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European Technical Assessment

ETA-21/0166 of 11/03/2021

General Part

Technical Assessment Body issuing the European Technical Assessment	Instytut Techniki Budowlanej
Trade name of the construction product	R-KER / RV200 R-KER-W / RV200-W R-KER-S / RV200-S
Product family to which the construction product belongs	Bonded fasteners for use in concrete
Manufacturer	RAWLPLUG S.A. ul. Kwidzyńska 6 51-416 Wrocław Poland
Manufacturing plant	Manufacturing Plant no. 3
This European Technical Assessment contains	17 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”

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 should be identified as such.

Specific Part

1 Technical description of the product

The R-KER / RV200, R-KER-W / RV200-W and R-KER-S / RV200-S are a bonded anchors (injection type) consisting of an injection mortar cartridge using an applicator gun equipped with a special mixing nozzle and steel element. The steel element consist of threaded rod of the sizes M8 to M30, made of:
- galvanized carbon steel,
- stainless steel
- high corrosion resistant stainless steel,

with hexagon nut and washer.

The steel element is placed into a drilled hole previously injected (using an applicator gun) with a mortar with a slow and slight twisting motion. The steel element is anchored by the bond between steel element, mortar and concrete.

The threaded rods are available for all diameters with three type of tip end: a one side 45° chamfer, a two sides 45° chamfer or a flat. The threaded rods are either delivered with the mortar cartridges or commercial threaded rods purchased separately. The mortar cartridges are available in different sizes and types.

Description of the products are given in Annex A.

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

The performances given in clause 3 are only valid if the fasteners are used in compliance with the specifications and conditions given in Annex B.

The performances given in this European Technical Assessment are based on an assumed working life of the product of 50 and/or 100 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 Performance of the product

3.1.1 Mechanical resistance and stability (BWR 1)

Essential characteristic	Performance
Characteristic resistance to tension load and shear load (static and quasi static loading), displacements	See Annex 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 of the products has been made in accordance with the EAD 330499-01-0601.

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

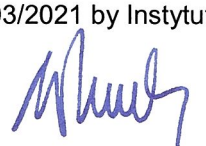
According to Decision 96/582/EC of the European Commission the system 1 of assessment and verification of constancy of performance (see Annex V to regulation (EU) No 305/2011) applies.

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

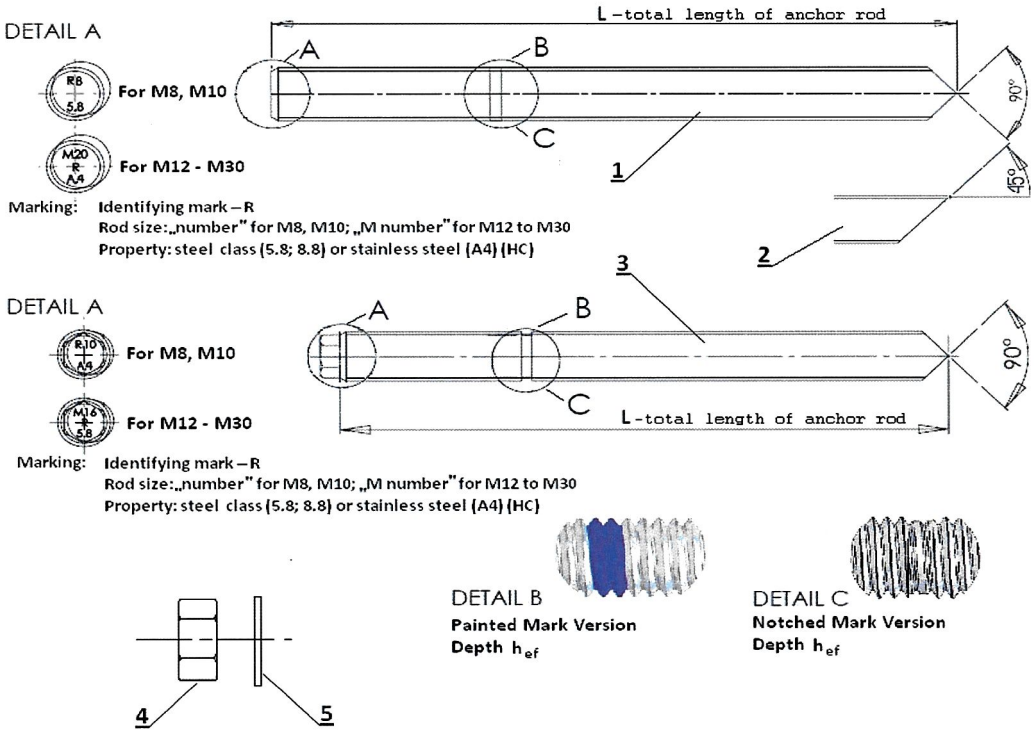
Technical details necessary for the implementation of the AVCP system are laid down in the control plan deposited at Instytut Techniki Budowlanej.

