PFEIFER

The angle with power

01/2017

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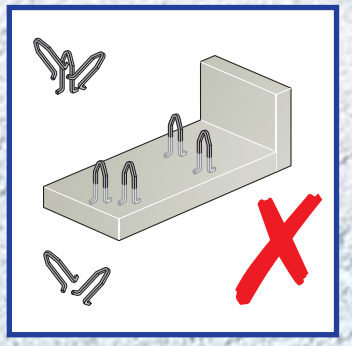
PFEIFER Bent Loop

Do precast slabs and angled elements have to be lifted safely and economically?

The economic limits are set very tightly when it comes to concrete elements. Nevertheless, there's no room for compromises on safety and use. Despite that, unsuitable and formally inadequate solutions are still often used in practice.

self-made lifting anchors

Made of reinforcing steel or prestressing cables are not permissible without verifications and tests. They do not conform to the EC Machinery Directive.



PFEIFER Bent Loops help you to transport precast slabs and angled elements safely and cost-effectively

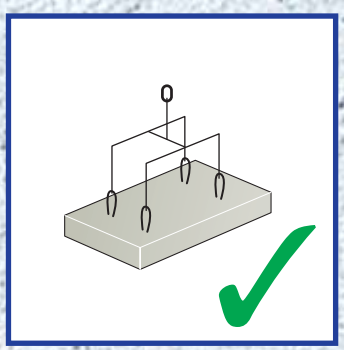
With a variety of possible applications, the new version of the PFEIFER Bent Loop enables the transport of the most diverse precast concrete elements - safely and in compliance with the directives.

economical use

- for flat elements and floor slab elements of all kinds
- for angled elements and L-shaped retaining walls

technically versatile usability

- straight pull
- parallel shear pull
- transversal shear pull



The PFEIFER Bent Loop – strong thanks to performance, quality and economy

tested for applications

with slabs and angled elements

reinforcement

ideally fastened via defined points

optimised holding bracket

enables the most diverse methods of fastening by:

- welding on
- fixing with tying wire
- fixing with cable ties, etc.

no additional reinforcement necessary

conforms to the EC Machinery Directive

taking into account the VDI/BV-BS Directive 6205

made in Germany

PFEIFER Bent Loop

Item no. 05.023

PFEIFER

Bent Loop

BS Anchor System

Can be used for:
- top-sided installation in plane elements
- angled elements

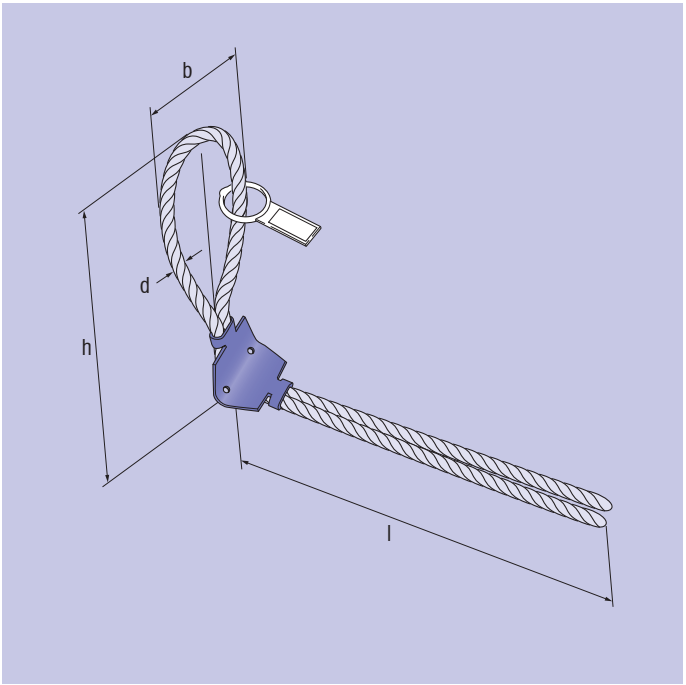
For use by:
- trained and qualified personal

