उत्पाद मैन्युअल
विद्युत् प्रयोजनों के लिए इंसुलेटिंग मैट
आई एस 15652 : 2006 के अनुसार
दस्तावेज संख्या - पीएम/ आई एस 15652/ 2/ मार्च 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।

Product Manual for
Insulating Mats for Electrical Purposes
According to IS 15652 : 2006
Document No - PM/IS 15652/2/March 2024

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.

भारतीय मानक ब्यूरो
BUREAU OF INDIAN STANDARDS
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1.	**मानक संख्या** **IS No.**	:	IS 15652: 2006
	शीर्षक **Title**	:	Insulation Mats for Electrical Purposes - Specification
	संशोधनों की संख्या **No. of amendments**	:	02
2.	**नमूना दिशानिर्देश** **Sampling Guidelines:**		
a)	**कच्चा माल** **Raw material**	:	As per Clause No. 5 of IS 15652: 2006
b)	**समूहीकरण दिशानिर्देश** **Grouping Guidelines**	:	Please refer ANNEX – A
c)	**नमूने का आकार** **Sample Size**	:	4 meter x 1 meter (For mats with width of less than 1 m, manufacturer shall provide test pieces of width 1 m).
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 test except Clause 8.2.1, 8.2.4, 8.3, 8.5, & 8.6
6.	**लाइसेंस का दायरा /Scope of the Licence**	:	
	"Licence is granted to use Standard Mark as per IS 15652 : 2006 with the following scope:		
	उत्पाद का नाम / Name of the product		Insulating Mats for Electrical Purposes
	मोटाई/Thickness		
	श्रेणी/Class		A/B/C
	वर्ग/Category		I/II/III
	मानक के अनुसार आवश्यक कोई अन्य पहलू / Any other aspect required per the Standard		Suitable for Extreme Low Temperature (if applicable, Class to be denoted with subscript c)

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Annex – A

समूहीकरण दिशानिर्देश
Grouping Guidelines

1. For the purpose of GoL/ CSoL, the following parameters may be considered for grouping of Insulating Mats for Electrical Purposes as per IS 15652:

a) Class – Class A/ Class B/ Class C
b) Category - Category I/ Category II/ Category III
c) Suitability for Extreme Low Temperature

2. Samples of each class and category shall be tested separately for including each in the scope of Licence.

3. However, the following relaxations are permitted:

a) If sample of higher class is tested, lower classes may also be covered. For e.g. if Class C is tested, Classes A & B may also be covered without further testing.
b) If Category III is tested, then category I and II may also be covered in the scope of license without further testing.

4. For a given Class, for covering mats suitable for Extreme Low Temperature, separate testing is required. However, if higher class of mat, suitable for extreme low temperature is tested, mats of lower classes, suitable for extreme low temperature may also covered.

5. The Firm shall declare the various varieties of Insulating Mats for Electrical Purposes they intend to cover in the license. The Scope of License may be restricted based on the Manufacturing and Testing capabilities of the Manufacturer.

6. During the operation of the License, BO shall ensure that all the Varieties covered in the License are tested in rotation to the extent possible.

