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Designated according to Article 29 of Regulation (EU) No 305/2011 and member of EOTA (European Organisation for Technical Assessment).

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European Technical Assessment ETA-09/0067 of 24.02.2015

English version prepared by ZAG

I GENERAL PART

Komercialno ime *Trade name*	**FM-MP3® evo**
Imetnik tehnične ocene *Holder of Technical Assessment*	**FRIULSIDER S.p.A.** **via Trieste 1** **33048 San Giovanni al Natisone (UD)** **Italy**
Družina proizvoda *Product family*	**Torzijsko kontrolirano zatezno galvansko pocinkano kovinsko sidro velikosti M6, M8, M10 in M12 za vgradnjo v nerazpokani beton** *Torque controlled expansion anchor made of galvanised steel of sizes M6, M8, M10 and M12 for use in non-cracked concrete*
Proizvodni obrat *Manufacturing plant*	**FRIULSIDER S.p.A.** **via Trieste 1** **33048 San Giovanni al Natisone (UD)** **Italy**
Ta Evropska tehnična ocena vsebuje *This European Technical Assessment contains*	10 strani vključno s 6 prilogami, ki so sestavni del te ocene *10 pages including 6 annexes, which form an integral part of the document*
Ta Evropska tehnična ocena je izdana na podlagi Uredbe (EU) št. 305/2001 na osnovi *This European Technical Assessment is issued in according to Regulation (EU) No 305/2011, on the basis of*	Smernice za evropska tehnična soglasja ETAG 001 – del 1 in 2, izdaja 2013, ki se uporablja kot EAD *Guideline for European Technical Approval ETAG 001 – part 1 and 2, edition 2013, used as EAD*
Ta ocena zamenjuje *This Assessment replaces*	ETA-09/0067 izdano dne 08.05.2013 *ETA-09/0067 issued on 08.05.2013*

II SPECIFIC PART OF THE EUROPEAN TECHNICAL ASSESSMENT

1 Technical description of the product

The FM-MP3® evo in the range of M6, M8, M10 and M12 is an anchor made of galvanised steel, which is placed into a drilled hole and anchored by torque-controlled expansion.

For the installed anchor see Figure given in Annex A1.

2 Specification and intended use

The performances given in Chapter 3 are only valid if the anchor is used in compliance with the specifications and conditions given in Annex B.

The provisions made in this European Technical Assessment are based on an assumed working life of the anchor of 50 years. The indications given on the working life cannot be interpreted as a guarantee given by the manufacturer, but are to be regarded only as a means for choosing the right products in relation to the expected economically reasonable working life of the works.

3 Performance of the product and references to the methods used for this assessment

3.1 Mechanical resistance and stability (BWR 1)

The basic work requirements for mechanical resistance and stability are listed in Annexes C1 and C2.

3.2 Safety in case of fire (BWR 2)

No performance determined.

3.3 Hygiene, health and environment (BWR 3)

Regarding dangerous substances contained in this European Technical Assessment, there may be requirements applicable to the products falling within its scope (e.g. transported European legislation and national laws, regulations and administrative provisions). In order to meet provisions of the regulation (EU) No 305/2011, these requirements need also to be complied with, when they apply.

3.4 Safety in use (BWR 4)

For basic work requirement safety in use the same criteria are valid as for basic work requirement mechanical resistance and stability.

3.5 Protection against noise (BWR 5)

Not relevant.

3.6 Energy economy and heat retention (BWR 6)

Not relevant.

3.7 Sustainable use of natural resources (BWR 7)

No performance determined.

3.8 General aspects relating to fitness for use

Durability and serviceability are only ensured if specifications of intended use according to Annex B1 are kept.

4 Assessment and verification of constancy of performance

According to the decision 96/582/EC of the European Commission[1] the system of assessment and verification of constancy of performance (see Annex V to regulation (EU) No 305/2011) given in the following table apply.

Product	Intended use	Level of class	System
Metal anchors for use in concrete	For fixing and/or supporting to concrete, structural elements (which contributes to the stability of the works) or heavy units	-	1

5 Technical details necessary for the implementation of the AVCP system

5.1 Tasks for the manufacturer

The manufacturer shall exercise permanent internal control of production of concerned product. All the elements, requirements and provisions adopted by the manufacturer shall be documented in a systematic manner in the form of written policies and procedures, including records of results performed. This production control system shall ensure that the product is in conformity with this European Technical Assessment.

The manufacturer may only use raw materials stated in the technical documentation of this European Technical Assessment.

The factory production control shall be in accordance with the Control plan which is a part of the technical documentation of this European Technical Assessment. The Control plan[2] is laid down in the context of the factory production control system operated by the manufacturer and deposited at Slovenian National Building and Civil Engineering Institute (ZAG Ljubljana). The results of factory production Control shall be recorded and evaluated in accordance with the provisions of the control plan.

