
Ships and marine technology — Major components of emergency towing arrangements

Navires et technologie maritime — Principaux éléments des dispositifs de remorquage d'urgence





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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.

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For an explanation on 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 the following URL: www.iso.org/iso/foreword.html.

This document was prepared by 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.

Ships and marine technology — Major components of emergency towing arrangements

1 Scope

This document specifies the technical requirements, test methods, inspection rules and markings for major components of emergency towing arrangements (ETA) provided for tankers, gas carriers (LPG, LNG, etc.) and chemical vessels no less than 20 000 deadweight tonnes (DWT).

It is only applicable to emergency towing arrangements as defined in 3.1.

NOTE For any other applications, such as for mooring at a single point mooring (SPM) facility, the appropriate standards need to be referred to.

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 3808, *Road vehicles — Unscreened high-voltage ignition cables — General specifications, test methods and requirements*

ISO 4306-1, *Cranes — Vocabulary — Part 1: General*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 4306-1, ISO 3808 and the following 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

emergency towing arrangement **ETA**

system equipped on tankers, gas carriers and chemical vessels, used to tow the vessel in an emergency such as mechanical failure or lack of power

Note 1 to entry: The International Maritime Organization (IMO) requires that tankers, gas carriers and chemical vessels of not less than 20 000 DWT and constructed since Jan 1, 1996, be provided with emergency towing arrangements installed on both the bow and the stern.

3.2

safe working load **SWL**

maximum permissible load determined after the equipment has been tested according to the relevant regulations

3.3
ultimate strength

certified minimum breaking load of a wire rope, chafing chain, shackle, etc.

Note 1 to entry: In the case of equipment such as chain stoppers, fairleads, etc., it can be defined as the load that will cause a general failure of the structure or its attachment to the deck.

3.4
classification society

institution that establishes and maintains technical standards for the construction and operation of ships and offshore facilities

4 Technical requirements

4.1 Major components of ETA

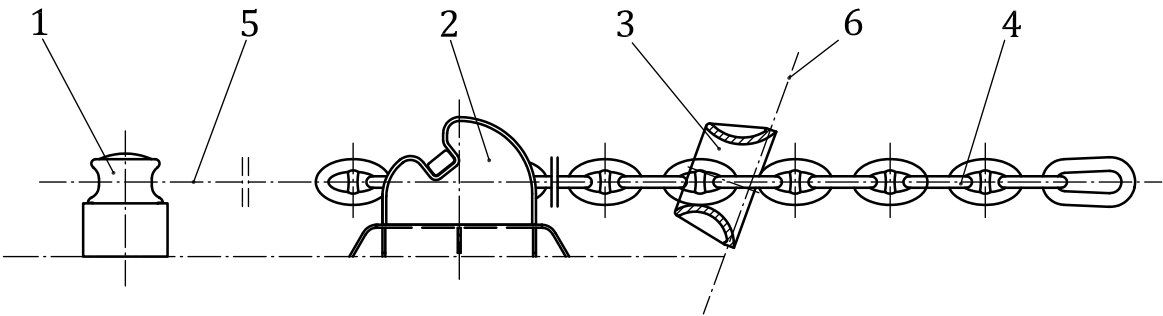
The major components of ETA are listed in [Table 1](#) with their installation requirements.

Table 1 — ETA major components and installation requirements

Component	Bow ETA (not preconfigured)	Stern ETA (preconfigured)	Strength requirements (see 4.3.1)
Pick-up gear	Optional	Required	—
Towing rope	Optional	Required	Required
Chafing chain	Required	Determined according to the design	Required
Fairlead	Required	Required	Required
Strong point	Required	Required	Required
Pedestal rollers	Required	Determined according to the design	—

4.2 Design arrangement of ETA

4.2.1 A typical arrangement of bow ETA is shown in [Figure 1](#).



Key

- | | | |
|--------------------|-----------------|---------------------------|
| 1 pedestal rollers | 3 fairlead | 5 centreline of the chain |
| 2 chain stopper | 4 chafing chain | 6 bulwark |

NOTE The centreline of the chain is parallel to the deck.

