



INSTYTUT TECHNIKI BUDOWLANEJ

- ★ Designated according to Article 29 of
- ★ Regulation (EU) No 305/2011 and member of EOTA
- ★ (European Organisation for Technical Assessment)



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European Technical Assessment

**ETA-25/0815
of 29/08/2025**



General Part

Technical Assessment Body issuing the European Technical Assessment

Instytut Techniki Budowlanej

Trade name of the construction product

ETA Ankerbolt and ETA Socket Bolt

Product family to which the construction product belongs

Concrete screws for use in concrete

Manufacturer

Hexstone Ltd Trading
as JCP Construction Products
Opal Way, Stone Business Park
Stone, Staffordshire, ST15 0SW
Great Britain

Manufacturing plant

JCP Plant 58

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

European Assessment Document (EAD)
330232-01-0601 "Mechanical fasteners for use in concrete"

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Specific Part

1 Technical description of the product

ETA Ankerbolt and ETA Socket Bolt are concrete screws of sizes: 6, 8, 10, 12, 14 and 16 mm, made of zinc coated, hardened steel.

The anchor is screwed into a predrilled cylindrical drill hole. The special thread of the anchor cuts an internal thread into a concrete member while setting. The anchorage is characterized by mechanical interlock in the special thread.

The description of the product is given in Annex A.

2 Specification of the intended use in accordance with the applicable European Assessment Document (EAD)

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 provisions given in this European Technical Assessment are based on an assumed working life of the fastener of 50 years. The indications given on the working life cannot be interpreted as a guarantee given by the producer or the Technical Assessment Body, 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 Performance of the product

3.1.1 Mechanical resistance and stability (BWR 1)

Essential characteristic	Performance
Characteristic resistance to tension and shear loads (static and quasi-static loading)	Annex C1 and C2
Displacements under static and quasi-static loading	Annex C2

3.1.2 Safety in case of fire (BWR 2)

Essential characteristic	Performance
Reaction to fire	Anchors satisfy requirements for Class A1
Resistance to fire	Annex C3

3.2 Methods used for the assessment

The assessment has been made in accordance with EAD 330232-01-0601.

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

According to Decision 96/582/EC of the European Commission the system 1 of assessment and verification of constancy of performance applies (see Annex V to regulation (EU) No 305/2011).

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

Technical details necessary for the implementation of the AVCP system are laid down in the control plan deposited in Instytut Techniki Budowlanej.

For type testing the results of the tests performed as part of the assessment for the European Technical Assessment shall be used unless there are changes in the production line or plant. In such cases the necessary type testing has to be agreed between Instytut Techniki Budowlanej and the notified body.

Issued in Warsaw on 29/08/2025 by Instytut Techniki Budowlanej

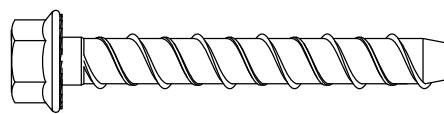


Anna Panek, MSc
Deputy Director of ITB

ETA Ankerbolt F

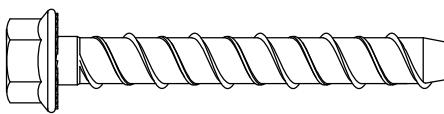
Hexagon flange head

Sizes: 6, 8, 10, 12, 14 and 16


ETA Ankerbolt FX

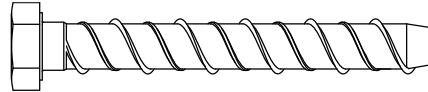
Hexagon flange head with Torx

Sizes: 6, 8 and 10


ETA Ankerbolt H

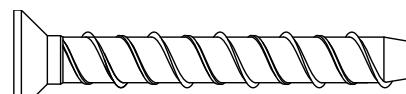
Hexagon head

Sizes: 8, 10, 12, 14 and 16


ETA Ankerbolt C

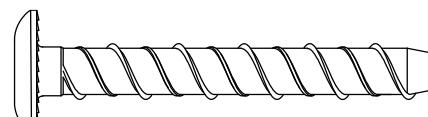
Countersunk head

Sizes: 6, 8 and 10


ETA Ankerbolt PM

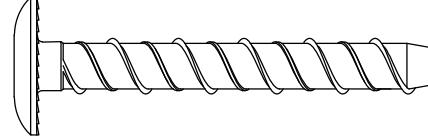
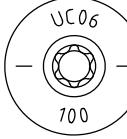
Pan head Ø16 mm

