

PFEIFER – waved anchor, short

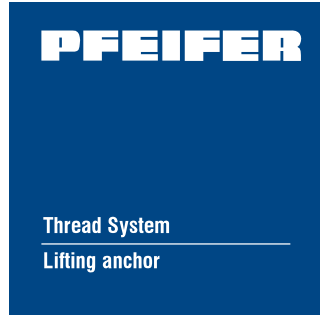
Item No. 05.018

Can be used for:

- Installation in the face of structural elements
- Longitudinal installation in column-shaped elements

For use by:

- trained and qualified personal

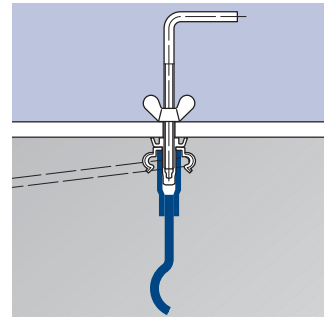
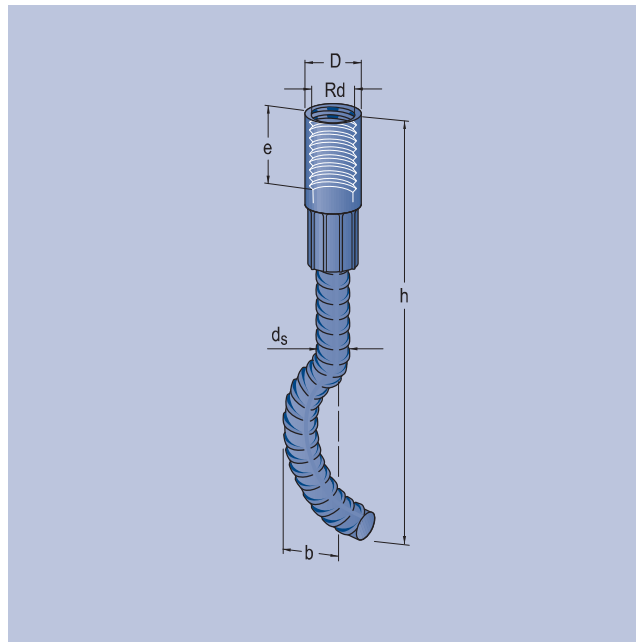


The PFEIFER waved anchor short, is one of the lifting anchors in the PFEIFER thread system. It is intended in particular for use in large-area pre-fabricated concrete elements with moderate thickness perpendicular to the plane of the slab. Longitudinal installation in the more strongly reinforced structural elements such as columns and girders is also possible. Through the waved shape, the forces are applied safely into the concrete.

Advantages: Safe load application, unambiguous assignment through PFEIFER colour coding

Material:

Socket of high grade precision steel tube, galvanized or in stainless steel, swaged on with reinforcing bar B500 A/B, black



Ref.-No. galvanized	Ref.-No. stainless steel	Type/Size	N _{R,adm} [kN]	Dimensions [mm]			d _s	e	h	Weight approx. [kg/piece]
				Rd	D	b				
05.018.123	05.018.124	Rd 12	5	Rd 12 x 1,75	15,0	15	8	22	108	0,07
05.018.143	05.018.144	Rd 14	8	Rd 14 x 2,00	18,0	20	10	25	130	0,12
05.018.163	05.018.164	Rd 16	12	Rd 16 x 2,00	21,0	21	12	27	172	0,21
05.018.183	05.018.184	Rd 18	16	Rd 18 x 2,50	24,0	25	14	34	175	0,29
05.018.203	05.018.204	Rd 20	20	Rd 20 x 2,50	27,2	25	16	35	192	0,40
05.018.243	05.018.244	Rd 24	25	Rd 24 x 3,00	31,0	30	16	43	250	0,60
05.018.303	05.018.304	Rd 30	40	Rd 30 x 3,50	39,5	40	20	56	300	1,10
05.018.363	05.018.364	Rd 36	63	Rd 36 x 4,00	47,0	50	25	67	382	2,04
05.018.423	05.018.424	Rd 42	80	Rd 42 x 4,50	54,0	50	28	80	450	3,00

