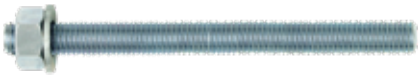
Injection System VM-EA

Threaded Stud V-A



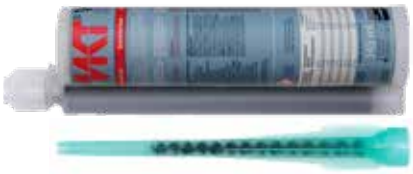
Threaded Stud VMU-A

Threaded Stud VM-A
1 meter length, to be cut to the required length

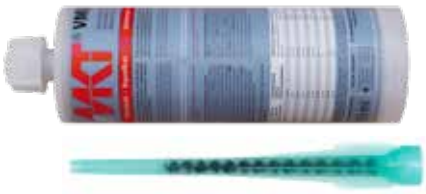
Internally Threaded Sleeve VMU-IG

Perfo sleeve VM-SH

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



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



Cartridge VM-EA 420
Coaxial cartridge
Content: 420ml

Range of loading: **0,1 kN–114,9 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. MKT VM-A) as well as nut and washer. Applications in perforated brick additionally require a perfo sleeve.

ETA-16/0856
M8-M24
IG M6-IG M16

ETA-17/0006
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 in non-cracked concrete with VMU-IG internally threaded rods
- 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

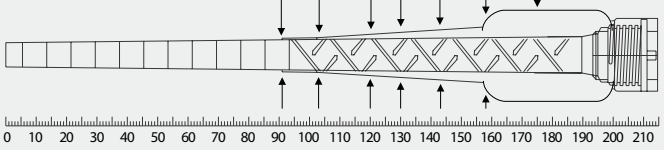
Description	Ref. No.	Content ml	Content of master box pcs	Weight per master box kg	Weight per piece kg
Cartridge VM-EA 300	28253101	300	12	6,40	0,53
Cartridge VM-EA 345	28255211	345	12	8,00	0,65
Cartridge VM-EA 420	28256201	420	12	10,1	0,83
Static mixer VM-X	28305111	-	12	0,12	0,01
Mixer extension VM-XE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

Drill holes must always be filled from the bottom of the hole to ensure no air pokkets are trapped in the adhesive. This is only possible when the tip of the mixing nozzle reaches the very bottom of the drill hole before injecting the adhesive. If the mixing nozzle does not reach the bottom of the drill hole, a mixer extension tube must be used.

Outer diameter mixer: Ø9,5 Ø12 Ø14 Ø16 Ø18 Ø22 Ø28



Curing Time Injection Adhesive VM-EA

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

Temperature (°C) in the drill hole	maximum working time	Curing time[1]
-5°C to - 1°C	90 min	6 h
0°C to + 4°C	45 min	3 h
+ 5°C to + 9°C	25 min	2 h
+ 10°C to + 14°C	20 min	100 min
+ 15°C to + 19°C	15 min	80 min
+ 20°C to + 29°C	6 min	45 min
+ 30°C to + 34°C	4 min	25 min
+ 35°C to + 39°C	2 min	20 min

[1]In wet or dry concrete

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

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

Accessories for Injection System VM-EA in concrete

Threaded Stud	Internally Threaded Sleeve	Rebar Ø mm	Blow-out pump / Air gun	Cleaning brush RB	Extension tube[2]	Dispenser
M8		10	VM-AP 360 VM-ABP 200	RB 10 M6	VM-XE 10	VM-P 345 Standard, VM-P 345 Profi, VM-P 380 Standard, VM-P 380 Profi, VM-P 345 Akku, VM-P 380 Akku, VM-P 345 Pneumatic Eco, VM-P 345 Pneumatic, VM-P 380 Pneumatic
M10	VMU-IG M6	12	VM-AP 360 VM-ABP 200	RB 12 M6 RB 12 M8	VM-XE 10	
M12	VMU-IG M8	14	VM-AP 360 VM-ABP 200	RB 14 M6 RB 14 M8	VM-XE 10	
M16	VMU-IG M10	18	VM-AP 360 VM-ABP 200 / 250 / 500 / 1000	RB 18 M6 RB 18 M8	VM-XE 10	
M20	VMU-IG M12	22	VM-AP 360[1] VM-ABP 250 / 500 / 1000	RB 24 M6	VM-XE 10	
M24	VMU-IG M16	28	VM-AP 360[1] VM-ABP 250 / 500 / 1000	RB 28 M6	VM-XE 10	
See page			**169**	**170**	**171**	**172 / 173**

[1]Can be used up to a anchorage depth of 240 mm ($h_{ef} \leq 240$mm)

[2]If the static mixer does not reach the bottom of the borehole (see usable length of static mixer) or from a anchorage depth of 190 mm, a extension tube must be used.

Accessories for Injection System VM-EA in brickwork

Threaded Stud (without Perfo sleeve)	Perfo sleeve-Ø	Rebar Ø	Blow-out pump / Air gun	Cleaning brush RB	Extension tube[1)]	Dispenser
mm	mm	mm				
M8		10	VM-AP 360 VM-ABP 200	RB 10 M6	VM-XE 10	VM-P 345 Standard, VM-P 345 Profi, VM-P 380 Standard, VM-P 380 Profi, VM-P 345 Akku, VM-P 380 Akku, VM-P 825 Akku, VM-P 345 Pneumatic Eco, VM-P 345 Pneumatic, VM-P 380 Pneumatic
M10	VM-SH 12 x 80	12	VM-AP 360 VM-ABP 200	RB 12 M6	VM-XE 10	
M12		14	VM-AP 360 VM-ABP 200	RB 14 M6	VM-XE 10	
	VM-SH 16 x 85 VM-SH 16 x 130 VM-SH 16 x 130/330[1)]	16	VM-AP 360 VM-ABP 200	RB 16 M6	VM-XE 10	
M16		18	VM-AP 360 VM-ABP 200 / 250	RB 18 M6	VM-XE 10	
	VM-SH 20 x 85 VM-SH 20 x 130 VM-SH 20 x 200	20	VM-AP 360 VM-ABP 200 / 250	RB 20 M6	VM-XE 10	
See page			**169**	**170**	**171**	**172 / 173**

[1)]Required if the static mixer does not reach the bottom of the borehole or the bottom of the perfo sleeve

Threaded Studs for the Injection System VM-EA in non-cracked concrete and brickwork

Threaded Stud VMU-A
Steel, zinc plated 5.8
Dimensions see page 163

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

Threaded Stud VMU-A fvz
Steel, hot dip galvanized 5.8
Dimensions see page 163

- For use in structures subject to dry internal conditions

NEW

Threaded Stud VMU-A A4
Stainless steel A4-70
Dimensions see page 163

- For use in structures subject to dry internal conditions
- Stainless steel HCR on request

Internally Threaded Sleeve VMU-IG
Steel, zinc plated 5.8
Dimensions see page 165

- For use in structures subject to dry internal conditions
- Only in non-cracked concrete
- With internal thread

Internally Threaded Sleeve VMU-IG A4
Stainless steel A4-70
Dimensions see page 165

- For use in structures subject to dry internal conditions or external atmospheric exposure
- Only in non-cracked concrete
- With internal thread

Threaded Stud V-A
Steel, zinc plated 5.8
Dimensions see page 164

- For use in structures subject to dry internal conditions

Threaded Stud V-A fvz
Steel, hot dip galvanized 5.8
Dimensions see page 164

- For use in structures subject to dry internal conditions

Threaded Stud V-A 8.8
Steel, zinc plated 8.8
Dimensions see page 164

- For use in structures subject to dry internal conditions

Threaded Stud V-A A4
Stainless steel A4-70
Dimensions see page 164

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

Threaded Stud V-A HCR
Stainless steel HCR-70
Dimensions see page 164

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

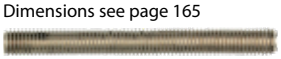
Threaded Stud VM-A
Steel, zinc plated 5.8
Dimensions see page 165

- 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 8.8
Steel, zinc plated 8.8
Dimensions see page 165

- 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 A4
Stainless steel A4-70
Dimensions see page 165



- 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

Perfo sleeve VM-SH
Polypropylene
Dimensions see page 166

- Approved for solid and perforated bricks

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°C[1)] and for temperature range II -40°C to +50°C/+80°C[1)]. Total safety factor as per ETAG 001 included (γ_M and γ_F).

