Hilti HUS4 Screw Anchor

Submission Folder

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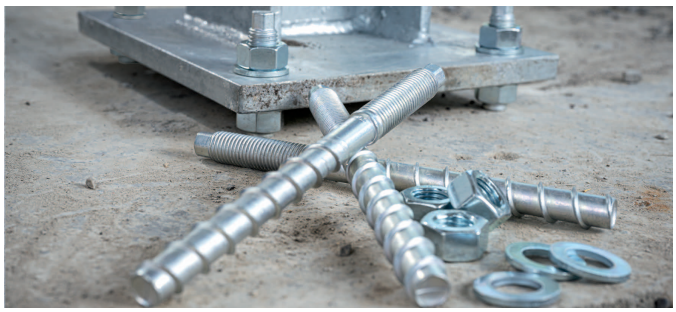
Screw anchor HUS4



BASE MATERIALS

- Concrete (aerated)
- Concrete (cracked)
- Concrete (hollow deck)
- Concrete (uncracked)
- Masonry (solid)

APPLICATIONS

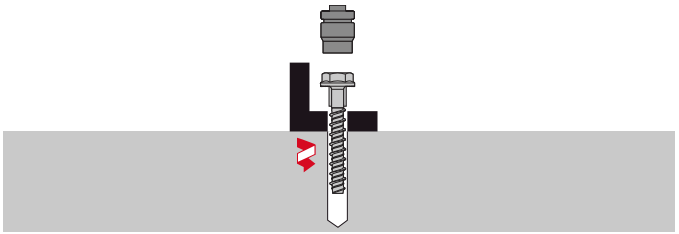
- Railings and handrails
- Structural steel
- Formwork and bracing
- Temporary applications
- Base plate fastening in steel and metal applications

ADVANTAGES

- Higher productivity - less drilling and fewer operations than with conventional anchors
- Reduced edge and spacing distances
- Hex bolt head style for convenient installation using the SIW 22T-A impact wrench
- Adjustable screw
- For use in both cracked and uncracked concrete
- Reusable

Approvals	
ETA, Seismic	ETA-20/0867 for HUS4 screw anchor

Approvals and test reports may apply to selected products only. Please refer to the documents for details.



These are abbreviated instructions which may vary according to the application.

Technical data	
Material composition	Steel, zinc-plated (min. 5 µm)
Material, corrosion	Carbon steel
Suitable for cracked concrete with redundant fastenings	Yes

Recommended load (kN), non-cracked concrete at 25N/mm², safety factor(γ)=3

Model	Size	M8 (H,C)	M10 (H,C,A)	M12 (H)	M14 (H,A)	M16 (H)
Standard embedment depth		60	75	80	85	85
HUS4	Tensile Load, Nrec	5.4	7.3	8.2	8.9	7.3
	Shear Load, Vrec	6.3	9.6	13.0	17.7	17.8

Recommended load (kN), cracked concrete at 25N/mm², safety factor(γ)=3

Model	Size	M8 (H,C)	M10 (H,C,A)	M12 (H)	M14 (H,A)	M16 (H)
Standard embedment depth		60	75	80	85	85
HUS4	Tensile Load, Nrec	3.8	5.3	5.7	6.2	5.3
	Shear Load, Vrec	6.3	9.6	11.5	12.4	12.5

Remarks:
1) All the data applies to no edge distance, spacing and other influences
2) For detail design method, please refer to Fastening Technology Manual
3) For redundant fastening only, please contact Hilti for technical assistance

HUS4-H (Hexagon head, galvanized min. 5um)

Order Now

Ordering designation	Anchor size	Drill bit diameter	Drilling Hole Depth at embed. 2	Fastening thickness at embed.2	Base plate clearance hole	Sales pack quantity	Item number
HUS4-H 8x55 15/-/-	8	8 mm	-	-	12 mm	50 pc	**2293135**
HUS4-H 8x65 25/5/-	8	8 mm	70 mm	5 mm	12 mm	50 pc	**2293136**
HUS4-H 8x75 35/15/5	8	8 mm	70 mm	15 mm	12 mm	50 pc	**2293137**
HUS4-H 8x85 45/25/15	8	8 mm	70 mm	25 mm	12 mm	50 pc	**2293138**
HUS4-H 8x100 60/40/30	8	8 mm	70 mm	40 mm	12 mm	50 pc	**2293139**[1)]
HUS4-H 8x120 80/60/50	8	8 mm	70 mm	60 mm	12 mm	50 pc	**2293550**[1)]
HUS4-H 8x150 110/90/80	8	8 mm	70 mm	90 mm	12 mm	50 pc	**2293551**[1)]
HUS4-H 10x60 5/-/-	10	10 mm	-	-	14 mm	50 pc	**2293552**[1)]
HUS4-H 10x70 15/-/-	10	10 mm	-	-	14 mm	50 pc	**2293553**
HUS4-H 10x80 25/5/-	10	10 mm	85 mm	5 mm	14 mm	50 pc	**2293554**
HUS4-H 10x90 35/15/5	10	10 mm	85 mm	15 mm	14 mm	50 pc	**2293555**
HUS4-H 10x100 45/25/15	10	10 mm	85 mm	25 mm	14 mm	50 pc	**2293556**
HUS4-H 10x110 55/35/25	10	10 mm	85 mm	35 mm	14 mm	50 pc	**2293557**
HUS4-H 10x130 75/55/45	10	10 mm	85 mm	55 mm	14 mm	50 pc	**2293558**[1)]
HUS4-H 10x150 95/75/65	10	10 mm	85 mm	75 mm	14 mm	50 pc	**2293559**
HUS4-H 12x70 10/-/-	12	12 mm	90 mm	-	16 mm	25 pc	**2293565**
HUS4-H 12x100 40/20/-	12	12 mm	90 mm	20 mm	16 mm	25 pc	**2293566**
HUS4-H 12x130 70/50/30	12	12 mm	90 mm	50 mm	16 mm	25 pc	**2293567**
HUS4-H 12x150 90/70/50	12	12 mm	90 mm	70 mm	16 mm	25 pc	**2293568**
HUS4-H 14x75 10/-/-	14	14 mm	-	-	18 mm	16 pc	**2293569**[1)]
HUS4-H 14x100 35/15/-	14	14 mm	95 mm	15 mm	18 mm	16 pc	**2293570**
HUS4-H 14x130 65/45/15	14	14 mm	95 mm	45 mm	18 mm	16 pc	**2293571**
HUS4-H 14x150 85/65/35	14	14 mm	95 mm	65 mm	18 mm	16 pc	**2293572**
HUS4-H 16x100 15/-	16	16 mm	-	-	20 mm	16 pc	**2333575**
HUS4-H 16x140 55/10	16	16 mm	95 mm	10 mm	20 mm	16 pc	**2333576**
HUS4-H 16x165 80/35	16	16 mm	95 mm	35 mm	20 mm	16 pc	**2333577**
HUS4-H 16x205 120/75	16	16 mm	95 mm	75 mm	20 mm	16 pc	**2333578**[1)]

[1)] For detailed stock availability and lead time information please contact your Hilti representative.

Please visit Hilti website for the latest item numbers and related products

HUS4-C (Countersunk torx head, galvanized min. 5um)

Order Now

Ordering designation	Anchor size	Drill bit diameter	Drilling Depth at embed. 2	Fastening thickness at embed.2	Base plate clearance hole	Bit size	Sales pack quantity	Item number
HUS4-C 8x55 15/-/-	8	8 mm	-	-	12 mm	T45	50 pc	**2293583**
HUS4-C 8x75 35/15/-	8	8 mm	70 mm	15 mm	12 mm	T45	50 pc	**2293584**
HUS4-C 8x85 45/25/15	8	8 mm	70 mm	25 mm	12 mm	T45	50 pc	**2293585**[1)]
HUS4-C 10x70 15/-/-	10	10 mm	-	-	14 mm	T50	50 pc	**2293586**
HUS4-C 10x90 35/15/-	10	10 mm	85 mm	15 mm	14 mm	T50	50 pc	**2293587**[1)]
HUS4-C 10x100 45/25/15	10	10 mm	85 mm	25 mm	14 mm	T50	50 pc	**2293588**[1)]
HUS4-C 10x120 65/45/35	10	10 mm	85 mm	45 mm	14 mm	T50	50 pc	**2293589**

[1)] For detailed stock availability and lead time information please contact your Hilti representative.

Please visit Hilti website for the latest item numbers and related products

HUS4-A (Externally threaded, galvanized min. 5um)

Order Now

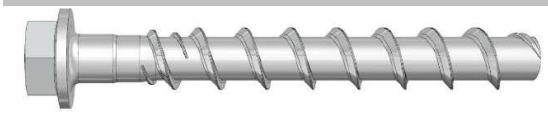
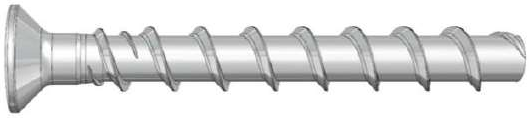
Ordering designation	Anchor size	Drill bit diameter	Drilling Depth at embed. 2	Fastening thickness at embed.2	Sales pack quantity	Item number
HUS4-A 10x120 M12x33/20	10	10 mm	85 mm	20 mm	25 pc	**2293573**
HUS4-A 10x140 M12X38/30	10	10 mm	85 mm	30 mm	25 pc	**2293574**
HUS4-A 10x165 M12X49/55	10	10 mm	85 mm	55 mm	25 pc	**2293575**[1)]
HUS4-A 14x155 M16X47/35	14	14 mm	95 mm	35 mm	16 pc	**2293576**
HUS4-A 14x185 M16X47/35	14	14 mm	95 mm	35 mm	16 pc	**2293577**
HUS4-A 14x185 M16X48/55	14	14 mm	95 mm	55 mm	16 pc	**2293578**[1)]

[1)] For detailed stock availability and lead time information please contact your Hilti representative.

Please visit Hilti website for the latest item numbers and related products

HUS4 Screw anchor

Ultimate performance screw anchor for single point fastening

Anchor version		Benefits
	HUS4-H(F) (8-16)*	- High productivity - less drilling and fewer operations than with conventional anchors - ETA approval for cracked and non-cracked concrete - ETA approval for Seismic C1 and technical data for C2 - ETA approval for adjustability (unscrew-rescrew) - Smaller edge and spacing distance - abZ (DIBt) approval for reusability in fresh concrete ($f_{ck,\ cube}$ = 10/15/20/25 Nmm^2) for temporary applications - Three embedment depths for maximum design flexibility and flexible design for concrete cone capacity - No cleaning required size 8 to 14 - HUS4-HF and HUS4-AF with multilayer coatings for additional corrosion protection - Through fastening with H, A and C head - Pre-fastening with A head
	HUS4-C (8-10)	
	HUS4-A(F) (10-14)	

Base material

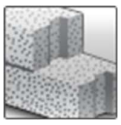

Concrete (non-cracked)

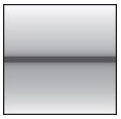

Concrete (cracked)


Hollow core slabs


Solid brick

Load conditions


Autoclaved aerated concrete


Static / quasi-static


Seismic ETA-C1 Hilti TD: C2


Fire resistance

Installation conditions


Small edge distance and spacing

Other information


European Technical Assessment


CE conformity

PROFIS Engineering software

DIBt Approval Reusability

Approvals / certificates

Description	Authority / Laboratory	No. / date of issue
European Technical Assessment	DIBt, Berlin	ETA-20/0867 / 14-04-2022
Fire test report	DIBt, Berlin	ETA-20/0867 / 14-04-2022
ABG for temporary fastening	DIBt, Berlin	Z-21.8-2137 / 21-12-2021

*HUS4-HF not available in size 12

Static and quasi-static loading data (for a single anchor)

All data in this section applies to:

- Correct setting (See setting instruction)
- No edge distance and spacing influence
- *Steel* failure
- Minimum base material thickness
- Concrete C 20/25, $f_{ck,cube}$ = 25 N/mm²

Anchor size		8			10			12			14			16	
Type	HUS4	H, HF, C			H, HF, C, A, AF			H			H, HF, A, AF			H, HF	
Nominal embedmenth 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}	h_{nom1}	h_{nom2}
		40	60	70	55	75	85	60	80	100	65	85	115	85	130

Characteristic resistance

Anchor size		8			10			12			14			16	
Type	HUS4	H, HF, C			H, HF, C, A, AF			H			H, HF, A, AF			H, HF	
		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_{nom1}	h_{nom2}
Non-cracked concrete															
Tension N_{Rk}	[kN]	8,3	16,2	20,7	13,0	22,0	27,6	15,3	24,5	35,1	17,0	26,6	43,3	22,0	46,0
Shear V_{Rk}	[kN]	8,3	*18,8*	*21,9*	13,6	*28,8*	*32,0*	30,6	*38,9*	*44,9*	34,1	53,1	*62,0*	53,5	*73,1*
Cracked concrete															
Tension N_{Rk}	[kN]	5,5	11,3	14,5	9,5	15,8	19,3	10	17,2	24,6	11,9	18,6	30,3	16,0	32,0
Shear V_{Rk}	[kN]	5,8	*18,8*	*21,9*	9,5	*28,8*	*32,0*	21,4	34,4	*44,9*	23,8	37,2	60,6	37,4	*73,1*

