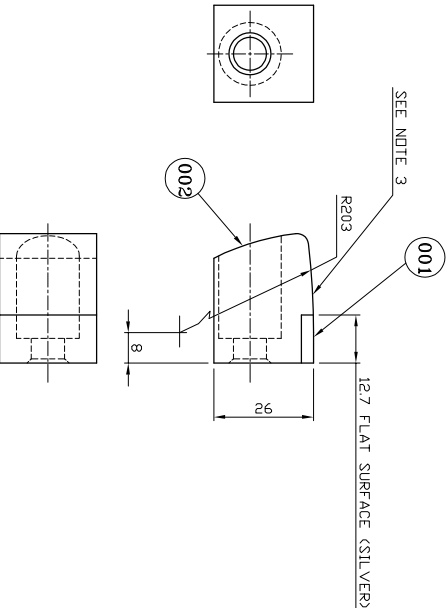


FIRST ANGLE PROJECTION

(ALL DIMENSIONS ARE IN mm.)

1E00 3 11 085 3 ON GINWAD

STYLE LIST				RECORDED SIG. DATE
STYLE	ITEM INCLUDED	DESCRIPTION OR REMARKS		
BP9048586259	VAR.00	ASSY. OF BOTTOM CONTACT	LMO	17/96



- NOTES :-**
- ITEMS 001 & 002 TO BE SILVER SOLDERED TOGETHER.
 - VAR-00 TO BE SUITABLY PACKED TO PROTECT SURFACE FROM MECHANICAL DAMAGE.
 - MACHINE SKIM THIS SURFACE AFTER SILVER BRAZING TO GET EVEN SURFACE BETWEEN COPPER & SILVER.
 - PLATING THICKNESS IS CRITICAL TO QUALITY AND TO BE CHECKED AS FOLLOWING :
A)- 5% RANDOMLY FOR THE SUPPLY LOT OF 1000 NUMBER OR BELOW.
B)- 2% RANDOMLY FOR THE SUPPLY LOT OF MORE THAN 1000 NUMBER.

FINISH :- CR SILVER PLATE VAR. 00 (0.008TK) TO P.R.S. AA06/73613.

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IT MUST NOT BE USED DIRECTLY OR INDIRECTLY IN ANY WAY DETRIMENTAL TO THE INTEREST OF THE COMPANY.

E8600794 COL. B
REF. DRG. NO.

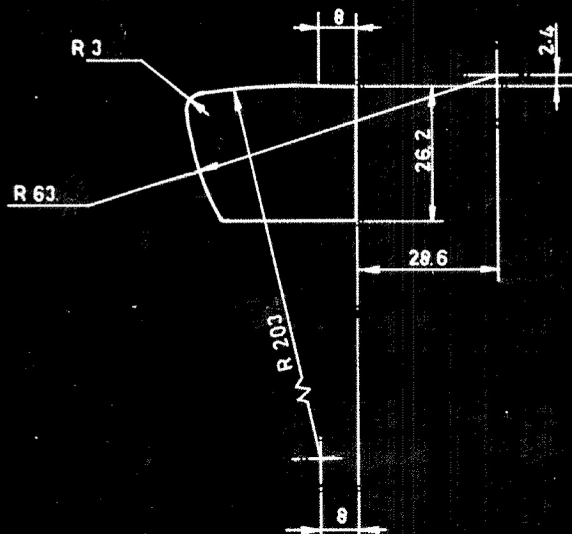
001		002	BOTTOM CONTACT	3 580 11 30056	001			0.1836 KG
001		001	INSERT	4 580 11 30029	001			0.011 KG
VAR. 00	REMARKS	VAR. NO.	ITEM NO.	DESCRIPTION	DWG. NO.	IT. NO.	MATL. CODE	UNIT WT.
						VAR	MATL. SPECN.	QTY.

INVENTORY No.		SIGN. & DATE		E8600794 COL. B REF. DRG. NO.															
REV	DATE	ALTERED BY	ASSED BY	REV	DATE	ALTERED BY	ASSED BY												
06	26.07.16	CHECKED BY	MANOJ	05	08.03.14	CHECKED BY	RKS												
NOTE 2 WAS 'PELIFILM DIPPED'.		NOTE 4 ADDED FOR CTIO DN PLATING THICKNESS.		NOTE 1 ADDED FOR CTIO DN PLATING THICKNESS.		NOTE 3 ADDED FOR CTIO DN PLATING THICKNESS.													
G404																			
ADDITIONAL INFORMATION								STATUS OF DRAWING M											
DISTRIBUTION OF PRINTS								OFFICE COPY - 1											
SWM (SWM)								- 4											
REV								DATE		ALTERED BY		ASSED BY							
04								20.7.04		CHECKED BY		MANOJ							
REV								DATE		ALTERED BY		ASSED BY							
001 & 002								20.7.04		CHECKED BY		MANOJ							
WEIGHT ADDED FOR ITEMS								001 & 002		NEW ORIGINAL MADE.									
ASSEMBLY OF BOTTOM CONTACT																			
3 580 11 3 0031																			
REV								DATE		ALTERED BY		ASSED BY							
06								021		CHECKED BY		MANOJ							

