Deutsches Institut für Bautechnik

Public-law institution jointly founded by the federal states and the Federation

European Technical Assessment Body for construction products

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

European Technical Assessment ETA-20/0867 of 22 December 2025

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 HUS4
Product family to which the construction product belongs	Mechanical fasteners for use in concrete
Manufacturer	Hilti AG Feldkircherstraße 100 9494 Schaan FÜRSTENTUM LIECHTENSTEIN
Manufacturing plant	Hilti Plants
This European Technical Assessment contains	50 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 330232-02-0601
This version replaces	ETA-20/0867 issued on 13 June 2025

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Specific Part

1 Technical description of the product

The Hilti screw anchor HUS4 is an anchor in size 8, 10, 12, 14 and 16 mm made of galvanized and stainless steel. 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.

Product and product description are given in Annex A.

2 Specification of the intended use in accordance with the applicable European Assessment Document

The performances given in Section 3 are only valid if the anchor is used in compliance with the specifications and conditions given in Annex B.

The verifications and assessment methods on which this European Technical Assessment is based lead to the assumption of a working life of the anchor of at least 50 years. The indications given on the working life cannot be interpreted as a guarantee given by the producer, but are to be regarded only as a means for choosing the right products in relation to the expected economically reasonable working life of the works.

3 Performance of the product and references to the methods used for its assessment

3.1 Mechanical resistance and stability (BWR 1)

Essential characteristic	Performance
Characteristic resistance to tension load (static and quasi-static loading)	See Annex B5 to B9, Annex C1, C3, C5 and C7
Characteristic resistance to shear load (static and quasi-static loading)	See Annex C2, C4, C6 and C7
Displacements (static and quasi-static loading)	See Annex C21 to C23
Stiffness	No performance assessed
Characteristic resistance and displacements for seismic performance categories C1 and C2	See Annex C8 to C13 and C24

3.2 Safety in case of fire (BWR 2)

Essential characteristic	Performance
Reaction to fire	Class A1
Resistance to fire	See Annex C14 to C20

3.3 Aspects of durability linked with the Basic Works Requirements

Essential characteristic	Performance
Durability	See Annex B1

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. 330232-02-0601 the applicable European legal act is: [96/582/EC].

The system to be applied is: 1

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 at Deutsches Institut für Bautechnik.

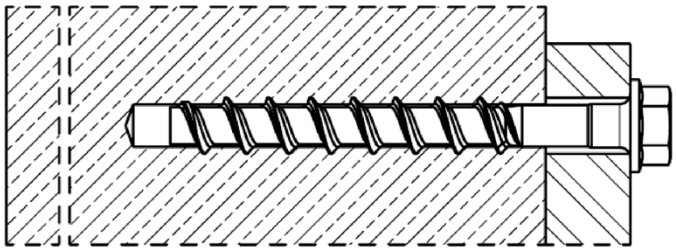
Issued in Berlin on 22 December 2025 by Deutsches Institut für Bautechnik

Dipl.-Ing. Beatrix Wittstock
Head of Section

beglaubigt:
Tempel

Deutsches Institut für Bautechnik DIBt

Installed condition without adjustment



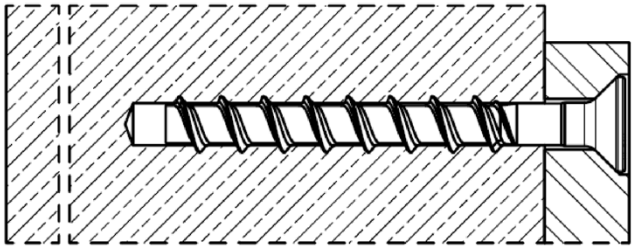
HUS4-H (hexagon head configuration sizes 8, 10, 12, 14 and 16)

HUS4 T-H (hexagon head configuration sizes 8 and 10)

HUS4-HF (hexagon head configuration sizes 8, 10, 12, 14 and 16)

HUS4 T-HF (hexagon head configuration sizes 8 and 10)

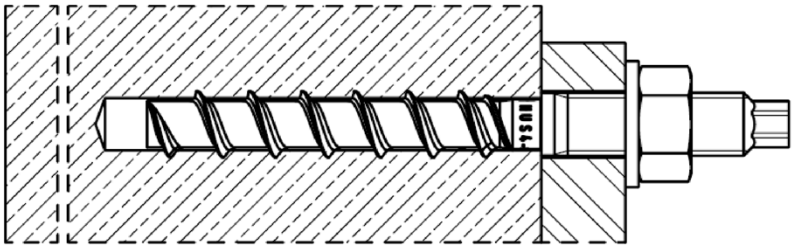
HUS4-HR (hexagon head configuration sizes 6, 8, 10 and 14)



HUS4-C (countersunk head configuration sizes 8 and 10)

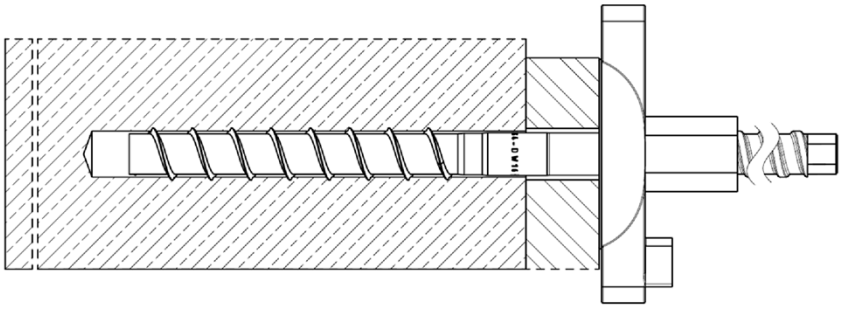
HUS4 T-C (countersunk head configuration sizes 8 and 10)

HUS4-CR (countersunk head configuration size 6, 8 and 10)



HUS4-A
(threaded rod connection
sizes 10 with M12 and 14 with M16)

HUS4-AF
(threaded rod connection
sizes 10 with M12 and 14 with M16)



HUS4-DW
(trapezoidal threaded rod connection,
size 16)

Hilti screw anchor HUS4	
Product description Installed condition without adjustment	**Annex A1**

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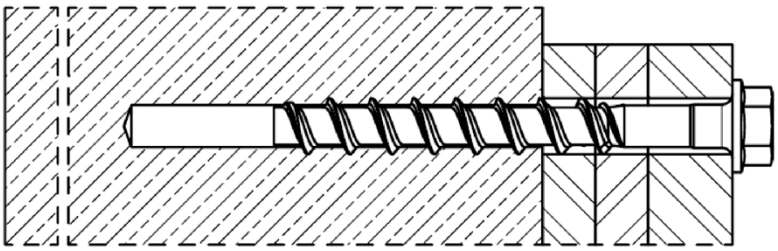
Installed condition with adjustment

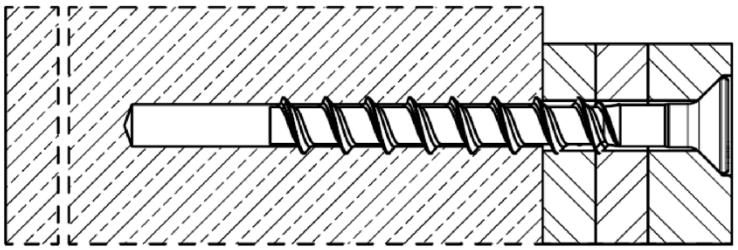


HUS4-H (hexagon head configuration sizes 8, 10, 12, 14 and 16 G02)

HUS4 T-H (hexagon head configuration sizes 8 and 10)

HUS4-HF (hexagon head configuration sizes 8, 10, 12, 14 and 16 G02)

HUS4 T-HF (hexagon head configuration sizes 8 and 10)



HUS4-C (countersunk head configuration sizes 8 and 10)

HUS4 T-C (countersunk head configuration sizes 8 and 10)

Hilti screw anchor HUS4	**Annex A2**
Product description Installed condition with adjustment	

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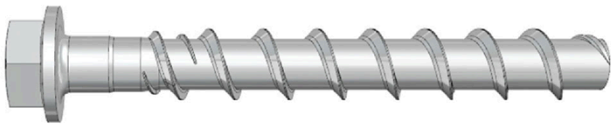
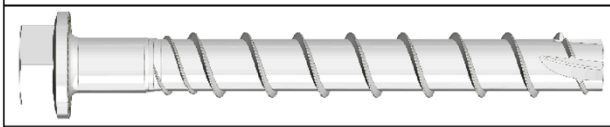
Table A1: Screw types

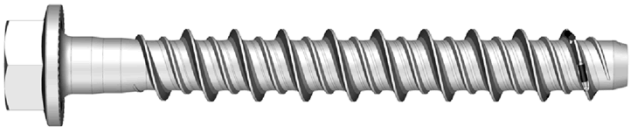
Hilti HUS4-H, sizes 8,10, 12, 14 and 16, hexagonal head configuration, carbon steel galvanized
Hilti HUS4-HF, sizes 8,10, 12, 14 and 16, hexagonal head configuration, carbon steel multilayer coating



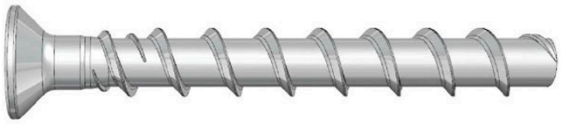
Hilti HUS4 T-H, sizes 8 and 10 hexagonal head configuration, carbon steel galvanized
Hilti HUS4 T-HF, sizes 8 and 10, hexagonal head configuration, carbon steel multilayer coating



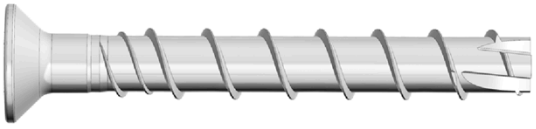
Hilti HUS4-HR, sizes 6, 8, 10 and 14 hexagonal head configuration, stainless steel



Hilti HUS4-C, sizes 8 and 10, countersunk head configuration, carbon steel galvanized



Hilti HUS4 T-C, sizes 8 and 10, countersunk head configuration, carbon steel galvanized



Hilti HUS4-CR, sizes 6, 8 and 10 countersunk head configuration, stainless steel

Hilti HUS4-A, size 10 with external thread M12 and size 14 with external thread M16, carbon steel galvanized
Hilti HUS4-AF, size 10 with external thread M12 and size 14 with external thread M16, carbon steel multilayer coating

Hilti HUS4-DW, size 16 with external trapeziodial thread, carbon steel galvanized

Hilti screw anchor HUS4	**Annex A3**
Product description HUS4 screw types	

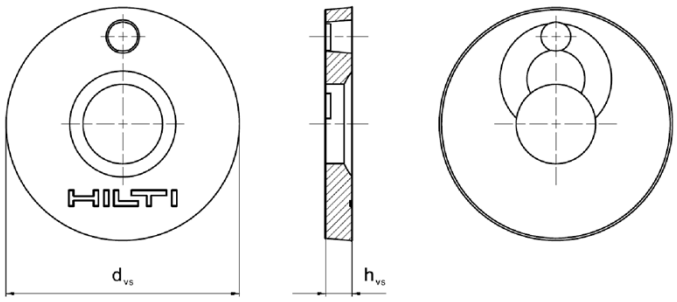
Table A2: Materials

Designation	Material
HUS4 (T)-H(F), HUS4 (T)-C and HUS4-A(F) screw anchor	Carbon steel, galvanized Rupture elongation $A_5 \leq 8\%$
HUS4-HR and HUS4-CR screw anchor	Stainless steel A4 according to EN 10088-1:2014 Rupture elongation A5 > 8% Corrosion resistance class CRC III according to EN 1993-1-4:2006+A1:2015
Hilti Filling Set (carbon steel)	Carbon steel, galvanized
Hilti Filling Set A4 (stainless steel)	Stainless steel A4 according to EN 10088-1:2014 Corrosion resistance class CRC III according to EN 1993-1-4:2006+A1:2015
Injection Mortar	Injection Mortar Hilti HIT-HY… or Hilti HIT-RE… (with ETA)

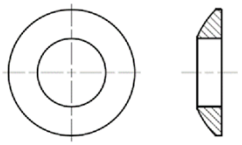
Table A3: Geometry and compatibility of Hilti Filling set

Filling set size		M10	M12	M16	M20
Diameter of filling washer	d_{vs} [mm]	42	44	52	60
Thickness of filling washer	h_{vs} [mm]	5	5	6	6
Thickness of Hilti Filling Set	h_{fs} [mm]	9	10	11	13
Fastener size of HUS4 (T)-H (F, R)		8	10	12 + 14	16
Fastener size of HUS4-A (F)		-	10	14	-

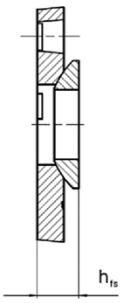
Sealing washer



Spherical washer



Filling Set



Hilti screw anchor HUS4	**Annex A4**
Product description HUS4 Materials	

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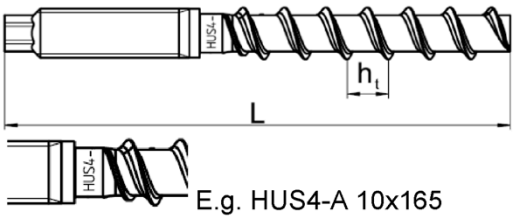
Table A4: Fastener dimensions and marking HUS4-A(F)

Fastener size HUS4-			**A(F) 10**			**A(F) 14**		
Nominal fastener diameter	d	[mm]	10			14		
Metric thread conection			M12			M16		
Pitch of the thread	h_t	[mm]	10			14		
Nominal embedment depth			h_{nom1}	h_{nom2}	h_{nom3}	h_{nom1}	h_{nom2}	h_{nom3}
	h_{nom}	[mm]	55	75	85	65	85	115
Effective embedment depth	h_{ef}	[mm]	$h_{ef} = 0{,}85 * (h_{nom} - 5) \leq h_{ef,max}$			$h_{ef} = 0{,}85 * (h_{nom} - 7) \leq h_{ef,max}$		
Limits of effective embedment depth	$h_{ef,max}$	[mm]	68,0			91,8		
Length of screw min / max	L	[mm]	120 / 165			155 / 205		



