Deutsches Institut für Bautechnik

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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-15/0259 of 8 June 2017

English translation prepared by DIBt - Original version in German language

General Part

Technical Assessment Body issuing the European Technical Assessment:	Deutsches Institut für Bautechnik
Trade name of the construction product	Hilti ETICS anchors D8-FV H and HTH
Product family to which the construction product belongs	Screwed-in plastic anchor for fixing of external thermal insulation composite systems with rendering in concrete and masonry
Manufacturer	HILTI Corporation Feldkircherstraße 100 9494 SCHAAN FÜRSTENTUM LIECHTENSTEIN
Manufacturing plant	Hilti Werke Hilti manufacturing plant
This European Technical Assessment contains	17 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	European Assessment Document (EAD) 330335-00-0604
This version replaces	ETA-15/0259 issued on 21 July 2015

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Specific Part

1 Technical description of the product

The Hilti ETICS screwed-in anchors D8-FV H and HTH with a helix consist of a plastic part made of polypropylene and an accompanying specific screw of galvanised steel.

The description of the product 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 verification 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 25 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
Characteristic resistance	See Annex C 1
Edge distances and spacing	See Annex B 3
Displacements	See Annex C 2

3.2 Energy economy and heat retention (BWR 6)

Essential characteristic	Performance
Point thermal transmittance	See Annex C 2

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

In accordance with EAD No. 330335-00-0604, the applicable European legal act is: [97/463/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 EAD

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 8 June 2017 by Deutsches Institut für Bautechnik

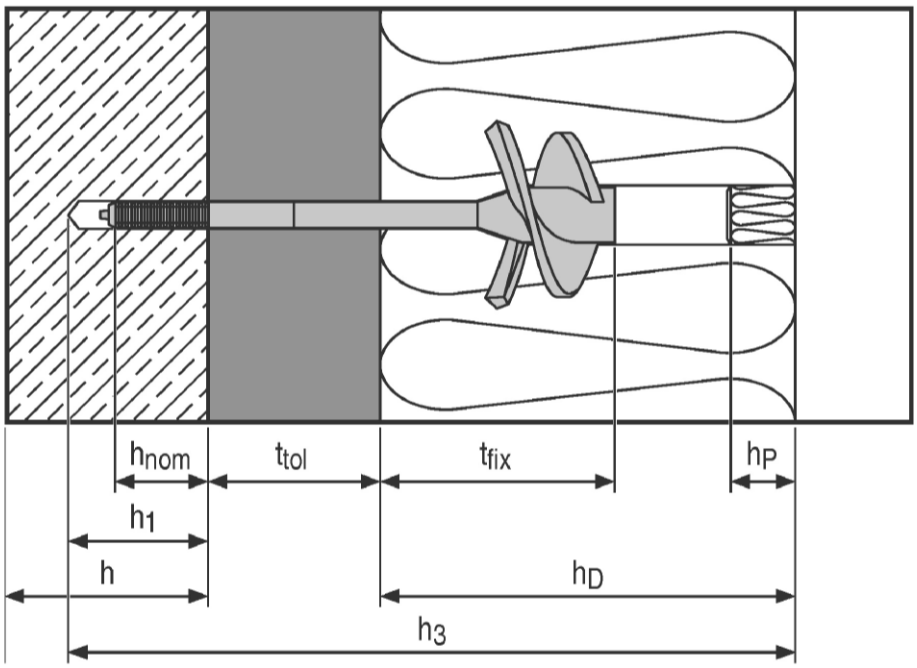
BD Dipl.-Ing. Andreas Kummerow
Head of Department

beglaubigt:
Ziegler

Deutsches Institut für Bautechnik DIBt

Hilti ETICS anchor D8-FV H

Intended use: **Fixing of external thermal insulation composite systems in concrete, masonry, lightweight aggregate concrete and autoclaved aerated concrete**



Legend:

h = thickness of member (wall)
h_1 = depth of drilled hole in base material to deepest point
h_3 = total length of borehole from insulation material surface to deepest point
h_{nom} = overall plastic anchor embedment depth in the base material
h_D = thickness of insulation material
h_P = thickness of plug
t_{fix} = thickness of fixture
t_{tol} = thickness of equalizing layer for compensation of tolerances or non-loadbearing layer

