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**Ships and marine technology — Ship's  
mooring and towing fittings — Mooring  
chocks**

*Navires et technologie maritime — Corps-morts et ferrures de  
remorquage de navires — Chaumards*



Reference number  
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Case postale 56 • CH-1211 Geneva 20  
Tel. + 41 22 749 01 11  
Fax + 41 22 749 09 47  
E-mail [copyright@iso.org](mailto:copyright@iso.org)  
Web [www.iso.org](http://www.iso.org)

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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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.

ISO 13713 was prepared by Technical Committee ISO/TC 8, *Ships and marine technology*, Subcommittee SC 4, *Outfitting and deck machinery*.

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## Introduction

The mooring chock is a type of ship's mooring and towing fitting installed on the shipside to lead the mooring and towing rope from the ship's inboard to outboard.

The mooring chocks are normally adopted for ships which use nylon or other synthetic ropes other than wire ropes considering the small bending ratio (for wire ropes see ISO 13729.)

The tensile strength of rope is reduced depending on bend radius through the chock in accordance with the rope manufacturer's guidelines.



# Ships and marine technology — Ship's mooring and towing fittings — Mooring chocks

## 1 Scope

This International Standard specifies the design, size and technical requirements for mooring chocks installed to lead the mooring and towing rope of a ship.

## 2 Normative references

The following referenced documents are indispensable for the application 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 purpose of this document, the following terms and definitions apply.

### 3.1

**safe working load**

**SWL**

maximum load in kN on the rope that should normally be applied in service conditions

## 4 Classification

### 4.1 Type

The mooring chocks shall be classified by its installation site as follows:

- Type A – Deck-mounted mooring chock;
- Type B – Bulwark-mounted mooring chock.

### 4.2 Nominal sizes

The nominal sizes,  $L \times H$  of mooring chocks are denoted by reference to the width and height of the opening of the chock, in millimetres. For the mooring chocks having the same size, the alphabetical character is followed by nominal size for the different safe working load (SWL).

The nominal sizes are:

250x200, 300x250, 350x250, 400x250, 450x250, 500x250A, 500x250B

## 5 Dimensions

Mooring chocks have dimensions and particulars in accordance with Tables 1 and 2, and Figures 1 and 2.

## 6 Materials

The following material shall be used for manufacturing the mooring chocks:

- Chock: steel casting material having a yield point of not less than 235 N/mm<sup>2</sup> or equivalent.

The carbon contents of the steel casting are not to be more than 0,23 % considering weldability.

## 7 Construction

The foundation of the mooring chocks shall be determined by considering actual load direction. The foundation and welding connections to the hull shall be guaranteed reliable transmission of the maximum loading of the mooring chocks to hull construction without any plastic deformation or cracks.

## 8 Manufacturing and inspection

8.1 All surfaces of the mooring chocks, including welding, 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 mooring chocks shall be coated externally with an anti-corrosion protective finish.

## 9 Marking

9.1 The SWL intended for the use of the mooring chocks shall be noted in the towing and mooring plan available on board for the guidance of the shipmaster, as specified in MSC/Circ.1175.

9.2 The actual SWL on board shall be determined by considering the foundation and under deck reinforcement, and it shall be marked on the towing and mooring plan. The actual SWL shall not be over the SWL indicated in this International Standard.

