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Designated according to Article 29 of Regulation (EU) No 305/2011

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European Technical Assessment

ETA-22/0409
of 20. 01. 2025

English version prepared by ZAG

General Part

Technical Assessment Body issuing the European Technical Assessment	**ZAG**
Trade name of the construction product	**EVO (EVO+)**
Product family to which the construction product belongs	**33: Concrete screw of size 5 for use in concrete for redundant non-structural systems**
Manufacturer	**Evolution Fasteners (UK) Ltd** **Clyde Gateway Trade Park** **Dalmamock Road** **GB-G73 1AN Glasgow** **United Kingdom** http://evolutionfasteners.co.uk
Manufacturing plant	**Evolution Fasteners (UK) Ltd** **Manufacturing Plant 1**
This European Technical Assessment contains	13 pages including 3 annexes, which form an integral part of the document
This European Technical Assessment is issued in accordance with Regulation (EU) No 305/2011, on the basis of	EAD 330747-00-0601, edition May 2018
This version is a Corrigendum No. 1 to	ETA-22/0409, issued on 20. 01. 2025

Specific part

1 Technical description of the product

Anchor EVO (EVO+) is a concrete screw size 5 made of stainless steel. The fastener is screwed into a predrilled cylindrical hole. The special thread of the anchor cuts an internal thread into the member while setting. The anchorage is characterised by mechanical interlock in the special thread.

For the installed anchor see Figure given in Annex A1/A3 and A3/A3.

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 Safety in case of fire (BWR 2)

The basic work requirements for safety in case of fire are listed in Annexes C1/C4 and C4/C4.

Regarding to reaction to fire product is specified in class A1 according to EN 13501-1.

3.2 Safety in use (BWR 4)

The basic work requirement for safety in use are listed in Annex C3/4 and C4/4.

3.3 General aspects relating to fitness for use

Durability and serviceability are only ensured if specifications of intended use according to Annex B1/B3 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 Commission[1] the system of assessment and verification of constancy of performance (see Annex V to regulation (EU) No 305/2011) **2+** applies.

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 330747-00-0601.

Issued in Ljubljana on 20. 01. 2025

Signed by:

Franc Capuder, M.Sc.

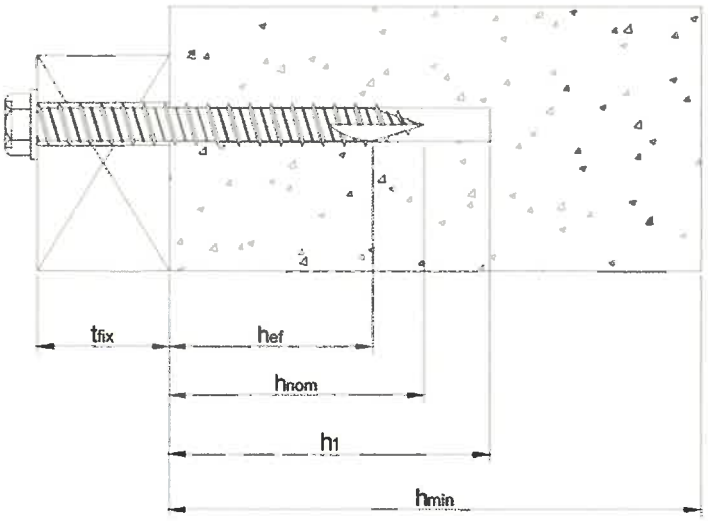
Head of Service of TAB

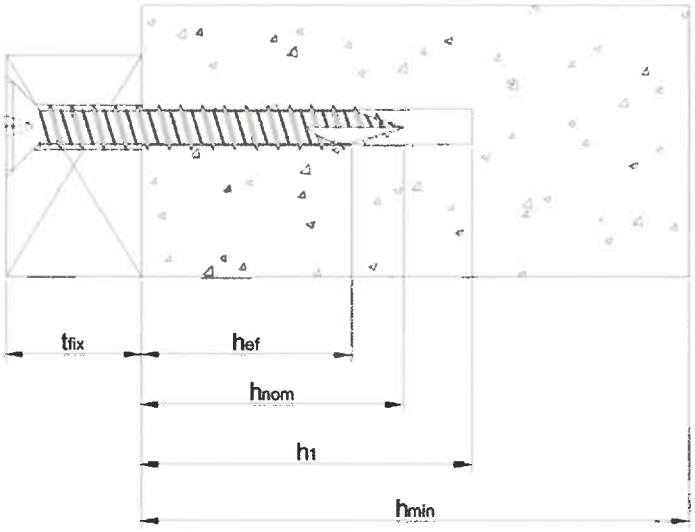
[1] Official Journal of the European Communities L 254 of 8.10.1996

