Deutsches Institut für Bautechnik

Approval body for construction products and types of construction

Bautechnisches Prüfamt

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European Technical Assessment ETA-04/0043 of 25 April 2018

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	Hilti Ceiling Anchor HK, HK-R, HK-HCR
Product family to which the construction product belongs	Deformation-controlled expansion anchor for multiple use for non-structural applications in concrete
Manufacturer	Hilti Aktiengesellschaft 9494 SCHAAN FÜRSTENTUM LIECHTENSTEIN
Manufacturing plant	Werk 0456, Deutschland
This European Technical Assessment contains	13 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 Hilti Ceiling Anchor HK is an anchor made of galvanised steel, stainless or high corrosion resistant steel which is placed into a drilled hole and anchored by deformation-controlled expansion.

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)

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

3.2 Safety in case of fire (BWR 2)

Essential characteristic	Performance
Reaction to fire	Class A1
Resistance to fire	See Annex C 1

3.3 Safety in use (BWR 4)

Essential characteristic	Performance
to static and quasi-static loading	See Annex C 1

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, 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+

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 25 April 2018 by Deutsches Institut für Bautechnik

BD Dipl.-Ing. Andreas Kummerow
Head of Department

beglaubigt:
Baderschneider

Deutsches Institut für Bautechnik DIBt

Product description: Hilti Ceiling Anchor HK

Multiple use for non-structural applications only

Installed condition

Figure A1:

Hilti Ceiling Anchor HK with pre-set and though-set installation

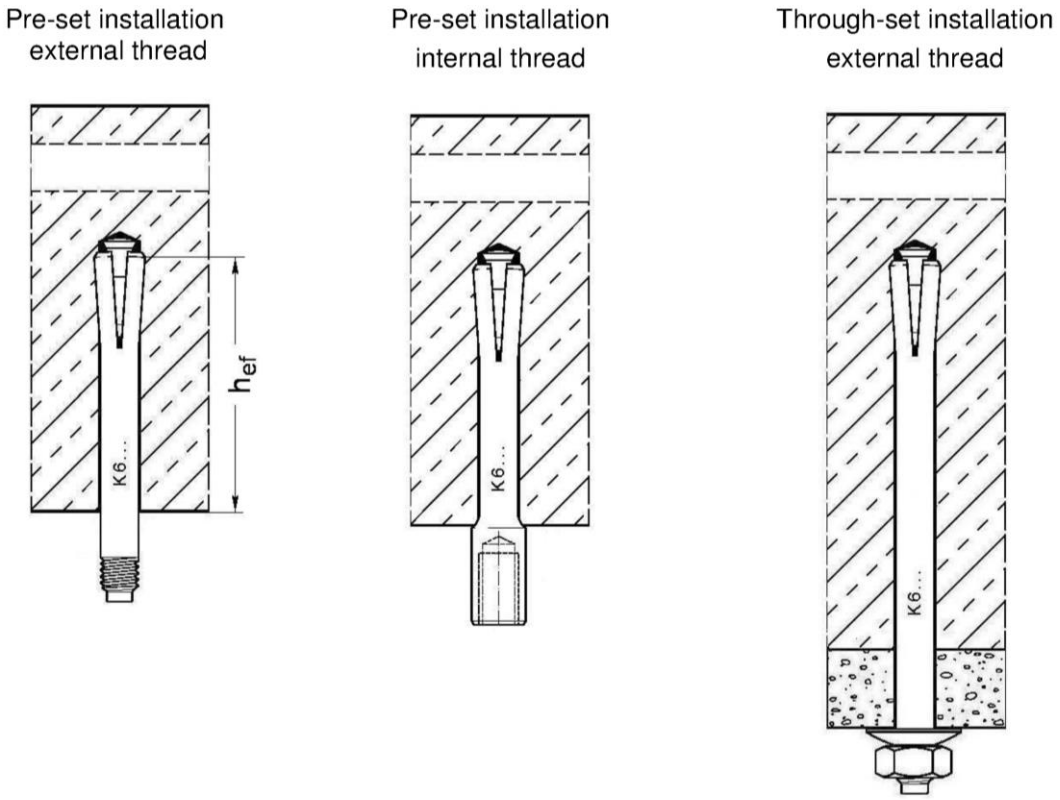
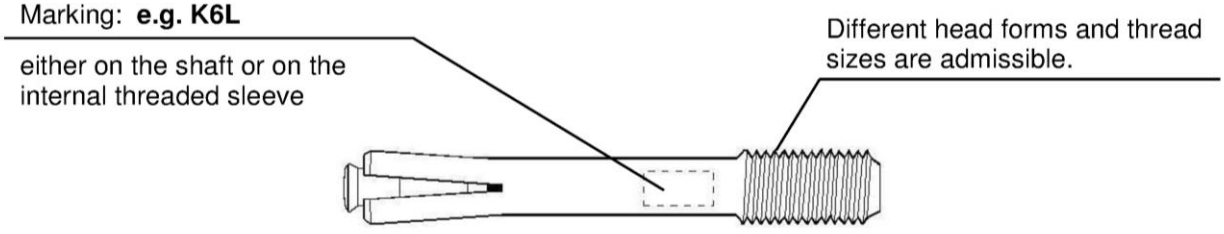