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.

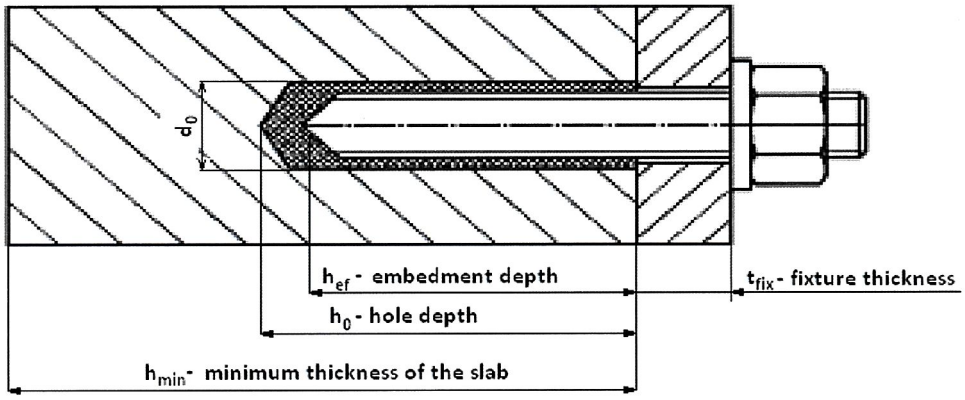
Issued in Warsaw on 11/03/2021 by Instytut Techniki Budowlanej



Anna Panek, MSc
Deputy Director of ITB



1. Anchor rod R-STUDS–(88),(A4),(HC)-FL
2. 45° shape with anchor rod
3. Anchor rod R-STUDS–(88),(A4),(HC) with the hexagonal tip
4. Hexagonal nut
5. Washer



R-KER / RV200, R-KER-W / RV200-W and R-KER-S / RV200-S	**Annex A1** of European Technical Assessment ETA-21/0166
Product description Steel elements	

Table A1: Threaded rods

Part	Material		
	Steel, zinc plated	**Stainless steel**	**High corrosion resistance stainless steel (HCR)**
Threaded rod	Steel, property class 5.8 to 12.9, acc. to EN ISO 898-1; electroplated ≥ 5 µm acc. to EN ISO 4042 or hot-dip galvanized ≥ 45 µm acc. to EN ISO 10684	Material 1.4401, 1.4404, 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
Hexagon nut	Steel, property class 5 to 12, acc. to EN 20898-2; electroplated ≥ 5 µm acc. to EN ISO 4042 or hot-dip galvanized ≥ 45 µm acc. to EN ISO 10684	Material 1.4401, 1.4404, 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; electroplated ≥ 5 µm acc. to EN ISO 4042 or hot-dip galvanized ≥ 45 µm acc. to EN ISO 10684	Material 1.4401, 1.4404, 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 – standard 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.

