_WELDING PROCEDURE SPECIFICATION,
WOR.\_WELDING PROCEDURE SPECIFICATION,
WOR.\_WELDING PROCEDURE SPECIFICATION,
WOR.\_WELDING PROCEDURE SPECIFICATION
P. PERFORM, W: WITNESS,
D\*:QUALITY DOCUMENTATION
V: VERIFICATION OF RECORDS FOR WITNESSED ITEMS
AT THE TIME OF:INSPECTION: REVIEWED & APPROVED BY S.Lakshmi S. Carellet NAME & SIGNATURE PREPARED BY - The N,Nagamuthu Pandlan

		· · · ·	<u> </u>		Γ		Γ-	Γ	_	Γ			<u> </u>	···	
PROJECT: KKNPP-TG Secondary Cycle & Sea Water	System CONTRACT NO: KKNPP/CTC/2019/S/1189 MAIN SUPPLIER: BIREL BHEL CUST NO: 3200852	NPCIL WO NUMBER: 400442 dated 05:08,2019	REMARKS		Ţij.			W@ \$ Gate Valves	W@ 40t As applicable				W@ @ 10 %/Type of valve		
onda	I'C/2	date		z		:	W We		W@		W W	_	@  X		
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	CO WA BHI	NPC	ACCEPTANCE NORMS		.8.		3/ ASME B16.34	V ASME B1634	V ASME B16.34		ess records		g scheme		
MANUFACTURING QUALITY PLAN	QP NO: CQP: 6359 REY. NO: 00 DATE: 03.08.2021	rage: 8008	REVERENCE DOCUMENT		7.		Drawing/API 598/ ASME B16.34	Drawing/API 598/ ASME B16.34	Drawing/API 598/ ASME B16.34		Drawing / In process records		Approved Painting scheme.	-	
	TTEM: GATE & CHECK OF NO. COP: 6359 VALVES REV. NO: 00 DATE: 03.08.2021	FAGE	QUANTOM OF CHECK		79		100%	100%	100%		26001		100%		-
		SUB-SYSTEM:	CHECK	-	Ċ.		Hydro test	Air lest	Hydro test		Visual		Visual	Measurement	
M	JTEM:	SUB-SX:	CLASS		7		¥	¥	Y		В		ט		-9 -
BR'S NAME	AL/APPD.		CHARACTERISTICS		ត		b) Seaf lest	c) Seat (cst (Air)\$	d) Back seat test**	. NO)	Overall dimensions		Surface Condition,	DFT & Appearance	
MANUFACTI	AND ADDRESS  THEIR INP CONTRACTIONS  SUB-CONTRACTIONS		COMPONENT & OPERATIONS		77			•=		FINAL INSPECTION	Verification of	completion	Painting	Preservation &	Protection:
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Chemical and Mechanical tests on the material shall be performed in laboratories approved by NPCIL. Notes:
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Manufacturer's Test Certificate

Drawing/ Sale Order

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Visual Certificate compilation

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Order Compliance Sale Order, Item

Identification Certification

3.3 4.6

Electrodes/Hillor wire shall be brand approved by NRCIL.
NECIL approved chemicals for Liquid Penetrant examination shall be used. NDE personnel qualification shall be as per ISNT or ASNT Level II.
RT for Valves, castings is not envisaged as per VMS 51380,53080 & 53380 and for flush valves.

FOR CUSTOMER USE - DOC NO: 1046:KK34-0-0-CA-CR-WD007				NAME & SIGN, OF APPROVING AUTHORITY & SEAL	45.
FOR CUSTOMER USE	X mode			REVIEWED BY	Ç
LEGEND:	M. MANUFACTURER / SUB CONTRACTOR  B. BREL / BREL NOMINATED INSPECTION AGENCY  N. NPCIL. A:CRITICAL BARJOR C.MINOR	WFS - WELDING PROGEDURE SPECIFICATION. WOR - WELDER QUALIFICATION RECORDS	ST CERTIFICATE ORM, W.WITNE LITY DOCUMENT	V-VERIFICATION OF RECORDS FOR WITNESSED TIEMS AT THE TIME OF INSPECTION	
	3. Landay	S.Lakshmi	REVIEWED.8 APPROVED.8Y	SIGNATURE	
	- Jane Hills	N:Nagamulhu Pandian	PREPARED BY	NAME'S SIGN	

### न्युक्लियर पावर कॉर्पोरेशन ऑफ इंडिया लिमिटेड

(भारत सरकार का उद्यम)

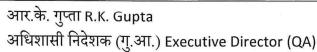


(A Government of India Enterprise) गुणवत्ता आश्वासन निदेशालय

**Directorate of Quality Assurance** नाभिकीय ऊर्जा भवन, अणुशक्तिनगर, मुंबई-400 094

Nabhikiya Urja Bhavan, Anushaktinagar, Mumbai - 400 094.

