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Ships and marine technology — Sea anchors for survival craft and rescue boats

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Foreword

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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 17339 was prepared by Technical Committee ISO/TC 8, *Ships and marine technology*, Subcommittee SC 1, *Lifesaving and fire protection*.

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Ships and marine technology — Sea anchors for survival craft and rescue boats

1 Scope

This International Standard specifies requirements for the design, performance and prototype testing of sea anchors fitted to survival craft (lifeboats and liferafts) and rescue boats in accordance with the IMO *International Life-Saving Appliance Code*.

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, this publication 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.

IMO *International Life-Saving Appliance (LSA) Code*¹⁾

3 Term and definition

For the purposes of this International Standard, the following term and definition applies.

3.1

sea anchor

device to stabilize the motion and to reduce wind-driven drift of a waterborne craft

4 Design and performance criteria

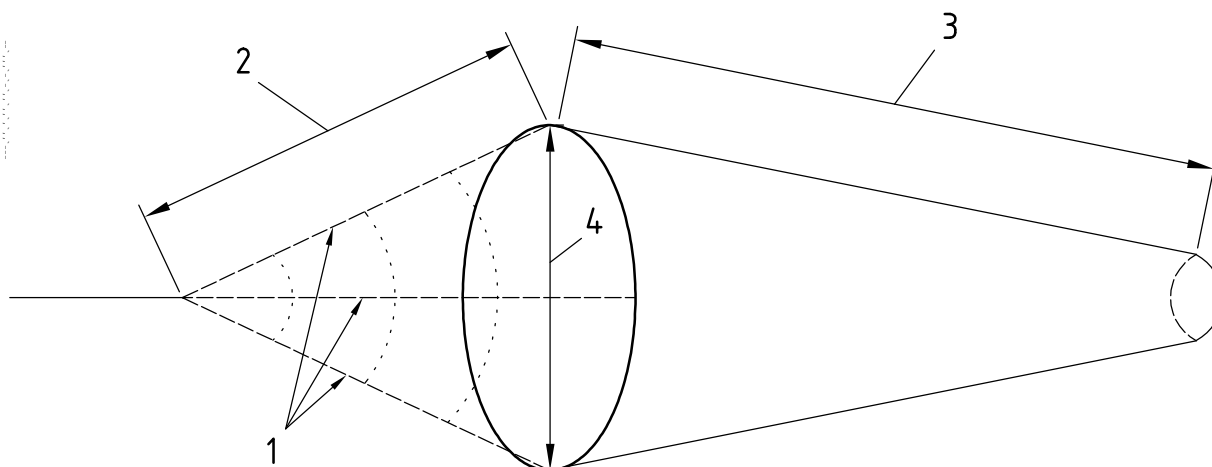
4.1 A sea anchor shall generally be in the form of a cone or a truncated cone, as specified in Figure 1 and Table 1. Alternative designs that meet all of the performance requirements of this International Standard may be accepted. A sea anchor shall develop the minimum drag forces specified in Table 2, when tested in accordance with 5.2.

4.2 The fabric used in the construction of the sea anchor shall be porous and rotproof, and shall allow a water penetration of between 100 l/s/m² and 120 l/s/m² when tested in accordance with 5.4.

4.3 The towing line used to secure the sea anchor to a survival craft or rescue boat shall be inherently rotproof and of braided construction. It shall be at least 30 m long, not less than 8 mm in diameter and have a breaking load including attachments and knots of not less than:

- 7,5 kN for liferafts of capacity up to 10 persons;
- 10,0 kN for liferafts of capacity 11 persons to 25 persons; or
- 10,0 kN for all other sea anchors, or have a safety factor of 3:1 based on a towing strain at 6 kn, whichever is the greater.

1) Available from the International Maritime Organization.