Design resistance

Anchor size		8			10			12			14			16	
Type	HUS4	H, HF, C			H, HF, C, A, AF			H			H, HF, A, AF			H, HF	
		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_{nom1}	h_{nom2}
Non-cracked concrete															
Tension	[kN]	5,6	10,8	13,8	7,2	14,7	18,4	10,2	16,4	23,4	11,4	17,7	28,8	14,7	30,7
Shear	[kN]	5,6	*15,0*	*17,5*	9,1	*23,0*	*25,6*	20,4	*31,1*	*35,9*	22,7	35,4	*49,6*	35,6	*58,5*
Cracked concrete															
Tension	[kN]	3,7	7,5	9,6	5,3	10,5	12,9	6,7	11,5	16,4	7,9	12,4	20,2	10,7	21,3
Shear	[kN]	3,9	*15,0*	*17,5*	6,4	21,1	*25,6*	14,3	22,9	32,8	15,9	24,8	40,4	25,0	49,3

Recommended loads

Anchor size		8			10			12			14			16	
Type	HUS4	H, HF, C			H, HF, C, A, AF			H			H, HF, A, AF			H, HF	
		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_{nom1}	h_{nom2}
Non-cracked concrete															
Tension N_{Rec}	[kN]	2,8	5,4	6,9	4,3	7,3	9,2	5,1	8,2	11,7	5,7	8,9	14,4	7,3	15,3
Shear V_{Rec}	[kN]	2,8	*6,3*	*7,3*	4,5	*9,6*	*10,7*	10,2	*13,0*	*15,0*	11,4	17,7	20,7	17,8	*24,4*
Cracked concrete															
Tension N_{Rec}	[kN]	1,8	3,8	4,8	3,2	5,3	6,4	3,3	5,7	8,2	4,0	6,2	10,1	5,3	10,7
Shear V_{Rec}	[kN]	1,9	*6,3*	*7,3*	3,2	9,6	*10,7*	7,1	11,5	*15,0*	7,9	12,4	20,2	12,5	24,4

a) With global safety factor γ = 3,0.

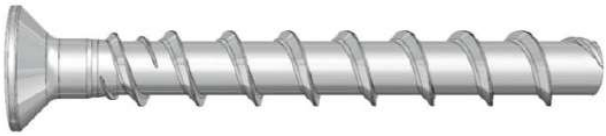
Materials

Material quality

Type	Material
HUS4 – H, A, C	Carbon steel, galvanized
HUS4 – HF, AF	Carbon steel, multi-layer coating [a)]

A) Multi-layer coating provides a higher corrosion resistance compared to regular hot dip galvanized (HDG) systems with a 40µm coating thickness.

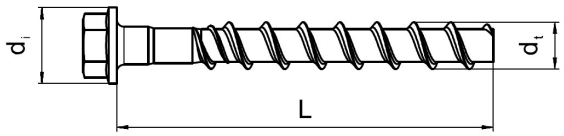
Head configuration

Type	Part	
HUS4-H **HUS4-HF**	Hexagonal head	
HUS4-C	Countersunk head	
HUS4-A	External thread	

Hilti HUS4-A, size 10 with external thread M12 and size 14 with external thread M16

Fastener dimensions and marking HUS4-H(F)

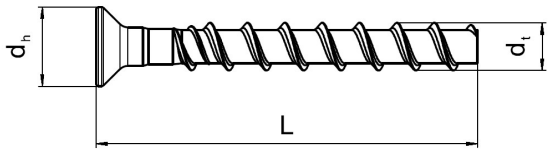
Anchor size			8	10	12	14	16
Type		**HUS4**	**H, HF**	**H, HF**	**H**	**H,HF**	**H, HF**
Outer diameter of screw thread	d_t	[mm]	10,50	12,70	14,70	16,70	18,80
Diameter of integrated washer	d_i	[mm]	17,50	20,50	23,60	29,00	32,60
Length of the screw (min/max)	L	[mm]	45/150	60/305	70/150	75/150	100/205



HUS4: Hilti Universal Screw 4th generation
H: Hexagonal head
10: Screw diameter
100: total length of the screw

Fastener dimensions and marking HUS4-C

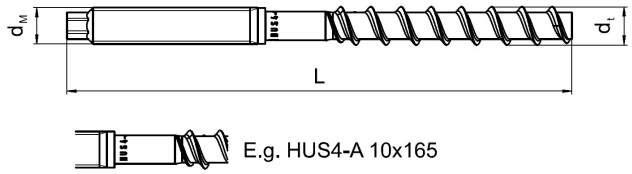
Anchor size			8	10
Type		**HUS4**	**C**	**C**
Outer diameter of the screw thread	d_t	[mm]	10,50	12,70
Countersunk head diameter	d_h	[mm]	18,00	21,00
Length of the screw (min/max)	L	[mm]	55/85	70/120



HUS4: Hilti Universal Screw 4th generation
C: Countersunk head
10: Screw diameter
100: total length of the screw

Fastener dimensions and marking HUS4-A(F)

Anchor size			10	14
Type		**HUS4**	**A, AF**	**A, AF**
Outer diameter of the screw thread	d_t	[mm]	12,70	16,70
Diameter of the metric thread	d_M	[mm]	M12	M16
Length of the screw (min/max)	L	[mm]	120/165	155/205



HUS4: Hilti Universal Screw 4th generation
A: Threaded head
10: Screw diameter
100: total length of the screw
8: carbon steel 8.8
K: length of the screw (more info in ETA)

Setting information

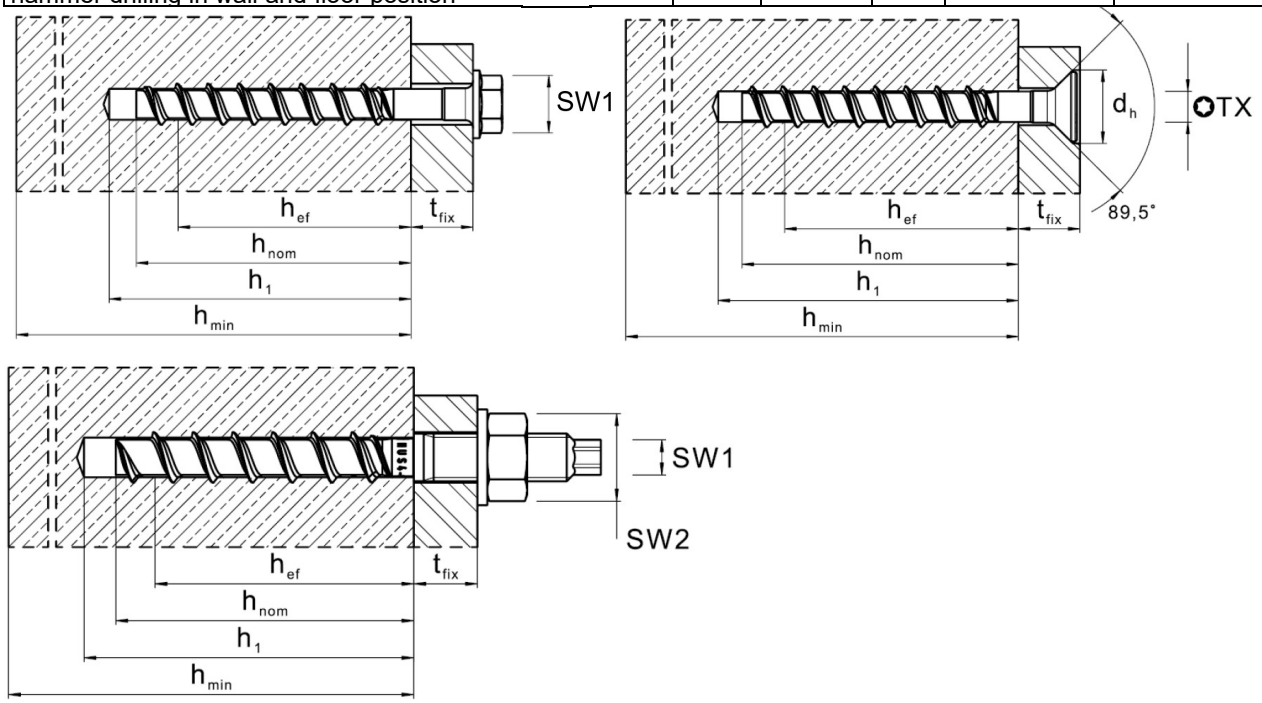
Setting details size 8-12

Anchor size			8			10			12		
Type		**HUS4**	**H, HF, C**			**H, HF, C, A, AF**			**H**		
Nominal embedmenth depth		**[mm]**	h_{nom1}	h_{nom2}	h_{nom3}	h_{nom1}	h_{nom2}	h_{nom3}	h_{nom1}	h_{nom2}	h_{nom3}
			40	**60**	**70**	**55**	**75**	**85**	**60**	**80**	**100**
Nominal diameter of drill bit	d_0	[mm]	8			10			12		
Clearance hole diameter	$d_f \leq$	[mm]	12			14			16		
Wrench size HEX head	SW1	[mm]	13			15			17		
Wrench size Threaded head	SW1	[mm]	-			8			-		
Wrench size for nut on Threaded head	SW2	[mm]	-			19			-		
Torx size “C” head	TX	-	45			50			-		
Countersunk head diameter	d_h	[mm]	18			21					
Depth of drill hole for cleaned hole; or uncleand hole overhead	$h_1 \geq$	[mm]	50	70	80	65	85	95	70	90	110
Depth of drill hole for uncleanded hole hammer drilling in wall and floor position	$h_1 \geq$	[mm]	66	86	96	85	105	115	94	114	134

Setting details size 14-16

Anchor size			14			16	
Type		**HUS4**	**H, HF, A, AF**			**H, HF**	
Nominal embedmenth depth		**[mm]**	h_{nom1}	h_{nom2}	h_{nom3}	h_{nom1}	h_{nom2}
			65	**85**	**115**	**85**	**130**
Nominal diameter of drill bit	d_0	[mm]	14			16	
Clearance hole diameter	$d_f \leq$	[mm]	18			20	
Wrench size Hex head	SW1	[mm]	21			24	
Wrench size Threaded head	SW1	[mm]	12			-	

Wrench size for nut on Threaded head	SW2	[mm]	24			-	
Depth of drill hole for cleaned hole; or uncleand hole overhead	$h_1 \geq$	[mm]	75	95	125	95	140
Depth of drill hole for uncleanded hole hammer drilling in wall and floor position	$h_1 \geq$	[mm]	103	123	153	-	-



Installation equipment table:

Anchor size	**8**	**10**	**12**	**14**	**16**
Type HUS4-	**H,C,HF**	**H,HF, C, A, AF**	**H**	**H,HF, A, AF**	**H,HF**
Rotary hammer	TE4 – TE30				
Drill bit for concrete, solid clay brick and solid sand-lime brick	CX 8	CX 10	CX 12	CX 14	CX 16
Socket wrench insert for hex screw	SI-S ½“ 13S	SI-S ½“ 15S	S ½“ 17S	SI-S ½“ 21S	S ½“ 24S
Socket wrench insert for threaded head screw		SI-S ½“ 8S		SI-S ½“ 12S	
Torx bit for countersunk screw	S-SY TX45	S-SY TX50	-	-	-
Check gauge for reusability [1)]	HRG 8	HRG 10	HRG 12	HRG 14	HRG 16
Setting tool for cracked and un-cracked concrete	SIW 6 AT-A22 gear 3 SIW 6.2 AT-A22 gear1	SIW 22T-A SIW 6 AT-A22 gear 3 SIW 6.2 AT-A22 SIW 8.1 AT gear 1 SIW 9-A22	SIW 22T-A SIW 6.2 AT-A22 SIW 8.1 AT SIW 9-A22		
Setting tool for solid brick and aerated concrete	SIW6 AT-A22, SF4-A22				
Setting tool for hollow core slab	SIW 22 A, SIW6 AT-A22, SIW 22T-A				

