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Ships and marine technology — Fireproof watertight hatch covers

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Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 8, *Ships and marine technology*, Subcommittee SC 8, *Ship design*.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Ships and marine technology — Fireproof watertight hatch covers

1 Scope

This document specifies the classification, flagging, requirements, test methods, inspection rules, markings, packaging, transportation and storage of fireproof watertight hatch covers installed on decks (hereafter referred to as "hatch covers").

This document applies to the design, manufacture and acceptance of fireproof watertight hatch covers installed on decks of ships where anticipated water pressure by wave is up to 10 m.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 8501-1, *Preparation of steel substrates before application of paints and related products — Visual assessment of surface cleanliness — Part 1: Rust grades and preparation grades of uncoated steel substrates and of steel substrates after overall removal of previous coatings*

IEC 60529, *Degrees of Protection provided by enclosures (IP Code)*

IMO *International Convention for the Safety of Life at Sea (SOLAS),* 1974*, and its Protocol of 1988, as amended*

IMO *International Code for Application of Fire Test Procedures,* 2010 *(2010 FTP Code), Resolution 307(88), as amended*

3 Terms and definitions

No terms and definitions are listed in this document.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

4 Classification and designation

4.1 Types

4.1.1 Based on their shape, watertight hatch covers shall be classified into the two following types:

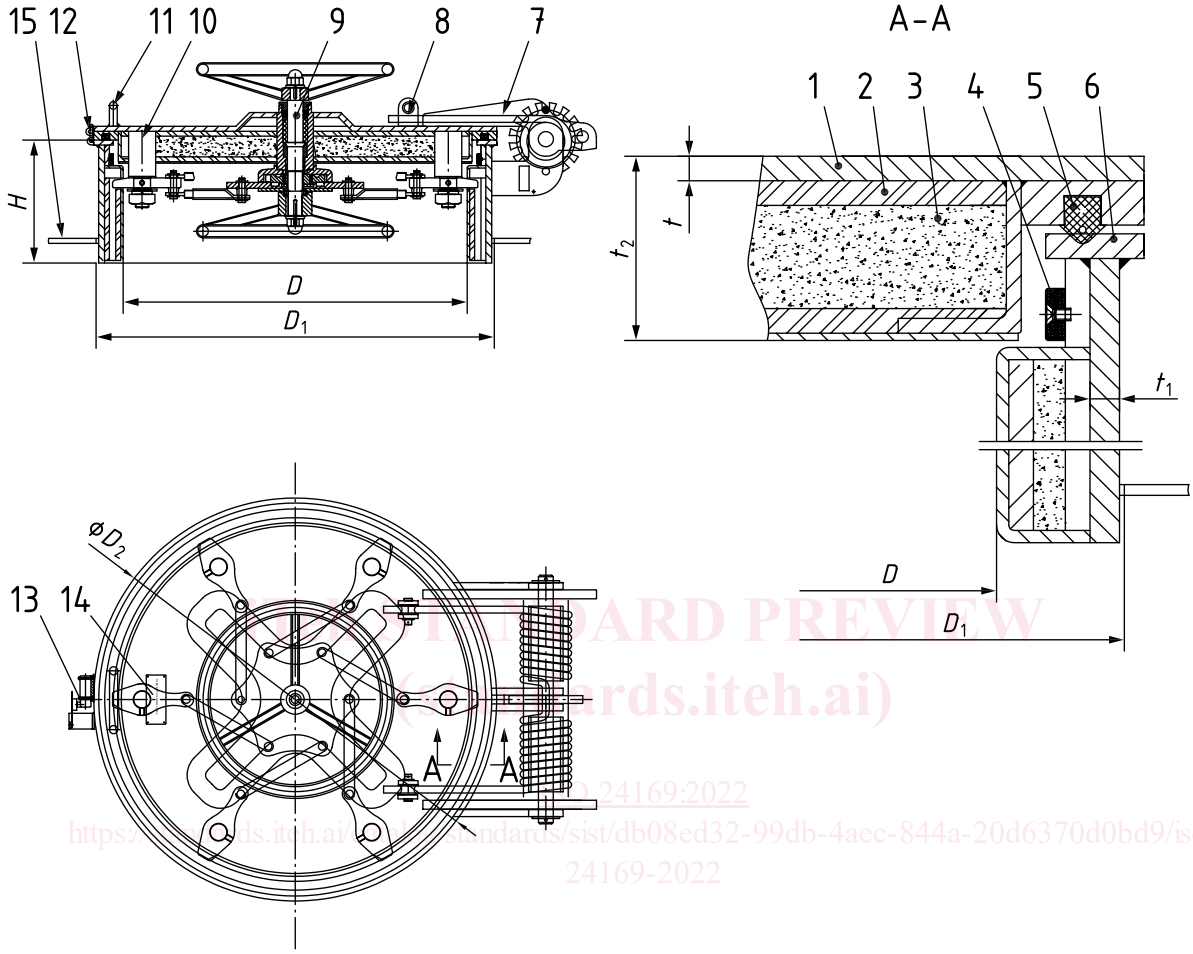
— A-type (round hatch cover);

