

Injection System VMH



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



Cartridge VMH 280
Coaxial cartridge suitable for silicone guns
Content: 280ml including 2 mixers



Cartridge VMH 345
Side-by-side cartridge
Content: 345ml



Cartridge VMH 420
Coaxial cartridge
Content: 420ml

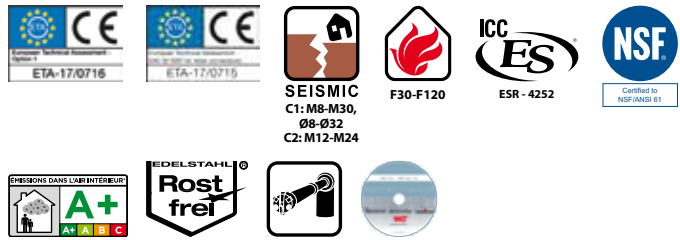
Range of loading: 3,9 kN–221,6 kN

Concrete quality: C20/25–C50/60

Material: Steel zinc plated, hot dip galvanized, stainless steel A4, stainless steel HCR

Description

The Injection System VMH is a universal injection system for heavy duty fastenings, usable in cracked and non-cracked concrete. It is composed of a hybrid injection adhesive as well as a threaded stud V-A, a threaded stud VMU-A, or an internally threaded sleeve VMU-IG. A standard threaded stud with strength test certificate 3.1 or a rebar can also be used. The variable anchorage depths allow for a perfect adjustment to the respective installation situation, even under seismic action. The drill holes can also be created with MKT hollow drill bit SB, the use of which reduces contamination and fine dust exposure of the respiratory tract to a minimum and makes subsequent drill hole cleaning unnecessary.



Advantages

- Extremely high loads in cracked and non-cracked concrete, strength class C20/25 to C50/60
- Working life 100 years for use in concrete (ETA-17/0716)
- Approved for post-installed rebar connection (Ø8–Ø32)
- Approved with threaded studs V-A, VMU-A, standard threaded studs with strength test certificate and internally threaded sleeves VMU-IG, thus more flexibility in the choice of the fastening
- Variable anchorage depths allow perfect adjustment to the respective installation situation for an economic working process
- Approved for use under seismic action according to the performance categories C1 (Threaded studs M8 – M30, Reinforcement Bars Ø8 – Ø32) and C2 (Threaded studs M12 Steel, zinc plated ≥8.8, M12 A4, M12 HCR: FKL ≥70)
- For higher loads under seismic action, the annular gap between anchor rod and fixture can be filled using the VS backfill disc
- Due to the high short-term temperature resistance up to +160°C, also suitable for fastenings exposed to high temperature
- Fire test report for all diameters
- Approved for installation in wet concrete or water-filled drill holes
- Base material temperature during installation -5°C to +40°C
- Opened cartridges can be re-used with a new mixer nozzle
- Styrene free
- When using the hollow drill bit SB, the subsequent cleaning of the borehole can be omitted

Applications

Heavy duty fastenings in cracked and non-cracked concrete:

Steel structures, railings, base plates, supports, brackets, facade structures.

Fastenings with rebar in cracked and non-cracked concrete

with shear force: Shear connectors, wall connecting reinforcement, concrete overlay.

Injection Cartridge VMH



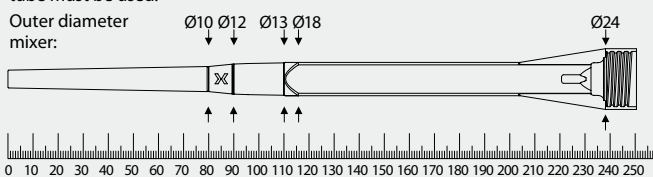
- Hybrid injection adhesive, styrene free
- Approved for cracked and non-cracked concrete

Description	Ref. No.	Content ml	Content of master box	Weight per master box kg	Weight per piece kg
Cartridge VMH 280 ¹⁾	28251501	280	12	6,70	0,56
Cartridge VMH 345	28253501	345	12	8,00	0,65
Cartridge VMH 420	28257501	420	12	10,1	0,83
Static mixer VM-XH	28304801	-	12	0,16	0,01

One static mixer comes with each cartridge. ¹⁾Cartridge VMH 280 comes with 2 mixers.

Usable length Static mixer VM-XH

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.



