

**EXPANDET®**

®

Svedebuen 2-6 DK-3230

Tlf.: +45 70227979

expandet@expandet.dk

Declaration of Performance

No. DEA990075

Expandet Drop-In anchors E & EK (Zinc plated)

Intended use or uses of the construction product according to ETAG 001	
Generic type	Deformation-controlled expansion anchor (Drop-in)
Intended use I (ETAG 001, part 1 & 4)	Structural anchorage in un-cracked concrete C20/25 to C50/60 acc. to EN 206-1:2003
Material (Intended use I)	Carbon galvanized steel together with screw/rods & nut in class 4.6, 5.6 5.8 & 8.8 according to EN ISO 898-1 & 2
Intended use II (ETAG 001, part 1 & 6)	Non-Structural anchorage in cracked & un-cracked concrete C20/25 to C50/60 acc. to EN 206-1:2003
Material (Intended use II)	Carbon galvanized steel together with screw/rods & nut in class 4.6, 4.8, 5.6 5.8 & 8.8 according to EN ISO 898-1 & 2
Durability	Internal dry conditions
Loading	static, quasi-static
Fire Reaction	A1 according to EN13501-1
Fire Resistance (Intended use II)	R120
Intended use I	
ETA - 11/0499 issued by	DEUTSCHES INSTITUT FÜR BAUTECHNIK (DIBt)
On the basis of	ETAG 001
Certificate of Conformity 0756-CPD-0484 issued by	Technische Universität Darmstadt Institut für Massivbau
Under System	1
Intended use II	
ETA - 12/0177 issued by	DEUTSCHES INSTITUT FÜR BAUTECHNIK (DIBt)
On the basis of	ETAG 001
Certificate of Conformity 0756-CPD-0485 issued by	Technische Universität Darmstadt Institut für Massivbau
Under System	2+

Declared performances according to ETAG 001

Essential Characteristics			Performance (Intended Use I & II)							Performance (Intended Use I)		
			M6	M8	M8 x 40	M10 x 30	M10	M12	M16	M12 x 80	M16 x 80	M20
Installation parameters												
d ₀	Nominal diameter of drill bit	[mm]	8	10	10	12	12	15	20	15	20	25
d _{fix}	Diameter of clearance hole in the fixture	[mm]	7	9	9	12	12	14	18	14	18	22
h _{eff}	Effective anchorage depth	[mm]	30	30	40	30	40	50	65	50	65	80
L _{th}	Available thread length (inner thread)	[mm]	13	13	20	12	12	18	25	45	38	34
L _{sadmin}	Minimum Installation depth of male thread	[mm]	7	9	9	10	11	13	18	13	18	22
h _{min}	Minimum thickness of the concrete member	[mm]	100	100	100	120	120	130	160	130	160	200
T _{inst}	Maximum torque moment	[Nm]	4	8	8	15	15	35	60	35	60	120
s _{min}	Minimum spacing	[mm]	55	60	80	100	100	120	150	120	150	160
for c ≥	Edge distance	[mm]	95	95	95	115	135	165	200	165	200	260
c _{min}	Minimum edge distance	[mm]	95	95	95	115	135	165	200	165	200	260
for s ≥	Anchor spacing	[mm]	55	60	80	100	100	120	150	120	150	160



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Declared performances according to ETAG 001 part 1 & 4

