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Ships and marine technology — Inflatable rescue boats — Coated fabrics for inflatable chambers

Navires et technologie marine — Bateaux de sauvetage gonflables — Supports textiles revêtus pour chambres gonflables

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ISO 15372:2000(E)

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 3.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

International Standard ISO 15372 was prepared by Technical Committee ISO/TC 8, *Ships and marine technology*, Subcommittee SC 1, *Lifesaving and fire protection*.

Introduction

This International Standard is intended to supplement International Maritime Organization (IMO) requirements for rescue boats used on ships complying with the 1974 Safety of Life At Sea Convention (SOLAS 74), as amended.

Ships and marine technology — Inflatable rescue boats — Coated fabrics for inflatable chambers

1 Scope

This International Standard specifies the minimum requirements for coated fabrics, and test procedures for those fabrics, for use in the construction of inflatable chambers of rescue boats complying with the 1974 Safety of Life at Sea Convention (SOLAS), as amended; Chapter I, paragraph 1.2, and Chapter V of the International Life-Saving Appliance Code [IMO Resolution MSC.48 (66)]; and the IMO Assembly resolution A.689(17), as amended. These coated fabrics consist of a base textile with a synthetic elastomeric or plastomeric compound applied to one or both faces.

Requirements for fabrics for inflatable boats other than SOLAS rescue boats are contained in ISO 6185:1982, *Shipbuilding and marine structures — Inflatable boats — Boats made of reinforced elastomers or plastomers*.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this International Standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

ISO 1421:1998, *Rubber- or plastics-coated fabrics — Determination of tensile strength and elongation at break*.

ISO 1817:1999, *Rubber, vulcanized — Determination of the effect of liquids*.

ISO 2286-2:1998, *Rubber- or plastics-coated fabrics — Determination of roll characteristics — Part 2: Methods for determination of total mass per unit area, mass per unit area of coating and mass per unit area of substrate*.

ISO 2411:2000, *Rubber- or plastics-coated fabrics — Determination of coating adhesion*.

ISO 3011:1997, *Rubber- or plastics-coated fabrics — Determination of resistance to ozone cracking under static conditions*.

ISO 4674:1977, *Fabrics coated with rubber or plastics — Determination of tear resistance*.

ISO 4675:1990, *Rubber- or plastics-coated fabrics — Low temperature bend test*.

ISO 4892-2:1994, *Plastics — Methods of exposure to laboratory light sources — Part 2: Xenon-arc sources*.

ISO 4892-4:1994, *Plastics — Methods of exposure to laboratory light sources — Part 4: Open-flame carbon-arc lamps*.

ISO 5470:1980, *Rubber or plastics coated fabrics — Determination of abrasion resistance*.

ISO 5978:1990, *Rubber- or plastics-coated fabrics — Determination of blocking resistance*.

ISO 7854:1995, *Rubber- or plastics-coated fabrics — Determination of resistance to damage by flexing*.

International Convention for the Safety of Life at Sea, 1974 (SOLAS 1974), as amended in 1996.

IMO Resolution MSC.48(66), Adoption of the International Life-Saving Appliance (LSA) Code.

IMO Resolution A.689(17)(as amended), Recommendation on Testing of Life-Saving Appliances.

3 General requirements

3.1 Coated fabric

3.1.1 Coated fabric for use in the construction of inflatable chambers of rescue boats shall conform to the performance requirements specified in Table 1 when type tested in accordance with the specified test procedures in clause 6.

3.1.2 Type approval of a fabric applies only to a particular colour or range of colours as tested.

3.2 Base fabric

The base fabric shall be inherently rot-proof.

NOTE Cotton fabric is not considered to be rot-proof.

3.3 Coating material

Coating materials shall be synthetic elastomeric or plastomeric compounds formulated to conform to the relevant performance requirements specified in Table 1.

3.4 Adhesives and welding

Coated fabrics complying with this International Standard are suitable for use in the manufacture of inflatable rescue boats using adhesives and/or thermal-welding techniques consistent with the fabric manufacturer's instructions.

Manufacturers of rescue boats should confer with fabric proofers concerning specific fabrication techniques for specific coated fabrics.