Curing Time Injection Adhesive VMH

→ Cartridge temperature when installing + 5°C to + 40°C

Temperature (°C) of the base material	Gel time	Curing time	
		Dry base material	Wet base material
-5°C to -1°C	50 min	5 h	10 h
0°C to +4°C	25 min	3,5 h	7 h
+5°C to +9°C	15 min	2 h	4 h
+10°C to +14°C	10 min	1 h	2 h
+15°C to +19°C	6 min	40 min	80 min
+20°C to +29°C	3 min	30 min	60 min
+30°C to +40°C	2 min	30 min	60 min

Storage Box

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

Description	Ref. No.	Contents	Quantity pcs.	Weight per Box kg
Storage box VMH 345	28999646	Cartridge VMH 345	20	15,3
		Static mixer VM-XH	40	
Storage box VMH 420	28999648	Cartridge VMH 420	20	18,0
		Static mixer VM-XH	40	

Accessories for Injection System VMH

Threaded stud	Internally threaded stud	Rebar Ø mm	Drill bit Ø mm	Blow-out pump ¹⁾ / Air gun ¹⁾	Cleaning brush RB ¹⁾	Retaining Washer VM-IA ³⁾	Retaining Washer VM-IA ³⁾	Dispenser
M8		8	10	VM-AP 360 ²⁾ VM-ABP 200	RB 10 M6		VM-XE 10	
M10	VMU-IG M6	8 / 10	12	VM-AP 360 ²⁾ VM-ABP 200	RB 12 M6 RB 12 M8		VM-XE 10	
M12	VMU-IG M8	10 / 12	14	VM-AP 360 ²⁾ VM-ABP 200	RB 14 M6 RB 14 M8		VM-XE 10	
		12	16	VM-AP 360 ²⁾ VM-ABP 200	RB 16 M6 RB 16 M8		VM-XE 10	
M16	VMU-IG M10	14	18	VM-AP 360 ²⁾ VM-ABP 200 / 250 / 500 / 1000	RB 18 M6 RB 18 M8	VM-IA 18	VM-XE 10, VM-XLE 16	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, VM-P 825 Pneumatic
		16	20	VM-AP 360 ²⁾ VM-ABP 200 / 250 / 500 / 1000	RB 20 M6 RB 20 M8	VM-IA 20	VM-XE 10, VM-XLE 16	
M20	VMU-IG M12	20	22	VM-ABP 250 / 500 / 1000	RB 22 M6	VM-IA 22	VM-XE 10, VM-XLE 16	
M24	VMU-IG M16	20	25	VM-ABP 250 / 500 / 1000	RB 25 M8 RB 26 M6	VM-IA 25	VM-XE 10, VM-XLE 16	
		24 / 25	32	VM-ABP 250 / 500 / 1000	RB 32 M6 RB 32 M8	VM-IA 32	VM-XE 10, VM-XLE 16	
M30	VMU-IG M20	28	35	VM-ABP 250 / 500 / 1000	RB 35 M6 RB 35 M8	VM-IA 35	VM-XE 10, VM-XLE 16	
		32	40	VM-ABP 250 / 500 / 1000	RB 40 M6	VM-IA 40	VM-XE 10, VM-XLE 16	
See page				169	170	172	171	172 / 173

¹⁾When using the hollow drill bit SB (see page 168), the subsequent cleaning of the borehole can be omitted. (Load reduction see ETA)

²⁾Approved in non-cracked concrete up to a maximum drilling depth of 10 times the outer diameter of the anchor rod/anchor sleeve (for cracked concrete and load reduction, see ETA).

³⁾If the static mixer does not reach the bottom of the borehole (see usable length of static mixer), an extension tube must be used. From a drill-Ø \geq 18 mm, retaining washer and extension tube must be used for overhead installation and for drill hole depths > 250 mm.

Threaded studs for the injection system VMH

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
Dimensions see page 163



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

Internally Threaded Sleeve VMU-IG

Steel, zinc plated 5.8
Dimensions see page 165



- For use in structures subject to dry internal conditions
- With internal thread

Internally Threaded Sleeve VMU-IG A4

Stainless steel A4
Dimensions see page 165



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



Extract from Permissible Service Conditions of European Technical Assessment ETA-17/0716

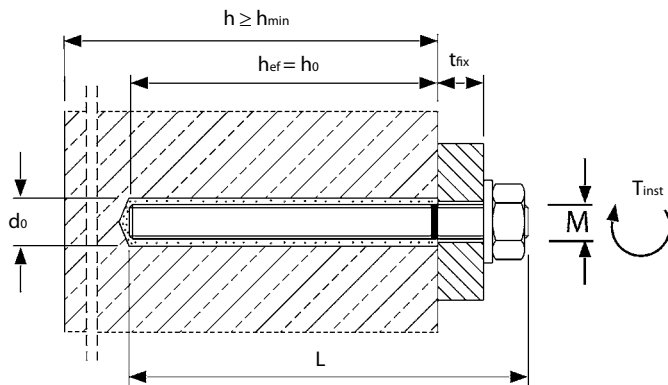
Approved loads for working life of up to 50 years without influence of spacing and edge distance in dry or wet concrete for temperature range II -40°C to +50°C/+80°C¹⁾ (Approved loads for temperature range I -40°C to +24°C/+40°C¹⁾, temperature range III -40°C to +72°C/+120°C¹⁾ and IV -40°C to +100°C/+160°C¹⁾ please see ETA-17/0716). Total safety factor as per ETAG included (γ_M and γ_F). Load capacities under fire exposure see page 190.

