

# EUROPEAN TECHNICAL ASSESSMENT

# BETABOLTSEVEN





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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-18/0429 of 2018/05/22

### 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:**

BETABOLT SEVEN

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

Mechanical fasteners for use in non-cracked concrete

**Manufacturer:**

SCCELL-IT  
28, Rue Paul Dubrulle  
FR-59810 Lesquin  
Internet [www.scellit.com](http://www.scellit.com)

**Manufacturing plant:**

SCCELL-IT  
Manufacturing plant I

**This European Technical Assessment contains:**

12 pages including 7 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 330232-00-0601; Mechanical fasteners for use in concrete

**This version replaces:**

Translations of this European Technical Assessment in other languages shall fully correspond to the original issued document and should be identified as such.

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

### **1 Technical description of product and intended use**

#### **Technical description of the product**

BETABOLT SEVEN is a concrete screw made of galvanized steel. The anchor is installed in a drilled hole and anchored by deformation-controlled expansion.

An illustration of the product is given in Annex A.

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 of this European Technical Assessment.

The anchors are intended to be used with embedment depth given in Annex B, Table B1. The intended use specifications of the product are detailed in the Annex B1.

### **2 Specification of the intended use in accordance with the applicable 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 B.

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.

### **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 C2.

##### **Safety in case of fire (BWR 2):**

The essential characteristics are detailed in the Annex from C3.

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

Regarding the dangerous substances contained in this European Technical Assessment, there may be other requirements applicable to the products falling within its scope (e.g. transposed European legislation and national laws, regulations and administrative provisions). In order to meet the provisions of the Construction Products Regulation, these requirements need also to be complied with, when and where they apply.

##### **Safety in use (BWR4):**

For basic requirement Safety in use the same criteria are valid for Basic Requirement Mechanical resistance and stability (BWR1).

##### **Sustainable use of natural resources (BWR7)**

No performance determined

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 Works Requirements 1 and 4 has been made in accordance with EAD 330232-00-0601; Mechanical fasteners for use in concrete.

## **4 Assessment and verification of constancy of performance (AVCP)**

### **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 foreseen 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

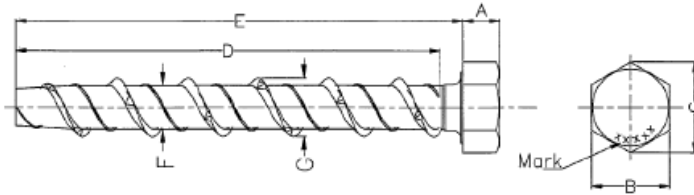
Issued in Copenhagen on 2018-05-22 by



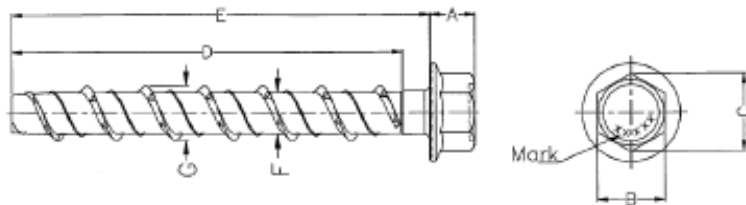
Thomas Bruun  
Managing Director, ETA-Danmark

