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**Ships and marine technology — Ship's  
mooring and towing fittings — Seats  
for Panama chocks**

*Navires et technologie maritime — Corps-morts et ferrures de  
remorquage de navires — Sièges pour écubiers de Panama*

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CP 401 • Ch. de Blandonnet 8  
CH-1214 Vernier, Geneva  
Phone: +41 22 749 01 11  
Email: [copyright@iso.org](mailto:copyright@iso.org)  
Website: [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.

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](http://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](http://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](http://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*.

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](http://www.iso.org/members.html).

## Introduction

The seat for Panama chocks is a seat 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.

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# Ships and marine technology — Ship's mooring and towing fittings — Seats for Panama chocks

## 1 Scope

This document specifies the types, nominal sizes, dimensions and materials, as well as construction, manufacturing and marking requirements, for the seats for Panama chocks installed to lead the mooring and towing rope of a ship. It is applicable to ships passing through the Panama Canal, which are normally assisted by locomotives using steel towing wires and/or by tug boats. These seats for chocks meet normal mooring requirements and Panama Canal requirements.

NOTE The seat for Panama chocks (SWL of 90 tons) for Panamax Plus and Neopanamax vessels can be replaced by seats for closed chocks (see ISO 23113).

## 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*

*Panama Canal Requirements — OP Notice to shipping No. N-1-2018 — Vessel requirements*

## 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

The seat for Panama chocks shall be classified by its installation site as belonging to one of the following types:

- a) Type A: seat for deck-mounted Panama chock;
- b) Type B: seat for deck and side shell-mounted Panama chock;
- c) Type C: brackets for bulwark-mounted Panama chock.

## 4.2 Nominal sizes

The nominal sizes of the seats for the Panama chocks are denoted by reference to the width of the opening, in millimetres.

The nominal sizes are 310 and 360.

## 5 Dimensions

The seats for Panama chocks shall have dimensions and particulars in accordance with [Tables 1, 2 and 3](#), and [Figures 1, 2 and 3](#).

## 6 Materials

Weldable steel plates having a yield point of not less than 235 N/mm<sup>2</sup> shall be used for manufacturing the seats for mooring chocks.

## 7 Construction

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

## 8 Manufacturing and inspection

**8.1** All surfaces of the seats for Panama chocks, 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 seats for Panama chocks shall be coated externally with an anti-corrosion protective finish.

## 9 Marking

**9.1** The SWL for the intended use of the seats for Panama chocks 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 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 document.

