

# PHILIPPGROUP

## PHILIPP Nailing plate for diagonal tension system



VB3-T-079-en - 09/21 - PDF

### Installation and Application Instruction

## Transport and mounting systems for prefabricated building

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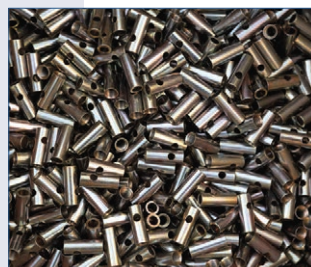
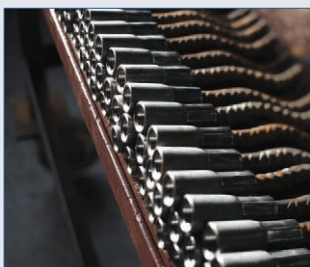
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## Nailing plate for diagonal tension system

By using a recess former for diagonal tension SZ15 an installation of a Threaded transport anchor straight tail results in an anchor axis inclined by 15° to the concrete surface. This allows a diagonal tension  $\beta_{\max} 30^\circ$  without the installation of additional reinforcement (U-bar).

### Combinations:

#### ☑ Lifting devices

- ☑ Lifty
- ☑ Lifty with wire rope
- ☑ Lifting loop with threaded end
- ☑ Lifting loop plus

#### ☑ Recess former SZ15

- ☑ Plastic recess former
- ☑ Steel recess former

#### ☑ Sealing cap (plastic)

- ☑ Outside cap (72ASS\_\_)
- ☑ Sealing cap (72KAS\_\_)

#### ☑ Marking ring

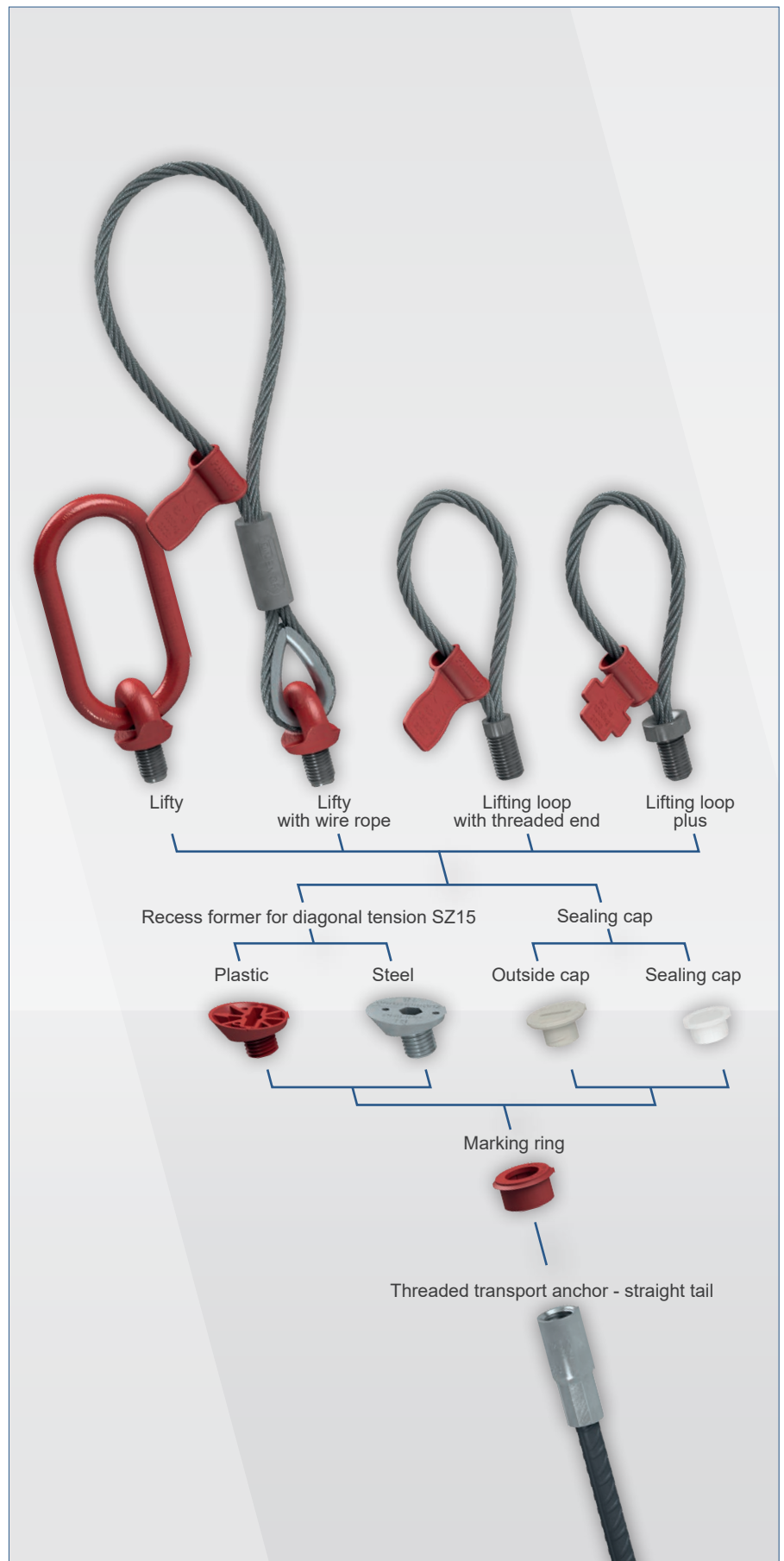
- ☑ Marking ring (74KR\_\_)

