
**Ships and marine technology —
Installation, inspection and
maintenance of container securing
devices for ships**

*Navires et technologie maritime — Installation, contrôle et
maintenance des dispositifs de fixation des containers pour navires*

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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).

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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*

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Ships and marine technology — Installation, inspection and maintenance of container securing devices for ships

1 Scope

This International Standard specifies the requirements for installation, inspection and maintenance of container securing devices for ships (hereinafter referred to as “securing devices”) to ensure their safe use.

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 3874:1997, *Series 1 freight containers — Handling and securing*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1

loose fittings

securing devices not welded to the hull [ISO 17905:2015](#)

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3.2

fixed fittings

securing devices welded to the hull

3.3

securing fittings

securing devices used between containers and between a container and the deck, hatch cover, or bilge, to prevent the container from longitudinal, transverse, or vertical movements relative to the hull during transportation

3.4

lashing fittings

securing devices used to lash a container to a hatch cover or deck

3.5

buttress fittings

securing devices used to eliminate the clearance between a container and a longitudinal bulkhead and transfer any transverse forces to the longitudinal bulkhead

4 Installation, inspection and maintenance

4.1 Securing devices

4.1.1 Types

Securing devices can be divided into three types, namely securing fittings, lashing fittings and buttress fittings, each type divided into fixed fittings and loose fittings.

4.1.2 Securing fittings

The structural types of securing fittings are given in [Table 1](#).

Table 1 — Structural types of securing fittings






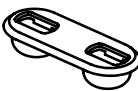



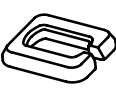



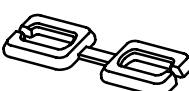

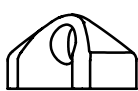


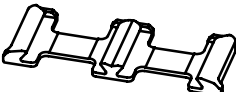

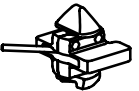




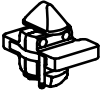
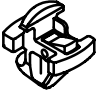
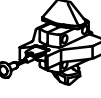
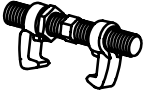
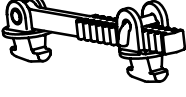
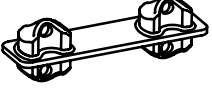





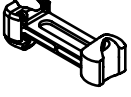
Type	Code	Name	Illustration	Code	Name	Illustration
Fixed fitting	A11	Raised socket		C11	Flush socket	
	A12	Raised transverse double socket		C12	Transverse double flush socket	
	A13	Raised longitudinal double socket		C13	Longitudinal double flush socket	
	A21	Raised elongated socket		C14	Quadruple flush socket	
	A31	Longitudinal sliding socket		D11	Doubling plate	
	A32	Transverse sliding socket		D12	Transverse double doubling plate	
	A33	Transverse sliding double socket		D13	Longitudinal double doubling plate	
	A34	Longitudinal sliding double socket		E11	Weldable cone	
	B11	Dovetail foundation		E12	Weldable cone with hole	
	B12	Double dovetail foundation				
F11-L	Left hand dovetail twistlock		F21-L	Left hand manual twistlock		
F11-R	Right hand dovetail twistlock		F21-R	Right hand manual twistlock		
F12-L	Left hand manual bottom twistlock		F22	Semi-automatic twistlock		

Table 1 (continued)

Type	Code	Name	Illustration	Code	Name	Illustration
Loose fitting	F12-R	Right hand manual bottom twistlock		F31	Midlock	
	F13	Semi-automatic bottom twistlock		G11	Bridge fitting	
	G12	Rack adjusting bridge fitting		H23	Longitudinal double stacker	
	H11	Bottom stacker		H31	Hanging stacker	
	H21	Single stacker		H32	Flangeless hanging stacker	
	H22	Transverse double stacker		H33	Hanging double stacker	

4.1.3 Lashing fittings

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The structural types of lashing fittings are given in Table 2.

