



HILTI HKD (REDUND.) EXPANSION ANCHOR

ETA-06/0047 (03.12.2020)



English 2- 21

Deutsch 23-42

Polski 44-65

Approval body for construction products
and types of construction

Bautechnisches Prüfamt

An institution established by the Federal and
Laender Governments



European Technical Assessment

ETA-06/0047
of 3 December 2020

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 push-in anchor HKD

Product family
to which the construction product belongs

Mechanical fastener for non-structural applications in
concrete

Manufacturer

Hilti Aktiengesellschaft
9494 SCHAAN
FÜRSTENTUM LIECHTENSTEIN

Manufacturing plant

Hilti Werke

This European Technical Assessment
contains

20 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

EAD 330747-00-0601 Edition 06/2018

This version replaces

ETA-06/0047 issued on 8 February 2016

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Specific Part

1 Technical description of the product

The Hilti push-in anchor HKD is a fastener made of galvanized or stainless steel which is placed into a drilled hole and anchored by deformation-controlled expansion.

The fastener consists of an anchor body and an internal plug.

The fixture shall be anchored with a fastening screw or threaded rod according to Annex B2.

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 Safety in case of fire (BWR 2)

Essential characteristic	Performance
Reaction to fire	Class A1
Resistance to fire	See Annex C4

3.2 Safety in use (BWR 4)

Essential characteristic	Performance
Characteristic resistance for all load directions and modes of failure for simplified design	See Annex C1 to C3

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

In accordance with European Assessment Document EAD No. 330747-00-0601, 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 3 December 2020 by Deutsches Institut für Bautechnik

Dipl.-Ing. Beatrix Wittstock
Head of Section

beglaubigt:
Lange

Installed condition

Multiple use for non-structural applications only

Figure A1:
Hilti push-in anchor HKD with screw

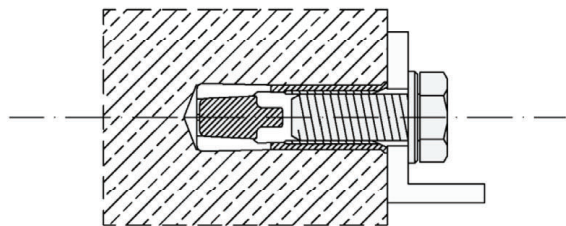


Figure A2:
Hilti push-in anchor HKD with threaded rod, washer and nut

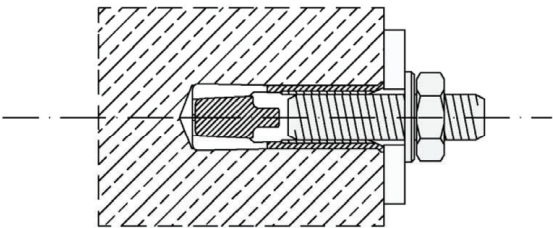
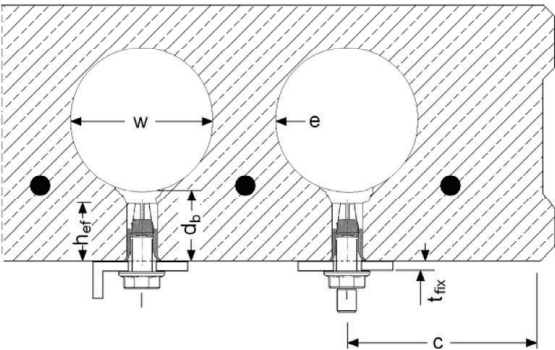


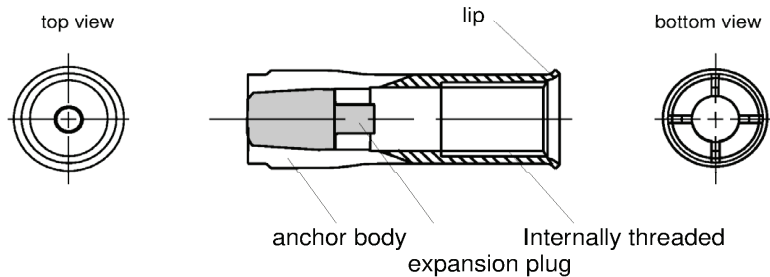
Figure A3:
Hilti push-in anchor HKD in precast prestressed hollow core slabs ($w/e \leq 4,2$)

- w core width
- e web thickness
- d_b bottom flange thickness
 $\geq 35\text{ mm}$ for M6x25 and M8x25
 $\geq 40\text{ mm}$ for M10x25
- h_{ef} embedment depth
- t_{fix} thickness of fixture
- c edge distance

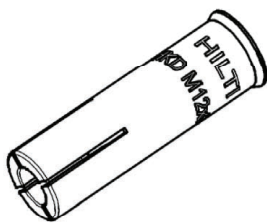


Hilti push-in anchor HKD	Annex A1
Product description Installed condition	

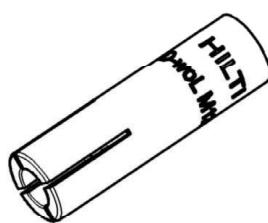
Product description: Hilti push-in anchor HKD
multiple use for non-structural applications only



