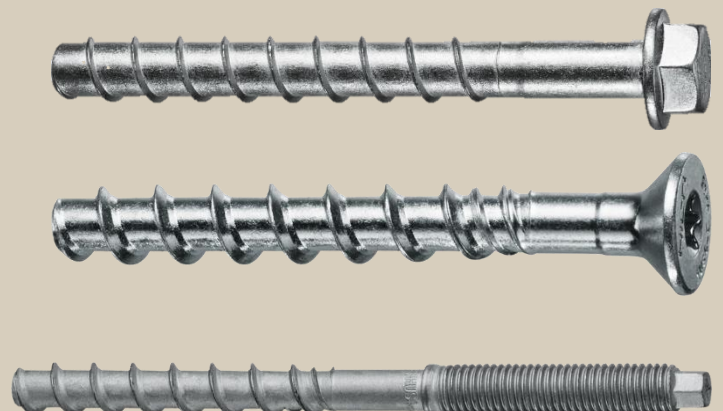







HUS4 Screw anchor

Product Technical Datasheet
Steel-to-concrete
Update: June 24



HUS4 Screw anchor for use in concrete

High performance screw anchor for single point fastening

Anchor version	Benefits
 <p>HUS4-H(F) (8-16)*</p>	<ul style="list-style-type: none"> - High productivity - less drilling and fewer operations than with conventional anchors
 <p>HUS4-C (8-10)</p>	<ul style="list-style-type: none"> - ETA 'cracked and uncracked concrete - ETA approval for Seismic C1 and C2 - ETA approval for adjustability
 <p>HUS4-A(F) (10-14)</p>	<ul style="list-style-type: none"> - (unscrew-rescrew) - Smaller edge and spacing distance
<ul style="list-style-type: none"> - Three embedment depths for maximum design flexibility and flexible design for concrete cone capacity - No cleaning required for 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 	



Base material	Load conditions
<div style="display: flex; justify-content: space-around;"> <div data-bbox="140 1576 256 1693"> <p>Concrete (uncracked)</p> </div> <div data-bbox="309 1576 426 1693"> <p>Concrete (cracked)</p> </div> <div data-bbox="478 1576 595 1693"> <p>SFRC</p> </div> </div>	<div style="display: flex; justify-content: space-around;"> <div data-bbox="826 1576 943 1693"> <p>Static / quasi-static</p> </div> <div data-bbox="995 1576 1112 1693"> <p>Seismic, C1, C2</p> </div> <div data-bbox="1165 1576 1281 1693"> <p>Fire resistance</p> </div> </div>
Drilling, cleaning, setting	Other information
<div style="display: flex; justify-content: space-around;"> <div data-bbox="148 1845 264 1962"> <p>Hammer drilled holes</p> </div> <div data-bbox="309 1845 426 1962"> <p>Hollow drill-bit drilling</p> </div> </div>	<div style="display: flex; justify-content: space-around;"> <div data-bbox="826 1845 943 1962"> <p>PROFIS Engineering Software</p> </div> <div data-bbox="995 1845 1112 1962"> <p>Steel to concrete Handbook</p> </div> </div>



Linked Approvals/Certificates and Instructions for use

Approvals/certificates for normal weight concrete without steel fibre and with maximum steel fibre content of 80 kg/m³

Approval no	Application / loading condition	Authority / Laboratory	Date of issue
ETA-20/0867	Static and quasi-static / Seismic/ Fire.	DIBt, Berlin	25-04-2024

HUS4 16 in general and adjustability of HUS4 8 and 10 for SFRC are not in the scope of the ETA.

Instructions for use

Anchor size	8	10	12	14	16
H, HF	IFU HUS4-H(F)-8	IFU HUS4-H(F)-10	IFU HUS4-H(F)-12	IFU HUS4-H(F)-14	IFU HUS4-H(F)-16
C	IFU HUS4-C-8	IFU HUS4-C-10			
A, AF		IFU HUS4-A-10		IFU HUS4-A-14	

Instructions for use (Filling set)


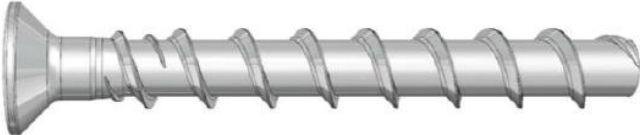

Anchor size	8	10	12	14	16
H, HF, A, AF	IFU Filling set				

Link to Hilti Webpage

HUS4-H	HUS4-HF	HUS4-C	HUS4-A	HUS4-AF
				

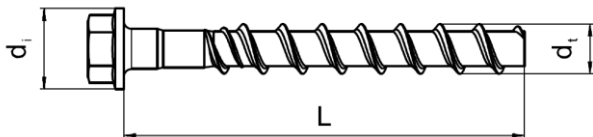
Fastener special dimensions

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)

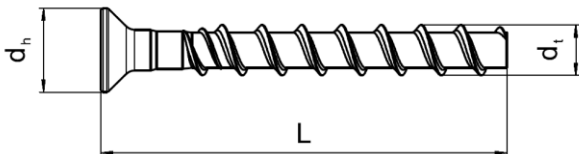
Anchor size			8	10	12	14	16
Type	HUS4		H, HF	H, HF	H	H, HF	H, HF
Outer diameter of screw thread	d_t	[mm]	10,50	12,70	14,70	16,70	18,80
Diameter of integrated washer	d_i	[mm]	17,50	20,50	23,60	29,00	32,60
Length of the screw (min/max)	L	[mm]	45/150	60/305	70/150	75/150	100/205



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

Fastener dimensions and marking HUS4-C

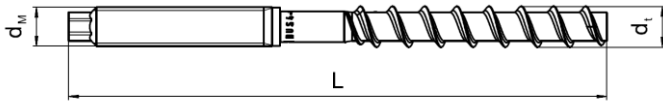
Anchor size			8	10
Type	HUS4		C	C
Outer diameter of the screw thread	d_t	[mm]	10,50	12,70
Countersunk head diameter	d_h	[mm]	18,00	21,00
Length of the screw (min/max)	L	[mm]	55/85	70/120



