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## European Technical Assessment

**ETA-19/0335  
of 25.11.2019***English version prepared by ZAG*

### General Part

**Technical Assessment Body issuing the  
European Technical Assessment****ZAG Ljubljana****Trade name of the construction product****Hilti HKD****Product family to which the construction  
product belongs****33: Deformation-controlled expansion  
anchor of sizes 1/4", 5/16", 3/8"  
and 1/2" for multiple use for  
non-structural applications in  
concrete****Manufacturer****HILTI Corporation  
Feldkircherstrasse 100  
9494 Schaan  
Liechtenstein**[www.hilti.com](http://www.hilti.com)**Manufacturing plant****HILTI plants****This European Technical Assessment  
contains**18 pages including 15 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 330747-00-0601: Fasteners for  
use in concrete for redundant non-  
structural systems, edition May 2018

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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## **Specific parts**

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

Hilti HKD is a deformation-controlled expansion anchor of sizes 1/4"×25, 5/16"×30, 3/8"×30, 3/8"×40 and 1/2"×50 made of galvanised 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.

For the installed anchor see Figure given in Annex A1.

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

The performances given in Chapter 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 working life of the anchor of 50 years. The indications given on the working life cannot be interpreted as a guarantee given by the manufacturer, 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 basic work requirements for mechanical resistance and stability are listed in Annexes C1 and C2.

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

Anchorage satisfy requirements for class A1.

Performances for resistance to fire are listed in Annex C3.

#### **3.3 Hygiene, health and environment (BWR 3)**

Regarding dangerous substances contained in this European Technical Assessment, there may be requirements applicable to the products falling within its scope (e.g. transported European legislation and national laws, regulations and administrative provisions). In order to meet provisions of the regulation (EU) No 305/2011, these requirements need also to be complied with, when they apply.

#### **3.4 Safety in use (BWR 4)**

For basic work requirement safety in use the same criteria are valid as for basic work requirement mechanical resistance and stability.

#### **3.5 Protection against noise (BWR 5)**

Not relevant.

#### **3.6 Energy economy and heat retention (BWR 6)**

Not relevant.

#### **3.7 Sustainable use of natural resources (BWR 7)**

No performance assessed.

### **3.8 General aspects relating to fitness for use**

Durability and serviceability are only ensured if specifications of intended use according to Annex B1 are kept.

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

According to the decision 96/582/EC of the European Commission<sup>1</sup> the system of assessment and verification of constancy of performance (see Annex V to regulation (EU) No 305/2011) **2+** apply.

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

Technical details necessary for the implementation of the AVCP system are laid down in Chapter 3 of EAD 330747-00-0601.

Issued in Ljubljana on 25.11.2019

Signed by:

Franc Capuder, M.Sc., Research Engineer

*Head of Service of TAB*

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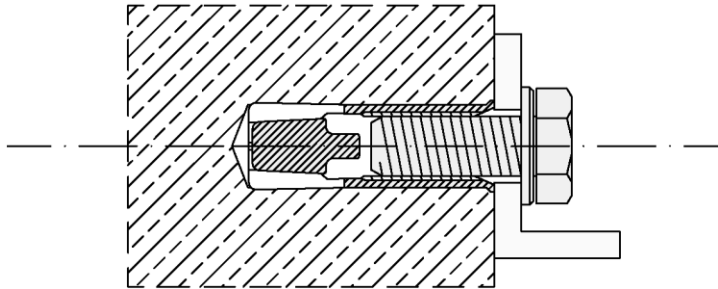
<sup>1</sup>

