

# ICE mini

## Baukasten 4 mm Assembly kit 4 mm

### Betriebsanleitung

Diese Betriebsanleitung/Herstellereklärung muss über die gesamte Nutzzeit aufbewahrt werden.

**ORIGINALBETRIEBSANLEITUNG**

### Safety instructions

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

**Translation of the original safety instruction**



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RUD-Art.-Nr.: 7905034 / 09.018



> ICE-MINI <  
Baukasten 4 mm / Kette 4x12 in Güteklasse 12  
Assembly kit 4 mm / chain 4x12  
in quality grade 120



#### EG-Konformitätserklärung

entsprechend der EG-Maschinenrichtlinie 2006/42/EG, Anhang II A und ihren Änderungen

Hersteller: **RUD Ketten**  
**Rieger & Dietz GmbH u. Co. KG**  
Friedensinsel  
73432 Aalen

Hiermit erklären wir, dass die nachfolgend bezeichnete Maschine aufgrund ihrer Konzipierung und Bauart, sowie in der von uns in Verkehr gebrachten Ausführung, den grundlegenden Sicherheits- und Gesundheitsanforderungen der EG-Maschinenrichtlinie 2006/42/EG sowie den unten aufgeführten harmonisierten und nationalen Normen sowie technischen Spezifikationen entspricht.  
Bei einer nicht mit uns abgestimmten Änderung der Maschine verliert diese Erklärung ihre Gültigkeit.

Produktbezeichnung: Anschlagkettengehänge Gk12 ICE  
ND 4-16 mm, verkürzbar und unverkürzbar

Folgende harmonisierten Normen wurden angewandt:

<u>DIN EN 1677-1 : 2009-03</u>	<u>DIN EN 1677-2 : 2008-06</u>
<u>DIN EN 1677-3 : 2008-06</u>	<u>DIN EN 1677-4 : 2009-03</u>
<u>DIN EN 818-1 : 2008-12</u>	<u>DIN EN 818-2 : 2008-12</u>
<u>DIN EN 818-4 : 2008-12</u>	<u>DIN EN 818-6 : 2008-12</u>
<u>DIN EN ISO 12100 : 2011-03</u>	

Folgende nationalen Normen und technische Spezifikationen wurden außerdem angewandt:

<u>BGR 500, KAP2.8 : 2008-04</u>	<u>DIN 15428 : 1978-08</u>
<u>DIN 15429 : 1978-07</u>	<u>DIN 5688-3 : 2007-04</u>
<u>DIN 5692 : 2011-04</u>	<u>PAS 1061 : 2006-04</u>

Für die Zusammenstellung der Konformitätsdokumentation bevollmächtigte Person:  
Michael Betzler, RUD Ketten, 73432 Aalen

Aalen, den 26.09.2016 Dr.-Ing. Arne Kriegsmann (Prokurist/QMB)  
Name, Funktion und Unterschrift Verantwortlicher *Arne Kriegsmann*



#### EC-Declaration of conformity

According to the EC-Machinery Directive 2006/42/EC, annex II A and amendments

Manufacturer: **RUD Ketten**  
**Rieger & Dietz GmbH u. Co. KG**  
Friedensinsel  
73432 Aalen

We hereby declare that the equipment sold by us because of its design and construction, as mentioned below, corresponds to the appropriate, basic requirements of safety and health of the corresponding EC-Machinery Directive 2006/42/EC as well as to the below mentioned harmonized and national norms as well as technical specifications.  
In case of any modification of the equipment, not being agreed upon with us, this declaration becomes invalid.

