

PHILIPP GROUP

PHILIPP Cast-in lifting hoop



VB3-T-040-en - 05/18

Type AS 0.8 - AS 25.0

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.

■ On-site service

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.

■ Software solutions

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

■ Engineering contact

Phone: +49 (0) 6021 / 40 27-318
Fax: +49 (0) 6021 / 40 27-340
E-mail: technik@philipp-gruppe.de

■ Sales contact

Phone: +49 (0) 6021 / 40 27-300
Fax: +49 (0) 6021 / 40 27-340
E-mail: vertrieb@philipp-gruppe.de



Content

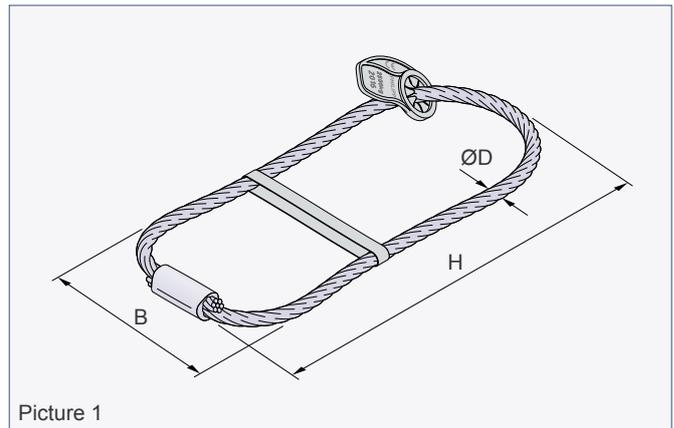
- Cast-in lifting hoop Page 4
 - Materials Page 5
 - Marking Page 5
 - Corrosion Page 5
 - Storage of the precast elements Page 5
 - Concrete Page 5
- Cast-in lifting hoops
in beams and concrete elements similar to walls Page 6
 - Element thicknesses, centre and edge distances Page 6
 - Permissible load directions Page 6
 - Reinforcement Page 7
- Cast-in lifting hoops in narrow beams Page 8
 - Element thicknesses, centre and edge distances Page 8
 - Permissible load directions Page 8
 - Reinforcement Page 9
- Safety / Application Page 10
 - Installation Page 10
 - Safety notices Page 10
 - Application instructions Page 10
 - Storage of the precast elements Page 11



PHILIPP Cast-in lifting hoop

The Cast-in lifting hoop is part of the PHILIPP Transport anchor system and complies with the VDI/BV-BS Guideline "Lifting anchors and lifting insert systems for precast concrete elements" (VDI/BV-BS 6205). The use of Cast-in lifting hoops require the compliance with this Installation and Application Instruction as well as the General Installation Instruction.

Cast-in lifting hoops 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. A repeated use (e.g. ballasts for cranes) is not allowed.



Picture 1

Table 1: Dimensions

Ref.-No. bright	Ref.-No.: galvanised	Type	Colour code	H ① [mm]	B ① [mm]	ØD ② [mm]	Weight [kg/100 pcs.]
-	442008	AS 0.8	Pure white	235	95	6.0	8.5
-	442012	AS 1.2	Flame red	235	95	7.0	11.0
-	442016	AS 1.6	Light pink	235	100	8.0	14.5
-	442020	AS 2.0	Pastel green	270	115	9.0	21.5
-	442025	AS 2.5	Jet black	310	135	10.0	30.5
441040	442040	AS 4.0	Emerald green	340	150	12.0	49.5
441052	442052	AS 5.2	Curry	365	165	14.0	72.5
441063	442063	AS 6.3	Light blue	380	180	16.0	99.5
441080	442080	AS 8.0	Silver grey	440	205	18.0	144.5
441100	442100	AS 10.0	Claret violet	515	245	20.0	208.0
441125	442125	AS 12.5	Sulfur yellow	570	270	22.0	279.5
441160	442160	AS 16.0	Blue lilac	605	286	24.0	394.5
441200	442200	AS 20.0	Beige	730	345	28.0	589.0
441250	442250	AS 25.0	Clay brown	780	375	32.0	826.0

① Dimensions H and B are standard values and can vary depending on the position of the fixation strap.

② Rope diameter ØD is a standard value and can vary depending on the wire rope construction.

Cast-in lifting hoops with higher safe working loads (from 280 kN up to 990 kN) are described in a separate data sheet. Depending on the individual application it might be necessary to contact our technical department before use.



