


 1. Identification of the product: **FM753 Crack**

2. Identification code (art. 11.4), for the batch or serial number see packaging:

d <sup>1)</sup>	L <sup>2)</sup> [mm]	t <sub>fix,1</sub> <sup>3)</sup> [mm]	t <sub>fix,2</sub> <sup>4)</sup> [mm]	Marking	ID	Cod.
M8	68	4	18	FM-C 8/4	A	75350b08068
	75	10	24	FM-C 8/10	B	75350b08075
	90	25	39	FM-C 8/25	C	75350b08090
	115	50	64	FM-C 8/50	D	75350b08115
	135	70	84	FM-C 8/70	E	75350b08135
	165	100	114	FM-C 8/100	G	75350b08165
M10	90	10	30	FM-C 10/10	A	75350b10090
	105	25	45	FM-C 10/25	B	75350b10105
	115	35	55	FM-C 10/35	C	75350b10115
	135	55	75	FM-C 10/55	D	75350b10135
	155	75	95	FM-C 10/75	E	75350b10155
	185	105	125	FM-C 10/105	F	75350b10185
M12	110	10	30	FM-C 12/10	A	75350b12110
	120	20	40	FM-C 12/20	B	75350b12120
	145	45	65	FM-C 12/45	C	75350b12145
	170	70	90	FM-C 12/70	D	75350b12170
	200	100	120	FM-C 12/100	E	75350b12120
M16	130	10	30	FM-C 16/10	A	75350b16130
	150	30	50	FM-C 16/30	B	75350b16150
	185	60	80	FM-C 16/60	C	75350b16185
	220	100	120	FM-C 16/100	D	75350b16220

<sup>1)</sup>Nominal diameter of thread; <sup>2)</sup> Length of anchor; <sup>3)</sup> Thickness fixture max for standard embedment; <sup>4)</sup> Thickness fixture max for low embedment.

3. Intended use:

Generic type	Torque controlled expansion anchor throughbolt type
Base material	Cracked and un-cracked concrete C20/25 to C50/60 acc. to EN 206:2013+A1:2016
Material	Steel galvanised ≥8µm acc. to EN ISO 4042 (bolt M8-M10 acc. to EN 10269 and M12-M16 acc. to EN 10263-4)
Durability	Internal dry conditions
Loading	Static, quasi-static and Seismic C1-C2
Fire Resistance	R120
Fire Reaction	A1 according to EN 13501-1

 4. Manufacturer (art. 11.5): **Friulsideer SpA via Trieste, 1 - 33048 San Giovanni al Natisone (UD) - Italy**

 5. Authorised representative (art. 12.2): **Not Relevant**

 6. System of Assessment AVCP (annex V): **System 1**

7/8. Harmonised Specification & Notified Body:	Name of Body	System of Assessment	Reference	EAD / EN Document
Technical Specification Document	CSTB [TAB]	1	<b>ETA-09/0056</b>	<b>EAD 330232-01-0601</b>
Constancy of Performance & FPC	ZAG nr.1404 [NB]	1	1404-CPR-3583	EAD 330232-01-0601

 9. Declared Performance: **See Annexes**

10. The performance of the product identified in points 1 and 2 is in conformity with declared performance in point 9.

This declaration of performance is issued under the sole responsibility of Friulsideer SpA.

Signed for and behalf of the manufacturer by:

Function	Name	Signature	Place and date of issue
Technical Manager	Raffaele Palmieri		San Giovanni al Natisone, 03-01-2023