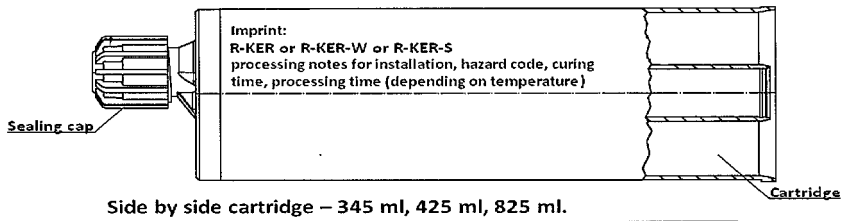
Note: Commercial threaded rods made of galvanized steel with property class above 8.8 are not permitted in some Member States.

Table A2: Injection mortars

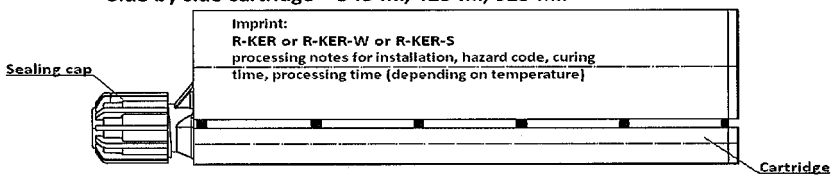
Product	Composition
R-KER / RV200 R-KER-W / RV200-W R-KER-S / RV200-S	Bonding agent: vinylester styrene free resin Hardener: dibenzoyl peroxide Additive: quartz sand (filler)

R-KER / RV200, R-KER-W / RV200-W and R-KER-S / RV200-S	**Annex A2** of European Technical Assessment ETA-21/0166
Product description Materials	

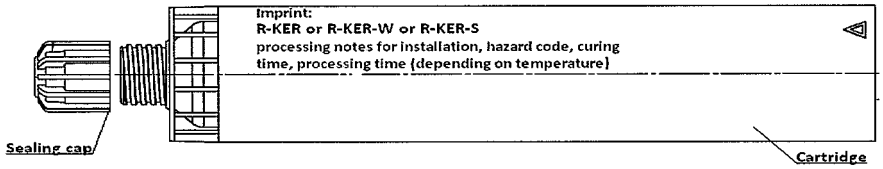
Coaxial cartridge –
150 ml, 280 ml, 300 ml, 310 ml, 330 ml, 380 ml, 400 ml, 410 ml, 420 ml.



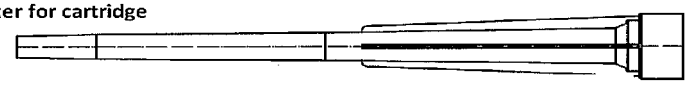
Side by side cartridge – 345 ml, 425 ml, 825 ml.



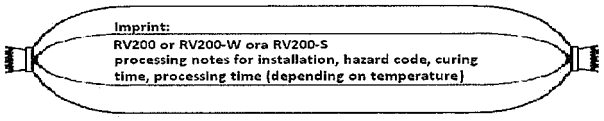
Cartridge a single component for two part foil capsules –
150 ml, 175 ml, 280ml, 300 ml, 310 ml, 380 ml, 400 ml, 550 ml, 600 ml.



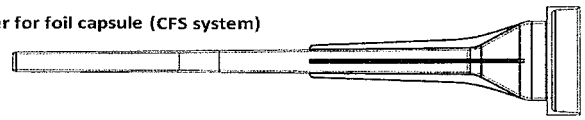
Mixer for cartridge



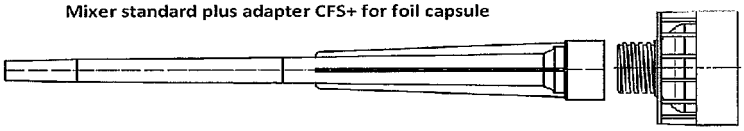
Foil capsule (CFS system) –
150 ml, 175 ml, 280ml, 300 ml, 310 ml, 380 ml, 400 ml, 550 ml, 600 ml.