#### ☑ Transport anchor

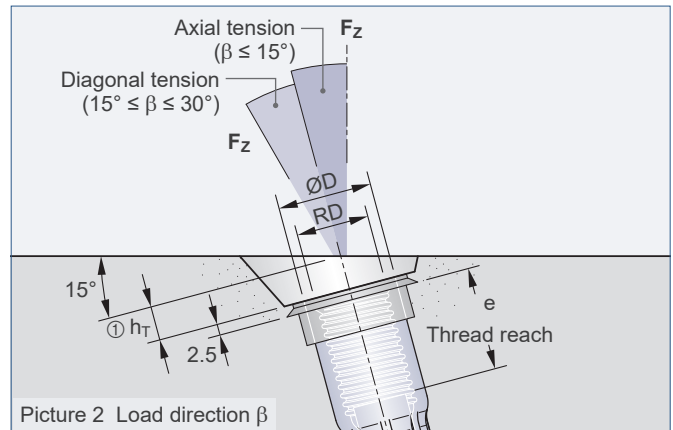
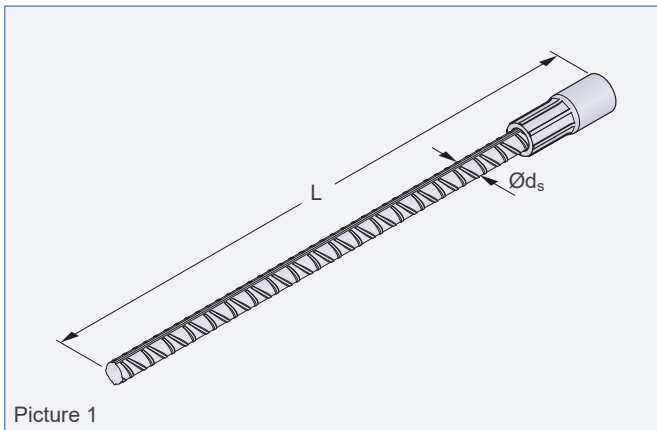
- ☑ Threaded transport anchor - straight tail



A combination of the recess former for diagonal tension with other threaded anchors as well as lifting devices is not permitted.



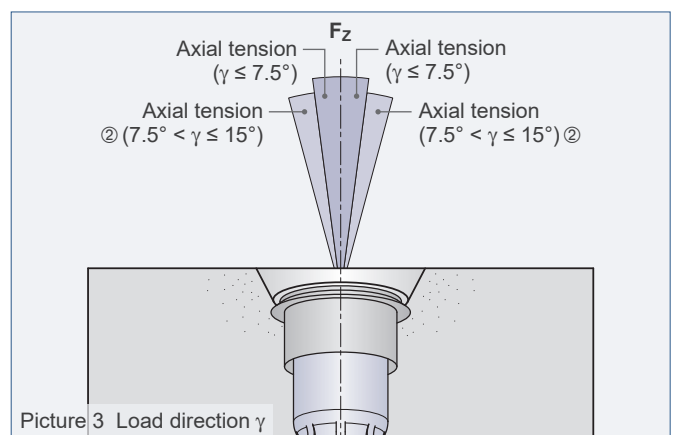
**Threaded transport anchor - straight tail**



The Threaded transport anchor – straight tail is used for face-side installation in wall-like elements. It is part of the PHILIPP Transport anchor system and complies with the VDI/BV-BS Guideline "Lifting inserts and lifting systems for precast concrete elements" (VDI/BV-BS 6205).

The use of Threaded transport anchors requires the compliance with this Installation Instruction as well as the General Installation Instruction. The Application Instructions for the belonging PHILIPP lifting devices (Lifty, Lifty with wire rope, Lifting loop with threaded end and Lifting loop plus) 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. The Threaded transport anchor is not specified for a repeated usage (e.g. ballasts for cranes) or a permanent fixation.



Picture 3 Load direction  $\gamma$   
 ② Only possible when using a tilting Table!



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



**Table 1: Threaded transport anchor - straight tail**

Ref. no. ③ galvanised	Type	Dimensions					Weight [kg/100 pcs.]
		RD	ØD [mm]	L [mm]	e [mm]	Øds [mm]	
67M16	RD 16	16	21.0	275	27	12	28.0
67M20	RD 20	20	27.0	355	35	16	64.0
67M24	RD 24	24	31.0	405	43	16	76.0
67M30	RD 30	30	39.5	505	56	20	116.0
67M36	RD 36	36	47.0	690	68	25	310.0
67M42	RD 42	42	54.0	840	75	28	470.0
67M52	RD 52	52	67.0	900	95	32	714.0

① Mind the embedment depth  $h_T$  of the recess former SZ15 (picture 2, table 3).

