> INOX-STAR <

EDELSTAHL Rostfrei INOX STAINLESS STEEL

EN

Safety instructions

This safety instruction has to be kept on file for the whole lifetime of the product and forwarded with the product.

TRANSLATION OF THE ORIGINAL INSTRUCTIONS

RUD®

RUD Ketten
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RUD-Art.-Nr.: 7996554-EN / V04 / 10.024

Eye bolts INOX-STAR
made out of DUPLEX stainless steel

RUD®

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: INOX-Star

Folgende harmonisierten Normen wurden angewandt:

DIN EN ISO 12100 : 2011-03

Folgende nationalen Normen und technische Spezifikationen wurden außerdem angewandt:

DGUV-R 109-017 : 2020-12

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

Aalen, den 16.04.2021 Hermann Kolb, Bereichsleitung MA

Name, Funktion und Unterschrift Verantwortlicher

RUD®

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: INOX-STAR

The following harmonized norms were applied:

DIN EN ISO 12100 : 2011-03

The following national norms and technical specifications were applied:

DGUV-R 109-017 : 2020-12

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

Aalen, den 16.04.2021 Hermann Kolb, Bereichsleitung MA

Name, function and signature of the responsible person

Before every use, please read the Safety Instruction of the INOX-STAR carefully and make sure that you understand all substance.
Improper use or care of this eyebolt can result in bodily injury or property damage and eliminates any warranty!

1 Application and warning information

WARNING
Improper assembled or damaged INOX-STAR and inappropriate use can result in deadly injury or lead to heavy injuries when load drops. Inspect the INOX-STAR before each use carefully!

- During the lifting process, remove all body parts (fingers, hands, arms, etc.) from the danger zone, arms, etc.) out of the danger zone (danger of squeezing).
- The INOX-STAR may only be used by authorised and trained persons in compliance with the DGUV Regulations 109-017 and in compliance with any valid national regulations if used outside Germany.
- The stated WLL at the INOX-STAR must not be exceeded.
- The INOX-STAR must be able to rotate by 360° once it is tightened.
- The INOX-STAR is not permissible to be rotated permanently under load.
- Any technical modifications at the INOX-STAR are prohibited.
- Keep persons out of the hazardous area.
- Detention under a floating load is forbidden.
- Jerkily lifts with shock loads must be avoided.
- When the lift starts, pay attention to a stable position of the load. Avoid swinging of the load.
- Damaged or worn INOX-STAR must no longer be used.

2 Intended use of INOX-STAR

The eyebolt INOX-STAR can be used as a lifting point in general.

The INOX-STAR **must not be used when load swivels**, because the INOX-STAR could turn loose.

The lifting point must only be used up to the maximum required WLL (see *Table 3*).

The INOX-STAR eyebolt must only be used in the hereby specified application.

3 Material properties

The utilised stainless Duplex-steel 1.4462 for the body and the bolt has a good resistance against wear and local corrosion like pitting, crevice corrosion and stress corrosion cracking in sea water and high chloride and H2S containing media.

This steel is very common in the construction industry, chemical industry, oil industry, food industry (only limited resistance against lactic acid), in the machine engineering for example, as REA-components and transport boxes, in desalting plants at OFF-Shore areas like shipbuilding.

The material can also be utilised in the nuclear industry as far as nuclear technical requirements or object specifications do allow the usage (according to VdTÜV 418).

HINT
The material must not be used in the following areas:
Load bearing parts in indoor swimming pool atmospheres, which are neither permanent rinsed with water nor cleaned, if their failure could cause serious personal injury.
For example when used as connecting element for a suspended ceiling, pendents or loudspeakers or for the fixation of water slides or any other construction elements (read ISER-Merkblatt 831).

4 Installation information

4.1 General information

- Capability of temperature usage:
  The stainless steel PSA-INOX-STAR eye bolts can be used in the temperature range between -60°C up to 280°C (according to VdTÜV 418).
- RUD lifting points must not be used under chemical influences such as acids, alkaline solutions and vapours. Please observe chapter *3 Material properties*.

4.2 Assembly information

1 The material construction to which the lifting point will be attached should be of adequate strength to withstand forces during lifting without deformation (certificate of static forces). **Rm > 340 N/mm²** For steel of the strength S235JR (1.0037) or Cast iron GG 25 (0.6025 - without blowhole) the bolt length should be 1,5xM (=L).

When lifting light metals, nonferrous metals and gray cast iron or other materials the thread has to be chosen in such a way that the WLL of the thread corresponds to the requirements of the corresponding base material. For material with lower strength, please use lifting points with longer thread engagement.
German employers insurance association (BG/DGUV) recommends the following minimum thread engagement lengths:
2 x M in aluminium alloys
2,5 x M in light metal with low strength.
Please choose for light metals, nonferrous metals and grey cast iron or other materials the thread has to be chosen in such a way that the WLL of the thread corresponds to the requirements of the corresponding base material.

