RIGGING PRODUCTS AND SERVICE

Material Handling - Easily and Safely

COLUMBUS McKINNON

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To all our users and partners!

Welcome to the latest Columbus McKinnon Rigging products and service catalogue. We hope you will find it quick and easy to select the most suitable product or products from our extensive range to provide you with the most productive and safe materials handling equipment. The many new and improved products in the catalogue, in particular chain, rope and other load-carrying devices, reflect the valuable feedback and comments from clients which are a vital component of our new product development programme.

All our products are backed by a comprehensive after-sales service, including professional repair and maintenance, with replacement parts and inspections carried out in accordance with the latest legal and industry requirements. Fully equipped workshops and trained personnel ensure minimum downtime and maximum productivity for your equipment. The complete test documentation offers you the highest level of convenience.

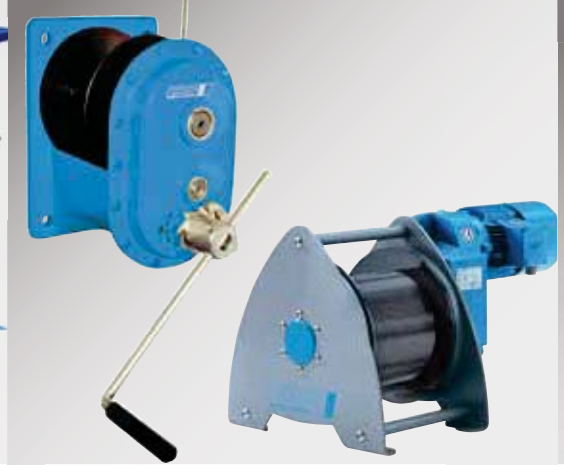
We hope that the expansion of our service offering meets your requirements and we look forward to further dialogue!

Material Handling

- Cranes
- Lifting equipment
- Atex
- Load carrying devices
- Hydraulics
- Industrial trucks
- Textile slings
- Lifting tables
- Electrical cable winches
- Drive technology

COLUMBUS McKINNON

- Easily and Safely

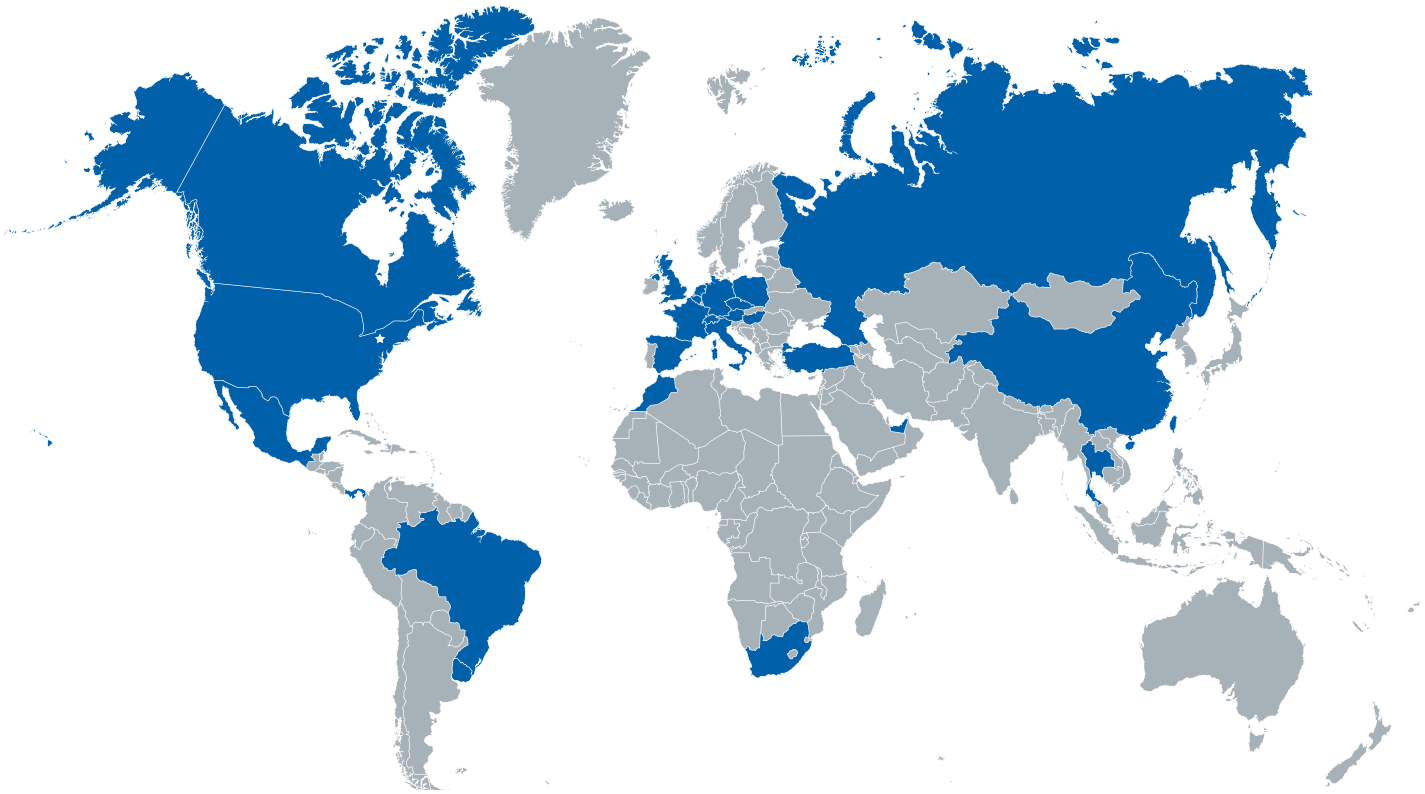


Columbus McKinnon Corporation

The Columbus McKinnon Corporation is one of the world's leading suppliers of conveying technology and can look back on over 140 years of experience in the development and manufacture of cranes, lifting equipment and slings. The company headquarters is located in Amherst, New York. The group has production facilities in America, Europe and Asia as well as a worldwide network of sales companies and partners.

The success story of Columbus McKinnon has its origins in the manufacture of chains and forged slings. At the beginning of the last century, the product programme was expanded to include the field of manual and motorised lifting equipment. Today, the company is the market leading supplier of cranes, manual and motorised lifting equipment, slings, chains and forged load lifting equipment in America.

Columbus McKinnon products are now found all over the world in all industrial and commercial application areas. Against a background of steadily increasing market requirements, Columbus McKinnon is successful at an international level thanks to the highest safety and quality standards in combination with the best possible closeness to customers.



28 manufacturing and distribution facilities worldwide

- Corporate Headquarters
- Manufacturing Facility (17)
- Warehouse Facility (11)
- Sales & Service Office (24)

- Amherst - New York, USA
- Edmonton, Alberta
- Cobourg, Ontario
- Apodaca N.L. Mexico
- Mexico City, Mexico
- Santiago Tianguistenco, Mexico
- Villahermosa, Mexico
- Panama City, Panama
- Recife, Brazil
- Sao Paulo, Brazil
- Montevideo, Uruguay
- Ambacht, Netherlands
- Newtownabbey, N. Ireland
- Chester, UK
- Prenton, UK
- Romeny-sur-Marne, France
- Vierzon, France
- Buchs, Switzerland
- Legnano, Italy
- Seville, Spain
- Casablanca, Morocco
- Istanbul, Turkey
- Wuppertal, Germany
- Heilbronn, Germany
- Kissing, Germany
- Pleuiska, Poland
- Pfaffstaetten, Austria
- Székesfehérvár, Hungary
- St. Petersburg, Russia
- Honeydew, South Africa
- Pretoria, South Africa
- Magaliesburg, South Africa
- Viestmead, South Africa
- Dubai, UAE
- Bankok, Thailand
- Singapore, Singapore
- Chengdu, China
- Xi'an, China
- Wiuhan, China
- Beijing, China
- Shanhai, China
- Shenyang, China
- Hangzhou, China
- Guangzhou, China

Expertise and quality

Our team of skilled employees have a wealth of experience and expertise in lifting technology and are ready to ensure that the equipment you select is the most suitable for the task in hand, whether standard products or a bespoke project.

Regular training courses for our own staff and our distributors ensure that the entire team is always up to date with the latest developments.

We encourage a positive attitude and motivation to delivering outstanding customer service to make sure every employee feels a sense of personal investment in the company and its success.

Information and training

It is vital that all our staff are fully informed about every detail of such complex technical equipment for which in-depth knowledge is required, to ensure the safety of all our users and high quality operational performance.

To make sure that you and all your colleagues have all the information you need, we provide:

- Extensive product documentation
- Up-to-date information through our newsletters
- Training on specific topics and types of equipment

Services

Service is an integral part of our business, with comprehensive sales and life-time after-sales support and assistance, including:

- Installation
- Acceptance and handover
- Testing and maintenance
- Parts and repair

A comprehensive range of lifting equipment

The long-standing partnership between Yale Industrial Products and Columbus McKinnon means we are able to provide a comprehensive range of high quality, precision-engineered hoists, slings, clamps, jacks, actuators, lifting equipment and accessories.

Working closely with our partners ensures that each new product or product range has been developed to meet identified customer needs. Every new or improved product is thoroughly tested by our experienced and professional team of engineers, backed by complete and detailed operation, service and repair documentation in line with ISO 8001 that we have held for the past 15 years.

Maintenance and testing

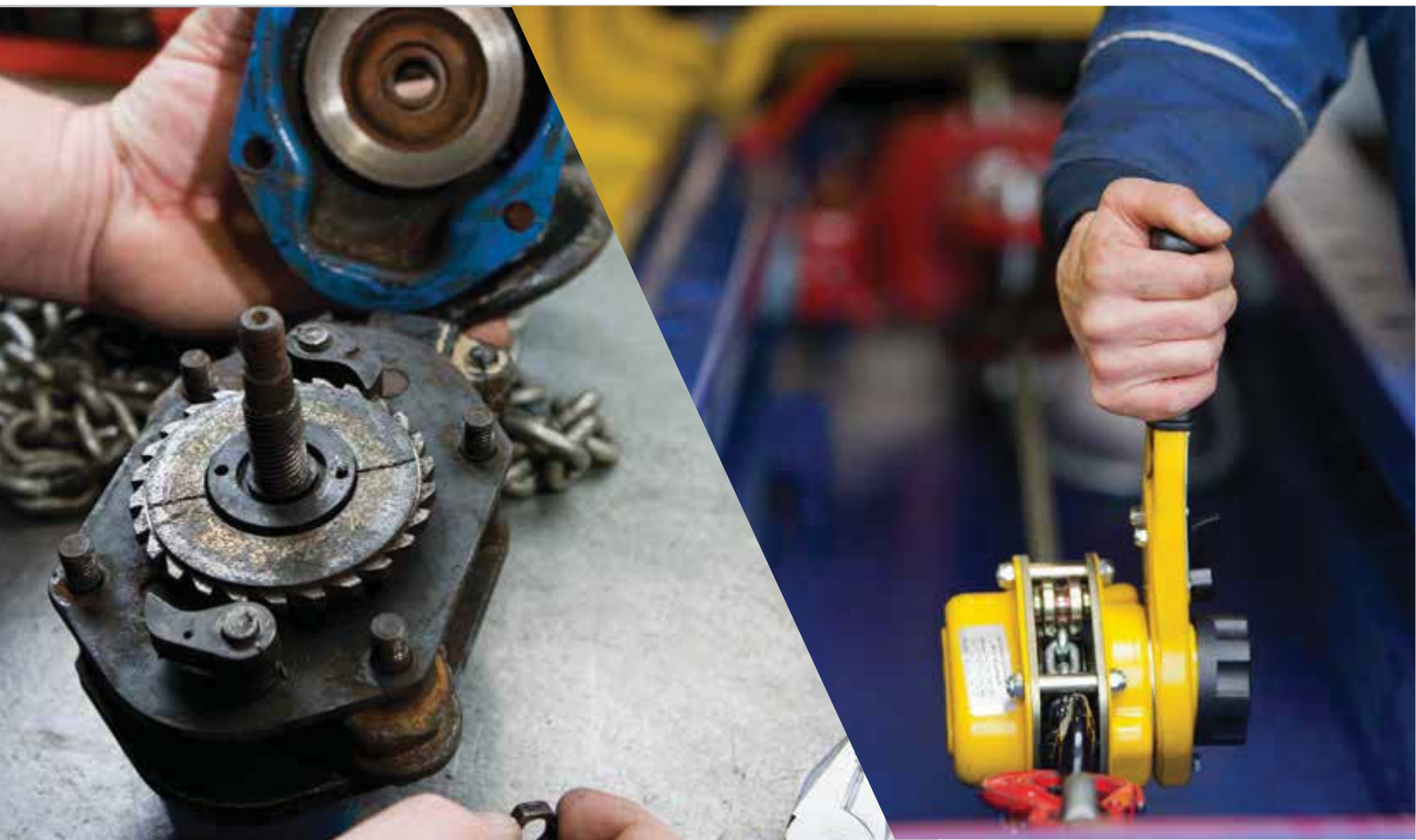
As part of our business service we can carry out maintenance and testing on all current branded makes of equipment in line with the relevant regulations. We check and record data from a range of different manufacturers, their products and brands to save you time and money. For example we carry out retrofitting as required by current regulations or repair and testing to ensure safe and reliable equipment performance. We ensure we meet all legal requirements, keep downtime and holdups to a minimum.

Testing and preventive maintenance

- Prevent sudden failure of load carrying devices and slings from cracks or other types of damage
- Spot wear and other defects in time to carry out repairs to ensure long-term reliability and safety
- Replace wear parts such as brake discs before undue loss of performance, saving downtime and costs
- Ensure workforce safety
- Comply with occupational and engineering regulations and requirements

We maintain and test

- Hoists and small crane systems
- Electrical and manual lifting gear and winches
- Explosion-protected equipment
- Lifting tables
- Load carrying devices
- Slings



Mobile maintenance and test service

Our mobile maintenance and testing service carries out full servicing and checks on lifting equipment, load carrying devices, slings and personal protective equipment on site, providing a fast and convenient service. We handle all current brands and comply with all current legal requirements. By taking care of every aspect of maintenance and repair quickly and efficiently, we free users to concentrate or their core business activities.

Our mobile testing service offers

- Test bank up to 31.5 tonnes for chain slings (up to 22mm grade 10 and 26mm grade 8), cables, lifting equipment and clamps.
- Test bench up to 10 tonnes (traction) and 20 tonnes (compression) for all lifting equipment including clamps, magnets, and rack and pinion jacks.
- Our mobile service units provide a full on-site workshop facility with fast-moving replacement parts for maintenance and repair
- **IT systems and equipment** for recording and printing out test results.

Plant testing service

Our workshops are fully equipped to carry out major maintenance, repair and inspection projects on standard and special products. With manufacturing facilities including a wire rope press, gluing device up to 40mm in diameter and a sewing machine for webbing slings we can manufacture products to individual specifications and requirements.

Our plant testing service offers:

- Test bench up to 100 tonnes for chain slings
- Inspection gear for all lifting equipment including clamps, magnets, and rack and pinion jacks
- Fully equipped workshop for all current brands of lifting equipment
- Extensive replacement parts store

Chain slings

User instructions

Please read our general user instructions for load carrying equipment and slings

Lifting with chain slings may only be carried out by a professionally trained rigger. Correct use ensures that chain slings provide the highest degree of safety, prevent damage to people and property and ensure maximum service life.

Changes and modifications

The shape and design of chain slings must not be changed or modified in any way by bending, welding, grinding, disassembly, or removal of safety components such as locks, safety pins and latches. Surface coating treatments such as hot-dip galvanising or electro-galvanising must not be applied. The use of alkaline solutions for stripping may be harmful and should only be carried out after consulting with our technical staff.

Limitation of use

Temperature
Load capacity may be adversely affected at high temperatures depending on the chain quality class. See page 17.

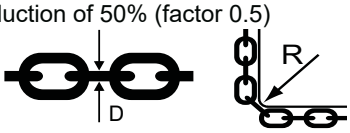
This only applies until the chain has cooled down to room temperature.
Equipment should not be used in temperatures above or below permissible values.

Impact load
Specified loading capacities assume impact free loading. Full load capacity can be used when minor impacts occur, such as those caused by lifting, lowering or moving the load on a crane. For medium impact such as load chain slipping when picking up a load, the capacity must be reduced by 30% (factor 0.7). Strong impacts such as a falling load must be avoided.

Edge load
Load capacities specified are designed for loads on the chain when it is pulled in a straight line. Allowing the chain to come into contact with or fed over an edge or obstruction risks bending, damage, or breakage. The minimum radius of an edge (R) over which the chain is fed must be twice (x2) the chain's diameter to lift safely at full capacity.

In such cases the load capacity must be reduced as follows:

R = larger than x1 or x2 chain diameter (2 x D > R > 1 x D)
→ load reduction of 30% (factor 0.7)
R = or smaller than chain diameter D
→ load reduction of 50% (factor 0.5)



Vibration
Chain slings and accessories are designed in line with regulations for 20,000 cycles. In the case of highly dynamic loads there is the risk that the chain or a component could be damaged. This can be overcome by reducing the workload by using larger nominal thickness or size.

Dangerous conditions
Specified loading capacities assume that the equipment is operating in a safe manner and environment. However lifting personnel or dangerous loads such as liquid metals, toxic substances, radioactive materials and such require assessing and approval by an expert, and the load capacity may be lowered accordingly, or special precautions put in place.
Chain slings for personnel working platforms must comply with EN 14502-1.

Chemicals
Chain slings exposed to acids, corrosive materials or their gases must be taken out of operation and sent to us for assessment.

User information

- Only undamaged chain slings with legible load capacity tags may be used. Users are advised to check for any damage or defects before every use.
- Chain slings with broken, clearly damaged or deformed links or accessories, or which have been subject to overload or any other potentially damaging use, must be immediately taken out of use until fully inspected and any repairs required have been completed.
- Make sure when selecting chain slings that they can safely handle the specified load without undue movement.

Chain slings

User instructions

m Chains must not be twisted or knotted.

m Loads must always be placed on the hook base, not on its tip. For multi-strand chain slings the hook tip must point outwards after hooking and be free to move.

m Never hang chain links from the hook tip.

m The lifting ring must have sufficient space in the crane hook to move freely.

m The load must not be placed directly onto the chain sling.

m Strands of the chain sling that are not in use should be re-suspended in the lifting ring to reduce the risk of being caught accidently while lifting.

m If the chain slings are used in a noose or are slung several times the windings must be close to each other but not cross.

m Do not force chains that are jammed or blocked.

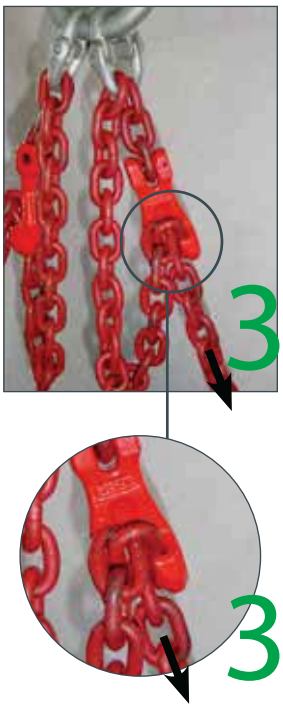
m When using shortening sections that are integrated in a chain strand or connecting links such as fixed hook type XKW or parallel hook type PW, PSW or KPW, it is essential to ensure that only the associated chain strand is hooked into the shortening component. If not all strands are shortened, this can lead to dangerous overloading as shown below:

CORRECT USE

INCORRECT USE

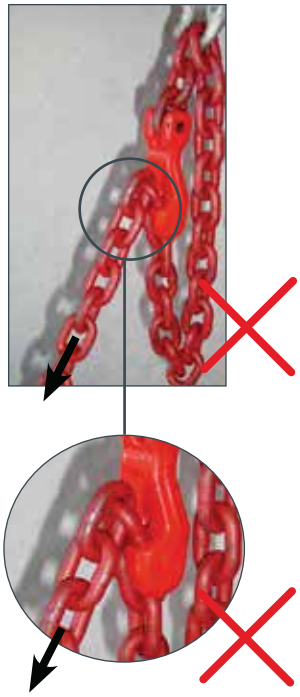
Incorrect use of a chain strand; the strand was suspended in the free shortening component of the non-shortened strand. The overlying connecting element musk take the load of both strands which means it is overloaded.

For all chain shortening claws of type HVSCH or similar still in use, make sure that the chain is correctly hooked in. Incorrect suspension as illustrated below (right hand side image) will cause the HVSCH or the chain to break with the risk of accidently dropping the load.
Claws of this type have not been offered by the company since 2003 and are no longer provided for the winner chain programme.



CORRECT USE

The loaded strand comes from the RIGHT LOWER side of the hook. The suspended chain link is held in the claw by the loaded strand and no chain link is subject to bending.



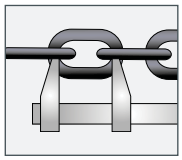
INCORRECT USE

The loaded strand comes from the INCORRECT UPPER side of the hook. The suspended chain link is bent over the edge and broken off or pulled out of the claw.

Rejection criteria

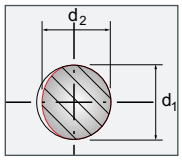
A chain sling should no longer be used if:

m There is a chain link or accessory on the chain that has stretched by more than 5%.

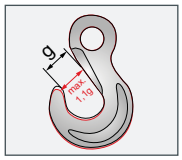


m A chain section is jammed.

m The actual member thickness at any point falls below the nominal thickness by more than 10% (the average value of two measurements at right angles to each other, see d1 and d2).



m The hook mouth has been enlarged by more than 10%.



m The label is missing or can no longer be read.

m Chain links are bent or twisted

m Discolouration has occurred from heat or there are signs of subsequent welds or weld spatter (which are not easy to remove and leave traces of discolouration)

m Cuts, nicks, grooves, cracks or excessive corrosion (such as clearly visible rust) or similar faults.

Reuse is then only permitted after repair has taken place.

Ongoing records are to be kept of the inspections carried out.

Maintenance, testing and repair

m Regular inspections must be carried out at least once a year or according to section 8(13) AMVO, or more frequently in heavy use applications, by a professional examiner. Chain slings that are often fully loaded or exposed to heat or chemicals must be examined at least every six months.

m After an exceptional event such a load falling, collision, heat exposure or other risks that could have safely implications, slings must be inspected according to AMVO section 9. (1) to check the condition of the equipment.

m Records must be kept concerning inspections and repair work carried out. During inspections the condition of components concerning damage, wear, corrosion or other potential defects must be assessed as a priority. According to ÖNORM M 9605 -1 in every secondary inspection a load test must be carried out with 1.5 times the load capacity. The load test can be replaced by a crack test procedure (magnifying or dye penetrating procedures.)

m The sling must be cleaned before testing. The cleaning process must not cause any chemical damage (no acids) or unapproved heating through burning off, removing too much, from example from sandblasting. By providing us with clean chains we can save inspection costs. All inspections are to be arranged by the operator.

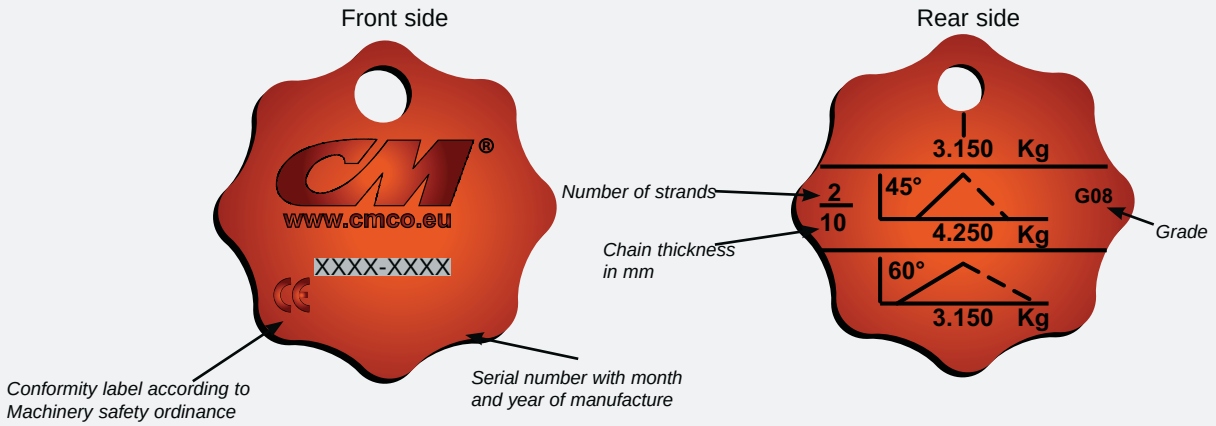
m Repairs and overhauls should only be carried out by trained personnel using original replacement parts.

m Should a chain show any defect it can be sent to us for assessment and repair; or be tested and repaired by our mobile lifting technology unit on your premises.

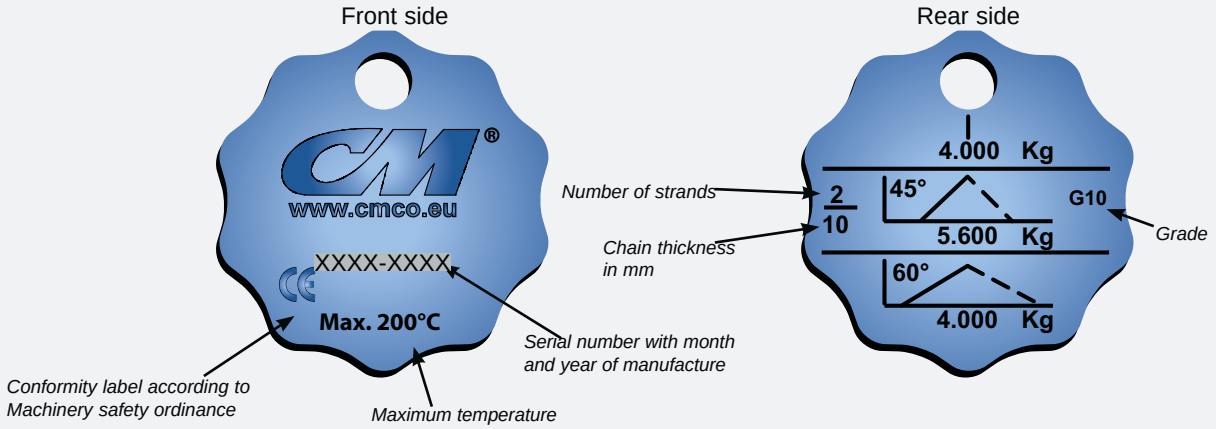
Labelling (load tag)

We deliver our chain slings with a load capacity tag with sequential test number, a conformity and factory certification and the necessary user instructions – for every single unit!

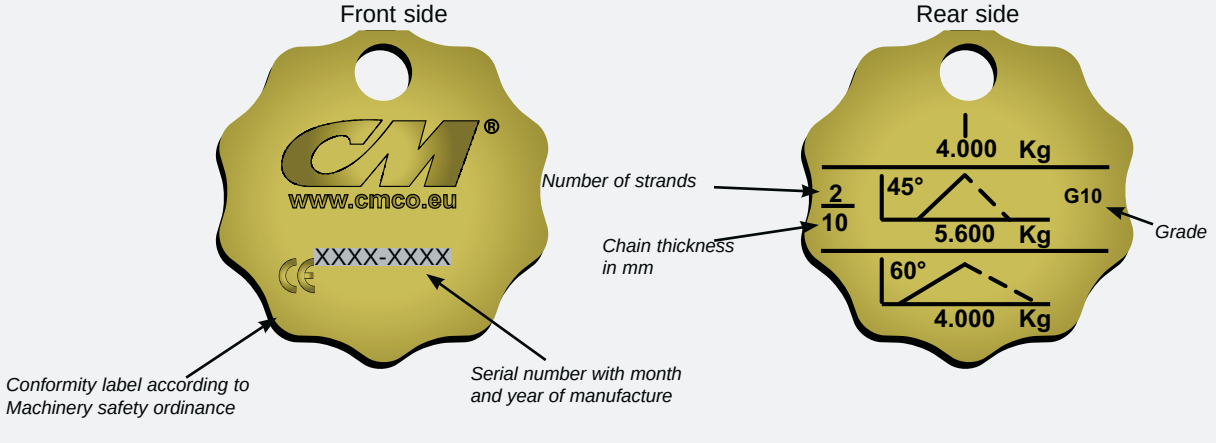
Grade 8



Grade 10 - 200 °C



Grade 10 - 400 °C



Characteristics

Grade 8

- **Chain quality:**
  Chain slings are delivered according to EN 848 Part 1, 2 and 4
- **Working load:** 200 N/mm2
- **Test load:** 500 N/mm2
  that corresponds to 2.5 times the load capacity
- **Failure stress:** 800 N/mm2
  that corresponds to 4 times the load capacity
- **Elongation at break:** descaled
- **Deflection:** 0.8 x d
- **Usage temperature:** -40 °C - 400 °C
  (note corresponding reduction of the load capacity at high temperatures)
- **Grade stamping:**
  Chain: is stampted every 300 mm in compliance with standard with the manufacturer's mark and the grade stamp.

Grade 10 200 °C

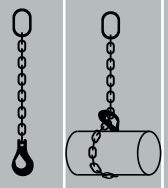
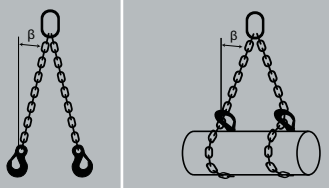
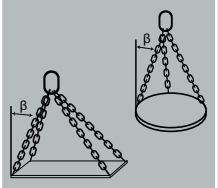
- **Chain quality:**
  corresponds to EN 818-2 with higher load capacity (but permissible operating temperature of max. 200°) and Machinery Directive 2006/42/EC
- **Working load:** 250 N/mm2
- **Test load:** 625 N/mm2
  that corresponds to 2.5 times the load capacity
- **Failure stress:** 1,000 N/mm2
  that corresponds to 4 times the load capacity
- **Breaking elongation:** min. 20%
- **Deflection according to EN 818-2or PAS 1061:**
  0.8 x nominal diameter
- **Usage temperature:** -20 °C - 200 °C
  (note corresponding reduction of the load capacity at high temperatures)
- **Grade stamping:**
  Chain: is stampted every 300 mm in compliance with standard with the manufacturer's mark and the grade stamp.

Grade 10 380 °C

- **Chain quality:**
  corresponds to EN 818-2 with higher load capacity or PAS 1061 up to 16 mm and Machinery Directive 2006/42/EC
- **Working load:** 250 N/mm2
- **Test load:** 625 N/mm2
  that corresponds to 2.5 times the load capacity
- **Breaking tension**1,000 N/mm2
  that corresponds to 4 times the load capacity
- **Breaking elongation:**min. 20%
- **Deflection according to EN 818-2or PAS 1061:**
  0.8 x nominal diameter
- **Usage temperature:** -40 °C - 380 °C
  (note corresponding reduction of the load capacity at high temperatures)
- **Grade stamp:**
  chain: *8*W at clearance of approx. 300 mm up to size 16 (above that 900 mm) and W on each link back
  Components: 10
- **Manufacturer name or symbol:**
  PW and/or pewag and/or H16
- **Compatibility:**
  Winner chains and components should only be assembled by trained personnel using grade 8 components which comply with EN 818 and EN 1766 standards. They may be combined with competitors' G10 chains and components only provided they are also compatible with EN 818 and EN 1766 products.
  For replacement parts such as bolts, safety pins and covers, use only pewag products. Note that the load capacity of the total system is based on the weakest part.

Load capacity table

The load capacities specified in tonnes are maximum values of the different lifting types according to the unit method. In the event of load complications such as asymmetry, temperature, edges or impact loads, see page 17

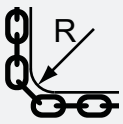
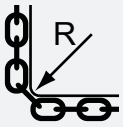
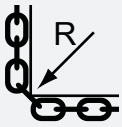
Safety factor		1 strand		2 strands				3 and 4 strands		Chain slings	Loop chains	
4												
Inclination angle		0°	0°	up to 45°	46° - 60°	up to 45°	46° - 60°	up to 45°	46° - 60°	up to 45°	up to 45°	up to 45°
Load factor		1	0.8	1.4	1	1.12	0.8	2.1	1.5	1.6	1.4	2.1
Code	D	Load capacity (t)										
Chain sling grade 10												
CM10C-05	5	1.00	0.80	1.40	1.00	1.12	0.80	2.00	1.50	1.60	1.40	2.00
CM10C-06	6	1.40	1.12	2.00	1.40	1.60	1.12	3.00	2.12	2.24	2.00	3.00
CM10C-07	7	1.90	1.50	2.65	1.90	2.12	1.50	4.00	2.80	3.00	2.65	4.00
CM10C-08	8	2.50	2.00	3.55	2.50	2.80	2.00	5.30	3.75	4.00	3.55	5.30
CM10C-10	10	4.00	3.15	5.60	4.00	4.25	3.15	8.00	6.00	6.30	5.60	8.00
CM10C-13	13	6.70	5.30	9.50	6.70	7.50	5.30	14.00	10.00	10.60	9.50	14.00
CM10C-16	16	10.00	8.00	14.00	10.00	11.20	8.00	21.20	15.00	16.00	14.00	21.20
CM10C-20	19	14.00	11.20	20.00	14.00	16.00	11.20	30.00	21.20	22.40	20.00	30.00
CM10C-22	22	19.00	15.00	26.50	19.00	21.20	15.00	40.00	28.00	30.00	26.50	40.00
CM10C-26	26	26.50	21.20	37.50	26.50	30.00	21.20	56.00	40.00	42.50	37.50	56.00
CM10C-32	32	40.00	31.50	56.00	40.00	45.00	31.50	85.00	60.00	63.00	56.00	85.00
Chain slings grade 8												
CM08C-06	6	1.12	0.90	1.60	1.12	1.25	0.90	2.36	1.70	1.80	1.60	2.36
CM08C-07	7	1.50	1.20	2.12	1.50	1.70	1.20	3.15	2.24	2.50	2.12	3.15
CM08C-08	8	2.00	1.60	2.80	2.00	2.24	1.60	4.25	3.00	3.15	2.80	4.25
CM08C-10	10	3.15	2.50	4.25	3.15	3.55	2.50	6.70	4.75	5.00	4.25	6.70
CM08C-13	13	5.30	4.25	7.50	5.30	5.90	4.25	11.20	8.00	8.50	7.50	11.20
CM08C-16	16	8.00	6.30	11.20	8.00	9.00	6.30	17.00	11.80	12.50	11.20	17.00
CM08C-20	19	11.20	8.95	16.00	11.20	12.50	8.95	23.60	17.00	18.00	16.00	23.60
CM08C-22	22	15.00	12.00	21.20	15.00	17.00	12.00	31.50	22.40	23.60	21.20	31.50
CM08C-26	26	21.20	16.95	30.00	21.20	23.70	16.95	45.00	31.50	30.50	30.00	45.00
CM08C-32	32	31.50	25.20	45.00	31.50	35.20	25.20	67.00	47.50	50.00	45.00	67.00

Reduction factors

If the chains are subject to load obstacles (e.g. temperature too high, asymmetry, edge loading, impacts ...), the maximum loading capacities in the loading table are to be reduced. The load factors below are to be used for this. Please also note the details in the user information.

