INSTYTUT TECHNIKI BUDOWLANEJ
PL 00-611 WARSZAWA
ul. Filtrowa 1
tel.: (+48 22) 825-04-71
(+48 22) 579-62-94
eta@itb.pl
www.itb.pl

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

Member of EOTA
www.eota.eu

European Technical Assessment

ETA-21/1078 of 30/12/2021

General Part

Technical Assessment Body issuing the European Technical Assessment	Instytut Techniki Budowlanej
Trade name of the construction product	TSC V Spin In Capsules
Product family to which the construction product belongs	Bonded fasteners for use in concrete
Manufacturer	Trutek Fasteners Polska Sp. z o.o. Al. Krakowska 38, Janki 05-090 Raszyn, Poland e-mail: info@trutek.com.pl www.trutek.com.pl www.trutekfasteners.eu
Manufacturing plant	Plant no. 10
This European Technical Assessment contains	18 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 330499-01-0601 "Bonded fasteners for use in concrete"

Specific Part

1 Technical description of the product

The TSC V Spin In Capsules are bonded anchors (injection type) consisting of chemical mortar glass capsules with mortar and threaded anchor rod sizes M8 to M30 made of:

- galvanized carbon steel,
- stainless steel,
- high corrosion resistant stainless steel,

with hexagon nut and washer.

The threaded rods are made with two types of tip end: a one side 45 chamfer or a two sides 45 chamfer.

The glass capsule is placed into a drilled hole previously cleaned and the threaded rod is driven by machine with simultaneous hammering and turning. The steel rod is anchored by the bond between rod, mortar and concrete.

The product description 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 anchorages are used in compliance with the specifications and conditions given in Annex B.

The provisions made in this European Technical Assessment are based on an assumed working life of the anchor 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 static and quasi-static loading, displacements	See Annexes C1 to C5

3.1.2 Hygiene, health and the environment (BWR 3)

No performance assessed.

3.2 Methods used for the assessment

The assessment has been made in accordance with EAD 330499-01-0601.

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 for in the applicable European Assessment Document (EAD)

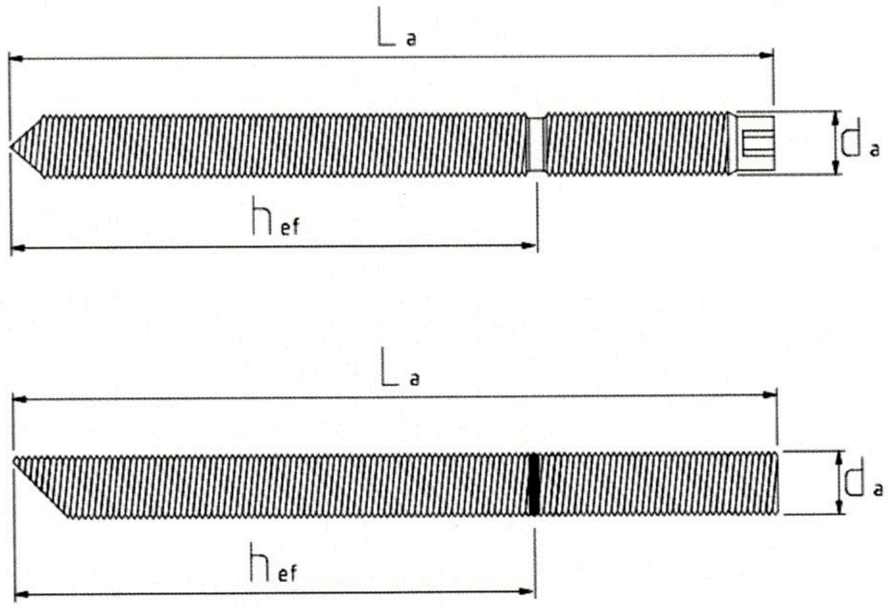
Technical details necessary for the implementation of the AVCP system are laid down in the control plan deposited at Instytut Techniki Budowlanej.

