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उत्पाद मैनुअल

पूर्वबलित रेशेदार पाइप रोधन –विशिष्टि
IS 9842: 2024 के अनुसार

**PRODUCT MANUAL
PREFORMED FIBROUS PIPE INSULATION
ACCORDING TO IS 9842: 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 9842 : 2024
	शीर्षक Title	:	पूर्वबलित रेशेदार पाइप रोधन –विशिष्टि PREFORMED FIBROUS PIPE INSULATION - SPECIFICATION
	संशोधनों की संख्या No. of amendments	:	0
2.	नमूना दिशानिर्देश Sampling Guidelines		
a)	कच्चा माल Raw material	:	Raw material shall be in accordance with Cl 4.1. 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	:	कृपया Annex-ए देखें Please see Annex – A

c)	नमूने का परिमाण Sample Quantity	:	1meter Preformed pipe x 6nos. + For thermal conductivity test per Mean temperature: 225mmx120mmx50mm flat slabs (of same bulk density and fibrous structure as that of pipe) x 3nos. + For Heat Resistance and Recovery after compression: 75mm Internal Dia. x 1.25metre Length Preformed pipe x 3nos. or 300mmx300mm flat slabs (of same bulk density and fibrous Structure as that of pipe) x 3nos. 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 (incase 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)
3.	परीक्षण उपकरणों की सूची List of Test Equipment	:	Please refer to Annex-B
4.	निरीक्षण और परीक्षण की स्कीम Scheme of Inspection and Testing	:	Please refer to Annex-C
5.	एक दिन में संभावित परीक्षण Possible tests in a day		(i) Description (ii) Bulk Density (iii) Shot Content (iv) Moisture Content (v) Incombustibility (vi) Dimensions (vii) Recovery after compression (viii) Sulphur Content (ix) Fiber Diameter 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 ready reference 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 IS 9842 : 2024 with the followingscope: IS 9842: 2024 के अनुसार मानक मुहर का उपयोग करने के लिए लाइसेन्स निम्नलिखित कार्यक्षेत्र के लिए प्रदान किया जाता है		
	Name of the product उत्पाद का नाम		पूर्वबलित रेशेदार पाइप रोधन -विशिष्ट Preformed Fibrous Pipe Insulation
	Group(s) based on Bulk Density:		1/2/3/4

	Mean Temperature(s) for Thermal Conductivity:	50/100/150/200/250/300 °C
	Dimensions	Nominal Thicknesses: 25 mm, 40 mm, 50 mm, 60 mm, 75 mm, 90 mm, and 100 mm etc.
	Optional requirement	With/without alkalinity With/without resistance to microorganisms With/without odour emission With/without Leachable Chloride content

**BUREAU OF INDIAN STANDARDS
MANAK BHAVAN,9, BAHADUR SHAH ZAFAR MARG,
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ANNEX – A
GROUPING GUIDELINES

IS 9842:2024 classifies Preformed Fibrous Pipe Insulation according to:

- i) Group: 1/2/3/4 (based on bulk density)
- ii) Mean Temperature(s) for Thermal Conductivity: 50/100/150/200/250/300 °C
- iii) Sizes/Dimensions: Length, Thickness

For the purpose of grant of licence, and change in scope of licence, the following grouping guidelines shall apply:

Sample(s) of **each group (1/2/3/4)**, of **each Mean Temperature(s) for Thermal Conductivity, (50/100/150/200/250/300 °C)** and **any of the sizes** intended to be covered in the scope of licence shall be drawn and tested.

In case optional requirements i.e. alkalinity, resistance to microorganisms, odour emission, Leachable Chloride content are intended to be covered in the scope of licence, samples shall be tested for the applicable optional requirements as well.

However, scope of licence shall be restricted according to the manufacturing and testing facilities available

During operation of licence, samples of all varieties covered in the scope of licence, shall be drawn in rotation, to the extent possible.

ANNEX – B

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

Sr. No.	Tests used in with Clause Reference	Test Equipment/Chemicals/Glassware
1.	Bulk Density content (IS 5688 Cl.4.2)	• Flexible Steel Rule of LC 1mm • Drying Oven • Desiccator • Balance
2.	Shot Content (IS 3144) Cl.4.3	• Glass Elutriator as per Cl 13.2 of IS 3144 • Analytical Balance of 0.1 mg LC • Knife • Furnace • Beaker • stirrer • Distilled water • Wetting agent • Glass stirring rod • IS sieves (250 and 500 micron) • Spatula • Oven • Desiccator • Rubber stopper • Bristles brush
3.	Moisture Content (IS 3144) Cl.4.4.1	• Thermostat fitted Drying Oven with vent • Chicken gauze • Analytical Balance
4	Moisture Absorption (IS 3144) Cl.4.4.2	• Thermostat fitted Drying Oven with vent • Chicken gauze • Analytical Balance • Thermostatically controlled Humidity Chamber
5.	Incombustibility (IS 3144) Cl.4.5	• Incombustibility test apparatus as per Cl 16.3 of IS 3144 • Thermocouple • Temp. Indicator • Timer • Oven • Analytical Balance • Drying Unit • wire gauze
6.	Thermal Conductivity (IS 3346) Cl.4.6	• Low-temperature metal-surface guarded hot plate apparatus • High-temperature guarded hot plate apparatus • Heat Flow Measurement – • Vacuum • Cold Surface Control
7.	Dimensions (IS 9842) (Cl.4.7)	• Steel rule of LC 1mm • Thickness measuring instrument • Measuring tape • T-square

