

Injection System VMZ



Conical Stud VMZ-A



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

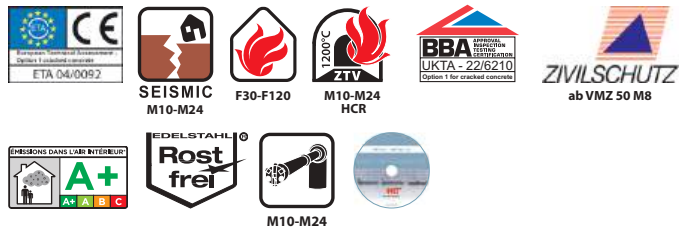


**Cartridge VMZ 345
express**
Side-by-side Cartridge
Content: 345ml

Range of loading: 4,1 kN–105,7 kN
Range of concrete quality: C20/25–C50/60
Material: Steel, zinc plated, Stainless steel A4,
Stainless steel HCR
**on demand: hot dip galvanized
or sheradized**

Description

The Injection System VMZ consists of an anchor rod 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. 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.



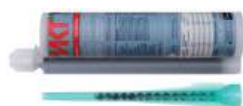
Advantages

- Approved in cracked and uncracked concrete
- Very high loads with low anchorage depths and component thicknesses
- Greatest possible economy of the fastening due to small anchors with low drilling effort
- No load reduction for wet or water-filled drill holes (drill holes $d_0=14\text{mm}$ and larger)
- Approved to use under seismic action according to the performance category C1 and C2 (M10-M24)
- For higher loads under seismic action, the annular gap between anchor rod and fixture can be filled using the VS backfill disc
- Fire test report for all dimensions
- Tested according to ZTV tunnel temperature curve (M10-M24 HCR)
- Suitable for Pre- and through-setting installation (M10 – M24)
- The large variety of threaded studs of different diameters, anchorage depths and fixture thicknesses covers almost all requirements
- VMZ-A 75 M12: drill hole like M10 but connection thread M12 (ideally suited for through fastening installation)
- Styrene-free 2 component adhesive VMZ on vinyl ester basis for approved processing from a substrate temperature of -15°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, e.g. steel beams, steel supports, railings, brackets, facade substructures, cable trays, fixing of bridge railings according to GEL 14 (VMZ 75 M12-40/135 A4) and GEL 33 (VMZ 90 M16-60/175 A4).

Injection Cartridge VMZ



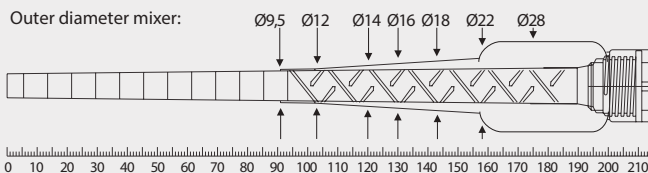
- Two component cartridge, styrene-free
- Various cartridge systems
- Approved for cracked and uncracked concrete

Description	Ref. No.	Content ml	Content of master box pcs.	Weight per master box kg	Weight per piece kg
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 cartridges)	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
Installation wedge VMZ-MK	33300103	-	10	-	0,01

One static mixer comes with each cartridge.
¹⁾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 ¹⁾
-9°C to -5°C	45 min	10:30 h	21:00 h ¹⁾
-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⁾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 ¹⁾
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⁾It must be ensured that icing does not occur in the drill hole.

Accessories for Injection System VMZ

VMZ-A Threaded Stud	Drill bit Ø mm	Blow-out pump ¹⁾ / Air gun ¹⁾	Cleaning brush RB ¹⁾	Extension tube	Dispenser
VMZ-A 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 380 Pneumatic Eco, VM-P 380 Pneumatic
VMZ-A M10 VMZ-A 75 M12	12	VM-AP 360 VM-ABP 200	RB 12 M6 / RB 12 M8	VM-XE 10	
VMZ-A M12	14	VM-AP 360 VM-ABP 200	RB 14 M6 / RB 14 M8	VM-XE 10	
VMZ-A M16	18	VM-AP 360 VM-ABP 200 / 250 / 500	RB 18 M6 / RB 18 M8	VM-XE 10	
VMZ-A 115 M20	22	VM-ABP 250 / 500	RB 22 M6	VM-XE 10	
VMZ-A M20	24	VM-ABP 250 / 500	RB 24 M6	VM-XE 10	
VMZ-A M24	26	VM-ABP 250 / 500	RB 26 M6	VM-XE 10	
See page		179	180	181	

