MIT600RE Pure Epoxy for highest loads in concrete

Injection anchors for use in concrete

The anchor is placed into a drilled hole filled with injection epoxy. The steel element is anchored via the bond between metal part, injection mortar and concrete. The steel consist of a threaded rod or reinforcing bar.

1 SPECIFICATIONS OF INTENDED USE

Anchorages subject to:
-Static and quasi-static loads: M8 to M39, Rebar ø8 to ø40
-Seismic action for Performance Category C1 + C2

Base materials:
-Reinforced or unreinforced cracked or non-cracked normal weight concrete strength classes C20/25 to C50/60 according to EN 206-1:2000 (see ETA-09/0340 of 13 December 2016)
-Dry or wet concrete and flooded bore holes (see ETA-09/0340 of 13 December 2016)

Approvals:
-European Assessment Document (ETAG 001 Part 5)
-European Assessment Document, for post-installed rebar connections (EAD 330087-00-0601)
-European Assessment Document, for diamond drilled holes in non-cracked concrete (ETAG 001 Part 5)
-Seismic action for Performance Category C1 and C2 is part of assessment document

Reaction to fire:
-Anchorages with threaded rod or Rebar satisfy requirements for Class A1

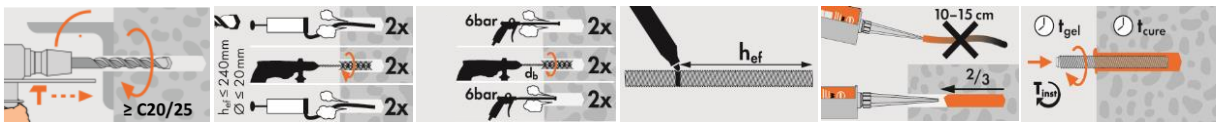
Resistance to fire:
-Assessment of resistance under fire exposure F30-F240 for rebar
-Assessment of resistance under fire exposure F30-F120 for threaded rod

Installation:
-Dry or wet concrete and flooded holes (not sea water)
-Hole drilling by hammer, compressed air drill mode or diamond drilled holes in non-cracked concrete
-Anchor Installation carried out by appropriately qualified personnel and under the supervision of the person responsible for technical matters of the site

2 CURING TIME AND INSTALLATION INSTRUCTIONS

MAXIMUM WORKING TIME AND MINIMUM CURING TIME IN DRY CONCRETE					
Concrete temperature	**5 ÷ 9°C**	**10 ÷ 19°C**	**20 ÷ 29°C**	**30 ÷ 39°C**	**> + 40°C**
max. working time t_{gel}	120 min	90 min	30 min	20 min	12 min
min. curing time in dry concrete t_{cure}	50 h	30 h	10 h	6 h	4 h
min. curing time in wet concrete t_{cure}	100 h	60 h	20 h	12 h	8 h
Cartridge temperature	**5 ÷ 40°C**				

Graphic installation guide for MIT600RE Injection system



1. 2.1. 2.2. 3. 4. 5.

1. Drilling the hole with hammer drill or compressed air drill.
2.1. **Uncracked concrete:** Cleaning the hole with manual cleaning (diameter of metal anchor ≤ 20 mm and embedment depth ≤ 240 mm).
2.2. **Cracked or uncracked concrete:** Compressed air cleaning (≥ 6 bar) can be used for all sizes.
3. Prior to inserting the anchor rod into the filled bore hole, the position of the embedment depth shall be marked on the anchor.
4. Inject mixture into the hole only when an even color is flowing. Start filling from the bottom of the hole to avoid air pockets.
5. Push the threaded rod or reinforcing bar into the drilled hole while turning slightly to ensure positive distribution of the adhesive until the embedment depth is reached. Allow the adhesive to cure to the specified time prior to applying any load or torque (do not move or load the anchor until it is fully cured). After full curing, plate can be installed with the torque wrench on predetermined value.

