

Annexure-1 :: Conditions of Contract

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

BHEL NIT No.: _____ dt _____

(Copper Braided 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 subject to acceptance. 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 tender opening.
5. Delivery time should be quantified for the sequential lots from the date of each PO. 1st lot of 3MT within 02 months from PO & subsequently 3MT/ 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 Braided 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 Braided 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.
- B. Distribution matrix as below shall be referred for distribution of this tender quantity.

	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				

- 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 Braided Flexible
(RU/BDE/ENGG/CPPER BRAIDED FLEXIBLE/001 REV-00 (02 pages)
19. Sample Drawings **41001200024 R02** & **41001200025 R03**.
20. General Instructions for Sweating & Silver Plating on Copper Conductor & Flexible
(**45410000005 R06**)
21. Corporate Purchasing Specification for Flexible Copper Braid-Annealed, Flat
(**AA120 10 R03**) (04 pages)
22. Corporate Purchasing Specification for Solid Drawn Copper Tubes-Half Hard
(**AA120 14 R01**) (08 pages)
23. Quality Assurance Plan (**QAP**)
24. Test Certificates shall be required with material in line with the attached annexure.

BIDDER's SIGN & SEAL:

Annxure-2 :: Total Quantity of Contract

Tender Enquiry:14E0___ date:___11.2014 due on:___12.2014

BHEL NIT NO.: _____ dt: _____

(Copper Braided Flexibles including Silver Plating & Electro Tinning)

Sl No	Items Description	Tentative Qty.(Units)
1	Copper Braided Flexibles (tinned braids)	100,000 kg.
2	Silver Plating	80,00,000 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 Braided Flexibles including Silver Plating & Electro Tinning)

Sl. No.	Item	Rate	Remarks	Please tick
1	Copper Braided Flexible with TINNED BRAIDS as per specification & Drawing of Tender	Rs. _____ per kg.	Just mention compliance to this format.	Quoted/ Not Quoted
	Discount agreed for Bare Braids (braids of flexibles are NOT Tinned)	Rs. 45/-	_____	_____
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 Braided Flexibles including Silver Plating & Electro Tinning

Qualifying Criteria

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

Bidder should confirm the following qualifying requirements with documentary evidence.

- 1.) Average supply minimum @ 10 MT per year in past 03 three years or 10 MT in previous year. (Attach proper documents/ Purchase Order for this scope of tender)
- 2.) Monthly capacity minimum @3 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 Braided Flexibles**.
- 5.) Bidder to furnish audited copy of annual account/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 Braided 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 BRAIDED
FLEXIBLE/001
REV-00

PAGE 1 OF 2

TECHNICAL REQUIREMENTS OF COPPER BRAIDED FLEXIBLE

SPECIFICATION, PROCESS & DRAWING

- 1) EACH BRAID SHALL BE ELECTROTINNED.
- 2) SPECIFICATIONS AND ALL TECHNICAL REQUIREMENT OF COPPER BRAIDS SHALL BE AS PER CORPORATE PURCHASE SPECIFICATION NO. AA 12010 REV-03 (ATTACHED WITH THIS ENQUIRY)
- 3) SPECIFICATIONS AND ALL TECHNICAL REQUIREMENT OF END FERRULE COPPER TUBES SHALL BE AS PER CORPORATE PURCHASE SPECIFICATION NO. AA 12014 (ATTACHED WITH THIS ENQUIRY).
- 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.
- 6) TYPICAL DRAWINGS OF COPPER BRAIDED FLEXIBLES ARE AS FOLLOWS-
 - (I) 41001200024
 - (II) 41001200025

DIMENSIONS

- 1) CURRENT STANDARD THICKNESS OF COPPER WIRES (STRANDS) IS 38 SWG AND THE SAME IS PREFERRED.
- 2) NO. OF BRAIDS CAN BE 5 TO 10 NOS. THICKNESS OF FLEXIBLE SHALL VARY BETWEEN 12 TO 30 MM.
- 3) WIDTH OF FLEXIBLE SHALL GENERALLY BE 48 MM. LENGTH SHALL VARY BETWEEN 450 TO 700 MM
- 4) CURRENTLY BEING USED CROSS SECTION OF EACH COPPER BRAID IS 105 SQ CM. AND THE SAME IS PREFERRED.
- 5) THE END COPPER FERRULE TUBES (TOTAL 2 NOS. PER FLEXIBLE) TO BE OF 1.5 MM THICKNESS. THE TUBE ID AND OD SHALL BE SUITABLY SELECTED BY THE SUPPLIER SO AS TO ENSURE PROPER GRIP ON COPPER BRAIDS AND AT THE SAME TIME, AVOID DAMAGE TO BRAIDS DUE TO EXCESS PRESSURE.