¹⁾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-A

Steel, zinc plated



→ For use in structures subject to dry internal conditions

→ Version LG: with thread to concrete surface

→ Drill hole depth from 42mm

Description	Ref. No.	Drill hole Ø x depth mm	Setting depth mm	Seismic C1 / C2	Fixture thickness mm	Anchor length mm	Thread mm	Pkg. cont. pcs.	Weight per pkg. kg
VMZ-A 40 M8-15/65	32115101	10x42	41	- / -	15	65	M8x22	10	0,30
VMZ-A 50 M8-15/80	32120101	10x55	52	- / -	15	80	M8x22	10	0,36
VMZ-A 50 M8-30/95	32135101	10x55	52	- / -	30	95	M8x31	10	0,41
VMZ-A 50 M8-45/110	32145101	10x55	52	- / -	45	110	M8x31	10	0,47
VMZ-A 60 M10-10/85	32205101	12x65	63	✓ / ✓	10	85	M10x18	10	0,61
VMZ-A 60 M10-20/95	32220101	12x65	63	✓ / ✓	20	95	M10x27	10	0,66
VMZ-A 60 M10-30/105	32225101	12x65	63	✓ / ✓	30	105	M10x27	10	0,72
VMZ-A 60 M10-60/135	32235101	12x65	63	✓ / ✓	60	135	M10x47	10	0,87
VMZ-A 60 M10-100/175	32245101	12x65	63	✓ / ✓	100	175	M10x57	10	1,10
VMZ-A 75 M10-20/110	32255101	12x80	78	✓ / ✓	20	110	M10x27	10	0,75
VMZ-A 75 M12-25/120	32323171	12x80	78	✓ / ✓	25	120	M12x37	10	0,85
VMZ-A 75 M12-40/135	32324171	12x80	78	✓ / ✓	40	135	M12x52	10	0,95
VMZ-A 75 M12-60/155	32333101	12x80	78	✓ / ✓	60	155	M12x72	10	1,05
VMZ-A 75 M12-80/175	32336101	12x80	78	✓ / ✓	80	175	M12x87	10	1,20
VMZ-A 70 M12-25/115	32323101	14x75	74	✓ / ✓	25	115	M12x36	10	1,20
VMZ-A 80 M12-10/110	32305101	14x85	84	✓ / ✓	10	110	M12x21	10	1,17
VMZ-A 80 M12-25/125	32325101	14x85	84	✓ / ✓	25	125	M12x36	10	1,28
VMZ-A 80 M12-50/150	32330101	14x85	84	✓ / ✓	50	150	M12x46	10	1,49
VMZ-A 80 M12-100/200	32345101	14x85	84	✓ / ✓	100	200	M12x71	10	1,93
VMZ-A 80 M12-125/225	32355101	14x85	84	✓ / ✓	125	225	M12x71	10	2,17
VMZ-A 80 M12-165/265	32365101	14x85	84	✓ / ✓	165	265	M12x71	10	2,57
VMZ-A 95 M12-25/140	32327101	14x100	99	✓ / ✓	25	140	M12x36	10	1,40
VMZ-A 100 M12-25/145	32375101	14x105	104	✓ / ✓	25	145	M12x36	10	1,46
VMZ-A 100 M12-60/180	32385101	14x105	104	✓ / ✓	60	180	M12x56	10	1,75
VMZ-A 100 M12-100/220	32390101	14x105	104	✓ / ✓	100	220	M12x84	10	2,12
VMZ-A 110 M12-25/155	32377101	14x115	114	✓ / ✓	25	155	M12x36	10	1,55
VMZ-A 125 M12-25/170	32379101	14x130	129	✓ / ✓	25	170	M12x36	10	1,75
VMZ-A 90 M16-30/145	32555101	18 x 98	94	✓ / ✓	30	145	M16x44	10	2,20
VMZ-A 105 M16-30/160	32550101	18x113	109	✓ / ✓	30	160	M16x44	10	2,45
VMZ-A 125 M16-30/180	32515101	18x133	130	✓ / ✓	30	180	M16x44	10	2,78
VMZ-A 125 M16-60/210	32520101	18x133	130	✓ / ✓	60	210	M16x55	10	3,60
VMZ-A 125 M16-100/250	32530101	18x133	130	✓ / ✓	100	250	M16x65	10	4,23
VMZ-A 125 M16-165/315	32540101	18x133	130	✓ / ✓	165	315	M16x90	10	5,25
VMZ-A 145 M16-30/200	32560101	18x153	150	✓ / ✓	30	200	M16x44	10	3,70
VMZ-A 160 M16-30/215	32502101	18x168	165	✓ / ✓	30	215	M16x44	10	3,54
VMZ-A 160 M16-60/245	32504101	18x168	165	✓ / ✓	60	245	M16x55	10	3,98
VMZ-A 160 M16-100/285	32506101	18x168	165	✓ / ✓	100	285	M16x65	10	4,62
VMZ-A 115 M20-30/175	32608101	22x120	120	✓ / ✓	30	175	M20x46	5	2,40
VMZ-A 170 M20-20/225 LG	32603101	24x180	180	✓ / ✓	20	225	M20x41	5	3,40
VMZ-A 170 M20-25/230	32605101	24x180	180	✓ / ✓	25	230	M20x33	5	3,52
VMZ-A 170 M20-50/255	32610101	24x180	180	✓ / ✓	50	255	M20x46	5	3,83
VMZ-A 170 M20-100/305	32620101	24x180	180	✓ / ✓	100	305	M20x71	5	4,46
VMZ-A 190 M20-50/275	32612101	24x200	200	✓ / ✓	50	275	M20x46	5	4,20
VMZ-A 170 M24-50/260	32705101	26x185	182	✓ / ✓	50	260	M24x50	5	4,58
VMZ-A 170 M24-100/310	32715101	26x185	182	✓ / ✓	100	310	M24x75	5	5,46
VMZ-A 200 M24-50/290 LG	32711101	26x215	212	✓ / ✓	50	290	M24x75	5	5,11
VMZ-A 200 M24-50/290	32710101	26x215	212	✓ / ✓	50	290	M24x50	5	5,11
VMZ-A 200 M24-100/340	32720101	26x215	212	✓ / ✓	100	340	M24x75	5	6,01
VMZ-A 225 M24-50/315	32712101	26x240	237	✓ / ✓	50	315	M24x50	5	5,73

Other lengths or threads on demand.