**Figure A1 BETABOLT SEVEN concrete screw and head types**

Head type A - Anchor type with hexagon head



Head type B - Anchor type with washer and hexagon head

**Table A1. Dimensions of the anchor head type A**

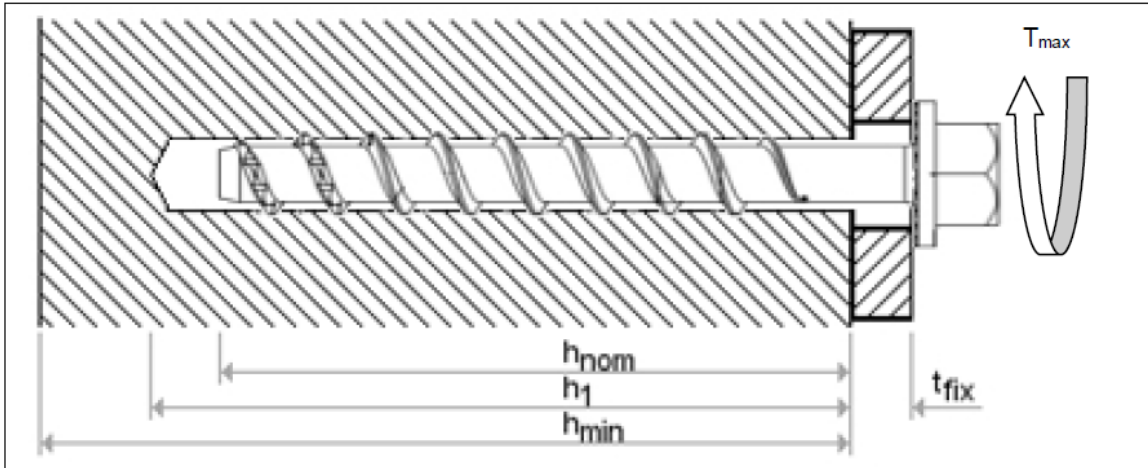
Diameter [mm]	A h [mm]	B l <sub>1</sub> [mm]	C l <sub>2</sub> [mm]	D L <sub>cut</sub> [mm]		E L <sub>s</sub> [mm]	F d <sub>k</sub> [mm]	G d <sub>cut</sub> / d <sub>s</sub> [mm]
				< 100	N / A			
Ø 6	4,46 ± 0,24	9,88 ± 0,125	11,20 ± 0,20	< 100	N / A	≤ 120,00 ± 2,00	5,45 ± 0,20	7,50 ± 0,15
				≥ 100	95,00 ± 2,00			
Ø 8	5,30 ± 0,24	14,90 ± 0,15	16,90 ± 0,20	< 100	N / A	≤ 310,00 ± 2,00	7,45 ± 0,25	9,70 ± 0,15
				≥ 100	95,00 ± 2,00			
Ø 10	6,00 ± 0,29	16,90 ± 0,15	19,30 ± 0,20	< 100	N / A	≤ 320,00 ± 2,00	9,50 ± 0,20	11,80 ± 0,15
				≥ 100	95,00 ± 2,00			
Ø 12	7,50 ± 0,18	18,90 ± 0,15	21,60 ± 0,20	< 100	N / A	≤ 310,00 ± 2,00	11,50 ± 0,20	14,25 ± 0,15
				≥ 100	95,00 ± 2,00			

**Table A2. Dimensions of the anchor head type B**

Diameter [mm]	A h [mm]	B l <sub>1</sub> [mm]	C l <sub>2</sub> [mm]	D L <sub>cut</sub> [mm]		E L <sub>s</sub> [mm]	F d <sub>k</sub> [mm]	G d <sub>cut</sub> / d <sub>s</sub> [mm]
				< 100	N / A			
Ø 6	6,00 Max	9,80 + 0,20 - 0,00	11,05 Min	< 100	N / A	≤ 120,00 ± 2,00	5,45 ± 0,20	7,50 ± 0,15
				≥ 100	95,00 ± 2,00			
Ø 8	8,00 Max	11,75 + 0,25 - 0,00	13,25 Min	< 100	N / A	≤ 310,00 ± 2,00	7,45 ± 0,25	9,70 ± 0,15
				≥ 100	95,00 ± 2,00			
Ø 10	10,00 Max	13,75 + 0,25 - 0,00	15,50 Min	< 100	N / A	≤ 320,00 ± 2,00	9,50 ± 0,20	11,80 ± 0,15
				≥ 100	95,00 ± 2,00			
Ø 12	11,50 Max	16,75 + 0,25 - 0,00	18,90 Min	< 100	N / A	≤ 310,00 ± 2,00	11,50 ± 0,20	14,25 ± 0,15
				≥ 100	95,00 ± 2,00			

**BETABOLT SEVEN**Product description  
Characteristics of the product**Annex A1**  
of European  
Technical Assessment  
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**Figure A2 BETABOLT SEVEN Installed anchor**



**Table A3. Materials**

Member	Material
All sizes	Coldformed steel grade 20MnB4 in accordance with table 3 in EN 10263-4 or coldformed steel grade 1022 in accordance with table 3 in ASTM A510. Galvanized

<b>BETABOLT SEVEN</b>	<b>Annex A2</b> of European Technical Assessment ETA-18/0429
Product description Materials	



**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 Requirements 1 and 4 of Regulation 305/2011 (EU) 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 M6, M8, M10, M12.

**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: sizes M6, M8, M10, M12.

**Temperature range:**

The anchors may be used in the following temperature range:

- Normal internal temperature ranges

**Use conditions (Environmental conditions):**

- The anchors may be used in structures subject to dry internal conditions only.