For special solutions please contact our technical department under +49 (0) 60 21 / 40 27-318 or by e-mail to technik@philipp-group.de.

General information

Materials

The Cast-in lifting hoop consists of a steel wire rope both ends are bounded together by a ferrule and forms a hoop. They are available in bright (type 4.0 up to 25.0) and galvanized quality.

Marking

In order to identify the types of the Cast-in lifting hoop visually they are marked with a coloured tag. This tag must also be visible at the segment sticking out after concreting. With its fins the tag guarantees an easy fixing to this part of the Cast-in lifting hoop sticking out of the element.

Following data are given on the tag:

- Manufacturer (PHILIPP)
- CE mark ①
- Bearing capacity (e.g. 2500 kg)
- Year of manufacturing (e.g. 2016)
- Illustration of the installation dimensions



① The EC Declaration of Conformity (DoC) of the Cast-in lifting hoop is available on request or can be downloaded from our website www.philipp-group.de.



Corrosion

For concrete with an increased chlorine equivalent the use of a Cast-in lifting hoop with aluminium ferrule is not recommended. For this application a Cast-in lifting hoop with a steel ferrule is more suitable and can be delivered by PHILIPP on request.

An increased chlorine equivalent exists if the values given in the German standards EN 206-1 and DIN 1045-2 are exceeded.



The aluminium ferrule used with Cast-in lifting hoops must not be placed near-surface of the concrete element. The concrete cover for the ferrule has to be determined using following equation.

$$C_{\text{Ferrule}} \geq 1-2 * C_{\text{min}}$$

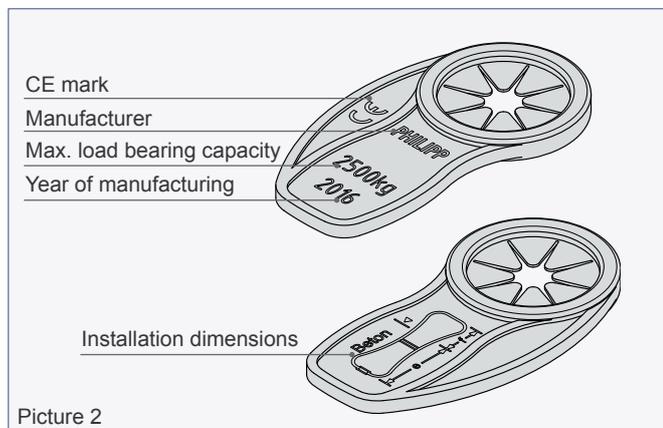
(EN 1992-1-1 part 4 a. Tab. 4.4N)
(EN 1992-1-1/NA Tab. NA.4.4)

Storage of Cast-in lifting hoops

Cast-in lifting hoops shall be stored in a clean, dry and aerated area, without contact to acids, bases or corrosive elements.

Concrete

All concrete strengths given in tables 2, 3 and 5 are cube strengths at the time of the first lifting.



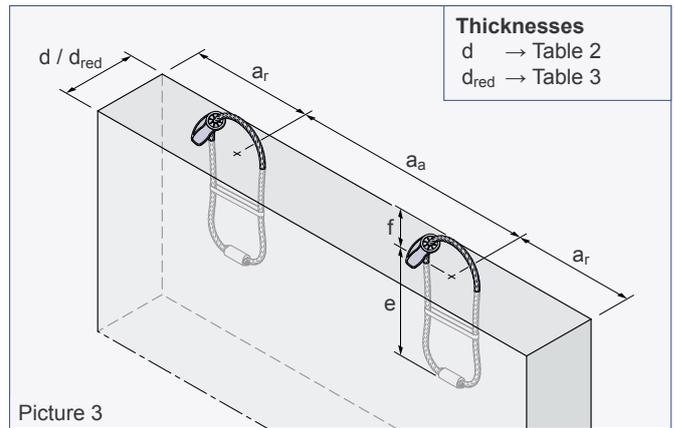
Picture 2

Cast-in lifting hoops in beams and concrete elements similar to walls

Element thicknesses, centre and edge distances

The installation and position of Cast-in lifting hoops in pre-cast concrete elements require minimum dimensions and centre/edge distances for a safe load transfer. Given unit thickness d in table 2 covers axial and diagonal loading. Reduced unit thicknesses d_{red} are valid for a concrete strength f_{cc} of **30 N/mm²** and higher.

