

Declaration of Performance 0756-CPD-0308

valid from LOT no: see final page of this document

MIT-SE Plus bonded anchor

(Bonded anchor with anchor rod of sizes M8-M30 and rebar \varnothing 8-32 for use in cracked and non-cracked concrete)

Intended Use or Uses of the Construction Product According to ETAG 001 Parts 1 and 2	
Generic type	Bonded anchor for anchorage of threaded rod.
Base material	Cracked and non-cracked concrete C20/25 to C50/60 acc. to EN 206:2000-12;
Material	<p>a) Carbon galvanized steel class 5.8 and 8.8 according to EN ISO 898-1 for dry internal conditions.</p> <p>b) Stainless steel A4-50 (> M24) and A4-70 (\leq M24) according to EN ISO 3506 for dry internal conditions, external atmospheric exposure (including industrial and marine environment) or exposure in permanently damp internal conditions if no particular aggressive conditions exist.</p> <p>c) High resistant corrosion stainless steel (HCR) class 50 (> M24) and class 70 (\leq M24) according to EN ISO 10088-1 for all conditions.</p> <p>d) Bst 500</p>
Durability	Internal dry conditions and atmospheric conditions (stainless and HCR)
Loading	static, quasi-static, seismic (C1)
Service temperature range	<p>Temperature range I: -40°C to +40°C (max. short term temperature +40°C and max. long term temperature +24°C),</p> <p>Temperature range II: -40°C to +80°C (max. short term temperature +80°C and max. long term temperature +50°C).</p> <p>Temperature range III: -40°C to +120°C (max. short term temperature +120°C and max. long term temperature +72°C).</p>
Use category	ETAG 001-1, Option 1. Dry and wet concrete: uncracked concrete M8-M30, \varnothing 8- \varnothing 32; cracked concrete and seismic C1: M12-M30, \varnothing 12- \varnothing 32. Water filled boreholes: M8-M16, \varnothing 8- \varnothing 16. Overhead installation: allowed. Perforation with hammer drilling machine
Fire resistance	F120 (for anchor rods made of steel class 5.8, 8.8, A4, HCR)
Fire reaction	According to DIN EN 1363-1
ETA – 10/0130 issued by	Deutsches Institut für Bautechnik DIBt, Berlin
On the basis of	ETAG 001-05
Certificate of Conformity 0756-CPD-0308 issued by	Institut für Massivbau, Darmstadt
Under AVCP System	1

Declared performances for threaded rod M8-M30

E Declared Performances According to ETAG 001 Parts 1 and 5										
Essential Characteristics			Performance							
			M8	M10	M12	M16	M20	M24	M27	M30
Installation Parameters										
d	Diameter of thread diameter	[mm]	8	10	12	16	20	24	27	30
d ₀	Nominal diameter of drill bit	[mm]	10	12	14	18	24	28	32	35
d _{fix}	Diameter of clearance hole in the fixture	[mm]	9	12	14	18	22	26	30	33
h _{eff}	Minimum effective anchorage depth	[mm]	60	60	70	80	90	96	108	120
	Maximum effective anchorage depth	[mm]	160	200	240	320	400	480	540	600
h ₁	Depth of the drilling hole	[mm]	= h _{eff}							
h _{min}	Minimum thickness of the concrete member	[mm]	h _{eff} + 30mm ≥ 100mm				h _{eff} + 2d ₀			
T _{inst}	Nominal torque moment	[Nm]	10	20	40	80	120	160	180	200
t _{fix}	Minimum thickness to be fixed	[mm]	0							
	Maximum thickness to be fixed	[mm]	1500							
s _{min}	Minimum spacing	[mm]	40	50	60	80	100	120	135	150
c _{min}	Minimum edge distance	[mm]	40	50	60	80	100	120	135	150

