

Original Instructions

Shackle acc. to EN 13889

Grade 60

Read thoroughly before assembling and using

These instructions should be made available at any time for the user and should be kept over the entire period of use

Intended Use

Shackles acc. to EN 13889 are designed for lifting operations. These operations should only be carried out by competent personnel as laid down in national regulations.

The working load limit capacity listed below should never be exceeded. Please refer to other National Standard for specific uses e.g. man riding or offshore use.

Shackles acc. to EN 13889 can be used in a temperature range from -20 °C up to 200 °C.

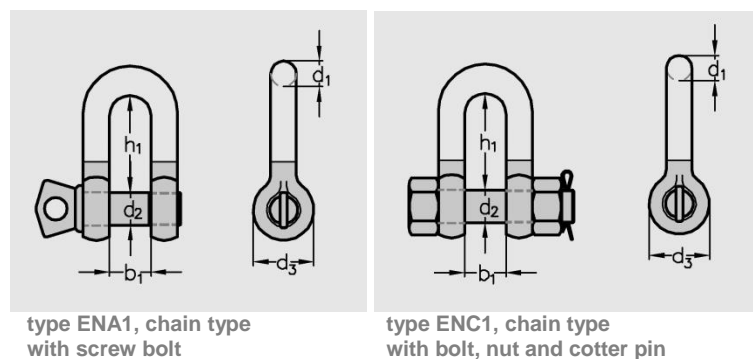
Do not expose to chemical influences (like acids or acids fumes).

Attention! In case of misuse, shackles could fail and drop the load, which could cause significant injury to personnel.

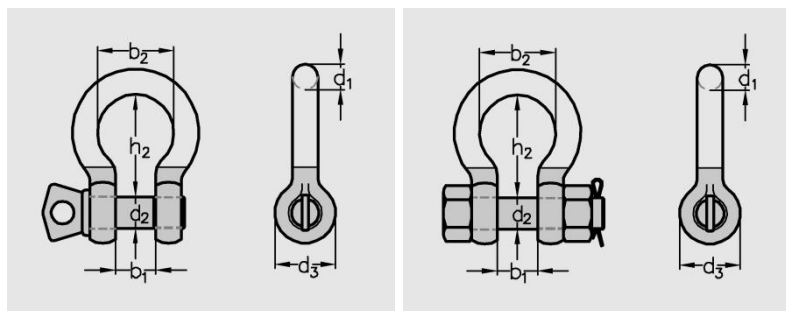
Types, Nominal Sizes and Dimensions

Shackles acc. to EN 13889 are available with the following working load limits (WLL) and dimensions. They are offered as chain type and bow type shackles with screw bolt or with bolt, nut and cotter pin.

In general, shackles with screw bolt should not be used for long-term connections. In this case shackles with bolt, nut and cotter pin should be used. This type should also be used when there is a possibility that the bolt may be turned under load.



nom. size = working load limit t	d ₁ mm	d ₂ mm	d ₃ mm	b ₁ mm	h ₁ Mm	weight per piece ENA1 kg	weight per piece ENC1 kg	stock no. ENA1	stock no. ENC1
0,5	6,5	8	17	13	23	0,1	0,1	145 641 005	145 640 005
0,75	8	10	21	13	26	0,1	0,1	145 641 007	145 640 007
1	10	11	25	16	31	0,1	0,2	145 641 010	145 640 010
1,5	11	13	27	18	36	0,2	0,2	145 641 015	145 640 015
2	13	16	30	21	41	0,3	0,3	145 641 020	145 640 020
3,25	16	19	40	27	51	0,5	0,6	145 641 032	145 640 032
4,75	19	22	48	32	60	0,9	1,0	145 641 047	145 640 047
6,5	22	25	54	36	71	1,4	1,5	145 641 065	145 640 065
8,5	25	29	60	43	81	2,0	2,3	145 641 085	145 640 085
9,5	29	32	67	46	90	2,8	3,1	145 641 095	145 640 095
12	32	35	76	52	100	4,1	4,7	145 641 120	145 640 120
13,5	35	38	84	57	113	5,2	6,1	145 641 135	145 640 135
17	38	41	92	60	124	7,1	7,8	145 641 170	145 640 170
25	44	51	110	73	146	11,6	13,1	145 641 250	145 640 250