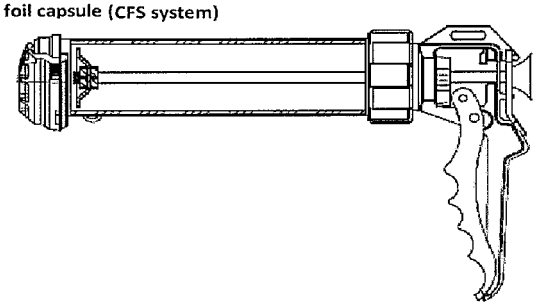
Mixer for foil capsule (CFS system)



Mixer standard plus adapter CFS+ for foil capsule



Gun for foil capsule (CFS system)



R-KER / RV200, R-KER-W / RV200-W and R-KER-S / RV200-S	**Annex A3** of European Technical Assessment ETA-21/0166
Product description Cartridge types and sizes	

Specification of intended use

Anchorages subject to:

Static and quasi-static loading: sizes from M8 to M30.

Base material:

- Reinforced or unreinforced normal weight concrete of strength class C20/25 – C50/60 according to EN 206:2013+A1:2016.
- Uncracked concrete: sizes from M8 to M30.
- Cracked concrete: sizes from M12 to M24.

Temperature range:

Installation temperature (temperature of substrate):

- -5°C to +40°C in case of R-KER / RV200.
- -20°C to +20°C in case of R-KER-W / RV200-W.
- -5°C to +50°C in case of R-KER-S / RV200-S.

In-service temperature:

- -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 1993-1-4:2006+A1:2015 corresponding to corrosion resistance class (CRC): elements made of stainless steel or high corrosion resistance steel (HCR).

Design:

- Anchorages under static or quasi-static loads are designed in accordance to EN 1992-4:2018 and EOTA Technical Report TR 055.
- Anchors 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): sizes from M8 to M30.
- Flooded holes with the exception of seawater (use category I2): sizes from M8 to M30.
- Installation direction D2 (downward and horizontal installation): sizes from M8 to M30.
- The fasteners are suitable for rotary hammer drilled holes: sizes from M8 to M30.

Table B1: Installation parameters

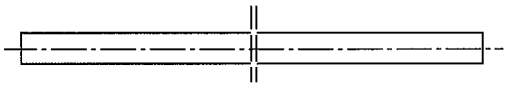
Size		**M8**	**M10**	**M12**	**M16**	**M20**	**M24**	**M30**
Diameter of anchor rod	d [mm]	8	10	12	16	20	24	30
Nominal drilling diameter	d_0 [mm]	10	12	14	18	24	28	35
Maximum diameter hole in the fixture	d_{fix} [mm]	9	12	14	18	22	26	33
Effective embedment depth	$h_{ef,min}$ [mm]	60	70	80	100	120	140	165
	$h_{ef,max}$ [mm]	160	200	240	320	400	480	600
Depth of the drilling hole	h_0 [mm]	h_{ef} + 5 mm						
Minimum thickness of the concrete member	h_{min} [mm]	h_{ef} + 30 mm; ≥ 100 mm			$h_{ef} + 2 \cdot d_0$			
Maximum installation torque	$T_{inst, max}$ [Nm]	10	20	40	80	120	180	300
Minimum spacing	s_{min} [mm]	40	40	40	50	60	70	85
Minimum edge distance	c_{min} [mm]	40	40	40	50	60	70	85