Product name: Chain sling Grade 120 - ICE  
ND 4-16 mm, adjustable/not adjustable

The following harmonized norms were applied:

<u>DIN EN 1677-1 : 2009-03</u>	<u>DIN EN 1677-2 : 2008-06</u>
<u>DIN EN 1677-3 : 2008-06</u>	<u>DIN EN 1677-4 : 2009-03</u>
<u>DIN EN 818-1 : 2008-12</u>	<u>DIN EN 818-2 : 2008-12</u>
<u>DIN EN 818-4 : 2008-12</u>	<u>DIN EN 818-6 : 2008-12</u>
<u>DIN EN ISO 12100 : 2011-03</u>	

The following national norms and technical specifications were applied:

<u>BGR 500, KAP2.8 : 2008-04</u>	<u>DIN 15428 : 1978-08</u>
<u>DIN 15429 : 1978-07</u>	<u>DIN 5688-3 : 2007-04</u>
<u>DIN 5692 : 2011-04</u>	<u>PAS 1061 : 2006-04</u>

Authorized person for the configuration of the declaration documents:  
Michael Betzler, RUD Ketten, 73432 Aalen

Aalen, den 26.09.2016 Dr.-Ing. Arne Kriegsmann (Prokurist/QMB)  
Name, function and signature of the responsible person *Arne Kriegsmann*

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EN



*Before every use, please read the Safety Instruction of the >MINI-components< carefully and make sure that you understand all substance.*

*Improper use can result in bodily injury or property damage and eliminates any warranty!*

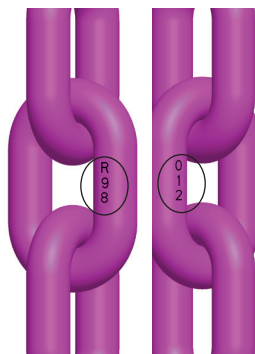
## 1 Safety hints



### WARNING

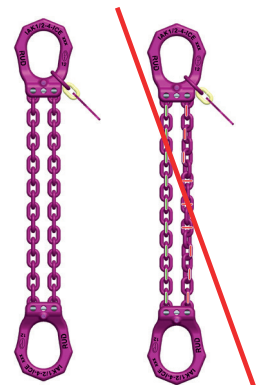
*Improper assembled or damaged VIP-MINI Slings and inappropriate use can result in deadly injury or lead to heavy injuries when load drops. Inspect VIP-MINI lifting means before each use carefully!*

- Do not mix with chains and components from other manufacturers and other quality classes.
- Assemble only ICE chains and components of the same nominal diameter.
- At parallel 2-leg slings all strands must be from the same production batch (**= identical manufacturing and batch numbers and identical number of chain links**). This is also valid when repairings are carried out.
- Parallel 2-leg slings are only permissible with a IAK-1/2-4 masterlinks



Pic. 1: Manufacturing number (character + numerics)  
Pic. 2: Batch number (numerics only)

- Chain slings must only be used without being twisted, knotted or bend (Picture 3). At parallel strands both chains must be assembled facing the same direction.



Pic. 3: Allowed usage

Pic. 4: Forbidden usage

- An assembly and usage with crosswise installed chain is forbidden (Pic. 5).
- Leave direct danger zone whenever possible. Attached loads must not be left unattended.
- RUD >MINI-components< must only be used by competent and designated persons which have been trained, and outside Germany by respecting the country specific regulations.

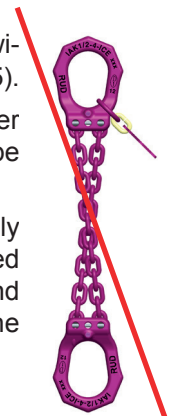


Abb. 5: Forbidden, crosswise usage

## 2 Intended use

- ICE-MINI components must only be used for the intended described usage.
- Assemble and use only RUD ICE-4 chains and components which are clearly marked with D1-12 and connecting pins which are stamped with 4 and ICE.



Pic. 6: D-1-stamp



Pic. 7: Connecting pin

## 3 Rules and standards

When using sling chains pay attention to the following rules and standards:

- European machine guideline 2006/42/EG
- DGUV-rules 100-500, chapter 2.8 (BGR 500)
- EN 818 (chapter 1, 2, 4 and 6)
- EN 1677
- PAS 1061
- and also to the country specific statutory regulations (outside of Germany).



#### HINT

We do not take any responsibility for damage occurred by non-conformance of these standards, regulations and hints!



= Identification of the complete assembled chain slings.

= this mark confirms that the technical requirements of the European Directives are fulfilled.