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



E.g. HUS4-A 10x165

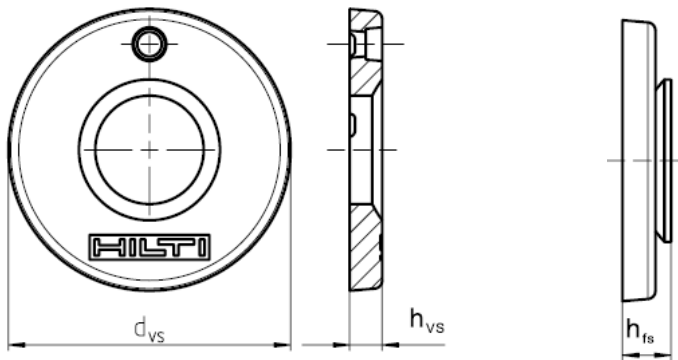


HUS4: Hilti Universal Screw 4th generation
A: Threaded head
10: Screw diameter
100: total length of the screw
8: carbon steel 8.8
K: length of the screw (more info in ETA)

Hilti Filling set

Hilti Filling set dimensions

Hilti filling set size	M10	M12	M16	M20
HUS4-H(F)	8	10	12, 14	16
HUS4-A(F)		10	14	
Filling washer diameter d_{vs} [mm]	42	44	52	60
Filling washer + spherical washer thickness h_{fs} [mm]	7	8	9	13



Static and quasi-static loading based on ETA-20/0867. Design according to EN 1992-4

All data in this section applies to:

- Correct setting (See setting instruction)
- For a single anchor
- No edge distance and spacing influence (see table with characteristic distances)
- Characteristic spacing and edge distance for splitting failure apply only for uncracked concrete.
- For cracked concrete only the characteristic spacing and characteristic edge distance for concrete cone failure are decisive
- Minimum base material thickness (see table)
- Embedment depth, as specified in the table of this section
- Anchor material, as specified in the tables of this section
- Concrete C20/25 with and without steel fibre
- Hammer drilled holes
- Recommended loads: With overall partial safety factor for action $\gamma = 1,4$.

For specific design cases refer to [PROFIS Engineering](#).

Design resistance

Type	HUS4	H, HF, C			H, HF, C, A, AF			H			H, HF, A, AF			H, HF	
Anchor size		8			10			12			14			16	
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
Uncracked concrete															
Tension	N_{Rd} [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	V_{Rd} [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	N_{Rd} [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	V_{Rd} [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

Type	HUS4	H, HF, C			H, HF, C, A, AF			H			H, HF, A, AF			H, HF	
Anchor size		8			10			12			14			16	
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
Uncracked concrete															
Tension	N_{rec} [kN]	4,0	7,7	9,8	5,2	10,5	13,1	7,3	11,7	16,7	8,1	12,6	20,6	10,5	21,9
Shear	V_{rec} [kN]	4,0	10,7	12,5	6,5	16,5	18,3	14,6	22,2	25,7	16,2	25,3	35,4	25,5	41,8
Cracked concrete															
Tension	N_{rec} [kN]	2,6	5,4	6,9	3,8	7,5	9,2	4,8	8,2	11,7	5,7	8,9	14,4	7,6	15,2
Shear	V_{rec} [kN]	2,8	10,7	12,5	4,5	15,1	18,3	10,2	16,4	23,4	11,4	17,7	28,8	17,8	35,2

The partial safety factors for action depend on the type of loading and shall be taken from national regulations

Seismic loading based on ETA-20/0867. Design according to EN 1992-4

All data in this section applies to:

- Correct setting (See setting instruction)
- For a single anchor
- No edge distance and spacing influence (see table with characteristic distances)
- Characteristic spacing and edge distance for splitting failure apply only for uncracked concrete.
- For cracked concrete only the characteristic spacing and characteristic edge distance for concrete cone failure are decisive
- Minimum base material thickness (see table)
- Embedment depth, as specified in the table of this section
- Anchor material, as specified in the tables of this section
- Concrete C20/25 with and without steel fibre for C1 and without steel fibres for C2
- $\alpha_{gap} = 1,0$ (using Hilti filling set) and $\alpha_{gap} = 0,5$ (without using Hilti filling set) accordingly
- Hammer drilled holes

For specific design cases refer to [PROFIS Engineering](#).

Design resistance in case of seismic performance category C2

with Hilti filling set										
Type	HUS4	H, HF			H, HF, A, AF		H	H, HF, A, AF		
Anchor size		8			10		12	14		
Nominal embedment depth	h_{nom} [mm]	h_{nom3}			h_{nom3}		h_{nom3}	h_{nom3}		
		70	55	75	85		100	115		
Tension	$N_{Rd,seis}$ [kN]	1,8	1,7	2,4	3,6		7,6	11,8		
Shear	$V_{Rd,seis}$ [kN]	12,8	12,1		18,5		22,9	34,3		
without Hilti filling set										
Type	HUS4	H, HF, C			H, HF, C, A, AF		H	H, HF, A, AF		
Anchor size		8			10		12	14		
Nominal embedment depth	h_{nom} [mm]	h_{nom3}			h_{nom3}		h_{nom3}	h_{nom3}		
		70	55	75	85		100	115		
Tension	$N_{Rd,seis}$ [kN]	1,8	1,7	2,4	3,6		7,6	11,8		
Shear	$V_{Rd,seis}$ [kN]	4,3			5,9		9,5	13,8		

Design resistance in case of seismic performance category C1

with Hilti filling set											
Type	HUS4	H, HF		H, HF, A, AF		H		H, HF, A, AF		H, HF	
Anchor size		8		10		12		14		16	
Nominal embedment depth	h_{nom} [mm]	h_{nom2}	h_{nom3}	h_{nom2}	h_{nom3}	h_{nom2}	h_{nom3}	h_{nom2}	h_{nom3}	h_{nom2}	h_{nom3}
		60	70	75	85	80	100	85	115	85	130
Tension	$N_{Rd,seis}$ [kN]	6,4	8,2	9,0	10,9	9,7	13,9	10,5	17,2	5,0	12,7
Shear	$V_{Rd,seis}$ [kN]	12,8	15,0	17,9	21,4	19,5	27,9	18,0	27,6	21,2	20,2
without Hilti filling set											
Type	HUS4	H, HF, C			H, HF, C, A, AF		H		H, HF, A, AF		
Anchor size		8			10		12		14		
Nominal embedment depth	h_{nom} [mm]	h_{nom2}	h_{nom3}	h_{nom2}	h_{nom3}	h_{nom2}	h_{nom3}	h_{nom2}	h_{nom3}	h_{nom2}	h_{nom3}
		60	70	75	85	80	100	85	115	85	130
Tension	$N_{Rd,seis}$ [kN]	6,4	8,2	9,0	10,9	9,7	13,9	10,5	17,2	5,0	12,7
Shear	$V_{Rd,seis}$ [kN]	6,4	7,5	9,0	10,7	9,7	13,9	9,0	13,8	10,6	10,1

Fire loading based on ETA-20/0867. Design according to EN 1992-4

All data in this section applies to:

- Correct setting (See setting instruction)
- For a single anchor
- No edge distance and spacing influence (see table with characteristic distances)
- Characteristic spacing and edge distance for splitting failure apply only for uncracked concrete.
- For cracked concrete only the characteristic spacing and characteristic edge distance for concrete cone failure are decisive
- Minimum base material thickness (see table)
- Embedment depth, as specified in the table of this section
- Anchor material, as specified in the tables of this section
- Concrete C20/25 with and without steel fibre, Hammer drilled holes
- Partial safety factor for resistance under fire exposure $\gamma_{M,fi} = 1,0$ (in absence of other national regulations)

For specific design cases refer to [PROFIS Engineering](#).