Temperature load	Load factor		
Usage temperature	**Grade 8**	**Grade 10 200 °C**	**Grade 10 380 °C**
-40 °C to -20 °C	without deduction	not permitted	without deduction
-20 °C to +200 °C	without deduction	without deduction	without deduction
+200 °C to +300 °C	0.90	not permitted	0.90
+300 °C to +380 °C	0.75	not permitted	0.75
+380 °C to +400 °C	0.75	not permitted	not permitted
over +400 °C	not permitted	not permitted	not permitted

Asymmetrical load distribution	The load capacity is to be reduced by at least 1 chain strand. In case of doubt, assume only 1 strand is being loade, e.g.: classify 3 or 4-leg slings as 2-leg slings.

Edge load	 **R = larger than 2x chain diameter**	 **R = larger than chain diameter**	 **R = chain diameter or smaller**
Load factor	**1**	**0.7**	**0.5**

Impact load	**slight impacts**	**medium impacts**	**strong impacts**
Load factor	**1**	**0.7**	**not permitted**

Designation

CS08-400-2-08-300-ML-CSH-CGH

Length in cm

Chain thickness in mm:
08...8 mm
10...10 mm...

Number of strands:
1...1 strand
2...2 strands
3...3 strands
4...4 strands

Grade
-Usage temperature:
CS08...Grade 8 (400°)
CS10...Grade 10 (200°)
CS10...Grade 10 (380°)

Shortening option:
CGH
EGH

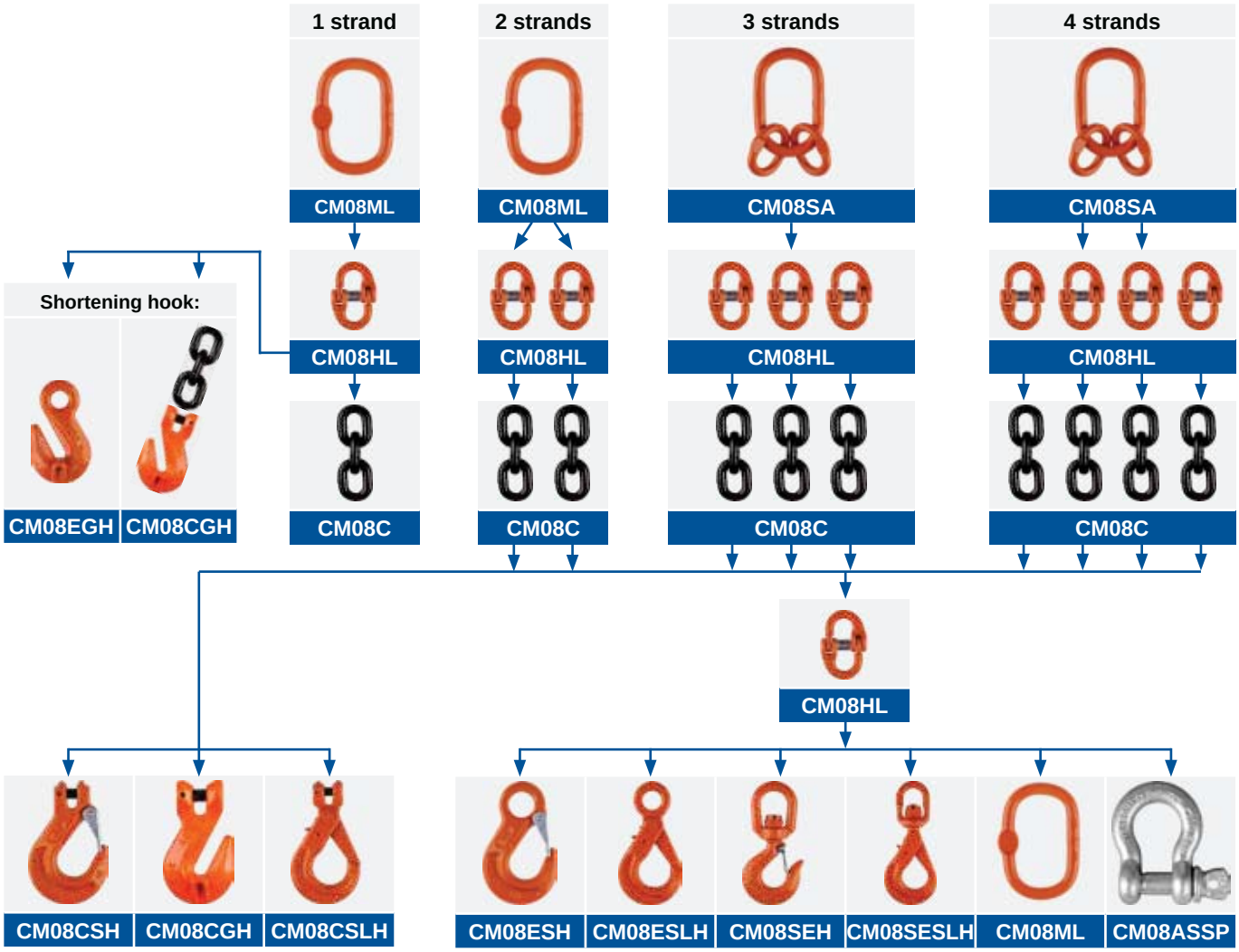
End fitting
ESH
ESLH
SEH
CSH
CSLH
ASSP
ML

Lifting ring
ML...1/2-strand
SA...3/4-strand

Chain slings

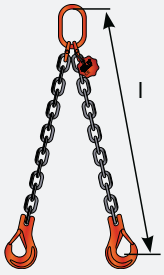
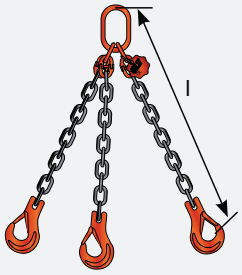
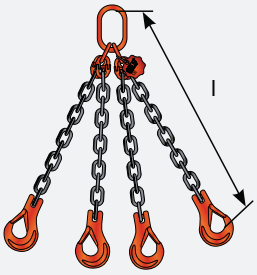
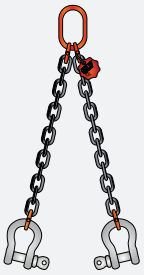
Chain slings grade 8

Component overview



Chain diameter						
mm		1 strand	2 strands	3+4 strands		
6	CM08C-06	CM08ML-D13	CM08ML-D13	CM08SA-0607	CM08HL-06	CM08CGH-06
7	CM08C-07	CM08ML-D13	CM08ML-D16	CM08SA-0607	CM08HL-08	CM08CGH-08
8	CM08C-08	CM08ML-D16	CM08ML-D18	CM08SA-08	CM08HL-08	CM08CGH-08
10	CM08C-10	CM08ML-D18	CM08ML-D22	CM08SA-10	CM08HL-10	CM08CGH-10
13	CM08C-13	CM08ML-D22	CM08ML-D26	CM08SA-13	CM08HL-13	CM08CGH-13
16	CM08C-16	CM08ML-D26	CM08ML-D32	CM08SA-16	CM08HL-16	CM08CGH-16
18	CM08C-18	CM08ML-D32	CM08ML-D36	CM08SA-20	CM08HL-20	CM08CGH-20
20	CM08C-20	CM08ML-D36	CM08ML-D40	CM08SA-20	CM08HL-20	CM08CGH-20
22	CM08C-22	CM08ML-D40	CM08ML-D45	CM08SA-22	CM08HL-22	CM08CGH-22
26	CM08C-26	CM08ML-D45	CM08ML-D50	CM08SA-26	CM08HL-26	CM08CGH-26
32	CM08C-32	CM08ML-D50	-	CM08SA-32	CM08HL-32	-

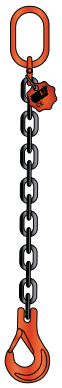
Most commonly used chain slings

1 strand	2 strands	3 strands	4 strands
			
CS08-400-1-**-****-ML-CSH	CS08-400-2-**-****-ML-CSH	CS08-400--3-**-****-SA-CSH	CS08-400-4-**-****-SA-CSH
			
CS08-400-1-**-****-ML-ASSP	CS08-400-2-**-****-ML-ASSP	CS08-400-3-**-****-SA-ASSP	CS08-400--4-**-****-SA-ASSP
			
CS08-400-1-**-****-ML-CSH-CGH	CS08-400-2-**-****-ML-CSH-CGH	CS08-400-3-**-****-SA-CSH-CGH	CS08-400-4-**-****-SA-CSH-CGH

							
							EN shackle*
CM08CSH-06	CM08CSLH-06	CM08ESH-06	CM08ESLH-06	CM08SEH-06	CM08SESLH-06	ASSP/BN-1,00	
CM08CSH-08	CM08CSLH-08	CM08ESH-08	CM08ESLH-08	CM08SEH-08	CM08SESLH-08	ASSP/BN-1,50	
CM08CSH-08	CM08CSLH-08	CM08ESH-08	CM08ESLH-08	CM08SEH-08	CM08SESLH-08	ASSP/BN-2,00	
CM08CSH-10	CM08CSLH-10	CM08ESH-10	CM08ESLH-10	CM08SEH-10	CM08SESLH-10	ASSP/BN-3,25	
CM08CSH-13	CM08CSLH-13	CM08ESH-13	CM08ESLH-13	CM08SEH-13	CM08SESLH-13	ASSP/BN-6,50	
CM08CSH-16	CM08CSLH-16	CM08ESH-16	CM08ESLH-16	CM08SEH-16	CM08SESLH-16	ASSP/BN-8,50	
CM08CSH-20	CM08CSLH-20	CM08ESH-20	CM08ESLH-20	CM08SEH-20	CM08SESLH-20	ASSP/BN-12,00	
CM08CSH-20	CM08CSLH-20	CM08ESH-20	CM08ESLH-20	CM08SEH-20	CM08SESLH-20	ASSP/BN-13,50	
CM08CSH-22	CM08CSLH-22	CM08ESH-22	CM08ESLH-22	CM08SEH-22	CM08SESLH-22	ASSP/BN-17,00	
CM08CSH-26	CM08CSLH-26	CM08ESH-26	CM08ESLH-26	CM08SEH-26	CM08SESLH-26	ASSP/BN-25,00	
CM08CSH-32	CM08CSLH-32	CM08ESH-32	CM08ESLH-32	CM08SEH-32	CM08SESLH-32	ASSP/BN-35,00	

** Only the ASSP-EN and ASBN-EN shackles may be used for installation in slings*

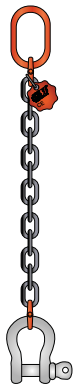
Chain sling CS08-400-1-**-****-ML-CSH



Type	Load capacity at 0°	Prices		
		2 m	4 m	each additional m
	t	EUR	EUR	EUR
CS08-400-1-06-****-ML-CSH	1.12			
CS08-400-1-07-****-ML-CSH	1.50			
CS08-400-1-08-****-ML-CSH	2.00			
CS08-400-1-10-****-ML-CSH	3.15			
CS08-400-1-13-****-ML-CSH	5.30			
CS08-400-1-16-****-ML-CSH	8.00			

*** Diameter*
***** Length in mm*

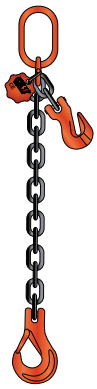
Chain sling CS08-400-1-**-****-ML-ASSP



Type	Load capacity at 0°	Prices		
		2 m	4 m	each additional m
	t	EUR	EUR	EUR
CS08-400-1-06-****-ML-ASSP	1.12			
CS08-400-1-07-****-ML-ASSP	1.50			
CS08-400-1-08-****-ML-ASSP	2.00			
CS08-400-1-10-****-ML-ASSP	3.15			
CS08-400-1-13-****-ML-ASSP	5.30			
CS08-400-1-16-****-ML-ASSP	8.00			

*** Diameter*
***** Length in mm*

Chain sling CS08-400-1-**-****-ML-CSH-CGH



Type	Load capacity at 0°	Prices		
		2 m	4 m	each additional m
	t	EUR	EUR	EUR
CS08-400-1-06-****-ML-CSH-CGH	1.12			
CS08-400-1-07-****-ML-CSH-CGH	1.50			
CS08-400-1-08-****-ML-CSH-CGH	2.00			
CS08-400-1-10-****-ML-CSH-CGH	3.15			
CS08-400-1-13-****-ML-CSH-CGH	5.30			
CS08-400-1-16-****-ML-CSH-CGH	8.00			

*** Diameter*
***** Length in mm*

Chain sling CS08-400-2-**-****-ML-CSH

Type	Load capacity		Prices		
	at 0°- 45°	at 46° - 60°	2 m	4 m	each additional m
	t	t	EUR	EUR	EUR
CS08-400-2-06-****-ML-CSH	1.60	1.12			
CS08-400-2-07-****-ML-CSH	2.12	1.50			
CS08-400-2-08-****-ML-CSH	2.80	2.00			
CS08-400-2-10-****-ML-CSH	4.25	3.15			
CS08-400-2-13-****-ML-CSH	7.50	5.30			
CS08-400-2-16-****-ML-CSH	11.20	8.00			

*** Diameter*
***** Length in mm*

Chain sling CS08-400-2-**-****-ML-ASSP

Type	Load capacity		Prices		
	at 0°- 45°	at 46° - 60°	2 m	4 m	each additional m
	t	t	EUR	EUR	EUR
CS08-400-2-06-****-ML-ASSP	1.60	1.12			
CS08-400-2-07-****-ML-ASSP	2.12	1.50			
CS08-400-2-08-****-ML-ASSP	2.80	2.00			
CS08-400-2-10-****-ML-ASSP	4.25	3.15			
CS08-400-2-13-****-ML-ASSP	7.50	5.30			
CS08-400-2-16-****-ML-ASSP	11.20	8.00			

*** Diameter*
***** Length in mm*

Chain sling CS08-400-2-**-****-ML-CSH-CGH

Type	Load capacity		Prices		
	at 0°- 45°	at 46° - 60°	2 m	4 m	each additional m
	t	t	EUR	EUR	EUR
CS08-400-2-06-****-ML-CSH-CGH	1.60	1.12			
CS08-400-2-07-****-ML-CSH-CGH	2.12	1.50			
CS08-400-2-08-****-ML-CSH-CGH	2.80	2.00			
CS08-400-2-10-****-ML-CSH-CGH	4.25	3.15			
CS08-400-2-13-****-ML-CSH-CGH	7.50	5.30			
CS08-400-2-16-****-ML-CSH-CGH	11.20	8.00			

*** Diameter*
***** Length in mm*

Chain sling CS08-400-3-**-****-SA-CSH

Type	Load capacity		Prices		
	at 0°- 45°	at 46° - 60°	2 m	4 m	each additional m
	t	t	EUR	EUR	EUR
CS08-400-3-06-****-SA-CSH	2.36	1.70			
CS08-400-3-07-****-SA-CSH	3.15	2.24			
CS08-400-3-08-****-SA-CSH	4.25	3.00			
CS08-400-3-10-****-SA-CSH	6.70	4.75			
CS08-400-3-13-****-SA-CSH	11.20	8.00			
CS08-400-3-16-****-SA-CSH	17.00	11.80			

*** Diameter*
***** Length in mm*

Chain sling CS08-400-3-**-****-SA-ASSP

Type	Load capacity		Prices		
	at 0°- 45°	at 46° - 60°	2 m	4 m	each additional m
	t	t	EUR	EUR	EUR
CS08-400-3-06-****-SA-ASSP	2.36	1.70			
CS08-400-3-07-****-SA-ASSP	3.15	2.24			
CS08-400-3-08-****-SA-ASSP	4.25	3.00			
CS08-400-3-10-****-SA-ASSP	6.70	4.75			
CS08-400-3-13-****-SA-ASSP	11.20	8.00			
CS08-400-3-16-****-SA-ASSP	17.00	11.80			

*** Diameter*
***** Length in mm*

Chain sling CS08-400-3-**-****-SA-CSH-CGH

Type	Load capacity		Prices		
	at 0°- 45°	at 46° - 60°	2 m	4 m	each additional m
	t	t	EUR	EUR	EUR
CS08-400-3-06-****-SA-CSH-CGH	2.36	1.70			
CS08-400-3-07-****-SA-CSH-CGH	3.15	2.24			
CS08-400-3-08-****-SA-CSH-CGH	4.25	3.00			
CS08-400-3-10-****-SA-CSH-CGH	6.70	4.75			
CS08-400-3-13-****-SA-CSH-CGH	11.20	8.00			
CS08-400-3-16-****-SA-CSH-CGH	17.00	11.80			

*** Diameter*
***** Length in mm*

Chain sling CS08-400-4-**-****-SA-CSH

Type	Load capacity		Prices		
	at 0°- 45°	at 46° - 60°	2 m	4 m	each additional m
	t	t	EUR	EUR	EUR
CS08-400-4-06-****-SA-CSH	2.36	1.70			
CS08-400-4-07-****-SA-CSH	3.15	2.24			
CS08-400-4-08-****-SA-CSH	4.25	3.00			
CS08-400-4-10-****-SA-CSH	6.70	4.75			
CS08-400-4-13-****-SA-CSH	11.20	8.00			
CS08-400-4-16-****-SA-CSH	17.00	11.80			

*** Diameter*
***** Length in mm*

Chain sling CS08-400-4-**-****-SA-ASSP

Type	Load capacity		Prices		
	at 0°- 45°	at 46° - 60°	2 m	4 m	each additional m
	t	t	EUR	EUR	EUR
CS08-400-4-06-****-SA-ASSP	2.36	1.70			
CS08-400-4-07-****-SA-ASSP	3.15	2.24			
CS08-400-4-08-****-SA-ASSP	4.25	3.00			
CS08-400-4-10-****-SA-ASSP	6.70	4.75			
CS08-400-4-13-****-SA-ASSP	11.20	8.00			
CS08-400-4-16-****-SA-ASSP	17.00	11.80			

*** Diameter*
***** Length in mm*

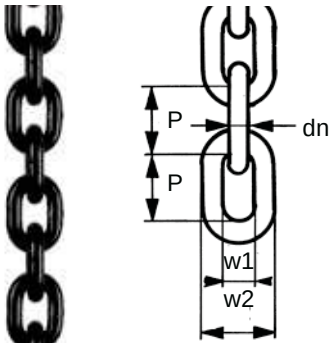
Chain sling CS08-400-4-**-****-SA-CSH-CGH

Type	Load capacity		Prices		
	at 0°- 45°	at 46° - 60°	2 m	4 m	each additional m
	t	t	EUR	EUR	EUR
CS08-400-4-06-****-SA-CSH-CGH	2.36	1.70			
CS08-400-4-07-****-SA-CSH-CGH	3.15	2.24			
CS08-400-4-08-****-SA-CSH-CGH	4.25	3.00			
CS08-400-4-10-****-SA-CSH-CGH	6.70	4.75			
CS08-400-4-13-****-SA-CSH-CGH	11.20	8.00			
CS08-400-4-16-****-SA-CSH-CGH	17.00	11.80			

*** Diameter*
***** Length in mm*

Round steel chain CM08C

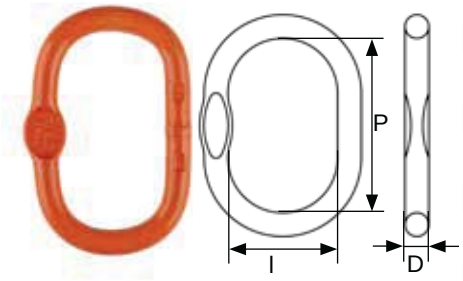
Grade 8 according to EN 818-2
Maximum usage temperature **400 °C.**



Type	Load capacity	Diameter dn	Division P	w1 min.	w2 max.	Weight	Price/m
	t	mm	mm	mm	mm	kg/m	EUR
CM08C-06	1.12	6	18	7.8	22.2	0.83	
CM08C-07	1.50	7	21	9.1	25.9	1.17	
CM08C-08	2.00	8	24	10.4	29.6	1.51	
CM08C-10	3.15	10	30	13.0	37.0	2.30	
CM08C-13	5.30	13	39	16.9	48.1	3.90	
CM08C-16	8.00	16	48	20.8	59.2	5.79	
CM08C-18	10.00	18	54	23.4	66.6	7.38	
CM08C-20	12.50	20	60	26.0	74.0	9.21	
CM08C-22	15.00	22	66	28.6	84.1	11.20	
CM08C-26	21.20	26	78	33.8	96.2	15.50	
CM08C-32	31.50	32	96	41.6	118.0	24.10	

Lifting ring CM08ML

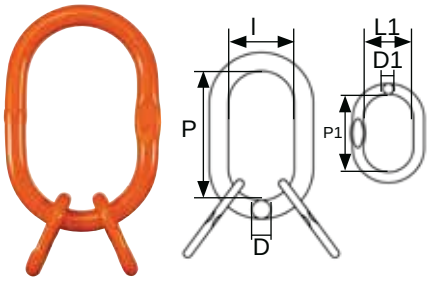
Grade 8 according to EN 1677-4
Suspension link for 1+2 strand chain
Can also be used as end link.



Type	Load capacity	D	P	l	For chain diameter		Weight	Price per item
					1 strand	2 strands		
	t	mm	mm	mm	mm	mm	kg/pc.	EUR
CM08ML-D13	1.60	13	110	60	6+7	6	0.34	
CM08ML-D16	2.12	16	110	60	8	7	0.54	
CM08ML-D18	3.15	18	135	75	10	8	0.82	
CM08ML-D22	5.30	22	160	90	13	10	1.50	
CM08ML-D26	8.00	26	180	100	16	13	2.32	
CM08ML-D32	11.20	32	200	110	18	16	3.95	
CM08ML-D36	14.00	36	260	140	20	18	6.34	
CM08ML-D40	17.00	40	300	160	22	20	8.96	
CM08ML-D45	21.20	45	340	180	26	22	12.80	
CM08ML-D50	31.50	50	350	190	32	26	16.55	

Four strand set CM08SA

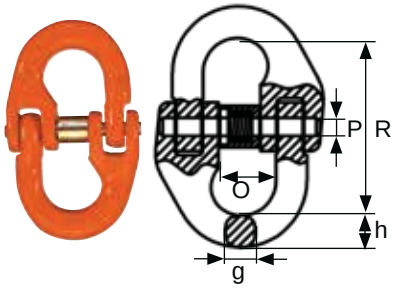
Grade 8 according to EN 1677-4
For creation of 3 and 4-strand chains with connecting links.



Type	Load capacity	D	P	l	D1	P1	L1	For chain diameter	Weight	Price per item
								3+4 strands		
	t	mm	mm	mm	mm	mm	mm	mm	kg/pc.	EUR
CM08SA-0607	3.15	18	135	75	13	60	38	6+7	1.24	
CM08SA-08	4.25	22	160	90	16	70	34	8	2.20	
CM08SA-10	6.70	26	180	100	18	85	40	10	3.40	
CM08SA-13	11.20	32	200	110	22	115	50	13	6.10	
CM08SA-16	17.00	36	260	140	16	140	65	16	9.98	
CM08SA-20	26.50	50	350	190	32	180	100	20	22.60	
CM08SA-22	31.50	50	350	190	36	180	100	22	25.20	
CM08SA-26	45.00	56	400	200	40	180	100	26	35.20	

Connecting link CM08HL

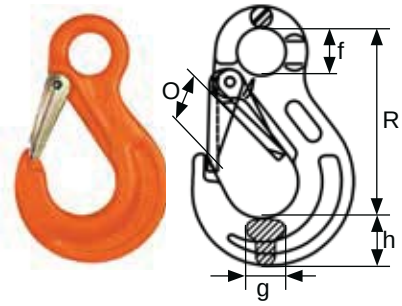
Grade 8 according to EN 1677-1
Connecting link for:
Suspension link – Chain
Chain – Chain
Hook – Chain



Type	Load capacity	g	h	O	R	P	Weight	Price per item
	t	mm	mm	mm	mm	mm	kg/pc.	EUR
CM08HL-06	1.12	7.0	7.5	15.0	42.0	4.8	0.08	
CM08HL-08	2.00	8.5	9.5	18.0	60.5	6.3	0.15	
CM08HL-10	3.15	11.5	12.0	25.0	68.0	8.0	0.30	
CM08HL-13	5.30	15.0	15.0	29.0	87.0	10.0	0.70	
CM08HL-16	8.00	19.8	19.8	34.5	108.4	14.0	1.30	
CM08HL-20	12.50	24.0	24.0	41.0	121.5	16.0	2.10	
CM08HL-22	15.00	26.0	26.0	48.0	141.5	16.0	3.20	
CM08HL-26	21.20	30.0	31.0	57.5	158.0	18.0	4.5	
CM08HL-32	31.50	37.0	38.0	67.0	205.0	25.0	9.0	

Eyehooks CM08ESH

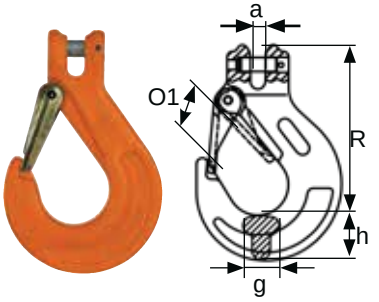
Grade 8 according to EN 1677-2
With forged safety latch.



Type	Load capacity	g	h	O	R	f	Weight	Price per item
	t	mm	mm	mm	mm	mm	kg/pc.	EUR
CM08ESH-06	1.12	13.5	19.0	24	80.0	20	0.24	
CM08ESH-08	2.00	17.0	23.0	30	98.5	25	0.40	
CM08ESH-10	3.15	22.0	32.0	34	120.0	38	0.90	
CM08ESH-13	5.30	26.0	42.5	39	152.0	43	2.35	
CM08ESH-16	8.00	34.0	48.0	46	183.5	50	3.20	
CM08ESH-20	12.50	42.0	58.5	48	221.0	63	6.36	
CM08ESH-22	15.00	44.0	75.5	71	241.0	62	9.20	
CM08ESH-26	21.20	60.0	80.5	81	279.0	64	13.00	
CM08ESH-32	31.50	66.0	88.0	102	355.0	88	17.00	

Coupling hook CM08CSH

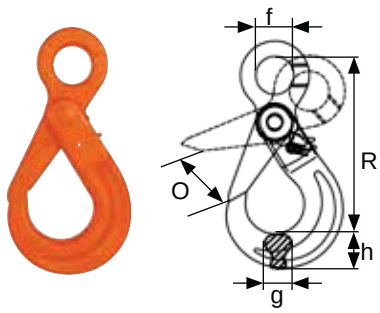
Grade 8 according to EN 1677-2
Can be used without connecting link. With forged safety latch.



Type	Load capacity	g	h	O1	R	a	Weight	Price per item
	t	mm	mm	mm	mm	mm	kg/pc.	EUR
CM08CSH-06	1.12	14.0	20.0	27	92.0	8.0	0.32	
CM08CSH-08	2.00	18.0	25.0	29	104.5	9.5	0.48	
CM08CSH-10	3.15	23.0	31.0	39	127.0	12.5	0.95	
CM08CSH-13	5.30	27.5	42.5	47	155.8	16.5	2.00	
CM08CSH-16	8.00	35.0	54.0	55	183.0	21.5	3.40	
CM08CSH-20	12.50	42.0	58.0	61	219.5	24.0	5.67	
CM08CSH-22	15.00	50.0	62.0	72	258.0	27.0	10.40	
CM08CSH-26	21.20	60.0	75.0	101	314.0	30.0	14.20	
CM08CSH-32	31.50	66.0	88.0	124	392.0	35.0	25.30	

Safety hook with eye-let CM08ESLH

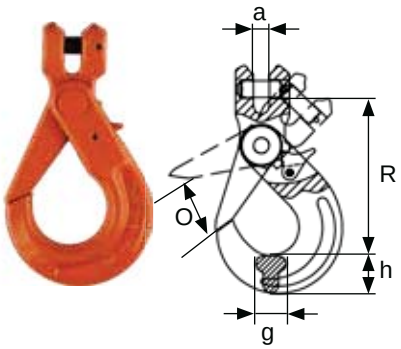
Grade 8 according to EN 1677-3
Closes and locks automatically.



Type	Load capacity	g	h	O	R	f	Weight	Price per item
	t	mm	mm	mm	mm	mm	kg/pc.	EUR
CM08ESLH-06	1.12	16	19.5	28	110.5	34	0.50	
CM08ESLH-08	2.00	20	24.0	34	136.0	46	0.80	
CM08ESLH-10	3.15	25	30.0	44	171.0	56	1.55	
CM08ESLH-13	5.30	34	40.0	52	208.5	69	3.20	
CM08ESLH-16	8.00	35	50.5	60	257.5	86	5.74	
CM08ESLH-20	12.50	50	55.0	81	275.0	100	8.00	
CM08ESLH-22	15.00	52	67.0	82	320.0	98	13.00	
CM08ESLH-26	21.20	58	75.0	110	363.0	110	18.00	
CM08ESLH-32	31.50	76	97.0	168	472.0	166	44.50	

Coupling safety load hook CM08CSLH

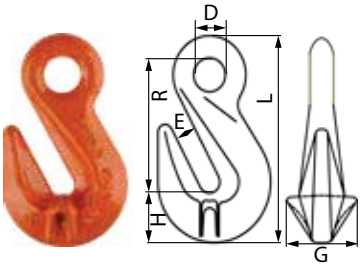
Grade 8 according to EN 1677-3
Can be used without connecting link. Closes and locks automatically.



Type	Load capacity	g	h	O	R	a	Weight	Price per item
	t	mm	mm	mm	mm	mm	kg/pc.	EUR
CM08CSLH-06	1.12	16	19.5	29.0	95.5	8.5	0.5	
CM08CSLH-08	2.00	20	24.0	34.0	121.0	9.5	0.8	
CM08CSLH-10	3.15	25	30.0	44.0	146.0	12.0	1.5	
CM08CSLH-13	5.30	34	40.0	52.0	182.0	15.0	2.8	
CM08CSLH-16	8.00	35	50.5	60.0	218.0	18.0	5.6	
CM08CSLH-20	12.50	50	55.0	83.0	240.0	25.0	7.5	
CM08CSLH-22	15.00	52	67.0	88.0	276.5	25.5	11.5	
CM08CSLH-26	21.20	58	75.0	95.5	310.0	30.0	18.5	
CM08CSLH-32	31.50	76	97.0	160.0	411.5	36.0	49.1	

Shortening hook CM08EGH

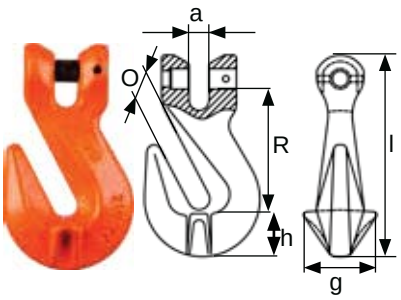
Grade 8 according to EN 1677-1
For shortening loops which should not tighten.



Type	Load capacity	g	h	e	D	R	l	Weight	Price per item
	t	mm	mm	mm	mm	mm	mm	kg/pc.	EUR
CM08EGH-06	1.12	26.7	17.9	8.0	13.5	51.4	75.3	0.14	
CM08EGH-08	2.00	33.5	20.0	10.8	18.0	61.5	91.2	0.25	
CM08EGH-10	3.15	46.0	29.0	13.0	20.0	80.0	122.0	0.65	
CM08EGH-13	5.30	57.5	42.8	16.5	26.0	99.7	158.0	1.39	
CM08EGH-16	8.00	72.0	47.7	20.0	30.5	104.0	169.0	2.20	
CM08EGH-20	12.50	74.0	56.0	25.0	37.5	140.0	219.0	4.60	
CM08EGH-22	15.00	90.0	68.0	28.0	44.0	165.0	259.0	8.20	
CM08EGH-26	21.20	102.0	77.0	30.0	41.0	188.5	298.0	9.80	
CM08EGH-32	31.50	125.5	95.0	38.0	57.0	228.0	361.0	19.40	

Coupling shortening hook CM08CGH

Grade 8 according to EN 1677-1
Can be used without connecting link. For shortening loops which should not tighten.

