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## Ships and marine technology — Embarkation ladders

*Navires et technologie marine — Échelles d'embarcation*

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CH-1214 Vernier, Geneva  
Phone: +41 22 749 01 11  
Email: [copyright@iso.org](mailto:copyright@iso.org)  
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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.

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 document 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](http://www.iso.org/directives)).

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This document was prepared by Technical Committee ISO/TC 8, *Ships and marine technology*, Subcommittee SC 1, *Maritime safety*.

This fourth edition cancels and replaces the third edition (ISO 5489:2008), which has been technically revised.

The main changes are as follows:

- normative references in [Clause 2](#) have been updated;
- [Clause 3](#) (Terms and definitions) has been added;
- [Clause 4](#) has been harmonized with ISO 799-1: 2019;
- [Annexes A](#) and [B](#) have been added.

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](http://www.iso.org/members.html).

## Introduction

This document is intended to supplement existing requirements of the International Maritime Organization (IMO) for embarkation ladders. Since IMO instruments do not include specific requirements for prototype testing of embarkation ladders for approval, these types of tests have been included in this document and therefore go beyond the scope of the existing IMO requirements. The inclusion of these tests is considered necessary in order to ensure that specifications embarkation ladders are aligned with the performance requirements prescribed in IMO instruments and in this document.

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# Ships and marine technology — Embarkation ladders

## 1 Scope

This document specifies requirements for a ship's embarkation ladder that is provided to enable passengers and crew to safely embark to waterborne survival crafts 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)<sup>[1]</sup>, as amended. Embarkation ladders complying with this document can be used by National maritime administrations on their ships in order to comply with the requirements of SOLAS.

## 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 209, *Aluminium and aluminium alloys — Chemical composition*

ISO 877-2, *Plastics — Methods of exposure to solar radiation — Part 2: Direct weathering and exposure behind window glass*

ISO 1181, *Fibre ropes — Manila and sisal — 3-, 4- and 8-strand ropes*

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

ISO 15510, *Stainless steels — Chemical composition*

## 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 Materials

### 4.1 Wooden parts

Each wooden part shall be made of hardwood (ash, oak, beech, teak, or other hardwood having equivalent properties) free from knots. Wood shall not be treated or coated with paint, varnish or other coatings that changes the friction coefficient or hides the natural grain. Where parts of the steps outside the side ropes are varnished in order to prevent cracking of the influence of the moisture, deterioration, corrosion, and mould formation, the varnish on the wooden parts should not hide the grain of wood or significantly change the coefficient of the friction.

## 4.2 Side ropes

### 4.2.1 General arrangement

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 colour that contrasts with the spun polyester.

Each side rope shall have a breaking strength of at least 24 kN, and the specification of the diameter of side ropes should be 20 mm to 22 mm (63 mm to 69 mm circumference).

### 4.2.2 Alternative side rope arrangement

Alternative side ropes of synthetic material may be used, if they

- a) meet the breaking strength and size requirements of [4.2.1](#),
- b) are at least as resistant to elongation under load as the standard ropes described in [4.2.1](#),
- c) have an exterior surface suitable to be grasped by 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 [4.2.1](#).

## 4.3 Metallic materials

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

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

**4.3.3** Each stainless-steel part shall be of a marine grade alloy with a corrosion resistance at least equal to grade "4401-316-001" in ISO 15510.

**4.3.4** Each aluminium part shall be 5254 alloy, or another grade containing not more than 0,06 % copper, in accordance with ISO 209.

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

## 4.4 Step fixtures

Step fixtures for securing each step of a ladder shall have rope seizing or an arrangement such as seawater-resistant aluminium clamps to prevent the steps and chocks from loosening. Cable ties, u-clamps, and worm driven clips are not acceptable.

## 4.5 Plastic materials

Each plastic material (including the nylon material) shall be of a type that retains at least 30 % of its original tensile strength and at least 80 % of its original impact strength when subjected to the one-year outdoor weathering test described in Method A of ISO 877-2.

