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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-12/0587 of 11.11.2015

English version prepared by ZAG

I GENERAL PART

Komercialno ime *Trade name*	**ECO4800**
Imetnik tehnične ocene *Holder of Technical Assessment*	**SOCOM SAS** **Zl les mourgues** **30350 Cardet** **France**
Družina proizvoda *Product family*	**Kovinsko kemično sidro za uporabo v zidakih** *Metal injection anchor for use in masonry*
Proizvodni obrat *Manufacturing plant*	**SOCOM SAS** **Zl les mourgues** **30350 Cardet** **France**
Ta Evropska tehnična ocena vsebuje *This European Technical Assessment contains*	18 strani vključno z 14 prilogami, ki so sestavni del te ocene *18 pages including 14 annexes, which form an integral part of the document*
Ta Evropska tehnična ocena je izdana na podlagi Uredbe (EU) št. 305/2001 na osnovi *This European Technical Assessment is issued in according to Regulation (EU) No 305/2011, on the basis of*	Smernice za evropska tehnična soglasja ETAG 029, izdaja 2013, ki se uporablja kot EAD *Guideline for European Technical Approval ETAG 029, edition 2013, used as EAD*
Ta ocena zamenjuje *This Assessment replaces*	ETA-12/0587 izdano dne 15.02.2013 *ETA-12/0587 issued on 15.02.2013*

II SPECIFIC PART OF THE EUROPEAN TECHNICAL ASSESSMENT

1 Technical description of the product

The injection system ECO4800 is a bonded anchor (injection type) consisting of a mortar cartridge with injection mortar ECO4800, a perforated plastic sleeve and an anchor rod (with hexagon nut and washer) of sizes M8, M10 and M12. The steel elements are made of zinc coated steel or stainless steel.

The anchor rod is placed into a drilled hole/perforated plastic sleeve filled with the injection mortar and anchored through the bond between element, injection mortar and masonry.

An illustration and the description of the product are given in Annex A.

2 Specification of the intended use

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 essential characteristics for mechanical resistance and stability are listed in Annexes C1 to C3.

3.2 Safety in case of fire (BWR 2)

Anchorages satisfy requirements for Class A1 relating to Reaction to fire.

Resistance to fire isn't relevant.

3.3 Hygiene, health and environment (BWR 3)

Regarding dangerous substances contained in this European Technical Assessment, there may be requirements applicable to the products falling within its scope (e.g. transported European legislation and national laws, regulations and administrative provisions). In order to meet provisions of the regulation (EU) No 305/2011, these requirements need also to be complied with, when they apply.

3.4 Safety in use (BWR 4)

For basic requirement safety in use the same criteria are valid as for basic requirement mechanical resistance and stability.

3.5 Protection against noise (BWR 5)

Not relevant.

3.6 Energy economy and heat retention (BWR 6)

Not relevant.

3.7 Sustainable use of natural resources (BWR 7)

For sustainable use of natural resources no performance was determined for this product.

3.8 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 (AVCP)

According to the decision 97/177/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) given in the following table apply.

Product	Intended use	Level of class	System
Metal injection anchors for use in masonry	For fixing and/or supporting to masonry, structural elements (which contribute to the stability of the works) or heavy units such as claddings as well as installations	all/any	1

5 Technical details necessary for the implementation of the AVCP system

5.1 Tasks for the manufacturer

The manufacturer shall exercise permanent internal control of production of concerned product. All the elements, requirements and provisions adopted by the manufacturer shall be documented in a systematic manner in the form of written policies and procedures, including records of results performed. This production control system shall ensure that the product is in conformity with this European Technical Assessment.

The manufacturer may only use raw materials stated in the technical documentation of this European Technical Assessment.

The factory production control shall be in accordance with the Control plan which is a part of the technical documentation of this European Technical Assessment. The Control plan[2] is laid down in the context of the factory production control system operated by the manufacturer and deposited at Slovenian National Building and Civil Engineering Institute (ZAG Ljubljana). The results of factory production Control shall be recorded and evaluated in accordance with the provisions of the control plan.

The manufacturer shall, on the basis of a contract, involve a body, which is notified for the tasks referred to in a section 4 in the field of anchors in order to undertake the actions laid down in section 5.2. For this purpose the Control plan referred to in sections 5.1 and 5.2 shall be handed over by the manufacturer to the notified body involved.

