

Annexure-1 :: Conditions of Contract

Tender Enquiry:14E0___ date:__.11.2014 due on:__.12.2014

BHEL NIT No.:_____dt:_____

(Copper Strip Flexibles including Silver Plating & Electro Tinning)

General Conditions of Contract (GCC):

1. Rates shall be quoted FOR BHEL RUDRAPUR (Address: CFP-BHEL RUDRAPUR, Kichha Bye Pass Road, Near FCI Godown, U.S.Nagar, Uttaranchal).
2. Rates should be quoted for entering into frame work agreement for 01 year. Rates quoted shall be firm for 01 year for ordering. Multiples Orders shall be placed during currency of year on firm rates. PV Clause for Copper & Silver shall be applicable with this enquiry.
3. 100% payment shall be made in 45 days after receipt and verification of material at store. Any deviation in payment terms will be loaded @ (SBI PLR rate at the time of tender opening + 6 %) annual interest for comparing standing.
4. Validity of the quotation must be 3 months from the date of quotation.
5. Delivery time should be quantified for the sequential lots from the date of each PO. 1st lot of 2MT within 03 months from PO & subsequently 2MT/ month.
6. Minimum 21 days notice period shall be given for inviting offers. `
7. Risk Purchase clause shall be applicable with this enquiry.
8. LD/Penalty clause shall be applicable with this enquiry.
The delivery of goods shall be made strictly as per time limit specified in delivery schedule. Failure to supply within this period will make the supplier liable to a penalty of ½% (half percent) of the total order value per week of delay or part thereof subject to a maximum of 10% of the total order value for the reasons attributable to the party.
9. The Offered Bids against tender must reach at our office on or before due date. Late offers shall not be considered received after due date even if posted by speed/registered post before due date.
10. In addition to above terms and conditions, provision of public procurement policy of MSEs order 2012 shall also apply as per Annexure-‘D’.

BIDDER’S SIGN & SEAL:

Special Conditions of Contract (SCC):

11. PV Clause & its applicability:

a) Copper Base Price:

- i) Rates should be based on HCL's price of CC Copper Rod Ø16 @ **Rs. 4,74,032 /- PMT of 01.09.2014.** This is the basic HCL price, ED, CST & Octroi is extra. Rates based on any other base price shall NOT be acceptable.
- ii) Reference: Price circular no. HCL/HO/MKTG/Cu-P/2014-15 dated: 01-Sept-2014.
- iii) Applicable rates shall be those of 1 month prior from the month in which delivery is being made e.g., if delivery of Copper Flexible is being made in September that the HCL price of 01-August will be taken for operating PV Clause.
- iv) PVC ratio shall be **1:1 per kg. (or 1:Unit weight of flexible as mentioned in different drawings).** PVC ratio other than mentioned above shall not be acceptable.

b) Silver Base Price:

- i) The rates of Silver Plating are based on the basic rates of (Ready) Silver (99.9% purity) @**Rs.41,200/-** as per Mumbai Bullion Market & for any change in this rate, the Silver Closing Rate of Mumbai Bullion Market on the 1st working day of calendar month as published in the next day's edition of "The Economic Times" or "The Financial Express" shall be effective for supplies till the end of that month in which the plated components are to be supplied to BHEL.

Reference: **ET Intelligence Group, Mumbai Bullion Market (Ready) Silver 1kg** dated 12-Sept-2014.

- ii) PVC ratio for Silver Plating shall be **2:1 (two is to one)** i.e., for every increase/decrease by 1% in the rates of Silver, there shall be corresponding increase/decrease by 1/2%(half) in the rates of Silver Plating.

12. In case of Silver Plating on Ferrules of Copper Strip Flexibles, sq. cm. area of only outer portion will be applicable. Bidders, who do not agree for the same, may quote their Silver Plating rates for Copper Strip Flexibles after adjusting it suitably.

13. No extra charges for tinning will be payable. Wherever tinning is required on ferrules, the rates should be inclusive of tinning charges.

14. Although the purchases shall be made in "Nos.", however, **total weight of finished copper component/item shall be verified for inspection & payment purposes.** Payment shall be restricted to DRAWING WEIGHT. However, if actual weight is less than drawing weight payment shall be made as per ACTUAL WEIGHT.

15. Offers shall be submitted in TWO BID SYSTEM.

PART- (A) BID :: TECHNO COMMERCIAL BID WITH UNPRICE COPY

PART- (B) BID :: PRICE BID

Offer submitted in single bid shall be liable to REJECT.

16. BHEL reserves the right to:

- A. To finalize the contract with maximum of 05 acceptable bidders.

	DISTRIBUTION OF TENDER QUANTITY (%)				
Slab	L1	L2	L3	L4	L5
05 bidders	35	25	18	13	9
04 bidders	40	30	20	10	
03 bidders	50	30	20		
02 bidders	60	40			
01 bidder	100				

- B. Distribution matrix as above shall be referred for distribution of this tender quantity.
- C. **BHEL reserves the right to decide the successful bidder on the basis of Reverse Auction (RA) process.** In such case all qualified bidders will be intimated regarding procedure / modality for RA process prior to Reverse Auction and price will be decided as per the rules for Reverse Auction. However, if reverse auction process is unsuccessful as defined in the RA rules/ procedures, or for whatsoever reason, then the sealed 'PRICE BIDS' will be opened for deciding the successful bidder. BHEL's decision in this regard will be final and binding on bidder.
- D. If lowest landed bidder for COPPER & SILVER will be different, then lowest landed rate of SILVER shall be COUNTER OFFERED to lowest landed bidder of COPPER to arrive at lowest landing rate in this tender.
- E. Accept/ reject, any or all tenders or part thereof without assigning any reasons.
- F. To extend /truncate the R/c Period by 03 months or part & including its validity shall be 1 & 1/4th years for the frame work agreement.
- G. To terminate the F/A by giving a notice period of 15 days if the performance of the party is not found to be satisfactory.

- 17.** For terms & conditions other than mentioned here, the bidders should go through the terms & conditions mentioned on the reverse of Enquiry format before submitting their offers.

