Deutsches Institut für Bautechnik
DIBt

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Approval body for construction products and types of construction
Bautechnisches Prüfamt
An institution established by the Federal and Laender Governments

Designated according to Article 29 of Regulation (EU) No 305/2011 and member of EOTA (European Organisation for Technical Assessment)

European Technical Assessment

ETA-13/1038 of 20 May 2015

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 screw anchor HUS3
Product family to which the construction product belongs	Concrete screw of sizes 8, 10 and 14 for use in concrete
Manufacturer	Hilti Aktiengesellschaft 9494 SCHAAN FÜRSTENTUM LIECHTENSTEIN
Manufacturing plant	Hilti Werke
This European Technical Assessment contains	17 pages including 3 annexes
This European Technical Assessment is issued in accordance with Regulation (EU) No 305/2011, on the basis of	Guideline for European technical approval of "Metal anchors for use in concrete", ETAG 001 Part 3: "Undercut anchors", amended version April 2013, used as European Assessment Document (EAD) according to Article 66 Paragraph 3 of Regulation (EU) No 305/2011 and EAD 330011-00-0601 "Adjustable concrete screws", July 2014
This version replaces	ETA-13/1038 issued on 13 January 2015

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Specific Part

1 Technical description of the product

The Hilti screw anchor HUS 3 is made of galvanised steel of sizes 8, 10 and 14. The anchor may be provided with hexagon head (HUS 3 H) or with countersunk head (HUS 3 C). 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.

An illustration of the product and intended use is given in A.

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 verifications and assessment methods on which this European Technical Assessment is based lead the assumption of 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, 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)

Essential characteristic	Performance
Product performance for static and quasi static action	See Annex C 1
Product performance for seismic category C1	See Annex C 2
Displacements under tension and shear load	See Annex C 5

3.2 Safety in case of fire (BWR 2)

Essential characteristic	Performance
Reaction to fire	Anchorages satisfy requirements for Class A1
Product performance for resistance to fire	See Annex C 3 / C 4

3.3 Hygiene, health and the environment (BWR 3)

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

3.4 Safety and accessibility in use (BWR 4)

For Basic requirement Safety in use the same criteria are valid as for Basic 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)

For the sustainable use of natural resources no performance was determined for this product.

3.8 General aspects

The verification of durability is part of testing the essential characteristics. Durability is only ensured if the specifications of intended use according to Annex B are taken into account.

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

According to Decision 96/582/EC of the Commission of 24 June 1996 (Official Journal of the European Communities L 254 of 08.10.1996, p. 62–65) the system of assessment and verification of constancy of performance (see Annex V and Article 65 Paragraph 2 to Regulation (EU) No 305/2011) given in the following table apply.

Product	Intended use	Level or class	System
Metal anchors for use in concrete (heavy-duty type)	For fixing and/or supporting concrete structural elements or heavy units such as cladding and suspended ceilings	—	1

5 Technical details necessary for the implementation of the AVCP system, as provided for in the applicable EAD

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

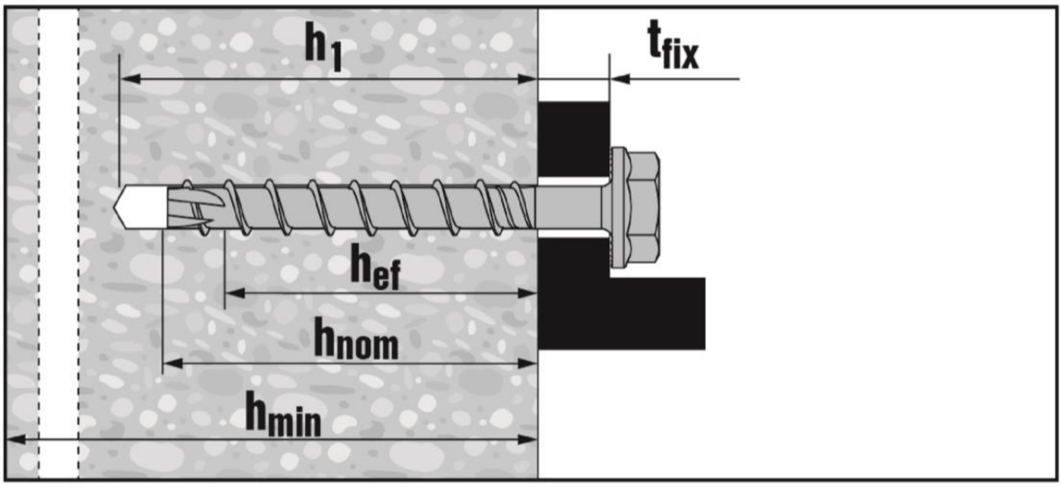
Issued in Berlin on 20 May 2015 by Deutsches Institut für Bautechnik

