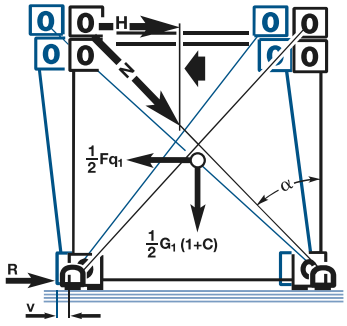

CONTAINER TECHNICS nv

CARGO LASHING & LIFTING

Dear Customer and Reader,

It is with great pride and pleasure that Container Technics hereby presents to you its new 2018 catalogue.
A team of specialists has worked hard for several years to create this new overview reflecting our fields of activity, namely cargo lashing and lifting gear for mainly coastal and seagoing vessels of all types.
This catalogue will not only trigger maritime customers. Stevedoring and general cargo handling companies all over the world will also be interested in what we have to offer.

Our catalogue reflects our fields of activity in comprehensible chapters: fixed and loose lashing gear, followed by lifting and rigging gear. All of our products are supplied with care from our various stock points around the world. For the past 40 years our focus has been on providing superior service, quality, reliability and on maintaining long term partnerships with our customers.

A printed catalogue may be rare in the current digital world, but we notice that our customers remain attached to this tangible paper copy.
Of course, Container Technics also provides a website (**www.containertechnics.com**) offering support and easy access to all drawings and pictures of our assortment.
The latest news regarding our company and products can be found easily on LinkedIn.

In conclusion, Container Technics would like to thank those who have made all of this possible for the past 40 years: our customers!

Please enjoy browsing through our catalogue or visiting our website and feel free to contact us personally if you have any questions.

Our commitment to serving you 7 days a week, 24 hours a day, is no idle promise!

Best regards,

The Container Technics Team

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Definitions

Typical examples of force types

TENSION FORCE	
SHEAR FORCE	
COMPRESSION FORCE	

Definition of loads

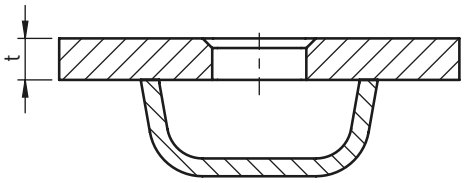
MSL	**Maximum Securing Load**	Maximum load allowed on a lashing item when used in practice
WLL	**Working Load Limit**	Maximum load allowed on a lifting item when used in practice
SWL	**Safe Working Load**	Maximum load allowed on a lifting item when used in practice
PL	**Proof Load**	Load applied on an item in test conditions. No plastic deformation may remain after this load has been applied.
TL	**Test Load**	= Proof Load
(M)BL	**(Minimum) Breaking Load**	Minimum load an item has to sustain before breaking
SF	**Safety Factor**	BL/MSL or BL/WLL. Typical value for most lashing items is 2. For lifting items 4 or more.
(D)WT	**Deadweight**	Own weight of a lifting item

If not stated explicity, all dimensions in this catalogue are in millimeter

Chamfer Types

Chamfer type A

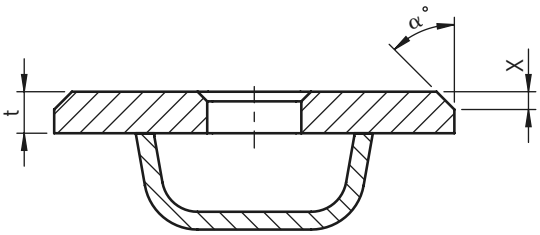
Without chamfer



t = typically 16 or 28mm

Chamfer type B

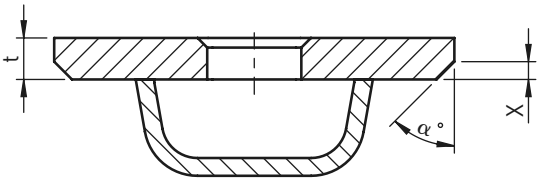
With chamfer from above



α = typically 30°, 45° and 60°
t = typically 16 or 28mm
X = to be specified

Chamfer type C

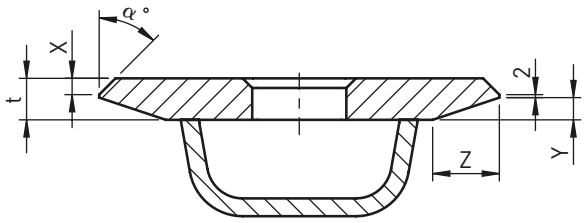
With chamfer from below



α = typically 30°, 45° and 60°
t = typically 16 or 28mm
X = to be specified

Chamfer type D

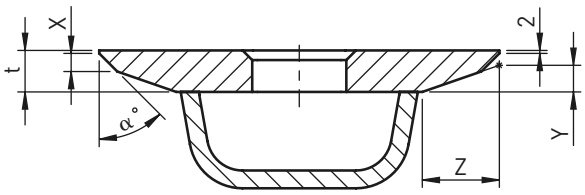
With chamfer from above and smooth transition of thickness



α = typically 30°, 45° and 60°
t = typically 16 or 28mm
X, Y = to be specified
Z = typically 3*Y

Chamfer type E

With chamfer from below and smooth transition of thickness



α = typically 30°, 45° and 60°
t = typically 16 or 28mm
X, Y = to be specified
Z = typically 3*Y

Containers

I. DESCRIPTION

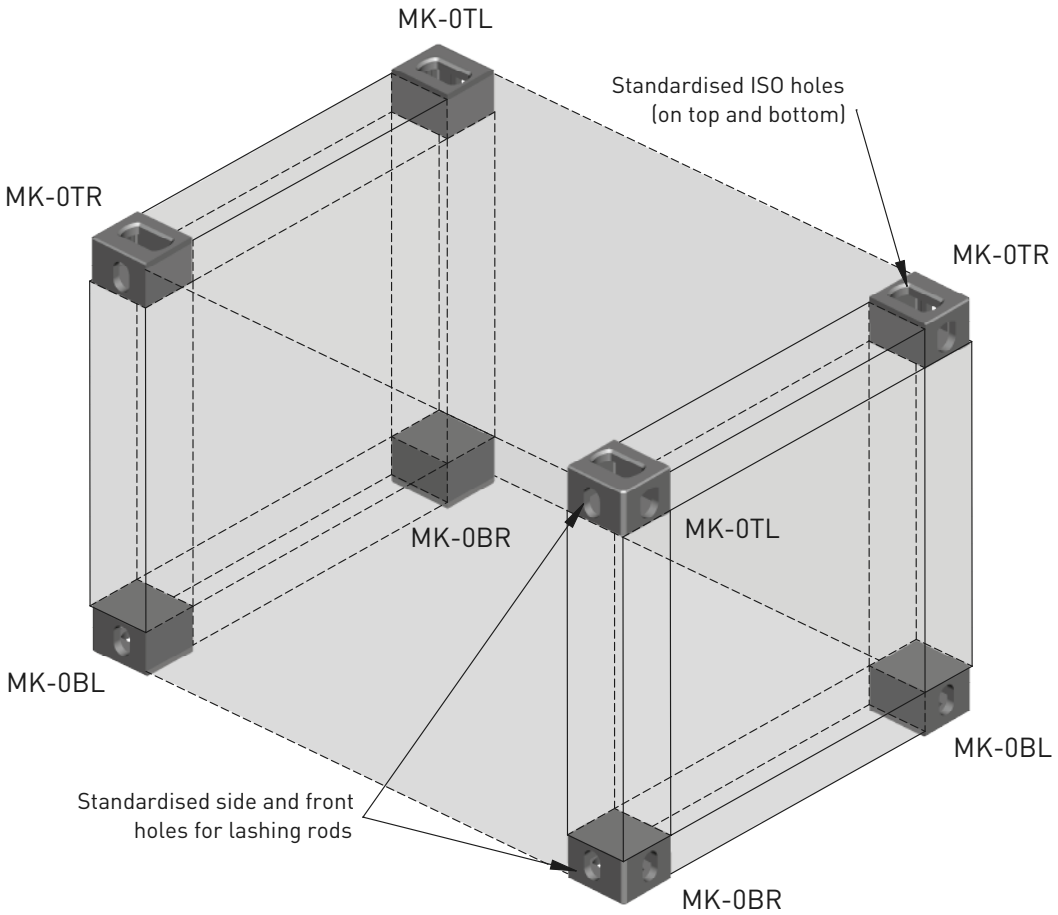
Shipping containers are standardised according to ISO standards such as ISO 668, 1496, ...

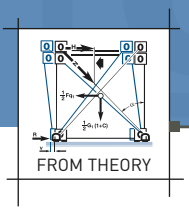
From a structural point of view, a container consists of a strong frame at the front side and a strong frame with a door at the aft side. Each of these frames is composed of 2 vertical corner posts, 2 horizontal girders at the bottom and on top, and 4 corner castings (2 at the bottom, 2 on top, see also MK-0). These elements are designed to take all the external loads working on the container.

The rest of the container (roof, longitudinal walls, and bottom) is not taken into account for securing calculations, because these elements are weak in comparison to the end frames. Only for special, by the classification society defined, cases may the strength of these longitudinal elements be taken into account for the securing calculations.

Containers can be secured to a foundation or to eachother by connecting elements fitting into the ISO-holes located the underside of the bottom corner castings and in the upper side of the top corner castings.

Containers can be additionally secured of stiffened by lashing elements fitting into the standardised front and side openings of the top and bottom corner castings.

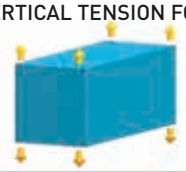
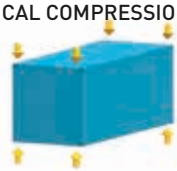




II. STRENGTH

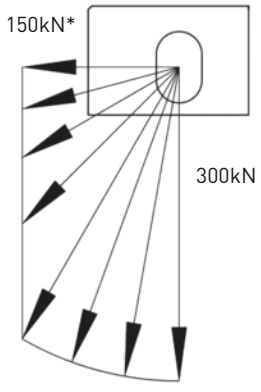
Containers are designed to sustain combinations of loads in various directions. The allowable forces on a container are however not standardised and defer from one classification organization to the other. An overview of these forces for standard containers is given in the table below.

ALLOWABLE FORCES ON CONTAINERS (In kN)

			STANDARDIZATION OF CLASSIFICATION SOCIETY					
			ISO	LRS	BV	DNV-GL	ABS	RINA
RACKING FORCE 	Door and front wall		150	150	150	150	150	150
	Side walls		75	150	100	150	125	100
	Side walls of open containers			75	75	75	75	75
VERTICAL TENSION FORCE 	Top	20'	118	250	250	250	250	250
		40'	150					
	Bottom	20'	110	250	250	250	250	250
		40'	140					
VERTICAL COMPRESSION FORCE 	Corner post		942	848	848	848	848	848
	Bottom corner	20'	1048	954	ns	ns	954	ns
		40'	1077					
HORIZONTAL TENSION FORCE 	Top	20'	150	340	200	200	250	200
		40'				250		
	Bottom	20'	150	500	300	200	350	300
		40'				250		
HORIZONTAL COMPRESSION FORCE 	Top	20'	100	340	200	250	250	200
		40'						
	Bottom	20'	150	500	300	400	350	300
		40'						

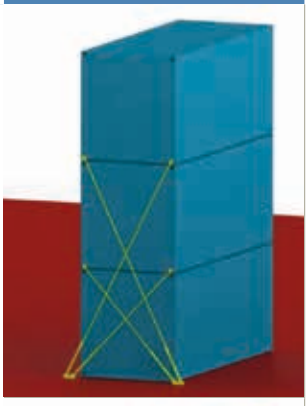
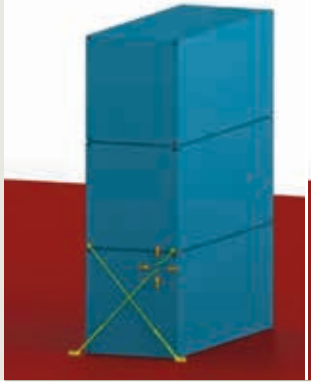
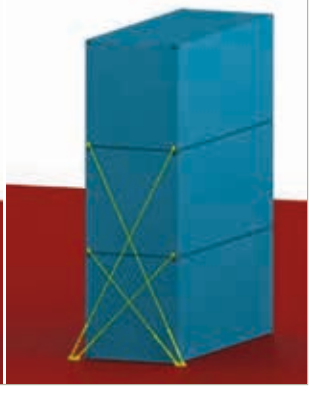
The allowable forces acting between two containers (for instance in buttresses) are to be taken as the appropriate sum of top and bottom forces.

LASHING FORCES



* max. Horizontal forces 225 kN acc. to LRS

When containers are stacked and secured on board, some of the forces given on the previous page may become too high due to the movement of the ship and external loads such as wind. An overview on the possible overloading and how to prevent them is given below.

LOAD	PROBLEM	SOLUTION
RACKING LOAD Transversal (rolling, wind) and longitudinal (pitching) forces parallel to deck tend to deform the container end and side frames. Excess racking forces can be reduced by stiffening the container frames with diagonal lashing rods.		
LIFTING LOAD Tranversal (rolling, wind) and longitudinal (pitching) forces parallel to deck, together with vertical forces tend to tip-over or lift the container or container stack, creating uplift force at some of the bottom corners. Excess lifting forces can be reduced by diagonal or vertical lashing rods in addition to twistlocks or stackers.		
COMPRESSION LOAD Transversal (rolling, wind) and longitudinal (pitching) forces parallel to deck, together with vertical forces tend to press down the container or container stack, creating compression force in the vertical corner posts. Excess compression forces can only be reduced by reducing the container weights or lowering the c.o.g. Adding extra internal lashing rods only increases the compression load.		
LASHING LOAD The reaction forces of the lashing rods are acting on the container castings. Excess lashing forces can be reduced by adding more lashing rods or changing the weight distribution.		

III. SIZES AND DISTANCES

Dimensions of various container types can be found in the table below.

Standardised longitudinal centre-to-centre distance between the holes of the end sockets of two adjacent 20' containers is 279mm in order to fit into one 40' module. (The same is valid for two 10' containers in a 20' module)

Transversal centre-to-centre distance between the side sockets of two adjacent containers is not fully standardised. Because – for practical reasons – a clearance of minimum 20 to 35mm is required between containers, transversal centre-to-centre distance between the holes of two 8' wide containers is standardised at 203mm. However, more and more pallet wide EURO-containers of 2500mm width are transported: transversal centre-to-centre distance between two 2500mm wide containers is standardised at 258mm. Other transversal centre-to-centre distances encountered are: 216mm, 265mm or 365mm (for two adjacent 2600mm wide containers).

In ships with cell guides, the cell guides are in most cases designed for 8' wide containers; so no 2500mm wide containers can be carried in the cell guide system. The lay-out of a cell guide system can be based on 2500mm wide containers: in the case of 8' wide containers being carried in such a system, compensating pieces have to be provided in order to limit the clearance of these 8' wide containers in the 2500mm cell guide system.

Cell guides are to be constructed with maximum 25mm clearance transversally and 38mm longitudinally (therefore the distance between the guides = container width + 25mm, container length + 38mm).

SIZES AND DISTANCES FOR VARIOUS CONTAINER TYPES

CONTAINER SIZE/TYPE	CONTAINER SIZES (mm)			CENTRE-TO-CENTRE (mm)		MAX. WEIGHT	REMARKS
	LENGTH	WIDTH	HEIGHT	LENGTH	WIDTH[1]	(t)	
10' x 8' x 8' 10' x 8' x 8'6"	2991	2438	2438 2591	2787	2259	10,16	ISO 668
20' x 8' x 8' 20' x 8' x 8'6" 20' x 8' x 9' 20' x 8' x 9'6"	6058	2438	2438 2591 2743 2896	5853[2]	2259	24,0	ISO 668
20' x 2500 x 8'6" 20' x 2500 x 9'6"	6058	2500	2591 2896	5853	2259	24,0	'EURO'
24' x 8' x 8' 24' x 8' x 8'6"	7315	2438	2438 2591	7108		24,95	'MATSON'
24,5' x 8'6"5/32 x 8'6" 24,5' x 8'6"5/32 x 9'6"	7430	2595	2591 2896	5838/7225[3]	2259		ISO
30' x 8' x 8' 30' x 8' x 8'6"	9125	2438	2438 2591	8918	2259	25,4	ISO 668
35' x 2430 x 2590	10659	2438	2603		2134	27,4	'SEA LAND'
40' x 8' x 8' 40' x 8' x 8'6" 40' x 8' x 9' 40' x 8' x 9'6"	12192	2438	2438 2591 2743 2896	11985	2259	30,48	ISO 668
40' x 2500 x 8'6" 40' x 2500 x 9' 40' x 2500 x 9'6"	12192	2500	2591 2743 2896	11985	2259	30,48	'EURO'
43' x 8' x 8'6"	13107	2438	2591	12900	2259	32,5	'Reefer'
45' x 8' x 9' 45' x 8' x 9'6"	13716	2438	2743 2896	11985/ 13509	2259	30,48	US standard
48' x 8'6" x 9'6,5"	14630	2600	2900	11985/14423	2259	30,48	US standard
49' x 8'6"5/32 x 8'6" 49' x 8'6"5/32 x 9'6"	14953	2595	2591 2896	11985/14728	2259	30,48	ISO
53' x 8'6" x 9'6,5"	16154	2600	2900	11985/16147	2259	30,48	US standard

TOLERANCES

Width: +0, -5mm for all containers
Height: +0, -5mm for all containers
Length: +0, -6mm for 10' - 24,5' containers
+0, -10mm for 30' - 53' containers

[1] Transverse offset (distance from centre point to centre point of ISO holes) of all containers is 2259mm standard, except for 'SEALAND' containers.
[2] Two 20' containers behind each other fit the offsets of one 40' container with a spacing of 76mm between the two containers (or 279mm c/c spacing).
[3] Two 24,5' containers behind each other fit the offsets of one 49' container with a spacing of 51mm between the two containers (or 279mm c/c spacing).

Container Stowage Systems

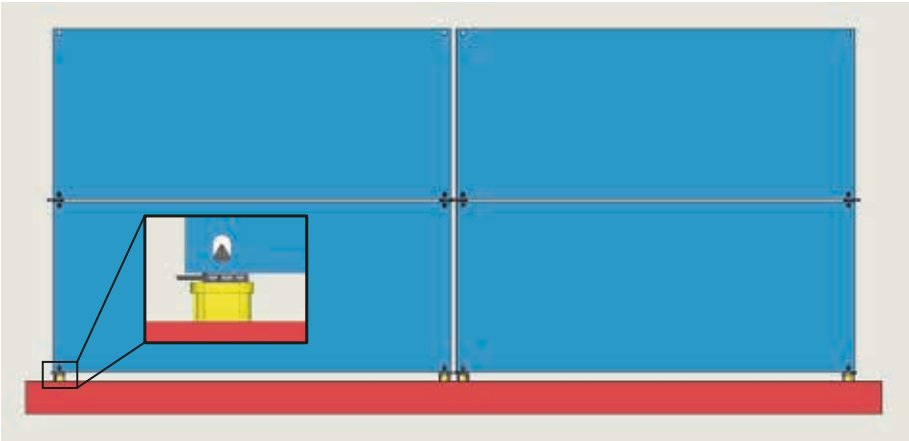
HATCH COVER ARRANGEMENTS

Hatch covers equipped for containers can be designed to stow containers in point load mode or line load mode.

POINT LOAD MODE

DEFINITION

The container is resting on its 4 bottom corner castings on the container fittings. The other parts of the container don't make contact with the hatch covers.



INSTALLATION OF FIXED FITTINGS ON HATCH COVERS

The foundations can be installed:
- Flush with the surrounding structure, e.g. a flush ISO foundation FF-81 (page 22)
- Raised above the surrounding structure, e.g. a raised ISO foundation FR-71 (page 26)

LOOSE LASHING GEAR

Standard twistlocks or bottom twistlocks are to be used.

T-1L

B-45L

B-55L

PRINCIPLE

All forces of the container stack are transferred to the foundations through the 4 corner castings of the bottom container.

REMARKS

This is the most common design of hatch covers for container carrying vessels. In general the hatch covers have a higher stack load but they are also heavier than their line load counterparts.

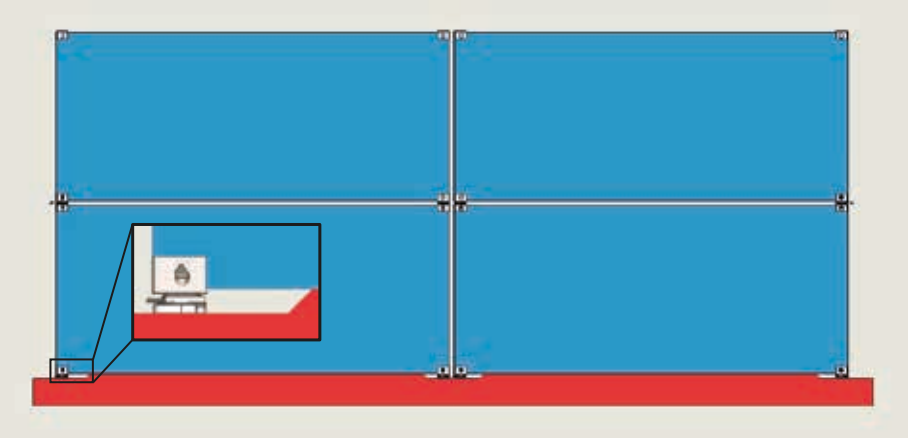
RESTRICTIONS

As the container is designed for point load mode, the standard limitations of forces acting on the containers are valid together with the allowable stack weight of the hatch cover.

LINE LOAD MODE

DEFINITION

The container is resting on its 2 longitudinal bottom girders. The 4 corner castings are not in contact with the structure below.



INSTALLATION OF FIXED FITTINGS ON HATCH COVERS

Sliding foundations are installed in recesses of the hatch covers. The depth of these recesses is 80mm* (although on older vessels this can be 72mm) to prevent corner castings being supported by the hatch cover structure below.

PRINCIPLE

As the container is resting on its bottom girders and the corner casting are "hanging" above the structure, the compressive force of the stack is transferred through these girders into the hatch covers. The shear and tension forces are transferred through the corner castings and the bottom twistlocks, which are placed in the recess.

LOOSE LASHING GEAR

Special bottom twistlocks for line load are to be used. These have a longer cone to overcome the additional height of the recess.

B-45LL

B-55LL

RESTRICTIONS

Due to the fact that forces from containers on higher levels are transferred into the unsupported cornerposts of the bottom containers, the weight on top of the bottom container and the number of tiers are limited by class regulations.

REMARKS

For a line load configuration the tolerances of the hatch cover, the type of twistlock and the condition of the container are important to attain a correct stowage and securing. A correct securing is done when:

- The corner casting of the container is not resting on the twistlock body
- The head of the twistlock is completely inserted in the ISO-hole of the corner casting
- The corner casting is not resting on the head of the twistlock
- The handle of the twistlock can easily be shifted into a locked position

When correct securing as described above is not possible, the following cases should be checked.

- Figure 1: The recess is not deep enough. Line load twistlocks are designed for recesses of 72-80mm
- Figure 2: A standard twistlock is used instead of a line load twistlock
- Figure 3: The recess is not deep enough and a standard twistlock is used
- Figure 4: Deformation or deflection of the hatch cover increases the actual depth of the recess. The line load twistlock will not lock as it appears to be too low.

PROTRUSION OF CORNER CASTINGS

FIGURE 1

Top of cone is hitting the inner body of the corner casting, top of hatch cover is to low for bottom twistlock with lengthened cone shaft.

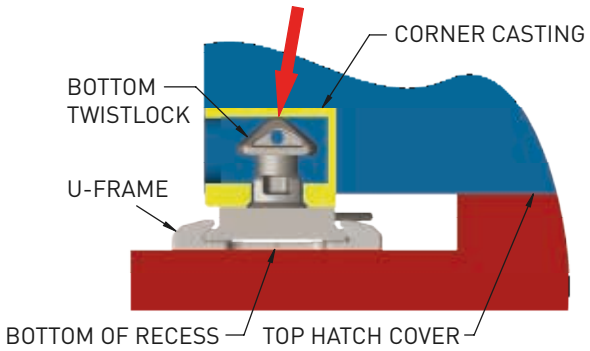


FIGURE 2

Cone of twistlock is not fully inserted into corner casting. Top of hatch cover is to high for standard bottom twistlock.

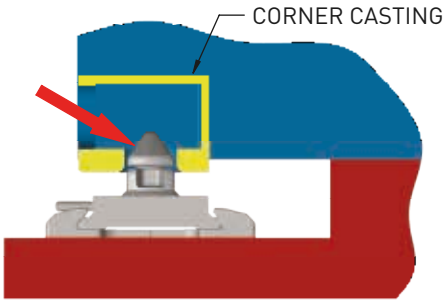


FIGURE 3

Bottom of corner casting is resting on body of bottom twistlock, top of hatch cover is to low.

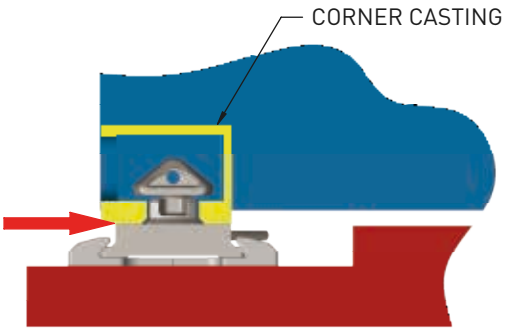
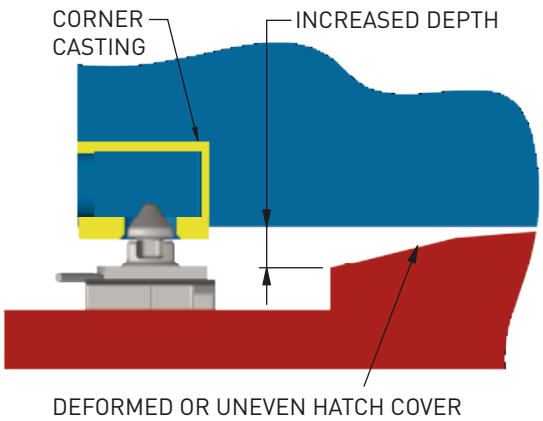


FIGURE 4

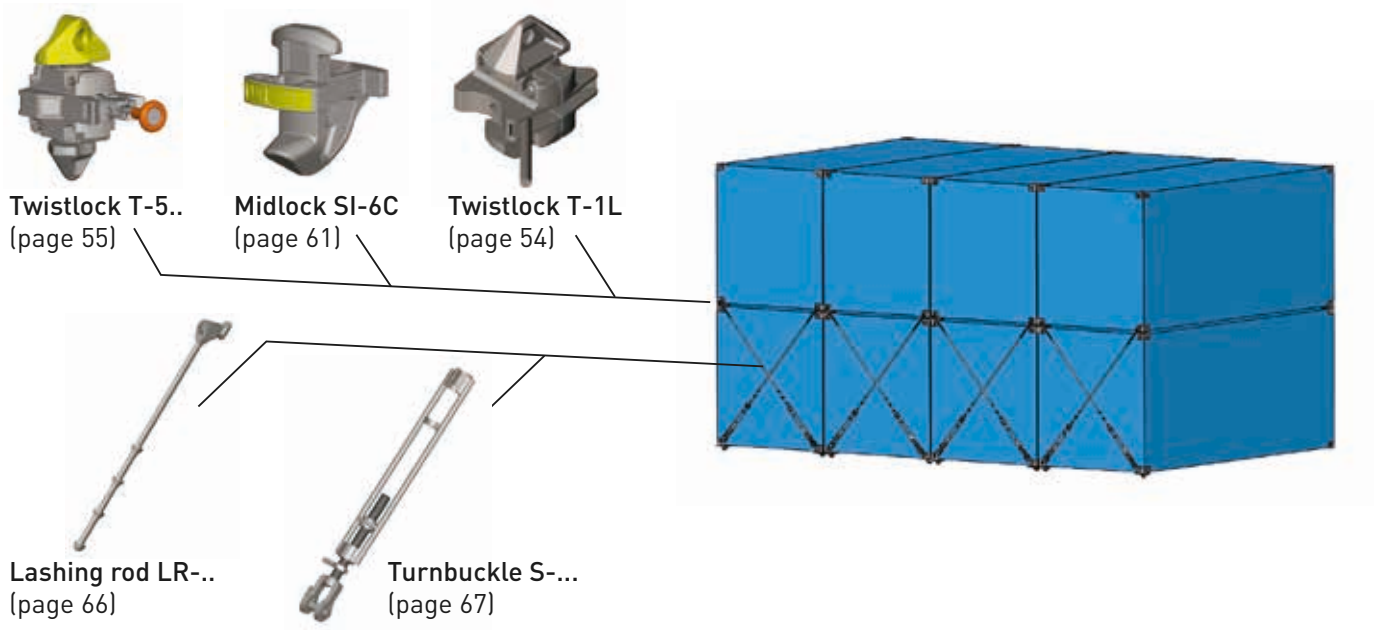
Top of hatch cover is deformed or uneven, twistlock is unable to lock.



NOTE: For clarity, in some of the above examples the U-frame, twistlock and ISO hole of the corner casting have been turned 90° from normal alignment.

Securing Arrangements

SECURING OF INDEPENDENT STACKS WITH TWISTLOCKS AND LASHING RODS



DESCRIPTION

This is the most common securing arrangement used nowadays. Containers are stowed in a stack and only connected with the containers above and below them. The containers are connected by means of twistlocks and midlocks which are inserted in the corner castings of the containers. All forces are transmitted through the twistlocks into the cornercastings and corner posts of the containers to the bottom structure.

As there's no connection with the containers of adjacent stacks or to side structures the lower containers are always subject to the highest forces. In case the allowable racking or uplift forces are exceeded, lashing rods with turnbuckles can be installed at both container ends. Installing lashing rods will increase the compression force in the corner post which can be limiting for high and heavy stacks of containers. In this cases external lashings can be a solution. The possible causes of failure and means of prevention can be found on page 11.

When using lashing rods the advised distance in between the containers is at least 860mm in accordance with the IMO MSC.1/Circ.1352.

CHARACTERISTICS

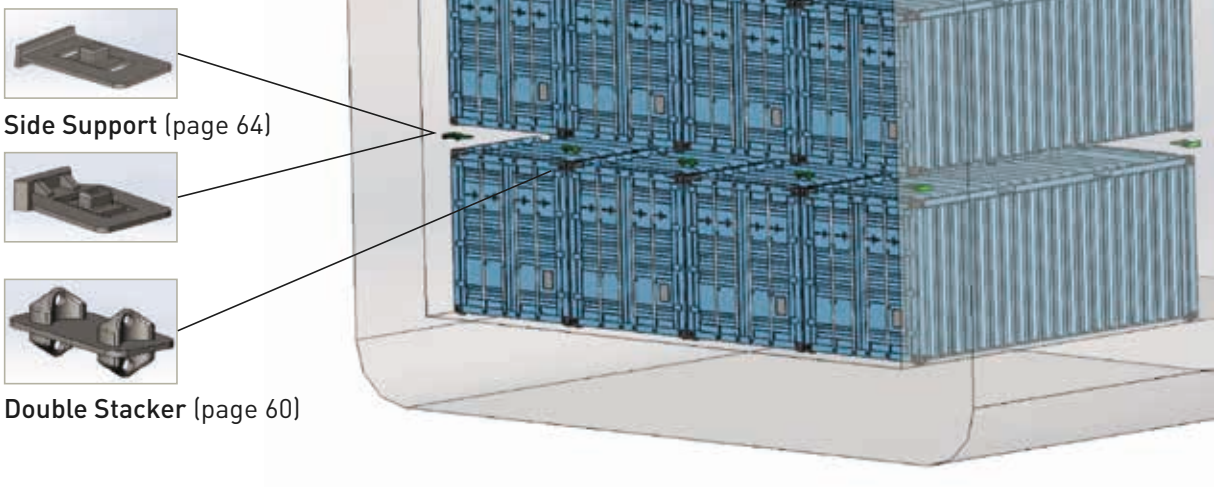
Advantages

+ Can be in compliance with requirements of OSHA and specialized container terminals
+ Flexible stowage possible
  > Combinations of containers with different heights is possible
  > One container can easily be loaded/unloaded without necessarily transferring containers in adjacent stacks.
+ Allows for fast loading and unloading operations

Disadvantages

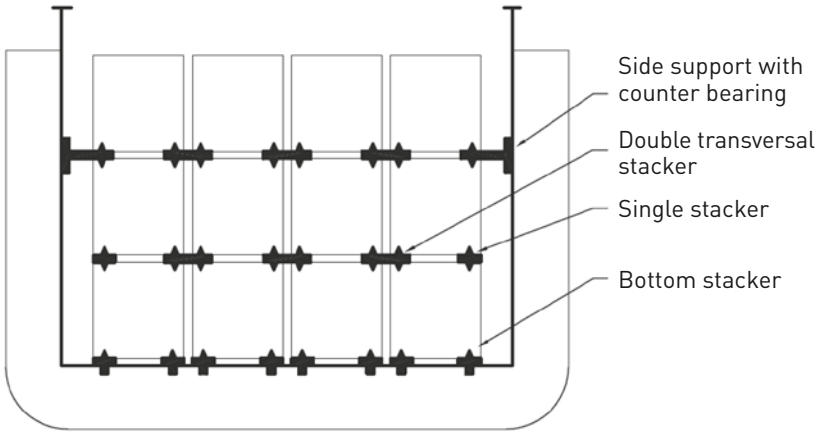
– Stack weight is limited according to the strength of the bottom containers

SECURING OF CONTAINERS STOWED IN BLOCK WITH SIDE SUPPORTS AND STACKERS



DESCRIPTION

This securing configuration can be used in the hold of ships with bulkheads reinforced for this purpose. All containers are transversally connected by double stackers, forming one solid block of containers. The forces acting on this block are transferred to the ships bulkheads by means of side supports and to the bottom using bottom stackers. Side supports can be of the pressure type or the tension-pressure type. The first can only transfer pressure into the bulkhead the latter needs to be inserted into the bulkhead-fittings and can transfer tension and pressure forces. The upper containers can be connected by bridge fittings and supported by top supports.



The type, position and number of supports required needs to be determined by detailed calculation taking into account the weight of all containers.

CHARACTERISTICS

Advantages

+ High stack loads can be achieved

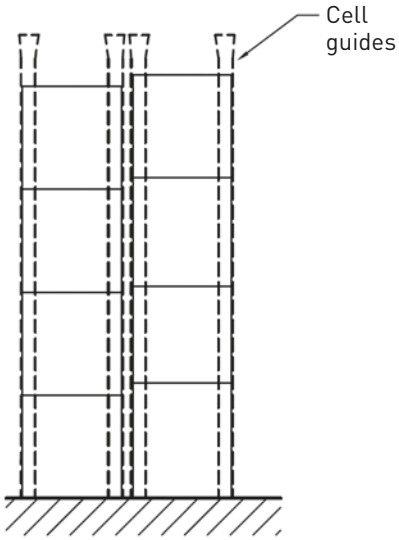
Disadvantages

- Inflexible (un-)loading operations as it has to be done tier by tier and not stack by stack
- Slow and labor-intensive loading and unloading operations
- Mixture of containers with different heights only possible with additional height adapters
- Not in compliance with OSHA or requirements of specialized container terminals

SECURING OF INDEPENDENT STACKS IN CELL GUIDES WITH APPROPRIATE LENGTH

DESCRIPTION

Each stack of containers is well enclosed by 4 guiding elements or cell guides. These cell guides are rigidly connected with the ship structure and by consequence transfer the forces acting on the containers into the ship structure. Because every container is enclosed at its 4 corners by cell guides, no other securing materials between the containers are required. The maximum stack load of the containers is given by the gross weight of the containers or the specified stack weight by the cell-guide designer.



Cell guides are, in general, fixed structures which are designed for 1 size of containers. However, containers with a lower length can also be stowed. For example the stowage of 20ft containers in 40ft cell guides is a common practice. As only 1 end of the container is enclosed by the cell guides, additional securing measures are to be taken for this stowage configuration. On the tank top fixed stackers at the cell-end and bottom guidance at the free-end are placed to prevent the bottom containers from shifting. In between the container tiers single stackers are to be placed. Depending on the type of stackers and the ship's design, 2 or 4 stackers (SI-7D or SI-7F) need to be placed in between the layers for levelling the containers. The stack load of this stowage is limited by *class* rules.

CHARACTERISTICS

Advantages

+ In compliance with OSHA regulations and requirements of modern container terminals
+ High stack weights possible
+ Combinations of different container heights is no problem
+ No or limited manipulation of loose gear required

Disadvantages

– Cell guides are heavy steel structures and therefore reduce the deadweight of the ship
– Cell guides prevent the carriage of out of gauge containers and non-containerized cargo

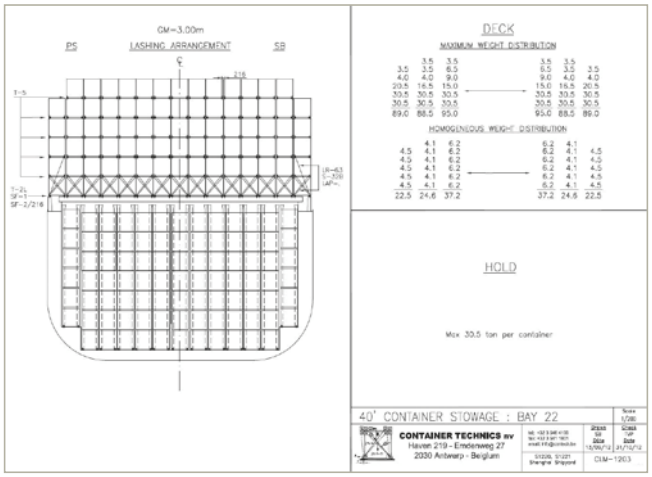
Cargo Securing Manuals

SOLAS Ch VI Carriage of Cargoes, Regulation 5 Stowage and Securing states that:

> *"All cargoes, other than solid and liquid bulk cargoes, cargo units and cargo transport units, shall be loaded, stowed and secured throughout the voyage in accordance with the Cargo Securing Manual".*

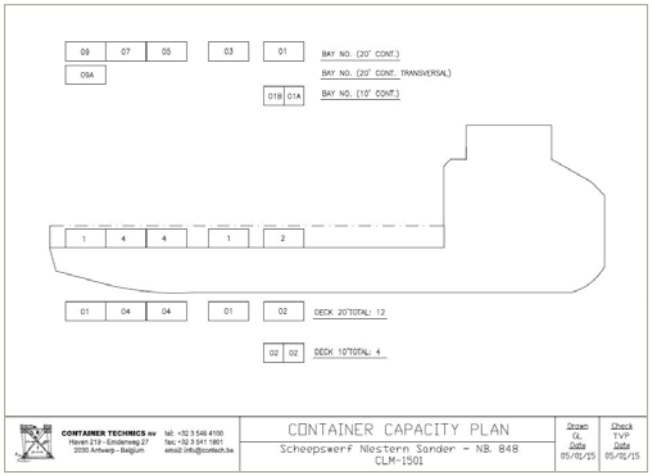
These manuals need to be approved by the flag state or by a classification society on behalf of the flag state in accordance with the *IMO Revised Guidelines on the Preparation of the Cargo Securing Manual and the Code of Safe Practice for Cargo Stowage and Securing.*

Due to our longtime experience we can provide Cargo Securing Manuals in accordance with all required regulations. The Cargo Securing Manual consists, inter alia, out of a list of all loose and fixed securing fittings, instructions on how to operate and maintain these fittings, general information on the stowage of cargoes, ship specific accelerations and example calculations, ...



For ships which are intended to carry containers, a Container Lashing Manual or Container Securing Manual is to be included in the Cargo Securing Manual. The Container Lashing Manual shows the allowable weight distribution of each container stack for 1 or more GM-values. It also gives guidance on the type and location of the container securing materials.

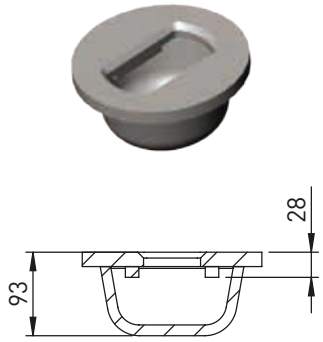
We always intend to deliver manuals which contain all information regarding types, maintenance and operation instructions of the securing items and in this way support the cargo securing operations of our customers in the best way. Each document is prepared in accordance with the regulations and specific requirements of the customer.

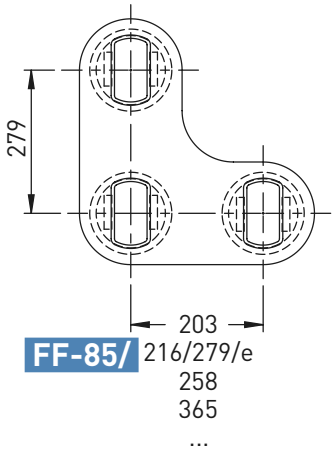


A

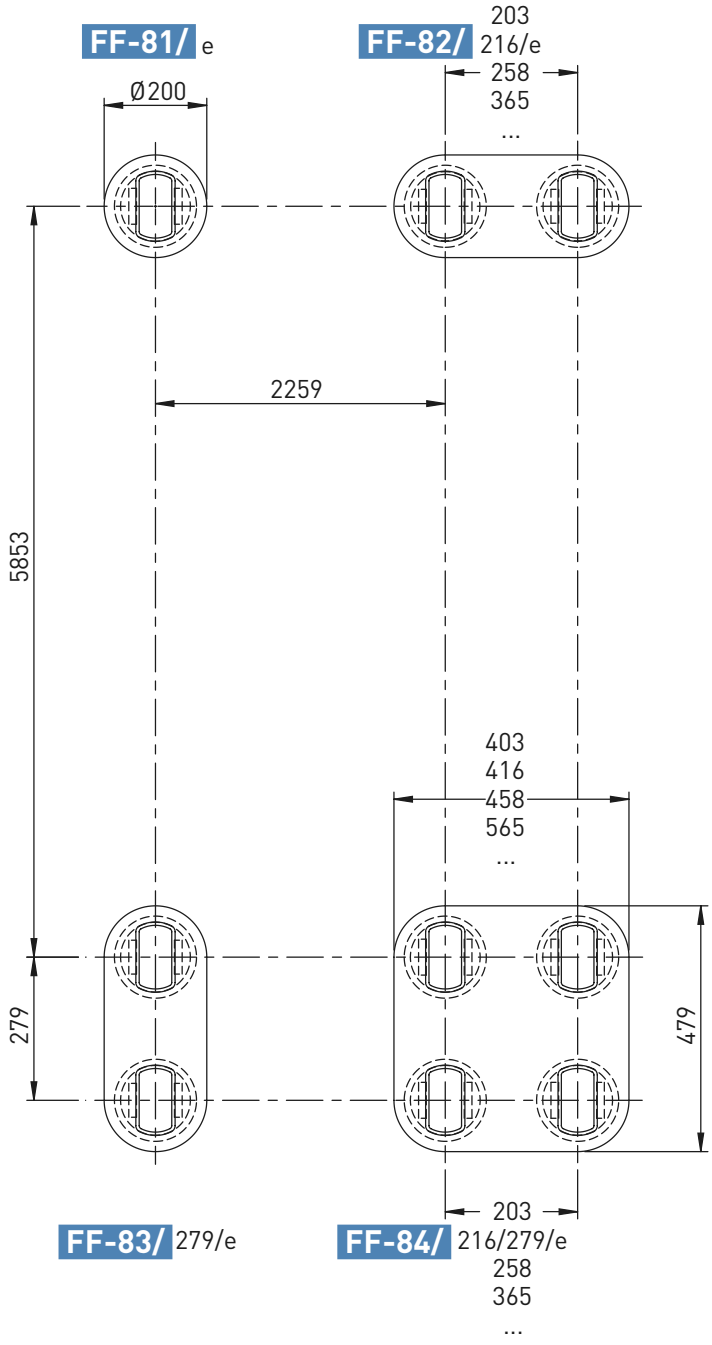
FIXED LASHING EQUIPMENT

Flush ISO Foundation - With Collar





FF-85/ 216/279/e
258
365
...



FF-81/ e

FF-82/ 203
216/e
258
365
...

FF-83/ 279/e

FF-84/ 203
216/279/e
258
365
...

SPECIFICATIONS

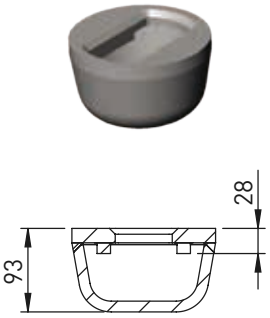
(MSL) Max. securing load: tension 250kN, shear 210kN
(MBL) Min. breaking load: tension 500kN, shear 210kN
Approval possible from any classification society
Edge preparation see page 8
Pressure tested for watertightness

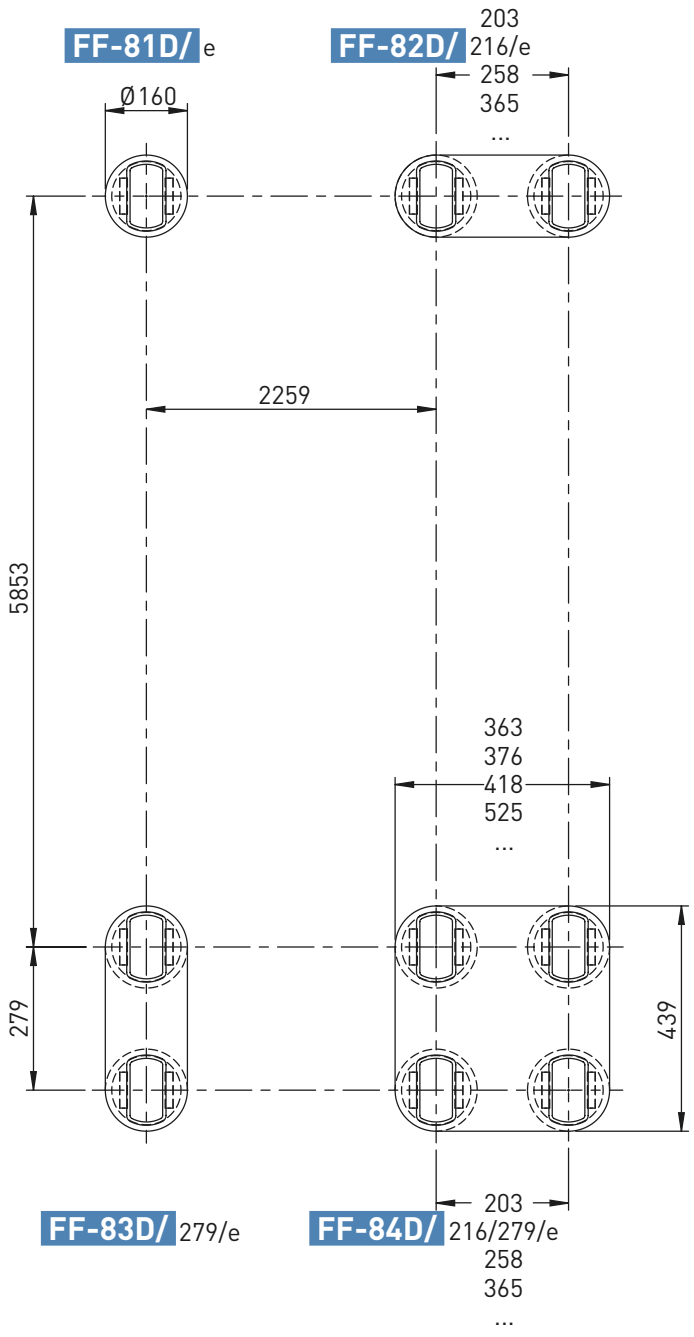
PLUG FOR ISO-HOLE

FF-70
plastic

FF-90
rubber

Flush ISO Foundation - Without Collar





SPECIFICATIONS

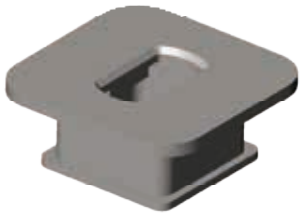
(MSL) Max. securing load: tension 250kN, shear 210kN
(MBL) Min. breaking load: tension 500kN, shear 420kN
Approval possible from any classification society
Edge preparation see page 8
Pressure tested for watertightness

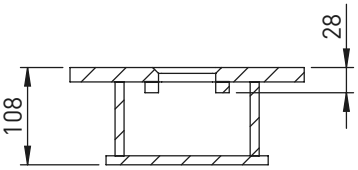
PLUG FOR ISO-HOLE

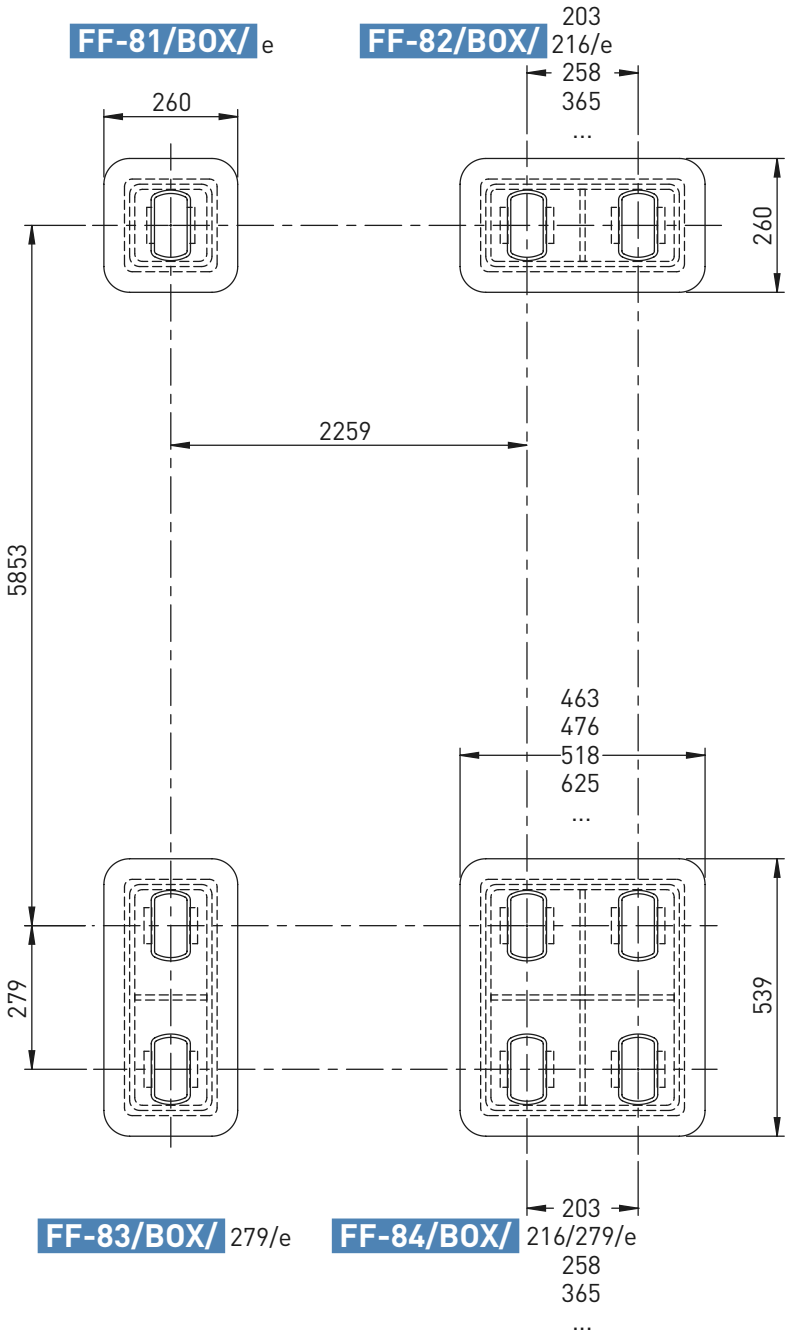
FF-70
plastic

FF-90
rubber

Flush ISO Foundation - Box Shaped







SPECIFICATIONS

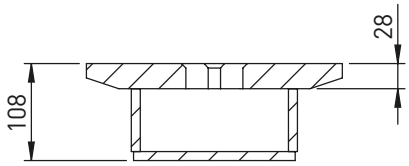
(MSL) Max. securing load: tension 250kN, shear 210kN
(MBL) Min. breaking load: tension 500kN, shear 420kN
Approval possible from any classification society
Edge preparation see page 8
Pressure tested for watertightness

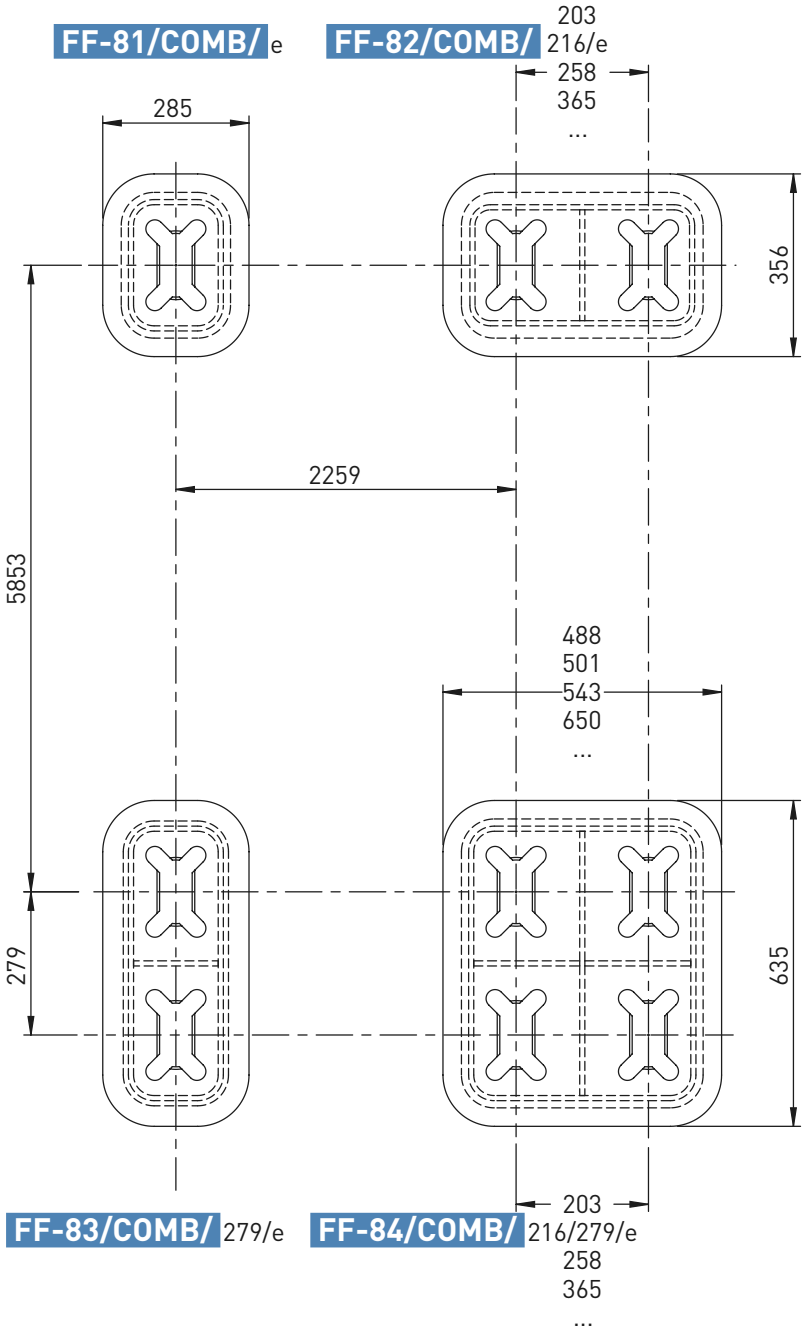
PLUG FOR ISO-HOLE

FF-70
plastic

FF-90
rubber

Flush ISO Foundation - Combination

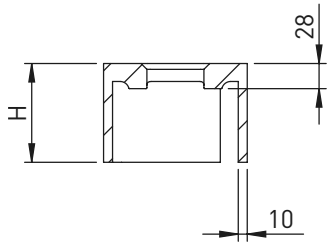


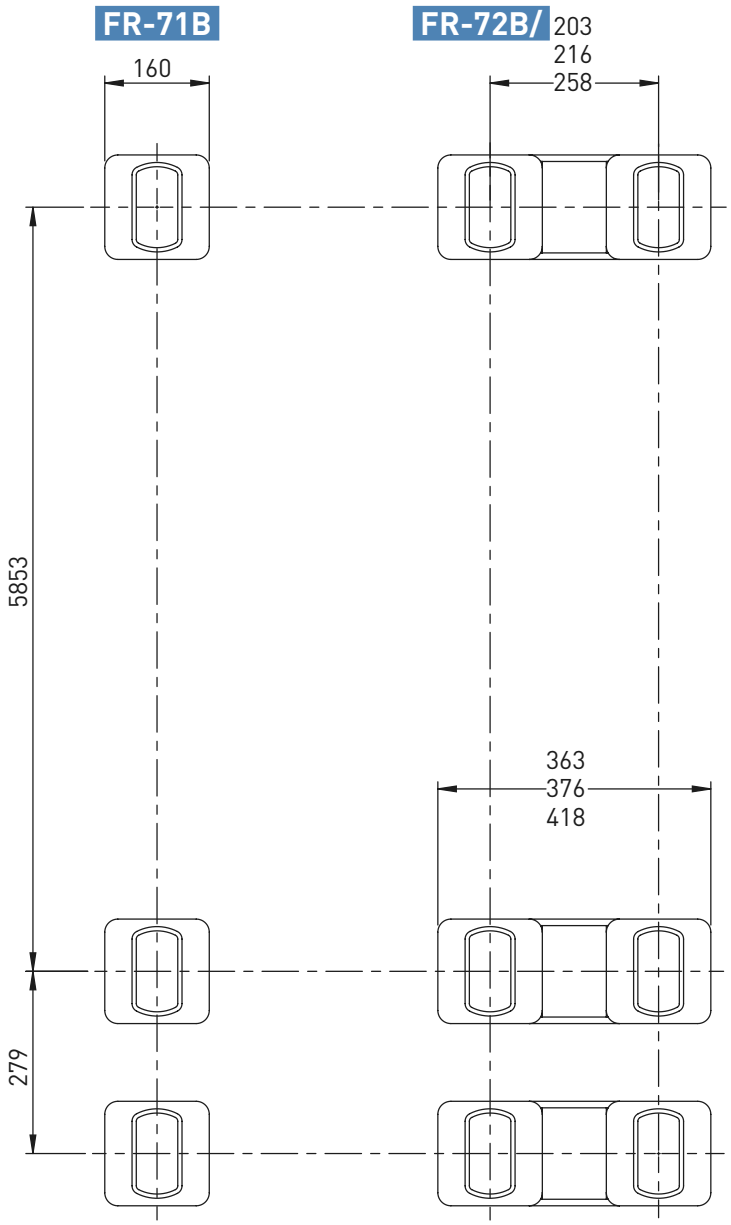


SPECIFICATIONS

(MSL) Max. securing load: tension 250kN, shear 210kN of ISO hole
(MSL) Max. securing load: tension 2x100kN of elephant foot sleeves
(MBL) Min. breaking load: tension 500kN, shear 420kN of ISO hole
(MBL) Min. breaking load: tension 2x200kN of elephant foot sleeves
Approval possible from any classification society
Edge preparation see page 8
Pressure tested for watertightness
To be used in combination with: twistlock & elephant foot

Raised ISO Foundations

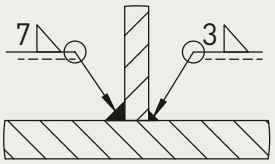




SPECIFICATIONS

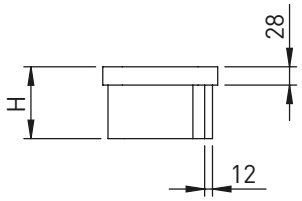
(MSL) Max. securing load: tension 250kN, shear 210kN
(MBL) Min. breaking load: tension 500kN, shear 420kN
Approval possible from any classification society
Standard H = 110mm
Maximum H = 160mm, minimum H = 65mm

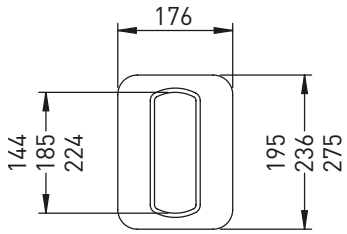
WELDING DETAIL



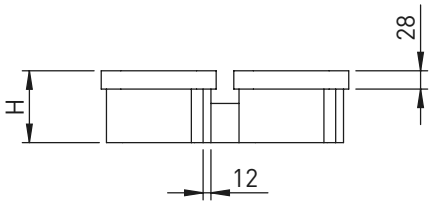
Raised ISO Foundations - Elongated

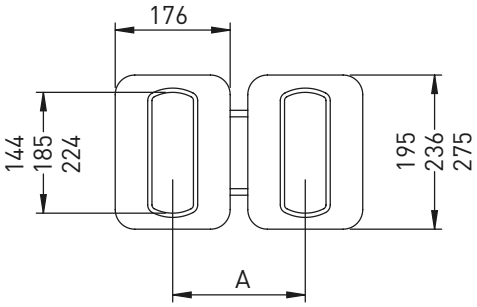
FR-71Q



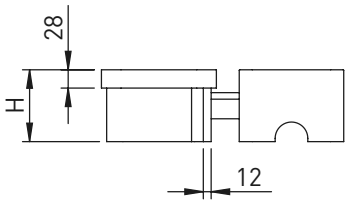


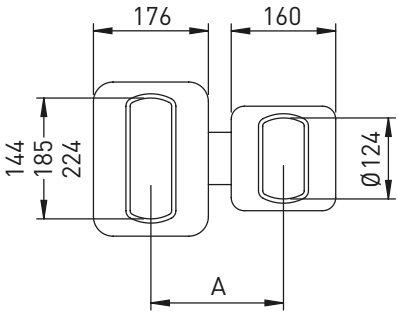
FR-72Q/A





FR-72DQ/A





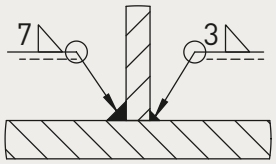
SLIDING RANGES

144mm ISO hole = sliding range of ±10mm
185mm ISO hole = sliding range of ±30mm
224mm ISO hole = sliding range of ±50mm

SPECIFICATIONS

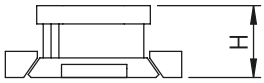
(MSL) Max. securing load: tension 250kN, shear 210kN
(MBL) Min. breaking load: tension 500kN, shear 420kN
Approval possible from any classification society
Standard H = 110mm
Maximum H = 160mm, minimum H = 65mm
A = center distance of ISO holes: 203, 216, 258mm

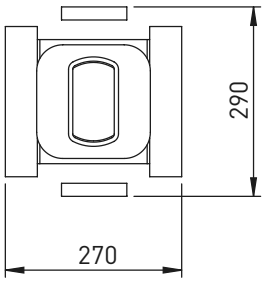
WELDING DETAIL



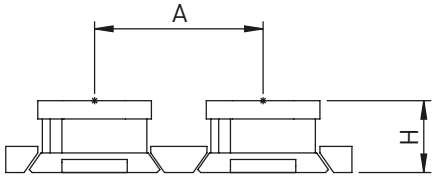
Sliding ISO Foundations - Longitudinal

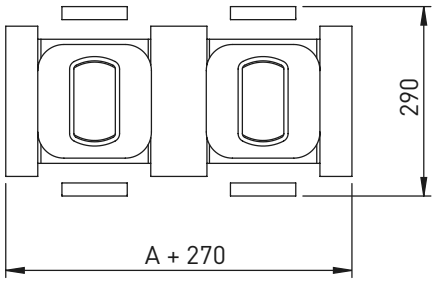
FR-74Q



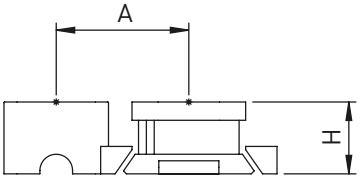


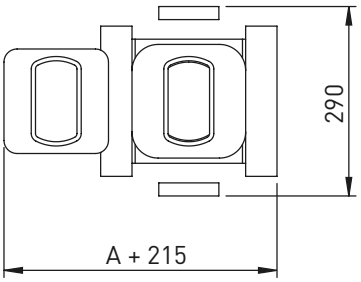
FR-75Q/A





FR-75/A



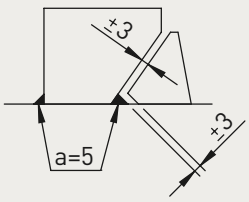


■ **SLIDING RANGES** ±30mm

■ **SPECIFICATIONS**

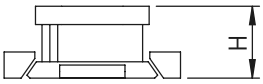
(MSL) Max. securing load: tension 250kN, shear 210kN
(MBL) Min. breaking load: tension 500kN, shear 420kN
Approval possible from any classification society
Standard H = 110mm
Maximum H = 180mm, minimum H = 85mm
A = center distance of ISO holes: 203, 216, 258mm