E.g. HUS4-A 10x165

8K

HUS4: Hilti Universal Screw 4th generation					
A: Thread connection, galvanized **AF:** Thread connection, multilayer coating					
10: Nominal screw diameter d [mm]					
165: Length of screw L [mm]					
8: Carbon steel					
K: Length identification HUS4-A 10x165					
G	**I**	**K**	**J**	**L**	**N**
10x120	10x140	10x165	14x155	14x185	14x205

Hilti screw anchor HUS4

Production description
Fastener dimensions and head marking

Annex A5

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Table A5: Fastener dimensions and marking HUS4 (T)-H(F)

Fastener size HUS4-			**H(F) 8**			**T-H(F) 8**			**H(F) 10**			**T-H(F) 10**		
Nominal fastener diameter	d	[mm]	8			8			10			10		
Pitch of the thread	h_t	[mm]	8			8			10			10		
Nominal embedment depth			h_{nom1}	h_{nom2}	h_{nom3}	h_{nom1}	h_{nom2}	h_{nom3}	h_{nom1}	h_{nom2}	h_{nom3}	h_{nom1}	h_{nom2}	h_{nom3}
	h_{nom}	[mm]	40	60	70	50	60	70	55	75	85	55	75	85
Effective embedment depth	h_{ef}	[mm]	0,85 * (h_{nom} – 4,0) ≤ $h_{ef,max}$			0,85 * (h_{nom} – 5,45) ≤ $h_{ef,max}$			0,85 * (h_{nom} – 5,0) ≤ $h_{ef,max}$			0,85 * (h_{nom} – 6,1) ≤ $h_{ef,max}$		
Limits of effective embedment depth	$h_{ef,max}$	[mm]	56,1			54,9			68,0			67,1		
Length of screw min / max	L	[mm]	45 / 150			55 / 150			60 / 305			60 / 150		

Fastener size HUS4-			**H(F) 12**			**H(F) 14**			**H(F) 16**		**H(F) 16 G02**		
Nominal fastener diameter	d	[mm]	12			14			16		16		
Pitch of the thread	h_t	[mm]	12			14			13,2		14,5		
Nominal embedment depth			h_{nom1}	h_{nom2}	h_{nom3}	h_{nom1}	h_{nom2}	h_{nom3}	h_{nom1}	h_{nom2}	h_{nom1}	h_{nom2}	h_{nom3}
	h_{nom}	[mm]	60	80	100	65	85	115	85	130	85	110	130
Effective embedment depth	h_{ef}	[mm]	0,85 * (h_{nom} – 6,0) ≤ $h_{ef,max}$			0,85 * (h_{nom} – 7,0) ≤ $h_{ef,max}$			0,85 * (h_{nom} – 6,6) ≤ $h_{ef,max}$		0,85 * (h_{nom} – 7,2) ≤ $h_{ef,max}$		
Limits of effective embedment depth	$h_{ef,max}$	[mm]	79,9			91,8			104,9		104,3		
Length of screw min / max	L	[mm]	70 / 150			75 / 150			100 / 205		100 / 205		

Hilti screw anchor HUS4

Production description
Fastener dimensions and head marking

Annex A6

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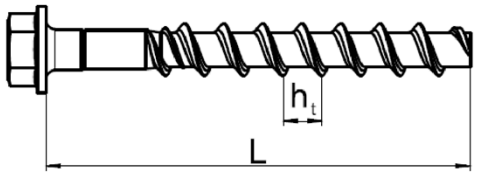
Table A6: Fastener dimensions and marking HUS4-HR

Fastener size HUS4-			**HR 6**	**HR 8**		**HR 10**		**HR 14**	
Nominal fastener diameter	d	[mm]	6	8		10		14	
Pitch of the thread	h_t	[mm]	4,75	7,6		8,0		9,8	
Nominal embedment depth			h_{nom1}	h_{nom1}	h_{nom2}	h_{nom1}	h_{nom2}	h_{nom1}	h_{nom2}
	h_{nom}	[mm]	55	60	80	70	90	70	110
Effective embedment depth	h_{ef}	[mm]	$0,85 * (h_{nom} - 2,37) \leq h_{ef,max}$	$0,85 * (h_{nom} - 4,8) \leq h_{ef,max}$		$0,85 * (h_{nom} - 6,4) \leq h_{ef,max}$		$0,85 * (h_{nom} - 9,0) \leq h_{ef,max}$	
Limits of effective embedment depth	$h_{ef,max}$	[mm]	45	64		71		86	
Length of screw min / max	L	[mm]	60 / 70	65 / 105		75 / 130		80 / 135	



HUS4: Hilti Universal Screw 4th generation	
(T-)H: Hexagonal head, galvanized **(T-)HF**: Hexagonal head, multilayer coating **HR**: Hexagonal head, stainless steel	
10: Nominal screw diameter d [mm]	
100: Length of screw [mm]	

Hilti screw anchor HUS4

Production description
Fastener dimensions and head marking

Annex A7

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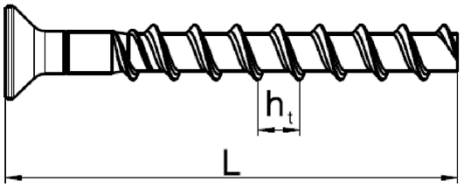
Table A7: Fastener dimensions and marking HUS4 (T)-C(R)

Fastener size HUS4-			**C 8**			**T-C 8**			**C 10**			**T-C 10**		
Nominal fastener diameter	d	[mm]	8			8			10			10		
Pitch of the thread	h_t	[mm]	8			8			10			10		
Nominal embedment depth	h_{nom}	[mm]	h_{nom1}	h_{nom2}	h_{nom3}	h_{nom1}	h_{nom2}	h_{nom3}	h_{nom1}	h_{nom2}	h_{nom3}	h_{nom1}	h_{nom2}	h_{nom3}
			40	60	70	50	60	70	55	75	85	55	75	85
Effective embedment depth	h_{ef}	[mm]	$0,85 * (h_{nom} - 4) \le h_{ef,max}$			$0,85 * (h_{nom} - 5,45) \le h_{ef,max}$			$0,85 * (h_{nom} - 5) \le h_{ef,max}$			$0,85 * (h_{nom} - 6,1) \le h_{ef,max}$		
Limits of effective embedment depth	$h_{ef,max}$	[mm]	56,1			54,9			68,0			67,1		
Length of screw min / max	L	[mm]	55 / 160			65 / 85			70 / 180			70 / 305		

Fastener size HUS4-			**CR 6**	**CR 8**		**CR 10**	
Nominal fastener diameter	d	[mm]	6	8		10	
Pitch of the thread	h_t	[mm]	4,75	7,6		8,0	
Nominal embedment depth	h_{nom}	[mm]	h_{nom2}	h_{nom2}	h_{nom3}	h_{nom2}	h_{nom3}
			55	60	80	70	90
Effective embedment depth	h_{ef}	[mm]	$0,85 * (h_{nom} - 2,37) \le h_{ef,max}$	$0,85 * (h_{nom} - 4,8) \le h_{ef,max}$		$0,85 * (h_{nom} - 6,4) \le h_{ef,max}$	
Limits of effective embedment depth	$h_{ef,max}$	[mm]	45	64		71	
Length of screw min / max	L	[mm]	60 / 70	65 / 95		75 / 105	

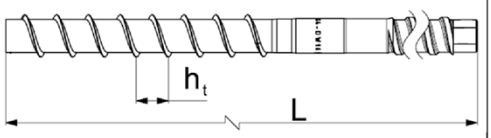


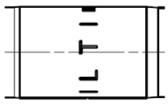
HUS4:	Hilti Universal Screw 4th generation
(T-)C: **CR:**	Countersunk head, galvanized Countersunk head, stainless steel
10:	Nominal screw diameter d [mm]
100:	Length of screw L [mm]

Hilti screw anchor HUS4	**Annex A8**
Production description Fastener dimensions and head marking	

Table A8: Fastener dimensions and marking HUS4-DW

Fastener size HUS4-			**DW 16**
Nominal fastener diameter	d	[mm]	16
Pitch of the thread	h_t	[mm]	14,5
Nominal embedment depth			h_{nom}
	h_{nom}	[mm]	130
Effective embedment depth	h_{ef}	[mm]	$0,85 * (h_{nom} - 7,2) \leq h_{ef,max}$
Limits of effective embedment depth	$h_{ef,max}$	[mm]	104,3
Length of screw min / max	L	[mm]	458 / 858





HUS4: Hilti Universal Screw 4th generation

DW: trapeziodal thread connection, galvanized

16: Nominal screw diameter d [mm]

458: Length of screw [mm]

Hilti screw anchor HUS4

Production description
Fastener dimensions and head marking

Annex A9

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Specifications of intended use

Anchorages subject to:

- Static and quasi-static loadings
- Seismic action for performance category C1 and C2 for HUS4 (T)-H(F)/-C/-A(F) (carbon steel screw)
- Seismic action for performance category C1: HUS4-HR/-CR (stainless steel screw)
- Fire exposure

Base materials:

- Compacted reinforced or unreinforced normal weight concrete according to EN 206:2013 +A1:2016.
- Strength classes C20/25 to C50/60 according to EN 206-1:2010+A1:2016.
- Cracked and uncracked concrete.
- The fastener is intended to be used in fibre reinforced concrete according to EN 206:2013 +A2:2021 including steel fibres (SFRC) according to EN 14889-1:2006 clause 1, group I. The maximum content of steel fibres is 80 kg/m³.

Use conditions (Environmental conditions):

- Anchorages subject to dry internal conditions: all screw types
- For all other conditions corresponding to corrosion resistance classes CRC according to EN 1993-1-4:2006+A1:2015
  - Stainless steel according to Annex A3 Table A2, screw types HUS4-HR/-CR: CRC III

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 fastener is indicated on the design drawings (e. g. position of the fastener relative to reinforcement or to supports, etc.).
- Anchorages are designed in accordance with: EN 1992-4:2018 and EOTA Technical Report TR 055, edition February 2018.
- In case of requirements to resistance to fire local spalling of the concrete cover must be avoided.
- The design method according to EN 1992-4:2018 applies for use in Steel Fibre Reinforced Concrete (SFRC) with the essential characteristics as specified for plain concrete without fibres.

Installation:

- Fastener installation carried out by appropriately qualified personnel and under the supervision of the person responsible for technical matters on 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 fastener must not be possible.
- The head of the fastener (HUS4 (T)-H (F, R) and HUS4 (T)-C/-CR) must be supported on the fixture and is not damaged.
- Hilti filling set is suitable for HUS4 (T)-H (F, R) and HUS4-A (F)

Hilti screw anchor HUS4	**Annex B1**
Intended use Specifications	

Specifications of intended use: Drilling and cleaning for HUS4 carbon steel

Adjustment according to Annex B11 is possible for carbon steel HUS4 screws in sizes 8 to 10 at h_{nom2+3} and 12, 14 and 16 G02 at all h_{nom}.

Table B1: HUS4 (T)-H(F)/-C/-A(F) intended use for static and quasi static loading

HUS4 (T)-H(F)/-C/-A(F) carbon steel			Fastener size and embedment depth h_{nom}
Cracked and uncracked concrete			
Hammer drilling (HD)[1)]	cleaned		sizes 8 to 16 at all h_{nom}
	not cleanded		sizes 8 to 14 and 16 G02 at all h_{nom}
Hammer drilling with Hilti hollow drill bit TE-CD (HDB) [1)]			sizes 12 and 14 at all h_{nom}
Uncracked concrete			
Diamond coring (DD) DD30-W handheld and with stand DD-EC1 handheld			sizes 10 to 14 at h_{nom3} (HUS4 T excluded)

Table B2: HUS4 (T)-H(F)/-C/-A(F) intended use for seismic performance category C1

HUS4 (T)-H(F)/-C/-A(F) carbon steel			Fastener size and embedment depth h_{nom}
Hammer drilling (HD)[1)]	cleaned		sizes 8 to 16 at all h_{nom} (HUS4 8 at h_{nom1} excluded)
	not cleanded		sizes 8 to 14, 16 G02 and 16 DW at all h_{nom} (HUS4 8 at h_{nom1} excluded)
Hammer drilling with Hilti hollow drill bit TE-CD (HDB) [1)]			sizes 12 and 14 at all h_{nom}

Table B3: HUS4 (T)-H(F)/-C/-A(F) intended use for seismic performance category C2

HUS4 (T)-H(F)/-C/-A(F) carbon steel			Fastener size and embedment depth h_{nom}
Hammer drilling (HD)[1)]	Cleaned and not cleanded		sizes 8 to 14, 16 G02 and 16 DW at all h_{nom} (HUS4 8 at h_{nom1} excluded)

Table B4: HUS4 (T)-H(F)/-C/-A(F) intended use for static and quasi static loading under fire exposure

HUS4 (T)-H(F)/-C/-A(F) carbon steel			Fastener size and embedment depth h_{nom}
Hammer drilling (HD)[1)]	cleaned		sizes 8 to 16 at all h_{nom}
	not cleanded		sizes 8 to 14 and 16 G02 at all h_{nom}
Hammer drilling with Hilti hollow drill bit TE-CD (HDB) [1)]			sizes 12 and 14 at all h_{nom}

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Table B5: Intended use for HUS4 (T)-H(F)/-C/-A(F) in concrete with SFRC (seismic category C2 is excluded)

HUS4 (T)-H(F)/-C/-A(F) carbon steel		Fastener size and embedment depth h_{nom}
Cracked and uncracked concrete		
Hammer drilling (HD)[1)]	cleaned	sizes 8 to 16 at all h_{nom}
	not cleanded	sizes 8 to 14 and 16 G02 at all h_{nom}
Hammer drilling with Hilti hollow drill bit TE-CD (HDB) [1)]		sizes 12 and 14 at all h_{nom}
Uncracked concrete		
Diamond coring (DD) DD30-W handheld and with stand DD-EC1 handheld		sizes 10 to 14 at h_{nom3} (HUS4 T excluded)

Specifications of intended use: Drilling and cleaning for HUS4 stainless steel

Adjustment according to Annex B11 is not possible.

