



**PRODUCT MANUAL
FOR TEXTILES — TARPULINS MADE FROM HIGH DENSITY POLYETHYLENE (HDPE) WOVEN FABRICS
ACCORDING TO IS 7903:2017**

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. | Product | : | IS 7903:2017 |
| | Title | : | Textiles — Tarpaulins Made from High Density Polyethylene (HDPE) Woven Fabrics - Specification |
| | No. of Amendments | : | 01 |
| 2. | Sampling Guidelines: | | |
| a) | Raw material | : | HDPE Tapes, HDPE Fabric, Eyelets, and Line/Cord Beading shall conform to the requirements given in Cl. 3 of IS 7903:2017 |
| b) | Grouping guidelines | : | Sample of each type to be tested to cover the same in the scope of licence. If sample of coloured tarpaulin is tested, the addition of black tarpaulins (without colour) in the scope may be considered on its basis as well. |
| c) | Sample Size | : | One complete sheet (For mechanical testing) 2 in. x 2 in. cut piece (for chemical testing) |
| 3. | List of Test Equipment | : | Please refer Annex –A |
| 4. | Scheme of Inspection and Testing | : | Please refer Annex - B |
| 5. | Possible tests in a day : | : | Please refer Annex - C |
| 6. | Scope of the Licence : | | |
| | Licence is granted to use Standard Mark as per IS 7903:2017with the following scope: | | |
| | Name of the product | Textiles — Tarpaulins Made from High Density Polyethylene (HDPE) Woven Fabrics - Specification | |
| | Type | Type I/II/III/IV/V/VI/VII | |
| | Colour | Coloured/Black (without colour) | |

ANNEX-A
PRODUCT MANUAL
FOR TEXTILES — TARPULINS MADE FROM HIGH DENSITY POLYETHYLENE (HDPE) WOVEN FABRICS
ACCORDING TO IS 7903:2017

LIST OF TEST EQUIPMENTS
Major test equipment required to test as per the Indian Standard

| Sr. No. | Test Equipment | Tests used in with Clause Reference |
|---------|---|--|
| 1 | Steel Scale | Construction - Cl. 5.2 |
| 2 | Vernier Calliper | Eyelets Cl. 3.3, Line/Cord Beading 3.4, |
| 3 | Measuring tape | Dimensions Cl. 6.2 |
| 4 | Weighing Balance with GSM cutter for mass | Mass of finished tarpaulin and laminated fabric - Annex B & C of IS 7903 |
| 5 | Dial Gauge with thickness tester for thickness measurement with footer applying pressure $2 \pm 0.01 \text{ kPa}$ | Lamination thickness - Cl. 5.1 of IS 7903 and IS 13162(Part 3) |
| 6 | Constant rate of extension Tensile testing machine and AC drive for variable speed | Breaking Strength and Elongation at Break - IS 1969(P-1) |
| 7 | Humidity chamber | Conditioning of samples –Cl. 7.1.1 of IS 13162(P-3), Cl. 4.1 of IS 7941, IS 7940, Annex C of IS 7903 |
| 8 | Static hydro pressure test apparatus as per fig 1 of IS 7940 | Water proofness - Cl. 6.3.1 of IS 7903 and Cl. 6 of IS 7940 |
| 9 | Cone test apparatus consisting of glass or conical funnel, wire cone, glass rod, conical flask, A stand, measuring flask and distilled water as per IS 7941 | Water proofness-Cl. 6.3 of IS 7903 and IS 7941 |
| 10 | Hot air oven for Ageing test of least count 1Deg C | Ageing for water proofness test -Cl. 6.3.2 of IS 7903 |
| 11 | Carbon black content test apparatus with furnace, quartz tube boat, desicator, glasswares and chemicals | Carbon black content - Cl. 3.1, 5.1.1 of IS 7903 and IS 2530 |
| 12 | Tensile testing machine with template as per Fig.1 of IS 14293 and vessel | Trapezoid Tear Strength - IS 14293 |
| 13 | Tensile testing machine with attachment for puncture (Ring Clamp Attachment and Solid Steel Rod) test as per Fig. 1 & 2 of Annex-D of IS | Puncture Resistance- Annex D of IS 7903 |