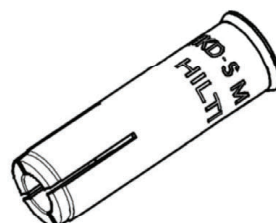
Marking:



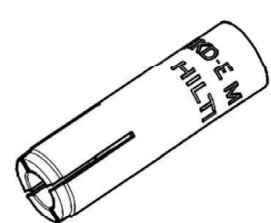
HKD



HKD-woL



**HKD-S /
HKD-SR**



**HKD-E /
HKD-ER**

HKD

HKD M6 x 25
HKD M8 x 25
HKD M8 x 30
HKD M8 x 40
HKD M10 x 25
HKD M10 x 30
HKD M10 x 40
HKD M12 x 25
HKD M12 x 50
HKD M16 x 65

HKD-woL

HKD-woL M6 x 25
HKD-woL M8 x 25
HKD-woL M8 x 30
HKD-woL M8 x 40
HKD-woL M10 x 25
HKD-woL M10 x 30
HKD-woL M10 x 40
HKD-woL M12 x 25
HKD-woL M12 x 50
HKD-woL M16 x 65

HKD-S

HKD-S M6 x 30 ø8
HKD-S M8 x 30 ø10
HKD-S M8 x 40 ø10
HKD-S M10 x 30 ø12
HKD-S M10 x 40 ø12
HKD-S M12 x 50 ø15

HKD-SR

HKD-SR M6 x 30 ø8
HKD-SR M8 x 30 ø10
HKD-SR M10 x 40 ø12
HKD-SR M12 x 50 ø15

HKD-E

HKD-E M6 x 30 ø8
HKD-E M8 x 30 ø10
HKD-E M8 x 40 ø10
HKD-E M10 x 30 ø12
HKD-E M10 x 40 ø12
HKD-E M12 x 50 ø15

HKD-ER

HKD-ER M6 x 30 ø8
HKD-ER M8 x 30 ø8
HKD-ER M10 x 40 ø12
HKD-ER M12 x 50 ø15

Hilti push-in anchor HKD

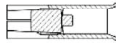
Product description
Anchor types / Marking

Annex A2

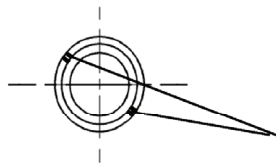
Identification after installation

Each anchor can be identified with setting tool after installation

Table A1: Identification HKD and HKD-woL

Size		Setting tool	Top view
HKD M6x25		HSD-G M6 x 25	
HKD M8x25		HSD-G M8 x 25/30	
HKD M8x30		HSD-G M8 x 25/30	
HKD M8x40		HSD-G M8 x 40	
HKD M10x25		HSD-G M10 x 25/30	
HKD M10x30		HSD-G M10 x 25/30	
HKD M10x40		HSD-G M10 x 40	
HKD M12x25		HSD-G M12 x 25	
HKD M12x50		HSD-G M12 x 50	
HKD M16x65		HSD-G M16 x 65	

Identification HKD-E(R) and HKD-S(R)



additional marking on end-face for M8x40 and M10x40

Hilti push-in anchor HKD

Product description

Identification after installation

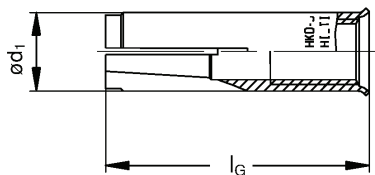
Annex A3

Anchor materials and anchor dimensions

Table A2: Materials

Designation	Material
HKD; HKD-woL	
Anchor body	cold formed steel – galvanized to $\geq 5 \mu\text{m}$
expansion plug	cold formed steel
HKD-S; HKD-E	
Anchor body	Steel Fe/Zn5 (galvanized $\geq 5 \mu\text{m}$)
expansion plug	cold formed steel
HKD-SR; HKD-ER	
Anchor body	Stainless steel of corrosion resistance class III according to EN1993-1-4:2006+A1:2015 1.4401, 1.4404 or 1.4571 according to EN 10088-1:2014
expansion plug	

Anchor body



Expansion plug

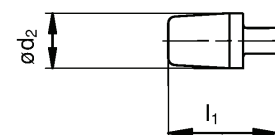
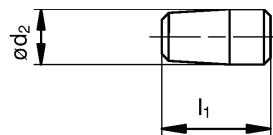


Table A3: Dimensions

Anchor size		M6x25	M6x30	M8x25	M8x30	M8x40	M10x25	M10x30	M10x40	M12x25	M12x50	M16x65
Anchor length	l_G [mm]	25	30	25	30	40	25	30	40	25	50	65
Anchor diameter	$\varnothing d_1$ [mm]	7,9	8	9,95	9,95	9,95	11,9	11,8	11,95	14,9	14,9	19,75
Plug diameter	$\varnothing d_2$ [mm]	5,1	5	6,35	6,5	6,35	8,1	8,2	8,2	9,7	10,3	13,8
Plug length	l_1 [mm]	10	15	7	12	16	7	12	16	7,2	20	29

Hilti push-in anchor HKD

Product description

Anchor materials and anchor dimensions

Annex A4

Specifications of intended use

Multiple use for non-structural applications only

Anchorage subject to:

- Static and quasi-static loading.
- The anchor is to be used only for multiple use for non-structural applications, the definition of multiple use according to the member states is given in EN 1992-4:2018, 7.3 and CEN/TR 17079.