Corporate Identification No. U40104MH1987GOI149458



Phone: 022- 25995030/25558487

Fax.No.: 022-25565354 e-mail: rk\_gupta@npcil.co.in

सं.No. एनपीसीआईएलNPCIL/02500/क्यूएडी QAD/एमM/2019//6/

दिनांक Date: December 17, 2019

विषय: वेल्डिंग कंज्यूमेबल्स के अनुमोदित ब्रांड की सूची। Sub: List of approved brands of welding consumables

17/12/2019 की स्थिति में एनपीसीआईएल कार्यों के उपयोग हेतु वेल्डिंग कंज्यूमेबल्स के अनुमोदित ब्रांडों की सूची इसके साथ संलग्न है:

The lists of approved brands of welding consumables for use on NPCIL jobs as on 17/12/2019 are enclosed herewith.

- 1) अनुमोदित कार्बन स्टील एवं निम्न एलॉय स्टील वेल्डिंग इलेक्ट्रोड्स की सूची (2 शीट) List of Approved Carbon Steel & Low Alloy Steel Welding Electrodes (2 Sheets).
- 2) अनुमोदित स्टेनलेस स्टील एवं अन्य निकिल एलॉय इलेक्ट्रोड्स की सूची (2 शीट) List of Approved Stainless Steel & other Ni Alloy Electrodes (2 Sheets).
- 3) वायर के अनुमोदित ब्रांड एवं वायर फ्लक्स संयोजन की सूची (1 शीट) List of Approved Brands of Wire and Wire Flux Combination (1 Sheet).

वेल्डिंग कंज्यूमेबल्स (क्यूएडी/प्रापण/वेल्डिंग कंज्यूमेबल्स/002 संशो.: 2) के अनुमोदन के लिए प्रक्रिया में एवं एएसएमई खंड II भाग C के अद्यतन संस्करण में निर्धारित आवश्यकताओं के अनुसार अनुमोदन प्रदान किया जाता है। तथापि, विशेष मामलों में जहाँ कहीं भी बैच क्वालिफिकेशन अपेक्षित होगा, अलग से निष्पादित किया जाएगा।

The approvals are granted in conformance to the requirements stipulated in Procedure for approval of Welding Consumables (QAD/Proc/Welding Consumables/002 Rev:2) and latest edition of ASME Section II Part C. However, batch qualification wherever called for in specific cases, will have to be carried out separately.

(आर.के. गुप्ता R.K. Gupta) 12'19

अधिशासी निदेशक (ग्.आ.) Executive Director (QA)

### न्यूक्लियर पावर कॉर्पोरेशन ऑफ इंडिया लिमिटेड

(भारत सरकार का उद्यम)



#### NUCLEAR POWER CORPORATION OF INDIA LTD.

(A Government of India Enterprise) गुणवत्ता आश्वासन निदेशालय

Directorate of Quality Assurance नाभिकीय ऊर्जा भवन, अणुशक्तिनगर, मुंबई-400 094

Nabhikiya Urja Bhavan, Anushaktinagar, Mumbai - 400 094.



### 1) LIST OF APPROVED CARBON STEEL & LOW ALLOY STEEL WELDING ELECTRODES

(2 pages)