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



PRODUCT STANDARD

BUSDUCT ENGINEERING DIVISION

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

PAGE 2 OF 2

- 6) TRIMMING OFF SURPLUS LENGTH AFTER FORMING AT ENDS TO BE DONE.
- 7) FOR A VERY SMALL REQUIREMENT OF EARTHING FLEXIBLE BRAIDS (AROUND 1% OF TOTAL YEARLY REQMT.), NO. OF BRAIDS SHALL BE 1 AND CROSS SECTION SHALL BE AS PER AVAILABLE SIZES. LENGTH OF THESE FLEXIBLES WILL ALSO BE MUCH LESS (UPTO 300 MM)

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) 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.
- 3) SAMPLE DRAWINGS ARE ATTACHED FOR REFERENCE TO UNDERSTAND THE VARIOUS TYPES OF CONSTRUCTION.
- 4) IN CASE OF SILVER PLATING ON FERRULES OF COPPER BRAIDED FLEXIBLES, SQ.CM. AREA OF ONLY OUTER PORTION WILL BE APPLICABLE.

IMPORTANT NOTES

THE WIRE SIZE/ FLEXIBLE WIDTH/ BRAIDS CROSS SECTION SHALL BE STANDARDISED FOR MAXIMUM REQUIREMENT (UPTO 90%) TO 38SWG/ 48 MM/ 105 SQ MM RESPECTIVELY. HOWEVER, OTHER THICKNESSES MAY HAVE TO BE SUPPLIED AS PER OUR END CUSTOMER REQUIREMENT. THERE IS LIKELY TO BE NOT MORE THAN FIVE TYPES OF FLEXIBLES FOR OUR 90% REQUIREMENT. ONLY THE LENGTH, NO. OF HOLES, WIDTH OF FLATTENED FERRULE PALM AT BOTH ENDS MAY VARY FOR A VERY SMALL REQUIREMENT OF BALANCE 10% QUANTITY.

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

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.

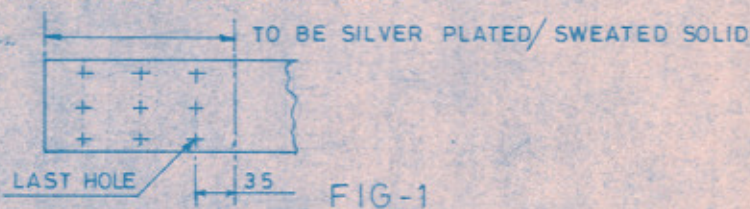


FIG-1

66	64	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	STD.	DRAWING No.		ITEM No.		MATL. SPECN.		57	A	COMP GROUP		UNIT WEIGHT (Kg.)		74	78
VARI-1				BASIC		R.M. UNIT		ANT		QTY		VARI-2		ANT		QTY		VARI-3		ANT		QTY		VARI-4	
ANT				ANT		ANT		ANT		ANT		ANT		ANT		ANT		ANT		ANT		ANT		ANT	

CARD TYPE-2

CARD TYPE-1



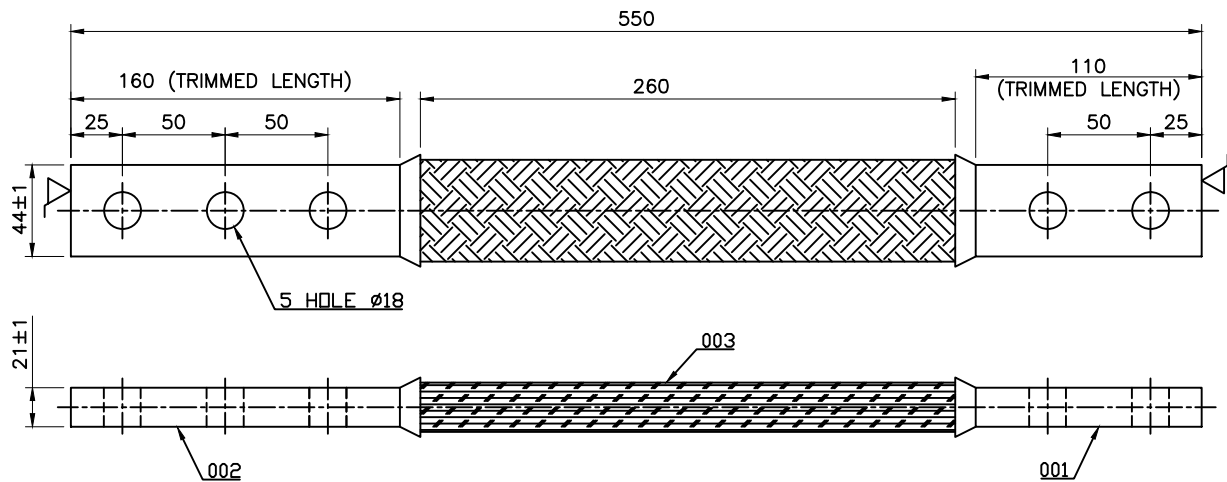
**BHARAT HEAVY ELECTRICALS LIMITED
JHANSI**