Base material:

- Compacted, reinforced or unreinforced normal weight concrete without fibers in accordance with EN 206:2013+A1:2016.
- Strength classes C20/25 to C50/60 according to EN 206:2013+A1:2016.
- Cracked and uncracked concrete.
- Fire resistance: M6 to M16.

Table B1: Specifications of intended use

Anchorage subject to:	HKD / HKD-woL / HKD-E(R) and HKD-S(R) with ... Threaded rods or screws
Hammer drilling 	✓
Static and quasi static loading in cracked and uncracked concrete	M6 to M16 Table: C1, C2, C3 und C4
Fire resistance	M6 to M16 Table: C5 und C6

Use conditions (Environmental conditions):

- Structures subject to dry internal conditions (zinc coated steel or stainless 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).

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 designed in accordance with: EN 1992-4:2018.

Installation:

- Anchor installation carried out by appropriately qualified personnel and under the supervision of the person responsible for technical matters of the site.
- The anchor may only be set once.
- Overhead installation is admissible.

Hilti push-in anchor HKD

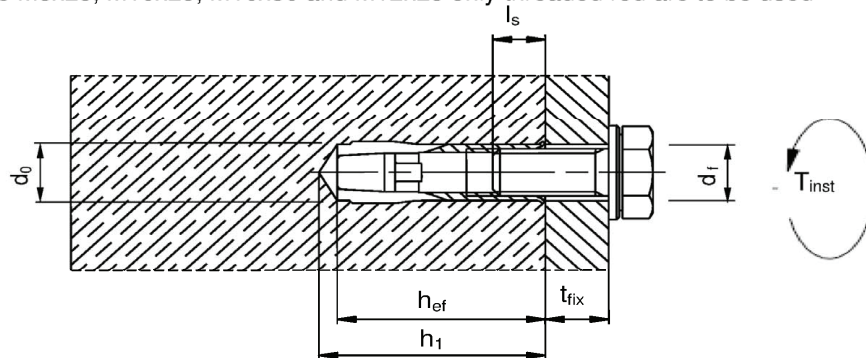
Intended use
Specifications

Annex B1

Table B2: Installation parameters

HKD			M6x25	M6x30	M8x25 ¹⁾	M8x30	M8x40	M10x25 ¹⁾	M10x30 ¹⁾	M10x40	M12x25 ¹⁾	M12x50	M16x65
Diameter of drill bit	d_0	[mm]	8	8	10	10	10	12	12	12	15	15	20
Thread diameter	d	[mm]	6	6	8	8	8	10	10	10	12	12	16
drill hole depth	h_1	[mm]	27	32	27	33	43	27	33	43	27	54	70
Effective embedment depth	h_{ef}	[mm]	25	30	25	30	40	25	30	40	25	50	65
Maximum screwing depth	$l_{s,max}$	[mm]	12	12,5	11,5	14,5	17,5	12	12,7	18	12	23,5	30,5
Minimum screwing depth	$l_{s,min}$	[mm]	6	6	8	8	8	10	10	10	12	12	16
Maximum torque moment	T_{inst}	[Nm]	≤ 4	≤ 4	≤ 8	≤ 8	≤ 8	≤ 15	≤ 15	≤ 15	≤ 35	≤ 35	≤ 60
Maximum diameter of clearance hole in the fixture	d_f	[mm]	7	7	9	9	9	12	12	12	14	14	18

¹⁾ with anchor size M8x25, M10x25, M10x30 and M12x25 only threaded rod are to be used



Requirements for fastening screw or threaded rod:

For anchors made of galvanized steel (HKD, HKD-wol, HKD-E and HKD-S) fastening screws or threaded rods of steel grade 4.6 / 5.6 / 5.8 or 8.8 according to EN ISO 898-1:2013 shall be specified.

For anchors made of stainless steel (HKD-ER and HKD-SR) fastening screw or threaded rod of steel grade 70 according to EN ISO 3506:2020 shall be specified.