Size: 6


ETA Ankerbolt P

Pan head Ø18 mm

Size: 6


ETA Socket Bolt M10
ETA Socket Bolt M8
ETA Socket Bolt M3/8

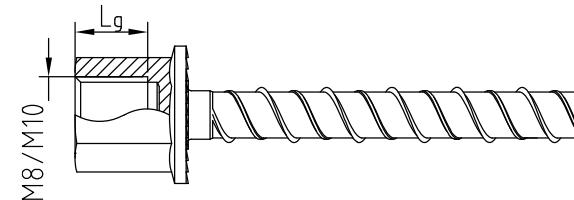
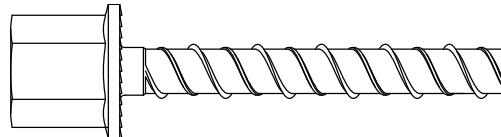
Socket head

M10 internal thread for M10

M8 internal thread for M8

3/8 UNC int. thread for M3/8

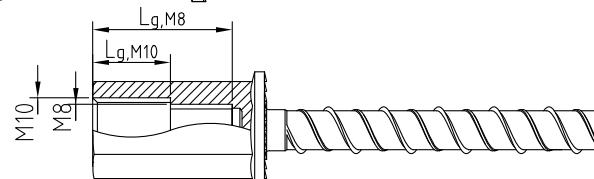
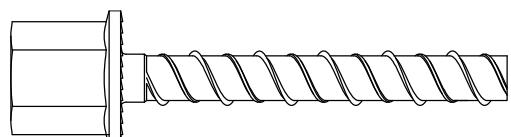
Size: 6

 $L_g = 9 \text{ mm, D = M10 for M10}$
 $L_g = 7 \text{ mm, D = M8 for M8}$
 $L_g = 9 \text{ mm, D = 3/8 UNC for M3/8}$

ETA Socket Bolt Dual

Dual Socket head

M10 and M8 dual internal thread

Size: 6

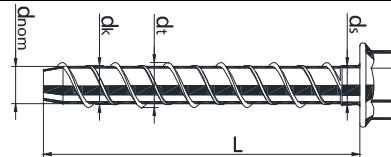
 $L_{g,M8} = 7 \text{ mm}$
 $L_{g,M10} = 9 \text{ mm}$

ETA Ankerbolt and ETA Socket Bolt
Product description

Screw types

Annex A1
 of European
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Table A1: Head screw characteristic

Head screw characteristic			6	8	10	12	14	16	
ETA Ankerbolt F	Wrench size	SW	Mm	10	13	15	16	18	21
	Flange diameter	$\varnothing d_h$	Mm	14,0	18,0	22,3	26,6	30,5	35,0
ETA Ankerbolt FX	Wrench size	SW	Mm	10	13	15	-	-	-
	Flange diameter	$\varnothing d_h$	Mm	14,0	18,0	22,3	-	-	-
	Torx size	-	-	T30	T40	T50	-	-	-
ETA Ankerbolt H	Wrench size	SW	Mm	-	15	17	19	24	27
ETA Ankerbolt C	Head diameter	$\varnothing d_h$	Mm	13,0	19,5	21	-	-	-
	Torx size	-	-	T30	T40	T50	-	-	-
ETA Ankerbolt PM	Head diameter	$\varnothing d_h$	Mm	16	-	-	-	-	-
	Torx size	-	-	T30	-	-	-	-	-
ETA Ankerbolt P	Head diameter	$\varnothing d_h$	Mm	18	-	-	-	-	-
	Torx size	-	-	T30	-	-	-	-	-
ETA Socket Bolt M10	Wrench size	SW	Mm	13	-	-	-	-	-
ETA Socket Bolt M8	Wrench size	SW	Mm	13	-	-	-	-	-
ETA Socket Bolt M3/8	Wrench size	SW	Mm	13	-	-	-	-	-
ETA Socket Bolt Dual	Wrench size	SW	Mm	13	-	-	-	-	-