DEPT. SWE	CODE 409		SCALE	WEIGHT (Kg.)	REF. TO ASSY. DRG.	ITEM No.
TITLE GENERAL INSTRUCTIONS FOR SWEATING & SILVER PLATING ON COPPER CONDUCTOR & FLEXIBLE					DRAWN H. LAL CHECKED ILB APPROVED <i>sd.</i>	SIGN. <i>sd.</i> DATE 5.6.81 5 6 81
DIMENSIONS TO BE CONTROLLED WITHIN AS LIMITS SHOWN. MACHINING TOLERANCE ± 0.25 mm UNLESS OTHERWISE SHOWN. NON - MACHINING TOLERANCE $\pm$					DRAWING No. 15 16 17 CARD CODE 4 5 4 1 0 0 0 0 0 0 5 SHEET No. 1 No. OF SHEETS	

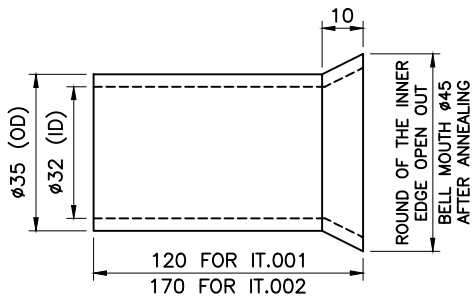
ALL DIMENSIONS IN MM.

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1			2			3		
REV.	DATE	ALTERD	REV.	DATE	ALTERD	REV.	DATE	ALTERD
		CHECKED	02	21.09.13	CHECKED	01	15.02.13	CHECKED
			WEIGHT, S.P. AREA AND ITEM DESCRIPTION ARE REVISED.			HOLE ADDED FOR SECOND END OF FLEXIBLE.		



VAR.00



ITEM-001 & 002

NOTES:-

1. EACH ELECTRO TINNED COPPER FLEXIBLE BRAID IS OF 38 SWG WIRE HAVING CROSS SECTION 105 SQMM.
2. ENDS ARE TO BE SWAGED AND SURFACES TO BE FLAT AND FREE FROM BELMISHES.
3. IF REQUIRED ENDS MAY BE PRESSED AGAIN TO MAINTAIN FLATNESS.
4. EACH FLEXIBLE ARE TO BE WRAPPED WITH POLYTHENE SHEET.
5. TRIMMED LENGTH TO BE SILVER PLATED.
6. FOR SILVER PLATING REF. DRG. NO. 45410000005 REV.06.
7. FOR BELL MOUTH AND BOTH SIDE GRINDING, MANUFACTURER TAKE EXTRA LENGTH OF TUBE AND BRAID AS SUITABLE.

SILVER PLATING AREA:-VAR.00=403.41 SQCM.

WEIGHT:-VAR.00=3.75±5% KG.