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.

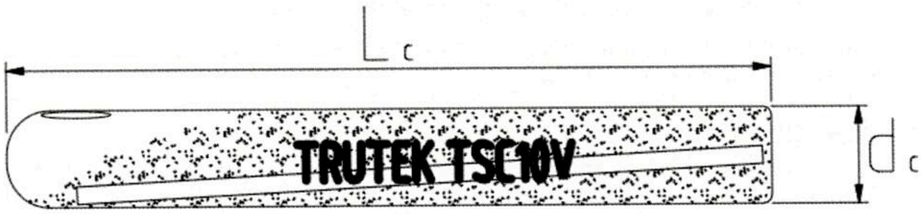
Issued in Warsaw on 30/12/2021 by Instytut Techniki Budowlanej

Anna Panek, MSc
Deputy Director of ITB

Threaded anchor rods



Capsule



TSC V Spin In Capsules	**Annex A1** of European Technical Assessment ETA-21/1078
Product description Threaded anchor rods and capsule	

Table A1: Threaded rods

Part	Designation		
	Steel, galvanized	**Stainless steel**	**High corrosion resistance stainless steel**
Threaded rod	Steel, property class from 5.8 to 12.9, acc. to EN ISO 898-1; zinc plated ≥ 5 µm acc. to EN ISO 4042 or hot-dip galvanized ≥ 40 µm acc. to EN ISO 10684	Material 1.4401, 1.4404, 1.4578, 1.4571, 1.4439, 1.4362, 1.4062, 1.4662, 1.4462 acc. to EN 10088; property class 70 and 80 (A4-70 and A4-80) acc. to EN ISO 3506 Corrosion resistance class CRC III acc. to EN 1993-1-4:2006+A1:2015	Material 1.4565, 1.4529 acc. to EN 10088; property class 70 acc. to EN ISO 3506 Corrosion resistance class CRC V acc. to EN 1993-1-4:2006+A1:2015
Hexagon nut	Steel, property class 5 to 12, acc. to EN 898-2; zinc plated ≥ 5µm acc. to EN ISO 4042 or hot-dip galvanized ≥ 40 µm acc. to EN ISO 10684	Material 1.4401, 1.4404, 1.4578, 1.4439, 1.4462, 1.4571 acc. to EN 10088; property class 70 and 80 (A4-70 and A4-80) acc. to EN ISO 3506 Corrosion resistance class CRC III acc. to EN 1993-1-4:2006+A1:2015	Material 1.4529, 1.4565, 1.4547 acc. to EN 10088; property class 70 acc. to EN ISO 3506 Corrosion resistance class CRC V acc. to EN 1993-1-4:2006+A1:2015
Washer	Steel, acc. to EN ISO 7089; zinc plated ≥ 5µm acc. to EN ISO 4042 or hot-dip galvanized ≥ 40 µm acc. to EN ISO 10684	Material 1.4401, 1.4404, 1.4578, 1.4439, 1.4462, 1.4571 acc. to EN 10088; corresponding to anchor rod material Corrosion resistance class CRC III acc. to EN 1993-1-4:2006+A1:2015	Material 1.4529, 1.4565, 1.4547 acc. to EN 10088; corresponding to anchor rod material Corrosion resistance class CRC V acc. to EN 1993-1-4:2006+A1:2015

Commercial threaded rods (in the case of rods made of galvanized steel – rods with property class ≤ 8.8 only), with:

- material and mechanical properties according to Table A1,
- confirmation of material and mechanical properties by inspection certificate 3.1 according to EN-10204:2004; the documents shall be stored,
- marking of the threaded rod with the embedment depth.

Note: Commercial standard threaded rods made of galvanized steel with property class above 8.8 are not permitted in some Member States.

Table A2: Mortar

Product	**Composition**
TSC V Spin In Capsules	Bonding agent: resin Hardener: peroxide powder Additives: quartz sand

Specification of intended use

Anchors subject to:

Static and quasi-static loads: sizes M8 to M30.