Table B6: HUS4-HR/-CR intended use for static and quasi static loading

HUS4-HR/-CR stainless steel		Fastener size and embedment depth h_{nom}
Cracked and uncracked concrete		
Hammer drilling (HD)	cleaned not cleanded	sizes 6 to 14 at all h_{nom}

Table B7: HUS4-HR/-CR intended use for seismic performance category C1

HUS4-HR/-CR stainless steel		Fastener size and embedment depth h_{nom}
Hammer drilling (HD)	cleaned	sizes 8 to 14 at h_{nom2}
	not cleanded	sizes 8 to 14 at h_{nom2}

Table B8: HUS4-HR/-CR intended use for static and quasi static loading under fire exposure

HUS4-HR/-CR stainless steel		Fastener size and embedment depth h_{nom}
Hammer drilling (HD)	cleaned	sizes 6 to 14 at all h_{nom}
	not cleanded	sizes 6 to 14 at all h_{nom}

Hilti screw anchor HUS4	**Annex B3**
Intended use Specifications	

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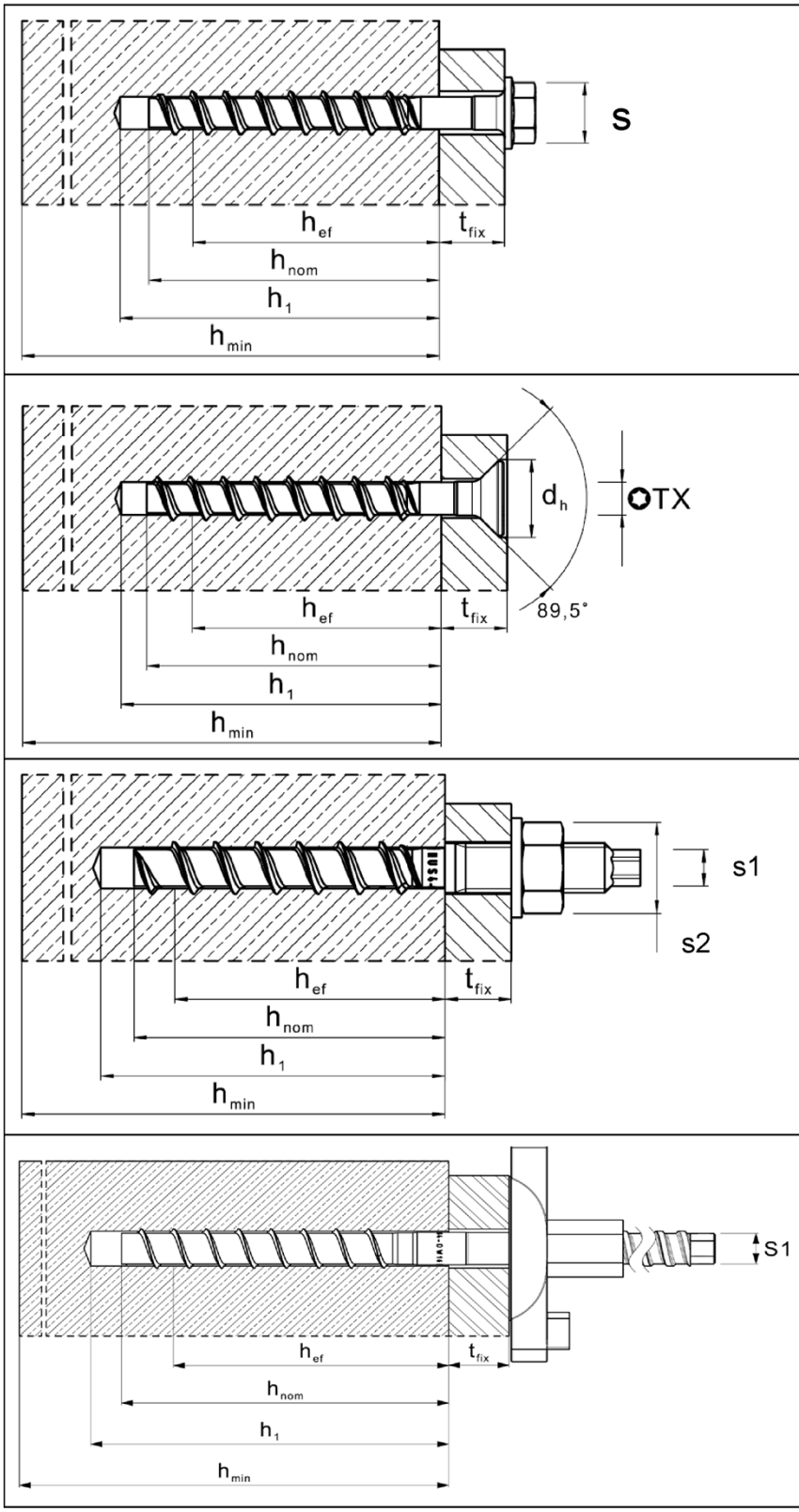
Installation parameters



Hilti screw anchor HUS4	**Annex B4**
Intended use Installation parameters	

Table B9: Installation parameters HUS4 8 and 10

Fastener size HUS4 **Type**			**8** **H(F), C**			**8** **T-H(F), T-C**			**10** **H(F), C, A(F)**		
			h_{nom1}	h_{nom2}	h_{nom3}	h_{nom1}	h_{nom2}	h_{nom3}	h_{nom1}	h_{nom2}	h_{nom3}
Nominal embedmenth depth	h_{nom}	[mm]	40	60	70	50	60	70	55	75	85
Nominal drill hole diameter	d_0	[mm]	8			8			10		
Cutting diameter of drill bit	$d_{cut} \leq$	[mm]	8,45			8,45			10,45		
Cutting diameter of diamond core bit	$d_{cut} \leq$	[mm]	-			-			9,9		
Clearance hole diameter through setting	d_f min	[mm]	11			11			13		
	d_f max	[mm]	12			12			14		
Clearance hole diameter pre setting (A-type)	$d_f \leq$	[mm]	-			-			14		
Wrench size (H, HF-type)	s	[mm]	13			13			15		
Wrench size for hex head (A-type)	s1	[mm]	-			-			8		
Wrench size for nut (A-type)	s2	[mm]	-			-			19		
Maximum installation torque (A-type)	max T_{inst}	[Nm]	-			-			40		
Torx size (C-type)	TX	-	45			45			50		
Diameter of countersunk head	d_h	[mm]	18			18			21		
Depth of drill hole for cleaned hole hammer drilling, diamond coring or for uncleanded hole when drilling upwards	$h_1 \geq$	[mm]	(h_{nom} + 10 mm)								
			50	70	80	60	70	80	65	85	95
Depth of drill hole for uncleanded hole hammer drilling in wall and floor position	$h_1 \geq$	[mm]	h_{nom} + 25						h_{nom} + 30		
			65	85	95	75	85	95	85	105	115
Depth of drill hole (with adjustability) for cleaned hole hammer drilling, diamond coring or for uncleanded hole when drilling upwards	$h_1 \geq$	[mm]	h_{nom} + 20 mm								
			-	80	90	70	80	90	-	95	105
Depth of drill hole (with adjustability) for uncleaned hole hammer drilling in wall and floor position	$h_1 \geq$	[mm]	h_{nom} + 35						h_{nom} + 40		
			-	95	105	85	95	105	-	115	125
Minimum thickness of concrete member	$h_{min} \geq$	[mm]	h_1 + 30 mm								
			80	100	120	100	100	120	100	130	140
Minimum spacing	$s_{min} \geq$	[mm]	35			50[2)]	50	50	40		
Minimum edge distance	$c_{min} \geq$	[mm]	35			40	40	40	40		
Hilti Setting tool [1)]			SIW 4(AT)-22 SIW 6(AT)-A22 SIW 6(AT)-22 gear 1 SI-AT-22 module optional						SIW 6(AT)-22 SIW 22T-A SIW 8-22 gear 1 SIW 9-A22 SI-AT-22 module optional		

[1)] Installation with other impact wrench of equivalent power is possible.

[2)] s_{min} = 40 mm is possible if $c_{min} \geq$ 50 mm.

Hilti screw anchor HUS4	**Annex B5**
Intended use Installation parameters	

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Table B10: Installation parameters HUS4 10 to 14

Fastener size HUS4			**10**			**12**			**14**		
Type			**T-H(F), T-C**			**H(F)**			**H(F), A(F)**		
			h_{nom1}	h_{nom2}	h_{nom3}	h_{nom1}	h_{nom2}	h_{nom3}	h_{nom1}	h_{nom2}	h_{nom3}
Nominal embedmenth depth	h_{nom}	[mm]	55	75	85	60	80	100	65	85	115
Nominal drill hole diameter	d_0	[mm]	10			12			14		
Cutting diameter of drill bit	$d_{cut} \leq$	[mm]	10,45			12,50			14,50		
Cutting diameter of diamond core bit	$d_{cut} \leq$	[mm]	-			12,2			14,2		
Clearance hole diameter through setting	d_f min / max	[mm]	14			16			18		
Clearance hole diameter pre setting (A-type)	$d_f \leq$	[mm]	-			-			18		
Wrench size (H, HF-type)	s	[mm]	15			17			21		
Wrench size for hex head (A-type)	s1	[mm]	-			-			12		
Wrench size for nut (A-type)	s2	[mm]	-			-			24		
Maximum installation torque (A-type)	max T_{inst}	[Nm]	-			-			80		
Torx size (C-type)	TX	-	50			-			-		
Diameter of countersunk head	d_h	[mm]	21			-			-		
Depth of drill hole for cleaned hole hammer drilling, diamond coring or for uncleanded hole when drilling upwards	$h_1 \geq$	[mm]	h_{nom} + 10 mm								
			65	85	95	70	90	110	75	95	125
Depth of drill hole for uncleanded hole hammer drilling in wall and floor position	$h_1 \geq$	[mm]	h_{nom} + 30			h_{nom} + 35			h_{nom} + 40		
			85	105	115	95	115	135	105	125	155
Depth of drill hole (with adjustability) for cleaned hole hammer drilling, diamond coring or for uncleanded hole when drilling upwards	$h_1 \geq$	[mm]	h_{nom} + 20 mm								
			75	95	105	80	100	120	85	105	135
Depth of drill hole (with adjustability) for uncleaned hole hammer drilling in wall and floor position	$h_1 \geq$	[mm]	h_{nom} + 40			h_{nom} + 45			h_{nom} + 50		
			95	115	125	105	125	145	115	135	165
Minimum thickness of concrete member	$h_{min} \geq$	[mm]	h_1 + 30 mm								
			100	130	140	110	130	150	120	160	200
Minimum spacing	$s_{min} \geq$	[mm]	50			50			60		
Minimum edge distance	$c_{min} \geq$	[mm]	50			50			60		
Hilti Setting tool [1)]			SIW 6(AT)-22 SIW 22T-A SIW 8-22 gear 1 SIW 9-A22 SI-AT-22 module optional			SIW 6(AT)-22 SIW 22T-A SIW 8-22 SIW 9-A22 SI-AT-22 module optional					

[1)] Installation with other impact wrench of equivalent power is possible.

Hilti screw anchor HUS4

Intended use
Installation parameters

Annex B6

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Table B11: Installation parameters HUS4-16

Fastener size HUS4			**16**		**16**			**16**
Type			**H(F)**		**H(F) G02**			**DW**
			h_{nom1}	h_{nom2}	h_{nom1}	h_{nom2}	h_{nom3}	h_{nom}
Nominal embedmenth depth	h_{nom}	[mm]	85	130	85	110	130	130
Nominal drill hole diameter	d_0	[mm]	16		16			16
Cutting diameter of drill bit	$d_{cut} \leq$	[mm]	16,50		16,50			16,50
Clearance hole diameter through setting	$d_f \leq$	[mm]	20		20			20
Clearance hole diameter pre setting (DW-type)	$d_f \leq$	[mm]	-		-			20
Wrench size (H, HF-type)	s	[mm]	24		24			-
Wrench size for hex head (DW-type)	s1	[mm]	-		-			13
Depth of drill hole for cleaned hole hammer drilling or for uncleanded hole when drilling upwards	$h_1 \geq$	[mm]	h_{nom} + 10 mm					
			95	140	95	120	140	140
Depth of drill hole for uncleanded hole hammer drilling in wall and floor position	$h_1 \geq$	[mm]	-		h_{nom} + 40 mm			
					125	150	170	170
Depth of drill hole (with adjustability) for cleaned hole hammer drilling, diamond coring or for uncleanded hole when drilling upwards	$h_1 \geq$	[mm]	-		h_{nom} + 20 mm			
					105	130	150	150
Depth of drill hole (with adjustability) for uncleaned hole hammer drilling in wall and floor position	$h_1 \geq$	[mm]	-		h_{nom} + 50 mm			
					135	160	180	180
Minimum thickness of concrete member	$h_{min} \geq$	[mm]	h_1 + 35 mm					
			130	195	130	155	175	175
Minimum spacing	$s_{min} \geq$	[mm]	90		70			
Minimum edge distance	$c_{min} \geq$	[mm]	65		65			
Hilti Setting tool [1)]			SIW 22T-A SIW 6(AT)-22 SIW 8-22 SIW 9-A22 SIW 10-22 SI-AT-22 module optional					SIW 22T-A SIW 6(AT)-22 SIW 8-22 SIW 9-A22 SIW 10-22

[1)] Installation with other impact wrench of equivalent power is possible.