When the Cast-in lifting hoop is installed it must be considered that the values e and f comply with table 2.



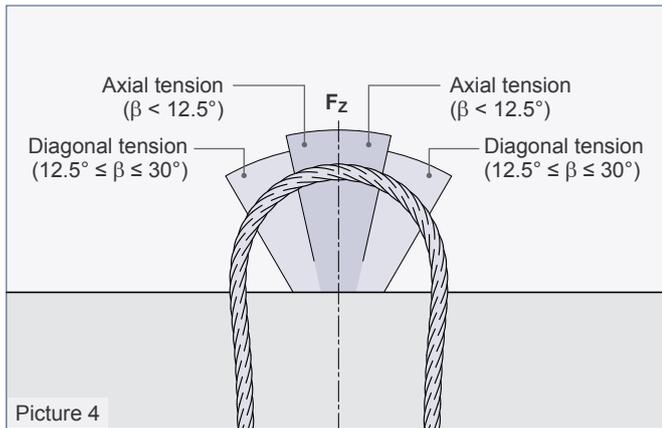
Picture 3

Permissible load directions

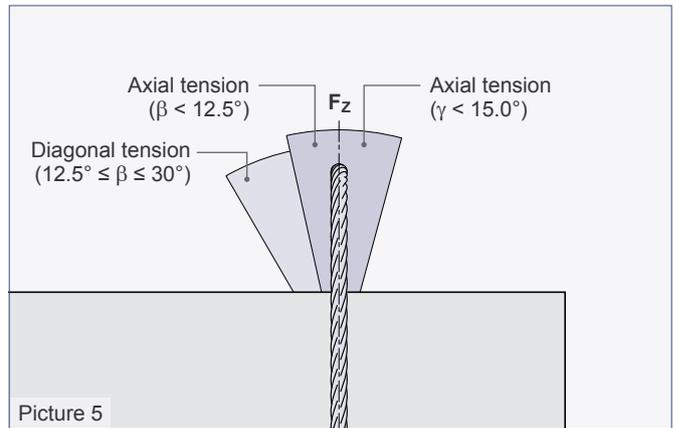
Cast-in lifting hoops can be used only for axial and diagonal tension $\beta \leq 30^\circ$.



Lateral tension is not allowed within the whole transport chain! This also applies to a diagonal tension with angle β more than 30° !



Picture 4



Picture 5

Table 2: Permissible load bearing capacities for thickness d for concrete strengths f_{cc} 15 / 20 / 25 N/mm²

Load class	Element thicknesses, centre and edge distances			Embedded depth		Perm. F					
						if f_{cc} 15 N/mm ²		if f_{cc} 20 N/mm ²		if f_{cc} 25 N/mm ²	
						Axial tension perm. F_z 0°- 12.5° [kN]	Diagonal tension perm. F_z 12.5°-30° [kN]	Axial tension perm. F_z 0°- 12.5° [kN]	Diagonal tension perm. F_z 12.5°-30° [kN]	Axial tension perm. F_z 0°- 12.5° [kN]	Diagonal tension perm. F_z 12.5°-30° [kN]
d [mm]	a_a [mm]	a_r [mm]	e [mm]	f [mm]							
0.8	80	600	300	150	85	8.0	8.0	8.0	8.0	8.0	8.0
1.2	90	640	320	160	75	12.0	11.8	12.0	12.0	12.0	12.0
1.6	100	660	330	165	70	13.2	11.8	15.3	12.4	16.0	13.8
2.0	110	800	400	200	70	15.9	12.9	18.4	14.9	20.0	16.6
2.5	120	920	460	230	80	21.2	18.6	24.4	21.5	25.0	24.1
4.0	200	960	480	240	100	32.9	26.6	38.0	30.8	40.0	34.4
5.2	250	1040	520	260	105	43.5	35.2	50.2	40.7	52.0	45.5
6.3	300	1120	560	280	100	62.0	51.0	63.0	58.9	63.0	63.0
8.0	380	1280	640	320	120	75.4	61.1	80.0	70.6	80.0	78.9
10.0	460	1560	780	390	125	100.0	81.6	100.0	94.2	100.0	100.0
12.5	560	1680	840	420	150	125.0	125.0	125.0	125.0	125.0	125.0
16.0	620	1800	900	450	155	149.4	125.0	160.0	139.7	160.0	156.2
20.0	680	2200	1100	550	180	178.0	144.2	200.0	166.5	200.0	186.2
25.0	750	2320	1160	580	200	223.8	228.1	250.0	250.0	250.0	250.0

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

- The weight of 1.0 t corresponds to 10.0 kN.