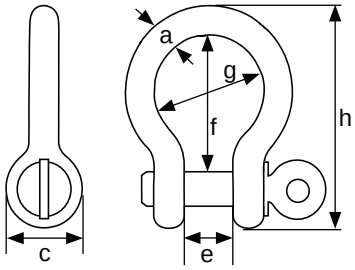


Type	Load capacity	g	h	O	R	a	l	Weight	Price per item
	t	mm	mm	mm	mm	mm	mm	kg/pc.	EUR
CM08CGH-06	1.12	21.5	17.7	8.0	43	7.5	75.0	0.25	
CM08CGH-08	2.00	33.5	18.5	10.5	52	9.5	89.0	0.32	
CM08CGH-10	3.15	46.0	29.0	13.0	75	12.5	126.0	0.73	
CM08CGH-13	5.30	57.5	42.5	16.5	91	15.0	163.5	1.60	
CM08CGH-16	8.00	74.0	45.5	19.0	98	18.5	183.5	2.80	
CM08CGH-20	12.50	74.0	56.0	24.0	121	23.0	219.0	5.00	
CM08CGH-22	15.00	90.0	68.5	27.0	138	27.0	254.0	6.30	
CM08CGH-26	21.20	102.0	77.0	30.0	169	30.0	309.0	14.50	

Standard shackle -curved ASSP/ASBN

Finish: galvanised

Material: bracket and bolts made from hardened and tempered steel.
Safety factor: 5 times WLL = minimum breakage load.
Temperature range : -20 °C to +200 °C




ASSP-RR/EN


ASSBN-RR/EN

Load capacity	Suitable for G8 chain[1]	Dimensions							Weight		Price per item			
									ASSP	ASBN	ASSP		ASBN	
		c	h	e	a	g	b	f	Eye bolts	Nut + splint	RR	EN	RR	EN
t	mm	mm	mm	mm	mm	mm	mm	mm	kg	kg	EUR	EUR	EUR	EUR
0.50		16.5	48.5	12.0	7.0	20.0	8.0	29.0	0.05	0.06				
0.75		20.0	56.0	13.5	9.0	22.0	10.0	32.0	0.10	0.11				
1.00		22.5	63.5	17.0	10.0	26.0	11.0	36.5	0.14	0.16				
1.50	6 - 7	26.5	74.0	19.0	11.0	29.0	13.0	43.0	0.19	0.22				
2.00	8	34.0	89.0	22.0	13.5	32.0	16.0	51.0	0.36	0.42				
3.25	10	40.0	110.0	27.0	16.0	43.0	19.0	64.0	0.63	0.74				
4.75		46.0	129.0	31.0	19.0	51.0	22.0	76.0	1.01	1.18				
6.50	13	52.0	144.0	36.0	22.0	58.0	25.0	83.0	1.50	1.77				
8.50	16	59.0	164.0	43.0	25.0	68.0	28.0	95.0	2.21	2.58				
9.50		66.0	185.0	47.0	28.0	75.0	32.0	108.0	3.16	3.66				
12.00	18	72.0	201.0	51.0	32.0	83.0	35.0	115.0	4.31	4.91				
13.50	20	80.0	227.0	57.0	35.0	92.0	38.0	133.0	5.55	6.54				
17.00	22	88.0	249.0	60.0	38.0	99.0	42.0	146.0	7.43	8.19				
25.00	26	103.0	300.0	74.0	45.0	126.0	50.0	178.0	12.84	14.22				
35.00	32	111.0	331.0	83.0	50.0	138.0	57.0	197.0	18.15	19.85				
55.00		145.0	433.0	105.0	65.0	180.0	70.0	260.0	37.60	39.59				
85.00		162.0	527.0	127.0	75.0	190.0	83.0	329.0	-	62.00				

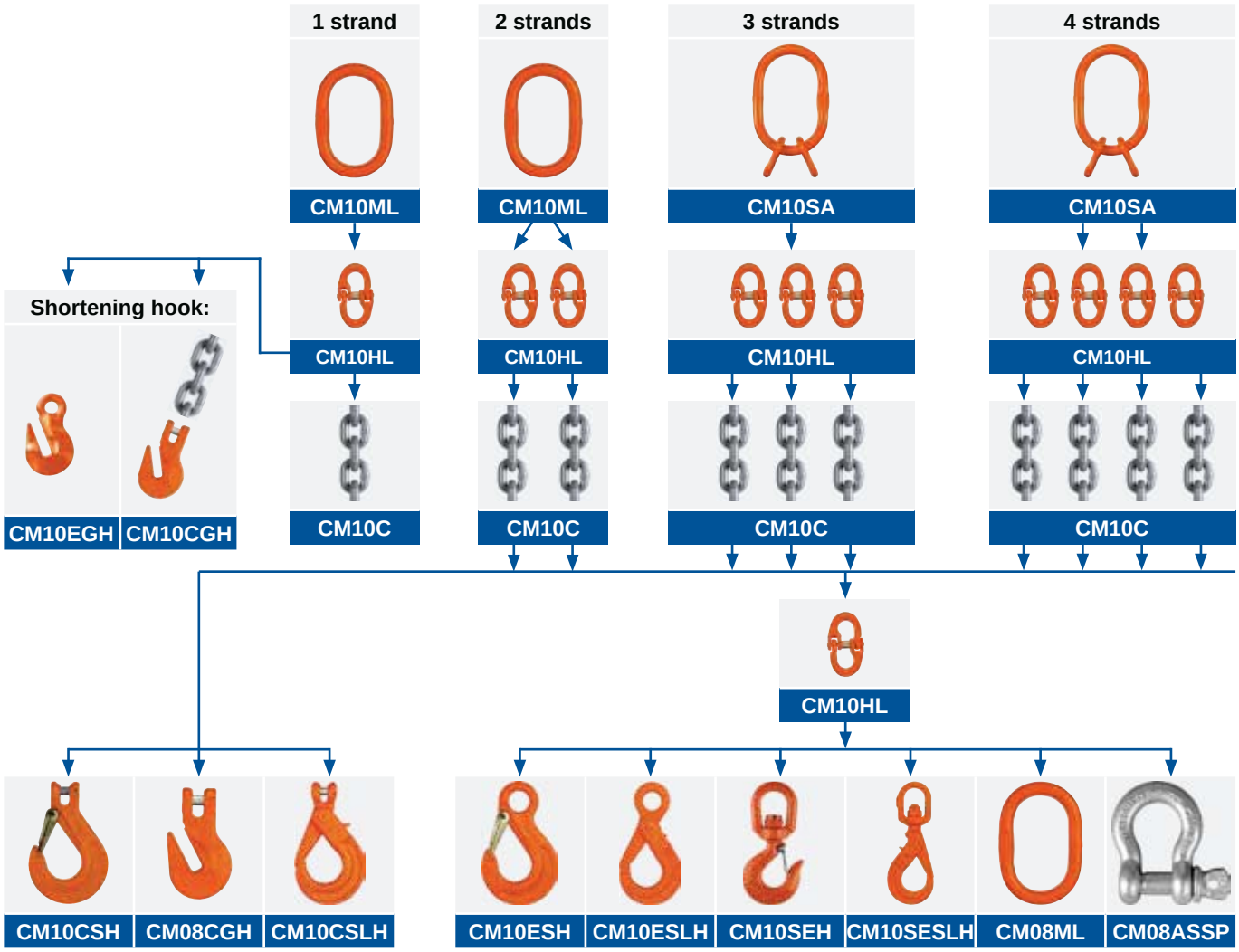
1 according to EN 818, only types ASSP-EN and ASBN-EN are installed in chain slings.

Shackle type ASSP-RR+ASBN-RR manufactured according to U.S. Federal Specification RR-C-271, CE-tested
Shackle type ASSP-EN+ASBN-EN manufactured according to EN 13889, CE-tested, suitable in accordance with EN for installation in slings

Chain slings

Chain sling grade 10

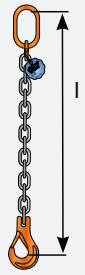
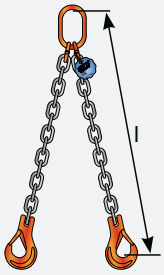
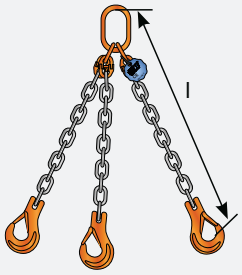
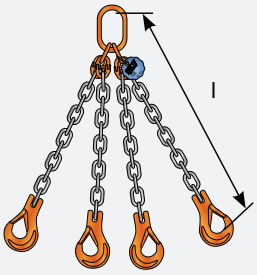
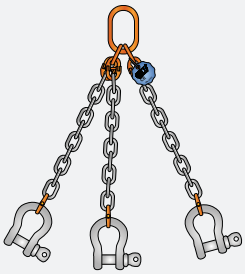
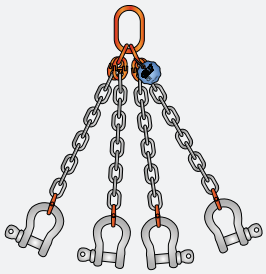
Component overview



Chain diameter						
mm		1 strand	2 strands	3+4 strands		
6	CM10-200C-06*	CM10ML-D13	CM10ML-D13	CM10SA-06	CM10HL-06	CM10CGH-0506
7	CM10-200C-07*	CM10ML-D13	CM10ML-D16	CM10SA-0708	CM10HL-07	CM10CGH-07
8	CM10-200C-08*	CM10ML-D16	CM10ML-D18	CM10SA-0708	CM10HL-08	CM10CGH-08
10	CM10-200C-10*	CM10ML-D18	CM10ML-D22	CM10SA-10	CM10HL-10	CM10CGH-10
13	CM10-200C-13*	CM10ML-D22	CM10ML-D26	CM10SA-13	CM10HL-13	CM10CGH-13
16	CM10-200C-16*	CM10ML-D26	CM10ML-D32	CM10SA-16	CM10HL-16	CM10CGH-16
19	CM10-200C-19*	CM10ML-D32	CM10ML-D36	CM10SA-1920	CM10HL-1920	CM10CGH-1920
22	CM10-200C-22*	CM10ML-D36	CM10ML-D45	CM10SA-22	CM10HL-22	CM10CGH-22
26	CM10-200C-26*	CM10ML-D45	CM10ML-D50	CM10SA-26	CM10HL-26	-
32	CM10-200C-32*	CM10ML-D50	CM10ML-D56	CM10SA-32	CM10HL-32	-

**available also as 400° version*

Most commonly used chain slings

1 strand	2 strands	3 strands	4 strands
			
CS10-200-1-**-****-ML-CSH	CS10-200-2-**-****-ML-CSH	CS10-200-3-**-****-SA-CSH	CS10-200-4-**-****-SA-CSH
			
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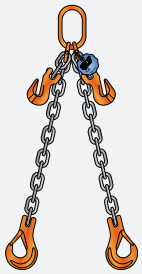
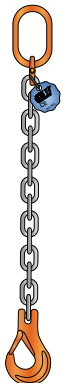
			
CS10-200-1-**-****-ML-CSH-CGH	CS10-200-2-**-****-ML-CSH-CGH	CS10-200-3-**-****-SA-CSH-CGH	CS10-200-4-**-****-SA-CSH-CGH

							
							EN shackle*
CM10CSH-0506	CM10CSLH-0506	CM10ESH-0506	CM10ESLH-0506	-	CM10SESLH-06	ASSP/BN-1,50	
CM10CSH-07	CM10CSLH-07	CM10ESH-0708	CM10ESLH-0708	CM10SEH-0708	CM10SESLH-0708	ASSP/BN-2,00	
CM10CSH-08	CM10CSLH-08	CM10ESH-0708	CM10ESLH-0708	CM10SEH-0708	CM10SESLH-0708	ASSP/BN-3,25	
CM10CSH-10	CM10CSLH-10	CM10ESH-10	CM10ESLH-10	CM10SEH-10	CM10SESLH-10	ASSP/BN-4.75	
CM10CSH-13	CM10CSLH-13	CM10ESH-13	CM10ESLH-13	CM10SEH-13	CM10SESLH-13	ASSP/BN-8,50	
CM10CSH-16	CM10CSLH-16	CM10ESH-16	CM10ESLH-16	-	CM10SESLH-16	ASSP/BN-12,00	
CM10CSH-1920	CM10CSLH-1920	CM10ESH-1920	CM10ESLH-1920	-	-	ASSP/BN-17,00	
CM10CSH-22	CM10CSLH-22	CM10ESH-22	CM10ESLH-22	-	-	ASSP/BN-25,00	
-	CM10CSLH-26	CM10ESH-26	-	-	-	ASSP/BN-35,00	
-	-	CM10ESH-32	-	-	-	ASSP/BN-55.00	

** Only the ASSP-EN and ASBN-EN shackles may be used for installation in slings*

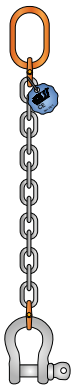
Chain sling CS10-200-1-**-****-ML-CSH



Type	Load capacity at 0°	Prices		
		2 m	4 m	each additional m
	t	EUR	EUR	EUR
CS10-200-1-06-****-ML-CSH	1.40			
CS10-200-1-07-****-ML-CSH	1.90			
CS10-200-1-08-****-ML-CSH	2.50			
CS10-200-1-10-****-ML-CSH	4.00			
CS10-200-1-13-****-ML-CSH	6.70			
CS10-200-1-16-****-ML-CSH	10.00			

*** Diameter*
**** Length in mm*
Max. use temperature 200 °C (380 °C available on request)

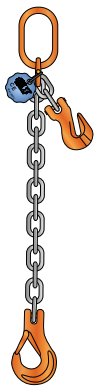
Chain sling CS10-200-1-**-****-ML-ASSP



Type	Load capacity at 0°	Prices		
		2 m	4 m	each additional m
	t	EUR	EUR	EUR
CS10-200-1-06-****-ML-ASSP	1.40			
CS10-200-1-07-****-ML-ASSP	1.90			
CS10-200-1-08-****-ML-ASSP	2.50			
CS10-200-1-10-****-ML-ASSP	4.00			
CS10-200-1-13-****-ML-ASSP	6.70			
CS10-200-1-16-****-ML-ASSP	10.00			

*** Diameter*
**** Length in mm*
Max. use temperature 200 °C (380 °C available on request)

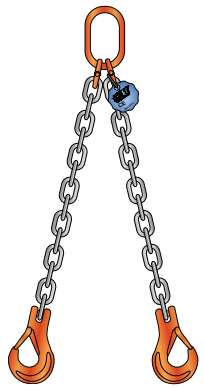
Chain sling CS10-200-1-**-****-ML-CSH-CGH



Type	Load capacity at 0°	Prices		
		2 m	4 m	each additional m
	t	EUR	EUR	EUR
CS10-200-1-06-****-ML-CSH-CGH	1.40			
CS10-200-1-07-****-ML-CSH-CGH	1.90			
CS10-200-1-08-****-ML-CSH-CGH	2.50			
CS10-200-1-10-****-ML-CSH-CGH	4.00			
CS10-200-1-13-****-ML-CSH-CGH	6.70			
CS10-200-1-16-****-ML-CSH-CGH	10.00			

*** Diameter*
**** Length in mm*
Max. use temperature 200 °C (380 °C available on request)

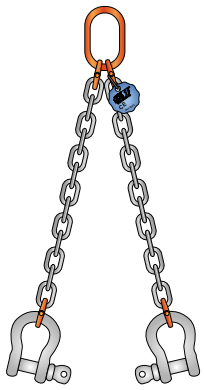
Chain sling CS10-200-2-**-****-ML-CSH



Type	Load capacity		Prices		
	at 0°- 45°	at 46° - 60°	2 m	4 m	each additional m
	t	t	EUR	EUR	EUR
CS10-200-2-06-****-ML-CSH	2.00	1.40			
CM10-200-2-07-****-ML-CSH	2.65	1.90			
CM10-200-2-08-****-ML-CSH	3.55	2.50			
CM10-200-2-10-****-ML-CSH	5.60	4.00			
CM10-200-2-13-****-ML-CSH	9.50	6.70			
CM10-200-2-16-****-ML-CSH	14.00	10.00			

*** Diameter*
**** Length in mm*
Max. use temperature 200 °C (380 °C available on request)

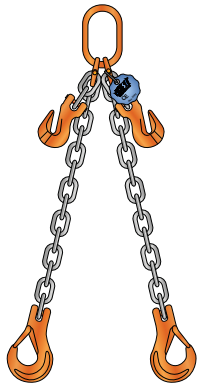
Chain sling CS10-200-2-**-****-ML-ASSP



Type	Load capacity		Prices		
	at 0°- 45°	at 46° - 60°	2 m	4 m	each additional m
	t	t	EUR	EUR	EUR
CS10-200-2-06-****-ML-ASSP	2.00	1.40			
CS10-200-2-07-****-ML-ASSP	2.65	1.90			
CS10-200-2-08-****-ML-ASSP	3.55	2.50			
CS10-200-2-10-****-ML-ASSP	5.60	4.00			
CS10-200-2-13-****-ML-ASSP	9.50	6.70			
CS10-200-2-16-****-ML-ASSP	14.00	10.00			

*** Diameter*
**** Length in mm*
Max. use temperature 200 °C (380 °C available on request)

Chain sling CS10-200-2-**-****-ML-CSH-CGH



Type	Load capacity		Prices		
	at 0°- 45°	at 46° - 60°	2 m	4 m	each additional m
	t	t	EUR	EUR	EUR
CS10-200-2-06-****-ML-CSH-CGH	2.00	1.40			
CS10-200-2-07-****-ML-CSH-CGH	2.65	1.90			
CS10-200-2-08-****-ML-CSH-CGH	3.55	2.50			
CS10-200-2-10-****-ML-CSH-CGH	5.60	4.00			
CS10-200-2-13-****-ML-CSH-CGH	9.50	6.70			
CS10-200-2-16-****-ML-CSH-CGH	14.00	10.00			

*** Diameter*
**** Length in mm*
Max. use temperature 200 °C (380 °C available on request)

Chain slings

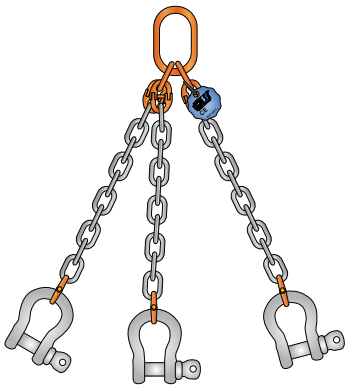
Chain sling grade 10

Chain sling CS10-200-3-**-****-SA-CSH

Type	Load capacity		Prices		
	at 0°- 45°	at 46° - 60°	2 m	4 m	each additional m
	t	t	EUR	EUR	EUR
CS10-200-3-06-****-SA-CSH	3.00	2.12			
CS10-200-3-07-****-SA-CSH	4.00	2.80			
CS10-200-3-08-****-SA-CSH	5.30	3.75			
CS10-200-3-10-****-SA-CSH	8.00	6.00			
CS10-200-3-13-****-SA-CSH	14.00	10.00			
CS10-200-3-16-****-SA-CSH	21.20	15.00			

*** Diameter*
**** Length in mm*
Max. use temperature 200 °C (380 °C available on request)

Chain sling CS10-200-3-**-****-SA-ASSP



Type	Load capacity		Prices		
	at 0°- 45°	at 46° - 60°	2 m	4 m	each additional m
	t	t	EUR	EUR	EUR
CS10-200-3-06-****-SA-ASSP	3.00	2.12			
CS10-200-3-07-****-SA-ASSP	4.00	2.80			
CS10-200-3-08-****-SA-ASSP	5.30	3.75			
CS10-200-3-10-****-SA-ASSP	8.00	6.00			
CS10-200-3-13-****-SA-ASSP	14.00	10.00			
CS10-200-3-16-****-SA-ASSP	21.20	15.00			

*** Diameter*
**** Length in mm*
Max. use temperature 200 °C (380 °C available on request)

Chain sling CS10-200-3-**-****-SA-CSH-CGH

Type	Load capacity		Prices		
	at 0°- 45°	at 46° - 60°	2 m	4 m	each additional m
	t	t	EUR	EUR	EUR
CS10-200-3-06-****-SA-CSH-CGH	3.00	2.12			
CS10-200-3-07-****-SA-CSH-CGH	4.00	2.80			
CS10-200-3-08-****-SA-CSH-CGH	5.30	3.75			
CS10-200-3-10-****-SA-CSH-CGH	8.00	6.00			
CS10-200-3-13-****-SA-CSH-CGH	14.00	10.00			
CS10-200-3-16-****-SA-CSH-CGH	21.20	15.00			

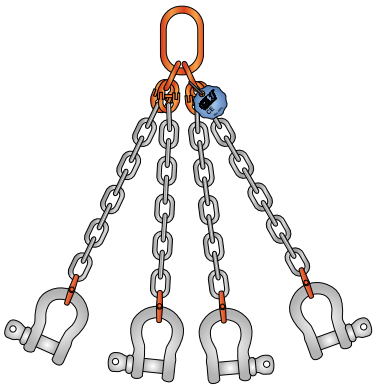
*** Diameter*
**** Length in mm*
Max. use temperature 200 °C (380 °C available on request)

Chain sling CS10-200-4-**-****-SA-CSH

Type	Load capacity		Prices		
	at 0°- 45°	at 46° - 60°	2 m	4 m	each additional m
	t	t	EUR	EUR	EUR
CS10-200-4-06-****-SA-CSH	3.00	2.12			
CS10-200-4-07-****-SA-CSH	4.00	2.80			
CS10-200-4-08-****-SA-CSH	5.30	3.75			
CS10-200-4-10-****-SA-CSH	8.00	6.00			
CS10-200-4-13-****-SA-CSH	14.00	10.00			
CS10-200-4-16-****-SA-CSH	21.20	15.00			

*** Diameter*
**** Length in mm*
Max. use temperature 200 °C (380 °C available on request)

Chain sling CS10-200-4-**-****-SA-ASSP



Type	Load capacity		Prices		
	at 0°- 45°	at 46° - 60°	2 m	4 m	each additional m
	t	t	EUR	EUR	EUR
CS10-200-4-06-****-SA-ASSP	3.00	2.12			
CS10-200-4-07-****-SA-ASSP	4.00	2.80			
CS10-200-4-08-****-SA-ASSP	5.30	3.75			
CS10-200-4-10-****-SA-ASSP	8.00	6.00			
CS10-200-4-13-****-SA-ASSP	14.00	10.00			
CS10-200-4-16-****-SA-ASSP	21.20	15.00			

*** Diameter*
**** Length in mm*
Max. use temperature 200 °C (380 °C available on request)

Chain sling CS10-200-4-**-****-SA-CSH-CGH

Type	Load capacity		Prices		
	at 0°- 45°	at 46° - 60°	2 m	4 m	each additional m
	t	t	EUR	EUR	EUR
CS10-200-4-06-****-SA-CSH-CGH	3.00	2.12			
CS10-200-4-07-****-SA-CSH-CGH	4.00	2.80			
CS10-200-4-08-****-SA-CSH-CGH	5.30	3.75			
CS10-200-4-10-****-SA-CSH-CGH	8.00	6.00			
CS10-200-4-13-****-SA-CSH-CGH	14.00	10.00			
CS10-200-4-16-****-SA-CSH-CGH	21.20	15.00			

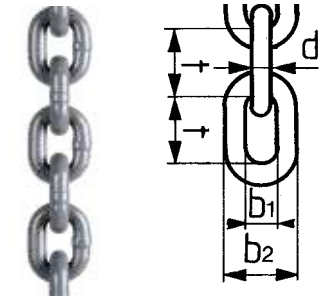
*** Diameter*
**** Length in mm*
Max. use temperature 200 °C (380 °C available on request)

Chain slings

Chain sling grade 10

Round steel chain CM10-200/CM10-380

CM10-200: corresponds to EN 818-2 with higher load capacity (but permissible operating temperature of max. 200 °C)
CM10-380: :corresponds to EN 818-2 with higher load capacity or PAS 1061 up to 16 mm (permissible operating temperature of max. 380 °C)

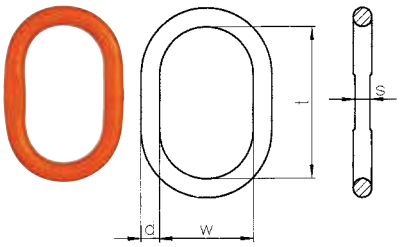


Type	Load capacity	Nominal diameter d	Separator t	internal width b1 min.	external width b2 max.	Weight	CM10-200 (200 °C) price/m	CM10-380 (380 °C) price/m
	t	mm	mm	mm	mm	kg	EUR	EUR
CM10C-05	1.00	5	16	8	19	0.61		
CM10C-06	1.40	6	18	9	22	0.96		
CM10C-07	1.90	7	21	10	25	1.20		
CM10C-08	2.50	8	24	11	29	1.57		
CM10C-10	4.00	10	30	14	36	2.46		
CM10C-13	6.70	13	39	18	47	4.18		
CM10C-16	10.00	16	48	22	58	6.28		
CM10C-19	14.00	19	57	27	69	8.92		
CM10C-22	19.00	22	66	30	79	11.88		
CM10C-26	26.50	26	78	35	94	16.18		
CM10C-32	40.00	32	96	43	115	24.10		

Suspension link CM10ML

Grade 10 according to EN 1677-4 with increased load capacity
Finish: orange powder coat

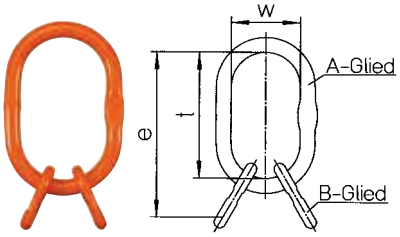
Suspension link for 1+2 strand chain
Can als be used as end link.



Type	D	t	w	s	Weight	For chain diameter		Price per item
						1 strand	2 strands	
	mm	mm	mm	mm	kg/pc.	mm	mm	EUR
CM10ML-10	10	80	50	10	0.14	5	5	
CM10ML-13	13	110	60	10	0.34	6+7	6	
CM10ML-16	16	110	60	14	0.53	8	7	
CM10ML-18	19	135	75	14	0.92	10	8	
CM10ML-22	23	160	90	17	1.60	13	10	
CM10ML-26	27	180	100	20	2.46	16	13	
CM10ML-32	33	200	110	26	4.14	19	16	
CM10ML-36	36	260	140	29	6.22	22	19	
CM10ML-45	45	340	180	-	12.82	26	22	
CM10ML-50	50	350	190	43	16.55	32	26	
CM10ML-56	60	400	200	-	27.01	-	32	
CM10ML-72	70	460	250	-	45.00	-	-	

Four-strand set CM10SA

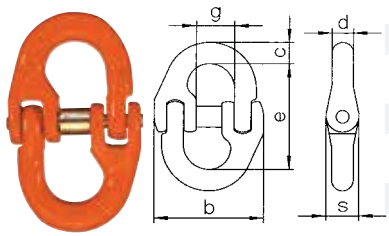
Grade 10 according to EN 1677-4 with increase load capacity
Finish: orange powder coat
For 3 and 4-strand chains with connecting link.



Type	e	t	w	Weight	For chain diameter	Price per item
					3+4 strands	
	mm	mm	mm	kg/pc.	mm	EUR
CM10SA-05	154	110	60	0.52	5	
CM10SA-06	189	135	75	1.26	6	
CM10SA-0708	230	160	90	2.32	7+8	
CM10SA-10	265	180	100	3.68	10	
CM10SA-13	315	200	110	6.46	13	
CM10SA-16	400	260	140	10.06	16	
CM10SA-1920	500	350	190	22.87	19+20	
CM10SA-22	520	350	190	24.79	22	
CM10SA-26	570	400	200	41.31	26	
CM10SA-32	660	460	250	66.60	32	

Connecting link CM10HL

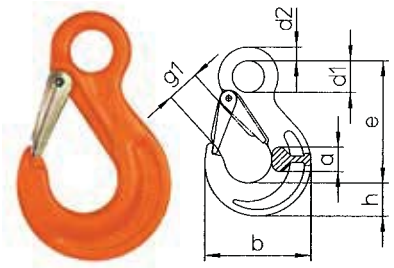
Grade 10 according to EN 1677-1 with increase load capacity
Finish: orange powder coat bolts and clamping sleeves CBHW also available separately. Connecting link for:
Suspension link – Chain
Chain – Chain
Hook – Chain



Type	Load capacity	e	c	s	D	b	g	Weight	Price per item
	t	mm	mm	mm	mm	mm	mm	kg/pc.	EUR
CM10HL-05	1.00	36	7	9	7	35	13	0.05	
CM10HL-06	1.40	44	8	11	8	39	14	0.06	
CM10HL-07	1.90	51	10	13	9	47	17	0.12	
CM10HL-08	2.50	62	12	14	10	55	18	0.23	
CM10HL-10	4.00	72	15	18	13	64	24	0.42	
CM10HL-13	6.70	88	20	22	17	79	28	0.84	
CM10HL-16	10.00	103	21	29	21	106	33	1.40	
CM10HL-1920	16.00	115	30	35	24	123	42	2.40	
CM10HL-22	19.00	161	34	39	25	148	51	4.15	
CM10HL-26	26.50	190	40	46	30	175	60	6.70	
CM10HL-32	40.00	206	47	56	35	216	80	11.20	

Eyehooks CM10ESH

Grade 10 according to EN 1677-2 with increased load capacity
Finish: orange powder coat. With forged safety latch.

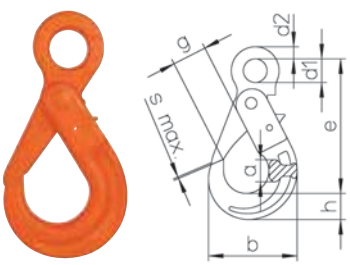


Type	Load capacity	e	h	a	D1	d2	g1	b	Weight	Price per item
	t	mm	mm	mm	mm	mm	mm	mm	kg/pc.	EUR
CM10ESH-0506	1.40	85	21	17	20	10	19	68	0.3	
CM10ESH-0708	2.50	106	27	19	25	11	26	88	0.5	
CM10ESH-10	4.00	131	33	26	34	16	31	109	1.1	
CM10ESH-13	6.70	164	44	33	43	19	39	134	2.2	
CM10ESH-16	10.00	183	50	40	50	25	45	155	3.5	
CM10ESH-1920	16.00	205	55	48	55	27	53	178	5.8	
CM10ESH-22	19.00	225	62	50	60	29	62	196	8.0	
CM10ESH-26	26.50	259	75	70	70	37	73	235	13.4	
CM10ESH-32	40.00	299	97	82	66	45	87	291	27.5	

Safety hook with eyelet CM10ESLH

Grade 10 according to EN 1677-3 with increased load capacity
Finish: orange powder coat

Large eyelet, therefore can also be used for ropes and lifting straps. Closes and locks automatically.



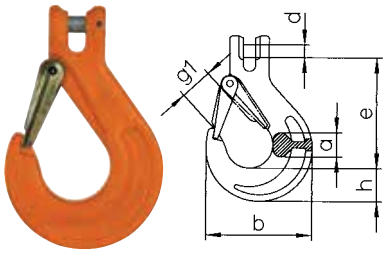
Type	Load capacity	e	h	a	b	D1	d2	g	s max.	Weight	Price per item
	t	mm	mm	mm	mm	mm	mm	mm	mm	kg/pc.	EUR
CM10ESLH-05	1.40	110	20	17	71	21	11	28	1.0	0.5	
CM10ESLH-07	2.50	136	26	20	88	25	12	34	1.0	0.9	
CM10ESLH-10	4.00	169	30	29	107	35	15	45	1.0	1.5	
CM10ESLH-13	6.70	205	40	35	138	40	20	52	1.5	2.7	
CM10ESLH-16	10.00	251	50	41	168	50	27	60	2.0	5.7	
CM10ESLH-19	16.00	290	62	50	194	60	30	70	2.0	9.8	
CM10ESLH-22	19.00	322	65	52	211	70	32	81	2.0	12.4	

Chain slings

Chain sling grade 10

Coupling hook CM10CSH

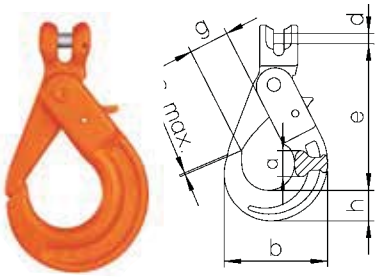
Grade 10 according to EN 1677-2 with increased load capacity
Finish: orange powder coat
Can be used without connecting link.
With forged safety latch.



Type	Load capacity	e	h	a	D	g1	b	Weight	Price per item
	t	mm	mm	mm	mm	mm	mm	kg/pc.	EUR
CM10CSH-0506	1.40	69	20	15	7.0	19	66	0.20	
CM10CSH-07	1.90	95	28	19	9.0	26	90	0.60	
CM10CSH-08	2.50	95	28	19	10.0	26	90	0.60	
CM10CSH-10	4.00	109	35	25	12.5	31	108	1.10	
CM10CSH-13	6.70	136	41	34	16.0	39	131	2.00	
CM10CSH-16	10.00	155	49	37	20.0	45	153	3.48	
CM10CSH-1920	16.00	184	53	51	24.0	53	177	5.00	
CM10CSH-22	19.00	214	62	52	27.0	62	196	9.00	

Coupling safety load hook CM10CSLH

Grade 10 according to EN 1677-3 with increased load capacity
Finish: orange powder coat. Can be used without connecting link. Closes and locks automatically.



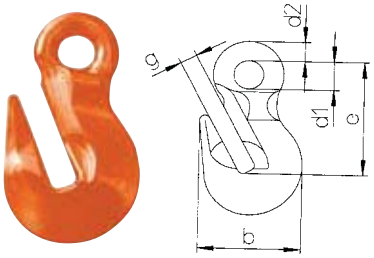
Type	Load capacity	e	h	a	b	D	g	s max.	Weight	Price per item
	t	mm	mm	mm	mm	mm	mm	mm	kg/pc.	EUR
CM10CSLH-05	1.40	94	20	17	71	7.0	28	1.0	0.5	
CM10CSLH-07	1.90	123	26	20	88	9.0	34	1.0	0.9	
CM10CSLH-08	2.50	123	26	20	88	10.0	34	1.0	0.9	
CM10CSLH-10	4.00	144	30	29	107	12.5	45	1.0	1.6	
CM10CSLH-13	6.70	180	40	35	138	16.0	52	1.5	2.9	
CM10CSLH-16	10.00	218	50	41	168	20.0	60	2.0	5.8	
CM10CSLH-19	16.00	259	62	50	194	24.0	70	2.0	9.90	
CM10CSLH-22	19.00	286	65	52	211	27.0	81	2.0	12.80	
CM10CSLH-26	26.50	338	79	61	253	33.0	100	2.0	20.50	

Replacement coupling bolts available on request!