**Table A2:** Dimensions and material

Anchor size		6	8	10	12	14	16	
Length of anchor	L_{min}	mm	44	50	55	65	85	100
	L_{max}	mm	150	150	200	200	200	200
Nominal hole diameter	d_0	mm	6,00	8,00	10,00	12,00	14,00	16,00
Nominal core diameter	d_{hom}	mm	5,35	7,35	9,35	11,35	13,35	15,35
Shaft diameter	d_s	mm	5,72	7,50	9,72	11,90	13,70	15,95
Higher thread diameter	d_t	mm	7,70	10,00	12,00	14,20	16,40	18,60
Lower thread diameter	d_k	mm	6,00	8,00	10,00	12,00	14,00	16,00
Thread pitch	h_t	mm	7,50	11,00	14,00	17,00	20,00	23,00
Tip chamfer for M10, M8, M3/8 and Dual	h_s	mm	-	-	-	-	-	-
Tip chamfer for other anchors	h_s	mm	4,00	4,00	5,00	5,00	5,00	5,00
Material	Hardened carbon steel, $A_s \leq 8\%$							
Coating	Zinc coating ($\geq 5 \mu\text{m}$); electroplated acc. to EN ISO 4042 or mechanically deposited acc. to EN ISO 12683							

Marking:

	ETA Ankerbolt and Socket Bolt	Designations
	F, C, H, PM, P	UC Product identification 6 / 06 Screw size 120 Screw length L, mm
	FX	UC Product identification 6 / 06 Screw size 120 Screw length L, mm
	M10, M8, M3/8, Dual	D Length of anchor, mm L = 55

ETA Ankerbolt and ETA Socket Bolt**Annex A2**
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Product description

Head screw characteristic, dimensions, materials and marking

Specification of intended use

Anchorage subject to:

- Static and quasi-static loads: all sizes and all embedment depth.
- Anchorages with requirements related to resistance to fire: all sizes and all embedment depths.

Base material:

- Reinforced or unreinforced normal weight concrete with strength class C20/25 to C50/60 according to EN 206.
- Uncracked and cracked concrete: all sizes.

Use conditions (environmental conditions):

- Structures subject to dry internal conditions.

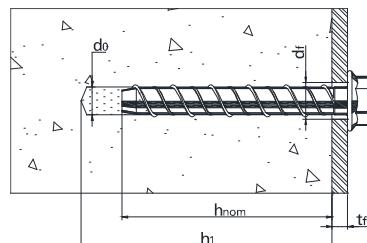
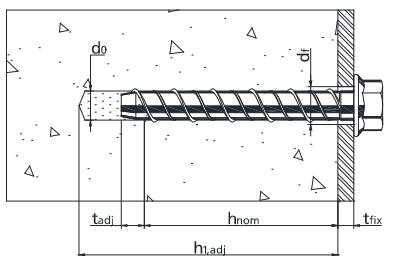
Design:

- 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 transmitted. The position of the anchor is indicated on the design drawings (e.g. position of the anchor relative to reinforcement or to supports, etc.).
- Anchorages under static and quasi-static loads are designed in accordance with EN 1992-4:2018.

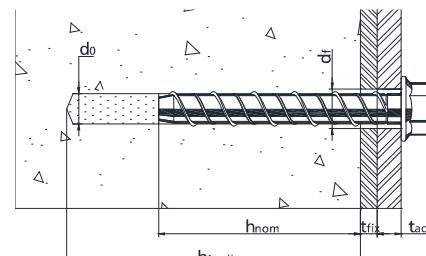
Installation:

- Hammer drilling only: all sizes and all embedment depths.
- 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.
- In case of aborted hole: new drilling at a minimum distance away of twice the depth of the aborted hole or smaller distance if the aborted drill hole is filled with high strength mortar and if under shear or oblique tension load it is not in the direction of load application.
- After installation further turning of the anchor is not possible. The head of the anchor is supported on the fixture and is not damaged.
- Adjustment according to Annex B2, B4 and Table C1.

ETA Ankerbolt and ETA Socket Bolt	Annex B1
Intended use Specification	of European Technical Assessment ETA-25/0815

Installation parameters without adjustment

Installation parameters with adjustment


before adjustment



after adjustment

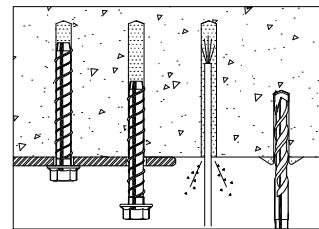
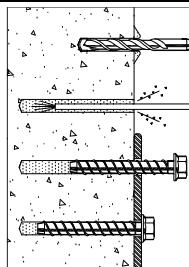
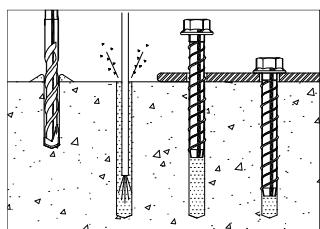
Table B1: Installation parameters