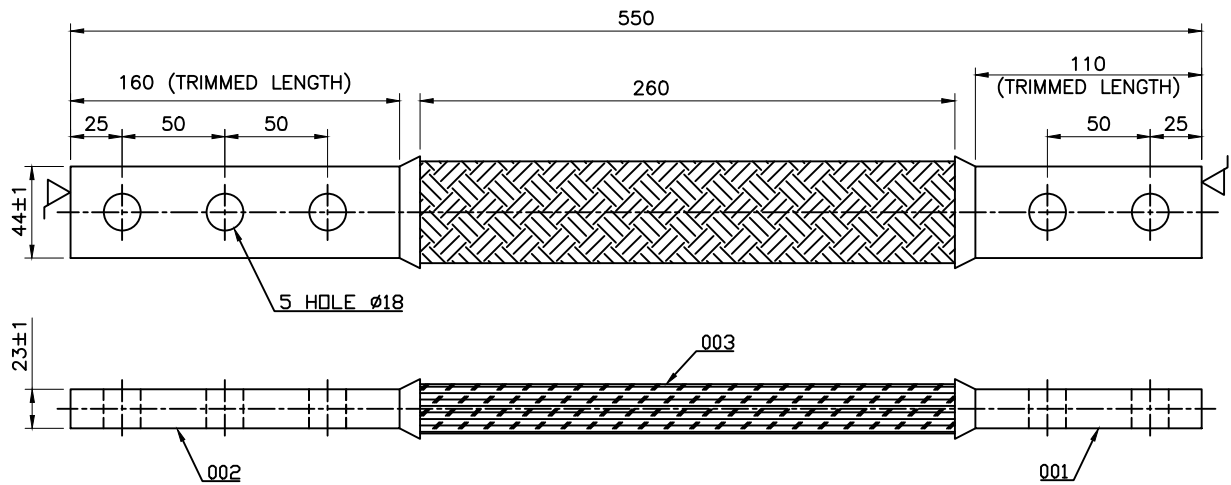
007		003	E.T. COPPER FLEXIBLE BRAID 3.2TKx48x550 LG.	—	—	AA12010	0.513	
001		002	COPPER TUBE 35 OD x 32 ID x 170 LG.	—	—	AA12014	0.239	
001		001	COPPER TUBE 35 OD x 32 ID x 120 LG.	—	—	AA12014	0.168	
VAR 00	REMARKS	ITEM NO.	DESCRIPTION	DRAWING NO.	IT.NO. VAR.	MATL.CODE MATL.SPCN.	WT. QTY.	0 0

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 BRAIDED FLEXIBLE FOR IPBD					DRAWING NO. 41001200024			REV. 02
					SHEET NO.— 01		NO.OF SHEETS— 01	

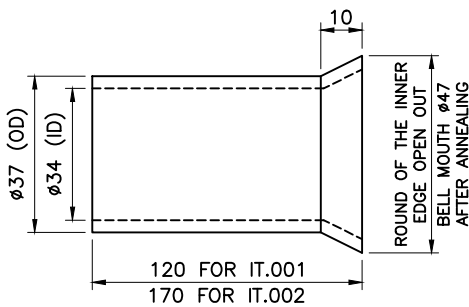
ALL DIMENSIONS IN MM.

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1			2			3		
REV.	DATE	ALTERD	REV.	DATE	ALTERD	REV.	DATE	ALTERD
03	21.09.13	CHECKED	02	21.06.13	CHECKED	01	15.02.13	CHECKED
LENGTH CHANGE TO 550mm, WEIGHT, S.P. AREA AND ITEM DESCRIPTION ARE REVISED.			LENGTH CHANGE TO 685mm.			HOLE ADDED FOR SECOND END OF FLEXIBLE.		



VAR.00



ITEM-001 & 002

NOTES:-

1. EACH ELECTRO TINNED COPPER FLEXIBLE BRAID IS OF 38 SWG WIRE HAVING CROSS SECTION 105 SQMM.
2. ENDS ARE TO BE SWAGED AND SURFACES TO BE FLAT AND FREE FROM BELMISHES.
3. IF REQUIRED ENDS MAY BE PRESSED AGAIN TO MAINTAIN FLATNESS.
4. EACH FLEXIBLE ARE TO BE WRAPPED WITH POLYTHENE SHEET.
5. TRIMMED LENGTH TO BE SILVER PLATED.
6. FOR SILVER PLATING REF. DRG. NO. 45410000005 REV.06.
7. FOR BELL MOUTH AND BOTH SIDE GRINDING, MANUFACTURER TAKE EXTRA LENGTH OF TUBE AND BRAID AS SUITABLE.

SILVER PLATING AREA:-VAR.00=421.62 SQCM.

WEIGHT:-VAR.00=4.27±5% KG.

008		003	E.T. COPPER FLEXIBLE BRAID 3.2TKx48x550 LG.	—	—	AA12010	0.513	
001		002	COPPER TUBE 37 OD x 34 ID x 170 LG.	—	—	AA12014	0.253	
001		001	COPPER TUBE 37 OD x 34 ID x 120 LG.	—	—	AA12014	0.178	
VAR 00	REMARKS	ITEM NO.	DESCRIPTION	DRAWING NO.	IT.NO.	MATL.CODE	WT.	0
					VAR.	MATL.SPCN.	QTY.	0

