उत्पाद मानुयल
पॉलीमर परिवर्तित बिटुमेन (पीएमबी) - विशिष्टि
IS 15462:2019 के अनुसार

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

भारतीय मानक ब्यूरो (अनुरूपता मूल्यांकन) विनियम 2018 की स्कीम-I के तहत यह उत्पाद मानुयल प्रमाणीकरणके प्रचलन मे रीति और पारदर्शिता के सुसंगता सुनिश्चित करने के लिए सभी क्षेत्रीय/शाखा कार्यालयों एवं लाइसेन्स धारियों द्वारा संदर्भ सामग्री के रूप मे उपयोग किया जाएगा। बीआईएस लाइसेन्स/प्रमाण पत्र प्राप्त करने के इच्छुक भावी आवेदकों द्वारा भी इस दस्तावेज़ का उपयोग किया जा सकता है।

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 license/certificate.

1	**उत्पाद** **Product**	:	IS 15462:2019
	शीर्षक **Title**	:	Polymer Modified Bitumen (PMB)- Specification
	संशोधन संख्या **No. of Amendments**	:	Nil
2	**नमुनाकरण दिशा निर्देश** **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)
b)	**समूहिकरण दिशा निर्देश** **Grouping guidelines**	:	**कृपया** Annex-A **देखें** Please refer ANNEX-A
c)	**नमूने का परिमाण** **Sample Size**	:	6 litres
3	**परीक्षण उपकरणो की सूची** **List of Test Equipment**	:	**कृपया** Annex-B **देखें** Please refer ANNEX–B

4	**निरीक्षण व परीक्षण 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)
6	**लाइसेन्स का कार्यक्षेत्र / Scope of the Licence**:		
	IS 15462:2019 के अनुसार मानक मुहर का उपयोग करने के लिए लाइसेंस निम्नलिखित कार्यक्षेत्र के लिए प्रदान किया जाता है: 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 Grade (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.

2. The sample of each grade of material (Polymer Modified Bitumen (PMB)) shall be subjected to testing for considering grant of licence/inclusion of that type.

3. 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.

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

ANNEX – B
LIST OF TEST EQUIPMENT
FOR POLYMER MODIFIED BITUMEN (PMB)ACCORDING TO IS 15462:2019

Major test equipment required to test as per the Indian Standard

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, 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, Perforated Metal Shelf, Thermometer, Container

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

This is an indicative list and may not be taken as being exhaustive

ANNEX C
SCHEME OF INSPECTION AND TESTING
FOR POLYMER MODIFIED BITUMEN (PMB)
ACCORDING TO IS 15462:2019

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 and implement 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. **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 - 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.

3.1 Marking - The information as mentioned under clause 8.2.1 of IS 15462:2019 shall be legibly and indelibly marked on each container. In addition, the following shall be incorporated on each container:

(i) BIS Licence No. CM/L --.

(ii) BIS website details i.e. ―"For details of BIS certification please visit www.bis.gov.in".

4 CONTROL UNIT – 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.

4.1 The batch shall be considered fit for the purpose of marking if sample taken from control unit and tested as in Table 1 is found to conform to the relevant requirements of thespecification.

4.2 In case the sample fails to conform to any of the requirements as laid down in the specification, the entire material in the batch shall be considered as unfit for the application of the Certification Mark of the Bureau. The batch could, however, be reprocessed and then retested for compliance with the specification.

4.3 Bitumen may be tested as per IS 73 or test certificate may be received from the supplier and appropriate records maintained. In respect of all other clauses for the specification, the factory will maintain appropriate controls and checks to ensure that their finished product conforms to the specification.

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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 (LEVELS OF CONTROL)
(Para 5 of Scheme of Inspection and Testing)

(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	IS				
6.1	Material and Manufacture	6.1	IS 15462: 2019	S	One	Each consignment	No further testing is required iftest certificatefrom manufacturer is available
6.2	Homogeneity	6.2	-do-	R	One	-do-	
6.3	Mineral matter	6.3	-do-	R	One	-do-	Undertaking/ declaration to be submitted by manufacturer
6.4	Degrading/ separation of Modifier	6.4	-do-	R	One	-do-	
(A) Tests to be carried out on original binder							
i)	Softening point (R and B)	-	IS 1205	R	One	Each control unit	

ii)	Elastic recovery of half thread in ductilometer at 15°C	Annex A	IS 15462: 2019	R	One	-do-	
iii)	Flash point, COC	-	IS 1209	R	One	-do-	
iv)	Viscosity at 150°C	-	ASTMD 4402	R	One	-do-	
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	R	One	-do-	
vi)	Phase Angle (δ), degree	Annex B	IS 15462: 2019	R	One	-do-	
vii)	Separation, difference in softening point (R&B)	Annex C	IS 15462: 2019	R	One	-do-	
viii)	FRAASS breaking point		IS 9831	R	One	-do-	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		IS 9382	R	One	-do-	

ii)	Complex modulus (G*) divided by Sin delta (G*/sin δ)	Annex B	IS 15462: 2019	R	One	-do-	
iii)	MSCR TEST	Annex D	IS 15462: 2019	R	One	-do-	
(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	R	One	-do-	

Note-1: Whether test equipment is required or sub-contracting is permitted in column 2 shall be decided by the Bureau and shall be mandatory. Sub-contracting is permitted to a laboratory recognized by the Bureau or Government laboratories empaneled 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 the approval by BO Head.