Base material:

- Reinforced or unreinforced normal weight concrete of strength class C20/25 to C50/60 to EN 206:2013+A1:2016.
- Uncracked concrete for anchors sizes M8 to M30 and cracked concrete for anchors sizes M12 to M24.

Temperature ranges:

Installation temperature (temperature of substrate):

- -5°C to +40°C.

In-service temperature:

The anchorages may be used in the following temperature range:

- -40°C to +40°C (max. short term temperature +40°C and max. long term temperature +24°C).
- -40°C to +80°C (max. short term temperature +80°C and max. long term temperature +50°C).

Use conditions (environmental conditions):

- Structures subject to dry internal conditions: all materials.
- For all other conditions according to EN 1993-1-4 corresponding to corrosion resistance class (CRC): elements made of stainless steel.

Design:

- Anchorages under static or quasi-static loads are designed in accordance to EN 1992-4:2018 and EOTA Technical Report TR 055.
- Anchorages are designed under the responsibility of the 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.).

Installation:

- Dry or wet concrete (use category I1).
- Flooded holes (use category I2).
- Installation direction D3 (downward, horizontal and upwards installation).
- Rotary hammer drilled holes.

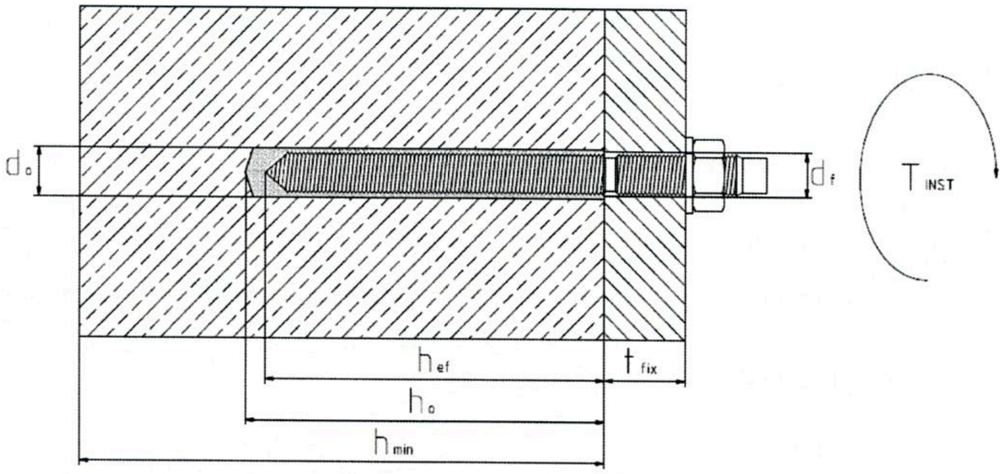


Table B1: Installation parameters

Size			M8	M10	M12	M16	M20	M24	M27	M30
Diameter of anchor rod	d	[mm]	8	10	12	16	20	24	27	30
Nominal drilling diameter	d_0	[mm]	10	12	14	18	24	28	32	35
Maximum diameter hole in the fixture	d_f	[mm]	12	14	16	20	26	30	28	37
Effective embedment depth	h_{ef}	[mm]	85	90	110	125	180	210	250	260
Depth of the drilling hole	h_0	[mm]	90	95	115	130	185	215	255	265
Minimum thickness of the concrete slab	h_{min}	[mm]	120	130	140	180	230	270	300	340
Installation torque	T_{inst}	[Nm]	10	20	40	80	120	200	250	300
Capsule length	L_c	[mm]	85	85	95	98	180	210	250	260
Capsule diameter	d_c	[mm]	9,25	10,75	12,75	16,75	21,50	23,50	27,00	30,00
Minimum spacing	s_{min}	[mm]	40	40	50	65	80	100	110	120
Minimum edge distance	c_{min}	[mm]	40	40	50	65	80	100	110	120

TSC V Spin In Capsules

Intended use
Installation parameters

Table B2: Minimum curing time

Mortar temperature [°C]	Concrete (substrate) temperature [°C]	Minimum curing time [1] [min.]
+ 15	-5	480
+ 15	0	240
+ 15	+5	150
+ 15	+10	120
+ 15	+15	90
+ 15	+20	45
+ 15	+30	20
+ 15	+40	10

[1] Minimum mortar temperature for installation +5°C; maximum mortar temperature for installation +25°C. For wet condition and flooded holes the curing time must be doubled.

