



Bharat Heavy Electricals Limited
(Seamless steel Tube Plant)
Tiruchirappalli – 620014, TAMIL NADU, INDIA

Annexure-E - Important Note to New Vendors (thro' web Viewers)

The new vendors will be required to furnish the following documentary proof/ information along with their offers:

1. Certificate of registration to Manufacturer of Machining Items (copy of certificate given by the govt. to be submitted).
2. Banker's information (copy of bank pass book first page to be submitted).
3. MSME vendor certificate (if applicable).
4. Address of your organization (complete postal address with PINCODE).
5. Contact person's Phone No. /Mobile No. / FAX No. /E-mail ID.
6. Statutory documents – VAT / TIN / EXCISE REGISTRATION / CST REGN / SERVICE TAX REGISTRATION etc. (copy to be furnished)
7. NSIC Certificate (if applicable)
8. ISO Certificate (if applicable)
9. Experience certificate as proof of supply of similar supply of SRM & Push Bench Rolls to any Govt. agencies / PSU / Organizations (copy of PO's to be furnished).
10. Audit Report/ IT Return (if applicable)
11. Agency agreement with manufacturer (if applicable)
12. Partnership Deed (if applicable).

The below Qualifying criteria for SRM & Push Bench Rolls:

- 1) The vendor shall have copies of recent Purchase Orders for the supply of SRM & Push Bench Rolls
- 2) The vendor shall confirm to the all points of TDC. (Technical delivery condition).
- 3) Trail order will be placed 15 Nos of any one Item. After successful completion of order you be regularized for further tender processing.

If the new vendors fail to submit the above documentary proof/information, their offers will not be considered for this enquiry.

Sr. Manger / Purchase /SSTP
Phone: 0431-257 8426.
Mail: barathiar@bheltry.co.in



General Note:

Page:1/3

PHONE : 91-44-28158821
GRAMS : BHARATELEC
FAX NO:
E-mail :
Web :

OFFICE COPY

Collective No.

9621700182

Enquiry Date

19.10.2017

Due Date For
Quotation

15.11.2017

Please quote Enquiry No, Date and due date in all
correspondences.
This is only a request for quotation and not an order

Item	Description	Unit	Quantity	Delivery Quantity	Schedule Date
10	SP6906210017 PUSH BENCH FIXED ROLL (20 - 158 / 05) FIXED ROLL DRAWING No. : 20.ST.192.01.158/05 TDC NO. : TDC/TE/MFG : 05 REV. No. : 09 DATE : 17.08.2012.	NO	100.000	100.00	29.09.18
20	SP6906310011 PUSH BENCH ADJUSTABLE ROLL 20-159/ 05 ADJUSTABLE ROLL DRAWING No. : 20.ST.192.02.159/05 TDC NO. : TDC/TE/MFG : 05 REV.NO. : 09 DATE : 17.08.2012	NO	60.000	60.00	29.09.18
30	SP6911110564 STEEL ROLL SRM380/R40 (20-157/08) STEEL ROLL SRM380 - R40 DRG. NO. : 20-ST-115-01-157/08 SL. NO. : 01 TDC NO : TDC/TE/MFG-06 REV.NO : 04 DATED : 26.08.2010	NO	60.000	60.00	29.09.18
40	SP6912510094 STEEL ROLL SRM300/R20 STEEL ROLL SRM300/R20 DRG NO. : 20.ST.115.02.160/11 SL.NO. : 01 RADIUS-R : R20 TDC NO. : TDC/TE/MFG-06 REV.NO. : 04 DATE : 26.08.2010	NO	175.000	175.00	29.09.18
50	SP6912510541 STEEL ROLL SRM300/R24 DRAWING NUMBER : 20.ST.115.02.160/11 SL.NO. : 2 RADIUS,R : 24 TDC NO. : TDC/TE/MFG-06 REV.NO. : 04 DATE : 26.08.2010	NO	70.000	70.00	29.09.18

General Note:

- This Tender is floated on TWO-BID basis.
- Following details are enclosed.
a.,,Annexure-A - Important Note to Tenderers & Annexure-D Note to
MSE Vendors enclosed. Send your MSE Certificate accordingly.
Tenderers are requested to submit their Offers in TWO-BID basis,

The offers should reach us 30 minutes before the time of opening of tenders.
The offers will be opened at 14.30 hrs on the due date of tender in the presence of
tenderers who have submitted their offer and who may like to be present for the tender
opening.Late and delayed offers are liable to be rejected.

Yours faithfully,
For BHARAT HEAVY ELECTRICALS LIMITED

MANAGER / PURCHASE
(SSTP)



9621700182 / 19.10.2017

11793

viz.,

I.,Part I,,,,,Technical and Un-Priced Commercial Bid

II.,Part II,,,,,Price Bid

b.,Annexure-B - Technical Conditions

c.,Annexure-C - Commercial Conditions

3. Tenderers are required to fill in above Annexure-B and C and enclose them along with their UN-PRICED BID.

4.a. Delivery date furnished in the Enquiry is only indicative.

4.b. For Delivery Schedule - Pl. refer Clause No. C.4 of Annexure- C.

5. Price Bid of Vendors, who accept the Clause No. B.1 to B.3 of Annexure-B & C.1 to C.5 of Annexure- C. shall only be considered for further processing. Fill the Annexure-B & C and enclose it with Technical and Un-Priced commercial Bid.

For Payment term - Refer Annexure - C Point No. C- 2. Any deviation in the above payment term will attract loading as mentioned below.

For payment term deviation - "Base rate of SBI (as applicable on the date of bid opening. Techno-commercial bid opening in case of two part bids) + 6% shall be considered for loading for the period of relaxation sought by bidders.

Payment through Bank. LC/Advance Payment are liable for rejection.

THE ROLL SHALL BE SUPPLIED AS PER THE DRAWING & TDC.

2) THE ROLL PROFILE CHECKING TEMPLATE SHALL BE COLLECTED BY THE SUPPLIER FROM SSTP/BHEL TO CHECK THE ROLL PROFILE.

3) THE TEMPLATE SHALL BE RETURNED ALONG WITH THE FINAL SUPPLY BY THE FIRM WITHOUT FAIL, OTHERWISE PURCHASE IS REQUESTED TO RECOVER THE COST OF THE TEMPLATE FROM THE PENDING BILL OF THE FIRM.

Enclosures:

"LD clause has to be confirmed without fail."

The bidder along with its associate / collaborators / sub-contractors / sub-vendors / consultants /service providers shall strictly adhere to BHEL fraud prevention policy displayed on BHEL website

<http://www.bhel.com> and shall immediately bring to the notice of BHEL Management about any fraud or suspected fraud as soon as it comes to their notice.

"Payment to vendors will be made only thro E-Payment mode."