Hilti screw anchor HUS4	**Annex B7**
Intended use Installation parameters	

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Table B12: Installation parameters HUS4-HR/-CR 6 and 8

Fastener size HUS4			**6**	**8**	
Type			**HR, CR**	**HR, CR**	
			h_{nom1}	h_{nom1}	h_{nom2}
Nominal embedment depth	h_{nom}	[mm]	55	60	80
Nominal drill hole diameter	d_0	[mm]	6	8	
Cutting diameter of drill bit	$d_{cut} \leq$	[mm]	6,40	8,45	
Clearance hole diameter	$d_f \leq$	[mm]	9	12	
Wrench size (H-type)	s	[mm]	13	13	
Torx size (C-type)	TX	[-]	30	45	
Diameter of countersunk head	d_h	[mm]	11	18	
Depth of drill hole for cleaned hole hammer drilling or for uncleanded hole when drilling upwards	$h_1 \geq$	[mm]	h_{nom} + 10 mm		
			65	70	90
Depth of drill hole for uncleanded hole hammer drilling in wall and floor position	$h_1 \geq$	[mm]	h_{nom} + 20 mm	h_{nom} + 25 mm	
			75	85	105
Minimum thickness of concrete member	$h_{min} \geq$	[mm]	h_1 + 30 mm		
			100	100	120
Minimum spacing	$s_{min} \geq$	[mm]	35	45	50
Minimum edge distance	$c_{min} \geq$	[mm]	35	45	50
Hilti Setting tool [1)]			SIW 6(AT)-A22 SIW 4(AT)-22 SI-AT-22 module optional	SIW 22T-A SIW 6(AT)-A22 SIW 4(AT)-22 SIW 6(AT)-22 SI-AT-22 module optional	

[1)] Installation with other impact wrench of equivalent power is possible.

Hilti screw anchor HUS4	**Annex B8**
Intended use Installation parameters	

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Table B13: Installation parameters HUS4-HR/-CR 10 and 14

Fastener size HUS4			**10**		**14**	
Type			**HR, CR**		**HR**	
			h_{nom1}	h_{nom2}	h_{nom1}	h_{nom2}
Nominal embedment depth	h_{nom}	[mm]	70	90	70	110
Nominal drill hole diameter	d_0	[mm]	10		14	
Cutting diameter of drill bit	$d_{cut} \leq$	[mm]	10,45		14,50	
Clearance hole diameter	$d_f \leq$	[mm]	14		18	
Wrench size (H-type)	s	[mm]	15		21	
Torx size (C-type)	TX	[-]	50		-	
Diameter of countersunk head	d_h	[mm]	21		-	
Depth of drill hole for cleaned hole hammer drilling, diamond coring or for uncleanded hole when drilling upwards	$h_1 \geq$	[mm]	h_{nom} + 10mm			
			80	100	80	120
Depth of drill hole for uncleanded hole hammer drilling in wall and floor position	$h_1 \geq$	[mm]	h_{nom} + 30 mm		h_{nom} + 40 mm	
			100	120	110	150
Minimum thickness of concrete member	$h_{min} \geq$	[mm]	h_1 + 30 mm			
			120	140	140	160
Minimum spacing	$s_{min} \geq$	[mm]	50		50	60
Minimum edge distance	$c_{min} \geq$	[mm]	50		50	60
Hilti Setting tool [1)]			SIW 22T-A SIW 6(AT)-A22 SIW 4(AT)- 22 SIW 6(AT)-22 SI-AT-22 module optional		SIW 22T-A SIW 6(AT)-22 SIW 8-22 gear 1 SIW 9-A22 SI-AT-22 module optional	

[1)] Installation with other impact wrench of equivalent power is possible.

Hilti screw anchor HUS4	**Annex B9**
Intended use Installation parameters	

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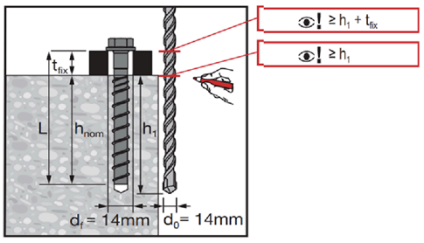
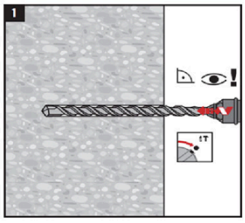
Installation instructions

Hole drilling and cleaning

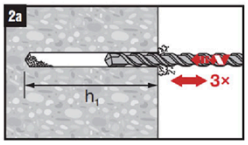


Select the right drill bit size
Mark drilling depth h_1 for pre or through installation.
Details for drilling depth h_1 for the different drilling methods (with and without cleaning) and directions in table B9 to B13.

Hammer drilling (HD)

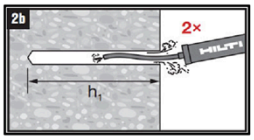


Hammer drilling (HD):
- All sizes for carbon and stainless steel



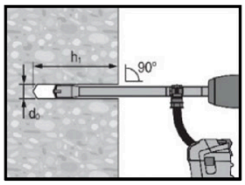
No cleaning is allowed when:
- drilling in upward direction
- drilling in downward and horizontal direction when 3x ventilation[1)] after drilling is executed.
- h_1 according B9 to B13 for uncleaned hole

[1)] moving the drill bit in and out of the drill hole 3 times after the recommended drilling depth h_1 is achieved. This procedure shall be done with both revolution and hammer functions activated in the drilling machine. For more details read the relevant installation instruction (MPII).



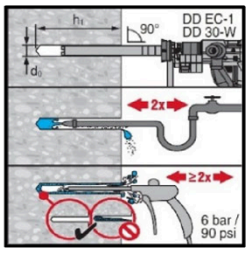
Cleaning is needed:
- When drilling in downward and horizontal direction
- For HUS4 16 (not for 16 G02)

Hammer drilling with Hilti hollow drill bit (HDB)



Hammer drilling with Hilti hollow drill bit (HDB):
- Size 12 and 14 for carbon steel screw
- No cleaning needed

Diamond coring (DD)



Diamond coring (DD):
- Size 10 to 14 for carbon steel screw
- Cleaning needed in all installation directions

Hilti screw anchor HUS4	**Annex B10**
Intended use Installation instructions	

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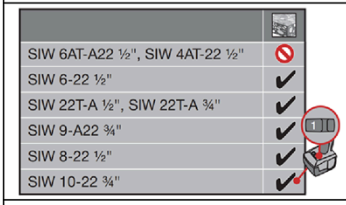
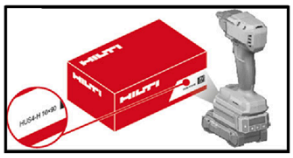
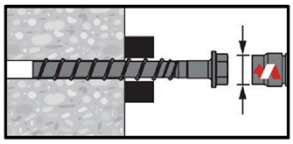
Fastener setting



Select the right impact wrench for the used screw (see Table B9 to B13)

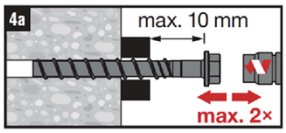


Optional: insert the SI-AT-22 module between the battery and the tool and select the anchor or scan the anchor box (in the case the gear is automatically selected)

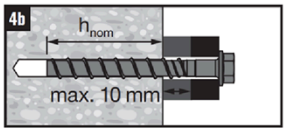


Installation using an impact wrench.
In case SI-AT-22 module is used, no gear selection on the tool needed.

Optional: Adjusting process (carbon steel screws only)

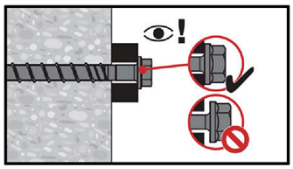


Unscrew by a maximum of 10 mm. A screw may be adjusted up to two times. The total thickness of shims added during the adjustment process must not exceed 10 mm.



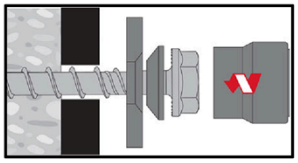
The final embedment depth after adjustment process must be larger or equal than the required one (e.g. h_{nom1}, h_{nom2} or h_{nom3}).

Setting check

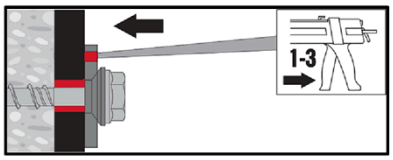


The screw head must be in contact with the fixture

Optional: Fastener setting with Hilti filling set



Setting with Hilti filling set



Fill the annular gap between screw and fixture with 1-3 strokes of a Hilti injection mortar HIT-HY … or HIT-RE … .
Follow the installation instructions supplied with the respective Hilti injection mortar. After required curing time t_{cure} the fastening can be loaded.

Hilti screw anchor HUS4	**Annex B11**
Intended use Installation instructions	

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Table C1: Essential characteristics under static and quasi-static load in concrete for HUS4 carbon steel size 8 and 10

Fastener size HUS4				**8**			**8**			**10**		
Type				**H(F), C**			**T-H(F), T-C**			**H(F), C, A(F)**		
Nominal embedment depth		h_{nom}	[mm]	h_{nom1}	h_{nom2}	h_{nom3}	h_{nom1}	h_{nom2}	h_{nom3}	h_{nom1}	h_{nom2}	h_{nom3}
				40	60	70	50	60	70	55	75	85
Adjustment												
Total max. thickness of adjustment layers		t_{adj}	[mm]	-	10	10	-	10	10	-	10	10
Max. number of adjustments		n_{adj}	[-]	-	2	2	-	2	2	-	2	2
Steel failure for tension load												
Characteristic resistance		$N_{Rk,s}$	[kN]	36,0			39,2			55,0		
Partial factor		$\gamma_{Ms,N}$ [1]	[-]	1,5			1,4			1,5		
Pull-out failure												
Characteristic resistance in uncracked concrete C20/25		$N_{Rk,p,ucr}$	[kN]	≥ $N^0_{Rk,c}$ [3]			9	12	16	13	22	≥$N^0_{Rk,c}$ [3]
Characteristic resistance in cracked concrete C20/25		$N_{Rk,p,cr}$	[kN]	5,5	≥ $N^0_{Rk,c}$ [3]		6	9	12	≥ $N^0_{Rk,c}$ [3]		
Increasing factor for $N_{Rk,p} = N_{Rk,p(C20/25)} * \psi_c$		ψ_c	[-]	$(f_{ck}/20)^{0,5}$								
Concrete cone and splitting failure												
Effective embedment depth		h_{ef} [2]	[mm]	30,6	47,6	56,1	40	46,4	54,9	42,5	59,5	68,0
Factor for	Uncracked	$k_{ucr,N}$	[-]	11,0								
	Cracked	$k_{cr,N}$	[-]	7,7								
Concrete cone failure	Edge distance	$c_{cr,N}$	[mm]	1,5 h_{ef}								
	Spacing	$s_{cr,N}$	[mm]	3 h_{ef}								
Characteristic resistance		$N^0_{Rk,sp}$	[kN]	min ($N_{Rk,p}$; $N^0_{Rk,c}$ [2),3)]								
Splitting failure	Edge distance	$c_{cr,sp}$	[mm]	1,5 h_{ef}			1,5 h_{ef}			1,65 h_{ef}		
	Spacing	$s_{cr,sp}$	[mm]	3,0 h_{ef}			3,0 h_{ef}			3,30 h_{ef}		
Installation factor		γ_{inst}	[-]	1,0						1,2	1,0	

[1] In absence of other national regulations.
[2] In case $h_{nom} > h_{nom1}$ and $< h_{nom3}$ the actual h_{ef} for concrete failure can be calculated according to Tables A4, A5 or A7
[3] $N^0_{Rk,c}$ for C20/25 according to EN 1992-4:2018

Hilti screw anchor HUS4	**Annex C1**
Performances Essential characteristics under static and quasi-static load in concrete	

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Table C1 continued

Fastener size HUS4			**8**			**8**			**10**		
Type			**H(F), C**			**T-H(F), T-C**			**H(F), C, A(F)**		
Nominal embedment depth	h_{nom}	[mm]	h_{nom1}	h_{nom2}	h_{nom3}	h_{nom1}	h_{nom2}	h_{nom3}	h_{nom1}	h_{nom2}	h_{nom3}
			40	60	70	50	60	70	55	75	85
Steel failure for shear load											
Characteristic resistance	$V^0_{Rk,s}$	[kN]	18,8		21,9	19,0		22,0	28,8		32,0
Partial factor	$\gamma_{Ms,V}$ [1)]	[-]	1,25			1,50			1,25		
Ductility factor	k_7	[-]	0,8								
Characteristic resistance	$M^0_{Rk,s}$	[Nm]	32			46			64		
Concrete pry-out failure											
Pry-out factor	k_8	[-]	1,0	2,0		1,0	2,0		1,0	2,0	
Concrete edge failure											
Effective length of fastener	l_f	[mm]	40	60	70	50	60	70	55	75	85
Outside diameter of fastener	d_{nom}	[mm]	8			8			10		

[1)] In absence of other national regulations.

