

Approval body for construction products  
and types of construction

Bautechnisches Prüfamt

An institution established by the Federal and  
Laender Governments



## European Technical Assessment

ETA-05/0116  
of 25 September 2015

English translation prepared by DIBt - Original version in German language

### General Part

Technical Assessment Body issuing the  
European Technical Assessment:

Deutsches Institut für Bautechnik

Trade name of the construction product

MKT Drop-in Anchor E / ES

Product family  
to which the construction product belongs

Deformation-controlled expansion anchor  
for multiple use for non-structural  
applications in concrete

Manufacturer

MKT  
Metall-Kunststoff-Technik GmbH & Co. KG  
Auf dem Immel 2  
67685 Weilerbach

Manufacturing plant

MKT  
Metall-Kunststoff-Technik GmbH & Co. KG  
Auf dem Immel 2  
67685 Weilerbach

This European Technical Assessment  
contains

13 pages including 3 annexes which form an integral part  
of this assessment

This European Technical Assessment is  
issued in accordance with Regulation (EU)  
No 305/2011, on the basis of

Guideline for European technical approval of "Metal  
anchors for use in concrete", ETAG 001 Part 6: "Anchors  
for multiple use for non-structural applications", August  
2010,  
used as European Assessment Document (EAD)  
according to Article 66 Paragraph 3 of Regulation (EU)  
No 305/2011.

The European Technical Assessment is issued by the Technical Assessment Body in its official language. Translations of this European Technical Assessment in other languages shall fully correspond to the original issued document and shall be identified as such.

Communication of this European Technical Assessment, including transmission by electronic means, shall be in full. However, partial reproduction may only be made with the written consent of the issuing Technical Assessment Body. Any partial reproduction shall be identified as such.

This European Technical Assessment may be withdrawn by the issuing Technical Assessment Body, in particular pursuant to information by the Commission in accordance with Article 25(3) of Regulation (EU) No 305/2011.

## Specific Part

### 1 Technical description of the product

The MKT Drop-in anchor E respectively ES in sizes M6×30, M8×30, M8×40, M10×30, M10×40, M12×50 and M16×65 is an anchor made of zinc-plated steel, of stainless steel or high corrosion resistant steel which is placed into a drilled hole and anchored by deformation-controlled expansion.

The product description is given in Annex A.

### 2 Specification of the intended use in accordance with the applicable European Assessment Document

The performances given in Section 3 are only valid if the anchor is used in compliance with the specifications and conditions given in Annex B.

The verifications and assessment methods on which this European Technical Assessment is based lead to the assumption of a working life of the anchor of at least 50 years. The indications given on the working life cannot be interpreted as a guarantee given by the producer, but are to be regarded only as a means for choosing the right products in relation to the expected economically reasonable working life of the works.

### 3 Performance of the product and references to the methods used for its assessment

#### 3.1 Mechanical resistance and stability (BWR 1)

The essential characteristics regarding mechanical resistance and stability are included under the Basic Works Requirement Safety in use.

#### 3.2 Safety in case of fire (BWR 2)

Essential characteristic	Performance
Reaction to fire	Anchorage satisfy requirements for Class A1
Resistance to fire	See Annex C 2

#### 3.3 Safety in use (BWR 4)

Essential characteristic	Performance
Characteristic resistance for all load directions	See Annex C 1

### 4 Assessment and verification of constancy of performance (AVCP) system applied, with reference to its legal base

In accordance with guideline for European technical approval ETAG 001, August 2010, used as European Assessment Document (EAD) according to Article 66 Paragraph 3 of Regulation (EU) No 305/2011, the applicable European legal act is: [97/161/EC].

The system to be applied is: 2+

English translation prepared by DIBt

**5 Technical details necessary for the implementation of the AVCP system, as provided for in the applicable European Assessment Document**

Technical details necessary for the implementation of the AVCP system are laid down in the control plan deposited with Deutsches Institut für Bautechnik.