PR Links

Material.	PR.No	PR.Item.	Quantity	Acc. Assign	Customer Number
SP6906210017	119802306	00050	100.000	/000000	
SP6906310011	119802306	00040	60.000	/000000	
SP6911110564	119802306	00030	60.000	/000000	
SP6912510094	119802306	00010	175.000	/000000	
SP6912510541	119802306	00020	70.000	/000000	

list of suppliers

RFQ-5100257571

The offers should reach us 30 minutes before the time of opening of tenders.
The offers will be opened at 14.30 hrs on the due date of tender in the presence of tenderers who have submitted their offer and who may like to be present for the tender opening.Late and delayed offers are liable to be rejected.

Yours faithfully,
For BHARAT HEAVY ELECTRICALS LIMITED

MANAGER / PURCHASE
(SSTP)

IMPORTANT NOTE TO TENDERERS
(FOR INDIGENOUS & OVERSEAS SUPPLIERS)

This Tender is floated on Three-BID System. Tenders are requested to submit their offers in Three-BIDS (Part I: Qualifying criteria, Part II : Un priced bid and Part III: Price Bid) separately in a sealed cover as follows.

1. **Part I : Qualifying criteria** as per Annexure-E.
2. **Part II: UN PRICED BID:** (Complete with technical & Commercial conditions as per enquiry including un priced copy of price schedule i.e. identical to part II with prices blanked and replaced by “Quoted”)

The Tenderer should confirm their acceptance / comments to the Enquiry along with other commercial Terms & Conditions of the Tender. In case any deviation is taken by the Tenderer from the Tender requirements, it is to be clearly indicated in the offer with reference to the particular clause. If such deviations are not explicitly indicated in the offer, it will be construed by BHEL that the Tenderer is complying with Annexure Clause(s), Commercial terms & conditions and other conditions in full.

2. **Part III: PRICE BID:** Price (with break-up details wherever required) to be indicated.
3. **The qualifying criteria, Un priced Bid and Price Bid is** to be submitted in a single envelop before 1400 hours (Indian Time) on tender Due Date.
4. The qualifying criteria shall be put in a separate sealed cover superscripted with Tender number, Tender Date & Tender Due Date and also the cover should be clearly marked with “QUALIFYING CRITERIA”.
5. The **Unpriced Bid** shall be put in a separate sealed cover superscripted with Tender number, Tender Date & Tender Due Date and also the cover should be clearly marked with “UNPRICED BID”.
6. The **Price Bid** shall be put in a separate sealed cover superscripted with Tender number, Tender Date & Tender Due Date & the cover should be clearly marked with “PRICE BID”.
7. All the 3 individually enveloped **QUALIFYING CRITERIA UNPRICED BID** and **PRICE BID** covers as mentioned above, have to be put in another single bigger cover clearly indicating Tender number, Tender Date & Tender Due Date at the top of the cover.
This cover is to be addressed to

Purchase Executive,
Purchase Department,
Seamless Steel Tube Plant (SSTP),
BHEL, Tiruchirapalli-620014, India.
Phone No: 91 431 2578502, 2578491

8. Qualifying criteria shall only be opened on the Tender Due Date mentioned in the Tender, in the presence of Tenderers / their Authorized Representative, who may like to be present for such opening. The un priced bid and price bid will NOT be opened on the date of tender opening. It will be evaluated and informed the suitability.
8. After accepting the qualifying criteria, the unpriced bid will be opened and the Unpriced Bid, they shall be evaluated by BHEL for their suitability. BHEL shall hold discussions with the responded Tenderers on the Technical and Commercial terms and freeze the terms & conditions of the offer. These frozen technical specifications will be communicated to responded tenderers.
9. BHEL shall offer opportunity to the responded and technically / commercially suitable Tenderers, to submit their latest Price Bid/ Impact of prices, if any in line with the frozen technical, Commercial, delivery conditions.
10. This latest Price Bid & the Impact of prices for the frozen technical specifications submitted by the Tenderers will be opened in the presence of Tenderers. Based on the above, the ranking of the Tenderers shall be made and accordingly the Tender shall be finalized.

Important Note to MSE Vendors

1. 20% of the tendered quantity is earmarked for MSE suppliers in this tender.
2. Out of the 20% tendered quantity reserved for MSE suppliers, 4% shall be earmarked for procurement from MSE owned by SC / ST entrepreneurs.
3. In case MSE vendor participating in the tender quotes within the price band of L1 + 15%, they will be allowed to supply the portion of the requirement subject to acceptance of L1 price by MSE vendor. In case of more than one such MSE, the supply shall be shared proportionately.
4. MSE suppliers can avail the intended benefits only if they submit along with offer, attested copies of either EM II certificate having deemed validity (Five years from the date of issue of acknowledgement in EM II) or valid NSIC certificate or EM II certificate along with CA certificate (Format enclosed) applicable for the year, certifying quantum of investment in plant and machinery within the permissible limit as per the act for relevant status (Micro or small) where the deemed validity of EM IIs over. Date to be reckoned for determining the deemed validity will be the last date of technical bid submission. Non submission of such documents will lead to consideration of their bids at par with other bidders and MSE status of such suppliers shall be shifted to Non MSE supplier till the supplier submits these documents.

Certificate by Chartered Accountant

This is to Certify that M/S,
(hereinafter referred to as 'company') having its registered office at
..... is registered under MSMED Act 2006, (Entrepreneur
MeMemorandum No (Part—II).....dtd:.....,

Category:..... (Micro/Small)). (Copy enclosed).

Further verified from the Books of Accounts that the investment of the company as on
date as per MSMED Act 2006 is as follows:

1. **For Manufacturing Enterprises: Investment in plant and machinery** (i.e. original cost excluding land and building and the items specified by the Ministry of Small Scale Industries vide its notification No.5.0.1722(E) dated October 5, 2006:

Rs. Lacs

2. **For Service Enterprises: Investment in equipment** (original cost excluding land and building and furniture, fittings and other items not directly related to the service rendered or as may be notified under the MSMED Act, 2006:

Rs. Lacs

The above investment of Rs Lacs is within permissible limit of

Rs Lacs for Micro / Small (Strike off which is not applicable)

Category under MSMED Act 2006.