BIDDER's SIGN & SEAL:

Technical Conditions of Contract (TCC):

18. Technical Requirements of Copper Strip Flexible
(RU/BDE/ENGG/CPPER STRIP FLEXIBLE/001 REV-00 (02 pages)
19. _Sample Drawings **41001200030 R02 & RST0145 R00.**
20. General Instructions for Sweating & Silver Plating on Copper Conductor & Flexible
(45410000005 R06)
21. Corporate Purchasing Specification for Copper Strip –Annealed (Close Tolerances)
(AA120 07 R03) (05 pages)
22. Quality Assurance Plan (**QAP**)
23. Test Certificates shall be required with material in line with the approved QAP & testing procedures.
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BIDDER's SIGN & SEAL:

Annxure-2 :: Total Quantity of Contract

Tender Enquiry:14E0___ date:___09.2014 due on:___10.2014

BHEL NIT NO.:_____ dt:_____

(Copper Strip Flexibles including Silver Plating & Electro Tinning)

Sl No	Items Description	Tentative Qty.(Units)
1	Copper Strip Flexibles	45,000 kg.
2	Silver Plating	35,00,000 sq. cm.

BIDDER'S SIGN & SEAL:

Annexure-3 :: Price Bid of Contract

Tender Enquiry:14E0___ date: __.09.2014 due on: __.10.2014

BHEL NIT NO.: _____ dt: _____

(Copper Strip Flexibles including Silver Plating & Electro Tinning)

Sl. No.	Item	Rate	Remarks	Please tick
1	Copper Strip Flexible as per specification & Drawing of Tender	Rs. _____ per kg.	Just mention compliance to this format.	Quoted/ Not Quoted
2	Silver Plating	Rs. _____ per cm ²		Quoted/ Not Quoted
	Taxes & Duties (To be mentioned if applicable)			
	Delivery :FOR BHEL RUDRAPUR		YES/NO	
	NO DEVIATION FROM SPECIFICATION & DRAWING IS CONFIRMED		YES/NO	If deviation, please mention exclusively in separate sheet titled 'LIST OF DEVIATIONS'. Otherwise, we will assume full compliance.

- a) We confirm that the rates quoted above are on **F.O.R. BHEL Rudrapur basis**
- b) We confirm that the rates of Copper Flexibles quoted are based on the basic HCL's price of CC Copper Rod Ø16 @ **Rs. 4,74,032/- PMT** of 01-09-2014 which is the basic HCL price exclusive of ED, CST & Octroi
- c) We confirm that the PVC ratio is **1:1 (one is to one) on per kg. basis** or **1:unit weight of each flexible on per no. basis.**
- d) We confirm that the rates of Silver Plating are based on the basic rates of Silver (99.9% purity) @ **Rs. 41,200/- per kg.(reference rate 12-09-2014, ET Intelligence Group, Mumbai Ready-Silver-1kg.)** as per Mumbai Bullion market and for any change in this rate, the Silver Closing Rate of Mumbai Bullion Market on the 1st working day of calendar month as published in the next day's edition of "The Economic Times" or "The Financial Express" shall be effective for supplies till the end of that month in which the plated components are to be supplied to BHEL.
- e) We confirm that the PVC ratio for Silver Plating shall be **2:1 (two is to one)** i.e., for every increase / decrease by 1% in the rates of Silver, there shall be corresponding increase / decrease by ½ % in the rates of Silver Plating.
- f) We confirm that we have gone through Annexure - 1 and confirm the correctness of weight & Plating area per flexible mentioned in the same.
- g) We agree to the **reverse auction** clause.

Name of Bidder: _____

(Signature & Seal of Bidder)

Note: An unpriced-copy of this price bid duly signed & stamped should be enclosed in the techno-commercial bid.

Annexure-4: ESSENTIAL QUALIFYING CRITERIA

Tender Enquiry: 14E0 ____ dt: ____ due on: ____

BHEL NIT NO.: ____ dt: ____

Copper Strip Flexibles including Silver Plating & Electro Tinning

Qualifying Criteria

Copper Strip Flexibles on Finished Basis including Silver Plating & Electro Tinning

Bidder should confirm the following qualifying requirements with documentary evidence.

- 1.) Average supply minimum @ 5 MT per year in past 03 three years or 5 MT in previous year. (Attach proper documents/ Purchase Order for this scope of tender)
- 2.) Monthly capacity minimum @2 MT.(Self declaration required)
- 3.) Registered with Sales Tax, Income Tax, Excise if applicable & other authorities. (Attach proper documents)
- 4.) Bidder should have all required facilities for manufacturing of **Copper Strip Flexibles**.
- 5.) Bidder to furnish audited copy of annual accounts/tax audit report for last 03 years along with the PART (I) Techno-commercial bid.

Please submit all essential supporting documents with this criteria along with PART (I) Techno-commercial bid.

Only after qualifying to this criterion, bids/offers shall be liable to consider for further evaluation.

Note:-If required BHEL technical committee may visit the bidder's works for assessment before acceptance of their techno-commercial bid. Failure comply the above requirement, bidder's offer shall be technically **REJECTED**.

Bidder's Sign & Seal:

Public Procurement Policy for MSEs Order 2012

Tender Enquiry No. 14E0___ dated: _____2014

(Copper Strip Flexibles including Silver Plating & Electro Tinning)

In line with the order dated 23-03-2012 of Ministry of Micro, Small & Medium enterprises, New Delhi following provisions shall apply to the tenders floated against this TC MoU:

1. BHEL, CFP, Rudrapur has set an annual goal of procurement from Micro and Small Enterprises from the FY 2012-13 and onwards, with the objective of achieving an overall procurement of minimum of 20% of total annual purchases of products produced and services rendered by Micro and Small Enterprises in a period of 3 years.
2. Out of 20% target of annual procurement from Micro and Small Enterprises, a sub-target of 20% (i.e. 4% out of 20%) is earmarked for procurement from Micro and Small Enterprises owned by the Scheduled Caste or Scheduled Tribe entrepreneurs. In the even of failure of such Micro and Small Enterprises to participate in the tender process or meet tender requirements or L1 price, 4% sub-target for procurement earmarked for Micro and Small Enterprises owned by Scheduled Caste or Scheduled Tribe entrepreneurs shall be met from other Micro and Small Enterprises.
3. In tender, participating Micro and Small Enterprises quoting price within price band of L1+15% 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 & Small Enterprise shall be allowed to supply up to 20% of total tendered quantity. In case of more than one such Micro and Small Enterprise, the supply shall be shared proportionately (to tendered quantity).
4. Tender Cost is free for Micro and Small Enterprises
5. Micro and Small Enterprises are exempt from paying Earnest Money Deposit.