FIRST ANGLE PROJECTION

ALL DIMENSIONS ARE IN mm.

DRG. NO. 3 580 11 3 0041



NOTE:-

1. MATERIAL SUPPLIED IN MILL LENGTHS UNLESS OTHERWISE ORDERED.
2. SECTION IS STYLED. THIS SECTION STYLE NUMBER APPLIES TO THE SECTION OR SHAPE WITHOUT ANY REFERENCE TO THE LENGTH.
3. A VARIATION OF ± 254 IS PERMISSIBLE ON ALL DIMENSIONS.
4. WEIGHT - 7.20 KG./METRE LENGTH.

STYLE LIST

STYLE NO.	ITEM INCLUDED	DESCRIPTION OR REMARKS	RECORDED SIGN	DATE
BP9078576235	001	EXTRUDED COPPER SECTION	L.M.O.	6.10.81

VAR. NO.		REMARKS		ITEM NO.		DESCRIPTION		DRAWING NO.		UNIT WT.		QTY.	
001						EXTRUDED COPPER SECTION HARD				AA 120 23			
28		CARD TYPE 3		28		CARD TYPE 1		28		CARD TYPE 2			
ADDITIONAL INFORMATION												TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT INDIAN RAILWAYS	
STATUS OF DRAWING M												BHARAT HEAVY ELECTRICALS LTD. BHOPAL	
DISTRIBUTION OF PRINTS QTY.												DRN L.M. OTARI	
OFFICE COPY 1												CHD Manu	
SWM 4												APPD V.P.A. Upadhyay	
TCX (SWM) 1												DATE 6.10.81	
REV. DATE 25-5-81												REF. TO ASSY. DRG. 3 580 11 3 0056	
ALTERED BY Vishwajit												ITEM NO. 001	
CHECKED BY APN												NO. OF SHEETS 01	
MATERIAL WAS EXTRUDED COPPER SECTION ANNEALED TO AA12021. STYLE NO. WAS IN 6 DIGITS. NOTE 4 ADDED.												SHEET NO. 01	
DEPT. CODE 410												NO. OF SHEETS 01	
GRADE OF UN. TOL. DIM. REFER. 1:1												SIZE-A	
TITLE EXTRUDED SECTION													
CARD CODE 3													
DRAWING NO. 3 580 11 3 0041													

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D8637710 IT.1 REF. DRG. NO.

SIGN. & DATE

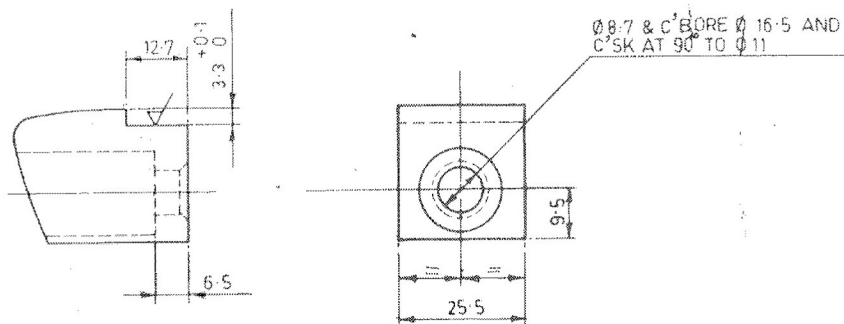
INVENTORY NO.

FIRST ANGLE PROJECTION

(ALL DIMENSIONS ARE IN mm.)