Table B2: Maximum processing time and minimum curing time

Mortar temperature	Concrete temperature	Maximum processing (open) time			Minimum curing time [1]		
		R-KER /..	R-KER-W / ..	R-KER-S / ..	R-KER /..	R-KER-W / ..	R-KER-S / ..
+5°C	-20°C	-	100 min.	-	-	24 h	-
+5°C	-15°C	-	60 min.	-	-	16 h	-
+5°C	-10°C	-	30 min.	-	-	8 h	-
+5°C	-5°C	60 min.	16 min.	65 min.	6 h	4 h	24 h
5°C	0°C	40 min.	12 min.	-	3 h	2 h	-
5°C	5°C	20 min.	8 min.	35 min.	2 h	1 h	12 h
10°C	10°C	12 min.	5 min.	20 min.	80 min.	45 min.	8 h
15°C	15°C	8 min.	3 min.	12 min.	60 min.	30 min.	6 h
20°C	20°C	5 min.	2 min.	9 min.	45 min.	10 min.	4 h
25°C	25°C	-	-	7 min.	-	-	3 h
25°C	30°C	2 min.	-	6 min.	20 min.	-	2 h
25°C	40°C	0,5 min.	-	5 min.	10 min.	-	45 min.
25°C	45°C	-	-	3 min.	-	-	35 min.
25°C	50°C	-	-	3 min.	-	-	25 min.

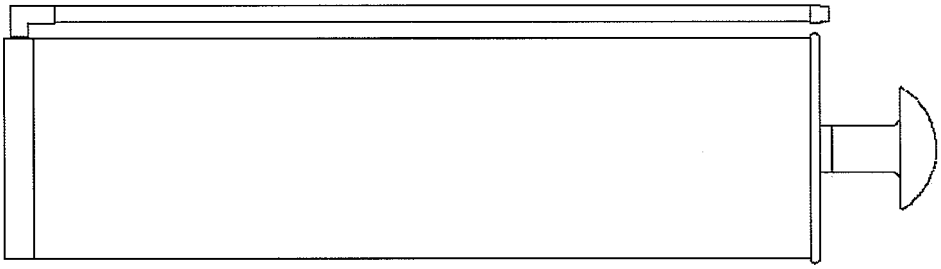
[1] Minimum resin temperature for installation +5°C; maximum resin temperature for installation +25°C. For wet condition and flooded holes the curing time must be doubled.

Additional mixer extension



*Variable length from 300mm up to 1000mm.

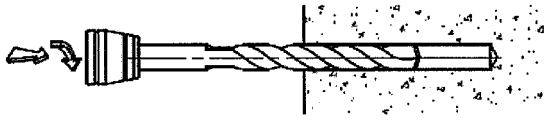
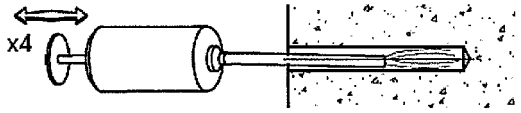
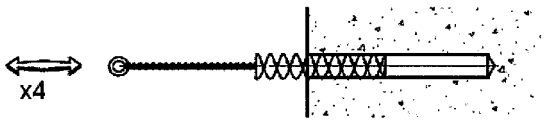
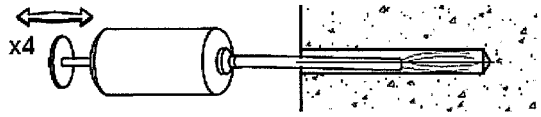
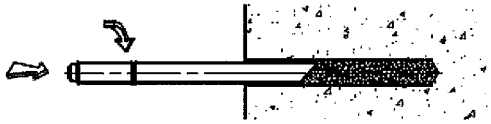
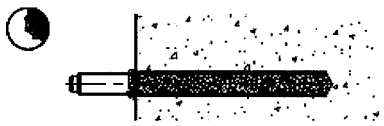
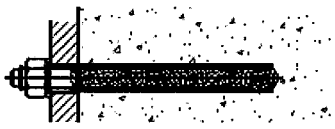
Manual blower pump



Steel brush

Brush diameter

Size rod	M8	M10	M12	M16	M20	M24	M30
Brushes diameter d_b (mm)	12	14	16	20	26	30	37

