



**ISO/FDIS 5489:2023(E)**

© ISO 2023

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office  
CP 401 • Ch. de Blandonnet 8  
CH-1214 Vernier, Geneva  
Phone: + 41 22 749 01 11  
Email: [copyright@iso.org](mailto:copyright@iso.org)  
Website: [www.iso.org](http://www.iso.org)

Published in Switzerland

**Formatted:** Font: 11 pt

**Formatted:** Header, Space After: 0 pt, Line spacing: single

**Formatted:** Left: 1.9 cm, Right: 1.9 cm, Bottom: 1 cm, Gutter: 0 cm, Header distance from edge: 1.27 cm, Footer distance from edge: 0.5 cm

**Commented [eXtyles1]:** The reference is to a withdrawn standard which has been replaced

ISO 20344, Personal protective equipment — Test methods for footwear

**Formatted:** Default Paragraph Font

**Formatted:** Default Paragraph Font

**Formatted:** Indent: Left: 0 cm, Right: 0 cm, Space Before: 0 pt, No page break before, Adjust space between Latin and Asian text, Adjust space between Asian text and numbers

**Formatted:** French (Switzerland)

**Formatted:** French (Switzerland)

**Formatted:** French (Switzerland)

iTeh Standards  
(<https://standards.iteh.ai>)  
Document Preview

ISO/FDIS 5489

<https://standards.iteh.ai/catalog/standards/sist/c6b6daf8-80c2-4a8c-bf21-4ae2a16a50af/iso-fdis-5489>

Contents

**Foreword** ..... vi

**Introduction**..... vii

**1 Scope** ..... 1

**2 Normative references** ..... 1

**3 Terms and definitions**..... 1

**4 Materials**..... 2

**4.1 Wooden parts**..... 2

**4.2 Side ropes** ..... 2

**4.2.1 General arrangement**..... 2

**4.2.2 Alternative side rope arrangement**..... 2

**4.3 Metallic materials**..... 2

**4.4 Step fixtures**..... 3

**4.5 Plastic materials**..... 3

**4.6 Quality of materials** ..... 3

**4.7 Rope seizing**..... 3

**5 Constructions**..... 3

**6 Testing and inspection** ..... 8

**6.1 Prototype test for approval**..... 8

**6.2 Product inspection**..... 10

**7 Designation**..... 10

**8 Marking**..... 10

**9 Production tests and inspections** ..... 11

**10 Maintenance**..... 11

**Annex A (informative) Recommended production tests and inspections**..... 13

**Annex B (informative) Natural fibre rope embarkation ladders — Care and maintenance**..... 14

**Bibliography**..... 19

Foreword — vi

Introduction — vii

1 — Scope — 1

2 — Normative references — 1

3 — Terms and definitions — 1

4 — Materials — 1

© ISO 2023 — All rights reserved

© ISO 2023 – All rights reserved

iii

Formatted: Font: 11 pt

Formatted: Header, Left, Space After: 0 pt, Line spacing: single

Formatted: Adjust space between Latin and Asian text, Adjust space between Asian text and numbers

iTeh Standards  
 (https://standards.iteh.ai)  
 Document Preview

ISO/FDIS 5489

4ae2a16a50af/iso-fdis-5489

**ISO/FDIS 5489:2023(E)**

4.1 — Wooden parts — 1  
4.2 — Side ropes — 2  
4.2.1 — General arrangement — 2  
4.2.2 — Alternative side rope arrangement — 2  
4.3 — Metallic materials — 2  
4.4 — Step fixtures — 2  
4.5 — Plastic materials — 3  
4.6 — Quality of materials — 3  
4.7 — Rope seizing — 3  
5 — Constructions — 3  
6 — Testing and inspection — 3  
6.1 — Prototype test for approval — 3  
6.2 — Product inspection — 5  
7 — Designation — 6  
8 — Marking — 6  
9 — Production tests and inspections — 7  
10 — Maintenance — 7  
Annex A (informative) Recommended production tests and inspections — 8  
Annex B (informative) Natural fiber rope embarkation ladders — Care and maintenance — 1

Formatted: Font: 11 pt

Formatted: Header, Space After: 0 pt, Line spacing: single

iTeh Standards  
(<https://standards.itih.ai>)  
Document Preview

ISO/FDIS 5489

<https://standards.itih.ai/catalog/standards/sist/c6b6daf8-80c2-4a8c-bf21-4ae2a16a50af/iso-fdis-5489>

## 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)).

ISO draws attention to the possibility that the implementation of this document may involve the use of (a) patent(s). ISO takes no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, ISO had not received notice of (a) patent(s) which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at [www.iso.org/patents](http://www.iso.org/patents). ISO shall not be held responsible for identifying any or all such patent rights.

