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Ships and marine technology — Loose gear of lifting appliances on ships — Pulleys

Navires et technologie maritime — Accessoires mobiles des appareils de levage sur les navires — Poulies

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Foreword

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For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information

The committee responsible for this document is ISO/TC 8, *Ships and marine technology*, Subcommittee SC 4, *Outfitting and deck machinery*.

Ships and marine technology — Loose gear of lifting appliances on ships — Pulleys

1 Scope

This International Standard specifies the structural types, basic parameters, technical requirements, test methods, inspection rules, marking, storage, and transportation of sheaves, loose gear of lifting appliances on ships.

This International Standard is applicable to hot-rolled sheaves of lifting appliances on ships.

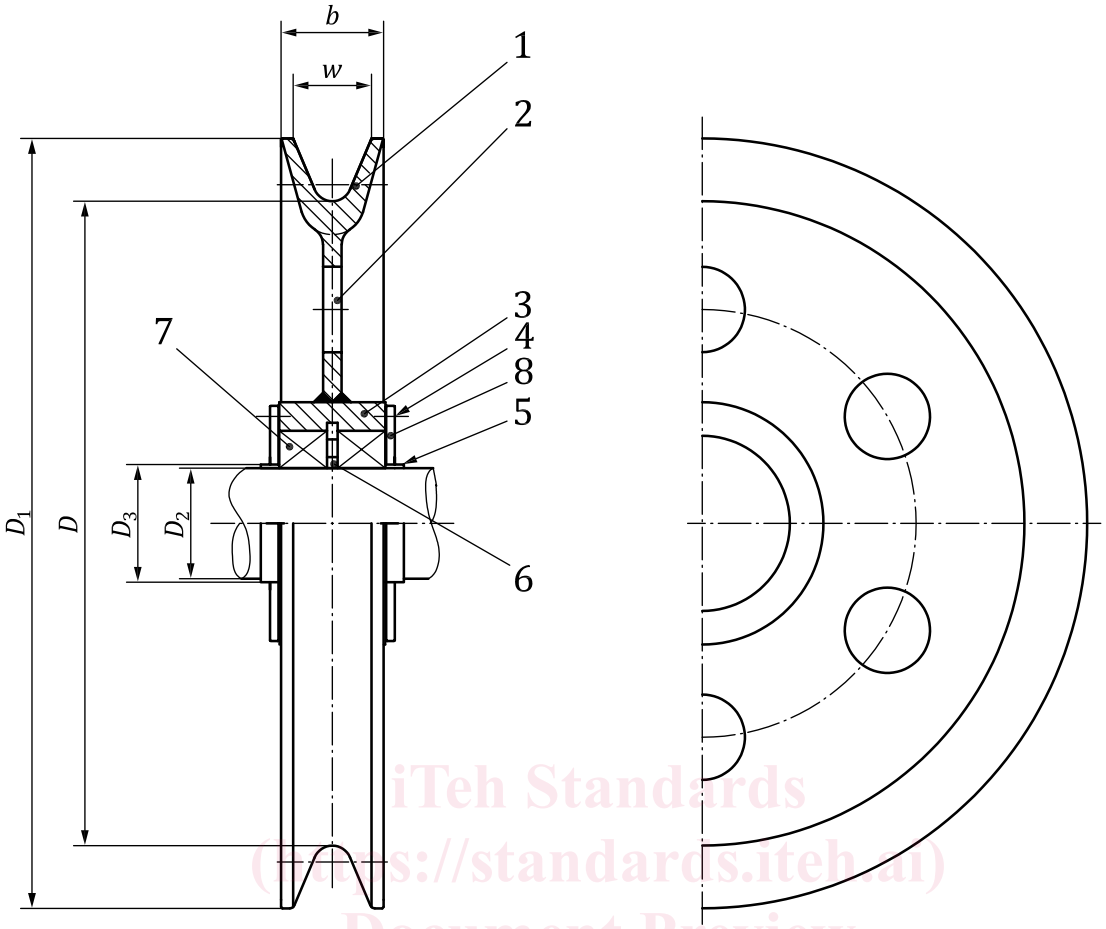
2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 16855, *Ships and Marine Technology — Loose gear of lifting appliances on ships — General requirements*

3 Sheave components

For the components and basic dimensions of hot-rolled sheaves, see Figure 1.



Key

1 rim
2 plate
3 hub
4 bolt
5 spacer
6 spacer sleeve
7 bearing
8 dust washer (optional)

Figure 1 — Sheave components

4 Designation of sheaves

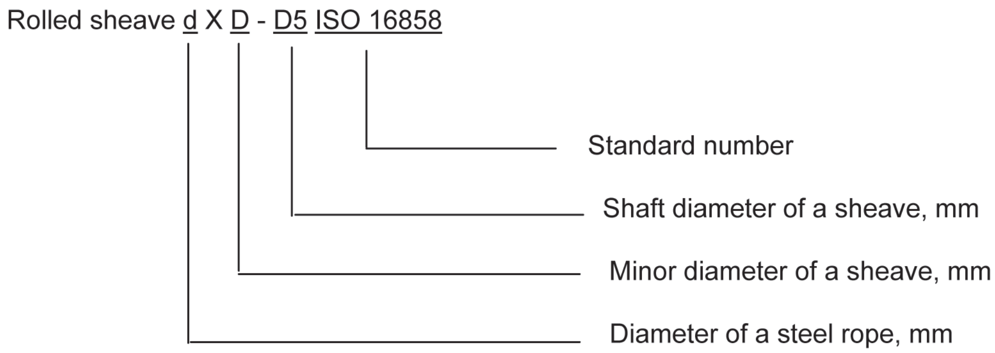


Figure — Example

5 Technical requirements

5.1 Materials

The materials of sheave components shall comply with the provisions in Table 1.