Design resistance

Type	HUS4	H, HF			C			H, HF			C			A		
Anchor size		8						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}	h_{nom1}	h_{nom2}	h_{nom3}
		40	60	70	40	60	70	55	75	85	55	75	85	55	75	85
Fire exposure R30																
Tension	$N_{Rd,fi}$ [kN]	0,8	2,6	2,6	0,5	0,5	0,5	2,0	3,9	4,2	1,0	1,0	1,0	2,0	3,9	4,2
Shear	$V_{Rd,fi}$ [kN]	0,9	2,6	2,6	0,5	0,5	0,5	2,0	3,9	4,2	1,0	1,0	1,0	2,0	4,2	4,2
Fire exposure R60																
Tension	$N_{Rd,fi}$ [kN]	0,8	1,9	1,9	0,4	0,4	0,4	2,0	3,1	3,1	0,9	0,9	0,9	2,0	3,3	3,3
Shear	$V_{Rd,fi}$ [kN]	0,8	1,9	1,9	0,4	0,4	0,4	3,1	3,1	3,1	0,9	0,9	0,9	2,0	3,3	3,3
Fire exposure R90																
Tension	$N_{Rd,fi}$ [kN]	0,8	1,2	1,2	0,3	0,3	0,3	2,0	2,3	2,3	0,7	0,7	0,7	2,0	2,5	2,5
Shear	$V_{Rd,fi}$ [kN]	0,8	1,2	1,2	0,3	0,3	0,3	2,0	2,3	2,3	0,7	0,7	0,7	2,0	2,5	2,5
Fire exposure R120																
Tension	$N_{Rd,fi}$ [kN]	0,7	0,9	0,9	0,2	0,2	0,2	1,5	1,7	1,7	0,6	0,6	0,6	1,6	2,1	2,1
Shear	$V_{Rd,fi}$ [kN]	0,7	0,9	0,9	0,2	0,2	0,2	1,5	1,7	1,7	0,6	0,6	0,6	1,6	2,1	2,1

Design resistance

Type	HUS4	H, HF			H, HF			A			H, HF	
Anchor size		12			14						16	
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}
		60	80	100	65	85	115	55	75	85	85	130
Fire exposure R30												
Tension	$N_{Rd,fi}$ [kN]	2,4	4,2	6,1	2,9	4,5	7,5	2,9	4,5	7,5	4,6	8,7
Shear	$V_{Rd,fi}$ [kN]	4,9	7,6	7,6	5,9	10,4	10,5	5,9	8,4	8,4	10,6	10,7
Fire exposure R60												
Tension	$N_{Rd,fi}$ [kN]	2,4	4,2	5,8	2,9	4,5	7,5	2,9	4,5	6,8	4,6	8,2
Shear	$V_{Rd,fi}$ [kN]	4,9	5,7	5,8	5,9	7,9	6,0	5,9	6,8	6,8	8,1	8,2
Fire exposure R90												
Tension	$N_{Rd,fi}$ [kN]	2,4	3,9	4,1	2,9	5,6	5,8	2,9	4,5	5,1	4,6	5,9
Shear	$V_{Rd,fi}$ [kN]	3,7	3,9	4,1	5,2	5,6	5,8	5,1	5,1	5,1	5,7	5,9
Fire exposure R120												
Tension	$N_{Rd,fi}$ [kN]	1,9	3,0	3,1	2,3	3,6	4,4	2,3	3,6	4,3	3,7	4,5
Shear	$V_{Rd,fi}$ [kN]	2,8	3,0	3,1	3,9	4,2	4,4	4,3	4,3	4,3	4,3	4,5

Setting information

Setting details size 8-12

Type	HUS4	H, HF, C			H, HF, C, A, AF			H		
Anchor size		8			10			12		
Nominal embedment 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
Effective embedment depth	h_{ef} [mm]	30.6	47.6	56.1	42.5	59.5	68	45.9	62.9	79.9
Nominal diameter of drill bit	d_0 [mm]	8			10			12		
Clearance hole diameter	d_{fmax} [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 uncleaned hole overhead	h_{1min} [mm]	50	70	80	65	85	95	70	90	110
Depth of drill hole for uncleaned hole hammer drilling in wall and floor position	h_{1min} [mm]	66	86	96	85	105	115	94	114	134
Minimum base material thickness	h_{min} [mm]	80	100	120	100	130	140	110	130	150

