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Ships and marine technology — Accommodation ladders

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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 documents 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).

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For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information

The committee responsible for this document is ISO/TC 8, *Ships and marine technology*, Subcommittee SC 1, *Lifesaving and fire protection*.

This second edition cancels and replaces the first edition (ISO 5488:1979), which has been technically revised.

Ships and marine technology — Accommodation ladders

1 Scope

This International Standard specifies requirements and the method of test for accommodation ladders used on merchant ships (excluding passenger ships) to enable crew and pilots to embark and disembark safely.

This International Standard is applicable to the design, manufacturing and testing of accommodation ladders as well as accommodation ladder used specifically in combination with pilot ladder (hereinafter referred as "pilot accommodation ladder").

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 209:2007, *Aluminium and aluminium alloys — Chemical composition*

ISO 630-1, *Structural steels — Part 1: General technical delivery conditions for hot-rolled products*

ISO 2408, *Steel wire ropes for general purposes — Minimum requirements*

IMO Resolution A.1045(27), *Pilot transfer arrangements*

3 Types

3.1 Revolving-platform ladder

The ladder, of single-flight, multi-flight or telescopic construction, is hinged from an upper revolving platform and is capable of being varied in direction and inclination between the ship and the lower access level.

The ladder may be supported by steel wire ropes or chains from the lower suspension point or by rollers fixed to the bottom of the ladder (see Figure 1, Figure 2 and Figure 3).

3.2 Fixed-platform ladder

The ladder is hinged from a fixed anchorage and is capable of being varied in inclination between the ship and the lower access level.

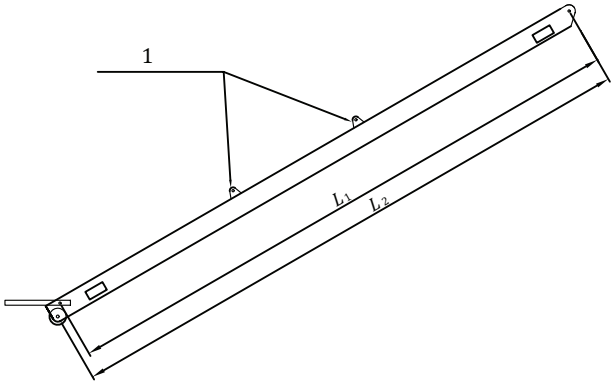
This ladder is supported by steel wire ropes or chains from suspension point(s) in the lower part of the ladder (see Figure 1, Figure 2 and Figure 3). This ladder may be of single-flight or telescopic construction.

This ladder is mainly applicable to pilot accommodation ladders.

4 Definitions

4.1 Nominal length, L_1

4.1.1 For a single-flight ladder, the distance from the centre of the top pin to the centre of the lower platform holding pin (see Figure 1).



Key

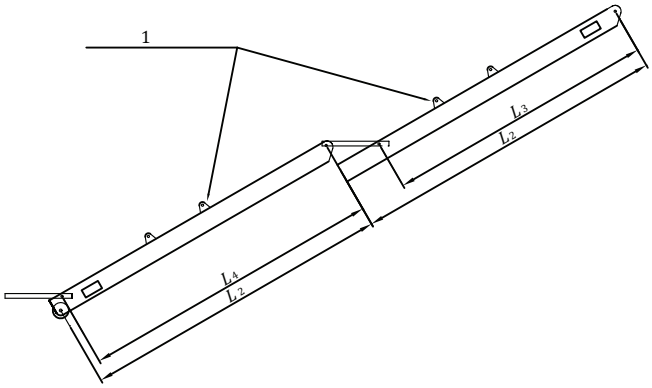
1 intermediate suspension points

L_1 nominal length

L_2 design length

Figure 1 — Single-flight ladder

4.1.2 For a multi-flight ladder, the sum of the lengths L_3 and L_4 of the separate flights measured from the centre of the top pin to the centre of the lower pin in each case (see Figure 2)



Key

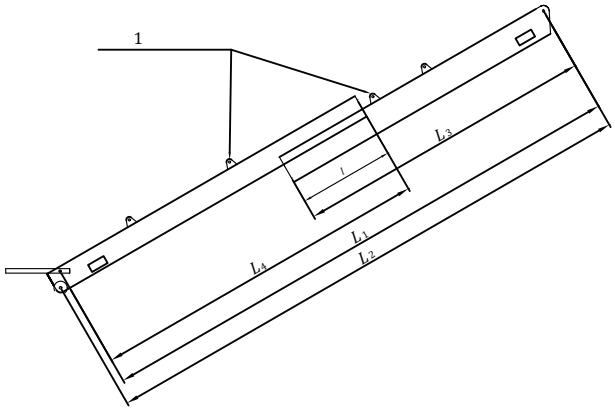
1 intermediate suspension points

L_1 nominal length, $L_1 = L_3 + L_4$

L_2 design length, for each separate flight

Figure 2 — Multi-flight ladder

4.1.3 For a telescopic ladder, the maximum length is the sum of the lengths L_3 and L_4 minus overlap length l, i.e. from the centre of the top pin of the upper flight to the centre of the lower platform holding pin of the lower telescopic ladder (see Figure 3), the minimum retraction length, L_0, is the sum of L_3 and l_1 (see Figure 4).