Note:

- a) All Micro and Small Enterprises and those Micro and Small Enterprises which are owned by the Scheduled Caste or the Scheduled Tribe entrepreneurs are required to submit LATEST & VALID CERTIFICATES for availing the benefits enumerated in "Public Procurement Policy for MSEs Order 2012".
- b) Out of the 358 items reserved for exclusive purchase from Micro and Small Enterprises, the following items are procured by BHEL, CFP, Rudrapur at present from Industrial Entrepreneurs:
 - a. Bolts & Nuts upto 10 mm² nominal CS.
 - b. Boots & shoes of all types including canvas shoes.
 - c. Conduit pipes
 - d. Hand Gloves of all types
 - e. Hand tools of all types
 - f. Crates, wooden & plastic
 - g. Lightning arresters upto 22 kV
 - h. Domestic Electric appliances as:
 - i. Measuring tapes & sticks as per BIS specifications.
 - ii. Metal Clad Switches up to 30 Amps
 - iii. Domestic (house wiring) PVC Cables and Wires (Aluminium)
 - iv. PVC Pipes upto 110 mm conforming to the prescribed
 - i. Screws of all types including High Tensile strength.



PRODUCT STANDARD

BUSDUCT ENGINEERING DIVISION

RU/BDE/ENGG/
COPPER STRIP
FLEXIBLE /001
REV-00

PAGE 1 OF 2

TECHNICAL REQUIREMENTS OF COPPER STRIP FLEXIBLE

SPECIFICATION, PROCESS & DRAWING

- 1) THE COPPER STRIP FLEXIBLES TO BE MADE BY HOT FUSION PROCESS.
- 2) ALL TECHNICAL SPECIFICATION, TESTING REQUIREMENTS ETC. SHALL BE GOVERNED BY BHEL CORPORATE PURCHASE SPECIFICATION NO. AA 12007 REV-03 WHICH IS FORMING PART OF THIS ENQUIRY.
- 3) HOT FUSED CU PORTION WILL BE SUBJECTED TO METALLOGRAPHIC TEST ON SAMPLE TO VALIDATE PROCESS.
- 4) PROPER PROCESS SHALL BE ENSURED TO AVOID GREEN SULPHATE FORMATION DUE TO MOISTURE ENTRY/RETENTION DURING MANUFACTURING OR ANY OTHER REASON. IN CASE SUCH DEFECTS ARE OBSERVED DURING GUARANTEE PERIOD - REPAIR/ REPLACEMENT SHALL BE IN THE SCOPE OF SUPPLIER.
- 5) ALL SPECIFICATION & DETAILS IN DRAWINGS SHALL BE FOLLOWED IN ADDITION TO CORPORATE PURCHASE SPECIFICATION AA 12007 REV-03.
- 6) TYPICAL DRAWINGS OF STRIP FLEXIBLES ATTACHED DRG.
(I) RST0145
(II) 41001200030

DIMENSIONS

- 1) THE COPPER STRIP FLEXIBLE THICKNESS SHALL VARY BETWEEN 10 MM TO 20 MM AFTER HOT PRESS FUSION.
- 2) THICKNESS OF CU STRIPS TO BE USED FOR MAKING FLEXIBLE SHALL BE RANGING BETWEEN 0.3 MM TO 0.6 MM.
- 3) WIDTH OF COPPER STRIP SHALL VARY BETWEEN 50 MM TO 150 MM.
- 4) LENGTH OF FLEXIBLE SHALL VARY BETWEEN 450 MM TO 750 MM.
- 5) VARIATIONS IN FINISHED THICKNESS AT HOT FUSED ENDS SHALL NOT EXCEED BY 0.25MM.
- 6) TRIMMING OFF SURPLUS LENGTH AFTER FORMING AT ENDS TO BE DONE.

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REV.

00

PRINTS TO: -

APPROVED -

ALTD.

R K BINDAL

APPD.

PREPARED

ISSUED

DATE

DATE.

RURESH
KUMAR

22/09/2014



PRODUCT STANDARD

BUSDUCT ENGINEERING DIVISION

RU/BDE/ENGG/
COPPER STRIP
FLEXIBLE /001
REV-00

PAGE 2 OF 2

FINISH, PAINTING & PLATING

- 1) BOTH ENDS OF THE COPPER FLEXIBLE (PRESSED ENDS OF LENGTH UPTO 100 TO 150 MM ON BOTH SIDE) SHALL BE SILVER PLATED WHEN MARKED IN DRAWING.
- 2) SILVER PLATING AT HOT FUSED ENDS IF REQUIRED AND CALLED IN P.O. SHALL BE DONE AND SHALL BE ACCOUNTED SEPARATELY ON THE BASIS OF PER SQCM RATES.
- 3) IN CASE SILVER PLATING IS NOT SPECIFIED, BOTH ENDS SHALL BE TINNED UP TO 13 MICRONS. NO SEPARATE CHARGES FOR TINNING AT ENDS SHALL BE ADMISSIBLE.
- 4) BALANCE LENGTH OF THE STRIP FLEXIBLE SHALL BE BLACK MATT PAINTED.
- 5) SAMPLE DRAWINGS ARE ATTACHED FOR REFERENCE TO UNDERSTAND THE VARIOUS TYPES OF CONSTRUCTION.

