PHILIPPGROUP

PHILIPP Nailing plate for diagonal tension system

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Installation and Application Instruction

Transport and mounting systems for prefabricated building

Technical department

Our staff will be pleased to support your planning phase with suggestions for the installation and use of our transport and mounting systems for precast concrete construction.

Special designs

Customized to your particular needs.

Practical tests on site

We ensure that our concepts are tailored precisely to your requirements.

Inspection reports

For documentation purposes and your safety.

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Our engineers will be pleased to instruct your technicians and production personnel at your plant, to advise on the installation of precast concrete parts and to assist you in the optimisation of your production processes.

High safety level when using our products

Close cooperation with federal materials testing institutes (MTIs), and official approvals for the use of our products and solutions whenever necessary.

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The latest design software, animated videos and CAD libraries can always be found under www.philipp-gruppe.de.

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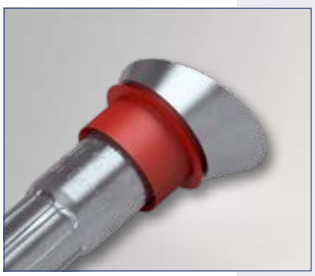
Content





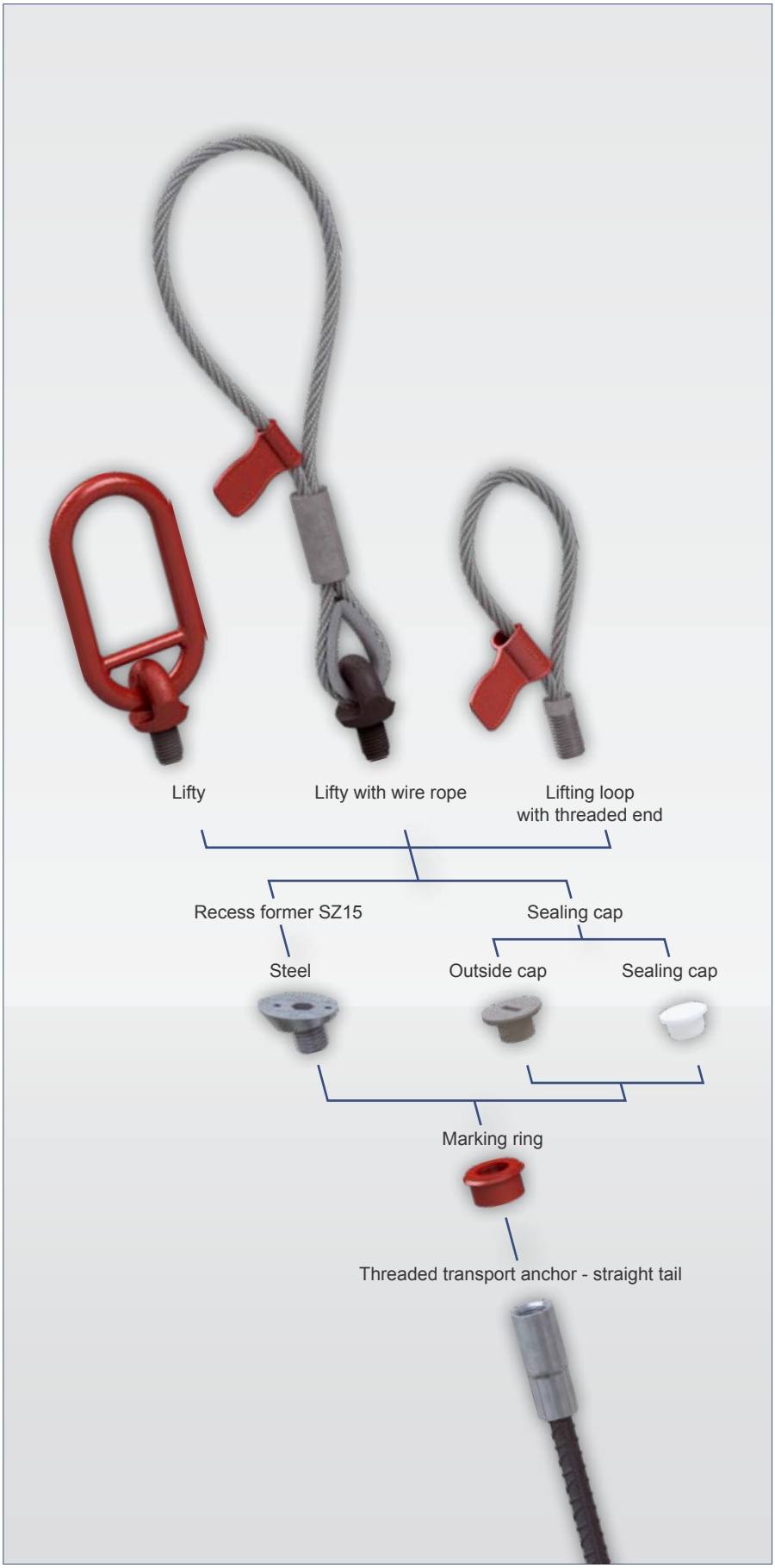

Nailing plate for diagonal tension system

