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उत्पाद मैन्युअल
पॉलीमर परिवर्तित बिटुमेन (पीएमबी) – विशिष्टि
IS 15462: 2019 के अनुसार

PRODUCT MANUAL FOR
POLYMER MODIFIED BITUMEN (PMB)- SPECIFICATION
ACCORDING TO IS 15462: 2019

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 15462:2019
	शीर्षक **Title**	:	Polymer Modified Bitumen (PMB)- Specification
	संशोधनों की संख्या **No. of amendments**	:	2
2	**नमूना दिशानिर्देश** **Sampling Guidelines**		
a)	**कच्चा माल** **Raw material**	:	Any suitable viscosity grade bitumen conforming to IS 73 or a feed stock compatible with additives, may be used (as per provisions of Clause 6.1 of IS 15462:2019) Note: This section indicates the requirements for raw material (if specified in the IS) for which compliance is to be establishedduring Grant of Licence/Change in Scope of Licence/Factory Surveillance
b)	**समूहीकरण दिशानिर्देश** **Grouping Guidelines**	:	**कृपया** Annex-A **देखें** Please refer ANNEX-A
c)	**नमूने का परिमाण** **Sample Quantity**	:	6 litres 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 the required quantity of product sample, as far as possible since raw material sample may not be available in market)

d)	**परीक्षण अनुरोध में घोषित किए जाने वाले पैरामीटर** **Parameters to be Declared in Test Request**	:	Grade Note: Apart from the above, any other requirements / parameters may also be declared as per the standard, as applicable.
3	**परीक्षण उपकरणों की सूची** **List of Test Equipment**	:	**कृपया** Annex-B **देखें** Please refer ANNEX–B
4	**निरीक्षण और परीक्षण की स्कीम** **Scheme of Inspection and Testing**	:	**कृपया** Annex-C **देखें** Please refer ANNEX–C
5	**एक दिन में संभावित परीक्षण** **Possible tests in a day**	:	i) Homogeneity ii) Mineral matter iii) Degrading/separation of Modifier iv) Softening point (R and B) v) Elastic recovery of half thread in ductilometer at 15°C vi) Flash point, COC vii) Viscosity at 150°C viii) Complex modulus (G*) divided by Sin delta (G*/sin δ) as Min 1.0 kPa, 25 mm Plate, 1 mm Gap, at 10 rad/s ix) Phase Angle (δ), degree x) Separation, difference in softening point (R&B) xi) FRAASS breaking point xii) Loss in mass xiii) Complex modulus (G*) divided by Sin delta (G*/sin δ) xiv) MSCR Test xv) Complex modulus (G*) multiplied by Sin delta (G*sin δ) 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 15462:2019 with the following scope:		
	उत्पाद का नाम Name of the product	Polymer Modified Bitumen (PMB)	
	Grade(s)	a) Grade PMB 64-10, and/or b) Grade PMB 70-10, and/or c) Grade PMB 76-10, and/or d) Grade PMB 82-10, and/or e) Grade PMB 76-22	

ANNEX-A
GROUPING GUIDELINES

FOR POLYMER MODIFIED BITUMEN (PMB)ACCORDING TO IS 15462:2019

1. The manufacturer shall declare the Grades (as per Clause 5 of IS 15462:2019), in their application for considering grant of licence and/or change in scope of licence, which they intend to cover in the scope of the licence as follows:

a. Grade PMB 64-10
b. Grade PMB 70-10
c. Grade PMB 76-10
d. Grade PMB 82-10
e. Grade PMB 76-22

2. The grade PMB 76-22 shall be tested for considering grant of licence/inclusion of that Grade.

3. Grade PMB 64-10 and Grade PMB 82-10 shall be tested to cover all the 4 grades of PMB 64-10, PMB 70-10, PMB 76-10 and PMB 82-10.

4. It shall be ensured that the firm is having all the necessary manufacturing and testing facilities for the grades to be included in the licence.

