

# Drop-in Anchor E / ES

Steel, zinc plated



**Drop-in Anchor E**



**Drop-in Anchor ES**



**Drop-in Anchor ES**

**Range of loading:** 1,2 kN - 28,6 kN

**Range of concrete quality:** C20/25 - C50/60

## Description

The Drop-in Anchor E/ES is approved for redundant fastening for non-structural applications in cracked and non-cracked concrete. The anchor sizes with an embedment of 30 mm deep are also approved as single anchor in non-cracked concrete. The Drop-in Anchors with an anchorage depth of 25 mm are, however, permitted in pre-stressed hollow core slabs.

The Drop-in Anchor E/ES is placed into the drill hole in pre-setting installation and expanded reliably by means of a manual or hammer drill setting tool. Using a detachable setting tool with a stop drill bit (ASW) allows for quick and efficient, high volume installations. Using the marking setting tool produces a visible marking on the anchors-leave which confirms the correct installation.

## Advantages

- Approved for use as multiple fixing in cracked and uncracked concrete
- Approved as multiple fixing in pre-stressed concrete slabs
- Approved for use as single fixing in non-cracked concrete (Anchorage depth  $\geq 30$  mm)
- Shallow drilling depth, thus low risk of hitting reinforcement strikes (Anchorage depth 25 mm)
- Quick, rational and efficient installation due to the detachable setting tool with a stop drill bit (ASW)
- Simple visual inspection with marking tool
- Many possible applications due to the use of standard metric screws and threaded rods
- FM approval for the installation of sprinkler systems (M10-M20)<sup>1)4)</sup>
- Suitable for the installation of sprinkler systems according to the requirements of damage prevention VDS, GmbH (M8-M16)<sup>2)</sup>
- Fire resistance tested in concrete C20/25 to C50/60



## Applications

Suspensions in the area of heating, sanitary and ventilation, anchoring with threaded rods and screws, flt steel, profiled steel.

<sup>1)</sup>Applies only to anchorage depths  $h_{ef} \geq 30$  mm

<sup>2)</sup>Not for applications in pre-stressed hollow core slabs

<sup>3)</sup>Only for multiple use for non-structural applications

<sup>4)</sup>Also applies to ES M10x25

**Drop-in Anchor E**

→ Steel, zinc plated

→ Approved for concrete

Description	Ref. No.	Drill hole Ø x depth mm	Thread Ø x length mm	Package content pcs.	Weight per package kg
E M 5 x 25 <sup>1)</sup>	05000101	8 x 25	M5 x 10	100	0,74
E M 6 x 30	05005101	8 x 30	M6 x 13	100	0,84
E M 8 x 30	05100101	10 x 30	M8 x 13	100	1,17
E M 8 x 40	05105101	10 x 40	M8 x 20	100	1,49
E M 10 x 40	05200101	12 x 40	M10 x 15	50	1,07
E M 12 x 50	05300101	15 x 50	M12 x 18	50	2,18
E M 12 x 80	05305101	15 x 80	M12 x 45	50	3,15
E M 16 x 65	05500101	20 x 65	M16 x 23	25	2,55
E M 16 x 80	05505101	20 x 80	M16 x 38	25	2,91
E M 20 x 80	05600101	25 x 80	M20 x 34	25	4,45

<sup>1)</sup>Not part of assessment

**Drop-in Anchor ES**

→ Steel, zinc plated/Approved for concrete

→ Lipped Drop-in for installations in a bottomless hole

Description	Ref. No.	Drill hole Ø x depth mm	Thread Ø x length mm	Package content pcs.	Weight per package kg
ES M 6x25	05025101	8 x 25	M6 x 12	100	0,74
ES M 8 x 25	05125101	10 x 25	M8 x 12	100	1,05
ES M 8 x 30	05150101	10 x 30	M8 x 13	100	1,15
ES M 8 x 40	05155101	10 x 40	M8 x 20	100	1,53
ES M 10 x 25	05225101	12 x 25	M10 x 12	50	0,80
ES M 10 x 30	05230101	12 x 30	M10 x 12	50	0,89
ES M 10 x 40	05250101	12 x 40	M10 x 15	50	1,10
ES M 12 x 25	05325101	15 x 25	M12 x 12	50	1,15
ES M 12 x 50	05350101	15 x 50	M12 x 18	50	2,15
ES M 16 x 65	05551101	20 x 65	M16 x 23	25	2,53

