

Injection System VM-EA



Threaded stud VMU-A
for concrete and brickwork



Threaded stud VM-A
1 meter length, to be cut to the required length, for concrete and brickwork

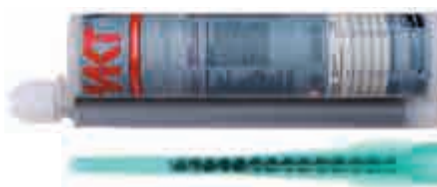


Perfo sleeve VM-SH
for hollow block



Cartridge VM-EA 300
Foil tube cartridge suitable for silicone guns
Content: 300 ml styrene-free

NEW



Cartridge VM-EA 345
Side-by-side cartridge
Content: 345ml styrene-free

NEW



Cartridge VM-EA 420
Coaxial cartridge
Content: 420ml styrene-free

NEW

Range of loading: 0,1 kN - 176,38 kN

Concrete quality: C20/25 - C50/60

Brickwork: Solid and perforated bricks

**Material: Steel zinc plated, stainless steel A4
On demand: Steel hot dip galvanized,
Stainless steel HCR**

Description

The Injection System VM-EA is used for fixations in non-cracked concrete and brickwork. It is composed of a styrene-free injection adhesive, based on epoxy acrylate, in a cartridge, MKT anchor rods VMU-A, V-A or with threaded studs with manufacturer's certificate (e.g. MKTVM-A) as well as nut and washer. Applications in perforated brick additionally require a perfo sleeve.



M8-M16



Advantages

- Versatile injection system for different applications in concrete and masonry
- Approved for non-cracked concrete
- Approved application in wet concrete and water-filled drill holes
- Approved for autoclaved aerated concrete, solid and perforated brickwork in wet or dry condition
- Approved with standard threaded studs (test certificate required)
- Approved with shortenable perfo sleeve VM-SH16 x 130/330 for bridging structures over insulation systems and other soft substrates
- Base material temperature during installation -5°C to +40°C
- Ambient temperature when completely cured -40°C to +80°C
- Variable anchorage depths for more flexibility
- Opened cartridges can be re-used with a new mixer nozzle
- Styrene-free

Applications

Fastenings in non-cracked concrete:

Base plates, supports, wall brackets, mounting of joint tapes.

Fastenings in brickwork:

Canopies, door and window frames, facade substructures, battens, gates etc.

With the perfo sleeve VM-SH 16 x 130/330, lightweight fixations in perforated brick are also possible on insulation boards.

Injection Cartridge VM-EA



- modified epoxy acrylate, styrene-free
- Approved for use in non-cracked concrete and in brickwork

Description	Ref. No.	Content ml	Content of master box pcs	Weight per master box kg	Weight per piece kg
Cartridge VM-EA 300	28253101	300	12	6,40	0,53
Cartridge VM-EA 345	28255211	345	12	8,00	0,65
Cartridge VM-EA 420	28256201	420	12	10,1	0,83
Static mixer VM-X	28305111	-	12	0,12	0,01
Mixer extension VM-XE 10/200 (200mm)	28306011	-	12	-	0,01
Mixer extension VM-XE 10/500 (500mm)	85951101	-	10	-	0,02

One static mixer comes with each cartridge. Usable length of the static mixer see page 106.

NEW

Curing Time Injection Adhesive VM-EA

- Cartridge temperature during installing + 5°C to + 40°C

Temperature (°C) in the drill hole	Gel time	Curing time	
		dry base material	wet base material
-5°C bis - 1°C	90 min	6 h	12 h
0°C bis + 4°C	45 min	3 h	6 h
+ 5°C bis + 9°C	25 min	2 h	4 h
+ 10°C bis + 14°C	20 min	100 min	200 min
+ 15°C bis + 19°C	15 min	80 min	160 min
+ 20°C bis + 29°C	6 min	45 min	90 min
+ 30°C bis + 34°C	4 min	25 min	50 min
+ 35°C bis + 39°C	2 min	20 min	40 min

Storage Box



- In stackable multi-purpose container
- Storage Box, the container for various items
- H x W x D: 220 x 400 x 300 mm

NEW

Description	Ref. No.	Content	Quantity Pcs.	Weight per Box kg
Storage Box VM-EA 300	28998201	Cartridge VM-EA 300 Static mixer VM-X	20 40	12,8
Storage Box VM-EA 345	28998501	Cartridge VM-EA 345 Static mixer VM-X	20 40	15,3
Storage Box VM-EA 420	28998801	Cartridge VM-EA 420 Static mixer VM-X	20 40	18,0

Threaded Studs for applications in non-cracked concrete and brickwork

Threaded Stud VMU-A

Steel, zinc plated 5.8
Dimensions see page 107



- For use in structures subject to dry internal conditions
- Steel, zinc plated 8.8 on demand

Threaded Stud VMU-A A4

Stainless steel A4
Dimensions see page 107



- For use in structures subject to dry internal conditions or external atmospheric exposure
- Stainless steel HCR on demand

Threaded Stud V-A

Steel, zinc plated 5.8
Dimensions see page 144



- For use in structures subject to dry internal conditions
- Steel, zinc plated 8.8 on demand

Threaded Stud V-A A4

Stainless steel A4
Dimensions see page 144



- For use in structures subject to dry internal conditions or external atmospheric exposure

Threaded Stud V-A fvz

Steel, hot dip galvanized 5.8
Dimensions see page 144



- For use in structures subject to dry internal conditions
- Steel hot dip galvanized 8.8 on demand

Threaded Stud V-A HCR

Stainless steel HCR
Dimensions see page 144



- For use in particularly corrosive environments
- High corrosion resistant steel 1.4529 (HCR)

Threaded studs for applications in non-cracked concrete and brickwork

Threaded stud VM-A

Steel 5.8, zinc plated
Dimensions see page 108



- For use in structures subject to dry internal conditions
- Threaded studs, of 1 meter length, to be cut to the required length
- Comes with manufacturer's certificate (3.1 EN 10204) in every package

Threaded stud VM-A

Stainless steel A4
Dimensions see page 108



- For use in structures subject to dry internal conditions or external atmospheric exposure
- Threaded studs, of 1 meter length, to be cut to the required length
- Comes with manufacturer's certificate (3.1 EN 10204) in every package

Threaded stud VM-A

Steel 8.8, zinc plated
Dimensions see page 108



- For use in structures subject to dry internal conditions
- Threaded studs, of 1 meter length, to be cut to the required length
- Comes with manufacturer's certificate (3.1 EN 10204) in every package

Perfo sleeve VM-SH



- Material: Polypropylene
- Approved for solid and perforated bricks

Description	Ref. No.	Drill hole Ø x Depth mm	For threaded studs Ø mm	Package content pcs.	Weight per pkg. kg
VM-SH 12 x 80	28151201	12 x 85	M8	10	0,02
VM-SH 16 x 85	28152001	16 x 90	M8 / M10	10	0,03
VM-SH 16 x 130	28153001	16 x 135	M8 / M10	10	0,04
NEW VM-SH 16 x 130/330	28153201	16 x 135 + t _{fix} ¹⁾	M8 / M10	10	0,16
VM-SH 20 x 85	28154001	20 x 90	M12 / M16	10	0,04
VM-SH 20 x 130	28154301	20 x 135	M12 / M16	10	0,07
VM-SH 20 x 200	28154601	20 x 205	M12 / M16	10	0,10

¹⁾ t_{fix} = shortened length perfo sleeves -130 mm

Drill hole cleaning

Cleaning brush RB M6



- With connection thread M6
- Extension for large drill hole depths
- Separate SDS plus adapter with internal thread M6 for SDS plus drill holder
- For drilling machines with keyed chuck

Description	Ref. No.	Suitable for drill holes Ø mm	Total length of brush mm	Suitable for		Package content pcs.	Weight per piece kg
				Threaded stud	Perfo sleeve VM-SH		
RB 10 M6	33510101	10	130	M8	-	1	0,05
RB 12 M6	33512101	12	140	M10	12x80	1	0,05
RB 14 M6	33514101	14	180	M12	-	1	0,05
RB 16 M6	33516101	16	200	-	16x85, 16x130, 16x130/330	1	0,05
RB 18 M6	33518101	18	200	M16	-	1	0,05
RB 20 M6	33520101	20	220	-	20x85, 20x130, 20x200	1	0,06
RB 24 M6	33529101	24	250	M20	-	1	0,06
RB 28 M6	33528101	28	260	M24	-	1	0,06

Blow-out pump VM-AP



→ For approval-compliant air-cleaning of drill holes with a diameter in brickwork and concrete up to 20 mm and a maximum drill hole depth of 240 mm (VM-EA)

→ For best drill hole cleaning, the hose must reach the bottom of the drill hole

Description	Ref. No.	Hose Ø mm	For drill hole Ø mm	Max. drill hole depth ²⁾ mm	Pkg. cont. pcs	Weight per piece kg
Blow-out pump VM-AP 360	33200101	8	8 ¹⁾ -20	330	1	0,27