Annex – B

परिक्षण उपकरणों की सूची
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.	Shape (Clause 6.1)	Visual examination
2.	Dimensions –Length &Width (Clause 6.2 & 6.2.1)	Measuring Tapes
3.	Thickness (Clause 6.3 & Table 2)	Dial Thickness Gauge/Vernier Calliper/Screw Gauge
4.	Colour (Clause 6.4)	Visual examination
5.	Workmanship and finish (Clause7.1)	Visual examination
6.	Tensile Strength and Elongation at Break (Clause 8.1 &Table 3)	Tensile Testing Machine, Dumb-bell die
7.	Insulation Resistance with water (Clause 8.2.1)	Insulation Resistance Tester, Adhesives
8.	Leakage current (Clause 8.2.2)	Milli Ammeter
9.	ac Di-electric Strength (Clause 8.2.3 & Table 4)	KV Meter
10.	ac proof voltage (Clause 8.2.4&Table5)	KV Meter, Metal Plate, Wet Sponge, Plexiglass Mask
11.	Ageing Properties (Clause 8.3)	Ageing Oven
12.	Flame Retardance (Clause 8.4.1)	Flame retardance test apparatus with burner, Stop Watch
13.	Low Temperature Resistance (Clause 8.4.2)	Deep Freezer for maintaining -10$\pm$ 3 ºC, Two Polyethylene Plates of 150x150x5mm, Load monitor/ Load 100 N
14.	Acid/Alkalis and Oil Resistance (Clause 8.5)	Conc. Sulphuric Acid, NaOH LR Grade, HSD, Transformer Oil
15.	Extreme low Temperature (Clause 8.6)	Deep Freezer for maintaining -40$\pm$ 3 ºC, Two Polyethylene Plates of 150x150x5mm, Load monitor/ Load 100 N
16.	General Test Equipment Required.	Steel Scale, Cutting Knife, Insulating Oils, Electrodes of Dia. 25 mm and 75 mm, Thermometer, Hygrometer, Air Conditioner, Conditioning Chamber

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

Annex - C

निरिक्षण और परीक्षण की स्कीम
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 differenttests 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 rolls/ flats of the same class, category and thickness manufactured out of the same elastomer at a time and vulcanized simultaneously shall constitute a control unit**. The manufacturer has the choice to define their own control unit/batch/lot and submit the same to the BIS

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 requirementsof 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 givenbelow. 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 perIS/ISO/IEC 17025.

2.2 **For MSME manufacturers, the requirement of maintaining a laboratory/in-house testingfacility 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 facilitiesor 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 withtest facilities for routine tests (indicated as "R" in Column 2 of Table 1)**, where different testsgiven 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 laboratoryor 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 rolls/ flats and also on its packaging** 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 **15652 : 2006**.

3.2 **Additional Marking requirements**: The material shall also be marked with the following additional requirement on packaging:

a) "For BIS certification details please visit www.bis.gov.in"

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.

TABLE 1
(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**				
9	Marking	9	IS 15652	R	Each Roll/Flat		
5	Composition	5.1, 5.2	IS 15652	R	Each Roll/Flat		--
6.1	Shape	6.1	IS 15652	R	Each Roll/Flat		--
6.2	Dimensions – Length & Width	6.2 & 6.2.1	IS 15652	R	5	Each Control unit	Refer Note -1
6.3	Thickness	6.3, 6.3.1, Table 2, C-1	IS 15652	R	5		
6.4	Colour	6.4	IS 15652	R	5		--
7	Workmanship and finish	7.1	IS 15652	R	Each Roll/Flat		Refer Note -1
8.1	Tensile Strength and Elongation at Break	8.1, C-2, Table3	IS 15652	R	2	Each Control unit	--
8.2.1	Insulation Resistance with water	8.2.1, C-3.1	IS 15652	R	2		
8.2.2	Leakage current	8.2.2, C-3.2	IS 15652	R	2		
8.2.3	ac Di-electric Strength	8.2.3, C-3.3	IS 15652	R	2		
8.2.4	ac proof voltage	8.2.4, C-3.4, Table5	IS 15652	R	2		

8.2.4	ac proof voltage (routine)	8.2.4, C-3.4, Table5	IS 15652	R	Each Roll/Flat		
8.3	Ageing Properties	8.3, C-4	IS 15652	R	1	Once in a month for each type of roll/ flat manufactured in the period	
8.4.1	Flame Retardance	8.4.1, C-5.1	IS 15652	R	2	Each Control unit	
8.4.2	Low Temperature Resistance	8.4.2, C-5.2	IS 15652	R	2	Each Control unit	
8.5	Acid/ Alkali and Oil Resistance	8.5, C-6	IS 15652	R	1	Once in a month for each type of roll/ flat manufactured in the period	
8.6	Extreme low Temperature (as applicable)	8.6, C-7	IS 15652	R	2	Each Control unit	

Note-1: Firm should exercise adequate control so that whole production should meet the requirements.