Cast-in lifting hoops in beams and concrete elements similar to walls

Table 3: Permissible bearings for thicknesses d_{red} for concrete strengths f_{cc} 30 / 35 / 45 N/mm²

Load class	Element thicknesses, centre and edge distances			Embedded depth		Perm. F					
						if f_{cc} 30 N/mm ²		if f_{cc} 35 N/mm ²		if f_{cc} 45 N/mm ²	
	d_{red} [mm]	a_a [mm]	a_r [mm]	e [mm]	f [mm]	Axial tension perm. F_z 0°- 12.5° [kN]	Diagonal tension perm. F_z 12.5°-30° [kN]	Axial tension perm. F_z 0°- 12.5° [kN]	Diagonal tension perm. F_z 12.5°-30° [kN]	Axial tension perm. F_z 0°- 12.5° [kN]	Diagonal tension perm. F_z 12.5°-30° [kN]
0.8	60	600	300	150	85	8.0	8.0	8.0	8.0	8.0	8.0
1.2	60	640	320	160	75	12.0	12.0	12.0	12.0	12.0	12.0
1.6	80	660	330	165	70	14.7	12.0	15.9	12.9	16.0	14.6
2.0	90	800	400	200	70	18.2	14.7	19.6	15.9	20.0	18.0
2.5	100	920	460	230	80	21.8	21.3	23.6	23.0	25.0	25.0
4.0	150	960	480	240	100	34.0	27.5	36.7	29.7	40.0	33.7
5.2	190	1040	520	260	105	45.4	36.8	49.0	39.7	52.0	45.0
6.3	220	1120	560	280	100	63.0	61.6	63.0	63.0	63.0	63.0
8.0	270	1280	640	320	120	72.6	61.6	78.4	63.5	80.0	72.0
10.0	330	1560	780	390	125	98.0	79.4	100.0	85.8	100.0	97.2
12.5	390	1680	840	420	150	125.0	125.0	125.0	125.0	125.0	125.0
16.0	430	1800	900	450	155	139.1	125.0	150.3	125.0	160.0	138.0
20.0	480	2200	1100	550	180	169.9	137.6	183.5	148.6	200.0	168.5
25.0	530	2320	1160	580	200	250.0	250.0	250.0	250.0	250.0	250.0

- To determine the correct type please refer also to our General Installation Instruction.
- The weight of 1.0 t corresponds to 10.0 kN.
- Permissible load bearing capacities for a concrete strength of f_{cc} 40 N/mm² can be interpolated.

Reinforcement

For the installation of Cast-in lifting hoops in elements similar to panels and beams a minimum reinforcement near surface acc. to table 4 is needed.

This minimum reinforcement can be replaced by comparable reinforcement bars. Should it be necessary to cut single bars for the installation of Cast-in lifting hoops these have to be replaced by bars of the same diameter, strength and enough lap length according to EC 2.

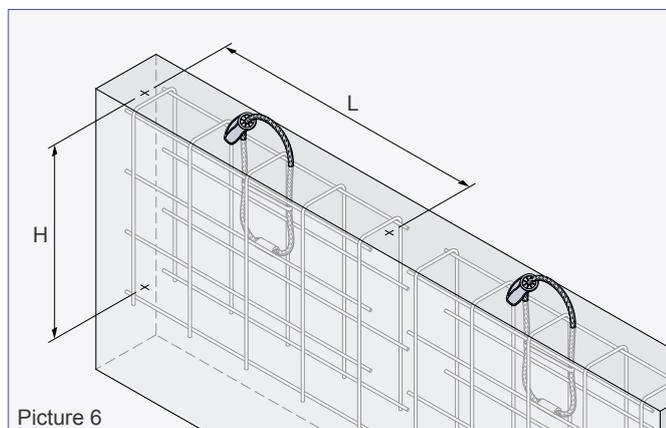
At the first time of lifting the concrete must have a minimum strength f_{cc} acc. to table 2 and table 3. The user is personally responsible for further transmission of load into the concrete unit.