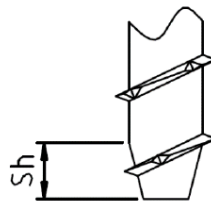
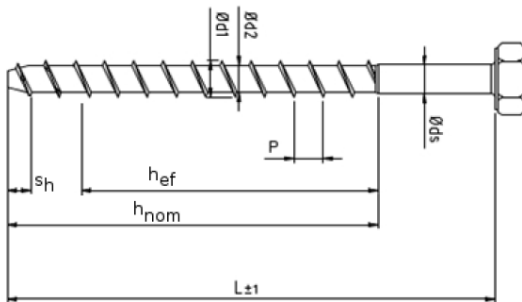
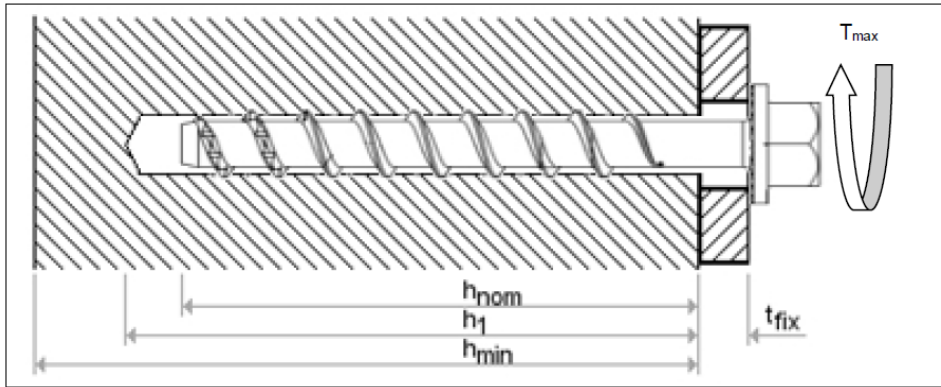
**Installation:**

- The anchors may be installed in:
  - Dry concrete: sizes M6, M8, M10, M12.
- Anchor installation carried out by appropriately qualified personnel and under the supervision of the person responsible for technical matters of the site.
- Anchor installation in accordance with the manufacturer's specifications and drawings and using the appropriate tools.
- Check before placing the anchor to ensure that the strength class of the concrete, in which the anchor is to be placed, is identical with the values which the characteristic loads apply.
- Check of concrete being well compacted, e.g. without significant voids.
- Edge distances and spacings not less than the specified values without minus tolerances.
- Positioning of the drill holes without damaging the reinforcement.
- The sequence of the installation is according to the following setting-through installation:
  - o Placing the fixture on the surface of the concrete member.
  - o Make a drill hole by means of hammer drill through the prepared holes of the fixture. The position of drill hole has to be coordinated with reinforcement in order to avoid damaging it. The drill hole must be drilled perpendicular to the surface of the concrete.
  - o The drilled hole must be cleaned from dust.
  - o The installation of the concrete screw has to be carried out automatically.

**Proposed design methods:**

- Anchorages are designed under the responsibility of an engineer experienced in anchorages and concrete work.
- Verifiable calculation notes and drawings are prepared taking account of the loads to be transmitted. 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 and quasi-static loads are designed in accordance with ETAG 001, Annex C, design method A.

<b>BETABOLT SEVEN</b>	<b>Annex B1</b> of European Technical Assessment ETA-18/0429
Intended use – Specification	



**Table B1. Installation parameters**

Installation parameters		Ø 6	Ø 8	Ø 10	Ø 12
Nom. drill hole diameter	Ø d <sub>0</sub> [mm] =	6	8	10	12
Max. Cutting diameter of drill bit	Ø d <sub>cut</sub> [mm] ≤	6,40	8,45	10,45	12,50
Depth of drill hole	h <sub>1</sub> [mm] ≥	40	50	60	70
Nominal anchorage depth	h <sub>nom</sub> [mm] ≥	30	40	50	55
Diameter of clearance hole in the fixture	d <sub>f</sub> [mm] ≤	9	12	14	16
Thickness of fixture	t <sub>fix</sub> [mm] ≤	90	270	270	255
Installation moment	T <sub>inst</sub> [Nm] =	SIW 22-A (1/2 with 200 Nm) <sup>1)</sup>			

<sup>1)</sup> Installation with other impact screw driver of equivalent power is possible

		Ø 6	Ø 8	Ø 10	Ø 12
Minimum thickness of member	h <sub>min</sub> [mm] =	120	120	130	140
Minimum edge distance	c <sub>min</sub> [mm] =	50	50	100	100
Minimum spacing	s <sub>min</sub> [mm] =	45	50	60	70

<b>BETABOLT SEVEN</b>	<b>Annex B2</b> of European Technical Assessment ETA-18/0429
Intended use – installation parameters	

