

The bonded anchor for cracked concrete with threaded rod RG M without drill hole cleaning



Crash barriers



Collision protection

VERSIONS

- Zinc-plated steel
- Stainless steel
- Highly corrosion-resistant steel
- Hot-dip galvanised steel

BUILDING MATERIALS

Approved for:

- Concrete C20/25 to C50/60, cracked and non-cracked

Also suitable for:

- Natural stone with dense structure

ASSESSMENT/APPROVAL



Option 1 for cracked concrete

ADVANTAGES

- RM II is the first bonded anchor with threaded rod RG M for cracked and non-cracked concrete that does not require drill hole cleaning. This allows for a rapid working progress and an economic installation.
- Moreover, there is a reduced exposition to drill dust on the building site. This increases the safety for the user.
- The pre-portioned resin capsule is easy to install and especially suitable for individual applications and overhead installations.

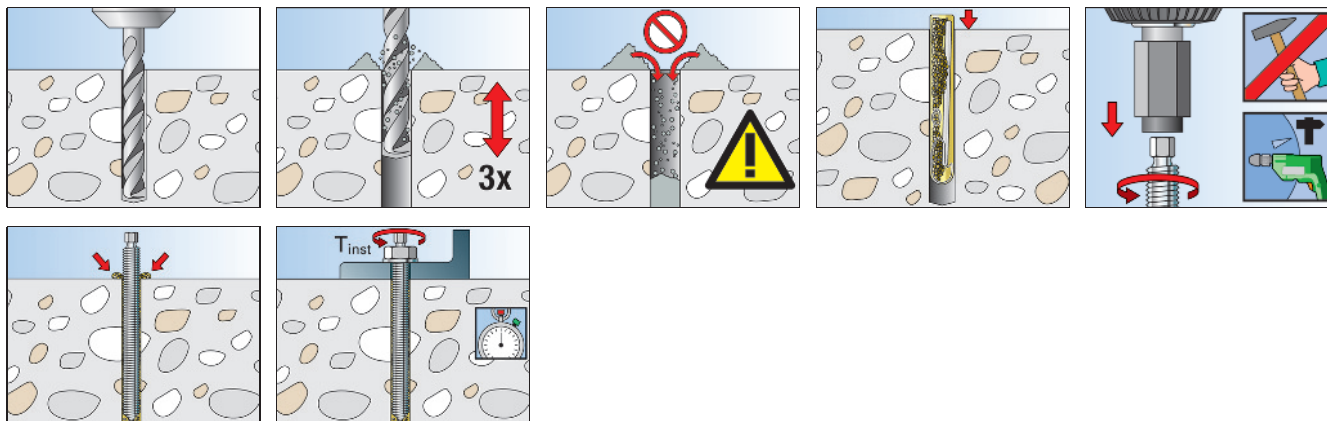
APPLICATIONS

- Steel constructions
 - Guard rails
 - Staircases
 - Column bases
 - Machines
 - Masts
- Ideal for:**
- Overhead installations
 - Water-filled drill holes

FUNCTIONING

- The resin anchor RM II is suitable for pre-positioned installation when combined with the threaded rod RG M.
- The 2-component resin capsule RM II contains styrene-free vinyl ester resin and hardener.
- The threaded rod RG M is set using a hammer drill and the accompanying setting tool in rotating and hitting motions.
- During setting, the oblique edge of the RG M destroys the capsule, and mixes and activates the mortar.
- The mortar bonds the entire surface of the threaded rod with the drill hole wall and seals the drill hole.