Official Journal of the European Communities L 254 of 8.10.1996

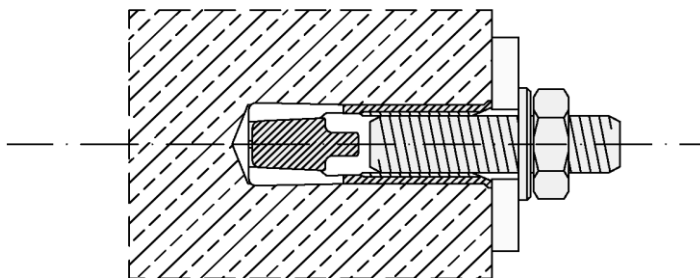
## Installed condition

multiple use for non-structural applications only

### Hilti HKD with screw

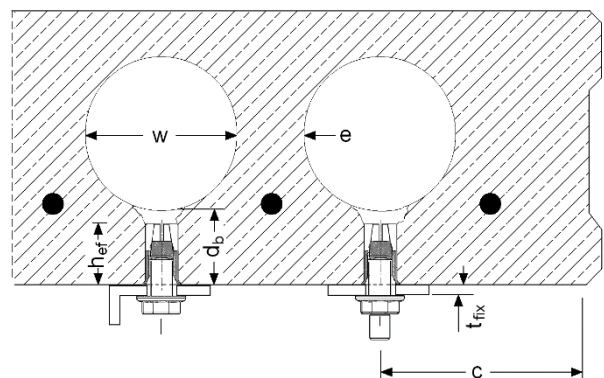


### Hilti HKD with threaded rod, washer and nut



### Hilti 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 $\frac{1}{4}'' \times 25$
$h_{ef}$	embedment depth
$t_{fix}$	thickness of fixture
c	edge distance



**Hilti HKD**

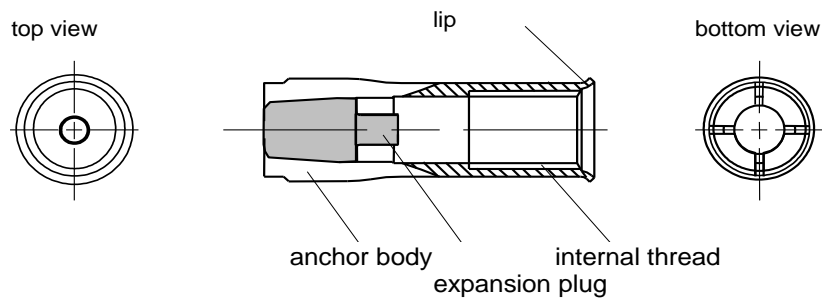
**Product description**

Installed condition

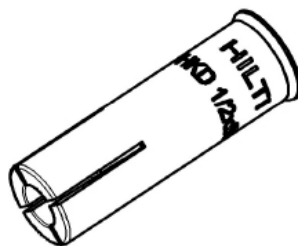
**Annex A1**

## Product description: Hilti HKD

multiple use for non-structural applications only



## Marking:



## Hilti HKD



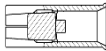
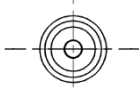
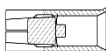


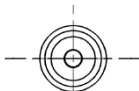
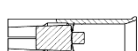
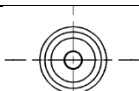
HKD 1/4" x 25  
HKD 5/16" x 30  
HKD 3/8" x 30  
HKD 3/8" x 40  
HKD 1/2" x 50

Hilti HKD	Annex A2
Product description Anchor types / Marking	

## Identification after installation

Each anchor can be identified with setting tool after installation

**Table A1: Identification of Hilti HKD**

Size		Setting tool	Top view
HKD 1/4"x 25		HSD-G M6-1/4" x 25	
HKD 5/16"x30		HSD-G M8-5/16" x 25/30	
HKD 3/8"x30		HSD-G M10-3/8" x 25/30	
HKD 3/8"x40		HSD-G M10-3/8" x 40	
HKD 1/2"x50		HSD-G M12-1/2" x 50	

**Hilti HKD**

**Product description**

Identification after installation

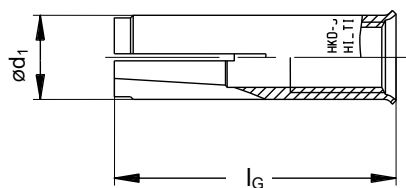
**Annex A3**

## Materials and dimensions

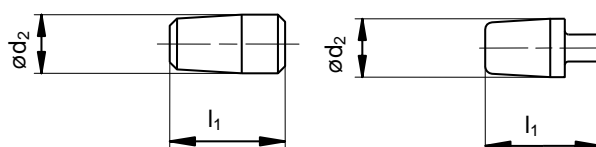
**Table A2: Materials**

Designation	Material
Anchor body	cold formed steel – galvanised to $\geq 5 \mu\text{m}$
Expansion plug	cold formed steel

