

SUORITUSTASOILMOITUS

DoP Nro: **MKT-1.2-100**_fi

- ◇ **Tuotetyypin yksilöllinen tunniste:** **MKT Lyöntiankkuri E/ES**
- ◇ **Aiottu käyttötarkoitus (aiotut käyttötarkoitukset):** Polkuohjattu laajeneva ankkuri käytettäväksi rakenteellisten järjestelmien moninkertaisena kiinnityksenä betoniin, katso liite / Annex B
- ◇ **Valmistaja:** MKT Metall-Kunststoff-Technik GmbH & Co.KG
Auf dem Immel 2
67685 Weilerbach
- ◇ **Suoritustason pysyvyyden arvioinnissa ja varmentamisessa käytetty järjestelmä/käytetyt järjestelmät:** 2+
- ◇ **Eurooppalainen arviointiasiakirja:** **ETAG 001-6**
Eurooppalainen tekninen arviointi: **ETA-05/0116, 04.01.2017**
Teknisestä arvioinnista vastaava laitos: DIBt, Berlin
Ilmoitettu laitos/ilmoitetut laitokset: NB 2873 – Technische Universität Darmstadt

◇ **Ilmoitettu suoritustaso/ilmoitetut suoritustasot:**

Olennaiset ominaisuudet	Suoritustaso
Paloturvallisuus (BWR 2)	
Palokäyttäytyminen	Luokka A1
Palonkestävyys	Liite/Annex C4 – C5
Käyttöturvallisuus käytössä (BWR 4)	
Ominaisarvot kaikille kuorman suunnan	Liite/Annex C1 – C3

Edellä yksilöidyn tuotteen suoritustaso on ilmoitettujen suoritustasojen joukon mukainen. Tämä suoritustasoilmoitus on asetuksen (EU) N:o 305/2011 mukaisesti annettu edellä ilmoitetun valmistajan yksinomaisella vastuulla.

Valmistajan puolesta allekirjoittanut:



Stefan Weustenhagen
(Toimitusjohtaja)
Weilerbach, 01.01.2021

p.p. 
Dipl.-Ing. Detlef Bigalke
(Tuotekehityksen johtaja)



Tämän suoritusilmoituksen alkuperäinen teksti on kirjoitettu saksaksi. Jos käännökset poikkeavat toisistaan, saksankielinen versio on pätevä.

Specifications of intended use

Drop-in Anchor							
Anchorage depth $h_{ef} \geq 30$ mm	M6x30	M8x30	M8x40	M10x30	M10x40	M12x50	M16x65
Steel, zinc plated				✓			
Stainless steel A4 and high corrosion resistant steel HCR		✓		-		✓	
Static and quasi-static loads				✓			
Fire exposure				✓			
Cracked and uncracked concrete				✓			
Solid concrete C20/25 to C50/60				✓			
Anchorage depth $h_{ef} = 25$ mm	M6x25	M8x25	M10x25	M12x25			
Steel, zinc plated			✓				
Stainless steel A4 and high corrosion resistant steel HCR			-				
Static and quasi-static loads			✓				
Fire exposure (solid concrete, C20/25 to C50/60)			✓				
Cracked and uncracked concrete			✓				
Solid concrete C12/15 to C50/60			✓				
Precast pre-stressed hollow core slabs (C30/37 to C50/60)			✓				

Base materials:

- reinforced or unreinforced normal weight concrete according to EN 206-1:2000

Use conditions:

- Structures subject to dry internal conditions (zinc plated steel, stainless steel or high corrosion resistant steel).
- Structures subject to external atmospheric exposure (including industrial and marine environment) or exposure to permanently damp internal condition, if no particular aggressive conditions exist (stainless steel or high corrosion resistant steel).
- Structures subject to external atmospheric exposure and to permanently damp internal condition, if other particular aggressive conditions (high corrosion resistant steel).

Note: Particular aggressive conditions are e.g. permanent, alternating immersion in seawater or the splash zone of seawater, chloride atmosphere of indoor pools or atmosphere with extreme chemical pollution (e.g. in desulphurization plants or road tunnels where de-icing materials are used.)