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

Table 4: Minimum reinforcement near surface

Load class	Mesh reinforcement (square) [mm ² /m]	L [mm]	H ② [mm]
0.8	1 × 188 (in centre)	600	710
1.2	1 × 188 (in centre)	640	720
1.6	2 × 188	660	725
2.0	2 × 188	800	760
2.5	2 × 188	920	790
4.0	2 × 188 ①	960	800
5.2	2 × 188 ①	1040	820
6.3	2 × 188 ①	1120	840
8.0	2 × 188 ①	1280	880
10.0	2 × 188 ①	1560	950
12.5	2 × 257 ①	1680	1080
16.0	2 × 524 ①	1800	1390
20.0	2 × 524 ①	2200	1490
25.0	2 × 524 ①	2320	1520

- ① Mesh reinforcement must be done as a mesh cap.
- ② Required H at f_{cc} 15 N/mm². H can be reduced, if the required anchorage length of the reinforcement acc. to EC 2 will be chosen longer than the embedded depth e.



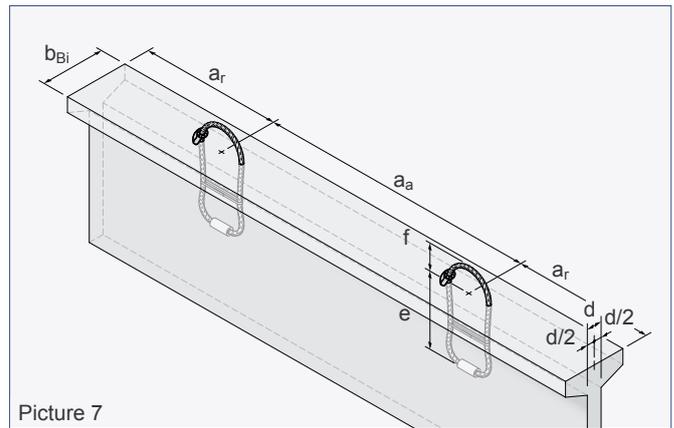
Picture 6

Cast-in lifting hoops for narrow beams

Element thicknesses, centre and edge distances

The installation and position of Cast-in lifting hoops in narrow beams require minimum dimensions and centre/edge distances for a safe load transfer. Thicknesses given in table 5 cover the axial and diagonal tension and can be used only for the parallel installation of Cast-in lifting hoops (Picture 7).

When installing the Cast-in lifting hoop it must be considered that the values e and f comply with table 5.



Picture 7

Table 5: Permissible load bearing capacities

Load class	Element thicknesses, centre and edge distances				Embedded depth		Perm. F	
	d [mm]	b_{Bi} [mm]	a_a [mm]	a_r [mm]	e [mm]	f [mm]	if f_{cc} 25 N/mm ² Axial tension / diagonal tension perm. F_z 0° - 30° [kN]	if f_{cc} 30 N/mm ² Axial tension / diagonal tension perm. F_z 0° - 30° [kN]
16.0	120	≥ 400	2000	1400	450	165	160.0	160.0
20.0	120	≥ 400	2000	1400	550	180	200.0	200.0
25.0	120	≥ 400	2000	1400	600	180	246.5	250.0

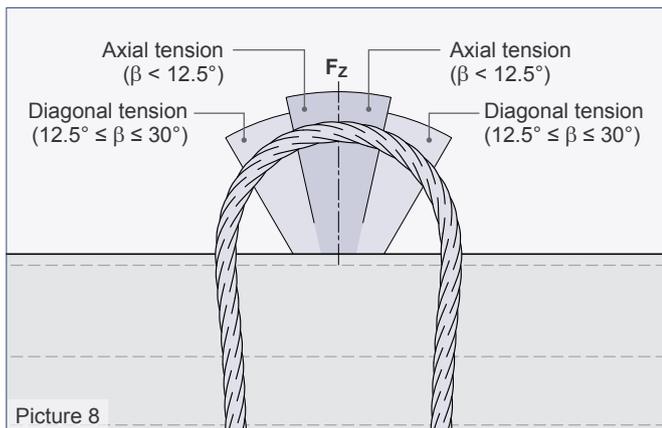
- To determine the correct type please refer also to our General Installation Instruction.
- The weight of 1.0 t corresponds to 10.0 kN.