Minimum screw depth $l_{s,min}$:

The length of the screw shall be determined depending on thickness of fixture t_{fix} , admissible tolerances and available thread length $l_{s,max}$ as well as minimum screw depth $l_{s,min}$ according to table B2

Hilti push-in anchor HKD

Intended use
Installation parameters

Annex B2

Admissible anchor positions in precast pre-stressed hollow core slabs ($w/e \leq 4,2$)

core distance:

$$l_c \geq 100 \text{ mm}$$

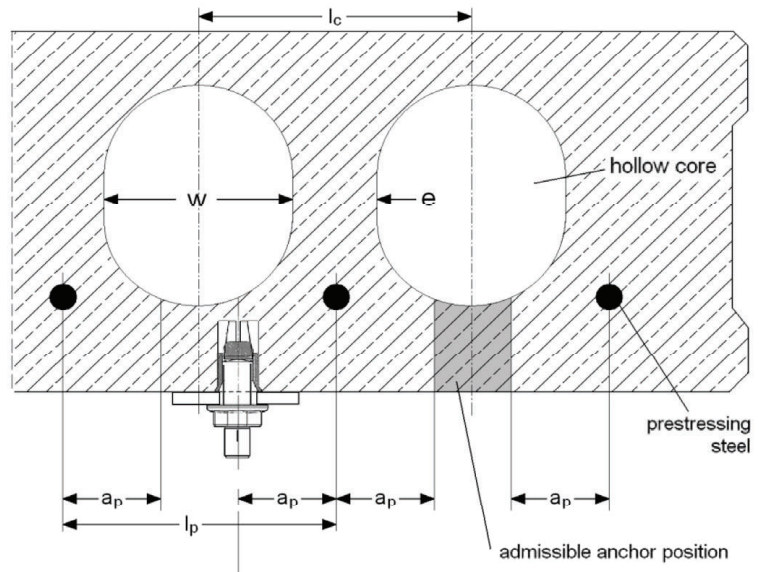
pre-stressing steel distance:

$$l_p \geq 100 \text{ mm}$$

distance between anchor

position and pre-stressing steel:

$$a_p \geq 50 \text{ mm}$$

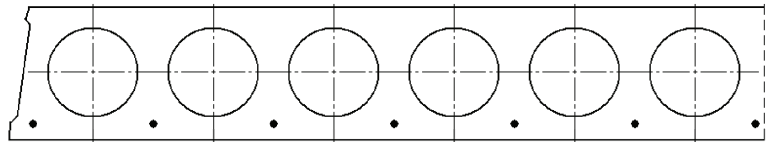


Minimum spacing and edge distance of anchors and distance between anchor groups in precast pre-stressed hollow core slabs

C_1, C_2 edge distance

S_1, S_2 anchor spacing

a_1, a_2 distances between anchor groups



Minimum edge distance

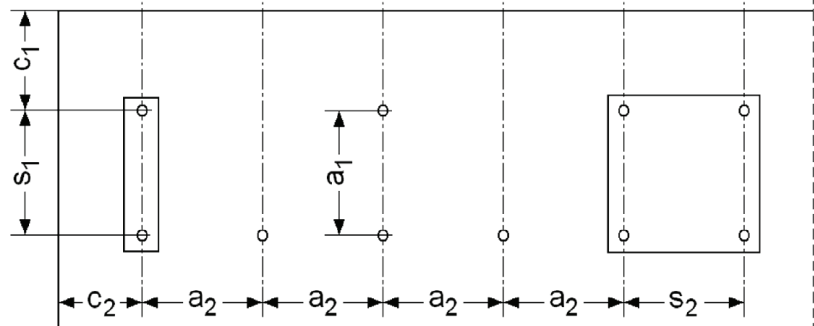
$$C_{min} \geq 200 \text{ mm}$$

Minimum anchor spacing

$$S_{min} \geq 400 \text{ mm}$$

Minimum distance between anchor groups

$$a_{min} \geq 400 \text{ mm}$$



The maximum shear load of an anchor group is restricted to max. $V = 25 \text{ kN}$.

Hilti push-in anchor HKD

Intended use

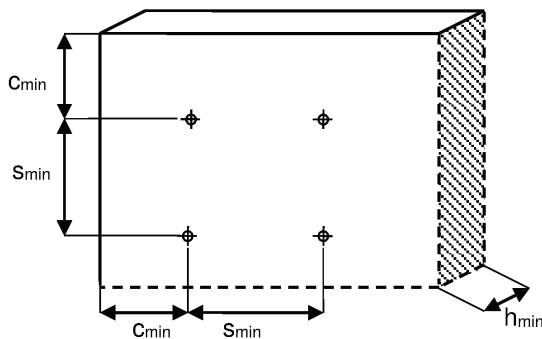
Installation data for precast pre-stressed hollow core slabs

Annex B3

Table B3: Minimum spacing and minimum edge distance

HKD-S(R), HKD-E(R)		M6x30 M8x30 M10x30	M8x40 M10x40	M12x50
Minimum spacing and minimum edge distance				
Minimum thickness of concrete member	h_{min} [mm]	100	100	100
Minimum spacing	s_{min} [mm]	60	80	125
Minimum edge distance	c_{min} [mm]	105	140	175
Minimum thickness of concrete member				
Minimum thickness of concrete member	h_{min} [mm]	80	80	
Minimum spacing	s_{min} [mm]	200	200	
Minimum edge distance	c_{min} [mm]	150	150	