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DRG. NO. 3 580 11 3 0056



4 TOOL LIST		
ITEM	TOOL	DESCRIPTION
001	1485919	DRILL JIG

VAR 00	REMARKS	VAR NO.	001	ITEM NO.	001	DESCRIPTION	3 580 11 3 0041	001	MATL. CODE	UNIT WT.	QTY.	CS	
28 CARD TYPE-3 ADDITIONAL INFORMATION STATUS OF DRAWING M DISTRIBUTION OF PRINTS, QTY OFFICE COPY 1 SWM 6 TCX (SWM) 1 28 CARD TYPE-1 TYPE OF PRODUCT A C EMU OR NAME OF CUSTOMER/PROJECT INDIAN RAILWAYS 28 CARD TYPE-2 BHARAT HEAVY ELECTRICALS LIMITED BHOPAL													
02 2.07.83 ALTR. CHRD. N/E WEIGHT ADDED.				REV 1 DATE 4.1.82 ALTERED BY 18.00 CHECKED TOOL NO. 1485919 ADDED.				DEPT CEE GRADE OF UN. TOL. DIM. C/M/P SCALE 1:1 WEIGHT (Kg.) 0.1836 REF TO ASSY. DRG. 3 580 11 3 0031 ITEM NO. 002 NO. OF ITEMS 001				73 74 NO. OF OF VAR 00	
TITLE BOTTOM CONTACT				CARD CODE DRAWING NO. 3 580 11 3 0056				22 23 24 REV. 02				NO. OF SHEETS 1	

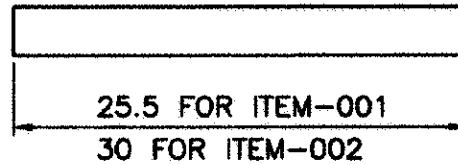
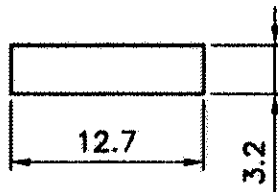
SIZE A3

(ALL DIMENSIONS ARE IN mm)

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REV.	DATE	ALTERED	REV.	DATE	ALTERED	ADDITIONAL INFORMATION
		CHECKED			CHECKED	AC EMU
		APPROVED	02	29.04.05	APPROVED	STATUS OF DRAWING M
ITEM-002 ADDED. DRG. COMPUTERISED.			DISTRIBUTION 0/C - 1 SWM - 4 OF PRINTS TCX (SWM) - 1			

001 002



NOTE :-

1. TOLERANCE ON ALL DIMENSIONS TO BE $\begin{matrix} +0.10 \\ 0 \end{matrix}$.

B 8700263, IT.002
REF. DRG. NO.

	002	INSERT, 3.2TK.x12.7 99.9% PURE SILVER		Kg.	0.013 30
BP 9078505869	001	INSERT, 3.2TK.x12.7 99.9% PURE SILVER		Kg.	0.011 25.9
REMARKS	ITEM NO.	DESCRIPTION	STD	MATL. CODE MATL. SPECN.	UNIT WT. QTY.

R/110/83

SIGN. & DATE

INVENTORY NO.

DEPT. CBE CODE 407 /TITLE INSERT		UNTOL. DIMS. GR. CG 06503		SCALE 2:1	WEIGHT(KG) -	NAME L.M.O. SIGN Sd/- DATE 29.09.81	NO. OF VAR. -
						NAME MANI SIGN Sd/- DATE 11.01.82	
						NAME V.P.A. SIGN Sd/- DATE 16.09.82	
						REF. TO ASSY. DRG. 2 580 11 3 0031 2 580 11 3 0050	
REF. TO ASSY. DRG. 2 580 11 3 0031 2 580 11 3 0050						ITEM NO. 001 002	NO. OF ITEM 002
DRAWING NO. 4 580 11 3 0029						REV 02	
SHT. NO 01						NO. OF SHT. 01	

 कम्प्यूटर ड्राईंग
 पत्रक क्रमांक 45801130029

BHARAT HEAVY ELECTRICALS LTD.
BHOPAL

	CORPORATE PURCHASING SPECIFICATION	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 2px;">AA 120 23</td> </tr> <tr> <td style="padding: 2px;">Rev. No. 08</td> </tr> <tr> <td style="padding: 2px;">PAGE 1 OF 5</td> </tr> </table>	AA 120 23	Rev. No. 08	PAGE 1 OF 5
AA 120 23					
Rev. No. 08					
PAGE 1 OF 5					
COPPER RODS AND SECTIONS - HARD					
1.0 GENERAL: This specification governs the quality requirements of copper rods/bars and sections. 2.0 APPLICATION: Used for general electrical purposes in Transformers, switch gears, Bus - bars, HT/MT caps and control equipment. 3.0 CONDITION OF DELIVERY: The copper rods shall be supplied in hard condition in straight lengths. Rectangular rods shall be supplied with radiused edges to clause 5.3. 4.0 COMPLIANCE WITH NATIONAL STANDARDS: The copper rods and bars shall comply with the requirements of the following national standard and also meet the requirements of this specification. IS: 613- 2000 : Copper Rods and Bars For Condition : Hard Electrical purposes - specification. 5.0 DIMENSIONS AND TOLERANCES: 5.1 Sizes. Copper rods and sections shall be supplied to the dimensions specified in BHEL order / drawing. 5.2 Tolerances: 5.2.1 The tolerances for round, square, rectangular and hexagonal rods / bars shall be as given below : [Table - 2 of IS: 613] 5.2.2 Sections: Shall be as per BHEL drawing accompanying the order.					
Revisions : Cl: 24.1 of MOM of MRC-NFCW+HE		APPROVED : INTERPLANT MATERIAL RATIONALISATION COMMITTEE-MRC (NFCW+HE)			
Rev. No.08	Amd.No.	Reaffirmed			
Dt:06.06.2012	Dt :	Year :			
Prepared BHOPAL		Issued Corp. R&D			
Dt. of 1st Issue Nov, 1978					

