

## Injection System VMZ-IG



**Conical Stud VMZ-IG**  
with internal thread



**Cartridge VMZ 280**  
Coaxial Cartridge  
for silicone guns  
Content: 280ml, incl. 2  
Static mixer on Cartridge



**Cartridge VMZ 345**  
Side-by-side Cartridge  
Content: 345ml



**Cartridge VMZ 420**  
Coaxial Cartridge  
Content: 420ml



**Cartridge VMZ 345  
express**  
Side-by-side Cartridge  
Content: 345ml

**Range of loading:** 3,1 kN–51,9 kN  
**Range of concrete quality:** C20/25–C50/60  
**Material:** Steel, zinc plated, Stainless steel A4,  
Stainless steel HCR

### Description

The Injection System VMZ-IG consists of an internally threaded sleeve with conical expansion elements and a 2 component injection adhesive. This combination provides extremely high load bearing capacity even at minimum edge distance and spacing. The VMZ system combines the benefits of bonded anchors and expansion anchors in a European technical approved fastening system for both cracked and uncracked concrete. The variety of screws, threaded studs and nuts that can be used for fastening opens up a wide range of application and design options. Hammer drills, diamond drills or suction drills can be used to create the drill holes. When using the hollow drill bit SB, contamination and fine dust exposure of the respiratory tract are reduced to a minimum and subsequent drill hole cleaning is not necessary.



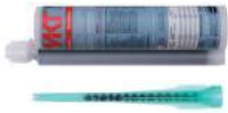
### Advantages

- Approved in cracked and uncracked concrete
- Very high loads with low anchorage depths and component thicknesses
- No load reduction for wet or water-filled drill holes (drill holes  $d_0=14\text{mm}$  and larger)
- Fire test report for all dimensions
- Fire test report according to ZTV tunnel temperature curve for threaded studs VMZ-IG M8 HCR-VMZ-IG M20 HCR
- Wide range of application and design options as various screws, threaded studs and nuts (galvanized steel: FKL  $\geq 8.8$ , stainless steel A4, HCR: FKL  $\geq 70$ ) can be used for fastening
- Also suitable for architecturally demanding applications
- No projection parts after de-installation of fixture
- Styrene-free 2 component adhesive on vinyl ester basis for approved processing from a substrate temperature of  $-15^\circ\text{C}$
- Styrene-free injection adhesive VMZ 345 express for fast curing
- Opened cartridges can be re-used with a new mixer nozzle
- Drill hole creation with hammer drill, diamant drill or suction drill

### Applications

Heavy duty fastenings in cracked and uncracked concrete with standards screws or threaded studs: Steel structures, brackets, railings, posts, columns, ladders, gates

**Injection Cartridge VMZ**



- Two component cartridge, styrene-free
- Various cartridge systems
- Approved for cracked and uncracked concrete

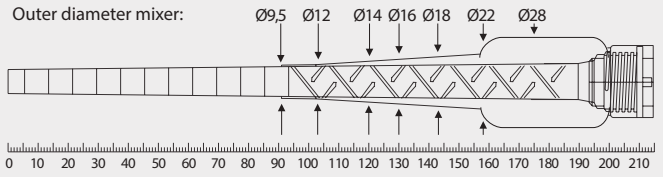
Description	Ref. No.	Content	Content of master box pcs.	Weight per master box kg	Weight per piece
					kg
Cartridge VMZ 280 <sup>1)</sup>	28252601	280	12	6,70	0,56
Cartridge VMZ 345	28255310	345	12	8,28	0,69
Cartridge VMZ 420	28254701	420	12	9,84	0,83
Cartridge VMZ 345 express	28254201	345	12	8,00	0,65
Static mixer VM-X (for all cartridge)	28305111	-	12	0,12	0,01
Mixer extension VM-XE 10/200 (200mm)	28306011	-	12	-	0,01
Installation wedge VMZ-MK	33300103	-	10	-	0,01

One static mixer VM-X comes with each cartridge.

