INTERNATIONAL STANDARD

ISO 13776

First edition
2012-07-01

Ships and marine technology — Ship's mooring and towing fittings — Pedestal fairleads

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

Reference number
ISO 13776:2012(E)

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Published in Switzerland

Contents

Page

Foreword

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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.

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ISO 13776 was prepared by Technical Committee ISO/TC 8, *Ships and marine technology*, Subcommittee SC 4, *Outfitting and deck machinery*.

Introduction

The pedestal fairlead is a type of ship's mooring fitting installed on board to lead and change the direction of mooring ropes.

Ships and marine technology — Ship's mooring and towing fittings — Pedestal fairleads

1 Scope

This International Standard specifies the design, size and technical requirements for pedestal fairleads installed to lead the mooring 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.

ISO 13755, *Ships and marine technology — Ship's mooring and towing fittings — Steel rollers*

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.

3.1
safe working load
SWL
maximum load in kN on the rope that should normally be applied in service conditions

4 Nominal sizes

The nominal sizes, D_n, of pedestal fairleads are denoted by reference to the outside diameter of the roller in millimetres from a basic series of preferred numbers.

The nominal sizes are: 150, 200, 250, 300, 350, 400, 450 and 500.

5 Dimensions

Pedestal fairleads have dimensions and particulars in accordance with Table 1, and Figures 1 and 2.

6 Materials

The following material shall be used for manufacturing the pedestal fairleads:

— Pedestal: weldable steel plates having a yield point of not less than 235 N/mm^2.

7 Manufacturing and inspection

7.1 All surfaces of the pedestal fairleads, including welding, shall be free from any visible flaws or imperfections.

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

7.3 The pedestal fairleads shall be coated externally with an anti-corrosion protective finish.

8 Marking

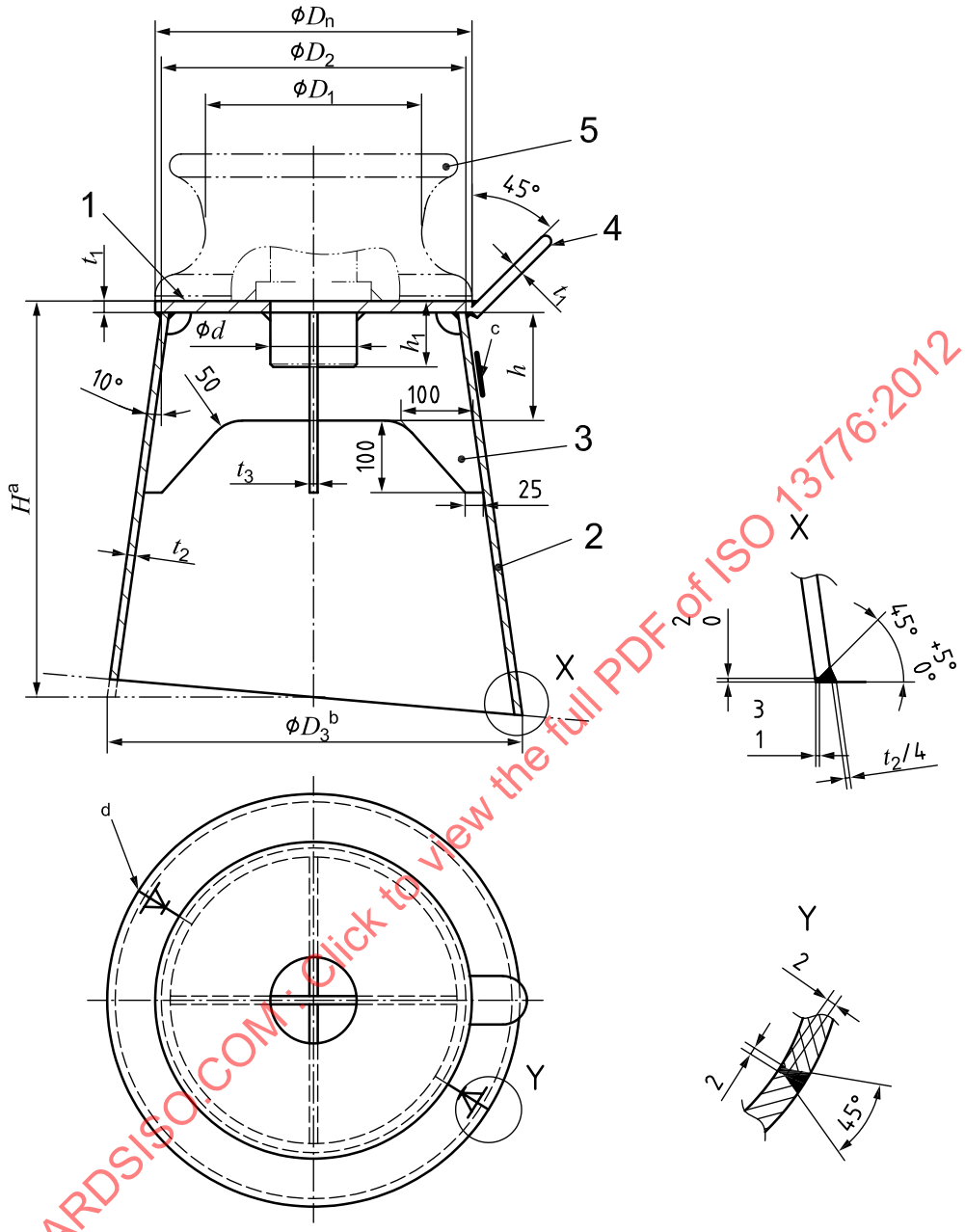
8.1 The safe working load (SWL) intended for the use of the pedestal fairleads shall be noted in the towing and mooring plan available on board for the guidance of the shipmaster as specified in MSC/Circ.1175.