The manufacturer shall make a Declaration of Performance, stating that the construction product is in conformity with the provisions of this European Technical Assessment.

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1 Official Journal of the European Communities L 254 of 8.10.1996

2 The Control plan is a confidential part of the technical documentation of this European Technical Assessment, but not published together with the ETA, and handed over only to the notified body or bodies involved in the procedure of attestation of conformity.

5.2 Tasks for the notified bodies

The notified body shall retain the essential points of its actions defined in Annex V of Regulation (EU) No. 305/2011 for system 1 and state results obtained and conclusions drawn in a written report.

The notified certification body involved by the manufacturer shall issue an EC certificate of constancy of performance the product stating the conformity with the provisions of this European Technical Assessment.

In cases where the provisions of the European Technical Assessment and its Control plan are no longer fulfilled the notified body shall withdraw the certificate of constancy of performance and inform the Slovenian National Building and Civil Engineering Institute (ZAG Ljubljana) without delay.

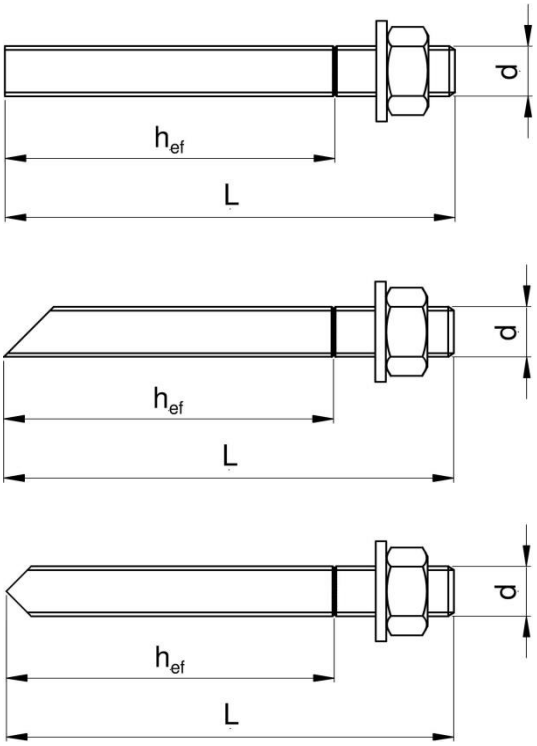
Issued in Ljubljana on 11.11.2015

Signed by:

Franc Capuder, M.Sc., Research Engineer

Head of Service of TAB

Anchor rods

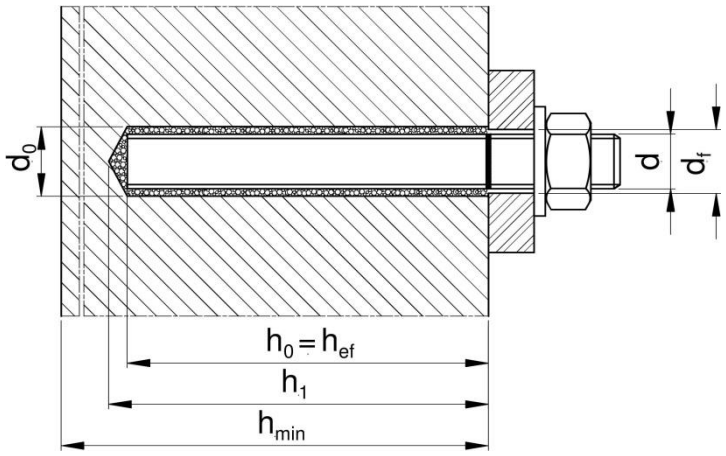


Perforated plastic sleeve

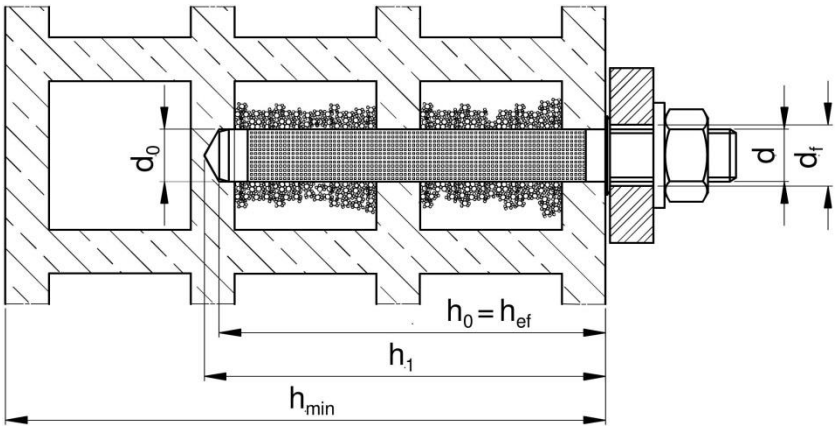
Diameter of the sleeve: d_s = 16 mm
Length of the sleeve: l_s = 85 mm, 130 mm

