Lashing chains in quality grade 12-ICE

ICE-VSK-CURT

ICE-Lashing chain combinations
must only be used for lashing.

EN

User instruction

This safety instruction / declaration of the manufacturer has to be kept on file for the whole lifetime of the product.
Translation of the original user instruction

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Hint for the change of EN 12195-1:2003:
The EN 12195-1:2011 is contradictory to the results of many academic and by practical confirmed tests. The status of an accepted technical regulation (acc. to §22, Abs. 1 StVO) is doubtable (and currently not confirmed by case law).
To guarantee a sufficiant safety level, the following statements refer to the DIN EN 12195-1:2004 resp. to the VDI 2700 ff.

Declaration of the manufacturer

We hereby declare (supported by certification as per ISO 9001) that the equipment, as mentioned below, corresponds to the appropriate, basic requirements of safety and health of the corresponding EC regulation in the design as it is sold by us because of its design and construction. In case of any modification of the equipment, not being agreed upon with us, this declaration becomes invalid. Furthermore, this declaration will become invalid if the equipment is not used according to the prescriptions mentioned in the manual and if the necessary examinations are not carried out regularly as per EN 12195.

Designation of the equipment: **Lashing chain**
Type: **ICE-VSK-CURT**
Manufacturer's sign: D 1

Herstellererklärung

Hiermit erklären wir (unterstützt durch die Zertifizierung nach ISO 9001), dass die nachfolgend bezeichnete Ausrüstung aufgrund ihrer Konzipierung und Bauart, sowie der von uns in Verkehr gebrachten Ausführung, den einschlägigen grundlegenden Sicherheits- und Gesundheitsanforderungen der betreffenden europäischen Norm EN 12195-Teil 3 entspricht. Bei einer nicht mit uns abgestimmten Änderung der Ausrüstung verliert diese Erklärung ihre Gültigkeit. Weiterhin verliert diese Erklärung ihre Gültigkeit, wenn die Ausrüstung nicht entsprechend den in der Betriebsanleitung aufgezeigten bestimmungsmäßigen Fällen eingesetzt wird und die regelmäßig durchzuführenden Überprüfungen nicht vorgenommen werden.

Bezeichnung der Ausrüstung: **Zurrkette**
Type: **ICE-VSK-CURT**
Herstellerzeichen: D 1

Déclaration du fabricant

Nous déclarons (conformément à la certification ISO 9001) que l'équipement suivant correspond aux demandes appropriées fondamen-tales de sécurité et santé de la directive CE respectives dans la version vendue par nous, grâce à sa construction. En cas d'une modi-fication de l'équipement sans notre accord, cette déclaration perd sa validité. En outre, cette déclaration ne sera plus valable dans le cas où l'équipement n'est pas utilisé confor-mément aux applications indiquées dans le guide d'opération et dans le cas où les vérifications ne sont pas réalisées régulièrement selon EN 12195.

Désignation de l'équipement: **Chaînes d'arrimage**
Type: **ICE-VSK-CURT**
signe du fabricant: D 1

Before use of lashing chains please read user instruction carefully. Make sure that you have understood all subject matters.
Non-observance can lead to personal and material damage and eliminates warranty.

In the following user manual, the ICE-CURT is mentioned regularly, and the product range includes (synonym for ICE-CURT-GAKO, ICE-CURT-K-GAKO, ICE-CURT-SL and ICE-CURT-K-SL).
To describe the special characteristics of the different types, the appropriate naming is mentioned.

1 Safety instructions

ATTENTION
Wrong assembled or damaged lashing chains can lead to injuries of persons and damage of items when loads fall down.
Please inspect all lashing chains before each use.

The securing disc at the ICE-CURT tensioning element includes strong magnets. The usage of these lashing system is due to safety requirements therefore strictly forbidden for people with heart pacemaker or any other implanted defibrillators.

After a short driving distance check the tensioning of the lashing chains and tighten them if necessary.

When using a choke hitch, reduce LC by 20 % based on the stated LC.

ICE-CURT ratchet tensioners must only be loaded with pull forces. Bending forces are forbidden (see picture 13).

2 Intended use

ICE-Lashing chains must **not be used** for lifting!

The choosen lashing chain must be strong and long enough for the intended usage and must have according to the lashing method the correct length.

In a complete assembled lashing chain of a higher quality grade, f.e. D1-12 (Grade 120-ICE) no chain and / or components of a lower quality grade must be build in. Lashing chains of higher quality must only be assembled with chains and components from the same manufacturer.

Due to different characteristics and because of alternation in length under load, different lashing means (f.e. lashing chains and lashing belts made out of chemical fiber) must **not** be used for lashing of same load.

Pay attention when using additional connecting parts and lashing devices for load securing that they fit to the lashing chain.

3 Selecting lashing chains

3.1 Considerable facts

When selecting and using lashing chains please consider the following facts:

- necessary lashing force
- method of lashing
- type of load which has to be secured

The size, shape and the weight of the load determine the correct selection, but also the intended lashing methode (see EN 12195), the environment of transport and the kind of load.