Table 1 — Performance requirements

Property	Performance criteria	Test procedure
Tensile strength	Not less than 3,5 kN/50 mm width.	6.2.1
Elongation	Elongation at break to be not more than 35 %.	6.2.1
Tear strength: method 6.2.2.1 method 6.2.2.2	Not less than 140 N. Not less than 1 500 N.	6.2.2
Ageing resistance	No stickiness, brittleness, cracks or any other deterioration. Tensile strength after ageing shall be not less than 90 % of that before ageing. The difference in dimensions before and after ageing shall be not more than 2 %.	6.2.3
Seam strength	In the tensile test, the break shall occur at a load of at least 85 % of the strength recorded in the tensile test, but not less than 3,5 kN/50 mm width.	6.2.4
Oil resistance	Free of tackiness or any other deterioration.	6.2.5
Cold resistance	No visible cracking under 5 × magnification.	6.2.6
Coating adhesion	Not less than 50 N/25 mm width.	6.2.7
Resistance to flex cracking	No cracking or deterioration after 200 000 cycles.	6.2.8
Airtightness	No bubbles after 5 min.	6.2.9
Ozone resistance	No visible cracking under 5 × magnification.	6.2.10
Sea-water resistance	No peeling and colour fading. In the tensile test, the break shall occur at a load of at least 85 % of the strength recorded in the tensile test, but not less than 3,5 kN/50 mm width.	6.2.11
Hydrolysis resistance (thermoplastic-coated fabrics only)	Coating adhesion and weld strength after exposure shall be not less than 70 % of that before exposure. When subjected to the blocking resistance test, the 100 g weight shall not be lifted. After folding, there shall be no visible cracks, ply separation, brittleness or stickiness.	6.2.12
Blocking resistance	Resistance rating no greater than 2.	6.2.13
Ultraviolet resistance (weathering)	No cracking when bent, heavily coated side out, over a 3,2 mm diameter mandrel after exposure. Tensile strength after exposure shall be not less than 90 % of that before exposure.	6.2.14
Abrasion resistance	After 500 revolutions of the test-piece holder, the base fabric shall not be visible, and the abrasion shall not exceed 0,7 mg/revolution.	6.2.15
Mass per unit area	As required by manufacturer's specification.	6.2.16

4 Testing of production fabrics

4.1 Routine production tests

Coated fabrics for use in the manufacture of inflatable chambers of rescue boats shall be tested periodically for the following properties:

— tensile strength and elongation;

— tear strength;

— ageing resistance;

— oil resistance;

— cold resistance;

— coating adhesion;

— air-tightness;

— mass per unit area.

4.2 Other production tests

The remaining tests in Table 1 shall be performed less frequently.

4.3 Frequency of production tests

The minimum frequency of production testing shall be as specified in the individual material specification.

5 Marking

The coated fabric shall be marked in such a manner as to allow traceability of the fabric manufacturer and production-lot number.

6 Approval-testing procedures

6.1 General conditions for tests

6.1.1 Standard test atmospheres

Unless otherwise specified, the test atmospheres shall be at a temperature of 20 °C ± 2 °C and a relative humidity of (65 ± 5) %. The temperature, humidity and atmospheric pressure at the time of the test shall be recorded.

6.1.2 Conditioning of test specimens

The test specimens shall have been vulcanized, if applicable, for not less than 24 h and not more than 3 months and shall be kept under the standard atmosphere for at least 24 h prior to test.

6.1.3 Test specimens

The required number of test specimens shall be taken from the effective width of the coated fabric well away from the selvedges and the ends, and in both directions parallel to the warp and to the weft.

6.2 Test procedures

6.2.1 Tensile test

6.2.1.1 This test shall be carried out to determine tensile strength and elongation concurrently with breaking. The test shall be performed in accordance with the method specified in ISO 1421, with dry specimens, using a constant rate of traverse (CRT) machine.

6.2.1.2 The specimens shall be tested at a tensile speed of (100 ± 10) mm/min.

6.2.2 Tear test

Two alternative test methods, the constant rate of traverse method (6.2.2.1) or the wound test method (6.2.2.2) may be used for the tear test, at the discretion of the national administration.

6.2.2.1 Constant rate of traverse method

6.2.2.1.1 The test shall be performed in accordance with Method A — Constant rate of tear, specified in ISO 4674:1977.

6.2.2.1.2 Five test specimens shall be cut parallel to the warp and five to the weft. The test specimens shall be the so-called trouser-shaped test pieces of Method A2 specified in ISO 4674:1977: a rectangular strip (225 ± 0,5) mm by (75 ± 0,5) mm wide, with a longitudinal slit 80 mm long beginning from the middle of the width.