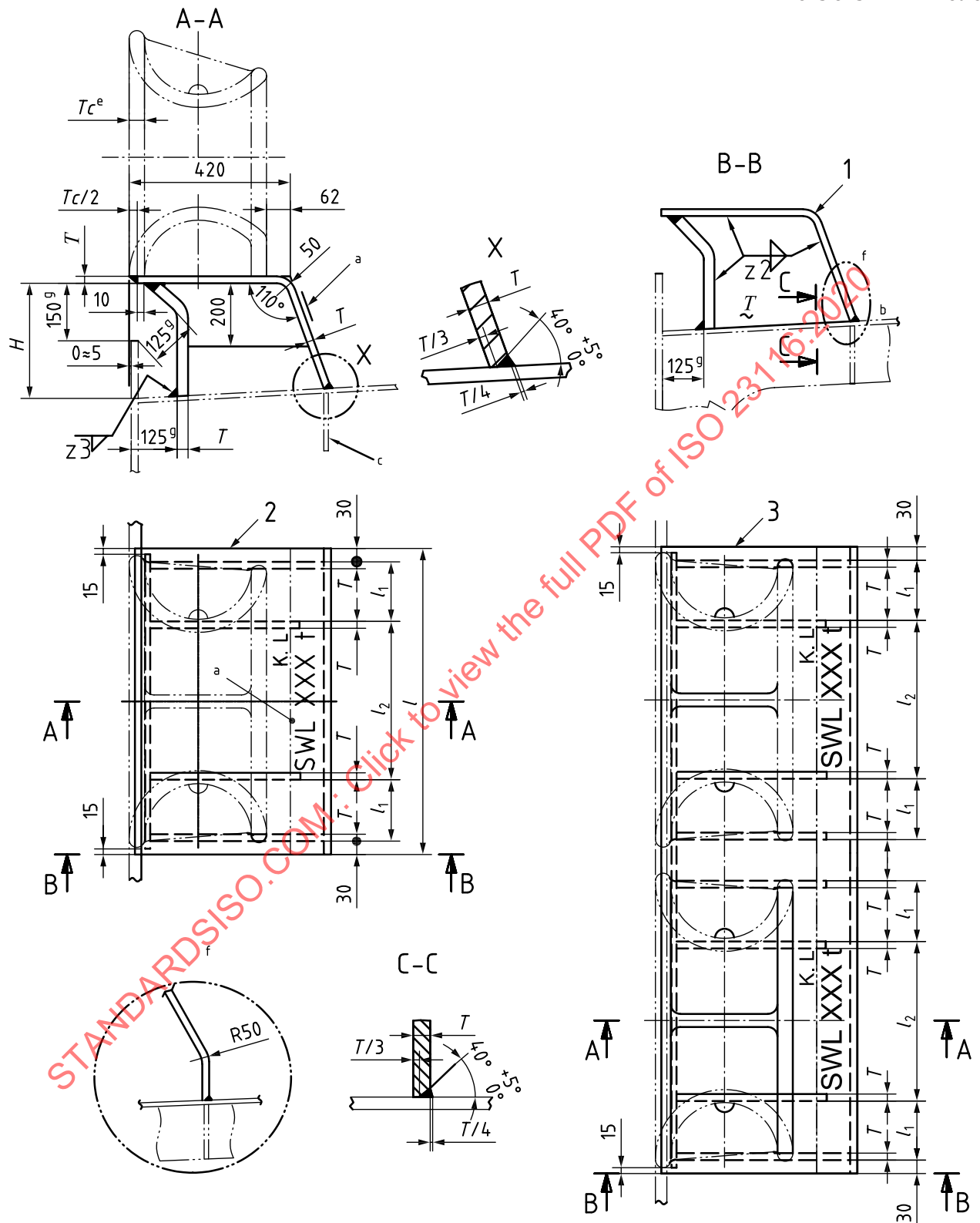
**9.3** The seats for Panama chocks shall be clearly marked with their SWL by weld bead or equivalent. The SWL shall be expressed in tonnes (symbol 't') and be placed so that it is not obscured during operation of the fitting.

EXAMPLE      SWL XXX t

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



Dimensions in millimetres



# Key

- 1 seat for Panama chock
- 2 seat for single Panama chock
- 3 seat for double Panama chock
- a SWL marking.
- b Deck.

- c Under carling.
- d Smooth grinding.
- e Thickness of Panama chock (refer to ISO 13728).
- f Alternative application method.
- g Minimum height (may be adjusted depending on welding workability).

The height of seat for the Panama chock ( $H$ ) shall be determined in accordance with the hull construction design.  
K.L is the knuckle line.

**Figure 1 — Type A — Seat for deck-mounted Panama chocks**

**Table 1 — Dimensions and SWL of Type A — Seats for deck-mounted Panama chocks**

Dimensions in millimetres

Nominal size $L \times H$	$I$	$I_1$	$I_2$	$T$	$T_1$	Welding leg length <sup>a</sup>			SWL <sup>b</sup>		Calculated weight <sup>c</sup> kg
						$z_1$	$z_2$	$z_3$	kN	t	
310	738	168	342	15	18	8	9	11	471	48	165
360	790	168	394	18	24	9	13	17	687	70	214

<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](#). The strength of the seat for the Panama chocks was evaluated on the basis of a seat height of 400 mm.  
The “SWL” which is marked on the fitting 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 (mass) is for reference only, which was calculated on the basis of a seat height of 400 mm for single chock, excluding the Panama chock itself.