Parallel hook CM10EGH

Grade 10 according to EN 1677-1 with increased load capacity

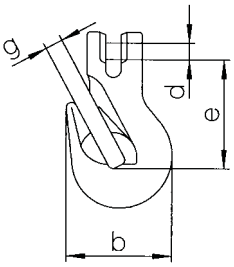
Finish: orange powder coat
For shortening loops that should not be tightened.



Type	Load capacity	e	b	D1	d2	g	Weight	Price per item
	t	mm	mm	mm	mm	mm	kg/pc.	EUR
CM10EGH-0506	1.40	51	48	12	9	8	0.18	
CM10EGH-0708	2.50	71	58	20	12	11	0.40	
CM10EGH-10	4.00	88	76	22	15	13	0.90	
CM10EGH-13	6.70	98	98	24	17	16	1.60	
CM10EGH-16	10.00	129	118	32	23	19	3.60	
CM10EGH-1920	16.00	151	150	36	27	25	6.15	
CM10EGH-22	19.00	170	165	42	31	27	8.30	
CM10EGH-26	26.50	201	195	50	37	32	13.8	
CM10EGH-32	40.00	243	242	60	43	38	25.0	

Coupling parallel hook CM10CGH

Grade 10 according to EN 1677-1 with increased load capacity
Finish: orange powder coat. Can be used without connecting link. For shortening loops which should not tighten.

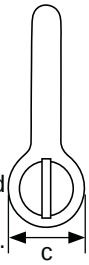


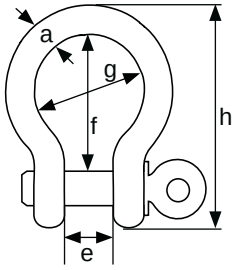
Type	Load capacity	e	b	D	g	Weight	Price per item
	t	mm	mm	mm	mm	kg/pc.	EUR
CM10CGH-0506	1.40	45	47	7.0	8	0.19	
CM10CGH-07	1.90	61	58	9.0	11	0.38	
CM10CGH-8	2.50	61	58	10.0	11	0.38	
CM10CGH-10	4.00	76	76	12.5	13	0.85	
CM10CGH-13	6.70	104	101	16.0	17	1.90	
CM10CGH- 16	10.00	116	120	20.0	20	3.60	
CM10CGH-1920	16.00	141	150	24.0	25	6.15	
CM10CGH-22	19.00	158	165	27.0	27	9.00	

Standard shackle -curved ASSP/ASBN

Finish: galvanised

Material: bracket and bolts made from hardened and tempered steel.
Safety factor: 5 times WLL = minimum breakage load.
Temperature range : -20 °C to +200 °C





ASSP-RR/EN

ASBN-RR/EN

Load capacity	Suitable for GK10 chain[1]	Dimensions							Weight		Price per item			
									ASSP	ASBN	ASSP		ASBN	
		c	h	e	a	g	b	f	Eye bolts	Nut + splint	RR	EN	RR	EN
t	mm	mm	mm	mm	mm	mm	mm	mm	kg	kg	EUR	EUR	EUR	EUR
0.50		16.5	48.5	12.0	7.0	20.0	8.0	29.0	0.05	0.06				
0.75		20.0	56.0	13.5	9.0	22.0	10.0	32.0	0.10	0.11				
1.00	05	22.5	63.5	17.0	10.0	26.0	11.0	36.5	0.14	0.16				
1.50	06	26.5	74.0	19.0	11.0	29.0	13.0	43.0	0.19	0.22				
2.00	07	34.0	89.0	22.0	13.5	32.0	16.0	51.0	0.36	0.42				
3.25	08	40.0	110.0	27.0	16.0	43.0	19.0	64.0	0.63	0.74				
4.75	10	46.0	129.0	31.0	19.0	51.0	22.0	76.0	1.01	1.18				
6.50		52.0	144.0	36.0	22.0	58.0	25.0	83.0	1.50	1.77				
8.50	13	59.0	164.0	43.0	25.0	68.0	28.0	95.0	2.21	2.58				
9.50		66.0	185.0	47.0	28.0	75.0	32.0	108.0	3.16	3.66				
12.00	16	72.0	201.0	51.0	32.0	83.0	35.0	115.0	4.31	4.91				
13.50		80.0	227.0	57.0	35.0	92.0	38.0	133.0	5.55	6.54				
17.00	19	88.0	249.0	60.0	38.0	99.0	42.0	146.0	7.43	8.19				
25.00	22	103.0	300.0	74.0	45.0	126.0	50.0	178.0	12.84	14.22				
35.00	26	111.0	331.0	83.0	50.0	138.0	57.0	197.0	18.15	19.85				
55.00	32	145.0	433.0	105.0	65.0	180.0	70.0	260.0	37.60	39.59				
85.00		162.0	527.0	127.0	75.0	190.0	83.0	329.0	-	62.00				

1 according to EN 818 only types ASSP-EN and ASBN-EN are built into chain slings.

Shackle type ASSP-RR+ASBN-RR manufactured according to U.S. Federal Specification RR-C-271, CE-tested
Shackle type ASSP-EN+ASBN-EN manufactured according to EN 13889, CE-tested, suitable in accordance with EN for installation in slings

Rope slings

User instructions

The following instructions only provide a general overview of the use of rope slings and do not replace the equipment manufacturers' operating instructions. Please also read our general user instructions for load carrying equipment and slings.

Lifting with slings should only be carried out by a trained and authorised rigger. Slings with broken, damaged or deformed links or accessories, or where an overload or other damaging occurrence is known, must be taken out of service and only be reused after inspection and required repairs have been carried out.

Delivery condition

The sling's shape and finish may not be changed by bending, welding, grinding, disassembly, drilling holes, removal of safety sections such as locks, bolts and safety pins without the manufacturer's permission. This will invalidate the manufacturer's warranty and liability.

Use limitations

Temperature
Rope slings are only suitable for use in the following temperature ranges:

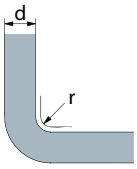
If they are used within permissible temperature ranges there is no lasting reduction in capacity once the rope has returned to normal temperature. Operating the rope above the maximum permissible temperature is not allowed and if this occurs it must be taken out of operation.

Rope end connection	Core	Permissible temperature	Load capacity
		°C	%
Aluminium wire rope clamp	Fibre	-40° to +100°	100
	Steel	-40° to +150°	100
Splice	Fibre	-40° to +100°	100
	Steel	-40° to +150°	100
	Steel	+150° to +200°	90
	Steel	+200° to +300°	75
	Steel	+300° to +400°	65

For use below -40C, contact the manufacturer.

Edge loading

Rope slings must not be placed under tension or pulled across sharp edges without protection. There are suitable edge protectors and protective hoses in the accessories section. A sharp edge is defined as one where the edge radius r is smaller than rope diameter d.



Chemicals

Rope slings are not designed for use in acids, strong alkalines or their gases. Please consult us before use in such environments and if they have been exposed to such chemicals they should be taken out of use and assessed by us. Aluminium clamps also only have limited chemical resistance.

Use in dangerous conditions

Use in extreme conditions such as galvanising plants, acid baths and ovens, or in the transport of dangerous goods such as molten metals, caustic substances or radioactive/nuclear materials is not permitted without clearance, approval and guidance from a trained inspector.
Lifting ropes for access xxxxx must comply with EN 14502-1 (suspended access equipment).

Usage instructions

Checking before first use
Before using a rope sling after delivery the following should be checked:

- The rope sling must match the order
- It must include the manufacturer's certificate
- The manufacturer's mark and load capacity on the sling must match the manufacturer's certificate

Check before starting work
Only use undamaged rope slings with legible load capacity information.
Before use check the rope for obvious defects such as kinks, corrosion, clamp damage etc:

- Check the rope sling for obvious defects (kinks, strong corrosion, damaged wire rope clamp, etc.)

Rope slings

User instructions

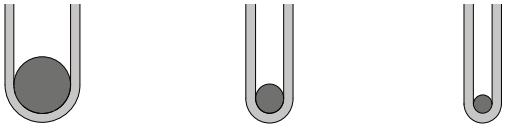
- Check the rope sling's load tag and the weight to be lifted
- Check if the sling type, rope sling, length and methods of attachment are suitable
- Check that the load can be moved freely and lifted safely
- Always wear gloves when working with rope slings

The load capacities specified assume impact-free loading. Slight impacts such as those caused by lifting, lowering or moving the load on the crane are allowed. Strong impact such as striking the load during transport or swinging the load are not permitted.

If rope slings with tight radii are bent, the load capacities should be reduced according to the table below to ensure optimum safety and service life, and to avoid lasting deformation or damage.

Rope slings		Cable-laid rope	
Load diameter	**% of the load capacity**	**Load diameter**	**% of the load capacity**
>6 x d	100	>4 x d	100
>3 x d	75	>1 x d	75
>2 x d	65		

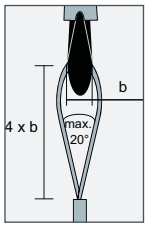
(d= rope diameter)



>6 x d 100% **>3 x d 75%** **>2 x d 65%**

For single stranded or endless rope slings, the sling point should be located vertically above the centre of gravity. For multi-strand rope slings, the sling point should be on one level and around the centre of gravity. Make sure the correct sling type and rope sling are selected.

The opening angle of the rope loop may not exceed 20° otherwise the wire rope clamp will be damaged. If loops are to be suspended from a crane hook with inserted thimbles they must have enough space to move freely.



- Components such as lifting rings, load hooks and shackles must be able to move freely. Lifting rings must have enough space in the crane hook to move freely.
- If loads are slung more than once the rope swing windings must be laid close together and not cross.
- Rope slings may not be shortened by entwining the crane hook, knotted or lengthened by knotting together several slings.

- Wire rope clamps, splices and the red marked area of endless cable-laid ropes must not be allowed to bend. They should not lie on the load edges, in the crane hook area or in strappings. Otherwise the rope bundle of the cable-laid rope will be irreparably damaged (see image)!
- If a single rope sling is used (especially for spliced ropes) suitable measures are to be taken to counter the rope rotating under load – for example by attaching a load rope so the rigger can guide the load. Rope slings may not be tensioned by twisting, which risks damaging the load or rope bundle
- The load must not be set down directly onto the sling.

Rope sling storage

Rope slings should be stored in a dry, clean location, preferably hung up, away from harmful chemicals and not accidentally damaged. Storage temperatures must be within the permissible range (see permissible temperature ranges).

Rejection criteria

If during checking any one of the following criteria are met, the rope sling should be discarded:

- If the label is no longer in place or illegible.
- Cracks, deformation, wear or excessive corrosion are evident in lifting rings, links, load hooks or thimbles.
- Cracks and deformation or wear of more than 5% on wire rope clamps, loose or free splices.
- More than 10% wear of the rope's diameter.
- Braid breakage.
- Loosening of the outer layer of the free length.
- Core emerging.
- Burning of power lines, welds etc

m Kinks and bends.

m Compression of the free length.

m Excessive corrosion.

m Closely packed wire breaks such as three adjacent breaks in the outer braid wire; maximum permissible number of visible and random breaks in exterior wires (according to EN 13414-2):

Rope sling type	Length of 6 x d	Length of 30 x d
Steel wire rope	6	14
Cable-laid rope	15	40

d... Rope diameter

Maintenance, testing and repair of rope

slings

m Rope slings are to be kept is a safe operating condition through regular maintenance in line with the manufacturer's specifications and regulations.

m Regular inspection of slings according to section 8 (13) AMVO are to be carried out at least once a year by a qualified tester, or more frequently in heavy usage applications.

m After accidental damage or collision that could impact on safety such as a falling load, collision or exposure to excessive heat, all load-carrying devices must be inspected according to AMVO section 9 (1) for their condition.

m Ongoing records must be maintained on all inspection and maintenance work. Inspection means primarily visual and functional testing to assess the condition of components for damage, wear, corrosion or other faults, as well as the effectiveness of safety features.

m All inspections must be organised by a trained and approved operator.

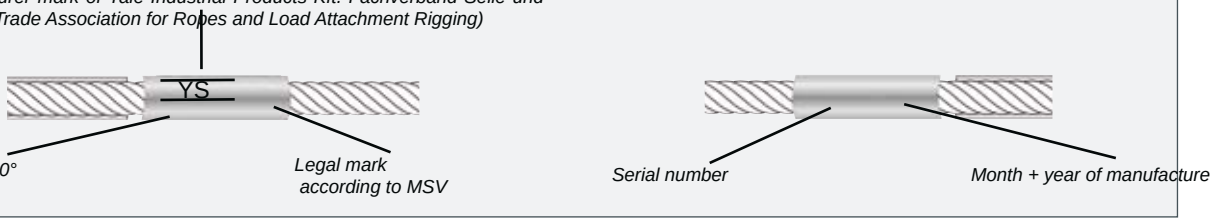
m Repairs and overhauls may only be carried out by the manufacturer or authorised personnel using original spare parts.

Labelling

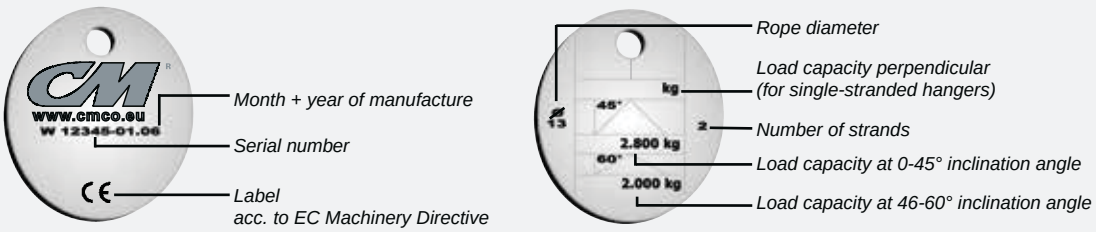
All wire rope and wire rope slings are shipped with a stamp or load capacity tag with a sequential test number, conformity and factory certification and user instructions.

Wire rope strops

Registered manufacturer mark of Yale Industrial Products Kft. Fachverband Seile und Anschlagmittel e.V. (Trade Association for Ropes and Load Attachment Rigging)

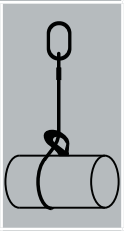
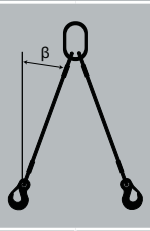
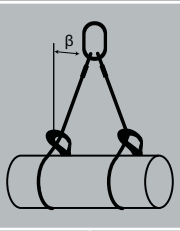
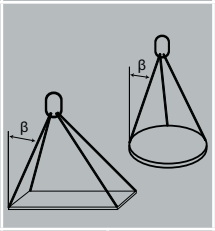


Wire rope slings



Load capacity table

Load capacity WLL in t for symmetrical loading according to EN 13414 (also see general advice for slings here.)

Safety factor		1 strand		2 strands				3 and 4 strands		Endless rope	
5											
Inclination angle		0°	0°	0 - 45°	46° - 60°	0 - 45°	46° - 60°	0 - 45°	46°- 60°	0°	0°
Load factor		1	0.8	1.4	1	1.12	0.8	2.1	1.5	2	1.6
Rope thickness (mm)	Core	Load capacity (t)									
8	IWRC	0.75	0.60	1.05	0.75	0.84	0.60	1.55	1.10	1.50	1.20
10	IWRC	1.15	0.92	1.60	1.15	1.28	0.92	2.40	1.70	2.30	1.85
12	IWRC	1.70	1.36	2.30	1.70	1.90	1.36	3.55	2.50	3.40	2.70
14	IWRC	2.25	1.80	3.15	2.25	2.52	1.80	4.80	3.40	4.50	3.60
16	IWRC	3.00	2.40	4.20	3.00	3.36	2.40	6.30	4.50	6.00	4.80
18	FC	3.40	2.72	4.80	3.40	3.80	2.72	7.20	5.20	6.80	5.65
20	FC	4.35	3.48	6.00	4.35	4.87	3.48	9.00	6.50	8.70	6.90
22	FC	5.20	4.16	7.20	5.20	5.82	4.16	11.00	7.80	10.40	8.40
24	FC	6.30	5.04	8.80	6.30	7.05	5.04	13.50	9.40	12.60	10.00
26	FC	7.20	5.76	10.00	7.20	8.06	5.76	15.00	11.00	14.40	11.80
30	IWRC	11.10	8.88	15.50	11.10	12.43	8.88	23.30	16.60	22.20	17.70
40	IWRC	18.50	14.80	26.00	18.50	20.72	14.80	39.00	28.00	37.00	30.00

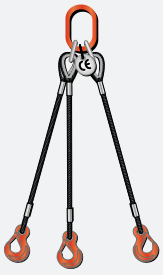
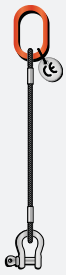
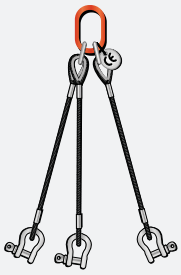
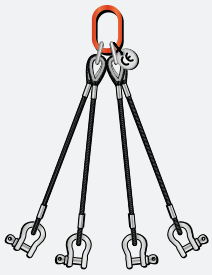
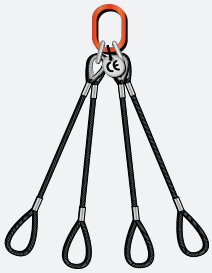
Reduction factors

If the chains are subject to load obstacles (e.g. temperature too high, edge loading ...), the maximum loading capacities in the loading table are to be reduced. The load factors below are to be used for this. Please also note the details in the user information.

Rope end connection	Core	Permissible temperature	Load factor
		°C	
Aluminium wire rope clamp	Fibre	-40° to +100°	1
	Steel	-40° to +150°	1
Splice	Fibre	-40° to +100°	1
	Steel	-40° to +150°	1
	Steel	+150° to +200°	0.9
	Steel	+200° to +300°	0.75
	Steel	+300° to +400°	0.65

Rope slings		Cable-laid rope	
Load diameter	Load factor	Load diameter	Load factor
>6 x d	1	>4 x d	1
>3 x d	0.75	>1 x d	0.75
>2 x d	0.65		

Most commonly used wire rope slings

1 strand	2 strands	3 strands	4 strands
			
CM08-1-**-****-ML-CSH			CM08CSH
			
CM08-1-**-****-ML-ASSP/BN			
			
CM08-1-**-****-ML-CSH-CGH			

Designation

WRFC-2-08-300-ML-CSH

Length in cm

Rope diameter in mm:
08...8 mm
10...10 mm
...

Number of strands:
1...1 strand
2...2 strands
3...3 strands
4...4 strands

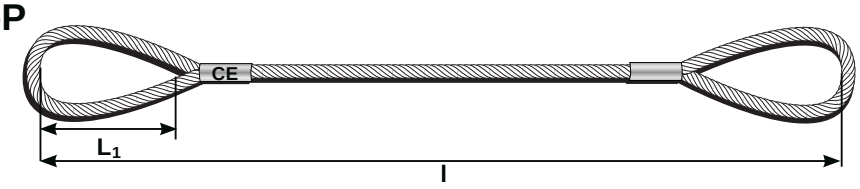
Rope core:
FC..
SC..

End fitting
ESH
ESLH
SEH
CSH
P (special loop length in mm)
K
ASSP/BN

Lifting ring
ML...1/2-strand
SA...3/4-strand
P0250
K

Wire rope strop WR*-1-**-***-P-P

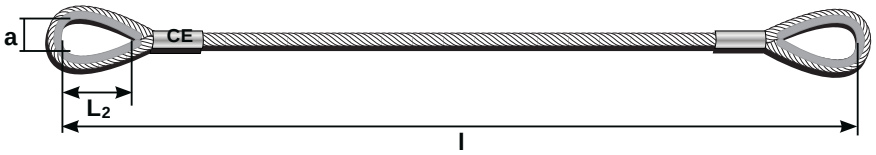
with loops pressed in on both sides
galvanised finish



Type	Rope diameter	Load capacity 0°	Loop length L_1 Standard	L_1 min. [1]	shortest poss. Length L	L min. [2]	Price for L = 2 m	3 m	4 m	each additional m
	mm	t	mm	mm	m	m	EUR			
WRSC-1-08-***-P-P	8	0.75	200	120	0.64	0.48				
WRSC-1-10-***-P-P	10	1.15	250	150	0.80	0.60				
WRSC-1-12-***-P-P	12	1.70	250	180	0.86	0.72				
WRSC-1-14-***-P-P	14	2.25	250	210	0.92	0.84				
WRSC-1-16-***-P-P	16	3.00	250	240	0.98	0.96				
WRFC-1-18-***-P-P	18	3.40	300	270	1.12	1.06				
WRFC-1-20-***-P-P	20	4.35	300	300	1.18	1.18				
WRFC-1-22-***-P-P	22	5.20	330	330	1.30	1.30				
WRFC-1-24-***-P-P	24	6.30	360	360	1.42	1.42				
WRFC-1-26-***-P-P	26	7.20	390	390	1.53	1.53				
WRSC-1-30-***-P-P	30	11.10	465	465	1.84	1.84				
WRSC-1-40-***-P-P	40	18.50	600	600	2.40	2.40	Price on request			

Wire rope strop WR*-1-**-***-K-K

with thimbles pressed in on both sides
galvanised finish

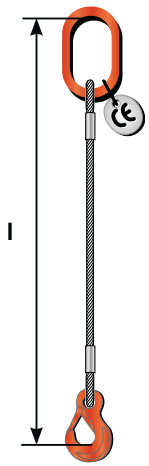


Type	Rope diameter	Load capacity 0°	Thimble width a	Thimble length L_2	shortest poss. Length L	Price for L = 2 m	3 m	4 m	each additional m
	mm	t	mm	mm	m	EUR			
WRSC-1-08-***-K-K	8	0.75	24	38	0.34				
WRSC-1-10-***-K-K	10	1.15	28	45	0.41				
WRSC-1-12-***-K-K	12	1.70	32	51	0.49				
WRSC-1-14-***-K-K	14	2.25	36	58	0.58				
WRSC-1-16-***-K-K	16	3.00	40	64	0.65				
WRFC-1-18-***-K-K	18	3.40	45	72	0.72				
WRFC-1-20-***-K-K	20	4.35	50	80	0.80				
WRFC-1-22-***-K-K	22	5.20	56	90	0.88				
WRFC-1-24-***-K-K	24	6.30	62	99	0.96				
WRFC-1-26-***-K-K	26	7.20	70	112	1.06				
WRSC-1-30-***-K-K	30	11.10	80	128	1.26				
WRSC-1-40-***-K-K	40	18.50	120	192	1.74	Price on request			

1...smallest possible loop according to EN 13411-3
2...shortest possible length with loop according to EN 13411-3
**Rope core Ø*
***** Length in mm*

Wire rope sling WR*-1-**-***-ML-ESH

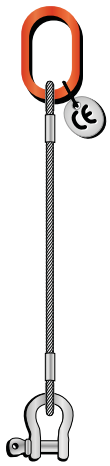
Galvanised finish



Type	Rope diameter	Load capacity 0°	Price for L =			each additional m
			2 m	3 m	4 m	
	mm	t	EUR			
WRSC-1-08-***-ML-ESH	8	0.75				
WRSC-1-10-***-ML-ESH	10	1.15				
WRSC-1-12-***-ML-ESH	12	1.70				
WRSC-1-14-***-ML-ESH	14	2.25				
WRSC-1-16-***-ML-ESH	16	3.00				
WRFC-1-18-***-ML-ESH	18	3.40				
WRFC-1-20-***-ML-ESH	20	4.35				
WRFC-1-22-***-ML-ESH	22	5.20				
WRFC-1-24-***-ML-ESH	24	6.30				
WRFC-1-26-***-ML-ESH	26	7.20				
WRSC-1-30-***-ML-ESH	30	11.10				
WRSC-1-40-***-ML-ESH	40	18.50		Price on request		

Wire rope sling WR*-1-**-***-ML-ASSP

Galvanised finish



Type	Rope diameter	Load capacity 0°	Price for L =			each additional m
			2 m	3 m	4 m	
	mm	t	EUR			
WRSC-1-08-***-ML-ASSP	8	0.75				
WRSC-1-10-***-ML-ASSP	10	1.15				
WRSC-1-12-***-ML-ASSP	12	1.70				
WRSC-1-14-***-ML-ASSP	14	2.25				
WRSC-1-16-***-ML-ASSP	16	3.00				
WRFC-1-18-***-ML-ASSP	18	3.40				
WRFC-1-20-***-ML-ASSP	20	4.35				
WRFC-1-22-***-ML-ASSP	22	5.20				
WRFC-1-24-***-ML-ASSP	24	6.30				
WRFC-1-26-***-ML-ASSP	26	7.20				
WRSC-1-30-***-ML-ASSP	30	11.10				
WRSC-1-40-***-ML-ASSP	40	18.50		Price on request		

**Rope core*
*** Diameter*
***** Length in mm*

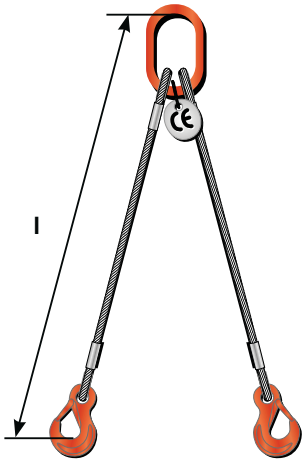
Wire rope sling WR*-1-**-***-ML-P

Galvanised finish

Type	Rope diameter	Load capacity 0°	Price for L =			each additional m
			2 m	3 m	4 m	
	mm	t	EUR			
WRSC-1-08-***-ML-P	8	0.75				
WRSC-1-10-***-ML-P	10	1.15				
WRSC-1-12-***-ML-P	12	1.70				
WRSC-1-14-***-ML-P	14	2.25				
WRSC-1-16-***-ML-P	16	3.00				
WRFC-1-18-***-ML-P	18	3.40				
WRFC-1-20-***-ML-P	20	4.35				
WRFC-1-22-***-ML-P	22	5.20				
WRFC-1-24-***-ML-P	24	6.30				
WRFC-1-26-***-ML-P	26	7.20				
WRSC-1-30-***-ML-P	30	11.10				
WRSC-1-40-***-ML-P	40	18.50	Price on request			

Wire rope sling WR*-2-**-***-ML-ESH

Galvanised finish

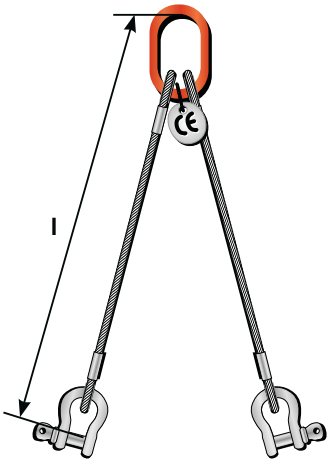


Type	Rope diameter	Load capacity		Price for L =			each additional m
		0° - 45°	46° - 60°	2 m	3 m	4 m	
	mm	t	t	EUR			
WRSC-2-08-***-ML-ESH	8	1.05	0.75				
WRSC-2-10-***-ML-ESH	10	1.60	1.15				
WRSC-2-12-***-ML-ESH	12	2.30	1.70				
WRSC-2-14-***-ML-ESH	14	3.15	2.25				
WRSC-2-16-***-ML-ESH	16	4.20	3.00				
WRFC-2-18-***-ML-ESH	18	4.80	3.40				
WRFC-2-20-***-ML-ESH	20	6.00	4.35				
WRFC-2-22-***-ML-ESH	22	7.20	5.20				
WRFC-2-24-***-ML-ESH	24	8.80	6.30				
WRFC-2-26-***-ML-ESH	26	10.00	7.20				
WRSC-2-30-***-ML-ESH	30	15.50	11.10				
WRSC-2-40-***-ML-ESH	40	26.00	18.50	Price on request			

**Rope core*
*** Diameter*
***** Length in mm*

Wire rope sling WR*-2-**-***-ML-ASSP

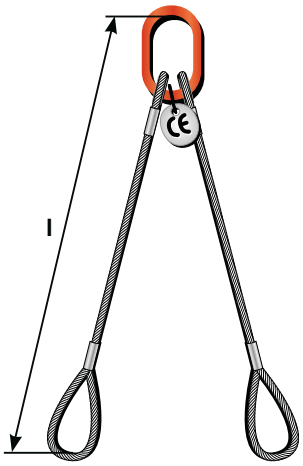
Galvanised finish



Type	Rope diameter	Load capacity		Price for L =			each additional m
		0° - 45°	46° - 60°	2 m	3 m	4 m	
	mm	t	t	EUR			
WRSC-1-08-***-ML-ASSP	8	1.05	0.75				
WRSC-1-10-***-ML-ASSP	10	1.60	1.15				
WRSC-1-12-***-ML-ASSP	12	2.30	1.70				
WRSC-1-14-***-ML-ASSP	14	3.15	2.25				
WRSC-1-16-***-ML-ASSP	16	4.20	3.00				
WRFC-1-18-***-ML-ASSP	18	4.80	3.40				
WRFC-1-20-***-ML-ASSP	20	6.00	4.35				
WRFC-1-22-***-ML-ASSP	22	7.20	5.20				
WRFC-1-24-***-ML-ASSP	24	8.80	6.30				
WRFC-1-26-***-ML-ASSP	26	10.00	7.20				
WRSC-1-30-***-ML-ASSP	30	15.50	11.10				
WRSC-1-40-***-ML-ASSP	40	26.00	18.50	Price on request			

Wire rope sling WR*-2-**-***-ML-P

Galvanised finish

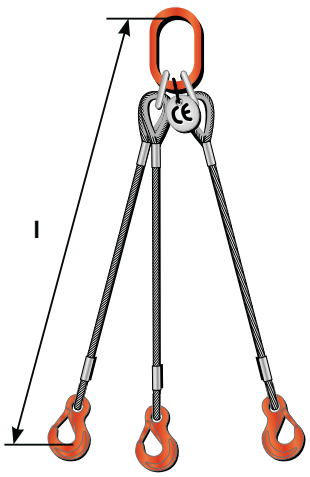


Type	Rope diameter	Load capacity		Price for L =			each additional m
		0° - 45°	46° - 60°	2 m	3 m	4 m	
	mm	t	t	EUR			
WRSC-2-08-***-ML-P	8	1.05	0.75				
WRSC-2-10-***-ML-P	10	1.60	1.15				
WRSC-2-12-***-ML-P	12	2.30	1.70				
WRSC-2-14-***-ML-P	14	3.15	2.25				
WRSC-2-16-***-ML-P	16	4.20	3.00				
WRFC-2-18-***-ML-P	18	4.80	3.40				
WRFC-2-20-***-ML-P	20	6.00	4.35				
WRFC-2-22-***-ML-P	22	7.20	5.20				
WRFC-2-24-***-ML-P	24	8.80	6.30				
WRFC-2-26-***-ML-P	26	10.00	7.20				
WRSC-2-30-***-ML-P	30	15.50	11.10				
WRSC-2-40-***-ML-P	40	26.00	18.50	Price on request			

**Rope core*
*** Diameter*
***** Length in mm*

Wire rope sling WR*-3-**-***-ML-ESH

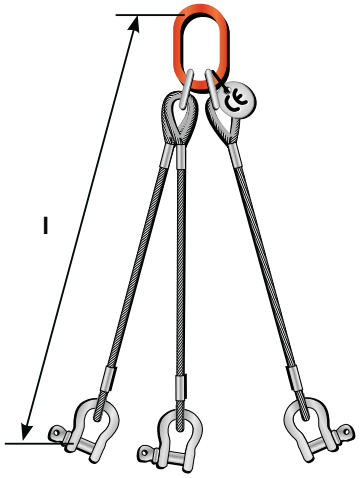
Galvanised finish



Type	Rope diameter	Load capacity		Price for L =			each additional m
		0° - 45°	46° - 60°	2 m	3 m	4 m	
	mm	t	t	EUR			
WRSC-3-08-***-ML-ESH	8	1.55	1.10				
WRSC-3-10-***-ML-ESH	10	2.40	1.70				
WRSC-3-12-***-ML-ESH	12	3.55	2.50				
WRSC-3-14-***-ML-ESH	14	4.80	3.40				
WRSC-3-16-***-ML-ESH	16	6.30	4.50				
WRFC-3-18-***-ML-ESH	18	7.20	5.20				
WRFC-3-20-***-ML-ESH	20	9.00	6.50				
WRFC-3-22-***-ML-ESH	22	11.00	7.80				
WRFC-3-24-***-ML-ESH	24	13.50	9.40				
WRFC-3-26-***-ML-ESH	26	15.00	11.00				
WRSC-3-30-***-ML-ESH	30	23.30	16.60				
WRSC-3-40-***-ML-ESH	40	39.00	28.00	Price on request			

Wire rope slings WR*-3-**-***-ML-ASSP

Galvanised finish

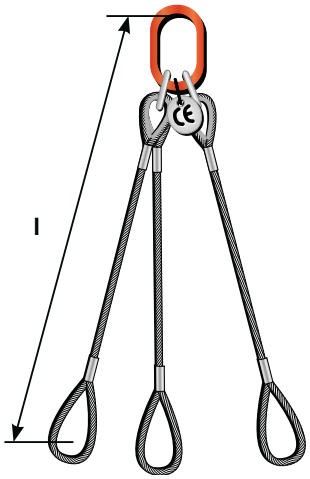


Type	Rope diameter	Load capacity		Price for L =			each additional m
		0° - 45°	46° - 60°	2 m	3 m	4 m	
	mm	t	t	EUR			
WRSC-3-08-***-ML-ASSP	8	1.55	1.10				
WRSC-3-10-***-ML-ASSP	10	2.40	1.70				
WRSC-3-12-***-ML-ASSP	12	3.55	2.50				
WRSC-3-14-***-ML-ASSP	14	4.80	3.40				
WRSC-3-16-***-ML-ASSP	16	6.30	4.50				
WRFC-3-18-***-ML-ASSP	18	7.20	5.20				
WRFC-3-20-***-ML-ASSP	20	9.00	6.50				
WRFC-3-22-***-ML-ASSP	22	11.00	7.80				
WRFC-3-24-***-ML-ASSP	24	13.50	9.40				
WRFC-3-26-***-ML-ASSP	26	15.00	11.00				
WRSC-3-30-***-ML-ASSP	30	23.30	16.60				
WRSC-3-40-***-ML-ASSP	40	39.00	28.00	Price on request			