Figure A2:

marking and identification of the Hilti Ceiling Anchor HK



The anchor may only be set with appropriate stop drill bits and setting tools.

Hilti Ceiling Anchor HK	
Product description Installed condition, marking and identification	**Annex A1**

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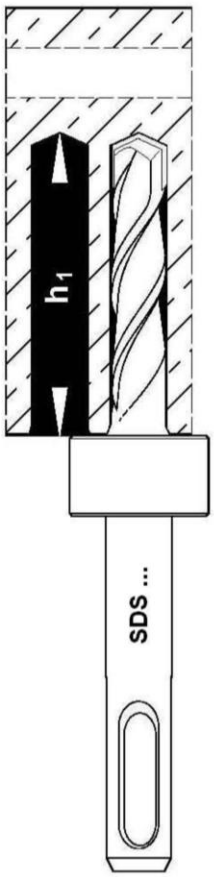
Product description: HK6, HK6-R and HK6-HCR

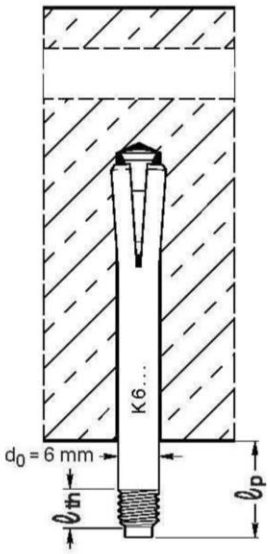
Table A1: Pre-set installation HK6, HK6-R and HK6-HCR

Anchor type			HK6 M6/t_{fix}	HK6 M8/t_{fix}
Thread size			external thread M6	external thread M8
Stop drill bit			TE-C/SDS 1	TE-C/SDS 1
Setting tool			HSM 6/t_{fix}	HSM 8/t_{fix}
Length of thread	ℓ_{th}	[mm]	$5 \leq \ell_{th} \leq 50$	
Max. thickness of fixture	t_{fix}	[mm]	$t_{fix} = \ell_p - 7$	