Loads and performance data				Injection system VMH M8-M30		Range of temperature II -40°C to +50°C/+80°C ¹⁾							
Threaded Studs				M8	M10	M12	M16	M20	M24	M27	M30		
Range of anchorage depths $h_{ef,min} - h_{ef,max}$				[mm]	60 - 160	60 - 200	70 - 240	80 - 320	90 - 400	96 - 480	108 - 540	120 - 600	
Injection System VMH, threaded stud steel 5.8													
Approved loads, tension for $h_{ef,min} - h_{ef,max}$													
Cracked concrete	C20/25	appr. N	[kN]	5,0 - 8,6	6,7 - 13,8	10,0 - 20,0	12,3 - 37,1	14,6 - 58,1	16,1 - 83,8	19,2 - 109,5	22,5 - 133,3		
Non-cracked concrete	C20/25	appr. N	[kN]	8,6	11,2 - 13,8	14,1 - 20,0	17,2 - 37,1	20,5 - 58,1	22,6 - 83,8	27,0 - 109,5	31,6 - 133,3		
Approved loads, shear for $h_{ef,min} - h_{ef,max}$													
Cracked concrete	C20/25	appr. V	[kN]	6,3	9,7	14,3	24,5 - 26,9	29,3 - 42,3	32,2 - 60,6	38,5 - 78,9	45,1 - 96,0		
Non-cracked concrete	C20/25	appr. V	[kN]	6,3	9,7	14,3	26,9	41,1 - 42,3	45,2 - 60,6	54,0 - 78,9	63,2 - 96,0		
Injection System VMH, threaded stud steel 8.8													
Approved loads, tension for $h_{ef,min} - h_{ef,max}$													
Cracked concrete	C20/25	appr. N	[kN]	5,0 - 13,4	6,7 - 21,9	10,0 - 31,9	12,3 - 59,5	14,6 - 93,3	16,1 - 120,6	19,2 - 152,7	22,5 - 188,5		
Non-cracked concrete	C20/25	appr. N	[kN]	11,2 - 13,8	11,2 - 21,9	14,1 - 31,9	17,2 - 59,5	20,5 - 93,3	22,6 - 134,3	27,0 - 175,2	31,6 - 213,8		
Approved loads, shear for $h_{ef,min} - h_{ef,max}$													
Cracked concrete	C20/25	appr. V	[kN]	8,6	13,1	19,4	24,5 - 36,0	29,3 - 56,0	32,2 - 80,6	38,5 - 105,1	45,1 - 128,0		
Non-cracked concrete	C20/25	appr. V	[kN]	8,6	13,1	19,4	34,4 - 36,0	41,1 - 56,0	45,2 - 80,6	54,0 - 105,1	63,2 - 128,0		
Injection System VMH, threaded stud stainless steel A4-70, HCR-70													
Approved loads, tension for $h_{ef,min} - h_{ef,max}$													
Cracked concrete	C20/25	appr. N	[kN]	5,0 - 9,9	6,7 - 15,7	10,0 - 22,5	12,3 - 42,0	14,6 - 65,3	16,1 - 94,3	19,2 - 57,4	22,5 - 70,2		
Non-cracked concrete	C20/25	appr. N	[kN]	9,9	11,2 - 15,7	14,1 - 22,5	17,2 - 42,0	20,5 - 65,3	22,6 - 94,3	27,0 - 57,4	31,6 - 70,2		
Approved loads, shear for $h_{ef,min} - h_{ef,max}$													
Cracked concrete	C20/25	appr. V	[kN]	6,0	9,2	13,7	24,5 - 25,2	29,3 - 39,4	32,2 - 56,8	34,5	42,0		
Non-cracked concrete	C20/25	appr. V	[kN]	6,0	9,2	13,7	25,2	39,4	45,2 - 56,8	34,5	42,0		
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	134 - 444	152 - 536	168 - 600	190 - 670
Minimum spacing				s_{min}	[mm]	40	50	60	75	95	115	125	140
Minimum edge distance				c_{min}	[mm]	35	40	45	50	60	65	75	80
Installation parameters													
Drill hole diameter				d_o	[mm]	10	12	14	18	22	28	30	35
Clearance hole in the fixture for Pre-setting installation				$d_f \leq$	[mm]	9	12	14	18	22	26	30	33
Clearance hole in the fixture for Through-setting installation				$d_f \leq$	[mm]	12	14	16	20	24	30	33	40
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	108 - 540	120 - 600
Installation torque				$T_{inst} \leq$	[Nm]	10	20	40 (FKL4.6:35)	60	100	170	250	300
Amount of adhesive per 100mm drill hole depth				[ml]		6,53	8,16	9,82	13,61	17,89	32,25	30,69	48,70

