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Authorised and notified according  
to Article 29 of the Regulation (EU)  
No 305/2011 of the European  
Parliament and of the Council of 9  
March 2011

MEMBER OF EOTA



## European Technical Assessment ETA-15/0560 of 2024/02/29

### I General Part

**Technical Assessment Body issuing the ETA and designated according to Article 29 of the Regulation (EU) No 305/2011: ETA-Danmark A/S**

**Trade name of the construction product:**

BOSSONG BCR POLY SF

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

Bonded anchor with anchor rod for use in non-cracked concrete  
Threaded rod sizes: M8 – M24

**Manufacturer:**

BOSSONG SPA  
Via Enrico Fermi 51  
IT-24050 Grassobbio (Bg)  
Tel. +39 035 3846 011  
Fax +39 035 3846 012  
Internet [www.bossong.com](http://www.bossong.com)

**Manufacturing plant:**

BOSSONG SPA  
Via Enrico Fermi 51  
IT-24050 Grassobbio (Bg)

**This European Technical Assessment contains:**

22 pages including 17 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 330499-01-0601 - Bonded fasteners for use in concrete

The ETA with the same number issued on 2015-09-30

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## **II SPECIFIC PART OF THE EUROPEAN TECHNICAL ASSESSMENT**

### **1 Technical description of product**

The BOSSONG BCR POLY SF is a bonded anchor (injection type) consisting of an injection mortar cartridge equipped with a special mixing nozzle and threaded anchor rod of the sizes from M8 to M24 made of:

- galvanized carbon steel,
- stainless steel A4-70, A4-80 or high corrosion resistant stainless steel with hexagon nut and washer.

The threaded rod is placed into a drilled hole previously injected (using an applicator gun) with a mortar with a slow and slight twisting motion. The anchor rod is anchored by the bond between rod, mortar and concrete.

The threaded rod is available for all diameters with three type of tip end a one side 45° chamfer, a two sided 45° chamfer or a flat. The threaded rods are either delivered with the mortar cartridges or commercial standard threaded rods purchased separately. Each mortar cartridge is marked with the identifying mark of the producer and with the trade name. The mortar cartridges are available in different sizes.

The anchor in the range of M8 to M24 and the mortar cartridges corresponds to the drawings given in the Annex A1 to A3.

The characteristic material values, dimensions and tolerances of the anchors not indicated in Annexes shall correspond to the respective values laid down in the technical documentation<sup>1</sup> of this European Technical Assessment.

The anchors are intended to be used with embedment depth given in Annex A2, Table A1. For the installed anchor see Figure given in Annex A1. The intended use specifications of the product are detailed in the Annex B1.

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

The performances given in Section 3 are only valid if the anchor is used in compliance with the specifications and conditions given in Annex B1 to B10.

The provisions made in this European Technical Assessment are based on an assumed intended 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 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.

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<sup>1</sup> The technical documentation of this European Technical Assessment is deposited at ETA-Danmark and, as far as relevant for the tasks of the Notified bodies involved in the attestation of conformity procedure, is handed over to the notified bodies.

### **3 Performance of the product and references to the methods used for its assessment**

#### **3.1 Characteristics of product**

##### **Mechanical resistance and stability (BWR 1):**

The essential characteristics are detailed in the Annex from C1 to C4.

##### **Hygiene, health and the environment (BWR3):**

No performance assessed.

Other Basic Requirements are not relevant.

#### **3.2 Methods of assessment**

The assessment of fitness of the anchor for the intended use in relation to the requirements for mechanical resistance and stability and safety in use in the sense of the Basic Requirements 1 has been made in accordance with EAD 330499-01-0601, on the basis of Option 7.

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

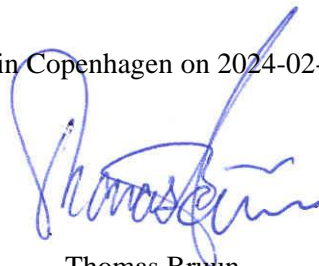
##### **4.1 AVCP system**

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

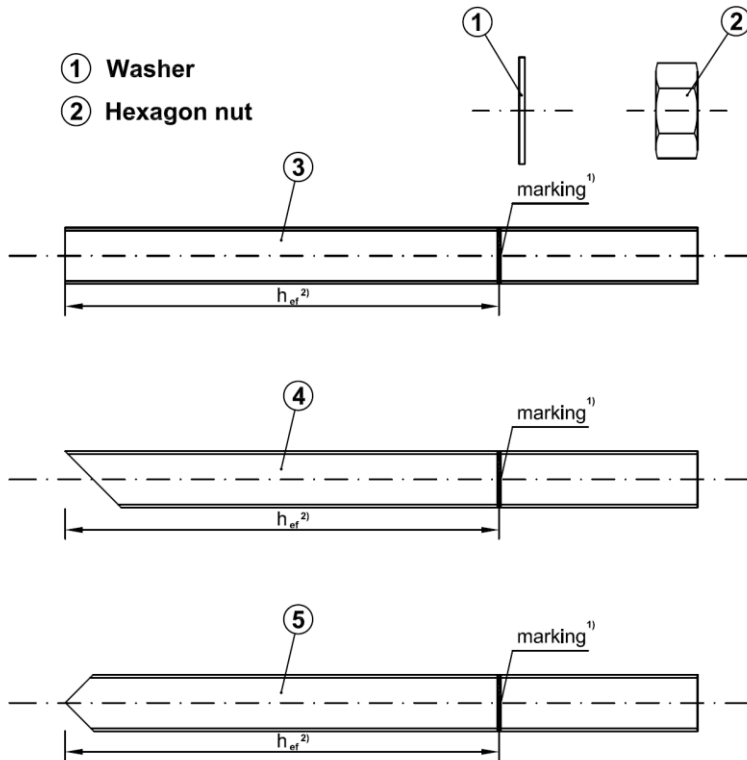
#### **5 Technical details necessary for the implementation of the AVCP system, as provided for in the applicable EAD**

Technical details necessary for the implementation of the AVCP system are laid down in the control plan deposited at ETA-Danmark prior to CE marking.