Permissible load directions

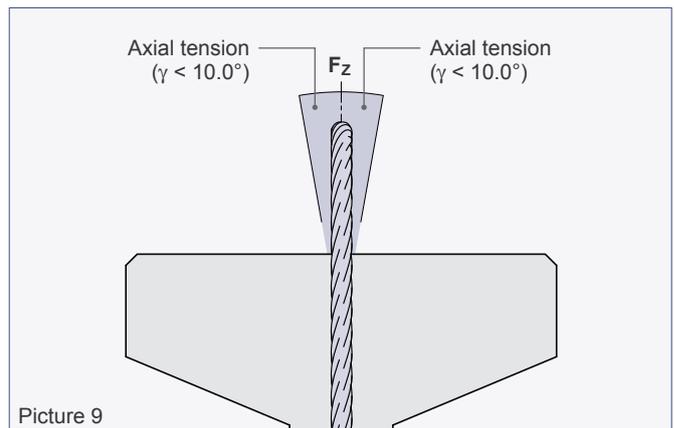
Cast-in lifting hoops can only be used for axial and diagonal tension up to 30°.



Lateral tension is not allowed within the whole transport chain! This also applies to a diagonal tension with angle β more than 30°!



Picture 8



Picture 9

Cast-in lifting hoops for narrow beams

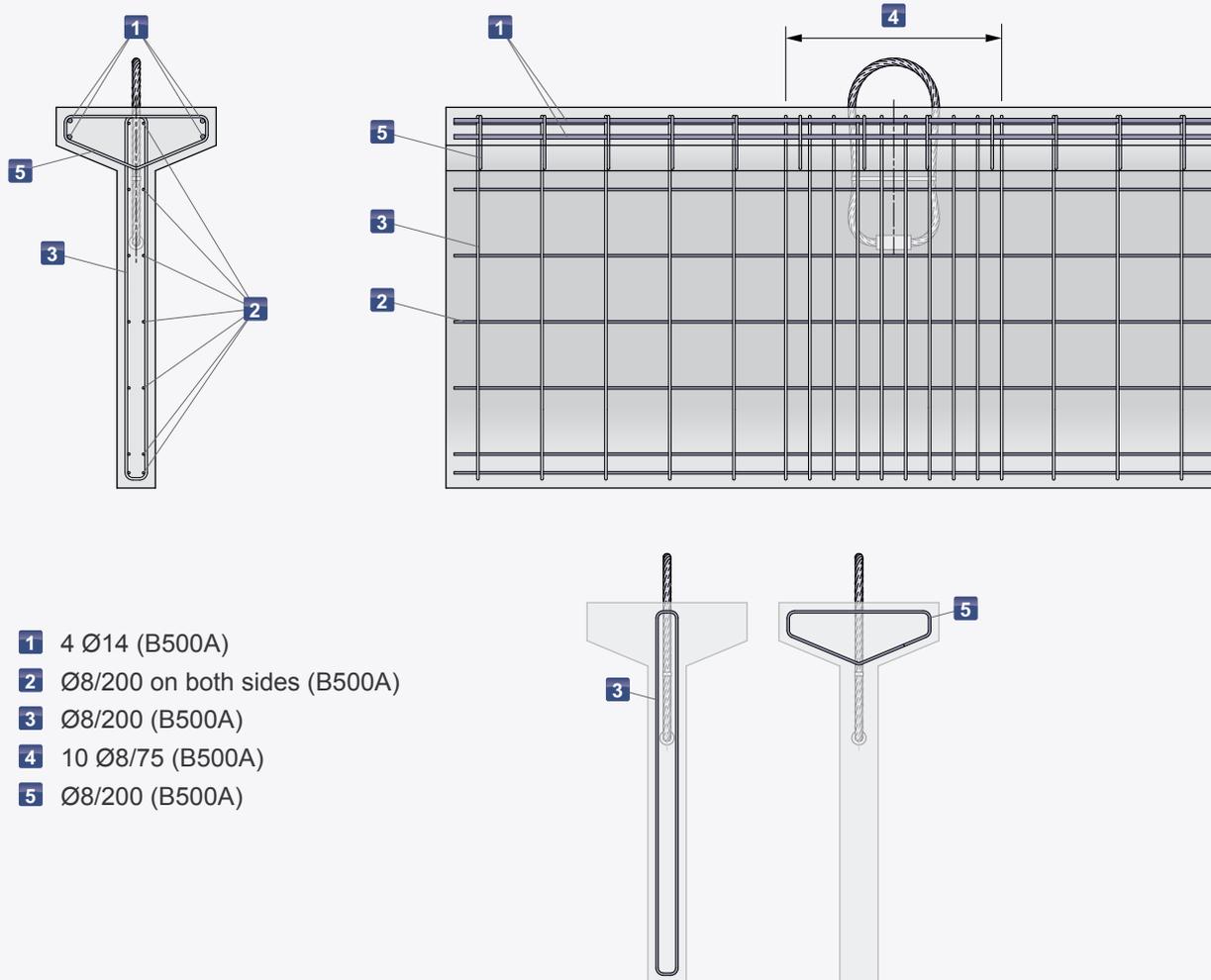
Reinforcement

For the installation of Cast-in lifting hoops in beams the pre-cast elements must be reinforced with a minimum reinforcement (Picture 10). Should it be necessary to cut single bars for the installation of Cast-in lifting hoops these have to be replaced by bars of the same diameter, strength and enough lap length according to EC 2. At the first time of lifting the concrete must have a minimum strength f_{cc} of **25 N/mm²**.

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 10.



Picture 10 Reinforcement

Installation / Safety

Installation

If Cast-in lifting hoops are installed in an open side of a mould (Picture 11) it must be fixed carefully to the reinforcement so that the embedded depth is guaranteed.