Drop-in Anchor E / ES

Intended use
Specifications

Annex B1

Specifications of intended use

Design:

- Anchorages are designed under the responsibility of an engineer experienced in anchorages and concrete work.
- Verifiable calculation notes and drawings are prepared taking account of the loads to be anchored. The position of the anchor is indicated on the design drawings (e.g. position of the anchor relative to reinforcement or to supports, etc.).
- The strength class and the length of the fastening screw or threaded rod shall be defined by the designing engineer
- Anchorages under static or quasi-static actions for multiple use for non-structural applications are designed in accordance with:
 - ETAG 001, Annex C, design method B, Edition August 2010 or
 - CEN/TS 1992-4:2009, design method B
- Anchorages under static or quasi-static actions for precast pre-stressed hollow core slabs:
 - ETAG 001, Annex C, design method C, Edition August 2010.
 - CEN/TS 1992-4:2009, design method C
- Anchorages under fire exposure are designed in accordance with:
 - ETAG 001, Annex C, design method B, Edition August 2010 and EOTA Technical Report TR 020, Edition May 2004 or
 - CEN/TS 1992-4:2009, Annex D
 - It must be ensured that local spalling of the concrete cover does not occur.

Installation:

- Anchor installation carried out by appropriately qualified personnel and under the supervision of the person responsible for technical matters of the site,
- Anchor installation in accordance with the manufacturer's specifications and drawings and using the appropriate tools,
- Drill hole by hammer drilling only (use of vacuum drill bits is admissible),
- Positioning of the drill holes without damaging the reinforcement.

Drop-in Anchor E / ES

Intended use
Specifications

Annex B2

Table B1: Installation parameters for $h_{ef} \geq 30$ mm

Anchor size			M6x30	M8x30	M8x40	M10x30	M10x40	M12x50	M16x65
Depth of drill hole	$h_0 =$	[mm]	30	30	40	30	40	50	65
Drill hole diameter	$d_0 =$	[mm]	8	10	10	12	12	15	20
Cutting diameter of drill bit	$d_{cut} \leq$	[mm]	8,45	10,45	10,45	12,5	12,5	15,5	20,55
Max. recommended installation torque	$T_{inst} \leq$	[Nm]	4	8	8	15	15	35	60
Diameter of clearance hole in the fixture	$d_f \leq$	[mm]	7	9	9	12	12	14	18
Available thread length	L_{th}	[mm]	13	13	20	12	15	18	23
Minimum screw-in depth	L_{sdmin}	[mm]	7	9	9	10	11	13	18
Steel, zinc plated									
Minimum thickness of member	h_{min}	[mm]	100	100	100	120	120	130	160
Minimum spacing	s_{min}	[mm]	55	60	80	100	100	120	150
Minimum distance	c_{min}	[mm]	95	95	95	115	135	165	200
Stainless steel A4, HCR									
Minimum thickness of member	h_{min}	[mm]	100	100	100	-	130	140	160
Minimum spacing	s_{min}	[mm]	50	60	80	-	100	120	150
Minimum distance	c_{min}	[mm]	80	95	95	-	135	165	200

Table B2: Installation parameters for $h_{ef} = 25$ mm

Anchor size			M6x25	M8x25	M10x25	M12x25
Depth of drill hole	$h_0 =$	[mm]	25	25	25	25
Drill hole diameter	$d_0 =$	[mm]	8	10	12	15
Cutting diameter of drill bit	$d_{cut} \leq$	[mm]	8,45	10,45	12,5	15,5
Max. recommended installation torque	$T_{inst} \leq$	[Nm]	4	8	15	35
Diameter of clearance hole in the fixture	$d_f \leq$	[mm]	7	9	12	14
Available thread length	L_{th}	[mm]	12	12	12	12
Minimum screw-in depth	L_{sdmin}	[mm]	6	8	10	12
Minimum thickness of member	$h_{min,1}$	[mm]	80			
Minimum spacing	s_{min}	[mm]	30	70	70	100
Minimum edge distance	c_{min}	[mm]	60	100	100	130
Standard thickness of member	$h_{min,2}$	[mm]	100			
Minimum spacing	s_{min}	[mm]	30	50	60	100
Minimum edge distance	c_{min}	[mm]	60	100	100	110
Installation in precast pre-stressed hollow core slabs C30/37 to C50/60						
Spacing	s_{min}	[mm]	200			
Edge distance	c_{min}	[mm]	150			