**Safety Setting Tool**

For Drop-in Anchor E and ES  
With hand guard



Description	Ref. No.	Weight per piece kg
E-MSH 6 x 25	09025801	0,42
E-MSH 8 x 25	09125801	0,42
E-MSH 8 x 30	09100801	0,42
E-MSH 8 x 40	09105801	0,38
E-MSH 10 x 25	09225801	0,50
E-MSH 10 x 30	09205801	0,50
E-MSH 10 x 40	09200801	0,45
E-MSH 12 x 25	09325801	0,45
E-MSH 12 x 50	09300801	0,47
E-MSH 12 x 80	09305801	0,51
E-MSH 16 x 65	09500801	0,50
E-MSH 16 x 80	09505801	0,55
E-MSH 20 x 80	09600801	0,62

**Standard Setting Tool**

For Drop-in Anchor E and ES



Description	Ref. No.	Weight per piece kg
E-SW 5 x 25	09000150	0,08
E-SW 6 x 25	09002150	0,09
E-SW 6 x 30	09005150	0,09
E-SW 8 x 25	09125150	0,14
E-SW 8 x 30	09100150	0,14
E-SW 8 x 40	09105150	0,14
E-SW 10 x 25	09225150	0,15
E-SW 10 x 30	09205150	0,15
E-SW 10 x 40	09200150	0,15
E-SW 12 x 25	09325150	0,24
E-SW 12 x 50	09300150	0,25
E-SW 12 x 80	09305150	0,22
E-SW 16 x 65	09500150	0,41
E-SW 16 x 80/DW 15	09505150	0,42
E-SW 20 x 80	09600150	0,68

**Plug-on setting tool with stop drill bit**

For Drop-in Anchor E and ES.



Description	Ref. No.	For Drop-in Anchor	Suitable stop drill bit	Package content pcs.	Weight per piece kg
E-ASW 6 x 25	09097101	ES M 6 x 25	BB 8 x 25	1	0,20
E-ASW 6 x 30	09098101	E/ES M 6 x 30	BB 8 x 30	1	0,20
E-ASW 8 x 25	09197101	ES M 8 x 25	BB 10 x 25	1	0,20
E-ASW 8 x 30	09198101	E/ES M 8 x 30	BB 10 x 30	1	0,20
E-ASW 8 x 40	09199101	E/ES M 8 x 40	BB 10 x 40	1	0,23
E-ASW 10 x 25	09297101	ES M 10 x 25	BB 12 x 25	1	0,21
E-ASW 10 x 30	09298101	E/ES M 10 x 30	BB 12 x 30	1	0,21
E-ASW 10 x 40	09299101	E/ES M 10 x 40	BB 12 x 40	1	0,24

**Stop drill bit**

For Drop-in Anchor E and ES.



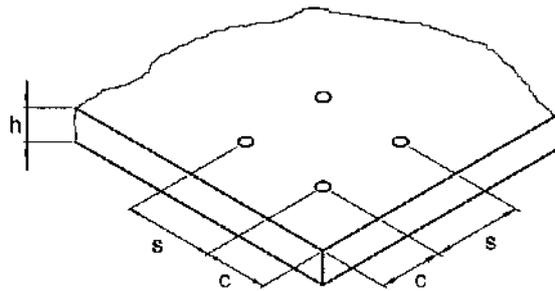
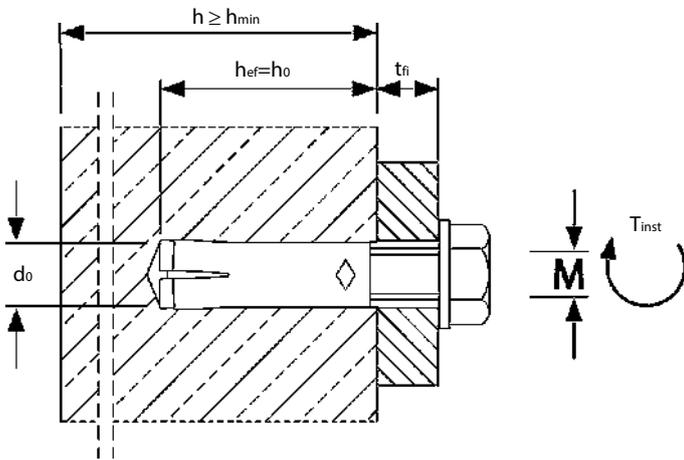
Description	Ref. No.	Drill hole Ø x depth [mm]	For Drop-in Anchor	Suitable for plug-on setting tool	Package content pcs.	Weight per piece kg
BB 8 x 25	50031001	8 x 25	ES M 6 x 25	E-ASW 6 x 25	1	0,11
BB 8 x 30	50031501	8 x 30	E/ES M 6 x 30	E-ASW 6 x 30	1	0,11
BB 10 x 25	50041001	10 x 25	ES M 8 x 25	E-ASW 8 x 25	1	0,11
BB 10 x 30	50041501	10 x 30	E/ES M 8 x 30	E-ASW 8 x 30	1	0,11
BB 10 x 40	50042001	10 x 40	E/ES M 8 x 40	E-ASW 8 x 40	1	0,12
BB 12 x 25	50051001	12 x 25	ES M 10 x 25	E-ASW 10 x 25	1	0,12
BB 12 x 30	50051501	12 x 30	E/ES M 10 x 30	E-ASW 10 x 30	1	0,12
BB 12 x 40	50052001	12 x 40	E/ES M 10 x 40	E-ASW 10 x 40	1	0,12
BB 15 x 25	50071001	15 x 25	ES M 12 x 25	-	1	0,15
BB 15 x 50	50072501	15 x 50	E/ES M 12 x 50	-	1	0,17