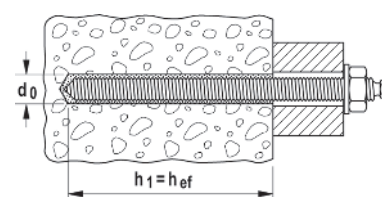
INSTALLATION



TECHNICAL DATA



RM II



Item	Art.-No.	Approval ETA	Drill hole diameter d_0 [mm]	Min. drill hole depth h_1 [mm]	Effect. anchorage depth h_{ef} [mm]	Suitable for anchor rod	Sales unit [pcs]
RM II 8	539796	■	10	80	80	RG M 8	10
RM II 10	539797	■	12	90	90	RG M 10	10
RM II 12	539798	■	14	110	110	RG M 12	10
RM II 14	539799	—	16	120	120	RG M 14	10
RM II 16	539800	■	18	125	125	RG M 16	10
RM II 20/22	539802 1)	■	25	170 / 190	170 / 190	RG M 20 / RG M 22	10
RM II 24	539803	■	28	210	210	RG M 24	5

1) RM II 20/22 in combination with RG M 22 and effect. anchorage depth of 190 mm is not part of the assessment.

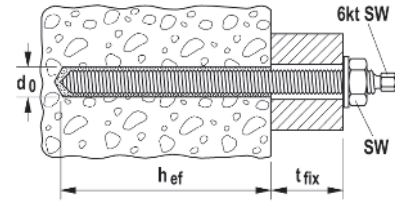
CURING TIME

Temperature at anchoring base	Curing time
-15 °C - -10 °C	30 hrs.
- 9 °C - - 5 °C	16 hrs.
- 4 °C - ± 0 °C	10 hrs.
+ 1 °C - + 5 °C	45 min.
+ 6 °C - +10 °C	30 min.
+11 °C - +20 °C	20 min.
+21 °C - +30 °C	5 min.
+31 °C - +40 °C	3 min.

TECHNICAL DATA



Threaded rod **RG M**



Chemical fixings

3

	zinc plated, steel grade 5.8	zinc plated, steel grade 8.8	stainless steel	Approval	Drill hole diameter d ₀ [mm]	Effect. anchorage depth h _{ef} [mm]	Max. fixture thickness t _{fix} [mm]	Hexagon drive 6kt SW [mm]	Hexagon nut ○ SW [mm]	Fits capsules	Sales unit [pcs]
Item	gvz	gvz	A4	ETA							
RG M 8 x 110	050256	—	050263	■	10	80	14	5	13	539796 RM II 8	10
RG M 8 x 150	095698	519443	050293	■	10	80	54	5	13	539796 RM II 8	10
RG M 10 x 130	050257	—	050264	■	12	90	20	7	17	539797 RM II 10	10
RG M 10 x 165	050280	—	050294	■	12	90	55	7	17	539797 RM II 10	10
RG M 10 x 190	050281	—	050296	■	12	90	80	7	17	539797 RM II 10	10
RG M 10 x 220	—	519444	—	■	12	90	110	7	17	539797 RM II 10	10
RG M 10 x 250	095703	—	095701	■	12	90	140	7	17	539797 RM II 10	10
RG M 10 x 350	—	—	095709	■	12	90	240	7	17	539797 RM II 10	10
RG M 10 x 350	095718	—	—	■	12	90	240	—	17	539797 RM II 10	10
RG M 12 x 160	050258	—	050265	■	14	110	26	8	19	539798 RM II 12	10
RG M 12 x 200	—	—	050576 2)	■	14	150	26	8	19	539798 RM II 12	10
RG M 12 x 220	050283	—	050297	■	14	110	86	8	19	539798 RM II 12	10
RG M 12 x 250	050284	—	095702	■	14	110	116	8	19	539798 RM II 12	10
RG M 12 x 300	050285	—	095705	■	14	110	166	8	19	539798 RM II 12	10
RG M 12 x 380	095720 3)	—	095710 1)	■	14	110	246	8	19	539798 RM II 12	10
RG M 14 x 170	050286	—	—	—	16	120	38	10	22	539799 RM II 14	10
RG M 16 x 165	050287	—	095704	■	18	125	8	12	24	539800 RM II 16	10
RG M 16 x 190	050259	—	050266	■	18	125	33	12	24	539800 RM II 16	10
RG M 16 x 250	050288	—	050298	■	18	125	93	12	24	539800 RM II 16	10
RG M 16 x 270	—	519446	—	■	18	125	113	12	24	539800 RM II 16	10
RG M 16 x 300	050289	—	050299	■	18	125	143	12	24	539800 RM II 16	10
RG M 16 x 380	095722 3)	—	095712 1)	■	18	125	223	—	24	539800 RM II 16	10
RG M 16 x 500	095723 3)	—	095713 1)	■	18	125	343	—	24	539800 RM II 16	10
RG M 20 x 260	050260	—	050267	■	25	170	54	12	30	539802 RM II 20/22	10
RG M 20 x 290	—	519447	—	■	25	170	84	12	30	539802 RM II 20/22	10
RG M 20 x 350	095707	—	095706	■	25	170	124	12	30	539802 RM II 20/22	10
RG M 20 x 500	095725 1)	—	—	■	25	170	294	—	30	539802 RM II 20/22	10
RG M 22 x 280	512252 1)	—	—	—	30	190	65	—	32	539802 RM II 20/22	5
RG M 24 x 295	—	519448 1)	—	■	28	210	56	—	36	539803 RM II 24	10
RG M 24 x 300	050261 1)	—	050268 1)	■	28	210	61	—	36	539803 RM II 24	10
RG M 24 x 400	095727 1)	—	095715 1)	■	28	210	161	—	36	539803 RM II 24	10
RG M 24 x 600	095728	—	—	■	28	210	361	—	36	539803 RM II 24	5