Anchor size			6		8		10			12			14			16																				
Nominal embedment depth	h _{nom}	[mm]	h _{nom2}		h _{nom1}		h _{nom2}		h _{nom1}		h _{nom3}		h _{nom2}		h _{nom1}																					
			44	55	50	65	55	65	85	65	85	100	85	100	115	100	120																			
Nominal drill hole diameter	d ₀	[mm]	6		8		10			12			14			16																				
Nominal core diameter	d _{nom}	[mm]	5,35			7,35			9,35			11,35			13,35																					
Cutting diameter of drill bit	d _{cut} ≤	[mm]	6,40			8,45			10,45			12,45			14,50																					
Clearance hole diameter	d _{cl} ≤	[mm]	8			11			13			15			17																					
Effective embedment depth	h _{ef}	[mm]	30	41	34	47	37	45	62	44	61	73	60	72	85	71	88																			
Installation torque	T _{inst}	[Nm]	10		20		30			50			60			80																				
Maximum torque impact screw driver	[Nm]	250				350																														
Setting tool (impact screw driver)	-	[·]	BOSCH GDS 18E or equivalent																																	
For vertically downwards, vertically upwards and horizontally installation in concrete with cleaning and for vertically upwards installation in concrete with no cleaning																																				
Depth of drill hole	h ₁ ≥	[mm]	50	65	60	75	65	75	95	75	95	110	95	110	125	115	135																			
For horizontally and vertically downwards installation in concrete with no cleaning (h_{1uc} = h₁ + 3 d₀)																																				
Depth of drill hole	h _{1uc} ≥	[mm]	68	83	84	99	95	105	125	111	131	146	137	152	167	163	183																			
For vertically downwards, vertically upwards and horizontally installation in concrete with cleaning and for vertically upwards installation in concrete with no cleaning, with adjustment t_{adj} = 10 mm (h_{1,adj} = h₁ + t_{adj})																																				
Depth of drill hole	h _{1,adj} ≥	[mm]	-	75	-	85	-	-	105	-	-	120	-	-	135	-	145																			
For horizontally and vertically downwards installation in concrete with no cleaning, with adjustment t_{adj} = 10 mm (h_{1uc,adj} = h₁ + 3 d₀ + t_{adj})																																				
Depth of drill hole	h _{1uc,adj} ≥	[mm]	-	85	-	109	-	-	135	-	-	156	-	-	177	-	193																			
Minimum thickness of member	h _{min}	[mm]	80	80	80	80	80	90	120	100	120	150	120	150	150	150	150																			
Minimum spacing	s _{min}	[mm]	35	35	35	35	40	40	40	50	50	50	60	60	60	70	70																			
Minimum edge distance	c _{min}	[mm]	35	35	35	35	40	40	40	50	50	50	60	60	60	70	70																			

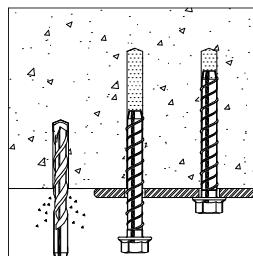
ETA Ankerbolt and ETA Socket Bolt
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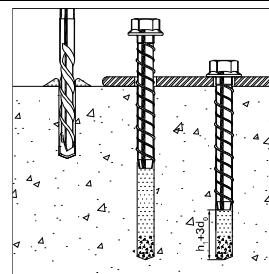
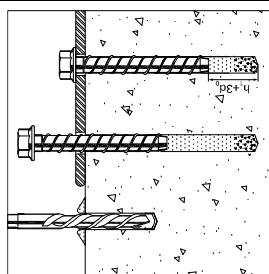
Intended use
Installation parameters

Vertically downwards, vertically upwards and horizontally installation in concrete with cleaning


Drilling	Make drilling depth h_1 .
Cleaning	Cleaning 3 times needed in downward and horizontal installation direction with drill hole depth.
Setting	Setting by specified by manufacturer impact screw driver (impact wrench tool) or torque wrench up to T_{inst} only (according to Table B1).
Checking	After installation a further turning of the screw must not be possible. The head of the screw must be in contact with the fixture and undamaged.

Vertically upwards installation in concrete with no cleaning


Drilling	Make drilling depth h_1 .
Cleaning	No cleaning needed.
Setting	Setting by specified by manufacturer impact screw driver (impact wrench tool) or torque wrench up to T_{inst} only (according to Table B1).
Checking	After installation a further turning of the screw must not be possible. The head of the screw must be in contact with the fixture and undamaged.