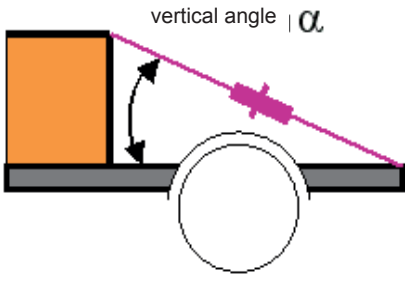
Calculate the number of lashing chains according to EN 12195 and VDI 2700 or use the RUD lashing card, the RUD-CD-ROM or www.rud.com, click on: lashing means Additional information offers our article: “Optimal load securing”. RUD Ident-No: 7900064 Free of charge

3.2 Sliding coefficient of friction (μ) acc. VDI 2700-2

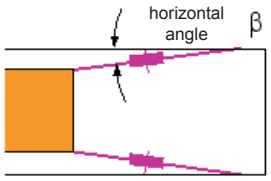
To see additional material pairings look also into DIN EN 12195-1

Material pairing	dry	wet	greasy
wood/wood	0.20-0.50	0.20-0.25	0.05-0.15
metal/wood	0.20-0.50	0.20-0.25	0.02-0.10
metal/metal	0.10-0.25	0.10-0.25	0.01-0.10

Table 1: Sliding coefficient of friction (μ)



Pic. 1:



Pic. 2:

3.3 Which lashing chain for which load?

Diagonal lashing for round steel link chains of quality grade 12 - Grade 120

Chain type	LC Lashing capacity [daN]	**Max. weight in metric tons** (Horizontal angle ß: 20°-45° and use of 2 lashing chains for each direction) **α: 0°-30° vertical angle**						**α: 30°-60° vertical angle**					
		μ=0.1	μ=0.2	μ=0.3	μ=0.4	μ=0.5	μ=0.6	μ=0.1	μ=0.2	μ=0.3	μ=0.4	μ=0.5	μ=0.6
ICE-VSK 6	**3600**	6.2	8.4	10.4	13.0	17.4	26.2	4.5	6.3	9.0	12.8	19.2	32.0
ICE-VSK 8	**6000**	10.5	14.0	17.4	21.8	29.1	43.9	7.6	10.7	15.0	21.4	32.0	53.4
ICE-VSK 10	**10000**	17.5	23.4	29.0	36.4	48.6	73.1	12.8	17.9	25.0	35.6	53.4	89.0
ICE-VSK 13	**16000**	28.0	37.5	46.4	58.2	77.8	117.0	20.5	28.6	40.0	57.1	85.5	142.4
ICE-VSK 16	**25000**	43.7	58.6	72.6	91.0	121.6	182.8	32.0	44.7	62.5	89.1	133.6	222.5

Table 2:

Important hint
Mind the determined angles!

Values refer to:
stability of load, road transportation, no combined lashing

4 Calculation formulas

4.1 Diagonal lashing

Formula for the determination of necessary lashing force LC (daN) of the required lashing mean:

- In driving direction, **with friction:**

$$LC\ \frac{G(daN)\times(c_x-\mu)}{(\sin\alpha\times\mu+\cos\alpha\times\cos\beta)\times 2}(daN)$$

- Lateral to driving direction, **with friction:**

$$LC\ \frac{G(daN)\times(c_y-\mu)}{(\sin\alpha\times\mu+\cos\alpha\times\sin\beta)\times 2}(daN)$$

- In driving direction, **without friction:**

$$LC=\frac{G(daN)\times c_x}{\cos\alpha\times\cos\beta\times 2}(daN)$$

- Lateral to driving direction, **without friction:**

$$LC=\frac{G(daN)\times c_y}{\cos\alpha\times\sin\beta\times 2}(daN)$$

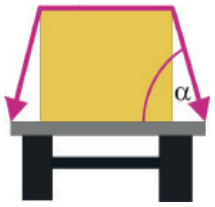
4.2 Vertical (frictional) lashing

Formula for the determination of the required total pre-tensioning force Fv (daN):

$$Fv=\frac{G\times(c_{x,y}-\mu)}{\mu\times\sin\alpha}(daN)$$

4.3 No. of required spans

$$n=\frac{Fv}{STF\times 1{,}5}$$



Pic. 3:

$c_{x,y}$ = accelerating factor
c_x = accelerating factor in driving direction = 0,8
accelerating factor against driving direction = 0,5
c_y = accelerating factor lateral to driving direction = 0,5
G = weight force in daN ≈ m = Load weight in kg
μ = Sliding coefficient of friction (table 2)
β = horizontal angle (picture 1)
α = Vertical angle between loading platform and chain strand (picture 3)
STF = Standard tensioning force (which can be achieved by the tensioning device at a hand force of 50 daN).
n = No. of effective lashing strands

angle	sinus	cosine
0	0	1
10°	0.17	0.98
20°	0.34	0.94
30°	0.50	0.87
40°	0.64	0.77
45°	0.71	0.71
50°	0.77	0.64
60°	0.87	0.50
70°	0.94	0.34
80°	0.98	0.17
90°	1	0

Table 3:

5 Overview of RUD Lashing Chain types

5.1 ICE-VSK-CURT-IVH (vertical and direct lashing) - Ratched spindle tensioner

Chain Ø [mm]	Type	Permitted lashing force LC [daN]	Tensioning device		Lmin [mm]	Weight [kg/pc.] (Tenionser+ chain)	Ref.-No.
			Type	Standard tensioning force STF [daN]			
6	ICE-VSK-6-CURT-IVH	3.600	ICE-CURT-6-GAKO	1.500	780	4,8+2,2	7903443
8	ICE-VSK-8-CURT-IVH	6.000	ICE-CURT-8-GAKO	2.800	1040	8,0+5,2	7901129
10	ICE-VSK-10-CURT-IVH	10.000	ICE-CURT-10-GAKO	2.800	1210	13,0+7,1	7901130
13	ICE-VSK-13-CURT-IVH	16.000	ICE-CURT-13-GAKO	2.800	1600	21,9+13,6	7902626
16	ICE-VSK-16-CURT-IVH	25.000	ICE-CURT-16-GAKO	direct lashing only	1910	34,5+24,3	7902627