Hilti screw anchor HUS4

Performances
Essential characteristics under static and quasi-static load in concrete

Annex C2

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Table C2: Essential characteristics under static and quasi-static load in concrete for HUS4 carbon steel size 10 to 14

Fastener size HUS4				**10**			**12**			**14**		
Type				**T-H(F), T-C**			**H(F)**			**H(F), A(F)**		
Nominal embedment depth		h_{nom}	[mm]	h_{nom1}	h_{nom2}	h_{nom3}	h_{nom1}	h_{nom2}	h_{nom3}	h_{nom1}	h_{nom2}	h_{nom3}
				55	75	85	60	80	100	65	85	115
Adjustment												
Total max. thickness of adjustment layers		t_{adj}	[mm]	-	10	10	10	10	10	10	10	10
Max. number of adjustments		n_{adj}	[-]	-	2	2	2	2	2	2	2	2
Steel failure for tension load												
Characteristic resistance		$N_{Rk,s}$	[kN]	62,2			79,0			101,5		
Partial factor		$\gamma_{Ms,N}$ [1]	[-]	1,4			1,5					
Pull-out failure												
Characteristic resistance in uncracked concrete C20/25		$N_{Rk,p,ucr}$	[kN]	12	20	32	≥ $N^0_{Rk,c}$ [3]					
Characteristic resistance in cracked concrete C20/25		$N_{Rk,p,cr}$	[kN]	9	15	19	10	≥ $N^0_{Rk,c}$ [3]				
Increasing factor for $N_{Rk,p} = N_{Rk,p(C20/25)} * \psi_c$		ψ_c	[-]	$(f_{ck}/20)^{0,5}$								
Concrete cone and splitting failure												
Effective embedment depth		h_{ef} [2]	[mm]	41,6	58,6	67,1	45,9	62,9	79,9	49,3	66,3	91,8
Factor for	Uncracked	$k_{ucr,N}$	[-]	11,0								
	Cracked	$k_{cr,N}$	[-]	7,7								
Concrete cone failure	Edge distance	$c_{cr,N}$	[mm]	1,5 h_{ef}								
	Spacing	$s_{cr,N}$	[mm]	3 h_{ef}								
Characteristic resistance		$N^0_{Rk,sp}$	[kN]	min ($N_{Rk,p}$; $N^0_{Rk,c}$ [2),3)]								
Splitting failure	Edge distance	$c_{cr,sp}$	[mm]	1,60 h_{ef}			1,65 h_{ef}			1,60 h_{ef}		
	Spacing	$s_{cr,sp}$	[mm]	3,20 h_{ef}			3,30 h_{ef}			3,20 h_{ef}		
Installation factor		γ_{inst}	[-]	1,0								

[1] In absence of other national regulations.
[2] In case $h_{nom} > h_{nom1}$ and $< h_{nom3}$ the actual h_{ef} for concrete failure can be calculated according to Tables A4, A5 or A7
[3] $N^0_{Rk,c}$ for C20/25 according to EN 1992-4:2018

Hilti screw anchor HUS4

Performances
Essential characteristics under static and quasi-static load in concrete

Annex C3

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Table C2 continued

Fastener size HUS4			**10**			**12**			**14**		
Type			**T-H(F), T-C**			**H(F)**			**H(F), A(F)**		
Nominal embedment depth	h_{nom}	[mm]	h_{nom1}	h_{nom2}	h_{nom3}	h_{nom1}	h_{nom2}	h_{nom3}	h_{nom1}	h_{nom2}	h_{nom3}
			55	75	85	60	80	100	65	85	115
Steel failure for shear load											
Characteristic resistance	$V^0_{Rk,s}$	[kN]	30		34	38,9		44,9	55		62
Partial factor	$\gamma_{Ms,V}$ [1)]	[-]	1,50			1,25					
Ductility factor	k_7	[-]	0,8								
Characteristic resistance	$M^0_{Rk,s}$	[Nm]	92			120			186		
Concrete pry-out failure											
Pry-out factor	k_8	[-]	1,0	2,0		2,0					
Concrete edge failure											
Effective length of fastener	l_f	[mm]	55	75	85	60	80	100	65	85	115
Outside diameter of fastener	d_{nom}	[mm]	10			12			14		

[1)] In absence of other national regulations.

Hilti screw anchor HUS4

Performances
Essential characteristics under static and quasi-static load in concrete

Annex C4

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Table C3: Essential characteristics under static and quasi-static load in concrete for HUS4 carbon steel size 16

Fastener size HUS4				**16**		**16**			**16**
Type				**H(F)**		**H(F) G02**			**DW**
Nominal embedment depth		h_{nom}	[mm]	h_{nom1}	h_{nom2}	h_{nom1}	h_{nom2}	h_{nom3}	h_{nom}
				85	130	85	110	130	130
Adjustment									
Total max. thickness of adjustment layers		t_{adj}	[mm]	-	-	10	10	10	-
Max. number of adjustments		n_{adj}	[-]	-	-	2	2	2	-
Steel failure for tension load									
Characteristic resistance		$N_{Rk,s}$	[kN]	107,7		141,9			120,0
Partial factor		$\gamma_{Ms,N}$ [1]	[-]	1,5		1,5			1,5
Pull-out failure									
Characteristic resistance in uncracked concrete C20/25		$N_{Rk,p,ucr}$	[kN]	22	46	$\geq N^0_{Rk,c}$ [2),3)]			$\geq N^0_{Rk,c}$ [2),3)]
Characteristic resistance in cracked concrete C20/25		$N_{Rk,p,cr}$	[kN]	16	32	$\geq N^0_{Rk,c}$ [2),3)]			$\geq N^0_{Rk,c}$ [2),3)]
Increasing factor for $N_{Rk,p} = N_{Rk,p(C20/25)} * \psi_c$		ψ_c	[-]	$(f_{ck}/20)^{0,5}$					
Concrete cone and splitting failure									
Effective embedment depth		h_{ef} [2)]	[mm]	66,6	104,9	66,1	87,3	104,3	104,3
Factor for	Uncracked	$k_{ucr,N}$	[-]	11,0					
	Cracked	$k_{cr,N}$	[-]	7,7					
Concrete cone failure	Edge distance	$c_{cr,N}$	[mm]	1,5 h_{ef}					
	Spacing	$s_{cr,N}$	[mm]	3 h_{ef}					
Characteristic resistance		$N^0_{Rk,sp}$	[kN]	min ($N_{Rk,p}$; $N^0_{Rk,c}$ [2),3)])					
Required splitting area		$A_{sp,rqd}$	[-]	-		$(N^0_{Rk,sp} + 2,81) / 0,000745$			
Splitting failure	Edge distance	$c_{cr,sp}$	[mm]	1,60 h_{ef}		$\min\left[\frac{A_{sp,rqd} + 0,8 \cdot (h_{min} - h_{ef})^2}{3,41 \cdot h_{min} - 0,59 \cdot h_{ef}}; \frac{A_{sp,rqd}}{s_{min} \cdot \sqrt{8}}\right] \geq (1,50 \cdot h_{ef})$			
	Spacing	$s_{cr,sp}$	[mm]	3,20 h_{ef}		2,00 $c_{cr,sp}$			
Installation factor		γ_{inst}	[-]	1,0		1,0			

[1)] In absence of other national regulations.
[2)] In case $h_{nom} > h_{nom1}$ and $< h_{nom3}$ the actual h_{ef} for concrete failure and pullout can be calculated according to Table A5 or A8
[3)] $N^0_{Rk,c}$ for C20/25 according to EN 1992-4:2018

Hilti screw anchor HUS4	**Annex C5**
Performances Essential characteristics under static and quasi-static load in concrete	

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Table C3 continued

Fastener size HUS4			**16**		**16**			**16**
Type			**H(F)**		**H(F) G02**			**DW**
Nominal embedment depth	h_{nom}	[mm]	h_{nom1}	h_{nom2}	h_{nom1}	h_{nom2}	h_{nom3}	h_{nom}
			85	130	85	110	130	130
Steel failure for shear load								
Characteristic resistance	$V^0_{Rk,s}$	[kN]	65,1	73,1	77,8		82,9	60,0
Partial factor	$\gamma_{Ms,V}$ [1)]	[-]	1,25					
Ductility factor	k_7	[-]	0,8					
Characteristic resistance	$M^0_{Rk,s}$	[Nm]	240		350			283
Concrete pry-out failure								
Pry-out factor	k_8	[-]	2,0					
Concrete edge failure								
Effective length of fastener	l_f	[mm]	85	130	85	110	130	130
Outside diameter of fastener	d_{nom}	[mm]	16		16			16

[1)] In absence of other national regulations.

Hilti screw anchor HUS4	**Annex C6**
Performances Essential characteristics under static and quasi-static load in concrete	

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Table C4: Essential characteristics under static and quasi-static load in concrete for HUS4 stainless steel

Fastener size HUS4				**6**	**8**		**10**		**14**	
Type				**HR, CR**	**HR, CR**		**HR, CR**		**HR**	
Nominal embedment depth		h_{nom}	[mm]	h_{nom1}	h_{nom1}	h_{nom2}	h_{nom1}	h_{nom2}	h_{nom1}	h_{nom2}
				55	60	80	70	90	70	110
Steel failure for tension and shear load										
Characteristic resistance		$N_{Rk,s}$	[kN]	24,0	34,0		52,6		102,2	
Partial factor		$\gamma_{Ms,N}$ [1]	[-]	1,4						
Characteristic resistance		$V_{Rk,s}$	[kN]	17,0	26,0		33,0		55,0	77,0
Partial factor		$\gamma_{Ms,V}$ [1]	[-]	1,5						
Ductility factor		k_7	[-]	1,0						
Characteristic resistance		$M^0_{Rk,s}$	[Nm]	19	36		66		193	
Pull-out failure										
Characteristic resistance in cracked concrete C20/25		$N_{Rk,p,cr}$	[kN]	5	8,5	15	12	16	12	25
Characteristic resistance in uncracked concrete C20/25		$N_{Rk,p,ucr}$	[kN]	9	12	16	16	25	$\geq N^0_{Rk,c}$ [3]	
Increasing factor for $N_{Rk,p} = N_{Rk,p(C20/25)} * \psi_c$		ψ_c	[-]	$(f_{ck}/20)^{0,5}$						
Concrete cone and splitting failure										
Effective anchorage depth		h_{ef} [2]	[mm]	45	47	64	54	71	52	86
Factor for	Cracked	$k_{cr,N}$	[-]	7,7						
	Uncracked	$k_{ucr,N}$	[-]	11,0						
Concrete cone failure	Edge distance	$c_{cr,N}$	[mm]	1,5 h_{ef}						
	Spacing	$s_{cr,N}$	[mm]	3 h_{ef}						
Characteristic resistance		$N^0_{Rk,sp}$	[kN]	$N_{Rk,p}$						
Splitting failure	Edge distance	$c_{cr,sp}$	[mm]	1,5 h_{ef}	1,5 h_{ef}		1,8 h_{ef}		1,8 h_{ef}	
	Spacing	$s_{cr,sp}$	[mm]	3 h_{ef}	3 h_{ef}		3,6 h_{ef}		3,6 h_{ef}	
Robustness		γ_{inst}	[-]	1,4	1,0	1,2	1,2	1,0	1,2	
Concrete pry-out failure										
Pry-out factor		k_8	[mm]	1,5	2,0					
Concrete edge failure										
Effective length of anchor		l_f	[mm]	55	60	80	70	90	70	110
Effective diameter of anchor		d_{nom}	[mm]	6	8		10		14	

[1] In absence of other national regulations.
[2] In case $h_{nom} > h_{nom1}$ and $< h_{nom2}$ the actual h_{ef} for concrete failure can be calculated according to Tables A6 or A7
[3] $N^0_{Rk,c}$ for C20/25 according to EN 1992-4:2018

Hilti screw anchor HUS4	**Annex C7**
Performances Essential characteristics under static and quasi-static load in concrete	

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Table C5: Essential characteristics for seismic performance category C1 in concrete for HUS4 carbon steel size 8 to 10

Fastener size HUS4				**8**		**8**			**10**		
Type				**H(F), C**		**T-H(F), T-C**			**H(F), C, A(F)**		
Nominal embedment depth		h_{nom}	[mm]	h_{nom2}	h_{nom3}	h_{nom1}	h_{nom2}	h_{nom3}	h_{nom1}	h_{nom2}	h_{nom3}
				60	70	50	60	70	55	75	85
Adjustment											
Total max. thickness of adjustment layers		t_{adj}	[mm]	10	10	-	10	10	-	10	10
Max. number of adjustments		n_{adj}	[-]	2	2	-	2	2	-	2	2
Steel failure for tension and shear load											
Characteristic resistance		$N_{Rk,s,C1}$	[kN]	36,0		39,2			55,0		
Partial factor		$\gamma_{Ms,N}$ [1]	[-]	1,5		1,4			1,5		
Characteristic resistance		$V_{Rk,s,C1}$	[kN]	18,8		16,5			26,1	26,7	
Partial factor		$\gamma_{Ms,V}$ [1]	[-]	1,25		1,5			1,25		
Reduction factor acc. to EN 1992-4:2018 annular gap unfilled		α_{gap}	[-]	0,5							
Reduction factor acc. to EN 1992-4:2018 annular gap filled		α_{gap}	[-]	1,0							
Pull-out failure											
Characteristic resistance in cracked concrete		$N_{Rk,p,C1}$	[kN]	≥ $N^0_{Rk,c}$ [3]		6	9	12	≥ $N^0_{Rk,c}$ [3]		
Concrete cone failure											
Effective embedment depth		h_{ef} [2]	[mm]	47,6	56,1	40	46,4	54,9	42,5	59,5	68,0
Concrete cone failure	Edge distance	$c_{cr,N}$	[mm]	1,5 h_{ef}							
	Spacing	$s_{cr,N}$	[mm]	3 h_{ef}							
Installation factor		γ_{inst}	[-]	1,0					1,2	1,0	
Concrete pry-out failure											
Pry-out factor		k_8	[-]	2,0		1,0	2,0		1,0	2,0	
Concrete edge failure											
Effective length of fastener		l_f	[mm]	60	70	50	60	70	55	75	85
Outside diameter of fastener		d_{nom}	[mm]	8		8			10		

[1] In absence of other national regulations.
[2] In case $h_{nom} > h_{nom1}$ and $< h_{nom3}$ the actual h_{ef} for concrete failure can be calculated according to Tables A4, A5 or A7
[3] $N^0_{Rk,c}$ for C20/25 according to EN 1992-4:2018

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Table C6: Essential characteristics for seismic performance category C1 in concrete for HUS4 carbon steel size 10 to 14

Fastener size HUS4				**10**			**12**			**14**		
Type				**T-H(F), T-C**			**H(F)**			**H(F), A(F)**		
Nominal embedment depth		h_{nom}	[mm]	h_{nom1}	h_{nom2}	h_{nom3}	h_{nom1}	h_{nom2}	h_{nom3}	h_{nom1}	h_{nom2}	h_{nom3}
				55	75	85	60	80	100	65	85	115
Adjustment												
Total max. thickness of adjustment layers		t_{adj}	[mm]	-	10	10	10	10	10	10	10	10
Max. number of adjustments		n_{adj}	[-]	-	2	2	2	2	2	2	2	2
Steel failure for tension and shear load												
Characteristic resistance		$N_{Rk,s,C1}$	[kN]	62,2			79,0			101,5		
Partial factor		$\gamma_{Ms,N}$ [1]	[-]	1,5								
Characteristic resistance		$V_{Rk,s,C1}$	[kN]	25,7			33,2	38,9		46,0		
Partial factor		$\gamma_{Ms,V}$ [1]	[-]	1,5			1,25					
Reduction factor acc. to EN 1992-4: 2018 annular gap unfilled		α_{gap}	[-]	0,5								
Reduction factor acc. to EN 1992-4: 2018 annular gap filled		α_{gap}	[-]	1,0								
Pull-out failure												
Characteristic resistance in cracked concrete		$N_{Rk,p,C1}$	[kN]	9	15	19	$\geq N^0_{Rk,c}$ [3]					
Concrete cone failure												
Effective embedment depth		h_{ef} [2]	[mm]	41,6	58,6	67,1	45,9	62,9	79,9	49,3	66,3	91,8
Concrete cone failure	Edge distance	$c_{cr,N}$	[mm]	1,5 h_{ef}								
	Spacing	$s_{cr,N}$	[mm]	3 h_{ef}								
Installation factor		γ_{inst}	[-]	1,0								
Concrete pry-out failure												
Pry-out factor		k_8	[-]	1,0	2,0		2,0					
Concrete edge failure												
Effective length of fastener		l_f	[mm]	55	75	85	60	80	100	65	85	115
Outside diameter of fastener		d_{nom}	[mm]	10			12			14		