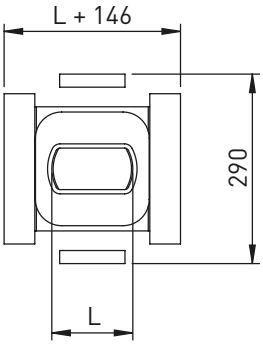
■ **WELDING DETAIL**



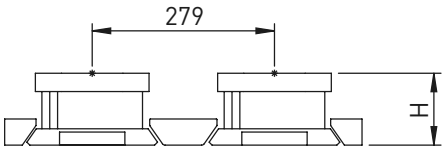
Sliding ISO Foundations - Transversal

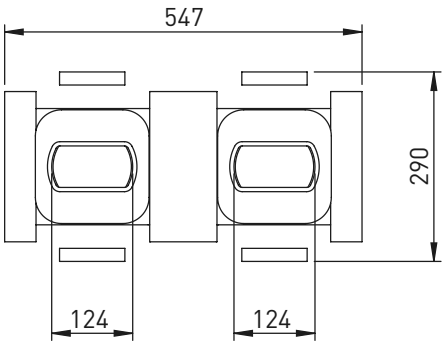
FR-76Q





FR-77Q/279



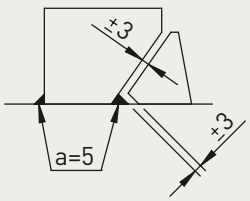


■ **SLIDING RANGES** ±30mm

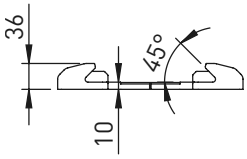
■ **SPECIFICATIONS**

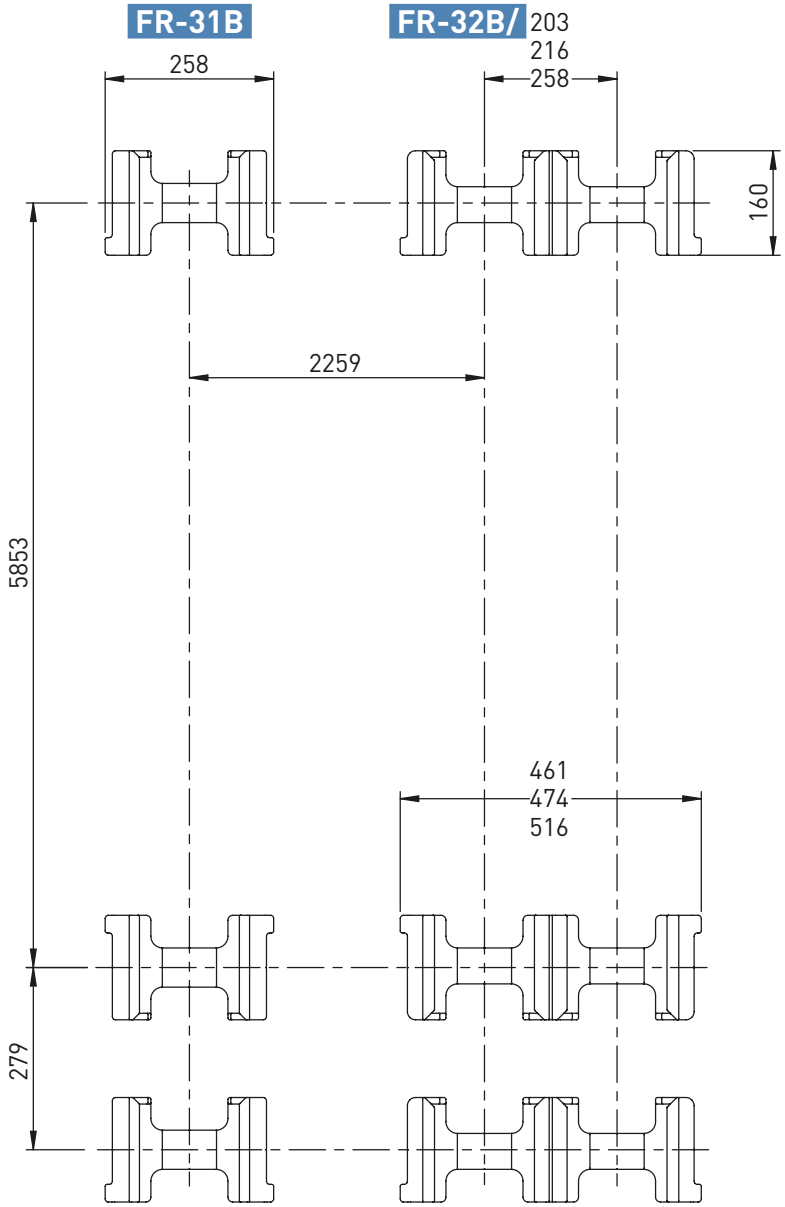
(MSL) Max. securing load: tension 250kN, shear 210kN
(MBL) Min. breaking load: tension 500kN, shear 420kN
Approval possible from any classification society
Standard H = 110mm
Maximum H = 180mm, minimum H = 85mm
L = dimension of ISO hole: 124, 144, 185 & 224mm

■ **WELDING DETAIL**



45° Dovetail Foundations - Standard

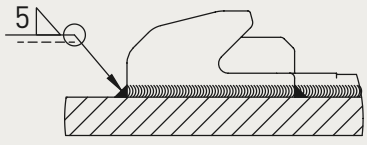




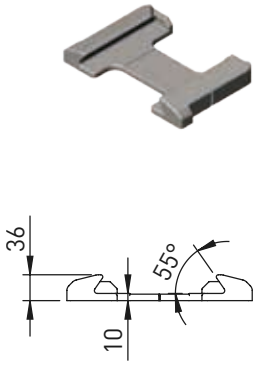
SPECIFICATIONS

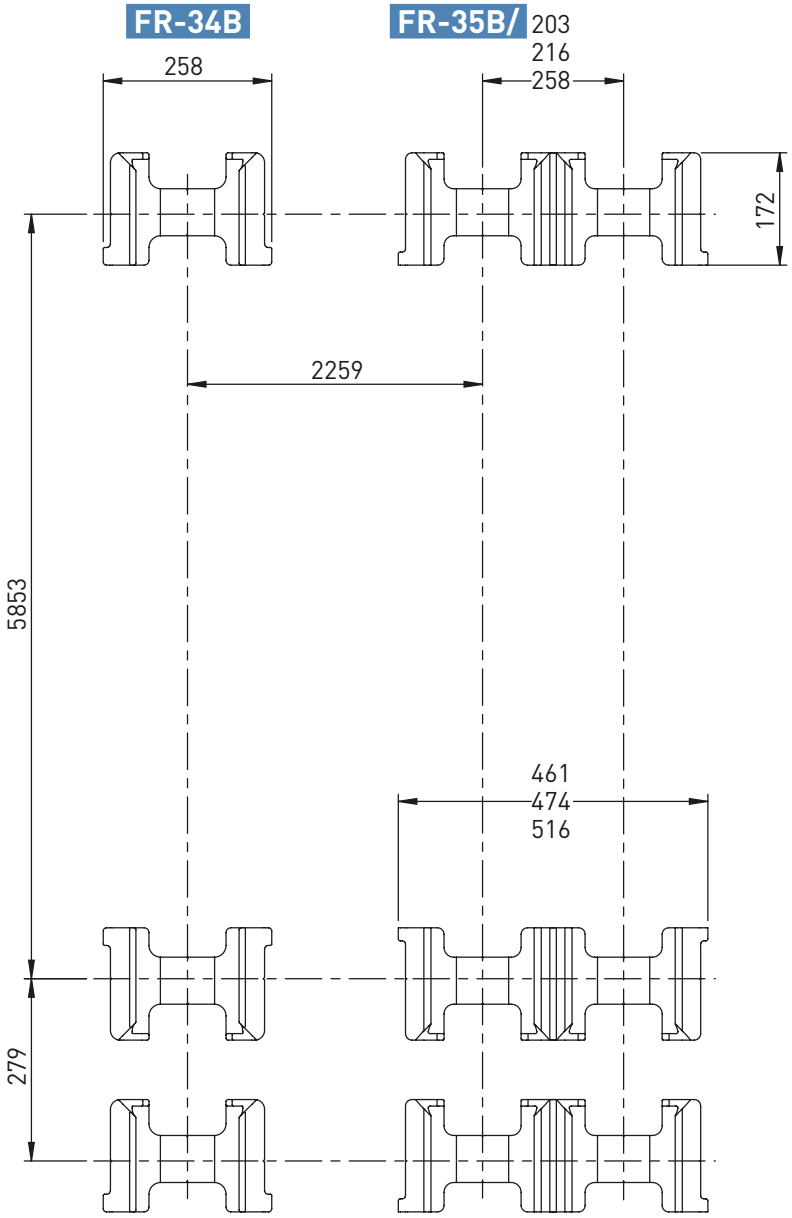
(MSL) Max. securing load: tension 250kN, shear 210kN
(MBL) Min. breaking load: tension 500kN, shear 420kN
Approval possible from any classification society
Guiding angle 45°
To be used in combination with: B-45, B-45L, B-46 & B-46L

WELDING DETAIL



55° Dovetail Foundations - Standard

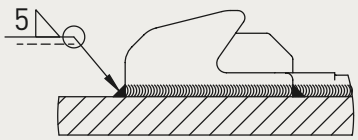




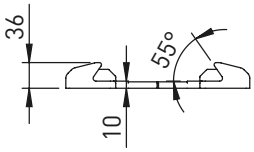
SPECIFICATIONS

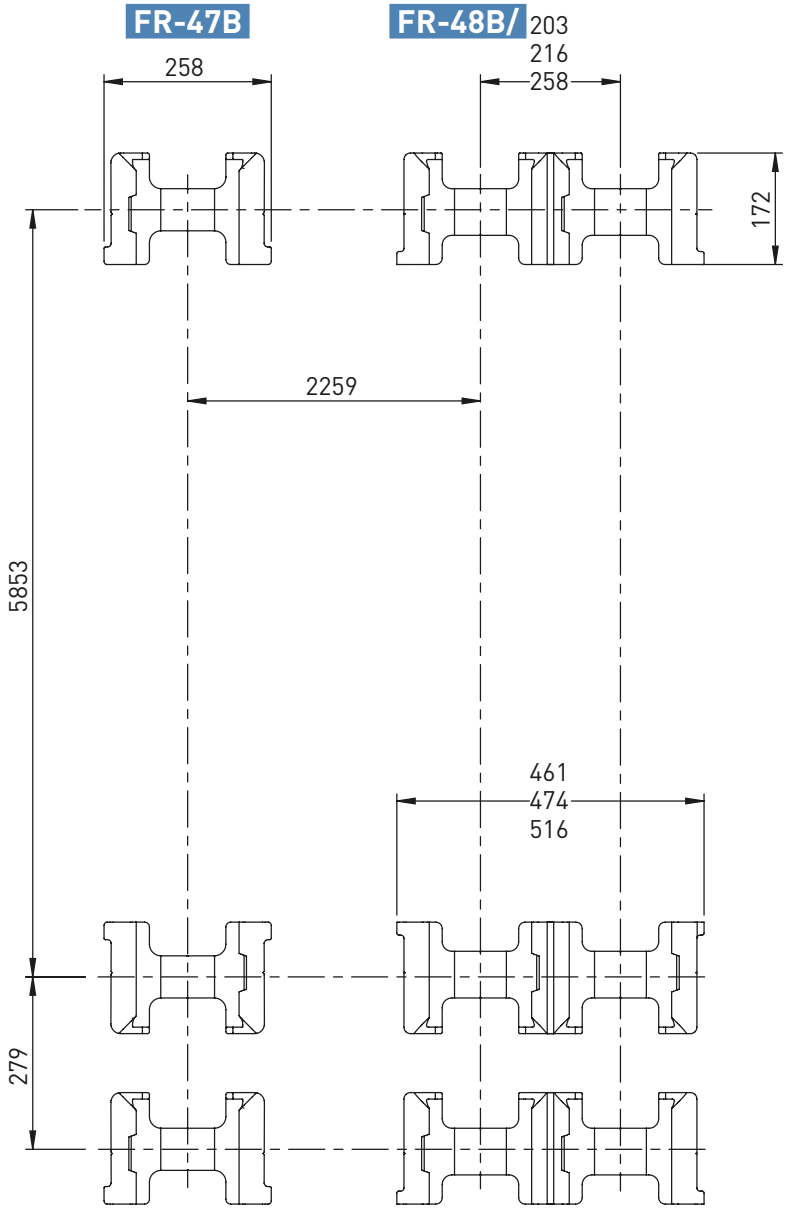
(MSL) Max. securing load: tension 250kN, shear 210kN
(MBL) Min. breaking load: tension 500kN, shear 420kN
Approval possible from any classification society
Guiding angle 55°
To be used in combination with: B-55A, B-56 & B-57

WELDING DETAIL



55° Dovetail Foundations - Standard

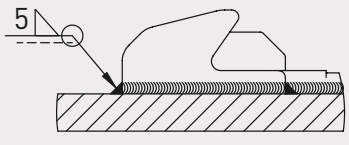




SPECIFICATIONS

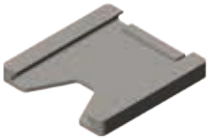
(MSL) Max. securing load: tension 250kN, shear 210kN
(MBL) Min. breaking load: tension 500kN, shear 420kN
Approval possible from any classification society
Guiding angle 55°
To be used in combination with: B-55A, B-56 & B-57

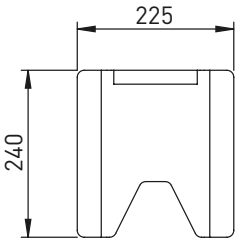
WELDING DETAIL

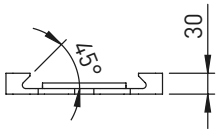


Dovetail Foundations - Elongated

FR-31Q



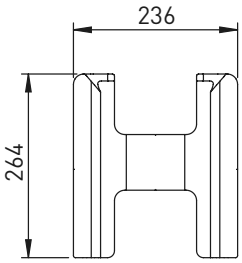


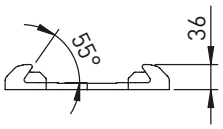


SPECIFICATIONS

(MSL) Max. securing load: tension 150kN, shear 210kN
(MBL) Min. breaking load: tension 300kN, shear 420kN
Approval possible from any classification society
Guiding angle 45°
To be used in combination with: B45 & B-46

FR-34BQ

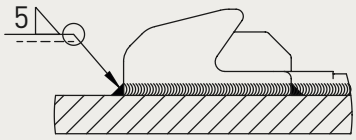




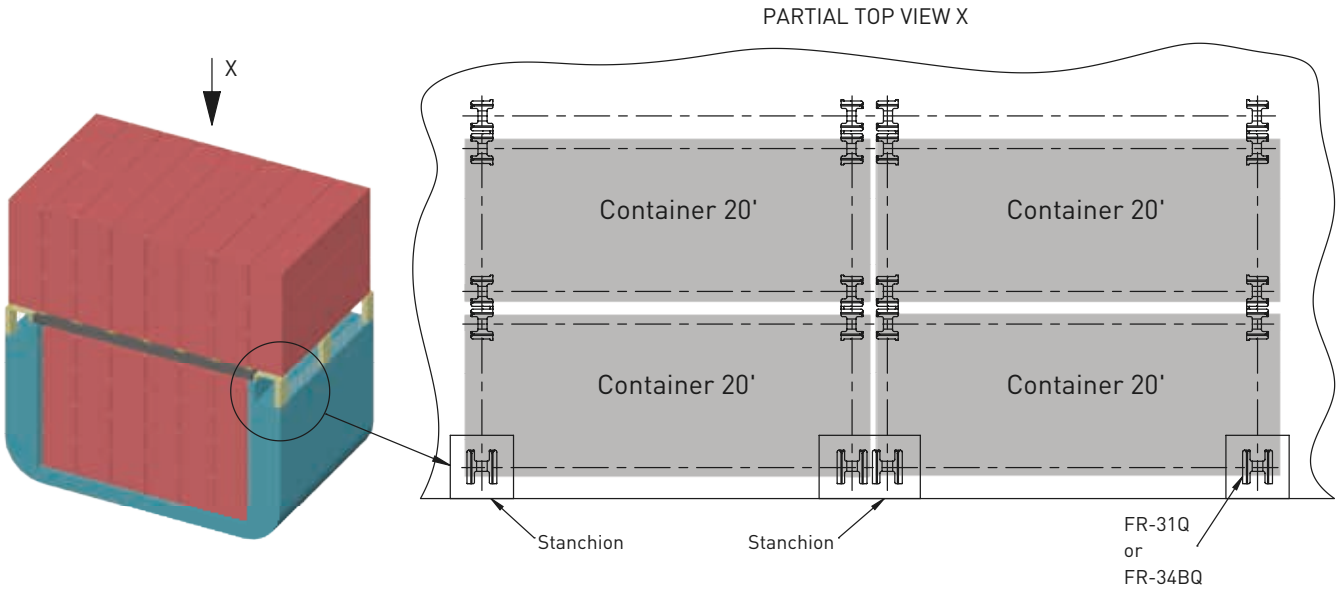
SPECIFICATIONS

(MSL) Max. securing load: tension 250kN, shear 210kN
(MBL) Min. Breaking load: tension 500kN, shear 420kN
Approval possible from any classification society
Guiding angle 55°
To be used in combination with: B-55A, B-56 & B-57

WELDING DETAIL



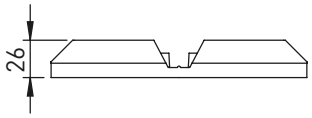
TYPICAL ARRANGEMENT OF ELONGATED DOVETAIL FOUNDATIONS



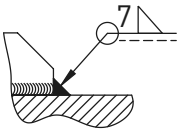
Breech Base Foundations

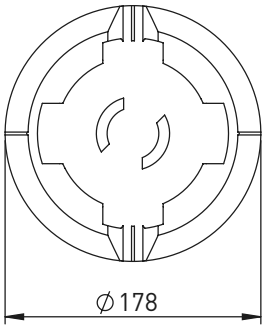
FR-22

Raised breech base



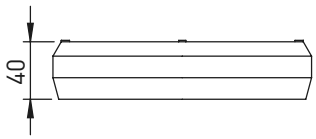
WELDING DETAIL



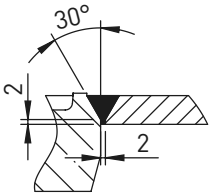


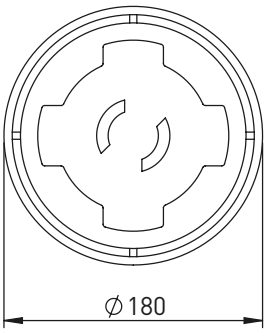
FF-31

Flush breech base



WELDING DETAIL

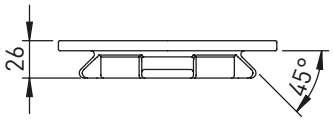


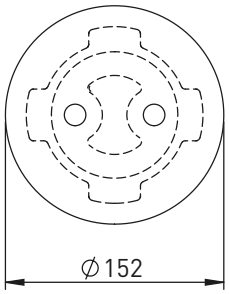


ACCESSORIES

FF-80

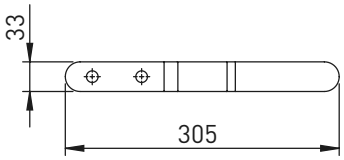
Breech base socket cover

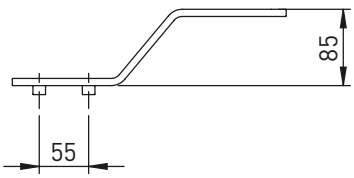




FF-80A

Wrench



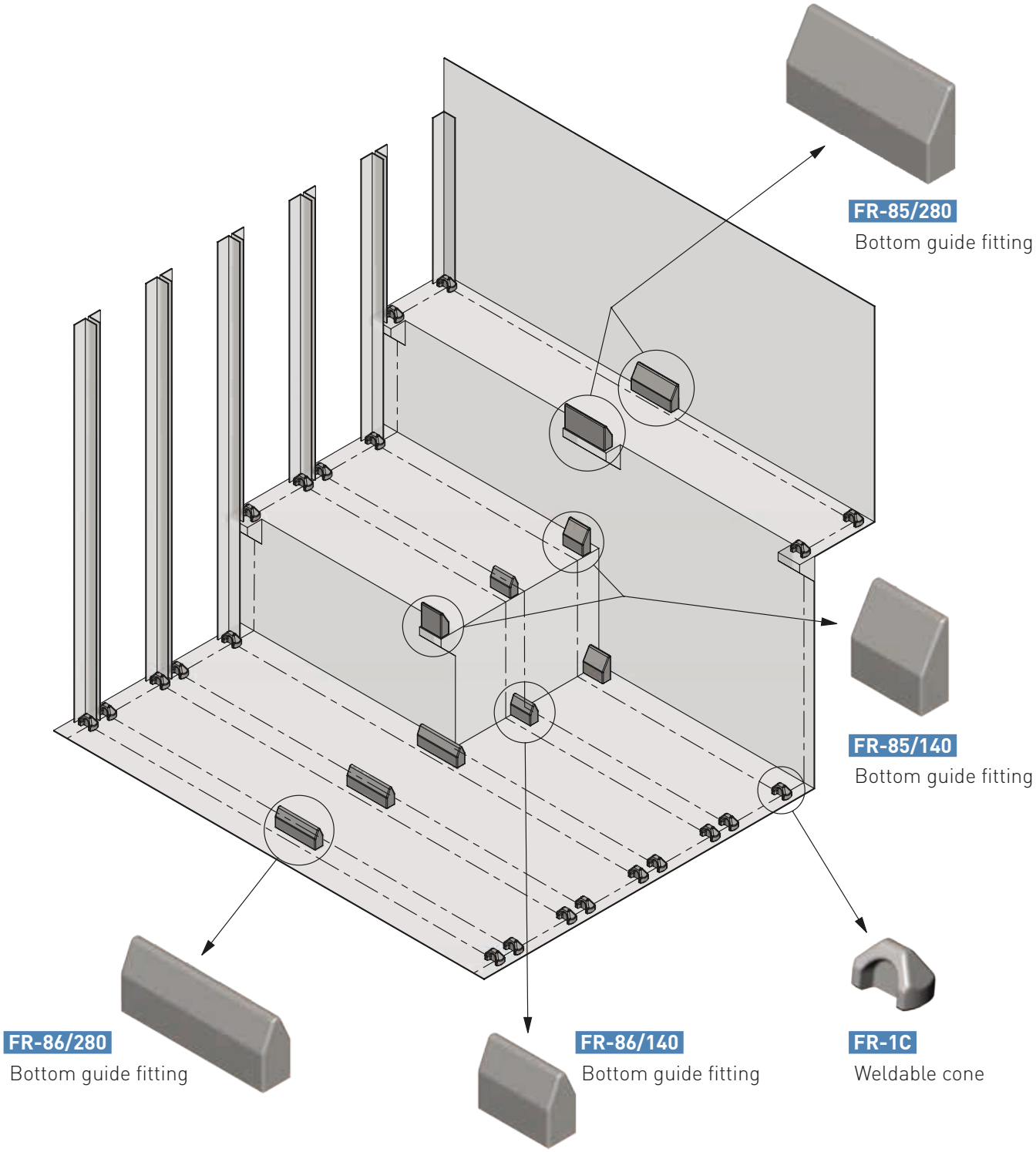


PRACTICE

SPECIFICATIONS

(MSL) Max. securing load: tension 250kN, shear 210kN
(MBL) Min. breaking load: tension 500kN, shear 420kN
To be used in combination with: B-22R, LE-12

Guide Fittings In Combination With Cell Guides



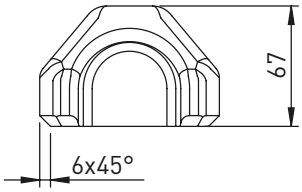
SPECIFICATIONS

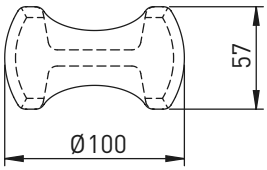
(MSL) Max. securing load: shear 210kN
(MBL) Min. breaking load: shear 420kN
Placed at free end of 20' containers, stowed in 40' cell guides

Welding Cones

FR-1C

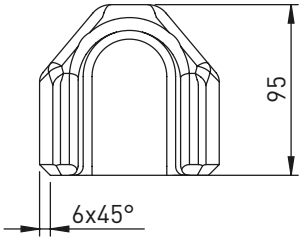
Weldable cone

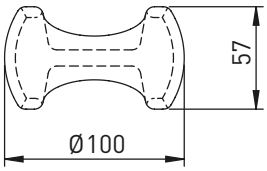




FR-1C/95

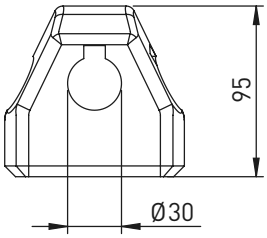
Weldable cone

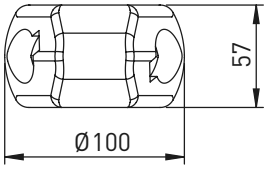




FR-3

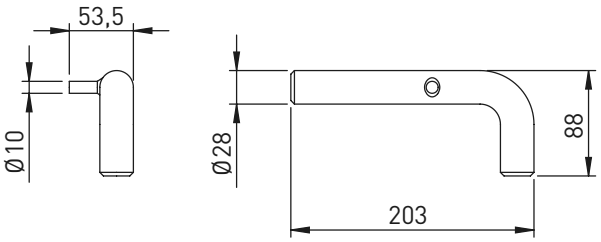
Weldable locking cone



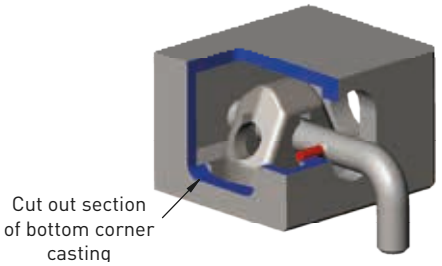


SB-1

Locking pin



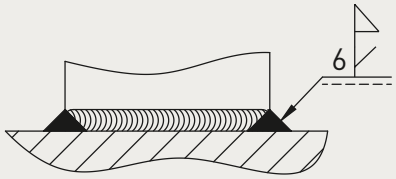
PRACTICE



SPECIFICATIONS

(MSL) Max. securing load: shear 210kN
(MSL) Max. securing load: tension for FR-3 with SB-1, 200kN
(MSL) Min. breaking load: shear 420kN
(MSL) Min. breaking load: tension for FR-3 with SB-1, 400kN

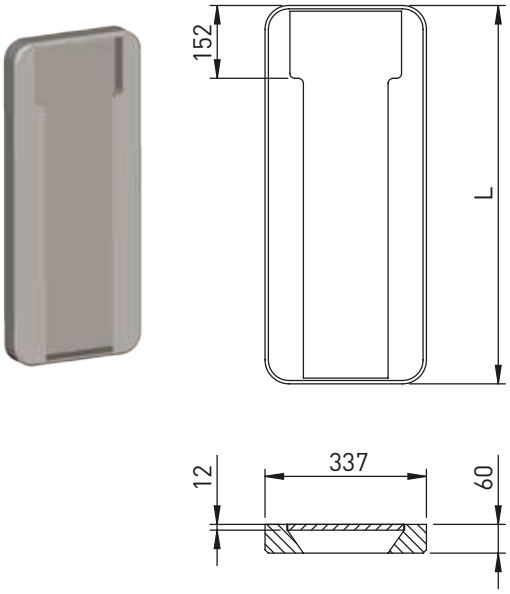
WELDING DETAIL



Counter Bearings

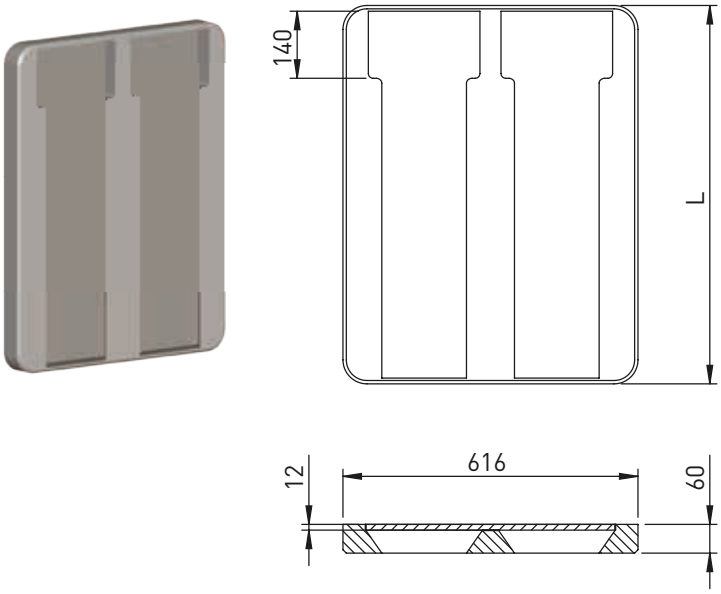
FF-55/L

Single flush counter bearing



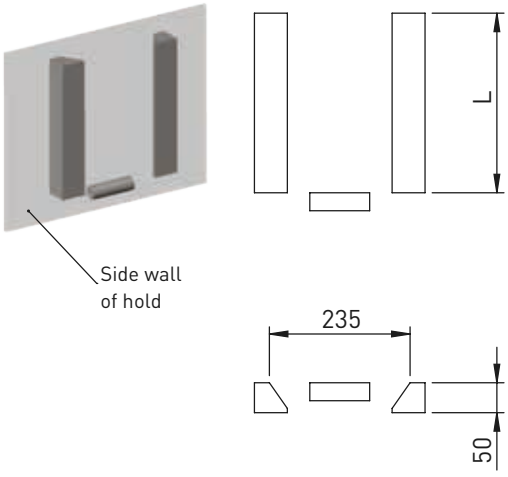
FF-56/L

Double flush counter bearing



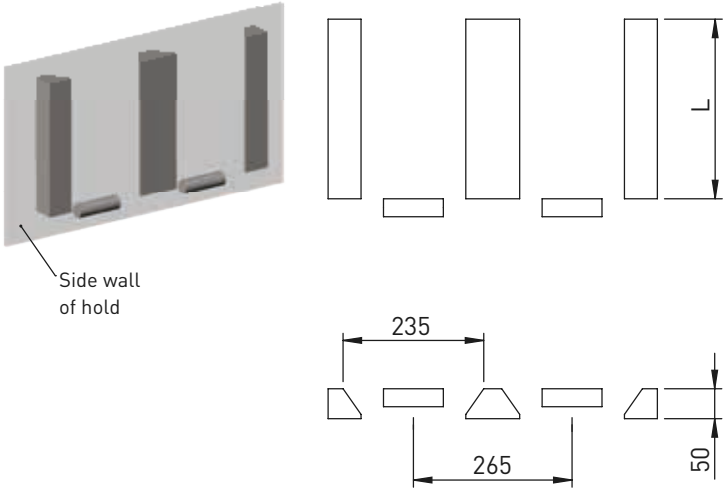
FR-61/L

Single raised counter bearing



FR-62/L

Double raised counter bearing



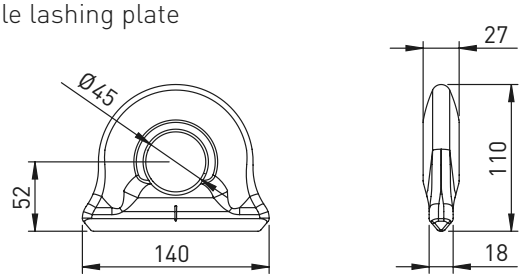
SPECIFICATIONS

(MSL) Max. securing load: tension 425kN
(MBL) Min. breaking load: tension 850kN
Other types on request
To be used in combination with: IT-14/A, TT-14/A

Lashing Plates

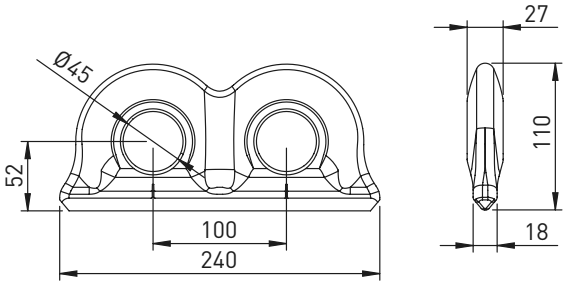
LE-31

Single lashing plate



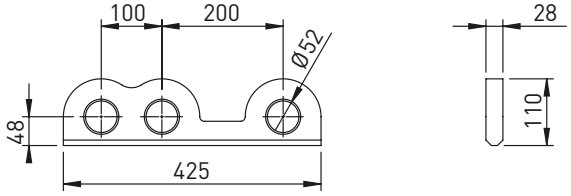
LE-32

Lashing plate with 2 eyes



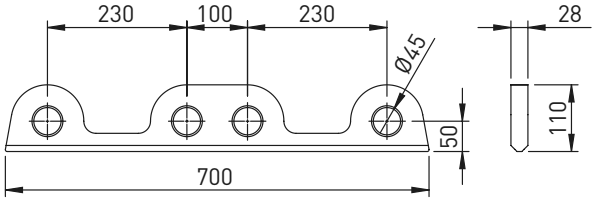
LE-33

Lashing plate with 3 eyes



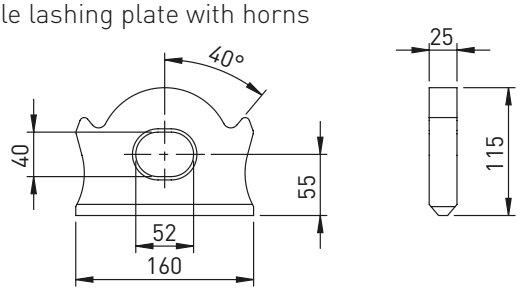
LE-34

Lashing plate with 4 eyes



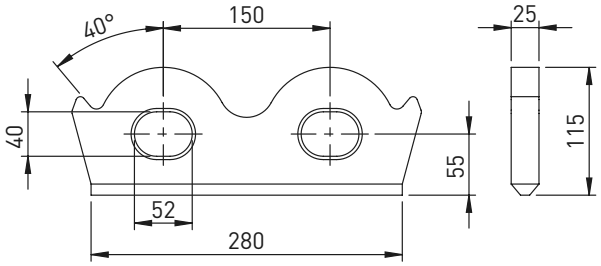
LE-31A

Single lashing plate with horns



LE-32A

Lashing plate with 2 eyes and horns



Because of the oval eye and special horns on both sides of the lashing plate the turnbuckle can either be:

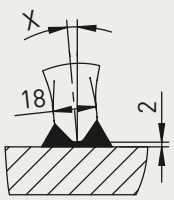
- placed diagonally, or

- laid down horizontally

SPECIFICATIONS

(MSL) Max. Securing load: tension 250kN
(MBL) Min. Breaking load: tension 500kN
Other types on request

WELDING DETAIL



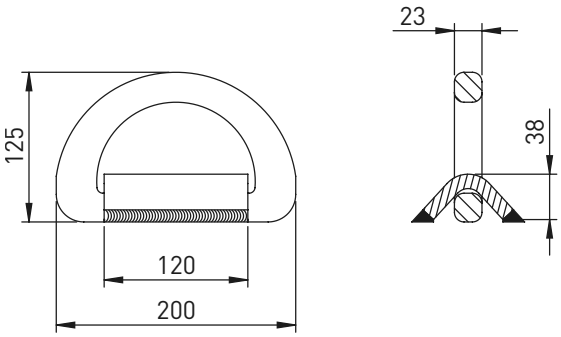
Angle X as per alignment of lashing rod

Cargo Lashing Eyes

LE-1/36

D-ring with strap

D-ring: LE-1X/36
Strap: LE-1Y/36

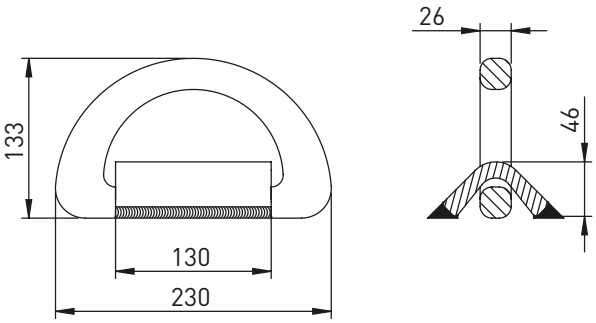


SPECIFICATIONS
(MSL) Max. securing load: tension 180kN
(MBL) Min. breaking load: tension 360kN

LE-1/50

D-ring with strap

D-ring: LE-1X/50
Strap: LE-1Y/50

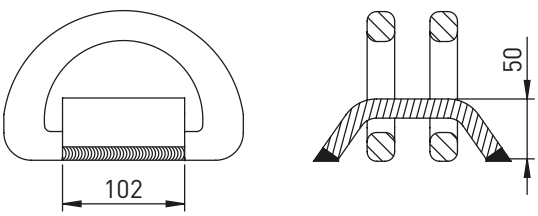


SPECIFICATIONS
(MSL) Max. securing load: tension 245kN
(MBL) Min. breaking load: tension 490kN

LE-2/36

Double D-ring with strap

D-ring: LE-1X/36 (x2)
Strap: LE-2Y/36

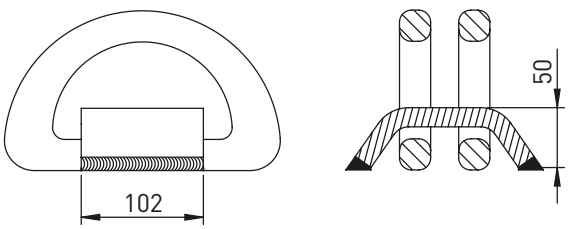


SPECIFICATIONS
(MSL) Max. securing load per ring: tension 180kN
(MBL) Min. breaking load per ring: tension 360kN

LE-2/50

Double D-ring with strap

D-ring: LE-1X/50 (x2)
Strap: LE-2Y/50



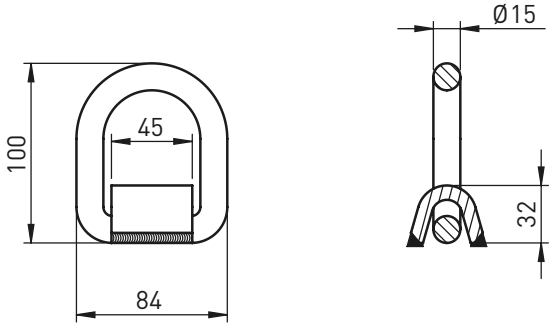
SPECIFICATIONS
(MSL) Max. securing load per ring: tension 245kN
(MBL) Min. breaking load per ring: tension 490kN

Cargo Lashing Eyes

LE-1/15

D-ring with strap

D-ring: LE-1X/15
Strap: LE-1Y/15

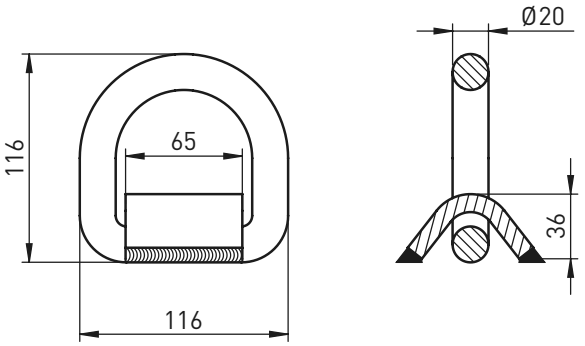


SPECIFICATIONS
(MSL) Max. securing load: 75kN
(MBL) Min. breaking load: 150kN

LE-1/20

D-ring with strap

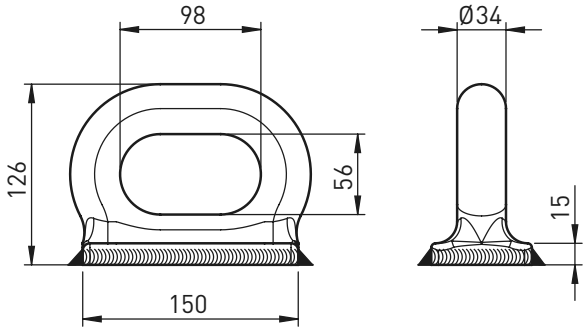
D-ring: LE-1X/20
Strap: LE-1Y/20



SPECIFICATIONS
(MSL) Max. securing load: 100kN
(MBL) Min. breaking load: 200kN

LE-7

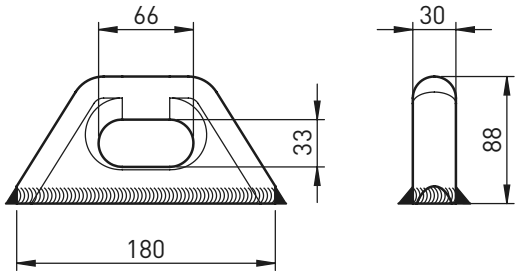
Pad eye



SPECIFICATIONS
(MSL) Max. securing load: tension 98kN (lashing applications)
(MBL) Min. breaking load: tension 196kN
Safe working load: 49kN (lifting applications)

LE-7C/3

Oval eye plate

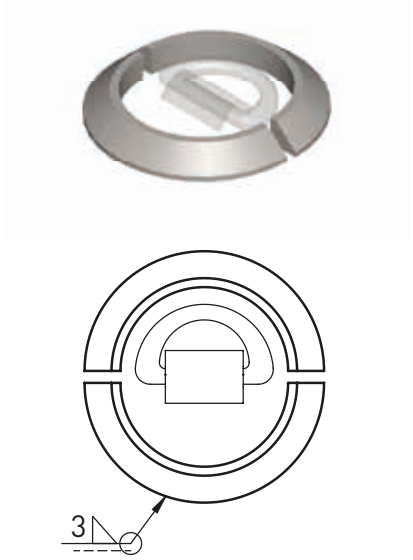


SPECIFICATIONS
(MSL) Max. securing load: 30kN
(MBL) Min. breaking load: 60kN

Cargo Lashing Points

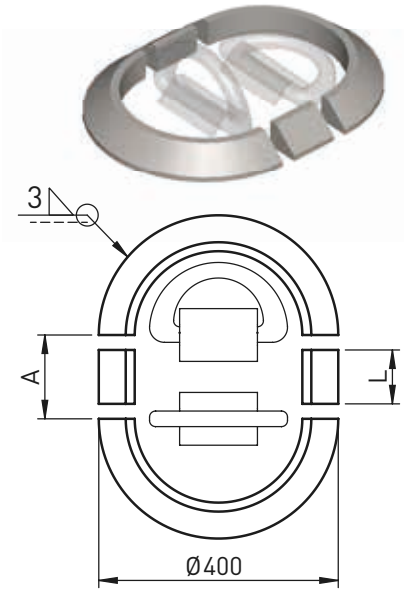
LE-1Z/50

Protection ring for single D-ring



LE-2Z/50

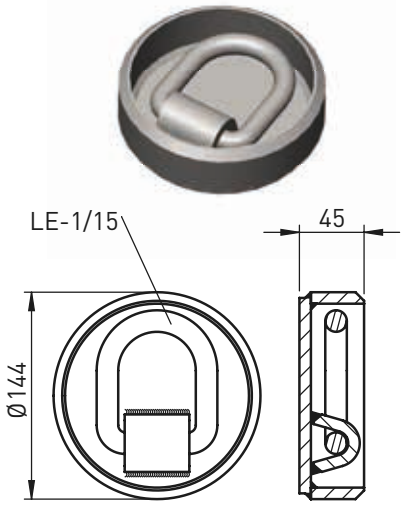
Protection ring for double D-ring



L = 0, in case of 1 D-ring
L = A -20mm, in case of 2 D-rings

LE-8C

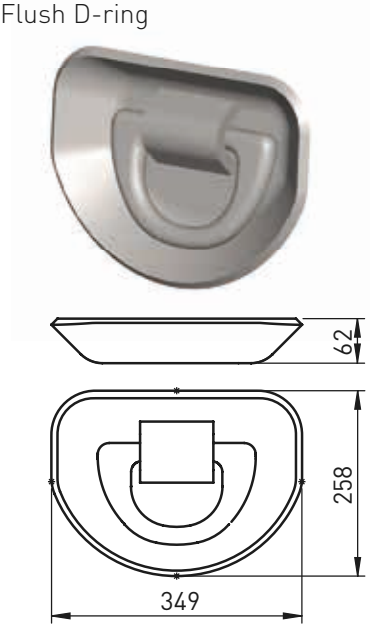
Flush D-ring



SPECIFICATIONS
(MSL) Max. securing load: tension 75kN
(MBL) Min. breaking load: tension 150kN

LE-8B

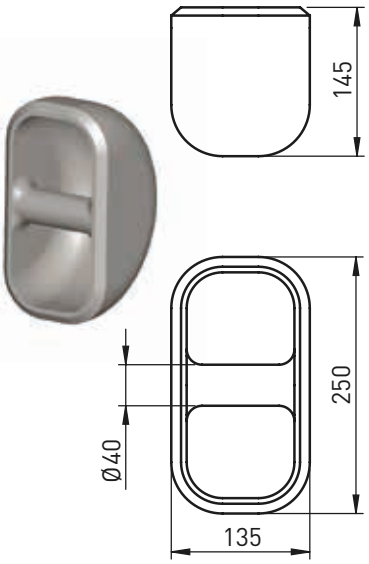
Flush D-ring



SPECIFICATIONS
(MSL) Max. securing load: tension 245kN
(MBL) Min. breaking load: tension 490kN

FF-3

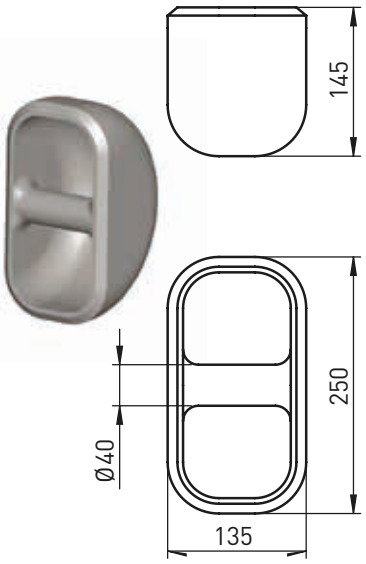
Flush lashing pot



SPECIFICATIONS
(MSL) Max. securing load: tension 177kN
(MBL) Min. breaking load: tension 354kN

FF-3/50

Flush lashing pot



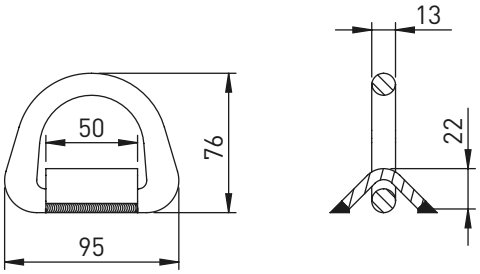
SPECIFICATIONS
(MSL) Max. securing load: tension 245kN
(MBL) Min. breaking load: tension 490kN

Car Lashing Eyes

LE-10

D-ring with strap

D-ring: LE-10X
Strap: LE-10Y

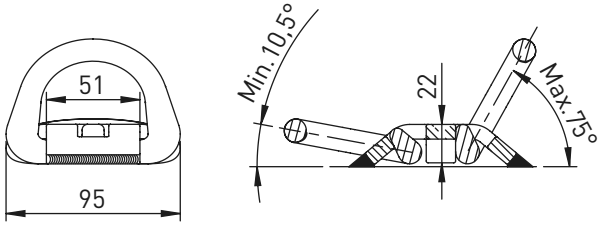


SPECIFICATIONS
(MSL) Max. securing load: 38kN
(MBL) Min. breaking load: 76kN

LE-11

D-ring with strap

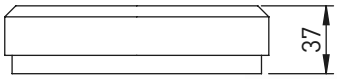
D-ring: LE-11X
Strap: LE-11Y



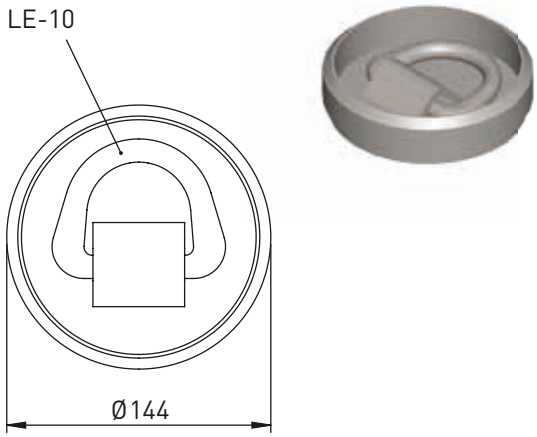
SPECIFICATIONS
(MSL) Max. securing load per ring: 38kN
(MBL) Min. breaking load per ring: 76kN

LE-8F

Flush D-ring



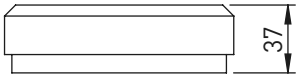
LE-10



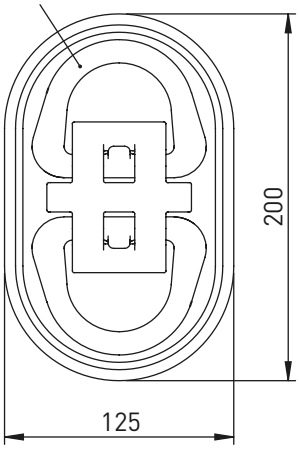
SPECIFICATIONS
(MSL) Max. securing load: 38kN
(MBL) Min. breaking load: 76kN

LE-9E

Flush double D-ring



LE-11

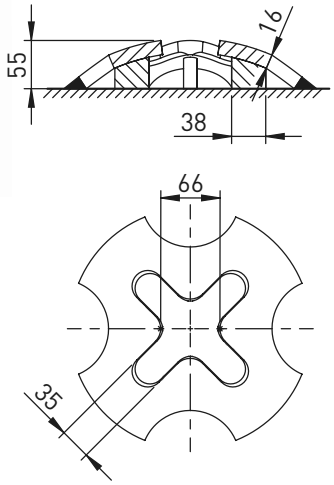


SPECIFICATIONS
(MSL) Max. securing load per ring: 38kN
(MBL) Min. breaking load per ring: 76kN

Elephant Foot Lashing Points

FR-6B

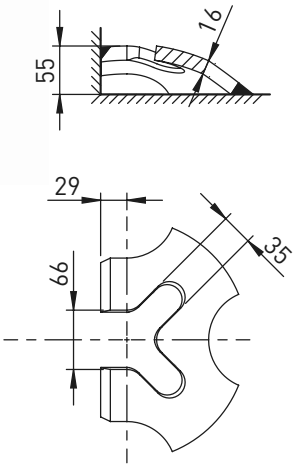
Convex lashing point



SPECIFICATIONS
(MSL) Max. securing load: 2x100kN
(MBL) Min. breaking load: 2x200kN

FR-6A

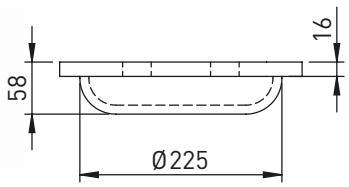
Convex lashing point



SPECIFICATIONS
(MSL) Max. securing load: 2x100kN
(MBL) Min. breaking load: 2x200kN

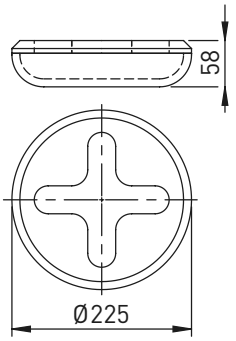
FF-8

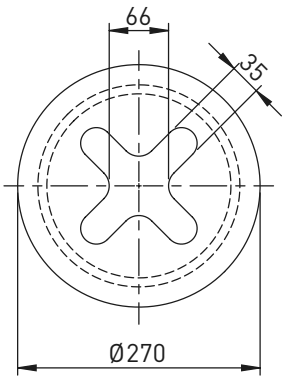
Elephant foot lashing point with collar



FF-8A

Elephant foot lashing point without collar

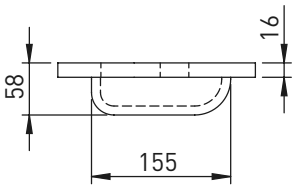




SPECIFICATIONS
(MSL) Max. securing load: 2x100kN
(MBL) Min. breaking load: 2x200kN

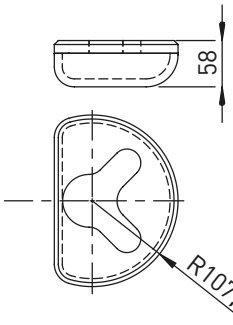
FF-9

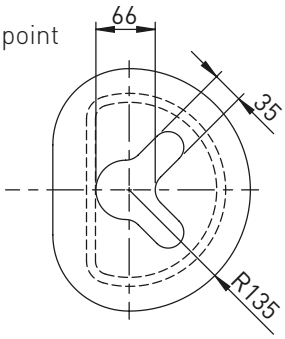
Elephant foot lashing point with collar



FF-9A

Elephant foot lashing point without collar



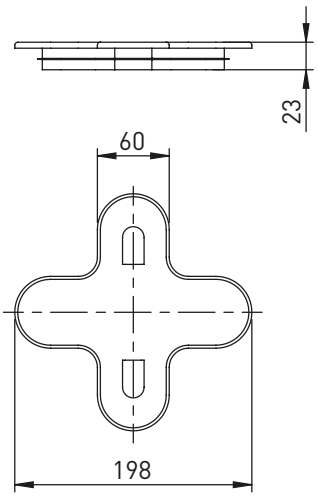


SPECIFICATIONS
(MSL) Max. securing load: 2x100kN
(MBL) Min. breaking load: 2x200kN

Vehicle Lashing Points

FF-94

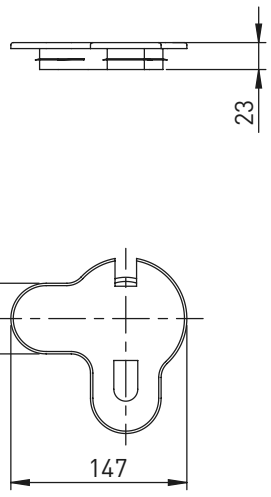
Plug



SPECIFICATIONS
Fits in FF-8 and FF-8A
Material: plastic

FF-92

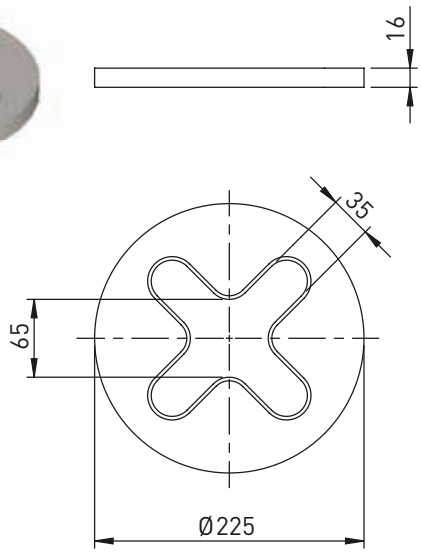
Plug



SPECIFICATIONS
Fits in FF-9 and FF-9A
Material: plastic

FF-8A/T

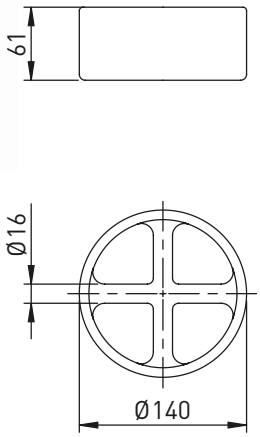
Top plate for elephant foot fitting



SPECIFICATIONS
(MSL) Max. securing load: 2x100kN
(MBL) Min. breaking load: 2x200kN
Edge preperation see page 8

FF-4

Crossbar lashing pot

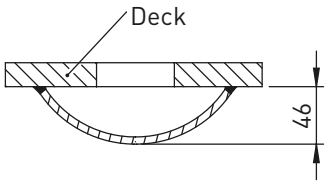


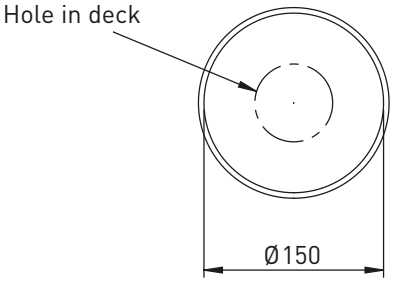
SPECIFICATIONS
(MSL) Max. securing load: 2x40kN
(MBL) Min. breaking load: 2x80kN

Car Lashing Points

FF-2/150

Cup for lashing hole



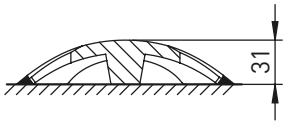


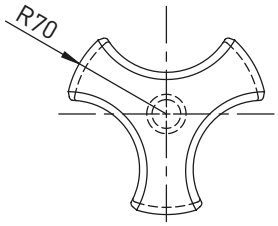
■ **SPECIFICATIONS**

Prevents water ingress to lower decks

FR-7B

Car lashing point



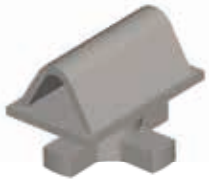


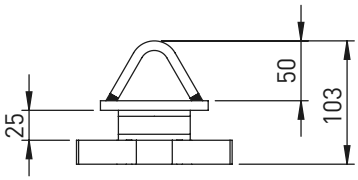
■ **SPECIFICATIONS**

(MSL) Max. securing load: 50kN
(MBL) Min. breaking load: 100kN

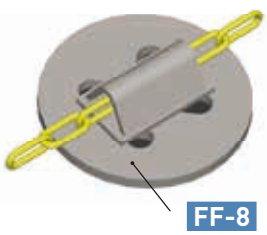
LE-46

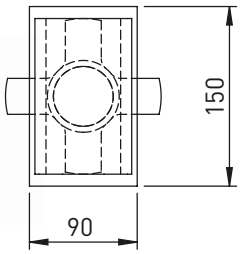
Chain strap





■ **PRACTICE**



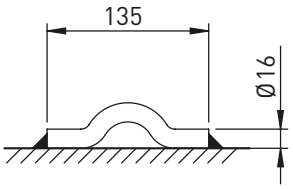


■ **SPECIFICATIONS**

(MSL) Max. securing load: shear 60kN
(MBL) Min. breaking load: shear 120kN

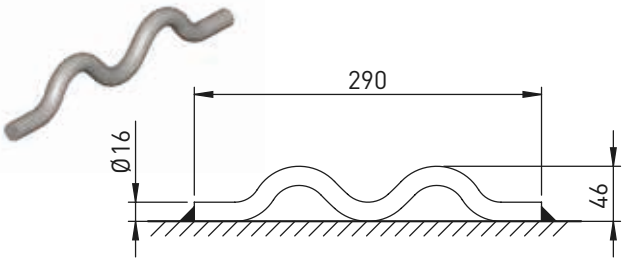
LE-14/1

Crinckle bar



LE-14/2

Double crinckle bar

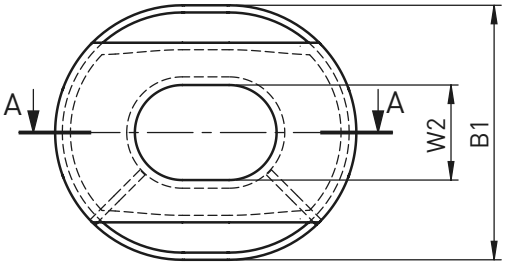


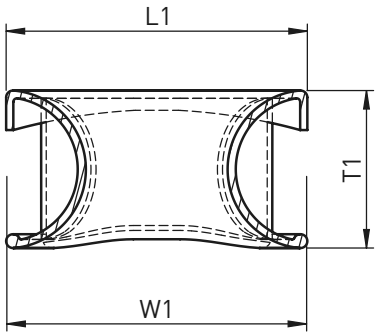
■ **SPECIFICATIONS**

(MSL) Max. securing load: 30kN
(MBL) Min. breaking load: 60kN

Panama Chocks

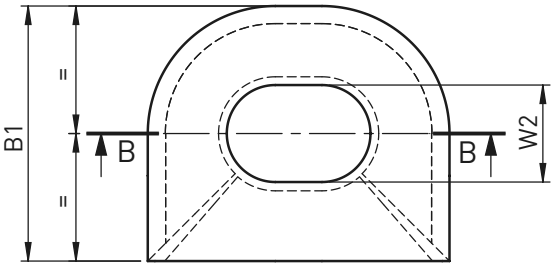
MC-A-..

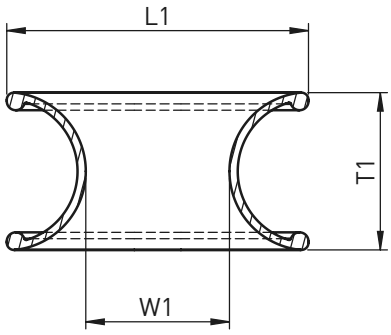




SECTION A-A

MC-C-..