Table 4: ICE-VSK-CURT-IVH (vertical and direct lashing)

5.2 ICE-VSK-CURT-IMVK (vertical and direct lashing) - Ratched spindle tensioner

Chain Ø [mm]	Type	Permitted lashing force LC [daN]	Tensioning device		Lmin [mm]	Weight [kg/pc.]	Ref.-No.
			Type	Standard tensioning force STF [daN]			
6	ICE-VSK-6-CURT-IMVK	3,600	ICE-CURT-6-GAKO	1,500	770	6,3	7904614
8	ICE-VSK-8-CURT-IMVK	6,000	ICE-CURT-8-GAKO	2,800	1010	11,7	7904615
10	ICE-VSK-10-CURT-IMVK	10,000	ICE-CURT-10-GAKO	2,800	1170	17,0	7904616
13	ICE-VSK-13-CURT-IMVK	16,000	ICE-CURT-13-GAKO	2,800	1540	28,6	7904617
16	ICE-VSK-16-CURT-IMVK	25,000	ICE-CURT-16-GAKO	direct lashing only	1840	46,0	7904618

Table 5: ICE-VSK-CURT-IMVK (vertical and direct lashing)

5.3 ICE-VSK-CURT-IVS (vertical and direct lashing) - Ratched spindle tensioner

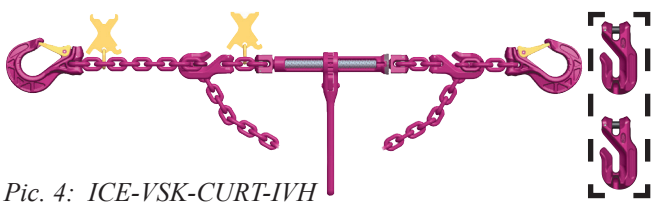
Chain Ø [mm]	Type	Permitted lashing force LC [daN]	Tensioning device		Lmin [mm]	Weight [kg/pc.]	Ref.-No.
			Type	Standard tensioning force STF [daN]			
6	ICE-VSK-6-CURT-IVS	3,600	ICE-CURT-6-GAKO	1,500	680	6,4	7904602
8	ICE-VSK-8-CURT-IVS	6,000	ICE-CURT-8-GAKO	2.800	870	11,9	7904603
10	ICE-VSK-10-CURT-IVS	10,000	ICE-CURT-10-GAKO	2.800	1000	17,7	7904604
13	ICE-VSK-13-CURT-IVS	16,000	ICE-CURT-13-GAKO	2.800	1330	29,9	7904605
16	ICE-VSK-16-CURT-IVS	25,000	ICE-CURT-16-GAKO	direct lashing only	1590	48,8	7904606

Table 6: ICE-VSK-CURT-IVS (vertical and direct lashing)

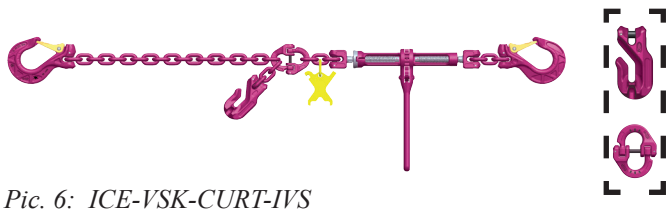
5.4 ICE-VSK-CURT-SL (vertical and direct lashing) - Ratched spindle tensioner

Chain Ø [mm]	Type	Permitted lashing force LC [daN]	Tensioning device		Lmin [mm]	Weight [kg/pc.]	Ref.-No.
			Type	Standard tensioning force STF [daN]			
6	ICE-VSK-6-CURT-SL	3,600	ICE-CURT-6-SL	1.500	640	6,5	7903444
8	ICE-VSK-8-CURT-SL	6,000	ICE-CURT-8-SL	2.800	817	12,6	7900026
10	ICE-VSK-10-CURT-SL	10,000	ICE-CURT-10-SL	2.800	935	18,1	7900027

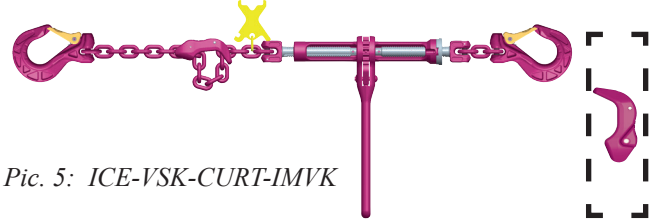
Table 7: ICE-VSK-CURT-SL (vertical and direct lashing)



