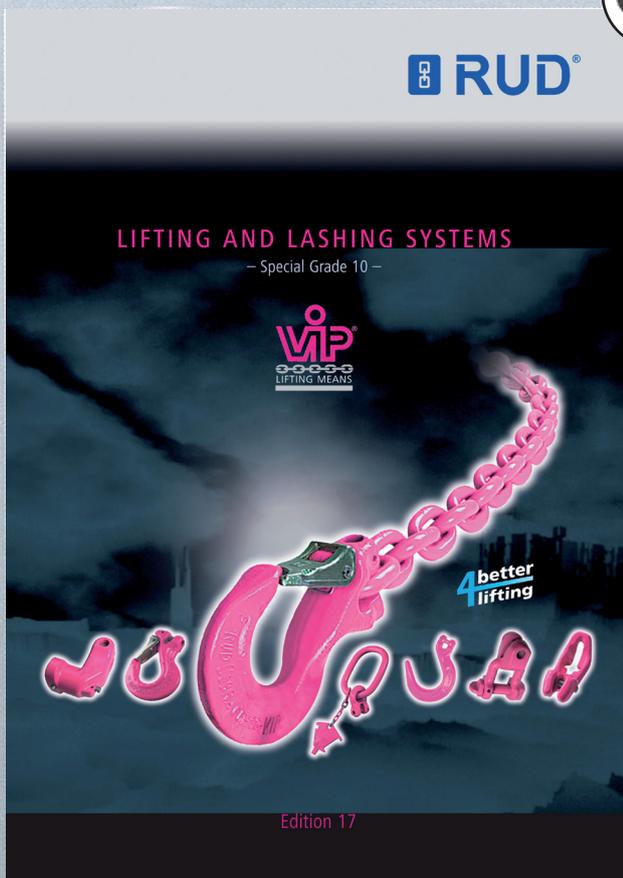


USER MANUAL

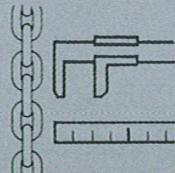
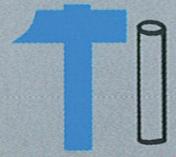
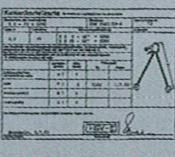
for RUD sling chains

... special quality VIP

... grade 8



According to EG-Machinery Directive 2006/42/EG, EG material use directive and DGVV 109-017, BetrSichV., EN 818, EN 1677

| Selection | Use | Inspection/Test | Maintenance and Repair | Documentation |
|---|---|---|--|---|
|  |  |  |  |  |
| 1 | 2 | 3 | 4 | 5 |

Translation of the Original instructions

Determined usage for lifting and transportation of loads

1. Selection of sling chains

1.1 The weight of the corresponding load must be known.

1.2 The center of gravity from the load must be known.

1.3 Method of sling

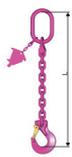
For multiple leg lifting the inclined angle should be between 15° and 60°. Inclined angles exceeding 60° creating overloading in the legs. Angles less than 15° can create instability of the load. When using choke hitch, the WLL must be reduced to 80 % of the indicated WLL. Generally it is always possible with a 4 leg lifting that only 2 legs are carrying the load even the load is symmetrical.

1.4 Asymmetrical loads

If one leg must be shortened in multiple leg application could this be an indication for an uneven load.

Acc. to EN 818-6 (section A.1.3.5), the WLL for single fall becomes valid when unsymmetrical load occurs at a multiple strand sling.