By using the Steel recess former 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 β_{max} 30° without the installation of additional reinforcement.

Combinations:

- **Lifting devices**
  - Lifty
  - Lifty with wire rope
  - Lifting loop with threaded end
- **Recess former SZ15**
  - Steel recess former SZ15
- **Sealing cap (plastic)**
  - Outside cap (72ASS__)
  - Sealing cap (72KAS__)
- **Transport anchor**
  - Threaded transport anchor
    Version: straight tail

A combination of the recess former SZ15 for diagonal tension with other threaded anchors or lifting devices is not permissible.

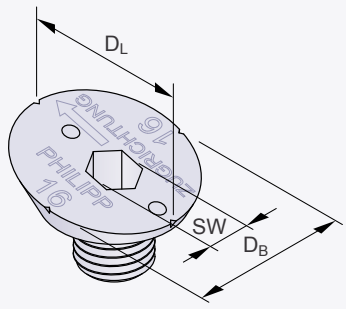


Recess former SZ15

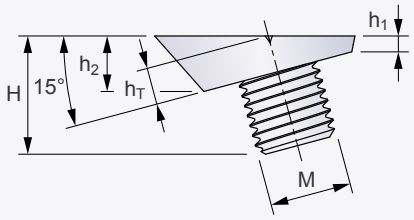
Steel recess former SZ15

By using the Steel recess former SZ15 Threaded transport anchors straight tail can be fixed with an anchor axis inclined by 15° to the formwork.

After demoulding, the steel recess former can be removed quickly and easily with an Allen key.



Picture 1



Picture 2

Table 1: Steel recess former SZ15

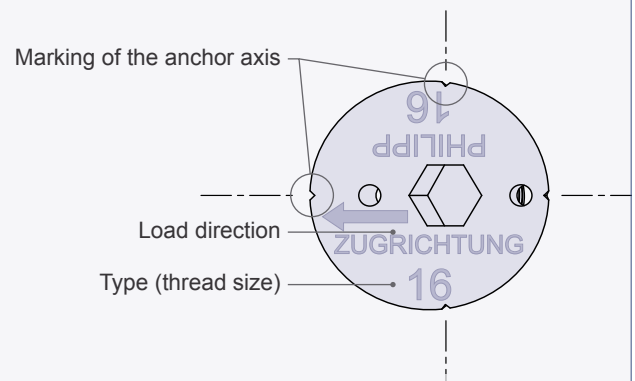
Ref.-no.	Type RD / M	M	D_L [mm]	D_B [mm]	H [mm]	h_1 [mm]	h_2 [mm]	h_T [mm]	SW [mm]	Weight [kg/100 pcs.]
72KHN16-SZ15	16	M 16	38.5	38.0	23.5	3.5	11.2	7.5	8	7.4
72KHN20-SZ15	20	M 20	55.5	55.0	30.5	3.3	15.0	9.5	10	19.3
72KHN24-SZ15	24	M 24	55.5	55.0	31.0	3.3	15.0	9.5	10	21.5
72KHN30-SZ15	30	M 30	72.5	72.0	38.0	3.2	18.7	11.5	10	44.3
72KHN36-SZ15	36	M36	72.5	72.0	39.0	3.2	18.7	11.5	10	50.3
72KHN42-SZ15	42	M 42	99.5	99.0	48.0	3.3	25.5	15.0	10	112.0
72KHN52-SZ15	52	M 52	99.5	99.0	50.0	3.3	25.5	15.0	10	129.3

