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

Navires et technologie maritime — Corps-morts et ferrures de remorquage de navires — Bittes d'amarrage encastrées (type moulage)

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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).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

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.

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 13799:2012), 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 mark numbers in Figure 1 have been amended;

— technical information on FEM has been added in A.3.2.

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.

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.

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

1 Scope

This document specifies the types, nominal sizes, dimensions and materials, as well as construction, manufacturing and marking requirements, for casting 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 size and strength of the material, recessed bitts shall be classified as belonging to one of the following six types:

a) Type 75: nominal size 850, casting material having a yield point of not less than 235 N/mm^2;

b) Type 110: nominal size 850, casting material having a yield point of not less than 350 N/mm^2;

c) Type 135: nominal size 850, casting material having a yield point of not less than 430 N/mm^2;

d) Type 100: nominal size 920, casting material having a yield point of not less than 235 N/mm^2;

e) Type 150: nominal size 920, casting material having a yield point of not less than 350 N/mm^2;

f) Type 180: nominal size 920, casting material having a yield point of not less than 430 N/mm^2.

4.2 Nominal sizes

The nominal sizes of recessed bitts are denoted by reference to the outside diameter of the bitt, in millimetres.

The nominal sizes are 850 and 920.

5 Dimensions

The recessed bitts shall have dimensions and particulars in accordance with Tables 1 and 2, and Figure 1.

6 Materials

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

— Type 75 and type 100: weldable steel casting having a yield point of not less than 235 N/mm^2;

— Type 110 and type 150: weldable steel casting having a yield point of not less than 350 N/mm^2;

— Type 135 and type 180: weldable steel casting having a yield point of not less than 430 N/mm^2.

7 Construction

7.1 The welding connections to the hull shall guarantee a reliable transmission of the maximum loading of the recessed bitts to the hull construction without any plastic deformation or cracks.

7.2 The hull construction on which the recessed bitts are installed shall be reinforced by carlings, stiffeners, etc.

7.3 The recessed bitts shall be considered as a part of the hull side shell 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

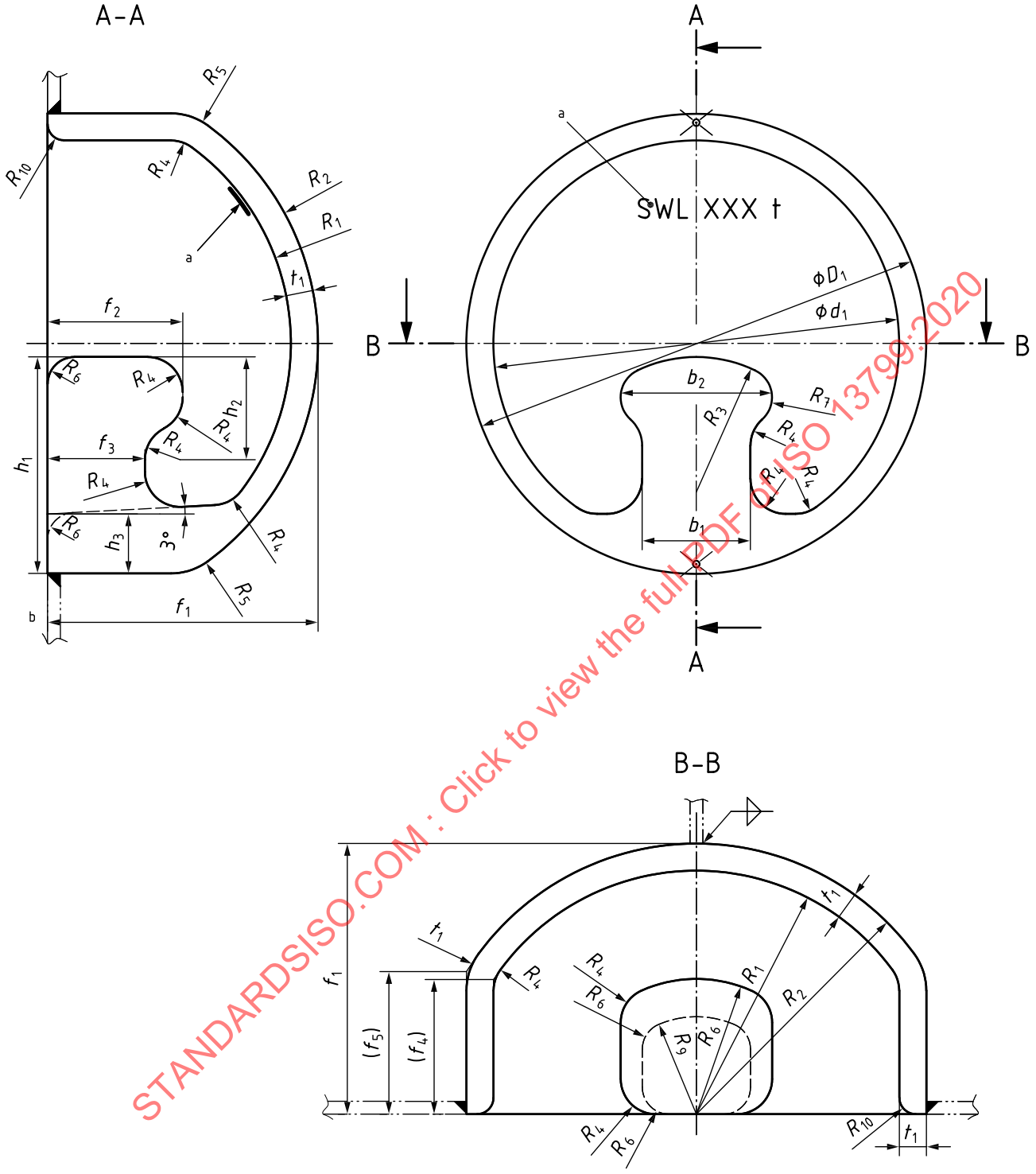
9.1 The safe working load (SWL) for the intended use of the recessed bitts shall be noted in the towing and mooring plan available on board for the guidance of the shipmaster, as specified in IMO circular MSC/Circ.1175.