For the installation on a side of the mould a slot hole is needed (Picture 12). After installation of the Cast-in lifting hoop the slot hole must be closed accurately in order to avoid the Cast-in lifting hoop to be moved in a false position. In order to guarantee the position of the Cast-in lifting hoop during concreting and compacting it must be fixed to the reinforcement. It might be necessary to add some more steel bars to ensure the right position. Here attention has to be paid not to place those steel bars directly on the ferrule of the hoop.



Welding or other strong heat influences on the lifting hoops are not allowed.

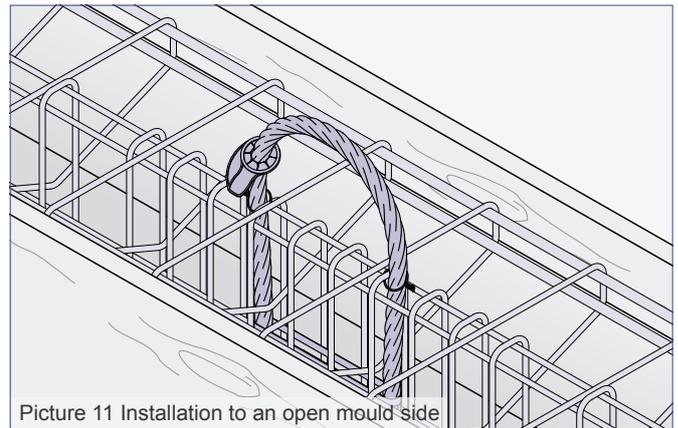
Safety notices

By using too small, too large or sharp-edged hooks the lifetime of the lifting device will be reduced. The transition radii of used hooks must be at least 1.75 times of the wire rope diameter of the Cast-in lifting hoop (Picture 13).

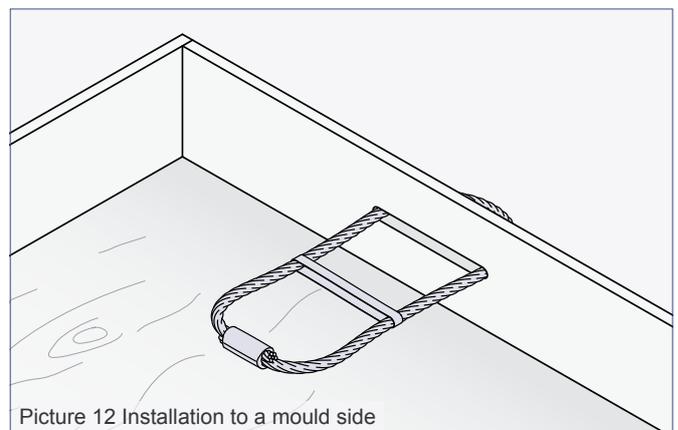
Using a shackle the pin must be at least 3.5 times of the wire rope diameter of the Cast-in lifting hoop (Picture 14).