## ANNEX I°

Declared Performances acc. to **ETA-09/0056 - EAD 330232-01-0601**

Design Method acc. to EN 1992-4

ESSENTIAL CHARACTERISTICS			PERFORMANCE							
			M8		M10		M12		M16	
<b>Installation parameters</b>			M8		M10		M12		M16	
<b>h<sub>ef</sub></b>	Effective anchorage depth	[mm]	<b>34</b>	<b>48</b>	<b>40</b>	<b>60</b>	<b>52</b>	<b>72</b>	<b>66</b>	<b>86</b>
<b>d<sub>0</sub></b>	Nominal diameter of drill bit	[mm]	8		10		12		16	
<b>h<sub>nom</sub></b>	Minimum installation depth	[mm]	40	54	47	67	61	81	77	97
<b>h<sub>min</sub></b>	Minimum thickness of the concrete member	[mm]	80	100	100	120	120	150	150	170
<b>T<sub>inst</sub></b>	Nominal torque moment	[Nm]	20		40		60		120	
<b>S<sub>min</sub></b>	Minimum spacing	[mm]	102	50	180	60	200	70	120	80
	for c ≥ Edge distance	[mm]	51	65	100	80	100	90	120	120
<b>C<sub>min</sub></b>	Minimum edge distance	[mm]	51	50	100	60	100	70	120	85
	for s ≥ Anchor spacing	[mm]	102	75	180	120	200	150	120	170
<b>TENSION Steel failure</b>			M8		M10		M12		M16	
<b>N<sub>Rk,s</sub></b>	Tension Steel characteristic failure	[kN]	23,8		38,7		54,7		98,4	
<b>γ<sub>Ms</sub><sup>1)</sup></b>	Partial safety factor for tension steel failure	[-]	1,5							
<b>Pull-out failure</b>			M8		M10		M12		M16	
<b>h<sub>ef</sub></b>	Effective anchorage depth	[mm]	34	48	40	60	52	72	66	86
<b>N<sub>Rk,p,cr</sub></b>	Tension characteristic load in <b>cracked concrete</b> C20/25	[kN]	<b>1,5</b>	<b>6</b>	<b>4,5</b>	<b>12</b>	<b>6,5</b>	<b>16</b>	<b>19</b>	<b>20</b>
<b>N<sub>Rk,p,ucr</sub></b>	Tension characteristic load in <b>un-cracked concrete</b> C20/25	[kN]	<b>7,5</b>	<b>9</b>	<b>10</b>	<b>16</b>	<b>20</b>	<b>20</b>	<b>30</b>	<b>35</b>
<b>γ<sub>inst</sub></b>	Installation safety factor	[-]	1,0							
<b>ψ<sub>c C30/37</sub></b>	Increasing factor for concrete C30/37	[-]	1,22							
<b>ψ<sub>c C40/50</sub></b>	Increasing factor for concrete C40/50	[-]	1,41							
<b>ψ<sub>c C50/60</sub></b>	Increasing factor for concrete C50/60	[-]	1,55							
<b>Concrete cone failure and Splitting failure</b>			M8		M10		M12		M16	
<b>K<sub>cr,N</sub></b>	Factor for cracked concrete ref. EN 1992-4 § 7.2.1.4	[-]	7,7							
<b>K<sub>ucr,N</sub></b>	Factor for un-cracked concrete ref. EN 1992-4 § 7.2.1.4	[-]	11,0							
<b>S<sub>cr,N</sub></b>	Critical spacing for concrete cone failure	[mm]	102	144	180	180	200	220	198	120
<b>C<sub>cr,N</sub></b>	Critical edge distance for concrete cone failure	[mm]	51	72	100	90	100	110	99	120
<b>S<sub>cr,sp</sub></b>	Critical spacing for splitting failure	[mm]	204	290	240	360	354	430	396	520
<b>C<sub>cr,sp</sub></b>	Critical edge distance for splitting failure	[mm]	102	145	120	180	177	215	198	260
<b>γ<sub>inst</sub></b>	Installation safety factor	[-]	1,0							
<b>Displacement on Tension Load (C20/25)</b>			M8		M10		M12		M16	
<b>N<sub>cr</sub></b>	Service tension load in <b>cracked concrete</b> C20/25	[kN]	<b>0,71</b>	<b>2,86</b>	<b>2,14</b>	<b>5,71</b>	<b>3,10</b>	<b>7,62</b>	<b>9,05</b>	<b>9,52</b>
<b>δ<sub>N0,cr</sub></b>	Short term displacement under tension load	[mm]	0,50	1,40	0,41	1,20	1,05	0,90	2,05	0,60
<b>δ<sub>N∞,cr</sub></b>	Long term displacement under tension load	[mm]	1,45	1,40	1,63	1,20	1,63	1,30	2,05	0,60
<b>N<sub>ucr</sub></b>	Service tension load in <b>un-cracked concrete</b> C20/25	[kN]	<b>3,57</b>	<b>4,29</b>	<b>4,76</b>	<b>7,62</b>	<b>9,52</b>	<b>9,52</b>	<b>14,29</b>	<b>16,67</b>
<b>δ<sub>N0,ucr</sub></b>	Short term displacement under tension load	[mm]	0,03	0,10	0,12	0,10	1,71	0,10	0,06	0,10
<b>δ<sub>N∞,ucr</sub></b>	Long term displacement under tension load	[mm]	1,45	0,50	1,63	0,50	1,66	0,50	2,05	0,50
<b> SHEAR Steel failure</b>			M8		M10		M12		M16	
<b>h<sub>ef</sub></b>	Effective anchorage depth	[mm]	34	48	40	60	52	72	66	86
<b>V<sub>Rk,s</sub></b>	Shear Steel characteristic failure	[kN]	<b>12,9</b>		<b>24,2</b>		<b>33,8</b>		<b>66,4</b>	
<b>k<sub>γ</sub></b>	Ductility factor acc.to CEN/TS 1992-4-5 Section § 6.3.2.1	[-]	1,0							
<b>M<sup>0</sup><sub>Rk,s</sub></b>	Bending Moment characteristic failure	[Nm]	33,4		66,9		117,7		299,1	
<b>γ<sub>Ms</sub><sup>1)</sup></b>	Partial safety factor	[-]	1,5							
<b>Shear Concrete Pry-out failure</b>			M8		M10		M12		M16	
<b>k<sub>8</sub></b>	Factor acc. to EN 1992-4 § 7.2.2.4	[-]	1,0		1,0		2,0		2,0	
<b>γ<sub>inst</sub></b>	Installation safety factor	[-]	1,0							
<b>Shear Concrete Edge failure</b>			M8		M10		M12		M16	
<b>l<sub>f</sub></b>	Effective anchorage length	[mm]	34	48	40	60	52	72	66	86
<b>d<sub>nom</sub></b>	Nominal diameter of anchor	[mm]	8		10		12		16	
<b>γ<sub>inst</sub></b>	Installation safety factor	[-]	1,0							
<b>Displacement on Shear Load</b>			M8		M10		M12		M16	
<b>V</b>	Service shear load in concrete	[kN]	<b>6,14</b>		<b>11,52</b>		<b>16,10</b>		<b>31,62</b>	
<b>δ<sub>V0</sub></b>	Short term displacement under shear load	[mm]	2,50		1,77		1,05		2,19	
<b>δ<sub>V∞</sub></b>	Long term displacement under shear load	[mm]	3,75		2,66		1,58		3,28	

