



उत्पाद मैनुअल
विद्युत अनुप्रयोग के लिए तांबे की बार एवं छड़ें- विशिष्टि
IS 613 : 2000 के अनुसार

PRODUCT MANUAL
For Copper Rods and Bars for Electrical Purposes – Specification
ACCORDING TO IS 613 : 2000

विभिन्न उत्पादों के लिए भारतीय मानक ब्यूरो (अनुरूपता मूल्यांकन) विनियम, 2018 की योजना -I के तहत प्रमाणन के संचालन में एकरूपता और पारदर्शिता के लिए इस उत्पाद मैनुअल का उपयोग सभी क्षेत्रीय / शाखा कार्यालयों और लाइसेंसधारियों द्वारा संदर्भ सामग्री के रूप में किया जाएगा। दस्तावेज़ का उपयोग बीआईएस प्रमाणन प्राप्त करने के इच्छुक संभावित आवेदकों द्वारा भी किया जा सकता है।

This Product Manual shall be used as reference material by all Regional/Branch Offices & licensees to ensure uniformity of practice and transparency in operation of certification under Scheme-I of Bureau of Indian Standards (Conformity Assessment) Regulations, 2018 for various products. The document may also be used by prospective applicants desirous of obtaining BIS certification.

1.	मानक संख्या IS No.	:	IS 613 : 2000
	शीर्षक Title	:	Copper rods and bars for electrical purposes – Specification
	संशोधनों की संख्या No. of amendments	:	2
2.	नमूना दिशानिर्देश Sampling Guidelines		
a)	कच्चा माल Raw material	:	Chemical composition of copper used to manufacture the product shall conform to Grades Cu-ETP and Cu-FRHC of IS 191:2007. No further testing of product for chemical composition is required if the copper is ISI marked and received with the manufacturer's test certificate. Note: This section indicates the requirements for raw material (if specified in the IS) for which compliance is to be established during Grant of Licence/Change in Scope of Licence/Factory Surveillance
b)	समूहीकरण दिशानिर्देश Grouping Guidelines	:	Please refer Annex-A

c)	नमूने का परिमाण Sample Quantity	:	6 m Note: This section indicates the quantity of the sample of the product and/or the raw material (if applicable), required to be sent to the laboratory for testing, for the purpose of Grant of Licence/Change in Scope of Licence/ Factory Surveillance (in case of market surveillance, effort may be made to procure the required quantity of product sample, as far as possible since raw material sample may not be available in market)
3.	परीक्षण उपकरणों की सूची List of Test Equipment	:	Please refer Annex-B
4.	निरीक्षण और परीक्षण की स्कीम Scheme of Inspection and Testing	:	Please refer Annex - C
5.	एक दिन में संभावित परीक्षण Possible tests in a day		
	All tests Note: This section is for the guidance of BIS Certification Officers/Technical Auditors of BIS Authorized Outside Surveillance Agencies (OSAs) during factory inspection to provide readyreference regarding the tests which can be witnessed during the inspection in the factory by the officer/auditor.		
6.	लाइसेंस का दायरा /Scope of the Licence:		
	“Licence is granted to use Standard Mark as per IS 613 : 2000 with the following scope:		
	Name of the product	Copper rods and bars for electrical purposes	
	Grade of material	Cu-ETP/Cu-FRHC	
	Condition	O (Annealed) /HB (Half Hard) /HD (Full hard)	
	Shape/Size	Round bars/rods of diameter from .. up to and including .. mm Square bars/rods of width across flat from .. up to and including .. mm Hexagonal bars/rods of width across flat from .. up to and including .. mm Rectangular bars/rods of smaller size width or thickness from .. up to and including .. mm	

BUREAU OF INDIAN STANDARDS
MANAK BHAVAN,9, BAHADUR SHAH ZAFAR MARG,
NEW DELHI-110002

ANNEX-A

GROUPING GUIDELINES

1) The following grouping guidelines shall apply for Grant of Licence (GoL)/Change in Scope of Licence(CSoL):

- i) Samples of each Grade (Cu-ETP, Cu-FRHC) to be drawn and tested.
- ii) Samples of each Condition (O (Annealed), HB (Half Hard) and HD (Hard)) to be drawn and tested.
- iii) Samples of each Shape (Round, Square and Hexagonal, Rectangular) to be drawn and tested.
- iv)

Group	Sizes (Diameter, width across flat or thickness)	Grouping
1	Over 6 mm up to and including 10 mm	One sample of any size from each Group shall be drawn and tested to cover all sizes within the Group.
2	Over 10 mm up to and including 12 mm	
3	Over 12 mm up to and including 50 mm	
4	Over 50 mm up to and including 90 mm	
5	Over 90 mm	

2) While drawing samples of different sizes from the above groups, samples may be drawn in such combination which cover all Grades, all Conditions and all Shapes, intended to be covered in the scope of the licence.