Table 2 — Structural types of lashing fittings









Type	Code	Name	Illustration	Code	Name	Illustration
Fixed fitting	I11	D-ring		J22	Slewing lashing plate	
	J11	Lashing plate		K11	Single guide fitting	
	J12	Double lashing plate		K12	Double guide fitting for platform	
	J21	Limit lashing plate		K13	Double guide fitting	

Table 2 (continued)

Type	Code	Name	Illustration	Code	Name	Illustration
Loose fitting	L11	Hook turn-buckle		M13	Knob vertical lashing rod	
	L12	Knob turn-buckle		M14	External lashing rod	
	M11	Knob lashing rod		M21	Knob extension lashing rod	
	M12	Eye lashing rod		M22	Eye extension lashing rod	

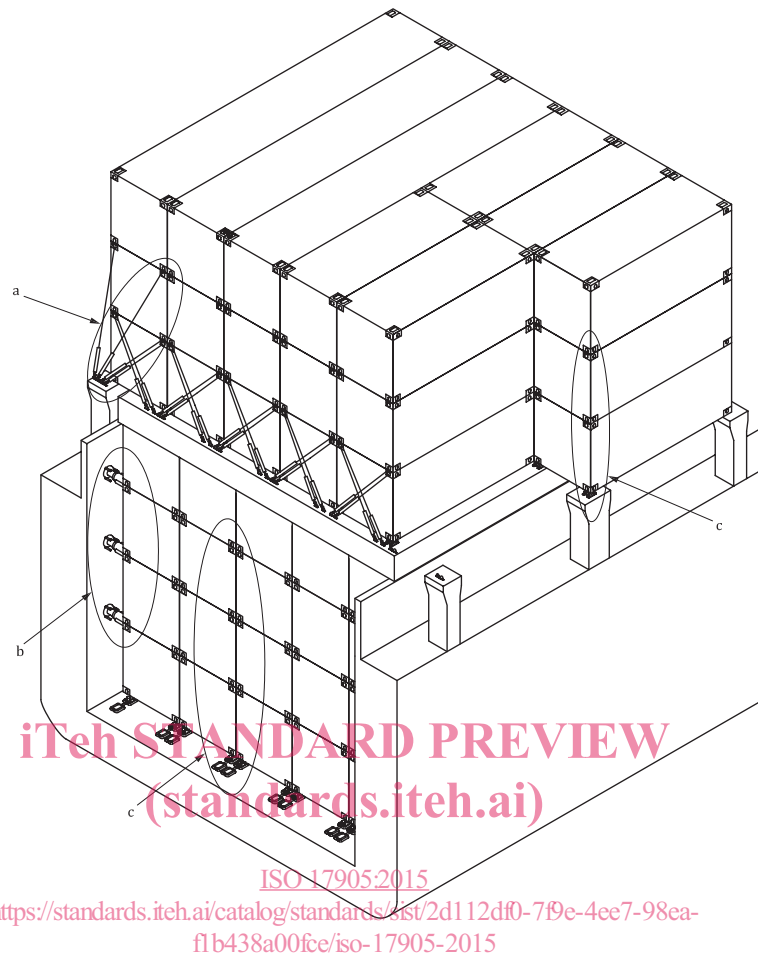
4.1.4 Buttress fittings

The structural types of buttress fittings are given in Table 3.

Table 3 — Structural types of buttress fittings

Type	Code	Name	Illustration	Code	Name	Illustration
Fixed fitting	N11	Raised counter bearing		N31	Flush dovetail counter bearing	
	N21	Flush counter bearing				
Loose fitting	011	Compression top support		022	Rack adjusting compression intermediate support	
	012	Rack adjusting Compression top support		023	Tension/compression intermediate support	
	013	Tension/compression top support		024	Rack adjusting tension/compression intermediate support	
	014	Rack adjusting tension/compression top support		031	Hanging compression intermediate support	
	021	Compression intermediate support				