CORPORATE PURCHASING SPECIFICATION



5.2.3 Length - Rod/Sections:

Tolerance on length shall be as follows:

Length, mm		Tolerances, $\pm$ mm
Over	Upto & incl.	
-	150	1.2
150	1200	1.5
1200	2400	2.5
2400	-	5.0

5.2.4 Straightness:

The straightness and/or edgewise curvature (edge bow) shall not exceed 3 mm for every 1000 mm length.

5.2.5 Radius on Edges - Rectangular & Squares:

Thickness, mm		Edges Radius, mm	Tolerance in Radius $\pm$ mm
Over	Upto and incl .		
6	25	2.5	0.25
25	50	3.2	0.25
50	-	as agreed to between BHEL & manufacturer.	

6.0 MANUFACTURE:

The copper rods shall be manufactured from copper of ETP grade conforming to IS: 191. The conductor shall be manufactured from ETP grade copper conforming to BHEL specification AA 120 24:: 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 copper rods shall be clean, bright, smooth and free from fins, spills, scaling, blisters, cracks and other defects.

8.0 CHEMICAL COMPOSITION:

The analysis of copper when analyzed in accordance with IS 440 or by any other Conventional/ Instrumental method shall be as follows:

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



CORPORATE PURCHASING SPECIFICATION

AA 120 23

Rev. No. 08

PAGE 3 OF 5

- These elements need not be determined when the material supplied conforms with the 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:

9.1 Tests shall be conducted as follows:

Rods and bars : Mechanical and Electrical.
Sections : Hardness and Electrical.

9.2 One sample 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:

The test samples, when tested in accordance with IS: 1608 shall show the following properties and hardness as per IS:1501.

10.1.1 Round: TABLE FOR HD

Dia., Width, Across flats or Thickness, mm		Tensile strength, N/mm ² ,min.			Elongation on 5.65√So of gauge length, % min.			Hardness for all shapes HV, min.
Over	Upto & incl.	Round	Square/ Hexagonal	Rect- angular	Round	Square/ Hexagonal	Rect- angular	
6.0	10.0	330	-	-	-	-	-	90
10.0	12.0	320	310	270	6	6	8	
12.0	25.0	290	280	260	8	8	8	
25.0	90.0	260	250	250	12	12	10	
> 90.0		As agreed between BHEL and manufacturer.						

10.1.2 Rods /Bars other than rectangular:

For material over 30 mm dia, thickness or width a cross flats, the test piece shall be turned with its centre 14mm from the surface of the material for material of smaller dia or width, which may not be tested in the condition as manufacture of the test pieces shall be turned from the centre of the material.

10.1.3 Rectangular Bars/Rods:

The test piece shall be taken from the centre of the rod/bar.

10.2 Bend Test:

The material shall be tested for bend test in accordance with IS:1599, if specified in BHEL order.

11.0 ELECTRICAL RESISTIVITY (As Received):

When measured in accordance with IS: 3635, the electrical resistivity of the sample in as received condition at 20⁰ C shall not be greater than 0.0177 ohm. mm² / metre, which is equivalent to an electrical conductivity of 97% 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.

AA 120 23	CORPORATE PURCHASING SPECIFICATION 
Rev. No. 08	
PAGE 4 OF 5	

12.0 CHECK LIST:

The supplier shall fill up the enclosed checklist as per Annexure-A and submit the same alongwith each batch.

13.0 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.

14.0 TEST CERTIFICATES:

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

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

The test certificate shall bear the following information:

AA 12023 (Rev. No. 08) : Copper Rods and sections - Hard

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.