CUSTOMER			PROJECT/PRODUCT		
—			—		
 भारत हेवी इलेक्ट्रिकल्स लिमिटेड - रुद्रपुर BHARAT HEAVY ELECTRICALS LIMITED RUDRAPUR			NAME	SIGN.	DATE
			DRN.	एस. के. गुप्ता	—
			CKD.	एस. के. गुप्ता	—
			APPD.	आर. के. लाल	—
DEPTT.	UNTOL.DIM.GR.	SCALE	WEIGHT-KG	REF.TO ASSY.DRG.	IT.NO.
BDE	C/M/F	—	—	—	—
TITLE			DRAWING NO.		REV.
COPPER BRAIDED FLEXIBLE FOR IPBD			41001200025		03
SHEET NO.- 01		NO.OF SHEETS- 01		SIZE- A4	



CORPORATE PURCHASING SPECIFICATION

AA 120 10

Rev. No. 03

PREFACE SHEET

FLEXIBLE COPPER BRAID – ANNEALED, FLAT

FOR INTERNAL USE ONLY

REMOVE THIS PREFACE BEFORE ISSUE TO SUPPLIERS

Comparable Standards:

Suggested/Probable Suppliers and Grades:

Refer plant vendors list.

User Plant References:

1. BHOPAL : PS 12067

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

November, 1978

**FLEXIBLE COPPER BRAID – ANNEALED, FLAT****1.0 GENERAL:**

This specification governs the quality requirements of flat flexible copper braid in annealed condition, manufactured from high conductivity copper wire, plated in a tubular form.

2.0 APPLICATION:

Used in the manufacture of flexible connections of electrical apparatus.

3.0 CONDITION OF DELIVERY:

Copper braid shall be supplied in flat flexible annealed condition. The braid shall be of ordinary flexible quality or stretch wires refer Cl.6.3.

4.0 COMPLIANCE WITH NATIONAL STANDARDS:

There is no Indian Standard covering this material.

5.0 DIMENSIONS AND TOLERANCES:**5.1 Sizes:**

The Copper braid shall be supplied with the width and thickness as specified in BHEL order. The stranding of the preferred sizes are given below:

Thickness mm	Width mm	No of strands	Wire dia mm	No of braids	Effective area, cm ²
1.60	19.05	648	0.122	1	0.1174
3.20	25.40	1908	0.152	3	0.4355

The stranding of other sizes shall be as described in BHEL order

5.2 Tolerances:**5.2.1 Width & Thickness:**

The tolerance on width and thickness shall be ± 0.381 mm measured on the braid under no compression or tension.

Revisions :

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Dt. of 1st Issue

D :15.02.2006

Dt :

Year :

BHOPAL

Corp. R&D

November, 1978

**5.2.2 Wire:**

The tolerance on wire diameter shall be as follows:

Nominal Over	Diameter mm upto & incld.	Tolerance (±)
--	0.127	0.0025
0.127	0.190	0.0051

6.0 MANUFACTURE:

6.1 The wires for the braid shall be manufactured from copper of ETP grade conforming to IS:191.

6.2 **Braiding:** The stands shall be divided into groups of equal number and braided in tubular form. The braid shall then be flattened. The lay of the braid side shall, at the supplier's discretion, meet the flexibility and dimensional details specified.

For large number of strands the braids may be manufactured in two or more concentric tubular forms.

6.3 **Stretch wires:** Whenever specified in BHEL order, the braid shall be supplied with two parallel stretch wires of large diameter than the wire used in the braid running the whole length of the braid, to assist in controlling the width during manufacture and excessive stretching.

7.0 FREEDOM FROM DEFECTS:

The braid shall be clean, and free from harmful defects.

8.0 CHEMICAL ANALYSIS:

The analysis of copper when analyzed in accordance with IS:440, shall as follows.

Element	Percent	
	Min.	Max
Copper and Silver	99.90	-----
Bismuth*	-----	0.001
Lead*	-----	0.005
Total of all impurities excl. silver and oxygen	-----	0.030
Silver present will be counted as copper.		



CORPORATE PURCHASING SPECIFICATION

AA 120 10

Rev. No. 03

PAGE 3 OF 4

*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 sample per size per melt per consignment of 3 tonnes or part thereof shall be taken for chemical and electrical tests.

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

10.0 ELECTRICAL RESISTIVITY (AS RECEIVED)

When measured in accordance with IS: 3635, the electrical resistivity at 20⁰.C shall not be greater than 0.01739 ohm-mm²/metre, which is equivalent to an electrical conductivity of 99.14%, minimum of IACS standard. (Refer Appendix B of IS: 613 for temperature correction factor).

11.0 INSPECTION AT SUPPLIER ' WORKS:

When ever 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 works, the supplier shall make Necessary arrangements for carrying out the prescribed test 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.

12.0 TEST CERTIFICATES:

Unless other wise stated, three copies of certificates shall be supplied along with each consignment.

