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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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ISO copyright office
Ch. de Blandonnet 8 • CP 401
CH-1214 Vernier, Geneva, Switzerland
Tel. +41 22 749 01 11
Fax +41 22 749 09 47
copyright@iso.org
www.iso.org

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Foreword

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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 — 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

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

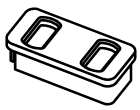
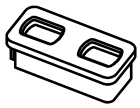
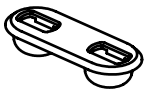
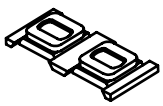
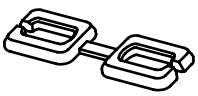
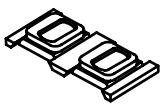
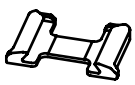
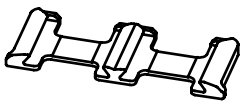
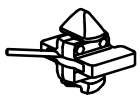
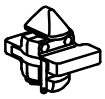
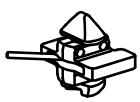
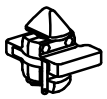
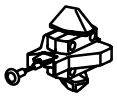
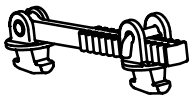
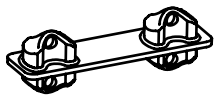
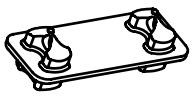
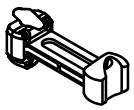
Type	Code	Name	Illustration	Code	Name	Illustration
Fixed fitting	A11	Raised socket		C11	Flush socket	
	A12	Raised transverse double socket		C12	Transverse double flush socket	
	A13	Raised longitudinal double socket		C13	Longitudinal double flush socket	
	A21	Raised elongated socket		C14	Quadruple flush 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	

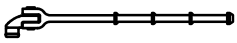
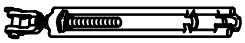
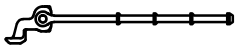
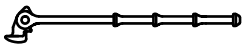
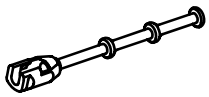
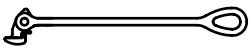
4.1.3 Lashing fittings

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	

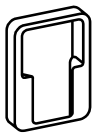
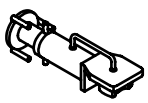
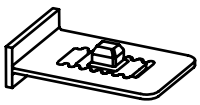
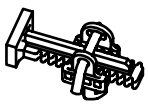
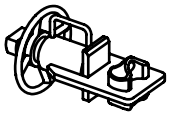
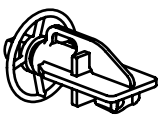
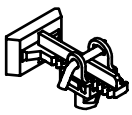
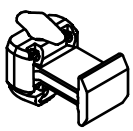
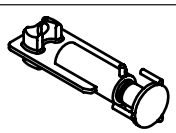
Table 2 *(continued)*

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	

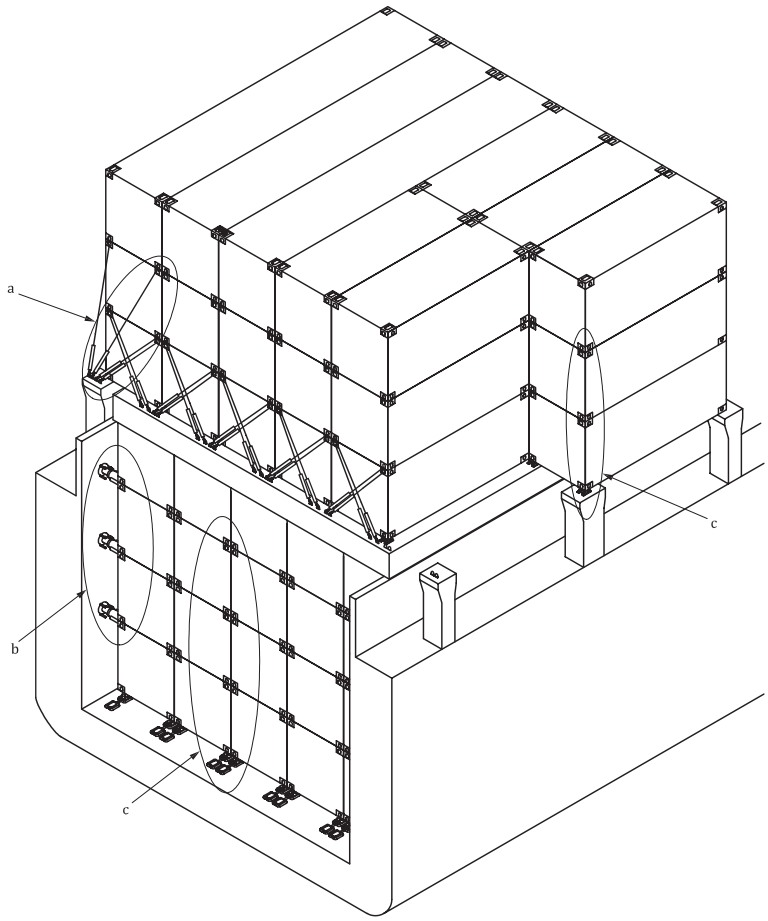
4.1.4 Buttress fittings

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	O11	Compression top support		O22	Rack adjusting compression intermediate support	
	O12	Rack adjusting Compression top support		O23	Tension/compression intermediate support	
	O13	Tension/compression top support		O24	Rack adjusting tension/compression intermediate support	
	O14	Rack adjusting tension/compression top support		O31	Hanging compression intermediate support	
	O21	Compression intermediate support				