IMPORTANT NOTES

- 1) BELOW MENTIONED INFORMATION GIVEN TO FACILITATE ESTIMATION. BUT THIS IS NOT BINDING ON US.
- 2) WE HAVE MENTIONED A LARGE RANGE OF DIMENSIONS WITH A VIEW TO KEEP OPTIONS OF FURTHER DEVELOPMENT. HOWEVER, THERE IS LIKELY TO BE NOT MORE THAN FIVE TYPES OF FLEXIBLES FOR OUR 95% REQUIREMENT. FOLLOWING DIMENSIONS SHALL BE MOST PREVALENT (FOR 95% REQUIREMENT):
 - (I) THICKNESS OF STRIPS 0.40 MM OR NEARBY - MOSTLY ONE THICKNESS SHALL BE FOLLOWED.
 - (II) WIDTH 50 MM REQUIREMENT 40%/ WIDTH 150 MM REQMT. 55%/ OTHER REQMT 5%.
- 3) SUGGESTIONS REGARDING SUITABLE SIZE SELECTION BASED ON AVAILABILITY, EASE IN PROCESSING MAY BE CONSIDERED BY US DURING TECHNICAL BID REVIEW.

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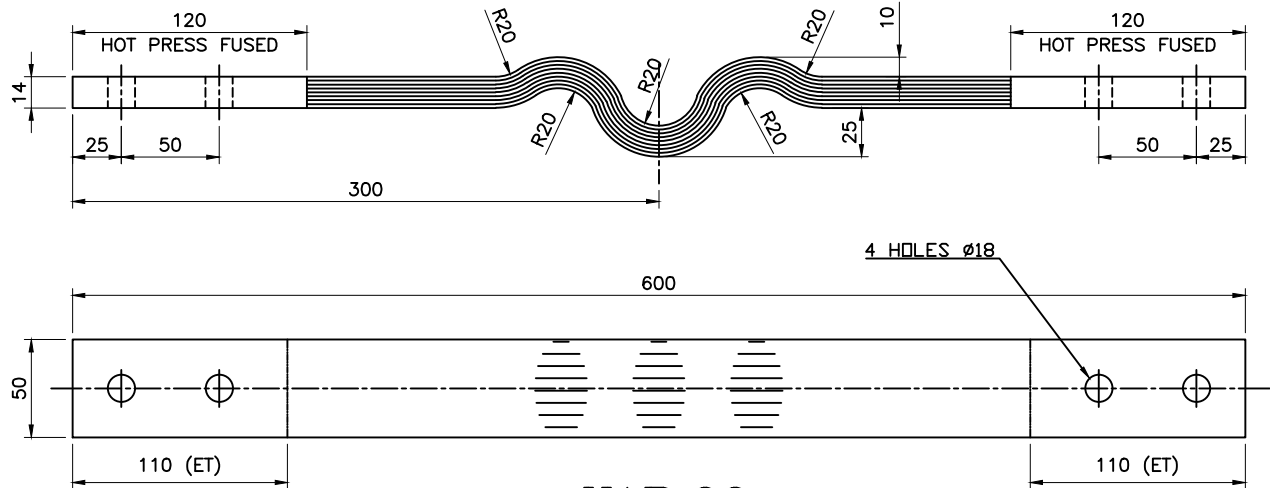
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REV.	00	PRINTS TO: -	APPROVED -
ALTD.			R K BINDAL
APPD.			PREPARED
DATE.			ISSUED
			DATE
			RUPESH KUMAR
			22/09/2014

ALL DIMENSIONS IN MM.

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1			2			3		
REV.	DATE	ALTERD	REV.	DATE	ALTERD	REV.	DATE	ALTERD
		CHECKED	02	29.06.13	CHECKED	01	15.02.13	CHECKED
			WEIGHT AND ELECTRO TINNING AREA REVISED.			NO. OF STRIP 35 WAS 40.		

**MANUFACTURING PROCESS:-**

- 1- TRIM OFF SURPLUS LENGTH AFTER FORMING.
- 2- REQUIRED QUANTITY OF SHEETS TO BE HELD TOGETHER AND BOTH ENDS TO BE HOT PRESS FUSED BEFORE DRILLING.
- 3- CONDUCTIVITY OF COPPER FLEXIBLE SHOULD BE 99% AT FINISH STAGE.
- 4- HOT PRESS FUSED COPPER PORTION SHOULD WITHSTAND THE METALLOGRAPHY TEST.
- 5- VARIATION OF THICKNESS AT BOTH ENDS (HOT PRESS FUSED PORTION) MUST NOT EXCEED 0.25mm.
- 6- EXPOSED SURFACE WHICH ARE NOT HOT PRESS FUSED TO BE PAINTED WITH MATT BLACK FOR BETTER EMISSIVITY.
- 7- BOTH ENDS HOT PRESS FUSED PORTION TO BE ELECTRO TINNED (E.T. TK. 13 TO 15 MICRON)

ELECTRO TINNING AREA:-VAR.00=306.91 SQCM.**WEIGHT:-**VAR.00=3.828 KG.

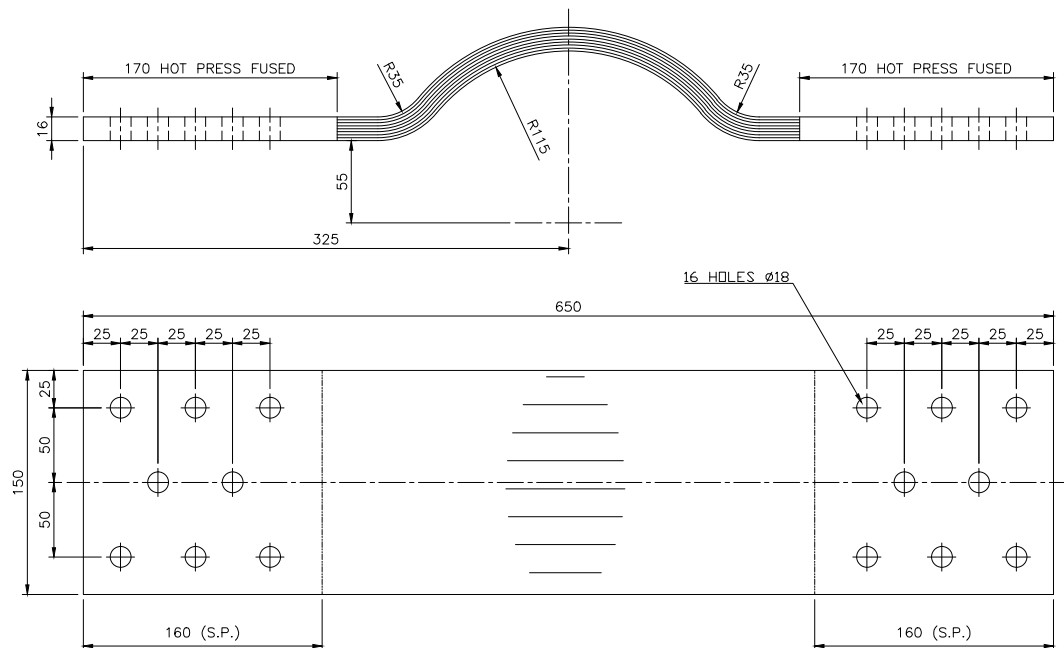
035		001	COPPER STRIP 0.4TKx50x635 LG.	—	—	AA12007	0.113	
VAR 00	REMARKS	ITEM NO.	DESCRIPTION	DRAWING NO.	IT.NO. VAR.	MATL.CODE MATL.SPCN.	WT. QTY.	0 0