The manufacturer shall, on the basis of a contract, involve a body, which is notified for the tasks referred to in a section 4 in the field of anchors in order to undertake the actions laid down in section 5.2. For this purpose the Control plan referred to in sections 5.1 and 5.2 shall be handed over by the manufacturer to the notified body involved.

The manufacturer shall make a Declaration of performance, stating that the construction product is in conformity with the provisions of this European Technical Assessment.

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1 Official Journal of the European Communities L 254 of 8.10.1996

2 The Control plan is a confidential part of the technical documentation of this European Technical Assessment, but not published together with the ETA, and handed over only to the notified body or bodies involved in the procedure of attestation of conformity.

5.2 Tasks for the notified bodies

The notified body shall retain the essential points of its actions defined in Annex V of Regulation (EU) No. 305/2011 for system 1 and state results obtained and conclusions drawn in a written report.

The notified certification body involved by the manufacturer shall issue an EC certificate of constancy of performance the product stating the conformity with the provisions of this European Technical Assessment.

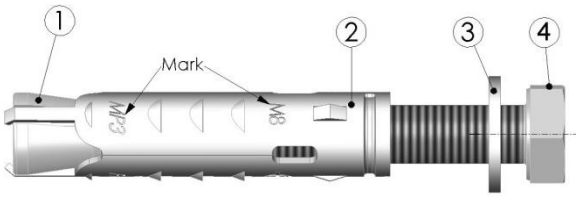
In cases where the provisions of the European Technical Assessment and its Control plan are no longer fulfilled the notified body shall withdraw the certificate of constancy of performance and inform the Slovenian National Building and Civil Engineering Institute (ZAG Ljubljana) without delay.

Issued in Ljubljana on 24.02.2015

Signed by:

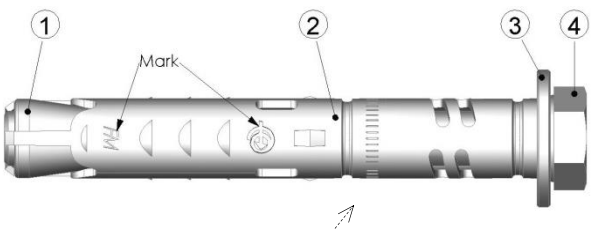
Franc Capuder, M.Sc., Research Engineer

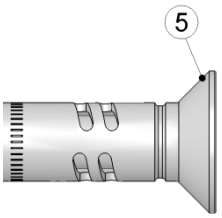
Head of Service of TAB



1 cone
2 sleeve
3 washer
4 hexagonal screw
5 countersunk screw

Figure A1: FM-MP3®evo anchor





Note for FM-MP3®evo LONG:
- Minimum embedded and maximum thickness fixture -

Figure A2: FM-MP3®evo LONG anchor

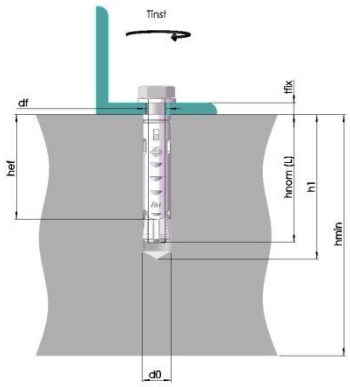


Figure A3: Installed FM-MP3®evo anchor

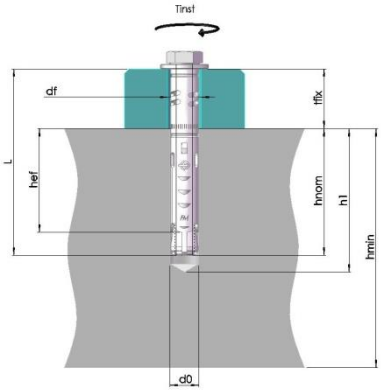


Figure A4: Installed FM-MP3®evo LONG-S anchor

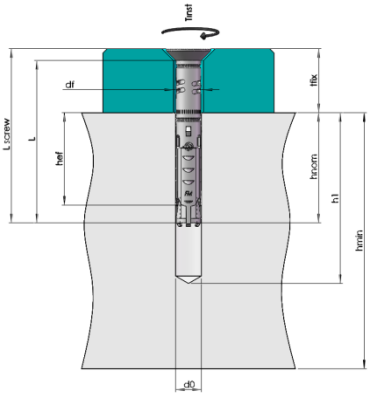


Figure A5: Installed FM-MP3®evo LONG-SK anchor

FM-MP3® evo	
Product description Product and intended use	**Annex A1**

Table A1: Dimensions of different parts of an anchor

Anchor type	h_{nom} (mm)	L (mm)	d (mm)	d_0 (mm)	L_{screw} (mm)
FM-MP3® evo M6	45	45	6	10	(1)
FM-MP3® evo M8	50	50	8	12	(1)
FM-MP3® evo M10	60	60	10	15	(1)
FM-MP3® evo M12	80	80	12	18	(1)
FM-MP3® evo LONG-S M6	45	70	6	10	70
FM-MP3® evo LONG-S M8	50	75	8	12	80
FM-MP3® evo LONG-S M10	60	85	10	15	90
FM-MP3® evo LONG-S M12	80	105	12	18	110
FM-MP3® evo LONG-SK M6	45	70	6	10	75
FM-MP3® evo LONG-SK M8	50	75	8	12	80
FM-MP3® evo LONG-SK M10	60	85	10	15	90
FM-MP3® evo LONG-SK M12	80	105	12	18	110

h_{nom} = overall embedment depth in the concrete
L = length of anchor
d = diameter of the threaded part of the screw
d_0 = nominal diameter of drill bit and external diameter of the sleeve
L_{screw} = length of the screw
(1) not prescribed by the producer

Table A2: Materials

Part	Description	Material	Protection
1	Cone	Machined or cold formed carbon steel EN 10277	galvanised min. 5μm
2	Sleeve	Cold formed carbon steel EN 10130	galvanised min. 8μm
3	Washer for FM-MP3®evo	Steel to DIN 125-1	galvanised min. 5μm
	Washer for FM-MP3®evo LONG-S	Steel to EN 10139	galvanised min. 5μm
4	Hexagonal screw	Steel to DIN 933, grade 8.8	galvanised min. 5μm
5	Countersunk screw	Steel grade 8.8	galvanised min. 5μm

FM-MP3® evo	**Annex A2**
Product description Product and materials	

Specifications of intended use

Anchorages subjected to:

- Static, quasi static load.

Base materials:

- Non-cracked concrete.
- Reinforced and unreinforced normal weight concrete of strength class C20/25 at minimum and C50/60 at maximum according to EN 206-1:2000/A2:2005.

Use conditions (Environmental conditions):

- The anchor may be used in concrete subject to dry internal conditions

Design:

- Anchorages are designed under the responsibility of an engineer experienced in anchorages and concrete work.
- Anchorages under static and quasi-static actions are designed in accordance with ETAG 001, Annex C, design method A, Edition August 2010 or CEN/TS 1992-4-4.
- Verifiable calculation notes and drawings are prepared taking into account of the load to be anchored. The position of the anchor is indicated on the design drawings (e.g. position of the anchor relative to reinforcement or to supports, etc.).

Installation:

- Anchor installation carried out by appropriately qualified personnel and under the supervision of the person responsible for technical matters on the site.
- Use of the anchor only as supplied by the manufacturer without exchanging the components of an anchor.
- Anchor installation in accordance with the manufacturer's specifications and drawings using the appropriate tools.
- Thickness of the fixture corresponding to the range of required thickness values for the type of anchor.
- Checks before placing the anchor to ensure that the strength class of the concrete in which the anchor is to be placed is in the rang given and is not lower that of the concrete to which the characteristic loads apply for.
- Check of concrete being well compacted, e.g. without significant voids.
- Cleaning of the hole of drilling dust.
- Anchor installation ensuring the specified embedment depth.
- Keeping of the edge distance and spacing to the specified values without minus tolerances.
- Positioning of the drill holes without damaging the reinforcement.
- In case of aborted hole: new drilling at a minimum distance away of twice the depth of the aborted hole or smaller distance if the aborted drill hole is filled with high strength mortar and if under shear or oblique tension load it is not to the anchor in the direction of load application.
- Application of the torque moment given in Annex 3 using a calibrated torque wrench.

FM-MP3® evo	**Annex B1**
Intended use Specification	

Table B1: Installation data for FM-MP3® evo

Anchor type		M6	M8	M10	M12
Nominal diameter of drill bit	d_0 [mm]	10	12	15	18
Diameter of clearance hole in the fixture	d_f [mm]	8	10	12	14
Depth of drill hole	$h_1 \geq$ [mm]	60	70	70	100
Minimum thickness of the member	h_{min} [mm]	100	100	100	140
Effective anchorage depth	h_{ef} [mm]	36	43	50	69
Torque moment	T_{inst} [Nm]	8	15	30	50
Thickness of fixture-maximum	t_{fix} [mm]	(2)	(2)	(2)	(2)