Anchor body



Expansion plug



**Table A3: Dimensions**

Anchor size		1/4"x25	5/16"x30	3/8"x30	3/8"x40	1/2"x50
Anchor length	$l_G$ [mm]	25	30	30	40	50
Anchor diameter	$\varnothing d_1$ [mm]	7,9	9,9	11,9	11,95	15,85
Plug diameter	$\varnothing d_2$ [mm]	5,1	6,35	8,2	7,86	10,2
Plug length	$l_1$ [mm]	10	12	12	16,2	20

**Hilti HKD**

**Product description**  
Materials and dimensions

**Annex A4**

## Specifications of intended use

### Anchorage subjected to:

- Static and quasi static load.
- Use only for multiple use for non-structural application.
- Fire exposure.

### Base materials:

- Reinforced or unreinforced normal weight concrete according to EN 206:2013+A1:2016.
- Strength classes C20/25 to C50/60 according to EN 206:2013+A1:2016.
- Cracked and non-cracked concrete.

### Use conditions (Environmental conditions):

- Structures 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 loading and for multiple use for non-structural applications 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 applications are permitted.

**Table B1: Overview use categories and performance categories**

Anchorage subjected to:	Threaded rod or screw
Hammer drilling 	✓
Static and quasi static loading in cracked and non-cracked concrete	1/4" to 1/2" Table : C1 and C2
Fire resistance	5/16" to 1/2" Table : C3'

**Hilti HKD**

**Intended use**  
Specifications

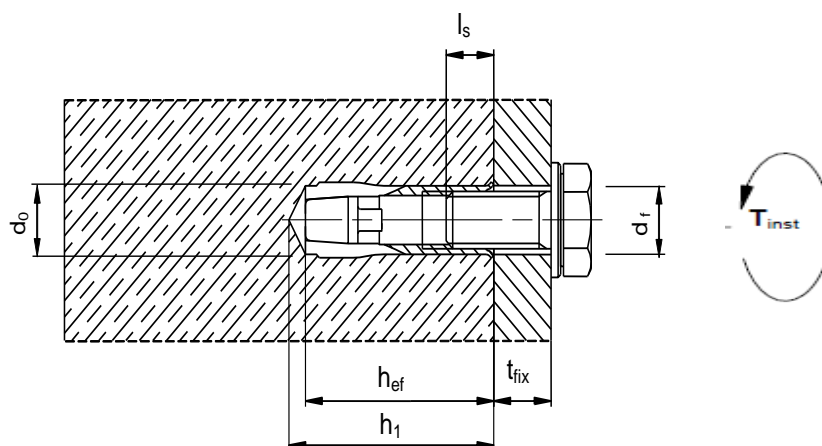
**Annex B1**



**Table B2: Installation parameters for Hilti HKD**

Hilti HKD			1/4"x25	5/16"x30	3/8"x30	3/8"x40	1/2"x50
Nominal diameter of drill bit	$d_0$	[mm]	8	10	12	12	16
Thread diameter	$d$	[mm]	6,35	7,94	9,53	9,53	12,7
Drill hole depth	$h_1$	[mm]	27	33	33	43	54
Effective embedment depth	$h_{ef}$	[mm]	25	30	30	40	50
Thread engagement length	$l_{s,max}$	[mm]	12	14,5	13	18	23,5
Minimum screwing depth <sup>1)</sup>	$l_{s,min}$	[mm]	6	8	10	10	12,7
Maximum torque moment	$T_{inst}$	[Nm]	≤ 4	≤ 8	≤ 15	≤ 15	≤ 35
Maximum diameter of clearance hole in the fixture	$d_f$	[mm]	7	9	12	12	14

<sup>1)</sup> with anchor size 3/8"x30 only threaded rod is to be used.