ECO4800	**Annex A1**
Product description Components of the anchor	

Installation in solid masonry



Installation in hollow or perforated masonry



d = diameter of the threaded rod
d_0 = diameter of drill bit
h_{ef} = embedment depth
h_{min} = minimum thicknes of the base material

ECO4800	**Annex A2**
Product description Installed condition	

Mortar cartridges and applicator guns

	cartridge	Applicator gun	Mixing nozzle
Coaxial cartridge: 160 ml/280 ml		 DT 300	 MN1
Sausage cartridge: 300 ml			
Side by side cartridge: 345 ml		 DT 345	
Coaxial cartridge: 380 ml		 DT 380	
Side by side cartridge: 825 ml		 DT 825	 MN3

ECO4800	**Annex A3**
Product description Injection system	

Table A1: Materials

Part		Material
1	Chemical mortar ECO4800	Methacrylate, blue/grey[1)]
2	Perforated plastic sleeve	Polypropylene
3	Threaded rod	**Zinc electroplated steel ≥ 5 μm according to EN ISO 4042 (A2)** **Hot-dip galvanized steel ≥ 40 μm according to EN ISO 10684** Carbon steel property class 5.8 or 8.8 acc. to EN ISO 898-1 **Stainless steel** Stainless steel: 1.4362, 1.4401, 1.4404, 1.4439, 1.4571, 1.4578 according to EN 10088, property class 70 according to EN ISO 3506-1 **Stainless steel – High corrosion resistance steel (HCR)** Stainless steel: 1.4529, 1.4565 according to EN 10088, property class 70 according to EN ISO 3506-1 **Commercial threaded rods** with Inspection certificate 3.1 according to EN 10204:2004 and marking of embedment depth (this may be done by the manufacturer of the rod or by the worker in jobsite)
4	Hexagon nut	**Zinc electroplated steel ≥ 5 μm according to EN ISO 4042 (A2)** **Hot-dip galvanized steel ≥ 40 μm according to EN ISO 10684** According to DIN 934 (EN ISO 4032), property class 8 according to EN ISO 898-2 **Stainless steel** According to DIN 934 (EN ISO 4032), property class 70 according to EN ISO 3506-2, Stainless steel: 1.4362, 1.4401, 1.4404, 1.4439, 1.4571, 1.4578 according to EN 10088 **Stainless steel – High corrosion resistance steel (HCR)** According to DIN 934 (EN ISO 4032), property class 70 according to EN ISO 3506-2, Stainless steel: 1.4529, 1.4565 according to EN 10088
5	Washer	**Zinc electroplated steel ≥ 5 μm according to EN ISO 4042 (A2)** **Hot-dip galvanized steel ≥ 40 μm according to EN ISO 10684** According to DIN 125 (EN ISO 7089), DIN 440 (EN ISO 7094), DIN 9021 (EN ISO 7093) **Stainless steel** According to DIN 125 (EN ISO 7089), DIN 440 (EN ISO 7094), DIN 9021 (EN ISO 7093) Stainless steel: 1.4362, 1.4401, 1.4404, 1.4439, 1.4571, 1.4578 according to EN 10088 **Stainless steel – High corrosion resistance steel (HCR)** According to DIN 125 (EN ISO 7089), DIN 440 (EN ISO 7094), DIN 9021 (EN ISO 7093), Stainless steel: 1.4529, 1.4565 according to EN 10088

[1)] Change of the colour happened after curing above 5°C

ECO4800	**Annex A4**
Product description Materials	

Specifications of intended use

Anchorages subjected to:

- Static, quasi static load.

Base materials:

- Solid masonry (use category b), according to Annex B3.
- Hollow or perforated masonry (use category c), according to Annex B3.
- Autoclaved aerated concrete masonry (use category d), according to Annex B3.
- Mortar strength class of masonry M 2,5 at minimum according to EN 998-2:2003.
- For masonry made of other solid, hollow or perforated bricks, the characteristic resistance of the anchor may be determined by job site tests according to ETAG 029, Annex B under consideration of the β-factor according to Annex C2, Table C4.

