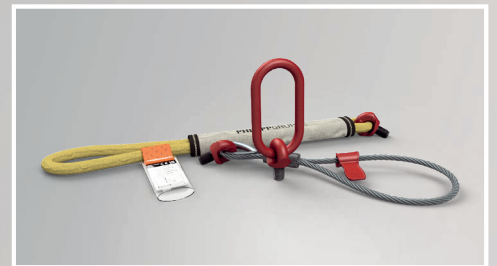


Nailing plate for diagonal tension system



Installation and Application Instruction

Our products from the division BUILDING SOLUTIONS

SERVICES

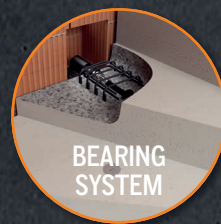
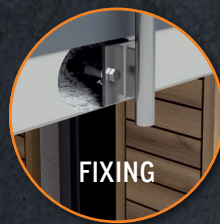
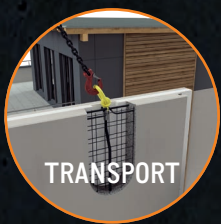
- » On-site tests -> we ensure that your requirements are properly covered by our planning.
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PHILIPP Nailing plate for diagonal tension system

THE NAILING PLATE FOR DIAGONAL TENSION SYSTEM

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

Combinations:

» Lifting devices

- › Lifty
- › Lifty DS
- › 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_)

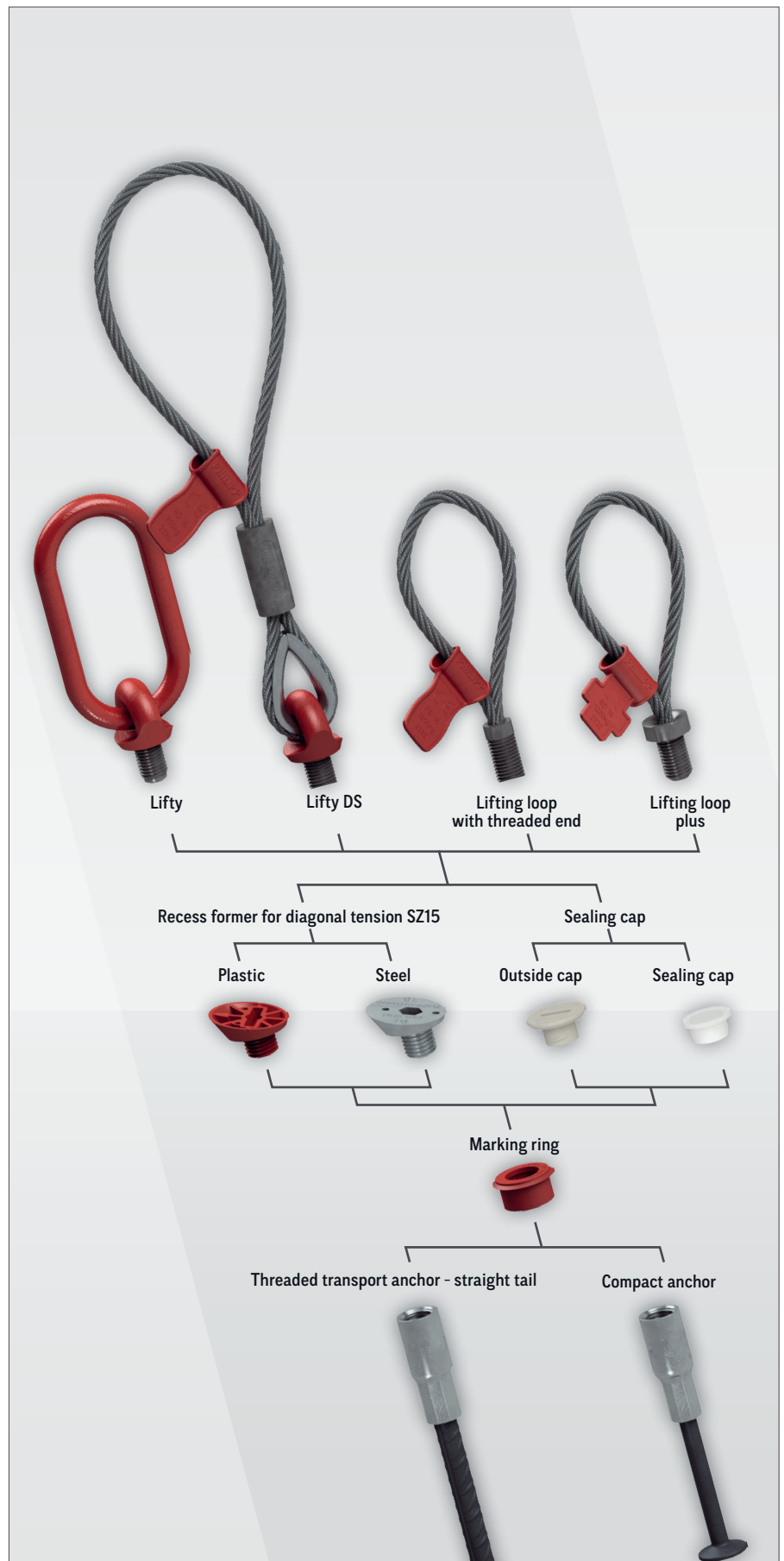
» Transport anchor

- › Threaded transport anchor - straight tail
- › Compact anchor



COMBINATION

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



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.