Issued in Copenhagen on 2024-02-29 by



Thomas Bruun  
Manager, ETA-Danmark



**Table A1: Threaded rod dimensions**

Size	d [mm]	$h_{ef,min}$ [mm]	$h_{ef,max}$ [mm]
M8	8	60	160
M10	10	70	200
M12	12	80	240
M14	14	80	280
M16	16	100	320
M20	20	120	400
M24	24	145	480

<sup>1)</sup> Marking according to point 1.1 of EAD 330499-01-0601

<sup>2)</sup> Effective anchorage depths according to the range specified in Table A1

**BOSSONG BCR POLY-SF**

**Product description**  
Steel element

**Annex A1**  
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**Table A2: Threaded rod materials**

Designation	Material				
Steel, zinc plated electroplated $\geq 5 \mu\text{m}$ acc. to EN ISO 4042 hot-dip galvanized $\geq 40 \mu\text{m}$ acc. to EN ISO 1461					
Threaded rod	Property class	Characteristic steel ultimate strength	Characteristic steel yield strength	Fracture elongation	EN ISO 898-1
	4.8	$f_{uk} \geq 400 \text{ N/mm}^2$	$f_{yk} \geq 320 \text{ N/mm}^2$	$A_5 > 8\%^{(1)}$	
	5.8	$f_{uk} \geq 500 \text{ N/mm}^2$	$f_{yk} \geq 400 \text{ N/mm}^2$	$A_5 > 8\%^{(1)}$	
	8.8	$f_{uk} \geq 800 \text{ N/mm}^2$	$f_{yk} \geq 640 \text{ N/mm}^2$	$A_5 \geq 12\%^{(1)}$	
Hexagon nut	4	for class 4.8 rods			EN 898-2
	5	for class 5.8 rods			
	8	for class 8.8 rods			
Washer	Steel, according to EN ISO 7089; corresponding to anchor rod material				
Stainless steel A2 (Materials) 1.4301, 1.4307, 1.4567, 1.4541					
Stainless steel A4 (Materials) 1.4401, 1.4404, 1.4571, 1.4362, 1.4578					
High corrosion resistance stainless steel (HCR) (Materials) 1.4529, 1.4565					
Threaded rod	Property class	Characteristic steel ultimate strength	Characteristic steel yield strength	Fracture elongation	EN 10088 EN ISO 3506
	50	$f_{uk} \geq 500 \text{ N/mm}^2$	$f_{yk} \geq 210 \text{ N/mm}^2$	$A_5 > 8\%^{(1)}$	
	70	$f_{uk} \geq 700 \text{ N/mm}^2$	$f_{yk} \geq 450 \text{ N/mm}^2$	$A_5 \geq 12\%^{(1)}$	
	80	$f_{uk} \geq 800 \text{ N/mm}^2$	$f_{yk} \geq 600 \text{ N/mm}^2$	$A_5 \geq 12\%^{(1)}$	
Hexagon nut	50	for class 50 rods			EN 10088 EN ISO 3506
	70	for class 70 rods			
	80	for class 80 rods			
Washer	Steel, according to EN 10088; corresponding to anchor rod material				

Commercial standard threaded rods may be used, with:

- material and mechanical properties according to Table A3,
- confirmation of material and mechanical properties by inspection certificate 3.1 according to EN-10204:2004,
- marking of the threaded rod with the embedment depth.

**Table A3: Injection mortar**

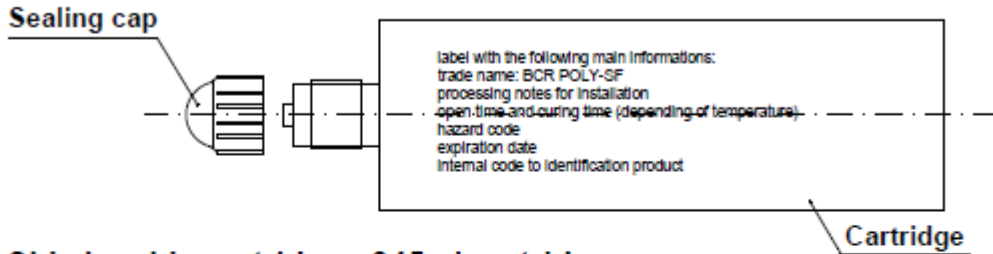
Product	Composition
BOSSONG BCR POLY-SF two components injection mortar	Mortar resin styrene-free, hardener, filler

**BOSSONG BCR POLY-SF**

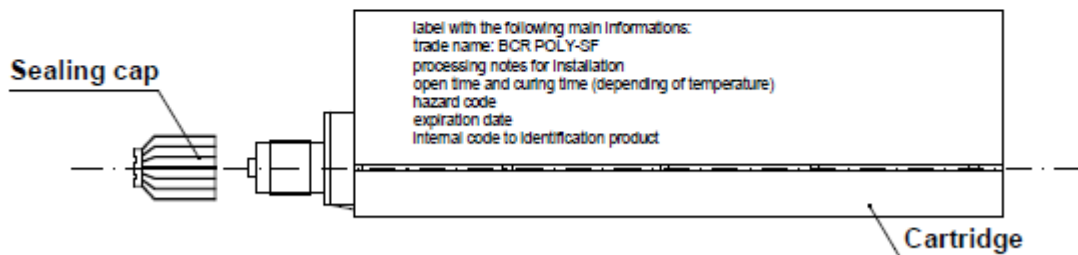
**Product description**  
Materials (1)