SECTION B-B

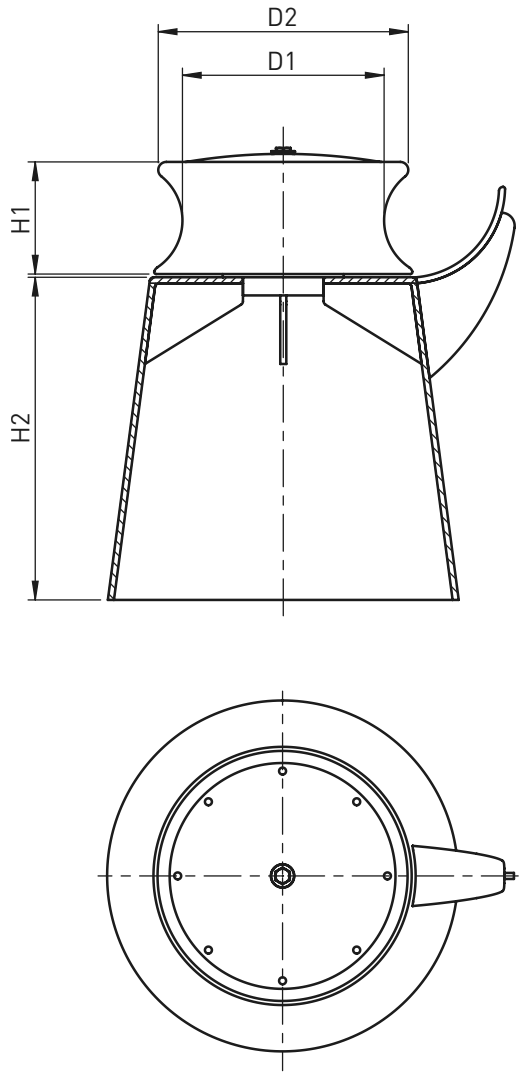
TYPE	NOM. TOWING PULL (kN)	DIMENSIONS (mm)					WEIGHT (kg)	
		B1	T1	L1	W1	W2	MC-A-..	MC-C-..
MC-..-3	30	390	250	450	200	140	42	48
MC-..-5	50	480	300	550	250	180	74	85
MC-..-8	80	585	360	680	320	225	120	136
MC-..-12	120	710	440	840	400	270	185	211
MC-..-20	200	840	520	1020	500	320	285	326
MC-..-32	320	1100	700	1300	600	400	795	840

■ **SPECIFICATION**
In accordance with DIN 81915

■ Various types available on request

Warping Roller

MC-01



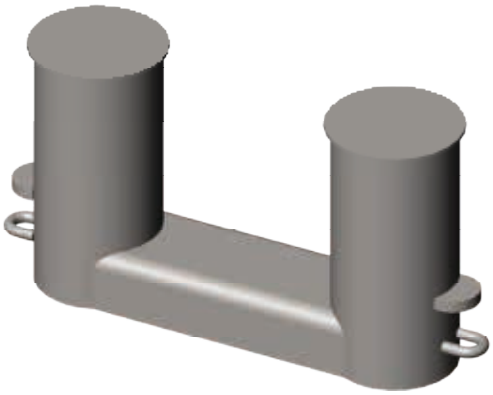
TYPE	NOM. TOWING PULL (kN)	BREAKING LOAD OF ROPE (kN)	ROPE Ø (mm)	DIMENSIONS (mm)			
				D1	D2	H1	H2
MC-01/1	10	90	12	160	195	80	200-800
MC-01/2	20	150	16	200	245	102	200-800
MC-01/3	30	220	20	250	300	126	200-800
MC-01/5	50	350	24	320	390	160	200-800
MC-01/8	80	500	32	400	490	208	200-800
MC-01/12	120	800	40	450	560	256	200-800
MC-01/20	200	1150	48	500	620	278	200-600
MC-01/32	320	1750	48	560	740	348	200-600

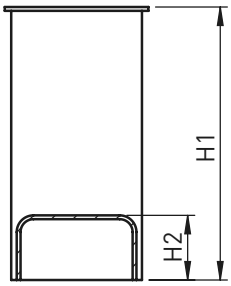
■ **SPECIFICATIONS**
In accordance with DIN 81907
Treatment: 1x shop primer

■ Various types available on request

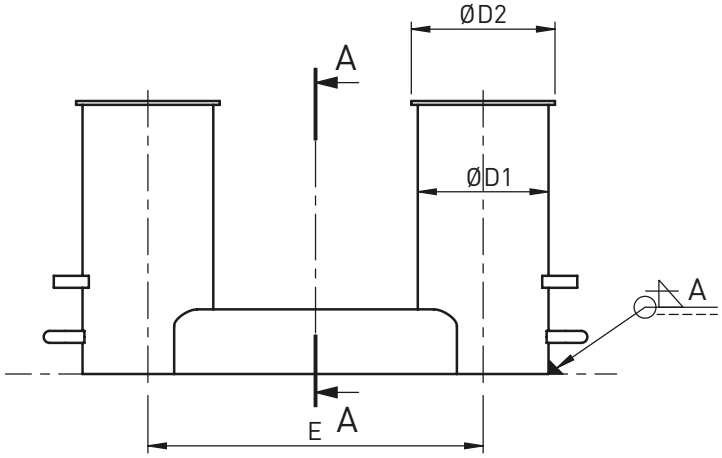
Double Bollard

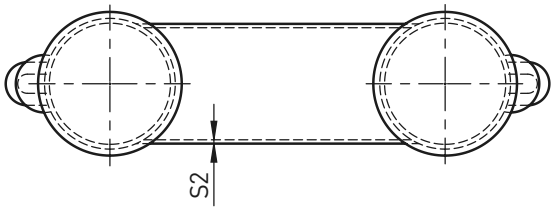
MC-02





SECTION A-A





TYPE	NOM. TOWING PULL (kN)	WEIGHT (kg)	TUBE (D1) (mm)	DIMENSIONS (mm)						
				B	D2	E	H1	H2	S2	A
MC-02/1	10	15	139,7 x 5	130	160	350	305	105	5	4
MC-02/2	20	35	193,7 x 6,3	180	215	500	395	115	6	4
MC-02/3	30	85	273 x 10	250	300	650	505	135	8	5
MC-02/5	50	140	323,9 x 10	300	355	800	600	150	8	6
MC-02/8	80	235	355,6 x 14,2	330	390	950	685	175	10	8
MC-02/12	120	435	457 x 16	420	490	1100	770	195	16	12
MC-02/20	200	590	508 x 17,5	470	545	1250	870	230	16	12
MC-02/32	320	740	559 x 20	530	600	1400	880	270	16	12

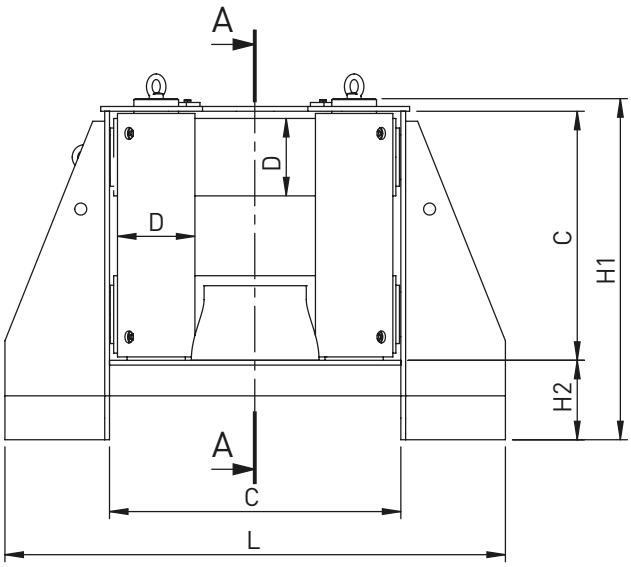
■ **SPECIFICATIONS**
In accordance with DIN 82607
Treatment: 1x shop primer

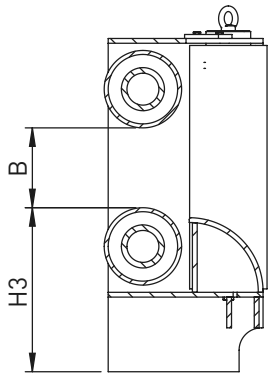
■ Various types available on request

Roller Fairleads

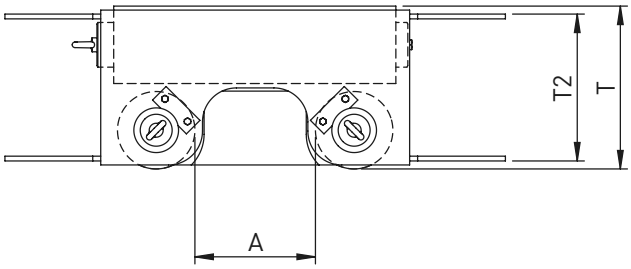
MC-07/D

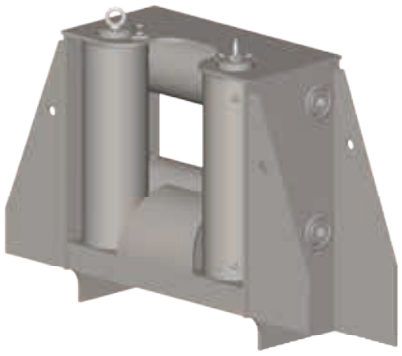
Deck type





SECTION A-A





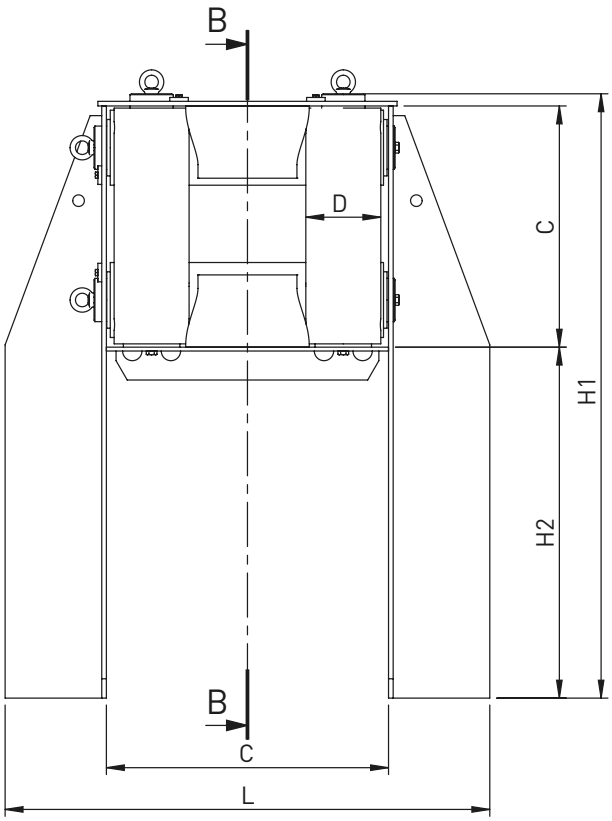
TYPE	NOM. TOWING PULL (kN)	DIMENSIONS (mm)										WEIGHT (kg)
		L	T	H1	A	B	C	D	T2	H2	H3	
MC-07/D/1	10	460	130	348	120	80	260	60	120	70	160	30
MC-07/D/2	20	640	174	464	180	100	364	82	160	80	212	68
MC-07/D/3	30	800	219	579	220	120	454	102	180	100	267	140
MC-07/D/5	50	900	264	676	250	140	524	127	240	120	312	251
MC-07/D/8	80	1000	290	757	280	150	580	140	260	140	355	382
MC-07/D/12	120	1200	368	876	300	160	680	178	320	150	410	657
MC-07/D/16	160	1300	400	948	320	169	732	194	350	170	452	827
MC-07/D/20	200	1350	500	1082	340	180	856	244	450	180	518	1193
MC-07/D/32	320	1700	608	1355	400	250	1026	298	550	220	608	2200

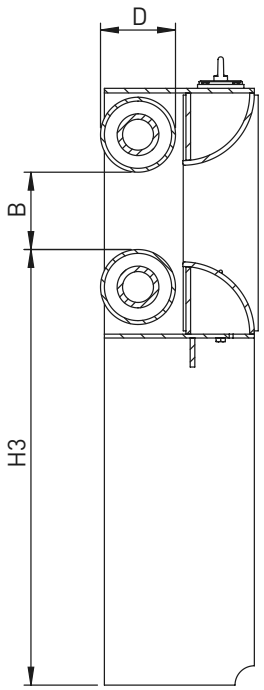
SPECIFICATIONS
In accordance with DIN 81902
Treatment: 1x shop primer

Various types available on request

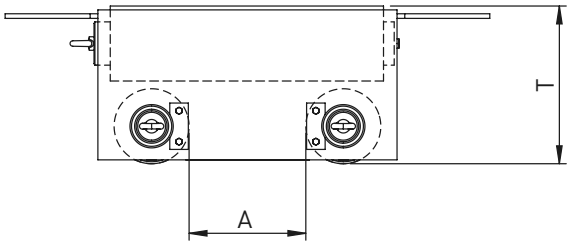
Roller Fairleads

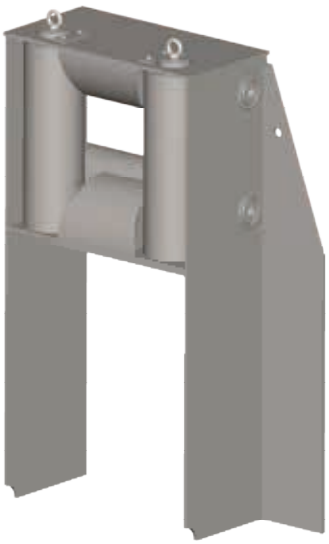
MC-07/B
Bulwark type





SECTION B-B





TYPE	NOM. TOWING PULL (kN)	DIMENSIONS (mm)					
		L	T	A	B	C	D
MC-07/B/1	10	460	130	120	80	260	60
MC-07/B/2	20	640	174	180	100	364	82
MC-07/B/3	30	800	219	220	120	454	102
MC-07/B/5	50	900	264	250	140	524	127
MC-07/B/8	80	1000	290	280	150	580	140
MC-07/B/12	120	1200	368	300	160	680	178
MC-07/B/16	160	1300	400	320	169	732	194
MC-07/B/20	200	1350	500	340	180	856	244
MC-07/B/32	320	1700	608	400	250	1026	298

SPECIFICATIONS
In accordance with DIN 81902
Treatment: 1x shop primer
Dimensions H1, H2 & H3 to be specified

Various types available on request

TO PRACTICE

Notes

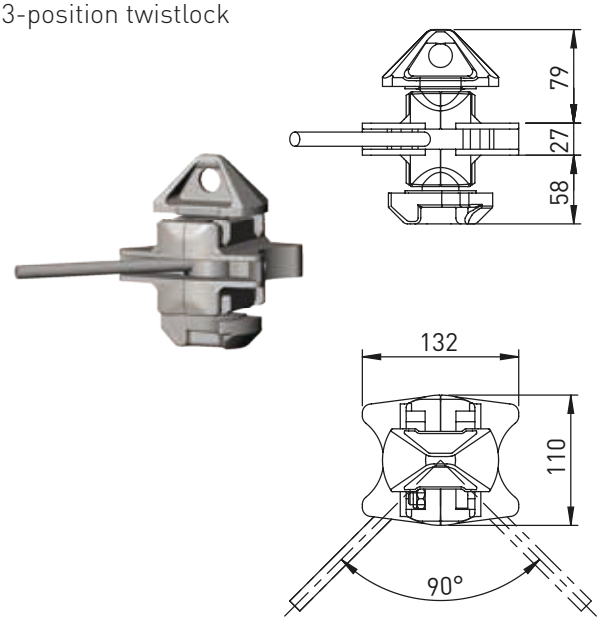
LC 5000 daN
100% POLYESTER
NOT FOR LIFTING
RR-311/10/75
5000Kg
10000Kg
www.contech.be
+32(0)3 546.41.00
M.D.10/16
NOT FOR LIFTING
RR-321/15/75
5000Kg
10000Kg
M.D.05/13

B

LOOSE LASHING EQUIPMENT

Manual Twistlocks

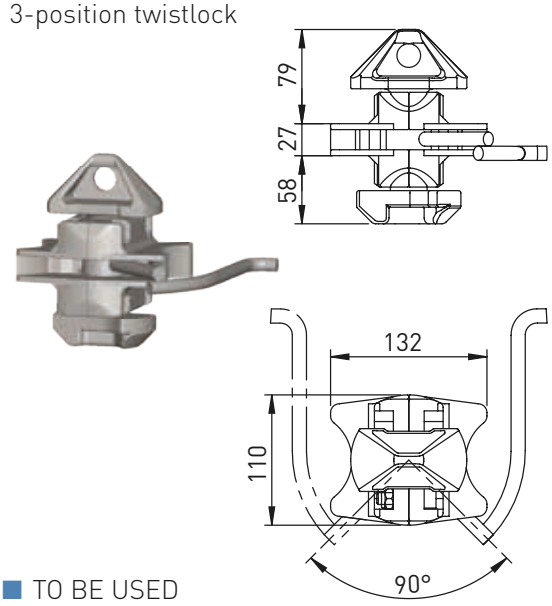
T-1
3-position twistlock



T-1L left locking

T-1R right locking

T-1/UP
3-position twistlock

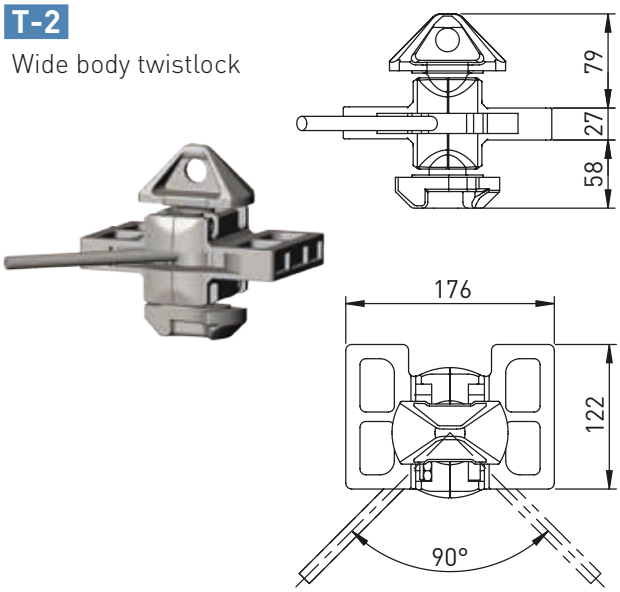


■ TO BE USED IN CELL GUIDES

T-1L/UP left locking

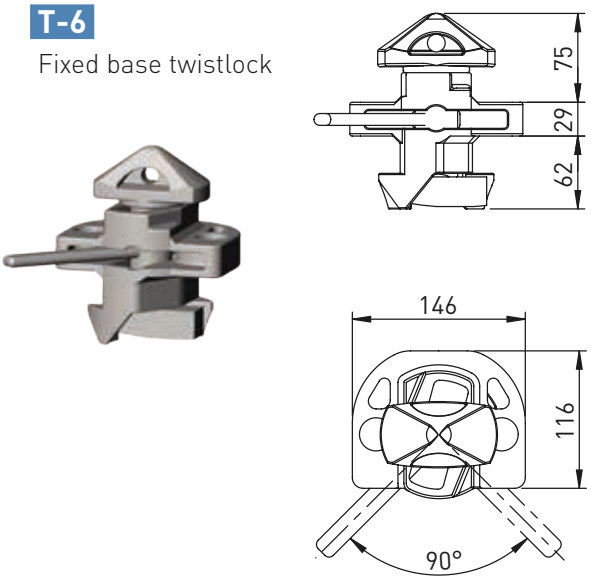
T-1R/UP right locking

T-2
Wide body twistlock



T-2L left locking

T-6
Fixed base twistlock



T-6L left locking

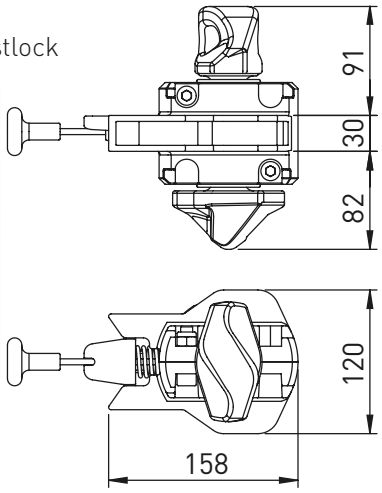
T-6R right locking

■ **SPECIFICATIONS**

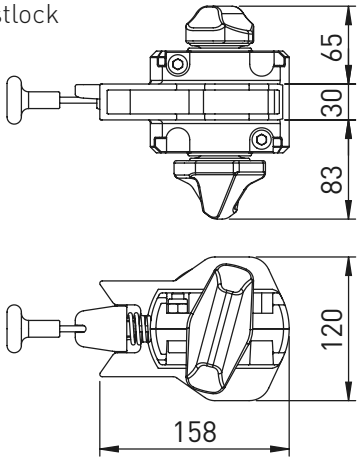
(MSL) Max. securing load: tension 250kN, shear 210kN
(MBL) Min. breaking load: tension 5000kN, shear 420kN
To be used in ISO-holes

Semi-Automatic Twistlocks

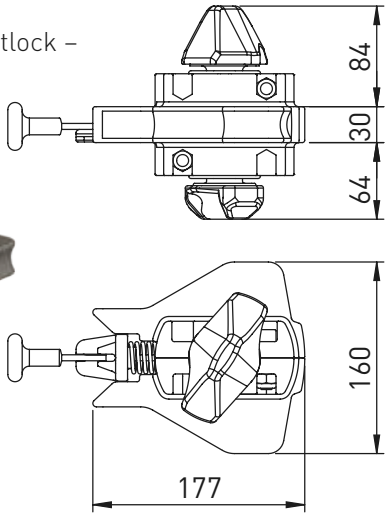
T-5
Semi-automatic twistlock



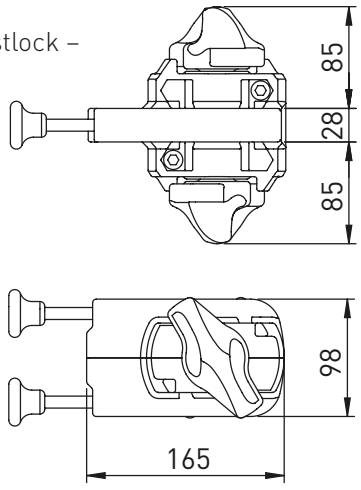
T-5B
Semi-automatic twistlock



T-5/SB
Semi-automatic twistlock – wide body



T-7
Semi-automatic twistlock – double wire

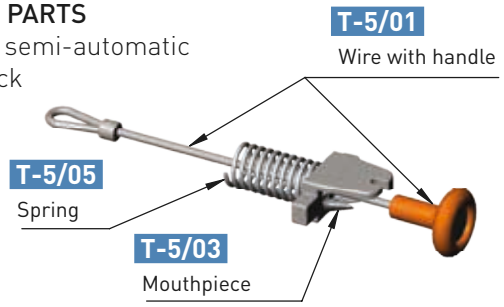


SPECIFICATIONS

(MSL) Max. securing load: tension 250kN, shear 210kN
(MBL) Min. breaking load: tension 500kN, shear 420kN
To be used in ISO-holes

SPARE PARTS

for T-5 semi-automatic twistlock



PT nut M10

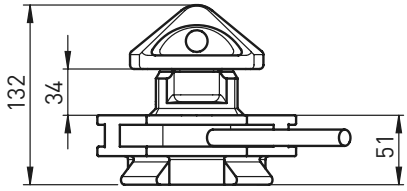
Bolt DIN 912 M10x45

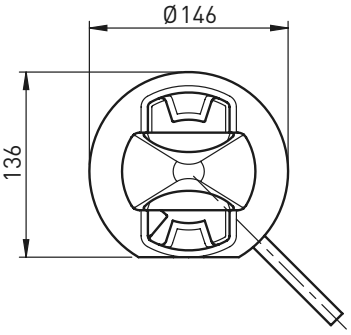
S-99A
Emergency tool

Bottom Twistlocks - Standard

B-22

Breech base bottom twistlock





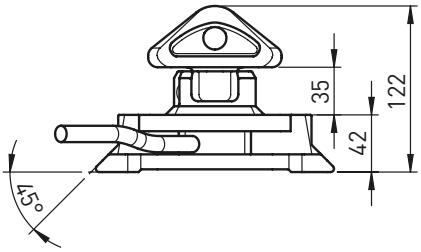
B-22R
right locking

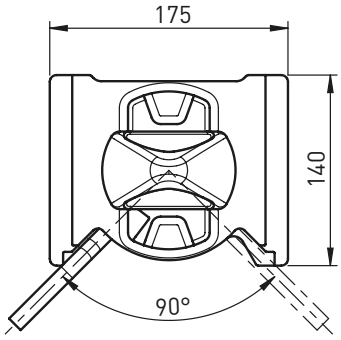
TO BE USED IN COMBINATION WITH:

FF-31
FR-22

B-45

45° U-frame bottom twistlock





B-45L
left locking

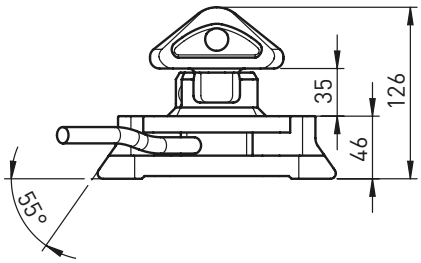
B-45R
right locking

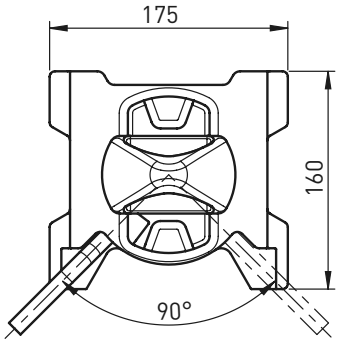
TO BE USED IN COMBINATION WITH:

FR-31B
FR-32B/A
FR-31Q

B-55A

55° U-frame bottom twistlock with cut-out section





B-55AL
left locking

B-55AR
right locking

TO BE USED IN COMBINATION WITH:

FR-34B
FR-35B/A
FR-34BQ
FR-47B
FR-48B/A

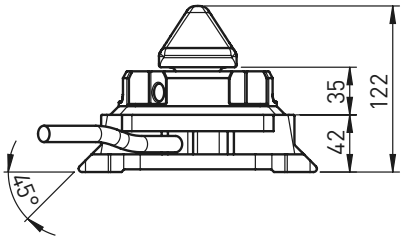
SPECIFICATIONS

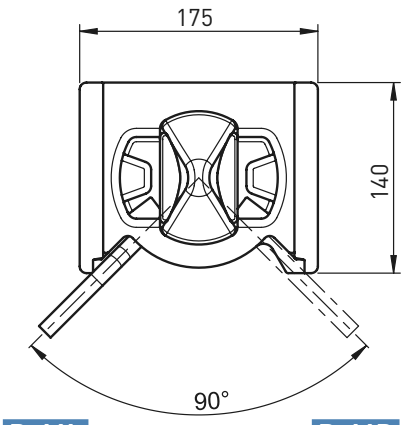
(MSL) Max. securing load: tension 250kN, shear 210kN
(MBL) Min. breaking load: tension 500kN, shear 420kN
Approval from any classification society

Bottom Twistlocks - Transversal

B-46

45° U-frame bottom twistlock





B-46L left locking

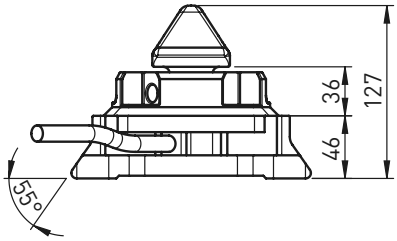
B-46R right locking

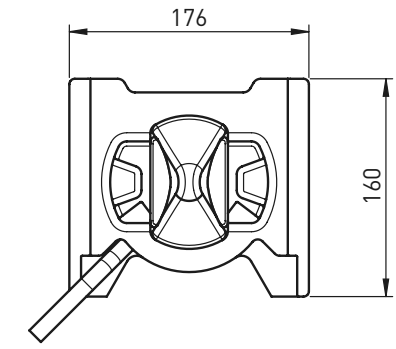
TO BE USED IN COMBINATION WITH:

FR-31B
FR-32B/A
FR-31Q

B-56

55° U-frame bottom twistlock





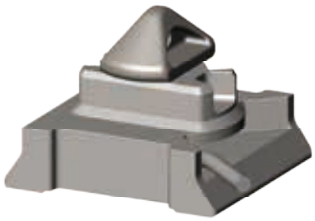
B-56L left locking

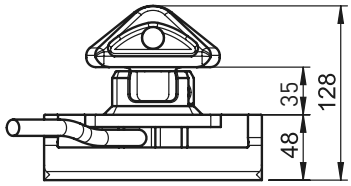
TO BE USED IN COMBINATION WITH:

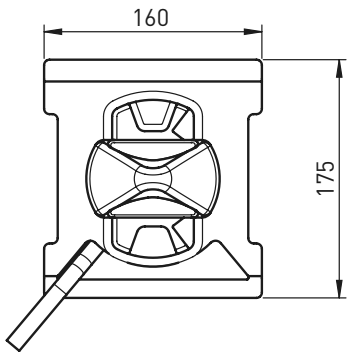
FR-34B
FR-35B/A
FR-34BQ
FR-47B
FR-48B/A

B-57

55° U-frame bottom twistlock







B-57L left locking

TO BE USED IN COMBINATION WITH:

FR-34B
FR-35B/A
FR-34BQ
FR-47B
FR-48B/A

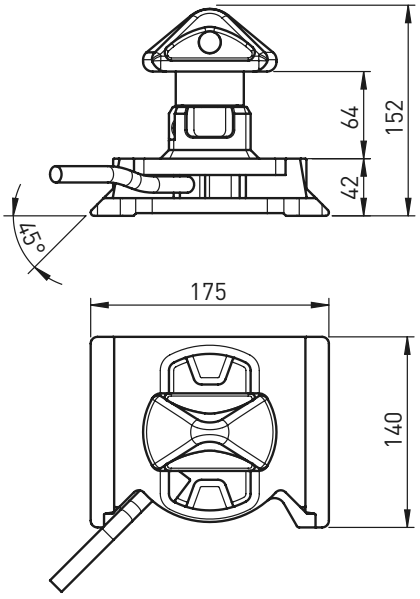
SPECIFICATIONS

(MSL) Max. securing load: tension 250kN, shear 210kN
(MBL) Min. breaking load: tension 500kN, shear 420kN

Bottom Twistlocks - Line Load

B-45L

45° U-frame bottom twistlock

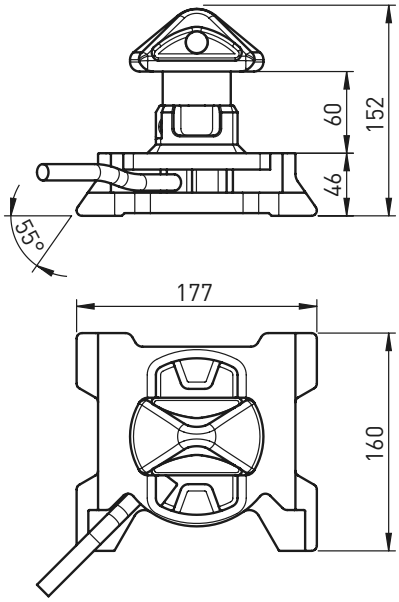


B-45LL

left locking

B-55L

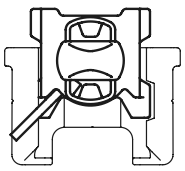
55° U-frame bottom twistlock



B-55LL

left locking

PRACTICE



TO BE USED IN COMBINATION WITH:

FR-31B
FR-32B/A
FR-31Q

TO BE USED IN COMBINATION WITH:

FR-34B
FR-35B/A
FR-34BQ
FR-47B
FR-48B/A

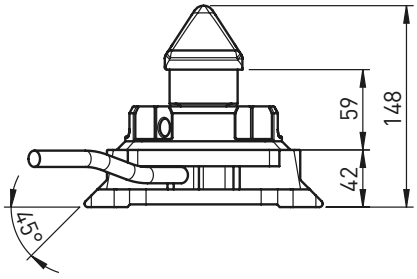
SPECIFICATIONS

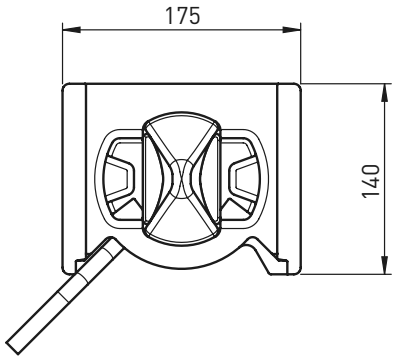
(MSL) Max. securing load: tension 250kN, shear 210kN
(MBL) Min. breaking load: tension 500kN, shear 420kN
Approval from any classification society
For recess depth of 72 – 80mm

Bottom Twistlocks - Line Load Transversal

B-46L

45° U frame bottom twistlock





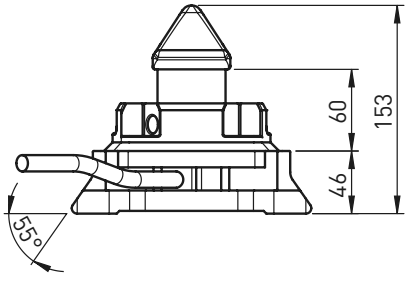
B-46LL
left locking

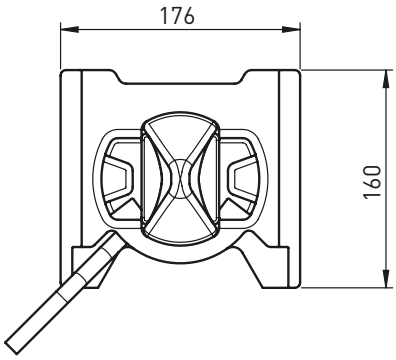
TO BE USED IN COMBINATION WITH:

FR-31B
FR-32B/A
FR-31Q

B-56L

55° U-frame bottom twistlock





B-56LL
left locking

TO BE USED IN COMBINATION WITH:

FR-34B
FR-35B/A
FR-34BQ
FR-47B
FR-48B/A

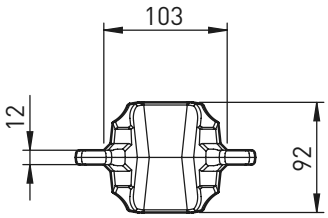
SPECIFICATIONS

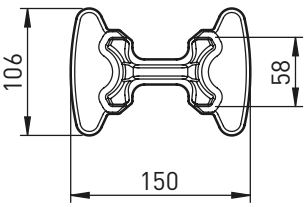
(MSL) Max. securing load: tension 250kN, shear 210kN
(MBL) Min. breaking load: tension 500kN, shear 420kN
Approval from any classification society

Stackers

SI-1

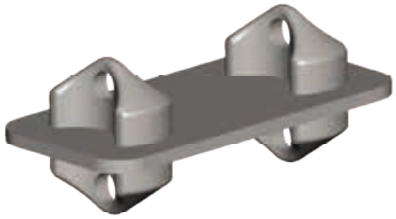
Single stacker

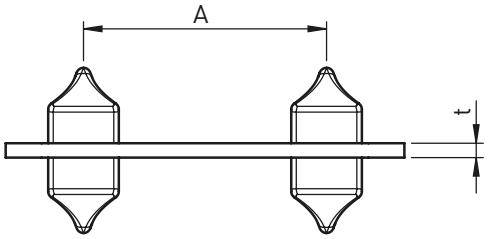


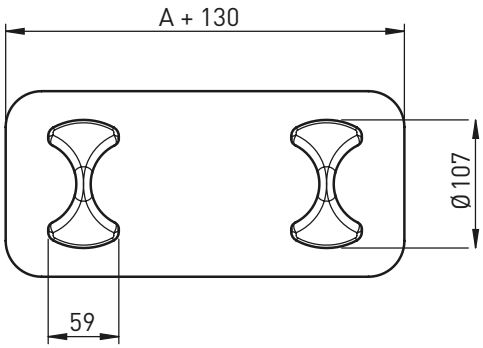


SI-2/A/t

Double stacker







STANDARD SIZES

TYPE	A (mm)
SI-2/203/12	203
SI-2/216/12	216
SI-2/258/12	258
SI-2/366/12	366

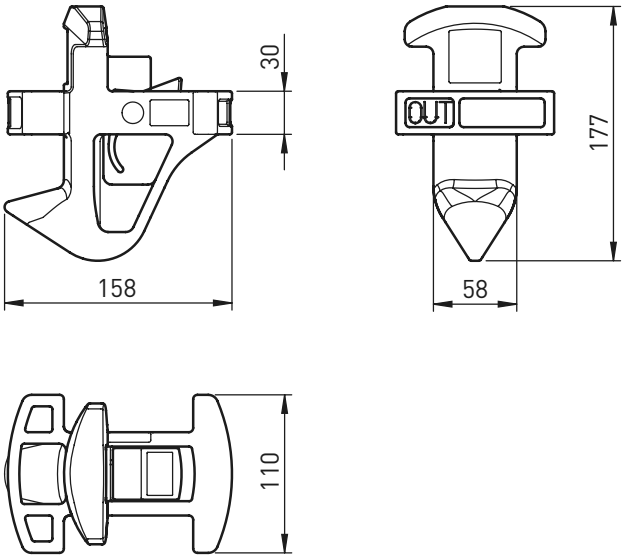
SPECIFICATIONS

(MSL) Max. securing load: shear 210kN
(MBL) Min. breaking load: shear 420kN
Standard 't': 12mm, other thicknesses upon request

Stackers

SI-6C

Semi-automatic stacker

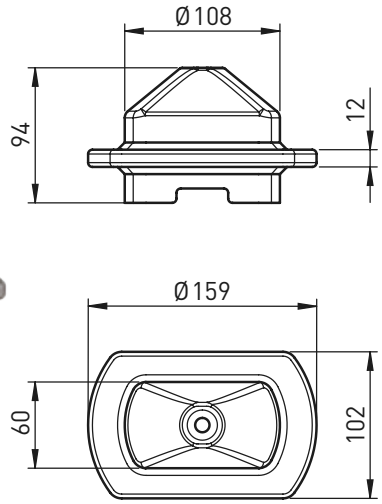


SPECIFICATIONS

(MSL) Max. Securing load: tension 250kN, shear 210kN
(MBL) Min. breaking load: tension 500kN, shear 420kN
Only to be used in combination with intermediate twistlocks

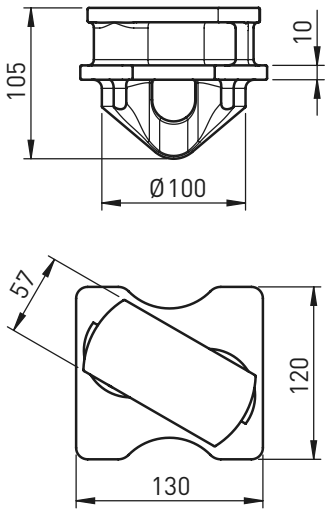
SB-5

ISO bottom stacker



SI-5D

Terminal stacker



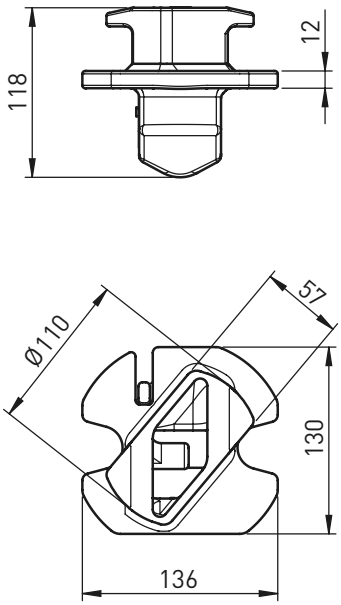
SPECIFICATIONS

(MSL) Max. Securing load: shear 210kN
(MBL) Min. Breaking load: shear 420kN

Stackers

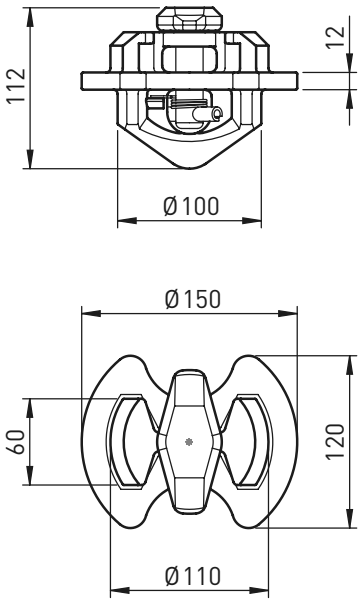
SI-7A

Safety stacker



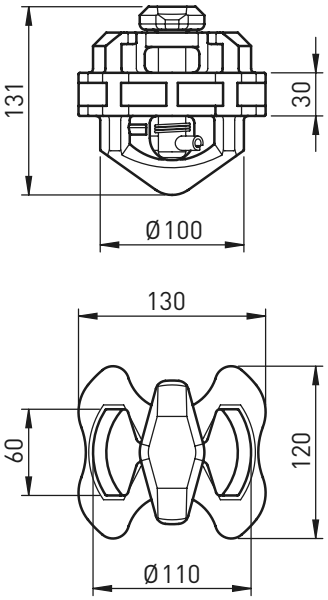
SI-7D

Self-hanging stacker



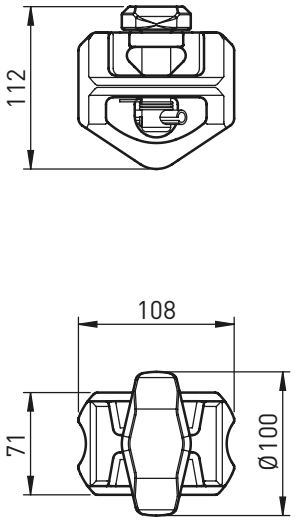
SI-7D/30

Self-hanging stacker



SI-7F

Safety stacker



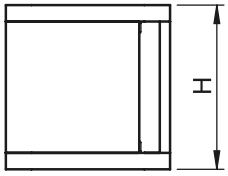
SPECIFICATIONS

(MSL) Max. securing load: shear 210kN
(MBL) Min. breaking load: shear 420kN

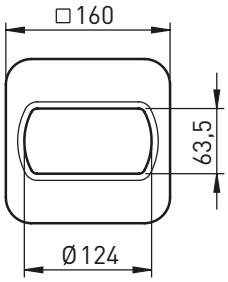
Height Adapter

SI-10

Height adapter

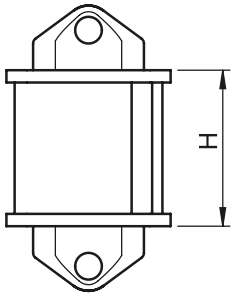


- H = 210mm

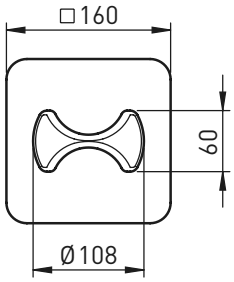


SI-11

Intermediate stacker



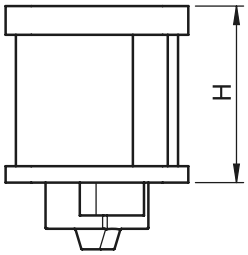
- H = 164mm



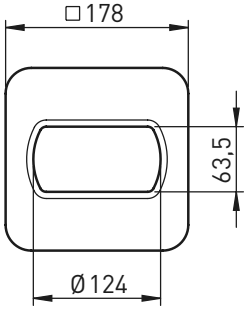
- No retrain for uplift

SI-12

Height adapter

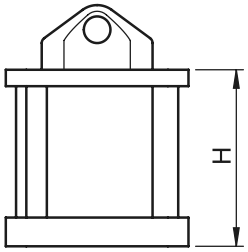


- H = 152mm
  = 305mm

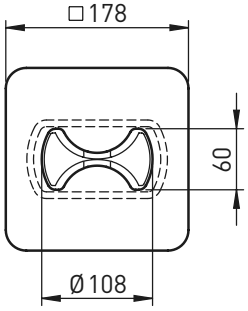


SI-14

Compensating cone



- H = 152mm
  = 305mm



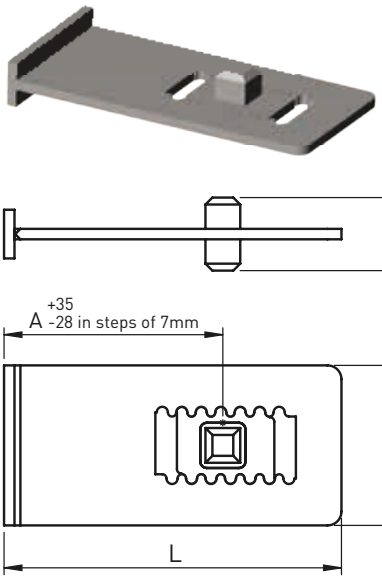
- No retrain for uplift

- **SPECIFICATIONS**
  Other heights upon request
  Strength depends on height

Side Supports

IP-04

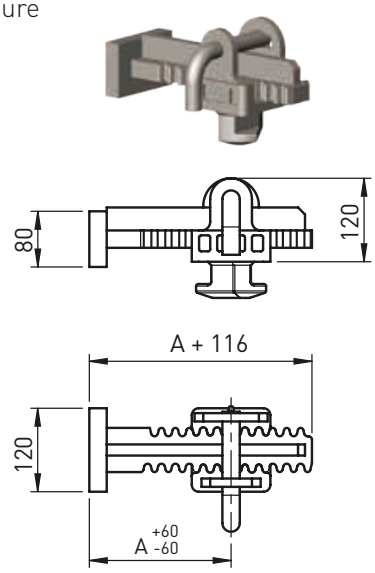
Intermediate pressure support



SPECIFICATIONS
(MSL) Max. securing load: tension 650kN
(MBL) Min. breaking load: tension 850kN

TP-04

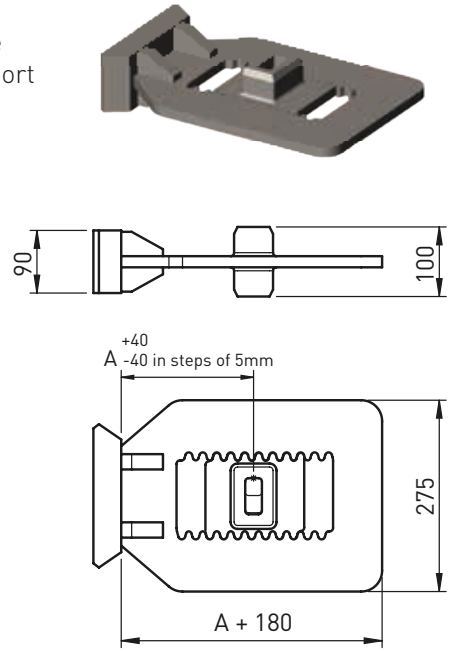
Top pressure support



SPECIFICATIONS
(MSL) Max. securing load: tension 250kN
(MBL) Min. breaking load: tension 324kN

IT-14

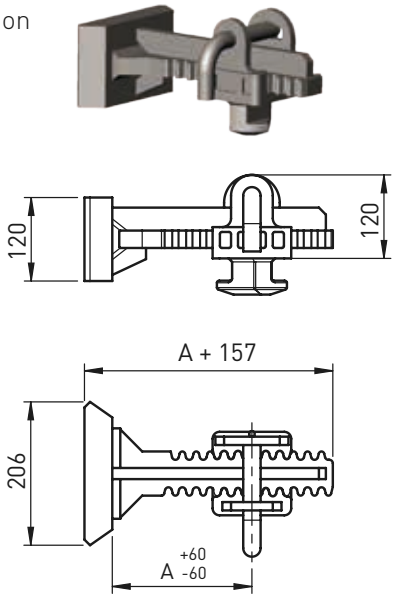
Intermediate tension support



SPECIFICATIONS
(MSL) Max. securing load: tension 650kN
(MBL) Min. breaking load: tension 850kN

TT-14

Top tension support

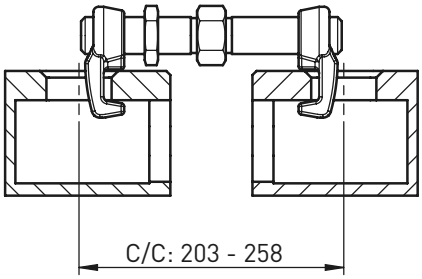


SPECIFICATIONS
(MSL) Max. securing load: tension 250kN
(MBL) Min. breaking load: tension 324kN

Bridge Fittings

CL-1/50

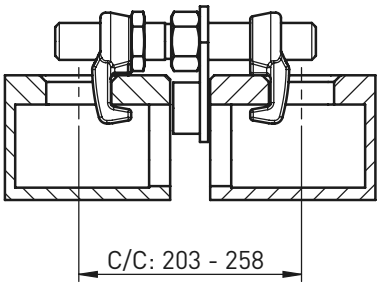
Bridge fitting



SPECIFICATIONS
(MSL) Max. securing load: tension 50kN
(MBL) Min. breaking load: tension 100kN

CL-2

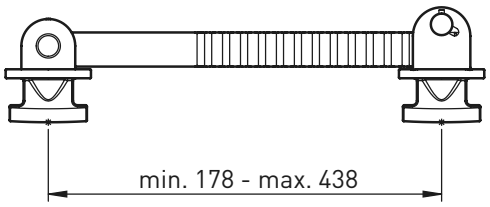
Bridge fitting



SPECIFICATIONS
(MSL) Max. securing load: tension 50kN
(MBL) Min. breaking load: tension 100kN

CL-6A

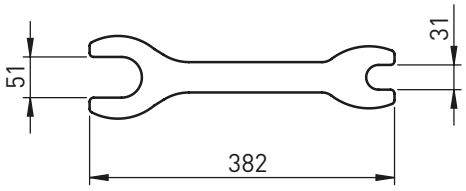
Bridge fitting



SPECIFICATIONS
(MSL) Max. securing load: tension150kN
(MBL) Min. breaking load: tension 300kN

S-91/30-50

Bridge fitting key



Lashing Rods

LR-03/L (Eye type)

One tier high:
L = 2400

Two tier high:
L = 4600

LR-04/L (Extension rod)

L = 310
L = 420
L = 600

LR-63/L (Knob type)

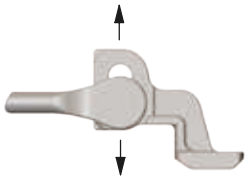
One tier high:
L = 2450

Two tier high:
L = 4700
L = 4950

LR-64/L (Extension rod)

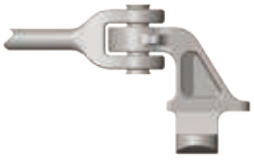
L = 405
L = 550

LR-63E/L (External type)



LR-65B/L (For vertical lashing)

Two tier high:
L = 4400



LR-65T/L (For vertical lashing)

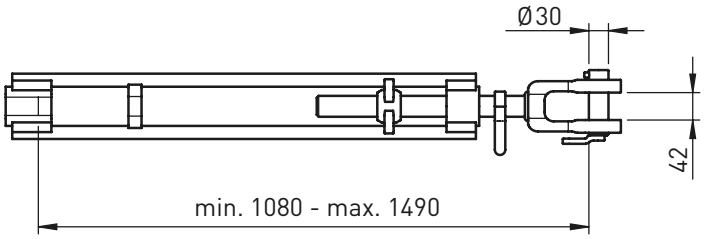
Two tier high:
L = 4400

■ **SPECIFICATIONS**

(MSL) Max. securing load: tension 250kN
(MBL) Min. breaking load: tension 500kN

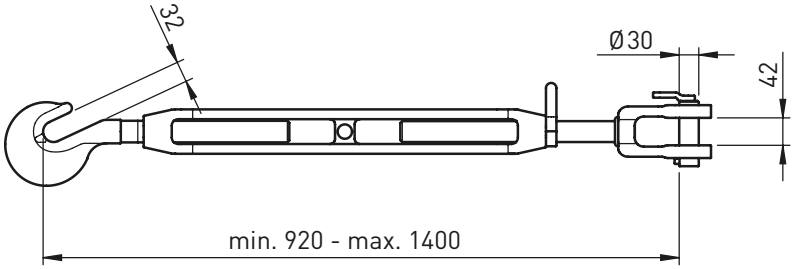
Turnbuckles

S-32B
Turnbuckle with jaw



S-97A
Spanner for S-32B

S-312/50
Turnbuckle with jaw and hook



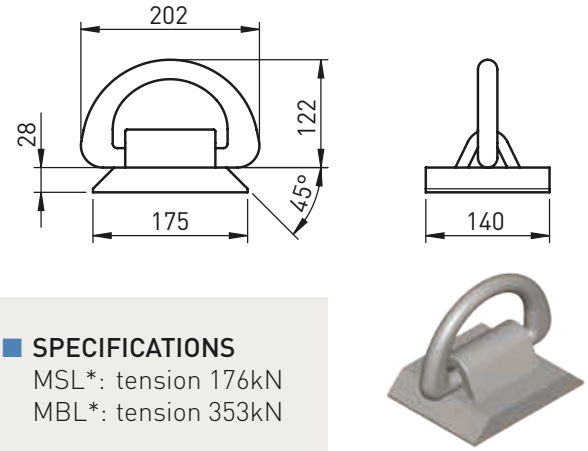
S-96
Pin spanner for S-312/50
S-24
S-25

■ **SPECIFICATIONS**
(MSL) Max. securing load: tension 250kN
(MBL) Min. breaking load: tension 500kN

Removable Lashing Points

LE-4

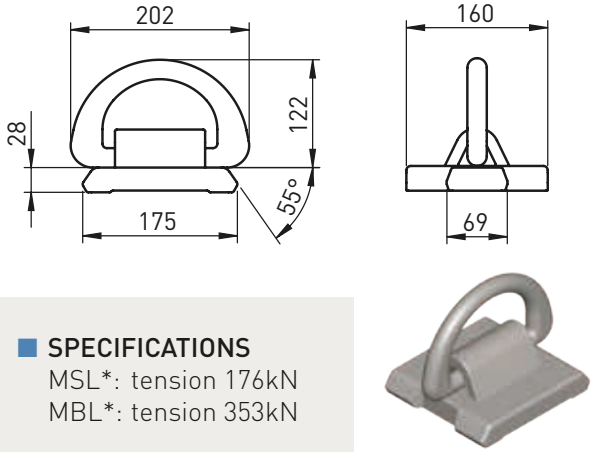
45° U-frame D-ring



SPECIFICATIONS
MSL*: tension 176kN
MBL*: tension 353kN

LE-5A

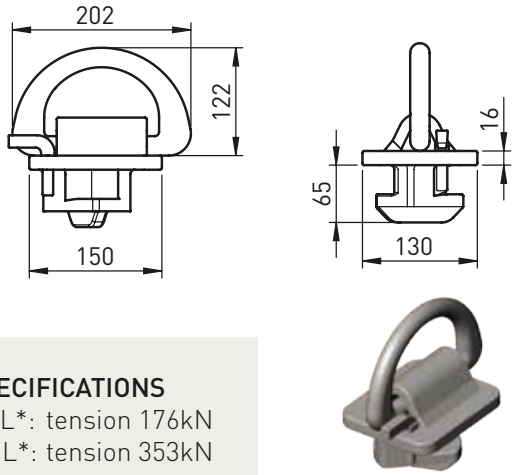
55° U-frame D-ring



SPECIFICATIONS
MSL*: tension 176kN
MBL*: tension 353kN

LE-3

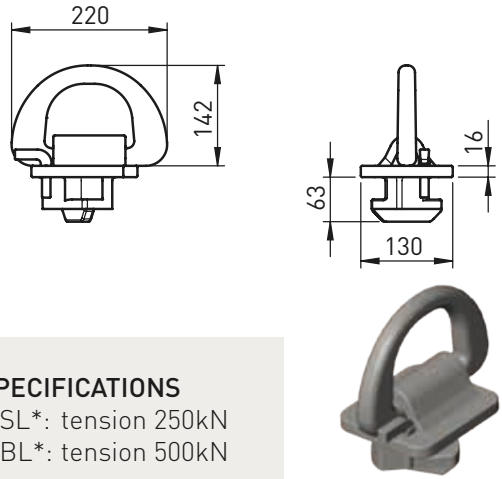
Turnfoot D-ring



SPECIFICATIONS
MSL*: tension 176kN
MBL*: tension 353kN

LE-3/50

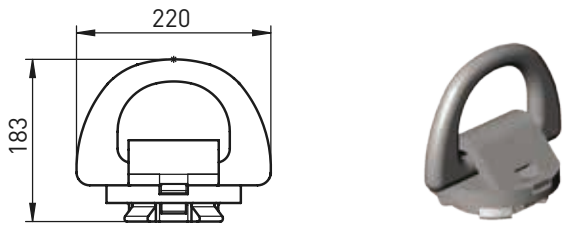
Turnfoot D-ring



SPECIFICATIONS
MSL*: tension 250kN
MBL*: tension 500kN

LE-12

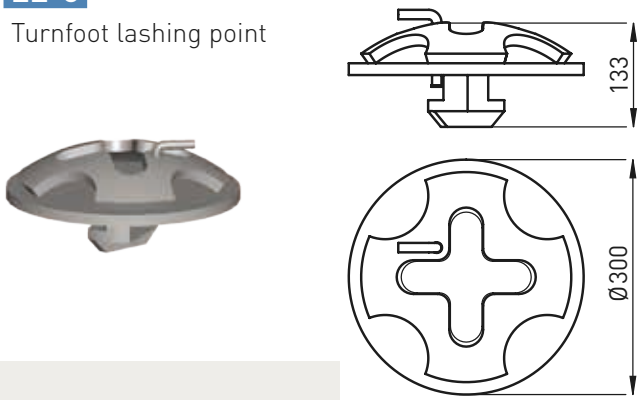
Breech base D-ring



SPECIFICATIONS
MSL*: tension 250kN
MBL*: tension 500kN

LE-6

Turnfoot lashing point



SPECIFICATIONS
MSL*: tension 100kN
MBL*: tension 200kN

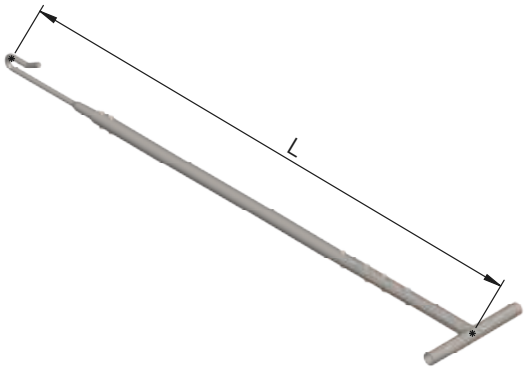
* MSL = Max. securing load
MBL = Min. breaking load

Tools

S-90/L

Actuator pole
(For standard twistlock)

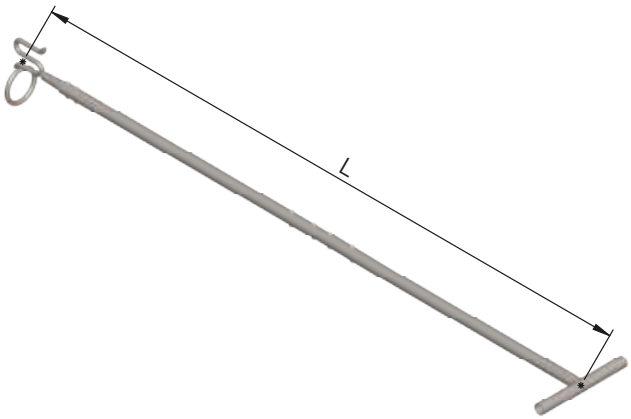
REF.	L IS ACCORDING TO ORDERS (mm)
S-90/4.0	4000
S-90/6.0	6000

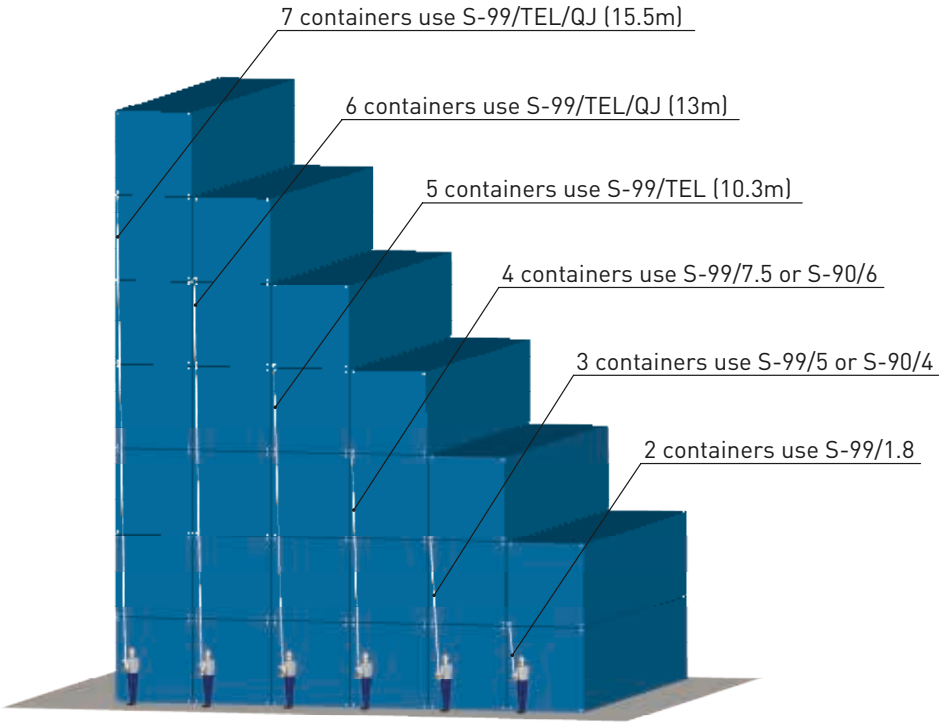


S-99/L

Operation pole
(For semi-automatic twistlock)

REF.	L IS ACCORDING TO ORDERS (mm)
S-99/7.5	7500
S-99/5.0	5000
S-99/1.8	1800

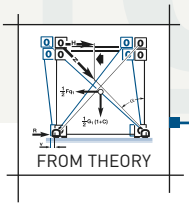




- Also available as telescopic or quick joint:

S-99/TEL (telescopic)

S-99/TEL/QJ (quick joint)

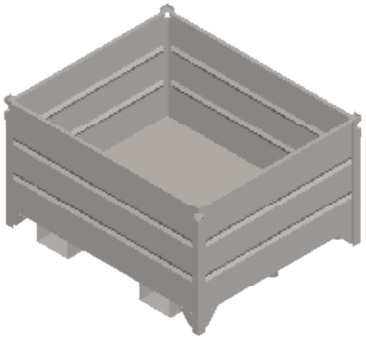


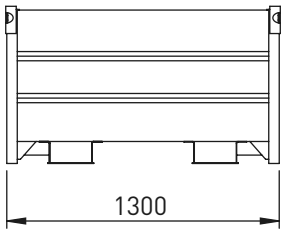
Flat Racks

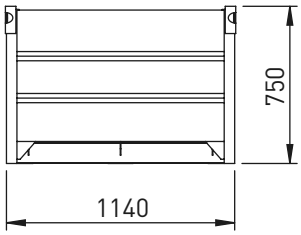
Z-8/2

Bin

REF.	WEIGHT (kg)	CAPACITY (t)	USE WITH
Z-8/2	106	2,0	Z-8/20

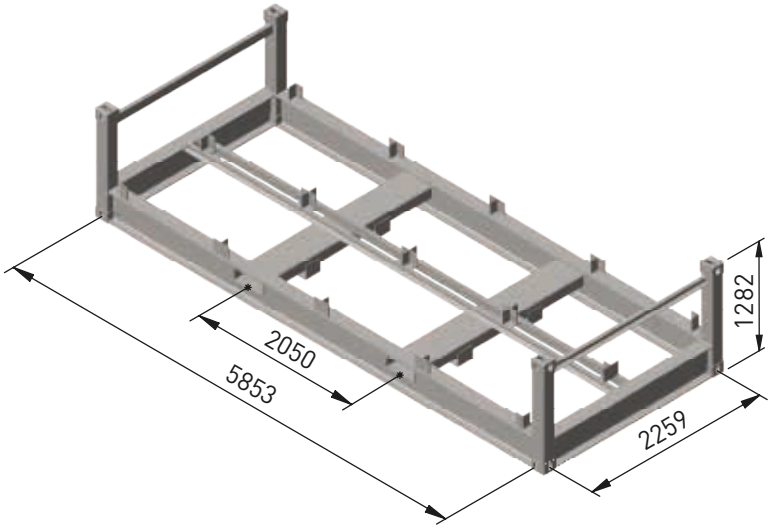






Z-8/20

20' Flat rack



SPECIFICATIONS

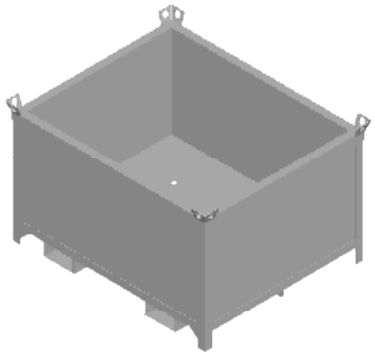
Capacity: 8 bins Z-8/2
Weight: 2100kg
Max. gross weight: 24t

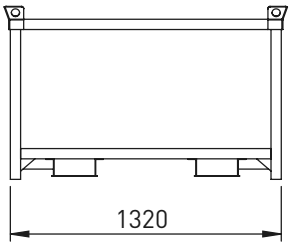
Flat Racks

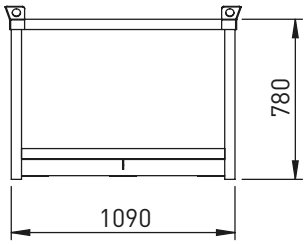
Z-8/3

Bin

REF.	A (mm)	CAPACITY (t)	USE WITH
Z-8/3	1090	2,0	Z-8/40

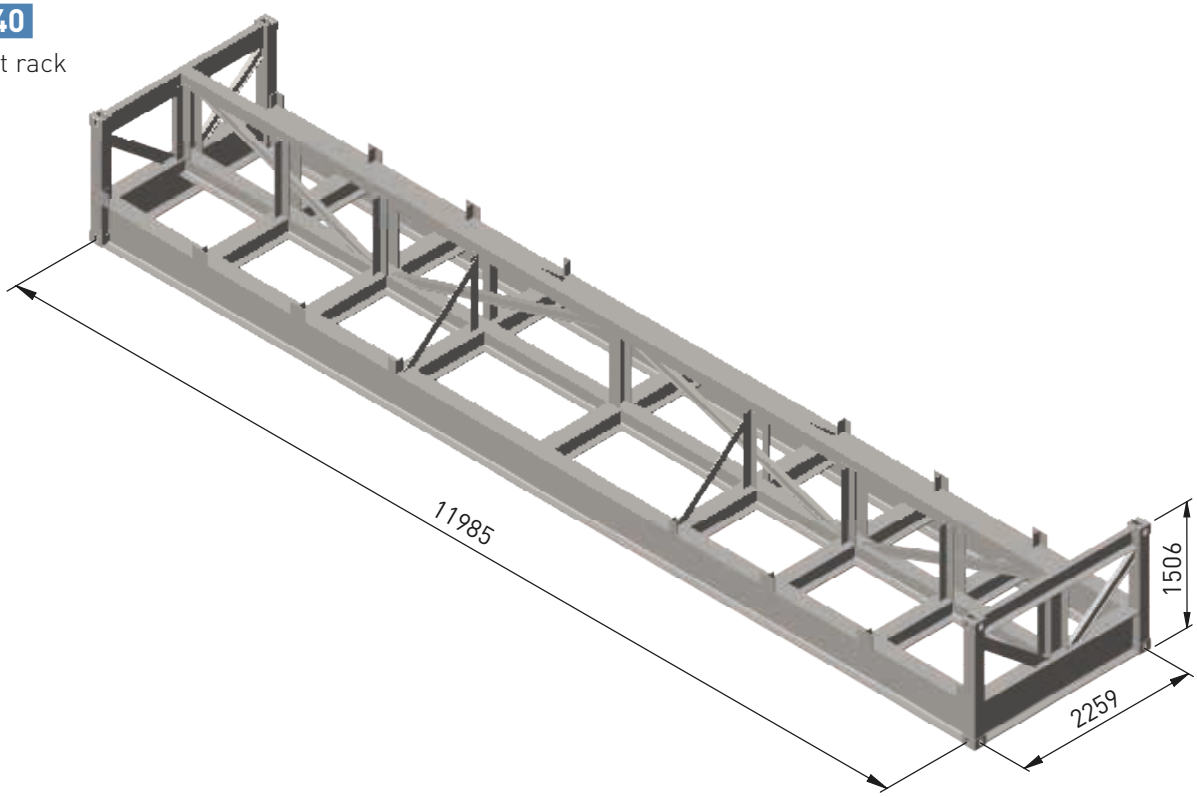






Z-8/40

40' flat rack



SPECIFICATIONS

Capacity: 12 bins Z-8/3
Weight: 4300kg
Max. gross weight: 28t

High Tensile Turnbuckles

Instructions for use

IMPORTANT
Turnbuckles must be used for straight or in-line pulling only. Special attention should be paid to prevent overloading.