Uwe Bender
Head of Department

beglaubigt:
Lange

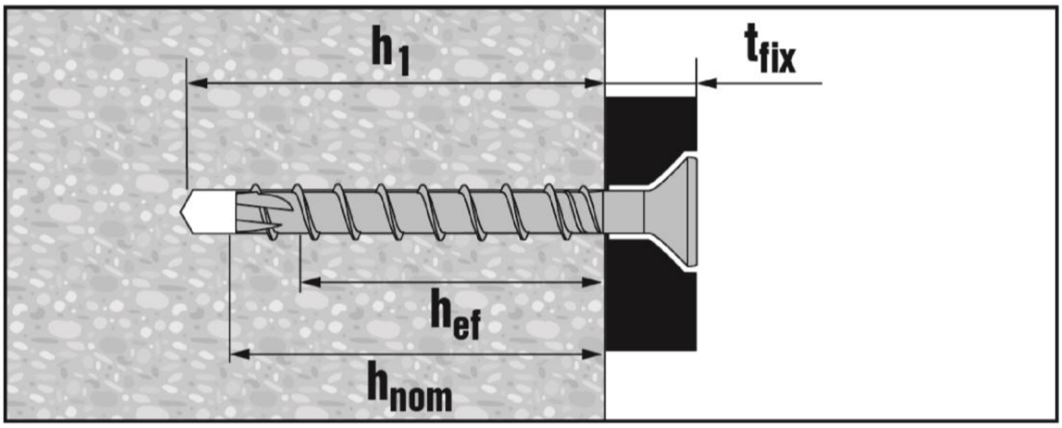
Deutsches Institut für Bautechnik DIBt

Product and installed condition without adjustment



HUS3-H (hexagon head configuration sizes 8, 10 and 14)

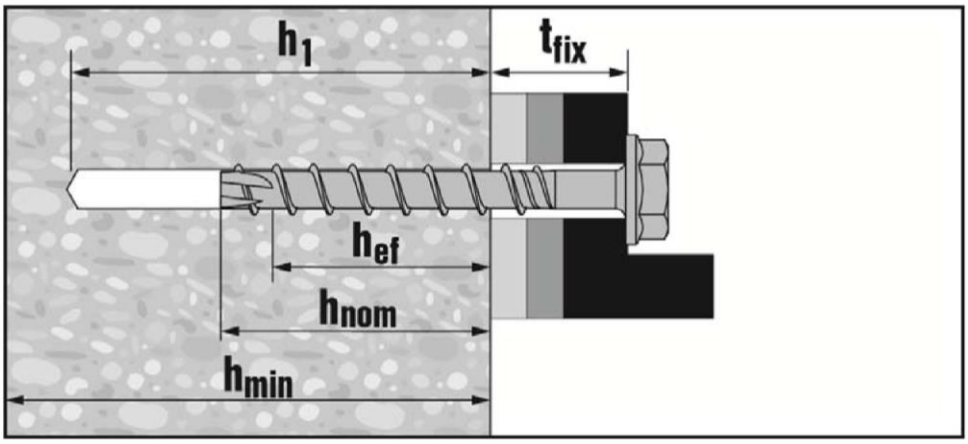
HUS3-HF (hexagon head configuration sizes 8, 10 and 14)



HUS3-C (countersunk head configuration sizes 8 and 10)

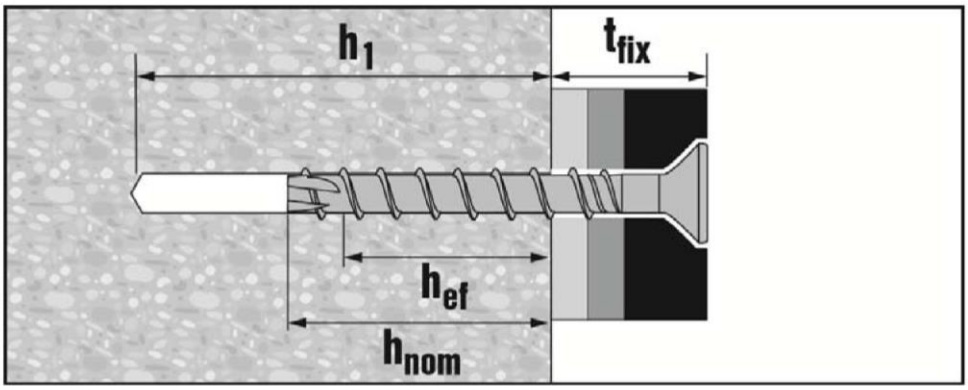
Hilti Screw anchor HUS3	**Annex A 1**
Product description Installed condition without adjustment	

Product and installed condition with adjustment



HUS3-H (hexagon head configuration sizes 8, 10 – h_{nom2} only)

HUS3-HF (hexagon head configuration sizes 8 and 10 – h_{nom2} only)



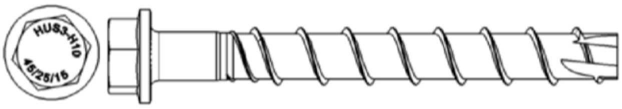
HUS3-C (countersunk head configuration sizes 8 and 10 – h_{nom2} only)

Hilti Screw anchor HUS3	**Annex A 2**
Product description Installed condition with adjustment	