**Requirements for fastening screw or threaded rod:**

For anchors made of galvanised steel (Hilti HKD) 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.

**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 table B2.

<b>Hilti HKD</b>	<b>Annex B2</b>
<b>Intended use</b> Installation parameters	

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

core distance:

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

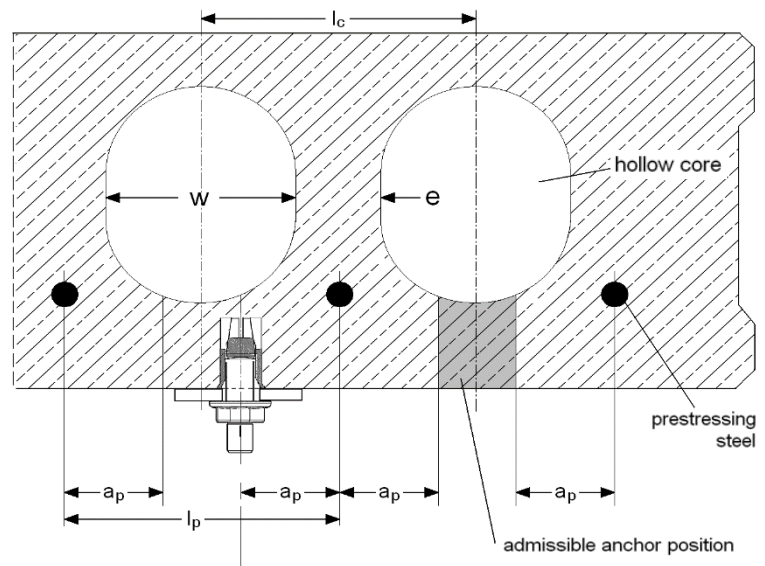
pre-stressing steel distance:

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

distance between anchor

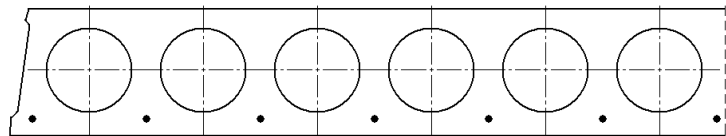
position and pre-stressing steel:

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



## 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

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

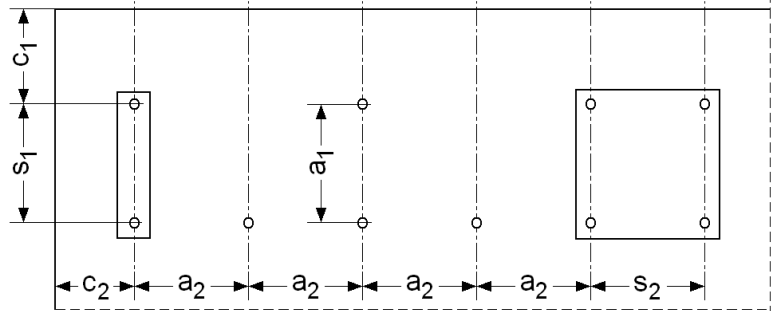
Minimum anchor spacing

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

Minimum distance between

anchor groups

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



**Hilti HKD**

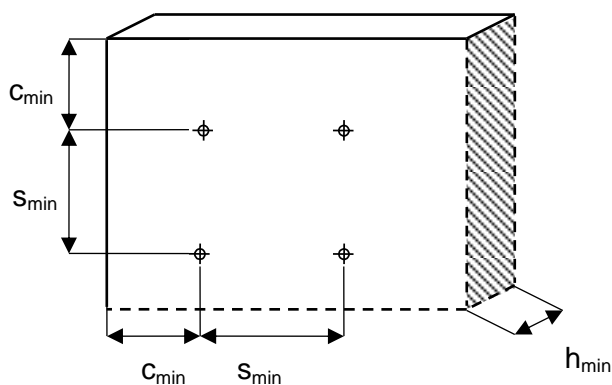
**Intended use**

Installation data for precast pre-stressed hollow core slabs

**Annex B3**

**Table B3: Minimum spacing and minimum edge distance for Hilti HKD**

Hilti HKD		1/4"x25	5/16"x30 3/8"x30	3/8"x40	1/2"x50
<b>Minimum spacing and minimum edge distance</b>					
Minimum thickness of concrete member	$h_{min}$ [mm]	100	100	100	100
Minimum spacing	$s_{min}$ [mm]	60	60	80	125
	for $c \geq$ [mm]	105	105	140	175
Minimum edge distance	$c_{min}$ [mm]	80	80	140	175
	for $s \geq$ [mm]	120	120	80	125
<b>Minimum thickness of concrete member</b>					
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 HKD**

**Intended use**

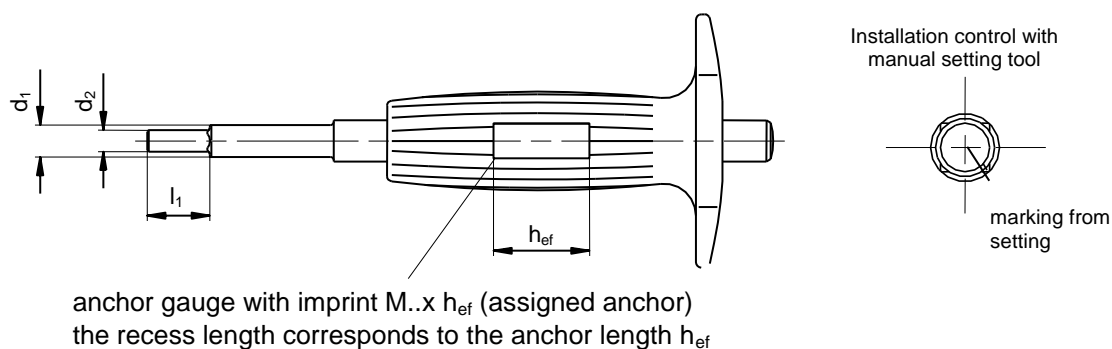
Minimum spacing and edge distance

**Annex B4**

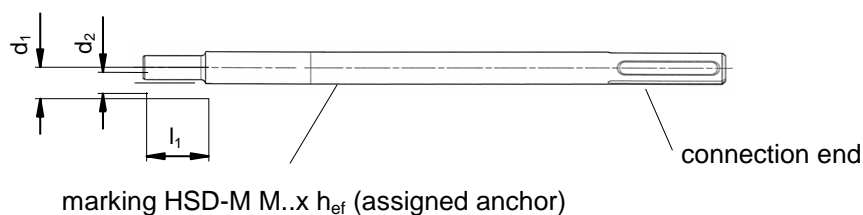
**Table B4: Dimensions of the setting tools**

Setting tools HSD			1/4"x25	5/16"x30	3/8"x30	3/8"x40	1/2"x50
Diameter	$d_1$	[mm]	7,5	9,5	11,5	11,5	14,5
Diameter	$d_2$	[mm]	5	6,5	8	8	10,2
Length	$l_1$	[mm]	15	18	18	24	30

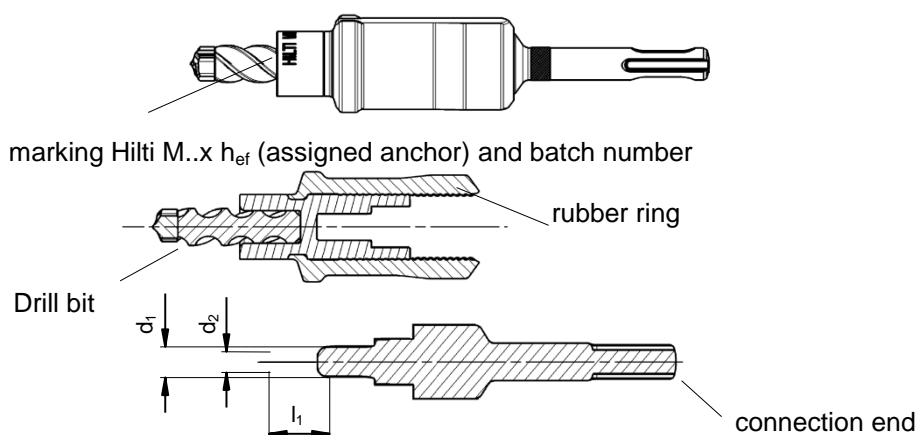
**Manual setting tool HSD-G M.. x  $h_{ef}$  (e.g. HSD-G M8-5/16"x 30)**