Key

- 1 Shroud lines
- 2 Shroud length
- 3 Slope length
- 4 Mouth diameter, D

Figure 1 — Sea-anchor geometry (typical)

Table 1 — Design criteria (typical)

| Craft | Sea anchor | | Minimum shroud length mm |
|---|-----------------------------------|----------------------------|-----------------------------|
| | Minimum mouth diameter, D mm | Minimum slope length mm | |
| Liferafts of capacity up to 10 persons | 400 | 600 | 600 |
| Liferafts of capacity 11 persons up to 25 persons | 500 | 670 | 670 |
| Liferafts of capacity 26 persons up to 75 persons Lifeboats and rescue boats up to 6 m in length | 600 | 780 | 780 |
| Liferafts of capacity 76 persons up to 150 persons Lifeboats and rescue boats over 6 m and up to 9 m in length | 700 | 920 | 920 |
| Lifeboats over 9 m in length | 800 | 1 050 | 1 050 |

- 4.4** The shroud lines shall be designed to restrict the sea anchor from tumbling through itself.
- 4.5** The sea anchor shall be stable when towed through the water at speeds up to 6 kn.
- 4.6** The sea-anchor mouth shall open immediately on deployment from its packed condition and shall remain open.
- 4.7** The sea-anchor mouth shall be reinforced by a corrosion-resistant ring that regains its ring form regardless of the packed shape.

Table 2 — Required drag force by craft type and size

| Craft | Minimum required drag force at indicated speed | | |
|---|--|---------|---------|
| | 1,5 kn | 3 kn | 6 kn |
| Liferafts of capacity up to 10 persons | 135 N | 350 N | 900 N |
| Liferafts of capacity 11 persons up to 25 persons | 210 N | 545 N | 1,40 kN |
| Liferafts of capacity 26 persons up to 75 persons Lifeboats and rescue boats up to 6 m in length | 303 N | 785 N | 2,00 kN |
| Liferafts of capacity 76 persons up to 150 persons Lifeboats and rescue boats over 6 m and up to 9 m in length | 410 N | 1,07 kN | 2,75 kN |
| Lifeboats over 9 m in length | 540 N | 1,40 kN | 3,60 kN |

5 Prototype testing

5.1 Deployment test

A sea anchor, in its packed condition, with its full length of line shall be thrown into water, for example a swimming pool, or from a jetty into the sea. The mouth of the sea anchor shall open up immediately, and remain open.

5.2 Towing test

5.2.1 A fully deployed sea anchor shall be towed over a distance of at least 500 m at a speed of 1 kn to 6 kn. The sea anchor shall be observed throughout the towing test and shall remain stable, not breaking through the surface of the water. On completion, the sea anchor and attachments shall be examined and shall not show any signs of deterioration or damage.

5.2.2 With a tension tester (e.g., load cell or spring balance) fitted in the tow line, the sea anchor shall again be towed over a distance of at least 500 m and the tensile force in the line recorded at speeds of 1,5 kn, 3 kn and 6 kn. If there is a current running, the force shall be recorded in each direction and the mean taken. The drag force measured in the tow line shall comply with Table 2.

5.2.3 With a tension tester (e.g., load cell or spring balance) fitted in the tow line, the sea anchor shall be towed at 6 kn for at least 20 s or until a steady drag-force reading is obtained, whichever is longer. The drag force measured in the tow line shall be not less than that specified in Table 2. The power to the boat shall then be cut. After 20 s the power shall be reapplied until the sea anchor is again being towed at 6 kn or until a steady drag-force reading is obtained, whichever is longer. During the second and subsequent test cycles, the drag-force measured in the tow line shall be not less than that specified in Table 2. This procedure shall be repeated until 20 cycles have been completed. At the end of 20 cycles, the sea anchor shall be examined. The sea anchor shall not be tangled in its shroud lines or turned inside out.

5.3 Strength test

To demonstrate the strength of the sea anchor and its attachments to the shroud and towing line, the anchor shall be uniformly loaded internally with weight as indicated in Table 3. The sea anchor shall then be suspended by at least 2 m of towing line for a period of 6 h. On completion, the anchor, shroud lines and all attachments shall be carefully examined and there shall not be any visible signs of any damage.