Conical Stud VMZ-A A4

Stainless steel A4 / 316



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

→ Version LG: with thread to concrete surface

→ Drill hole depth from 42mm

Description	Ref. No.	Drill hole Ø x depth mm	Setting depth mm	Seismic C1 / C2	Fixture thickness mm	Anchor length mm	Thread mm	Pkg. cont. pcs.	Weight per pkg. kg
VMZ-A 40 M8-15/65 A4	32115501	10x42	41	- / -	15	65	M8x22	10	0,30
VMZ-A 50 M8-15/80 A4	32120501	10x55	52	- / -	15	80	M8x22	10	0,36
VMZ-A 50 M8-30/95 A4	32135501	10x55	52	- / -	30	95	M8x31	10	0,41
VMZ-A 50 M8-45/110 A4	32145501	10x55	52	- / -	45	110	M8x31	10	0,47
VMZ-A 60 M10-10/85 A4	32205501	12x65	63	✓ / ✓	10	85	M10x18	10	0,61
VMZ-A 60 M10-20/95 A4	32220501	12x65	63	✓ / ✓	20	95	M10x27	10	0,66
VMZ-A 60 M10-30/105 A4	32225501	12x65	63	✓ / ✓	30	105	M10x27	10	0,72
VMZ-A 60 M10-60/135 A4	32235501	12x65	63	✓ / ✓	60	135	M10x47	10	0,87
VMZ-A 60 M10-100/175 A4	32245501	12x65	63	✓ / ✓	100	175	M10x57	10	1,10
VMZ-A 75 M10-20/110 A4	32255501	12x80	78	✓ / ✓	20	110	M10x27	10	0,75
VMZ-A 75 M10-40/130 A4	32265501	12x80	78	✓ / ✓	40	130	M10x47	10	0,86
VMZ-A 75 M12-25/120 A4	32323571	12x80	78	✓ / ✓	25	120	M12x37	10	0,85
VMZ-A 75 M12-40/135 A4	32324571	12x80	78	✓ / ✓	40	135	M12x52	10	0,95
VMZ-A 75 M12-60/155 A4	32333501	12x80	78	✓ / ✓	60	155	M12x72	10	1,05
VMZ-A 75 M12-80/175 A4	32336501	12x80	78	✓ / ✓	80	175	M12x92	10	1,20
VMZ-A 70 M12-25/115 A4	32323501	14x75	74	✓ / ✓	25	115	M12x36	10	1,20
VMZ-A 70 M12-40/130 A4	32324501	14x75	74	✓ / ✓	40	130	M12x36	10	1,33
VMZ-A 80 M12-10/110 A4	32305501	14x85	84	✓ / ✓	10	110	M12x21	10	1,17
VMZ-A 80 M12-25/125 A4	32325501	14x85	84	✓ / ✓	25	125	M12x36	10	1,28
VMZ-A 80 M12-50/150 A4	32330501	14x85	84	✓ / ✓	50	150	M12x46	10	1,49
VMZ-A 80 M12-100/200 A4	32345501	14x85	84	✓ / ✓	100	200	M12x71	10	1,93
VMZ-A 80 M12-125/225 A4	32355501	14x85	84	✓ / ✓	125	225	M12x71	10	2,17
VMZ-A 80 M12-165/265 A4	32365501	14x85	84	✓ / ✓	165	265	M12x71	10	2,57
VMZ-A 95 M12-25/140 A4	32327501	14x100	99	✓ / ✓	25	140	M12x36	10	1,40
VMZ-A 100 M12-25/145 A4	32375501	14x100	104	✓ / ✓	25	145	M12x36	10	1,46
VMZ-A 100 M12-60/180 A4	32385501	14x100	104	✓ / ✓	60	180	M12x56	10	1,75
VMZ-A 100 M12-100/220 A4	32390501	14x100	104	✓ / ✓	100	220	M12x84	10	2,12
VMZ-A 110 M12-25/155 A4	32377501	14x115	114	✓ / ✓	25	155	M12x36	10	1,55
VMZ-A 125 M12-25/170 A4	32379501	14x130	129	✓ / ✓	25	170	M12x36	10	1,75
VMZ-A 90 M16-30/145 A4	32555501	18x98	94	✓ / ✓	30	145	M16x44	10	2,20
VMZ-A 90 M16-45/160 A4	32558501	18x98	94	✓ / ✓	45	160	M16x59	10	2,78
VMZ-A 90 M16-60/175 A4	32559501	18 x 98	94	✓ / ✓	60	175	M16x74	10	3,08
VMZ-A 105 M16-30/160 A4	32550501	18x113	109	✓ / ✓	30	160	M16x44	10	2,45
VMZ-A 125 M16-30/180 A4	32515501	18x133	130	✓ / ✓	30	180	M16x44	10	2,78
VMZ-A 125 M16-60/210 A4	32520501	18x133	130	✓ / ✓	60	210	M16x55	10	3,60
VMZ-A 125 M16-100/250 A4	32530501	18x133	130	✓ / ✓	100	250	M16x65	10	4,23
VMZ-A 125 M16-165/315 A4	32540501	18x133	130	✓ / ✓	165	315	M16x90	10	5,25
VMZ-A 145 M16-30/200 A4	32560501	18x153	150	✓ / ✓	30	200	M16x44	10	3,70
VMZ-A 160 M16-30/215 A4	32502501	18x168	165	✓ / ✓	30	215	M16x44	10	3,54
VMZ-A 160 M16-60/245 A4	32504501	18x168	165	✓ / ✓	60	245	M16x55	10	3,98
VMZ-A 160 M16-100/285 A4	32506501	18x168	165	✓ / ✓	100	285	M16x65	10	4,62
VMZ-A 115 M20-30/175 A4	32608501	22x120	120	✓ / ✓	30	175	M20x46	5	2,40
VMZ-A 170 M20-20/225 LG A4	32603501	24x180	180	✓ / ✓	20	225	M20x41	5	3,40
VMZ-A 170 M20-25/230 A4	32605501	24x180	180	✓ / ✓	25	230	M20x33	5	3,52
VMZ-A 170 M20-50/255 A4	32610501	24x180	180	✓ / ✓	50	255	M20x46	5	3,83
VMZ-A 170 M20-100/305 A4	32620501	24x180	180	✓ / ✓	100	305	M20x71	5	4,46
VMZ-A 190 M20-50/275 A4	32612501	24x200	200	✓ / ✓	50	275	M20x46	5	4,20
VMZ-A 170 M24-50/260 A4	32705501	26x185	182	✓ / ✓	50	260	M24x50	5	4,58
VMZ-A 170 M24-100/310 A4	32715501	26x185	182	✓ / ✓	100	310	M24x75	5	5,46
VMZ-A 200 M24-50/290 LG A4	32711501	26x215	212	✓ / ✓	50	290	M24x75	5	5,11
VMZ-A 200 M24-50/290 A4	32710501	26x215	212	✓ / ✓	50	290	M24x50	5	5,11
VMZ-A 200 M24-100/340 A4	32720501	26x215	212	✓ / ✓	100	340	M24x75	5	6,01
VMZ-A 225 M24-50/315 A4	32712501	26x240	237	✓ / ✓	50	315	M24x50	5	5,73

Other lengths or threads on demand.