**Machine setting tool HSD-M M.. x  $h_{ef}$  (e.g. HSD-M M8-5/16"x30)**



**Machine setting tool HKD-TE CX M.. x  $h_{ef}$  (e.g. HKD-TE-CX M8-5/16"x30)**



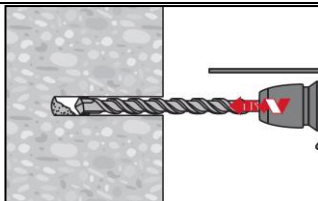
**Hilti HKD**

**Intended use**  
Setting tools

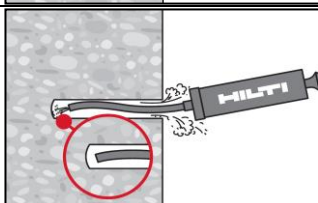
**Annex B5**

## Installation instructions

### Hole drilling and cleaning

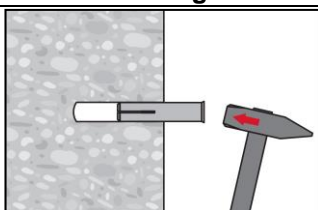


Make a cylindrical hole.

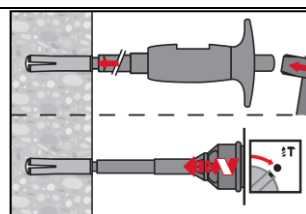
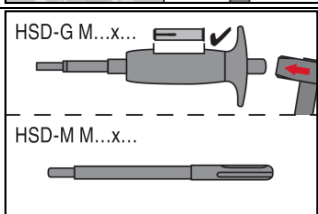


Remove dust.

### Fastener setting

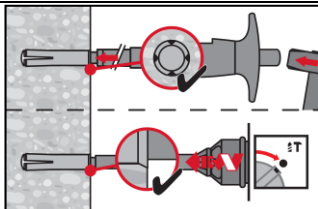


Install the anchor by hammering.



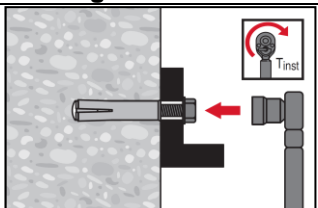
Choose the setting tool; and confirm the size of setting tool according to the size of the anchor.  
HSD-G M...x...: Hammer setting  
HSD-M M...x...: Machine setting

### Setting check



HSD-G M...x...: Hammer on the top of setting tool until to observe the 4 marks on the lips of the anchor.  
HSD-M M...x...: Set the anchor until the setting tool touches on the border.

### Loading the anchor



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

**Hilti HKD**

**Intended use**

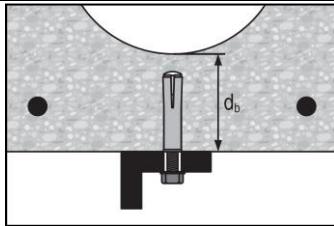
Installation instructions

**Annex B6**

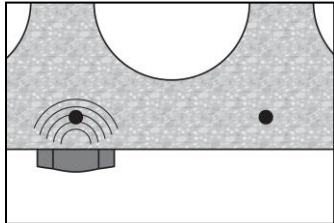
## Installation instructions in precast pre-stressed hollow core slabs