③ Also available in stainless steel version (ref. no. 75M\_\_VA).

## General notes / reinforcement

### Materials

The Threaded transport anchors consist of a straight reinforcement bar B500B with crimped-on insert. All inserts are made of special high precision steel tubes and are galvanized conforming to standards.

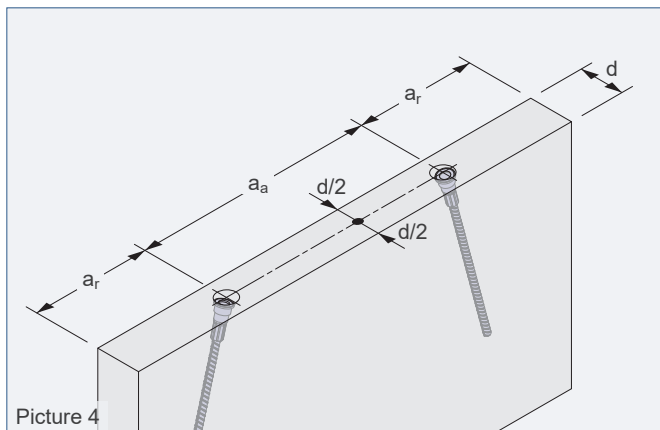
This galvanisation protects the anchor temporarily from the storage at the producer site to the final installation in the concrete element.

### 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 cut surface of the reinforcement bar is protected by a special sealing against corrosion.

### Element thicknesses, centre and edge distances

The installation and position of threaded transport anchors in precast concrete elements require minimum element thicknesses and centre/edge distances for a safe load transfer (table 2).



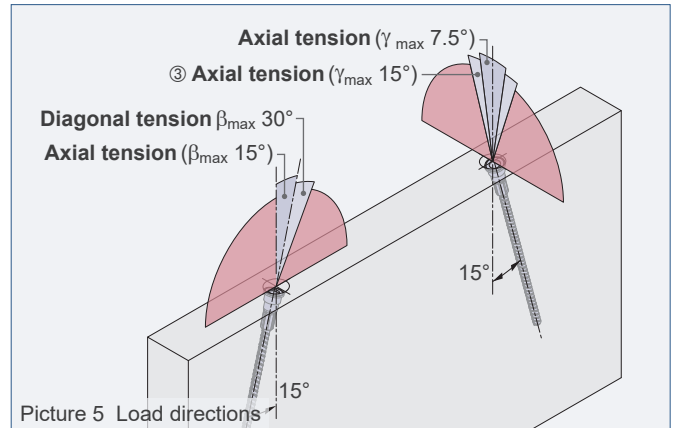
Picture 4

### 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 compressive strengths at the time of the first lifting.

### Load directions

Due to the 15° inclined installation of the Threaded transport anchors an axial load as well as a diagonal load direction  $\beta_{max} 30^\circ$  is possible. Basically, a lateral load on the anchors up to  $\gamma_{max} 7.5^\circ$  during transport of the elements is allowed. If an element is produced on a tilting table an angle up to  $\gamma_{max} 15^\circ$  is possible.



Picture 5 Load directions

ⓐ Only possible when using a tilting table!

### Minimum reinforcement

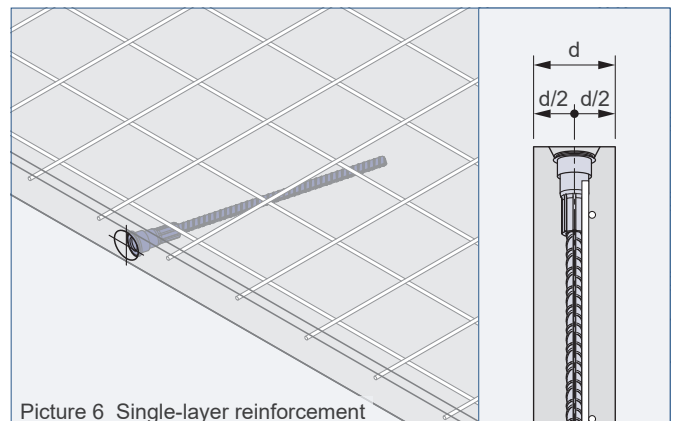
In use of Threaded transport anchors precast units must be reinforced with a minimum reinforcement according to table 2. This minimum reinforcement can be replaced by a comparable steel bar single reinforcement. The user is personally responsible for further transmission of load into the concrete unit.



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

### Single-layer reinforcement

In order to ensure a central position of the anchor in the element, the mesh reinforcement has to be installed asymmetrically in the element in case of a single-layer reinforcement (see picture 6).



