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European Technical Assessment

**ETA-15/0361
of 14.12.2020**

English version prepared by ZAG

General Part

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

ZAG Ljubljana

**Trade name of the construction
product**

CELO Quick fix anchor BA A4

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

**33: Torque controlled expansion anchor
made of stainless steel of sizes M8,
M10, M12 and M16 for use in
concrete**

Manufacturer

**CELO Befestigungssysteme GmbH
Industriestrasse 6
86551 AICHACH, Germany
www.celofixings.de**

Manufacturing plant(s)

Plant 14

**This European Technical Assessment
contains**

10 pages including 7 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**

EAD 330232-00-0601,
edition October 2016

This version replaces

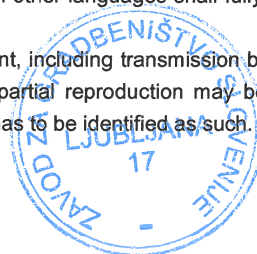
ETA-15/0361 issued on 17. 06. 2015

Corrigendum 1

23.12.2020

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Specific parts

1. Technical description of the product

The CELO Quick fix anchor BA A4 in the range of M8, M10, M12 and M16 is an anchor made of stainless steel. Anchors are placed into a drilled hole and anchored by torque-controlled expansion.

For the installed anchor see Figure A2 given in Annex A1.

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 its assessment

3.1 Mechanical resistance and stability (BWR 1)

Basic work requirements for mechanical resistance and stability are listed in Annex C.

3.2 Safety in case of fire (BWR 2)

No performance assessed.

3.3 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 (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.

¹ Official Journal of the European Communities L 254 of 8.10.1996



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

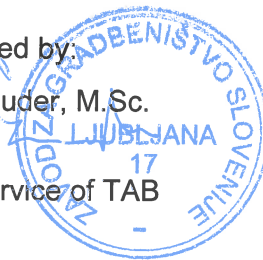
Technical details necessary for the implementation of the AVCP system are laid down in the control plan deposited at ZAG Ljubljana.

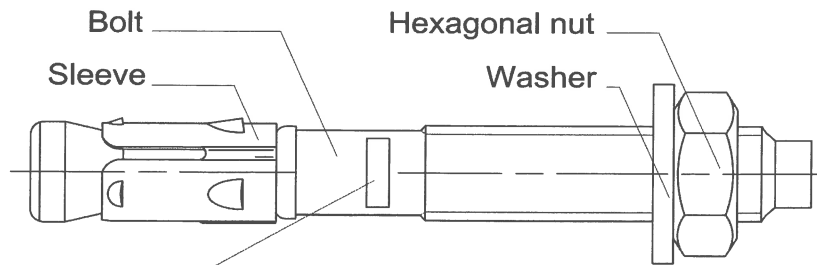
Issued in Ljubljana on 14. 12. 2020

Signed by:

Franc Capuder, M.Sc.

Head of Service of TAB





Marking: Identifying mark: N
 Anchor identity: T (through bolt)
 Category ^{*1)}: SS (stainless steel)
 Thread size: M8 ... M16
 Max. fixture thickness: t_{fix}
 Examples: BA A4: NTSS 10/20

