



PM/ IS 16627/ 1/ Aug 2018

PRODUCT MANUAL FOR
“Agro textiles- HDPE laminated woven lay flat tube for use in mains and submains of drip irrigation system”
According to IS 16627:2017

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 16627:2017						
	Title	:	Agro textiles- HDPE laminated woven lay flat tube for use in mains and submains of drip irrigation system						
	No. of amendments	:	Nil						
2.	Sampling Guidelines								
a)	Raw material	:	HDPE granules, LDPE/LDPE and LLDPE combination, carbon black or suitable UV stabilizer						
b)	Grouping Guidelines	:	Please refer Annex - A						
c)	Sample Size	:	40m of HDPE laminated woven lay flat tube, 5m of fabric and 50m of HDPE tapes						
3.	List of Test Equipment	:	Please refer Annex - B						
4.	Scheme of Inspection and Testing	:	Please refer Annex - C						
5.	Possible tests in a day	:	All tests from Cl.6.1 to 6.7						
6.	Scope of the Licence :								
	Licence is granted to use Standard Mark on HDPE laminated woven lay flat tube for use in mains and submains of drip irrigation system as per IS 16627:2017 with the following scope: <table><tr><td>Type</td><td></td><td></td></tr><tr><td>Sizes</td><td></td><td></td></tr></table>			Type			Sizes		
Type									
Sizes									

Annex-A**Grouping Guidelines**

The varieties mentioned in the ISS are as given below:

Type	Nominal Internal Diameter
I	50mm to 90mm
II	50mm to 90mm

1. Any one size from each type may be tested to cover all the sizes under the type.
2. Raw materials also to be tested in accordance with the ISS.
3. The scope to be given as per the manufacturing and testing capability of the firm.

During surveillance inspections samples shall be drawn on rotation to cover all the sizes in the group for all tests except tests as per Cl.6.8-welded seam strength after UV exposure

Annex-B**List of Test Equipments**

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

Sr. No.	Test Equipment	Tests used in with Clause Reference
1	Conditioning Chamber Wrap reel Balance LC 0.005 g Verniercalipers, LC 0.01 mm	HDPE Tapes
2	Thickness tester with presser foot capable of exerting a pressure of 2 ± 0.01 kPa	Measurement of coating/sandwich lamination thickness, Cl 5.2
3	Combustion boat, min dimensions 25 mm x 9 mm x 8 mm Combustion tube Gas flow meter Thermometer 250 ⁰ C to 550 ⁰ C Furnace, 500 ⁰ C Nitrogen Trichloroethylene	Carbon black content (if added)
4	Steel scale, LC 1 mm	5.3 Overlap
5	Horizontal flat smooth table Graduated steel scale Balance, LC 0.005 g Conditioning chamber	Table 2 i) Mass
6	Abrasion tester with indicator and weights	Table 2 v) Abrasion resistance
7	Tensile testing machine with clamps and trapezoidal template	Table 2 vi) Trapezoidal tear strength
8	Tensile testing machine, CRE Ring clamp attachment internal diameter of 45 ± 0.025 mm Solid steel rod, diameter of 8 ± 0.01 mm having a flat end with a 45 ⁰ x 0.8 mm chamfered edge	Table 2 vii) Puncture strength
9	Air oven with accuracy 2 ⁰ C 0.5 percent aqueous solution of polyoxyethylatednonylphenol	Table 2 viii) Environmental stress cracking
10	Air oven with provision for suspending test specimen and thermometer with accuracy 1 ⁰ C	Table 2 ix) Accelerated ageing test for 72 h at $70 \pm 1^{\circ}\text{C}$
11	Impact device (impact mass 500g)for determination of cold crack temperature with cooling chamber and thermometer with accuracy 0.5 ⁰ C	Table 2 x) Cold cracking resistance test at -5 ⁰ C
12	Conical plug gauge as per internal nominal diameter	6.1 Internal diameter
13	Scale or tape to measure 100 m	6.5 Length
14	Hydraulic pump	6.3 Hydrostatic burst pressure test

	Pressure gauge, LC 0.1 kg/cm ²	6.4 Proof pressure test 6.6 Kink test
15	Xenon arc apparatus equipped with an inner and outer borosilicate filter glass Conditioning Chamber Tensile testing machine, CRE Equipment for cutting test specimen	Table 2 iv) Retention of breaking strength after UV exposure of 500 h 6.8 Welded seam after UV exposure
16	Conditioning Chamber Tensile testing machine, CRE Equipment for cutting test specimen	Table 2 ii) Breaking strength before UV Exposure Table 2 iii) Elongation 6.7 Welded seam before UV exposure
17	Pressure impulse test apparatus	6.9 Pressure impulse test