6.2.2.1.3 Place the test specimens symmetrically in the grips with one tongue in each of the grips, with the uncut end of the test specimen remaining free. Ensure that each tongue is fixed in a grip so that the beginning of the tear is parallel to the direction in which the tearing force is applied.

6.2.2.1.4 The test shall be carried out at a tensile speed of (100 ± 10) mm/min for both warp and weft directions up to the breaking point.

6.2.2.1.5 The test results shall be recorded as the arithmetical average of five specimens each for warp and weft.

6.2.2.2 Wound test method

6.2.2.2.1 Apparatus

The apparatus shall be an approved strength-testing machine complying with clause 5 of ISO 1421:1998 except that

— the constant rate of traverse method shall be used, the rate being not more than (70 ± 10) mm/min grip separation; and

— the load indicated at any part of the range used shall be correct within 1 % of the actual load.

6.2.2.2.2 Test specimens

From the test sample, cut three rectangular specimens each (75 ± 0,5) mm wide and 300 mm to 400 mm long as convenient, with the length closely parallel to the direction of the warp threads and also three specimens with the

length closely parallel to the direction of the weft threads. Space the selection across the full width and full length of the sample. Make a 12,5 mm cut across the middle of each specimen at right angles to the length.

6.2.2.2.3 Test procedures

6.2.2.2.3.1 Grip the specimen under test accurately and evenly in the grips so that they are 200 mm apart and so that the specimen length is virtually in the pull direction. Operate the machine in accordance with 6.2.2.2.1.

6.2.2.2.3.2 As the load is applied, the specimen yields by tearing outward from both ends of the 12,5 mm cut, and in the case of two-ply fabric, by parting of the plies. Record the maximum load sustained as the wounded tearing strength; calculate the average of the results for the three specimens; measure the maximum elongation at break; and express the results as a percentage of the original 20 mm gauge length.

6.2.3 Ageing tests

Three separate tests are involved: dimensional stability (see 6.2.3.3.1), folding (see 6.2.3.3.2) and tensile strength (see 6.2.3.3.3).

6.2.3.1 Test specimens

6.2.3.1.1 For the dimensional stability and folding tests, cut four specimens at least 100 mm square from the test sample.

6.2.3.1.2 For the tensile-strength test, cut a total of 12 specimens — three pieces each for warp for dry condition and wet condition and three pieces each for weft for dry condition and wet condition — as for the tensile test in 6.2.1.

6.2.3.2 Ageing of specimens

6.2.3.2.1 Freely suspend half the samples in an oven for 7 days at 70 °C ± 1 °C.

6.2.3.2.2 Suspend the other half of the samples over water in a loosely closed vessel for the same period of time at 70 °C ± 1 °C.

6.2.3.3 Test procedures

6.2.3.3.1 Dimensional stability test

Measure the overall dimensions of the specimens before and after ageing and report the percentage change in warp and weft directions.

6.2.3.3.2 Folding test

6.2.3.3.2.1 Remove the specimens and, after 15 min at room temperature, fold them consecutively in two directions parallel to the edges and at right angles to each other so as to reduce the exposed area of each specimen to one quarter of its original size. Unfold and again fold the specimens along the same creases but with each fold reversed in direction.

6.2.3.3.2.2 After each folding, press the fold by rubbing the fingers and thumb along it.

6.2.3.3.2.3 Inspect the specimens for cracks, separation of plies, stickiness or brittleness.

6.2.3.3.3 Tensile-strength test

Follow the procedure specified in 6.2.1.

6.2.4 Seam test

6.2.4.1 Test specimens shall be 50 mm wide by 300 mm long, with a seam across the centre. Representative seams reflecting the fabric manufacturer's recommendations for seam construction shall be tested. Five test specimens each shall be prepared parallel to warp and to weft for each seam type tested. The seams shall be produced in the same manner in which the fabric will be used in a rescue boat.