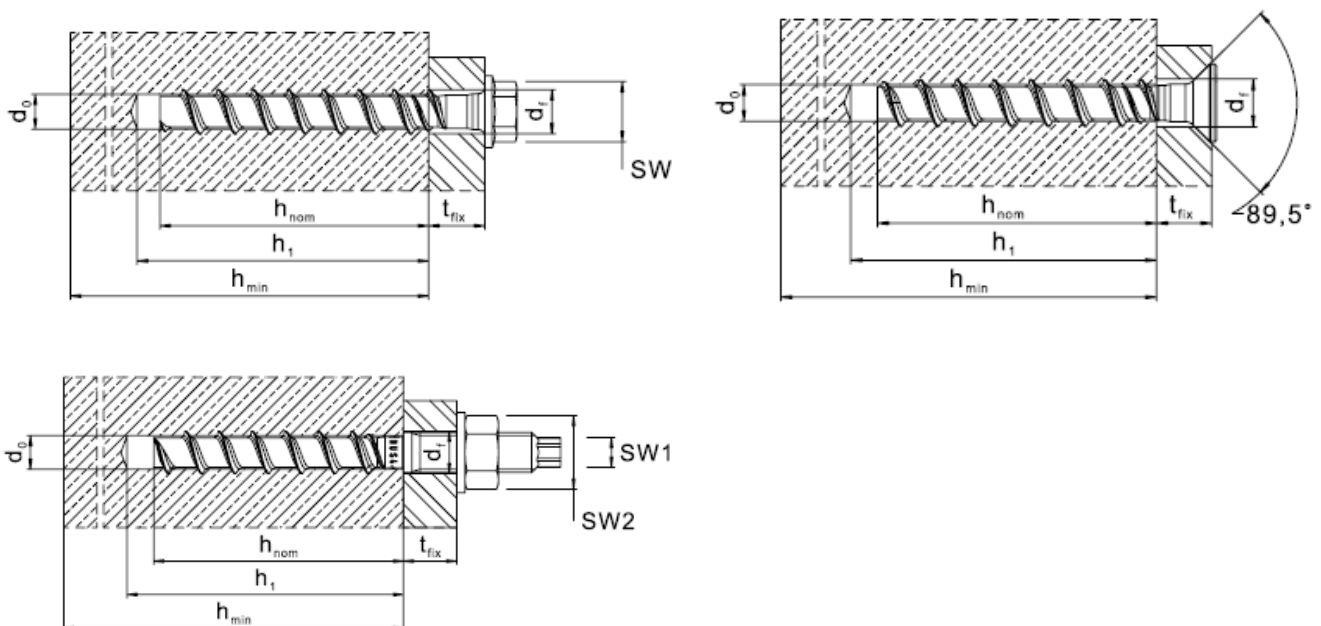
Minimum distances										
Spacing	S_{min} [mm]	35			40			50		
Edge distance	C_{min} [mm]	35			40			50		
Characteristics distances										
Spacing for splitting failure	$S_{cr,sp}$ [mm]	3 h_{ef}			3,3 h_{ef}			3,3 h_{ef}		
Edge distance for splitting	$C_{cr,sp}$ [mm]	1,5 h_{ef}			1,65 h_{ef}			1,65 h_{ef}		
Spacing for concrete cone failure	$S_{cr,N}$ [mm]				3 h_{ef}					
Edge distance for concrete cone failure	$C_{cr,N}$ [mm]				1,5 h_{ef}					

Setting details size 14-16

Type	HUS4	H, HF, A, AF			H, HF	
Anchor size		14			16	
Nominal embedment depth	[mm]	h_{nom1}	h_{nom2}	h_{nom3}	h_{nom1}	h_{nom2}
		65	85	115	85	130
Effective embedment depth	h_{ef} [mm]	49.3	66.3	91.8	66.6	104.9
Nominal diameter of drill bit	d_0 [mm]	14			16	
Clearance hole diameter	d_{fmax} [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 uncleaned hole overhead	h_{1min} [mm]	75	95	125	95	140
Depth of drill hole for uncleaned hole hammer drilling in wall and floor position	h_{1min} [mm]	103	123	153	-	-

Minimum distances						
Minimum base material thickness	h_{min} [mm]	120	160	200	130	195
Minimum spacing	s_{min} [mm]	60	90			
Minimum edge distance	c_{min} [mm]	60	65			
Characteristics distances						
Spacing for splitting failure	$s_{cr,sp}$ [mm]	3,3 h_{ef}				
Edge distance for splitting	$c_{cr,sp}$ [mm]	1,65 h_{ef}				
Spacing for concrete cone failure	$s_{cr,N}$ [mm]	3 h_{ef}				
Edge distance for concrete cone failure	$c_{cr,N}$ [mm]	1,5 h_{ef}				

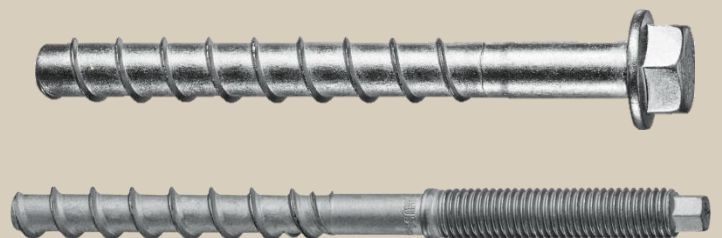
For spacing (edge distance) smaller than characteristic spacing (characteristic edge distance) the design loads have to be reduced (see system design resistance)







HUS4 Screw anchor

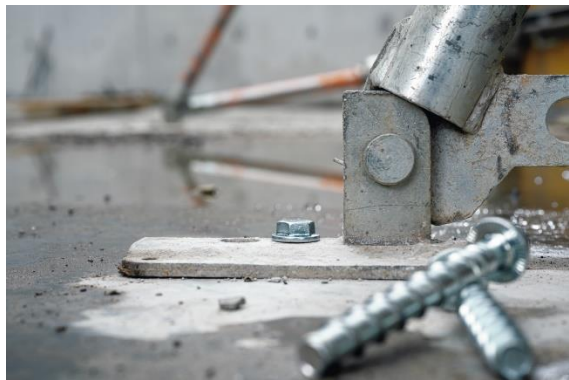
Product Technical Datasheet
Temporary fastening
Steel-to-concrete
Update: June 24


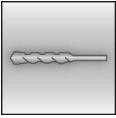



HUS4 Screw anchor for use in concrete temporary fastening

High performance screw anchor for single point fastening

Anchor version	Benefits
 <p>HUS4-H(F) (8-16)*</p>	<ul style="list-style-type: none"> - High productivity - less drilling and fewer operations than with conventional anchors - Smaller edge and spacing distance - aBG (DIBt) approval for reusability in fresh concrete ($f_{ck, cube} = 10/15/20/25 \text{ Nmm}^2$) for temporary applications - Three embedment depths
 <p>HUS4-A(F) (10-14)</p>	<ul style="list-style-type: none"> - HUS4-HF and HUS4-AF with multilayer coatings for additional corrosion protection - Through fastening with H, A head - - Pre-fastening with A head



Base material	Load conditions
<div style="display: flex; justify-content: space-around;"> <div data-bbox="140 1402 256 1518"> <p>Concrete (uncracked)</p> </div> <div data-bbox="309 1402 426 1518"> <p>Concrete (cracked)</p> </div> </div>	<div style="text-align: center;">  <p>Static / quasi-static</p> </div>
Drilling, cleaning, setting	Other information
<div style="text-align: center;">  <p>Hammer drilled holes</p> </div>	<div style="text-align: center;">  <p>Steel to concrete Handbook</p> </div>



Linked Approvals/Certificates and Instructions for use



Approvals/certificates

Approval no	Application / loading condition	Authority / Laboratory	Date of issue	Date of expiry
Z-21.8-2137	aBG for temporary fastening	DIBt, Berlin	21-12-2021	21-12-2026

Instructions for use

Anchor size	8	10	12	14	16
H	IFU HUS4-H(F)-8	IFU HUS4-H(F)-10	IFU HUS4-H(F)-12	IFU HUS4-H(F)-14	IFU HUS4-H(F)-16
A		IFU HUS4-A-10		IFU HUS4-A-14	

Link to Hilti Webpage (QR codes)

HUS4-H	HUS4-A
	

Basic loading data for temporary application in standard and fresh concrete <28 days old, based on DIBt approval Z-21.8-2137. Design according to EN 1992-4 (Method C).