Picture 6 Single-layer reinforcement

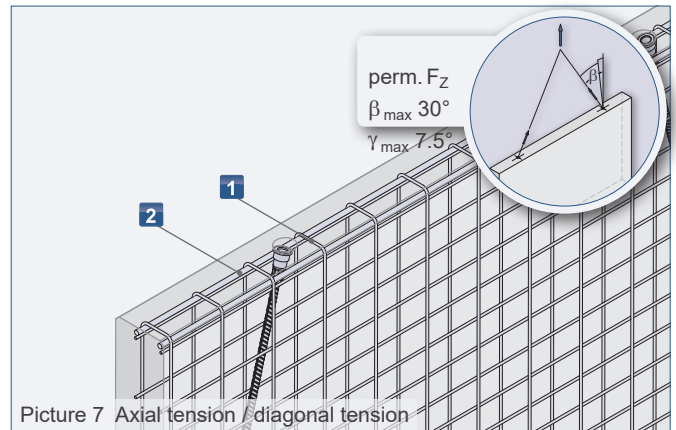


## Axial tension / diagonal tension: Permissible load bearing capacities and boundary conditions

If the Threaded transport anchor is used under axial and diagonal tension  $\beta > 30^\circ$  an additional reinforcement according to table 2 is required.



A lateral load on the anchors above  $\gamma_{\max} 7.5^\circ$  is not allowed during transport! If the element is produced on a tilting table an angle up to  $\gamma_{\max} 15^\circ$  is possible. Also a diagonal load direction with an angle  $\beta$  above  $30^\circ$  is not allowed!

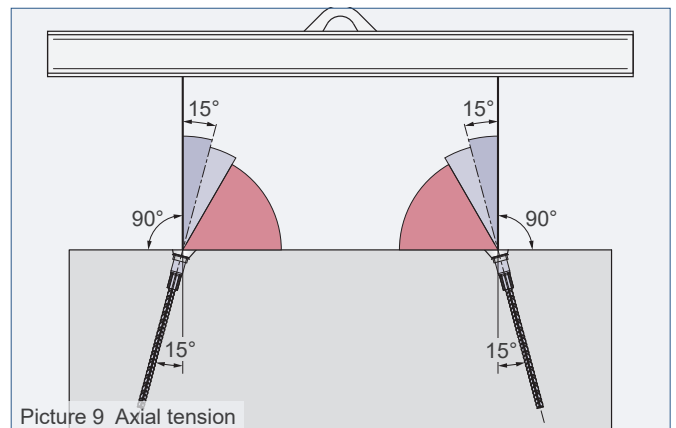
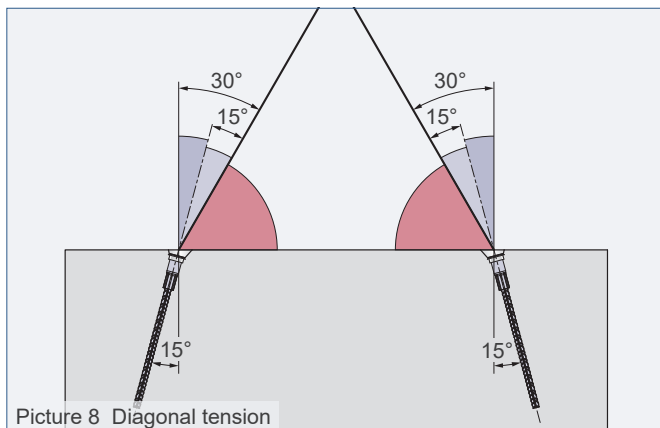


**Table 2: Axial and diagonal tension**

Load class	Element thicknesses, centre and edge distances			perm. $F_Z$		$\beta_{\max} 30^\circ / \gamma_{\max} 7.5^\circ$ ③		1 Mesh reinforcement (square) [mm <sup>2</sup> /m]	2 Longitudinal reinforcement
	d [mm]	a <sub>a</sub> [mm]	a <sub>r</sub> [mm]	$f_{cc} \geq 15 \text{ N/mm}^2$	$f_{cc} \geq 17.5 \text{ N/mm}^2$	$f_{cc} \geq 20 \text{ N/mm}^2$	$f_{cc} \geq 22.5 \text{ N/mm}^2$		
16	60	400	200	9.1	9.8	10.5	10.5	1 × #188	-
20	100	600	300	18.9	20.0	20.0	20.0	2 × #188 ④	-
24	100	600	300	24.6	25.0	25.0	25.0	2 × #188 ④	-
30	120	700	350	38.6	40.0	40.0	40.0	2 × #188 ④	-
36	120	900	450	60.5	63.0	63.0	63.0	2 × #188 ④	-
				70.1	75.8	78.1	78.1	2 × #188 ④	-
42	140	1100	550	70.1	75.8	80.0	80.0	2 × #257 ④	-
				-	86.9	92.9	95.0	2 × #188 ④	-
52	150	1200	600	-	86.9	92.9	95.0	2 × #188 ④	-
				125.0	125.0	125.0	125.0	2 × #257 ④	2 × Ø10 / 1100

③ If a tilting table is used an angle of  $\gamma_{\max} 15^\circ$  is possible!

④ The reinforcement shall be in the form of a double-bended mesh reinforcement or with equivalent stirrups.