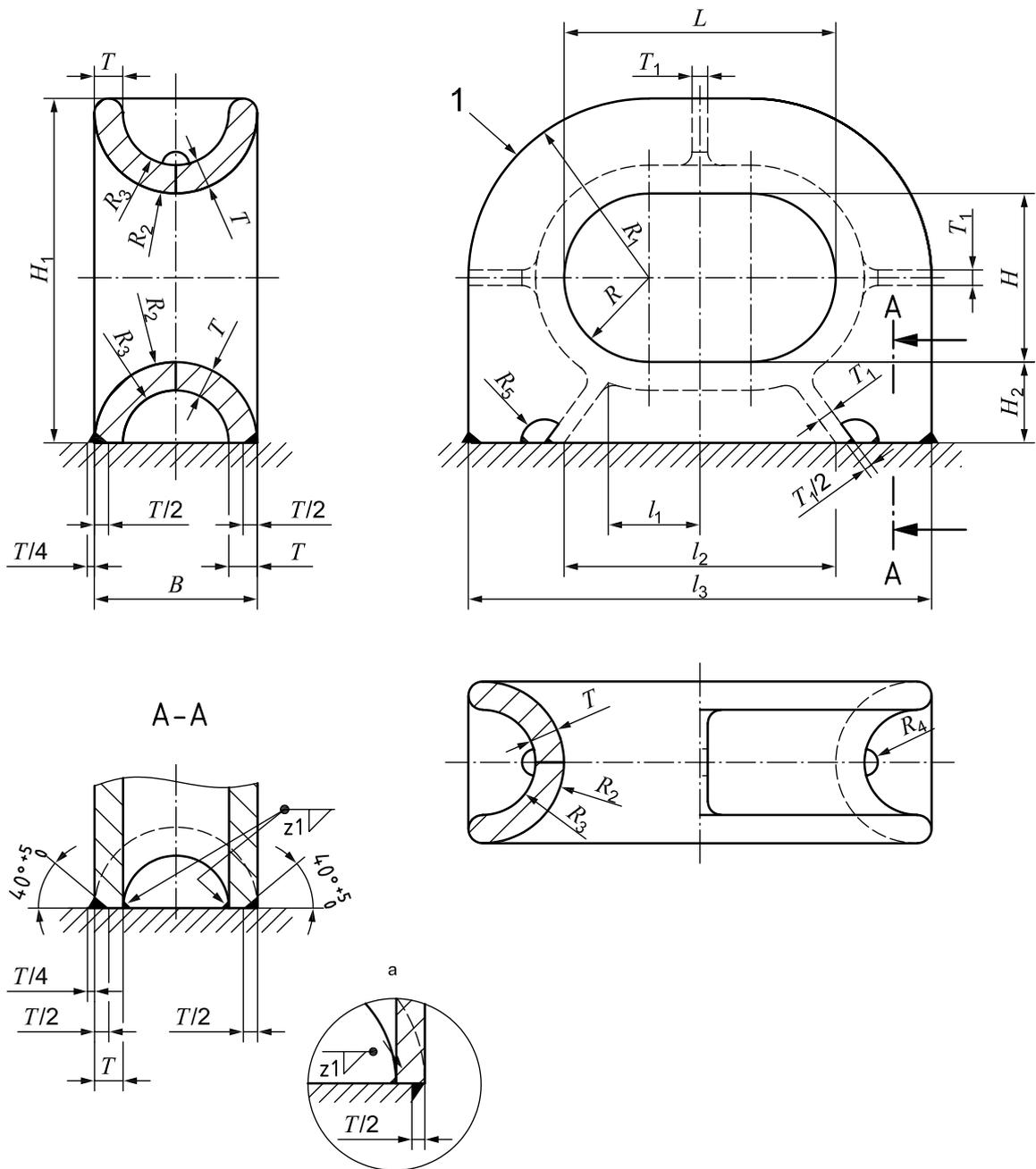
9.3 The mooring chock shall be clearly marked with its SWL by weld bead or equivalent. The SWL shall be expressed in tonnes (letter 't') and be placed so that it is not obscured during operation of the fitting.

EXAMPLE SWL XXX t

9.4 The SWL mark shall be placed on the foundation of the chock or on deck.

9.5 The radii of edges and corners not shown in Figures 1 and 2 shall be of minimum 25 mm.

Dimensions in millimetres



**Key**

- 1 mooring chock
- a Alternative welding method.