3) For inclusion of a particular Grade, Condition or Shape in the existing Scope of licence, sample of that Grade/Condition/Shape, of any size within the range of sizes covered in the existing scope of licence, shall be tested separately.

4) Scope of the licence shall be restricted based on the manufacturing and testing facilities available.

5) During the operation of the licence, samples of each variety covered in the scope of licence, shall be tested in rotation, to the extent possible.

ANNEX – B

**LIST OF TEST EQUIPMENTS
(INDICATIVE LIST, FOR GUIDANCE ONLY)**

Sl. No.	Tests Used In With Clause Reference	Test Equipment/Chemical
1	Chemical Composition, Cl. 8	Laboratory apparatus and reagents as per chemical methods given in IS 440 or suitable instruments such as Optical Emission Spectrometer for instrumental analysis
2	Tensile Strength and Elongation, Cl. 9.1	Tensile Testing Machine (With extensometer)
3	Hardness, Cl. 9.1	Vickers Hardness Testing Machine
4	Bend Test, Cl. 9.1	Tensile Testing Machine or Bend testing machine with suitable mandrels and attachments
5	Dimensions, Cl. 10	Micrometers, Vernier calipers, measuring tapes/scales, radius gauges, straight edges
6	Electrical Resistivity, Cl. 11	Kelvin double bridge or potentiometer

ANNEX C

SCHEME OF INSPECTION AND TESTING

1. QUALITY ASSURANCE PLAN

1.1 It is expected that manufacturers (licensees/applicants) will implement a Quality Assurance Plan

i.e. a plan of regular testing and in-process controls, designed to ensure that the product bearing the Standard Mark conforms to all requirements of the Indian Standard.

1.2 The manufacturers shall define a Quality Assurance Plan defining the control unit (i.e. lot/batch etc.) and the levels of control (i.e. the frequency and number of samples for conducting the different tests as per the Indian Standard) and submit the same to BIS Branch Office for information. The manufacturer shall comply with the same and maintain test records in accordance with para 2.4.

1.3 RECOMMENDED LEVELS OF CONTROL/CONTROL UNIT:

1.3.1 For the guidance of manufacturers, the recommended definition of control unit is : For the purpose of this scheme, entire quantity of material of the same grade of material, condition, shape and size manufactured from the same consignment of raw material under similar conditions on the same production line in one go shall be taken as one control unit.

1.3.2 For the guidance of manufacturers in preparing the Quality Assurance Plan, recommended levels of control are given in **Table 1**.

1.3.3 The manufacturer shall ensure inspection and testing as per the Quality Assurance Plan submitted by them on the whole production of the factory which is covered by this plan. Alternatively, the manufacturer has the option of adherence to the quality plan as per levels of control recommended in column 3 of Table 1.

1.4 However, all manufacturers shall ensure compliance of their products to all the requirements of the Indian Standard.

2. ENSURING COMPLIANCE THROUGH TESTING- It is expected that manufacturers (licensees/applicants) will establish a suitably equipped and staffed in house laboratory (In house testing facility) for testing at least those parameters of the Indian Standard which require routine testing for ensuring quality of the product. This includes in-process controls as may be defined and put in place by the manufacturer and testing parameters/requirements which can only be performed in the factory.

2.1 For the guidance of manufacturers, Table 1 giving the recommended levels of control is given below. Column 2 of Table 1 indicates routine tests where test equipment is required in house as "R" or other tests which can be subcontracted as "S". Subcontracting is permitted to BIS recognized/empanelled laboratory or any other laboratory having valid NABL accreditation as per IS/ISO/IEC 17025.

2.2 For MSME manufacturers, the requirement of maintaining a laboratory/in-house testing facility for routine tests (indicated as "R" in Column 2 of Table 1) is also optional.

2.2.1 MSME manufacturers may utilize common cluster based facilities as per guidelines for the utilization of cluster based test facilities by MSMEs or the provisions of Sharing of testing facilities or get testing done from BIS recognized/empaneled laboratory or any other laboratory having valid NABL accreditation as per IS/ISO/IEC 17025.

2.3 Large Scale manufacturers shall maintain an in-house laboratory equipped at least with test facilities for routine tests (indicated as “R” in Column 2 of Table 1), where different tests given in the specification shall be carried out in accordance with the method given in the specification. They shall also implement a calibration plan for the in-house test equipment.