¹⁾With extension tube Ø 6 x 100mm

²⁾For through fastening: Maximum drill hole depth through fixture

Air gun VM-ABP



→ For approval-compliant drill hole cleaning with compressed air for drill holes with a diameter larger than 6 mm

→ For best drill hole cleaning, the nozzle of the air gun must reach the bottom of the drill hole

Description	Ref. No.	Nozzle-ø mm	For drill hole Ø mm	Max. drill hole depth ¹⁾ mm	Pkg. cont. pcs.	Weight per piece kg
VM-ABP 200	33090101	5	6-20	240	1	0,55
VM-ABP 250	33100101	16	18-40	240	1	1,00
VM-ABP 500	33106101	16	18-40	480	1	1,30

¹⁾For through fastening: Maximum drill hole depth through fixture

Dispenser VM-P Profi



→ Professional dispenser with an ideal center of gravity for more comfortable working

→ Automatic pressure release for minimum adhesive overrun

Description	Ref. No.	Suitable for cartridges	Pkg. cont. pcs	Weight per piece kg
VM-P 345 Profi	28350511	150ml, 280ml, 300ml, 345ml also suitable for silicone cartridges	1	1,00
VM-P 380 Profi	28351001	380ml, 410ml, 420ml	1	1,10

Dispenser VM-P Standard



→ For occasional use, metal version

→ Piston rod with adjusting screw

Description	Ref. No.	Suitable for cartridges	Pkg. cont. pcs	Weight per piece kg
VM-P 345 Standard	28350505	150ml, 280ml, 300ml, 345ml also suitable for silicone cartridges	1	1,00
VM-P 380 Standard	28353005	380ml, 410ml, 420ml	1	1,15

Dispenser VM-P Pneumatic



→ Professional air tool with an optimum center of gravity and quick cartridge exchange

→ Automatic pressure release system reduces adhesive overrun to a minimum

→ Single-hand pressure regulation to adjust the piston speed

→ With compressed air connection nipple

Description	Ref. No.	Suitable for cartridges	max. working pressure 8 bar, 40l/min	Pkg. cont. pcs	Weight per piece kg
VM-P 345 Pneumatic	28350601	280ml, 300ml, 345ml	max. working pressure 8 bar, 40l/min	1	2,41
VM-P 380 Pneumatic	28352002	380ml, 410ml, 420ml	max. working pressure 8 bar, 40l/min	1	2,00

Dispenser VM-P Akku



¹⁾ with battery 18V/2,0 Ah

→ Professional, solid battery cartridge dispenser in a plastic case

→ Repeat function, for retrieving the last full quantity

→ Stepless variable pressing speed

→ Overrun-quantity-stop by automatic return after release of the dispensing switch

Description	Ref. No.	Suitable for cartridges	Press-out force kN	Weight ¹⁾ kg	Dimensions ¹⁾ L x B x H mm	Pkg. cont. pcs	Weight per piece kg
VM-P 345 Akku	28350801	345ml	5,0	3,53	395 x 180 x 285	1	7,72
VM-P 380 Akku	28352601	380ml, 410ml, 420ml	3,95	3,62	375 x 180 x 285	1	7,80
Accessories (for all models)							
Replacement battery	28352411		18 V/2,0 Ah			1	1,00
Shoulder strap	28359991		adjustable			1	0,02



Extract from Permissible Service Conditions of European Technical Assessment ETA-16/0898

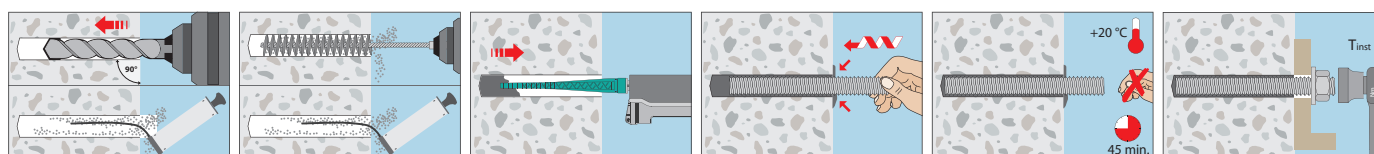
Approved loads for single anchors without influence of spacing and edge distance in dry or wet concrete for temperature range I -40°C to +24°C/+40°C¹⁾ and for temperature range II -40°C to +50°C/+80°C¹⁾. Total safety factor as per ETAG 001 included (γ_{M} and γ_{P}).

Loads and performance data				non-cracked concrete						
Injection System VM-EA, threaded stud Steel 5.8				M8	M10	M12	M16	M20	M24	
Range of anchorage depth	$h_{ef,min} - h_{ef,max}$	[mm]		60 - 160	60 - 200	70 - 240	80 - 320	90 - 400	96 - 480	
Approved tension load for $h_{ef,min} - h_{ef,max}$										
Range of temperature	24°C/40°C ¹⁾	C20/25	appr. N	[kN]	5,1 - 8,7	6,0 - 13,8	8,4 - 20,1	12,8 - 37,4	17,1 - 58,3	18,8 - 84,0
	50°C/80°C ¹⁾	C20/25	appr. N	[kN]	3,9 - 8,7	4,5 - 13,8	6,3 - 20,1	9,6 - 37,4	13,5 - 58,3	17,2 - 84,0
Approved shear load for $h_{ef,min} - h_{ef,max}$										
Range of temperature	24°C/40°C ¹⁾	C20/25	appr. V	[kN]	5,2	8,3	12,0	22,4	35,0	45,2 - 50,4
	50°C/80°C ¹⁾	C20/25	appr. V	[kN]	5,2	8,3	12,0	22,4	32,3 - 35,0	41,4 - 50,4
Injection System VM-EA, threaded stud Steel 8.8				M8	M10	M12	M16	M20	M24	
Range of anchorage depth	$h_{ef,min} - h_{ef,max}$	[mm]		60 - 160	60 - 200	70 - 240	80 - 320	90 - 400	96 - 480	
Approved tension load for $h_{ef,min} - h_{ef,max}$										
Range of temperature	24°C/40°C ¹⁾	C20/25	appr. N	[kN]	5,1 - 13,6	6,0 - 19,9	8,4 - 28,7	12,8 - 51,1	17,1 - 79,8	18,8 - 114,9
	50°C/80°C ¹⁾	C20/25	appr. N	[kN]	3,9 - 10,4	4,5 - 15,0	6,3 - 21,5	9,6 - 38,3	13,5 - 59,8	17,2 - 86,2
Approved shear load for $h_{ef,min} - h_{ef,max}$										
Range of temperature	24°C/40°C ¹⁾	C20/25	appr. V	[kN]	8,4	13,3	19,3	30,6 - 35,9	41,1 - 56,0	45,2 - 80,7
	50°C/80°C ¹⁾	C20/25	appr. V	[kN]	8,4	10,8 - 13,3	15,1 - 19,3	23,0 - 35,9	32,3 - 56,0	41,4 - 80,7
Injection System VM-EA, threaded stud Stainless Steel A4, HCR				M8	M10	M12	M16	M20	M24	
Range of anchorage depth	$h_{ef,min} - h_{ef,max}$	[mm]		60 - 160	60 - 200	70 - 240	80 - 320	90 - 400	96 - 480	
Approved tension load for $h_{ef,min} - h_{ef,max}$										
Range of temperature	24°C/40°C ¹⁾	C20/25	appr. N	[kN]	5,1 - 9,8	6,0 - 15,5	8,4 - 22,6	12,8 - 42,1	17,1 - 65,6	18,8 - 94,6
	50°C/80°C ¹⁾	C20/25	appr. N	[kN]	3,9 - 9,8	4,5 - 15,0	6,3 - 21,5	9,6 - 38,3	13,5 - 59,8	17,2 - 86,2
Approved shear load for $h_{ef,min} - h_{ef,max}$										
Range of temperature	24°C/40°C ¹⁾	C20/25	appr. V	[kN]	5,9	9,3	13,5	25,2	39,4	45,2 - 56,7
	50°C/80°C ¹⁾	C20/25	appr. V	[kN]	5,9	9,3	13,5	23,0 - 25,2	32,3 - 39,4	41,4 - 56,7
Spacing and edge distance										
Min. thickness of concrete slab for $h_{ef,min} - h_{ef,max}$	h_{min}	[mm]		100 - 190	100 - 230	100 - 270	116 - 356	138 - 448	152 - 536	
Minimum spacing	s_{min}	[mm]		40	50	60	80	100	120	
Minimum edge distance	c_{min}	[mm]		40	50	60	80	100	120	
Installation parameters										
Diameter of drill hole	d_o	[mm]		10	12	14	18	24	28	
Clearance hole in the fixture	$d_{fr} \leq$	[mm]		9	12	14	18	22	26	
Diameter of brush	$d_b \geq$	[mm]		12	14	16	20	26	30	
Range of drill hole depth for $h_{ef,min} - h_{ef,max}$	h_o	[mm]		60 - 160	60 - 200	70 - 240	80 - 320	90 - 400	96 - 480	
Installation torque	$T_{inst,max}$	[Nm]		10	20	40	80	120	160	
Amount of adhesive per 100mm drill hole depth		[ml]		6,53	8,16	9,82	13,61	26,71	32,25	

¹⁾Max. long term temperature / max. short term temperature
Higher concrete strength may lead to higher approved loads.