Mungo
Befestigungstechnik AG
Bornfeldstrasse 2
CH-4600 Olten · Switzerland
Phone +41 62 206 75 75
Fax +41 62 206 75 85
mungo@mungo.swiss

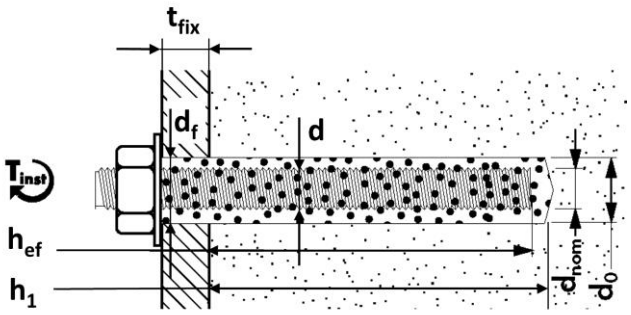
3 INSTALLATION DATA IN CONCRETE

Installation parameters for Mungo Injection system MIT600RE for concrete are based on ETA-09/0340 of 13 December 2016

Installation parameters for threaded rod

THREADED ROD SIZE			M8	M10	M12	M16	M20	M24	M27	M30	M33[2)]	M36[2)]	M39[2)]
Thread diameter	d	[mm]	8	10	12	16	20	24	27	30	33	36	39
Diameter of clearence hole in the fixture	d_f	[mm]	9	12	14	18	22	26	30	33	36	39	42
MIT600RE INSTALLATION DATA													
Drill hole diameter in substrate	d_0	[mm]	10	12	14	18	24	28	32	35	38	42	46
Depth of drilled hole	h_1	[mm]	h_{ef} + 5 mm										
Effective anchorage depth	$h_{ef,min}$	[mm]	60	60	70	80	90	96	108	120	125	125	150
	$h_{ef,max}$	[mm]	96	120	144	192	240	288	324	360	400	440	480
Installation torque	T_{inst} ≤	[Nm]	10	20	40	80	120	160	180	200	230	260	290
Minimum thickness of concrete memeber	h_{min}	[mm]	h_{ef} + 30 mm (≥100 mm)			h_{ef} + 2d_0							
Minimum spacing	s_{min}	[mm]	40	50	60	80	100	120	135	150	165	180	195
Minimum edge distance	c_{min}	[mm]	40	50	60	80	100	120	135	150	165	180	195

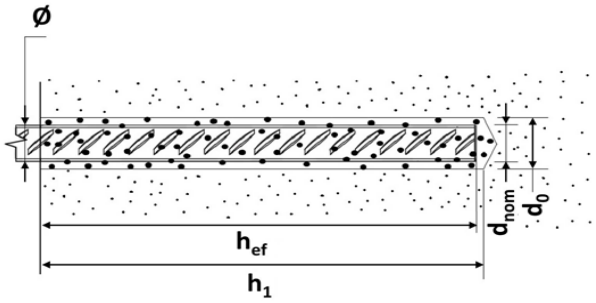
[2)] Threaded rod is not part of the European Technical Assessment



Installation parameters for reinforcing bar

REINFORCING BAR SIZE			Ø8	Ø10	Ø12	Ø14	Ø16	Ø20	Ø25	Ø28	Ø32	Ø36[2)]	Ø40[2)]
Rebar diameter	Ø	[mm]	8	10	12	14	16	20	25	28	32	36	40
MIT600RE INSTALLATION DATA													
Drill hole diameter in substrate	d_0	[mm]	12	14	16	18	20	24	32	35	40	46	50
Depth of drilled hole	h_1	[mm]	h_{ef} + 5 mm										
Effective anchorage depth	$h_{ef,min}$	[mm]	60	60	70	75	80	90	100	112	128	150	150
	$h_{ef,max}$	[mm]	96	120	144	168	192	240	300	336	384	432	480
Minimum thickness of concrete memeber	h_{min}	[mm]	h_{ef} + 30 mm (≥100 mm)		h_{ef} + 2d_0								
Minimum spacing	s_{min}	[mm]	40	50	60	70	80	100	125	140	160	180	200
Minimum edge distance	c_{min}	[mm]	40	50	60	70	80	100	125	140	160	180	200

[2)] Reinforcing bar is not part of the European Technical Assessment



Mungo
Befestigungstechnik AG
Bornfeldstrasse 2
CH-4600 Olten · Switzerland
Phone +41 62 206 75 75
Fax +41 62 206 75 85
mungo@mungo.swiss

4 RECOMMENDED TENSION RESITANCE

Basic performance data for MIT600RE system in cracked and non-cracked concrete C20/25 without influence of edge distance, spacing and splitting failure due to dimensions of concrete member

REQUIRED PROOFS FOR RECOMMENDED TENSION RESISTANCE:

For design tension resistance with chemical system MIT600RE the minimum value for combined pull-out, concrete cone failure and steel failure needs to be considered:

For use in non-cracked concrete; $N_{rec,ucr} = \min(N_{rec,c,ucr}; N_{rec,s})$

For use in cracked concrete; $N_{rec,cr} = \min(N_{rec,c,cr}; N_{rec,s})$

4.1 Recommended tension resistance ($N_{rec,c}$) for combined pull-out and concrete cone failure Cracked and non-cracked concrete with threaded rod:

Metrical Thread Size				[mm]	M8[1]	M10[1]	M12	M16	M20	M24	M27	M30	M33[2]	M36[2]	M39[2]
Setting Depth h_{ef} [mm]	60	Non-Cracked	$N_{rec,c,ucr}$	[kN]	8.98	9.31*									
		Cracked	$N_{rec,c,cr}$		4.19	5.24									
	70	Non-Cracked	$N_{rec,c,ucr}$	[kN]	10.48	11.74*	11.74*								
		Cracked	$N_{rec,c,cr}$		4.89	6.11	7.86								
	80	Non-Cracked	$N_{rec,c,ucr}$	[kN]	11.97	14.34*	14.34*	14.34*							
		Cracked	$N_{rec,c,cr}$		5.59	6.98	8.98	10.22*							
	90	Non-Cracked	$N_{rec,c,ucr}$	[kN]	13.47	16.84	17.11*	17.11*	14.67*						
		Cracked	$N_{rec,c,cr}$		6.29	7.86	10.10	11.67	10.45*						
	100	Non-Cracked	$N_{rec,c,ucr}$	[kN]		18.71	20.04*	20.04*	17.18*	17.18*					
		Cracked	$N_{rec,c,cr}$			8.73	11.22	12.97	12.24*	12.24*					
	120	Non-Cracked	$N_{rec,c,ucr}$	[kN]		22.45	26.34*	26.34*	22.58*	22.58*	22.58*	22.58*	22.58*	22.58*	
		Cracked	$N_{rec,c,cr}$			10.48	13.47	15.56	15.39	16.10*	16.10*	16.10*	16.10*	16.10*	
	140	Non-Cracked	$N_{rec,c,ucr}$	[kN]			31.43	33.20	28.45*	28.45*	28.45*	28.45*	28.45*	28.45*	28.45*
		Cracked	$N_{rec,c,cr}$				15.71	18.16	17.96	19.76	20.28*	20.28*	20.28*	20.28*	20.28*
	160	Non-Cracked	$N_{rec,c,ucr}$	[kN]				40.56*	34.76*	34.76*	34.76*	34.76*	34.76*	34.76*	34.76*
		Cracked	$N_{rec,c,cr}$					20.75	20.52	22.58	24.78*	24.78*	24.78*	24.78*	24.78*
	190	Non-Cracked	$N_{rec,c,ucr}$	[kN]				52.48	44.99*	44.99*	44.99*	44.99*	44.99*	44.99*	44.99*
		Cracked	$N_{rec,c,cr}$					24.64	24.37	26.81	30.16	32.07*	32.07*	32.07*	32.07*
	220	Non-Cracked	$N_{rec,c,ucr}$	[kN]					56.05*	56.05*	56.05*	56.05*	56.05*	56.05*	56.05*
		Cracked	$N_{rec,c,cr}$						28.22	31.04	34.92	38.80	39.96*	39.96*	39.96*
	240	Non-Cracked	$N_{rec,c,ucr}$	[kN]					63.86*	63.86*	63.86*	63.86*	63.86*	63.86*	63.86*
		Cracked	$N_{rec,c,cr}$						30.79	33.87	38.10	42.33	45.53*	45.53*	45.53*
	280	Non-Cracked	$N_{rec,c,ucr}$	[kN]						80.48*	80.48*	80.48*	80.48*	80.48*	80.48*
		Cracked	$N_{rec,c,cr}$							39.51	44.45	49.39	54.33	57.37*	57.37*
	320	Non-Cracked	$N_{rec,c,ucr}$	[kN]							98.33*	98.33*	98.33*	98.33*	98.33*
		Cracked	$N_{rec,c,cr}$								50.80	56.44	62.09	67.73	70.09*
	360	Non-Cracked	$N_{rec,c,ucr}$	[kN]								117.33*	117.33*	117.33*	117.33*
		Cracked	$N_{rec,c,cr}$									63.50	69.85	76.20	82.55