Make sure before the first lift that:

- the chain assembly corresponds to the order specifications;
- the test certificate 3.1 of the factory approval 2.1 (form EN 10204 with the details from EN 818-4) and declaration of conformity is present;
- the details marked on the identification tag of the assembly correspond to the specification on the test certificate and the declaration of conformity.

## 4 General information

- When selecting chain slings, the following parameters must be known:
  - Weight of the load
  - Centre of gravity
- Capability of temperature usage:  
If chain slings are used in temperatures ranging from 200°C upwards (e.g. in hot environments such as steel production, forges, foundries etc.) the WLL has to be reduced according to the following table:  
-60°C up to 200°C --> no reduction  
200°C up to 250°C --> minus 10 %  
250°C up to 300°C --> minus 40 %  
Temperatures higher than 300°C are prohibited



#### HINT

Lifting chains must not be used at temperatures below -60°C.

- The special ICE-Pink powder coating signalizes permanently the maximum temperature at which the ICE chain has been used. ICE-Pink turns into brown-black when the chain is used in forbidden temperature areas higher than 300°C (Bubbles start to occur; see Pic. 8).

ICE chains must be replaced or send back to manufacturer for inspection.



Pic. 8: Patented ICE overheating indicator for pink powder coated chains

- Sling chains of quality grade 12-ICE must not be used under chemical influences (acids, alkaline solutions and vapours), e.g. in pickling baths or hot dip galvanizing processing plants. Attention should be paid to special instructions such as BGR 150 (DGUV-rules 100-500) or other country specific statutory regulations.
- Before using sling chains in chemicals, the manufacturer must be contacted first regarding the concentration, period of penetration and temperature of use.
- RUD-ICE chains and components are acc. to DIN EN 818 and 1677 designed for a dynamical load of 20000 cycles.

The BG (Employer's insurance association) recommends: For high dynamical operational demands with a high number of load cycles (permanent usage), the bearing stress must be reduced acc. to FEM group 1Bm(M3 acc. To EN 818-7), f.e. by choosing the next bigger nominal size.

## 5 Assembly and user instruction

### 5.1 Handling

Pay attention to the following hints in regard of the handling of ICE-MINI slings and components:

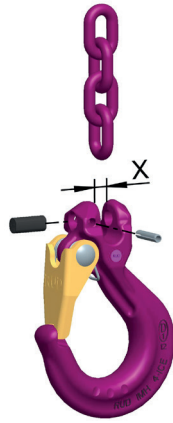
- Lifting chains must be used with straight legs without twists, knots or breaks.
- Load hooks must not be tip loaded and must be equipped with safety latches to avoid unintentional unloading.
- Master links and MINI-Lifter must be free moveable at the base of the crane hook.
- Avoid shock loading f.e. using fast motion lifting from slack chain.
- Avoid sharp edges because they bend or damage chain links and components. In this case either use edge protection, next bigger chain size or reduce the WLL by 20 %.
- Assemble and use only RUD ICE-4mm chains and components plus connecting pins which are stamped with 4 and ICE.
- Install roller pin for securing of the connecting pin in such a way that the slot of the roller pin can be seen from the outside.
- Use retaining pins only once!
- Use only original spare parts!
- Finally have the ongoing suitability checked after the assembly by a competent person (acc. to BetrSichV § 2 Begriffsbestimmung Abs. 4).

## 5.2 Assembly system

The ICE-MINI masterlink has a forged clevis connection which is a mandatory fixing for the chain and the number of strands.

Connecting pin and roller pins are pre-assembled.

The RUD clevis system yields through it's dimensional design to a mandatory fool-proof classification of the correct ICE chain size.



Pic. 9: Assembly system

## 5.3 Shortening system MINI-Lifter

By pressing the suspended mounted fixing bolts the chain can be released and pulled through the chain cross. This allows a quick shortening or extension of the chain strand. The chain strands can be adjusted separately.