1.5 WLL in tons for symmetrical conditions (see table)

| RUD-Lifting means  | | 1-leg  | | 2-leg  | | 3- and 4-leg  | | EN-818 Grade 8  | |
|--|----------|--|-------|--|-------|---|---|---|--|
| Inclination angle β | | 0 | 0-45° | 45-60° | 0-45° | 45-60° | Inclination angle β | | |
| Load factor | | 1 | 1.4 | 1.0 | 2.1 | 1.5 | Load factor | | |
| Nom. chain size | | | | | | | | Nom. chain size | |
|  | ▶ VIP 4 | 0.63 | 0.88 | 0.63 | 1.32 | 0.95 |  | | |
| | 6 | 1.12 | 1.6 | 1.12 | 2.36 | 1.7 | | | |
| | ▶ VIP 6 | 1.5 | 2.1 | 1.5 | 3.15 | 2.25 | | | |
| | 8 | 2.0 | 2.8 | 2.0 | 4.25 | 3.0 | | | |
| | ▶ VIP 8 | 2.5 | 3.5 | 2.5 | 5.25 | 3.75 | | | |
| | 10 | 3.15 | 4.25 | 3.15 | 6.7 | 4.75 | | | |
| | ▶ VIP 10 | 4.0 | 5.6 | 4.0 | 8.4 | 6.0 | | | |
| | 13 | 5.3 | 7.5 | 5.3 | 11.2 | 8.0 | | | |
| | ▶ VIP 13 | 6.7 | 9.5 | 6.7 | 14.0 | 10.0 | | | |
| | 16 | 8.0 | 11.2 | 8.0 | 17.0 | 11.8 | | | |
| | ▶ VIP 16 | 10.0 | 14.0 | 10.0 | 21.0 | 15.0 | | | |
| | 18 | 10.0 | 14.0 | 10.0 | 21.2 | 15.0 | | | |
| | ▶ VIP 20 | 16.0 | 22.4 | 16.0 | 33.6 | 24.0 | | | |
| | 22 | 15.0 | 21.2 | 15.0 | 31.5 | 22.4 | | | |
| | ▶ VIP 22 | 20.0 | 28.0 | 20.0 | 42.0 | 30.0 | | | |
| | 26 | 21.2 | 30.0 | 21.2 | 45.0 | 31.5 | | | |
| ▶ VIP 28 | 31.5 | 45.0 | 31.5 | 67.0 | 47.5 | | | | |
| 32 | 31.5 | 45.0 | 31.5 | 67.0 | 47.5 | | | | |

Attention: Acc. to EN 818-6 (section A.1.3.5), the WLL for single fall becomes valid when unsymmetrical load occurs at a multiple strand sling.

When using choke hitch, the WLL has to be additionally reduced by 20 %.

RUD-VIP chains and components are designed for a dynamic load of 20.000 cycles according to DIN EN 818 and 1677 standard

German Employer's insurance Association recommends: When high dynamic stress com-

binies with high number of load cycles, the bearing stress must be reduced to Mechanism group 1Bm (M3 acc. to EN 818-7), for example by selecting the next larger chain size.

1.6 RUD MECANO assembly system for Special quality VIP 10 and Grade 8

RUD master link with an in all multi-directional movable welded connector. Thus ensuring that the correct chain diameter and number of legs can be connected. Complete identification tag with the WLL indications. Connecting bolts and tensioning sleeves are pre-assembled. With other pins they are not pre-assembled and must be relocated to the corresponding component.

With the RUD MECANO system the assembly is very simple. Additional the system is fool proof, therefore it is inevitably that the correct chain size will be attached.

Dimension X prevents the assembly of a bigger RUD chain size.

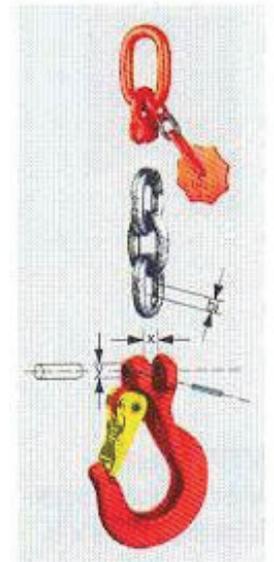
The diameter Y of the load pin prevents from a connection of a smaller RUD chain size.

Only RUD chains and RUD components with the same nominal size can be assembled.

Attention:

- Grade 8: only chains, components and pins stamped with H1 can be used or assembled.
- Special quality VIP 10: only chains, components and pins stamped with VIP-H1-8S or H1-10 can be used or assembled.
- Slot of the retaining pin must be visible from outside.
- Use retaining pins only once.
- **Use only RUD original spare parts**

Non fool proof



1.7 Assembly system INTER-LINE-SYSTEM

Universal system, chains and components are non fool proof assembled with VS-hammerlock.

It is a necessity to pay particular attention that for assembly and repair, chains, masterlinks and components are from the same nominal size. Identification tags must be assembled separately.

Attention:

- Use retaining pins only once!
- Identification must be correct!
- Use only RUD original spare parts!

INTER LINE SYSTEMS
Universal-System

Non fool proof



The assembly of chains and components from different manufacturers is not permitted!

A combination of RUD slings of Grade 80 with RUD components of Grade 100-VIP is allowed when the connectings are designed equal in regard of bolt diameter, width of clevis and inside width of chain (bi = inside width of chain links).



