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Ships and marine technology — Cable stoppers

Navires et technologie maritime — Stoppeurs de chaîne

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Foreword

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

This third edition cancels and replaces the second edition (ISO 6325:1987), which has been technically revised.

The main changes are as follows:

— in Figure 3, a combined track and roller stopper with adjust block has been added;

— in 4.2, the nominal size of the cable stopper corresponding to the nominal size of anchor chain has been added according to ISO 1704;

— in 5.1, designed environmental conditions and material requirements have been added;

— in 5.7, location design requirements of cable stopper have been added;

— in Clause 6, functional, operational and installation requirements have been added;

— in Clause 7, acceptance tests requirements have been added;

— Annex A and Annex B have been deleted.

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.

Ships and marine technology — Cable stoppers

1 Scope

This document specifies requirements for the types, sizes, design, construction, strength, safety, function, operation, installation and acceptance tests of cable stoppers.

This document is applicable to the design, manufacturing and acceptance tests of cable stoppers for use with marine windlasses and anchor capstans as defined in ISO 4568.

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.

ISO 1704, *Ships and marine technology — Stud-link anchor chains*

ISO 3828, *Shipbuilding and marine structures — Deck machinery — Vocabulary and symbols*

ISO 4568, *Ships and marine technology — Sea-going vessels — Windlasses and anchor capstans*

ISO 7825:2017, *Shipbuilding — Deck machinery — General requirements*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 3828, ISO 4568 and the following apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

3.1
cable stopper
device which is secured to the ship's structure, separate from the cable lifter, for the purpose of securing a chain cable against the tension from the anchor

Note 1 to entry: The stopper also serves as a guide for the chain cable during operation.

3.2
class A cable stopper
cable stopper (3.1) designed and constructed to withstand, without permanent deformation, 80 % of the nominal breaking load of the maximum diameter and the highest chain cable grade for which it is intended

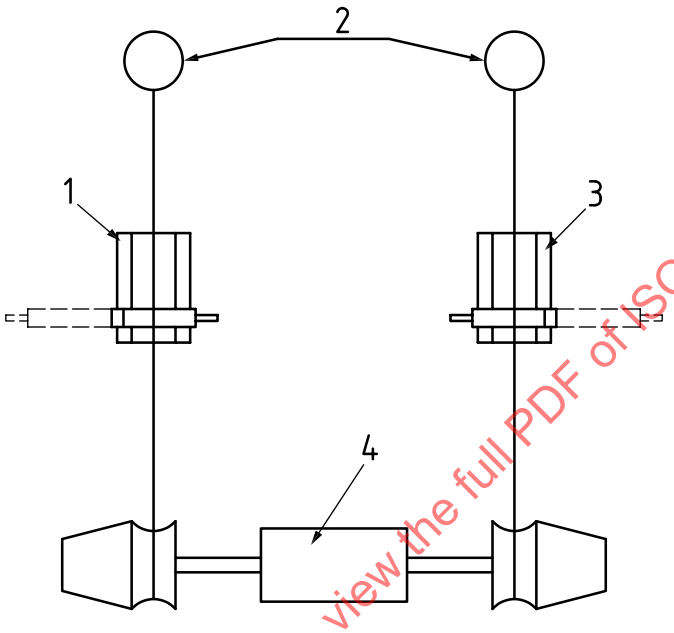
3.3
class B cable stopper
cable stopper (3.1) designed and constructed to withstand, without permanent deformation, 40 % of the nominal breaking load of the maximum diameter and the highest chain cable grade for which it is intended

3.4
right-hand cable stopper
cable stopper (3.1) which is operated from the right-hand side when seen from the cable lifter

Note 1 to entry: The right-hand cable stopper is shown in Figure 1.

3.5
left-hand cable stopper
cable stopper (3.1) which is operated from the left-hand side when seen from the cable lifter

Note 1 to entry: The left-hand cable stopper side is shown in Figure 1.



Key

1	left-hand cable stopper	3	right-hand cable stopper
2	hawse pipe	4	windlass

Figure 1 — Cable stopper side

3.6
chain cable grade
classification determined by the nominal tensile strength of the chain cable steel used for manufacturing

Note 1 to entry: Stud link chain cables are to be subdivided into grades 1, 2 and 3.

[SOURCE: IACS, UR W18]

4 Types and sizes

4.1 Main types

4.1.1 There are two types of cable stoppers according to the structure and function: the fixing cable stopper and adjusting type cable stopper.