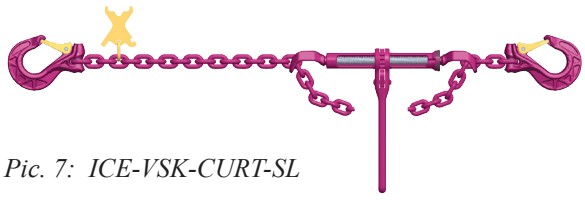
Pic. 4: ICE-VSK-CURT-IVH



Pic. 6: ICE-VSK-CURT-IVS



Pic. 5: ICE-VSK-CURT-IMVK



Pic. 7: ICE-VSK-CURT-SL

5.5 ICE-VSK-CURT-K-IVH (direct lashing only) - Bar spindle tensioner

Chain Ø [mm]	Type	Permitted lashing force LC [daN]	Tensioning device		Lmin [mm]	Weight [kg/pc.] (Tenionser+ chain)	Ref.-No.
			Type	Standard tensioning force STF [daN]			
6	ICE-VSK-6-CURT-K-IVH	3,600	ICE-CURT-K-6-GAKO	direct lashing only	780	4.8+2.5	7904493
8	ICE-VSK-8-CURT-K-IVH	6,000	ICE-CURT-K-8-GAKO	direct lashing only	1040	8.0+4.5	7904494
10	ICE-VSK-10-CURT-K-IVH	10,000	ICE-CURT-K-10-GAKO	direct lashing only	1210	13.0+6.4	7904495
13	ICE-VSK-13-CURT-K-IVH	16,000	ICE-CURT-K-13-GAKO	direct lashing only	1600	21.9+12.6	7904496
16	ICE-VSK-16-CURT-K-IVH	25,000	ICE-CURT-K-16-GAKO	direct lashing only	1910	34.5+23.2	7904497

Table 8: ICE-VSK-CURT-IVH (direct lashing only)

5.6 ICE-VSK-CURT-K-IMVK (direct lashing only) - Bar spindle tensioner

Chain Ø [mm]	Type	Permitted lashing force LC [daN]	Tensioning device		Lmin [mm]	Weight [kg/pc.]	Ref.-No.
			Type	Standard tensioning force STF [daN]			
6	ICE-VSK-6-CURT-K-IMVK	3,600	ICE-CURT-K-6-GAKO	direct lashing only	770	6.6	7904608
8	ICE-VSK-8-CURT-K-IMVK	6,000	ICE-CURT-K-8-GAKO	direct lashing only	1010	11.0	7904610
10	ICE-VSK-10-CURT-K-IMVK	10,000	ICE-CURT-K-10-GAKO	direct lashing only	1170	16.3	7904611
13	ICE-VSK-13-CURT-K-IMVK	16,000	ICE-CURT-K-13-GAKO	direct lashing only	1540	27.6	7904612
16	ICE-VSK-16-CURT-K-IMVK	25,000	ICE-CURT-K-16-GAKO	direct lashing only	1840	44.9	7904613

Table 9: ICE-VSK-CURT-IMVK (direct lashing only)

5.7 ICE-VSK-CURT-K-IVS (direct lashing only) - Bar spindle tensioner

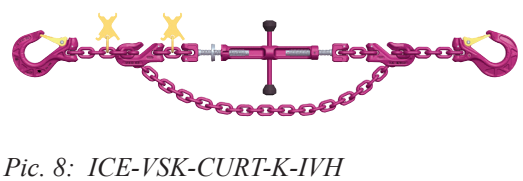
Chain Ø [mm]	Type	Permitted lashing force LC [daN]	Tensioning device		Lmin [mm]	Weight [kg/pc.]	Ref.-No.
			Type	Standard tensioning force STF [daN]			
6	ICE-VSK-6-CURT-K-IVS	3,600	ICE-CURT-K-6-GAKO	direct lashing only	680	6.7	7904596
8	ICE-VSK-8-CURT-K-IVS	6,000	ICE-CURT-K-8-GAKO	direct lashing only	870	11.2	7904598
10	ICE-VSK-10-CURT-K-IVS	10,000	ICE-CURT-K-10-GAKO	direct lashing only	1000	17.0	7904599
13	ICE-VSK-13-CURT-K-IVS	16,000	ICE-CURT-K-13-GAKO	direct lashing only	1330	28.9	7904600
16	ICE-VSK-16-CURT-K-IVS	25,000	ICE-CURT-K-16-GAKO	direct lashing only	1590	47.7	7904601

Table 10: ICE-VSK-CURT-IVS (direct lashing only)

5.8 ICE-VSK-CURT-K-SL (direct lashing only) - Bar spindle tensioner

Chain Ø [mm]	Type	Permitted lashing force LC [daN]	Tensioning device		Lmin [mm]	Weight [kg/pc.]	Ref.-No.
			Type	Standard tensioning force STF [daN]			
6	ICE-VSK-6-CURT-K-SL	3,600	ICE-CURT-K-6-SL	direct lashing only	640	6.8	7904498
8	ICE-VSK-8-CURT-K-SL	6,000	ICE-CURT-K-8-SL	direct lashing only	817	11.7	7904499
10	ICE-VSK-10-CURT-K-SL	10,000	ICE-CURT-K-10-SL	direct lashing only	935	17.3	7904500

Table 11: ICE-VSK-CURT-SL (direct lashing only)



Pic. 8: ICE-VSK-CURT-K-IVH

Pic. 10: ICE-VSK-CURT-K-IVS

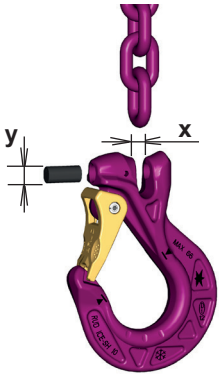
Pic. 9: ICE-VSK-CURT-K-IMVK

Pic. 11: ICE-VSK-CURT-K-SL

6 Assembly system kit quality grade 12-ICE

The clevis system yields by its size adjustement a fool proof, madatory allocation of the correct ICE chain diameter to the component.

- Clevis groove **x** avoids the connection of a bigger ICE chain (picture 12).
- Pin diameter **y** avoids the connection of a smaller ICE chain (picture 12).
- Only ICE chains and ICE components of the same nominal size must be assembled together.