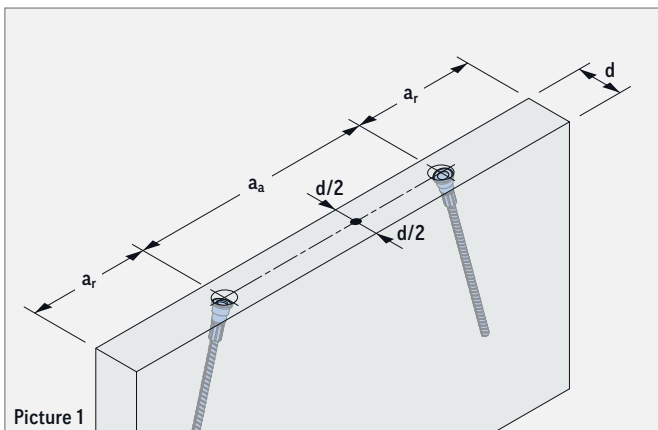
This galvanisation protects the anchor temporarily from the storage at the producer site to the final installation in the concrete element.

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 or 4).



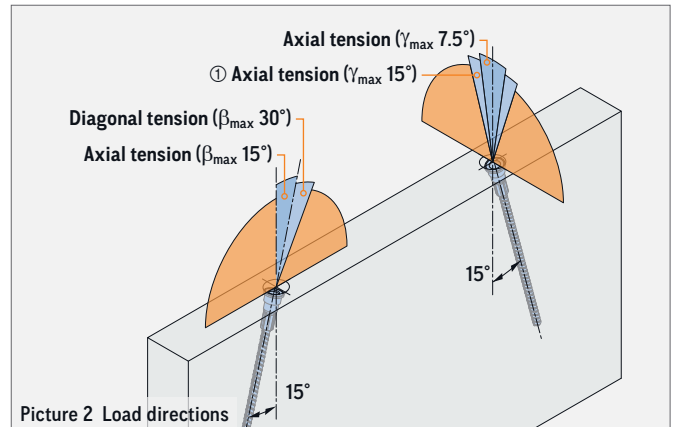
Picture 1

CONCRETE STRENGTH

At the time of the first lift the concrete must have a minimum strength f_{cc} acc. to table 2 or 4. 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 2 Load directions

① 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 comparable reinforcing bars. The user is personally responsible for further transmission of load into the concrete unit.

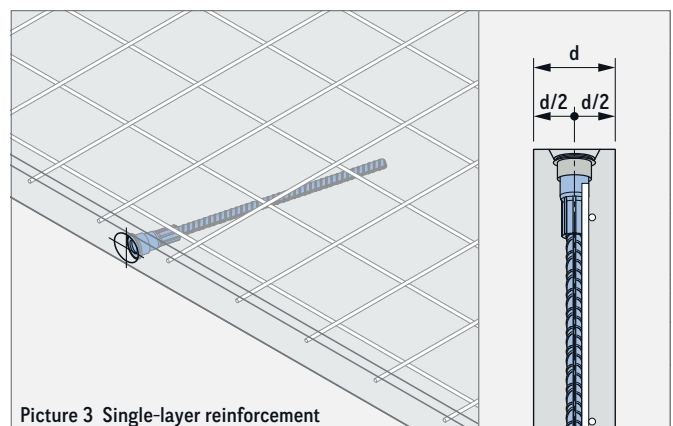


EXISTING REINFORCEMENT

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

SINGLE-LAYER REINFORCEMENT

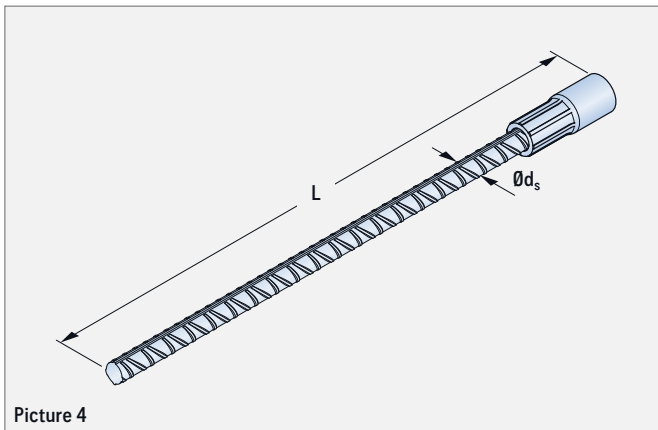
In order to ensure a central position of the anchor in the element, the mesh reinforcement has to be installed asymmetrically in the element in case of a single-layer reinforcement (see picture 3).



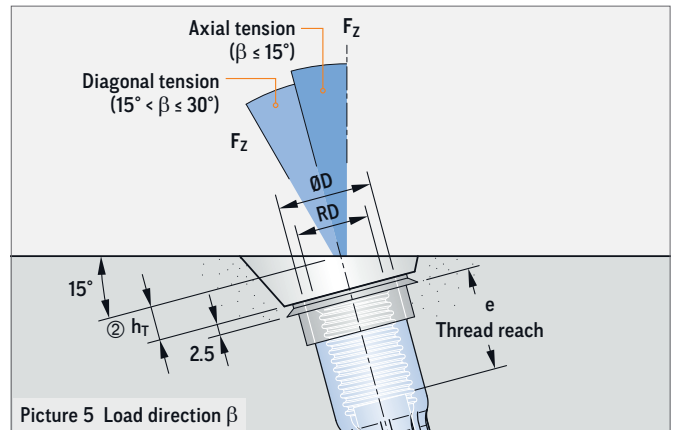
Picture 3 Single-layer reinforcement

PHILIPP Nailing plate for diagonal tension system

THREADED TRANSPORT ANCHOR - STRAIGHT TAIL



Picture 4

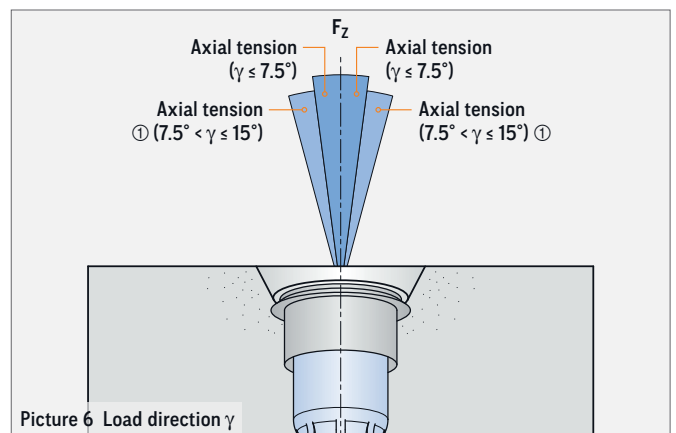


Picture 5 Load direction β

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 DS, 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 6 Load direction γ

① Only possible when using a tilting table!



