

# Screw anchor



## Installation Instruction



# Our products from the division BUILDING SOLUTIONS

## SERVICES

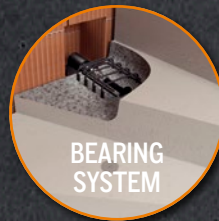
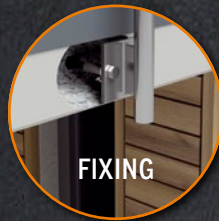
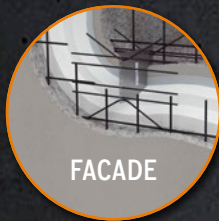
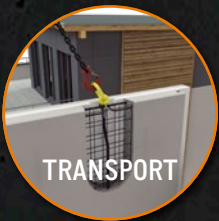
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## HIGH DEMANDS ON PRODUCT SAFETY AND PRACTICALITY

- » Close cooperation with notified bodies and - if necessary - approval of our solutions.

## TECHNICAL DEPARTMENT

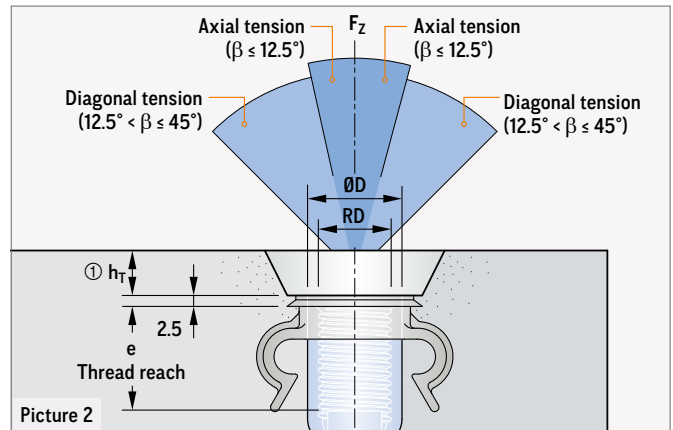
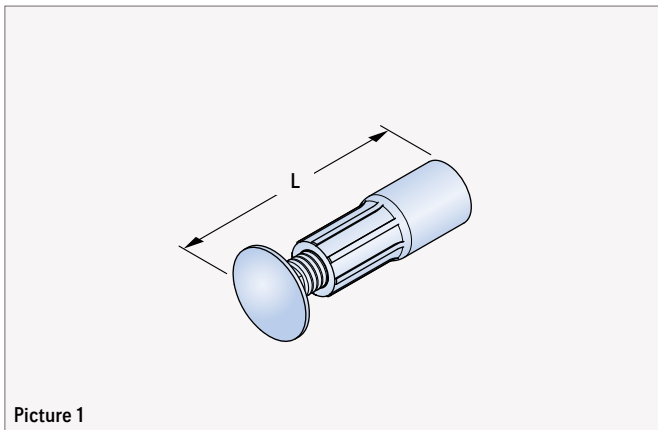
- » Our expert-team will support you at any time during your planning phase with detailed advice.



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## THE PHILIPP SCREW ANCHOR



In general, the PHILIPP Screw anchor is used in slab-like and comparable concrete elements. The Screw 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 DGUV 101-001).

The use of Screw anchors requires the compliance with this Installation Instruction as well as the General Installation Instruction. Both, the instructions for the belonging PHILIPP lifting devices and data sheets of the necessary PHILIPP accessories must be followed also. The anchor may only be used in combination with the mentioned PHILIPP lifting devices. Screw 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. The Screw anchor is not specified for a repeated usage (e.g. ballasts for cranes) or a permanent fixation.



### EC DECLARATION OF CONFORMITY (DOC)

The EC Declaration of Conformity (DoC) of the Screw anchor can be downloaded from our website [www.philipp-group.de](http://www.philipp-group.de) or is available on request.



TABLE 1: DIMENSIONS

Ref. no. ② galvanised	Type	Dimensions				
		RD	ØD (mm)	L (mm)	e (mm)	
67SA12	RD 12	12	15.0	60	22	
67SA16	RD 16	16	21.0	80	27	
67SA20	RD 20	20	27.0	100	35	
67SA24	RD 24	24	31.0	115	43	
67SA30	RD 30	30	39.5	150	56	

① Mind the embedding depth  $h_T$  of the corresponding recess former (picture 2).