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

8.3 The pedestal fairleads shall be clearly marked with their 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

Dimensions in millimetres



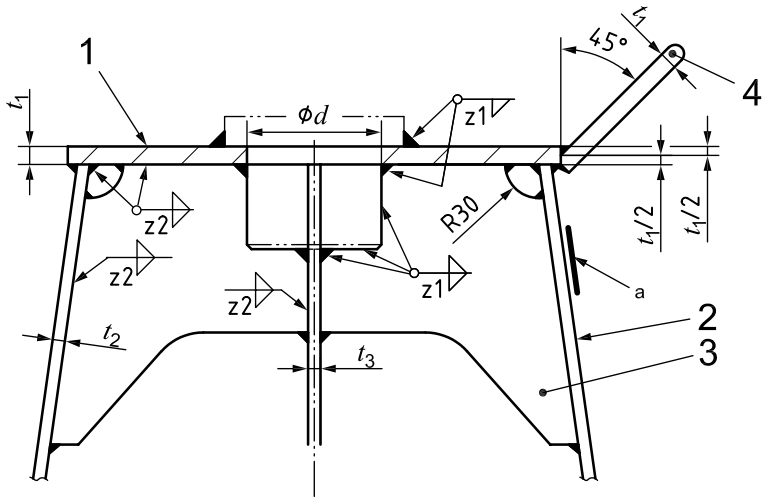
Key

1 top plate
2 body
3 reinforcement
4 rope guide
5 steel roller (ISO 13755 steel rollers)

a Height is to be determined in accordance with actual mooring rope height through the pedestal fairlead.
b Diameter Ø D_3 is to be calculated depending on the height of the pedestal , H [$D_3 = D_2 + 2 \times (H - t_1)$ x tan 10°].
c SWL marking.
d Seam.

Figure 1 — Assembly of pedestal fairleads

Dimensions in millimetres



Key

1 top plate
2 body
3 reinforcement
4 rope guide
[a] SWL marking.

Figure 2 — Detail of pedestal fairleads

Table 1 — Dimensions and SWL of pedestal fairleads

Dimensions in millimetres

Nominal size D_n	D_1	D_2	d[e]		h	h_1	t_1	t_2	t_3	Welding leg length[a]	
			Type A and B	Type C						z_1	z_2
150	220	230	71,5	81,5	200	100	16	10	16	8	5
200	288	300	93,5	102,5	200	100	20	12	20	10	6
250	357	370	113,5	119,5	200	100	22	12.5	22	11	6
300	417	430	128,5	130,5	225	125	24	13	24	12	6,5
350	472	490	145,5	152,5	225	125	26	17	26	15	8,5
400	540	560	154,5	164,5	250	150	28	18	28	17	9
450	600	620	167,5	179,5	250	150	30	20	30	20	10
500	655	680	178,5	195,5	250	150	32	22	34	23	11