5. During operation of licence, samples of each variety covered in the scope of licence, shall be tested in rotation, to the extent possible

ANNEX – B

LIST OF TEST EQUIPMENTS

(INDICATIVE LIST, FOR GUIDANCE ONLY)

Sl. No	Tests used in with Clause Reference	Test Equipment
1	Softening point (R and B), Cl. 6.5 and 9.5.3, Table 1, Sl. No. A (i)	Ring and Ball Apparatus (Steel Balls, Brass Rings, Ball Guide, Support, Thermometer, Bath, Stirrer),
2	Elastic recovery of half thread in ductilometer at 15°C, Cl. 6.5 and 9.5.3, Table 1, Sl. No. A (ii)	Ductility Machine and Moulds as per IS 1208 (Part 2) and Fig 1 of Annex A to IS 15462, Thermometer, Scissors, Scale
3	Flash point, COC, Cl. 6.5 and 9.5.3, Table 1, Sl. No. A (iii)	Pensky — Martens Closed Tester (Cup, Lid including stirring device, cover proper, Shutter and Flame-exposure device, Stove consisting of an air bath and a top plate on which the flange of the cup rests,
4	Viscosity at 150°C, Cl. 6.5 and 9.5.3, Table 1, Sl. No. A (iv)	Rotational Viscometer, Apparatus-measuring geometry, Temperature-controlled Thermal Chamber Heater, Sample Chambers (reusable/ disposable), temperature Controller, Balance, Platinum Resistance Thermometer (PRT), Solvents for cleaning sample chamber, apparatus-measuring geometry and accessories
5	Complex modulus (G*) divided by Sin delta (G*/sin δ) as Min 1.0 kPa, 25 mm Plate, 1 mm Gap, at 10 rad/s, Cl. 6.5 and 9.5.3, Table 1, Sl. No. A (v)	Dynamic Shear Rheometer (DSR) Test System, Test Plates, Environmental Chamber, Temperature Controller, Loading Device, Control and Data Acquisition System, Specimen Mold, Specimen Trimmer, Calibrated Temperature Detector
6	Phase Angle (δ), degree, Cl. 6.5 and 9.5.3, Table 1, Sl. No. A (vi)	Dynamic Shear Rheometer (DSR) Test System, Test Plates, Environmental Chamber, Temperature Controller, Loading Device, Control and Data Acquisition System, Specimen Mold, Specimen Trimmer, Calibrated Temperature Detector
7	Separation, difference in softening point (R&B), Cl. 6.5 and 9.5.3, Table 1, Sl. No. A (vii)	Aluminum Tubes, Oven, Freezer, Rack, Spatula and Hammer
8	FRAASS breaking point, Cl. 6.5 and 9.5.3, Table 1, Sl. No. A (viii)	Bending Apparatus, Plaque, Cooling Apparatus, Thermometer, Plate and Stand
9	Loss in mass, Cl. 6.5 and 9.5.3, Table 1, Sl. No. B (i)	Oven, Flow meter, Thermometer, Container, Cooling rack as per Annex E of IS 15462

10	Complex modulus (G*) divided by Sin delta (G*/sin δ), Cl. 6.5 and 9.5.3, Table 1, Sl. No. B (ii)	Dynamic Shear Rheometer (DSR) Test System, Test Plates, Environmental Chamber, Temperature Controller, Loading Device, Control and Data Acquisition System, Specimen Mold, Specimen Trimmer, Calibrated Temperature Detector
11	MSCR Test, Cl. 6.5 and 9.5.3, Table 1, Sl. No. B (iii)	Dynamic Shear Rheometer (DSR)
12	Complex modulus (G*) multiplied by Sin delta (G*sin δ), Cl. 6.5 and 9.5.3, Table 1, Sl. No. C (i)	Aluminum Tubes, Oven, Freezer, Rack, Spatula and Hammer
13	Sample Preparation for Rolling Thin Film Oven (RTFO) Test Residue	Oven, Flowmeter, Thermometer, Container, Cooling Rack
14	Sample Preparation for Pressurized Aging Vessel (PAV) Residue	Pressure Vessel, Pressure and Temperature Controlling Devices, Temperature Controlling Device, Temperature and Pressure Measuring Devices (platinum resistive thermometric device (RTD), Stainless Steel Pans, Balance, Vacuum Oven, temperature sensor capable of measuring the vacuum oven chamber temperature, vacuum gauge or absolute pressure gauge or digital vacuum measuring system capable of measuring the absolute pressure in the chamber, Vacuum System, Oven

ANNEX C

SCHEME OF INSPECTION AND TESTING

1. QUALITY ASSURANCE PLAN

1.1 It is expected that during operation of BIS licence, manufacturers will implement a Quality Assurance Plan (QAP) 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 (QAP) defining the control unit (i.e. lot/batch etc.), the levels of control (i.e. the frequency and number of samples for conducting the different tests as per the Indian Standard) and declare the arrangement for testing i.e. whether in-house or subcontracting/sharing for each applicable test and submit the same to BIS Branch Office for information. The manufacturer shall comply with the QAP and maintain test records in accordance with para 2.1.