Horizontally and vertically downwards installation in concrete with no cleaning


Drilling	Make drilling depth: $h_{1uc} = h_1 + 3 \cdot d_0$
Cleaning	No cleaning needed.
Setting	Setting by specified by manufacturer impact screw driver (impact wrench tool) or torque wrench up to T_{inst} only (according to Table B1).
Checking	After installation a further turning of the screw must not be possible. The head of the screw must be in contact with the fixture and undamaged.

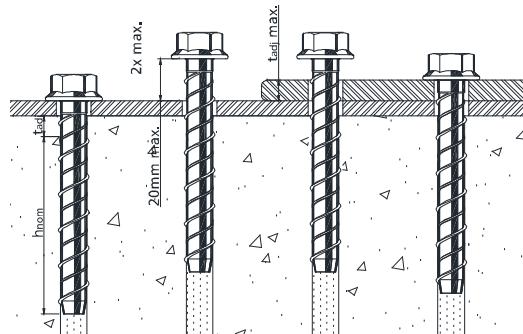
ETA Ankerbolt and ETA Socket Bolt
Annex B3

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Intended use
 Installation instruction and tools **without adjustment**

Vertically downwards, vertically upwards and horizontally installation in concrete with cleaning or without cleaning, with adjustment

Installation	Installation according to Annex B3 but with $h_{1,adj} = h_1 + t_{adj}$ (for installation without cleaning) or $h_{1uc,adj} = h_{1uc} + t_{adj}$ (for installation with cleaning). Install the screw with: $h_{nom,adj} = h_{nom} + t_{adj}$
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Unscrewing	The screw may be untightened to a maximum of $L_{adj} = 20$ mm off the surface of the initial fixture. It is permissible to adjust the screw twice.
Shimming	The total permissible thickness of shims added during the adjustment process is $t_{adj} \leq 10$ mm
Setting	Setting by specified by manufacturer impact screw driver (impact wrench tool) or torque wrench up to T_{inst} only (according to Table B1). The final embedment depth after adjustment process must be $\geq h_{nom,1}$
Checking	After installation a further turning of the screw must not be possible. The head of the screw must be in contact with the fixture and undamaged.

ETA Ankerbolt and ETA Socket Bolt

Intended use
Installation instruction and tools **with adjustment**

Annex B4

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Table C1: Characteristic resistance to tension load in cracked and uncracked concrete C20/25 to C50/60, design method A

Anchor size			6		8		10			12			14			16		
Nominal embedment depth			h_{nom}	$h_{\text{nom}2}$	$h_{\text{nom}1}$	$h_{\text{nom}2}$	$h_{\text{nom}1}$	$h_{\text{nom}3}$	$h_{\text{nom}2}$	$h_{\text{nom}1}$	$h_{\text{nom}3}$	$h_{\text{nom}2}$	$h_{\text{nom}1}$	$h_{\text{nom}3}$	$h_{\text{nom}2}$	$h_{\text{nom}1}$	$h_{\text{nom}3}$	
			[mm]	44	55	50	65	55	65	85	65	85	100	85	100	115	100	120
Adjustment																		
Total max. thickness of adjustment layers	t_{adj}	[mm]	-	10	-	10	-	-	10	-	-	10	-	-	10	-	10	
Max. number of adjustments	n_a	-	-	2	-	2	-	-	2	-	-	2	-	-	2	-	2	
Steel failure																		
Characteristic resistance	$N_{Rk,s}$	[kN]	20,2		38,2		61,8		80,9		112,0		148,1					
Partial safety factor	$\gamma_{Ms}^{1)}$	[-]	1,50		1,50		1,50		1,50		1,50		1,50		1,50		1,50	
Pull-out failure																		
Characteristic resistance in uncracked concrete C20/25	$N_{Rk,p}$	[kN]	1	7,5	7,5	11	9	11	20	10	15	20	19	28	28	28	36	
Characteristic resistance in cracked concrete C20/25	$N_{Rk,p}$	[kN]	- ²⁾	4	2,5	8,5	4,5	9	13	7	11	15	14	21	24	15	24	
Installation safety factor	γ_{inst}	[-]	1,4	1,2	1,4	1,2	1,4	1,2	1,2	1,4	1,2	1,2	1,2	1,2	1,2	1,2	1,2	
Increasing factor	C30/37	[-]	1,09	1,10	1,06	1,09	1,06	1,07	1,08	1,06	1,08	1,06	1,07	1,07	1,07	1,08	1,09	
	C40/45	[-]	1,16	1,18	1,11	1,17	1,11	1,13	1,13	1,11	1,14	1,10	1,11	1,11	1,12	1,14	1,16	
	C50/60	[-]	1,21	1,25	1,15	1,23	1,14	1,18	1,18	1,15	1,18	1,13	1,15	1,15	1,16	1,19	1,22	
Concrete cone failure and splitting failure																		
Effective embedment depth	h_{ef}	[mm]	30	41	34	47	37	45	62	44	61	73	60	72	85	71	88	
Factor for uncracked concrete	$k_{ucr,N}$	[-]									11,0							
Factor for cracked concrete	$k_{cr,N}$	[-]									7,7							
Installation safety factor	γ_{inst}	[-]	1,4	1,2	1,4	1,2	1,4	1,2	1,2	1,4	1,2	1,2	1,2	1,2	1,2	1,2	1,2	
Concrete cone failure	Spacing	$s_{cr,N}$	[mm]								3 x h_{ef}							
	Edge distance	$c_{cr,N}$	[mm]								1,5 x h_{ef}							
Splitting failure	Spacing	$s_{cr,sp}$	[mm]	80	110	110	130	110	130	180	130	180	200	180	200	240	210	260
	Edge distance	$c_{cr,sp}$	[mm]	40	55	55	65	55	65	90	65	90	100	90	100	120	105	130