<sup>1)</sup>Cartridge VMZ 280 comes with 2 mixers.

**Usable length Static mixer VM-X**

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 VMZ**

→ Cartridge temperature when installing min. +5°C

Temperature (°C) of the base material	Gel time	Curing time	
		dry base material	wet base material
-15°C to -10°C	45 min	7 d	14 d <sup>1)</sup>
-9°C to -5°C	45 min	10:30 h	21:00 h <sup>1)</sup>
-4°C to -1°C <sup>1)</sup>	45 min	6:00 h	12:00 h <sup>2)</sup>
0°C to +4°C	20 min	3:00 h	6:00 h
+5°C to +9°C	12 min	2:00 h	4:00 h
+10°C to +19°C	6 min	1:20 h	2:40 h
+20°C to +29°C	4 min	45 min	1:30 h
+30°C to +34°C	2 min	25 min	50 min
+35°C to +39°C	1,4 min	20 min	40 min
+40°C	1,4 min	15 min	30 min

<sup>1)</sup>It must be ensured that icing does not occur in the drill hole.

**Curing Time Injection Adhesive VMZ express**

→ Cartridge temperature when installing min. +5°C

Temperature (°C) of the base material	Gel time	Curing time	
		dry base material	wet base material
-5°C to -1°C	20 min	4:00 h	8:00 h <sup>1)</sup>
0°C to +4°C	10 min	2:00 h	4:00 h
+5°C to +9°C	6 min	1:00 h	2:00 h
+10°C to +19°C	3 min	40 min	80 min
+20°C to +29°C	1 min	20 min	40 min
+30°C	1 min	10 min	20 min

<sup>1)</sup>It must be ensured that icing does not occur in the drill hole.

**Accessories for Injection System VMZ-IG**

VMZ-IG Internally threaded anchor	Drill bit Ø mm	Blow-out pump <sup>1)</sup> / Air gun <sup>1)</sup>	Cleaning brush RB <sup>1)</sup>	Extension tube	Dispenser
VMZ-IG M6	10	VM-AP 360 VM-ABP 200	RB 10 M6	VM-XE 10	
VMZ-IG M8	12	VM-AP 360 VM-ABP 200	RB 12 M6 / RB 12 M8	VM-XE 10	
VMZ-IG M10	14	VM-AP 360 VM-ABP 200	RB 14 M6 / RB 14 M8	VM-XE 10	
VMZ-IG M12	18	VM-AP 360 VM-ABP 200 / 250 / 500	RB 18 M6 / RB 18 M8	VM-XE 10	
VMZ-IG 115 M16	22	VM-ABP 250 / 500	RB 22 M6	VM-XE 10	
VMZ-IG 170 M16	24	VM-ABP 250 / 500	RB 24 M6	VM-XE 10	
VMZ-IG M20	26	VM-ABP 250 / 500	RB 26 M6	VM-XE 10	
<b>See page</b>		<b>179</b>	<b>180</b>	<b>181</b>	<b>182 / 183</b>

<sup>1)</sup>When using the hollow drill bit SB (see page 178), subsequent cleaning is no longer necessary. In the case of diamond drilled holes, the drill hole is rinsed with water and blown out with compressed air (see ETA-04/0092).



**Conical Stud VMZ-IG**

Steel, zinc plated



→ For use in structures subject to dry internal conditions

→ With internal thread, to be used with standard screws or threaded studs (steel strength 8.8)