Marking

For an easy assignment of the recess formers to the corresponding threaded anchors to be fixed, these are marked with the load class (thread size).

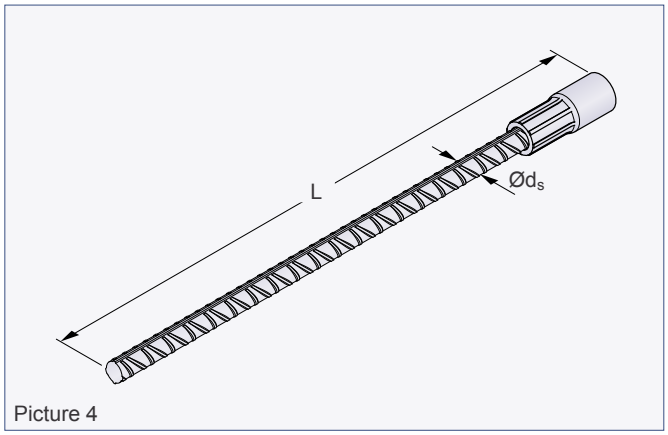
In order to position the recess formers quickly on the formwork, there are special notches on the edge of the plate which mark the anchor axis.

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

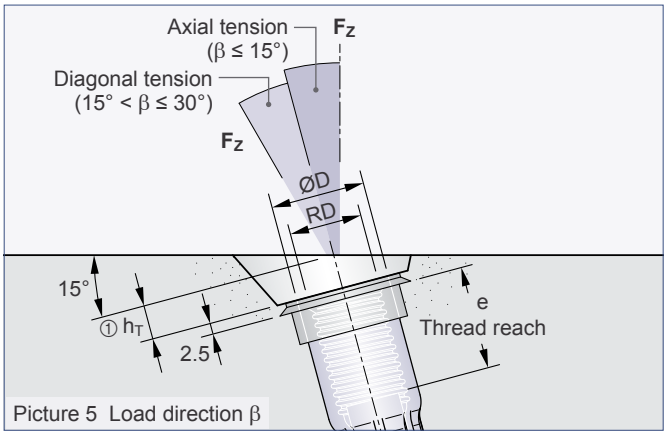


Picture 3 Marking of the Steel recess former SZ15

Threaded transport anchor - straight tail



Picture 4

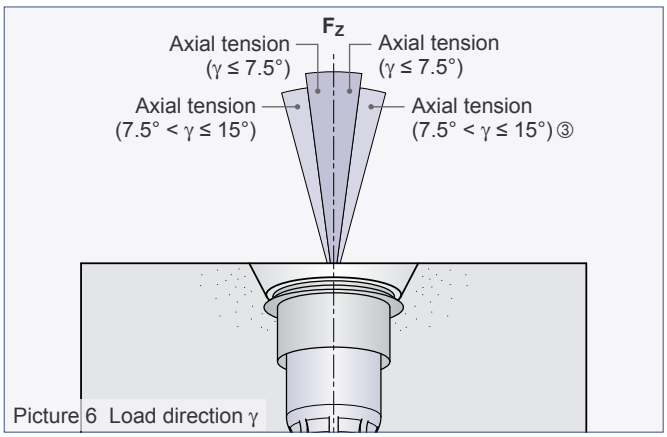


Picture 5 Load direction β

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 insert 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 and Lifting loop with threaded end) 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 threaded transport anchor is not specified for a repeated usage (e.g. ballasts for cranes) or a permanent fixation.