¹⁾ In the absence of other national regulations

²⁾ not applicable

ETA Ankerbolt and ETA Socket Bolt

Annex C1

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Performances

Characteristic resistance to tension load (static and quasi-static loading)

Table C2: Characteristic resistance to shear load (static and quasi-static loading) in cracked and uncracked concrete C20/25 to C50/60

Anchor size		6		8		10			12			14			16		
Nominal embedment depth	h_{nom}	$h_{\text{nom}2}$	$h_{\text{nom}1}$	$h_{\text{nom}2}$	$h_{\text{nom}1}$	$h_{\text{nom}3}$	$h_{\text{nom}2}$	$h_{\text{nom}1}$	$h_{\text{nom}3}$	$h_{\text{nom}2}$	$h_{\text{nom}1}$	$h_{\text{nom}3}$	$h_{\text{nom}2}$	$h_{\text{nom}1}$	$h_{\text{nom}2}$	$h_{\text{nom}1}$	
	[mm]	44	55	50	65	55	65	85	65	85	100	85	100	115	100	120	
Steel failure without lever arm																	
Characteristic resistance	$V^0_{\text{Rk,s}}$	[kN]	9,3	12,6	16,3	20,3	27,6	31,2	31,2	34,5	40,4	40,4	56,0	56,0	56,0	71,5	73,4
Factor considering ductility	k_7	[\cdot]											1,0				
Partial safety factor	$\gamma_{\text{Ms}}^1)$	[\cdot]											1,5				
Steel failure with lever arm																	
Characteristic bending resistance	$M^0_{\text{Rk,s}}$	[Nm]	16,2		42,1		86,7		137,8		224,2		340,9				
Partial safety factor	$\gamma_{\text{Ms}}^1)$	[\cdot]											1,5				
Concrete pry-out failure																	
Factor	k_8	[\cdot]	1,0		1,0		1,0		2,0	1,0	2,0		2,0		2,0		2,0
Installation safety factor	γ_{inst}	[\cdot]	1,4	1,2	1,4	1,2	1,4	1,2	1,4	1,2	1,4	1,2	1,2	1,2	1,2	1,2	
Concrete edge failure																	
Effective length of anchor under shear loads	l_f	[mm]	30	41	34	47	37	45	62	44	61	73	60	72	85	71	88
Outside anchor diameter	d_{nom}	[mm]	6		8		10		12		14		16				
Installation safety factor	γ_{inst}	[\cdot]	1,4	1,2	1,4	1,2	1,4	1,2	1,2	1,4	1,2	1,2	1,2	1,2	1,2	1,2	
Minimum member thickness	h_{min}	[mm]	80	80	80	80	80	90	120	100	120	150	120	150	150	150	