(2) $t_{fix} = L_{screw} - h_{nom}$

Table B2: Installation data for FM-MP3® evo LONG-S and FM-MP3® evo LONG-SK

Anchor type		M6	M8	M10	M12
Nominal diameter of drill bit	d_0 [mm]	10	12	15	18
Diameter of clearance hole in the fixture	d_f [mm]	12	14	17	20
Depth of drill hole	$h_1 \geq$ [mm]	60	70	70	100
Minimum thickness of the member	h_{min} [mm]	100	100	100	140
Effective anchorage depth	h_{ef} [mm]	36	43	50	69
Torque moment	T_{inst} [Nm]	8	15	30	50
Thickness of fixture-maximum LONG-S	t_{fix} [mm]	25			
Thickness of fixture-maximum LONG-SK	t_{fix} [mm]	30			

FM-MP3® evo	
Intended use Installation data	**Annex B2**

Table C1: **Characteristic values for Tension loads in case of static and quasi-static loading for design method A acc. ETAG 001-Annex C or CEN/TS1992-4-4**

Essential characteristics			Performance			
			M6	M8	M10	M12
Installation parameters						
d_0	Nominal diameter of drill bit	[mm]	10	12	15	18
h_{ef}	Effective anchorage depth	[mm]	36	43	50	69
h_{min}	Minimum thickness of concrete member	[mm]	100	100	100	140
T_{inst}	Torque moment	[Nm]	8	15	30	50
s_{min}	Minimum spacing	[mm]	35	45	50	75
c_{min}	Minimum edge distance	[mm]	35	45	50	75
Tension steel failure mode						
$N_{Rk,s}$	Characteristic tension steel failure	[kN]	16	29	46	67
γ_{MsN}	Partial safety factor	[-]	1,50			
Pull-out failure mode						
$N_{Rk,p}$	Characteristic pull-out failure in non-cracked concrete	[kN]	7,5	12	[1]	25
γ_2	Partial safety factor	[-]	1,0			
γ_{Mp}		[-]	1,5			
$s_{cr,N}$	Characteristic spacing	[mm]	108	129	150	207
$c_{cr,N}$	Characteristic edge distance	[mm]	54	65	75	104
ψ_C **C30/37**	Increasing factor for $N_{Rk,p}$ in non-cracked concrete	[-]	1,22			
ψ_C **C40/50**		[-]	1,41			
ψ_C **C50/60**		[-]	1,55			
Concrete Cone failure mode						
k_{ucr}	Factor for non-cracked concrete CEN/TS 1992-4-4 §. 6.2.1.4	[-]	10,1			
γ_{Mc}	Partial safety factor	[-]	1,5			
Splitting failure mode						
$s_{cr,sp}$	Characteristic spacing	[mm]	216	258	300	414
$c_{cr,sp}$	Characteristic edge distance	[mm]	108	130	150	208
γ_{Msp}	Partial safety factor	[-]	1,5			
Displacement under tension load						
Non-cracked concrete C20/25						
N	Service tension load	[kN]	3,6	5,7	8,5	11,9
δ_{N0}	Short term displacement	[mm]	0,12	0,11	0,27	0,37
$\delta_{N\infty}$	Long term displacement	[mm]	0,95	0,95	0,95	0,95

[1] Pull – out failure not decisive

FM-MP3® evo

Design acc. to ETAG 001-Annex C or CEN/TS 1992-4-4
Characteristic resistance under Tension loads – BWR 1

Annex C1

Table C2: **Characteristic values for Shear loads in case of static and quasi-static loading for design method A acc. ETAG 001-Annex C or CEN/TS 1992-4-4**

Essential characteristics			Performance			
			M6	M8	M10	M12
Shear steel failure						
$V_{Rk,s}$	Characteristic shear steel failure	[kN]	6,4	14,4	23,2	33,7
$M^0_{Rk,s}$	Bending moment characteristic failure	[Nm]	12	30	60	105
K_2	Factor considering ductility	[-]	0,8			
γ_{MsV}	Partial safety factor	[-]	1,25			
Shear concrete pry-out and edge failure						
k	Factor in equation (5.6) of ETAG 001 Annex C § 5.2.3.3	[mm]	1,0			2,0
K_3	Factor in equation (16) of CEN/TS 1992-4-4 § 6.2.2.3	[mm]	1,0			2,0
l_{ef}	Effective anchorage depth	[mm]	36	43	50	69
d_{nom}	Diameter of anchor	[mm]	10	12	15	18
γ_{Mc}	Partial safety factor	[-]	1,5			
Displacement under shear load						
V	Service shear load	[kN]	3,7	8,2	13,3	19,3
δ_{V0}	Short term displacement	[mm]	0,96	2,95	2,42	3,94
$\delta_{V\infty}$	Long term displacement	[mm]	1,40	4,42	3,63	5,91

FM-MP3® evo

Design acc. to ETAG 001-Annex C or CEN/TS 1992-4-4
Characteristic resistance under Shear loads – BWR 1

Annex C2