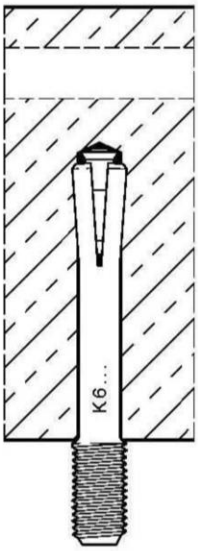
Stop drill bit SDS 1



HK6 M6/t_{fix}



HK6 M8/t_{fix}



Setting tool with marking

Hilti Ceiling Anchor HK	
Product description HK6, HK6-R and HK6-HCR	**Annex A2**

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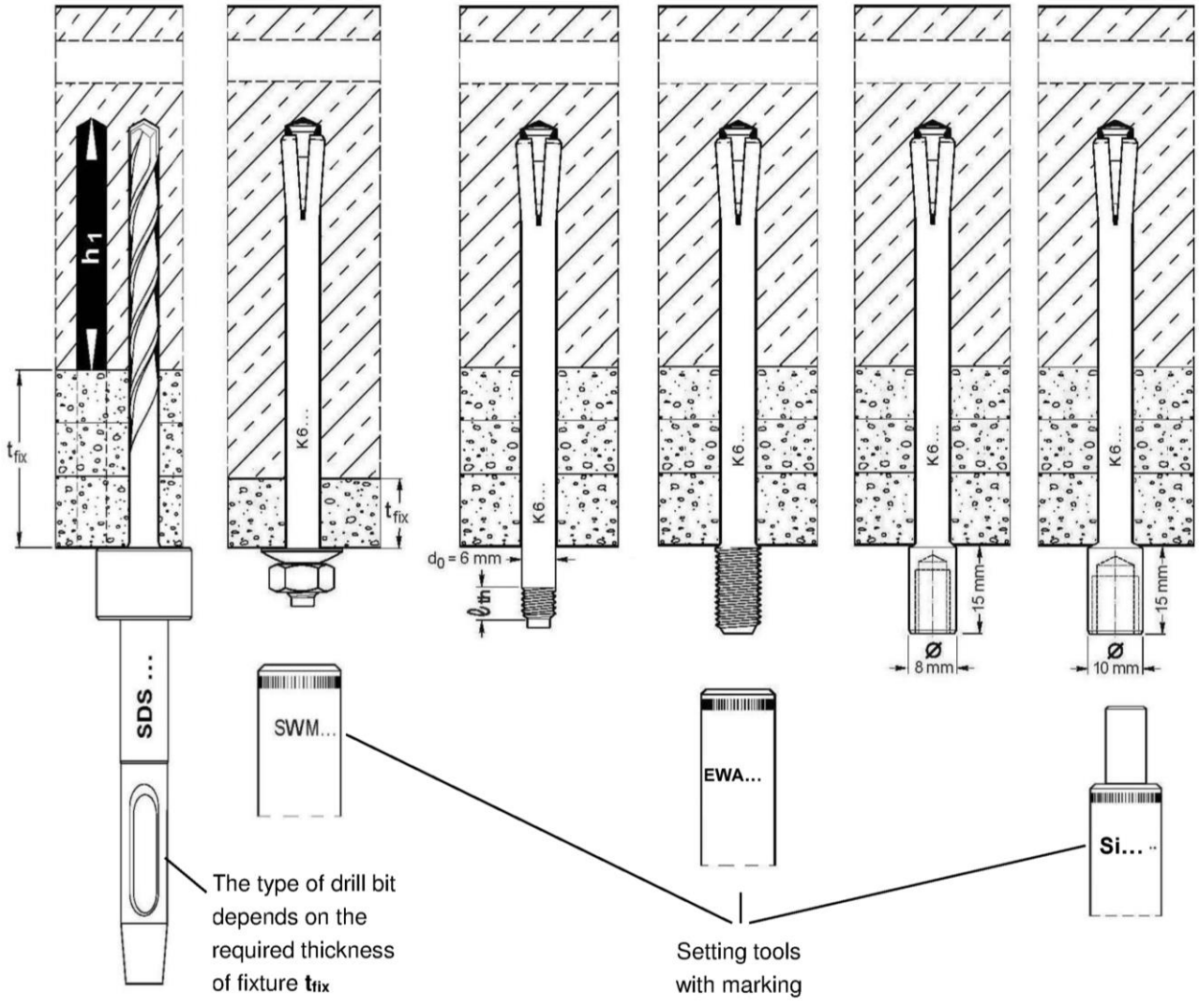
Product description: HK6 L, HK6 L-R and HK6 L-HCR

Table A2: Through-set installation HK6 L, HK6 L-R and HK6 L-HCR

Anchor type	**HK M6/4L** with washer and hexagon nut	**HK6 M6/t_{fix} L**	**HK6 M8/t_{fix} L**	**HK6-I M6 L**	**HK6-I M8 L**
Thread size	external thread M6	external thread M6	external thread M8	internal thread M6	internal thread M8
Stop drill bit	TE-C/SDS 2				
Setting tool	HSM 6/t_{fix}	HSM 6/t_{fix}	HSM 8/t_{fix}	HSM I M6	HSM I M8
Length of thread ℓ_{th} [mm]	≥ 5	≥ 5	≥ 5	--	--
Max. thickness of fixture t_{fix} [mm]	4	t_{fix} ≤ 300	t_{fix} ≤ 300	--	--
Available thread length [mm]	--	--	--	6 to 12	8 to 12