Pull-Out Failure Mode											
				M8	M10	M12	M16	M20	M24	M27	M30
τ _{Rk,ucr}	Characteristic bond resistance in dry and wet concrete, C20/25 Temperature range I	Uncracked concrete	[N/mm ²]	10	12	12	12	12	11	10	9
		Cracked concrete		-	-	5,5	5,5	5,5	5,5	6,5	6,5
	Characteristic bond resistance in dry and wet concrete, C20/25 Temperature range II	Uncracked concrete	[N/mm ²]	7,5	9	9	9	9	8,5	7,5	6,5
		Cracked concrete		-	-	4,0	4,0	4,0	4,0	4,5	4,5
	Characteristic bond resistance in dry and wet concrete, C20/25 Temperature range III	Uncracked concrete	[N/mm ²]	5,5	6,5	6,5	6,5	6,5	6,5	5,5	5,0
		Cracked concrete		-	-	3,0	3,0	3,0	3,0	3,5	3,5
γ _{MS,N}	Partial safety factor		[-]	1,50	1,80						
τ _{Rk,cr}	Characteristic bond resistance in water filled holes, C20/25 Temperature range I	Uncracked concrete	[N/mm ²]	7,5	8,5	8,5	8,5	Not admissible			
		Cracked concrete		5,5	5,5	-	-				
	Characteristic bond resistance in water filled holes, C20/25 Temperature range II	Uncracked concrete	[N/mm ²]	5,5	6,5	6,5	6,5				
		Cracked concrete		4,0	4,0	-	-				
	Characteristic bond resistance in water filled holes, C20/25 Temperature range III	Uncracked concrete	[N/mm ²]	4,0	5,0	5,0	5,0				
		Cracked concrete		3,0	3,0	-	-				
γ _{MS,N}	Partial safety factor		[-]	2,1							
ψ _{C_{ucr}} C30/37 [-]	Increasing factor for concrete C30/37		[-]	1,04							
ψ _{C_{ucr}} C40/50 [-]	Increasing factor for concrete C40/50		[-]	1,08							
ψ _{C_{ucr}} C50/60 [-]	Increasing factor for concrete C50/60		[-]	1,10							

Resistance for Splitting Failure			
$s_{cr,sp}$	Critical spacing (splitting)	[mm]	$2 C_{cr,sp}$
$c_{cr,sp}$	Critical edge distance (splitting)	[mm]	$10 \cdot h_{ef} \leq 2 \cdot h_{ef} \left(25 - \frac{h}{h_{ef}} \right) \leq 24 \cdot h_{ef}$

Displacement under Tension Load											
Displacement for tension load Temp range I											
δ_{N0}	Short term displacement under tension load	Uncracked concrete	[mm/Nmm ²]	0,021	0,023	0,026	0,031	0,036	0,041	0,045	0,049
		Cracked concrete		-	-	0,070					
$\delta_{N\infty}$	Short term displacement under tension load	Uncracked concrete	[mm/Nmm ²]	0,030	0,033	0,037	0,045	0,052	0,060	0,065	0,071
		Cracked concrete		-	-	0.105					
Displacement for tension load Temp range II											
$\delta_{0,ucr}$	Short term displacement under tension load	Uncracked concrete	[mm/Nmm ²]	0,050	0,056	0,063	0,075	0,088	0,100	0,110	0,119
		Cracked concrete		-	-	0,170					
$\delta_{\infty,ucr}$	Short term displacement under tension load	Uncracked concrete	[mm/Nmm ²]	0,072	0,081	0,090	0,108	0,127	0,145	0,159	0,172
		Cracked concrete		-	-	0,245					
Displacement for tension load Temp range III											
$\delta_{0,ucr}$	Short term displacement under tension load	Uncracked concrete	[mm/Nmm ²]	0,050	0,056	0,063	0,075	0,088	0,100	0,110	0,119
		Cracked concrete		-	-	0,170					
$\delta_{\infty,ucr}$	Short term displacement under tension load	Uncracked concrete	[mm/Nmm ²]	0,072	0,081	0,090	0,108	0,127	0,145	0,159	0,172
		Cracked concrete		-	-	0,245					
$V_{Rk,s}$	Shear Steel char. failure prop. class 5.8	[kN]	9	15	21	39	61	88	115	140	
$V_{Rk,s}$	Shear Steel char. failure prop. class 8.8	[kN]	15	23	34	63	98	141	184	224	
$V_{Rk,s}$	Shear Steel char. failure prop. class A4/HCR	[kN]	13	20	30	55	86	124	115	140	
$M_{Rk,s}^0$	Bending Moment char. failure prop. class 5.8	[Nm]	19	37	65	166	324	560	833	1123	
$M_{Rk,s}^0$	Bending Moment char. failure prop class 8.8	[Nm]	30	60	105	266	519	896	1333	1797	
$M_{Rk,s}^0$	Bending Moment char. failure prop class A4/HCR	[Nm]	26	52	92	323	454	784	832	1125	
$\gamma_{m,sV}$	Partial safety factor for shear steel failure 5.8/8.8	[-]	1,25								
$\gamma_{m,sV}$	Partial safety factor for shear steel failure A4/HCR	[-]	1,56						2,38		
Shear Concrete Edge Failure Mode											
k	Factor for concrete edge failure	[-]	TR 029 §5.2.3.4								
Displacement under Shear Load											
δ_{V0}	Short term displacement under shear load	[mm/kN]	0,06	0,06	0,05	0,04	0,04	0,03	0,03	0,03	
$\delta_{V\infty}$	Long term displacement under shear load	[mm/kN]	0,09	0,08	0,08	0,06	0,06	0,05	0,05	0,05	
Fire Resistance											
$N_{Rk,s,f,30}$	For fire resistance duration = 30 minutes	[kN]	1,64	2,60	3,35	6,25	9,75	14,04	-	18,26	
$N_{Rk,s,f,60}$	For fire resistance duration = 60 minutes	[kN]	1,12	1,77	2,59	4,82	7,52	10,84	-	14,10	
$N_{Rk,s,f,90}$	For fire resistance duration = 90 minutes	[kN]	0,59	0,94	1,82	3,40	5,30	7,64	-	9,94	
$N_{Rk,s,f,120}$	For fire resistance duration = 120 minutes	[kN]	0,33	0,52	1,44	2,69	4,19	6,04	-	7,86	

