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उत्पाद मैनुअल

Agro Textiles — Laminated Woven Orchard  
Protection Covers — Specification

IS 17731: 2021 के अनुसार

PRODUCT MANUAL  
FOR Agro Textiles — Laminated Woven  
Orchard Protection Covers —  
Specification ACCORDING TO  
IS 17731: 2021

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 17731:2021                                                             |
|    | शीर्षक<br>Title                          | : | Agro Textiles — Laminated Woven Orchard Protection Covers — Specification |
|    | संशोधनों की संख्या<br>No. of amendments  | : | 01                                                                        |
| 2. | नमूना दिशानिर्देश<br>Sampling Guidelines |   |                                                                           |

|    |                                                                  |   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|----|------------------------------------------------------------------|---|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| a) | कच्चा माल<br>Raw material                                        | : | <p>HDPE Tapes, HDPE Fabric, Eyelets, and Line/Cord : Beading shall conform to the requirements given in Cl. 4, Cl.6.4 of IS 17731:2021.</p> <p><i>Conformity to the above requirements may be established through supplier test certificate/test report from BIS recognized lab/empanelled lab or any other lab having accreditation as per IS/ISO/IEC17025 or in-house testing/combination thereof.</i></p> <p>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.</p> |
| b) | समूहीकरण दिशानिर्देश<br>Grouping Guidelines                      | : | <i>Please refer to Annex-A</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| c) | नमूने का परिमाण<br>Sample Quantity                               | : | <p>“Full width X 5 meter” Laminated Woven Orchard Protection Covers.</p> <p>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)</p>                                                                                                 |
| d) | Sampling during Surveillance                                     | : | <p>Only one factory and market sample shall be tested each year and the test for Retention of Breaking Strength after UV Exposure (1000 h) shall be conducted only on one factory sample every 2 years (and not on market samples).</p> <p>Test report of the factory sample tested shall be shared by BIS with the licensee, who may utilize this report for the purpose of establishing compliance to the provisions of the Scheme of Inspection and Testing/Levels of Control.</p>                                                                                                                                        |
| 3. | परीक्षण उपकरणों की सूची<br>List of Test Equipment                | : | <i>Please refer to Annex-B</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 4. | निरीक्षण और परीक्षण की स्कीम<br>Scheme of Inspection and Testing | : | <i>Please refer to Annex-C</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 5. | एक दिन में संभावित परीक्षण<br>Possible tests in a day            |   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|    | i.                                                               |   | Coating thickness & Mass of finished and laminated fabric#                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|    | ii.                                                              |   | Breaking strength, welded seam strength, Tape tenacity                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|    | iii.                                                             |   | Breaking strength before UV exposure                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|    | iv.                                                              |   | Strain at maximum load                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

|    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                           |
|----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------|
|    | <p>v. Impact failure load</p> <p>vi. Reinforcement band strength</p> <p>vii. Ash content</p> <p>viii. Heat shrinkage test</p> <p># These tests require conditioning and can be done if equilibrium is reached.</p> <p>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 ready reference regarding the tests which can be witnessed during the inspection in the factory by the officer/auditor.</p> |                                                           |
| 6. | <b>लाइसेंस का दायरा/Scope of the Licence:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                           |
|    | "Licence is granted to use Standard Mark as per IS 17731:2021 with the following scope:                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                           |
|    | Name of the product                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Agro Textiles — Laminated Woven Orchard Protection Covers |
|    | Types                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Type 1,2,3,4                                              |

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

**ANNEX-A**

**GROUPING GUIDELINES**

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

IS 17731:2021 classifies the product into 4 types : Types 1,2,3,4 based on the thickness and mass, in g/m<sup>2</sup> and type of reinforcement at edges of woven fabric. Types 1 and 3 are without laminated reinforcement band at the edges while Types 2 and 4 are with laminated reinforcement band at the edges.

Considering the above, the product is classified for the purpose of these guidelines, into 2 groups as follows:

Group 1 – Type 1 and 2

Group 2 – Type 3 and 4

From group 1, if sample of type 2 (i.e. with laminated reinforcement band at the edges) is tested, then type 1 can be covered in the scope on that basis.

From group 2, if sample of type 4 (i.e. with laminated reinforcement band at the edges) is tested, then type 3 can be covered in the scope on that basis.

