

friulsider**Declaration of Performance****FM753 Nautilus hrg**

Throughbolt anchor made of galvanised steel high corrosion resistance



1. Identification of the product: **FM753 Nautilus hrg**
2. Identification code (art. 11.4), for the batch or serial number see packaging:

d ¹⁾	L ²⁾ [mm]	t _{fix,RED} ³⁾ [mm]	t _{fix,STD} ⁴⁾ [mm]	Marking	ID	Cod.
M6	45	3	-	FM-R 6/3	A	75320c06045
	65	(20)	15	FM-L 6/15	B	75320c06065
	85	(40)	35	FM-L 6/35	C	75320c06085
	100	(55)	50	FM-L 6/50	D	75320c06100
M8	50	5	-	FM-R 8/5	A	75320c08050
	65	(15)	7	FM-L 8/7	B	75320c08065
	75	(25)	15	FM-L 8/15	C	75320c08075
	90	(40)	30	FM-L 8/30	D	75320c08090
	115	(65)	55	FM-L 8/55	E	75320c08115
	135	(85)	75	FM-L 8/75	F	75320c08135
M10	165	(115)	105	FM-L 8/105	G	75320c08165
	60	5	-	FM-R 10/5	A	75320c10060
	75	(20)	5	FM-L 10/5	B	75320c10075
	90	(35)	20	FM-L 10/20	C	75320c10090
	100	(45)	30	FM-L 10/30	I	75320c10100
	120	(65)	50	FM-L 10/50	D	75320c10120
	145	(90)	75	FM-L 10/75	E	75320c10145
M12	170	(115)	100	FM-L 10/100	F	75320c10170
	210	(155)	140	FM-L 10/140	G	75320c10210
	80	7	-	FM-R 12/7	A	75320c12080
	100	(25)	10	FM-L 12/10	B	75320c12100
	110	(35)	20	FM-L 12/20	C	75320c12110
	135	(60)	45	FM-L 12/45	D	75320c12135
	160	(85)	70	FM-L 12/70	E	75320c12160
	185	(115)	100	FM-L 12/100	F	75320c12185
	200	(130)	115	FM-L 12/115	G	75320c12200
	220	(150)	135	FM-L 12/135	H	75320c12220
M16	240	(170)	155	FM-L 12/155	I	75320c12240
	255	(185)	170	FM-L 12/170	L	75320c12255
	285	(215)	200	FM-L 12/200	M	75320c12285
	300	(230)	215	FM-L 12/215	N	75320c12300
	325	(255)	240	FM-L 12/240	P	75320c12325
	355	(285)	270	FM-L 12/270	Q	75320c12355
	110	15	-	FM-R 16/15	P	75320c16110
	125	(30)	10	FM-S 16/10	A	75320c16125
	145	(50)	30	FM-S 16/30	B	75320c16145
	175	(80)	60	FM-S 16/60	C	75320c16175
M20	215	(120)	100	FM-S 16/100	D	75320c16215
	230	(135)	115	FM-S 16/115	E	75320c16230
	250	(155)	135	FM-S 16/135	F	75320c16250
	270	(175)	155	FM-S 16/155	G	75320c16270
	285	(190)	170	FM-S 16/170	H	75320c16285
	320	(225)	205	FM-S 16/205	I	75320c16320
	170	-	30	FM-S 20/30	A	75320c20170
	215	-	75	FM-S 20/75	B	75320c20215
M20	260	-	120	FM-S 20/120	C	75320c20260
	280	-	140	FM-S 20/140	D	75320c20280

¹⁾Nominal diameter of thread; ²⁾Length of anchor; ³⁾Thickness fixture max for reduced embedment; ⁴⁾Thickness fixture max for standard embedment.

3. Intended use:

Generic type	Torque controlled expansion anchor throughbolt type		
Base material	Un-cracked concrete C20/25 to C50/60 acc. to EN 206-1		
Material	----- [Durability]	Steel cl. 5.8 min. as EN ISO 898-1 zinc coated as EN ISO 4042	----- [Internal dry conditions]
Loading	----- [Fire Reaction]	Static and quasi-static	----- [A1 according to EN 13501-1]

4. Manufacturer (art. 11.5): **Friulsider 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 / hEN Document
Technical Specification Document	ZAG [TAB]	1	ETA-13/0367	ETAG001 p.1-2
Constancy of Performance & FPC	ZAG nr.1404 [NB]	1	1404-CPR-2551	ETAG001 p.1

9. Declared Performance: **See Annex**

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 Friulsider SpA. Signed for and behalf of the manufacturer by:

Name and functions	Signature	Place and date of issue
Fabrizio Fasan Sales Manager		San Giovanni al Natisone, 23-06-2017