1) Straight cut, additional setting tool required.

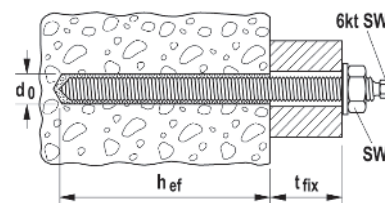
2) Delivery time on request.

3) Straight cut, setting tool is enclosed.

TECHNICAL DATA



Threaded rod **RG M**



	highly corrosion resistant steel	hot-dip galvanised steel	Approval	Drill hole diameter	Effect. anchorage depth	Max. fixture thickness	Hexagon drive	Hexagon nut	Fits capsules	Sales unit
	Art.-No.	Art.-No.	ETA	d_0 [mm]	h_{ef} [mm]	t_{fix} [mm]	6kt SW [mm]	○ SW [mm]		[pcs]
Item	C	fvz								
RG M 10 x 130	096217 ¹⁾	—	■	12	90	20	7	17	539797 RM II 10	10
RG M 12 x 160	096218 ¹⁾	512247	■	14	110	25	8	19	539798 RM II 12	10
RG M 16 x 165	—	537062	—	18	125	8	12	24	539800 RM II 16	10
RG M 16 x 190	096219 ¹⁾	512250	■	18	125	35	12	24	539800 RM II 16	10

¹⁾ Delivery time on request.

ACCESSORIES



Machine setting tool **RA-SDS**



Adapter **SDS plus 1/2" VK**



Adapter **SDS max 1/2" VK**



Adapter **SK SW 8 1/2" VK**



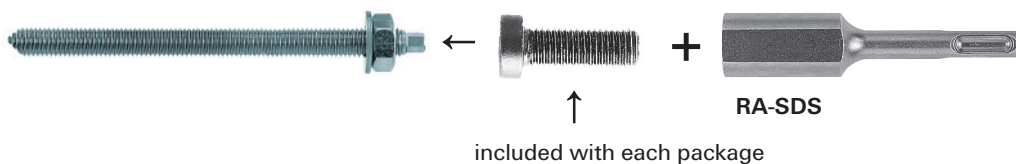
Adapter **SDS max 3/4" VK**

Item	Art.-No.	Match	Sales unit [pcs]
RA-SDS	062420	Adapter suitable fits set screw	1
SK SW 8 1/2	001536	Adapter suitable fits threaded rods M8 - M22	1
SDS plus 1/2	001537	Adapter suitable fits threaded rods M8 - M16	1
SDS max 1/2	001538	Adapter suitable fits threaded rods M16 - M20	1
SDS max 3/4	001539	Adapter suitable fits threaded rods M20 - M30	1