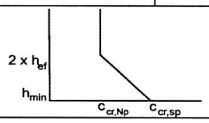
	Drill a hole to the required diameter and depth using a rotary hammer drilling machine.
	Starting from the drill hole bottom blow the hole at least 4 times using the hand pump.
	Using the specified brush, mechanically brush out the hole at least 4 times.
	Starting from the drill hole bottom, blow at least 4 times with the hand pump.
	Insert the mixing nozzle to the far end of the hole and inject the mortar, slowly withdrawing the nozzle as the hole is filled to 2/3 of its' depth.
	Immediately insert the rod, slowly and with a slight twisting motion. Remove excess of mortar around the hole before it sets.
	Leave the fixing undisturbed until the cure time elapses.
	Attach fixture and tighten the nut. The applied installation torque cannot exceed $T_{inst,max}$.

R-KER / RV200, R-KER-W / RV200-W and R-KER-S / RV200-S	**Annex B5** of European Technical Assessment ETA-21/0166
Intended use Installation instruction	

Table C1: Characteristic resistance under tension loads

Size			M8	M10	M12	M16	M20	M24	M30
Steel failure									
Steel failure with threaded rod grade 5.8									
Characteristic resistance	$N_{Rk,s}$	[kN]	18	29	42	78	122	176	280
Partial safety factor	$\gamma_{Ms,N}$ [1)]	[-]	1,50						
Steel failure with threaded rod grade 8.8									
Characteristic resistance	$N_{Rk,s}$	[kN]	29	46	67	126	196	282	449
Partial safety factor	$\gamma_{Ms,N}$ [1)]	[-]	1,50						
Steel failure with threaded rod grade 10.9									
Characteristic resistance	$N_{Rk,s}$	[kN]	37	58	84	157	245	353	561
Partial safety factor	$\gamma_{Ms,N}$ [1)]	[-]	1,40						
Steel failure with threaded rod grade 12.9									
Characteristic resistance	$N_{Rk,s}$	[kN]	44	70	101	188	294	424	673
Partial safety factor	$\gamma_{Ms,N}$ [1)]	[-]	1,40						
Steel failure with stainless steel threaded rod A4-70									
Characteristic resistance	$N_{Rk,s}$	[kN]	26	41	59	110	171	247	393
Partial safety factor	$\gamma_{Ms,N}$ [1)]	[-]	1,87						
Steel failure with stainless steel threaded rod A4-80									
Characteristic resistance	$N_{Rk,s}$	[kN]	29	46	67	126	196	282	449
Partial safety factor	$\gamma_{Ms,N}$ [1)]	[-]	1,60						
Steel failure with high corrosion threaded rod grade 70									
Characteristic resistance	$N_{Rk,s}$	[kN]	26	41	59	110	171	247	393
Partial safety factor	$\gamma_{Ms,N}$ [1)]	[-]	1,87						
Combined pull-out and concrete cone failure for a working life of 50 years									
Characteristic bond resistance in uncracked concrete C20/25									
Temperature range I: 24°C / 40°C	$\tau_{Rk,ucr,50}$	[N/mm²]	13	13	13	11	9,5	9	7
Temperature range II: 50°C / 80°C	$\tau_{Rk,ucr,50}$	[N/mm²]	10	11	10	9	7,5	7	5,5
Characteristic bond resistance in cracked concrete C20/25									
Temperature range I: 24°C / 40°C	$\tau_{Rk,cr,50}$	[N/mm²]	-	-	6,5	4,5	4	4	-
Temperature range II: 50°C / 80°C	$\tau_{Rk,cr,50}$	[N/mm²]	-	-	5,5	4	3	3	-
Influence factors									
Increasing factor	Ψ_c	C30/37	1,04						
		C40/50	1,07						
		C50/60	1,09						
Sustained load factor	Ψ^0_{sus}	24°C/40°C	0,82						
		50°C/80°C	0,87						
Combined pull-out and concrete cone failure for a working life of 100 years									
Characteristic bond resistance in uncracked concrete C20/25									
Temperature range I: 24°C / 40°C	$\tau_{Rk,ucr,100}$	[N/mm²]	12	12	12	10	9	8,5	6,5
Temperature range II: 50°C / 80°C	$\tau_{Rk,ucr,100}$	[N/mm²]	10	10	10	8	7	7	5,5
Characteristic bond resistance in cracked concrete C20/25									
Temperature range I: 24°C / 40°C	$\tau_{Rk,cr,100}$	[N/mm²]	-	-	6	4,5	4	3,5	-
Temperature range II: 50°C / 80°C	$\tau_{Rk,cr,100}$	[N/mm²]	-	-	5	3,5	3	2,5	-
Influence factor									
Increasing factor	Ψ_c	C30/37	1,04						
		C40/50	1,07						
		C50/60	1,09						

