



कृषि वस्त्रादी – जल अवरोधक लाइनिंग के लिए लेमिनेटेड
उच्च घनत्व वाले पालीइथाईलीन (एच^० डी^० पी^० ई^०) की बुनी भूझिल्ली
IS 15351 : 2015 के अनुसार

PRODUCT MANUAL FOR
Agro Textiles — Laminated High Density Polyethylene
(HDPE) Woven Geomembrane for Water Proof Lining
According to IS 15351: 2015

विभिन्न उत्पादों के लिए भारतीय मानक ब्यूरो(अनुरूपता मूल्यांकन) विनियम, 2018 की योजना -I के तहत प्रमाणन के संचालन में एकरूपता और पारदर्शिता 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 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 uniformity 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.

1.	मानक संख्या IS No.	:	IS 15351 : 2015
	शीर्षक Title	:	Agro Textiles — Laminated High Density Polyethylene (HDPE) Woven Geomembrane for Water Proof Lining — Specification.
	संशोधनों की संख्या No. of amendments	:	01
2.	नमूना दिशानिर्देश Sampling Guidelines		
a)	कच्चा माल Raw material	:	HDPE Tapes and HDPE Fabric shall conform to the requirements given in Cl. 3 of IS 15351 : 2015. Note: This section indicates the requirements for raw material (if specified in the IS) for which compliance is to be established during Grant of Licence/Change in Scope of Licence/Factory Surveillance.
b)	समूहीकरण दिशानिर्देश Grouping Guidelines	:	NA - Sample of each type to be tested to cover the same in the scope of licence
c)	नमूने का परिमाण Sample Quantity	:	Please refer Annex-A Note: This section indicates the quantity of the sample of the product and/or the raw material (if applicable), required to be sent to the laboratory for testing, for the purpose of Grant of Licence/Change in Scope of Licence/ Factory Surveillance (incase of market surveillance, effort may be made to procure therequired quantity of product sample, as far as possible since raw material sample may not be available in market).

d)	परीक्षण अनुरोध में घोषित किए जाने वाले पैरामीटर Parameters to be Declared in Test Request	:	Type Note: Apart from the above, any other requirements/parameters may also be declared as per the standard, as applicable.
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		
	Dimensions and Visual Examination Note: This section is for the guidance of BIS Certification Officers/Technical Auditors of BIS Authorized Outside Surveillance Agencies (OSAs) during factory inspection to provide readyreference regarding the tests which can be witnessed during the inspection in the factory by the officer/auditor.		
6.	लाइसेंस का दायरा /Scope of the Licence: Licence is granted to use Standard Mark as per IS 15351 : 2015 with the following scope		
	Name of the product	Agro Textiles — Laminated High Density Polyethylene (HDPE) Woven Geomembrane for Water Proof Lining — Specification.	
	Type	Type I/II/III/IV	

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ANNEX-A

SAMPLE SIZE

S. No.	Sample	Referred Cl. Of IS 15351	Size Recommended	Remarks
1	HDPE Tape	3.1	3 bobbins	In case the waterproof lining is to be used for drinking water, the tape used for lamination shall be of food grade quality (see IS 10146).
2	HDPE Woven Fabric (Unlaminated)	3.2	1 pc.	Roughly 1 m x 1m
3	laminated HDPE Woven Geomembrane with different layer separated (As separation of different layer is not possible after the pond lining has been manufactured)	5.1.1 (Coating lamination thickness)	1 pc.	Roughly 1 m x 1m. Also see Cl. 5.1.3 of IS 15351.
4	Laminated HDPE Woven Geomembrane (Finished Good)	5 and 6	1 pc. of declared dimension by the firm.	Including Panel width, joints/seams as applicable.