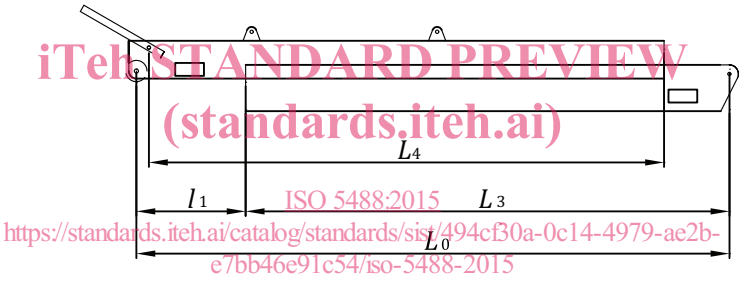
Key

1 intermediate suspension points

NOTE 1 Nominal length: L_1.

NOTE 2 Maximum design telescopic: $L_2 = L_3 + L_4 - l$.

Figure 3 — Telescopic ladder



NOTE Minimum design retraction: $L_0 = L_3 + l_1$.

Figure 4 — Retraction diagram of telescopic ladder

4.2 Design length, L_2

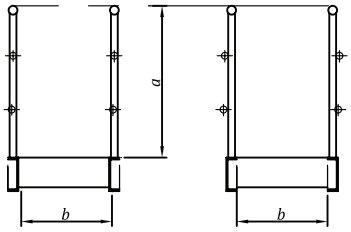
The maximum distance between supporting points for each separate flight (see Figure 1, Figure 2 and Figure 3).

4.3 Width, b

The effective width of the walking surface (see Figure 5).

4.4 Handrail height, a

The vertical height of the handrail, measured from the highest point of the standing surface presented by the steps when the ladder is horizontal.



NOTE The sections shown are examples only.

Figure 5 — Minimum width, *b*, and handrail height, *a*

5 Dimensions

5.1 Nominal length, L_1

The range of nominal lengths shall be as follows:

— 3,6 m to 18 m in 0,6 m increments;

— above 18 m in 0,7 m increments.

5.2 Width, *b*

The width of all accommodation ladders shall be 600 mm.

5.3 Distance between steps

The distance between the steps, referring to the distance between the neighbouring steps when the ladder is horizontal, shall be not less than 300 mm and not more than 350 mm. It shall be 300 mm for the nominal length of not more than 18 m, and about 350 mm for the nominal length of more than 18 m.

5.4 Handrail height, *a*

The top handrail height, a, shall be not less than 1 000 mm. Two handrails evenly spaced at mid-height shall be provided.

5.5 Distance between stanchions

The distance between the neighbouring stanchions shall be not more than 1 500 mm.

6 Manufacture

6.1 Design

6.1.1 Minimum angle of use

Ladders of single-flight, multi-flight or telescopic types shall be designed for safe operation in a horizontal position.

6.1.2 Maximum angle of use

With the steps horizontal, the ladder shall operate safely at an angle of 55° from the horizontal. According to the requirements of IMO Resolution A.1045(27), the pilot accommodation ladder shall operate safely at an angle of 45° from the horizontal.

6.1.3 Design loading

6.1.3.1 The ladders shall be designed to support a uniform load equivalent to 735 N on every step when the ladder is in a horizontal position.

6.1.3.2 The pilot accommodation ladders shall be designed to support loads equivalent to 1470 N on intermediate two steps simultaneously when the ladder is horizontal.

6.1.4 Step design

6.1.4.1 The steps shall be designed to be anti-slip with the right profile (arc shape) and can operate at the inclination required in 6.1.2 while being light but rigid enough to withstand the average weight of men.

6.1.4.2 Individual steps shall be designed to withstand a central point load of 735 N.

6.1.5 Design loading for access and intermediate platforms

The platforms shall be designed to support a uniform loading of 4 000 N/m^2. The framework and supporting structure of the upper and intermediate platforms shall in addition be designed to carry the weight of the suspended ladder together with the design load given in 6.1.3.

6.1.6 Design loading for handrail

6.1.6.1 Handrails and supports shall be designed for a side loading at the upper handrail of 500 N/m without permanent deformation.

6.1.6.2 Where fixed handrails become one of the considerations in the integral strength design of ladder frame of the ladder, no permanent deformation has taken place for the handrail after the integral strength test is carried out for the ladder frame.

6.1.7 Support points

6.1.7.1 All support points (pivots, rollers, etc.) and suspension points (lugs, pulley yokes, brackets, etc.) shall be of adequate strength to support the weight of the ladder plus the loading stipulated in 6.1.3.

6.1.7.2 Pulley yokes of the suspension ladders on the two sides of the ladders and pilot accommodation ladders over 15m in length, shall be designed to meet the requirement of simultaneously hoisting at the two rope exits on one steel cable according to ISO 2408.

6.1.8 Strength and design of the ladder frame

The strength and design of the ladder frame shall be so as it will be anti-twist type.

6.1.9 Safety factor

The allowable stress used in the design of the ladder, with the loading specified in 6.1.3, shall be determined by applying a safety factor of 2 to the yield point for steel and to the 0.2 % proof stress for aluminium.

6.2 Materials

The ladder frame of the ladder shall be constructed from steel or aluminium in accordance with the table, but alternative materials may be used for these and other components provided that they are at least suitable in all respects for the intended duty and are equally acceptable to the purchaser (see Table 1).