### HINT

At the ICE-MINI-Lifter the chain strand must either be secured by the ICE-Endfitting (IEA-4) or by using a captive through going chain strand



### ATTENTION

The slack chain and the chain ends must not be loaded

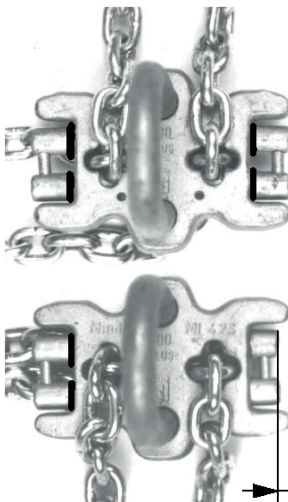


### ATTENTION

Before each loading please check whether chain is completely locked!

### 5.3.2 Wrong usage

- Chain connections must not be loaded around edges.



#### Pic. 10 - CORRECT:

Protection ribs and fixing bolts are at the same level. The green markings should be visible!

#### Pic. 11 - INCORRECT:

Fixing bolts are below protection ribs. The green markings cannot be seen!

Chain is not locked!

- Load hooks must not be tip loaded



Pic. 12: Wrong usage

- When using two MINI-Lifters in one hoist hook, unintended self-loosening can occur. Use the original 4-Strand MINI-Lifter IML-4.



Pic. 13: Wrong usage

### 5.3.3 Hint for usage with large crane hooks

In addition to the MINI-Lifter simply just use the appropriate ICE Master link IAK-RG-1-10:

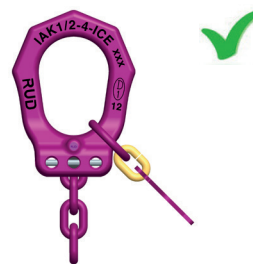
- MINI-Lifter and IAK-RG 1-10: suitable up to crane hook-No. 6 (DIN 15401)



Pic. 14: MINI-Lifter for large crane hooks

## 5.4 Lifting method

Assemble the single chain strands as follows (example A and B):



**A**  
One strand  
(single fall)

– connect **only at the hole in the middle!**

Pic. 15: Single fall



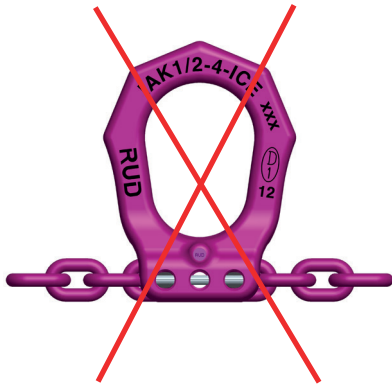
**B**  
Two strands  
(double fall)

– connect **only at the two holes outside!**

Pic. 16: Double fall



## Wrong assembly / misuse



Pic. 17: Wrong assembly / missuse

### 5.4.1 Single Fall

For single fall sling only use the hole in the middle of the masterlink (see picture 15 A).

### 5.4.2 Multiple leg (symmetrical)

- For double fall slings always use the two holes on the outside of the masterlink (see picture 16 B).
- For multiple strand slings an inclination angle between  $15^\circ$  and  $60^\circ$  should be chosen.



#### HINT

*Inclination angles bigger than  $60^\circ$  lead to an overloading of the chain sling Inclination angles below  $15^\circ$  can lead to instable loads.*

- Chain slings must only be used without being twisted, knotted or bend (Picture 3). At parallel strands both chains must be assembled facing the same direction.
- Usage with crosswise installed chains is forbidden
- When using a 4 leg sling/4 lifting points, even at symmetrical loads it might happen that only two diagonal chain strands are load bearing.
- At choke hitch lifts the WLL must be reduced to 80 % of the stated WLL.

### 5.4.3 Multiple strands (unsymmetrical)

When multiple strands are shortened it means that the load distribution to the several chain strands are diverse.



#### HINWEIS

*Acc. to DGUV-rules 100-500 section 2.8 (BGR 500), the WLL for single fall becomes valid when unsymmetrical load occurs at a multiple strand sling.*

### 5.4.4 Multiple strands (parallel)

When using parallel multiple strand slings the following points must be observed:



#### WARNING

*At parallel 2-leg slings (pic. 4) all strands must be from the same production batch (= identical manufacturing and batch numbers and identical number of chain links).*

*This is also valid when reparings are carried out.*



#### WARNING

*Disregarding the special requirements at parallel 2-leg slings the safety factor against breaking will be reduced dramatically.*

## 5.5 Hints for the storage

Consider the following regulations when storing sling chains.