② Also available in version stainless steel (ref. no. 75SA\_\_VA).



### TRANSPORT ANCHORS - TYPE RD 36 - 52

For transport anchors of size RD 36 - 52 for use in slab-like or comparable precast elements please refer to the Installation Instruction Compact anchor - short.



## GENERAL NOTES

### MATERIALS

Screw anchors consist of an electro galvanized flat-head bolt with crimped-on insert. The threaded inserts are made of special high precision steel tubes and are galvanized according to common standards. This galvanization protects the anchor temporarily, from the storage at the producer site to the final installation in the concrete element.

### CORROSION

In order to avoid contamination or damage to the concrete surface of the precast concrete element due to corrosion of the transport anchor (stream of rust or similar), the insert can be delivered in stainless steel alternatively. Here the end face of the galvanized flat-head bolt is protected by a special sealing against corrosion.

### CONCRETE STRENGTH

At the time of the first lift the concrete must have a minimum strength  $f_{cc}$  acc. to table 2. Given concrete strengths  $f_{cc}$  are cube compression strengths at the time of the first lifting.

### ELEMENT THICKNESSES, CENTRE AND EDGE DISTANCES

The installation and position of threaded transport anchors in precast concrete elements require minimum element dimensions and centre/edge distances for a safe load transfer. Table 2 shows the minimum thickness  $d$  of a unit which covers the load directions axial and diagonal tension.

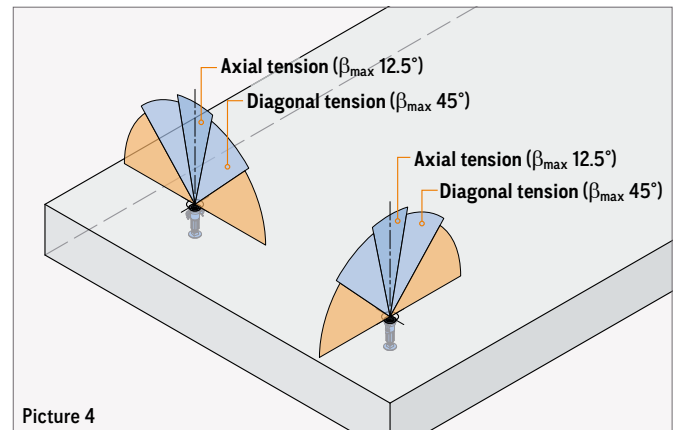
### LOAD DIRECTIONS

The Screw anchor can only be used for axial and diagonal tension exclusively.



#### LATERAL TENSION

Lateral tension is not allowed within the whole transport chain. This also applies to a diagonal tension with angle  $\beta$  more than  $45^\circ$ !

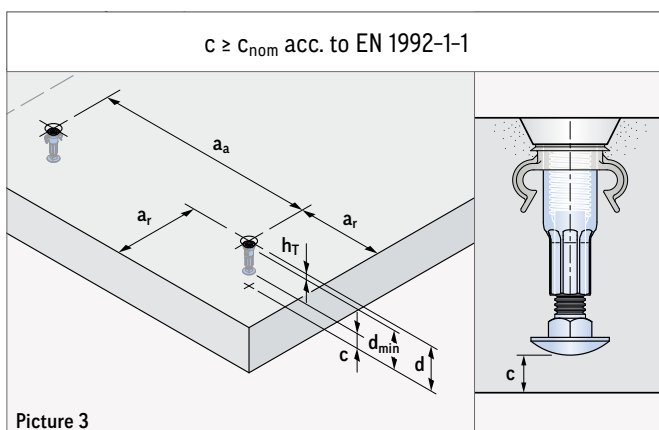


Picture 4



#### RECESSED INSTALLATION

If the Screw anchor is installed recessed (e.g. by using a recess former), the minimum thickness  $d_{min}$  has to be increased by  $h_T$  (picture 3).