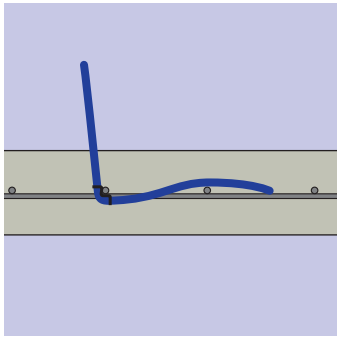
The PFEIFER Bent Loop was developed to be used as a lifting anchor for lifting concrete elements. Regular stresses are straight pull, parallel shear pull and transversal shear pull. The shape and the form of the holding bracket enable very simple installation and easy fixing to the reinforcement. Following concreting, a suitable suspension hook can be hooked into the protruding loop and the element can be transported safely.

Advantages: Safe lifting for the intended applications, simple installation, secure fastening in the reinforcement, no additional reinforcement and safe identification by means of colour coding.

Material:

round strand rope, high strength, galvanized, Holding bracket, bare sheet steel





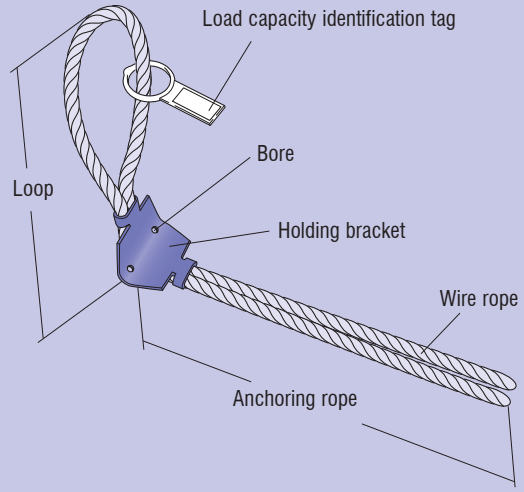
Type/Size	**Ref. no.**	b [mm]	d [mm]	l [mm]	h [mm]	Weight [kg/pc]
WS 0.8	**05.023.083.205**	~ 85	6	280	205	0.20
WS 1.6	**05.023.163.205**	~ 85	8	280	205	0.33
WS 2.4	**05.023.243.285**	~120	10	280	285	0.45

Example order for 50 PFEIFER Bent Loops WS 0.8:
50 pcs WS 0.8; ref. no. 05.023.083.205

Instructions for installation and use

Product description

Figure 1



PFEIFER Bent Loops consist of a specially shaped holding bracket, a high-quality rope and an appropriately marked load capacity tag.

The holding bracket has two holes that can be used to fasten the loop to the reinforcement. The free ends are for anchoring in the concrete. After casting into the concrete, the loop protrudes above the concrete surface and can be used for attachment when lifting or transporting the precast concrete element.

Table 1: Colour coding

Type/Size	Colour
WS 0.8	Pure white
WS 1.6	Light pink
WS 2.4	Anthracite grey

Safety

The following working coefficient values for the PFEIFER Lifting Anchor System are derived as follows in accordance with the VDI/BV-BS 6205 directive, with the prerequisite of the machinery directive 2006/42/EC.

– Steel rope failure: $\gamma_s = 4.0$
– Concrete failure: $\gamma_c = 2.1$
– Working coefficient (load-side): $\psi_{dyn} = 1.3$

Notice: Lifting anchor for precast concrete elements from constantly monitored factory production

Intended use

straight pull 0°

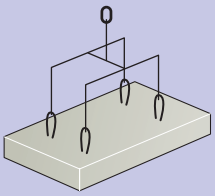


Figure 2

parallel shear pull

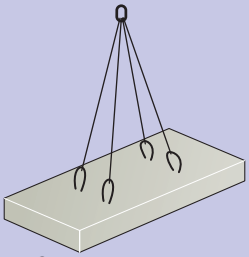


Figure 3

transversal shear pull

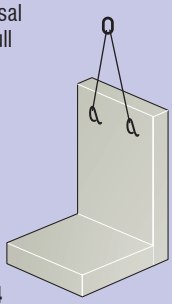


Figure 4

The PFEIFER Bent Loop is intended for the lifting and transport of plane and angled precast concrete elements. In regular use the Bent Loops may be subject to straight pull up to an angle of inclination of 30° from the perpendicular only in the direction of the free rope ends or with transversal shear pull perpendicular to the component level.