Pump

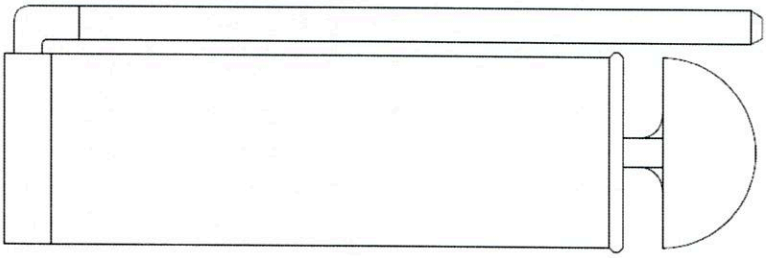


Table B3: Brush diameter

Size rod			M8	M10	M12	M16	M20	M24	M27	M30
d_b	Brush diameter	[mm]	12	14	16	20	26	30	35	37

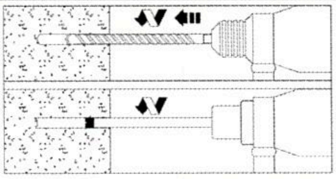
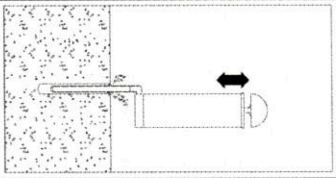
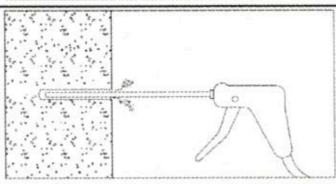
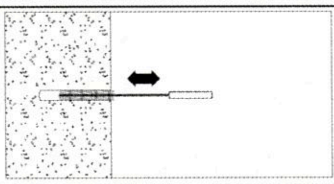
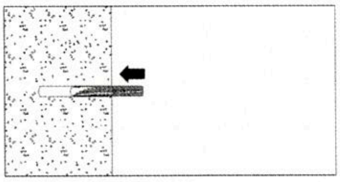
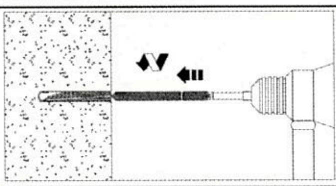
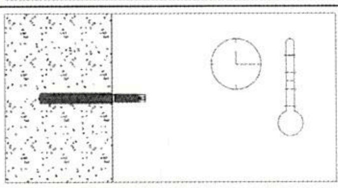
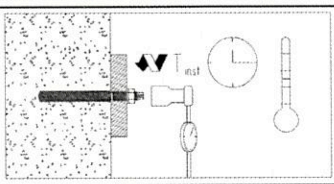
	1. Drill the correct diameter hole to the correct depth using a rotary percussion drill. Clean up the dust from the surface.
	2. Blow out the dust for 4 times with a hand pump or compressed air gun.
	3. Blow out the dust with 4 pumps of a hand pump or compressed air gun.
	4. Clean the hole 4 times with the correct size brush by inserting and removing the brush with a rotary action.
	5. Insert the capsule into the hole with the air gap nearest to the surface. In case of fixing in the ceiling, secure the capsule against falling out for example with adhesive tape.
	6. Attach the rod to the setting tool and drive it into the capsule using a rotary percussion drill.
	7. Remove any excess resin from the surface and leave for the correct curing time depending on temperature.
	8. Attach the fixture and tighten using a calibrated torque wrench. Do not exceed the recommended installation torque.