Use conditions (Environmental conditions):

- The elements made of galvanized steel may be only used in structures subjected to dry internal conditions.
- The elements made of stainless steel may be used in structures subjected to dry internal conditions and also in structures subjected to external atmospheric exposure (including industrial and marine environment), or exposure in permanently damp internal conditions, if no particular aggressive conditions exist. Such particular aggressive conditions are e.g. permanent, alternating immersion of 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 material are used).

Temperature range:

- Service temperature range from -40°C to +80°C (maximum long term temperature +50°C and maximum short term temperature +80°C).

Design:

- Verifiable calculation notes and drawings are prepared taking account the relevant masonry in the region of the anchorage (nature and strength of the base materials), the loads to be transmitted and their transmission to the supports of the structure. The position of the anchor is indicated on the design drawings (e.g. position of the anchor relative to the supports etc.).
- The anchorages are designed in accordance with the ETAG 029 – Annex C “Metal injection anchors for use in masonry – design methods for anchorages”, Design Method A under the responsibility of an engineer experienced in anchorages and masonry work.

ECO4800	**Annex B1**
Intended use Specifications	

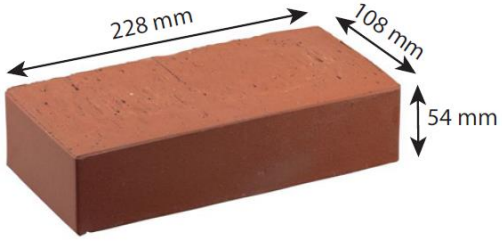
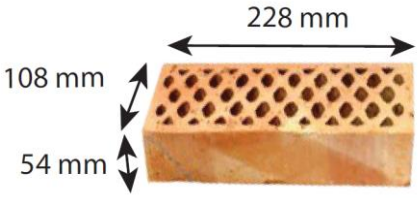
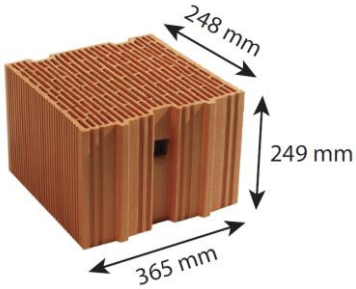
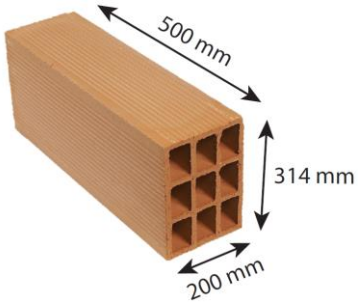
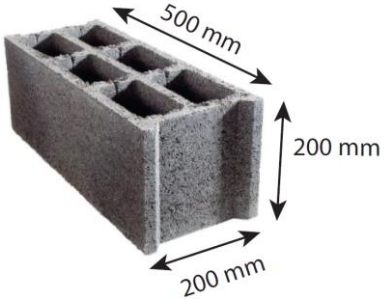
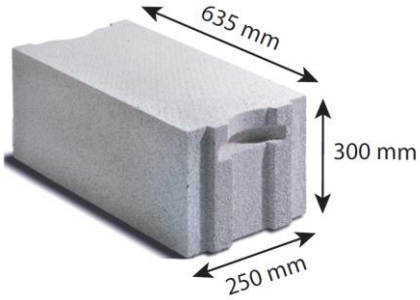
Specifications of intended use - continuing

Installation:

- Anchor installation carried out by appropriately qualified personnel under the supervision of the person responsible for technical matters on 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 using tools indicated in this European Technical Assessment.
- Commercial standard threaded rods, washers and hexagon nuts may also be used if the following requirements are fulfilled:
  - Material, dimensions and mechanical properties of the metal parts according to the specification given in Annex A4, Table A1 and Annexes B4 – B5, Tables B2 – B6,
  - Confirmation of material and mechanical properties of the metal parts by inspection certificate 3.1 according to EN 12024:2004, the documents should be stored,
  - Marking of the threaded rod with the envisage embedment depth. This may be done by the manufacturer of the rod or the person on jobsite.
- Checks before placing the anchor, to ensure that the characteristic values of the base material in which the anchor is to be placed, is identical with the values, which the characteristic loads apply for.
- Holes to be drilled perpendicular to the surface of the base material.
- In case of aborted hole the drill hole should be filled with mortar.
- Hole cleaning and anchor installation in accordance with the manufacturer’s installation instructions (Annexes B6 and B7).
- Keeping the installation parameters (Annexes B4 and B5).
- Marking and keeping the effective anchorage depth.
- Keeping edge distance and spacing according to Annex C3 without minus tolerances.
- Observation of the curing time according to Annex B5, Table B7 until the anchor may be loaded.