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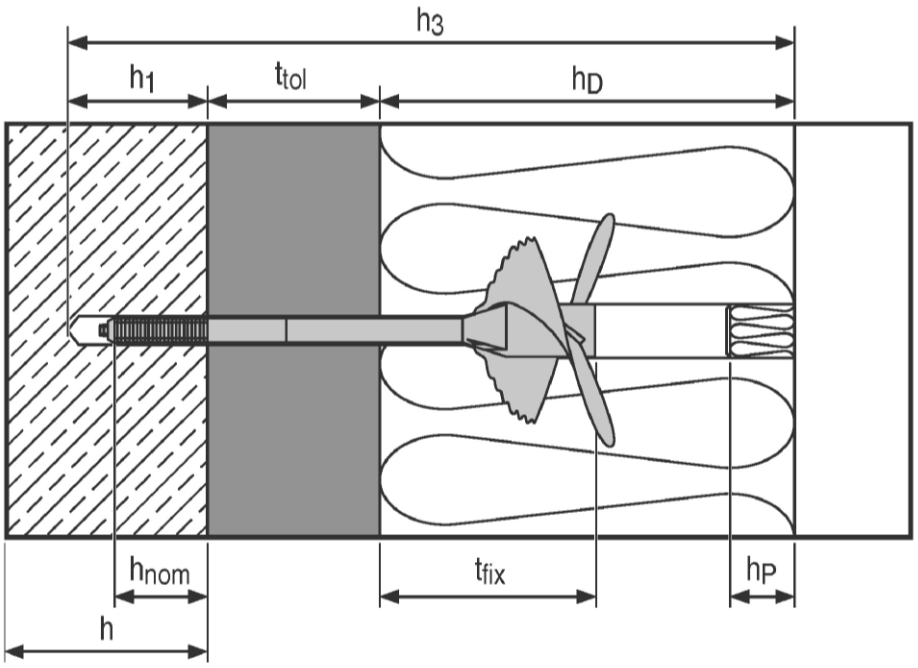
Hilti ETICS anchor HTH

Intended use: **Fixing of external thermal insulation composite systems in concrete, masonry, lightweight aggregate concrete and autoclaved aerated concrete**



Legend:

- h = thickness of member (wall)
- h_1 = depth of drilled hole to deepest point
- h_3 = total length of borehole from insulation material surface to deepest point
- h_{nom} = overall plastic anchor embedment depth in the base material
- h_D = thickness of insulation material
- h_P = thickness of plug
- t_{fix} = thickness of fixture
- t_{tol} = thickness of equalizing layer for compensation of tolerances or non-loadbearing layer

Hilti ETICS anchors D8-FV H and HTH	Annex A 2
Product description Installed condition HTH	

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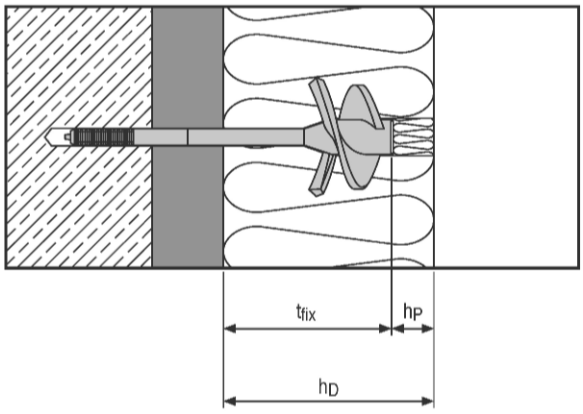
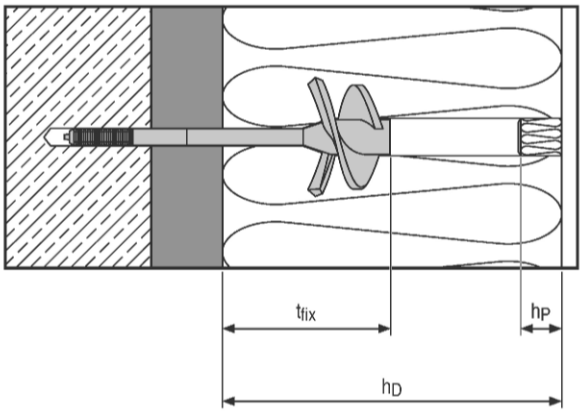
Use in different insulation material thickness

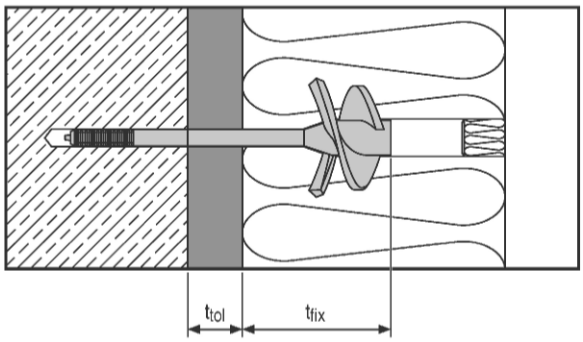
Minimum thickness

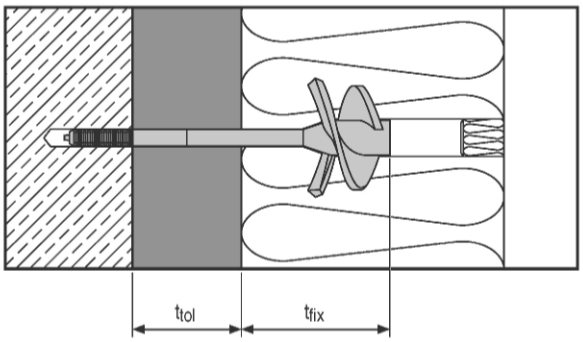


Maximum thickness



Use in different thickness of equalizing or non-loadbearing layer





Legend:

h_D = thickness of insulation material
h_P = thickness of plug
t_{fix} = thickness of fixture
t_{tol} = thickness of equalizing layer for compensation of tolerances or non-loadbearing layer

