



उत्पाद मैनुअल

Agro textiles - High density polyethylene (HDPE) laminated woven lay flat tube for irrigation purpose

IS 16190 : 2014 के अनुसार

PRODUCT MANUAL

FOR Agro textiles - High density polyethylene (HDPE) laminated woven lay flat tube for irrigation purpose

ACCORDING TO IS 16190 : 2014

विभिन्न उत्पादों के लिए भारतीय मानक ब्यूरो (अनुरूपता मूल्यांकन) विनियम, 2018 की योजना- I के तहत प्रमाणन के संचालन में अभ्यास और पारदर्शिता के संचालन में पारदर्शिता सुनिश्चित करने के लिए इस उत्पाद मैनुअल का उपयोग सभी क्षेत्रीय / शाखा कार्यालयों और लाइसेंसधारियों द्वारा संदर्भ सामग्री के रूप में किया जाएगा। दस्तावेज़ का उपयोग बीआईएस प्रमाणन लाइसेंस/प्रमाणपत्र प्राप्त करने के इच्छुक संभावित आवेदकों द्वारा भी किया जा सकता है।

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.	उत्पाद Product	:	IS 16190 : 2014
	शीर्षक Title	:	Agro textiles - High density polyethylene (HDPE) laminated woven lay flat tube for irrigation purpose - Specification
	संशोधनों की संख्या No. of amendments	:	3
2.	नमूना दिशानिर्देश Sampling Guidelines		
a)	कच्चा माल Raw material	:	HDPE Tapes and HDPE Fabric used to make the product shall conform to the requirements of Clause 4 of IS 16190:2014. In case granules/tapes/fabric are procured from outside, they shall be accompanied by test certificate of supplier. Conformity of tapes/woven fabric may be established through raw material supplier's test certificates, test reports of NABL accredited or BIS recognized/empaneled labs or in house testing.

			However, in case HDPE laminated fabric is being procured from outside, conformity shall be established through in house testing/third party lab testing as prescribed in SIT (see Annex-C)
b)	समूहीकरण दिशानिर्देश Grouping Guidelines	:	Please refer Annex-A
c)	नमूने का आकार Sample Size	:	40m of HDPE laminated woven lay flat tube, 5m of fabric and 50m of HDPE tapes
3.	परीक्षण उपकरणों की सूची List of Test Equipment	:	Please refer Annex-B
4.	निरीक्षण और परीक्षण की स्कीम Scheme of Inspection and Testing	:	Please refer Annex-C
5.	एक दिन में संभावित परीक्षण Possible tests in a day		
	Width and linear density of HDPE tapes, Cl. 4.1, No of tapes/dm in HDPE woven fabric, Cl. 4.2, Lamination, Cl. 5.1 to 5.2, Internal Diameter and Minimum Overlap, Workmanship, Cl. 6.2, Hydrostatic burst pressure test, Cl. 6.3, Proof Pressure test, Cl. 6.4, Length, Cl. 6.5, Kink Test, Cl. 6.6 and Mass, Breaking Strength before UV exposure, Elongation at Break, Abrasion resistance, Trapezoid Tear Strength, Puncture Strength, Cold cracking resistance test - Cl. 6.1, Welded Seam Strength Before UV Exposure, Cl. 6.7 (on conditioned test samples)		
6.	लाइसेंस का दायरा /Scope of the Licence:		
	“Licence is granted to use Standard Mark as per IS 16190 : 2014 with the following scope:		
	Name of the product	Agro textiles - High density polyethylene (HDPE) laminated woven lay flat tube for irrigation purpose	
	Nominal Internal Diameter	As per table 1	

**BUREAU OF INDIAN STANDARDS
MANAK BHAVAN,9, BAHADUR SHAH ZAFAR MARG,
NEW DELHI-110002**

ANNEX-A

GROUPING GUIDELINES

Following grouping guidelines shall apply for Grant of Licence (GoL)/Change in Scope of Licence (CSoL):

Based on size (nominal internal diameter), the woven lay flat tube is classified into 3 groups

Group 1 – 50 to 75 mm

Group 2 – 90 to 125 mm

Group 3 – 150 to 200 mm

One sample of any size from each group may be tested to cover the entire range of nominal internal diameters being manufactured.