*Concrete cone failure

[1] Resistance in cracked concrete not part of the European Technical Assessment

[2] Threaded rod is not part of the European Technical Assessment

Recommended tension resistance for steel failure ($N_{rec,s}$):

Metrical Thread Size			[mm]	M8[1]	M10[1]	M12	M16	M20	M24	M27	M30	M33[2]	M36[2]	M39[2]
Steel property class	Zinc Plated 4.6	$N_{rec,s}$	[kN]	5.23	8.27	12.04	22.42	34.97	50.40	65.51	80.13	98.92	116.78	139.34
	Zinc Plated 5.8	$N_{rec,s}$	[kN]	8.72	13.79	20.06	37.37	58.29	84.00	109.19	133.54	164.87	194.63	232.24
	Zinc Plated 8.8	$N_{rec,s}$	[kN]	13.95	22.07	32.10	59.79	93.27	134.40	174.70	213.67	263.79	311.41	371.59
	Stainless steel A4-70	$N_{rec,s}$	[kN]	9.79	15.49	22.53	41.97	65.46	94.33	87.58	107.12	132.25	156.12	186.29
	Stainless steel HCR, class 70	$N_{rec,s}$	[kN]	9.79	15.49	22.53	41.97	65.46	94.33	87.58	107.12	132.25	156.12	186.29

[1] Resistance in cracked concrete not part of the European Technical Assessment

[2] Resistance not part of the European Technical Assessment

Mungo
Befestigungstechnik AG
Bornfeldstrasse 2
CH-4600 Olten · Switzerland
Phone +41 62 206 75 75
Fax +41 62 206 75 85
mungo@mungo.swiss
www.mungo.swiss

4.2 Recommended tension resistance ($N_{rec,c}$) for combined pull-out and concrete cone failure

Cracked and non-cracked concrete with reinforcement rebar:

Rebar Size				[mm]	Ø8[1]	Ø10[1]	Ø12	Ø14	Ø16	Ø20	Ø25	Ø28	Ø32	Ø36[2]	Ø40[2]
Setting Depth h_{ef} [mm]	60	Non-Cracked	Nrec,c,ucr	[kN]	8.38	9.31*									
		Cracked	Nrec,c,cr		4.19	5.24									
	70	Non-Cracked	Nrec,c,ucr	[kN]	9.78	11.74*	11.74*								
		Cracked	Nrec,c,cr		4.89	6.11	7.86								
	80	Non-Cracked	Nrec,c,ucr	[kN]	11.17	13.97	14.34*	14.34*	14.34*						
		Cracked	Nrec,c,cr		5.59	6.98	8.98	9.78	10.22*						
	90	Non-Cracked	Nrec,c,ucr	[kN]	12.57	15.71	17.11*	17.11*	17.11*	14.67*					
		Cracked	Nrec,c,cr		6.29	7.86	10.10	11.00	11.67	10.45*					
	100	Non-Cracked	Nrec,c,ucr	[kN]		17.46	19.46	20.04*	20.04*	17.18*	17.18*				
		Cracked	Nrec,c,cr			8.73	11.22	12.22	12.97	12.24*	12.24*				
	120	Non-Cracked	Nrec,c,ucr	[kN]		20.95	23.35	26.34*	26.34*	22.58*	22.58*	22.58*	22.58*		
		Cracked	Nrec,c,cr			10.48	13.47	14.67	15.56	15.39	16.10*	16.10*	16.10*		
	140	Non-Cracked	Nrec,c,ucr	[kN]			27.24	31.78	33.20*	28.45*	28.45*	28.45*	28.45*	28.45*	28.45*
		Cracked	Nrec,c,cr				15.71	17.11	18.16	17.96	20.28*	20.28*	20.28*	20.28*	20.28*
	160	Non-Cracked	Nrec,c,ucr	[kN]				36.32	38.31	34.76*	34.76*	34.76*	34.76*	34.76*	34.76*
		Cracked	Nrec,c,cr					19.56	20.75	20.52	23.52	24.78*	24.78*	24.78*	24.78*
	190	Non-Cracked	Nrec,c,ucr	[kN]					45.50	44.99*	44.99*	44.99*	44.99*	44.99*	44.99*
		Cracked	Nrec,c,cr						24.64	24.37	27.93	31.28	32.07*	32.07*	32.07*
	220	Non-Cracked	Nrec,c,ucr	[kN]						56.05*	56.05*	56.05*	56.05*	56.05*	56.05*
		Cracked	Nrec,c,cr							28.22	32.34	36.22	39.96*	39.96*	39.96*
	240	Non-Cracked	Nrec,c,ucr	[kN]						61.57	63.86*	63.86*	63.86*	63.86*	63.86*
		Cracked	Nrec,c,cr							30.79	35.25	39.51	45.15	45.53*	45.53*
	300	Non-Cracked	Nrec,c,ucr	[kN]							88.19	89.25*	89.25*	89.25*	89.25*
		Cracked	Nrec,c,cr								44.10	49.39	56.44	63.50	63.63*
	330	Non-Cracked	Nrec,c,ucr	[kN]								102.97*	102.97*	102.97*	102.97*
		Cracked	Nrec,c,cr									54.33	62.09	69.85	73.41*
	380	Non-Cracked	Nrec,c,ucr	[kN]									127.24*	127.24*	127.24*
		Cracked	Nrec,c,cr										71.49	80.43	89.37