**Conical Stud VMZ-A
HCR**

Stainless steel HCR



→ For use in particularly corrosive environments

→ High Corrosion Resistant Steel grade 1.4529

→ Version LG: with thread to concrete surface

Description	Ref. No.	Drill hole Ø x depth mm	Setting depth mm	Seismic C1 / C2	Fixture thickness mm	Anchor length mm	Thread mm	Pkg. cont. pcs.	Weight per pkg. kg
VMZ-A 40 M8-15/65 HCR	32115651	10x42	41	- / -	15	65	M8x22	10	0,30
VMZ-A 50 M8-15/80 HCR	32120651	10x55	52	- / -	15	80	M8x22	10	0,36
VMZ-A 50 M8-30/95 HCR	32135651	10x55	52	- / -	30	95	M8x31	10	0,41
VMZ-A 50 M8-45/110 HCR	32145651	10x55	52	- / -	45	110	M8x31	10	0,47
VMZ-A 60 M10-10/85 HCR	32205651	12x65	63	✓ / ✓	10	85	M10x18	10	0,61
VMZ-A 60 M10-20/95 HCR	32220651	12x65	63	✓ / ✓	20	95	M10x27	10	0,66
VMZ-A 60 M10-30/105 HCR	32225651	12x65	63	✓ / ✓	30	105	M10x27	10	0,72
VMZ-A 60 M10-60/135 HCR	32235651	12x65	63	✓ / ✓	60	135	M10x47	10	0,87
VMZ-A 60 M10-100/175 HCR	32245651	12x65	63	✓ / ✓	100	175	M10x57	10	1,10
VMZ-A 75 M10-20/110 HCR	32255651	12x80	78	✓ / ✓	20	110	M10x27	10	0,75
VMZ-A 75 M12-25/120 HCR	32323671	12x80	78	✓ / ✓	25	120	M12x37	10	0,85
VMZ-A 70 M12-25/115 HCR	32323651	14x75	74	✓ / ✓	25	115	M12x36	10	1,20
VMZ-A 80 M12-10/110 HCR	32305651	14x85	84	✓ / ✓	10	110	M12x21	10	1,17
VMZ-A 80 M12-25/125 HCR	32325651	14x85	84	✓ / ✓	25	125	M12x36	10	1,28
VMZ-A 80 M12-50/150 HCR	32330651	14x85	84	✓ / ✓	50	150	M12x46	10	1,49
VMZ-A 80 M12-100/200 HCR	32345651	14x85	84	✓ / ✓	100	200	M12x71	10	1,93
VMZ-A 80 M12-125/225 HCR	32355651	14x85	84	✓ / ✓	125	225	M12x71	10	2,17
VMZ-A 80 M12-165/265 HCR	32365651	14x85	84	✓ / ✓	165	265	M12x71	10	2,57
VMZ-A 95 M12-25/140 HCR	32327651	14x100	99	✓ / ✓	25	140	M12x36	10	1,40
VMZ-A 100 M12-25/145 HCR	32375651	14x105	104	✓ / ✓	25	145	M12x36	10	1,46
VMZ-A 100 M12-60/180 HCR	32385651	14x105	104	✓ / ✓	60	180	M12x56	10	1,75
VMZ-A 100 M12-100/220 HCR	32390651	14x105	104	✓ / ✓	100	220	M12x84	10	2,12
VMZ-A 110 M12-25/155 HCR	32377651	14x115	114	✓ / ✓	25	155	M12x36	10	1,55
VMZ-A 125 M12-25/170 HCR	32379651	14x130	129	✓ / ✓	25	170	M12x36	10	1,75
VMZ-A 90 M16-30/145 HCR	32555651	18x98	94	✓ / ✓	30	145	M16x44	10	2,20
VMZ-A 105 M16-30/160 HCR	32550651	18x113	109	✓ / ✓	30	160	M16x44	10	2,45
VMZ-A 125 M16-30/180 HCR	32515651	18x133	130	✓ / ✓	30	180	M16x44	10	2,78
VMZ-A 125 M16-60/210 HCR	32520651	18x133	130	✓ / ✓	60	210	M16x55	10	3,60
VMZ-A 125 M16-100/250 HCR	32530651	18x133	130	✓ / ✓	100	250	M16x65	10	4,23
VMZ-A 125 M16-165/315 HCR	32540651	18x133	130	✓ / ✓	165	315	M16x90	10	5,25
VMZ-A 145 M16-30/200 HCR	32560651	18x153	150	✓ / ✓	30	200	M16x44	10	3,70
VMZ-A 160 M16-30/215 HCR	32502651	18x168	165	✓ / ✓	30	215	M16x44	10	3,54
VMZ-A 115 M20-30/175 HCR	32608651	22x120	120	✓ / ✓	30	175	M20x46	5	2,40
VMZ-A 170 M20-20/225 LG HCR	32603651	24x180	180	✓ / ✓	20	225	M20x41	5	3,40
VMZ-A 170 M20-25/230 HCR	32605651	24x180	180	✓ / ✓	25	230	M20x33	5	3,52
VMZ-A 170 M20-50/255 HCR	32610651	24x180	180	✓ / ✓	50	255	M20x46	5	3,83
VMZ-A 170 M20-100/305 HCR	32620651	24x180	180	✓ / ✓	100	305	M20x71	5	4,46
VMZ-A 190 M20-50/275 HCR	32612651	24x200	200	✓ / ✓	50	275	M20x46	5	4,20
VMZ-A 170 M24-50/260 HCR	32705651	26x185	182	✓ / ✓	50	260	M24x50	5	4,58
VMZ-A 200 M24-50/290 LG HCR	32705651	26x215	215	✓ / ✓	50	290	M24x75	5	5,11
VMZ-A 200 M24-50/290 HCR	32710651	26x215	215	✓ / ✓	50	290	M24x50	5	5,11
VMZ-A 200 M24-100/340 HCR	32720651	26x215	215	✓ / ✓	100	340	M24x75	5	6,01
VMZ-A 225 M24-50/315 HCR	32712651	26x240	237	✓ / ✓	50	315	M24x50	5	5,73

Other lengths or threads 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 (γ_M und γ_p) is included. For further details and temperature ranges see ETA. Load capacities under fire exposure see page 200.