Table C1: (continuation)

Size			**M8**	**M10**	**M12**	**M16**	**M20**	**M24**	**M30**
Concrete cone failure									
Factor for uncracked concrete	k_{ucr}	[-]	11,0						
Factor for cracked concrete	k_{cr}	[-]	7,7						
Edge distance	$c_{cr,N}$	[mm]	$1,5 \cdot h_{ef}$						
Spacing	$s_{cr,N}$	[mm]	$3,0 \cdot h_{ef}$						
Splitting failure									
Edge distance	$c_{cr,sp}$ for h_{min}	[mm]	$2,5 \cdot h_{ef}$		$2,0 \cdot h_{ef}$		$1,5 \cdot h_{ef}$		
	$c_{cr,sp}$ 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]	$c_{cr,Np}$						
Spacing	$s_{cr,sp}$	[mm]	$2,0 \cdot c_{cr,sp}$						
Installation safety factor for combined pull-out, concrete cone and splitting failure									
Installation safety factor for category I1 + I2	γ_{inst}	[-]	1,2						1,4

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

Table C2: Characteristic resistance under shear loads for steel failure without lever arm

Size			**M8**	**M10**	**M12**	**M16**	**M20**	**M24**	**M30**
Steel failure with threaded rod grade 5.8									
Characteristic resistance	$V^0_{Rk,s}$	[kN]	9	14	21	39	61	88	140
Partial safety factor	γ_{Ms}	[-]	1,25						
Ductility factor	k_7	[-]	0,8						
Steel failure with threaded rod grade 8.8									
Characteristic resistance	$V^0_{Rk,s}$	[kN]	15	23	34	63	98	141	224
Partial safety factor	γ_{Ms}	[-]	1,25						
Ductility factor	k_7	[-]	0,8						
Steel failure with threaded rod grade 10.9									
Characteristic resistance	$V^0_{Rk,s}$	[kN]	18	29	42	78	122	176	280
Partial safety factor	γ_{Ms}	[-]	1,50						
Ductility factor	k_7	[-]	0,8						
Steel failure with threaded rod grade 12.9									
Characteristic resistance	$V^0_{Rk,s}$	[kN]	22	35	51	94	147	212	337
Partial safety factor	γ_{Ms}	[-]	1,50						
Ductility factor	k_7	[-]	0,8						
Steel failure with stainless steel threaded rod A4-70									
Characteristic resistance	$V^0_{Rk,s}$	[kN]	13	20	29	55	86	124	196
Partial safety factor	γ_{Ms}	[-]	1,56						
Ductility factor	k_7	[-]	0,8						
Steel failure with stainless steel threaded rod A4-80									
Characteristic resistance	$V^0_{Rk,s}$	[kN]	15	23	34	63	98	141	224
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]	13	20	29	55	86	124	196
Partial safety factor	γ_{Ms}	[-]	1,56						
Ductility factor	k_7	[-]	0,8						

Table C3: Characteristic resistance under shear loads for steel failure with lever arm