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

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

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).

Formatted: Font: 11 pt

Formatted: Header, Left, Space After: 0 pt, Line spacing: single

Formatted: Adjust space between Latin and Asian text, Adjust space between Asian text and numbers

Formatted: English (United Kingdom)

Formatted: English (United Kingdom)

Field Code Changed

Formatted: Default Paragraph Font

Formatted: Default Paragraph Font

Formatted: Default Paragraph Font

Formatted: Adjust space between Latin and Asian text, Adjust space between Asian text and numbers, Tab stops: Not at 0.7 cm + 1.4 cm + 2.1 cm + 2.8 cm + 3.5 cm + 4.2 cm + 4.9 cm + 5.6 cm + 6.3 cm + 7 cm

Formatted: Default Paragraph Font

Formatted: Default Paragraph Font

Formatted: Default Paragraph Font

Formatted: Default Paragraph Font

Formatted: Adjust space between Latin and Asian text, Adjust space between Asian text and numbers

## 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.

# iTeh Standards (<https://standards.iteh.ai>) Document Preview

[ISO/FDIS 5489](https://standards.iteh.ai/catalog/standards/sist/c6b6daf8-80c2-4a8c-bf21-4ae2a16a50af/iso-fdis-5489)

<https://standards.iteh.ai/catalog/standards/sist/c6b6daf8-80c2-4a8c-bf21-4ae2a16a50af/iso-fdis-5489>

## 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>[4], [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.

~~<std>ISO 209, Aluminium and aluminium alloys — Chemical composition</std>~~

~~<std>ISO 877-2, Plastics — Methods of exposure to solar radiation — Part 2: Direct weathering and exposure behind window glass</std>~~

~~<std>ISO 1181, Fibre ropes — Manila and sisal — 3-, 4- and 8-strand ropes</std>~~

~~<std>ISO 1461, Hot dip galvanized coatings on fabricated iron and steel articles — Specifications and test methods</std>~~

~~<std>ISO 15510, Stainless steels — Chemical composition</std>~~

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/>

**Formatted:** Left: 1.9 cm, Right: 1.9 cm, Bottom: 1 cm, Gutter: 0 cm, Header distance from edge: 1.27 cm, Footer distance from edge: 0.5 cm

**Formatted:** Main Title 1, Adjust space between Latin and Asian text, Adjust space between Asian text and numbers

**Formatted:** Adjust space between Latin and Asian text, Adjust space between Asian text and numbers

**Formatted:** Adjust space between Latin and Asian text, Adjust space between Asian text and numbers, Tab stops: Not at 0.7 cm + 1.4 cm + 2.1 cm + 2.8 cm + 3.5 cm + 4.2 cm + 4.9 cm + 5.6 cm + 6.3 cm + 7 cm

## 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) ~~a)~~ meet the breaking strength and size requirements of 4.2.1;4.2.1.
- b) ~~b)~~ are at least as resistant to elongation under load as the standard ropes described in 4.2.1;4.2.1.
- c) ~~c)~~ have an exterior surface suitable to be grasped by bare hands, similar to manila or spun polyester~~;~~.
- d) ~~d)~~ are of a thermoset polymer, resistant to deterioration from ultraviolet light~~;~~ and
- e) ~~e)~~ provide a visual indication of excessive wear, similar to the spun polyester/polypropylene construction described in 4.2.1;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.