**SDS Setting Tool**

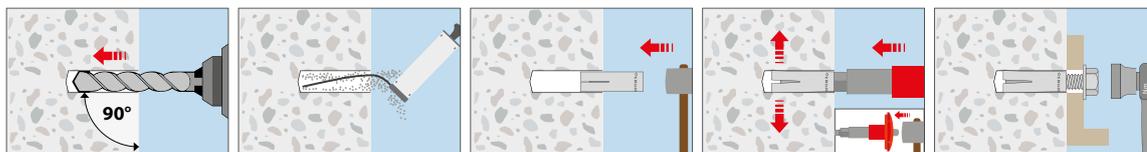
For Drop-in Anchor E and ES.  
With SDS plus connection.



Description	Ref. No.	Weight per piece kg
E-SW 6 x 25 SDS	09090101	0,07
E-SW 8 x 25 SDS	09185101	0,07
E-SW 8 x 30 SDS	09190101	0,07
E-SW 8 x 40 SDS	09195101	0,07
E-SW 10 x 25 SDS	09286101	0,08
E-SW 10 x 30 SDS	09288101	0,08
E-SW 10 x 40 SDS	09290101	0,08
E-SW 12 x 25 SDS	09395101	0,10
E-SW 12 x 50 SDS	09390101	0,10



**Installation**





### Extract from Permissible Service Conditions of European Technical Assessment ETA-02/0020

Approved loads for single anchor without influence of spacing and edge distance. Total safety factor as per ETAG 001 included ( $\gamma_M$  and  $\gamma_P$ ). Load capacities under fire exposure see page 166.