During use of Cast-in lifting hoops the following must be considered:

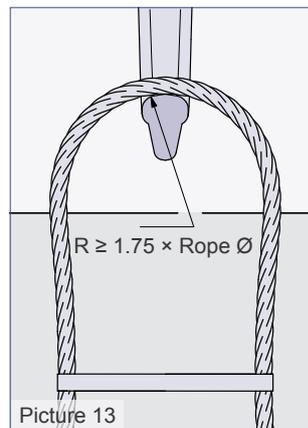
- The use of damaged Cast-in lifting hoops with broken strands, contusions, kinks and corrosion pits is not allowed.
- Contact of Cast-in lifting hoops with acids and alkalis must be avoided.
- Misuse of Cast-in lifting hoops because of wrong load directions must be also avoided.
- Lever arms caused by rotating, tilting and swinging which result in local blow-out failures in the concrete or broken wire ropes are inadmissible!



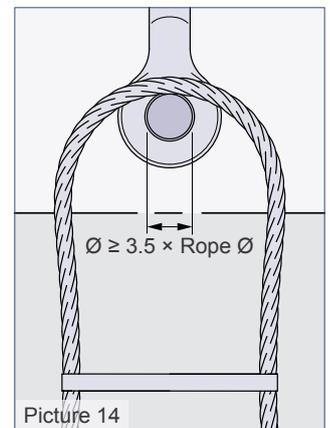
Picture 11 Installation to an open mould side



Picture 12 Installation to a mould side



Picture 13



Picture 14



In order to guarantee the correct transition radii we recommend to use our special Wire protection pulley. This is available in six dimensions for all our Cast-in lifting hoops from load class 0.8 up to 99.0. For more details please refer to the separate data sheet of the Wire protection pulley.



Safety

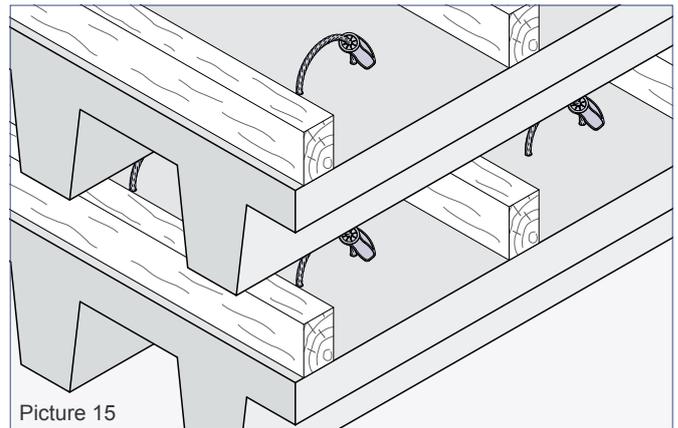
Storage of the precast units

During storage of the concrete units please make sure that the Cast-in lifting hoops are not bent in any way. This can be guaranteed by using a spacer (e.g. a squared timber) between the concrete elements.

An outdoor storage of the concrete units can lead to corrosion and as a result to a reduction of the bearing capacity.



If a significant corrosion appears to the installed Cast-in lifting hoops they cannot be used for lifting anymore.



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.

Welcome to the PHILIPP Group

Sustainable
solutions

PHILIPPGROUP



PHILIPP GmbH

Lilienthalstrasse 7-9
D-63741 Aschaffenburg
Phone: + 49 (0) 6021 / 40 27-0
Fax: + 49 (0) 6021 / 40 27-440
info@philipp-group.de

PHILIPP GmbH

Roßlauer Strasse 70
D-06869 Coswig/Anhalt
Phone: + 49 (0) 34903 / 6 94-0
Fax: + 49 (0) 34903 / 6 94-20
info@philipp-group.de

PHILIPP GmbH

Sperberweg 37
D-41468 Neuss
Phone: + 49 (0) 2131 / 3 59 18-0
Fax: + 49 (0) 2131 / 3 59 18-10
info@philipp-group.de

PHILIPP ACON Hydraulic GmbH

Hinter dem grünen Jäger 3
D-38836 Dardesheim
Phone: + 49 (0) 39422 / 95 68-0
Fax: + 49 (0) 39422 / 95 68-29
info@philipp-group.de



PHILIPP Vertriebs GmbH

Leogangerstraße 21
A-5760 Saalfelden / Salzburg
Phone + 43 (0) 6582 / 7 04 01
Fax + 43 (0) 6582 / 7 04 01 20
info@philipp-gruppe.at

For more information visit our website: www.philipp-group.de