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European Technical Assessment

ETA-24/0703
of 26.9.2024

English version prepared by ZAG

General Part

**Technical Assessment Body issuing the
European Technical Assessment**

ZAG

Trade name of the construction product

BARACO/M FM-753 evo ZN

**Product family to which the construction
product belongs**

**33: Torque controlled expansion
anchor made of zinc coated steel
for use in non-cracked concrete**

Manufacturer

**SAS ATELIERS LR ETANCO PARC DES
ERABLES - BATIMENT 1
66 Route de Sartrouville-BP49
FR-78231 Le Pecq Cedex
France
www.etanco.fr**

Manufacturing plant

PLANT 1

**This European Technical Assessment
contains**

**9 pages including 3 annexes, which form an
integral part of the document**

**This European Technical Assessment is
issued in according to Regulation (EU)
No 305/2011, on the basis of**

**EAD 330232-01-0601,
edition December 2019**

Translations of this European Technical Assessment in other languages shall fully correspond to the original issued document and should be identified as such.

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Specific Parts

1 Technical description of the product

The BARACO/M FM-753 evo ZN of sizes M6, M8, M10, M12 and M16 is an anchor made of galvanised steel, which is placed into a drilled hole and anchored by torque-controlled expansion.

The product description is given in Annex A (1/2) and A (2/2).

2 Specification of the intended use(s) in accordance with the applicable European Assessment Document (hereinafter EAD)

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 C (1/2) and C (2/2).

3.2 Safety in case of fire (BWR 2)

No performance assessed.

3.8 General aspects relating to fitness for use

Durability and serviceability are only ensured if specifications of intended use according to Annex B (1/2), B(2/3) and B(3/3) are kept.

4 Assessment and verification of constancy of performance (hereinafter AVCP) system applied, with reference to its legal base

According to the decision 96/582/EC of the European Commission¹ the system of assessment and verification of constancy of performance (see Annex V to regulation (EU) No 305/2011) 1 apply.

5 Technical details necessary for the implementation of the AVCP system, as provided for on the applicable EAD

Technical details necessary for the implementation of the AVCP system are laid down in chapter 3 of EAD 330232-01-0601.

Issued in Ljubljana on 26.9.2024

Signed by: 