Declared performances for rebar (BSt 500 according to DIN 488-2:2006) ø8- ø32

Declared Performances According to ETAG 001 Parts 1 and 5												
Essential Characteristics			Performance									
			8	10	12	14	16	20	25	28	32	
Installation Parameters												
d	Diameter of thread diameter	[mm]	8	10	12	14	16	20	25	28	32	
d ₀	Nominal diameter of drill bit	[mm]	12	14	16	18	20	24	32	35	40	
h _{eff}	Minimum effective anchorage depth	[mm]	60	60	70	75	80	90	100	112	128	
	Maximum effective anchorage depth	[mm]	160	200	240	280	320	400	480	540	640	
h ₁	Depth of the drilling hole	[mm]	= h _{eff}									
h _{min}	Minimum thickness of the concrete member	[mm]	h _{eff} + 30 mm ≥ 100 mm			h _{eff} + 2d ₀						
s _{min}	Minimum spacing	[mm]	40	50	60	70	80	100	125	140	160	
c _{min}	Minimum edge distance	[mm]	40	50	60	70	80	100	125	140	160	
Pull-Out Failure Mode												
τ _{Rk,ucr}	Characteristic bond resistance in dry and wet concrete, C20/25 Temperature range I	Uncracked concrete	[N/mm ²]	10	12	12	12	12	12	11	10	8,5
		Cracked concrete		-	-	5,5	5,5	5,5	5,5	5,5	6,5	6,5
	Characteristic bond resistance in dry and wet concrete, C20/25 Temperature range II	Uncracked concrete	[N/mm ²]	7,5	9	9	9	9	9	8	7	6
		Cracked concrete		-	-	4,0	4,0	4,0	4,0	4,0	4,5	4,5
	Characteristic bond resistance in dry and wet concrete, C20/25 Temperature range III	Uncracked concrete	[N/mm ²]	5,5	6,5	6,5	6,5	6,5	6,5	6	5	4,5
		Cracked concrete		-	-	3	3	3	3	3	3,5	3,5
γ _{MS,N}	Partial safety factor	[-]	1,5	1,8								
τ _{Rk,cr}	Characteristic bond resistance in water filled holes, C20/25 Temperature range I	Uncracked concrete	[N/mm ²]	7,5	8,5	8,5	8,5	8,5	Not admissible			
		Cracked concrete		-	-	5,5	5,5	5,5				
	Characteristic bond resistance in water filled holes, C20/25 Temperature range II	Uncracked concrete	[N/mm ²]	5,5	6,5	6,5	6,5	6,5				
		Cracked concrete		-	-	4,0	4,0	4,0				
	Characteristic bond resistance in water filled holes, C20/25 Temperature range III	Uncracked concrete	[N/mm ²]	4,0	5,0	5,0	5,0	5,0				
		Cracked concrete		-	-	3,0	3,0	3,0				
γ _{MS,N}	Partial safety factor	[-]	2,1									
ψ _{c,ucr} C30/37 [-]	Increasing factor for concrete C30/37	[-]	1,04									
ψ _{c,ucr} C40/50 [-]	Increasing factor for concrete C40/50	[-]	1,08									
ψ _{c,ucr} C50/60 [-]	Increasing factor for concrete C50/60	[-]	1,10									