Drop-in Anchor E / ES

Intended use
Installation parameters

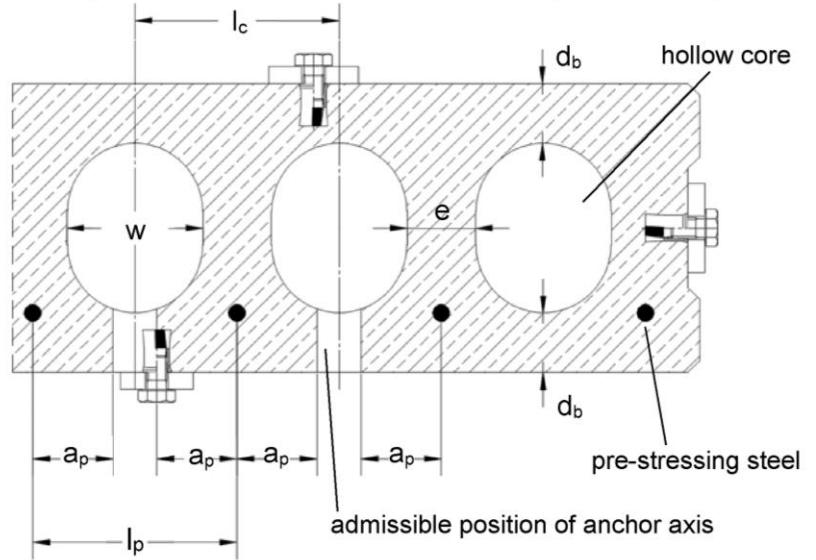
Annex B3

Admissible anchor positions in precast pre-stressed hollow core slabs ($w / e \leq 4,2$)

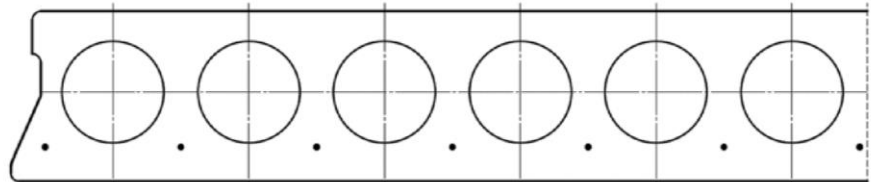
core distance:
 $l_c \geq 100 \text{ mm}$

pre-stressing steel distance:
 $l_p \geq 100 \text{ mm}$

distance between anchor
 position and pre-stressing steel:
 $a_p \geq 50 \text{ mm}$

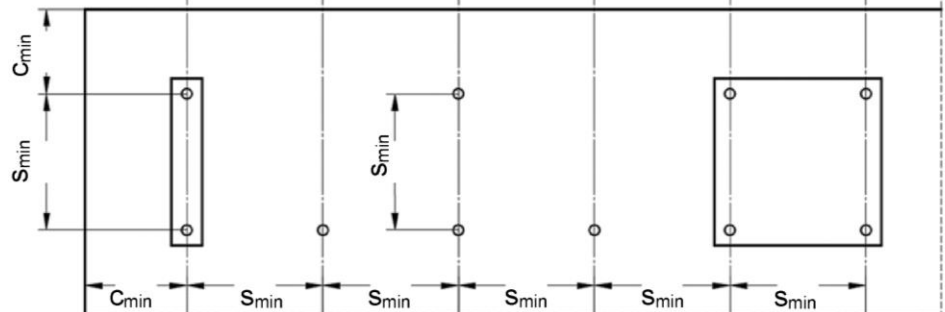


Minimum spacing and edge distance of anchors and distance between anchor groups in precast pre-stressed hollow core slabs



Minimum edge distance
 $c_{min} \geq 150 \text{ mm}$

Minimum anchor spacing
 $s_{min} \geq 200 \text{ mm}$

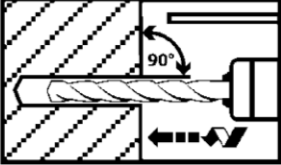
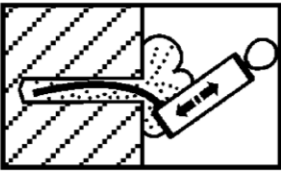
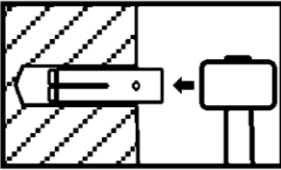
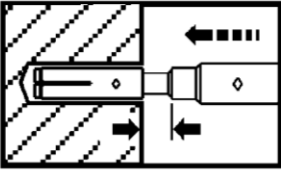
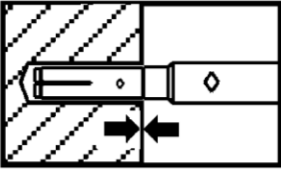
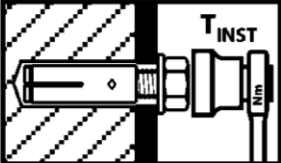