EVO (EVO+)

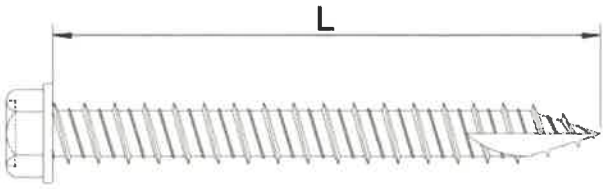
Type A4HH6.3

Type A4CSK6.3

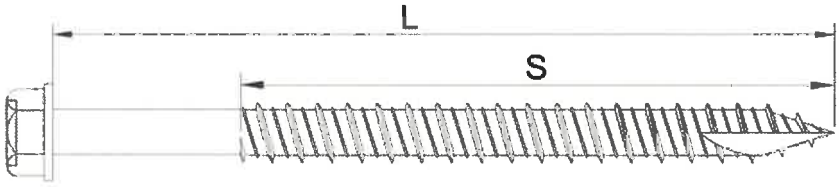




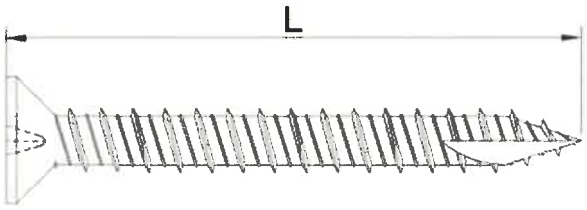
EVO (EVO+)	
Product description Types and installed condition	**Annex A1/A3**



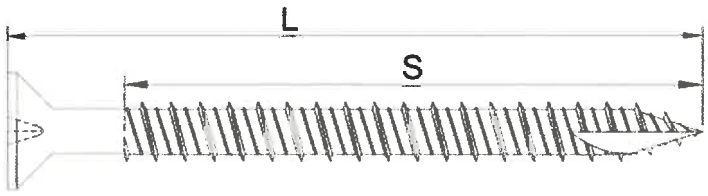
Type A4HH6.3
with thread along
whole length



Type A4HH6.3
with thread along
limited length



Type A4CSK6.3
with thread along
whole length



Type A4CSK6.3
with thread
along limited
length

EVO (EVO+)	
Product description Dimensions	**Annex A2/A3**

Table A1: Materials for EVO (EVO+)

Material	
Shaft and head	Stainless steel EN 1.4404/A$ (AISI 316)

EVO (EVO+)	
Product description Materials	**Annex A3/A3**

Specifications of intended use

Anchorages subjected to:

- Static and quasi static load;
- Use only for multiple use for redundant non-structural systems;
- Fire exposure.

Base materials:

- Cracked and 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 EVO (EVO+) anchors 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 permanently damp internal conditions, if no particular aggressive conditions exist.
  Note: Particular aggressive conditions are e.g. permanent, alternating immersion in seawater or the 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 EN 1992-4:2018.
- For application with resistance under fire exposure the anchorages are designed in accordance with the method given in 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 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.
- 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 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.
- 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 non-shrinkage mortar. No shear or oblique tension loads are allowed in the direction of a not filled aborted hole.