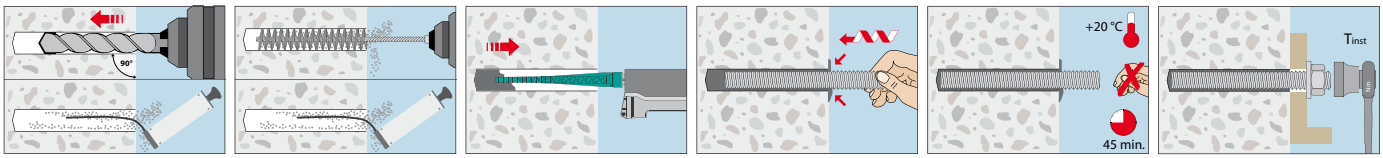
Loads and performance data					non-cracked concrete					
Injection System VM-EA, threaded stud Steel 5.8					**M8**	**M10**	**M12**	**M16**	**M20**	**M24**
Range of anchorage depth		$h_{ef,min}$ - $h_{ef,max}$		[mm]	60 - 160	60 - 200	70 – 240	80 – 320	90 – 400	96 - 480
Approved tension load for $h_{ef,min}$ - $h_{ef,max}$										
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]	6,3	9,9	14,5	26,9	41,1 - 42,0	45,2 - 60,5
	50°C/80°C [1)]	C20/25	appr. V	[kN]	6,3	9,9	14,5	23,0 - 26,9	32,3 - 42,0	41,4 - 60,5
Injection System VM-EA, threaded stud Steel 8.8										
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 A4-70, HCR-70										
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			$d_f \leq$	[mm]	9	12	14	18	22	26
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.

Loads and performance data					non-cracked concrete							
Internally threaded sleeves					**IG M6 x 80**	**IG M6 x 90**	**IG M8 x 80**	**IG M8 x 100**	**IG M10 x 80**	**IG M10 x 100**	**IG M12 x125**	**IG M16 x 170**
Effective anchorage depth h_{ef}				[mm]	80	90	80	100	80	100	125	170
Injection System VM-EA, Internally threaded sleeve VMU-IG, Steel 5.8												
Approved loads, tension for h_{ef}												
Temperature range	24°C/40°C [1)]	C20/25	appr. N	[kN]	4,8	4,8	8,1	8,1	12,8	13,8	20,0	36,2
	50°C/80°C [1)]	C20/25	appr. N	[kN]	4,8	4,8	7,2	8,1	9,6	12,0	18,7	30,5
Approved loads, tension for h_{ef}												
Temperature range	24°C/40°C [1)]	C20/25	appr. V	[kN]	3,4	3,4	5,7	5,7	9,7	9,7	14,3	25,7
	50°C/80°C [1)]	C20/25	appr. V	[kN]	3,4	3,4	5,7	5,7	9,7	9,7	14,3	25,7
Injection System VM-EA, Internally threaded sleeve VMU-IG, Stainless steel A4-70, HCR-70												
Approved loads, tension for h_{ef}												
Temperature range	24°C/40°C [1)]	C20/25	appr. N	[kN]	5,3	5,3	9,6	9,9	12,8	15,7	22,5	40,7
	50°C/80°C [1)]	C20/25	appr. N	[kN]	5,3	5,3	7,2	9,0	9,6	12,0	18,7	30,5
Approved loads, tension for h_{ef}												
Temperature range	24°C/40°C [1)]	C20/25	appr. V	[kN]	3,2	3,2	6,0	6,0	9,2	9,2	13,7	25,2
	50°C/80°C [1)]	C20/25	appr. V	[kN]	3,2	3,2	6,0	6,0	9,2	9,2	13,7	25,2
Spacing and edge distance												
Minimum thickness of concrete slab for h_{ef}			h_{min}	[mm]	110	120	110	130	116	136	173	226
Minimum spacing			s_{min}	[mm]	50	50	60	60	80	80	100	120
Minimum edge distance			c_{min}	[mm]	50	50	60	60	80	80	100	120
Installation parameters												
Diameter of drill hole			d_o	[mm]	12	12	14	14	18	18	24	28
Clearance hole in the fixture			$d_f \leq$	[mm]	7	7	9	9	12	12	14	18
Range of drill hole depth for h_{ef}			d_0	[mm]	80	90	80	100	80	100	125	170
Installation torque			$T_{inst} \leq$	[Nm]	10	10	10	10	20	20	40	60
Amount of adhesive per drill hole				[ml]	6,6	7,4	7,9	9,9	10,9	13,6	33,4	54,9

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

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°C/40°C[1] – use category dry/dry. (For temperature range II -40°C to +50°C/+80°C[1] and other use categories see ETA-17/0006). Total safety factor as per ETAG 001 included (γ_M and γ_F).

Injection System VM-EA, Solid brick without Perfo Sleeve[2]

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: ≥ FKL. 5.8; A4, HCR: ≥ 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	$f_b \geq 10$ N/mm²	appr. N	[kN]	0,4	0,4	0,4	0,7
	$f_b \geq 20$ N/mm²	appr. N	[kN]	0,7	0,7	0,6	1,0
	$f_b \geq 28$ N/mm²	appr. N	[kN]	0,9	0,9	0,7	1,3
Approved shear load for compressive strength	$f_b \geq 10$ N/mm²	appr. V	[kN]	0,9	1,0	1,4	1,4
	$f_b \geq 20$ N/mm²	appr. V	[kN]	1,3	1,6	2,1	2,1
	$f_b \geq 28$ N/mm²	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)							
Threaded studs[1]: Steel: ≥ FKL. 5.8; A4, HCR: ≥ 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	$f_b \geq 10$ N/mm²	appr. N	[kN]	0,9	0,9	1,1	0,9
	$f_b \geq 20$ N/mm²	appr. N	[kN]	1,3	1,3	1,6	1,3
	$f_b \geq 27$ N/mm²	appr. N	[kN]	1,6	1,6	1,9	1,6
Approved shear load for compressive strength	$f_b \geq 10$ N/mm²	appr. V	[kN]	0,9	0,9	1,0	1,0
	$f_b \geq 20$ N/mm²	appr. V	[kN]	1,3	1,3	1,4	1,4
	$f_b \geq 27$ N/mm²	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)							
Threaded studs[1]: Steel: ≥ FKL. 5.8; A4, HCR: ≥ 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	$f_b \geq 2$ N/mm²	appr. N	[kN]	0,6	0,6	0,6	0,6
Approved shear load for compressive strength	$f_b \geq 2$ N/mm²	appr. V	[kN]	0,9	1,0	1,1	1,1
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)							
Threaded studs[1]: Steel: ≥ FKL. 5.8; A4, HCR: ≥ 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	$f_b \geq 3$ N/mm²	appr. N	[kN]	0,6	0,9	0,9	0,9
Approved shear load for compressive strength	$f_b \geq 3$ N/mm²	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: ≥ FKL. 5.8; A4, HCR: ≥ 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		$T_{inst,max}$	[Nm]		s. brick information		
Installation torque			[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

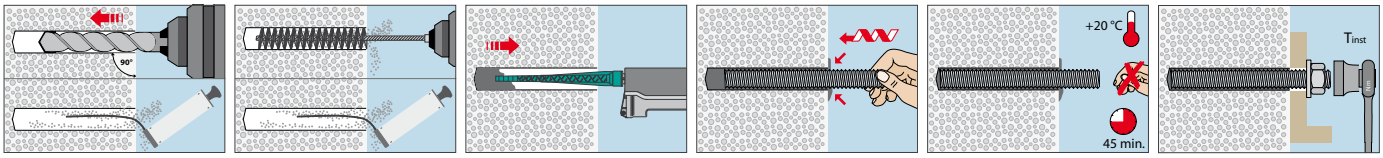
Extract from Permissible Service Conditions of European Technical Assessment ETA-17/0006

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°C[1)] – use category dry/dry. (For temperature range II -40°C to +50°C/+80°C[1)] and other use categories see ETA-17/0006). Total safety factor as per ETAG 001 included (γ_M and γ_F).

