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

Member of EOTA
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European Technical Assessment

ETA 23/0838
of 17/10/2023

English translation prepared by IETcc. Original version in Spanish language

General Part

Technical Assessment Body issuing the ETA designated according to Art. 29 of Regulation (EU) 305/2011:	Instituto de Ciencias de la Construcción Eduardo Torroja (IETcc)
Trade name of the construction product:	**STA-EVO**
Product family to which the construction product belongs:	Torque controlled expansion anchor made of galvanized steel of size M12 for use in concrete.
Manufacturer:	**ICCONS** 383 Frankston Dandenong Road Dandenong South VIC 3175 Australia website: www.iccons.com.au
Manufacturing plants:	ICCONS 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 330232-01-0601 “Mechanical Fasteners for use in concrete”, ed. December 2019

This European Technical Assessment is issued by the Technical Assessment Body in its official language. Translations of this European Technical Assessment in other languages shall fully correspond to the original issued document and should be identified as such.

This European Technical Assessment may be withdrawn by the issuing Technical Assessment Body, in particular pursuant to information by the Commission according to article 25 (3) of Regulation (EU) No 305/2011.

SPECIFIC PART

1. Technical description of the product

The ICCONS STA EVO heavy duty anchor product in M12 is an anchor made of galvanised steel. The anchor is installed into a predrilled cylindrical hole and anchored by torque-controlled expansion. The anchorage is characterised by friction between the expansion tube and the concrete.

Product and installation descriptions are given in annex A1.

2. Specification of the intended use in accordance with the applicable European Assessment Document.

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

The verifications and assessment methods on which this European Technical Assessment is based lead to the assumption of a working life of the anchor of at least 50 years. The indications given on the working life cannot be interpreted as a guarantee given by the producer but are to be regarded only as a mean to 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)

Essential characteristic	Performance
Characteristic resistance to tension loads	See annex C2
Characteristic resistance to shear loads	See annex C3

3.2 Safety in case of fire (BWR 2)

Essential characteristic	Performance
Reaction to fire	Anchorages satisfy requirements for class A1 according to EN 13501-1
Resistance to fire	See annexes C4

4. Assessment and Verification of Constancy of Performances (hereinafter AVCP) system applied, with reference to its legal base

The applicable European legal act for the system of Assessment and Verification of Constancy of Performances (see annex V to Regulation (EU) No 305/2011) is 96/582/EC.

The system to be applied is 1.

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

The technical details necessary for the implementation of the AVCP system are laid down in the quality plan deposited at Instituto de Ciencias de la Construcción Eduardo Torroja.

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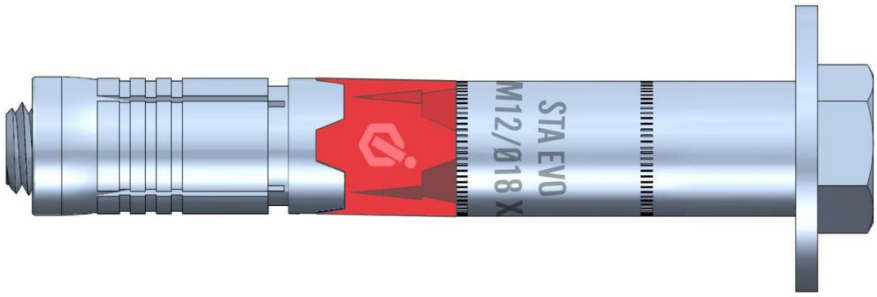
On behalf of the Instituto de Ciencias de la Construcción Eduardo Torroja
Madrid, 17th of October 2023

Mr. Ángel Castillo Talavera
Director

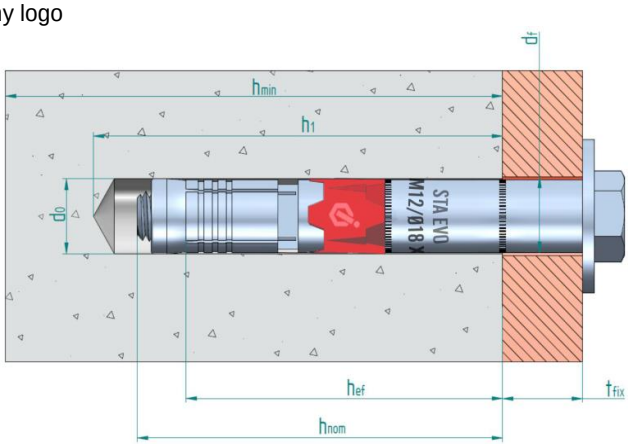
Product and installed condition

STA EVO anchor



Identification on anchor:

- Bolt: "STA EVO" + "Ø18x90" + "80 Nm" + "IC"
- Sleeve: "STA EVO" + "M12 / Ø18x90 / 12"
- Plastic ring: company logo



d_0: Nominal diameter of drill bit
d_f: Fixture clearance hole diameter
h_{ef}: Effective anchorage depth
h_1: Depth of drilled hole
h_{nom}: Overall anchor embedment depth in the concrete
h_{min}: Minimum thickness of concrete member
t_{fix}: Fixture thickness