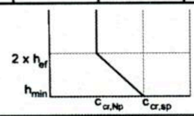
Table C1: Characteristic resistance under tension load in uncracked concrete – static and quasi-static loads

Size			M8	M10	M12	M16	M20	M24	M27	M30
Steel failure										
Steel failure with standard threaded rod grade 5.8										
Characteristic resistance	$N_{Rk,s}$	[kN]	18,3	29,0	42,1	78,5	122,5	176,5	229,5	280,5
Partial safety factor	γ_{Ms} [1]	[-]	1,25							
Steel failure with standard threaded rod grade 8.8										
Characteristic resistance	$N_{Rk,s}$	[kN]	29,3	46,4	67,4	125,6	196,0	282,4	367,2	448,8
Partial safety factor	γ_{Ms} [1]	[-]	1,25							
Steel failure with standard threaded rod grade 10.9										
Characteristic resistance	$N_{Rk,s}$	[kN]	36,6	58,0	84,3	157,0	245,0	353,0	459,0	561,0
Partial safety factor	γ_{Ms} [1]	[-]	1,50							
Steel failure with standard threaded rod grade 12.9										
Characteristic resistance	$N_{Rk,s}$	[kN]	43,9	69,6	101,2	188,4	294,0	423,6	550,8	673,2
Partial safety factor	γ_{Ms} [1]	[-]	1,50							
Steel failure with standard stainless steel threaded rod A4-70										
Characteristic resistance	$N_{Rk,s}$	[kN]	25,6	40,6	59,0	109,9	171,5	247,1	321,3	392,7
Partial safety factor	γ_{Ms} [1]	[-]	1,56							
Steel failure with standard stainless steel threaded rod A4-80										
Characteristic resistance	$N_{Rk,s}$	[kN]	29,3	46,4	67,4	125,6	196,0	282,4	367,2	448,8
Partial safety factor	γ_{Ms} [1]	[-]	1,33							
Steel failure with standard high corrosion threaded rod grade 70										
Characteristic resistance	$N_{Rk,s}$	[kN]	25,6	40,6	59,0	109,9	171,5	247,1	321,3	392,7
Partial safety factor	γ_{Ms} [1]	[-]	1,56							
Combined pull-out and concrete cone failure (working life 50 years)										
Characteristic bond resistance in uncracked concrete C20/25, working life 50 years										
Temperature range I: 40°C/24°C	$\tau_{Rk,ucr,50}$	[N/mm²]	10	10	10	10	10	10	7,5	7,5
Temperature range II: 80°C/50°C	$\tau_{Rk,ucr,50}$	[N/mm²]	10	10	10	10	10	10	7,5	7,5
Increasing factors	ψ_c	C30/37	1,04							
		C40/50	1,07							
		C50/60	1,10							

1) In the absence of national regulations

2) h – concrete member thickness

Table C1: (continuation)

Concrete cone failure										
Factor for uncracked concrete	$k_{ucr,N}$	[-]	11,0							
Edge distance	$c_{ucr,N}$	[mm]	$1{,}5 \cdot h_{ef}$							
Spacing	$s_{ucr,N}$	[mm]	$3{,}0\ h_{ef}$							
Splitting failure										
Edge distance	$c_{cr,sp}$ for h_{min}	[mm]	85	85	95	95	270	315	375	390
	$c_{cr,sp}$ for $h_{min} < h^{2)} < 2 \cdot h_{ef}$ ($c_{cr,sp}$ from linear interpolation)	[mm]								
	$c_{cr,sp}$ for $h^{2)} \geq 2 \cdot h_{ef}$	[mm]	$c_{cr,N}$							
Spacing	$s_{cr,sp}$	[mm]	$2 \cdot c_{cr,sp}$							
Installation safety factors for combined pull-out, concrete cone and splitting failure										
Installation safety factors for category I1	γ_{inst}	[-]	1,2							
Installation safety factors for category I2	γ_{inst}	[-]	1,4							