Pic. 12:

7 Use of the ICE Lashing chains

HINT
*ICE lashing chains **must only be used** for lashing and **not** for lifting of loads!*

- Lashing chains ICE-VSK-16-CURT and ICE-VSK-CURT-K (sizes 6-16 mm) are not suitable for vertical lashing. ICE-CURT-K-Bar spindle tensioners in the nominal sizes 6-16 mm, as well as ICE-CURT-Ratchet spindle tensioners of the size 16 mm must be equipped with identification tags without STF-statement, when assembled in lashing chains (approval is only valid for direct lashing)!

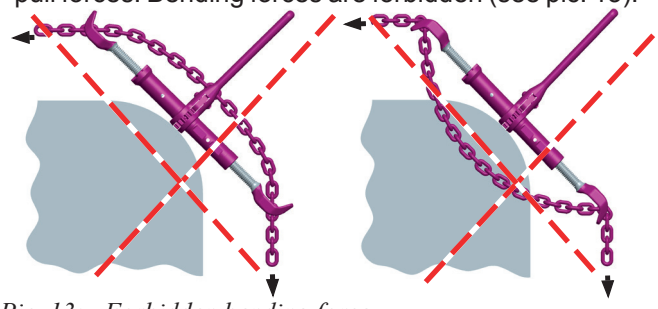
Type	Ref.-Nr.
ICE-VSK-KZA-K-6	*7905320*
ICE-VSK-KZA-K-8	*7905321*
ICE-VSK-KZA-K-10	*7905322*
ICE-VSK-KZA-K-13	*7905323*
ICE-VSK-KZA-13	*7903502*

Table 12: Identification tag without STF

- Assemble resp, use only chains, components and connecting pins which are marked with ICE-D1-12.
- The clamping sleeve for the securing of the load pin must be positioned in such a way that the groove can be seen from to the outside.
- Use clamping sleeve only once!
- **Use original RUD-ICE spare parts only.**

7.1 General information

- The usage is only permitted for authorized and trained persons.
- Inspect ICE lashing means regularly and before every use and watch out for visible defects. Visible defects are f.e. deformation, cracks, breakage, incomplete marking.
- When using ICE lashing means pay attention to the following regulations and requirements:
  - **EN 12195-1** Load restraint assemblies on road vehicles - Safety - Part 1: Calculation of lashing forces.
  - **EN 12195-3** Load restraint assemblies on road vehicles - Safety - Part 3: Lashing chains
  - **VDI-Richtlinie 2700**-VDI-Guide line 2700- Securing of loads on road vehicles and the corresponding data sheets.
  - Loading requirements and recommendations of Deutsche Bahn AG
  - Accident avoiding regulation- vehicles BGV D 29 (former UVV VBG 12)
  - Handbook „Load securing on vehicles“ **BGI 649**
- The usage under chemical influences like acids, bases is forbidden.
- Before initial usage make sure that:
  - The ICE lashing chain conforms to the order.
  - That the test certificate/manufacturer´s declaration is on hand.
  - That the statement on the identification tags of the ICE-lashing chains are according to the indication of the manufacturer´s declaration.
- Use only ICE lashing chain where the declaration can be read and which are equipped with tags. Avoid damage of tags by keeping them away from edges of the load and if possible keep the tags away from load.
- ICE lashing chains are used in straigth strands, without twisting, knoting and kinking.
- Hooks must not be loaded at the tip. The hooks must be equipped with safety latches to avoid unintentional unhinge.
- Remove slings before lashing.
- Watch out for deep hanging electricity overhead power lines.
- ICE lashing chains must not be overloaded: The max. hand force SHF must only be applied by hand. No additional mechanical auxiliary material like bars, or levers must be used unless they are part of the tensioning element.
- Pay attention that the ICE lashing chains will not be damaged by sharp edges of the load on which they are used. Use edge protection, use next bigger chain dimension or reduce LC by 20 %.
- Plan the lashing as well as the opening of the lashing chain. Consider that load might be partially be taken off.
- Before off loading, the ICE lashing chains must be released in such a way that the load stands free.
- Opening of lashing: Make sure that load stands safe before opening the lashing and that off loading persons are not at risk by falling down. If necessary, additional lashing means have to be attached for the ongoing transport to the load, to avoid dropping of load.
- Inspect after a short driving distance the tensioning of the lashing chains und retighten them if necessary.
- ICE-CURT ratchet tensioners must only be loaded with pull forces. Bending forces are forbidden (see pic. 13).



Pic. 13: Forbidden bending force

7.2 Tensioning action (ICE-CURT-GAKO / ICE-CURT-SL)

ATTENTION
The securing disc has strong magnets. The usage of these lashing system is due to safety requirements therefore strictly forbidden for people with a heart pacemaker or any other implanted defibrillator.

1. Release the securing disc of the load tube.

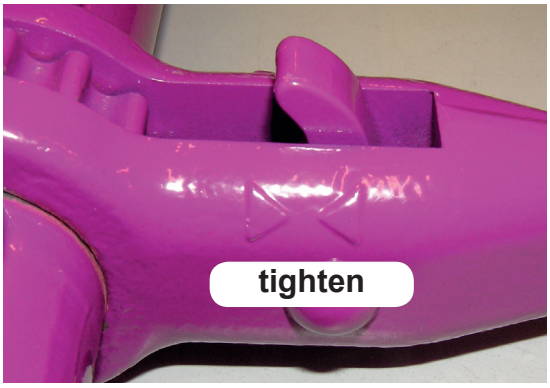
IMPORTANT HINT
Make sure that the securing disc does not stick to the load tube. Otherwise there is a danger of damaging the securing disc.

