PFEIFER – waved anchors, long

Item-No. 05.017

Can be used for:
- Installation in the edge of structural elements
- Installation in column-shaped structural elements

For use by:
- trained and qualified personal

PFEIFER

Thread System

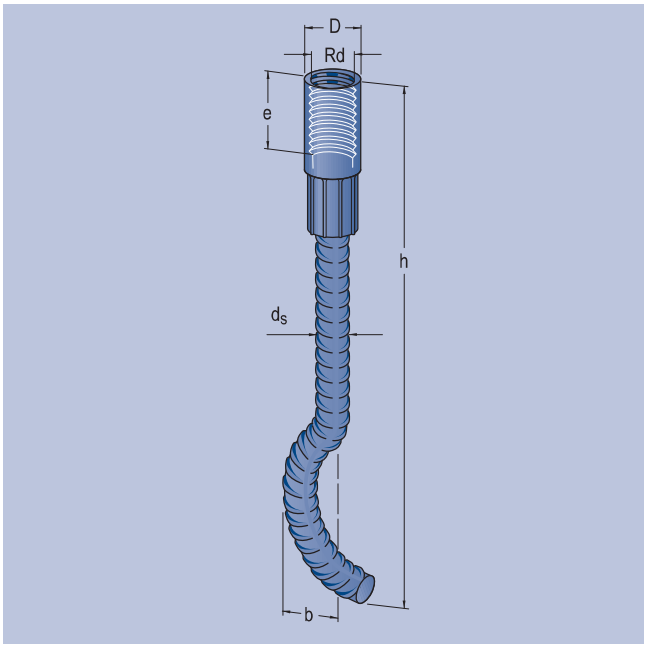
Lifting anchor

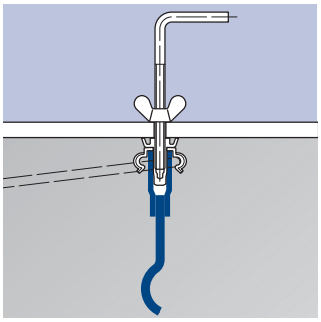
The PFEIFER waved anchor long, is one of the lifting anchors in the PFEIFER thread system. In combination with the associated PFEIFER lifting devices it is suitable for lifting precast concrete elements of all types, specifically for erecting thin slabs. The specially shaped wave gives, particularly for thin wall elements with a low level of reinforcement, a gentle load application.

Advantages: Safe and gentle load application in thin shear walls, 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]	$V_{R, adm}$ [kN]	Thread	Dimensions D	[mm] b	d_S	e	h	Weight approx. [kg/piece]
05.017.123	**05.017.124**	Rd 12	5	2,5	Rd 12 x 1,75	15,0	15	8	22	137	0,08
05.017.143	**05.017.144**	Rd 14	8	4,0	Rd 14 x 2,00	18,0	20	10	25	170	0,14
05.017.163	**05.017.164**	Rd 16	12	6,0	Rd 16 x 2,00	21,0	21	12	27	216	0,25
05.017.183	**05.017.184**	Rd 18	16	8,0	Rd 18 x 2,50	24,0	25	14	34	235	0,39
05.017.203	**05.017.204**	Rd 20	20	10,0	Rd 20 x 2,50	27,2	25	16	35	257	0,55
05.017.243	**05.017.244**	Rd 24	25	12,5	Rd 24 x 3,00	31,0	30	16	43	360	0,75
05.017.303	**05.017.304**	Rd 30	40	20,0	Rd 30 x 3,50	39,5	40	20	56	450	1,45
05.017.363	**05.017.364**	Rd 36	63	31,5	Rd 36 x 4,00	47,0	50	25	67	570	2,70
05.017.423	**05.017.424**	Rd 42	80	40,0	Rd 42 x 4,50	54,0	50	28	80	620	3,75
05.017.523	**05.017.524**	Rd 52	125	62,5	Rd 52 x 5,00	67,0	70	32	97	880	7,65
05.017.563		Rd 56	150	–	Rd 56 x 5,50	70,0	80	36	80	1200	11,00
05.017.603		Rd 60	200	–	Rd 60 x 5,50	76,0	80	40	85	1410	15,00

Notice: The waved anchors in sizes Rd 56 and Rd 60 are only intended for loads at angles of inclination up to max. 12.5°. Transversal shear pull, such as when erecting wall elements, is not intended for waved anchors Rd 56 and Rd 60.

