



PRODUCT MANUAL FOR CONCRETE ADMIXTURES ACCORDING TO IS 9103 : 1999

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 9103 : 1999
	Title	:	Concrete Admixtures
	No. of Amendments	:	2
2.	Sampling Guidelines:		
a)	Raw material	:	Not applicable
b)	Grouping guidelines	:	Sample of each Type and Physical State (Solid/Liquid) shall be tested for all requirements to cover that variety in the scope of licence.
c)	Sample Size	:	Admixture – 10 kg or 10 litre
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:		
	i) Slump Test (Clause 4, Table 1A)	iv) pH (Clause 9, Table 2)	
	ii) Setting time, (Clause 4, Table 1A)	v) Relative Density (Clause 9, Table 2)	
	iii) Chloride Content (Clause 9, Table 2)		
6.	Scope of the Licence:		
	“Licence is granted to use on Standard Mark as per IS 9103 : 1999 on following scope:		
	Name of the product	Concrete Admixtures	
	Type	a) Accelerating admixtures b) Retarding admixtures c) Water-reducing admixtures d) Air-entraining admixtures e) Normal Super plasticizing admixtures f) Retarding Super plasticizing admixtures	
	Physical State	Solid/Liquid	

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

Sl. No.	Tests used in with Clause Reference	Test Equipment
1	Requirements for admixture (Clause 4, Table 1)	
i)	Water Content percent of control sample	Weighing Balance Hot air oven, A wire basket of not more than 6-3 mm mesh Stout watertight container. Two dry soft absorbent cloths each not less than 75 x 45 cm. Shallow tray of area not less than 650 cm ² . Airtight container of capacity similar to that of the basket
ii)	Slump	Slump cone mould with base plate Tamping rod Funnel Rule (Graduated) Shovel Re-mixing tray Scoop Timer Spirit level
iii)	Time of setting allowable deviation from control sample hours	Containers for Mortar Specimens, Penetration Resistance Apparatus Pipette Tamping Rod Thermometer
iv)	Compressive Strength percent of control sample	Compressive Testing Machine Cube Mould of 15cm x 15cm x 15cm, Tamping Bar Air Conditioner Curing tanks with temperature control mechanism
v)	Flexural Strength percent of control sample	Flexural Testing Machine Metal Moulds for flexural Strength Tamping Bar
vi)	Length Change, percent increase over control sample	Measuring Apparatus with Micrometre or suitable Dial Gauge as per Fig 11 of IS 1199 Drying Oven Suitable Mould
vii)	Bleeding, percent increase over percent sample of Concrete	Cylindrical container of approximately 0.01 m ³ Tamping Bar Pipette Graduated Jar – 100 cm ³ Capacity Air Conditioner

viii)	Loss of workability	Arrangement for maintaining temperature of 27 ± 2 °C and relative humidity of 65 ± 5 % Rh Slump cone mould with base plate Tamping rod Funnel Rule (Graduated) Shovel Re-mixing tray Scoop Timer Spirit level Compaction factor apparatus with quick release mechanism etc
ix)	Air Content, over control	Weighing Balance Taping Bar Measure as per Table III of IS 1199 Vibration Machine (Optional)/Internal vibrator/ Vibrating table/compacting rod/ compacting bar
		Container for determination by pressure gauge apparatus Cover assembly Pressure gauge Air pump Scoop Sampling tray Shovel Syringe Mallet
		Water column method apparatus Scoop Shovel Container Mallet
2	Requirements for high workability test mix (Clause 4, Table 1 B)	
i)	Flow	Slump Cone Tamping Bar Flow Table Mould
ii)	Loss of Workability on Standing	Humidity Chamber Stop Watch Slump Mould as per IS 1199 Tamping Rod Scale

iii)	Minimum compressive strength percent of control mix concrete	Same as SI No 1(iv)
3	Uniformity test and requirements (Clause 9, Table 2)	
i)	Dry Material Content	<p>For Liquid Admixture: Wide mouth glass weighing bottle (60 mm dia, 30 mm height) provided with ground glass stopper. Oven Desiccator Weighing Balance Pipette Stop Watch</p> <p>For Solid admixture: Weighing Bottle with stopper Oven Desiccator Weighing Balance Stop Watch</p>
ii)	Ash Content	Weighing Balance Silica or Porcelain Crucible Muffle Furnace Steam water bath or air oven Desiccator
iii)	Relative Density	Constant Temperature bath Hydrometer Measuring cylinder
vi)	Chloride ion content	Nitric acid Sod or Potassium Chloride Pott Chromate indicator Silver Nitrate solution Nitrobenzene Ferric alumn indicator Ammonium thiocyanate solution Hydrochloric acid Hot plate Sod. Chloride solution Turbiditimeter Hot plate Glassware
v)	pH Value	pH Meter

