

PHILIPP GROUP

PHILIPP Threaded transport anchor

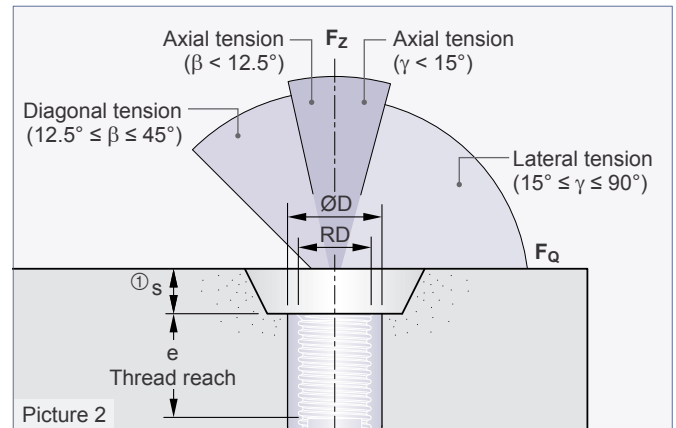
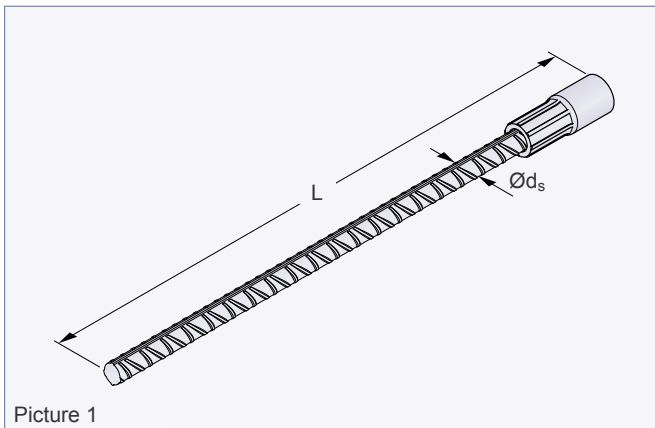


VB3-T-002-en - 06/16

Version: straight tail

Installation and Application Instruction

The PHILIPP Threaded transport anchor - straight tail



The Threaded transport anchor is part of the PHILIPP Transport anchor system and complies with the VDI/BV-BS-Guideline "Lifting inserts and lifting insert systems for precast concrete elements" (VDI/BV-BS 6205). The use of Threaded transport anchors requires the compliance with this Installation and Application Instruction as well as the General Installation Instruction. The Installation and Application Instructions for the belonging PHILIPP lifting devices (Lifting loop with threaded end, Adapter for lateral tension, "Wirbelstar", "Lifty") as well as the data sheets of the be-

longing PHILIPP accessories (Plastic nailing plates, Retaining caps KH etc.) must be followed also. The anchor may only be used in combination with the mentioned PHILIPP lifting devices. Threaded transport anchors are designed for the transport of precast concrete units only. Multiple use within the transport chain (from production to installation of the unit) means no repeated usage. This Installation and Application Instruction does not specify a repeated usage (e.g. ballasts for cranes) or a permanent fixation.

Table 1: Dimensions

Ref.-No. bright zinc plated	Ref.-No. stainless steel	Type	Dimensions					Weight [kg/100 pcs.]
			RD	ØD [mm]	L [mm]	e [mm]	Ød _s [mm]	
67M12	75M12VA	RD 12	12	15.0	195	22	8	9.0
67M14	75M14VA	RD 14	14	18.0	235	25	10	17.0
67M16	75M16VA	RD 16	16	21.0	275	27	12	28.0
67M18	75M18VA	RD 18	81	24.0	305	34	14	44.0
67M20	75M20VA	RD 20	20	27.0	355	35	16	64.0
67M24	75M24VA	RD 24	24	31.0	405	43	16	76.0
67M30	75M30VA	RD 30	30	39.5	505	56	20	116.0
67M36	75M36VA	RD 36	36	47.0	690	68	25	310.0
67M42	75M42VA	RD 42	42	54.0	840	75	28	470.0
67M52	75M52VA	RD 52	52	67.0	900	100	32	714.0
67M56 ②	-	RD 56	56	70.0	1200	75	36	1101.0
67M60 ②	-	RD 60	60	76.0	1400	80	40	1636.0

① Mind the embedding depth of the corresponding nailing plate and retaining cap (Picture 2).