Date:

(Signature)

Name -

Membership number -

Seal of Chartered Accountant

Annexure – B.
Technical Conditions

Vendor Code:	Vendor Name:	
Tender No.:	Tender Date:	Tender Due Date:

Sl.No.	Technical Requirement	Accepted
B.1.	To supply of Materials as per Tender Specifications, Drawings, TDC - without any deviation.	
B.2.	Heat treatment will be witnessed by SSTP/BHEL. Advance intimation to be given for the same.	
B.3.	The Test certificate will be sent along with the supply Material Chemistry – NABL accredited Lab certificate & Harness certificate	
B.4	To supply of materials with suitable packing to avoid transit Damage	
<u>Deviations, if any (attach additional sheet, if reqd) :</u>		

Signature :

Date :

Seal :

Annexure – C. **Commercial Conditions**

Vendor Code:	Vendor Name:	
Tender No.:	Tender Date:	Tender Due Date:

Sl. No.	Commercial Terms	Accepted										
C1.	<u>Delivery Terms :</u> Free delivery at BHEL/SSTP Stores.											
C2.	<u>Payment :</u> 100% after 45 days after receipt and acceptance of materials by BHEL											
C3.	<u>LIQUIDATED DAMAGES:</u> It is clearly understood among the parties to the Contract that TIME IS THE ESSENCE OF THE CONTRACT. Therefore, the delivery of the goods specified in the Purchase Order shall be made within the time prescribed. Where the Seller supplies or despatches the goods, beyond the delivery period specified, and the Purchaser will have no obligation to accept the goods. If accepted, Liquidated Damages at the rate of 0.5% (Zero point five Percent) of the total lot value of goods, per week of delay, subject to a maximum of 10% (Ten Percent) or part thereof, will be levied without prejudice to any other relief or compensation due to the Purchaser under any other conditions of the Contract. <u>RISK PURCHASE:</u> Alternatively, the Purchaser, at his option, will be entitled to terminate the Contract and to purchase elsewhere at the risk and cost of Seller, either the whole of the goods or any part, which the Seller has failed to deliver or dispatch within the time stipulated as aforesaid or if the same were not available the best and nearest available substitute thereof. The Seller shall be liable for any loss, which the Purchaser may sustain by reason of such Risk Purchase(s), in addition to penalty at the rate mentioned as above.											
C4.	<u>Delivery Period :</u> <table border="1"><thead><tr><th>Delivery from PO Date</th><th>Qty to be supplied For all items</th></tr></thead><tbody><tr><td>10 Weeks</td><td>30% of Enq. Qty</td></tr><tr><td>16 weeks</td><td>25% of Enq. Qty</td></tr><tr><td>24 weeks</td><td>25% of Enq. Qty</td></tr><tr><td>32 weeks</td><td>20% of enq. Qty.</td></tr></tbody></table> The Enquiry quantity will be splitted into 60:40 to L1 : L2 , L3, L4 Etc sequentially leaving H1 vendor whom to accept the L1 Rate.	Delivery from PO Date	Qty to be supplied For all items	10 Weeks	30% of Enq. Qty	16 weeks	25% of Enq. Qty	24 weeks	25% of Enq. Qty	32 weeks	20% of enq. Qty.	
Delivery from PO Date	Qty to be supplied For all items											
10 Weeks	30% of Enq. Qty											
16 weeks	25% of Enq. Qty											
24 weeks	25% of Enq. Qty											
32 weeks	20% of enq. Qty.											
C5	<u>Validity – 60 Days from the date of Tender Opening.</u>											
<u>Deviations, if any (attach additional sheet, if reqd) :</u>												

Sl.No.	Commercial Terms	
C6.	a. GST HSN No.	
	b. GST (%)	
	C. GST Regn certificate & PAN No.	
C7.	Other Cost (if any) - % (or) Rs.	
C8	Are you Micro/Small/Medium Industry? (If YES, please furnish MSE Regn.No., along with a copy of MSE Certificate)	YES / NO MSE No. MSE Certificate enclosed(Yes/NO)
C9.	Contact detail Name Mobile No. Mail Id	
C10.	<u>Deviations, if any (attach additional sheet, if reqd) :</u>	

Signature with Date :
Seal :

TERMS AND CONDITIONS OF ENQUIRY

1.0 OFFER

1.1 Each Tender shall be sent in double cover. Inner cover shall be sealed with Tenderer's distinctive seal and super scribed with correct Enquiry No. and Enquiry Due Date. The Outer cover shall only bear the address of this Office and shall not have any indication that a Tender is within. Two or more Offers shall not be sent in one cover but the Offer against each Enquiry shall be sent separately to avoid confusion. Tender shall not be addressed to any individual's name but only by Designation.

1.2 Tenders shall be free from CORRECTION AND ERASURES Corrections. If any, must be attested. All amounts shall be indicated both in words as well as in figures. Where there is difference between the amount quoted in words and figures, amount quoted in words shall prevail.

1.3 Rate(s) shall be net F.O.R./BHEL-SSTP STORES, inclusive of risk in transit and remain valid for 60 days from the Enquiry Due/other Taxes/Duties.

1.4 If any Sales Tax and/ or Excise Duty and/ or other Taxes/Duties is/are payable as extra to the quoted Rate, it shall be specifically stated in offer, failing which the Purchaser will not be liable for payment of Sales/Excise Duty/other Taxes/Duties.

1.5 No voluntary revision of prices will be entertained after opening the Tender(s).

1.6 Manufacturer's Name, Trade Mark or Patent No., if any, shall be specified. Illustrative leaflets giving technical particulars are required along with the Offer, wherever necessary.

1.7 Products with I.S.I. Certification Marks will be preferred.

1.8 The Purchaser shall be under no obligation to accept the Lowest Tender or any other Tender. The Purchaser shall be entitled to accept or reject any Tender, in part or full, without assigning any reason whatsoever.

1.9 The Purchaser also reserves the right to allow the Purchase Preference Facilities to the Public Enterprises, as admissible under Government Policy and Amendments thereto from time to time.

1.10 BHEL reserves the right to increase or decrease the Tender Quantity and split the Tender Quantity among more than one Tenderer and place Orders accordingly in proportion, based on commitment, requirement and Supplier's capability in terms of delivery and quality.

1.11 Lowest Rate received against Tender(s) need not be the technically acceptable L-1 Rate and BHEL reserves the right not to consider the same.

1.12 BHEL reserves the right to negotiate or re-float the opened Tender, if L-1 rate is not the lowest acceptable rate to them, inter-alia other reasons.

1.13 BHEL reserves the right to negotiate the L-1 Rate.

1.14 BHEL may order more than one Vendor at the lowest acceptable Rate.

2.0 **SAMPLES:** Wherever possible, samples shall be submitted separately whether specifically requested or not, so as to reach the Purchaser on or before the Enquiry Due Date. They shall be clearly marked with the Enquiry No. and Enquiry Date, on the cover to facilitate identification.

3.0 **PACKING AND MARKING:** The Seller shall arrange for securely protecting and packing the stores to avoid loss or damage during transit.

4.0 **TERMS OF PAYMENT:** 100% Payment will be made after 45 days of receipt & acceptance of materials at BHEL. Wherever required by the Purchaser, the successful Tenderer must send the Operation and maintenance Manual(s), Test Certificate(s), Drawing(s) etc., for the materials ordered, along with the materials and a statement to that effect shall be made in the invoice. Failure to comply with this provision, will result in delay in payment of the Bill(s), Goods dispatched either by V.P.P. or routing the documents through Bank, will not be accepted unless agreed to by the Purchaser.

5.0 **LIQUIDATED DAMAGES:** It is clearly understood among the parties to the Contract that TIME IS THE ESSENCE OF THE CONTRACT. Therefore, the delivery of the goods specified in the Purchase Order shall be made within the time prescribed. Where the Seller supplies or despatches the goods, beyond the delivery period specified, and the Purchaser will have no obligation to accept the goods. If accepted, Liquidated Damages at the rate of 0.5% (Zero point five Percent) of the order value , per week of

delay, subject to a maximum of 10% (Ten Percent) or part thereof, will be levied without prejudice to any other relief for compensation due to the Purchaser under any other conditions of the Contract.