1) For HUS4-A and HUS4-H

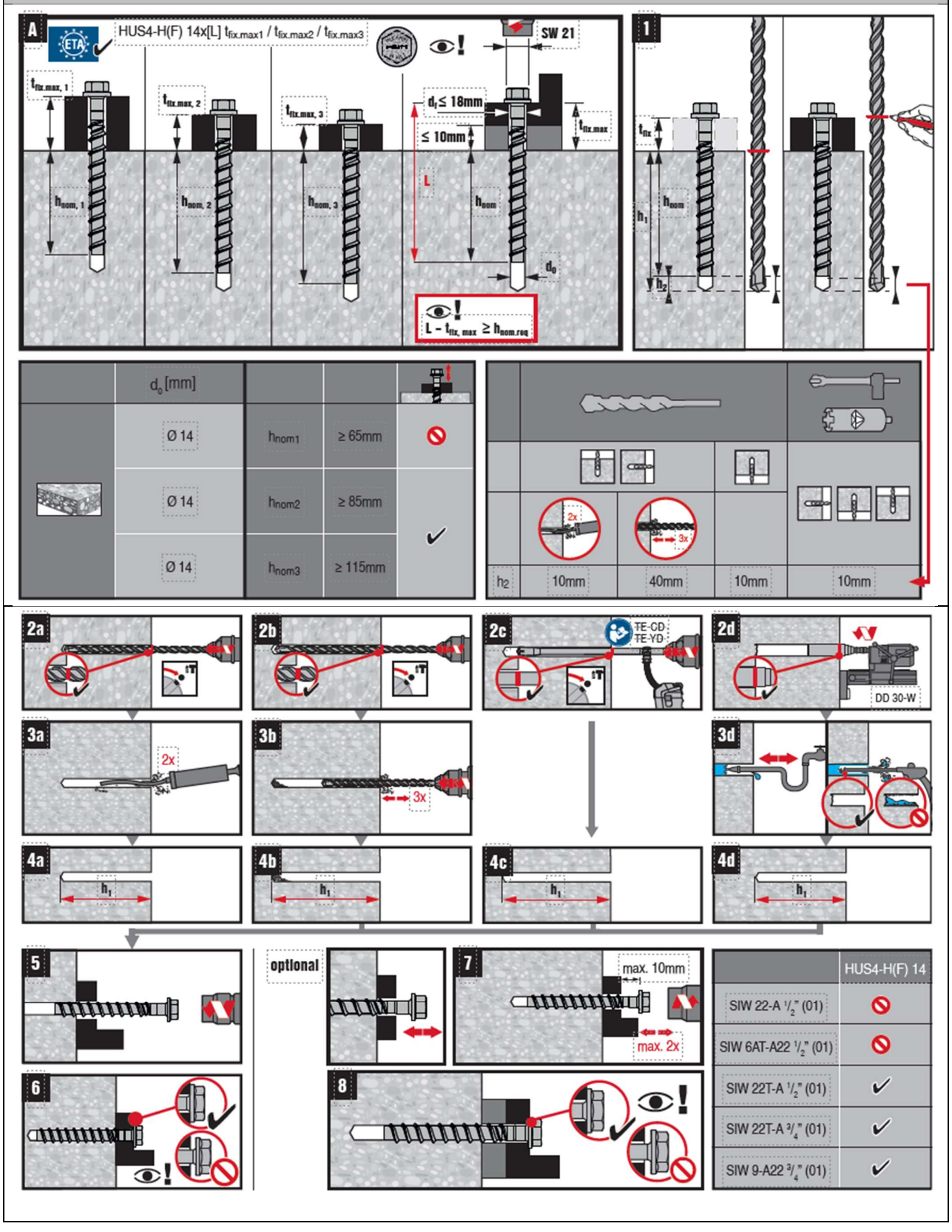
Setting parameters

Anchor size			8			10			12			14			16	
Type		**HUS4**														
Nominal embedment depth	h_{nom}	[mm]	40	60	70	55	75	85	60	80	100	65	85	115	85	130
Minimum base material thickness	h_{min}	[mm]	80	100	120	100	130	140	110	130	150	120	160	200	130	195
Minimum spacing	s_{min}	[mm]	35			40			50			60			90	
Minimum edge distance	c_{min}	[mm]	35			40			50			60			65	
Critical spacing for splitting failure	$s_{cr,sp}$	[mm]	3 h_{ef}			3.3 h_{ef}			3.3 h_{ef}			3.3 h_{ef}				
Critical edge distance for splitting	$c_{cr,sp}$	[mm]	1.5 h_{ef}			1.65 h_{ef}			1.65 h_{ef}			1.65 h_{ef}				
Critical spacing for concrete cone failure	$s_{cr,N}$	[mm]	3 h_{ef}													
Critical edge distance for concrete cone failure	$c_{cr,N}$	[mm]	1,5 h_{ef}													

For spacing (edge distance) smaller than critical spacing (critical edge distance) the design loads have to be reduced (see system design resistance).
Critical spacing and critical edge distance for splitting failure apply only for non-cracked concrete. For cracked concrete only the critical spacing and critical edge distance for concrete cone failure are decidive.

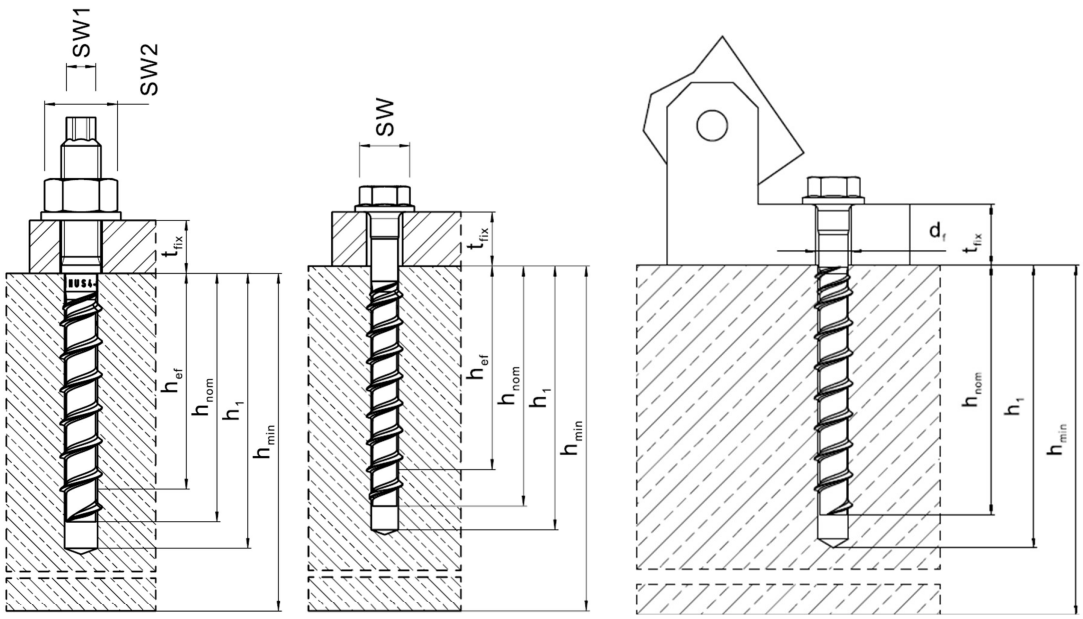
Setting instructions
***For detailed information on installation see instruction for use given with the package of the product**

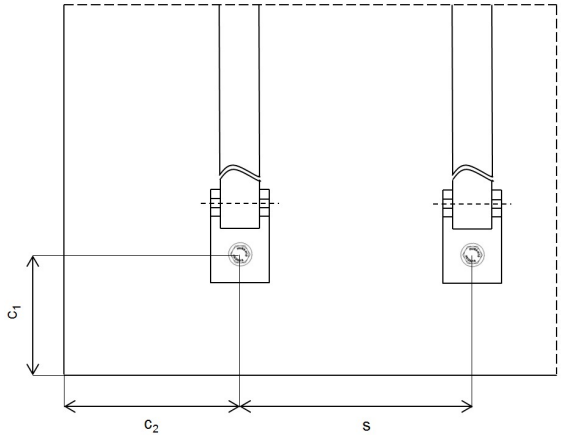
Setting instruction with adjustment



Setting details

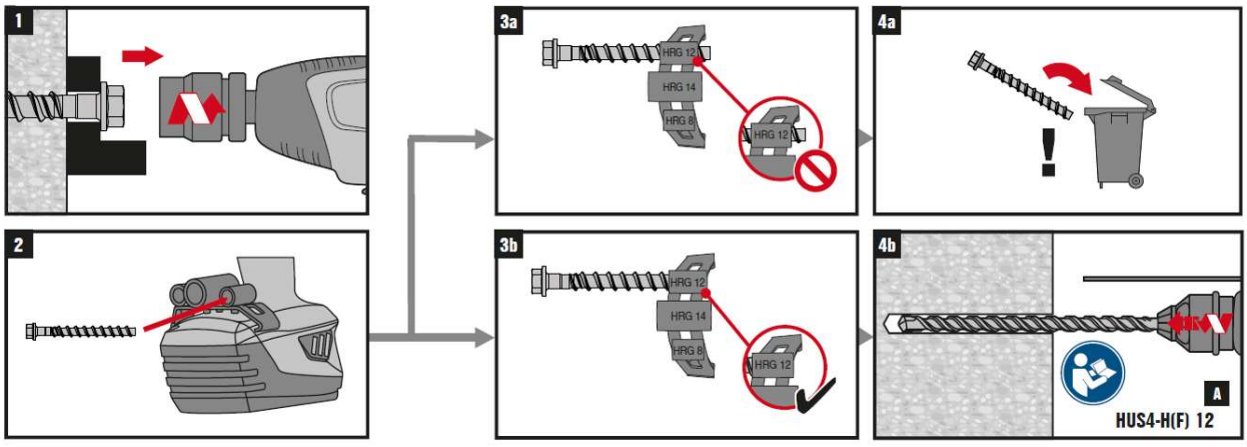
Anchor size	HUS4-H (A)		8		10			12			14			16	
			h_{nom2}	h_{nom3}	h_{nom1}	h_{nom2}	h_{nom3}	h_{nom1}	h_{nom2}	h_{nom3}	h_{nom1}	h_{nom2}	h_{nom3}	h_{nom1}	h_{nom2}
Nominal embedment depth	h_{nom}	[mm]	60	70	55	75	85	60	80	100	65	85	115	85	130
Drilling depth	$h_1 \geq$	[mm]	70	80	65	85	95	70	90	110	75	95	125	95	140
Option 1															
Minimum edge distance	$c_1 \geq$	[mm]	80	100	75	100	115	65	105	135	85	115	180	105	180
Minimum base material thickness	$h_{min} \geq$	[mm]	120	150	115	150	175	110	160	205	130	175	255	160	220
Option 2															
Minimum edge distance	$c_1 \geq$	[mm]	85	110	85	120	135	65	120	160	100	135	300	115	215
Minimum base material thickness	$h_{min} \geq$	[mm]	100	120	100	130	140	110	130	150	120	160	200	130	195
Minimum edge distance	$c_2 \geq$	[mm]	1.5 x c_1												
Minimum spacing	$s_{min} \geq$	[mm]	3.0 x c_1												
Check gauge			HRG 8		HRG 10			HRG 12			HRG 14			HRG 16	
Diameter of clearance hole for H head	$d_f \leq$	[mm]	14		16			20			22			24	
Diameter of clearance hole for A head	$d_f \leq$	[mm]	-		14			-			18			-	
Socket size H head	SW		13		15			17			21			24	
Socket size A head	SW1 (SW2)		-		8 (17)			-			12 (24)			-	





Setting instructions

***For detailed information on installation see instruction for use given with the package of the product example for size 10 screw**



Basic loading data (for a single anchor) in solid masonry units

All data in this section applies to:

- Load values valid for holes drilled with TE rotary hammers (without hammering for PPW)
- Correct anchor setting (see instruction for use, setting details)
- Recommended setting machine: SIW 6AT-A
- The ratio of hollow or holes space to solid may not exceed 15 % of a bed joint area
- The brim area around holes must be at least 70mm
- Edge distances, spacing and other influences, see below
- All data given in this section according to Hilti Technical Data

Anchor size			8	10
Nominal embedmenth depth	h_{nom}	[mm]	60	75
Drilling diameter for Mz, KS	d_0	[mm]	8	10
Drilling diameter for Vbl, PPW, Leca5®	d_0	[mm]	6	8

Anchor size			8	10
			H, C, HF	H, C, HF
	Compressive strength class	[N/mm²]	N_{rec} Tensile loads	
	Solid clay brick Mz 12 / 2,0 (EN 771-1)	≥ 12	1,4	1,4
		≥ 20	1,8	1,8
	Solid sand-lime brick KS 12 / 2,0 (EN 771-2)	≥ 12	3,7	4,2
		≥ 20	4,8	5,4
	Aerated concrete PPW 6-0,4 (EN 771-4)	≥ 6	1,0	1,6
	Solid lightweight concrete brick Vbl, 2DF (EN 771-3) Solid lightweight concrete brick Leca5® Murblock 19 (EN 771-3)	≥ 5	2,0	2,0