While tensioning, the forces on the turnbuckle must not be such that any deformation occurs. In case of deformation, the tension should be decreased immediately and deformed parts should be replaced. Should extreme circumstances or shock loading be applicable this must be taken into account when selecting the correct products to be used for the application.

Closed body rigging screws and commercial open body rigging screws are used for tensioning wires and ropes for minor loads (i.e. rope railings). The WLL values are only indicative, and these products are not suitable for bearing constructions.

For the rigging of wires, ropes, rods etc., Green Pin® turnbuckles and turnbuckles according to DIN 1480 with forged eyes or with welding ends are to be used.

The Working Load Limit (WLL) should be applied in a straight pull only and overloading is not permitted. Nor should side loads be applied, as the products have not been designed for this purpose.
It is required that the products are regularly inspected and that the inspection should take place in accordance with the safety standards given in the country of use. This is required because the products in use may be affected by wear, misuse, overloading etc. with a consequence of deformation and alteration of the steel structure.

Safe use of turnbuckles

Turnbuckles should be inspected before use to insure that:

- the threads of the body and the end fittings are of the same type;
- the threads of the body and the end fittings are undamaged

Furthermore, it must be ensured that the end fittings are correctly screwed into the body. Always use the locking nuts supplied to prevent the turnbuckles from unscrewing.

Never replace an end fitting, other than the one designed for the purpose, as it may not be suitable for the loads imposed.

High Tensile Steel Turnbuckles

In accordance with ASTM F 1145-92 (EX FF-T-791B)

Material: Drop forged high tensile steel SAE 1035 or 1045
Safety Factor: MBL = 5 x WLL
Finishing: Hot dipped galvanized

IMPORTANT: This material should NEVER be used for lifting.


T 1


T 2


T 3


T 4

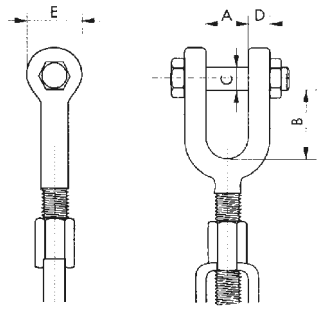

T 5

THREAD Ø X TAKE-UP (inch)	THREAD Ø X TAKE-UP (mm)	WLL T 3, 4, 5 (kg)	WLL T 1, 2 (kg)	L CLOSED (mm)	WEIGHT T 1 (kg)	WEIGHT T 2 (kg)	WEIGHT T 3 (kg)	WEIGHT T 4 (kg)	WEIGHT T 5 (kg)
⅜ x 6	9,53 x 152	540	450	302	0,36	0,47	0,47	0,51	0,57
½ x 6	12,7 x 152	1000	680	338	0,62	0,82	0,84	0,89	0,96
½ x 9	12,7 x 229	1000	680	414	0,85	1,06	1,05	1,1	1,18
½ x 12	12,7 x 305	1000	680	490	1,04	1,28	1,26	1,31	1,5
⅝ x 6	15,9 x 152	1590	1020	394	0,98	1,31	1,35	1,58	1,84
⅝ x 9	15,9 x 229	1590	1020	470	1,18	1,56	1,6	1,84	2,12
⅝ x 12	15,9 x 305	1590	1020	546	1,71	1,71	1,92	2,22	2,56
¾ x 6	19,1 x 152	2360	1360	432	1,53	2,04	2,03	2,34	2,68
¾ x 9	19,1 x 229	2360	1360	508	1,88	4,49	2,49	2,72	3,03
¾ x 12	19,1 x 305	2360	1360	584	2,3	2,3	2,65	2,95	3,29
¾ x 18	19,1 x 457	2360	1360	737	2,85	2,85	3,06	3,3	3,65
⅞ x 12	22,2 x 305	3270	1810	618	3,33	3,33	3,98	4,35	4,9
⅞ x 18	22,2 x 457	3270	1810	772	4,24	4,24	5,12	5,46	5,95
1 x 6	25,4 x 152	4540	2270	524	3,87	3,87	4,35	4,66	5,21
1 x 12	25,4 x 305	4540	2270	676	5,09	5,09	5,92	6,35	6,96
1 x 18	25,4 x 457	4540	2270	829	6	6	7,17	7,98	8,95
1 x 24	25,4 x 610	4540	2270	980	7,52	7,52	7,52	7,39	7,85
1 ¼ x 12	31,8 x 305	6900	2950	753	8,12	8,12	9,8	10,92	11,9
1 ¼ x 18	31,8 x 457	6900	2950	905	10,4	10,4	11,31	11	14
1 ¼ x 24	31,8 x 610	6900	2950	1058	12,1	12,1	12,1	12,9	13
1 ½ x 12	38,1 x 305	9710	3400	804	12,7	12,7	14,2	13,1	16,9
1 ½ x 18	38,1 x 457	9710	3400	956	15,1	15,1	16,5	14,7	18,7
1 ½ x 24	38,1 x 610	9710	3400	1109	17,1	17,1	17,1	17,8	18,4
1 ¾ x 18	44,5 x 457	12700	–	1049	–	–	23,1	22,3	25
1 ¾ x 24	44,5 x 610	12700	–	1201	–	–	26,3	27,5	28,7
2 x 24	51 x 610	16780	–	1295	–	–	40,7	42,9	45,4
2 ½ x 24	63,5 x 610	27220	–	1476	–	–	64	68	73
2 ¾ x 24	70,1 x 610	34020	–	1560	–	–	88	91	98

All the turnbuckles are provided with locking nuts.
T5 is supplied with pins for sizes ¾" up to and including 2 ¾" (locking nuts on request).

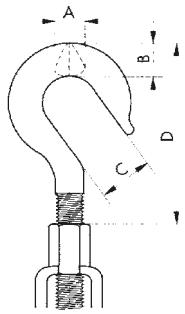
High Tensile Steel Turnbuckle Terminations

Clevis



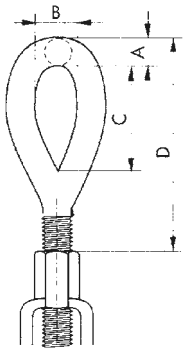
Ø THREAD (inch)	Ø THREAD (mm)	WLL (kg)	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)
⅜	9,53	540	13	22	8	8	21
½	12,7	1000	16	26	9,5	10	25
⅝	15,9	1590	18	33	13	13	33
¾	19,1	2360	23	38	15,5	16	41
⅞	22,2	3270	27	44	19	18	48
1	25,4	4540	30	52	22	20	54
1 ¼	31,8	6900	44	73	29	25	67
1 ½	38,1	9710	52	70	35	27	80
1 ¾	44,5	12700	59	85	41	33	90
2	51	16780	64	93	51	39	108
2 ½	63,5	27220	75	114	57	38	143
2 ¾	70	34020	89	110	70	42	156

Hook



Ø THREAD (inch)	Ø THREAD (mm)	WLL (kg)	A (mm)	B (mm)	C (mm)	D (mm)
⅜	9,53	450	10	15	14	58
½	12,7	680	13	19	17	72
⅝	15,9	1020	16	23	22	90
¾	19,1	1360	20	27	25	98
⅞	22,2	1810	23	30	29	126
1	25,4	2270	25	35	32	144
1 ¼	31,8	2270	28	37	39	175
1 ½	38,1	3400	33	44	47	212

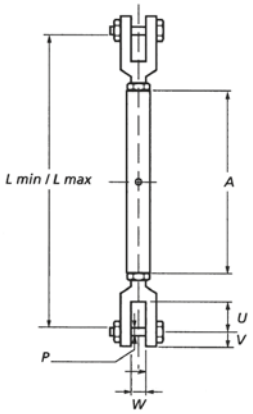
Eye



Ø THREAD (inch)	Ø THREAD (mm)	WLL (kg)	A (mm)	B (mm)	C (mm)	D (mm)
⅜	9,53	540	9	13	28	65
½	12,7	1000	12	18	36	80
⅝	15,9	1590	14	21	43	98
¾	19,1	2360	17	25	53	113
⅞	22,2	3270	20	31	59	118
1	25,4	4540	22	36	74	155
1 ¼	31,8	6900	29	45	88	197
1 ½	38,1	9710	32	54	105	215
1 ¾	44,5	12700	38	60	119	254
2	51	16780	45	69	146	308
2 ½	63,5	27220	51	79	165	344
2 ¾	70	34020	57	83	178	381

Heavy Duty Turnbuckles With Trapezium Thread

IMPORTANT: Turnbuckles should NEVER be used for lifting.

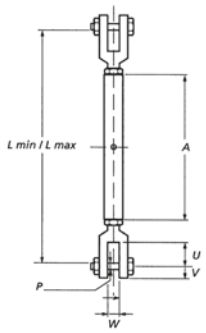


Jaw/Jaw

WLL (t)	LENGTH CLOSED (mm)	LENGTH OPEN (mm)	JAW OPENING (mm)	Ø PIN (mm)	WEIGHT (kg)
1	354	522	19	16	2
1,6	384	572	23	20	3
2	412	612	26	22	4
2,5	506	712	30	24	6
3,1	537	765	32	27	8
4	569	810	35	30	10
5	610	850	40	36	15
6,3	691	954	45	39	21
8	742	1038	50	45	31
10	793	1102	60	48	40
12,6	862	1202	65	52	52
16	926	1280	70	60	69
20	1010	1392	75	68	85
25	1084	1488	80	72	98
31,5	1170	1600	90	80	141
40	1280	1775	100	90	176
50	1390	1940	110	100	240
63	1525	2130	120	110	340
80	1655	2315	140	125	420
100	1750	2465	156	140	510
125	1880	2650	176	160	600
160	2090	2970	200	180	690

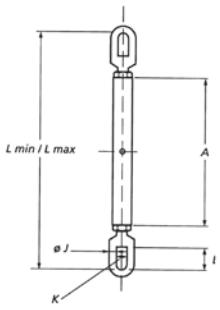
M Turnbuckles

IMPORTANT: Turnbuckles should NEVER be used for lifting.



Jaw/Jaw

WLL (t)	MBL (t)	THREAD	L min (mm)	L max (mm)	TAKE UP (mm)	DIMENSIONS (mm) A	P	U	V	W	WEIGHT (kg)
0,3	1,5	M 8	203	305	102	127	6	21	9	9	0,2
0,5	2,5	M10	245	355	110	160	8	21	9	11	0,3
0,7	3,5	M12	345	525	180	230	10	35	13	19	0,8
1,2	6	M16	395	565	170	230	12	50	16	21	1,4
1,5	7,5	M20	395	555	160	230	16	46	18	21	2,2
2,2	11	M22	476	702	226	305	20	60	20	25	3,5
3,2	16	M24	580	860	280	360	22	63	24	30	4,1
3,8	19	M27	600	870	270	356	22	63	24	31	4,5
5	25	M33	650	930	280	385	24	74	30	38	6,4
6,3	31,5	M36	680	910	230	385	30	85	30	48	11
7	35	M39	670	949	279	407	34	90	32	47	11
8,5	42,5	M45	780	1020	240	410	35	120	43	50	19
10	55	M48	743	977	234	407	43	121	46	51	22
12,6	63	M56	862	1202	340	500	52	122	60	65	39
16	80	M64	925	1280	355	540	60	130	65	70	48



Oval Eye / Oval Eye

WLL (r)	MBL (r)	THREAD	L min (mm)	L max (mm)	TAKE UP (mm)	DIMENSIONS (mm) A	J	K	L	WEIGHT (kg)
0,3	1,5	M 8	203	305	102	127	8	9	20	0,3
0,5	2,5	M10	235	349	114	152	8	11	25	0,4
0,7	3,5	M12	330	530	200	229	11	14	36	0,9
1,2	6	M16	377	560	183	229	14	18	40	1,2
1,5	7,5	M20	410	565	155	229	17	25	55	2
2,2	11	M22	486	730	244	305	17	25	55	3,1
3,2	16	M24	556	856	300	356	20	26	57	3,9
3,8	19	M27	576	856	280	356	20	26	57	4,8
5	25	M33	640	920	280	381	25	34	64	6,8
6,3	31,5	M36	650	920	270	381	27	38	75	9
7	35	M39	687	970	283	407	27	38	75	10
8,5	42,5	M45	720	1020	300	407	30	40	85	14
10	50	M48	770	1020	280	407	37	44	92	18

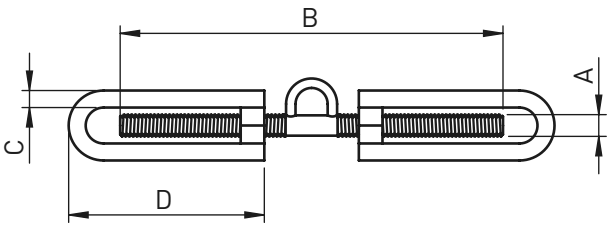
SPECIFICATIONS

Standard hot dip galvanized
Factory supplied with locking nuts
Bolt secured with nut and split pin
Straight or in-line pull only

Wire Lashing

S-01

Hamburger turnbuckle



TYPE	MBL (t)	THREAD Ø (mm) A	THREAD LENGTH (mm) B	BOW Ø (mm) C	BOW LENGTH (mm) D	WEIGHT (kg)
S-01/24/400	13	24	400	16	210	2,8
S-01/24/500	13	24	500	16	260	3,8
S-01/27/400	18	27	400	18	210	4,4
S-01/27/500	18	27	500	18	260	5,5
S-01/30/400	20	30	400	20	210	5
S-01/30/500	20	30	500	20	260	6,3
S-01/36/400	21	36	400	20	210	7
S-01/36/500	21	36	500	20	260	8,8

Lashing wire

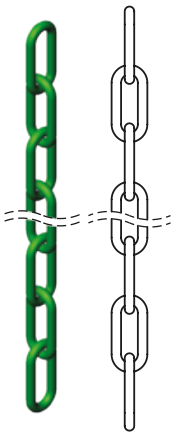
CONSTRUCTION	Ø (mm)	MBL (kN)	WEIGHT (kg/100m)
6 x 12 + FC	8	20	14
6 x 19 + FC	10	29	22
6 x 19 + FC	12	46	28
6 x 19 + FC	14	59	43
6 x 19 + FC	16	165	87
6 x 19 + FC	18	206	108
6 x 19 + FC	20	251	132
6 x 19 + FC	22	308	162

Lashing fibre rope

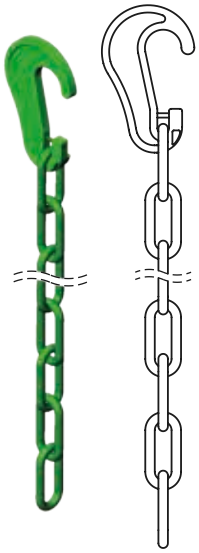
Ø (mm)	MBL (kN)	WEIGHT (kg/100m)
8	9,41	4
10	13,97	8,6
12	19,9	11,5

Lashing Chains

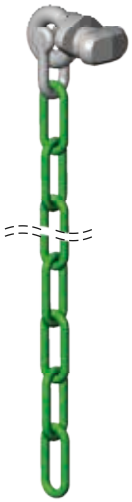
LC-00



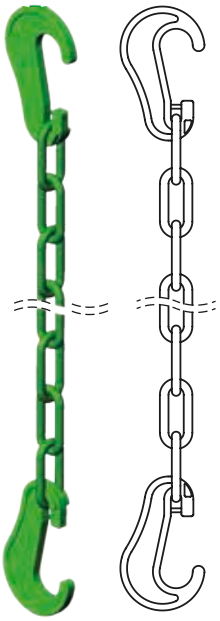
LC-01



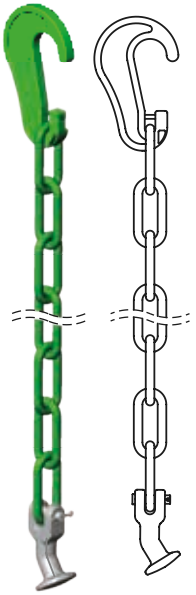
LC-03



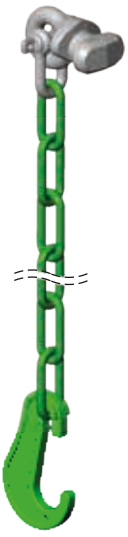
LC-11



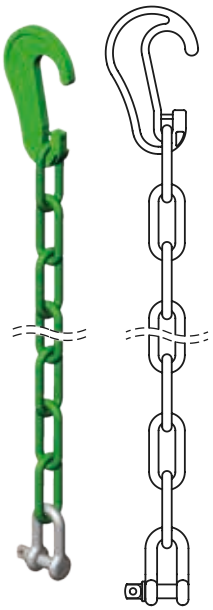
LC-12



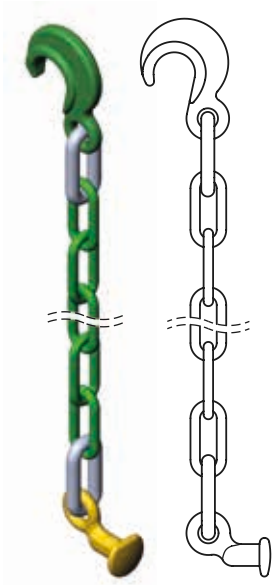
LC-13



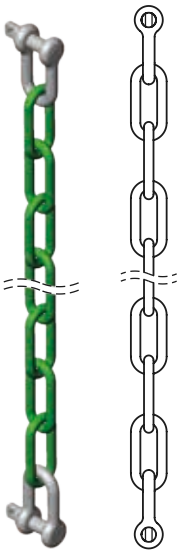
LC-14



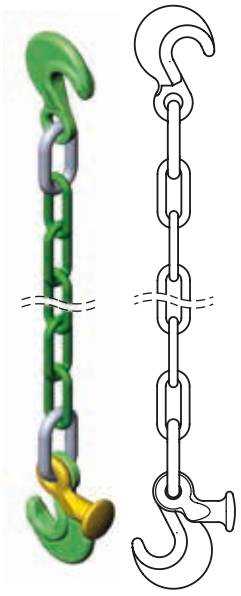
LC-112

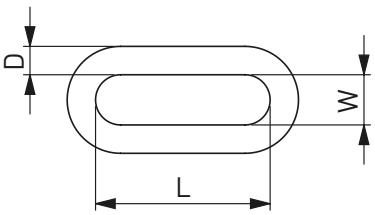


LC-44



LC-112A



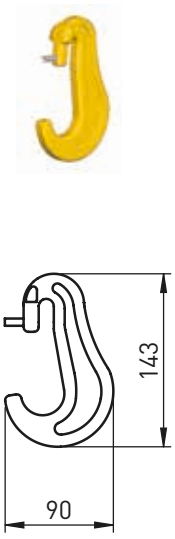


DIAMETER (mm)	LENGTH (mm)	WIDTH (mm)	WEIGHT (kg)	(MSL) MAX. SEC. LOAD (kN)	(MBL) MIN. BREAK. LOAD (kN)
9	56	15	1,45	50	100
11	65	18	2,2	63	125
13	80	23	3	100	200

Hooks

H-12/9

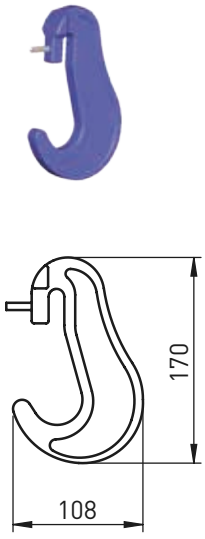
Hook for 9mm lashing



■ **SPECIFICATIONS**
(MSL) Max. securing load: tension 50kN
(MBL) Min. breaking load: tension 100kN

H-12/11

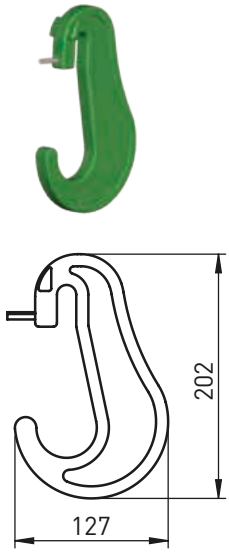
Hook for 11mm lashing



■ **SPECIFICATIONS**
(MSL) Max. securing load: tension 75kN
(MBL) Min. breaking load: tension 150kN

H-12/13

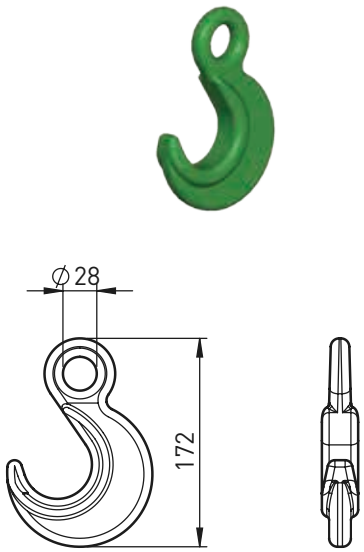
Hook for 13mm lashing



■ **SPECIFICATIONS**
(MSL) Max. securing load: tension 100kN
(MBL) Min. breaking load: tension 200kN

H-10

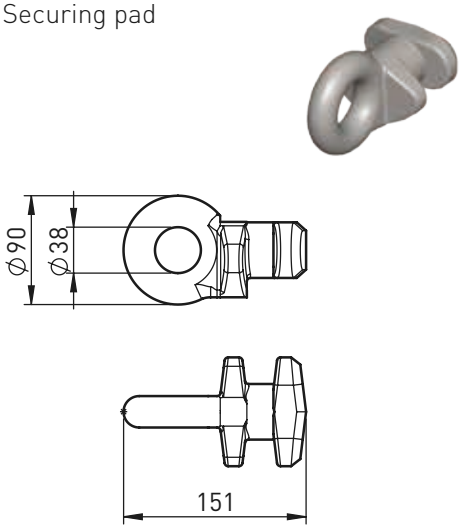
Eye hook



■ **SPECIFICATIONS**
(MSL) Max. securing load: tension 100kN
(MBL) Min. breaking load: tension 200kN

H-30

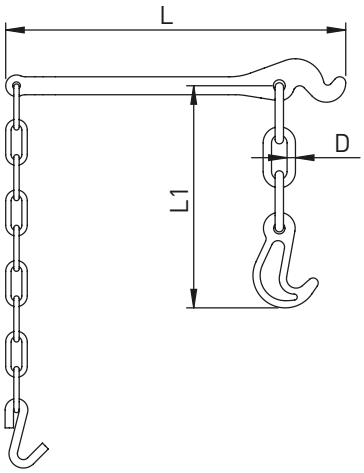
Securing pad



■ **SPECIFICATIONS**
(MSL) Max. securing load: tension 120kN
(MBL) Min. breaking load: tension 240kN

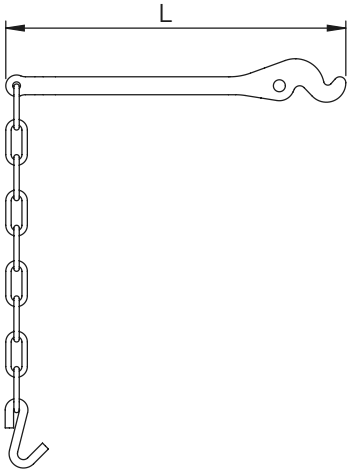
Chain Tension Levers

WITH FLAT HOOK FOR SHORTENING



REF.	Ø (mm)	L (mm)	L1 (mm)	D (mm)	MSL (kN)	MBL (kN)	COLOR
S-510	9	575	275	11	50	100	Yellow
S-530	11	590	335	12	75	150	Blue
S-550	13	570	370	14	100	200	Green

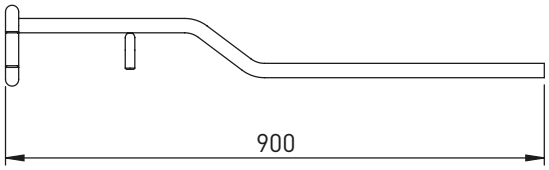
WITHOUT FLAT HOOK FOR SHORTENING



REF.	Ø (mm)	L (mm)	MSL (kN)	MBL (kN)	COLOR
S-540	11	590	75	150	Blue
S-560	13	570	100	200	Green

S-92B

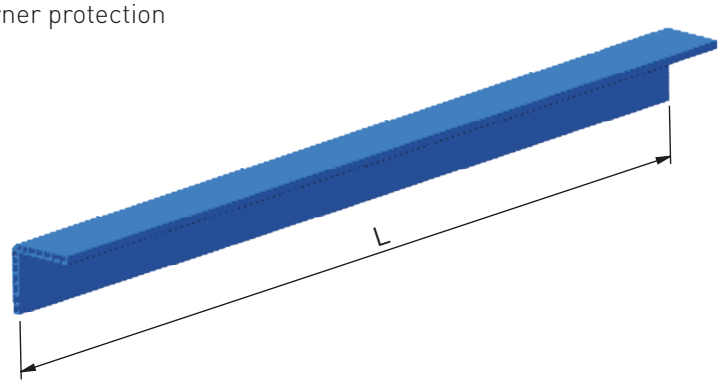
Lever extension

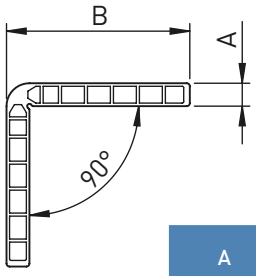


Cargo Accessories

Z-1

Corner protection

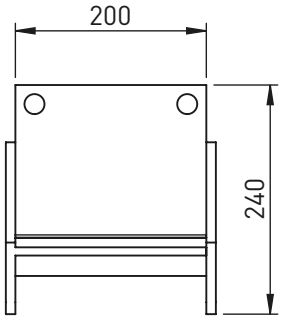


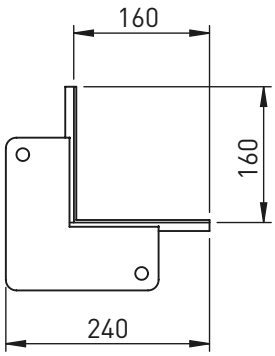


A (mm)	B (mm)
15	120
19	190

Z-2A

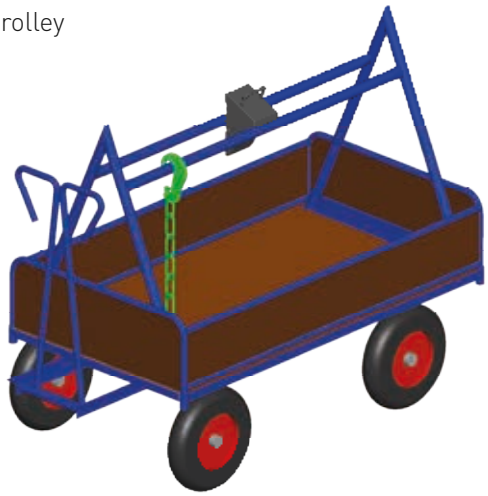
Heavy duty corner protection





Z-27

Transport trolley



Z-23

Traffic cone

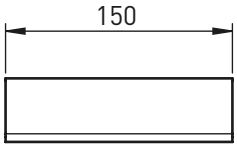
SPECIFICATION
Capacity: 1t

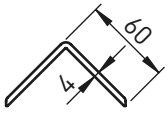
Cargo Accessories

Z-25
Dunnage wood

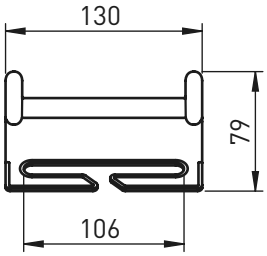
Z-12
Tarpaulin for bins

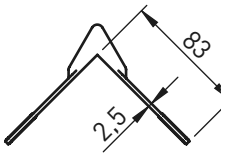
Z-1A
Cardboard corner protector



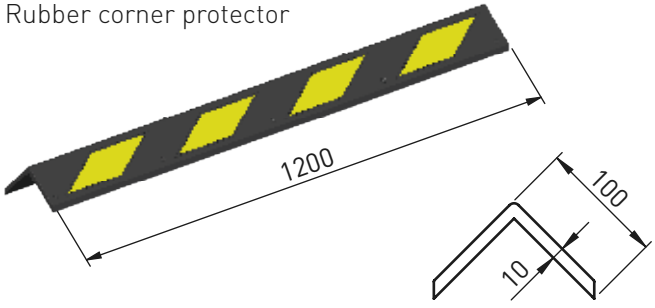


Z-1B
Plastic corner protector





Z-1R
Rubber corner protector

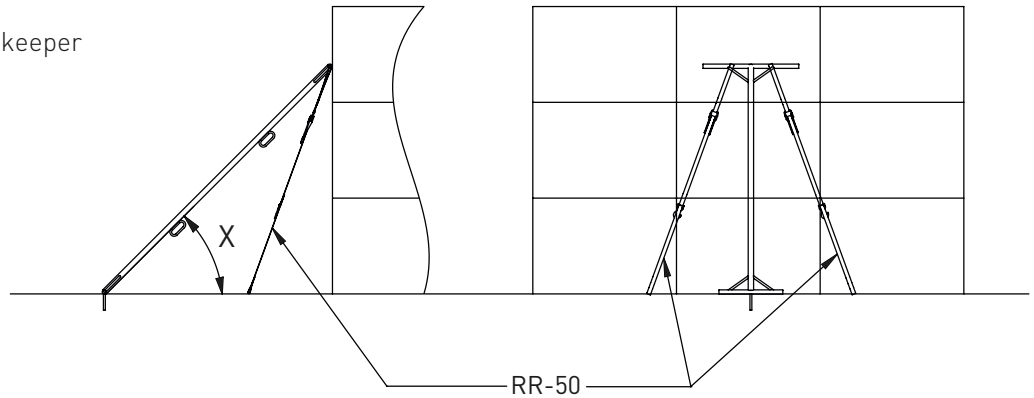


Z-10
Anti-skid mats

Z-6
Stepladder

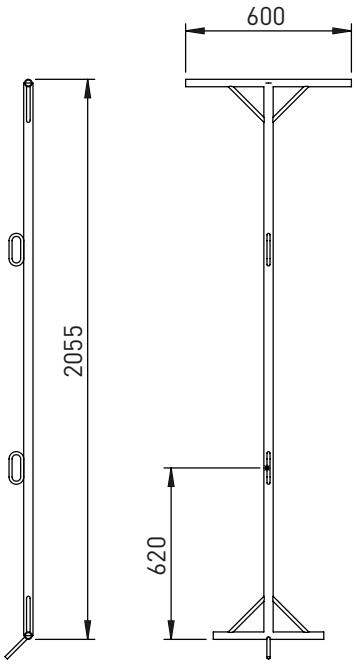
Reefer Keeper

Z-13
Reefer keeper



Capacity [MSL]: Maximum horizontal force

ANGLE X	ONE LASHING (kg)	TWO LASHINGS (kg)
30°	1090	1090
45°	750	1340
60°	430	870



ADDITIONAL MATERIALS FOR SECURING PALLETIZED CARGO

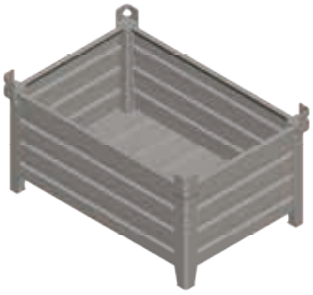
RR-50
Web lashing for reefer keeper

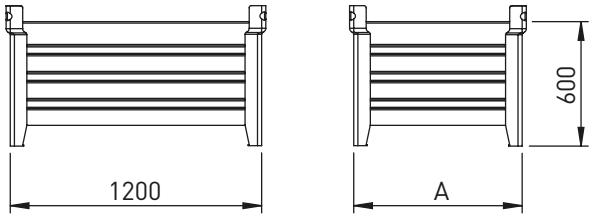
H-9A
T-hook for grating

H-9C
Hook for grating

Bins

Z-8/1

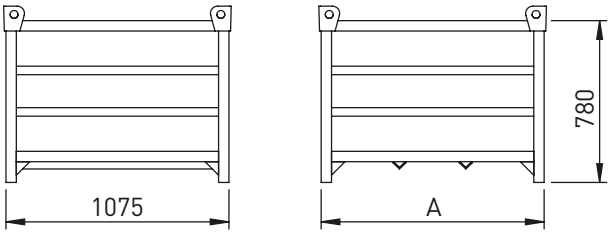




REF.	A (mm)	WEIGHT (kg)	CAPACITY (t)
Z-8/1	800	71	1,5

Z-8/4

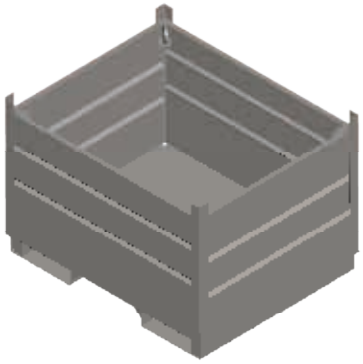
Bin for flat rack

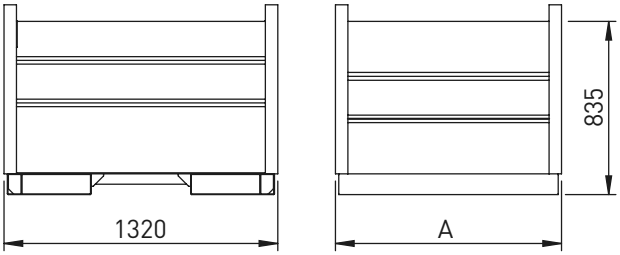


REF.	A (mm)	WEIGHT (kg)	CAPACITY (t)
Z-8/4	1075	100	2,0

Z-8/6

Bin for flat rack

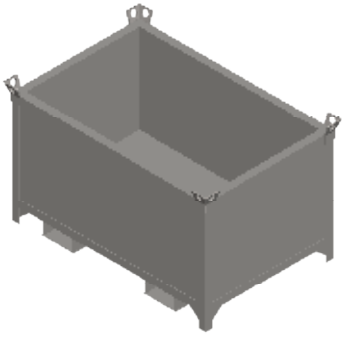


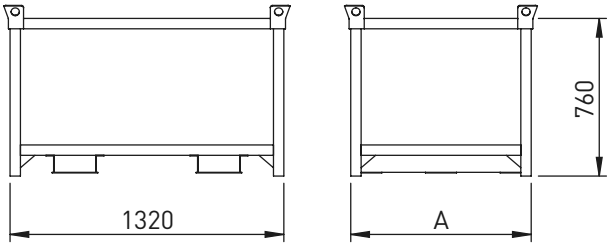


REF.	A (mm)	WEIGHT (kg)	CAPACITY (t)
Z-8/6	1090	180	2,0

Z-8/7

Bin for flat rack



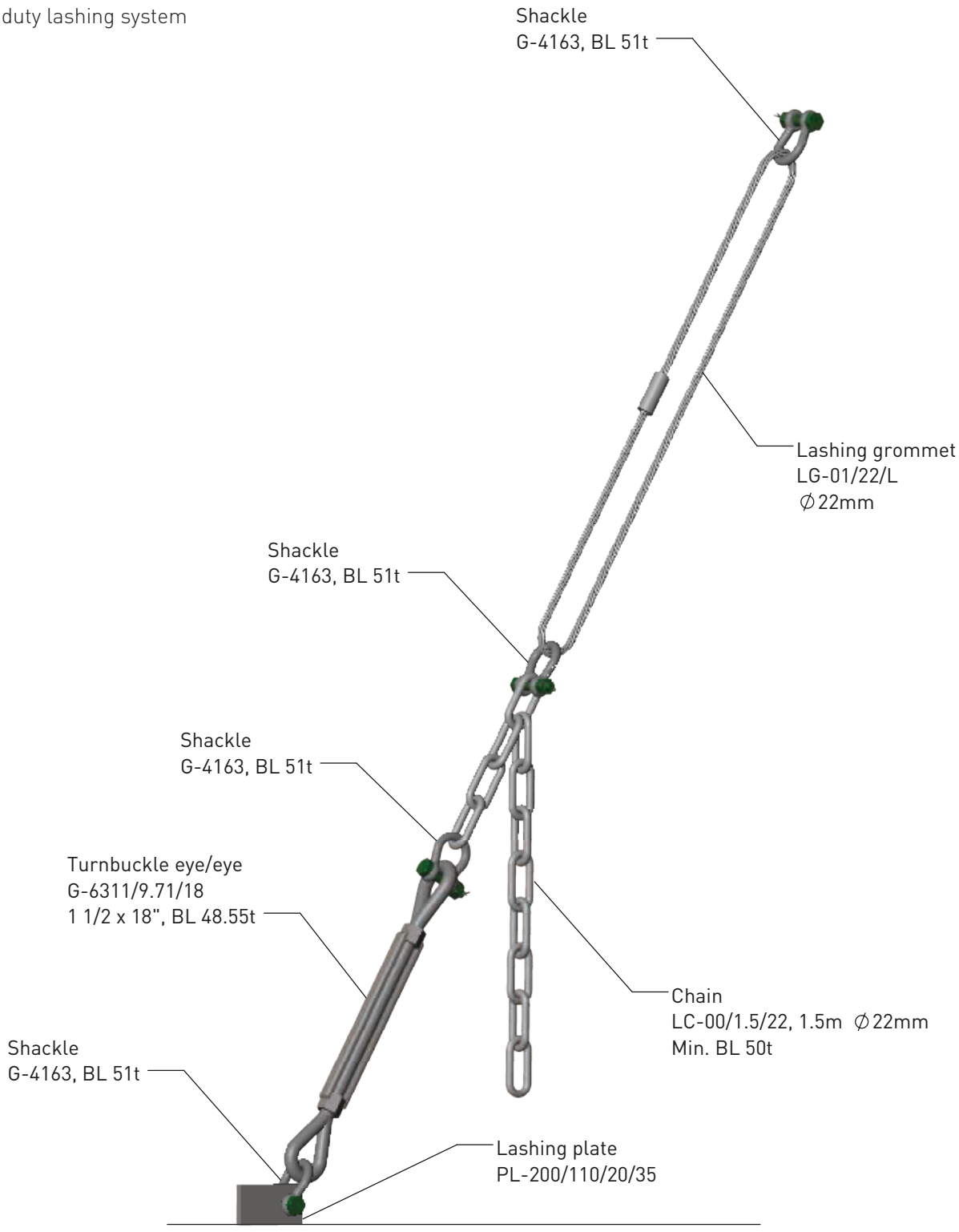


REF.	A (mm)	WEIGHT (kg)	CAPACITY (t)
Z-8/7	870	120	2,0

Heavy Duty Lashing

Z-80

Heavy duty lashing system

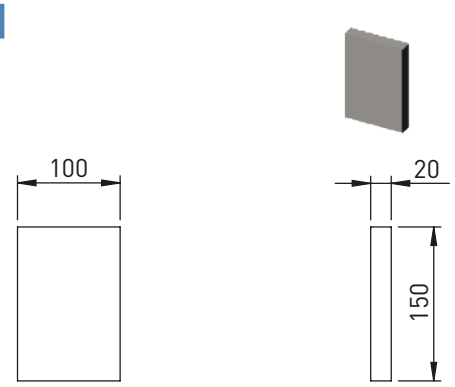


SPECIFICATIONS

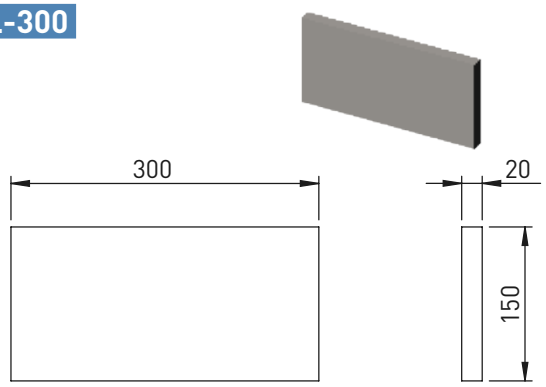
(MSL) Max. securing load: 10t
Safety factor: 4

Stopper Plates

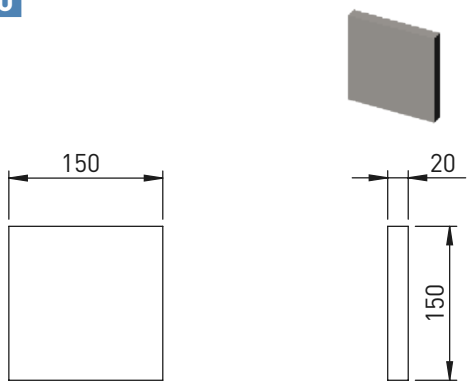
PL-100



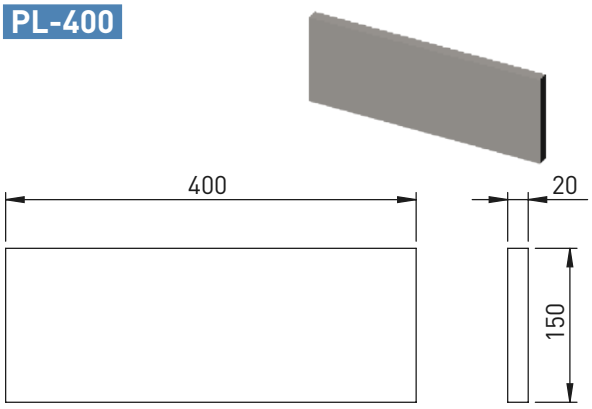
PL-300



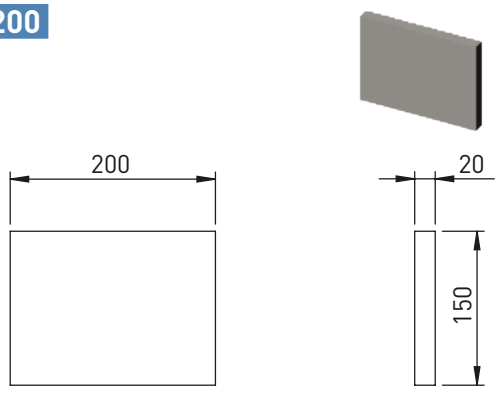
PL-150



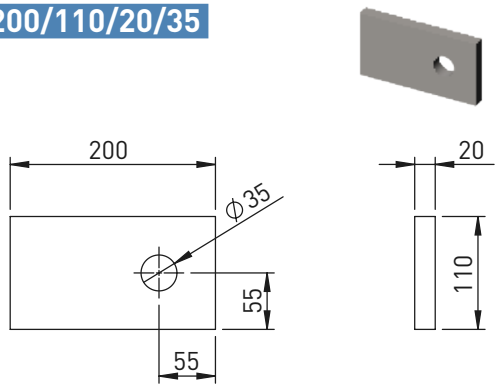
PL-400



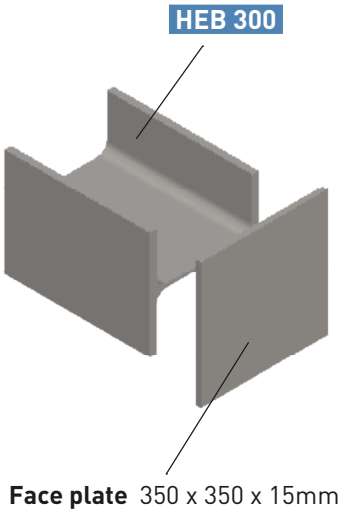
PL-200



PL-200/110/20/35



STOPPER BEAM

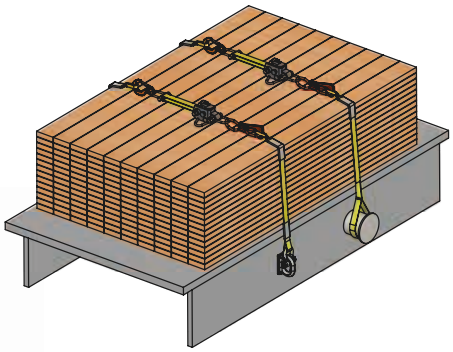


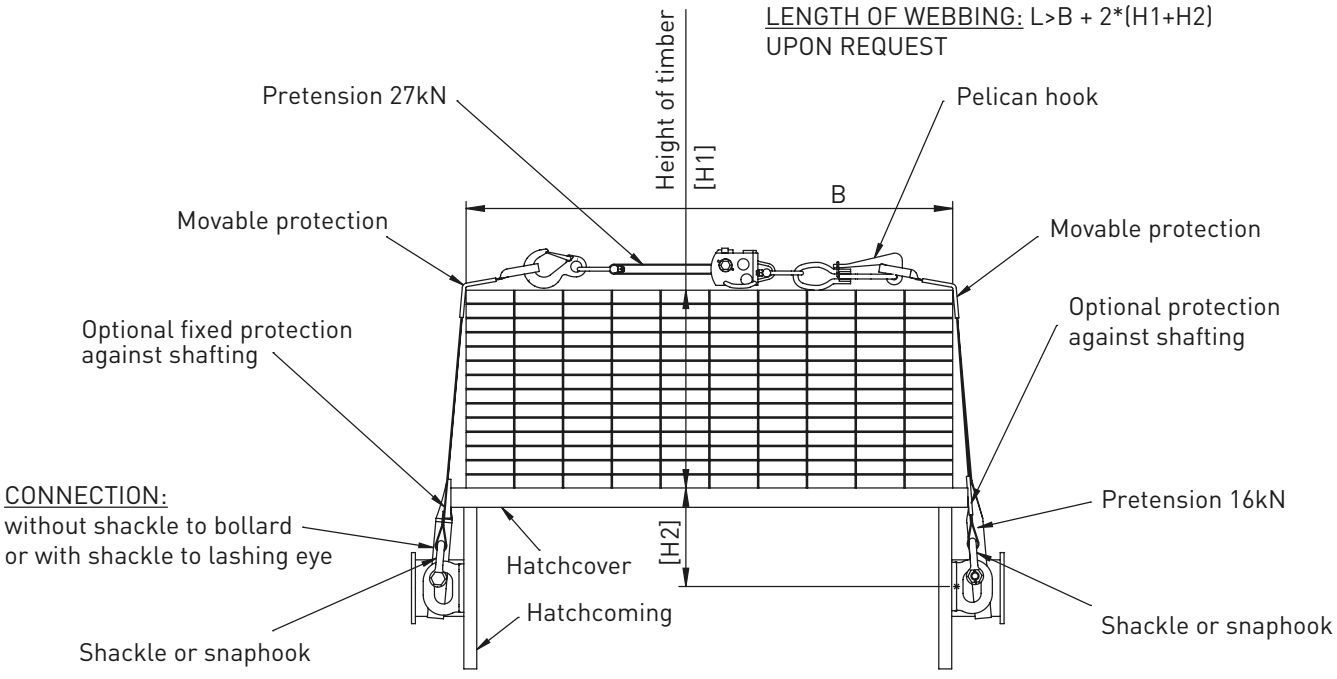
Face plate 350 x 350 x 15mm

Complete Lashing System

Z-7

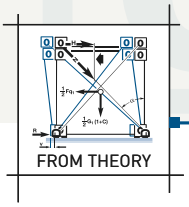
Timber lashing system





SPECIFICATION

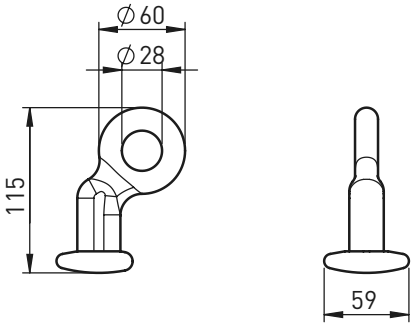
(MSL) Max. securing load: 133kN



Hooks

H-20

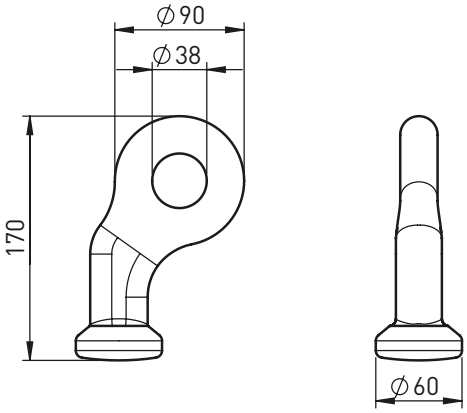
Elephant foot with eye



SPECIFICATION
(MSL) Max. securing load: tension 100kN
(MBL) Min. breaking load: tension 200kN

H-20/50

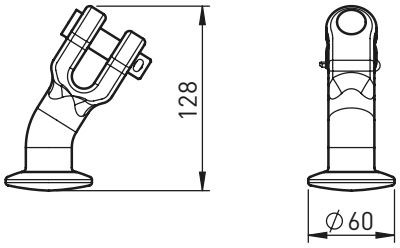
Elephant foot with eye



SPECIFICATION
(MSL) Max. securing load: tension 245kN
(MBL) Min. breaking load: tension 490kN

H-21

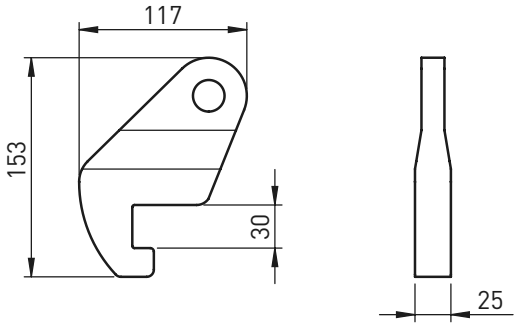
Elephant foot with jaw



SPECIFICATION
(MSL) Max. securing load: tension 100kN
(MBL) Min. breaking load: tension 200kN

H-43

Hook for ISO-hole

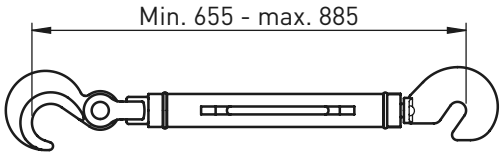


SPECIFICATION
(MSL) Max. securing load: tension 100kN
(MBL) Min. breaking load: tension 200kN

Chain Spanners - Turnbuckles

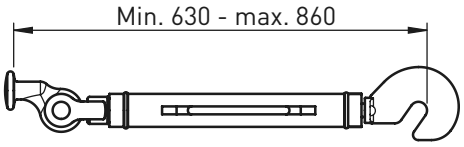
S-21A

Chain turnbuckle:
hook - hook



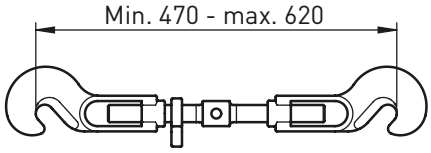
S-23

Chain turnbuckle:
elephant foot - hook



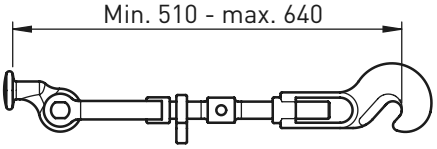
S-24

Chain turnbuckle:
hook - hook



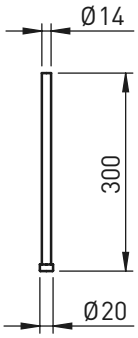
S-25

Chain turnbuckle:
elephant foot - hook



S-96

Spanner for S-312/50
S-24
S-25



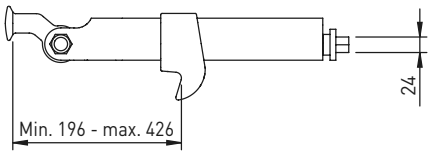
SPECIFICATION

(MSL) Max. securing load: tension 100kN
(MBL) Min. breaking load: tension 200kN

Chain Spanners - Speedkings

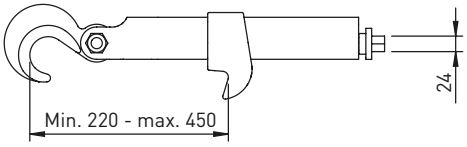
S-42

Speedking with elephant foot



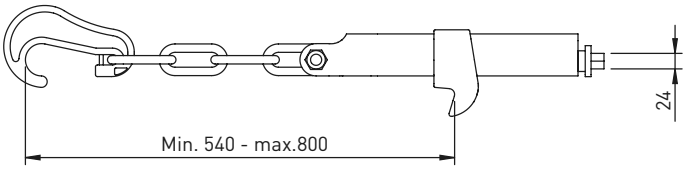
S-44

Speedking with hook



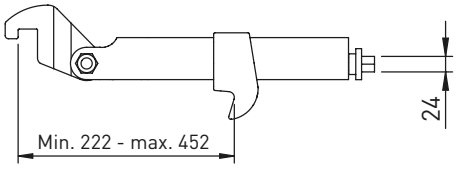
S-45

Speedking with chain and hook



S-46

Speedking with ISO hook



PNEUMATIC TOOLS FOR SPEEDKINGS

S-98A

S-98

S-98D

S-98B

S-98C

SPECIFICATION

(MSL) Max. securing load: tension 100kN
(MBL) Min. breaking load: tension 200kN

Lashing Straps

RR-33/3/50

Hook-hook trailer lashing with ratchet

SPECIFICATIONS
(MBL) Min. breaking load: 12t
Length: 3m

RR-33/3/75

Hook-hook (swivel) trailer lashing with ratchet

SPECIFICATIONS
(MBL) Min. breaking load: 20t
Length: 3m

RR-34/3/50

Hook-elephant foot trailer lashing with ratchet

SPECIFICATIONS
(MBL) Min. breaking load: 12t
Length: 3m

RR-34/3/75

Hook (swivel)-elephant foot trailer lashing with ratchet

SPECIFICATIONS
(MBL) Min. breaking load: 20t
Length: 3m

Lashing Straps

RR-35

Hook-hook trailer lashing with 28mm nut winch

■ **SPECIFICATIONS**
(MBL) Min. breaking load: 20t
Length upon request

S-93

28mm nut winch handle,
to be used with RR-35 or RR-36

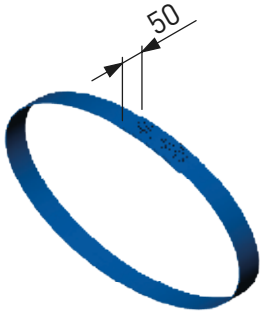
RR-36

Hook-elephant foot trailer lashing with 28mm nut winch

■ **SPECIFICATIONS**
(MBL) Min. breaking load: 20t
Length upon request

RR-38/3/50

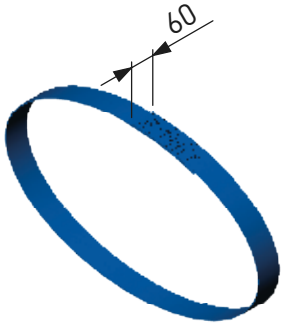
Truck loop



■ **SPECIFICATIONS**
Circumference: 3000mm
(MBL) Min. breaking load: 9t

RR-38/3/60

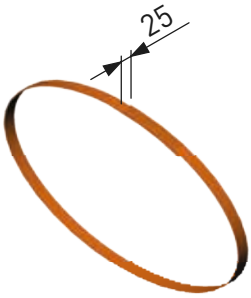
Truck loop



■ **SPECIFICATIONS**
Circumference: 3000mm
(MBL) Min. breaking load: 15t

RR-40

Car loop

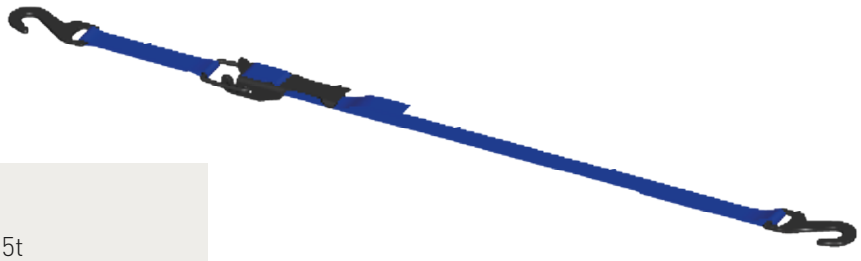


■ **SPECIFICATIONS**
Circumference: 1000mm
(MBL) Min. breaking load: 2,5t

Car Lashing Straps

RR-31

Car lashing



SPECIFICATIONS
(MBL) Min. breaking load: 1,5t
Max. working length: 2m

RR-31A and RR-31A/20

Car lashing with loop

SPECIFICATIONS
(MBL) Min. breaking load RR-31A: 1,5t
(MBL) Min. breaking load RR-31A/20: 2t
Max. working length: 2m

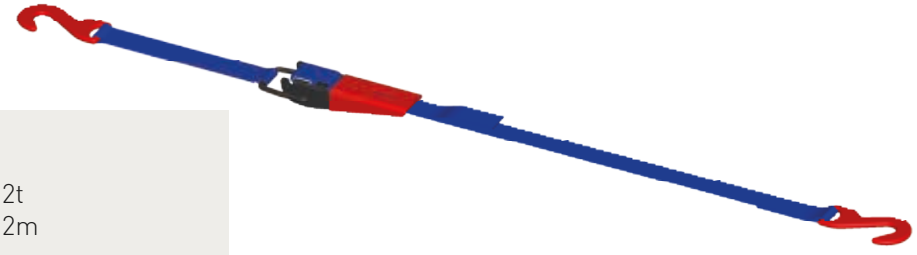
RR-31C/20

Car lashing with loop

SPECIFICATIONS
(MBL) Min. breaking load: 2t
Max. working length: 2m

RR-31D

Car lashing



SPECIFICATIONS
(MBL) Min. breaking load: 2t
Max. working length: 2m

Vehicle Lashing Straps

RR-32/L/50

Cargo lashing with ratchet

SPECIFICATIONS
(MBL) Min. breaking load: 5t
Length: 3m/5m/9m

RR-32/L/75

Cargo lashing with ratchet

SPECIFICATIONS
(MBL) Min. breaking load: 10t
Length: 10m/15m/20m/25m

RR-321/L/50

Bus lashing with ratchet

SPECIFICATIONS
(MBL) Min. breaking load: 5t
Length: 5m/9m

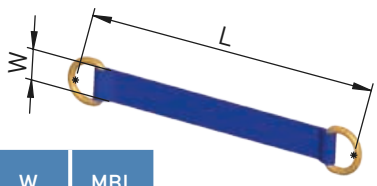
RR-321/L/75

Bus lashing with ratchet

SPECIFICATIONS
(MBL) Min. breaking load: 10t
Length: 10m/15m

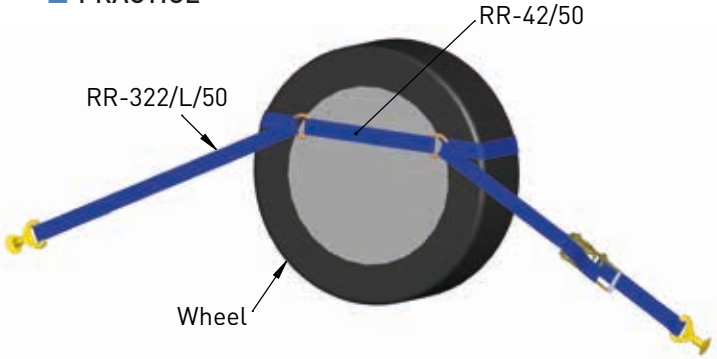
RR-42

For wheel lashing



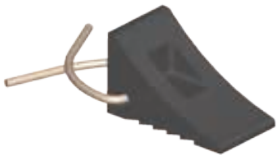
REF.	L (mm)	W (mm)	MBL (t)
RR-42/50	520	50	5
RR-42/75	850	75	10

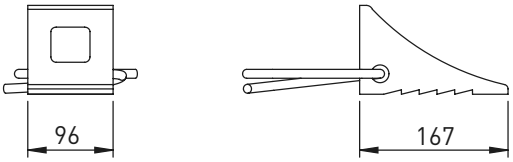
PRACTICE



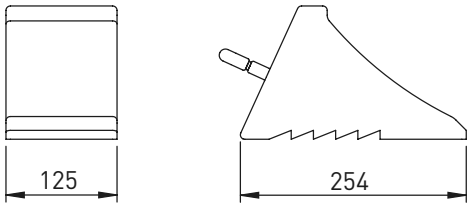
Chocks and Jacks

RR-01
Car chock

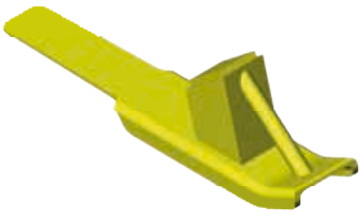


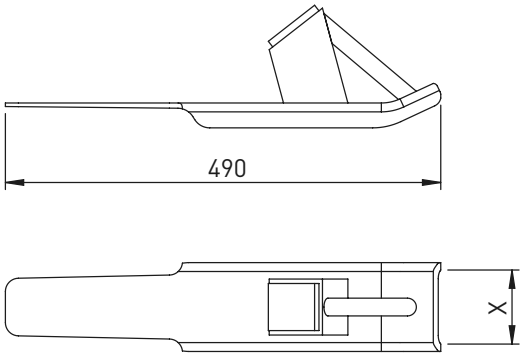


RR-02
Trailer chock

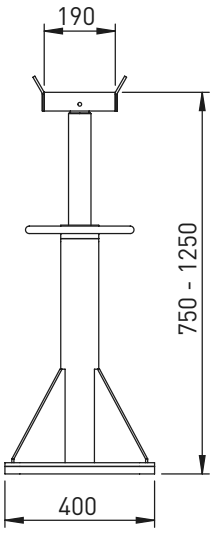


RR-03
Railway chock

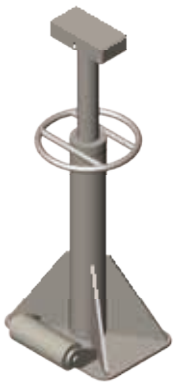


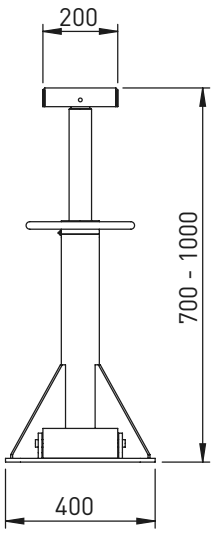


RR-11
Trailer jack



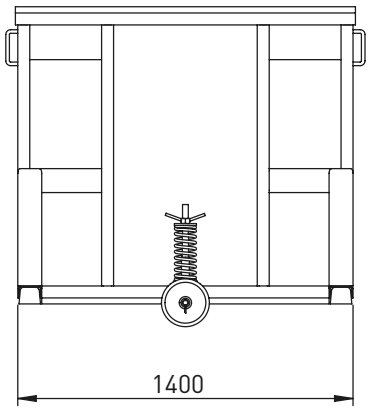
RR-14
Rail car jack

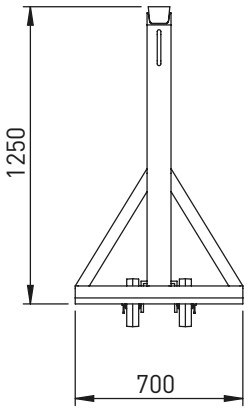




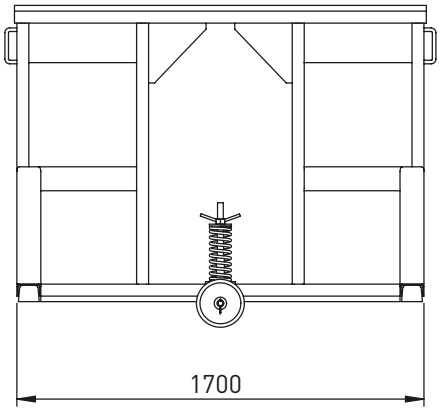
Trailer Horses

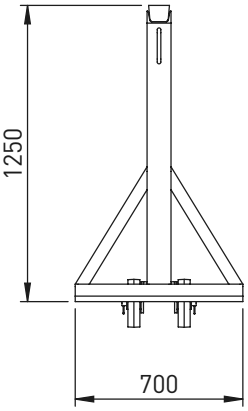
RR-21/140





RR-21/170





ALTERNATIVE PARTS

Synthetic top beam

Rubber wheels

SPARE PARTS

Wheels

Wheel assembly

SPECIFICATIONS

(MBL) Min. Breaking load: compression 1000kN
Other types on request
Spare: hardwood top beams, synthetic top beams, wheels and wheel assembly

TO PRACTICE

Notes

LIFTING




Regulations And Inspection In The Lifting Field

Regulations

THE MACHINERY DIRECTIVE

The founder text of regulations regarding lifting, the Machinery Directive has evolved many times since 1989 and presently bears the N° 2006/42/CE, which has been in force since 29/12/2009. This Directive fixes the essential health and safety requirements concerning the products design and imposes on all CE States to transpose enacted principles in their respective law.