2 The bolting location for the eyebolt should be marked with paint.

3 The eyebolt should be installed as follows:
the coupling element must be free moveable, locate lifting point in such a way that prohibited loading, like turning or flipping of the load will be avoided:
- **Single fall lifting:** vertical, above centre of gravity.
- **Double leg lifting:** over and at each side of the centre of gravity.
- **Three- or 4 leg lifting:** equal in the same level around centre of gravity.

4 Symmetry of load:
Determine the necessary WLL of each lifting point for symmetrical loading according to the following physical calculation correlation:

$$W_{LL} = \frac{G}{n \times \cos ß}$$

W_{LL} = necessary working load limit of the single lifting point (kg)
G = weight of load (kg)
n = number of load bearing
ß = inclination angle of single strand

Number of load bearing strands:

	Symmetric
Double strand	2
Three-/ Four strand	3

Table 1: see also Table 3

HINT
At unsymmetrical loads, even if several lifting points are used, the WLL of a single lifting point must be at least equal to the load weight or ask the manufacturer.

5 Make sure that a plane bolting surface is provided (Ø E, see *Table 4*). Maximum countersink of the threaded hole = Nominal diameter of thread

6 Drill the tapped blind holes deep enough so that the shoulder of the INOX-STAR bolt sits properly on the plane surface. Machine through holes up to DIN EN 20273-middle.

7 The INOX-STAR must be adjustable through 360° when installed.
- For a **temporary** assembly, hand tightening with an allen key is sufficient.
- If the INOX-STAR shall be installed permanently, a torque of 25 Nm (±10 %) must be applied (*Table 2)*, plus securing with threadlocker has to be done. It is possible to receive a socket wrench for the usage of a torque:

Type metric	Torque	Part-No. key
INOX-STAR M8	10 Nm	7997749
INOX-STAR M10	10 Nm	7997749
INOX-STAR M12	25 Nm	7997750
INOX-STAR M16	60 Nm	7997751
INOX-STAR M20	115 Nm	7997752
INOX-STAR M24	190 Nm	7997753

Table 2: Torque

Secure in general all lifting points which are installed permanently, e.g. with glue.

HINT
Shock loading or vibrations can cause unintentional dismantling. To avoid this use liquid thread locker such as Loctite or WEICONLOCK (depending on the application, please pay attention to the manufacturer's instruction).
Attention: Ring Body has to be free rotatable.

8 After the installation has been done, a competent person should check the suitability of the fall protection eyebolt (see chapter *5 Inspection / Repair / Disposal*).

4.3 User information

- The whole lifting point must be inspected regularly by a competent person in regard of tightening of bolt, strong corrosion, wear and deformations (e.g. by the person responsible for attachment). See chapter *5 Inspection / Repair / Disposal*

WARNING
Wrong assembled or damaged lifting means as well as incorrect usage may result in serious or deadly injuries.
Lifting means must be in general inspected before each usage.

- RUD components have been designed as per DIN EN 818 and DIN EN 1677 for a dynamic load of 20,000 load cycles.
  - Observe and be aware that multiple load cycles can occur during a lifting operation.
  - Observe the risk of product damage caused by high dynamical influences at high load cycle numbers.
  - BG/DGUV Germany's employer insurance association recommends: At high dynamical loading with a high number of load cycles (permanent use), the stress at WLL acc. to FEM class 1Bm (M3 acc. to DIN EN 818-7) must be reduced. Use a lifting point with a higher WLL.
- If a safe usage is doubtable or if the lifting mean has been stressed by a dropped load, for safety reasons the usage must be withdrawn.
  A competent person must decide whether the lifting mean can be used further on.
- The INOX-STAR has to be adjustable through 360° when fitted and with key disengaged. Adjust to direction of pull **before** attaching of the lifting mean.

HINT
*Attention: INOX-STAR eyebolts **are not suited for turning under load!***

- Please observe that the lifting mean connected to the INOX-STAR should be free moving. When connecting and disconnecting the lifting means (sling chain, round loop, wire rope) pinches and impacts should be avoided. Damage of the lifting means caused by sharp edges should be avoided as well.

- Eliminate any damage of the INOX-STAR for example caused by loading on sharp edges.
- If the INOX-STAR is used **exclusively** for lashing, the value of the working load limit can be doubled. LC = 2 x WLL

NOTE
If the INOX-STAR is/was used as a lashing point, with a force higher than the WLL, it must not be used as a lifting point afterwards.
If the INOX-STAR is/was used as a lashing point, up to the WLL only, it can still be used afterwards as a lifting point.

5 Inspection / Repair / Disposal

5.1 Hints for the regularly inspection

The operator has to determine and dictate the necessary inspection periods and the deadlines by a risk assessment (see sections *5.2 and 5.3*).
The persisting appropriateness of the lifting point must be checked by a competent person (auditor) at least once per year.
Depending on the conditions of use e.g. frequent use, increased wear or corrosion, it may be necessary to carry out inspections at shorter intervals than once per year. A verification is also required following damage and after special events.
The operator must specify the test cycles.