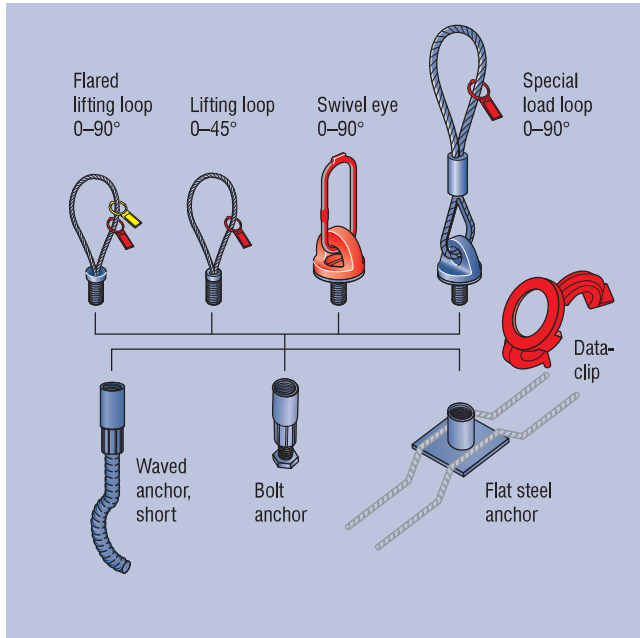
Example order for PFEIFER waved anchors, short form, galvanized, Rd 12:
500 PFEIFER waved anchors, Ref.-No. 05.018.123

Technical installation instructions on page 34

Instructions for installation and use for slab face installation

System

FOR PLANNERS, FOR PRECAST PLANTS, FOR USERS



The PFEIFER thread system consists of the corresponding lifting anchor, the selected lifting device and the colour-coded data clip.

Type/Size	Ref.-No.	Colour
Rd 12	05.220.120	Pastel orange
Rd 14	05.220.140	Pure white
Rd 16	05.220.160	Flame red
Rd 18	05.220.180	Light pink
Rd 20	05.220.200	Pastel green
Rd 24	05.220.240	Anthracite grey
Rd 30	05.220.300	Emerald green
Rd 36	05.220.360	Light blue
Rd 42	05.220.420	Silver grey
Rd 52	05.220.520	Sulphur yellow
Rd 56	*	Orange
Rd 60	*	Red

* For these sizes the marking of the anchor is inside the socket. Here, the front face of the reinforcing steel is marked in the appropriate colour.

Safety

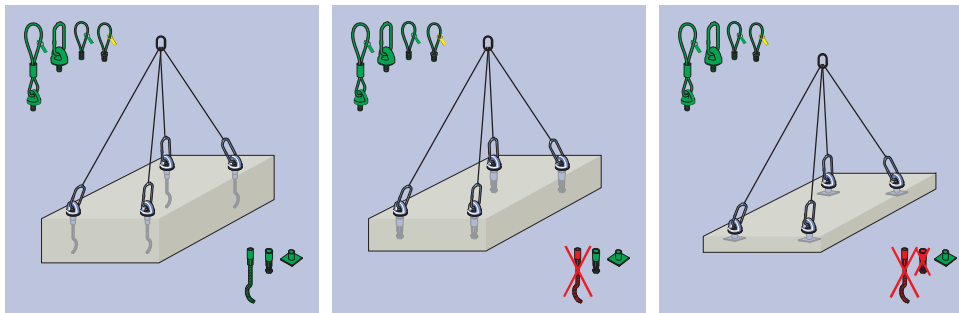
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The following safety parameter values for the PFEIFER lifting anchor system are derived as follows in accordance with the VDI/BV-BS 6205 directive, with the prerequisite of the machinery directive 2006/42/EC. For this, a load-side dynamic working coefficient $v_{dyn}=1.3$ was assumed.

- Steel failure wire rope: $\gamma_s = 4,0$
 - Steel failure chains or full sections: $\gamma_s = 3,0$
 - Concrete failure (procedure B*): $\gamma_c = 2,5$
 - Concrete failure (procedure A*): $\gamma_c = 2,1$
- * for factory monitored fabrication of the prefab concrete elements

Use

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Warning: The use of non-matched system components can cause reduced safety levels and hazards to life and limb. Always use PFEIFER components that are matched to each other!

Caution: The concreted-in anchors must be determined by the planning engineer. The instructions for installation and use of the selected anchor type must be complied with!

! Notice: The anchor must always be attached higher than the centre of gravity of the concrete structural element because otherwise the element can tip over during transport!

