

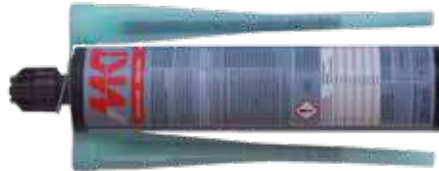
Injection System VMZ-IG



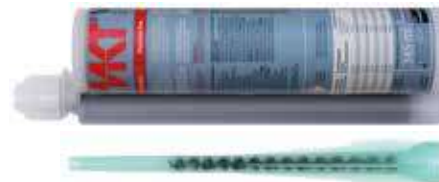
Conical Stud VMZ-IG
with internal thread



Cartridge VMZ 150
Coaxial Cartridge
for silicone guns
Content: 150ml



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



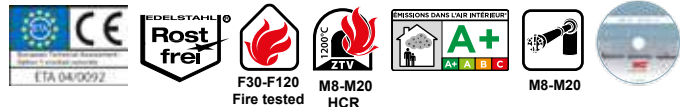
Cartridge VMZ 345
Side-by-side Cartridge
Content: 345ml



Cartridge VMZ 420
Coaxial Cartridge
Content: 420ml



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



Advantages:

- Small thickness of concrete slab
- No load reduction for wet or water-filled (M10 and larger) drill holes
- Approved from -5 °C to +40°C temperature of base material while installation
- No projection parts after de-installation of fixture
- Opened cartridges can be re-used with a new mixer nozzle

Applications:

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

Range of loading: 4,3 kN - 53,2 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 non-cracked concrete.

Injection Cartridge VMZ



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

Description	Ref. No.	Content	Content of master box	Weight per master box	Weight per piece
		ml	pcs.	kg	kg
Cartridge VMZ 150	28999301	150	12	4,32	0,36
Cartridge VMZ 280 ¹⁾	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 as well as one screw-on cap comes with each cartridge.

Usable length of static mixer see page 84.

¹⁾Cartridge VMZ 280 comes with 2 mixers.

Dispenser and Accessories for drill hole cleaning see page 84/85.

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 70)

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.

**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
-5°C ¹⁾	1:30 h	6:00 h	12:00 h ²⁾
-4°C to -1°C ¹⁾	45 min	6:00 h	12:00 h ²⁾
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

¹⁾Not part of ETA-17/0194 (VMZ dynamic)²⁾It must be ensured that icing does not occur in the drill hole.

The hole must be drilled and cleaned directly prior to the installation of the anchor.

**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 ¹⁾	40 min	4:00 h	8:00 h ²⁾
-4°C to -1°C ¹⁾	20 min	4:00 h	8:00 h ²⁾
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

¹⁾Not part of ETA-17/0194 (VMZ dynamic)²⁾It must be ensured that icing does not occur in the drill hole.

The hole must be drilled and cleaned directly prior to the installation of the anchor.



Extract from Permissible Service Conditions of ETA-04/0092

Approved loads for single anchor without influence of spacing and edge distance for temperature range -40°C to +80°C¹⁾ (Approved loads for temperature range -40°C to +120°C see ETA-04/0092). Total safety factor as per ETAG 001 included (γ_M and γ_P).

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
VMZ-IG, steel zinc plated															
cracked concrete															
Approved loads, tension	C20/25	appr. N	[kN]	4,3	6,1	8,0	11,1	10,0	12,3	14,6	18,4	24,0	21,1	38,0	38,0
non-cracked concrete															
Approved loads, tension	C20/25	appr. N	[kN]	4,3	7,6	9,0	13,8	14,1	16,7	20,5	25,8	31,9	24,8	53,2	51,4
cracked and non-cracked concrete															
Approved loads, shear	≥ 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

				40 M6	50 M6	60 M8	75 M8	70 M10	80 M10	90 M12	105 M12	125 M12	115 M16	170 M16	170 M20
VMZ-IG, stainless steel A4 / HCR															
cracked concrete															
Approved loads, tension	C20/25	appr. N	[kN]	4,3	5,2	8,0	10,0	10,0	12,3	14,6	18,4	22,4	21,1	38,0	38,0
non-cracked concrete															
Approved loads, tension	C20/25	appr. N	[kN]	4,3	5,2	9,0	10,0	14,1	15,7	20,5	22,4	22,4	29,6	41,9	44,8
cracked and non-cracked concrete															
Approved loads, shear	≥ 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

Spacing and edge distance

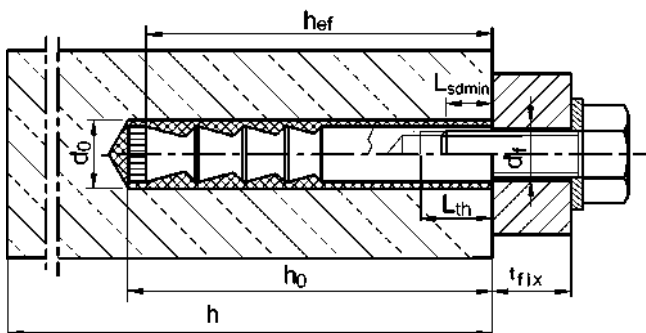
Effective anchorage depth	h_{ef}	[mm]	40	50	60	75	70	80	90	105	125	115	170	170	
Characteristic spacing	$s_{cr,N}$	[mm]	120	150	180	225	210	240	270	315	375	345	510	510	
Characteristic edge distance	$c_{cr,N}$	[mm]	60	75	90	112,5	105	120	135	157,5	187,5	172,5	255	255	
cracked concrete															
Minimum 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	
non-cracked 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	50	50	55	55	50	60	60	80	80	80	
Minimum edge distance	c_{min}	[mm]	40	40	50	50	55	55	50	60	60	80	80	80	

Installation parameters

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_{smin}	[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 150/VMZ 280	[Quan.]		31/70	26/58	18/39	15/34	16/35	12/27	9/21	8/19	7/16	5/11	3/7	3/7
Drill holes per cartridge VMZ 345	[Quan.]		88	73	49	43	44	34	27	23	20	14	10	9
Drill holes per cartridge VMZ 420	[Quan.]		111	92	62	54	55	44	34	30	26	18	12	11

¹⁾Max. long term temperature +50 °C / max. short term temperature +80 °C

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



Installation