*Concrete cone failure

[1] Resistance in cracked concrete not part of the European Technical Assessment

[2] Reinforcing bar is not part of the European Technical Assessment

Recommended tension resistance for steel failure ($N_{rec,s}$):

Rebar Size		[mm]	Ø8	Ø10	Ø12	Ø14	Ø16	Ø20	Ø25	Ø28	Ø32	Ø36[2]	Ø40[2]
Steel property BSt 500 S	Nrec,s	[kN]	14.10	22.03	31.72	43.18	56.39	88.11	137.68	172.70	225.57	285.48	352.45

[1] Resistance in cracked concrete not part of the European Technical Assessment

[2] Reinforcing bar is not part of the European Technical Assessment

Mungo
Befestigungstechnik AG
Bornfeldstrasse 2
CH-4600 Olten · Switzerland
Phone +41 62 206 75 75
Fax +41 62 206 75 85
mungo@mungo.swiss

5 RECOMMENDED SHEAR RESISTANCE

Basic performance data for MIT600RE system in cracked and non-cracked concrete C20/25 without influence of edge distance, spacing and splitting failure due to dimensions of concrete member

REQUIRED PROOFS FOR RECOMMENDED SHEAR RESISTANCE:

For design shear resistance with chemical system MIT600RE the minimum value for concrete pry-out failure and steel failure needs to be considered:

For use in non-cracked concrete; $V_{rec,ucr} = \min(V_{rec,cp,ucr}; V_{rec,s})$

For use in cracked concrete; $V_{rec,cr} = \min(V_{rec,cp,cr}; V_{rec,s})$

5.1 Recommended shear resistance for concrete pry-out failure ($V_{rec,cp}$)

Cracked or non-cracked concrete C20/25 with threaded rod:

Metrical Thread Size				[mm]	M8[1]	M10[1]	M12	M16	M20	M24	M27	M30	M33[2]	M36[2]	M39[2]
Setting Depth h_{ef} [mm]	60	Non-Cracked	$V_{rec,cp,ucr}$	[kN]	21.55	22.35									
		Cracked	$V_{rec,cp,cr}$		10.06	12.57									
	70	Non-Cracked	$V_{rec,cp,ucr}$	[kN]	25.14	28.17	28.17								
		Cracked	$V_{rec,cp,cr}$		11.73	14.67	18.86								
	80	Non-Cracked	$V_{rec,cp,ucr}$	[kN]	28.73	34.41	34.41	34.41							
		Cracked	$V_{rec,cp,cr}$		13.41	16.76	21.55	24.53							
	90	Non-Cracked	$V_{rec,cp,ucr}$	[kN]	32.33	40.41	41.06	41.06	41.06						
		Cracked	$V_{rec,cp,cr}$		15.09	18.86	24.24	28.02	29.27						
	100	Non-Cracked	$V_{rec,cp,ucr}$	[kN]		44.90	48.10	48.10	48.10	48.10					
		Cracked	$V_{rec,cp,cr}$			20.95	26.94	31.13	34.29	34.29					
	120	Non-Cracked	$V_{rec,cp,ucr}$	[kN]		53.88	63.22	63.22	63.22	63.22	63.22	63.22	63.22	63.22	
		Cracked	$V_{rec,cp,cr}$			25.14	32.33	37.36	43.10	45.07	45.07	45.07	45.07	45.07	
	140	Non-Cracked	$V_{rec,cp,ucr}$	[kN]			75.43	79.67	79.67	79.67	79.67	79.67	79.67	79.67	79.67
		Cracked	$V_{rec,cp,cr}$				37.71	43.58	50.29	55.31	56.79	56.79	56.79	56.79	56.79
	160	Non-Cracked	$V_{rec,cp,ucr}$	[kN]				97.34	97.34	97.34	97.34	97.34	97.34	97.34	97.34
		Cracked	$V_{rec,cp,cr}$					49.81	57.47	63.22	69.39	69.39	69.39	69.39	69.39
	190	Non-Cracked	$V_{rec,cp,ucr}$	[kN]				125.96	125.96	125.96	125.96	125.96	125.96	125.96	125.96
		Cracked	$V_{rec,cp,cr}$					59.15	68.24	75.07	84.45	89.79	89.79	89.79	89.79
	220	Non-Cracked	$V_{rec,cp,ucr}$	[kN]					156.94	156.94	156.94	156.94	156.94	156.94	156.94
		Cracked	$V_{rec,cp,cr}$						79.02	86.92	97.79	108.65	111.88	111.88	111.88
	240	Non-Cracked	$V_{rec,cp,ucr}$	[kN]					178.82	178.82	178.82	178.82	178.82	178.82	178.82
		Cracked	$V_{rec,cp,cr}$						86.20	94.82	106.68	118.53	127.48	127.48	127.48
	280	Non-Cracked	$V_{rec,cp,ucr}$	[kN]						225.34	225.34	225.34	225.34	225.34	225.34
		Cracked	$V_{rec,cp,cr}$							110.63	124.46	138.29	152.11	160.64	160.64
	320	Non-Cracked	$V_{rec,cp,ucr}$	[kN]							275.31	275.31	275.31	275.31	275.31
		Cracked	$V_{rec,cp,cr}$								142.24	158.04	173.84	189.65	196.26
	360	Non-Cracked	$V_{rec,cp,ucr}$	[kN]								328.52	328.52	328.52	328.52
		Cracked	$V_{rec,cp,cr}$									177.80	195.58	213.36	231.13

[1] Resistance in cracked concrete not part of the European Technical Assessment

[2] Threaded rod is not part of the European Technical Assessment

Recommended shear resistance for steel failure ($V_{rec,s}$):

Metrical Thread Size			[mm]	M8[1]	M10[1]	M12	M16	M20	M24	M27	M30	M33[2]	M36[2]	M39[2]
Steel property class	Zinc Plated 4.6	$V_{rec,s}$	[kN]	3.13	4.95	7.21	13.43	20.94	30.18	39.23	47.98	59.23	69.93	83.44
	Zinc Plated 5.8	$V_{rec,s}$	[kN]	5.23	8.27	12.04	22.42	34.97	50.40	65.51	80.13	98.92	116.78	139.34
	Zinc Plated 8.8	$V_{rec,s}$	[kN]	8.37	13.24	19.26	35.87	55.96	80.64	104.82	128.20	158.27	186.85	222.95
	Stainless steel A4-70	$V_{rec,s}$	[kN]	5.55	8.78	12.77	23.78	37.09	53.46	49.63	60.70	74.94	88.47	105.56
	Stainless steel HCR, class 70	$V_{rec,s}$	[kN]	5.55	8.78	12.77	23.78	37.09	53.46	49.63	60.70	74.94	88.47	105.56

[1] Resistance in cracked concrete not part of the European Technical Assessment

[2] Threaded rod is not part of the European Technical Assessment

Mungo
Befestigungstechnik AG
Bornfeldstrasse 2
CH-4600 Olten · Switzerland
Phone +41 62 206 75 75
Fax +41 62 206 75 85
mungo@mungo.swiss

5.2 Recommended shear resistance for concrete pry-out failure ($V_{rec.cp}$)
Cracked or non-cracked concrete C20/25 with reinforcing bar (REBAR):