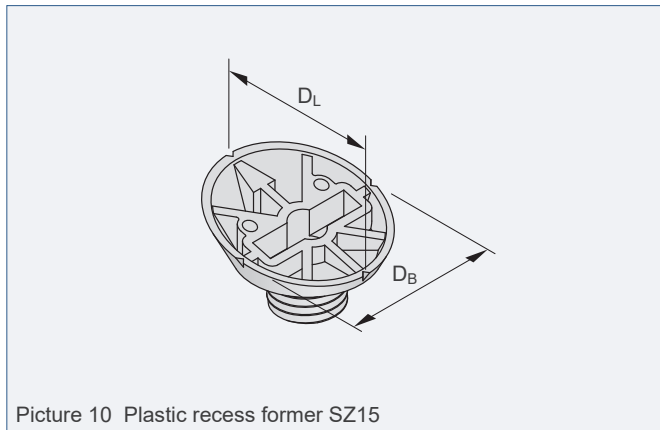


## Recess former SZ15

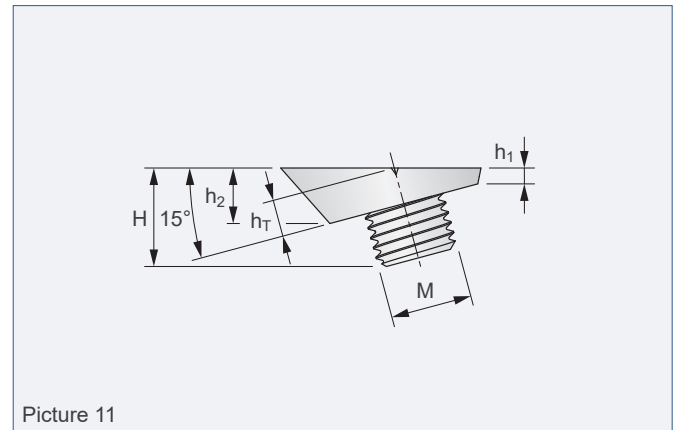
### Plastic recess former SZ15

By using the Plastic recess former SZ15 Threaded transport anchors can be fixed with an angle of 15° to the formwork. Then, the Threaded transport anchor is screwed onto the recess former attached to the formwork. Depending on the length of the Threaded transport anchor, it may be necessary to fix it additionally to the reinforcement of the

concrete element. After the demoulding, the Plastic recess former SZ15 can be quickly and easily removed e.g. with the PHILIPP tool 72KHNS (page 9).



Picture 10 Plastic recess former SZ15



Picture 11

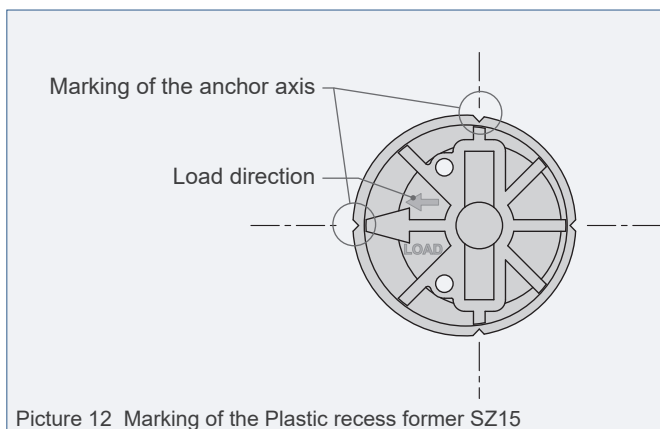
**Table 3: Plastic recess former SZ15**

Ref. no.	Type RD / M	M	$D_L$ [mm]	$D_B$ [mm]	H [mm]	$h_1$ [mm]	$h_2$ [mm]	$h_T$ [mm]	Colour code
72KHN16-SZ15	16	M 16	38.5	38.0	20.5	3.5	11.2	7.5	Flame red
72KHN20-SZ15	20	M 20	55.5	55.0	30.5	3.3	15.0	9.5	Pastel green
72KHN24-SZ15	24	M 24	55.5	55.0	31.0	3.3	15.0	9.5	Jet black
72KHN30-SZ15	30	M 30	72.5	72.0	38.5	3.2	18.7	11.5	Emerald green
72KHN36-SZ15	36	M 36	72.5	72.0	39.0	3.2	18.7	11.5	Light blue
72KHN42-SZ15	42	M 42	99.5	99.0	48.0	3.3	25.5	15.0	Silk grey
72KHN52-SZ15	52	M 52	99.5	99.0	49.5	3.3	25.5	15.0	Sulphur yellow

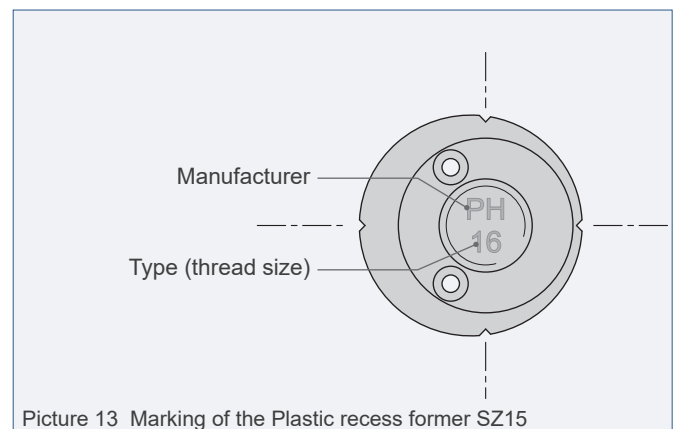
### Marking

Due to its colour code as well as the marking with the load class (thread size), an easy matching of the recess formers to the Threaded transport anchors to be fixed and the required lifting devices is ensured.