- Keep chains dry
- Hang chains vertical into a rack
- Protect chains from climatic influences.

## 6 Inspection and test

### 6.1 Visual and functional test

Controlling of used chain slings require a regular inspection by an expert who carries out the test within a period of 12 months. Depending on the conditions of use, e.g. permanent usage, increased wear or corrosion the inspection must to be carried out earlier. The inspection must also be carried out after accidents and unusual incidents

- The competent person has to record the examination either in the chain card or in the AYE-D. NET-Application.
- Protocols of tests and any other records have to be kept at least until the next inspection.
- Should any of the following damage occur, the sling chain should immediately be taken out for maintenance and servicing:
  - a) The identification tag is unreadable or the tag is missing.
  - b) Twisting, deformation and breakage of chains, components and master links.
  - c) Lengthening of the chain by plastic deformation of individual links by more than 5 % referred to the pitch of 3d.

- d) Wear occurs at the chain links caused by abrasion on the outside and between chain links hanging together. For measuring the wear with a caliper, the chain must be loose. A wear up to 10 % (dm) is permissible.
- e) Cuts, notches, grooves, failure, increased corrosion, discolouring due to heat, bent or twisted chains and components. Especially deep notches in the tensile strength region and sharp-edged notches in lateral direction are not allowed.
- f) At the lifting hook, the widening of the hook must not exceed 10 % of the nominal value. The hook securing (safety latch) must still slip into the hook tip in order to occur from closure. Carefully examine bowl of the hook for notches at the max. until the forged and patented wear mark has reached.



#### WARNING

At parallel 2-leg slings all strands must be from the same production batch (= identical manufacturing and batch numbers and identical number of chain links). This is also valid when repairs are carried out.

Maximum of allowed wear of the pin diameter = 10 %. Fundamentally, use new connecting bolts and tensioning sleeves when changing these parts. Use only original RUD spare parts! It is only allowed to connect VIP-chains with VIP components (pink coloured and VIP stamped). Any carried out repairs, maintaining have to be recorded in the chain card file resp. into the AYE-D.NET-Application.

### 6.2 Crack detection

Inspections going further than just visual checking, the corresponding national regulations have to be fulfilled.

RUD recommends, respectively to DGUV-rules 100-500, chapter 2.8 (BGR 500), to do a crack test inspection at least after 3 years.

A proof load test for chains and components is insufficient because cracks can only be recognized with a magnetic crack test.

### 7 Repair and Maintenance

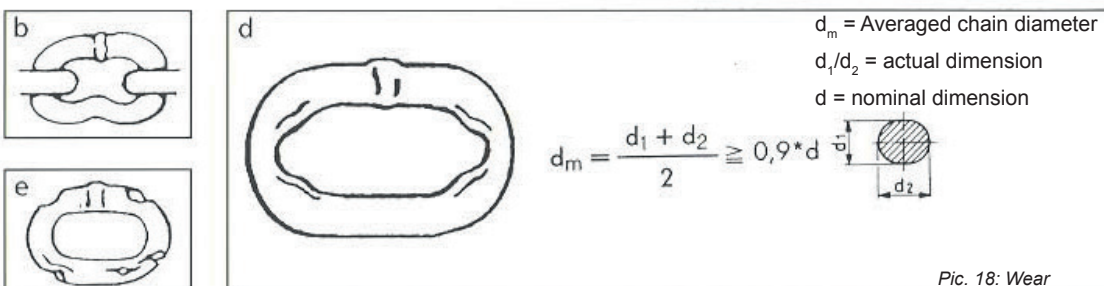
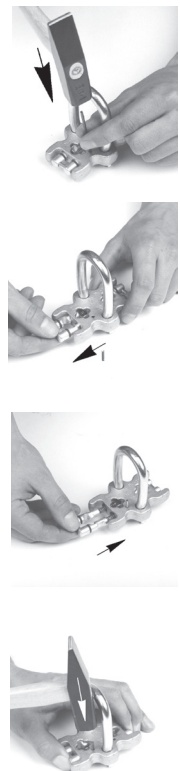
Repair works have only to be carried out by a competent person, disposing of the knowledge and skills required. Components and chains with failures, being bent, twisted and considerably deformed must be replaced. Replace only the complete strand of chain. Minor faults such as notches and grooves have to be grind off carefully (no notch effect). The cross section of the material must not be decreased by more than 10 %. Welding on chains and components is forbidden.