EVO (EVO+)	**Annex B1/B3**
Intended use Specifications	

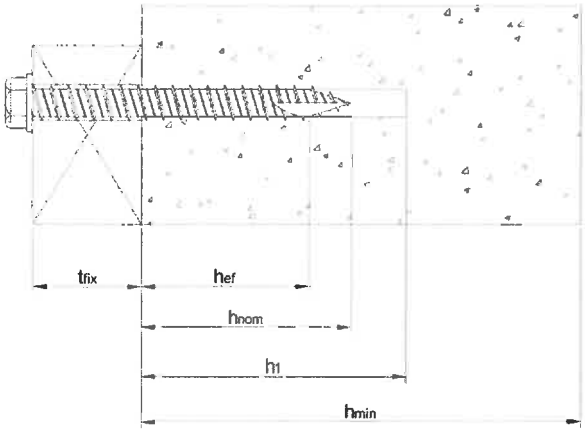


Table B1: Instalation data

Anchor size			EVO (EVO+) size 5	
			5-1	5-2
Maximum installation torque for installation with impact power screw driver		T_{SD} [Nm]	90 Nm	
Nominal diameter of drill bit		d_0 [mm]	5	
Cutting diameter of drill bit		$d_{cut} \leq$ [mm]	5,40	
Depth of drill hole		$h_1 \geq$ [mm]	40	50
Overall anchor embedment depth		$h_{nom} \geq$ [mm]	32	42
Effective anchorage depth		h_{ef} [mm]	19,2	27,7
.....		h_{nom} - h_t [mm]	28,8	38,8
Diameter of clearance hole		$d_f \leq$ [mm]	8	
Minimum edge distance		c_{min} [mm]	35	
Minimum spacing		s_{min} [mm]	35	
Minimum thickness of the member		h_{min} [mm]	80	
Wrench size	HH	WS [-]	8	
	CSK	... .PH [-]	3	

EVO (EVO+)	
Intended use Installation data	**Annex B2/B3**

Table B3: Minimum thickness of concrete member, spacing and edge distance

EVO (EVO+)			Anchor size	
			5-1	5-2
Minimum thickness of concrete member	h_{min}	[mm]	80	
Minimum spacing	s_{min}	[mm]	35	
Minimum edge distance	c_{min}	[mm]	35	

EVO (EVO+)	**Annex B3/B3**
Intended use Installation data	

Table C1: Characteristic resistances under tension loads in case of static and quasi-static loading for design according to EN 1992-4:2018

EVO (EVO+)			Anchor size	
			EVO (EVO+)	
			5-1	5-2
Steel failure				
Characteristic resistance	$N_{Rk,s}$	[kN]	9,3	
Partial safety factor	γ_{Ms} [1)]	[-]	1,4	
Pull-out failure				
Characteristic resistance in **cracked and non-cracked** concrete C20/25	$N_{Rk,p}$	[kN]	1,2	2,0
Increasing factor for $N_{Rk,p}$	Ψ_C	C25/30	1,12	1,10
		C30/37	1,22	1,18
		C35/45	1,32	1,26
		C40/50	1,41	1,33
		C45/55	1,50	1,40
		C50/60	1,58	1,46
Partial safety factor	γ_{inst}	[-]	1,0	
	γ_{Mp} [1)]	[-]	1,5 [2)]	
Concrete cone and splitting failure				
Effective anchorage depth	h_{ef}	[mm]	19,2	27,7
Factor for cracked concrete	k_{cr}	[-]	7,7	
Factor for non-cracked concrete	k_{ucr}	[-]	11,0	
Spacing	$s_{cr,N}$	[mm]	58	83
Edge distance	$c_{cr,N}$	[mm]	29	42
Spacing (splitting)	$s_{cr,sp}$	[mm]	90	84
Edge distance (splitting)	$c_{cr,sp}$	[mm]	45	63
Partial safety factor	γ_{Msp} [2)]	[-]	1,5 [2)]	

[1)] In absence of other national regulations

[2)] The installation safety factor of γ_{inst} = 1,0 is included

EVO (EVO+)	**Annex C1/C4**
Performance Characteristic resistance under tension loads	

Table C2: Characteristic resistances under shear loads in case of static and quasi-static loading for design according to EN 1992-4:2018

EVO (EVO+)			Anchor size	
			EVO (EVO+)	
			5-1	5-1
Steel failure without lever arm				
Characteristic resistance	$V_{Rk,s}$	[kN]	7,9	
Partial safety factor	γ_{Ms} [1)]	[-]	1,25	
Factor for considering ductility	k_7	[-]	1,0	
Steel failure with lever arm				
Characteristic resistance	$M^0_{Rk,s}$	[Nm]	6,2	
Partial safety factor	γ_{Ms} [1)]	[-]	1,25	
Concrete pryout failure				
k-factor	k_8	[-]	1,0	
Partial safety factor	γ_{Mc} [1)]	[-]	1,25	
Concrete edge failure				
Effective length of anchor under shear load	l_f	[mm]	19,2	27,7
Outside diameter of anchor	d_{nom}	[mm]	8	
Partial safety factor	γ_{Mc} [1)]	[-]	1,5	