Table A1: Material and screw types

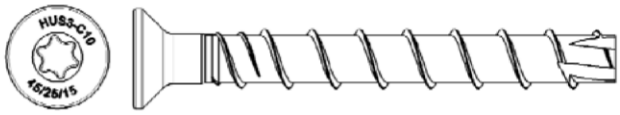
Part	Designation	Material
1, 2, 3	Screw anchor	Carbon steel

Anchor size HUS3			8	10	14
Characteristic yield strength	f_{yk}	[N/mm^2]	695	690	630
Characteristic ultimate strength	f_{uk}	[N/mm^2]	810	805	730
Elongation at rupture	A_5	[%]	≤8		



1) Hilti HUS3-H, hexagonal head configuration, galvanized

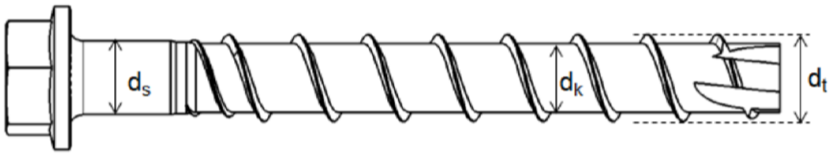
2) Hilti HUS3-HF, hexagonal head configuration, multilayer coating



3) Hilti HUS3-C, countersunk head configuration, galvanized

Table A2: Specification and marking

Anchor Size			8			10			14		
Anchor type			H, HF, C			H, HF, C			H, HF		H
			h_{nom1}	h_{nom2}	h_{nom3}	h_{nom1}	h_{nom2}	h_{nom3}	h_{nom1}	h_{nom2}	h_{nom3}
Nominal embedment depth	h_{nom}	[mm]	50	60	70	55	75	85	65	85	115
Threaded outer diameter	d_t	[mm]	10,30			12,40			16,85		
Core diameter	d_k	[mm]	7,85			9,90			12,95		
Shaft diameter	d_s	[mm]	8,45			10,55			13,80		
Stressed section	A_s	[mm^2]	48,4			77,0			131,7		



HUS3 : Hilti Universal Screw 3rd generation

H : Hexagonal head

10 : screw diameter

45/25/15 : maximum thickness fixture $t_{fix1}/t_{fix2}/t_{fix3}$ related to the embedment depth $h_{nom1}/h_{nom2}/h_{nom3}$ (see Annex B3)

Hilti Screw anchor HUS3	**Annex A 3**
Production description Material and screw types	

Intended use

Anchorages subject to:

- Static and quasi-static loads:
  All sizes and all embedment depths.
- Seismic action for Performance Category C1:
  HUS3-H all sizes, maximum embedment depth only (h_{nom3}).
  HUS3-C and HUS3-HF sizes 8 and 10, maximum embedment depth only (h_{nom3}).
- Fire exposure: HUS3-H, HUS3-HF and HUS3-C all sizes and all embedment depths.

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 and all embedment depths.

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 and under fire exposure are designed for design method A in accordance with:
  - Either ETAG 001, Annex C, Edition August 2010 and EOTA Technical Report TR 020, Edition May 2004
  - Or CEN/TS 1992-4:2009
- Anchorages under seismic actions are designed in accordance with:
  - EOTA Technical Report TR 045, Edition February 2013
  - Anchorages shall be positioned outside of critical regions (e.g. plastic hinges) of the concrete structure.
  - Fastenings in stand-off installation or with a grout layer are not allowed.
- In case of requirements for resistance to fire exposure it must be ensured that local spalling of the concrete cover does not occur.

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.
- Adjustability according to Annex B5 for:
  HUS3-H, HUS3-HF and HUS3-C size 8 (h_{nom2} = 60 mm)
  HUS3-H, HUS3-HF and HUS3-C size 10 (h_{nom2} = 75 mm)