**Table 2 — Dimensions and SWL of Type B — Seats for deck and side shell-mounted Panama chocks**

Dimensions in millimetres

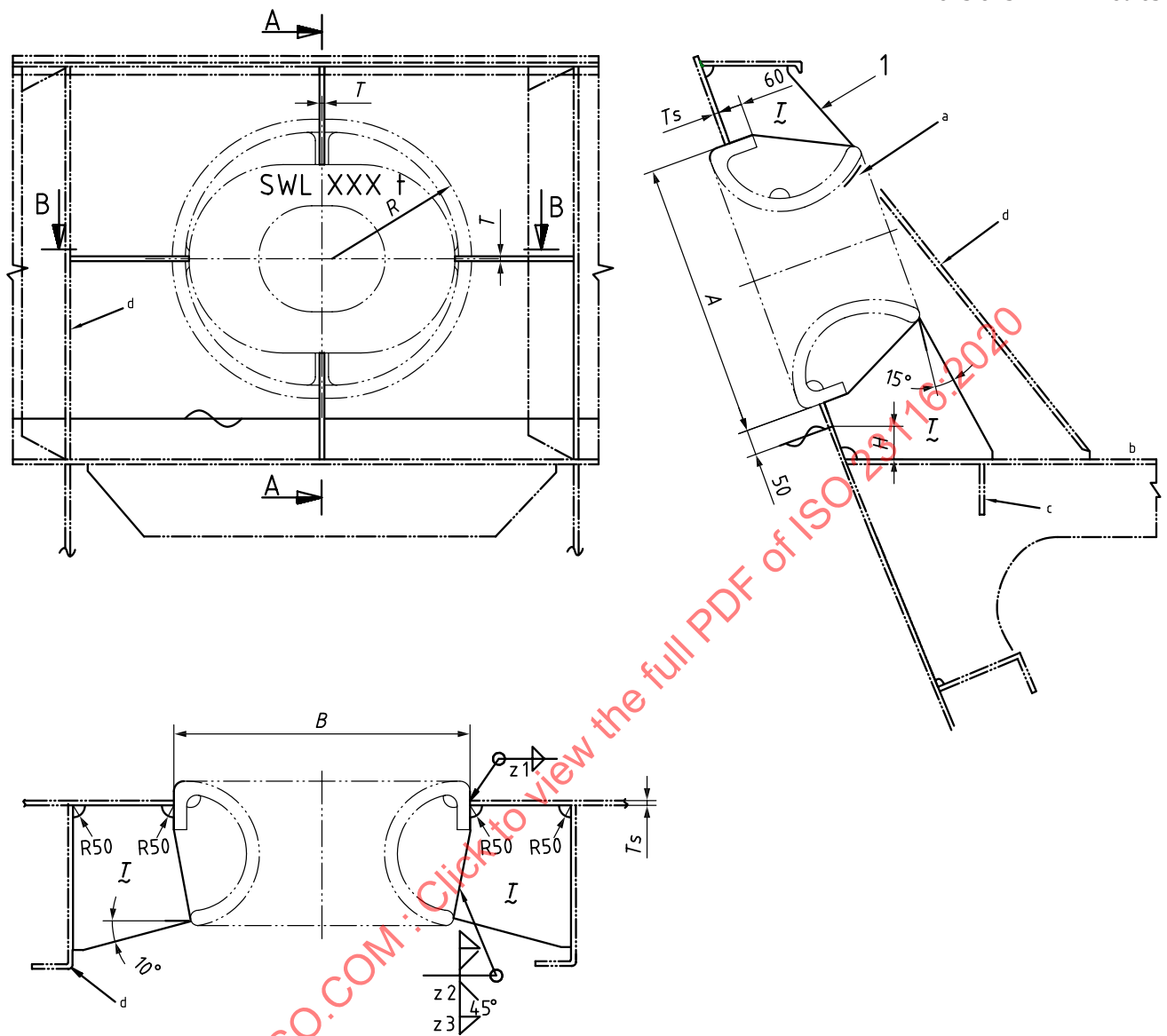
Nominal size $L \times H$	$I$	$I_1$	$I_2$	$T$	Welding leg length <sup>a</sup>		SWL <sup>b</sup>	
					$z_1$	$z_2$	kN	t
310	738	168	342	15	8	11	353	48
360	790	168	394	18	9	13	491	70

<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](#). The strength of seat for the closed chocks was evaluated on the basis of a seat height of 400 mm.

The “SWL” which is marked on the fitting may be adjusted depending on the actual loading conditions of mooring rope under the agreement between the user and the manufacturer.

Dimensions in millimetres



**Key**

- 1 brackets for Panama chock
- a SWL marking
- b Deck.
- c Under carling.
- d Bulwark stay.

The height of Panama chock(H) shall be determined in accordance with the hull construction design.