4.2 The basic combination types for installation are given in Figures 1 and 2.



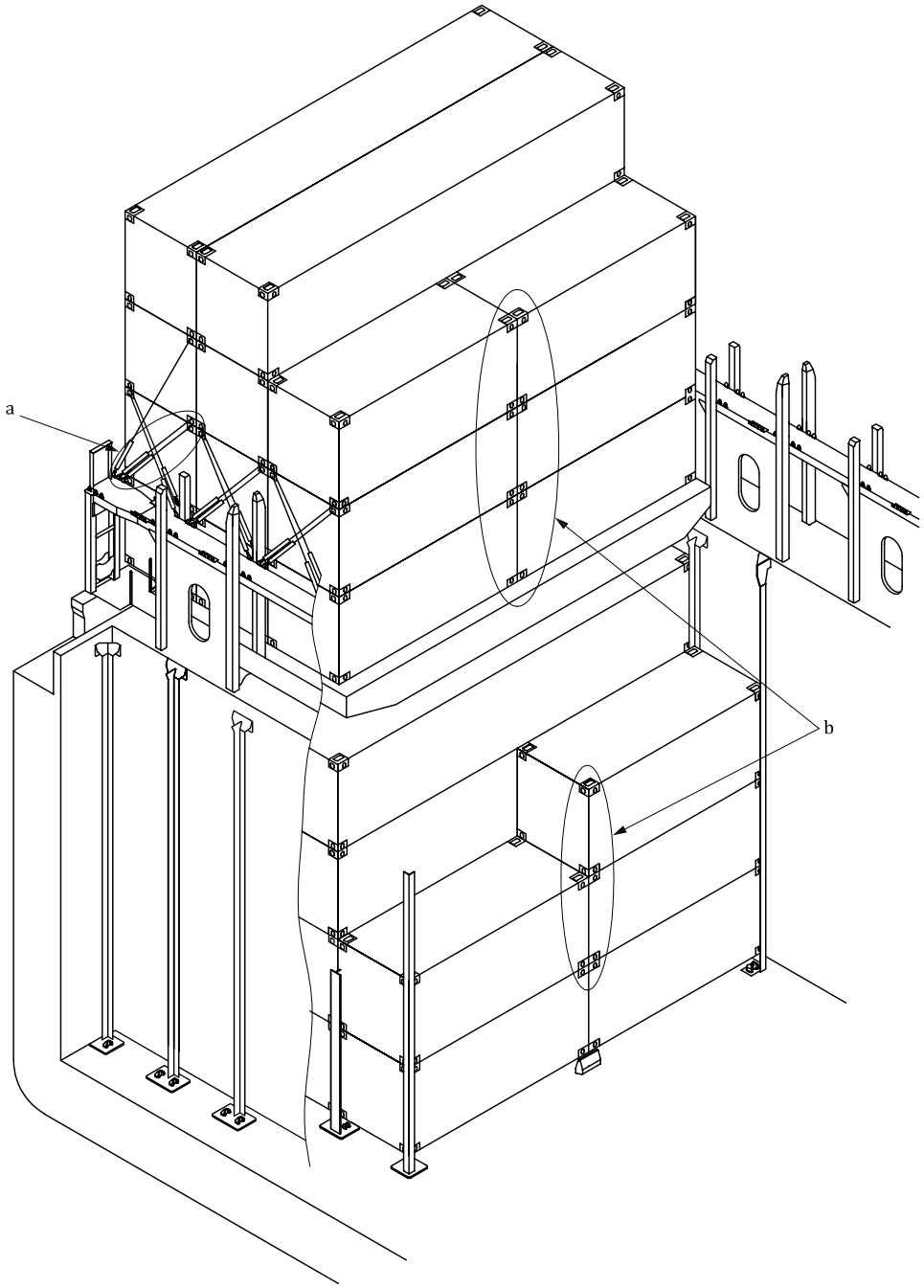
Key

a Combination type of lashing fittings.

b Combination type of buttress 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

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.

4.4.1.7 Fixed fittings shall be cleared of dusts, gravels, or other residues before use.

4.4.1.8 Daily maintenance, such as rust-removal and painting shall be conducted.

4.4.2 Maintenance of loose fittings

4.4.2.1 Loose fittings should be regularly coated with grease in order for moving parts to operate smoothly. The surface of fittings shall be kept clean and free of debris.

4.4.2.2 Cracked or deformed fittings shall be replaced immediately.

4.4.2.3 Fittings with filiform corrosion shall be replaced immediately.

4.4.2.4 If connection components, such as bolts or nuts become loose, they shall be retightened to the design torque.

4.4.2.5 Fittings with slight rust on their surfaces shall have the rust removed before the application of a coating of rust-proof paint. In cases where the plate thickness is reduced by more than 2 mm after rust-removal, or the pitting depth is more than 1 mm, the fitting shall be replaced. If the pitting depth is less than 1 mm any rust shall be removed and the fitting coated with anti-corrosive paint.

4.4.2.6 For thread type components, the thread part shall be sufficiently greased. Components with slightly damaged threads or non-rotatable components with minor imperfections, shall be repaired, non-rotatable components showing serious damage, such as deformation shall be replaced.

4.4.2.7 A fitting with specific marking requirements shall retain the same marking after maintenance. If it is necessary to replace it the new fitting shall have the same marking as the original.

5 Recording

The inspection, maintenance and update of fittings shall be recorded and filed in a timely manner. This has the benefit of documenting the measures taken for the inspection and maintenance of a ship's securing devices and extending their serviceable life.

6 Storage

Securing devices, other than fixed fittings, not in use shall be stored in a special container, storage rack, or other designated area. Specific requirements are given in Annex D.

Annex A
(normative)

Strength requirements

A.1 General

Securing fittings, lashing fittings and buttress fittings shall meet either the strength requirements specified by corresponding classification societies or the specified values listed at Tables A.1 to A.3.

