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-25/0817 of 29/08/2025

General Part

Technical Assessment Body issuing the European Technical Assessment	Instytut Techniki Budowlanej
Trade name of the construction product	TUC
Product family to which the construction product belongs	Concrete screws for use in concrete
Manufacturer	Trutek Fasteners Polska Sp. z o.o. ul. Wojska Polskiego 3 39-300 Mielec Poland
Manufacturing plants	Trutek Plants
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”

This 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.

Specific Part

1 Technical description of the product

The TUC 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

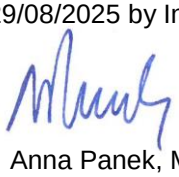
According to Decision 96/582/EC of the European Commission the system 1 of assessment and verification of constancy of performance applies (see Annex V to regulation (EU) No 305/2011).

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.

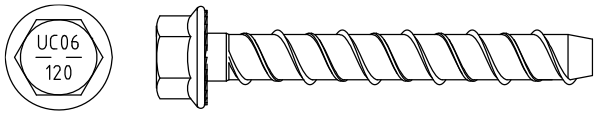
For type testing the results of the tests performed as part of the assessment for the European Technical Assessment shall be used unless there are changes in the production line or plant. In such cases the necessary type testing has to be agreed between Instytut Techniki Budowlanej and the notified body.

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

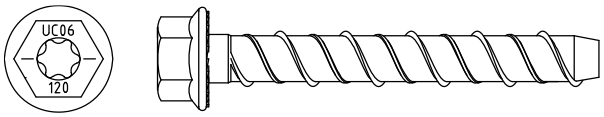


Anna Panek, MSc
Deputy Director of ITB

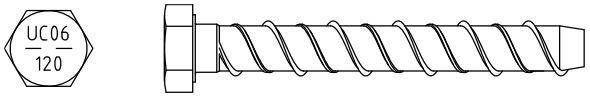
TUC Anchor
Hexagon flange head
Sizes: 6, 8, 10, 12, 14 and 16



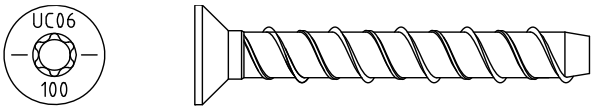
TUC Anchor TX
Hexagon flange head with Torx
Sizes: 6, 8 and 10



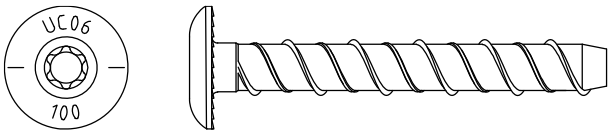
TUC Anchor H
Hexagon head
Sizes: 8, 10, 12, 14 and 16



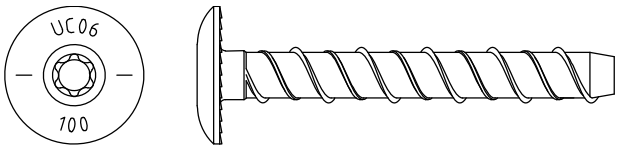
TUC Anchor CS
Countersunk head
Sizes: 6, 8 and 10