Hilti Ceiling Anchor HK

Product description
HK6 L, HK6 L-R and HK6 L-HCR

Annex A3

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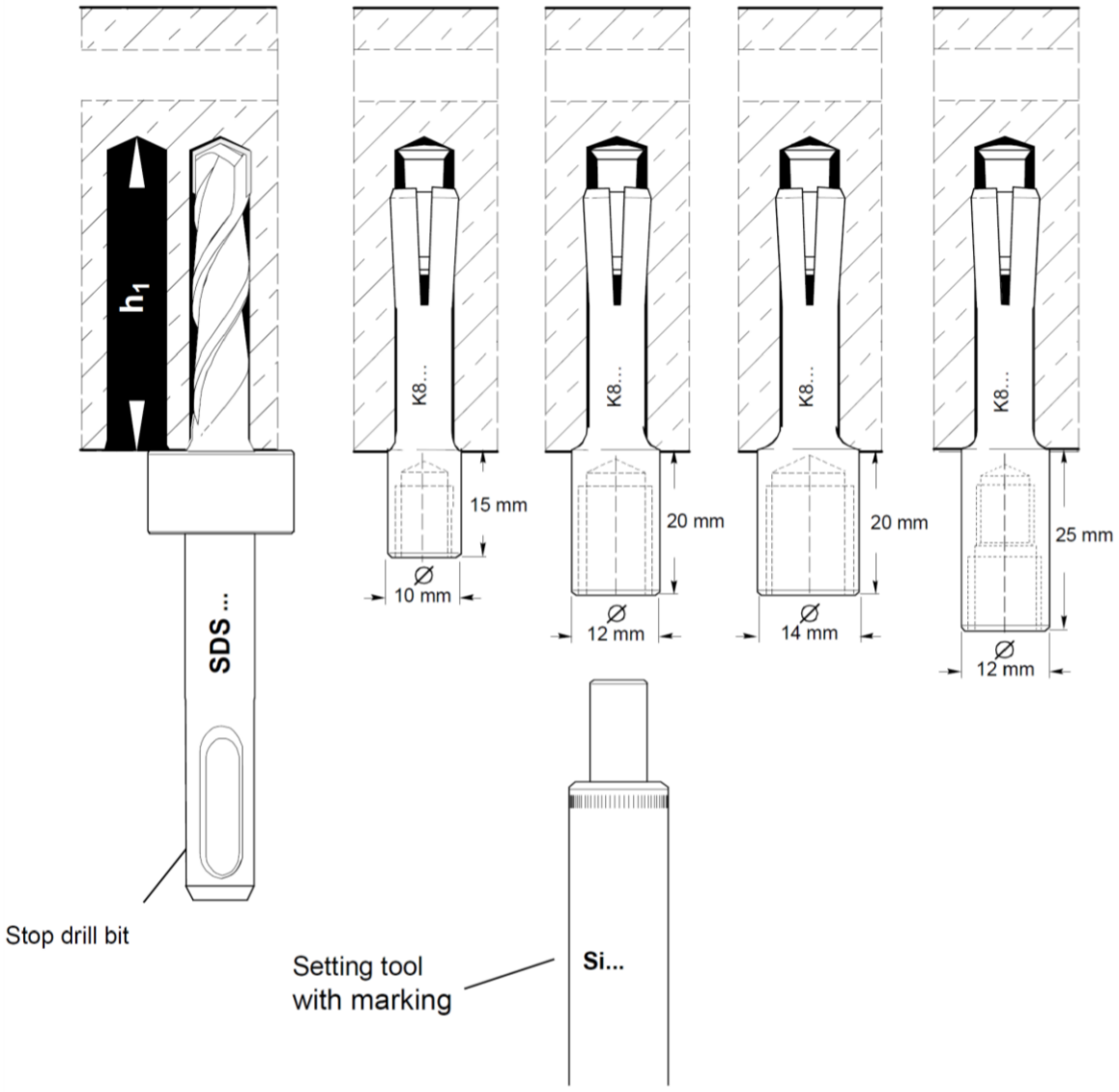
Product description: HK 8-I, HK8-I-R and HK8-I-HCR