### Installation with the stop drill bit HKD-TE-CX only

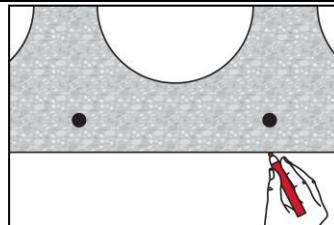
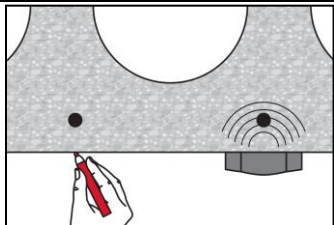
#### Positioning the anchor



Verify the bottom flange thickness of the hollow core slab ( $\geq 35$  mm for  $\frac{1}{4}$ "x25).

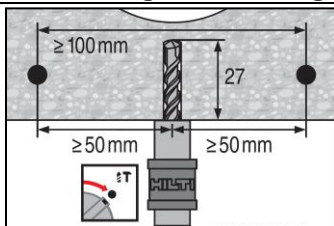


Detect the position of reinforcement.

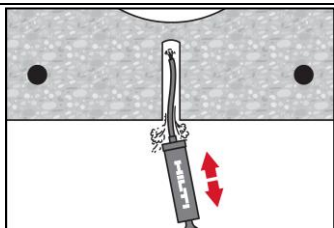


Detect the position of reinforcement and mark.

#### Hole drilling and cleaning



Make a cylindrical hole using HKD-TE-CX.



Remove dust.

**Hilti HKD**

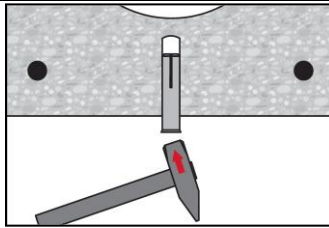
#### Intended use

Installation instructions in precast pre-stressed hollow core slabs

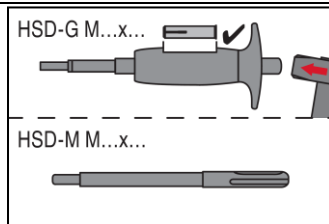
**Annex B7**

continue

### Fastener setting



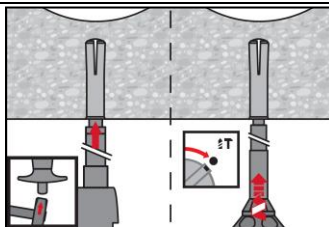
Install the anchor by hammering.



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

HSD-G M...x...: Hammer setting

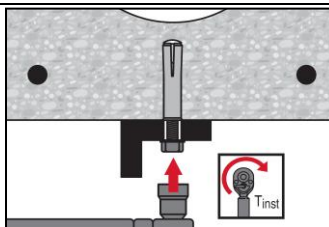
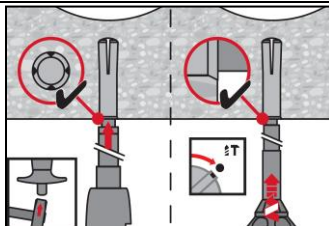
HSD-M M...x...: Machine setting



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

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

### Setting check



Apply the torque (values for max  $T_{inst}$  in ETA) using torque wrench.

