



PLANT PURCHASING SPECIFICATION BHOPAL

BP 12080

REV NO. 11

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RECTANGULAR COPPER BAR- HARD HALF-ROUND EDGE AND PROFILES (CONTROLLED OXYGEN)

**SUPERSEDES
BP 12080 Rev 10**

1. GENERAL:

This specification governs the quality of drawn rectangular copper bars with half-round edge & profiles as per drawing having an Oxygen content of 400 PPM Max. (Controlled Oxygen) for sizes upto 30 mm thick in the hard condition.

2. APPLICATION:

For electrical apparatus.

3. CONDITION OF DELIVERY:

Drawn, in straight length, with half-round edges in hard condition. Profiles as per drawing.

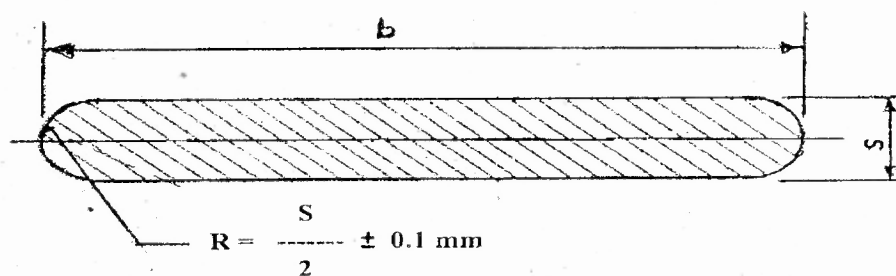
4. COMPLAINE WITH NATIONAL STANDARDS:

There is no Indian standard covering ETP gr. Copper with controlled oxygen content.

5. DIMENSIONS AND TOLERANCES:

5.1 Sizes

The dimensions shall comply with that stated in the order/drawing accompanying our order, In Case drg. is not furnished, half round edged bars shall have profiles as per figure show below.



5.2 Tolerances (REF. Fig. Above)

The tolerances for the material shall be as stated in Table below.

Revision :		Issued by :	
Cl. 9.1 & 10 reviewed & modified with reference to IS 613, as advised by AME.		STANDARDS AND MATERIALS GROUP TECHNICAL SERVICES DEPTMENT	
Rev. 11	Date : 03-07-2015	Date of first Issue : Aug' 1984	

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Width		Thickness S			
b		Above 3 to 6	Above 6 to 10	Above 10 to 18	Above 18 to 30
Above 6 to 10	+/- 0.07	+/- 0.04	+/- 0.07	-	-
Above 10 to 18	+/- 0.10	+/- 0.04	+/- 0.07	+/- 0.10	-
Above 18 to 30	+/- 0.15	+/- 0.06	+/- 0.08	+/- 0.12	+/- 0.15
Above 30 to 50	+/- 0.20	+/- 0.08	+/- 0.10	+/- 0.15	+/- 0.18
Above 50 to 80	+/- 0.25	+/- 0.10	+/- 0.12	+/- 0.15	+/- 0.18

Note :- 1) For making the rounds, the centre must lie on the thickness & a circle must pass tangentially on the flat sides.

2) The Tolerance table shall be applicable only when specific drg. is not provided or tolerance is not specified on the flat sides.

5.3 Straightness:-

Limits of convexity, concavity, square-ness of ends, edge bow side face, bow and twist of side face as described in IS : 4519 shall not exceed 3.0 mm in any 1000 mm length.

5.4 Length :

In straight lengths with half-round edges, as called for in the order/drawing.

6. MANUFACTURE :

6.1 Conductor Material

The conductor shall be manufactured from ETP gr. Copper conforming to AA 12024 Electrolytic tough pitch copper wire bars/Ingots /Continuously Cast Wire Rods."

Note:- It is preferable to manufacture conductor from continuous cast copper rods provided all other acceptance parameters & conditions remain same.

7. FREEDOM FROM DEFECTS:

The material shall be clean, smooth, straight, free from cracks, slivers, scales and other harmful defects.

8. TEST SAMPLE

One test sample shall be selected per size per heat treatment batch per consignment for testing, The sample shall be cut off cold and shall receive no further treatment before being tested.



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9. Mechanical Properties:

The material when tested in accordance with IS:1608 shall show the following properties.

9.1 Tensile:

Thickness mm	Tensile strength N/mm ²	Elongation on 5.65 $\times$ So G.L. Min.
Upto 30	270-330	10

9.2 Hardness (Brinell) :*

When tested in accordance with IS : 1500 the material shall have a Brinell Hardness of 80-105 HB.

*Note : _ Hardness Tests shall be done only when Tensile Test cannot be carried out.

10. ELECTRICAL RESISTIVITY: _

When tested in accordance with IS: 3635, the Electrical Resistivity of the material at 20 Deg. C shall be 0.01777 Ohms mm²/metre max which corresponds to 97% Min. of Electricals conductivity of IACS standard. Alternately the method of measurement employing Eddy Current probes as per ASTM E1004 shall also be acceptable.

Refer appendix B of IS: 613 for temperature correction factor

11. TEST CERTIFICATE:

Three copies of the test certificate shall be supplied, unless otherwise stated on the order.

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

The test certificate shall bear the following information:

BHEL Reference :

BP 12080 – Rev. 11

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Supplier's References:

Supplier's Name

Size and Number.

Batch No.

Test Results: Test result for Electrical & Material properties and dimensional Tolerances, shall be recorded.

12. PACKING AND MARKING:

The material shall be properly wrapped with kraft packing paper., bound with cord of soft wire and packed in crates to prevent corrosion and damage during transit.

Each crate shall be legibly marked with the following information.

BP 12080 : Rectangular copper Bar-Hard, Half-Round Edge & Profiles
(Controlled Oxygen)

BHEL ORDER NO.

SUPPLIER's NAME

SIZE AND WEIGHT.

GENERAL INFORMATION FOR CALCULATION

(NOT TO FORM ACCEPTANCE CRITERION)

0.28 proof stress – 250 N/mm² Minimum