6.0 RISK PURCHASE: Alternatively, the Purchaser, at his option, will be entitled to terminate the Contract and to purchase elsewhere at the risk and cost of Seller, either the whole of the goods or any part, which the Seller has failed to deliver or dispatch within the time stipulated as aforesaid or if the same were not available the best and nearest available substitute thereof. The Seller shall be liable for any loss, which the Purchaser may sustain by reason of such Risk Purchase(s), in addition to penalty at the rate mentioned in Clause No.05 above.

7.0 CENVAT CREDIT:

7.1 Please explicitly indicate the following in the Offer to enable us to avail CENVAT Credit.

7.1.2 Central Excise Chapter Heading Number, under which the goods will be cleared and Present Rate of Excise Duty.

7.2 In the event of an Order being placed, Excise Duty will be reimbursed only based on the Duplicate Copy EXCISE INVOICE (Transporters Copy), Seller shall take acknowledgement from the authorized personnel/transporter, while delivering the goods, for having handed over the above Duplicate Copy.

7.3 If the Seller is a First Stage Dealer/Second Stage Dealer/Depot/Consignment Agent/Importer/Importer-Agent, the Seller has to confirm that he will be following the procedures in terms of the provisions of Central Excise Rules-2002 to enable BHEL to avail CENVAT Credit, under CENVAT Credit Rules-2002.

7.4 All the time of submission of Invoice(s), the Seller is required to furnish the following Certificate.

The Amount of Rs. (Rupees in words.) claimed as CENVAT in the Bill is in accordance with the provisions of the Rules in all respects and that the same has been paid to the Central Excise Authorities in respect of the materials covered by the Bill.

8.0 GENERAL: Any other conditions which might have been quoted by the Seller and are in contravention to the Terms prescribed in the Tender/Order and which have not been specifically accepted by the Purchaser, will not be applicable to the Contract and BHEL's standard Terms and Conditions shall only be applicable.

9.0 IMPORTANT NOTE:

9.1 In the event of quoting Packing and Forwarding charges extra in the offer, the Packing charges and Forwarding charges shall be separately quoted and shall not be combined. Also please note that no Excise Duty and Sales Tax shall be payable on Forwarding charges. In case this is not complied with, corresponding Excise Duty and Sales Tax on packing charges will not be paid.

9.2 Tenderer is requested to furnish all the details called for in the Tender. In case any required data/information is / are not furnished in the Offer, Purchaser reserves the right to assume the same for the purpose of evaluation/comparison and decide the Tender accordingly.

10.0 Important Note to MSE Vendors:

10.1 20% of the tender quantity is earmarked for MSE suppliers in the tender.

10.2 Out of the 20% tendered quantity reserved for MSE suppliers, 4% shall be for procurement from MSE owned by SC/ST entrepreneurs.

10.3 In case MSE vendor participating in the tender quotes within the price band of L1 + 15%, they will be allowed to supply the portion of the requirement subject to acceptance of L1 price by MSE vendor. In case of more than one such MSE, the supply shall be shared proportionately.

10.4 MSE suppliers can avail the intended benefits only if they submit along with offer, attested copies of either EM II certificate having deemed validity five years from the date of issue with CA certificate (Format enclosed) applicable for the year, certifying quantum of investment in plant and machinery within the permissible limit as per the act for relevant status (Micro or Small) where the deemed validity of EM IIs over. Date to be reckoned for determining the deemed validity will be the last date of technical bid submission.

10.5 Non submission of such documents will lead to consideration of their bids at par with other bidders and MSE status of such suppliers shall be shifted to Non MSE supplier till the supplier submits these documents.

BHEL, Tiruchirapalli-620014		SSTP / Tool Engineering	Technical Delivery Conditions
Product : SRM ROLLS			
Document No.	Revision No.	Effective Date	Page No.
TDC/TE/MFG- 06	04	26.08.2010	1 of 2
Revision Record	04 – Clause 3.4 : modified Clause 7.1 : liquid penetrant test details added Clauses 6.0 – 11.0 rearranged & renumbered to 6.0 – 10.0 Clause 8.0 : modified		

1.0 **PRODUCT:**

Sl.No.	Equipment / Product	Drg. No.	Drg. Rev. No.
1.	Steel Roll SRM 300	20.ST.115.02.160	AS PER LATEST ENQUIRY / PURCHASE ORDER
2.	Steel Roll SRM 380	20.ST.115.01.157	

2.0 **APPLICATION:**

Used in Stretch Reducing Mill Stands - for Hot Rolling of Seamless Steel Tubes in Temperature 850 - 900 Deg.C

3.0 **MATERIAL:**

- DIN 1.2201 – X165Cr.V12 (OR) SAE J438(70) D2 (OR) IS:3748-1990 XT160Cr12**
- Conduct Ultrasonic Test on Raw Material after proof machining in accordance with SA 388.
- Acceptance Standard in accordance with AM 203.2(c), ASME Sec VIII Div.2.
- Chemistry : As per drawing
 Original mill test certificate shall be provided. Otherwise copy of original mill test certificate and test report from **NABL accredited lab** for chemical check on sample from the procured material shall be provided.

4.0 **DIMENSIONS AND TOLERANCE:**

Shall be as per Drawing

5.0 **HEAT TREATMENT:**

Sl.No.	Process	Detail
1.	Stress Relieving	650-705 Deg.C 2 Hours / 25mm Soaking Slow cooling to 500 Deg.C Air Cool
2.	Hardening	980-1025 Deg.C 1 Hour / 25mm Soaking
3.	Oil Quenching	80 Deg.C (Servo Quench 11)
4.	Tempering – I	470-580 Deg.C 3-4 Hrs. Soaking Air Cool to Hand-warm Temperature (about 50 Deg.C)
5.	Tempering – II	530-550 Deg.C 1 Hour / 25mm Soaking

6.0 **INSPECTION & TESTING:**

6.1 **DIMENSIONAL INSPECTION :**

Dimensional inspection shall be carried out by the supplier and report for the same shall be sent along with the supplies – Acceptance as per drawing.

Air gap to be checked using template and the same shall be given by SSTP/BHEL on placement of order

BHEL, Tiruchirapalli-620014	SSTP / Tool Engineering	Technical Delivery Conditions	
Product : SRM ROLLS			
Document No.	Revision No.	Effective Date	Page No.
TDC/TE/MFG - 06	04	26.08.2010	2 of 2

6.2 **MECHANICAL TESTING:**

1. Hardness Test as per **DIN EN ISO 6508-1** FOR X165CrV12 - Acceptance as per Drawing.
2. Hardness Test as per **SAE J438(70)** for D2 - Acceptance as per Drawing.
3. Hardness Test as per **IS:3748-1990** for XT160Cr12 - Acceptance as per Drawing.