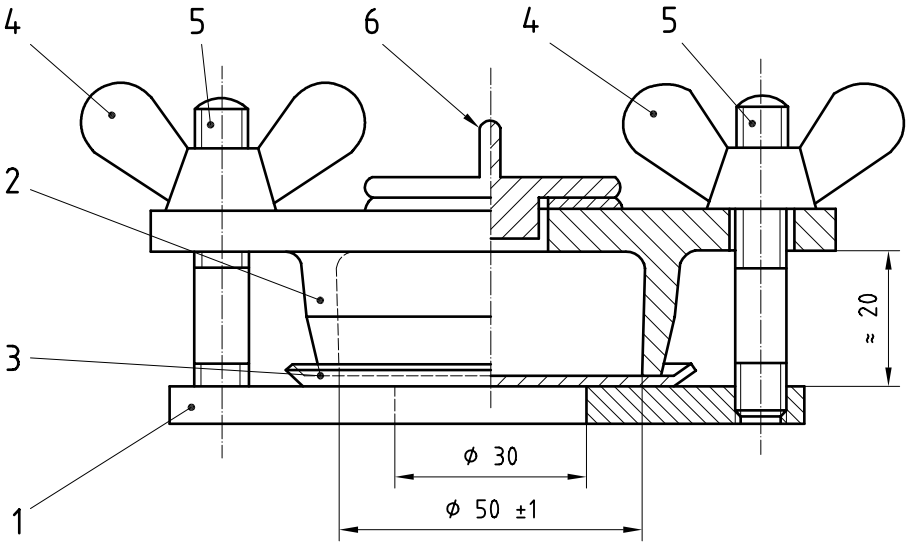
6.2.4.2 The tensile test specified in 6.2.1 shall be carried out to determine the breaking resistance.

6.2.4.2.1 This test shall also be carried out after 7 days of ageing at a temperature of 70 °C ± 1 °C as specified in 6.2.3.2.

6.2.5 Oil-resistance test

6.2.5.1 The disc specimen for testing shall be at least 70 mm in diameter. The typical apparatus required is shown in Figure 1. It consists of a base-plate (1) and an open-ended cylindrical chamber (2) which is held tightly against the test specimen (3) by the wing nut (4), with the wing nuts mounted on bolts (5). A hole of approximately 30 mm diameter may be made in the base-plate to examine the surface that is not in contact with the liquid. During the test, the opening in the top of the chamber is closed by a close-fitting plug (6).

Dimensions in millimetres



Key

1 Base-plate
2 Cylindrical chamber
3 Test specimen
4 Wing nut
5 Bolts
6 Close-fitting plug

Figure 1 — Apparatus for test with liquid on one surface only

6.2.5.2 Condition test specimens in the “as-received” condition for not less than 3 h at 20 °C ± 2 °C immediately before testing.

6.2.5.3 Place the test specimens in the apparatus as shown in Figure 1. Fill the chamber of the apparatus with the test liquid to a depth of approximately 20 mm and insert the plug (6). Maintain the apparatus at the required temperature of 70 °C ± 2 °C for the duration of the liquid contact of 22 h.

6.2.5.4 At the end of the contact period, remove the test liquid and release the test specimen. Remove any surplus liquid from the surface of the test specimen by blotting with filter paper or a textile fabric which does not deposit lint. Fold the test specimen over so that the surfaces are pressed together, to see if there are any signs of residual tackiness. With the test specimen opened out, a single pass of the finger over the exposed surface shall not produce smearing.

6.2.5.4.1 The liquid to be used as a standard test oil shall be oil No. 1 specified in ISO 1817.

6.2.6 Cold-resistance test

6.2.6.1 The cold-resistance test shall be carried out in accordance with ISO 4675.

6.2.6.2 Test specimens shall be kept at a temperature of $\left(-30\,^{0}_{-5}\right)$ for 1 h prior to testing.

6.2.7 Coating-adhesion test

Adhesion between the coating and the fabric shall be tested in accordance with ISO 2411.

6.2.8 Flex-cracking test

After the specimen has been conditioned by exposing the outer surface to a 2 % by mass solution of brine for seven days at 20 °C ± 2 °C, it shall be tested as described in ISO 7854. After 200 000 flexings, no cracking or delamination shall be visible when inspected under a magnification of × 2.

6.2.9 Airtightness test

NOTE Two alternative test methods, the hydrogen gas method (see 6.2.9.1) or the air-twist porosity test (see 6.2.9.2), may be used for the airtightness test.