Scope of licence shall be restricted based on the manufacturing and testing capabilities

During the operation of the licence, samples of each nominal internal diameter covered in the scope of licence shall be tested in rotation, to the extent possible

ANNEX – B

LIST OF TEST EQUIPMENTS

Major test equipment required to test as per the Indian Standard

Sl. No.	Tests Used In With Clause Reference	Test Equipment/Chemical
1.	Width of the tape used in the fabric, Cl. 4.1, internal diameter of the lay flat tube and overlap, Cl. 6.1	Measuring tape, Vernier Calipers, Conical plug gauge as per internal nominal diameter
2.	Linear density of the tape, Cl. 4.1	Conditioning Chamber Wrap reel Balance LC 0.005 g Verniercalipers, LC 0.01 mm
3.	Coating Thickness, Thickness of sandwich lamination, Cl. 5.2	Thickness tester/micrometer with least count of 1 μ
4.	Mass of laminated HDPE woven fabric, Cl. 6.1	Weighing balance, Drying oven, conditioning chamber
5.	Breaking Strength before UV exposure and Elongation at Break laminated HDPE woven fabric, Cl. 6.1	Tensile Testing Machine
6.	Retention of Breaking Strength after UV exposure of 500 h laminated HDPE woven fabric, Cl. 6.1	Tensile Testing Machine, UV exposure arrangement (Xenon Arc Apparatus)
7.	Abrasion resistance of laminated HDPE woven fabric, Cl. 6.1	Abrasion resistance tester
8.	Trapezoid Tear Strength of laminated HDPE woven fabric, Cl. 6.1	Tensile Testing Machine with trapezoidal templates
9.	Puncture Strength of laminated HDPE woven fabric, Cl. 6.1	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 450 x 0.8 mm chamfered edge
10.	Environmental stress cracking test of laminated HDPE woven fabric, Cl. 6.1	Air oven with accuracy 2°C, 0.5 percent aqueous solution of polyoxyethylated nonylphenol
11.	Accelerated ageing test for 72 h on laminated HDPE woven fabric, Cl. 6.1	Air oven with provision for suspending test specimen and thermometer with accuracy 10°C
12.	Cold Cracking Resistance Test at 5 °C for laminated HDPE woven fabric, Cl. 6.1	Impact device (impact mass 500g) for determination of cold crack temperature with cooling chamber and thermometer with accuracy 0.5°C
13.	Hydrostatic Burst Pressure Test, Cl. 6.3	hand pump, hydraulic pump or accumulator, pressure gauges
14.	Proof pressure test, Cl. 6.4	hand pump, hydraulic pump or accumulator, pressure gauges

15.	Length, Cl. 6.5	Measuring tape or scale
16.	Kink Test, Cl. 6.6	hand pump, hydraulic pump or accumulator, pressure gauges with stopcock arrangement
17.	Welded Seam Strength before UV exposure, Cl. 6.7	Tensile Testing Machine
18.	Welded Seam Strength after UV exposure, Cl. 6.8	Tensile Testing Machine, UV exposure arrangement (Xenon Arc Apparatus)

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

ANNEX C

SCHEME OF INSPECTION AND TESTING

1. **LABORATORY-** A laboratory shall be maintained, which shall be suitably equipped (as given in column 2 of Table 1) and staffed, where different tests given in the specification shall be carried out in accordance with the method given in the specification.

1.1 The manufacturer shall prepare and implement a calibration plan for the test equipment.

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

3. **PACKING AND MARKING** - The Standard Mark as given in the Schedule of the licence shall be incorporated legibly and indelibly on Each bundle of woven lay flat tubes either on the tag or by printing on it with the ink provided always that the material so marked conforms to each requirement of the specification.