= identification of completely assembled chains slings.

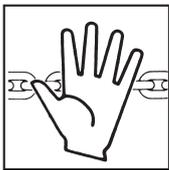
= the sign confirms that technical requirements of the European standards NORM – CEN are fulfilled.

The identification resp. WLL tag must be stamped with the lower WLL and attached separately.

Please pay attention to the following regulations:

EN 818-1 / EN 818-2 / EN 818 – 4/ EN 1677/ DGUV 109-017 and country specific statutory regulations.

We do not take any responsibility for damages occurred by non-respecting these standards, regulations and above mentioned hints.



2. Usage for lifting chains

When using lifting chain assemblies, attention must be paid according to the regulations DGUV 109-017 (BGR 500 chapter 2.8) „Betreiben von Lastaufnahmeeinrichtungen im Hebezeugbetrieb“ or other specific country statutory regulations (out of Germany). Whenever it is possible leave the danger zone. Never leave lifted loads unattended.

Be sure before the first lift that:

- The chain assembly corresponds to the ordered ones
- The test certificate or the factory approval (form DIN EN 10204 with the details from EN 818-4) and declaration of conformity is present.
- The details marked on the identification tag of the chain assembly correspond to the specification on the test certificate and the declaration of conformity.
- The details are in the chain card file. This documentation should include a description of the chain assembly, as well as the proof of identity (test certificate resp. declaration of conformity/ref. no.).

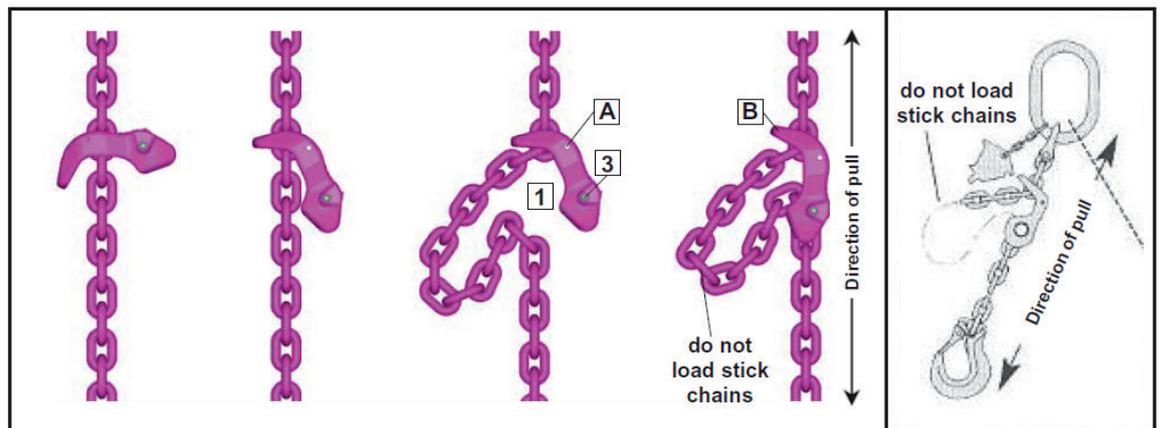
2.1 Handling

Lifting chains must be used with straight legs without twists, knots or breaks. Lifting hooks are not designed for tip loading and must be equipped with safety latches to avoid unintentional unloading. Before the usage of hooks without a safety latch a risk assessment has to be carried out and the whole operation must be made extra careful. When using chain shorteners DIN 5692:2011-4 must be observed in regard to the technical requirements.

Master links must be free moveable at the bowl of the crane hook. Avoid shock loading. Sharp edges are bending or damaging chain links and components. In this case use edge protection, next bigger chain size or reduce the WLL by 20 %.

When endusers are changing the original design of a chain sling (exchange of the OEM-parts), essential health and safety requirements must be observed and appropriate actions must be carried out. These actions must be assured again by a risk assessment.

VIP-Multi-shortening claw VMVK



Assembly:

Pull loose chain strand through the crucifix. Secure the chain in the locking pocket at the required position and drive in the retaining pin A. Thus the multi shortening claw is fixed in the VIP chain strand. It is preferable to fit and secure the claw from the suspension link for maximum adjustment. Slide the chain into the slot and secure.