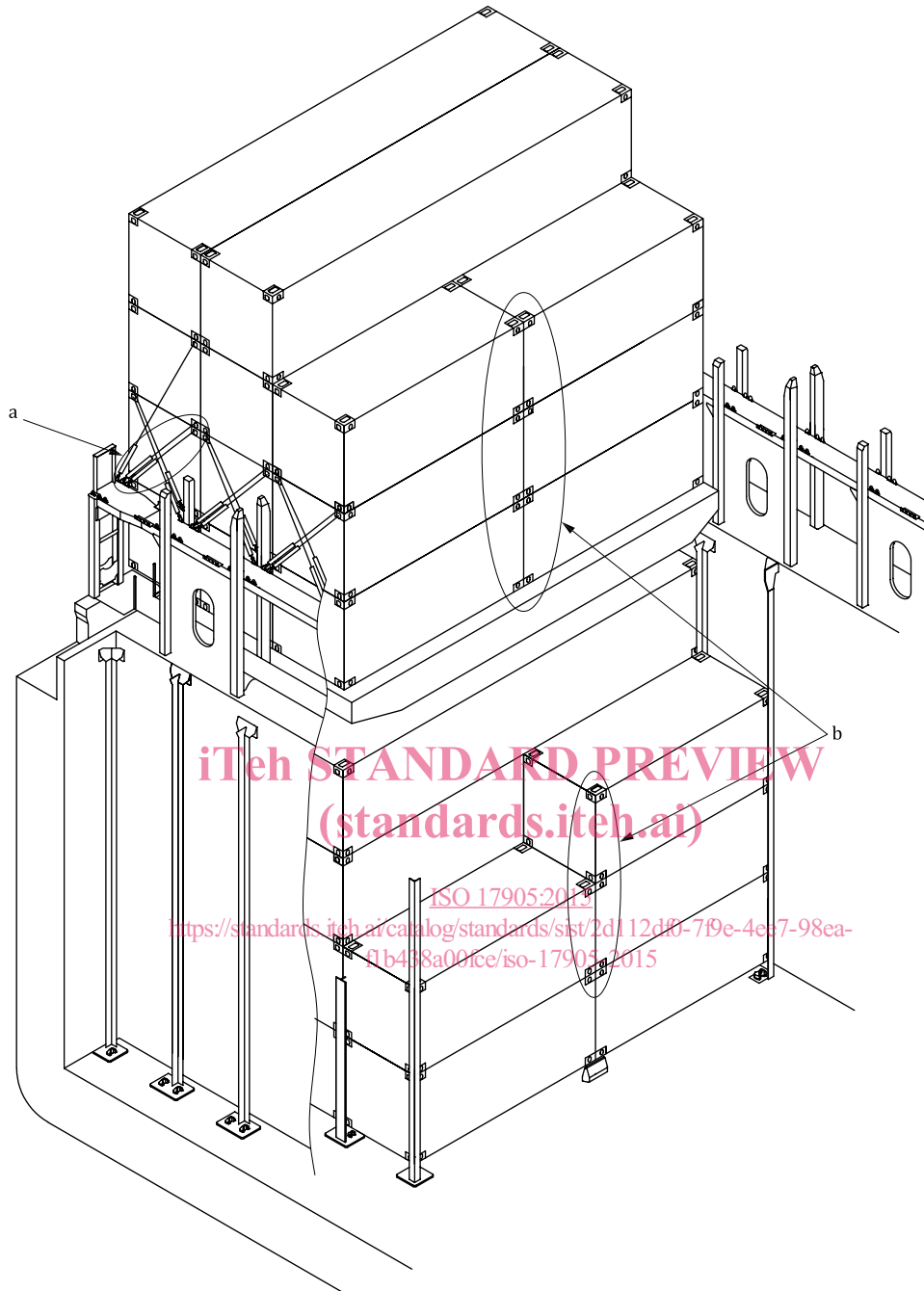
4.2 The basic combination types for installation are given in [Figures 1](#) and [2](#).



Key

- a Combination type of lashing fittings.
- b Combination type of buttruss fittings.
- c Combination type of securing fittings.

Figure 1 — Basic types of container securing (I)



Key

- a Combination type of lashing fittings.
- b Combination type of securing fittings.

Figure 2 — Basic types of container securing (II)

4.2.1 Fixed fittings shall be installed on the hull according to the requirements of the layout of fixed fittings. Fixed fittings with colour marks shall be installed in the corresponding positions with colour code requirements taken into consideration. Fixed fittings that will require marking after installation shall be marked. The specific marking requirements are given in [Annex C](#).

4.2.2 Loose fittings shall be installed according to their specific installation positions in the lashing system and the requirements of each product’s manufacturer’s instructions. Products shall be installed

in the correct positions with the requirements of their length marks and direction marks taken into consideration. The specific marking requirements are given in [Annex C](#).