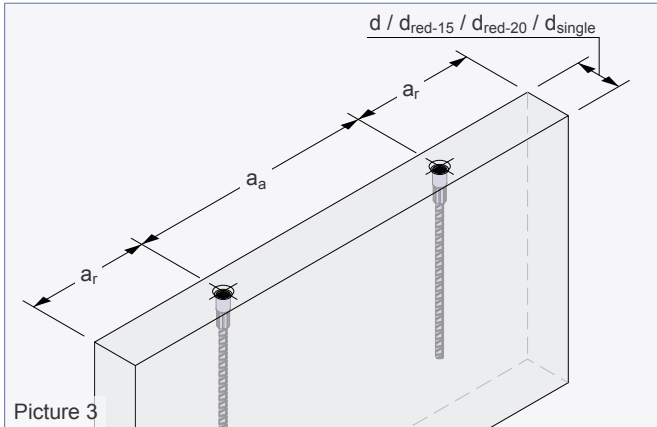
② Only to be used with lifting device PHILIPP Wirbelstar.

Materials

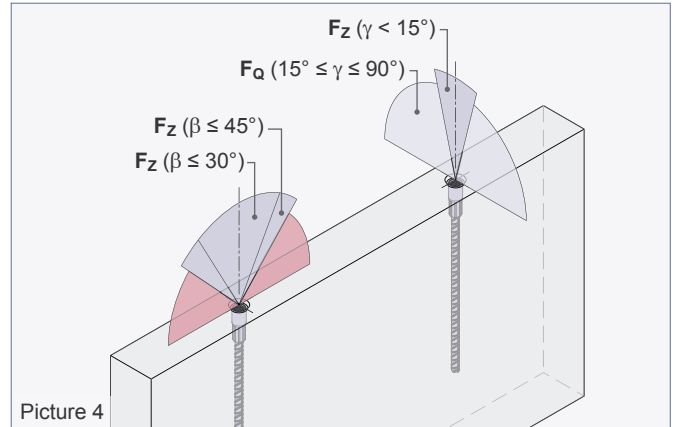
The Threaded transport anchors consist of a straight reinforcement bar B500B with crimped-on insert. The threaded inserts are made of special high precision steel tubes and are galvanised conforming to standards. This galvanisation protects the anchor temporarily, from the storage at the producer site to the final installation in the concrete element.

If the surface of a concrete element has to fulfil special conditions (e.g. no stream of rust) the insert can be delivered in stainless steel alternatively. Here the cut surface of the reinforcement bar is protected by a special sealing against corrosion.

Bearing capacities



Picture 3



Picture 4

Element thicknesses, centre and edge distances

The installation and position of threaded anchors in precast concrete units require minimum element dimensions and centre distances for a safe load transfer. Table 2 shows the minimum thickness d of a unit to cover all load directions (axial, diagonal and lateral). If the thickness of a concrete unit is only d_{red-15} or d_{red-20} or it is a single mesh reinforced element with thickness d_{single} only diagonal tension with $\beta \leq 30^\circ$ is allowed.



Lateral tension on anchors in concrete units with thickness d_{red-15} , d_{red-20} or d_{single} is not permitted within the whole transport chain. This also applies to a diagonal tension with angle β more than 30° !

