



Epoxy acrylate resin anchor M50-PLUS



X CHEMICALS



SYMPAFIX
serious fixings

M50-PLUS

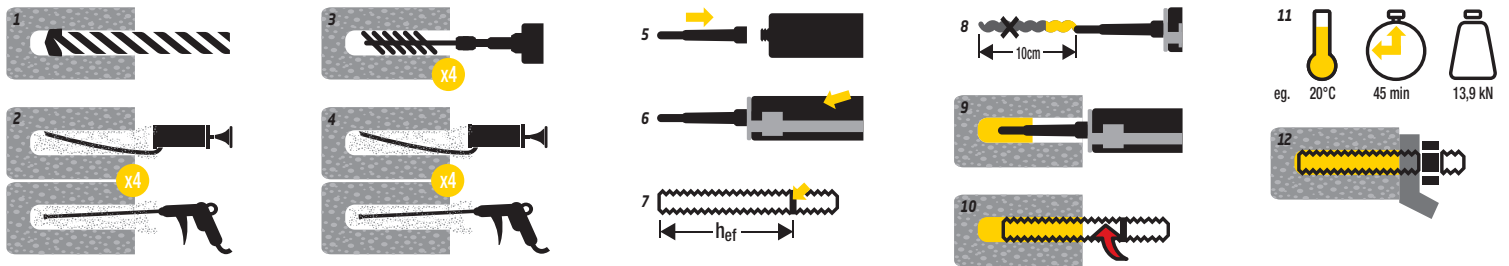
PROPERTIES

- Fast curing **high performance** epoxy acrylate mortar
- **ETA option 7 approval** for M8-M24 threaded rods in non-cracked concrete
- ETA TR-029 approval for M8-M16 threaded rods in **masonry, sandlimestone and brickwork**
- ETA option 7 approval for **overhead use**
- Designed for most common applications: **threaded rods in concrete and masonry**
- Approved for use with **standard commercial threaded rods**
- Approved up from **-5°C**

APPROVALS AND TEST REPORTS



INSTALLATION INSTRUCTIONS



Installation instruction valid for applications according to ETA-12/0205. For applications in masonry, please consult the approval document

ASSORTMENT OVERVIEW

Type	Art. Nr.	QTY	QTY	71158 QTY	ML	Stockbox	
M50-PLUS 300ML	71122	1	20	1	300	71404	20
M50-PLUS 360ML	71124	1	15	1	360		
M50-PLUS 410ML	71126	1	15	1	410	71408	20

Installation parameters for concrete, ETA-12/0205

	M8	M10	M12	M16	M20	M24
Nominal drill hole diameter (mm)	10	12	14	18	24	28
Diameter of cleaning brush Ø (mm)	12	14	16	20	26	30
Approved embedment depth h _{ef} (mm)	60 - 160	60 - 200	70 - 240	80 - 320	90 - 400	96 - 480
Min. member thickness (mm)	h _{ef} + 30mm; > 100mm			h _{ef} + 2x d _o		
Min. edge distance / spacing (mm)	40	50	60	80	100	120
Installation torque (Nm)	10	20	40	80	120	160

Load values in non-cracked C20/25 concrete, ETA-12/0205, 24°C/40°C

	M8	M10	M12	M16	M20	M24
Minimum approved embedment depth h _{ef} min (mm)	60	60	70	80	90	96
Maximum approved embedment depth h _{ef} max (mm)	160	200	240	320	400	480
Recommended load for minimum embedment depth, 4.8 steel rod, tension N _{rec} (kN)	5,1	6,0	7,1	11,5	16,3	18,5
Recommended load for maximum embedment depth, 4.8 steel rod, tension N _{rec} (kN)	7,1	11,0	16,2	30,0	46,7	67,1
Recommended load for minimum embedment depth, 4.8 steel rod, shear V _{rec} (kN)	4,6	6,9	9,7	13,4	16,5	18,7
Recommended load for maximum embedment depth, 4.8 steel rod, shear V _{rec} (kN)	4,6	6,9	9,7	18,3	28,0	40,6