All data in this section applies to the following conditions:

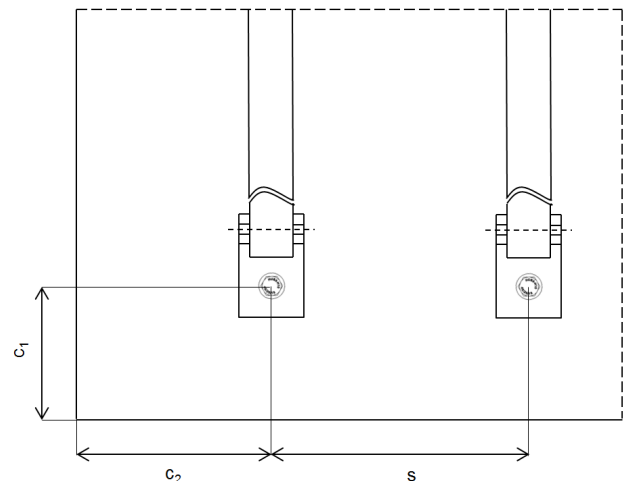
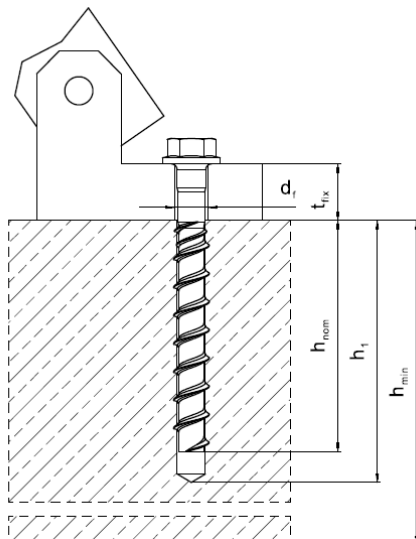
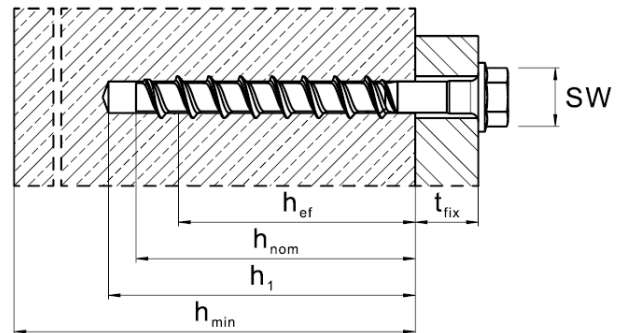
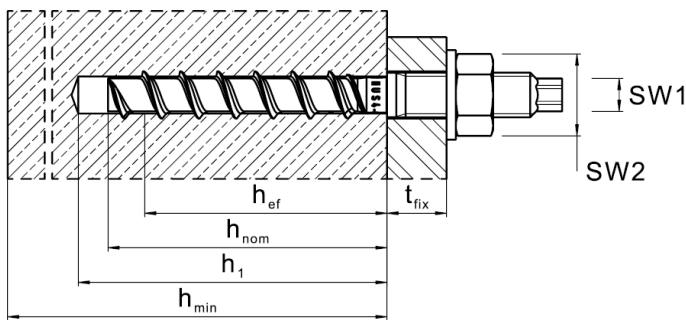
- Strength class, $f_{ck,cube} \geq 10 \text{ N/mm}^2$
- Temporary use
- Screw is reusable, before each usage it must be checked according to Hilti instruction for use with the suited tube Hilti HRG
- Design resistance is valid for single anchor only
- Design resistance is valid for all load directions and valid for both cracked and uncracked concrete
- Minimum base material thickness
- No edge distance and spacing influence (provided $c \geq c_{min}$ and $s \geq s_{min}$)

Anchor size		HUS4-H (A)	8		10			12			14			16		
Nominal embedment depth h_{nom}		[mm]	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}	
			60	70	55	75	85	60	80	100	65	85	115	85	130	
Tension	$f_{ck,cube} \geq 10 \text{ N/mm}^2$	N_{Rd}	[kN]	3,3	4,7	3,3	5,3	6,3	2,6	5,4	7,8	4,4	7,0	12,3	5,5	12,6
	$f_{ck,cube} \geq 15 \text{ N/mm}^2$	N_{Rd}	[kN]	4,0	5,7	4,0	6,4	7,8	3,5	7,3	10,6	5,4	8,5	15,0	7,5	17,0
Shear	$f_{ck,cube} \geq 20 \text{ N/mm}^2$	V_{Rd}	[kN]	4,6	6,6	4,7	7,4	9,0	4,0	8,4	12,2	6,2	9,9	17,3	8,7	19,7
	$f_{ck,cube} \geq 25 \text{ N/mm}^2$	V_{Rd}	[kN]	5,1	7,4	5,3	8,3	10,1	4,5	9,4	13,6	6,9	11,1	19,3	9,7	22,0

Setting information

Setting details

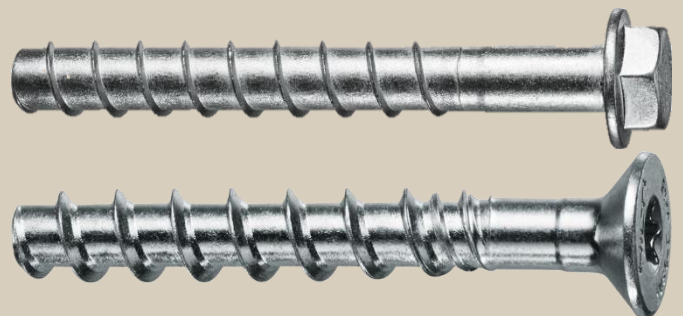
Anchor size	HUS4-H (A)	8			10			12			14			16	
Nominal embedment depth	h_{nom} [mm]	h_{nom2}	h_{nom3}	h_{nom1}	h_{nom2}	h_{nom3}	h_{nom1}	h_{nom2}	h_{nom3}	h_{nom1}	h_{nom2}	h_{nom3}	h_{nom1}	h_{nom2}	
		60	70	55	75	85	60	80	100	65	85	115	85	130	
Drilling depth	h_{1min} [mm]	70	80	65	85	95	70	90	110	75	95	125	95	140	
Option 1															
Minimum edge distance	c_{1min} [mm]	80	100	75	100	115	65	105	135	85	115	180	105	180	
Minimum base material thickness	h_{min} [mm]	120	150	115	150	175	110	160	205	130	175	255	160	220	
Option 2															
Minimum edge distance	c_{1min} [mm]	85	110	85	120	135	65	120	160	100	135	300	115	215	
Minimum base material thickness	h_{min} [mm]	100	120	100	130	140	110	130	150	120	160	200	130	195	
Minimum edge distance	c_{2min} [mm]	1,5 c_1													
Minimum spacing	s_{min} [mm]	3,0 c_1													
Check gauge		HRG 8			HRG 10			HRG 12			HRG 14			HRG 16	
Diameter of clearance hole for H head	d_{fmax} [mm]	14			16			20			22			24	
Diameter of clearance hole for A head	d_{fmax} [mm]	-			14			-			18			-	
Socket size H head	SW	13			15			17			21			24	
Socket size A head	SW1 (SW2)	-			8 (17)			-			12 (24)			-	