Picture 3

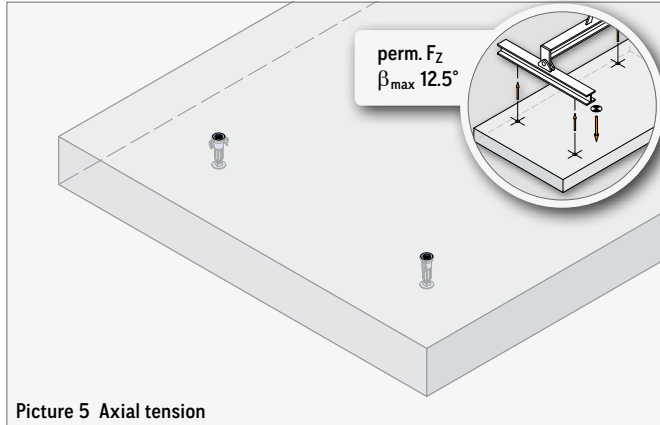


## REINFORCEMENT / LOAD BEARING CAPACITIES AND BOUNDARY CONDITIONS (AXIAL TENSION)

### AXIAL TENSION

No minimum surface reinforcement is required for the use of screw anchors with axial tension  $\beta \leq 12.5^\circ$ .

The minimum component thicknesses, minimum centre distances and minimum edge distances acc to table 2 must be observed.



Picture 5 Axial tension

TABLE 2: AXIAL TENSION AT  $f_{cc} \geq 15 \text{ N/mm}^2$

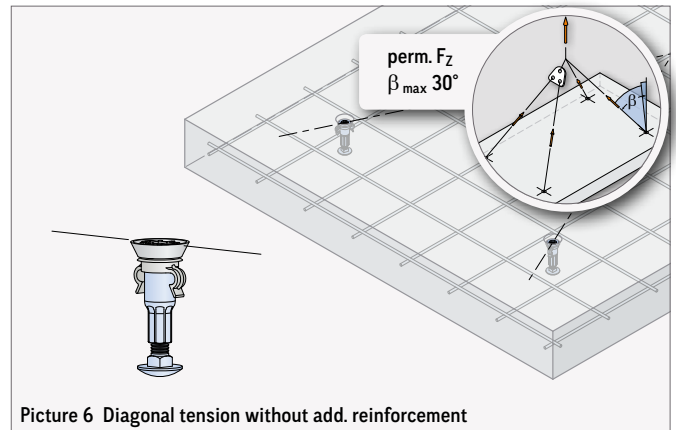
Load class	Min. element thicknesses min. centre distances min. edge distances			Axial tension $\beta_{\max} 12.5^\circ$	
	$d_{\min}$ (mm)	$a_a$ (mm)	$a_r$ (mm)	perm. $F_z$ (kN)	Mesh reinforcement
12	80	360	180	5.0	Not necessary
16	100	480	240	12.0	
20	120	600	300	20.0	
24	135	690	345	25.0	
30	170	900	450	40.0	

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

## REINFORCEMENT / LOAD BEARING CAPACITIES AND BOUNDARY CONDITIONS (DIAGONAL TENSION)

### DIAGONAL TENSION (WITHOUT ADD. REINFORCEMENT)

The loading of the screw anchors with diagonal tension  $\beta > 12.5^\circ$  requires a minimum surface reinforcement according to table 3 as well as a recessed installation of at least 10 mm by using nailing plates such as 72KHN system or similar.



Picture 6 Diagonal tension without add. reinforcement

#### EXISTING REINFORCEMENT

Existing static or structural reinforcement can be taken into account for the minimum reinforcement required for the respective load case.

TABLE 3: DIAGONAL TENSION AT  $f_{cc} \geq 15 \text{ N/mm}^2$  (WITHOUT ADD. REINFORCEMENT)

Load class	Min. element thicknesses min. centre distances min. edge distances			perm. $F_z$ (kN)	$\beta_{\max} 30^\circ$ Mesh reinforcement Position	
	$d_{\min} \text{ ①}$ (mm)	$a_a$ (mm)	$a_r$ (mm)		(mm <sup>2</sup> /m)	
16	110	480	240	12.0	1 × #188	middle
20	130	600	300	20.0	1 × #188	middle
24	145	690	345	25.0	2 × #188	top/bottom
30	180	900	450	40.0	2 × #188	top/bottom

- To determine the correct load class please refer also to our General Installation Instruction.