6.2.9.1 Hydrogen gas method

6.2.9.1.1 Apparatus

The apparatus shall consist of the Cambridge fabric permeameter or its equivalent. The essential components, properly assembled for the tests, are shown diagrammatically in Figure 2.

6.2.9.1.2 Specimen preparation

Seal a test specimen 150 mm in diameter at the periphery on both surfaces and edge with wax to leave a wax-free central area approximately 120 mm in diameter.

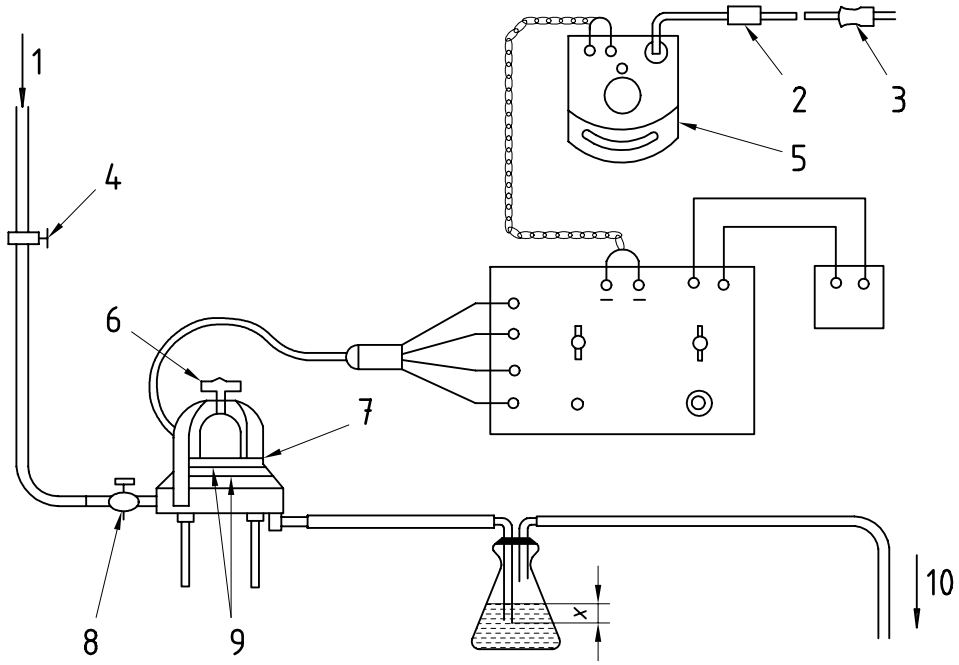
6.2.9.1.3 Test procedure

6.2.9.1.3.1 Subject the apparatus to a preliminary balancing period, to bring the operation onto the straight line portion of a curve of permeability plotted against time. Clamp the specimen between the test plates, start the hydrogen flow and allow it to continue for the duration of the balancing period.

6.2.9.1.3.2 Take the exact moment that the galvanometer spot crosses the zero line as the start of the actual test. Then allow the galvanometer to deflect for the specified period without further balancing; at the end of the specified period, read the permeability directly from the galvanometer scale.

6.2.9.1.4 Report

The permeability shall be expressed in litres of hydrogen per square metre per 24 h, as an arithmetical average of the results obtained from the three specimens tested.



Key

1	Hydrogen inlet	6	Clamp screw
2	Switch	7	Plate-opening cam
3	Source	8	Inlet stop-cock
4	Tube clamp for regulating hydrogen flow	9	Test plates
5	Galvanometer	10	To waste

x 3 cm of water.

Figure 2 — Apparatus for airtightness test: hydrogen gas method

6.2.9.2 Air-twist porosity test

6.2.9.2.1 Apparatus

The required apparatus consists of

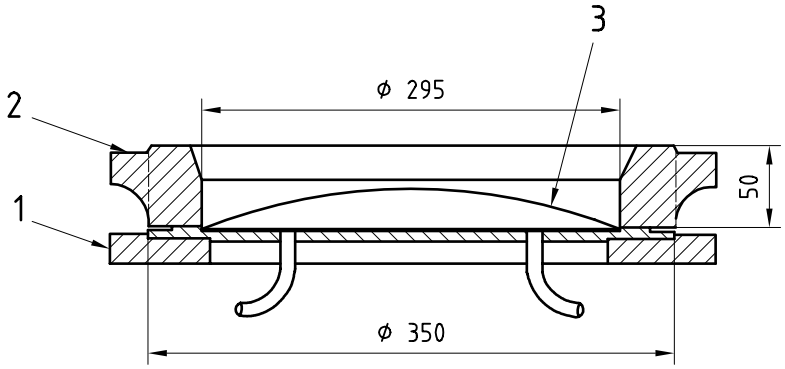
— a mandrel 2 cm in diameter and 50 cm long, and