Loads and performance data Injection System VMZ, steel zinc plated M8-M12

				40 M8	50 M8	60 M10	75 M10	75 M12	70 M12	80 M12	95 M12	100 M12	110 M12	125 M12
cracked concrete														
Mean ultimate loads, tension	C25/30	N _{um}	[kN]	12,3	19,5	28,0	29,5	34,9	41,0	48,2	51,6	67,2	67,2	67,2
Mean ultimate loads, shear	C25/30	V _{um}	[kN]	14,6	14,6	23,2	23,2	33,7	33,7	33,7	33,7	33,7	33,7	33,7
Approved loads, tension	C20/25	appr. N	[kN]	4,1	5,8	7,6	10,7	10,7	9,6	11,7	15,2	16,4	18,9	22,9
	C25/30	appr. N	[kN]	4,6	6,5	8,5	11,9	11,9	10,7	13,1	17,0	18,3	21,1	25,6
	C30/37	appr. N	[kN]	5,1	7,1	9,3	11,9	13,0	11,8	14,3	18,6	20,1	23,2	27,1
	C40/50	appr. N	[kN]	5,9	8,2	10,8	11,9	15,1	13,6	16,6	21,5	23,2	26,7	27,1
	C50/60	appr. N	[kN]	6,6	8,6	11,9	11,9	16,7	15,2	18,5	24,0	25,9	27,1	27,1
uncracked concrete														
Approved loads, tension	C20/25	appr. N	[kN]	4,3	8,3	10,9	11,9	15,2	13,7	16,8	19,0	23,4	23,8	23,8
	C25/30	appr. N	[kN]	4,8	8,6	11,9	11,9	16,7	15,3	18,7	21,3	26,2	26,6	26,6
	C30/37	appr. N	[kN]	5,2	8,6	11,9	11,9	16,7	16,8	20,5	23,3	27,1	27,1	27,1
	C40/50	appr. N	[kN]	6,1	8,6	11,9	11,9	16,7	19,4	23,7	25,7	27,1	27,1	27,1
	C50/60	appr. N	[kN]	6,8	8,6	11,9	11,9	16,7	21,7	25,7	25,7	27,1	27,1	27,1
cracked / uncracked concrete														
Approved loads, shear	≥ C20/25	appr. V	[kN]	8,0	8,0	12,0	12,0	19,4	19,2/19,4	19,4	19,4	19,4	19,4	19,4
Approved loads, shear Type LG	≥ C20/25	appr. V	[kN]	8,0	8,0	12,0	12,0	19,4	19,4	19,4	19,4	19,4	19,4	19,4
Approved bending moments		appr. M	[Nm]	17,1	17,1	34,3	34,3	60,0	60,0	60,0	60,0	60,0	60,0	60
Spacing and edge distance														
Effective anchorage depth		h _{ef} ≥	[mm]	40	50	60	75	75	70	80	95	100	110	125
Characteristic spacing		s _{cr,N}	[mm]	120	150	180	225	225	210	240	285	300	330	375
Characteristic edge distance		c _{cr,N}	[mm]	60	75	90	112,5	112,5	105	120	142,5	150	165	187,5
cracked concrete														
Minimum thickness of concrete slab		h _{min}	[mm]	80	80	100	110	110	110	110	130	130	140	160
Minimum spacing		s _{min}	[mm]	40	40	40	40	50	55	40	40	50	50	50
Minimum edge distance		c _{min}	[mm]	40	40	40	40	50	55	50	50	50	50	50
uncracked concrete														
Minimum thickness of concrete slab		h _{min}	[mm]	80	80	100	110	110	110	110	130	130	140	160
Minimum spacing		s _{min}	[mm]	40	40	50	50	50	55	55	55	80 ¹⁾	80 ¹⁾	80 ¹⁾
Minimum edge distance		c _{min}	[mm]	40	40	50	50	50	55	55	55	55 ¹⁾	55 ¹⁾	55 ¹⁾
Installation parameters														
Drill hole diameter		d _o	[mm]	10	10	12	12	12	14	14	14	14	14	14
Diameter of clearance hole in the fixture Pre-installation		d _r ≤	[mm]	9	9	12	12	14	14	14	14	14	14	14
Diameter of clearance hole in the fixture Through fastening ²⁾		d _r ≤	[mm]	- ⁴⁾	- ⁴⁾	14	14	16 ⁵⁾	16	16	16	16	16	16
Depth of drill hole		h _o ≥	[mm]	42	55	65	80	80	75	85	100	105	115	130
Installation torque		T _{inst} ≤	[Nm]	10	10	15	15	25	25	25	25	30	30	30
Width across nut		SW	[mm]	13	13	17	17	19	19	19	19	19	19	19
Amount of adhesive; Scale on cartridge VMZ 345			[mm]	2	3	4	4	4	4	5	6	6	6	6
Amount of adhesive per drill hole ³⁾			[ml]	3,4	4,1	6,1	7,0	7,0	6,8	8,6	9,0	9,2	9,4	9,6
Add. amount of adhesive per drill hole for Through fastening per 10mm of fixture thickness			[ml/10mm]	-	-	1,0	1,0	0,7	1,2	1,2	1,2	1,2	1,2	1,2
Drill holes per cartridge ³⁾ VMZ 280			[Quan.]	70	58	39	34	34	35	27	26	26	25	24
Drill holes per cartridge ³⁾ VMZ 345			[Quan.]	88	73	49	43	43	44	34	33	32	32	31
Drill holes per cartridge ³⁾ VMZ 420			[Quan.]	111	92	62	54	54	55	44	42	41	40	39

¹⁾For edge distance c ≥ 80 mm, minimal spacing distance s_{min} = 55 mm

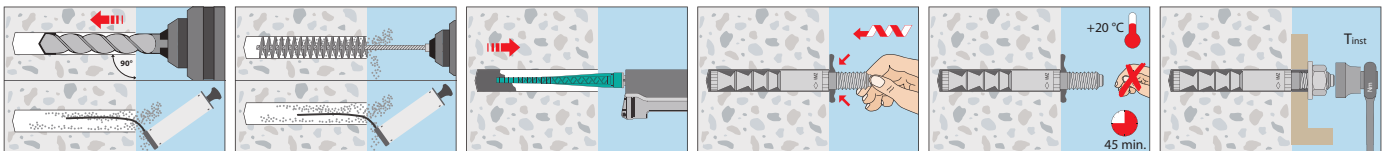
⁴⁾Not for use in through fastening applications.

²⁾The annular gap of the clearance hole must be completely filled with adhesive after fixing.

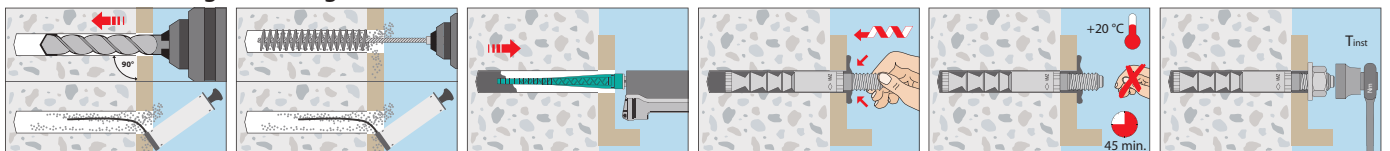
⁵⁾14mm with offset mounting

³⁾Values shown are for pre-installation. For through fastening additional adhesive is required to completely fill the clearance hole in the fixture.

Installation (Pre-installation)



Installation (Through fastening)





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 (γ_M und γ_P) is included. For further details and temperature ranges see ETA. Load capacities under fire exposure see page 200.