SETTING TOOLS

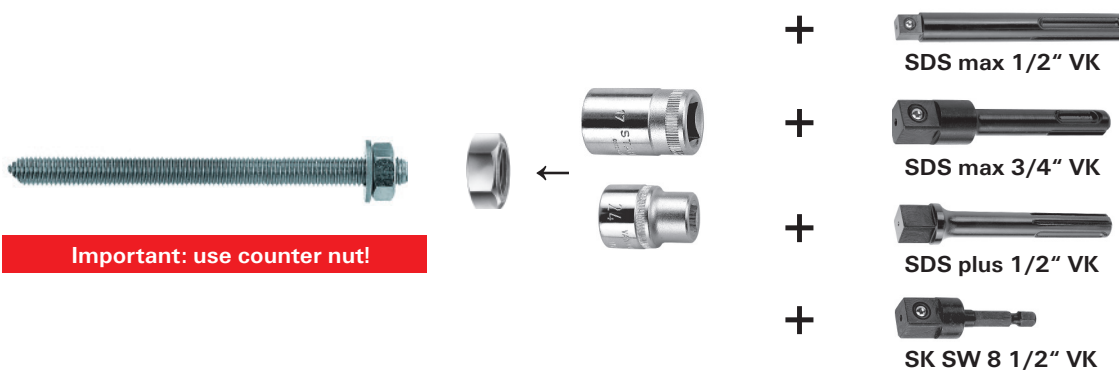
Setting tool with SDS adapter

For simple installation of bonded anchors for example Resin anchor R, Highbond anchor FHB II, Superbond resin capsule RSB.



Adapter for installing anchor rods

Threaded rods without external hex-drive (special lengths).



Resin anchor RM II: Resin capsule RM II with Threaded rod RGM zinc plated steel 5.8 / zinc plated steel 8.8 / stainless steel A4-70 / high corrosion resistant steel C-70



Permissible loads of a single anchor in non-cracked normal concrete (concrete compression zone) of strength class C20/25 (~B25) ^{1) 2) 3) 4)}										Minimum spacings while reducing	
Type	Material fixing element	Min. member thickness	Effective anchorage depth	Maximum installation torque	Permissible tension load	Permissible shear load	Required edge distance (with one edge) for		Required spacing	Min. spacing	Min. edge distance
		h_{min} [mm]	h_{ef} [mm]	T_{max} [Nm]	N_{perm} ⁵⁾ [kN]	V_{perm} ⁵⁾ [kN]	Max. tension load c [mm]	Max. shear load c [mm]	Max. load S_{cr} [mm]	s_{min} ⁶⁾ [mm]	c_{min} ⁶⁾ [mm]
RG M 8	5.8	110	80	10	9.0	5.1	95	70	240	40	40
	8.8				10.0	8.6	115				
	A4-70				9.9	6.0	75				
	C-70				10.0	7.4	100				
RG M 10	5.8	120	90	20	13.8	8.6	150	105	270	45	45
	8.8				14.0	13.1	155	170			
	A4-70					9.2		110			
	C-70					11.4		145			
RG M 12	5.8	140	110	40	20.5	12.0	215	130	330	55	55
	8.8				20.6	19.4		230			
	A4-70					13.7		155			
	C-70					17.1		200			
RG M 16	5.8	170	125	60	28.0	22.3	285	235	375	65	65
	8.8					36.0		405			
	A4-70					25.2		270			
	C-70					31.4		350			
RG M 20	5.8	220	170	120	44.4	34.9	385	300	510	85	85
	8.8					56.0		525			
	A4-70					39.4		345			
RG M 24	5.8	270	210	150	61.0	50.9	475	390	630	105	105
	8.8					80.6		675			
	A4-70					56.8		445			

