



उत्पाद मैनुअल
धनायनित परिवर्तित बिटुमिन इमल्शन - विशिष्टि
17016 : 2018 के अनुसार

PRODUCT MANUAL FOR
CATIONIC MODIFIED BITUMEN EMULSION - SPECIFICATION
ACCORDING TO IS 17016 : 2018

भारतीय मानक ब्यूरो (अनुरूपता मूल्यांकन) विनियम 2018 की स्कीम-I के तहत यह उत्पाद मैनुअल प्रमाणीकरण की संचालन रीति में सुसंगतता और पारदर्शिता सुनिश्चित करने के लिए सभी क्षेत्रीय/शाखा कार्यालयों एवं लाइसेन्स धारियों द्वारा संदर्भ सामग्री के रूप में 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 licence/certificate.

1.	उत्पाद Product	:	IS 17016: 2018
	शीर्षक Title	:	धनायनित परिवर्तित बिटुमिन इमल्शन - विशिष्टि Cationic Modified Bitumen Emulsion - Specification
	संशोधनों की संख्या No. of Amendments	:	0 NIL
2.	नमूनाकरण दिशा निर्देश Sampling Guidelines:		
a)	कच्चा माल Raw material	:	Any suitable grade of bitumen as given in IS 73 or modified bitumen as given in IS 15462 with or without addition of suitable flux, shall be used. For modification in aqueous phase, modifier shall be Styrene Butadiene Rubber (SBR) as per IS 11356 or natural rubber as per IS 4588.

b)	समूहीकरण दिशा निर्देश Grouping guidelines	:	Sample of each grade shall be drawn for testing to cover in the scope of the licence.
c)	नमूने का परिमाण Sample Size	:	6 liters
3.	परीक्षण उपकरणों की सूची List of Test Equipment	:	कृपया Annex-A देखें Please see Annex – A
4.	निरीक्षण व परीक्षण स्कीम Scheme of Inspection and Testing	:	कृपया Annex-B देखें Please see Annex – B
5.	एक दिन में संभावित परीक्षण Possible tests in a day :		
	All tests, except Storage Stability after 24 h can be carried out in a day. However, since testing facility is not available in any BIS/BIS recognized lab, complete testing has to be carried out in the Factory for certification and during surveillance. 02 days inspection required for complete testing.		
6.	लाइसेन्स का कार्यक्षेत्र/ Scope of the Licence:		
	IS 17016 : 2018 के अनुसार मानक मुहर का उपयोग करने के लिए लाइसेन्स निम्नलिखित कार्यक्षेत्र के लिए प्रदान किया जाता है Licence is granted to use Standard Mark as per 17016 : 2018 with the following scope:		
	उत्पाद का नाम Name of the product		Cationic Modified Bitumen Emulsion
	Grade		QSME and/or RSME and/or SSME

ANNEX – A

**LIST OF TEST EQUIPMENTS
TO THE PRODUCT MANUAL FOR
CATIONIC MODIFIED BITUMEN EMULSION - SPECIFICATION
AS PER IS 17016 : 2018**

Major test equipment required to test as per the Indian Standard

Sr. No.	Tests used in with Clause Reference	Test equipment
1.	Residue on 600 Micron IS Sieve, Table 1 Sr. No i	600 Micron IS Sieve — A circular sieve approximately 100 mm diameter and 40 mm height. Metal or Glass Dish — A small metal or glass dish about 110 mm in diameter (such as a clock glass) Oven — A well ventilated oven thermostatically controlled to 100 to 110°C Balances — 250 g accurate to 0.01 g and 10 kg capacity accurate to 1 g. Container — A clean, weighed, 1.5-litre container. Distilled Water Solvents – Xylene and Acetone
2.	Viscosity by Saybolt Furol Viscometer, Table 1 Sl No ii	Saybolt Furol Viscometer as per Annex A of IS 3117 Thermostatically controlled bath Oil tube Thermometers Timing device Withdrawal tube or Pipette
3.	Coagulation of emulsion at low temperature, Table 1 Sl no iii	Water Bath, thermostatically controlled, Glass boiling tube 600 micron IS sieve Beakers, 600 ml capacity Solution - One percent solution of cetrimide in N/10 hydrochloric acid Solvents – Xylene and Acetone
4.	Storage stability after 24, Table 1 Sl no iv	Cylinders — Two 500-ml glass cylinders, with pressed or moulded glass bases and cork or glass stoppers, having an outside diameter of 50 ± 5 mm and having 5 ml graduations. Glass Pipette — A 60-ml siphon glass tube pipette. Balance — 500 g capacity accurate to 0.1 g.