Essential Characteristics			Performance (Intended Use I)									
			M6	M8	M8 x 40	M10 x 30	M10	M12	M16	M12 x 80	M16 x 80	M20
Tension, steel failure mode												
N _{Rk,s}	Tension Steel characteristic failure, 4.6 steel	[kN]	8,0	14,6	23,2		33,7	62,8	37,7	62,8	98,0	
γ _{m,sN}	Partial safety factor for tension steel failure	[-]	2,0									
N _{Rk,s}	Tension Steel characteristic failure , 5.6 steel	[kN]	10	18,3	18,0	20,2	42,1	78,3	42,1	78,3	122	
γ _{m,sN}	Partial safety factor for tension steel failure	[-]	2,0		1,5		2,0					
N _{Rk,s}	Tension Steel characteristic failure , 5.8 steel	[kN]	10	18,3	18,0	20,2	42,1	67,1	43,0	67,1	106	
γ _{m,sN}	Partial safety factor for tension steel failure	[-]	1,5									1,6
N _{Rk,s}	Tension Steel characteristic failure, 8.8	[kN]	15	19,9	18	20,2	43,0	67,1	43,0	67,1	106	
γ _{m,sN}	Partial safety factor for tension steel failure	[-]	1,5									1,6
Pull-out failure mode												
N _{Rk,p,ucr}	Tension characteristic load in un-cracked concrete (C20/25)	[kN]	1) ¹⁾	1) ¹⁾	9	1) ¹⁾	1) ¹⁾	1) ¹⁾	1) ¹⁾	1) ¹⁾	1) ¹⁾	1) ¹⁾
γ ₂	Partial safety factor	[-]	1,2									
ψ _{c,ucr} C30/37	Increasing factor for un-cracked concrete C30/37	[-]				1,12						
ψ _{c,ucr} C40/50	Increasing factor for un-cracked concrete C40/50	[-]				1,23						
ψ _{c,ucr} C50/60	Increasing factor for un-cracked concrete C50/60	[-]				1,30						
¹⁾ Pullout is not decisive												
Resistance for Concrete Cone failure												
s _{cr,N}	Critical spacing	[mm]	1,5h _{eff}									
c _{cr,N}	Critical edge distance	[mm]	3,0h _{eff}									
γ ₂	Partial safety factor	[-]	1,2									
Resistance for splitting failure												
s _{cr,sp}	Critical spacing (splitting)	[mm]	190	190	190	230	270	330	400	330	400	520
c _{cr,sp}	Critical edge distance(splitting)	[mm]	95	95	95	115	135	165	200	165	200	260
γ ₂	Partial safety factor	[-]	1,2									
Displacement on Tension Load												
N _{ucr}	Service tension load in un-cracked concrete	[kN]	3,0	3,0	3,6	3,3	4,8	6,4	10	6,4	10	14,8
δ _{0,ucr}	Short term displacement under tension load	[mm]	0,24									
δ _{∞,ucr}	Long term displacement under tension load	[mm]	0,36									
Shear, steel failure without leverarm												
V _{Rk,s}	Shear Steel characteristic failure (4.6 steel)	[kN]	4,0	7,3		11,6	9,6	16,8	31,3	16,8	31,3	49,0
γ _{m,sV}	Partial safety factor for shear steel failure (4.6 steel)	[-]	1,67									
V _{Rk,s}	Shear Steel characteristic failure (5.6 steel)	[kN]	5,0	9,1		10,1	9,6	21,1	39,2	21,1	39,2	61,2
γ _{m,sV}	Partial safety factor for shear steel failure (5.6 steel)	[-]	1,67			1,25	1,67					
V _{Rk,s}	Shear Steel characteristic failure (5.8 steel)	[kN]	5,0	6,9		10,1	7,2	21,1	33,5	21,1	33,5	53,2
V _{Rk,s}	Shear Steel characteristic failure (8.8 steel)	[kN]	7,5	6,9		10,1	7,2	21,5	33,5	21,5	33,5	53,2
γ _{m,sV}	Partial safety factor for shear steel failure (5.8 & 8.8 steel)	[-]	1,25									1,33
Shear Concrete Edge failure mode												
k	Factor for concrete edge failure	[-]	1,0					1,5	2,0	1,5	2,0	
γ ₂	Partial safety factor	[-]	1,5									
Shear Concrete edge failure mode												
l _f	Effective length of anchor under shear loading	[mm]	30	30	40	30	40	50	65	50	65	80
d _{nom}	Outside diameter of anchor	[mm]	8	10	10	12	12	15	20	15	20	25
γ ₂	Partial safety factor	[-]	1,5			2,0	1,5					
Displacement on Shear Load												
V	Service shear load in concrete	[kN]	2,0	4,0	4,0	5,7	4	11,3	18,8	11,3	18,8	32,2
δ _{V0}	Short term displacement under shear load	[mm]	0,9	0,9	1,0	1,5	0,6	1,2	1,2	1,2	1,2	1,6
δ _{V∞}	Long term displacement under shear load	[mm]	1,3	1,3	1,5	2,3	0,9	1,9	1,9	1,9	1,9	2,4



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Declared performances according to ETAG 001												
Essential Characteristics			Performance (Intended Use I & II)							Performance (Intended Use I)		
			M6	M8	M8 x 40	M10 x 30	M10	M12	M16	M12 x 80	M16 x 80	M20
Shear, steel failure with leverarm												
M ⁰ _{Rk,s}	Bending Moment characteristic failure (4.6 steel)	[Nm]	6,1	15,0	15,0	30,0	30,0	52,0	133	52,0	133	259
γ _{m,sV}	Partial safety factor for shear steel failure (4.6 steel)	[-]	1,67									
M ⁰ _{Rk,s}	Bending Moment characteristic failure (5.6 steel)	[Nm]	7,6	19,0	19,0	37,0	37,0	65	166	65	166	324
γ _{m,sV}	Partial safety factor for shear steel failure (5.6 steel)	[-]	1,67									
M ⁰ _{Rk,s}	Bending Moment characteristic failure (5.8 steel)	[Nm]	7,6	19,0	19,0	37,0	37,0	65	166	65	166	324
M ⁰ _{Rk,s}	Bending Moment characteristic failure (8.8 steel)	[Nm]	12,0	30	30	59	60	105	266	105	266	519
γ _{m,sV}	Partial safety factor for shear steel failure (5.8 & 8.8 steel)	[-]	1,25									