For the design the complete assessment ETA-16/0340 has to be considered. ⁷⁾

1) The partial safety factors for material resistance as regulated in the ETA-16/0340 as well as a partial safety factor for load actions of $\gamma_L = 1.4$ are considered. As a single anchor counts e.g. an anchor with a spacing $s \geq 3 \cdot h_{ef}$ and an edge distance $c \geq 1.5 \cdot h_{ef}$. Accurate data

2) The given loads are valid for the glass capsule RM II for fixations in dry and humid concrete for temperatures in the substrate up to 24 °C (resp. short term up to 40 °C). According ETA-16/0340 a drill hole cleaning is not required.

3) For higher concrete strength classes up to C50/60 higher permissible loads may be possible.

4) Drill method hammer drilling. For further allowable application conditions see ETA-16/0340.

5) For combinations of tensile loads and shear loads or for shear loads with lever arm (bending moments) as well as reduced edge distances or spacings (anchor groups) we recommend to use our anchor design software C-FIX.

6) Minimum possible axial spacings resp. edge distance while reducing the permissible load.

7) The given loads refer to the European Technical Assessment ETA-16/0340, issue date 14/02/2017. Design of the loads according ETAG 001, Technical Report TR 029 (for static resp. quasi-static loads).

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LOADS

Resin anchor RM II with threaded rod RG M⁵⁾ (steel property class 5.8)

Highest permissible load for a single anchor¹⁾ in normal weight concrete C20/25^{4) 6)}

For the design the complete assessment⁷⁾ ETA-16/0340 has to be considered.

Type				Cracked concrete				Non-cracked concrete			
	effective anchorage depth	min. member thickness	maximum torque moment	permissible tensile load	permissible shear load	min. spacing	min. edge distance	permissible tensile load	permissible shear load	min. spacing	min. edge distance
	h_{ef} [mm]	h_{min} [mm]	$T_{inst,max}$ [Nm]	$N_{perm}^{3)}$ [kN]	$V_{perm}^{3)}$ [kN]	$s_{min}^{2)}$ [mm]	$c_{min}^{2)}$ [mm]	$N_{perm}^{3)}$ [kN]	$V_{perm}^{3)}$ [kN]	$s_{min}^{2)}$ [mm]	$c_{min}^{2)}$ [mm]
RG M 8	80	110	10	-	-	-	-	8,4	5,1	40	40
RG M 10	90	120	20	3,9	8,6	45	45	11,8	8,6	45	45
RG M 12	110	140	40	5,8	12,0	55	55	17,3	12,0	55	55
RG M 16	125	161	60	8,7	20,9	65	65	26,2	22,3	65	65
RG M 20	170	220	120	14,8	34,9	85	85	44,4	34,9	85	85
RG M 24	210	266	150	22,0	50,9	105	105	61,0	50,9	105	105

¹⁾ The partial safety factors for material resistance as regulated in the assessment as well as a partial safety factor for load actions of $\gamma_F = 1,4$ are considered. As an single anchor counts e.g. an anchor with a spacing $s \geq 3 \times h_{ef}$ and an edge distance $c \geq 1,5 \times h_{ef}$. Accurate data see assessment.

²⁾ Minimum possible axial spacings resp. edge distance while reducing the permissible load.

³⁾ For combinations of tensile loads, shear loads, bending moments as well as reduced edge distances or spacings (anchor groups) see assessment.

⁴⁾ For higher concrete strength classes up to C50/60 higher permissible loads may be possible.

⁵⁾ The given loads are valid for the glass capsule RM II for fixations in dry and humid concrete for temperatures in the substrate up to 72 °C (resp. short term up to 120 °C).

⁶⁾ Drill method hammer drilling. For further allowable drill methods and application conditions see assessment.

⁷⁾ The given loads refer to the assessment ETA-16/0340, issue date 14/02/2017. Design of the loads according ,ETAG 001, Technical Report TR 029' (for static resp. quasi-static loads).