[1] In the absence of national regulations

[2] h – concrete member thickness

TSC V Spin In Capsules	**Annex C1** of European Technical Assessment ETA-21/1078
Performances Characteristic resistance under tension loads in uncracked concrete (2)	

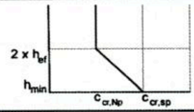
Table C2: Characteristic resistance under tension load in cracked concrete – static and quasi-static loads

Size			M12	M16	M20	M24
Steel failure						
Steel failure with standard threaded rod grade 5.8						
Characteristic resistance	$N_{Rk,s}$	[kN]	42,1	78,5	122,5	176,5
Partial safety factor	γ_{Ms} [1)	[-]	1,25			
Steel failure with standard threaded rod grade 8.8						
Characteristic resistance	$N_{Rk,s}$	[kN]	67,4	125,6	196,0	282,4
Partial safety factor	γ_{Ms} [1)	[-]	1,25			
Steel failure with standard threaded rod grade 10.9						
Characteristic resistance	$N_{Rk,s}$	[kN]	84,3	157,0	245,0	353,0
Partial safety factor	γ_{Ms} [1)	[-]	1,50			
Steel failure with standard threaded rod grade 12.9						
Characteristic resistance	$N_{Rk,s}$	[kN]	101,2	188,4	294,0	423,6
Partial safety factor	γ_{Ms} [1)	[-]	1,50			
Steel failure with standard stainless steel threaded rod A4-70						
Characteristic resistance	$N_{Rk,s}$	[kN]	59,0	109,9	171,5	247,1
Partial safety factor	γ_{Ms} [1)	[-]	1,56			
Steel failure with standard stainless steel threaded rod A4-80						
Characteristic resistance	$N_{Rk,s}$	[kN]	67,4	125,6	196,0	282,4
Partial safety factor	γ_{Ms} [1)	[-]	1,33			
Steel failure with standard high corrosion threaded rod grade 70						
Characteristic resistance	$N_{Rk,s}$	[kN]	59,0	109,9	171,5	247,1
Partial safety factor	γ_{Ms} [1)	[-]	1,56			
Combined pull-out and concrete cone failure (working life 50 years)						
Characteristic bond resistance in cracked concrete C20/25, working life 50 years						
Temperature range I: 40°C/24°C	$\tau_{Rk,cr,50}$	[N/mm²]	4	5	5	5
Temperature range II: 80°C/50°C	$\tau_{Rk,cr,50}$	[N/mm²]	4	5	5	5
Increasing factors	ψ_c	C30/37	1,04			
		C40/50	1,07			
		C50/60	1,10			

[1)] In the absence of national regulations
[2)] h – concrete member thickness

TSC V Spin In Capsules	Annex C2 of European Technical Assessment ETA-21/1078
Performances Characteristic resistance under tension loads in cracked concrete	

Table C2: (continuation)

Concrete cone failure						
Factor for cracked concrete	$k_{cr,N}$	[-]	7,7			
Edge distance	$c_{cr,N}$	[mm]	$1,5 \cdot h_{ef}$			
Spacing	$s_{cr,N}$	[mm]	$3,0\ h_{ef}$			
Splitting failure						
Edge distance	$c_{cr,sp}$ for h_{min}	[mm]	95	95	270	315
	$c_{cr,sp}$ for $h_{min} < h^{2)} < 2 \cdot h_{ef}$ ($c_{cr,sp}$ from linear interpolation)	[mm]				
	$c_{cr,sp}$ for $h^{2)} \geq 2 \cdot h_{ef}$	[mm]	$c_{cr,N}$			
Spacing	$s_{cr,sp}$	[mm]	$2 \cdot c_{cr,sp}$			
Installation safety factors for combined pull-out, concrete cone and splitting failure						
Installation safety factors for category I1	γ_{inst}	[-]	1,2			
Installation safety factors for category I2	γ_{inst}	[-]	1,4			