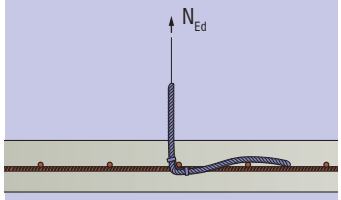


Figure 5

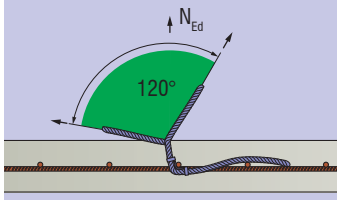


Figure 6

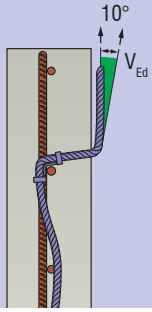


Figure 7

Warning: The PFEIFER Bent Loops may only be loaded at the angles given in figs. 5, 6 and 7. Loads outside this angle lead to reduced system safety, falling and deadly danger!

Instructions for installation and use

Intended use

Figure 8

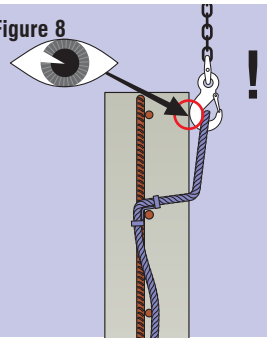
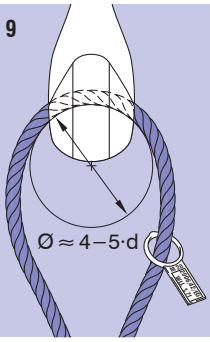


Figure 9

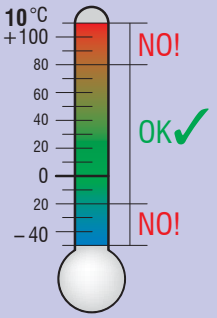


Warning: The deflection diameters shown in fig. 9 must be complied with. Deviating diameters lead to reduced system safety, falling and deadly danger!

Caution: Only suspension hooks of a size suitable for the Bent Loop may be used.

Overly large hooks can become wedged and exert additional forces on the Bent Loop. This reduces the residual strength.

Figure 10



Dimensioning

Figure 11

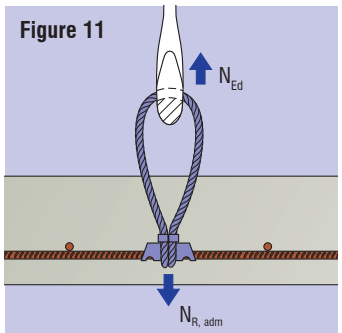
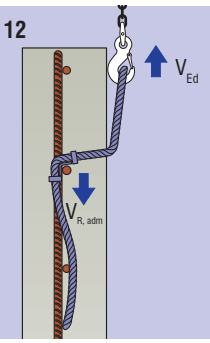


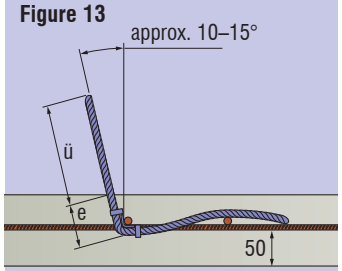
Figure 12



$$E_d \leq R_{perm}$$

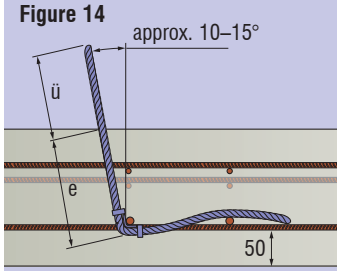
Notice: Dimensioning by a trained technical person (expert) according to VDI/BV-BS 6205