Handling:

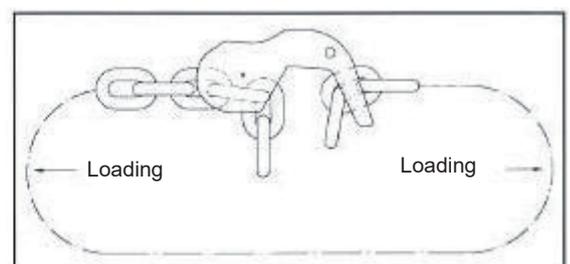
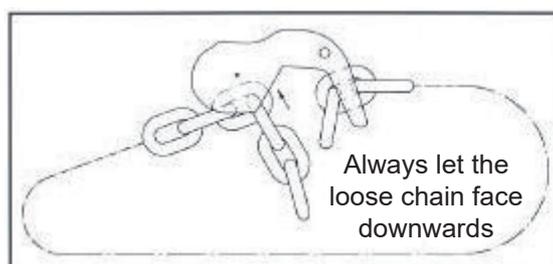
Laterally swing out VMVK. In a loosened condition, insert the required chain link of the to be loaded slack chain leg into the pocket support of the VMVK 1. Pull down the chain leg and press the securing bolt 3. The securing bolt locks automatically. Check the locking. To unlock, reverse the above procedure while simultaneously pressing the securing bolt 3.

Attention:

If the VMVK or the BSEK are used without securing bolt the chain must always be completely seated in the locking slot B ! When pulling/fitting the shortened chain assembly attention must be paid to ensure that the chain remains in the locking slot B until the lift has been completed.

User advice!

It makes it easier for a chain basket assembly.



2.2 Multi – leg sling chains, where not all individual legs are used:

| Application of the lifting means | Number of individual used legs | Load factor for the nominal WLL |
|----------------------------------|--------------------------------|---------------------------------|
| 2-leg | 1 | 1 / 2 |
| 3- and 4-legs | 2 | 2 / 3 |
| 3- and 4-legs | 1 | 1 / 3 |

2.3 Storage of sling chains

Sling chains should be stored on racks in hanging conditions.

forges, foundries etc.) the WLL has to reduced according to the following table.

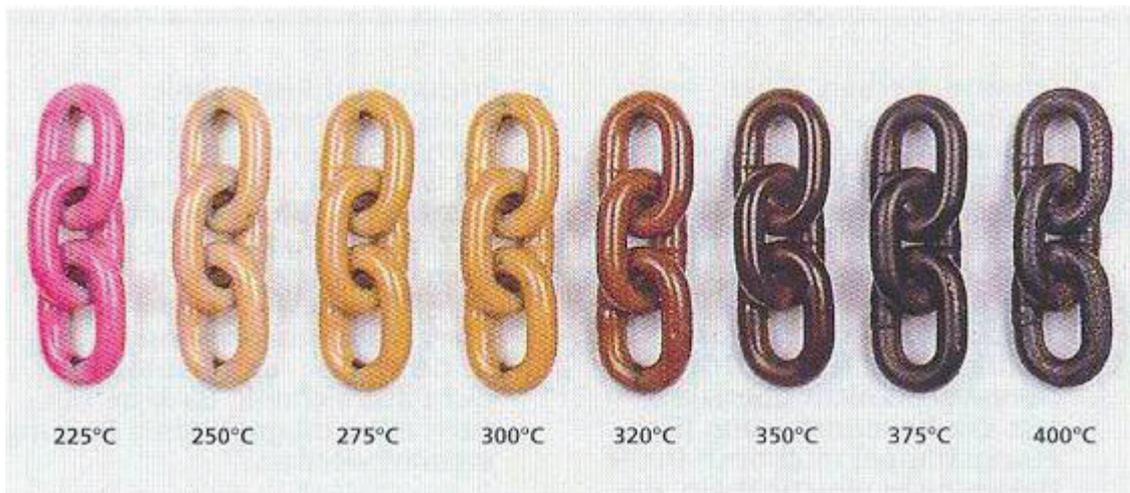
2.4 Influences of high and low temperature

If sling chains are used in temperatures ranging from 200°C upwards (e.g. in hot environments such as steel production,

Reduced WLL in % where the chain slings reaches temperatures of:

| VIP | °C % | -40° to +200°C 100 % | above 200° up to 300° 90 % | above 300° to 380° 60 % |
|---------|------|--------------------------|-------------------------------|----------------------------|
| grade 8 | °C % | -40° bis +200°C 100 % | über 200° bis 300° 90 % | above 300° to 400° 75 % |

With lower temperatures, the sling chains must not be used because of their sensitivity against brittle failure. Temperatures ranging from 380°C upwards (Grade 8: 400°C) are not allowed.



