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उत्पाद मैनुअल
Specification for copper wires for general engineering purposes

IS 4412:1981 के अनसार

PRODUCT MANUAL
FOR Specification for copper wires for general engineering purposes
ACCORDINGTO IS 4412:1981

विभिन्न उत्पादों के लिए भारतीय मानक ब्यूरो (अनुरूपता मूल्यांकन) विनियम, 2018 की योजना- I के तहत प्रमाणन के संचालन में अभ्यास और पारदर्शिता के संचालन में पारदर्शिता सुनिश्चित करने 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 लाइसेंस/प्रमाणपत्र 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 coherence 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 licence/certificate.

1.	**उत्पाद** **Product**	:	IS 4412:1981
	शीर्षक **Title**	:	Specification for copper wires for general engineering purposes
	संशोधनों की संख्या **No.of amendments**	:	1
2.	**नमूना दिशानिर्देश** **Sampling Guidelines**		
a)	**कच्चामाल** **Raw material**	:	No specific requirement
b)	**समूहीकरण दिशानिर्देश** **Grouping Guidelines**	:	Please refer Annex-A
c)	**नमूने का आकार** **Sample Size**	:	6m for physical tests 5 nos. of 5cm length for chemical test
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		
6.	**लाइसेंस का दायरा /Scope of the Licence:**		
	"Licence is granted to use Standard Mark as per IS **4412:1981** with the following scope:		
	Name of the product	Copper wires for general engineering purposes	
	Sizes	From … mm up to and including … mm	
	Temper Condition (as applicable)	O (Annealed), HB (Half Hard) and HD (Hard)	
	Optional Test (Embrittlement)	With or Without Resistance to Embrittlement	

BUREAU OF INDIAN STANDARDS
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ANNEX-A

GROUPING GUIDELINES

For the purpose of grant of licence (GoL)/Change in Scope of Licence (CSoL), the following grouping guidelines shall apply, on the basis of wire size and temper (for copper wires of dia. 1 mm and above

Group	Sizes (Diameter or distance between parallel faces in mm)
I	Up to and including 1 mm
II	1 mm and above*

1. Samples of the lowest size from each group may be tested to cover the range of sizes covered in that group from the size tested to the highest size in that group.

2. *However, in group II i.e. wires of sizes 1 mm and above, samples of each temper condition i.e. O (Annealed), HB (Half Hard) and HD (Hard) shall be tested.

3. In case embrittlement test is required to be mentioned in the scope of licence, sample(s) shall be tested for embrittlement test as well.

4. Scope of the licence shall be restricted based on the manufacturing and testing capabilities

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

ANNEX – B

LIST OF TEST EQUIPMENTS

Major test equipment required to test as per the Indian Standard

Sl. No.	Tests Used In With Clause Reference	Test Equipment/Chemical
1	Chemical Composition, Cl. 4	Instrumental methods Instruments such as Optical emission spectrometer, Milling machine, Sulphur analyser, Oxygen analyser Chemical Methods Platinum electrode apparatus for electrolytic method and other laboratory equipment/reagents as per methods specified in IS 440
2	Tensile Test, Cl. 5.1	Universal Tensile Testing Machine, Extensometer
3	Embrittlement Test, Cl. 5.2	Arrangement to expose test pieces to atmosphere of hydrogen for 30 minutes at a temperature of 825 to 857°C
4	Diameter and Tolerances, Cl. 7	Micrometers, Vernier Calipers

The list above is indicative only and may not be considered as exhaustive

ANNEX B

SCHEME OF INSPECTION AND TESTING

1. **LABORATORY-** A laboratory shall be maintained, which shall be suitably equipped (as given in column 2 of Table 1) and staffed, where different tests given in the specification shall be carried out in accordance with the method given in the specification.

1.1 The manufacturer shall prepare and implement a calibration plan for the test equipment.

2. **TEST RECORD**- The manufacturer shall maintain test records for the tests carried out to establish conformity.

3. **PACKING AND MARKING** - The Standard Mark as given in the Schedule of the licence shall be incorporated legibly and indelibly on each coil/spool/length of wire and/or the test certificate accompanying each consignment provided always that the material so marked conforms to each requirement of the specification.

3.2 Packing and Marking shall be done as per the requirements of the Indian Standard. In addition the product (on the accompanying tag or label or the test certificate) shall also be marked with the BIS licence number and "For BIS certification details please visit www.bis.gov.in"

4. CONTROL UNIT- For the purpose of this scheme, entire quantity of wire of same size, manufactured from same charge/cast, and to the same temper(as applicable) under identical conditions at the same place shall constitute a control unit shall be taken as one control unit.

5. LEVELS OF CONTROL :- The tests as indicate in Table 1 and at the levels of controls in column 3 of Table 1, shall be carried out on the whole production of the factory which is covered by this plan and records maintained in accordance with paragraph 2 above.

5.1 All the production which conforms to the Indian Standard and covered under the scope of this licence shall be marked with the Standard Mark.

6. **TEST CERTIFICATE**-For each consignment of BIS Certified material conforming to IS 4412:1981 there shall be a test certificate which shall contain the Standard Mark, the cast/Control Unit number and the corresponding test results (as given in Annexure-I enclosed)

7. REJECTION - 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

LEVELS OF CONTROL

(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
4	Chemical Composition		IS 440 or any other established chemical or instrumental method	R	One	Each coil/spool	In case of wire rods purchased from outside, they shall be accompanied with test certificate from the supplier
5.1	Tensile Strength and Elongation		IS 1608 (Part 1)	R	One	Each coil/spool	
5.2	Embrittlement Test	5.2.1	IS 4412	R	One	Each coil/spool	When required by the purchaser
6	Freedom from Defects	6	IS 4412	R	manufacturers shall maintain adequate inspections/in process controls to ensure freedom from defects		
7	Diameters and Tolerances		IS 9861	R	One	Each coil/spool	

Note-1: Whether test equipment is required or sub-contracting is permitted in column 2 shall be decided by the Bureau and shall be mandatory. Sub-contracting is permitted to a laboratory recognized by the Bureau or Government laboratories empanelled by the Bureau.

Note–2: Levels of control given in column 3 are only recommendatory in nature. The manufacturer may define the control unit/batch/lot and submit his

own levels of control in column 3 with proper justification for approval by BO Head.

Note-3: The manufacturer shall declare the established instrumental method adopted for chemical analysis along with details of the reference material accompanied with test certificate used for its calibration and frequency of calibration.

ANNEX-I
(PARA 6 OF THE SCHEME OF INSPECTION AND TESTING)

XYZ LTD

TEST CERTIFICATE FOR COPPER WIRES FOR GENERAL ENGINEERING PURPOSES

TEST CERTIFICATE NO.

DATE:

To M/s_____
We certified that the material described below fully conforms to IS 4412:1981

Chemical composition, and Physical properties of the product, as tested in accordance with the Scheme of Inspection and Testing contained in the BIS Certification Marks LicenceNo.CM/L_____ are as indicated below against each order No

(PLEASE REFER TO IS 4412:1981 FOR DETAILS OF THE SPECIFICATION REQUIREMENTS)

TEST RESULTS

Order No and Date	Size	Control Unit/Lot No.	Quantity in tonnes	Chemical Composition	Physical Properties	Embrittlement test results (if required)

REMARKS

WAGON NO./TRUCK NO.

FOR XYZ LTD.