Franc Capuder, M.Sc., Research Engineer

Head of Service of TAB

¹ Official Journal of the European Communities L 254 of 8.10.1996

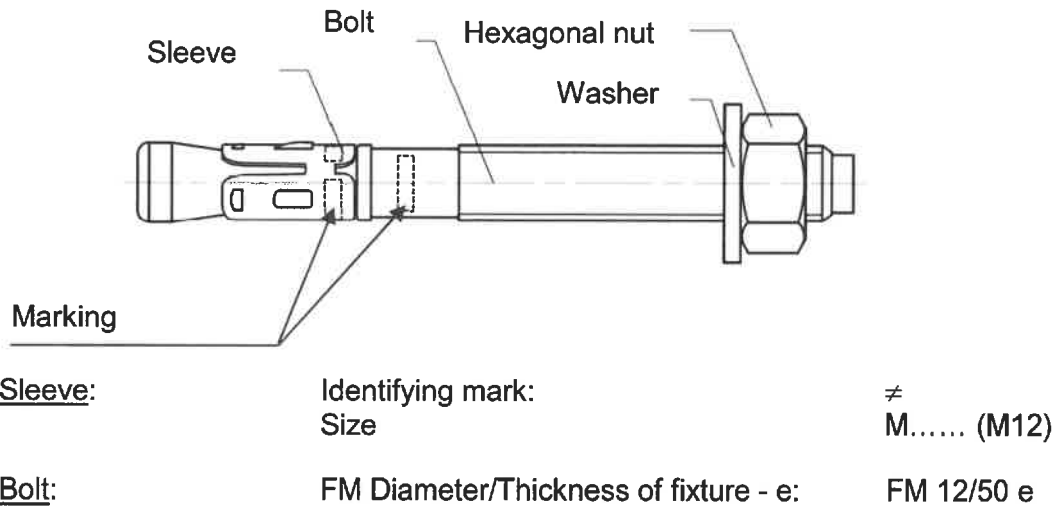


Figure A1: BARACO/M FM-753 evo ZN anchor

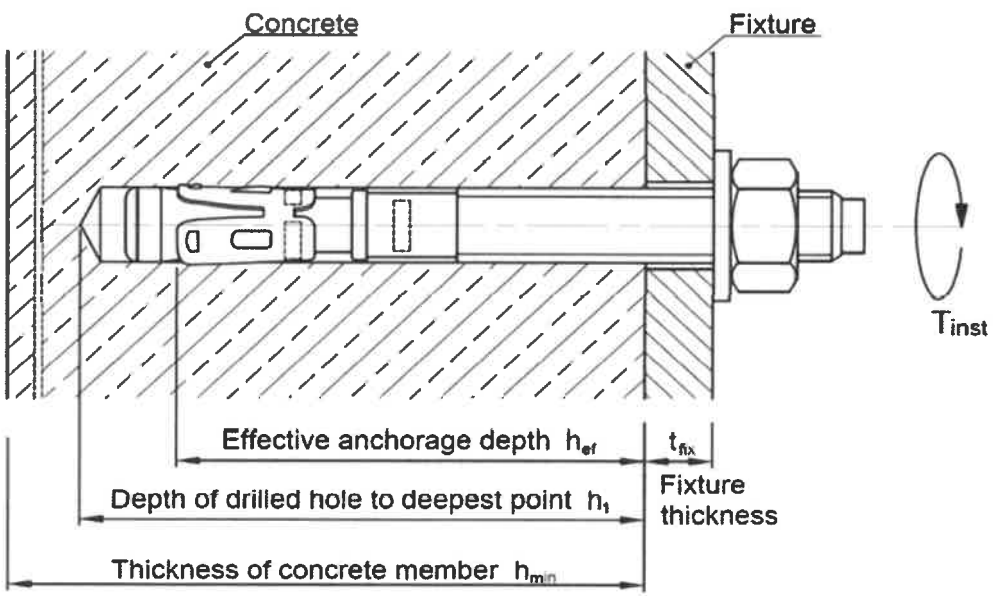


Figure A2: Installed BARACO/M FM-753 evo ZN anchor

BARACO/M FM-753 evo ZN	Annex A (1/2)
Product description Product, marking and installation condition	

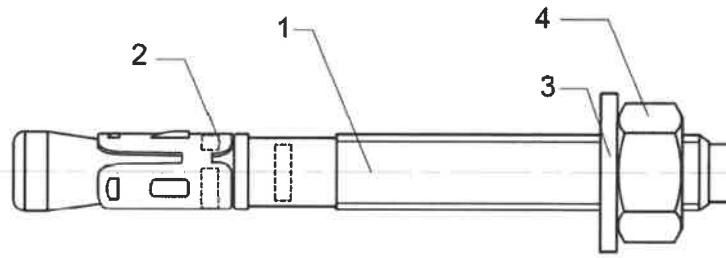


Table A1: Materials

Part	Component	Material ¹⁾
1	Bolt	Carbon steel, turned and cold formed
2	Sleeve	Carbon steel streep, cold formed
3	Washer	Steel; DIN 125 (EN ISO 7089), DIN 440 (EN ISO 7094) DIN 9021 (EN ISO 7093)
4	Hexagonal nut	Steel DIN 934 (EN ISO 4032, . Property class 8 acc. EN 20898-2