### 8 Cleaning when polluted

If a malfunction, caused by extreme pollution, of the holding pins occurs at the MINI-Lifter, a competent person can solve this problem. The following tools are needed: Hammer and drift punch.

While cleaning please proceed as follows:

1. Remove sleeve pin with a drift punch.
2. Pull out fixing pin. The fixing pins and the pressure springs are now exposed.
3. Clean MINI-Lifter.
4. Recommendation: Lubricate pins with grease before re-assembly.
5. Position sleeve pin and install then fixing pins and springs into the housing.
6. Press holding pin now into the housing and install a new sleeve pin.
7. Once you have cleaned the MINI-Lifter check function carefully. When retaining pins are released the chain cross must be completely self-locked.



## 9 Documentation

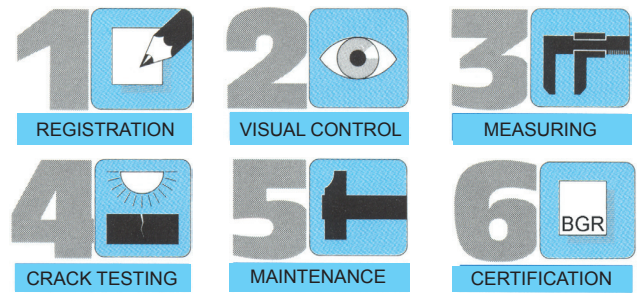
### 9.1 Chain card file

The chain card file contains the continuous history of a chain sling. The contents are: first record (paragr. 2), inspection/test dates (paragr. 3) as well as repair and maintenance (paragr. 4). If there are any repairs, the reason must be indicated. The records in the chain card file gives proof on steady super-vision measurements of the user during the use of the sling chains. Carefully adhere to statutory requirements and the approval code of practise issued by the trade association.

Our test personnel are well skilled experts according to DIN EN ISO 9712, working with the most modern equipment.

Test certificate according to DGUV-rules 100-500 (BGR 500) as well as the actual EU law. RUD lifting means inspection service means safety and keeps the value of goods conserved. The RUD inspection service offers you the complete safety service directly on-site. We are testing every lifting mean according to the adjoining 6 points safety program.

Service phone: 0049 7361/504-1351



#### HINT

ICE-MINI components must not be combined with parts from quality grade 8 and 10!

### 9.2 RFID

The MINI components will be equipped with a RUD-ID-Point® and can clearly be related by the identification number. This number can be determined with the RUD-ID-EASY-CHECK® readers and data can be transferred into the AYE-ID.NET-Application.



The application will support your product administration and documentation.

For further information please go to the RUD webpage or ask your RUD authorized distributor.

inclination $\beta$	0°	0°	0-45°	>45-60°	0-45°	>45-60°
load factor	1	2	1.4	1	2.1	1.5
WLL [t]	0.8	1.6**	1.12	0.8	1.7	1.18
inclination $\beta$	0-45°	>45-60°	0-45°	45-60°	0-7°	>7-45°
load factor	1.1	0.8	1.7	1,2	4	2.8
WLL [t]	0.88*	0.64*	1.36*	0.96*	3.2*	2.24*

! When lifting in a basket hitch, make sure that loads do not move hazardous or drop (see German work safety regulation "Betr SichV", attachment 1 acc. §7).

