

**CORPORATE PURCHASING SPECIFICATION**

AA 121 14

Rev. No. 03

PREFACE SHEET

**FREE CUTTING BRASS BARS, RODS, WIRES AND SECTIONS
(HALF HARD)**

FOR INTERNAL USE ONLY
REMOVE THIS PREFACE BEFORE ISSUE TO SUPPLIERS

Comparable Standards:

1. INDIAN : IS : 319 - 89 (Reaffirmed 1996)
Gr: 1 (HB) - Half hard bars 6mm and above.
IS: 8364-1989 (Reaffirmed 1996)
Gr: 1 (HB) - Half hard wires upto 6mm.
2. GERMAN : DIN 17660-1983
DIN 17672-1983 Gr: CuZn40Pb3 (F44)

Suggested/Probable Suppliers and Grades:

Refer plant vendors list.

User Plant References:

1. BHOPAL : PS 12018
2. HEER, HARDWAR : 0502.208
3. HYDERABAD : IS:319 Type-1 (1/2 H), CSN 423223.0, ASEA 21570.00

Revisions :

Cl: 17.11.25 of MOM of MRC-NFCW+HE

APPROVED :**INTERPLANT MATERIAL RATIONALISATION
COMMITTEE-MRC (NFCW+HE)**

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FREE CUTTING BRASS BARS, RODS, WIRES AND SECTIONS (HALF HARD)

1.0 GENERAL:

This specification governs the quality requirements of Free cutting Brass Bars, Rods, Wires and Sections.

2.0 APPLICATION:

For screws and bushes.

3.0 CONDITION FO DELIVERY:

"Half Hard" wires upto 6mm diameter may be supplied in coils.

4.0 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 : 319 - 89 (Reaffirmed 1996) : Free cutting Brass Bars, Rods and Sections
Gr: 1 (HB) - Half hard

IS: 8364-1989 (Reaffirmed 1996) : Free cutting Rods and Sections
Gr: 1 (HB) - Half hard

5.0 DIMENSIONS AND TOLERANCES:

5.1 Sizes:

The material shall be supplied to the dimensions specified in BHEL order:

5.2 Tolerances:

5.2.1 Wires:

Tolerances shall be as per Table-1 of IS:9861.

5.2.2 Bars/Rods and Sections:

Tolerances for round, square, rectangular and hexagonal rods shall be as given in Table-1, 2, 3 and 4 respectively of IS:2826.

Revisions :

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**6.0 MANUFACTURE:**

By rolling / extrusion / drawing.

7.0 FREEDOM FROM DEFECTS:

The material shall be clean, smooth free from surface defects, reasonably straight and free from twists.

8.0 CHEMICAL COMPOSITION:

The analysis of copper when analysed in accordance with IS:3685 (Method for chemical analysis of brasses) or any other conventional/Instrumental methods shall be as follows:

Element	Percent	
	Min.	Max
Copper plus incidental nickel	56	59.0
Lead	2.0	3.5
*Iron	-----	0.35
*Total Impurities (excluding Iron)	-----	0.7
Zinc	Remainder	

Note: These elements need not be determined, when the materials supplied conform with mechanical properties specified.

9.0 TEST SAMPLES:

9.1 One sample per heat shall be taken for chemical analysis.

9.2 One sample per heat per size shall be taken for other tests.

10.0 MECHANICAL PROPERTIES:

When tested in accordance with IS 1608, (Mechanical testing of metals-Tensile testing), the material shall show the following properties. The fractured test piece shall be free from pipes and such other defects.



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Cross sectional dimension, mm		Ultimate tensile strength, in N/mm ²	Percent, elongation
Over	upto & incld	min.	min.
-	10	410	4.0
10	12	405	4.0
12	25	395	6.0
25	50	355	12.0
50	---	325	17.0

- Upto 10 mm size, guage length shall be 100 mm. Above 10mm size gauge length shall be $5.65\sqrt{S_0}$.

11.0 MERCUROUS NITRATE TEST:

The mercurous nitrate test shall be carried out on a piece cut from each bar/rod selected for testing. When tested in accordance with IS: 2305, the test piece shall not show any sign of cracking. Should any specimen fail under mercurous nitrate test, all bars/rods submitted for inspection at the same time shall be withdrawn but may be resubmitted for inspection after stress relieving treatment.

12.0 OPTIONAL TEST:

If specified in the order/drawing, the material shall be tested for its electrical conductivity. The electrical conductivity shall be as per mutual agreement within BHEL and manufacturer. Refer ASTM B 193 , clause 6 for temperature correction factor.

13.0 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 testing 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 form 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 samples shall be rejected.

14.0 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.

15.0 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.

The test certificate shall bear the following information:

AA 12114 (Rev.03) Free cutting brass bars, rods, wires and sections (Half 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 all other tests as called for.

16.0 PACKING AND MARKING:

The material shall be suitably packed in crates to prevent corrosion and damage during transit. Each package or crate shall be legibly marked with the following information:

AA 12114 :

BHEL Order No.

Identification No:

Size

Weight

Supplier's Reference and Name

17.0 REFERRED STANDARDS : (Latest Publications Including Amendments):

1. IS:319

2. IS: 1608

3. IS: 3205

4. IS: 2826

5. IS: 3685

6. IS: 8364

7. IS: 9861

8. ASTM B 193