Description	Ref. No.	Drill hole Ø x depth mm	Effective anchorage depth	Anchor length mm	Thread	Pkg. cont. pcs.	Weight per pkg. kg
VMZ-IG 40 M6	32802101	10x42	40	41	M6x12	10	0,15
VMZ-IG 50 M6	32804101	10x55	50	52	M6x15	10	0,18
VMZ-IG 60 M8	32812101	12x65	60	63	M8x16	10	0,28
VMZ-IG 75 M8	32814101	12x80	75	78	M8x19	10	0,47
VMZ-IG 70 M10	32822101	14x80	70	74	M10x20	10	0,57
VMZ-IG 80 M10	32824101	14x85	80	84	M10x23	10	0,63
VMZ-IG 90 M12	32832101	18x98	90	94	M12x24	10	1,26
VMZ-IG 105 M12	32834101	18x113	105	109	M12x27	10	1,45
VMZ-IG 125 M12	32836101	18x133	125	130	M12x30	10	1,69
VMZ-IG 115 M16	32852101	22x120	115	120	M16x32	5	1,12
VMZ-IG 170 M16	32854101	24x180	170	180	M16x32	5	2,22
VMZ-IG 170 M20	32862101	26x185	170	182	M20x40	5	2,44

**Conical Stud VMZ-IG A4**

Stainless steel A4 / 316



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

→ With internal thread, to be used with standard screws or threaded studs (steel strength 8.8)

Description	Ref. No.	Drill hole Ø x depth mm	Effective anchorage depth	Anchor length mm	Thread	Pkg. cont. pcs.	Weight per pkg. kg
VMZ-IG 40 M6 A4	32802501	10x42	40	41	M6x12	10	0,15
VMZ-IG 50 M6 A4	32804501	10x55	50	52	M6x15	10	0,18
VMZ-IG 60 M8 A4	32812501	12x65	60	63	M8x16	10	0,28
VMZ-IG 75 M8 A4	32814501	12x80	75	78	M8x19	10	0,47
VMZ-IG 70 M10 A4	32822501	14x80	70	74	M10x20	10	0,57
VMZ-IG 80 M10 A4	32824501	14x85	80	84	M10x23	10	0,63
VMZ-IG 90 M12 A4	32832501	18x98	90	94	M12x24	10	1,26
VMZ-IG 105 M12 A4	32834501	18x113	105	109	M12x27	10	1,45
VMZ-IG 125 M12 A4	32836501	18x133	125	130	M12x30	10	1,69
VMZ-IG 115 M16 A4	32852501	22x120	115	120	M16x32	5	1,12
VMZ-IG 170 M16 A4	32854501	24x180	170	180	M16x32	5	2,22
VMZ-IG 170 M20 A4	32862501	26x185	170	182	M20x40	5	2,44

HCR on demand.



**Extract from Permissible Service Conditions of European Technical Assessment ETA-04/0092 for use in cracked and uncracked concrete (Option 1)**

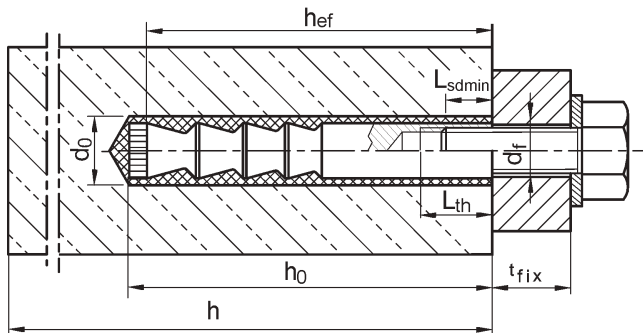
Approved loads according to EN 1992-4 for single anchors without the influence of spacing and edge distances in dry and wet concrete for temperature range -40°C to +50°C (short term temperature +80°C) . The total safety factor ( $\gamma_{m}$  und  $\gamma_{\gamma}$ ) is included. For further details and temperature ranges see ETA.

