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Ships and marine technology — Hydrostatic release units

Navires et technologie maritime — Dispositifs de largage hydrostatique

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Foreword

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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 15734 was prepared by Technical Committee ISO/TC 8, *Ships and marine technology*, Subcommittee SC 1, *Lifesaving and fire protection*.

Ships and marine technology — Hydrostatic release units

1 Scope

This International Standard specifies performance and testing requirements for hydrostatic release units used in conjunction with float-free lifesaving appliances including inflatable liferafts and Emergency Position Indicating Radio Beacons (EPIRB 's). Hydrostatic release units which comply with this International Standard and which have been formally approved by the cognizant Maritime Safety Administration may be considered to comply with the 1974 Safety Of Life At Sea Convention (SOLAS 74) and the IMO Life-Saving Appliances Code, as amended.

2 Normative reference

The following normative document contains 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 edition of the normative document 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 9227:1990, *Corrosion tests in artificial atmospheres — Salt spray tests*.

3 General requirements

3.1 Construction

A hydrostatic release unit used in the float-free arrangements of a survival craft or EPIRB shall be so constructed that

— the materials used are compatible so as to prevent malfunction of the unit; particular care shall be taken to ensure that metallic-coated parts are not used where damage to the coating from contact with other parts could adversely affect the functioning of the unit,

— it has drains to prevent the accumulation of water in the hydrostatic chamber when the unit is in its normal position,

— each structural part connected to the painter system has a strength not less than that required by the painter,

— it can readily be removed for replacement or annual servicing,

— materials and components shall be corrosion-resistant and not affected by seawater, oil or detergents,

— it can function properly throughout an air temperature range of $-30\ ^{\circ}C$ to $+65\ ^{\circ}C$,

— it can function properly throughout a seawater temperature range of $-1\ ^{\circ}C$ to $+30\ ^{\circ}C$,

— it can automatically release the float-free lifesaving appliance at a depth of not more than 4 m, and

— it cannot release prematurely when seawater washes over the unit.

3.2 Markings

The unit shall be marked permanently on its exterior with

— its manufacturer, type, and serial number,

— a means of identifying its date of manufacture,

— the maximum-capacity liferaft with which the unit may be used, if the unit has such a limitation, and

— a means of indelibly marking its date of expiry, if it is of the disposable type.

3.3 Servicing record plate

If the unit is of a type which requires annual servicing, it shall be provided with a permanently attached plate to maintain a record of servicing.

3.4 Operating and maintenance instructions

Operating and maintenance instructions and information shall be provided in a clear and concise form in the appropriate language or languages and shall include the following:

— general description of the unit;

— installation instructions;

— any on-board maintenance requirements;

— servicing requirements.

3.5 Weak link

3.5.1 Materials

A weak link used in conjunction with a hydrostatic release unit in a float-free arrangement shall

— be made from a material which is corrosion-resistant and not affected by seawater, oil or detergent,

— have the ends either whipped or heat treated, when made of cordage, and

— have each end looped around a thimble and secured with a locking ferrule, when made from a flexible wire.

3.5.2 Strength

A weak link used in conjunction with a hydrostatic release unit in a float-free arrangement of an inflatable liferaft shall be of sufficient strength to

— pull the painter out of the liferaft container,

— operate the liferaft inflation system, and

— break under a tensile force of between 1,8 kN and 2,6 kN.

4 Prototype tests

4.1 Technical tests

4.1.1 Testing sequence

At least two prototype hydrostatic release units shall be tested in the sequence listed below. No parts may be renewed or repaired between the tests.

a) Corrosion-resistance test (4.1.2).

b) Temperature cycling test (4.1.3).

c) Submergence and manual release test (4.1.4).

d) Strength test (4.1.5).

e) Membrane-material technical tests (4.1.6).