Picture 6 Load direction γ

③ 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.

Table 2: Threaded transport anchor - straight tail

Ref.-no. ② **galvanised**	Type	Dimensions RD	ØD [mm]	L [mm]	e [mm]	Ød$_s$ [mm]	Weight [kg/100 pcs.]
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 embedding depth h$_T$ of the recess former SZ15 (Picture 5, Table 1).
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 galvanised conforming to standards.

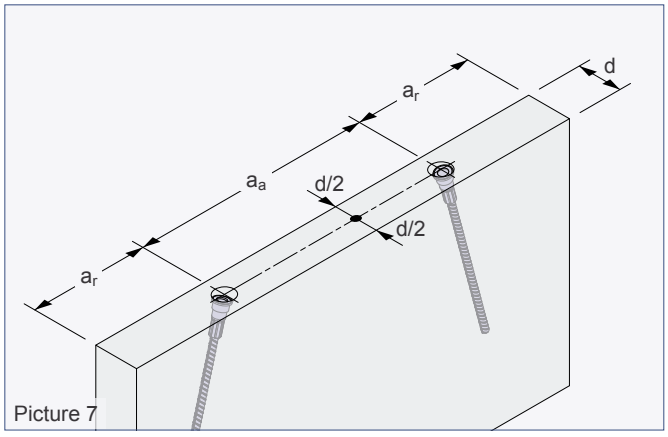
This galvanisation protects the anchor temporarily from the storage at the producer site to the final installation in the concrete element.

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 dimensions and centre/edge distances for a safe load transfer.



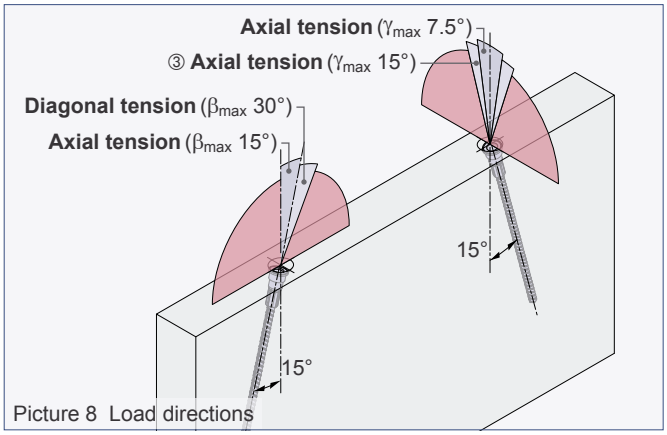
Picture 7

Concrete strength

At the time of the first lift the concrete must have a minimum strength f_{cc} acc. to table 3. 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 β_{max} 30° is possible**.** Basically, a lateral load on the anchors up to γ_{max} 7.5° during transport of the elements is allowed. If an element is produced on a tilting table an angle up to γ_{max} 15° is possible.



Picture 8 Load directions

③ Only possible when using a tilting table!

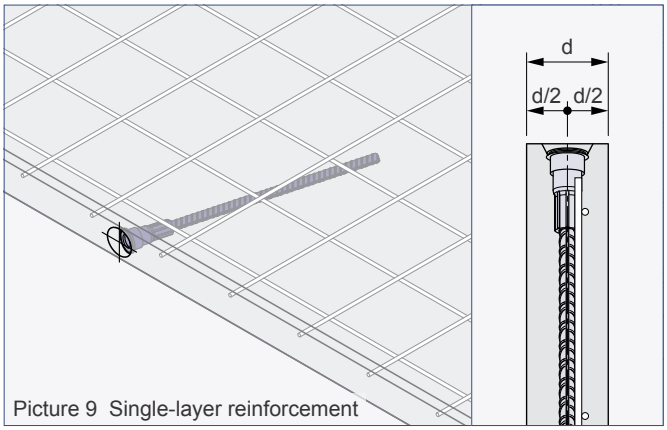
Minimum reinforcement

In use of Threaded transport anchors precast units must be reinforced with a minimum reinforcement according to table 3. 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