ECO4800	**Annex B2**
Intended use Specifications	

Table B1: Types of solid and hollow/perforated masonry

Solid clay brick RT 307 according to EN 771-1 – HD  $f_b \geq 22$ N/mm^2 $\rho \geq 1830$ kg/m^3	Hollow clay brick RT 301– Type 1 according to EN 771-1 – LD  $f_b \geq 22$ N/mm^2 $\rho \geq 1305$ kg/m^3
Hollow clay brick POROTON– Type 2 according to EN 771-1 – LD  $f_b \geq 8$ N/mm^2 $\rho \geq 650$ kg/m^3	Hollow clay brick LS BGV THERMO – Type 3 according to EN 771-1 – LD  $f_b \geq 6$ N/mm^2 $\rho \geq 570$ kg/m^3
Concrete hollow block – Type 4 according to EN 771-1 – LD  $f_b \geq 4$ N/mm^2 $\rho \geq 900$ kg/m^3	Autoclaved aerated concrete block according to EN 771 – 4  $f_b \geq 3$ N/mm^2 $\rho \geq 350$ kg/m^3

ECO4800	
Intended use Type of bricks and dimensions	**Annex B3**

Table B2: Installation parameters of anchor rods for solid brick

		M8	M10	M12
Drill hole diameter	d_0 (mm)	10	12	14
Maximum clearance hole in the fixture	d_f (mm)	9	12	14
Effective embedment depth	h_{ef} (mm)	80		
Depth of the drilling hole	h_1 (mm)	85		
Installation torque moment	T_{inst} (nm)	4	6	8

Table B3: Installation parameters of anchor rods for hollow brick type 1*

		M8	M10	M12
Drill hole diameter	d_0 (mm)	16		
Size of sleeve	d_s x l_s (mm)	16 x 85		
Maximum clearance hole in the fixture	d_f (mm)	9	12	14
Effective embedment depth	h_{ef} (mm)	85		
Depth of the drilling hole	h_1 (mm)	90		
Installation torque moment	T_{inst} (nm)	4	6	6

Table B4: Installation parameters of anchor rods for hollow bricks type 2*

		M8	M10	M12
Drill hole diameter	d_0 (mm)	16		
Size of sleeve	d_s x l_s (mm)	16 x 130		
Maximum clearance hole in the fixture	d_f (mm)	9	12	14
Effective embedment depth	h_{ef} (mm)	130		
Depth of the drilling hole	h_1 (mm)	135		
Installation torque moment	T_{inst} (nm)	4	6	6

Table B5: Installation parameters of anchor rods for hollow bricks type 3*

		M8	M10	M12
Drill hole diameter	d_0 (mm)	16		
Size of sleeve	d_s x l_s (mm)	16 x 130		
Maximum clearance hole in the fixture	d_f (mm)	9	12	14
Effective embedment depth	h_{ef} (mm)	130		
Depth of the drilling hole	h_1 (mm)	135		
Installation torque moment	T_{inst} (nm)	4	6	8

* Type of bricks are detailed in the Annex B3

ECO4800

Intended use
Installation parameters

Annex B4

Table B6: Installation parameters of anchor rods for hollow bricks type 4*

		M8	M10	M12
Drill hole diameter	d_0 (mm)	16		
Size of sleeve	d_s x l_s (mm)	16 x 130		
Maximum clearance hole in the fixture	d_f (mm)	9	12	14
Effective embedment depth	h_{ef} (mm)	130		
Depth of the drilling hole	h_1 (mm)	135		
Installation torque moment	T_{inst} (nm)	4	4	4

* Type of bricks are detailed in the Annex B3

Table B7: Installation parameters of anchor rods for autoclaved aerated concrete

		M8	M10	M12
Drill hole diameter	d_0 (mm)	10	12	14
Maximum clearance hole in the fixture	d_f (mm)	9	12	14
Effective embedment depth	h_{ef} (mm)	80		
Depth of the drilling hole	h_1 (mm)	85		
Installation torque moment	T_{inst} (nm)	4	6	8

Table B8: Maximum working time and maximum curing time for ECO 4800 chemical resin

Temperature of resin	Temperature of support	Working time	Curing time
+5°C	-5°C	45′	9h00′
+5°C	0°C	15′	4h00′
+5°C	+5°C	12′	1h30′
+10°C	+10°C	9′	60′
+20°C	+20°C	4′	30′
+30°C	+30°C	1′	20′

After the minimum curing time the blue injection mortar changes into grey. The curing colour proof works above +5°C.