Chemical Anchors

Installation in concrete




Extract from Permissible Service Conditions of European Technical Assessment ETA-17/0006

Approved loads for single anchor without influence of spacing and edge distance. Butt joint and horizontal joint with adhesive.

 Range of temperature -40°C to $24^{\circ}\text{C}/40^{\circ}\text{C}^{1)}$ – use category dry/dry. Total safety factor as per ETAG 001 included (γ_M and γ_F).

Injection System VM-EA, Solid brick without Perfo Sleeve²⁾
Solid brick Mz-DF according EN 771-1, Bulk density ρ : 1,64 kg/dm³, Minimum brick size: 240x115x55 mm (e.g. Unipor)

Threaded studs ¹⁾ : Steel: \geq FKL 5.8; A4, HCR: \geq FKL 70			M8	M10	M12	M16
Anchorage depth	h_{ef}	[mm]	80	90	100	100
Spacing = Minimum spacing	$s_{cr} = s_{min}$	[mm]	240	270	300	300
Edge distance = Minimum edge distance	$c_{cr} = c_{min}$	[mm]	120	135	150	150
Approved tension load for compressive strength	$f_b \geq 10 \text{ N/mm}^2$	appr. N [kN]	0,4	0,4	0,4	0,7
	$f_b \geq 20 \text{ N/mm}^2$	appr. N [kN]	0,7	0,7	0,6	1,0
	$f_b \geq 28 \text{ N/mm}^2$	appr. N [kN]	0,9	0,9	0,7	1,3
Approved shear load for compressive strength	$f_b \geq 10 \text{ N/mm}^2$	appr. V [kN]	0,9	1,0	1,4	1,4
	$f_b \geq 20 \text{ N/mm}^2$	appr. V [kN]	1,3	1,6	2,1	2,1
	$f_b \geq 28 \text{ N/mm}^2$	appr. V [kN]	1,6	1,9	2,6	2,6
Drilling method			Hammer drilling			
Installation torque	$T_{inst,max}$	[Nm]	6	10	10	10

Calcium silicate solid brick KS-NF according EN 771-2, Bulk density ρ : 2,0 kg/dm³, Minimum brick size: 240x115x71 mm (e.g. Wemding)¹⁾

Threaded studs ¹⁾ : Steel: \geq FKL 5.8; A4, HCR: \geq FKL 70			M8	M10	M12	M16
Anchorage depth	h_{ef}	[mm]	80	90	100	100
Spacing = Minimum spacing	$s_{cr} = s_{min}$	[mm]	240	270	300	300
Edge distance = Minimum edge distance	$c_{cr} = c_{min}$	[mm]	120	135	150	150
Approved tension load for compressive strength	$f_b \geq 10 \text{ N/mm}^2$	appr. N [kN]	0,9	0,9	1,1	0,9
	$f_b \geq 20 \text{ N/mm}^2$	appr. N [kN]	1,3	1,3	1,6	1,3
	$f_b \geq 27 \text{ N/mm}^2$	appr. N [kN]	1,6	1,6	1,9	1,6
Approved shear load for compressive strength	$f_b \geq 10 \text{ N/mm}^2$	appr. V [kN]	0,9	0,9	1,0	1,0
	$f_b \geq 20 \text{ N/mm}^2$	appr. V [kN]	1,3	1,3	1,4	1,4
	$f_b \geq 27 \text{ N/mm}^2$	appr. V [kN]	1,4	1,6	1,7	1,7
Drilling method			Hammer drilling			
Installation torque	$T_{inst,max}$	[Nm]	10	20	20	20

Brickwork of solid lightweight concrete according EN 771-3, Bulk density ρ : 0,63 kg/dm³, Minimum brick size: 300x123x248 mm (e.g. Bisotherm)¹⁾

Threaded studs ¹⁾ : Steel: \geq FKL 5.8; A4, HCR: \geq FKL 70			M8	M10	M12	M16
Anchorage depth	h_{ef}	[mm]	80	90	100	100
Spacing = Minimum spacing	$s_{cr} = s_{min}$	[mm]	240	270	300	300
Edge distance = Minimum edge distance	$c_{cr} = c_{min}$	[mm]	120	135	150	150
Approved tension load for compressive strength	$f_b \geq 2 \text{ N/mm}^2$	appr. N [kN]	0,6	0,6	0,6	0,6
	$f_b \geq 2 \text{ N/mm}^2$	appr. V [kN]	0,9	1,0	1,1	1,1
Drilling method			Rotary drilling			
Installation torque	$T_{inst,max}$	[Nm]	6	6	10	14

Brickwork of solid lightweight concrete Leca Lex harkko RUH-200 according EN 771-3, Bulk density ρ : 0,78 kg/dm³, Minimum brick size: 498x200x195 mm (e.g. Saint-Gobain Weber)¹⁾

Threaded studs ¹⁾ : Steel: \geq FKL 5.8; A4, HCR: \geq FKL 70			M8	M10	M12	M16
Anchorage depth	h_{ef}	[mm]	80	90	100	100
Spacing = Minimum spacing	$s_{cr} = s_{min}$	[mm]	240	270	300	300
Edge distance = Minimum edge distance	$c_{cr} = c_{min}$	[mm]	120	135	150	150
Approved tension load for compressive strength	$f_b \geq 3 \text{ N/mm}^2$	appr. N [kN]	0,6	0,9	0,9	0,9
	$f_b \geq 3 \text{ N/mm}^2$	appr. V [kN]	0,9	1,1	1,1	1,1
Drilling method			Rotary drilling			
Installation torque	$T_{inst,max}$	[Nm]	6	12	14	16

Installation parameters in solid brick without perfo sleeve

Threaded studs: Steel: \geq FKL 5.8; A4, HCR: \geq FKL 70			M8	M10	M12	M16
Diameter of drill hole	d_o	[mm]	10	12	14	18
Drill hole depth	h_o	[mm]	80	90	100	100
Drilling method			s. brick information			
Minimum wall thickness	h_{min}	[mm]	110	120	130	130
Clearance hole in the fixture	$d_{f \leq}$	[mm]	9	12	14	18
Diameter of brush	$d_{b \geq}$	[mm]	12	14	16	20
Installation torque			s. brick information			
Amount of adhesive per drill hole		[ml]	5,2	7,3	9,8	13,6
Drill holes per cartridge	VM-EA 300	[Pcs.]	50	36	26	19
	VM-EA 345	[Pcs.]	59	42	31	22
	VM-EA 420	[Pcs.]	73	52	39	28

¹⁾Max. long term temperature / max. short term temperature

²⁾Installation with perfo sleeve, see ETA-17/0006



Extract from Permissible Service Conditions of European Technical Assessment ETA-17/0006

Approved loads for single anchor without influence of spacing and edge distance. Butt joint and horizontal joint with adhesive.
 Range of temperature -40°C to 24°C/40°C¹⁾ – use category dry/dry. Total safety factor as per ETAG 001 included (γ_{M} and γ_{P}).

