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उत्पाद मैनुअल

तांबे की इलेक्ट्रोप्लेटेड कोटिंग्स के लिए विशिष्टता

IS 1772:2024 के अनुसार

**PRODUCT MANUAL
FOR SPECIFICATION FOR ELECTROPLATED COATINGS OF COPPER
ACCORDING TO IS 1772:2024**

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 1772: 2024
	शीर्षक Title	:	ELECTROPLATED COATINGS OF COPPER-SPECIFICATION
	संशोधनों की संख्या No.of amendments	:	1
2.	नमूना दिशानिर्देश Sampling Guidelines		
a)	कच्चा माल Raw material	:	No specific requirement <i>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</i>
b)	समूहीकरण दिशानिर्देश Grouping Guidelines	:	Please refer Annex-A
c)	नमूने का परिमाण Sample Quantity	:	One Coated article with at least 500 mm ² of area covered with coating <i>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 therequired quantity of product sample, as far as possible since raw material sample may not be available in market)</i>

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		
	1. Appearance CI 5.1 2. Thickness CI 5.2 3. Baking Test CI 8.2.1 4. Bend Test CI 8.2.2 5. Burnishing Test CI 8.2.3 6. Test for Continuity CI 8.3 <i>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.</i>		
6.	लाइसेंस का दायरा /Scope of the Licence:		
	"Licence is granted to use Standard Mark as per IS 1772:2024 with the following scope:		
	Name of the product	ELECTROPLATED COATINGS OF COPPER	
	Service Condition Grade	Grade 1 Mild Grade 2 Moderate Grade 3 Severe Grade 4 Exceptionally Severe	
	Base Metal	Steel Basis Metal Non Ferrous Basis Metal	

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ANNEX-A

GROUPING GUIDELINES

1. For the purpose of grant of licence and/or change in scope of licence, the following grouping guidelines shall apply

a) Samples of each service condition grade shall be tested. However, if sample of Service Condition Grade 4 is tested, Grade 3, 2 & 1 can be covered in the scope of licence on that basis. Further, if sample of Service Condition Grade 3 is tested, Grade 2 & 1 can be covered in the scope of licence on that basis and so on.

b) Sample shall be tested for each type of Base metal on Coating. For eg: If Steel base metal is tested, then licence shall be granted for Steel base metal only

2. The Firm shall declare the varieties of Electroplated Coatings of Copper they intend to cover in the Licence. The Scope of Licence may be restricted based on the Manufacturing and Testing capabilities of the Manufacturer

3. During the operation of the Licence, BO shall ensure that all varieties covered in the Licence are tested in rotation, to the extent possible.

ANNEX – B

LIST OF TEST EQUIPMENT
(Indicative List, For Guidance only)

Sl. No.	Tests used in with Clause Reference	Test Equipment
1	Coating Thickness Measurement (Clause 8.1)	<u>Determination of Thickness by microscopic method of IS 3203:1982</u> Arrangement for mounting of specimen Arrangement for preparation of section (grinding and polishing machines, abrasives) Reagents for etching plated coatings: Ammonium hydroxide, Hydrogen Peroxide Filar Micrometer ocular or Metallographic Microscope <u>Determination of Thickness by magnetic method of IS 3203:1982</u> Apparatus for determination of thickness of coating using magnetic method employing permanent magnet or movable iron core or pair of magnetic poles as described in IS 3203 <u>Determination of Thickness by BNF Jet Test Method</u> Apparatus for BNF Jet Test as described in IS 3203 <u>Measurement of coating thickness by eddy current method as per IS 6012 : 1992</u> Eddy Current Instrument for determination of coating thickness as described in IS 6012:1992
2	Adhesion - Baking Test (Clause 8.2.1)	• Oven (capable of heating specimen between 310 to 315 °C) • Stop Watch/Clock
3	Adhesion - Bend Test (Clause 8.2.2)	• Bend Tester – 4 mm radius of bending
4	Adhesion - Burnishing Test (Clause 8.2.3)	• Smooth Metal implement
5	Test for Continuity (Clause 8.3)	• Absorbent Paper • Gelatin • Sodium chloride solution (30g/L) • Stop watch • Potassium ferricyanide (10g/L)

6	Corrosion Resistance test (Clause 5.5)	• Sodium Chloride • Distilled Water or Deionized Water • pH meter or pH Paper in increments of 0.1pH • Cupric Chloride Dihydrate • Glacial Acetic Acid • Spray Cabinet (0.4 m³ Volume) with Temperature controllers, Atomizers, Reservoir, Support • Air Compressor with Pressure Gauge • Cotton Swab • Weighing Balance (LC 1g) • Magnesium Oxide • Trichloroethylene • Analytical balance, Standard laboratory glassware, equipment and chemicals
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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 all electroplated articles of the same type (e.g. plates, bars, screws etc.), (of the same heat, if heat treated) same Service Condition Grade, same Classification Number, electroplated at one time in the same bath with the same consignment of copper under similar conditions in one go.

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/empaneled 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 plated article and/or the package containing plated articles along with the legend **“FOR COPPER PLATING ONLY”** provided always that the material so marked conforms to each requirement of the specification.

3.1 Copper plated articles, which relate only to the coating and not to the quality of the article, shall be marked with service condition grade or classification number and the name or trade-mark of the manufacturer)

4. 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
LEVELS OF CONTROL
(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 Method			No. of Sample	Frequency	Remarks
		Clause	Reference				
5.1	Appearance	5.1	IS 1772	R	Firm shall exercise adequate in-process controls to ensure that each plated article remains free from harmful defects		
5.2	Thickness	8.1, Table 2	IS 3203 or IS 6012	R	1	Each Control unit	----
5.3	Adhesion						
8.2.1	Baking Test	8.2.1	1772	R	1	Each Control unit	On articles used for service condition grades 4 and 3
8.2.2	Bend Test	8.2.2	1772	R	1	Each Control unit	On articles used for service condition grades 1 and 2
8.2.3	Burnishing Test	8.2.3	1772	R	1	Each Control unit	-do-
5.4	Test for Continuity	8.3	1772	R	1	Each Control unit	On articles used for service condition grade 4 only
5.5	Corrosion Resistance test	---	IS 6009 IS 5528	S	1	Once in a Three Months	On articles used for service condition grade 2 only