Drop-in Anchor E / ES

Intended use
 Installation in precast pre-stressed hollow core slabs

Annex B4

Installation instructions for solid concrete slabs

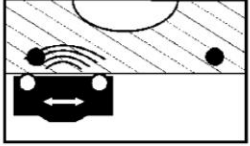
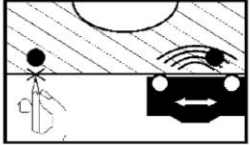

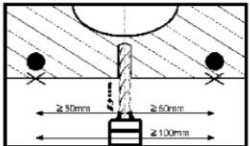
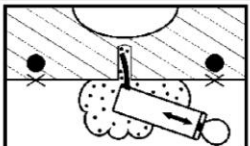
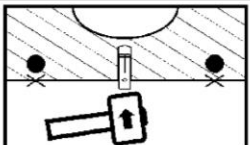
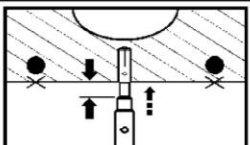
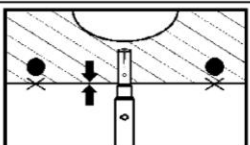
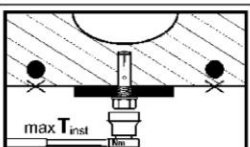
1		<p>Drill hole perpendicular to concrete surface. When using vacuum drill bit proceed with step 3.</p>
2		<p>Blow out dust. Alternatively vacuum-clean down to the bottom of the hole.</p>
3		<p>Drive in anchor.</p>
4		<p>Drive in cone by using setting tool.</p>
5		<p>Shoulder of setting tool must fit on anchor rim.</p>
6		<p>Apply installation torque T_{inst} by using calibrated torque wrench.</p>

Drop-in Anchor E / ES

Intended use
Installation instructions for solid concrete slabs

Annex B5

Installation instructions for precast pre-stressed hollow core slabs

1		Search for the position of the reinforcement.
2		Mark the position of the reinforcement and search for the other position of the reinforcement
3		Mark the positions of reinforcement.
4		Drill hole while maintaining the required distances.
5		Blow out dust. Alternatively vacuum clean down to the bottom of the hole.
6		Drive in anchor.
7		Drive in cone by using setting tool.
8		Shoulder of setting tool must fit on anchor rim.
9		Apply installation torque T_{inst} by using calibrated torque wrench.

Drop-in Anchor E / ES

Intended use
Installation instructions for precast pre-stressed hollow core slabs

Annex B6

Table C1: Characteristic resistance for $h_{ef} \geq 30$ mm in solid concrete slabs

Anchor size			M6x30	M8x30	M8x40	M10x30	M10x40	M12x50	M16x65
Load in any direction									
Characteristic resistance in concrete C20/25 to C50/60	F_{RK}^0	[kN]	3	5	6	6	6	6	16
Partial safety factor	γ_M	[-]	1,8	2,16		2,1	2,16	1,8	1,8
Spacing	s_{cr}	[mm]	130	180	210	230	170	170	400
Edge distance	c_{cr}	[mm]	65	90	105	115	85	85	200
Shear load with lever arm, Steel zinc plated									
Characteristic resistance (Steel 4.6)	$M_{RK,s}^0$ ¹⁾	[Nm]	6,1	15	15	30	30	52	133
Partial safety factor	γ_{Ms}	[-]	1,67						
Characteristic resistance (Steel 4.8)	$M_{RK,s}^0$ ¹⁾	[Nm]	6,1	15	15	30	30	52	133
Partial safety factor	γ_{Ms}	[-]	1,25						
Characteristic resistance (Steel 5.6)	$M_{RK,s}^0$ ¹⁾	[Nm]	7,6	19	19	37	37	65	166
Partial safety factor	γ_{Ms}	[-]	1,67						
Characteristic resistance (Steel 5.8)	$M_{RK,s}^0$ ¹⁾	[Nm]	7,6	19	19	37	37	65	166
Partial safety factor	γ_{Ms}	[-]	1,25						
Characteristic resistance (Steel 8.8)	$M_{RK,s}^0$ ¹⁾	[Nm]	12	30	30	59	60	105	266
Partial safety factor	γ_{Ms}	[-]	1,25						
Shear load with lever arm, Stainless steel A4 / HCR									
Characteristic resistance (Property class 70)	$M_{RK,s}^0$ ¹⁾	[Nm]	11	26	26	-	52	92	233
Partial safety factor	γ_{Ms}	[-]	1,56						
Characteristic resistance (Property class 80)	$M_{RK,s}^0$ ¹⁾	[Nm]	12	30	30	-	60	105	266
Partial safety factor	γ_{Ms}	[-]	1,33						

