



**DECLARATION OF PERFORMANCE NR:
DOP fm753crackA4**

Version: V-1.2018

ACCORDING TO THE REGULATION (EU) No 574/2014 OF 21 FEBRUARY 2014r.

1. Unique product type identification code:

FM-753 Crack A4

2. Intended use or uses of the construction product:

Torque controlled expansion anchor made of stainless steel of sizes M8, M10, M12 and M16 for use in concrete

3. Manufacturer:

Friulsider SpA via trieste,1 - 33048 San Giovanni al Natisone (UD) - Italy

4. Authorized representative:

Not applicable

5. System of assessment and verification of constancy of performance:

System 1 according Annex V Regulation No 305/2013 of the European Parliament and of the Council of 9 March 2011 (Construction Product Regulation - CPR)

6. European Assessment Document:

N/A

European technical assessment:

ETA-10/0293 dated 17.07.2015

Technical Assessment Unit:

Slovenian National Building and Civil Engineering Institute nr 1404

Notified body or bodies:

1404,

ZAG - ZAVOD ZA GRADBENISTVO SLOVENIJE

7. Declared performance:

Essential characteristic	Performance	European Technical Specification
Wymiary	According to Annex A1 ETA 10/0293	ETA-10/0293
Characteristic values of tension resistance $N_{R,k}$ [kN]	According to Annex C1 ETA 10/0293	
Characteristic values of shear resistance $V_{R,k}$ [kN]	According to Annex C2 ETA 10/0293	
Characteristic values for resistance in case of Seismic performance category C1-C2	According to Annex C3-C4 ETA 10/0293	
Characteristic resistance under Fire exposure	According to Annex C5 ETA 10/0293	

Table 1.

Declared Performances acc. to ETA-10/0293 - ETAG001 p.1 and 2 Design Method acc.to ETAG001-Annex C or CEN/TS 1992-4						
ESSENTIAL CHARACTERISTICS			PERFORMANCE			
Installation parameters			M8	M10	M12	M16
d_0	Nominal diameter of drill bit	[mm]	8	10	12	16
h_{nom}	Minimum installation depth	[mm]	54	67	81	97
h_{ef}	Effective anchorage depth	[mm]	48	60	72	86
h_{min}	Minimum thickness of the concrete member	[mm]	100	120	150	170
T_{inst}	Nominal torque moment	[Nm]	20	40	60	120
s_{min}	Minimum spacing	[mm]	50	55	60	70
for $c \geq$	Edge distance	[mm]	50	70	80	100
c_{min}	Minimum edge distance	[mm]	50	50	60	70
for $s \geq$	Anchor spacing	[mm]	50	110	120	130
TENSION Steel failure			M8	M10	M12	M16
$N_{Rk,s}$	Tension Steel characteristic failure	[kN]	21	34	49	88
$\gamma_{m,sN}^{1)}$	Partial safety factor for tension steel failure	[-]	1,5			
Pull-out failure			M8	M10	M12	M16
$N_{Rk,p,cr}$	Tension characteristic load in cracked concrete C20/25	[kN]	5	9	12	25
$N_{Rk,p,ucr}$	Tension characteristic load in un-cracked concrete C20/25	[kN]	9	16	20	35
γ_2	Partial safety factor	[-]	1,0			
$\gamma_{mc}^{1)}$	Partial safety factor	[-]	1,5			
$\gamma_{c\ C30/37}$	Increasing factor for concrete C30/37	[-]	1,22			
$\gamma_{c\ C40/50}$	Increasing factor for concrete C40/50	[-]	1,41			
$\gamma_{c\ C50/60}$	Increasing factor for concrete C50/60	[-]	1,55			
Concrete cone failure and Splitting failure			M8	M10	M12	M16
K_{cr}	Factor for cracked concrete ref. CEN/TS 1992-4-4 §. 6.2.1.4	[-]	7,2			
K_{ucr}	Factor for un-cracked concrete ref. CEN/TS 1992-4-4 §. 6.2.1.4	[-]	10,1			
$s_{cr,N}$	Critical spacing for concrete cone failure	[mm]	144	180	220	260
$c_{cr,N}$	Critical edge distance for concrete cone failure	[mm]	72	90	110	130
$s_{cr,sp}$	Critical spacing for splitting failure	[mm]	144	180	220	260
$c_{cr,sp}$	Critical edge distance for splitting failure	[mm]	72	90	110	130
$\gamma_{mc} = \gamma_{msp}^{1)}$	Partial safety factor	[-]	1,5			
Displacement on Tension Load			M8	M10	M12	M16
N_{cr}	Service tension load in cracked concrete C20/25	[kN]	2,4	4,3	5,7	11,9
$\delta_{N0,cr}$	Short term displacement under tension load	[mm]	0,7	0,6	0,7	0,7
$\delta_{N\infty,cr}$	Long term displacement under tension load	[mm]	1,4	1,5	0,9	1,4
N_{ucr}	Service tension load in un-cracked concrete C20/25	[kN]	4,3	7,6	9,5	16,7
$\delta_{N0,ucr}$	Short term displacement under tension load	[mm]	0,3	0,4	0,4	0,3
$\delta_{N\infty,ucr}$	Long term displacement under tension load	[mm]	1,4	1,5	0,9	1,4
SHEAR Steel failure			M8	M10	M12	M16
$V_{Rk,s}$	Shear Steel characteristic failure	[kN]	11,9	18,8	27,4	51,0
K_2	Ductility factor acc.to CEN/TS 1992-4-5 Section § 6.3.2.1	[-]	0,8			
$M_{Rk,s}^0$	Bending Moment characteristic failure	[Nm]	24	49	85	216
$\gamma_{m,sV}^{1)}$	Partial safety factor	[-]	1,3			
Shear Concrete Pry-out failure			M8	M10	M12	M16
k	Factor equation (5.6) of ETAG 001-Annex C, § 5.2.3.3	[-]	1,0	2,0		
k_3	Factor equation (16) of CEN/TS 1992-4-4, § 6.2.2.3	[-]	1,0	2,0		
$\gamma_{mc}^{1)}$	Partial safety factor	[-]	1,5			
Shear Concrete Edge failure			M8	M10	M12	M16
l_f	Effective anchorage length	[mm]	48	60	72	86
d_{nom}	Nominal diameter of anchor	[mm]	8	10	12	16
$\gamma_{mc}^{1)}$	Partial safety factor	[-]	1,5			
Displacement on Shear Load			M8	M10	M12	M16
V	Service shear load in concrete	[kN]	6,5	10,4	15,1	28,0
δ_{V0}	Short term displacement under shear load	[mm]	0,8	0,9	1,2	2,5
$\delta_{V\infty}$	Long term displacement under shear load	[mm]	1,3	1,3	1,8	3,8