**Rope core*
*** Diameter*
***** Length in mm*

Wire rope slings WR*-3-**-***-ML-P

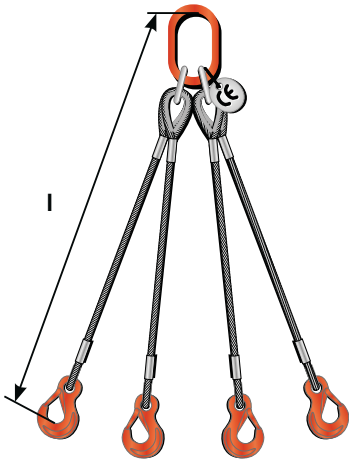
Galvanised finish



Type	Rope diameter	Load capacity		Price for L =			each additional m
		0° - 45°	46° - 60°	2 m	3 m	4 m	
	mm	t	t	EUR			
WRSC-3-08-***-ML-P	8	1.55	1.10				
WRSC-3-10-***-ML-P	10	2.40	1.70				
WRSC-3-12-***-ML-P	12	3.55	2.50				
WRSC-3-14-***-ML-P	14	4.80	3.40				
WRSC-3-16-***-ML-P	16	6.30	4.50				
WRFC-3-18-***-ML-P	18	7.20	5.20				
WRFC-3-20-***-ML-P	20	9.00	6.50				
WRFC-3-22-***-ML-P	22	11.00	7.80				
WRFC-3-24-***-ML-P	24	13.50	9.40				
WRFC-3-26-***-ML-P	26	15.00	11.00				
WRSC-3-30-***-ML-P	30	23.30	16.60				
WRSC-3-40-***-ML-P	40	39.00	28.00	Price on request			

Wire rope sling WR*-4-**-***-ML-ESH

Galvanised finish

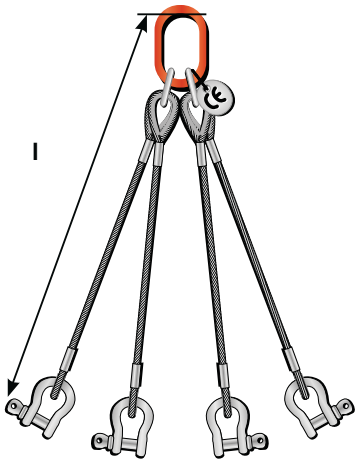


Type	Rope diameter	Load capacity		Price for L =			each additional m
		0° - 45°	46° - 60°	2 m	3 m	4 m	
	mm	t	t	EUR			
WRSC-4-08-***-ML-ESH	8	1.55	1.10				
WRSC-4-10-***-ML-ESH	10	2.40	1.70				
WRSC-4-12-***-ML-ESH	12	3.55	2.50				
WRSC-4-14-***-ML-ESH	14	4.80	3.40				
WRSC-4-16-***-ML-ESH	16	6.30	4.50				
WRFC-4-18-***-ML-ESH	18	7.20	5.20				
WRFC-4-20-***-ML-ESH	20	9.00	6.50				
WRFC-4-22-***-ML-ESH	22	11.00	7.80				
WRFC-4-24-***-ML-ESH	24	13.50	9.40				
WRFC-4-26-***-ML-ESH	26	15.00	11.00				
WRSC-4-30-***-ML-ESH	30	23.30	16.60				
WRSC-4-40-***-ML-ESH	40	39.00	28.00	Price on request			

**Rope core*
*** Diameter*
***** Length in mm*

Wire rope slings WR*-3-**-***-ML-ASSP

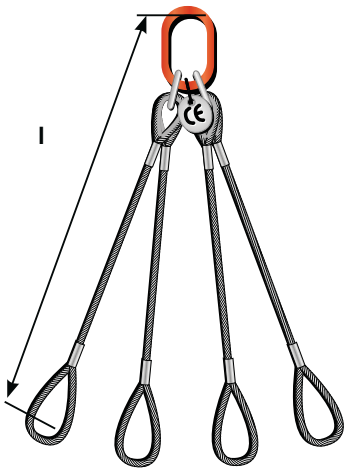
Galvanised finish



Type	Rope diameter	Load capacity		Price for L =			each additional m
		0° - 45°	46° - 60°	2 m	3 m	4 m	
	mm	t	t	EUR			
WRSC-4-08-***-ML-ASSP	8	1.55	1.10				
WRSC-4-10-***-ML-ASSP	10	2.40	1.70				
WRSC-4-12-***-ML-ASSP	12	3.55	2.50				
WRSC-4-14-***-ML-ASSP	14	4.80	3.40				
WRSC-4-16-***-ML-ASSP	16	6.30	4.50				
WRFC-4-18-***-ML-ASSP	18	7.20	5.20				
WRFC-4-20-***-ML-ASSP	20	9.00	6.50				
WRFC-4-22-***-ML-ASSP	22	11.00	7.80				
WRFC-4-24-***-ML-ASSP	24	13.50	9.40				
WRFC-4-26-***-ML-ASSP	26	15.00	11.00				
WRSC-4-30-***-ML-ASSP	30	23.30	16.60				
WRSC-4-40-***-ML-ASSP	40	39.00	28.00	Price on request			

Wire rope slings WR*-3-**-***-ML-P

Galvanised finish



Type	Rope diameter	Load capacity		Price for L =			each additional m
		0° - 45°	46° - 60°	2 m	3 m	4 m	
	mm	t	t	EUR			
WRSC-4-08-***-ML-P	8	1.55	1.10				
WRSC-4-10-***-ML-P	10	2.40	1.70				
WRSC-4-12-***-ML-P	12	3.55	2.50				
WRSC-4-14-***-ML-P	14	4.80	3.40				
WRSC-4-16-***-ML-P	16	6.30	4.50				
WRFC-4-18-***-ML-P	18	7.20	5.20				
WRFC-4-20-***-ML-P	20	9.00	6.50				
WRFC-4-22-***-ML-P	22	11.00	7.80				
WRFC-4-24-***-ML-P	24	13.50	9.40				
WRFC-4-26-***-ML-P	26	15.00	11.00				
WRSC-4-30-***-ML-P	30	23.30	16.60				
WRSC-4-40-***-ML-P	40	39.00	28.00	Price on request			

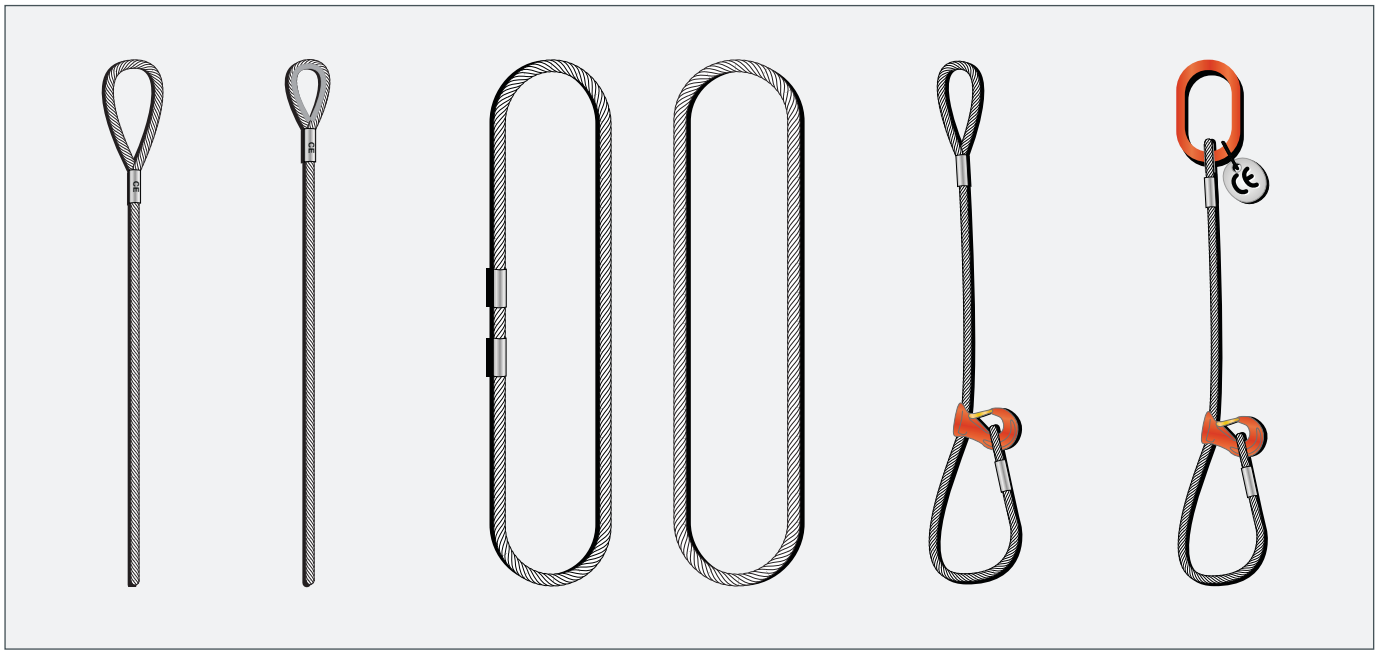
**Rope core*
*** Diameter*
***** Length in mm*

Standard program rope slings

Rope diameter	Construction according to EN 12385-4	New designation	Old designation		Strength	Surface	Minimum breaking force	Price per m
		Core	according to DIN	Core				
					N/mm²		daN	EUR
WRSC-08	6 x 19S	IWRC	3058	SE	1,770	VZ	4,030	
WRSC-10	6 X 36S	IWRC	3064	SE	1,770	VZ	6,300	
WRSC-12	6 X 36S	IWRC	3064	SE	1,770	VZ	9,070	
WRSC-14	6 X 36S	IWRC	3064	SE	1,770	VZ	12,400	
WRSC-16	6 X 36S	IWRC	3064	SE	1,770	VZ	16,100	
WRFC-18	6 X 36S	FC	3064	FE	1,770	VZ	18,900	
WRFC-20	6 X 36S	FC	3064	FE	1,770	VZ	23,400	
WRFC-22	6 X 36S	FC	3064	FE	1,770	VZ	28,300	
WRFC-24	6 X 36S	FC	3064	FE	1,770	VZ	33,600	
WRFC-26	6 X 36S	FC	3064	FE	1,770	VZ	39,500	
WRSC-30	6 X 36S	IWRC	3064	SE	1,960	VZ	62,800	
WRSC-40	6 X 36S	IWRC	3064	SE	1,770	VZ	101,000	**on request**

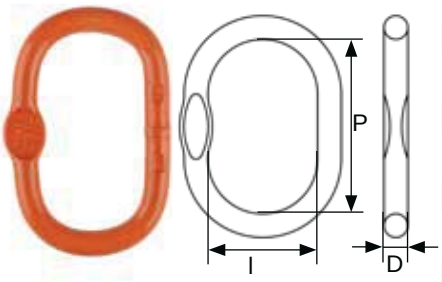
FC = Fibre core SC = Steel core

Other designs on request



Lifting ring CM08ML

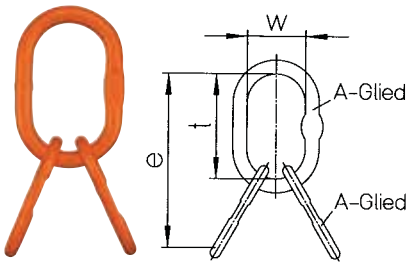
Grade 8 according to EN 1677-4
Suspension link for 1+2 wire rope slings. Can also be used as end link.



Type	Load capacity	D	P	l	Lifting ring for rope diameter		Weight	Price per item
					1 strand	2 strands		
	t	mm	mm	mm	mm	mm	kg/pc.	EUR
CM08ML-D13	1.60	13	110	60	6/7	6	0.34	
CM08ML-D16	2.12	16	110	60	8	7	0.54	
CM08ML-D18	3.15	18	135	75	10	8	0.82	
CM08ML-D22	5.30	22	160	90	13	10	1.50	
CM08ML-D26	8.00	26	180	100	16	13	2.32	
CM08ML-D32	11.20	32	200	110	18	16	3.95	
CM08ML-D36	14.00	36	260	140	20	18	6.34	
CM08ML-D40	17.00	40	300	160	22	20	8.96	
CM08ML-D45	21.20	45	340	180	26	22	12.80	
CM08ML-D50	31.50	50	350	190	32	26	16.55	

Over-size suspension link OSA

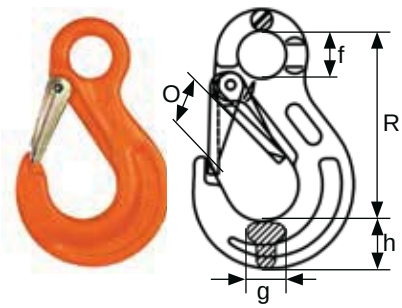
For 3 and 4-strand wire rope slings



Type	Load capacity 0° - 45°	e	t	w	Weight	Suspension link for rope diameter	Price per item
						3+4 strands	
	t	mm	mm	mm	kg/pc.	mm	EUR
CM10OSA-0607	5.00	245	135	75	1.72	8 - 14	
CM10OSA-8	6.30	270	160	90	2.66	16	
CM10OSA-10	9.50	315	180	100	4.30	18 - 20	
CM10OSA-13	16.10	380	200	110	9.06	22 - 26	
CM10OSA-16	25.10	460	260	140	14.50	30	
CM10OSA-19/20	41.10	625	350	190	31.51	40	

Eyehooks CM08ESH

Grade 8 according to EN 1677-2
With forged safety latch.

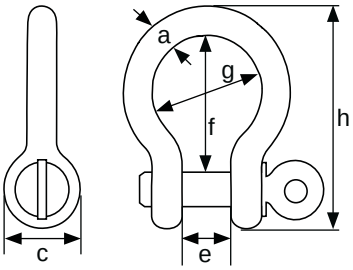


Type	Load capacity	g	h	O	R	f	Weight	Price per item
	t	mm	mm	mm	mm	mm	kg/pc.	EUR
CM08ESH-06	1.12	16.5	20	18.5	84.5	20.5	0.30	
CM08ESH-08	2.00	19.0	27	22.0	106.0	25.0	0.55	
CM08ESH-10	3.15	26.0	33	28.0	131.0	34.0	1.05	
CM08ESH-13	5.30	33.0	40	35.0	164.0	42.5	1.75	
CM08ESH-16	8.00	40.0	48	43.0	182.0	52.0	3.20	
CM08ESH-20	12.50	48.0	56	51.5	205.0	62.0	5.30	
CM08ESH-22	15.00	44.0	75.5	71	241.0	62	9.20	
CM08ESH-26	21.20	60.0	80.5	81	279.0	64	13.00	
CM08ESH-32	31.50	66.0	88.0	102	355.0	88	17.00	

Standard shackle -curved
ASSP/ASBN

Finish: galvanised

Material: bracket and bolts made from hardened and tempered steel.
Safety factor: 5 times WLL = minimum breakage load.
Temperature range : -20 °C to +200 °C



ASSP-RR/EN

ASBN-RR/EN

Load capacity	suitable for rope	Dimensions							Weight		Price per item			
									ASSP	ASBN	ASSP		ASBN	
		c	h	e	a	g	b	f	Eye bolts	Nut + splint	RR	EN	RR	EN
t	mm	mm	mm	mm	mm	mm	mm	mm	kg	kg	EUR	EUR	EUR	EUR
0.50		16.5	48.5	12.0	7.0	20.0	8.0	29.0	0.05	0.06				
0.75		20.0	56.0	13.5	9.0	22.0	10.0	32.0	0.10	0.11				
1.00		22.5	63.5	17.0	10.0	26.0	11.0	36.5	0.14	0.16				
1.50		26.5	74.0	19.0	11.0	29.0	13.0	43.0	0.19	0.22				
2.00		34.0	89.0	22.0	13.5	32.0	16.0	51.0	0.36	0.42				
3.25	8 - 16	40.0	110.0	27.0	16.0	43.0	19.0	64.0	0.63	0.74				
4.75	18 - 20	46.0	129.0	31.0	19.0	51.0	22.0	76.0	1.01	1.18				
6.50	22	52.0	144.0	36.0	22.0	58.0	25.0	83.0	1.50	1.77				
8.50	24 - 26	59.0	164.0	43.0	25.0	68.0	28.0	95.0	2.21	2.58				
9.50		66.0	185.0	47.0	28.0	75.0	32.0	108.0	3.16	3.66				
12.00		72.0	201.0	51.0	32.0	83.0	35.0	115.0	4.31	4.91				
13.50	30	80.0	227.0	57.0	35.0	92.0	38.0	133.0	5.55	6.54				
17.00		88.0	249.0	60.0	38.0	99.0	42.0	146.0	7.43	8.19				
25.00		103.0	300.0	74.0	45.0	126.0	50.0	178.0	12.84	14.22				
35.00		111.0	331.0	83.0	50.0	138.0	57.0	197.0	18.15	19.85				
55.00		145.0	433.0	105.0	65.0	180.0	70.0	260.0	37.60	39.59				
85.00		162.0	527.0	127.0	75.0	190.0	83.0	329.0	-	62.00				

1 according to EN 13414-1, only types ASSP-EN + ASBN-EN are installed in rope slings

Shackle type ASSP-RR+ASBN-RR manufactured according to U.S. Federal Specification RR-C-271, CE-tested
Shackle type ASSP-EN+ASBN-EN manufactured according to EN 13889, CE-tested, suitable in accordance with EN for installation in slings

Lashing chains

User instructions

These user instructions give a general overview as regards the use oflashing chains according to EN 12195-3. Principally, the relevant regulations and standards for load safety and our operating manual "General instructions for load safety in road transportation" apply for the safe transport of loads.

Selection and usage instructions

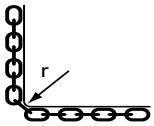
The required lashing force as well as the application and type of load to be secured must be considered when selecting lashing chains. The size, shape and weight of the load will determine the correct choice as well as the intended type of use and the transport environment. For stability at least two lashing chains must be used, and two more chains diagonally placed to ensure the load will not twist or slip.

- The lashing chain selected must be strong enough for the purpose and have the right length for the type of lashing.
- Fitting and removal must be planned before the start of the journey, and partial unloading during the journey must also be considered.
- The number of lashing chains needed must be calculated in accordance with EN 12195-1 or be calculated using our tested lashing tables.
- Only lashing chains with details of the pre-load force (STF) on the lashing tag may be used. The pre-load force is reached by applying a manual force on the tension lever of 50daN (approx. 50kg). Do not use mechanical aids such as rods or lever extensions. The high pre-load forces of the chain tensioning elements offer much higher values during lashing down than a lashing strap. However during the journey the chain can quickly lose its pre-tension force, for example due to the load settling, so that it has little or no strain. Therefore pre-load should be checked at short intervals during the journey. Due to the high pre-load forces, lashing chains should only be used to retain stable units or materials. Take note too of poor anti-friction properties of the chain on the load, especially on the edges. Chains can easily cause damage if they are tensioned over an unprotected load, so when lashing down, use suitable edge protectors to protect the chain and the load, and transfer the pre-load force to the tensioning element on the opposite side of the lashing chain by the chain sliding on the load edge.
- Before first commissioning make sure the lashing material and the factory certificate supplied correspond to the design ordered.
- Lashing chains are to be examined for obvious defects before and after use.
- Make sure that supplementary fitting components or tensioning elements that are not fixed to the lashing chain, actually do fit the lashing chain.
- Due to different behaviour and different length changes under load, different lashing materials (those made from man-made fibres) may not be used to lash the same load. Combinations of materials such as chain-strap within a lashing material are permitted but all lashing material for a load must have the same properties.

Use and applications

- Lashing chains must only be used by trained personnel.
- The lashing chain must not be exposed to chemical effects without consultation. Contact with acid environments is not permitted under any circumstances as it may make the chain brittle.
- Should such contact occur the chain must be washed in water and checked by an expert before reuse.
- Lashing chains may be used in temperatures ranging from -40°C to +200°C. Please check with us if they are to be used outside these temperatures.
- Avoid damage by keeping lashing chains away from the load or its edges.
- Do not overload, knot, roll over, crush or use lashing chains for lifting and pulling loads.
- Only tension untwisted lashing chains.
- Immediately take out of operation lashing chains with obvious defects such as bent links, high level of wear, damaged tensioning elements etc).
- When lashing down, a normal manual force of 50 daN is to be applied to the tensioning lever. They should not be pre-tensioned more than 0.5 x LC.
- Progressively and evenly pretension all lashing chains for direct lashing (as opposed to lashing down) until they are tensioned straight, do not sag and cannot unhook accidently, ensuring that the largest possible amount of lashing force is retained. Arrange as symmetrically a possible.
- Do not load lashing and chain shortening hooks on their tips as a safeguard against accidental unhooking.
- Do not allow tensioning and connecting elements to rest on edges to avoid bending. Rope slings should not be tensioned or pulled over sharp edges without protection.
- A sharp edge is given when the edge radius r is smaller than the diameter D of the lashing chain. In these instances, suitable edge protectors

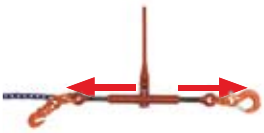
are mandatory. Attach the steel edge protection bracket with the safety chain on the lashing chain to protect against falling out during the journey!



- No supplementary extensions or devices may be attached on tensioning elements to achieve a higher pre-tensioning force.
- After shorter stretches and during the entire journey the pretension of the lashing chain, above all for lashing down, is to be checked and re-tensioned if necessary.

Steps

Lashing the load:



- Unscrew both threaded spindles of the tensioning element until the stop. Caution: an unscrewing safeguard against complete unscrewing of the thread is present and must be functional.

- Lay the lashing chain on the load and suspend the connecting elements in the lashing points / attachment points.
- Make a rough length adjustment with the shortening hook. Pretension the lashing chain as well as possible, so that enough tensioning distance remains for applying the pre-tensioning force.

- For slack chains, no autonomous unhooking of the lashing chain may occur from the shortening element or the lashing points. The safety catch in the shortening elements and the connecting elements must therefore be functional.
- Tensioning of the lashing chain takes place by turning the tensioning element with a ratchet lever.
- The tensioning elements are to be arranged so that they are not bent over the edges in a tensioned state.
- For diagonal lashing, the lashing strand should only be pre-tensioned until the chain no longer sags.
- When lashing down, pretension with a manual force of 50 daN to achieve the pre-tensioning force specified on the lashing tag.

Opening the lashing:

- Before opening you must make sure that the load is still secure without the lashing material attached and that the personnel or other people are not endangered by it falling down.
- If necessary, the slings already provided for further transportation are to be attached to the load to prevent it from falling down. Before starting to unload, the lashings must be loosened enough so that the load is free.
- Turn the ratchet tightener to the stop, unhook the chain from the shortening element and then remove the connecting element from the lashing points / sling points.

Storage

After use, the lashing chain must be stored safely (e.g. on truck secured against falling down) and as dry as possible. Caution if storing in places in the truck where the lashing chains are exposed to constant moisture or the spray from gritting salt in winter - rapid corrosion and a short service life are the result!

Cleaning

The lashing chain is to be cleaned before testing. The cleaning process may not generate any chemical damage (e.g. no acids / embrittlement), no impermissible temperature loads through burning off... etc. or possibly cover cracks or remove too much material (caution with sandblasting ...). We'll gladly advise you concerning this matter! Please provide the chains to us for testing in a clean state. This will save you considerable inspection costs!

Inspection, testing

Lashing materials are to be examined for obvious defects before and after every use. They must be taken out of operation immediately

- if they show signs of damage that could impair safety

or

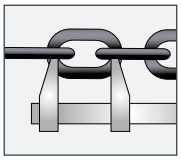
- also after extraordinary events that could have a damaging effect on the safety of the lashing material (e.g. overload, chem. influences, ...).

Further use of this lashing material is only permitted after possibly required repairs and inspection by an expert.
In addition, depending on usage conditions lashing materials must undergo an inspection by an expert at regular intervals, at least once a year. The inspections are to be documented.
Our recommendation: give a copy of the last test certificate to the driver. It is not mandatory but can be very helpful according to our experience, especially in neighbouring countries with all too precise checks!

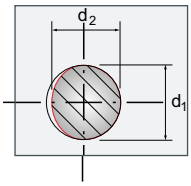
Rejection criteria

Chains and accessory parts

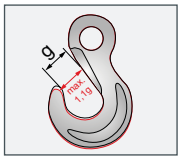
- If there is a chain link or an accessory on the chain with a lengthening of more than 5%.



m Strong degree of wear on chain links from friction, if the determined link thickness falls below the nominal thickness at any point by more than 10% (average of two measurements carried out at right angles to one another, d1 and d2).



m Cuts, notches, grooves, cracks, excessive corrosion (e.g. clearly visible rust scars), discolouration from heat, signs of subsequent welding or welding spatters (which are not easy to remove or leave discolourations behind), bent or twisted chain links and similar faults are detectable.
m Expansion of the hook by more than 5%. Hook lock must latch into the hook tip.
m Excessive corrosion as well as illegible component designations are further rejection criteria.



Tensioning element
m Cuts, notches, grooves, cracks, excessive corrosion
m Bent or missing components, as well as strong signs of wear

Labelling
m Illegible details on the tag
m Missing labelling tag

Repair and overhaul

Repair work may only be performed by expert personnel who have the required knowledge and capabilities using original spare parts. After repair, the original properties of the lashing material must be restored.

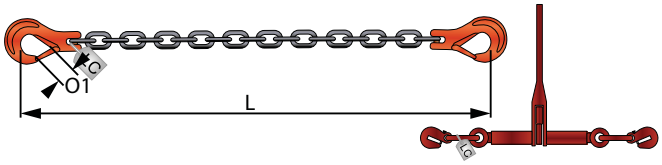
Documentation

The results of the inspections are to be recorded. It is recommended to have a test card, a log book or an table on a computer (spreadsheet).

Constructions and designations:

Partitioned lashing chains

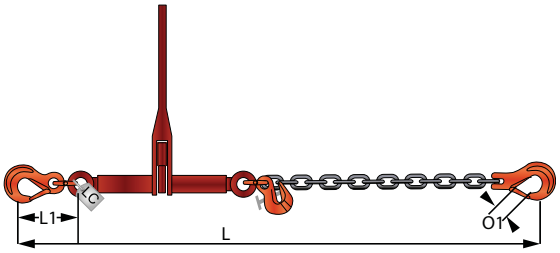
According to EN 12195-3, our partitioned lashing chains may only be used with a tensioner in accordance with EN 12195-3 (details of the pre-tensioning force on a lashing tag on tensioner, stop collar of the spindle and hook safety catch)!



Instructions on this can be found on the lashing tag of the lashing chain. The advantage of a partitioned lashing chain lies in the ease of handling or the tensioning elements can be fixed into the relevant required position. The user is responsible for the correct assignment of tensioning element and chain!
Further designs will be, as long as they meet the standard, gladly produced to your wishes.

Lashing chains complete

Lashing chain ready for use according to EN 12195-3 with integrated tensioning element. This prevents a mix up between chain and tensioning element. When choosing the chain, make sure that the hook, connecting links and tensioning elements do not lie on the edges. For lashing points which are not mounted on the loading surface, variants with the dimension L1 = 1 m are suitable.



Further designs will be, as long as they meet the standard, gladly produced according to your wishes.

LC08-400-2-08-300-CSH-**-CGH-***-EGHSP

Length in cm

Chain thickness in mm:
08...8 mm
10...10 mm...

Design:
1...partitioned
2... complete

Grade
Usage temperature:
LC08...Grade 8 (400°)
LC10...Grade 10 (200°)
LC10...Grade 10 (380°)

Shortening option:
EGHSP

Chain length L2 (optional)

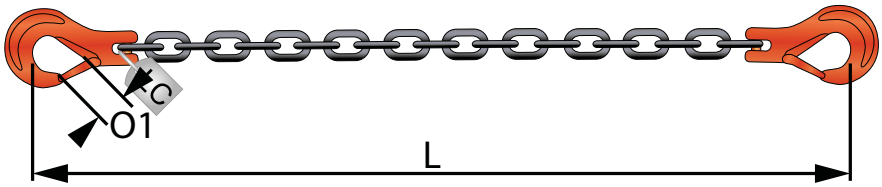
End fitting
CSH
EGHSP

Chain length L1

End fitting
CSH
EGHSP
ML
ESH

Lashing chain type LC08-400-1-*-**-CSH-CSH

without tensioner with double-sided eyehook CM08CSH with safety catch

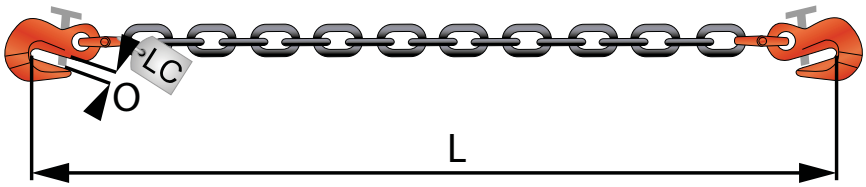


Type	Lashing capacity	Lashing capacity	Chain	Pre-tensioning force	to be used	O1	EUR price for	EUR price for
	LC kN	LC daN	mm	tensioner	STF daN	mm	L = 6 m	m + / -
LC08-400-1-08-**-CSH-CSH	40	4,000	8	RLSP-08-EE	2,000	24.0		
LC08-400-1-10-**-CSH-CSH	63	6,300	10	RLSP-10-EE	3,150	28.0		
LC08-400-1-13-**-CSH-CSH	100	10,000	13	RLSP-13-EE	3,150	34.5		

** Chain thickness*
*** Total length in cm*

Lashing chain type LC08-400-1-*-**-EGHSP-EGHSP

without tensioner with double-sided parallel hook CM08EGHSP with safety catch

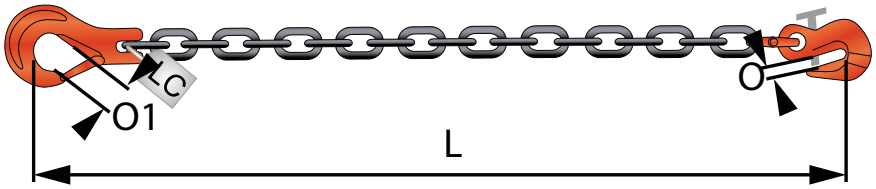


Type	Lashing capacity	Lashing capacity	Chain	Pre-tensioning force	to be used	O	EUR price for	EUR price for
	LC kN	LC daN	mm	tensioner	STF daN	mm	L = 6 m	m + / -
LC08-400-1-08-**-EGHSP-EGHSP	40	4,000	8	RLSP-08-EE	2,000	11.0		
LC08-400-1-10-**-EGHSP-EGHSP	63	6,300	10	RLSP-10-EE	3,150	13.0		
LC08-400-1-13-**-EGHSP-EGHSP	100	10,000	13	RLSP-13-EE	3,150	16.5		

** Chain thickness*
*** Total length in cm*

Lashing chain type LC08-400-1-*-**-EGHSP-EGHSP

without tensioner with coupling hook CM08CSH and parallel hook CM08EGHSP with safety catch

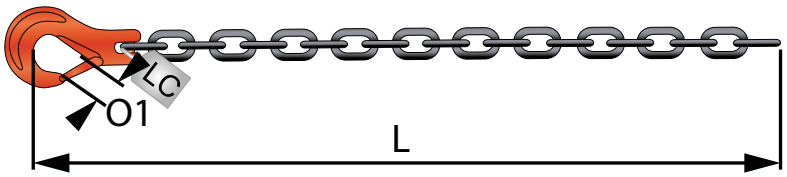


Type	Lashing capacity	Lashing capacity	Chain	Pre-tensioning force	to be used	O1	O	EUR price for	EUR price for
	LC kN	LC daN	mm	tensioner	STF daN	mm	mm	L = 6 m	m + / -
LC08-400-1-08-**-CSH-EGHSP	40	4,000	8	RLSP-08-EE	2,000	24.0	11.0		
LC08-400-1-10-**-CSH-EGHSP	63	6,300	10	RLSP-10-EE	3,150	28.0	13.0		
LC08-400-1-13-**-CSH-EGHSP	100	10,000	13	RLSP-13-EE	3,150	34.5	16.5		

** Chain thickness*
*** Total length in cm*

Lashing chain type LC08-400-1-*-**-CSH

without tensioner on coupling hook side CM08CSHwith safety catch

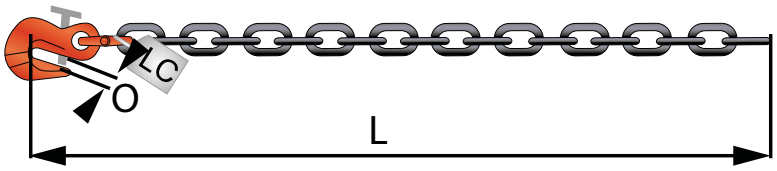


Type	Lashing capacity	Lashing capacity	Chain	Pre-tensioning force	to be used	O1	EUR price for	EUR price for
	LC kN	LC daN	mm	tensioner	STF daN	mm	L = 6 m	m + / -
LC08-400-1-08-**-CSH	40	4,000	8	RLSP-08-EE	2,000	24.0		
LC08-400-1-10-**-CSH	63	6,300	10	RLSP-10-EE	3,150	28.0		
LC08-400-1-13-**-CSH	100	10,000	13	RLSP-13-EE	3,150	34.5		

** Chain thickness*
*** Total length in cm*

Lashing chain type LC08-400-1-*-**-EGHSP

without tensioner on one side parallel hook CM08EGHSP with safety catch

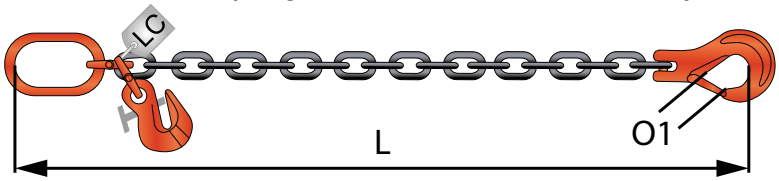


Type	Lashing capacity	Lashing capacity	Chain	Pre-tensioning force	to be used	O	EUR price for	EUR price for
	LC kN	LC daN	mm	tensioner	STF daN	mm	L = 6 m	m + / -
LC08-400-1-08-**-EGHSP	40	4,000	8	RLSP-08-EE	2,000	11.0		
LC08-400-1-10-**-EGHSP	63	6,300	10	RLSP-10-EE	3,150	13.0		
LC08-400-1-13-**-EGHSP	100	10,000	13	RLSP-13-EE	3,150	16.5		

