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Ships and marine technology — Vertical steel ladders

Navires et technologie maritime — Échelles verticales en acier

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Foreword

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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).

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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.

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

This second edition cancels and replaces the first edition (ISO 3797:1976), which has been technically revised.

The main changes are as follows:

— the types and the scope of application have been extended;

— the dimensions of ladders have been extended;

— a fall protection requirement has been added;

— the steel grade of material has been specified;

— the requirements of surface treatment, appearance and tolerance have been specified.

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.

Ships and marine technology — Vertical steel ladders

1 Scope

This document specifies the types, structure, dimension and technical requirements for vertical steel ladders to be fitted on board ships.

This document applies to design and manufacture of vertical steel ladders.

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 630-2, *Structural steels — Part 2: Technical delivery conditions for structural steels for general purposes*

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

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 Type, structure and dimensions

4.1 Type

Vertical steel ladders shall be classified into the following two types:

a) type A: vertical steel ladder with square bar rung (see ISO 1035-2);

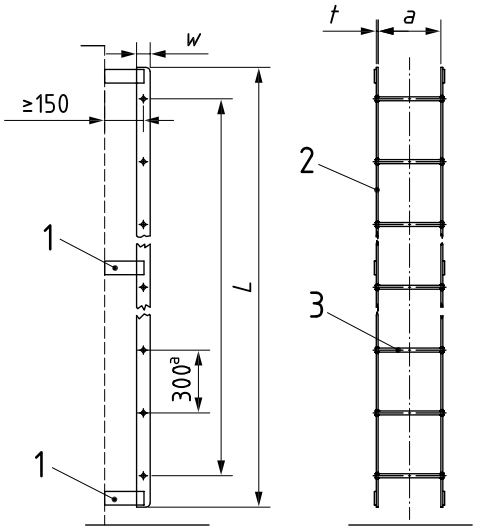
b) type B: vertical steel ladder with round bar rung (see ISO 1035-1).

4.2 Structure and dimensions

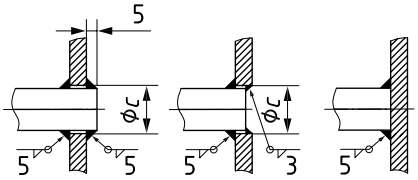
4.2.1 Structure

The structure of a vertical steel ladder is shown in Figure 1.

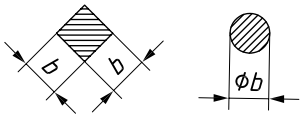
Dimensions in millimetres



a) Vertical steel ladder



b) Connection between rung and stringer



c) Rung section

Key

1	support	*a*	width of ladder
2	stringer	*L*	length of ladder
3	rung	*b*	side length of square bar or diameter of round bar
w	width of stringer	*c*	diameter of opening for rung through stringer
t	thickness of stringer		

[a] The step pitch shall be equal. It shall be between 250 mm to approximately 350 mm; 300 mm is recommended.

Figure 1 — Example of a structure of a vertical steel ladder

4.2.2 Dimensions

The dimensions of a vertical steel ladder are shown in Table 1.

Table 1 — Dimensions of vertical steel ladder

Dimensions in millimetres

Type	Width *a*	Rung *b*	Stringer *w* × *t*	Stringer opening *c*
A	300 350	19	60 × 10 65 × 9	28
		20		30
		22		32
	400	22		32
B	300 350	19	60 × 10 65 × 9	20
		20		21
		22		23

5 Technical requirement

5.1 Material

The vertical steel ladder shall be made of steel meeting the requirements of ISO 630-2. The grade of the material shall not be lower than S235.

5.2 Surface treatment

The vertical steel ladder shall be given a protective surface coating at the appropriate location.

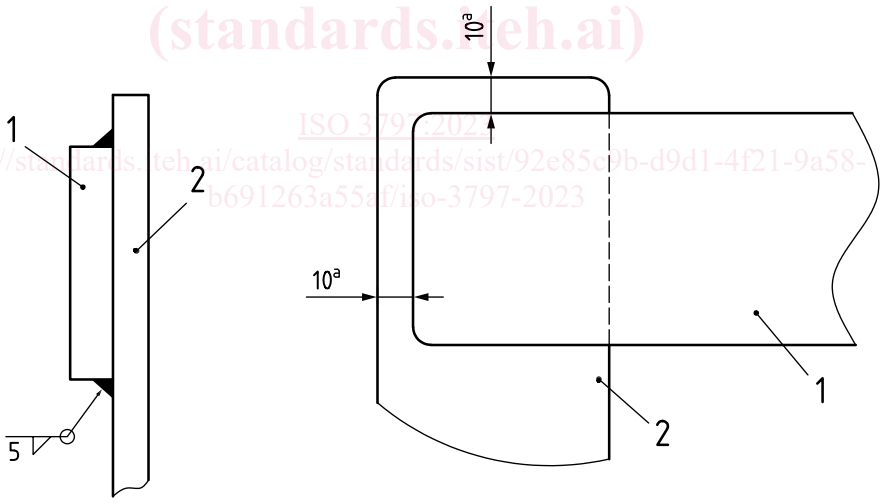
The vertical steel ladders fitted in the ballast tank shall comply with PSPC requirements. All free edges shall be rounded to R2 mm, and hot-dip galvanizing should be applied after de-rusting and surface cleaning. The galvanized coating thickness of the vertical steel ladder shall be in accordance with ISO 1461.

5.3 Support

The vertical steel ladder shall be fitted on board vertically by support. Either welding connection support (see Figure 2) or movable connection support (see Figure 3) shall be used. In each case the support shall be adequate for sustaining the load of 1 000 N with a safety factor of 1:5.