**Figure 3 — Type C — Brackets for bulwark-mounted Panama chocks**

**Table 3 — Dimensions and SWL of Type C — Brackets for bulwark-mounted Panama chocks**

Dimensions in millimetres

Nominal size $L \times H$	Opening size of Bulwark			Thick- ness of bracket <sup>a</sup>	Thickness of side shell (Ref- erence only)	Welding leg length <sup>b</sup>			SWL <sup>c</sup>	
	$A$	$B$	$R$			$z_1$	$z_2$	$z_3$	kN	t
310	674	724	337	15	14	10	6	4	687	70
360	674	774	337	15	14	10	6	5	775	79

<sup>a</sup> The thickness of brackets may be adjusted based on the same strength.

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

<sup>c</sup> The SWLs shown are for reference only. These are based on the loadings as mentioned in [Annex A](#).

The “SWL” which is marked on the fitting may be adjusted depending on the actual loading conditions of mooring rope under the agreement between the user and the manufacturer.

## Annex A (normative)

### Basis for strength assessment of the seats for Panama chocks

#### A.1 General

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

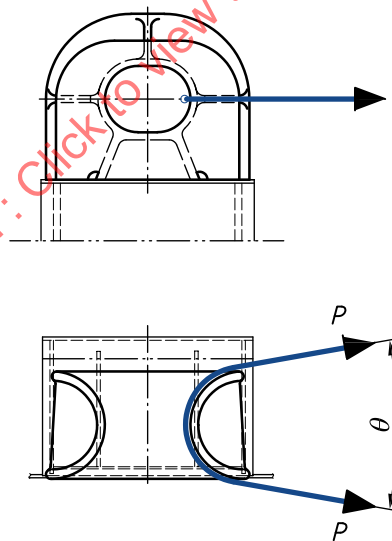
#### A.2 Loading

The seats for Panama 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

See Figure A.1.



**Key**

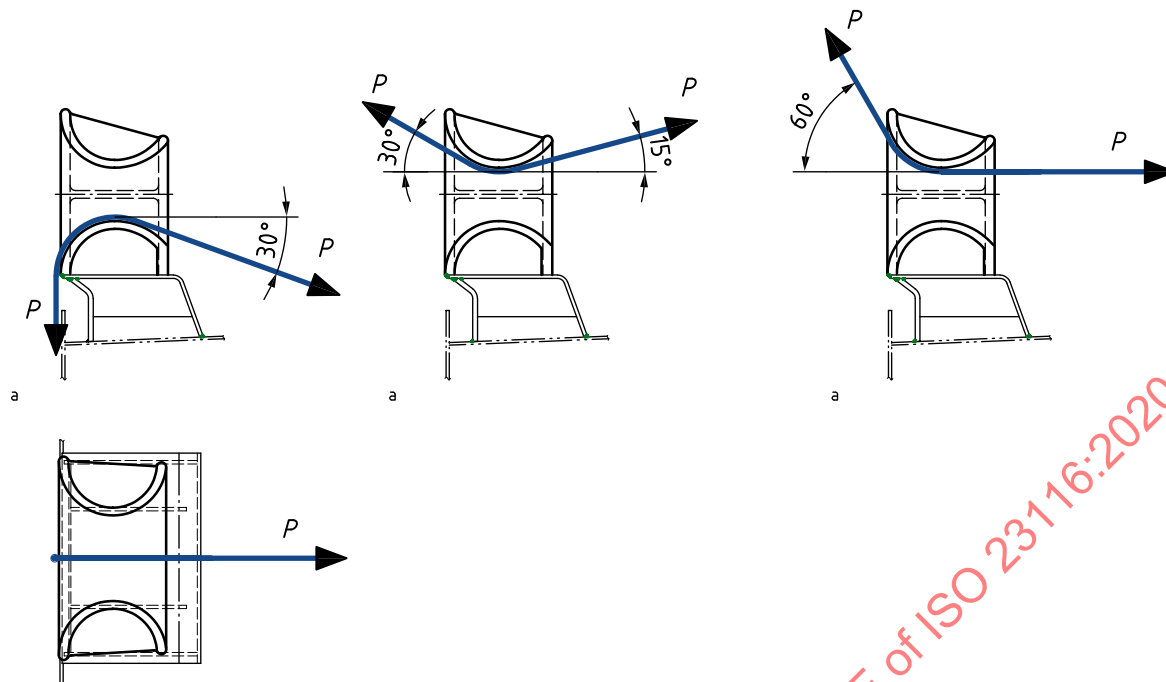
$P$  mooring force or towing force

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

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

##### A.2.2 Case 2 — Vertical loading

See [Figures A.2](#) and [A.3](#).