1) In the absence of national regulations

2) h – concrete member thickness

TSC V Spin In Capsules	**Annex C2** of European Technical Assessment ETA-21/1078
Performances Characteristic resistance under tension loads in cracked concrete (2)	

Table C3: Characteristic resistance under shear load – steel failure without lever arm

Size			M8	M10	M12	M16	M20	M24	M27	M30
Steel failure with standard threaded rod grade 5.8										
Characteristic resistance	$V^0_{Rk,s}$	[kN]	9,2	14,5	21,1	29,3	61,3	88,3	114,75	140,3
Partial safety factor	γ_{Ms}	[-]	1,25							
Ductility factor	k_7	[-]	0,8							
Steel failure with standard threaded rod grade 8.8										
Characteristic resistance	$V^0_{Rk,s}$	[kN]	14,6	23,2	33,7	62,8	98,0	141,2	183,6	224,4
Partial safety factor	γ_{Ms}	[-]	1,25							
Ductility factor	k_7	[-]	0,8							
Steel failure with standard threaded rod grade 10.9										
Characteristic resistance	$V_{Rk,s}$	[kN]	18,3	29,0	42,2	78,5	122,5	176,5	229,5	280,5
Partial safety factor	γ_{Ms}	[-]	1,50							
Ductility factor	k_7	[-]	0,8							
Steel failure with standard threaded rod grade 12.9										
Characteristic resistance	$V^0_{Rk,s}$	[kN]	22,0	34,8	50,6	94,2	147,0	211,8	275,4	336,6
Partial safety factor	γ_{Ms}	[-]	1,50							
Ductility factor	k_7	[-]	0,8							
Steel failure with standard stainless steel threaded rod A4-70										
Characteristic resistance	$V^0_{Rk,s}$	[kN]	12,8	20,3	29,5	55,0	85,8	123,6	160,65	196,3
Partial safety factor	γ_{Ms}	[-]	1,56							
Ductility factor	k_7	[-]	0,8							
Steel failure with standard stainless steel threaded rod A4-80										
Characteristic resistance	$V^0_{Rk,s}$	[kN]	14,6	23,2	33,7	62,8	98,0	141,2	183,6	224,4
Partial safety factor	γ_{Ms}	[-]	1,33							
Ductility factor	k_7	[-]	0,8							
Steel failure with high corrosion stainless steel threaded rod grade 70										
Characteristic resistance	$V^0_{Rk,s}$	[kN]	12,8	20,3	29,5	55,0	85,8	123,6	160,65	196,3
Partial safety factor	γ_{Ms}	[-]	1,56							
Ductility factor	k_7	[-]	0,8							

Table C4: Characteristic values for shear load – steel failure with lever arm

Size			M8	M10	M12	M16	M20	M24	M27	M30
Steel failure with standard threaded rod grade 5.8										
Characteristic resistance	$M^0_{Rk,s}$	[Nm]	18,7	37,4	65,5	166,5	324,5	561,3	832,2	1124,5
Partial safety factor	γ_{Ms}	[-]	1,25							
Steel failure with standard threaded rod grade 8.8										
Characteristic resistance	$M^0_{Rk,s}$	[Nm]	30,0	59,8	104,8	266,4	519,3	898,0	1331,5	1799,2
Partial safety factor	γ_{Ms}	[-]	1,25							
Steel failure with standard threaded rod grade 10.9										
Characteristic resistance	$M^0_{Rk,s}$	[Nm]	37,5	74,8	131,0	333,0	649,1	1122,6	1664,4	2249,0
Partial safety factor	γ_{Ms}	[-]	1,50							
Steel failure with standard threaded rod grade 12.9										
Characteristic resistance	$M^0_{Rk,s}$	[Nm]	45,0	89,7	157,2	399,6	778,9	1347,1	1997,3	2698,8
Partial safety factor	γ_{Ms}	[-]	1,50							
Steel failure with standard stainless steel threaded rod A4-70										
Characteristic resistance	$M^0_{Rk,s}$	[Nm]	26,2	52,3	91,7	233,1	454,4	785,8	1165,1	1574,3
Partial safety factor	γ_{Ms}	[-]	1,56							
Steel failure with standard stainless steel threaded rod A4-80										
Characteristic resistance	$M^0_{Rk,s}$	[Nm]	30,0	59,8	104,8	266,4	519,3	898,0	1331,5	1799,2
Partial safety factor	γ_{Ms}	[-]	1,33							
Steel failure with high corrosion stainless steel threaded rod grade 70										
Characteristic resistance	$M^0_{Rk,s}$	[Nm]	26,2	52,3	91,7	233,1	454,4	785,8	1165,1	1574,3
Partial safety factor	γ_{Ms}	[-]	1,56							