¹⁾ zinc electroplated $\geq 5 \mu\text{m}$ according to EN ISO 4042; passivated

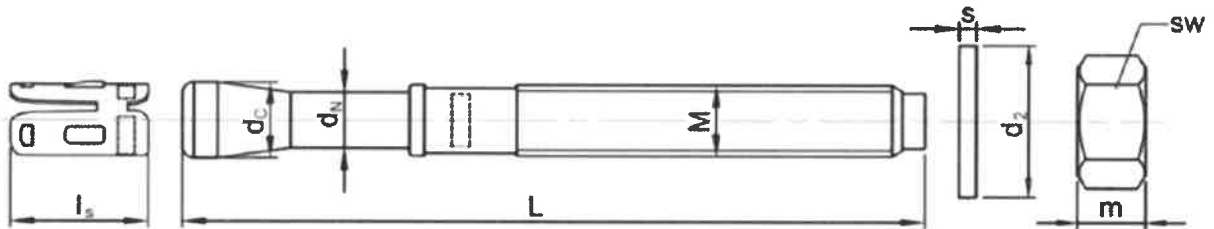


Table A2: Dimensions

Anchor type / size	L	M	d _c	d _N	l _s	s	d ₂	m	SW
	[mm]		[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
BARACO/M FM-753 evo ZN/6	t _{fix} +55	M6	6,00	4,3	12,5	≥1,6	≥12	5,0	10
BARACO/M FM-753 evo ZN/8	t _{fix} +63	M8	8,00	5,9	15,0	≥1,6	≥16	6,5	13
BARACO/M FM-753 evo ZN/10	t _{fix} +73	M10	10,00	7,6	16,8	≥2,0	≥20	8,0	17 (16)
BARACO/M FM-753 evo ZN/12	t _{fix} +99	M12	11,95	8,8	20,0	≥2,5	≥24	10,0	19 (18)
BARACO/M FM-753 evo ZN/16	t _{fix} +121	M16	15,95	12,0	22,6	≥3,0	≥30	13,0	24

BARACO/M FM-753 evo ZN

Product description
Dimensions and materials

Annex A (2/2)

Specifications of intended use

Anchorage subjected to:

- Static and quasi static action.

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 206:2013+A2:2021.

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 EN 1992-4:2018.
- 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:


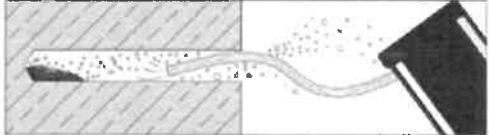
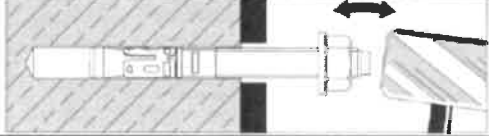
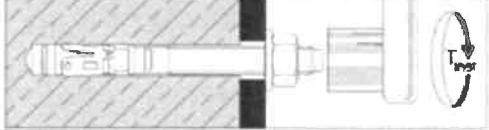
- Anchor installation carried out by appropriately qualified personnel and under supervision of the person responsible for technical matters of the site.
- Use of the anchor only supplied by the manufacturer without exchanging the components of an anchor.
- Anchor installation in accordance with the manufacturer's specification and drawings and using the appropriate tools.
- 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 range given and is not lower than that of the concrete to which the characteristic loads apply for.
- Check of concrete being well compacted, e.g. without significant voids.
- Effective anchorage depth, edge distances and spacing not less than the specified values without minus tolerances.
- Hole drilling by hammer drill.
- Cleaning of the hole of drilling dust.
- Positioning of the drill holes without damaging the reinforcement.
- Application of specified torque moment using a calibrated torque wrench.
- In case of aborted hole, drilling of new hole at a minimum distance of twice the depth of the aborted hole, or smaller distance provided the aborted drill hole is filled with high strength mortar and no shear or oblique tension loads in the direction of aborted hole.

BARACO/M FM-753 evo ZN	Annex B (1/3)
Intended use Specifications	

Table B1: Installation data

BARACO/M FM-753 evo ZN			Anchor size				
			M6	M8	M10	M12	M16
Max. total length	L	[mm]	100	163	233	369	321
Diameter of drill bit	d ₀	[mm]	6	8	10	12	16
Cutting diameter at the upper tolerance limit	d _{cut,max} ≤	[mm]	6,45	8,45	10,45	12,50	16,50
Effective anchorage depth	h _{ef}	[mm]	40	45	50	65	80
Depth of drilled hole	h ₁ ≤	[mm]	55	65	70	90	110
Diameter of clearance hole	d _f ≤	[mm]	7	9	12	14	18
Maximum thickness of the fixture	t _{fix,max}	[mm]	45	100	160	270	200
Installation torque	T _{inst}	[Nm]	8	15	30	50	100
Width across flats	SW	[mm]	10	13	17(16)	19(18)	24
Minimum thickness of concrete member	h _{min}	[mm]	100	100	100	130	160
Minimum spacing	s _{min}	[mm]	30	40	50	70	90
Minimum edge distance	c _{min}	[mm]	40	40	50	70	90

BARACO/M FM-753 evo ZN	Annex B (2/3)
Intended use Installation data minimum spacing and edge distance	

	<p>Drill hole perpendicular to concrete surface.</p>
	<p>Blow out dust. Alternatively vacuum cleaning down to the bottom of the hole.</p>
	<p>Insert the anchor through the fixture.</p>
	<p>Apply installation torque T_{inst} using an calibrated torque-wrench.</p>