**Annex A2**  
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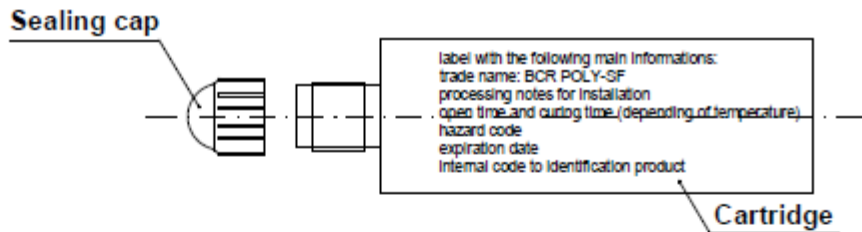
**Coaxial cartridge - sizes from 75 ml to 420 ml**



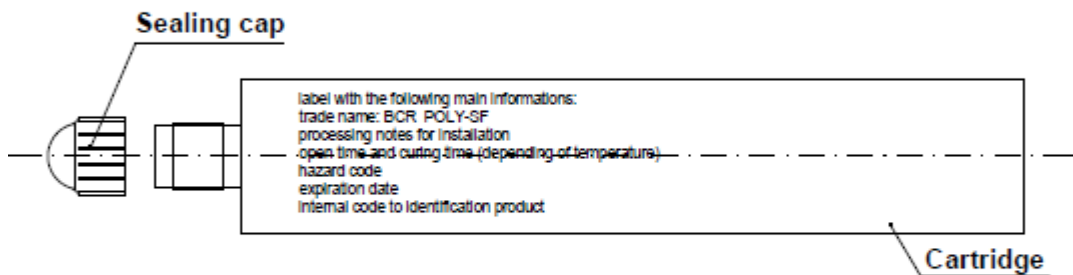
**Side by side cartridge - 345ml cartridge**



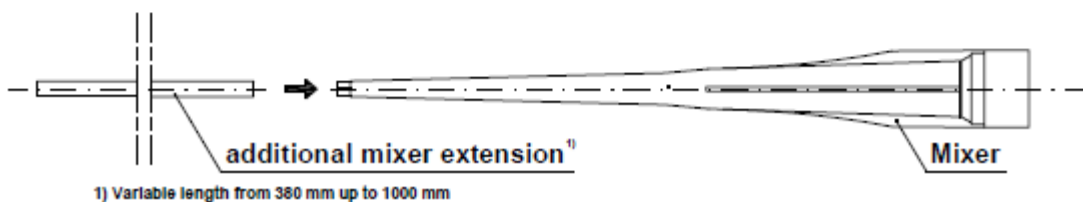
**CIC foil cartridge - sizes from 165 ml to 300 ml**



**Coaxial peeler cartridge - size of 280 ml**



**MIXER - the mixer is suitable for each type of cartridge**



**BOSSONG BCR POLY-SF**

**Product description**  
 Cartridge types and sizes

**Annex A3**  
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**Use:**

The anchors are intended to be used for anchorages for which requirements for mechanical resistance and stability and safety in use in the sense of the Basic Requirement 1 (EU) 305/2011 shall be fulfilled and failure of anchorages made with these products would compromise the stability of the works, cause risk to human life and/or lead to considerable economic consequences.

**Anchors subject to:**

- Static and quasi-static loads: sizes from M8 to M24

**Base materials:**

- Reinforced or unreinforced normal weight concrete of strength class C20/25 at minimum to C50/60 at maximum according to EN 206-1.
- Non cracked concrete for M8 to M24

**Temperature range:**

The anchors may be used in the following temperature range:

- a) -40°C to +50°C (max. short term temperature +50°C and max. long term temperature +40°C).

**Use conditions (Environmental conditions):**

- Structures subject to dry internal conditions: all materials according to Table A2.
- For all other conditions according to EN 1993-1-4:2006+A1:2015 corresponding to corrosion resistance class:
- Stainless steel A2 according to Annex A2, Table A3: CRC II
- Stainless steel A4 according to Annex A2, Table A3: CRC III
- High corrosion resistance steel HCR according to Annex A2, Table A3: CRC V

**Installation:**

The anchors may be installed in:

- Dry, wet concrete (use category I1) for all sizes
- Overhead installation allowed.
- The anchor is suitable for hammer drilled holes (HD) and compressed air drill (CA) for all sizes

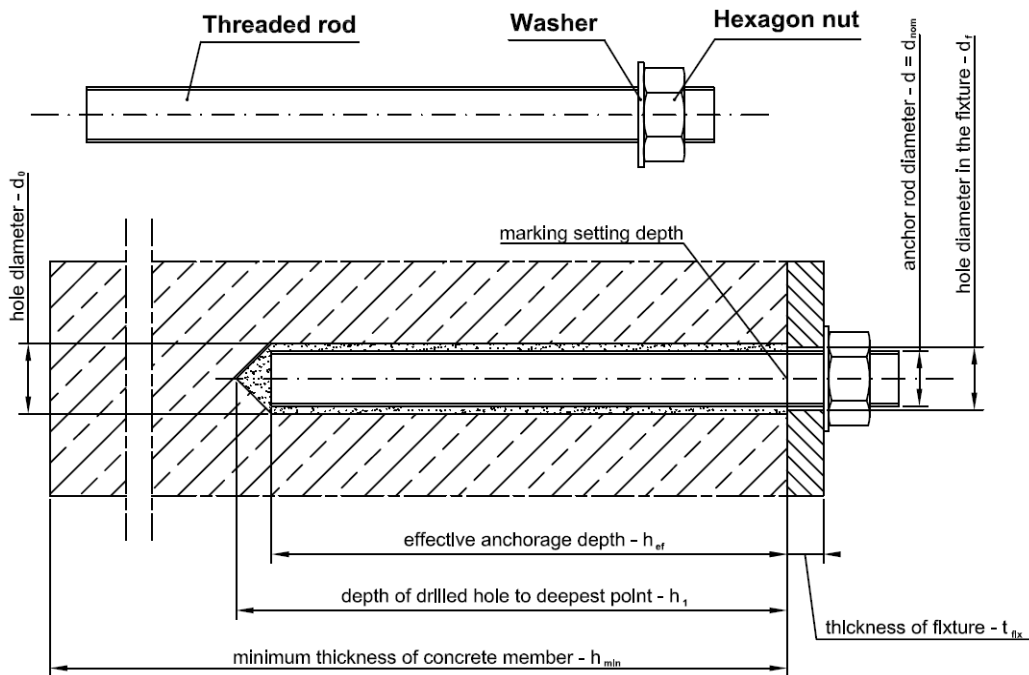
**Proposed design methods:**

- Verifiable calculation notes and drawings are prepared taking account of 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 are designed under the responsibility of an engineer experienced in anchorages and concrete work.
- Anchorages under static or quasi-static loads are designed in accordance to EN 1992-4 and Technical Report TR055.