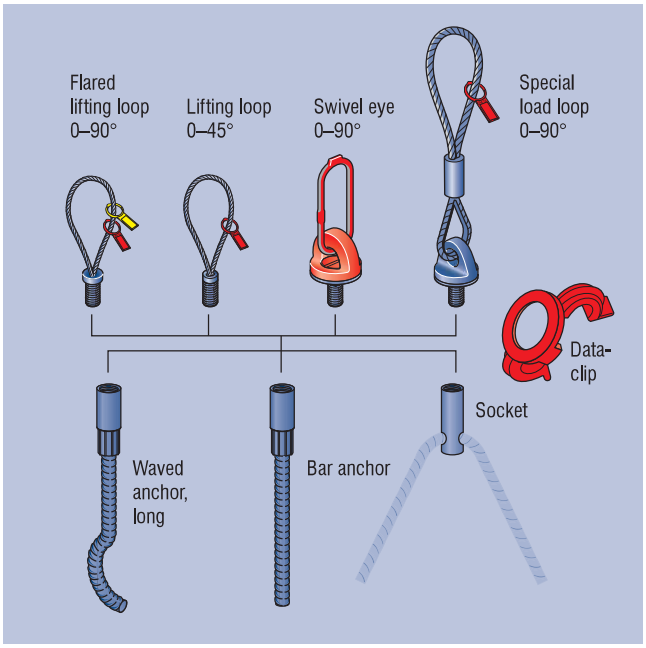
Example order for PFEIFER waved anchors, long shape, galvanized, Rd 12:
500 PFEIFER waved anchors, Ref.-No. 05.017.123.195

Technical installation instructions on page 14

Instructions for installation and use for slab edge 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

FOR PLANNERS, FOR PRECAST PLANTS, FOR USERS

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 $\psi_{dyn} = 1.3$ was assumed.

– Steel failure wire rope: $\gamma_s = 4{,}0$

– Steel failure chains or full sections: $\gamma_s = 3{,}0$

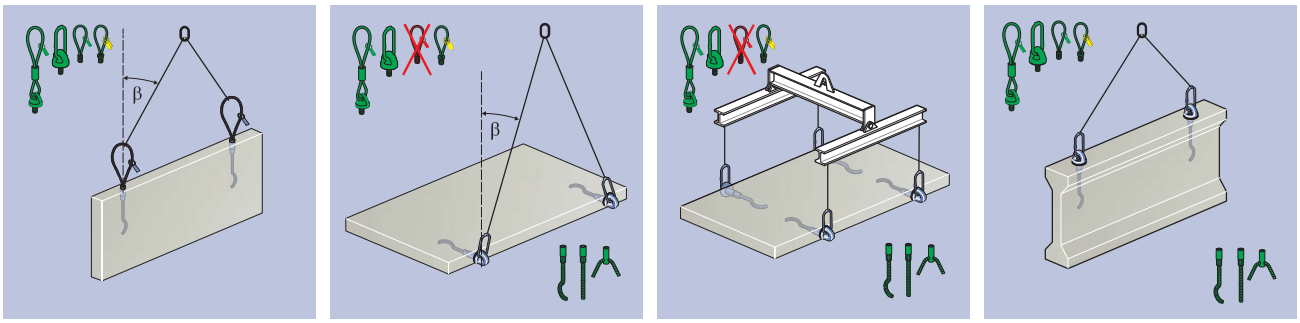
– Concrete failure (procedure B*): $\gamma_c = 2{,}5$

– Concrete failure (procedure A*): $\gamma_c = 2{,}1$

* for factory monitored fabrication of the prefab concrete elements

Use

FOR PLANNERS, FOR PRECAST PLANTS, FOR USERS



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!

Dimensioning

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

Notice: To achieve the stated carrying capacity, you need to comply with the minimum additional reinforcements as in Tables 1, 2, 3 or 4 (depending on the load) and the minimum dimensions as in Table 5 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.