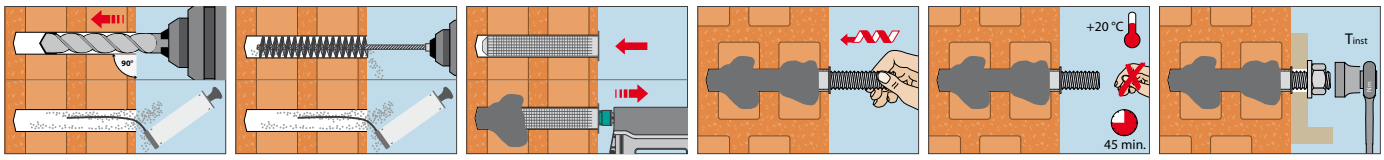
Injection System VM-EA, perforated brick without Perfo Sleeve							
Autoclaved aerated concrete block AAC2 according EN 771-4, Bulk density ρ: 0,35 kg/dm³, Minimum brick size: 599x375x249 mm (e.g. Ytong)							
Threaded studs: Steel: ≥ FKL. 5.8; A4, HCR: ≥ FKL 70				**M8**	**M10**	**M12**	**M16**
Anchorage 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	$f_b \geq 2$ N/mm²	appr. N	[kN]	0,3	0,3	0,5	0,5
Approved shear load for compressive strength	$f_b \geq 2$ N/mm²	appr. V	[kN]	0,5	0,7	0,9	1,3
Autoclaved aerated concrete block AAC4 according EN 771-4, Bulk density ρ: 0,50 kg/dm³, Minimum brick size: 499x375x249 mm (e.g. Ytong)							
Threaded studs: Steel: ≥ FKL. 5.8; A4, HCR: ≥ 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	$f_b \geq 4$ N/mm²	appr. N	[kN]	0,3	0,9	0,9	1,3
Approved shear load for compressive strength	$f_b \geq 4$ N/mm²	appr. V	[kN]	0,5	0,7	0,9	1,3
Autoclaved aerated concrete block AAC6 according EN 771-4, Bulk density ρ: 0,60 kg/dm³, Minimum brick size: 499x240x249 mm (e.g. Porit)							
Threaded stud: Steel: ≥ FKL. 5.8; A4, HCR: ≥ 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	$f_b \geq 6$ N/mm²	appr. N	[kN]	0,7	1,1	1,6	2,0
Approved shear load for compressive strength	$f_b \geq 6$ N/mm²	appr. V	[kN]	2,0	3,2	3,2	3,9
Installation parameters autoclaved aerated concrete without perfo sleeve							
Threaded studs: Steel: ≥ FKL. 5.8; A4, HCR: ≥ 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					Drehbohren		
Minimum wall thickness		h_{min}	[mm]	110	120	130	130
Clearance hole in the fixture		$d_f \leq$	[mm]	9	12	14	18
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°C/40°C[1] – use category dry/dry. For temperature range II -40°C to +50°C/+80°C[1] and other use categories see ETA-17/0006. 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: ≥ FKL. 5.8; A4, HCR: ≥ 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	240	240
Minimum spacing vertical to the horizontal joint		$s_{cr} = s_{min\_I\_}$	[mm]	113	113	113		113	113	113	113	113
Edge distance = Minimum edge distance		$c_{cr} = c_{min}$	[mm]	100	100	100		120	120	120	120	120
Approved tension load for compressive strength	$f_b \geq 8$ N/mm²	appr. N	[kN]	0,4	0,4	0,7		0,4	0,7	0,7	0,7	0,7
	$f_b \geq 12$ N/mm²	appr. N	[kN]	0,6	0,6	1,0		0,6	1,0	1,0	1,0	1,0
	$f_b \geq 14$ N/mm²	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	$f_b \geq 8$ N/mm²	appr. V	[kN]	0,6	0,7	0,9		0,9	0,9	0,9	1,1	1,1
	$f_b \geq 12$ N/mm²	appr. V	[kN]	0,7	1,0	1,3		1,0	1,3	1,3	1,4	1,4
	$f_b \geq 14$ N/mm²	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	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: ≥ FKL. 5.8; A4, HCR: ≥ 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		$s_{cr} = s_{min\_I\_}$	[mm]	238	238	238	238	238
Minimum spacing vertical to the horizontal joint		$c_{cr} = c_{min}$	[mm]	100	100	100	120	120
Approved tension load for compressive strength	$f_b \geq 10$ N/mm²	appr. N	[kN]	0,1	0,3	1,0	0,3	1,0
	$f_b \geq 12$ N/mm²	appr. N	[kN]	0,1	0,4	1,3	0,4	1,3
	$f_b \geq 16$ N/mm²	appr. N	[kN]	0,1	0,6	1,6	0,6	1,6
Approved shear load for compressive strength	$f_b \geq 10$ N/mm²	appr. V	[kN]	0,9	1,7	2,0	1,7	2,0
	$f_b \geq 12$ N/mm²	appr. V	[kN]	1,0	2,0	2,3	2,0	2,3
	$f_b \geq 16$ N/mm²	appr. V	[kN]	1,1	2,6	2,9	2,4	2,9
Installation torque		$T_{inst,max}$	[Nm]	2	4	4	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: ≥ FKL. 5.8; A4, HCR: ≥ 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	497	497
Minimum spacing vertical to the horizontal joint		$s_{cr} = s_{min\_I\_}$	[mm]	238	238	238	238	238	238	238	238
Edge distance = Minimum edge distance		$c_{cr} = c_{min}$	[mm]	100	100	100	100	100	120	120	120
Approved tension load for compressive strength	$f_b \geq 6$ N/mm²	appr. N	[kN]	0,3	0,4	0,7	0,4	0,7	0,6	0,7	0,7
	$f_b \geq 9$ N/mm²	appr. N	[kN]	0,3	0,6	0,9	0,6	0,9	0,7	0,9	0,9
	$f_b \geq 12$ N/mm²	appr. N	[kN]	0,4	0,7	1,0	0,7	1,0	1,0	1,0	1,0
	$f_b \geq 14$ N/mm²	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	$f_b \geq 6$ N/mm²	appr. V	[kN]	0,7	1,1	1,1	1,1	1,7	1,1	1,7	1,7
	$f_b \geq 9$ N/mm²	appr. V	[kN]	0,9	1,3	1,4	1,4	2,0	1,4	2,0	2,0
	$f_b \geq 12$ N/mm²	appr. V	[kN]	1,0	1,6	1,7	1,7	2,3	1,7	2,3	2,3
	$f_b \geq 14$ N/mm²	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	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: ≥ FKL. 5.8; A4, HCR: ≥ 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	500	500
Minimum spacing vertical to the horizontal joint		$s_{cr} = s_{min\_I\_}$	[mm]	299	299	299	299	299
Edge distance = Minimum edge distance		$c_{cr} = c_{min}$	[mm]	100	100	100	120	120
Approved tension load for compressive strength	$f_b \geq 6$ N/mm²	appr. N	[kN]	0,3	0,3	0,4	0,3	0,4
	$f_b \geq 8$ N/mm²	appr. N	[kN]	0,3	0,3	0,4	0,3	0,4
	$f_b \geq 10$ N/mm²	appr. N	[kN]	0,3	0,4	0,6	0,4	0,6
Approved shear load for compressive strength	$f_b \geq 6$ N/mm²	appr. V	[kN]	0,6	0,6	0,7	0,9	0,9
	$f_b \geq 8$ N/mm²	appr. V	[kN]	0,7	0,7	0,9	1,0	1,0
	$f_b \geq 10$ N/mm²	appr. V	[kN]	0,9	0,9	1,0	1,1	1,1
Installation torque		$T_{inst,max}$	[Nm]	2	6	6	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°C[1] – use category dry/dry. For temperature range II -40°C to +50°C/+80°C[1] and other use categories see ETA-17/0006. Total safety factor as per ETAG 001 included (γ_M and γ_F).