STA EVO anchor	**Annex A1**
Product description Installed condition	

Table A1: Materials

Item	Designation	Material for STA EVO zinc plated	Material for STA EVO zinc nickel
1	Bolt	DIN 931 ISO 898-1 class 8.8 Galvanized ≥ 5 µm ISO 4042 Zn5/An/T0	DIN 931 ISO 898-1 class 8.8 Zinc nickel ≥ 8 µm, sealed ISO 4042 ZnNi8/Cn/T2
2	Washer	DIN 9021. Galvanized ≥ 5 µm ISO 4042 Zn5/An/T0	DIN 9021. Zinc nickel ≥ 8 µm, sealed ISO 4042 ZnNi8/Cn/T2
3	Sleeve	Carbon steel. Galvanized ≥ 5 µm ISO 4042 Zn5/An/T0	Carbon steel. Zinc nickel ≥ 8 µm, sealed ISO 4042 ZnNi8/Cn/T2
4	Plastic ring	POM	
5	Expansion sleeve	Carbon steel. Galvanized ≥ 5 µm ISO 4042 Zn5/An/T0	
6	Cone	Hardened carbon steel. Galvanized ≥ 5 µm ISO 4042 Zn5/An/T0	

STA EVO anchor	**Annex A2**
Product description Materials	

Specifications of intended use

Anchorages subjected to:

- Static or quasi static loads.
- Resistance to fire exposure up to 120 minutes.

Base materials:

- Reinforced or unreinforced normal weight concrete without fibres according to EN 206-1:2013 + A2:2021.
- Strength classes C20/25 to C50/60 according to EN 206-1:2013 + A2:2021.
- Cracked or uncracked concrete

Use conditions (environmental conditions):

- Temperature range of the anchorage base material during the working life: -40 ºC to +80 ºC
- Anchorages subjected to dry internal conditions.

Design:

- Anchorages are designed under the responsibility of an engineer experienced in anchorages and concrete.
- Verifiable calculation rules and drawings are prepared taking into considering the loads 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.).
- Anchorages under static or quasi-static actions are designed for design method A in accordance with EN 1992-4:2018
- Anchorages under fire exposure are designed in accordance with EN 1992-4:2018. It must be ensured that local spalling of the concrete cover does not occur.

Installation:

- Hole drilling by rotary plus hammer mode.
- Anchor installation carried out by appropriately qualified personal and under the supervision of the person responsible for technical matters of the site.
- In case of aborted hole: new drilling at a minimum distance away of twice the depth of aborted hole or smaller distance if the aborted hole is filled with high strength mortar and if under shear or oblique tension load it is not the direction of the load application.

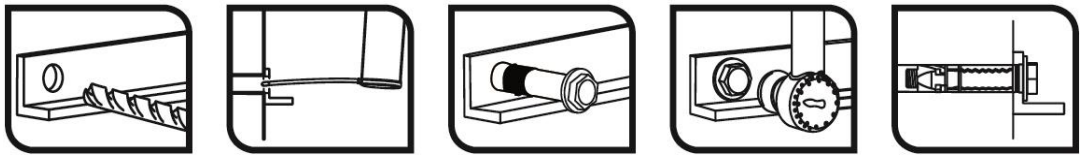
STA EVO anchor	**Annex B1**
Intended use Specifications	

Table C1: Installation parameters STA EVO

Installation parameters			Performances
			M12 Ø18
d_0	Nominal diameter of drill bit:	[mm]	18
d_f	Fixture clearance hole diameter ≤	[mm]	20
T_{inst}	Nominal installation torque:	[Nm]	80
h_{min}	Minimum thickness of concrete member:	[mm]	125
h_1	Depth of drilled hole ≥	[mm]	90
h_{nom}	Overall anchor embedment depth in the concrete:	[mm]	78
h_{ef}	Effective anchorage depth:	[mm]	68
t_{fix}	Thickness of fixture[1)] ≤	[mm]	12
s_{min}	Minimum allowable spacing:	[mm]	205
c_{min}	Minimum allowable edge distance:	[mm]	110
SW	Socket size:	[--]	22

[1)] L = total anchor length

Installation process



STA EVO anchor	**Annex C1**
Performances Installation parameters and installation process	

Table C2: Characteristic values to tension loads of design method A according to EN 1992-4:2018 for STA EVO anchors