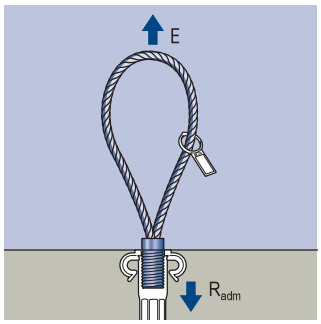
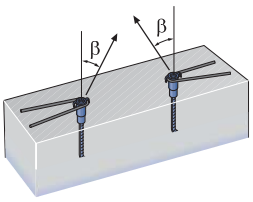
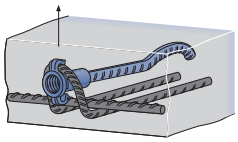


Table 1 – Resistance

Angle of inclination ß=0–45°



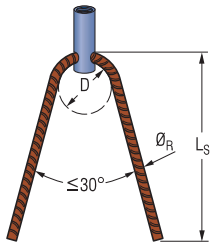
Transversal shear pull perpendicular to the panel plane



Load/application	Type/Size	Adm. resistance $N_{R,adm}$ [kN]	Adm. resistance $V_{R,adm}$ [kN]	Surface reinforcement [mm²/m]
	Rd 12	5	2,5	131
	Rd 14	8	4,0	131
	Rd 16	12	6,0	131
	Rd 18	16	8,0	188
	Rd 20	20	10,0	188
	Rd 24	25	12,5	188
	Rd 30	40	20,0	188
	Rd 36	63	31,5	188
	Rd 42	80	40,0	188
	Rd 52	125	62,5	188
Notice: Parallel shear pull possible only up to 12.5°	Rd 56	150	–	188
	Rd 60	200	–	188

Table 2 – Retention reinforcement, socket

Type/Size	Retention reinforcement L_S [mm]	D [mm]	$Ø_R$ [mm]	Retention reinforcement PFEIFER socket
Rd 12	220	24	6	
Rd 14	260	32	8	
Rd 16	310	40	10	
Rd 18	420	40	10	
Rd 20	430	48	12	
Rd 24	470	56	14	
Rd 30	650	64	16	
Rd 36	820	140	20	
Rd 42	840	175	25	
Rd 52	1190	196	28	



Notice: Retention reinforcement applies only to PFEIFER sockets.

Caution: Missing or incorrectly installed retention reinforcement of PFEIFER sockets results in anchor failure and falling of the structural element – hazard to life. The retention reinforcement must always be installed in accordance with the Instructions for use.

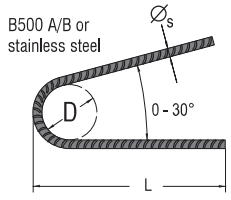
Notice: The use of PFEIFER sockets is admissible only with the retention reinforcement inserted by the customer in accordance with Table 2.

Hinweis: Werden PFEIFER-Hülsen mit Hülsenschraube eingebaut, so ist automatisch sichergestellt, dass der Bewehrungsstahl zur Rückverankerung in direkten Kontakt zur Hülse ist, da die Hülsenschraube über den Innenstopfen den Bewehrungsstab fest an die Hülsenquetschung drückt.

Table 3 – parallel shear reinforcement

Type/Size	$Ø_s$ [mm] 12,5–30°	D [mm] 12,5–30°	$Ø_s$ [mm] 31–45°	D [mm] 31–45°	L [mm]
Rd 12	6	24	6	24	150
Rd 14	6	24	6	24	200
Rd 16	8	32	8	32	200
Rd 18	8	32	8	32	250
Rd 20	8	32	8	32	300
Rd 24	10	40	10	40	300
Rd 30	12	48	12	48	400
Rd 36	12	48	14	56	550
Rd 42	14	56	16	64	600
Rd 52	16	68	20	140	750
Rd 56	–	–	–	–	–
Rd 60	–	–	–	–	–

Additional reinforcement
Parallel shear reinforcement, all sizes as in Table 3

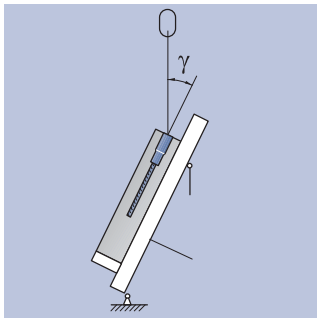


Warning: Waved anchors of sizes Rd 56 and 60 can be loaded up to a parallel shear pull of 12.5°. Loading at greater parallel shear pull results in reduced safety levels and therefore a hazard for life and limb!