Rebar Size				[mm]	Ø8[1]	Ø10[1]	Ø12	Ø14	Ø16	Ø20	Ø25	Ø28	Ø32	Ø36[2]	Ø40[2]
Setting Depth h_{ef} [mm]	60	Non-Cracked	$V_{rec,cp,ucr}$	[kN]	20.11	22.35									
		Cracked	$V_{rec,cp,cr}$		10.06	12.57									
	70	Non-Cracked	$V_{rec,cp,ucr}$	[kN]	23.47	28.17	28.17								
		Cracked	$V_{rec,cp,cr}$		11.73	14.67	18.86								
	80	Non-Cracked	$V_{rec,cp,ucr}$	[kN]	26.82	33.52	34.41	34.41	34.41						
		Cracked	$V_{rec,cp,cr}$		13.41	16.76	21.55	23.47	24.53						
	90	Non-Cracked	$V_{rec,cp,ucr}$	[kN]	30.17	37.71	41.06	41.06	41.06	41.06					
		Cracked	$V_{rec,cp,cr}$		15.09	18.86	24.24	26.40	28.02	28.02					
	100	Non-Cracked	$V_{rec,cp,ucr}$	[kN]		41.90	46.69	48.10	48.10	48.10	48.10				
		Cracked	$V_{rec,cp,cr}$			20.95	26.94	29.33	31.13	31.13	34.29				
	120	Non-Cracked	$V_{rec,cp,ucr}$	[kN]		50.29	56.03	63.22	63.22	63.22	63.22	63.22	63.22		
		Cracked	$V_{rec,cp,cr}$			25.14	32.33	35.20	37.36	37.36	45.07	45.07	45.07		
	140	Non-Cracked	$V_{rec,cp,ucr}$	[kN]			65.37	76.27	79.67	79.67	79.67	79.67	79.67	79.67	79.67
		Cracked	$V_{rec,cp,cr}$				37.71	41.07	43.58	43.58	56.79	56.79	56.79	56.79	56.79
	160	Non-Cracked	$V_{rec,cp,ucr}$	[kN]				87.16	91.95	97.34	97.34	97.34	97.34	97.34	97.34
		Cracked	$V_{rec,cp,cr}$					46.93	49.81	49.81	65.85	69.39	69.39	69.39	69.39
	190	Non-Cracked	$V_{rec,cp,ucr}$	[kN]					109.19	125.96	125.96	125.96	125.96	125.96	125.96
		Cracked	$V_{rec,cp,cr}$						59.15	59.15	78.20	87.58	89.79	89.79	89.79
	220	Non-Cracked	$V_{rec,cp,ucr}$	[kN]						156.94	156.94	156.94	156.94	156.94	156.94
		Cracked	$V_{rec,cp,cr}$							68.48	90.54	101.41	111.88	111.88	111.88
	240	Non-Cracked	$V_{rec,cp,ucr}$	[kN]						172.41	178.82	178.82	178.82	178.82	178.82
		Cracked	$V_{rec,cp,cr}$							74.71	98.78	110.63	126.43	127.48	127.48
	300	Non-Cracked	$V_{rec,cp,ucr}$	[kN]							246.94	249.91	249.91	249.91	249.91
		Cracked	$V_{rec,cp,cr}$								123.47	138.29	158.04	177.80	178.15
	330	Non-Cracked	$V_{rec,cp,ucr}$	[kN]								288.32	288.32	288.32	288.32
		Cracked	$V_{rec,cp,cr}$									152.11	173.84	195.58	205.53
	380	Non-Cracked	$V_{rec,cp,ucr}$	[kN]									356.27	356.27	356.27
		Cracked	$V_{rec,cp,cr}$										200.19	225.21	250.23

[1] Resistance in cracked concrete not part of the European Technical Assessment
[2] Reinforcing bar is not part of the European Technical Assessment

Recommended shear resistance for steel failure ($V_{rec,s}$):

Rebar Size		[mm]	Ø8	Ø10	Ø12	Ø14	Ø16	Ø20	Ø25	Ø28	Ø32	Ø36[2]	Ø40[2]
Steel property BSt 500 S	$V_{rec,s}$	[kN]	6.58	10.28	14.80	20.15	26.32	41.12	64.25	80.59	105.26	133.23	164.48

[1] Resistance in cracked concrete not part of the European Technical Assessment
[2] Reinforcing bar is not part of the European Technical Assessment

Mungo
Befestigungstechnik AG
Bornfeldstrasse 2
CH-4600 Olten · Switzerland
Phone +41 62 206 75 75
Fax +41 62 206 75 85
mungo@mungo.swiss