| | 7903 | |
|----|---|---|
| 14 | Impact resistance apparatus consisting of a two piece Annular specimen Clamp, Adapter, Dart, Masses of SS, positioning devices and Cushioning and shielding devices as per Annex-E of IS 7903 | Impact failure load Annex- E of IS 7903 |
| 15 | Muffle furnace (590 \pm 10 $^{\circ}$ C) | Ash Content - Annex F of IS 7903 |
| 16 | Weighing balance of least count 0.001gm | Ash Content -Annex F of IS 7903 |
| 17 | Silica crucibles, Bunsen burner, silica triangle and tripod, Desiccator and Gloves and crucible Holder | Ash Content -Annex F of IS 7903 |
| 18 | Air conditioner | Cl. 7.2 of IS 14293 |
| 19 | Stop watch | Cl. 7.3.1 of IS 13162(P-3),, Cl. 6.3.1 of IS 7903 |
| 20 | pH meter /pH paper | Cl. 6.2 of IS 7940 |
| 21 | Xenon-arc apparatus as per IS 2454 (May be subcontracted) | For UV and colour fastness tests as per IS 13162(P-2) |

The list above is indicative and may not be taken as exhaustive

ANNEX – B

**SCHEME OF INSPECTION AND TESTING
FOR TEXTILES — TARPAULINS MADE FROM HIGH DENSITY POLYETHYLENE (HDPE) WOVEN FABRICS
ACCORDING TO IS 7903:2017**

1. **LABORATORY** - A laboratory shall be maintained which shall be suitably equipped (as per the requirement given in column 2 of Table 1) and staffed, where different tests given in the specification shall be carried out in accordance with the methods given in the specification.
 - 1.1 The manufacturer shall prepare a calibration plan for the test equipment.
2. **TEST RECORDS** – 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 license shall be printed indelibly on each tarpaulin or on a label affixed to it; provided that tarpaulins to which this mark is thus applied conforms to every requirement of the specification.
 - 1.1 Marking and packing shall be done as per the provisions of the Indian Standard. In addition In addition, the following details shall be mentioned on each tarpaulin or on a label affixed to it:
 - a) BIS Licence No. CM/L _____.
 - b) BIS website details i.e.–“For details of BIS certification please visit www.bis.gov.in”
2. **CONTROL UNIT** – For the purpose of this scheme, all tarpaulins made from same batch of laminated HDPE woven fabric (using same variety of basic fabric) and having same manufacturing particulars manufactured under similar condition in a day shall constitute a control unit.
3. **LEVELS OF CONTROL** - The tests as indicated in column 1 of Table 1 and the levels of control in column 3 of Table 1, shall be carried out on the whole production of the factory which is covered by this plan and appropriate records maintained in accordance with paragraph 2 above.
 - 3.1 All the production which conforms to the Indian Standard and covered by the licence should be marked with Standard Mark.
4. **REJECTIONS** – Disposal of non-conforming product shall be done in such a way so as to ensure that there is no violation of provisions of BIS Act, 2016.

**Table 1 LEVELS OF CONTROL
(Scheme of Inspection and Testing)**

| (1) | | | | (2) | (3) | | (4) |
|---------------------|-------------------|-------------|--------------|--|--------------------------|------------------------------------|--|
| <u>TEST DETAILS</u> | | | | Test equipment requirement R: required (or) S: Sub-contracting permitted | <u>LEVELS OF CONTROL</u> | | <u>REMARKS</u> |
| Clause. | Requirement | Test Method | | | No. of Sample | Frequency | |
| | | Clause | Reference | | | | |
| 3.1 | HDPE tape | 3.1 | IS 7903:2017 | R | Five | Every 8 hours | i) Applicable to manufacturers of tarpaulins from HDPE granules with Integrated processing facility ii) Applicable to manufacturers of tarpaulins from brought out unlaminated fabric — Every Consignment shall be accompanied with test certificate from supplier, indicating that the tapes used in woven fabric conforms to Clause 3.1 and 3.2 of IS 7903:2017 |
| 3.2 | HDPE fabric | 3.2 | IS 7903:2017 | S | Five | Every 8 hours | |
| 3.3 | Eyelets | 3.3 | IS 7903:2017 | R | 32 | Each Control Unit/Each consignment | In case of dimensions other than size 28 or 30 as per IS 4084, records of all such agreed dimensions between manufacturer and purchaser shall be maintained. |
| 3.4 | Line/Cord Beading | 3.4 | IS7903:2017 | R | Three | Each Control unit | |
| 5.1 | Lamination | 5.1.1 | IS 7903:2017 | R | Five | Every 8 hours | |

