



उत्पाद मैनुअल
PRODUCT MANUAL
GEOSYNTHETICS — POLYMERIC STRIP / GEOSTRIP
USED AS SOIL REINFORCEMENT IN RETAINING
STRUCTURES — SPECIFICATION
IS 17372 : 2020

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 17372 : 2020
	शीर्षक Title	:	Geosynthetics — Polymeric Strip / Geostrip used as Soil Reinforcement in Retaining Structures
	संशोधनों की संख्या No. of amendments	:	NIL
2.	नमूना दिशानिर्देश Sampling Guidelines		
a)	कच्चा माल Raw material	:	Polymeric strip/geostrip shall be coated with polyethylene polymeric coating and shall conform to the requirements given in Cl. 4.1 of IS 17372. In case of PET geostrip, it shall have average molecular weight more than or equal to 25000 g/mol when tested by method given in ISO 16014-4 or GRIGG8 and shall have carboxyl end group content less than 30 mmol/kg when tested by method given in ASTM D7409 or GRI-GG7. Conformity may be established through supplier's test certificate, or third party lab test report or NABL accredited lab test report or in house testing.
b)	समूहीकरण दिशानिर्देश Grouping Guidelines	:	Please refer Annex-A
c)	नमूने का आकार Sample Size	:	1 geostrip

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.	Sampling guidelines for surveillance		During surveillance, one factory sample per year shall be tested for all requirements except material and Reduction factor. Further, two market samples per year shall be tested for all requirements excluding material, UV resistance (500h), strength retained, Chemical resistance, strength retained after 72 h immersion, and Reduction factor.
5.	एक दिन में संभावित परीक्षण Possible tests in a day		
	Dimensional Stability (Cl. 5.1), Ultimate tensile strength (Cl. 5.2), width (Cl 5.2), Roll length (Cl. 5.2) .		
6.	लाइसेंस का दायरा /Scope of the Licence:		
	“Licence is granted to use Standard Mark as per IS 17372 : 2020 with the following scope:		
	Name of the product	GEOSYNTHETICS — POLYMERIC STRIP/GEOSTRIP USED AS SOIL REINFORCEMENT IN RETAINING STRUCTURES	
	Grades based on Ultimate tensile strength	GS-20, GS -30, ...GS 100	
	Including/Excluding Requirements of	Reduction Factors / Partial Safety Factors	

BUREAU OF INDIAN STANDARDS
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ANNEX-A

GROUPING GUIDELINES

Following grouping guidelines shall apply in case of grant of licence or change in scope of licence.

Samples of geostrips of two grades- lowest Minimum Ultimate Tensile Strength grade and highest Minimum Ultimate Tensile Strength grade may be tested to include all the varieties from the lowest Minimum Ultimate Tensile Strength grade tested to the highest Minimum Ultimate Tensile Strength grade tested. For example if samples of GS 20 and GS 60 are tested , then all the grades starting from GS-20, GS-30, GS 37.5, GS 40, GS 50 and GS 60 may be included in the scope of the licence.

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

During operation of the licence, samples of all varieties covered in the licence shall be drawn 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.	Dimensional Stability (Clause 5.1)	Visual
2.	Ultimate Tensile Strength, (Clause 5.2, Table 1 Sr.no,i)	Tensile testing Machine(complying with ISO 7500-1, class-2 or better, CRE Type, having Compressive jaws with sufficient width with swivel on top) Cutters for sample preparation AC Relative Humidity maintaining equipments such as humidifier/dehumidifier
3.	UV Resistance , Strength Retained(Cl. 5.2, Table 1, Sl ii)	Conditioning Chamber, Xenon-arc apparatus (as described in IS 2454 : 1985), Sample preparation tools(like electric cutter, scissors, etc), Tensile testing Machine(class-2 or better, CRE Type, Compressive jaws with sufficient width with swivel on top) Provision for measuring strength at different strain (0.5%, 1%, 2%, 3%, 4%, 5%, 10% , 15%), With digital Extensometer
4.	Chemical resistance, strength retained after 72 h Immersion	a pneumatic vessel, is to be used, equipped with: - a sealing lid or equivalent device and if necessary a reflux condenser or equivalent device to restrict evaporation of volatile components; - a stirring or equivalent device to maintain homogeneity of the liquid and the exchange of matter between the liquid and the specimens; - specimen holders to ensure correct placing of the specimens, the free distance between specimens being at least 10 mm; - at least one closable aperture in the lid for access to control the composition of the liquid. - general borosilicate glass or stainless steel Containers. * Two types of test liquids are to be used: an inorganic acid: 0,025 M sulfuric acid (method A); an inorganic base: calcium hydroxide (Ca(OH)₂), used as a saturated suspension, i.e. approximately 2,5 grams per litre (method B). * Water – Grade 3 as per IS 3696 * 0.01 M sodium carbonate solution Trisodiumnitrilotriacetate, acetic acid • Constant temperature Water Bath- capable of