1) Characteristic bending moment $M_{RK,s}^0$ for equation (5.5) in ETAG 001, Annex C or for equation (14) in CEN/TS 1992-4-4

Drop-in Anchor E / ES

Performance
 Characteristic resistance for $h_{ef} \geq 30$ mm in solid concrete

Annex C1

Table C2: Characteristic resistance for $h_{ef} = 25$ mm in solid concrete slabs

Anchor size			M6x25	M8x25	M10x25	M12x25
Load in any direction						
Characteristic resistance in concrete C12/15 and C16/20	F^{0}_{Rk}	[kN]	2,5	2,5	3,5	3,5
Characteristic resistance in concrete C20/25 to C50/60	F^{0}_{Rk}	[kN]	3,5	4,0	4,5	4,5
Partial safety factor	γ_M	[-]	1,5			
Spacing	s_{cr}	[mm]	75	75	75	75
Edge distance	c_{cr}	[mm]	38	38	38	38
Shear load with lever arm						
Characteristic resistance (Steel 4.6)	$M^{0}_{Rk,s}{}^1$	[Nm]	6,1	15	30	52
Partial safety factor	γ_{Ms}	[-]	1,67			
Characteristic resistance (Steel 4.8)	$M^{0}_{Rk,s}{}^1$	[Nm]	6,1	15	30	52
Partial safety factor	γ_{Ms}	[-]	1,25			
Characteristic resistance (Steel 5.6)	$M^{0}_{Rk,s}{}^1$	[Nm]	7,6	19	37	65
Partial safety factor	γ_{Ms}	[-]	1,67			
Characteristic resistance (Steel 5.8)	$M^{0}_{Rk,s}{}^1$	[Nm]	7,6	19	37	65
Partial safety factor	γ_{Ms}	[-]	1,25			
Characteristic resistance (Steel 8.8)	$M^{0}_{Rk,s}{}^1$	[Nm]	12	30	60	105
Partial safety factor	γ_{Ms}	[-]	1,25			

¹⁾ Characteristic bending moment $M^{0}_{Rk,s}$ for equation (5.5) in ETAG 001, Annex C or for equation (14) in CEN/TS 1992-4-4

Drop-in Anchor E / ES

Performance
 Characteristic resistance for $h_{ef} = 25$ mm in solid concrete

Annex C2

Table C3: Characteristic resistance for $h_{ef} = 25$ mm in precast pre-stressed hollow core slabs

Anchor size			M6x25	M8x25	M10x25	M12x25
Load in any direction						
Flange thickness	d_b	[mm]	≥ 35 (30) ¹⁾			
Characteristic resistance in precast pre-stressed hollow core slabs C30/37 to C50/60	F_{Rk}	[kN]	3,5	4,0	4,5	4,5
Partial safety factor	γ_M	[-]	1,5			
Spacing	s_{cr}	[mm]	200			
Edge distance	c_{cr}	[mm]	150			
Shear load with lever arm						
Characteristic resistance (Steel 4.6)	$M^0_{Rk,s}$ ²⁾	[Nm]	6,1	15	30	52
Partial safety factor	γ_{Ms}	[-]	1,67			
Characteristic resistance (Steel 4.8)	$M^0_{Rk,s}$ ²⁾	[Nm]	6,1	15	30	52
Partial safety factor	γ_{Ms}	[-]	1,25			
Characteristic resistance (Steel 5.6)	$M^0_{Rk,s}$ ²⁾	[Nm]	7,6	19	37	65
Partial safety factor	γ_{Ms}	[-]	1,67			
Characteristic resistance (Steel 5.8)	$M^0_{Rk,s}$ ²⁾	[Nm]	7,6	19	37	65
Partial safety factor	γ_{Ms}	[-]	1,25			
Characteristic resistance (Steel 8.8)	$M^0_{Rk,s}$ ²⁾	[Nm]	12	30	60	105
Partial safety factor	γ_{Ms}	[-]	1,25			

¹⁾ The anchor may be set in a flange thickness of 30 mm with identical characteristic loads, if the borehole cuts no hollow core.

