TÜV CERT
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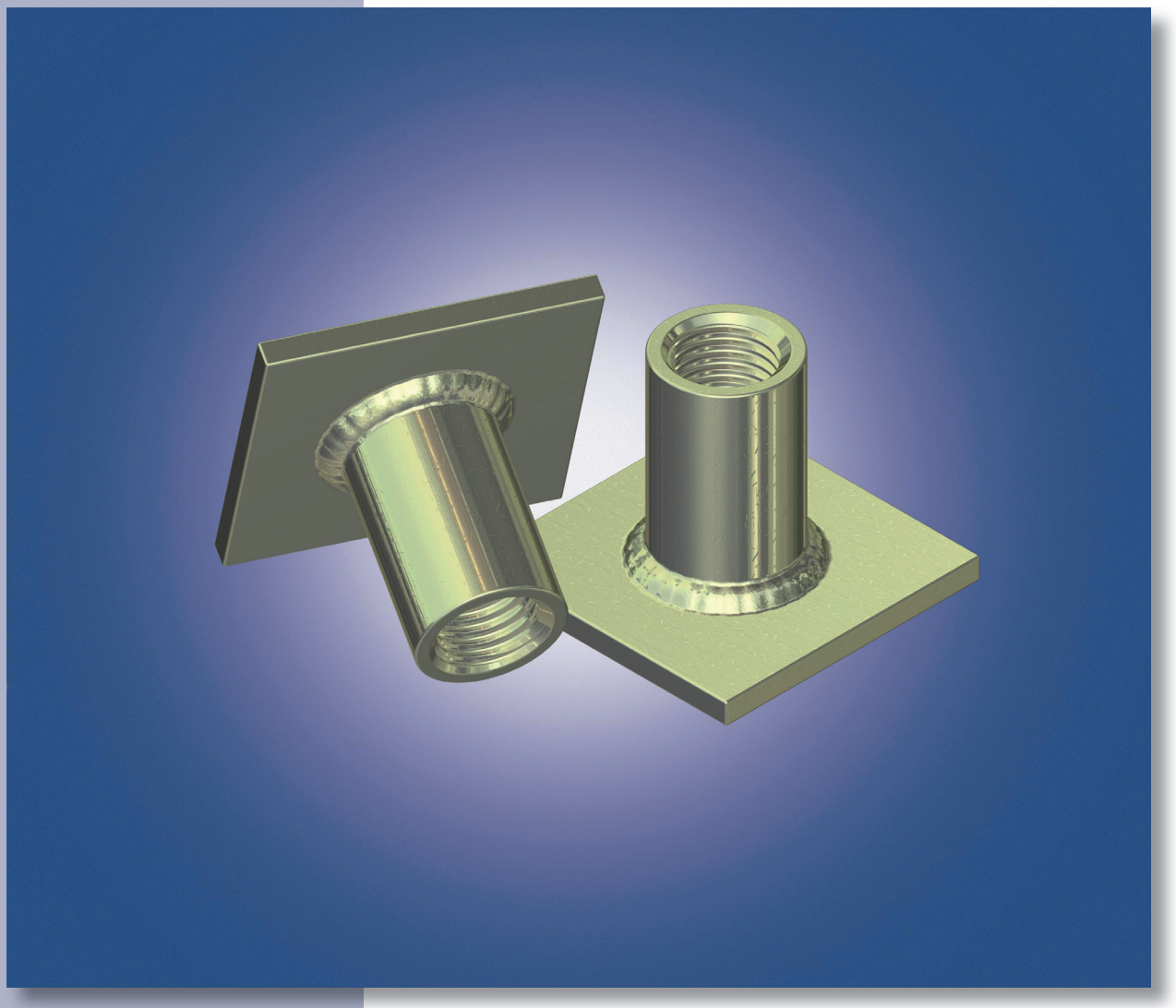
PHILIPP GROUP

PHILIPP Capped End Anchor

Installation Instruction

PHILIPP GROUP
QUALITY MADE IN GERMANY



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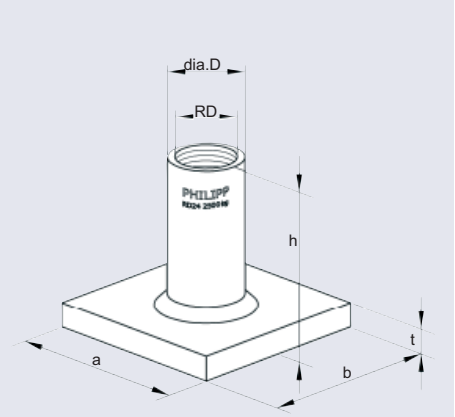
INSTALLATION INSTRUCTION OF PHILIPP CAPPED END ANCHOR

The **PHILIPP Capped End Anchor** is part of the **PHILIPP Transport Anchor System** and complies with the „Safety Rules for Transport Anchors and Systems for Precast Concrete Units“ (German regulation, BGR 106).