Characteristic values of resistance to tension loads of design according to design method A				Performances M12 Ø18
Tension loads: steel failure				
$N_{Rk,s}$	Characteristic resistance:		[kN]	67.4
γ_{Ms}	Partial safety factor [2]:		[-]	1.5
Tension loads: pull-out failure in concrete				
$N_{Rk,p,ucr}$	Characteristic resistance in C20/25 uncracked concrete:		[kN]	--[1]
$N_{Rk,p,cr}$	Characteristic resistance in C20/25 cracked concrete:		[kN]	--[1]
γ_{ins}	Installation safety factor:		[-]	1.0
ψ_c	Increasing factor for $N^0_{Rk,p}$ for uncracked concrete:	C30/37	[-]	1.22
		C40/50	[-]	1.41
		C50/60	[-]	1.58
ψ_c	Increasing factor for $N^0_{Rk,p}$ for cracked concrete:	C30/37	[-]	1.03
		C40/50	[-]	1.06
		C50/60	[-]	1.08
Tension loads: concrete cone and splitting failure				
h_{ef}	Effective embedment depth:		[mm]	68
$k_{ucr,N}$	Factor for uncracked concrete:		[-]	11.0
$k_{cr,N}$	Factor for cracked concrete:		[-]	7.7
γ_{ins}	Installation safety factor:		[-]	1.0
$s_{cr,N}$	Concrete cone failure:		[mm]	3 x h_{ef}
$c_{cr,N}$			[mm]	1.5 x h_{ef}
$s_{cr,sp}$	Splitting failure:		[mm]	440
$c_{cr,sp}$			[mm]	220

[1] The pull-out failure mode is not decisive
[2] In absence of other national regulations

Table C3: Displacements under tension load for STA EVO anchors

Displacements under tension loads			Performances M12 Ø18
N	Service tension load in uncracked concrete C20/25 to C50/60:	[kN]	13.13
δ_{N0}	Short term displacement:	[mm]	2.75
$\delta_{N\infty}$	Long term displacement:	[mm]	3.45
N	Service tension load in cracked concrete C20/25 to C50/60:	[kN]	9.20
δ_{N0}	Short term displacement:	[mm]	1.97
$\delta_{N\infty}$	Long term displacement:	[mm]	2.67

STA EVO anchor	**Annex C2**
Performances Characteristic values for tension loads	

Table C4: Characteristic values to shear loads of design method A according to EN 1992-4:2018 for STA EVO anchors

Characteristic values of resistance to shear loads of design according to design method A			Performances M12 Ø18
Shear loads: steel failure without lever arm			
$V_{Rk,s}$	Characteristic resistance:	[kN]	74.8
k_7	Ductility factor:	[-]	1.0
γ_{Ms}	Partial safety factor [1]:	[-]	1.25
Shear loads: steel failure with lever arm			
$M^0_{Rk,s}$	Characteristic bending moment:	[Nm]	104.8
γ_{Ms}	Partial safety factor [1]:	[-]	1.25
Shear loads: concrete pryout failure			
k_8	Pryout factor:	[-]	2.0
γ_{ins}	Installation safety factor:	[-]	1.0
Shear loads: concrete edge failure			
l_f	Effective length of anchor under shear loads:	[mm]	68
d_{nom}	Outside anchor diameter:	[mm]	18
γ_{ins}	Installation safety factor:	[-]	1.0

[1] In absence of other national regulations

Table C5: Displacements under shear load for STA EVO anchors

Displacements under shear loads			Performances M12 Ø18
V	Service shear load in uncracked and cracked concrete C20/25 to C50/60:	[kN]	35.62
δ_{V0}	Short term displacement:	[mm]	3.56
$\delta_{V\infty}$	Long term displacement:	[mm]	5.33

STA EVO anchor	**Annex C3**
Performances Characteristic values for shear load.	

Table C6: Characteristic values for resistance under fire exposure for STA EVO anchors

Characteristic values under fire exposure				Performances M12 Ø18
Steel failure				
$N_{Rk,s,fi}$	Characteristic tension resistance:	R30	[kN]	1.7
		R60	[kN]	1.3
		R90	[kN]	1.1
		R120	[kN]	0.8
$V_{Rk,s,fi}$	Characteristic shear resistance:	R30	[kN]	1.7
		R60	[kN]	1.3
		R90	[kN]	1.1
		R120	[kN]	0.8
$M^0_{Rk,s,fi}$	Characteristic bending resistance:	R30	[Nm]	2.6
		R60	[Nm]	2.0
		R90	[Nm]	1.7
		R120	[Nm]	1.3
Pull out failure				
$N_{Rk,p,fi}$	Characteristic resistance:	R30 to R120	[kN]	-- 1)
Concrete cone failure 2)				
$N_{Rk,c,fi}$	Characteristic resistance:	R30 R60 R90	[kN]	6.56
		R120	[kN]	5.25
$s_{cr,N,fi}$	Critical spacing:	R30 to R120	[mm]	4 x h_{ef}
$c_{cr,N,fi}$	Critical edge distance:	R30 to R120	[mm]	2 x h_{ef}
$s_{min,fi}$	Minimum spacing:	R30 to R120	[mm]	205
$c_{min,fi}$	Minimum edge distance:	R30 to R120	[mm]	c_{min} = 2 x h_{ef}; if fire attack comes from more than one side, the edge distance of the anchor has to be ≥ 300 mm and ≥ 2 x h_{ef}
Concrete pryout failure				
k_8	Pryout factor:	R30 to R120	[-]	2.0

1) The pull-out failure mode is not decisive.
2) As a rule, splitting failure can be neglected since cracked concrete and reinforcement is assumed.
3) In absence of other national regulations the partial safety factor for resistance under fire exposure $\gamma_{m,fi}$ = 1,0 is recommended

STA EVO anchor	**Annex C4**
Performances Characteristic values for resistance to fire	