Figure A1: CELO Quick fix anchor BA A4

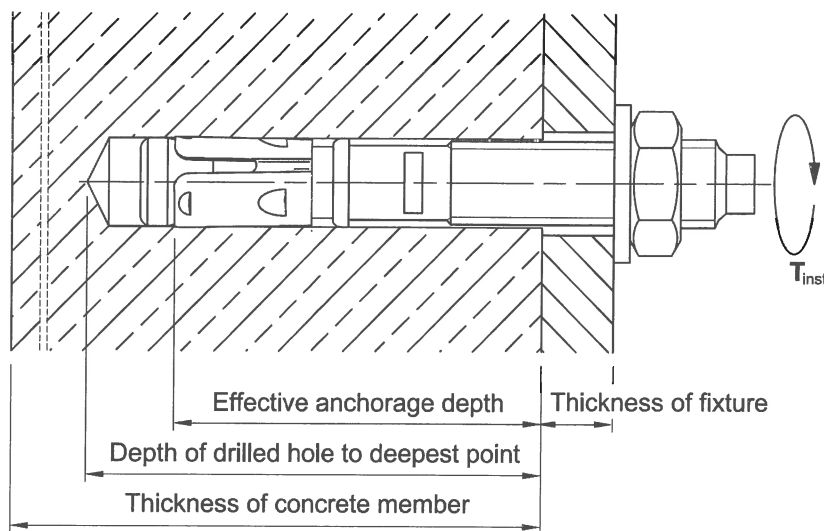


Figure A2: Installed CELO Quick fix anchor BA A4

CELO Quick fix anchor BA A4

Product description

Product and intended use

Annex A1



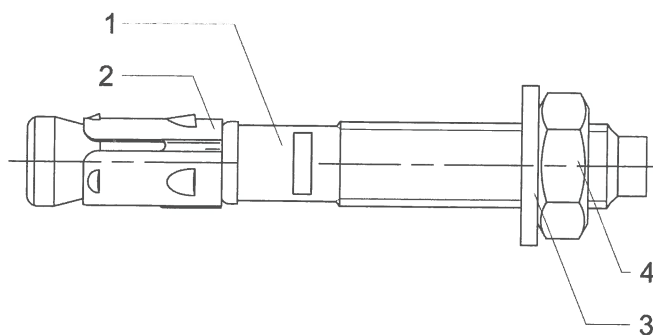


Table A2: Materials for CELO Quick fix anchor BA A4

Part	Component	Diameter	Material	f_{yk} [N/mm ²]	f_{uk} [N/mm ²]
1	Anchor body (bolt)	M8 – M16	Cold forged stainless steel acc. to EN 10088-3;	560	600
2	Expansion sleeve	M8 – M16	Stainless steel strip acc. to EN 10088-3;		
3	Washer	M8 – M16	Stainless steel acc. to DIN 125/EN ISO 7089, DIN 440/EN ISO 7094, DIN 9021/EN ISO 7093;		
4	Hexagonal nut	M8 – M16	Stainless steel acc. to DIN 934/EN ISO 4032, property class 80;		

CELO Quick fix anchor BA A4

Product description

Materials

Annex A2



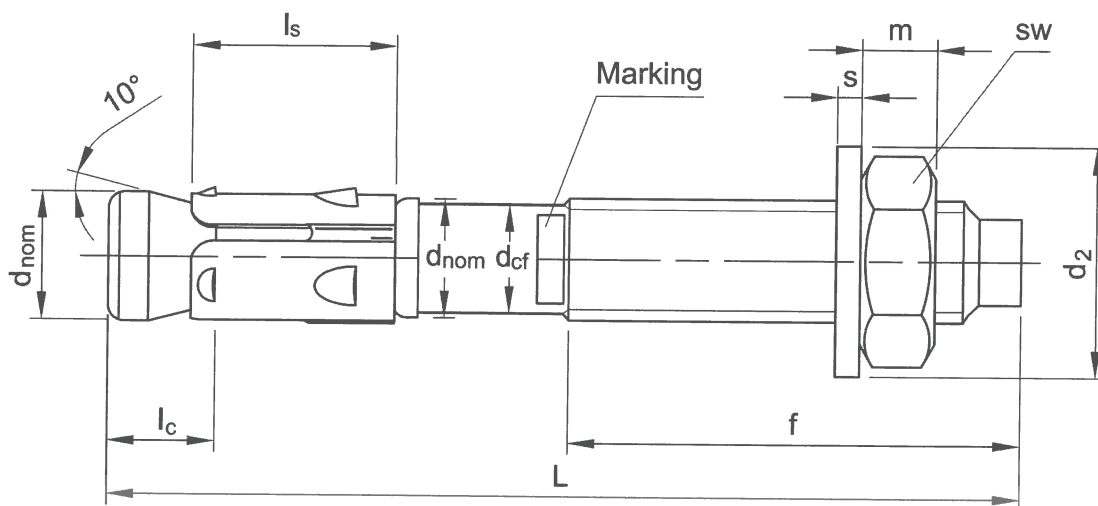


Table A3: Dimensions

Main dimensions		Stud bolt		Cone bolt		Expansion sleeve	Washer			Hexagonal nut		
Anchor type	Size	L	f	d _{cf}	d _{nom}	l _c	l _s	s	d ₁	d ₂	SW	m
		[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
8 / 0....358	M8	62....420	22....220	7,1	8	20,9	15,9	≥ 1,6	≥ 8,4	≥ 16	13	≥ 6,5
10 / 0....338	M10	82....420	37....215	9,0	10	25,7	17,9	≥ 2,0	≥ 10,5	≥ 20	≥ 16	≥ 8,0
12 / 0....322	M12	98....420	48....210	10,8	12	30,3	19,1	≥ 2,5	≥ 13,0	≥ 24	≥ 18	≥ 10,0
16 / 0....302	M16	118....420	60....202	14,6	16	38,1	26,3	≥ 3,0	≥ 17,0	≥ 30	24	≥ 13,0

CELO Quick fix anchor BA A4

Product description

Dimensions

Annex A3



Specifications of intended use**Anchorage subjected to:**

- Static, quasi static load and fire.