Hilti ETICS anchors D8-FV H and HTH	**Annex A 3**
Product description Different installed conditions	

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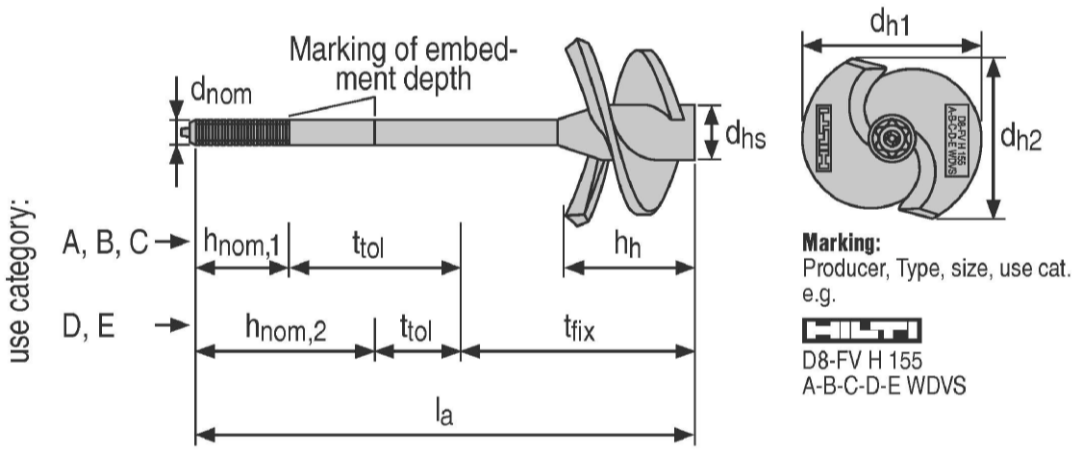
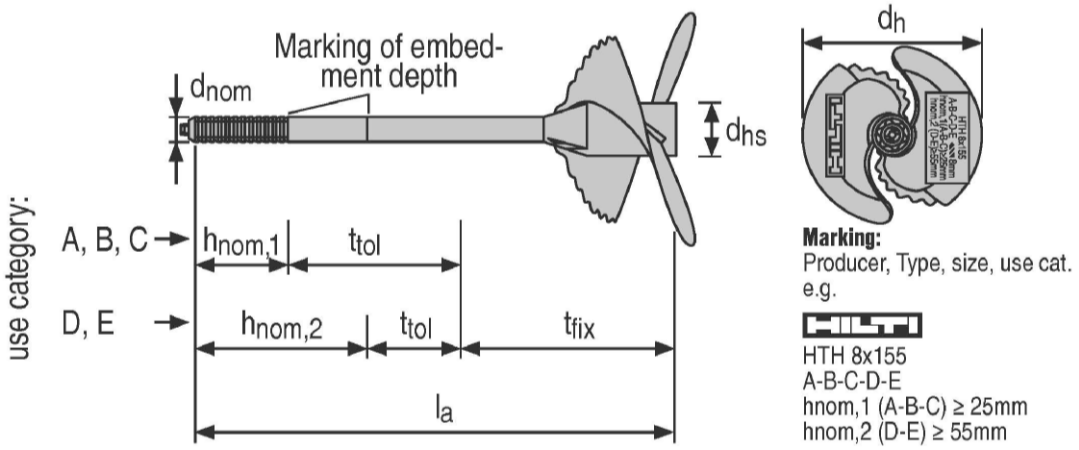
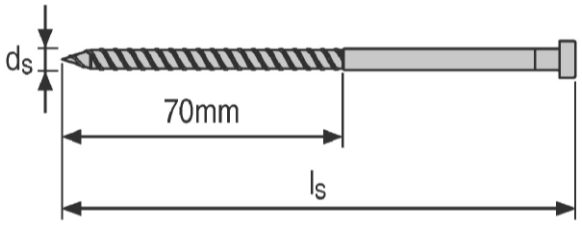
Anchor sleeve D8-FV H



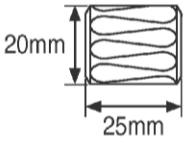
Anchor sleeve HTH



Screw for D8-FV H, HTH



Plug for D8-FV H, HTH



Note: PU-Foam with specifications according to Table A5 can be used alternatively

Hilti ETICS anchors D8-FV H and HTH	
Product description Dimensions and marking of the anchor sleeve D8-FV H and HTH expansion element, plug	**Annex A 4**