EC DECLARATION OF CONFORMITY (DOC)

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



TABLE 1: DIMENSIONS THREADED TRANSPORT ANCHOR - STRAIGHT TAIL

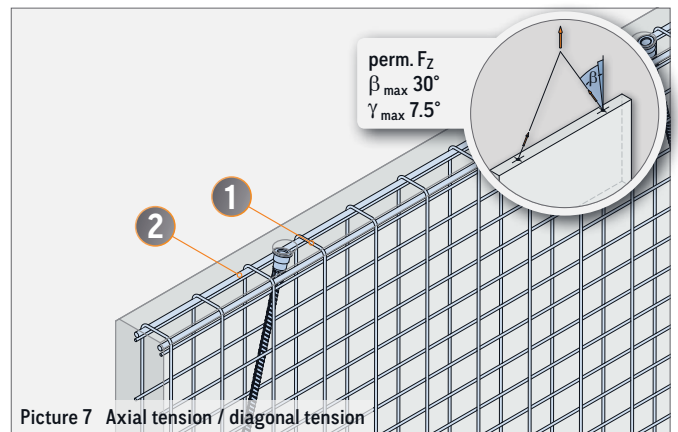
Ref. no. ③ galvanised	Type	Dimensions					Weight [kg/100 pcs.]
		RD	ØD (mm)	L (mm)	e (mm)	Ød _s (mm)	
67M16	RD 16	16	21.0	275	27	12	28.0
67M20	RD 20	20	27.0	355	35	16	64.0
67M24	RD 24	24	31.0	405	43	16	76.0
67M30	RD 30	30	39.5	505	56	20	116.0
67M36	RD 36	36	47.0	690	68	25	310.0
67M42	RD 42	42	54.0	840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

② Mind the embedment depth h_T of the recess former SZ15 (picture 5, table 6 or 8).

③ Also available in stainless steel version (ref. no. 75M_VA).

THREADED TRANSPORT ANCHOR - STRAIGHT TAIL: 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.



Picture 7 Axial tension / diagonal tension

LATERAL AND DIAGONAL TENSION LOAD

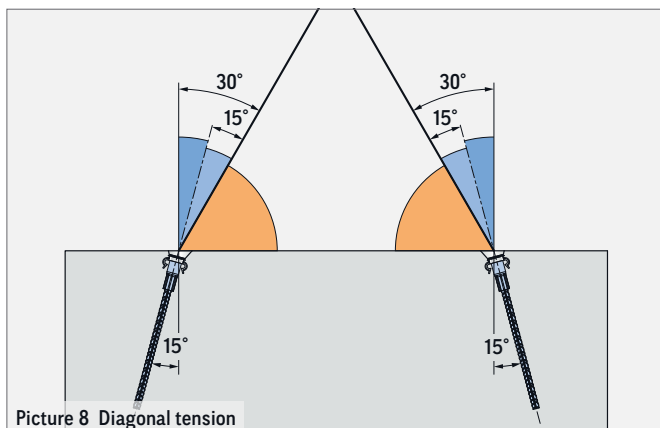
A lateral load on the anchors above $\gamma_{\max} 7.5^\circ$ is not allowed during transport! If the element is produced on a tilting table an angle up to $\gamma_{\max} 15^\circ$ is possible. Also a diagonal load direction with an angle $\beta > 30^\circ$ is not allowed!

TABLE 2: AXIAL AND DIAGONAL TENSION

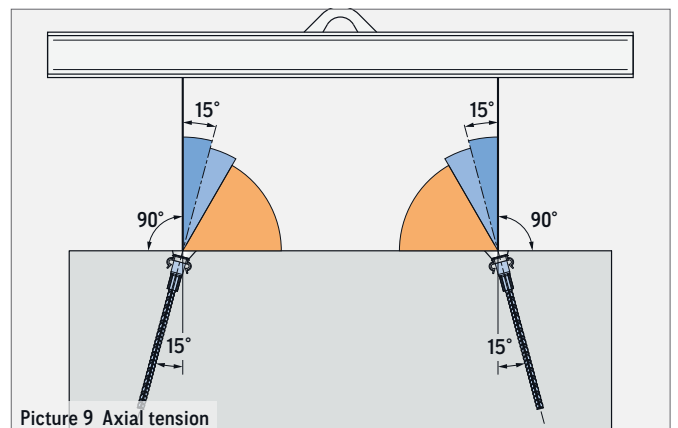
Load class	Element thicknesses, centre and edge distances			perm. F_z $f_{cc} \geq 15 \text{ N/mm}^2$ (kN)	perm. F_z $f_{cc} \geq 17.5 \text{ N/mm}^2$ (kN)	$\beta_{\max} 30^\circ / \gamma_{\max} 7.5^\circ$ ①		① Mesh reinforcement (square) (mm ² /m)	② Longitudinal reinforcement
	d (mm)	a_a (mm)	a_r (mm)			perm. F_z $f_{cc} \geq 20 \text{ N/mm}^2$ (kN)	perm. F_z $f_{cc} \geq 22.5 \text{ N/mm}^2$ (kN)		
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

① 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.