[1] In absence of other national regulations.
[2] In case $h_{nom} > h_{nom1}$ and $< h_{nom3}$ the actual h_{ef} for concrete failure can be calculated according to Tables A4, A5 or A7
[3] $N^0_{Rk,c}$ for C20/25 according to EN 1992-4:2018

Hilti screw anchor HUS4	**Annex C9**
Performances Essential characteristics for seismic performance category C1 in concrete	

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Table C7: Essential characteristics for seismic performance category C1 in concrete for HUS4 carbon steel size 16

Fastener size HUS4				**16**		**16**			**16**
Type				**H(F)**		**H(F) G02**			**DW**
Nominal embedment depth		h_{nom}	[mm]	h_{nom1}	h_{nom2}	h_{nom1}	h_{nom2}	h_{nom3}	h_{nom}
				85	130	85	110	130	130
Adjustment									
Total max. thickness of adjustment layers		t_{adj}	[mm]	-	-	10	10	10	10
Max. number of adjustments		n_{ad}	[-]	-	-	2	2	2	2
Steel failure for tension and shear load									
Characteristic resistance		$N_{Rk,s,C1}$	[kN]	107,7		141,9			120
Partial factor		$\gamma_{Ms,N}$ [1]	[-]	1,5		1,5			1,5
Characteristic resistance		$V_{Rk,s,C1}$	[kN]	42,9	25,3	47,9	47,9	51,0	37,0
Partial factor		$\gamma_{Ms,V}$ [1]	[-]	1,25					
Reduction factor acc. to EN 1992-4: 2018 annular gap unfilled		α_{gap}	[-]	0,5					
Reduction factor acc. to EN 1992-4: 2018 annular gap filled		α_{gap}	[-]	1,0					
Pull-out failure									
Characteristic resistance in cracked concrete		$N_{Rk,p,C1}$	[kN]	7,5	19,0	$\geq N^0_{Rk,c}$ [2),3)]			$\geq N^0_{Rk,c}$ [2),3)]
Concrete cone failure									
Effective embedment depth		h_{ef} [2)]	[mm]	66,6	104,9	66,1	87,3	104,3	104,3
Concrete cone failure	Edge distance	$c_{cr,N}$	[mm]	1,5 h_{ef}		1,5 h_{ef}			
	Spacing	$s_{cr,N}$	[mm]	3 h_{ef}		3 h_{ef}			
Installation factor		γ_{inst}	[-]	1,0		1,0			
Concrete pry-out failure									
Pry-out factor		k_8	[-]	2,0					
Concrete edge failure									
Effective length of fastener		l_f	[mm]	85	130	85	110	130	130
Outside diameter of fastener		d_{nom}	[mm]	16					

[1)] In absence of other national regulations.
[2)] In case $h_{nom} > h_{nom1}$ and $< h_{nom3}$ the actual h_{ef} for concrete and pullout failure can be calculated according to Table A5
[3)] $N^0_{Rk,c}$ for C20/25 according to EN 1992-4:2018

Hilti screw anchor HUS4	**Annex C10**
Performances Essential characteristics for seismic performance category C1 in concrete	

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Table C8: Essential characteristics for seismic performance category C1 in concrete for HUS4 stainless steel

Fastener size HUS4				**8**	**10**	**14**
Type				**HR, CR**	**HR, CR**	**HR**
Nominal embedment depth		h_{nom}	[mm]	h_{nom2}	h_{nom2}	h_{nom2}
				80	90	110
Steel failure for tension and shear load						
Characteristic resistance		$N_{Rk,s,C1}$	[kN]	34,0	52,6	102,2
Partial factor		$\gamma_{Ms,N}$[1)]	[-]	1,4		
Characteristic resistance		$V_{Rk,s,C1}$	[kN]	11,1	17,9	53,9
Partial factor		$\gamma_{Ms,V}$[1)]	[-]	1,5		
Pull-out failure						
Characteristic resistance in cracked concrete		$N_{Rk,p,C1}$	[kN]	7,7	12,5	17,5
Concrete cone failure						
Effective embedment depth		h_{ef}	[mm]	64	71	86
Concrete cone failure	Edge distance	$c_{cr,N}$	[mm]	1,5 h_{ef}		
	Spacing	$s_{cr,N}$	[mm]	3 h_{ef}		
Robustness		γ_{inst}	[-]	1,2	1,0	1,2
Concrete pry-out failure						
Pry-out factor		k_8	[-]	2,0		
Concrete edge failure						
Effective length of fastener		$l_f = h_{ef}$	[mm]	64	71	86
Outside diameter of fastener		d_{nom}	[mm]	8	10	14

[1)] In absence of other national regulations.

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Table C9: Essential characteristics for seismic performance category C2 in concrete for HUS4 carbon steel size 8 to 10

Fastener size HUS4 / **Type**				**8** **H(F), C**		**8** **T-H(F), T-C**			**10** **H(F), C, A(F)**		
Nominal embedment depth		h_{nom}	[mm]	h_{nom2}	h_{nom3}	h_{nom1}	h_{nom2}	h_{nom3}	h_{nom1}	h_{nom2}	h_{nom3}
				60	70	50	60	70	55	75	85
Adjustment											
Total max. thickness of adjustment layers		t_{adj}	[mm]	10	10	-	10	10	-	10	10
Max. number of adjustments		n_{adj}	[-]	2	2	-	2	2	-	2	2
Steel failure for tension											
Characteristic resistance		$N_{Rk,s,C2}$	[kN]	36,0		39,2			55,0		
Partial factor		$\gamma_{Ms,N}$ [1]	[-]	1,5		1,4			1,5		
Steel failure for shear load											
Partial factor		$\gamma_{Ms,V}$ [1]	[-]	1,25		1,5			1,25		
Installation with Hilti filling set (HUS4-H and HUS4-A)											
Characteristic resistance		$V_{Rk,s,C2}$	[kN]	8,7	16,0	9,2		14,7	15,1		23,2
Partial factor annular gap filled		α_{gap}	[-]	1,0							
Installation without Hilti filling set											
Characteristic resistance		$V_{Rk,s,C2}$	[kN]	8,7	10,8	9,2		10,8	14,8		
Partial factor annular gap not filled		α_{gap}	[-]	0,5							
Pull-out failure											
Characteristic resistance in cracked concrete		$N_{Rk,p,C2}$	[kN]	1,8	2,7	2,3	2,8	3,2	2,6	3,6	5,4
Concrete cone failure											
Effective embedment depth		h_{ef} [2]	[mm]	47,6	56,1	40	46,4	54,9	42,5	59,5	68,0
Concrete cone failure	Edge distance	$c_{cr,N}$	[mm]	1,5 h_{ef}							
	Spacing	$s_{cr,N}$	[mm]	3 h_{ef}							
Installation factor		γ_{inst}	[-]	1,0					1,2	1,0	
Concrete pry-out failure											
Pry-out factor		k_8	[-]	2,0		1,0	2,0		1,0	2,0	
Concrete edge failure											
Effective length of fastener		l_f	[mm]	60	70	50	60	70	55	75	85
Outside diameter of fastener		d_{nom}	[mm]	8		8			10		

[1] In absence of other national regulations.
[2] In case $h_{nom} > h_{nom1}$ and $< h_{nom3}$ the actual h_{ef} for concrete failure can be calculated according to Tables A4, A5 or A7

Hilti screw anchor HUS4	**Annex C12**
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Table C10: Essential characteristics for seismic performance category C2 in concrete for HUS4 carbon steel size 10 to 14

Fastener size HUS4 **Type**				**10** **T-H(F), T-C**			**12** **H(F)**			**14** **H(F), A(F)**		
Nominal embedment depth		h_{nom}	[mm]	h_{nom1} 55	h_{nom2} 75	h_{nom3} 85	h_{nom1} 60	h_{nom2} 80	h_{nom3} 100	h_{nom1} 65	h_{nom2} 85	h_{nom3} 115
Adjustment												
Total max. thickness of adjustment layers		t_{adj}	[mm]	-	10	10	10	10	10	10	10	10
Max. number of adjustments		n_a	[-]	-	2	2	2	2	2	2	2	2
Steel failure for tension												
Characteristic resistance		$N_{Rk,s,C2}$	[kN]	62,2			79,0			101,5		
Partial factor		$\gamma_{Ms,N}$ [1]	[-]	1,4			1,5					
Steel failure for shear load												
Partial factor		$\gamma_{Ms,V}$ [1]	[-]	1,5			1,25					
Installation with Hilti filling set (HUS4-H and HUS4-A)												
Characteristic resistance		$V_{Rk,s,C2}$	[kN]	13,3		25,6	20,0		28,6	29,2		46,5
Partial factor annular gap filled		α_{gap}	[-]	1,0								
Installation without Hilti filling set												
Characteristic resistance		$V_{Rk,s,C2}$	[kN]	13,3		17,7	20,0		23,7	29,2		34,4
Partial factor annular gap not filled		α_{gap}	[-]	0,5								
Pull-out failure												
Characteristic resistance in cracked concrete		$N_{Rk,p,C2}$	[kN]	2,8	5,4	6,4	5,7	8,5	11,4	5,4	8,9	17,7
Concrete cone failure												
Effective embedment depth		h_{ef} [2]	[mm]	41,6	58,6	67,1	45,9	62,9	79,9	49,3	66,3	91,8
Concrete cone failure	Edge distance	$c_{cr,N}$	[mm]	1,5 h_{ef}								
	Spacing	$s_{cr,N}$	[mm]	3 h_{ef}								
Installation factor		γ_{inst}	[-]	1,0								
Concrete pry-out failure												
Pry-out factor		k_8	[-]	1,0	2,0		2,0					
Concrete edge failure												
Effective length of fastener		l_f	[mm]	55	75	85	60	80	100	65	85	115
Outside diameter of fastener		d_{nom}	[mm]	10			12			14		

[1] In absence of other national regulations.
[2] In case $h_{nom} > h_{nom1}$ and $< h_{nom3}$ the actual h_{ef} for concrete failure can be calculated according to Tables A4, A5 or A7

Hilti screw anchor HUS4	**Annex C13**
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Table C11: Essential characteristics for seismic performance category C2 in concrete for HUS4 carbon steel size 16

Fastener size HUS4				**16**			**16**
Type				**H(F) G02**			**DW**
Nominal embedment depth		h_{nom}	[mm]	h_{nom1}	h_{nom2}	h_{nom3}	h_{nom3}
				85	110	130	130
Adjustment							
Total max. thickness of adjustment layers		t_{adj}	[mm]	10	10	10	10
Max. number of adjustments		n_a	[-]	2	2	2	2
Steel failure for tension load							
Characteristic resistance		$N_{Rk,s,C2}$	[kN]	141,9			120
Partial factor		$\gamma_{Ms,N}$[1)]	[-]	1,5			
Steel failure for shear load							
Partial factor		$\gamma_{Ms,V}$[1)]	[-]	1,25			
Installation with Hilti filling set							
Characteristic resistance		$V_{Rk,s,C2}$	[kN]	58,1	58,1	61,8	44,0
Partial factor annular gap filled		α_{gap}	[-]	1,0			
Installation without Hilti filling set							
Characteristic resistance		$V_{Rk,s,C2}$	[kN]	58,1	58,1	61,8	44,0
Partial factor annular gap not filled		α_{gap}	[-]	0,5			
Pull-out failure							
Characteristic resistance in cracked concrete		$N_{Rk,p,C2}$	[kN]	11,7	20,1	25,8	25,8
Concrete cone failure							
Effective embedment depth		h_{ef}[2)]	[mm]	66,1	87,3	104,3	104,3
Concrete cone failure	Edge distance	$c_{cr,N}$	[mm]	1,5 h_{ef}			
	Spacing	$s_{cr,N}$	[mm]	3 h_{ef}			
Installation factor		γ_{inst}	[-]	1,0			
Concrete pry-out failure							
Pry-out factor		k_8	[-]	2,0			
Concrete edge failure							
Effective length of fastener		l_f	[mm]	85	110	130	130
Outside diameter of fastener		d_{nom}	[mm]	16			

[1)] In absence of other national regulations.
[2)] In case $h_{nom} > h_{nom1}$ and $< h_{nom3}$ the actual h_{ef} for concrete failure can be calculated according to Table A6 or A8

Hilti screw anchor HUS4	**Annex C14**
Performances Essential characteristics for seismic performance category C2 in concrete	

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Table C12: Essential characteristics under fire exposure in concrete for HUS4 (T)-H carbon steel sizes 8 and 10