Loads and performance data Injection System VMZ, steel zinc plated M16-M24



				90	105	125	145	160	115	170	190	170	200	225
				M16	M16	M16	M16	M16	M20	M20 LG	M20 LG	M24 LG	M24 LG	M24 LG
cracked concrete														
Mean ultimate loads, tension	C25/30	Num	[kN]	49,0	74,8	108,7	108,7	114,7	103,3	149,6	149,6	146,2	200,9	200,9
Mean ultimate loads, shear	C25/30	V _{um}	[kN]	62,8	62,8	62,8	62,8	62,8	68,6	150,7(98,0 ³⁾)	150,7(98,0 ³⁾)	179,5(140,8 ³⁾)	179,5(140,8 ³⁾)	179,5(140,8 ³⁾)
Approved loads, tension	C20/25	appr. N	[kN]	14,0	17,6	22,9	28,6	33,2	20,2	36,3	42,9	36,3	46,4	55,3
	C25/30	appr. N	[kN]	15,7	19,7	25,6	32,0	37,1	22,6	40,6	48,0	40,6	51,9	61,9
	C30/37	appr. N	[kN]	17,1	21,6	28,1	35,1	40,6	24,8	44,5	52,6	44,5	56,8	67,8
	C40/50	appr. N	[kN]	19,8	25,0	32,4	40,5	46,2	28,6	51,4	60,7	51,4	65,6	78,3
	C50/60	appr. N	[kN]	22,1	27,9	36,2	45,3	46,2	32,0	57,4	67,9	57,4	73,3	87,5
uncracked concrete														
Approved loads, tension	C20/25	appr. N	[kN]	20,0	25,2	32,7	35,7	42,9	28,9	51,9	61,3	51,9	66,2	79,0
	C25/30	appr. N	[kN]	22,4	28,2	36,6	39,9	46,2	32,3	58,0	68,6	58,0	74,1	88,4
	C30/37	appr. N	[kN]	24,5	30,9	40,1	43,7	46,2	35,4	63,6	75,1	63,6	81,1	96,8
	C40/50	appr. N	[kN]	28,3	35,6	46,3	50,5	46,2	40,8	73,4	86,7	73,4	93,7	105,7
	C50/60	appr. N	[kN]	31,6	39,8	51,8	52,9	46,2	40,8	82,1	89,5	82,1	104,7	105,7
cracked / uncracked concrete														
Approved loads, shear	≥ C20/25	appr. V	[kN]	28,0/36,0	35,3/36,0	36,0	36,0	36,0	35,7	72,7	85,1	72,7/101,7	92,8/101,7	101,8
Approved loads, shear Type LG	≥ C20/25	appr. V	[kN]	28,0/36,0	35,3/36,0	36,0	36,0	36,0	35,7	56,0	56,0	72,7/80,6	80,6	80,6
Approved bending moments		appr. M	[Nm]	152,0	152,0	152,0	152,0	152,0	200,0	296,6	296,6	512,0	512,0	512,0
Spacing and edge distance														
Effective anchorage depth		h _{ef} ≥	[mm]	90	105	125	145	160	115	170	190	170	200	225
Characteristic spacing		s _{cr,N}	[mm]	270	315	375	435	480	345	510	570	510	600	675
Characteristic edge distance		c _{cr,N}	[mm]	135	157,5	187,5	217,5	240	172,5	255	285	255	300	337,5
cracked concrete														
Minimum thickness of concrete slab		h _{min}	[mm]	130	150	160	190	205	160	220	250	230	270	300
Minimum spacing		s _{min}	[mm]	50	50	60	60	60	80	80	80	80	80	80
Minimum edge distance		c _{min}	[mm]	50	50	60	60	60	80	80	80	80	80	80
uncracked concrete														
Minimum thickness of concrete slab		h _{min}	[mm]	130	150	170	190	205	160	230	250	230	270	300
Minimum spacing		s _{min}	[mm]	50	60	60	60	60	80	80	80	80	105	105
Minimum edge distance		c _{min}	[mm]	50	60	60	60	60	80	80	80	80	105	105
Installation parameters														
Drill hole diameter		d _o	[mm]	18	18	18	18	18	22	24	24	26	26	26
Diameter of clearance hole in the fixture Pre-installation		d _r ≤	[mm]	18	18	18	18	18	22	24 (22 ³⁾)	24 (22 ³⁾)	26	26	26
Diameter of clearance hole in the fixture Through fastening ¹⁾		d _r ≤	[mm]	20	20	20	20	20	24	26	26	28	28	28
Depth of drill hole		h _o ≥	[mm]	98	113	130	153	168	120	180	200	185	215	240
Installation torque		T _{inst} ≤	[Nm]	50	50	50	50	50	80	80	80	100	120	120
Width across nut		SW	[mm]	24	24	24	24	24	30	30	30	36	36	36
Amount of adhesive; Scale on cartridge VMZ 345			[mm]	7	8	9	9	10	12	17	19	20	21	23
Amount of adhesive per drill hole ²⁾			[ml]	11,1	12,6	14,5	15,8	17,4	20,8	30,1	32,2	33,3	36,6	41,3
Add. amount of adhesive per drill hole for Through fastening per 10mm of fixture thickness			[ml/10mm]	1,6	1,6	1,6	1,6	1,6	2,1	2,9	2,9	2,6	2,6	2,6
Drill holes per cartridge ²⁾ VMZ 280			[Quan.]	21	19	16	15	13	11	7	7	7	6	5
Drill holes per cartridge ²⁾ VMZ 345			[Quan.]	27	23	20	19	17	14	10	9	9	8	7
Drill holes per cartridge ²⁾ VMZ 420			[Quan.]	34	30	26	24	21	18	12	11	11	10	9

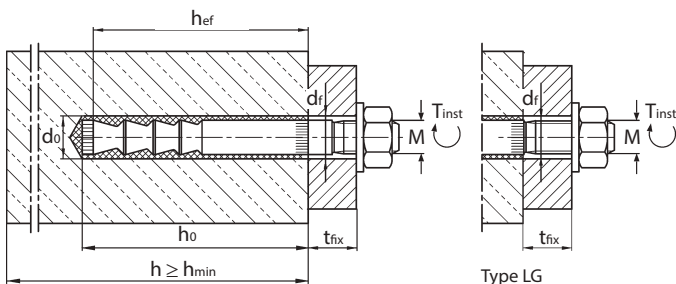
¹⁾The annular gap of the clearance hole must be completely filled with adhesive after fixing.

³⁾Values in brackets are for Type LG

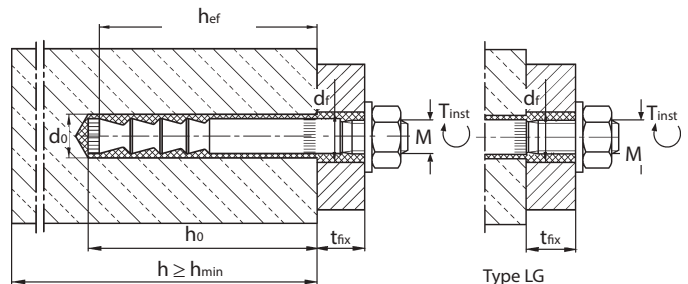
²⁾Values shown are for pre-installation. For through fastening additional adhesive is required to completely fill the clearance hole in the fixture.

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

Pre-installation



Through fastening





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 (γ_M und γ_F) is included. For further details and temperature ranges see ETA. Load capacities under fire exposure see page 200.