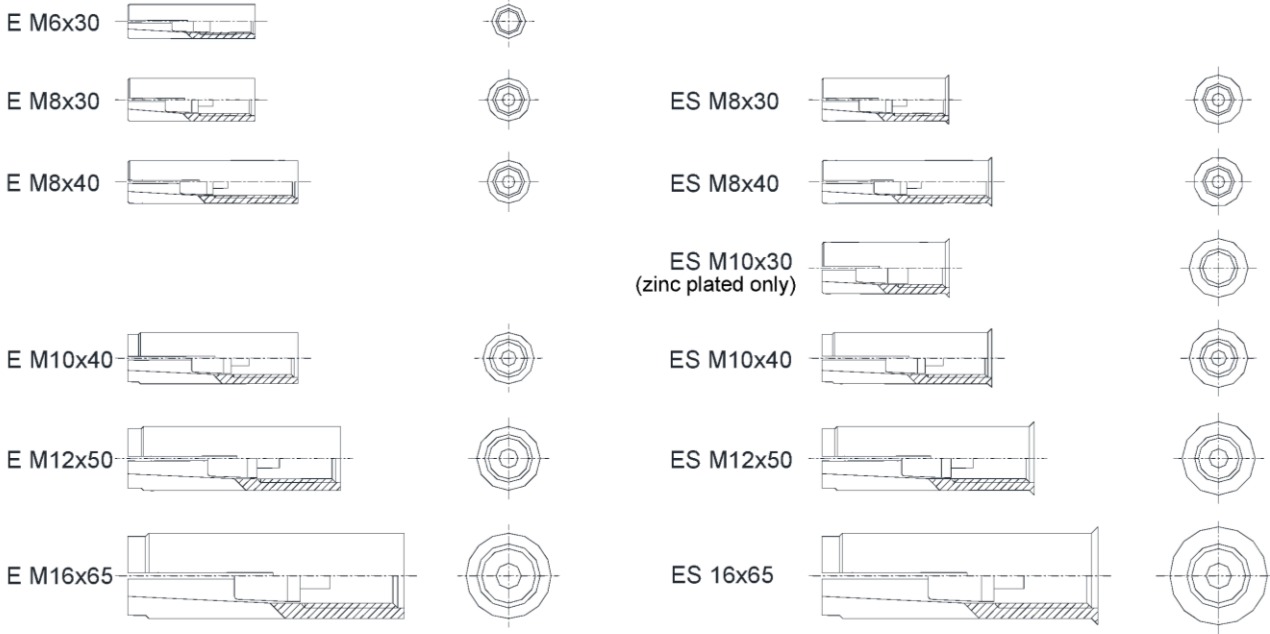
Issued in Berlin on 25 September 2015 by Deutsches Institut für Bautechnik

Andreas Kummerow  
p.p. Head of Department

*beglaubigt:*  
Baderschneider

## Drop-in Anchor E / ES

### Anchor size

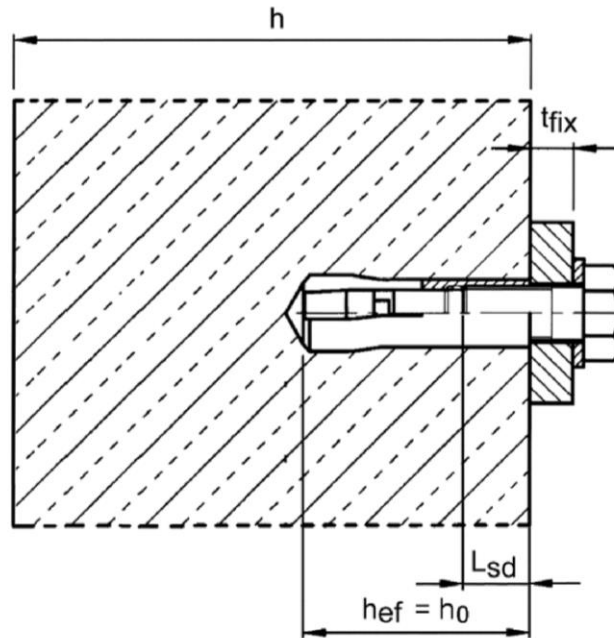


### Drop-in Anchor E / ES

Product description  
Anchor size

Annex A1

### Installation situation



**Tabelle A1: Designation and Material**

Part	Designation	Steel, zinc plated	Stainless steel A4	High corrosion resistant steel HCR
1	Anchor sleeve	Cold formed or machining steel, zinc plated, EN ISO 4042:1999	Stainless steel, 1.4401, 1.4404, 1.4571, 1.4362, EN 10088:2005, Property class 70, EN ISO 3506:2010	Stainless steel, 1.4529, 1.4565, EN 10088:2005, Property class 70, EN ISO 3506:2010
2	Cone	Steel for cold forming acc. to EN 10263-2:2001	Stainless steel, 1.4401, 1.4404, 1.4571, 1.4362, EN 10088:2005	