Table A3: Pre-set installation HK 8-I, HK8-I-R and HK8-I-HCR

Anchor type	HK 8-I M8	HK 8-I M10	HK 8-I M12	HK 8-I M8/M10
Thread size	M8 internal thread	M10 internal thread	M12 internal thread	M8/M10 internal thread
Stop drill bit	TE-C/SDS 3			
Setting tool	HSM 8 I M8	HSM 8 I M10	HSM 8 I M12	HSM 8 I M8
Available thread length [mm]	8 to 10	10 to 15	12 to 15	**M8**: 8 to 10 **M10**: 10



Hilti Ceiling Anchor HK	Annex A4
Product description HK6, HK6-R and HK6-HCR	

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Table A4: Naming, material and marking

Anchor type	**HK6, HK6-R, HK6-HCR**	**HK6 L, HK6 L-R, HK6 L-HCR**	**HK8-I..., HK8-I-R, HK8-I-HCR**
Material	**Steel galvanised**		
Marking	K6	K6L	K8
Description of type	HK6 M6/t_{fix}	HK6 M6/t_{fix} L HK6/4 L HK6-I M6L HK6-I M8L HK6 M8L	HK8-I M8 HK8-I M8/M10 HK8-I M10 HK8-I M12
Material	**Stainless steel 1.4401 or 1.4404**		
Marking	K6E	K6LE	K8E
Description of type	HK6 M6/t_{fix} –R	HK6 M6/t_{fix} L-R	HK8-I M8-R
Material	**Stainless steel 1.4571**		
Marking	K6X	K6LX	K8X
Description of type	HK6 M6/t_{fix} –R	HK6 M6/t_{fix} L-R	HK8-I M8-R
Material	**High corrosion resistant steel 1.4529 or 1.4565**		
Marking	K6C	K6LC	K8C
Description of type	HK6 M6/t_{fix} -HCR	HK6 M6/t_{fix} L-HCR	HK8-I M8-HCR

Hilti Ceiling Anchor HK	**Annex A5**
Product description Materials	

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Specifications of intended use

Anchorages subject to:

- Static and quasi static loading
- Only to be used for multiple use for non-structural application
- Fire exposure: R30 to R120

Base material:

- 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.
- Cracked and non-cracked concrete.

Use conditions (Environmental conditions):

- Structures subject to dry internal conditions.
  (zinc coated steel, stainless steel or high corrosion resistant steel)
- Structures subject to external atmospheric exposure (including industrial and marine environment) and to permanently damp internal conditions, if no particular aggressive conditions exist.
  (stainless steel or high corrosion resistant steel)
- Structures subject to external atmospheric exposure, to permanently damp internal conditions or other particular aggressive conditions (high corrosion resistant steel).

  Note: Particular aggressive conditions are e.g. permanent, alternating immersion in seawater or the splash zone of seawater, chloride atmosphere of indoor swimming pools or atmosphere with extreme chemical pollution (e. g. in desulphurization plants or road tunnels where de-icing products are used).

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 loading are to be designed in accordance with:
  - ETAG 001, Annex C, design method Band C, Edition August 2010 or
  - CEN/TS 1992-4:2009, design method B
- Fasteners are only to be used for multiple use for non-structural application, according to: ETAG 001 Part 6, Edition August2010
- Anchorages under fire exposure are designed in accordance with:
  - EOTA Technical Report TR 020, Edition May 2004
  - CEN/TS 1992-4:2009
  - It must be ensured that local spalling of the concrete cover does not occur.