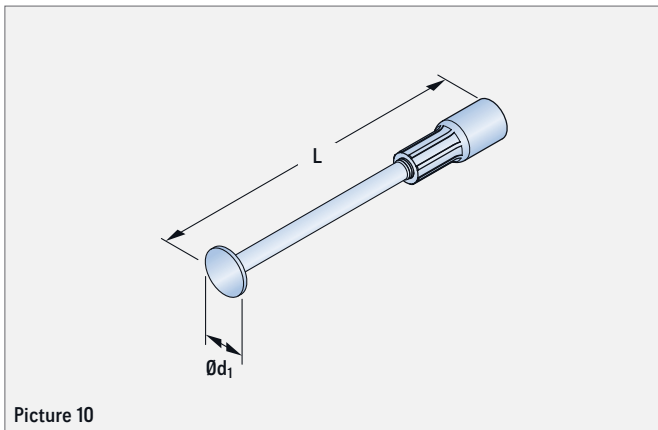
Picture 8 Diagonal tension



Picture 9 Axial tension

PHILIPP Nailing plate for diagonal tension system

COMPACT ANCHOR

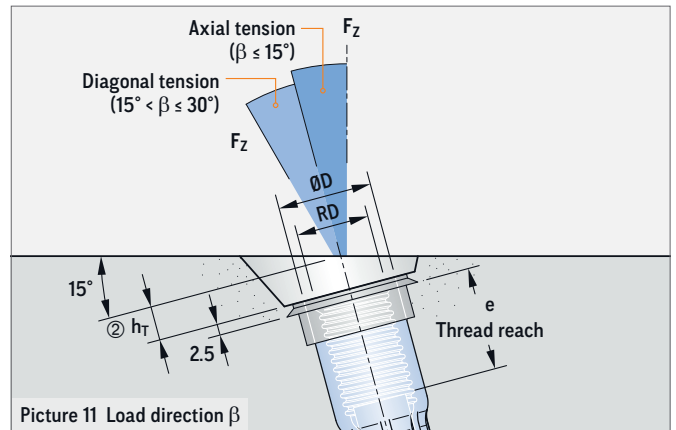


Picture 10

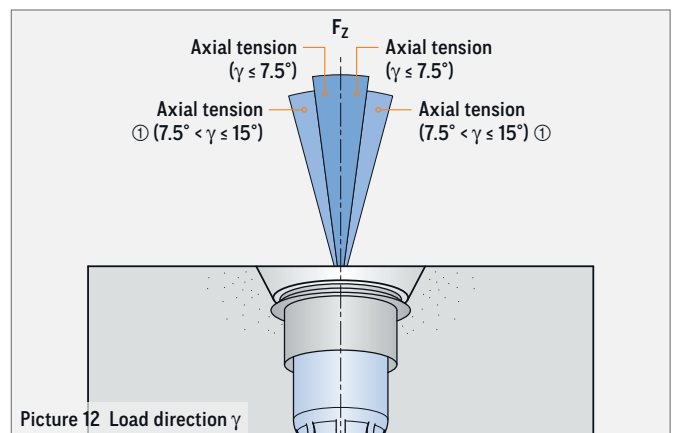
The Compact anchor is used for face-side installation in wall-like elements. It is part of the PHILIPP Transport anchor system and complies with the VDI/BV-BS Guideline "Lifting inserts and lifting systems for precast concrete elements" (VDI/BV-BS 6205).

The use of Compact 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 DS, 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.

Compact 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 Compact anchor is not specified for a repeated usage (e.g. ballasts for cranes) or a permanent fixation.



Picture 11 Load direction β



Picture 12 Load direction γ

① Only possible when using a tilting table!



EC DECLARATION OF CONFORMITY (DOC)

The EC Declaration of Conformity (DoC) of the Compact anchor can be downloaded from our website www.philipp-group.de or is available on request.



TABLE 3: DIMENSIONS COMPACT ANCHOR

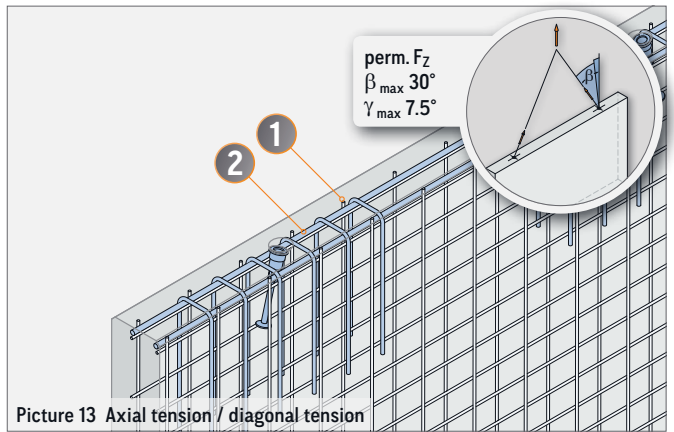
Ref. no. ③ galvanised	Type	Dimensions					Weight (kg/100 pcs.)
		RD	ØD (mm)	L (mm)	e (mm)	Ød ₁ (mm)	
67K160130	RD 16	16	21.0	130	27	25	14.0
67K200185	RD 20	20	27.0	185	35	35	34.0
67K240200	RD 24	24	31.0	200	43	35	42.0
67K300275	RD 30	30	39.5	275	56	50	105.0
67K360334	RD 36	36	47.0	334	68	60	184.0
67K420385	RD 42	42	54.0	385	75	85	273.0
67K520550	RD 52	52	67.0	550	100	85	567.0

② Mind the embedment depth h_T of the recess former SZ15 (picture 11, table 6 or 8).

③ Also available in stainless steel version (ref. no. 75M_VA).

COMPACT ANCHOR: PERMISSIBLE LOAD BEARING CAPACITIES AND BOUNDARY CONDITIONS

If the Compact anchor is used under axial and diagonal tension $\beta < 30^\circ$ an additional reinforcement according to table 4 is required.



Picture 13 Axial tension / diagonal tension



LATERAL AND DIAGONAL TENSION LOAD

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 $\beta > 30^\circ$ is not allowed!