	CUSTOMER —				PROJECT/PRODUCT —				
	भारत हेवी इलेक्ट्रिकल्स लिमिटेड - रुद्रपुर BHARAT HEAVY ELECTRICALS LIMITED RUDRAPUR					NAME	SIGN.	DATE	NO. OF VAR.
					DRN.	एस. के. गुप्ता		—	
					CKD.	एस. के. गुप्ता		—	
					APPD.	आर. के. लाल		—	
DEPTT. BDE	UNTOL.DIM.GR. C/M/F		SCALE —	WEIGHT—KG —	REF.TO ASSY.DRG. —			IT.NO. —	NO.OF ITEM
TITLE COPPER STRIP FLEXIBLE FOR IPBD					DRAWING NO. 41001200030				REV. 02
					SHEET NO.— 01		NO.OF SHEETS— 01		SIZE— A4

ALL DIMENSIONS IN MM.

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1			2			3		
REV.	DATE	ALTERD	REV.	DATE	ALTERD	REV.	DATE	ALTERD
		CHECKED			CHECKED	—	—	CHECKED



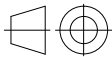
VAR.00

MANUFACTURING PROCESS:-

- 1- TRIM OFF SURPLUS LENGTH AFTER FORMING.
- 2- REQUIRED QUANTITY OF SHEETS TO BE HELD TOGETHER AND BOTH ENDS TO BE HOT PRESS FUSED BEFORE DRILLING.
- 3- CONDUCTIVITY OF COPPER FLEXIBLE SHOULD BE 100% AT FINISH STAGE.
- 4- HOT PRESS FUSED COPPER PORTION SHOULD WITHSTAND THE METALLOGRAPHY TEST.
- 5- VARIATION OF THICKNESS AT BOTH ENDS (HOT PRESS FUSED PORTION) MUST NOT EXCEED 0.25mm.
- 6- EXPOSED SURFACE WHICH ARE NOT HOT PRESS FUSED TO BE PAINTED WITH MATT BLACK FOR BETTER EMISSIVITY.
- 7- BOTH ENDS HOT PRESS FUSED PORTION TO BE SILVER PLATING (S.P. TK. 13 TO 15 MICRON)
- 8- SILVER PLATING DONE AS PER REF. DRG. NO. 45410000005.

SILVER PLATING AREA:-VAR.00=1173.73 SQCM.**WEIGHT:-**VAR.00=14.37 KG.

040		001	COPPER STRIP 0.4TKx150x700 LG.	—	—	AA120097	0.3738	
VAR 00	REMARKS	ITEM NO.	DESCRIPTION	DRAWING NO.	IT.NO. VAR.	MATL.CODE MATL.SPCN.	WT. QTY.	0 0

CUSTOMER			PROJECT/PRODUCT					
—			GENERAL					
			NAME			SIGN.	DATE	NO. OF VAR.
भारत हैवी इलेक्ट्रिकल्स लिमिटेड - रुद्रपुर			DRN.			एस. के. गुप्ता	—	
BHARAT HEAVY ELECTRICALS LIMITED RUDRAPUR			CKD.			एस. के. गुप्ता	—	
			APPD.			आर. के. लाल	—	
DEPTT. BDE	UNTOL.DIM.GR. C/M/F		SCALE —	WEIGHT—KG —	REF.TO ASSY.DRG. —		IT.NO. —	NO.OF ITEM
TITLE					DRAWING NO.			REV.
COPPER STRIP FLEXIBLE FOR IPBD					RST0145			00
SHEET NO.— 01			NO.OF SHEETS— 01			SIZE— A4		

