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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-19/0403 of 28/06/2019

General Part

Technical Assessment Body issuing the European Technical Assessment	Instytut Techniki Budowlanej
Trade name of the construction product	FPN-CE7
Product family to which the construction product belongs	Torque controlled expansion anchor of sizes M6, M8, M10, M12 and M16 for use in non-cracked concrete
Manufacturer	UNIFIX SWG – S.r.l. Via Enzenberg 2 39018 Terlano (BZ) Italy
Manufacturing plant	UNIFIX Plant 1
This European Technical Assessment contains	11 pages including 3 Annexes which form an integral part of this assessment
This European Technical Assessment is issued in accordance with Regulation (EU) No 305/2011, on the basis of	European Assessment Document (EAD) 330232-00-0601 “Mechanical fasteners for use in concrete”

Specific Part

1 Technical description of the product

The anchor FPN-CE7 in the sizes of M6, M8, M10, M12 and M16 is an anchor made of galvanized steel which is placed into a drill hole and anchored by torque-controlled expansion.

The description of the product is given in Annex.

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

The performances given in Section 3 are only valid if the anchors are used in compliance with the specifications and conditions given in Annex B.

The performances given 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 producer or the Technical Assessment Body, 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 its assessment

3.1 Performance of the product

3.1.1 Mechanical resistance and stability (BWR 1)

Essential characteristic	Performance
Characteristic tension resistance (static and quasi-static loading) and displacements	See Annex C1
Characteristic shear resistance (static and quasi-static loading) and displacements	See Annex C2

3.1.2 Safety in case of fire (BWR 2)

Essential characteristic	Performance
Reaction to fire	Anchors satisfy requirements for Class A1
Resistance to fire	No performance assessed

3.2 Methods used for the assessment

The assessment of fitness of the product has been made in accordance with the European Assessment Document EAD 330232-00-0601 “Mechanical fasteners for use in concrete”.

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

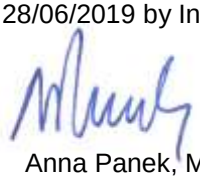
According to Decision 96/582/EC of the European Commission the system 1 of assessment and verification of constancy of performance (see Annex V to Regulation (EU) No 305/2011) applies.

5 Technical details necessary for the implementation of the AVCP system, as provided for in the applicable European Assessment Document (EAD)

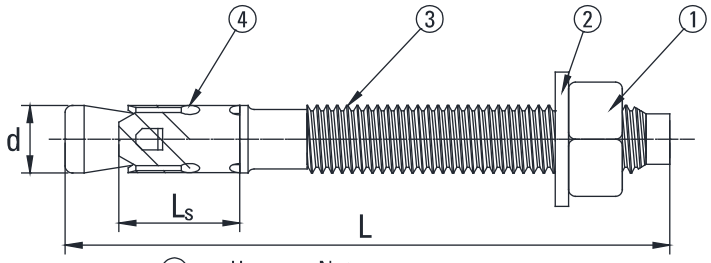
Technical details necessary for the implementation of the AVCP system are laid down in the control plan which is deposited at Instytut Techniki Budowlanej.

For type testing the results of the tests performed as part of the assessment for the European Technical Assessment shall be used unless there are changes in the production line or plant. In such cases the necessary type testing has to be agreed between Instytut Techniki Budowlanej and the notified body.

Issued in Warsaw on 28/06/2019 by Instytut Techniki Budowlanej

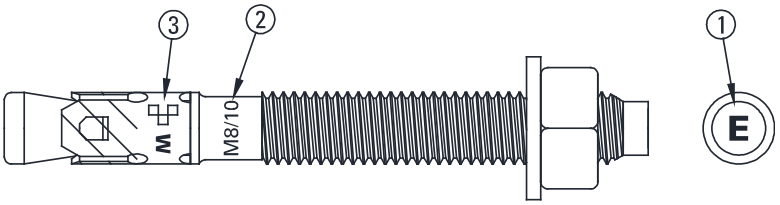


Anna Panek, MSc
Deputy Director of ITB



① Hexagon Nut
② Washer
③ Cold formed cone bolt
④ Expansion sleeve

Example of the product marking:



1. Marking on bolt head

Length of anchor (mm):

Code	A	B	C	D	E	F	G	H	I	J	K	L	M
≥	-	50	60	70	80	90	100	110	120	130	140	150	160
<	50	60	70	80	90	100	110	120	130	140	150	160	170
Code	**N**	**O**	**P**	**Q**	**R**	**S**	**T**	**U**	**V**	**W**	**X**	**Y**	**Z**
≥	170	180	190	200	220	240	260	280	300	320	340	360	380
<	180	190	200	220	240	260	280	300	320	340	360	380	400

