

Approval body for construction products  
and types of construction

Bautechnisches Prüfamt

An institution established by the Federal and  
Laender Governments



## European Technical Assessment

**ETA-17/0628**  
**of 31 August 2017**

English translation prepared by DIBt - Original version in German language

### General Part

Technical Assessment Body issuing the  
European Technical Assessment:

Deutsches Institut für Bautechnik

Trade name of the construction product

Betongskruer mekanisk galvaniseret

Product family  
to which the construction product belongs

Concrete screw for multiple use  
for non-structural applications

Manufacturer

HITACHI POWER TOOLS NORWAY AS  
Kjeller Vest 7  
2007 KJELLER  
NORWEGEN

Manufacturing plant

Taiwan plant no. 1

This European Technical Assessment  
contains

10 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

ETAG 001 Part 6: "Anchors for multiple use for non-  
structural applications", January 2011,  
used as EAD according to Article 66 Paragraph 3 of  
Regulation (EU) No 305/2011.

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## Specific Part

### 1 Technical description of the product

The Betongskruer mekanisk galvanisert of sizes SK 6 is an anchor made of galvanized steel. The anchor is screwed into a predrilled cylindrical drill 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.

The product description is given in Annex A.

### 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 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 Mechanical resistance and stability (BWR 1)

Wesentliches Merkmal	Leistung
Characteristic resistance under static and quasi-static loading, displacements	See Annex C1 and C2

#### 3.2 Safety in case of fire (BWR 2)

Essential characteristic	Performance
Reaction to fire	Anchorage satisfies requirements for Class A1
Resistance to fire	No performance determined

#### 3.3 Safety in use (BWR 4)

The essential characteristics regarding Safety in use are included under the Basic Works Requirement Mechanical resistance and stability.

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

In accordance with guideline for European technical approval ETAG 001-6, January 2011 used as European Assessment Document (EAD) according to Article 66 Paragraph 3 of Regulation (EU) No 305/2011 the applicable European legal act is: [97/161/EC].

The system to be applied is: 2+

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

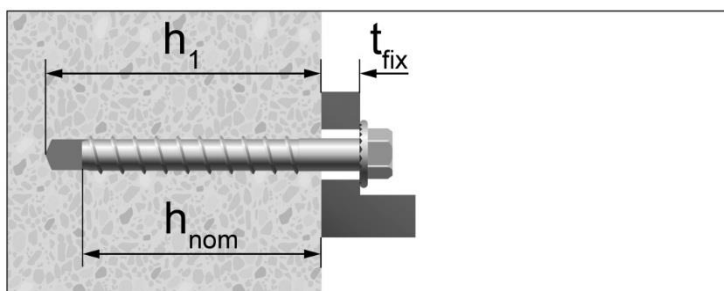
Technical details necessary for the implementation of the AVCP system are laid down in the control plan deposited with Deutsches Institut für Bautechnik.

Issued in Berlin on 31 August 2017 by Deutsches Institut für Bautechnik

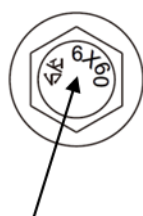
Lars Eckfeldt  
p.p. Head of Department

*beglaubigt:*  
Baderschneider

### Concrete screw after installation



### Marking of head

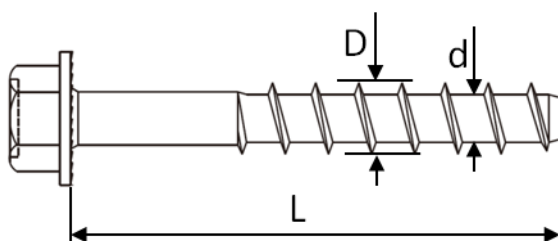


#### Head marking:

Identifying mark of producer: SK

Nominal size: 6 mm

Length L: e.g. 60mm



Reverse Locking  
Serrations

**Table A1: Dimension and materials**

Anchor size			<b>SK 6</b>
Length of anchor	min L	[mm]	60
	max L	[mm]	140
Thread diameter	D	[mm]	7,5
Shaft diameter	d	[mm]	5,5
Thread pitch	p	[mm]	4,45
Material			Steel 10B21 acc. to SAE-J403 Elongation $A_5 \leq 8\%$
Coating			zink coating: elektro plated ( $>5\mu\text{m}$ ) or mechanical plated ( $>30\mu\text{m}$ )

Betongskruer mekanisk galvaniseret

**Product description**  
Installed condition, dimensions and materials

Annex A1

## Specifications of Intended use

### Anchorage subject to:

- Static and quasi-static loads.
- Used only for multiple use for non structural application according to ETAG 001, Teil 6.