Two main notions sum up the Directive philosophy:

a) The design of machines and partly completed machinery must eliminate or reduce the risks to the utmost and users must be informed of any remaining risks; in other words, the manufacturer should ascertain the employability of the material put on the market (i.e. that it satisfies all health and safety requirements, with a technical file, the issue of instructions, the delivery of a declaration of conformity and the affixing of CE marking);

b) Users of lifting equipment (machines, lifting accessories, accessory components, chains, metallic or textile wire ropes, lifting webbings) should choose them according to the performed work, the factory characteristics and take all the necessary steps to secure their safety, i.e. that they are fully responsible for checking when putting into service, of periodical examinations and when restarting.

STANDARDS

They refer to technical specifications published by standardization organisms (ISO, CEN, AFNOR) made with the participation of interested parties (manufacturers, users, notified bodies) and serve as a basis for the establishment of the supply agreements of new equipment; the reference to European standards (prefix EN) means – for the products respecting them – a presumption of conformity to the regulation: as for any standard, the conformity is not compulsory, but unquestionably constitutes an evidence of safety.

CE MARKING AND DECLARATION OF CONFORMITY

Marking certifies that the working equipment conforms with the technical rules and respects the clauses of the directives which concern it (assessment of conformity with internal checks, CE type examination, full quality assurance). Regulatory compulsory, the marking is used for the free movement of goods in the European Community, but is not a certification label.

Moreover, all lifting appliances, lifting accessories and machines – as defined in the Machinery Directive – must be delivered with a CE declaration of conformity and instructions (safety advice and forbidden dangerous uses). The final user must read it before putting the machinery or the accessory into use.

THE NEW LABOUR CODE AND THE PERIODICAL CHECKING

The corner stone of all regulations governing lifting, the Labour Code defines not only the duties of the factory manager regarding the putting at disposal of working equipment, but also the duties to be respected by their users. The Order of 1st March 2004 fixes very precisely the inspections to be performed on working equipment as well as on individual protective equipment, when putting into service and when restarting (examination of adequacy, examination concerning assembly and installation, operating test, static and dynamic tests).

Loads and factors -Inspection documents

MINIMUM BREAKING LOAD (MBL)

Value, specified in kN, reached at the point of a tensile test at which breaking or destruction occurs.

WORKING LOAD LIMIT (WLL) OR SAFE WORKING LOAD (SWL)

Maximum load that the material can support in service, while taking into account the safety factor.

SAFETY FACTOR / WORKING COEFFICIENT (SF)

Ratio between the breaking load and the working load limit MBL / WLL

TEST COEFFICIENT

Test coefficient means the arithmetic ratio between the load used to carry out the static or dynamic tests on lifting machinery or a lifting accessory and the maximum working load marked on the lifting machinery or lifting accessory.

- STATIC TEST: Static test means the test during which lifting machinery or a lifting accessory is first inspected and subjected to a force corresponding to the maximum working load multiplied by the appropriate static test coefficient and then re-inspected once the said load has been released to ensure that no damage has occurred. The factor is equal to 1,5 for hand powered lifting equipment and to 1,25 for the other equipment.

- DYNAMIC TEST: Dynamic test means the test during which lifting machinery is operated in all its possible configurations at the maximum working load multiplied by the appropriate dynamic test coefficient with account being taken of the dynamic behavior of the lifting machinery in order to check that it functions properly. The factor is equal to 1,1.

SAFETY FACTORS / WORKING COEFFICIENTS

- The working coefficient of wire-rope / rope-end combinations is equal to 5.
- The working coefficient of chains is equal to 4.
- The working coefficient for textile ropes or slings is dependent on the material, method of manufacture, dimensions and use. This coefficient must be chosen in such a way as to guarantee an adequate level of safety; it is equal to 7, provided the materials used are shown to be of very good quality and the method of manufacture is appropriate to the intended use. Should this not be the case, the coefficient is set at a higher level in order to secure an equivalent level of safety.
- All metallic components making up, or used with, a sling must have a working coefficient equal to 4.

TYPES OF INSPECTION DOCUMENTS ACCORDING TO EN 10204

a) Type 2.1: Declaration of compliance with the order:
Document in which the producer declares that the delivered products are conform to the order instructions, with no test results.

b) Type 2.2: Test report:
Document in which the producer declares that the delivered products are conform to the order instructions, and in which he supplies test results based on a non specific inspection.

b) Type 3.1: Inspection certificate:
Document in which the producer declares that the delivered products are conform to the order instructions, and in which he supplies test results, defined by the product specification, regulations and/or by the order. The document is authenticated by the authorized inspection representative of the producer, independent of manufacturing department.

c) Type 3.2: Inspection certificate:
Document prepared at the same time by the authorized inspection representative of the producer, independent of the manufacturing department, and either by the authorized inspection representative of the buyer, or by the inspector designated by regulations and in which they declare that the delivered products are conform to the order instructions, with test results supplied.

Lifting Beam Design

Container Technics nv is specialized in the delivery of custom-made lifting gear like spreader bars and lifting beams. The whole process from the design to delivery of the lifting gear is managed by our experts.

They design the lifting gear to the customers' demands and in accordance with all relevant regulations i.e. from classification societies. Our logistic team is experienced in ensuring a smooth world-wide delivery.

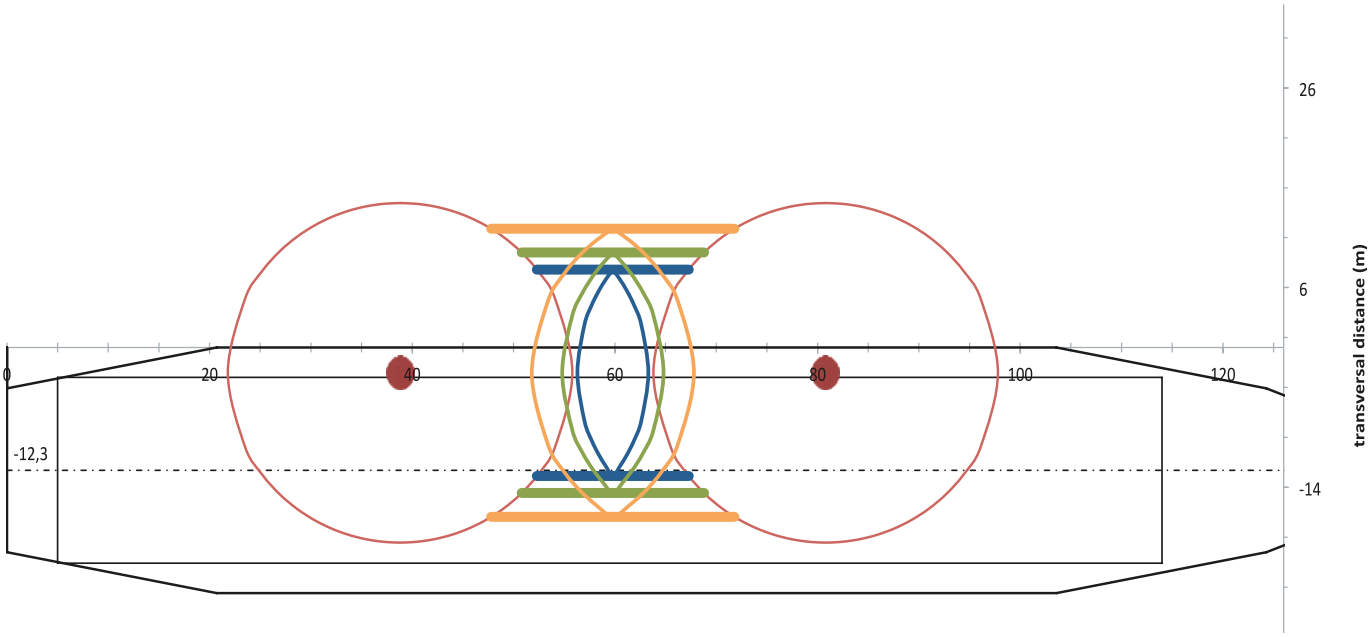
How we work

DESIGN → ENGINEERING → PRODUCTION → TESTING → DELIVERY

Design

A design always starts with the translation of the customers' demands into technical requirements for the lifting device. From this stage on we think along with our customers to create a design to suit their needs. For project and/or cargo specific lifting gear, these requirements are often very clear.

For lifting gear that will be on board of a specific ship during its entire lifetime, there is a lot of uncertainty about the load that is to be hoisted. For these lifting beams we always aim to make the design as flexible as possible to ensure that the lifting beam can satisfy not only current but also future market demands.



On the following pages, you will find some basic principles which serve as a base for our custom designs.

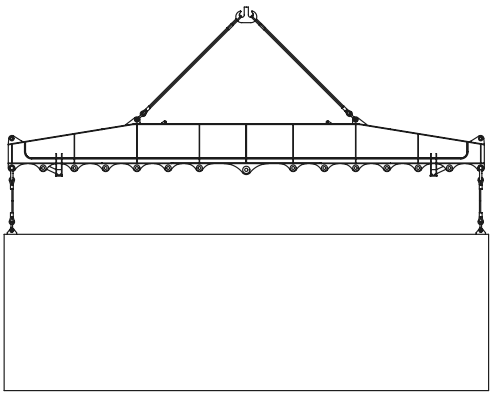
Lifting beams

Lifting beams are structures that can be used between the crane hook and the cargo to decrease the lifting height, avoid the induction of stress in the cargo or to combine two cranes to increase the total lifting capacity of the vessel.

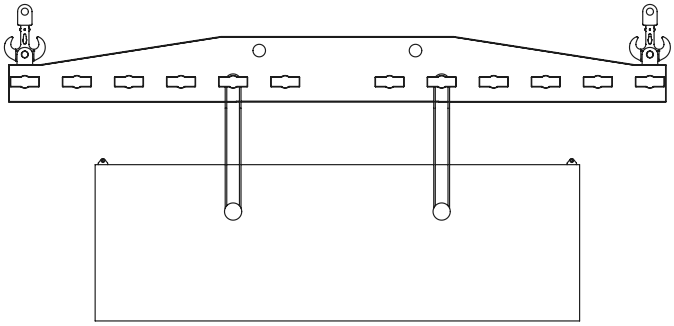
Lifting beams are designed in such a way as to create a horizontal distance between the connection point to the load and the connection point to the crane. This distance is called the bending lever and forms – in combination with the lifting capacity – the bending moment, which is one of the most important design factors of a lifting beam. The other important design characteristics are:

- Maximum length
- The capacity or SWL
- The type of connection points
- The number of connection points

These characteristics form the base on which the most suitable design is chosen. The two main types of lifting beams and their characteristics are shown below.



Lifting beam avoids adverse forces on cargo



Tandem lift with reduced lifting height

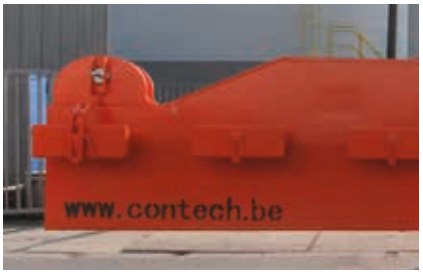
BOX-SHAPED LIFTING BEAMS

The most common box beam is equipped with bollards to facilitate the connection of the crane to the load. The key characteristics of such a beam are:

- Highly versatile
- Connection with grommets, heavy and expensive shackles are not required
- Ideal for heavy loads and long lengths
- Heavier but sturdier than its I-beam counterpart

Other types of connection points can be added or can replace the bollards as connection point between the load and the crane. A brief overview of the possibilities is shown in the pictures below.

Additional eye for crane connection



Eye structure for direct crane connection

With rounded top for oversling to load

I-SHAPED LIFTING BEAMS

The most common I-beam is provided with lifting eyes to facilitate the connection of the crane to the load. This implies that shackles compatible with the lifting eyes are to be used.

The I-shaped beams are most suited to:

- Lower capacities
- Shorter lengths

Typical limiting dimensions are about 15m and SWL: 180t

The main advantage compared to a box beam is the lower own weight of an I-shaped beam.

Although the use of lifting eyes is the most common solution, we can provide I-shaped beams with other connection points on request. Examples of other connection points are shown on the following page.

I-Shaped beam with bollards andoversling

Spreader beams

Spreader beams avoid adverse loading of the cargo and its connection points when more than one connection point is to be connected to one connection point of the lifting appliance. In contrast to lifting beams, spreader beams are not designed for bending moments. This implies that spreader beams have their connection points to the load closely positioned to the crane connection points. Designing the lifting device according to this principle has the advantage of reducing its own weight and the disadvantage of reducing its flexibility and increasing the required lifting height. Making the beam more flexible means compromising on the own weight factor and as a consequence different kind of systems are developed: some with a stronger focus on a low own weight and some with a stronger focus on flexibility. The main types are shown below.

FIXED LENGTH SPREADER BEAMS WITH ONE PAIR OF EYES

- Lowest own weight
- Only one pair of top wires required
- No flexibility

FIXED LENGTH SPREADER BEAMS WITH MULTIPLE PAIRS OF EYES

- Relatively lightweight
- More versatile due to multiple connection points
- Multiple pairs of top wires required (one per eye-pair)
- Outer eyes limit positioning in hold when using the inner eyes

MODULAR SPREADER BEAM WITH BOLTED CONNECTION

- Versatile due to length adjustments
- No protruding parts obstructing position in hold
- Multiple pairs of top wires required
- Mounting of bolted connection takes time

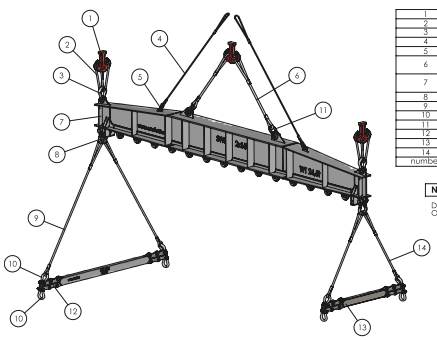
MODULAR SPREADER BEAM WITH PIN CONNECTION

- Heavier than the fixed length and bolted beams
- Versatile due to length adjustments
- No protruding parts obstructing position in hold
- Multiple pairs of top wires required
- Fast and easy connection of multiple parts

EXTENDABLE SPREADER BEAM

- Length of extension limited by minimum length
- Small length adjustments possible
- Heavy concept due to overlap
- Easily adjustable by sliding
- Multiple pairs of top wires required

Lifting Sets

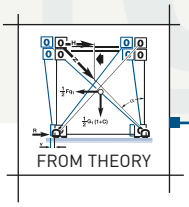


number	item	quantity
1	Crane hook	
2	Grommet SWL 82t - 1.5m	4
3	Wide body shackle SWL 200t	2
4	Wire 25t + 7m timble / eye	2
5	Bow Shackle 25t	2
6	Wire SWL 120t - 4250mm Timble/eye	2
7	Lifting beam SWL 2x150t - 18.5m (MC-300/180/22)	1
8	Bow Shackle SWL 150t	2
9	Grommet Dia 72 L=7.5m	4
10	Wide body shackle SWL 125t	8
11	Shackle SWL 120t	2
12	Spreader beam (ML=65/82/22)	2
13	Spreader beam (ML=165/52/22)	2
14	Grommet Dia 72 L=4.5m	4

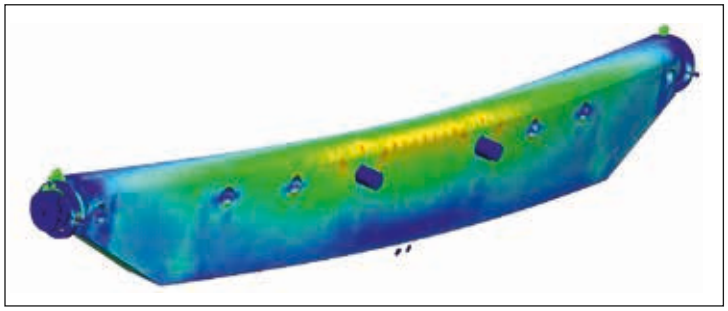
Note

Drawing shows different load and lift possibilities.
Only meant to give an overview

The above concepts can also be used in combination. We can propose complete lifting solutions ranging from one lifting beam combined with two spreader beams to a whole set of different lifting beams.



Engineering



Once the conceptual design is agreed we start with the engineering of the lifting beam. Taking into account all limiting parameters – i.e. own weight, cost, bending moments, lifting height, ... – as determined during the conceptual phase we make the design as competitive as possible. We can design in accordance with the rules and regulations of all major classification societies such as DNV-GL, Lloyds Register of Shipping, Bureau Veritas, and (inter)national standards like CE and ASME. To do this we use 3D modeling and calculation programs such as Solidworks and Dlubal Rfem in addition to our in-house developed calculation sheets.

Production

When the design is finished – and in some case approved by a third party – the manufacturer can start ordering materials and preparing the production drawings. To produce our designs, we work together with multiple manufacturers in Europe and Asia. This gives us the opportunity to look into the market and pick the right supplier on a project by project basis. All beams are made following strict procedures and are followed up by our engineers and – depending on the required certification – a third-party surveyor.

MATERIAL

We have experience in the delivery of lifting beams out of normal strength steels, e.g. D36, and high strength steels, e.g. S690. This gives us the opportunity to optimize the own weight of the lifting device taking into account its total cost. The materials are certified according the requirements of the applicable regulations.

PROOF LOAD TEST

A proof load test is performed on the lifting devices as required by the customer or according to the applicable regulations. The proof load tests often include more than one lifting configuration to ensure that the design is well fabricated and that no flaws are present in the design or production.

FINAL EXAMINATION

The beam is subject to a final control by a third party surveyor before its surface is coated or painted. The control includes a dimensional check and non-destructive testing of the weld. If all tests are passed the lifting beam is ready for the final stage: coating and painting.

COATING AND PAINTING

The lifting beams are painted following the agreed description with regards to the number of layers, layer thickness, marking and colour. To protect areas sensitive to wear an additional protective coating, e.g. Zn-Al, can be applied. To guarantee the quality of the painting, an inspection report including the results of thickness measurements is made.

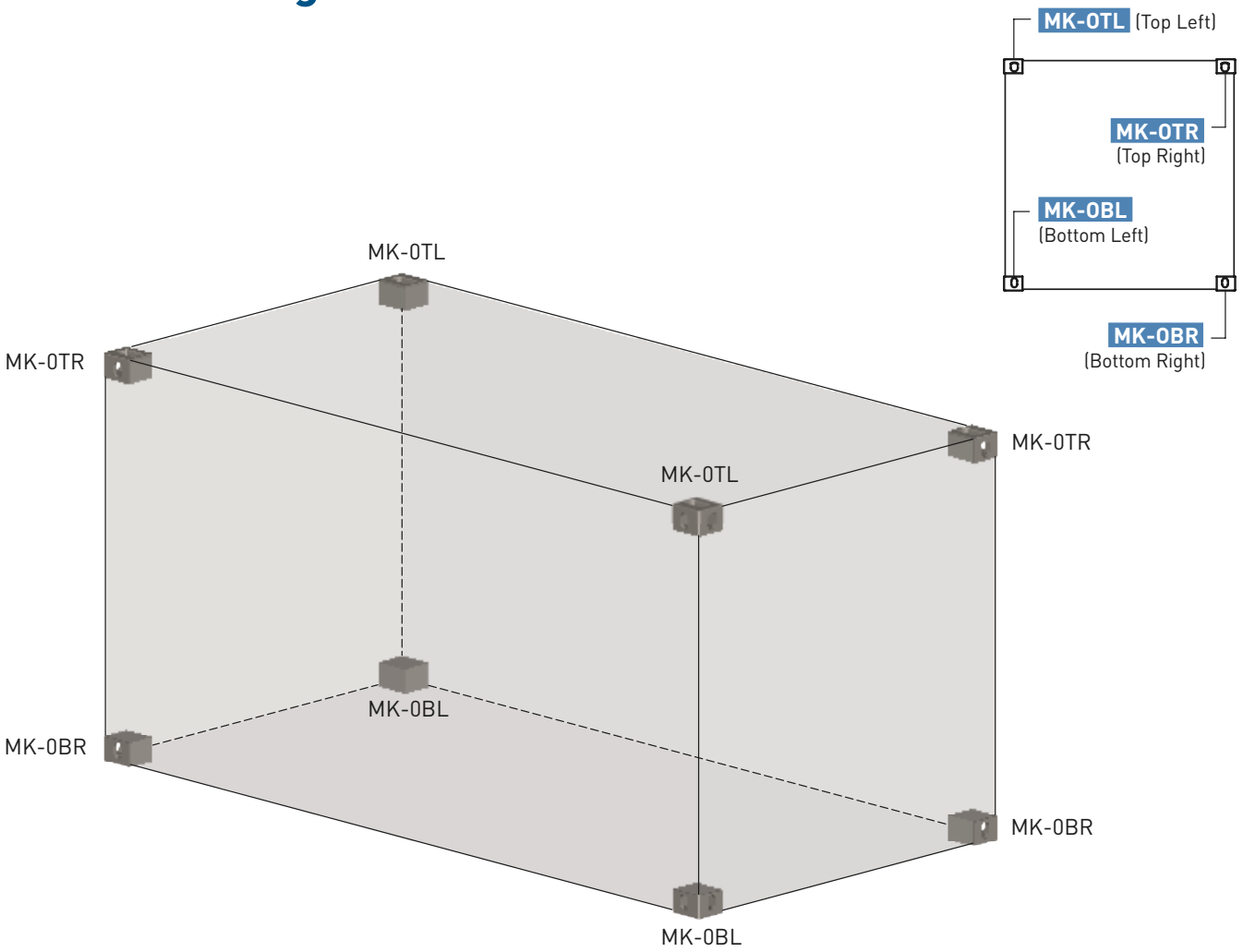
Delivery

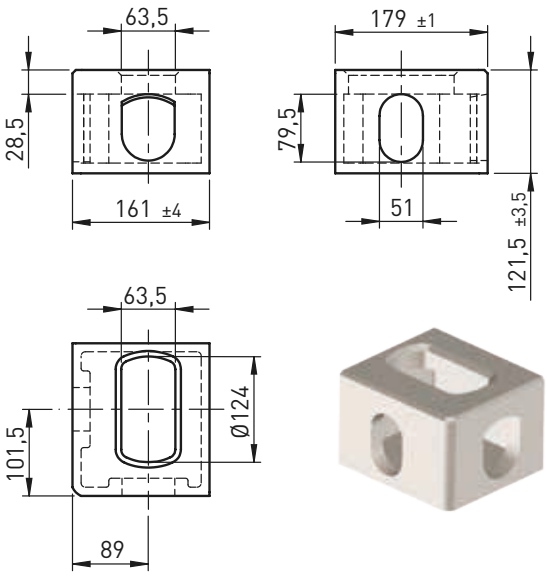
After a final check the lifting beams are ready to be delivered.

STOWAGE ON BOARD

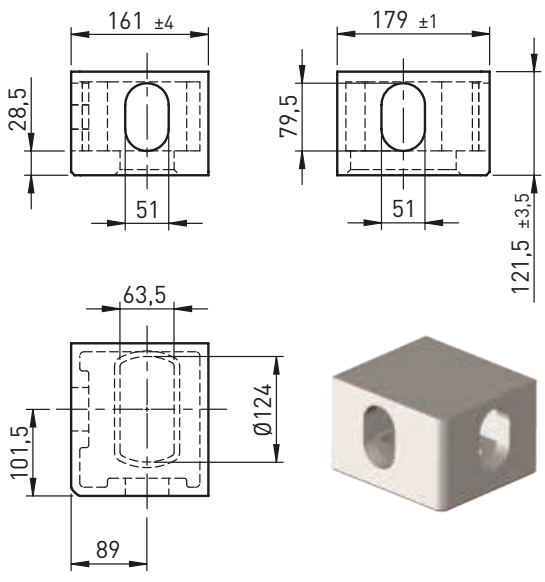
LIFTING SETS

Corner Castings





MK-0TL (MK-0TR mirror inverted)

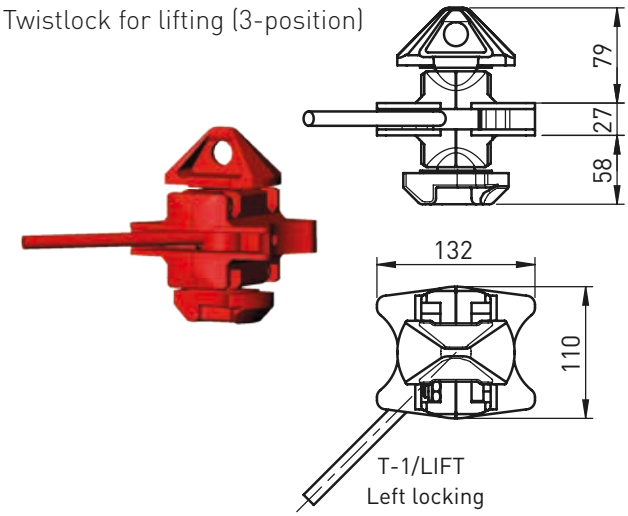


MK-0BL (MK-0BR mirror inverted)

Lifting Products

T-1/LIFT

Twistlock for lifting (3-position)

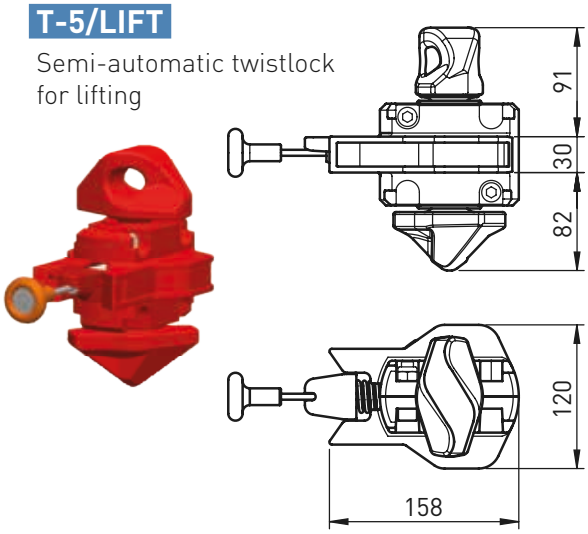


T-1/LIFT
Left locking

■ **SPECIFICATIONS**
(SWL) Safe working load: tension 100kN
(MBL) Min. breaking load: tension 500kN

T-5/LIFT

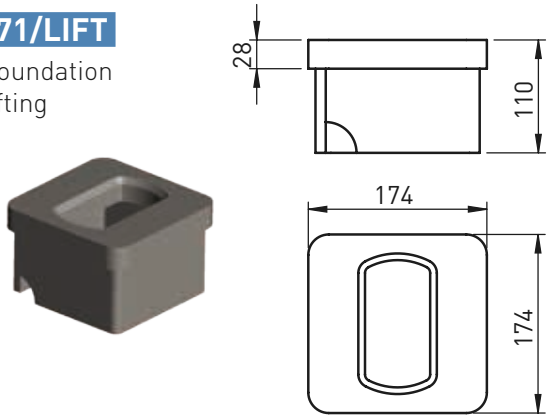
Semi-automatic twistlock for lifting



■ **SPECIFICATIONS**
(SWL) Safe working load: tension 100kN
(MBL) Min. breaking load: tension 500kN

FR-71/LIFT

ISO foundation for lifting



■ **SPECIFICATIONS**
(SWL) Safe working load: tension 100kN
(MBL) Min. breaking load: tension 500kN

■ **OTHER FOUNDATION VARIANTS**

ISO foundations with eye for lifting

FR-71/LIFT/L

FR-71/LIFT/R

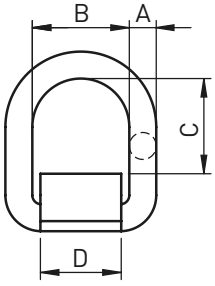
FR-71/LIFT/L2

FR-71/LIFT/R2

■ More information available on request

Weld-on transport D-ring

ISO foundation for lifting

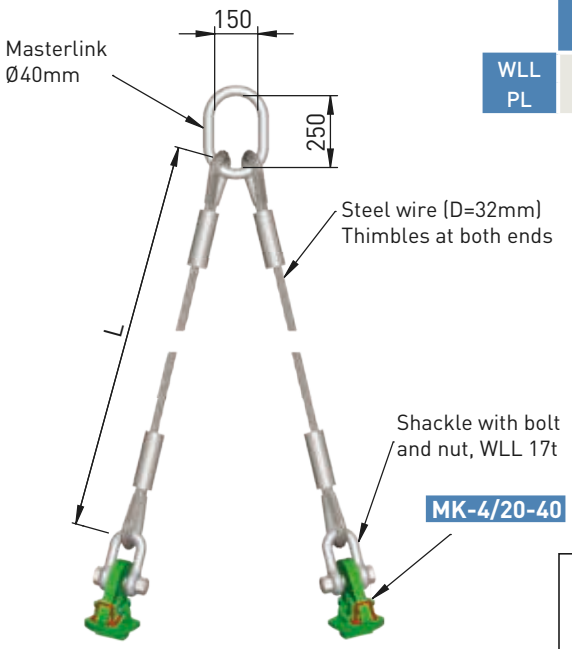


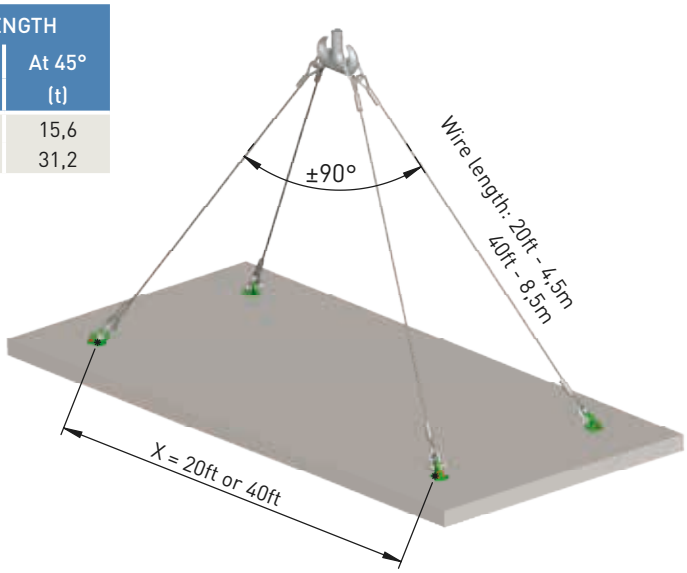
LASHING CAPACITY (t)	DIMENSIONS (mm) A	B	C	D	MBL (t)	WEIGHT (kg)
1,2	42	40	13	35	4,8	0,4
3,2	48	45	118	42	12,8	0,7
5,3	57	55	22	49	21,2	1,2
8	67	70	26	64	32	2,4
15	93	97	34	86	60	5,9

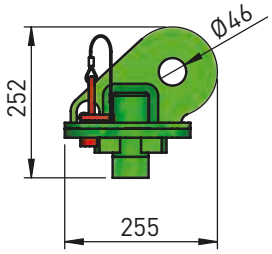
Hatch Cover Lifting Gear

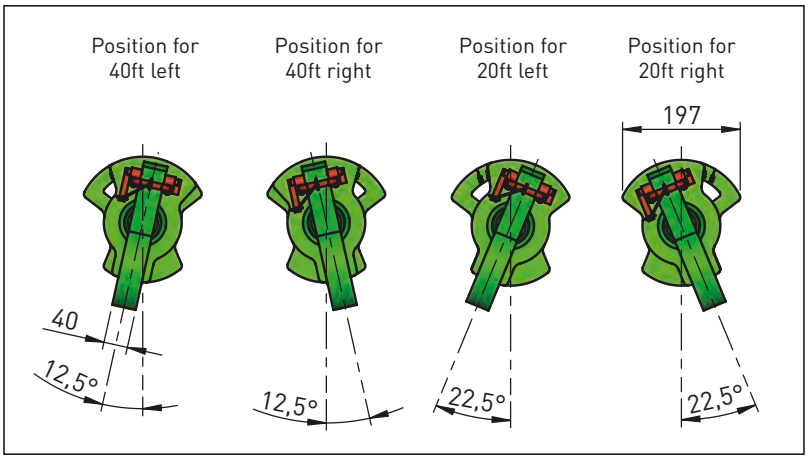
MK-4/20-40/set

	STRENGTH At 60° (t)	At 45° (t)
WLL	16,5	15,6
PL	33	31,2





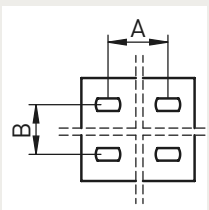




SPECIFICATIONS

WLL of total set is 36t
Combinations with higher WLL
are available on request.
Weight: 15,89kg
Material: Steel
Finish: Painted

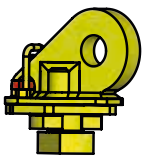
ISO HOLES IN HATCH COVER



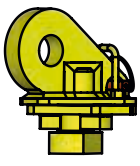
Use only when B ≤ 0,4A

MK-4D

Hatch cover lifting lug (Transversal)

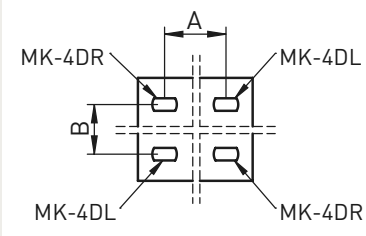


MK-4D/Left



MK-4D/Right

ISO HOLES IN HATCH COVER



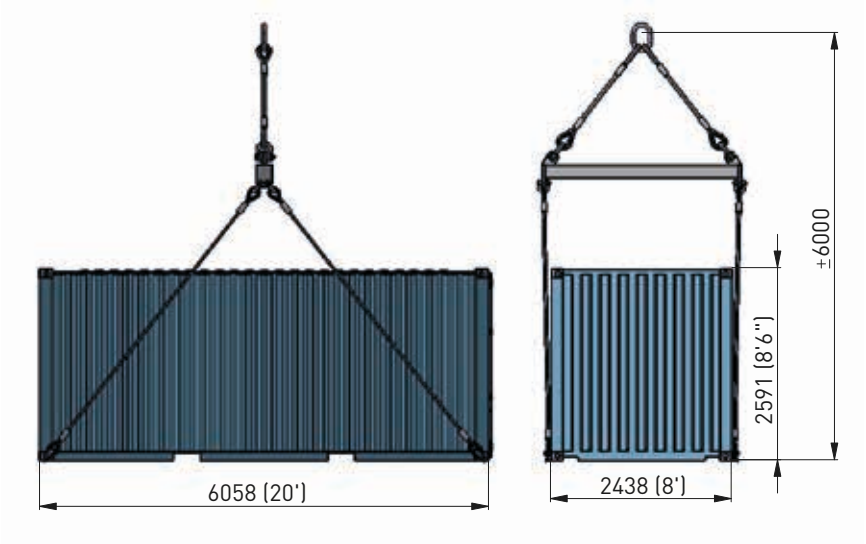
Use only when B ≥ 0,75 x A

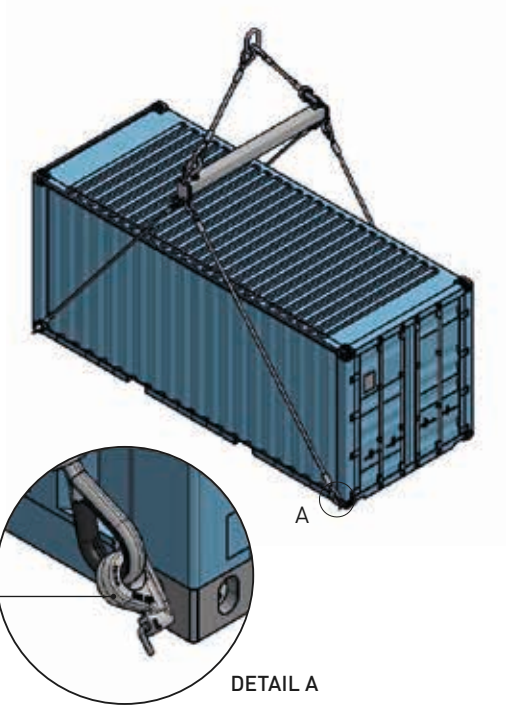
Cannot be used for 20' and
40' container positions

Bottom Lifting Set

20´ with bottom lugs

Bottom lifting set for 20ft
Standard capacities: 25t, 32t, 40t and 56t



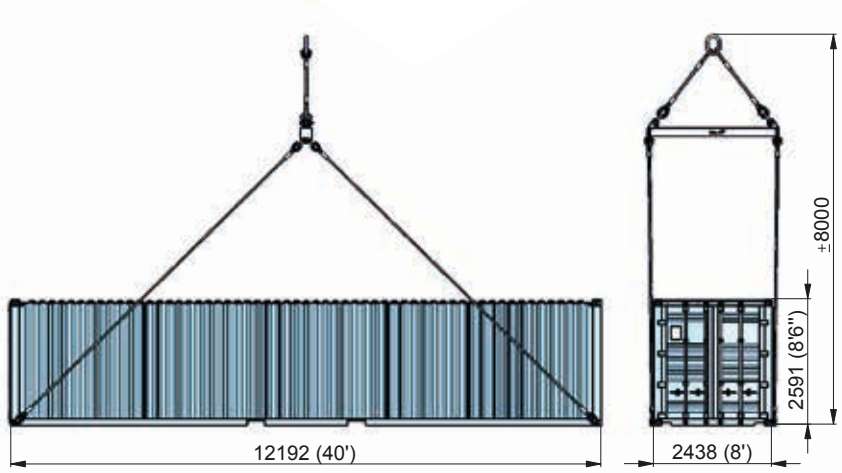


MK-5 bottom lifting lug

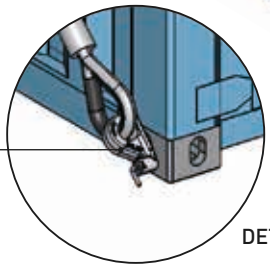
DETAIL A

40´ with bottom lugs

Bottom lifting set for 40ft
Standard capacities: 25t, 32t, 40t and 56t



MK-5 bottom lifting lug

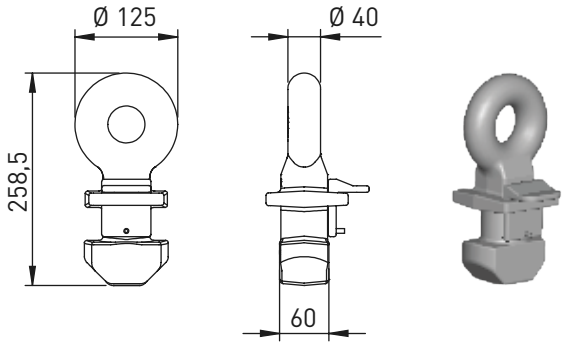


DETAIL A

Lifting Gear For Containers / Cargo

MK-2 Top lifting lug

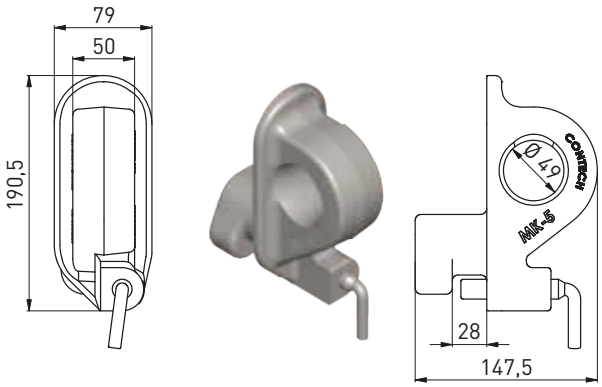
NOTE
Only for vertical lifting, example MK-8



■ **SPECIFICATION**
SWL: 15t

MK-5 ISO Bottom lifting lug

NOTE
Position angle from 0° to 45°;
top angle of wires from 0° to 90°



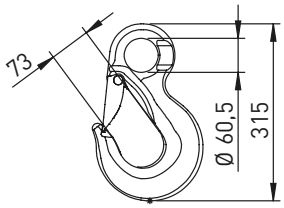
■ **SPECIFICATIONS**
SWL: 20t
PL: 40t

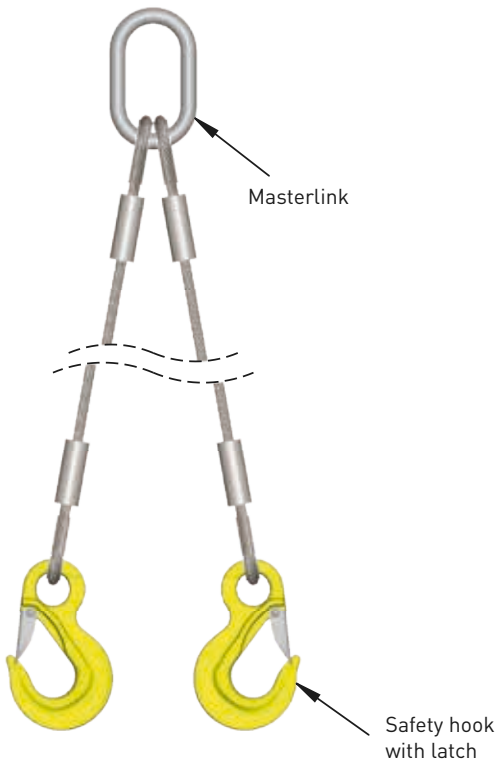
MK-2C/20 and MK-2C/40
Lifting gear for general cargo

NOTE
For lifting 2 pcs, of these double leg slings are required,
Can also be used for top lifting of empty containers.

TYPE	MASTERLINK (mm)	WIRE LENGTH (mm)	SWL (t)
MK-2C/20	240x140	4500	20
MK-2C/40	250x150	8500	30

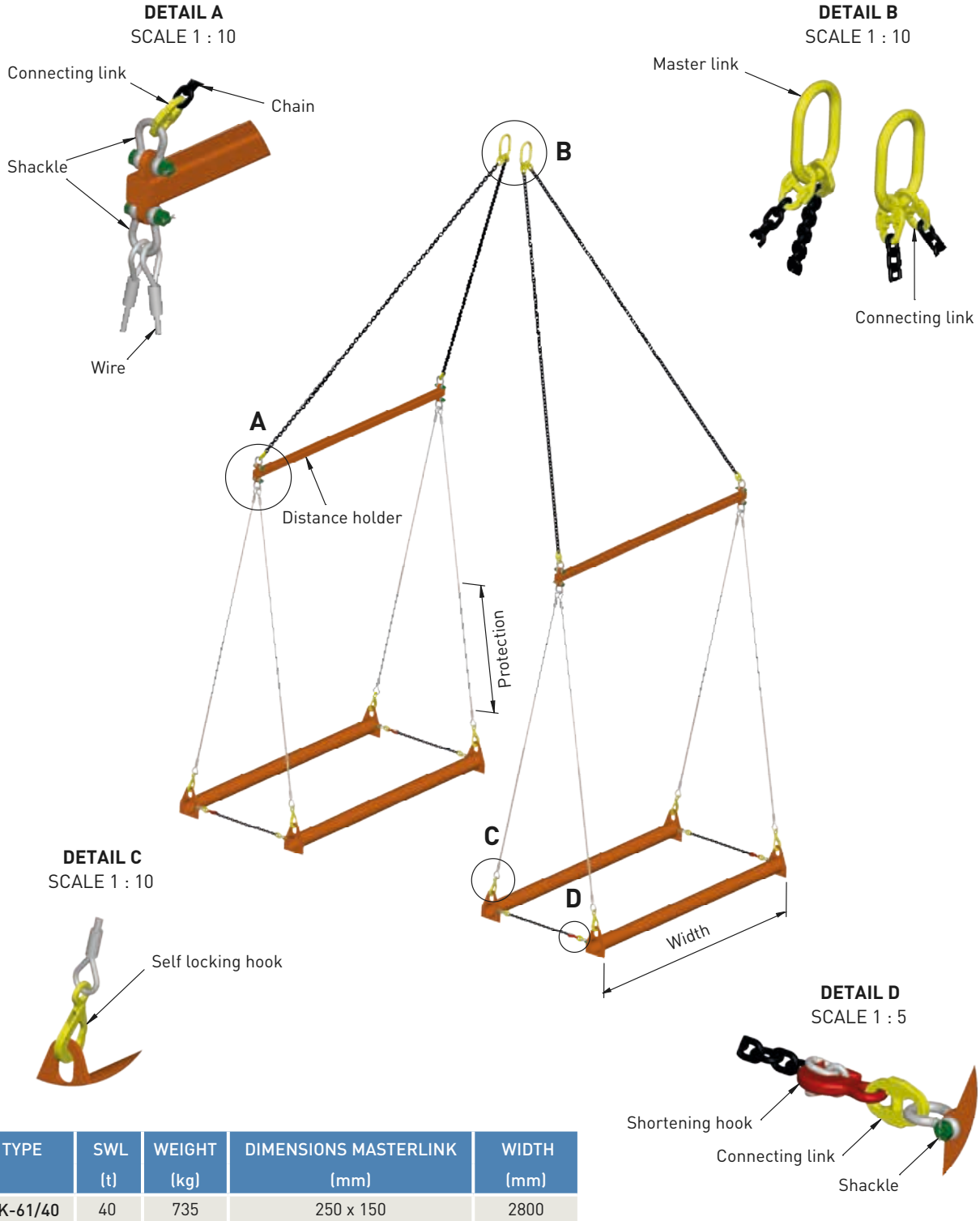
■ EKN-hook
WLL: 16t





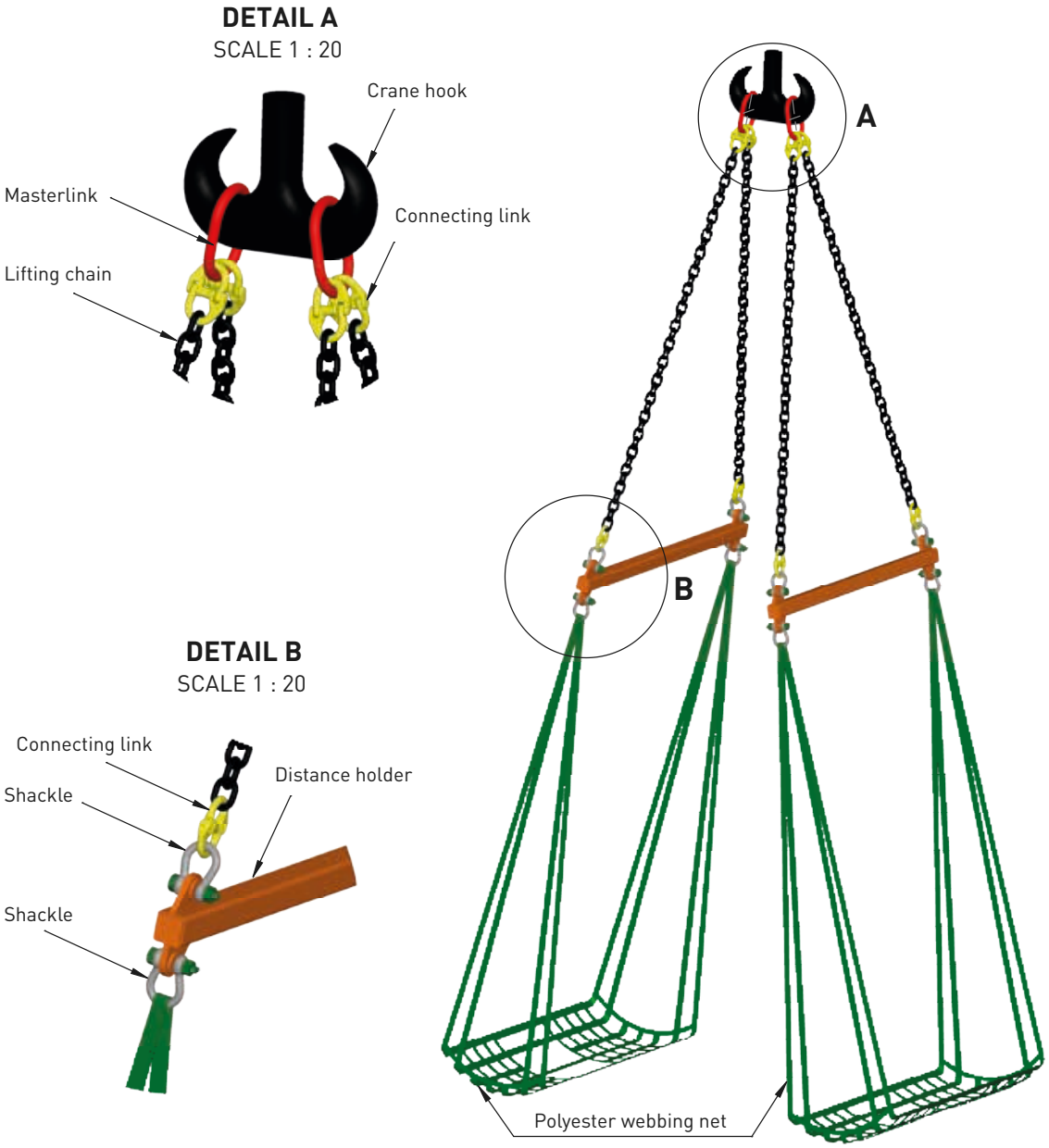
Lifting Gear For Trucks, Vans And Cars

Double beam vehicle lifting gear for trucks



TYPE	SWL (t)	WEIGHT (kg)	DIMENSIONS MASTERLINK (mm)	WIDTH (mm)
MK-61/40	40	735	250 x 150	2800
MK-61/25	25	650	240 x 140	2800
MK-61/15	15	500	190 x 110	2800
MK-71/8	8	400	160 x 95	2200
MK-81/3	3	275	120 x 70	2000

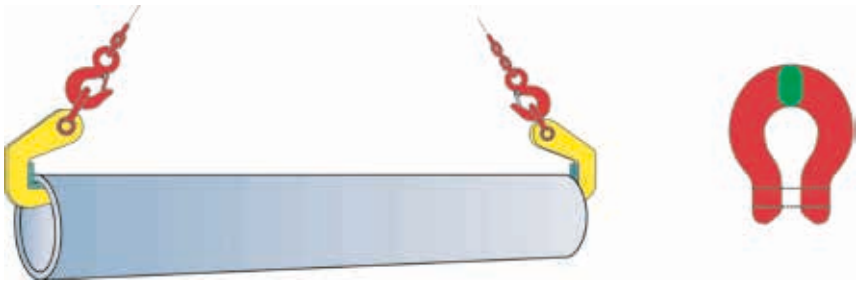
Polyester webbing net

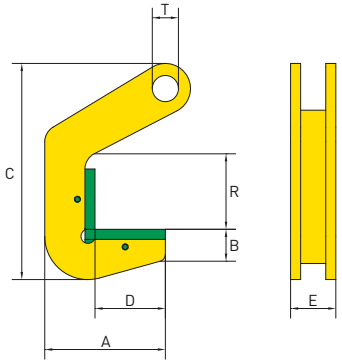


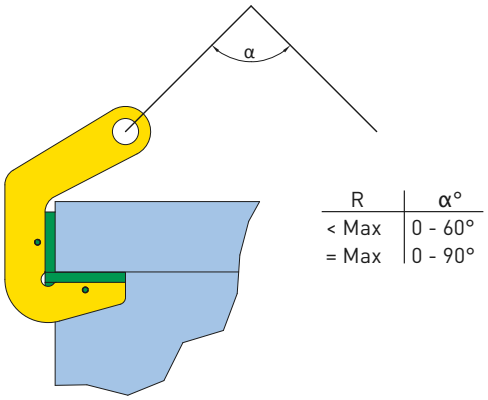
TYPE	SWL (t)	WEIGHT (kg)	DIM. MASTERLINK (mm)	WIDTH (mm)
MK-63/32	32	260	250 x 150	2800
MK-73/10	10	180	160 x 95	2200
MK-83/3	3	120	160 x 70	2000

Lifting Clamp For Tubes

- For the horizontal lifting and transporting of steel and concrete pipes.
- Compact shape and relatively low unit weight combined with a high lifting capacity.
- The surface is equipped with special wear resistant plastic.
- TPH clamps are delivered in pairs.
- Replacement parts for the plastic cover are available and easy to change.



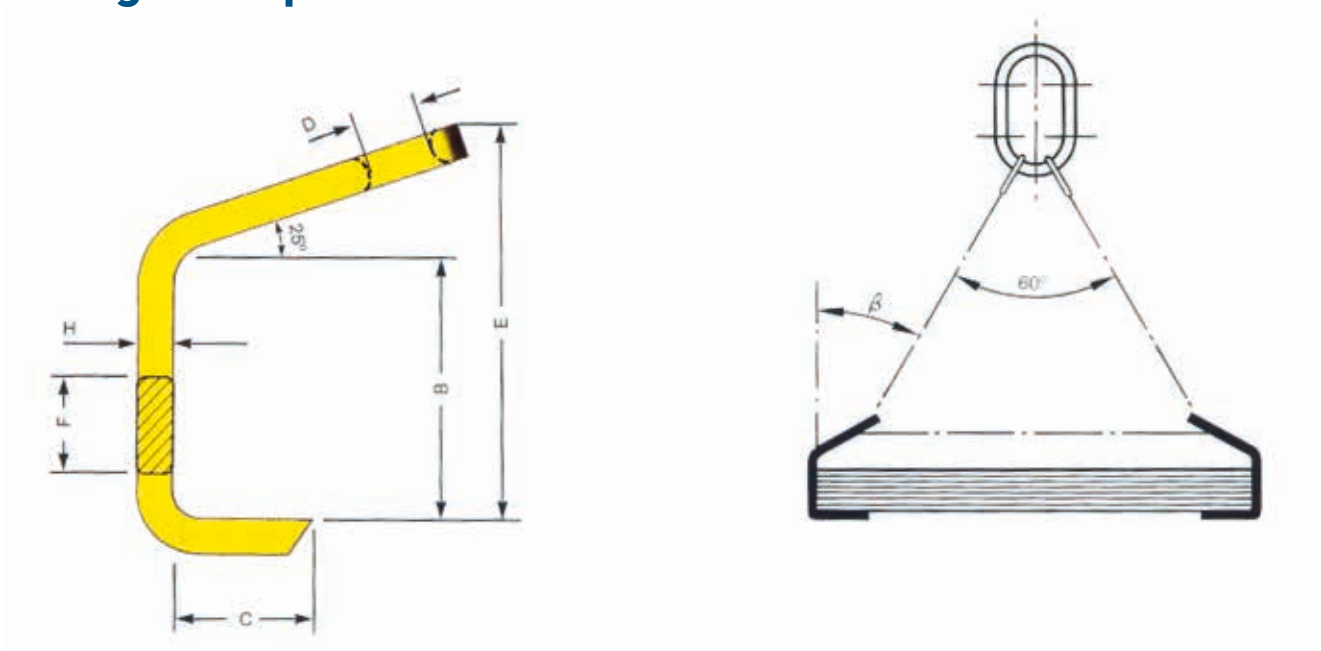




R	α°
< Max	0 - 60°
= Max	0 - 90°

ARTICLE N°	MODEL	CAPACITY PER PAIR	JAW OPENING	DIMENSIONS							WEIGHT PER PC.
				V	S	W	U	T	X	Y	
		(kg)	(mm)	(mm	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(kg)
960150	1.5 TPH	1500	40	120	70	50	185	16	41	25	2
960300	3 TPH	3000	40	120	70	50	185	16	41	25	2
960400	4 TPH	4000	50	140	70	58	204	26	41	25	3
960600	6 TPH	6000	50	140	70	58	204	26	41	25	3
960800	8 TPH	8000	70	140	70	58	224	26	45	25	3,4
960810	10TPH	10000	70	140	70	58	224	26	85	45	7
960812	12TPH	12000	70	140	70	58	224	26	85	45	7
960815	15TPH	15000	70	155	70	76	250	26	100	60	9
960820	20TPH	20000	70	155	70	76	250	26	100	60	9
965050	5 TPH-HD	5000	60	271	100	85	230	26	80	20	6,7
965100	10 TPH-HD	10000	60	271	100	85	230	26	80	30	9,7
965200	20 TPH-HD	20000	60	291	100	105	269	36	80	35	14
965300	30 TPH-HD	30000	60	309	100	115	293	43	80	40	19
965600	60 TPH-HD	60000	60	309	100	115	313	62	80	60	28,5

Lifting Clamp For Steel Plates



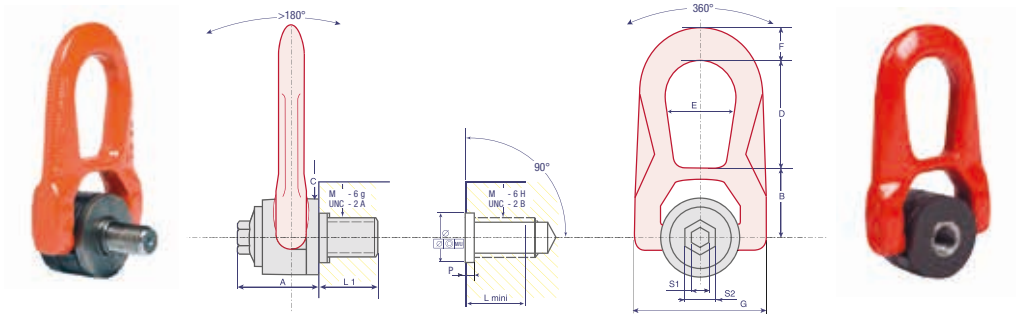
TYPE	WLL	DIMENSIONS					WEIGHT
		B	C	D	F	H	
	(t)	(mm)	(mm)	(mm)	(mm)	(mm)	(kg)
6-8	1,6	90	60	32	60	20	2,4
8-8	2,8	90	80	38	70	25	3,5
10-8	4,25	140	90	50	80	30	8
13-8	7,5	145	100	62	90	35	10,5
16-8	11,2	155	120	76	110	45	16
18/20-8	17	175	120	92	120	62	25
22-8	21,2	205	130	95	140	65	34
26-8	30	230	140	115	160	75	50
32-8	45	255	140	135	180	85	69

ATTENTION: Only to be used at a 30° angle!

WLL: per pair

Double Swivel Lifting Rings

Lifting ring with double articulation – Class 8 high strength



- Double articulation allows it to line up perfectly with the sling
- Two possible ways to tighten: with an open spanner or with an Allen key
- Standard from M8 to M30, for loads from 0,3 to 6,3 tons

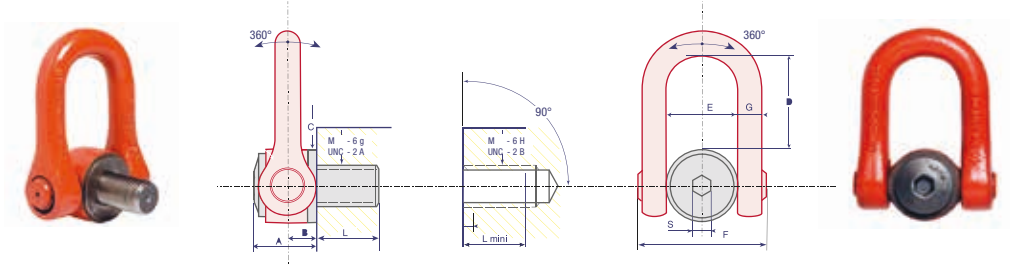
Ref	WLL (t)	Ø (mm)	L1 std (mm)	L2 (mm)	L max (mm)	TIGHTENING TORQUE (Nm)	S1 (mm)	S2 (mm)	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	G (mm)
M 4	0,05	M4 x 0,7	15	-	-	2	3	-	33	30	30	38	27	14	53
M 5	0,075	M5 x 0,8	15	-	-	3	4	-	33	30	30	38	27	14	53
M 6	0,1	M6 x 1,0	15	-	-	4	5	-	33	30	30	38	27	14	53
M 8	0,3	M8 x 1,25	14	-	179	6	8	16	33	30	30	38	27	14	53
M10	0,6	M10 x 1,5	17	50/50	179	10	8	16	33	30	30	38	27	14	53
M12	1	M12 x 1,75	21	50/50	179	15	8	16	33	30	30	38	27	14	53
M14	1,3	M14 x 2,0	23	-	170	30	8	20	45	42	45	54	38	17	76
M16	1,6	M16 x 2,0	27	100/110	170	50	8	20	45	42	45	54	38	17	76
M18	2	M18 x 2,5	27	-	170	70	8	20	45	42	45	54	38	17	76
M20	2,5	M20 x 2,5	30	100/110	170	100	8	20	45	42	45	54	38	17	76
M22	3	M22 x 2,5	33	-	200	120	14	24	62	55	60	83	55	25	117
M24	4	M24 x 3,0	36	100/110	200	160	14	24	62	55	60	83	55	25	117
M27	5	M27 x 3,0	40	-	200	160	14	24	62	55	60	83	55	25	117
M30	6,3	M30 x 3,5	45	100/110	200	250	14	24	62	55	60	83	55	25	117

Safety factor = 5

Other variants of fitting bolts upon request:

- Stainless steel version available
- The female version exists in 0,3 / 0,6 / 1 / 1,3 / 1,6 / 2 / 2,5 / 3 tons

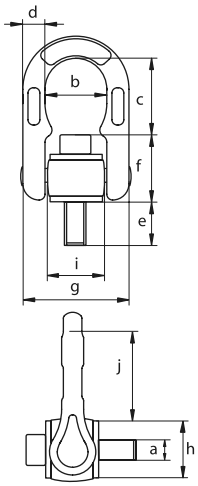
Universal lifting ring – Class 8 high strength



Ref	WLL (t)	Ø (mm)	L std (mm)	TIGHTENING TORQUE (Nm)	S (mm)	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	G (mm)	WEIGHT (kg)	SAFETY FACTOR
M30	7,3	M30 x 3,5	45	250	19	61	31	70	104	73	145	29	5,5	5
M33	8	M33 x 3,5	50	250	19	61	31	70	104	73	145	29	5,5	5
M36	10	M36 x 4	54	320	19	61	31	70	104	73	145	29	5,5	5
M36 x 3	10	M36 x 3	54	320	19	61	31	70	104	73	145	29	5,5	5
M39	10	M39 x 4	58	329	19	61	31	70	104	73	145	29	5,7	5
M42	12,5	M42 x 4,5	63	400	19	61	31	70	104	73	145	29	5,8	5
M42 x 3	12,5	M42 x 3	63	400	19	61	31	70	104	73	145	29	5,8	4
M45	15	M45 x 4,5	63	400	19	61	31	70	104	73	145	29	5,7	4
M48	20	M48 x 5	68	600	19	79	38	90	125	91	184	33	11	4
M48 x 3	20	M48 x 3	68	600	19	79	38	90	125	91	184	33	11	4
M48 x 4	20	M48 x 4	68	600	19	79	38	90	125	91	184	33	11	4
M52	20	M52 x 5	68	600	19	79	38	90	125	91	184	33	11	4
M56	25	M56 x 5,5	78	600	19	79	38	90	125	91	184	33	11,3	4
M56 x 4	25	M56 x 4	78	600	19	79	38	90	125	91	184	33	11,3	4
M64	32,1	M64 x 6	90	600	19	79	38	90	125	91	184	33	12	4
M64 x 4	32,1	M64 x 4	90	600	19	79	38	90	125	91	184	33	12	4
M72	25	M72 x 6	90	600	19	79	38	90	125	91	184	33	14	4
M72 x 4	25	M72 x 4	90	600	19	79	38	90	125	91	184	33	14	4
M80	32,1	M80 x 6	90	600	19	79	38	90	125	91	184	33	15	4
M90	32,1	M90 x 6	90	600	19	79	38	90	125	91	184	33	16	4
M100	32,1	M100 x 6	90	600	19	79	38	90	125	91	184	33	16	4

Swivel hoist ring -Grade 80 steel (Bolt-on)

ADA

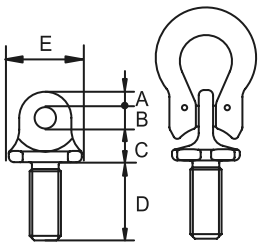


These hoist rings are forged from Grade 8 alloy steel. They can rotate 360° and pivot 180°. They have ISO metric threads as standard. The cylindrical head of the screw prevents jamming during rotation of the shackle. The WLL indicated hereunder are given in the worst conditions of use, i.e. 90° - it is necessary to check that the pivoting shackle can move freely.