ECO4800	
Intended use Installation parameters	**Annex B5**

Installation procedure for solid masonry

1 Drill hole to the required embedment depth (h_{ef}) with a percussive/hammer drill using specified carbide drill bit diameter (d_0).

2 The hole shall be cleaned by at least 2 blowing operations, 2 brushing operations followed again by 2 blowing operations starting from the bottom of the hole. The brush shall have a sufficient resistance as it enters the drill hole. If this is not the case a new brush shall be used.

3 Remove the cap an install mixing nozzle.

Using sausage cartridges: Cut to open the sausage.

4 Load the cartridge into applicator gun.

5 Dispense and discard first part of resin until it is properly mixed (uniform color). 3 strokes at least are needed.

6 Fill up the hole approximately 2/3rd with mortar starting at the bottom of the cleaned drilled hole. Withdraw the nozzle slowly step by step after each trigger to avoid creating air pockets.

7 Insert a clean, oil free threaded rod, turning slowly until it touches the bottom of the hole or until to the marking of h_{ef}. Setting control: After the rod has been fully inserted to the marking of embedment depth, excess mortar flows out of the drilled hole. Clean excess resin.

8 Do not touch/move the threaded rod until mortar is fully cured. The curing time is given in Table B8. After required curing time the anchor can be loaded. Apply the installation torque T_{inst} using calibrated torque wrench.

ECO4800	
Intended use Installation instructions	**Annex B6**

Installation procedure for hollow/perforated masonry

1 Drill hole to the required depth (h_1) with a rotary drill using specified carbide drill bit diameter (d_0).

2 The hole shall be cleaned by at least 2 brushing operations. The brush shall have a sufficient resistance as it enters the drill hole. If this is not the case a new brush shall be used.

3 Insert the sleeve into the hole.

Remove the cap an install mixing nozzle.
Using sausage cartridges: Cutting to open the sausage.

4 Load the cartridge into applicator gun.

5 Dispense and discard first part of resin until it is properly mixed (uniform color). 3 strokes at least are needed.

6 Place the mixer at the bottom of the sleeve and inject the mortar as long as the sleeve is completely filled. Withdraw the nozzle slowly step by step after each trigger.

7 Insert a clean, oil free threaded rod, turning slowly until it touches the bottom of the sleeve. Clean excess resin.

8 Do not touch/move the threaded rod until mortar is fully cured. The curing time is given in Table B8. After required curing time the anchor can be loaded. Apply the installation torque T_{inst} using calibrated torque wrench.

ECO4800	
Intended use Installation instructions	**Annex B7**

Table C1: Characteristic tension and shear load

Brick type	Brick parameters: Density ρ (kg/m^3) Compressive strength f_b (N/mm^2)	Sleeve size (mm)	Anchor size	N_{Rk} [1)] (kN)	V_{Rk} [2)] (kN)
Solid clay brick RT 307 according to EN 771-1 HD	$\rho \geq 1830$ $f_b = 22$	/	M8	2	2
			M10	2	2
			M12	2	2
Hollow clay brick RT 301 – Type 1 according to EN 771-1 LD	$\rho \geq 1305$ $f_b = 22$	16 x 85	M8	1,5	1,5
			M10	1,5	1,5
			M12	1,5	1,5
Hollow clay brick POROTON – Type 2 according to EN 771-1 LD	$\rho \geq 650$ $f_b = 8$	16 x 130	M8	1,5	1,5
			M10	1,5	1,5
			M12	2,0	2,0
Hollow clay brick LS BGV THERMO – Type 3 according to EN 771-1 LD	$\rho \geq 570$ $f_b = 6$	16 x 130	M8	1,5	1,5
			M10	2,0	2,0
			M12	3,0	3,0
Hollow clay brick BLOCS CREUX – Type 4 according to EN 771-1 LD	$\rho \geq 900$ $f_b = 4$	16 x 130	M8	1,2	1,2
			M10	2,0	2,0
			M12	2,0	2,0
Autoclaved aerated concrete EN 771-4	$\rho \geq 350$ $f_b = 3$	/	M8	0,9	0,9
			M10	1,2	1,2
			M12	1,2	1,2
Partial safety factor $\gamma_M = 2,5$ [3)]					