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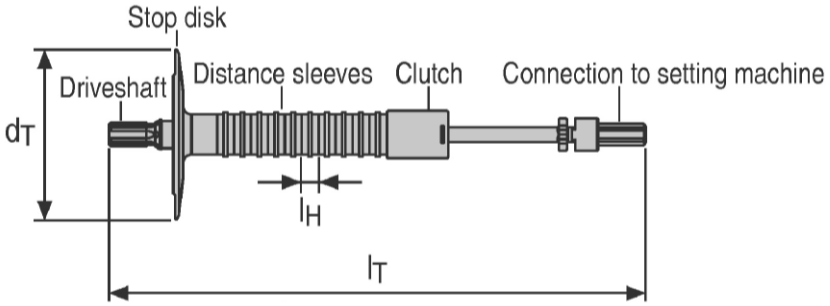
Setting tools

Setting tool D8-SW 1 or setting tool D8-SW 2 suitable for D8-FV H and HTH



Setting tool HTH-SW 1 or setting tool HTH-SW 2 suitable for D8-FV H and HTH

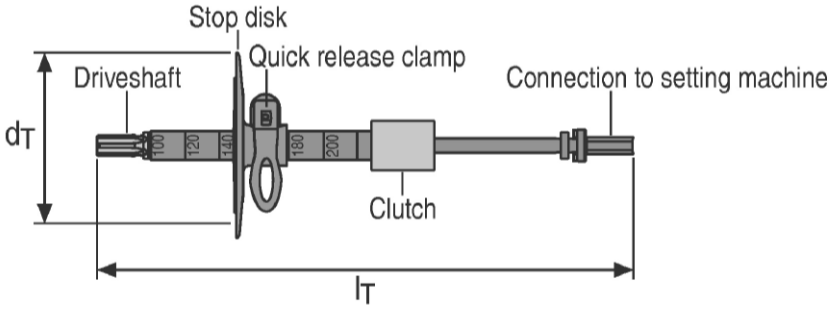


Table A1 Dimensions for setting tool types D8-SW 1 and D8-SW 2

Setting tool type		D8-SW 1	D8-SW 2
Diameter of disk	d_T [mm]	100	
Length of the tool	ℓ_T [mm]	310	477
Length of distance sleeve (insulation thickness increment)	ℓ_H [mm]	10	
Applicable insulation thickness	$h_{D,min}$ [mm]	100[1)]	200
	$h_{D,max}$ [mm]	200	360

1) This value applies for t_{fix} = 80 mm (for t_{fix} = 110 mm: $h_{D,min}$ = 130 mm).

Table A2 Dimensions for setting tool types HTH-SW 1 and HTH-SW 2

Setting tool type		HTH-SW 1	HTH-SW 2
Diameter of disk	d_T [mm]	100	
Length of the tool	ℓ_T [mm]	310	477
Applicable insulation thickness	$h_{D,min}$ [mm]	100[1)]	200
	increment [mm]	10	
	$h_{D,max}$ [mm]	200	360

1) This value applies for t_{fix} = 80 mm (for t_{fix} = 110 mm: $h_{D,min}$ = 130 mm).

Hilti ETICS anchors D8-FV H and HTH

Product description
Setting tools

Annex A 5

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Table A3 Anchor types and dimensions of D8-FV H

Anchor type			D8-FV H 125	D8-FV H 155	D8-FV H 215
Plastic sleeve	Sleeve diameter	d_{nom} [mm]	8		
	Length of sleeve	ℓ_a [mm]	125	155	215
	Height of helix	h_h [mm]	40		
	Diameter of helix centre	d_{hs} [mm]	17		
	Diameter 1 of helix	d_{h1} [mm]	65		
	Diameter 2 of helix	d_{h2} [mm]	58		
Special screw	Screw diameter	d_s [mm]	5,35		
	Length of screw	ℓ_s [mm]	94	124	184

Table A4 Anchor types and dimensions of HTH

Anchor type			HTH 8x125	HTH 8x155	HTH 8x215
Plastic sleeve	Sleeve diameter	d_{nom} [mm]	8		
	Length of sleeve	ℓ_a [mm]	125	155	215
	Diameter of helix centre	d_{hs} [mm]	17		
	Diameter of helix	d_h [mm]	75		
Special screw	Screw diameter	d_s [mm]	5,35		
	Length of screw	ℓ_s [mm]	94	124	184

Table A5 Materials of D8-FV H and HTH

Element	Material
Anchor sleeve	Polypropylene, colour: black
Screw	Steel, galvanised ≥ 5 µm, f_{yk} = 480 N/mm², f_{uk} = 600 N/mm²
Plug	EPS or mineral wool
PU-Foam	Polyurethane, thermal conductivity ≤ 0,045 W/(mK) Remark: use of foam only in accordance with ETICS system suppliers

Hilti ETICS anchors D8-FV H and HTH

Product description
Dimensions and Materials

Annex A 6

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Specifications of intended use

Anchorages subject to:

- The anchor may only be used for transmission of wind suction loads and shall not be used for the transmission of dead loads of the thermal insulation composite system.