In addition, the supplier shall ensure to send one copy of test certificates along with the dispatch documents to facilitate quick clearance of the material.

AA 120 10	CORPORATE PURCHASING SPECIFICATION	
Rev. No. 03		
PAGE 4 OF 4		

The test certificate shall bear the following information:

AA 12010 (Rev.03) : Flexible Copper Braid - Annealed, Flat
 BHEL Order No.
 Manufacturer 's/Supplier's Name:
 Lot/Identification/Batch/Melt No.
 Sizes and Quantity Supplied

The effective cross sectional area of the braid in square cm calculated from $W/o.887$ where W is the weight of finished braid in kg per metre length.

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

13.0 PACKING AND MARKING:

The material shall be suitably packed to prevent damage during transit.
 Each package shall be legibly marked or labeled with the following information:

AA 12010 : Flexible Copper braid – Annealed, Flat
 BHEL Order No.
 Manufacturer's/Supplier's Name :
 Lot/Identification/Batch/Melt No.
 Sizes and Quantity Supplied

14.0 REFERRED STANDARDS (Latest Publications Including Amendments):

- | | | |
|------------|-----------|-----------|
| 1. IS:191 | 2. IS:440 | 3. IS:613 |
| 4. IS:3635 | | |



CORPORATE PURCHASING SPECIFICATION

AA 120 14

Rev. No. 01

PREFACE SHEET

SOLID DRAWN COPPER TUBES - HALF HARD

FOR INTERNAL USE ONLY

REMOVE THIS PREFACE BEFORE ISSUE TO SUPPLIERS

Comparable Standards:

1. BRITISH : BS EN 1057

Probable/Suggested Suppliers and Grades:

Refer plant vendors list.

User Plant References:

1. HARDWAR : --

Revisions :

Cl : 19.10.14 of MOM of MRC-NFCW+HE

APPROVED :

INTERPLANT MATERIAL RATIONALISATION
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Dt: 15.11.2004

Dt :

Year :

HARDWAR

Corp. R&D

March, 1978



CORPORATE PURCHASING SPECIFICATION

AA 120 14

Rev. No. 01

PAGE 1 OF 8

SOLID DRAWN COPPER TUBES - HALF HARD

1.0 GENERAL:

This specification governs the quality requirements of solid drawn copper tubes.

2.0 APPLICATION:

For general engineering purpose.

3.0 CONDITION OF DELIVERY:

The tubes shall be in half hard condition (Stress relieved) and shall be cut square, cleaned and deburred.

The tubes shall be supplied in half - hard condition through out their length and suitable for expansion and bell mouthing at both ends.

4.0 COMPLIANCE WITH NATIONAL STANDARDS:

Assistance has been taken from BSEN: 1057.

5.0 DIMENSIONS AND TOLERANCES:

5.1 Sizes:

The tubes shall be supplied to the dimensions specified in BHEL order.

5.2 Tolerances:

The tolerance on outside diameter, wall thickness, and length shall comply with the following.

5.2.1 Tolerance on outside Diameter:

Table 1: Tolerance on outside diameter			
Nominal outside diameter, d		Tolerance on nominal diameter (Values in mm)	
over	up to and including	Applicable to mean diameter	Applicable to any diameter *
≥ 6	18	± 0.04	± 0.09
18	28	± 0.05	± 0.10

Revisions :

Cl : 19.10.14 of MOM of MRC-NFCW+HE

APPROVED :

INTERPLANT MATERIAL RATIONALISATION
COMMITTEE-MRC (NFCW+HE)

Rev. No. 01

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Year :

HARDWAR

Corp. R&D

March, 1978



28	54	± 0.06	± 0.11
54	76.1	± 0.07	± 0.15
76.1	88.9	± 0.07	± 0.20
88.9	108	± 0.07	± 0.30
108	159	± 0.2	± 0.40
159	267	± 0.6	-

* Including deviation from circular form

5.2.2 Tolerances on wall thickness:

The tolerance on wall thickness expressed in percentage of the nominal thickness as measured at any point shall conform to the requirements given below:

Table 2: Tolerance on wall thickness

Nominal outside diameter, d	Tolerance on wall thickness e *	
	e < 1 mm %	e ≥ 1 mm %
< 18	± 10	± 13
≥ 18	± 10	± 15 **

* Including deviation from concentricity

** ± 10 % for half - hard tubes of 35 mm, 42 mm and 54 mm diameter with wall thickness of 1.2 mm.

NOTE: Concentricity (uniformity of wall thickness) is controlled by tolerance on wall thickness.