¹⁾ In the absence of other national regulations

Table C3. Displacements under static and quasi-static loading

Anchor size			6		8		10			12			14			16		
Nominal embedment depth		h _{nom} [mm]	h _{nom2}	h _{nom1}	h _{nom2}	h _{nom1}	h _{nom3}	h _{nom2}	h _{nom1}	h _{nom3}	h _{nom2}	h _{nom1}	h _{nom3}	h _{nom2}	h _{nom1}	h _{nom2}	h _{nom1}	
			44	55	50	65	55	65	85	65	85	100	85	100	115	100	120	
Displacements under tension loads																		
Uncracked concrete C20/25 to C50/60	Tension load	N	[kN]	1,4	3,1	2,8	4,7	3,2	4,7	8,0	3,5	6,1	8,4	7,7	11,2	11,8	11,6	14,8
	Displacement	δ _{NO}	[mm]	0,15	0,20	0,20	0,30	0,30	0,30	0,35	0,30	0,33	0,38	0,35	0,42	0,43	0,40	0,45
		δ _{N∞}	[mm]	0,40	0,40	0,50	0,50	0,50	0,50	0,50	0,55	0,55	0,55	0,60	0,60	0,60	0,60	0,65
Cracked concrete C20/25 to C50/60	Tension load	N	[kN]	-	1,6	0,9	3,5	1,6	3,7	5,4	2,5	4,7	6,2	5,8	8,5	9,1	6,2	10,0
	Displacement	δ _{NO}	[mm]	-	0,10	0,10	0,20	0,20	0,20	0,25	0,21	0,24	0,26	0,24	0,25	0,28	0,30	0,30
		δ _{N∞}	[mm]	-	1,07	1,30	1,20	1,60	1,45	1,40	1,70	1,50	1,50	1,80	1,56	1,50	1,80	1,60
Displacements under shear loads																		
Uncracked concrete C20/25 to C50/60	Shear load	V	[kN]	2,8	5,1	3,3	6,3	3,8	5,9	14,9	4,9	18,6	19,2	18,2	23,9	26,7	23,3	32,2
	Displacement	δ _{V0}	[mm]	1,19	1,76	1,34	1,78	1,45	1,22	1,86	1,46	1,30	1,85	1,55	1,65	1,85	1,63	1,92
		δ _{V∞}	[mm]	1,79	2,64	2,01	2,67	2,18	1,83	2,79	2,19	1,65	2,78	2,33	2,48	2,78	2,45	2,88
Cracked concrete C20/25 to C50/60	Shear load	V	[kN]	-	3,6	2,3	4,4	2,7	4,1	13,3	3,4	18,6	17,1	12,7	16,7	21,4	16,3	22,5
	Displacement	δ _{V0}	[mm]	-	1,54	1,05	1,60	1,22	1,15	1,64	1,30	1,20	1,66	1,36	1,57	1,70	1,42	1,74
		δ _{V∞}	[mm]	-	2,31	1,58	2,40	1,83	1,73	2,46	1,95	1,80	2,49	2,04	2,36	2,55	2,13	2,61

Table C4: Characteristic resistance under fire exposure in cracked and uncracked concrete
 C20/25 to C50/60

