



**उत्पाद मैनुअल
आई एस 7404 (Part 1): 1991 के अनुसार
पेपर कवर कॉपर कंडक्टर- राउंड कंडक्टर
दस्तावेज संख्या – पीएम/आईएस 7404 (Part 1)/1/ अप्रैल 2023**

भारतीय मानक ब्यूरो की स्कीम-I (अनुरूपता मूल्यांकन) विनियम, 2018 के तहत यह उत्पाद मैनुअल प्रमाणीकरण के प्रचालन में रीति और पारिश्रिता की सुसंगतता सुनिश्चित करने के लिए सभी क्षेत्रीय/शाखा कार्यालयों और लाइसेंसी द्वारा संदर्भ सामग्री के रूप में उपयोग किया जाएगा। बीआईएस प्रमाणीकरण लाइसेंस/ प्रमाणपत्र प्राप्त करने के इच्छुक भावी आवेदकों द्वारा भी इस दस्तावेज का उपयोग किया जा सकता है।

**PRODUCT MANUAL FOR
Paper Covered Copper Conductors- Specification: Part 1 Round Conductors
ACCORDING TO IS 7404 (Part 1): 1991
Document No - PM/IS 7404 (Part 1)/1/ April 2023**

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.

PRODUCT MANUAL FOR
Paper Covered Copper Conductors-
Specification: Part 1 Round Conductors
ACCORDING TO IS 7404 (Part 1): 1991

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.	Product	IS 7404 (Part 1): 1991		
	Title	Paper Covered Copper Conductors- Specification: Part 1 Round Conductors		
	No. of Amendments	0		
2.	Sampling Guidelines:			
a)	Raw material	Enamelled Round Copper Wire	IS 13730 (Part 0/Sec 1): 2018	10 m
		Electrical Paper	IS 9553 (Part 3/Sec 1): 1984	Sheets (250x250) mm - 40 Nos (or) Paper Roll - 10 m
b)	Sample Size	Paper tape covered Round Copper Wire – 10 m		
3.	Grouping guidelines	Please refer Annex – A		
4.	List of Test Equipment	Please refer Annex – B		
5.	Scheme of Inspection and Testing	Please refer Annex – C		
6.	Possible tests in a day:	All		
7.	Scope of the Licence:	Please refer Annex – D		

BUREAU OF INDIAN STANDARDS
Manak Bhawan, 9, Bahadur Shah Zafar Marg,
New Delhi – 110002

ANNEX A**Grouping Guidelines**

1. For the purpose of certification, following technical parameters are considered for classifications of Paper Covered Copper Conductors- Round Conductors as per IS 7404 (Part 1): 1991

Nominal Conductor Dia	Group A	Group B
Grades of Covering		
Double Paper Covering, Ordinary (O)	0.25 mm to 1 mm (including)	1 mm to 5 mm (including)
Double Paper Covering, Fine (F)	0.25 mm to 1 mm (including)	1 mm to 5 mm (including)
Multiple Paper Covering (S)	0.25 mm to 1 mm (including)	1 mm to 5 mm (including)

2. Considering the above, the grouping guidelines given below shall be followed for GoL/CSoL:
- Sample of any size (preferably highest) shall be tested to cover conductors of all sizes in that size group.
 - Each grade of covering must be tested for each group separately.
3. The Firm shall declare the varieties to be covered in the Licence for which the firm is having complete manufacturing and testing facilities. The Scope of Licence may be restricted based on the Manufacturing and testing capabilities of the Manufacturer.
4. During operation of the licence, BO shall ensure that all the types covered in the licence are tested in rotation to the extent possible.

Note 1: The above table is applicable for Double Paper Covered Conductor

Note 2: For Multiple Paper Covering, firm shall declare the number of layers of paper it intend to use. The increase in diameter due to covering shall be as per the tolerance specified in Table 2.

ANNEX B
List of Test Equipment

Major test equipment required to test as per the Indian Standard

Sl. No.	Tests used in with Clause Reference	Test Equipment
1	Conductor Conditioning as per Cl. 4.1	Thermometer Hygrometer Air-conditioner Humidifier
2	Measurement of Wire Dia. as per Cl. 5.2 Width of Paper as per Cl. 7.2	Micrometer Vernier Caliper
3	Conductor Resistance Test as per Clause 5.1 of IS 7404 (Part 1) & Cl. 5 of IS 13730-0-1	Double Kelvin Bridge with Galvanometer Thermometer
4	Overall diameter and increase in diameter	Micrometer (as specified in Cl. 8.3) Steel scale Goniometer or Protractor
5	Elongation Test as per Clause 6 of IS 13730 Part 0: Sec 1	Tensile Testing Machine

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

ANNEX C

Scheme of Inspection and Testing

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

1.1 The manufacturer shall prepare a calibration plan for the test equipments.

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

3. **LABELLING AND MARKING** – The Standard Mark as given in the Schedule of the licence shall be incorporated legibly and indelibly on each label securely attached to the reel.

3.1 Marking on the labels shall be as per the requirement of IS 7404 (Part 1): 1991

3.2 In addition, the licence no. CM/L-_____ and details of BIS website shall be marked at an appropriate place as follows: “For details of BIS certification please visit www.bis.gov.in”

4. **CONTROL UNIT** – Paper Covered Copper Conductors - Round Conductors of each Nominal Conductor Diameter and for same Grade of Covering manufactured in a day under similar process condition from the same consignment of raw materials shall constitute a control unit.

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

5.1 All the production which conforms to the Indian Standards and covered by the licence should be marked with Standard Mark.

6. **REJECTIONS** – 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.

TABLE 1

(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	Enamelled Round Copper Wire		IS 13730 (Part 0) / (Sec 1): 2018	S	One	Each Consignment	No further testing is required if accompanied with Test Certificate
6.1	Electrical Paper		IS 9335 (Part 3) / (Sec 1): 1984	S			
5.2	Conductor Diameter	Cl. 5.2 & Table 1	IS 7404 (Part 1)	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		
7	Application of Paper						
7.1	General	Cl. 7.1	IS 7404 (Part 1)	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		
7.2	Width of Paper	Cl. 7.2	IS 7404 (Part 1)	R	One	Each batch of Raw material	
7.3	Arrangement of Layers	Cl. 7.3	IS 7404 (Part 1)	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		
8	Overall Diameter and Increase in Diameter						
8.1	Double Paper Covering Ordinary (O) and Fine (F)	Table 1	IS 7404 (Part 1)	R	One	Each Control Unit	--
8.2	Multiple Paper Covering Special (S)	Cl. 8.2 & Table 2	IS 7404 (Part 1)	R	One	Each Control Unit	--
9	Marking	Cl. 9.1.1	IS 7404 (Part 1)	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
--	--	--	--	--

Note-1: 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.

Annex – D
Scope of the Licence

Licence is granted to use Standard Mark as per IS 7404 (Part 1): 1991 with the following scope

Name of the product	Paper Covered Copper Conductors- Specification: Part 1 Round Conductors
Nominal Conductor Diameter (mm)	 to upto and including
Grades of Covering	Double Paper Covering, Ordinary (O) or/and Double Paper Covering, Fine (F) or/and Multiple Paper Covering (S)
No. of layers of Paper	
Any Other Declarations	Increase in diameter due to covering (for MPC)