2.3.1 Alternatively, in lieu of an in-house laboratory, large scale manufacturers can also utilize the provisions of Sharing of testing facilities as per the Guidelines for Grant of Licence available on BIS website www.bis.gov.in. (Under Conformity Assessment>Product Certification Process). Even for subcontracted tests, provisions for sharing of testing facilities can be utilized.

2.4 TEST RECORDS- The manufacturers maintaining an in-house laboratory or utilizing common cluster based facilities or shared test facilities shall maintain test records for the tests carried out to establish conformity. For the tests being subcontracted to BIS recognized/empanelled laboratory or any other laboratory having valid NABL accreditation as per IS/ISO/IEC 17025, test reports issued by the laboratories shall be available for inspection by BIS.

3. PACKING AND MARKING - The Standard Mark as given in the Schedule of the licence shall be incorporated legibly and indelibly on each package or the attached metal tag and/or on the test certificate (See 4) provided always that the material so marked conforms to each requirement of the specification.

3.1 Packing and Marking shall be done as per the Indian Standard.

4. TEST CERTIFICATE: For each consignment of BIS Certified material conforming to the specification there shall be a test certificate which shall contain the Standard Mark, the lot number, etc. and the corresponding test results (as given in **Annexure I** enclosed).

5. REJECTION - All the production which conforms to the Indian Standard and covered under the scope of this licence shall be marked with the Standard Mark. Disposal of non-conforming product shall be done in such a way so as to ensure that there is no violation of provisions of BIS Act, 2016.

TABLE1
(ONLY FOR GUIDANCE PURPOSE)

(1)				(2)	(3)		
Test Details				Test equipment requirement R: required (or)S: Sub-contracting permitted	Levels of Control		
Cl.	Requirement	Test Methods Clause	Reference		No. of Sample	Frequency	Remarks
6	Freedom from defects	6	IS 613	R	Firm shall exercise adequate in-process controls to ensure that the material is free from harmful defects.		---
8	Chemical Composition (All elements except Oxygen)	8.1, 8.2	IS 440/Any other established instrumental or chemical Method IS 191	R*	One	Each control unit	*No further testing is required if raw material is ISI marked and received with manufacturer's test certificate (as per IS 191)
	Oxygen	8.1, 8.2.	IS 440/Any other established instrumental or chemical Method IS 191	S	One	Each Control Unit	---
9	Mechanical properties						
9.1	Tensile Strength		IS 1608 (Part 1)	R	One	Each control unit	
9.1	Elongation		IS 1608 (Part 1)	R	One	Each control unit	
9.1	Hardness		IS 1501 (Part 1)	R	One	Each control unit	

9.2	Bend Test		IS 1599	R	One	Each control unit	
10	Dimensions (tolerances)	10.1 to 10.4	IS 613	R	Firm to have adequate in-process controls to check compliance of this parameter as per the tolerances given in the Indian Standard. However, appropriate records shall be maintained by the manufacturer for evidence of conformity		
11	Electrical Resistivity Test		IS 3635	R	One	Each control unit	

ISI
Mark

**ANNEXURE I
TEST CERTIFICATE FORMAT**

XYZ COPPER COMPANY

TEST CERTIFICATE FOR WROUGHT COPPER RODS AND BARS FOR ELECTRICAL PURPOSES

TEST CERTIFICATE NO. _____ DATED _____
TO M/s _____

It is certified that the material described below fully conforms to IS 613 : 2000. Chemical, physical and electrical properties of the product, as tested in accordance with the Scheme of Inspection and Testing contained in the BIS Certification Marks Licence No. CM/L _____ are as indicated below against each order no. etc.
(PLEASE REFER TO IS 613 : 2000 FOR DETAILS OF SPECIFICATION REQUIREMENTS)

TEST RESULTS

Order Number and date	Quantity in tonnes	Lot No and date of mfg	Condition (O/HB/HD)	Shape and Size in mm	Grade and Chemical analysis (in %)	Mechanical properties	Electrical Resistivity (ohm mm ² /m at 20°C) and Conductivity (IACS)	Freedom from defects and joints
					Grade Cu-ETP/Cu-FRHC Cu+Ag – Bi – Pb- O2- Impurities-	TS (Mpa) EL% HV Bend		

The material supplied conforms to specified tolerances
REMARKS
SHIPPING ADVICE NO.
WAGON NO.

“For details of BIS certification please visit www.bis.gov.in”

FOR XYZ COPPER COMPANY