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Ships and marine technology — Embarkation ladders

Navires et technologie marine — Échelles d'embarcation

[Revision of second edition (ISO 5489:1986)]

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Foreword

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ISO 5489 was prepared by Technical Committee ISO/TC 8, *Ships and Marine Technology*, Subcommittee SC 1, *Lifesaving and Fire Protection*.

This third edition cancels and replaces the second edition (ISO 5489:1986), of which it constitutes a complete revision in order to take into account new designs and manufacturing methods for embarkation ladders which have entered the market since 1986.

Introduction

This International Standard is intended to supplement existing IMO requirements for embarkation ladders. Since IMO instruments do not include specific requirements for prototype testing of embarkation ladders for approval, those tests included in this standard are in excess of the existing IMO requirements. The inclusion of these tests was considered necessary in order to provide a means of ensuring conformance of embarkation ladders with the performance requirements prescribed in IMO instruments and in this International Standard.

Ships and marine technology — Embarkation ladders

1 Scope

This International Standard specifies requirements for a ship's embarkation ladder which is provided to enable safe embarkation of waterborne survival craft along a vertical portion of the ship's hull. It is applicable to merchant ships required to carry embarkation ladders under Chapter III of the 1974 International Convention for the Safety of Life at Sea (SOLAS), as amended. National maritime safety administrations are urged to accept ladders complying with this International Standard on their ships, as complying fully with the requirements of SOLAS.

2 Normative reference(s)

The following referenced documents are indispensable for the application 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 209-1:1989, *Wrought aluminium and aluminium alloys – Chemical composition and form of products – Part 1: Chemical composition*

ISO 877:1994, *Plastics -- Methods of exposure to direct weathering, to weathering using glass-filtered daylight, and to intensified weathering by daylight using Fresnel mirrors*

ISO 1181:1990, *Ropes -- Manila and sisal -- Specification*

ISO 1461:1999, *Hot dip galvanized coatings on fabricated iron and steel articles – Specifications and test methods*

3 Materials

3.1 Wooden parts

Each wooden part shall be made of hardwood (ash, oak, elm, beech or teak) free from knots.

3.2 Side ropes

3.2.1 Each side rope shall be mildew-resistant manila rope meeting ISO 1181, Quality 1, or a spun thermoset polyester rope with a polypropylene core of a color that contrasts with the spun polyester. Each side rope shall have a breaking strength of at least 24 kN, and a nominal diameter of 18 mm (57 mm circumference).

3.2.2 Alternative side ropes of synthetic material may be used if they:

a) meet the breaking strength and size requirements of 3.2.1;

b) are at least as resistant to elongation under load as the standard ropes described in 3.2.1;

c) have an exterior surface suitable for grasping with bare hands, similar to manila or spun polyester;

d) are of a thermoset polymer, resistant to deterioration from ultraviolet light; and

e) provide a visual indication of excessive wear, similar to the spun polyester/polypropylene construction described in 3.2.1.

3.3 Metallic materials

3.3.1 Each metal fastener shall be made of material which is inherently corrosion-resistant, or treated to be corrosion-resistant.

3.3.2 Each ferrous metal part which is not stainless steel, shall be coated in accordance with ISO 1461.

3.3.3 Each stainless steel part shall be of a marine grade alloy with a corrosion resistance at least equal to grade 316[1] .

3.3.4 Each aluminium part shall be 5254 or 5652 alloy, or other grade containing not more than 0,06% copper, in accordance with ISO 209-1.

3.3.5 Metals in contact with each other shall be galvanically compatible, or insulated to prevent galvanic corrosion in a marine environment.

3.4 Mechanical fastening devices

Each mechanical fastening device securing a part of a ladder shall have a locking mechanism to prevent the device from loosening.

3.5 Plastic materials

Each plastic material shall be of a type that retains at least 30 percent of its original tensile strength and at least 80 percent of its original impact strength when subjected to the one year outdoor weathering test described in Method A of ISO 877:1994.

3.6 Quality of materials

Each part of a ladder shall be free of splinters, burrs, sharp edges, corners, projections, or other defects that could injure a person using the ladder.