A.2 Securing fittings

Table A.1 — Strength of securing fittings

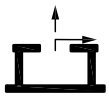
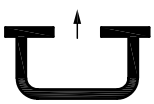
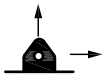
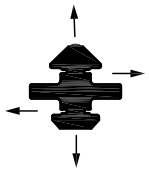
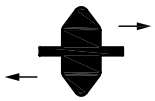
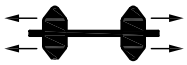
Type	Code	Safe working load (SWL)	Proof load (PL)	Minimum breaking load (BL)	Reference mass /kg	Loading
		kN				
Fixed fitting	A11	Tensile 250 Shear 210 Compression 1020	Tensile 375 Shear 315 Compression 1326	Tensile 500 Shear 420	6,9 ~ 9	
	A12				14,8 ~ 22,5	
	A13				18,0 ~ 22,6	
	A21				8,6 ~ 11,0	
	A31				15 ~ 17,5	
	A32				15 ~ 17,5	
	A33				30 ~ 38,5	
	A34				23,5 ~ 36,5	
	B11	Tensile 250 Shear 210	Tensile 375 Shear 315	Tensile500 Shear 420	4,5	
	B12				6,72 ~ 8,7	
	C11	Tensile 250	Tensile 375	Tensile 500	6,2 ~ 7,5	
	C12				17,2 ~ 19,3	
	C13				20,1	
	C14				48,5 ~ 57	
	D11	Shear 210	Shear 315	Shear 420	3,2	
	D12				6.5 ~ 6,8	
	D13				6,9	
	E11	Shear 210	Shear 315	Shear 420	1,0 ~ 1,5	
	E12	Tensile176 Shear 210	Tensile265 Shear 315	Tensile353 Shear 420	1,5	

Table A.1 *(continued)*

Type	Code	Safe working load (SWL)	Proof load (PL)	Minimum breaking load (BL)	Reference mass /kg	Loading
		kN				
Loose fitting	F11	Tensile 250 Shear 210	Tensile 375 Shear 315	Tensile 500 Shear 420	7,4	
	F12				5,4	
	F13				6,7	
	F21				5,0	
	F22				5,8	
	F31				4,3	
	G11	Tensile 50	Tensile 75	Tensile 100	3,5 ~ 4,4	
	G12	Tensile 150	Tensile 225	Tensile 300	8,8	
	H11	Shear 210	Shear 315	Shear 420	3,0 ~ 3,5	
	H21				3,6 ~ 4,9	
	H31				3,1	
	H32				2,7	
	H22	Shear 400	Shear 600	Shear 800	8,6 ~ 11,2	
	H23				8,8 ~ 11,5	
	H33				8,7 ~ 9,2	

A.3 Lashing fittings

Table A.2 — Strength of lashing fittings

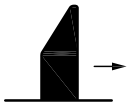
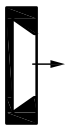
Type	Code	Safe working load (SWL)	Proof load (PL)	Minimum breaking load (BL)	Reference mass /kg	Loading
		kN				
Fixed fitting	I11	Tensile 245	Tensile 367	Tensile 490	4,0	
	J11	Tensile 245	Tensile 367	Tensile 490	1,5	
	J12				2,8 ~ 3,0	
	J21				2,3	
	J22				8,5	
	K11	Shear 210	Shear 315	Shear 420	4,0 ~ 7,5	
	K12				5,8 ~ 9,5	
	K13				3,2 ~ 6,1	

Table A.2 *(continued)*

Type	Code	Safe working load (SWL)	Proof load (PL)	Minimum breaking load (BL)	Reference mass /kg	Loading
		kN				
Loose fitting	L11	Tensile 245	Tensile 367	Tensile 490	13,4 ~ 14,0	
	L12				12,6	
	M11				11,7 ~ 20	
	M12				10,4 ~ 18,7	
	M13				10,4 ~ 18,7	
	M14				12,9	
	M21				3,4	
	M22				3,9	

A.4 Buttress fittings

Table A.3 — Strength of buttress fittings

Type	Code	Safe working load (SWL)	Proof load (PL)	Minimum breaking load (BL)	Reference mass /kg	Loading
		kN				
Fixed fitting	N11	Tensile 425	Tensile 468	Tensile 553	5,3	
	N21	Tensile 600	Tensile 660	Tensile 780	17	
	N31	Tensile 650	Tensile 715	Tensile 850	31	
Loose fitting	O11	Compression 210	Compression 231	Compression 273	19,3	
	O12	Compression 250	Compression 275	Compression 325	19,5	
	O21	Compression 450	Compression 495	Compression 585	19,9	
	O22	Compression 500	Compression 550	Compression 650	12,5	
	O31	Compression 500	Compression 550	Compression 650	5,0	
	O13	Tensile compression 252	Tensile compression 277	Tensile compression 328	18	
	O14	Tensile compression 250	Tensile compression 275	Tensile compression 325	18,5	
	O23	Tensile compression 500	Tensile compression 550	Tensile compression 650	17,5	
	O24	Tensile compression 650	Tensile compression 715	Tensile compression 850	15,5	

Annex B
(normative)

Test requirements

B.1 General test requirements

B.1.1 Tests on a securing device shall simulate the actual stress condition.

B.1.2 After being subjected to the proof load (PL) given in Annex A, securing devices shall not suffer any permanent deformation and rotatable parts shall be capable of normal rotation.

B.1.3 Securing devices shall withstand the minimum breaking load (BL) given in Annex A without fracture.