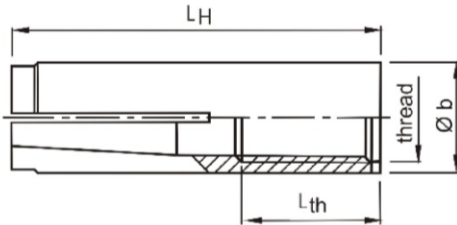
### Drop-in Anchor E / ES

**Product description**  
Installation situation and material

**Annex A2**

## Anchor sleeve

Anchor version without shoulder (E)

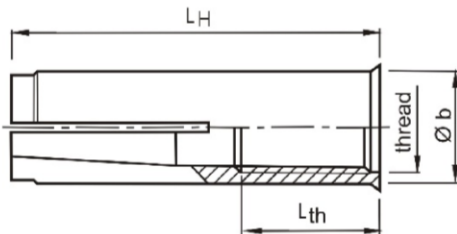


Marking: see Table A2

e.g.:  $\diamond$  E M8x40

$\diamond$  Identifying mark of manufacturing plant  
E Anchor identity (version without shoulder)  
ES Anchor identity (version with shoulder)  
M8 Size of thread  
40 Anchorage depth

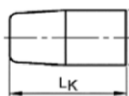
Anchor version with shoulder (ES)



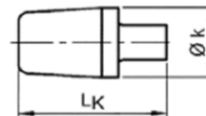
A4 additional marking  
of stainless steel A4

HCR additional marking of  
high corrosion resistant steel

Cone



Size M6x30 and M10x30



Size M8x30 – M20x80

Tabelle A2: Dimensions and marking

Anchor size	Anchor sleeve				Cone		Marking		
	thread	Ø b	L <sub>H</sub>	L <sub>th</sub>	Ø k	L <sub>K</sub>	version E	version ES	alternatively
M6x30	M6	8	30	13	5,0	13	$\diamond$ E M6x30	$\diamond$ ES M6x30	$\diamond$ E M6
M8x30	M8	10	30	13	6,5	12	$\diamond$ E M8x30	$\diamond$ ES M8x30	$\diamond$ E M8
M8x40	M8	10	40	20			$\diamond$ E M8x40	$\diamond$ ES M8x40	$\diamond$ E M8x40
M10x30	M10	12	30	12	8,2	12	-	$\diamond$ ES M10x30	$\diamond$ E M10x30
M10x40	M10	12	40	15	8,2	16	$\diamond$ E M10x40	$\diamond$ ES M10x40	$\diamond$ E M10
M12x50	M12	15	50	18	10,3	20	$\diamond$ E M12x50	$\diamond$ ES M12x50	$\diamond$ E M12
M16x65	M16	19,7	65	23	13,8	29	$\diamond$ E M16x65	$\diamond$ ES M16x65	$\diamond$ E M16