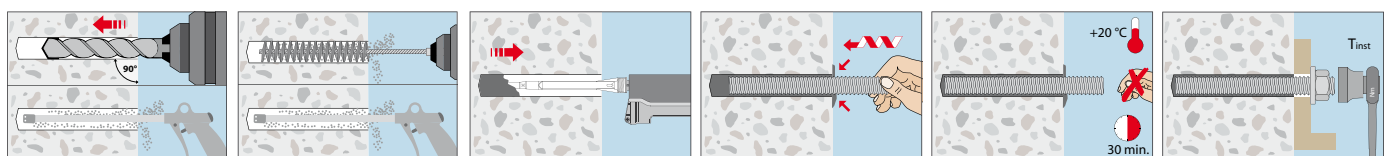
¹⁾Max. long term temperature/max. short term temperature

Higher concrete strength may lead to higher approved loads. Manual cleaning or the use of a suction drill without subsequent cleaning may lead to lower loads. For further information, please refer to the European Technical Assessment ETA-17/0716.

For anchor designing, an easy to operate Software is available on request or can be downloaded at www.mkt.de.



Installation threaded stud in concrete





Extract from Permissible Service Conditions of European Technical Assessment ETA-17/0716

Approved loads for working life of up to 50 years without influence of spacing and edge distance in dry or wet concrete for temperature range II -40°C to + 50°C/+80°C¹⁾ (Approved loads for temperature range I -40°C to + 24°C/+40°C¹⁾, temperature range III -40°C to +72°C/+ 120°C¹⁾ and IV -40°C to +100°C/+ 160°C please see ETA-17/0716). Total safety factor as per ETAG included (γ_M and γ_p).

Loads and performance data		Injection system VMH IG M6 - IG M20		Range of temperature II -40°C to + 50°C/+80°C ¹⁾								
Internally Threaded Sleeve		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 x 125	IG M16 x 170	IG M20 x 200		
Anchorage depth h_{ef}	[mm]	80	90	80	100	80	100	125	170	200		
Injection System VMH, internally threaded sleeve VMU-IG steel 5.8												
Approved loads, tension for h_{ef}												
Cracked concrete	C20/25 appr. N [kN]	4,8	4,8	8,1	8,1	12,3	13,8	20,0	36,2	48,5		
Non-cracked concrete	C20/25 appr. N [kN]	4,8	4,8	8,1	8,1	13,8	13,8	20,0	36,2	58,6		
Approved loads, shear for h_{ef}												
Cracked concrete	C20/25 appr. V [kN]	3,4	3,4	5,7	5,7	9,7	9,7	14,3	25,7	42,3		
Non-cracked concrete	C20/25 appr. V [kN]	3,4	3,4	5,7	5,7	9,7	9,7	14,3	25,7	42,3		
Injection System VMH, internally threaded sleeve VMU-IG stainless steel A4-70, HCR-70												
Approved loads, tension for h_{ef}												
Cracked concrete	C20/25 appr. N [kN]	5,3	5,3	9,9	9,9	12,3	15,7	22,5	38,0	31,0		
Non-cracked concrete	C20/25 appr. N [kN]	5,3	5,3	9,9	9,9	15,7	15,7	22,5	42,0	31,0		
Approved loads, shear for h_{ef}												
Cracked concrete	C20/25 appr. V [kN]	3,2	3,2	6,0	6,0	9,2	9,2	13,7	25,2	18,6		
Non-cracked concrete	C20/25 appr. V [kN]	3,2	3,2	6,0	6,0	9,2	9,2	13,7	25,2	18,6		
Spacing and edge distance												
Min. thickness of concrete slab	h_{min} [mm]	110	120	110	130	116	136	169	226	270		
Minimum spacing	s_{min} [mm]	50	50	60	60	75	75	95	115	140		
Minimum edge distance	c_{min} [mm]	40	40	45	45	50	50	60	65	80		
Installation parameters												
Drill hole diameter	d_o [mm]	12	12	14	14	18	18	22	28	35		
Clearance hole in the fixture	$d_{r \leq}$ [mm]	7	7	9	9	12	12	14	18	22		
Range of drill hole depth for h_{ef}	h_o [mm]	80	90	80	100	80	100	125	170	200		
Installation torque	$T_{inst \leq}$ [Nm]	10	10	10	10	20	20	40	60	100		
Amount of adhesive per drill hole	[ml]	6,6	7,4	7,9	9,9	10,9	13,6	22,4	54,9	97,4		

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

Higher concrete strength may lead to higher approved loads. Manual cleaning or the use of a suction drill without subsequent cleaning may lead to lower loads. For further information, please refer to the European Technical Assessment ETA-17/0716.