WLL	Ø ISO	DIMENSIONS									HEX QUEY	TIGHTENING TORQUE	MBL	WEIGHT
		A	B	C	D	E	F	G	I	L				
(t)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)		(Nm)	(t)	(kg)
0,4	M 8	8	35	15	13	34	44	68	13	18 52 92	6	6,5	2	0,43 0,45 0,47
0,7	M10	10	37	15	13	34	44	68	16	18 62 125	8	13	3,5	0,43 0,47 0,5
1	M12	12	39	15	13	34	44 53	68	18	23 62 125	10	22	5	0,46 0,49 0,53
1,3	M14	14	41	15	13	34	44	68	21	23	12	35	6,5	0,46
1,6	M16	16	43	15	13	34	53	68	24	23 92 172	10	55	8	0,47 0,6 0,7
2	M18	18	45	15	13	34	53	68	27	28	10	80	10	0,47
2,5	M20	20	47	15	13	34	53	68	30	32 112 172	10	110	12,5	0,47 0,75 0,87
3	M22	22	69	26	20	53	70	105	33	33	14	150	15	1,85
4	M24	24	71	26	20	53	70	105	36	33 112 172	14	190	20	1,87 2,15 2,33
5	M27	27	65	26	20	53	70	105	40	36 90	14	280	25	1,93 2,19
6,3	M30	30	65	26	20	53	70	105	40	45 90 240	14	380	31,5	2 2,27 3,05
7	M33	33	83	35	29	72	100	146	55	50	19	520	35	4,9
10	M36	36	83	35	29	72	100	146	55	54 110	19	600	50	5,2 5,72
12,5	M42	42	83	35	29	72	100	146	55	63 120	19	1000	62,5	5,5 6,07

Small lifting eye type OL

OL



WLL	ISO	DIMENSIONS					MBL	WEIGHT
		A	B	C	D	E		
(t)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(t)	(kg)
0,5 0,9 1,25	M 8 M10 M12	6	8	13	30	26	2 3,6 5	0,05 0,06 0,07
1,5 1,9 2,25	M14 M16 M18	10	9	16	45	29	6 7,6 9	0,13 0,15 0,17
3,12 3,8	M20 M22	11	13	19	55	37	12,5 15,2	0,28 0,31
5 6,25	M24 M27	12	16	28	67	49	20 25	0,59 0,65
8 9 10	M30 M33 M36	13	20	33	90	54	32 36 40	1,07 1,17 1,29
12,5 15	M39 M42	19	24	39	105	69	50 60	2 2,16


OL+CSC


OL+XLC

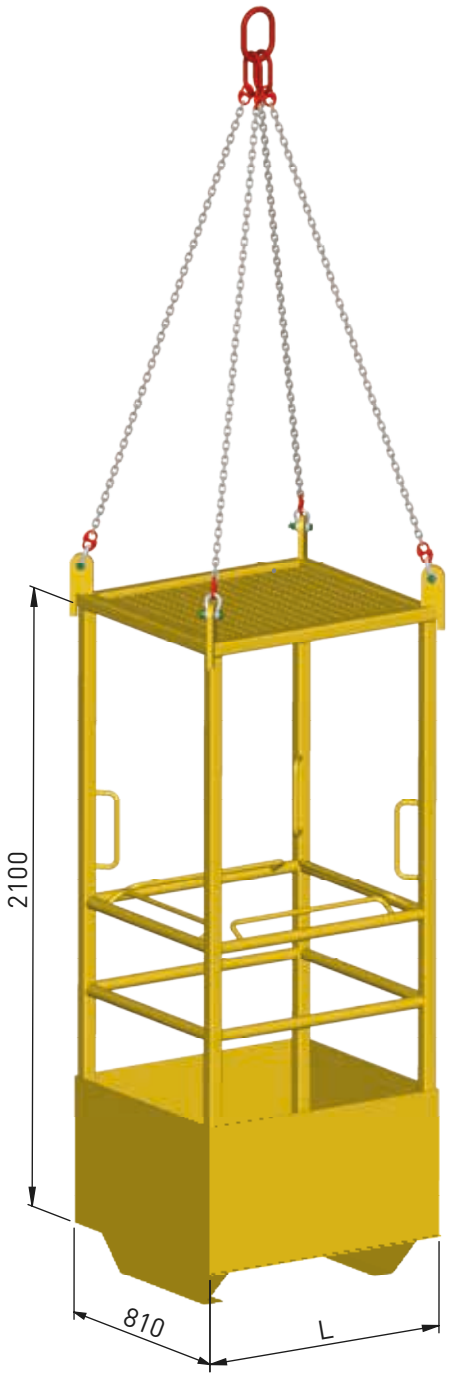

OL+MP

- These small lifting eyes are designed for assembly with all clevis components. These combinations result in articulated lifting eyes, capable of lifting angles. Fitting the lifting eyes is made easier with their 6 sided bases.
- The OL corresponds to the lifting eye alone. The other clevis accessory must be ordered separately.
- A Nylstop screw is also available upon request.

Personnel Lifting Baskets

MK-124/1P

Basket for lifting 1 person

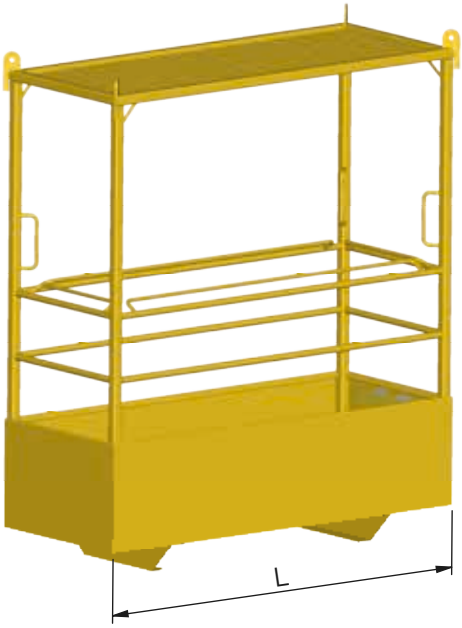


MK-124/2P

Basket for lifting 2 persons

MK-124/3P

Basket for lifting 3 persons



TYPE	LENGTH (mm)	WEIGHT (kg)	WORKING LOAD (kg)
MK-124/1p	900	200	250
MK-124/2p	1500	300	250
MK-124/3p	2000	370	500

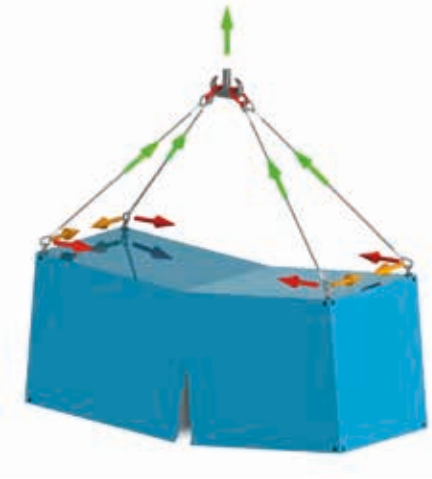
SPREADERS

Safely Lifting A Container

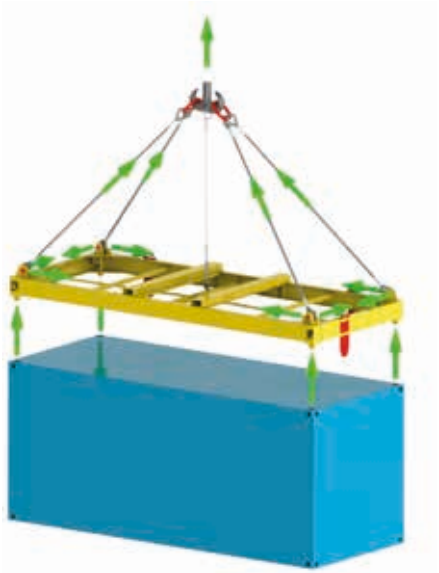
Hundreds of thousands of containers are lifted every day. Lifting a container is however not without risks. For a number reasons (limited lifting height, limited crane capacity, ...) it is often asked if a spreader is really necessary to lift a container. The answer is – in most cases – yes.

Why lifting a container by its top corners, using only a 4-legged sling, is not permitted

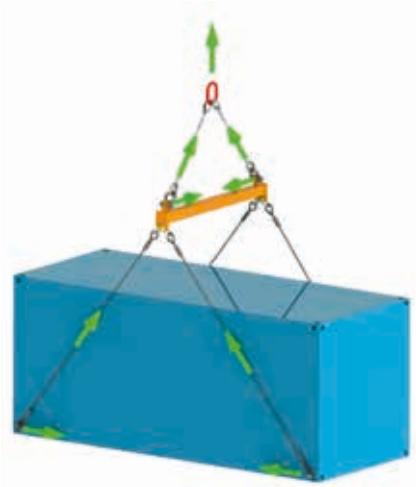
A typical 4-legged sling, attached to the four top corners of a container induces compression loads in the roof plane of the container, especially lengthwise. Containers are not designed to take this compression load at the roof plane in a lengthwise direction. The actual strength of the roof varies from container to container, depending on the manufacturer, age, size ... Therefore it is possible that several lifts are made with only a 4-legged sling, and that no particular problem is noticed. The operator is lured into believing that this is a safe way of handling the containers. However, due to this practice, unseen damage is done to the container and every lift can lead to the instant breaking of the container.



Why a spreader should be used between the 4-legged sling and the container



When using a spreader like the MK-20 or MK-40, the compression load is no longer induced on the roof of the container, but directly on the spreader (which is designed for this load). The top frame of the container is thus free of compression loads. The container is now lifted vertically, which is the only configuration for top lifting, allowed by the international standard (ISO 1496).
The use of a (semi-automatic) spreader also has several other advantages, such as quicker handling of the containers and less operators required.

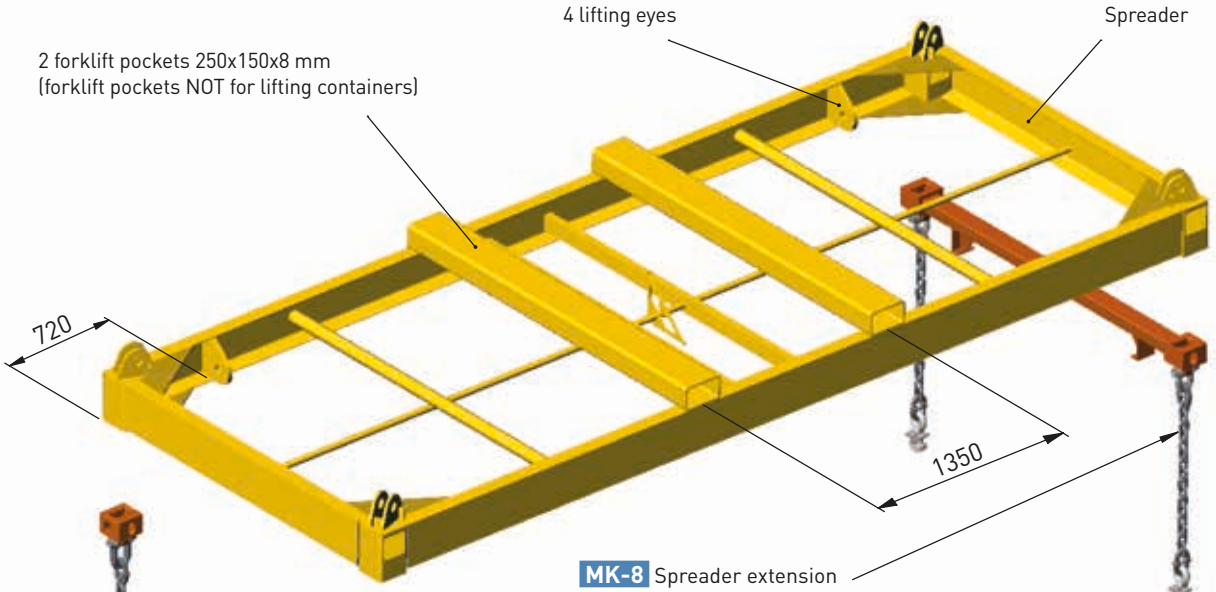


What to do if no spreader is available

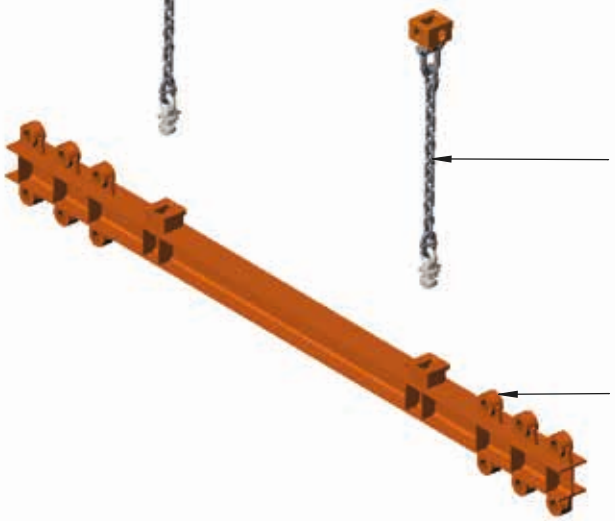
There is still a possibillity to lift a container without a spreader, using bottom lifting parts such as MK-5L & MK-5R. These parts fit the side holes of the bottom corners of the container. In this case, the compression load in a lengthwise direction is taken by the floor frame of the container, which is a lot stronger than the roof plane.

The transverse compression load is absorbed by the crossbar. This method of lifting is also mentioned in the ISO 1496 standard.
Another advantage of this system is that the required lifting height is in most cases less than when using a spreader.

Container Spreader + Options



MK-8 Spreader extension
SWL = 20t
(with 2 top lifting lugs MK-2)
2x MK-8 = 1 set



MK-8A Spreader extension
with top lifting lug MK-2)
(4 legs per spreader needed)
SWL = 12t

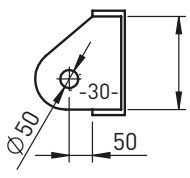
ML-42/46/22 Lifting beam
for special purposes

SPREADERS

TYPE	SWL (t)	PL (t)	WEIGHT (kg)
10 ft	25	35,6	650
20 ft	25	35,6	1060
20 ft	33*	44	1350
20 ft	50*	60,6	1750
40 ft	35	46	2100
40 ft	42*	53,2	2250

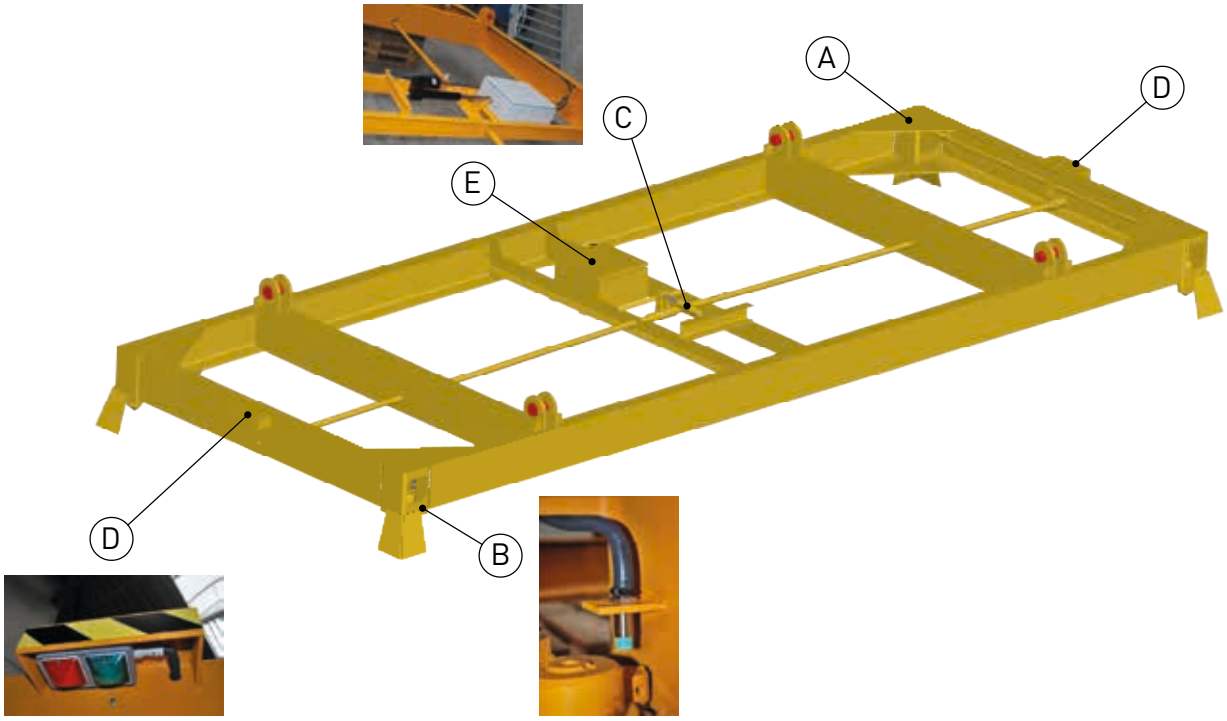
* Available from stock (if not sold)

DETAIL LIFTING EYE



Depending on
beam's height

Electric Operated Spreader



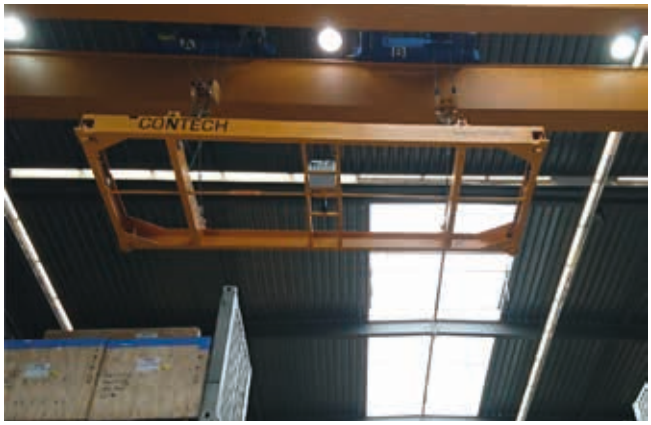
This type of spreader is developed for use in places with limted overhead space like warehouses or underground processing plants. It is equipped with with two lifting points along the central axis wich accepts the hooks of a twin bridge crane system. A version with four points, or other custom made configurations are also possible.

The electric linear actuator (C) mounted in the centre of the spreader, operates the 4 twistlocks at the bottom corners of the spreader. Two sets of solid state proximity switches detect the position of the twistlocks (open or closed) (B) and the presence of the container at the corner (A).

The Siemens LOGO! PLC computer, located in the metal electric box in the centre of the spreader (E), controls the linear actuator and all the safety features, for example the blocking of the bridge crane lifting engines while the twistlocks are operating. This is to prevent for instance that the operator would lift the container while the twistlocks are not fully closed/open. Two sets of warning lamps with green and red lights (D), mounted on the sides of the spreader, display the system status and warn the user of operation errors.

This type of spreader can be operated either with a dedicated radio remote controller or, if required all the commands can be integrated seamlessly in the bridge crane controller.

The standard model for 20' containers has a SWL of 20ton, but custom made designs are also available for other container sizes and/or different SWL values.



TO PRACTICE

Notes

D

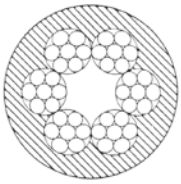
RIGGING GEAR

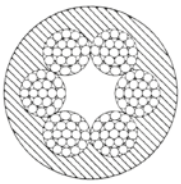


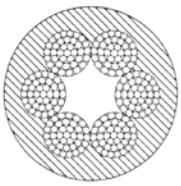

Steel Wire Ropes

Cable with synthetic cover

Available on request up to diameter 48 mm





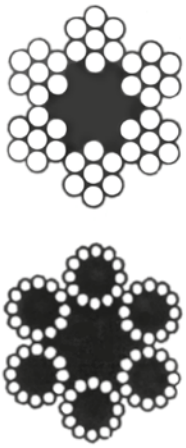


INSIDE Ø (mm)	OUTSIDE Ø (mm)	CONSTRUCTION	WEIGHT (kg % m ca.)	MIN. BREAKING LOAD 1770 N/mm² 180 kg/mm² (kN)	(kg)
2	3	5 x 7 + 1 TWK/FC	2	2,75	279
2,5	3,5	6 x 7 + 1 TWK/FC	3	3,67	374
3	4	6 x 7 + 1 TWK/FC	4	5,29	538
3	4,5	6 x 7 + 1 TWK/FC	4,5	5,29	538
3	5	6 x 7 + 1 TWK/FC	5	5,29	538
4	6	6 x 7 + 1 TWK/FC	8	9,41	957
4	6	6 x 19 + 1 TWK/FC	7,5	8,7	885
5	7	6 x 7 + 1 TWK/FC	11,5	14,7	1500
5	7	6 x 19 + 1 TWK/FC	9,8	13,6	1380
6	8	6 x 7 + 1 TWK/FC	18	21,1	2150
6	8	6 x 19 + 1 TWK/FC	15,8	19,6	1990
8	10	6 x 19 + 1 TWK/FC	25,4	34,8	3540
10	12	6 x 19 + 1 TWK/FC	42	54,4	5530
10	12	6 x 37 + 1 TWK/FC	40	52,2	5310
12	14	6 x 19 + 1 TWK/FC	56	78,3	7970
12	14	6 x 37 + 1 TWK/FC	59	75,1	7640
14	16	6 x 19 + 1 TWK/FC	75	107	10800
14	16	6 x 37 + 1 TWK/FC	77	102	10400

We cover with the following synthetics: PVC, polyamide, polyurethane, polypropylene.

Cable for general use / Lashing wire

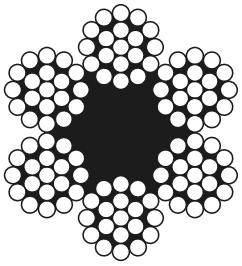
■ 6 X 7, 6 X 12, 6 X 24 + FIBRE CORE



NOMINAL Ø	6 x 7		6 x 12		6 x 24	
	WEIGHT 100 m	MIN. BREAKING LOAD 1770 N = 180 kg/mm²	WEIGHT 100 m	MIN. BREAKING LOAD 1770 N = 180 kg/mm²	WEIGHT 100 m	MIN. BREAKING LOAD 1770 N = 180 kg/mm²
(mm)	(kg)	(kN)	(kg)	(kN)	(kg)	(kN)
2	1,43	2,35	–	–	–	–
3	3,22	5,29	2,26	2,95	–	–
4	5,72	9,41	4,01	5,24	–	–
5	8,94	14,7	6,27	8,19	–	–
6	12,9	21,2	9,02	11,8	11,5	15,8
7	17,5	28,8	12,3	16	15,6	21,6
9	28,9	47,6	16	21	20,4	28,2
10	35,7	58,8	20,3	26,5	25,8	35,6
11	43,2	71,1	25,1	32,8	31,8	44
12	51,5	84,7	30,3	39,6	38,5	53,2
13	60,4	99,4	36,1	47,2	45,8	63,3
14	70,1	115	42,4	55,3	53,8	74,3
16	91,5	151	49,1	64,2	62,4	86,2
18	116	191	64,2	83,8	81,5	113
20	143	235	81,2	106	103	143
22	–	–	100	131	127	176
24	–	–	121	159	154	213
26	–	–	144	189	183	253
28	–	–	169	221	215	297
32	–	–	196	257	250	345
36	–	–	257	335	326	450
40	–	–	–	–	413	570
–	–	–	–	–	509	704

Winch wire rope general

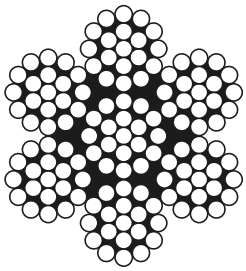
6 x 19 + FIBRE CORE



Modulus of elasticity:
E = ± 85000 N/mm²

DIAMETER (mm)	WIRE DIAMETER (mm)	SECTION (mm²)	WEIGHT/m (kg)	BREAKING LOAD 1770 N/mm² (kN)	BREAKING LOAD 1960 N/mm² (kN)
3	0,2	–	0,03	4,9	5,4
4	0,25	–	0,06	8,7	9,6
5	0,33	–	0,09	13,6	15,1
6	0,39	14	0,12	21	23
7	0,45	18	0,16	28	31
8	0,52	24	0,22	37	41
9	0,58	30	0,27	46	51
10	0,64	37	0,33	56	63
11	0,72	47	0,41	71	79
12	0,78	55	0,49	84	93
13	0,84	64	0,57	97	108
14	0,9	73	0,65	111	124
15	0,96	83	0,74	127	141
16	1,04	98	0,87	149	165
17	1,1	109	0,97	166	185
18	1,16	122	1,08	185	206
19	1,22	135	1,19	205	227
20	1,28	148	1,32	225	251
21	1,36	167	1,48	254	282
22	1,42	183	1,62	277	308

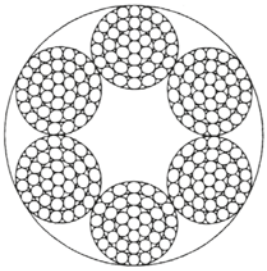
7 x 19



Modulus of elasticity:
E = ± 115000 N/mm²

DIAMETER (mm)	WIRE DIAMETER (mm)	SECTION (mm²)	WEIGHT/m (kg)	BREAKING LOAD 1770 N/mm² (kN)	BREAKING LOAD 1960 N/mm² (kN)
6	0,39	16	0,14	24	26
7	0,45	22	0,19	32	35
8	0,52	29	0,25	42	46
9	0,58	36	0,31	52	58
10	0,64	44	0,38	64	71
11	0,72	55	0,47	80	89
12	0,78	65	0,55	94	104
13	0,84	75	0,64	109	121
14	0,9	87	0,74	126	139
15	0,96	99	0,85	143	159
16	1,04	116	0,99	167	186
17	1,1	129	1,1	187	208
18	1,16	144	1,23	209	232
19	1,22	160	1,36	231	257
20	1,28	176	1,5	255	283
21	1,36	197	1,68	286	317
22	1,42	216	1,84	312	347
23	1,48	234	2	339	377
24	1,56	259	2,21	376	417
25	1,62	280	2,39	405	450
26	1,68	301	2,57	436	484

6 x 37 (1 + 6 + 12 + 18) + FIBRE CORE



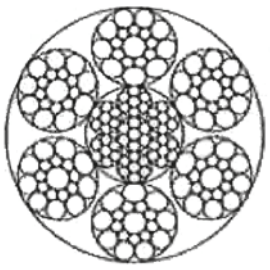
Modulus of elasticity:
E = ± 80000 N/mm²

DIAMETER (mm)	APPROX. WEIGHT (kg % m)	MIN. BREAKING LOAD 1770 N/mm² 180 kg/mm² (KN)	(kg)
5	8,7	13	1330
6	12,5	18,8	1910
7	17	25,6	2600
8	22,1	33,4	3400
9	28	42,3	4300
10	34,6	52,2	5310
11	41,9	63,1	6420
12	49,8	75,1	7640
13	58,5	88,2	8970
14	67,8	102	10400
16	88,6	134	13600
18	112	169	17200
20	138	209	21200
22	167	253	25700
24	199	301	30600
26	234	353	35900
28	271	409	41600
32	354	534	54300
36	448	676	68800
40	554	835	84900
44	670	1010	103000
48	797	1200	122000
50	865	1300	133000

Trolley wire

6 x 19 SEALE (1 + 6/6 F + 12) = 114 WIRES

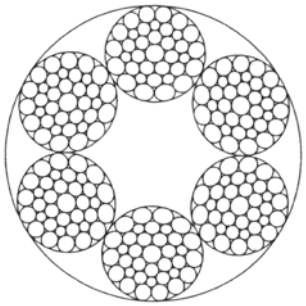
with one steel core in parallel lay



NOMINAL ROPE DIAMETER (mm)	APPROX. WEIGHT (kg % m)	MIN. BREAKING LOAD 1960 N/mm² 200 kg/mm² (kN)	(kg)
5	10,2	17,5	1790
5,5	12,4	21,2	2160
6	14,7	25,2	2570
6,5	17,3	29,6	3020
7	20,1	34,3	3500
7,5	23	39,4	4020
8	26,2	44,8	4570
9	33,2	56,7	5800
10	41	70,1	7160
11	49,6	84,7	8660
12	59	101	10300
13	69,3	118,0	12100

Hoist wire rope / Slings

DIN 3064 6 X 36 WARRINGTON-SEALE + FIBRE CORE

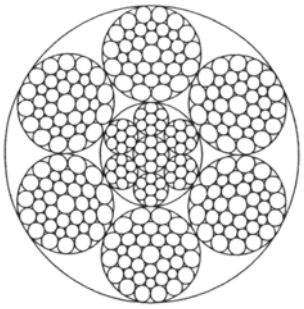


1 + 7 + (7 + 7) + 14

Modulus of elasticity:
E = ± 80000 N/mm²

NOMINAL DIAMETER (mm)	WEIGHT/METER (APPROX.) (kg/m)	MINIMUM BREAKING LOAD 1770 N/mm² (kN)	1960 N/mm² (kN)	2160 N/mm² (kN)
8	0,24	37,4	41,4	45,5
9	0,31	47,3	52,4	57,6
10	0,38	58,4	64,7	71,2
11	0,46	70,6	78,2	86
12	0,55	84,1	93,1	102
13	0,64	98,7	109	120
14	0,75	114	127	140
15	0,86	131	145	160
16	0,97	149	166	183
17	1,1	169	187	206
18	1,23	189	209	230
19	1,37	211	233	256
20	1,52	234	259	285
21	1,68	257	285	314
22	1,84	283	313	344
23	2,01	309	342	376
24	2,19	336	372	409
25	2,38	365	404	444
26	2,57	395	437	481
27	2,77	426	471	518
28	2,98	458	507	558
29	3,2	491	544	598
30	3,42	525	582	640
31	3,65	561	621	683
32	3,89	598	662	728
33	4,14	636	704	774
34	4,4	675	747	822
35	4,66	715	792	871
36	4,93	757	838	922
37	5,21	799	885	974
38	5,49	843	934	1027
39	5,78	888	983	1081
40	6,08	934	1034	1137
41	6,39	981	1087	1196
42	6,71	1030	1140	1254
43	7,03	1080	1195	1315
44	7,36	1130	1252	1377
45	7,7	1182	1309	1440
46	8,05	1235	1368	1505
47	8,4	1290	1428	1571
48	8,76	1345	1490	1639
49	9,13	1402	1552	1707
50	9,51	1460	1616	1778
51	9,89	1519	1682	1850
52	10,3	1579	1748	1923
53	10,7	1640	1816	1998
54	11,1	1703	1885	2074
55	11,5	1766	1956	2152
56	11,9	1831	2028	2231
57	12,4	1897	2101	2311
58	12,8	1964	2175	2393
59	13,2	2032	2251	2476
60	13,7	2102	2328	2561
62	14,6	2244	2485	2734
64	15,6	2392	2648	2913
66	16,6	2543	2816	3098
68	17,6	2700	2990	3289
70	18,6	2861	3168	3485
72	19,7	3027	3352	3687

DIN 3064 6 X 36 WARRINGTON-SEALE + STEEL CORE



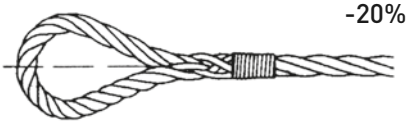
1 + 7 + (7 + 7) + 14

Modulus of elasticity:
E = ± 105000 N/mm²

NOMINAL DIAMETER (mm)	WEIGHT/ METER (kg/m ±)	MINIMUM BREAKING LOAD 1770 N/mm² (kN)	1960 N/mm² (kN)	2160 N/mm² (kN)	Z/ZZ grade (kN)
8	0,27	40,4	44,7	49,1	–
9	0,34	51,1	56,6	62,3	–
10	0,42	63,1	69,8	76,8	–
11	0,51	76,3	84,5	93	–
12	0,6	90,8	101	111	–
13	0,71	107	118	130	–
14	0,82	124	137	151	–
15	0,94	142	157	173	–
16	1,07	161	179	197	–
17	1,21	182	202	222	–
18	1,36	204	226	249	–
19	1,51	228	252	277	–
20	1,67	252	279	307	–
21	1,84	278	308	339	–
22	2,02	305	338	372	–
23	2,21	334	369	406	–
24	2,41	363	402	442	–
25	2,61	394	436	480	–
26	2,83	426	472	519	–
27	3,05	460	509	560	–
28	3,28	494	547	602	–
29	3,52	430	587	546	–
30	3,76	568	628	691	–
31	4,02	606	671	738	–
32	4,28	646	715	787	–
33	4,55	687	760	836	–
34	4,83	729	807	888	–
35	5,12	772	855	941	–
36	5,42	817	905	996	–
37	5,73	863	956	1052	–
38	6,04	911	1008	1109	–
39	6,36	959	1062	1168	–
40	6,69	1009	1117	1229	–
41	7,03	1060	1174	1291	–
42	7,38	1112	1232	1355	–
43	7,73	1166	1291	1420	–
44	8,1	1221	1352	1487	–
45	8,47	1277	1414	1555	–
46	8,85	1334	1478	1626	–
47	9,24	1393	1543	1697	–
48	9,64	1453	1609	1770	–
49	10	1514	1677	1845	–
50	10,5	1576	1746	1921	–
51	10,9	1640	1816	1998	–
52	11,3	1705	1888	2076	–
53	11,7	1771	1961	2157	–
54	12,2	1839	2036	2240	–
55	12,7	1908	2112	2323	–
56	13,1	1978	2190	2409	–
57	13,6	2049	2269	2496	–
58	41,1	2121	2349	2583	–
59	14,6	2195	2431	2674	–
60	15,1	2270	2514	2765	–
62	16,1	2424	2684	2952	–
64	17,1	2583	2860	3146	–
66	18,2	2747	3042	3346	–
67	18,7	–	3050	3355	3820
68	19,3	2916	3229	3552	–
70	20,5	3090	3395	3735	–
71	21,2	–	3422	3764	4218
72	21,7	3269	3620	3982	–
76	24,6	–	4169	4586	–
77	26,6	–	4250	4670	4800
83	28,6	–	4777	5255	5896
86	30,7	–	5101	5611	–
90	32,4	–	5290	5930	6465
93	35,2	–	5738	6278	–
96	40	–	5930	6312	7860
103	46	–	6524	7063	8750
115	55,7	–	7906	8593	9810
122	62,1	–	8730	9603	10067
128	68,8	–	9594	10425	11124

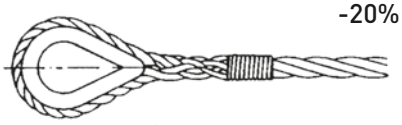
Loss of breaking strength for wire rope terminations

The breaking strength of a wire rope differs significantly according to the selected termination.
The values below are indicative.

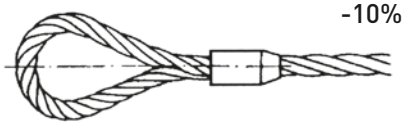


■ SPLICED LOOP

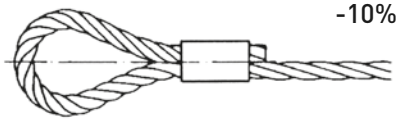
■ HIDDEN TUCK LOOP



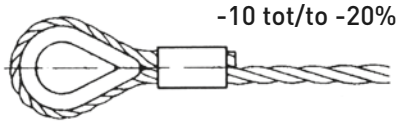
■ SPLICED THIMBLE



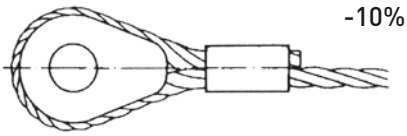
■ FERRULED HIDDEN TUCK LOOP



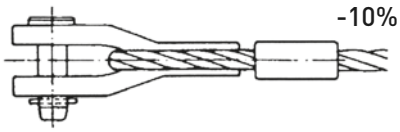
■ FERRULED LOOP



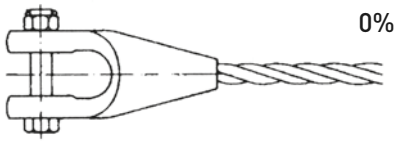
■ FERRULED THIMBLE



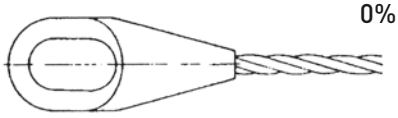
■ FERRULED SOLID THIMBLE



■ FERRULED CLEVIS

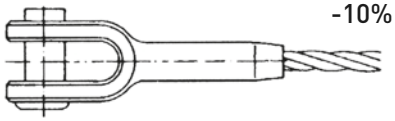


■ CLEVIS SOCKET

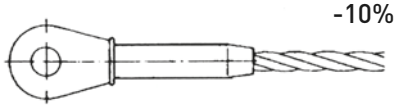


■ EYE SOCKET

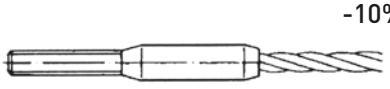
■ CYLINDRICAL SOCKET



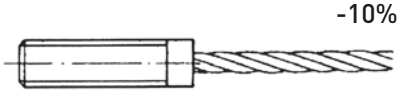
■ STEEL CLEVIS TERMINAL



■ STEEL EYE TERMINAL

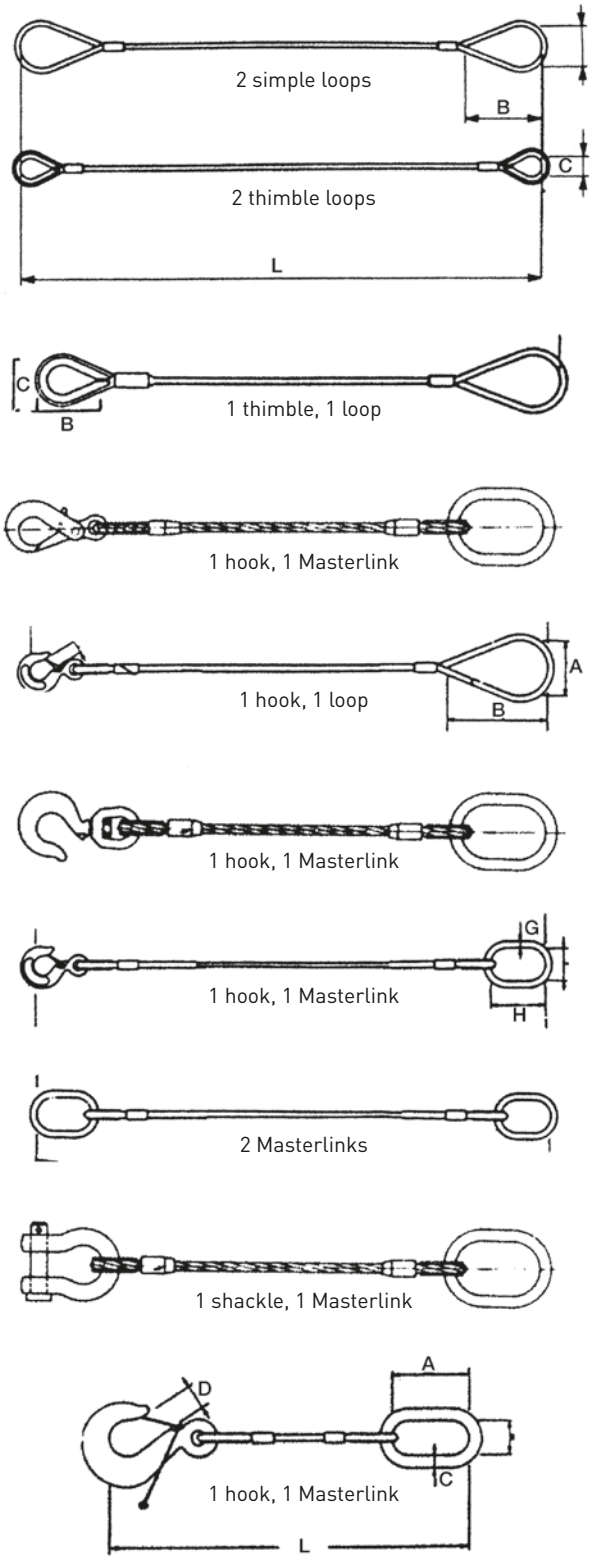


■ STEEL THREADED TERMINAL

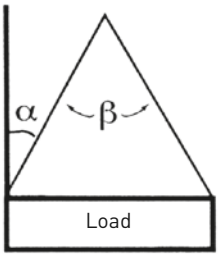


■ STOPPER TERMINAL

Possible configurations



Angle formed by legs

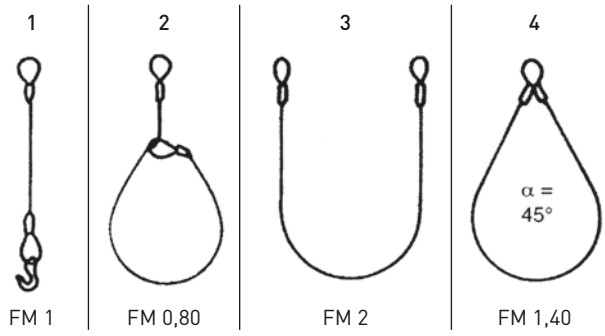


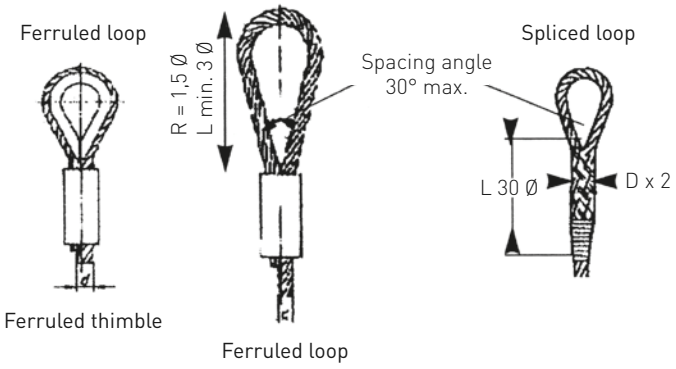
α	25°	35°	40°	45°	60°
β	50°	70°	80°	90°	120°

Overloads

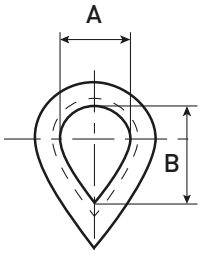
1,1	1,25	1,3	1,4	2

Angle must **never** exceed α: 60°, ß: 120°, otherwise dangerous.





Avoid splitting whilst the sling is exposed to torsion along the length of its axis.



- Approximate standard thimble dimensions:
  A = wire rope Ø x 3;
  B = wire rope Ø x 5
- A wire rope spooled around its own diameter can lose 50% of its strength. In practice, do not spool slings around diameters less than 5 d.
- The angle separating the two elements of the loop must not exceed 30°.

Grommet according to EN 13414-3+A1 (2009)

WLL based on wire rope with metal core in tensile strength 1960 N/mm2

IMPORTANT
NEVER lift on the red mark.

CONSTRUCTION	WIRE ROPE Ø (mm)	GROMMET Ø (mm ±)	CGBL (kg/2B)	WLL (t)	WEIGHT (kg/m)
7x7x19	3	9	8424	1,5	0,29
7x7x19	4	12	13338	2,8	0,46
7x7x19	5	15	19656	4,2	0,65
7x7x19	6	18	28080	6,1	1,23
7x7x19	7	21	38532	7,3	1,39
7x7x19	8	24	50642	9,9	1,91
7x7x19	9	27	63853	12,7	2,41
7x6x36	10	30	76844	15,4	3,07
7x6x36	12	36	111193	22	4,42
7x6x36	13	39	129908	25,9	5,18
7x6x36	14	42	150826	29,7	6,01
7x6x36	16	48	197064	39,1	7,87
7x6x36	18	54	248807	49,5	9,97
7x6x36	20	60	307156	61,1	12,3
7x6x36	22	66	372110	75,9	14,8
7x6x36	24	72	442569	92,4	17,7
7x6x36	26	78	519633	112,2	20,8
7x6x36	28	84	602202	133,1	24,1
7x6x36	30	90	691376	158	22,6
7x6x36	32	96	787156	184,8	31,4
7x6x36	34	102	888440	217	35,6
7x6x36	36	108	996330	249,7	39,7
7x6x36	38	114	1109725	262	42,3
7x6x36	40	120	1229725	300	46,8
7x6x36	42	126	1356330	344	51,7
7x6x36	44	132	1488440	392	56,7
7x6x36	48	144	1771376	505	67,5
7x6x36	52	156	2078532	700	79,1
7x6x36	56	168	2411009	800	95,2
7x6x36	64	192	3148624	1000	119,7

CALCULATION OF THE CGBL
12 x F min x K (0,9)

SAFETY FACTOR
Up to 60 mm: SF 5/1
60 – 150 mm: 6,33 - (0,022 x dia)
Above 150 mm: SF 3/1

DIAMETER OF THE SHAFTS FOR THE CORRECT LENGTH MEASUREMENT OF THE GROMMET

GROMMET DIAMETER (mm)	AXIAL DIAMETER (mm)
≤ 60	150 to 300
61 to 151	250 to 500
152 to 251	375 to 750
252 to 376	500 to 1000

Grommet working load acc. to IMCA M 79 regulations for offshore applications

CALCULATED GROMMET BREAKING LOAD (CGBL)

The CGBL is calculated as follows:

$$CGBL = \frac{12\ F_{min} \times C_L}{K}\ \text{Tonnes}$$

where:

- F_{min} = the minimum calculated breaking load of the unit rope (in kN), as defined in ISO 2408 and EN 12385–4
- K = a constant which converts the force units (kN) into the mass units (metric tonnes) used in lifting operations. For these purposes this is taken as 9,81 m/s^2
- C_L = a factor which allows for the spinning losses in cabling (currently taken as 0,85)

NOTE
Although the cross section of the grommet comprises a total of 14 ropes, the core section of the unit rope should be discounted in the calculation of the breaking load because the joint is butted and not spliced.

WORKING LOAD LIMIT (WLL) OR RATING

The Working Load Limit is the maximum mass that the grommet is designed to raise, lower or suspend.

This is calculated as follows:

$$WLL = \frac{CGBL \times E_B}{f}$$

where:

- CGBL = the calculated breaking load of the grommet in metric tonnes
- f = a factor which allows for the circumstances of use (safety factor). For these applications, f is taken as not less than 2,25.
- E_B = Bending factor for the bend of a grommet at its ends or when used as a doubled grommet at the grommet body. The bending factor E_B shall be calculated according to the formula:

$$E_B = 1 - \frac{0,5}{\sqrt{D/d}}$$

where:

- d = the cable rope diameter
- D = the minimum diameter over which the grommet end or body when doubled is bent

NOTE
Under no circumstances should the grommet contact any surface where the radius is less than 0,5 d

BENDING LOSS

D/d RATIO	LOSS
1/1	50%
2/1	36%
3/1	29%
10/1	16%

For example:
Dia 42 mm: 30t WLL
15t
19,5t
21,3t
25,2t

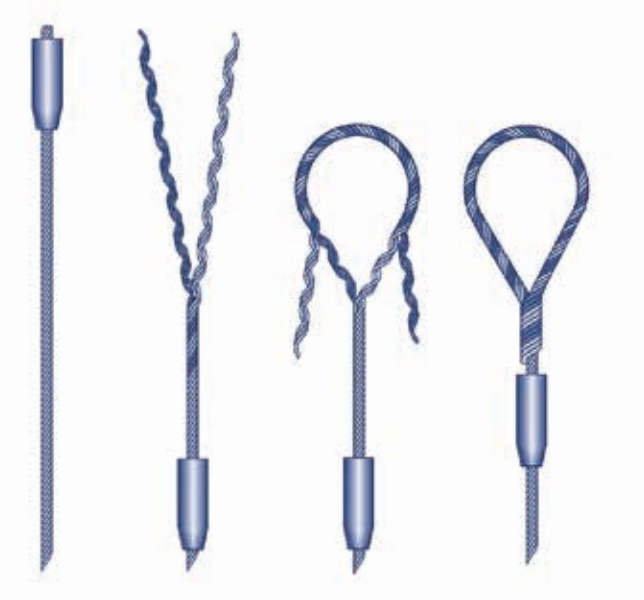
The ferruled SUPERLOOP

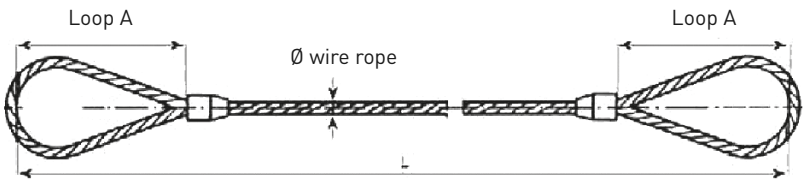
This is the combination of a splice and a steel ferrule. The rope is untwisted on a certain length according to the required eye. 3 strands on one side, 3 strands + the core on the other side. The loop is made by pulling back one end to the rope whilst rewiring the 2 strands. This ensures equal distribution of the tensile stresses on the 2 strands.

The steel ferrule, smaller than standard and tapered, is cold stamped, and will concentrically tighten the rope & the strands of the loop.

ADVANTAGES

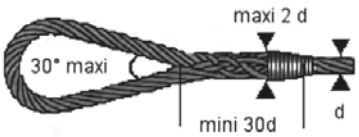
- a perfectly close ferrule (no risk of injury)
- the conical form ensures a good sliding under load without any wedging risk
- the steel brings a good resistance to crushing and abrasion, the rewiring plus the ferrule giving a total security





Spliced loop slings

There have to be at least 5 and a half tucks to make a splice. All strands are tucked 5 times and half of them are then cut, the other half being tucked a sixth time and then cut. The maximum diameter of the splice is twice the rope diameter.



SPLICED LOOP

The splice length is about 20 to 30 times the rope diameter.
The maximum diameter on which a rope may be bent without deformation nor reducing its strength is 5 times its own diameter.

No matter how much care is taken when making a splice, the tuck process of untwisted strands over the rope strands leads inevitably to a reduction of the strength by 5% to 30% depending on the rope diameter. The manufacturer takes that into account when determining the working load limit (WLL), which explains why – for the same rope diameter – the WLL is not the same for a spliced sling or a ferruled sling.
The splice should work in a straight line; if this is not the case (passing over a pulley, for instance), one must add another tuck when splicing and pay particularly good attention to it.

Flat braided slings

These slings are formed with one sole interlaced rope; the width of the braid may be of 6, 8 or 12 hawsers; made under load.

Braiding enables the sling to adapt to the material to lift; the flexibility of cable plaiting adds to the performance of the layer.

ADVANTAGES

- a very strong resistance combined with a great flexibility
- a certain rigidity & an significant contact surface

Flat braided wire rope slings (also known as coilslings)

In compliance with European regulation 2006/42/CE

- Load factor: 5
- Braided loops or masterlinks

8-PART WIRE ROPE SLINGS

WLL 1 LEG (t)	WIRE ROPE Ø (mm)	WIRE ROPE COMPOSITION	Ø LOOP (mm)
1	4	6 x 19 APP	200 x 100
1,6	5	6 x 19 APP	240 x 120
2,4	6	6 x 19 APP	250 x 125
3,2	7	6 x 19 APP	300 x 150
4,2	8	6 x 19 APP	350 x 175
5,4	9	6 x 19 APP	400 x 200
6,6	10	6 x 19 APP	450 x 225
10	12	6 x 36 APP	500 x 250
14	14	6 x 36 APP	600 x 300
18,5	16	6 x 36 APP	700 x 350
23,5	18	6 x 36 APP	800 x 400
29	20	6 x 36 APP	850 x 425

12-PART WIRE ROPE SLINGS

WLL 1 LEG (t)	WIRE ROPE Ø (mm)	WIRE ROPE COMPOSITION	Ø LOOP (mm)
1,7	4	6 x 19 APP	200 x 100
2,7	5	6 x 19 APP	240 x 120
4	6	6 x 19 APP	250 x 125
5,4	7	6 x 19 APP	300 x 150
7	8	6 x 19 APP	350 x 175
9	9	6 x 19 APP	400 x 200
11	10	6 x 19 APP	450 x 225
16	12	6 x 36 APP	500 x 250
22	14	6 x 36 APP	600 x 300
30	16	6 x 36 APP	700 x 350
37	18	6 x 36 APP	800 x 400
46	20	6 x 36 APP	850 x 425

Cable grips

G106
Closed type with one loop

TYPE	DIAMETER (mm)	MBL (kg)	LENGTH (mm)	WEIGHT PER PIECE (kg)
G106/10	10 tot / to 20	1860	750	0,17
G106/20	20 tot / to 30	1990	900	0,25
G106/30	30 tot / to 40	2900	900	0,35
G106/40	40 tot / to 50	4250	950	0,6
G106/50	50 tot / to 65	4250	1000	0,65
G106/65	65 tot / to 80	5700	1000	0,8
G106/80	80 tot / to 95	5700	1100	0,9
G106/95	95 tot / to 110	5700	1100	1,3
G106/110	110 tot / to 125	5700	1200	1,3

G206
Open type with two loops

G206/10	10 tot / to 20	1860	750	0,25
G206/20	20 tot / to 30	1990	900	0,27
G206/30	30 tot / to 40	2900	900	0,41
G206/40	40 tot / to 50	4250	950	0,6
G206/50	50 tot / to 65	4250	1000	0,7
G206/65	65 tot / to 80	5700	1000	0,82
G206/80	80 tot / to 95	5700	1100	0,9
G206/95	95 tot / to 10	5700	1100	1,4
G206/110	110 tot / to 125	5700	1200	1,4

G306
Open type with one loop

G306/10	10 tot / to 20	1860	750	0,2
G306/20	20 tot / to 30	1990	900	0,25
G306/30	30 tot / to 40	2900	900	0,4
G306/40	40 tot / to 50	4250	950	0,55
G306/50	50 tot / to 65	4250	1000	0,65
G306/65	65 tot / to 80	5700	1000	0,75
G306/80	80 tot / to 95	5700	1100	0,85

G406
Stitchable type with two loops

G406/10	10 tot / to 20	1860	750	0,2
G406/20	20 tot / to 30	1990	900	0,25
G406/30	30 tot / to 40	2900	900	0,37
G406/40	40 tot / to 50	4250	950	0,63
G406/50	50 tot / to 65	4250	1000	0,87
G406/65	65 tot / to 80	5700	1000	0,91
G406/80	80 tot / to 95	5700	1100	0,95

G506
Stitchable type with one loop

G506/10	10 tot / to 20	1860	750	0,2
G506/20	20 tot / to 30	1990	900	0,25
G506/30	30 tot / to 40	2900	900	0,37
G506/40	40 tot / to 50	4250	950	0,63
G506/50	50 tot / to 65	4250	1000	0,87
G506/65	65 tot / to 80	5700	1000	0,91
G506/80	80 tot / to 95	5700	1100	0,95

Wire rope clips

Instructions for use

Wire rope clips should be inspected before use to ensure that:
- all markings are legible;
- the wire rope clip is free from nicks, gouges and cracks;
- a wire rope clip with the correct dimension has been selected;
- never repair or reshape a wire rope clip by welding, heating or bending as this may affect the performance

The wire rope clip should be fitted to the wire rope as shown in the figures. The bridge of the wire rope clip should always be placed on the load bearing part of the rope. The U-bolt of the clip should be placed on the rope tail, also known as the dead end of the rope.

Turn back enough wire rope length so that the required minimum number of clips can be installed according to the instructions below. The first clip must be placed one bridge width from the turned back rope tail or dead end of the rope, according to **figure 1**. Tighten the nuts to the specified torque.

The second clip must be placed immediately against the thimble but nevertheless in such a position that the correct tightening of the clip does not damage the outer wires of the wire rope (**figure 2**). Tighten the nuts firmly but not yet to the specified torque.

The following clips should be placed on the wire rope between the first and second clip in such a way that they are separated by at least 1½ times the clip-width with a maximum of 3 times the clip-width, according to **figure 3**.

FIGURE 1

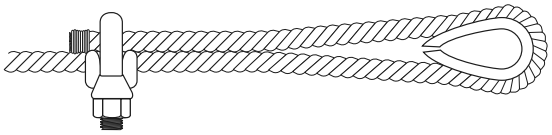


FIGURE 2

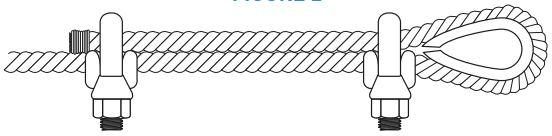
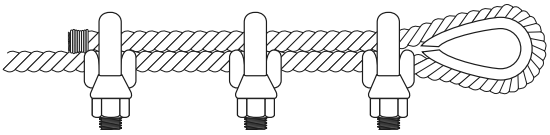


FIGURE 3



Apply light tension on the rope and tighten all nuts evenly, alternating until reaching the specified torque.

During assembly and before the rope is taken into service, the nuts must be tightened once again to the prescribed torque. After the load is applied for the first time, the torque value must be checked again and corrected if necessary. Periodically re-tightening of the nuts must be done at 10000 cycles (heavy usage), 20000 cycles (moderate usage) or 50000 cycles (light usage). If cycles are unknown, a fixed time period could be used, e.g. every 3 months, 6 months, annually.

The torque values and the minimum number of clips to be applied, in relation to the rope size, are given in the following table.

The efficiency of a wire rope termination made with wire rope clips will depend on the correct placement on the ropes and on the care and skill of the fitting of the clips. With inadequately tightened nuts or with an insufficient number of wire rope clips, the rope end may slide through the clips at a very early stage in loading.

A number of factors can adversely affect the tightness of the clips on ropes, such as:
- the nut may be tight on the thread, yet not tight against the bridge;
- contamination of the thread by dirt, oil or corrosion products, which may prevent the correct tightening of the nut.

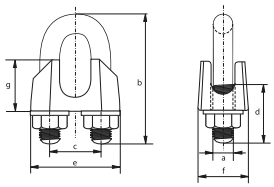
Forged wire rope clips provide greater bearing surface and more consistent strength than malleable cast iron clips.

Wire rope clips should not be used on the following applications:
- hoist ropes in mines;
- rope drives for cranes in steel works and rolling mills;
- permanent fastening of ropes in other rope drives;
- rope terminations for load suspension devices in the operation of lifting appliances except in the case of lifting tackles where these are produced for a special application and are not re-used

It is required that the products are regularly inspected and that the inspection should take place in accordance with the safety standards given in the country of use. This is required because the products in use may be affected by wear, misuse, overloading etc. with a consequence of deformation and alteration of the material structure.
Inspection should take place at least every six months and even more frequently when the products are used in severe operating conditions.