### Base materials:

- Reinforced or unreinforced normal weight concrete according to EN 206-1:2000,
- Strength classes C20/25 to C50/60 according to EN 206-1:2000,
- Non-cracked or cracked concrete: all sizes.

### Use conditions (Environmental conditions)

- Anchorages subject to dry internal conditions.

### Design:

- 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 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:
  - Either ETAG 001, Annex C, Edition August 2010
  - Or CEN/TS 1992-4:2009

### Installation:

- Hammer drilling only: all sizes and all embedment depths.
- Anchor installation carried out by appropriately qualified personnel 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 the 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.
- After installation further turning of the anchor must not be possible.
- The head of the anchor must be supported on the fixture and is not damaged.

Betongskruer mekanisk galvanisert

**Intended Use**  
Specifications

Annex B1

**Table B1: Installation parameters**

Anchor size			SK 6
Nominal diameter of drill bit	$d_0$	[mm]	6
Nominal embedment depth	$h_{nom}$	[mm]	55
Min. hole depth in concrete	$h_1 \geq$	[mm]	64
Effective anchorage depth	$h_{ef}$	[mm]	42,6
Clearance hole	$d_f$	[mm]	9
Thickness of fixture	$t_{fix}$	[mm]	5-85
Installation torque	$T_{inst}$	[Nm]	20
Wrench size	WS	[mm]	10
Max. torque moment, machine setting	$T_{max} \leq$	[Nm]	80

**Table B2: Minimum thickness of member, Minimum spacing and edge distance**

Anchor size			SK 6
Minimum member thickness	$h_{min}$	[mm]	100
Minimum edge distance	$c_{min}$	[mm]	40
Minimum spacing	$s_{min}$	[mm]	40

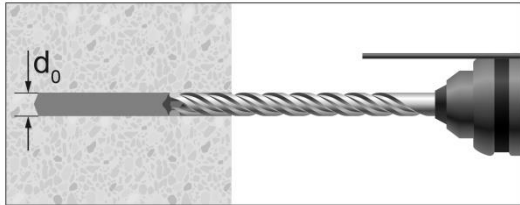
Betongskruer mekanisk galvanisert

**Intended Use**

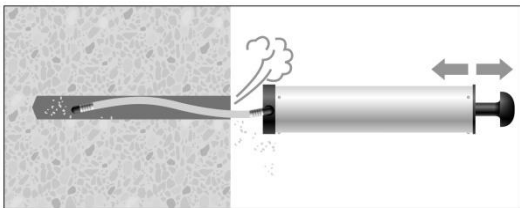
Installation parameters,  
Minimum thickness of member, Minimum spacing and edge distance

Annex B2

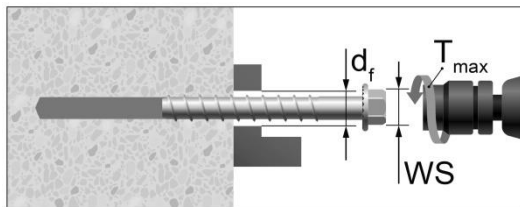
## Installation instructions



Drill the hole to the depth  $h_1$ .



Clean the hole.

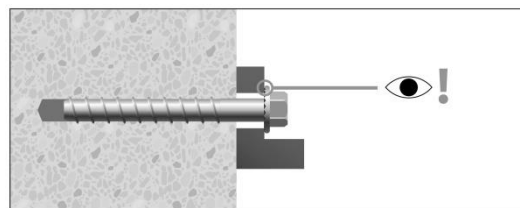


Screw in the anchor by using a torque wrench or an impact screw driver.