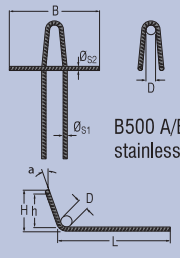
Dimensioning

Table 4 – transverse shear reinforcement

Size	$Ø_{S1}$ [mm]	L [mm]	h [mm]	H [mm]	D [mm]	α Grad	B [mm]	$Ø_{S2}$ [mm]
Rd 12	6	270	23	35	24	15	280	8
Rd 14	6	350	30	42	24	15	350	12
Rd 16	8	420	33	49	32	15	400	12
Rd 18	8	460	39	55	32	15	450	12
Rd 20	10	490	44	64	40	15	490	14
Rd 24	12	520	51	75	48	15	550	14
Rd 30	12	570	68	92	48	15	580	16
Rd 36	14	690	90	118	56	15	700	16
Rd 42	16	830	111	143	64	15	850	20
Rd 52	20	930	134	174	140	15	1000	20



Additional reinforcement: Transverse shear reinforcement, all sizes as in Table 3



Notice: With an angle γ ≤ 15° inclusion of transverse shear reinforcement is not required. This is applicable, for example, in the use of tilting tables.

Notice: For simultaneous parallel and transversal shear pull only the transverse shear reinforcement as in Table 4 is required.

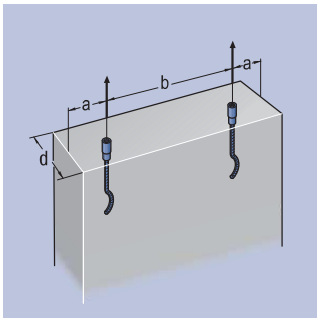


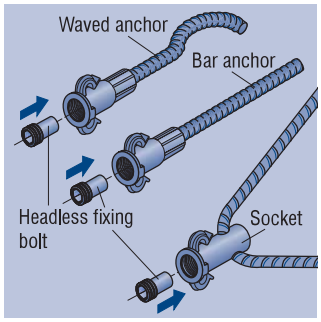
Table 5 – minimum rod dimensions and distances

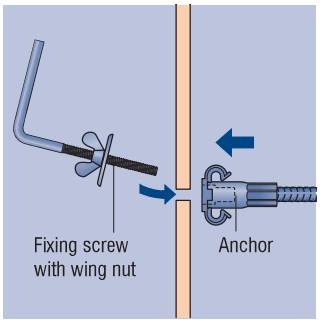
Type/Size	Minimum wall thickness d [mm]				Edge distance a [mm]	Distances between anchors b [mm]
	ß ≤ 12,5°	ß >12,5°≤ 30°	30° <ß ≤ 45°	Transversal shear pull		
Rd 12	55	55	60	60	150	300
Rd 14	60	60	70	70	200	400
Rd 16	65	65	80	80	200	400
Rd 18	80	80	95	95	250	500
Rd 20	90	90	110	110	275	550
Rd 24	100	100	125	125	300	600
Rd 30	120	120	140	140	350	700
Rd 36	130	130	150	210	500	1000
Rd 42	140	140	160	240	500	1000
Rd 52	150	150	170	280	600	1200
Rd 56	150	–	–	–	1250	2500
Rd 60	200	–	–	–	1600	3200

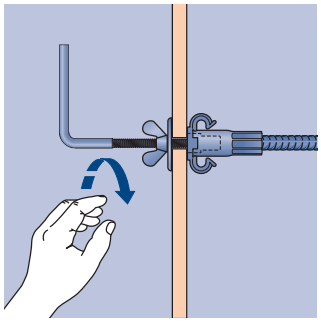
Notice: Maintenance of the required concrete cover should be independently checked. A concrete cover of 25 mm was assumed here.

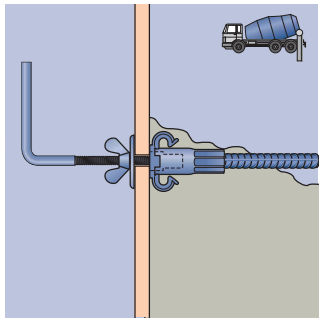
Notice: For each installation, the available concrete cover must be compared with that required. If the available cover is less than the concrete cover required, stainless steel parallel or transversal shear reinforcement must be employed as applicable.