¹⁾ In absence of other national regulations.

Table 2.

SEISMIC RESISTANCE Declared Performances acc. to ETA-10/0293 - ETAG001 Annex E						
Design Method according to TR045						
ESSENTIAL CHARACTERISTICS			PERFORMANCE			
SEISMIC RESISTANCE Category C1			M8	M10	M12	M16
$N_{rk,p,seis\ C1}$	Tension charact. load in concrete C20/25 for Seismic Category C1	[kN]	4,1	9	12	25
$\alpha_{mpN,seis}^{2)}$	Partial safety factor for seismic actions under tension load	[-]	1,5			
$V_{rk,s,seis\ C1}$	Shear Steel characteristic failure Seismic for Category C1	[kN]	8	12,3	15,8	36,6
$\alpha_{msV,seis}^{2)}$	Partial safety factor for seismic actions under shear load	[-]	1,3			
SEISMIC RESISTANCE Category C2			M8	M10	M12	M16
$N_{rk,p,seis\ C2}$	Tension charact. load in concrete C20/25 for Seismic Category C2	[kN]	-	2,4	8,8	21,9
$\alpha_{mpN,seis}^{2)}$	Partial safety factor for seismic actions under tension load	[-]	1,5			
$\alpha_{N,seis(DSL)}^{3) 4)}$	Displacement at DSL	[mm]	-	2,9	4,9	6,3
$\alpha_{N,seis(USL)}^{3) 4)}$	Displacement at USL	[mm]	-	15,8	15,7	21,0
$V_{rk,s,seis\ C2}$	Shear Steel characteristic failure for Seismic Category C2	[kN]	-	12,3	15,8	36,6
$\alpha_{msV,seis}^{2)}$	Partial safety factor for seismic actions under shear load	[-]	1,3			
$\alpha_{V,seis(DSL)}^{3) 4)}$	Displacement at DSL	[mm]	-	2,4	5,2	6,0
$\alpha_{V,seis(USL)}^{3) 4)}$	Displacement at USL	[mm]	-	4,1	9,7	10,7

²⁾ The recommended partial safety factors under seismic action ($\alpha_{m,seis}$) are the same as for static loading.