Table 1: WLL overview (symmetrical loading)



#### IMPORTANT HINTS

- Acc. to DGUV-rules 100-500 section 2,8 (BGR 500), the WLL for single fall becomes valid when unsymmetrical load occurs at a multiple strand sling.
- \* Choke hitch and endless chain: Bollard-, bolt- or shackle diameter  $3 \times t > 36 \text{ mm}$ . A reduction of 20 % for the choke hitch and bundling (sharp edge) is already within the calculation.

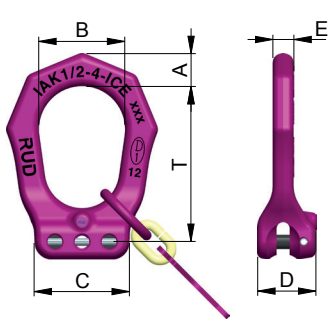
- \*\* At parallel 2-leg slings all strands must be from the same production batch (=identical manufacturing and batch numbers and identical number of chain links). This is also valid when repairing are carried out.
- RUD-VIP chains and components are acc. to DIN EN 818 and 1677 designed for dynamical load of 20000 cycles.

Type	Ø [mm]	WLL [t]	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	F [mm]	T [mm]	weight [kg/pc.]	Ref.-No.
IAK-1/2	4	0.8	13	34	38	22.5	8	---	58	0.2	7905031
IAK-3/4	4	1.7/1.18	10	35	60	---	---	---	108	0.5	7905033
ISH-4 (IMH)	4	0.8	22	15	13	14.5	16.5	21	55	0.16	7904693
ICE-chain 4x12*	4	0.8	---	5.2	---	4	---	---	12	0.44 kg/m	7904694*
ICE-chain 4x12**	4	0.8	---	5.2	---	4	---	---	12	0.44 kg/m	7905283**
IML-2	4	1.12/0.8	10	30	---	---	---	---	66	0.35	7905075
IML4-4	4	1.7/1.18	11	35	60	---	---	---	156	0.85	7905076
IEA-4	4	---	4.8	---	---	---	---	---	---	0.04	7905039
IMKS-4	4	in preparation									

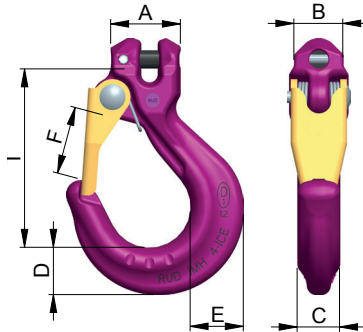
Table 2: Dimensioning

\* pink powder coated ICE-Pink / \*\* phosphated/oiled

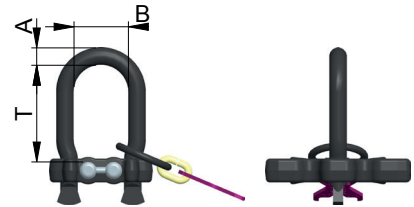
Subject to technical alterations



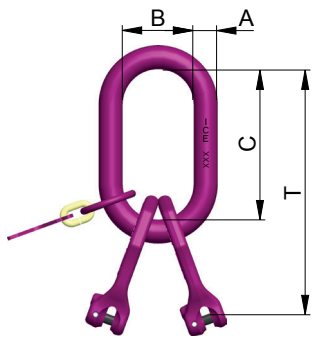
Pic. 19: IAK-1/2



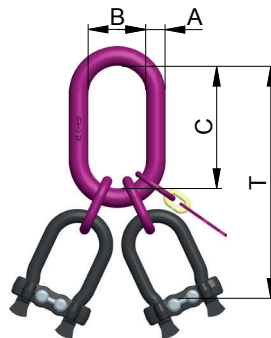
Pic. 20: ISH-4 (IMH)



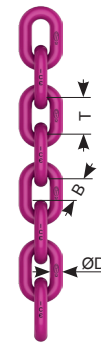
Pic. 21: IML 2-4



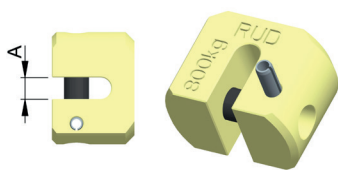
Pic. 22: IAK-3/4



Pic.23: IML4-4



Pic. 24: IMK 4



Pic. 25: IEA 4