15.0 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 12023 : Copper Rod and sections - Hard

BHEL Order No

Manufacturer's/ supplier's Name

Lot/Identification/ Batch /Melt No.

Size and Quantity supplied.

16.0 REFERRED STANDARDS(LATEST PUBLICATION INCLUDING AMENDMENTS):

1) IS:191
2) IS:440
3) IS:613
4) IS:1501
5) IS:1599
6) IS:1608
7) IS: 2826
8) IS: 3635
9) ASTM E 1004



CORPORATE PURCHASING SPECIFICATION

AA 120 23

Rev. No. 08

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ANNEXURE - A (Clause 12.0)

CHECK LIST FOR AA 120 23: COPPER RODS AND SECTIONS - HARD (To be filled by Supplier)

- A. Name of Principal Supplier :
- B. Name of Indian Agent :
1. Grade of material as per specification : Yes/No
2. Tolerance on diameter/ Width/thickness/ length and flatness as per specification and drawing : Yes/No
3. Chemical composition as per specification : Yes/No
4. Mechanical properties as per specification : Yes/No
5. Electrical Resistivity : Yes/No
6. Tests : (1) Bend
7. Details of previous experience enclosed : Yes/No.
(For New suppliers only)
- C. Deviations taken (Please specify clearly, if any) : Yes/No.
- 1
- 2
- 3

Date:

Signature &

Place:

Seal of Supplier

Pre-Qualification requirements
for “Indented Item”

S. No	Description of requirement	Document to be attached
1	Quoted Items SL NO.	Mention SI No.
2	Bidder should submit a self-declaration stating that, “Offered item is same as per enquiry Specification and there is no deviation”.	Self-declaration on letterhead of firm
3	In case Bidder is not be OEM but its Reseller then bidder to submit valid authorisation certificate from OEM with the bid.	Valid authorisation letter from OEM.
4	Bidder should have supplied same or similar other assembly (which have involved manufacturing activities such as bending, machining, brazing etc.) items of minimum 10 nos in any one of last 15 years (To be reckoned from the Bid opening date) to BHEL or any Central / State Govt Organization /Private/ PSU or any other establishment of Indian Railways or/ through Rail System designer/manufacturer/Channel Partner/Supplier Bidder to furnish Purchase Order copy(s)/Invoice(s) as proof of supply.	PO Copy/Invoice Copy for other than BHEL BHOPAL PO (PO no for BHEL Bhopal PO)

Terms Other than PQR to be compiled during Bidding:

Terms	Complied/Not Complied
Quoted SL NO.	
OEM Declaration/Authorization Certificate to be submitted by vendor	
Delivery accepted as per Tender	
Mobile no of concerned Person	
Email ID	

Note: Bidders providing above documents and not meeting above criteria essential for Offer Consideration.

NO DEVIATION CERTIFICATE

Reference: Bid No. _____ Dated: _____

Subject: Self-Declaration for No Deviation

This is to certify that the items/services offered by us against the above-referred enquiry are **fully compliant** with the specifications, terms, and conditions mentioned in the bid document.

We hereby confirm that **there are no deviations** from the stipulated specifications, commercial terms, conditions, and other requirements of the enquiry.

For _____
(Authorized Signatory)

Date: _____

Seal:

OEM SELF-DECLARATION (FOR OEM)

Date: _____

Subject: **OEM Self-Declaration**

Ref: Bid No. _____

We certify that:

1. The bidder **M/s** _____ is the OEM** itself.
2. The product(s) offered are **new, genuine, and comply** with all specifications mentioned in the tender.
3. We shall provide full **warranty support, technical assistance, and spare parts** availability as required.

For **(Name of OEM)**

Authorized Signatory

Name: _____

Designation: _____

Seal:

OEM address:

**** OEM refers to (Original Equipment Manufacturer)**

B. OEM AUTHORIZATION CERTIFICATE (FOR BIDDER AS DEALER)

Date: _____

Subject: **OEM Authorization Certificate**

Ref: Bid No. _____

We, **(Name of Original Equipment Manufacturer – OEM)**, hereby authorize:

M/s _____
(Address: _____)

We confirm that:

1. Bidder is **authorized partner / dealer / distributor / bidder** for participating in the above-mentioned tender
2. The bidder is authorized to **quote, supply, install (if any), and support** our products.
3. The products offered will be **genuine, brand-new, and manufactured by us (OEM)**.
4. We will provide full **warranty support, technical support, and spare parts** for the supplied equipment throughout the warranty/AMC period.

For **(Name of OEM)**

Authorized Signatory

Name: _____

Designation: _____

Seal:

**** OEM refers to (Original Equipment Manufacturer)**