



उत्पाद मैनुअल

भुकृत्रिम – तटीय और जलमार्ग संरक्षण के लिए कृत्रिम बहुलक रस्सी के गेबियन - विशिष्टि

IS 17880: 2022 के अनुसार

**PRODUCT MANUAL FOR**  
**Geosynthetics – Synthetic Polymer Rope Gabions for Coastal and Waterways Protection –**  
**Specification**  
**According to IS 17880: 2022**

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<br>IS No.                       | : | IS 17880: 2022                                                                                      |
|    | शीर्षक<br>Title                             | : | Geosynthetics – Synthetic Polymer Rope Gabions for Coastal and Waterways Protection - Specification |
|    | संशोधनों की संख्या<br>No. of amendments     | : | 01                                                                                                  |
| 2. | नमूना दिशानिर्देश<br>Sampling Guidelines    |   |                                                                                                     |
| a) | कच्चा माल<br>Raw material                   | : | Material of Synthetic Polymer Rope Gabions shall be as per Cl. 5 of IS 17880: 2022.                 |
| b) | समूहीकरण दिशानिर्देश<br>Grouping Guidelines | : | Each type to be drawn and tested.                                                                   |

|    |                                                                                                                                                                                                                                                                                                                                                                        |                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| c) | नमूने का परिमाण<br>Sample Quantity                                                                                                                                                                                                                                                                                                                                     | :                                                                                   | a) Rope – 10 m length<br>b) Gabion box – 1 number of at least 1 m x 1 m x 1 m size<br><br>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 (in case of market surveillance, effort may be made to procure the required 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<br>Parameters to be Declared in Test Request                                                                                                                                                                                                                                                                           | :                                                                                   | <ul style="list-style-type: none"> <li>Type</li> </ul> <p>Note: Apart from the above, any other requirements/parameters may also be declared as per the standard, as applicable.</p>                                                                                                                                                                                                                                                                                                                                                   |
| 3. | परीक्षण उपकरणों की सूची<br>List of Test Equipment                                                                                                                                                                                                                                                                                                                      | :                                                                                   | Please refer to ANNEX –A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 4. | निरीक्षण और परीक्षण की स्कीम<br>Scheme of Inspection and Testing                                                                                                                                                                                                                                                                                                       | :                                                                                   | Please refer to ANNEX –B                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 5. | एक दिन में संभावित परीक्षण<br>Possible tests in a day                                                                                                                                                                                                                                                                                                                  |                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|    | i) Mesh opening size<br>ii) Rope diameter<br>iii) Linear density of the rope<br>iv) Mass in kg per square meter of gabions<br>v) Breaking strength of rope<br>vi) Breaking strength after abrasion resistance of rope for 1000 cycles<br>vii) Breaking strength after thermal stability at 45 °C for 3 hours<br>viii) Rope net strength<br>ix) Punching shear strength |                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 6. | लाइसेंस का दायरा /Scope of the Licence:                                                                                                                                                                                                                                                                                                                                |                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|    | “Licence is granted to use Standard Mark as per IS 17880 : 2022 with the following scope                                                                                                                                                                                                                                                                               |                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|    | Name of the product                                                                                                                                                                                                                                                                                                                                                    | Geosynthetics – Synthetic Polymer Rope Gabions for Coastal and Waterways Protection |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|    | Type                                                                                                                                                                                                                                                                                                                                                                   | Type 1/Type 2                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

**ANNEX – A**  
**LIST OF TEST EQUIPMENTS**  
**(INDICATIVE LIST, FOR GUIDANCE ONLY)**

| Sl. No. | Tests used in with Clause Reference                                              | Test equipment/Chemical                                                                                                                                                                                                                  |
|---------|----------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1.      | Dimensions, Mesh Opening size, Clause 5.1, 6.2, 7.1                              | Measuring Tape<br>Steel Scale                                                                                                                                                                                                            |
| 2.      | Rope Diameter, Clause 7.1                                                        | Vernier Caliper                                                                                                                                                                                                                          |
| 3.      | Linear density of the rope, Clause 7.1                                           | Liner density Machine<br>Weighing Balance                                                                                                                                                                                                |
| 4.      | Mass in kg per square meter of Gabions, Clause 7.1                               | Weighing Scale                                                                                                                                                                                                                           |
| 5.      | Breaking strength of rope, Clause 7.1                                            | Vertical Tensile Testing machine<br><br>Any of the following types of CRT testing machines:<br><br>– bollard-type grip testing machine;<br>testing machine with pins for eye splices;<br>wedge-grip testing machine.                     |
| 6.      | Breaking strength after abrasion resistance of rope for 1 000 cycles, Clause 7.1 | Abrasion tester<br>Horizontal Tensile Testing machine<br><br>Any of the following types of CRT testing machines:<br><br>—bollard-type grip testing machine;<br>testing machine with pins for eye splices;<br>wedge-grip testing machine. |
| 7.      | Breaking strength after thermal stability at 45 °C for 3 hours , Clause 7.1      | Water Bath<br>Horizontal Tensile Testing machine<br><br>Any of the following types of CRT testing machines:<br><br>– bollard-type grip testing machine;<br>testing machine with pins for eye splices;<br>wedge-grip testing machine.     |
| 8.      | Rope net strength, Clause 7.1                                                    | Horizontal Tensile Testing machine<br>Any of the following types of CRT testing machines:<br><br>– bollard-type grip testing machine;<br>testing machine with pins for eye splices;<br>wedge-grip testing machine.                       |
| 9.      | Punching shear strength, Clause 7.1                                              | Horizontal Tensile Testing machine<br><br>Any of the following types of CRT testing machines:<br><br>—bollard-type grip testing machine;<br>testing machine with pins for eye splices;<br>wedge-grip testing machine.                    |