Loads and performance data **Injection System VMZ Stainless steel A4 / HCR M8-M12**



			40 M8	50 M8	60 M10	75 M10	75 M12	70 M12	80 M12	95 M12	100 M12	110 M12	125 M12
cracked concrete													
Mean ultimate loads, tension	C25/30	Num [kN]	12,3	19,5	28,0	29,5	34,9	41,0	48,2	51,6	67,2	67,2	67,2
Mean ultimate loads, shear	C25/30	V _{um} [kN]	17,6	17,6	27,8	27,8	40,5	40,5	40,5	40,5	40,5	40,5	40,5
Approved loads, tension	C20/25	appr. N [kN]	4,1	5,8	7,6	10,7	10,7	9,6	11,7	15,2	16,4	18,9	22,9
	C25/30	appr. N [kN]	4,6	6,5	8,5	11,9	11,9	10,7	13,1	17,0	18,3	21,1	25,6
	C30/37	appr. N [kN]	5,1	7,1	9,3	11,9	13,0	11,8	14,3	18,6	20,1	23,2	27,1
	C40/50	appr. N [kN]	5,9	8,2	10,8	11,9	15,1	13,6	16,6	21,5	23,2	26,7	27,1
	C50/60	appr. N [kN]	6,6	8,6	11,9	11,9	16,7	15,2	18,5	24,0	25,9	27,1	27,1
uncracked concrete													
Approved loads, tension	C20/25	appr. N [kN]	4,3	8,3	10,9	11,9	15,2	13,7	16,8	19,0	23,4	23,8	23,8
	C25/30	appr. N [kN]	4,8	8,6	11,9	11,9	16,7	15,3	18,7	21,3	26,2	26,6	26,6
	C30/37	appr. N [kN]	5,2	8,6	11,9	11,9	16,7	16,8	20,5	23,3	27,1	27,1	27,1
	C40/50	appr. N [kN]	6,1	8,6	11,9	11,9	16,7	19,4	23,7	25,7	27,1	27,1	27,1
	C50/60	appr. N [kN]	6,8	8,6	11,9	11,9	16,7	21,7	25,7	25,7	27,1	27,1	27,1
cracked / uncracked concrete													
Approved loads, shear	≥ C20/25	appr. V [kN]	8,3/8,6	8,6	13,1	13,1	19,4	19,2/19,4	19,4	19,4	19,4	19,4	19,4
Approved loads, shear Type LG	≥ C20/25	appr. V [kN]	8,3/8,6	8,6	13,1	13,1	19,4	19,2/19,4	19,4	19,4	19,4	19,4	19,4
Approved bending moments		appr. M [Nm]	17,1	17,1	34,3	34,3	60,0	60,0	60,0	60,0	60,0	60,0	60,0
Spacing and edge distance													
Effective anchorage depth	h _{ef} ≥	[mm]	40	50	60	75	75	70	80	95	100	110	125
Characteristic spacing	s _{cr,N}	[mm]	120	150	180	225	225	210	240	285	300	330	375
Characteristic edge distance	c _{cr,N}	[mm]	60	75	90	112,5	112,5	105	120	142,5	150	165	187,5
cracked concrete													
Minimum thickness of concrete slab	h _{min}	[mm]	80	80	100	110	110	110	110	130	130	140	160
Minimum spacing	s _{min}	[mm]	40	40	40	40	50	55	40	40	50	50	50
Minimum edge distance	c _{min}	[mm]	40	40	40	40	50	55	50	50	50	50	50
uncracked concrete													
Minimum thickness of concrete slab	h _{min}	[mm]	80	80	100	110	110	110	110	130	130	140	160
Minimum spacing	s _{min}	[mm]	40	40	50	50	50	55	55	55	80 ¹⁾	80 ¹⁾	80 ¹⁾
Minimum edge distance	c _{min}	[mm]	40	40	50	50	50	55	55	55	55 ¹⁾	55 ¹⁾	55 ¹⁾
Installation parameters													
Drill hole diameter	d _o	[mm]	10	10	12	12	12	14	14	14	14	14	14
Diameter of clearance hole in the fixture Pre-installation	d _f ≤	[mm]	9	9	12	12	14	14	14	14	14	14	14
Diameter of clearance hole in the fixture Through fastening ²⁾	d _f ≤	[mm]	- ⁴⁾	- ⁴⁾	14	14	16 ⁵⁾	16	16	16	16	16	16
Depth of drill hole	h _o ≥	[mm]	42	55	65	80	80	75	85	100	105	115	130
Installation torque	T _{inst} ≤	[Nm]	10	10	15	15	25	25	25	25	30	30	30
Width across nut	SW	[mm]	13	13	17	17	19	19	19	19	19	19	19
Amount of adhesive; Scale on cartridge VMZ 345		[mm]	2	3	4	4	4	4	5	6	6	6	6
Amount of adhesive per drill hole ³⁾		[ml]	3,4	4,1	6,1	7,0	7,0	6,8	8,6	9,0	9,2	9,4	9,6
Add. amount of adhesive per drill hole for Through fastening per 10mm of fixture thickness		[ml/10mm]	-	-	1,0	1,0	0,7	1,2	1,2	1,2	1,2	1,2	1,2
Drill holes per cartridge ³⁾ VMZ 280		[Quan.]	70	58	39	34	34	35	27	26	26	25	24
Drill holes per cartridge ³⁾ VMZ 345		[Quan.]	88	73	49	43	43	44	34	33	32	32	31
Drill holes per cartridge ³⁾ VMZ 420		[Quan.]	111	92	62	54	54	55	44	42	41	40	39

¹⁾For edge distance c ≥ 80 mm, minimal spacing distance s_{min} = 55 mm

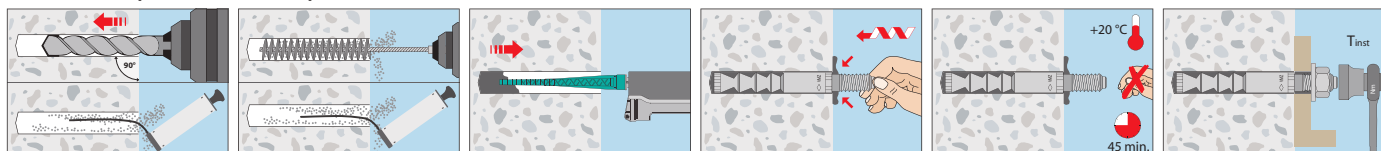
⁴⁾Not for use in through fastening applications.

²⁾The annular gap of the clearance hole must be completely filled with adhesive after fixing.

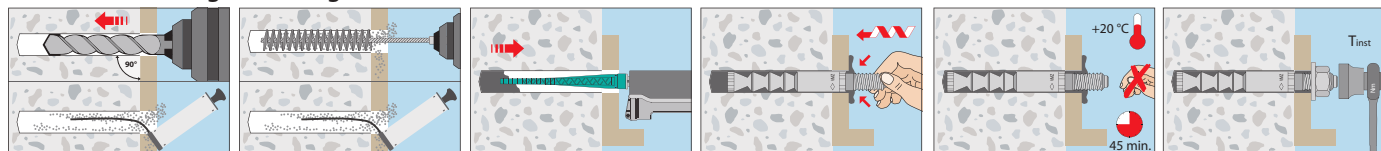
⁵⁾14mm with offset mounting

³⁾Values shown are for pre-installation. For through fastening additional adhesive is required to completely fill the clearance hole in the fixture.

Installation (Pre-installation)



Installation (Through fastening)





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 (γ_{m} und γ_p) is included. For further details and temperature ranges see ETA. Load capacities under fire exposure see page 200.