<b>BOSSONG BCR POLY-SF</b>	<b>Annex B1</b> of European Technical Assessment ETA-15/0560
<b>Intended use</b> Specifications	

**Table B1: Installation data for threaded rod**

Size		M8	M10	M12	M14	M16	M20	M24
Nominal drilling diameter	$d_0$ [mm]	10	12	14	16	18	22-24	28
Maximum diameter hole in the fixture	$d_{fix}$ [mm]	9	12	14	16	18	22	26
Embedment depth	$h_{ef,min}$ [mm]	60	70	80	80	100	120	145
	$h_{ef,max}$ [mm]	160	200	240	280	320	400	480
Depth of the drilling hole	$h_1$ [mm]	$h_{ef} + 5$ mm						
Minimum thickness of the slab	$h_{min}$ [mm]	$h_{ef} + 30$ mm; $\geq 100$ mm			$h_{ef} + 2d_0$			
Torque moment	$T_{inst}$ [Nm]	10	20	40	40	80	130	200
Minimum spacing	$S_{min}$ [mm]	40	50	60	75	75	90	115
Minimum edge distance	$C_{min}$ [mm]	40	40	40	50	50	55	60



**BOSSONG BCR POLY-SF**

**Intended use**  
Installation data for threaded rods

**Annex B2**

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**Table B2: Minimum curing time <sup>1)</sup>**

Concrete temperature	Processing time	Minimum curing time <sup>3)</sup>
-5°C <sup>2)</sup>	30 min	360 min
0°C <sup>2)</sup>	25 min	180 min
5°C <sup>2)</sup>	15 min	120 min
10°C	12 min	90 min
15°C	8 min	60 min
20°C	6 min	45 min
25°C	4 min	30 min
30°C	3 min	20 min
40°C	1 min	20 min

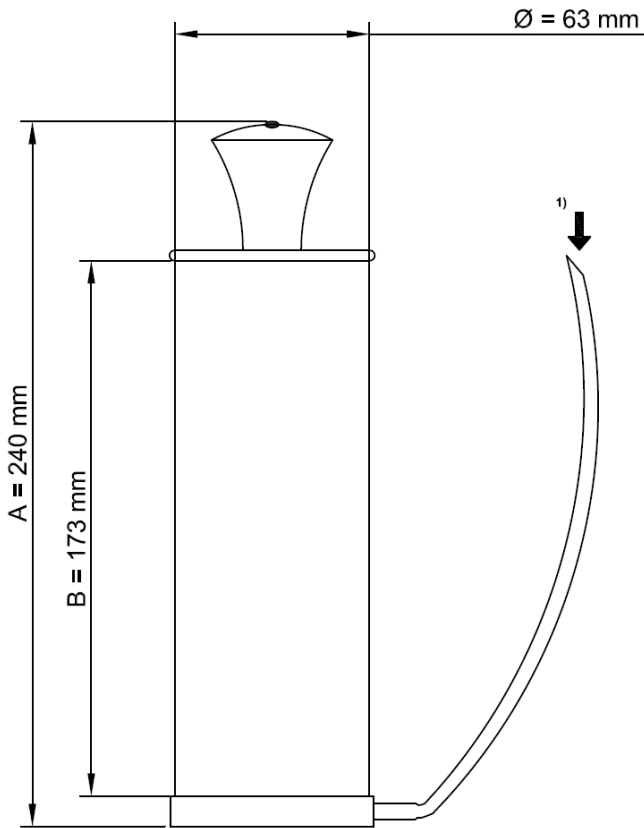
- 1) the minimum time from the end of the mixing to the time when the anchor may be torque or loaded.
- 2) minimum resin temperature recommended, for injection between -5°C and 5°C, equal to 10°C.
- 3) minimum curing time for dry and wet conditions.

**BOSSONG BCR POLY-SF**

**Intended use**  
Processing time and curing time

**Annex B3**  
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**Manual blower pump: nominal dimensions**



**It is possible to use the mixer extension with the manual blower pump.**

**However it is possible to blow the hole using the mechanical air system (compressed air) also with the mixer extension**



**Suitable min pressure 6 bar at 6 m<sup>3</sup>/h  
Oil-free compressed air  
Recommended air gun with an orifice opening of minimum 3.5 mm in diameter**

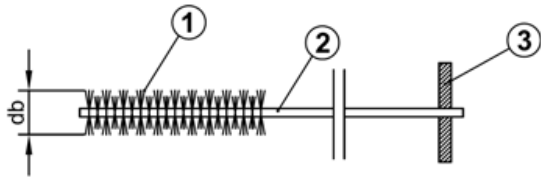
1) Position to Insert the mixer extension



**Mixer extension (from 380 mm to 1000 mm) with nominal diameter equal to 10 mm**

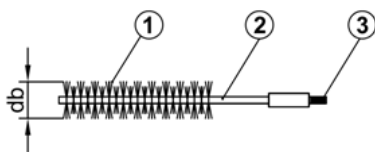
<b>BOSSONG BCR POLY-SF</b>	<b>Annex B4</b> of European Technical Assessment ETA-15/0560
<b>Intended use</b> Cleaning tools (1)	