Anchor size			8	10
			H, C, HF	H, C, HF
	Compressive strength class	[N/mm²]	V_{rec} Shear loads	
	Solid clay brick Mz 12 / 2,0 (EN 771-1)	≥ 12	3,8	5,5
	Solid sand-lime brick KS 12 / 2,0 (EN 771-2)	≥ 12	4,6	5,7
	Aerated concrete PPW 6-0,4 (EN 771-4)	≥ 6	1,3	1,5
	Solid lightweight concrete brick Vbl, 2DF (EN 771-3) Solid lightweight concrete brick Leca5® Murblock 19 (EN 771-3)	≥ 5	2,1	2,8

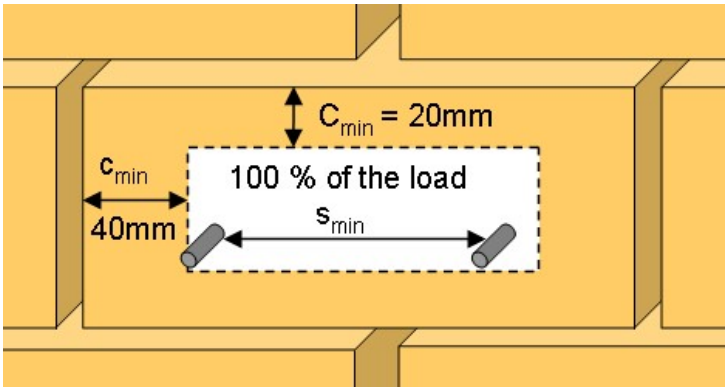
Permissible anchor location in brick and block walls

Edge distance and spacing influence

- The technical data for HUS4 anchors are reference loads for MZ 12, KS 12, Vbl 6, PPW 6 and Leca5®. Due to the large variation of natural stone slid bricks, on site anchor testing is recommended to validate technical data
- The HUS4 anchor was installed and tested in center of solid bricks as shown. The HUS4 anchor was not tested in the mortar joint between solid bricks or in hollow bricks, however a load reduction is expected
- For brick walls where anchor position in brick can not be determined, 100 % anchor testing is recommended
- Distance to free edge free edge to solid masonry (Mz, KS and light weight concrete) units ≥ 200mm
- Distance to free edge free edge to solid masonry (autoclaved aerated gas concrete) units ≥ 170mm
- The minimum distance to horizontal and vertical mortar joint (c_{min}) is started in drawing below
- Minimum anchor spacing (s_{min}) in one brick/block is ≥ 80 mm

Limits

- All data is for multiple use for non-structural applications
- Plaster, graveling, lining or levelling courses are regarded as non-bearing and may not be taken into account for the calculation of embedment depth
- The decisive resistance to tension loads is the lower value of N_{rec} (brick breakout, pull out) and $N_{max,pb}$ (pull out of one brick)



Basic loading data for single anchor in pre-stressed Hollow core slab (HCS) for permanent fastening

All data in this section applies to

- Correct anchor setting (see instruction for use, setting details)
- Recommended drilling machine: TE2 A22, recommended setting machine: SIW 6AT-A
- No edge distance and spacing influence
- Ratio core width / web thickness w/e ≤ 5,3
- Concrete C30/37 to C50/60, uncracked
- All data given in this section according to Hilti Technical Data

Anchor size			**8**	**10**
Nominal embedmenth depth	h_{nom}	[mm]	d_b	d_b
Drilling depth	d_0	[mm]	≥ d_b + 10 mm	

Characteristic resistance

Anchor size		**HUS4**	**8**					**10**				
Concrete strength			**C30/37**			**C45/55**		**C30/37**			**C45/55**	
Bottom flange thickness	d_b ≥	[mm]	30	35	40	35	40	30	35	40	35	40
Tension loading	N_{Rk}	[kN]	2,0	5,8	7,1	7,1	8,7	2,0	5,8	7,1	7,1	8,7
Shear loading	V_{Rk}	[kN]	2,0	9,3	11,4	11,4	14,0	2,0	10,2	12,4	12,5	15,2

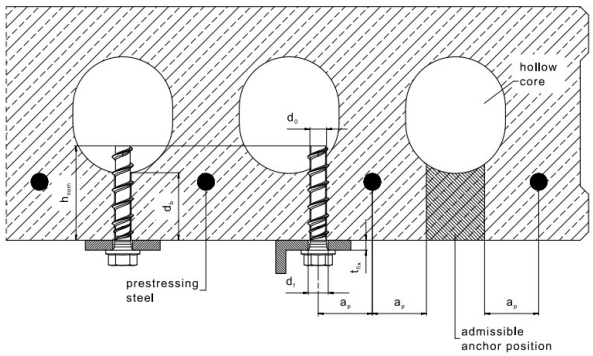
Design resistance

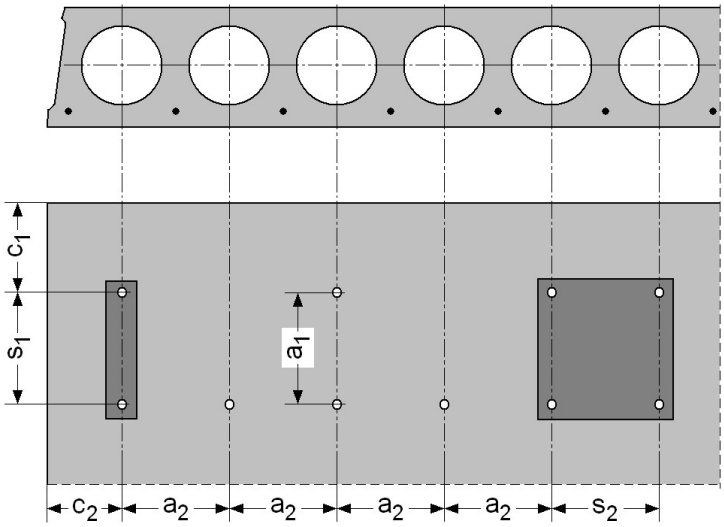
Anchor size		**HUS4**	**8**					**10**				
Concrete strength			**C30/37**			**C45/55**		**C30/37**			**C45/55**	
Bottom flange thickness	d_b ≥	[mm]	30	35	40	35	40	30	35	40	35	40
Tension loading	N_{Rd}	[kN]	1,3	3,2	3,9	4,0	4,8	1,3	3,2	3,9	4,0	4,8
Shear loading	V_{Rd}	[kN]	1,3	6,2	7,6	7,6	9,3	1,3	6,8	8,3	8,3	10,1

Recommended loads

Anchor size		**HUS4**	**8**					**10**				
Concrete strength			**C30/37**			**C45/55**		**C30/37**			**C45/55**	
Bottom flange thickness	d_b ≥	[mm]	30	35	40	35	40	30	35	40	35	40
Tension loading	N_{Rec}	[kN]	0,7	1,9	2,4	2,4	2,9	0,7	1,9	2,4	2,4	2,9
Shear loading	V_{Rec}	[kN]	0,7	3,1	3,8	3,8	4,7	0,7	3,4	4,1	4,2	5,1

With global safety factor γ = 3,0.



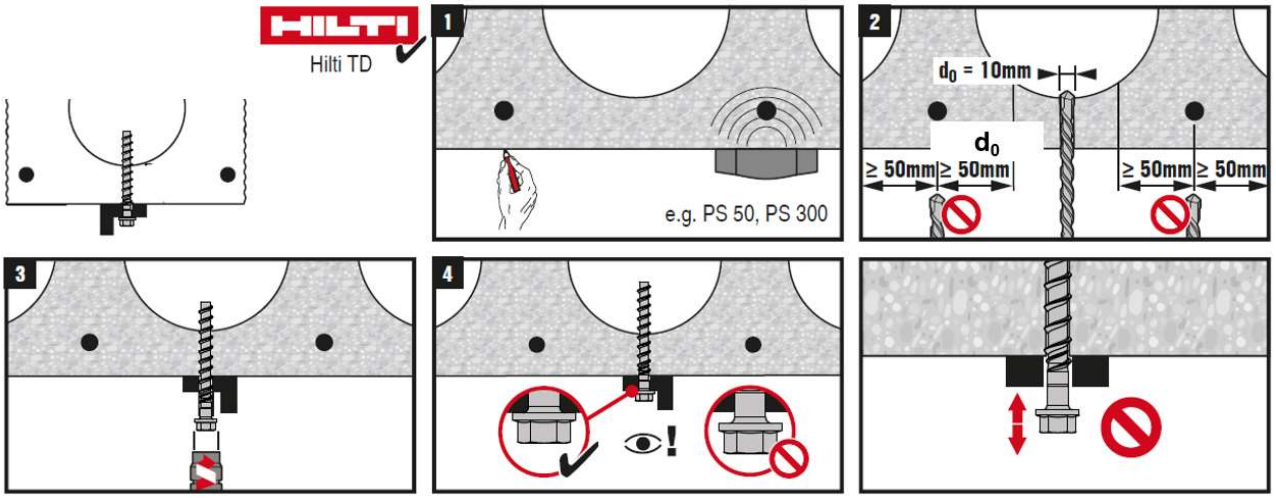


Anchor size			8	10
Type		**HUS4**	**C, H, HF**	**C, H, HF, A, AF**
Minimum and characteristic spacing	$s_{min} = s_{cr}$	[mm]	4 * d_b	
Minimum and characteristic edge distance	$c_{min} = c_{cr}$	[mm]	4 * d_b	
Minimum group distance	a_{min}	[mm]	4 * d_b	

Setting instructions

***For detailed information on installation see instruction for use given with the package of the product**

Installation in Hollow core slabs - example size 10



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Bautechnisches Prüfamt

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European Technical Assessment ETA-20/0867 of 14 April 2022

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 concrete screw HUS4
Product family to which the construction product belongs	Mechanical fastener for use in concrete
Manufacturer	Hilti Aktiengesellschaft Feldkircherstrasse 100 9494 SCHAAN FÜRSTENTUM LIECHTENSTEIN
Manufacturing plant	Hilti Werke
This European Technical Assessment contains	29 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 330232-01-0601, Edition 05/2021
This version replaces	ETA-20/0867 issued on 2 December 2021

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Specific Part

1 Technical description of the product

The Hilti concrete screw HUS4 is an anchor in size 8, 10, 12, 14 and 16 mm made of galvanized 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 B4 to B6, Annex C1 and C3
Characteristic resistance to shear load (static and quasi-static loading)	See Annex C2 and C4
Displacements (static and quasi-static loading)	See Annex C12 and C13
Characteristic resistance for seismic performance categories C1 and C2	See Annex C5 to C7

3.2 Safety in case of fire (BWR 2)

Essential characteristic	Performance
Reaction to fire	Class A1
Resistance to fire	See Annex C8 to C11

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. 330232-01-0601 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

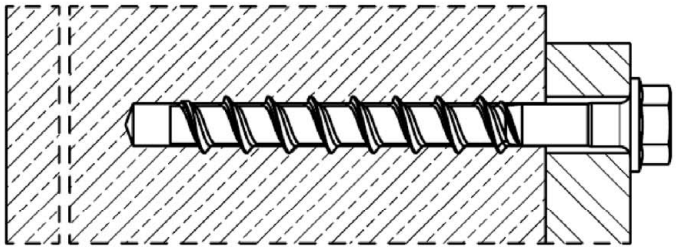
Technical details necessary for the implementation of the AVCP system are laid down in the control plan deposited at Deutsches Institut für Bautechnik.