**Figure 1 — Type A — Deck-mounted mooring chocks**

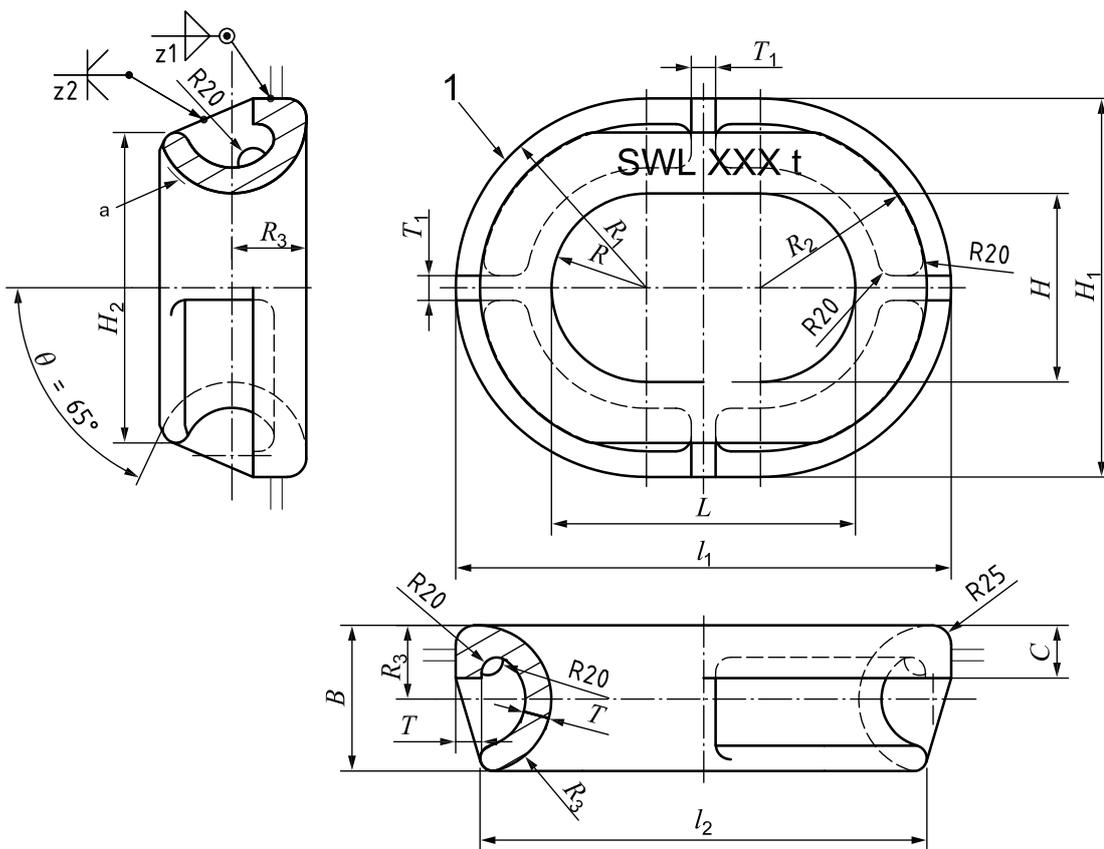
**Table 1 — Dimensions and SWL of Type A — Deck-mounted mooring chocks**

Dimensions in millimetres

Nominal size <i>L x H</i>	<i>l</i> <sub>1</sub>	<i>l</i> <sub>2</sub>	<i>l</i> <sub>3</sub>	<i>B</i>	<i>H</i> <sub>1</sub>	<i>H</i> <sub>2</sub>	<i>R</i>	<i>R</i> <sub>1</sub>	<i>R</i> <sub>2</sub>
250x200	100	250	444	160	377	80	100	197	80
300x250	110	300	536	200	468	100	125	243	100
350x250	125	350	608	220	489	110	125	254	110
400x250	135	400	682	240	511	120	125	266	120
450x250	150	450	760	260	535	130	125	280	130
500x250A	175	500	832	280	556	140	125	291	140
500x250B	175	500	840	280	560	140	125	295	140
Nominal size <i>L x H</i>	<i>R</i> <sub>3</sub>	<i>R</i> <sub>4</sub>	<i>R</i> <sub>5</sub>	<i>T</i>	<i>T</i> <sub>1</sub>	Welding leg length <sup>a</sup>	SWL <sup>b</sup>		Calculated weight <sup>c</sup> (kg)
							<i>z</i> <sub>1</sub>	(kN)	
250x200	46	20	15	34	18	8,5	353	36	73
300x250	64	25	20	36	20	9	491	50	121
350x250	72	30	20	38	20	9,5	589	60	151
400x250	78	30	20	42	23	10,5	736	75	200
450x250	80	30	20	50	28	12,5	981	100	280
500x250A	88	30	20	52	30	13	1 128	115	338
500x250B	80	30	20	60	36	15	1 373	140	396
<p><sup>a</sup> The welding method may be changed based on the same welding volume/strength.</p> <p><sup>b</sup> The SWLs shown are for reference only. These are based on the loadings as mentioned in Annex A. The "SWL" may be adjusted depending on the actual loading conditions, and the actual marking shall be agreed between the user and the manufacturer.</p> <p><sup>c</sup> The calculated weight is for reference only.</p>									

www.iso.org

Dimensions in millimetres



**Key**

- 1 mooring chock
- $\theta^\circ$  maximum available line leading angle limited by the end of curve surface (for reference)
- a SWL marking.