Formatted: Font: 11 pt

Formatted: Header, Space After: 0 pt, Line spacing: single

Formatted: Adjust space between Latin and Asian text, Adjust space between Asian text and numbers

Formatted: Adjust space between Latin and Asian text, Adjust space between Asian text and numbers, Tab stops: Not at 0.71 cm

Formatted: Adjust space between Latin and Asian text, Adjust space between Asian text and numbers

Formatted: Adjust space between Latin and Asian text, Adjust space between Asian text and numbers, Tab stops: Not at 0.71 cm

Formatted: Adjust space between Latin and Asian text, Adjust space between Asian text and numbers, Tab stops: Not at 0.71 cm + 0.99 cm + 1.27 cm

Formatted: Default Paragraph Font

Formatted: Default Paragraph Font

Formatted: Adjust space between Latin and Asian text, Adjust space between Asian text and numbers

Formatted: Adjust space between Latin and Asian text, Adjust space between Asian text and numbers, Tab stops: Not at 0.71 cm + 0.99 cm + 1.27 cm

Formatted: Adjust space between Latin and Asian text, Adjust space between Asian text and numbers

Formatted: Numbered + Level: 1 + Numbering Style: a, b, c, ... + Start at: 1 + Alignment: Left + Aligned at: 0 cm + Indent at: 0 cm, Adjust space between Latin and Asian text, Adjust space between Asian text and numbers, Tab stops: Not at 0.7 cm + 1.4 cm + 2.1 cm + 2.8 cm + 3.5 cm + 4.2 cm + 4.9 cm + 5.6 cm + 6.3 cm + 7 cm

Formatted: Adjust space between Latin and Asian text, Adjust space between Asian text and numbers, Tab stops: Not at 0.71 cm

Formatted: Adjust space between Latin and Asian text, Adjust space between Asian text and numbers, Tab stops: Not at 0.7 cm + 1.4 cm + 2.1 cm + 2.8 cm + 3.5 cm + 4.2 cm + 4.9 cm + 5.6 cm + 6.3 cm + 7 cm

Formatted: Font: Bold

Formatted: Default Paragraph Font

Formatted: Default Paragraph Font

Formatted: Default Paragraph Font

Formatted: Default Paragraph Font

Formatted: Default Paragraph Font

Formatted: Default Paragraph Font



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

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

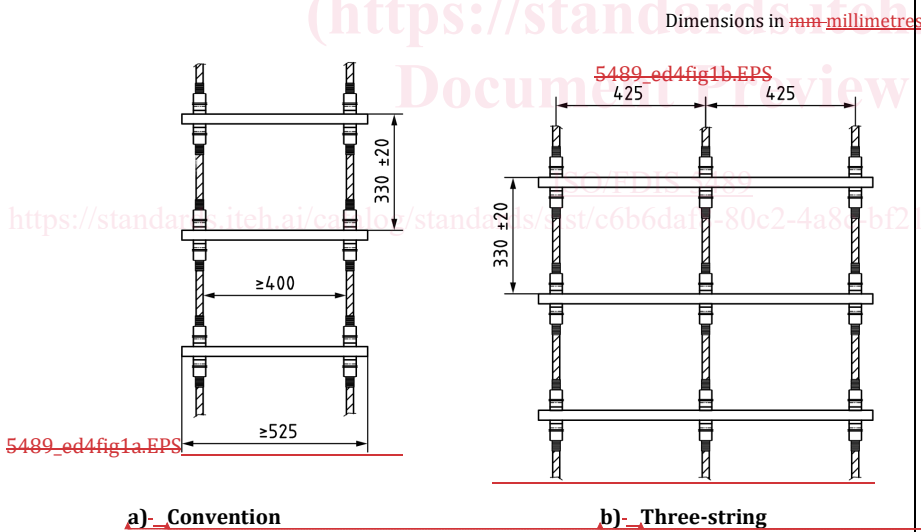
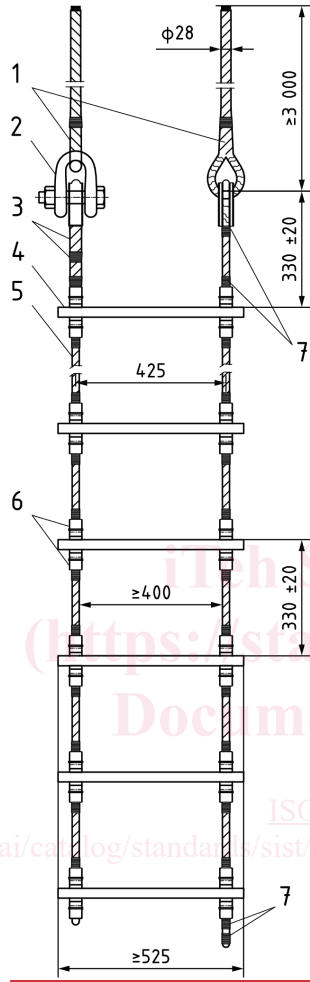