Hilti Screw anchor HUS3	Annex B 1
Intended Use Specifications	

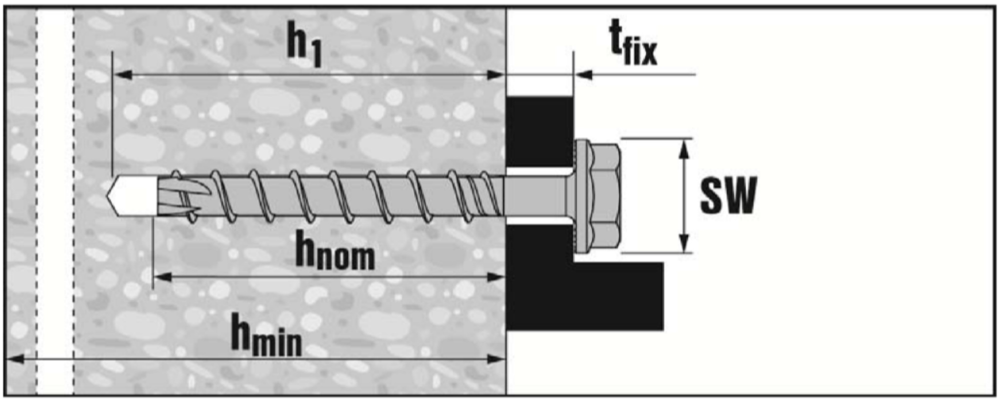
Table B1: Installation parameters

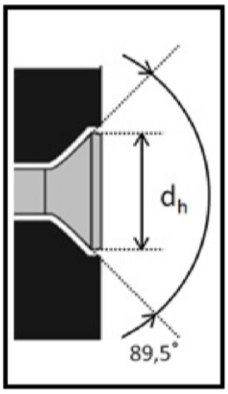
Anchor size HUS3			8			10			14		
			h_{nom1}	h_{nom2}	h_{nom3}	h_{nom1}	h_{nom2}	h_{nom3}	h_{nom1}	h_{nom2}	h_{nom3}
Nominal embedmenth depth	h_{nom}	[mm]	50	60	70	55	75	85	65	85	115
Nominal drill hole diameter	d_0	[mm]	8			10			14		
Cutting diameter of drill bit	$d_{cut} \leq$	[mm]	8,45			10,45			14,50		
Clearance hole diameter	$d_f \leq$	[mm]	12			14			18		
Wrench size (H-type)	SW	[mm]	13			15			21		
Diameter of countersunk head	d_h	[mm]	18			21			-		
Torx size (C-type)	T	-	45			50			-		
Depth of drill hole	$h_1 \geq$	[mm]	60	70	80	65	85	95	75	95	125
Depth of drill hole (with adjustability setting process)	$h_1 \geq$	[mm]	-	80	-	-	95	-	-	-	-
Setting tool[1)]	Strength class	C20/25	Hilti SIW 14 A or Hilti SIW 22 A or Hilti SIW 22 T-A			Hilti SIW 22 A or Hilti SIW 22 T-A			Hilti SIW 22 T-A		
		> C20/25	Hilti SIW 22 T-A								

[1)] Installation with other impact screw driver of equivalente power is possible

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

Anchor size HUS3				8			10			14		
				h_{nom1}	h_{nom2}	h_{nom3}	h_{nom1}	h_{nom2}	h_{nom3}	h_{nom1}	h_{nom2}	h_{nom3}
Nominal embedmenth depth		h_{nom}	[mm]	50	60	70	55	75	85	65	85	115
Minumum thickness of concrete member		h_{min}	[mm]	100	100	120	100	130	140	120	160	200
Cracked and non-cracked concrete	Minimum spacing	s_{min}	[mm]	40	50	50	50	50	60	60	75	75
	Minimum edge distance	c_{min}	[mm]	50	50	50	50	50	60	60	75	75





Hilti Screw anchor HUS3

Intended Use
Installation parameter

Annex B 2

Table B3: Screw length and maximum thickness of fixture for HUS3-H and HUS3-HF1)

Anchor size	8			10			14		
Nominal embedment depth [mm]	h_{nom1} 50	h_{nom2} 60	h_{nom3} 70	h_{nom1} 55	h_{nom2} 75	h_{nom3} 85	h_{nom1} 65	h_{nom2} 85	h_{nom3} 115
Length of screw [mm]	Thickness of fixture [mm]								
	t_{fix1}	t_{fix2}	t_{fix3}	t_{fix1}	t_{fix2}	t_{fix3}	t_{fix1}	t_{fix2}	t_{fix3}
55	5	-	-	-	-	-	-	-	-
60	-	-	-	5	-	-	-	-	-
65	15	5	-	-	-	-	-	-	-
70	-	-	-	15	-	-	-	-	-
75	25	15	5	-	-	-	10	-	-
80	-	-	-	25	5	-	-	-	-
85	35	25	15	-	-	-	-	-	-
90	-	-	-	35	15	5	-	-	-
100	50	40	30	45	25	15	35	15	-
110	-	-	-	55	35	25	-	-	-
120	70	60	50	-	-	-	-	-	-
130	-	-	-	75	55	45	65	45	15
150	100	90	80	95	75	65	85	65	35

1) HUS3-HF available for size 14 with h_1 and h_2 only

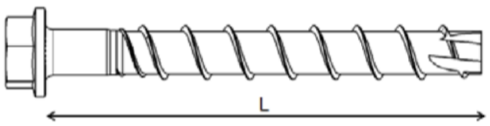
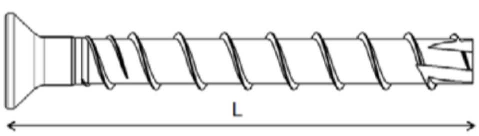


Table B4: Screw length and maximum thickness of fixture for HUS3-C

Anchor size	8			10		
Nominal embedment depth [mm]	h_{nom1} 50	h_{nom2} 60	h_{nom3} 70	h_{nom1} 55	h_{nom2} 75	h_{nom3} 85
Length of screw [mm]	Thickness of fixture [mm]					
	t_{fix1}	t_{fix2}	t_{fix3}	t_{fix1}	t_{fix2}	t_{fix3}
65	15	5	-	-	-	-
70	-	-	-	15	-	-
75	25	15	-	-	-	-
85	35	25	15	-	-	-
90	-	-	-	35	15	-
100	-	-	-	45	25	15