		60+-1 C • pH meter
5.	Width (Cl. 5.2, Table 1, SI iv)	Measuring tape
6.	Roll length (Cl. 5.2, Table 1, SI v)	Measuring tape Length Counter meter
7.	Conditioning	Laboratory with temperature and humidity control and indicators

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 the label affixed to each POLYMERIC STRIP / GEOSTRIP and/or each package of POLYMERIC STRIPS / GEOSTRIPS, provided always that the material so marked conforms to each requirement of the specification.

3.1 The POLYMERIC STRIP / GEOSTRIP shall be packed either in rolls or as per the contract or order. It shall be supplied in coils/rolls sealed with packaging strip to prevent it from the adverse impact of heat and moisture, oil, grease, dirt, dust and other stains. Number of coils/rolls may be packed on pallet wrapped in plastic sheet to keep them together during transport.

3.2 The geostrip material shall be marked with the following by attaching the printed labels::

- a) Identification of the geostrip style like Polyester geostrip for soil reinforcement
- b) Type of geostrip that is, GS-20, GS-30;
- c) Style number, lot number and roll number;
- d) Date of manufacture of geostrip material;
- e) Any other information/instruction provided by the manufacturer;
- f) Manufacturer's name, initials or trademark; and
- g) The country of origin.
- h) BIS licence number and "For BIS certification details please visit www.bis.gov.in"

5. **CONTROL UNIT-** For the purpose of this scheme, entire quantity of geostrip of the same grade made from the same consignment of raw material under similar conditions in a day, shall be taken as one control unit.

6. **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.

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

7. **IDENTIFICATION, DELIVERY, STORAGE AND HANDLING** – of geostrips, shall be done as specified under Cl. 8 of the IS 17372

8. **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.

TABLE1
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	4.1 and 4.2	IS 17372	S	One	Each Consignment	No testing is required if material is accompanied by supplier's test certificate and/or test report from BIS recognized or empaneled lab or Any other NABL Accredited Lab or ISI Marked.
5.1	Dimensional Stability	5.1	IS 17372	R	05	Each Control Unit	Samples of each type and variety to be drawn and tested
5.2	Requirements of Geostrips						
i)	Ultimate tensile strength	-	IS 16635	R	05	Each Control Unit	-do
ii)	UV Resistance (500h) Strength Retained	-	IS 13162 Part 2	S	02	Once in 3 years (or whenever there is change	Samples of different types to be drawn and tested in rotation such that each

						in the material or process)	type of geogrid covered in the scope of licence is tested at least once in three years
iii)	UV resistance, strength retained after 500 h exposure	-	IS 13162 (Part 2)	S	02	Once in 3 years (or whenever there is change in the material or process)	Samples of different types to be drawn and tested in rotation such that each type of geogrid covered in the scope of licence is tested at least once in three years
iv)	Chemical Resistance strength retained after 72 h immersion (see note 3)	-	IS 17363	S	02	-do-	-do
v)	Width	-	IS 17372	R	10	Each control unit	-do
vi)	Roll length	-	IS 17372	R	10	Each control unit	-do
vii)	Reduction Factors / Partial Safety Factors	5.3.1, 5.3.2 and 5.3.3	IS 17372	S	As per the agreement between the buyer and the seller based on the specific site conditions		

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.

Note – 3 - For weathering and chemical degradation having a range of products identical except for mass per area, it is sufficient to subject only the product with the lowest mass per area to the test. The results of the test may be applied for the other products in the range, unless they have been tested separately.