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: ≥ FKL. 5.8; A4, HCR: ≥ 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		$s_{cr} = s_{min,\perp}$	[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	$f_b \geq 4$ N/mm²	appr. N	[kN]	0,1	0,2	0,3	0,3	0,2	0,3	0,3
	$f_b \geq 6$ N/mm²	appr. N	[kN]	0,2	0,3	0,3	0,4	0,3	0,3	0,4
	$f_b \geq 10$ N/mm²	appr. N	[kN]	0,3	0,3	0,4	0,4	0,3	0,4	0,4
Approved shear load for compressive strength	$f_b \geq 4$ N/mm²	appr. V	[kN]	0,6	0,6	0,7	0,7	0,6	0,6	0,7
	$f_b \geq 6$ N/mm²	appr. V	[kN]	0,6	0,7	0,9	0,9	0,9	0,9	0,9
	$f_b \geq 10$ N/mm²	appr. V	[kN]	0,9	1,0	1,1	1,1	1,0	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: ≥ FKL. 5.8; A4, HCR: ≥ 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		$s_{cr} = s_{min,\perp}$	[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	$f_b \geq 6$ N/mm²	appr. N	[kN]	0,2	0,2	0,3	0,3	0,2	0,3	0,3	0,3
	$f_b \geq 9$ N/mm²	appr. N	[kN]	0,3	0,3	0,3	0,3	0,3	0,4	0,3	0,4
	$f_b \geq 12$ N/mm²	appr. N	[kN]	0,3	0,3	0,3	0,4	0,3	0,4	0,4	0,4
Approved shear load for compressive strength	$f_b \geq 6$ N/mm²	appr. V	[kN]	0,7	1,0	1,0	1,0	1,7	1,7	1,7	1,7
	$f_b \geq 9$ N/mm²	appr. V	[kN]	1,0	1,3	1,3	1,3	2,1	2,1	2,1	2,1
	$f_b \geq 12$ N/mm²	appr. V	[kN]	1,1	1,6	1,6	1,6	2,4	2,4	2,4	2,4
Installation torque		$T_{inst,max}$	[Nm]	2	2	2	2	2	2	2	2

Clay hollow brick Urbanbric according EN 771-1, Bulk density ρ: 0,74 kg/dm³, Brick size: 560x200x274 mm (e.g. Imerys)								
Threaded studs: Steel: ≥ FKL. 5.8; A4, HCR: ≥ 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]	560	560	560	560	560
Minimum spacing vertical to the horizontal joint		$s_{cr} = s_{min,\perp}$	[mm]	274	274	274	274	274
Edge distance = Minimum edge distance		$c_{cr} = c_{min}$	[mm]	100	100	100	120	120
Approved tension load for compressive strength	$f_b \geq 6$ N/mm²	appr. N	[kN]	0,3	0,3	0,4	0,3	0,4
	$f_b \geq 9$ N/mm²	appr. N	[kN]	0,3	0,4	0,6	0,4	0,6
Approved shear load for compressive strength	$f_b \geq 6$ N/mm²	appr. V	[kN]	0,9	1,0	1,0	1,1	1,1
	$f_b \geq 9$ N/mm²	appr. V	[kN]	1,0	1,1	1,3	1,4	1,4
Installation torque		$T_{inst,max}$	[Nm]	2	2	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: ≥ FKL. 5.8; A4, HCR: ≥ 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	250
Minimum spacing vertical to the horizontal joint		$s_{cr} = s_{min,\perp}$	[mm]	250	250	250	250	250	250
Edge distance = Minimum edge distance		$c_{cr} = c_{min}$	[mm]	100	100	100	120	120	120
Approved tension load for compressive strength	$f_b \geq 4$ N/mm²	appr. N	[kN]	0,1	0,1	0,1	0,1	0,1	0,1
	$f_b \geq 6$ N/mm²	appr. N	[kN]	0,1	0,1	0,2	0,1	0,2	0,2
	$f_b \geq 8$ N/mm²	appr. N	[kN]	0,2	0,2	0,2	0,2	0,2	0,2
Approved shear load for compressive strength	$f_b \geq 4$ N/mm²	appr. V	[kN]	0,6	0,6	0,6	0,6	0,6	0,6
	$f_b \geq 6$ N/mm²	appr. V	[kN]	0,6	0,6	0,6	0,7	0,7	0,7
	$f_b \geq 8$ N/mm²	appr. V	[kN]	0,7	0,7	0,7	0,9	0,9	0,9
Installation torque		$T_{inst,max}$	[Nm]	4	4	4	4	4	4

[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°C[1] – use category dry/dry. For temperature range II -40°C to +50°C/+80°C[1] and other use categories see ETA-17/0006. Total safety factor as per ETAG 001 included (γ_M and γ_F).

Perforated brick with Perfo Sleeve

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: ≥ FKL. 5.8; A4, HCR: ≥ 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	250	
Minimum spacing vertical to the horizontal joint	$s_{cr} = s_{min,\perp}$	[mm]	120	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	$f_b \geq 10$ N/mm²	appr. N	[kN]	0,3	0,3	0,3	0,3	0,3	0,3
	$f_b \geq 16$ N/mm²	appr. N	[kN]	0,3	0,3	0,3	0,4	0,4	0,4
	$f_b \geq 20$ N/mm²	appr. N	[kN]	0,3	0,3	0,4	0,4	0,4	0,4
	$f_b \geq 28$ N/mm²	appr. N	[kN]	0,4	0,4	0,4	0,6	0,6	0,6
Approved shear load for compressive strength	$f_b \geq 10$ N/mm²	appr. V	[kN]	0,6	0,6	0,6	0,6	0,6	0,6
	$f_b \geq 16$ N/mm²	appr. V	[kN]	0,7	0,7	0,7	0,7	0,7	0,7
	$f_b \geq 20$ N/mm²	appr. V	[kN]	0,9	0,9	0,9	0,9	0,9	0,9
	$f_b \geq 28$ N/mm²	appr. V	[kN]	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: ≥ FKL. 5.8; A4, HCR: ≥ 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	$s_{cr} = s_{min,\perp}$	[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	$f_b \geq 4$ N/mm²	appr. N	[kN]	0,1	0,2	0,6	0,3	0,6	
Approved shear load for compressive strength	$f_b \geq 4$ N/mm²	appr. V	[kN]	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: ≥ FKL. 5.8; A4, HCR: ≥ 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	$s_{cr} = s_{min,\perp}$	[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	$f_b \geq 2,7$ N/mm²	appr. N	[kN]	0,6	0,6	0,7	0,7	0,7	
Approved shear load for compressive strength	$f_b \geq 2,7$ N/mm²	appr. V	[kN]	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: ≥ FKL. 5.8; A4, HCR: ≥ FKL 70			**M8**	**M8 / M10**			**M12 / M16**		
Perfo sleeves VM-SH			12x80	16x85	16x130	16x130 16x130/330	20x85	20x130	20x200
Diameter of drill hole	d_0	[mm]	12	16	16	16	20	20	20
Drill hole depth	h_0	[mm]	85	90	135	135 + t_{fix}	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
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

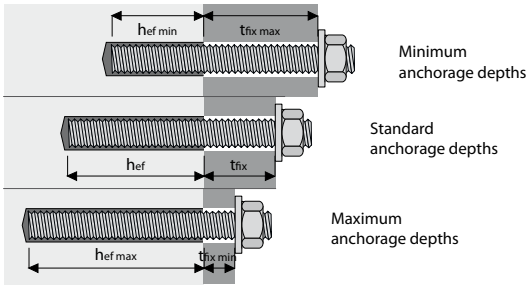
[1] Max. long term temperature / max. short term temperature

[2] Dependent on actual perfo sleeve length

Threaded Studs, Perfo Sleeves and Tension Anchors for MKT Injection Systems

Threaded Studs for the Injection Systems VMH, VMU plus, VME plus, VME and VM-EA in concrete and brickwork: A flexible system means less inventory

The flexible anchoring depths of the Injection Systems VMH, VMU plus, VME plus, VME and VM-EA in concrete 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.