**Table C1: Design method A, characteristic tension load values**

			$\varnothing 6$	$\varnothing 8$	$\varnothing 10$	$\varnothing 12$
<i>Steel failure</i>						
Resistance to steel failure	$N_{Rk,s}$	[kN]	24,26	45,33	73,72	108,02
Partial safety factor under tension load	$\gamma_{Ms}$	[-]	1.40	1.40	1.40	1.40
<i>Pull-out failure</i>						
Resistance to pull-out failure in non-cracked concrete C20/25	$N_{Rk,ucr}$	[kN]	3.5	5.0	6.5	12.0
Increase factors for cracked and non-cracked concrete	$\psi_c$		1.48	1.17	1.37	1.52
<i>Concrete cone failure</i>						
Partial safety factor in non-cracked concrete	$k_{ucr,N}$	[-]	11.0			
Effective embedment depth	$h_{ef}$	[mm]	18	25	31	32
Edge distance	$c_{cr,N}$	[mm]	1.5xh <sub>ef</sub>			
Spacing	$s_{cr,N}$	[mm]	3xh <sub>ef</sub>			
Partial safety factor	$\gamma_{Mp} = \gamma_{Mc}$	[-]	1.8			
<i>Robustness</i>						
Installation safety factor	$\gamma_{inst}$	[-]	1.2			
<i>Minimum edge distance and spacing</i>						
Minimum edge distance	$c_{min}$	[mm]	50	50	100	100
Minimum spacing distance	$s_{min}$	[mm]	45	50	60	70
Min. thickness of the concrete member	$h_{min}$	[mm]	120	120	130	140
<i>Edge distance to prevent splitting under load</i>						
	$N^0_{Rk,sp}$	[kN]	3.5	5.0	6.5	12.0
Appropriate edge distance	$c_{cr,sp}$	[mm]	50	50	100	100
<i>Displacements under static and quasi-static loading</i>						
Short time tension displacement	$\delta_{N0}$	[mm]	0.26	0.21	0.26	0.43
Long-time tension displacement	$\delta_{N\infty}$	[mm]	0.43	0.29	0.19	0.20

**BETABOLT SEVEN**

Performance for static and quasi-static loads: Resistances

**Annex C1**  
of European  
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**Table C2: Design method A, Characteristic shear load values**

			$\varnothing 6$	$\varnothing 8$	$\varnothing 10$	$\varnothing 12$
<i>Resistance to steel failure under shear load</i>						
Resistance to shear load without lever arm	$V_{Rk,s}^0$	[kN]	7.5	10.0	17.0	30.0
Resistance to shear load with lever arm	$M_{Rk,s}^0$	[Nm]	19.0	50.0	100.0	185.0
Factor for group fasteners	$k_7$	[-]	1.0	1.0	1.0	1.0
<i>Resistance to pry-out failure</i>						
Factor for pry-out failure	$k_8$	[-]	1.0	1.0	1.0	1.0
<i>Resistance to concrete edge failure</i>						
Outside diameter of the fastener relevant for shear loading	$d_{nom}$	[mm]	6	8	10	12
Effective length of the fastener for transfer of shear load	$l_e$	[mm]	18	25	31	32
<i>Displacements under static and quasi-static loading</i>						
Short time shear displacement	$\delta_{V0}$	[mm]	2.20	3.65	4.17	5.26
Long-time shear displacement	$\delta_{V\infty}$	[mm]	3.30	5.48	6.26	7.89

**BETABOLT SEVEN**

Performance for static and quasi-static loads: Resistances and Displacements

**Annex C2**  
of European  
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**Table C3: Resistance to fire**

<b>HARMONIZED TECHNICAL SPECIFICATION: ETAG 001 PART 1 PARAGRAPH 5.2.2 AND TECHNICAL REPORT TR020</b>	
<b>ESSENTIAL CHARACTERISTICS</b>	<b>PERFORMANCE</b>
<b>Resistance to fire</b>	NPD

**Table C4: Reaction to fire**

<b>HARMONIZED TECHNICAL SPECIFICATION: ETAG 001 PART 1 PARAGRAPH 5.2.1</b>	
<b>ESSENTIAL CHARACTERISTICS</b>	<b>PERFORMANCE</b>
<b>Reaction to fire</b>	In the final application, the thickness of the mortar layer is about 1 to 2 mm and most of the mortar is material classified class A1 according to EC Decision 96/603/EC. Therefore, it may be assumed that the bonding material (synthetic mortar or a mixture of synthetic mortar and cementitious mortar) in connection with the metal anchor in the end use application do not contribute to fire growth or to the fully developed fire and they have no influence to the smoke hazard.

**BETABOLT SEVEN**

Performance for exposure to fire

**Annex C3**  
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