Declared performances according to ETAG 001 part 1 & 6												
Essential Characteristics			Performance (Intended Use II)									
			M6	M8	M8 x 40	M10 x 30	M10	M12	M16	M12 x 80	M16 x 80	M20
Load in any direction												
F ⁰ _{Rk}	Charracteristic resistance in concrete C20/25 to C50/60	[kN]	3,0	5,0	6,0	6,0	6,0	6,0	16			
γ ₂	Partial safety factor	[-]	1,2	1,44	1,44	1,4	1,44	1,2	1,2			
Shear, steel failure without leverarm												
M ⁰ _{Rk,s}	Bending Moment characteristic failure (4.8 steel)	[Nm]	6,1	15,0	15,0	30,0	30,0	52,0	133			
γ _{m,sV}	Partial safety factor for shear steel failure (4.8 steel)	[-]	1,25									
Fire resistance, Load in any direction, Concrete C20/25 to C50/60												
F _{Rk,s,fi,30}	Steel 4.6	For fire resistance duration = 30 minutes	[kN]	0,2	0,4	0,4	0,9	0,9	1,5	3,1		
F _{Rk,s,fi,60}		For fire resistance duration = 60 minutes	[kN]	0,2	0,3	0,3	0,8	0,8	1,3	2,4		
F _{Rk,s,fi,90}		For fire resistance duration = 90 minutes	[kN]	0,1	0,3	0,3	0,6	0,6	1,1	2,0		
F _{Rk,s,fi,120}		For fire resistance duration = 120 minutes	[kN]	0,1	0,2	0,2	0,5	0,5	0,8	1,6		
F _{Rk,s,fi,30}	Steel 4.8	For fire resistance duration = 30 minutes	[kN]	0,4	0,9	1,1	0,9	1,5	1,5	4,0		
F _{Rk,s,fi,60}		For fire resistance duration = 60 minutes	[kN]	0,3	0,9	0,9	0,9	1,5	1,5	4,0		
F _{Rk,s,fi,90}		For fire resistance duration = 90 minutes	[kN]	0,3	0,6	0,6	0,9	1,1	1,5	3,0		
F _{Rk,s,fi,120}		For fire resistance duration = 120 minutes	[kN]	0,3	0,5	0,5	0,7	0,9	1,2	2,4		
F _{Rk,s,fi,30}	Steel ≥ 5.6	For fire resistance duration = 30 minutes	[kN]	0,8	0,9	1,5	0,9	1,5	1,5	4,0		
F _{Rk,s,fi,60}		For fire resistance duration = 60 minutes	[kN]	0,8	0,9	1,5	0,9	1,5	1,5	4,0		
F _{Rk,s,fi,90}		For fire resistance duration = 90 minutes	[kN]	0,4	0,9	0,9	0,9	1,5	1,5	3,7		
F _{Rk,s,fi,120}		For fire resistance duration = 120 minutes	[kN]	0,3	0,5	0,5	0,7	1,0	1,2	2,4		
Spacing and edge distance under fire exposure R30 to R120												
s _{cr,fi}	Critical spacing	[mm]	130	180	210	170	170	200	400			
s _{min}	Minimum spacing	[mm]	55	60	80	100	100	120	150			
c _{cr,fi}	Critical edge distance	[mm]	65	90	105	85	85	100	200			
c _{min}	Minimum edge distance	[mm]	95	95	95	115	135	165	200			
If fire attack is from more than one side the edge distance shall be ≥ 300 mm												



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The above performances apply for the following article numbers:

Article Number	Installation tool (art#)
77031	977950
77032	977951
77035	977952
77034	977953
77039	977954
77040	977955

The performance of the product identified above is in conformity with the set of declared performance/s.

This declaration of performance is issued, in accordance with Regulation (EU) No 305/2011, under the sole responsibility of the manufacturer identified above.

Signed for and on behalf of Expandet Screw Anchors A/S by:

Place and date of issue: Græsted, 15/07/2014

Peter van der Wel, Managing Director