— a permeameter as shown diagrammatically in Figure 3, where item 1 is a base-plate with a grooved margin for clamping, with an air inlet and a means of connection to a pressure gauge, and item 2 is a grooved mating clamping ring of sufficient depth to permit flooding of the specimen with water. The fabric may be gripped tightly between the clamping ring and base-plate using G-clamps. Alternatively, the ring and base-plate may have eight equally spaced lugs cast on them, drilled to take bolts.

6.2.9.2.2 Test specimens

From the test sample, cut a specimen 400 mm × 440 mm, and dust the outer face evenly with French chalk.

Dimensions in millimetres



Key

1 Base plate with grooved margin
2 Grooved mating clamping ring
3 Fabric specimen

Figure 3 — Apparatus for airtightness test: air-twist porosity method

6.2.9.2.3 Test procedure

6.2.9.2.3.1 Roll the specimen, in the direction of the warp threads, onto the mandrel, with the chalked face next to the mandrel.

6.2.9.2.3.2 Wind a string, tape or wire helically around the rolled test piece to hold it temporarily in position. Withdraw the mandrel and grip 45 mm of each end of the test piece in suitable clamps to leave a length between the clamps of 350 mm.

Preferably, the clamps should be a pair of wave-profile surfaces closed by wing nuts and bolts and having a central hub with a hole in it for upper attachment to support and lower suspension of weight.

6.2.9.2.3.3 Remove the winding and suspend the specimen vertically so that one end cannot rotate.

6.2.9.2.3.4 From the lower clamp, suspend a load of 230 N for single-ply or two-ply fabric, or 360 N for three-ply fabric, and, after 1 min, rotate the movable clamp through 4 turns at an approximate rate of 1 turn in 5 s. Allow the roll to untwist at about the same rate, checking its speed by hand, and, at the same rate as before, rotate through 4 turns in the opposite direction.

6.2.9.2.3.5 Again allow the roll to untwist at about the same rate, remove the load, release the fabric from the clamps, unroll and smooth out the specimen by hand.

6.2.9.2.3.6 From the same specimen, cut a disc 350 mm in diameter and seal at the periphery on both surfaces and the edge by dipping in molten wax to leave a wax-free central test area 290 mm in diameter.

NOTE A mixture of 3 parts petroleum jelly and 1 part beeswax is suitable.

6.2.9.2.3.7 When the wax is set, clamp the specimen, with the outer face uppermost, firmly in the apparatus shown diagrammatically in Figure 3.

6.2.9.2.3.8 Apply and maintain an air pressure of 27,5 kN/m^2 or as otherwise specified beneath the fabric.

6.2.9.2.3.9 Not less than 10 min nor more than 15 min after the pressure has become steady, flood the fabric with water so that the crown of the bulge is immersed to a depth of about 13 mm. Allow it to stand for 1 min and then brush the surface all over with a fairly soft brush to remove adherent air bubbles.

6.2.9.2.3.10 Record zero time and count the number of bubbles breaking the surface of the water within the next 5 min. If the test specimen contains a leak at a single site disregard the result, repeat the test on two further specimens from the same piece and report the occurrence.

6.2.9.2.4 Report

Report the air porosity as the number of bubbles breaking the surface of the water in 5 min.