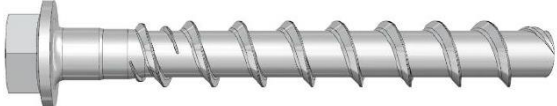

HUS4 Screw anchor

Product Technical Datasheet
Steel-to-masonry
Update: June 24

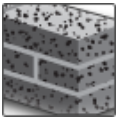

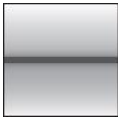


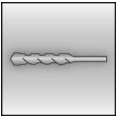

HUS4 Screw anchor for use in masonry

High performance screw anchor for single point fastening

Anchor version	Benefits
 <p>HUS4-H(F) (8-10)*</p>	<ul style="list-style-type: none"> - High productivity - less drilling and fewer operations than with conventional anchors
 <p>HUS4-C (8-10)</p>	<ul style="list-style-type: none"> - HUS4-HF and HUS4-AF with multilayer coatings for additional corrosion protection - Through fastening with H and C head



Base material	Load conditions
<div style="display: flex; justify-content: space-around;"> <div data-bbox="140 1205 256 1323">  <p>Solid brick</p> </div> <div data-bbox="309 1205 426 1323">  <p>Autoclaved aerated concrete</p> </div> </div>	<div style="text-align: center;">  <p>Static / quasi-static</p> </div>

Drilling, cleaning, setting	Other information
<div style="text-align: center;">  <p>Hammer drilled holes</p> </div>	<div style="text-align: center;">  <p>Hilti Technical data</p> </div>



Linked Instructions for use

Instructions for use

Anchor size	8	10
H, HF	IFU HUS4-H(F)-8	IFU HUS4-H(F)-10
C	IFU HUS4-C-8	IFU HUS4-C-10

Link to Hilti Webpage (QR codes)






HUS4-H	HUS4-HF	HUS4-C
		

Basic loading data in solid masonry units as per Hilti Technical data. Design according to EOTA TR 054, design method A.

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)
- For a single anchor
- 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

Anchor size			8	10
Nominal embedment 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/mm ²]		Loads			
	Solid clay brick Mz 12 / 2,0 (EN 771-1)	≥ 12	Tension N_{rec} [kN]	1,4	1,4
			Shear V_{rec} [kN]	3,8	5,5
	Solid sand-lime brick KS 12 / 2,0 (EN 771-2)	≥ 12	Tension N_{rec} [kN]	1,8	1,8
			Shear V_{rec} [kN]	4,6	5,7
	Aerated concrete PPW 6-0,4 (EN 771-4)	≥ 6	Tension N_{rec} [kN]	1,0	1,6
			Shear V_{rec} [kN]	1,3	1,5
	Solid lightweight concrete brick Vbl 5, 2DF (EN 771-3) Solid lightweight concrete brick Leca5® Murblock 19 (EN 771-3)	≥ 5	Tension N_{rec} [kN]	2,0	2,0
			Shear V_{rec} [kN]	2,1	2,8
	Solid lightweight concrete brick Vbl 6, 2DF (EN 771-3) Solid lightweight concrete brick Leca5® Murblock 19 (EN 771-3)	≥ 5	Tension N_{rec} [kN]	2,0	2,0
			Shear N_{rec} [kN]	2,0	2,0

Brick code	Brick name	Size [mm]	t_o [mm]	t_i [mm]	a [mm]	f_b [N/mm ²]	ρ [kg/dm ³]
SC3	Solid clay brick Mz 12 / 2,0 (EN 771-1)	l: ≥ 240 b: ≥ 115 h: ≥ 113	-	-	-	12 20	2,0
SCS1	Solid sand-lime brick KS 12 / 2,0 (EN 771-2)	l: ≥ 240 b: ≥ 115 h: ≥ 113	-	-	-	12 20	2,0
SC5	Aerated concrete PPW 6-0,4 (EN 771-4)						
SLWC1	Solid lightweight concrete brick Vbl 5 2DF (EN 771-3) Solid lightweight concrete brick Leca5® Murblock 19 (EN 771-3)	l: ≥ 240 b: ≥ 115 h: ≥ 113	-	-	-	4 6	0,9

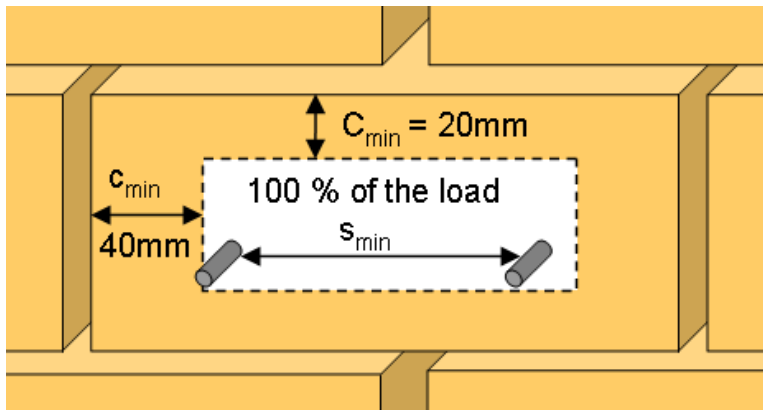
Permissible anchor location in brick and block walls