HKD, HKD-woL		M6x25 M8x25 M10x25 M12x25	M8x30 M10x30	M8x40 M10x40	M12x50	M16x65
Minimum spacing and minimum edge distance						
Minimum thickness of concrete member	h_{min} [mm]	100	100	100	100	120
Minimum spacing	s_{min} [mm]	80	60	80	125	130
	for $c \geq$ [mm]	140	105	140	175	230
Minimum edge distance	c_{min} [mm]	100	80	140	175	230
	for $s \geq$ [mm]	150	120	80	125	130
Minimum thickness of concrete member						
Minimum thickness of concrete member	h_{min} [mm]	80	80	80	-	-
Minimum spacing	s_{min} [mm]	200	200	200	-	-
Minimum edge distance	c_{min} [mm]	150	150	150	-	-



Hilti push-in anchor HKD

Intended use

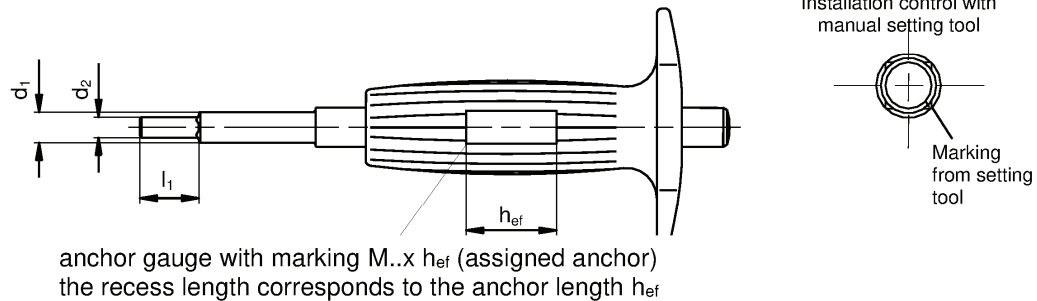
Minimum spacing and minimum edge distance

Annex B4

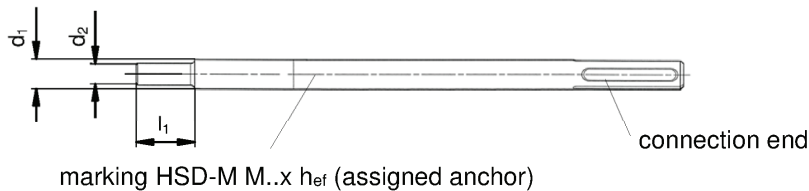
Table B4: Dimensions of the setting tools

Setting tool HSD / HSG		M6x25 M6x30	M8x25 M8x30	M8x40	M10x25 M10x30	M10x40	M12x25	M12x50	M16x65
Diameter	d_1 [mm]	7,5	9,5	9,5	11,5	11,5	14,5	14,5	18
Diameter	d_2 [mm]	5	6,5	6,5	8	8	10,2	10,2	13,5
Length	l_1 [mm]	15	18	28	18	24	18	30	36

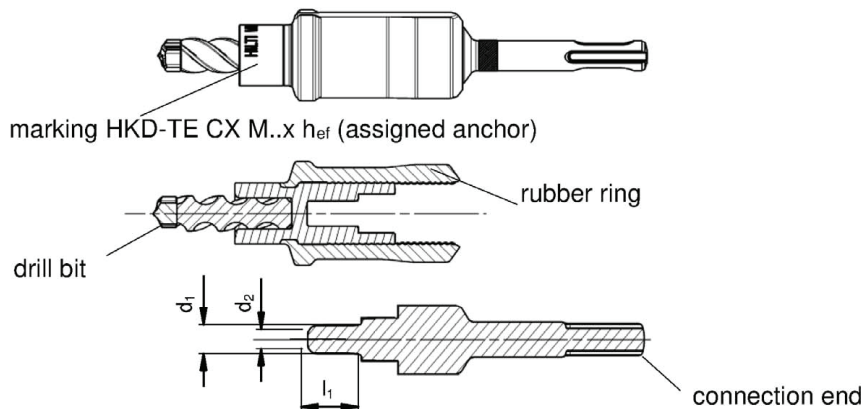
Manual setting tool HSD-G M.. x h_{ef} (e.g. HSD-G M8 x 30)



Machine setting tool HSD-M M.. x h_{ef} (e.g. HSD-M M8 x 30)



Machine setting tool HKD-TE CX M.. x h_{ef} (z.B. HKD-TE-CX M8 x 30)



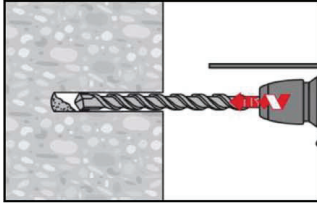
Hilti push-in anchor HKD

Intended use
Setting tools

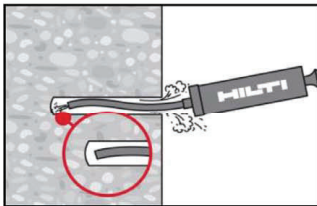
Annex B5

Installation instructions

Hole drilling and cleaning

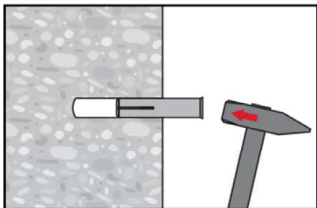


Make a cylindrical hole.