For a fast mounting of the recess former to the formwork small notches on the edge are given to mark the anchor axis. In addition, a marking indicates the installation direction (later load direction of the transport anchors).



Picture 12 Marking of the Plastic recess former SZ15



Picture 13 Marking of the Plastic recess former SZ15



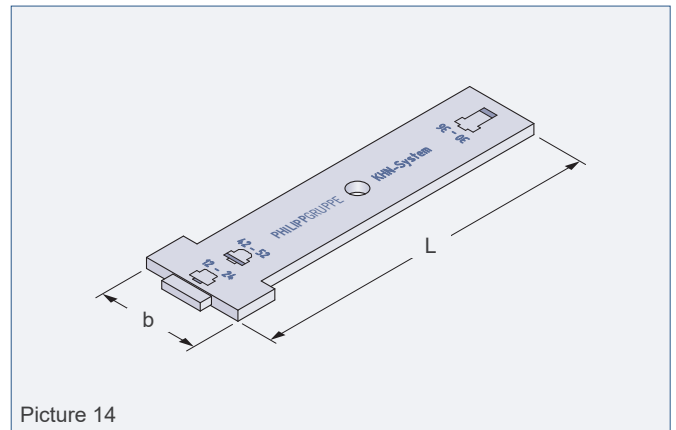
## Recess former SZ15

### Tool/key for Plastic recess former SZ15

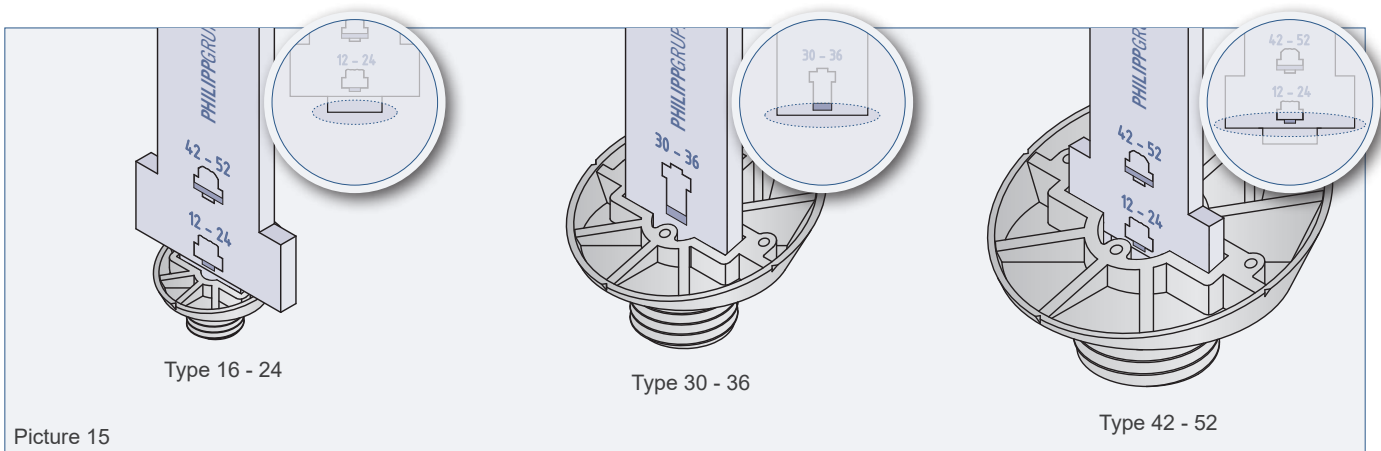
The tool/key is used for an easy unscrewing of the Plastic recess former (72KHNS-SZ15) of the Threaded transport anchors set in concrete. Because of its special geometry, the tool/key can be used for all sizes (16-52) of the SZ15 system.