Issued in Berlin on 14 April 2022 by Deutsches Institut für Bautechnik

Dipl.-Ing. Beatrix Wittstock
Head of Section

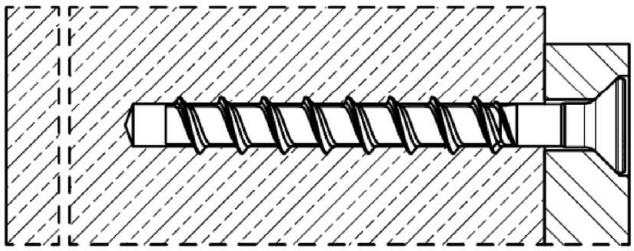
beglaubigt:
Tempel

Installed condition without adjustment

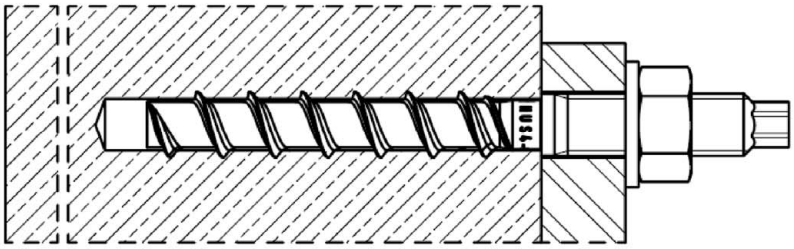


HUS4-H (hexagon head configuration sizes 8, 10, 12, 14 and 16)

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



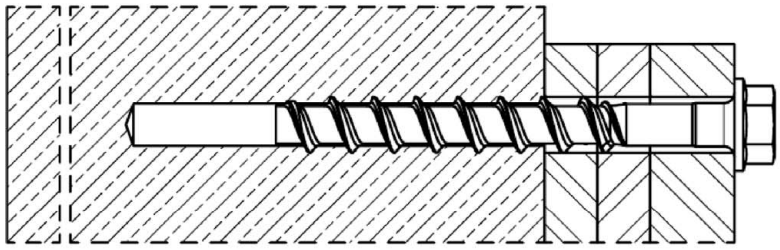
HUS4-C (countersunk head configuration sizes 8 and 10)



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

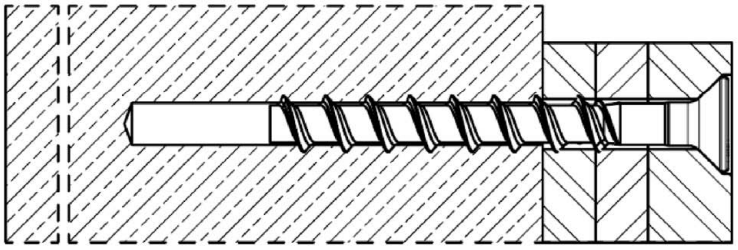
HUS4-AF
(threaded rod connection
sizes 10 with M12 and 14 with M16)

Installed condition with adjustment - h_{nom2}, h_{nom3}



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

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



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

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

Table A1: Screw types

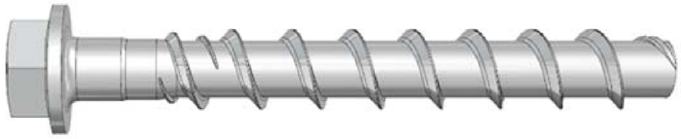
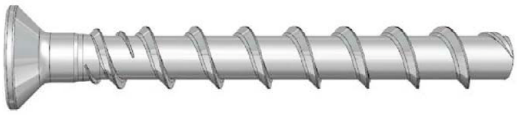
Hilti HUS4-H, sizes 8,10, 12, 14 and 16, hexagonal head configuration, galvanized **Hilti HUS4-HF**, sizes 8,10, 14 and 16, hexagonal head configuration, multilayer coating

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

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


Table A2: Hilti filling set (for HUS4-H and HUS4-A) and Hilti injection mortar

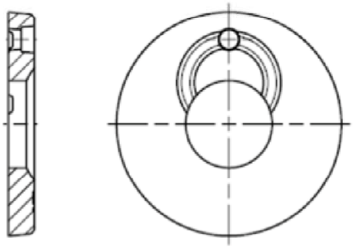
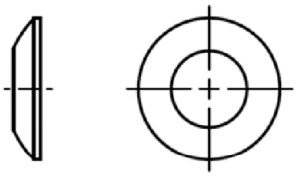
Filling washer	Spherical washer	Injection mortar
		 Hilti HIT-HY … with ETA Hilti HIT-RE … with ETA

Table A3: Materials

Part	Material
HUS4 screw anchor (all types in Table A1)	Carbon steel Rupture elongation $A_5 \leq 8\%$

Hilti screw anchor HUS4	**Annex A2**
Product description HUS4 screw types, Filling set and Hilti injection mortar Materials	

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Table A4: Filling set dimensions

Filling set size			**M10**	**M12**	**M16**	**M20**
Diameter	d_{vs}	[mm]	42	44	52	60
Thickness	h_{vs}	[mm]	5	5	6	6
HUS4-H			8	10	12 + 14	-
HUS4-A			-	10	14	16

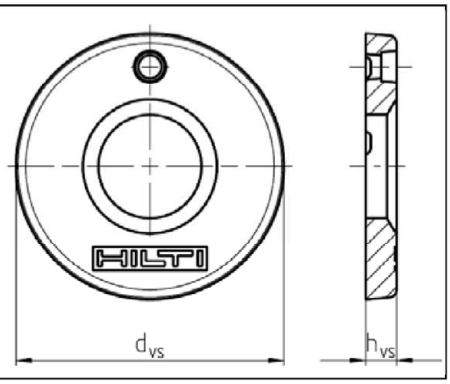
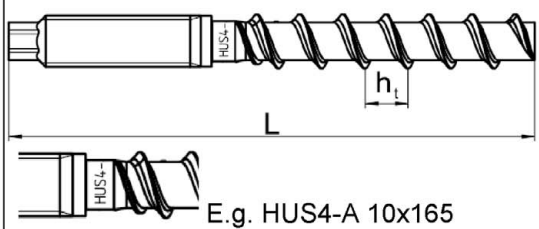


Table A5: Fastener dimensions and marking HUS4-A(F)

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	80	115
Effective embedment depth	h_{ef}	[mm]	$h_{ef} = 0{,}85 * (h_{nom} - 0{,}5 * h_t) \leq h_{ef,max}$					
Limits of effective embedment depth	$h_{ef,max}$	[mm]	68,0			91,8		
Length of screw min / max	L	[mm]	120 / 165			155 / 205		



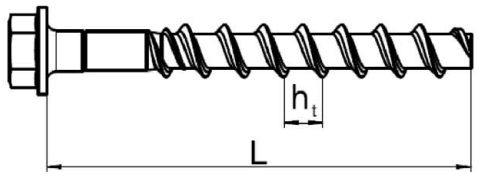
HUS4:	Hilti Universal Screw 4th generation
A: **AF**:	Thread connection, galvanized Thread connection, multilayer coating
10:	Nominal screw diameter d [mm]
165:	Length of screw L [mm]
8:	Carbon steel
K:	Length identification HUS4-A 10x165

G	**I**	**K**	**J**	**L**	**N**
10x120	10x140	10x165	14x155	14x185	14x205

Hilti screw anchor HUS4	**Annex A3**
Production description Fastener dimensions and head marking	

Table A6: Fastener dimensions and marking HUS4-H

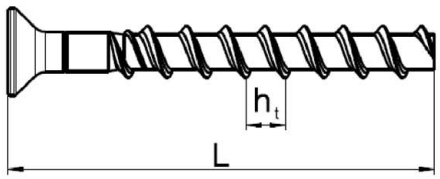
Fastener size HUS4-			**H(F) 8**			**H(F) 10**			**H 12**			**H(F) 14**			**H(F) 16**	
Nominal fastener diameter	d	[mm]	8			10			12			14			16	
Pitch of the thread	h_t	[mm]	8			10			12			14			13,2	
Nominal embedment depth	h_{nom}	[mm]	h_{nom1}	h_{nom2}	h_{nom3}	h_{nom1}	h_{nom2}	h_{nom3}	h_{nom1}	h_{nom2}	h_{nom3}	h_{nom1}	h_{nom2}	h_{nom3}	h_{nom1}	h_{nom2}
			40	60	70	55	75	85	60	80	100	65	85	115	85	130
Effective embedment depth	h_{ef}	[mm]	$h_{ef} = 0{,}85 * (h_{nom} - 0{,}5 * h_t) \leq h_{ef,max}$													
Limits of effective embedment depth	$h_{ef,max}$	[mm]	56,1			68,0			79,9			91,8			104,9	
Length of screw min / max	L	[mm]	45 / 150			60 / 305			70 / 150			75 / 150			100 / 205	



HUS4:	Hilti Universal Screw 4th generation
H:	Hexagonal head, galvanized
HF:	Hexagonal head, multilayer coating
10:	Nominal screw diameter d [mm]
100:	Length of screw [mm]

Table A7: Fastener dimensions and marking HUS4-C

Fastener size HUS4-			**C 8**			**C 10**		
Nominal fastener diameter	d	[mm]	8			10		
Pitch of the thread	h_t	[mm]	8			10		
Nominal embedment depth	h_{nom}	[mm]	h_{nom1}	h_{nom2}	h_{nom3}	h_{nom1}	h_{nom2}	h_{nom3}
			40	60	70	55	75	85
Effective embedment depth	h_{ef}	[mm]	$h_{ef} = 0{,}85 * (h_{nom} - 0{,}5 * h_t) \leq h_{ef,max}$					
Limits of effective embedment depth	$h_{ef,max}$	[mm]	56,1			68,0		
Length of screw min / max	L	[mm]	55 / 85			70 / 120		



HUS4:	Hilti Universal Screw 4th generation
C:	Countersunk head, galvanized
10:	Nominal screw diameter d [mm
100:	Length of screw [mm]

Hilti screw anchor HUS4	**Annex A4**
Production description Fastener dimensions and head marking	

Specifications of intended use

Anchorages subject to:

- Static and quasi-static loadings
- Seismic action for performance category C1 and C2
- Fire exposure

Base materials:

- Compacted reinforced or unreinforced normal weight concrete without fibres 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.

Use conditions (Environmental conditions):

- Anchorages subject to dry internal conditions.

Design:

- Anchorages are designed under the responsibility of an engineer experienced in anchorages and concrete work.
- Verifiable calculation notes and drawings are prepared taking account of the loads to be anchored. The position of the 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.

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-H and HUS4-C) must be supported on the fixture and is not damaged.
- Hilti filling set is suitable for HUS4-H and HUS4-A

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

Specifications of intended use: Drilling and cleaning

Table B1: Static and quasi static loading

HUS4		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 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}

[1)] Adjustment is possible for sizes 8 to 14 at h_{nom2+3}

Table B2: Seismic performance category C1

HUS4		Fastener size and embedment depth h_{nom}
Hammer drilling (HD)[1)]	cleaned 	sizes 8 to 14 at h_{nom2+3} size 16 at h_{nom1+2}
	not cleanded	sizes 8 to 14 at h_{nom2+3}
Hammer drilling with Hilti hollow drill bit TE-CD (HDB) [1)] 		sizes 12 and 14 at h_{nom2+3}

[1)] Adjustment is possible for sizes 8 to 14 at h_{nom2+3}

Table B3: Seismic performance category C2

HUS4		Fastener size and embedment depth h_{nom}
Hammer drilling (HD)[1)]	cleaned 	sizes 8 to 14 at h_{nom3}
	not cleanded	sizes 8 to 14 at h_{nom3}

[1)] Adjustment is possible for sizes 8 to 14 at h_{nom3}

Table B4: Static and quasi static loading under fire exposure

HUS4		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 at all h_{nom}
Hammer drilling with Hilti hollow drill bit TE-CD (HDB) [1)] 		sizes 12 and 14 at all h_{nom}

[1)] Adjustment is possible for sizes 8 to 14 at h_{nom2+3}

Hilti screw anchor HUS4	**Annex B2**
Intended use Specifications	

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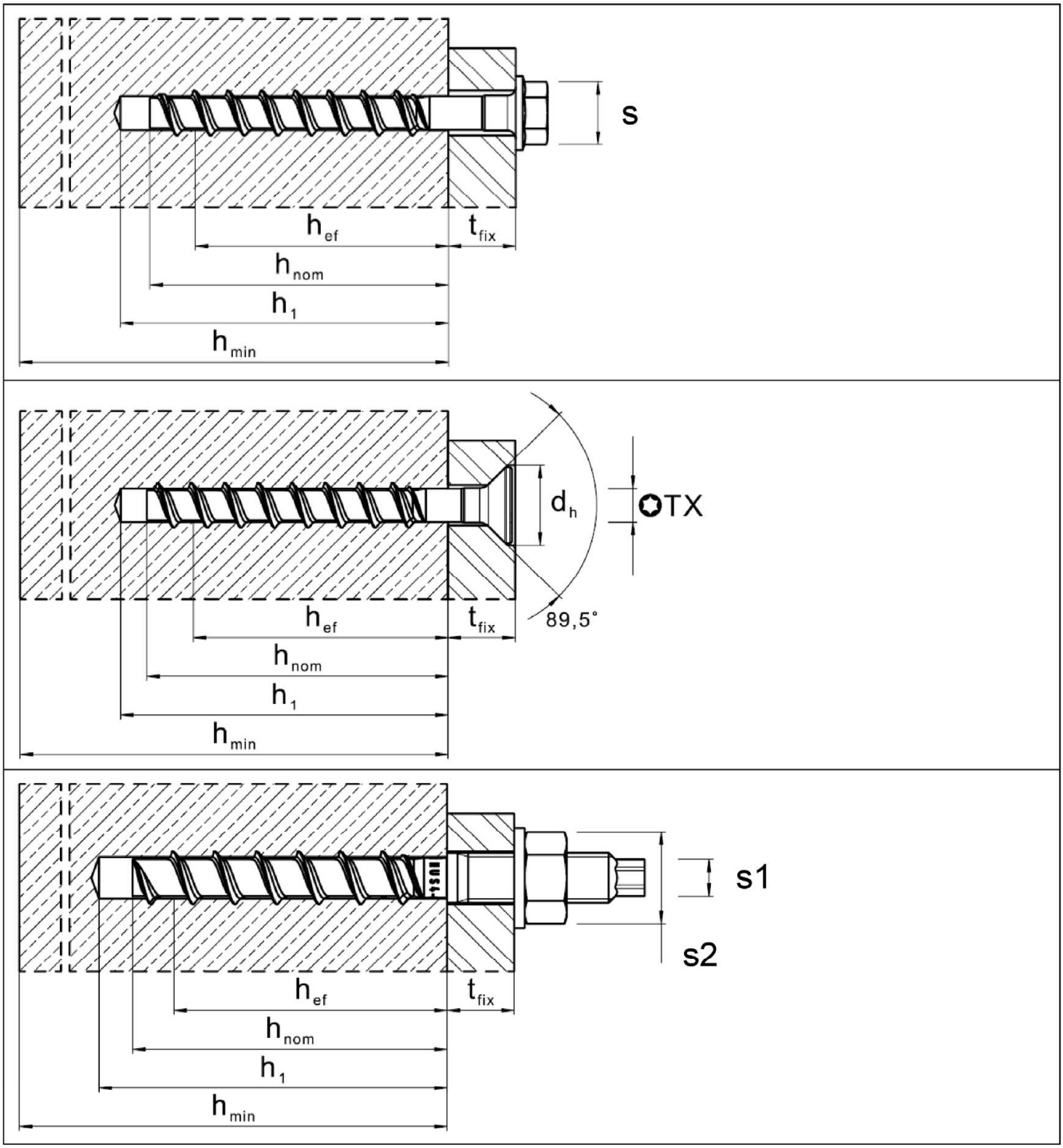
Installation parameters