As on 17-12-2019

Sr. No.	Manufacturers	Brand name	AWS No.	Valid up to
1.	ADOR WELDING LTD., SILVASSA	SUPABASE X PLUS	E7018	FEB2024
2.	ADOR WELDING LTD., SILVASSA	MOLYTEN	E7018-A1	APR2020
3.	ADOR WELDING LTD., SILVASSA	CHROMOTEN	E8018 B2	APR2020
4.	ADOR WELDING LTD., SILVASSA	CHROMOTEN-C	E9018 B3	APR2020
5.	ADOR WELDING LTD., SILVASSA	TENALLOY Z PLUS	E7018-1	JUN2022
6.	D&H INDIA LTD., INDORE	SUPER -CR-1	E8018 B2	DEC2020
7.	D&H INDIA LTD., INDORE	SUPER -CR-2	E9018 B3	DEC2020
8.	D&H INDIA LTD., INDORE	SUPER -LH (SPL)	E7018-1 (DCEP Only)	FEB2021
9.	D&H INDIA LTD., INDORE	STANDARD	È6013	FEB2021
10.	D&H INDIA LTD., INDORE	SUPER LH	E7018 (DCEP Only)	FEB2021
11.	D&H SECHERON, INDORE	MEDIO	E6013	JUN2020
12.	D&H SECHERON, INDORE	EXOBEL	E6013	JUN2020
13.	D&H SECHERON, INDORE	SUPERTHERME	E7018	JUN2020
14.	D&H SECHERON, INDORE	MOLYTHERME	E7018-A1	JUN2022
15.	D&H SECHERON, INDORE	SUPERTHERME(SPL)	E7018-1	NOV2023
16.	HONAVAR ELECTRODES, THANE	REGULAR S	E6013	JAN2020
17.	HONAVAR ELECTRODES, THANE	ULTIMATE - 18	E7018	JAN2020
18.	HONAVAR ELECTRODES, THANE	ULTIMATE – 18 SPL	E7018-1	JAN2020
19.	MAILAM INDIA LTD., PUDUCHERRY	MAILARC -13R	E6013	SEP2020
20.	MAILAM INDIA LTD., PUDUCHERRY	MAILARC -18	E7018	SEP2020
21.	MAILAM INDIA LTD., PUDUCHERRY	MAILARC -18 PLUS	E7018-1	SEP2020
22.	MAILAM INDIA LTD., PUDUCHERRY	MAILARC -1 CR	E8018-B2	JUN2024
23.	MAILAM INDIA LTD., PUDUCHERRY	MAILARC -2 CR	E9018-B3	JUN2024
24.	RAJ KESARI ELECTRODES, UDAIPUR	SUPERLET 18	E7018	AUG2022
25.	RAJ KESARI ELECTRODES, UDAIPUR	SUPERLET 18 (SPL.)	E7018-1	AUG2022
26.	RAJ KESARI ELECTRODES, UDAIPUR	RAJCORD 13S	E6013	AUG2022
27.	RAJRATNA ELECTRODES, AHEMEDABAD	RATNA 7018 SPL.	E7018-1	MAR2020
28.	RAJRATNA ELECTRODES, AHEMEDABAD	RATNA 7018	E7018	NOV2023
29.	ROYAL ARC ELECTRODES LTD, VASAI	ROYAL THERM SPL.	E7018-1	SEP2021
30.	ROYAL ARC ELECTRODES LTD, VASAI	ROYAL CHROM 1	E8018-B2	FEB2023
31.	ROYAL ARC ELECTRODES LTD, VASAI	ROYAL CHROM 2	E9018-B3	FEB2023
32.	ROYAL ARC ELECTRODES LTD, VASAI	ROYAL THERM MOLY	E7018-A1	MAR2023
33.	ROYAL ARC ELECTRODES LTD, VASAI	ROYAL THERM	E7018	DEC2023
34.	ROYAL ARC ELECTRODES LTD, VASAI	ROYAL S	E6013	DEC2023
35.	SUPERON SCHWEISSTECHNIK INDIA LTD. DELHI	GARANT MO	E7018-A1	SEP2020
36.	SUPERON SCHWEISSTECHNIK INDIA LTD., DELHI	SUPER CROMO 1B	E8018-B2	DEC2020



Sr. No.	Manufacturers	Brand name	AWS No.	Valid up to
37.	SUPERON SCHWEISSTECHNIK INDIA LTD., DELHI	SUPER CROMO 2B	E9018-B3	DEC2020
38.	VIJEY ELECTRODES & WIRES PVT. LTD.,	VJ 6013 X	E6013	SEP2020
	CHENNAI			
39.	VIJEY ELECTRODES & WIRES PVT. LTD.,	VJ 7018	E7018	SEP2020
	CHENNAI		*	6
40.	VIJEY ELECTRODES & WIRES PVT. LTD.,	VJ 7018 - 1	E7018-1	SEP2020
	CHENNAI			
41.	WELD FAST ELECTRODES, NAGPUR	WELDFAST LH 18	E-7018	MAR2020
42.	WELD FAST ELECTRODES, NAGPUR	WELDFAST LH-18-1	E-7018-1	MAR2020
43.	WELD FAST ELECTRODES, NAGPUR	WELDFAST CROMO 0500	E7018-A1	FEB2023
44.	WELD FAST ELECTRODES, NAGPUR	WELDFAST CROMO 1500	E8018-B2	FEB2023
45.	WELD FAST ELECTRODES, NAGPUR	WELDFAST CROMO 2251	E9018-B3	FEB2023

The approvals are granted in conformance to the requirements stipulated in latest edition of ASME Section II Part C. However, batch qualification wherever called for in specific cases, will have to be carried out separately.