4.1.2 Corrosion resistance test

The hydrostatic release units shall be exposed to a salt water spray test (5 % sodium chloride solution) in accordance with ISO 9227, at a temperature of $+ 35\ ^{\circ}C \pm 3\ ^{\circ}C$ for 160 h without interruption. After completion, the hydrostatic release units shall show no corrosion which could affect their efficient functioning, and shall then be subjected to the following tests, after which they shall continue to function efficiently.

4.1.3 Temperature tests

4.1.3.1 The hydrostatic release units shall be alternately submitted to surrounding temperatures of $- 30\ ^{\circ}C$ and $+ 65\ ^{\circ}C$. These alternating half-cycles need not follow immediately after each other, and the following procedure is acceptable:

— an 8 h half-cycle at 65 °C to be completed in one day;

— the units removed from the hot chamber and left exposed under normal room conditions until the next day;

— an 8 h half-cycle at $- 30\ ^{\circ}C$ to be completed in one day;

— the units removed from the cold chamber and left exposed under normal room conditions until the next day;

— repeat the above procedure for a further nine cycles.

4.1.3.2 On completion, the release shall be capable of being released manually if it is designed for manual release.

4.1.3.3 Following the temperature cycling, as specified in 4.1.3.1, one hydrostatic release unit shall be taken from a stowage temperature of $- 30\ ^{\circ}C$ and shall operate in seawater at a temperature of $- 1\ ^{\circ}C$. Another hydrostatic release unit shall be taken from a stowage temperature of $+ 65\ ^{\circ}C$ and shall then operate in seawater at a temperature of $+ 30\ ^{\circ}C$.

4.1.4 Submergence and manual release test

4.1.4.1 Each hydrostatic release unit submerged in water or a water-filled pressure-testing tank shall, when a buoyant load equal to its designated capacity is applied, release at a depth of between 1,5 m and 4 m. On completion of these tests and resetting, the hydrostatic release unit shall be capable of being released manually if it is designed to allow manual release of the unit. It shall then be opened for inspection and shall show no significant signs of corrosion or degradation.

4.1.4.2 On being opened up for inspection, the unit shall show no significant signs of corrosion or degradation which could affect its efficient functioning.

4.1.5 Strength test

Each hydrostatic release unit, if intended to form part of the painter system of a liferaft, shall be subjected to a tensile load of at least 10 kN for a period of 30 min. If the release is to be fitted to a liferaft approved to carry more than 25 persons, the tensile load shall be increased to 15 kN. On completion, the unit, if designed with a manual release, shall be capable of being released manually.

4.1.6 Membrane-material tests for temperature resistance

4.1.6.1 Requirements

Two membranes shall show no visible signs of cracking when tested for resistance to cold and heat as specified in 4.1.6.2 and 4.1.6.3, respectively.

4.1.6.2 Resistance to cold

— Temperature: − 30 °C.

— Exposure time: 30 min.

— Flex testing: 180° (stretching both inside and outside face).

4.1.6.3 Resistance to heat

— Temperature: + 65 °C.

— Exposure time: 7 days.

4.1.7 Resistance to oil, seawater, and detergent tests

4.1.7.1 Requirements

Two membranes shall show no signs of any deterioration when tested for resistance to oil, seawater and detergent as specified in 4.1.7.2 to 4.1.7.4.

4.1.7.2 Surface resistance to oil

— Temperature: +18 °C to 20 °C.

— Type of oil: ASTM Oil No. 1 or No. 5, or ISO Oil No. 1.

— Exposure time: 3 h on each side.

4.1.7.3 Resistance to seawater

Two membranes shall be immersed in a 5 % sodium chloride solution at +18 °C to 20 °C for a period of 7 days.

4.1.7.4 Resistance to detergents

Two membranes shall be immersed in at least three different typical ship detergent solutions at +18 °C to 20 °C for a period of 7 days.