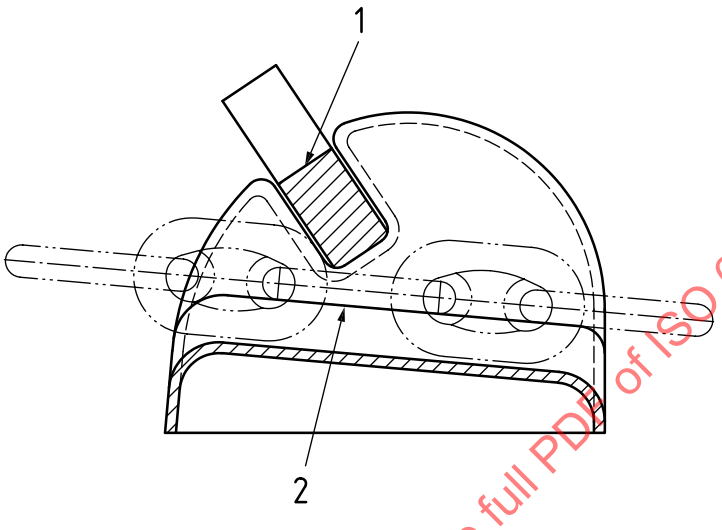
4.1.2 Fixing cable stoppers include the following:

— track-type stopper (T type): this is the cable stopper over which the chain cable passes by sliding. It has a track to guide and keep the chain cable in place. See Figure 2 a).

— roller-type stopper (R type): this cable stopper is fitted with a roller over which the chain cable passes. The roller can be shaped for guiding and holding functions. See Figure 2 b).

— combined track and roller stopper without adjust block (C type): this cable stopper has the characteristics of both the track-type stopper and roller-type stopper. See Figure 2 c).

4.1.3 The adjusting type stopper has one type: the combined track and roller stopper with adjust block. This cable stopper has the characteristics of both the track-type stopper and roller-type stopper defined in 4.1.2. See Figure 3.