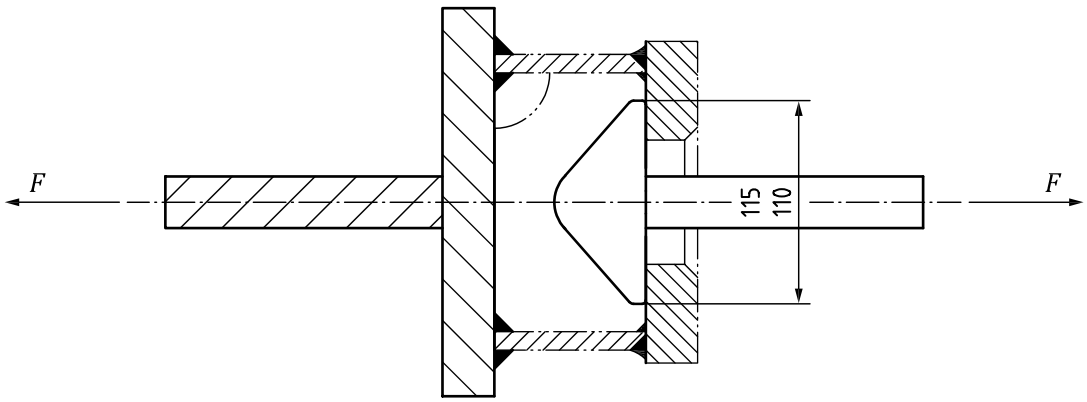
B.2 Test methods

B.2.1 Methods for testing sockets

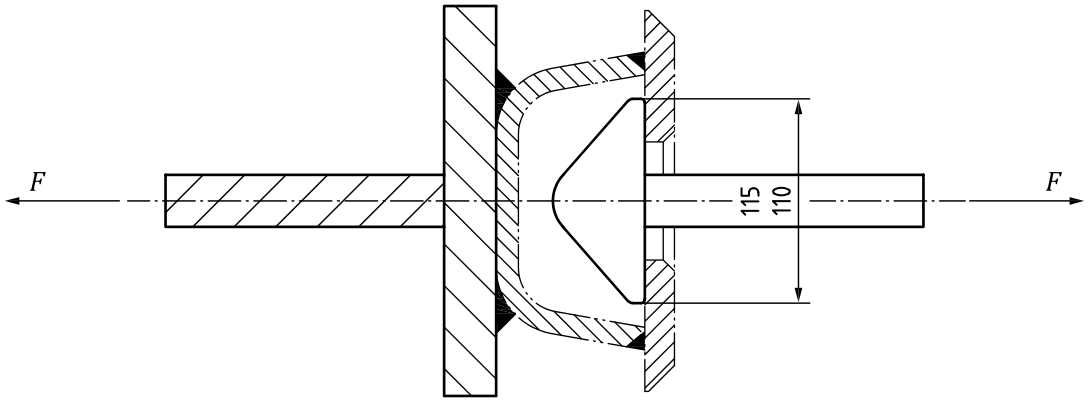
B.2.1.1 Tensile test

The socket shall be mounted in the test fixture as shown in the illustration, and the force shall be applied to the socket by a tensile test machine (see Figure B.1).

Dimensions in millimetres



a) Raised socket



b) Flush socket

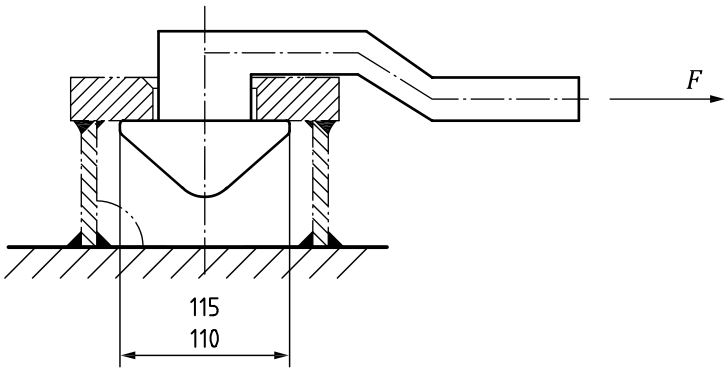
NOTE *F* is the test force.

Figure B.1 — Tensile test on a socket

B.2.1.2 Shear strength test

The shear strength test shall be carried out for sockets with shear strength requirements (see Figure B.2).

Dimensions in millimetres



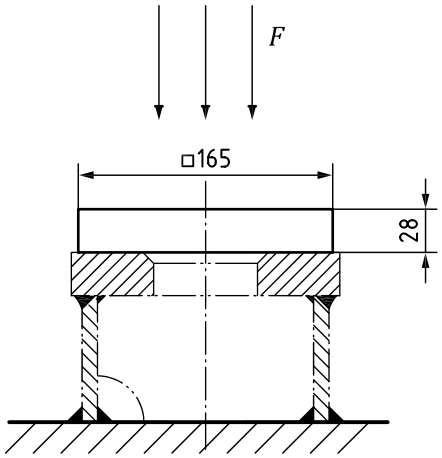
NOTE *F* is the test force.

Figure B.2 — Shear strength test on a socket

B.2.1.3 Compression test

The compression test shall be carried out for sockets with compression requirements (see Figure B.3).

Dimensions in millimetres



NOTE *F* is the test force.

Figure B.3 — Compression test on a socket

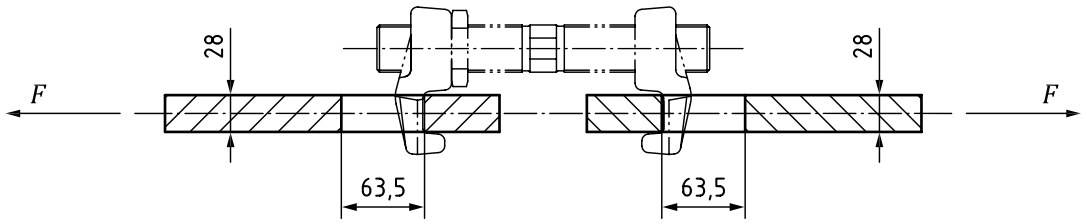
B.2.2 Method for testing locks

The locks shall be tested in accordance with ISO 3874:1997, A.8 Test method.

B.2.3 Method for testing bridge fittings

When performing the tensile test, the two ends of the bridge fitting shall be placed in the maximum position (see Figure B.4).

Dimensions in millimetres



NOTE *F* is the test force.