**Standard brush**



- ① Steel bristles
- ② Steel stem
- ③ Wood handle

**Special brush**



- ① Steel bristles
- ② Steel stem
- ③ Threaded connection for drilling tool extension
- ④ Extension special brush
- ⑤ Drilling tool connection (SDS connection)



**Table B3: Brush diameter for threaded rod**

Threaded rod diameter - d			M8	M10	M12	M14	M16	M20	M24
<b>d<sub>0</sub></b>	Nominal drill hole	[mm]	10	12	14	16	18	22-24	28
<b>d<sub>b</sub></b>	Brush diameter	[mm]	12	14	16	18	20	26	30

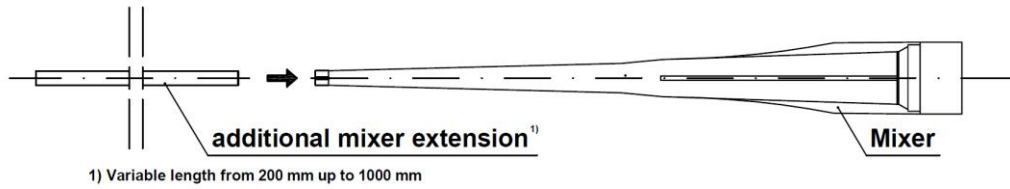
**BOSSONG BCR POLY-SF**

**Intended use**  
Cleaning tools (2)

**Annex B5**  
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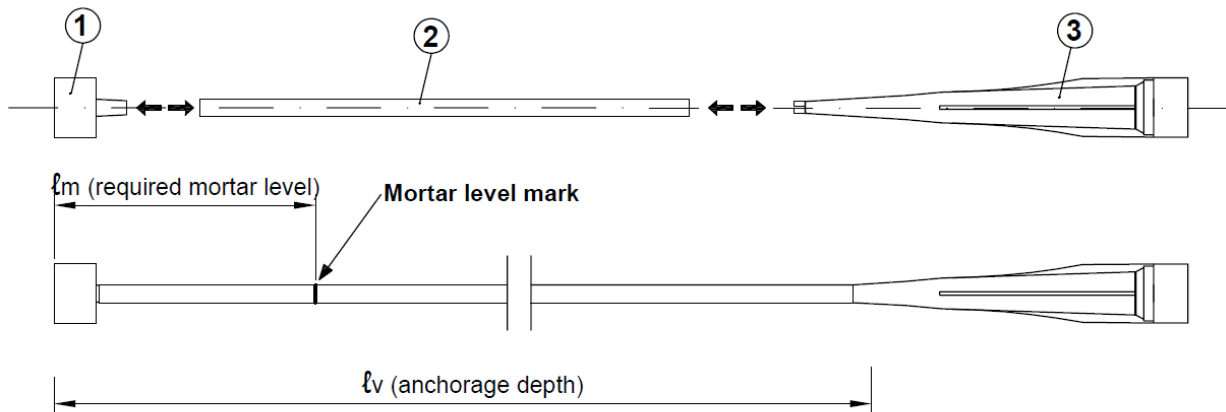
### Injection up to 300 mm:

Use the mixer or, if necessary, the mixer with the mixer extension assembled.



### Injection up to 480 mm and/or overhead installation:

It is recommended to use the system as described in the pictures below.  
Use pneumatic or battery dispenser.

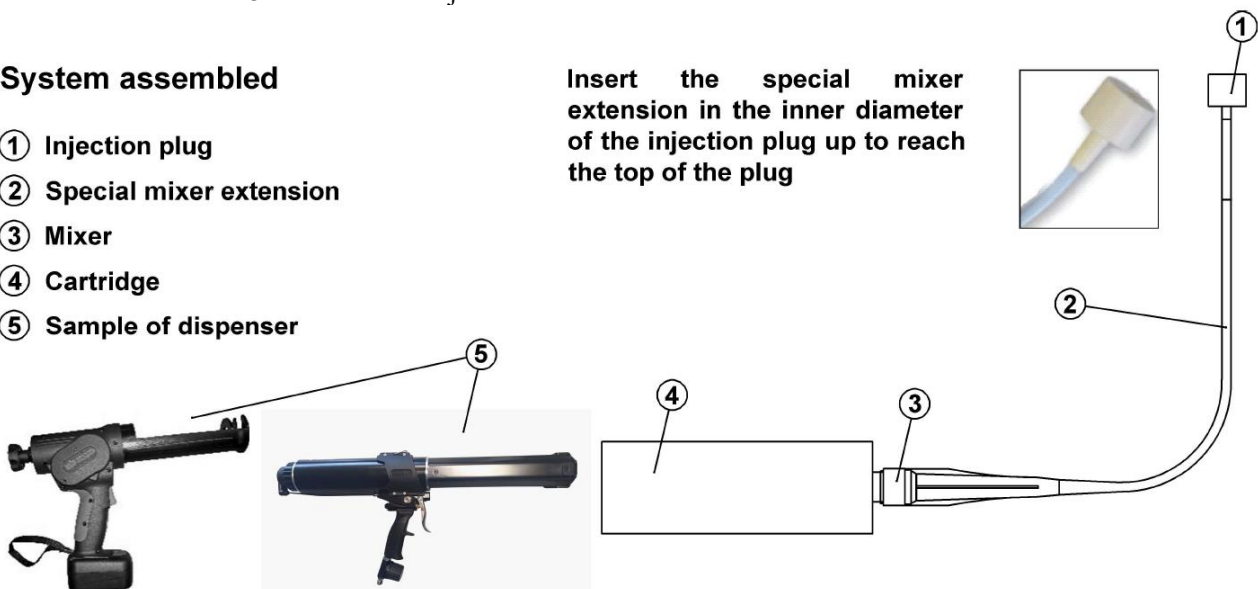


Mark the required mortar level  $\ell_m$  and embedment depth  $\ell_v$  with tape or marker on the injection extension.  
Quick estimation:  $\ell_m = 1/3 \cdot \ell_v$ . Continue injection until the mortar level mark  $\ell_m$  becomes visible.