Anchor size			6		8		10			12			14			16		
Nominal embedment depth		h _{nom}	h _{nom2}	h _{nom1}	h _{nom2}	h _{nom1}	h _{nom3}	h _{nom2}	h _{nom1}	h _{nom3}	h _{nom2}	h _{nom1}	h _{nom3}	h _{nom2}	h _{nom1}	h _{nom2}	h _{nom1}	
		[mm]	44	55	50	65	55	65	85	65	85	100	85	100	115	100	120	
Steel failure for tension and shear load $F_{Rk,s,fi} = N_{Rk,s,fi} = V_{Rk,s,fi}$																		
Characteristic resistance	R30	F _{Rk,s,fi}	[kN]	0,22	0,22	0,42	0,42	1,03	1,03	1,03	2,02	2,02	2,02	2,80	2,80	2,80	3,70	3,70
	R60	F _{Rk,s,fi}	[kN]	0,20	0,20	0,38	0,38	0,89	0,89	0,89	1,52	1,52	1,52	2,10	2,10	2,10	2,78	2,78
	R90	F _{Rk,s,fi}	[kN]	0,16	0,16	0,30	0,30	0,69	0,69	0,69	1,32	1,32	1,32	1,82	1,82	1,82	2,41	2,41
	R120	F _{Rk,s,fi}	[kN]	0,11	0,11	0,21	0,21	0,55	0,55	0,55	1,01	1,01	1,01	1,40	1,40	1,40	1,85	1,85
	R30	M ⁰ _{Rk,s,fi}	[Nm]	0,18	0,18	0,47	0,47	1,44	1,44	1,44	3,45	3,45	3,45	5,61	5,61	5,61	8,52	8,52
	R60	M ⁰ _{Rk,s,fi}	[Nm]	0,16	0,16	0,42	0,42	1,25	1,25	1,25	2,58	2,58	2,58	4,20	4,20	4,20	6,39	6,39
	R90	M ⁰ _{Rk,s,fi}	[Nm]	0,13	0,13	0,33	0,33	0,96	0,96	0,96	2,24	2,24	2,24	3,64	3,64	3,64	5,54	5,54
	R120	M ⁰ _{Rk,s,fi}	[Nm]	0,09	0,09	0,23	0,23	0,77	0,77	0,77	1,72	1,72	1,72	2,80	2,80	2,80	4,26	4,26
Concrete cone failure																		
Characteristic resistance	R30	N _{Rk,c,fi}	[kN]	-	1,85	1,16	2,61	1,43	2,34	5,21	2,21	5,00	7,84	4,80	7,57	11,47	7,31	12,51
	R60	N _{Rk,c,fi}	[kN]	-	1,85	1,16	2,61	1,43	2,34	5,21	2,21	5,00	7,84	4,80	7,57	11,47	7,31	12,51
	R90	N _{Rk,c,fi}	[kN]	-	1,85	1,16	2,61	1,43	2,34	5,21	2,21	5,00	7,84	4,80	7,57	11,47	7,31	12,51
	R120	N _{Rk,c,fi}	[kN]	-	1,48	0,93	2,09	1,15	1,87	4,17	1,77	4,00	6,27	3,84	6,06	9,18	5,85	10,01
Pull-out failure																		
Characteristic resistance	R30	N _{Rk,p,fi}	[kN]	-	1,00	0,63	2,13	1,13	2,25	3,25	1,75	2,75	3,75	3,50	5,25	6,00	3,75	6,00
	R60	N _{Rk,p,fi}	[kN]	-	1,00	0,63	2,13	1,13	2,25	3,25	1,75	2,75	3,75	3,50	5,25	6,00	3,75	6,00
	R90	N _{Rk,p,fi}	[kN]	-	1,00	0,63	2,13	1,13	2,25	3,25	1,75	2,75	3,75	3,50	5,25	6,00	3,75	6,00
	R120	N _{Rk,p,fi}	[kN]	-	0,80	0,50	1,70	0,90	1,80	2,60	1,40	2,20	3,00	2,80	4,20	4,80	3,00	4,80
Concrete pry-out failure																		
Characteristic resistance	R30	V _{Rk,cp,fi}	[kN]	-	1,85	1,16	2,61	1,43	2,34	10,42	2,21	10,01	15,68	9,60	15,15	22,94	14,63	25,02
	R60	V _{Rk,cp,fi}	[kN]	-	1,85	1,16	2,61	1,43	2,34	10,42	2,21	10,01	15,68	9,60	15,15	22,94	14,63	25,02
	R90	V _{Rk,cp,fi}	[kN]	-	1,85	1,16	2,61	1,43	2,34	10,42	2,21	10,01	15,68	9,60	15,15	22,94	14,63	25,02
	R120	V _{Rk,cp,fi}	[kN]	-	1,48	0,93	2,09	1,15	1,87	8,34	1,77	8,01	12,54	7,68	12,12	18,35	11,70	20,01
Concrete edge failure																		
Characteristic resistance	R30	V ⁰ _{Rk,cp,fi}	[kN]	0,58	0,61	0,62	0,66	0,78	0,81	0,86	1,12	1,19	1,24	1,55	1,61	1,67	2,01	2,10
	R60	V ⁰ _{Rk,cp,fi}	[kN]	0,58	0,61	0,62	0,66	0,78	0,81	0,86	1,12	1,19	1,24	1,55	1,61	1,67	2,01	2,10
	R90	V ⁰ _{Rk,cp,fi}	[kN]	0,58	0,61	0,62	0,66	0,78	0,81	0,86	1,12	1,19	1,24	1,55	1,61	1,67	2,01	2,10
	R120	V ⁰ _{Rk,cp,fi}	[kN]	0,46	0,49	0,50	0,53	0,62	0,65	0,69	0,89	0,95	0,99	1,24	1,29	1,34	1,61	1,68
Edge distance																		
R30 to R120		c _{cr,fi}	[mm]	2 · h _{ef}														
In case of fire attack from more than one side, the minimum edge distance shall be ≥ 300 mm																		
Anchor spacing																		
R30 to R120		s _{cr,fi}	[mm]	4 · h _{ef}														
Factor		k ₈	[-]	1,0	1,0	1,0	1,0	1,0	1,0	1,0	2,0	1,0	2,0	2,0	2,0	2,0	2,0	2,0

ETA Ankerbolt and ETA Socket Bolt

Performances

Characteristic resistance under fire exposure

Annex C3

of European

Technical Assessment

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