REV. 03	DATE 9.8.85	ALTERED <i>sd.</i> CHECKED <i>sd.</i>	REV. 04	DATE 2.3.93	ALTERED <i>sd.</i> CHECKED <i>sd.</i>	ADDITIONAL INFORMATION
DIMN 35 WAS 40 AND SPEC NO 7610 B WAS 2704/FP.			SPEC NO. 7604 B ADDED.			STATUS OF DRAWING REV. 05 DATE 4.3.93 DRG. RETRACED. REV. 06 DATE 15.12.93 ALT. <i>sd.</i> CHD. <i>sd.</i> AGAINST SL. NO. 2 SPECIFICATION NO. WAS 7604 B.
SPECIAL INSTRUCTIONS— 1 FOR SWEATING/TINNINING (FLEXIBLES): 1.1 CLEAN INDIVIDUAL SHEET ELECTROTINNED 4 TO 5 MICRON TK AS PER PR. SPEC NO. 7610 B TO A SURFACE AS PER FIG. 1 1.2 CLAMP TOGETHER REQUIRED NO. OF PARALLEL STRIPS, APPLY FLUX, DIP IN TO SOLDERING BATH CONTAINING 60% TIN AND 40% LEAD. REMOVE THE BUNCH FROM BATH, SHAKE IT WELL TO REMOVE EXCESS MATERIAL, PRESS IT WELL TO GET REQUIRED TK'S, GROUND THE EDGES AFTER SOLDERING, REFIL IF CAVITIES ARE LEFT ON EDGES, GROUND/ BUFF THE EDGES SMOOTHLY. FOR SILVER PLATING: 1.3 REMOVE SWEATING MATERIAL FROM OUTER SURFACES ONLY FOR SILVER PLATING PURPOSES. AFTER PROPER CLEANING, SILVER PLATING TO BE DONE TO 13 TO 15 MICRON TK.						
2. FOR CONDUCTOR PALM AND OTHER ITEM— TO SPEC NO. AA 0673613. 2.1 HANDLE CAREFULLY TO AVOID DENTS ETC, SKIM CUT IF DENTS ARE VISIBLE. SILVER PLATE 13 TO 15 MICRON TK TO THE REQUIRED LENGTH AS PER FIG. 1 3. HANDLING: 3.1 SILVER PLATED SURFACE TO BE COVERED BY COTTON/ ASBESTOS TAPE AFTER SILVER PLATING. 3.2 TAKE PROPER CARE THAT "SILVER PLATED" SURFACES SHOULD NOT BE DAMAGED WHILE WELDING THE CONDUCTOR. 3.3 COTTON/ ASBESTOS TAPE SHOULD NOT BE REMOVED AT ANY STAGE TILL THE CONDUCTORS ARE REQUIRED FOR MAKING THE BOLTED JOINTS AT SITE.						

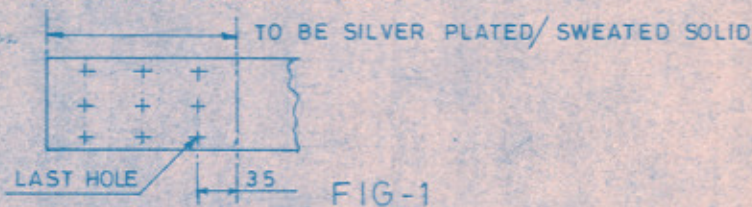


FIG-1

6664	63	62	53	52	51	22	18	20	22	23	34	35	36	39	MATL. CODE		50	58	59	64	65	73	79	80
QTY				UNIT OF QTY.		DESCRIPTION		ITEM No.	STD.	DRAWING No.		ITEM No.		51	MATL. SPECN.		57	COMP GROUP		UNIT WEIGHT (Kg.)		78	81	
VARI-1				BASIC		R.M. UNIT		ANT		61	54	VARI-2		ANT	QTY.		74	QTY.		78	BMT/CRP		D1	

REF. DRG. No.	SIGN. & DATE	INVENTORY No.		BHARAT HEAVY ELECTRICALS LIMITED JHANSI									
DEPT. SWE	CODE 409			SCALE	WEIGHT (Kg.)	REF. TO ASSY. DRG.				ITEM No.			
TITLE						DRAWN		NAME H. LAL		SIGN. <i>sd.</i>		DATE 5.6.81	
GENERAL INSTRUCTIONS FOR SWEATING & SILVER PLATING ON COPPER CONDUCTOR & FLEXIBLE						CHECKED		ILB		SIGN. <i>sd.</i>		DATE 5.6.81	
						APPROVED		<i>sd.</i>					
DIMENSIONS TO BE CONTROLLED WITHIN AS LIMITS SHOWN.						DRAWING No.				REV. 0.6			
MACHINING TOLERANCE ± 0.25 mm UNLESS OTHERWISE SHOWN.						CARD CODE 4 5 4 1 0 0 0 0 0 0 5				SHEET No. 1			
NON - MACHINING TOLERANCE ±						No. OF SHEETS							



CORPORATE PURCHASING SPECIFICATION

AA 120 07

Rev. No. 03

PREFACE SHEET

COPPER STRIP – ANNEALED (CLOSE TOLERANCES)

FOR INTERNAL USE ONLY
REMOVE THIS PREFACE BEFORE ISSUE TO SUPPLIERS

Comparable Standards:

1. INDIAN : IS : 1897 – 1983, Gr.O – Annealed.

Suggested/Probable Suppliers and Grades:

Refer plant vendors list.

User Plant References:

1. HEEP, HARDWAR : 0502 002 (Strips)
0502 008
2. BHOPAL : PS 12009
PS 12054 (Strips)
PS 12070 to PS 12073
(Partially i.e. for application in electrical windings)
3. HYDERABAD : TADS - A

Revisions :

Cl: 20.10.9 of MOM of MRC-NFCW+HE

APPROVED :

INTERPLANT MATERIAL RATIONALISATION
COMMITTEE-MRC (NFCW+HE)

Rev. No. 03

Amd.No.

Reaffirmed

Prepared

Issued

Dt. of 1st Issue

Dt: 15.02.2006

Dt :

Year :

BHOPAL

Corp. R&D

March, 1980



CORPORATE PURCHASING SPECIFICATION

AA 120 07

Rev. No. 03

PAGE 1 OF 5

COPPER STRIP – ANNEALED (CLOSE TOLERANCES)

1.0 GENERAL:

This specification governs the quality requirements of bright annealed bare Copper strip of thickness over 0.15 mm and upto 10 mm and widths upto 160 mm with radiused edges and close tolerances.

2.0 APPLICATION: Used for general electrical purposes such as bus bars, connectors etc.

3.0 CONDITION OF DELIVERY:

Bright and Annealed.

The material shall be supplied in annealed condition, with close tolerances in coils or straight lengths as specified in BHEL order.

4.0 COMPLIANCE WITH NATIONAL STANDARDS:

The material shall in general comply with the requirements of the following national standard and also meet the requirements of this specification.

IS: 1897 – 1983 : Copper strips for Electrical Purposes.