### System assembled

- ① Injection plug
- ② Special mixer extension
- ③ Mixer
- ④ Cartridge
- ⑤ Sample of dispenser

Insert the special mixer extension in the inner diameter of the injection plug up to reach the top of the plug



**BOSSONG BCR POLY-SF**

**Intended use**  
Tools for installation (1)


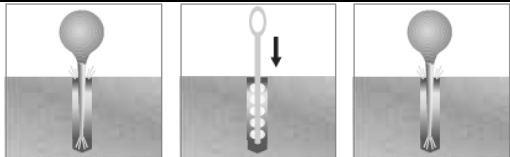
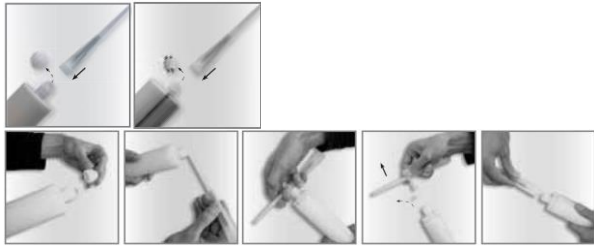
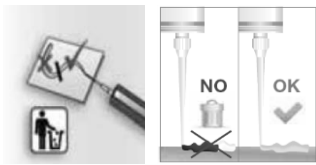
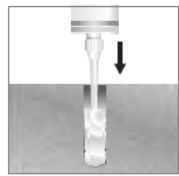
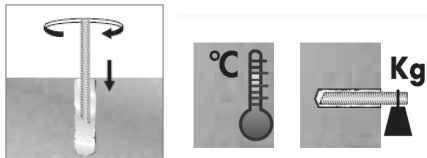
**Annex B6**  
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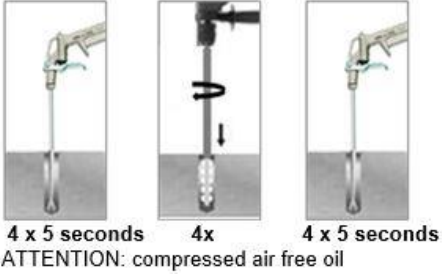
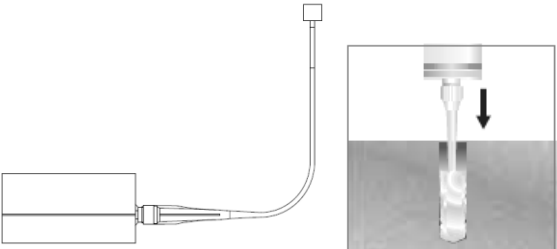
**Table B5: Mortar injection dispenser**

Injection dispensers	Cartridges	Maximum depth of the drilled hole
 <p><i>Manual</i></p>	420 ml 400 ml 380 ml	up to 300 mm *
 <p><i>Manual</i></p>	345 ml 300 ml 280 ml 165 ml	up to 300 mm *
 <p><i>Manual</i></p>	300 ml 280 ml 165 ml	up to 300 mm *
 <p><i>Pneumatic</i></p>	420 ml 400 ml 380 ml	up to 480 mm *
 <p><i>Battery</i></p>	420 ml 400 ml 380 ml 345 ml 300 ml	up to 480 mm *

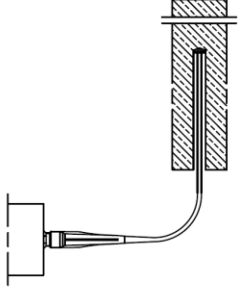
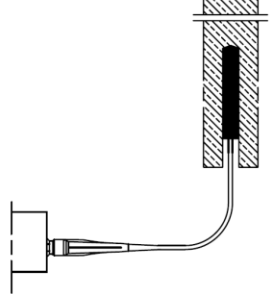
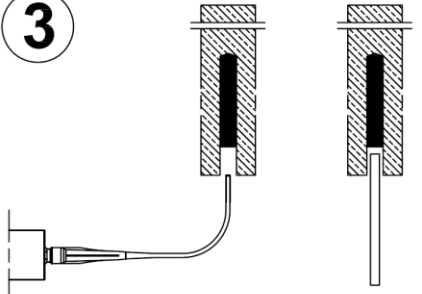
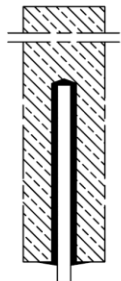
\* Note: use the mixer extension described in Annex B6 for the injection of the mortar

<b>BOSSONG BCR POLY-SF</b>	<b>Annex B7</b> of European Technical Assessment ETA-15/0560
<b>Intended use</b> Tools for installation (2)	

1		<p>Drill the hole with the correct diameter and depth using a rotary percussive machine. Check the perpendicularity of the hole during the drilling operation.</p>
2	 <p><b>4 x Blower      4 x Brush      4 x Blower</b></p>	<p>Clean the hole from drilling dust: the hole shall be cleaned by at least 4 blowing operations, by at least 4 brushing operations followed again by at least 4 blowing operations; before brushing clean the brush and check (see Annex B5) if the brush diameter is sufficient. For the blower tools see Annex B4.</p>
3		<p>For coaxial, side by side and peeler cartridges unscrew the front cup, screw on the mixer and insert the cartridge in the gun. For the size 300 ml and 165 ml, unscrew the front cup, pull-out the steel closing clip according to the following operations: - insert the mixer in the eye of the plastic extractor, - pull the extractor to unhook the steel closing clip of the foil. In the version without extractor cut the foil pack. After that, screw on the mixer and insert the cartridge in the gun.</p>
4		<p>Before starting to use the cartridge, eject a first part of the product, being sure that the two components are completely mixed. The complete mixing is reached only after that the product, obtained by mixing the two components, comes out from the mixer with a uniform color.</p>
5	 <p><b>if necessary, use a mixer extension for the injection (see Annex A3)</b></p>	<p>Fill the drilled hole uniformly starting from the drilled hole bottom, in order to avoid entrapment of the air; remove the mixer slowly bit by bit during pressing-out; filling the drill hole with a quantity of the injection mortar corresponding to 2/3 of the drill hole depth.</p>
6	 <p><b>ATTENTION: Use the rods dry and free oil and other contaminants</b></p>	<p>Insert immediately the steel element, marked according to the proper anchorage depth, slowly and with a slight twisting motion, removing excess of injection mortar around the steel element. Observe the processing time according Annex B3. Wait the curing time according Annex B3.</p>
<p><b>BOSSONG BCR POLY-SF</b></p>		<p><b>Annex B8</b> of European Technical Assessment ETA-15/0560</p>
<p><b>Intended use</b> Procedure of installation up to 300 mm depth</p>		