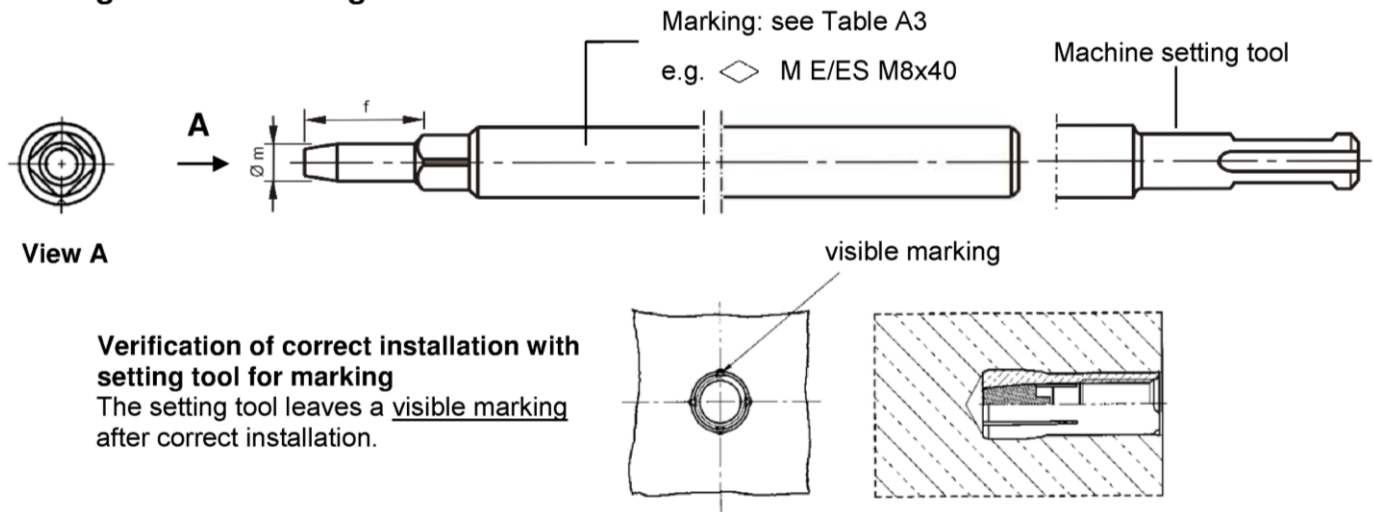
Dimensions in mm

Drop-in Anchor E / ES

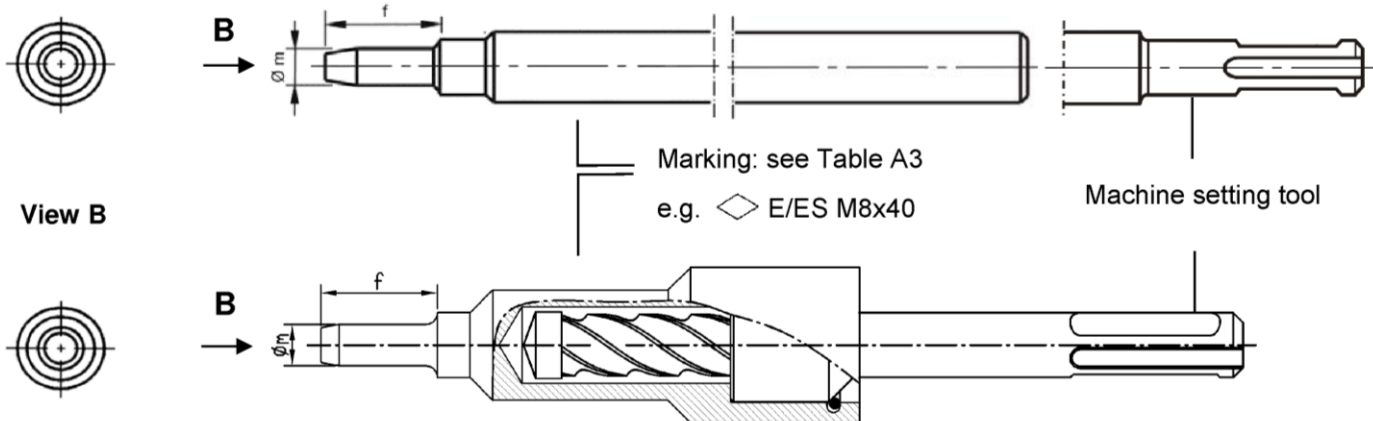
Product description  
Dimensions and marking

Annex A3

### Setting tool for marking



### Setting tool



**Tabelle A3: Dimensions and marking of setting tools**

Anchor size	$\varnothing m$	f	Setting tool for marking		Setting tool	
			Marking	alternatively	Marking	alternatively
M6x30	4,9	17	$\diamond M E/ES M6x30$	$\diamond M E M6$	$\diamond E/ES M6x30$	$\diamond E M6$
M8x30	6,4	18	$\diamond M E/ES M8x30$	$\diamond M E M8$	$\diamond E/ES M8x30$	$\diamond E M8$
M8x40	6,4	28	$\diamond M E/ES M8x40$	$\diamond M E M8x40$	$\diamond E/ES M8x40$	$\diamond E M8x40$
M10x30	8,0	18	$\diamond M ES M10x30$	$\diamond M E M10x30$	$\diamond ES M10x30$	$\diamond E M10x30$
M10x40	8,0	24	$\diamond M E/ES M10x40$	$\diamond M E M10$	$\diamond E/ES M10x40$	$\diamond E M10$
M12x50	10,0	30	$\diamond M E/ES M12x50$	$\diamond M E M12$	$\diamond E/ES M12x50$	$\diamond E M12$
M16x65	13,5	36	$\diamond M E/ES M16x65$	$\diamond M E M16$	$\diamond E/ES M16x65$	$\diamond E M16$