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 from free edge to solid masonry (Mz, KS and light weight concrete) units $\geq 200\text{mm}$
- Distance from free edge to solid masonry (autoclaved aerated gas concrete) units $\geq 170\text{mm}$
- The minimum distance to horizontal and vertical mortar joint (C_{\min}) is stated in drawing below
- Minimum anchor spacing (s_{\min}) in one brick/block is $\geq 80\text{ mm}$

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 $N_{\text{max,pb}}$ (pull out of one brick)



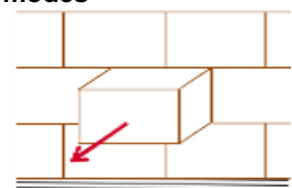
Design tension and shear resistance – Pull out / Pushing out of one brick failure modes

Pull out of one brick (tension):

$$N_{\text{Rd,pb}} = 2 \cdot l \cdot b \cdot (0,5 \cdot f_{\text{vko}} + 0,4 \cdot \sigma_d) / (2,5 \cdot 1000) \quad [\text{kN}]$$

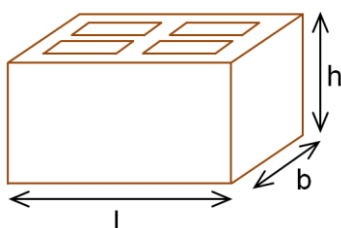
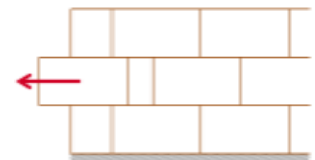
$$N_{\text{Rd,pb}} = (2 \cdot l \cdot b \cdot (0,5 \cdot f_{\text{vko}} + 0,4 \cdot \sigma_d) + b \cdot h \cdot f_{\text{vko}}) / (2,5 \cdot 1000) \quad [\text{kN}]$$

* this equation is applicable if the vertical joints are filled



Pushing out of one brick (shear):

$$V_{\text{Rd,pb}} = 2 \cdot l \cdot b \cdot (0,5 \cdot f_{\text{vko}} + 0,4 \cdot \sigma_d) / (2,5 \cdot 1000) \quad [\text{kN}]$$





σ_d = design compressive stress perpendicular to the shear (N/mm²)

f_{vko} = initial shear strength according to EN 1996-1-1, Table 3.4





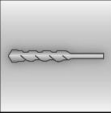


Brick type	Mortar strength	f_{vko} [N/mm ²]
Clay brick	M2,5 to M9	0,20
	M10 to M20	0,30
All other types	M2,5 to M9	0,15
	M10 to M20	0,20

HUS4 Screw anchor for use in Hollow core slabs

High performance screw anchor for single point fastening

Anchor version		Benefits
	<p>HUS4-H(F) (8-10)*</p>	<ul style="list-style-type: none"> - High productivity - less drilling and fewer operations than with conventional anchors
	<p>HUS4-C (8-10)</p>	<ul style="list-style-type: none"> - Smaller edge and spacing distance - Three embedment depths for maximum design flexibility and flexible design for concrete cone capacity
		<ul style="list-style-type: none"> - HUS4-HF with multilayer coatings for additional corrosion protection - Through fastening with H-and C head



Base material		Load conditions	
			
<p>Concrete (uncracked)</p>	<p>Hollow core slabs</p>	<p>Static / quasi-static</p>	<p>Fire resistance</p>
Drilling, cleaning, setting		Other information	
		 	
<p>Hammer drilled holes</p>		<p>Hilti Technical data</p> <p>Steel to concrete Handbook</p>	



Linked Approvals/Certificates and Instructions for use

Approvals/certificates

Approval no	Application / loading condition	Authority / Laboratory	Date of issue
GS 6.1/21-041-3	Fire assessment for prestressed HCS	MFPA, Leipzig	29-06-2022

Instructions for use

Anchor size	8	10
H, HF	IFU HUS4-H(F)-8	IFU HUS4-H(F)-10
C	IFU HUS4-C-8	IFU HUS4-C-10

Link to Hilti Webpage (QR codes)

HUS4-H	HUS4-HF	HUS4-C
		

Basic loading data and design in pre-stressed Hollow core slab (HCS) for permanent fastening based on Hilti Technical data.

All data in this section applies to

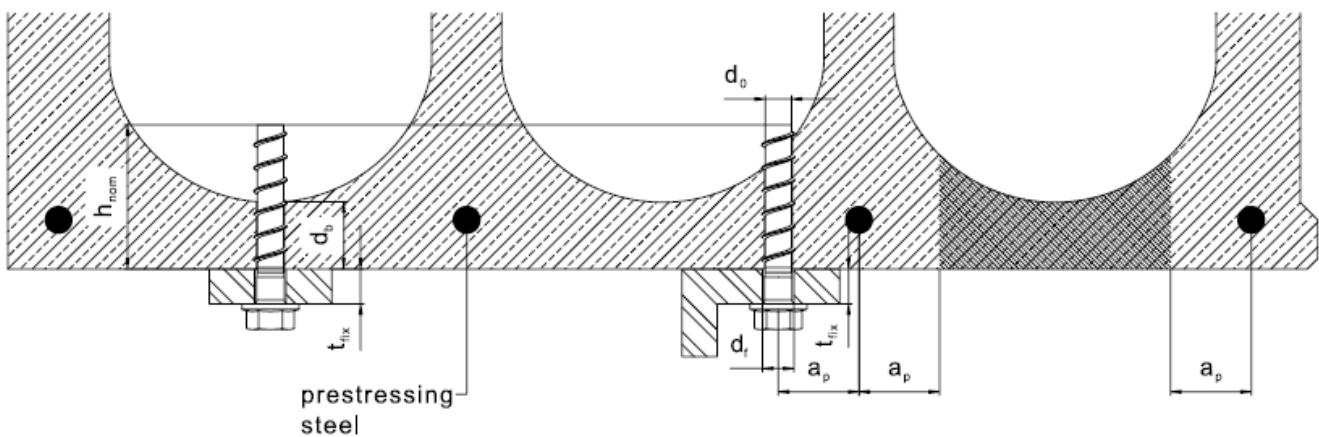
- Correct anchor setting (see instruction for use, setting details)
- Recommended drilling machine: TE2 A22, recommended setting machine: SIW 6AT-A
- For a single anchor
- No edge distance and spacing influence
- Ratio core width / web thickness $\leq 5,3$
- Concrete from C30/37 to C45/55
- With overall partial safety factor for action $\gamma = 1,4$. The partial safety factors for action depend on the type of loading and shall be taken from national regulations.

