

**CORPORATE PURCHASING SPECIFICATION**

AA 121 02

Rev. No. 03

PREFACE SHEET

**COLD ROLLED BRASS, SHEET, STRIP AND FOIL
(HALF - HARD)****FOR INTERNAL USE ONLY****REMOVE THIS PREFACE BEFORE ISSUE TO SUPPLIERS****Equivalent/Comparable Standards:**

- | | | |
|----|----------|--|
| 1. | INDIAN | IS : 410 - 1977 (Reaffirmed 1996)
Gr:Cu Zn37(HB) |
| 2. | AMERICAN | ASTM : B 36 M- 1991, alloy C 27200 HO, |
| 3. | BRITISH | BS : 2870 - 1980 CZ 108 (1/2 H) |
| 4. | GERMAN | DIN: 17660 -1983
17670 – 1983
Gr. Cu Zn 37 (F38) |

User Plants & Replaced Plant Specifications / References:

- | | | |
|----|-----------|---|
| 1. | BHOPAL | P.S. 12043 |
| 2. | HARD WAR | 0502-211
IS: 410 -1967,
Gr. Cu Zn 37(1/2 H) |
| 3. | HYDERABAD | CSN : 423213.1
ASEA: 25150-02 |

Revisions :Refer cl. No. 13.4 of MOM MRC (NFC&W)
Cl.16.3.41 of MRC-NFCW+HE**APPROVED:****INTERPLANT MATERIAL RATIONALISATION
COMMITTEE-MRC (NFCW+HE)****Rev. No. 03****Amd. No.01****Reaffirmed****Prepared****Issued****Dt. of 1 st Issue****Dt: 01-08-93****Dt :01-11-01****Year:****CORP. R&D****Corp. R&D****01-03-78**



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COLD ROLLED BRASS, SHEET, STRIP AND FOIL (HALF HARD)

1. GENERAL:

This specification governs the requirements of cold rolled brass sheet, strip, and foils.

2. APPLICATION:

Traction and Industrial machines, Controlgear, Boiler feed pump motors and steam turbine components.

3. CONDITION OF DELIVERY : Half-hard

4. COMPLIANCE WITH NATIONAL STANDARDS :

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

IS : 410 - 1977 (Reaffirmed 1996) | COLD ROLLED BRASS SHEET,
Gr : Cu Zn 37 (HB) STRIP AND FOIL

5. DIMENSIONS AND TOLERANCES :

Dimensional tolerance (Normal) shall be as per IS : 3052.

6. MANUFACTURE:

The sheet, strip and foil may be manufactured by cold rolling process.

7. FREEDOM FROM DEFECTS :

The material shall be clean, smooth and free from harmful defects, which may affect the utility.

8. CHEMICAL COMPOSITION:

The chemical composition of the material, when analysed in accordance with IS:3635 (Methods of chemical analysis of brasses) or any other conventional/ instrumental methods shall be as follows:

Element	Percent	
	Min	Max.
Copper	61.5	64.5
*Lead		0.30
*Iron		0.075
*Zinc		Remainder
Total impurities(Including Iron)		0.60

*Note : These elements need not be determined when the material supplied conforms with mechanical properties

Revisions :

Refer cl. No. 13.4 of MOM MRC (NFC&W)
Cl.16.3.41 of MRC-NFCW+HE

APPROVED :

**INTERPLANT MATERIAL RATIONALISATION
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9. TEST SAMPLES :

9.1 Quantities of sheet (or strip) of the same width, thickness and temper shall be batched together. For each batch the number of samples taken shall be as given below :

The samples shall be cut off cold in longitudinal direction and shall receive no further treatment (except that they may be machined to the shape of the test piece) before being tested.

9.1.1 From batches weighing up to 1000 kg the number of samples taken shall be in the proportion of one per 200kg of material submitted, and fractional remainder being considered as 200 kg. Where **strip** is supplied in coils weighing more than 200 kg, one sample shall be taken from each coil to provide the necessary test pieces.