— B-type (square or rectangular hatch cover).

4.1.2 According to the fire-protection rating, watertight hatch covers shall be classified into three levels: A-60, A-30, and A-0.

4.2 Structure and main dimensions

4.2.1 Examples of the structure and main dimensions of A-type hatch covers are shown in Figure 1 and Table 1.



Key

1	cover plate	9	central opening device
2	insulation plate	10	dog device
3	insulation	11	handle
4	fireproof bar	12	lock catch
5	seal ring	13	limit switch
6	coaming	14	warning sign
7	spring hinge	15	deck
8	link rod		

H is the height of the hatch cover coaming. H can be designed according to users practice.

t_2 is the thickness of the hatch cover. t_2 shall be no more than 75 mm, and shall be designed based on fire-protection rating.

t is the thickness of cover plate. t can be designed based on water pressure.

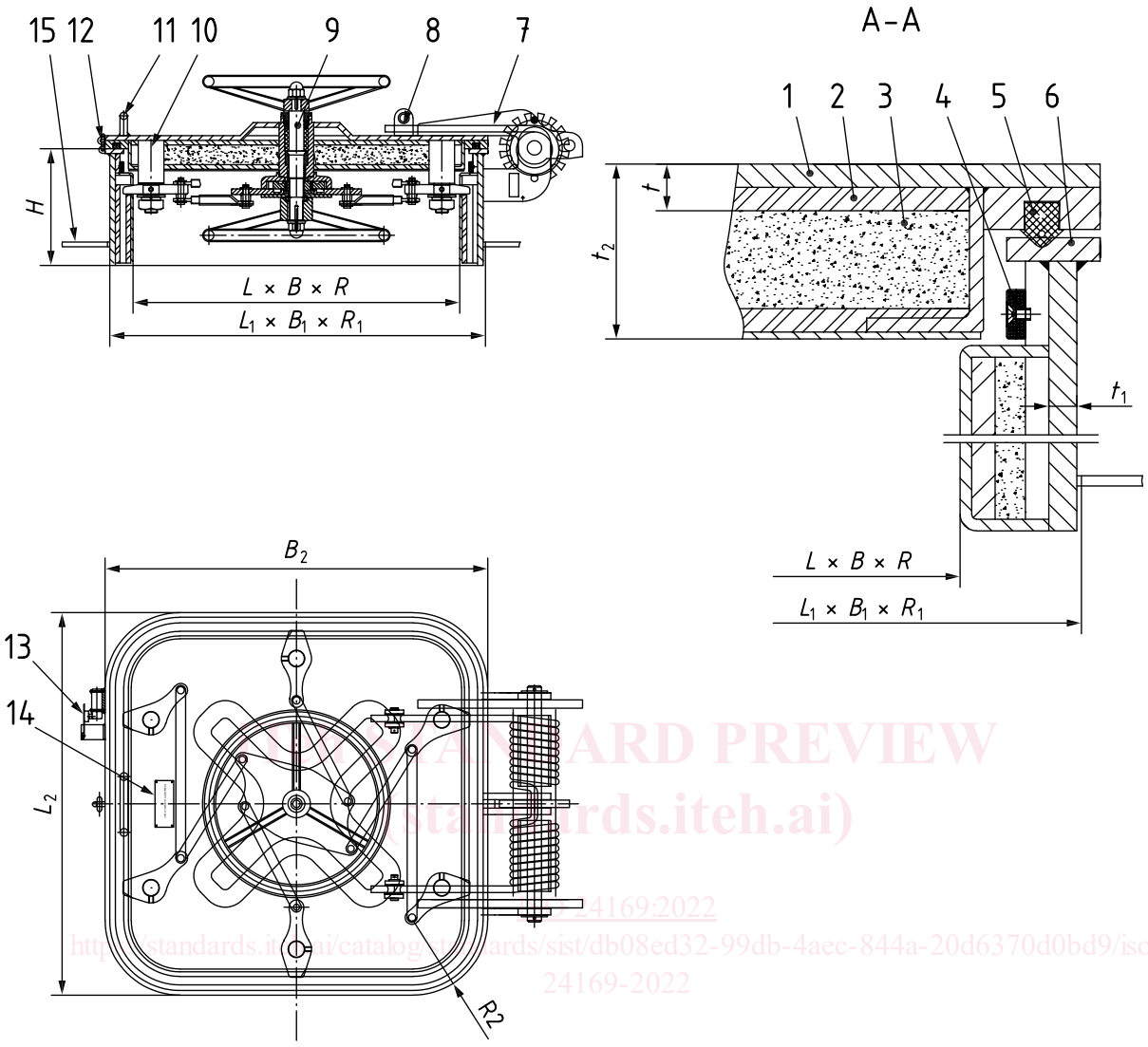
Figure 1 — Examples of structure of A-type hatch covers

