



## PRODUCT MANUAL FOR BITUMEN FELTS FOR WATER-PROOFING AND DAMP-PROOFING ACCORDING TO IS 1322: 1993

*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.	<b>Product</b>	:	IS 1322: 1993
	<b>Title</b>	:	BITUMEN FELTS FOR WATER-PROOFING AND DAMP- PROOFING
	<b>No. of Amendments</b>	:	2
2.	<b>Sampling Guidelines:</b>		
a)	<b>Raw material</b>	:	As per clause 4 of IS 1322:1993
b)	<b>Grouping guidelines</b>	:	Please refer ANNEX – A
c)	<b>Sample Size</b>	:	Bitumen felt - 10 m x 1 m for complete test
3.	<b>List of Test Equipment</b>	:	Please refer ANNEX – B
4.	<b>Scheme of Inspection and Testing</b>	:	Please refer ANNEX – C
5.	<b>Possible tests in a day:</b>		
	i) Dimension (Clause 6) ii) Total weight of the finished bitumen felt (Clause 5.4) iii) Heat resistance test (Clause 8, Table 2) iv) Pressure head test (Clause 8, Table 2)		
6.	<b>Scope of the Licence:</b>		
	“Licence is granted to use Standard Mark as per IS 1322:1993 with the following scope:		
	Name of the product	Bitumen felts for Water Proofing and Damp Proofing	
	Base and Type	Fibre Base – Type 1/Type 2 and/or Hessian Base – Type 3 – Grade 1/Grade 2	

**ANNEX A****Grouping Guidelines**

1. Bitumen felts for water-proofing and damp-proofing as per IS 1322 :1993 are classified as below:

<b>Type of Base</b>	<b>Type</b>	<b>Grade</b>
Fibre Base	Type 1 – Saturated felt for underlay	---
	Type 2 – Self finished felt for water-proofing	---
Hessian Base	Type 3 – Self finished felt	For water proofing – Grade 1
		For damp-proofing – Grade 2

2. Considering the above, the following grouping guidelines is developed for GoL/CSoL:

- a) One sample of bitumen felt of each type of base shall be tested for all requirements to cover that type of base of bitumen felt in the scope of the licence.
- b) If Type 2, Fibre base bitumen felt is tested, Type 1 fibre base bitumen felt may be included in the scope of the licence.
- c) If grade 2, Type 3, Hessian base bitumen felt is tested, Grade 1, Type 3, Hessian base bitumen felt may be included in the scope of the licence.

4. The Firm shall declare the varieties of bitumen felts they intend to cover in the Licence. The Scope of Licence may be restricted based on the Manufacturing and Testing capabilities of the Manufacturer.

5. During the operation of the Licence, BO shall ensure that all the types and sizes covered in the Licence are tested in rotation, to the extent possible.

**ANNEX A****List of Test Equipment***Major test equipment required to test as per the Indian Standard*

<b>Sl. No.</b>	<b>Tests used in with Clause Reference</b>	<b>Test Equipment</b>
<b>1</b>	Fibre base felt (Clause 4.1.1)	Silica crucible
		Oven
		weighing balance
<b>2</b>	Hessian base fibre (Clause 4.1.2)	Moisture meter,
		Gauge for ends and picks
		Single pan weighing balance
		Tensile testing machine
		Electric heater
		Flask
		Thimble
		Trichloro ethylene
		Soxelt apparatus
		Distillation apparatus
		Penetrometer needle container
		Stop watch
		Dish
Thermostatically controlled water bath with thermometer		
<b>3</b>	Bituminous Saturant (clause 4.2.1)	Thermometer
		Water bath
		Vacuume system
		Stop watch
		Reference liquid of known viscosity
		Mould
		Testing machine for pulling the briquette
		Cleveland open cup apparatus, shield
		Barometer
		Ring and ball apparatus
		Stirrer
		Gooch crucible
		conical flask
carbon-di-sulphide		
trichloro ethylene		

4	Bitumen coatant (Clause 4.3) and	Single pan balance
		Steel scale
		Tensile testing machine
		Deep freezer
		Motorized winding machine
		Storage sticking apparatus with weight in chamber at 55 °C
		Heat chamber with clamps
		Air conditioner
		IS sieve 150 $\mu$ , 75 $\mu$ , 600 $\mu$
5	Mineral powder for dusting (Clause 4.4)	Single pan balance
		Steel scale or steel tape
		Weighing balance
6	Weight (Clause 5.4)	Steel scale
		Weighing balance
7	Dimension (Clause 6)	Steel scale
		Steel tape
8	Breaking Strength (Clause 7.1)	A standard constant rate of transverse type cloth testing machine with rate of transverse of the moving jaws as 450 mm/min
		Cutting tools for sample preparation
		Conditioning chamber of temperature 27 $\pm$ 2° C and humidity 65 $\pm$ 5 %
9	Pilability (Clause 7.1)	Metallic mandrel of diameter from 50 to 75 mm
		Low temperature-controlled conditioning chamber
10	Storage sticking test (Clause 7.1)	Temperature controlled chamber as per Fig 1 of IS 13826 (Part 3) with arrangement for pressure application on the sample and pressure gauge
11	Pressure Head Test (Clause 7.1)	Arrangement for putting sample under constant pressure as per Fig 1 of IS 13826 (Part 4)
		Temperature controlled cabinet to maintain temperature 5 ° C and 65 $\pm$ 2° C
12	Heat Resistance (Clause 7.1)	Thermostatically controlled chamber with clamps
13	Water absorption (Clause 7.1)	Weighing balance
		Trough to immerse sample in water
		Arrangement for hanging samples diagonally
14	Total bitumen Content (Clause 7.2)	Test apparatus as per Fig 1 of IS 13826 (Part 7) with normal Soxhlet, extraction thimble and glass jar of 500 ml capacity
		Electric heater with regulator or gas heater
		Bezene or trichloroethylene
		Weighing balance