Loads and performance data	Drop-in Anchor E/ES		M5x25 <sup>1,2)</sup>	M6x30 <sup>1)</sup>	M8x30 <sup>1)</sup>	M8x40	M10x30 <sup>1)</sup>	M10x40	M12x50 M12x80	M16x65 M16x80	M20x80
			non-cracked concrete								
Mean ultimate loads, tension (Screw 8.8)	C25/30 Num	[kN]	8,0	10,0	11,5	13,5	15,6	16,9	24,1	36,4	50,5
Mean ultimate loads, shear (Screw 8.8)	C25/30 Vum	[kN]	5,7	6,9	11,1	11,1	13,5	13,5	29,5	50,4	76,4
Approved loads, tension (Screw 5.6 to 8.8)	C20/25 appr. N	[kN]	1,4	3,3	3,3	3,6	3,3	5,1	7,1	10,5	14,3
	C25/30 appr. N	[kN]	1,5	3,6	3,6	3,8	3,6	5,6	7,8	11,5	15,7
	C30/37 appr. N	[kN]	1,7	3,6	4,0	4,0	4,0	6,2	8,6	12,8	17,4
	C40/50 appr. N	[kN]	1,9	3,6	4,7	4,4	4,7	7,2	10,0	14,9	20,3
	C50/60 appr. N	[kN]	2,1	3,6	5,1	4,6	5,1	7,9	11,0	16,3	22,2
Approved loads, shear (Screw 5.6)	≥ C20/25 appr. V	[kN]	1,5	2,1	3,9	3,9	4,0	4,1	9,0	16,8	26,2
Approved loads, shear (Screw 5.8)	≥ C20/25 appr. V	[kN]	2,0	2,9	3,9	3,9	4,0	4,1	11,1	18,0	28,6
Approved loads, shear (Screw 8.8)	≥ C20/25 appr. V	[kN]	2,0	2,9	3,9	3,9	4,0	4,1	11,1	18,0	28,6
Approved bending moments (Screw 5.6)	appr. M	[Nm]	-	3,3	8,1	8,1	15,8	15,8	27,8	71,0	138,6
Approved bending moments (Screw 5.8)	appr. M	[Nm]	-	4,3	10,9	10,9	21,1	21,1	37,1	94,9	185,1
Approved bending moments (Screw 8.8)	appr. M	[Nm]	-	6,9	17,1	17,1	33,7	34,3	60,0	152,0	296,6
<b>Spacing and edge distance</b>											
Effective anchorage depth	h <sub>ef</sub>	[mm]	25	30	30	40	30	40	50	65	80
Characteristic spacing	s <sub>cr, N</sub>	[mm]	75	90	90	120	90	120	150	195	240
Characteristic edge distance	c <sub>cr, N</sub>	[mm]	37,5	45	45	60	45	60	75	97,5	120
Minimum spacing	s <sub>min</sub>	[mm]	60	55	60	80	100	100	120	150	160
Minimum edge distance	c <sub>min</sub>	[mm]	95	95	95	95	115	135	165	200	260
Minimum thickness of concrete slab	h <sub>min</sub>	[mm]	100	100	100	100	120	120	130	160	200
<b>Installation parameters</b>											
Drill hole diameter	d <sub>o</sub>	[mm]	8	8	10	10	12	12	15	20	25
Diameter of clearance hole in the fixture	d <sub>f</sub>	[mm]	6	7	9	9	12	12	14	18	22
Depth of drill hole	h <sub>o</sub>	[mm]	25	30	30	40	30	40	50/80 <sup>3)</sup>	65/80 <sup>4)</sup>	80
Installation torque	T <sub>inst ≤</sub>	[Nm]	3	4	8	8	15	15	35	60	120
Minimum screwing depth	L <sub>sd</sub>	[mm]	6	7	9	9	10	11	13	18	22
Maximum screwing depth	L <sub>th</sub>	[mm]	10	13	13	20	12	15	18/45 <sup>3)</sup>	23/38 <sup>4)</sup>	34

<sup>1)</sup> Valid only for statically indeterminate systems.

<sup>2)</sup> Not part of assessment.

<sup>3)</sup> E/ES M12x50 / E M12x80

<sup>4)</sup> E M16x55 / E M16x80



### Extract from Permissible Service Conditions of European Technical Assessment ETA-05/0116

Multiple use for non-structural applications. Total safety factor as per ETAG 001 included ( $\gamma_M$  and  $\gamma_P$ ). The maximum load per fixing point for multiple use for non-structural applications may, depending on national regulations, are below the approved load of the anchor. The approved loads per fixing point are regulated for their respective countries in the ETAG 001, Part 6.