TABLE 4: AXIAL AND DIAGONAL TENSION

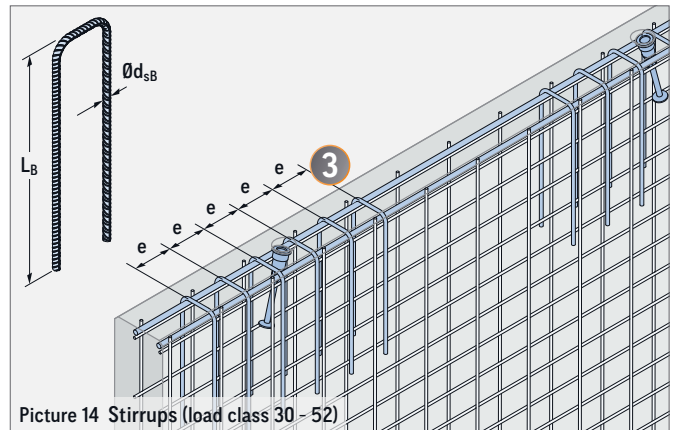
Load class	Element thicknesses, centre and edge distances			perm. F_z $f_{cc} \geq 15 \text{ N/mm}^2$	perm. F_z $f_{cc} \geq 17.5 \text{ N/mm}^2$	$\beta_{max} 30^\circ / \gamma_{max} 7.5^\circ$ ① perm. F_z $f_{cc} \geq 20 \text{ N/mm}^2$	① Mesh reinforcement (mm ² /m)	② Longitudinal reinforcement
	d (mm)	a _a (mm)	a _r (mm)					
16	80	400	200	9.1	9.8	10.5	1 × #188	-
20	100	600	300	18.9	20.0	20.0	2 × #188 ④	-
24	120	600	300	25.0	25.0	25.0	2 × #188 ④	-
30	130	700	350	40.0	40.0	40.0	2 × #257	2 × Ø12 / 800
36	160	900	450	63.0	63.0	63.0	2 × #257	2 × Ø12 / 800
42	160	1100	550	80.0	80.0	80.0	2 × #257	2 × Ø12 / 1000
52	200	1200	600	125.0	125.0	125.0	2 × #257	2 × Ø12 / 1200

① If a tilting table is used an angle of $\gamma_{max} 15^\circ$ is possible!

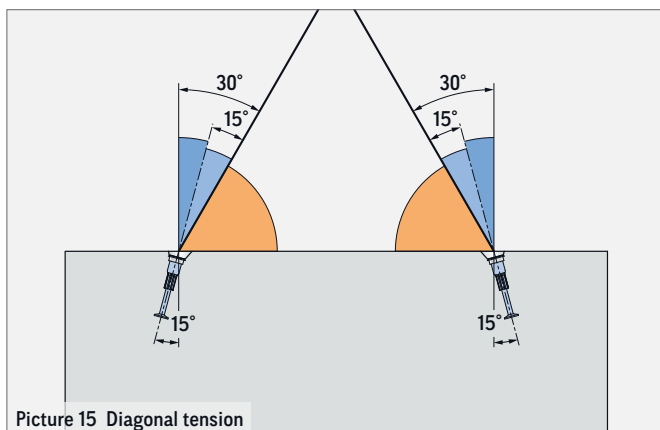
④ The reinforcement shall be in the form of a double-bended mesh reinforcement or with equivalent stirrups.

TABLE 5: ADDITIONAL REINFORCEMENT

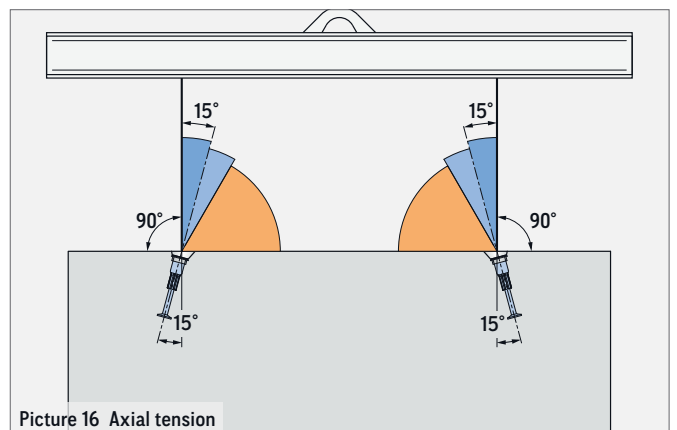
Load class	③ Stirrups in the anchor area (B500A)			
	Quantity (pcs)	Ød _{sB} (mm)	L _B (mm)	e (mm)
30	6	8	350	130
36	6	8	400	150
42	6	8	500	150
52	6	10	600	150



Picture 14 Stirrups (load class 30 - 52)



Picture 15 Diagonal tension



Picture 16 Axial tension

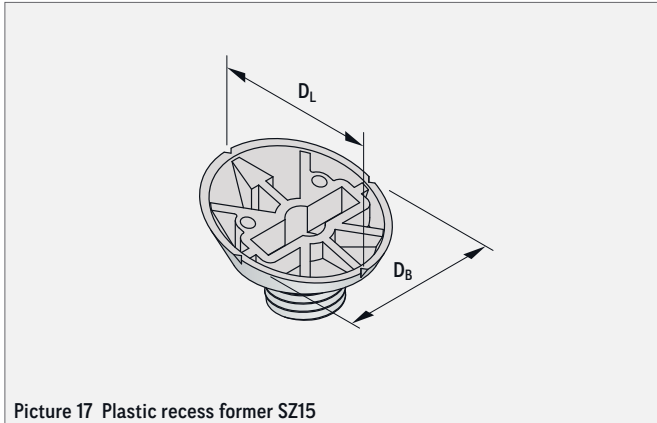
PHILIPP Nailing plate for diagonal tension system