In case of using torque wrench:  $T_{inst}$  acc. to Table B1.

In case of using impact screw driver:  $T_{max}$  acc. to Table B1.

WS= Wrench Size



Control of complete setting, full contact of screw head with fixture part.

Betongskruer mekanisk galvaniseret

**Intended Use**  
Installation Instructions

Annex B3



**Table C1: Characteristic resistances under tension loads, Design method A**

Anchor size			SK 6
<b>Steel failure</b>			
Characteristic resistance	$N_{Rk,s}$	[kN]	19,7 <sup>4)</sup>
Partial safety factor	$\gamma_{Ms}$ [-]	[kN]	1,4
<b>Pull-out failure</b>			
Characteristic resistance in cracked and uncracked concrete C20/25	$N_{Rk,p}$	[kN]	5,0
Installation safety factor	$\gamma_2^{2)} = \gamma_{inst}^{1)}$	[-]	1,0
<b>Concrete cone failure</b>			
Effective anchorage depth	$h_{ef}$	[mm]	42,6
Characteristic edge distance	$c_{cr,N}$	[mm]	1,5 $h_{ef}$
Characteristic spacing	$s_{cr,N}$	[mm]	3 $h_{ef}$
Installation safety factor	$\gamma_2^{2)} = \gamma_{inst}^{1)}$	[-]	1,0
Factor for cracked concrete	$k_{cr}^{1)}$	[-]	7,2
Factor for uncracked concrete	$k_{ucr}^{1)}$	[-]	10,1
<b>Splitting failure<sup>3)</sup></b>			
Characteristic edge distance for splitting	$c_{cr,sp}$	[mm]	1,5 $h_{ef}$
Characteristic anchor spacing for splitting	$s_{cr,sp}$	[mm]	3 $h_{ef}$
Installation safety factor	$\gamma_2^{2)} = \gamma_{inst}^{1)}$	[-]	1,0
Factor for cracked concrete	$k_{cr}^{1)}$	[-]	7,2
Factor for uncracked concrete	$k_{ucr}^{1)}$	[-]	10,1

- 1) Parameters relevant only for design according to CEN/TS 1992-4:2009
- 2) Parameter relevant only for design according to ETAG001 Annex C
- 3) The value  $N_{Rk,p}$  has to be inserted as  $N_{Rk,c}^0$  in Equation (5.3) of ETAG 001, Annex C or as  $N_{Rk}^0$  in Equation (12) of CEN/TS 1992-4-4:2009 resp.
- 4) The design value  $N_{Rd,s}$  has to be limited according to ETAG001, part 6, Annex 1.

Betongskruer mekanisk galvaniseret

**Performances**  
Characteristic values under tension loads

Annex C1

**Table C2: Characteristic resistance under shear loads, Design method A**

<b>Anchor size</b>			<b>SK 6</b>
Setting depth	$h_{nom}$	[mm]	55
Effective embedment depth	$h_{ef}$	[mm]	42,6
<b>Steel failure without lever arm</b>			
Characteristic resistance	$V_{Rk,s}$	[kN]	7,3
Factor for groups	$k_2^{1)}$	[-]	0,8
Partial safety factor	$\gamma_{Ms}$	[-]	1,4
<b>Steel failure with lever arm</b>			
Characteristic resistance	$M_{Rk,s}^0$	[Nm]	15,9
Partial safety factor	$\gamma_{Ms}$	[-]	1,4
<b>Concrete pryout failure</b>			
k-factor	$k^{2)} = k_3^{1)}$	[-]	1,0
Partial safety factor	$\gamma_{Mcp}$	[-]	1,5
<b>Concrete edge failure</b>			
Effective length of anchor in shear loading	$\ell_f$	[mm]	42,6
Effective diameter of anchor	$d_{nom}$	[mm]	5,37
Partial safety factor	$\gamma_{Mc}$	[-]	1,5

- 1) Parameters relevant only for design according to CEN/TS 1992-4:2009  
2) Parameter relevant only for design according to ETAG001 Annex C

Betongskruer mekanisk galvaniseret

**Performances**  
Characteristic values under shear loads

Annex C2