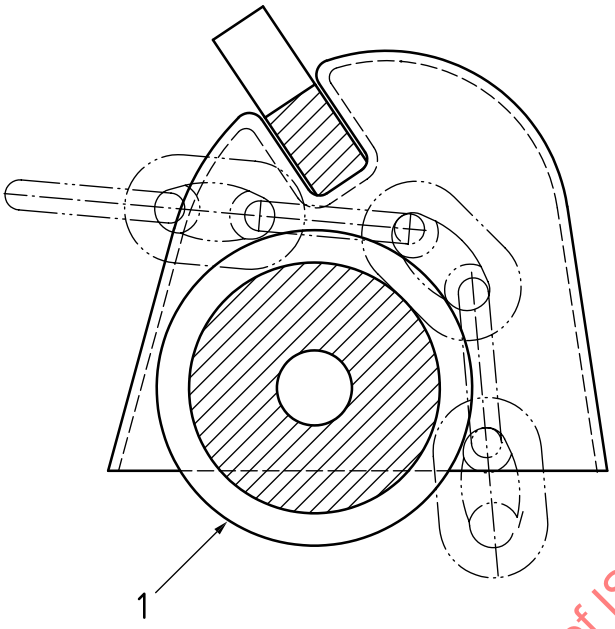


Key

1 hinged bar in closed position

2 track

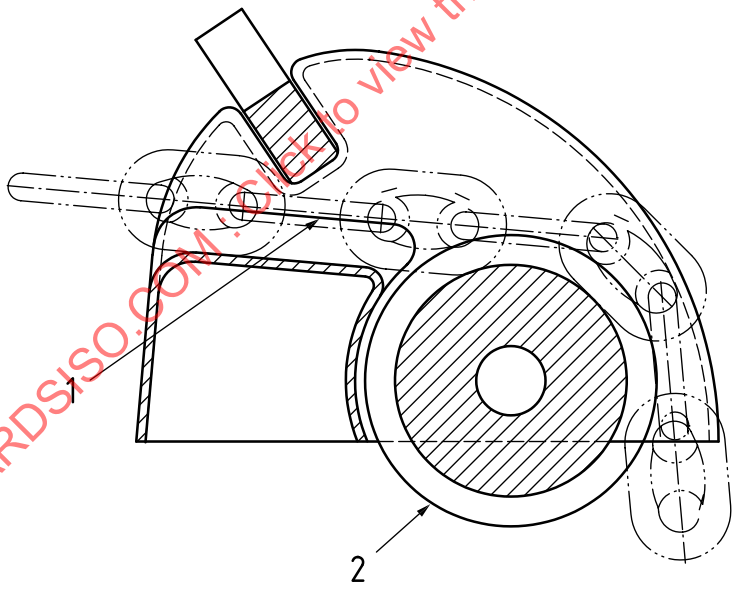
a) Track-type stopper



Key

1 roller

b) Roller-type stopper



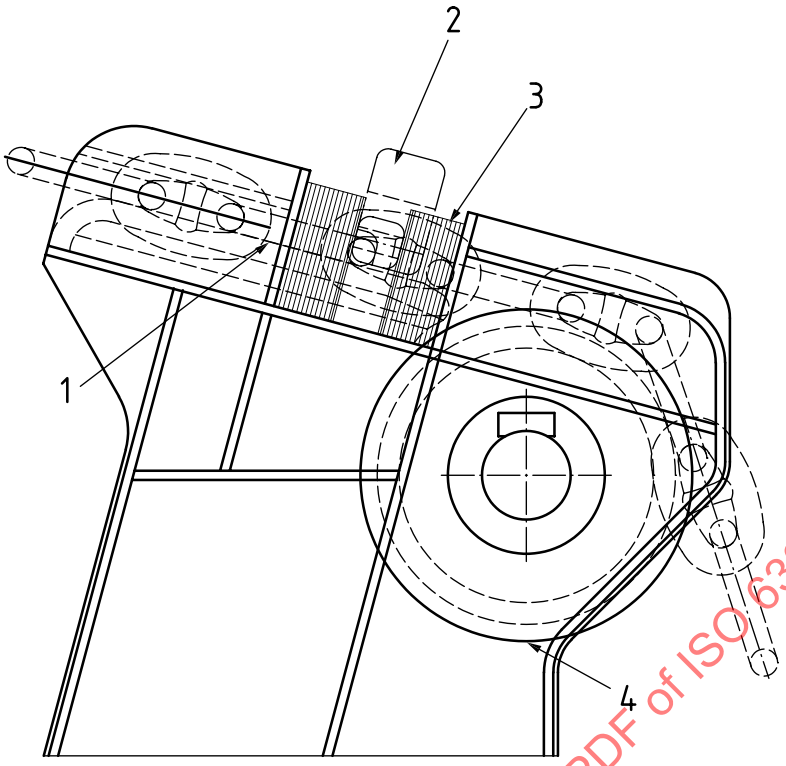
Key

1 track

2 roller

c) Combined track and roller stopper without adjust block

Figure 2 — Fixing type cable stopper



Key

1	track	3	adjust block
2	lever	4	roller

Figure 3 — Combined track and roller stopper with adjust block

4.2 Nominal sizes

The nominal size for the cable stopper corresponds to the nominal size of anchor chain, which shall be accordance with ISO 1704.

5 Design, construction, strength and safety

5.1 The designed environment conditions of cable stoppers shall meet the requirements in ISO 7825:2017, Clause 4. The materials shall meet the requirements given in ISO 7825:2017, Clause 5.

5.2 Designed stresses at the load defined for class A and class B cable stoppers (80 % and 40 % of the nominal breaking load, respectively), shall not exceed the yield stresses of the materials used.

NOTE The International Association of Classification Societies (IACS) recommends that class A cable stoppers be used for bow anchors on ships.

5.3 Class A cable stoppers shall also be designed and constructed so that the stresses in the chain cable, at 80 % of the nominal breaking load, do not exceed the yield stress of the cable material. Class B cable stoppers shall also be designed to avoid stresses in the chain cable, at 40 % of the nominal breaking load.

5.4 Roller-type stoppers may have cylindrical rollers or rollers of any suitable design. The rollers shall be designed in accordance with ISO 1704 so that anchor chains can pass through smoothly. The stoppers shall be designed to prevent high bending moments in the cable links.

5.5 When in the closed position, the stopping device shall be arranged in such a way to prevent it from gradually working to the open position, which would release the chain and allow the cable to pay out. Stopping devices shall be easy to operate and, in the open position, shall be properly secured.

5.6 The cable stopper may be fitted with a lashing device for holding the anchor tight in its housed position. This lashing shall hold at least equal to twice the anchor weight plus 10 m of chain cable.

If a lashing device is considered part of a chain stopper, the stresses in the lashing device shall not exceed 0,4 of the yield stress of the material, under the conditions specified in 5.2 to 5.5.

The stress in the chain cable, when lashed, shall not exceed 0,2 of the breaking strength of the chain cable used under the conditions described in 5.2.

5.7 The location of cable stopper should be designed so that the anchor is as close as possible to its storage location. This also can be achieved by the adjust block of the stopping device.

6 Functional, operational and installation requirements

6.1 The function of the cable stopper is to lock the chain when the ship is already at anchor. The stopper shall thus take the load defined for class A and class B cable stoppers (80 % and 40 % of the nominal breaking load, respectively), in the chain cable. The cable stopper is normally fitted between the windlass and the hawse pipe, or the fairlead.

6.2 The cable stopper shall be easy to operate and safe for the operator. Parts which can cause danger to the operator by unintended movements shall be fitted with locking devices.