$h_{ef} + t_{fix}$ = Usable length of the threaded rod (without nut and washer)

Threaded Stud VMU-A
Steel, zinc plated 5.8

- For use 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 fvz
Steel, hot dip galvanized 5.8

- For use in structures subject to dry internal conditions

NEW

Threaded Stud VMU-A A4
Rostfrei
Stainless steel A4-70

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

Description	Ref. No.			Use in									Package content	Weight per package
				Concrete[1]	Solid base material without Perfo Sleeve		Solid and hollow base material with VM-SH[2]							
	Steel, zinc plated 5.8	Steel, hot dip galvanized 5.8	Stainless steel A4-70	Usable length	Drill hole Ø x depth	Maximum fixture thickness t_{fix}	12x85	16x90	16x135	20x90	20x135	20x205		
							Maximum fixture thickness t_{fix}							
				mm	mm	mm	mm						pcs.	kg
VMU-A 8x100	31510101	-	31510501	90	10x80	10	10	5	-	-	-	-	10	0,42
VMU-A 8x110	31515101	31515201	31515501	100	10x80	20	20	15	-	-	-	-	10	0,46
VMU-A 8x130	31525101	-	31525501	120	10x80	40	40	35	-	-	-	-	10	0,52
VMU-A 8x145	31528101	-	31528501	135	10x80	55	55	50	5	-	-	-	10	0,55
VMU-A 8x160	31530101	-	31530501	150	10x80	70	70	65	20	-	-	-	10	0,60
VMU-A 8x205	31550101	-	31550501	195	10x80	115	115	110	65	-	-	-	10	0,74
VMU-A 10x110	31605101	-	31605501	100	12x90	10	-	15	-	-	-	-	10	0,75
VMU-A 10x130	31625101	31625201	31625501	120	12x90	30	-	35	-	-	-	-	10	0,85
VMU-A 10x150	31630101	31630201	31630501	140	12x90	50	-	55	10	-	-	-	10	0,95
VMU-A 10x165	31635101	-	31635501	155	12x90	65	-	70	25	-	-	-	10	1,02
VMU-A 10x190	31645101	31645201	31645501	180	12x90	90	-	95	50	-	-	-	10	1,15
VMU-A 10x260	31655101	-	31655501	250	12x90	160	-	165	120	-	-	-	10	1,50
VMU-A 12x120	31717101	-	31717501	105	14x100	5	-	-	-	20	-	-	10	1,14
VMU-A 12x130	31718101	-	31718501	115	14x100	15	-	-	-	30	-	-	10	1,21
VMU-A 12x135	31710101	-	31710501	120	14x100	20	-	-	-	35	-	-	10	1,25
VMU-A 12x155	31720101	31720201	31720101	140	14x100	40	-	-	-	55	10	-	10	1,42
VMU-A 12x175	31730101	31730201	31730501	160	14x100	60	-	-	-	75	30	-	10	1,54
VMU-A 12x185	31734101	-	31734501	170	14x100	70	-	-	-	85	40	-	10	1,63
VMU-A 12x210	31740101	31740201	31740501	195	14x100	95	-	-	-	110	65	-	10	1,82
VMU-A 12x225	31748101	-	31748501	210	14x100	110	-	-	-	125	80	10	10	1,89
VMU-A 12x250	31750101	-	31750501	235	14x100	135	-	-	-	150	105	35	10	2,13
VMU-A 12x265	31757101	-	31757501	250	14x100	150	-	-	-	165	120	50	10	2,18
VMU-A 12x300	31760101	-	31760501	285	14x100	185	-	-	-	200	155	85	10	2,50
VMU-A 16x160	31810101	-	31810501	140	18x100	40	-	-	-	55	10	-	10	2,65
VMU-A 16x175	31815101	31815201	31815501	155	18x100	55	-	-	-	70	25	-	10	2,85
VMU-A 16x205	31820101	31820201	31820501	185	18x100	85	-	-	-	100	55	-	10	3,25
VMU-A 16x235	31830101	-	31830501	215	18x100	115	-	-	-	130	85	15	10	3,65
VMU-A 16x300	31840101	-	31840501	280	18x100	180	-	-	-	195	150	80	10	4,53
VMU-A 20x240	31910101	-	31910501	220	-	-	-	-	-	-	-	-	10	5,85
VMU-A 20x260	31915101	-	-	240	-	-	-	-	-	-	-	-	10	6,30
VMU-A 20x285	31920101	-	31920501	265	-	-	-	-	-	-	-	-	10	6,75
VMU-A 20x300	31925101	-	31925501	280	-	-	-	-	-	-	-	-	10	7,15
VMU-A 20x350	31930101	-	-	330	-	-	-	-	-	-	-	-	10	8,10
VMU-A 20x400	31935101	-	-	380	-	-	-	-	-	-	-	-	10	9,10
VMU-A 24x290	31960101	-	31960501	265	-	-	-	-	-	-	-	-	5	4,95
VMU-A 24x350	31965101	-	31965501	325	-	-	-	-	-	-	-	-	5	5,85
VMU-A 24x400	31970101	-	31970501	375	-	-	-	-	-	-	-	-	5	6,60
VMU-A 30x370	31990101	-	31990501	340	-	-	-	-	-	-	-	-	5	9,90

[1] Drill hole Ø and drill depth depend on selected injection system and anchorage depth

[2] Drill hole Ø and drill depth see Perfo Sleeves on page 166

Threaded Stud V-A

- For use in structures subject to dry internal conditions
- Steel, zinc plated 5.8

Threaded Stud V-A A4

- For use in structures subject to dry inernal conditions or external atmospheric exposure
- Stainless steel A4-70

Threaded Stud V-A 8.8

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

Threaded Stud V-A HCR

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

Threaded Stud V-A fvz

- For use in structures subject to dry internal conditions
- Steel, hot dip galvanized 5.8

Description	Ref. No.					Use in									Package content	Weight per package
						Concrete[1]	Solid base material without Perfo Sleeve		Solid and hollow base material with VM-SH[2]							
	Steel, zinc plated 5.8	Steel, zinc plated 8.8	Steel, hot dip galvanized 5.8	Stainless steel A4-70	Stainless steel HCR-70	Usable Length	Drill hole Ø x depth	Maximum fixture thickness t_{fix}	12x85	16x90	16x135	20x90	20x135	20x205		
									Maximum fixture thickness t_{fix}							
						mm	mm	mm	mm						pcs.	kg
V-A 8-20/110	21101101	21101171	21101201	21101501	21101651	100	10x80	20	20	15	-	-	-	-	10	0,43
V-A 8-60/150	21105101	21105171	-	21105501	-	140	10x80	60	60	55	-	-	-	-	10	0,53
V-A 10-15/115	21202101	21202171	-	21202501	-	105	12x90	15	-	20	-	-	-	-	10	0,73
V-A 10-30/130	21203101	21203171	21203201	21203501	21203651	120	12x90	30	-	35	-	-	-	-	10	0,81
V-A 10-65/165	21207101	21207171	-	21207501	-	155	12x90	65	-	70	25	-	-	-	10	0,98
V-A 10-90/190	21210101	21210171	21210201	21210501	-	180	12x90	90	-	95	50	-	-	-	10	1,11
V-A 10-150/250	21216101	-	-	21216501	-	240	12x90	150	-	155	110	-	-	-	10	1,42
V-A 10-200/300	21221101	-	-	21221501	-	290	12x90	200	-	205	160	-	-	-	10	1,71
V-A 12-10/135	21304101	21304171	-	21304501	-	120	12x90	20	-	-	-	35	-	-	10	1,19
V-A 12-35/160	21306101	21306171	21306201	21306501	21306651	145	14x100	45	-	-	-	60	15	-	10	1,37
V-A 12-55/180	-	-	-	21309501	-	165	14x100	65	-	-	-	80	35	-	10	1,51
V-A 12-85/210	21312101	21312171	-	21312501	-	195	14x100	95	-	-	-	110	65	-	10	1,73
V-A 12-95/220	21313101	-	-	21313501	-	205	14x100	105	-	-	-	120	75	5	10	1,82
V-A 12-125/250	21316101	21316171	-	21316501	-	235	14x100	135	-	-	-	150	105	35	10	2,02
V-A 12-175/300	21321101	21321171	-	21321501	-	285	14x100	185	-	-	-	200	155	85	10	2,40
V-A 16-5/150	-	-	-	21505501	-	130	18x100	30	-	-	-	45	-	-	10	2,38
V-A 16-20/165	21507101	21507171	21507201	21507501	-	145	18x100	45	-	-	-	60	15	-	10	2,77
V-A 16-45/190	21510101	21510171	21510201	21505501	21510651	170	18x100	70	-	-	-	85	40	-	10	2,96
V-A 16-65/210	-	-	21512201	21512501	-	190	18x100	90	-	-	-	105	60	-	10	3,20
V-A 16-85/230	21514101	21514171	-	21514501	-	210	18x100	110	-	-	-	125	80	10	10	3,65
V-A 16-105/250	21516101	21516171	-	21516501	-	230	18x100	130	-	-	-	145	100	30	10	3,91
V-A 16-155/300	21521101	21521171	-	21521501	-	280	18x100	180	-	-	-	195	150	80	10	4,58
V-A 20-20/220	21613101	21613171	21613201	21613501	-	190	-	-	-	-	-	-	-	-	10	5,56
V-A 20-60/260	21617101	21617171	21617201	21617501	-	230	-	-	-	-	-	-	-	-	10	6,39
V-A 20-100/300	21621101	21621171	-	21621501	-	270	-	-	-	-	-	-	-	-	10	7,23
V-A 24-15/260	21717101	21717171	21717201	21717501	-	225	-	-	-	-	-	-	-	-	5	4,89
V-A 24-55/300	21721101	21721171	-	21721501	-	265	-	-	-	-	-	-	-	-	5	5,54
V-A 30-70/380[2]	21829101	-	21721201	21829501	-	350	-	-	-	-	-	-	-	-	5	10,00

[1]Drill hole Ø and drill depth depend on selected injection system and anchorage depth. For maximum fixture thickness for Chemical Anchor V, see page 158 / 159.