Installation:

- Anchor installation carried out by appropriately qualified personnel and under the supervision of the person responsible for technical matters of the site.
- Anchor installation such that the effective setting depth is complied with. This compliance is ensured, if the drill hole is made with the appropriate depth guided stop drills.
- Anchor expansion by impact using the setting tools. The anchor with external thread for pre-set installation or anchor internal thread is properly expanded if the setting tool rests on the concrete surface. The anchor for through-set installation is properly expanded if the setting tool rests on the surface of the fixture.
- The screw-in depth of fastening screw or threaded rod for anchors with internal thread must be at least the nominal thread size.

Hilti Ceiling Anchor HK	**Annex B1**
Intended Use Specifications	

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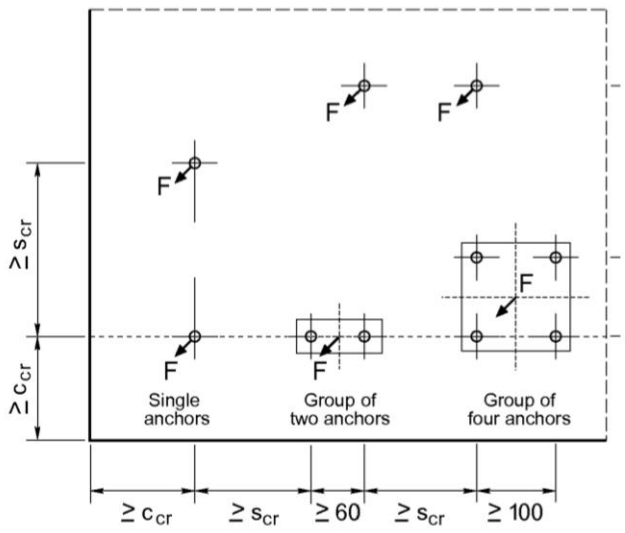
Table B1: Installation parameters for HK

Anchor type			HK6 HK6-R, HK6-HCR	HK6L HK6L-R, HK6L-HCR	HK8 HK8-R, HK8-HCR
Diameter of drill hole	d_0	[mm]	6	6	8
Depth of drill hole	h_1	[mm]	32	42	43
Effective anchorage depth	$h_{ef} \geq$	[mm]	26	36	36
Maximum torque moment	T_{max}	[Nm]	5	5	10
Minimum thickness of member	h_{min}	[mm]	80		
Spacing	s_{cr}	[mm]	200		
Edge distance	c_{cr}	[mm]	150		

Edge distance and spacing



The values given in Table C1 and C2 are valid for one fixing point.

Fixing points can be:

- **single anchors,**
  groups of 2 anchors
  with $s_1 \geq 60$ mm
  or
- **groups of 4 anchors**
  with $s_1 = s_2 \geq 100$ mm

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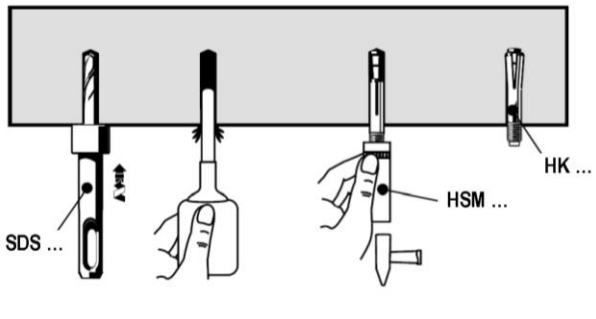
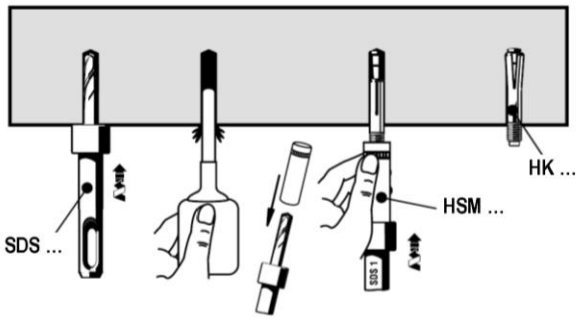
Installation instruction for external and internal thread