Injection System VM-EA, autoclaved aerated concrete without perfo sleeve

Autoclaved aerated concrete block AAC2 according EN 771-4, Bulk density ρ : 0,35 kg/dm³, Minimum brick size: 599x375x249 mm (e.g. Ytong)

			M8	M10	M12	M16
Threaded studs: Steel: \geq FKL 5.8; A4, HCR: \geq FKL 70						
Anchorage depth	h_{ef}	[mm]	80	90	100	100
Spacing = Minimum spacing	$s_{cr} = s_{min}$	[mm]	240	270	300	300
Edge distance = Minimum edge distance	$c_{cr} = c_{min}$	[mm]	120	135	150	150
Approved tension load for compression strength	appr. N	[kN]	0,3	0,3	0,5	0,5
Approved shear load for compression strength	appr. V	[kN]	0,5	0,7	0,9	1,3
Installation torque	$T_{inst,max}$	[Nm]		2		

Autoclaved aerated concrete block AAC4 according EN 771-4, Bulk density ρ : 0,50 kg/dm³, Minimum brick size: 499x375x249 mm (e.g. Ytong)

			M8	M10	M12	M16
Threaded studs: Steel: \geq FKL 5.8; A4, HCR: \geq FKL 70						
Anchorage depth	h_{ef}	[mm]	80	90	100	100
Spacing = Minimum spacing	$s_{cr} = s_{min}$	[mm]	240	270	300	300
Edge distance = Minimum edge distance	$c_{cr} = c_{min}$	[mm]	120	135	150	150
Approved tension load for compression strength	appr. N	[kN]	0,3	0,9	0,9	1,3
Approved shear load for compression strength	appr. V	[kN]	0,5	0,7	0,9	1,3
Installation torque	$T_{inst,max}$	[Nm]		2		

Autoclaved aerated concrete block AAC6 according EN 771-4, Bulk density ρ : 0,60 kg/dm³, Minimum brick size: 499x240x249 mm (e.g. Porit)

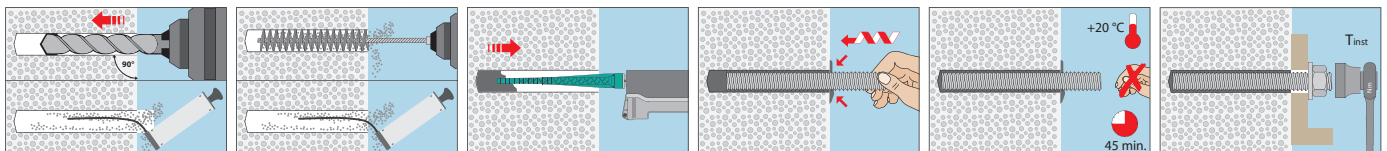
			M8	M10	M12	M16
Threaded stud: Steel: \geq FKL 5.8; A4, HCR: \geq FKL 70						
Anchorage depth	h_{ef}	[mm]	80	90	100	100
Spacing = Minimum spacing	$s_{cr} = s_{min}$	[mm]	240	270	300	300
Edge distance = Minimum edge distance	$c_{cr} = c_{min}$	[mm]	120	135	150	150
Approved tension load for compression strength	appr. N	[kN]	0,7	1,1	1,6	2,0
Approved shear load for compression strength	appr. V	[kN]	2,0	3,2	3,2	3,9
Installation torque	$T_{inst,max}$	[Nm]		2		

Installation parameters autoclaved aerated concrete without perfo sleeve

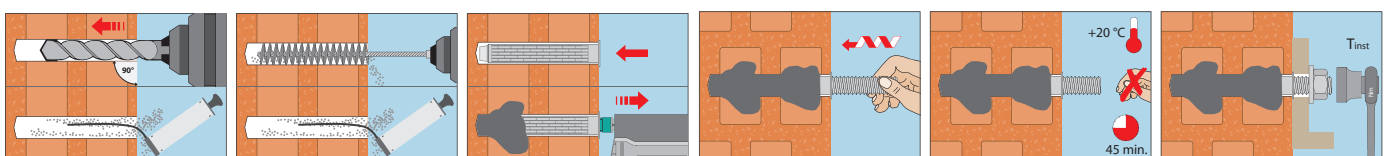
			M8	M10	M12	M16
Threaded studs: Steel: \geq FKL 5.8; A4, HCR: \geq FKL 70						
Diameter of drill hole	d_o	[mm]	10	12	14	18
Drill hole depth	h_o	[mm]	80	90	100	100
Drilling method				Rotary drilling		
Minimum wall thickness	h_{min}	[mm]	110	120	130	130
Clearance hole in the fixture	$d_{f \leq}$	[mm]	9	12	14	18
Diameter of brush	$d_b \geq$	[mm]	12	14	16	20
Installation torque	$T_{inst,max}$	[Nm]	2	2	2	2
Amount of adhesive per drill hole		[ml]	5,2	7,3	9,8	13,6
Drill holes per cartridge	VM-EA 300	[Pcs.]	50	36	26	19
	VM-EA 345	[Pcs.]	59	42	31	22
	VM-EA 420	[Pcs.]	73	52	39	28

¹⁾Max. long term temperature / max. short term temperature

Installation in autoclaved aerated concrete and solid brick without perfo sleeve



Installation in perforated brick with perfo sleeve




Extract from Permissible Service Conditions of European Technical Assessment ETA-17/0006

Approved loads for single anchor without influence of spacing and edge distance. Butt joint and horizontal joint with adhesive.

 Range of temperature -40°C to $24^{\circ}\text{C}/40^{\circ}\text{C}^{1)}$ – use category dry/dry. Total safety factor as per ETAG 001 included (γ_M and γ_F).

Injection System VM-EA, perforated brick with Perfo Sleeve
Calcium silicate hollow brick KSL-3DF according EN 771-2, Bulk density ρ : 1,4 kg/dm³, Brick size: 240x175x113 mm (e.g. Wemding)

Threaded studs: Steel: \geq FKL 5.8; A4, HCR: \geq FKL 70			M8	M8 / M10		M12/M16	M12	M16		
Perfo sleeves VM-SH			12x80	16x85	16x130 / 16x130/330	20x85	20x130	20x200	20x130	20x200
Anchorage depth	h_{ef}	[mm]	80	85	130	85	130	200	130	200
Spacing = Minimum spacing parallel to the horizontal joint			$S_{cr} = S_{min,II}$	[mm]	240	240	240	240	240	240
Minimum spacing vertical to the horizontal joint			$S_{min,I}$	[mm]	113	113	113	113	113	113
Edge distance = Minimum edge distance			$C_{cr} = C_{min}$	[mm]	100	100	100	120	120	120
Approved tension load for compressive strength	$f_b \geq 8 \text{ N/mm}^2$	appr. N [kN]	0,4	0,4	0,7	0,4	0,7	0,7	0,7	0,7
	$f_b \geq 12 \text{ N/mm}^2$	appr. N [kN]	0,6	0,6	1,0	0,6	1,0	1,0	1,0	1,0
	$f_b \geq 14 \text{ N/mm}^2$	appr. N [kN]	0,7	0,7	1,1	0,7	1,1	1,1	1,1	1,1
Approved shear load for compressive strength	$f_b \geq 8 \text{ N/mm}^2$	appr. V [kN]	0,6	0,7	0,9	0,9	0,9	0,9	1,1	1,1
	$f_b \geq 12 \text{ N/mm}^2$	appr. V [kN]	0,7	1,0	1,3	1,0	1,3	1,3	1,4	1,4
	$f_b \geq 14 \text{ N/mm}^2$	appr. V [kN]	0,9	1,1	1,4	1,3	1,4	1,4	1,7	1,7
Installation torque			$T_{inst,max}$	[Nm]	8	8	8	8	8	8

Calcium silicate hollow brick KSL-12DF according EN 771-2, Bulk density ρ : 1,4 kg/dm³, Brick size: 498x175x238 mm (e.g. Wemding)

Threaded studs: Steel: \geq FKL 5.8; A4, HCR: \geq FKL 70			M8	M8 / M10		M12 / M16	
Perfo sleeves VM-SH			12x80	16x85	16x130 / 16x130/330	20x85	20x130
Anchorage depth	h_{ef}	[mm]	80	85	130	85	130
Spacing = Minimum spacing parallel to the horizontal joint			$S_{cr} = S_{min,II}$	[mm]	498	498	498
Minimum spacing vertical to the horizontal joint			$S_{min,I}$	[mm]	238	238	238
Edge distance = Minimum edge distance			$C_{cr} = C_{min}$	[mm]	100	100	120
Approved tension load for compressive strength	$f_b \geq 10 \text{ N/mm}^2$	appr. N [kN]	0,1	0,3	1,0	0,3	1,0
	$f_b \geq 12 \text{ N/mm}^2$	appr. N [kN]	0,1	0,4	1,3	0,4	1,3
	$f_b \geq 16 \text{ N/mm}^2$	appr. N [kN]	0,1	0,6	1,6	0,6	1,6
Approved shear load for compressive strength	$f_b \geq 10 \text{ N/mm}^2$	appr. V [kN]	0,9	1,7	2,0	1,7	2,0
	$f_b \geq 12 \text{ N/mm}^2$	appr. V [kN]	1,0	2,0	2,3	2,0	2,3
	$f_b \geq 16 \text{ N/mm}^2$	appr. V [kN]	1,1	2,6	2,9	2,4	2,9
Installation torque			$T_{inst,max}$	[Nm]	2	4	4

Clay hollow brick HLZ-16DF according EN 771-1, Bulk density ρ : 0,83 kg/dm³, Brick size: 497x238x240 mm (e.g. Unipor)