NOTE The SWL mark shall be provided on the chock or on the shell plate near the chock.

**Figure 2 — Type B — Bulwark-mounted mooring chocks**

[www.iso.org/iso/standards\\_catalogue/standards/iso\\_13713.htm](http://www.iso.org/iso/standards_catalogue/standards/iso_13713.htm)

**Table 2 — Dimensions and SWL of Type B — Bulwark-mounted mooring chocks**

Dimensions in millimetres

Nominal size <i>L x H</i>	<i>l</i> <sub>1</sub>	<i>l</i> <sub>2</sub>	<i>B</i>	<i>H</i> <sub>1</sub>	<i>H</i> <sub>2</sub>	<i>C</i>	<i>R</i>	<i>R</i> <sub>1</sub>	<i>R</i> <sub>2</sub>
250x200	450	398	154	408	327	57	100	200	174
300x250	516	460	168	466	387	60	125	233	205
350x250	582	520	177	482	395	65	125	241	210
400x250	652	588	193	502	412	70	125	251	219
450x250	734	662	213	534	433	77	125	267	231
500x250A	812	730	237	562	447	82	125	281	240
500x250B	828	750	253	578	466	82	125	289	250
Nominal size <i>L x H</i>	<i>R</i> <sub>3</sub>	<i>T</i>	<i>T</i> <sub>1</sub>	Welding leg length <sup>a</sup>		SWL <sup>b</sup>		Calculated weight <sup>c</sup> (kg)	
				<i>z</i> <sub>1</sub>	<i>z</i> <sub>2</sub>	(kN)	(t)		
250x200	78	26	20	8	8	353	36	48	
300x250	85	27	24	8	9,5	491	50	83	
350x250	90	29	25	9	10	589	60	100	
400x250	98	34	32	9,5	13	736	75	145	
450x250	108	41	36	12,5	14,5	981	100	215	
500x250A	120	41	36	12,5	14,5	1 128	115	235	
500x250B	128	48	41	14,5	16,5	1 373	140	266	

<sup>a</sup> The welding method may be changed based on the same welding volume/strength.

<sup>b</sup> The SWLs shown are for reference only. These are based on the loadings as mentioned in Annex A.  
 "SWL" may be adjusted depending on the actual loading conditions, and the actual marking shall be agreed between the user and the manufacturer.

<sup>c</sup> The calculated weight is for reference only.

## Annex A (informative)

### Basis for strength assessment of mooring chocks

#### A.1 General

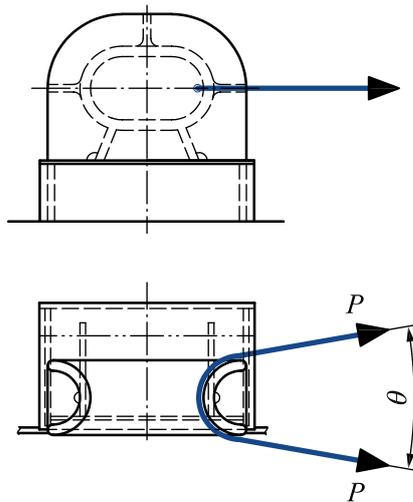
The strength of the mooring chocks was evaluated by finite element model analysis and determined based on the following design criteria.

#### A.2 Loading

The mooring chocks shall be designed to withstand the horizontal (Figure A.1) and vertical (Figures A.2 and A.3) load cases.

The horizontal and vertical loadings were considered individually, but both loadings were not considered simultaneously.