5.2 Inspection criteria for the regularly examination carried out by the operator

- Completeness of the lifting point.
- Complete, readability of the Working Load Limit (WLL) as well as existing sign of manufacturer.
- Bolt tightening (torque).
- Deformation on load bearing parts like basic body and bolt.
- Mechanical damages like notches, especially when located in areas of tensile stress.
- Easy turning of the ring, free of jerk must be assured.

5.3 Additional inspection criteria for the competent person resp. auditor

- Reduction of cross section caused by wear > 10 %
- strong corrosion
- Function and damage of bolts and threads
- Additional inspections may be necessary depending on the result of the risk assessment (e.g. incipient cracks at load bearing parts).

5.4 Disposal

Dispose worn out components / attachments or packaging according to the local waste removal requirements.

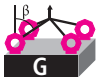
Method of lift										
Number of legs	1	1	2	2	2	2	2	3/4	3/4	3/4
Angle of inclination < ß	0-7°	90°	0-7°	90°	0-45°	>45-60°	un symm.	0-45°	>45-60°	un symm.
Factor	1	1	2	2	1.4	1	1	2.1	1.5	1
Safety factor 4:1	**Safety factor 4:1**	**for max. load weight t in Tons.** tightened and adjusted to the load direction								
	INOX-STAR M8	0.7	**0.3**	1.4	0.6	0.42	0.3	0.3	0.63	0.45	0.3
	INOX-STAR M10										
	INOX-STAR M12	1.2	**0.5**	2.4	1	0.71	0.5	0.5	1.06	0.75	0.5
	INOX-STAR M16	2.4	**1**	4.8	2	1.4	1	1	2.1	1.5	1
	INOX-STAR M20	3.6	**2**	7.2	4	2.8	2	2	4.25	3	2
	INOX-STAR M24	5.2	**2.5**	10.4	5	3.5	2.5	2.5	5.25	3.75	2.5
	Safety factor 4:1	**for max. load weight in lbs.** tightened and adjusted to the load direction									
	INOX-STAR M8	1540	**660**	3080	1320	930	660	660	1400	990	660
	INOX-STAR M10										
	INOX-STAR M12	2640	**1100**	5280	2200	1550	1100	1100	2330	1650	1100
	INOX-STAR M16	5290	**2200**	10580	4400	3110	2200	2200	4660	3300	2200
	INOX-STAR M20	7930	**4400**	15860	8800	6220	4400	4400	9330	6600	4400
	INOX-STAR M24	11450	**5500**	22900	11000	7770	5500	5500	11660	8250	5500
		At a lift with one strand and two parallel strands where the inclination angles are at the max. ± 7°. the lifting methode can be assumed as a vertical lift.				When lifting with two. three or four leg lifting means. inclination angles of less than 15° shall be avoided. if possible (Risk of instability).					

Table 3: Working load limit

Type	WLL [t]	weight [kg/pc.]	T [mm]	B [mm]	C [mm]	D [mm]	E [mm]	G [mm]	I [mm]	K [mm]	L [mm]	M	N [SW]	torque [Nm]	Ref.-No.
INOX-STAR - metric															
INOX-STAR M8	0.3	0.11	35	12	10	25	25	28	16.3	46	12	M8	6	10	7912457
INOX-STAR M10	0.3	0.12	35	12	10	25	25	28	16.3	46	15	M10	6	10	7912454
INOX-STAR M12	0.5	0.19	43	14	12	30	30	32	18	56	18	M12	8	25	7993835
INOX-STAR M16	1	0.31	50	16	14	35	36	38	22	65	24	M16	10	60	7993836
INOX-STAR M20	2	0.53	58	19	16	40	43	47	27.5	74	30	M20	12	115	7993837
INOX-STAR M24	2.5	0.92	70	24	19	48	51	56	33	92	36	M24	14	190	7993838
INOX-STAR - metric special length															
INOX-STAR M12	0.5	0.22	43	14	12	30	30	32	18	56	50	M12	8	25	7997822
INOX-STAR M16	1	0.35	50	16	14	35	36	38	22	65	50	M16	10	60	7910089
INOX-STAR M20	2	0.6	58	19	16	40	43	47	27.5	74	60	M20	12	115	7998714

Table 4: Overview of dimensions metric

We reserve the right to make technical changes

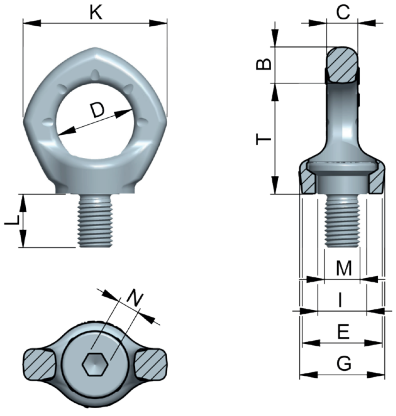


Abb. 1:

HINT

Translation of the original instruction manual. In case of doubts or misunderstandings, the German version of this document is decisive.