(Anoop Singh) ACE & Head QA (M-6)

Through: Shri A.K. Singh, AD (QA- Opns. & Group-1)

Executive Director (QA)

प्रमुग देशह मिला

17:12:19

### न्यूक्लियर पावर कॉर्पोरेशन ऑफ इंडिया लिमिटेड

(भारत सरकार का उद्यम)



#### NUCLEAR POWER CORPORATION OF INDIA LTD.

(A Government of India Enterprise) गुणवत्ता आश्वासन निदेशालय

Directorate of Quality Assurance नाभिकीय ऊर्जा भवन, अणुशक्तिनगर, मुंबई-400 094

Nabhikiya Urja Bhavan, Anushaktinagar, Mumbai - 400 094.



### 2) LIST OF APPROVED STAINLESS STEEL & OTHER NI ALLOY ELECTRODES

(2 Pages)

As on 17-12-2019

Sr. No.	MANUFACTURERS	BRAND NAME	AWS No.	VALID UPTO
1.	ADOR WELDING LTD., SILVASSA	BETANOX-DL	E 309L-16	SEP2020
2.	ADOR WELDING LTD., SILVASSA	SUPERINOX-2C	E 316L-16	SEP2020
3.	ADOR WELDING LTD., SILVASSA	SUPERINOX-1C	E 308L-16	SEP2020
4.	D&H INDIA LTD., INDORE	SV-308L	E-308L-15	DEC2022
5.	D&H INDIA LTD., INDORE	SV-309L	E 309L-15	DEC2022
6.	D&H INDIA LTD., INDORE	CROMALLOY-B	E 308L-16	DEC2022
7.	D&H INDIA LTD., INDORE	CROMALLOY 309L	E 309L-16	DEC2020
8.	ADOR FONTECH, BENGALURU	LH 511	E Ni Cu7	OCT2020
9.	ADOR FONTECH, BENGALURU	LH 521	E Ni Cr Fe 3	OCT2020
10.	D&H SECHERON, INDORE	CRONITHERME 25/12	E 309-16	JUN2022
11.	D&H SECHERON, INDORE	RUTOX-D	E 316L-16	JUN2022
12.	D&H SECHERON, INDORE	BATOX-B	E 308L-15	JUN2020
13.	D&H SECHERON, INDORE	RUTOX-B	E 308L-16	JUN2020
14.	D&H SECHERON, INDORE	D&H 309L	E 309L-16	NOV2023
15.	The state of the s	D&H 1250	E NiCu-7	JAN2021
16.	D&H SECHERON, INDORE	D&H 1212NS	E NiCr Fe-3	JAN2021
17.	D&H SECHERON, INDORE	RUTOX-A	E 308-16	NOV2023
18.	D&H SECHERON, INDORE	RUTOX-A St	E 347-16	NOV2023
19.	D&H SECHERON, INDORE	RUTOX-Mo	E 316-16	NOV2023
20.	HONAVAR ELECTRODES, THANE	SILVER SHINE 308L-15	E 308L-15	FEB2024
21.	HONAVAR ELECTRODES, THANE	SILVER SHINE 316L	E 316L-16	FEB2024
22.	RAJRATNA ELECTRODES, AHEMEDABAD	RATNA 308L	E 308L-16	MAR2020
23.	RAJRATNA ELECTRODES, AHEMEDABAD	RATNA 316 L	E 316L-16	MAR2020
24.	MAILAM INDIA LTD., PUDUCHERRY	MAILEX-A	E 308-16	JUN2024
25.	MAILAM INDIA LTD., PUDUCHERRY	MAILEX-AL	E 308L-16	JUN2024
26.	MAILAM INDIA LTD., PUDUCHERRY	MAILEX-AL-15	E 308L-15	JUN2024
27.	MAILAM INDIA LTD., PUDUCHERRY	MAILEX-25/12	E 309-16	JUN2024
28.	MAILAM INDIA LTD., PUDUCHERRY	MAILEX-25/12-L	E 309L-16	JUN2024
29.	MAILAM INDIA LTD., PUDUCHERRY	MAILEX-25/12-Mo	E 309 Mo-16	JUN2024
30.	MAILAM INDIA LTD., PUDUCHERRY	MAILEX Mo	E 316-16	JUN2024
31.	MAILAM INDIA LTD., PUDUCHERRY	MAILEX MoL	E 316L-16	JUN2024
32.	ROYAL ARC ELECTRODES, VASAI,	ROYAL 1C	E 308L-16	OCT2024
33.	ROYAL ARC ELECTRODES, VASAI,	ROYAL 2C	E 316L-16	OCT2024