Scope of licence shall be restricted based on the manufacturing and testing facilities available.

During operation of licence, samples of each variety covered in the scope of licence, shall be tested in rotation, to the extent possible.

## ANNEX-B

### LIST OF TEST EQUIPMENTS

*(INDICATIVE LIST, FOR GUIDANCE ONLY)*

| S. No. | Tests used with clause reference                                                                                                           | Test Equipment/Chemicals                                                                                                                                                                                                   |
|--------|--------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1.     | Width of HDPE tape, fabric, linear density of HDPE tape, Cl. 4.1                                                                           | Vernier caliper, micrometer, measuring tape, Analytical Balance, Wrap reel                                                                                                                                                 |
| 2.     | Heat shrinkage of the HDPE tape, Cl. 4.2                                                                                                   | air circulating oven (capable of 60 °C), hot water bath (capable of 95 °C)                                                                                                                                                 |
| 3.     | Coating thickness (for HDPE woven fabric and sandwich lamination), Cl. 6.1, Thickness of Laminated Woven Orchard Protection Covers, Cl.7.2 | Thickness tester incorporating a removable presser foot as per IS 13162 (Part 3)                                                                                                                                           |
| 4.     | Mass                                                                                                                                       | Weighing Balance, measuring scale                                                                                                                                                                                          |
| 5.     | Average breaking strength of laminated woven orchard protection cover fabric                                                               | Tensile Testing Machine                                                                                                                                                                                                    |
| 6.     | Retention of breaking strength after UV exposure of 1000 h                                                                                 | Tensile Testing Machine, Xenon-arc apparatus, Conditioning Chamber                                                                                                                                                         |
| 7.     | Strain at maximum load                                                                                                                     | Tensile Testing Machine                                                                                                                                                                                                    |
| 8.     | Impact failure load at 1524 mm drop                                                                                                        | Impact testing apparatus comprising annular specimen clamp, adapter, dart, masses and positioning device, cushioning and shielding devices as per Annex C                                                                  |
| 9.     | Reinforcement band strength                                                                                                                | Tensile Testing Machine                                                                                                                                                                                                    |
| 10.    | Ash content,                                                                                                                               | Weighing Balance, accurate to 0.001 g, Silica Crucibles, Bunsen Burner, Silica Triangle and Tripod, Muffle Furnace, capable of being controlled thermostatically at $590 \pm 10$ °C, Desicator, Gloves and Crucible Holder |
| 11.    | Total visible light transmission,                                                                                                          | Apparatus for measurement of total visible light transmission as per IS 13360 Part 9 Sec 5                                                                                                                                 |
| 12.    | Light diffusion                                                                                                                            | Apparatus for measurement of light diffusion as per IS 13360 Part 9 Sec 5                                                                                                                                                  |
| 13.    | Thermicity IR effectiveness                                                                                                                | Fourier Transform Infrared Spectroscopy (FTIR) or Infrared spectrophotometer with a recorder, Analytical balance with a 0.1 mg margin of error or planimeter.                                                              |

## ANNEX C

### SCHEME OF INSPECTION AND TESTING

#### 1. QUALITY ASSURANCE PLAN

1.1 It is expected that manufacturers (licensees/applicants) will implement a Quality Assurance Plan 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 defining the control unit (i.e. lot/batch etc.) and the levels of control (i.e. the frequency and number of samples for conducting the different tests as per the Indian Standard) and submit the same to BIS Branch Office for information. The manufacturer shall comply with the same and maintain test records in accordance with para 2.4.

#### 1.3 RECOMMENDED LEVELS OF CONTROL/CONTROL UNIT:

1.3.1 For the guidance of manufacturers, the recommended definition of control unit is : all orchard protection cover made from same consignment of laminated HDPE woven fabric (using same variety of basic fabric) of the same type, and 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**.

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. Alternatively, the manufacturer has the option of adherence to the quality plan as per levels of control recommended in column 3 of Table 1.

1.4 However, all manufacturers shall ensure compliance of their products to all the requirements of the Indian Standard.

**2. ENSURING COMPLIANCE THROUGH TESTING-** It is expected that manufacturers (licensees/applicants) will establish a suitably equipped and staffed in house laboratory (In house testing facility) for testing at least those parameters of the Indian Standard which require routine testing for ensuring quality of the product. This includes in-process controls as may be defined and put in place by the manufacturer and testing parameters/requirements which can only be performed in the factory.