Base materials:

- Normal weight concrete (use category A) according to Annex C 1
- Solid masonry (use category B), according to Annex C 1
- Hollow or perforated masonry (use category C), according to Annex C 1
- Lightweight aggregate concrete (use category D), according to Annex C 1
- Autoclaved aerated concrete (use category E), according to Annex C 1
- For other base materials of the use categories A, B, C, D or E the characteristic resistance of the anchor may be determined by job site tests according to EOTA Technical Report TR 051 edition December 2016.

Temperature Range:

- 0°C to +40°C (max. short term temperature +40°C and max. long term temperature +24°C)

Design:

- The anchorages are designed under the responsibility of an engineer experienced in anchorages and masonry work with the partial safety factors γ_M = 2,0 and γ_F = 1,5, if there are no other national regulations.
- 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.
- Fasteners are only to be used for multiple fixings of thermal insulation composite systems.

Installation:

- Hole drilling by the drill modes according to Annex C 1
- Anchor installation carried out by appropriately qualified personnel and under the supervision of the person responsible for technical matters of the site
- Installation temperature from 0°C to +40°C
- Exposure to UV due to solar radiation of the anchor not protected by rendering ≤ 6 weeks

Hilti ETICS anchors D8-FV H and HTH	**Annex B 1**
Intended use Specifications	

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Table B1 Installation parameters for use in concrete and solid masonry (use category A, B)

Anchor type			D8-FV H 125 HTH 8x125	D8-FV H 155 HTH 8x155	D8-FV H 215 HTH 8x215	
Drill hole diameter	d_0 =	[mm]	8			
Cutting diameter of drill bit	d_{cut} ≤	[mm]	8,45			
Minimum depth of drilled hole to deepest point	h_1 ≥	[mm]	45			
Overall plastic anchor embedment depth in the base material	$h_{nom,1}$ ≥	[mm]	25			
Thickness of fixture	t_{fix} =	[mm]	80	80	80	110
Thickness of equalizing layer for compensation of tolerances or non-loadbearing layer	$t_{tol,min}$ =	[mm]	0	0	50	20
	$t_{tol,max}$ =	[mm]	20	50	110[1)]	80[1)]
Total length of borehole	h_3 ≥	[mm]	h_D+65	h_D+95	h_D+155	h_D+125

[1)] If $t_{tol,max}$ exceeds 50 mm it has to be ensured that the material t_{tol} has enough capability to carry the dead load of the ETICS. This can be considered as given if t_{tol} consists of plaster, old insulation or shells of jacket blocks.

Table B2 Installation parameters for use in thin concrete members (e.g. weather resistant skin of external wall panels) and hollow masonry (use category C)

Anchor type			D8-FV H 125 HTH 8x125	D8-FV H 155 HTH 8x155	D8-FV H 215 HTH 8x215	
Drill hole diameter	d_0 =	[mm]	8			
Cutting diameter of drill bit	d_{cut} ≤	[mm]	8,45			
Minimum depth of drilled hole to deepest point	h_1 ≥	[mm]	45			
Overall plastic anchor embedment depth in the base material	$h_{nom,1}$ ≥	[mm]	25			
Thickness of fixture	t_{fix} =	[mm]	80	80	80	110
Thickness of equalizing layer for compensation of tolerances or non-loadbearing layer	$t_{tol,min}$ =	[mm]	0	20[1)]	80[1)]	50[1)]
	$t_{tol,max}$ =	[mm]	20	50	110[2)]	80[2)]
Total length of borehole	h_3 ≥	[mm]	h_D+65	h_D+95	h_D+155	h_D+125

[1)] $t_{tol,\ min}$ may be lower if the anchor performance is tested on site.

[2)] If $t_{tol,max}$ exceeds 50 mm it has to be ensured that the material t_{tol} has enough capability to carry the dead load of the ETICS. This can be considered as given if t_{tol} consists of plaster, old insulation or shells of jacket blocks.

Hilti ETICS anchors D8-FV H and HTH

Intended use
Installation parameters – use categories A, B, C

Annex B 2

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Table B3 Installation parameters for use in lightweight aggregate concrete and autoclaved aerated concrete (use category D, E)