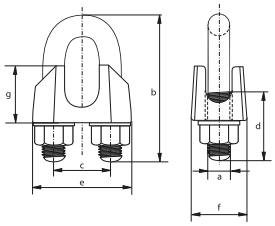
Ø WIRE ROPE (mm)	5	6,5	8	10	12	13	14	16	19	22	26	30	34	40
NUMBER OF CLIPS REQUIRED	3	3	4	4	4	4	4	4	5	5	5	6	6	6
TORQUE VALUE (Nm)	2	3,5	6	9	20	33	33	49	68	107	147	212	296	363

WIRE ROPE CLIPS GENERALLY TO DIN 741



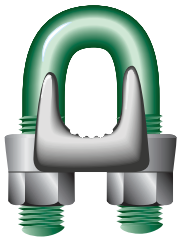
ROPE Ø (mm)	Ø a (mm)	LENGTH BOW b (mm)	WIDTH INSIDE c (mm)	LENGTH THREADING d (mm)	WIDTH BASE e (mm)	THICKNESS BASE f (mm)	HEIGHT BASE g (mm)	WEIGHT PER 100 PCS (kg)
3	4	20	9	12	21	10	10	1,4
5	5	24	11	13	23	11	10	1,5
6	5	28	13	15	26	12	11	2,1
8	6	34	16	19	30	14	15	4,1
10	8	42	19	22	34	18	17	6,8
11	8	44	20	22	36	19	18	7,2
13	10	55	24	30	42	23	21	13
14	10	57	25	30	44	23	22	13,5
16	12	63	29	33	50	26	26	21
19	12	75	32	38	54	29	30	28
22	14	85	37	44	61	33	34	40
26	14	95	41	45	65	35	37	44
30	16	110	48	50	74	37	43	66
34	16	120	52	55	80	42	50	85
40	16	140	58	60	80	45	55	104

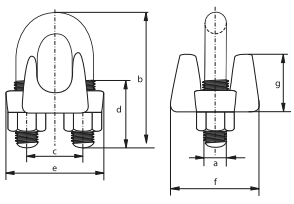
WIRE ROPE CLIPS GENERALLY TO EN 13411-5 - TYPE A



ROPE Ø (mm)	Ø a (mm)	LENGTH BOW b (mm)	WIDTH INSIDE c (mm)	LENGTH THREADING d (mm)	WIDTH BASE e (mm)	THICKNESS BASE f (mm)	HEIGHT BASE g (mm)	WEIGHT PER 100 PCS (kg)
5	4	25	12	14	25	13	13	2
6,5	5	32	14	17	30	16	14	4
8	7	41	18	20	39	20	18	8,2
10	7	46	20	24	40	20	21	9,2
12	10	56	24	28	50	25	24	21,5
13	11	64	29	29	55	28	29	27,5
14	12	66	28	31	59	30	28	39,5
16	12	76	34	35	64	32	35	43
19	12	83	37	36	68	33	40	49
22	14	96	41	40	74	34	44	68
26	18	111	46	50	84	38	51	117
30	18	127	54	55	95	41	59	140
34	22	141	60	60	105	45	67	213
40	24	159	68	65	117	49	77	268

GREEN PIN WIRE ROPE CLIPS GENERALLY TO EN 13411-5 - TYPE B

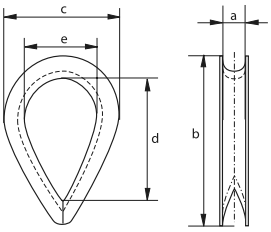




ROPE Ø (mm)	Ø a (mm)	LENGTH BOW b (mm)	WIDTH INSIDE c (mm)	LENGTH THREADING d (mm)	WIDTH BASE e (mm)	THICKNESS BASE f (mm)	HEIGHT BASE g (mm)	WEIGHT PER 100 PCS (kg)
4	5	24	12	11	24	21	10	2
5	6	31	15	13	29	24	13	4
7	8	34	19	13	37	30	18	8
8	10	45	22	19	43	33	19	14
10	11	49	26	19	49	42	25	19
11	12	60	30	25	58	46	26	31
13	13	61	30	25	58	48	31	34
15	14	72	33	32	63	52	31	36
16	14	74	33	32	64	54	36	45
20	16	86	38	37	72	57	38	68
22	19	98	45	41	80	62	40	108
26	19	108	48	46	88	67	47	113
30	19	117	51	51	91	73	48	140
34	22	130	59	54	105	79	56	207
36	22	140	60	59	108	79	58	234
40	22	147	66	60	112	85	64	266
42	25	161	70	67	121	92	67	329
46	29	174	78	70	134	97	76	441
52	32	195	86	78	150	113	85	603
58	32	213	98	81	162	116	100	707
65	32	227	105	87	168	119	113	806
72	32	243	112	91	174	127	124	1000
78	38	271	121	98	194	135	136	1440

Thimbles

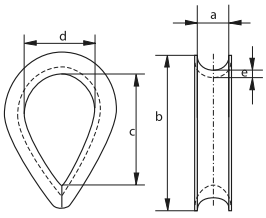
Standard thimbles



LIGHT TYPE

ROPE Ø (mm)	WIDTH GROOVE a (mm)	HEIGHT b (mm)	WIDTH OUTSIDE c (mm)	INTERNAL HEIGHT d (mm)	INTERNAL WIDTH e (mm)	WEIGHT PER 100 PCS (kg)
4	4	25	19	16	11	0,4
5	5	31	22	22	16	0,8
6	6	37	29	26	19	1,4
7	7	44	32	32	22	2
8	8	51	38	34	24	2,8
9	9	57	42	38	29	3
10	10	64	44	42	32	4,8
11	11	70	51	48	35	7,5
12	12	76	57	51	38	8
14	14	82	60	57	40	10
16	16	89	64	60	42	15
18	18	102	69	67	45	22
20	20	115	79	76	51	25
22	22	127	89	83	54	32
24	24	140	102	88	64	46
26	26	152	105	102	68	66
28	28	165	115	110	73	77
30	30	178	121	115	79	80
32	32	203	133	140	93	130

Heavy duty thimbles

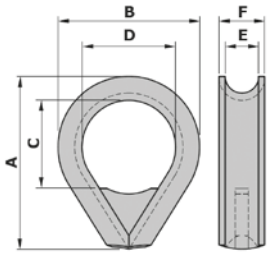


REINFORCED THIMBLES

ROPE Ø (mm)	WIDTH GROOVE a (mm)	EXTERNAL LENGTH b (mm)	LENGTH INSIDE c (mm)	WIDTH INSIDE d (mm)	THICKNESS BACK e (mm)	WEIGHT PER 100 PCS (kg)
8	8	51	35	22	4	6
10	10	64	47	30	4	7
12	12	76	57	35	5	14
14	14	89	65	45	6	22
16	16	102	76	50	6	24
18	18	114	86	53	8	43
20	20	127	94	60	9	65
22	22	140	107	65	10	93
24	24	152	114	70	10	102
28	28	178	130	80	10,5	135
32	32	203	157	100	10,5	162
36	36	229	177	115	12	363
40	40	254	198	120	12	376
44	44	279	214	130	15	608
50	50	305	215	140	20	960
56	56	356	245	160	20	1400
64	64	407	275	180	20	1700

K 2 B

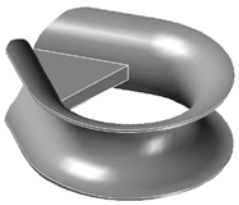
REINFORCED HEAVY DUTY THIMBLES (for wire rope)

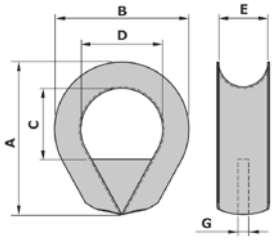


DIMENSIONS						WEIGHT
A (inch)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	(kg/100)
4	75	50	50	17	22	40
4,5	85	50	53	19	25	50
5	100	60	60	21	29	80
5,5	110	60	65	23	33	90
6	115	70	70	25	34	100
7	135	75	80	30	38	170
8	155	80	100	33	44	250
9	175	110	115	38	49	400
10	190	120	120	41	52	450
11	210	120	130	46	60	700
12	225	140	140	52	65	830
14	240	150	150	60	72	1250
17	290	185	180	70	84	1950
19	320	225	220	81	119	2900
22	375	280	240	92	130	3500
24	410	280	250	105	145	4200
26	450	280	280	120	155	5800

K 3 B

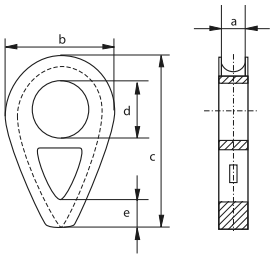
REINFORCED THIMBLE (for fibre rope)





DIMENSIONS						WEIGHT
A (inch)	B (mm)	C (mm)	D (mm)	E (mm)	G (mm)	(kg/100)
5	110	50	65	40	10	80
6	120	65	75	48	10	130
7	140	90	85	56	10	190
8	160	95	105	64	10	240
9	180	100	110	72	10	580
10	200	115	120	80	10	690
11	220	135	145	88	15	850
12	245	135	150	102	15	1200
14	300	135	170	115	15	1950
16	320	150	185	130	20	2000
18	350	200	205	150	20	3000

SOLID THIMBLE – DIN 3091

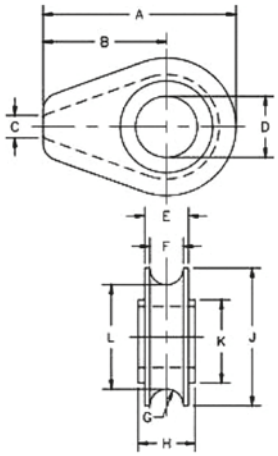


Finish: self coloured or galvanised

WIRE ROPE Ø (mm)	GROOVE WIDTH a (mm)	OUTSIDE WIDTH b (mm)	TOTAL HEIGHT c (mm)	Ø d (mm)	HEIGHT e (mm)	WEIGHT (Kg/100)
8	9	40	66	14	–	18
10	11	50	82	18	–	32
12	13	60	98	21	–	52
14	16	70	114	25	–	80
16	18	80	130	28	16	90
18	20	90	145	31	18	121
20	22	100	161	35	20	161
22	24	110	177	38	22	211
24	26	120	193	41	24	271
26	29	130	209	44	26	355
28	31	140	224	47	28	420
32	35	160	256	53	32	630
36	40	180	288	59	36	884
40	44	200	320	65	40	1100
44	48	220	352	70	44	1500
48	53	240	384	76	48	2000
52	57	260	416	81	52	2500
56	62	280	448	86	56	3200
64	70	320	512	95	64	4600
72	79	360	576	104	72	6600
80	88	400	640	112	80	9000

SOLID THIMBLE – S 412

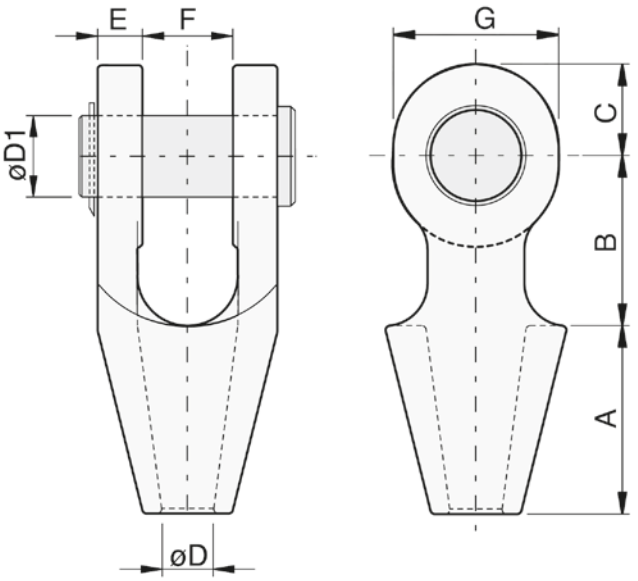
Cast ductile iron



ROPE Ø (mm)	DIMENSIONS A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	G (mm)	H (mm)	J (mm)	K (mm)	L (mm)	WEIGHT (kg/100)
13	71,5	44,5	6,35	26,9	19,1	14,2	7,1	22,4	54	41,4	39,6	30
16	119	76	9,65	33,3	26,9	20,6	10,4	28,7	88	57	65	100
18 - 20	119	76	9,65	38,1	26,9	20,6	10,4	35,1	88	57	65	105
22	154	97	12,7	44,5	35,1	26,9	13,5	41,4	114	82,5	87,5	250
24 - 26	154	97	12,7	54	35,1	26,9	13,5	46	114	82,5	87,5	240
28 - 30	184	116	16	60,5	44,5	33,3	16,8	52,5	137	98,5	103	420
32 - 35	184	116	16	67	49,3	38,9	19,8	58,5	137	98,5	105	440

Sockets

Open spelter socket

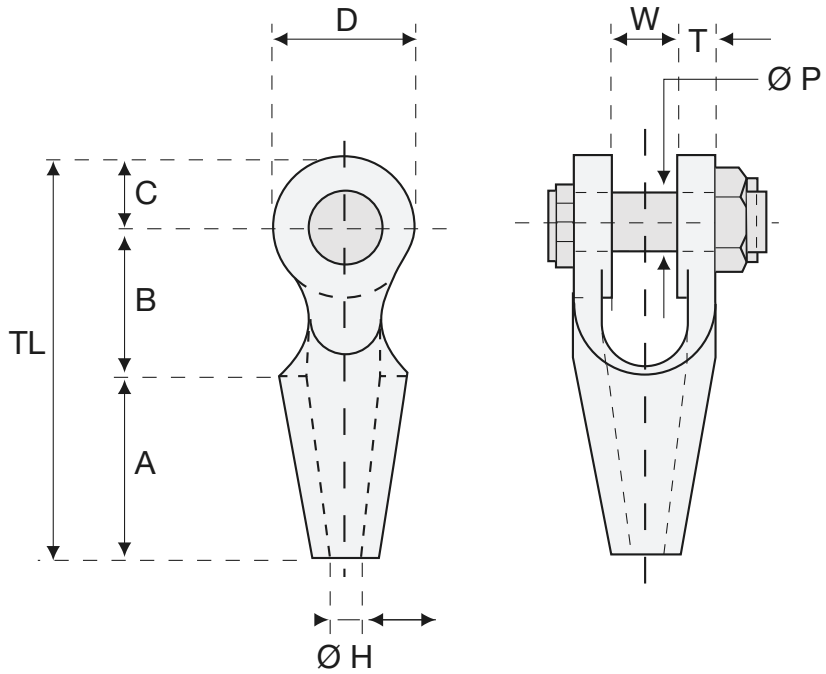


With linchpin

With nut and bolt

N°	MBL	ROPE Ø	DIMENSIONS								WEIGHT PER PIECE
			A	B	C	Ø D	Ø D1	E	F	G	
	(t)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(kg)
196	5	6 - 7	57	39,6	20	9,6	17,5	9,1	19,1	33,3	0,5
197	10	8 - 10	57	44,5	25	12,7	20,6	11,2	20,6	38,1	0,6
198	20	11 - 13	63,5	51,0	28	14,2	25,4	12,7	25,4	47,8	1
199	25	14 - 16	76	63,5	35	17,5	30,2	14,2	31,8	57	1,6
100	40	18 - 19	89	76	40	21	35	16	38	70	3,2
104	50	20 - 22	101	89	45	24	41	19	44	80	4,6
108	63	23 - 26	114	101	60	28	51	22	51	104	8
111	80	27 - 30	127	114	65	32	57	25	57	114	11
115	100	31 - 36	139	127	72	38	63	28	63	126	16
118	125	37 - 39	152	162	80	41	70	30	76	142	23
120	160	40 - 42	165	165	88	44	76	33	76	152	27
125	200	43 - 48	190	178	100	51	89	39	89	176	41
128	250	49 - 54	216	228	108	57	95	46	101	194	58
130	320	55 - 60	228	250	120	63	108	53	113	210	85
132	400	61 - 68	248	273	133	73	121	60	127	236	118
135	450	69 - 75	279	279	138	79	127	73	133	240	155
138	500	76 - 80	305	286	146	86	133	76	146	252	173
140	600	81 - 86	330	298	160	92	140	79	159	290	230
142	700	87 - 93	356	318	178	99	152	83	171	320	265
144	800	94 - 102	381	343	190	108	178	89	191	350	370
146	1000	108 - 115	450	480	215	125	195	100	205	400	525
150	1200	120 - 130	500	500	280	138	250	110	225	560	900

JIS sockets

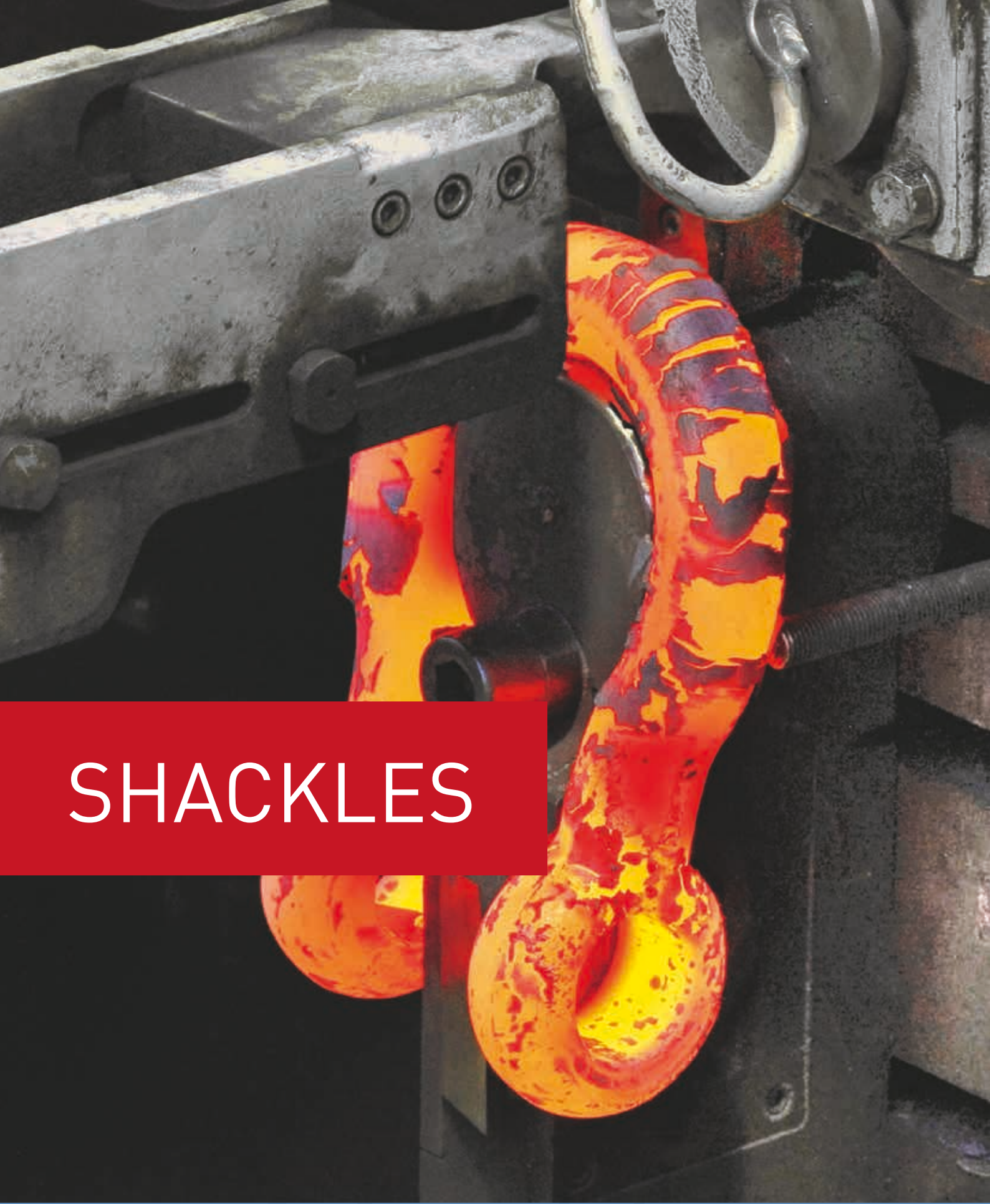


OPEN SPELTER SOCKET WITH BOLD AND NUT

Alternative for JIS type sockets

WIRE ROPE Ø (mm	ALT.	WLL (t)	DIMENSIONS A (mm)	B (mm)	C (mm)	D (mm)	H (mm)	P (mm)	T (mm)	TL (mm)	W (mm)	WEIGHT PER PIECE (kg)
20,1	(JIS 20)	3,5	89	76	40	70	21	30	16	205	38	3
22,4	(JIS 22)	4,5	101	89	45	80	24	34	19	235	44	5
24	(JIS 24)	5	114	101	60	104	28	37	22	275	51	8,5
25	(JIS 25)	6	114	101	60	104	28	40	22	275	51	8,5
28	(JIS 28)	7	127	114	65	114	32	43	25	306	57	13
30	(JIS 30)	9	127	114	65	114	32	46	25	306	57	13
31,5	(JIS 32)	10	139	127	72	126	38	48	28	338	63	16
33,5	(JIS 34)	11	139	127	72	126	38	52	28	338	63	16
35,5	(JIS 36)	13	152	162	80	142	41	56	30	394	76	22,5

WLL = Working Load Limit.
Standard blue painted (RAL 5019). Galvanised on request.
All sockets will be supplied with a EN 10204/DIN 50049 3.1B certificate.
Other certificates on request for a supplementary fee.



SHACKLES

General Information About Shackles

APPLICATIONS

Shackles are used in lifting operations and static systems as removable links to connect (steel) wire rope, chain and other fittings. Screw pin shackles are used mainly for non-permanent applications. Safety bolt shackles are used for long-term or permanent applications or where the load may slide on the pin causing rotation of the pin. Chain- or dee shackles are mainly used on one-leg systems whereas anchor- or bow shackles are mainly used on multi-leg systems.

RANGE

Van Beest offers a wide range of bow and dee shackles for a wide variety of applications. The range stretches from WLL 0,33t to 1550t. This provides our customers with a very extensive range to choose a shackle that suits their application best.

DESIGN

All Van Beest shackles have a specific design for a specific application.

Some examples are:
- Green Pin® Super shackles which are made out of grade 8 steel. They are designed to be used in confined spaces. The higher material strength is used to reduce the physical dimensions of the product whilst maintaining its WLL and functionality of the product;
- Green Pin® Polar shackles are for use in extreme climatic conditions with material properties guaranteed up to temperatures of -40°C;
- Green Pin® Sling shackles are designed to provide a better radius to the sling it lifts. A bigger radius increases the life span of the sling significantly;

These are all examples of highly functional designs, to optimize the use of the Van Beest shackles in daily use.
Shackles used for lifting applications are generally marked with:
- Working Load Limit: e.g. WLL 25 T
- Manufacturer's symbol: e.g. GP
- Traceability code: e.g. HA indicating a particular batch
- Steel grade: e.g. 4, 6, 8
- CE conformity code (Conformité Européenne): CE

Van Beest Green Pin® shackles meet all relevant requirements of the Machinery Directive 2006/42/EC and its latest amendments.

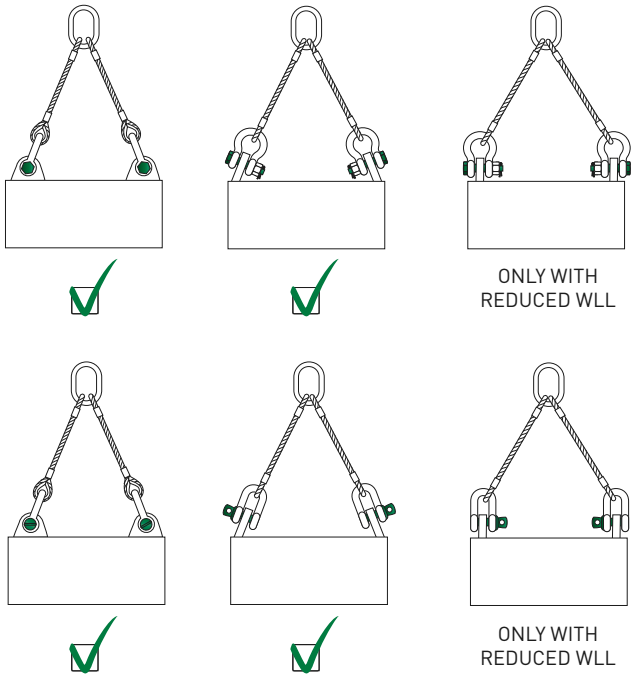
INSTRUCTIONS FOR USE

Select the correct type and WLL of shackle and WLL for the particular application. If extreme circumstances or shock loading may occur, this must be well taken into account when selecting the correct shackle.

Shackles should be inspected before use to ensure that:
- all markings are legible;
- the body and pin are both of the same brand and type;
- the body and pin are both of the correct size;
- never use a safety bolt type shackle without using a securing pin;
- the pin, nut, cotter pin, or any other locking system cannot vibrate out of position;
- the threads of the pin and the body are undamaged;
- the body and the pin are not distorted or unduly worn;
- the body and pin are free from nicks, gouges, cracks and corrosion;
- shackles may not be heat treated as this may affect their WLL;
- never modify, repair or reshape a shackle by machining, welding, heating or bending as this will affect the WLL.

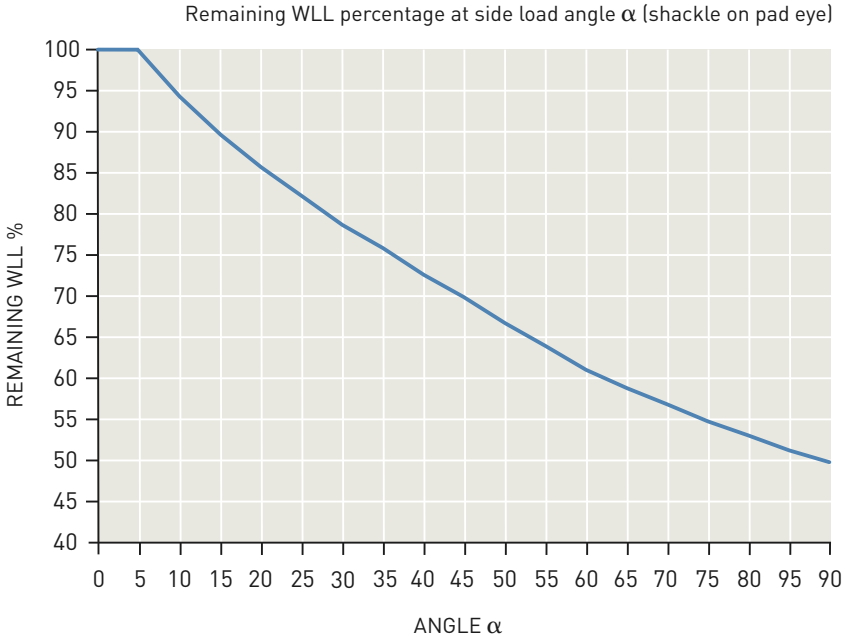
ASSEMBLY

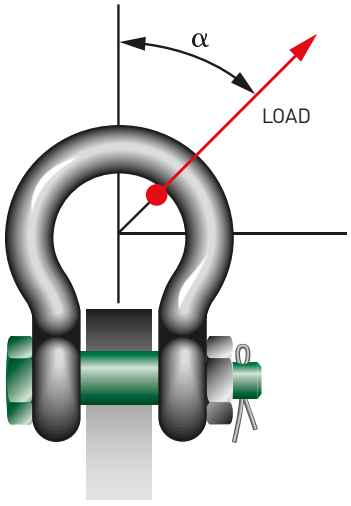
- Ensure that the pin is correctly screwed into the shackle eye: tighten it hand-tight, then secure it using a wrench or other suitable tool so that the collar of the pin is fully seated against the shackle eye.
- Ensure that the pin is of the correct length so that it penetrates the full depth of the threaded eye and the collar of the pin seats against the surface of the shackle eye.
- Incorrect seating of the pin may be caused by a bent pin, too tight fitting thread or misalignment of the pin holes. Do not use the shackle under these circumstances.
- Never replace a shackle pin except with one of the same brand, type, make and size to ensure the shackle maintains its original WLL.
- Make sure that the shackle is supporting the load correctly, i.e. along the axis of the shackle body centerline.
- Avoid bending loads, unstable loads and overloads.



SIDE LOADS

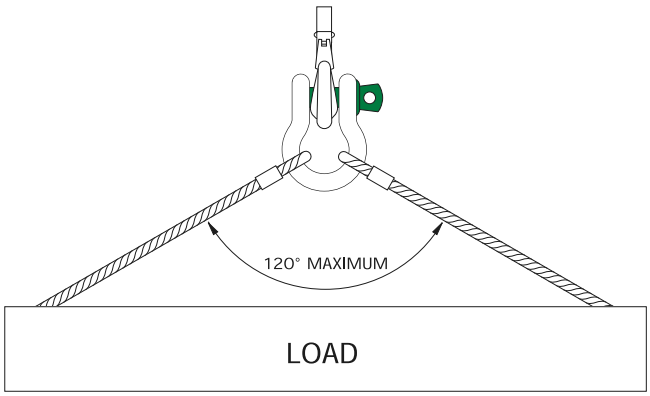
Side loads should be avoided, as the products are not designed for this purpose.
If side loads cannot be avoided, the WLL of the shackle must be reduced:





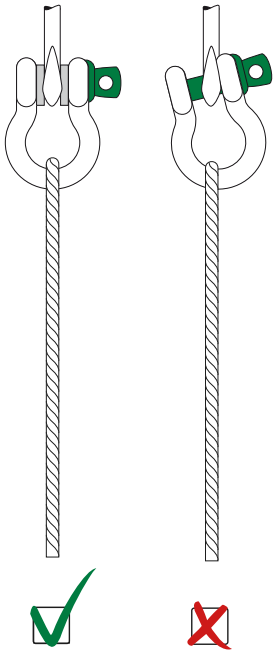
This graph is valid for all Green Pin® shackles, except P-6033 (Sling shackles).
In-line lifting is considered to be a load perpendicular to the pin and in the plane of the bow. The load angles in the graph represent the deviating angles from in-line loading.

When connecting shackles to multi-leg slings, consider the effect of the angle between the legs of the sling. As the angle increases, so does the load in the sling leg and consequently in any shackle attached to that leg.



When a shackle is used to connect two slings to the hook of a lifting device, a bow type shackle must be used. The slings must be connected to the shackle body, and the shackle pin must be placed in the hook. The angle between the slings should not exceed 120°. If symmetrically loaded the shackle may be used to the full WLL.

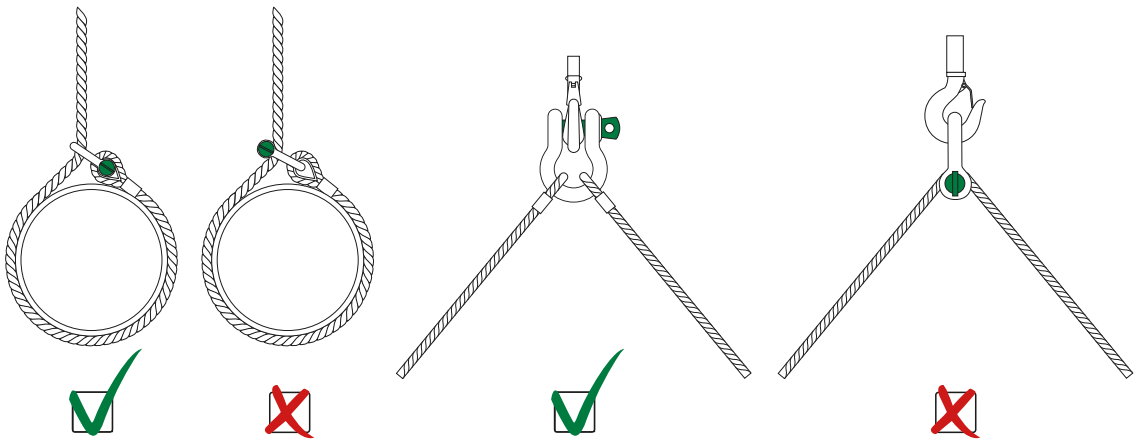
To avoid eccentric loading of the shackle a loose spacer may be used on either end of the shackle pin. Do not reduce the width between the shackle jaws by welding washers or spacers to the inside of the shackle eyes or by narrowing the jaws, as this will affect the WLL of the shackle.

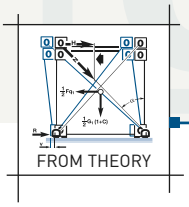


When a shackle is attached to the top block of a set of wire rope blocks the load on this shackle is increased by the value of the hoisting effect.

Avoid applications where the load moves over the shackle pin; the pin may rotate and possibly be unscrewed. If moving of the load cannot be avoided, or when the shackle is to be left in place for a prolonged period or where maximum pin security is required, use a shackle with a safety bolt, nut and cotter pin.

Shackles should not be immersed in acidic solutions or exposed to acidic fumes or other chemicals that are potentially harmful for the shackle.



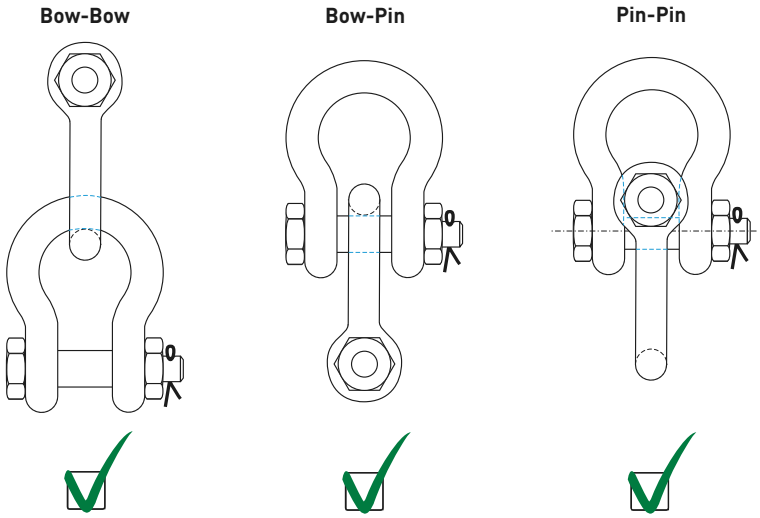


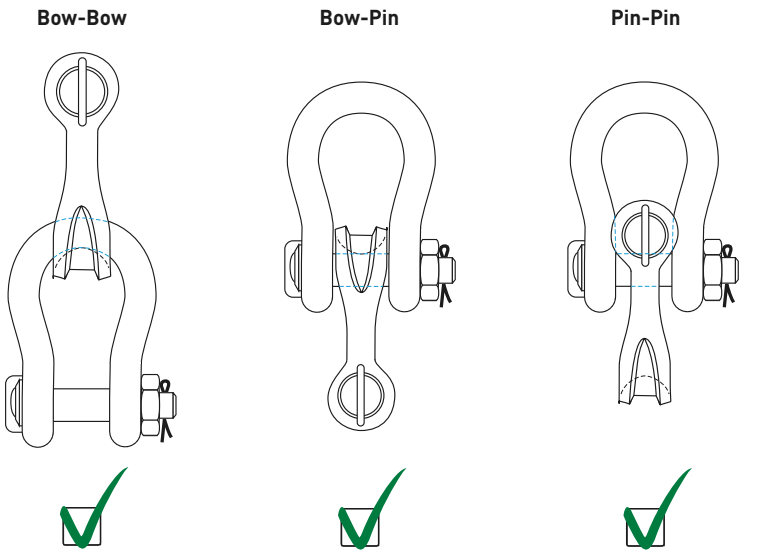
POINT LOADING

Shackles are used in lifting- and static systems as removable links to connect (steel) wire rope, chain and other fittings. Most of the times the load bearing component that connects to a shackle is of a rounded shape. Point loading of shackles during lifting operations is allowed but the minimum dimension of the rounded component to be lifted should be equal to or bigger than the bow size of the shackle being used. The maximum load of the configuration is limited by the component with the lowest WLL.

Increasing the contact area by using bigger diameters and/or pad eyes can be an advantage. Sharp edges should be avoided.

Green Pin® shackles can also be used in the configurations below. The maximum load of the configuration is limited by the component with the lowest WLL.





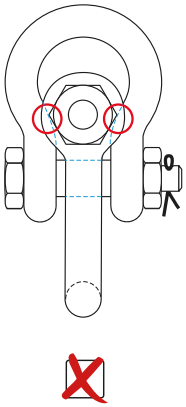
The crown of a Green Pin® Sling shackle is wider than that of a standard shackle, thus creating a bigger bearing surface. This improves the lifetime of the sling.

Green Pin® Sling shackles can also be used in the following configurations. The maximum load of the configuration is limited by the component with the lowest WLL.

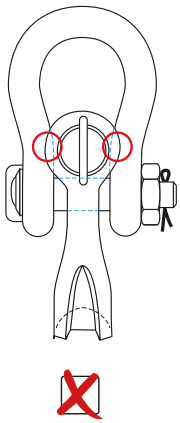
Pin-Pin configuration

When the shackle eyes touch and the pins do not bear properly, the configuration should not be used.

Pin-Pin



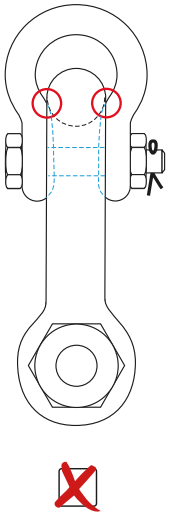
Pin-Pin



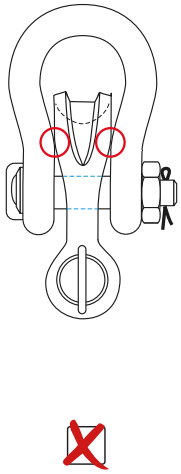
Bow-Pin configuration

When the shackle body of the inner shackle touches the shackle eyes of the outer shackle and body and pin do not bear properly, the configuration should not be used.

Bow-Pin



Bow-Pin



TEMPERATURE

If extreme temperature situations occur, the following load reductions must be taken into account:

TEMPERATURE	REDUCTION FOR ELEVATED TEMPERATURES New Working Load Limit
up to 200°C	100% of original Working Load Limit
200 - 300°C	90% of original Working Load Limit
300 - 400°C	75% of original Working Load Limit
> 400°C	not allowed

The rating of shackles to EN 13889 assumes the absence of exceptionally hazardous conditions. Exceptionally hazardous conditions include offshore activities, the lifting of persons and the lifting of potentially dangerous loads such as molten metals, corrosive materials or fissile materials. In such cases a competent person should assess the degree of hazard and the WLL should be reduced accordingly.

INSPECTION

Shackles must be regularly inspected in accordance with the safety standards given in the country of use. This is required because the products in use may be affected by wear, misuse, overloading etc. which may lead to deformation and alteration of the material structure.

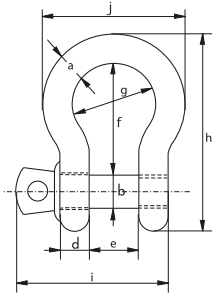
Inspection should take place at least every six months and more frequently when the shackles are used in severe operating conditions.

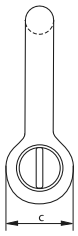
Green Pin® Standard Shackles

G-4161 BOW SHACKLES WITH SCREW COLLAR PIN

Material: Bow and pin high tensile steel, Grade 6, quenched and tempered
Safety Factor: MBL equals 6 x WLL
Standard: EN 13889 and meets performance requirements of US Fed. Spec. RR-C-271 Type IVA Class 2, Grade A from 2 t and upward these shackles comply with ASME B30.26
Finish: Hot dipped galvanized
Temperature Range: -40°C up to +200°C
Certification: Workshop certificate

G-4161

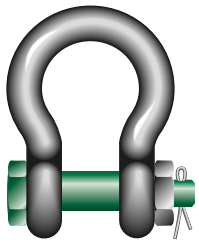




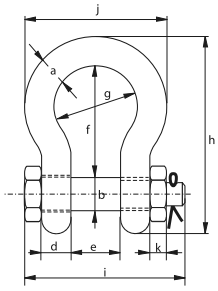
WLL (t)	Ø BOW a (mm)	Ø PIN b (mm)	Ø EYE c (mm)	WIDTH EYE d (mm)	WIDTH INSIDE e (mm)	LENGTH INSIDE f (mm)	WIDTH BOW g (mm)	LENGTH h (mm)	LENGTH BOLT i (mm)	WIDTH j (mm)	WEIGHT EACH (kg)
0,33	5	6	12	5	9,5	22	16	36	29,5	26	0,02
0,5	7	8	16,5	7	12	29	20	48,5	38	34	0,05
0,75	9	10	20	9	13,5	32	22	56	46,5	40	0,1
1	10	11	22,5	10	17	36,5	26	63,5	54	46	0,14
1,5	11	13	26,5	11	19	43	29	74	59,5	51	0,19
2	13,5	16	34	13	22	51	32	89	73	58	0,36
3,25	16	19	40	16	27	64	43	110	89	75	0,63
4,75	19	22	46	19	31	76	51	129	103	89	1,01
6,5	22	25	52	22	36	83	58	144	119	102	1,5
8,5	25	28	59	25	43	95	68	164	137	118	2,21
9,5	28	32	66	28	47	108	75	185	153	131	3,16
12	32	35	72	32	51	115	83	201	170	147	4,31
13,5	35	38	80	35	57	133	92	227	186	162	5,55
17	38	42	88	38	60	146	99	249	203	175	7,43
25	45	50	103	45	74	178	126	300	243	216	12,84
35	50	57	111	50	83	197	138	331	272	238	18,15
42,5	57	65	130	57	95	222	160	377	310	274	26,29
55	65	70	145	65	105	260	180	433	344	310	37,6

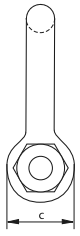
G-4163 BOW SHACKLES WITH SAFETY BOLT

Material: Bow and pin high tensile steel, Grade 6, quenched and tempered
Safety Factor: MBL equals 6 x WLL
Standard: EN 13889 and meets performance requirements of US Fed. Spec. RR-C-271 Type IVA Class 3, Grade A from 2t and upward these shackles comply with ASME B30.26
Finish: Hot dipped galvanized
Temperature Range: -40°C up to +200°C
Certification: Workshop certificate



G-4163





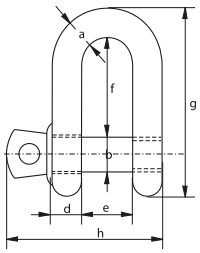
WLL (t)	Ø BOW a (mm)	Ø PIN b (mm)	Ø EYE c (mm)	WIDTH EYE d (mm)	WIDTH INSIDE e (mm)	LENGTH INSIDE f (mm)	WIDTH BOW g (mm)	LENGTH h (mm)	LENGTH BOLT i (mm)	WIDTH j (mm)	THICKNESS NUT k (mm)	WEIGHT EACH (kg)
0,5	7	8	16,5	7	12	29	20	48,5	42	34	4	0,06
0,75	9	10	20	9	13,5	32	22	56	50	40	5	0,11
1	10	11	22,5	10	17	36,5	26	63,5	60	46	8	0,16
1,5	11	13	26,5	11	19	43	29	74	67	51	11	0,22
2	13,5	16	34	13	22	51	32	89	82	58	13	0,42
3,25	16	19	40	16	27	64	43	110	98	75	17	0,74
4,75	19	22	46	19	31	76	51	129	114	89	19	1,18
6,5	22	25	52	22	36	83	58	144	130	102	22	1,77
8,5	25	28	59	25	43	95	68	164	150	118	25	2,58
9,5	28	32	66	28	47	108	75	185	166	131	27	3,66
12	32	35	72	32	51	115	83	201	178	147	30	4,91
13,5	35	38	80	35	57	133	92	227	197	162	33	6,54
17	38	42	88	38	60	146	99	249	202	175	19	8,19
25	45	50	103	45	74	178	126	300	249	216	23	14,22
35	50	57	111	50	83	197	138	331	269	238	26	19,53
42,5	57	65	130	57	95	222	160	377	301	274	29	28,33
55	65	70	145	65	105	260	180	433	330	310	32	39,59
85	75	83	162	73	127	329	190	527	380	340	39	62

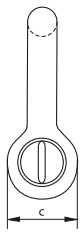
Green Pin® Standard Shackles

G-4151 DEE SHACKLES WITH SCREW COLLAR PIN

G-4151

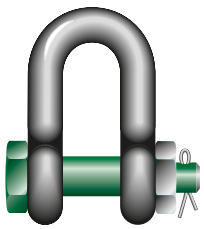
Material: Bow and pin high tensile steel, Grade 6, quenched and tempered
Safety Factor: MBL equals 6 x WLL
Standard: EN 13889, ASME B30.26 and meets performance requirements of US Fed. Spec. RR-C-271 Type IVB Class 3, Grade A
Finish: Hot dipped galvanized
Temperature Range: -40°C up to +200°C
Certification: Workshop certificate





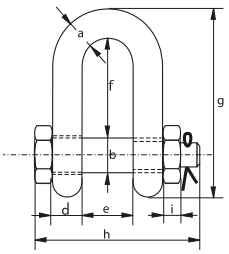
WLL (t)	Ø BOW a (mm)	Ø PIN b (mm)	Ø EYE c (mm)	WIDTH EYE d (mm)	WIDTH INSIDE e (mm)	LENGTH INSIDE f (mm)	LENGTH g (mm)	LENGTH BOLT h (mm)	WEIGHT EACH (kg)
0,33	5	6	12	5	9,5	19	33	29,5	0,02
0,5	7	8	16,5	7	12	22	41,5	38	0,05
0,75	9	10	20	9	13,5	26	50	46,5	0,09
1	10	11	22,5	10	17	32	59	54	0,14
1,5	11	13	26,5	11	19	37	68	59,5	0,19
2	13,5	16	34	13	22	43	81	73	0,32
3,25	16	19	40	16	27	51	97	89	0,54
4,75	19	22	46	19	31	59	112	103	0,87
6,5	22	25	52	22	36	73	134	119	1,34
8,5	25	28	59	25	43	85	154	137	2,08
9,5	28	32	66	28	47	90	167	153	2,77
12	32	35	72	32	51	94	180	170	3,72
13,5	35	38	80	35	57	115	209	186	5,14
17	38	42	88	38	60	127	230	203	6,85
25	45	50	103	45	74	149	271	243	11,45
35	50	57	111	50	83	171	305	272	16,86
42,5	57	65	130	57	95	190	345	310	24,61
55	65	70	145	65	105	203	376	344	32,65

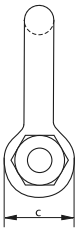
G-4153 DEE SHACKLES WITH SAFETY BOLT



G-4153

Material: Bow and pin high tensile steel, Grade 6, quenched and tempered
Safety Factor: MBL equals 6 x WLL
Standard: EN 13889, ASME B30.26 and meets performance requirements of US Fed. Spec. RR-C-271 Type IVB Class 3, Grade A
Temperature Range: -40°C up to +200°C
Certification: Workshop certificate



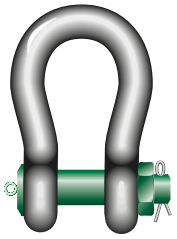


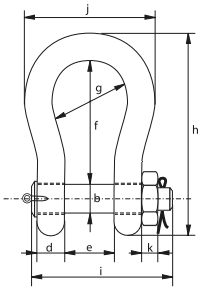
WLL (t)	Ø BOW a (mm)	Ø PIN b (mm)	Ø EYE c (mm)	WIDTH EYE d (mm)	WIDTH INSIDE e (mm)	LENGTH INSIDE f (mm)	LENGTH g (mm)	LENGTH BOLT h (mm)	THICKNESS NUT i (mm)	WEIGHT EACH (kg)
2	13,5	16	34	13	22	43	81	82	13	0,39
3,25	16	19	40	16	27	51	97	98	17	0,67
4,75	19	22	46	19	31	59	112	114	19	1,08
6,5	22	25	52	22	36	73	134	130	22	1,66
8,5	25	28	59	25	43	85	154	150	25	2,46
9,5	28	32	66	28	47	90	167	166	27	3,4
12	32	35	72	32	51	94	180	178	30	4,51
13,5	35	38	80	35	57	115	209	197	33	6,1
17	38	42	88	38	60	127	230	202	19	7,63
25	45	50	103	45	74	149	271	249	23	12,88
35	50	57	111	50	83	171	305	269	26	17,35
42,5	57	65	130	57	95	190	345	301	29	25,94
55	65	70	145	65	105	203	376	330	32	35,33
85	75	83	162	73	127	229	427	380	39	52,97

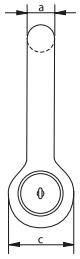
Green Pin® Heavy Duty Shackles

P-6036 BOW SHACKLES WITH SAFETY BOLT

Material: Bow and pin alloy steel, Grade 8 quenched and tempered
Safety Factor: MBL equals 5 x WLL
Finish: Shackle bow painted silver, pin painted green (120 ton shackle is hot dipped galvanized)
Certification: Workshop certificate, above 120t LRS certificate


P-6036





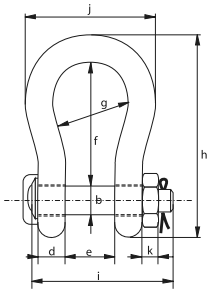
WLL (t)	Ø BOW a (mm)	Ø PIN b (mm)	Ø EYE c (mm)	WIDTH EYE d (mm)	WIDTH INSIDE e (mm)	LENGTH INSIDE f (mm)	WIDTH BOW g (mm)	LENGTH h (mm)	LENGTH BOLT i (mm)	WIDTH j (mm)	THICKNESS NUT k (mm)	WEIGHT EACH (kg)
120	95	95	208	91	147	400	238	647	440	428	50	110
150	105	108	238	102	169	410	275	688	490	485	60	160
200	120	130	279	113	179	513	290	838	520	530	60	235
250	130	140	299	118	205	554	305	904	560	565	65	285
300	140	150	325	123	205	618	305	996	575	585	70	340
400	170	175	376	164	231	668	325	1114	690	665	70	560
500	180	185	398	164	256	718	350	1190	720	710	70	685
600	200	205	444	189	282	718	375	1243	810	775	70	880
700	210	215	454	204	308	718	400	1263	870	820	70	980
800	210	220	464	204	308	718	400	1270	870	820	70	1100
900	220	230	485	215	328	718	420	1296	920	860	70	1280
1000	240	240	515	215	349	718	420	1336	940	900	70	1460
1250	260	270	585	230	369	768	450	1456	1025	970	70	1990
1500	280	290	625	230	369	818	450	1556	1025	1010	70	2400

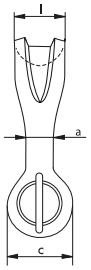
Green Pin® Sling Shackles

P-6033 BOW SHACKLES WITH SAFETY BOLT

Material: Bow and pin alloy steel, Grade 8, quenched and tempered
Safety Factor: MBL equals 5 x WLL
Finish: Shackle bow painted silver, pin painted green
Temperature Range: -20 °C up to +200 °C
Certification: Workshop certificate, above 125t LRS certificate

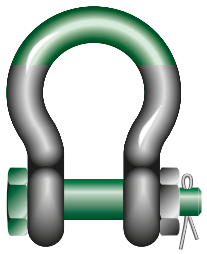

P-6033





WLL (t)	Ø BODY a (mm)	Ø PIN b (mm)	Ø EYE c (mm)	WIDTH EYE d (mm)	WIDTH INSIDE e (mm)	LENGTH INSIDE f (mm)	WIDTH BOW g (mm)	LENGTH h (mm)	LENGTH BOLT i (mm)	WIDTH j (mm)	THICKNESS NUT k (mm)	BEARING SURFACE l (mm)	WEIGHT EACH (kg)
7	22	22	46	19	32	96	64	153	115	110	19	41	2
12,5	28	28	61	25	44	121	82	197	151	146	24	54	4
18	35	35	69	30	54	148	102	239	175	180	29	64	7
30	40	42	90	35	69	165	126	279	211	200	34	79	13
40	55	51	109	45	84	199	140	331	252	235	38	97	21
55	60	57	115	55	90	240	160	389	299	270	45	100	30
75	68	70	125	54	110	290	185	473	327	317	54	120	48
125	85	80	154	85	137	366	220	583	426	390	64	150	92
150	94	95	179	89	147	391	253	645	435	434	50	170	140
200	110	105	199	100	158	481	280	759	470	482	50	205	205
250	126	120	227	110	179	542	300	859	519	530	60	240	264
300	135	134	245	122	195	601	350	947	575	620	70	265	360
400	160	160	293	145	231	576	370	985	675	690	80	320	580
500	170	180	328	160	263	681	450	1131	748	790	90	339	780
600	190	200	348	170	289	741	490	1234	809	865	100	370	980
700	200	215	392	190	315	751	540	1284	879	901	100	400	1360
800	218	230	420	200	342	851	554	1426	942	947	110	420	1430
900	242	255	466	220	368	851	580	1488	1023	1023	120	440	1650
1000	260	270	490	240	399	851	614	1532	1103	1107	120	460	2970
1250	285	300	510	260	452	931	650	1666	1227	1182	150	530	3700
1550	285	320	550	280	483	950	680	1710	1300	1253	150	560	4000

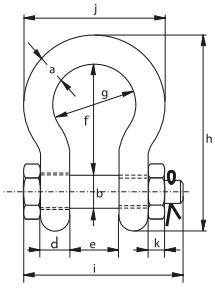
Green Pin® Super Shackles

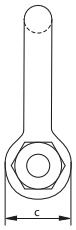


G-5263

G-5263 BOW SHACKLES WITH SAFETY BOLT

Material:	Bow and pin alloy steel, Grade 8, quenched and tempered
Safety Factor:	MBL equals 5 x WLL
Standard:	ASME B30.26 and meets performance requirements of US Fed. Spec. RR-C-271 Type IVA Class 3, Grade B
Finish:	Hot dipped galvanized (175 ton shackle is painted)
Temperature Range:	-20 °C up to +200 °C
Certification:	Workshop certificate, above 120t LRS certificate

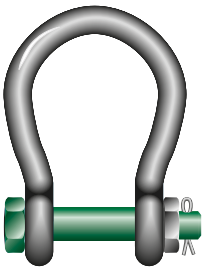




WLL (t)	Ø BOW a (mm)	Ø PIN b (mm)	Ø EYE c (mm)	WIDTH EYE d (mm)	WIDTH INSIDE e (mm)	LENGTH INSIDE f (mm)	WIDTH BOW g (mm)	LENGTH h (mm)	LENGTH BOLT i (mm)	WIDTH j (mm)	THICKNESS NUT k (mm)	WEIGHT EACH (kg)
3,3	13,5	16	34	13	22	51	32	89	82	58	13	0,40
5	16	19	40	16	27	64	43	110	98	75	17	0,73
7	19	22	46	19	31	76	51	129	114	89	19	1,19
9,5	22	25	52	22	36	83	58	144	130	102	22	1,73
12,5	25	28	59	25	43	95	68	164	150	118	25	2,56
15	28	32	66	28	47	108	75	185	166	131	27	3,6
18	32	35	72	32	51	115	83	201	178	147	30	4,95
21	35	38	80	35	57	133	92	227	197	162	33	6,62
30	38	42	88	38	60	146	99	249	217	175	34	8,11
40	45	50	103	45	74	178	126	300	260	216	40	15
55	57	57	117	57	83	197	138	341	303	252	46	23
85	70	70	143	70	105	260	180	437	363	320	56	44
120	83	83	162	83	127	329	190	535	425	356	66	72
150*	95	95	208	91	147	400	238	647	511	428	50	112
175*	105	108	238	102	169	410	275	688	561	485	60	160

* = round headed bolt

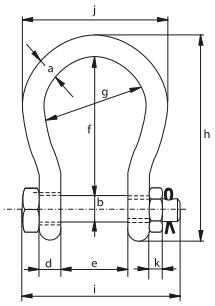
Green Pin® Wide Mouth Shackles

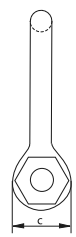


G-4263

G-4263 BOW SHACKLES WITH SAFETY BOLT

Material:	Bow and pin alloy steel, Grade 8, quenched and tempered
Safety Factor:	MBL equals 6 x WLL
Finish:	Hot dipped galvanized
Temperature Range:	-20 °C up to +200 °C
Certification:	Workshop certificate





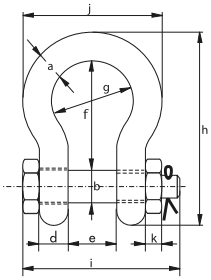
WLL (t)	Ø BOW a (mm)	Ø PIN b (mm)	Ø EYE c (mm)	WIDTH EYE d (mm)	WIDTH INSIDE e (mm)	LENGTH INSIDE f (mm)	WIDTH BOW g (mm)	LENGTH h (mm)	LENGTH BOLT i (mm)	WIDTH j (mm)	THICKNESS NUT k (mm)	WEIGHT EACH (kg)
4,75	22	25	52	22	63	112	88	173	157	132	22	2,08
6,5	25	28	59	25	75	135	105	204	183	155	25	3,14
8,5	28	32	66	28	82	148	115	225	205	171	27	4,36
9,5	32	35	72	32	90	162	126	248	224	190	30	5,95
12	35	38	79	35	100	180	140	274	245	210	33	7,87
16	38	42	88	38	106	216	159	319	248	235	19	12,5
25	45	50	103	45	127	248	175	370	296	265	23	16,7
30	50	57	118	50	146	273	207	411	332	307	26	25
55	65	70	145	65	165	314	213	487	391	343	32	45
75	83	83	164	83	184	330	254	537	460	420	39	70

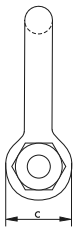
Green Pin® Polar Shackles

G-5163

G-5163 BOW SHACKLES WITH SAFETY BOLT, FOR USE UNDER EXTREME CLIMATIC CONDITIONS

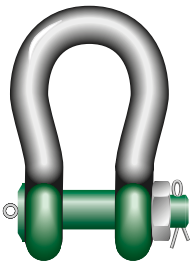
Material:	Bow and pin alloy steel, Grade 8, quenched and tempered
Safety Factor:	MBL equals 8 x WLL. For shackles with WLL 55 and 85 tons, MBL equals 6 x WLL.
Standard:	EN 13889, ASME B30.26 and meets performance requirements of US Fed. Spec. RR-C-271 Type IVA Class 3, Grade A
Finish:	Hot dipped galvanized
Temperature Range:	-60°C up to +200°C
Certification:	Workshop certificate





WLL (t)	Ø BOW a (mm)	Ø PIN b (mm)	Ø EYE c (mm)	WIDTH EYE d (mm)	WIDTH INSIDE e (mm)	LENGTH INSIDE f (mm)	WIDTH BOW g (mm)	LENGTH h (mm)	LENGTH BOLT i (mm)	WIDTH j (mm)	THICKNESS NUT k (mm)	WEIGHT EACH (kg)
2	13,5	16	34	13	22	51	32	89	82	58	13	0,42
3,25	16	19	40	16	27	64	43	110	98	75	17	0,74
4,75	19	22	46	19	31	76	51	129	114	89	19	1,18
6,5	22	25	52	22	36	83	58	144	130	102	22	1,77
8,5	25	28	59	25	43	95	68	164	150	118	25	2,58
9,5	28	32	66	28	47	108	75	185	166	131	27	3,66
12	32	35	72	32	51	115	83	201	178	147	30	4,91
13,5	35	38	80	35	57	133	92	227	197	162	33	6,54
17	38	42	88	38	60	146	99	249	202	175	19	8,19
25	45	50	103	45	74	178	126	300	249	216	23	14,22
35	50	57	116	50	83	197	138	334	269	238	26	19,85
42,5	57	65	130	57	95	222	160	377	301	274	29	28,33
55	65	70	145	65	105	260	180	433	330	310	32	39,59
85	75	83	162	73	127	329	190	527	380	340	39	62

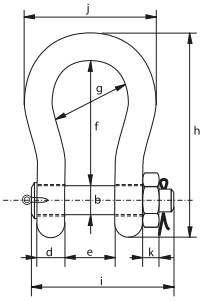
Green Pin® Heavy Duty Polar Shackles

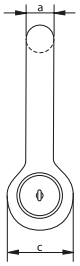


P-6031

G-6031 BOW SHACKLES WITH SAFETY BOLT, FOR USE UNDER EXTREME CLIMATIC CONDITIONS

Material:	Bow and pin alloy steel, Grade 8, quenched and tempered
Safety Factor:	MBL equals 5 x WLL
Finish:	Shackle bow painted silver, pin painted green (120 tons shackle is hot dipped galvanized)
Temperature Range:	-40 °C up to +200 °C
Certification:	Workshop certificate, above 120t LRS certificate





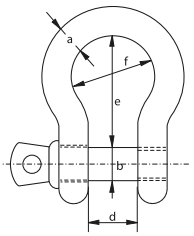
WLL (t)	Ø BOW a (mm)	Ø PIN b (mm)	Ø EYE c (mm)	WIDTH EYE d (mm)	WIDTH INSIDE e (mm)	LENGTH INSIDE f (mm)	WIDTH BOW g (mm)	LENGTH h (mm)	LENGTH BOLT i (mm)	WIDTH j (mm)	THICKNESS NUT k (mm)	WEIGHT EACH (kg)
120	95	95	208	91	147	400	238	647	440	428	50	110
150	105	108	238	102	169	410	275	688	490	485	60	160
200	120	130	279	113	179	513	290	838	520	530	60	235
250	130	140	299	118	205	554	305	904	560	565	65	285
300	140	150	325	123	205	618	305	996	575	585	70	340
400	170	175	376	164	231	668	325	1114	690	665	70	560
500	180	185	398	164	256	718	350	1190	720	710	70	685
600	200	205	444	189	282	718	375	1243	810	775	70	880
700	210	215	454	204	308	718	400	1263	870	820	70	980
800	210	220	464	204	308	718	400	1270	870	820	70	1100
900	220	230	485	215	328	718	420	1296	920	860	70	1280
1000	240	240	515	215	349	718	420	1336	940	900	70	1460
1250	260	270	585	230	369	768	450	1456	1025	970	70	1990
1500	280	290	625	230	369	818	450	1556	1025	1010	70	2400

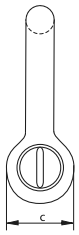
Yellow Pin Shackles

G-3161 BOW SHACKLES WITH SCREW COLLAR PIN

G-3161

Material: Bow and pin high tensile steel, Grade 6
Standard: Generally to US Fed. Spec. RR-C-271
Finish: Hot dipped galvanized
Certification: Workshop certificate
Note: Import quality



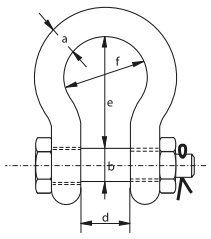


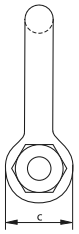
WLL (t)	Ø BOW a (mm)	Ø PIN b (mm)	EYE c (mm)	WIDTH INSIDE d (mm)	LENGTH INSIDE e (mm)	WIDTH BOW f (mm)	WEIGHT EACH (kg)
0,33	5	6	14	9,5	22	15	0,03
0,5	6	8	16	12	29	20	0,05
0,75	8	10	19	13,5	31	21	0,08
1	10	11	23	17	37	26	0,14
1,5	11	13	27	19	43	29	0,2
2	13	16	30	20	48	33	0,33
3,25	16	19	38	27	60	43	0,62
4,75	19	22	46	32	71	50	1,07
6,5	22	25	53	36	84	58	1,62
8,5	25	28	61	43	95	68	2,28
9,5	28	32	68	46	108	74	3,36
12	32	35	76	51	119	82	4,31
13,5	35	38	84	57	133	92	6,14
17	38	42	92	60	146	98	7,81
25	45	50	106	73	177	127	12,61

G-3163 BOW SHACKLES WITH SAFETY BOLT

G-3163

Material: Bow and pin high tensile steel, Grade 6
Standard: Generally to US Fed. Spec. RR-C-271
Finish: Hot dipped galvanized
Certification: Workshop certificate
Note: Import quality





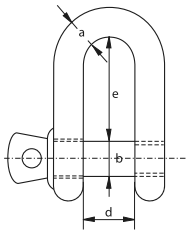
WLL (t)	Ø BOW a (mm)	Ø PIN b (mm)	EYE c (mm)	WIDTH INSIDE d (mm)	LENGTH INSIDE e (mm)	WIDTH BOW f (mm)	WEIGHT EACH (kg)
2	13	16	30	20	48	33	0,36
3,25	16	19	38	27	60	43	0,7
4,75	19	22	46	32	71	50	1,1
6,5	22	25	53	36	84	58	1,61
8,5	25	28	61	43	95	68	2,42
9,5	28	32	68	46	108	74	3,35
12	32	35	76	51	119	82	5,32
13,5	35	38	84	57	133	92	7,19
17	38	42	92	60	146	98	9,44
25	45	50	106	73	177	127	13,8

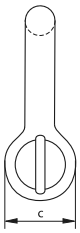
Yellow Pin Shackles

G-3151

G-3151 DEE SHACKLES WITH SCREW COLLAR PIN

Material: Bow and pin high tensile steel, Grade 6
Standard: Generally to US Fed. Spec. RR-C-271
Finish: Hot dipped galvanized
Certification: Workshop certificate
Note: Import quality



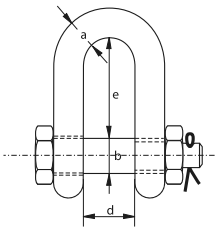


WLL (t)	BOW a (mm)	Ø PIN b (mm)	EYE c (mm)	WIDTH INSIDE d (mm)	LENGTH INSIDE e (mm)	WEIGHT EACH (kg)
0,33	5	6	12	9,5	19	0,03
0,5	6	8	16	12	22	0,04
0,75	8	10	19	13,5	26	0,08
1	10	11	23	17	32	0,13
1,5	11	13	27	19	37	0,2
2	13	16	30	20	41	0,28
3,25	16	19	38	27	51	0,57
4,75	19	22	46	32	60	1,19
6,5	22	25	53	36	71	1,43
8,5	25	28	61	43	81	2,16
9,5	28	32	68	46	90	3,06
12	32	35	76	51	100	4,11
13,5	35	38	84	57	111	5,28
17	38	42	92	60	122	6,69
25	45	50	106	73	146	12,14

G-3153

G-3153 DEE SHACKLES WITH SAFETY BOLT

Material: Bow and pin high tensile steel, Grade 6
Standard: Generally to US Fed. Spec. RR-C-271
Finish: Hot dipped galvanized
Certification: Workshop certificate
Note: Import quality



WLL (t)	BOW a (mm)	Ø PIN b (mm)	EYE c (mm)	WIDTH INSIDE d (mm)	LENGTH INSIDE e (mm)	WEIGHT EACH (kg)
2	13	16	30	20	41	0,33
3,25	16	19	38	27	51	0,62
4,75	19	22	46	32	60	1,02
6,5	22	25	53	36	71	1,49
8,5	25	28	61	43	81	2,26
9,5	28	32	68	46	90	3,2
12	32	35	76	51	100	4,91
13,5	35	38	84	57	111	5,84
17	38	42	92	60	122	8,4
25	45	50	106	73	146	11,9

CHAINS & HOOKS

Chain Terminology

NOMINAL DIMENSION (Dn)
Nominal diameter of wire or steel rod of circular section from which the chain is manufactured.

PITCH (p)
Measured inner length of link.

CHAIN MANUFACTURING TEST FORCE (MPF)
Force at which the whole chain is subject during manufacturing.

BREAKING FORCE (BF)
Maximum force that the chain can support during static tension test until it breaks.

WORKING LOAD LIMIT OF THE CHAIN (WLL)
Maximum mass that the chain vertically suspended is admissible to support in normal lifting service.

OVERALL ELONGATION (A)
Overall stretching to the breaking point of the chain, expressed in percentage of the inner length of the tested sample.

FINISHING
Any treatment of the chain after welding, for instance: heat treatment, polishing or dimensional calibration.

DUCTILITY
The energy necessary to break a piece according to its unit section; it is generally expressed in joules per cm^2 (J/cm^2).
It may also be expressed as tenacity, i.e. the capacity to resist to breaking or intensity factor of critical stress.

QUALIFIED PERSON
Person appointed, trained, properly qualified by his knowledge and practical experience and having received the necessary instructions to enable him to carry out tests and required inspection.