If BHEL requires more than one sample to be taken from any coil, the method of taking the additional sample or samples shall be agreed to between the supplier and BHEL.

9.1.2 Batches exceeding 1000 kg shall be sub-divided into smaller batches of not less than 200 kg and not more than 1000 kg to which the provision of 9.1.1 shall then apply.

10. MECHANICAL PROPERTIES:

10.1 Tensile Strength and Hardness :

The material when tested in accordance with IS: 1608 (Method for tensile testing of copper and copper alloys) and IS: 1501, Part.1 (Method for Vicker's hardness test for copper and copper alloys) shall show the following properties :

Material	Tensile Strength N/mm ² Min.	%Elongation on 50mm Gauge length Min.	Hardness HV5 Min.
1. Width upto & Inclgd. 450 mm	380	15	110
2. Width over 450mm & Upto 900 mm	345	15	100

Note:

1. Tensile strength shall be carried out for material above 0.5 thickness.
2. Percentage elongation shall be carried out for material above 0.8 mm thickness and above 12 mm width.

10.2 Bend Test :

Where possible the material shall be subjected to a transverse bend test made on test piece cut with their major axes at right angles to the direction of rolling; where this is not possible it shall be subjected to a longitudinal bend test, made on test pieces cut with their major axes



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parallel to the direction of rolling. Both surfaces of the test piece shall be tested. The test pieces shall not crack when bent once through the appropriate angle as specified below:

Material Thickness	Transverse Bend Angle deg.	Transverse Bend Radius	Longitudinal Bend Angle deg.	Longitudinal Bend Radius
Upto 3.5 mm	180	close	180	close
Above 3.5 mm & upto 10 mm	180	t	180	t

t = thickness of material

The bend test shall be made in accordance with IS: 1599. The test pieces shall be of convenient length and width. It shall be 12 mm for thickness upto 6 mm and twice the thickness for over 6 mm thickness.

The longer edges shall be carefully rounded and smoothed longitudinally so that the material up to 3.0 mm thick cross-section has approximately semi-circular edges;

For material over 3.0 mm thick the edges shall be rounded to a radius of 1.5 mm.

11. OPTIONAL TEST:

If specified in the drawing/order, the material shall be tested for its electrical conductivity. The electrical conductivity of the material at 20°C shall be 23.75 - 26.25 % IACS.

12. RETEST:

Should any of the test pieces first selected, fail to pass the prescribed tests mentioned under various clauses in this specification, two further samples from the same batch shall be selected for tested, one of which shall be from the same component from which the original test sample was taken, unless that component has been withdrawn by the supplier.

Should the test pieces from both these additional samples pass, the batch represented by the test sample shall be accepted. Should the test pieces from either of these additional samples fail the batch represented by the test sample shall be selected.

13. INSPECTION AT SUPPLIER'S WORKS:

Tests and inspection are to be conducted in the presence of the customer's representative. The representative shall have free access at all times while the work on the contract is being performed, to all parts of the manufacturer's works. The supplier shall offer the purchaser'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 arrangement for carrying out the prescribed test elsewhere.

14. TEST CERTIFICATES:

The supplier shall submit 5 copies of test certificates giving the following information.

BHEL Order No.

AA 12102 - (Rev. No. xx) Cold Rolled Brass Sheet Strip and Foil (Half Hard)



Manufacturer's/Supplier's Name

Batch No./Heat No.

Sizes and quantity supplied

Results of chemical analysis, mechanical and all other tests as called for in this specification/order.

Consignment/Identification No.

15. PACKING AND MARKING :

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

Each package shall be legibly marked with the following information.

BHEL Order No.

AA 12102

Batch No.

Identification mark/No.

Weight

Supplier's Reference and Name

16. REJECTION AND REPLACEMENT:

In the event of the material proving defective in the course of preparation, machining forming, fabrication testing etc., such material shall be rejected notwithstanding any previous certification of satisfactory testing and/or inspection.

The supplier shall undertake to replace the material, free of charge, without any delay to arrange to take back the rejected material at his own cost.