ANNEX

Declared Performances acc. to ETA-13/0367 - ETAG001 p.1 and 2															
Design method acc. to ETAG001 Annex C or CEN/TS 1992-4															
ESSENTIAL CHARACTERISTICS				PERFORMANCE											
Installation parameters				M6		M8		M10		M12		M16		M20	
d_0	Nominal diameter of drill bit	[mm]		6		8		10		12		16		20	
h_{nom}	Minimum installation depth	[mm]	36	41	38	48	44	59	56	71	76	96	115		
h_{ef}	Effective anchorage depth	[mm]	30 ²⁾	35 ²⁾	30 ²⁾	40	35 ²⁾	50	45	60	65	85	95		
h_{min}	Minimum thickness of the concrete member	[mm]	100		100		100		100		120		130	170	200
T_{inst}	Nominal torque moment	[Nm]	6		15		25		50		100		150		
s_{min}	Minimum spacing	[mm]	45	50	45	55	50	55	120	90	140	130	200		
c_{min}	Minimum edge distance	[mm]	45	50	45	55	50	55	80	90	100	130	145		
Tension Steel failure															
$N_{Rk,s}$	Tension Steel characteristic failure	[kN]	11		17		28		33		72		108		
$\gamma_{m,sV}^{1)}$	Partial safety factor for tension steel failure	[-]	1,5		1,4		1,4		1,4		1,5		1,5		
Pull-out failure C20/25				M6		M8		M10		M12		M16		M20	
$N_{Rk,p,ucr}$	Tension characteristic load in un-cracked concrete	[kN]	5 ²⁾	6 ²⁾	6 ²⁾	12	6 ²⁾	12	12	23 ³⁾	26 ³⁾	35	40		
γ_2	Partial safety factor	[-]	1,0												
$\gamma_{m,c}^{1)}$	Partial safety factor	[-]	1,5												
$s_{cr,N}$	Critical spacing	[mm]	90	105	90	120	105	150	135	180	195	255	290		
$c_{cr,N}$	Critical edge distance	[mm]	45	53	45	60	53	75	80	90	100	130	145		
ψ_c C30/37	Increasing factor for concrete C30/37	[-]	1,07				1,10				1,22				
ψ_c C40/50	Increasing factor for concrete C40/50	[-]	1,14				1,20				1,41				
ψ_c C50/60	Increasing factor for concrete C50/60	[-]	1,20				1,30				1,55				
Splitting failure															
$s_{cr,sp}$	Critical spacing (splitting)	[mm]	90	105	90	120	105	150	135	180	195	255	290		
$c_{cr,sp}$	Critical edge distance (splitting)	[mm]	45	53	45	60	53	75	80	90	100	130	145		
$\gamma_{m,c}^{1)}$	Partial safety factor	[-]	1,5												
Displacement on Tension Load															
N_{ucr}	Service tension load in un-cracked concrete	[kN]	2,4	2,9	2,9	5,7	2,9	5,7	5,7	11,2	12,6	16,7	19,0		
$\delta_{N0,ucr}$	Short term displacement under tension load	[mm]	0,2	0,3	0,1	1,6	0,1	0,4	0,1	0,1	0,1	0,1	0,1		
$\delta_{N\infty,ucr}$	Long term displacement under tension load	[mm]	1,6												
Shear Steel failure				M6		M8		M10		M12		M16		M20	
$V_{Rk,s}$	Shear Steel characteristic failure	[kN]	6,5		9,2		13,9		20,1		42,6		51,5		
$M^0_{Rk,s}$	Bending Moment characteristic failure	[Nm]	12		24		49		72		193		338		
$\gamma_{m,sV}^{1)}$	Partial safety factor for shear steel failure	[-]	1,5												
Shear Concrete Pry-out or Edge failure															
k	Factor equation (5.6) of ETAG, Annex C, § 5.2.3.3	[-]	1,0						2,0						
l_{ef}	Effective anchorage length	[mm]	30	35	30	40	35	50	45	60	65	85	90		
d_{nom}	Nominal diameter of anchor	[mm]	6		8		10		12		16				
$\gamma_m^{1)}$	Partial safety factor ($\gamma_{m,c}=\gamma_{m,pr}$)	[-]	1,5												
Displacement on Shear Load															
V	Service shear load in concrete	[kN]	3,1		4,4		6,6		9,6		20,3		24,5		
δ_{V0}	Short term displacement under shear load	[mm]	2,1		2,0		2,6		2,8		3,0		2,6		
$\delta_{V\infty}$	Long term displacement under shear load	[mm]	3,1		3,1		3,9		4,2		4,4		4,0		

¹⁾ In absence of other national regulations;

²⁾ Use restricted to anchoring of structural components statically indetermined;

³⁾ Pull-out failure not decisive.