8.	Linear Shrinkage (IS 5724) (Cl.4.8)	• Furnace with temperature indicator/recorder as per Cl 10.2.1 of IS 5724 • Oven • Dessicator • Length Measuring instrument of LC 0.05mm as per Cl 10.2.2 of IS 5724 • Balance
9.	Heat Resistance (IS 3144) (Cl.4.9)	• Desiccator/ ventilated oven • Hot plate/ pipe mandrel quipped for internal heating as per Cl 12.3 of IS 3144 • Thermocouple • Steel plate
10	Recovery after Compression IS 9842 (Cl.4.10)	• Thickness measuring instrument as per 7.1 of IS 3144 • Mandrel/pipe • Arrangement for Load as per A 2.1 of IS 9842 : 2024
11.	Sulphur Content (IS 3144) (Cl.4.11)	• Gas Absorption flasks • Flask fitted with dropping funnel • Sulphuric Acid • Cadmium Acetate • Hydrochloric acid • Iodine • Sodium thiosulphate • Starch • Mercuric Iodide • Distilled water • Analytical balance • Apparatus for Titration • Standard Iodine
12.	Fibre Diameter (IS 3144 Cl.4.12)	• Projection Microscope as per Cl 24.1.1 of IS 3144 • Microscope slides • Mounting Medium (Glycerine + distilled water)
13.	Alkalinity (Annex B) Cl.4.13.1	• pH meter • distilled water
14.	Resistance to Micro-organisms (IS 3144) Cl.4.13.2)	• Incubator • Hot-air oven • Autoclave • Analytical Balance (0.1 mg LC) • Stereoscopic Microscope • Petri Dish • Test organisms – <i>Aspergillus Niger</i> and <i>Bacillus Subtilis</i> • Volumetric Flask • Pipettes • Test tube • Erlenmeyer flasks • Microbial solutions • Ethanol-water mixture • O-phenylphenol • Ethanol • Lactic Acid

		• Soyabean Casein Digest Agar (SCDA) • Potato Dextrose Agar (PDA) • Sodium Chloride • Distilled water • Sterile Saline
15.	Odour Emission Test (IS 3144) (Cl.4.13.3)	• Refrigerator • Pans • Glass Squares • Butter
16.	Leachable Chloride Content (Cl.4.13.4)	• Distilled Deionized Water • Hot plate • Electronic Balance • Blender • Beaker • Buchner funnel with filter Paper • Amperometric – Coulometric Titrator/ Specific Ion Electrode/ An ion chromatograph

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 Preformed Fibrous Pipe Insulation of the same Group and same mean temperature of Thermal conductivity produced under the similar conditions of manufacture in a day

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 container/package 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.

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

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		
Clause	Requirement	Test Method			No. of Sample	Frequency	Remarks
		Clause	Reference				
4.1	Description	4.1	IS 9842	R	one	Firm to have adequate in-process controls to check compliance of this parameter. However, appropriate records shall be maintained by the manufacturer for evidence of conformity	
4.2	Bulk Density and Variation in Bulk Density	5	IS 5688	R	one	Each control unit	
4.3	Shot Content	13	IS 3144	R	one	Each control unit	
4.4	Moisture Content	14	IS 3144	R	one	Each control unit	
4.4	Moisture Absorption	15	IS 3144	R	one	Once a week	For each group and thermal conductivity
4.5	Incombustibility and Loss in Total Mass	16	IS 3144	R	one	Each control unit	
4.6	Thermal Conductivity	-	IS 3346	S	one	Once a year	For each group and thermal conductivity
4.7	Dimensions	-	IS 9842				
i)	Thickness	-	IS 9842	R	one	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	
ii)	Width and length						
4.8	Linear Shrinkage	10	IS 5724	R	one	Once a week	For each group and thermal conductivity
4.9	Heat Resistance	12	IS 3144	S	one	Once a month	For each group and thermal conductivity
4.10	Recovery after compression	Annex A	IS 9842	R	one	Each control unit	
4.11	Sulphur Content	19	IS 3144	R	one	Each control unit	
4.12	Fibre Diameter	24	IS 3144	R	one	Each control unit	

4.13	OPTIONAL REQUIREMENTS						
4.13.1	Alkalinity	Annex B	IS 9842	S	one	Once a month	
4.13.2	Resistance to Micro- organisms	17	IS 3144	S	one	Once a month	
4.13.3	Odour Emission Test	18	IS 3144	S	one	Once a month	
4.13.4	Leachable Chloride content	Annex C	IS 9842	S	one	Once a month	