2. Open up the ICE ratched tensioner ICE-CURT to the turn-out securing.

IMPORTANT HINT
*Spindles **must not be released** with an additional force against the turn-out securing device. There is a danger of damaging the thread.*

Pic. 14:

3. Pay especially attention that the lashing chains **are not twisted** and turned straight before they will be attached to the lashing points.
4. Attach the ICE Star hooks, ICE end links, or end fittings into the intended lashing points.
5. To tighten the ICE ratchet tensioner ICE-CURT, adjust the detent pawl to the two triangle symbols (see picture 15).

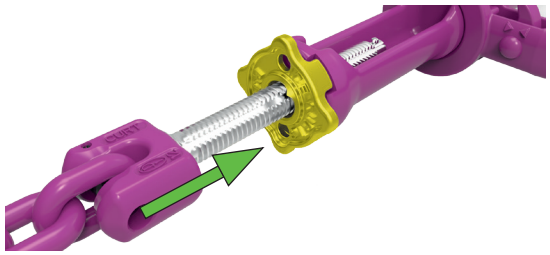


Pic. 15:

The load tube will turn into the direction of arrow when ratchet operates (see picture 16).

Pic. 16:

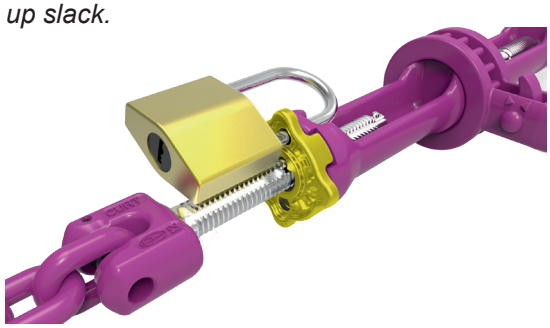
6. Make sure that the securing disc has been released from the load tube (see picture 14). Otherwise there is a risk of damaging the securing disc.
7. Tighten the ICE tensioner ICE-CURT, by applying a hand force of **50 daN** = 50 KG (110 lbs.) to the end of the ratchet lever.
8. After tightening has been done, slide securing disc into the direction of the load tube. The securing disc must form fit and easy run into the **cross profile** of the load tube (see picture 17).
9. If this is not the case, turn spindle and load tube until both cross profiles are congruent. Then push the securing disc into the final position. The disc is hold by magnet force in position and avoids an self-acting release of the spindle tensioner caused by vibrations.



Pic. 17:

10. Optionally ICE-lashing chains of the ICE-ratchet tensioner ICE-CURT can be protected against theft by using a padlock (Type ABUS 85/40 HB), see pic. 18.

IMPORTANT HINT
Please check after a short driving distance the tightening of the lashing chain and take up slack.



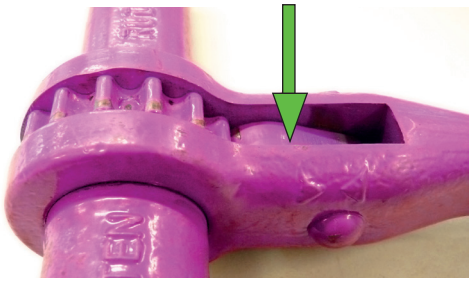
Pic. 18:

7.3 Release procedure

1. Release the securing disc from the load tube.

IMPORTANT HINT
Make sure that the securing disc does not stick to the load tube. Otherwise there is a risk of damaging the securing disc.

2. To release the ICE-CURT ratchet tensioner, press the detent pawl at the two triangle symbols downwards resp. to the back (see picture 19).



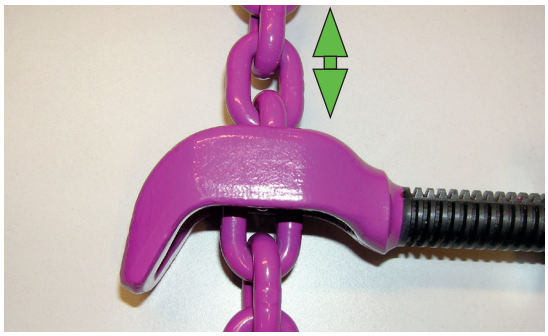
Pic. 19:

The load tube will turn against to the direction of arrow when ratched operates.

7.4 Feature ICE-CURT-SL

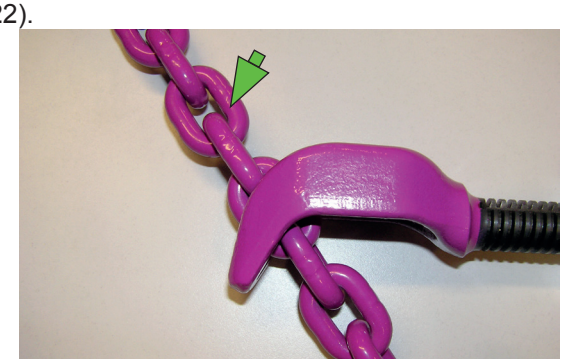
To ensure safe handling of the ICE-CURT-SL tensioner (with shortening latch) the following factors have to be obeyed.