##### A.2.1 Case 1 — Horizontal loading



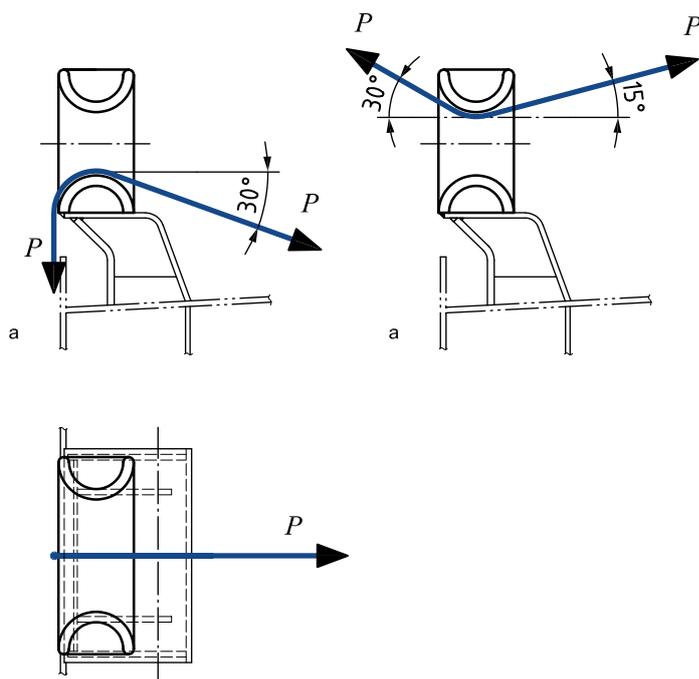
#### Key

$P$  mooring force or towing force

NOTE The loads were considered for a rope deflected 180° ( $\theta = 0^\circ$ ) through the mooring chock.

**Figure A.1 — Case 1 — Horizontal loading**

A.2.2 Case 2 — Vertical loading



**Key**

*P* mooring force or towing force

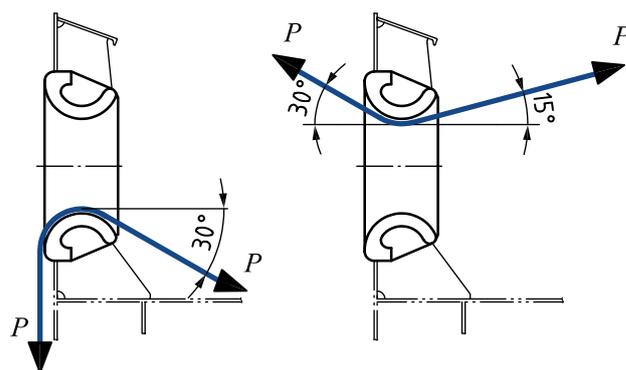
a Ship side.

NOTE The loads were considered for a rope deflected through the mooring chock, as shown in this figure.

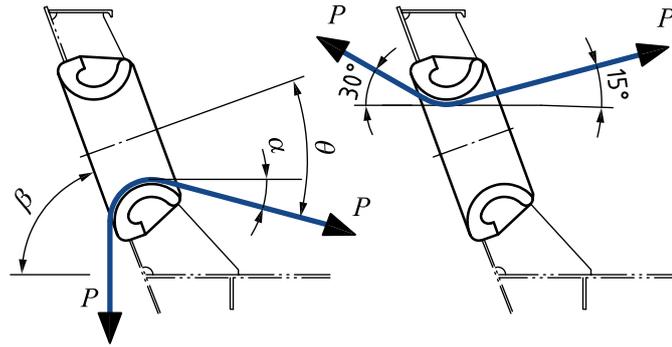
Vertical down side: Outboard down 90°, Inboard down 30°

Vertical up side: Outboard up 30°, Inboard up 15°

**Figure A.2 — Vertical loading for Type A — Deck-mounted mooring chocks**



**a) Bulwark-mounted mooring chocks without bulwark inclination**



### b) Bulwark-mounted mooring chocks with bulwark inclination

#### Key

$P$  mooring force or towing force

NOTE The loads were considered for a rope deflected as in this figure through the mooring chock.

Vertical down side: Outboard down  $90^\circ$ , Inboard down  $\theta^\circ$  is not to be over  $65^\circ$ .

( $\alpha^\circ$  = Maximum  $30^\circ$  for instance, at the design bulwark angle of  $\beta = 55^\circ$ .)

Vertical up side: Outboard up  $30^\circ$ , Inboard up  $15^\circ$ .

Figure A.3 — Vertical loading for Type B — Bulwark-mounted mooring chocks

### A.3 Load and stress criterion

Under the SWL, the following stress criterion was adopted:

- The combined stress is limited to 85 % of the yield stress of the material.

### A.4 Wear-down allowances and corrosion additions

The wear-down margin and corrosion margin were already included in the safety factor.

## Bibliography

- [1] IACS UR A2, *Shipboard fittings and supporting hull structures associated with towing and mooring on conventional vessels*
- [2] OCIMF, *Mooring Equipment Guidelines (MEG3)*
- [3] ISO 4990, *Steel castings — General technical delivery requirements*
- [4] ISO 13729, *Ships and marine technology — Ship's mooring and towing fittings — Closed chocks*

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