> INOX-STAR <

EDELSTAHL Rostfrei INOX STAINLESS STEEL

EN

Safety instructions

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

Translation of the Original instructions

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Eye bolts made out of
DUPLEX stainless steel

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:

BGR 500, KAP2.8 : 2008-04

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

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:

BGR 500, KAP2.8 : 2008-04

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

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!

The INOX-STAR must only be used by competent and trained people with adequate knowledge respecting BGR/DGUV 100-500 requirements, and outside Germany the corresponding country specific requirements must be utilised.

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 chart 2).

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 2, *Intended use of INOX-STAR* and 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 and unsymmetrical 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	Unsymmetric
Double strand	2	1
Three-/ Four strand	3	1

(see also chart 2)

5. Make sure that a plane bolting surface is provided (Ø E, see chart 1). 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, 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 M12	25 Nm	7997750
INOX-STAR M16	60 Nm	7997751
INOX-STAR M20	115 Nm	7997752
INOX-STAR M24	190 Nm	7997753

table 1

   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 criteria*).

4.3 User information

- Inspect INOX-STAR eyebolt regularly before each usage in regard of tightening, corrosion, wear, deformation etc. (see chapter 5 *Inspection criteria*).

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.

- 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

4.4 Hints for the regular inspection

In time periods complying to the need or usage a technical expert should control at least once a year the appropriateness of the lifting point. This inspection must also be done after each event of damage or special incident.

5 Inspection criteria

Observe and control the following points before each usage in regular periods, after assembly and after special incidents:

- Bolt tightening (torque)
- Completeness of the lifting point
- Complete, readability of the Working Load Limit (WLL) as well as existing sign of manufacturer
- Deformation on load bearing parts like basic body and bolt
- Mechanical damages like notches, especially when located in areas of tensile stress
- strong corrosion
- Reduction of cross section caused by wear > 10 %
- Function and damage of bolts and threads
- Easy turning of the ring, free of jerk must be assured

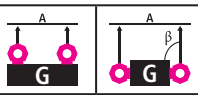
Methode of lift										
Number of strands	1	1	2	2	2	2	2	3/4	3/4	3/4
Inclination angle <ß	0-7°	90°	0-7°	90°	0-45°	45°-60°	Unsymm.	0-45°	45°-60°	Unsymm.
Factor	1	1	2	2	1.4	1	1	2.1	1.5	1
Type metric	**for max. load weight t in Tons.** tightened and adjusted to the load direction									
INOX-STAR M12	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	1.50	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
Type metric	**for max. load weight in lbs.** tightened and adjusted to the load direction									
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	7900	**4400**	15800	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 2

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 [mm]	torque [Nm]	Ref.-No.
INOX-STAR - metric															
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 3

Subject to technical alterations

HINT

Translation of the original instruction manual
In case of doubts or misunderstandings, the German version of this document is decisive.
RUD components are tested in accordance with DIN EN 1677, with a minimum of 20.000 load cycles at 1.5 x WLL.
Employers insurance association (BG/DGUV) recommends: At high dynamic stress with a high number of load cycles (permanent usage), the bearing stress must be reduced acc. to FEM with 1BM (M3 acc. to DIN EN 818-7), e.g. by using the next bigger nominal size.