LOADS

Resin anchor RM II with threaded rod RG M⁵⁾ (steel property class 5.8)

Highest permissible load for a single anchor¹⁾ in normal weight concrete C20/25^{4) 6)}

For the design the complete assessment⁷⁾ ETA-16/0340 has to be considered.

Type				Cracked concrete				Non-cracked concrete			
	effective anchorage depth	min. member thickness	maximum torque moment	permissible tensile load	permissible shear load	min. spacing	min. edge distance	permissible tensile load	permissible shear load	min. spacing	min. edge distance
	h_{ef} [mm]	h_{min} [mm]	$T_{inst,max}$ [Nm]	$N_{perm}^{3)}$ [kN]	$V_{perm}^{3)}$ [kN]	$s_{min}^{2)}$ [mm]	$c_{min}^{2)}$ [mm]	$N_{perm}^{3)}$ [kN]	$V_{perm}^{3)}$ [kN]	$s_{min}^{2)}$ [mm]	$c_{min}^{2)}$ [mm]
RG M 8	80	110	10	-	-	-	-	8,4	8,6	40	40
RG M 10	90	120	20	3,9	9,4	45	45	11,8	13,1	45	45
RG M 12	110	140	40	5,8	13,8	55	55	17,3	19,4	55	55
RG M 16	125	161	60	8,7	20,9	65	65	26,2	36,0	65	65
RG M 20	170	220	120	14,8	35,6	85	85	44,4	56,0	85	85
RG M 24	210	266	150	22,0	52,8	105	105	61,0	80,6	105	105

¹⁾ The partial safety factors for material resistance as regulated in the assessment as well as a partial safety factor for load actions of $\gamma_F = 1,4$ are considered. As an single anchor counts e.g. an anchor with a spacing $s \geq 3 \times h_{ef}$ and an edge distance $c \geq 1,5 \times h_{ef}$. Accurate data see assessment.

²⁾ Minimum possible axial spacings resp. edge distance while reducing the permissible load.

³⁾ For combinations of tensile loads, shear loads, bending moments as well as reduced edge distances or spacings (anchor groups) see assessment.

⁴⁾ For higher concrete strength classes up to C50/60 higher permissible loads may be possible.

⁵⁾ The given loads are valid for the glass capsule RM II for fixations in dry and humid concrete for temperatures in the substrate up to 72 °C (resp. short term up to 120 °C).

⁶⁾ Drill method hammer drilling. For further allowable drill methods and application conditions see assessment.

⁷⁾ The given loads refer to the assessment ETA-16/0340, issue date 14/02/2017. Design of the loads according ,ETAG 001, Technical Report TR 029' (for static resp. quasi-static loads).

LOADS

Resin anchor RM II with threaded rod RG M⁵⁾ (steel property class A4-70)

Highest permissible load for a single anchor¹⁾ in normal weight concrete C20/25^{4) 6)}

For the design the complete assessment⁷⁾ ETA-16/0340 has to be considered.

Type	effective anchorage depth h_{ef} [mm]	min. member thickness h_{min} [mm]	maximum torque moment $T_{inst,max}$ [Nm]	Cracked concrete				Non-cracked concrete			
				permissible tensile load $N_{perm}^{3)}$ [kN]	permissible shear load $V_{perm}^{3)}$ [kN]	min. spacing $s_{min}^{2)}$ [mm]	min. edge distance $c_{min}^{2)}$ [mm]	permissible tensile load $N_{perm}^{3)}$ [kN]	permissible shear load $V_{perm}^{3)}$ [kN]	min. spacing $s_{min}^{2)}$ [mm]	min. edge distance $c_{min}^{2)}$ [mm]
RG M 8	80	110	10	-	-	-	-	8,4	6,0	40	40
RG M 10	90	120	20	3,9	9,2	45	45	11,8	9,2	45	45
RG M 12	110	140	40	5,8	13,7	55	55	17,3	13,7	55	55
RG M 16	125	161	60	8,7	20,9	65	65	26,2	25,2	65	65
RG M 20	170	220	120	14,8	35,6	85	85	44,4	39,4	85	85
RG M 24	210	266	150	22,0	52,8	105	105	61,0	56,8	105	105