Dimensions in mm

### Drop-in Anchor E / ES

**Product description**  
Setting tools, dimensions and marking

**Annex A4**



## Specifications of intended use

### Anchorage subject to:

- Static and quasi-static loads

### Base materials:

- reinforced or unreinforced normal weight concrete according to EN 206-1:2000
- strength classes C20/25 to C50/60 according to EN 206-1:2000
- cracked and non-cracked concrete

### 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.)

### 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 are designed in accordance with:
  - ETAG 001, Annex C, design method B, Edition August 2010 or
  - CEN/TS 1992-4:2009, design method B
- Fasteners are only to be used for multiple use for non-structural applications, according to ETAG 001 Part 6, Edition 2010. Definition acc. to the member State is given in Annex 1 (informative)
- Anchorages under fire exposure are designed in accordance with:
  - 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,
- Positioning of the drill holes without damaging the reinforcement.

## Drop-in Anchor E / ES

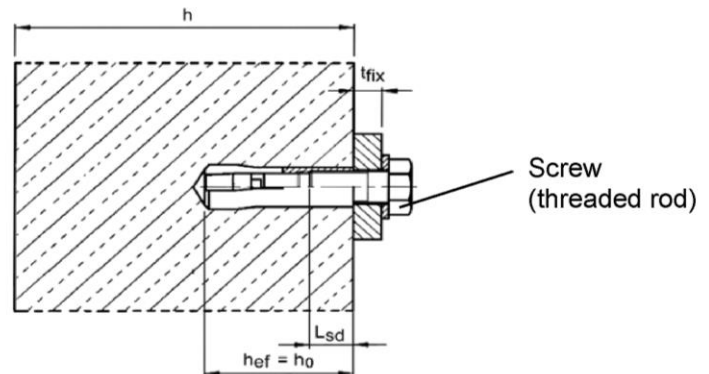
Intended use  
Specifications

Annex B1

**Table B1: Installation parameters**

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 setting torque <sup>1)</sup>	$T_{inst} \leq$	[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 screwing depth	$L_{sdmin}$	[mm]	7	9	9	10	11	13	18
Spacing	$s_{cr}$	[mm]	130	180	210	230	170	170	400
Edge distance	$c_{cr}$	[mm]	65	90	105	115	85	85	200
<b>Steel, zinc plated</b>									
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
<b>Stainless steel A4, HCR</b>									
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

1) If the screw or threaded rod is otherwise secured against unscrewing, the torque can be omitted.



**Requirements of the fastening screw or the threaded rod and nut according to the engineering documents:**

- Minimum screw-in depth  $L_{sdmin}$  see Table B1
- The length of screw or the threaded rod shall be determined depending on the thickness of fixture  $t_{fix}$ , available thread length  $L_{th}$  (= maximum screw-in depth) and the minimum screw-in depth  $L_{sdmin}$ .
- $A_5 > 8$  % Ductility

**Steel, zinc plated**

- Property class 4.6 / 4.8 / 5.6 / 5.8 or 8.8 according to EN ISO 898-1:2013 or EN ISO 898-2:2012

**Stainless steel A4**

- Material 1.4401; 1.4404; 1.4578; 1.4571; 1.4439; 1.4362 EN 10088:2005
- Property class 70 or 80 according to EN ISO 3506:2010

**High corrosion resistant steel (HCR)**

- Material 1.4529; 1.4565, acc. to EN 10088:2005
- Property class 70 or 80 acc. to EN ISO 3506:2010

**Drop-in Anchor E / ES**

**Intended use**  
Installation parameters

**Annex B2**

### Installation instructions

1		Drill hole perpendicular to concrete surface.
2		Blow out dust.
3		Drive in anchor.
4		Drive in cone by using setting tool.
5		Shoulder of setting tool must fit on anchor rim.
6		Apply installation torque $T_{inst}$ by using calibrated torque wrench.