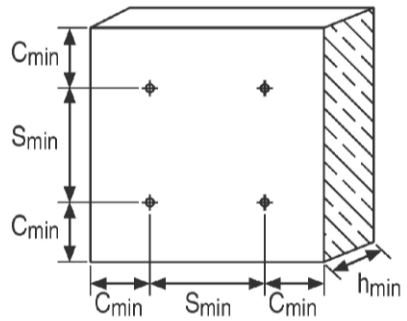
Anchor type			D8-FV H 125 HTH 8x125	D8-FV H 155 HTH 8x155	D8-FV H 215 HTH 8x215	
Drill hole diameter	d_0 =	[mm]	-	8		
Cutting diameter of drill bit	d_{cut} ≤	[mm]		8,45		
Minimum depth of drilled hole to deepest point	h_1 ≥	[mm]		75		
Overall plastic anchor embedment depth in the base material	$h_{nom,2}$ ≥	[mm]		55		
Thickness of fixture	t_{fix} =	[mm]		80	80	110
Thickness of equalizing layer for compensation of tolerances or non-loadbearing layer	$t_{tol,min}$ =	[mm]		0	0	0
	$t_{tol,max}$ =	[mm]		20	80[1)]	50
Total length of borehole	h_3 ≥	[mm]		h_D+95	h_D+155	h_D+125

[1)] If $t_{tol,max}$ exceeds 50 mm it has to be ensured that the material t_{tol} has enough capability to carry the dead load of the ETICS. This can be considered as given if t_{tol} consists of plaster, old insulation or shells of jacket blocks.

Table B4 Minimum thickness of base material, edge distance and anchor spacing

				D8-FV H HTH
Minimum thickness of the base material	concrete, masonry, lightweight aggregate concrete and autoclaved aerated concrete	h_{min}	[mm]	100
	thin concrete members (e.g. weather resistant skin of external wall panels)	h_{min}	[mm]	40
Minimum allowable spacing		s_{min}	[mm]	100
Minimum allowable edge distance		c_{min}	[mm]	100

Scheme of minimum thickness of base material, edge distances and anchor spacings



Hilti ETICS anchors D8-FV H and HTH

Intended use
Installation parameters – use categories D, E
Minimum thickness of base material, distances and spacings

Annex B 3

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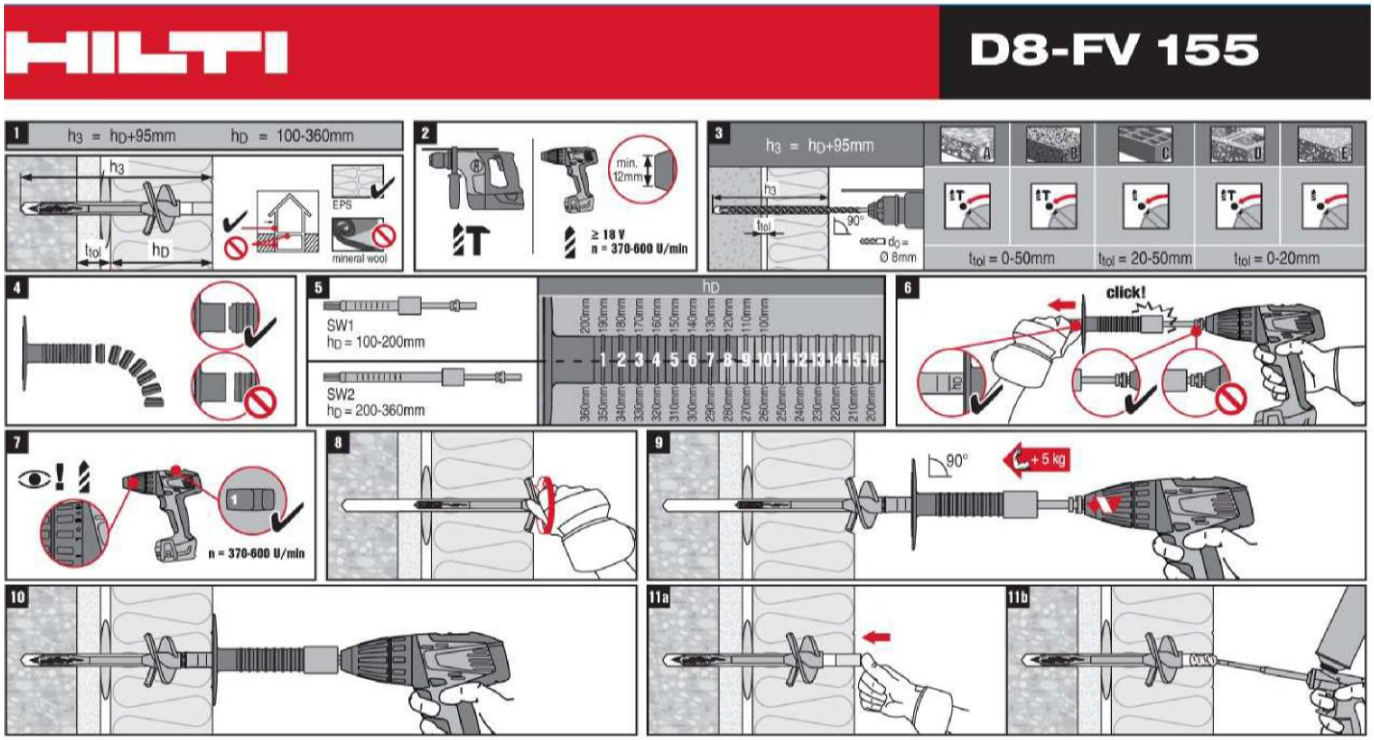
Installation instructions of D8-FV H