4	Freezing and Thawing (Note under Clause 4)- If required by the purchaser	Suitable Deep Freezer as per Annex B Variable frequency oscillator Electro-magnetic exciter unit of the moving-coil or variable air-gap type Electro-magnetic pick-up unit of the ordinary telephone type OR piezo-electric gauge Audio-frequency amplifier Amplitude indicator consisting of a voltmeter, milliammeter OR cathode-ray oscilloscope Fixed clamp or support with a maximum width of ,1/20 th of the length of the specimen
5	General requirement	Mechanical power-driven mixer 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 9103: 1999.

4. CONTROL UNIT – Concrete admixture of each type and physical state produced in a day from same lot of raw material under similar conditions of manufacturing 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	Requirements for Admixtures						
4, Table 1A	Physical requirements						
i)	Water Content, percent of control sample	4, 7.2.5	IS 9103 IS 2386 IS 1199	R	One	Every 5 th control unit	-
ii)	Slump	4, 7.2.1	IS 9103 IS 1199	R	One	Each Control unit @	-
iii)	Time of setting, allowable deviation from control sample - Initial - Final	4, 7.2.3	IS 9103 IS 8142	R	One	Each Control unit @	-
iv)	Compressive strength, percent of control sample	4, 8.2.1	IS 9103 IS 516	R	-	-	-
	1 day				One	Each Control unit @	
	3 day				One	Each Control unit @	
	7 day				One	Every 5 th control unit *	
	28 day				One	Every 10 th control unit *	
	6 months				One	Once in six months **	
	1 year				One	Once in a year **	

v)	Flexural strength present of control sample	4, 8.2.2	IS 9103 IS 516	R	-	-	-
	3 days				One	Each Control unit @	
	7 days				One	Every 5 th Control unit @	
	28 days				One	Every 10 th Control unit @	
vi)	Length Change, percent increase over control sample	4, 8.2.3	IS 9103 IS 1199	R	-	-	-
	28 days				One	Each 10 th Control unit *	
	6 months				One	Once in six months **	
	1 Year				One	Once in a year **	
vii)	Bleeding percent increase over control sample	7.2.4, Annex D	IS 9103 IS 2386	R	One	Every 5 th Control unit *	-
viii)	Loss of workability	4, 7.2.1.2	IS 9103 IS 1199	R	One	Each Control unit @	-
ix)	Air content over control	4	IS 9103 IS 1199	R	One	Each Control unit @	-
4, Table 1 B	Requirements for high workability test mix (Applicable for superplasticizing Admixture only)						
i)	Flow	4, 7.2.1.1, Annex-C	IS 9103	R	One	Each Control unit @	-
ii)	Loss of Workability on Standing	4, 7.2.1.2	IS 9103 IS 1199	R	One	Each Control unit @	-
iii)	Minimum compressive strength percent of control mix concrete	4, 8.2.1	IS 9103 IS 516	R	-	-	-
	7 days				One	Every 5 th control unit *	
	28 days				One	Every 10 th control unit *	
	6 months				One	Once in six months **	
	1 year				One	Once in a year **	

4	Freezing and Thawing	Annex B	IS 9103	S	-	This test may be carried out if required by purchaser.	
9, Table 2	Uniformity test and requirements						
i)	Dry material content a) For liquid admixture b) For solid admixture	9, Annex -E	IS 9103	R	One	Every 2 nd control unit	In case of failure, control unit tested shall be rejected and other control unit shall be accepted only if found passing.
ii)	Ash content	9, Annex -E	IS 9103	R	One	Every 2 nd control unit	
iii)	Relative density	9, Annex -E	IS 9103	R	One	Each Control unit @	-
iv)	Chloride ion content	9, Annex -E	IS 9103 IS 6925	R	One	Each Control unit @	-
v)	pH	9, Annex -E	IS 9103	R	One	Each Control unit @	-

@ In case of failure, the control unit shall be rejected.

* In case of failure, the control unit shall be rejected. Frequency of testing shall be made every control unit till results of five consecutive control units are found satisfactory.

** In case of failure marking shall be stopped and corrective action shall be taken. Marking shall be resumed only after satisfactory corrective actions are taken.

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.