**Loads and performance data Injection System VMZ-IG, steel zinc plated and stainless steel A4 / HCR**



			40 M6	50 M6	60 M8	75 M8	70 M10	80 M10	90 M12	105 M12	125 M12	115 M16	170 M16	170 M20
<b>VMZ-IG, steel zinc plated</b>			cracked concrete											
Approved loads, tension	C20/25	appr. N [kN]	4,1	5,8	7,6	10,7	9,6	11,7	14,0	17,6	22,9	20,2	36,3	36,3
			uncracked concrete											
Approved loads, tension	C20/25	appr. N [kN]	4,3	7,6	9,0	13,8	13,7	16,7	20,0	25,2	31,9	24,8	51,9	51,4
			cracked and uncracked concrete											
Approved loads, shear	$\geq$ C20/25	appr. V [kN]	4,6	4,6	5,4	8,6	10,3	10,3	19,4	19,4	19,4	14,9	36,0	30,9
Approved bending moments		appr. M [Nm]	6,9	6,9	17,1	17,1	34,3	34,3	60,0	60,0	60,0	121,1	152,0	296,6
<b>VMZ-IG, stainless steel A4 /HCR</b>			cracked concrete											
Approved loads, tension	C20/25	appr. N [kN]	4,1	5,2	7,6	10,0	9,6	11,7	14,0	17,6	22,4	20,2	36,3	36,3
			uncracked concrete											
Approved loads, tension	C20/25	appr. N [kN]	4,3	5,2	9,0	10,0	13,7	15,7	20,0	22,4	22,4	28,9	41,9	44,8
			cracked and uncracked concrete											
Approved loads, shear	$\geq$ C20/25	appr. V [kN]	3,1	3,1	5,4	5,7	9,1	9,1	13,7	13,7	13,7	18,3	25,1	26,9
Approved bending moments		appr. M [Nm]	4,9	4,9	12,0	12,0	24,0	24,0	42,3	42,3	42,3	106,9	106,9	208,6
<b>Spacing and edge distance</b>			cracked concrete											
Effective anchorage depth	$h_{ef}$	[mm]	40	50	60	75	70	80	90	105	125	115	170	170
Characteristic spacing	$s_{cr,N}$	[mm]	120	150	180	225	210	240	270	315	375	345	510	510
Characteristic edge distance	$c_{cr,N}$	[mm]	60	75	90	112,5	105	120	135	157,5	187,5	172,5	255	255
			uncracked concrete											
Minimum thickness of concrete slab	$h_{min}$	[mm]	80	80	100	110	110	110	130	150	170	160	230	230
Minimum spacing	$s_{min}$	[mm]	40	40	40	40	55	40	50	50	60	80	80	80
Minimum edge distance	$c_{min}$	[mm]	40	40	40	40	55	50	50	50	60	80	80	80
<b>Installation parameters</b>			cracked concrete											
Drill hole diameter	$d_o$	[mm]	10	10	12	12	14	14	18	18	18	22	24	26
Diameter of clearance hole in the fixture	$d_f$	[mm]	7	7	9	9	12	12	14	14	14	18	18	22
Depth of drill hole	$h_o$	[mm]	42	55	65	80	80	85	98	113	133	120	180	185
Installation torque	$T_{inst \leq}$	[Nm]	8	8	10	10	15	15	25	25	25	50	50	80
Minimum screwing depth	$L_{sdmin}$	[mm]	7	7	9	9	12	12	14	14	14	18	18	22
Maximum screwing depth	$L_{th}$	[mm]	12	15	16	19	20	23	24	27	30	32	32	40
Amount of adhesive per drill hole		[ml]	3,4	4,1	6,1	7,0	6,8	8,6	11,1	12,6	14,5	20,8	30,1	33,3
Drill holes per cartridge VMZ 280		pcs.	70	58	39	34	35	27	21	19	16	11	7	7
Drill holes per cartridge VMZ 345		pcs.	88	73	49	43	44	34	27	23	20	14	10	9
Drill holes per cartridge VMZ 420		pcs.	111	92	62	54	55	44	34	30	26	18	12	11

For anchor designing an easy to operate CD-ROM is available on request or can be downloaded at [www.mkt.de](http://www.mkt.de).



**Installation**