Fastener size HUS4 (T)-H(F)				**8**			**T-8**			**10**		
				h_{nom1}	h_{nom2}	h_{nom3}	h_{nom1}	h_{nom2}	h_{nom3}	h_{nom1}	h_{nom2}	h_{nom3}
Nominal embedment depth		h_{nom}	[mm]	40	60	70	50	60	70	55	75	85
Adjustment												
Total max. thickness of adjustment layers		t_{adj}	[mm]	-	10	10	-	10	10	-	10	10
Max. number of adjustments		n_a	[-]	-	2	2	-	2	2	-	2	2
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]	2,6			3,2	3,5	3,8	4,1	4,2	
	R60	$F_{Rk,s,fi}$	[kN]	1,9			2,4	2,6	2,8	3,1	3,1	
	R90	$F_{Rk,s,fi}$	[kN]	1,2			1,6	1,6	1,9	2,2	2,3	
	R120	$F_{Rk,s,fi}$	[kN]	0,9			1,2	1,2	1,5	1,5	1,7	
	R30	$M^0_{Rk,s,fi}$	[Nm]	2,3			3,8	4,1	4,4	4,8	4,9	
	R60	$M^0_{Rk,s,fi}$	[Nm]	1,7			2,8	3,0	3,4	3,6	3,7	
	R90	$M^0_{Rk,s,fi}$	[Nm]	1,1			1,9	1,9	2,3	2,6	2,7	
	R120	$M^0_{Rk,s,fi}$	[Nm]	0,8			1,5	1,4	1,7	1,8	1,9	
Pull-out failure												
Characteristic resistance	R30 R60 R90	$N^0_{Rk,p,fi}$	[kN]	1,3	2,8	3,6	1,5	2,3	3,0	2,3	3,9	4,7
	R120	$N^0_{Rk,p,fi}$	[kN]	1,0	2,2	2,8	1,2	1,8	2,4	1,9	3,1	3,7
Concrete cone failure												
Characteristic resistance	R30 R60 R90	$N^0_{Rk,c,fi}$	[kN]	0,8	2,6	4,0	1,8	2,6	4,0	2,0	4,7	6,5
	R120	$N^0_{Rk,c,fi}$	[kN]	0,7	2,1	3,2	1,4	2,1	3,2	1,6	3,7	5,2
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												
Fastener spacing												
R30 to R120		$s_{cr,fi}$	[mm]	2 $c_{cr,fi}$								
Concrete pry-out failure												
R30 to R120		k_8	[-]	1,0		2,0	1,0		2,0	1,0		2,0
The anchorage depth shall be increased for wet concrete by at least 30 mm compared to the given value												

Hilti screw anchor HUS4	**Annex C15**
Performances Essential characteristics under fire exposure in concrete	

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Table C13: Essential characteristics under fire exposure in concrete for HUS4 (T)-H carbon steel sizes 10 to 14

Fastener size HUS4 (T)-H(F)				**T-10**			**12**			**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]	55	75	85	60	80	100	65	85	115
Adjustment												
Total max. thickness of adjustment layers		t_{adj}	[mm]	-	10	10	10	10	10	10	10	10
Max. number of adjustments		n_a	[-]	-	2	2	2	2	2	2	2	2
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]	6,1	6,2		7,5	7,6	7,6	10,3	10,4	10,5
	R60	$F_{Rk,s,fi}$	[kN]	4,6	4,7		5,5	5,7	5,8	7,7	7,9	8,0
	R90	$F_{Rk,s,fi}$	[kN]	3,1	3,2		3,7	3,9	4,1	5,2	5,6	5,8
	R120	$F_{Rk,s,fi}$	[kN]	2,4	2,5		2,8	3,0	3,1	3,9	4,2	4,4
	R30	$M^0_{Rk,s,fi}$	[Nm]	9,1	9,2		11,4	11,6	11,6	18,9	19,2	19,3
	R60	$M^0_{Rk,s,fi}$	[Nm]	6,9	7,0		8,4	8,8	8,9	14,1	14,6	14,8
	R90	$M^0_{Rk,s,fi}$	[Nm]	4,6	4,8		5,7	6,0	6,2	9,5	10,2	10,7
	R120	$M^0_{Rk,s,fi}$	[Nm]	3,5	3,7		4,3	4,6	4,7	7,2	7,7	8,1
Pull-out failure												
Characteristic resistance	R30 R60 R90	$N^0_{Rk,p,fi}$	[kN]	2,4	4,0	4,9	2,6	4,2	6,1	2,9	4,5	7,5
	R120	$N^0_{Rk,p,fi}$	[kN]	1,9	3,2	3,9	2,1	3,4	4,9	2,3	3,6	6,0
Concrete cone failure												
Characteristic resistance	R30 R60 R90	$N^0_{Rk,c,fi}$	[kN]	2,0	4,7	6,6	2,4	5,4	9,8	2,9	6,1	13,9
	R120	$N^0_{Rk,c,fi}$	[kN]	1,6	3,8	5,3	1,9	4,3	7,8	2,3	4,9	11,1
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												
Fastener spacing												
R30 to R120		$s_{cr,fi}$	[mm]	2 $c_{cr,fi}$								
Concrete pry-out failure												
R30 to R120		k_8	[-]	1,0	2,0		2,0					
The anchorage depth shall be increased for wet concrete by at least 30 mm compared to the given value												

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Table C14: Essential characteristics under fire exposure in concrete for HUS4-H carbon steel size 16

Fastener size HUS4-H(F) (G02)				**H(F) 16**		**H(F) 16 G02**			**DW 16**
				h_{nom1}	h_{nom2}	h_{nom1}	h_{nom2}	h_{nom3}	h_{nom3}
Nominal embedment depth		h_{nom}	[mm]	85	130	85	110	130	130
Adjustment									
Total max. thickness of adjustment layers		t_{adj}	[mm]	-	-	10	10	10	10
Max. number of adjustments		n_a	[-]	-	-	2	2	2	2
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]	10,6	10,7	10,6	10,6	10,7	3,9
	R60	$F_{Rk,s,fi}$	[kN]	8,1	8,2	8,1	8,1	8,2	2,9
	R90	$F_{Rk,s,fi}$	[kN]	5,7	5,9	5,7	5,7	5,9	2,5
	R120	$F_{Rk,s,fi}$	[kN]	4,3	4,5	4,3	4,3	4,5	2,0
	R30	$M^0_{Rk,s,fi}$	[Nm]	23,7	23,9	23,7	23,7	23,9	9,2
	R60	$M^0_{Rk,s,fi}$	[Nm]	18,1	18,3	18,1	18,1	18,3	6,9
	R90	$M^0_{Rk,s,fi}$	[Nm]	12,7	13,2	12,7	12,7	13,2	6,0
	R120	$M^0_{Rk,s,fi}$	[Nm]	9,6	10,0	9,6	9,6	10,0	4,6
Pull-out failure									
Characteristic resistance	R30 R60 R90	$N^0_{Rk,p,fi}$	[kN]	4,6	8,7	5,1	9,1	11,7	11,7
	R120	$N^0_{Rk,p,fi}$	[kN]	3,7	7,0	4,1	7,3	9,4	9,4
Concrete cone failure									
Characteristic resistance	R30 R60 R90	$N^0_{Rk,c,fi}$	[kN]	6,2	19,4	6,1	12,3	19,1	19,1
	R120	$N^0_{Rk,c,fi}$	[kN]	4,9	15,5	4,9	9,8	15,3	15,3
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									
Fastener spacing									
R30 to R120		$s_{cr,fi}$	[mm]	2 $c_{cr,fi}$					
Concrete pry-out failure									
R30 to R120		k_8	[-]	2,0					
The anchorage depth shall be increased for wet concrete by at least 30 mm compared to the given value									

Hilti screw anchor HUS4

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Table C15: Essential characteristics under fire exposure in concrete for HUS4 (T)-C carbon steel size 8

Fastener size HUS4 (T)-C				**8**			**T-8**		
				h_{nom1}	h_{nom2}	h_{nom3}	h_{nom1}	h_{nom2}	h_{nom3}
Nominal embedment depth		h_{nom}	[mm]	40	60	70	50	60	70
Adjustment									
Total max. thickness of adjustment layers		t_{adj}	[mm]	-	10	10	-	10	10
Max. number of adjustments		n_a	[-]	-	2	2	-	2	2
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			0,5		
	R60	$F_{Rk,s,fi}$	[kN]	0,4			0,4		
	R90	$F_{Rk,s,fi}$	[kN]	0,3			0,3		
	R120	$F_{Rk,s,fi}$	[kN]	0,2			0,2		
	R30	$M^0_{Rk,s,fi}$	[Nm]	0,4			0,6		
	R60	$M^0_{Rk,s,fi}$	[Nm]	0,3			0,5		
	R90	$M^0_{Rk,s,fi}$	[Nm]	0,2			0,4		
	R120	$M^0_{Rk,s,fi}$	[Nm]	0,2			0,3		
Pull-out failure									
Characteristic resistance	R30 R60 R90	$N^0_{Rk,p,fi}$	[kN]	1,3	2,8	3,6	1,5	2,3	3,0
	R120	$N^0_{Rk,p,fi}$	[kN]	1,0	2,2	2,8	1,2	1,8	2,4
Concrete cone failure									
Characteristic resistance	R30 R60 R90	$N^0_{Rk,c,fi}$	[kN]	0,8	2,6	4,0	1,8	2,6	4,0
	R120	$N^0_{Rk,c,fi}$	[kN]	0,7	2,1	3,2	1,5	2,1	3,2
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									
Fastener spacing									
R30 to R120		$s_{cr,fi}$	[mm]	2 $c_{cr,fi}$					
Concrete pry-out failure									
R30 to R120		k_8	[-]	1,0	2,0		1,0	2,0	
The anchorage depth shall be increased for wet concrete by at least 30 mm compared to the given value									

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Table C16: Essential characteristics under fire exposure in concrete for HUS4 (T)-C carbon steel size 10

Fastener size HUS4 (T)-C				**10**			**T-10**		
				h_{nom1}	h_{nom2}	h_{nom3}	h_{nom1}	h_{nom2}	h_{nom3}
Nominal embedment depth		h_{nom}	[mm]	55	75	85	55	75	85
Adjustment									
Total max. thickness of adjustment layers		t_{adj}	[mm]	-	10	10	-	10	10
Max. number of adjustments		n_a	[-]	-	2	2	-	2	2
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]	1,0			1,2		
	R60	$F_{Rk,s,fi}$	[kN]	0,9			1,0		
	R90	$F_{Rk,s,fi}$	[kN]	0,7			0,8		
	R120	$F_{Rk,s,fi}$	[kN]	0,6			0,6		
	R30	$M^0_{Rk,s,fi}$	[Nm]	1,2			1,7		
	R60	$M^0_{Rk,s,fi}$	[Nm]	1,0			1,5		
	R90	$M^0_{Rk,s,fi}$	[Nm]	0,8			1,1		
	R120	$M^0_{Rk,s,fi}$	[Nm]	0,6			0,9		
Pull-out failure									
Characteristic resistance	R30 R60 R90	$N^0_{Rk,p,fi}$	[kN]	2,3	3,9	4,7	2,4	4,0	5,0
	R120	$N^0_{Rk,p,fi}$	[kN]	1,9	3,1	3,7	1,9	3,2	4,0
Concrete cone failure									
Characteristic resistance	R30 R60 R90	$N^0_{Rk,c,fi}$	[kN]	2,0	4,7	6,5	2,0	4,7	6,6
	R120	$N^0_{Rk,c,fi}$	[kN]	1,6	3,7	5,2	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									
Fastener spacing									
R30 to R120		$s_{cr,fi}$	[mm]	2 $c_{cr,fi}$					
Concrete pry-out failure									
R30 to R120		k_8	[-]	1,0	2,0		1,0	2,0	
The anchorage depth shall be increased for wet concrete by at least 30 mm compared to the given value									

Hilti screw anchor HUS4	**Annex C19**
Performances Essential characteristics under fire exposure in concrete	

Deutsches Institut für Bautechnik DIBt

Table C17: Essential characteristics under fire exposure in concrete for HUS4-A carbon steel

Fastener size HUS4-A(F)				**10**			**14**		
				h_{nom1}	h_{nom2}	h_{nom3}	h_{nom1}	h_{nom2}	h_{nom3}
Nominal embedment depth		h_{nom}	[mm]	55	75	85	65	85	115
Adjustment									
Total max. thickness of adjustment layers		t_{adj}	[mm]	-	10	10	10	10	10
Max. number of adjustments		n_a	[-]	-	2	2	2	2	2
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]	4,2			8,4		
	R60	$F_{Rk,s,fi}$	[kN]	3,3			6,8		
	R90	$F_{Rk,s,fi}$	[kN]	2,5			5,1		
	R120	$F_{Rk,s,fi}$	[kN]	2,1			4,3		
	R30	$M^0_{Rk,s,fi}$	[Nm]	4,8			15,4		
	R60	$M^0_{Rk,s,fi}$	[Nm]	3,8			12,4		
	R90	$M^0_{Rk,s,fi}$	[Nm]	2,9			9,3		
	R120	$M^0_{Rk,s,fi}$	[Nm]	2,4			7,8		
Pull-out failure									
Characteristic resistance	R30 R60 R90	$N^0_{Rk,p,fi}$	[kN]	2,3	3,9	4,7	2,9	4,5	7,5
	R120	$N^0_{Rk,p,fi}$	[kN]	1,9	3,1	3,7	2,3	3,6	6,0
Concrete cone failure									
Characteristic resistance	R30 R60 R90	$N^0_{Rk,c,fi}$	[kN]	2,0	4,7	6,5	2,9	6,1	13,9
	R120	$N^0_{Rk,c,fi}$	[kN]	1,6	3,7	5,2	2,3	4,9	11,1
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									
Fastener spacing									
R30 to R120		$s_{cr,fi}$	[mm]	2 $c_{cr,fi}$					
Concrete pry-out failure									
R30 to R120		k_8	[-]	1,0	2,0				
The anchorage depth shall be increased for wet concrete by at least 30 mm compared to the given value									

Hilti screw anchor HUS4	**Annex C20**
Performances Essential characteristics under fire exposure in concrete	

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Table C18: Essential characteristics under fire exposure in concrete for HUS4 stainless steel