Figure 1 — Typical arrangement of bow ETA

4.2.2 A typical arrangement of stern ETA is shown in [Figure 2](#).

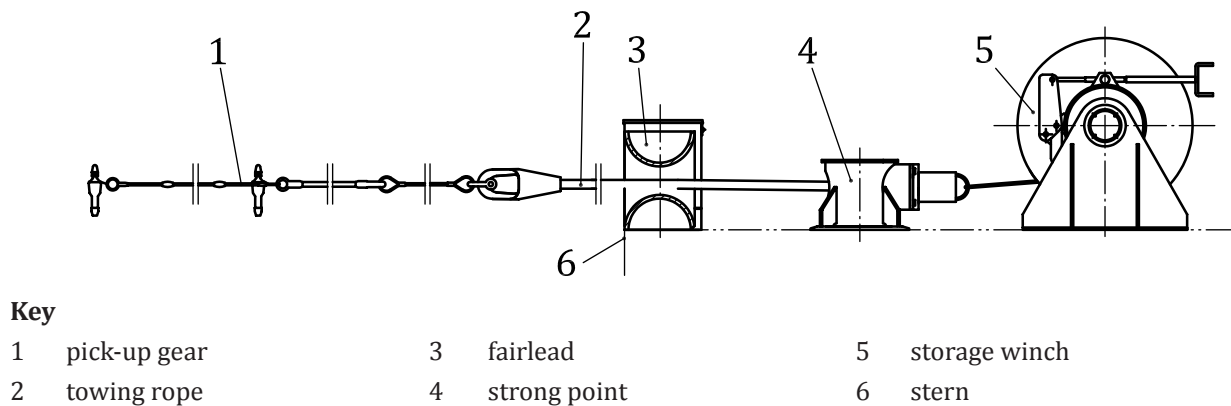


Figure 2 — Typical arrangement of stern ETA

4.3 Design and manufacturing requirements for major components

4.3.1 Minimum strength requirement for ETA components

The minimum strength requirement for ETA components under stress during the towing operation is given in [Table 2](#).

Table 2 — Minimum strength requirement

Ship size	Working strength	Ultimate strength
	kN	kN
20 000 tonnes ≤ DWT < 50 000 tonnes	1 000	2 000
50 000 tonnes ≤ DWT	2 000	4 000

The strength should be sufficient for all relevant angles of the towline, i.e. up to 90° from the ship's centreline to the port and starboard and 30° vertical downwards.

4.3.2 Strength requirement for other parts

Other parts shall have sufficient strength to withstand the load to which they may be subjected in towing operations.

4.3.3 Bow ETA

4.3.3.1 Fairlead

- The fairlead shall be of a closed type, with the opening dimensions of at least 600 mm in width and 450 mm in height.
- The fairlead should be capable of supporting the stress at the angles described in [4.3.1](#).
- See [Annex A](#) for the general configuration of a bow fairlead.
- Materials shall be weldable cast steel, e.g. 200-400 W in accordance with ISO 14737.
- The fairlead shall be free from defects that affect its intended use, such as cracks, sand holes and pores.
- The SWL of the installed fairlead shall be marked at a conspicuous location on the fairlead.

4.3.3.2 Chafing chain

- a) The chafing chain shall be of a welded stud type and made of materials of Grade III or better chain steel. (See [Annex B](#) for the typical chemical composition and mechanical properties of steel bars for a ship anchor chain). The minimum diameters of chafing chains are given in [Table 3](#).

Table 3 — Minimum diameters of chafing chains

SWL kN	Minimum diameter ϕ of chafing chains mm
1 000	52
2 000	76

- b) The length of chafing chain shall not be less than 8 m and the length outboard of the fairlead shall be at least 3 m.
- c) One end of the chafing chain shall be connected to the chain stopper, and the other end shall be fitted with a standard pear-shaped studless link of a size suitable for the attachment to a standard bow shackle.
- d) See [Annex C](#) for the general configuration of a chafing chain.
- e) The manufacturing quality shall meet the relevant technical standards, e.g. ISO 1704.

4.3.3.3 Chain stopper

- a) Based upon the defined SWL, the specification of minimum chain stoppers is given in [Table 4](#).

Table 4 — Specification of minimum chain stoppers

SWL kN	Specification of minimum chain stoppers
1 000	Chafing chain diameter 52 mm
2 000	Chafing chain diameter 76 mm

- b) See [Annex D](#) for the general configuration of a chain stopper.
- c) In the closed position, the chain stopper design shall be such that it prevents chafing chains from being thrown-out due to their sudden release.
- d) Materials may be weldable cast steel, forged steel or rolled steel that conforms to the manufacturer's standards. The weldments must conform to the requirements of qualified welding procedures (WPS), etc.
- e) The chain stopper product shall be free from defects that affect its intended use, such as cracks, sand holes and pores.
- f) If the chain stopper is welded to its foundation, the weld strength shall be capable to resist design loads of at least 1,3× specified ultimate strength of the chain stopper or the weakest component of the emergency towing arrangement if that be lower.
- g) If the chain stopper is bolted to its foundation, effective thrust blocks shall be provided to reduce the shear.
- h) The chain stopper's SWL shall be marked at a conspicuous location on the chain stopper.
- i) When the ship is provided with a chain stopper for a single point mooring arrangement (SPM), that chain stopper may also be used for the ETA.