Figure 13



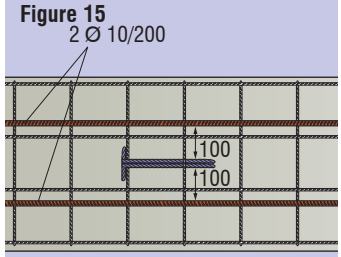
single-layer reinforcement

Figure 14



double-layer reinforcement

Figure 15



Additional reinforcement WS 2.4[1)]

Table 2: Structural element dimension, resistances and reinforcement

Type/Size	$N_{R,adm}$ 0–30° [kN] ≥ 15 N/mm²	$V_{R,adm}$ 90° [kN] ≥ 25 N/mm²	Minimum reinforcement	Additional reinforcement	Minimum structural element thickness d [mm]	Overlap ü [mm]	Dimension e [mm]	Minimum distance from edge c_1 [mm]	Minimum distance from edge c_2 [mm]	Minimum distance s [mm]
WS 0.8	6	7	R188[2)]	-	100	145	60	240	240	480
WS 0.8	8	7	2 x R188[2)]	-	120	120	85	240	240	480
WS 1.6	11	12	2 x R188[2)]	-	120	120	85	240	240	480
WS 2.4	14	14	2 x R188[2)]	-	150	170	115	240	240	480
WS 2.4	24	18	2 x R188[2)]	2 Ø 10mm[1)]	200	120	165	240	390	480

[1)] For the Bent Loop WS 2.4 with a permissible resistance of 24 kN an additional reinforcement 2ø 10 mm is to be installed in the upper reinforcement layer parallel to the anchor axis (fig. 15).

[2)] across section: longitudinal direction = 188 mm²/m, transverse direction = 113 mm²/m

Instructions for installation and use

Dimensioning

Figure 16

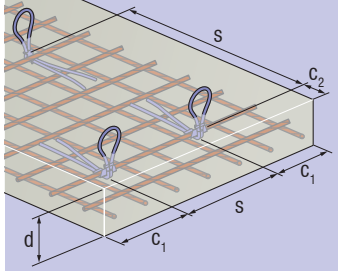


Figure 17

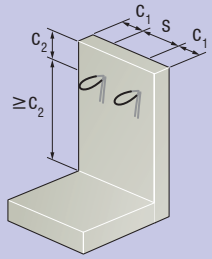
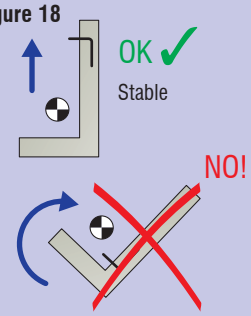


Figure 18



Notice: Always install the anchors above the centre of gravity, otherwise there is a danger of tipping during transport!

Installation

Notice: Installation only by trained expert personnel:
– use only original PFEIFER Bent Loops
– adhere to all installation rules
– fasten the Bent Loop in such a way that its position cannot change
– compact the concrete carefully, paying attention to the built-in components