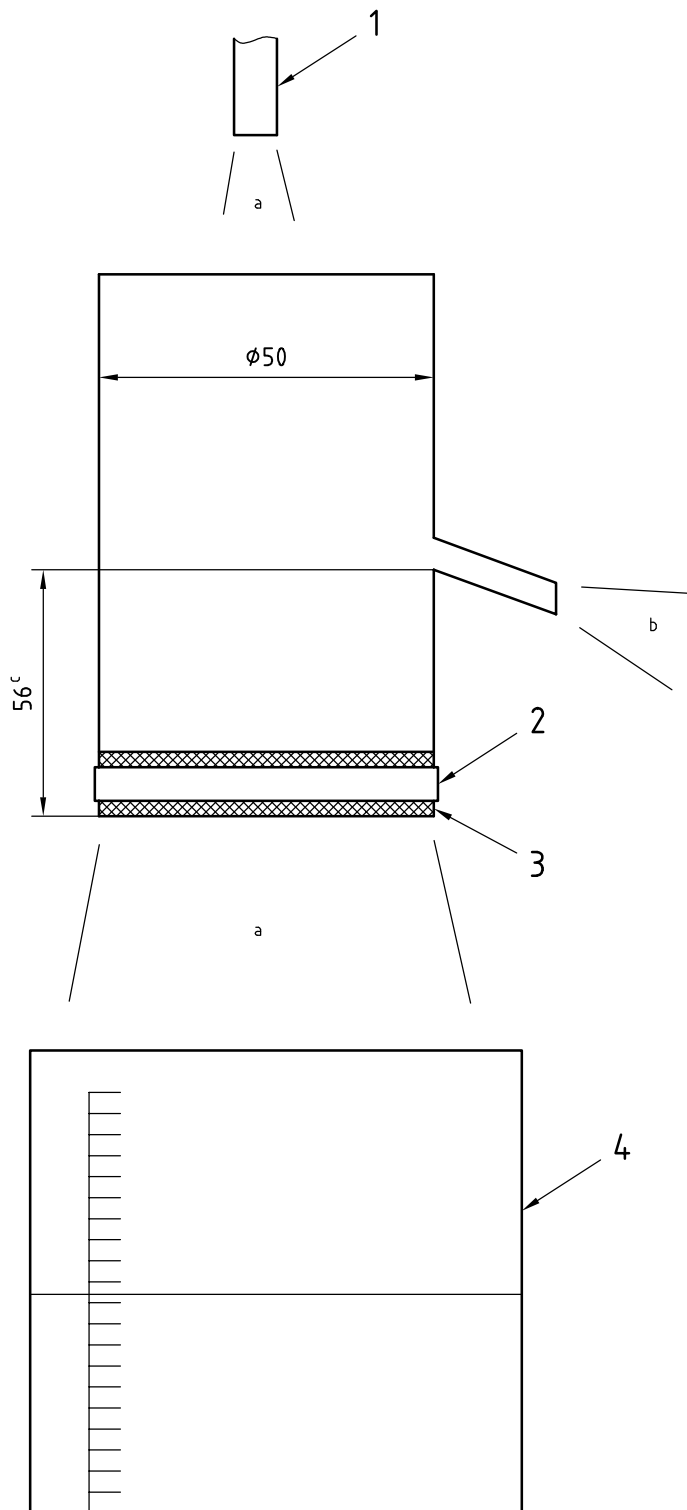
5.4 Porosity test

The material used in the manufacture of the sea anchor shall be tested for porosity by attaching it to the open end of a pipe with 50 m internal diameter as shown in Figure 2. Water shall be supplied to the apparatus at a rate of 0,24 L/s. The test shall be carried out over at least 10 s and repeated five times using a different sample of material each time, the average value being taken as the flow rate. An accuracy of $\pm 10\%$ shall be considered acceptable.

Table 3 — Strength test by size

| Sea anchor for craft of indicated size | Weight for strength test |
|---|--------------------------|
| Liferafts of capacity up to 10 persons | 900 N |
| Liferafts of capacity 11 persons up to 25 persons | 1,4 kN |
| Liferafts of capacity 26 persons up to 75 persons Lifeboats and rescue boats up to 6 m in length | 2,0 kN |
| Liferafts of capacity 76 persons up to 150 persons Lifeboats and rescue boats over 6 m and up to 9 m in length | 2,75 kN |
| Lifeboats over 9 m in length | 3,6 kN |

Dimensions in millimetres



Key

- 1 Water-supply pipe
- 2 Hose clamp
- 3 Material under test
- 4 Calibrated 2,2 L container

- a Water flow
- b Surplus water discharge
- c Head of water equivalent to a speed of 2 kn

Figure 2 — Test set-up to determine the porosity of the sea-anchor material

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