5.2.3 Tolerances on specified length of tubes:

The length shall be equal to or greater than those ordered.

6.0 FREEDOM FROM DEFECTS:

The tubes shall be leak tight and shall have no detrimental defects.



CORPORATE PURCHASING SPECIFICATION

AA 120 14

Rev. No. 01

PAGE 3 OF 8

6.1 Surface quality:

The outer and inner surface of the tubes shall be clean and smooth.

The inner surface shall not contain any detrimental film nor present a carbon level high enough to allow the formation of such film during installation. When tested in accordance with 10.4 and 10.5 as appropriate the tube shall conform to the appropriate requirements given in table 3.

Table 3: Quantitative and qualitative specification for carbon residues

Nominal outside diameter d mm		Residual Carbon ¹⁾	Potential Carbon ¹⁾	Total Carbon ¹⁾	Carbon Film test
From Up to and Including	10 54	0.20	-	-	Yes
Over	54	0.20	-	-	Yes

Table 4: Testing of drift expanding

Nominal outside diameter d mm		Technological test
Over	Up to and including	Drift expanding test
6 *	18	M
18	54	A
54	267	-
* Including 6 M- Mandatory A- As agreed upon by BHEL and the supplier		

6.4 Drift expanding:

No crack, break or tearing of the metal shall be visible to the unaided eye when tubes of sizes and tempers given in table 4 are tested in accordance with 10.6.

7.0 CHEMICAL COMPOSITION:

The chemical composition of the material when analysed as per IS: 440 or any other established instrumental / chemical method shall be as follows:

Copper (Incl. Silver) : 99.90%, minimum.

$0.015 \% \leq \text{Phosphorus} \leq 0.040$

8.0 MECHANICAL PROPERTIES:

When tested in accordance with IS: 1608 tensile strength and elongation shall conform to the requirements given below:

Tensile strength : 250 MPa, min.

Hardness Vickers (HV5) : 75 – 100

Elongation (for 6 to 66.7 mm dia. tube and either $e < 1\text{mm}$ or $d/e^2 > 24$) $\geq 30\%$
(for 6 to 159 mm dia. tube or $e \geq 1\text{mm}$ and also $d/e^2 \leq 24$) $\geq 20\%$

Where

d is the nominal outside diameter in millimetres;

e is the nominal wall thickness in millimetres.

9.0 SAMPLING:

For the purpose of quality assurance during production, the number of sampling units to be taken at random shall be as follows:

Sampling Rate		
Tube weight per meter kg/m	Quantity for one sampling unit at predicted monthly metreage *	
	< 100 000m kg	$\geq 100\ 000\text{m}$ kg
≤ 0.25	1 500	3 000
> 0.25	2 500	5 000
* at least one sampling unit shall be taken per production batch.		

These sampling rates shall apply when testing for dimensional controls; control of other mandatory properties shall be carried out on each second sampling unit.

For the verification of the composition, results may be used from analyses carried out at an earlier stage of manufacturing of product, e.g. at the casting or billets inward stage.

10.0 TEST MERHODS:

10.1 Analysis

For composition, analysis shall be carried out on the test samples obtained in accordance with clause 9. The analytical methods shall be chemical or spectrographic in accordance with appropriate national / international standards. In cases of dispute the reference method shall be by chemical analysis.

10.2 Tensile test

The tensile test shall be carried out in accordance with EN 10002 -1 / IS: 1608 on test pieces prepared from the samples obtained in accordance with clause 9.



CORPORATE PURCHASING SPECIFICATION

AA 120 14

Rev. No. 01

PAGE 5 OF 8

10.3 Hardness test

When required, the Vickers hardness test shall be carried out in accordance with ISO 6507 -1 / IS: 1608.

10.4 Carbon content test:

The determination of carbon content shall be carried out on the samples obtained in accordance with clause 9 using reference method described in prEN723.

10.5 Carbon film test:

The detection and assessment of carbon film shall be carried out on the samples obtained in accordance with clause 9 using the method described in annex. A.

10.6 Drift expanding test:

When required, the drift expanding test shall be carried out in accordance with IS 2501. The outside diameter of the tube end shall be expanded by 30% using a conical mandrel having an angle of 45°.

10.7 Freedom from defects tests:

Each tube shall be subjected to one of the following tests:

- eddy current test for detection of local defects, in accordance with prEN 1971 and the requirements in B.1;
- hydrostatic test in accordance with the method in B.2;
- Pneumatic test in accordance with the method in B. 3.

The choice of method, selected from the above, is at the discretion of the manufacturer.