**Table 4: Key**

Ref. no.	Type	L [mm]	b [mm]
72KHNS	16 - 52	200	57



Picture 14



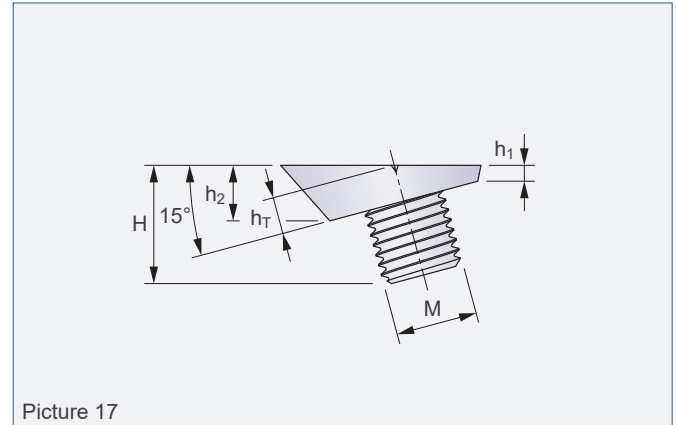
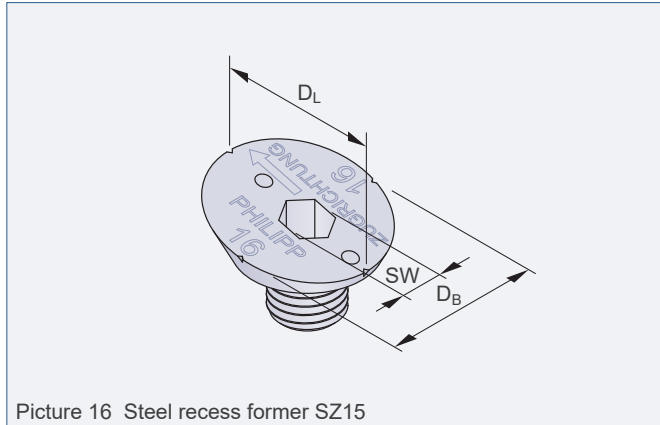
Picture 15

## Recess former SZ15

### Steel recess former SZ15

By using the Steel recess former SZ15 Threaded transport anchors can be fixed with screws (with metric thread) or nails with an angle of 15° to the formwork. Then, the Threaded transport anchor is screwed onto the recess former attached to the formwork. Depending on the length of

the Threaded transport anchor, it may be necessary to fix it additionally to the reinforcement of the concrete element. After the demoulding, the Steel recess former SZ15 can be quickly and easily removed with an Allen key (see table 5).



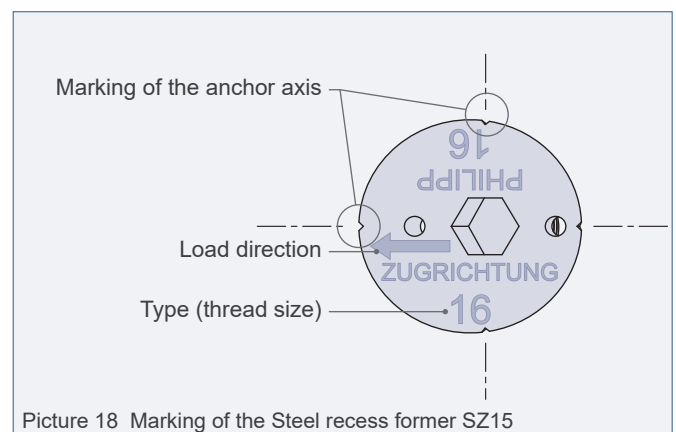
Ref. no.	Type RD/M	M	DL [mm]	DB [mm]	H [mm]	h <sub>1</sub> [mm]	h <sub>2</sub> [mm]	h <sub>T</sub> [mm]	SW [mm]
72KHN16-SZ15ST	16	M 16	38.5	38.0	23.5	3.5	11.2	7.5	8
72KHN20-SZ15ST	20	M 20	55.5	55.0	30.5	3.3	15.0	9.5	10
72KHN24-SZ15ST	24	M 24	55.5	55.0	31.0	3.3	15.0	9.5	10
72KHN30-SZ15ST	30	M 30	72.5	72.0	38.0	3.2	18.7	11.5	10
72KHN36-SZ15ST	36	M 36	72.5	72.0	39.0	3.2	18.7	11.5	10
72KHN42-SZ15ST	42	M 42	99.5	99.0	48.0	3.3	25.5	15.0	10
72KHN52-SZ15ST	52	M 52	99.5	99.0	50.0	3.3	25.5	15.0	10

### Marking

Additionally, a marking is provided which ensures an easy assignment of the recess formers to the corresponding threaded anchors to be fixed, these are marked with the load class (thread size).

In order to position the recess formers quickly on the formwork, there are special notches on the edge of the plate which mark the anchor axis.

Additionally, a marking is provided which identifies the installation direction (later load direction of the transport anchors).