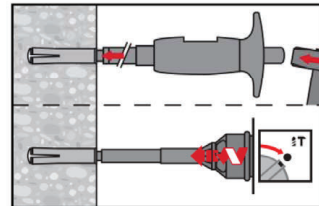
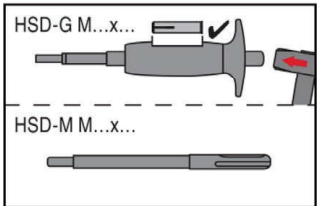


Clean the drill hole.

Fastener setting

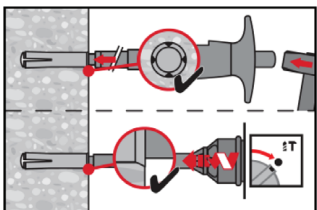


Install the anchor by hammering.



Choose the setting tool; and confirm the size of setting tool according to the size of the anchor.

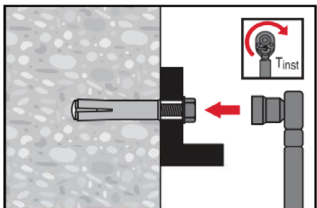
Setting check



HSD-G M...x...: Hammer on the top of setting tool until the 4 marks are visible on the lips of the anchor.

HSD-M M...x...: set the anchor until the setting tool touches the rim of the anchor.

Loading the anchor



Apply the torque (check the values for T_{inst}) using torque wrench.

Hilti push-in anchor HKD

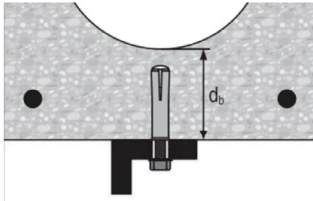
Intended use
Installation instructions

Annex B6

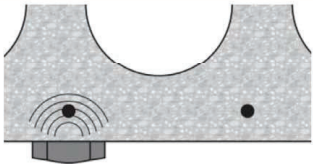
Installation instructions

Installation with the stop drill bit HKD-TE CX only

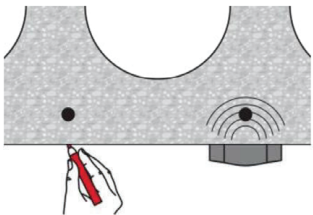
Positioning the anchor



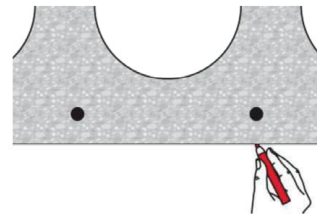
Verify the bottom flange thickness of the hollow core slab according to Table C3.



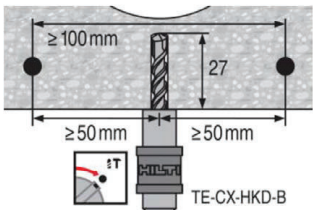
Detect the position of reinforcement.



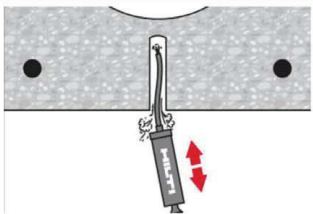
Detect the position of reinforcement and mark.



Hole drilling and cleaning



Make a cylindrical hole.



Clean the drill hole.