Hilti screw anchor HUS4	**Annex B3**
Intended use Installation parameters	

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Table B5: Installation parameters HUS4-8 and 10

Fastener size HUS4			**8**			**10**		
Type			**H, C**			**H, C, A**		
			h_{nom1}	h_{nom2}	h_{nom3}	h_{nom1}	h_{nom2}	h_{nom3}
Nominal embedmenth depth	h_{nom}	[mm]	40	60	70	55	75	85
Nominal drill hole diameter	d_0	[mm]	8			10		
Cutting diameter of drill bit	$d_{cut} \leq$	[mm]	8,45			10,45		
Cutting diameter of diamond core bit	$d_{cut} \leq$	[mm]	-			9,9		
Clearance hole diameter through setting	$d_f \leq$	[mm]	12			14		
Clearance hole diameter pre setting (A-type)	$d_f \leq$	[mm]	-			14		
Wrench size (H, HF-type)	s	[mm]	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			50		
Diameter of countersunk head	d_h	[mm]	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	65	85	95
Depth of drill hole for uncleanded hole hammer drilling in wall and floor position	$h_1 \geq$	[mm]	(h_{nom} + 10 mm) + 2 * d_0					
			66	86	96	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	-	95	105
Depth of drill hole (with adjustability) for uncleaned hole hammer drilling in wall and floor position	$h_1 \geq$	[mm]	(h_{nom} + 20 mm) + 2 * d_0					
			-	96	106	-	115	125
Minimum thickness of concrete member	$h_{min} \geq$	[mm]	(h_1 + 30 mm)					
			80	100	120	100	130	140
Minimum spacing	$s_{min} \geq$	[mm]	35			40		
Minimum edge distance	$c_{min} \geq$	[mm]	35			40		
Hilti Setting tool [1)]			SIW 6 AT-A22 SIW 6.2 AT-A22 gear 1			SIW 22T-A SIW 6 AT-A22 SIW 6.2 AT-A22 SIW 8.1 AT gear 1 SIW 9-A22		

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

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

Table B6: Installation parameters HUS4-12 and 14

Fastener size HUS4			**12**			**14**		
Type			**H**			**H, A**		
			h_{nom1}	h_{nom2}	h_{nom3}	h_{nom1}	h_{nom2}	h_{nom3}
Nominal embedmenth depth	h_{nom}	[mm]	60	80	100	65	85	115
Nominal drill hole diameter	d_0	[mm]	12			14		
Cutting diameter of drill bit	$d_{cut} \leq$	[mm]	12,50			14,50		
Cutting diameter of diamond core bit	$d_{cut} \leq$	[mm]	12,2			-		
Clearance hole diameter through setting	$d_f \leq$	[mm]	16			18		
Clearance hole diameter pre setting (A-type)	$d_f \leq$	[mm]	-			18		
Wrench size (H, HF-type)	s	[mm]	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		
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)					
			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} + 10 mm) + 2 * d_0					
			94	114	134	103	123	153
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)					
			-	100	120	-	105	135
Depth of drill hole (with adjustability) for uncleaned hole hammer drilling in wall and floor position	$h_1 \geq$	[mm]	(h_{nom} + 20 mm) + 2 * d_0					
			-	124	144	-	133	163
Minimum thickness of concrete member	$h_{min} \geq$	[mm]	(h_1 + 30 mm)					
			110	130	150	120	160	200
Minimum spacing	$s_{min} \geq$	[mm]	50			60		
Minimum edge distance	$c_{min} \geq$	[mm]	50			60		
Hilti Setting tool [1)]			SIW 22T-A SIW 6.2 AT-A22 SIW 8.1 AT SIW 9-A22			SIW 22T-A SIW 6.2 AT-A22 SIW 8.1 AT SIW 9-A22		

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

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

Table B7: Installation parameters HUS4-16

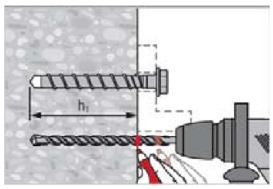
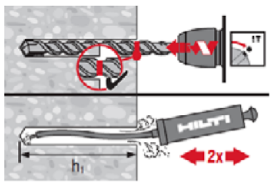
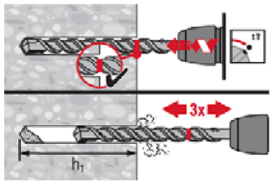
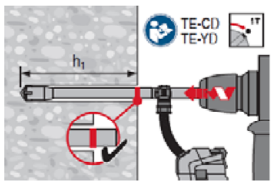
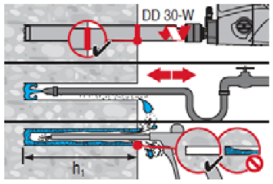
Fastener size HUS4			**16**	
Type			**H**	
			h_{nom1}	h_{nom2}
Nominal embedmenth depth	h_{nom}	[mm]	85	130
Nominal drill hole diameter	d_0	[mm]	16	
Nominal drill hole diameter	d_0	[mm]	16	
Cutting diameter of drill bit	$d_{cut} \leq$	[mm]	16,50	
Clearance hole diameter through setting	$d_f \leq$	[mm]	20	
Wrench size	s	[mm]	24	
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
Minimum thickness of concrete member	$h_{min} \geq$	[mm]	130	195
Minimum spacing	$s_{min} \geq$	[mm]	90	
Minimum edge distance	$c_{min} \geq$	[mm]	65	
Hilti Setting tool [1)]			SIW 22T-A SIW 6.2 AT-A22 SIW 8.1 AT SIW 9-A22	

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

Hilti screw anchor HUS4	**Annex B6**
Intended use Installation parameters	

Installation instructions

Hole drilling and cleaning

Hammer drilling (HD) all sizes (size 16 with cleaning only)	
	Mark drilling depth h_1 for pre or through installation. Details for drilling depth h_1 see table B5 to B7.
	Cleaning needed in downward and horizontal installation direction with drill hole depth. $h_1 = h_{nom} + 10$ mm
	No cleaning is allowed in upward installation direction. No cleaning is allowed in downward and horizontal installation direction when 3x ventilation[1)] after drilling is executed. Drill hole depth $h_1 = h_{nom} + 10$ mm$+ 2 * d_0$ [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 MPII.
Hammer drilling with Hilti hollow drill bit (HDB) TE-CD size 12 and 14.	
	No cleaning needed. $h_1 = h_{nom} + 10$ mm
Diamond coring with DD-EC1 or DD-30W size 10 to 14	
	Cleaning needed in all installation directions. $h_1 = h_{nom} + 10$ mm

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

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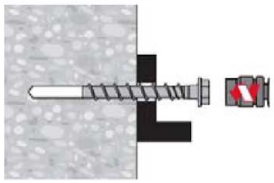
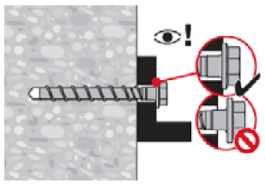
Fastener setting without adjustment

Setting by impact screw driver



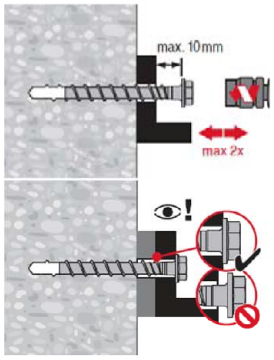
Setting parameters listed in Table B5 to B7.

Setting check



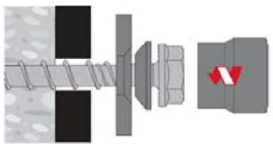
Fastener setting with adjustment

Adjusting process

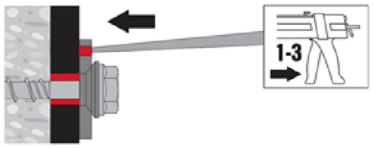


A screw can be adjusted maximum two times. The total allowed thickness of shims added during the adjustment process is 10 mm. The final embedment depth after adjustment process must be larger or equal than h_{nom2} or h_{nom3}.

Fastener setting with Hilti filling set



Injection of Hilti HIT mortar and curing time



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 B8**
Intended use Installation instructions	

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

Fastener size HUS4				**8**			**10**		
				h_{nom1}	h_{nom2}	h_{nom3}	h_{nom1}	h_{nom2}	h_{nom3}
Nominal embedment depth		h_{nom}	[mm]	40	60	70	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 load									
Characteristic resistance		$N_{Rk,s}$	[kN]	36,0			55,0		
Partial factor		$\gamma_{Ms,N}$ [1]	[-]	1,5					
Pull-out failure									
Characteristic resistance in uncracked concrete C20/25		$N_{Rk,p}$	[kN]	≥ $N^0_{Rk,c}$ [3]			13	22	≥ $N^0_{Rk,c}$ [3]
Characteristic resistance in cracked concrete C20/25		$N_{Rk,p}$	[kN]	5,5	≥ $N^0_{Rk,c}$ [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	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]	$N_{Rk,p}$					
Splitting failure	Edge distance	$c_{cr,sp}$	[mm]	1,5 h_{ef}			1,65 h_{ef}		
	Spacing	$s_{cr,sp}$	[mm]	3 h_{ef}			3,3 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: $h_{ef} = 0,85 * (h_{nom} - 0,5 * h_t)$
[3] $N^0_{Rk,c}$ according to EN 1992-4:2018

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

Table C1 continued

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

[1)] In absence of other national regulations.

Hilti screw anchor HUS4	**Annex C2**
Performances Essential characteristics under static and quasi-static load in concrete	

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Table C2: Essential characteristics under static and quasi-static load in concrete for HUS4 size 12 to 16

Fastener size HUS4				**12**			**14**			**16**	
				h_{nom1}	h_{nom2}	h_{nom3}	h_{nom1}	h_{nom2}	h_{nom3}	h_{nom1}	h_{nom2}
Nominal embedment depth		h_{nom}	[mm]	60	80	100	65	85	115	85	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		$N_{Rk,s}$	[kN]	79,0			101,5			107,7	
Partial factor		$\gamma_{Ms,N}$ [1]	[-]	1,5							
Pull-out failure											
Characteristic resistance in uncracked concrete C20/25		$N_{Rk,p}$	[kN]	≥ $N^0_{Rk,c}$ [3]						22	46
Characteristic resistance in cracked concrete C20/25		$N_{Rk,p}$	[kN]	10	≥ $N^0_{Rk,c}$ [3]					16	32
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]	45,9	62,9	79,9	49,3	66,3	91,8	66,6	104,9
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]	$N_{Rk,p}$							
Splitting failure	Edge distance	$c_{cr,sp}$	[mm]	1,65 h_{ef}			1,60 h_{ef}				
	Spacing	$s_{cr,sp}$	[mm]	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: $h_{ef} = 0,85 * (h_{nom} - 0,5 * h_t)$
[3] $N^0_{Rk,c}$ according to EN 1992-4:2018

Hilti screw anchor HUS4	**Annex C3**
Performances Essential characteristics under static and quasi-static load in concrete	

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Table C2 continued

Fastener size HUS4			**12**			**14**			**16**	
			h_{nom1}	h_{nom2}	h_{nom3}	h_{nom1}	h_{nom2}	h_{nom3}	h_{nom1}	h_{nom2}
Nominal embedment depth	h_{nom}	[mm]	60	80	100	65	85	115	85	130
Steel failure for shear load										
Characteristic resistance	$V^0_{Rk,s}$	[kN]	38,9		44,9	55	62		65,1	73,1
Partial factor	$\gamma_{Ms,V}$ [1)]	[-]	1,25							
Ductility factor	k_7	[-]	0,8							
Characteristic resistance	$M^0_{Rk,s}$	[Nm]	125			186			240	
Concrete pry-out failure										
Pry-out factor	k_8	[-]	2,0							
Concrete edge failure										
Effective length of fastener	l_f	[mm]	60	80	100	65	85	115	85	130
Outside diameter of fastener	d_{nom}	[mm]	12			14			16	

[1)] In absence of other national regulations.