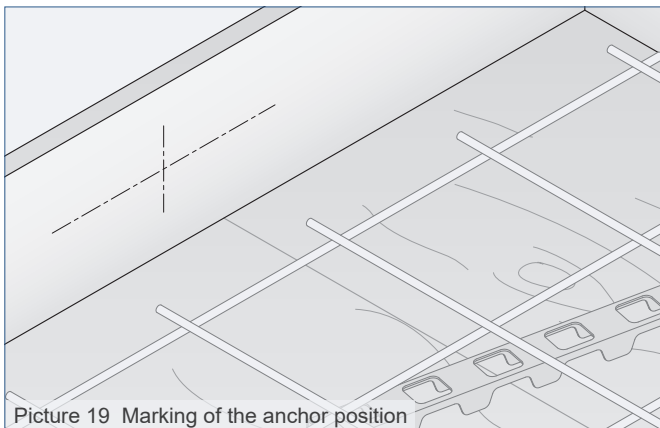


## Installation of the system

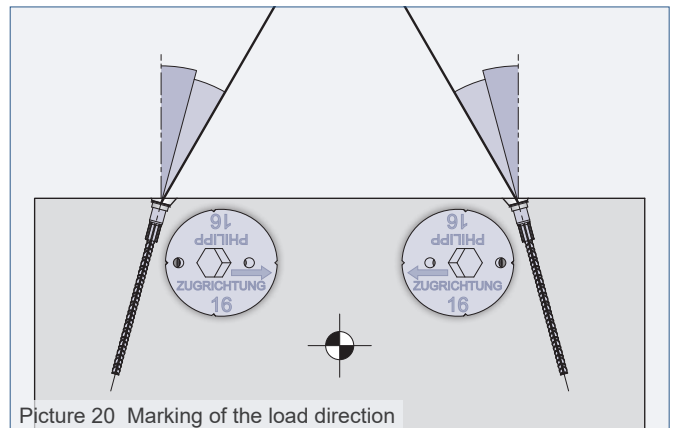
The recess former SZ15 is fixed to the formwork at the intended position with nails, screws or glue. Here, the marking of the tensile direction (later load direction of the anchors) has to be followed. This must point in the direction of the wall centre (centre of gravity, picture 20). For an exact positioning, the notches at the edge of the recess former are used. A precise positioning on the formwork is necessary, as otherwise e.g. a twisting of the recess former will lead to a misalignment of the anchor and thus the full load-bearing capacity is not given anymore (picture 22). Now the Threaded transport anchor can be screwed onto the fixed recess former.

Depending on the length of the Threaded transport anchor, it may be necessary to fix it additionally to the reinforcement of the concrete element. After the demoulding, the recess former can be quickly and easily removed with a tool/key (see also table 5).

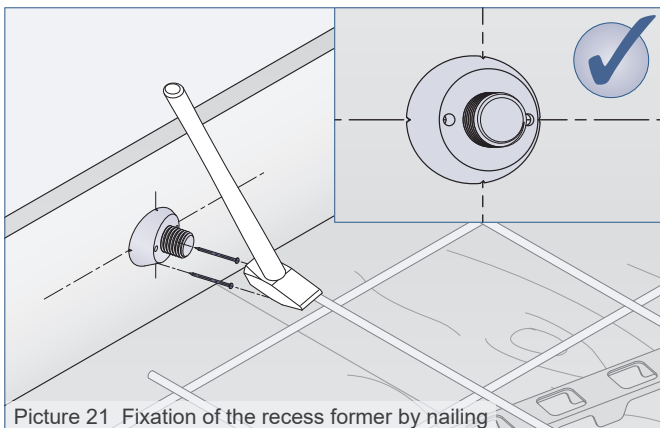
**i** In order to avoid dirt insight of the hexagon socket (e.g. caused by cement slurry), it can be protected with adhesive tape.



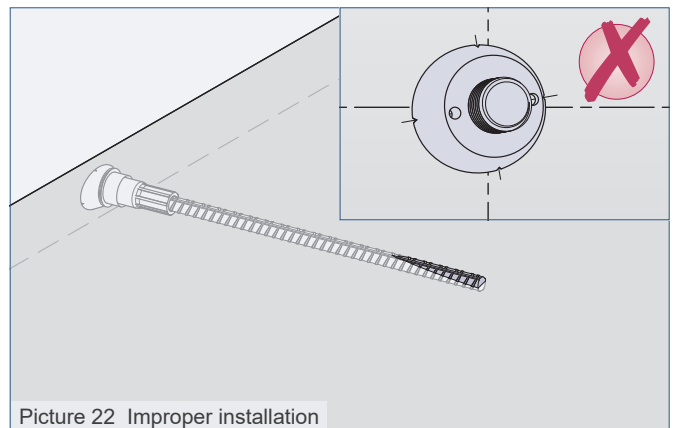
Picture 19 Marking of the anchor position



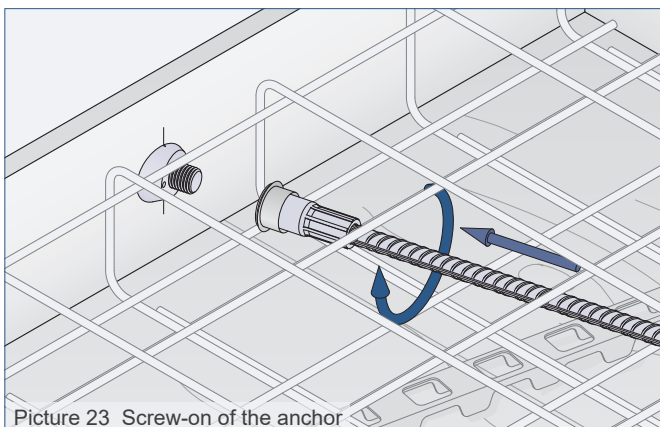
Picture 20 Marking of the load direction



Picture 21 Fixation of the recess former by nailing



Picture 22 Improper installation



Picture 23 Screw-on of the anchor



Picture 24

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