**Hilti HKD**

**Intended use**

Installation instructions

**Annex B8**

**Table C1: Essential characteristics for Hilti HKD**

HKD		1/4"x25	5/16"x30	3/8"x30	3/8"x40	1/2"x50
Installation safety factor	$\gamma_2$	1,00	1,20	1,00	1,00	1,20
<b>All load directions</b>						
Characteristic resistance in C20/25 to C50/60	$F_{Rk}^0$ [kN]	2,0	5,0	5,0	7,5	9,0
Characteristic spacing	$s_{cr}$ [mm]	80	90	90	120	150
Characteristic edge distance	$c_{cr}$ [mm]	40	45	45	60	75
<b>Shear load with lever arm</b>						
Steel grade 4.6	$M_{Rk,s}^0$ <sup>2)</sup> [Nm]	5	11	20		47
Partial safety factor	$\gamma_{Ms}$ <sup>1)</sup>	1,67				
Steel grade 5.6	$M_{Rk,s}^0$ <sup>2)</sup> [Nm]	6	14	25		59
Partial safety factor	$\gamma_{Ms}$ <sup>1)</sup>	1,67				
Steel grade 5.8	$M_{Rk,s}^0$ <sup>2)</sup> [Nm]	6	14	25		59
Partial safety factor	$\gamma_{Ms}$ <sup>1)</sup>	1,25				
Steel grade 8.8	$M_{Rk,s}^0$ <sup>2)</sup> [Nm]	10	22	40		94
Partial safety factor	$\gamma_{Ms}$ <sup>1)</sup>	1,25				

<sup>1)</sup> In absence of other national regulations.

<sup>2)</sup> Characteristic bending moment  $M_{Rk,s}^0$  according to equation (2.12) in EAD 330232-00-0601.

**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 EAD 330747-00-0601.**

<b>Hilti HKD</b>	<b>Annex C1</b>
<b>Performances</b>	
Essential characteristic for Hilti HKD	



**Table C2: Essential characteristics for Hilti push-in anchor in precast pre-stressed hollow core slabs C30/37 to C50/60**

<b>Hilti HKD</b>		<b>1/4"x25</b>
Installation safety factor	$\gamma_2$	1,0
<b>All load directions</b>		
bottom flange thickness	$d_b$ [mm]	$\geq 35$
Characteristic resistance in C20/25 to C50/60	$F_{Rk}^0$ [kN]	2
Characteristic spacing	$s_{cr}$ [mm]	400
Characteristic edge distance	$c_{cr}$ [mm]	200
<b>Shear load with lever arm</b>		
Steel grade 4.6	$M_{Rk,s}^0$ <sup>2)</sup> [Nm]	5
Partial safety factor	$\gamma_{Ms}$ <sup>1)</sup>	1,67
Steel grade 5.6	$M_{Rk,s}^0$ <sup>2)</sup> [Nm]	6
Partial safety factor	$\gamma_{Ms}$ <sup>1)</sup>	1,67
Steel grade 5.8	$M_{Rk,s}^0$ <sup>2)</sup> [Nm]	6
Partial safety factor	$\gamma_{Ms}$ <sup>1)</sup>	1,25
Steel grade 8.8	$M_{Rk,s}^0$ <sup>2)</sup> [Nm]	10
Partial safety factor	$\gamma_{Ms}$ <sup>1)</sup>	1,25

<sup>1)</sup> In absence of other national regulations.

<sup>2)</sup> Characteristic bending moment  $M_{Rk,s}^0$  according to equation (2.12) in EAD 330232-00-0601.

**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 the EAD 330747-00-0601.**

<b>Hilti HKD</b>	<b>Annex C2</b>
<b>Performances</b> Essential characteristics for Hilti HKD in precast pre-stressed hollow core slabs	

**Table C3: Essential characteristics for Hilti HKD under fire exposure in concrete C20/25 to C50/60 for all load directions**

Fire resistance class	Hilti HKD		1/4"x25	5/16"x30	3/8"x30	3/8"x40	1/4"x50
R 30	Characteristic resistance $F_{Rk,fi}^0$ <sup>1)</sup>	[kN]	/	0,30	0,66	0,66	1,57
R 60	Characteristic resistance $F_{Rk,fi}^0$ <sup>1)</sup>	[kN]	/	0,27	0,57	0,57	1,18
R 90	Characteristic resistance $F_{Rk,fi}^0$ <sup>1)</sup>	[kN]	/	0,21	0,44	0,44	1,02
R 180	Characteristic resistance $F_{Rk,fi}^0$ <sup>1)</sup>	[kN]	/	0,15	0,35	0,35	0,78
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 $\geq 300$ mm. The anchorage depth must be increased for wet concrete by at least 30 mm compared to the given value							

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

**Hilti HKD**

**Performances**

Essential characteristic for Hilti HKD under fire exposure

**Annex C3**