7.0 **NON-DESTRUCTIVE TEST :**

7.1. **Liquid Penetrant Test :**

To be conducted on entire surface after finish machining as per **ASTM E165** and shall be certified by **NDT Level II qualified personnel as per SNT-TC-1A.**

Acceptance standards : All surfaces to be examined shall be free of,

1. Relevant linear indications,
2. Relevant rounded indications greater than 3/16 inch (5 mm)
3. Four or more relevant rounded indications in a line separated by 1/16 inch (1.5 mm) or less, edge to edge.

8.0 **TEST CERTIFICATE/REPORT :**

Following test certificates shall be sent with Materials.

PO No., component name, TDC NO. and drawing no. shall be mentioned where ever applicable.

Traceability data like Heat / Melt No. & job Sl. No. shall be provided in all the reports.

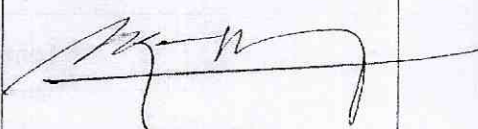
1. Raw Material Chemistry (**Clause 3.4**)
2. Hardness (**Clause 6.2**)
3. Temperature-Time-Recorder Graph for the Heat Treatment Cycle followed
4. Ultrasonic Test Report for Raw Material (**Clause 3.2 & 3.3**)
5. Liquid Penetrant Test (**Clause 7.1**)
6. Dimension Report (**Clause 6.1**)

9.0 **MARKING:**

The marking shall be done on the job as shown in the Drawing.

10.0 **PRESERVATION & PACKING :**

1. Supply with rust preventive coating which shall be dry after application and removable by common solvents.
2. Pack suitably to avoid transit & handling damages

Prepared By	Reviewed By	Approved By
 DM / TE	 DGM / QA&C	 AGM / TE

BHEL, Tiruchirapalli-620014		SSTP / Tool Engineering	Technical Delivery Conditions
Product : PUSH BENCH ROLL			
Document No.	Revision No.	Effective Date	Page No.
TDC/TE/MFG- 05	09	17.08.2012	1 of 3
Record of revision	07 – Clause 3.1,3.2 & 3.3 modified w.r.t Forging, UT and TC for raw material Clause 7.0 Forging acceptance details added Clause 7.1.1 & 7.1.2 Tensile & hardness test details added Clause 7.2.1 Liquid penetrant test & acceptance details added Clause 9.0 report requirement details added In Table A, tensile test piece details added 08 – Clause 3.1- 3.3 modified as 3.1 – 3.5; Clause 4.0 modified 09 – Drawing No. 20.St.192.02.238 added in clause 1.0 for higher dia. roll.		

1.0 PRODUCT:

Sl.No.	Equipment / Product	Drg. No.	Drg. Rev. No.
1.	Push Bench Fixed Rolls	20.ST.192.01.158	AS PER LATEST ENQUIRY / PURCHASE ORDER
2.	Push Bench Adjustable Rolls	20.ST.192.02.159	
		20.ST.192.02.238	

2.0 APPLICATION:

Used in Push Bench Stands for hot rolling of tubes in Temperature 1100-1200 Deg.C. and subjected withstand 60T - 120 T force (impact load), with cyclic heating and cooling.

3.0 MATERIAL:

DIN 1.2365 - X32CrMoV33

- 3.1 Raw material is to be forged to ensure uniformity of structure & strength with reduction ratio in cross section area of 4:1 from ingot to final forging, close to final shape and size. The forging shall be made as disk / ring forging so that the flow lines are oriented parallel to the circumference. The forging supplier shall furnish TC clearly indicating the size of ingot (cross section X length) used and the forging reduction ratio achieved. Forging shall undergo post forge **Stress Relieving at 650 degree C for 24 Hrs.** with furnace cooling and further **Spheroidizing Annealing at 800 degree C for 20 – 30 Hrs.** and cooled in furnace.
- 3.2 The ingot for the above forging shall be made with any one of the following:
Melting process : Electric Arc Furnace / Induction Furnace **and**
Refining : Vacuum De-gassing / Electro Slag Refining.
- 3.3 Inclusion rating shall be as per **ASTM E45**
1. Thick series 0.5 allowed. 2. Thin series 2 max.
3. Grain size shall be 6 or finer.
- 3.4 Ultrasonic testing shall be done on the forging after proof machining in accordance with **SA 388**. Acceptance Standard in accordance with Clause **3.3.4.2 of ASME Sec VIII Div.2**. Test shall be certified by **NDT Level II** qualified personnel as per **SNT-TC-1A** (Society for Non destructive Testing)
- 3.5 The ingot & forging supplier shall provide
Original mill Test Certificate (TC) for the Material Chemistry (or)
Copy of mill TC and NABL accredited Lab Test Report for Material Chemistry in original.
- 4.0 **HEAT TREATMENT:**
As per Table-A furnished in page 3. The temperatures shown are indicative which can be modified as necessary to achieve the specified mechanical properties.
- 5.0 **DIMENSIONS AND TOLERANCE:**
As given in the Drawing
- 6.0 **DIMENSIONAL INSPECTION:**
Dimensional inspection shall be carried out by the supplier - Acceptance as per drawing

BHEL, Tiruchirapalli-620014	SSTP / Tool Engineering	Technical Delivery Conditions	
Product : PUSH BENCH ROLL			
Document No.	Revision No.	Effective Date	Page No.
TDC/TE/MFG- 05	09	17.08.2012	2 of 3

7.0 INSPECTION & TESTING:

Forging details (refer clause 3.1 - 3.5) is to be submitted to BHEL and got approved before the start of proof machining.

7.1 MECHANICAL TESTING :

7.1.1 Tensile Test is to be done on test piece as per DIN 50145. Acceptance as per Drawing

7.1.2 Hardness Test is to be done on job & test piece as per DIN EN ISO 6508-1. Acceptance as per Drawing.

7.2 NON-DESTRUCTIVE TEST :

7.2.1 Liquid Penetrat Test :

To be done after finish machining as per ASTM E165 and shall be certified by NDT Level II qualified personnel as per SNT-TC-1A.

Acceptance standards : All surfaces to be examined shall be free of,

1. Relevant linear indications,
2. Relevant rounded indications greater than 3/16 inch (5 mm)
3. Four or more relevant rounded indications in a line separated by 1/16 inch (1.5 mm) or less, edge to edge.