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

Annex-C

**SCHEME OF INSPECTION AND TESTING
FOR CERTIFICATION OF
AGRO TEXTILES- HIGH DENSITY POLYETHYLENE (HDPE) LAMINATED
WOVEN LAY FLAT TUBE FOR USE IN MAINS AND SUBMAINS OF DRIP IRRIGATION
SYSTEM
ACCORDING TO IS 16627:2017**

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. **LABELLING AND MARKING:** The Standard Mark as given in the First Schedule of the license shall be printed with indelible ink or tag affixed at one corner on one side on each bundle of lay flat tube for use in mains and submains of drip irrigation, and the labeling/markings and packing shall be done as per the provisions of the Indian Standard, provided always that the lay flat tube for use in mains and submains of drip irrigation system thus marked conforms to all the requirements of the specification. In addition, BIS Licence Number CM/L- ..., and details of BIS Manakonline website shall be marked as follows: “For details of BIS certification please visit www.manakonline.in”
4. **CONTROL UNIT** – For the purpose of this scheme, all HDPE laminated woven lay flat tube for use in mains and submains of drip irrigation system of the same size and type manufactured under similar condition in a day 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. Fittings, if supplied shall meet the requirements of clause 7 of IS 16627:2017
7. **PATCHING OF THE LAY FLAT TUBE FOR DRIP IRRIGATION:** Lay flat tube for drip irrigation shall have the provision for patching, if it develops puncture or leak, after use. The manufacturer shall supply detailed instruction for carrying out patching on lay flat tube. If required by the buyer, a patching kit may also be supplied along with the lay flat tubes
8. **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. Appropriate records to be maintained for rejected material and it should be stored separately.

Table 1....

IS 16627:2017
AGRO TEXTILES- HIGH DENSITY POLYETHYLENE (HDPE) LAMINATED WOVEN
LAY FLAT TUBE FOR USE IN MAINS AND SUBMAINS OF DRIP IRRIGATION SYSTEM

TABLE 1 LEVELS OF CONTROL
(Para 5 of the Scheme of Inspection and Testing)

(1)				(2)	(3)		(4)
Test Details				Test equipment requirement R: required (or) S: Sub-contracting permitted	Levels of Control		Remark
Clause	Requirement	Test Method			No. of Samples	Frequency	
		Clause	Reference				
3.1	HDPE Tapes	3.1	IS 16627:2017	R	Ten	Every four hour production	Sample from 10 different spindles is to be taken
						One	Each control unit
3.2	HDPE Fabric	3.2	- do -	R	One	Every four hour production	Sample from different circular looms is to be taken
5.1 & 5.2	Lamination	5.1 & 5.2	- do -	R	One	Every two hour production	Carbon black content to be tested, only if added, for each C.U.
5.3 and Table 1	Overlap	5.3	- do -	R	One	Each roll	

6 & Table 2	i) Mass	-	IS 1964	R	Two	Every two hours	
	ii) Breaking strength before UV Exposure	-	IS 1969 (Part 1)	R	One	Each control unit	
	iii) Elongation	-	- do -	R	One	- do -	
	iv) Retention of breaking strength after UV exposure of 500 h	Annex B	IS 16627:2017	S	One	Once in a month	
	v) Abrasion resistance	-	IS 14714	R	One	Each control unit	
	vi) Trapezoidal tear strength	-	IS 14293	R	One	- do -	
	vii) Puncture strength	Annex C	IS 16627:2017	R	One	- do -	
	viii) Environmental stress cracking	Annex D	- do -	R	One	Weekly	
	ix) Accelerated ageing test for 72 h at $70 \pm 1^{\circ}\text{C}$	-	IS 7016 (Part 8) (Oven method)	R	One	- do -	
	x) Cold cracking resistance test at -5°C	Annex E	IS 16627:2017	R	One	- do -	
6.1 & Table 1	Internal diameter	6.1	- do -	R	Two	Each roll	
6.2	Workmanship	6.2	- do -	R	Each roll	-	
6.3	Hydrostatic burst pressure test	6.3	- do -	R	One	Each control unit	
6.4	Proof pressure test	6.4	- do -	R	One	Every four hour production	Sample from different tubing machine is to be taken
6.5	Length	6.5	- do -	R	Each roll	-	
6.6	Kink test	6.6	- do -	R	One	Each control unit	

6.7	Welded seam before UV exposure		IS 1969 (Part 1)	R	Each control unit	Sample from different tubing machine is to be taken	Seaming before UV is an important requirement and can be carried out daily to ensure the quality of product
6.8	Welded seam after UV exposure	Annex B	IS 16627:2017	S	One	Once in a month	
6.9	Pressure impulse test	Annex F	- do -	S	One	- do -	
6.10	Colour		Visual	R	Each roll	-	
7	Fittings	7	IS 16627:2017	R	Each fitting	Each fitting	
					One	Weekly	For Proof pressure test

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 by BO Head.