Fastener size HUS4				**6**		**8**				**10**				**14**	
Type				**HR**	**CR**	**HR**		**CR**		**HR**		**CR**		**HR**	
				h_{nom1}		h_{nom1}	h_{nom2}	h_{nom1}	h_{nom2}	h_{nom1}	h_{nom2}	h_{nom1}	h_{nom2}	h_{nom1}	h_{nom2}
Nominal embedment depth		h_{nom}	[mm]	55		60	80	60	80	70	90	70	90	70	110
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]	4,9	0,2	9,3		0,8		18,5		1,4		41,7	
	R60	$F_{Rk,s,fi}$	[kN]	3,3	0,2	6,3		0,6		12,0		1,1		26,9	
	R90	$F_{Rk,s,fi}$	[kN]	1,8	0,2	3,2		0,5		5,4		0,9		12,2	
	R120	$F_{Rk,s,fi}$	[kN]	1,0	0,1	1,7		0,4		2,4		0,8		5,4	
	R30	$M^0_{Rk,s,fi}$	[Nm]	4,0	0,2	8,2		0,8		19,4		1,5		65,6	
	R60	$M^0_{Rk,s,fi}$	[Nm]	2,7	0,2	5,5		0,7		12,6		1,2		42,4	
	R90	$M^0_{Rk,s,fi}$	[Nm]	1,4	0,1	2,8		0,5		5,7		0,9		19,2	
	R120	$M^0_{Rk,s,fi}$	[Nm]	0,8	0,1	1,5		0,4		2,5		0,8		8,5	
Concrete pull-out failure															
Characteristic resistance	R30 R60 R90	$N_{Rk,p,fi}$	[kN]	1,3		1,5	3,0	1,5	3,0	2,3	4,0	2,3	4,0	3,0	6,3
	R120	$N_{Rk,p,fi}$	[kN]	1,0		1,2	2,4	1,2	2,4	1,8	3,2	1,8	3,2	2,4	5,0
Edge distance															
R30 to R120		$c_{cr,fi}$	[mm]	$2\ h_{ef}$											
Anchor spacing															
R30 to R120		$s_{cr,fi}$	[mm]	$2\ c_{cr,fi}$											
Concrete pry-out failure															
R30 to R120		k_8	[-]	1,5		2,0									

Hilti screw anchor HUS4	**Annex C21**
Performances Essential characteristics under fire exposure in concrete	

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Table C19: Displacements under tension loads for HUS4 carbon steel

Fastener size HUS4				**8**			**8**			**10**		
Type				**H(F), C**			**T-H(F), T-C**			**H(F), C, A(F)**		
				h_{nom1}	h_{nom2}	h_{nom3}	h_{nom1}	h_{nom2}	h_{nom3}	h_{nom1}	h_{nom2}	h_{nom3}
Nominal embedment depth		h_{nom}	[mm]	40	60	70	50	60	70	55	75	85
Cracked concrete C20/25 to C50/60	Tension Load	N	[kN]	2,6	5,4	6,9	4,3	5,7	7,6	3,8	7,5	8,6
	Displacement	δ_{N0}	[mm]	0,1	0,3	0,4	0,3	0,4	0,3	0,2	0,4	0,4
		$\delta_{N\infty}$	[mm]	0,3	0,4	0,4	0,7	0,7	0,6	0,7	0,7	0,9
Uncracked concrete C20/25 to C50/60	Tension Load	N	[kN]	3,7	7,1	9,1	6,6	8,9	11,8	5,2	10,5	12,2
	Displacement	δ_{N0}	[mm]	0,1	0,2	0,2	0,1	0,2	0,1	0,1	0,3	0,3
		$\delta_{N\infty}$	[mm]	0,3	0,4	0,4	0,3	0,3	0,3	0,7	0,7	0,9

Fastener size HUS4				**10**			**12**			**14**		
Type				**T-H(F), T-C**			**H**			**H(F), A(F)**		
				h_{nom1}	h_{nom2}	h_{nom3}	h_{nom1}	h_{nom2}	h_{nom3}	h_{nom1}	h_{nom2}	h_{nom3}
Nominal embedment depth		h_{nom}	[mm]	55	75	85	60	80	100	65	85	115
Cracked concrete C20/25 to C50/60	Tension Load	N	[kN]	5,7	9,5	13,2	5,1	8,2	11,7	5,7	8,6	14,4
	Displacement	δ_{N0}	[mm]	0,4	0,4	0,4	0,3	0,4	0,6	0,3	0,4	0,7
		$\delta_{N\infty}$	[mm]	0,4	0,4	0,5	0,9	0,9	1,2	1,3	1,3	1,5
Uncracked concrete C20/25 to C50/60	Tension Load	N	[kN]	8,7	14,8	20,5	6,8	10,8	15,5	7,5	11,7	19,1
	Displacement	δ_{N0}	[mm]	0,1	0,1	0,1	0,2	0,3	0,4	0,2	0,3	0,5
		$\delta_{N\infty}$	[mm]	0,2	0,2	0,2	0,9	0,9	1,2	1,3	1,3	1,5

Fastener size HUS4				**16**		**16**			**16**
Type				**H(F)**		**H(F) G02**			**DW**
				h_{nom1}	h_{nom2}	h_{nom1}	h_{nom2}	h_{nom3}	h_{nom}
Nominal embedment depth		h_{nom}	[mm]	85	130	85	110	130	130
Cracked concrete C20/25 to C50/60	Tension Load	N	[kN]	8,7	16,7	8,8	13,4	17,5	17,5
	Displacement	δ_{N0}	[mm]	0,1	0,4	0,14	0,17	0,18	0,18
		$\delta_{N\infty}$	[mm]	1,3	1,4	0,88	1,07	1,11	1,11
Uncracked concrete C20/25 to C50/60	Tension Load	N	[kN]	11,5	22,9	12,6	19,1	25,0	25,0
	Displacement	δ_{N0}	[mm]	0,4	0,3	0,12	0,14	0,15	0,15
		$\delta_{N\infty}$	[mm]	1,3	1,4	0,56	0,56	0,56	0,56

Hilti screw anchor HUS4

Performances
Displacement values in case of static and quasi-static loading

Annex C22

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Table C20: Displacements under tension loads for HUS4 stainless steel

Fastener size HUS				**6**	**8**		**10**				**14**	
Type				**HR, CR**	**HR, CR**		**HR, CR**		**H**		**HR**	
				h_{nom1}	h_{nom1}	h_{nom2}	h_{nom1}	h_{nom2}	h_{nom1}	h_{nom2}	h_{nom1}	h_{nom2}
Nominal anchorage depth		h_{nom}	[mm]	55	60	80	70	90	70	85	70	110
Cracked concrete C20/25 to C50/60	Tension load	N	[kN]	1,7	2,4	4,8	3,6	6,3	3,0	4,1	4,8	9,9
	Displacement	δ_{N0}	[mm]	0,4	0,5	0,7	0,3	0,6	0,2	0,3	0,9	1,4
		$\delta_{N\infty}$	[mm]	0,5	0,7	1,1	0,6	1,1	0,3	0,7	1,1	1,4
		$\delta_{N,seis}$	[mm]	[1]	[1]	1,2	[1]	1,2	[1]	1,2	[1]	0,4
Uncracked concrete C20/25 to C50/60	Tension load	N	[kN]	3,1	4,8	6,3	6,3	9,9	4,8	6,8	7,5	16,0
	Displacement	δ_{N0}	[mm]	0,8	0,7	1,6	0,3	1,3	0,2	0,3	0,7	1,0
		$\delta_{N\infty}$	[mm]	0,8	0,7	1,6	0,3	1,3	0,3	0,7	0,7	1,0

[1] No performance assessed.

Hilti screw anchor HUS4

Performances
Displacement values in case of static and quasi-static loading

Annex C23

Table C21: Displacements under shear loads for HUS4 carbon steel

Fastener size HUS4				**8**			**8**			**10**		
Type				**H(F), C**			**T-H(F), T-C**			**H(F), C, A(F)**		
				h_{nom1}	h_{nom2}	h_{nom3}	h_{nom1}	h_{nom2}	h_{nom3}	h_{nom1}	h_{nom2}	h_{nom3}
Nominal embedment depth		h_{nom}	[mm]	40	60	70	40	60	70	55	75	85
Concrete C20/25 to C50/60	Shear Load	V	[kN]	10,7	10,7	12,5	8,1	8,1	8,1	16,5	16,5	18,3
	Displacement	δ_{V0}	[mm]	1,3	1,1	0,9	2,5	3,4	2,9	1,4	1,3	1,0
		$\delta_{V\infty}$	[mm]	2,0	1,7	1,4	3,7	5,1	4,4	2,1	2,0	1,5

Fastener size HUS4				**10**			**12**			**14**		
Type				**T-H(F), T-C**			**H(F)**			**H(F), A(F)**		
				h_{nom1}	h_{nom2}	h_{nom3}	h_{nom1}	h_{nom2}	h_{nom3}	h_{nom1}	h_{nom2}	h_{nom3}
Nominal embedment depth		h_{nom}	[mm]	55	75	85	60	80	100	65	85	115
Concrete C20/25 to C50/60	Shear Load	V	[kN]	13,3			22,2	22,2	25,7	31,4	35,4	35,4
	Displacement	δ_{V0}	[mm]	3,8	3,7	3,2	1,6	1,6	0,9	5,3	5,3	4,0
		$\delta_{V\infty}$	[mm]	5,7	5,5	4,9	2,3	2,4	1,4	7,9	7,9	6,0

Fastener size HUS4				**16**		**16**			**16**
Type				**H(F)**		**H(F) G02**			**DW**
				h_{nom1}	h_{nom2}	h_{nom1}	h_{nom2}	h_{nom3}	h_{nom}
Nominal embedment depth		h_{nom}	[mm]	85	130	85	110	130	130
Concrete C20/25 to C50/60	Shear Load	V	[kN]	37,2	41,8	44,5	44,5	44,5	44,5
	Displacement	δ_{V0}	[mm]	2,3	1,8	3,5	3,5	3,5	3,5
		$\delta_{V\infty}$	[mm]	3,5	2,7	5,3	5,3	5,3	5,3

Table C22: Displacements under shear loads for HUS4 stainless steel

Fastener size HUS4				**6**	**8**		**10**		**14**	
Type				**HR, CR**	**HR, CR**		**HR, CR**		**HR**	
				h_{nom1}	h_{nom1}	h_{nom2}	h_{nom1}	h_{nom2}	h_{nom1}	h_{nom2}
Nominal anchorage depth		h_{nom}	[mm]	55	60	80	70	90	70	110
Concrete C20/25 to C50/60	Shear load	V	[kN]	7,8	11,0	12,4	13,6	15,7	12,9	27,3
	Displacement	δ_{V0}	[mm]	0,4	2,0	2,3	1,1	1,7	3,5	3,9
		$\delta_{V\infty}$	[mm]	0,5	2,4	2,9	1,5	2,4	3,9	4,3
		$\delta_{V,C1}$	[mm]	[1]	[1]	4,8	[1]	5,3	[1]	7,6

[1] No performance assessed.

Hilti screw anchor HUS4

Performances
Displacement values in case of static and quasi-static loading

Annex C24

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Table C23: Displacements under tension and shear loads for seismic category C2 for HUS 4 carbon steel

Fastener size HUS4			**8**		**8**			**10**		
Type			**H(F), C**		**T-H(F), T-C**			**H(F), C, A(F)**		
			h_{nom2}	h_{nom3}	h_{nom1}	h_{nom2}	h_{nom3}	h_{nom1}	h_{nom2}	h_{nom3}
Nominal embedment depth	h_{nom}	[mm]	60	70	50	60	70	55	75	85
Tension load										
Displacement DLS	$\delta_{N,C2\ (DLS)}$	[mm]	0,59		0,35			0,80		
Displacement ULS	$\delta_{N,C2\ (ULS)}$	[mm]	1,36		0,65			3,66		
Shear load with Hilti filling set (HUS4-H and HUS4-A)										
Displacement DLS	$\delta_{V,C2\ (DLS)}$	[mm]	3,57	1,85	3,37		1,81	4,32		1,72
Displacement ULS	$\delta_{V,C2\ (ULS)}$	[mm]	5,56	5,44	5,38		4,60	7,72		6,88
Shear load without Hilti filling set										
Displacement DLS	$\delta_{V,C2\ (DLS)}$	[mm]	3,57	4,64	3,37		3,93	4,32		5,02
Displacement ULS	$\delta_{V,C2\ (ULS)}$	[mm]	5,56	7,96	5,38		5,55	7,72		8,97

Fastener size HUS4			**10**			**12**			**14**		
Type			**T-H(F), T-C**			**H(F)**			**H(F), A(F)**		
			h_{nom1}	h_{nom2}	h_{nom3}	h_{nom1}	h_{nom2}	h_{nom3}	h_{nom1}	h_{nom2}	h_{nom3}
Nominal embedment depth	h_{nom}	[mm]	55	75	85	60	80	100	65	85	115
Tension load											
Displacement DLS	$\delta_{N,C2\ (DLS)}$	[mm]	0,57			0,77			1,06		
Displacement ULS	$\delta_{N,C2\ (ULS)}$	[mm]	2,08			2,78			3,89		
Shear load with Hilti filling set (HUS4-H and HUS4-A)											
Displacement DLS	$\delta_{V,C2\ (DLS)}$	[mm]	4,07		1,80	4,05		1,73	4,00		2,52
Displacement ULS	$\delta_{V,C2\ (ULS)}$	[mm]	7,50		4,03	7,07		5,62	6,09		6,79
Shear load without Hilti filling set											
Displacement DLS	$\delta_{V,C2\ (DLS)}$	[mm]	4,07		4,15	4,05		4,90	4,00		4,93
Displacement ULS	$\delta_{V,C2\ (ULS)}$	[mm]	7,50		6,15	7,07		7,00	6,09		9,14

Hilti screw anchor HUS4

Performances
Displacement values in case of seismic C2 loading

Annex C25

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Table C23 continued

Fastener size HUS4 **Type**			**16** **H(F) G02**			**16** **DW**
			h_{nom1}	h_{nom2}	h_{nom3}	h_{nom}
Nominal embedment depth	h_{nom}	[mm]	85	110	130	130
Tension load						
Displacement DLS	$\delta_{N,C2\ (DLS)}$	[mm]	1,56	1,68		
Displacement ULS	$\delta_{N,C2\ (ULS)}$	[mm]	4,64	4,69		
Shear load with Hilti filling set						
Displacement DLS	$\delta_{V,C2\ (DLS)}$	[mm]	5,84			
Displacement ULS	$\delta_{V,C2\ (ULS)}$	[mm]	11,04			
Shear load without Hilti filling set						
Displacement DLS	$\delta_{V,C2\ (DLS)}$	[mm]	5,84			
Displacement ULS	$\delta_{V,C2\ (ULS)}$	[mm]	11,04			

Hilti screw anchor HUS4

Performances
Displacement values in case of seismic C2 loading

Annex C26