1.3 **RECOMMENDED LEVELS OF CONTROL/CONTROL UNIT**:

1.3.1 For the guidance of manufacturers, the recommended definition of control unit is : For the purpose of this scheme, the entire quantity of one grade of polymer modified bitumen manufactured in a day shall be considered as one 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**. Manufacturer has the discretion of declaring their own levels of control or accept the levels of control given in this document.

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.

2. ENSURING COMPLIANCE THROUGH TESTING- manufacturers shall ensure compliance of their products to all the requirements of the Indian Standard for which they may have in-house test facilities. However, there is no obligation to maintain in-house laboratory. Licensee may use alternative arrangements for tests of the production as per the declared QAP. Various alternatives are available for operation of BIS certification as given below and the relevant guidelines for availing such relaxations by the manufacturers, as amended from time to time, are to be referred :

i) Shared testing resources like common facility,

ii) Cluster based testing facility,

iii) Sub-contracting to outside laboratories which may either be:

a) BIS recognised/empanelled laboratories, or

b) Any accredited laboratory as per ISO/IEC 17025

2.1 **TEST RECORDS**- The manufacturers shall maintain test records for the tests carried out (either in-house or at a sub-contracted or at shared test facility) to establish conformity of the product to the Standard for operation of licence. For the tests being subcontracted or conducted at a shared test facility, test results issued by the laboratories or test facilities, shall be made available for inspection by BIS.

3. PACKING AND MARKING - The Standard Mark, as given in the Schedule of the licence, shall be printed on the container or the label applied to it, provided always that the product so marked conform to requirements of the specification.

3.1 Packing and Marking shall be done as per the Indian Standard. The material shall be packed in suitable form of container (bulk, drum or bags) as agreed between the purchaser and the supplier, in line with the provisions of Clause 8.1 of IS 15462:2019.

3.2 **Additional Marking requirements**: Additionally, the following shall also be marked on each container

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

4. REJECTION - 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

(Recommended Levels of Control by BIS- For Guidance Only)

(1)				(3)		
Test Details				**Levels of Control**		
Cl.	**Requirement**	**Test Methods**		**No. of Sample**	**Frequency**	**Remarks**
		Clause Reference	**IS**			
6.1	Material and Manufacture	6.1	IS 15462: 2019	One	Each consignment	No further testing is required if test certificate from manufacturer is available
6.2	Homogeneity	6.2	-do-	One	-do-	
6.3	Mineral matter	6.3	-do-	One	-do-	Undertaking/ declaration to be submitted by manufacturer
6.4	Degrading/ separation of Modifier	6.4	-do-	One	-do-	
(A) Tests to be carried out on original binder						
i)	Softening point (R and B)	-	IS 1205	One	Each control unit	
ii)	Elastic recovery of half thread in ductilometer at 15°C	Annex A	IS 15462: 2019	One	Each control unit	
iii)	Flash point, COC	-	IS 1209	One	Once in a month	
iv)	Viscosity at 150°C	-	ASTMD 4402	One	Each control unit	
v)	Complex modulus (G*) divided by Sin delta (G*/sin δ) as *Min* 1.0 kPa, 25 mm Plate, 1 mm Gap, at 10 rad/s	Annex B	IS 15462: 2019	One	Once in a month	
vi)	Phase Angle (δ), degree	Annex B	IS 15462: 2019	One	Once in a month	
vii)	Separation, difference in softening point (R&B)	Annex C	IS 15462: 2019	One	Once in a month	

viii)	FRAASS breaking point		IS 9831	One	Once in a month	FRAASS Breaking Point only to be evaluated in case the project site has subzero temperature conditions
(B) Tests to be Carried out on Rolling Thin Film Oven(RTFO) Residue						
i)	Loss in mass	Annex E		One	Once in a month	
ii)	Complex modulus (G*) divided by Sin delta (G*/sin δ)	Annex B	IS 15462: 2019	One	Once in a month	
iii)	MSCR TEST	Annex D	IS 15462: 2019	One	Once in a month	
(C) Tests to be Carried out on Pressure Aging Vessel(PAV) Residue						
i)	Complex modulus (G*) multiplied by Sin delta (G*sin δ)	Annex C	IS 15462: 2019	One	Once in a month	