Hilti push-in anchor HKD

Intended use

Installation instructions in precast pre-stressed hollow core slabs

Annex B7

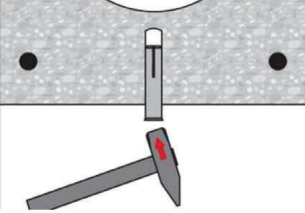
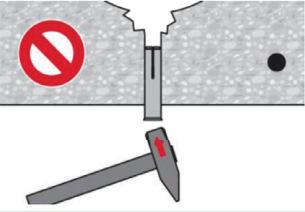
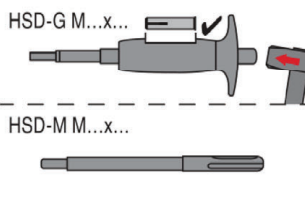
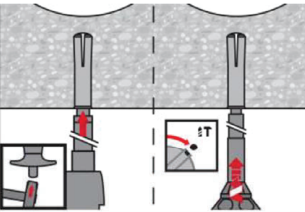
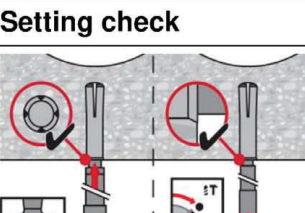
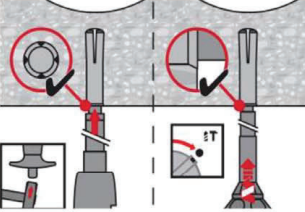
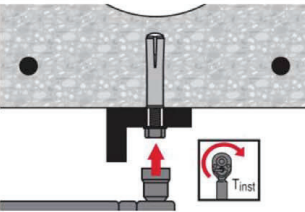
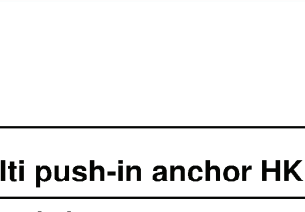
Fastener setting	Install the anchor by hammering. Fixing is not allowed for $h_{ef}=25\text{mm}$ and $d_b<35\text{mm}$ when a cavity is cut. Choose the setting tool; and confirm the size of setting tool according to the size of the anchor. HSD-G M...x... HSD-M M...x... HSD-G M...x...: Hammer on the top of setting tool until the 4 marks are visible on the lips of the anchor. HSD-M M...x...: set the anchor until the setting tool touches the rim of the anchor
	
	
	
	HSD-G M...x...: Hammer on the top of setting tool until the 4 marks are visible on the lips of the anchor. HSD-M M...x...: set the anchor until the setting tool touches the rim of the anchor
	
Setting check	Apply the torque (values for T_{inst} in ETA) using torque wrench.
	
	Apply the torque (values for T_{inst} in ETA) using torque wrench.
	
Hilti push-in anchor HKD	Annex B8
Intended use Installation instructions in precast pre-stressed hollow core slabs	

Table C1: Characteristic resistance for Hilti push-in anchor HKD-S(R) and HKD-E(R)

HKD-S, HKD-E HKD-SR, HKD-ER			M6x30	M8x30	M8x40	M10x30	M10x40	M12x50
Installation safety factor γ_{inst}			1,0					
All load directions								
Characteristic resistance in C20/25 to C50/60	F^0_{Rk}	[kN]	3	3	5	4	6	6
Characteristic spacing	s_{cr}	[mm]	90	90	120	90	120	150
Characteristic edge distance	c_{cr}	[mm]	45	45	60	45	60	75
Shear load with lever arm								
Steel grade 4.6	$M^0_{Rk,s}$	[Nm]	6	15	15	30	30	52
Partial safety factor	$\gamma_{Ms}^{1)}$		1,67					
Steel grade 5.6	$M^0_{Rk,s}$	[Nm]	8	19	19	37	37	65
Partial safety factor	$\gamma_{Ms}^{1)}$		1,67					
Steel grade 5.8	$M^0_{Rk,s}$	[Nm]	8	19	19	37	37	65
Partial safety factor	$\gamma_{Ms}^{1)}$		1,25					
Steel grade 8.8	$M^0_{Rk,s}$	[Nm]	12	30	30	60	60	105
Partial safety factor	$\gamma_{Ms}^{1)}$		1,25					
Steel grade 70	$M^0_{Rk,s}$	[Nm]	11	26	version not available		52	92
Partial safety factor	$\gamma_{Ms}^{1)}$		1,56				1,56	
Ductility factor	k_7	[-]	1,0					

¹⁾ In absence of other national regulations.

Hilti push-in anchor HKD

Performances

Characteristic resistance for Hilti push-in anchor HKD-S (R) and HKD-E (R) in case of static and quasi-static loading

Annex C1

Table C2: Characteristic resistance for Hilti push-in anchor HKD and HKD-woL

HKD HKD-woL			M6x25	M8x25	M8x30	M8x40	M10x25	M10x30	M10x40	M12x25	M12x50	M16x65
Installation safety factor γ_{inst}			1,0		1,2	1,0	1,2	1,0				
All load directions												
Characteristic resistance in C20/25 to C50/60		F^0_{Rk} [kN]	2	3	5	5	4	5	7,5	4	9	16
Characteristic spacing		s_{cr} [mm]	80	80	90	120	80	90	120	80	150	200
Characteristic edge distance		c_{cr} [mm]	40	40	45	60	40	45	60	40	75	100
Shear load with lever arm												
Steel grade 4.6		$M^0_{Rk,s}$ [Nm]	6	15			30			52		133
Partial safety factor $\gamma_{Ms}^{1)}$			1,67									
Steel grade 5.6		$M^0_{Rk,s}$ [Nm]	8	19			37			65		166
Partial safety factor $\gamma_{Ms}^{1)}$			1,67									
Steel grade 5.8		$M^0_{Rk,s}$ [Nm]	8	19			37			65		166
Partial safety factor $\gamma_{Ms}^{1)}$			1,25									
Steel grade 8.8		$M^0_{Rk,s}$ [Nm]	12	30			60			105		266
Partial safety factor $\gamma_{Ms}^{1)}$			1,25									
Ductility factor		k_7 [-]	1,0									

¹⁾ In absence of other national regulations.