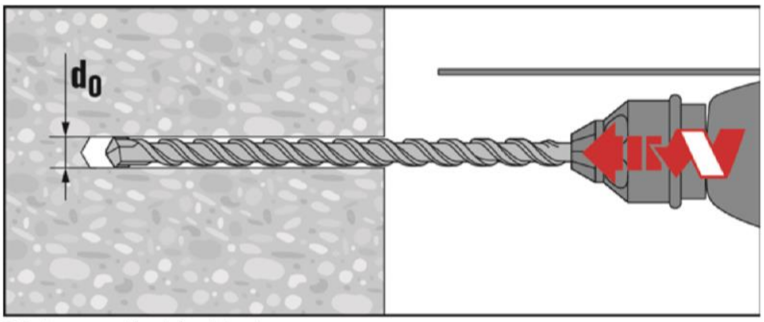


Hilti Screw anchor HUS3

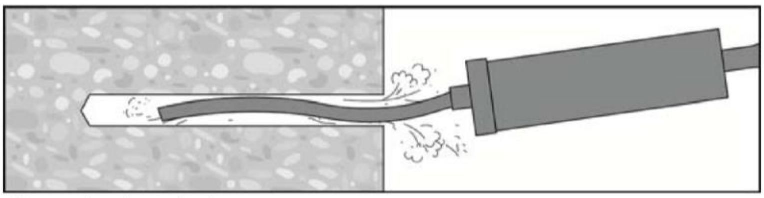
Intended Use
Installation parameters

Annex B 3

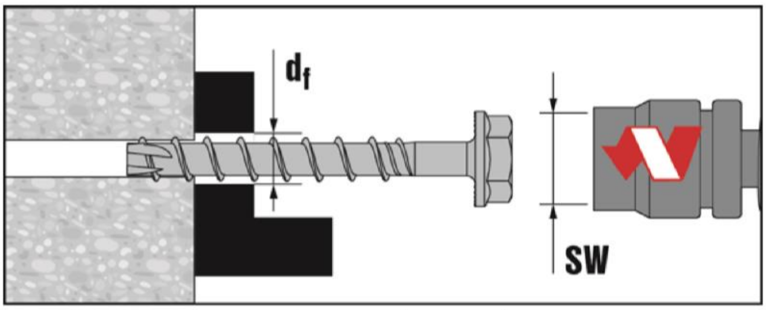
Installation instruction without adjustment