| | | | | | | | |
|--------------------------|--|---------|--|---|-----------------|----------------------|--|
| 5.1.2 | Sandwich lamination | 5.1.2 | -do- | R | -do- | -do- | |
| 5.2, 5.2.1 & 5.2.2 | Construction | 5.2 | IS 7903:2017 | R | Every Tarpaulin | | |
| 5.3 | Joints/Seams | 5.3 | -do- | R | Five | Each Control Unit | |
| 5.4 | Fixing of eyelets | 5.4 | -do- | R | -do- | -do- | |
| 6.2 | Dimension | 6.2 | -do- | R | Five | -do- | |
| 6.3 | Water Proofness | 6.3 | -do- | R | Three | -do- | |
| 6.1 and Table 1 | | | | | | | |
| i) | No. of HDPE fabric layer | - | - | R | Three | Each Control Unit | |
| ii) | No. of lamination layers | - | - | R | -do- | Each Control Unit | |
| iii) | Total number of layers in the finished tarpaulin | - | - | R | -do- | Each Control Unit | |
| iv) | Mass of finished tarpaulin, g/m ² . | Annex B | IS 7903:2017 | R | Two | Each Control Unit | |
| v) | Mass of laminated fabric, g/m ² , | Annex C | IS 7903:2017 | R | -do- | Each Control Unit | |
| vi) | Breaking strength before UV exposure, N, a)Warp b)Weft | | IS 1969 (Part 1) | R | -do- | Each control unit | |
| vii) | Elongation at break, percent (warp and weft) | | IS 1969 (Part 1) | R | Two | Each Control Unit | |
| viii) | Retention of breaking strength after UV exposure of 144 h (warp and weft), percent , N | | IS 13162 (Part 2) and IS 1969 (Part 1) | S | Three | Once in three months | |

| | | | | | | | |
|-------|--|---------|--|---|-------|----------------------|---|
| ix) | Welded seam strength before UV exposure (weft), N, | | IS 1969 (Part 1) | R | One | Each control unit | |
| x) | Retention of welded seam strength after UV exposure of 144 h (weft), percent, N, | | IS 13162 (Part 2) and IS 1969 (Part 1) | S | Three | Once in three months | |
| xi) | Trapezoid tear strength, N, | | IS 14293 | R | One | Each control unit | |
| xii) | Puncture resistance, N, | Annex D | IS 7903:2017 | R | -do- | -do- | |
| xiii) | Impact failure load, at 1 524 mm drop, min, gram force at 50 percent failure | Annex E | IS 7903:2017 | R | -do- | Once in a week | All types produced during one month shall be covered. |
| xiv) | Colour fastness to light (for coloured tarpaulins) | | IS 2454 | S | -do- | Once in six months | See Note 3 |
| xv) | Ash content, percent, | Annex F | IS 7903:2017 | R | -do- | Each control unit | |

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 empaneled 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 to BO head.

Note-3: In the first instance samples for each colour and shade shall be drawn and tested in an independent laboratory or in their own laboratory in case facilities exist. These colors and shades only shall be marked which confirm to the relevant requirement of the specification. Afterwards an undertaking to the effect that there shall be no change in brand of the colour used, colour shade and processing conditions may be obtained. However, 2 samples drawn from each colour and shade shall be get tested once a year in an independent laboratory.

ANNEX-C
PRODUCT MANUAL
FOR TEXTILES — TARPAULINS MADE FROM HIGH DENSITY POLYETHYLENE (HDPE) WOVEN FABRICS
ACCORDING TO IS 7903:2017

TESTS POSSIBLE IN A DAY

- a) Dimensions
 - b) Mass of finished and laminated fabric#
 - c) Breaking strength, welded seam strength, elongation before UV#
 - d) Resistance to water penetration before ageing#
 - e) Carbon black content
 - f) Trapezoid tear strength test#
 - g) Puncture resistance test#
 - h) Impact failure load
 - i) Ash content
- # These tests requires conditioning and can be done if equilibrium is reached.