



**PRODUCT MANUAL FOR
IRRIGATION EQUIPMENT- EMITTERS
According to
IS 13487:1992**

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 13487:1992
	Title	:	Irrigation Equipment- Emitters
	No. of Amendments	:	6
2.	Sampling Guidelines:		
a)	Raw material	:	<p>No specific ISS mentioned in Indian Standard for compliance.</p> <p>However, the materials used in emitter construction shall be suitable for use with water, fertilizers and chemicals commonly used in irrigation, including treated sewage water and shall not support the growth of algae and bacteria, nor be of metal which will corrode. Plastic parts of the emitter that are exposed to light shall be opaque and protected against UV degradation.</p> <p>Hence manufacturer's certificate may be obtained to ensure raw material used shall confirm to the above said requirements of cl.5.3 of IS 13487.</p>
b)	Grouping guidelines	:	No grouping guidelines exist, hence each and every type, category must be drawn for each variety applied for.
c)	Sample Size	:	50 number of samples, of each type and category to be drawn and to be sent to laboratory along with all the details as per cl.10 of IS 13487 for complete testing.
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 can be carried out in a day		
6.	Scope of the Licence :		
	Licence is granted to use Standard Mark as per IS 13487:1992 with the following scope:-		
	Name of the product	Irrigation Equipment- Emitter	
	Uniformity categories	Uniformity category A or uniformity category B	
	Emitter type	Regulated Unregulated, Turbulent flow Unregulated, Laminar flow Unregulated, Capillary or Orifice flow	

ANNEX-A**List of Test Equipment**

Major test equipment essentially required to test as per requirements of Indian Standard.

S. No	Clause No. & Requirement		Method of Test (If & as applicable)	Test Facility (Equipment, Reference Material etc.)	Range and Accuracy/Least Count (If & as applicable)	Calibration required or not
					Required	Yes/No
1	5.2	Emitter ends	IS 13487 5.2	Digital Vernier	0-150mm 0.02	Yes (preferably once in a year)
2	6.2	Test conditions	IS13487 6.2	Water bath with arrangement to maintain requisite temp Nominal aperture (micrometre)	27±3°C 75 -100µm 160-200 mesh	Yes (preferably once in a year) Yes (preferably once)
3	7.1	Construction & Workmanship	IS: 13487 7.1	Visual	-	
4	7.2	Flow paths in emitter	IS: 13487 7.2	Digital Vernier / Travelling microscope	0-150mm 0.02 / 0-10 mm, 0.01	Yes (preferably once in a year)
5	7.3	Resistance to Hydrostatic Pressure	IS: 13487 7.3	Pressure Testing Machine set up	0-15 Kgf/cm ² 0.01Kgf/cm ²	Yes (preferably once in a year)
6	7.4	Emitting Pull Out Test	IS: 13487 7.4	Pull Out Tester/ dead weights	40N/ 4 kg	Yes (preferably once in a year)
7	8.1	Uniformity of Emitting Rate	IS: 13487 8.1	Emitter Testing Machine set up	0-5.0Kgf/cm ² 0.01Kgf/cm ²	Yes (preferably once in a year)
				Timer	LC 0.1 sec	Yes (preferably once in a year)
				Measuring Jars	0.25,0.5,1.0,2.02 .5 & 5 ltrs	Yes (preferably once)
8	8.2	Emission rate as a function of inlet	IS 13487 8.1,8.2	Same as cl 8.1		
9	8.3	Determination of emitter quotient	IS 13487 8.3	Same as cl 8.1		

The list above is meant for guidance and may not be taken 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. PACKING AND MARKING – The Standard Mark as given in Schedule of the licence, shall be marked on each bag containing the emitters, provided always that the material in each bag to which the standard mark is thus applied conforms to every requirements of the specification.

3.1 Each emitter shall be marked clearly and permanently as per the provision of IS 13487 : 1992. In addition, the following details shall be marked:

- a) Control unit or batch number to enable to trace back lot numbers of button, cover, body and assembly;
- b) BIS Licence No. CM/L _____.
- c) BIS website details i.e –“For details of BIS certification please visit www.bis.gov.in”

The manufacturer shall make available to the user, together with the emitters, a catalogue that include the data as specified in clause 10 of IS 13487:1992.

4. CONTROL UNIT – For the purpose of this scheme, all the emitters of the same type, nominal flow rate and uniformity category, assembled in one shift shall constitute a control unit.

NOTE 1: The control unit number assigned to a particular control unit shall be such that it shall be possible to trace back the manufacturing details of each component from the factory records.

NOTE 2: Manufacturing details’ shall mean shift-wise production details of each component including mould number, quantities produced, accepted and rejected.

5. RAW MATERIAL – The raw materials used in the manufacturing of emitters shall meet the requirements of clause 5.3 of IS 13487 : 1992.

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. A separate record shall be maintained giving information relating to the rejection of the control units of the condensed milk, partly skimmed and skimmed condensed milk not conforming to the specification and the method of their disposal. Such material, if packed, shall in no case be stored together with that conforming to the specification.

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 Clause Reference			No. of Sample	Frequency	Remarks
5.2	Emitter ends	5.2	IS 13487	R	5 Samples	Once in a day	Applicable when PE pipe is used
7.1	Construction and workmanship	7.1	-do-	R	3 emitters from each mould cavity	Each control unit	If designed for disassemble, disassemble at least three emitters into their component parts.
7.2	Flow paths in emitter	7.2	-do-	R	-do-	-do-	
7.3	Resistance to Hydrostatic pressure	7.3.1, 7.3.2 &7.3.3	-do-	R	5 emitters	-do-	Testing shall be done on an assembly. Perform the test on at least five emitters connected to a lateral.
7.4	Emitter pull out	7.4.1 & 7.4.2	IS 13479 & IS 13487	R	3 emitters in case of In-line emitters and 1 emitter in case of On-line emitters	-do-	
8.1	Uniformity of emission rate	8.1.1 8.1.2& 8.1.3	IS 13487 -do- -do-	R	25 emitters for single outlet and 10 emitters with 25 outlets for multiple outlet	-do-	
8.2	Emission rate as a function of inlet pressure	8.2.1, 8.2.2 & 8.2.3	-do-	R	25 emitters	Once in a week	
8.3	Determination of emitter exponent	8.3 & 8.3.1	-do-	R	-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: The control unit and levels of control as decided by the Bureau are obligatory to which the licensee shall comply with.