Size			M8	M10	M12	M16	M20	M24	M30
Steel failure with threaded rod grade 5.8									
Characteristic resistance	$M^0_{Rk,s}$	[Nm]	19	37	65	166	324	561	1124
Partial safety factor	γ_{Ms} [1)]	[-]	1,25						
Steel failure with threaded rod grade 8.8									
Characteristic resistance	$M^0_{Rk,s}$	[Nm]	30	60	105	266	519	898	1799
Partial safety factor	γ_{Ms} [1)]	[-]	1,25						
Steel failure with threaded rod grade 10.9									
Characteristic resistance	$M^0_{Rk,s}$	[Nm]	37	75	131	333	649	1123	2249
Partial safety factor	γ_{Ms} [1)]	[-]	1,50						
Steel failure with threaded rod grade 12.9									
Characteristic resistance	$M^0_{Rk,s}$	[Nm]	45	90	157	400	779	1347	2699
Partial safety factor	γ_{Ms} [1)]	[-]	1,50						
Steel failure with stainless steel threaded rod A4-70									
Characteristic resistance	$M^0_{Rk,s}$	[Nm]	26	52	92	233	454	786	1574
Partial safety factor	γ_{Ms} [1)]	[-]	1,56						
Steel failure with stainless steel threaded rod A4-80									
Characteristic resistance	$M^0_{Rk,s}$	[Nm]	30	60	105	266	519	898	1799
Partial safety factor	γ_{Ms} [1)]	[-]	1,33						
Steel failure with high corrosion stainless steel threaded rod grade 70									
Characteristic resistance	$M^0_{Rk,s}$	[Nm]	26	52	92	233	454	786	1574
Partial safety factor	γ_{Ms} [1)]	[-]	1,56						

[1)] In the absence of national regulation

Table C4: Characteristic values for shear loads – pry out and concrete edge failure

Size			M8	M10	M12	M16	M20	M24	M30
Pry-out failure									
Pry-out factor	k_8	[-]	2	2	2	2	2	2	2
Concrete edge failure									
Outside diameter of anchor	d_{nom}	[mm]	8	10	12	16	20	24	30
Effective length of anchor under shear loading	l_f	[mm]	$l_f = h_{ef}$ and $\leq 12\ d_{nom}$						$l_f = h_{ef}$ and $\leq$ max ($8 \cdot d_{nom}$; 300 mm)

Table C5: Displacement under tension loads – uncracked concrete

Size			M8	M10	M12	M16	M20	M24	M30
Characteristic displacement in uncracked concrete C20/25 to C50/60 under tension loads									
Displacement [1]	δ_{N0}	[mm]	0,25	0,35	0,40	0,40	0,45	0,50	0,50
	$\delta_{N\infty}$	[mm]	0,60	0,60	0,60	0,60	0,60	0,60	0,60
[1] These values are suitable for each temperature range and categories specified in Annex B1 Calculation of the displacement: $\delta_{N0} = \delta_{N0\text{-factor}} \cdot N$; $\delta_N = \delta_{N\infty\text{-factor}} \cdot N$; (N – applied tension load)									

Table C6: Displacement under tension loads – cracked concrete

Size			M12	M16	M20	M24
Characteristic displacement in cracked concrete C20/25 to C50/60 under tension loads						
Displacement [1]	δ_{N0}	[mm]	0,10	0,30	0,30	0,32
	$\delta_{N\infty}$	[mm]	2,6	2,9	3,0	3,1
[1] These values are suitable for each temperature range and categories specified in Annex B1 Calculation of the displacement: $\delta_{N0} = \delta_{N0\text{-factor}} \cdot N$; $\delta_N = \delta_{N\infty\text{-factor}} \cdot N$; (N – applied tension load)						

Table C7: Displacement under shear loads

Size			M8	M10	M12	M16	M20	M24	M30
Characteristic displacement under shear loads									
Displacement [1]	δ_{V0}	[mm]	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
[1] These values are suitable for each temperature range and categories specified in Annex B1 Calculation of the displacement: $\delta_{N0} = \delta_{N0\text{-factor}} \cdot V$; $\delta_N = \delta_{N\infty\text{-factor}} \cdot V$; (V – applied shear load)									