** Chain thickness*
*** Total length in cm*

Lashing chain type LC08-400-1-*-**-ML-CSH

Designed for use with all-purpose traction PT, with suspension link to suspend the all-purpose traction and coupling hook CM08CSH with safety catch



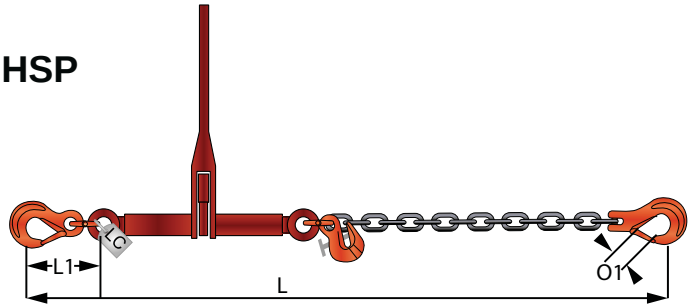
Type	Lashing capacity	Lashing capacity	Chain	Pre-tensioning force	to be used	O1	EUR price for	EUR price for
	LC kN	LC daN	mm	tensioner	STF daN	mm	L = 6 m	m + / -
LC08-400-1-08-**-ML-CSH	16	1,600	8	PT 1.6	1,600	24.0		
LC08-400-1-10-**-ML-CSH	32	3,200	10	PT 3.2	3,200	28.0		
LC08-400-1-13-**-ML-CSH	63	6,300	13	PT 6.3	6,300	34.5		

**Reduced to permissible values LC = WLL and STF = WLL of the all-purpose traction PT. For all-purpose traction according to EN 12195-3 the load capacity WLL is to be set equal with the lashing force LC. Through the resulting higher safety in the chain, in this case the pre-tensioning force STF and the lashing force LC are identical.*

Lashing chains

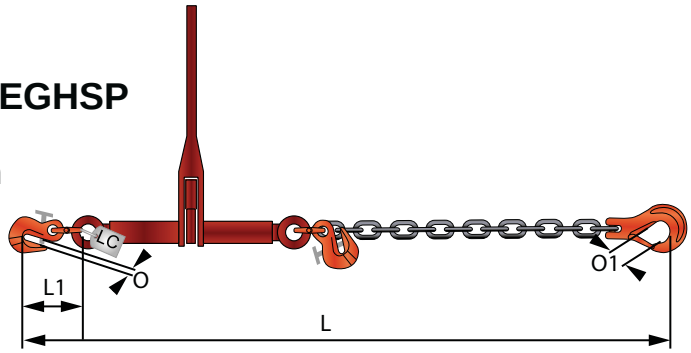
Complete lashing chains & tensioner

Lashing chain
type LC08-400-2-*-**-ESH-CSH-****-EGHSP
with tensioner with eyehook CM08CSH
and coupling hook CM08ESH with safety catch



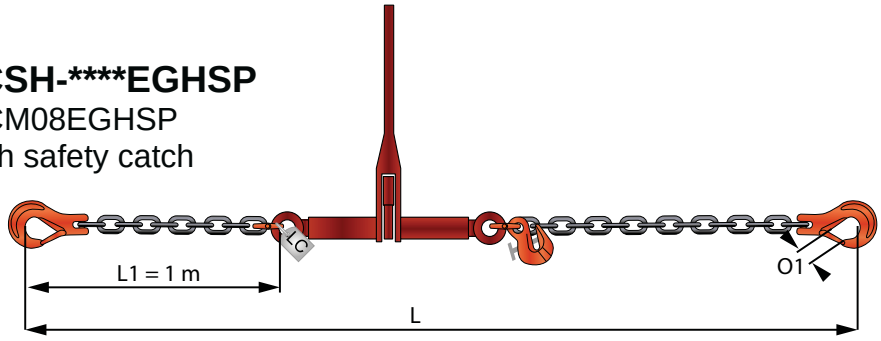
Type	Lashing capacity	Lashing capacity	Chain	to be used	O1	O	L1	EUR price for	EUR price for
	LC kN	LC daN	mm	STF daN	mm	mm	m	L = 6 m	m + / -
LC08-400-2-8-**-ESH-CSH-****-EGHSP	40	4,000	8	2,000	24.0	22	0.17		
LC08-400-2-10-**-ESH-CSH-****-EGHSP	63	6,300	10	3,150	28.0	28	0.20		
LC08-400-2-13-**-ESH-CSH-****-EGHSP	100	10,000	13	3,150	34.5	35	0.25		

Lashing chain
type LC08-400-2-*-**-EGHSP-CSH-****-EGHSP
with tensioner with parallel hook CM08EGHSP
and coupling hook CM08CSH with safety catch



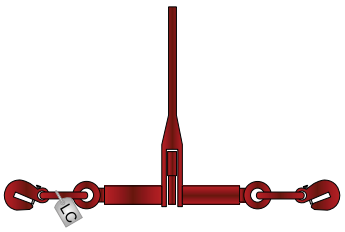
Type	Lashing capacity	Lashing capacity	Chain	to be used	O1	O	L1	EUR price for	EUR price for
	LC kN	LC daN	mm	STF daN	mm	mm	m	L = 6 m	m + / -
LC08-400-2-8-**-EGHSP-CSH-****-EGHSP	40	4,000	8	2,000	24.0	11.0	0.14		
LC08-400-2-10-**-EGHSP-CSH-****-EGHSP	63	6,300	10	3,150	28.0	13.0	0.16		
LC08-400-2-13-**-EGHSP-CSH-****-EGHSP	100	10,000	13	3,150	34.5	16.5	0.19		

Lashing chain
type LC08-400-2-*-**-CSH-CSH-****EGHSP
with tensioner with parallel hook CM08EGHSP
and coupling hook CM08CSH with safety catch



Type	Lashing force	Lashing force	Chain	to be used	O1	EUR price for	EUR price for
	LC kN	LC daN	mm	STF daN	mm	L = 6 m	m + / -
LC08-400-2-8-**-CSH-CSH-****-EGHSP	40	4,000	8	2,000	24.0		
LC08-400-2-10-**-CSH-CSH-****-EGHSP	63	6,300	10	3,150	28.0		
LC08-400-2-13-**-CSH-CSH-****-EGHSP	100	10,000	13	3,150	34.5		

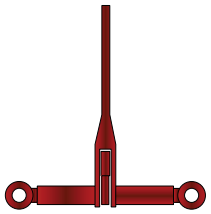
Ratchet load tensioner
for partitioned lashing chains according to EN 12195-3



Tensioner type RLSP-HH

Type	Lashing force	Lashing force	for chain	to be used	Handle length	Adjustment range	Tensioning distance	Price/pc.
	LC kN	LC daN	mm	STF daN *	mm	mm	mm	EUR
RLSP-08-HH	40	4,000	8	2,000	190	588-738	150	
RLSP-10-HH	63	6,300	10	3,150	220	630-780	150	
RLSP-13-HH	100	10,000	13	3,150	350	722-872	150	

Ratchet load tensioner
for lashing chains according to EN 12195-3



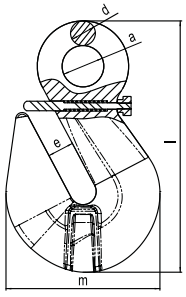
Tensioner type RLSP-EE

Type	Lashing force	Lashing force	for chain	to be used	Handle length	Adjustment range	Tensioning distance	Price/pc.
	LC kN	LC daN	mm	STF daN *	mm	mm	mm	EUR
RLSP-08-EE	40	4,000	8	2,000	190	360-510	150	
RLSP-10-EE	63	6,300	10	3,150	220	360-510	150	
RLSP-13-EE	100	10,000	13	3,150	350	366-516	150	

**Pre-tensioning force STF measured on new tensioner with oiled threads. If the thread is not oiled or is damaged, this pre-tensioning force cannot be reached!*

Shortening hook with eyelet and safety catch CM08EGHSP

High-strength tempered steel, grade 8, painted red
according to DIN EN 1677-1



Type	Load capacity	a	D	e	l	m	Weight	Price/pc.
	t	mm	mm	mm	mm	mm	kg	EUR
CM08EGHSP 7-8	2.00	17.0	9.5	11.0	88.3	50.0	0.33	
CM08EGHSP 10	3.15	20.0	13.0	13.0	121.5	71.0	0.75	
CM08EGHSP 13	5.30	26.0	15.5	16.5	158.0	96.0	1.62	

Sling points

User instructions

Please also read general user instructions for load carrying equipment and slings.

These instructions only give a general overview of the use of rope slings and do not replace the equipment manufacturer's operation instructions.

Changes to delivery condition

The shape and design of sling points should not be changed by bending, grinding, disassembly, drilling holes or other modifications.

Welding is only permitted if carried out according to instructions. Surface coverings such as hot-dip or electro-galvanising may not be applied to high strength sling points. Stripping with alkaline products is also dangerous and should only be carried out after consultation with the manufacturer.

Limits of use

Temperature
The manufacturer's product-related temperature restrictions must be observed. In particular this applies to ball bearing mounted sling points which can permanently reduce load capacity.

Impact loads
Specified load capacities assume there will be no impact when loading.
Slight impacts such as those caused by raising, lowering or moving the load are permitted but powerful impacts such as a falling load are not allowed.

Edge load
Damage to sling points from sharp edge loads should be avoided, including during attaching.

Dangerous conditions
Specified loading capacities assume that there are no dangerous conditions or operations such as lifting personnel, dangerous loads such as molten metal, caustic substances or nuclear materials. In such cases the operation should be assessed by authorised personnel and the load capacity reduced accordingly, or special procedures put in places.

Chemicals
Sling points must not be exposed to chemicals or their gases.
Note that certain production processes will release acids or their gases.

Check before starting work

m Before starting work carry out the following checks:
-That the conformity declaration or test certificate are available;
- Sling point labelling and load capacity details match those on the declaration or certificate;
- That the operating and installation instructions have been read

m Rope slings must be free of damage with legible signs and load capacity details. Visual checks should be carried out before and after use for obvious defects such as evident corrosion, wear, cracks or welding seams, bending and seized screw seats.

m Do not use slings with broken, obviously damaged or deformed links or accessories, or when they have been overloaded. In such cases the sling should not be used until it has been inspected and the necessary repairs carried out.

Instructions for use

m The sling point position must be set so that the load can carry the expected force (2.5x safety against remaining deformation and 4x safety against breakage).

m Full contact swivel area must be level and the threadhole at right-angles to the contact area.

m Attach sling points so they can easily be reached for attaching and suspending the sling. Other parts should not obstruct the sling points. Avoid deflection or placing on sharp items.

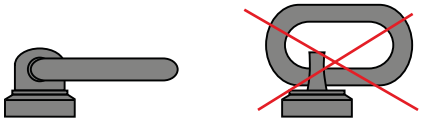
m Avoid danger points that could endanger the rigger, such as crushing or shearing when attaching the sling. Avoid protruding points that could prevent sling travel.

m The number and arrangement of sling points must be selected to avoid the load changing position unexpectedly during travel.

m When using multi-strand slings, especially in the position of the centre of gravity, the dimensioning of the sling points must take into account the number of bearing points and increased traction forces through the angle of inclination.

m The receiving link on the load hook must have sufficient space and should move freely.

m Before slinging, move the receiving link into the right position.



proper use *improper use*

m Use only nuts and screws (for example, through holes) to the manufacturer's specified grade and quality.

m In blind holes the thread length must be at least 1.1x the screw-in length, so that the sling point contact area lies securely on the load. Minimum recommended screw lengths are:

Steel; 1 x d
Cast iron; .25 x d (for casting strengths < 200MPa 1.5 x d)
Aluminium; 2x d
Aluminium-magnesium alloys 2.5 x d

Inspections

m Sling point inspections must be carried out by qualified personnel at least once a year in line with AMVO section 8 (13.

m Chain slings that are often exposed to heat or chemical effects must be inspected more frequently.

m Sling points must be cleaned before testing. The process should not cause any chemical damage, heating through burning off, cover cracks or remove excess material from sandblasting.

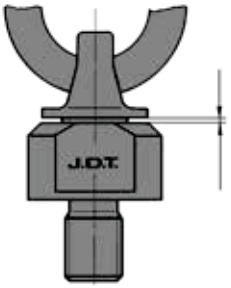
m After events such as falling loads, collisions, exposure to heat or chemicals that could affect safety, all load carrying devices must be inspected according to AMVO section 9 (1).

m All inspections should be recorded.

Criteria for rejection

Sling points may no longer be used if:

m The receiving link has been stretched by more than 5%.
m The actual thickness of any component is more than 10% below nominal thickness
m There is evidence of cuts, notches, grooves, cracks, excessive corrosion (such as major visible rust marks), heat discolouration, signs of welding (other than that carried out in line with the manufacturer's instructions), weld spatter on suspension links, bent or twisted receiving links and similar faults.
m The label is missing or illegible.
m The thread is damaged or worn.
m On ball bearing mounted sling swivels, the maximum play is >s< in the table below:



Nominal size	max. play >s<
t	mm
0.5 - 1.4	1.5
2.0 - 2.5	1.5
3.0 - 6.7	2.4
8.0 - 10,0	3.2
15.0	4.0
20.0 - 30.0	

Reuse is then only permitted after repair has taken place.

Temperature reductions

Usage temperature	Reduction				
	CM08EN CM08EB	CM08EN+ CM08EB+ CM08REB+	CM08SEB	Theipa[1] FP[1]	CM08WLP
	%	%	%	%	%
-40 °C to -20 °C	without deduction	without deduction	without deduction	without deduction	without deduction
-20 °C to +200 °C	without deduction	without deduction	without deduction	without deduction	without deduction
+200 °C to +300 °C	- 10%	- 10%	- 10%	- 10%	- 10%
+300 °C to +400 °C	- 25%	- 25%	- 25%	- 25%	- 25%
over +400 °C	not permitted	not permitted	not permitted	not permitted	not permitted

[1] *After use over +200 °C, the load capacity must be permanently reduced for further use according to the table above. Accelerated wear in the ball bearings is possible in this case and must be monitored by the user.*

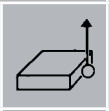
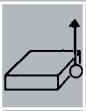
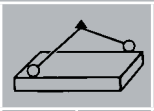
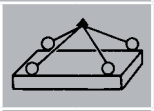
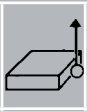
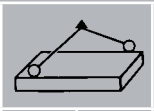
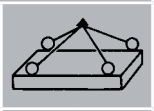
For the safe lifting, pulling or other further movement of loads, it is necessary to provide corresponding sling points on all technical products that cannot be moved manually or transported.

Only tested sling points or eyebolts are suitable for this. For the safe use the permissible load capacity, the manufacturer, the material used or the grade etc. must be known. The permissible usage conditions such as the max. inclination angle, permissible usage temperatures, rejection criteria etc. must also be considered. (Operating instructions)

Our high-strength, tested sling points and swivels fulfil these requirements!

Sling points

Load table

TYPE:	CM08EN/EB		CM08EN+/EB+/REB+						CM08SEB					
Sling type														
Number of sling points	1	1	1	1	2	2	3 or 4		1	1	2	2	3 or 4	
Inclination angle	0°	90°	0°	90°	0°-45°	46°-60°	0°-45°	46°-60°	0°	90°	0°-45°	46°-60°	0°-45°	46°-60°
Thread	**Load capacity t**													
M 6	0.40	0.15	0.40	0.10	0.20	0.16	0.32	0.24	-	-	-	-	-	-
M 8	1.00	0.40	0.80	0.20	0.40	0.32	0.64	0.48	-	-	-	-	-	-
M 10	1.00	0.40	1.00	0.25	0.50	0.40	0.80	0.60	0.90	0.45	0.63	0.45	0.95	0.68
M 12	2.00	0.75	1.60	0.40	0.80	0.64	1.28	0.96	1.00	0.50	0.70	0.50	1.05	0.75
M 14	4.00	1.50	3.00	0.75	1.50	1.20	2.40	1.80	-	-	-	-	-	-
M 16	4.00	1.50	4.00	1.00	2.00	1.60	3.20	2.40	2.00	1.12	1.57	1.12	2.35	1.68
M 18	-	-	5.00	1.25	2.50	2.00	4.00	3.00	-	-	-	-	-	-
M 20	6.00	2.30	6.00	1.50	3.00	2.40	4.80	3.60	4.00	2.00	2.80	2.00	4.20	3.00
M 24	8.00	3.20	8.00	2.00	4.00	3.20	6.40	4.80	6.30	3.15	4.41	3.15	6.62	4.73
M 27	-	-	10.00	2.50	5.00	4.00	8.00	6.00	-	-	-	-	-	-
M 30	-	-	12.00	3.00	6.00	4.80	9.60	7.20	10.60	5.30	7.42	5.30	11.13	7.95
M 33	-	-	14.00	3.50	7.00	5.60	11.20	8.40	-	-	-	-	-	-
M 36	-	-	16.00	4.00	8.00	6.40	12.80	9.60	11.80	8.00	11.20	8.00	16.80	12.00
M 42	-	-	24.00	6.00	12.00	9.60	19.20	14.40	-	-	-	-	-	-
M 45	-	-	-	-	-	-	-	-	-	-	-	-	-	-
M 48	-	-	32.00	8.00	16.00	12.80	25.60	19.20	-	-	-	-	-	-
M 56	-	-	-	-	-	-	-	-	-	-	-	-	-	-
M 64	-	-	-	-	-	-	-	-	-	-	-	-	-	-
M 72	-	-	-	-	-	-	-	-	-	-	-	-	-	-
M 80	-	-	-	-	-	-	-	-	-	-	-	-	-	-

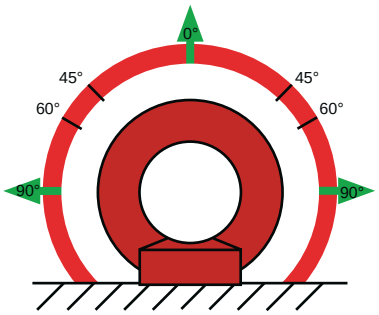
	Theipa						Flatpoint FP					
	1	1	2	2	3 or 4		1	1	2	2	3 or 4	
	0°	90°	0°-45°	46°-60°	0°-45°	46°-60°	0°	90°	0°-45°	46°-60°	0°-45°	46°-60°
	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
	1.00	0.50	0.70	0.50	1.00	0.75	0.50	0.70	0.70	0.50	1.00	0.70
	1.40	0.70	1.00	0.70	1.40	1.00	0.80	1.25	1.12	0.80	1.60	1.12
	2.00	1.00	1.40	1.00	2.12	1.50						
	2.80	1.40	2.00	1.40	3.00	2.12	1.50	2.12	2.00	1.50	3.15	2.24
	-	-	-	-	-	-	-	-	-	-	-	-
	3.40 / 5.00	1.70 / 2.50	2.40 / 3.55	1.70 / 2.50	3.55 / 5.30	2.50 / 3.75	2.50	3.55	3.35	2.50	5.00	3.75
	3.40 / 8.00	1.70 / 4.00	2.40 / 5.60	1.70 / 4.00	3.55 / 8.50	2.50 / 6.00	4.00	4.00	5.60	4.00	8.00	6.00
	-	-	-	-	-	-	5.30	7.10	7.10	5.30	11.20	8.00
	8.00 / 12.00	4.00 / 6.70	5.60 / 9.50	4.00 / 6.70	8.50 / 14.00	6.00 / 10.00	6.00	8.00	8.00	6.00	12.50	9.00
	-	-	-	-	-	-	-	-	-	-	-	-
	15.00	10.00	14.00	10.00	21.20	15.00	8.00	8.00	11.20	8.00	16.80	12.00
	15.00 / 20.00	12.50 / 13.00	17.00 / 18.00	12.50 / 13.00	25.00 / 27.00	18.00 / 19.00	10.00	15.00	14.00	10.00	21.20	15.00
	25.00	17.00	23.50	17.00	35.00	25.00	15.00	20.00	21.20	15.00	31.50	22.40
	25.00	17.00	23.50	17.00	35.00	25.00	-	-	-	-	-	-
	25.00	18.00	25.00	18.00	37.50	26.50	-	-	-	-	-	-
	25.00 / 32.50	20.00 / 28.00	28.00 / 39.00	20.00 / 28.00	42.50 / 58.00	30.00 / 42.00	-	-	-	-	-	-
	32.50	28.00	39.00	28.00	58.00	42.00	-	-	-	-	-	-
	32.50	28.00	39.00	28.00	58.00	42.00	-	-	-	-	-	-

Eye nuts CM08EN
Eye bolts CM08EB

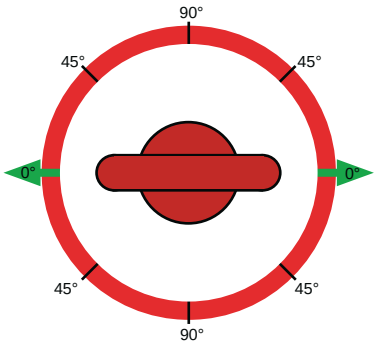
T
hese can be used as lifting eyelets for machine parts but are not suitable for multi-strand operations. No force should be exerted transverse to the ring level. Ensure that the thread is fully screwed in place and that the collar makes full contact. Thread holes must have a strength of at least 400N/mm².

Eye nut CM08EN

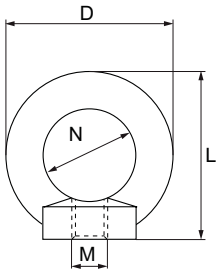
Eyebolt CM08EB

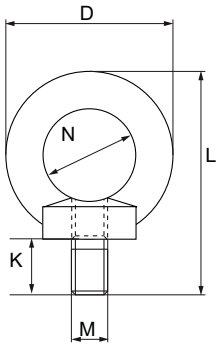


The permissible inclination angle of the slings is between 0 - 60°, the load capacity is to be reduced in accordance with the following table.



Horizontally the load through the sling may only be exerted in the longitudinal direction to the ring level. Diagonal or transverse loads are not permitted!





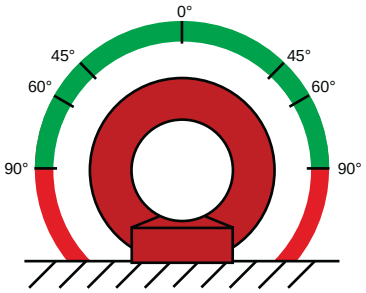
Sling type				Dimensions				Weight	Price per item
Number of sling points		1	1						
Inclination angle		0°	90°	D	K	N	l		
Type	Thread d_1	Load capacity t		mm	mm	mm	mm	kg	EUR
CM08EB-6	M 6	0.40	0.15	28	13	16	42	0.05	
CM08EB-8	M 8	1.00	0,40	36	15	20	51	0.06	
CM08EB-10	M 10	1.00	0,40	45	18	25	63	0.11	
CM08EB-12	M 12	2.00	0,75	54	22	30	75	0.18	
CM08EB-14	M 14	4.00	1,50	63	28	35	88	0.28	
CM08EB-16	M 16	4.00	1,50	63	28	35	88	0.28	
CM08EB-20	M 20	6.00	2,30	72	30	40	101	0.45	
CM08EB-24	M 24	8.00	3,20	90	38	50	128	0.87	
CM08EN-6	M 6	0.40	0.15	36	-	20	36	0.05	
CM08EN-8	M 8	1.00	0.40	36	-	20	36	0.05	
CM08EN-10	M 10	1.00	0.40	45	-	25	45	0.09	
CM08EN-12	M 12	2.00	0.75	54	-	30	53	0.16	
CM08EN-16	M 16	4.00	1.50	63	-	35	62	0.24	
CM08EN-20	M 20	6.00	2.30	63	-	35	62	0.36	
CM08EN-24	M 24	8.00	3.20	72	-	40	71	0.72	

Please note the usage temperatures allowed, see page 65 and the operating instructions!

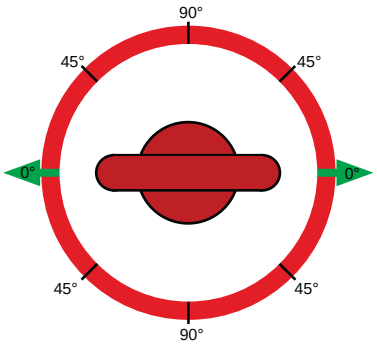
Ring nuts CM08EN+
Eye bolts CM08EB+
Ring screws CM08REB+ (adjustable)

These can be used as lifting eyelets for machine parts and are suitable for multi-strand operations. No force should be exerted transverse to the ring level. Ensure that the thread is fully screwed in place and that the collar makes full contact. Thread holes must have a strength of at least 400N/mm².

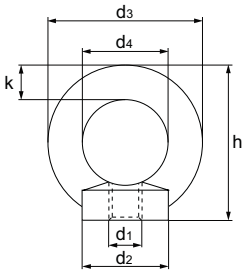
Eye nut CM08EN+ | Eyebolt CM08EB+ | Eyebolt CM08REB+

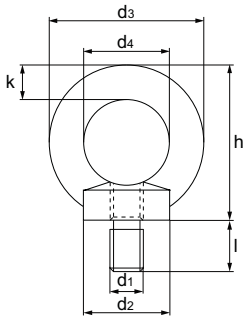


The permissible inclination angle of the slings is between 0 - 60°, the load capacity is to be reduced in accordance with the following table.



Horizontally the load through the sling may only be exerted in the longitudinal direction to the ring level. Diagonal or transverse loads are not permitted!





Sling type								Dimensions							Price per item		
Number of sling points		1	1	2	2	3 or 4									CM08..		
Inclination angle		0°	90°	0°-45°	46°-60°	0°-45°	46°-60°	d_2	d_3	d_4	h	K	l	Weight	EB+	EN+	REB
Type	Thread d_1	Load capacity t						mm	mm	mm	mm	mm	mm	kg	EUR	EUR	
...6	M 6	0.40	0.10	0.20	0.16	0.32	0.24	25	45	25	45	10	13	0.10			
... 8	M 8	0.80	0.20	0.40	0.32	0.64	0.48	25	45	25	45	10	13	0.10			
... 10	M 10	1.00	0.25	0.50	0.40	0.80	0.60	25	45	25	45	10	17	0.12			
...12	M 12	1.60	0.40	0.80	0.64	1.28	0.96	35	63	35	62	14	22	0.26			
...14	M 14	3.00	0.75	1.50	1.20	2.40	1.80	35	63	35	62	14	25	0.28			-
... 16	M 16	4.00	1.00	2.00	1.60	3.20	2.40	35	63	35	62	14	29	0.30			
... 18	M 18	5.00	1.25	2.50	2.00	4.00	3.00	50	90	50	90	20	29	0.82			-
... 20	M 20	6.00	1.50	3.00	2.40	4.80	3.60	50	90	50	90	20	30	0.84			
... 24	M 24	8.00	2.00	4.00	3.20	6.40	4.80	50	90	50	90	20	38	0.88			
... 27	M 27	10.00	2.50	5.00	4.00	8.00	6.00	65	108	60	109	24	42	1.58			
... 30	M 30	12.00	3.00	6.00	4.80	9.60	7.20	65	108	60	109	24	45	1.62			
... 33	M 33	14.00	3.50	7.00	5.60	11.20	8.40	65	144	80	144	30	65	3.72			-
...36	M 36	16.00	4.00	8.00	6.40	12.80	9.60	85	144	80	144	30	65	3.78			-
... 42	M 42	24.00	6.00	12.00	9.60	19.20	14.40	85	144	80	144	30	65	3.84			-

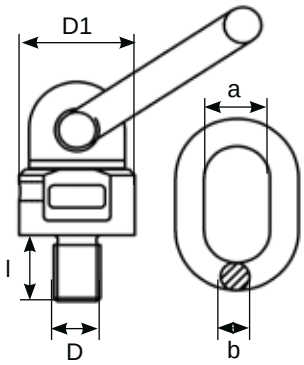
For asymmetrical load distribution, the load capacities for 1 strand at 90° applies for the 2- and 3/4-strand slings.
Please note the usage temperatures allowed, see page 65 and the operating instructions!

Sling point CM08SEB
cannot be rotated under load

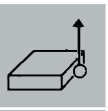
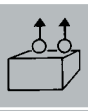
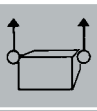
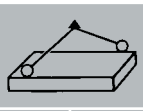
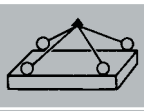
The CM08SEB sling point

Hand-tighten with wrench or spanner until flush to the contact surface, which must be flat and level. Check correct screw and thread sizes, and screw-in length. For blind holes the thread depth must be at least 1.1x screw-in length.

As minimum screw length we recommend:
- m in steel: 1 x d
- m in cast iron: 1.25 x d (for casting strengths < 200 MPa min. 1.5 x d
- m in aluminium: 2 x d
- m in aluminium-magnesium alloys: 2.5 x d



Type	Load capacity 0°	Load capacity 90°	D x L	D1	e	a	b	Weight	Price per item
	t	t	mm	mm	mm	mm	mm	kg/pc.	EUR
CM08SEB-1018	0.90	0.45	M10x18	36.0	36	41.0	30	0.43	
CM08SEB-1218	1.00	0.50	M12x18	36.0	36	41.0	30	0.44	
CM08SEB-1620	2.00	1.12	M16x40	36.0	36	42.0	30	0.46	
CM08SEB-2030	4.00	2.00	M20 x 30	49.5	56	35.0	35	0.96	
CM08SEB-2430	6.30	3.15	M24 x 40	57.0	57	66.5	40	1.45	
CM08SEB-3035	10.60	5.30	M30 x 35	66.0	66	80.5	40	2.17	
CM08SEB-3650	11.80	8.00	M36 x 90	80.0	80	89.5	50	4.17	

Sling type									
Number of sling points		1	1	2	2	2	2	3 or 4	
Inclination angle		0°	90°	0°	90°	0°-45°	46°-60°	0°-45°	46°-60°
Type	Thread	Load capacity t							
CM08SEB-1018	M10	0.90	0.45	1.80	0.90	0.63	0.45	0.95	0.68
CM08SEB-1218	M12	1.00	0.50	2.00	1.00	0.70	0.50	1.05	0.75
CM08SEB-1620	M16	2.00	1.12	4.48	2.24	1.57	1.12	2.35	1.68
CM08SEB-2030	M20	4.00	2.00	8.00	4.00	2.80	2.00	4.20	3.00
CM08SEB-2430	M24	6.30	3.15	12.60	6.30	4.41	3.15	6.62	4.73
CM08SEB-3035	M30	10.60	5.30	21.20	10.60	7.42	5.30	11.13	7.95
CM08SEB-3650	M36	11.80	8.00	32.00	16.00	11.20	8.00	16.80	12.00

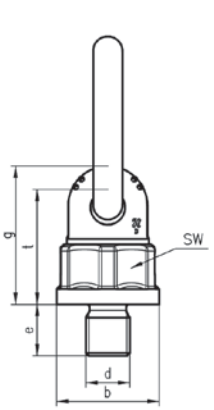
For asymmetrical load distribution, the load capacities for 1 strand at 90° applies for the 2- and 3/4-strand slings. Please note the usage temperatures allowed, see page 65 and the operating instructions!

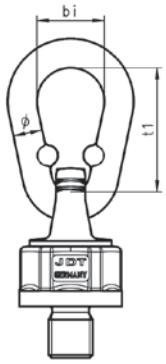
Theipa sling point
Ball bearing mounted and can be rotated under load

The new generation of sling swivels has at least 25% more load capacity while retaining TAWGK functional dimensions. Forged hexagonal shape on the swivel body provides easy installation and disassembly. Crimping marks prevent kinks in links, full internal and external corrosion protection galvanic coating.

Hand-tighten with wrench or spanner until flush to the contact surface, which must be flat and level. Check correct screw and thread sizes, and screw-in length. For blind holes the thread depth must be at least 1.1x screw-in length.

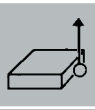
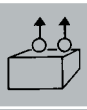
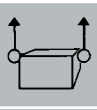
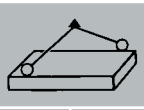
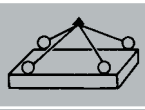
As minimum screw length we recommend:
- m in steel: 1 x d
- m in cast iron: 1.25 x d (for casting strengths < 200 MPa min. 1.5 x d
- m in aluminium: 2 x d
- m in aluminium-magnesium alloys: 2.5 x d





Type	Thread	Tightening torque		Incline	Load capacity		Diameter b	g	SW	t	Oval link ø x t_1 x b_1	Weight	Price per item
		Nm[1]	Nm[2]	DIN 13	0° t	90° t	mm	mm	mm	mm	mm	kg	EUR
Theipa 0.7	M12 x 18	15	40	1.75	1.4	0.7	36.5	48	34	41	13 x 55 x 32	0.43	
Theipa 1.4	M16 x 20	45	130	2.00	2.8	1.4	36.5	48	34	41	13 x 55 x 32	0.43	
Theipa 2.5	M20 x 30	100	170	2.50	5.0	2.5	52	68	46	57	16 x 70 x 34	0.95	
Theipa 4.0	M24 x 30	190	280	3.00	8.0	4.0	57	75	50	63	18 x 85 x 45	1.43	
Theipa 6.7	M30 x 35	230	400	3.50	12.0	6.7	70	95	65	78	20 x 85 x 45	2.33	
Theipa 10.0	M36 x 50	270	600	4.00	15.0	10.0	81	106	75	86	23 x 115 x 60	3.72	
Theipa 12.5	M42 x 50	270	700	4.50	15.0	12.5	81	106	75	86	23 x 115 x 60	3.82	

1 For a one-off transport process, hand-tighten with wrench until flush on the contact surface.
2 If the sling point permanently remains in the load or is used for rotating and turning of loads.
Other thread diameters, lengths and designs (in inches and round thread) on request.