Table 2: Permissible load bearing capacities

Load class	Element thicknesses and edge distances						perm.F if $f_{cc} \ 15 \text{ N/mm}^2$		Lateral tension perm. F_Q	perm.F if $f_{cc} \ 20 \text{ N/mm}^2$	
	d [mm]	d_{red-15} [mm]	d_{red-20} [mm]	d_{single} [mm]	a_a [mm]	a_r [mm]	Axial tension / diagonal tension perm. F_Z $0^\circ - 30^\circ$	Axial tension / diagonal tension perm. F_Z $0^\circ - 45^\circ$		Axial tension / diagonal tension perm. F_Z $0^\circ - 30^\circ$	
12	60	60	-	-	300	150	5.0	5.0	2.5	-	
14	60	60	-	-	400	200	8.0	8.0	4.0	-	
16	80	65	-	100	400	200	12.0	12.0	6.0	-	
18	100	80	-	-	500	250	16.0	16.0	8.0	-	
20	100	90	-	100	550	275	20.0	20.0	10.0	-	
24	120	100	-	100	600	300	25.0	25.0	12.5	-	
30	140	120	-	120	650	350	40.0	40.0	20.0	-	
36	200	150	130	-	800	400	63.0	63.0	31.5	63.0	
42	240	160	140	-	1000	500	80.0	80.0	40.0	80.0	
52	275	180	150	-	1200	600	125.0	125.0	62.5	125.0	
56	280	-	-	-	2000	1200	150.0	-	-	-	
60	280	-	-	-	2000	1200	200.0	-	-	-	

③ Element thickness d_{red-20} is only possible at $f_{cc} \ 20 \text{ N/mm}^2$!

- To determine the correct type please refer also to our General Installation Instruction.
- The weight of 1.0 t corresponds to 10.0 kN.

On lateral tension the Threaded transport anchors have only half of the capacity compared to axial loading. However, this is not a limitation as during tilt-up only half of the

weight has to be lifted (please refer to the General Installation Instruction).

Reinforcement

Main reinforcement / Axial tension

On use of Threaded transport anchors precast units must be reinforced with a minimum reinforcement (Table 3 and 4). This minimum reinforcement can be replaced by a comparable steel bar reinforcement. At the first time of lifting the concrete must have a minimum strength f_{cc} according to Table 2. The user is personally responsible for further transmission of load into the concrete unit.



Existing static or constructive reinforcement can be taken into account for the minimum reinforcement according to Table 3 and 4.

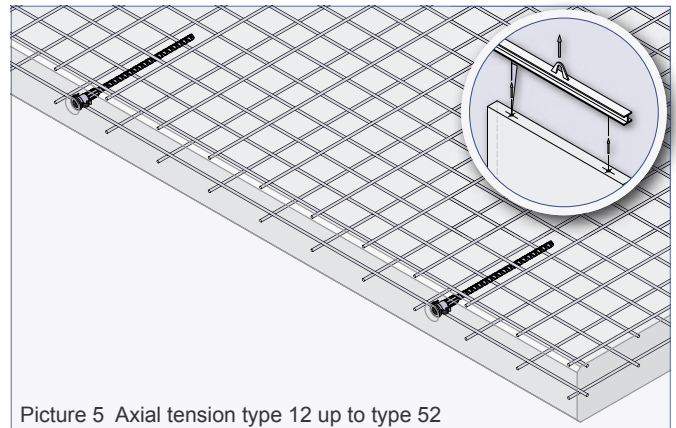
Table 3: Minimum reinforcement

Load class	Mesh reinforcement (square) for element thickness			
	d [mm ² /m]	d _{red-15} [mm ² /m]	d _{red-20} [mm ² /m]	d _{single} [mm ² /m]
12	2 × 131 ④	2 × 131 ④	-	-
14	2 × 131 ④	2 × 131 ④	-	-
16	2 × 131 ④	2 × 131 ④	-	1 × 188
18	2 × 188 ④	2 × 188 ④	-	-
20	2 × 188	2 × 188 ④	-	1 × 188
24	2 × 188	2 × 188	-	1 × 188
30	2 × 188	2 × 188	-	1 × 188
36	2 × 188	2 × 188	2 × 188	-
42	2 × 188	2 × 188	2 × 188	-
52	2 × 188	2 × 188	2 × 188	-
56	2 × 378	-	-	-
60	2 × 513	-	-	-