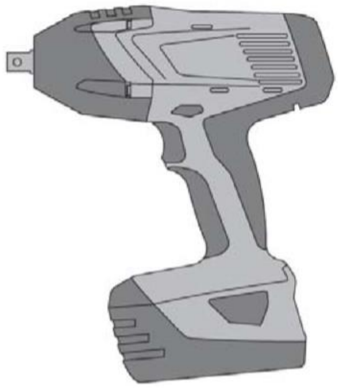


Make a cylindrical hole

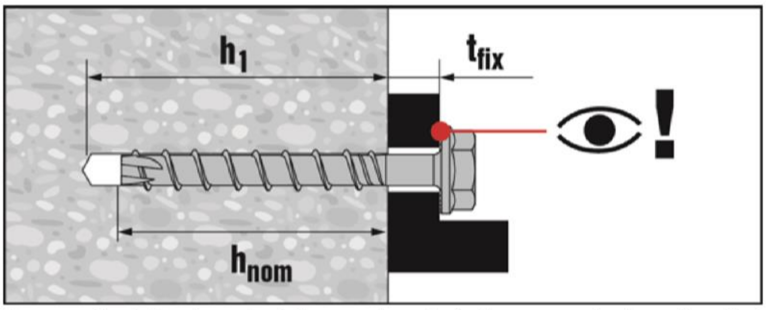


Clean the borehole





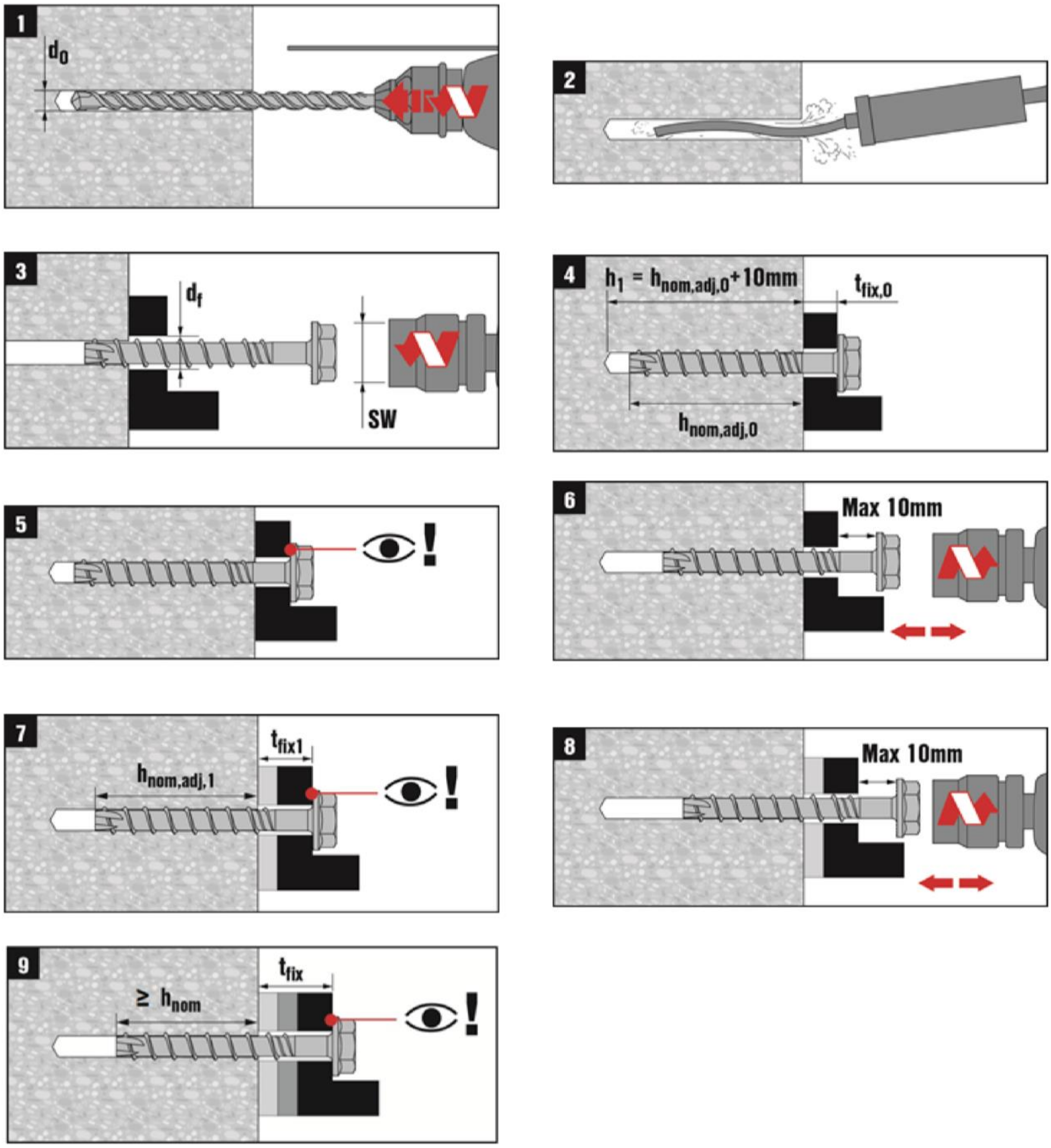
Install the screw anchor by impact screw driver



Ensure that the head of the anchor is fully supported on the fixture and it is not damaged.

Hilti Screw anchor HUS3	Annex B 4
Intended Use Installation Instruction without adjustment	

Installation instruction with adjustment



The anchor can be adjusted maximum two times.
The total allowed thickness of shims added during the adjustment process is 10mm.
The final embedment depth after adjustment process must be larger or equal than h_{nom2}.

Hilti Screw anchor HUS3	Annex B 5
Intended Use Installation instruction with adjustment	

Deutsches Institut für Bautechnik DIBt

Table C1: Product performance for static and quasi-static action

Anchor size HUS3			8			10			14		
			h_{nom1}	h_{nom2}	h_{nom3}	h_{nom1}	h_{nom2}	h_{nom3}	h_{nom1}	h_{nom2}	h_{nom3}
Nominal embedment depth	h_{nom}	[mm]	50	60	70	55	75	85	65	85	115
Adjustment											
Total max. thickness of adjustment layers	t_{adj}	[mm]	-	10	-	-	10	-	-	-	-
Max. number of adjustments	n_a	[-]	-	2	-	-	2	-	-	-	-
Steel failure for tension and shear load											
Characteristic resistance	$N_{Rk,s}$	[kN]	39,2			62,2			96,6		
	$V_{Rk,s}$	[kN]	17			28			45		
	k_2 [2)]	[-]	0,8								
	$M^0_{Rk,s}$	[Nm]	46			92			187		
Pull-out failure											
Characteristic resistance in non-cracked concrete C20/25	$N_{Rk,p}$	[kN]	9	12	16	12	20	1)	1)	1)	1)
Characteristic resistance in cracked concrete C20/25	$N_{Rk,p}$	[kN]	6	9	12	1)	1)	1)	1)	1)	1)
Increasing factor concrete – C30/37	ψ_c	[-]	1,22								
Increasing factor concrete – C40/50	ψ_c	[-]	1,41								
Increasing factor concrete – C50/60	ψ_c	[-]	1,55								
Concrete cone and splitting failure											
Effective embedment depth	h_{ef}	[mm]	40	46,4	54,9	41,6	58,6	67,1	49,3	66,3	91,8
Factor for – Cracked	k_{cr} [2)]	[-]	7,2								
Factor for – Non-cracked	k_{ucr} [2)]	[-]	10,1								
Concrete cone failure – Edge distance	$c_{cr,N}$	[mm]	1,5 h_{ef}								
Concrete cone failure – Spacing	$s_{cr,N}$	[mm]	3 h_{ef}								
Splitting failure – Edge distance	$c_{cr,sp}$	[mm]	60	70	85	65	90	110	85	100	140
Splitting failure – Spacing	$s_{cr,sp}$	[mm]	120	140	170	130	180	220	170	200	280
Installation safety factor	γ_2 [3)] $=\gamma_{inst}$ [2)]	[-]	1,0								
Concrete pry-out failure											
k factor	k [3)] $= k_3$ [2)]	[-]	1,0	2,0		1,0	2,0				
Concrete edge failure											
Effective length of anchor	$l_f = h_{ef}$	[-]	40	46,4	54,9	41,6	58,6	67,1	49,3	66,3	91,8
Outside diameter of anchor	d_{nom}	[mm]	8			10			14		