Nominal size D_n	SWL[c]				Calculated weight[d] (kg) (for reference only)		
	θ [b] = 90°		θ = 0°				
	(kN)	(t)	(kN)	(t)	H = 500	H = 1 000	H = 1 500
150	265	27	186	19	55	115	198
200	441	45	314	32	86	169	278
250	579	59	412	42	113	210	335
300	726	74	510	52	145	256	395
350	1 040	106	736	75	201	358	552
400	1 246	127	883	90	255	436	657
450	1 599	163	1 128	115	314	530	791
500	1 942	198	1 373	140	383	636	938

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

[b] θ is the relative angle of ropes on the pedestal fairlead (refer to Annex A).

[c] The SWL is the maximum applicable rope tension based 90° (θ = 90°) and 180° (θ = 0°) deflection of rope direction by the pedestal fairlead.

The SWLs shown in this table 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.

[d] The calculated weight is for reference excluding the steel roller on the pedestal fairlead.

[e] d shall be decided depending on the type of steel roller (Type A and B or Type C), as specified in ISO 13755.

Annex A
(informative)

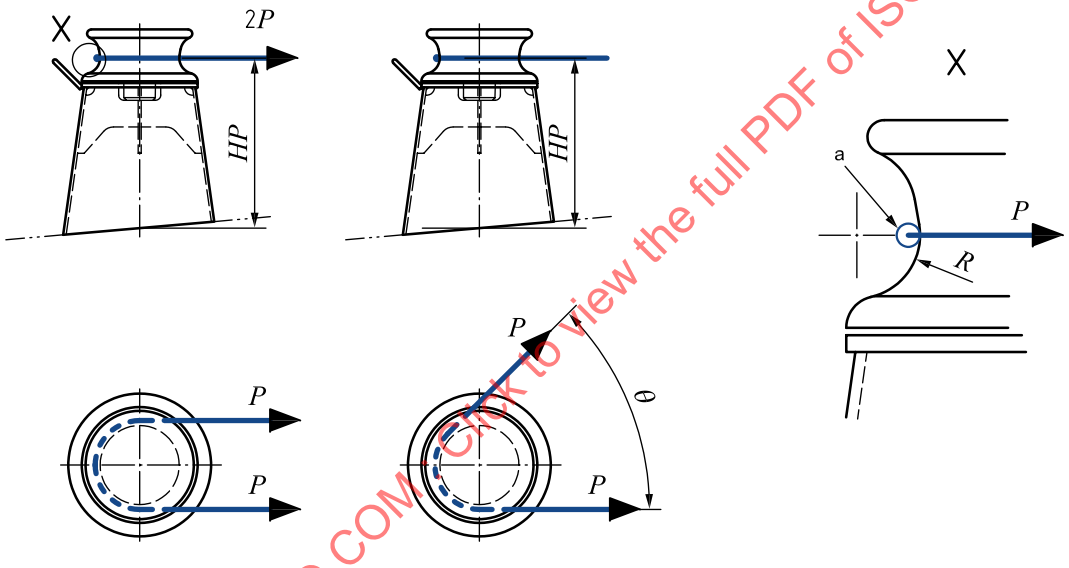
Basis for strength assessment of pedestal fairleads

A.1 General

The strength of the pedestal fairleads was evaluated by finite element model analysis and simple beam theory calculation, and determined based on the following design criteria.

A.2 Loading

The pedestal fairleads are to be designed to withstand the following load cases.



Key

P mooring force and towing force at the conical part of the throat of the roller

a Conical part of throat.

NOTE 1 The loads were considered with rope deflected 180° through the pedestal fairlead as shown in this figure.

NOTE 2 The loads can be increased in accordance with the deflecting angle of the rope smaller than 180°.

Figure A.1 — Loading on pedestal fairleads

A.3 Load and stress criteria

Under the SWL, the following stress criteria were adopted:

— The bending stress is limited to 85 % of the yield stress of the material.

— The shear stress is limited to 60 % of the yield stress of the material.