Figure B.4 — Tensile test on a bridge fitting

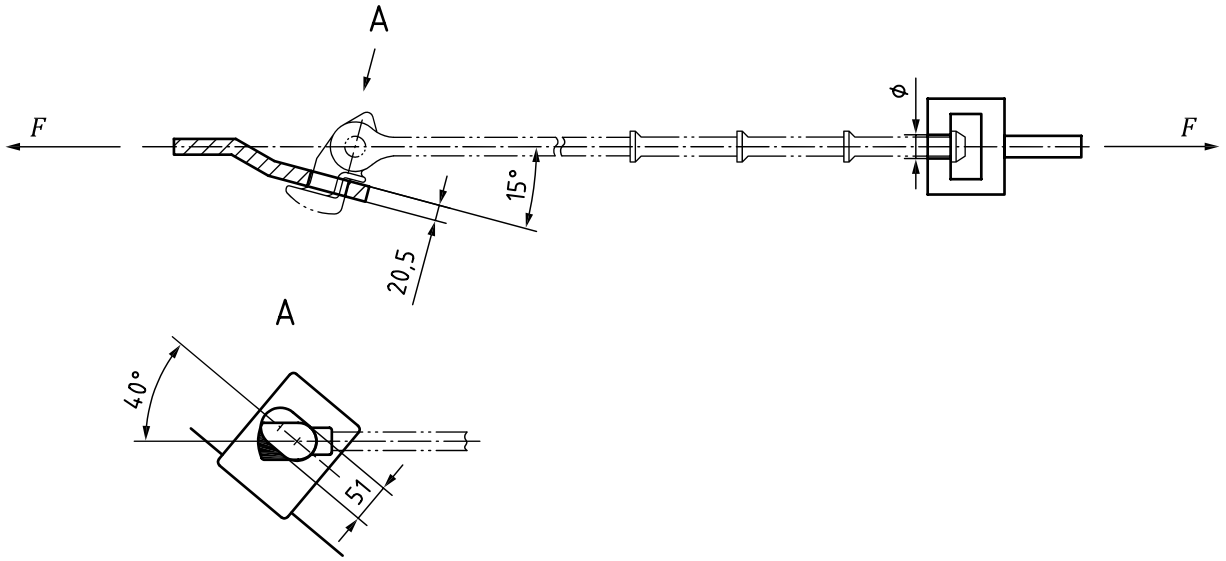
B.2.4 Method for testing lashing rods

When performing the tensile test, the two ends of the lashing rod shall be mounted in the test fixture, and the force shall be applied to the lashing rod by a tensile test machine.

B.2.4.1 Tensile test on a knob lashing rod

When performing the tensile test, the last section of the knob end shall be tested for knob lashing rod (see Figure B.5).

Dimensions in millimetres



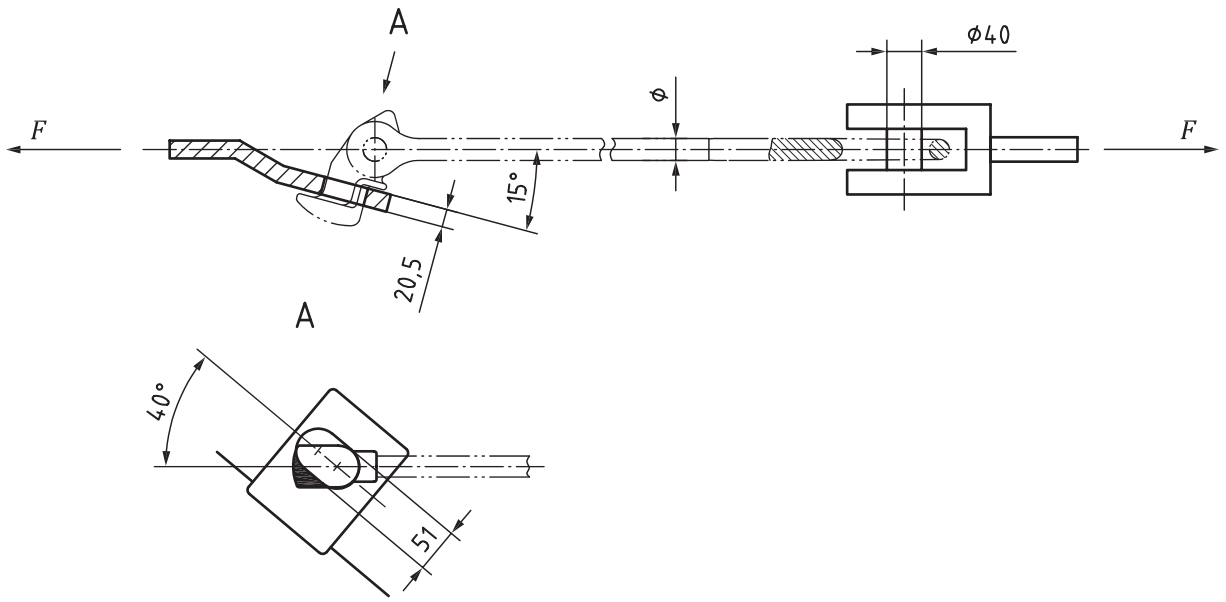
NOTE *F* is the test force.

Figure B.5 — Tensile test on a knob lashing rod

B.2.4.2 Tensile test on an eye lashing rods

The tensile test on the eye lashing rod is as shown in Figure B.6.

Dimensions in millimetres



NOTE *F* is the test force.

Figure B.6 — Tensile test on an eye lashing rod

B.2.5 Method for testing turnbuckles

When performing the tensile test, the two ends of the turnbuckle shall be mounted in the test fixture, and the force shall be applied to the turnbuckle by a tensile test machine.

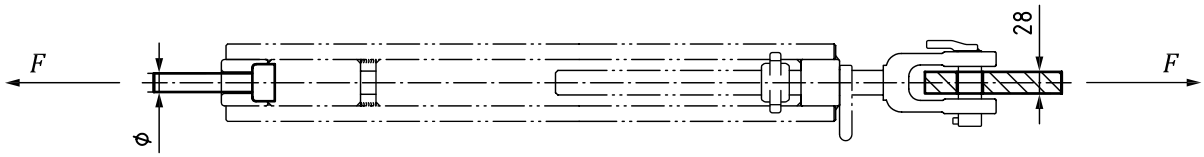
B.2.5.1 Tensile test on a hook turnbuckles

The hook turnbuckle shall be tested in accordance with ISO 3874:1997, D.7.2 Tensile test on tensioning device.

B.2.5.2 Tensile test on a knob turnbuckles

The arrangement for conducting a tensile test on a knob turnbuckles is as shown in Figure B.7.

Dimensions in millimetres



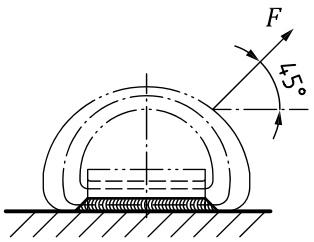
NOTE *F* is the test force.