type ENA2, bow type
with screw pintype ENC2, bow type,
with bolt, nut and cotter pint

nom. size = working load limit t	d ₁ mm	d ₂ mm	d ₃ mm	b ₁ mm	b ₂ mm	h ₂ mm	weight per piece ENA2 kg	weight per piece ENC2 kg	stock no. ENA2	stock no. ENC2
0,5	6,5	8	17	12	20	28	0,1	0,1	145 642 005	145 643 005
0,75	8	10	21	13	21	31	0,1	0,1	145 642 007	145 643 007
1	10	11	25	16	26	36	0,1	0,2	145 642 010	145 643 010
1,5	11	13	27	18	29	42	0,2	0,2	145 642 015	145 643 015
2	13	16	30	21	33	48	0,3	0,3	145 642 020	145 643 020
3,25	16	19	40	27	43	60	0,5	0,6	145 642 032	145 643 032
4,75	19	22	48	32	51	71	0,9	1,1	145 642 047	145 643 047
6,5	22	25	54	36	58	84	1,5	1,6	145 642 065	145 643 065
8,5	25	29	60	43	68	95	2,2	2,4	145 642 085	145 643 085
9,5	29	32	67	46	74	108	3,1	3,4	145 642 095	145 643 095
12	32	35	76	52	82	119	4,5	5,1	145 642 120	145 643 120
13,5	35	38	84	57	92	133	5,9	6,4	145 642 135	145 643 135
17	38	41	92	60	98	146	7,8	8,4	145 642 170	145 643 170
25	44	51	110	73	127	178	13,1	14,2	145 642 250	145 643 250

Assembly

Before use shackles must be checked for the following scores:

- » Shackle pin and body meets in nominal size and design.
- » All markings to be legible.
- » Threads should not be damaged.
- » The shackle components must not be deformed.
- » The shackle components must not be worn.
- » The shackle must be free of cracks and corrosion.
- » The bolt must be screwed in correctly. First tighten the bolts finger tight and then tighten with a round rod or other suitable tool.

Shackles with screw pin:

the bolt collar is flush with the body eye, the bolt thread fills the tapped hole in the body completely.

- » Shackles with bolt, nut and cotter pin:

the head of the bolt and the nut are flush on the body eyes. The nut is secured by a cotter pin.

Screwed correctly the inner width b_1 should not be reduced significantly.

- » If bolts / screw pins are not properly in place the following reasons may be responsible:

- the shackle is bent,
- the bolt has been tightened too firmly,
- the bore holes are not aligned.

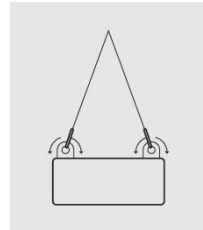
In these cases do not use the shackle.

- » If necessary, replace parts (e.g. bolts or nuts) only by original spare parts of the same size and type.

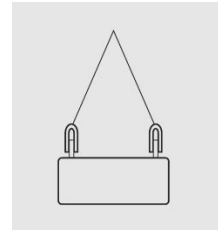
Use

Pay attention to the following items while using the shackles:

- » Shackles should not be subjected to lateral forces. The stress must be along the centre line.

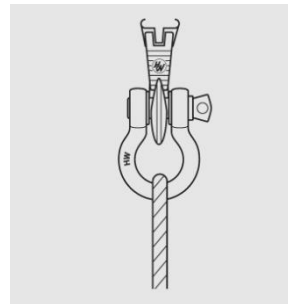


pic. 1: right

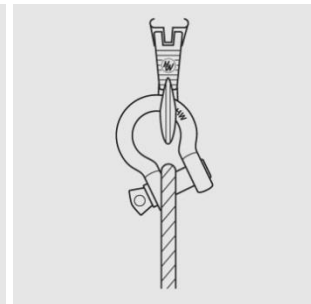


pic. 2: wrong!