1) Pull-out failure is not decisive

2) Parameters relevant only for design according to CEN/TS 1992-4:2009

3) Parameter relevant only for design according to ETAG001 Annex C

Hilti Screw anchor HUS3

Product Performance

For static and quasi-static action

Annex C 1

Table C2: Product performance for seismic category C1

Anchor size HUS3			8 h_{nom3}	10 h_{nom3}	14 h_{nom3}
Nominal embedment depth	h_{nom}	[mm]	70	85	115
Steel failure for tension and shear load					
Characteristic resistance	$N_{Rk,s,seis}$	[kN]	39,2	62,2	96,6
	$V_{Rk,s,seis}$	[kN]	11,9	16,8	22,5
Pull-out failure					
Characteristic resistance in cracked concrete	$N_{Rk,p,seis}$	[kN]	12	[1]	[1]
Concrete cone failure					
Effective embedment depth	h_{ef}	[mm]	54,9	67,1	91,8
Concrete cone failure – Edge distance	$c_{cr,N}$	[mm]	1,5 h_{ef}		
Concrete cone failure – Spacing	$s_{cr,N}$	[mm]	3 h_{ef}		
Installation safety factor	γ_2	[-]	1,0		
Concrete pry-out failure					
k factor	k	[-]	2,0		
Concrete edge failure					
Effective length of anchor	$l_f = h_{ef}$	[-]	54,9	67,1	91,8
Outside diameter of anchor	d_{nom}	[mm]	8	10	14

[1] Pull-out failure is not decisive.

Hilti Screw anchor HUS3

Performances
For seismic category C1

Annex C 2

Deutsches Institut für Bautechnik DIBt

Table C3: Product performance for resistance to Fire

Anchor HUS3-H and HUS3-HF				8			10			14		
				h_{nom1}	h_{nom2}	h_{nom3}	h_{nom1}	h_{nom2}	h_{nom3}	h_{nom1}	h_{nom2}	h_{nom3}
Nominal embedment depth		h_{nom}	[mm]	50	60	70	55	75	85	65	85	115
Steel failure for tension and shear load ($F_{Rk,s,fi} = N_{Rk,s,fi} = V_{Rk,s,fi}$)												
Characteristic resistance	R30	$F_{Rk,s,fi}$	[kN]	3,2	3,5	3,8	6,1	6,2		10,4	10,6	
	R60	$F_{Rk,s,fi}$	[kN]	2,4	2,6	2,8	4,6	4,7		7,8	8,1	
	R90	$F_{Rk,s,fi}$	[kN]	1,6	1,6	1,9	3,1	3,2		5,3	5,5	
	R120	$F_{Rk,s,fi}$	[kN]	1,2	1,2	1,5	2,4	2,5		4,0	4,3	
	R30	$M^0_{Rk,s,fi}$	[Nm]	14,6	15,9	17,2	35,2	35,6		78,9	79,8	
	R60	$M^0_{Rk,s,fi}$	[Nm]	11,0	11,7	13,0	26,6	27,1		59,6	60,7	
	R90	$M^0_{Rk,s,fi}$	[Nm]	7,4	7,4	8,8	18,0	18,6		40,2	41,7	
	R120	$M^0_{Rk,s,fi}$	[Nm]	5,7	5,3	6,8	13,7	14,4		30,6	32,1	
Pull-out failure												
Characteristic resistance	R30 R60 R90	$N_{Rk,p,fi}$	[kN]	1,5	2,3	3,0	2,4	4,0	4,9	3,1	4,8	7,8
	R120	$N_{Rk,p,fi}$	[kN]	1,2	1,8	2,4	1,9	3,2	3,9	2,5	3,8	6,3
Concrete cone failure												
Characteristic resistance	R30 R60 R90	$N^0_{Rk,c,fi}$	[kN]	1,8	2,6	4,0	2,0	4,7	6,6	3,0	6,4	14,4
	R120	$N^0_{Rk,c,fi}$	[kN]	1,4	2,1	3,2	1,6	3,8	5,3	2,4	5,1	11,5
Edge distance												
	R30 to R120	$c_{cr,fi}$	[mm]	$2\ h_{ef}$								
In case of fire attack from more than one side, the minimum edge distance shall be ≥ 300 mm.												
Anchor spacing												
	R30 to R120	$s_{cr,fi}$	[mm]	$2\ c_{cr,fi}$								
Concrete pry-out failure												
	R30 to R120	k	[-]	1,0	2,0		1,0	2,0				
The anchorage depth has to be increased for wet concrete by at least 30 mm compared to the given value.												