Figure B.7 — Tensile test on knob turnbuckle

B.2.6 Method for testing a D-ring and a lashing plate

B.2.6.1 Tensile test on a D-ring

When performing the tensile test, the D-ring shall be mounted in the test fixture and the force shall be applied to the D-ring in the direction shown in Figure B.8.

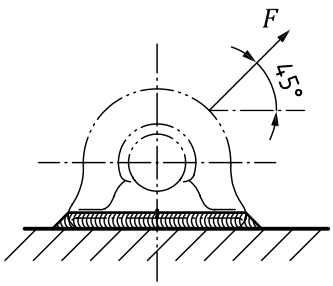


NOTE *F* is the test force.

Figure B.8 — Tensile test on a D-ring

B.2.6.2 Tensile test on a lashing plate

When performing the tensile test, the lashing plate shall be mounted in the test fixture and the force shall be applied to the lashing plate in the direction shown in Figure B.9.



NOTE *F* is the test force.

Figure B.9 — Tensile test on a lashing plate

B.2.7 Method for testing stackers

The stackers shall be tested in accordance with ISO 3874:1997, C.7 Test method.

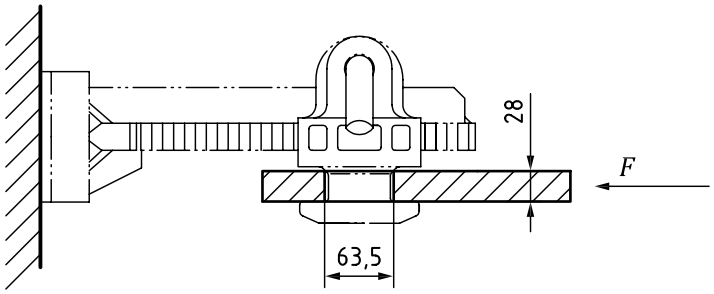
B.2.8 Method for testing supports

With one end of the support fixed, the force shall be applied to the other end connected to a locator.

B.2.8.1 Compression support test

The test method of compression supports is as shown in Figure B.10.

Dimensions in millimetres



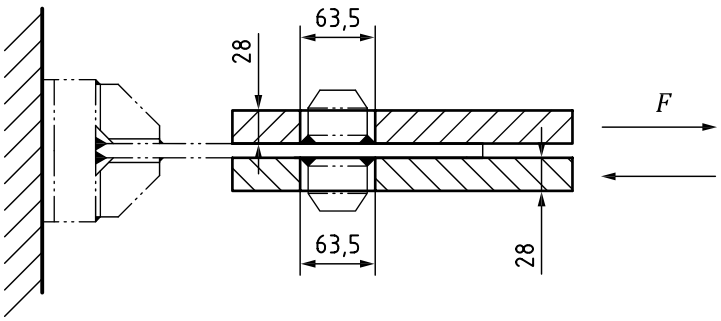
NOTE *F* is the test force.

Figure B.10 — Compression test on a compression support

B.2.8.2 Test on tension/compression support

The test method of tension/compression supports is as shown in Figure B.11.

Dimensions in millimetres



NOTE *F* is the test force.

Figure B.11 — Tensile and compression test on tension/compression support

Annex C
(informative)

Marking requirements

C.1 General

Where possible, it is recommended that the container securing devices be clearly marked with Colour codes to indicate fittings of different lengths, heights, or other variations, that may easily be misidentified, to ensure correct operation, assembly and management..

C.2 Marking requirements

Markings mainly include those to indicate length, height, installation direction and other marks.

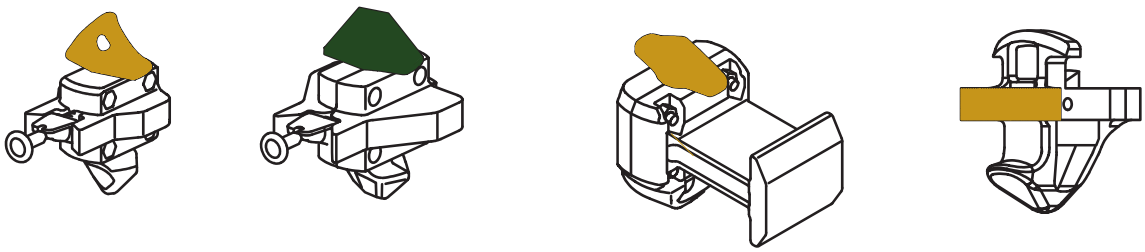
C.2.1 Direction markings

Securing devices that have parts that require a specific installation direction should have those parts coated with conspicuous paints.

— For securing devices such as semi-automatic twistlocks that require upward installation, the position of parts installed upward should be coated with conspicuously yellow paints. See Figure C.1 a), c).

— For fittings used in the bottom that require upward installation, the position of parts installed upward should be coated with conspicuously green paints, see Figure C.1 b).

— For fittings whose parts are required to be installed toward outside of the container, the position which faces outside should be coated with yellow paints, see Figure C.1 d).



a) Semi-automatic twistlocks that require upward installation

b) Fittings used in the bottom that require upward installation

c) Semi-automatic twistlocks that require upward installation

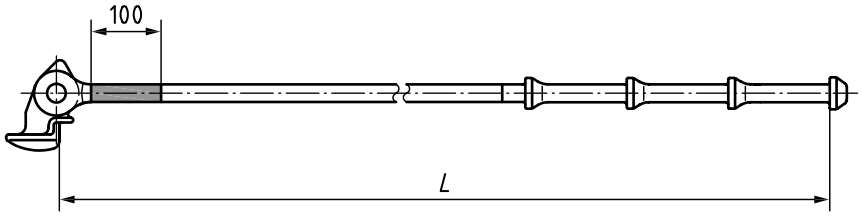
d) Fittings whose parts are required to be installed outside of the container

Figure C.1 — Direction markings

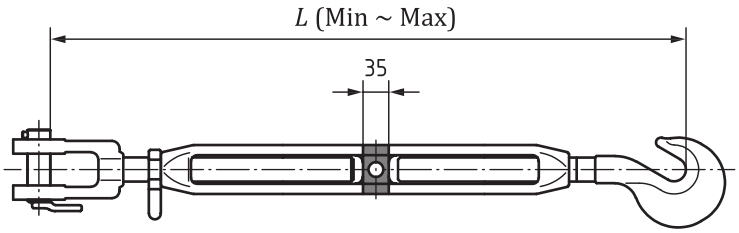
C.2.2 Length markings

Where lashing rods and turnbuckles of different lengths are indistinguishably similar in size, they should be coated with different colours of paint for marking. The positions of paints are given in Figure C.2 and recommended colours of paint in Table C.1.