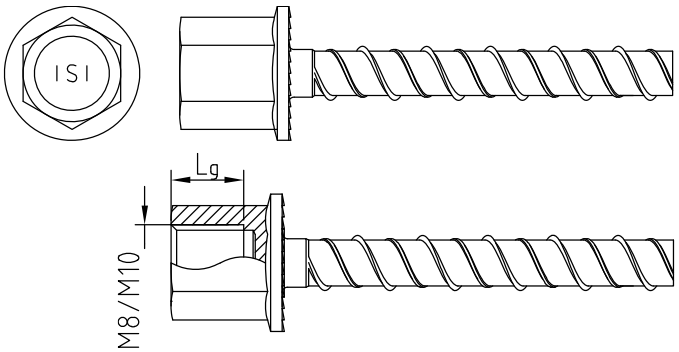
TUC Anchor PM
Pan head Ø16 mm
Size: 6



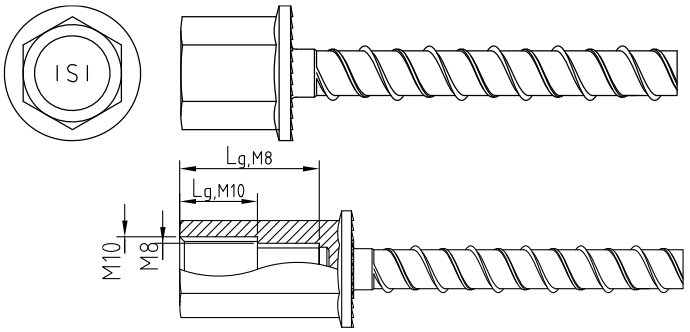
TUC Anchor P
Pan head Ø18 mm
Size: 6



TUC RH 10
TUC RH 8
TUC RH 3/8
Socket head
M10 internal thread for RH 10
M8 internal thread for RH 8
3/8 UNC int. thread for RH 3/8
Size: 6
L_g = 9 mm, D = M10 for RH 10
L_g = 7 mm, D = M8 for RH 8
L_g = 9 mm, D = 3/8 UNC for RH 3/8



TUC RH D
Dual Socket head
M10 and M8 dual internal thread
Size: 6
$L_{g,M8}$ = 7 mm
$L_{g,M10}$ = 9 mm



TUC	**Annex A1** of European Technical Assessment ETA-25/0817
Product description Screw types	

Table A1: Head screw characteristic

Head screw characteristic				6	8	10	12	14	16
TUC Anchor	Wrench size	SW	Mm	10	13	15	16	18	21
	Flange diameter	$Ød_h$	Mm	14,0	18,0	22,3	26,6	30,5	35,0
TUC Anchor TX	Wrench size	SW	Mm	10	13	15	-	-	-
	Flange diameter	$Ød_h$	Mm	14,0	18,0	22,3	-	-	-
	Torx size	-	-	T30	T40	T50	-	-	-
TUC Anchor H	Wrench size	SW	Mm	-	15	17	19	24	27
TUC Anchor CS	Head diameter	$Ød_h$	Mm	13,0	19,5	21	-	-	-
	Torx size	-	-	T30	T40	T50	-	-	-
TUC Anchor PM	Head diameter	$Ød_h$	Mm	16	-	-	-	-	-
	Torx size	-	-	T30	-	-	-	-	-
TUC Anchor P	Head diameter	$Ød_h$	Mm	18	-	-	-	-	-
	Torx size	-	-	T30	-	-	-	-	-
TUC RH 10	Wrench size	SW	Mm	13	-	-	-	-	-
TUC RH 8	Wrench size	SW	Mm	13	-	-	-	-	-
TUC RH 3/8	Wrench size	SW	Mm	13	-	-	-	-	-
TUC RH D	Wrench size	SW	Mm	13	-	-	-	-	-

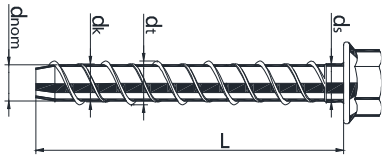
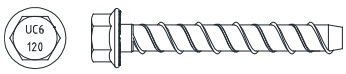
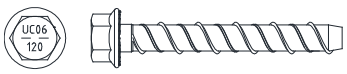
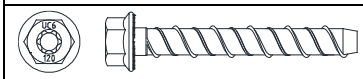
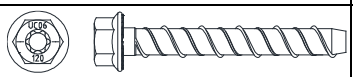
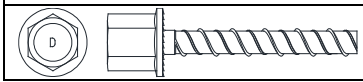
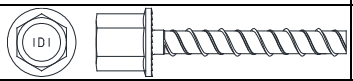