Installation parameters for solid masonry, ETA-13/0326

	M8	M10	M12	M16
Nominal drill hole diameter (mm)	10	12	14	18
Diameter of cleaning brush Ø (mm)	11	14	16	18
Embedment depth h _{ef} (mm)	80	90	100	100
Installation torque (Nm)	2	2	2	2
Minimum length threaded rod (mm)	100	110	110	110
Maximum length threaded rod (mm)	500	500	500	500

Installation parameters with sleeve, hollow (M8-M16) or solid (M8-M10) masonry, ETA-13/0326

	M8	M10	M12	M16
Nominal drill hole diameter (mm)	12	16	20	20
Drill hole depth (mm)	Length sleeve + 5mm			
Embedment depth h _{ef} (mm)	Length sleeve			
Sleeve size (mm)	12x80	16x85	20x85	20x85
		16x130		
		16x330		
Diameter of cleaning brush Ø (mm)	14	18	22	22
Installation torque (Nm)	2	2	2	2
Minimum length threaded rod (mm)	100	110	110	110
Maximum length threaded rod (mm)	500	500	500	500

Load values in kN, masonry, for approved embedment depth, without use of mesh sleeve, tension load, ETA-13/0326

	M8	M10	M12	M16
Clay masonry MZ DF acc. to EN771-1, compressive strength ≥ 28N/mm², density ≥ 1,8kg/dm³	0,9	0,9	0,7	1,3
Calcium silicate masonry acc. to EN771-1, compressive strength ≥ 20N/mm², density ≥ 2,0kg/dm³	1,7	1,7	2,0	1,7
Clay masonry 16DF acc. to EN771-1, compressive strength ≥ 12N/mm², density ≥ 0,9kg/dm³	n.a.: use of mesh sleeve mandatory			
Calcium silicate masonry KSL 12 -1,4- 3DF acc. to EN 771-1, compressive strength ≥ 12N/mm², density ≥ 1,4kg/dm³	n.a.: use of mesh sleeve mandatory			
Hollow brick Bloc creux B40 acc. to EN 771-3, compressive strength ≥ 4N/mm², density ≥ 1,0kg/dm³	n.a.: use of mesh sleeve mandatory			

Load values in kN, masonry, for approved embedment depth, with use of mesh sleeve, tension load, ETA-13/0326

	M8	M10, hef: 85mm	M10, hef: 130mm	M12	M16
Clay masonry MZ DF acc. to EN771-1, compressive strength ≥ 28N/mm², density ≥ 1,8kg/dm³	1,0	1,0	1,4	n.a.	n.a.
Calcium silicate masonry acc. to EN771-1, compressive strength ≥ 20N/mm², density ≥ 2,0kg/dm³	1,4	1,4	1,4	n.a.	n.a.
Clay masonry 16DF acc. to EN771-1, compressive strength ≥ 12N/mm², density ≥ 0,9kg/dm³	0,4	0,6	0,9	1,0	1,0
Calcium silicate masonry KSL 12 -1,4- 3DF acc. to EN 771-1, compressive strength ≥ 12N/mm², density ≥ 1,4kg/dm³	1,0	0,9	1,3	0,9	0,9
Hollow brick Bloc creux B40 acc. to EN 771-3, compressive strength ≥ 4N/mm², density ≥ 1,0kg/dm³	0,1	0,1	0,6	0,3	0,2

Load values in kN, masonry, for approved embedment depth, without use of mesh sleeve, shear load, ETA-13/0326

	M8	M10	M12	M16
Clay masonry MZ DF acc. to EN771-1, compressive strength $\geq 28\text{N/mm}^2$, density $\geq 1,8\text{kg/dm}^3$	0,9	0,9	0,7	1,3
Calcium silicate masonry acc. to EN771-1, compressive strength $\geq 20\text{N/mm}^2$, density $\geq 2,0\text{kg/dm}^3$	1,1	1,0	1,4	1,4
Clay masonry 16DF acc. to EN771-1, compressive strength $\geq 12\text{N/mm}^2$, density $\geq 0,9\text{kg/dm}^3$	n.a.: use of mesh sleeve mandatory			
Calcium silicate masonry KSL 12 -1,4- 3DF acc. to EN 771-1, compressive strength $\geq 12\text{N/mm}^2$, density $\geq 1,4\text{kg/dm}^3$	n.a.: use of mesh sleeve mandatory			
Hollow brick Bloc creux B40 acc. to EN 771-3, compressive strength $\geq 4\text{N/mm}^2$, density $\geq 1,0\text{kg/dm}^3$	n.a.: use of mesh sleeve mandatory			