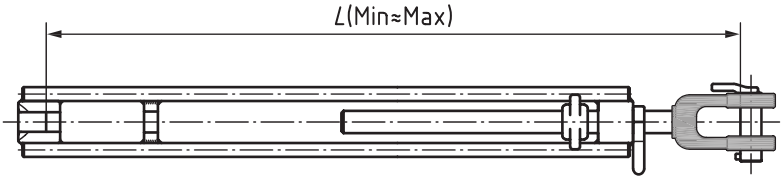
Dimensions in millimetres



a) Lashing rod



b) Hook turnbuckle (L11)



c) Knob turnbuckle (L12)

Figure C.2 — Locations for length markings

Table C.1 — Paint Colour requirements of lashing rods and turnbuckles

Dimensions in millimetres

Product type	Length range	Colour
Lashing rod (M11, M12, M13, M14)	L < 2 400	Red
	≥ 2 400 ~ 2 500	Galvanized Colour
	2 500 < L < 4 600	Yellow
	L ≥ 4 600 ~ 5 000	Galvanized Colour
	L > 5 000	Green
Hook turnbuckle (L11)	L Min < 880	Green
	L Min = 880	Blue
	L Min = 920	Galvanized Colour
	L Min = 965	Yellow
	L Min > 965	Red
Knob turnbuckle (L12)	L Min < 1 000	Yellow
	L Min = 1 000	Green
	L Min = 1 080	Galvanized Colour
	L Min = 1 150	Red
	L Min > 1 150	Blue
NOTE For lengths beyond the length scope specified in the table, paint colours shall be determined upon the actual demand.		

C.2.3 Height markings

Fittings of many indistinguishably similar heights should be coated with different colours of paint for marking. The top of the plate is partially painted. See Figure C.3.

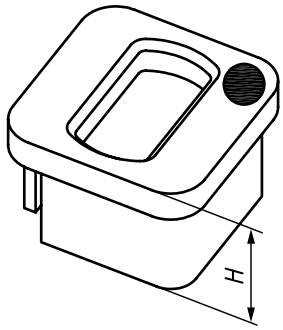


Figure C.3 — Method of applying height markings

Table C.2 — Socket paint colours

Dimensions in millimetres

Product type	Height range	Colour
Socket	H < 110	Red
	H = 110	Primer
	130 > H > 110	Yellow
	H = 130	Blue
	140 > H > 130	Green
	H = 140	Brown
	H > 140	Pink

C.2.4 Other markings

C.2.4.1 The top of the hatch cover lifting socket should be painted after installation for identification, the top plane or the whole body shall be coated with yellow paint. See Figure C.4.

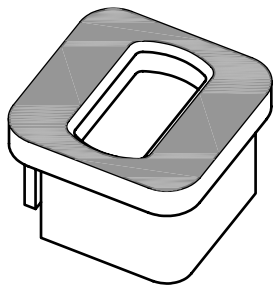


Figure C.4 — Method of marking a hatch cover lifting socket

C.2.4.2 Loose fittings which are maintained should be distinguished from those that are not maintained by distinct markings.

Annex D
(normative)

Storage requirements

D.1 General

Container securing devices shall be stored in special storages or fixed positions to facilitate management and operation, and prevent damage.

D.2 Storage requirements

D.2.1 Lashing rods shall be stored in a storage rack. See Figure D.1.

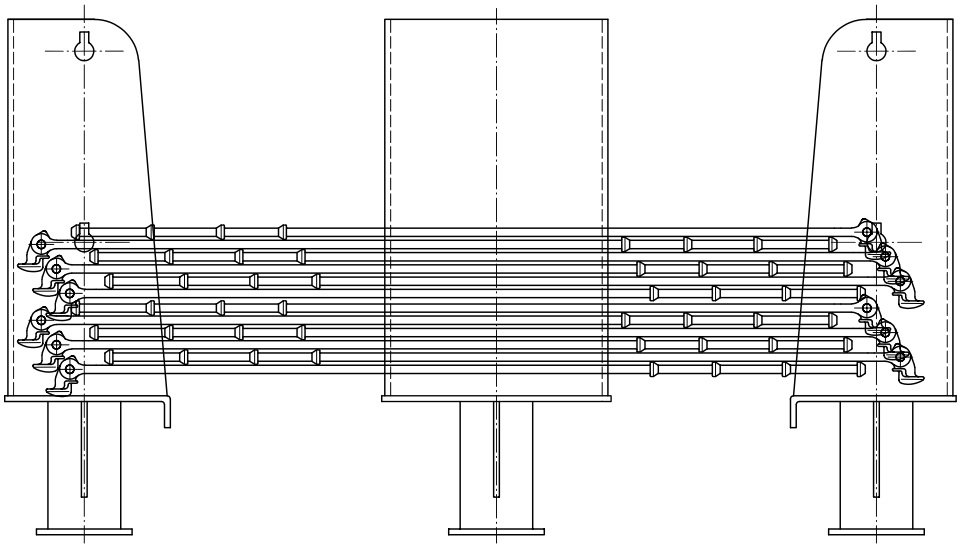
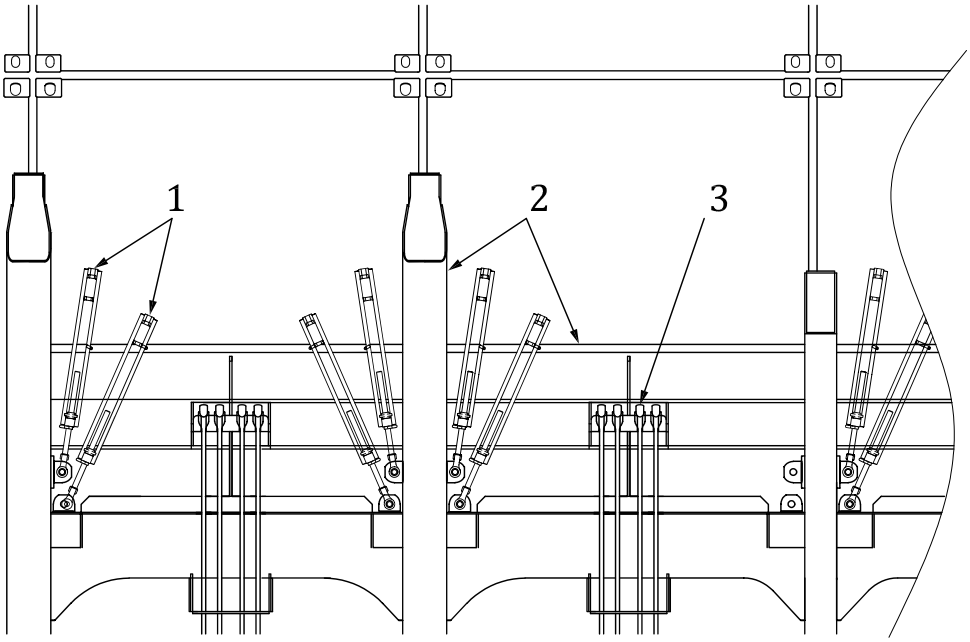