2. Marking on cone bolt

M8 thread size

10 maximum fixture thickness

3. Marking on expansion sleeve

producer identification

W anchor identification

FPN-CE7	**Annex A1** of European Technical Assessment ETA-19/0403
Characteristic of the product	

Table A1: Dimensions

Anchor size			M6	M8	M10	M12	M16
Total Length	Min.	L [mm]	55	65	75	95	120
	Max.		200	210	230	250	250
Thickness of the fixture	Min.	t_{fix} [mm]	1	1	1	1	1
	Max.		145	145	155	155	130
Length Expansion Sleeve		L_s [mm]	11,5	14,5	18	22	24
Thread Diameter		d_{th}	6	8	10	12	16
Width Torque Wrench		SW [mm]	10	13	17	19	24

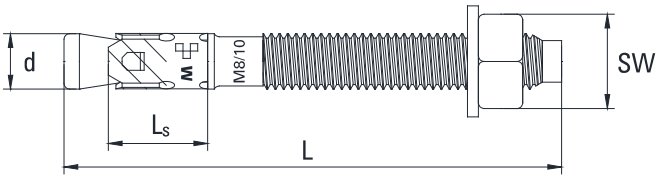


Table A2: Materials

Designation	Material	Protection
Threaded bolt	Carbon steel EN ISO 898-1 class 5.8	Zinc plated ≥ 5 µm EN ISO 4042
Expansion sleeve	Carbon steel	Zinc plated ≥ 5 µm EN ISO 4042
Hexagonal nut	Carbon steel DIN 934 class 8	Zinc plated ≥ 5 µm EN ISO 4042
Washer	Carbon steel DIN 125 or EN ISO 7089 DIN 9021 or EN ISO 7083 DIN 440	Zinc plated ≥ 5 µm EN ISO 4042

SPECIFICATION OF INTENDED USE

Anchorages subject to:

Static and quasi-static loads: sizes from M6 to M16.

Base material:

- Reinforced or unreinforced normal weight concrete of strength class C20/25 at minimum to C50/60 at maximum according to EN 206.
- Non cracked concrete: sizes from M6 to M16.

Use conditions (environmental conditions):

- Structures subject to dry internal conditions.

Design:

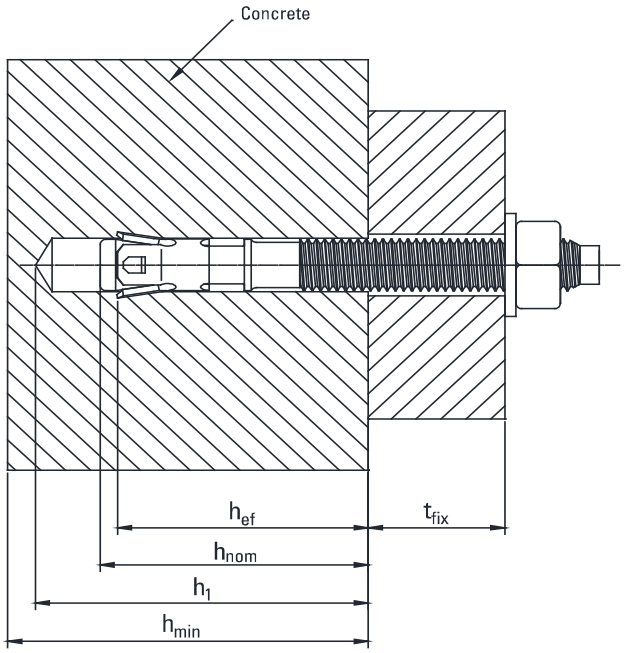
- Anchorages are designed under the responsibility of an engineer experienced in anchorages and concrete work.
- Verifiable calculation notes and drawings are prepared taking account of the loads to be transmitted. The position of the anchor is indicated on the design drawings (e.g. position of the anchor relative to reinforcement or to supports, etc.).
- Anchorages under static and quasi-static loads are designed in accordance with EOTA Technical Report TR 055 (ETAG 001 Annex C, CEN/TS 1992-4-4:2009 and prEN 1992-4:2016).

Installation:

- Anchor installation carried out by appropriately qualified personnel and under the supervision of the person responsible for technical matters of the site.
- Use of the anchor only as supplied by the manufacturer without exchanging any component of the anchor.
- Anchor installation in accordance with the manufacturer's specifications and drawings and using the appropriate tools.
- Check of concrete being well compacted, e.g. without significant voids.
- 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 in the direction of load application.
- Cleaning of the hole of drilling dust.
- Anchor installation such that the effective anchorage depth is complied with.
- Application of the torque moment given in Annex B2 using a calibrated torque wrench.