8.0 MARKING:

Shall be done as given in the drawing

9.0 TEST CERTIFICATE/REPORT:

Following test certificates /reports shall be sent with materials. In all the TCs & reports BHEL PO No., Component Name, TDC NO. and Drawing No., Material Identification No (heat/melt no), Job Sl. No. shall be mentioned where ever applicable:

1. Raw Material Chemistry – Clause 3.5
2. Ultrasonic Test Report for Raw Material – Clause 3.4
3. Hardness & Tensile Test - Clause 7.1.1 & 7.1.2
4. Temperature-Time-Recorder Graph for the Heat Treatment Cycle followed (Table A)
5. Liquid Penetrant Test – Clause 7.2.1
6. Dimension Report – Clause 5.0

10.0 PRESERVATION & PACKING :

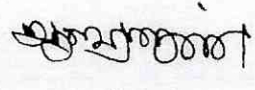
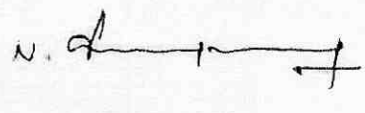
1. Supply with rust preventive coating which shall be dry after application and removable by common solvents.
2. Pack suitably to avoid transit & handling damages

BHEL, Tiruchirapalli-620014	SSTP / Tool Engineering	Technical Delivery Conditions	
Product : PUSH BENCH ROLL			
Document No.	Revision No.	Effective Date	Page No.
TDC/TE/MFG- 05	09	17.08.2012	3 of 3

TABLE – A
Rolls shall be heat-treated as per the following procedure.

Sl.No.	Process	Detail
1.	Stress Relieving	650–675 Deg. C. Hold for 1 Hour / 25mm of thickness Cool in Furnace upto 400 Deg. C and then Air-cool.
2.	Hardening – I Preheat	Charge during Furnace Temp. at 250 Deg.C. Raise Temp. to 540 – 650 Deg.C Rate of heating – 110 Deg.C per hour Hold for 1 Hour / 25mm of thickness of material.
3.	Hardening – II Preheat	845 – 870 Deg.C. Rate of heating – 110 Deg.C per hour Hold for 1 Hour / 25mm of thickness of material
4.	Austenising	1010 – 1040 Deg.C Soaking 15 – 40 min. in Salt Bath
5.	Quenching	596 – 650 Deg.C. Salt Bath Hold for 30 minutes After Temp. equalization – cool in Air.
6.	Alternate Quenching	After soaking – quench in Air
7.	Quenched Hardness	56 – 59 HRC
8.	First Tempering	Immediately after reaching 50 Deg.C – Temper to 525 – 550 Deg.C. Hold for 1 Hour / 25mm thick of materials Air Cool.
9.	Second Tempering	Temper to 600 – 620 Deg.C. Hold for 1 Hour / 25mm thick of materials Air Cool.
10.	Third Tempering	Temper to 580 – 600 Deg.C. Hold for 1 Hour / 25mm thick of materials Air Cool.

Tensile Test piece as per **DIN 50125 - A10 X 50** (Refer Page 3, Clause 4.2, Table 2 of DIN 50125) made from a test coupon heat treated in the same heat treatment batch of the P B Rolls shall be prepared to carry out the tensile test as given in **Clause 7.1.1**

Prepared By	Reviewed By	Approved By
 SR. ADDL ENGR / TE	 SM / QA&C	 MANAGER / TE

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DEVIATIONS OF UNTOLERANCED
DIMENSIONS TO BE AS PER
IS:2102-1969 MEDIUM



CHEMICAL COMPOSITION

EACH ROLL MUST BE FORGED INDIVIDUALLY

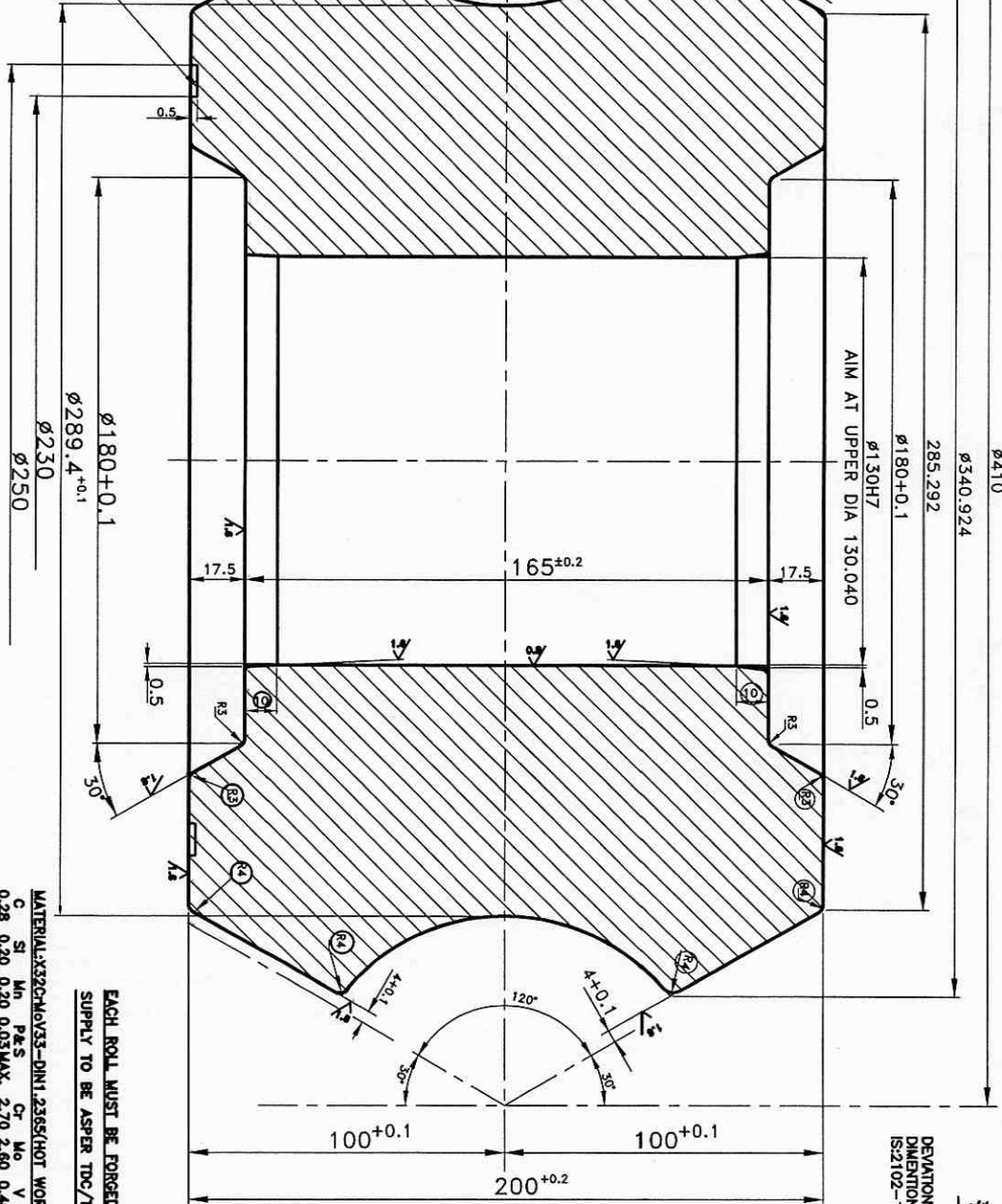
HEAT TREAT TO 155-170kg/mm²

HEAT TREAT TO 155-170K_g/mm²

REV	DATE	APPROVED	REVISOR	NAME	DATE	REVISION
05	08.03.08	08.03.08	08.03.08	08.03.08	08.03.08	08.03.08
BHN VALUE DELETED						
HARDNESS VALUE HRC ADDED						
REV	DATE	APPROVED	REVISOR	NAME	DATE	REVISION
01	06.09.09	06.09.09	06.09.09	06.09.09	06.09.09	06.09.09
DIN EN 0.2 IS INCREASED TO 0.5 FOR DISTINCT TAPER						
02	4.11.99	4.11.99	4.11.99	4.11.99	4.11.99	4.11.99
EACH ROLL FORGING ADDED						
03	09.12.99	09.12.99	09.12.99	09.12.99	09.12.99	09.12.99
SPACE ADDED FOR MARKING						
04	16.04.04	16.04.04	16.04.04	16.04.04	16.04.04	16.04.04
FOR MATL. H11)						
TITLE						
ADJUSTABLE ROLL (PRE FINISHED)						
DRAWING NO: 20.ST.192.02.159						
REV 05						