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+A1:2016.

Use conditions (Environmental conditions):

- The CELO Quick fix anchor BA A4 may be used in concrete subject to dry internal conditions and also in concrete subject to external atmospheric exposure (including industrial and marine environment), or exposure in permanent damp internal conditions, if no particular aggressive conditions exist. Such particular aggressive conditions are e.g. permanent, alternating immersion in seawater or splash zone of seawater, chloride atmosphere of indoor swimming pools or atmosphere with extreme chemical pollution (e.g. desulphurization plants or road tunnels where de-icing materials are used).

Design:

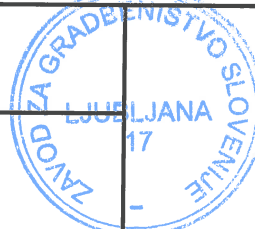
- Anchorages are designed under the responsibility of an engineer experienced in anchorages and concrete work.
- Anchorages under static and quasi-static actions are designed in accordance with EOTA TR 055, Edition December 2016 or EN 1992-4:2018.
- Verifiable calculation notes and drawings are prepared 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.
- Thickness of the fixture corresponding to the range of required thickness value for the type anchor.
- 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.

CELO Quick fix anchor BA A4**Intended use**

Specification

Annex B1

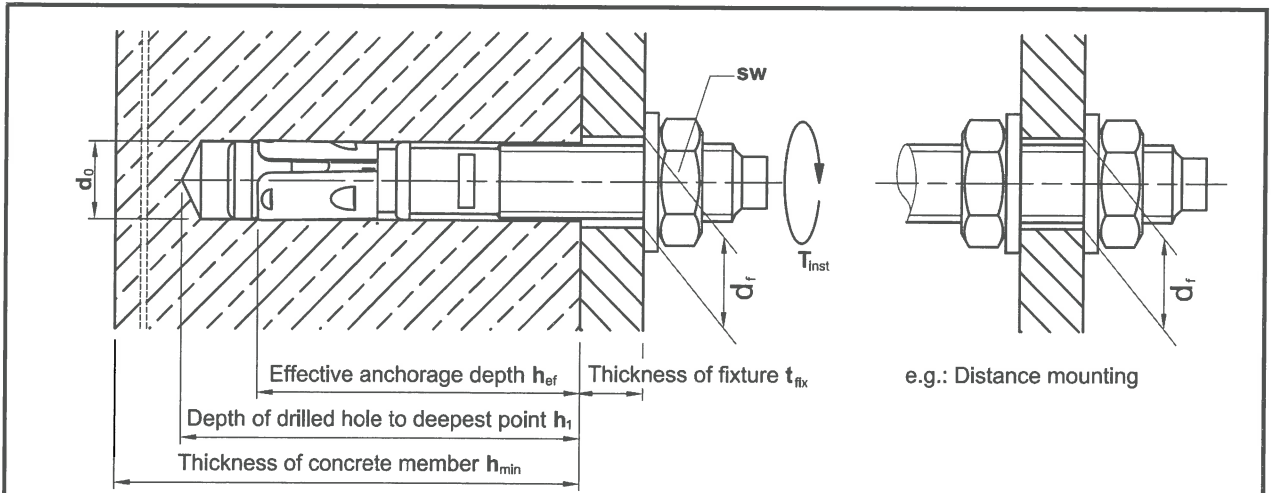


Table B1: Installation data

CELO Quick fix anchor BA A4			Anchor size				
			M8	M10	M12	M16	
Drill hole diameter	d_0	[mm]	8	10	12	16	
Cutting diameter at the upper tolerance limit (maximum drill bit diameter)	$d_{cut,max} \leq$	[mm]	8,45	10,45	12,50	16,50	
Depth of drilled hole	$h_1 \geq$	[mm]	60	75	90	110	
Effective anchorage depth	h_{ef}	[mm]	45	60	70	85	
Diameter of clearance hole of the fixture	d_r	[mm]	9	12	14	18	
Thickness of the fixture	$t_{fix,min...max}$	[mm]	0...358	0...338	0...322	0...302	
Width of flats	sw	[mm]	13	≥ 16	≥ 18	24	
Torque moment	NTSS	T_{inst}	[Nm]	20	35	70	120