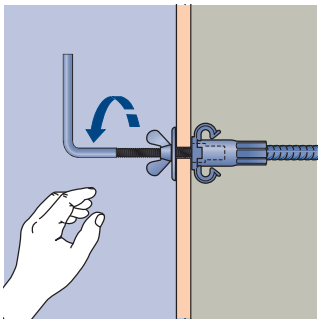
Installation

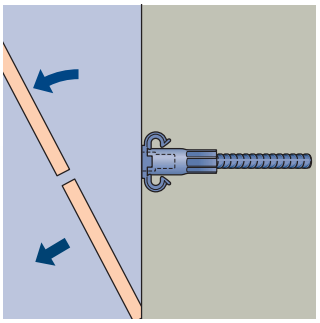








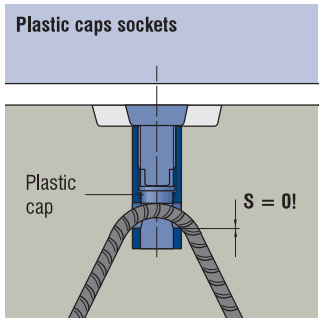




Notice: In the installation illustrations the slab face installation variant with the PFEIFER headless fixing bolt is shown.

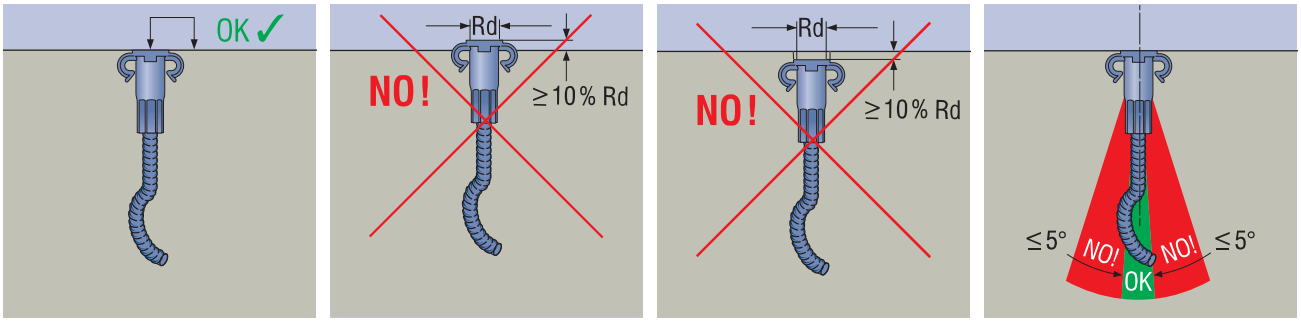
Different installation variants and product data (e.g. deeper installation) can be found in the accessories section from page 45.

Plastic caps sockets



Installation

Installation tolerances



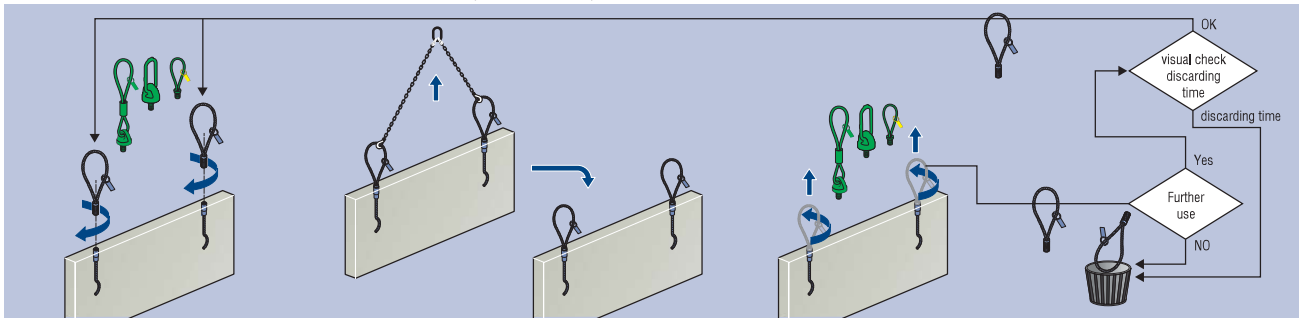
Notice: For a planned, recessed installation according to instructions for installation and use the same tolerance field is to be applied.