On use of **PHILIPP Capped End Anchor** attention must be paid to this installation instructions , the using instructions of **PHILIPP Lifting Loop with Threaded End**, **PHILIPP Wirbelstar** and **PHILIPP Lifty** as well as the general part. The anchor may only be used in combination with the mentioned lifting devices.

PHILIPP Capped End Anchors are used for transport of precast concrete units. Multiple uses within the transport chain (from production to installation of the unit) are no repeated uses. Repeated use is only allowed if it complies with the German Approval (DIBt, Berlin No. Z-30.3-6 stainless steel).



Picture 1

Version: Galvanized or Stainless Steel

Table 1: Allowed Load Bearing Capacities and Dimensions

Art.-No. Galvanized	Art.-No. Stainless Steel	Type RD	Load Bearing Capacity allow. F_Z [kN] 0°-45°	Dimensions [mm] dia.D	h	a	b	t	Weight [kg/100 pcs.]	PU [pcs.]
71FL12	77FL12VA	12	5.0	15.0	30	25	35	4	4.5	200
71FL14	77FL14VA	14	8.0	18.0	33	35	35	4	7.0	200
71FL16	77FL16VA	16	12.0	21.0	35	35	50	4	11.0	100
71FL18	77FL18VA	18	16.0	24.0	44	45	60	5	17.5	100
71FL20	77FL20VA	20	20.0	27.0	47	60	60	5	24.0	50
71FL24	77FL24VA	24	25.0	31.0	54	60	80	5	33.0	50
71FL30	77FL30VA	30	40.0	39.5	72	80	100	6	68.0	25
71FL36	77FL36VA	36	63.0	47.0	84	100	130	6	113.0	10
71FL42	77FL42VA	42	80.0	54.0	98	130	130	8	178.0	10
71FL52	77FL52VA	52	125.0	67.0	117	130	150	10	288.0	1

For ascertainment of the right load bearing capacity please follow our general installation instruction and technical advices. The weight of 1.0ton results in 10kN.

PHILIPP Capped End Anchors can only be used for axial and diagonal tension. **Lateral tension is inadmissible.**

1. Materials

PHILIPP Capped End Anchors consist of a steel plate with a welded threaded insert. The insert is made of special high-precision, galvanized steel according to DIN 50961. Alternatively the insert can be delivered in stainless steel with steel plate or completely made from stainless steel.

2. Reinforcement

On use of **PHILIPP Capped End Anchors** precast units must be reinforced with a minimum surface reinforcement (Table 2).

Existing static-structural reinforcement may be taken into account on requested minimum reinforcement according to Table 2.

This minimum reinforcement can be replaced by comparable single reinforcement bars. The concrete must have a minimum strength of **15 N/mm²** at first time of lifting. The user is personally responsible for further transmission of load into the unit.

If the **PHILIPP Capped End Anchor** is loaded by diagonal tension with an inclination of $\beta \geq 12.5°$ it requires an additional back hanging reinforcement (Table 4). For both axial and diagonal tension a back hanging reinforcement is required additionally to the surface reinforcement (according to Table 2). This back hanging reinforcement (Picture 2) is laid over the plate of the anchor. The contact between back hanging reinforcement and plate has to be ensured in an appropriate way.