¹⁾ The partial safety factors for material resistance as regulated in the assessment as well as a partial safety factor for load actions of $\gamma_F = 1,4$ are considered. As an single anchor counts e.g. an anchor with a spacing $s \geq 3 \times h_{ef}$ and an edge distance $c \geq 1,5 \times h_{ef}$. Accurate data see assessment.

²⁾ Minimum possible axial spacings resp. edge distance while reducing the permissible load.

³⁾ For combinations of tensile loads, shear loads, bending moments as well as reduced edge distances or spacings (anchor groups) see assessment.

⁴⁾ For higher concrete strength classes up to C50/60 higher permissible loads may be possible.

⁵⁾ The given loads are valid for the glass capsule RM II for fixations in dry and humid concrete for temperatures in the substrate up to 72 °C (resp. short term up to 120 °C).

⁶⁾ Drill method hammer drilling. For further allowable drill methods and application conditions see assessment.

⁷⁾ The given loads refer to the assessment ETA-16/0340, issue date 14/02/2017. Design of the loads according ,ETAG 001, Technical Report TR 029' (for static resp. quasi-static loads).

LOADS

Resin anchor RM II with threaded rod RG M⁵⁾ (steel property class C-70)

Highest permissible load for a single anchor¹⁾ in normal weight concrete C20/25^{4) 6)}

For the design the complete assessment⁷⁾ ETA-16/0340 has to be considered.

Type	effective anchorage depth h_{ef} [mm]	min. member thickness h_{min} [mm]	maximum torque moment $T_{inst,max}$ [Nm]	Cracked concrete				Non-cracked concrete			
				permissible tensile load $N_{perm}^{3)}$ [kN]	permissible shear load $V_{perm}^{3)}$ [kN]	min. spacing $s_{min}^{2)}$ [mm]	min. edge distance $c_{min}^{2)}$ [mm]	permissible tensile load $N_{perm}^{3)}$ [kN]	permissible shear load $V_{perm}^{3)}$ [kN]	min. spacing $s_{min}^{2)}$ [mm]	min. edge distance $c_{min}^{2)}$ [mm]
RG M 8	80	110	10	-	-	-	-	8,4	7,4	40	40
RG M 10	90	120	20	3,9	9,4	45	45	11,8	11,4	45	45
RG M 12	110	140	40	5,8	13,8	55	55	17,3	17,1	55	55
RG M 16	125	161	60	8,7	20,9	65	65	26,2	31,4	65	65

¹⁾ The partial safety factors for material resistance as regulated in the assessment as well as a partial safety factor for load actions of $\gamma_F = 1,4$ are considered. As an single anchor counts e.g. an anchor with a spacing $s \geq 3 \times h_{ef}$ and an edge distance $c \geq 1,5 \times h_{ef}$. Accurate data see assessment.

²⁾ Minimum possible axial spacings resp. edge distance while reducing the permissible load.

³⁾ For combinations of tensile loads, shear loads, bending moments as well as reduced edge distances or spacings (anchor groups) see assessment.

⁴⁾ For higher concrete strength classes up to C50/60 higher permissible loads may be possible.

⁵⁾ The given loads are valid for the glass capsule RM II for fixations in dry and humid concrete for temperatures in the substrate up to 72 °C (resp. short term up to 120 °C).

⁶⁾ Drill method hammer drilling. For further allowable drill methods and application conditions see assessment.

⁷⁾ The given loads refer to the assessment ETA-16/0340, issue date 14/02/2017. Design of the loads according ,ETAG 001, Technical Report TR 029' (for static resp. quasi-static loads).