Advice For Use And Maintenance

CHAIN SLINGS according to EN 818-6

IMPORTANT
Remember that a chain sling has the resistance of its weakest element.

GENERAL POINTS

1 Chain slings should be listed in a register recording the installation date, the type, the dimensional characteristics (diameter & number of legs) and the WLL.
2 All slings should have an identification tag stating their WLL according to the 0-45° angle in relation to the vertical, the manufacturer tag, the date of manufacture and the CE tag. Any sling without an identification tag should be discarded.
3 Before use, the load to lift should be determined and the sling chosen consequently according to the slinging angle.
4 Make sure that the load is not fixed or anchored. Center the lifting hook and the sling on the load. The sling legs should be arranged without any twisting or knotting. Never lift with a twisted chain. It is possible to adjust the length of the legs with shortening hooks. Never shorten by making a knot. Never lengthen a leg with a knot or a bolt. Never shock to rectify the position of legs or hooks.
5 Protect the edges against sharp angles by ensuring that the supports have a higher diameter than the chain thread diameter. Use protective fittings. Avoid shocks and jolts when lifting. The sling should be tensioned progressively, and lifting done without abrupt acceleration or operations. Operators should be sufficiently far enough away from the sling when tensioning the legs. During lifting, nobody should be in the danger zone; all the more, climbing up onto the load or passing underneath it is strictly forbidden. A suspended load should never be left unsupervised.
6 Slings should never be used in an acid environment (bath or steams).
Chainslings can be used within a temperature range from –40°C to 200°C. Between 200°C and 300°C, the lifting capacity is reduced by 10%, reaching 25% between 300°C and 400°C; one must consequently over dimension the sling. No lifting whatsoever is allowed beyond +400°C and –40°C.
7 Chainslings should not be wedged under the load after lifting, nor freed by pulling with force.

HOOKS

Please see below.

MASTER LINKS

The master link of the sling should be easily placed on the hook of the lifting device and play on it. It should never be wedged on the hook. Protect the link against any sharp edges and take care that it is not subjected to bending stresses.

CHAIN CONNECTORS

Check that all the elements (half connector, axis, locking system, ring or pin) are well positioned.
Check that the locking of all these parts is correct.

MAINTENANCE

Storage: Slings and their elements should be stored on a rack, immediately after use and inspection. They should never be left on the ground in a pile or dragged across the floor. They should never be subject to shocks, ridden over by vehicles or subject to any kind of impact. They should be cleaned when necessary, and when need be slightly lubricated.
Always check for the presence of an identification tag.

Detailed inspection: All the sling parts must be inspected at least once every 3 months, and more frequently if necessary, according to particular regulations and working conditions. The output of this inspection should be reported on the slings register.

Regular inspections: Generally, a sling should be inspected before and after each use.
Always make sure that the connector parts are correctly locked. Slings with bent, warped links, with open hooks or with distorted connectors should be discarded.
Check for notches, ridges, grooves, cracks, corrosion or bleaching marks which are also cause to immediately remove slings from use.

Wear: The wear of a sling, chain and the various components should never exceed 10% of original dimensions. The wear of a link may be detected by measuring the thread along two perpendicular diameters. Check for wear at the contact between adjacent links. In order to do this, loosen the chain and swing the links. The wear of a link is acceptable as long as the arithmetic average of 2 perpendicular diameters is not lower than 10% of the original diameter.
Wear or bending of only one link or of any other part of the sling is reason to immediately remove it from the circuit.

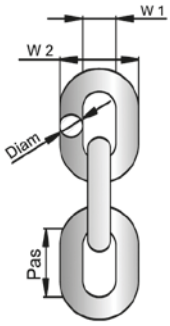
Elongation
This is revealed when checking the length of legs. It is probable if links do not articulate correctly between them. When the length of one link is 5% higher than its original length, the chain should immediately be discarded. The same applies to a leg with 5% elongation as to hooks having an opening superior to 5% of its initial dimensions. Elongation of connector components or link assembly is also reason to directly remove from service.

HOOKS according to EN 1677

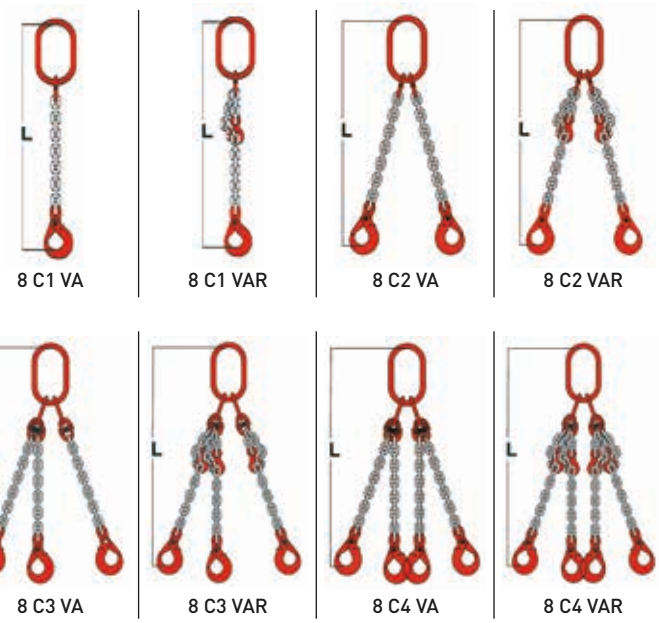
- **A qualified person** should periodically (at least once every 3 months) check that the hook has no cracks, nicks, wear or deformation of any kind and register his examination.
- In case of severe conditions of use, an annual inspection by magnetoscopy or by dye check is highly recommended.
- Never use a hook whose groove opening has increased by 5% or whose end is distorted by more than 10% in relation to the body hook plan. A hook that is twisted or bent for any reason should also be put out of service as the latch does not lock properly if the tip of the hook is bent or worn.
- Never repair, modify or change the shape of a hook by soldering, heating, burning or bending it.
- Never apply a side load to the hook, neither backwards nor on the tip of the hook.
- Never pivot a hook under load, except for when it is mounted on ball bearings.
- Always ensure that it is the hook which supports the load and never the latch.
- When two slings are put on a hook, make sure that the angle formed between the furthest leg and the vertical plan of the hook never exceeds 60°; moreover, the inner angle formed by the two legs should not exceed 120°.
- Sling loops must not overlap on the hook.

Chain Grade 80

Lifting chain grade 80

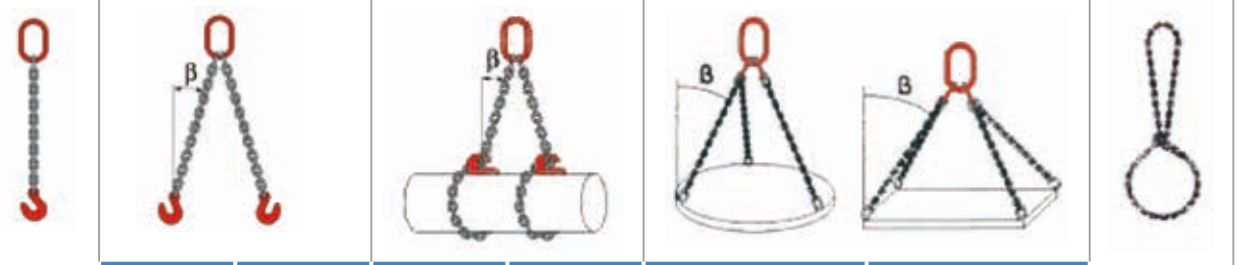


Ø D (mm)	WLL (t)	PITCH P (mm)	W1 (mm)	W2 (mm)	WEIGHT (kg/m)
6	1,12	18	8,5	21,5	0,75
7	1,5	21	10,5	24,5	1,1
8	2	24	11,5	27,5	1,4
10	3,15	30	13,5	34,5	2,2
13	5,3	39	19	45,5	3,6
16	8	48	22,5	55,5	5,4
19	11,2	57	28,5	66,5	8
20	12,5	60	30	70,5	8,5
22	15	66	30,5	76	10,4
26	21,2	72	36,5	90,5	15
32	31,5	94	41	108	22



Chain sling grade 80

Ø Chain (mm)	1 LEG (t)	2 LEGS ß 0°-45° (t)	2 LEGS ß 45°-60° (t)	2 LEGS ß 0°-45° (t)	2 LEGS ß 45°-60° (t)	3 & 4 LEGS ß 0°-45° (t)	3 & 4 LEGS ß 45°-60° (t)	SLIPKNOT (t)
6	1,12	1,6	1,12	1,25	0,9	2,36	1,7	1,8
7	1,5	2,12	1,5	1,7	1,2	3,15	2,24	2,5
8	2	2,8	2	2,24	1,6	4,25	3	3,15
10	3,15	4,25	3,15	3,55	2,5	6,7	4,75	5
13	5,3	7,5	5,3	5,9	4,25	11,2	8	8,5
16	8	11,2	8	9	6,3	17	11,8	12,5
19	11,2	16	11,2	12,5	8,9	23,6	17	18
20	12,5	17,5	12,5	14	10	26,25	18,75	20
22	15	21,2	15	17	12	31,5	22,4	23,6
26	21,2	30	21,2	23,7	16,9	45	31,5	33,5
32	31,5	45	31,5	35,2	25,2	67	47,5	50

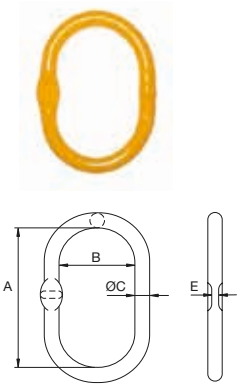


CAPACITY REDUCTION ACCORDING TO TEMPERATURE:

From minus 40° C to 200° C: load factor = 1
From 201° C to 300° C: load factor = 0,9
From 301° C to 400° C: load factor = 0,75

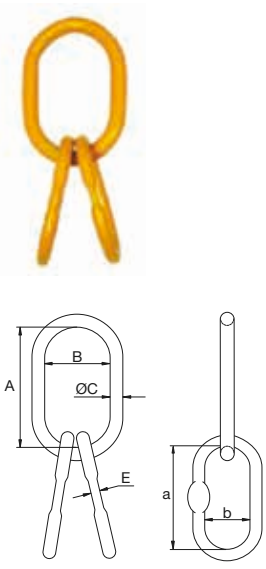
Grade 80

Welded master link - EN 1677-4



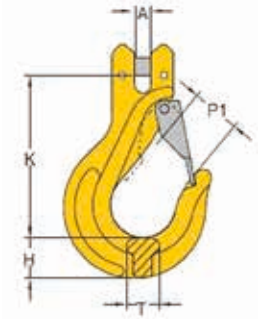
CHAIN Ø				DIMENSIONS				WLL	MBL	WEIGHT
1 leg	2 legs - ß			A	B	Ø C	E			
	30°	45°	60°							
(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(t)	(t)	(kg)
6 - 7	–	6	6 - 7	100	60	13	7	1,6	6,4	0,33
8	7	7 - 8	8	120	68	16	7	3,1	12,4	0,56
10	8	10	10	135	75	18	9	4,5	18	0,8
13	10	–	13	150	90	20	9	6,2	24,8	1,11
16	–	13	16	150	87	22	11	8	32	1,36
18	13	–	18	167	95	25	13	10,6	42,4	1,96
19	–	16	19	200	120	28	14	12	48	2,92
20 - 22	16	18	20 - 22	200	120	30	17	15	60	3,4
–	18 - 19	19 - 20	–	250	150	36	17	20	80	6,1
26	20	22	26	246	150	38	21	25	100	6,8
–	22	26	–	277	170	44	21	30	120	10,8
32	26	–	32	300	200	45	24	37	148	11,7
–	–	32	–	300	200	50	–	50	200	14,7
–	32	–	–	350	200	55	–	63	252	20
–	–	–	–	400	250	70	–	100	400	39
–	–	–	–	400	250	80	–	125	500	52

Master link assembly - EN 1677-4



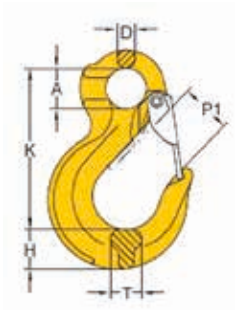
CHAIN Ø			DIMENSIONS							WLL	MBL	WEIGHT
ß			A	B	ØC	E	a	b	Ø			
30°	45°	60°										
(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(t)	(t)	kg)
–	6	6 - 7	117	70	16	7	99	59	13	2,5	10	1,2
6	7	8	134	73	18	8	99	60	16	3,5	14	1,7
7 - 8	8	10	150	86	22	9	119	69	18	6,5	26	2,8
10	10	13	167	95	25	11	118	69	20	8,5	34	3,8
–	–	–	198	118	28	11	118	69	20	10	40	4,7
–	13	16	198	118	30	14	134	75	22	13	52	5,8
13	16	18 - 19	250	147	36	14	134	75	25	17	68	9,4
–	–	20	250	147	38	17	170	93	28	20	80	11,8
16 - 18	18 - 20	22	272	170	45	17	200	115	33	27	108	18,5
19	–	–	300	195	45	21	198	120	37	30	120	22
20 - 22	22	26	300	200	50	21	150	90	38	40	160	24
–	26	32	300	200	55	23	150	90	38	50	200	27
26	–	–	350	200	58	–	147	90	42	60	240	34
–	32	–	400	250	70	–	296	150	55	80	320	72
32	–	–	400	250	80	–	300	150	60	100	400	92

Clevis sling hook type GKH



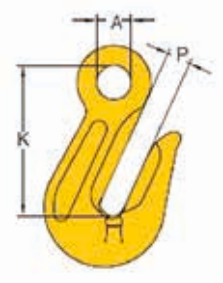
CHAIN SIZE (mm)	WLL (t)	DIMENSIONS A (mm)	H (mm)	K (mm)	P1 (mm)	T (mm)	WEIGHT (kg)
6	1,12	6	18	79	23	15	0,3
7,8	2	9	22	98	27	18	0,6
10	3,15	11	29	121	34	23	1,2
13	5,3	14	37	147	44	30	2,3
16	8	18	42	166	48	39	3,7
18 - 20	12,5	21	50	200	56	47	6,5

Eye sling hook type OKH



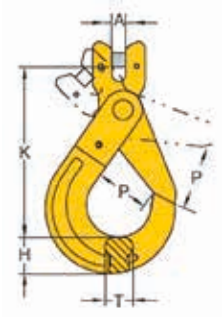
CHAIN SIZE (mm)	WLL (t)	DIMENSIONS A (mm)	D (mm)	H (mm)	K (mm)	P1 (mm)	T (mm)	WEIGHT (kg)
6	1,12	20	9	20	80	23	16	0,3
7 - 8	2	25	11	23	98	28	20	0,5
10	3,15	32	14	31	121	36	23	1
13	5,3	40	18	38	152	40	28	1,7
16	8	50	22	47	184	44	32	3,2
18 - 20	12,5	60	26	48	218	45	43	5,5
22	15	50	31	62	244	73	50	9
26	21,2	64	35	80	279	77	60	13,5
32	31,5	88	40	86	352	114	65	20

Grab hook type OIH



WLL (t)	FOR G80 CHAIN (mm)	DIMENSIONS P (mm)	A (mm)	K (mm)	NET WEIGHT (kg)
1,2	6 - 8	8	13	73	0,14
2	7/8 - 8	10,8	17	88	0,25
3,2	10 - 8	13	20	121	0,65
5,4	13 - 8	16,5	26	158	1,4
8,2	16 - 8	19,2	30	169	2,1
12,5	20 - 8	24	37	259	6,4
15,5	22 - 8	28	34	259	6,4
21	26 - 8	30	44	188	10
32,0	32 - 8	38	57	228	19

Grade 80 self locking Clevis safety hook type GVH

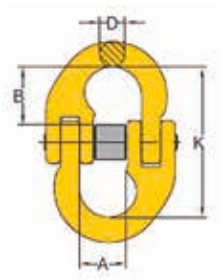


WLL (t)	FOR G80 CHAIN (m)	DIMENSIONS K (mm)	P (mm)	A (mm)	T (mm)	H (mm)	NET WEIGHT (kg)
1,2	6	95	27	8,5	14	19	0,45
2	7,8	98	34	9,5	19	24	0,85
3,2	10	142	44	12	24	31	1,45
5,4	13	181	53	15	27	40	2,9
8,2	16	222	60	18	26	53	5,6
12,5	18,2	239	80	25	47	55	6,5
15	22	256	82	28	48	64	16
21	26	310	110	30	49	75	18
32	32	400	166	36	60	97	44

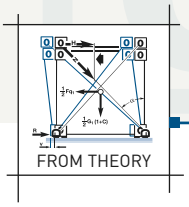
Grade 80 self locking eye safety hook type OVH

WLL (t)	FOR G80 CHAIN (m)	DIMENSIONS K (mm)	P (mm)	A (mm)	D (mm)	T (mm)	H (mm)	NET WEIGHT (kg)
1,2	6	110	28	22	10	15	19	0,46
2	7,8	134	34	25	12	19	24	0,75
3,2	10	170	45	32	13	24	31	1,5
5,4	13	206	54	40	17	27	40	2,8
8,2	16	249	63	56	22	36	53	5,8
12,5	18,2	273	81	64	24	47	55	7,8
15	22	320	82	70	25	48	64	14
21	26	363	115	80	28	49	75	18
32	32	472	170	105	30	50	97	44

Grade 80 connecting link (hammer locks) type AV



NOMINAL SIZE (mm)	WLL (t)	DIMENSIONS A (mm)	D (mm)	B (mm)	K (mm)	WEIGHT (kg)
6 - 8	1	14,5	7	18,5	47,5	0,14
7/8 - 8	2	20,5	8,5	22	57	0,16
10 - 8	3,2	25,7	11	26,5	69	0,34
13 - 8	5,1	26,5	15,5	32	86	0,65
16 - 8	8	33	19	39,5	103	1
18/20 - 8	12,6	41,5	22	46	122	1,78
22 - 8	15	47	25	53	138	2,1
24/26 - 8	20,6	59	29	59	152	3,55
30/32 - 8	32,2	68	36	68	176	6,8

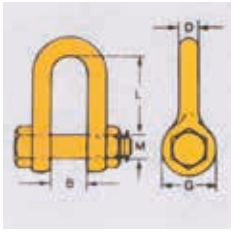


Safety hook type OBK

TYPE	WLL * (t)	CHAIN Ø (mm)	L (mm)	B (mm)	E (mm)	F (mm)	G (mm)	H (mm)	WEIGHT PER PIECE APPROX. (kg)
OBK-6-8	1,12	6	103	26	22	9	14	17	0,4
OBK-7/8-8	2	7,8	129	34	25	10	17	20	0,7
OBK-10-8	3,2	10	162	42	32	13	21	26	1,2
OBK-13-8	5,4	13	195	50	40	15	26	30	2
OBK-16-8	8	13	237	60	50	19	30	38	4,1
OBK-18/20-8	12,5	19	293	73	60	22	37	48	7,5
OBK-22-8	15,5	22	335	87	70	24	40	57	10

* Safety factor 4:1

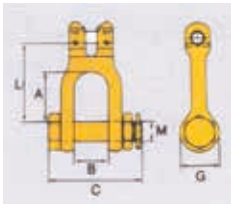
Shackle type SA



TYPE	WLL * (t)	CHAIN Ø (mm)	L (mm)	B (mm)	D (mm)	G (mm)	M (mm)	WEIGHT PER PIECE APPROX. (kg)
SA-7-8	1,5	7	30	15	8	20	10	0,1
SA-10-8	3,2	10	52	24	13	35	16	0,4
SA-13-8	5,4	13	65	28	16	42	20	0,7
SA-16-8	8	16	72	30	18	46	22	1
SA-19-8	11,5	19	86	36	22	55	27	1,8
SA-22-8	15,5	22	94	40	25	62	30	2,5
SA-26-8	21,6	26	116	48	32	75	39	4,8

* Safety factor 4:1

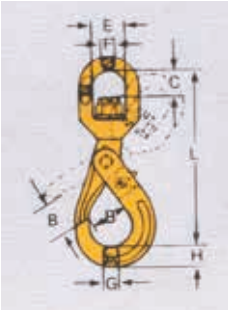
Clevis shackle type GSA



TYPE	WLL * (t)	CHAIN Ø (mm)	A (mm)	B (mm)	C (mm)	G (mm)	L (mm)	M (mm)	WEIGHT PER PIECE APPROX. (kg)
GSA-7/8-8	2	7,8	36	32	79	34	60	16	0,5
GSA-10-8	3,2	10	48	34	93	40	80	20	0,9
GSA-13-8	5,4	13	65	50	118	44	98	22	1,7
GSA-16-8	8	16	70	60	141	54	114	27	3

* Safety factor 4:1

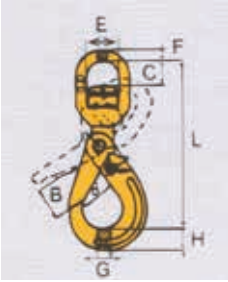
Swivel safety hook type BKL



TYPE	WLL * (t)	CHAIN Ø (mm)	L (mm)	B (mm)	C (mm)	E (mm)	F (mm)	G (mm)	H (mm)	WEIGHT PER PIECE APPROX. (kg)
BKL-6-8	1,12	6	149	28	23	33	11	14	19	0,6
BKL-7/8-8	2	7,8	183	36	27	36	12	17	23	1,1
BKL-10-8	3,2	10	218	44	37	42	15	25	29	2
BKL-13-8	5,4	13	276	54	43	48	19	28	38	3,8
BKL-16-8	8	16	334	63	58	62	22	37	49	6,8
BKL-18/20-8	12,5	19	367	69	80	74	26	42	56	10,8

* Safety factor 4:1

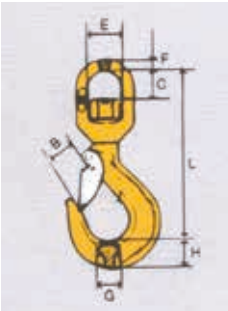
Ball bearing swivel safety hook type BKLK



TYPE	WLL * (t)	CHAIN Ø (mm)	L (mm)	B (mm)	C (mm)	E (mm)	F (mm)	G (mm)	H (mm)	WEIGHT PER PIECE APPROX. (kg)
BKLK-6-8	1,12	6	148	28	22	33	11	14	19	0,7
BKLK-7/8-8	2	7,8	184	36	27	35	12	17	23	1,1
BKLK-10-8	3,2	10	216	44	32	40	15	25	29	1,9
BKLK-13-8	5,4	13	277	54	41	48	19	28	38	3,8
BKLK-16-8	8	16	330	63	50	60	22	37	49	7,2
BKLK-18/20-8	12,5	19	367	69	59	74	26	42	56	10,8

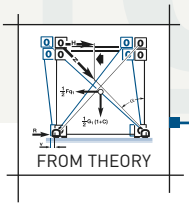
* Safety factor 4:1

Swivel latch hook type LKN

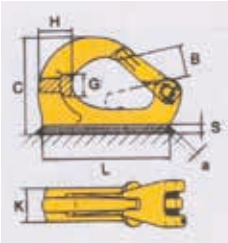


TYPE	WLL * (t)	CHAIN Ø (mm)	L (mm)	B (mm)	C (mm)	E (mm)	F (mm)	G (mm)	H (mm)	WEIGHT PER PIECE APPROX. (kg)
LKN-7/8-8	2	7,8	154	26	27	36	12	18	21	0,9
LKN-10-8	3,2	10	189	36	37	42	15	23	29	1,5
LKN-13-8	5,4	13	233	42	43	48	19	28	35	3
LKN-16-8	8	16	279	49	58	62	22	33	43	5,1

* Safety factor 4:1



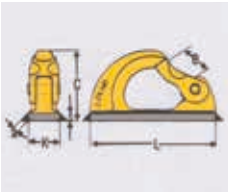
Universal weld-in hook type UKN



TYPE	WLL * (t)	B (mm)	C (mm)	G (mm)	H (mm)	K (mm)	L (mm)	S (mm)	a (mm)	WEIGHT PER PIECE APPROX. (kg)
UKN-0,75	0,75	20	56	13	20	19	81,5	5	3	0,25
UKN-1	1	21	72	17	25	25	95	6	4	0,6
UKN-2	2	26	86	20	30	30	114	8	5	1
UKN-3	3	29	105	23	30	35	132	10	6	1,3
UKN-4	4	29	111	29	38	42	140	11	7	1,9
UKN-5	5	34	130	30	46	45	165	12	8	2,8
UKN-8	8	34	133	39	51	50	172	13	9	3,7
UKN-10	10	47	168	43	58	55	220	14	9	6,3

* Safety factor 5:1

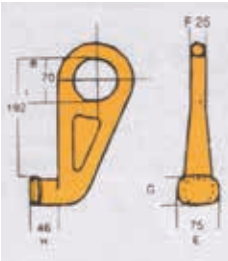
Universal weld-in hook type UH



TYPE	WLL * (t)	B (mm)	C (mm)	K (mm)	L (mm)	S (mm)	a (mm)	WEIGHT PER PIECE APPROX. (kg)
UH 1,1	1,12	18	53	20	86	6	4	0,3
UH 2,0	2	24	65	27	112	7	5	0,6
UH 3,2	3,2	27	74	32	129	8	6	0,9
UH 5,3	5,3	34	93	40	158	11	7	1,8
UH 8,0	8	39	105	50	181	14	9	2,9
UH 12,5	12,5	50	139	60	233	15	10	6,1

* Safety factor 4:1

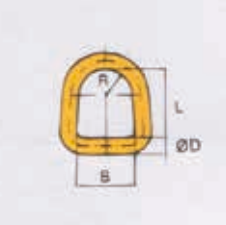
Hook type CH-3



TYPE	WLL * (t)	L (mm)	B (mm)	H (mm)	F (mm)	G (mm)	E (mm)	WEIGHT PER PIECE APPROX. (kg)
CH-3 Unturned	12,5	192	70	46	25	47	75	4
CH-3 Turned 45° left	12,5	192	70	46	25	47	75	4
CH-3 Turned 45° right	12,5	192	70	46	25	47	75	4

* Safety factor 4:1

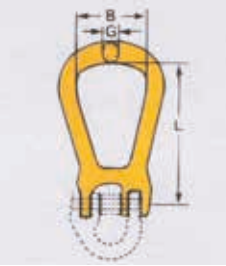
Pear-shaped ring type D



TYPE	WLL ** (t)	B (mm)	D (mm)	L (mm)	R (mm)	WEIGHT PER PIECE APPROX. (kg)
D-14-8	2,5	55	14	65	24	0,3
D-17-8	4	64	17	62	29	0,5
D-19-8	6,5	72	19	80	32	0,7
D-22-8	8	76	22	90	33	1

** The hoisting load must be distributed over at least 0.5 x B

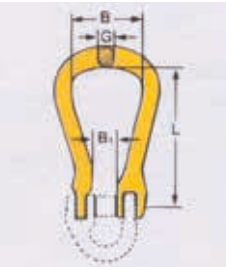
Closed link type SKG



TYPE	WLL * (t)	CHAIN Ø (mm)	L (mm)	B (mm)	G (mm)	WEIGHT PER PIECE APPROX. (kg)
SKG-7/8-8	2	7,8	99	50	14	0,3
SKG-10-8	3,2	10	127	66	18	0,6
SKG-13-8	5,4	13	145	72	22	1,1
SKG-16-8	8	16	175	82	25	1,7
SKG-18/20-8	12,5	19	204	105	30	2,8

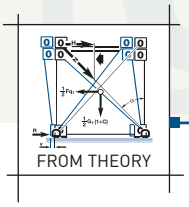
* Safety factor 4:1

Open link type SKO

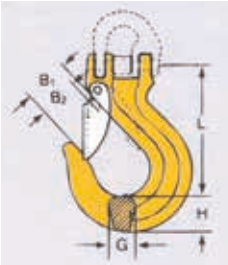


TYPE	WLL * (t)	CHAIN Ø (mm)	L (mm)	B (mm)	G (mm)	B_1 (mm)	WEIGHT PER PIECE APPROX. (kg)
SKO-7/8-8	2	7,8	99	50	14	15	0,3
SKO-10-8	3,2	10	127	66	18	20	0,6
SKO-13-8	5,4	13	145	72	22	25	1
SKO-16-8	8	16	175	82	25	30	1,6
SKO-18/20-8	12,5	19	204	105	30	36	2,6

* Safety factor 4:1



Latch hook SKN, no latch type SKH

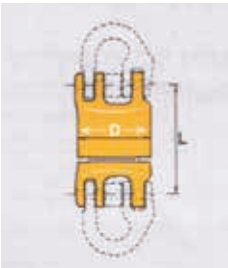


TYPE	WLL * (t)	CHAIN Ø (mm)	L (mm)	B_1 (mm)	B_2 (mm)	G (mm)	H (mm)	WEIGHT PER PIECE APPROX. (kg)
SKN-7/8-8	2	7,8	90	32	27	18	21	0,4
SKN-10-8	3,2	10	115	40	34	23	29	0,9
SKN-13-8	5,4	13	141	48	42	28	36	1,8
SKN-16-8	8	16	165	56	49	33	43	3,2
SKN-18/20-8	12,5	19	189	66	59	42	50	5,1

* Safety factor 4:1

Ball bearing swivel type SKLI

Insulated to 1000 V - eliminates parasitic currents in the crane during welding operations on suspended loads.

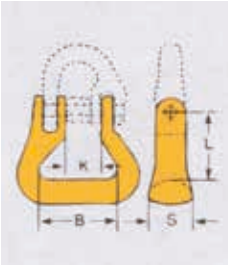


TYPE	WLL * (t)	CHAIN Ø (mm)	L (mm)	D (mm)	WEIGHT PER PIECE APPROX. (kg)
SKLI-7/8-8	2	7,8	75	48	0,7
SKLI-10-8	3,15	10	96	59	1,4
SKLI-13-8	5,3	13	120	75	2,9
SKLI-16-8	8	16	137	90	4,9
SKLI-18/20-8	12,5	19	159	104	7,2

* Safety factor 4:1

Wide half link type SKR

Also for connecting webbing slings



TYPE	WLL * (t)	L (mm)	B (mm)	K (mm)	S (mm)	WEIGHT PER PIECE APPROX. (kg)
SKR-7/8-8	2	35	40	18	24	0,2
SKR-10-8	3,2	42	47	24	29	0,4
SKR-13-8	5,4	50	53	29	35	0,7
SKR-16-8	8	62	67	35	43	1,2
SKR-18/20-8	12,5	71	80	43	52	1,9
SKR-22-8	15,5	111	125	50	70	5,3
SKR-26-8	21,6	129	150	58	86	9

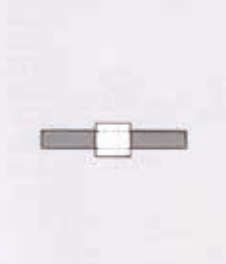
* Safety factor 4:1

Half link type SKT

TYPE	WLL * (t)	CHAIN Ø (mm)	L (mm)	B (mm)	G (mm)	E (mm)	WEIGHT PER PIECE APPROX. (kg)
SKT-7/8-8	2	7,8	28	18	9	22	0,1
SKT-10-8	3,2	10	34	25	12	26	0,2
SKT-13-8	5,4	13	44	29	15	33	0,4
SKT-16-8	8,	16	52	36	19	40	0,7
SKT-18/20-8	12,5	19	63	43	22	48	1,1
SKT-22-8	15,5	22	76	50	24	60	1,7
SKT-26-8	21,6	26	80	58	29	61	2,6
SKT-32-8	32	32	100	70	36	78	4,9

* Safety factor 4:1

Shaft type SKA



TYPE	WEIGHT PER PIECE APPROX. (kg)
SKA-6-8	0,01
SKA-7/8-8	0,02
SKA-10-8	0,05
SKA-13-8	0,1
SKA-16-8	0,2
SKA-18/20-8	0,3
SKA-22-8	0,4
SKA-26-8	0,6
SKA-32-8	1,1

LIFTING STRAPS

Advice For Use And Maintenance Of Textile Slings

TEXTILE SLINGS according to EN 1492-1/2/4

1 Limitations on the use of sling due to environmental conditions or due to dangerous applications

a) Resistance of the material to chemicals
- Polyester (PES) is resistant to most mineral acids, but is damaged by alkalis.
- Polyamide (PA) is resistant to alkalis, but is attacked by acids.
- Polypropylen (PP) is resistant to acids and alkalis, but not to solvents.

Due to evaporation, acid and alkaline solutions – initially harmless – may become concentrated enough to cause damage; in this case, one should immediately remove the contaminated slings, dip them into cold water, let them dry and ask a qualified person to examine them.
It is advisable not to use slings with accessories grade 8 and multi-leg slings with masterlinks Grade 80 in acid conditions; the contact with acids or acid steams causes a hydrogen embrittlement in Grade 80 materials.

b) Restrictions due to temperatures
- Polyester & Polyamid are usable from -40°C to 100°C
- Polypropylen is usable from –40°C to 80°C

At low temperature, if there is dampness, ice may appear – acting then as a cutting and abrasive agent, reducing the flexibility of the sling.

c) Damage due to U.V.
The chemical textile with which the sling is made is liable to U.V. damage; it is thus recommended not to expose or store slings under direct sunlight or beneath ultraviolet sources

2 Before the first use

It is advisable to make sure that the manufacturer certificate is attached and that the identification tag with WLL on the sling corresponds to the certificate data.

3 Before each use

It is recommended to inspect the sling to find defects and make sure that the specified identifications are correct.

4 During the period of use

- Frequent verifications should be carried out to find defects or damages, including damages concealed by dirt which may affect the safety of the sling;
- If doubt remains about serviceability, or if one of the required tags is lost or is illegible, the sling should be removed in order to be examined by a competent and qualified person.

Among the criteria for withdrawal from service:
A localized overheating of the surface, transverse or longitudinal cuts (on edges, seams or loops), a chemical attack of the material, damages due to heat or friction, damaged or distorted accessories ...

5 Selection and usage of slings

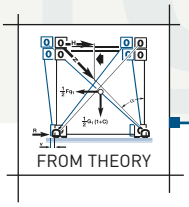
a) Determination of load mass
In order to make the best choice, one should take into account the required WLL, the mode of use, the nature of the load, its shape, its weight and the working environment.

b) Respect of working load limits
One must not overload slings by using the right mode factor (often mentioned on the tag); in case of multi-leg slings, respect the maximum angle (120°!!).

c) Fixing the sling to the hook
Slings should be correctly positioned and fixed to the load in order that the latter be equally distributed over their whole width; they should never be knotted or twisted; the seams should not be placed on hooks or other lifting accessories, but in the free part of the sling; tags should be kept far away from the load, the hook and the angle of the ring.

d) Fixing the sling to the load
In the case of multi-leg slings, WLL values have been determined according to the hypothesis that the load of a sling assembly is symmetric; which means that when lifting the load, the legs of the sling are set symmetrically in a plan and under tensioned to the same angle in relation to the vertical

e) Protecting the sling
One should protect the slings from angles, frictions and abrasion – whatever the load or the lifting appliance – by using protecting sleeves, corners or other protective material.



f) Control of the load
All precautions should be taken when lifting in order to be sure that the load is under control (no tipping over, fall, rotation or accidental collision, no jolt or load dragged on the ground).

g) Safety of the personnel
Lifting must be restricted to the danger zone.

h) Gripping force
It is advisable to carry out a lifting trial, by unslackening until the sling is in tension and slowly lifting the load, to verify that it is well fixed and in the right position, particularly for free or basket slings.

i) Untying the sling
The load must be pulled down in the same manner that it was lifted; avoid wedging the sling when pulling it down; do not let the load remain on the sling; do not try to pull the sling from underneath the load when it is lying on the sling.

j) Storage
Store in a clean, dry and ventilated area with ambient temperature, on a rack, far from any heat source or any contact with chemicals; slings should be inspected before storage – Never store a damaged sling.

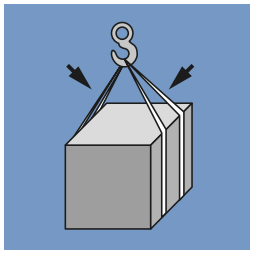
6 Inspection and periodical maintenance

Slings should be inspected at least once every three months by a competent person in order to ascertain if they can be re-used – The results of these examinations must be recorded and kept.
It is advisable to ask a qualified person to determine the appropriate inspection frequency, taking into account the application, the environment and the frequency of use.

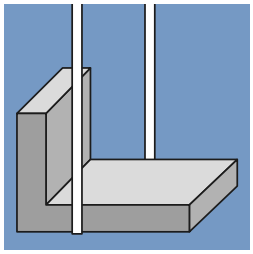
IMPORTANT
Any damaged sling should be discarded, never repaired.

Warning Instructions For Use And Maintenance Of Textile Slings

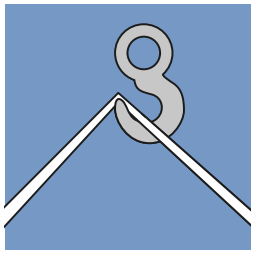
Check the weight of the load. Do not overload the strap.



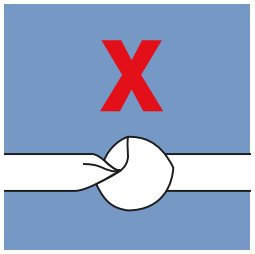
Take into account the slinging mode and the slope angle.



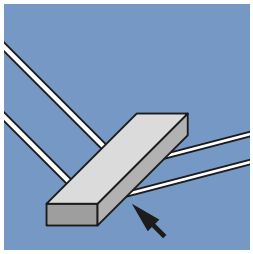
Take into account the center of gravity of the load.



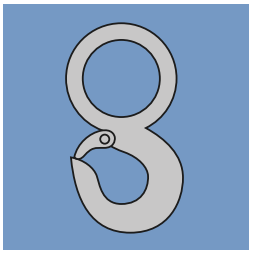
Never put the strap on the tip of a hook.



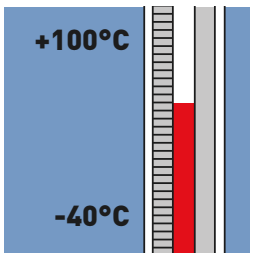
Never make a knot.



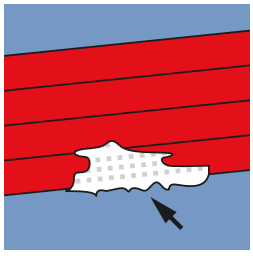
Protect straps from sharp edges.



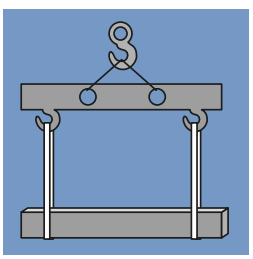
Take into account the hook dimensions – use a shortening hook if necessary.



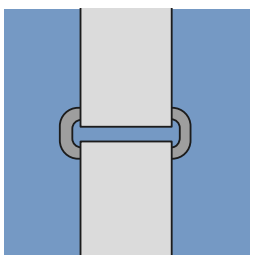
Use straps between -40° and +100°C.



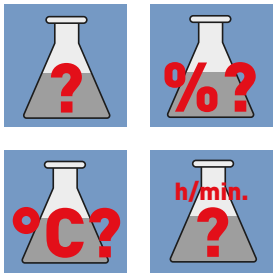
Discard straps as soon as pilot wires become visible.



Support the load with straps placed over its entire length.



Join straps together only with proper rings or buckles.



In case of chemical exposure, consult the manufacturer.

Flat Webbing Slings Acc. EN 1492-1

1000 - 40000 kg

L

Double layer
Length: to be determinated by the client

L-4

Four layers
Length: to be determinated by the client

COLOR	CODE	(kg)	(kg)	(kg)	(kg)	WEIGHT PER METER (kg)
PURPLE	L 30	1000	2000	1400	800	0,2
GREEN	L 60	2000	4000	2800	1600	0,4
YELLOW	L 90	3000	6000	4200	2400	0,55
GREY	L 120	4000	8000	5600	3200	0,8
RED	L 150	5000	10000	7000	4000	1
BROWN	L 180	6000	12000	8400	4800	1,2
BLUE	L 240	8000	16000	11200	6400	1,7
ORANGE	L 300	10000	20000	14000	8000	2,25
ORANGE	L4 / 240	15000	30000	21000	12000	3,4
ORANGE	L4 / 300	20000	40000	28000	16000	4,5
ORANGE	L5 / 300V	25000	50000	35000	20000	5,6
ORANGE	L4 / 2x240	30000	60000	42000	24000	6,8
ORANGE	L4 / 2x300	40000	80000	56000	32000	9
ORANGE	L4 / 2x300	50000	100000	70000	40000	11


With flat reinforced eyes


With folded reinforced eyes


With dee triangles on both ends


With choker triangles on both ends

Polyester Round Slings Acc. EN 1492-2

COLOR	(kg)	(kg)	(kg)	(kg)	WEIGHT PER USEFUL METER (kg)
PURPLE	1000	2000	1400	800	0,27
GREEN	2000	4000	2800	1600	0,445
YELLOW	3000	6000	4200	2400	0,56
GREY	4000	8000	5600	3200	0,76
RED	5000	10000	7000	4000	0,94
BROWN	6000	12000	8400	4800	1,17
BLUE	8000	16000	11200	6400	1,535
ORANGE	10000	20000	14000	8000	2,3
ORANGE	15000	30000	21000	12000	3,96
ORANGE	20000	40000	28000	16000	5,4
ORANGE	25000	50000	35000	20000	6,8
ORANGE	30000	60000	42000	24000	7,4
ORANGE	40000	80000	56000	32000	9,98
ORANGE	50000	100000	70000	40000	11,5
ORANGE	60000	120000	84000	48000	13,5
ORANGE	80000	160000	112000	64000	17,9
ORANGE	100000	200000	140000	80000	22
ORANGE	125000	250000	175000	100000	27,5
ORANGE	150000	300000	210000	120000	33
ORANGE	175000	350000	245000	140000	38,5

Standard type sleeve

Double reinforced sleeve

Double reinforced sleeve sewn in the middle

Endless Polyester Lifting Slings

500 - 10000 kg

CI

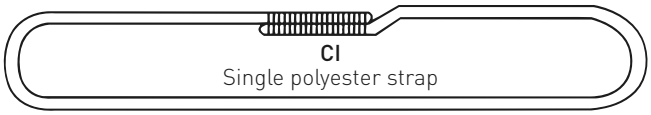
Endless polyester web sling - Single layer

DI

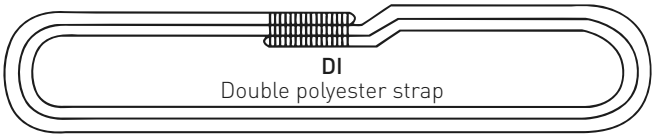
Endless polyester web sling - Double layer

COLOR	CODE	WIDTH (mm)	WLL SF.7:1			
			(kg)	(kg)	(kg)	(kg)
YELLOW	CI	25	500	1000	700	400
PURPLE	CI 48	50	1000	2000	1400	800
RED	CI 50	50	1500	3000	2100	1200
GREEN	CI 65	65	2000	4000	2800	1600
YELLOW	CI 75	75	3000	6000	4200	2400
GREY	CI 100	100	4000	8000	5600	3200
RED	CI 150	150	5000	10000	7000	4000
BROWN	CI 200	200	6000	12000	8400	4800
BLUE	CI 250	250	8000	16000	11200	6400
ORANGE	CI 300	300	10000	20000	14000	8000

CI x2 = DI = Double strap = WLL x2



CI
Single polyester strap



DI
Double polyester strap

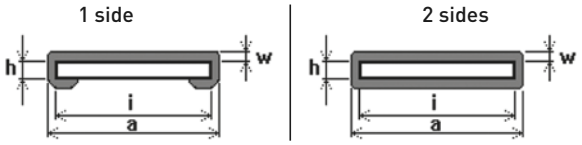
Special Straps

Pipeline strap

WLL (t)	NB HOOKS	TOTAL WIDTH STRAPS (mm)	Ø TUBES (inch)	USEFUL LENGTH (m)
10	2	150	6 - 8	0,9
20	2	300	12	1,3
30	4	450	20	2,1
40	5	600	24	2,5
50	6	750	30	3,1
60	7	900	36	3,7
70	8	1050	42	4,3
80	9/10	1200	49	4,9

Protection Sleeves

Polyurethane protection sleeves



STRAP WIDTH	DIMENSIONS			
	a (mm)	i (mm)	h (mm)	w (mm)
up to 30 mm	50	40	10	5
up to 60 mm	80	70	12	5
up to 80 mm	95	85	12	5
up to 100 mm	120	110	12	5
up to 120 mm	145	135	12	5
up to 160 mm	170	160	12	5
up to 180 mm	200	190	12	5
up to 240 mm	260	250	15	8

Layer thickness = 5 mm

Standard manufacturing transparent, but available with color coding acc. EN 1492

Other protection sleeves

Removable leather

PVC

Textile

Yarn reinforced hose

Velcro type

EXTREEMA® Round Slings With Dyneema®

Dyneema® is a synthetic fibre which is 15 times stronger than steel on a weight for weight basis. Compared to polyester, Dyneema® slings are 3 times lighter and the diameter of the slings is much smaller. Dyneema® is very durable, resistant to chemical, UV and moisture.
Therefore Dyneema® is a very versatile fibre used in the lifting industry.

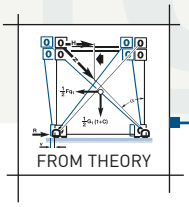
EXTREEMA® slings with Dyneema® are perfectly suitable for use both on- and off-shore. Dyneema® floats on water and does not absorb water like polyester does. Therefore in off-shore lifting projects EXTREEMA® slings hardly take on weight as they come in contact with water.

One of the features of Dyneema® is the extremely low elongation at break. This enables precise placements of heavy loads, such as modules, blades, turbines, monopiles or nacelles due to less movement and lower stretch. EXTREEMA® slings with Dyneema® act as a steel wire rope. The elongation for a sling with a safety factor of 7 is 0,3%. Moreover, round slings with Dyneema® are highly flexible compared to wire rope slings.

EXTREEMA® slings are engineered and proof loaded to meet specific length tolerances. All EXTREEMA® slings can be supplied with a proof load certificate issued by Lloyds or DNV. EXTREEMA® slings are equipped with an RFID chip for easy identification and inspection purposes in the future.

Extreema® DNV proof load testing

RFID label



THE MAIN ADVANTAGES OF EXTREEMA® ROUND SLINGS WITH DYNEEMA®:

- Light weight
- Easy handling, much more compact than polyester slings
- Highly flexible
- Soft material, hence less damage to the load
- Higher safety level for employees, fewer injuries, fewer claims
- Easy to transport (also by plane or helicopter)
- Extremely durable
- Cost effective
- Long life span
- Less crew needed
- Lower transportation costs
- Excellent chemical and UV resistance
- High abrasion resistance
- Because of durability lower environmental impact
- Extremely high efficiency performing precision and positioning lifting jobs

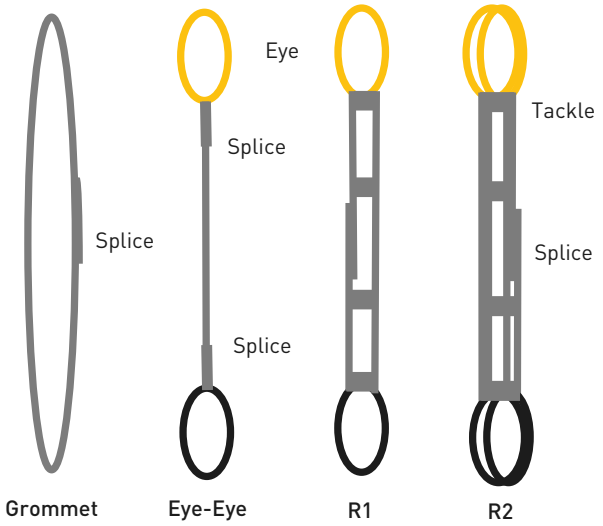
EXTREEMA® round slings with Dyneema® can be provided in WLL from 20T up to 200T in effective lengths starting from 2 meters up to 40 meters.

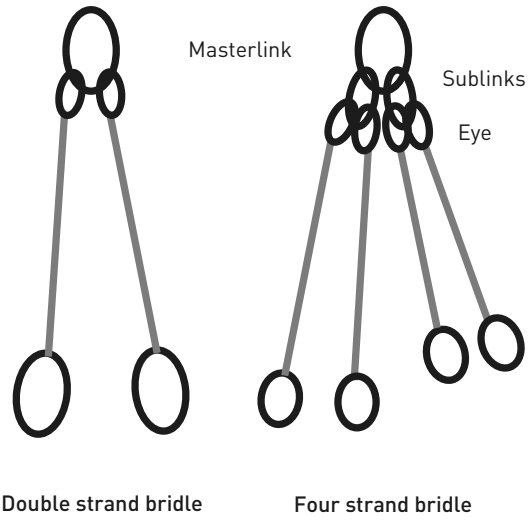
EXTREEMA® MANUFACTURING AND TESTING

Ultra-light Lifting Slings With DynaOne® (Dyneema®)

ADVANTAGES DURING OPERATIONS:

- Ultra-light (1/7 of steel wire)
- Easy handling on fields
- Very small bearing surface
- Flexible use for various operations
- Precise lifting from the first moment on through minimal elongation during lifting (max. 1,8%)
- High safety level (for instance no snap back under failure)





LS – UP TO 100T

NAME	TYPE	ROPE Ø (mm)	MIN. LENGTH (m)	WEIGHT AT MIN. LENGTH (kg)	WLL Working Load Limit (t)	BREAKING LOAD (t)
LS 10t	R1	24	2,3	2,5	10	70
LS 15t	R1	28	2,3	3,5	15	105
LS 30t	R2	28	2,5	9,5	30	210
LS 50t	R2	40	2,8	13,5	50	350
LS 70t	R2	48	3	21	70	490
LS 90t	R2	56	5	44	90	630
LS 100t	R2	64	5	59	100	700

Tailor made sling upon request

Heavy duty equipment has never been so light: LS-type delivers the performance of a wire rope sling – at just one seventh of its weight.

- Load bearing rope: DynaOne® HS, heat set Dyneema® SK78
- Single or doubled grommet, spliced and whipped
- Breaking load up to 700T
- 1,8% maximum elongation in working load area
- Bearing surface width from 39mm
- Production tolerance of length ± half rope diameter
- Even XL slings can be handled by a single person
- Custom-made slings from 1,0mm length possible
- Geothane coating for top protection against the elements & abrasion
- LA3 certification from DNV-GL
- With GS marker
- Certified in accordance with DIN EN 1492-4

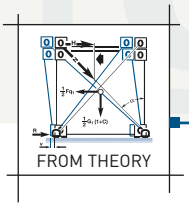
HD – HIGHER THAN 100T

NAME	TYPE	ROPE Ø (mm)	MIN. LENGTH (m)	WEIGHT AT MIN. LENGTH (kg)	SWL SF7 (t)	SWL SF5 (t)	BREAKING LOAD (t)
HD 125t	R2	80	8,2	121	125	175	926
HD 150t	R2	88	9	161	150	220	1100
HD 175t	R1	116	11,5	250	175	245	1225
HD 200t	R1	124	12,2	303	200	280	1400
HD 225t	R1	132	12,9	364	225	315	1575
HD 300t	R2	120	11,8	458	300	420	2100
HD 325t	R2	128	12,6	556	325	455	2275
HD 350t	R2	132	12,9	606	350	490	2450

Tailor made sling upon request

A higher level in the heavy duty sector – also for engineered lifting. HD-type effortlessly lifts heavy loads – up to 490T.

- DynaOne®, Dyneema® SK78
- Single or double grommet, spliced and whipped
- Breaking loads of up to 2450T
- Bearing surface width from 144mm
- Production tolerance of length ± half rope diameter
- 1,8% maximum elongation in working load area
- Excellent attributes for engineered lifting deployment due to most accurate manufacturing precision
- Deadweight only around 20% of a comparable wire rope sling
- Geothane coating for excellent protection against abrasion and the elements
- CG3 (formerly LA3) certification from DNV-GL
- Certified in accordance with DIN EN 1492-4



ROPE TESTING LABORATORY

A state-of-the-art facility enables extensive tests in closely replicated real-life conditions with loads of up to 300 tons.

- Conducting classic tensile tests to assess breaking loads
- Individual programs to be executed including precise shock and continuous load simulations
- Testing liquids

Beyond the limits: a megasling with 900t WLL being custom made

Our lifting slings have left their mark in the wind energy sector worldwide

LONG SERVICE LIFE

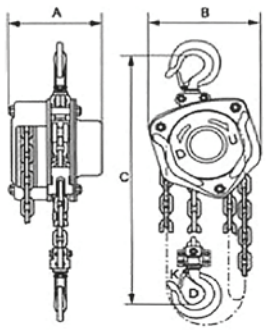
- Very abrasion resistant
- Targeted protection in attachment point areas
- Corrosion free, chemical resistant
- Resistant to salt water, UV and the elements

CHAIN BLOCKS

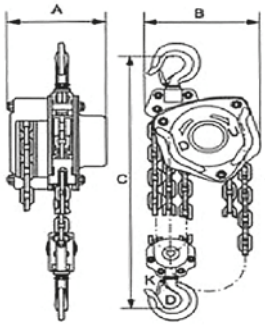
Manual Blocks

Hand chain hoist CH II / CH III with overload device

- **UTILIZATION**
  Hoisting of charges (with hand chain)
- **CHARACTERISTICS**
  Compact execution
- **ERGONOMICS**
  Light weight
- **SAFETY**
  Very reliable tool



500-2.000 kg



3.000-5.000 kg

CAPACITY (kg)	HAND EFFORT (N)	CHAIN FALLS	LOAD CHAIN (mm)	DIMENSIONS A (mm)	B (mm)	C (mm)	Hook opening (mm)	WEIGHT with 3 m (kg)	with 6 m (kg)	REFERENCE NUMBER with 3 m	with 6 m
500	231	1	6	131	127	270	30	10	15	2002000503	2002000506
1000	309	1	6	140	158	317	34	12	17	2002001003	2002001006
1500	320	1	8	161	187	399	38	19	25	2002001503	2002001506
2000	360	1	8	161	187	414	41	20	27	2002002003	2002002006
3000	340	2	8	161	210	465	48	29	40	2002003003	2002003006
5000	414	2	10	186	253	636	52	46	62	2002005003	2002005006

Manual chain block

The C21 manual chain block has a simple, compact and lightweight design and is intended for less intensive applications.

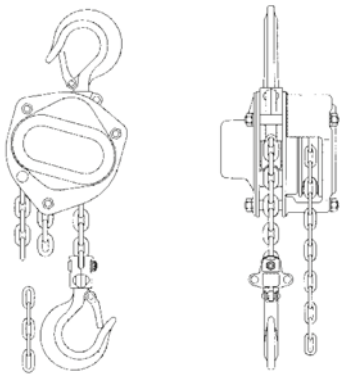
- The moving parts are mounted on plain bearings, reducing friction and improving performance
- Lifting height: 3 m standard
- Load chain: class 100
- Single load chain guide

THE MOST LIGHTWEIGHT

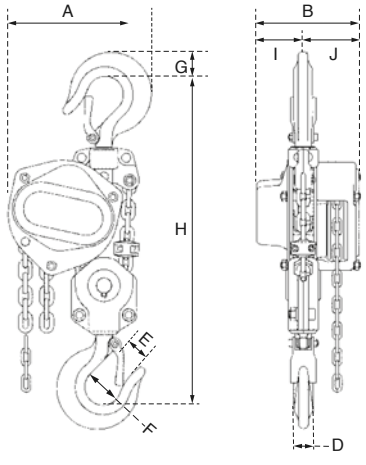
ATEX VERSION AVAILABLE

WLL	LOST OF HEIGHT	LOAD CHAIN		HAND CHAIN		WEIGHT UNCHAINED
		Pitch	Number of falls	Ø x Pitch	Effort	
(t)	(mm)	(mm)		(mm)	(kg)	(kg)
0,5	275	4,3 x 12	1	4 x 19	26	3,2
1	310	5,6 x 17	1	4 x 19	32	5,8
1,5	340	6,5 x 19	1	4 x 19	33	7,5
2	380	7,5 x 21	1	4 x 19	36	10,7
3	480	6,5 x 19	2	4 x 19	39	12,1
5	555	7,5 x 21	3	4 x 19	39	21,1
7,5	750	9 x 27	3	5 x 24	52	51,3
10	775	9 x 27	4	5 x 24	52	57,9

MODEL	CAPACITY	DIMENSIONS								
		A	B	D	E	F	G	H	I	J
	(t)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)
C21-05	0,5	121	129	13	24	36	16	275	53	76
C21-10	1	148	143	16	28	43	22	310	61	82
C21-15	1,5	168	152	21	30	43	26	340	68	84
C21-20	2	193	163	22	36	53	29	380	75	89
C21-30	3	209	152	28	35	53	35	480	68	84
C21-50	5	297	163	34	45	70	46	555	75	89
C21-75	7,5	370	190	80	70	85	74	750	90	100
C21-100	10	385	190	98	70	85	74	775	90	100



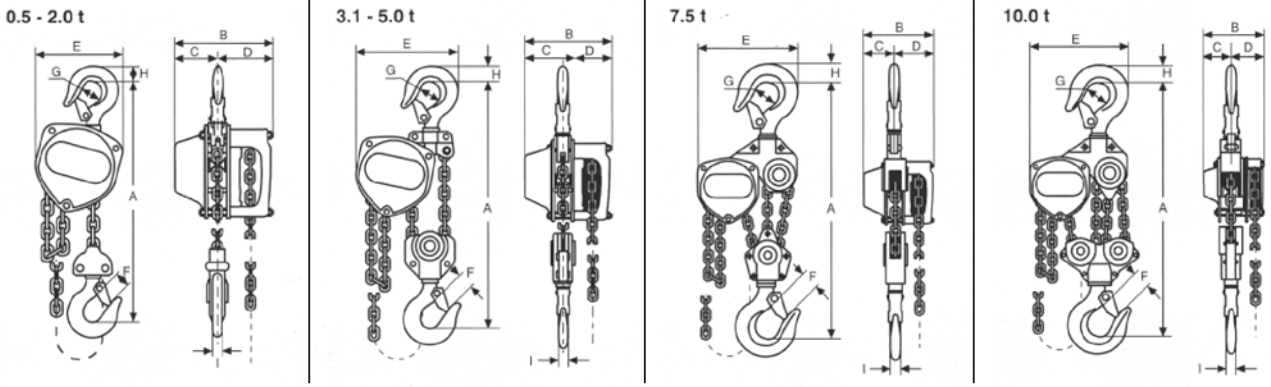
0,5~2 T



10 T

Elephant S-100 chain block

- **UTILIZATION**
  Hoisting of charges (with hand chain)
- **CHARACTERISTICS**
  Load sheave and hooks with bearings
- **ERGONOMICS**
  Bearings = minimal hand force
- **SAFETY**
  Overload device



TYPE	CAPACITY (kg)	HAND EFFORT (kg)	LOAD CHAIN (mm)	FALLS	DIMENSIONS A (mm)	B (mm)	E (mm)	G (mm)	H (mm)	I (mm)	WEIGHT (3 m) (kg)	REFERENCE NUMBER with 3 m	with 6 m
S100-0,5	500	22	5 x 15,1	1	277	155	140	36	17	13	9	S1001000503	S1001000506
S100-1,0	1000	25,5	6,3 x 19,1	1	303	160	160	43	22	16	11,4	S1001001003	S1001001006
S100-1,6	1600	34	7,2 x 21	1	338	167,5	183	48	27	20	14,7	S1001001603	S1001001606
S100-2,0	2000	34	8 x 24,2	1	379	183	215	53	29	22	21	S1001002003	S1001002006
S100-2,5	2500	35	9 x 27,2	1	416	190	233	55	34,5	24	25,4	S1001002503	S1001002506
S100-3,1	3150	36	7,2 x 21	2	516	167,5	230	60	37	27	24	S1001003103	S1001003106
S100-5,0	5000	36	9 x 27,2	2	613	190	282	70	46	34	39,5	S1001005003	S1001005006
S100-7,5	7500	37,5	9 x 27,2	3	716	190	370	85	74	50	70	S1001007503	S1001007506
S100-10,0	10000	40,5	9 x 27,2	4	789	190	385	85	74	50	82	S1001010003	S1001010006

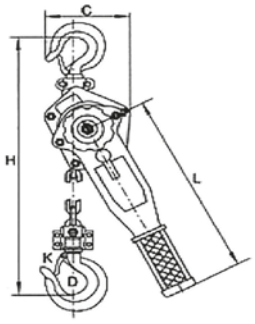
Chain block Victory SMV non-rusting

- **UTILIZATION**
  Food processing industrie / damp environment
- **CHARACTERISTICS**
  Chains and hook in Stainless steel + body in aluminium
- **ERGONOMICS**
  Easy maintenance
- **SAFETY**
  Overload device

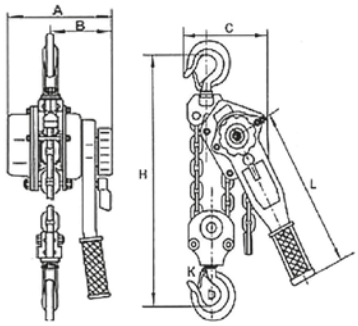
Capacity	From 250 to 2000 kg

Lever hoist LH-II

- **UTILIZATION**
  Hoisting, pulling and lashing of loads
- **CHARACTERISTICS**
  With neutral mechanism
- **ERGONOMICS**
  Handle with rubber grip
- **SAFETY**
  Very reliable tool



750-3000 kg

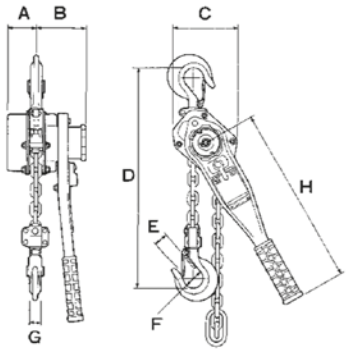


6000 kg

CAPACITY (kg)	HAND EFFORT (N)	CHAIN FALLS	LOAD CHAIN (mm)	DIMENSIONS A (mm)	B (mm)	C (mm)	D (mm)	L (mm)	WEIGHT WITH 3 M (kg)	REFERENCE NUMBER WITH 3 M
750	140	1	6	145	86	122	30	280	8,7	2003000750
1500	220	1	8	175	100	130	36	410	13,6	2003001500
3000	320	1	10	203	118	150	40	410	24,3	2003003000
6000	340	2	10	203	118	205	50	410	38,1	2003006000

Elephant Y3 bull lever hoist with overload device

TYPE	DIMENSIONS							
	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	G (mm)	H (mm)
Y III 50	26,5	83	85	265	23	35	15	284
Y III 80	52,5	98,5	122	290	23	36	15	268
Y III 160	62,5	105	140	350	29	43	21	385
Y III 320	83	110,5	176	420	36	53	28	385
Y III 630	83	110,5	235	570	45	70	34	385



ATEX VERSION AVAILABLE

TYPE	WLL (kg)	STD LIFTING (m)	DISTANCE BETWEEN HOOKS (mm)	FORCE ON LEVER (kg)	Ø CHAIN (mm)	CHAIN QUALITY	NUMBER OF FALLS	WEIGHT (kg)
Y III 50	500	1,5	265	34	5	80	1	3,6
Y III 80	800	1,5	290	30	5,6	80	1	6,2
Y III 160	1600	1,5	350	30	7,2	80	1	9,5
Y III 320	3200	1,5	420	37	9	80	1	15,5
Y III 630	6300	1,5	570	38	9,0	80	2	26,5

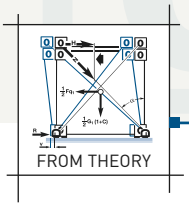
Aluminium lever hoist

- Aluminium housing
- Standard lift 1m
- Zinc plated load chain acc. to EN 818-7

CAPACITY (kg)	NUMBER OF FALLS	LOAD CHAIN Ø x pitch	LOW HEADROOM DIM. (mm)	LEVER FORCE (kg)	WEIGHT (kg)
250	1	3 x 9	200	20	1,5
500	1	4,2 x 12,2	250	24	2,2
750	1	5 x 15	260	29	3,4
1500	1	7,1 x 20,1	330	32	5,9

TO PRACTICE

Notes



Notes

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