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Loads and performance data		Range of temperature II -40°C to + 50°C/+80°C ¹⁾										
Injection System VMH, rebar B500B		Ø8	Ø10	Ø12	Ø14	Ø16	Ø20	Ø24	Ø25	Ø28	Ø32	
Range of anchorage depths $h_{ef,min} - h_{ef,max}$	[mm]	60 - 160	60 - 200	70 - 240	75 - 280	80 - 320	90 - 400	96 - 480	100 - 500	112 - 560	128 - 640	
Approved loads, tension for $h_{ef,min} - h_{ef,max}$												
Cracked concrete	C20/25 appr. N [kN]	3,9 - 10,5	4,9 - 16,5	7,5 - 25,9	10,2 - 38,1	12,3 - 49,8	14,6 - 77,8	16,1 - 112,0	17,1 - 130,9	20,3 - 164,2	24,8 - 214,5	
Non-cracked concrete	C20/25 appr. N [kN]	10,1 - 13,8	11,2 - 21,6	14,1 - 31,2	15,6 - 42,4	17,2 - 55,4	20,5 - 86,6	22,6 - 124,5	24,0 - 135,2	28,5 - 169,6	34,8 - 221,6	
Approved loads, shear for $h_{ef,min} - h_{ef,max}$												
Cracked concrete	C20/25 appr. V [kN]	6,5	9,9 - 10,1	14,5	19,8	24,5 - 25,9	29,3 - 40,4	32,2 - 58,1	34,3 - 63,1	40,6 - 79,2	49,7 - 103,4	
Non-cracked concrete	C20/25 appr. V [kN]	6,5	10,1	14,5	19,8	25,9	40,4	45,2 - 58,1	48,1 - 63,1	57,0 - 79,2	69,6 - 103,4	
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 / 102 - 272 ²⁾	111 - 316	120 - 360	140 - 450	160 - 544	164 - 564	182 - 630	208 - 720	
Minimum spacing	s_{min} [mm]	40	50	60	70	75	95	120	120	130	150	
Minimum edge distance	c_{min} [mm]	35	40	45	50	50	60	70	70	75	85	
Installation parameters												
Drill hole diameter	d_o [mm]	10/12 ²⁾	12/14 ²⁾	14/16 ²⁾	18	20	25	32	32	35	40	
Range of drill hole depth for $h_{ef,min} - h_{ef,max}$	h_o [mm]	60 - 160	60 - 200	70 - 240	75 - 280	80 - 320	90 - 400	96 - 480	100 - 500	112 - 560	128 - 640	
Amount of adhesive per 100mm drill hole depth	[ml]	4,16 / 8,46 ³⁾	5,07 / 10,12 ³⁾	5,97 / 11,78 ³⁾	13,44	15,09	23,11	44,65	40,03	44,22	57,32	

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

²⁾For Ø8, Ø10, Ø12 both drill hole diameters can be used.

³⁾The second value applies to the larger drill diameter

Higher concrete strength may lead to higher approved loads. Manual cleaning or the use of a suction drill without subsequent cleaning may lead to lower loads. For further information, please refer to the European Technical Assessment ETA-17/0716.

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Injections System VMH

for post-installed rebar connection



Reinforcement Bars BSt 500 S



Cartridge VMH 280
Coaxial cartridge suitable for silicone guns
Content: 280ml including 2 mixers



Cartridge VMH 345
Side-by-side cartridge
Content: 345ml



Cartridge VMH 420
Coaxial cartridge
Content: 420ml

Description

The Injection System VMH also has the European Technical Assessment for post-installed rebar connection. Reinforcement bars with diameters from 8mm to 32mm as well as tension anchors from M12 to M24 with a setting depth up to 2m¹⁾ can be fixed. Due to the short processing and curing times, the VMH is particularly suitable for low temperatures.