Sling type									
Number of sling points		1	1	2	2	2	2	3 or 4	
Inclination angle		0°	90°	0°	90°	0°-45°	46°-60°	0°-45°	46°-60°
Type	Thread	Load capacity t							
Theipa 0.7	M12	1.40	0.70	2.80	1.40	1.00	0.70	1.40	1.00
Theipa 1.4	M16	2.80	1.40	5.60	2.80	2.00	1.40	3.00	2.12
Theipa 2.5	M20	5.00	2.50	10.00	5.00	3.55	2.50	5.30	3.75
Theipa 4.0	M24	8.00	4.00	16.00	8.00	5.60	4.00	8.50	6.00
Theipa 6.7	M30	12.00	6.70	24.00	13.40	9.50	6.70	14.00	10.00
Theipa 10.0	M36	15.00	10.00	30.00	20.00	14.00	10.00	21.20	15.00
Theipa 12.5	M42	15.00	12.50	30.00	25.00	17.00	12.50	25.00	18.00

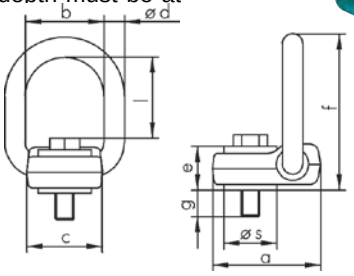
For asymmetrical load distribution, the load capacities for 1 strand at 90° applies for the 2- and 3/4-strand slings. Please note the usage temperatures allowed, see page 65 and the operating instructions!

Sling point FP

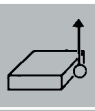
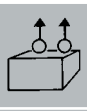
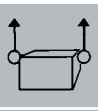
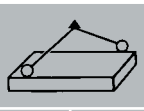
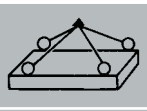
Very small build height, can be rotated through 360² (not under load), receiving link has 110² swivel range, delivery includes attachment screw, provides 4x safety against breakage in all directions.

Hand tighten with wrench or spanner until flush to the contact surface, which must be flat and level. Check correct screw and thread sizes, and screw-in length. For blind holes the thread depth must be at least 1.1x screw-in length. In crack-proof design, only use screws of strength class 10.9. Use of other screws than those supplied invalidates all liability for accidents or guarantees. Minimum recommended screw lengths:

- m Steel; 1 x d
- m Cast iron; .25 x d (for casting strengths < 200MPa 1.5 x d)
- m Aluminium; 2x d
- m Aluminium-magnesium alloys 2.5 x d



Type	Thread	Tightening torque	Load capacity		a	b	c	diameter d	e	f	g	l	diameter s	Weight	Price per item
		Nm	0° t	90° t	mm	mm	mm	mm	mm	mm	mm	mm	mm	kg	EUR
FP 0.5	M 10 x 40	40	0.50	0.70	69	50	48	13.0	28.0	100	12.0	52	34	0.71	
FP 0.8	M 12 x 45	65	0.80	1.25	69	50	48	13.0	28.0	100	17.0	51	34	0.73	
FP 1.5	M 16 x 55	160	1.50	2.12	69	50	48	13.0	28.0	100	27.0	49	34	0.77	
FP 2.5	M 20 x 70	250	2.50	3.55	69	50	48	13.0	28.0	100	42.0	46	34	0.86	
FP 4-S	M 24 x 80	300	4.00	4.00	69	50	48	13.0	30.0	100	50.0	42	34	0.98	
FP 4	M 24 x 80	300	4.00	5.60	104	76	72	18.0	39.0	147	41.0	74	58	2.50	
FP 5	M 27 x 90	400	5.30	7.10	104	76	72	18.0	39.0	147	51.0	72	58	2.63	
FP 6	M 30 x 90	600	6.00	8.00	104	76	72	18.0	39.0	147	51.0	70	58	2.74	
FP 8	M 36 x 100	600	8.00	8.00	104	76	72	18.0	43.0	147	57.0	62	58	3.15	
FP 10	M 42 x 110	1000	10.00	15.00	160	107	99	34.5	65.3	236	44.5	110	90	10.40	**on request**
FP 15	M 48 x 120	2000	15.00	20.00	160	107	99	34.5	65.5	236	54.4	106	90	11.00	**on request**

Sling type									
Number of sling points		1	1	2	2	2	2	3 or 4	
Inclination angle		0°	90°	0°	90°	0°-45°	46°-60°	0°-45°	46°-60°
Type	Thread	Load capacity t							
FP 0.5	M10	0.50	0.70	1.00	1.40	0.70	0.50	1.00	0.70
FP 0.8	M12	0.80	1.25	1.60	2.50	1.12	0.80	1.60	1.12
FP 1.5	M16	1.50	2.12	3.00	4.00	2.00	1.50	3.15	2.24
FP 2.5	M 20	2.50	3.55	5.00	7.10	3.35	2.50	5.00	3.75
FP 4-S	M 24	4.00	4.00	8.00	8.00	5.60	4.00	8.00	6.00
FP 4	M 24	4.00	5.60	8.00	11.20	5.60	4.00	8.00	6.00
FP 5	M 27	5.30	7.10	10.60	14.00	7.10	5.30	11.20	8.00
FP 6	M 30	6.00	8.00	12.00	16.00	8.00	6.00	12.50	9.00
FP 8	M 36	8.00	8.00	16.00	16.00	11.20	8.00	16.80	12.00
FP 10	M 42	10.00	15.00	20.00	30.00	14.00	10.00	21.20	15.00
FP 15	M 48	15.00	20.00	30.00	40.00	21.20	15.00	31.50	22.40

For asymmetrical load distribution, the load capacities for 1 strand at 90° applies for the 2- and 3/4-strand slings. Please note the usage temperatures allowed, see page 65 and the operating instructions!

Sling point type CM08WLP for attachment welding

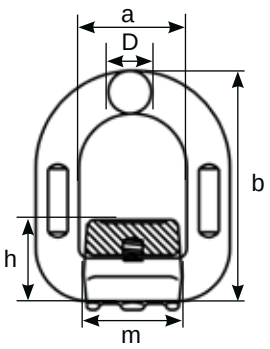
180° or 270° bracket swivel range,

Note the following points when welding:

- m Welding must be carried out by an approved welder in line with EN-287-1.
- m Base plate material must be St 52-3 (1.0570)
- m Before welding ensure that the surface to be welded is thoroughly clean and free of moisture, dirt, oil, paint and scale.
- m Ensure there is no contact between the red bracket and weld metal.
- m The assembly can be annealed several times at 600°C without reducing the load capacity.
- m Welding components must be suitable for force distribution.
- m Spacers provide clearance for the necessary air gap for foot welding (approx. 3mm)

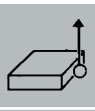
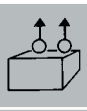
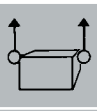
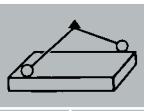
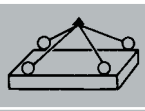
During welding (permanent HV), ensure the following as required by DIN 18000 steel structures:

For external points or special corrosion risk, welding seams should be continuous fillet welds. The HV weld seam on the LBS ensures connection across the entire material face, so that the fully enclosed seam prevents corrosion.



Transverse bracket loading to the swivel level is permitted but should not be provided as a standard load. Only attach to vehicles with the manufacturer's approval.
Observe EN 12640 lashing points on commercial vehicles!

Type	Load capacity		a	b	D	m	h	Weight	Price per item
	0°	90°							
	t		mm	mm	mm	mm	mm	kg/pc.	EUR
CM08WLP-01	1.60	1.12	41	78.5	13.0	37.0	35	0.40	
CM08WLP-02	3.00	2.00	42	88.0	14.0	40.0	37	0.47	
CM08WLP-03	4.75	3.15	45	94.0	17.0	42.5	40	0.69	
CM08WLP-05	8.00	5.30	55	118.0	22.0	61.0	52	1.46	
CM08WLP-08	12.00	8.00	70	141.0	26.5	70.5	57	2.50	
CM08WLP-15	22.40	15.00	97	188.0	34.0	90.0	77	5.79	

Sling type								
Number of sling points	1	1	2	2	2	2	3 or 4	
Inclination angle	0°	90°	0°	90°	0°-45°	46°-60°	0°-45°	46°-60°
Type	Load capacity t							
CM08WLP-01	1.60	1.12	3.20	2.24	1.50	1.12	2.36	1.60
CM08WLP-02	3.00	2.00	6.00	4.00	2.80	2.00	4.00	3.00
CM08WLP-03	4.75	3.15	9.50	6.30	4.25	3.15	6.30	4.75
CM08WLP-05	8.00	5.30	16.00	10.60	7.10	5.30	11.20	8.00
CM08WLP-08	12.00	8.00	24.00	16.00	11.20	8.00	16.00	12.00
CM08WLP-15	22.40	15.00	45.00	30.00	21.20	15.00	31.50	22.40

For asymmetrical load distribution for the 2- and 3/4-strand chain slings, the load capacities for 1 strand at 90° apply. For welding instructions see page 306 and the operating instructions!
Loading of the bracket transverse to the swivel level is permitted but should not be provided as standard load direction!

Crossarms

User instructions

The following instructions only provide a general overview of crossbeam usage and do not replace the equipment manufacturer's operation instructions.

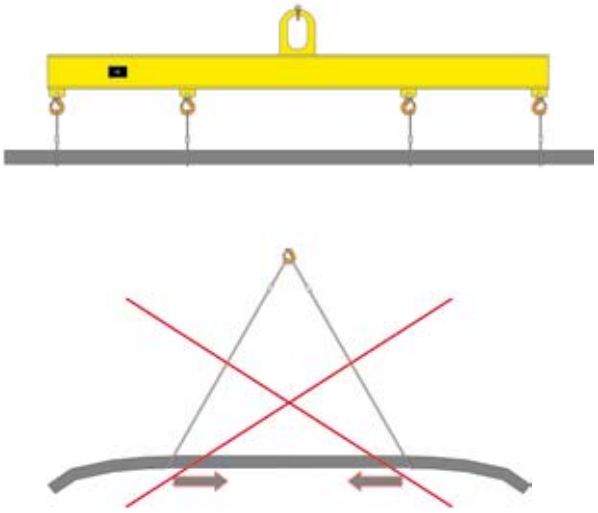
Please also read our general user instructions for load carrying equipment and slings.

All lifting operations should only be carried out by an approved rigger.

Crossbeams are design to carry longer and bulky loads, avoiding the use of slings with large inclination angles and related risks of overloading; or where they can come together causing an unstable or falling load.

Sagging on longer loads is prevented as the load can be carried on the crossbar's optimum points. Loads which sag slightly can

also be slung on multiple points with suitable crossbar configurations. The crane's lift height can also be used with a crossbar to hold the load horizontal, keeping the sling length short.



Delivery condition

The shape and configuration of the load carrying device may not be modified by bending, welding, grinding, disassembly, drilling holes, removal of safety features such as locks, bolts and safety pins, without the manufacturer's approval. Such actions may invalidate any liability or warranty on the part of the manufacturer.

Limits of use

Temperature
Crossbars can be used from -40°C to +100°C. (Depending on the details shown in the manufacturer's instructions).

Impact and swinging loads
Stated load capacities assume impact-free operation. Slight impacts such as those incurred by raising, lowering or moving the load are allowed. Users should ensure they avoid strong impacts and swinging loads.

Carrying personnel
Carrying personnel on any load carrying device that are not specifically approved and tested for this purpose is strictly forbidden and is dangerous. This includes TIGRIP crossbars.

Dangerous conditions
Crossbars should not be used in extreme environments such as galvanising or acid baths, high temperature ovens or carrying molten metal, caustic substances or radioactive material, without the manufacturer's approval or special measures as specified by an expert adviser.

Selecting the right crossbar for type and condition of material

m The single crossbar is only suitable for carrying items whose centre of gravity is directly below the suspension eyelet and cannot be adjusted for different load lengths.

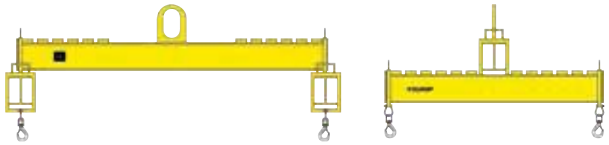
m If the centre of gravity does not lie under the suspension eye this may allow the load to lean which is not approved.

m The single crossbar with range adjustment can be adjusted longitudinally and is therefore suitable for carrying items whose longitudinal centre of gravity does not lie below the suspension eyelet. The resulting crossbar angle can therefore be adjusted.

m The crossbar is suitable for carrying large items provided the centre of gravity lies directly under the suspension eye. However it cannot be adjusted for different load sizes and should not be used for this purpose.

m When placing the load on the sling ensure that at least three sling points on the crossbar are evenly loaded.

m The crossbar with range adjustment can be used for carrying large items by adjusting the load longitudinally and transversely. It can therefore be used for items whose centre of gravity does not lie under the suspension eyelet. The resulting crossbar slope angle can be balanced within the range of adjustment for both axes. Ensure that at least three sling points on the crossbar are evenly loaded.



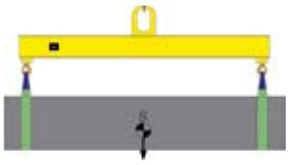
For further guidance on the load's centre of gravity and the danger of tipping, please see the chapter on general user instructions for load carrying and slings.

Before starting work please check

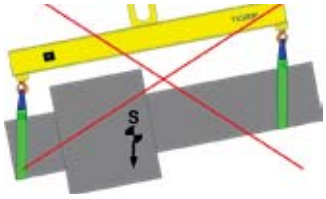
- That the crossbar corresponds with the order;
- That the conformity declaration or test certificate are provided;
- The labelling and load capacity details match those on the declaration or test certificate;
- Users have read the operating and installation instructions
- Use only undamaged crossbars with legible signs and load capacities. Carry out a visual inspection before the first and every use for obvious defects or damage.
- Do not use any device which is known to have been overloaded or damaged. It should be excluded from further use and only be re-used after inspection and repair.

m Standing under a raised load is dangerous and must not be allowed.

m The load carrying device must be placed above the load's centre of gravity, to ensure that it cannot swing when being lifted. For crossbars without adjustment options the centre of gravity must be immediately under the eyelet or crane hook.

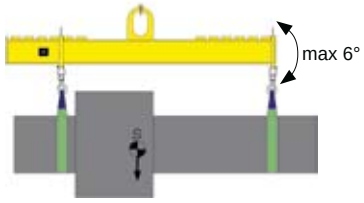


m For crossbars with an adjustment option the centre of gravity must be determined in advance and adjustable sling points correspondingly suspended on the longitudinal and transverse crossbars. The load will be connected by cable, chain or lifting straps with the load hook slightly above the ground. If the crossbar slopes the load must be lowered and the position of the load hook adjusted as required.



m The load can only be carried if the crossbar stays horizontal (or with a maximum 6° angle of slope) during a further lifting attempt. Make sure that the load carrying device can be operated so that the rigger is not in danger from the device, the sling or the load.

Maximum permissible angle of slope at the suspension points:



Use instructions

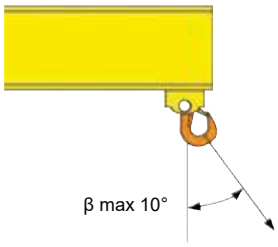
m The crossbar lifting ring must have sufficient crane hook space to move freely.

m The specified load capacity (WLL) is its maximum load and must not be exceeded.

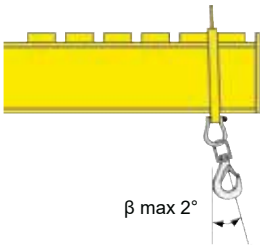
m The weight of the crossbar and slings must be added to the load weight when calculating the load capacity of the crane or lifting equipment. According to EN 13155 the weight of these items must be specified by the manufacturer on the load carrying device if it is over 50kg or more than 5% of the load capacity.

m Avoid lifting and moving loads if there are people in the vicinity.

Crossbars with fixed load hooks



Crossbars with adjustable load hook bracket



m The operator may begin to load only when certain that the load is correctly slung and that there is no-one in the danger area.

- Only ever carry one load or a securely tied unit of loads. Do not carry any loads that could move, come loose or fall while being moved. Do not leave loads unattended when suspended or tensioned.

- When raising or lowering, check that the load remains stable so that items do not roll or fall off, or come into contact with other loads stored nearby or below. The load carrying device is to be taken out of operation immediately in the event of functional faults.

Maintenance, testing and repairs

- Load carrying devices are to be kept in an operationally safe condition in accordance with regulations and the manufacturer's instructions (section 16 AMVO). Paint damage should be touched up to prevent corrosion and all joints and glide surfaces lightly oiled or greased.

- Regular inspections of all load carrying devices should be carried out at least once a year or more frequently for heavy usage applications, according to section 8 (13) AMVO.

- After an accident or similar occurrence such as falling load, exposure to heat, corrosive material or anything that could potential cause damage, slings must be inspected in line with AMVO section 9.1.

- Full inspection and maintenance records must be kept. Inspection mainly means visual and functional testing to check for damage, wear, corrosion or other changes to the condition of the device, as well as all safety-critical components and functions. Special attention should be paid to weld seams and load-bearing components such as eyelets, carrier bolts with bolt passages, for evidence of cracks or wear.

- Component repair or replacement is essential if any visible damage is apparent or if the material thickness of any component has been reduced by more than 10% from its nominal thickness.

- The operator is responsible for ensuring that inspections are carried out.

- Repairs and overhauls may only be carried out by the manufacturer or authorised personnel using original spare parts.

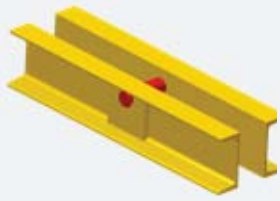
- Uses can send any load carrying device back to us or have our mobile lifting technology and inspection service carry out on-site inspection and repair.

Crossbar range

Bulkier or heavier loads must be carried on multiple points to ensure safe weight distribution and less sagging. Our extensive range provides a vast choice of load capacities, working widths, adjustment ranges and hook types to cater for the great majority of applications. In addition to our quality-engineered, robust and cost-effective standard range, we can also provide special designs to meet individual, bespoke customer requirements.

Options include side welding hooks (so-called cow horns), that take rope loops or lifting bands' crane eye for carrying pipes. Rolls or rollers on two or more points; star crossbars for carrying cylindrical items, or transverse crossbars for four point suspension, a further version of the reliable, easy to use and safe Tipgrip crane hook crossbars.

Crossbars can be used for a diverse range of shapes and designs, and can be individually designed to meet specific applications. The following illustrations provide a short overview of the many designs available. Suspension and load carrying variants can be easily combined with most designs.

Suspension variants	
Eyelet suspension Standard suspension for use with single hooks according to DIN 15401 Possible for defined load centre of gravity for symmetrical but also asymmetrical loads.	
Chain suspension To stabilise swinging movements Multitude of options in combination with our chain programme. Lifting ring for single hooks but also double hooks Shortening hooks allow the centre of gravity to be adjusted for asymmetrical loads.	
Internal bolt suspension To reduce the build height Fixed welded-on but also plug-in variants possible	
Double eyelet suspension for two crane operation Allows the transition crossbar to be used on two cranes at the same time. Each suspension variant can be operated as a double suspension.	
Bracket suspension For use with double hooks according to DIN 15402	

Load carrying variants

Eyehooks with forged safety latch

For use with any sling or sling points

Swivel hooks

Allows alignment of the hook to the sling point.
Variants possible with plain-bearing mounted swivel (cannot be rotated under load) and also ball-bearing mounted swivel (can be rotated under load)

Front welded-on hook (cow horn with safety latch)

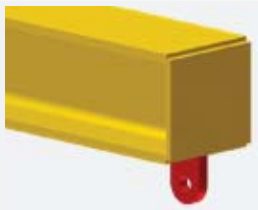
To reduce the height on single crossbars

Welded-on hooks (cow horns with safety latch)

For use with two single-stranded or singly wrapped sling
Also possible with adjusting bracket

Mounting eyelets for fixed slings

With the mounting eyelets, the crossbars can be combined with any slings from our program.



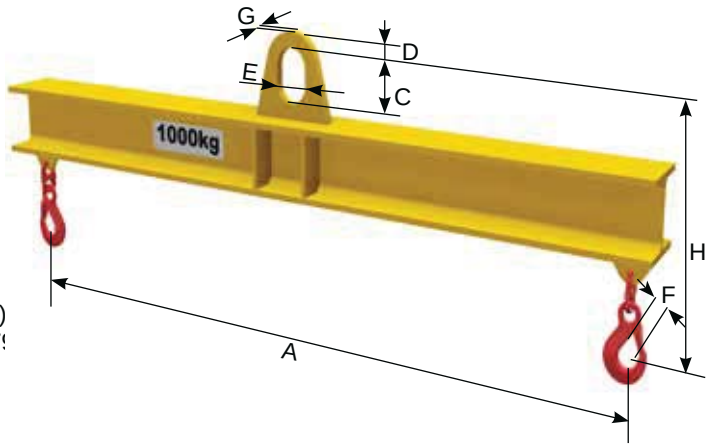
Centre hooks

For crane use if the crossbar is not required.
With the centre hook there is no need to place and remove the crossbar.
Variants possible as eyehooks or swivel hooks

Crossarms

TIGRIP® Single crossbar TTS-E

Load capacity 1 - 10 t



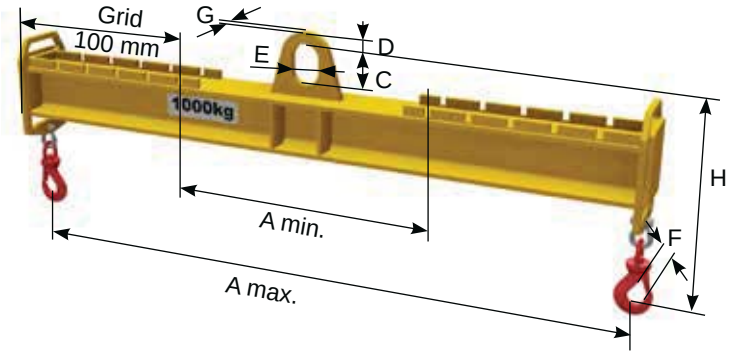
Processing and equipping
- For the transport of symmetrical loads
- Mounting lash for single hook according to DIN 15401
- Eyehook with forged safety latch

Optional:
- Can be combined with any suspension variant (see page 78)
- Can be combined with any load carrying variant (see page 7
- Other load capacities
- Working widths according to customer requirement
- Eccentric suspension for asymmetrical loads

Type	Load capacity	Grab width A	Height H	Crane hook eyelet			Hook mouth F	g	Weight	EAN no. 4025092*	Price per item
				c	D	e					
	t	mm	mm	mm	mm	mm	mm	mm	kg		EUR
TTS 1.0/1000 E	1.00	1,000	405	110	25	60	23	15	23	*552905	
TTS 2.0/1000 E	2.00	1,000	430	135	30	75	23	20	25	*554534	
TTS 3.0/1000 E	3.00	1,000	500	160	35	90	30	25	28	*552813	
TTS 5.0/1000 E	5.00	1,000	615	180	40	100	38	30	41	*554541	
TTS 7.5/1000 E	7.50	1,000	720	200	60	130	42	30	50	*554558	
TTS 10.0/1000 E	10.00	1,000	800	260	70	130	42	30	61	*554565	
TTS 1.0/2500 E	1.00	2,500	405	110	25	60	23	15	46	*554602	
TTS 2.0/2500 E	2.00	2,500	470	135	30	75	23	20	69	*552769	
TTS 3.0/2500 E	3.00	2,500	560	160	35	90	30	25	88	*552202	
TTS 5.0/2500 E	5.00	2,500	655	180	40	100	38	30	106	*552493	
TTS 7.5/2500 E	7.50	2,500	780	200	60	130	42	30	148	*554619	
TTS 10.0/2500 E	10.00	2,500	860	260	70	130	42	30	181	*554626	
TTS 1.0/5000 E	1.00	5,000	475	110	25	60	23	15	163	*554688	
TTS 2.0/5000 E	2.00	5,000	510	135	30	75	23	20	189	*552523	
TTS 3.0/5000 E	3.00	5,000	600	160	35	90	30	25	223	*554695	
TTS 5.0/5000 E	5.00	5,000	715	180	40	100	38	30	295	*554701	
TTS 7.5/5000 E	7.50	5,000	820	200	60	130	42	30	372	*554718	
TTS 10.0/5000 E	10.00	5,000	920	260	70	130	42	30	478	*554725	

Adjustable crossbar TTS

Load capacity 1 - 25 t



Processing and equipping

- For the transport of symmetrical and asymmetrical loads
- Mounting lash for single hook according to DIN 15401
- Adjustment by means of snap
- Adjustment bracket with handle and swivel hook (cannot be rotated under load)

Optional:

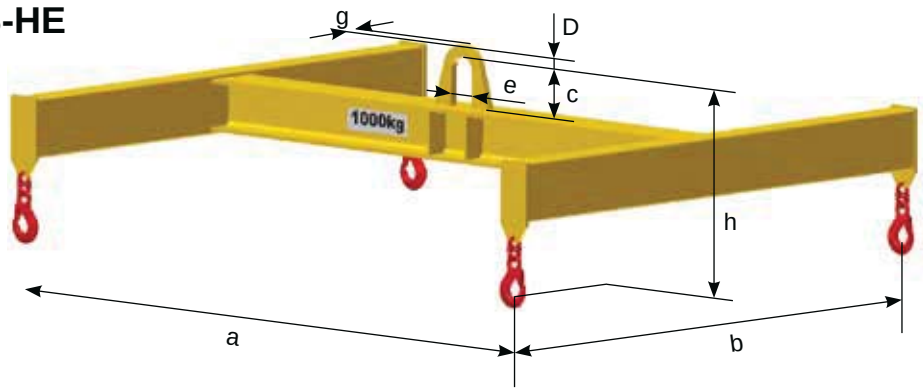
- Can be combined with any suspension variant (see page 78)
- Can be combined with any load carrying variant (see page 79)
- Other load capacities
- Working widths according to customer requirement

Type	Load capacity	Grab width A	Height H	Crane hook eyelet			Hook mouth F	g	Weight	EAN no. 4025092*	Price per item
				c	D	e					
	t	mm	mm	mm	mm	mm	mm	mm	kg		EUR
TTS 1.0/1500	1.00	700-1,500	440	110	25	60	18	15	40	*552646	
TTS 2.0/1500	2.00	700-1,500	470	135	30	75	18	20	41	*552295	
TTS 3.0/1500	3.00	700-1,500	570	160	35	90	21	25	53	*553988	
TTS 5.0/1500	5.00	700-1,500	655	180	40	100	23	30	79	*551281	
TTS 7.5/1500	7.50	700-1,500	740	200	60	130	32	30	98	*553995	
TTS 10.0/1500	10.00	700-1,500	835	260	70	130	32	30	117	*552219	
TTS 12.5/1500	12.50	700-1,500	865	260	75	140	40	30	116	*554008	
TTS 15.0/1500	15.00	700-1,500	910	260	85	140	40	30	137	*554015	
TTS 20.0/1500	20.00	700-1,500	1020	260	90	160	50	40	180	*554022	
TTS 25.0/1500	25.00	700-1,500	1230	300	100	160	50	40	226	*554039	
TTS 1.0/2500	1.00	1,500-2,500	440	110	25	60	18	15	58	*554046	
TTS 2.0/2500	2.00	1,500-2,500	505	135	30	75	18	20	84	*552158	
TTS 3.0/2500	3.00	1,500-2,500	610	160	35	90	21	25	105	*552448	
TTS 5.0/2500	5.00	1,500-2,500	675	180	40	100	23	30	127	*552424	
TTS 7.5/2500	7.50	1,500-2,500	785	200	60	130	32	30	178	*554053	
TTS 10.0/2500	10.00	1,500-2,500	880	260	70	130	32	30	215	*554060	
TTS 12.5/2500	12.50	1,500-2,500	915	260	75	140	40	30	198	*554077	
TTS 15.0/2500	15.00	1,500-2,500	955	260	85	140	40	30	237	*554084	
TTS 20.0/2500	20.00	1,500-2,500	1060	260	90	160	50	40	287	*554091	
TTS 25.0/2500	25.00	1,500-2,500	1255	300	100	160	50	40	342	*554107	
TTS 1.0/5000	1.00	2,000-5,000	495	110	25	60	18	15	190	*554367	
TTS 2.0/5000	2.00	2,000-5,000	550	135	30	75	18	20	219	*554374	
TTS 3.0/5000	3.00	2,000-5,000	655	160	35	90	21	25	260	*554381	
TTS 5.0/5000	5.00	2,000-5,000	740	180	40	100	23	30	372	*554398	
TTS 7.5/5000	7.50	2,000-5,000	830	200	60	130	32	30	423	*554404	
TTS 10.0/5000	10.00	2,000-5,000	950	260	70	130	32	30	531	*554411	
TTS 12.5/5000	12.50	2,000-5,000	980	260	75	140	40	30	449	*554428	
TTS 15.0/5000	15.00	2,000-5,000	1025	260	85	140	40	30	568	*554435	
TTS 20.0/5000	20.00	2,000-5,000	1155	260	90	160	50	40	691	*554442	

Crossarms

TIGRIP® H-crossbar TTS-HE

Load capacity up to 10 t

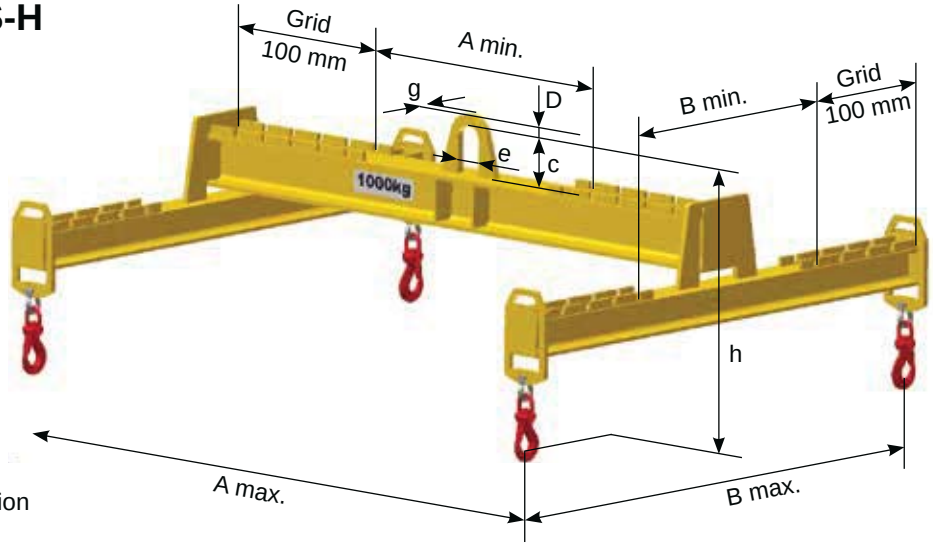


Processing and equipping
- m For the transport of symmetrical loads
- m Mounting lash for single hook according to DIN 15401
- m Eyehook with forged safety latch

Optional:
- m Can be combined with any suspension variant (see page 78)
- m Can be combined with any load-carrying variant (see page 79)
- m Other load capacities
- m Working widths and working lengths according to customer requirement
- m Eccentric suspension for asymmetrical loads

TIGRIP® H-crossbar TTS-H

Load capacity up to 25 t



Processing and equipping
- m For the transport of symmetrical and asymmetrical loads
- m Mounting lash for simple hook according to DIN 15401
- m Adjustment by means of snap
- m Adjustment bracket with handle and swivel hook (cannot be rotated under load)

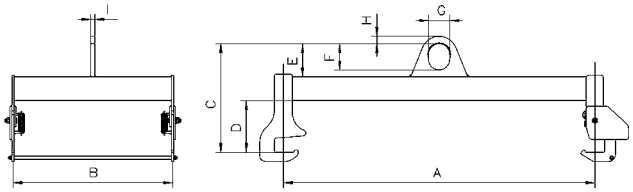
Optional:
- m Can be combined with any suspension variant (see page 78)
- m Can be combined with any load carrying variant (see page 79)
- m Other load capacities
- m Working widths and working lengths according to customer requirement

TIGRIP® Lattice box crossbars TTS

Standard lattice boxes which should be used with fork lift trucks in line with DIN 15155 are sufficiently stable that they can be safely carried by crossbar hooks attached to the upper frame, for lifting by crane.
The Tigrip lattice box crossbar also provides for carrying pipes, semi-finished and finished small parts which means that goods receipt and dispatch no longer need to rely on fork lift trucks.

Individual version has two fixed swivelling suspension brackets and two with a handlebar, which can be latched or released in the lattice box by one rigger.

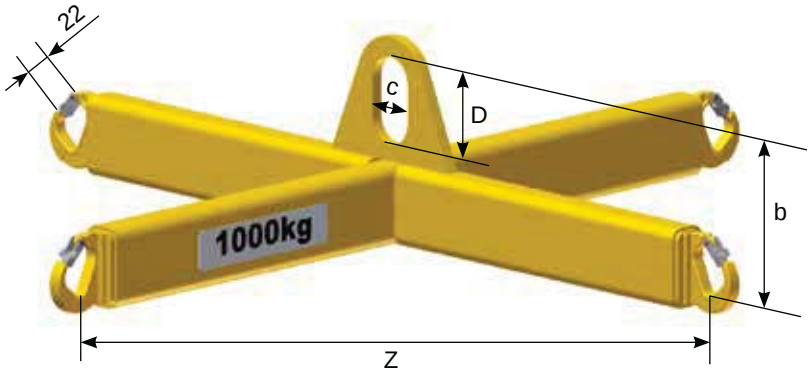
When using the lattice box crossbar, the crossbar hooks must always be suspended on the upper frame of the lattice boxes.