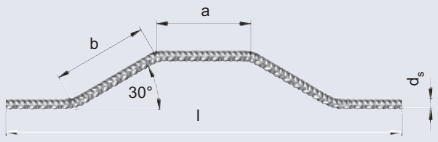
Table 2: Minimum Surface Reinforcement and Back Hanging Reinforcement

Type	Mesh Reinforcement (square)	Back Hanging Reinforcement					
		d_s	d_{br}	l	a	b	Number
	[mm²/m]	[mm]	[mm]	[mm]	[mm]	[mm]	[pcs.]
12	131	6	24	250	60	60	2
14	131	6	24	360	60	70	2
16	131	8	32	420	90	70	2
18	188	8	32	530	90	80	2
20	188	8	32	640	90	80	2
24	188	10	40	640	90	100	2
30	221	12	48	830	90	110	2
36	221	14	56	1140	140	120	2
42	513	16	64	1250	140	120	2
52	513	20	140	1530	140	150	2

3. Center Distances, Edge Distances and Unit Thicknesses

The installation and positioning of **PHILIPP Capped End Anchors** in concrete units requires for a safe load transmission minimum unit dimensions and center distances. The thicknesses given in Table 3 cover the load directions axial and diagonal tension.

If the **PHILIPP Capped End Anchors** is installed in a sunk position (e.g. through the **PHILIPP Nailing Plate**) the installation height is increased by the measure d. The minimum concrete cover c_{nom} according to DIN 1045-1 Section 6.2 and 6.3 has to be taken into account.

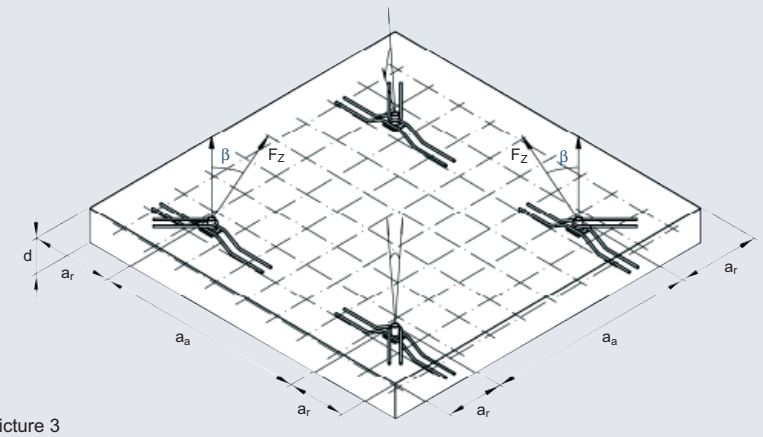


two stirrups per anchor

Picture 2

Table 3: Minimum Center Distance (a_a), Edge Distance (a_r), Minimum Thickness of Unit (d)

Type	a_a [mm]	a_r [mm]	d [mm]
12	350	180	70
14	350	180	80
16	500	250	85
18	600	300	95
20	600	300	100
24	800	400	115
30	1000	500	140
36	1300	650	160
42	1300	650	175
52	1500	750	215



Picture 3

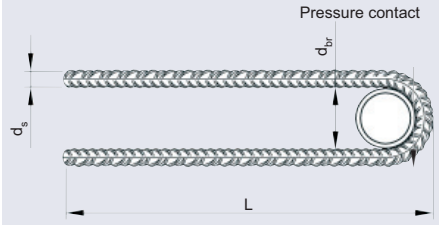
Table 4: Additional Reinforcement at Diagonal Loading
(required, if β ≥ 12.5°)

Type	at 12,5° ≤ β ≤ 45°			at 12,5° ≤ β ≤ 30°		
	d_s [mm]	L [mm]	d_{br} [mm]	d_s [mm]	L [mm]	d_{br} [mm]
12	6	150	24	6	150	24
14	6	200	24	6	200	24
16	8	200	32	6	250	24
18	8	250	32	8	200	32
20	8	300	32	8	250	32
24	10	300	40	8	300	32
30	12	400	48	10	350	40
36	14	550	56	12	450	48
42	16	600	64	14	600	56
52	20	750	140	16	700	67

4. Additional Reinforcement for Diagonal Loading

The use of **PHILIPP Capped End Anchor** under diagonal tension β ≥ 12.5° requires additional reinforcement according to Table 4. The diagonal reinforcement is placed contrary to the tensile direction (Picture 3) and has in the summit of the bending pressure contact with the threaded insert of the transport anchor. Table 4 offers the user the possibility to use appropriate steel diameter if the inclination is smaller than 30°. Decisive for the choice of the stirrups is the existing diagonal inclination in the transport chain till the mounting of the precast unit.

Lateral loading of the anchors is not permitted within the whole transport chain. This also counts for diagonal loading with an inclination larger than 45°



Picture 4