Threaded studs: Steel: \geq FKL 5.8; A4, HCR: \geq FKL 70			M8	M8	M8	M10	M10	M12/M16		
Perfo sleeves VM-SH			12x80	16x85	16x130 / 16x130/330	16x85	16x130 / 16x130/330	20x85	20x130	20x200
Anchorage depth	h_{ef}	[mm]	80	85	130	85	130	85	130	200
Spacing = Minimum spacing parallel to the horizontal joint			$S_{cr} = S_{min,II}$	[mm]	497	497	497	497	497	497
Minimum spacing vertical to the horizontal joint			$S_{min,I}$	[mm]	238	238	238	238	238	238
Edge distance = Minimum edge distance			$C_{cr} = C_{min}$	[mm]	100	100	100	100	120	120
Approved tension load for compressive strength	$f_b \geq 6 \text{ N/mm}^2$	appr. N [kN]	0,3	0,4	0,7	0,4	0,7	0,6	0,7	0,7
	$f_b \geq 9 \text{ N/mm}^2$	appr. N [kN]	0,3	0,6	0,9	0,6	0,9	0,7	0,9	0,9
	$f_b \geq 12 \text{ N/mm}^2$	appr. N [kN]	0,4	0,7	1,0	0,7	1,0	1,0	1,0	1,0
	$f_b \geq 14 \text{ N/mm}^2$	appr. N [kN]	0,4	0,7	1,0	0,7	1,0	1,0	1,0	1,0
Approved shear load for compressive strength	$f_b \geq 6 \text{ N/mm}^2$	appr. V [kN]	0,7	1,1	1,1	1,1	1,7	1,1	1,7	1,7
	$f_b \geq 9 \text{ N/mm}^2$	appr. V [kN]	0,9	1,3	1,4	1,4	2,0	1,4	2,0	2,0
	$f_b \geq 12 \text{ N/mm}^2$	appr. V [kN]	1,0	1,6	1,7	1,7	2,3	1,7	2,3	2,3
	$f_b \geq 14 \text{ N/mm}^2$	appr. V [kN]	1,1	1,7	1,9	1,7	2,6	1,7	2,6	2,6
Installation torque			$T_{inst,max}$	[Nm]	6	6	6	6	6	6

Clay hollow brick Porotherm Homebric according EN 771-1, Bulk density ρ : 0,68 kg/dm³, Brick size: 500x200x299 mm (e.g. Wienerberger)

Threaded studs: Steel: \geq FKL 5.8; A4, HCR: \geq FKL 70			M8	M8 / M10		M12 / M16	
Perfo sleeves VM-SH			12x80	16x85	16x130 / 16x130/330	20x85	20x130
Anchorage depth	h_{ef}	[mm]	80	85	130	85	130
Spacing = Minimum spacing parallel to the horizontal joint			$S_{cr} = S_{min,II}$	[mm]	500	500	500
Minimum spacing vertical to the horizontal joint			$S_{min,I}$	[mm]	299	299	299
Edge distance = Minimum edge distance			$C_{cr} = C_{min}$	[mm]	100	100	120
Approved tension load for compressive strength	$f_b \geq 6 \text{ N/mm}^2$	appr. N [kN]	0,3	0,3	0,4	0,3	0,4
	$f_b \geq 8 \text{ N/mm}^2$	appr. N [kN]	0,3	0,3	0,4	0,3	0,4
	$f_b \geq 10 \text{ N/mm}^2$	appr. N [kN]	0,3	0,4	0,6	0,4	0,6
Approved shear load for compressive strength	$f_b \geq 6 \text{ N/mm}^2$	appr. V [kN]	0,6	0,6	0,7	0,9	0,9
	$f_b \geq 8 \text{ N/mm}^2$	appr. V [kN]	0,7	0,7	0,9	1,0	1,0
	$f_b \geq 10 \text{ N/mm}^2$	appr. V [kN]	0,9	0,9	1,0	1,1	1,1
Installation torque			$T_{inst,max}$	[Nm]	2	6	6

¹⁾Max. long term temperature / max. short term temperature



Extract from Permissible Service Conditions of European Technical Assessment ETA-17/0006

Approved loads for single anchor without influence of spacing and edge distance. Butt joint and horizontal joint with adhesive.

Range of temperature -40°C to 24°C/40°C¹⁾ – use category dry/dry. Total safety factor as per ETAG 001 included (γ_M and γ_P).

Injection System VM-EA, perforated brick with Perfo Sleeve

Clay hollow brick BGV Thermo according EN 771-1, Bulk density ρ : 0,62 kg/dm³, Brick size: 500x200x314 mm (e.g. Leroux)

Threaded studs: Steel: \geq FKL 5.8; A4, HCR: \geq FKL 70			M8	M8/M10	M8	M10	M12	M16	M12/M16
Perfo sleeves VM-SH			12x80	16x85	16x130 16x130/330	16x130 16x130/330	20x85	20x85	20x130
Anchorage depth	h_{ef}	[mm]	80	85	130	130	85	85	130
Spacing = Minimum spacing parallel to the horizontal joint	$s_{cr} = s_{min,II}$	[mm]	500	500	500	500	500	500	500
Minimum spacing vertical to the horizontal joint	$s_{min,L}$	[mm]	314	314	314	314	314	314	314
Edge distance = Minimum edge distance	$c_{cr} = c_{min}$	[mm]	100	100	100	100	120	120	120
Approved tension load for compressive strength	$f_b \geq 4 \text{ N/mm}^2$	appr. N	[kN]	0,1	0,2	0,3	0,3	0,2	0,3
	$f_b \geq 6 \text{ N/mm}^2$	appr. N	[kN]	0,2	0,3	0,3	0,4	0,3	0,4
	$f_b \geq 10 \text{ N/mm}^2$	appr. N	[kN]	0,3	0,3	0,4	0,4	0,3	0,4
Approved shear load for compressive strength	$f_b \geq 4 \text{ N/mm}^2$	appr. V	[kN]	0,6	0,6	0,7	0,7	0,6	0,7
	$f_b \geq 6 \text{ N/mm}^2$	appr. V	[kN]	0,6	0,7	0,9	0,9	0,9	0,9
	$f_b \geq 10 \text{ N/mm}^2$	appr. V	[kN]	0,9	1,0	1,1	1,1	1,0	1,1
Installation torque	$T_{inst,max}$	[Nm]	2	4	4	4	4	4	4

Clay hollow brick Calibric Th according EN 771-1, Bulk density ρ : 0,62 kg/dm³, Brick size: 500x200x314 mm (e.g. Terreal)

Threaded studs: Steel: \geq FKL 5.8; A4, HCR: \geq FKL 70			M8	M8/M10	M8	M10	M12	M16	M12	M16
Perfo sleeves VM-SH			12x80	16x85	16x130 16x130/330	16x130 16x130/330	20x85	20x85	20x130	20x130
Anchorage depth	h_{ef}	[mm]	80	85	130	130	85	85	130	130
Spacing = Minimum spacing parallel to the horizontal joint	$s_{cr} = s_{min,II}$	[mm]	500	500	500	500	500	500	500	500
Minimum spacing vertical to the horizontal joint	$s_{min,L}$	[mm]	314	314	314	314	314	314	314	314
Edge distance = Minimum edge distance	$c_{cr} = c_{min}$	[mm]	100	100	100	100	120	120	120	120
Approved tension load for compressive strength	$f_b \geq 6 \text{ N/mm}^2$	appr. N	[kN]	0,2	0,2	0,3	0,3	0,2	0,3	0,3
	$f_b \geq 9 \text{ N/mm}^2$	appr. N	[kN]	0,3	0,3	0,3	0,3	0,3	0,4	0,3
	$f_b \geq 12 \text{ N/mm}^2$	appr. N	[kN]	0,3	0,3	0,3	0,4	0,3	0,4	0,4
Approved shear load for compressive strength	$f_b \geq 6 \text{ N/mm}^2$	appr. V	[kN]	0,7	1,0	1,0	1,0	1,7	1,7	1,7
	$f_b \geq 9 \text{ N/mm}^2$	appr. V	[kN]	1,0	1,3	1,3	1,3	2,1	2,1	2,1
	$f_b \geq 12 \text{ N/mm}^2$	appr. V	[kN]	1,1	1,6	1,6	1,6	2,4	2,4	2,4
Installation torque	$T_{inst,max}$	[Nm]	2	2	2	2	2	2	2	2

Clay hollow brick Urbric according EN 771-1, Bulk density ρ : 0,74 kg/dm³, Brick size: 560x200x274 mm (e.g. Imerys)

Threaded studs: Steel: \geq FKL 5.8; A4, HCR: \geq FKL 70			M8	M8 / M10	M12 / M16
Perfo sleeves VM-SH			12x80	16x85	16x130 16x130/330
Anchorage depth	h_{ef}	[mm]	80	85	130
Spacing = Minimum spacing parallel to the horizontal joint	$s_{cr} = s_{min,II}$	[mm]	560	560	560
Minimum spacing vertical to the horizontal joint	$s_{min,L}$	[mm]	274	274	274
Edge distance = Minimum edge distance	$c_{cr} = c_{min}$	[mm]	100	100	100
Approved tension load for compressive strength	$f_b \geq 6 \text{ N/mm}^2$	appr. N	[kN]	0,3	0,3
	$f_b \geq 9 \text{ N/mm}^2$	appr. N	[kN]	0,3	0,4
	$f_b \geq 12 \text{ N/mm}^2$	appr. N	[kN]	0,3	0,4
Approved shear load for compressive strength	$f_b \geq 6 \text{ N/mm}^2$	appr. V	[kN]	0,9	1,0
	$f_b \geq 9 \text{ N/mm}^2$	appr. V	[kN]	1,0	1,3
	$f_b \geq 12 \text{ N/mm}^2$	appr. V	[kN]	1,0	1,3
Installation torque	$T_{inst,max}$	[Nm]	2	2	2