ANNEXURE –B

LIST OF TEST EQUIPMENT

(INDICATIVE LIST, FOR GUIDANCE ONLY)

Sl. No.	Test used in with clause reference	Test Equipment/Chemical
1.	Materials, Cl.3.1	Eye lens (with scale)
2.	Materials , Cl. 3.1, Mass, Cl. 6.2	Conditioning Chamber, Weighing Balance with an accuracy of 1 mg, Cutter,
3.	Dimensions , Cl. 6.2	Measuring tape, up to 1% accuracy relative to dimensions
4.	Thickness , Cl. 5.1.1, 6.2	Dial gauge (of the deadweight type having a Least count- 0.01mm) with: a) Circular pressure foot (with a smooth, flat surface and a diameter of not less than 9 mm) b) Reference plate (anvil) (having a plane upper surface of diameter not less than, preferably 50 mm greater than that of the presser foot)
5.	Breaking Load, Cl. 6.2	Tensile testing machine (CRT/CRE/Extensometer)
6.	Carbon Black Content, Cl. 6.2	CBC tester apparatus with Furnace
7.	Impact Failure Load Test, Cl. 6.2	Impact Tester with weights (3 kg, 2 x 1000 g, 2 x 500 g, 2 x 300 g, 2 x 200 g, and 2 x 100 g)
8.	Tear Resistance, Cl. 6.2	Constant rate of extension tensile-testing machine, Clamping device, Conditioning Chamber
9.	Puncture Resistance, Cl. 6.2	Puncture testing attachment to tensile machine
10.	Bursting Strength , Cl. 6.2	Bursting strength tester
11.	Hydrostatic Resistance , Cl. 6.2	Mullen type hydrostatic tester
12.	UV Exposure , Cl. 6.2	Xenon Arc Apparatus (for UV exposure)
13.	Seam Strength , Cl. 6.2	Compressive block jaws for Seam strength
14.	Ash Content , Cl. 6.2	Muffle furnace (590± 10°C), Weighing balance of least count 0.001gm, Silica crucibles, Bunsen burner, silica triangle and tripod, Desiccator and Gloves and crucible Holder
15.	Requirements , Cl. 6.2	Ventilated Drying Oven, Stop watch, Humidity chamber, Thermometer, GSM cutter

ANNEX –C

SCHEME OF INSPECTION AND TESTING

1. QUALITY ASSURANCE PLAN

1.1 It is expected that during operation of BIS licence, manufacturers will implement a Quality Assurance Plan (QAP) i.e. a plan of regular testing and in-process controls, designed to ensure that the product bearing the Standard Mark conforms to all requirements of the Indian Standard.

1.2 The manufacturers shall define a Quality Assurance Plan (QAP) defining the control unit (i.e. lot/batch etc.), the levels of control (i.e. the frequency and number of samples for conducting the different tests as per the Indian Standard) and declare the arrangement for testing i.e. whether in-house or subcontracting/sharing for each applicable test and submit the same to BIS Branch Office for information. The manufacturer shall comply with the QAP and maintain test records in accordance with para 2.1.

1.3 RECOMMENDED LEVELS OF CONTROL/CONTROL UNIT:

1.3.1 For the guidance of manufacturers, the recommended definition of control unit is: All laminated woven geomembrane of the same type manufactured from same batch of HDPE fabric (using same variety of unlaminated basic fabric) manufactured under similar conditions in a day.

1.3.2 For the guidance of manufacturers in preparing the Quality Assurance Plan, recommended levels of control are given in **Table 1**. Manufacturer has the discretion of declaring their own levels of control or accept the levels of control given in this document.

1.3.3 The manufacturer shall ensure inspection and testing as per the Quality Assurance Plan submitted by them on the whole production of the factory which is covered by this plan.