[2]Drill hole Ø and drill depth see Perfo Sleeves on page 166

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

Other lengths on demand.

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 EN 10204) in every package

Description	Ref. No.	Threaded Studs	Length mm	Package content pcs.	Weight per package kg
VM-A 8x1000	31199101	M8	1000	10	3,91
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 A4

Stainless steel A4-70

- 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

Description	Ref. No.	Threaded Studs	Length mm	Package content pcs.	Weight per package kg
VM-A 8x1000 A4	31199501	M8	1000	10	3,77
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 8.8

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 EN 10204) in every package

Description	Ref. No.	Threaded Studs	Length mm	Package content pcs.	Weight per package kg
VM-A 8x1000 8.8	31199181	M8	1000	10	3,91
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

Internally Threaded Sleeve VMU-IG

Steel, zinc plated 5.8

- For use in structures subject to dry internal conditions

Internally Threaded Sleeve VMU-IG A4

Stainless steel A4-70

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

Description	Ref. No.		Use in			Outer Ø x Length	Thread depth min / max	Package content	Weight per package
			Concrete	**Solid base material without Perfo Sleeve**	**Solid and hollow base material with VM-SH[2]**				
	Steel, zinc plated 5.8	Stainless steel A4	Drill hole Ø x depth	Drill hole Ø x depth					
			mm	mm		mm	mm	pcs.	kg
VMU-IG M6x80	31502101	31502501	12 x 80	-	VM-SH 16x85	10 x 80	8 / 20	10	0,38
VMU-IG M6x90	31503101	31503501	12 x 90	12x90	-	10 x 90	8 / 20	10	0,42
VMU-IG M8x80	31562101	31562501	14 x 80	-	VM-SH 20x85	12 x 80	8 / 20	10	0,52
VMU-IG M8x100	31563101	31563501	14 x 100	14x100	-	12 x 100	8 / 20	10	0,66
VMU-IG M10x80	31601101	31601501	18 x 80	-	VM-SH 20x85	16 x 80	10 / 25	10	0,92
VMU-IG M10x100	31602101	31602501	18 x 100	18x100	-	16 x 100	10 / 25	10	1,18
VMU-IG M12x125	31652101	31652501	22/24[1] x 125	-	-	20 x 125	12 / 30	10	2,51
VMU-IG M16x170	31702101	31702501	28 x 170	-	-	24 x 170	16 / 32	5	2,41
NEW VMU-IG M20x200	31802101	31802501	35 x 200	-	-	30 x 200	20 / 40	5	4,18

[1] Drill hole Ø depend on selected injection system

[2] Drill hole Ø and drill depth see Perfo Sleeves on page 166

Internally Threaded Sleeve V-IG

- Steel, zinc plated 5.8
- Flush with concrete surface; with internal thread
- For fastenings not subject to approval

Description	Ref. No.	Suitable for perfo sleeve	Outer-Ø x Length mm	Drill hole Ø x depth mm	Thread mm	Package content pcs.	Weight per package kg
V-IG M 8	24105101	V-P 12	12 x 90	14 x 90	M8 x 25	10	0,50
V-IG M 10	24205101	V-P 14	14 x 90	16 x 90	M10 x 30	10	0,65
V-IG M 12	24305101	V-P 16	16 x 100	18 x 100	M12 x 35	10	1,00
V-IG M 16	24505101	V-P 16 IG	22 x 120	25 x 120	M16 x 40	10	1,65

A setting tool is included with each internally threaded sleeve package.

Internally Threaded Sleeve V-IG A4

- Stainless steel A4
- Flush with concrete surface; with internal thread
- For fastenings not subject to approval

Description	Ref. No.	Suitable for perfo sleeve	Outer-Ø x Length mm	Drill hole Ø x depth mm	Thread mm	Package content pcs.	Weight per package kg
V-IG M 8 A4	24105501	V-P 12	12 x 90	14 x 90	M8 x 25	10	0,50
V-IG M 10 A4	24205501	V-P 14	14 x 90	16 x 90	M10 x 30	10	0,65
V-IG M 12 A4	24305501	V-P 16	16 x 100	18 x 100	M12 x 35	10	1,00
V-IG M 16 A4	24505501	V-P 16 IG	22 x 120	25 x 120	M16 x 40	10	1,65

A setting tool is included with each internally threaded sleeve package.

Internally Threaded Sleeve VM-IG

- Steel, zinc plated
- Installation in hollow base material
- For fastenings not subject to approval

Description	Ref. No.	Suitable for perfo sleeve	Internal thread	Outer Ø mm	Length mm	Package content pcs.	Weight per package kg
VM-IG M 6	28101001	VM-SH 12 / 16	M 6	8	45	10	0,11
VM-IG M 8	28102001	VM-SH 16 / 22	M 8	12	80	10	0,38
VM-IG M 10	28103001	VM-SH 20 / 22	M 10	14	80	10	0,45
VM-IG M 12	28104001	VM-SH 22	M 12	16	80	10	0,52

Perfo Sleeve VM-SH

- Material: Polypropylene
- Installation in hollow base material

Description	Ref. No.	Drill hole Ø x depth mm	suitable for		Amount of mortar per 100 mm drill hole depth ml	Package content pcs.	Weight per package kg
			Threaded Studs	Threaded Sleeve			
VM-SH 12 x 50[1]	28151001	13 x 55	M8	-	7,5	10	0,01
VM-SH 12 x 80	28151201	12 x 85	M8	-	11,9	10	0,02
VM-SH 16 x 85	28152001	16 x 90	M8 / M10	VMU-IG M6x80	24,9	10	0,03
VM-SH 16 x 130	28153001	16 x 135	M8 / M10	-	38,0	10	0,04
VM-SH 16 x 130/330[2]	28153201	16 x 135 + t_{fix}[2]	M8 / M10	-	96,5	10	0,16
VM-SH 20 x 85	28154001	20 x 90	M12 / M16	VMU-IG M8x80 / M10x80	41,1	10	0,04
VM-SH 20 x 130	28154301	20 x 135	M12 / M16	-	62,9	10	0,07
VM-SH 20 x 200	28154601	20 x 205	M12 / M16	-	96,7	10	0,10

[1] For fastenings not subject to approval

[2] VM-SH 16 x 130/330 is only approved in combination with VM-EA. t_{fix} = shortened length perfo sleeves -130 mm

Perfo Sleeve VM-SH

- Steel, zinc plated
- Metal, to be cut to required length
- Installation in hollow base materials

Description	Ref. No.	Drill hole Ø x depth mm	suitable for		Amount of mortar per 100 mm drill hole depth ml	Package content pcs.	Weight per package kg
			Threaded Studs	Threaded Sleeve			
VM-SH 12 x 1000	28403001	12	M6 / M8	VM-IG M6	15,0	50	2,88
VM-SH 16 x 1000	28404001	16	M10	VM-IG M6 / M8	29,3	50	3,38
VM-SH 22 x 1000	28405001	22	M12 / M16	VM-IG M8 - M12	68,4	25	2,70

Hollow drill bit SB

Description
The hollow drill bit SB combines two steps in one: it drills and at the same time removes the drilling dust from the hole. As a result, it significantly reduces the dust created, resulting in a cleaner work space and reduces air contamination. Contamination in the work area is also avoided, making it the ideal hammer drill for indoors. Many MKT injection systems eliminate the need for additional cleaning, increasing efficiency and installation safety. Thanks to its SDS shank and its 38mm suction pipe connection, it can be used universally and flexibly with any SDS hammer drill and industrial vacuum cleaners.