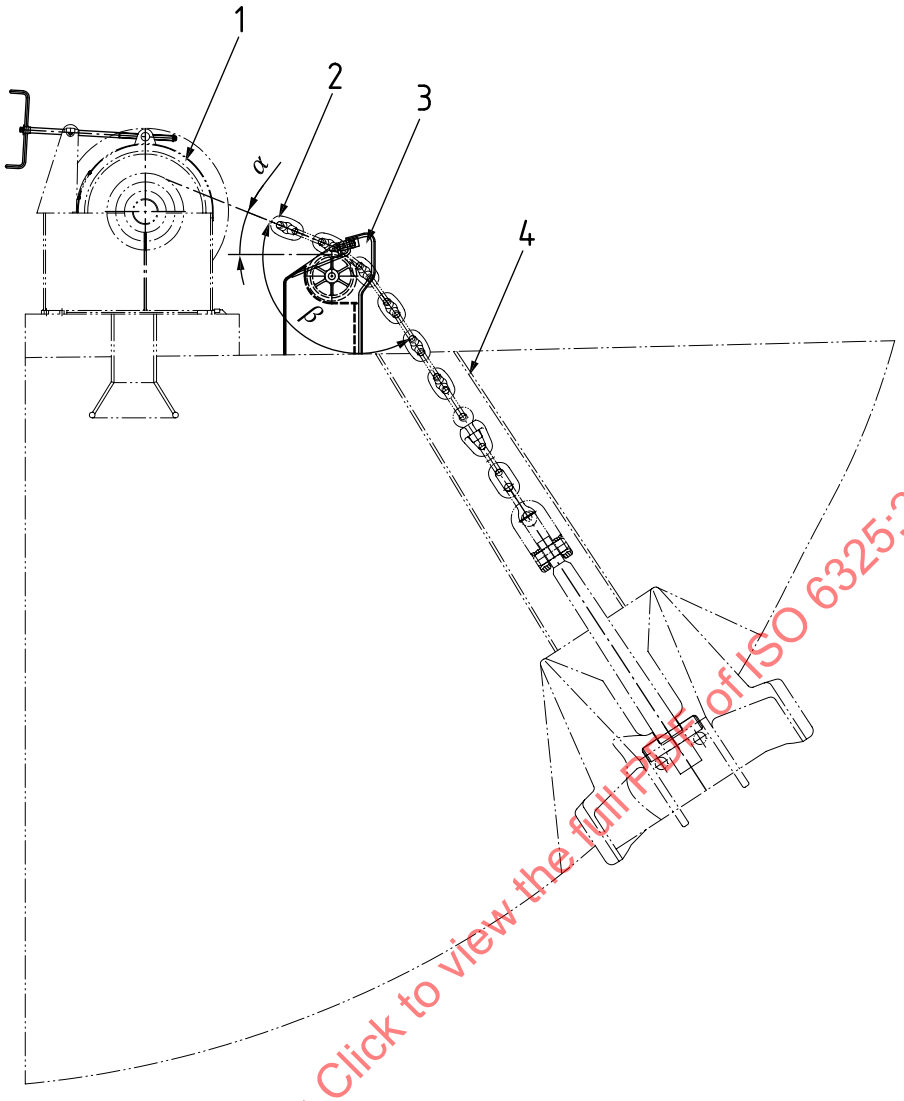
Under no load shall it be possible to manually operate the cable stopper. Manually operated cable stoppers shall not require a manual force greater than 350 N for chain cable diameters below 80 mm, or 500 N for cable diameters of 80 mm and above on the unloaded cable stopper (see ISO 1704).

The position of the cable stopper should be adjustable so that it can be closed when the anchor is fully housed and secured by the lashing device. This can also be achieved by adjusting the locking device.

The location area of the cable stopper on deck shall be of sufficient strength to fully support all possible loads and conditions of the cable stopper. It can be necessary to alter the position adopted for new chain cable as the chain cable becomes worn in use.

6.3 If the lashing device for holding the anchor tight is of sufficient strength to keep the anchor fully housed in all possible conditions (i.e. if it is of significantly greater strength than the minimum required by 5.6), then it will no longer be necessary to close the stopper.

6.4 The cable stopper should be fitted with the envelope angle of chain not less than 115° and the horizontal sextant angle of chain between 0° to 25°. See Figure 4.



Key

1	windlass	4	hawse pipe
2	chain	α	horizontal sextant angle of chain
3	cable stopper	β	envelope angle of chain

Figure 4 — Installation and arrangement of cable stopper

7 Acceptance tests

All cable stoppers shall be subject to visual inspection at the place of manufacture, to ensure:

a) correct operation of the stopping device;

b) freedom of rotation of the roller (if fitted);

c) quality of manufacturing:

— surfaces of all parts and components shall be smooth and free edges shall be rounded;

— no defect such as cracks, sand holes and air holes that affect the strength for steel castings;

— no defect such as lack of welding, blowholes and undercuts for welding parts.