6.2.10 Ozone-resistance test

This test shall be carried out in accordance with ISO 3011, exposing the side(s) of the fabric intended for exposure to the ambient environment. Three test specimens shall be tested under the following conditions:

— Concentration of ozone: $(50 \times 10^{-6} \pm 5 \times 10^{-6})$ % (parts per 100 million parts of volume)

— Temperature: 30 °C ± 2 °C

— Test time: 72 h

— Mandrel diameter: 5 times the material thickness

6.2.11 Sea-water resistance test

6.2.11.1 A 300 mm × 300 mm test specimen with a seam across the centre produced in accordance with 6.2.4.1 shall be tested in artificial sea water under the following conditions:

— Temperature: 70 °C ± 1 °C

— Mass fraction of salt: 3,3 % to 3,8 %

— Test time: 4 h

— Depth: completely submerged

6.2.11.2 After exposure, the specimen shall be subjected to a tensile test across the seam in accordance with 6.2.1.

6.2.12 Hydrolysis resistance (thermoplastic-coated fabrics only)

6.2.12.1 After storage over water in a closed container at 93 °C for 12 weeks, fabric specimens shall be dried for 1 h at 80 °C, and conditioned at 20 °C, 65 % relative humidity for 24 h.

6.2.12.2 Coating-adhesion samples shall be made up and tested in accordance with 6.2.7. Welded test samples shall be made up and tested in accordance with 6.2.4. The blocking resistance shall be tested in accordance with 6.2.13.

6.2.12.3 Two test samples 100 mm ± 2 mm square shall be cut from the stored material. The samples shall be folded as specified in 6.2.3.3.2 and examined for evidence of cracks, ply separation, stickiness or brittleness.

6.2.13 Blocking resistance

The preparation of specimens and test procedure shall be in accordance with ISO 5978 except that the duration of time under load shall be 24 h.

6.2.14 Ultraviolet resistance

This test shall be performed using either the carbon-arc method (6.2.14.1) or the xenon-arc method (6.2.14.2).

The performance requirements specified in this clause relate to the behaviour of individual specimens under particular conditions of test. As the spectrum of light from the carbon-arc differs from that of the xenon-arc, caution should be exercised in interpreting the test results of both methods.

6.2.14.1 Carbon-arc test

6.2.14.1.1 The test shall be performed in accordance with the methods specified in ISO 4892-4. Expose the conditioned samples to a carbon-arc light source without “Corex D” filters for 100 h. The carbons shall be Copper Clad Sunshine Arc Type, No. 22 for the upper pair and No. 13 for the lower pair, or equivalent. Only the intended outside surface of the fabric shall be exposed to the arc in the testing apparatus. The specimens shall be exposed to water spray, with the apparatus operated so that the specimens are exposed to successive cycles of 102 min of light without spray and 18 min of light with spray. The black panel temperature shall be 79 °C ± 5 °C.

6.2.14.1.2 Test the tensile strength of the material after exposure following the procedure in 6.2.1.

6.2.14.1.3 The exposed material shall be bent, with the more heavily coated side facing out, around a 3,2 mm mandrel and examined visually for cracking.

6.2.14.2 Xenon-arc test

6.2.14.2.1 The test shall be performed in accordance with the methods specified in ISO 4892-2. The specimens shall be exposed under the conditions specified in Table 2, using a controlled-irradiance water-cooled xenon-arc apparatus for a total exposure time of 150 h. Only the intended outside surface of the fabric shall be exposed to the arc.

6.2.14.2.2 Test the tensile strength of the material after exposure following the procedure in 6.2.1.

6.2.14.2.3 The exposed material shall be bent, with the more heavily coated side facing out, around a 3,2 mm mandrel and examined visually for cracking.

Table 2 — Exposure conditions for xenon-arc test

Exposure conditions	Dark cycle (1 h)	Light cycle (2 h)
Automatic irradiance (Filter Q/B)	Nil	0,55 W/m^2 at a wavelength of 340 nm
Black-panel temperature	(38 ± 2) °C	(70 ± 2) °C
Dry-bulb temperature	(38 ± 2) °C	(47 ± 2) °C
Relative humidity	(95 ± 5) %	(50 ± 5) %
Conditioning water	(40 ± 4) °C	(45 ± 4) °C
Water spray	60 min on front and back of specimen	40 min: Nil 20 min: Front of specimen 60 min: Nil

6.2.15 Abrasion resistance

The preparation of specimens and the test procedure shall be in accordance with ISO 5470, using S-35 tungsten carbide abrasion wheels and a vertical force per wheel of 1 000 g. Each test sample shall be subjected to 500 revolutions of the test-piece holder.

6.2.16 Mass per unit area

Determination of the mass per unit area shall be performed in accordance with the method specified in ISO 2286-2.

ICS 47.080

Price based on 12 pages