VIP over-heat indicator for pink powder coated chain.

-Patented-

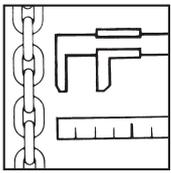
The special fluorescent pink powder coating signals permanently the maximum temperature at which the VIP chain had been used. The pink colour changes to black when the chain is used in temperature areas higher than 380°C (forbidden) and starts to bubble. Replace VIP chains or return to manufacturer for inspection.

2.5 Chemical influences

Sling chains of quality class 8 and VIP special quality 10 are not be used under chemical influences (acids, alkaline solutions and vapours) e.g. in pickling baths or hot dip galvanising plants. Attention should be paid to special instructions such as BGR 150 / DGUV 109-004 or other country specific statutory regulations.

2.6 Other influences

Before using sling chains in chemicals, the manufacturer must be contacted first regarding the concentration, period of penetration and temperature of use.



3. Inspection and test

3.1 Visual and function test

For controlling sling chains, regular inspection by an expert have to be carried out within a period of 12 months. Depending on the conditions of use, e.g. permanent usage, increased wear or corrosion the inspection needs to be carried out earlier. The expert has to record the examination in the chain card life. Protocols of tests and any other records have to be kept. Should any of the following damage occur, the sling chain should immediately be taken out for maintenance and service:

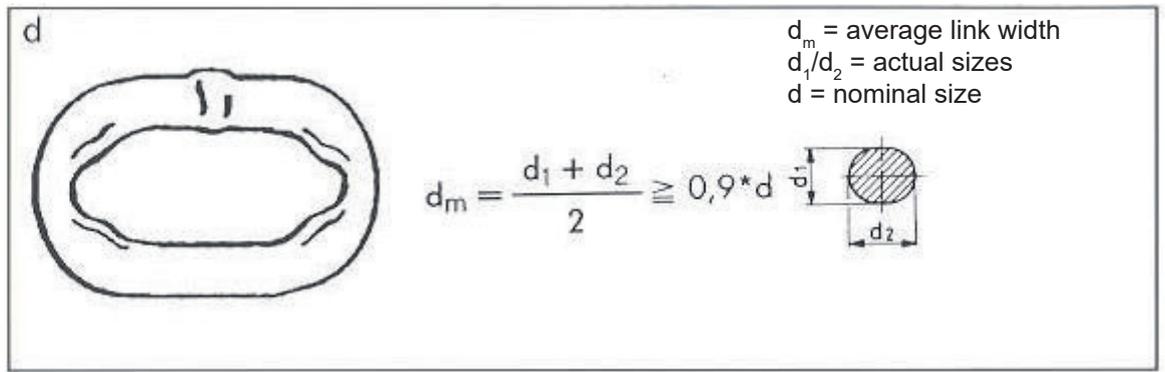
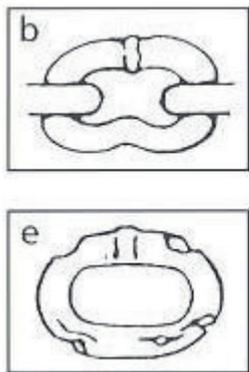
a) The identification tag is unreadable or the tag is missing.

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 caliber, the chain must be loose. A wear up to 10 % (d_m) 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.

3.2 Examination for cracks

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

RUD recommends, respectively to BGR 500 chapter 2.8 (DGUV 100-500), 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.

VIP identification tag with integrated chain testing gauge



Testing wear of nominal diameter



Testing pitch elongation caused by wear of nominal diameter



Testing plastic elongation caused by overloading

4. Repair and Maintenance

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

5 Documentation

5.1 Chain card file

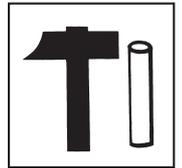
The chain card file contains the continuous history of a chain sling. The contents are: first record (paragr. 2), inspection/test dates (paragr. 3) as well as repair and maintenance (paragr. 4). If there are any repairs, the reason must be indicated. The records in the chain card file give proof on steady supervision 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.