Clay hollow brick Blocchi Leggeri according EN 771-1, Bulk density ρ : 0,55 kg/dm³, Brick size: 250x120x250 mm (e.g. Wienerberger)

Threaded studs: Steel: \geq FKL 5.8; A4, HCR: \geq FKL 70			M8	M8 / M10	M12 / M16
Perfo sleeves VM-SH			12x80	16x85	16x130 16x130/330
Anchorage depth	h_{ef}	[mm]	80	85	130
Spacing = Minimum spacing parallel to the horizontal joint	$s_{cr} = s_{min,II}$	[mm]	250	250	250
Minimum spacing vertical to the horizontal joint	$s_{min,L}$	[mm]	250	250	250
Edge distance = Minimum edge distance	$c_{cr} = c_{min}$	[mm]	100	100	100
Approved tension load for compressive strength	$f_b \geq 4 \text{ N/mm}^2$	appr. N	[kN]	0,1	0,1
	$f_b \geq 6 \text{ N/mm}^2$	appr. N	[kN]	0,1	0,2
	$f_b \geq 8 \text{ N/mm}^2$	appr. N	[kN]	0,2	0,2
Approved shear load for compressive strength	$f_b \geq 4 \text{ N/mm}^2$	appr. V	[kN]	0,6	0,6
	$f_b \geq 6 \text{ N/mm}^2$	appr. V	[kN]	0,6	0,6
	$f_b \geq 8 \text{ N/mm}^2$	appr. V	[kN]	0,7	0,7
Installation torque	$T_{inst,max}$	[Nm]	4	4	4

¹⁾Max. long term temperature / max. short term temperature


Extract from Permissible Service Conditions of ETA-17/0006

 Approved loads for single anchor without influence of spacing and edge distance. Butt joint and horizontal joint with adhesive.
 Range of temperature -40°C to $24^{\circ}\text{C}/40^{\circ}\text{C}^{1)}$ – use category dry/dry. Total safety factor as per ETAG 001 included (γ_{M} and γ_{P}).

Injection System VM-EA, perforated brick with Perfo Sleeve
Clay hollow brick Doppio Uni according EN 771-1, Bulk density ρ : 0,92 kg/dm³, Brick size: 250x120x120 mm (e.g. Wienerberger)

Threaded studs: Steel: \geq FKL 5.8; A4, HCR: \geq FKL 70			M8	M8 / M10		M12 / M16	
Perfo sleeves VM-SH			12x80	16x85	16x130 16x130/330	20x85	20x130 20x200
Anchorage depth	h_{ef}	[mm]	80	85	130	85	130 200
Spacing = Minimum spacing parallel to the horizontal joint	$s_{cr} = s_{min,II}$	[mm]	250	250	250	250	250
Minimum spacing vertical to the horizontal joint	$s_{min,I}$	[mm]	120	120	120	120	120
Edge distance = Minimum edge distance	$c_{cr} = c_{min}$	[mm]	100	100	100	120	120 120
Approved tension load for compressive strength	$f_b \geq 10 \text{ N/mm}^2$	appr. N	0,3	0,3	0,3	0,3	0,3 0,3
	$f_b \geq 16 \text{ N/mm}^2$	appr. N	0,3	0,3	0,3	0,4	0,4 0,4
	$f_b \geq 20 \text{ N/mm}^2$	appr. N	0,3	0,3	0,4	0,4	0,4 0,4
	$f_b \geq 28 \text{ N/mm}^2$	appr. N	0,4	0,4	0,4	0,6	0,6 0,6
Approved shear load for compressive strength	$f_b \geq 10 \text{ N/mm}^2$	appr. V	0,6	0,6	0,6	0,6	0,6 0,6
	$f_b \geq 16 \text{ N/mm}^2$	appr. V	0,7	0,7	0,7	0,7	0,7 0,7
	$f_b \geq 20 \text{ N/mm}^2$	appr. V	0,9	0,9	0,9	0,9	0,9 0,9
	$f_b \geq 28 \text{ N/mm}^2$	appr. V	1,0	1,0	1,0	1,0	1,0 1,0
Installation torque	$T_{inst,max}$	[Nm]	4	4	4	4	4 4

Brickwork of hollow lightweight concrete Bloc creux B40 according EN 771-3, Bulk density ρ : 0,8 kg/dm³, Brick size: 494x200x190 mm (e.g. Sepa)

Threaded studs: Steel: \geq FKL 5.8; A4, HCR: \geq FKL 70			M8	M8 / M10		M12 / M16	
Perfo sleeves VM-SH			12x80	16x85	16x130 16x130/330	20x85	20x130
Anchorage depth	h_{ef}	[mm]	80	85	130	85	130
Spacing = Minimum spacing parallel to the horizontal joint	$s_{cr} = s_{min,II}$	[mm]	494	494	494	494	494
Minimum spacing vertical to the horizontal joint	$s_{min,I}$	[mm]	190	190	190	190	190
Edge distance = Minimum edge distance	$c_{cr} = c_{min}$	[mm]	100	100	100	120	120
Approved tension load for compressive strength	$f_b \geq 4 \text{ N/mm}^2$	appr. N	0,1	0,2	0,6	0,3	0,6
Approved shear load for compressive strength	$f_b \geq 4 \text{ N/mm}^2$	appr. V	0,3	0,9	1,0	0,9	1,0
Installation torque	$T_{inst,max}$	[Nm]	2	2	2	2	2

Brickwork of hollow lightweight concrete Leca Lex harkko RUH-200 according EN 771-3, Bulk density ρ : 0,7 kg/dm³, Brick size: 498x200x195 mm (e.g. Saint-Gobain Weber)

Threaded studs: Steel: \geq FKL 5.8; A4, HCR: \geq FKL 70			M8	M8 / M10		M12 / M16	
Perfo sleeves VM-SH			12x80	16x85	16x130 16x130/330	20x85	20x130
Anchorage depth	h_{ef}	[mm]	80	85	130	85	130
Spacing = Minimum spacing parallel to the horizontal joint	$s_{cr} = s_{min,II}$	[mm]	498	498	498	498	498
Minimum spacing vertical to the horizontal joint	$s_{min,I}$	[mm]	195	195	195	195	195
Edge distance = Minimum edge distance	$c_{cr} = c_{min}$	[mm]	120	127	195	127	195
Approved tension load for compressive strength	$f_b \geq 2,7 \text{ N/mm}^2$	appr. N	0,6	0,6	0,7	0,7	0,7
Approved shear load for compressive strength	$f_b \geq 2,7 \text{ N/mm}^2$	appr. V	0,7	1,0	1,0	1,0	1,0
Installation torque	$T_{inst,max}$	[Nm]	8	8	8	8	8

Installation parameters in perforated bricks with perfo sleeve

Threaded studs: Steel: \geq FKL 5.8; A4, HCR: \geq FKL 70			M8	M8 / M10		M12 / M16	
Perfo sleeves VM-SH			12x80	16x85	16x130 16x130/330	20x85	20x130 20x200
Diameter of drill hole	d_o	[mm]	12	16	16	20	20 20
Drill hole depth	h_o	[mm]	85	90	135	90	135 205
Drilling method					Rotary drilling		
Minimum wall thickness	h_{min}	[mm]	115	115	175	175	115 175 240
Clearance hole in the fixture	$d_{f \leq}$	[mm]	9	9 / 12	9 / 12	9 / 12	14 / 18 14 / 18 14 / 18
Diameter of brush	$d_b \geq$	[mm]	14	18	18	18	22 22 22
Installation torque	$T_{inst,max}$	[Nm]			s. brick information		
Amount of adhesive per drill hole		[ml]	11,2	24,9	38,0	38 - 68 ²⁾	41,1 62,9 96,7
Drill holes per cartridge	VM-EA 300	[Pcs.]	23	10	6	3 - 6 ²⁾	6 4 2
	VM-EA 345	[Pcs.]	27	12	8	4 - 8 ²⁾	7 4 3
	VM-EA 420	[Pcs.]	33	15	10	5 - 10 ²⁾	9 6 3

¹⁾Max. long term temperature / max. short term temperature

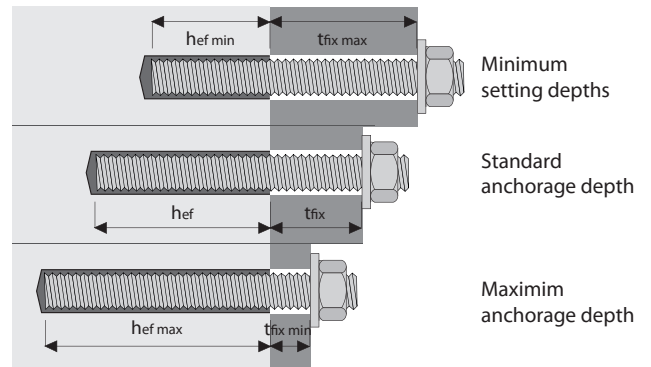
²⁾Dependent on actual perfo sleeve length

Threaded Studs for the Injection System VMU plus in concrete:
A flexible system means less inventory

The flexible anchoring depths of the Injection System VMU plus make it possible to adjust the setting depths to the required load. This allows at low loads, the use of shorter anchor rods with correspondingly shorter drilling depths, high loads can be supported by correspondingly deeper anchorage depths.