Table 1 — Examples of main dimensions of A-type hatch covers

Dimensions in millimetres

Nominal size D	Deck opening size D_1	Cover outer dimension size D_2
⌀630	⌀730	⌀750
⌀730	⌀830	⌀850
⌀830	⌀930	⌀950

4.2.2 Examples of the structure and main dimensions of B-type hatch covers are shown in Figure 2 and Table 2.



Key

1	cover plate	9	central opening device
2	insulation plate	10	dog device
3	insulation	11	handle
4	fireproof bar	12	lock catch
5	seal ring	13	limit switch
6	coaming	14	warning sign
7	spring hinge	15	deck
8	link rod		

H is the height of the hatch cover coaming. H can be designed according to users practice.

t_2 is the thickness of the hatch cover. t_2 shall be no more than 75 mm, and shall be designed based on fire-protection rating.

t is the thickness of the cover plate. t can be designed based on water pressure.

Figure 2 — Examples of structure of B-type hatch covers

Table 2 — Examples of main dimensions of B-type hatch covers

Dimensions in millimetres

Nominal size $L \times B \times R$	Deck opening size $L_1 \times B_1 \times R_1$	Cover outer dimension size $L_2 \times B_2 \times R_2$
630 × 630 × 100	730 × 730 × 150	750 × 750 × 160
630 × 830 × 100	730 × 930 × 150	750 × 950 × 160
830 × 830 × 100	930 × 930 × 150	950 × 950 × 160
1 030 × 1 030 × 100	1 130 × 1 130 × 150	1 150 × 1 150 × 160
830 × 1 230 × 100	930 × 1 330 × 150	950 × 1 350 × 160
1 230 × 1 230 × 100	1 330 × 1 330 × 150	1 350 × 1 350 × 160
1 330 × 1 330 × 100	1 430 × 1 430 × 150	1 450 × 1 450 × 160

4.2.3 Fireproof watertight hatch covers conforming to this document shall be designated as follows, in the order given:

a) type: hatch cover B or hatch cover A;

b) nominal size;

c) thickness of the cover plate;

d) thickness of coaming;

e) height of coaming.