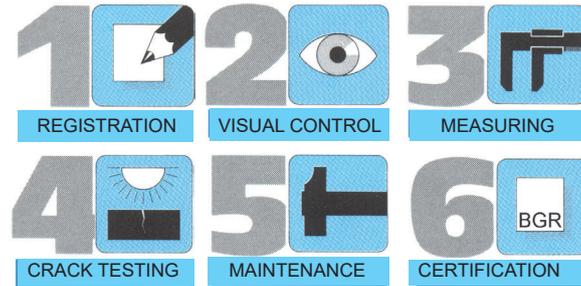
Our test personnel are well educated specialists according to EN 473 working with the most modern equipment. Test certificate according to BGR 500 / DGUV 109-017 as well as actual EU law. Testing equals safety and keeps the value added.

The RUD inspection service offers you the complete safety service directly on the field.

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 RUD-chains with VIP components. Any repairs, maintenance carried out have to be recorded in the chain card file resp. into the RUD-ID-NET®-Applikation.



It is not allowed to combine RUD chains and components with chains and components from different manufacturers.



HINT

It is not allowed to combine ICE chains and components with chains and components quality class 10 and 8.

5.2 RUD BLUE-ID-SYSTEM

RUD BLUE-ID  SYSTEM

The RUD-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-D.NET System. The application will support your product administration and documentation.

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

| | |
|---|--|
|  | |
| EC-Declaration of conformity | |
| <small>According to the EC-Machinery Directive 2006/42/EC, annex II A and amendments</small> | |
| Manufacturer: | RUD Ketten Rieger & Dietz GmbH u. Co. KG Friedensinsel 73432 Aalen |
| <small>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.</small> | |
| Product name: | <u>Chain sling Grade 100 - VIP</u> <u>ND 4-28 mm, adjustable/not adjustable</u> |
| <small>The following harmonized norms were applied:</small> | |
| DIN EN 1677-1 : 2009-03 | DIN EN 1677-2 : 2008-06 |
| DIN EN 1677-3 : 2008-06 | DIN EN 1677-4 : 2009-03 |
| DIN EN 818-1 : 2008-12 | DIN EN 818-2 : 2008-12 |
| DIN EN 818-4 : 2008-12 | DIN EN 818-6 : 2008-12 |
| DIN EN ISO 12100 : 2011-03 | |
| <small>The following national norms and technical specifications were applied:</small> | |
| DGUV-R 109-017 : 2020-12 | DIN 15428 : 1978-08 |
| DIN 15429 : 1978-07 | DIN 5688-3 : 2007-04 |
| DIN 5692 : 2011-04 | DIN 685 : 1981-11 |
| PAS 1061 : 2006-04 | |
| <small>Authorized person for the configuration of the declaration documents: Michael Betzler, RUD Ketten, 73432 Aalen</small> | |
| Aalen, den 19.11.2021 | Hermann Kolb, Bereichsleitung MA  |
| <small>Name, function and signature of the responsible person</small> | |

| | |
|---|--|
|  | |
| EC-Declaration of conformity | |
| <small>According to the EC-Machinery Directive 2006/42/EC, annex II A and amendments</small> | |
| Manufacturer: | RUD Ketten Rieger & Dietz GmbH u. Co. KG Friedensinsel 73432 Aalen Germany |
| <small>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.</small> | |
| Product name: | <u>Chain sling Grade 80</u> <u>ND 6-16 mm, adjustable/not adjustable</u> |
| <small>The following harmonized norms were applied:</small> | |
| DIN EN 1677-1 : 2009-03 | DIN EN 1677-2 : 2008-06 |
| DIN EN 1677-3 : 2008-06 | DIN EN 1677-4 : 2009-03 |
| DIN EN 818-1 : 2008-12 | DIN EN 818-2 : 2008-12 |
| DIN EN 818-4 : 2008-12 | DIN EN 818-6 : 2008-12 |
| DIN EN ISO 12100 : 2011-03 | |
| <small>The following national norms and technical specifications were applied:</small> | |
| DGUV-R 109-017 : 2020-12 | DIN 15428 : 1978-08 |
| DIN 15429 : 1978-07 | DIN 5688-3 : 2007-04 |
| DIN 5692 : 2011-04 | DIN 685 : 1981-11 |
| <small>Authorized person for the configuration of the declaration documents: Michael Betzler, RUD Ketten, 73432 Aalen</small> | |
| Aalen, den 19.11.2021 | Hermann Kolb, Bereichsleitung MA  |
| <small>Name, function and signature of the responsible person</small> | |

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