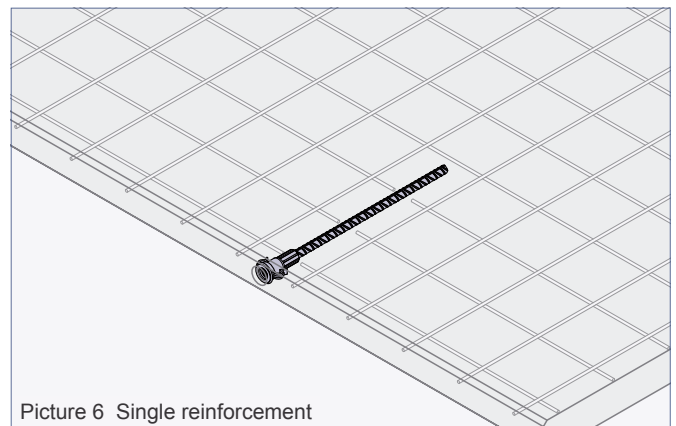
④ The specified reinforcement can be replaced in case of axial tension $\beta \leq 12.5^\circ$ and $\gamma < 15.0^\circ$ by a single mesh reinforcement Q188A placed centrally in the element. In order to ensure also a central position of the anchor in the element the mesh has to be cut in this area.

Table 4: Additional reinforcement

Load class	Longitudinal reinforcement		U-bar in anchor zone B500B Length = 600 mm
	B500B Ø [mm]	Length [mm]	
56	Ø14	1500	6 Ø10 / 125 mm
60	Ø14	1500	6 Ø10 / 125 mm



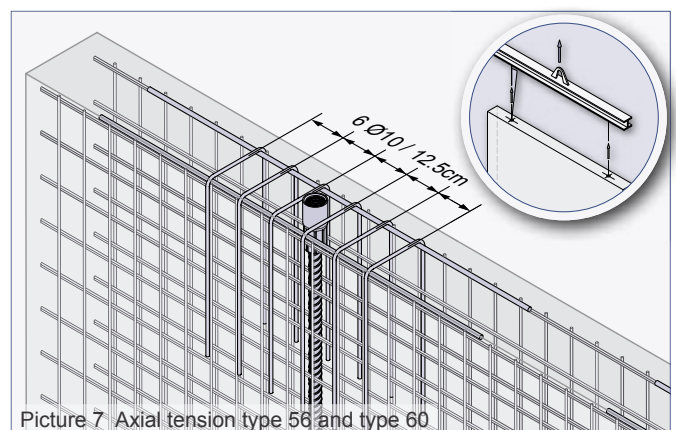
Picture 5 Axial tension type 12 up to type 52



Picture 6 Single reinforcement



④ This procedure requires for all subsequent loads only axial tension (e.g. within a transport chain).

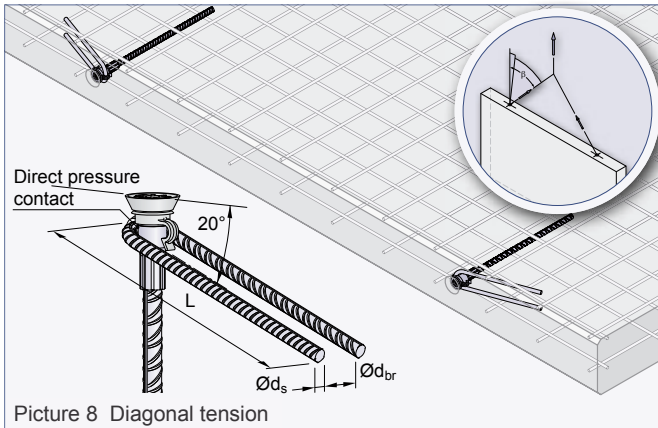


Picture 7 Axial tension type 56 and type 60

Reinforcement

Additional reinforcement for diagonal tension

If the Threaded transport anchor is used under diagonal tension $\beta > 12.5^\circ$ an additional reinforcement according to Table 5 is required. Here the reinforcement for diagonal tension is placed contrarily to the tensile direction (Picture 8) and must have direct pressure contact to the anchor insert in the peak of its bending.



Picture 8 Diagonal tension



Position of the direct pressure contact between insert and additional reinforcement must be within the thread reach of the insert. This is guaranteed by using the Marking ring with clip (74KR__CLIP or 74__CLIPVA).