### Drop-in Anchor E / ES

Intended use  
Installation instructions

Annex B3

**Tabelle C1: Characteristic values for resistance**  
(Design method B)

Anchor size			M6x30	M8x30	M8x40	M10x30	M10x40	M12x50	M16x65
<b>Load in any direction</b>									
Characteristic resistance in concrete C20/25 to C50/60	$F_{Rk}^0$	[kN]	3	5	6	6	6	6	16
Partial safety factor	$\gamma_M$	[-]	1,8	2,16		2,1	2,16	1,8	1,8
<b>Shear load with lever arm, Steel zinc plated</b>									
Characteristic resistance (Steel 4.6)	$M_{Rk,s}^0$ <sup>1)</sup>	[Nm]	6,1	15	15	30	30	52	133
Partial safety factor	$\gamma_{Ms}$	[-]	1,67						
Characteristic resistance (Steel 4.8)	$M_{Rk,s}^0$ <sup>1)</sup>	[Nm]	6,1	15	15	30	30	52	133
Partial safety factor	$\gamma_{Ms}$	[-]	1,25						
Characteristic resistance (Steel 5.6)	$M_{Rk,s}^0$ <sup>1)</sup>	[Nm]	7,6	19	19	37	37	65	166
Partial safety factor	$\gamma_{Ms}$	[-]	1,67						
Characteristic resistance (Steel 5.8)	$M_{Rk,s}^0$ <sup>1)</sup>	[Nm]	7,6	19	19	37	37	65	166
Partial safety factor	$\gamma_{Ms}$	[-]	1,25						
Characteristic resistance (Steel 8.8)	$M_{Rk,s}^0$ <sup>1)</sup>	[Nm]	12	30	30	59	60	105	266
Partial safety factor	$\gamma_{Ms}$	[-]	1,25						
<b>Shear load with lever arm, Stainless steel A4 / HCR</b>									
Characteristic resistance (Property class 70)	$M_{Rk,s}^0$ <sup>1)</sup>	[Nm]	11	26	26	-	52	92	233
Partial safety factor	$\gamma_{Ms}$	[-]	1,56						
Characteristic resistance (Property class 80)	$M_{Rk,s}^0$ <sup>1)</sup>	[Nm]	12	30	30	-	60	105	266
Partial safety factor	$\gamma_{Ms}$	[-]	1,33						

<sup>1)</sup> 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 values for resistance

**Annex C1**

**Tabelle C2: Characteristic values under fire exposure in concrete C20/25 to C50/60  
(Design method B)**

Anchor size				M6x30	M8x30	M8x40	M10x30	M10x40	M12x50	M16x65	
Fire resistance class		Fire resistance class									
Steel 4.6	R 30	Characteristic resistance	$F_{Rk,fi}^0$	[kN]	0,2	0,4	0,4	0,9	0,9	1,5	3,1
	R 60			[kN]	0,2	0,3	0,3	0,8	0,8	1,3	2,4
	R 90			[kN]	0,1	0,3	0,3	0,6	0,6	1,1	2,0
	R 120			[kN]	0,1	0,2	0,2	0,5	0,5	0,8	1,6
Steel 4.8	R 30	Characteristic resistance	$F_{Rk,fi}^0$	[kN]	0,4	0,9	1,1	0,9	1,5	1,5	4,0
	R 60			[kN]	0,3	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	$F_{Rk,fi}^0$	[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	$F_{Rk,fi}^0$	[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							
<b>Steel zinc plated</b>											
R 30 to R 120	Spacing	$s_{cr,fi}$	[mm]	130	180	210	170	170	200	400	
		$s_{min}$	[mm]	55	60	80	100	100	120	150	
	Edge distance	$c_{cr,fi}$	[mm]	65	90	105	85	85	100	200	
		$c_{min}$	[mm]	95	95	95	115	135	165	200	
If the fire attack is from more than one side, the edge distance shall be $\geq 300$ mm.											
<b>Stainless steel A4, HCR</b>											
R 30 to R 120	Spacing	$s_{cr,fi}$	[mm]	130	180	210	-	170	200	400	
		$s_{min}$	[mm]	50	60	80	-	100	120	150	
	Edge distance	$c_{cr,fi}$	[mm]	65	90	105	-	85	100	200	
		$c_{min}$	[mm]	80	95	95	-	135	165	200	
If the fire attack is from more than one side, the edge distance shall be $\geq 300$ mm.											

**Drop-in Anchor E / ES**

**Performance**  
Characteristic values under fire exposure

**Annex C2**