! Notice: To achieve the stated carrying capacity, you need to comply with the additional reinforcements as in Tables 2-4 (depending on the load) and the minimum dimensions as in Table 2 and a concrete cube compressive strength of at least 15 N/mm².

$$E \leq R_{adm}$$

! Notice: Determination of stress according to VDI/BV-BS 6205.

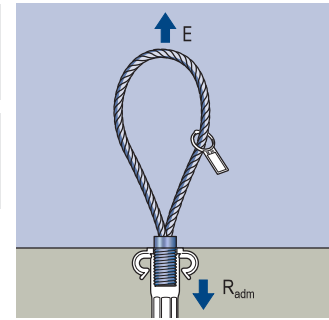
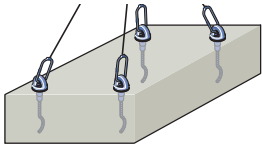
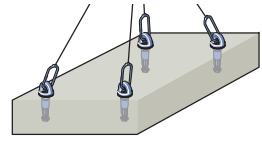
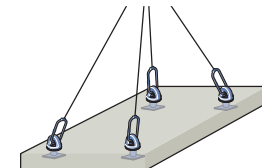


Table 2 – resistance and reinforcement

Load/application	Type/Size	Admissible resistance $N_{R,adm}$ [kN]	Surface reinforcement [mm ² /m]
Waved anchor, short 	Rd 12	5	188
	Rd 14	8	188
	Rd 16	12	188
	Rd 18	16	188
	Rd 20	20	188
	Rd 24	25	188
	Rd 30	40	188
	Rd 36	63	188
	Rd 42	80	188

Load/application	Type/Size	Admissible resistance $N_{R,adm}$ [kN]	Surface reinforcement [mm ² /m]
Bolt anchor 	Rd 12	5	188
	Rd 14	8	188
	Rd 16	12	188
	Rd 18	16	188
	Rd 20	20	188
	Rd 24	25	188
	Rd 30	40	188

Load/application	Type/Size	Admissible resistance $N_{R,adm}$ [kN]	Surface reinforcement [mm ² /m]
Flat steel anchor 	Rd 12	5	188
	Rd 14	8	188
	Rd 16	12	188
	Rd 18	16	188
	Rd 20	20	188
	Rd 24	25	188
	Rd 30	40	257
	Rd 36	63	257
	Rd 42	80	424
	Rd 52	125	424

! Notice: The dimensions for the additional reinforcement can be found in Tables 3 and 4.

Table 3 – parallel shear reinforcement for $B = 12.5^\circ - 45^\circ$

Type/Size	Admissible resistance $N_{R,adm}$ [kN]	ϕ_s [mm]	L [mm]	D [mm]
Rd 12	5	6	150	24
Rd 14	8	6	200	24
Rd 16	12	8	200	32
Rd 18	16	8	250	32
Rd 20	20	8	300	32
Rd 24	25	10	300	40
Rd 30	40	12	400	48
Rd 36	63	14	550	56
Rd 42	80	16	600	64
Rd 52	125	20	750	146

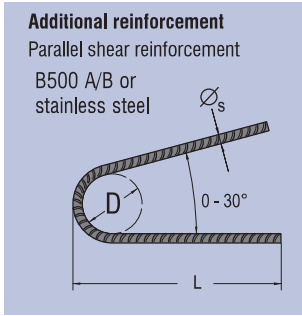
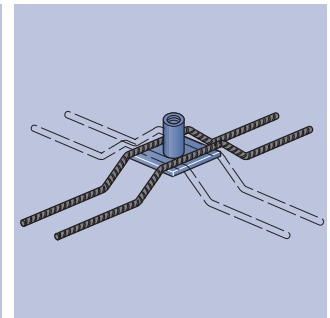
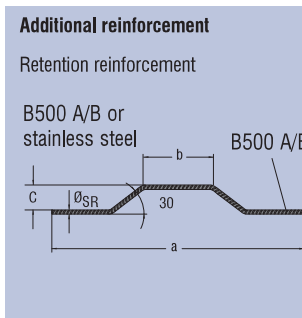


Table 4 – retention reinforcement for flat steel anchors

Typ/Size	Admissible resistance $N_{R,adm}$ [kN]	Number of retention stirrups	ϕ_{SR} [mm]	a [mm]	b [mm]	c [mm]
Rd 12	5	2	6	250	35	30
Rd 14	8	2	6	360	45	35
Rd 16	12	2	8	420	45	35
Rd 18	16	2	8	530	55	40
Rd 20	20	2	10	640	70	40
Rd 24	25	4	10	640	70	50
Rd 30	40	4	12	830	90	55
Rd 36	63	4	14	1140	110	60
Rd 42	80	4	16	1250	140	60
Rd 52	125	4	20	1530	140	75



Notice: In the case of the waved anchor, short, and bolt anchor, no additional retention reinforcement should be installed.

