



PRODUCT MANUAL
FOR Bitumen Emulsion for Roads (Cationic Type) — Specification
ACCORDING TO IS 8887:2017

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.	Product	:	IS 8887:2017
	Title	:	Bitumen Emulsion for Roads (Cationic Type) — Specification
	No. of Amendments	:	NIL
2.	Sampling Guidelines:		
a)	Raw material	:	Any suitable grade of bitumen as given in IS 73 with or without addition of suitable flux, may be used
b)	Grouping guidelines	:	NA (Sample of each grade shall be drawn and tested)
c)	Sample Size	:	6 litres
3.	List of Test Equipment	:	Please refer Annex –A
4.	Scheme of Inspection and Testing	:	Please refer Annex - B
5.	Possible tests in a day :	:	All tests except Storage Stability
6.	Scope of the Licence :		
	Licence is granted to use Standard Mark as per IS 8887:2017 with the following scope:		
	Name of the product		Bitumen Emulsion for Roads (Cationic Type) — Specification
	Grade		RS1, RS2, MS, SS-1, SS-2

ANNEX-A
PRODUCT MANUAL
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LIST OF TEST EQUIPMENTS

Major test equipment required to test as per the Indian Standard

Sr. No.	Test Equipment	Tests used in with Clause Reference
1.	<p>600 Micron IS Sieve — A circular sieve approximately 100 mm diameter and 40 mm height.</p> <p>Metal or Glass Dish — A small metal or glass dish about 110 mm in diameter (such as a clock glass)</p> <p>Oven — A well ventilated oven thermostatically controlled to 100 to 110°C</p> <p>Balances — 250 g accurate to 0.01 g and 10 kg capacity accurate to 1 g.</p> <p>Container — A clean, weighed, 1.5-litre container.</p>	Determination Of Residue By Sieving Through 600-Micron IS Sieve, Table 1 SI No i
2.	<p>SayboltFurol Viscometer as per Annex A of IS 3117</p> <p>Thermostatically controlled bath</p> <p>Oil tube Thermometers</p>	Viscosity by SayboltFurol Viscometer, Table 1 SI No ii
3.	<p>Water Bath, thermostatically controlled, LC 0.1°C'</p> <p>Glass boiling tube</p> <p>600 micron IS sieve</p> <p>Beaker</p>	Determination of coagulation of emulsion at low temperature, Table 1 SI no iii
4.	<p>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.</p> <p>Glass Pipette — A 60-ml siphon glass tube pipette.</p> <p>Balance — 500 g capacity accurate to 0.1 g.</p> <p>Glass Beakers — Three glass breakers of 600 or 1000 ml capacity, made of borosilicate glass.</p> <p>Glass Rods, with flame polished ends, 6.5 ± 0.5 mm diameter and 175 ± 5 mm in length.</p> <p>Oven — Thermostatically controlled, capable of</p>	Storage stability after 24, Table 1 SI no iv

	maintaining temperature of $163 \pm 2.8^{\circ}\text{C}$.	
5.	<p>Current Source — A 12 battery.</p> <p>Rheostat, of 2 000 Ohm capacity.</p> <p>Ammeter of preferable range of 20 mA or any suitable ammeter to accurately measure 4 mA.</p> <p>Stainless Steel Plates — Two, 25 × 75 mm size.</p> <p>Glass Container, of 500 ml capacity</p>	Particle charge, Table 1 SI No v
6.	<p>Mixing Pan — A whole enamelled kitchen pan with handle, of approximately 3-litre capacity.</p> <p>Mixing Blade — A putty knife with a 30 × 90 mm steel blade with rounded corners. A 254 mm kitchen-mixing spoon may be used as an alternative.</p> <p>Sieve — Standard sieve of 19 mm and 4.75 mm conforming to IS 460 (Part 2).</p> <p>Constant Head Water Spraying Apparatus — An apparatus for applying tap water in a spray under a constant head of 775 mm. The water shall spray from the apparatus in a low velocity.</p> <p>Thermometer — It shall be of the mercury in glass type nitrogen filled</p> <p>Balance, capable of weighing 1000g within ± 0.1 g.</p> <p>Pipette, of 10ml capacity</p>	Coating ability and water resistance, Table 1 SI No vi
7.	<p>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.</p> <p>Metal Dish — A round-bottomed metal utensil of approximately 500-ml capacity.</p> <p>Steel Rod — A steel rod with rounded ends 13 mm in diameter.</p> <p>Balance — 250 g capacity accurate to 0.1 g.</p> <p>Graduated Cylinder of 100 ml capacity.</p> <p>Shallow Pan of 100-mm diameter and of about 50-ml capacity.</p> <p>Oven — A well-ventilated oven controlled at 110°C.</p>	Stability to mixing with cement, Table 1 SI no vii
8.	400 ml beaker, thermometer, distilled water, measuring cylinder	Miscibility with water, , Table 1 SI no viii
9.	Glass Beakers — Low form of 1 000 ml capacity made of borosilicate glass.	Determination Of Residue By Evaporation, Table 1,