Gr: 'O' Annealed

5.0 DIMENSIONS AND TOLERANCES:

5.1 Sizes: Copper Strips shall be supplied to the dimensions specified in BHEL order:

5.2 Tolerances:

Tolerances on width, thickness, and length shall be as follows:

5.2.1 Width / Thickness:

Tolerance on thickness, width and length shall be as follows,

Width/Thickness, mm		Tolerance, $\pm$ mm
Over	Upto & including	
-	3.0	0.03
3.0	6.3	0.05
6.3	12.0	0.07
12.0	25.0	0.10
25.0	50.0	0.12
50.0	100.0	0.25
100.0	160.0	0.50

Revisions :

Cl: 20.10.9 of MOM of MRC-NFCW+HE

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March, 1980

**5.2.2 Length:**

Tolerance on fixed length, shall be as per the table given below:

<u>Length, meter</u>		Tolerance, $\pm$ mm
Over	up to & including	
-	0.2	1.0
0.2	1	2.0
1	2	3.0
2	4	6.0
4	6	10.0

5.3 Radius on Edges:

The strip shall be supplied with edge radiused as per IS:1897, reproduced below, reproduced below.

<u>Thickness, mm</u>		Nominal radius on edges, mm	Tolerance on radius, mm
Over	upto & incld.		
--	1.0	Semi circular	± 0.06
1.0	1.6	0.60	± 0.15 $- 0.10$
1.6	2.25	0.80	± 0.15
2.25	3.55	1.0	± 0.20
3.55	10.00	1.25	± 0.25

5.4 Straightness:

The edges of strips supplied in straight lengths shall not vary from a straight line by more than 20 mm in any 1000 mm length.

6.0 MANUFACTURE:

The strip shall be manufactured from copper of ETP grade conform to IS:191.

The conductor shall be manufactured from ETP grade copper conforming to BHEL specification: AA 12024: Electrolytic Tough Pitch Copper Wire/Bars/Ingots/Continuously cast wire rods.

NOTE: It is preferable to manufacture conductor from continuously cast copper rods provided all other parameters and conditions remain same.

7.0 FREEDOM FROM DEFECTS:

The strips shall be clean, bright, smooth and free from harmful defects.

**8.0 CHEMICAL COMPOSITION:**

The analysis of copper when analyzed in accordance with IS:440 or any other conventional/instrumental methods shall be as follows:

Element	Percent, min.	Percent, max.
Copper and Silver	99.90	--
Bismuth*	--	0.001
Lead*	--	0.005
Total of all impurities excluding silver and oxygen excl. silver and oxygen	--	0.030

* These elements need not be determined when the material supplied conforms with mechanical and electrical properties specified in this specification. However, the supplier shall ensure that the composition of the material lies within the limits specified above.

9.0 TEST SAMPLES:

One sampling per size per melt per consignment of 3 tonnes or part thereof shall be taken for chemical, mechanical and electrical tests.

The sample shall be cut off cold and shall receive no further treatment before being tested.

10.0 MECHANICAL PROPERTIES:**10.1 Tensile strength (For sizes over 0.50 mm and upto & including 10mm thick):**

The test samples, when tested in accordance with IS:1608 shall show the following properties:

IS:1608, shall show the following properties:

Tensile Strength : 205 N/mm², minimum.

Elongation on 4√A or 50 mm gauge length: 35% Min

NOTE: Material upto and including 0.5mm shall be tested only for hardness.

10.2 Hardness (Vickers):

When tested in accordance with IS:1501, the strips shall have a Vickers hardness not exceeding 60 HV, min.

10.3 Bend Test:

The strip shall not be subjected to transverse bend test. where this is not possible, it shall be subjected to a longitudinal bend test. The strip when tested in accordance with IS: 1897 shall withstand a close bend test, through an angle of 180°, without showing any sign of cracks or failures upon the convex surface of the bend.

10.4 Edgewise Bending:

The material shall withstand without showing any sign of cracks or failure, when bent on edge through an angle of 180° over a former of radius equal to half the width of the strip.

**11.0 ELECTRICAL RESISTIVITY (AS RECEIVED):**

When measured in accordance with IS: 3635, the electrical resistivity at 20⁰ shall not be greater than 0.01737 ohm-mm²/metre, which is equivalent to an electrical conductivity of 99.25%, minimum of IACS standard.(Refer Appendix B of IS: 613 for temperature correction factor).

Alternatively, the method of measurement employing eddy current probes as per ASTM E 1004 is also acceptable.

12.0 INSPECTION AT SUPPLIER'S WORKS:

Whenever specified, tests and inspection are to be conducted in the presence of BHEL'S representative.

The supplier shall offer BHEL'S representative all reasonable facilities, without charge to satisfy the latter that the material is being furnished in accordance with this specification. The supplier shall prepare and provide necessary test specimens for testing to be carried out at his premises. If facilities are not available at his carrying out the prescribed tests elsewhere. The supplier shall notify BHEL in advance about the readiness of the material for inspection and testing.

BHEL reserves the right to test the material at BHEL'S works and the final acceptance of the material shall be based on these test results.

13.0 TEST CERTIFICATES:

Unless otherwise specified, three copies of test certificates shall be supplied along with each consignment.

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

The test certificate shall bear the following information:

AA 120 07, Rev 03: Copper strip – Annealed, Close Tolerances

BHEL Order No,

Manufacturer's/Supplier's Name :

Lot/Identification/Batch/Melt No.

Sizes and Quantity Supplied

Results of dimensional inspection, chemical analysis, mechanical and electrical tests as per this specification.

**14.0 PACKING AND MARKING:**

The material shall be supplied in coils or drums or in straight length as ordered. The minimum eye of coil or barrel diameter of drums shall be 250 mm.

The material not supplied in drums shall be hessian wrapped and tied with string and not with wire and shall be suitably protected to with wire and shall be suitably protected to avoid damage in transit. Each coil or drum or bundle shall be legibly marked or labeled with the following information.

Each coil or drum or bundle shall be legibly marked or labeled with the following information:

AA 12007 : Copper strip – Annealed, (Close Tolerances)

BHEL Order No.

Manufacturer's/Supplier's Name :

Lot/Identification/Batch/Melt No.