1. Position the ICE-ratched tensioner ICE-CURT-SL at the required chain position.

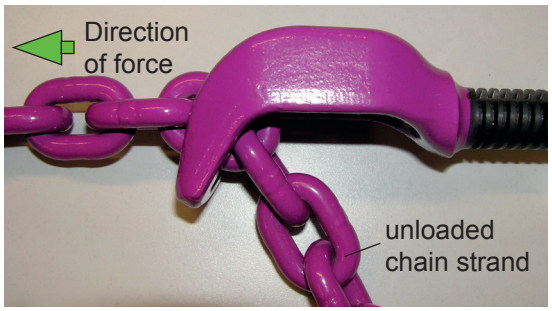


Pic. 20:

2. Pivot chain into the final position (compare picture 21 and 22).

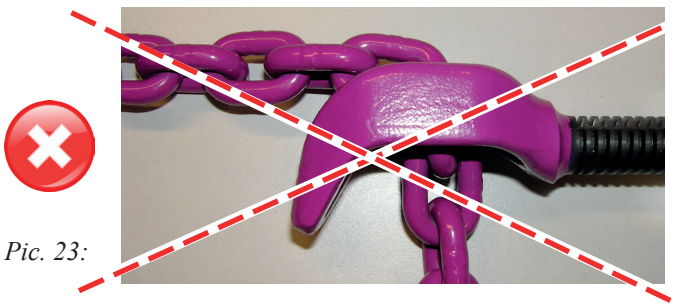


Pic. 21:

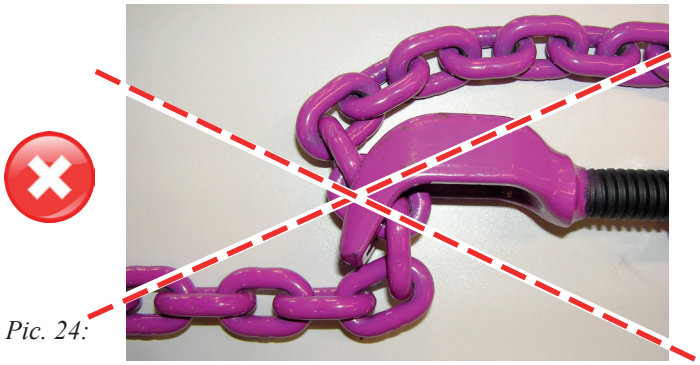


Pic. 22:

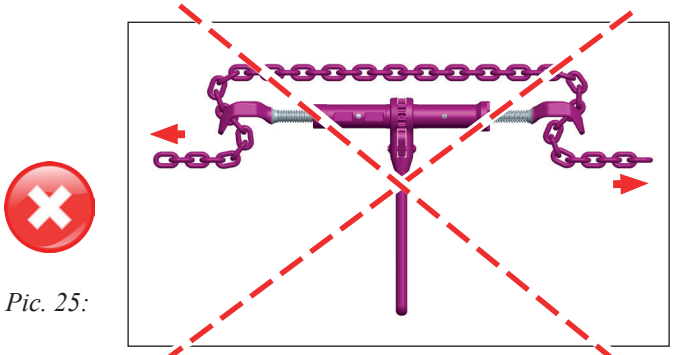
3. Make sure that the chain is always correct positioned in the shortening claw and will be loaded right.
   The following load types are forbidden (chain incorrect attached - see pictures 23 - 26).



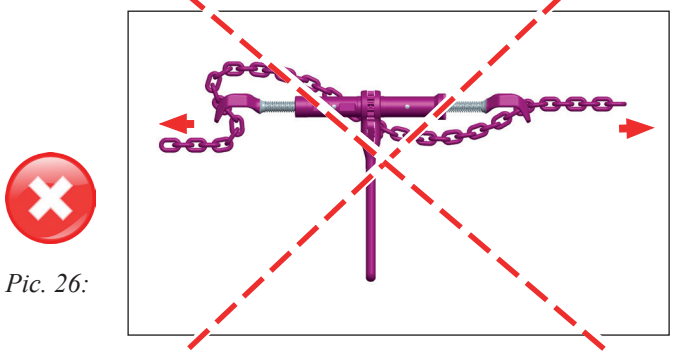
Pic. 23:



Pic. 24:



Pic. 25:



Pic. 26:

8 Inspection and testing

8.1 Visual and function test

ICE-lashing chains must be inspected in time periods depending on the usage, at least once per year. Inspection and test has to be carried out by a competent person. The examination results have to be recorded in the chain card datasheet. Protocols on tests and other notes have to be kept on file.

Should any of the following damage occur, ICE lashing chains should immediately be taken out for service and repair:

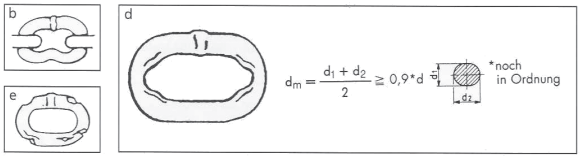
a) The identification on the tag is unreadable or the tag is missing.

b) Twisting, deformation and breakage of components and master / end links.

c) Elongation of the chain by a plastic deformation at individual links by more than 5 % referred to the pitch of 3d (picture 27).

Pic. 27: Patented ICE-lashing chain inspection gauge for an easy inspection of c) and d)

d) Wear occurs at chain links caused by abrasion on the outside and between chain links hanging together. For measuring the wear with a caliber the chain must be unloaded. A wear up to 10 % (dm) is permissible (see picture 28).



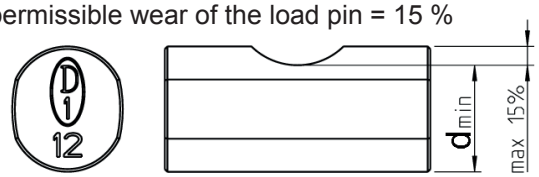
Pic. 28:

e) Cuts, grooves, notches, failures, increased corrosion, discoloring due to heat, bent or twisted chains and components, especially deep notches in pulling tension force areas or transverse cracks are inadmissible.

f) Width of mouth at ICE-Star hooks must not exceed 10 % of the nominal value. The hook securing (safety latch) must still slip into the hook tip in order to assure a form closure.