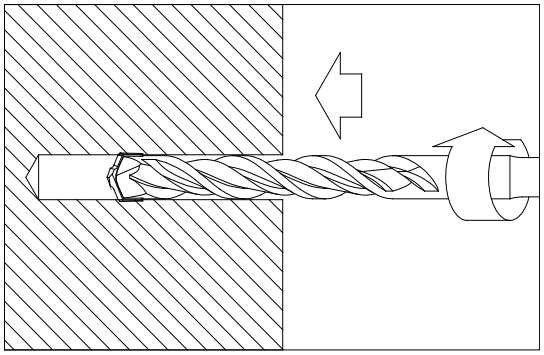
Table B1: Installation parameters

Anchor size		**M6**	**M8**	**M10**	**M12**	**M16**
Nominal drill hole diameter	d_o [mm]	6	8	10	12	16
Depth of drill hole	$h_1 \geq$ [mm]	55	65	70	90	110
Embedment depth in concrete	h_{nom} [mm]	46	53	60	77	97
Effective anchorage depth	h_{ef} [mm]	40	45	51	66	80
Diameter of clearance hole in the fixture	$d_f \leq$ [mm]	7	9	12	14	18
Installation torque moment	T_{inst} [Nm]	5	15	25	45	100
Minimum thickness of base material	h_{min} [mm]	100	100	105	135	160
Minimum spacing	s_{min} [mm]	60	67,5	76,5	99	120
Minimum edge distance	c_{min} [mm]	60	67,5	76,5	99	120

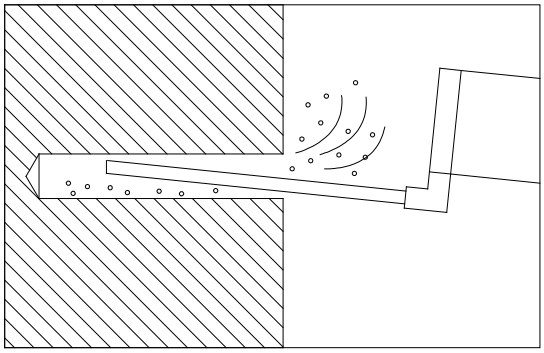


FPN-CE7	**Annex B2** of European Technical Assessment ETA-19/0403
Installation parameters	

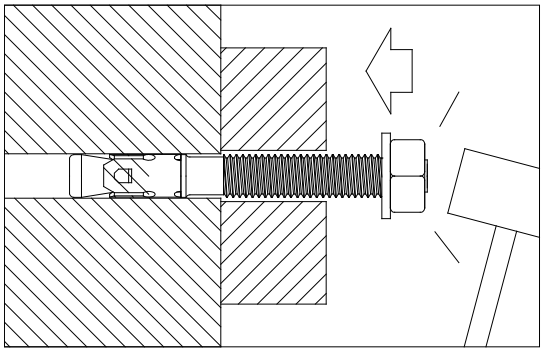
Step 1



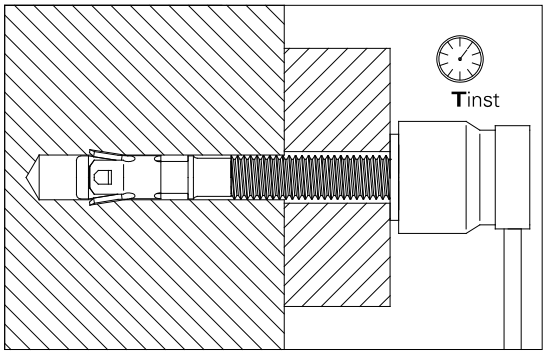
Step 2



Step 3



Step 4



FPN-CE7	**Annex B3** of European Technical Assessment ETA-19/0403
Installation instruction	

Table C1: Performance under tension loads in non-cracked concrete (static and quasi static loading)