Sr. No.	MANUFACTURERS	BRAND NAME	AWS No.	VALID UPTO
34.	ROYAL ARC ELECTRODES, VASAI,	ROYAL-D2L	E 309L-16	OCT2024
35.	WELD FAST ELECTRODES, NAGPUR	WELDFAST 308L	E 308L-16	JAN2021
36.	WELD FAST ELECTRODES, NAGPUR	WELDFAST 316L	E 316L-16	JAN2021
37.	WELD FAST ELECTRODES, NAGPUR	WELDFAST 309L	E 309L-16	JAN2021
38.	WELD FAST ELECTRODES, NAGPUR	WELDFAST 309MoL	E 309LMo-16	JAN2021

The approvals are granted in conformance to the requirements stipulated in latest edition of ASME Section II Part C. However, batch qualification wherever called for in specific cases, will have to be carried out separately.

(Anoop Singh) ACE & Head QA (M-6)

Through: Shri A.K. Singh, AD (QA-Opns. & Group-1)

17/12/19

17/12 17/12

Executive Director (QA)

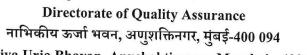
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### न्यूक्लियर पावर कॉर्पोरेशन ऑफ इंडिया लिमिटेड

(भारत सरकार का उद्यम)

### NUCLEAR POWER CORPORATION OF INDIA LTD.

(A Government of India Enterprise) गुणवत्ता आश्वासन निदेशालय





Nabhikiya Urja Bhavan, Anushaktinagar, Mumbai - 400 094.

## 3) LIST OF APPROVED BRANDS OF WIRE AND WIRE FLUX COMBINATION

(1 Page)

As on 17-12-2019

Sr.	MANUFACTURERS	BRAND NAME	AWS No.	TILLER
No.		DIGITO IVANIE	AWS No.	VALID
1.	ADOR FONTECH, BENGALURU	TIG 120	ER 308L	UPTO OCT2024
2.	ADOR FONTECH, BENGALURU	TIG 121	ER 316L	OCT2024
3.	ADOR FONTECH, BENGALURU	TIG 123	ER 309L	OCT2024
4.	ADOR FONTECH, BENGALURU	TIG 120S	ER 347	OCT2024
5.	ADOR FONTECH, BENGALURU	TIG 521	ER NiCr3	OCT2024
6.	ADOR WELDING LTD., SILVASSA	TIGFIL 70S-2	ER 70S-2	FEB2022
7.	ADOR WELDING LTD., SILVASSA	TIGINOX-308L	ER 308L	SEP2020
8.	ADOR WELDING LTD., SILVASSA	TIGINOX-309L	ER309L	SEP2020
9.	ADOR WELDING LTD., SILVASSA	AUTOMIG 70-S6	ER 70S-6	DEC2023
10.	ADOR WELDING LTD., SILVASSA	AUTOMELT-B71	F7A2-EH14	FEB2024
1.1	B 0 *** **	AUTOMELT-EH 14 WIRE		T EBZ0Z+
11.	D&H INDIA LTD., INDORE	SUPER TIG 308L	ER 308L	DEC2020
12.	D&H INDIA LTD., INDORE	SUPER TIG 309L	ER 309L	DEC2020
13.	D&H SECHERON, INDORE	FILLER WIRE FW 308L	ER 308L	FEB2021
14.	D&H SECHERON, INDORE	FILLER WIRE FW 309L	ER 309L	FEB2021
15.	D&H SECHERON, INDORE	F 70 S2	ER 70S-2	JUN2022
16.	RAJRATNA ELECTRODES,	RAAJTIG ER 308L	ER 308L	MAR2020
1.5	AHEMEDABAD			111111111111111111111111111111111111111
17.	RAJRATNA ELECTRODES,	RAAJTIG ER 316L	ER 316L	MAR2020
1.0	AHEMEDABAD			
18.	VENUS WIRES, KHOPOLI	VENUS 308L	ER 308L	SEP2021
19.	VENUS WIRES, KHOPOLI	VENUS 316L	ER 309L	SEP2021
20.	VENUS WIRES, KHOPOLI	VENUS 309L	ER 316L	SEP2021
21.	VENUS WIRES, KHOPOLI	VENUS 347	ER 347	SEP2021
22.	WELD FAST ELECTRODES, NAGPUR	TIG FAST-3	ER 70S-2	JAN2021
23.	WELD FAST ELECTRODES, NAGPUR	MIG FAST-1	ER 70S-6	JAN2021

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(Anoop Singh) ACE & Head QA (M-6)

Through: Shri A.K. Singh, AD (QA-Opns. & Group-1)

Executive Director (QA)

17.12.19

ABingh 17/12/19