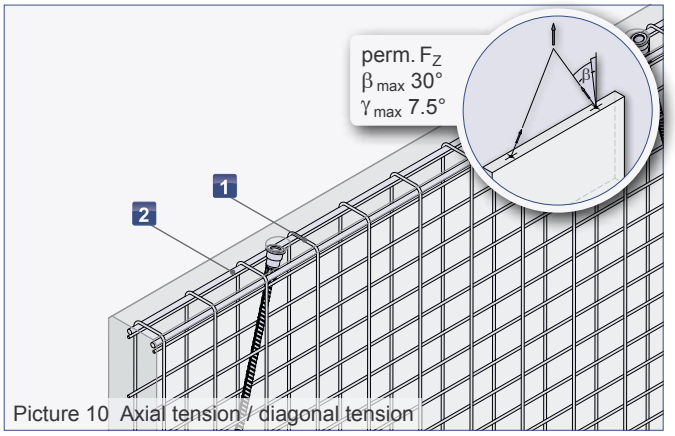
In order to ensure a central position of the anchor in the element, the mesh reinforcement has to be installed asymmetrically in the element in case of a single-layer reinforcement (see Picture 9).



Picture 9 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 $\beta > 30°$ an additional reinforcement according to Table 3 is required.



Picture 10 Axial tension / diagonal tension

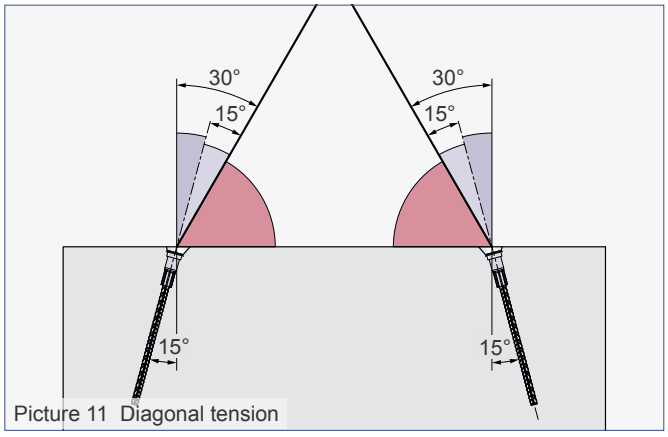
⚠ A lateral load on the anchors above γ_{max} 7.5° is not allowed during transport! If the element is produced on a tilt up table an angle up to γ_{max} 15° is possible.

Also a diagonal load direction with an angle β above 30° is not allowed!