4.2 Performance test

4.2.1 This test shall be performed using the smallest and the largest liferafts, or the EPIRB, with which the hydrostatic release unit may be used. If the occupant range between the smallest and largest liferaft exceeds 25 persons, the intermediate-size liferaft shall also be tested.

In the case of a liferaft, place a liferaft horizontally into a rack with its painter line and the hydrostatic release unit arranged as fitted on board a ship.

In the case of an EPIRB, install the EPIRB and the hydrostatic release unit on a rack, arranged as fitted on board a ship.

Attach sufficient weight to the rack to submerge the raft or EPIRB, then lower it into the water of depth at least 5 m in the orientations as specified in a) to d) (see Figure 1; liferaft only shown for clarity):

a) Horizontally;

b) Tilted 45° and then 100° with the hydrostatic release unit at the upper side;

c) Tilted 45° and then 100° with the hydrostatic release unit at the lower side;

d) Vertically.

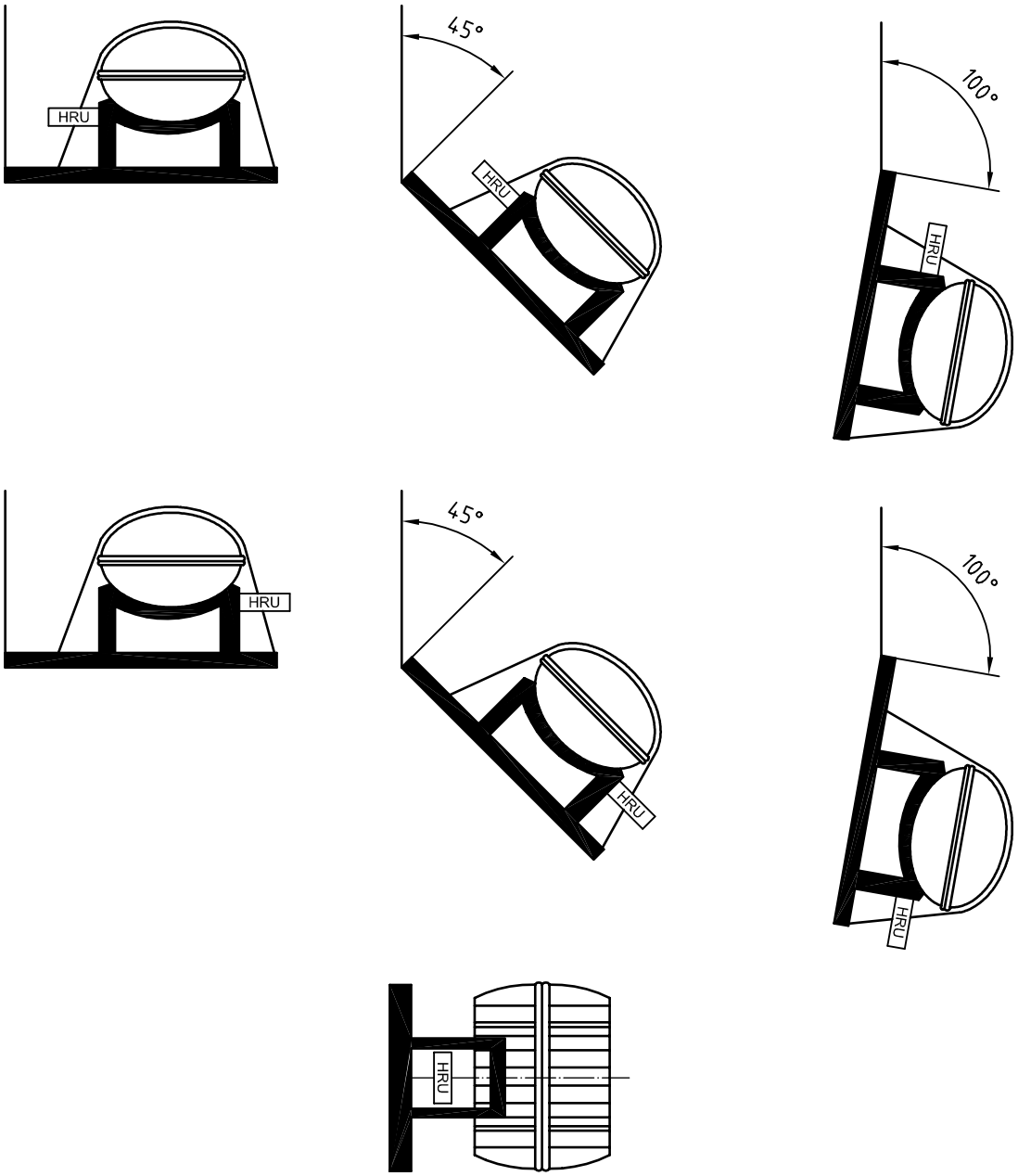

Figure 1 — Performance test

4.2.2 Under each of these conditions, the hydrostatic release unit shall release the liferaft or EPIRB at a depth of between 1,5 m and 4 m.

4.3 Weak-link tensile test

4.3.1 Using a dynamometer, a weak link assembled as fitted in the float-free arrangements of a lifesaving appliance shall be tensile tested until it breaks.

4.3.2 The test shall be repeated on a minimum of 5 weak links.

4.3.3 All 5 weak links shall break within the range of 1,8 kN to 2,6 kN.

5 Production tests

5.1 Requirements

Production tests for hydrostatic release units shall be performed in accordance with 5.2 and 5.3, and for associated weak links as specified in 5.4.

5.2 Visual and dimensional examination

A random sample of units shall be selected from each assembled lot in accordance with Table 1. The selected samples shall undergo an examination of visual and dimensional characteristics by comparison to their approved plans, with their acceptance based upon Table 1.

Table 1 — Sampling for visual and dimensional examination

No. of units in production lot (defectives)	No. of units in sample	Rejection No.
15 and under	All	