|            |                                                                                                           |                                                                                                                                                                                                                                                 |
|------------|-----------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>10</b>  | Retention in breaking strength of rope after UV exposure, Clause 7.1                                      | UV Exposure Tester QUV<br>Horizontal Tensile Testing machine<br><br>Any of the following types of CRT testing machines:<br><br>—bollard-type grip testing machine;<br>testing machine with pins for eye splices;<br>wedge-grip testing machine. |
| <b>11.</b> | Retention in breaking strength after exposure to saline water cyclic corrosion test for 168 h, Clause 7.1 | Water Bath<br>Horizontal Tensile Testing machine<br><br>Any of the following types of CRT testing machines:<br><br>—bollard-type grip testing machine;<br>testing machine with pins for eye splices;<br>wedge-grip testing machine.             |

## Annex B

### 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: entire quantity of Synthetic polymer rope gabions of the same type manufactured under similar conditions of manufacturing using the same consignment of raw material 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 the label attached to each bundle of Synthetic polymer rope gabions, 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:** The material shall also be marked with the following additional requirement on the label attached to each bundle of Synthetic polymer rope gabions:

a) “For BIS certification details please visit [www.bis.gov.in](http://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 |                                                                                                                                                                                                                |                   |                                                                                                                |
| 5            | MATERIAL                                                                            | 5            | IS 17880  | One                                                                                                                                                                                                            | Each consignment  | No testing is required if accompanied with test certificate of supplier.<br>(or test report of accredited lab) |
| 6            | MANUFACTURE                                                                         |              |           |                                                                                                                                                                                                                |                   |                                                                                                                |
| 6.1          | Netting                                                                             | 6.1          | IS 17880  | Firm to have adequate in-process controls to check compliance of these parameters as per the Indian Standard. However, appropriate records shall be maintained by the manufacturer for evidence of conformity. |                   |                                                                                                                |
| 6.2          | Gabion                                                                              | 6.2          | -do-      |                                                                                                                                                                                                                |                   |                                                                                                                |
| Table 1      | Requirements of Synthetic Polymer Rope Gabions for Coastal and Waterways Protection |              |           |                                                                                                                                                                                                                |                   |                                                                                                                |
| i)           | Mesh opening size                                                                   | --           | --        | Firm to have adequate in-process controls to check compliance of these parameters as per the Indian Standard. However, appropriate records shall be maintained by the manufacturer for evidence of conformity. |                   |                                                                                                                |
| ii)          | Rope diameter                                                                       | --           | IS 7071   |                                                                                                                                                                                                                |                   |                                                                                                                |
| iii)         | Linear density of the rope                                                          | --           | -do-      |                                                                                                                                                                                                                |                   |                                                                                                                |
| iv)          | Mass in kg per square meter of gabions                                              | Annex B      | IS 17880  |                                                                                                                                                                                                                |                   |                                                                                                                |
| v)           | Breaking strength of rope                                                           | --           | IS 7071   | 3                                                                                                                                                                                                              | Each control unit |                                                                                                                |
| vi)          | Breaking strength after abrasion resistance of rope for 1 000 cycles                | Annex C      | IS 17880  | 3                                                                                                                                                                                                              | Each control unit |                                                                                                                |
| vii)         | Breaking strength after thermal stability at 45 °C for 3 hours                      | Annex D      | IS 17880  | 3                                                                                                                                                                                                              | Each control unit |                                                                                                                |

|       |                                                                                               |         |                      |   |                                                                                           |  |
|-------|-----------------------------------------------------------------------------------------------|---------|----------------------|---|-------------------------------------------------------------------------------------------|--|
| viii) | Rope net strength                                                                             | Annex E | IS 17880             | 3 | Each control unit                                                                         |  |
| ix)   | Punching shear strength                                                                       | Annex F | IS 17880             | 3 | Each control unit                                                                         |  |
| x)    | Retention in breaking strength of rope after UV exposure                                      | Annex G | IS 17880 and IS 7071 | 1 | Once in a year or whenever there is a change in raw material supplier/polymer composition |  |
| xi)   | Retention in breaking strength after exposure to saline water cyclic corrosion test for 168 h | Annex H | IS 17880 and IS 7071 | 1 |                                                                                           |  |