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MARK: R65, MATERIAL CODE No.6906210017
PO/RO No,ROLL SL No & FIRMS NAME



DEVIATIONS OF UNTOLERANCED
DIMENSIONS TO BE AS PER
IS:2102-1969 MEDIUM

130 H7
+0.042
0

MATERIAL: X32CrMoV3-DIN1.2365 (HOT WORKING TOOL STEEL)
C SI Mn P S Cr Mo V
0.28 0.20 0.20 0.03 MAX. 2.70 2.60 0.40
0.35 0.40 0.40 3.20 3.00 0.70
HARDNESS: 46-50 HRC
HEAT TREAT TO 155-170 Kg/mm²

EACH ROLL MUST BE FORGED INDIVIDUALLY
SUPPLY TO BE ASPER TDC/TE/MFG-005

REV. DATE
01 18.5.98
BHN VALUE DELETED
HARDNESS VALUE HRC ADDED

REV. DATE
01 18.5.98
SL No.02 ADDED (QANT. H11)
DIN 0.2 IS INCREASED TO
0.5 FOR DISTINCT TAPER
03 04.11.99 INDIVIDUALLY FORGING ADDED
04 09.12.99 DIN 0.250, 0.250, 0.5
SPACE ADDED FOR MARKING

SCALE
1:1

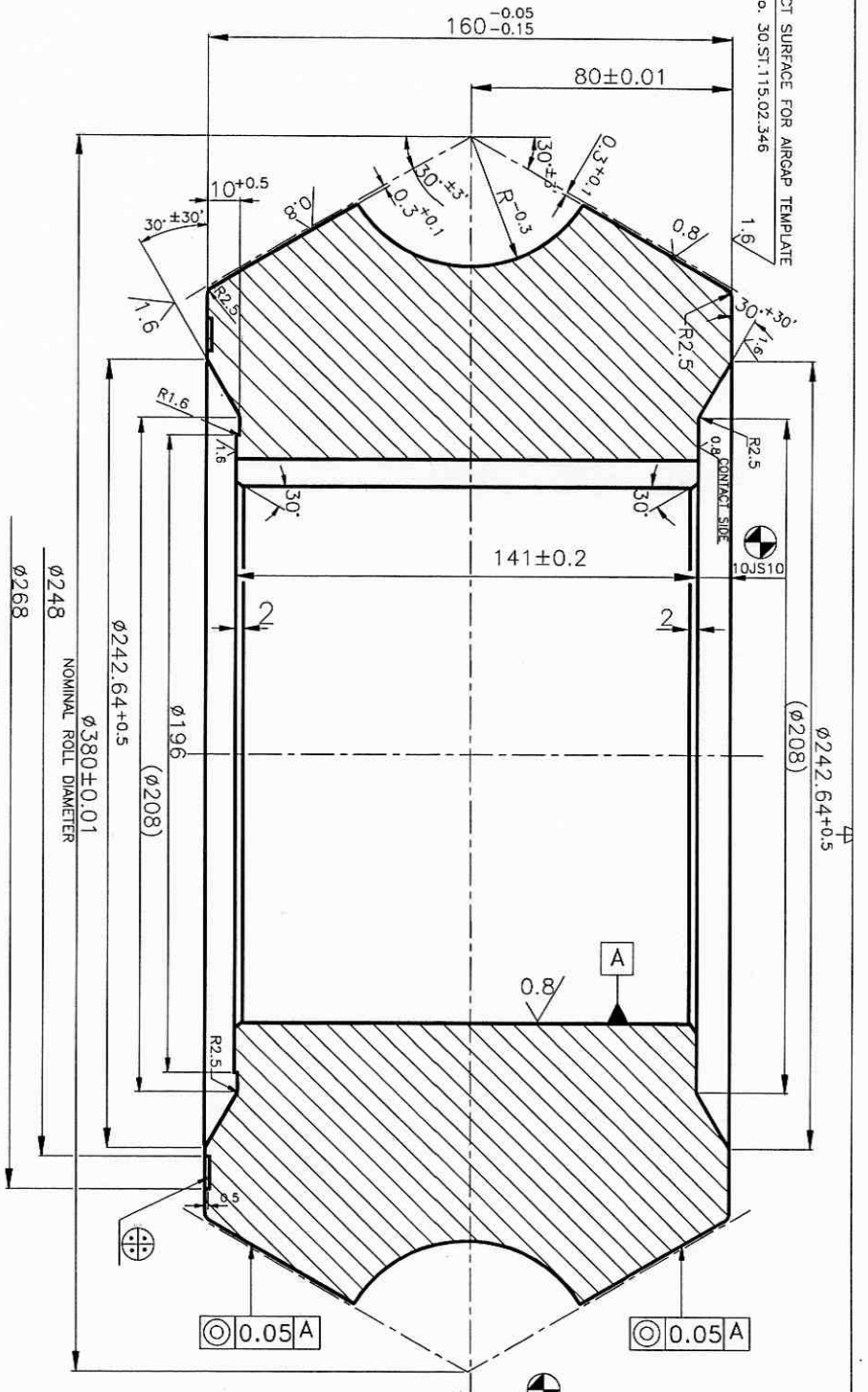
WEIGHT (KG)
93.61

FIXED ROLL
(PRE FINISHED)

20.ST.192.01.158

REV. 05

CONTACT SURFACE FOR AIRGAP TEMPLATE
DRG No. 30.ST.115.02.346



ALL DIMENSIONS ARE IN MILLIMETERS

3.2/1.6 0.8/

165 H7	+0.040
30 JS9	+0.026
10 JS10	+0.029

TOLERANCE SHOULD BE STRICTLY MAINTAINED.