Advantages

- Short processing and curing times, therefore ideal for low temperatures
- Wide range of application, as up to 35mm rebar diameter allowed
- Drill hole creation with hammer drill, compressed air drill or hollow drill bit
- Approved for installation in dry and wet concrete
- Opened cartridges can be reused with a new static mixer
- Approved for use under fire exposure
- Tie rods ZA with connecting thread M12 - M24 can be supplied in individual lengths on request

Application examples for post-installed rebar connection:
Subsequent connection of stairs, balconies, walls or columns, closing of wall and ceiling openings

Application examples for tension anchors:

Anchoring of railing posts and of supports subject to bending loads, anchoring of cantilevered components



Injection Cartridge VMH

→ Hybrid injection adhesive, styrene free

→ for post-installed rebar

Description	Ref. No.	Content ml	Content of master box	Weight per master box kg	Weight per piece kg
Cartridge VMH 280 ¹⁾	28251501	280	12	6,70	0,56
Cartridge VMH 345	28253501	345	12	8,00	0,65
Cartridge VMH 420	28257501	420	12	10,1	0,83
Static mixer VM-XH	28304801	-	12	0,16	0,01

One static mixer comes with each cartridge.

¹⁾Cartridge VMH 280 comes with 2 mixers.

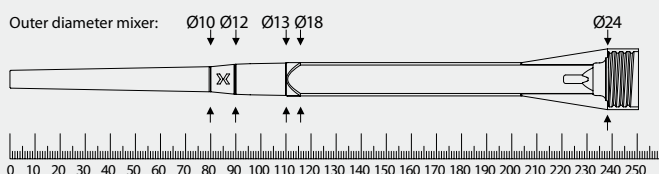
Curing Time Injection Adhesive VMH

→ Cartridge temperature when installing +5°C to +40°C

Temperature (°C) of the base material	Gel time	Curing time	
		Dry base material	Wet base material
-5°C to -1°C	50 min	5 h	10 h
0°C to +4°C	25 min	3,5 h	7 h
+5°C to +9°C	15 min	2 h	4 h
+10°C to +14°C	10 min	1 h	2 h
+15°C to +19°C	6 min	40 min	80 min
+20°C to +29°C	3 min	30 min	60 min
+30°C to +40°C	2 min	30 min	60 min

Usable length static mixer VM-XH

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.



¹⁾See table accessories for Injection system VMH

Accessories for Injection System VMH for post-installed rebar connection

Rebar Ø	Tension Anchor	Drill Bit Ø	Blow-out pump / Air gun ¹⁾	Cleaning brush RB ²⁾	Retaining washer VM-IA ¹⁾	Extension tube ¹⁾	Maximum permissible drilling depth for dispenser		
							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 ³⁾	VM-P 345 Pneumatic Eco; VM-P 345 Pneumatic, VM-P 380 Pneumatic	VM-P 825 Pneumatic ³⁾
mm	mm	mm					mm	mm	mm
8		12	VM-ABP 200 DLS with RS, RS25	RB 12 M6 RB 12 M8	-	VM-XE 10	700	800	800
10		14	VM-ABP 200 DLS with RS, RS25	RB 14 M6 RB 14 M8	VM-IA 14 ¹⁾	VM-XE 10	700	1000	1000
12	ZA-M12	16	VM-ABP 200 / 1000 DLS with RS, RS25	RB 16 M6 RB 16 M8	VM-IA 16 ¹⁾	VM-XE 10	700	1000	1200
14		18	VM-ABP 200 / 250 / 500 / 1000 DLS with RS, RS25	RB 18 M6 RB 18 M8	VM-IA 18 ¹⁾	VM-XE 10 ²⁾ , VM-XLE 16	700	1000	1400
16	ZA-M16	20	VM-ABP 200 / 250 / 500 / 1000 DLS with RS, RS25	RB 20 M6 RB 20 M8	VM-IA 20 ¹⁾	VM-XE 10 ²⁾ , VM-XLE 16	700	1000	1600
20	ZA-M20	25	VM-ABP 250 / 500 / 1000 DLS with RS, RS25	RB 25 M8 RB 26 M6	VM-IA 25 ¹⁾	VM-XE 10 ²⁾ , VM-XLE 16	500	700	2000
22		28	VM-ABP 250 / 500 / 1000 DLS with RS, RS25	RB 28 M6	VM-IA 28 ¹⁾	VM-XE 10 ²⁾ , VM-XLE 16	500	700	2000
24 / 25	ZA-M24	32	VM-ABP 250 / 500 / 1000 DLS with RS, RS35	RB 32 M6 RB 32 M8	VM-IA 32 ¹⁾	VM-XE 10 ²⁾ , VM-XLE 16	500	500	2000
28		35	VM-ABP 250 / 500 / 1000 DLS with RS, RS35	RB 35 M6 RB 35 M8	VM-IA 35 ¹⁾	VM-XE 10 ²⁾ , VM-XLE 16	500	500	2000
32		40	VM-ABP 250 / 500 / 1000	RB 40 M6	VM-IA 40 ¹⁾	VM-XE 10 ²⁾ , VM-XLE 16	500	500	2000
See page			169	170	172	171	172 / 173	173	173

¹⁾If the static mixer does not reach the bottom of the borehole (see usable length of static mixer), an extension tube must be used. From a drill-Ø ≥ 14 mm, retaining washer and extension tube must be used for horizontal and overhead installation and for drill hole depths > 240 mm.