EXAMPLE The designation of a B-type hatch cover with nominal size 830 mm × 830 mm × 100 mm, thickness of the cover plate 8 mm, thickness of coaming 8 mm and height of coaming 250 mm is:

Hatch cover B 830×830×8-8×250

5 Materials

5.1 The cover plate and coaming shall be manufactured from shipbuilding steel with a minimum tensile strength of *340 N/mm^2, or from materials with an equivalent strength.

5.2 The hinge shall be manufactured from materials with a minimum tensile strength of *340 N/mm^2.

5.3 Opening devices and hinge pins shall be manufactured from materials with a minimum tensile strength of *350 N/mm^2.

5.4 For ships adhering to the rules of a classification society, the material marked with (*) shall conform to the requirements of the society.

5.5 Fireproof materials shall be suitable for the marine environment, and shall meet the fire-protection rating requirements in accordance with SOLAS and the IMO FTP Code.

6 Quality of manufacture

6.1 The surface of hatch covers shall be free from burrs, sharp edges, scratches, press marks and other defects, and the welded seam shall be smooth and free from cavities, cracks, slag entrapments, undercuts, incomplete fusion and other defects.

6.2 The cover plate, coaming and its attachments shall not have any deformation. Hatch covers shall be treated as grade Sa2½ or grade St2 and coating anti-rust primer in compliance with the requirements of ISO 8501-1.

6.3 Hatch covers shall be capable of being opened and closed easily without obstruction, and the moving parts shall be maintained in good working condition.

6.4 Fire resistance properties of hatch covers shall comply with that of an "A" class fire door in IMO Resolution MSC.307 (88)-(2010 FTP Code) Annex 1, Part 3, as amended. In addition, the maximum temperature rise measured along the hatch coaming shall not exceed 180 °C for the required test duration. The fire testing and instrumentation requirements for hatch covers shall be in accordance with 7.2 of this document.

6.5 Hatch covers shall have no leakage under a water pressure of 0,1 MPa.

7 Test

7.1 Operate the hatch cover by opening and closing it twice in a row, to check the agility of the opening device and the hinge. The requirements in 6.3 shall be met.

7.2 Fire resistance properties of hatch covers shall be verified generally in accordance with the fire testing and instrumentation requirements of an "A" class fire door in IMO Res. MSC.307 (88)-(2010 FTP Code) Annex 1, Part 3, Appendix 1, paragraphs 2.3 and 7.6.3 respectively and additional requirements specified in 7.2.1. to 7.2.2 of this document. The result shall meet the requirements in 6.4 of this document.

7.2.1 As higher temperatures may be expected along the hatch coaming, additional thermocouples shall be placed directly on the hatch coaming 25 mm from the fire unexposed surface of the cover plate, provided that the thermocouples are at least 100 mm away from the gap between the edge of the hatch leaf and frame. Where this is not possible because the coaming does not extend 25 mm from the deck, or where the thermocouples are closer than 100 mm from the gap between the hatch leaf edge and frame, such thermocouples shall be placed directly on the deck plate 100 mm away from the coaming. Each of the thermocouples (minimum of four) shall be placed at the centre of each side of the coaming or corresponding location on the deck.

7.2.2 These thermocouples are additional to those required to be provided on the hatch cover/lid, stiffeners and/or any other special features in accordance with 2010 FTP Code Annex 1, Part 3, Appendix 1, paragraph 7.6.3.

7.3 Install the hatch cover on a dedicated water pressure test box, increase the water pressure within the test box to 0,10 MPa, and keep it for 5 min, then release the water pressure. The requirements in 6.5 shall be met.

8 Status display

8.1 In case local indicators and indicators located at the central control console in the navigation bridge are provided to indicate the status of each hatch cover, the indicators shall be regular indicators together with a sound and light warning function:

a) when the cover is fully open, the red light shall be on;

b) when the cover is fully closed, the green light shall be on;

c) if the hatch cover dogs are loose, an indicator shall display a sound and light alarm.