Loads and performance data	Drop-in Anchor E/ES		M6x25	M6x30	M8x25	M8x30	M8x40	M10x25	M10x30	M10x40	M12x25	M12x50	M16x65	
			cracked and non-cracked concrete											
Approved loads (C12/15 and C16/20)	appr. F	[kN]	1,2	-	1,2	-	-	1,7	-	-	1,7	-	-	
Approved loads (C20/25 to C50/60)	appr. F	[kN]	1,7	1,2	1,9	1,7	2,0	2,1	2,0	2,0	2,1	2,4	6,3	
Approved bending moments (Screw 4.6)	appr. M	[Nm]	2,6	2,6	6,4	6,4	6,4	12,8	12,8	12,8	22,2	22,2	56,9	
Approved bending moments (Screw 5.6)	appr. M	[Nm]	3,3	3,3	8,1	8,1	8,1	15,8	15,8	15,8	27,8	27,8	71,0	
Approved bending moments (Screw 5.8)	appr. M	[Nm]	4,3	4,3	10,9	10,9	10,9	21,1	21,1	21,1	37,1	37,1	94,9	
Approved bending moments (Screw 8.8)	appr. M	[Nm]	6,9	6,9	17,1	17,1	17,1	34,3	33,7	34,3	60,0	60,0	152,0	
<b>Spacing and edge distance</b>														
Effective anchorage depth	h <sub>ef</sub>	[mm]	25	30	25	30	40	25	30	40	25	50	65	
Characteristic spacing	s <sub>cr</sub>	[mm]	75	130	75	180	210	75	230	170	75	170	400	
Characteristic edge distance	c <sub>cr</sub>	[mm]	38	65	38	90	105	38	115	85	38	85	200	
Minimum spacing <sup>1)</sup>	s <sub>min</sub>	[mm]	30	55	50	60	80	60	100	100	100	120	150	
Minimum edge distance <sup>1)</sup>	c <sub>min</sub>	[mm]	60	95	100	95	95	100	115	135	110	165	200	
Standard/Minimum thickness of concrete slab	h <sub>min 2</sub> / h <sub>min 1</sub>	[mm]	100/80	100	100/80	100	100	100/80	120	120	100/80	130	160	
<b>Installation parameters</b>														
Drill hole diameter	d <sub>o</sub>	[mm]	8	8	10	10	10	12	12	12	15	15	20	
Diameter of clearance hole in the fixture	d <sub>f</sub>	[mm]	7	7	9	9	9	12	12	12	14	14	18	
Depth of drill hole	h <sub>o</sub>	[mm]	25	30	25	30	40	25	30	40	25	50	65	
Installation torque	T <sub>inst ≤</sub>	[Nm]	4	4	8	8	8	15	15	15	35	35	60	
Minimum screwing depth <sup>1)</sup>	L <sub>sd</sub>	[mm]	6	7	8	9	9	10	10	11	12	13	18	
Maximum screwing depth <sup>1)</sup>	L <sub>th</sub>	[mm]	12	13	12	13	20	12	12	15	12	18	23	
<b>Loads under fire exposure (C20/25 to C50/60)</b>														
(for screw ≥ 4.8)	Approved loads R30	appr. F	[kN]	0,4	0,4	0,6	0,9	1,1	0,6	0,9	1,5	0,6	1,5	4,0
	Approved loads R60	appr. F	[kN]	0,35	0,35	0,6	0,9	0,9	0,6	0,9	1,5	0,6	1,5	4,0
	Approved loads R90	appr. F	[kN]	0,3	0,3	0,6	0,6	0,6	0,6	0,9	1,1	0,6	1,5	3,0
	Approved loads R120	appr. F	[kN]	0,25	0,3	0,5	0,5	0,5	0,5	0,7	0,9	0,5	1,2	2,4
(for screw ≥ 5.6)	Approved loads R30	appr. F	[kN]	0,4	0,8	0,6	0,9	1,5	0,6	0,9	1,5	0,6	1,5	4,0
	Approved loads R60	appr. F	[kN]	0,35	0,8	0,6	0,9	1,5	0,6	0,9	1,5	0,6	1,5	4,0
	Approved loads R90	appr. F	[kN]	0,3	0,4	0,6	0,9	0,9	0,6	0,9	1,5	0,6	1,5	3,7
	Approved loads R120	appr. F	[kN]	0,25	0,3	0,5	0,5	0,5	0,5	0,7	1,0	0,5	1,2	2,4
Characteristic spacing	s <sub>cr, fi</sub>	[mm]	100	130	100	180	210	100	170	170	100	200	400	
Characteristic edge distance	c <sub>cr, fi</sub>	[mm]	50	65	50	90	105	50	85	85	50	100	200	

For anchor designing, an easy to operate software on CD-ROM is available on request or can be downloaded at [www.mkt.de](http://www.mkt.de).

