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Ships and marine technology — Ship's mooring and towing fittings — Recessed bitts (steel plate type)

Navires et technologie maritime — Corps-morts et ferrures de remorquage de navires — Bittes d'amarrage encastrées (type plaques d'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 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 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 Technical Committee ISO/TC 8, *Ships and marine technology*, Subcommittee SC 4, *Outfitting and deck machinery.*

This second edition cancels and replaces the first edition (ISO 13798:2012), which has been technically revised.

The main changes compared to the previous edition are as follows:

— the definition of SWL (3.1) has been reworded;

— the leader line in Figure 1 has been amended.

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.

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Introduction

The recessed bitt is a type of ship's towing fitting installed on the side shell of the ship.

Recessed bitts are normally provided to easily attach the towing lines where the height of the mooring deck is too high.

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Ships and marine technology — Ship's mooring and towing fittings — Recessed bitts (steel plate type)

1 Scope

This document specifies the types, nominal sizes, dimensions and materials, as well as construction, manufacturing and marking requirements, for steel plate type recessed bitts to meet normal towing requirements.

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.

IMO Circular MSC/Circ.1175, *Guidance on shipboard towing and mooring equipment*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

3.1
safe working load
SWL
safe load limit (maximum permissible load) of the fittings used for mooring and towing

4 Classification

4.1 Type

Depending on the manufacturing method, recessed bitts shall be classified as belonging to one of the following two types:

a) Type A: manufactured by steel pipes;

b) Type B: manufactured by steel plates.

4.2 Nominal sizes

The nominal sizes, D_n, of recessed bitts are denoted by reference to the outside diameter of the main post, in millimetres, in terms of the nearest number drawn from a basic series of preferred numbers. For the recessed bitts having the same post diameter, the letter of the alphabet, i.e. A or B, is followed by the nominal size for the different SWL.

The nominal sizes are 200, 250, 400A and 400B.

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5 Dimensions

Recessed bitts shall have dimensions and particulars in accordance with Table 1 and Figure 1.

6 Materials

The following materials shall be used for manufacturing the recessed bitts:

a) Type B: weldable steel plates having a yield point of not less than 235 N/mm^2;

b) Type A: weldable steel pipes having a yield point of not less than 215 N/mm^2 or equivalent.

7 Construction

7.1 The posts of the recessed bitts shall be constructed from steel pipes or formed from plate.

7.2 The recess boxes for the installation of the recessed bitt shall be designed with enough space for easy connection of the towing rope. The recess boxes shall be designed to prevent the chafing and damage of the towing rope as much as possible, and shall have enough strength as a part of the hull construction.

8 Manufacturing and inspection

8.1 All surfaces of the recessed bitts, including welded surfaces, shall be free from any visible flaws or imperfections.

8.2 All surfaces in contact with the ropes shall be free from surface roughness or irregularities likely to cause damage to the ropes by abrasion.

8.3 The recessed bitts shall be coated externally with an anti-corrosion protective finish.

9 Marking

9.1 The safe working load (SWL) for the intended use of the recessed bitts shall be noted in the towing and mooring plan available on board for the guidance of the shipmaster, as specified in IMO circular MSC/Circ.1175.

9.2 The actual SWL on board shall be determined by considering the reinforcement around the recess box, and it shall be marked on the towing and mooring plan. The actual SWL shall not be over the SWL indicated in this document.

9.3 The recessed bitts shall be clearly marked with their SWL by weld bead or equivalent. The SWL shall be expressed in tonnes (symbol 't') and be placed so that it is not obscured during operation of the fitting.

EXAMPLE SWL XXX t.