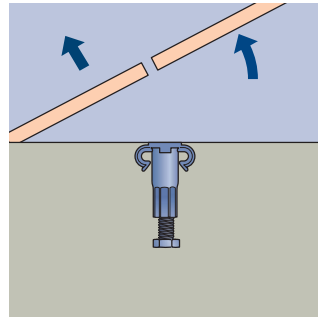
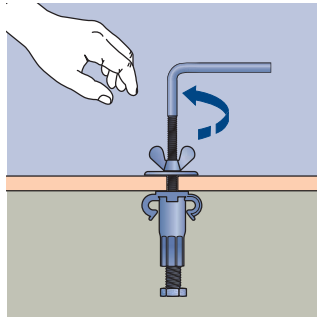
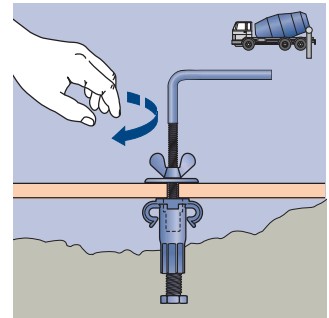
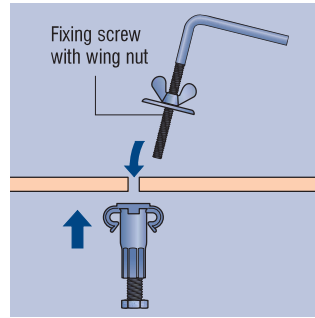
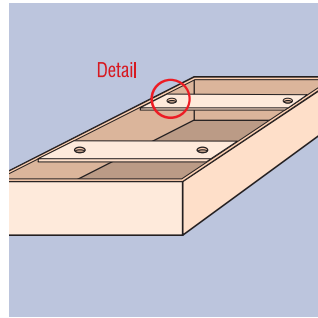
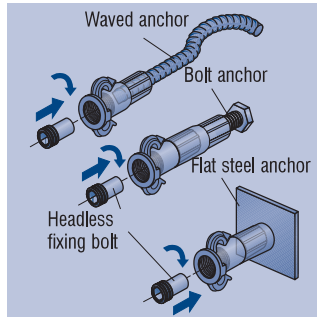
From size Rd 24 the reinforcements are installed crosswise – see illustration.

Table 5 – minimum rod dimensions and distances

	Size	Minimum edge distance a [mm]	Minimum distance between anchors b [mm]	Minimum slab thickness d [mm]
Waved anchor, short				
	Rd 12	95	200	130
	Rd 14	115	220	150
	Rd 16	135	260	195
	Rd 18	155	300	195
	Rd 20	170	350	215
	Rd 24	220	440	270
	Rd 30	275	550	320
	Rd 36	300	600	405
	Rd 42	400	800	470
Bolt anchor				
	Rd 12	130	260	95
	Rd 14	130	260	95
	Rd 16	155	290	100
	Rd 18	210	365	120
	Rd 20	300	470	150
	Rd 24	345	510	160
	Rd 30	475	630	190
Flat steel anchor				
	Rd 12	150	300	75
	Rd 14	200	400	85
	Rd 16	280	460	85
	Rd 18	290	580	100
	Rd 20	340	680	100
	Rd 24	340	680	120
	Rd 30	440	880	140
	Rd 36	590	1180	160
	Rd 42	650	1300	170
	Rd 52	790	1580	200