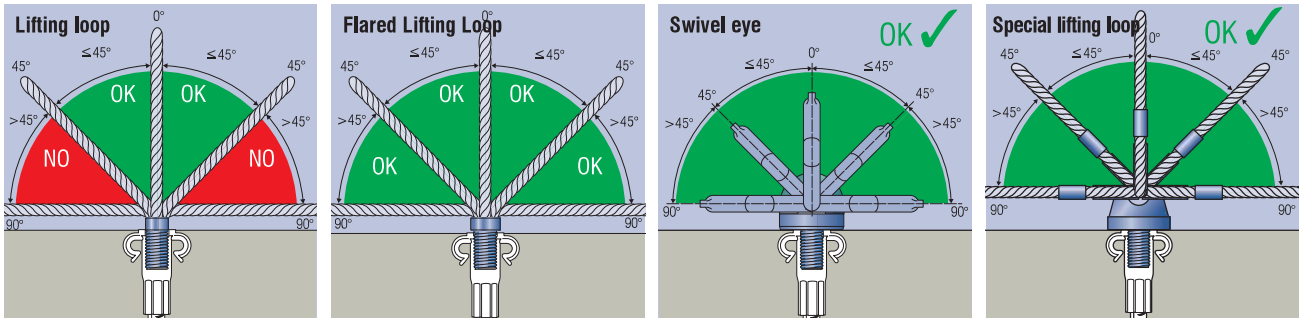
Caution: Incorrect positions and faulty installation of the anchor can lead to early failure and falling down – danger of death! As a rule, the anchor should be installed flush and at right-angles!

Use

Tensile load	0 – 45°	0 – 45°	0 – 45°
Transverse shear load*	OK ✓	OK ✓	OK ✓
Temperature	-20 to 80 °C	-20 to 80 °C	-20 to 80 °C

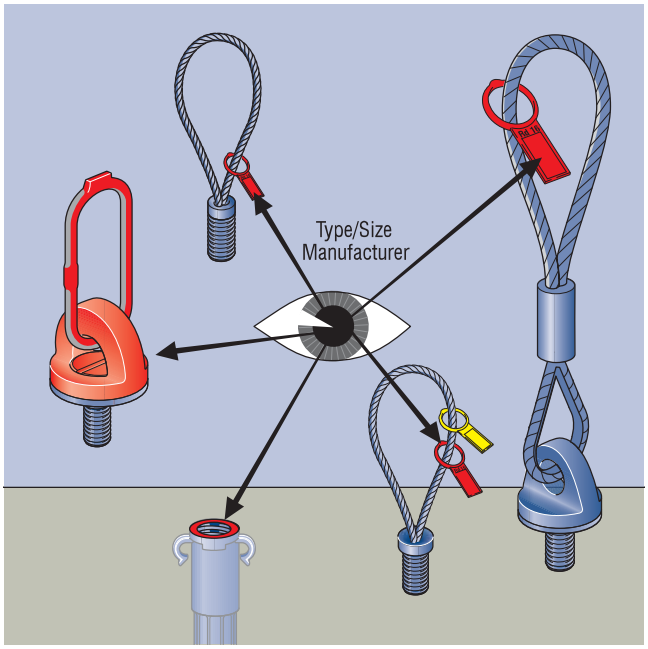
* With swivel eye, special lifting loop or flared lifting loop (where present) and suitable additional reinforcement





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!

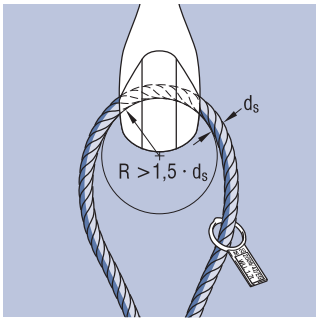
Use



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.

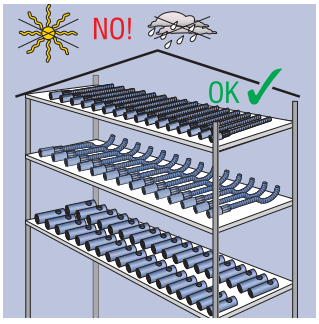
Misuse

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. Use only 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!

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!

Storage



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!