Load values in kN, masonry, for approved embedment depth, with use of mesh sleeve, shear load, ETA-13/0326

	M8	M10, hef: 85mm	M10, hef: 130mm	M12	M16
Clay masonry MZ DF acc. to EN771-1, compressive strength $\geq 28\text{N/mm}^2$, density $\geq 1,8\text{kg/dm}^3$	1,0	1,0	1,1	n.a.	n.a.
Calcium silicate masonry acc. to EN771-1, compressive strength $\geq 20\text{N/mm}^2$, density $\geq 2,0\text{kg/dm}^3$	1,4	1,1	1,4	n.a.	n.a.
Clay masonry 16DF acc. to EN771-1, compressive strength $\geq 12\text{N/mm}^2$, density $\geq 0,9\text{kg/dm}^3$	0,4	0,6	0,7	0,7	0,7
Calcium silicate masonry KSL 12 -1,4- 3DF acc. to EN 771-1, compressive strength $\geq 12\text{N/mm}^2$, density $\geq 1,4\text{kg/dm}^3$	0,7	0,7	0,7	0,7	0,7
Hollow brick Bloc creux B40 acc. to EN 771-3, compressive strength $\geq 4\text{N/mm}^2$, density $\geq 1,0\text{kg/dm}^3$	0,1	0,1	0,6	0,3	0,2

Minimum axial (Smin)- and edge distances (Cmin) in mm, masonry, without mesh sleeve, ETA-13/0326

	M8		M10		M12		M16	
	Cmin	Smin	Cmin	Smin	Cmin	Smin	Cmin	Smin
Clay masonry MZ DF acc. to EN771-1, compressive strength $\geq 28\text{N/mm}^2$, density $\geq 1,8\text{kg/dm}^3$	120	240	135	270	150	300	150	300
Calcium silicate masonry acc. to EN771-1, compressive strength $\geq 20\text{N/mm}^2$, density $\geq 2,0\text{kg/dm}^3$	120	240	135	270	150	300	150	300

Minimum axial (Smin)- and edge distances (Cmin) in mm, masonry, with mesh sleeve, ETA-13/0326

	M8		M10		M12		M16	
Type mesh sleeve	SH12x80	SH12x85	SH16x130	SH20x85	SH20x85			
	Cmin	Smin	Cmin	Smin	Cmin	Smin	Cmin	Smin
Clay masonry MZ DF acc. to EN771-1, compressive strength $\geq 28\text{N/mm}^2$, density $\geq 1,8\text{kg/dm}^3$	120	240	128	255	195	390	n.a.	n.a.
Calcium silicate masonry acc. to EN771-1, compressive strength $\geq 20\text{N/mm}^2$, density $\geq 2,0\text{kg/dm}^3$	120	240	128	255	195	390	n.a.	n.a.
Clay masonry 16DF acc. to EN771-1, compressive strength $\geq 12\text{N/mm}^2$, density $\geq 0,9\text{kg/dm}^3$	100	497	100	497	100	497	120	497
Calcium silicate masonry KSL 12 -1,4- 3DF acc. to EN 771-1, compressive strength $\geq 12\text{N/mm}^2$, density $\geq 1,4\text{kg/dm}^3$	100	240	100	240	100	240	120	240
Hollow brick Bloc creux B40 acc. to EN 771-3, compressive strength $\geq 4\text{N/mm}^2$, density $\geq 1,0\text{kg/dm}^3$	100	500	100	500	100	500	120	500