3.7 Rope seizing

Seizing, if used, shall consist of two- or three-ply marline of minimum breaking strength 800 N, or other suitable material of equivalent strength.

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[1] See Iron & Steel Society (ISS) publication *Stainless Steels*, available from Iron & Steel Society, 186 Thorn Hill Road, Warrendale, PA 15090-7528, USA, or http://www.iss.org.

4 Construction

4.1 Each ladder shall have two side ropes on each side. Ladders may also be constructed as three-string ladders with a third set of ropes in the middle of the ladder as illustrated in Figure 1. In a three-string ladder, the third set of ropes shall meet the same requirements as the side ropes. Each step in the ladder shall be supported by each side rope.

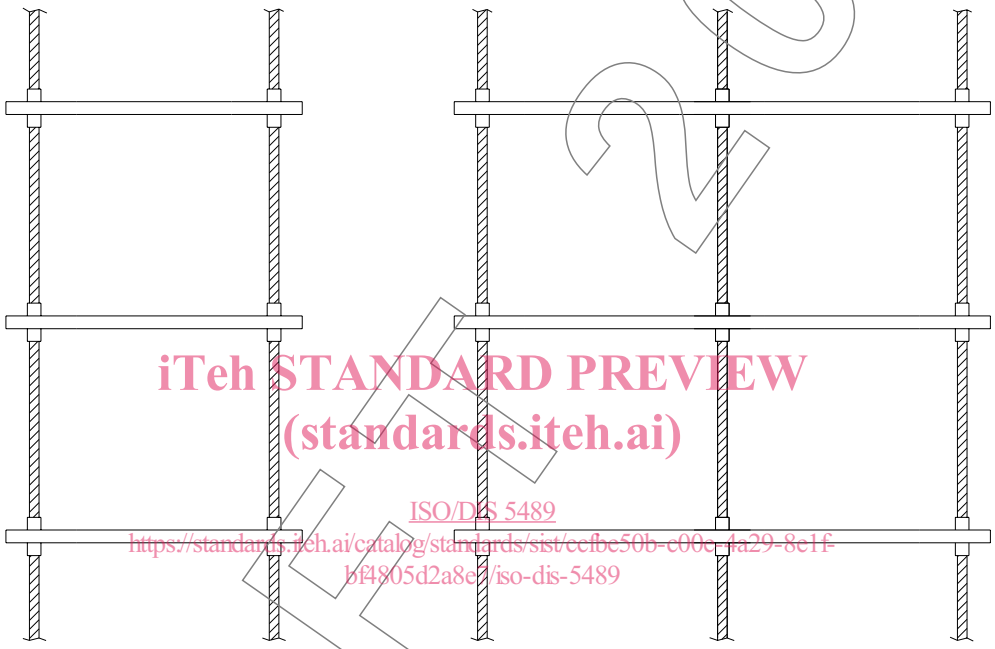


Figure 1 — Conventional embarkation ladder (left). Three-string ladder (right).

4.2 The side ropes shall:

a) be continuous from the top of the ladder to the bottom; and

b) not be painted or otherwise coated or covered.

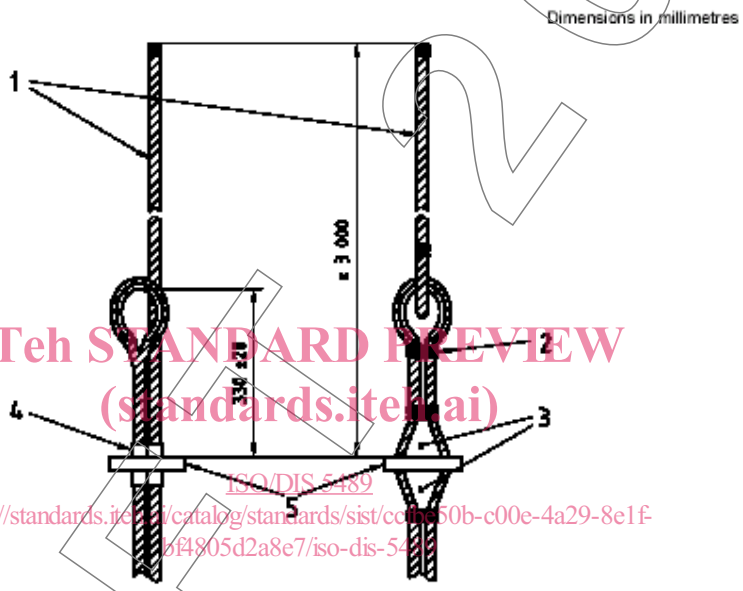
4.3 Unless a special arrangement is needed for a custom installation, the ends of the side ropes shall be finished as follows:

a) The top end of one or both of the side ropes on each side shall terminate just above the top step in a single eye splice or thimble large enough to accommodate at least two passes of side rope.