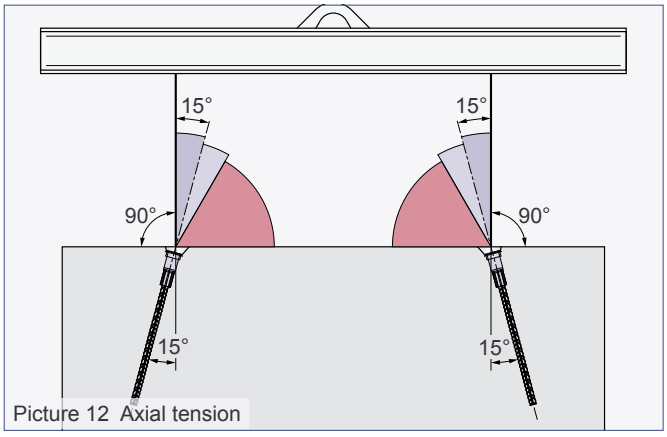
Table 3: Axial and diagonal tension

Load class	Element thicknesses, centre and edge distances			β_{max} 30° / γ_{max} 7.5° ③				1	2
				perm. F_Z $f_{cc} \geq 15$ N/mm²	perm. F_Z $f_{cc} \geq 17.5$ N/mm²	perm. F_Z $f_{cc} \geq 20$ N/mm²	perm. F_Z $f_{cc} \geq 22.5$ N/mm²	Mesh reinforcement (square)	Longitudinal reinforcement
	d [mm]	a_a [mm]	a_r [mm]	[kN]	[kN]	[kN]	[kN]	[mm²/m]	
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	-
42	140	1100	550	70.1	75.8	78.1	78.1	2 × #188 ④	-
				70.1	75.8	80.0	80.0	2 × #257 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 γ_{max} 15° is possible!
④ The reinforcement shall be in the form of a double-bended mesh reinforcement or with equivalent stirrups.



Picture 11 Diagonal tension



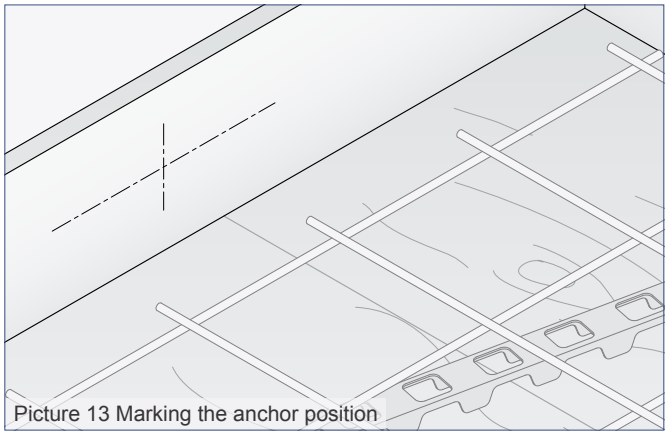
Picture 12 Axial tension

Installation of the system

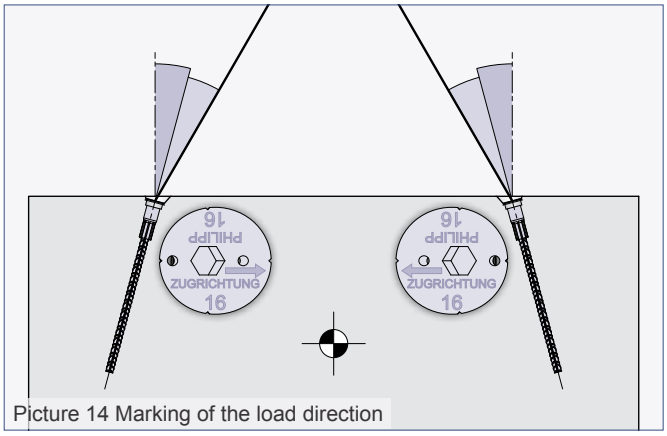
The Steel recess former SZ15 is fixed to the formwork at the intended position with nails. Here, the marking of the tensile direction (later load direction of the anchors) has to be followed. This must point in the direction of the wall centre (centre of gravity, Picture 14). For an exact positioning 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 16). 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 Steel recess former can be quickly and easily removed with an Allen key (see Table 1).