Figure 1 — Construction for embarkation ladder

Dimensions in millimetres

5489\_ed4fig2.EPS

- Formatted: Font: 11 pt
- Formatted: Header, Left, Space After: 0 pt, Line spacing: single
- Formatted: Adjust space between Latin and Asian text, Adjust space between Asian text and numbers, Tab stops: Not at 0.71 cm
- Formatted: Adjust space between Latin and Asian text, Adjust space between Asian text and numbers
- Formatted: Adjust space between Latin and Asian text, Adjust space between Asian text and numbers, Tab stops: Not at 0.71 cm
- Formatted: Adjust space between Latin and Asian text, Adjust space between Asian text and numbers
- Formatted: Default Paragraph Font
- Formatted: Default Paragraph Font
- Formatted: Default Paragraph Font
- Formatted: Adjust space between Latin and Asian text, Adjust space between Asian text and numbers, Tab stops: Not at 0.71 cm
- Formatted: Adjust space between Latin and Asian text, Adjust space between Asian text and numbers
- Formatted: Adjust space between Latin and Asian text, Adjust space between Asian text and numbers, Tab stops: Not at 0.71 cm
- Formatted: Adjust space between Latin and Asian text, Adjust space between Asian text and numbers
- Formatted: Default Paragraph Font
- Formatted: Adjust space between Latin and Asian text, Adjust space between Asian text and numbers, Tab stops: Not at 0.7 cm + 1.4 cm + 2.1 cm + 2.8 cm + 3.5 cm + 4.2 cm + 4.9 cm + 5.6 cm + 6.3 cm + 7 cm
- Formatted: Tab stops: Not at 0.7 cm + 1.4 cm + 2.1 cm + 2.8 cm + 3.5 cm + 4.2 cm + 4.9 cm + 5.6 cm + 6.3 cm + 7 cm
- Formatted Table
- Formatted: Font: Bold
- Formatted: Font: Bold
- Formatted: Font: Bold
- Formatted: Font: Bold
- Formatted: Table body (+)
- Formatted: Adjust space between Latin and Asian text, Adjust space between Asian text and numbers, Tab stops: Not at 0.7 cm + 1.4 cm + 2.1 cm + 2.8 cm + 3.5 cm + 4.2 cm + 4.9 cm + 5.6 cm + 6.3 cm + 7 cm



|            |   |   |   |
|------------|---|---|---|
| <b>Key</b> |   |   |   |
| 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

Dimensions in millimetres

5489\_ed4fig3.EPS

Formatted: Font: 11 pt

Formatted: Header, Space After: 0 pt, Line spacing: single

Formatted: Adjust space between Latin and Asian text, Adjust space between Asian text and numbers, Tab stops: Not at 0.7 cm + 1.4 cm + 2.1 cm + 2.8 cm + 3.5 cm + 4.2 cm + 4.9 cm + 5.6 cm + 6.3 cm + 7 cm

Formatted Table

Formatted: Indent: Left: 0 cm, Hanging: 0.61 cm, Adjust space between Latin and Asian text, Adjust space between Asian text and numbers, Tab stops: Not at 0.7 cm + 1.4 cm + 2.1 cm + 2.8 cm + 3.5 cm + 4.2 cm + 4.9 cm + 5.6 cm + 6.3 cm + 7 cm

Formatted: Indent: Left: 0 cm, Hanging: 0.61 cm, Adjust space between Latin and Asian text, Adjust space between Asian text and numbers, Tab stops: Not at 0.7 cm + 1.4 cm + 2.1 cm + 2.8 cm + 3.5 cm + 4.2 cm + 4.9 cm + 5.6 cm + 6.3 cm + 7 cm

Formatted: Adjust space between Latin and Asian text, Adjust space between Asian text and numbers, Tab stops: Not at 0.7 cm + 1.4 cm + 2.1 cm + 2.8 cm + 3.5 cm + 4.2 cm + 4.9 cm + 5.6 cm + 6.3 cm + 7 cm

Formatted: None, Adjust space between Latin and Asian text, Adjust space between Asian text and numbers

Formatted: Adjust space between Latin and Asian text, Adjust space between Asian text and numbers, Tab stops: Not at 0.7 cm + 1.4 cm + 2.1 cm + 2.8 cm + 3.5 cm + 4.2 cm + 4.9 cm + 5.6 cm + 6.3 cm + 7 cm