9.2 The actual SWL on board shall be determined by considering the reinforcement around the recessed bitts, 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

Dimensions in millimetres



a SWL marking.

b Side shell.

The bitt welding method to the hull connection shall be approved by a Classification Society.

NOTE Centre marking by punching for easy installation.

Figure 1 — Recessed bitts

Table 1 — Dimensions of recessed bitts

Dimensions in millimetres

Nominal size D_n	D_1	d_1	b_1	b_2	R_1	R_2	R_3	R_4	R_5	R_6	R_7	R_8
850	850	750	200	280	450	500	250	65	115	50	55	250
920	920	812	216	300	490	544	270	70	124	55	60	270
Nominal size D_n	R_9	R_{10}	t_1	f_1	f_2	f_3	f_4	f_5	h_1		h_2	h_3
850	180	30	50	500	250	180	248,7	263,4	400		190	110
920	195	30	54	544	270	195	274,3	290,4	430		205	110

Table 2 — Dimensions *(continued)* and SWL of recessed bitts

Dimensions in millimetres

Nominal size D_n	**Type**	**Material (minimum yield strength)**	**SWL**		**Calculated weight** kg
			kN	t	
850	Type 75	235 N/mm^2	736	75	770
	Type 110	350 N/mm^2	1 079	110	770
	Type 135	430 N/mm^2	1 324	135	770
920	Type 100	235 N/mm^2	981	100	826
	Type 150	350 N/mm^2	1 472	150	826
	Type 180	430 N/mm^2	1 766	180	826

[a] 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.

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

Annex A
(normative)

Basis for strength assessment of recessed bitts (casting type)

A.1 General

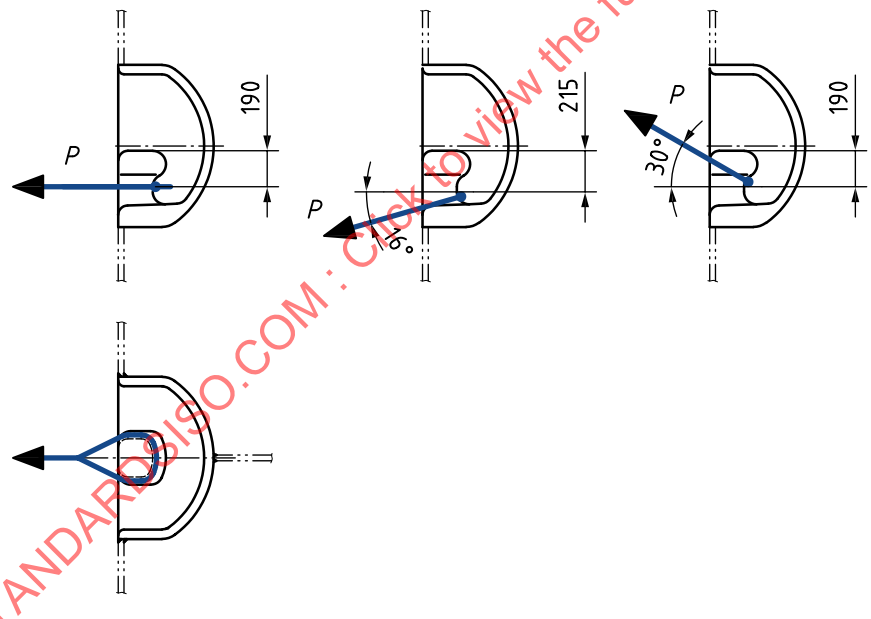
The strength of the recessed bitts was evaluated by finite element model analysis and determined based on the following design criteria.

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 produced by *P* imposed at the below positions, see Figure A.1.



Key
P towing force

Figure A.1 — Combined loads by towing rope

A.3 Load and stress criterion

A.3.1 Stress criterion

Under the SWL, the combined stress is limited to 85 % of the yield stress of the material.