2.1 For the guidance of manufacturers, Table 1 giving the recommended levels of control is given below. Column 2 of Table 1 indicates routine tests where test equipment is required in house as "R" or other tests which can be subcontracted as "S". Subcontracting is permitted to BIS recognized/empanelled laboratory or any other laboratory having valid NABL accreditation as per IS/ISO/IEC 17025.

**2.2 For MSME manufacturers, the requirement of maintaining a laboratory/in-house testing facility for routine tests (indicated as "R" in Column 2 of Table 1) is also optional.**

2.2.1 MSME manufacturers may utilize common cluster based facilities as per guidelines for the utilization of cluster based test facilities by MSMEs or the provisions of Sharing of testing facilities or get testing done from BIS recognized/empaneled laboratory or any other laboratory having valid NABL accreditation as per IS/ISO/IEC 17025.

**2.3 Large Scale manufacturers shall maintain an in-house laboratory equipped at least with test facilities for routine tests (indicated as “R” in Column 2 of Table 1),** where different tests given in the specification shall be carried out in accordance with the method given in the specification. They shall also implement a calibration plan for the in-house test equipment.

2.3.1 Alternatively, in lieu of an in-house laboratory, large scale manufacturers can also utilize the provisions of Sharing of testing facilities as per the Guidelines for Grant of Licence available on BIS website [www.bis.gov.in](http://www.bis.gov.in). (Under Conformity Assessment>Product Certification Process). Even for subcontracted tests, provisions for sharing of testing facilities can be utilized.

**2.4 TEST RECORDS-** The manufacturers maintaining an in-house laboratory or utilizing common cluster based facilities or shared test facilities shall maintain test records for the tests carried out to establish conformity. For the tests being subcontracted to BIS recognized/empanelled laboratory or any other laboratory having valid NABL accreditation as per IS/ISO/IEC 17025, test reports issued by the laboratories shall be 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 laminated woven orchard protection cover roll, 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 each laminated woven orchard protection cover roll:

a) “For BIS certification details please visit [www.bis.gov.in](http://www.bis.gov.in)”

**4. REJECTION** - All 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  
(ONLY FOR GUIDANCE PURPOSE)

| (1)                 |             |                                     |               | (2)                                                                                            | (3)                  |                  |                                                                                                                                                                                                                                                                                                                                |
|---------------------|-------------|-------------------------------------|---------------|------------------------------------------------------------------------------------------------|----------------------|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Test<br>Det<br>ails |             |                                     |               | Test<br>equipment<br>requireme<br>nt<br>R: required<br>(or)S: Sub-<br>contracting<br>permitted | Levels of Control    |                  |                                                                                                                                                                                                                                                                                                                                |
| Cl.                 | Requirement | Test<br>Methods Clause<br>Reference |               |                                                                                                | No. of<br>Sampl<br>e | Frequency        | Remarks                                                                                                                                                                                                                                                                                                                        |
| 4                   | Materials   |                                     |               |                                                                                                |                      |                  |                                                                                                                                                                                                                                                                                                                                |
| 4.1                 | HDPE Tapes  | 4.1                                 | IS 17731:2021 | R                                                                                              | Five                 | Every 8 hours    | Applicable to<br>manufacturers of<br>woven protection<br>covers from HDPE<br>granules with<br>Integrated processing<br>facility<br>(Manufacturers<br>procuring tapes from<br>outside may obtain a<br>test certificate for<br>each consignment<br>from supplier or a test<br>report from a third<br>party or<br>accredited lab) |
| 4.2                 | HDPE Fabric | 4.2                                 | IS 17731:2021 | R                                                                                              | Five                 | Every 8<br>hours | Applicable to<br>manufacturers of woven<br>protection covers from<br>unlaminated HDPE                                                                                                                                                                                                                                          |