Table C5: Concrete pry out failure and concrete edge failure

Size			M8	M10	M12	M16	M20	M24	M27	M30
Pry out failure										
Pry-out factor	k_8	[-]	2,0							
Concrete edge failure										
Outside diameter of anchor	d_{nom}	[mm]	8	10	12	16	20	24	27	30
Effective length of anchor shear loading	l_f	[mm]	min (h_{ef}; $12d_{nom}$)							min (h_{ef}; 300)

Table C6: Displacement under tension load in uncracked concrete

Size			M8	M10	M12	M16	M20	M24	M27	M30
Characteristic displacement in uncracked C20/25 to C50/60 concrete										
Displacement [1)]	δ_{N0}	[mm]	0,35	0,40	0,45	0,45	0,50	0,55	0,55	0,60
	$\delta_{N\infty}$	[mm]	0,82	0,82	0,82	0,82	0,82	0,82	0,82	0,82

[1)] These values are suitable for each temperature range and categories specified in Annex B1
Calculation of the displacement: $\delta_{N0} = \delta_{N0}$-factor · N; $\delta_N = \delta_{N\infty}$-factor · N; (N – applied tension load)

Table C7: Displacement under shear load in uncracked concrete

Size			M8	M10	M12	M16	M20	M24	M27	M30
Characteristic displacement in uncracked C20/25 to C50/60 concrete										
Displacement [1)]	δ_{V0}	[mm]	2,5	2,5	2,5	2,5	2,5	2,5	2,5	2,5
	$\delta_{V\infty}$	[mm]	3,7	3,7	3,7	3,7	3,7	3,7	3,7	3,7

[1)] These values are suitable for each temperature range and categories specified in Annex B1
Calculation of the displacement: $\delta_{N0} = \delta_{N0}$-factor · V; $\delta_N = \delta_{N\infty}$-factor · V; (V – applied shear load)

Table C8: Displacement under tension load in cracked concrete

Size			M12	M16	M20	M24
Characteristic displacement in cracked C20/25 to C50/60 concrete						
Displacement [1)]	δ_{N0}	[mm]	0,50	0,60	0,70	0,70
	$\delta_{N\infty}$	[mm]	2,8	2,7	2,7	2,6

[1)] These values are suitable for each temperature range and categories specified in Annex B1
Calculation of the displacement: $\delta_{N0} = \delta_{N0}$-factor · N; $\delta_N = \delta_{N\infty}$-factor · N; (N – applied tension load)

Table C9: Displacement under shear load in cracked concrete

Size			M12	M16	M20	M24
Characteristic displacement in cracked C20/25 to C50/60 concrete						
Displacement [1)]	δ_{V0}	[mm]	2,5	2,5	2,5	2,5
	$\delta_{V\infty}$	[mm]	3,7	3,7	3,7	3,7

[1)] These values are suitable for each temperature range and categories specified in Annex B1
Calculation of the displacement: $\delta_{N0} = \delta_{N0}$-factor · V; $\delta_N = \delta_{N\infty}$-factor · V; (V – applied shear load)