	<p>Glass Rods, with flame polished 6.5 ± 0.5 mm in diameter and 175 ± 0.5 mm in length.</p> <p>Balance — 500 g capacity accurate to 0.1 g.</p> <p>Oven — Thermostatically controlled at a temperature of $163 \pm 2.8^{\circ}\text{C}$.</p>	SI No. (ix) (1)
10.	<p>A metal or glass cylindrical, flat bottom container</p> <p>A straight, highly polished, cylindrical, stainless steel rod, with conical and parallel portions co-axial</p> <p>Water Bath – thermostatically controlled</p> <p>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.</p> <p>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</p> <p>Thermometer</p> <p>Time Device</p>	Determination Of penetration, Table 1, SI No. (ix) (1)
11.	Ductility apparatus consisting of ductility mould, water bath (Thermostatically controlled), testing machine (for pulling the briquette of bituminous material apart), and thermometer	Determination Of Ductility, Table 1, SI No. (ix) (3)
12.	<p>Method A as per IS 1216 (for Asphaltic Bitumen)</p> <p>Apparatus: Gooch Crucible, Conical Glass Flask - of 200-ml capacity</p> <p>Solvent: Carbon Disulphide-re distilled grade, conforming to IS :71, Trichloroethylene - conforming to IS : 245</p>	Solubility in trichloroethylene, Table 1, SI No. (ix) (4)
13.	<p>METHOD A (FOR CUTBACK BITUMEN) as per IS 1213</p> <p>Distillation Flask - 500 ml, side arm having dimensions as shown in Fig. 1.</p> <p>Thermometer - of high distillation, total immersion type</p>	Distillation in percent volume of distillate recovered at 360°C , Table 1, SI No. (x)
14.	<p>Flask - of 500 ml capacity (see Fig. 1), made of heat resistant glass, well annealed and as free as possible from striae and similar defects. (A metal flask may be used)</p> <p>Condenser - made of heat resistant glass, well</p>	Water content, Table 1, SI No. (xi)

	<p>annealed and as free as possible from striae and similar defects, with shape, dimensions and tolerances shown in Fig. 2.</p> <p>Receiver - made of heat resistant glass, well annealed and as free as possible from striae and similar defects, provided with ground glass joints with the dimensions and tolerances as given in Table 1</p> <p>A 100-ml Graduated Cylinder</p> <p>Heater - Any suitable gas burner or electric heater may be used.</p> <p>Solvent -Blend of 20 percent by volume of industrial grade toluene and 80 percent by volume of industrial grade xylene, or Petroleum or coal tar naphtha free from water yielding not more than 5 percent distillate at 125° C and not less than 20 percent at 160°C.</p>	
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The list above is indicative and may not be taken as exhaustive

ANNEX – B

SCHEME OF INSPECTION AND TESTING
FOR Bitumen Emulsion for Roads (Cationic Type) — Specification
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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 a calibration plan for the test equipment.
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 stenciled 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 Marking and packing shall be done as per the provisions of the Indian Standard. In addition In addition, the following details shall be mentioned 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 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 Standard 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
(Scheme of Inspection and Testing)

(1)				(2)	(3)		
Test Details				Test equipment requirement R: required(or) S:Sub contracting permitted	Recommended Levels of Control		
Cl.	Requirement	Test Methods	Clause Reference		No. of Sample	Frequency	Remark
4.1	Bitumen		IS 73:1992	S	One	One consignment	See Note 3
6.1, 6.2 & Table 1	Homogeneity	6.1	IS 8887:2004	R	One	Each month	
	i) Residue on 600 micron IS Sieve (Percent by mass)	Annex B	-do-	R	One	Each control unit	
	ii) Viscosity by Say bolt Furol Viscometer At 25° C At 50° C		IS 3117:2002	R	One	-do-	
	Coagulation of emulsion at low temperature	Annex C	IS 8887:2004	R	One	-do-	See note 4
	iv) Storage stability after 24 hrs.	Annex D	-do-	R	One	-do-	
	v) Particle charge	Annex E	IS 8887:2004	R	One	Each control unit	

	vi) Coating ability and water resistance	Annex F	-do-	R	One	-do-	Applicable to MS grade only
	vii) Stability to mixing with cement (Percentage Coagulation)	Annex G	-do-	R	One	Each control unit	Applicable to SS -2 grade only
	viii) Miscibility with water	Annex H	-do-	R	One	do-	
	ix) Test on Residue a. Residue by evaporation minimum percentage b. Penetration 25°C/100g/5 Sec c. Ductility 27°C/cm d. Solubility	Annex J	-do-	R	One	do-	a. Not applicable for SS-1 Grade b. Not applicable for SS-1 Grade c. Not applicable for SS-1 Grade d. Value of Solubility is determined on distillation residue at 3600 C for SS-1 Grade
	x) Distillation in percent	6.2 & Table 1	-do-	R	One	-do-	Applicable to SS-I grade only
	xi) Water content	6.2 & Table 1	-do-	R	One	-do-	-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 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

Note-4: This requirement of Coagulation of emulsion at low temp shall be applicable only under situation where the ambient temperature is below 150 C.