Type	Load capacity	Weight	a	b	c	D	e	f	g	h	l	EAN no. 4025092*	Price per item
	t		mm	mm	mm	mm	mm	mm	mm	mm	mm		EUR
TTS 1.0/1240 - 810	1.00	38.0	1175	600	410	195	125	100	80	28	15	*551595	
TTS 2.0/1240 - 810	2.00	61.0	1175	600	495	215	180	150	100	30	20	*551236	
TTS 3.0/1240 - 810	3.00	80.0	1175	600	520	215	205	170	130	40	25	*553742	

TIGRIP® Big-ag crossbar TTB

Transverse crossbars in closed frame design with welded-on hook and safety latch for the suspension and transport of big bags.



Type	Load capacity	Working area Z	Weight	b	c	D	EAN no. 4025092*	Price per item
	t	mm	mm	mm	mm	mm		EUR
TTB 1.0/1090 - 1090	1.00	750 - 800	27.0	210	60	110	*556293	
TTB 1.0/1320 - 1320	1.00	900 - 970	33.0	210	60	110	*556316	
TTB 2.0/1090 - 1090	2.00	750 - 800	42.0	240	75	135	*556330	
TTB 2.0/1320 - 1320	2.00	900 - 970	44.0	240	75	135	*556354	

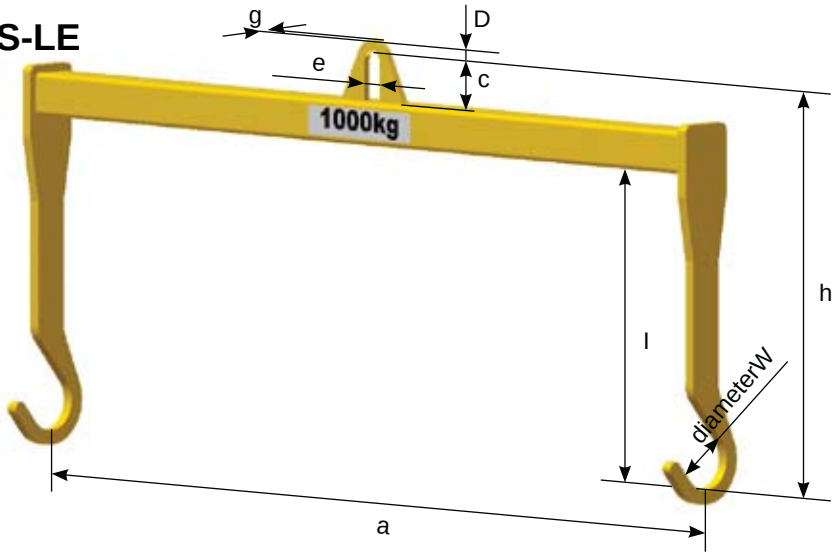
Crossarms

TIGRIP® Long hook crossbar TTS-LE

Load capacity up to 10 t

Processing and equipping
- m For the transport of symmetrical, cylindrical loads
- m Mounting strap for single hook according to DIN 15401
- m Long hooks according to customer requirements

Optional:
- m Can be combined with any suspension variant (see page 78)
- m Other load capacities
- m Working widths according to customer requirement
- m Eccentric suspension for asymmetrical loads

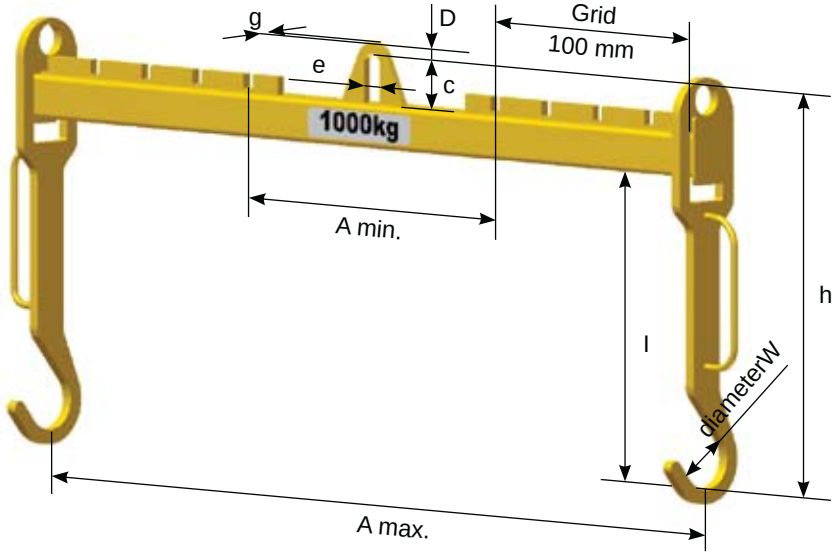


TIGRIP® Long hook crossbar TTS-L

Load capacity up to 10 t

Processing and equipping
- m For the transport of symmetrical and asymmetrical, cylindrical loads
- m Mounting strap for single hook according to DIN 15401
- m Long hooks according to customer requirements

Optional:
- m Can be combined with any suspension variant (see page 78)
- m Other load capacities
- m Working width according to customer requirements



TIGRIP® Spreader crossbar TTS-SPE

Processing and equipping
m Rigid for fixed working area
m Mounting eyelets for sling

Optional:
m Other load capacities
m Working width according to customer requirements

TIGRIP® Telescoping spreader crossbar TTS-SP

Processing and equipping
m Telescoping by means of positioning bolts for adjustment to the working area
m Mounting eyelets for sling

Optional:
m Other load capacities
m Working width according to customer requirements

General instructions for the use of load carrying devices and slings

The following instructions relate to the slinging and transportation of loads in trade and industry. For applications or loads which present special dangers, such as the transport of people, dangerous materials, liquid metals, irritating substances, nuclear material etc., corresponding measures must be taken by an expert or the load capacities lowered accordingly. In areas of application in which own regulations apply, such as in the area of platform technology, these instructions are not applicable. The legal regulations applicable in Austria were applied!

Definitions

Load carrying devices
Components that are not fixed to the lifting device, which are attached between crane or lifting gear hook to securely bear the load.
E.g. crossbars, lifting clamps, C-hooks, grippers, loading forks.

Examples:



Slings
Load carrying devices which can also work in a noose procedure (through formation of a loop) e.g. rope slings, chains or textile slings.

Examples:



Expert
(Definition from the Austrian working equipment regulation, the term of experts that is used, for example, in European standards.)
Experts in the sense of this regulation are persons who possess the required specialist knowledge and professional experience and also offer the guarantee of a certain performance of the work transferred to them. Company employees can also be deployed as expert persons.

Competent person
(Definition from EN 818-1)
A person equipped through specialist knowledge, practical experience and training, who can perform the inspections required when given the necessary directions.

Requirements for the rigger

The rigger must be trained by the employer and possess the required knowledge to safely sling the load on the crane hook. There is no prescribed training or testing for this such as for crane drivers of certain crane systems. For ground controller crane, the crane driver is often also the rigger and in this case must possess alongside the driver's license for the crane the required specialist knowledge of both areas. The employer must ensure the required training and instruction.

When the rigger has to train the crane driver (see ÖNORM M9624) to guarantee a safe transport of the load, they must master the communication symbols and know about the planned course of the transport. For a group of riggers only one person may always instruct. This person is to be made known to the crane driver by a suitable aid (e.g. helmet colour, labelling of a signal arm...).

The crane driver is then only not bound to the instructions if they contradict applicable regulations or in case of imminent danger.

The personal protective equipment of a rigger usually consists of head protection (helmet), protective gloves, work shoes with steel toecaps and poss. a puncture-proof sole (e.g. when using nails on supplementary wood) and hearing protection in noisy areas. For certain work also further personal protective equipment, such as against falling, may be required.

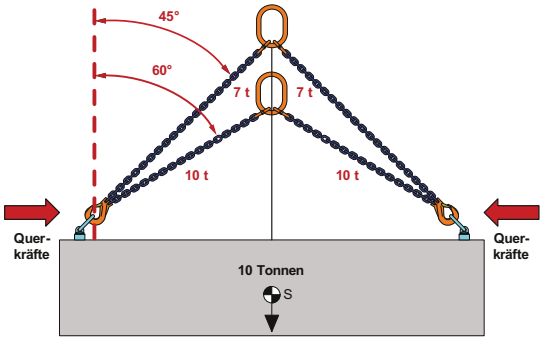
Example of the course of a safe crane transport:

- The planned transport paths must be clear and possibly secured.
- The unloading point is to be prepared and to be checked. (Load capacity, space conditions, prepare wooden underlays or other required aids).
- Determine the weight of the load. The crane driver must be informed of the load weight.
- Select suitable sling type.
- Select suitable load carrying device and/or slings and accessories, e.g. edge protector. Note inclination angle, slinging in noose process, asymmetry of the load, high temperatures etc., and, if necessary, decrease the load capacity of the load carrier or sling.
- Check the load carrier and/or sling and the sling points for obvious defects.
- Determine the position of the centre of gravity and position the crane hook over it.
- Slinging the load in the selected sling type. Hang unused strands in the lifting ring back up, so that they do not swing freely or do not snag accidentally during transport.
- The lifting ring in the crane hook and the hook-in sling point must move freely. Load hooks may only be loaded in the hook base and never on the tip. Hook tips should be aligned outwards.
- An accidental unhooking of the load carrier and/or sling must be prevented on the crane hook as well as on the load.
- The strands of the sling must be free of twists or knots.
- Never reach under strappings or between sling and load. Crushing risk, e.g. from accidental raising of the load during this process!
- Before lifting, ensure that the load moves freely.
- When raising or lowering, watch out for the stable position of the load in order to prevent accidents due to toppling, rolling or falling. This also applies for loads that are stored next to or below!
- Always only transport one load or a securely consolidated unit of loads. NO transportation of unsecured loads that could move, come loose and fall down during transportation!
- The operator may then only initiate a load movement, when he has convinced himself of that the load is correctly slung and that neither they nor anybody else remains within the danger area.
- If necessary, bystanders must be informed or warned before the transport is carried out. In general the following applies: No unnecessary stays in the danger area during crane operation!
- When using load carrying devices, which for example through magnetic, suction or frictional forces hold the load without additional positive locking devices, fundamentally the load acc. to the working appliance regulation section 18 (6) must not be lifted above people.
- Carry out test lifts and for loads that hang lopsided determine the correct centre of gravity position and re-sling. Slowly tighten loose hanging slings, so that impact loads are avoided.
- Instruction of the crane driver during the transport only given by one person.
- If the load has to be guided or positioned by the rigger (wind, danger of twisting, impact...), always go outside the danger area.. Never in front of the load!
- For larger lift heights or when a larger danger area is presented, guide the load with guide ropes to maintain the required distance.
- Carefully put down the load on the prepared put down location. Suitable wooden underlays must be used in suspension or noose processes. The load must not be directly applied on the sling.
- Watch out for danger area when putting the load down especially when stacking loads, which then increases it severely. Check the stability of the load (e.g. tilt danger) before the load carrier or sling are being eased.
- When the load - e.g. a bundle of pipes - is not consolidated into a unit, instead was bundled by the noose process, for example, suitable measures must be made, so that when putting down the individual parts of the load, they cannot roll away uncontrolled, slip, tip or fall down from the stack.
- Removal of the sling from the load - stuck strands may not be freed or pulled free with force! Otherwise there is a risk of the load tipping, damage to the load and/or the sling. If necessary re-sling the load and re-position the wooden underlays!
- If the sling remains on the crane hook, hang the hook back in the lifting ring.

Note degrees of inclination

When using multi-strand slings, ensure that the sling points and the length of the slings operate at angles within the limits shown on the load capacity label. All incline angles should be the same and at least 15° so that the load hangs in a stable position and the weight is evenly distributed.
The angle must never exceed 60° and the load hook from which the sling is suspended should be directly above the load's centre of gravity. For larger angles the load to be lifted will be subject to higher forces through the angle, so the sling points and load must remain stable to ensure safe handling.

For example:
A 10t load at a 45° inclination angle, each strand is subject to a 7t load.
At 60° inclination angle the load rises to 10t per strand,
which means the sling must be abler to handle double the actual load. (30% load capacity reduction up to 45° and 50% reduction up to 60°.)
Load capacity tables and tags already take these changes into consideration.



INCLINATION ANGLES OVER 60° ARE NOT ALLOWED!

An angle of 75% for example placed a load of 20t on each strand or four times the weight of the load, which is both inefficient and dangerous.
Every estimated or misjudged degree of the angle of inclination used results in a massive overloading of the sling!

Crossbars can be used to reduce large inclination angles!

Multi-strand slings where not all single stands are used

Make sure that strands that are not being used are hung in the suspension head to avoid accidental snagging.
The load capacity use reduced according to the number of strands used.
Either reduce the load capacity based on the tag data or work out the permitted load capacity for the lifting process with the effective number of strands using the load capacity table below. (See table data)

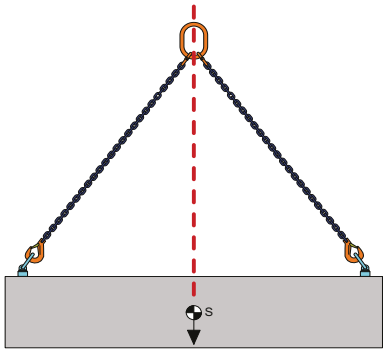
Total strand number of the sling	Number of the used (effective) strands	Usage factor to the load capacity specified
		Nm
Two strands	1	1/2
Three and four strands	2	2/3
Three and four strands	1	1/3
Four strands	3	Full load capacity

Note – position of Centre of Gravity

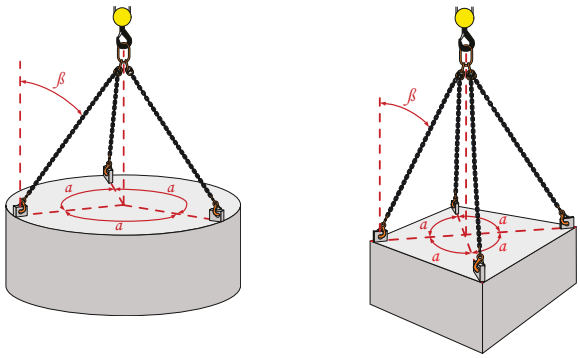
To lift a load and ensure it does not tilt, twist or turn, the crane hook must be positioned directly above the load's centre of gravity. The rigger must be able to identify the centre of gravity with the following conditions;

a) a) For single strand slings and chain slings, grommets, round slings and lifting bands, the sling point should lie directly above the centre of gravity;

b) b) For double-strand slings both sling points should be positioned directly above the centre of gravity

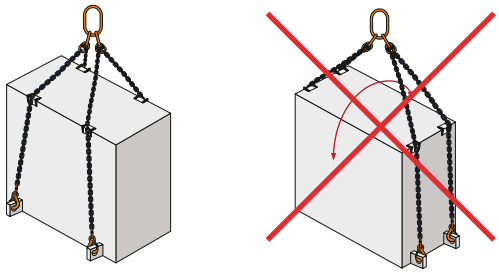


c) c) For three and four strand slings, the sling points should be evenly distributed and level around above the load centre of gravity.



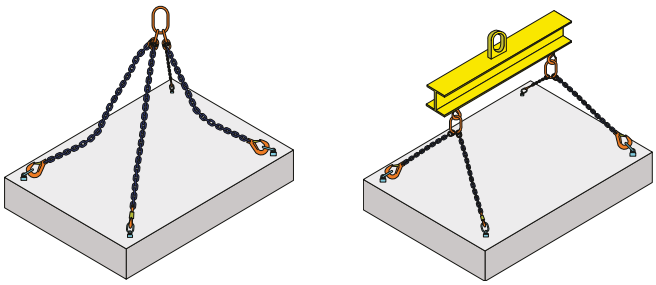
If the centre of gravity points are not known or identified, the rigger must estimate their position but carrying out a careful test lift just a few cm from the ground. If only one side of the load is raised, the load must be put down and the crane hook re-positioned. The only suitable slings for this operation must be adjustable to allow for the changed position of crossbars with adjustment range or chain slings with a shortening option. The centre of gravity is then within the area of the load which remains on the ground. The rigger may need to repeat this procedure until the load hangs horizontally.

For loads where the sling points are below the centre of gravity, ensure the load cannot slip or move position.

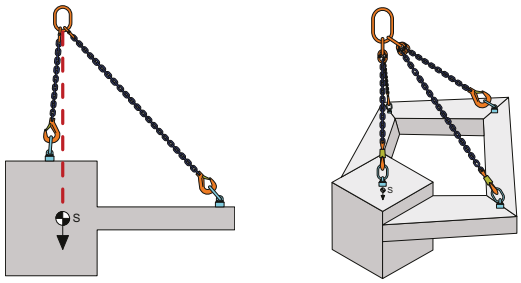


Note that the distribution of the sling points relative to the centre of gravity and number of strands remain symmetrical.

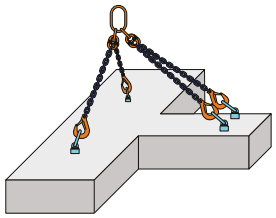
For symmetrically distributed, three or four point strand sling points for rigid loads such as steel plate or concrete panels, only two strands carry the load diagonally. The third strand holds the load in balance and the fourth performs no useful function.
In such cases where three or four strands are used, the item must be treated as a two strand load, taking into account the angle of inclination. Also the load itself and only two of all available sling points must be able to bear these forces!



Crossbars with two double strand hangers provide the option for even load distribution, which applies to rigid units with all strands. Using a crossbar reduces the angle of inclination, acts like a balance beam and prevents a diagonal load falling on just two strands.
For more flexible loads such as steel mesh the effect does not occur; the flexibility of the load balances out the small differences in strand lengths or small deviations in the distances of the sling points.



For multi strand string applications individual strands may adopt different inclination angles and the largest strain is placed on the single strand with the smallest angle.
In extreme cases a vertically hanging single strand will carry the whole load but this is dangerous as the load will be inherently unstable.
Where multi-strand slings where the string points are not evenly distributed, the full load capacity must not be assumed as the load will be shared unevenly on individual strands.

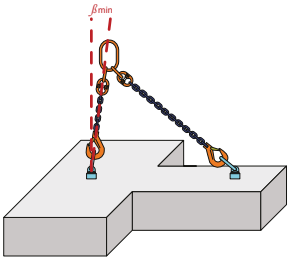


For unsymmetrical loads regardless of the number of strands, the load capacity of a single strand at 0° inclination is to be sued in line with the load capacity table.
If this value is not known, for double strand hangers work with an inclination angle of up to 60°, This corresponds to the load capacity of a single strand. For three and four strand hangers can as an aid the load capacity on the load capacity tag for the inclination angle 45° be reduced by half by the user. corresponding to the load for a single strand (the load factor of this specification of 2.1 halved results in 1.05 so fractionally, by 5% over the value of the single strand). That is why these values are always rounded off - not rounded up!

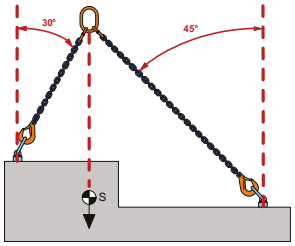
Given the relevant data and application details it is possible to work out the permissible load capacities for individual cases.

The load can be regarded as symmetrical if it meets the following conditions:

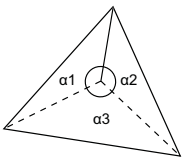
a) The load is less than 80% of specified load capacity of the load carrier or slings, and the smallest strand (ß min) inclination is at least 15°;



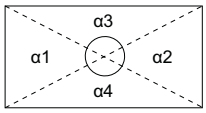
b) The largest (ß max) and the smallest (ß min) strand inclination angles do not deviate by more than 15°;



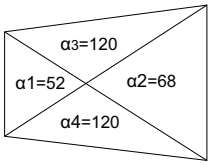
c) The angle of the sling points in the sling level see from above – i.e. the angles α1, α2 and α3 in a three strand hanger and the angle α1 to α2, and angle α3 to α4 in a four strand hanger, do not deviate by more than 15°.



Example:
Symmetrical distribution of the sling points in a three-stranded hanger - angles α 1, α 2 and α 3 are all the same (each 120°).



Example:
Symmetrical distribution of the sling points in a four-stranded hanger - angles α 1 and α 2 are the same size and angles α 3 and α 4 are the same.



Example:
Borderline case of a symmetrical distribution of sling points for a four-stranded hanger - angles α 1 and α 2 differ by 15° and angles α 3 and α 4 are the size.

For a four strand hanger the distribution of the sling points can be either square or rectangular.
In effect the load can be distributed on at least three strands (as shown for a four strand hanger in the load capacity calculations).

If the eccentric centre of gravity matches unevenly distributed sling points, the load can be lifted overlaid or reciprocally.

An almost vertically hanging strand in a multi-strand hanger bears almost the whole load and the load capacity is that of a single strand.

For three or four strand hangers a skilled rigger can select the load capacity of two strands, taking the larger inclination angle into consideration if the load is evenly distributed.

Attention:
Note, for three or four strand slings on an almost vertically hanging strand only one strand can be considered load-bearing.
Note– Unevenly distributed loads will be unstable.

Note the instability of the load with asymmetrical load distribution!

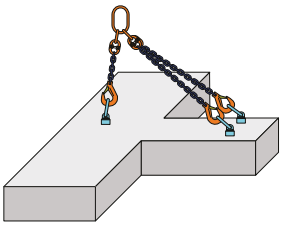


Fig. overlaying
When overlaying in the above example, only one of the three sling points is allocated on the side with the largest load. The unfavourable factors of eccentric centre of gravity and unfavourable distribution of sling points overlap.

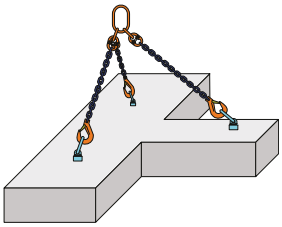


Fig. reciprocal lifting
In reciprocal lifting in the above example, two of three sling points are allocated and bear the main load with a small angle of inclination in the area of the largest load. The eccentric centre of gravity is, through a favourable distribution of the sling points in this case, partly or even fully eliminated.

Commissioning load carriers and slings

Before a sling is used for the first time, check that:
a) a) The sling is as ordered
b) b) The conformity declaration or test certificate are available
c) c) The labelling and load capacity details on the sling match the details on the conformity declaration or the test certificate
d) d) That you have carefully read the operating and installation procedures

Check the slings before each use for obvious defects,

including raised hooks, cracked or bent chain links, displaced connecting bolts in connecting links, breaks in fibre or wire ropes, cuts in lifting bands or breakage of the round sling shell.
Selection or control of the sling point

Selection or control of the sling point

Ensure that straps, ties and other critical components are never subject to force or blows as they are only designed for tying the load. Where excessive inclination angles occur or unevenly slung loads, a single sling point may have the bear most of the load. If the load cannot be supported a normal or
by a noose (?) high strength tested sling points should be attached by screw or by welding.

When using eyebolts and nuts take extra care and a number of untested and non-standard components are in circulation.
A standardised, non high-strength eyebolt (nut) must carry the manufacturer's mark, the relevant standard e.g. DIN 580, the

thread size and material e.g C15E (an EN-ISO standard for grade 4 general lifting eyebolts currently under development). All eyebolts and nuts purchased after 1994 must already carry the CE mark.
Eyebolts and nuts must never be loaded transverse to the eye level. For a diagonal force to a maximum of 45° angle with only half the load capacity, the angle should be reduced by a further 30% (?) (See load capacity table DIN 580). (See e.g. load capacity table DIN 580)

In the same way as the deployed sling, the sling points must be checked for obvious defects before use. Obviously damaged or bent sling points or eyebolts may not be slung on!

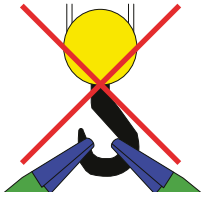
Avoiding unintentional unhooking of sling

Working appliance regulations and provisions in section 18 state that if there is a risk of accidental load release or of the load being caught by the hook, only qualified safety hooks or others that cannot accidently release the load can be used.

The decision about the need for a hook latch must be made by the operator who can assess the potential danger of accidental release or catching , by carrying out a risk assessment on how to operate without a safety catch.

A safety catch is required to prevent unhooking (e.g a safety catch or self-closing hook) on all lifting equipment and crane hooks, as it is not possible to predict all future applications or their scope.
Only the customer is in a position to carry out a risk assessment and determine which measures are suitable within the workplace and if the purposes for which the load carrier may or may not be used.
For example in a foundry, where a hook without an unhooking/ release safety latch may be used, unhooking the sling close to a hot load may endanger the rigger.

If a load without an unhook safety catch is frequently lowered to the ground, it must be checked again before raising to make sure that the hook has not been released by the unloaded strands, has slipped or may be loaded on the hook tip. For this reason the hook must always be hung with its tip outwards so that the unladen strand does not unhook and that the hooks on the base are loaded after raising.
This check is also required for chain shortening hooks without releasing the safety catch.



Lifting equipment and crane hooks without the required shaping and unhook safety catch are generally unsuited to slinging angled single loops. Where a safety catch may not be exposed to loads during goods movement, they can only prevent accidental unhooking when loaded.
Also the hook must not be loaded on the hook tip.

Danger zone

The working appliance regulations (
section 2(5) define a danger zone as follows; The zone within the vicinity of a working appliance where the health or safety of a worker who remains in the zone is or could be in danger.

Note that during lifting, horizontal acceleration and braking, the load may rotate, tile or lean. This may occur particularly during lifting if, for example, the hook was not positioned over the centre of gravity, which can lead to a dangerous situation or one difficult to assess. This may also apply to unplanned load movements during lifting such as slipping or tipping, when the direction of the load cannot be predicted, making the loading area a danger zone if there is no escape route for staff who may be blocked in by machinery, walls, racking or other impediments.
The rigger should therefore ensure that there suitable safety clearance and that guide ropes are used to control the load.
Avoid going in front of the load as unexpected obstacles may cause tripping .

There is the risk of tripping and the load will come towards you. The load may also swing towards the operator when the crane driver brings the load to a halt and it may not be possible to watch over both the load travel and the ground at the same time.
The danger from falling or sling failure depends on the type of load and transport height and is therefore difficult to forecast, therefore the load should be kept as close to the ground as practically possible, keeping the danger zone to a minimum. However with heavy round loads a rolling motion may be set up or goods being carried higher up may tip or fall.
The strands of a multi-strand sling will rarely fail at the same time. However a load when lifted high may swing unpredictably before the last strand fails and the load falls. Thinner metal sheets when carried high can come loose and sail through the air away from the original danger zone.

Prescribed maintenance and testing

Load carrying devices must be kept in a safe operating condition through regular maintenance according to the manufacturer's specifications.

Employee protection laws and Industrial safety regulation require that load carriers and slings are inspected by authorized personnel at least once a year.

Depending on use, inspections may be required more frequently, for example where equipment frequently handles the maximum permissible loads, is subject to increased wear, is affected by exposure to corrosion or heat or if there is a higher risk of damage.

All inspections must be recorded and if the operator has any doubts about the safe condition of the load carrier or sling, the equipment must be taken out of use for inspection.

Extraordinary inspections

The employer must make sure that all load carrying devices are additionally inspected according to section 9 of the AMVO after cases of damage or incidents that could affect load capacity, as well as following any repairs.

Cleaning before inspection

Slings, chain and ropes must be thoroughly cleaned before inspection to ensure they are free of any oil, dirt or corrosion. Any cleaning method may be used that does not attack the base material. Avoid processes that could cause the material to become brittle, overheating, erosion or material deformation that could mask crackes or surface damage.

Records and inspection certificates

Records must be kept of all inspections and repairs, and customers may wish to use our lifting technology inspection service.

We'll gladly support you in this with our LIFTING TECHNOLOGY inspection service!

Repair and Overhaul

If the rigger's visual checks reveal any defects they are to be fixed, for example, by replacing hooks, connecting elements or whole single strands, with the work being checked afterwards by authorised personnel. Slings can be returned to Columbus McKinnon at any time for repair and overhaul, or work ca be carried out by our mobile inspection service.

Note that rope crimping, welded connections or seams on textile slings may never be repaired and doing so will generally void the manufacturer's liability and warranties.

Required instruction and residual risks

When lifting a load with slings those under or around the load are in danger. As the manufacturer it is our duty to point out that as an operator such risks occur when handling slings if the connections are not safe or the load swings and puts the rigger in danger, with falling loads putting people and goods at risk. Falling loads endanger people and goods. As the operator you must ensure that all riggers and crane drivers are suitably trained,

According to the product instructions in the individual catalogue chapters.

1.) Scope and applicability:

1.1 These Terms and Conditions shall apply for all business cases, as long as the contractual parties do not expressly agree anything else in writing. Deviations from these conditions are only effective if we have expressly confirmed and recognised them in writing. This also applies according to ,unless otherwise specified, in the general business conditions (purchasing conditions) that are announced by the principal. The following agreements also apply without special instructions for all future deliveries and services.

2.) Offer and placing of order:

2.1 Our offers are without obligation, cost estimates are non-binding, and we reserve the right to sell the goods offered in the interim.

2.2 All information in catalogues, brochures, price lists and other printed material or electronic media is only an approximation issued to the best of our knowledge but remains non-binding. The same applies for information of this sort from the manufacturer.

2.3 Prices are delivered free of charge, including packaging, from a net order value of 140.- Euro. In the event of alterations of the cost factors, we reserve the right to adjust the prices accordingly. For orders below the minimum order value of 75.- EUR excl. VAT, we charge a 10 EUR (excl. VAT) processing fee.

2.4 In the context of the inspection/maintenance of lifting equipment, load carriers and slings on our site, we will send the customer a cost estimate as soon as the incident costs exceed 75 EUR. If after sending the cost estimate the customer should not approve the repair/overhaul, an invoice will be presented with the flat-rate expenses acc. to the agreed rates.

2.5 Orders (oral, telephonic, written) are binding for the customer. Acceptance of the order takes place via our written order confirmation or the order execution. The customer remains bound to this until expressing rejection of the order.

2.6 Statement and other agreements, especially oral subsidiary agreements by our employees, only become binding for us by our written confirmation.

2.7 Force majeure releases us from the contract.

2.8 Constructions and/or form and colour changes of the goods ordered do not entitle the customer to withdraw from the contract – as long as the application or use is not fundamentally impaired by this or the technical details contained in our documents (under consideration of point 2.2) are not affected by it.

2.9 The customer does not gain ownership of any plans, sketches or other technical documents passed on to them. These may not be forwarded and/ or duplicated, apart from the the customer's internal use

2.10 The customer makes all requirements available for on-site service provision at their costs that enable us to rapidly provide services, in particular:
- auxiliary devices, which are to be provided directly on the respective system according to applicable safety guidelines (such as work platforms, scaffolding);
- transport and loading equipment;
- technical documents (such as test logs, repair instructions) and necessary details of the systems;
- power, compressed air, supply facilities, working and operating resources;
- test weights for technical safety inspection of the systems;
- required auxiliary persons;

2.11 Before starting work, the customer has to thoroughly study the risks in the workplace and the existing safety and plant regulations and the working safety. The customer supports the client's personnel in all measures which serve to avert dangers. If the personnel requires special work safety devices and protective clothing, the customer will provide this free of charge.

3.) Delivery and transfer of risk:

3.1 We are entitled to perform partial and advance deliveries.

3.2 Delivery deadlines or service and installation deadlines are kept if possible. The agreed delivery date is not a fixed deadline. Delivery delay then applies as having occurred, if according to our procurement and production options, the appropriate extension period set by the customer has unsuccessfully expired.

3.3 The delivery period starts with the date of the order confirmation but not before the final clarification of all technical and commercial details. Its observance assumes the customer has fulfilled all the obligations incumbent upon them.

3.4 Force majeure, such as industrial disputes, in particular strikes and lockouts lengthen the delivery period.

3.5 Subsequent alterations made at the customer's request release us from the originally agreed delivery period. The delivery period is also extended- irrespective of our rights regarding the customer's default – by the time frame, by which the customer is in default with us from this or from other statements. This also applies accordingly to the delivery deadlines.

3.6 The compliance with the delivery period or the delivery deadline stands under the proviso of timely self-delivery. We will communicate impending delays as soon as possible.

3.7 The delivery period is kept if up to its expiry the delivery object has left the factory/warehouse or the dispatch readiness has been communicated.

3.8 Any possible claims for damages by the customer for non-compliance with the delivery deadline are excluded.

3.9 The dispatch takes place at the customer's costs and risk (under consideration of point 2.3) and when nothing else has been agreed in writing and also only then if part deliveries take place or if we have undertaken other services, such as the dispatch, carriage, set up or commissioning. If the dispatch is contractually taken on by us, we are only liable for the means of transport designated in the contract. If nothing has been expressly agreed to the contrary, the dispatch takes place according to our judgement and without obligation, by selecting the cheapest type of dispatch.

3.10 If the dispatch is delayed due to circumstances, which are the customer's fault, so the danger starting at the day of dispatch or acceptance readiness transfers to the customer, however we are obliged, at the wish and costs of the customer to effect the insurance that they demand.

3.11 Goods ordered on "demand" are to be accepted after a certain period from the date of the order. After this period we have the right, either to deliver the goods or to withdraw from the contract and to demand damage compensation and/or compensation for the profit lost.

3.12 If at the customer's request the dispatch is delayed, he will be billed, starting one week after display of dispatch readiness, for the costs resulting from storage, in storage in our plant/warehouse of at least 0.5% of the invoice amount for each month.

3.13 Possible agreements in relation to the acceptance of the transport costs and the insurance costs relate, in so far as the application of Incoterms and trade terms were agreed, exclusively to the named costs and leave the risk transfer unaffected.

4.) Complaints and notification of defects

4.1 Complaints and defect notifications are to be immediately and demonstrably in writing (however not by means of electronic post) communicated, with the exclusion of any other warranty.

4.2 If special conditions are agreed in relation to the type of investigation of the goods, this investigation must take place in the manufacturer's plant.. If in these cases the customer refrains from the results of the goods investigation in the plant despite settlement period, the goods apply as accepted as soon as they leave the plant. All costs of the investigation shall be borne by the customer.

4.3 In the event of timely communication, we are obliged to subsequent delivery or warranty according to section 6.

4.4 If the customer does not give us immediate opportunity to convince us of the defects notified to us, if in particular he does not make the goods complained about or samples of them available to us without delay, all guarantee claims in relation to this cease.