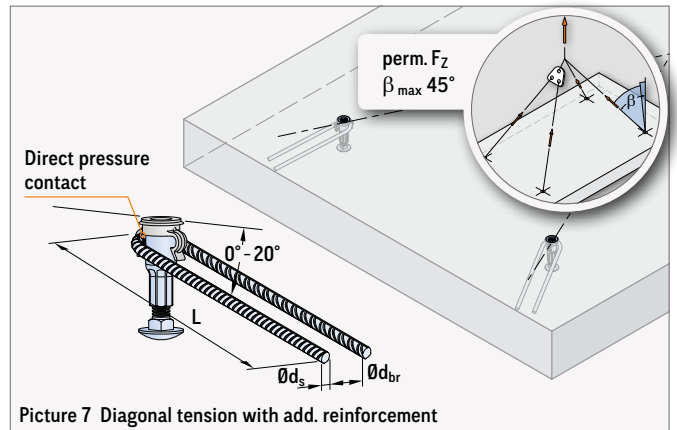
- The weight of 1.0 t corresponds to 10.0 kN.

① For an installation without add. reinforcement for diagonal tension, the screw anchor must be installed recessed with a recess former (KHN system).  
When using recess former with  $h_T > 10 \text{ mm}$ , the component thickness  $d_{\min}$  must be increased accordingly.

## REINFORCEMENT / LOAD BEARING CAPACITIES AND BOUNDARY CONDITIONS (DIAGONAL TENSION)

### DIAGONAL TENSION (WITH ADD. REINFORCEMENT)

If the Screw anchor is used under diagonal tension  $\beta > 12.5^\circ$  an additional reinforcement according to table 4 is required. Here the reinforcement for diagonal tension is placed contrarily to the tensile direction (picture 7) and must have direct pressure contact to the anchor insert in the peak of its bending. The installation of the rebars for diagonal tension can be done in an angle of  $0^\circ$  to  $20^\circ$  to the concrete surface. If an installation angle of  $0^\circ$  is given the transport anchor has to be installed in a deeper position (e.g. by using a recess former) in order to reach the minimum required concrete covering.



Picture 7 Diagonal tension with add. reinforcement

TABLE 4: DIAGONAL TENSION AT  $f_{cc} \geq 15 \text{ N/mm}^2$  (WITH ADD. REINFORCEMENT)

Load class	Min. element thicknesses min. centre distances min. edge distances			perm. $F_z$ (kN)	$\beta_{\max} 30^\circ$ Add. reinforcement for diagonal tension (B500B)			perm. $F_z$ (kN)	$\beta_{\max} 45^\circ$ Add. reinforcement for diagonal tension (B500B)		
	$d_{\min} \text{ ①}$ (mm)	$a_a$ (mm)	$a_r$ (mm)		$\text{Ø}d_s$ (mm)	L (mm)	$\text{Ø}d_{br}$ (mm)		$\text{Ø}d_s$ (mm)	L (mm)	$\text{Ø}d_{br}$ (mm)
12	80	360	180	5.0	6	150	24	5.0	6	150	24
16	100	480	240	12.0	6	250	24	12.0	8	200	32
20	120	600	300	20.0	8	250	32	20.0	8	300	32
24	135	690	345	25.0	8	300	32	25.0	10	300	40
30	170	900	450	40.0	10	350	40	40.0	12	400	48

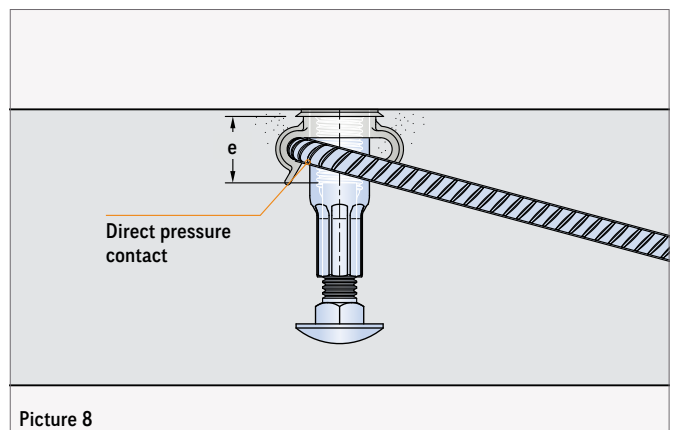
- To determine the correct load class please refer also to our General Installation Instruction.

- The weight of 1.0 t corresponds to 10.0 kN.