Table A2: Dimensions and material

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_{nom}	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 RH 10, RH 8, RH 3/8 and RH D	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, $A_5 \leq 8\%$					
Coating			Zinc coating (≥ 5 µm); electroplated acc. to EN ISO 4042 or mechanically deposited acc. to EN ISO 12683					

Marking:

Trutek Plants		TUC	Designations
		**Anchor, Anchor CS, Anchor H, Anchor PM, Anchor P**	UC Product identification 6 / 06 Screw size 120 Screw length L, mm
		**Anchor TX**	UC Product identification 6 / 06 Screw size 120 Screw length L, mm
		**RH 10, RH 8, RH 3/8, RH D**	D Length of anchor, mm L = 55

TUC

Product description
Head screw characteristic, dimensions, materials and marking

Annex A2
of European Technical Assessment ETA-25/0817

Specification of intended use

Anchorages 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.

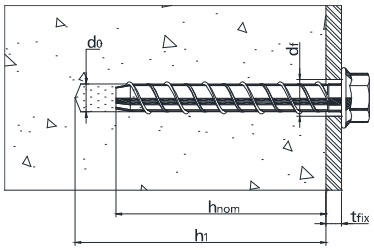
Design:

- 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.

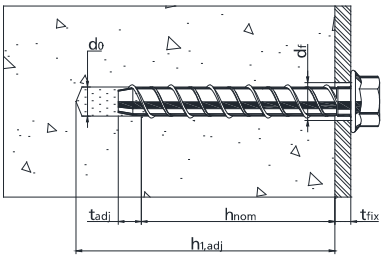
Installation:

- 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.

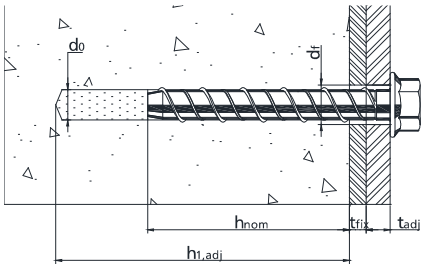
Installation parameters without adjustment



Installation parameters with adjustment



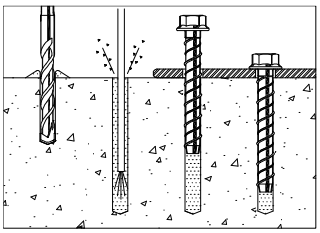
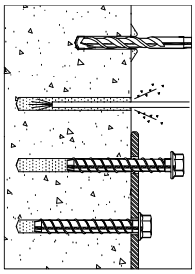
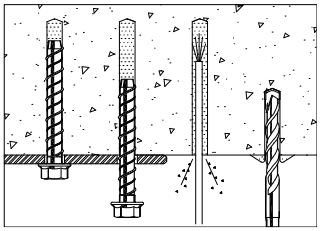
before adjustment

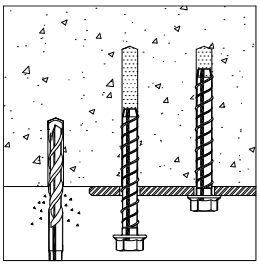


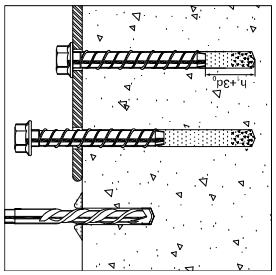
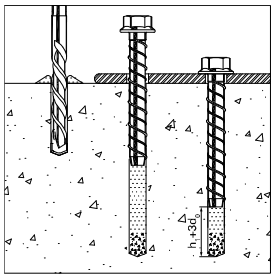
after adjustment

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}	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
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			15,35	
Cutting diameter of drill bit	$d_{cut} \leq$	[mm]	6,40		8,45		10,45			12,45			14,50			16,50	
Clearance hole diameter	$d_f \leq$	[mm]	8		11		13			15			17			19	
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	$h_1 \geq$	[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 ($h_{1uc} = h_1 + 3\ d_0$)																	
Depth of drill hole	$h_{1uc} \geq$	[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 ($h_{1,adj} = h_1 + t_{adj}$)																	
Depth of drill hole	$h_{1,adj} \geq$	[mm]	-	75	-	85	-	-	105	-	-	120	-	-	135	-	145
For horizontally and vertically downwards installation in concrete with no cleaning, with adjustment t_{adj} = 10 mm ($h_{1uc,adj} = h_1 + 3\ d_0 + t_{adj}$)																	
Depth of drill hole	$h_{1uc,adj} \geq$	[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

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.