<p>BARACO/M FM-753 evo ZN</p>	<p>Annex B (3/3)</p>
<p>Intended use Installation instructions</p>	

Table C1: Characteristic values for tension loads in case of static and quasi-static loading for design method A acc. to EN 1992-4:2018

Essential characteristics			Performance				
			M6	M8	M10	M12	M16
Installation parameters							
d_0	Nominal diameter of drill bit	[mm]	6	8	10	12	16
h_{ef}	Effective anchorage depth	[mm]	40	45	50	65	80
h_{min}	Minimum thickness of concrete member	[mm]	100	100	100	130	160
T_{inst}	Torque moment	[Nm]	8	15	30	50	100
s_{min}	Minimum spacing	[mm]	30	40	50	70	90
c_{min}	Minimum edge distance	[mm]	40	40	50	70	90
Steel failure mode							
$N_{Rk,s}$	Characteristic tension steel failure	[kN]	10,9	20,5	32,3	45,6	79,2
γ_{MeN}	Partial safety factor	[-]	1,4				
Pull-out failure mode							
$N_{Rk,p}$	Characteristic pull-out failure in non-cracked concrete	[kN]	6,0	12,0	17,4	25,8	35,2
γ_{inst}	Partial safety factor	[-]	1,0				
γ_{Mp}		[-]	1,5				
$s_{cr,N}$	Characteristic spacing	[mm]	3 x h_{ef}				
$c_{cr,N}$	Characteristic edge distance	[mm]	1,5 x h_{ef}				
ψ_c C30/37	Increasing factor for $N_{Rk,p}$ in non-cracked concrete	[-]	1,01	1,04	1,22	1,21	1,15
ψ_c C40/50		[-]	1,01	1,06	1,41	1,39	1,27
ψ_c C50/60		[-]	1,02	1,09	1,58	1,55	1,38
Concrete Cone failure mode							
k_{ucr}	Factor for un-cracked concrete EN 1992-4:2018 § 7.2.1.4	[-]	11				
γ_{Mc}	Partial safety factor	[-]	1,5				
Splitting failure mode							
$s_{cr,sp}$	Characteristic spacing	[mm]	160	225	250	360	400
$c_{cr,sp}$	Characteristic edge distance	[mm]	80	112,5	125	180	200
γ_{Msp}	Partial safety factor	[-]	1,5				
Displacement under tension load							
Non-cracked concrete C20/25							
N	Service tension load	[kN]	3,1	6,1	8,9	13,2	18,0
δ_{N0}	Short term displacement	[mm]	0,08	0,14	0,15	1,15	0,14
$\delta_{N\infty}$	Long term displacement	[mm]	3,19	3,19	3,19	3,19	3,19

BARACO/M FM-753 evo ZN

Performance

Characteristic resistance under tension load

Annex C (1/2)

Table C2: Characteristic values for shear loads in case of static and quasi-static loading for design method A acc. to EN 1992-4:2018

Essential characteristics			Performance				
			M6	M8	M10	M12	M16
Steel failure without lever arm							
$V_{Rk,s}$	Characteristic resistance	[kN]	6,4	9,9	17,4	25,1	46,9
γ_{Ms}	Partial safety factor	[Nm]	1,25				
k_7	Factor for considering ductility	[-]	1,0				
Steel failure with lever arm							
$M^0_{Rk,s}$	Characteristic resistance	[Nm]	11	28	56	98	233
γ_{Ms}	Partial safety factor	[mm]	1,25				
Concrete pryout failure							
k_8	k-factor	[-]	1,0			2,0	
γ_{Mc}	Partial safety factor	[-]	1,5				
Concrete edge failure							
l_{ef}	Effective length of anchor under shear load	[mm]	40	45	50	65	80
d_{nom}	Outside diameter of anchor	[mm]	6	8	10	12	16
γ_{Mc}	Partial safety factor	[-]	1,5				
Displacement under shear load							
V	Service shear load	[kN]	3,6	5,6	9,9	16,4	26,8
δ_{V0}	Short term displacement	[mm]	0,84	1,06	3,40	1,56	2,18
$\delta_{V\infty}$	Long term displacement	[mm]	1,26	1,59	5,10	2,34	3,27

BARACO/M FM-753 evo ZN

Performance

Characteristic resistance under shear load

Annex C (2/2)