All anchor rod groups from the existing MKT range listed below can be used with the Injection System VMU plus. But these anchor rods can, according to the applied load, be set deeper or shallower. The minimum and maximum possible anchorage depths are specified in the assessment for each diameter and can be found in the extract from Permissible Service Conditions of ETA-11/0415 on the following pages.

Variable anchorage depth:



hef + tfix = Usable length of the threaded rod (without nut and washer)

Threaded Studs for applications in cracked and non-cracked concrete

Threaded Stud VMU-A

Steel, zinc plated 5.8



- ➔ May be used in structures subject to dry internal conditions
- ➔ Steel, zinc plated grade 8.8 on demand or as threaded studs VM-A

Threaded Stud VMU-A A4

Stainless steel A4



- ➔ May be used in structures subject to dry internal conditions or to external atmospheric exposure
- ➔ Stainless steel HCR (1.4529) on demand

Description	Ref. No.	Usable length in concrete mm	Pkg. cont. pcs.	Weight per pkg. kg
VMU-A 8x100	31510101	90	10	0,42
VMU-A 8x110	31515101	100	10	0,46
VMU-A 8x130	31525101	120	10	0,52
VMU-A 8x145	31528101	135	10	0,55
VMU-A 8x160	31530101	150	10	0,60
VMU-A 8x205	31550101	195	10	0,74
VMU-A 10x110	31605101	100	10	0,75
VMU-A 10x130	31625101	120	10	0,85
VMU-A 10x150	31630101	140	10	0,95
VMU-A 10x165	31635101	155	10	1,02
VMU-A 10x190	31645101	180	10	1,15
VMU-A 10x260	31655101	250	10	1,50
VMU-A 12x120	31717101	105	10	1,14
VMU-A 12x130	31718101	115	10	1,21
VMU-A 12x135	31710101	120	10	1,25
VMU-A 12x155	31720101	140	10	1,42
VMU-A 12x175	31730101	160	10	1,54
VMU-A 12x185	31734101	170	10	1,63
VMU-A 12x210	31740101	195	10	1,82
VMU-A 12x225	31748101	210	10	1,89
VMU-A 12x250	31750101	235	10	2,13
VMU-A 12x265	31757101	250	10	2,18
VMU-A 12x300	31760101	285	10	2,50
VMU-A 16x160	31810101	140	10	2,65
VMU-A 16x175	31815101	155	10	2,85
VMU-A 16x205	31820101	185	10	3,25
VMU-A 16x235	31830101	215	10	3,65
VMU-A 16x300	31840101	280	10	4,53
VMU-A 20x240	31910101	220	10	5,85
VMU-A 20x260	31915101	240	10	6,30
VMU-A 20x285	31920101	265	10	6,75
VMU-A 20x300	31925101	280	10	7,15
VMU-A 20x350	31930101	330	10	8,10
VMU-A 20x400	31935101	380	10	9,10
VMU-A 24x290	31960101	265	5	4,95
VMU-A 24x350	31965101	325	5	5,85
VMU-A 24x400	31970101	375	5	6,60
VMU-A 30x370	31990101	340	5	9,90

Description	Ref. No.	Usable length in concrete mm	Pkg. cont. pcs.	Weight per pkg. kg
VMU-A 8x100 A4	31510501	90	10	0,42
VMU-A 8x110 A4	31515501	100	10	0,46
VMU-A 8x130 A4	31525501	120	10	0,52
VMU-A 8x145 A4	31528501	135	10	0,55
VMU-A 8x160 A4	31530501	150	10	0,60
VMU-A 8x205 A4	31550501	195	10	0,74
VMU-A 10x110 A4	31605501	100	10	0,75
VMU-A 10x130 A4	31625501	120	10	0,85
VMU-A 10x150 A4	31630501	140	10	0,95
VMU-A 10x165 A4	31635501	155	10	1,02
VMU-A 10x190 A4	31645501	180	10	1,15
VMU-A 10x260 A4	31655501	250	10	1,50
VMU-A 12x120 A4	31717501	105	10	1,14
VMU-A 12x130 A4	31718501	115	10	1,21
VMU-A 12x135 A4	31710501	120	10	1,25
VMU-A 12x155 A4	31720501	140	10	1,42
VMU-A 12x175 A4	31730501	160	10	1,54
VMU-A 12x185 A4	31734501	170	10	1,63
VMU-A 12x210 A4	31740501	195	10	1,82
VMU-A 12x225 A4	31748501	210	10	1,89
VMU-A 12x250 A4	31750501	235	10	2,13
VMU-A 12x265 A4	31757501	250	10	2,18
VMU-A 12x300 A4	31760501	285	10	2,50
VMU-A 16x160 A4	31810501	140	10	2,65
VMU-A 16x175 A4	31815501	155	10	2,85
VMU-A 16x205 A4	31820501	185	10	3,25
VMU-A 16x235 A4	31830501	215	10	3,65
VMU-A 16x300 A4	31840501	280	10	4,53
VMU-A 20x240 A4	31910501	220	10	5,85
VMU-A 20x260 A4	31915501	240	10	6,30
VMU-A 20x285 A4	31920501	265	10	6,75
VMU-A 20x300 A4	31925501	280	10	7,15
VMU-A 24x290 A4	31960501	265	5	4,95
VMU-A 24x350 A4	31965501	325	5	5,85
VMU-A 24x400 A4	31970501	375	5	6,60
VMU-A 30x370 A4	31990501	340	5	9,90

Threaded Studs and Internally Threaded Sleeves for applications in **cracked and non-cracked concrete**

Threaded Stud VM-A

Steel, zinc plated 5.8

- Threaded studs, of 1 meter length, to be cut to the required length
- Comes with manufacturer's certificate (3.1 EN10204) in every package

Description	Ref. No.	Thread	Length mm	Package content pcs.	Weight per pkg. kg
VM-A 10x1000	31299101	M10	1000	10	5,5
VM-A 12x1000	31399101	M12	1000	10	7,76
VM-A 16x1000	31599101	M16	1000	10	13,6
VM-A 20x1000	31699101	M20	1000	5	10,8
VM-A 24x1000	31799101	M24	1000	5	15,35

Threaded Stud VM-A

Stainless steel A4



- Threaded studs, of 1 meter length, to be cut to the required length
- Comes with manufacturer's certificate (3.1 EN10204) in every package

Description	Ref. No.	Thread	Length mm	Package content pcs.	Weight per pkg. kg
VM-A 10x1000 A4	31299501	M10	1000	10	5,43
VM-A 12x1000 A4	31399501	M12	1000	10	8,03
VM-A 16x1000 A4	31599501	M16	1000	10	13,95
VM-A 20x1000 A4	31699501	M20	1000	5	11,0
VM-A 24x1000 A4	31799501	M24	1000	5	15,6

Threaded Stud VM-A

Steel, zinc plated 8.8

- Threaded studs, of 1 meter length, to be cut to the required length
- Comes with manufacturer's certificate (3.1 EN10204) in every package

Description	Ref. No.	Thread	Length mm	Package content pcs.	Weight per pkg. kg
VM-A 10x1000 8.8	31299181	M10	1000	10	5,5
VM-A 12x1000 8.8	31399181	M12	1000	10	7,76
VM-A 16x1000 8.8	31599181	M16	1000	10	13,6

Threaded Stud V-A

Steel, zinc plated 5.8

Dimensions see page 144



- For use in structures subject to dry internal conditions
- Steel, zinc plated 8.8 on demand

Threaded Stud V-A A4

Stainless steel A4

Dimensions see page 144



- For use in structures subject to dry internal conditions or external atmospheric exposure

Threaded Stud V-A fvz

Steel, hot dip galvanized 5.8

Dimensions see page 144



- For use in structures subject to dry internal conditions
- Steel hot dip galvanized 8.8 on demand

Threaded Stud V-A HCR

Stainless steel HCR

Dimensions see page 144



- For use in particularly corrosive environments
- High corrosion resistant steel 1.4529 (HCR)

Internally Threaded Sleeve VMU-IG

Steel, zinc plated 5.8/Stainless steel A4



- With internal thread
- For cracked and non-cracked concrete

Description	Ref. No.		Drill hole-Ø x depth mm	Outer-Ø x Length mm	Thread depth min / max mm	Package content pcs.	Weight per pkg. kg
	Steel, zinc plated	Stainless steel A4					
VMU-IG M6x80	31502101	31502501	12 x 80	10 x 80	8 / 20	10	0,38
VMU-IG M6x90	31503101	31503501	12 x 90	10 x 90	8 / 20	10	0,42
VMU-IG M8x80	31562101	31562501	14 x 80	12 x 80	8 / 20	10	0,52
VMU-IG M8x100	31563101	31563501	14 x 100	12 x 100	8 / 20	10	0,66
VMU-IG M10x80	31601101	31601501	18 x 80	16 x 80	10 / 25	10	0,92
VMU-IG M10x100	31602101	31602501	18 x 100	16 x 100	10 / 25	10	1,18

Other dimensions on demand.