Table B2: Minimum thickness of concrete member, spacing and edge distance

CELO Quick fix anchor BA A4			Anchor size			
			M8	M10	M12	M16
Minimum thickness of concrete member	h_{min}	[mm]	100	120	140	170
Minimum spacing	s_{min}	[mm]	50	55	60	70
	$c \geq$	[mm]	50	80	90	120
Minimum edge distance	c_{min}	[mm]	50	50	55	85
	$s \geq$	[mm]	50	100	145	150

CELO Quick fix anchor BA A4

Intended use

Installation data

Annex B2



Table C1: Characteristic values for Tension loads in case of static and quasi-static loading for design acc. EOTA TR 055 or EN 1992-4: 2018

Essential characteristics			Performance			
			M8	M10	M12	M16
Installation parameters						
d_o	Nominal diameter of drill bit	[mm]	8	10	12	16
h_{ef}	Effective anchorage depth	[mm]	45	60	70	85
h_{min}	Minimum thickness of concrete member	[mm]	100	120	140	170
T_{inst}	Torque moment	[Nm]	20	35	70	120
s_{min}	Minimum spacing for $c \geq$	[mm]	50	55	60	70
		[mm]	50	80	90	120
c_{min}	Minimum edge distance for $s \geq$	[mm]	50	50	55	85
		[mm]	50	100	145	150
Tension steel failure mode						
$N_{Rk,s}$	Characteristic tension steel failure	[kN]	15	24	35	75
γ_{MsN}	Partial safety factor	[-]	1,4			
Pull-out failure mode						
$N_{Rk,p}$	Characteristic pull-out failure in non-cracked concrete	[kN]	9	16	20	35
γ_2	Partial safety factor	[-]	1,2			1,0
γ_{Mp}		[-]	1,8			1,5
$s_{cr,N}$	Characteristic spacing	[mm]	135	180	210	255
$c_{cr,N}$	Characteristic edge distance	[mm]	68	90	105	128
ψ_C C30/37	Increasing factor for $N_{Rk,p}$ in non-cracked concrete	[-]	1,10			
ψ_C C40/50		[-]	1,15			
ψ_C C50/60		[-]	1,20			
Splitting failure mode						
$s_{cr,sp}$	Characteristic spacing	[mm]	180	240	280	340
$c_{cr,sp}$	Characteristic edge distance	[mm]	90	120	140	170
γ_{Msp}	Partial safety factor	[-]	1,8			1,5
Displacement under tension load						
Non-cracked concrete C20/25						
N	Service tension load	[kN]	3,6	6,3	7,9	16,7
δ_{N0}	Short term displacement	[mm]	0,045	0,358	0,059	0,149
$\delta_{N\infty}$	Long term displacement	[mm]	0,204	0,358	0,204	0,204
Non-cracked concrete C50/60						
N	Service tension load	[kN]	4,3	7,6	9,5	20,0
δ_{N0}	Short term displacement	[mm]	0,029	0,071	0,072	0,220
$\delta_{N\infty}$	Long term displacement	[mm]	0,653	0,653	0,653	0,653

CELO Quick fix anchor BA A4

Design acc. EOTA TR 055 or EN 1992-4:2018

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 acc. EOTA TR 055 or EN 1992-4:2018

Essential characteristics			Performance			
			M8	M10	M12	M16
Shear steel failure						
$V_{Rk,s}$	Characteristic shear steel failure	[kN]	11	17	25	47
$M^0_{Rk,s}$	Bending moment characteristic failure	[Nm]	22	45	79	200
γ_{MsV}	Partial safety factor	[-]	1,5			
Shear concrete pry-out and edge failure						
k_8	k-factor for pry-out	[mm]	1,0	2,0		
l_{ef}	Effective anchorage depth	[mm]	45	60	70	85
d_{nom}	Diameter of anchor	[mm]	8	10	12	16
γ_{Mc}	Partial safety factor	[-]	1,8			1,5
Displacement under shear load						
V	Service shear load	[kN]	4,8	8,1	11,0	20,9
δ_{v0}	Short term displacement	[mm]	1,43	1,34	2,02	2,66
$\delta_{v\infty}$	Long term displacement	[mm]	2,15	2,01	3,03	4,00

CELO Quick fix anchor BA A4

Design acc. to EOTA TR 055 or EN 1992-4:2018

Characteristic resistance under Shear loads – BWR 1

Annex C2