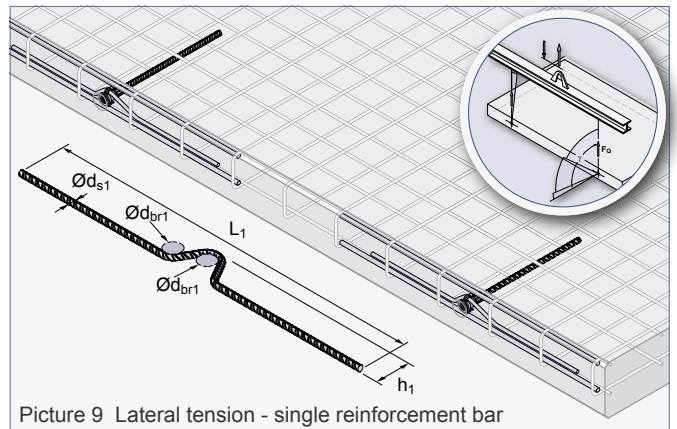
Table 5 shows possibilities to use appropriate steel diameters if the inclination is less than 30° . Decisive for the choice of the stirrups are the existing diagonal inclinations within the transport chain until the final mounting of the precast element.

Table 5: Additional reinforcement for diagonal tension (B500B) (required if $\beta > 12.5^\circ$)

Load class	Element thickness d if $12.5^\circ \leq \beta \leq 45^\circ$			Element thickness d / d _{red-15} / d _{red-20} / d _{single} if $12.5^\circ \leq \beta \leq 30^\circ$		
	Øds [mm]	L [mm]	Ødbr [mm]	Øds [mm]	L [mm]	Ødbr [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
56	-	-	-	25	750	175
60	-	-	-	25	900	175

Additional reinforcement for lateral tension

If an anchor is loaded by lateral tension and the inclination is $\gamma \geq 15^\circ$ an additional reinforcement is required (Table 6 or Table 7). The reinforcement for lateral tension can be done as a single reinforcement bar (Picture 9), double reinforcement bar (Picture 10) or reverse reinforcement (Picture 11). There must be direct pressure contact between the insert of the transport anchor and the reinforcement in the peak of the bending. Lateral forces on threaded transport anchors are only possible with wall thicknesses d according to Table 2. The reinforcement for lateral tension is installed in the front side of the wall contrary to the load direction. Tilting of walls can cause diagonal and lateral tension at the same time (Picture 10 and 11). In this case only the reinforcement for lateral tension is required (reverse reinforcement or double reinforcement bar). The diagonal tension is already covered by using this reinforcement. During mounting the tilt-up or turn over of a unit requires lateral reinforcement (single reinforcement bar according to Picture 9 or reverse reinforcement for lateral tension according to Picture 11). The double reinforcement bar for lateral tension (Picture 10) covers standard lifting directions. With lateral tension the mesh reinforcement (Table 2) must be applied as a mesh cap. In addition to the mesh cap longitudinal reinforcement must be installed as shown in Table 6 or 7.



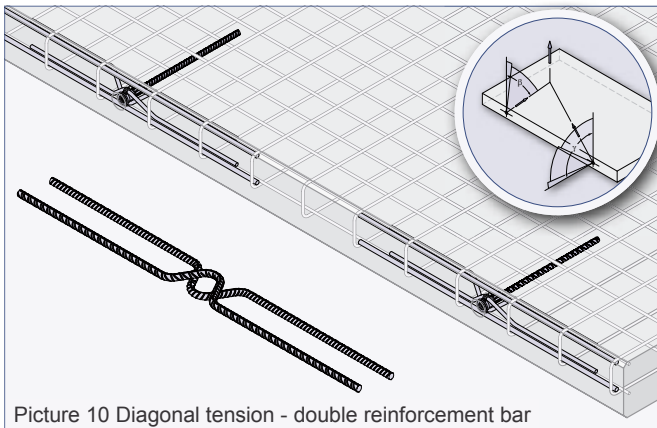
Picture 9 Lateral tension - single reinforcement bar

Table 6: Single reinforcement bar for lateral tension (B500B) (required if $\gamma \geq 15^\circ$)