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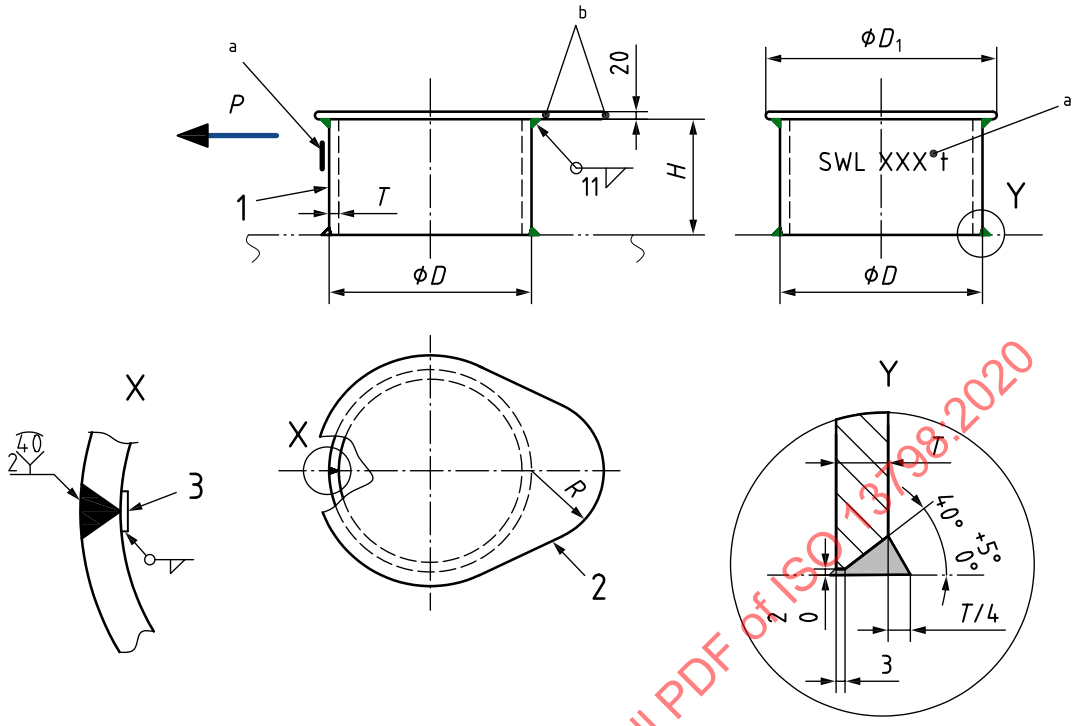
Dimensions in millimetres



Key

1 main post
2 top plate
3 chill strip
P towing force
a SWL marking.
b Smooth grinding.

Figure 1 — Type A (for nominal sizes 150, 200, 250A and 250B)

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Table 1 — Dimensions and SWL of recessed bitts

Dimensions in millimetres

Nominal size D_n	Type	D	D_1	R	H	T	SWL[b]		Calculated weight[c] kg
							kN	t	
200	Type A	216,3	250	80	140	10,3	294	30	16,5
	Type B	210,0				10,0			16,1
250	Type A	267,4	305	100	160	12,7	491	50	26,7
	Type B	260,0				12,0			25,7
400A	Type A	406,4	480	140	300	12,7	687	70	69,7
	Type B	410,0				12,0			68,0
400B	Type A	406,4	480	140	330	21,4	1 177	120	99,7
	Type B	410,0				20,0			96,1

[a] Welding with chamfering is available based on the same welding volume/strength.

[b] The SWL which is marked on the fitting is the maximum applicable rope tension.

The SWLs shown in this table are for reference only. These are based on the loadings as mentioned in Annex A.

[c] The calculated weight (mass) is for reference only.

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Annex A
(normative)

Basis for strength assessment of recessed bitts (steel plate type)

A.1 General

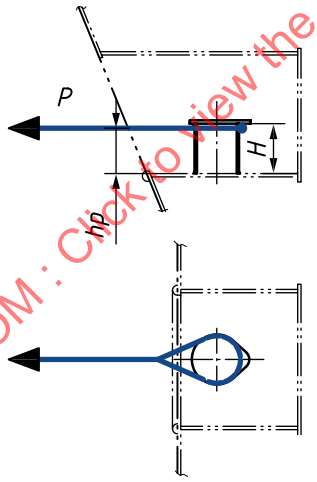
The strength of the recessed bitts was evaluated by simple beam theory calculation and determined based on the following design criteria.

A.2 Loading

A.2.1 The recessed bitts shall be designed to withstand the loads imposed by the towing ropes.

A.2.2 The recessed bitts shall be designed to withstand the following load case.

They shall be designed to withstand the combined load of the bending force and shear force produced by *P* imposed at the upper position, see Figure A.1.



Key

P towing force

d rope diameter (see A.2.3)

hp $H - d/2$

Figure A.1 — Combined loads by towing rope

A.2.3 For the consideration of load point from the towing ropes, the wire ropes in Table A.1 were adopted.

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Table A.1 — Diameter of applied ropes for load consideration

Dimensions in millimetres

Nominal size D_n	Rope diameter d
200	30
250	35
400A	40
400B	60

A.3 Load and stress criteria

Under the SWL, the following stress criteria were adopted:

a) the bending stress is limited to 85 % of the yield stress of the material;

b) the shear stress is limited to 60 % of the yield stress of the material;

c) the combined stress is limited to 100 % of the yield stress of the material.

A.4 Wear-down allowances and corrosion additions

A.4.1 Wear-down allowances

For the strength calculation, a wear-down of 2 mm is deducted from the gross thickness, where the rope is rubbing the surface.

A.4.2 Corrosion additions

The corrosion margin was already included in the stress criteria specified in Clause A.3.

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