Installation

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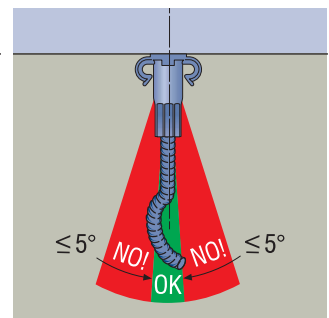
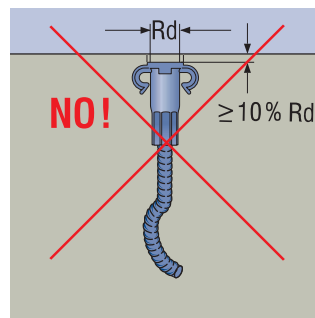
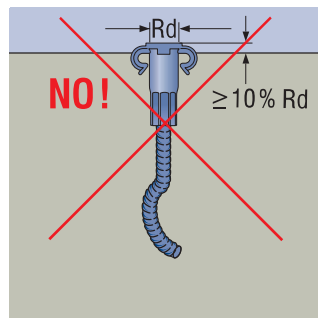
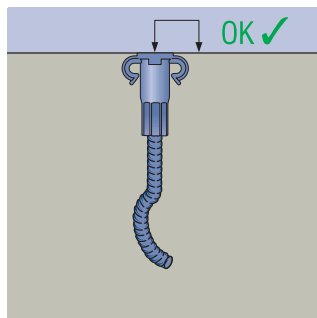


! Notice: Example drawing, using the bolt anchor. Similar principles apply for the other anchor variants.

! Caution: The anchor must always be attached higher than the centre of gravity of the subsequent concrete structural element because otherwise the element can tip over during transport.

! Notice: To achieve the stated carrying capacity, comply with the minimum dimensions according to Table 2 and a concrete cube strength compression of at least 15 N/mm².

Installation tolerances






! Notice: For a planned, recessed installation according to instructions for installation and use the same tolerance field to be applied.

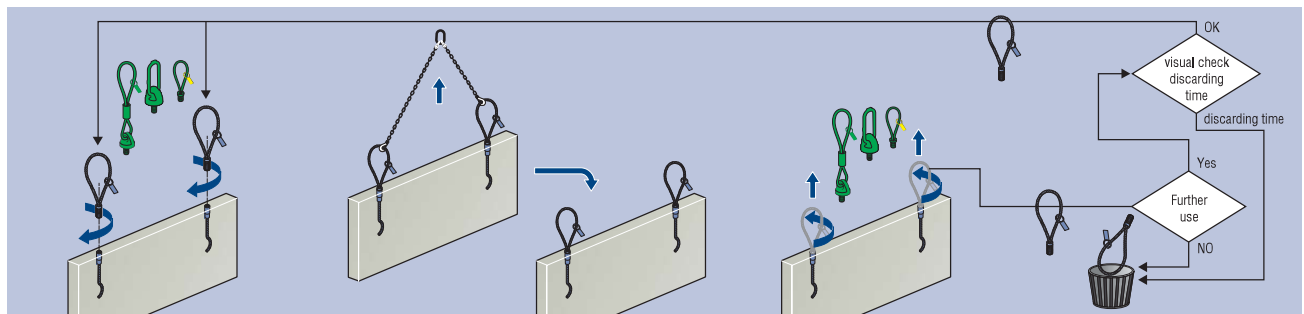
! Caution: Incorrect positions and faulty installation of the anchor can lead to early failure and falling down – danger of death! As a rule, the anchor should be installed flush and at right-angles!

Use

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Tensile load	0 – 45°	0 – 45°	0 – 45°
Transverse shear load*	NO!	NO!	NO!
Temperature	-20 to 80 °C	-20 to 80 °C	-20 to 80 °C

* Transversal shear pull is possible with a flared lifting loop, swivel eye or special lifting loop.



