



उत्पाद मैनुअल
फर्श टॉपिंग के लिए एपॉक्सी रेज़िन, हार्डनर्स और एपॉक्सी रेज़िन संरचना के लिए
आई एस 9197:1979 के अनुसार

PRODUCT MANUAL
EPOXY RESIN, HARDENERS AND EPOXY RESIN COMPOSITIONS FOR FLOOR
TOPPING ACCORDING TO IS 9197:1979

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 9197 : 1979
	शीर्षक Title	:	Epoxy Resin, Hardeners and Epoxy Resin Compositions for Floor Topping
	संशोधनों की संख्या No. of amendments	:	Nil
2.	नमूना दिशानिर्देश Sampling Guidelines		
a)	कच्चा माल Raw material	:	Please refer to Annex-A
b)	समूहीकरण दिशानिर्देश Grouping Guidelines	:	Please refer to Annex-B
c)	नमूने का परिमाण Sample Quantity	:	15 kg of Epoxy resin compositions (epoxy resin mix + Hardeners mix – as per proportions) 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)

3.	परीक्षण उपकरणों की सूची List of Test Equipment	:	Please refer to Annex-C
4.	निरीक्षण और परीक्षण की स्कीम Scheme of Inspection and Testing	:	Please refer to Annex-D
5.	एक दिन में संभावित परीक्षण Possible tests in a day		
	The samples due for testing on the day of visit are to be witnessed for testing during factory surveillance. 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 9197:1979 with the following scope:		
	Name of the product	Epoxy Resin, Hardeners and Epoxy Resin Compositions for Floor Topping	
	Epoxy resin	Grade: 1/ 2 / other grades	
		Class: I/ II/ III	
	Hardeners	Type: Aliphatic Amine/ Aromatic Amine Adduct/ Polyaminoamide/ Amino resin Compound/ Other Types	
		Sub-Type: A, B, C	
	Proportions of resin mix and hardener mix	___ parts of resin mix (variety of resin) : ___ parts of hardener mix (variety of hardener)	
	Optional Requirement	With/without Thermal Conductivity	

भारतीय मानक ब्यूरो
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 New Delhi – 110002

ANNEX A
Details of Raw Materials

Raw Material	Indian Standard
Epoxy resin	Epoxy resins shall confirm to Table 1/2 read with Cl 3.1 of IS 9197.
Hardeners	Hardeners shall confirm to Table 3 read with Cl 3.2 of IS 9197.
Liquid Coal Tar	Liquid Coal Tar shall confirm to Table 4 read with Cl 3.5 of IS 9197.
Aggregates	Aggregates shall confirm to IS 383 & Cl 3.6 of IS 9197.

ANNEX-B

Grouping Guidelines

1. Epoxy Resin, Hardeners and Epoxy Resin Compositions for Floor Topping as per IS 9197:1979 are classified as given below:

- a) Epoxy resin :

- (i) Grade: 1/ 2

- (ii) Class: I/ II/ III

Other grades of epoxy resins may be used where so agreed to between the purchaser and the supplier

- b) Hardeners :

- (i) Type: Aliphatic Amine/ Aromatic Amine Adduct/ Polyaminoamide/ Amino resin

Compound/ Other Types

- (ii) Sub-Type: A, B, C

Other types of hardeners may be used where so agreed to between the supplier and the purchaser.

- c) Firm shall declare the proportions of epoxy resin mix and hardener mix that are to be intermixed to form the epoxy resin compositions for floor topping before the application.

- d) Optional requirements: With/without Thermal Conductivity

2. Considering the above following grouping guidelines for GoL/CSoL have been developed:

- a) Each grade and class of epoxy resins shall be tested to cover that particular grade and class of epoxy resins.

- b) Each type and subtype of hardeners shall be tested to cover that particular type and subtype of hardeners.

- c) Each proportions of epoxy resin mix and hardener mix as declared by firm that are to be intermixed to form the epoxy resin compositions for floor topping, shall be tested to cover that proportions of epoxy resin mix and hardener mix.