Hilti screw anchor HUS4	**Annex C4**
Performances Essential characteristics under static and quasi-static load in concrete	

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Table C3: Essential characteristics for seismic performance category C1 in concrete for HUS4

Fastener size HUS4			**8**		**10**		**12**		**14**	
			h_{nom2}	h_{nom3}	h_{nom2}	h_{nom3}	h_{nom2}	h_{nom3}	h_{nom2}	h_{nom3}
Nominal embedment depth	h_{nom}	[mm]	60	70	75	85	80	100	85	115
Steel failure for tension and shear load										
Characteristic resistance	$N_{Rk,s,C1}$	[kN]	36,0		55,0		79,0		101,5	
Partial factor	$\gamma_{Ms,N}$ [1)]	[-]	1,5							
Characteristic resistance	$V_{Rk,s,C1}$	[kN]	18,8		26,7		38,9		22,5	34,5
Partial factor	$\gamma_{Ms,V}$ [1)]	[-]	1,25							
Reduction factor annular gap unfilled	α_{gap}	[-]	0,5							
Reduction factor annular gap filled	α_{gap}	[-]	1,0							
Pull-out failure										
Characteristic resistance in cracked concrete	$N_{Rk,p,C1}$	[kN]	$\geq N^0_{Rk,c}$ [3)]							
Concrete cone failure										
Effective embedment depth	h_{ef} [2)]	[mm]	47,6	56,1	59,5	68,0	62,9	79,9	66,3	91,8
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]	60	70	75	85	80	100	85	115
Outside diameter of fastener	d_{nom}	[mm]	8		10		12		14	

[1)] In absence of other national regulations.
[2)] In case $h_{nom} > h_{nom2}$ and $< h_{nom3}$ the actual h_{ef} for concrete failure can be calculated according to "$h_{ef} = 0,85 * (h_{nom} - 0,5 * h_t)$
[3)] $N^0_{Rk,c}$ according to EN 1992-4:2018

Hilti screw anchor HUS4	**Annex C5**
Performances Essential characteristics for seismic performance category C1 in concrete	

Table C3 continued

Fastener size HUS4			16	
			h_{nom1}	h_{nom2}
Nominal embedment depth	h_{nom}	[mm]	85	130
Steel failure for tension and shear load				
Characteristic resistance	$N_{Rk,s,C1}$	[kN]	107,7	
Partial factor	$\gamma_{Ms,N}$ [1)]	[-]	1,5	
Characteristic resistance	$V_{Rk,s,C1}$	[kN]	42,9	25,3
Partial factor	$\gamma_{Ms,V}$ [1)]	[-]	1,25	
Reduction factor annular gap unfilled	α_{gap}	[-]	0,5	
Reduction factor annular gap filled	α_{gap}	[-]	1,0	
Pull-out failure				
Characteristic resistance in cracked concrete	$N_{Rk,p,C1}$	[kN]	7,5	19,0
Concrete cone failure				
Effective embedment depth	h_{ef} [2)]	[mm]	66,6	104,9
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	130
Outside diameter of fastener	d_{nom}	[mm]	16	

[1)] In absence of other national regulations.
[2)] In case $h_{nom} > h_{nom2}$ and $< h_{nom3}$ the actual h_{ef} for concrete failure can be calculated according to "$h_{ef} = 0,85 * (h_{nom} - 0,5 * h_t)$

Hilti screw anchor HUS4	**Annex C6**
Performances Essential characteristics for seismic performance category C1 in concrete	

Table C4: Essential characteristics for seismic performance category C2 in concrete for HUS4

Fastener size HUS4				**8** h_{nom3}	**10** h_{nom3}	**12** h_{nom3}	**14** h_{nom3}
Nominal embedment depth		h_{nom}	[mm]	70	85	100	115
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							
Characteristic resistance		$N_{Rk,s,C2}$	[kN]	36,0	55,0	79,0	101,5
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 (HUS4-H and HUS4-A)							
Characteristic resistance		$V_{Rk,s,C2}$	[kN]	13,9	21,5	27,2	46,5
Reduction factor annular gap filled		α_{gap}	[-]	1,0			
Installation without Hilti filling set							
Characteristic resistance		$V_{Rk,s,C2}$	[kN]	9,4	13,7	22,5	34,4
Reduction factor annular gap filled		α_{gap}	[-]	0,5			
Pull-out failure							
Characteristic resistance in cracked concrete		$N_{Rk,p,C2}$	[kN]	2,7	5,4	11,4	17,7
Concrete cone failure							
Effective embedment depth		h_{ef}	[mm]	56,1	68,0	79,9	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	[-]	2,0			
Concrete edge failure							
Effective length of fastener		l_f	[mm]	70	85	100	115
Outside diameter of fastener		d_{nom}	[mm]	8	10	12	14

[1)] In absence of other national regulations.

Hilti screw anchor HUS4	**Annex C7**
Performances Essential characteristics for seismic performance category C2 in concrete	

Table C5: Essential characteristics under fire exposure in concrete for HUS4-H

Fastener size HUS4-H				**8**			**10**		
				h_{nom1}	h_{nom2}	h_{nom3}	h_{nom1}	h_{nom2}	h_{nom3}
Nominal embedment depth		h_{nom}	[mm]	40	60	70	55	75	85
Steel failure for tension and shear load ($F_{Rk,s,fi} = N_{Rk,s,fi} = V_{Rk,s,fi}$)									
Characteristic resistance	R30	$F_{Rk,s,fi}$	[kN]	2,6			4,1	4,2	
	R60	$F_{Rk,s,fi}$	[kN]	1,9			3,1	3,1	
	R90	$F_{Rk,s,fi}$	[kN]	1,2			2,2	2,3	
	R120	$F_{Rk,s,fi}$	[kN]	0,9			1,5	1,7	
	R30	$M^0_{Rk,s,fi}$	[Nm]	2,3			4,8	4,9	
	R60	$M^0_{Rk,s,fi}$	[Nm]	1,7			3,6	3,7	
	R90	$M^0_{Rk,s,fi}$	[Nm]	1,1			2,6	2,7	
	R120	$M^0_{Rk,s,fi}$	[Nm]	0,8			1,8	1,9	
Pull-out failure									
Characteristic resistance	R30 R60 R90	$N^0_{Rk,p,fi}$	[kN]	1,3	2,8	3,6	2,3	3,9	4,7
	R120	$N^0_{Rk,p,fi}$	[kN]	1,0	2,2	2,8	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	2,0	4,7	6,5
	R120	$N^0_{Rk,c,fi}$	[kN]	0,7	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 h_{ef}					
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 C8

Performances
Essential characteristics under fire exposure in concrete

Table C5 continued

Fastener size HUS4-H				**12**			**14**			**16**	
				h_{nom1}	h_{nom2}	h_{nom3}	h_{nom1}	h_{nom2}	h_{nom3}	h_{nom1}	h_{nom2}
Nominal embedment depth		h_{nom}	[mm]	60	80	100	65	85	115	85	130
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]	7,5	7,6	7,6	10,3	10,4	10,5	10,6	10,7
	R60	$F_{Rk,s,fi}$	[kN]	5,5	5,7	5,8	7,7	7,9	8,0	8,1	8,2
	R90	$F_{Rk,s,fi}$	[kN]	3,7	3,9	4,1	5,2	5,6	5,8	5,7	5,9
	R120	$F_{Rk,s,fi}$	[kN]	2,8	3,0	3,1	3,9	4,2	4,4	4,3	4,5
	R30	$M^0_{Rk,s,fi}$	[Nm]	11,4	11,6	11,6	18,9	19,2	19,3	23,7	23,9
	R60	$M^0_{Rk,s,fi}$	[Nm]	8,4	8,8	8,9	14,1	14,6	14,8	18,1	18,3
	R90	$M^0_{Rk,s,fi}$	[Nm]	5,7	6,0	6,2	9,5	10,2	10,7	12,7	13,2
	R120	$M^0_{Rk,s,fi}$	[Nm]	4,3	4,6	4,7	7,2	7,7	8,1	9,6	10,0
Pull-out failure											
Characteristic resistance	R30 R60 R90	$N^0_{Rk,p,fi}$	[kN]	2,6	4,2	6,1	2,9	4,5	7,5	4,6	8,7
	R120	$N^0_{Rk,p,fi}$	[kN]	2,1	3,4	4,9	2,3	3,6	6,0	3,7	7,0
Concrete cone failure											
Characteristic resistance	R30 R60 R90	$N^0_{Rk,c,fi}$	[kN]	2,4	5,4	9,8	2,9	6,1	13,9	6,2	19,4
	R120	$N^0_{Rk,c,fi}$	[kN]	1,9	4,3	7,8	2,3	4,9	11,1	4,9	15,5
Edge distance											
R30 to R120		$c_{cr,fi}$	[mm]	2 h_{ef}							
In case of fire attack from more than one side, the minimum edge distance shall be ≥ 300 mm											
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

Annex C9

Performances
Essential characteristics under fire exposure in concrete

Table C6: Essential characteristics under fire exposure in concrete for HUS4-C

Fastener size HUS4-C				**8**			**10**		
				h_{nom1}	h_{nom2}	h_{nom3}	h_{nom1}	h_{nom2}	h_{nom3}
Nominal embedment depth		h_{nom}	[mm]	40	60	70	55	75	85
Steel failure for tension and shear load ($F_{Rk,s,fi} = N_{Rk,s,fi} = V_{Rk,s,fi}$)									
Characteristic resistance	R30	$F_{Rk,s,fi}$	[kN]	0,5			1,0		
	R60	$F_{Rk,s,fi}$	[kN]	0,4			0,9		
	R90	$F_{Rk,s,fi}$	[kN]	0,3			0,7		
	R120	$F_{Rk,s,fi}$	[kN]	0,2			0,6		
	R30	$M^0_{Rk,s,fi}$	[Nm]	0,4			1,2		
	R60	$M^0_{Rk,s,fi}$	[Nm]	0,3			1,0		
	R90	$M^0_{Rk,s,fi}$	[Nm]	0,2			0,8		
	R120	$M^0_{Rk,s,fi}$	[Nm]	0,2			0,6		
Pull-out failure									
Characteristic resistance	R30 R60 R90	$N^0_{Rk,p,fi}$	[kN]	1,3	2,8	3,6	2,3	3,9	4,7
	R120	$N^0_{Rk,p,fi}$	[kN]	1,0	2,2	2,8	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	2,0	4,7	6,5
	R120	$N^0_{Rk,c,fi}$	[kN]	0,7	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]	$2\ h_{ef}$					
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 C10**
Performances Essential characteristics under fire exposure in concrete	

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Table C7: Essential characteristics under fire exposure in concrete for HUS4-A

Fastener size HUS4-A				**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
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 h_{ef}					
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 C11

Performances
Essential characteristics under fire exposure in concrete

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Table C8: Displacements under tension loads

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

Fastener size HUS4				**12**			**14**			**16**	
				h_{nom1}	h_{nom2}	h_{nom3}	h_{nom1}	h_{nom2}	h_{nom3}	h_{nom1}	h_{nom2}
Nominal embedment depth		h_{nom}	[mm]	60	80	100	65	85	115	85	130
Cracked concrete C20/25 to C50/60	Tension Load	N	[kN]	5,1	8,2	11,7	5,7	8,6	14,4	8,7	16,7
	Displacement	δ_{N0}	[mm]	0,3	0,4	0,6	0,3	0,4	0,7	0,1	0,4
		$\delta_{N\infty}$	[mm]	0,9	0,9	1,2	1,3	1,3	1,5	1,3	1,4
Uncracked concrete C20/25 to C50/60	Tension Load	N	[kN]	6,8	10,8	15,5	7,5	11,7	19,1	11,5	22,9
	Displacement	δ_{N0}	[mm]	0,2	0,3	0,4	0,2	0,3	0,5	0,4	0,3
		$\delta_{N\infty}$	[mm]	0,9	0,9	1,2	1,3	1,3	1,5	1,3	1,4

Table C9: Displacements under shear loads

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

Fastener size HUS4				**12**			**14**			**16**	
				h_{nom1}	h_{nom2}	h_{nom3}	h_{nom1}	h_{nom2}	h_{nom3}	h_{nom1}	h_{nom2}
Nominal embedment depth		h_{nom}	[mm]	60	80	100	65	85	115	85	130
Concrete C20/25 to C50/60	Shear Load	V	[kN]	22,2	22,2	25,7	31,4	35,4	35,4	37,2	41,8
	Displacement	δ_{V0}	[mm]	1,6	1,6	0,9	5,3	5,3	4,0	2,3	1,8
		$\delta_{V\infty}$	[mm]	2,3	2,4	1,4	7,9	7,9	6,0	3,5	2,7