Threaded Stud V-A



- May be used in structures subject to dry internal conditions
- Steel, zinc plated 5.8
- Approved for non-cracked concrete

Description	Ref. No.	Drill hole Ø x depth mm	Fixture thickness t _{fix} mm	Usable length in concrete ¹⁾ mm	Package content pcs.	Weight per package kg
V-A 8-20/110	21101101	10 x 80	20	100	10	0,43
V-A 8-60/150	21105101	10 x 80	60	140	10	0,53
V-A 10-15/115	21202101	12 x 90	15	105	10	0,73
V-A 10-30/130	21203101	12 x 90	30	120	10	0,81
V-A 10-65/165	21207101	12 x 90	65	155	10	0,98
V-A 10-90/190	21210101	12 x 90	90	180	10	1,11
V-A 10-150/250	21216101	12 x 90	150	240	10	1,42
V-A 10-200/300	21221101	12 x 90	200	290	10	1,71
V-A 12-10/135	21304101	14 x 110	10	120	10	1,19
V-A 12-35/160	21306101	14 x 110	35	145	10	1,37
V-A 12-85/210	21312101	14 x 110	85	195	10	1,73
V-A 12-95/220	21313101	14 x 110	95	205	10	1,82
V-A 12-125/250	21316101	14 x 110	125	235	10	2,02
V-A 12-175/300	21321101	14 x 110	175	285	10	2,83
V-A 14-35/170 ²⁾	21408101	16 x 120	35	155	10	1,91
V-A 16-20/165	21507101	18 x 125	20	145	10	2,77
V-A 16-45/190	21510101	18 x 125	45	170	10	2,96
V-A 16-85/230	21514101	18 x 125	85	210	10	3,65
V-A 16-105/250	21516101	18 x 125	105	230	10	3,91
V-A 16-155/300	21521101	18 x 125	155	280	10	4,58
V-A 20-20/220	21613101	22 x 170	20	190	10	5,56
V-A 20-60/260	21617101	22 x 170	60	230	10	6,39
V-A 20-100/300	21621101	22 x 170	100	270	10	7,23
V-A 24-15/260	21717101	26 x 210	15	225	5	4,89
V-A 24-55/300	21721101	26 x 210	55	265	5	5,54
V-A 30-70/380 ²⁾³⁾	21829101	32 x 280	70	350	5	10,00

Other lengths and grade 8.8 on demand.

¹⁾For VMH/VMU plus/VM-EA/VME

²⁾Not part of assessment

³⁾Setting tool V-A 30-70/380 ref. no. 27805160 to be ordered separately.

Threaded Stud V-A A4



- May be used in structures subject to dry internal conditions or external atmospheric exposure
- Stainless Steel A4
- Approved for non-cracked concrete

Description	Ref. No.	Drill hole Ø x depth mm	Fixture thickness t _{fix} mm	Usable length in concrete ¹⁾ mm	Package content pcs.	Weight per package kg
V-A 8-20/110 A4	21101501	10 x 80	20	100	10	0,43
V-A 8-60/150 A4	21105501	10 x 80	60	140	10	0,53
V-A 10-15/115 A4	21202501	12 x 90	15	105	10	0,73
V-A 10-30/130 A4	21203501	12 x 90	30	120	10	0,81
V-A 10-65/165 A4	21207501	12 x 90	65	155	10	0,98
V-A 10-90/190 A4	21210501	12 x 90	90	180	10	1,11
V-A 10-150/250 A4	21216501	12 x 90	150	240	10	1,42
V-A 10-200/300 A4	21221501	12 x 90	200	290	10	1,71
V-A 12-10/135 A4	21304501	14 x 110	10	120	10	1,19
V-A 12-35/160 A4	21306501	14 x 110	35	145	10	1,37
V-A 12-55/180 A4	21309501	14 x 110	55	165	10	1,51
V-A 12-85/210 A4	21312501	14 x 110	85	195	10	1,73
V-A 12-95/220 A4	21313501	14 x 110	95	205	10	1,82
V-A 12-125/250 A4	21316501	14 x 110	125	235	10	2,02
V-A 12-175/300 A4	21321501	14 x 110	175	285	10	2,83
V-A 14-35/170 A4 ²⁾	21408501	16 x 120	35	155	10	1,91
V-A 16-5/150 A4	21505501	18 x 125	5	130	10	2,38
V-A 16-20/165 A4	21507501	18 x 125	20	145	10	2,77
V-A 16-45/190 A4	21510501	18 x 125	45	170	10	2,96
V-A 16-65/210 A4	21512501	18 x 125	65	190	10	3,20
V-A 16-85/230 A4	21514501	18 x 125	85	210	10	3,65
V-A 16-105/250 A4	21516501	18 x 125	105	230	10	3,91
V-A 16-155/300 A4	21521501	18 x 125	155	280	10	4,58
V-A 20-20/220 A4	21613501	22 x 170	20	190	10	5,56
V-A 20-60/260 A4	21617501	22 x 170	60	230	10	6,39
V-A 20-100/300 A4	21621501	22 x 170	100	270	10	7,23
V-A 24-15/260 A4	21717501	26 x 210	15	225	5	4,89
V-A 24-55/300 A4	21721501	26 x 210	55	265	5	5,54
V-A 30-70/380 A4 ²⁾³⁾	21829501	32 x 280	70	350	5	10,00

Other lengths on demand.

¹⁾For VMH/VMU plus/VM-EA/VME

²⁾Not part of assessment

³⁾Setting tool V-A 30-70/380 ref. no. 27805160 to be ordered separately.

Threaded Stud V-A fvz



- Improved corrosion protection
- Steel, hot dip galvanized 5.8 (≥ 40µm, EN ISO 1461)
- Approved for non-cracked concrete

Description	Ref. No.	Drill hole Ø x depth mm	Fixture thickness t _{fix} mm	Usable length in concrete ¹⁾ mm	Package content pcs.	Weight per package kg
V-A 8-20/110 fvz	21101201	10 x 80	20	100	10	0,43
V-A 10-30/130 fvz	21203201	12 x 90	30	120	10	0,81
V-A 10-90/190 fvz	21210201	12 x 90	90	180	10	1,11
V-A 12-35/160 fvz	21306201	14 x 110	35	145	10	1,37
V-A 12-95/220 fvz	21313201	14 x 110	95	205	10	1,82
V-A 16-20/165 fvz	21507201	18 x 125	20	145	10	2,77
V-A 16-45/190 fvz	21510201	18 x 125	45	170	10	2,96
V-A 16-65/210 fvz	21512201	18 x 125	65	190	10	3,20
V-A 20-20/220 fvz	21613201	22 x 170	20	190	10	5,56
V-A 20-60/260 fvz	21617201	22 x 170	60	230	10	6,39
V-A 24-15/260 fvz	21717201	26 x 210	15	235	5	4,89
V-A 24-55/300 fvz	21721201	26 x 210	55	265	5	5,54

Other lengths and grade 8.8 on demand.

¹⁾For VMH/VMU plus/VM-EA/VME

Threaded Stud V-A HCR



- For use in particularly corrosive environments
- High corrosion resistant steel 1.4529 (HCR)
- Approved for non-cracked concrete

Description	Ref. No.	Drill hole Ø x depth mm	Fixture thickness t _{fix} mm	Usable length in concrete ¹⁾ mm	Package content pcs.	Weight per package kg
V-A 8-20/110 HCR	21101651	10 x 80	20	100	10	0,43
V-A 10-30/130 HCR	21203651	12 x 90	30	120	10	0,81
V-A 12-35/160 HCR	21306651	14 x 110	35	145	10	1,37
V-A 16-45/190 HCR	21510651	18 x 125	45	170	10	2,96

Other lengths on demand.

¹⁾For VMH/VMU plus/VM-EA/VME