



**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	:	06
2.	Sampling Guidelines:		
a)	Raw material	:	No specific ISS mentioned in Indian Standard for compliance. 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. 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.
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 :		
	<ul style="list-style-type: none"> i. Emitter ends ii. Construction and Workmanship iii. Flow paths in emitter iv. Resistance to Hydrostatic pressure v. Emitting Pull out test vi. Uniformity of Emitting Rate vii. Emission rate as a function of inlet viii. Determination of emitter quotient 		
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	
	Nominal Emission rate (q_n)	Unregulated Emitter Nominal Emission Rate Regulated Emitter Nominal Emission Rate Multiple-outlet Emitter Nominal Emission Rate	

**ANNEX-A
TO PRODUCT MANUAL
FOR IRRIGATION EQUIPMENT- EMITTERS
ACCORDING TO IS 13487 : 1992**

List of Test Equipment

Major test equipment 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	0.25,0.5,1.0,2.0, 2.5 & 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 indicative only and may not be taken as exhaustive.

ANNEX- B

SCHEME OF INSPECTION AND TESTING FOR PRODUCT MANUAL FOR IRRIGATION EQUIPMENT- EMITTERS ACCORDING TO IS 13487 : 1992

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. 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.

4. CONTROL UNIT – For the purpose of this scheme, all the emitters of the same 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. 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. RAW MATERIAL – The raw materials used in the manufacturing of emitters shall meet the requirements of clause 5.3 of IS 13487.

7. 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**

(1)				(2)	(3)		
Test Details				Test equipment requirement R: required (or) S: Sub-contracting permitted	Levels of Control		
Cl.	Requirement	Test Method Cl. Ref.	Test Method IS		No. of Sample	Frequency	Remarks
5.2	Emitter ends	5.2	IS 13487	R	5 Samples	Once in day	Applicable when PE pipe is used
5.3	Materials	5.3	-do-	S	-	Each consignment	Raw material supplier's certificate to be obtained.
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: 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: *Testing of different class of pipes shall be made on rotational basis in order to test every uniformity category/nominal flow rate covered in the scope of licence in an operative period of a year.