- » When shackles are used in multi-leg slings the total WLL have to be calculated in consideration of the inclination angles, the (dis-)symmetry of the legs and the resulting increased tensile forces (see e. g. EN 13414-2 or EN 818-4).
- » The inclination angle β (angle between the vertical and the individual leg) should not exceed 60° in multi-leg slings.
- » When a shackle is used to connect two slings to the hook of a lifting machine, an anchor type shackle should be assembled (see pic. 5).
- » Loose spacers on both sides of the bolts avoid one-side loads. The inner width must not be minimized by washers that are welded on the eyes or by bending the body.

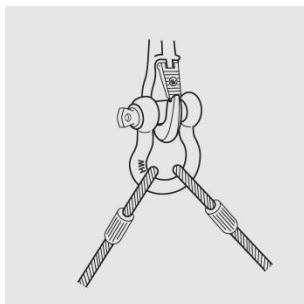


pic 3: right

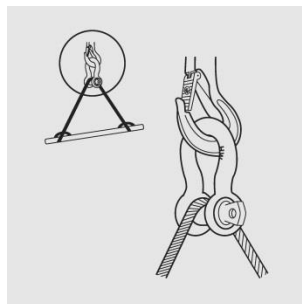


pic. 4: wrong!

- » When used on rope blocks the occurring shock effects are taken into account.
- » Avoid applications where the bolt can be turned and thereby possibly be unscrewed. (see pic. 6 and 8).



pic 5: right



pic. 6: wrong!



pic 7: right



pic. 8: wrong!

- » Use shackles type ENC1 or ENC2 with bolt, nut and cotter pin for long-term applications or for applications where a higher safety level is required.

- » Avoid unstable loads
- » Use the shackles only in the temperature range specified under "Intended Use". Shackles which have been heated higher than the maximum temperature (200 °C) must be taken out of operation.
- » The working load limit is valid for loading along centre line. Bending stresses are not allowed.
- » The working load limit refers to static loads. In case of intermittent loads (e. g. when using rope blocks) the actual stress increases significantly. This has to be taken into account when selecting the shackle.
- » In principle the shackles are designed for varying applications up to 20,000 load cycles.
- » During very intensive use (e. g. in automatic processes) material fatigue can occur. Under circumstances this leads to an unforeseeable break. Because of this in case of high dynamic loads with high load coefficient and high number of reversals the stresses should be reduced (e. g. group of gearing 1B_mM₃ acc. to EN 818-7).
- » The minimum breaking load (MBL) is 6 times higher than the working load limit (WLL).
- » Welding is not permitted. The high temperatures effects structural changes in the material and can reduce the working load limit significantly.
- » Repairs should only be performed after consultation of the manufacturer.
- » In case that there are additional national instructions or regulations they have to be respected as well.

Testing

- » Before use shackles acc. to EN 13889 should be checked (e.g. by the rigger) regularly for defects like for example cracks, deformations, corrosion, wear (more than 10 % of the initial diameter), signs for an overheating, not legible marking, missing cotter pin (types ENC1 and ENC2). If a defect exists the shackles should be taken out of service.
- » In addition minimum every 6 months the shackles should be inspected by a competent person. This inspection should be documented.

EC-Declaration of Conformity acc. to the EC-Machinery Directive 2006/42/EC add. II A

We hereby declare that the shackles acc. to EN 13889 meet the basic health and safety requirements of the aforementioned EC directive in respect of its concept and design. This declaration is invalid if the lifting accessory/equipment is altered or used in application for which it is not intended without prior consultation with us. The national regulations (in Germany for example the DGUV regulation 1 and 500-100 chapter 2.8) have to be considered.

The relevant technical documentation is prepared as described in Annex VII, part B, a copy of which is available on request of the national authorities.

Person authorized to compile the technical file:
Dipl.-Ing. Winfried Sander, c/o Hubert Waltermann GmbH & Co., Roetloh 4, 58802 Balve, Germany

Additional applied standards and technical specifications:
EN ISO 12100, EN 13889

Address:
Hubert Waltermann GmbH & Co.
Roetloh 4
58802 BALVE
GERMANY
Tel.: +49 - 23 75 – 91 82 – 0
Fax: +49 - 23 75 – 91 82 – 99
Internet: www.waltermann.de
E-Mail: info@waltermann.de

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