6 MORTAR PROPERTIES

6.1 Mortar properties data for MIT600RE system:

Properties	Test Method	Result
UV resistance		Pass
Watertightness	DIN EN 12390-8	Pass
Temperature stability		72 °C
Viscosity (A-component)	ASTM D 2556	16600 mPas
Viscosity (B-component)	ASTM D 2556	16400 mPas
pH-value		> 12
Density		1,41 kg / dm³
Compressive strength	EN 196 Teil1	120 N / mm²
Flexural strength	EN 196 Teil1	42 N / mm²
E modulus	EN 196 Teil1	10800 N / mm²
Shrinkage		< 0,02 %
Hardness Shore D		85
Electrical resistance	IEC 93	1.2 1012 W m
Thermal conductivity	IEC 60093	0,47 W/m·K

Mungo
Befestigungstechnik AG
Bornfeldstrasse 2
CH-4600 Olten · Switzerland
Phone +41 62 206 75 75
Fax +41 62 206 75 85
mungo@mungo.swiss

6.2 Chemical resistance data for MIT600RE system:

Chemical Agent	Concentration	Resistant	Not Resistant
Acetic acid	40		*
Laitance		*	
Acetone	10		*
Ammonia, aqueous solution	5	*	
Aniline	100		*
Beer	100	*	
Chlorine	All	*	
Benzol	100		*
Boric Acid, aqueous solution		*	
Calcium carbonate, suspended in water	All	*	
Calcium chloride, suspended in water		*	
Calcium hydroxide, suspended in water		*	
Carbon tetrachloride	100	*	
Caustic soda solution	40	*	
Citric acid	All	*	
Chlorine water, swimming pool	All	*	
Diesel oil	100	*	
Ethyl alcohol, aqueous solution	50		*
Formic acid	100		*
Formaldehyde, aqueous solution	30	*	
Freon		*	
Fuel Oil		*	
Gasoline (premium grade)	100	*	
Glycol (Ethylene glycol)		*	
Hydrochloric acid (Muriatic Acid)	Conc.		*
Hydrogen peroxide	30		*
Isopropyi alcohol	100		*
Lactic acid	All		*
Linseed oil	100	*	
Lubricating oil	100	*	
Magnesium chloride, aqueous solution	All	*	
Methanol	100	*	
Motor oil (SAE 20 W-50)	100	*	
Nitric acid	10		*
Oleic acid	100	*	
Perchloroethylene	100	*	
Petroleum	100	*	
Phenol, aqueous solution	8		*
Phosphoric acid	85	*	
Phosphoric acid	10	*	
Potash lye (Potassium hydroxide, 10% and		*	
Potassium carbonate, aqueous solution	All	*	
Potassium chlorite, aqueous solution	All	*	
Potassium nitrate, aqueous solution	All	*	
Sea water, salty	All	*	
Sodium carbonate	All	*	
Sodium Chloride, aqueous solution	All	*	
Sodium phosphate, aqueous solution	All	*	
Sodium silicate	All	*	
Sulfuric acid	30		*
Tartaric acid	All	*	
Tetrachloroethylene	100	*	
Toluene			*
Trichloroethylene	100		*
Turpentine	100	*	

Results shown in the table are applicable to brief periods of chemical contact with full cured adhesive (e.g. temporary contact with adhesive during a spill).

7 IMPORTANT NOTICE

Values given above are valid under the assumptions of sufficient cleaning of the drill hole (ETA-09/0340, Annex B3 and B4) and anchoring in non-cracked or cracked concrete (strength classes C20/25 to C50/60 according to EN 206-1:2000). For the design the complete technical assessment ETA-09/0340 of 13 December 2016 has to be considered. In design resistance the partial safety factor for material (concrete) as regulated in the ETA and partial safety factor for steel (in case of steel failure) γ_{Ms} = 1.4 are considered. For combination of tensile loads, shear loads, bending moments as well as well as reduced edge distances or spacing's (anchor groups) see ETA or Mungo design software. The data must be checked by the user under the responsibility of an engineer experienced in anchorage and concrete work. This is to ensure there are no errors and all data is complete and accurate and complies with all rules and regulations for the actual conditions and application. Anchor design is performed according to the ETAG 001, Part 5 in combination with assessment ETA-09/0340 of 13 December 2016.

Mungo
Befestigungstechnik AG
Bornfeldstrasse 2
CH-4600 Olten · Switzerland
Phone +41 62 206 75 75
Fax +41 62 206 75 85
mungo@mungo.swiss