³⁾ The listed displacement represent mean values

⁴⁾ A smaller displacement may be required in the design in the case of displacement sensitive fastenings or "rigid" supports.

The characteristic resistance associated with such smaller displacement may be determined by linear interpolation or proportional reduction.

Table 3.

FIRE RESISTANCE Declared Performances acc. to ETA-10/0293						
Design Method according to TR020						
ESSENTIAL CHARACTERISTICS			PERFORMANCE			
Tension steel failure mode			M8	M10	M12	M16
$N_{Rk,s,fi,R30}$	Characteristic Tension Resistance = 30 min.	[kN]	0,5	1,1	1,8	3,3
$N_{Rk,s,fi,R60}$	Characteristic Tension Resistance = 60 min.	[kN]	0,4	0,9	1,5	2,7
$N_{Rk,s,fi,R90}$	Characteristic Tension Resistance = 90 min.	[kN]	0,3	0,7	1,2	2,2
$N_{Rk,s,fi,R120}$	Characteristic Tension Resistance = 120 min.	[kN]	0,3	0,6	1,0	1,8
$S_{cr,N,fi}$	Critical spacing under fire exposure	[mm]	192	240	288	384
$C_{cr,N,fi}$	Critical edge distance under fire exposure	[mm]	96	120	144	192
S_{min}	Minimum spacing	[mm]	50	50	60	70
C_{min}	Minimum edge distance	[mm]	$C_{min} = 2 h_{ef}$; if fire attack from more than one side, the edge distance of the anchor has to be $\geq 300\text{mm}$ and $\geq 2 h_{ef}$			
$\alpha_{M,fi}^{5)}$	Partial safety factor under fire exposure	[-]	1,0			
Shear steel failure without lever arm						
$V_{Rk,s,fi,R30}$	Characteristic Shear Resistance = 30 min.	[kN]	0,7	1,5	2,5	4,7
$V_{Rk,s,fi,R60}$	Characteristic Shear Resistance = 60 min.	[kN]	0,6	1,2	2,1	3,9
$V_{Rk,s,fi,R90}$	Characteristic Shear Resistance = 90 min.	[kN]	0,4	0,9	1,7	3,1
$V_{Rk,s,fi,R120}$	Characteristic Shear Resistance = 120 min.	[kN]	0,4	0,8	1,4	2,5
Shear steel failure with lever arm						
$M^0_{Rk,s,fi,R30}$	Characteristic Bending Moment = 30 min.	[Nm]	0,7	1,9	3,9	10
$M^0_{Rk,s,fi,R60}$	Characteristic Bending Moment = 60 min.	[Nm]	0,6	1,5	3,3	8,3
$M^0_{Rk,s,fi,R90}$	Characteristic Bending Moment = 90 min.	[Nm]	0,4	1,2	2,6	6,7
$M^0_{Rk,s,fi,R120}$	Characteristic Bending Moment = 120 min.	[Nm]	0,4	1,0	2,1	5,3
Shear concrete pry-out failure						
k	Factor in equation (5.6) of ETAG Annex C § 5.2.3.3	[-]	1,0	2,0		
Shear concrete edge failure						
The characteristic resistance $V^0_{Rk,c,fi}$ in C20/25 to C50/60 concrete is determined by: $V^0_{Rk,c,fi} = 0,25 \times V^0_{Rk,c}$ ($\leq R90$) and $V^0_{Rk,c,fi} = 0,20 \times V^0_{Rk,c}$ (R120) with $V^0_{Rk,c}$ initial value of the characteristic resistance in cracked concrete C20/25 under normal temperature acc. ETAG 001-Annex C, 5.2.3.4.						

⁵⁾ In absence of other national regulations, under fire exposure is recommended the safety factor $\alpha_{M,fi} = 1,0$.

8. Relevant technical documentation or special technical documentation


Not applicable

Performance properties of the product described above are compatible with the set of declared performance characteristics. This declaration of performance is issued in accordance with Regulation (EU) No 305/2011 under the sole responsibility of the manufacturer referred above

On behalf of the producer signed:

Aleksander Stec

in Ornetá, date 28.06.2018


Aleksander Stec
Product Manager
Etanco Sp. z o.o.