Anchor				**FPN-CE7**				
Diameter				**M6**	**M8**	**M10**	**M12**	**M16**
Steel failure								
Characteristic resistance		$N_{Rk,s}$	[kN]	6,9	14,1	21,5	33,2	62,3
Partial safety factor		γ_{Ms} [1)]	[-]	1,50	1,50	1,50	1,50	1,50
Pullout failure								
Characteristic resistance in non-cracked concrete C20/25		$N_{Rk,p}$	[kN]	4	9	12	16	30
Installation safety factor		γ_2 [2)] = γ_{inst} [3)4)]	[-]	1,0	1,0	1,0	1,2	1,2
Increasing factor	concrete C30/37	ψ_c	[-]	1,08	1,08	1,08	1,08	1,08
	concrete C40/50		[-]	1,15	1,15	1,15	1,15	1,15
	concrete C50/60		[-]	1,19	1,19	1,19	1,19	1,19
Concrete cone failure and splitting failure								
Effective embedment depth		h_{ef}	[mm]	40	45	51	66	80
Factor for non-cracked concrete		k_1 [2)] = k_{ucr} [3)]	[-]	10,1	10,1	10,1	10,1	10,1
Factor for non-cracked concrete		$k_{ucr,N}$ [4)]	[-]	11,0	11,0	11,0	11,0	11,0
Installation safety factor		γ_2 [2)] = γ_{inst} [3)4)]	[-]	1,0	1,0	1,0	1,2	1,2
Increasing factor	concrete C30/37	ψ_c	[-]	1,08	1,08	1,08	1,08	1,08
	concrete C40/50		[-]	1,15	1,15	1,15	1,15	1,15
	concrete C50/60		[-]	1,19	1,19	1,19	1,19	1,19
Characteristic resistance for splitting concrete		$N^0_{Rk,sp}$	[kN]	4	9	12	16	30
Characteristic spacing	concrete cone failure	$s_{cr,N}$	[mm]	120	135	155	200	240
	splitting failure	$s_{cr,sp}$	[mm]	200	225	306	330	480
Characteristic edge distance	concrete cone failure	$c_{cr,N}$	[mm]	60	70	80	100	120
	splitting failure	$c_{cr,sp}$	[mm]	100	113	153	165	240
Displacements under tension load								
Tension load in non-cracked concrete C20/25 to C50/60								
Tension load		N	[kN]	2,7	6,5	8,0	8,1	15,8
Short term tension displacement		δ_{N0}	[mm]	0,4	0,5	0,7	0,4	0,6
Long term tension displacement		$\delta_{N\infty}$	[mm]	0,9	0,9	0,9	0,9	0,9

[1)] In the absence of other national regulations

[2)] Parameter for design acc. ETAG 001 Annex C

[3)] Parameter for design acc. CEN/TS 1992-4-4:2009

[4)] Parameter for design acc. prEN 1992-4:2016

Table C2: Performance under shear loads in non-cracked concrete (static and quasi static loading)

Anchor			**FPN-CE7**				
Diameter			**M6**	**M8**	**M10**	**M12**	**M16**
Steel failure without lever arm							
Characteristic resistance	$V_{Rk,s}$	[kN]	4,0	7,3	11,6	16,9	31,4
Factor considering ductility	k [2] $= k_2$ [3] $= k_7$ [4]	[-]	0,8	0,8	0,8	0,8	0,8
Partial safety factor	γ_{Ms} [1]	[-]	1,25	1,25	1,25	1,25	1,25
Steel failure with lever arm							
Characteristic bending resistance	$M^0_{Rk,s}$	[Nm]	6,1	15,0	29,9	52,4	133,2
Partial safety factor	γ_{Ms} [1]	[-]	1,25	1,25	1,25	1,25	1,25
Concrete pry-out failure							
Factor for non-cracked concrete	k [2] $= k_3$ [3] $= k_8$ [4]	[-]	1,0	1,0	1,0	2,0	2,0
Partial safety factor	γ_{Mc} [1]	[-]	1,5	1,5	1,5	1,5	1,5
Concrete edge failure							
Outside diameter on anchor	d_{nom}	[mm]	6	8	10	12	16
Effective length of anchor under shear loads	l_f	[mm]	40	45	51	66	80
Partial safety factor	γ_{Mc} [1]	[-]	1,5	1,5	1,5	1,5	1,5
Minimum member thickness	h_{min}	[mm]	100	100	105	135	160
Minimum edge distance	c_{min}	[mm]	60	67,5	76,5	99	120
Minimum spacing	s_{min}	[mm]	60	67,5	76,5	99	120
Displacements under shear load							
Shear load in non-cracked concrete C20/25 to C50/60							
Shear load	V	[kN]	3,3	6,0	7,3	8,0	15,0
Short term tension displacement	δ_{V0}	[mm]	0,8	1,8	1,8	2,0	2,0
Long term tension displacement	$\delta_{V\infty}$	[mm]	1,2	2,7	2,7	3,0	3,0

[1] In the absence of other national regulations

[2] Parameter for design acc. ETAG 001 Annex C

[3] Parameter for design acc. CEN/TS 1992-4-4:2009

[4] Parameter for design acc. prEN 1992-4:2016