Table 1 — Requirements of component materials

Component name	Materials
Rim, plate, hub	*σs* ≥ 235 MPa for common carbon steel
Spacer	*σs* ≥ 235 MPa for common carbon steel or *σb* ≥ 160 MPa for gray cast-iron
Spacer sleeve	*σs* ≥ 600 MPa for quality carbon steel
Bolt	Above grade 8,8 specified in ISO 898
Dust cover	Wool felt

5.2 Ranges

For the ranges of sheaves, see Annex A.

5.3 Process

5.3.1 Rims and web

The rims and web of sheaves shall be manufactured from a single steel piece, with groove produced by hot rolling process.

5.3.2 Welding and weld

5.3.2.1 Welding materials used for sheaves shall match the strength of welded materials, in accordance with International Standards.

5.3.2.2 The rims and hubs of sheaves shall be welded with groove weld, with double groove preferred. The types of weld shall be in accordance with the related provisions of ISO.

5.3.2.3 The appearance shall have no quality defects such as steel pits, splashes, slag, undercuts, and surface cracks after welding.

5.3.2.4 After welding of rims and hubs, and before machining of sheaves, the sheave weld shall be adequately stabilized through thermal or vibratory stress relief, to ensure dimensional stability.

5.3.3 Surface treatment

5.3.3.1 The surface roughness of rope grooves shall not be less than 12,5; their surface hardness shall be HB260 minimum.

5.3.3.2 Machining positions of sheaves and open positions such as spacer sleeves shall be painted with antirust oil to prevent corrosion; non-machining positions shall be painted with antirust paint after the surface removal of rust.

5.4 Assembly requirements

5.4.1 Components can be assembled only after they pass tests.

5.4.2 Rolling bearings shall be cleaned before assembly, with clean, rustless, and burr-free contact surface.

5.4.3 The fit between outer rings of rolling bearings and hubs of sheaves is N7; the fit between inner rings and shafts is n6.

5.4.4 After assembly, sheaves can turn flexibly around the shaft without blocking, when manually moved.

5.5 Accuracy requirements

5.5.1 For the requirements on the limit deviation of outside diameter D_1, see Table 2.

Table 2 — Requirements on limit deviation of outside diameter D_1

Dimension in millimetres

Outside diameter D_1	Limit deviation t_1
≤250	−0,5
>250–500	−1,0
>500–1 000	−1,5
>1 000–1 200	−2,0
>1 200–1 500	−2,5
>1 500–1 800	−3,0
>1 800–2 000	−3,5

5.5.2 For the requirements on the limit deviation of groove minor diameter D, see Table 3.

Table 3 — Requirements on limit deviation of groove minor diameter D

Dimension in millimetres

Groove minor diameter D	Limit deviation t_2
≤250	+2,5
>250–500	+3,0
>500–1 000	+4,0
>1 000–1 200	+5,0
>1 200–1 500	+6,0
>1 500–1 800	+7,0
>1 800–2 000	+8,0

5.5.3 For the requirements on the limit deviation of groove radius R, see Table 4.

Table 4 — Requirements on limit deviation of groove radius R

Dimension in millimetres

Basic dimensions R	Limit deviation t_3
≤15	+1,0
>15–30	+1,5

5.5.4 For the limit deviation of rim width (W + 2 m), see Table 5.

Table 5 — Limit deviation of rim width (W + 2 m)

Dimension in millimetres

Rim width (W + 2 m)	Limit deviation t_4
≤50	+2
≤75	+3
≤108	+4
≤136	+5

5.5.5 The lateral run-out tolerance of grooves (see Figure 2) shall comply with the requirements given in Table 6.

Table 6 — Lateral run-out tolerance of grooves

Dimension in millimetres

Groove minor diameter D	Limit deviation t_5
≤250	2,0
>250–500	2,5
>500–1 000	3,0
>1 000–1 200	4,0
>1 200–1 500	5,0
>1 500–1 800	6,0

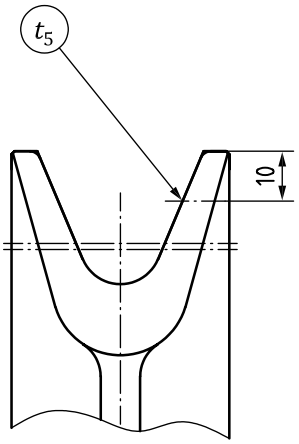


Figure 2 — Lateral run-out tolerance of grooves

5.5.6 Cycle run-out t_6 at the minor diameter D of sheaves shall comply with Formula (1) (see also Figure 3):

$$t_6 \leq \frac{2{,}5}{1\,000} \times D \tag{1}$$

5.5.7 Cylindricity tolerance t_7 at the hub bore D_0 shall comply with Formula (2) (see also Figure 3):

$$t_7 \leq \frac{\text{tolerance zone of } D0}{2} \tag{2}$$

5.5.8 Profile tolerance t_8 of a line within the tolerance zone of groove radius shall comply with Formula (3) (see also Figure 3):

$$t_8 \leq \text{limit deviation } t_3 \text{ of groove radius } R \tag{3}$$