Figure 19

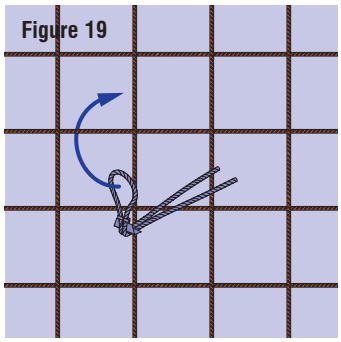


Figure 20

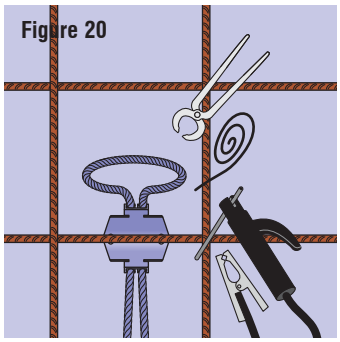


Figure 21

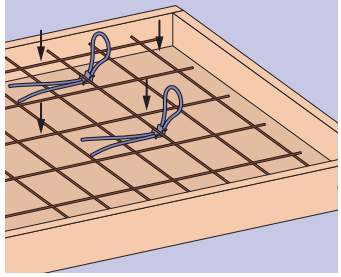
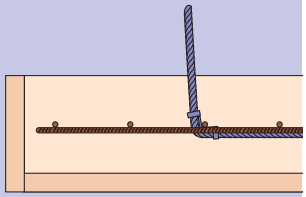
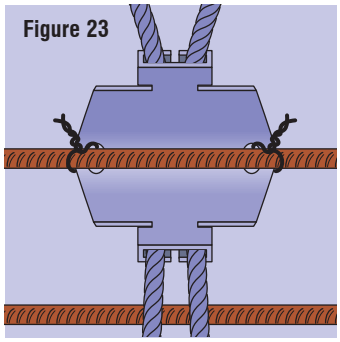


Figure 22



Fixing the loop

Figure 23



Notice: The loop can be fastened by
– tie-wire
– spot weld
– cable tie.

The holes should be used for fixing with cable ties and tie-wire.

Fixing with a spot weld

Figure 24

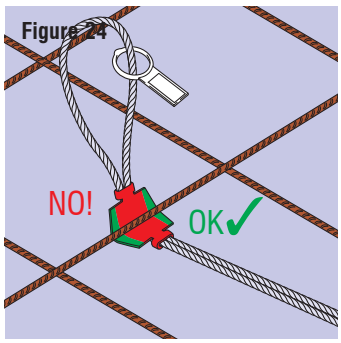


Figure 25

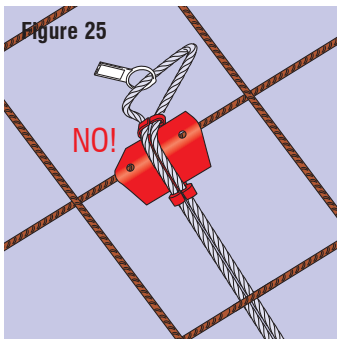
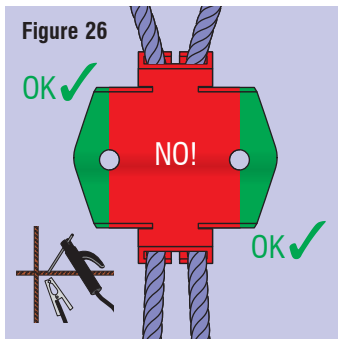


Figure 26



Caution: A spot weld for fixing the loop may only be placed in the areas marked in figs. 24, 25 and 26. The areas marked in red in figs. 24, 25 and 26 may not be used for this.

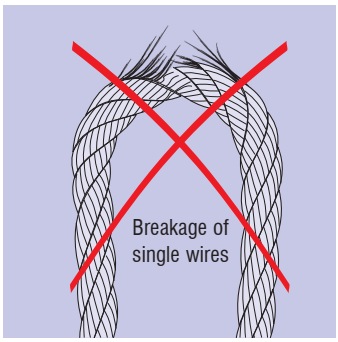
Instructions for installation and use

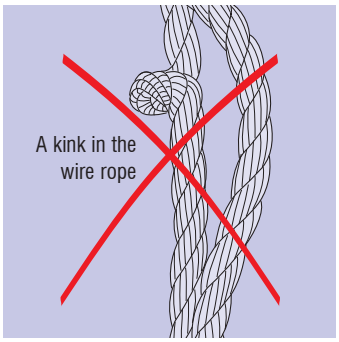
Incorrect use and discarding time

Caution: Incorrect installation and use can result in reduced carrying capacities. This results in the risk of a fall and a hazard to life and limb. Lifting anchor systems must be used only in accordance with the instructions for installation and use and only by suitable trained personnel

Warning: The use of the anchor system for lashing the structural element during transport is not permissible. Use these anchor systems only for lifting and moving the stated precast concrete elements!