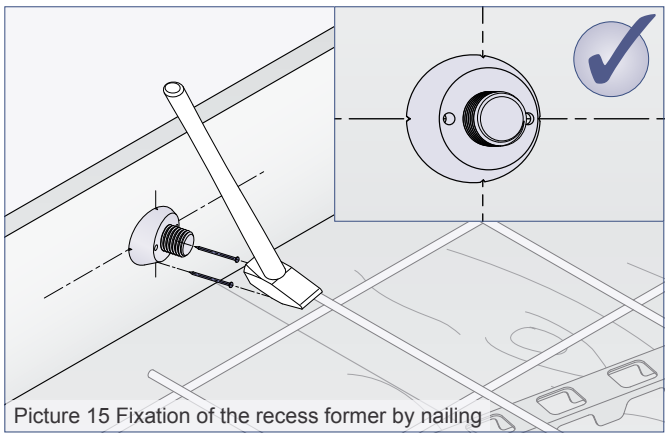
In order to avoid dirt insight of the hexagon socket (e.g. caused by cement slurry), it can be protected with adhesive tape.



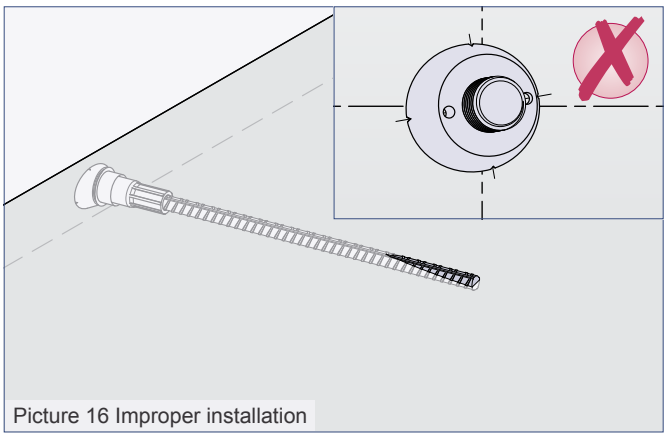
Picture 13 Marking the anchor position



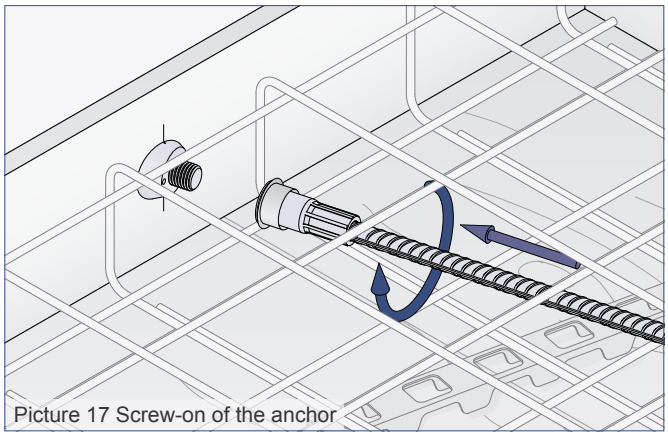
Picture 14 Marking of the load direction



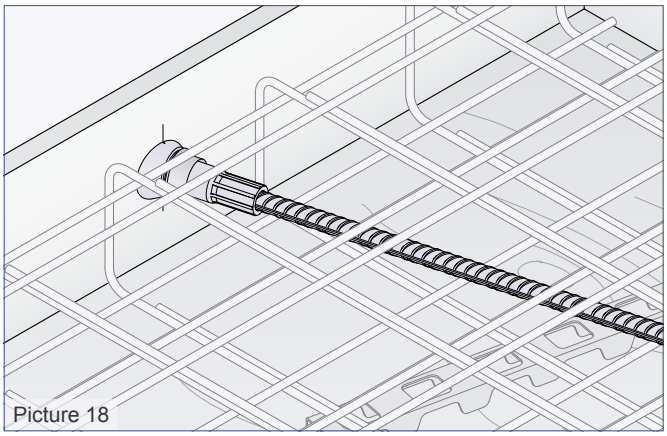
Picture 15 Fixation of the recess former by nailing



Picture 16 Improper installation



Picture 17 Screw-on of the anchor



Picture 18

Our customers trust us to deliver. We do everything in our power to reward their faith and we start each day intending to do better than the last. We provide strength and stability in an ever-changing world.

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Sustainable
solutions

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