Advantages
- 98% less air borne dust than during conventional drilling processes
- Permitted for use with approved anchors
- The separate cleaning of the drill hole can be omitted if this is permitted in the ETA
- Easy handling, insert in a hammer drill and connect to an industrial vacuum cleaner
- Efficient dust extraction and drilling thanks to extra large vacuum holes
- Optimum health and safety at the workplace, reduce respiratory complaints of dust particles by using an industrial vacuum cleaner of the M-Class
- Save money and time: there is no dirt generated, so no need to clean up afterwards
- Can be used with all standard SDS-max and SDS-plus hammer drills in conjunction with commercial industrial vacuum cleaners

Applications
For dust-free drilling in concrete, solid brick, solid lime and stone and natural stone indoors and outdoors.

Hollow drill bit with SDS-plus shank

→ 2-cutter with big vacuum holes for a fast drilling

Description	Ref.No.	Ø mm	Drilling depth mm	Total length mm	Adaptor	Type	Pkg. Content pcs.	Weight per pcs. kg
Hollow drill bit SB plus 8x270	50235501	8	150	270	SDS-plus	2-cutter	1	0,21
Hollow drill bit SB plus 10x270	50245501	10	150	270	SDS-plus	2-cutter	1	0,24
Hollow drill bit SB plus 12x320	50256001	12	200	320	SDS-plus	2-cutter	1	0,31
Hollow drill bit SB plus 14x370	50266501	14	250	370	SDS-plus	2-cutter	1	0,39
Hollow drill bit SB plus 16x370	50286501	16	250	370	SDS-plus	2-cutter	1	0,43
Hollow drill bit SB plus 18x370	50296501	18	250	370	SDS-plus	2-cutter	1	0,53
Hollow drill bit SB plus 20x370	50306501	20	250	370	SDS-plus	2-cutter	1	0,64
Hollow drill bit SB plus 24x370	50326501	24	250	370	SDS-plus	2-cutter	1	0,81

Hollow drill bit with SDS-max shank

→ Y-Cutter for more stable drilling

	Description	Ref.No.	Ø mm	Drilling depth mm	Total length mm	Adaptor	Type	Pkg. Content pcs.	Weight per pcs. kg
	Hollow drill bit SB max 18x600	50698001	18	400	600	SDS-max	Y-cutter	1	0,99
	Hollow drill bit SB max 24x600	50728001	24	400	600	SDS-max	Y-cutter	1	1,21
	Hollow drill bit SB max 25x600	50738001	25	400	600	SDS-max	Y-cutter	1	1,23
NEW	Hollow drill bit SB max 26x600	50748001	26	400	600	SDS-max	Y-cutter	1	1,25

Suction bell ASG

Description	Ref.No.	Connection diameter to a vacuum cleaner Ø [mm]	Suitable for drill hole Ø [mm]	Pkg. Content pcs.	Weight per pc. kg
Suction bell ASG	29980001	30-38	6-32	1	0,06

Description
For removing drilling dust when drilling or cleaning holes.

Advantages
- Easy handling, connection to a vacuum cleaner is su cient
- No mounting is necessary, because the suction bell sticks tight to floor, wall and ceiling by a strong vacuum
- Prevents contamination and provides a clear visibility due to almost dust-free drilling
- Reduce respiratory complaints due to tiny dust particles by using a vacuum cleaner of the M-Class

Accessories for MKT Injection Systems

Blow-out pump VM-AP

- For assessment-compliant drill hole cleaning of many anchor systems
- For best drill hole cleaning, the hose must reach the bottom of the drill hole

Description	Ref. No.	For drill hole Ø mm	Max. drill hole depth[1] mm	Length mm	Pkg. cont. pcs.	Weight per piece kg
Blow-out pump VM-AP 270	29990002	12 - 20	200	270	1	0,22
Blow-out pump VM-AP 360	33200101	8[2] - 20	330	360	1	0,27

[1]For through fastening: Maximum drill hole depth through fixture
[2]With extension tube Ø6 x 100mm

Air gun VM-ABP

- For assessment-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

Air gun VM-ABP 1000

- For assessment-compliant drill hole cleaning with compressed air for drill holes with a diameter larger than 16 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 1000	85806101	14	16-40	1000	1	0,32

[1]For through fastening: Maximum drill hole depth through fixture

Compressed Air System DLS

- For blowing out drill holes up to 3 m deep
- The connection set RS for connection to a compressor, an air hose RS and, for the injection system VME, the corresponding blow-out nozzle RD are required

Air Valve RS

- Connection set RS with manual slide valve with air valve and connector for connection to a compressor

Air hose RS

- Air hose RS, pre-assembled with connectors for connection between connection set RS and blow-out nozzle RD

Blow-out nozzle RD

- Blow-out nozzles RD for optimum cleaning of the drill hole and the drill hole walls
- Fits on the air hose RS

Description	Ref. No.	For drill hole Ø mm	Max. drill hole depth[1] mm	Length mm	Pkg. cont. pcs.	Weight per piece kg
Air hose RS	85890101	12 - 35	-	-	1	0,42
Air Valve RS 25	85802101	12 - 28	2000	2000	1	0,11
Air Valve RS 35	85804101	30 - 35	3000	3000	1	0,44
Blow-out nozzle RD 12/14	85852101	12 - 14	-	-	1	0,01
Blow-out nozzle RD 16/18	85854101	16 - 18	-	-	1	0,02
Blow-out nozzle RD 20/25	85856101	20 - 25	-	-	1	0,03
Blow-out nozzle RD 30/35	85858101	30 - 35	-	-	1	0,05

[1]For through fastening: Maximum drill hole depth through fixture

Cleaning Brush RB M6

- For machine cleaning of drill holes
- Stainless steel trim for a long service life
- With connection thread M6
- For drilling machines with keyed chuck
- SDS plus adapter for use in a hammer drill
- Use brush extensions according to the drilling depth. Several brush extensions can be screwed together for further extension.

Description	Ref. No.	Suitable for drill hole Ø mm	Length mm	Filling length mm	Pkg. cont. pcs.	Weight per piece kg
RB 10 M6	33510101	10	130	80	1	0,03
RB 12 M6	33512101	12	140	80	1	0,03
RB 14 M6	33514101	14	180	80	1	0,04
RB 16 M6	33516101	16	200	100	1	0,05
RB 18 M6	33518101	18	200	100	1	0,06
RB 20 M6	33520101	20	220	100	1	0,10
RB 22 M6	33522101	22	220	100	1	0,10
RB 24 M6	33524101	24	250	100	1	0,11
RB 26 M6	33526101	25 / 26	290	100	1	0,12
RB 28 M6	33528101	28	260	100	1	0,11
RB 30 M6	33530101	30	350	100	1	0,12
RB 32 M6	33532101	32	350	100	1	0,13
RB 35 M6	33535101	35	350	100	1	0,14
RB 40 M6	33537101	40	350	100	1	0,15
RB 45 M6	on request	45	-	-	1	-
RB 55 M6	on request	55	-	-	1	-
Brush extention RBL M6	33968101	-	150	-	1	0,09
SDS Plus adapter RBL M6 SDS	33350101	-	110	-	1	0,06

Cleaning Brush RB M8

- Extra sturdy construction for machine cleaning of particularly deep drill holes
- Stainless steel trim for a long service life
- With connection thread M8
- For drilling machines with keyed chuck
- SDS plus adapter for use in a hammer drill
- Use brush extensions according to the drilling depth. Several brush extensions can be screwed together for further extension.