11.0 RETEST:

In the event that the tube sample fails to meet the test requirements, further sample shall be taken from the batch at a sampling rate four times higher than specified in sampling clause and if any of the retest samples fail to meet the specification requirements, the tube represented by the sample shall be rejected. If all the retest samples meet the requirements, the tubes represented by the samples shall be accepted.

12.0 TEST CERTIFICATES:

Unless otherwise specified on order, three copies of test certificates shall be supplied.

In addition, supplier shall sure to enclose one copy of test certificate along with dispatch documents to facilitate quick clearance of material.

The test certificate shall bear the following information:

BHEL order No.

AA 12016, Rev. No. 01 : Solid Drawn Copper Tubes – Half hard

Batch No.

Identification Mark / No.

Weight

Supplier's Reference and Name

Result of Chemical, Mechanical, and all other tests called for.

**13.0 PACKING AND MARKING:**

The material shall be suitably packed in wooden crated to prevent corrosion and damage during transit.

Each crate shall be legibly marked with the following information.

BHEL order No.

AA 12014

Batch No.

Identification Mark / No.

Weight

Supplier's reference and Name

14.0 REFERRED STANDARDS (Latest Publications Including Amendments):

(1) BS EN 1057

(2) IS 440

(3) IS: 1608

(4) IS: 2305

(5) ASTM E 24

(6) AA 0490002



Annexure A

Carbon film test

A.1 Preparation of the test piece

The sample of tube to be tested shall be cleaned on its outside surface either abrasively by filing or turning in order to remove all traces of the original surface finish, or chemically by sealing one end with an acid resistant plug and then immersing in concentrated nitric acid to pickle the outside surface, and then rinsing with deionized water and drying.

A sample, at least 25 mm long, shall be then cut from the cleaned section, using a clean saw blade and cut in half longitudinally to make two test pieces. One test piece shall be degreased by dipping in acetone.

For tube dimensions exceeding 22 mm X 1 mm a sample of comparable surface area shall be taken, the preparation of which shall correspond to the procedure described.

A.2 Method

The degreased test piece shall be placed, with its internal surface upwards, in a small, flat bottomed white porcelain or glass dish and covered with 25% (V/V) nitric acid at ambient temperature.

The acid causes loosening of surface deposits which will float to the surface. When the acid turns blue in colour the test piece shall be removed and rinsed with deionized water to wash back into the acid any particles adhering to the test piece.

A.3 Detection and assessment of films

The reaction of the test piece in the acid shall be observed with a microscope of X10 magnification. The initial observation will assess whether a material released by the acid is in the form of a film or particulate. If nothing is detected, or particles are found, the test is passed.

If clearly visible films are seen floating to the surface these may be of carbon or oxide.

To distinguish between carbon and oxide, the porcelain or glass dish shall be gently heated and the acid allowed to boil for about 5 min to dissolve any oxide films.

If on re-examination the films have been eliminated or only particles remain, the test passed. If there is no reduction in the film element, then it is carbon and the test is failed.



Annexure B

Freedom from defect tests

B. 1 Eddy current test

Maximum drill diameters for the reference standard tube which is defined in EN 1971 and are given table B. 1. Signals produced by reference standard tubes set the sorting limits for acceptance or rejection. Tubes containing defects which produce signals equal to or greater than the sorting limit shall be rejected.

B. 2 Hydrostatic test

The tube under test shall be connected to a source of pressurized water. Water pressure as specified in table B. 2 shall be maintained in the tube for a minimum period for 10 second without evidence of leaking. If one or more leaks are observed, the tube shall be rejected. If no leak is observed, the tube shall be accepted.

Table B.2

Nominal outside diameter d (mm)		Hydrostatic pressure (bar)
Over	Up to and including	Min.
6 *	54	35
54	108	25
108	159	15
159	267	10
* Including 6		

B. 3 Pneumatic test

The tube under test shall be connected to a source of pressurized air. Air pressure at 4 bar (0.4 MPa) shall be maintained in the tube.

The tube shall be completely immersed in water for a minimum period of 10 Second and inspected for the issue of bubbles from the tube. Should any bubbles be observed then the tube shall be rejected. If no bubbles are observed then the tube shall be accepted.



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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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

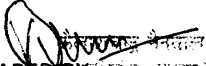
IEEE= INSTITUTE OF ELECTRONICS & ELECTRICAL ENGINEERS STANDARD

1= BHEL-QC

2= BHEL'S THIRD PARTY INSPECTION AGENCY

3= MANUFACTURER

4= NABL APPROVED EXTERNAL LABORATORY


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