|       |                                                 |       |                 |   |                                                                                                                                                                                                |                   |                                                                                                                                                                                                                            |
|-------|-------------------------------------------------|-------|-----------------|---|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|       |                                                 |       |                 |   |                                                                                                                                                                                                |                   | (Manufacturers procuring fabric from outside may obtain a test certificate for each consignment from supplier or a test report from a third party or accredited lab)                                                       |
| 6.3   | Eyelets                                         | 6.3   | IS 17731:2021   | R | Manufacturer shall put in place adequate inspections/in process controls to ensure eyelets conforming to the requirements are being used and are being incorporated in the cover as prescribed |                   | Each consignment of metal eyelets shall be accompanied with a test certificate of the supplier                                                                                                                             |
| 6.4   | Rope for tying laminated woven protection cover | 6.4   | IS 17731:2021   | R | Manufacturer shall put in place adequate inspections/in process controls to ensure ropes conforming to the requirements are being used                                                         |                   | Each consignment of ropes shall be accompanied with a test certificate of the supplier or test report from a third party or accredited lab.<br><br><b>No testing is required if the rope is ISI Marked as per IS 5175.</b> |
| 6.1   | Lamination                                      | 6.1.1 | IS 13162(part3) | R | Five                                                                                                                                                                                           | Every 8 hours     |                                                                                                                                                                                                                            |
| 6.1.2 | Sandwich lamination                             | 6.1.2 | IS 13162(part3) | R | Five                                                                                                                                                                                           | Every 8 hours     |                                                                                                                                                                                                                            |
| 6.2   | Joints/seams                                    | 6.2   | IS 17731:2021   | R | Five                                                                                                                                                                                           | Each control unit |                                                                                                                                                                                                                            |

|                 |                                                                                                                |                          |                              |   |                                                                                                                                             |                   |                                                                                                                                                                                                                                        |
|-----------------|----------------------------------------------------------------------------------------------------------------|--------------------------|------------------------------|---|---------------------------------------------------------------------------------------------------------------------------------------------|-------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 7.1             | Workmanship and Finish                                                                                         | 7.1                      | IS 17731:2021                | R | Manufacturer shall put in place adequate inspections/in process controls to ensure Workmanship and Finish is conforming to the requirements |                   |                                                                                                                                                                                                                                        |
| 7.2 and Table 1 | Requirement for Laminated Woven Orchard Protection Covers                                                      |                          |                              |   |                                                                                                                                             |                   |                                                                                                                                                                                                                                        |
| i)              | Thickness                                                                                                      |                          | IS 7016(part 1)-             | R | Three                                                                                                                                       | Each Control Unit |                                                                                                                                                                                                                                        |
| ii)             | Mass                                                                                                           |                          | IS 7016(part 1)              | R | Two                                                                                                                                         | Each Control Unit |                                                                                                                                                                                                                                        |
| iii)            | Average breaking strength of laminated woven orchard protection cover fabric, a)Warpway b)Weftway              | CI 7.2 Table 1 sr no iii | IS 1969 (Part 1)             | R | -do-                                                                                                                                        | Each control unit |                                                                                                                                                                                                                                        |
| iv)             | Retention of breaking strength after UV exposure of 1000 h (warp and weft), percent , of original actual value | CI 7.2 Table 1 sr no iv  | Annex B and IS 1969 (Part 1) | S | One                                                                                                                                         | Once in a year    | Test report of the factory sample tested shall be shared by BIS with the licensee, who may utilize this report for the purpose of establishing compliance to the provisions of the Scheme of Inspection and Testing/Levels of Control. |
| v)              | Strain at maximum load %                                                                                       |                          | IS 1969 (Part 1)             | R | Two                                                                                                                                         | Each control unit |                                                                                                                                                                                                                                        |

|       |                                                      |         |                        |   |       |                    |  |
|-------|------------------------------------------------------|---------|------------------------|---|-------|--------------------|--|
| vi)   | Impact failure load at 1524 mm drop at 50 % failure  | Annex C | IS 17731:2021          | R | Two   | Each control unit  |  |
| vii)  | Reinforcement band strength                          |         | IS 1969 (Part 1)       | R | Two   | Each control unit  |  |
| viii) | Ash content, percent,                                | Annex D | IS 17731:2021          | R | One   | Each control unit  |  |
| Xv)   | Total visible light transmission and light diffusion |         | IS 13360(part 9/sec 5) | R | Three | Once in a week     |  |
| xvi)  | Thermicity IR effectiveness percent                  | Annex E | IS 17731:2021          | S | Three | Once in six months |  |