Hilti screw anchor HUS4

Annex C12

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

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Table C10: Displacements under tension and shear loads for seismic category 2

Fastener size HUS4			**8** h_{nom3}	**10** h_{nom3}	**12** h_{nom3}	14 h_{nom3}
Nominal embedment depth	h_{nom}	[mm]	70	85	100	115
Tension load						
Displacement DLS	$\delta_{N,C2\ (DLS)}$	[mm]	0,59	0,80	0,77	1,06
Displacement ULS	$\delta_{N,C2\ (ULS)}$	[mm]	1,36	3,66	2,78	3,89
Shear load with Hilti filling set (HUS4-H and HUS4-A)						
Displacement DLS	$\delta_{V,C2\ (DLS)}$	[mm]	1,85	1,72	1,73	2,52
Displacement ULS	$\delta_{V,C2\ (ULS)}$	[mm]	5,44	6,88	5,62	6,79
Shear load without Hilti filling set						
Displacement DLS	$\delta_{V,C2\ (DLS)}$	[mm]	4,64	5,02	4,90	4,93
Displacement ULS	$\delta_{V,C2\ (ULS)}$	[mm]	7,96	8,97	7,00	9,14

Hilti screw anchor HUS4	**Annex C13**
Performances Displacement values in case of seismic C2 loading	

Ref. no : 053/AN/RY/2022
Date : 06 Jul 2022

Subject : **Phase-in of Hilti Screw Anchor HUS4 size 8/10/12/14/16**

To whom it may concern,

After several years of intense research and development, Hilti is introducing the new generation of Hilti HUS4 Screw Anchor. HUS4 further provide an even more optimized fastening solution.

The Hilti HUS4 Screw Anchor is now suitable for an even wider range of applications and conditions by offering increased performance in case of concrete related failure modes and a wider range of sizes, embedment depth and head configurations.

1. **Product approval & information**

Now you can enjoy the following technical documents and product features:

- ETA assessment for structural and non-structural applications
- ETA assessment for static, quasi-static and seismic C1 and C2 loading
- ETA assessment under fire action
- Technical data for use in solid masonry, Aerated Autoclaved Concrete, Light Weight Aggregate blocks and Hollow Core Slabs
- HUS4 screw anchor with 2 times bigger portfolio size 8/10/12/14 and 16 supplied with same packaging concept as HUS3
- HUS4-H (**Hexagonal head**), HUS4-C (**Countersunk**) and HUS4-A (**Threaded head**)

2. **Load performance**

Based on this testing, recently released ETA 20/0867 HUS4 is an ultimate performance screw anchor and in many cases has the best performance in the industry. HUS4 is equal to or better than HUS3 for designed static, quasi-static and seismic C1 loading.

The original version – HUS3 will be tentatively phased out by the end of Jul. You can refer to the following summary on the equivalent items.

Should you have any further questions, please do not hesitate to contact our Technical Representatives or Customer Service Hotline at 8228-8118.

Yours faithfully,

Ricky Yau
Head of Product Leadership Strategy
Hilti (Hong Kong) Ltd.

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HUS3		HUS4	
Item no.	**Product description**	**Item no.**	**Product description**
2079794	Screw anchor HUS3-H 8x55 5/-/-	2293135	Screw anchor HUS4-H 8x55 15/-/-
2079795	Screw anchor HUS3-H 8x65 15/5/-	2293136	Screw anchor HUS4-H 8x65 25/5/-
2079796	Screw anchor HUS3-H 8x75 25/15/5	2293137	Screw anchor HUS4-H 8x75 35/15/5
2079797	Screw anchor HUS3-H 8x85 35/25/15	2293138	Screw anchor HUS4-H 8x85 45/25/15
2079798	Screw anchor HUS3-H 8x100 50/40/30	2293139	Screw anchor HUS4-H 8x100 60/40/30
2079799	Screw anchor HUS3-H 8x120 70/60/50	2293550	Screw anchor HUS4-H 8x120 80/60/50
2079910	Screw anchor HUS3-H 8x150 100/90/80	2293551	Screw anchor HUS4-H 8x150 110/90/80
2079911	Screw anchor HUS3-H 10x60 5/-/-	2293552	Screw anchor HUS4-H 10x60 5/-/-
2079912	Screw anchor HUS3-H 10x70 15/-/-	2293553	Screw anchor HUS4-H 10x70 15/5/-
2079913	Screw anchor HUS3-H 10x80 25/5/-	2293554	Screw anchor HUS4-H 10x80 25/5/-
2079914	Screw anchor HUS3-H 10x90 35/15/5	2293555	Screw anchor HUS4-H 10x90 35/15/5
2079915	Screw anchor HUS3-H 10x100 45/25/15	2293556	Screw anchor HUS4-H 10x100 45/25/15
2079916	Screw anchor HUS3-H 10x110 55/35/25	2293557	Screw anchor HUS4-H 10x110 55/35/25
2079917	Screw anchor HUS3-H 10x130 75/55/45	2293558	Screw anchor HUS4-H 10x130 75/55/45
2079918	Screw anchor HUS3-H 10x150 95/75/65	2293559	Screw anchor HUS4-H 10x150 95/75/65
		2293565	Screw anchor HUS4-H 12x70 10/-/-
		2293566	Screw anchor HUS4-H 12x100 40/20/-
		2293567	Screw anchor HUS4-H 12x130 70/50/30
		2293568	Screw anchor HUS4-H 12x150 90/70/50
2079921	Screw anchor HUS3-H 14x75 10/-/-	2293569	Screw anchor HUS4-H 14x75 10/-/-
2079922	Screw anchor HUS3-H 14x100 35/15/-	2293570	Screw anchor HUS4-H 14x100 35/15/-
2079923	Screw anchor HUS3-H 14x130 65/45/15	2293571	Screw anchor HUS4-H 14x130 65/45/15
2079924	Screw anchor HUS3-H 14x150 85/65/35	2293572	Screw anchor HUS4-H 14x150 85/65/35
		2333575	Screw anchor HUS4-H 16x100 15/-
		2333576	Screw anchor HUS4-H 16x140 55/10
		2333577	Screw anchor HUS4-H 16x165 80/35
		2333578	Screw anchor HUS4-H 16x205 120/75
2079931	Screw anchor HUS3-C 8x65 15/-/-	2293583	Screw anchor HUS4-C 8x55 15/-/-
2079932	Screw anchor HUS3-C 8x75 25/15/-	2293584	Screw anchor HUS4-C 8x75 35/15/-
2079933	Screw anchor HUS3-C 8x85 35/25/15	2293585	Screw anchor HUS4-C 8x85 45/25/15
2079934	Screw anchor HUS3-C 10x70 15/-/-	2293586	Screw anchor HUS4-C 10x70 15/-/-
2079935	Screw anchor HUS3-C 10x90 35/15/-	2293587	Screw anchor HUS4-C 10x90 35/15/-
2079936	Screw anchor HUS3-C 10x100 45/25/15	2293588	Screw anchor HUS4-C 10x100 45/25/15
		2293589	Screw anchor HUS4-C 10x120 65/45/35
		2293573	Screw anchor HUS4-A 10x120 M12x33 / 20
		2293574	Screw anchor HUS4-A 10x140 M12x38 / 30
		2293575	Screw anchor HUS4-A 10x165 M12x49 / 55
		2293576	Screw anchor HUS4-A 14x155 M16x47 / 35
		2293577	Screw anchor HUS4-A 14x185 M16x47 / 35
		2293578	Screw anchor HUS4-A 14x205 M16x48 / 55

Attn. : To whom it may concern

Date : 26 September 2023
Ref. : 089/AM/DY/23

Subject : Country of Origin- Hilti HUS4 Screw Anchor

Dear Sir / Madam,

Enclosed please find the information of Hilti HUS4 Screw Anchor

Brand Name : Hilti

Model Name : Hilti HUS4 Screw Anchor

Manufacturer : Hilti Corporation

Address of Manufacturer : FL-9494, Principality of Liechtenstein.

Manufacturer Contact Person : Dennis Yeung

Supplier : Hilti (Hong Kong) Ltd

Address of Supplier : 701-704, 7/F, Tower A, Manulife Financial Centre,
223 Wai Yip Street, Kwun Tong, Kowloon, Hong Kong

Supplier Contact Person : Dennis Yeung (+852 9723 4621)

Country of Origin : Liechtenstein

Should you have further questions, please do not hesitate to contact our Technical Representatives, Customer Service Hotline at 8228-8118, or email us at hksales@hilti.com.

Yours faithfully,

Dennis Yeung
Head of Product Leadership Strategy, F&P

Hilti (Hong Kong) Ltd.
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Hilti HUS4 Screw Anchor Job Reference

Year	Project Name	Customer Name	Project type
2022	KAI TAK SPORTS PARK	MAJESTIC ENGINEERING CO LTD	Sport & Recreation
2022	SHING KAI RD, KAI TAK NKIL 6607	MAJESTIC ENGINEERING CO LTD	Hospitality
2022	HKIA 3508 TERMINAL 2	GAMMON ENGINEERING & CONSTRUCTION	Transport
2022	HKIA 3408 3RW CONCOURSE	BUCG - CCCL JOINT VENTURE	Transport
2022	R6 CTL KLN ROUTE-CENTRAL TUNNEL HY/2018/08	BOUYGUES TRAVAUX PUBLICS	Infrastructure
2022	NGONG WAN RD & CHI NGONG RD	GENUINE TREASURE ACCESS	Industrial
2022	R6 TKO-LAM TIN TUNNEL NE/2015/01	HO LEUNG ENGINEERING CO LTD	Infrastructure
2022	R6 CTL KLN ROUTE-KAI TAK WEST HY/2014/07	GAMMON CONSTRUCTION LIMITED	Infrastructure
2022	WEST KOWLOON - LYRIC THEATRE - (IPS)	MING TAI CONSTRUCTION ENGINEERING	Community & Cultural
2022	WAN CHAI HOPEWELL CENTRE 2	UNION MANOR LIMITED	Hospitality
2023	NGONG WAN RD & CHI NGONG RD	GENUINE TREASURE ACCESS	Industrial
2023	WAN PO RD, TKO TOWN LOT 131 - DATA CENTRE - (I	FU SING ENGINEERING COMPANY LIMITED	Office
2023	KAI TAK SPORTS PARK	MAJESTIC ENGINEERING CO LTD	Sport & Recreation
2023	HKIA 3408 3RW CONCOURSE	BUCG - CCCL JOINT VENTURE	Transport
2023	HKIA 3508 TERMINAL 2	GAMMON ENGINEERING & CONSTRUCTION	Transport
2023	R6 TRUNK ROAD T2 ED/2018/04	BOUYGUES TRAVAUX PUBLICS	Infrastructure
2023	R6 CTL KLN ROUTE-CENTRAL TUNNEL HY/2018/08	BOUYGUES TRAVAUX PUBLICS	Infrastructure
2023	New - Sport & Recreation - Pat Heung, Kam Tin	MODERN (INTERNATIONAL) SCAFFOLDING	Sport & Recreation
2023	QUEEN MARY HOSPITAL PH1 (SS F501)	ABLE CONTRACTORS LIMITED	Health
2023	WEST KOWLOON - LYRIC THEATRE - (IPS)	GAMMON CONSTRUCTION LIMITED	Community & Cultural
2024	NGONG WAN RD & CHI NGONG RD	GENUINE TREASURE ACCESS	Industrial
2024	HKIA 3408 3RW CONCOURSE	YEE TAT PLUMBING ENG. LIMITED	Transport
2024	TRANSIT MAIL CENTRE C19W12	WINDMILL ENGINEERING CO LTD	Office
2024	HKIA 3508 TERMINAL 2	GAMMON E&M LIMITED	Transport
2024	MTR NEW EXT. (REF. 1601)-KWU TUNG STATION ON	GRAND CONNECTION CONSULTANTS	Transport
2024	R6 CTL KLN ROUTE-CENTRAL TUNNEL HY/2018/08	BOUYGUES TRAVAUX PUBLICS	Infrastructure
2024	R6 TRUNK ROAD T2 ED/2018/04	BOUYGUES TRAVAUX PUBLICS	Infrastructure
2024	WEST KOWLOON - LYRIC THEATRE - (IPS)	GAMMON CONSTRUCTION LIMITED	Community & Cultural
2024	R6 CTL KLN ROUTE-YMT WEST HY/2014/20	CHI KEUNG CONSTRUCTION ENGINEERING	Infrastructure
2024	KAI TAK SPORTS PARK	WAI HING IRON WORKS LIMITED	Sport & Recreation