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

**ANNEX B**

**Scheme of Inspection And Testing**

**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 equipments.

**2. TEST RECORDS** – The manufacturer shall maintain test records for the tests carried out to establish conformity.

**3. LABELLING AND MARKING** – As per the requirement of IS 1322: 1993.

**4. CONTROL UNIT** – All the bitumen felts of the same classification, type and grade produced from one batch of coatant mix 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**

(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				
4.1.1	Fibre base felt	4.1.1	IS 1322	R	One	Each Consignment	#
4.1.2	Hessian base felt	4.1.2	IS 1322 IS 2818 (Part2)	R	One	Each Ten Bales or part thereof in a consignment	#
	Ends and Picks /dm						
	Weight in g/m <sup>2</sup>						
	Moisture regain						
	Breaking load						
Oil content							
4.2 and 4.3	<b>Bitumen Saturant, Bitumen Coatant (Used as admixture) – IS 73</b>						#
	Softening Point	-	IS 1205	R	Two	Two charge per Shift	
	Variation of Softening Point	-	IS 73	R	Two	Two charge per Shift	
	Penetration at 25 °C	-	IS 1203	R	Two	Two charge per Shift	
	Penetration Ratio	-	IS 73	R	Two	Two charge per Shift	
	Specific Gravity at 27°C	-	IS 1202	R	One	Each Consignment	
	Water, Percent by mass	-	IS 1211	R	One	Each Consignment	

	Flash Point	-	IS 1448 (Part 69)	R	One	Each Consignment	
	Homogenous and foaming test	-	IS 73	R	One	Each Consignment	
	Ductility	-	IS 1208	R	One	Each Consignment	
	Paraffin wax content	-	IS 10512	R	One	Each Consignment	
	Frass Breaking Point	-	IS 9381	R	One	Each Consignment	
	Loss on Heating	-	IS 1212	R	One	Each Consignment	
	Retained Penetration after thin film oven test as percent of original	-	IS 9382	R	One	Each Consignment	
	Matter soluble in trichloroethylene	-	IS 1216	R	One	Each Consignment	
	viscosity	-	IS 1206 (Part2 and 3)	R	One	Each Consignment	
<b>4.3.1 (a)</b>	<b>Bitumen for bitumen coatant</b>	<b>4.3.1 (a)</b>	<b>IS 1322 IS 702</b>	-	-	-	#
	Specific gravity at 27 °C	-	IS 1202	R	One	Each Consignment	
	Flash Point	-	IS 1209	R	One	Each Consignment	
	Softening Point	-	IS 1205	R	One	Each Consignment	

	Penetration at 25 °C	-	IS 1203	R	One	Each Consignment	
	Loss on heating	-	IS 1212	R	One	Each Consignment	
	Penetration of the residue at 25 °C, 100g, 5S % of original	-	IS 1203	R	One	Each Consignment	
	Ductility at 27 °C	-	IS 1208	R	One	Each Consignment	
	Water Soluble in Trichloro ethylene % by mass	-	IS 1216	R	One	Each Consignment	
4.4.1	Mineral powder for dusting	4.4.1	IS 1322	R	One	Each consignment	-
		4.4.2	IS 1322	R	One	Each control unit	
4.2.2, 4.3.1 (b), 4.3.3 5.4 and 7.2	Weight	-	-	-	-	-	While setting and checking process parameters
	Untreated base	4.3.1 (b), Table 1	IS 1322	R	One	Each charge	
	Bituminous Saturant	4.2.2, Table 1	IS 1322	R	One	Each charge	
	Bituminous Coatant	4.3.3, Table 1	IS 1322	R	One	Each charge	
	Bitumen content	5.4, Table 1	IS 1322	R	One	Each charge	
	Total weight of the finished Bitumen felt	5.4, 7.2 Table 1	IS 1322 IS 13826 (Part 7)	R	One	Each charge	
4.4	Mineral Dusting Powder	4.4.2	IS 1322	R	One	Each Charge	
		4.4.2	IS 1322	R	Two	Each control unit	-



5.5	Finishing	5.5	IS 1322	R		Each Roll	-
6	Dimensions	6	IS 1322	R	Each roll	Physical checking of one roll out of twenty roll manufactured shall be done and record for same maintained	
7.1	Breaking Strength Test	7.1, Table 1	IS 13826 (Part 1)	R	Two	Each control unit	-
7.1	Pilability Test	7.1, Table 1	IS 13826 (Part 2)	R	1	Third control unit	-
7.1	Storage Sticking Test	7.1, Table 1	IS 13826 (Part 3)	R	1	Third control unit	-
7.1	Heat Resistance Test	7.1, Table 1	IS 13826 (Part 5)	R	2	Each control unit	-
7.1	Pressue Head Test	7.1, Table 1	IS 13826 (Part 4)	R	1	Third control unit	\$
7,1	Heat Resistance Test	7.1, Table 1	IS 13826 (Part 5)	R	2	Each control unit	-
7.1	Water absorption Test	7.1, Table 1	IS 13826 (Part 6)	R	2	Each control unit	-
7.2	Total Bitumen Content	7.2, Table 1	IS 13826 (Part 7)	R	2	Each control unit	-

# No testing is required if accompanied with test certificate or ISI marked.

\$ In case of failure, a sample from each control unit shall be tested and original frequency resumed if five consecutive samples pass.

Note-1: Sub-contracting is permitted to a laboratory recognized by the Bureau or Government laboratories empanelled 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 by BO Head