16 to 25	15	1
26 to 40	25	1
41 to 110	35	2
111 to 180	50	2
181 to 300	75	3
301 to 500	110	2

5.3 Submergence test

5.3.1 Reusable units

Each reusable hydrostatic release unit in a production lot shall be tested by applying a buoyant load of its designed capacity while the device is submerged in water or in a water-filled pressure-testing tank. The unit shall automatically release the load at a depth of less than 4 m. The unit shall be reassembled and, if fitted with a manual release, shall be released manually. Units which do not pass this submergence test shall be removed from the production lot as unacceptable, but may be reworked and included in a subsequent lot.

5.3.2 Disposable units

A random sample of units shall be selected from each assembled lot in accordance with Table 2. Each unit selected shall be tested in accordance with 5.3.1, except it is not required that the unit be reassembled after the test. Any failures shall cause the entire production lot to be rejected.

Table 2 — Disposable-unit submergence test sampling

No. of units in production lot (defectives)	No. of units in sample	Rejection No.
15 and under	4	1
16 to 25	5	1
26 to 40	7	1
41 to 110	10	1
111 to 180	12	1
181 to 300	16	1
301 to 500	20	1

5.4 Weak-link tensile test

A random sample of not less than five weak links from each production batch, assembled as fitted on a ship, shall be tested using a dynamometer until they break. If any one of the five weak links breaks outside the designed limits of 1,8 kN to 2,6 kN, the whole batch shall be rejected.

6 Installation inspection

6.1 The hydrostatic release unit shall be fitted to a float-free lifesaving appliance strictly in accordance with the manufacturer's instructions.

6.2 On installation on board a ship, it shall be checked that

— the hydrostatic release unit is not permanently secured to the deck and can be removed for servicing or replacement,

— in the case of a liferaft, the weak link, if used, cannot become part of the painter system until the liferaft has floated free, and

— it shall be possible to release the float-free lifesaving appliance without the use of tools.

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