RECESS FORMER SZ15

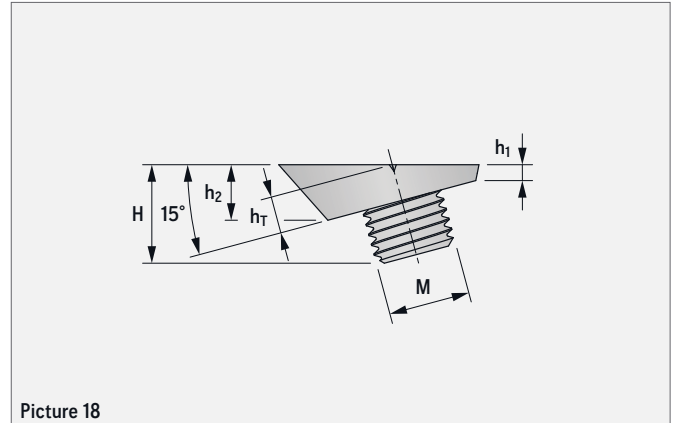
PLASTIC RECESS FORMER SZ15

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 11).



Picture 17 Plastic recess former SZ15



Picture 18

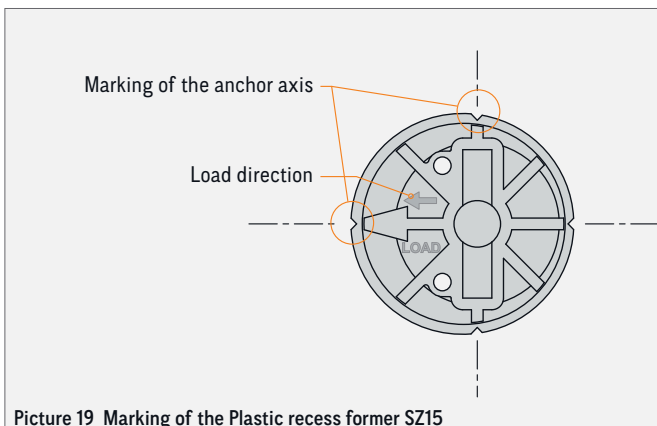
TABLE 6: PLASTIC RECESS FORMER SZ15

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

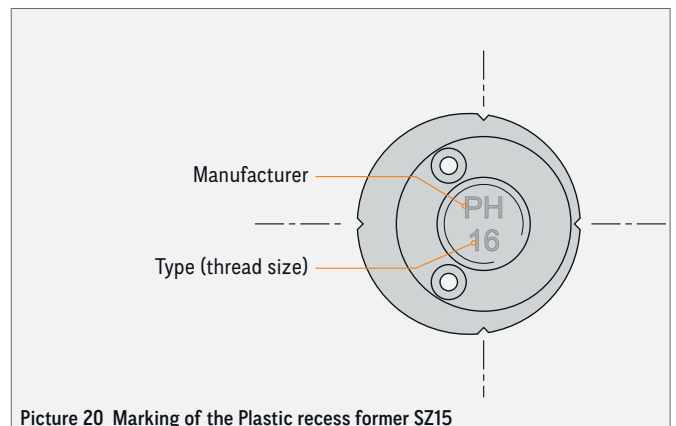
MARKING

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 19 Marking of the Plastic recess former SZ15



Picture 20 Marking of the Plastic recess former SZ15

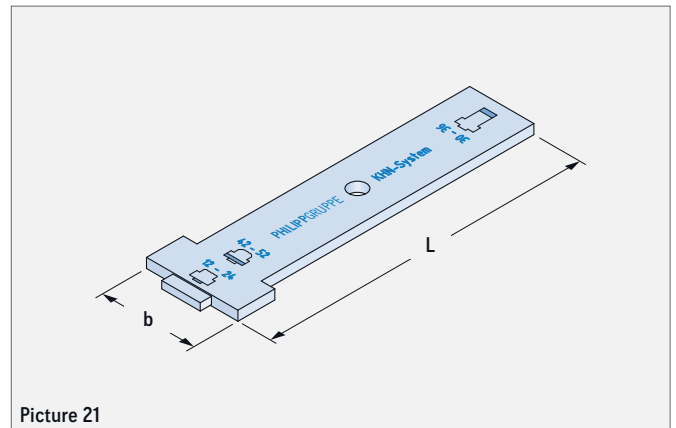
RECESS FORMER SZ15

TOOL/KEY FOR PLASTIC RECESS FORMER SZ15

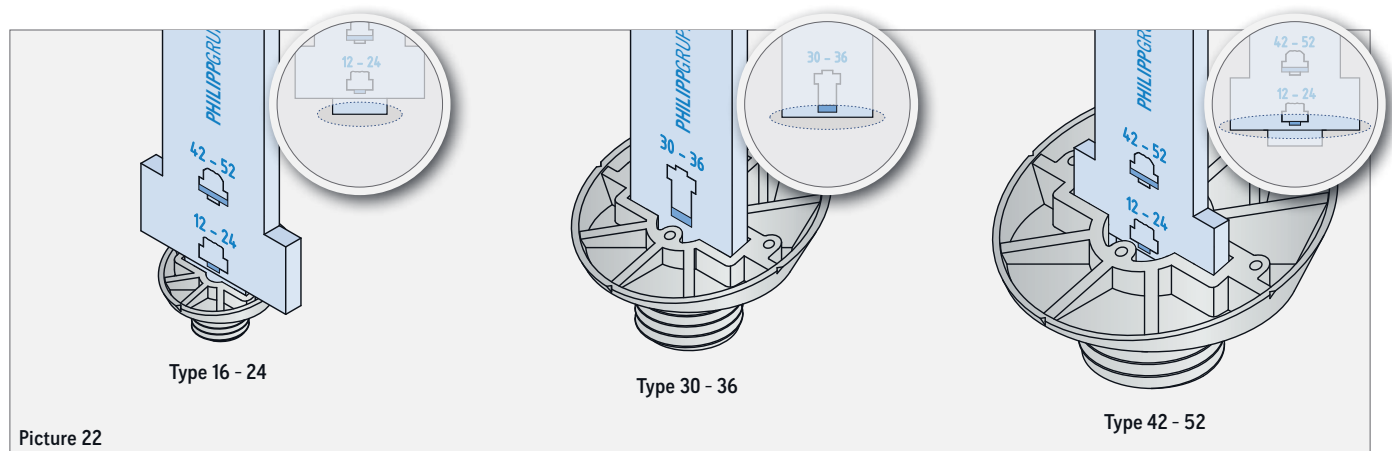
The tool/key is used for an easy unscrewing of the Plastic recess former (72KHN_-SZ15) of the Threaded transport anchors set in concrete. Because of its special geometry, the tool/key can be used for all sizes (16-52) of the SZ15 system.