**Key**

$P$  mooring force or towing force

a Ship side.

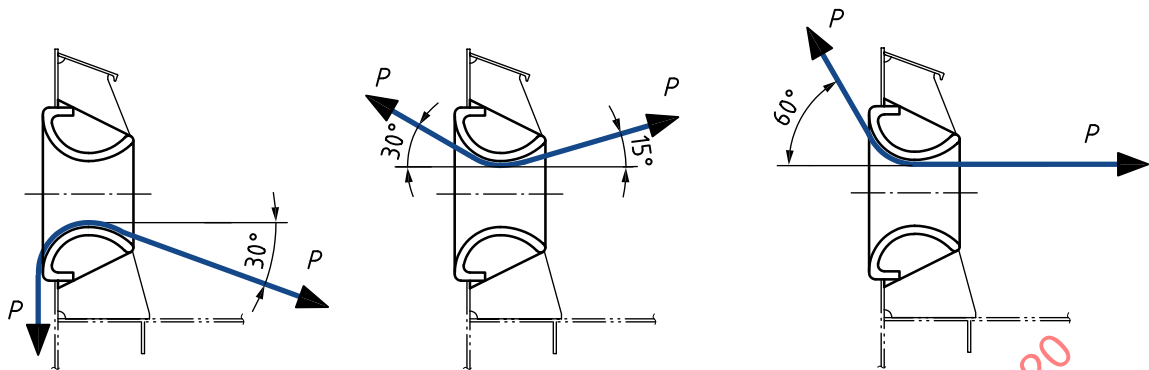
NOTE The loads were considered for a rope deflected through the Panama chock, as shown in this figure.

Vertical down side: outboard down 90°, inboard down 30°.

Vertical up side: outboard up 30°, inboard up 15°, or outboard up 60°, inboard up 0°.

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



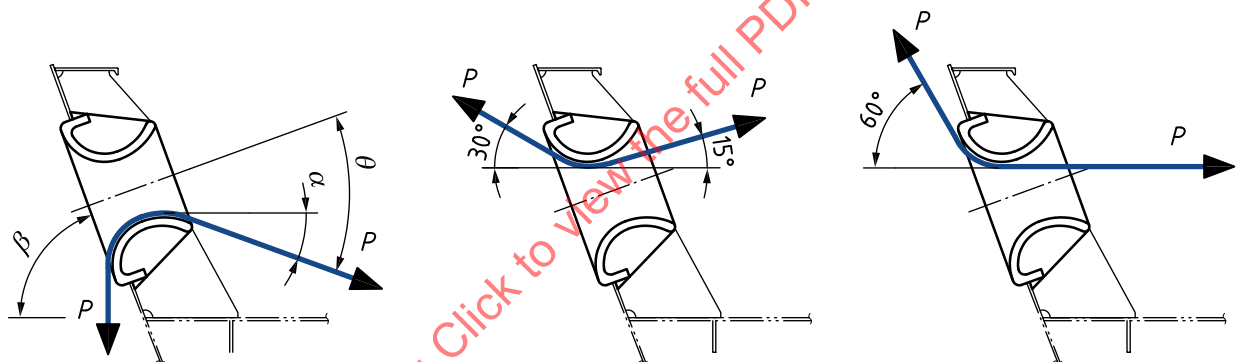


NOTE The loads were considered for a rope deflected as through the Panama chock as shown in [Figure A.3 a\)](#).

Vertical down side: outboard down 90°, inboard down 30°.

Vertical up side: outboard up 30°, inboard up 15°, or outboard up 60°, inboard up 0°.

#### a) Seats for bulwark-mounted Panama chocks without bulwark inclination



NOTE The loads were considered for a rope deflected as through the Panama chock as shown in [Figure A.3 b\)](#).

Vertical down side: outboard down 90°, inboard down  $\theta^\circ$  is not over the figures in [Table 2](#).

Vertical up side: outboard up 30°, inboard up 15°, or outboard up 60°, inboard up 0°.

#### b) Seats for bulwark-mounted Panama chocks with bulwark inclination

##### Key

$P$  mooring force or towing force