TUC	**Annex B3**
Intended use Installation instruction and tools **without adjustment**	of European Technical Assessment ETA-25/0817

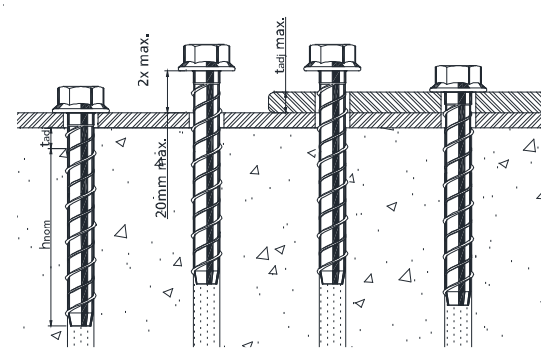
Vertically downwards, vertically upwards and horizontally installation in concrete with cleaning or without cleaning, with adjustment	
Installation	Installation according to Annex B3 but with $h_{1,adj} = h_1 + t_{adj}$ (for installation without cleaning) or $h_{1uc,adj} = h_{1uc} + t_{adj}$ (for installation with cleaning). Install the screw with: $h_{nom,adj} = h_{nom} + t_{adj}$
	
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.

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_{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
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		γ_{Ms} [1]	[-]	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

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}	[mm]	h_{nom2} 44	h_{nom1} 55	h_{nom2} 50	h_{nom1} 65	h_{nom3} 55	h_{nom2} 65	h_{nom1} 85	h_{nom3} 65	h_{nom2} 85	h_{nom1} 100	h_{nom3} 85	h_{nom2} 100	h_{nom1} 115	h_{nom2} 100	h_{nom1} 120
Steel failure without lever arm																	
Characteristic resistance	$V^0_{Rk,s}$	[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	[-]	1,0														
Partial safety factor	γ_{Ms} [1)]	[-]	1,5														
Steel failure with lever arm																	
Characteristic bending resistance	$M^0_{Rk,s}$	[Nm]	16,2		42,1		86,7			137,8			224,2			340,9	
Partial safety factor	γ_{Ms} [1)]	[-]	1,5														
Concrete pry-out failure																	
Factor	k_8	[-]	1,0		1,0		1,0		2,0	1,0	2,0		2,0			2,0	
Installation safety factor	γ_{inst}	[-]	1,4	1,2	1,4	1,2	1,4	1,2		1,4	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}	[-]	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
Minimum member thickness	h_{min}	[mm]	80	80	80	80	80	90	120	100	120	150	120	150	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} 44	h_{nom1} 55	h_{nom2} 50	h_{nom1} 65	h_{nom3} 55	h_{nom2} 65	h_{nom1} 85	h_{nom3} 65	h_{nom2} 85	h_{nom1} 100	h_{nom3} 85	h_{nom2} 100	h_{nom1} 115	h_{nom2} 100	h_{nom1} 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_{N0}	[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
		$\delta_{N\infty}$	[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_{N0}	[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
		$\delta_{N\infty}$	[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
		$\delta_{V\infty}$	[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
		$\delta_{V\infty}$	[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

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Annex C2

of European Technical Assessment ETA-25/0817

Performances

Characteristic resistance to shear load (static and quasi-static loading). Displacements under static and quasi-static loading

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]	$2 \cdot h_{ef}$														
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]	$4 \cdot h_{ef}$														
Factor		k_8	[-]	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	2,0