Figure D.1 — Lashing rod storage rack

D.2.2 Lashing rods and turnbuckles shall be stored on a lashing bridge. See Figure D.2.



Key

1 turnbuckle
2 lashing bridge
3 lashing rod

Figure D.2 — Lashing bridge for lashing rods and turnbuckles

D.2.3 Turnbuckles shall be stored on a hatch cover. See Figure D.3

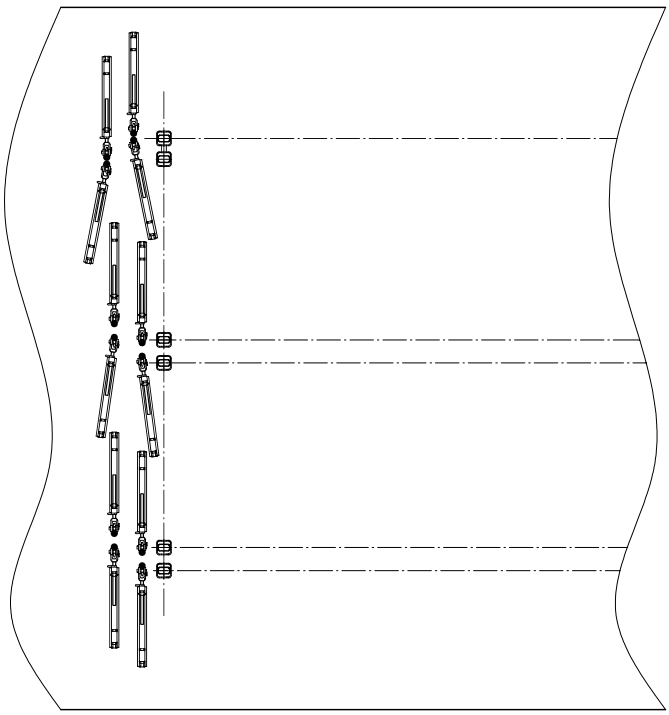


Figure D.3 — Storage of turnbuckles on a hatch cover

D.2.4 Loose fittings such as semi-automatic twistlocks, midlocks, hanging stackers and turnbuckles may be stored in separate containers or the containers may be stored together in a frame box. See Figure D.4. Manual twistlocks, single stackers and transverse double stackers, etc. may be stored in separate containers on-board.

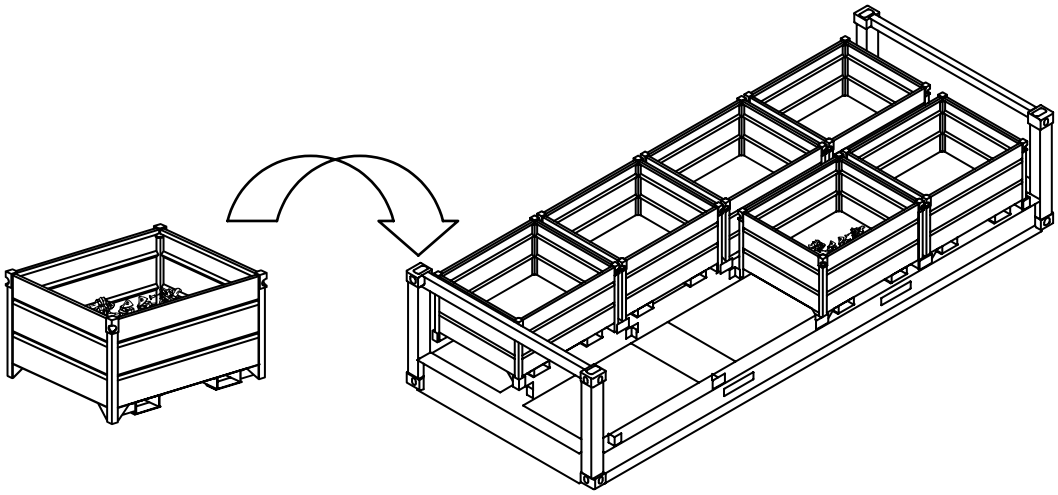


Figure D.4 — Methods of storing loose fittings separately

D.2.5 The storage area shall keep dry, have adequate drainage and be protected from erosion by chemicals, chemical gases, steam, or other corrosive agents. Securing devices shall be arranged neatly, and mixed storage shall be avoided for fittings with different markings.

Bibliography

[1] ISO 1161:—[1)], *Series 1 freight containers — Corner and intermediate fittings — Specification*

1) To be published.

ICS 47.020.50

Price based on 25 pages