b) The top end of one side rope on each side of the ladder shall extend at least 3 m beyond the top ladder step, or an extension service rope shall be fitted to each side rope eye splice or thimble by means of an eye splice or shackle, as shown in Figure 2. The diameter of an extension service rope shall be at least the diameter of the side ropes.

c) The side ropes shall not have fittings or form loops at the bottom of the ladder that can be used to attach additional ladder sections or tripping lines.

d) The ends of each side rope which do not terminate in a splice or fitting, shall be served or otherwise treated to prevent fraying.



Key

1 extension service rope
2 rope seizing (typical)
3 step fixture
4 mechanical clamping device
5 step

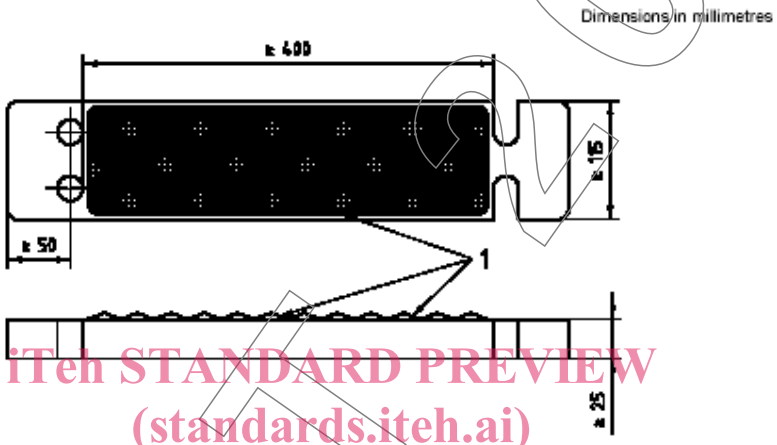
Figure 2 — Alternative extension service rope arrangements at top of ladder

4.4 Each side rope shall pass through a hole in each step. If the hole is in the form of a slot, the slot shall be in the longer edges of the steps. The center of each hole shall be at least 50 mm from the end of the step. Alternative arrangements are shown in Figure 3.

4.5 Each pair of side ropes shall be secured together both above and below each step with a mechanical clamping device or seizing method which holds each step level when the ladder is hanging freely. Alternative arrangements are shown in Figure 4.

4.6 If a mechanical clamping device is used to secure the side ropes and hold the step in place, the device shall not extend above or below the step surfaces by more than a distance equal to 0,7 x *W* (where *W* is the width of the step), so that the step is not prevented from rolling if caught between a boat and the hull of the ship. See Figure 4.

4.7 If a seizing method is used to secure steps and side ropes, a step fixture shall be used above and below the step. The step fixture shall be designed to lead and support the side ropes from the step to the point above or below the step where the side ropes are seized together. The step fixture shall be designed so that it stays in place when the ladder is rolled or the step is turned.



Key

1 grooved, patterned or textured non-skid surface area

Figure 3 — Typical ladder step showing alternative hole and slot designs for side ropes

4.8 The clear space between the side ropes on one side of the ladder and those on the other side shall be at least 400 mm. This distance shall be uniform throughout the length of the ladder. See Figure 2.

4.9 Each side rope shall be arranged so that, when the ladder is in use along the vertical hull of a ship, the side rope cannot come in contact with the ship's side.

4.10 The spacing from the top of one step to the top of the next step shall be 330 ± 20 mm, and shall be uniform throughout the length of the ladder. See Figure 3.

4.11 Each step shall be of one-piece construction, of either wood or resilient plastic or rubber material complying with the applicable requirements of 3.