The distance between the adjacent supports of a vertical steel ladder shall not exceed 2 500 mm, in order to reduce the vibration as much as possible.

Dimensions in millimetres



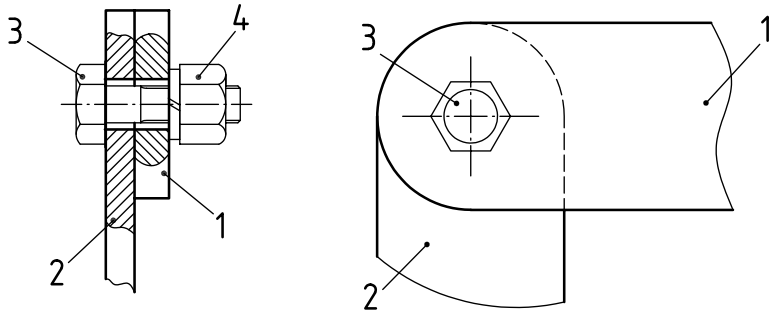
Key

1 support

2 stringer

[a] The distance shall meet the welding requirement; 10 mm is recommended.

Figure 2 — Example of a welding connection support



Key

1 support
2 stringer
3 bolt
4 nut

Figure 3 — Example of a movable connection support

5.4 Appearance

The sharp corner of the vertical steel ladder shall be smooth without burr and the surface shall be without dents, cracks etc.

5.5 Tolerance

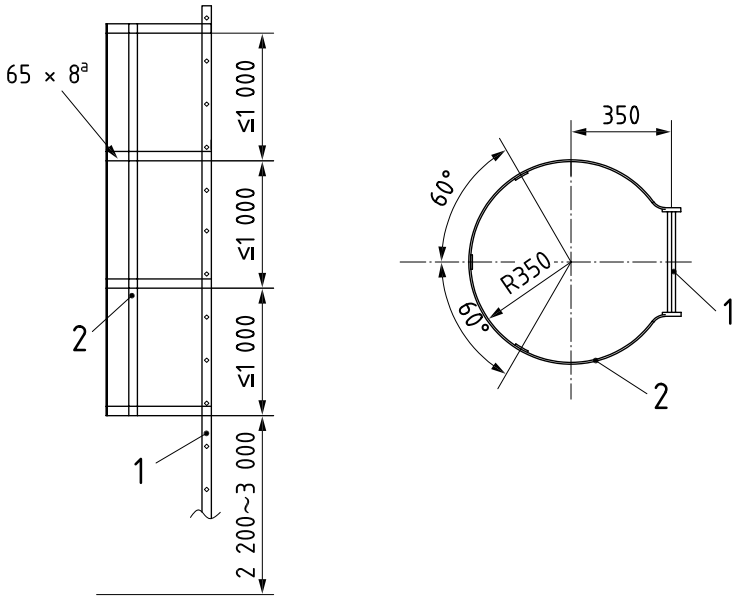
The tolerance for the width of the vertical steel ladder is ±2 mm (see ISO 2768-1).

The tolerance of the vertical steel ladder weight shall not exceed 4 % of the theoretical weight.

5.6 Safety protection

A fall protection, such as a ladder hoop should be fitted for safety. See Figure 4 and Figure 5.

Dimensions in millimetres



Key

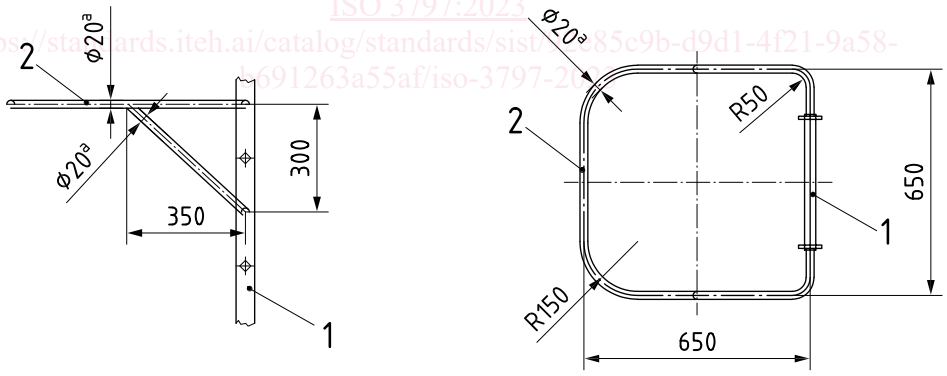
1 vertical steel ladder

2 basket type ladder hoop

[a] The flat bar specification is only recommended.

Figure 4 — Example of a basket type ladder hoop

Dimensions in millimetres



Key

1 vertical steel ladder

2 single type ladder hoop

[a] The round bar specification is only recommended.

Figure 5 — Example of a single type ladder hoop

6 Designation

The vertical steel ladder in compliance with the requirements in this document shall be designated in the delivery note as follows:

a) ISO 3797:2023;

b) type of vertical steel ladder;

c) rung;

d) connection between support and stringer;

e) dimensions of vertical steel ladder;

f) ladder hoop.

EXAMPLE The designation for a type-A vertical steel ladder without hoop, bolt connected, 3 600 mm long, 400 mm wide, with 22 mm × 22 mm square bar rung is as follows:

Vertical steel ladder ISO 3797:2023 A22-M-3 600 × 400

The designation for a type-B vertical steel ladder with a hoop, welding connected, 5 000 mm long, 350 mm wide, with ⌀ 20 mm round bar rung is as follows:

Vertical steel ladder ISO 3797:2023 B20-W-5 000 × 350 P