

Declaration of Performance 1109-CPD-0070

valid from lot no 909809 to lot no *****

m2r Throughbolt

(Torque-controlled expansion anchor made of stainless steel for use in non-cracked concrete)

Intended Use or Uses of the Construction Product According to ETAG 001 Parts 1 and 2	
Generic type	torque controlled expansion anchor sleeve type
Base material	un-cracked concrete C20/25 to C50/60 acc. to EN 206-1:2000-12
Material	made of galvanized steel
Durability	internal dry conditions and external atmospheric conditions including industrial & marine environment, without particular aggressive conditions
Loading	static, quasi-static
Fire resistance	no performance declared
Fire reaction	A1 according to EN13501-1
ETA - 05/0199 issued by	
Deutsches Institut für Bautechnik DIBt, Berlin	
On the basis of	
ETAG 001, Part 2 Option 7	
Certificate of Conformity 1109-CPD-0070 issued by	
IFBT GmbH, Leipzig	
Under AVCP System	
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Declared Performances According to ETAG 001 Parts 1 and 2							
Essential Characteristics			Performance				
			M6	M8	M10	M12	M16
Installation Parameters							
d ₀	Nominal diameter of drill bit	[mm]	6	8	10	12	16
h _{ef}	Effective anchorage depth	[mm]	40	50	58	68	80
h _{nom}	Minimum installation depth	[mm]	46,9	58,5	68,8	79,6	96,4
h _{min}	Minimum thickness of the concrete member	[mm]	100	100	120	140	160
T _{inst}	Nominal torque moment	[Nm]	6,5	25	35	125	140
s _{min}	Minimum spacing	[mm]	40	50	60	75	100
for c ≥	Edge distance	[mm]	70	90	115	150	190
c _{min}	Minimum edge distance	[mm]	40	50	60	100	130
for s ≥	Anchor spacing	[mm]	80	100	120	150	190
Tension Steel Failure Mode							
N _{Rk,s}	Tension Steel characteristic failure	[kN]	9,6	19,0	32,6	46,5	81,7
γ _{m,sN}	Partial safety factor for tension steel failure	[-]	1,6				
Pull-Out Failure Mode							
N _{Rk,d,cr}	Tension characteristic load in cracked concrete C20/25	[kN]					
N _{Rk,d,ucr}	Tension characteristic load in un-cracked concrete	[kN]	7,5	12	16	25	30
γ ₂	Partial safety factor	[-]	1,0				
s _{cr,N}	Critical spacing	[mm]	3 h _{ef}				
c _{cr,N}	Critical edge distance	[mm]	1,5 h _{ef}				
ψ _c C30/37	Increasing factor for concrete C30/37	[-]	1,17				
ψ _c C40/50	Increasing factor for concrete C40/50	[-]	1,32				
ψ _c C50/60	Increasing factor for concrete C50/60	[-]	1,42				
Splitting Failure Mode							
s _{cr,sp}	Critical spacing (splitting)	[mm]	6 h _{ef}			5 h _{ef}	
c _{cr,sp}	Critical edge distance(splitting)	[mm]	3 h _{ef}			2,5 h _{ef}	
Displacement on Tension Load							
N _{cr}	Service tension load in cracked concrete	[kN]	n.a.				

$\delta_{N0,cr}$	Short term displacement under tension load	[mm]	n.a.				
$\delta_{N\infty,cr}$	Long term displacement under tension load	[mm]	n.a.				
N_{ucr}	Service tension load in un-cracked concrete	[kN]	3,6	5,7	7,6	9,9	11,9
$\delta_{N0,ucr}$	Short term displacement under tension load	[mm]	0,3				
$\delta_{N\infty,ucr}$	Long term displacement under tension load	[mm]	1,3				
Shear Steel Failure Mode							
$V_{Rk,s}$	Shear Steel characteristic failure	[kN]	7,2	13,2	20,9	30,3	56,4
$M^0_{Rk,s}$	Bending Moment characteristic failure	[Nm]	12	30	60	105	266
$\gamma_{m,sV}$	Partial safety factor for shear steel failure	[-]	1,33				
Shear Concrete Edge Failure Mode							
l_{ef}	Effective anchorage length in shear loading	[mm]	40	50	58	68	80
Concrete Pry-Out Failure							
k	Factor in equation (5.6) of ETAG Annex C, § 5.2.3.3	[-]	1,0		2,0		
Displacement on Shear Load							
V	Service shear load in concrete	[kN]	3,9	7,1	11,2	16,3	30,3
δ_{V0}	Short term displacement under shear load	[mm]	1,5	1,9	2,3	3,1	3,9
$\delta_{V\infty}$	Long term displacement under shear load	[mm]	2,3	2,9	3,5	4,7	5,9
Fire Resistance							
$N_{Rk,s,fi,30}$	For fire resistance duration = 30 minutes	[kN]	n.a.				
$N_{Rk,s,fi,60}$	For fire resistance duration = 60 minutes	[kN]	n.a.				
$N_{Rk,s,fi,90}$	For fire resistance duration = 90 minutes	[kN]	n.a.				
$N_{Rk,s,fi,120}$	For fire resistance duration = 120 minutes	[kN]	n.a.				
Seismic Resistance – Performance Category CX							
$N_{Rk,s,seis}$	Characteristic steel tension resistance under seismic action	[kN]	n.a.				
$N_{Rk,p,seis}$	Characteristic tension pullout resistance under seismic	[kN]	n.a.				
$V_{Rk,s,seis}$	Characteristic steel shear resistance under seismic action	[kN]	n.a.				
Displacement on Seismic Load							
$\delta_{N,seis}(DLS)$	Displacement of the anchor under tension loading at DLS	[mm]	n.a.				
$\delta_{N,seis}(ULS)$	Displacement of the anchor under tension loading at ULS	[mm]	n.a.				
$\delta_{V,seis}(DLS)$	Displacement of the anchor under shear loading at DLS	[mm]	n.a.				
$\delta_{V,seis}(ULS)$	Displacement of the anchor under shear loading at ULS	[mm]	n.a.				

The above performances apply for the following article numbers:

d	Marking $d_o \times L / f_{tx}$ [mm]	Art. No
M6	M6x65/10	3300606
M8	M8x80/10	3300808
	M8x85/15	3300885
	M8x95/25	3300890
	M8x115/45	3300811
	M10x95/15	3301009
M10	M10x110/30	3301011
	M10x125/45	3301012
	M10x140/60	3301014
	M10x160/80	3301016
	M10x180/100	3301018
M12	M12x110/15	3301211
	M12x125/30	3301212
	M12x145/50	3301214
	M12x165/70	3301216
	M12x185/90	3301218

M16	M16x130/15	3301613
	M16x145/30	3301614
	M16x160/45	3301616
	M16x180/65	3301618

The performances of the product identified by the above identification code are in conformity with the declared performance.

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, 4.6.2013	

Further Information:

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