[1)] For design according to ETAG 029, Annex C: $N_{Rk} = N_{Rk,p} = N_{Rk,b} = N_{Rk,pb} = N_{Rk,s}$
[2)] For design according to ETAG 029, Annex C: $V_{Rk} = V_{Rk,b} = V_{Rk,c} = V_{Rk,s}$
[3)] In absence of other national regulations

ECO4800	**Annex C1**
Performances Characteristic tension and shear load	

Table C2: Characteristic bending moments

Size			M8	M10	M12
Characteristic bending moment for threaded steel rod grade 5.8	$M_{Rk,s}$	(Nm)	20	39	68
Partial safety factor	γ_{Ms}	(-)	1,25		
Characteristic bending moment for threaded steel rod grade 8.8	$M_{Rk,s}$	(Nm)	30	60	105
Partial safety factor	γ_{Ms}	(-)	1,25		
Characteristic bending moment for threaded stainless rod A4-70	$M_{Rk,s}$	(Nm)	26	52	92
Partial safety factor	γ_{Ms}	(-)	1,56		

Table C3: Displacement under tension and shear load

	F (kN)	δ_{N0} (mm)	$\delta_{N\infty}$ (mm)	δ_{V0} (mm)	$\delta_{V\infty}$ (mm)
Solid brick	$N_{Rk} / (1.4 \cdot \gamma_M)$	0,56	1,12	0,87	1,25
Hollow/perforated brick		0,81	1,62	1,20	1,80
Autoclaved aerated concrete		0,57	0,60	0,97	1,45

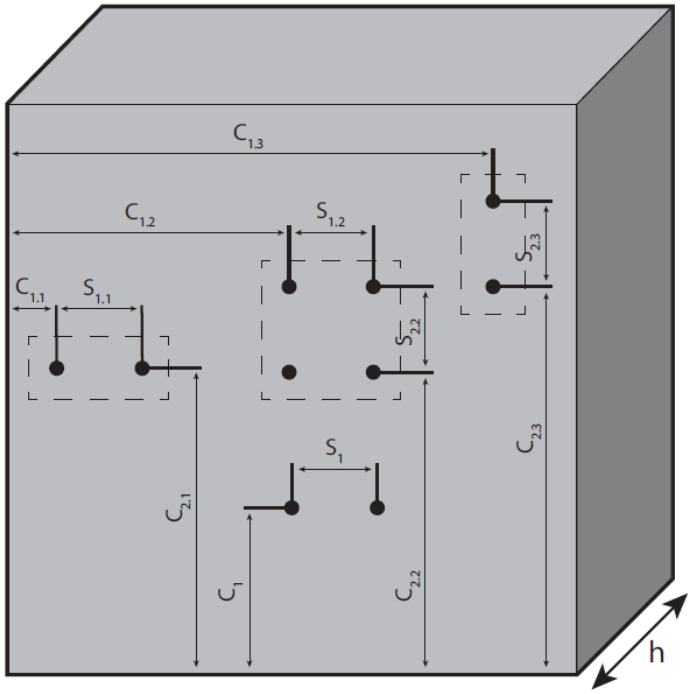
Table C4: β-factors for job site tests according to ETAG 029 – Annex B

Brick type	β-factor
Solid and hollow/perforated brick EN 771-1	0,86
Autoclaved aerated concrete EN 771-4	0,76

ECO4800	**Annex C2**
Performances Characteristic bending moment, displacements, β-factor	

Table C5: Edge distances and spacings

	s_{cr} (mm)	c_{cr} (mm)	s_{min} (mm)	c_{min} (mm)
Solid brick	20 x d	10 x d	50	50
Hollow/perforated brick	l_{unit}	0.5 x l_{unit}	100	100
Autoclaved aerated concrete	20 x d	10 x d	50	50



d = nominal diameter of threaded rod
l_{unit} = maximum dimension of masonry unit
h = thickness of masonry

ECO4800	
Performances Edge distances and spacing	**Annex C3**