2. ENSURING COMPLIANCE THROUGH TESTING- manufacturers shall ensure compliance of their products to all the requirements of the Indian Standard for which they may have in-house test facilities. However, there is no obligation to maintain in-house laboratory. Licensee may use alternative arrangements for tests of the production as per the declared QAP. Various alternatives are available for operation of BIS certification as given below and the relevant guidelines for availing such relaxations by the manufacturers, as amended from time to time, are to be referred:

- i) Shared testing resources like common facility,
- ii) Cluster based testing facility,
- iii) Sub-contracting to outside laboratories which may either be:
 - a) BIS recognised/empanelled laboratories, or
 - b) Any accredited laboratory as per ISO/IEC 17025

2.1 TEST RECORDS- The manufacturers shall maintain test records for the tests carried out (either in-house or at a sub-contracted or at shared test facility) to establish conformity of the product to the Standard for operation of licence. For the tests being subcontracted or conducted at a shared test facility, test results issued by the laboratories or test facilities, shall be made available for inspection by BIS.

3. PACKING AND MARKING - The Standard Mark, as given in the Schedule of the licence shall be incorporated legibly and indelibly on each geomembrane roll or on a label affixed to it, 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 Indian Standard.

3.2 **Additional Marking requirements:** Additionally, the following shall also be marked on each geomembrane roll or on a label affixed to it.

a) “For BIS certification details please visit www.bis.gov.in

4. REJECTION - The production which conforms to the Indian Standard and covered under the scope of this licence shall be marked with the Standard Mark. 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
(Recommended Levels of Control by BIS- For Guidance Only)

(1)				(2)		
Test Details				Levels of Control		
Cl.	Requirement	Test Methods		No. of Sample	Frequency	Remarks
		Clause	Reference			
3.1	HDPE Tapes	3.1	IS 15351	One	Every four hour of production	Samples from 10 different spindles is to be taken. See Note 1
3.2	HDPE Fabric	3.2	-do-	One	-do-	Sample from different loom is to be taken. See Note 1
5.1, 5.1.1, 5.1.2, 5.1.3	Lamination	5.1, 5.1.1, 5.1.2, 5.1.3	-do-	One	Every two hour of production	Sample from different lamination machine is to be taken.
5.2	Panel width	5.2	-do-	One	Every four hour of production	-
5.3	Joints/Seams	5.3	-do-	One	Every four hour of production	Sample from different jointing/seaming machine is to be taken.
6.1	Workmanship	6.1	-do-	Each roll/piece	-	-
6.2 Table 1 Sl. No.						
(i)	Thickness	-	IS 7016 (Part 1/Sec 3)	One	Every control unit	-
(ii)	Mass	-	IS 7016 (Part 1/Sec 2)	One	Every control unit	-
(iii)	Dimension (length & width)	Annex B	IS 11652	Each roll/piece		-
(iv)	Carbon black content	-	IS 2530	One	Every control unit	-

(v)	Breaking load before U.V exposure	-	IS 16635	One	-do-	-
(vi)	Strain at maximum load	-	-do-	One	-do-	-
(vii)	Breaking load after U.V exposure	Annex B	Annex B of IS 15351 and IS 16635	One	Once in a month	Sample for each type of geomembrane shall be tested
(viii)	Impact failure load	Annex C	IS 15351	One	Every control unit	-
(ix)	Tear resistance	-	Method A of IS 7016 (Part 3/ Sec 1)	One	-do-	-
(x)	Puncture resistance	Annex D	IS 15351	One	-do-	-
(xi)	Bursting strength (Ball burst)	-	IS 7016 (Part 6/ Sec 1)	One	-do-	-
(xii)	Seam strength before UV exposure	-	IS 15060	One	-do-	-
(xiii)	Seam strength after UV exposure	Annex B	Annex B of IS 15351 and IS 15060	One	Once in a month	Sample for each type of geomembrane shall be tested
(xiv)	Hydrostatic resistance	Annex E	IS 15351	One	Every control unit	-
(xv)	Hydrostatic resistance after UV exposure	Annex B and Annex E	IS 15351	One	Once in a month	Sample for each type of geomembrane shall be tested
(xvi)	Ash content	Annex F	IS 15351	One	Every control unit	-

Note-1: Conformity of HDPE Tape and Fabric to the requirements of the Indian Standard may be established either through in-house testing, or a test certificate issued by the supplier/manufacturer or test report issued by a laboratory recognized by the Bureau or Government laboratories empaneled by the Bureau