Sizes and Quantity Supplied

15.0 REFERRED STANDARDS (Latest Publications Including Amendments):

1. IS:191

2. IS:440

3. IS:613

4. IS: 1501

5. IS:1897

6. IS:1608

7. IS:3635

8. ASTM E 1004

9. AA 12024



Registered & Head Office
Tamra Bhavan
1 Ashutosh Chowdhury Avenue
Kolkata - 700019

Ref: HCL/HO/MKTG/Cu-P/ 2014-2015

Date : 01-SEP-14

Sub: Basic Price of Cathodes and CC Rods for the month of SEP 2014.

The Basic Price of Copper Cathodes and CC Copper Rods for the month of SEP 2014 are as follows:

Product	Basic Price (Ex-Works / Ex.Godown basis) Rs. / MT
CATHODE FULL ICC	464949
CONTINUOUS CAST COPPER WIRE ROD 11 MM	473383
CONTINUOUS CAST COPPER WIRE ROD 12.5 MM	473383
CONTINUOUS CAST COPPER WIRE ROD 16 MM	474032
CONTINUOUS CAST COPPER WIRE ROD 19.6 MM	476627
CONTINUOUS CAST COPPER WIRE ROD 8 MM	472734
CONTINUOUS CAST COPPER WIRE ROD NS	472334
COPPER CATHODE CUT	466449

The price ruling on the date of delivery will be applicable, irrespective of the date of making financial arrangements i.e. advance payment/opening of letter of credit. Excise duty, Education Cess, Secondary Higher Education Cess, Sales Tax, Octroi other statutory levies will be extra as applicable.

For purchase against usance Letter of Credit, the interest rate chargeable shall be @ 12 % per annum for the credit period up to 90/60/30 days .

Customers may note that the price and interest rate is subject to change without prior notice. The price and interest rate ruling on the date of delivery will be applicable irrespective of the date of their making financial arrangements. All bank charges of negotiating bank will be borne by us.


D.K. Mahajan
GM(Comm.)

01.10

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THE ECONOMIC TIMES

Reports

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Market Moksha

ETIG OneView

ETIndices

ET500

Commodity 360⁰

BULLION as on 12 Sep 2014	
GOLD(10 Gm) - CLOSE	
DELHI	
Biscuit	27375
Gold Sovereign	30500
One Kg.Bar(99.5)	27200
Ornaments (22 C)	25500
Standard (99.5)	27400
KOLKATA	
22 Carat	26000
24 Carat	27450
Hallmark (22 carat)	26400
MUMBAI	
(23 Carat)	26300
Bar	27475
Ornaments (22 C)	25300
Standard (99.5)	27320
SILVER(1 Kg) - CLOSE	
DELHI	
Coins Local(10gms a Pc)	720
Spot(.999)	41300
Weekly Delivery	41200
KOLKATA	
Portion	41400
Ready Bar	41300
MUMBAI	
Delivery	41000
Raw	40000
Ready	41200

- Building Material
- Bullion
- Chemicals
- Cotton
- Dry Fruits
- Fish & Broiler
- Fruits & Vegetables
- Ghee & Vanaspati
- Grains & Pulses
- Gur & Sugar
- Herbs
- Iron & Steel
- Jute & Jute Goods
- Kirana
- Milk Products
- Non-Ferrous Metals
- Oil & Oil Seeds
- Pan Leaf & Flower
- Plastics
- Rubber
- Tea & Coffee

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		QUALITY ASSURANCE PLAN					QAP NO: QP/BD/RU/CUFLEX						
							REV: 00						
		ITEM: COPPER STRIP/BRAIDED FLEXIBLE					DATE: 15.11.14						
							PAGE: 1 OF 1						
SL. NO.	COMPONENT	CHARACTERISTICS	CATEGORY	METHOD OF CHECK	EXTENT OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORDS	AGENCY				REMARKS
									P	W	R	H	
1.0	Copper strip/braided flexibles	a) Dimensions*	Major	Measurement	100 %	Appd TDS	Appd TDS	IR	3	1/2	-	-	* 5% random witness by 1/2 for characteristic (a)
		b) Surface finish	Minor	Visual	100 %	PS	PS	IR	3	1/2	-	-	
		c) Chemical Composition	Major	Chemical	Sample	IS: 191	IS: 191	TR	3/4	-	1/2	-	
		d) Tensile Strength	Critical	Mechanical	1 sample/lot	IS:613/IS:1897	IS:613/IS:1897	TR	3/4	-	1/2	-	
		e) % of Elongation	Critical	Mechanical	1 sample/lot	IS:613/IS:1897	IS:613/IS:1897	TR	3/4	-	1/2	-	
		f) Silver Plating for flexible connector	Critical	Measurement	5% sample/lot	PS	PS	IR	4	1/2	-	-	
		g) Electrical Conductivity	Critical	Electrical	1 sample/lot	IS:613/IS:1897	IS:613/IS:1897	TR	4	1/2	-	-	
		h) Pull test on flexible conductor (if applicable)	Critical	Mechanical	1 sample/lot	PS	PS	TR	3/4	1/2	-	-	
		i) Weight of flexible (to be verified with BHEL appd drg)	Critical	Visual	5 samples/lot	BHEL Drg	BHEL Drg	IR	4	1/2	-	-	

ABBREVIATIONS:

R= REVIEWED BY

P= PERFORMED BY

W= WITNESS BY

H= HOLD (UNLESS A WRITTEN CLEARANCE IS OBTAINED FROM BHEL, MANUFACTURER SHALL NOT PROCEED TO NEXT STAGE)

IR= INSPECTION REPORT

TR= TEST REPORT/CERTIFICATE

TDS= TECHNICAL DATA SHEET

APPD DRG= APPROVED DRAWING

PS= PLANT STANDARD

IS= INDIAN STANDARD

IEC= INTERNATIONAL ELECTRO TECHNICAL COMMISSION STANDARD

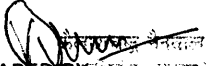
IEEE= INSTITUTE OF ELECTRONICS & ELECTRICAL ENGINEERS STANDARD

1= BHEL-QC

2= BHEL'S THIRD PARTY INSPECTION AGENCY

3= MANUFACTURER

4= NABL APPROVED EXTERNAL LABORATORY


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