## 4.6 Quality of materials

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

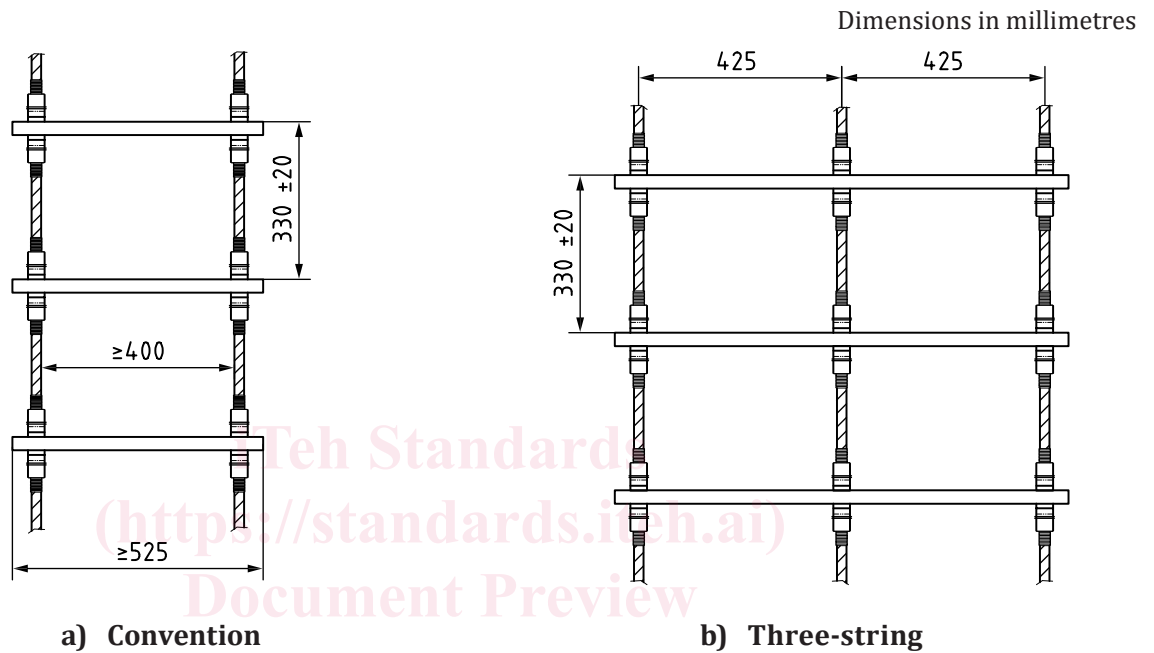


## 4.7 Rope seizing

Seizing shall consist of three-ply tarred marline of minimum breaking strength 800 N with a minimum diameter of 4 mm, or other suitable material of equivalent strength and diameter. All seizings shall be figure-of-eight racking seizings with a minimum length of seizing 32 mm.

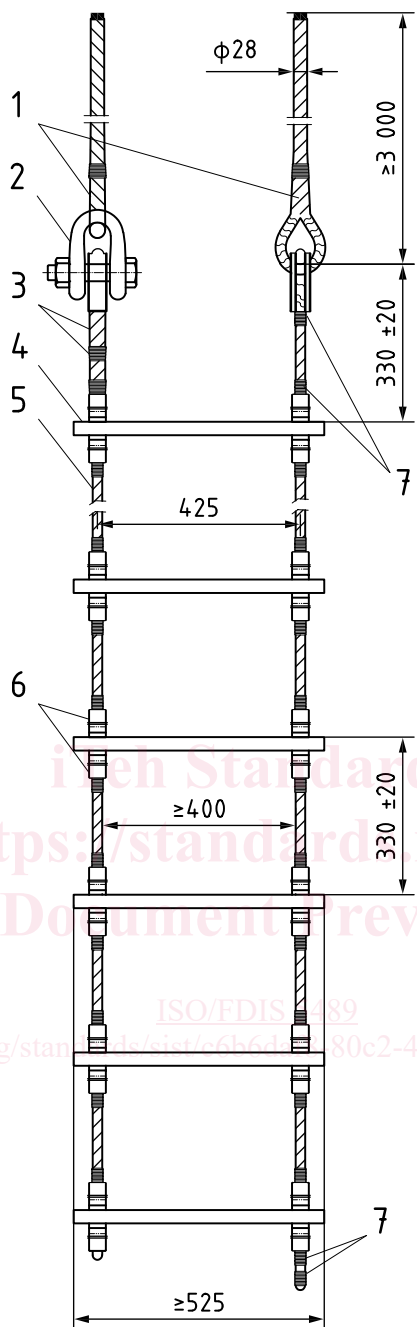
## 5 Constructions

Figures 1, 2, and 3 illustrate construction for embarkation ladders.



ISO/FDIS 5489  
**Figure 1 — Construction for embarkation ladder**

Dimensions in millimetres



**Key**

- |   |                                           |   |                                                                     |
|---|-------------------------------------------|---|---------------------------------------------------------------------|
| 1 | alternative arrangements of securing rope | 5 | side rope                                                           |
| 2 | shackle                                   | 6 | step fixture                                                        |
| 3 | splice and rope seizing                   | 7 | rope seizing or seawater resistant purpose-designed aluminium clamp |
| 4 | step                                      |   |                                                                     |

**Figure 2 — Construction details of embarkation ladder**