1	See clause 1 Annex B8	
2	 <p>4 x 5 seconds    4x    4 x 5 seconds ATTENTION: compressed air free oil</p>	<p>Clean the hole from drilling dust: the hole shall be cleaned by at least 4 blowing operations (5 seconds for single operation) with compressed air, by at least 4 brushing operations with special brush followed again by at least 4 blowing operations (5 seconds for single operation) with compressed air. Before brushing clean the brush and check if the brush diameter is sufficient.</p>
3	See clause 3 Annex B8	
4	See clause 4 Annex B8	
5		<p>Before starting the injection, assemble the system according to Annex B6. After that, fill the drilled hole uniformly from the drilled hole bottom, in order to avoid entrapment of the air; remove the special mixer extension with injection plug slowly bit by bit during pressing-out; filling the drill hole with a quantity of the injection mortar corresponding to 2/3 of the drill hole depth. Procedure for overhead installation is detailed in Annex B10.</p>
6	See clause 6 Annex B8	
<b>BOSSONG BCR POLY-SF</b>		<b>Annex B9</b> of European Technical Assessment ETA-15/0560
<b>Intended use</b> Procedure of installation up to 480 mm depth		

For overhead installation follow the procedure detailed in Annex B8 or B9 up to point 4.  
Put the mixer extension (cut the proper length) on the mixer see Annex B6 and follow the below procedure:

<p><b>1</b></p> 	<p><b>1 - Start injection</b></p> <p>Inject from the bottom of the hole. Use battery or pneumatic dispenser if the anchorage depth is greater than 200 mm.</p>
<p><b>2</b></p> 	<p><b>2 - Injection phase</b></p> <p>Inject the product about 2/3 of the hole depth. Remove the mixer extension slowly bit by bit during pressing-out.</p>
<p><b>3</b></p> 	<p><b>3 - End injection</b></p> <p>Remove the mixer extension. Insert immediately the steel element (turn the steel element during the insertion).</p>
<p><b>4</b></p> 	<p><b>4 - End installation</b></p> <p>To avoid the slipping of the steel element during the open time of the product (due to the steel element own weight) use a temporary interlocking element (for ex. wedge of wood)</p>

Observe the open time and wait the curing time according to Annex B3.

<p><b>BOSSONG BCR POLY-SF</b></p>	<p><b>Annex B10</b> of European Technical Assessment ETA-15/0560</p>
<p><b>Intended use</b> Overhead installation instruction</p>	

**Table C1: Characteristic values for steel: tension resistance and shear resistance for threaded rods**

Size			M8	M10	M12	M14	M16	M20	M24
<b>Steel failure – characteristic tension resistance</b>									
Steel class 4.8	$N_{Rk,s}$	[kN]	15	23	34	46	63	98	141
Steel class 5.8	$N_{Rk,s}$	[kN]	18	29	42	58	78	122	176
Steel class 8.8	$N_{Rk,s}$	[kN]	29	46	67	92	126	196	282
Stainless steel A2, A4, HCR class 50	$N_{Rk,s}$	[kN]	18	29	42	58	78	122	176
Stainless steel A2, A4, HCR class 70	$N_{Rk,s}$	[kN]	26	41	59	81	110	171	247
Stainless steel A4, HCR class 80	$N_{Rk,s}$	[kN]	29	46	67	92	126	196	282
<b>Steel failure – characteristic tension resistance – partial factor</b>									
Steel class 4.8	$\gamma_{Ms,N}^{1)}$	[-]	1,50						
Steel class 5.8	$\gamma_{Ms,N}^{1)}$	[-]	1,50						
Steel class 8.8	$\gamma_{Ms,N}^{1)}$	[-]	1,50						
Stainless steel A2, A4, HCR class 50	$\gamma_{Ms,N}^{1)}$	[-]	2,86						
Stainless steel A2, A4, HCR class 70	$\gamma_{Ms,N}^{1)}$	[-]	1,87						
Stainless steel A4, HCR class 80	$\gamma_{Ms,N}^{1)}$	[-]	1,60						
<b>Steel failure – characteristic shear resistance without lever arm</b>									
Steel class 4.8	$V_{Rk,s}^0$	[kN]	7	12	17	23	31	49	71
Steel class 5.8	$V_{Rk,s}^0$	[kN]	9	14	21	29	39	61	88
Steel class 8.8	$V_{Rk,s}^0$	[kN]	15	23	34	46	63	98	141
Stainless steel A2, A4, HCR class 50	$V_{Rk,s}^0$	[kN]	9	14	21	29	39	61	88
Stainless steel A2, A4, HCR class 70	$V_{Rk,s}^0$	[kN]	13	20	29	40	55	86	124
Stainless steel A4, HCR class 80	$V_{Rk,s}^0$	[kN]	15	23	34	46	63	98	141
<b>Steel failure – characteristic shear resistance with lever arm</b>									
Steel class 4.8	$M_{Rk,s}^0$	[Nm]	15	30	52	83	133	260	449
Steel class 5.8	$M_{Rk,s}^0$	[Nm]	19	37	65	104	166	324	561
Steel class 8.8	$M_{Rk,s}^0$	[Nm]	30	60	105	167	266	519	898
Stainless steel A2, A4, HCR class 50	$M_{Rk,s}^0$	[Nm]	19	37	66	104	166	324	561
Stainless steel A2, A4, HCR class 70	$M_{Rk,s}^0$	[Nm]	26	52	92	146	233	454	786
Stainless steel A4, HCR class 80	$M_{Rk,s}^0$	[Nm]	30	60	105	167	266	519	898
<b>Steel failure – characteristic shear resistance – partial factor</b>									
Steel class 4.8	$\gamma_{Ms,V}^{1)}$	[-]	1,25						
Steel class 5.8	$\gamma_{Ms,V}^{1)}$	[-]	1,25						
Steel class 8.8	$\gamma_{Ms,V}^{1)}$	[-]	1,25						
Stainless steel A2, A4, HCR class 50	$\gamma_{Ms,V}^{1)}$	[-]	2,38						
Stainless steel A2, A4, HCR class 70	$\gamma_{Ms,V}^{1)}$	[-]	1,56						
Stainless steel A4, HCR class 80	$\gamma_{Ms,V}^{1)}$	[-]	1,33						