Volume table; required #ml per 100 holes, with 10% waste

Anchor Ø	DrillØ d ₁ (mm): threaded rod	DrillØ d ₂ (mm): rebar	h _{ef} (mm)	#ml at d ₁	#ml at d ₂
M8 / Ø8	10	12	32	162	308
M8 / Ø8	10	12	48	243	462
M8 / Ø8	10	12	64	324	616
M8 / Ø8	10	12	80	405	770
M8 / Ø8	10	12	96	486	924
M8 / Ø8	10	12	112	567	1.078
M8 / Ø8	10	12	128	648	1.231
M8 / Ø8	10	12	144	729	1.385
M8 / Ø8	10	12	160	809	1.539
M10 / Ø10	12	14	40	265	481
M10 / Ø10	12	14	60	398	722
M10 / Ø10	12	14	80	531	962
M10 / Ø10	12	14	100	664	1.203
M10 / Ø10	12	14	120	796	1.443
M10 / Ø10	12	14	140	929	1.684
M10 / Ø10	12	14	160	1.062	1.924
M10 / Ø10	12	14	180	1.194	2.165
M10 / Ø10	12	14	200	1.327	2.405
M12 / Ø12	14	16	48	402	701
M12 / Ø12	14	16	72	603	1.051
M12 / Ø12	14	16	96	804	1.401
M12 / Ø12	14	16	120	1.005	1.752
M12 / Ø12	14	16	144	1.206	2.102
M12 / Ø12	14	16	168	1.407	2.452
M12 / Ø12	14	16	192	1.608	2.803
M12 / Ø12	14	16	216	1.809	3.153
M12 / Ø12	14	16	240	2.010	3.503
M16 / Ø16	18	20	64	791	1.295
M16 / Ø16	18	20	96	1.186	1.943
M16 / Ø16	18	20	128	1.582	2.590
M16 / Ø16	18	20	160	1.977	3.238
M16 / Ø16	18	20	192	2.373	3.885
M16 / Ø16	18	20	224	2.768	4.533
M16 / Ø16	18	20	256	3.164	5.181
M16 / Ø16	18	20	288	3.559	5.828
M16 / Ø16	18	20	320	3.954	6.476

Anchor Ø	DrillØ d ₁ (mm): threaded rod	DrillØ d ₂ (mm): rebar	h _{ef} (mm)	#ml at d ₁	#ml at d ₂
M20 / Ø20	24	24	80	2.123	2.123
M20 / Ø20	24	24	120	3.185	3.185
M20 / Ø20	24	24	160	4.246	4.246
M20 / Ø20	24	24	200	5.308	5.308
M20 / Ø20	24	24	240	6.370	6.370
M20 / Ø20	24	24	280	7.431	7.431
M20 / Ø20	24	24	320	8.493	8.493
M20 / Ø20	24	24	360	9.554	9.554
M20 / Ø20	24	24	400	10.616	10.616
M24 / Ø25	28	32	96-100	3.217	5.215
M24 / Ø25	28	32	144-150	4.825	7.823
M24 / Ø25	28	32	192-200	6.433	10.430
M24 / Ø25	28	32	240-250	8.042	13.038
M24 / Ø25	28	32	288-300	9.650	15.645
M24 / Ø25	28	32	336-350	11.258	18.253
M24 / Ø25	28	32	384-400	12.867	20.861
M24 / Ø25	28	32	432-450	14.475	23.468
M27 / Ø28	32	35	108-112	4.935	6.693
M27 / Ø28	32	35	162-168	7.403	10.040
M27 / Ø28	32	35	216-224	9.871	13.387
M27 / Ø28	32	35	270-280	12.339	16.733
M27 / Ø28	32	35	324-336	14.806	20.080
M27 / Ø28	32	35	378-392	17.274	23.427
M27 / Ø28	32	35	432-448	19.742	26.773
M27 / Ø28	32	35	486-504	22.210	30.120
M27 / Ø28	32	35	540-560	24.677	33.467
M30 / Ø32	35	40	120-128	6.283	9.714
M30 / Ø32	35	40	180-192	9.424	14.571
M30 / Ø32	35	40	240-256	12.565	19.427
M30 / Ø32	35	40	300-320	15.706	24.284
M30 / Ø32	35	40	360-384	18.848	29.141
M30 / Ø32	35	40	420-448	21.989	33.998
M30 / Ø32	35	40	480-512	25.130	38.855
M30 / Ø32	35	40	540-576	28.272	43.712
M30 / Ø32	35	40	600-640	31.413	48.569

Gel- and curing times

Base material temperature	Gel time (min)	Curing time (min)
-5°C to -1°C	90	360
0°C to +4°C	45	180
+5°C to +9°C	25	120
+10°C to +14°C	20	100
+15°C to +19°C	15	80
+20°C to +29°C	6	45
+30°C to +34°C	4	25
+35°C to +39°C	2	20

Cartridge temperature +5°C to +40°C

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