Resistance for splitting failure												
$s_{cr,sp}$	Critical spacing (splitting)	[mm]	$2 C_{cr,sp}$									
$c_{cr,sp}$	Critical edge distance (splitting)	[mm]	$10 \cdot h_{ef} \leq 2 \cdot h_{ef} \left(2,5 - \frac{h}{h_{ef}} \right) \leq 24 \cdot h_{ef}$									
Displacement under Tension Load												
Displacement for tension load Temperature Range I												
$\delta_{0,cr}$	Short term displacement under tension load	Uncracked concrete	[mm/Nmm ²]	0,021	0,023	0,026	0,028	0,031	0,036	0,043	0,047	0,052
		Cracked concrete		-								
$\delta_{\infty,cr}$	Short term displacement under tension load	Uncracked concrete	[mm/Nmm ²]	0,030	0,033	0,037	0,041	0,045	0,052	0,061	0,071	0,075
		Cracked concrete		-								
Displacement for tension load Temperature Range II												
$\delta_{0,ucr}$	Short term displacement under tension load	Uncracked concrete	[mm/Nmm ²]	0,050	0,056	0,063	0,069	0,075	0,088	0,104	0,113	0,126
		Cracked concrete		-								
$\delta_{\infty,ucr}$	Short term displacement under tension load	Uncracked concrete	[mm/Nmm ²]	0,072	0,081	0,090	0,099	0,108	0,127	0,149	0,163	0,181
		Cracked concrete		-								
Displacement for tension load Temperature Range III												
$\delta_{0,cr}$	Short term displacement under tension load	Uncracked concrete	[mm/Nmm ²]	0,021	0,023	0,026	0,028	0,031	0,036	0,043	0,047	0,052
		Cracked concrete		-								
$\delta_{\infty,cr}$	Short term displacement under tension load	Uncracked concrete	[mm/Nmm ²]	0,030	0,033	0,037	0,041	0,045	0,052	0,061	0,071	0,075
		Cracked concrete		-								
$V_{Rk,s}$	Shear Steel characteristic failure Bst500	[kN]	14	22	31	42	55	86	135	169	221	
$M_{Rk,s}^0$	Bending Moment characteristic failure Bst500	[Nm]	33	65	112	178	265	518	1012	1422	2123	
$\gamma_{m,sV}$	Partial safety factor	[-]	1,5									
Shear Concrete Edge failure mode												
k	Factor for concrete edge failure	[-]	TR 029 §5.2.3.4									
Displacement under Shear Load												
δ_{V0}	Short term displacement under shear load	[mm/kN]	0,06	0,05	0,05	0,04	0,04	0,04	0,03	0,03	0,03	
$\delta_{V\infty}$	Long term displacement under shear load	[mm/kN]	0,09	0,08	0,08	0,06	0,06	0,05	0,05	0,04	0,04	

Seismic load values for Anchor rods and Rebar

Reductionfactors $\alpha_{N,seis}$ and $\alpha_{V,seis}$ for performance class C1												
			M12	Ø14	M16 / Ø16	M20 / Ø20	M24 / Ø25	M27	Ø28	M30	Ø32	
$\alpha_{N,seis}$	Steel failure	[-]	1,0									
	Longterm displacement under shearload		0,68					0,69				
$\alpha_{V,seis}$	Steel failure without lever ($V_{Rk,s}$)	[-]	0,70									

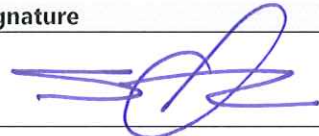
The below performances apply for the following article numbers:

Content	Art Nr	LOT nr
165ml	1710024	
	17100246	
300ml	1710017	
	17100170	
	17100171	
	17100175	
	17100176	
	1710102	
350ml	1710025	
	17100251	
	17100256	
	1710118	
400ml	1710013	
	1710026	
	17100260	
	17100261	
	171002601	
825ml	1710022	

The performances of the product identified in the declaration of performance are in conformity with the declared performance, only if a 3.1 steel-mill certificate can be provided for each production LOT of threaded bar that has been used in combination with the bonded anchor.

This declaration of performance is issued under the sole responsibility of Mungo AG.

Signed for and on behalf of the manufacturer by:

Name and Functions	Place and Date of Issue	Signature
Arnold Schefer Owner and CEO	Olten, 22.09.2014	

Further information:

Liability for printing errors is excluded. The full content of the corresponding ETA has to be observed.