Description	Ref. No.	Suitable for drill hole Ø mm	Length mm	Filling length mm	Pkg. cont. pcs.	Weight per piece kg
RB 12 M8	85812101	12	180	140	1	0,05
RB 14 M8	85814101	14	180	140	1	0,05
RB 16 M8	85816101	16	180	140	1	0,05
RB 18 M8	85818101	18	180	140	1	0,05
RB 20 M8	85820101	20	180	140	1	0,05
RB 25 M8	85825101	25	180	140	1	0,06
RB 32 M8	85832101	32	180	140	1	0,08
RB 35 M8	85835101	35	180	140	1	0,08
Brush extention RBL M8	85871101	-	550	-	1	0,32
SDS Plus adapter RBL M8 SDS	85881101	-	110	9	1	0,07

Cleaning Brush RB-H

- For manual drill hole cleaning of non-approved systems in solid and perforated masonry
- Nylon trim
- With wooden handle

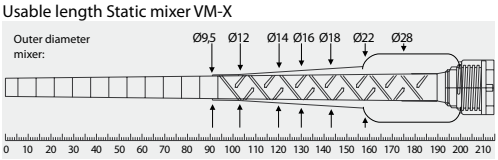
Description	Ref. No.	Suitable for drill hole Ø mm	Length mm	Pkg. cont. pcs.	Weight per piece kg
RB-H 12/250	29914501	8-12	250	1	0,04
RB-H 18/250	29918501	10-18	250	1	0,04
RB-H 18/400	33618101	10-18	400	1	0,05
RB-H 28/280	29928501	20-28	280	1	0,05
RB-H 28/400	33628101	20-28	400	1	0,06

Static mixer

- To mix the two components of the injection adhesive
- Before each application, squeeze out an approx. 10cm long strand (initial strand). The initial strand is not suitable for fastening. (See European Technical Assessment and Installation Instructions)
- Usable length static mixer: Drill holes must always be filled from the bottom of the hole to ensure no air pockets are trapped in the adhesive. This is only possible when the tip of the mixing nozzle reaches the very bottom of the drill hole before injecting the adhesive. If the mixing nozzle does not reach the bottom of the drill hole, a mixer extension tube must be used.

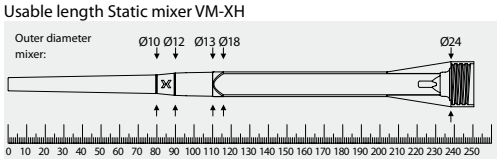
VM-X

Usable length Static mixer VM-X



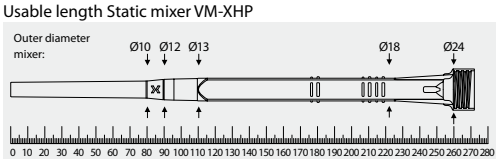
VM-XH

Usable length Static mixer VM-XH



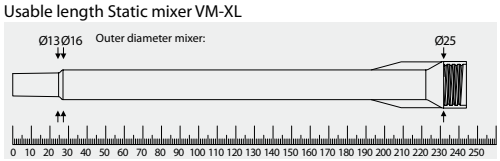
VM-XHP

Usable length Static mixer VM-XHP



VM-XL

Usable length Static mixer VM-XL



Description	Ref. No.	Suitable for Injection Systems / Cartridges	Length mm	Package content pcs.	Weight per pkg. kg
VM-X	28305111	VMZ: all Cartridges, VMU plus: 150ml, 280ml, 300ml, 345ml, 410ml VMU plus Polar: all Cartridges VM-EA: all Cartridges VM-PY: all Cartridges	215	12	0,12
VM-XH	28304801	VMH: all Cartridges	250	12	0,16
NEW VM-XHP	28305301	VME plus: all Cartridges VMH: all Cartridges	272	12	0,18
VM-XL[1)]	28305201	VMU plus: all Cartridges VME: all Cartridges	245	10	0,28

[1)]Static mixer VM-XL comes with a reducers / extension tube. Suitable for drill holes from 12mm diameter.

Extension tubes

VM-XE 10

VM-XLE 16

- Extension tubes for deeper drill holes
- Extension tubes VM-XE and VM-XLE can be cut to the required length

Possible combinations static mixer / Extension tube / Retaining Washer:

Description	Ref. No.	Diameter mm	Length mm	Drill hole-Ø mm	Suitable for static mixer	Package content pcs.	Weight per pkg. kg
VM-XE 10/200	28306011	10	200	12 - 40	VM-X VM-XH VM-XHP VM-XL	12	0,12
VM-XE 10/500	85951101	10	500	12 - 40		10	0,20
VM-XE 10/1000	85952101	10	1000	12 - 40		10	0,30
VM-XE 10/2000	85954101	10	2000	12 - 40		10	0,65
VM-XLE 16/250	85959101	16	250	18 - 55	VM-XHP VM-XH VM-XL	10	0,30
VM-XLE 16/1000	85956101	16	1000	18 - 55		10	1,15
VM-XLE 16/2000	85958101	16	2000	18 - 55		10	3,50

Retaining Washer VM-IA

- For bubble-free filling of the drill hole
- Suitable for extension tubes VM-XE 10 and VM-XLE 16

Description	Ref. No.	Suitable for drill hole Ø mm	Pkg. cont. pcs.	Weight per pkg. kg
VM-IA 14	85914201	14	20	0,04
VM-IA 16	85916201	16	20	0,04
VM-IA 18	85918201	18	20	0,04
VM-IA 20	85920201	20	20	0,06
VM-IA 22	85922201	22	20	0,06
VM-IA 24	85924101	24	20	0,06
VM-IA 25	85925201	25 / 26	20	0,06
VM-IA 28	85928101	28	20	0,06
VM-IA 30	on request	30	-	-
VM-IA 32	85932201	32	20	0,08
VM-IA 35	85935201	35	20	0,10
VM-IA 40	85938201	40	20	0,10
VM-IA 45	on request	45	-	-
VM-IA 55	on request	55	-	-

Dispenser VM-P Standard

- For occasional use, metal version
- Piston rod with adjusting screw

Description	Ref. No.	Suitable for cartridge		Pkg. cont.	Weight per piece kg
VM-P 345 Standard	28350505	150ml, 280ml, 300ml, 345ml	also suitable for silicone cartriges	1	1,00
VM-P 380 Standard	28353005	380ml, 410ml, 420ml		1	1,15
VM-P 385 Standard	28353010	385ml		1	1,33
VM-P 585 Standard	28352151	385ml, 440ml, 585ml		1	1,60

Dispenser VM-P Profi

- Professional dispenser with an ideal center of gravity for more comfortable working
- Automatic pressure realease for minimum adhesive overrun

Description	Ref. No.	Suitable for cartridge		Pkg. cont.	Weight per piece kg
VM-P 345 Profi	28350511	150ml, 280ml, 300ml, 345ml	also suitable for silicone cartriges	1	1,00
VM-P 380 Profi	28351001	380ml, 410ml, 420ml		1	1,10
VM-P 385 Profi	28353015	385ml		1	1,20

Dispenser VM-P 585 Profi

- Professional dispenser with an ideal center of gravity for more comfortable working
- Combi-tool for many different types of cartridges
- Automatic pressure release for minimum adhesive overrun

Description	Ref. No.	Suitable for cartridge		Pkg. cont.	Weight per piece kg
VM-P 585 Profi	28353201	280ml, 300ml, 330ml, 380ml, 385ml, 410ml, 420ml, 440ml, 585ml	also suitable for silicone cartriges	1	1,67

Dispenser VM-P Akku

- Professional, solid battery cartridge dispenser
- Repeat function, for retrieving the last fill quantity
- Stepless variable pressing speed
- Overrun-quantity-stop by automatic return after release of the dispending switch

Description	Ref. No.	Suitable for cartridge	Press-out force kN	Weight[1] kg	Dimensions[1] L x B x H mm	Pkg. cont.	Weight pro pcs. 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
VM-P 585 Akku	28353301	385ml, 440ml, 585ml	5,0	3,86	440 x 180 x 285	1	8,05
VM-P 825 Akku	28353501	825 ml	5,0	4,14	410 x 180 x 285	1	8,34
Accessories (for all models)							
Replacement battery	28352411		18 V/2,0 Ah			1	1,00
Shoulder strap	28359991		adjustable			1	0,18

[1] with Akku 18V/2,0 Ah

Dispenser VM-P Pneumatic

VM-P 345 Pneumatic Eco

VM-P 380 / 585 Pneumatic

VM-P 1400 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
- VM-P 825 Pneumatic and VM-P 1400 Pneumatic with additional handle

Description	Ref. No.	Suitable for cartridge	Maximum working pressure bar	Maximum Luftverbrauch l/min	Maximum Press-out force kN	Pkg. cont. pcs	Weight per piece kg
VM-P 345 Pneumatic Eco	28351601	280ml, 300ml, 345ml	6,8	40	2,2	1	2,55
VM-P 380 Pneumatic	28352002	380ml, 410ml, 420ml	8	40	4,0	1	2,80
VM-P 585 Pneumatic	28352101	385ml, 440ml, 585ml	8	40	4,0	1	3,20
VM-P 825 Pneumatic	28352110	825ml	8	40	4,0	1	5,00
VM-P 1400 Pneumatic	28352201	1400ml	8	40	8,3	1	7,00