<sup>1)</sup>In absence of other national regulations.<sup>2)</sup> Additional displacement due to anular gap between fastener and is to be taken into account.

## ANNEX II°

**SEISMIC RESISTANCE Declared Performances acc. to ETA-09/0056 - EAD 330232-01-0601**

Design Method according to EN 1992-4

ESSENTIAL CHARACTERISTICS			PERFORMANCE			
<b>SEISMIC RESISTANCE Category C1</b>			<b>M8</b>	<b>M10</b>	<b>M12</b>	<b>M16</b>
$h_{ef}$	Effective anchorage depth	[mm]	48	60	72	86
$N_{Rk,p,C1}$	Tension charact. load in concrete C20/25 for Seismic Category C1	[kN]	6	12	16	20
$\gamma_{inst}$	Installation safety factor	[-]	1,0			
$V_{Rk,s,C1}$	Shear Steel characteristic failure Seismic for Category C1	[kN]	7,7	17,0	30,4	57,6
$\gamma_{Ms,C1}^{3)}$	Partial safety factor for seismic actions	[-]	1,5			
<b>SEISMIC RESISTANCE Category C2</b>			<b>M8</b>	<b>M10</b>	<b>M12</b>	<b>M16</b>
$N_{Rk,p,C2}$	Tension charact. load in concrete C20/25 for Seismic Category C2	[kN]	-	3,3	11,8	20
$\gamma_{inst}$	Installation safety factor	[-]	1,0			
$\delta_{N,C2} (DSL)$	Displacement at DSL	[mm]	-	2,5	5,0	4,4
$\delta_{N,C2} (USL)$	Displacement at USL	[mm]	-	10,7	20,4	17,8
$V_{Rk,s,C2}$	Shear Steel characteristic failure Seismic for Category C2	[kN]	-	11,9	19,3	31,2
$\gamma_{Ms,C2}^{3)}$	Partial safety factor for seismic actions under shear load	[-]	1,5			
$\delta_{V,C2} (DSL)$	Displacement at DSL	[mm]	-	5,0	7,0	7,0
$\delta_{V,C2} (USL)$	Displacement at USL	[mm]	-	7,1	9,1	6,6