- d) One sample of epoxy resin compositions shall be tested for the optional requirement of Thermal Conductivity in order to cover the same in the scope of licence.

3. The Firm shall declare the varieties of epoxy resins, hardeners and their proportions to form the resin compositions, that they intend to cover in the Licence. The Scope of Licence may be restricted based on the Manufacturing and Testing capabilities of the Manufacturer.

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

ANNEX C

List of Test Equipment

(INDICATIVE LIST, FOR GUIDANCE ONLY)

Sl No.	Tests used in with Clause Reference	Test Equipment
1	Pot Life (Clause 4.1)	- Hot Air Oven - Moulds - Stop watch - Conditioning Chamber to maintain $27 \pm 2^{\circ}\text{C}$ and RH 65 ± 5 percent
2	Chemical Resistance (Clause 4.2)	- Analytical Balance of Range 0-1kg LC-0.1 gm or better - Corrosion resistant metal or a porcelain pan and a spatula or trowel for mixing - Plastic Moulds of 25 mm diameter and 25 mm height. - Constant Temperature Oven or Water bath with temperature controller to maintain temperature of $27 \pm 2^{\circ}\text{C}$ - Compression Testing Machine - Reagents as per table 1 of IS 4631 - Conditioning chamber to maintain $27 \pm 2^{\circ}\text{C}$
3	Resistance to wear (Clause 4.3, Table 5)	- Moulds for preparation of sample piece of 50 cm² - Abrasion Testing Machine as per Appendix A of IS 9162 - Hot air Oven - Dail Guage
4	Compressive Strength (Clause 4.4, Table 5)	- Analytical Balance of Range 0-1kg LC-0.1 gm - Spatula - Trowel - Moulds - Conditioning chamber to maintain $27 \pm 2^{\circ}\text{C}$ - Compression Testing Machine
5	Bond Strength (Clause 4.4, Table 5)	- Universal Testing Machine - Analytical Balance of Range 0-1kg LC-0.1 gm - Mixing Pan - Trowel - Special test Head as per Fig 3 of IS 9162 - Guide for marking - Hot Air Oven - Tiles - Conditioning chamber to maintain $27 \pm 2^{\circ}\text{C}$

6	Flexural Strength (Clause 4.4, Table 5)	- Flexural Testing Machine with loading nose and supports - Moulds 25x25x250mm - Scales as per clause 9.2.1 of IS 9162 - Standard weights - Conditioning chamber to maintain $27 \pm 2^{\circ}\text{C}$ - Air conditioner to maintain $27 \pm 2^{\circ}\text{C}$
8	Tensile Strength (Clause 4.4, Table 5)	- Universal Testing Machine - Analytical Balance of Range 0-1kg LC-0.1 gm - Mixing Pan - Trowel - Conditioning chamber to maintain $27 \pm 2^{\circ}\text{C}$ - Moulds as per Fig 1 of 9162
9	Modulus of Elasticity (Clause 4.4, Table 5)	- Flexural Testing Machine with loading nose and supports - Moulds 25x25x250mm - Scales as per clause 9.2.1 of IS 9162 - Standard weights as per Table 2 of Is 9162 - Conditioning Chamber to maintain $27 \pm 2^{\circ}\text{C}$ - Air conditioner to maintain $27 \pm 2^{\circ}\text{C}$ -
10	Coefficient of linear thermal expansion, $\text{mm/mm}^{\circ}\text{C}$ (Clause 4.4, Table 5)	- Scales as per clause 12.2.2. of IS 9162 - Standard weights as per Table 2 of Is 9162 - Trowel or Spatula - Moulds of 6.45x6.45.25.4 cm - Studs - Length Comparator of LC 0.00025cm - Micrometer of LC 0.00025cm - Hot Air Oven - Air conditioner to maintain $27 \pm 2^{\circ}\text{C}$ - Conditioning chamber to maintain $27 \pm 2^{\circ}\text{C}$
11	Thermal Conductivity (Optional Test) (Clause 4.4, Table 5)	- Low temperature Surfaced Hot plate as per Clause 16.4 of IS 9162 (or) - High temperature Guarded Hot plate as per Clause 16.5 of IS 9162
12	Linear shrinkage, percent (Clause 4.4, Table 5)	- Scales as per clause 12.2.2. of IS 9162 - Standard weights as per Table 2 of Is 9162 - Trowel or Spatula - Moulds of 6.45x6.45.25.4 cm - Studs - Length Comparator of LC 0.00025cm - Micrometer of LC 0.00025cm