4.2.3 Only securing devices recognized by qualified personnel can be installed and used on-board.

4.2.4 The lashing utility test shall be carried out before the securing device is used for the first time in a new ship in order to validate the installation and confirm that use of the securing device meet the requirements of lashing system.

4.2.5 For complex ship types, a lashing simulation test shall be carried out at the beginning of the lashing design.

4.2.6 For complex lashing, a lashing procedure diagram shall be provided and posted at one, or more, conspicuous location(s).

4.3 Inspection

4.3.1 Factory inspection

For factory inspection of securing devices, the proof load test shall be carried out on a sampling basis, see [Annexes A and B](#) for loads and test methods.

4.3.2 In-service inspection

Inspections, including initial, annual, intermediate and special inspections, shall be carried out on a regular basis. Each inspection shall include visual, functional and strength examinations to ensure that a securing device is in good operational condition.

4.3.2.1 Cycles

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4.3.2.1.1 An initial inspection shall be carried out concurrently with the classification survey of the ship.

4.3.2.1.2 An annual inspection shall be carried out concurrently with the annual inspection of the ship.

4.3.2.1.3 An intermediate inspection shall be carried out during daily use.

4.3.2.1.4 A special inspection shall be carried out concurrently with a special inspection of the ship or after adverse conditions, such as improper operation or experiencing a heavy sea state.

4.3.2.2 Conduct

4.3.2.2.1 Initial inspection

During the initial inspection, the comprehensive inspection shall be carried out for technical requirements of the securing device, such as materials, process and strength, to ensure that they satisfy the requirements of drawings approved by classification societies.

Visual inspection shall be carried out before use to ensure that there are no defects.

4.3.2.2.2 Annual inspection

The annual inspection is a general inspection of the securing device, to ensure that it is in effective operational condition.

Visual inspection shall be carried out to ensure that galvanized and paint coated surfaces are free of corrosion, without any breaks, serious wear, deformation, cracks, or severe rust.

4.3.2.2.3 Intermediate inspection

A securing device, whose lashing effect may be loose under stress during use, shall be examined and, if necessary, immediately adjusted by tightening or relashing.

Inspection shall be carried out after a container is loaded and secured on-board in a low temperature, or when the ship enters a hot environment.

Visual inspection of a securing device shall be carried out during daily use, to ensure its good performance.

4.3.2.2.4 Special inspection

Comprehensive inspection shall be carried out for all securing devices to ensure galvanized and paint surfaces are properly anti-corrosive, without any breakage, serious wear, deformation, cracks or severe rust.

For updated securing devices, the related certificates shall be obtained.

4.4 Maintenance

Maintenance can be subdivided into maintenance of fixed fittings and maintenance of loose fittings.

Securing devices shall be regularly maintained to ensure they are always in good operating condition.

Maintenance is generally conducted immediately after inspection and every six months thereafter.

In case of permanent deformation and damage, securing devices shall be scrapped and any corresponding parts shall be replaced simultaneously.

4.4.1 Maintenance of fixed fittings

4.4.1.1 Welds attached to the hull structure shall be inspected. Preferably, defects and cracks should be rectified by slotting or other methods. If necessary, welding repairs shall be made with an electrode matching the original materials. Before welding, an area out 20 mm all around the position to be welded shall have rust, greasy dirt and moisture removed and be polished until the metallic luster is exposed. In case of welding defects such as pores and cracks, they shall be polished until any such defects are eliminated before re-welding.

4.4.1.2 If the hull itself is defective (such as, uneven), the part of the hull where the device is to be rewelded shall be repaired in a proper manner.

4.4.1.3 If a fitting body has cracks, it shall be replaced and repair welding is not to be used.

4.4.1.4 If a fitting body has deformation, it shall be replaced.

4.4.1.5 Where a fitting has slight rust, the rust shall be removed and the surface paint coated. For severe rust, where the plate thickness is reduced by more than 2 mm after rust-removal or the pitting depth is more than 1mm, replacement is required. In case of any filiform corrosion, the fitting shall be replaced immediately.

4.4.1.6 If a small quantity of fittings is replaced during operation, they shall be replaced with those of at least the same strength (they may be of the same type or another type). Welding of the fittings to the hull shall be carried out in accordance with the appropriate welding process to ensure welding quality.