<sup>3)</sup> In absence of other national regulations

## ANNEX III°

FIRE RESISTANCE Declared Performances acc. to ETA-09/0056

Design Method according to EN 1992-4

ESSENTIAL CHARACTERISTICS		PERFORMANCE							
FIRE RESISTANCE <sup>4)</sup>		M8		M10		M12		M16	
<b>h<sub>ef</sub></b>	Effective anchorage depth [mm]	34	48	40	60	52	72	66	86
<b>TENSION Steel failure</b>									
<b>N<sub>Rk,s,fi,R30</sub></b>	Characteristic Tensile Resistance = 30 min. [kN]	0,26		0,65		1,22		2,19	
<b>N<sub>Rk,s,fi,R60</sub></b>	Characteristic Tensile Resistance = 60 min. [kN]	0,24		0,56		0,91		1,64	
<b>N<sub>Rk,s,fi,R90</sub></b>	Characteristic Tensile Resistance = 90 min. [kN]	0,18		0,43		0,79		1,42	
<b>N<sub>Rk,s,fi,R120</sub></b>	Characteristic Tensile Resistance = 120 min. [kN]	0,13		0,34		0,61		1,09	
<b>Pull-out failure</b>									
<b>N<sub>Rk,p,fi,R30</sub></b>	Characteristic Tensile Resistance = 30 min. [kN]	0,38	1,50	1,13	3,00	1,63	4,00	4,75	5,00
<b>N<sub>Rk,p,fi,R60</sub></b>	Characteristic Tensile Resistance = 60 min. [kN]								
<b>N<sub>Rk,p,fi,R90</sub></b>	Characteristic Tensile Resistance = 90 min. [kN]								
<b>N<sub>Rk,p,fi,R120</sub></b>	Characteristic Tensile Resistance = 120 min. [kN]	0,30	1,20	0,90	2,40	1,30	3,20	3,80	4,00
<b>Concrete cone failure and Splitting failure <sup>5)</sup></b>									
<b>N<sup>0</sup><sub>Rk,c,fi,R30</sub></b>	Characteristic Tensile Resistance = 30 min. [kN]	1,16	2,75	1,74	4,80	3,36	7,57	6,09	11,81
<b>N<sup>0</sup><sub>Rk,c,fi,R60</sub></b>	Characteristic Tensile Resistance = 60 min. [kN]								
<b>N<sup>0</sup><sub>Rk,c,fi,R90</sub></b>	Characteristic Tensile Resistance = 90 min. [kN]								
<b>N<sup>0</sup><sub>Rk,c,fi,R120</sub></b>	Characteristic Tensile Resistance = 120 min. [kN]	0,93	2,20	1,39	3,84	2,69	6,06	4,87	9,45
<b>S<sub>cr,N,fi</sub></b>	Critical spacing under fire exposure [mm]	136	192	160	240	208	288	264	344
<b>C<sub>cr,N,fi</sub></b>	Critical edge distance under fire exposure [mm]	68	96	80	120	104	144	132	172
<b>SHEAR Steel failure</b>									
<b>V<sub>Rk,s,fi,R30</sub></b>	Characteristic Shear Resistance = 30 min. [kN]	0,37		0,87		1,69		3,14	
<b>V<sub>Rk,s,fi,R60</sub></b>	Characteristic Shear Resistance = 60 min. [kN]	0,33		0,75		1,26		2,36	
<b>V<sub>Rk,s,fi,R90</sub></b>	Characteristic Shear Resistance = 90 min. [kN]	0,26		0,58		1,10		2,04	
<b>V<sub>Rk,s,fi,R120</sub></b>	Characteristic Shear Resistance = 120 min. [kN]	0,18		0,46		0,84		1,57	
<b>M<sup>0</sup><sub>Rk,s,fi,R30</sub></b>	Characteristic Bending Moment = 30 min. [Nm]	0,37		1,12		2,62		6,65	
<b>M<sup>0</sup><sub>Rk,s,fi,R60</sub></b>	Characteristic Bending Moment = 60 min. [Nm]	0,33		0,97		1,96		4,99	
<b>M<sup>0</sup><sub>Rk,s,fi,R90</sub></b>	Characteristic Bending Moment = 90 min. [Nm]	0,26		0,74		1,70		4,32	
<b>M<sup>0</sup><sub>Rk,s,fi,R120</sub></b>	Characteristic Bending Moment = 120 min. [Nm]	0,19		0,60		1,31		3,32	
<b>Shear Concrete Pry-out failure</b>									
<b>k<sub>g</sub></b>	Pry-out factor [-]	1,0		1,0	2,0	1,0	2,0	2,0	
<b>V<sub>Rk,cp,fi,R30</sub></b>	Characteristic Shear Resistance = 30 min. [kN]	1,16	2,75	1,74	4,80	3,36	7,57	12,19	23,62
<b>V<sub>Rk,cp,fi,R60</sub></b>	Characteristic Shear Resistance = 60 min. [kN]								
<b>V<sub>Rk,cp,fi,R90</sub></b>	Characteristic Shear Resistance = 90 min. [kN]								
<b>V<sub>Rk,cp,fi,R120</sub></b>	Characteristic Shear Resistance = 120 min. [kN]	0,93	2,20	1,39	3,84	2,69	6,06	9,75	18,89
<b>Shear Concrete Edge failure</b>									
<b>l<sub>f</sub></b>	Effective length of fastener [mm]	34	48	40	60	52	72	66	86
<b>d<sub>nom</sub></b>	Nominal diameter of anchor [mm]	8		10		12		16	

<sup>4)</sup> EN 1992-4 covers design for fire exposure from one side. For fire attack from more than one side the edge distance must be increased to  $c_{min} \geq 300\text{mm}$  and  $s_{min} \geq 2 \cdot h_{ef}$ .

<sup>5)</sup> As a rule, splitting failure can be neglected when cracked concrete and reinforcement is assumed.

<sup>6)</sup> In absence of other national regulations, under fire exposure is recommended the safety factor  $\gamma_{M,fi} = 1,0$ .