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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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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