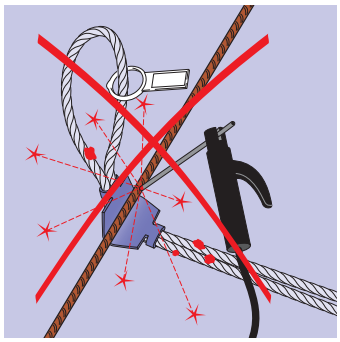
Warning: All changes or modifications to the anchor are impermissible or may only be carried out by the manufacturer. Each change or modification can lead to a reduction in safety extending to the failure of the anchor and the falling of the structural element.



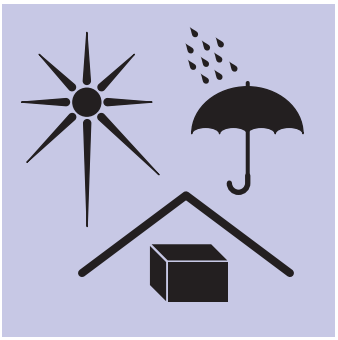


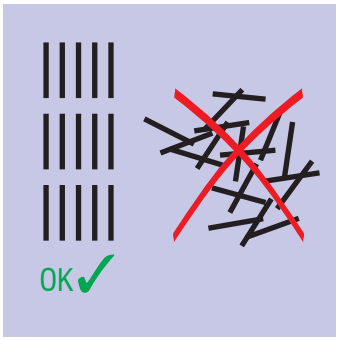
Caution: The complete Bent Loop must be replaced if there is welding sputter/ beads on the rope. A loop damaged in this way may no longer be used!

Danger to life!



Storage





Notice: Ensure damage-free storage.

Notice: Store the PFEIFER Bent Loops as far as possible protected in a dry place. There is a risk of corrosion if there are large temperature changes or wet conditions in combination with road salt or sea water!

PFEIFER

Notices

CE

EC Declaration of Conformity

according to the EC machinery directive 2006/42/EC, appendix II 1A

The manufacturer **PFEIFER Seil- und Hebetechnik GmbH**
Dr.-Karl-Lenz-Straße 66
D-87700 Memmingen

declares that the lifting device **PFEIFER Bent Loop** according to article 2d), consisting of the following system components:

PFEIFER Bent Loop 0.8, 1.6, 2.4

on the basis of its design and construction complies with the requirements of the **directive 2006/42/EC of the European Parliament and the Council of 17th May 2006 concerning machines and for the amendment of the directive 95/16/EC** (in short: EC machinery directive 2006/42/EC).

Applied harmonised standards
– EN ISO 12100:2011-03
Safety of machinery - General design principles - Risk assessment and risk reduction

Other applied standards or specifications
– Directive VDI/BV-BS 6205:2012-04
Lifting anchors and lifting anchor systems for precast concrete elements
Principles, design, applications

The person responsible for the creation and maintenance of the technical documentation is
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PFEIFER Seil- und Hebetechnik GmbH
Memmingen, 02.05.2016

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i.V.

Dipl.-Ing. Christoph Neef
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PFEIFER

THESE ARE OUR PRODUCT LINES


Lifting Anchor Systems
Thread System


Lifting Anchor Systems
BS Anchor System


Lifting Anchor Systems
WK Anchor System


Fixing Systems
DB Anchor 682
for Permanent Fixing


Fixing Systems
Socket Dowels
Polyamide Sockets


Fixing Systems
HK Assembly Anchor System


Connection Systems
Column Shoe System
Wall Shoe System


Connection Systems
Stell Bearing
Staircase Bearing VarioSonic


Connection Systems
Sandwich Anchor System
Delta Anchor System


Connection Systems
Concrete Earthing System BEB


Reinforcement Systems
VS®-Wire Rope Loop System


Reinforcement Systems
PH Reinforcement Continuity System


Cable Tension Members
Tension Rod System


Attachment Materials
(Wire Ropes, Chains, Textiles)


Lashing Systems


Grabs for Reinforcing Steel
Balancing Spreader Beams

This document is superseded when a new edition appears at www.pfeifer.info.

OUR LOCATIONS

Our products are sold by:

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