Slab edge installation

Slab face installation

Lifting Anchor

Column-shaped installation

Specialised applications

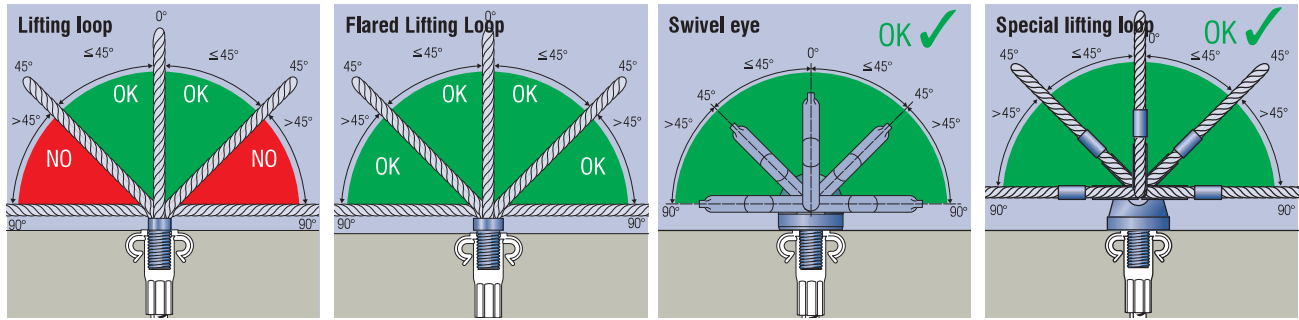
Accessories

Lifting device

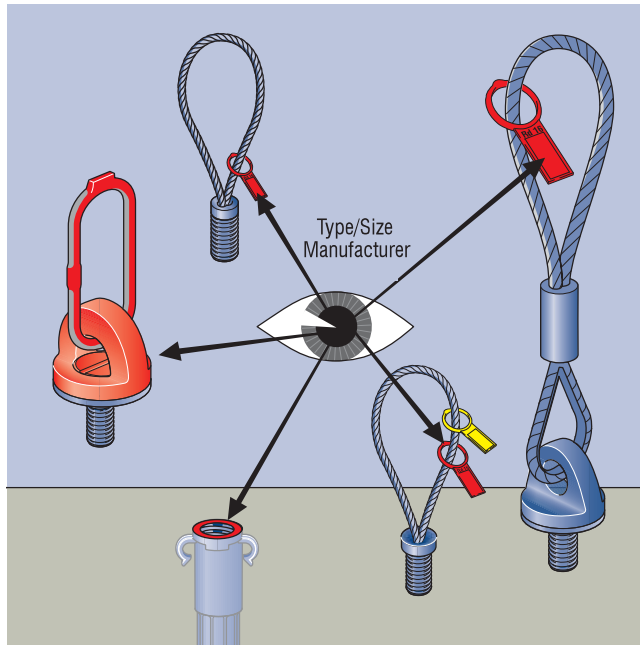
General Technical Info

Use

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Warning: Loading the lifting loop beyond the approved angle will lead to reduced safety of the system. Risk of falling, danger to life. Loading of the lifting devices according to figure only.



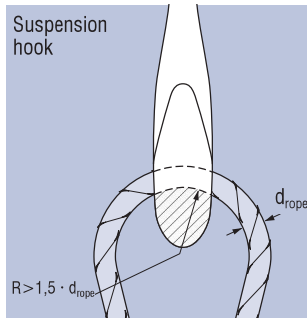
Check the system consistency by, for example, inspecting the data clip of the lifting anchor and the load capacity identification tag of the lifting loop.

Information on the markings:

- Type/Size
- Year of manufacture
- EC marking
- Manufacturer



Caution: If the markings are missing or illegible the lifting devices cannot be correctly allocated to the anchor. This can result in items falling and causing a hazard to life and limb. Lifting devices and anchors with absent or illegible markings must be immediately taken out of service.



Warning: If the deflection radius of the hook is too small, the lifting device can fail even at the rated load. This is a hazard to life. Only attach hooks with a deflection radius of at least 1.5 x the cable diameter.

Misuses

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Warning: Use of the anchor by untrained personnel results in the risk of incorrect use and the risk of items falling down, causing injury or death to persons. Use only trained personnel.



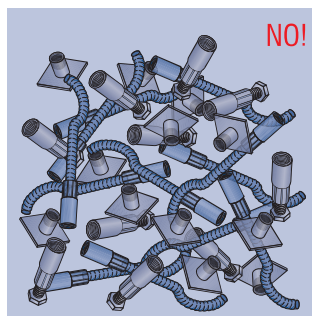
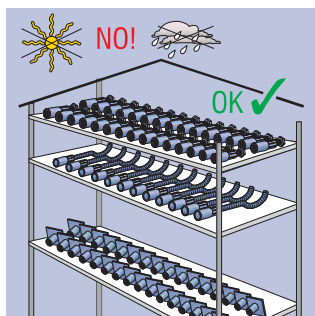
Caution: Incorrect use can result in safety hazards and reduced carrying capacity. This results in the risk of a fall and a hazard to life and limb. Lifting anchor systems must be used only in accordance with the instructions for installation and use and only by suitable trained personnel!



Warning: Use of the anchor systems for lashing during transport of the building component is not admissible since this can lead to the load falling and so to injury and death of persons. These anchor systems must be used only for lifting and moving the stated precast concrete elements!

Storage

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Notice: Store the thread system components dry and protected. There is a risk of corrosion if there are large changes of temperature, wetness (humidity) or any influence from acids, road salt or sea water!