²⁾Not in combination with the dispenser VM-P 825 Pneumatic

³⁾Cartridge VMH 825 available on request



Extract from Permissible Service Conditions of European Technical Assessment ETA-17/0715 for post-installed rebar connection with the Injektion System VMH

Concrete Strength	C12/15	C16/20	C20/25	C25/30	C30/37	C35/45	C40/50	C45/55	C50/60
Design value of bond strength $f_{bd,PIR}$ [N/mm ²]	1,6	2,0	2,3	2,7	3,0	3,4	3,7	4,0	4,3

¹⁾The values $f_{bd,PIR}$ are valid for "good" bond conditions according to EN 1992-1-1:2004.

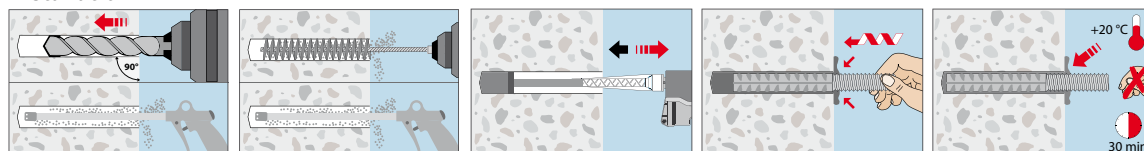
Installation parameters and Amount of adhesive Injection System VMH for post-installed rebar connection

Rebar-Ø	[mm]	8	10	12	14	16	20	22	24	25	28	32
Drill hole-Ø	do [mm]	12	14	16	18	20	25	28	32	32	35	40
Amount of adhesive / 100 mm setting depth	[ml]	8,46	10,12	11,78	13,44	15,09	23,11	30,4	44,65	40,03	44,22	57,32

Installation parameters Injection System VMH with Tension Anchor

Tension Anchor ZA		ZA M12	ZA M16	ZA M20	ZA M24
Rebar	[mm]	12	16	20	25
Drill hole diameter	do [mm]	16	20	25	32
Diameter of clearance hole	dr ≤ [mm]	14	18	22	26
Effective setting depth	lv [mm]	according to static calculation			
Installation torque	Tinst ≤ [Nm]	50	100	150	150
Width across nut	SW [mm]	19	24	30	36
Tension Anchor ZA see page		167	167	167	on request

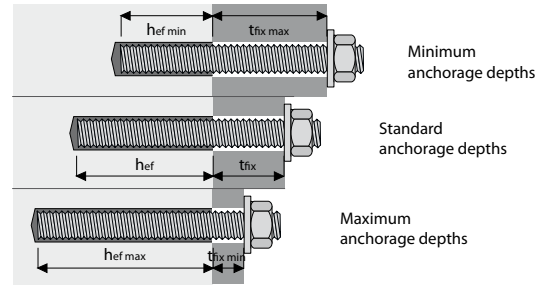
Installation



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.



$hef + t_{fix} =$ 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

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	
	Steel, zinc plated 5.8	Steel, hot dip galvanized 5.8	Stainless steel A4-70	Concrete ¹⁾ Usable length mm	Solid base material without Perfo Sleeve Drill hole Ø x depth mm	Maximum fixture thickness t _{fix} mm	Solid and hollow base material with VM-SH ²⁾							
							12x85	16x90	16x135	20x90	20x135			20x205
							Maximum fixture thickness t _{fix} 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	-	-	12x90	-	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 internal 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
	Steel, zinc plated 5.8	Steel, zinc plated 8.8	Steel, hot dip galvanized 5.8	Stainless steel A4-70	Stainless steel HCR-70	Concrete ¹⁾		Solid base material without Perfo Sleeve	Solid and hollow base material with VM-SH ²⁾								
						Usable Length	Drill hole Ø x depth	Maximum fixture thickness t _{fix}	12x85	16x90	16x135	20x90	20x135	20x205			
						mm	mm	mm	Maximum fixture thickness t _{fix}						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 ³⁾	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 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

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⁾						
									Drill hole Ø x depth	Drill hole Ø x depth
		Steel, zinc plated 5.8	Stainless steel A4	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

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

Internally Threaded Sleeve VMU-IG A4

Stainless steel A4-70



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

Tension Anchor ZA



Thread: M12, M16, M20
Range of Concrete Quality: C12/15–C50/60
Material: Stainless steel A4
On request: Stainless steel HCR

Description

The Tension Anchor ZA consists of a connection thread made of stainless steel A4 or HCR which is welded to a reinforcement bar B 500 B. It is part of the European Technical Assessments for post-installed reinforcement connections of the injections systems VMH, VMU plus, VME plus and VME and may be used in cracked and non-cracked concrete. The absorbable tensile force or the required anchorage length can be determined according to EN 1992-1 (EC2). If the full anchorage depth is not required, the reinforcement bar end can be shortened.