External thread

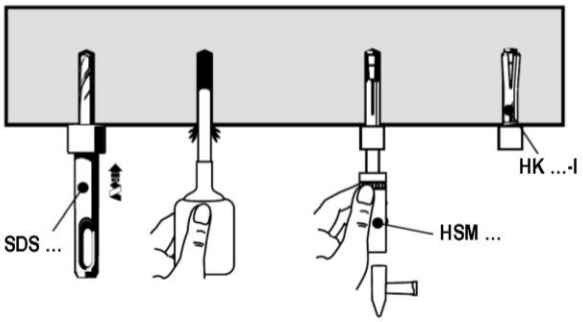


Setting of HK with hand setting tool

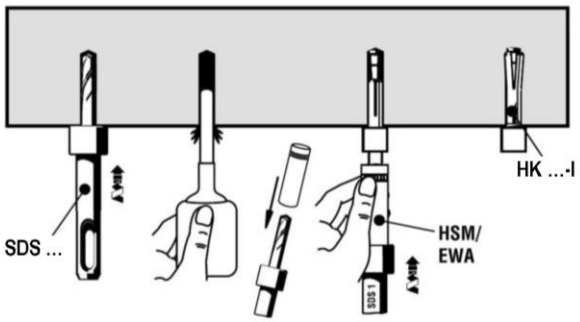


Setting of HK with machine setting tool

Internal thread



Setting of HK…-I with hand setting tool



Setting of HK…-I with machine setting tool

Hilti Ceiling Anchor HK	Annex B3
Intended Use Installation instructions	

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Table C1: Characteristic resistance for HK (Design method C)

Anchor type			HK6	HK6L	HK8
Any load direction					
Characteristic resistance C20/25 to C50/60	F_{Rk} [2]	[kN]	2	5	5
Partial safety factor [3]	γ_M [1]	[-]	1,5	2,1	
Shear load with lever arm					
Characteristic bending moment	$M^0_{Rk,s}$ [4]	[Nm]	3,6	5	10
Partial safety factor	γ_{Ms} [1]	[N/mm²]	1,25		

Table C2: Characteristic resistance for HK-R and HK-HCR (Design method C)

Anchor type			HK6-R, HK6-HCR	HK6-L-R, HK6-L-HCR	HK8-R, HK8-HCR
Any load direction					
Characteristic resistance C20/25 to C50/60	F_{Rk} [2]	[kN]	1,5	3	5
Partial safety factor [3]	γ_M [1]	[-]	2,1		1,8
Shear load with lever arm					
Characteristic bending moment	$M^0_{Rk,s}$ [4]	[Nm]	4,0	8,4	20,6
Partial safety factor	γ_{Ms} [1]	[N/mm²]	1,5		

[1] In absence of other national regulations.
[2] The anchor is to be used only for non-structural applications. The definition of multiple use according to the member states is given in the informative Annex 1 of ETAG 001, Part 6
[3] Including installation safety factor γ_2.
[4] Characteristic bending moment $M^0_{Rk,S}$ for equation (5.5) in ETAG 001, Annex C

Table C3: Characteristic resistance under fire exposure in any load direction in concrete C20/25 to C50/60 (Design method C)

Fire resistance class	Anchor type			HK6, HK6-R, HK6-HCR	HK6L, HK6-L-R, HK6-L-HCR	HK8, HK8-R, HK8-HCR
R30	Characteristic resistance	$F_{Rk,fi(30)}$	[kN]	0,3	0,6	1,2
R60	Characteristic resistance	$F_{Rk,fi(60)}$	[kN]	0,3	0,5	1,0
R90	Characteristic resistance	$F_{Rk,fi(90)}$	[kN]	0,3	0,3	0,6
R120	Characteristic resistance	$F_{Rk,fi(120)}$	[kN]	0,2	0,2	0,4
Spacing und edge distance under fire exposure						
R30 - R120	Spacing	$s_{cr} = s_{min}$	[mm]	200		
	Edge distance for fire attack from	one side only $c_{cr} = c_{min}$	[mm]	150		
		more than one side $c_{cr} = c_{min}$	[mm]	300		

In absence of other national regulations the partial safety factor for resistance under fire exposure $\gamma_{M,fi} = 1,0$ is recommended.

Hilti Ceiling Anchor HK

Performances
Characteristic resistance
Characteristic resistance under fire

Annex C1