Loads and performance data Injection System VMZ Stainless steel A4 / HCR M16-M24



			90	105	125	145	160	115	170	190	170	200	225	
			M16	M16	M16	M16	M16	M20	M20	M20	M24	M 24	M24	
			M16	M16	M16	M16	M16	M20	M20 LG	M20 LG	M24 LG	M 24 LG	M24 LG	
cracked concrete														
Mean ultimate loads, tension	C25/30	Num	[kN]	49,0	74,8	108,7	108,7	114,7	103,3	149,6	149,6	146,2	200,9	200,9
Mean ultimate loads, shear	C25/30	V _{um}	[kN]	75,4	75,4	75,4	75,4	75,4	102,9	158,2(102,9 ³⁾)	158,2(102,9 ³⁾)	188,4(147,8 ³⁾)	188,4(147,8 ³⁾)	188,4(147,8 ³⁾)
Approved loads, tension	C20/25	appr. N	[kN]	14,0	17,6	22,9	28,6	33,2	20,2	36,3	42,9	36,3	46,4	55,3
	C25/30	appr. N	[kN]	15,7	19,7	25,6	32,0	37,1	22,6	40,6	48,0	40,6	51,9	61,9
	C30/37	appr. N	[kN]	17,1	21,6	28,1	35,1	40,6	24,8	44,5	52,6	44,5	56,8	67,8
	C40/50	appr. N	[kN]	19,8	25,0	32,4	40,5	46,2	28,6	51,4	60,7	51,4	65,6	78,3
	C50/60	appr. N	[kN]	22,1	27,9	36,2	45,3	46,2	32,0	57,4	67,9	57,4	73,3	87,5
uncracked concrete														
Approved loads, tension	C20/25	appr. N	[kN]	20,0	25,2	32,7	35,7	42,9	28,9	51,9	61,3	51,9	66,2	79,0
	C25/30	appr. N	[kN]	22,4	28,2	36,6	39,9	46,2	32,3	58,0	68,6	58,0	74,1	88,4
	C30/37	appr. N	[kN]	24,5	30,9	40,1	43,7	46,2	35,4	63,6	75,1	63,6	81,1	92,4
	C40/50	appr. N	[kN]	28,3	35,6	46,3	50,5	46,2	40,9	73,4	78,6	73,4	92,4	92,4
	C50/60	appr. N	[kN]	31,6	39,8	51,8	52,9	46,2	45,7	78,6	78,6	82,1	92,4	92,4
cracked / uncracked concrete														
Approved loads, shear	≥ C20/25	appr. V	[kN]	28,0/36,0	35,3/36,0	36,0	36,0	36,0	40,4/43,9	72,7/74,9	74,9	72,7/89,1	89,1	89,1
Approved loads, shear Type LG	≥ C20/25	appr. V	[kN]	28,0/36,0	35,3/36,0	36,0	36,0	36,0	40,4/43,9	49,1	49,1	70,3	70,3	70,3
Approved bending moments		appr. M	[Nm]	152,0	152,0	152,0	152,0	152,0	231,6	259,4	259,4	448,0	448,0	448,0
Spacing and edge distance														
Effective anchorage depth	$h_{ef} \geq$	[mm]		90	105	125	145	160	115	170	190	170	200	225
Characteristic spacing	$s_{cr,N}$	[mm]		270	315	375	435	480	345	510	570	510	600	675
Characteristic edge distance	$c_{cr,N}$	[mm]		135	157,5	187,5	217,5	240	172,5	255	285	255	300	337,5
cracked concrete														
Minimum thickness of concrete slab	h_{min}	[mm]		130	150	170	190	205	160	230	250	230	270	300
Minimum spacing	s_{min}	[mm]		50	50	60	60	60	80	80	80	80	80	80
Minimum edge distance	c_{min}	[mm]		50	50	60	60	60	80	80	80	80	80	80
uncracked concrete														
Minimum thickness of concrete slab	h_{min}	[mm]		130	150	170	190	205	160	230	250	230	270	300
Minimum spacing	s_{min}	[mm]		50	60	60	60	60	80	80	80	80	105	105
Minimum edge distance	c_{min}	[mm]		50	60	60	60	60	80	80	80	80	105	105
Installation parameters														
Drill hole diameter	d_o	[mm]		18	18	18	18	18	22	24	24	26	26	26
Diameter of clearance hole in the fixture Pre-installation	$d_{f \leq}$	[mm]		18	18	18	18	18	22	24 (22 ³⁾)	24 (22 ³⁾)	26	26	26
Diameter of clearance hole in the fixture Through fastening ¹⁾	$d_{f \leq}$	[mm]		20	20	20	20	20	24	26	26	28	28	28
Depth of drill hole	$h_o \geq$	[mm]		98	113	133	153	168	120	180	200	185	215	240
Installation torque	$T_{inst \leq}$	[Nm]		50	50	50	50	50	80	80	80	100	120	120
Width across nut	SW	[mm]		24	24	24	24	24	30	30	30	36	36	36
Amount of adhesive; Scale on cartridge VMZ 345		[mm]		7	8	9	9	10	12	17	19	20	21	23
Amount of adhesive per drill hole ²⁾		[ml]		11,1	12,6	14,5	15,8	17,4	20,8	30,1	32,2	33,3	36,6	41,3
Add. amount of adhesive per drill hole for Through fastening per 10mm of fixture thickness		[ml/10mm]		1,6	1,6	1,6	1,6	1,6	2,1	2,9	2,9	2,6	2,6	2,6
Drill holes per cartridge ²⁾ VMZ 280		[pcs.]		21	19	16	15	13	11	7	7	7	6	5
Drill holes per cartridge ²⁾ VMZ 345		[pcs.]		27	23	20	19	17	14	10	9	9	8	7
Drill holes per cartridge ²⁾ VMZ 420		[pcs.]		34	30	26	24	21	18	12	11	11	10	9

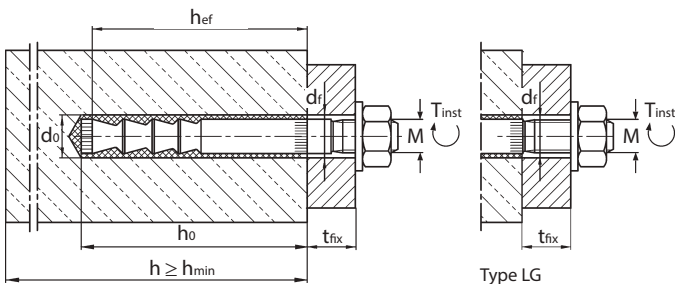
¹⁾The annular gap of the clearance hole must be completely filled with adhesive after fixing.

³⁾Values in brackets are for Type LG

²⁾Values shown are for pre-installation. For through fastening additional adhesive is required to completely fill the clearance hole in the fixture.

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

Pre-installation



Through fastening