<sup>1)</sup> In the absence of national regulation

<b>BOSSONG BCR POLY-SF</b>	<b>Annex C1</b> of European Technical Assessment ETA-15/0560
<b>Performances</b> Characteristic values for steel: tension and shear resistance for threaded rods	

**Table C2: Characteristic values in tension: resistance in non-cracked concrete for threaded rods**

Size	M8	M10	M12	M14	M16	M20	M24		
<b>Steel failure</b>									
Characteristic resistance	$N_{Rk,s}$	[kN]	See Annex C1 – Table C1						
Partial factor	$\gamma_{Ms,N}$	[-]	See Annex C1 – Table C1						
<b>Combined pull-out and concrete cone failure in non-cracked concrete C20/25</b>									
Characteristic bond resistance temperature range -40°C / +50°C	$\tau_{Rk,ucr}$	[N/mm <sup>2</sup> ]	12,0	12,0	11,0	10,0	9,0	9,0	8,0
<b>Reduction and increasing factor for concrete</b>									
Increasing factor for non-cracked concrete related to strength $f_{ck}$	$\psi_{c,ucr}$	[-]	1,0						
Sustained load factor temperature range -40°C / +50°C	$\psi_{sus}^0$	[-]	0,74						
<b>Concrete cone failure</b>									
Factor for non-cracked concrete	$k_{ucr,N}$	[-]	11,0						
Edge distance	$c_{cr,N}$	[mm]	1,5 $h_{ef}$						
Spacing	$s_{cr,N}$	[mm]	3,0 $\cdot h_{ef}$						
<b>Splitting failure</b>									
$S_{cr,sp}$ [mm]	for $h = h_{min}$		$S_{cr,sp} = 4 h_{ef}$						
	if $h_{min} \leq h < 2 h_{ef}$		$S_{cr,sp} = \text{interpolated value}$						
	if $h \geq 2 h_{ef}$		$S_{cr,sp} = S_{cr,Np} = 20 d (\tau_{Rk,ucr}/7,5)^{0,5} \leq 3 h_{ef}$						
$C_{cr,sp}$ [mm]			0,5 $S_{cr,sp}$						
<b>Installation factor for combined pull-out, concrete cone and splitting failure</b>									
Installation factors for category II	$\gamma_{inst}$	[-]	1,2						
<b>BOSSONG BCR POLY-SF</b>						<b>Annex C2</b>			
<b>Performances</b>						of European			
Characteristic values in tension: resistance in concrete for threaded rods						Technical Assessment			
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**Table C3: Characteristic values in shear: resistance in non-cracked concrete for threaded rods**

Size			M8	M10	M12	M14	M16	M20	M24
<b>Steel failure without lever arm</b>									
Characteristic resistance	$V_{Rk,s}^0$	[kN]	See Annex C1 – Table C1						
Partial factor	$\gamma_{Ms,V}$	[-]	See Annex C1 – Table C1						
Ductility factor	$k_7$	[-]	1,0						
<b>Steel failure with lever arm</b>									
Characteristic resistance	$M_{Rk,s}^0$	[Nm]	See Annex C1 – Table C1						
Partial factor	$\gamma_{Ms,V}$	[-]	See Annex C1 – Table C1						
<b>Concrete pry out failure</b>									
Factor	$k_g$	[-]	2,0						
Installation factor	$\gamma_{inst}$	[-]	1,0						
<b>Concrete edge failure</b>									
Effective length of anchor under shear loading	$l_f$	[mm]	$l_f = h_{ef}$ and $\leq 12 d_{nom}$						
Installation factor	$\gamma_{inst}$	[-]	1,0						

**BOSSONG BCR POLY-SF****Performances**

Characteristic values in shear: resistance in concrete for threaded rods

**Annex C3**  
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**Table C6: Displacements under service loads (static and quasi static) in non cracked concrete.**

Size	M8	M10	M12	M14	M16	M20	M24
<b>Displacement under service load Tensile load for concrete from C20/25 to C50/60</b>							
$\delta_{N0,unc}$ [mm/(N/mm <sup>2</sup> )]	0,025	0,025	0,032	0,030	0,039	0,039	0,050
$\delta_{N\infty,unc}$ [mm/(N/mm <sup>2</sup> )]	0,061	0,061	0,066	0,073	0,081	0,081	0,091
<b>Displacement under service load Shear load for concrete from C20/25 to C50/60</b>							
$\delta_{V0,unc}$ [mm/kN]	0,033	0,021	0,016	0,010	0,009	0,006	0,005
$\delta_{V\infty,unc}$ [mm/kN]	0,049	0,031	0,025	0,016	0,013	0,009	0,007

**BOSSONG BCR POLY-SF**

**Performances**  
Displacement under service load

**Annex C4**  
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