ETANCO®

DECLARATION OF PERFORMANCE NR:

DOP fm753crack

Version: V-1.2018

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

1. Unique product type identification code:

FM753 Crack

2. Intended use or uses of the construction product:

Torque controlled expansion anchor made of galvanized carbon steel with additional anti-corrosion coating 3DG of sizes M8, M10, M12, and M16 for use in cracked and un-cracked 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-09/0056 dated 18.07.2017

Technical Assessment Unit:

Scientific and Technical Centre for Building nr 0679

Notified body or bodies:

0679,
CSTB - Centre Scientifique et Technique du Bâtiment

7. Declared performance:

Essential characteristic	Performance	European Technical Specification
Dimension	According to Annex B2 ETA 09/0056	ETA 09/0056
Characteristic values of tension resistance $N_{R,k}$ [kN]	According to Annex C1 ETA 09/0056	
Characteristic values of shear resistance $V_{R,k}$ [kN]	According to Annex C2 ETA 09/0056	
Characteristic resistance under Fire exposure	According to Annex C3-C4 ETA 09/0056	
Characteristic values for resistance in case of Seismic performance category C1-C2	According to Annex C9 ETA 09/0056	

Table 1.

Declared Performances acc. to ETA-09/0056 - EAD 330232-00-0601 (ETAG001 p.1-2) Design Method 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	60	70	80
for $c \geq$	Edge distance	[mm]	65	80	90	120
c_{min}	Minimum edge distance	[mm]	50	60	70	85
for $s \geq$	Anchor spacing	[mm]	75	120	150	170
TENSION Steel failure			M8	M10	M12	M16
$N_{Rk,s}$	Tension Steel characteristic failure	[kN]	23,8	38,7	54,7	98,4
$\gamma_{m,sN}$ [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]	**6**	**12**	**16**	**20**
$N_{Rk,p,ucr}$	Tension characteristic load in **un-cracked concrete** C20/25	[kN]	**9**	**16**	**20**	**35**
γ_2	Partial safety factor	[-]	1,0			
γ_{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]	140	180	220	260
$c_{cr,N}$	Critical edge distance for concrete cone failure	[mm]	70	90	110	130
$s_{cr,sp}$	Critical spacing for splitting failure	[mm]	290	360	430	520
$c_{cr,sp}$	Critical edge distance for splitting failure	[mm]	145	180	215	260
$\gamma_{mc} = \gamma_{msp}$ [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]	**2,9**	**5,7**	**7,6**	**9,5**
$\delta_{N0,cr}$	Short term displacement under tension load	[mm]	1,4	1,2	0,9	0,6
$\delta_{N\infty,cr}$	Long term displacement under tension load	[mm]	1,4	1,2	1,3	0,6
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]	0,1	0,1	0,1	0,1
$\delta_{N\infty,ucr}$	Long term displacement under tension load	[mm]	0,5	0,5	0,5	0,5
SHEAR Steel failure			**M8**	**M10**	**M12**	**M16**
$V_{Rk,s}$	Shear Steel characteristic failure	[kN]	**12,9**	**24,2**	**33,8**	**66,4**
K_2	Ductility factor acc.to CEN/TS 1992-4-5 Section § 6.3.2.1	[-]	0,8			
$M^0_{Rk,s}$	Bending Moment characteristic failure	[Nm]	34	67	118	300
$\gamma_{m,sV}$ [1]	Partial safety factor	[-]	1,5			
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		
γ_{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
γ_{mc} [1]	Partial safety factor	[-]	1,5			
Displacement on Shear Load			M8	M10	M12	M16
V	Service shear load in concrete	[kN]	**6,2**	**11,4**	**16,2**	**31,4**
δ_{V0}	Short term displacement under shear load	[mm]	3,0	3,8	4,1	4,5
$\delta_{V\infty}$	Long term displacement under shear load	[mm]	4,1	5,1	5,5	6,1

[1] In absence of other national regulations.

Table 2.

SEISMIC RESISTANCE Declared Performances acc. to ETA-09/0056 - 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]	**6**	**12**	**16**	**20**
$\gamma_{msN,seis}$ [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]	**7,7**	**17,0**	**30,4**	**57,6**
$\gamma_{msV,seis}$ [2]	Partial safety factor for seismic actions under shear load	[-]	1,5			
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]	-	**3,3**	**11,8**	**20**
$\gamma_{mpN,seis}$ [2]	Partial safety factor for seismic actions under tension load	[-]	1,5			
$\delta_{N,seis\ (DSL)}$ [3] [4]	Displacement at DSL	[mm]	-	2,5	5,0	4,4
$\delta_{N,seis\ (USL)}$ [3] [4]	Displacement at USL	[mm]	-	10,7	20,4	17,8
$V_{rk,s,seis\ C2}$	Shear Steel characteristic failure Seismic for Category **C2**	[kN]	-	**11,9**	**19,3**	**31,2**
$\gamma_{msV,seis}$ [2]	Partial safety factor for seismic actions under shear load	[-]	1,5			
$\delta_{V,seis\ (DSL)}$ [3] [4]	Displacement at DSL	[mm]	-	5,0	7,0	7,0
$\delta_{V,seis\ (USL)}$ [3] [4]	Displacement at USL	[mm]	-	7,1	9,1	6,6

[2] The recommended partial safety factors under seismic action ($\gamma_{m,seis}$) 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-09/0056 Design Method according to TR020						
ESSENTIAL CHARACTERISTICS			**PERFORMANCE**			
FIRE RESISTANCE			**M8**	**M10**	**M12**	**M16**
$F_{Rk,s,fi,R30}$	Characteristic Tensile/Shear Resistance = 30 min.	[kN]	0,4	0,9	1,7	3,1
$F_{Rk,s,fi,R60}$	Characteristic Tensile/Shear Resistance = 60 min.	[kN]	0,3	0,8	1,3	2,4
$F_{Rk,s,fi,R90}$	Characteristic Tensile/Shear Resistance = 90 min.	[kN]	0,3	0,6	1,1	2,0
$F_{Rk,s,fi,R120}$	Characteristic Tensile/Shear Resistance = 120 min.	[kN]	0,2	0,5	0,8	1,6
$M^0_{Rk,s,fi,R30}$	Characteristic Bending Moment = 30 min.	[Nm]	0,4	1,1	2,6	6,7
$M^0_{Rk,s,fi,R60}$	Characteristic Bending Moment = 60 min.	[Nm]	0,3	1,0	2,0	5,0
$M^0_{Rk,s,fi,R90}$	Characteristic Bending Moment = 90 min.	[Nm]	0,3	0,7	1,7	4,3
$M^0_{Rk,s,fi,R120}$	Characteristic Bending Moment = 120 min.	[Nm]	0,2	0,6	1,3	3,3
$\gamma_{M,fi}$ [5]	Partial safety factor under fire exposure	[-]	1,0			
$S_{cr,N,fi}$	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

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

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 Orneta, date 28.06.2018

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