		- Hot Air Oven - Air conditioner to maintain $27 \pm 2^{\circ}\text{C}$ - Conditioning chamber to maintain $27 \pm 2^{\circ}\text{C}$ -
	Water absorption, percent (Clause 4.4, Table 5)	- Analytical Balance of range 0 to 100 gm and LC 0.5mg - Specific Gravity Balance of LC 0.5mg - Glass flask carrying a Reflux Condenser - Plastic moulds of 25mm dia and 25 mm height - Hot air Oven - Conditioning chamber to maintain $27 \pm 2^{\circ}\text{C}$
	Shear strength (Clause 4.4, Table 5)	- Analytical Balance of Range 0-1kg LC-0.1 gm - Spatula - Trowel - Moulds - Conditioning chamber to maintain $27 \pm 2^{\circ}\text{C}$ - Mould 10x10 cm or 15x15cm - Universal Testing Machine

ANNEX B

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 : Entire quantity of epoxy resin compositions for each grade, class of resins and each type & subtype of hardeners with the same declared proportions; manufactured in a day from same consignment of raw material shall constitute a control unit.

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 indelibly marked on each container provided always that the product so marked conforms to all requirements of the specification.

3.1 Packing and Marking shall be done as per the Indian Standard.

3.2 **Additional Marking requirements:** The product shall also be marked with the following additional requirement on the labels attached to each bag:

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 Methods			No. of Sample	Frequency	Remarks
		Clause	Reference				
Materials -							
3.1	Epoxy resin	Table1	IS 9197 IS 9162	S	One	Each Consignment	No further testing is required, if material received with test certificate or ISI Marked.
3.2	Hardeners	Table 3	IS 9197 IS 9162	S	One	Each Consignment	
3.5	Liquid Coal Tar	Table 4	IS 9197 IS 9162	S	One	Each Consignment	
3.6	Aggregates	Clause 3.6	IS 9197 IS 9162	S	One	Once in six months for each size	Additional sample shall be tested wherever there is change in source of raw material.
Epoxy Resin Composition -							
4	Pot Life	Clause 4.1	IS 9197	R	One	Each Control Unit	
	Chemical Resistance	Clause 4.2	IS 9197	S	One	Once in a month	
	Resistance to wear	Clause 4.3, Table 5	IS 9197	S	One	Once in a month	
	Compressive Strength	Clause 4.4, Table 5	IS 9197	R	One	Each Control Unit	
	Flexural Strength	Clause 4.4, Table 5	IS 9197	R	One	Each Control Unit	

	Tensile Strength	Clause 4.4, Table 5	IS 9197	R	One	Each Control Unit	
	Modulus of Elasticity	Clause 4.4, Table 5	IS 9197	R	One	Each Control Unit	
	Coefficient of linear thermal expansion, mm/mm ⁰ C	Clause 4.4, Table 5	IS 9197	R	One	Each Control Unit	
	Thermal Conductivity (Optional Test)	Clause 4.4, Table 5	IS 9197	S	One	Once in Six Months	
	Linear shrinkage, percent	Clause 4.4, Table 5	IS 9197	R	One	Each Control Unit	
	Water absorption, percent	Clause 4.4, Table 5	IS 9197	R	One	Each Control Unit	
	Shear strength	Clause 4.4, Table 5	IS 9197	R	One	Each Control Unit	