²⁾ Characteristic bending moment $M^0_{Rk,s}$ for equation (5.5) in ETAG 001, Annex C or for equation (14) in CEN/TS 1992-4-4

Drop-in Anchor E / ES

Performance

Characteristic resistance for $h_{ef} = 25$ mm in precast pre-stressed hollow core slabs

Annex C3

Table C4: Characteristic values under fire exposure in solid concrete slabs C20/25 to C50/60 for $h_{ef} \geq 30$ mm

Anchor size				M6x30	M8x30	M8x40	M10x30	M10x40	M12x50	M16x65	
Fire resistance class		Load in any direction									
Steel 4.6	R 30	Characteristic resistance	$F^{0}_{Rk,fi}$	[kN]	0,4	0,6	0,6	0,9	0,9	1,5	3,1
	R 60			[kN]	0,35	0,6	0,6	0,8	0,8	1,3	2,4
	R 90			[kN]	0,30	0,6	0,6	0,6	0,6	1,1	2,0
	R 120			[kN]	0,25	0,5	0,5	0,5	0,5	0,8	1,6
Steel 4.8	R 30	Characteristic resistance	$F^{0}_{Rk,fi}$	[kN]	0,4	0,9	1,1	0,9	1,5	1,5	4,0
	R 60			[kN]	0,35	0,9	0,9	0,9	1,5	1,5	4,0
	R 90			[kN]	0,3	0,6	0,6	0,9	1,1	1,5	3,0
	R 120			[kN]	0,3	0,5	0,5	0,7	0,9	1,2	2,4
Steel ≥ 5.6	R 30	Characteristic resistance	$F^{0}_{Rk,fi}$	[kN]	0,8	0,9	1,5	0,9	1,5	1,5	4,0
	R 60			[kN]	0,8	0,9	1,5	0,9	1,5	1,5	4,0
	R 90			[kN]	0,4	0,9	0,9	0,9	1,5	1,5	3,7
	R 120			[kN]	0,3	0,5	0,5	0,7	1,0	1,2	2,4
A4 / HCR	R 30	Characteristic resistance	$F^{0}_{Rk,fi}$	[kN]	0,8	0,9	1,5	-	1,5	1,5	4,0
	R 60			[kN]	0,8	0,9	1,5	-	1,5	1,5	4,0
	R 90			[kN]	0,4	0,9	0,9	-	1,5	1,5	3,7
	R 120			[kN]	0,3	0,5	0,5	-	1,0	1,2	2,4
Partial safety factor $\gamma_{M,fi}$			[-]	1,0							
Steel zinc plated											
R 30 – R 120	Spacing	$s_{cr,fi}$	[mm]	130	180	210	170	170	200	400	
	Edge distance	$c_{cr,fi}$	[mm]	65	90	105	85	85	100	200	
	If the fire attack is from more than one side, the edge distance shall be ≥ 300 mm.										
Stainless steel A4, HCR											
R 30 – R 120	Spacing	$s_{cr,fi}$	[mm]	130	180	210	-	170	200	400	
	Edge distance	$c_{cr,fi}$	[mm]	65	90	105	-	85	100	200	
	If the fire attack is from more than one side, the edge distance shall be ≥ 300 mm.										

Drop-in Anchor E / ES

Performance
Characteristic values under fire exposure for $h_{ef} \geq 30$ mm

Annex C4

Table C5: Characteristic values under fire exposure in solid concrete slabs C20/25 to C50/60 for $h_{ef} = 25$ mm

Anchor size				M6x25	M8x25	M10x25	M12x25
Fire resistance class		Load in any direction					
Steel ≥ 4.6	R 30	Characteristic resistance $F_{Rk,fi}^0$	[kN]	0,4	0,6	0,6	0,6
	R 60		[kN]	0,35	0,6	0,6	0,6
	R 90		[kN]	0,30	0,6	0,6	0,6
	R 120		[kN]	0,25	0,5	0,5	0,5
Partial safety factor $\gamma_{M,fi}$			[-]	1,0			
R 30 – R 120	Spacing	$s_{cr,fi}$	[mm]	100	100	100	100
	Edge distance	$c_{cr,fi}$	[mm]	50	50	50	50
If the fire attack is from more than one side, the edge distance shall be ≥ 300 mm.							

Drop-in Anchor E / ES

Performance
Characteristic values under fire exposure for $h_{ef} = 25$ mm

Annex C5