TABLE 7: KEY

Ref. no.	Type	L (mm)	b (mm)
72KHNS	16 - 52	200	57



Picture 21



Picture 22

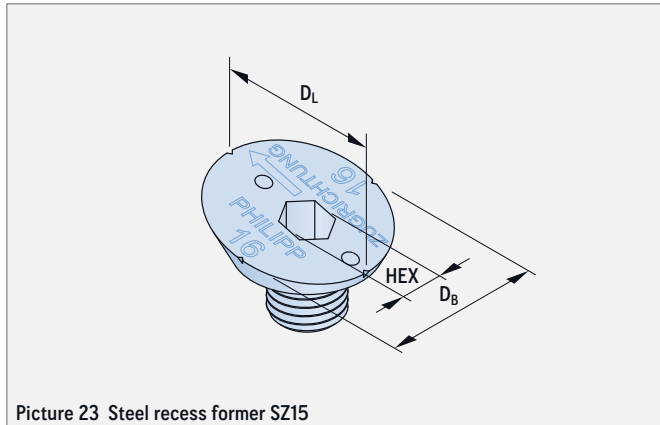
PHILIPP Nailing plate for diagonal tension system

RECESS FORMER SZ15

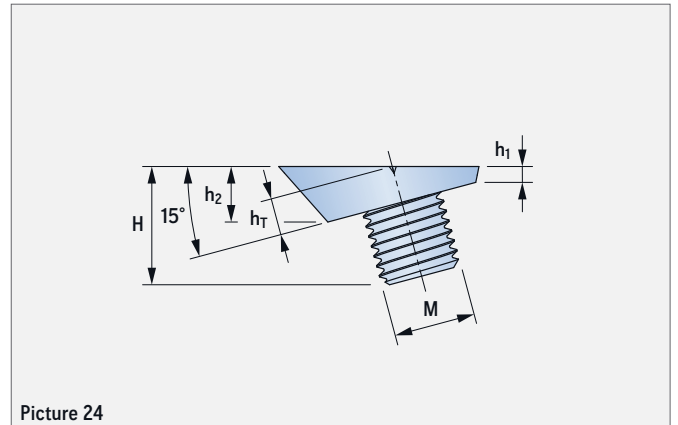
STEEL RECESS FORMER SZ15

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. Depen-

ding 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).



Picture 23 Steel recess former SZ15



Picture 24

TABLE 8: STEEL RECESS FORMER SZ15

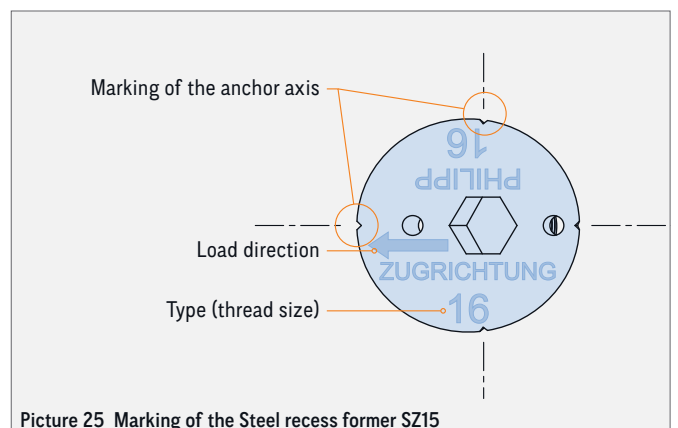
Ref. no.	Type RD / M	M	DL (mm)	DB (mm)	H (mm)	h1 (mm)	h2 (mm)	hT (mm)	HEX (mm)
72KHN16-SZ15ST	16	M 16	38.5	38.0	23.5	3.5	11.2	7.5	8
72KHN20-SZ15ST	20	M 20	55.5	55.0	30.5	3.3	15.0	9.5	10
72KHN24-SZ15ST	24	M 24	55.5	55.0	31.0	3.3	15.0	9.5	10
72KHN30-SZ15ST	30	M 30	72.5	72.0	38.0	3.2	18.7	11.5	10
72KHN36-SZ15ST	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 transport 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).



Picture 25 Marking of the Steel recess former SZ15

INSTALLATION OF THE SYSTEM

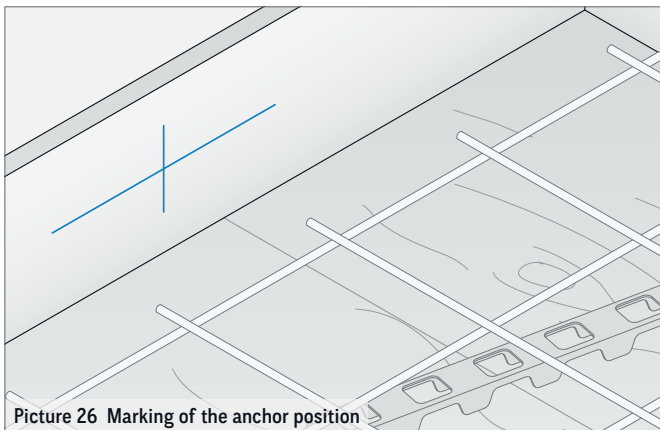
The recess former SZ15 is fixed to the formwork at the intended position with nails, screws or glue. Here, the marking of the tensile direction (later load direction of the anchors) has to be followed. This must point in the direction of the wall centre (centre of gravity, picture 27). For an exact positioning, the notches at the edge of the recess former are used (picture 28). 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 29). 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 8).