① When using recess former with  $h_T > 10 \text{ mm}$ , the component thickness  $d_{\min}$  must be increased accordingly.

### REINFORCEMENT INSTRUCTIONS

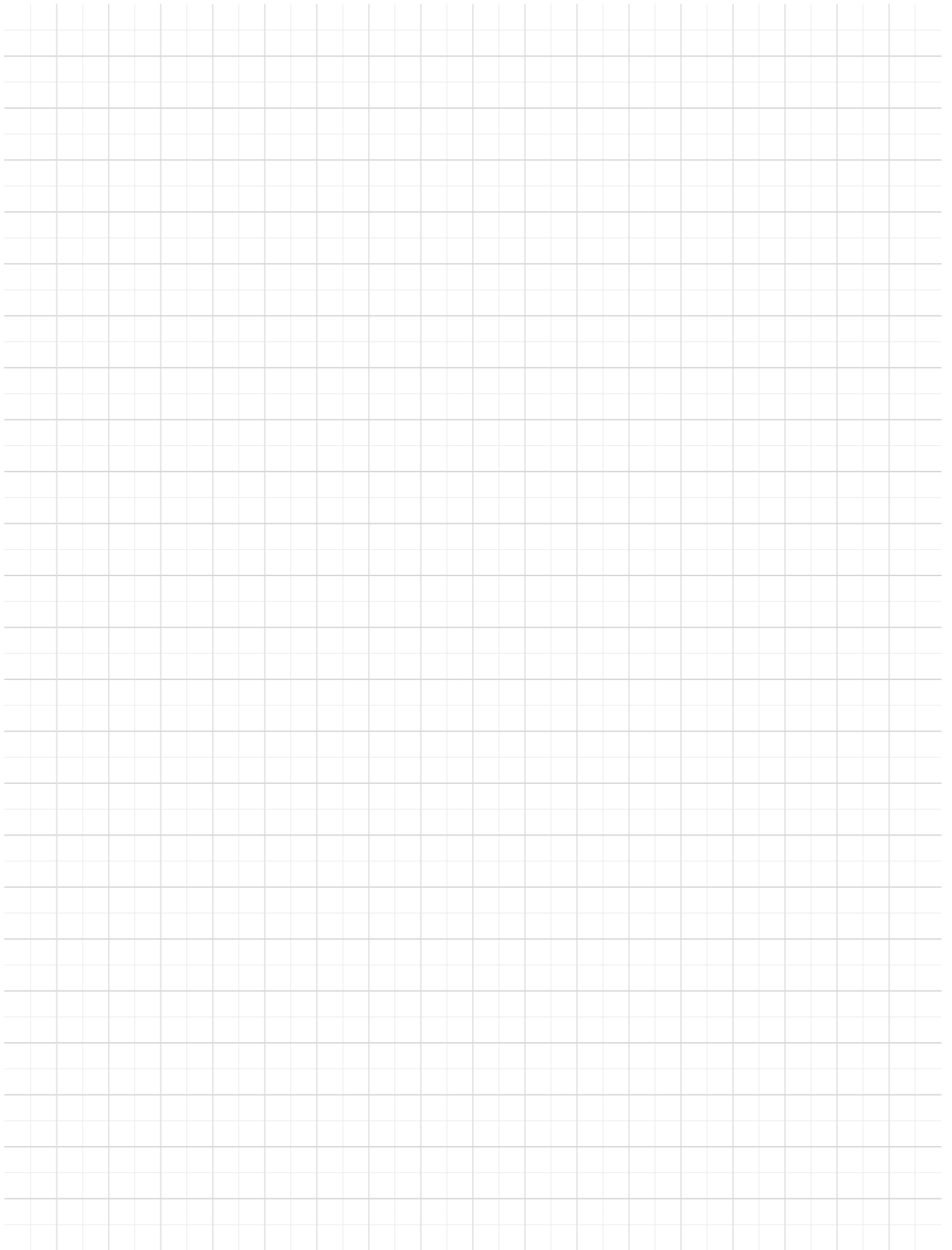
Additional reinforcement for diagonal tension has to be installed with pressure contact to the anchor insert. The position of the direct pressure contact must be within the thread reach  $e$  of the insert (see picture 8). By using the Marking ring with clip (74KR\_CLIP) this position is guaranteed.



Picture 8



## NOTES





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