Carefully examine bed of the hook for notches.
Maximum allowed wear in the bed of hook = 5 %

g) Max. permissible wear of the load pin = 15 %



Pic. 29:

9 Repair and Maintenance

9.1 General information about repair and maintenance

Repair works can only be carried out by experts disposing necessary knowledge and required skills. Pay attention to the following:

- Exchange broken, bent, twisted and deformed chains and components.
- Exchange the whole chain strand.
- Grind out small faults like notches and grooves very carefully (no notching effect must occure).
- The cross section of the material must not be reduced by more than 10 %.
- Welding must not be done on neither chain nor components.
- When replacing components use generally new retaining pins and securing elements (split taper sleeves).
- Use original RUD-ICE spare parts only!
- ICE lashing chains must only be used in combination with ICE components (marked with ICE).
- Make notes about carried out repairs in the chain card file.

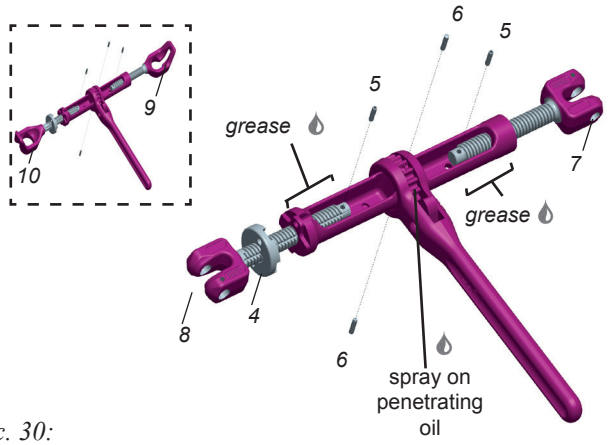
9.2 Lubriction of ICE ratchet tensioner

The ICE ratched tensioner should be lubricated in regular intervals with grease at the lubricating point, to guarantee the running characteristics.

1. For lubrication open up the ICE ratchet tensioner towards the turn-out securing.

IMPORTANT HINT
Spindles must not be turned out with an increased expenditure of force. There is a risk of damaging the thread.

2. Lubricate the ICE ratched tensioner ICE-CURT at the marked lubrication points (see picture 30).
3. Once lubrication is finished turn spindles back.



Pic. 30:

10 Spare part list

Pos	Components	ICE-VSK 6	ICE-VSK 8	ICE-VSK 10	ICE-VSK 13	ICE-VSK 16
1	retaining pin and securing pin for ICE components (pack of 10 pc/*4 pc)	7998740	7995739	7995740	7995741	7999102*
2	replacement latch for ICE Star hook ISH (latch, spring and pin)	7100300	7100301	7100302	7100303	7900419
3	ICE-VSK identification tag with connecting link	7903500	7995772	7995773	7995774	7903502
4	complete securing disc (with magnet)	7903495	7904226	7904226	7902680	7903867
5	sleeve pin	61697	7995723	7995723	57895	59022
6	Straight groove pin	7903493	7900045	7900045	7902683	7903865
7	GAKO-Spindle - right hand thread	7903479	7901140	7901142	7902681	7903850
8	GAKO-Spindle - left hand thread	7903478	7901141	7901143	7902682	7903849
9	SL-Spindle - right hand thread	7903481	7903762	7903764	----	----
10	SL-Spindle - left hand thread	7903480	7903761	7903763	----	----

Table 13: Spare part list

11 Documentation in a lashing chain card file

Recorded in the chain card file is the consecutive history of the ICE lashing chain. Inclusive the initial application, inspection – and testing dates as well as repair and maintenance notes. When repairs have made, plase make comments about reason.
The notes in the lashing chain card file report about ongoing inspections carried out by the user during the lifetime of the lashing chains.

Inspection during use		**Chain card file for ICE lashing means**			
I-No.	Inspection and test results	repair yes	repair no	Kind of repair	Date Signature of inspector
1					
2					
3					
4					
5					
6					

A	TYPE: _____	permissable pre tensioning force LC (Lashing capacity) _____ daN		Standard tensioning force STF _____ daN
A1	Identification tag ICE-VSK-KZS Ident-No.: _____			Reach / nom. length _____ mm
	All components like, ratchet tensioner, lashing hooks, shortening elements, connecting elements, shackles, end links, overload indicator, are according to the RUD special quality grade ICE. All components, including the chain are marked as follows with the BG permittance stamp D1-12 and ICE markings.			
		Manufacturer's sign:	**Quality grade**	**Nomination**
B	round steel link chain	D 1	12-ICE	
C1	ratchet tensioner ICE-CURT-GAKO	D 1	12-ICE	
C2	ratchet tensioner ICE-CURT-K-GAKO	D 1	12-ICE	
C3	ratchet tensioner ICE-CURT-SL	D 1	12-ICE	
C4	ratchet tensioner ICE-CURT-K-SL	D 1	12-ICE	
D1	lashing hook	D 1	12-ICE	
D2	endlink	D 1	12-ICE	
D3	shakle	D 1	12-ICE	
D4	shortening element	D 1	12-ICE	
D5	connecting element	D 1	12-ICE	
E1	pre tensioning indicator			
E2	overload control			
Type (see overview)				

The original test certificates of the manufacturers are present. We hereby confirm that the assembly was carried out complete and correct.

The lashing chain was assembled by:

Location and date

Signature