Example given for anchor size D8-FV H 155



Hilti ETICS anchors D8-FV H and HTH	**Annex B 4**
Intended use Installation instructions for D8-FV H	

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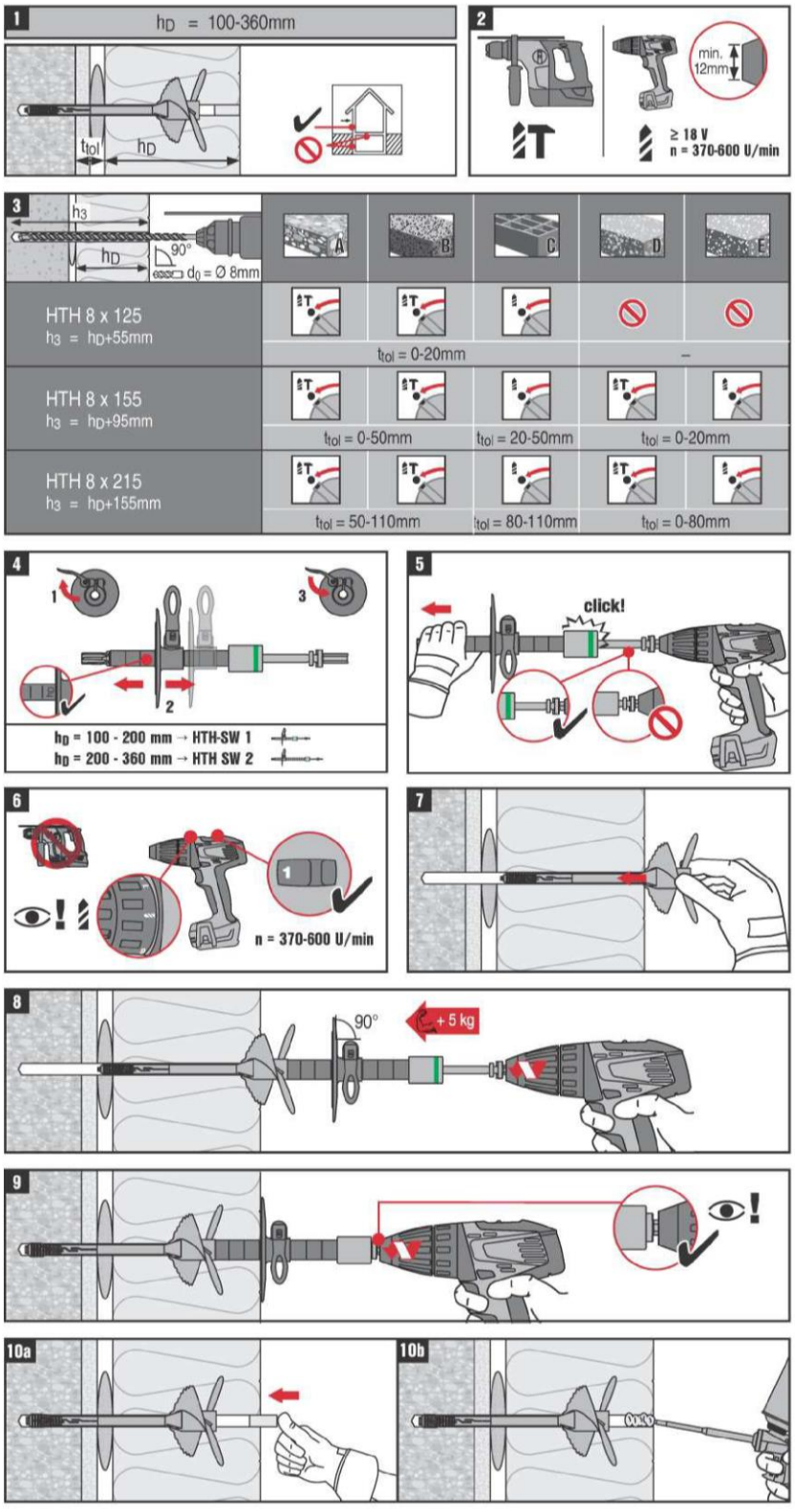
Installation instructions of HTH



Hilti ETICS anchors D8-FV H and HTH

Intended use
Installation instructions for HTH

Annex B 5

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Table C1 Characteristic resistance to tension loads N_{Rk} in concrete, masonry, lightweight aggregate concrete and autoclaved aerated concrete for single anchor