Hilti Screw anchor HUS3

Performances
For resistance to fire

Annex C 3

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Table C4: Product performance for resistance to Fire

Anchor HUS3-C				8			10		
				h_{nom1}	h_{nom2}	h_{nom3}	h_{nom1}	h_{nom2}	h_{nom3}
Nominal embedment depth		h_{nom}	[mm]	50	60	70	55	75	85
Steel failure for tension and shear load ($F_{Rk,s,fi} = N_{Rk,s,fi} = V_{Rk,s,fi}$)									
Characteristic resistance	R30	$F_{Rk,s,fi}$	[kN]	0,5			1,2		
	R60	$F_{Rk,s,fi}$	[kN]	0,4			1,0		
	R90	$F_{Rk,s,fi}$	[kN]	0,3			0,8		
	R120	$F_{Rk,s,fi}$	[kN]	0,2			0,6		
	R30	$M^0_{Rk,s,fi}$	[Nm]	0,6			1,7		
	R60	$M^0_{Rk,s,fi}$	[Nm]	0,5			1,5		
	R90	$M^0_{Rk,s,fi}$	[Nm]	0,4			1,1		
	R120	$M^0_{Rk,s,fi}$	[Nm]	0,3			0,9		
Pull-out failure									
Characteristic resistance	R30 R60 R90	$N_{Rk,p,fi}$	[kN]	1,5	2,3	3,0	2,4	4,0	5,0
	R120	$N_{Rk,p,fi}$	[kN]	1,2	1,8	2,4	1,9	3,2	4,0
Concrete cone failure									
Characteristic resistance	R30 R60 R90	$N^0_{Rk,c,fi}$	[kN]	1,8	2,6	4,0	2,0	4,7	6,6
	R120	$N^0_{Rk,c,fi}$	[kN]	1,5	2,1	3,2	1,6	3,8	5,3
Edge distance									
	R30 to R120	$c_{cr,fi}$	[mm]	$2\ h_{ef}$					
In case of fire attack from more than one side, the minimum edge distance shall be ≥ 300 mm.									
Anchor spacing									
	R30 to R120	$s_{cr,fi}$	[mm]	$2\ c_{cr,fi}$					
Concrete pry-out failure									
	R30 to R120	k	[-]	1,0	2,0		1,0	2,0	
The anchorage depth has to be increased for wet concrete by at least 30 mm compared to the given value.									

Hilti Screw anchor HUS3

Performances
For resistance to fire

Annex C 4

Table C5: Displacements under tension load

Anchor size HUS3				8			10			14		
				h_{nom1}	h_{nom2}	h_{nom3}	h_{nom1}	h_{nom2}	h_{nom3}	h_{nom1}	h_{nom2}	h_{nom3}
Nominal embedment depth		h_{nom}	[mm]	50	60	70	55	75	85	65	85	115
Cracked concrete C20/25 to C50/60	Tension Load	N	[kN]	4,3	5,7	7,6	5,7	9,5	13,2	8,3	13,0	21,2
	Displacement	δ_{N0}	[mm]	0,3	0,4	0,3	0,4	0,4	0,4	0,6	0,5	0,5
		$\delta_{N\infty}$	[mm]	0,7	0,7	0,6	0,4	0,4	0,5	0,9	1,2	1,0
		$\delta_{N,seis}$	[mm]	-	-	0,6	-	-	0,9	-	-	1,3
Non-cracked concrete C20/25 to C50/60	Tension Load	N	[kN]	6,6	8,9	11,8	8,7	14,8	20,5	12,9	20,1	32,8
	Displacement	δ_{N0}	[mm]	0,1	0,2	0,1	0,1	0,1	0,1	0,1	0,2	0,3
		$\delta_{N\infty}$	[mm]	0,3			0,2			0,5		

Table C6: Displacements under shear load

Anchor size HUS3				8			10			14		
				h_{nom1}	h_{nom2}	h_{nom3}	h_{nom1}	h_{nom2}	h_{nom3}	h_{nom1}	h_{nom2}	h_{nom3}
Nominal embedment depth		h_{nom}	[mm]	50	60	70	55	75	85	65	85	115
Cracked or non-cracked concrete C20/25 to C50/60	Shear Load	V	[kN]	8,1			13,3			21,4		
	Displacement	δ_{V0}	[mm]	2,5	3,4	2,9	3,8	3,7	3,2	3,6	3,2	2,4
		$\delta_{V\infty}$	[mm]	3,7	5,1	4,4	5,7	5,5	4,9	5,4	6,9	3,5
		$\delta_{V,seis}$	[mm]	-	-	5,3	-	-	4,3	-	-	5,5