		Glass Beakers — Three glass breakers of 600 or 1000 ml capacity, made of borosilicate glass. Glass Rods, with flame polished ends, 6.5 ± 0.5 mm diameter and 175 ± 5 mm in length. Oven — Thermostatically controlled, capable of maintaining temperature of $163 \pm 2.8^{\circ}\text{C}$.
5.	Particle charge, Table 1 Sr No v	Current Source — A 12 V battery. Rheostat, of 2000 Ohm capacity. Ammeter of preferable range of 20 mA or any suitable ammeter to accurately measure 4 mA. Stainless Steel Plates — Two, 25×75 mm size. Glass Container, of 500 ml capacity
6.	Miscibility with water, , Table 1 Sr no vi	400 ml beaker, Thermometer, Distilled water, Measuring cylinder
7.	Residue by Evaporation, Table 1, Sr No. (vii) (a)	Glass Beakers — Low form of 1000 ml capacity made of borosilicate glass. Glass Rods, with flame polished 6.5 ± 0.5 mm in diameter and 175 ± 0.5 mm in length. Balance — 500 g capacity accurate to 0.1 g. Oven — Thermostatically controlled at a temperature of $163 \pm 2.8^{\circ}\text{C}$.
8.	Penetration, Table 1, Sr No. (vii) (b)	Container - A metal or glass cylindrical, flat bottom container as per IS 1203 Needle -A straight, highly polished, cylindrical, stainless steel rod, with conical and parallel portions co-axial, having shape and dimensions as per IS 1203. Water Bath – thermostatically controlled Transfer Dish - A small dish or tray. provided with some means which ensure a firm bearing and prevent the rocking of the container and of such capacity as will ensure complete immersion of the container during the test. Penetration Apparatus - Any apparatus which will allow the needle to penetrate without appreciable friction, and which is accurately calibrated to yield results in tenths of millimeter Thermometer (Range : 0 to 44°C, L.C. – 0.2°C) Time Device
9.	Ductility, Table 1, Sr No. ((vii) (c)	Ductility apparatus consisting of ductility mould as per IS 1208,

		Water bath (Thermostatically controlled), Testing machine (for pulling the briquette of bituminous material apart), Thermometer (Range : 0 to 44 °C, L.C. – 0.2 °C) Knife or Spatula Brass Plate
10.	Softening point, Table 1, Sr No. (vii) (d)	Ring and ball apparatus , Steel balls, Brass rings and support, Ball guides , Thermometer - Low Temperature: Range - (- 2°C to 80°C), LC- 0.2°C; High Temperature : Range - (30 to 200 °C), LC- 0.5 °C Beaker, Stirrer, Water bath, Oven, Metal Plate, Glycerine, Dextrin, Knife, Forceps
11.	Elastic Recovery, Table 1, Sr No. (vii) (e)	Ductility Machine and Moulds as per IS 1208 and Fig. 1 , Thermometer – Any standard thermometer (ASTM 63 °C) of equivalent range and accuracy, Scissors, Scale, Water bath
12.	Polymer Content, Table 1, Sr No. (vii) (f)	Weighing Balance
13.	Stability to mixing with Cement, Table 1, Sr No. (vii) (g)	Sieve — A 1.40 mm IS Sieve approximately 100 mm in diameter and 40 mm in height and 150 micron IS Sieve approximately 200 mm in diameter. Metal Dish — A round-bottomed metal utensil of approximately 500-ml capacity. Steel Rod — A steel rod with rounded ends 13 mm in diameter. Balance — 250 g capacity accurate to 0.1 g. Graduated Cylinder of 100 ml capacity. Shallow Pan of 100-mm diameter and of about 50-ml capacity. Oven — A well-ventilated oven controlled at 110°C.
14.	Mixing Time, Table 1, Sr No. (vii) (h)	Stainless steel bowl, Spatula, Beakers, Measuring cylinder, spoon and Balance

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

ANNEX B
SCHEME OF INSPECTION AND TESTING FOR
CATIONIC MODIFIED BITUMEN EMULSION - SPECIFICATION
ACCORDING TO IS 17016 : 2018

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 license shall be stencilled on each container and / or printed on the label applied to the container; provided that the material in each container to which this mark is thus applied conforms to every requirement of the specification

3.1 Packing and Marking shall be done as per the provisions of the Indian Standard. In addition, the following details shall be marked on each container/package:-

- a) BIS Licence No. CM/L-----.
- b) 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 Cationic Modified Bitumen Emulsion of the same grade produced in a shift shall constitute a control unit.

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 Method			No. of Sample	Frequency	Remarks
		Clause	Reference				
4.1	Bitumen /modified bitumen		IS 73 /IS 15462	S	One	One consignment	See Note 3
4.3	Modifier		IS 11356 / IS 4588	S	One	One consignment	See Note 3
6.1	Homogeneity	IS 17016	IS 17016	R	One	Each month	
6.2 & Table 1	i) Residue on 600 micron IS Sieve	Annex -B	IS 8887	R	One	Each control unit	
	ii) Viscosity by Saybolt Furol Viscometer At 25° C	IS 8887	IS 8887	R	One	-do-	
	iii) Coagulation of emulsion at low temperature	Annex -C	IS 8887	R	One	-do-	
	iv) Storage stability after 24 h	Annex -D	IS 8887	R	One	-do-	
	v) Particle charge	Annex -E	IS 8887	R	One	Each control unit	
	vi) Miscibility with water	Annex -H	IS 8887	R	One	-do-	
	vii) Test on Residue			R	One	-do-	
	a. Residue by evaporation	Annex -J	IS 8887				
	b. Penetration at 25°C/100g/5 Sec	IS 1203	IS 1203				
	c. Ductility at 27°C	IS 1208	IS 1208				
	d. Softening Point,	IS 1205	IS 1205				
	e. Elastic Recovery	IS 15462	IS 15462				

	f. Polymer Content	To be reported	To be reported				
	g. Stability to mixing with cement	IS 8887	IS 8887				g) Applicable to SSME Grade only
	h. Mixing Time	Annexure B	IS 17016				h) Applicable to QSME Grade only

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 approval to BO head.

Note-3: Conformity of raw materials to the requirement of the specification may be established through either of the following or a combination of the same (No testing is required if the material is ISI marked):

- i. Test report from a laboratory recognized by the Bureau or Government laboratories empaneled by the Bureau
- ii. Material manufacturer's test certificate
- iii. In house factory test report