3.1 Packing and Marking shall be done as per the requirements of the standard. The lay flat tube shall also be marked with the following either on the tag or by printing on it with the ink:

a) BIS licence number and “For BIS certification details please visit www.bis.gov.in”

4. **CONTROL UNIT-** For the purpose of this scheme, entire quantity of HDPE laminated woven lay flat tube for irrigation purpose of the same nominal internal diameter and manufactured from the same consignment of raw material under similar conditions in a day shall be taken as one control unit.

5. **LEVELS OF CONTROL :-** The tests as indicate in Table 1 and at the levels of controls in column 3 of Table 1, shall be carried out on the whole production of the factory which is covered by this plan and records maintained in accordance with paragraph 2 above.

5.1 All the production which conforms to the Indian Standard and covered under the scope of this licence shall be marked with the Standard Mark.

6. **REJECTION** - 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 Methods Clause Reference			No. of Sample	Frequency	Remarks
4	Materials						
i.	HDPE Tapes (Material)		IS 6192	S	One	Each consignment	In case granules or tapes are procured from outside, they shall be accompanied by test certificate of supplier
ii.	HDPE Tapes (Width)	4.1	IS 16190	R	10	Every four hours production	Samples from different spindles to be taken
iii.	HDPE Tapes (Linear Density)	4.1	IS 16190	R	10	Every four hours production	Samples from different spindles to be taken
iv.	HDPE Fabric (Material)	4.2	IS 16190	S	One	Each consignment	In case fabric is procured from outside, they shall be accompanied by test certificate of supplier

v.	HDPE Fabric (No. of tapes/dm)	4.2	IS 16190	R	One	Every four hours	
5	Manufacture						
5.1 and 5.2	Lamination, Coating Thickness, Thickness of sandwich lamination	5.1., 5.2	IS 16190	R	One	Every two hours of production	
6.1	Internal Diameter and Overlap	6.1	IS 16190	R	One	Each roll	
6.1	Requirements of HDPE Woven Laminated Fabric						
i.	Mass		IS 1964	R	One	Every 4 hours	
ii.	Breaking Strength before UV exposure		IS 1969 Part 1	R	One	Each Control Unit	
iii.	Elongation at Break		IS 1969 Part 1	R	One	Each Control Unit	
iv.	Retention of Breaking Strength after UV exposure of 500 h	Annex B	IS 16190	S	One	Once in a month	
v.	Abrasion resistance		IS 14714	R	One	Each Control Unit	
vi.	Trapezoid Tear Strength		IS 14923	R	One	Each Control Unit	
vii.	Puncture Strength	Annex C	IS 16190	R	One	Each Control Unit	

viii.	Environmental stress cracking test	Annex D	IS 16190	R	One	Once in a week	
ix.	Accelerated ageing test for 72 h		IS 7016 (Part 8)	R	One	Once in a week	
x.	Cold Cracking Resistance Test at 5 °C	Annex E	IS 16190	R	One	Once in a week	
6.2	Workmanship	6.2	IS 16190	R	Manufacturer shall put in place adequate inspection/in process controls to ensure workmanship is as per the standard		
6.3	Hydrostatic Burst Pressure Test	6.3	IS 16190	R	One	Each Control Unit	
6.4	Proof pressure test	6.4	IS 16190	R	One	Each Control Unit	
6.5	Length	6.5	IS 16190	R	Manufacturer shall put in place adequate inspection/in process controls to ensure length of each roll is as per the standard		
6.6	Kink Test	6.6	IS 16190	R	One	Each Control Unit	

6.7	Welded Seam Strength before UV exposure		IS 1969 (Part 1)	R	One	Each Control Unit	
6.8	Welded Seam Strength after UV exposure	Annex B	IS 16190	S	One	Once in a month	

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 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.