<sup>1)</sup>Data for minimum thickness of concrete see ETA-05/0116



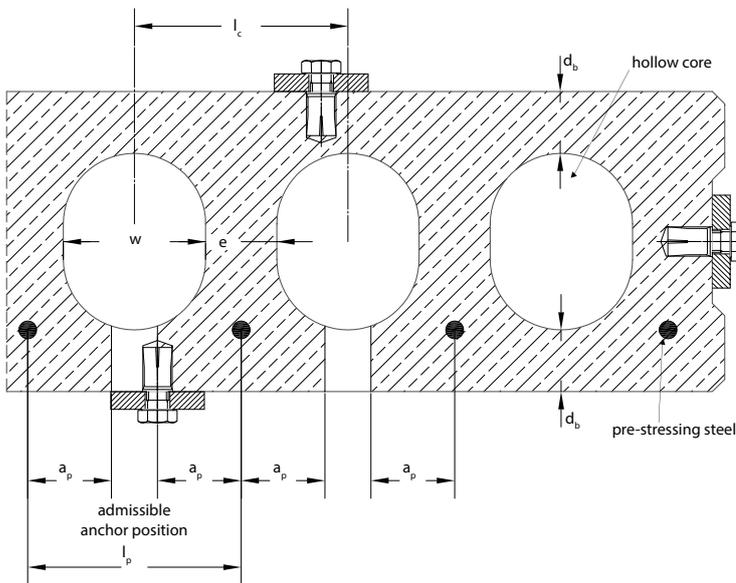
**Extract from Permissible Service Conditions of European Technical Assessment ETA-05/0116**

Multiple use for non-structural applications. Total safety factor as per ETAG 001 included ( $\gamma_M$  and  $\gamma_P$ ). The maximum load per fixing point for multiple use for non-structural applications may, depending on national regulations, are below the approved load of the anchor. The approved loads per fixing point are regulated for their respective countries in the ETAG 001, Part 6.

Loads and performance data	Drop-in Anchor ES	M6 x 25	M8 x 25	M10 x 25	M12 x 25	
Precast pre-stressed hollow core slabs C30/37 to C50/60						
Flange thickness	$d_b \geq$	[mm]	35 (30 <sup>1)</sup> )			
Approved loads	$F_{appr.}$	[kN]	1,7	1,9	2,1	2,1
Approved bending moments (Steel 4.6)	$appr. M$	[Nm]	2,6	6,4	12,8	22,2
Approved bending moments (Steel 4.8)	$appr. M$	[Nm]	3,5	8,6	17,1	29,7
Approved bending moments (Steel 5.6)	$appr. M$	[Nm]	3,3	8,1	15,8	27,8
Approved bending moments (Steel 5.8)	$appr. M$	[Nm]	4,3	10,9	21,1	37,1
Approved bending moments (Steel 8.8)	$appr. M$	[Nm]	6,9	17,1	34,3	60,0
<b>Spacing and edge distance</b>						
Spacing distance	$S_{cr} = S_{min}$	[mm]	200			
Edge distance	$C_{cr} = C_{min}$	[mm]	150			
<b>Installation parameters</b>						
Drill hole diameter	$d_o$	[mm]	8	10	12	15
Diameter of clearance hole in the flange	$d_f$	[mm]	7	9	12	14
Depth of drill hole	$h_0 \geq$	[mm]	25	25	25	25
Installation torque	$T_{inst} \leq$	[Nm]	4	8	15	35

<sup>1)</sup>Drill hole must not cut hollow core

**Admissible anchor positions in precast pre-stressed hollow core slabs**



$w / e \leq 4,2$

w hollow core width

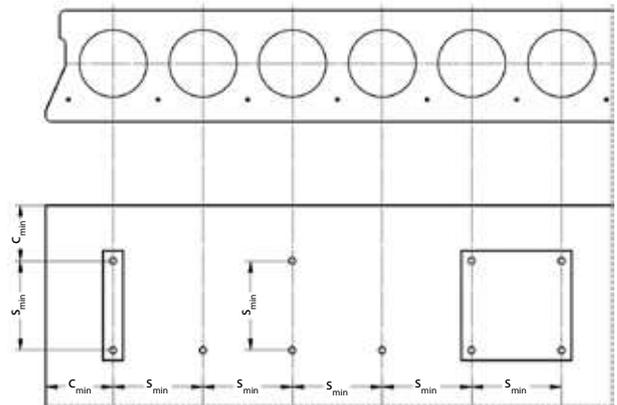
e web thickness

Core distance  $l_c \geq 100$  mm

Pre-stressing steel distance  $l_p \geq 100$  mm

Distance between anchor position and pre-stressing steel  $a_p \geq 50$  mm

**Minimum spacing and edge distance in precast pre-stressed hollow core slabs**



Minimum edge distance  $C_{min} \geq 150$  mm

Minimum spacing  $S_{min} \geq 200$  mm

**Installation**