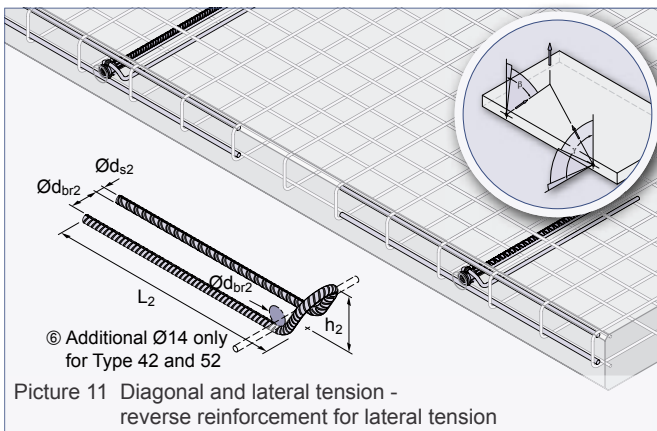
Load class	Øds1 [mm]	h1 [mm]	L1 [mm]	Ødbr1 [mm]	Longitudinal reinforcement Ø × length [mm]
12 ⑤	6	49	500	24	Ø10 × 850
14 ⑤	6	49	700	24	Ø10 × 850
16	8	49	600	32	Ø10 × 850
18	8	55	750	32	Ø12 × 850
20	10	64	800	40	Ø12 × 850
24	12	75	800	48	Ø12 × 850
30	12	92	1000	48	Ø16 × 1000
36	14	118	1000	56	Ø16 × 1000
42	16	143	1200	64	Ø16 × 1000
52	20	174	1500	140	Ø20 × 1200

⑤ Minimum element thickness of 80 mm is required.

Reinforcement



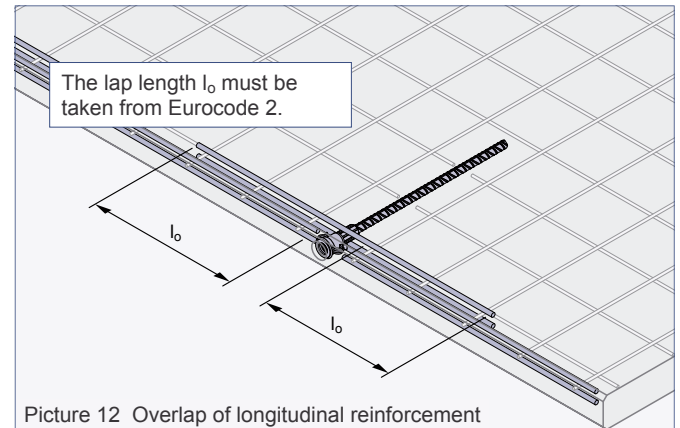
Picture 10 Diagonal tension - double reinforcement bar



Picture 11 Diagonal and lateral tension - reverse reinforcement for lateral tension

Note for reinforcement in thin elements

In thin elements it might be necessary to cut the longitudinal reinforcement close to the insert (counter brace) in order to have enough concrete cover in this area. Best position for the longitudinal reinforcement should be below the crimping.



Picture 12 Overlap of longitudinal reinforcement

Table 7: Reverse reinforcement for lateral tension (B500B) (required if $\gamma \geq 15^\circ$)

Load class	$\varnothing d_{s2}$	L_2	h_2	$\varnothing d_{br2}$	Longitudinal reinforcement $\varnothing \times \text{length [mm]}$
	[mm]	[mm]	[mm]	[mm]	
12	6	270	35	24	$\varnothing 10 \times 850$
14	6	350	42	24	$\varnothing 10 \times 850$
16	8	420	49	32	$\varnothing 10 \times 850$
18	8	460	55	32	$\varnothing 12 \times 850$
20	10	490	64	40	$\varnothing 12 \times 850$
24	12	520	75	48	$\varnothing 12 \times 850$
30	12	570	92	48	$\varnothing 16 \times 1000$
36	14	690	118	56	$\varnothing 16 \times 1000$
42 ©	16	830	143	64	$\varnothing 16 \times 1000$
52 ©	20	930	174	140	$\varnothing 20 \times 1200$

© Additional $\varnothing 14$, length = 600 mm (see Picture 11)