Hilti push-in anchor HKD

Performances

Characteristic resistance for Hilti push-in anchor HKD and HKD-woL

Annex C2

Table C3: Characteristic resistance for Hilti push-in anchor in precast pre-stressed hollow core slabs C30/37 to C50/60

HKD HKD-woL			M6x25	M8x25	M10x25
Installation safety factor γ_{inst}			1,0		1,2
All load directions					
bottom flange thickness		d _b [mm]	≥ 35 (or 30 ²⁾)	≥ 35	≥ 40
Characteristic resistance in C20/25 to C50/60		F ⁰ _{Rk} [kN]	2	3	4
Characteristic spacing		s _{cr} [mm]	400		
Characteristic edge distance		c _{cr} [mm]	200		
Shear load with lever arm					
Steel grade 4.6		M ⁰ _{Rk,s} [Nm]	6	15	30
Partial safety factor		γ _{Ms} ¹⁾	1,67		
Steel grade 5.6		M ⁰ _{Rk,s} [Nm]	8	19	37
Partial safety factor		γ _{Ms} ¹⁾	1,67		
Steel grade 5.8		M ⁰ _{Rk,s} [Nm]	8	19	37
Partial safety factor		γ _{Ms} ¹⁾	1,25		
Steel grade 8.8		M ⁰ _{Rk,s} [Nm]	12	30	60
Partial safety factor		γ _{Ms} ¹⁾	1,25		
Ductility factor		k ₇ [-]	1,0		

¹⁾ In absence of other national regulations.

²⁾ The anchor may be used in a flange thickness of 30 mm with the same characteristic resistance but the drill hole is not allowed to cut a cavity (see Annex B8).

Hilti push-in anchor HKD

Performances

Characteristic resistance for Hilti push-in anchor in precast pre-stressed hollow core slabs

Annex C3

Table C4: Characteristic resistance for Hilti push-in anchor HKD-SR and HKD-ER under fire exposure in concrete C20/25 to C50/60 for all load directions

Fire resistance class	HKD-SR, HKD-ER		M6x30	M8x30	M10x40	M12x50
R 30	Characteristic resistance	$F_{Rk,fi}^{1)}$ [kN]	0,5	0,9	1,8	2,3
R 60	Characteristic resistance	$F_{Rk,fi}^{1)}$ [kN]	0,5	0,9	1,8	2,3
R 90	Characteristic resistance	$F_{Rk,fi}^{1)}$ [kN]	0,5	0,9	1,8	2,3
R 120	Characteristic resistance	$F_{Rk,fi}^{1)}$ [kN]	0,3	0,7	1,5	1,8
R 30 to R 120	Spacing	$s_{cr,fi}$ [mm]	120	120	160	200
	Edge distance	$c_{cr,fi}$ [mm]	105	105	140	175
In case of fire attack from more than one side, the minimum edge distance shall be ≥ 300 mm. The anchorage depth has to be increased for wet concrete by at least 30 mm compared to the given value						

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

Table C5: Characteristic resistance²⁾ for Hilti push-in anchor HKD and HKD-woL under fire exposure in concrete C20/25 to C50/60 for all load directions

Fire resistance class	HKD HKD-woL		M6x25	M8x25	M8x30	M8x40	M10x25	M10x30	M10x40	M12x25	M12x50	M16x65
R 30	Characteristic resistance	$F_{Rk,fi}^{1)}$ [kN]	0,5	0,6	0,9	1,3	0,6	0,9	1,8	0,6	2,3	4,0
R 60	Characteristic resistance	$F_{Rk,fi}^{1)}$ [kN]	0,4	0,6	0,9	1,3	0,6	0,9	1,8	0,6	2,3	4,0
R 90	Characteristic resistance	$F_{Rk,fi}^{1)}$ [kN]	0,3	0,6	0,9	1,3	0,6	0,9	1,8	0,6	2,3	4,0
R 120	Characteristic resistance	$F_{Rk,fi}^{1)}$ [kN]	0,2	0,5	0,7	0,7	0,5	0,7	1,5	0,5	1,8	3,2
R 30 to R 120	Spacing	$s_{cr,fi}$ [mm]	160	160	120	160	120	120	160	160	200	260
	Edge distance	$c_{cr,fi}$ [mm]	140	140	105	140	105	105	140	140	175	230
In case of fire attack from more than one side, the minimum edge distance shall be ≥ 300 mm. The anchorage depth has to be increased for wet concrete by at least 30 mm compared to the given value												

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

²⁾ The fire resistance data is only valid for concrete C20/25 to C50/60 with a minimum slab thickness of 80 mm. The data is **not** valid for precast pre-stressed hollow core slabs.

Hilti push-in anchor HKD

Performances

Characteristic resistance for Hilti push-in anchor under fire exposure

Annex C4