SL. No.	R	MATERIAL CODE No.	WT. Kg
01	40	69 11 11 056 4	69.51
02	45	69 11 11 006 8	64.88
03	50	69 11 11 002 6	60.25
04	60	69 11 11 055 6	49.32
05	35	69 11 11 110 8	71.50

SL. No.	MATERIAL	C	Si	Mn	Cr	Mo	V	W	S	P	Co
01	X165CrV12 (DIN 1.2201)	1.55	0.25	0.20	11.00	-	0.07	-	0.035Max.	0.035Max.	-
02	X160CrV12 (S.3748-1990)	1.50	0.10	0.25	11.00	0.80Max.	0.80Max.	0.60Max.	0.035Max.	0.035Max.	-
03	D2 (AISI/SAE)	1.40	0.30	0.30	11.00	0.70	0.80Max.	-	-	-	0.60Max.

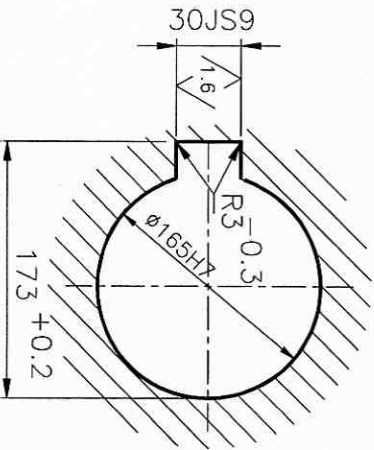
ANY ONE OF THE MATERIALS LISTED ABOVE SHALL BE USED
HARDNESS 50-54 HRC

MARK R VALUE & MATERIAL CODE No. PO/RO No. ROLL SL. No. & FIRMS NAME
SUPPLY TO BE ASPER TDC/TE/MFG-06

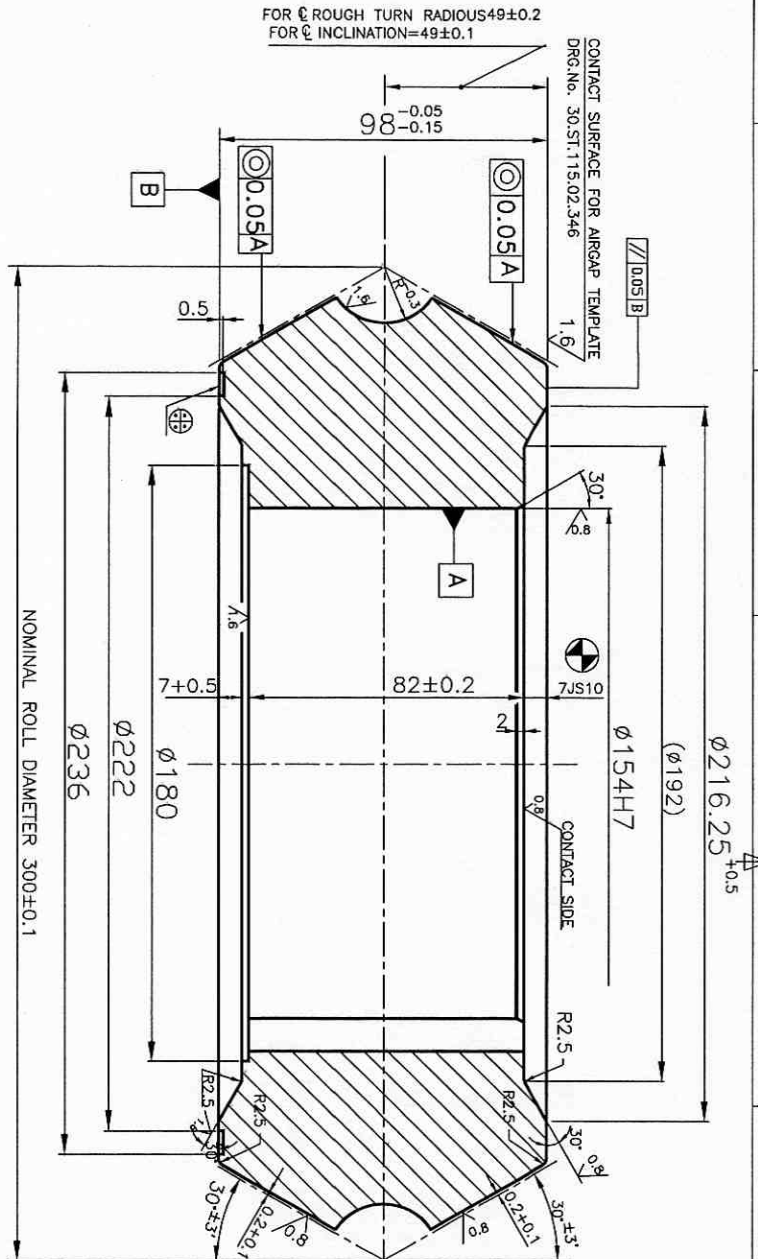
Bharat Heavy Electricals Ltd	TRICHIRAPALLI - 620014	DATE	11.07.11
SEAMLESS STEEL TUBE PLANT	APPRO	REVISION	MADE

REV	DATE	APPROVED	DESIGNED	SCALE	WEIGHT (Kg)	REV	DATE
08	10.12.08	XT160CrV12&D2 MATERIAL ADDED		1:1		08	20.ST.115.01.157

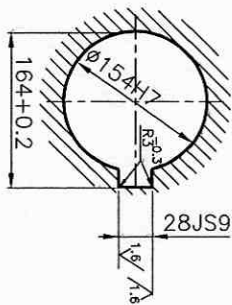
STEEL ROLL
(S R M 380)



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NOMINAL ROLL DIAMETER 300±0.1



3.2/1.6/0.8/
154 H7
28 JS9
7 JS10

TOLERANCE SHOULD BE STRICTLY MAINTAINED.

SL. No.	R	MATERIAL CODE No.	WT. Kg
01	20	69 12 51 009 4	27.5
02	24	69 12 51 054 1	26.1
03	35	69 12 51 055 9	21.1
04	15	69 12 51 110 8	28.3
05	28	69 12 51 111 6	24.8
06	12	69 12 51 110 2	29.1

SL. No.	C	SI	Mn	Cr	Mo	V	W	S	P	Co
01	X16SCV12	1.55	0.25	0.20	11.00	0.07	-	0.035Max.	0.035Max.	-
02	XT160C-12	1.50	0.10	0.25	11.00	0.80Max.	0.80Max.	0.035Max.	0.035Max.	-
03	(IS:3748-1990)	1.70	0.35	0.35	13.00	0.80Max.	0.80Max.	0.035Max.	0.035Max.	-

ANY ONE OF THE MATERIALS LISTED ABOVE SHALL BE USED

HARDNESS 50-54 HRC

MARK R VALUE & MATERIAL CODE No. P/RO No. ROLL SL. No. & FIRMS NAME
SUPPLY TO BE ASPER TDC/TE/MFG-06

REV	DATE	REASON	REV	DATE	REASON
11	19/10/13	AS PER APPROVED	10	18/10/13	AS PER APPROVED
SIN. NO. 06 R12 ADDED					
PARALLELISM 0.05 ADDED					
MATERIAL XT160C-12AD2 ADDED					
STEEL ROLL					
(S R M 300)					
DRAWING NO: 20-ST-115-02-160					
REV 11					