[1)] In absence of other national regulations

EVO (EVO+)	**Annex C3/C4**
Performance Characteristic resistance under shear loads	

Table C3: Characteristic resistances under tension loads in case of fire exposure for design according to EN 1992-4:2018

EVO (EVO+)			Anchor size	
			EVO (EVO+)	
			5-1	5-2
Steel failure				
Characteristic resistance $N_{Rk,s,fi}$	R30	[kN]	0,16	
	R60	[kN]	0,14	
	R90	[kN]	0,11	
	R120	[kN]	0,08	
Pull-out failure				
Characteristic resistance $N_{Rk,p,fi}$	R30	[kN]	0,30	0,50
	R60	[kN]	0,30	0,50
	R90	[kN]	0,30	0,50
	R120	[kN]	0,24	0,40
Concrete cone and splitting failure [1)]				
Characteristic resistance $N^0_{Rk,c,fi}$	R30	[kN]	0,28	0,70
	R60	[kN]	0,28	0,70
	R90	[kN]	0,28	0,70
	R120	[kN]	0,22	0,56
Spacing	$s_{cr,N,fi}$	[mm]	4 x h_{ef}	
	s_{min}	[mm]	35	35
Edge distance	$c_{cr,N,fi}$	[mm]	2 x h_{ef}	
	c_{min}	[mm]	Fire attack from one side: c_{min} = 2 x h_{ef}	
			Fire attack from more than one side: c_{min} ≥ 300 mm and ≥ 2 x h_{ef}	

[1)] As a rule, splitting failure can be neglected when cracked concrete and reinforcement is assumed

Design under fire exposure is performed according to the design method given in EN 1992-4.

Under fire exposure usually cracked concrete is assumed. The design equations are given in EN 1992-4.

In the absence of other national regulations the partial safety factor for resistance under fire exposure $\gamma_{M,fi}$ = 1,0 is recommended.

EVO (EVO+)	**Annex C3/C4**
Performance Characteristic tension resistance under fire exposure	

Table C4: Characteristic resistances under shear loads in case of fire exposure for design according to EN 1992-4:2018

EVO (EVO+)			Anchor size	
			EVO (EVO+)	
			5-1	5-1
Steel failure without lever arm				
Characteristic resistance $V_{Rk,s,fi}$	R30	[kN]	0,16	
	R60	[kN]	0,14	
	R90	[kN]	0,11	
	R120	[kN]	0,08	
Steel failure with lever arm				
Characteristic resistance $M^0_{Rk,s,fi}$	R30	[Nm]	0,10	
	R60	[Nm]	0,09	
	R90	[Nm]	0,07	
	R120	[Nm]	0,05	
Concrete pryout failure				
k-factor	k_8	[-]	1,0	
Characteristic resistance $V_{Rk,cp,fi}$	R30	[kN]	0,28	0,70
	R60	[kN]	0,28	0,70
	R90	[kN]	0,28	0,70
	R120	[kN]	0,22	0,56
Concrete edge failure				
The initial value $V^0_{Rk,c,fi}$ of the characteristic resistance in concrete C20/25 to C50/60 under fire exposure may be determined by: $V^0_{Rk,c,fi} = 0,25 \times V^0_{Rk,c}$ ($\leq$ R90) $\quad V^0_{Rk,c,fi} = 0,20 \times V^0_{Rk,c}$ (R120) with $V^0_{Rk,c}$ initial value of the characteristic resistance in cracked concrete C20/25 under normal temperature				

Design under fire exposure is performed according to the design method given in EN 1992-4.

Under fire exposure usually cracked concrete is assumed. The design equations are given in EN 1992-4.

EN 1992-4 covers design for fire exposure from one side. For fire attack from more than one side the edge distance must be increased to $c_{min} \geq 300$ mm and $\geq 2 \times h_{ef}$.

In the absence of other national regulations the partial safety factor for resistance under fire exposure $\gamma_{M,fi} = 1,0$ is recommended.

EVO (EVO+)	**Annex C4/C4**
Performance Characteristic shear resistance under fire exposure	