Base material	Use cat. [4]	Bulk density class ρ [kg/dm³]	Compressive strength class f_b [N/mm²]	Remarks	Drill method	N_{Rk} [kN]
Concrete C12/15 – C50/60 EN 206-1:2000	A	-	-	-	hammer	1,2
Thin concrete members (e.g. weather resistant skins of external wall panels) C16/20 – C50/60, EN 206-1:2000	A	-	-	Thickness of the thin skin h ≥ 40mm	hammer	1,2
Clay brick, Mz e.g. according to DIN 105-100:2012-01 / EN 771-1:2011	B	2,0	20	Cross section reduced up to 15% by perforation vertically to the resting area	hammer	1,2
Sand-lime solid brick, KS e.g. according to DIN V 106:2005-10 / EN 771-2:2011	B	2,0	20	Cross section reduced up to 15% by perforation vertically to the resting area	hammer	1,2
Vertically perforated clay brick, Hlz, e.g. according to DIN 105-100:2012-01 / EN 771-1:2011	C	1,2	12	Cross section reduced > 15% and ≤ 50% by perforation vertically to the resting area [1]	rotary	1,2
Vertically perforated clay brick, Hlz, e.g. according to DIN 105-100:2012-01 / EN 771-1:2011	C	0,8	12	Cross section reduced > 15% and ≤ 50% by perforation vertically to the resting area [2], net density ≥1,5 kg/dm³	rotary	0,6
Vertically perforated sand-lime brick, KSL e.g. according to DIN V 106:2005-10 / EN 771-2:2011	C	1,4	12	Cross section reduced > 15% and ≤ 50% by perforation vertically to the resting area [3]	rotary	1,2
Lightweight aggregate concrete, LAC, e.g. according to EN 1520:2011 / EN 771-3:2011	D	0,9	2 4	-	hammer	0,6 1,2
Autoclaved aerated concrete, AAC, e.g. according to EN 771-4:2011	E	0,5	4	-	rotary	0,9

[1] The value applies only for outer web thickness ≥ 12 mm
[2] The value applies only for outer web thickness ≥ 9 mm
[3] The value applies only for outer web thickness ≥ 23 mm
} Otherwise the characteristic resistance shall be determined by job-site pull-out tests

[4] Different installation parameters for use categories A, B, C and use categories D, E and thin concrete members to be considered (see Annex B 2 and B 3)

Hilti ETICS anchors D8-FV H and HTH

Performance
Characteristic resistance

Annex C 1

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Table C2 Point thermal transmittance acc. EOTA Technical Report TR 025:2007-06

Anchor type		Insulation thickness h_D [mm]	Point thermal transmittance χ [W/K]	
			Hole filled with EPS plug	Hole filled with PUR spray foam
D8-FV H 125 D8-FV H 155 D8-FV H 215	t_{fix}=80mm	$100 \le h_D \le 150$	0,001	0,001
		$150 < h_D \le 360$	0,001	0,000
D8-FV H 155 D8-FV H 215	t_{fix}=110mm	$130 \le h_D \le 150$	0,002	0,002
		$150 < h_D \le 360$	0,001	0,001
HTH 125 HTH 155 HTH 215	t_{fix}=80mm	$100 \le h_D \le 150$	0,001	0,001
		$150 < h_D \le 360$	0,000	0,000
HTH 155 HTH 215	t_{fix}=110mm	$130 \le h_D \le 150$	0,001	0,001
		$150 < h_D \le 360$	0,001	0,001
HTH 215	t_{fix}=140mm	$160 \le h_D \le 360$	0,002	0,002

Table C3 Displacements

Base material	**Bulk density class** ρ [kg/dm³]	**Compressive strength class** f_b [N/mm²]	**Tension load** N [kN]	δ_m(N) [mm]
Concrete, C12/15 – C50/60 (EN 206-1:2000)	-	-	0,40	< 0,6
Thin concrete members, C16/20 – C50/60 (EN 206-1:2000)	-	-	0,40	< 0,5
Clay brick, Mz (DIN 105-100:2012-01 / EN 771-1:2011)	2,0	20	0,40	< 0,5
Sand-lime solid brick, KS (DIN V 106:2005-10 / EN 771-2:2011)	2,0	20	0,40	< 0,5
Vertically perforated clay brick, HLz (DIN 105-100:2012-01 / EN 771-1:2011)	1,2	12	0,40	< 0,5
Vertically perforated clay brick, HLz net density ≥1,5 kg/dm³ (DIN 105-100:2012-01 / EN 771-1:2011)	0,8	12	0,20	< 0,2
Vertically perforated sand-lime brick, KSL (DIN V 106:2005-10 / EN 771-2:2011)	1,4	12	0,40	< 0,5
Lightweight aggregate concrete, LAC (EN 1520:2011 / EN 771-3:2011)	0,9	2 4	0,20 0,40	< 0,5 < 0,5
Autoclaved aerated concrete, AAC (EN 771-4:2011)	0,5	4	0,30	< 0,7

Hilti ETICS anchors D8-FV H and HTH

Performance
Point thermal transmittance and displacements

Annex C 2