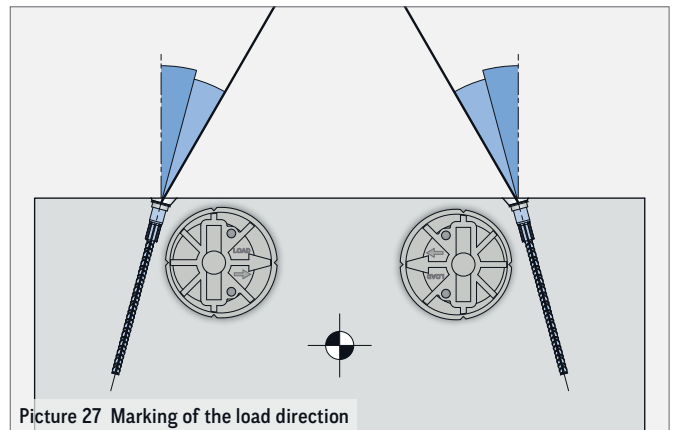


DIRT INSIGHT OF THE HEXAGON SOCKET

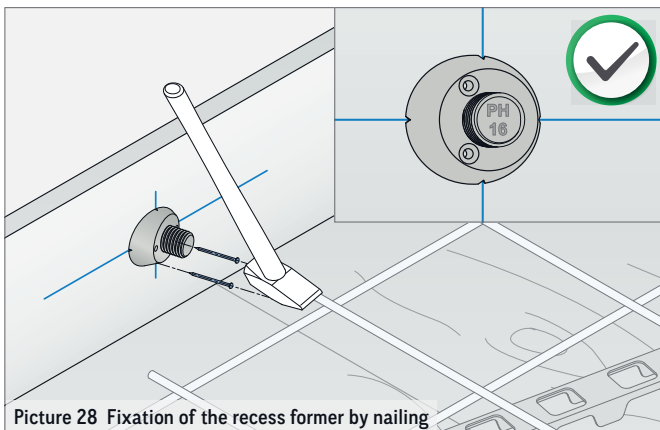
In order to avoid dirt insight of the hexagon socket (e.g. caused by cement slurry), it can be protected with adhesive tape.



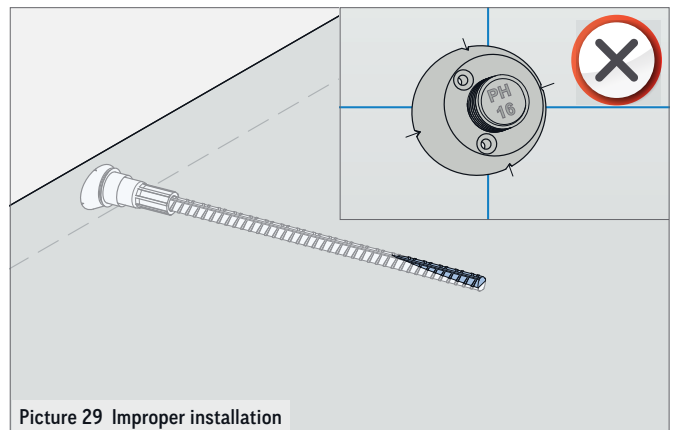
Picture 26 Marking of the anchor position



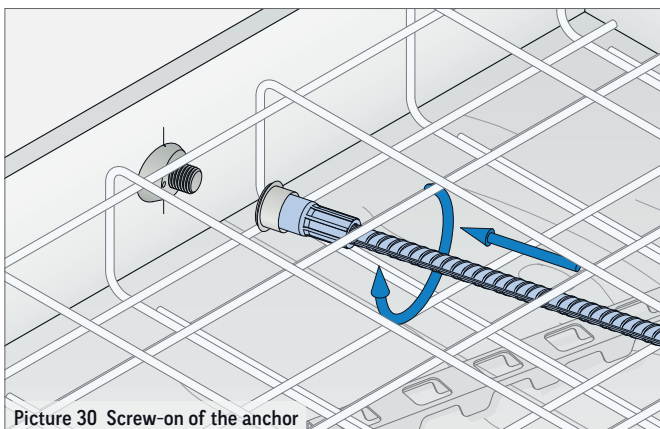
Picture 27 Marking of the load direction



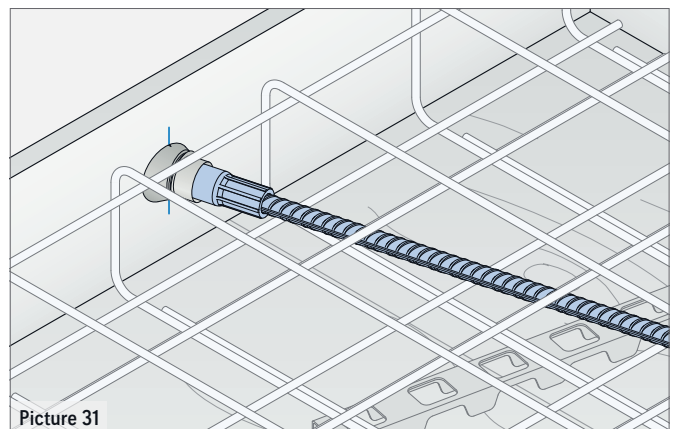
Picture 28 Fixation of the recess former by nailing



Picture 29 Improper installation



Picture 30 Screw-on of the anchor



Picture 31

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