Applications

- Connection of structural elements to reinforced concrete
- Introduction of highest tensile loads with minimal edge distances
- Fastening of brackets, canopies, traffic signs, stairs

Tension Anchor ZA



- Stainless steel A4
- Approved for cracked and non-cracked concrete

Description	Ref. No.	Drill-hole-Ø mm	max. setting depth mm	Fixture thickness t_{ix} mm	Anchor length mm	Weight per piece kg
ZA M12-60/975 A4	85306501	16	900	60	975	0,9
ZA M12-200/1115 A4	85320501	16	900	200	1115	1,0
ZA M16-60/1180 A4	85506501	20	1100	60	1180	1,9
ZA M16-200/1320 A4	85520501	20	1100	200	1320	2,1
ZA M20-60/1485 A4	85606501	25	1400	60	1485	3,7
ZA M20-200/1625 A4	85620501	25	1400	200	1625	4,0

Stainless steel HCR and other lengths on demand.

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 sufficient
- 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

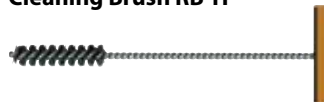

- For machine cleaning of drill holes
- Stainless steel trim for a long service life
- With connection thread M6
- For drilling machines with keyed chuck
- SDS plus adapter for use in a hammer drill
- Use brush extensions according to the drilling depth. Several brush extensions can be screwed together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


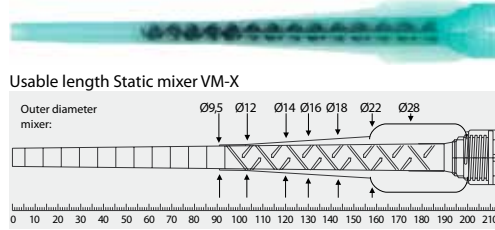
- For manual drill hole cleaning of non-approved systems in solid and perforated masonry
- Nylon trim
- With wooden handle

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

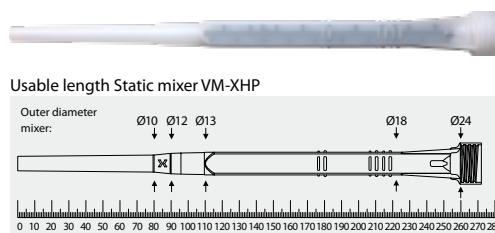
Static mixer

- ➔ 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.

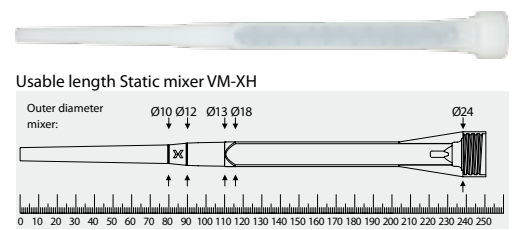
VM-X



VM-XHP



VM-XH



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 VME 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

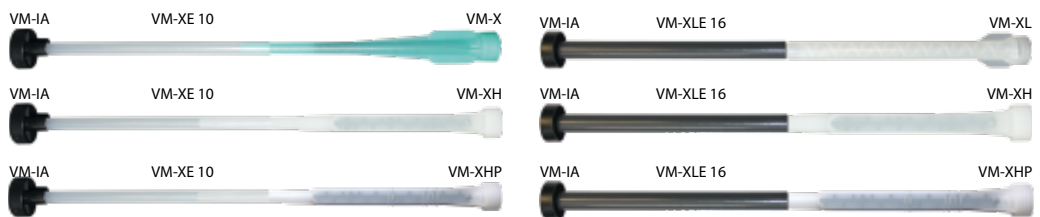
¹⁾Static mixer VM-XL comes with a reducers / extension tube. Suitable for drill holes from 12mm diameter.

Extension tubes



- ➔ 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		12	0,12
VM-XE 10/500	85951101	10	500	12 - 40	VM-X	10	0,20
VM-XE 10/1000	85952101	10	1000	12 - 40	VM-XHP VM-XL	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	10	0,30
VM-XLE 16/1000	85956101	16	1000	18 - 55	VM-XH	10	1,15
VM-XLE 16/2000	85958101	16	2000	18 - 55	VM-XL	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 cartridges	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 release 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 cartridges	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 cartridges	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 dispensing 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