Design resistance

Anchor size	HUS4	8					10				
		C30/37		C45/55			C30/37		C45/55		
Nominal embedment depth	h_{nom} [mm]	d_b+10									
Drilling depth	d_0 [mm]	$\geq h_{nom} + 10$									
Bottom flange thickness	d_{bmin} [mm]	30	35	40	35	40	30	35	40	35	40
Tension	N_{Rd} [kN]	1,3	3,2	3,9	4,0	4,8	1,3	3,2	3,9	4,0	4,8
Shear	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				
		C30/37		C45/55			C30/37		C45/55		
Nominal embedment depth	h_{nom} [mm]	d_b+10									
Drilling depth	d_0 [mm]	$\geq h_{nom} + 10$									
Bottom flange thickness	d_{bmin} [mm]	30	35	40	35	40	30	35	40	35	40
Tension	N_{rec} [kN]	0,95	2,3	2,8	2,9	3,4	0,95	2,3	2,8	2,9	3,4
Shear	V_{rec} [kN]	0,95	4,4	5,4	5,4	6,6	0,95	4,9	5,9	5,9	7,2



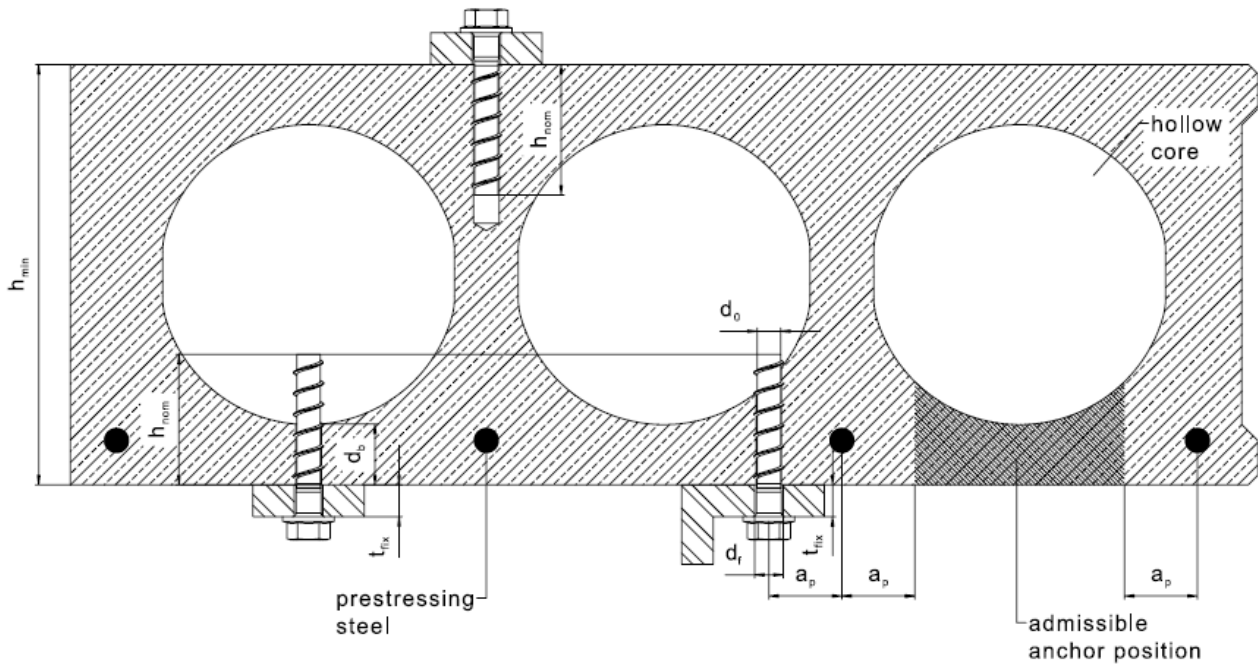
Fire resistance and design in pre-stressed Hollow core slab (HCS) for permanent fastening based on Hilti Technical data.

All data in this section applies to

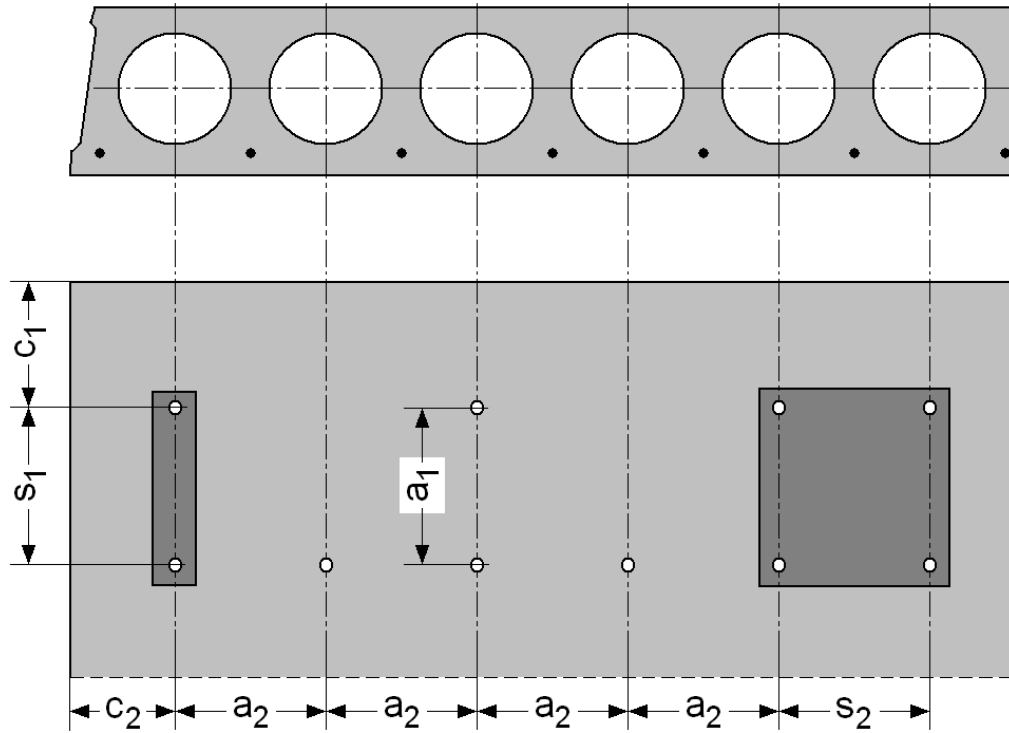
- Correct anchor setting (see instruction for use, setting details)
- Recommended drilling machine: TE2 A22, recommended setting machine: SIW 6AT-A
- No edge distance and spacing influence
- For a single anchor
- Ratio core width / web thickness $\leq 5,3$
- Concrete from C30/37
- Partial safety factor for resistance under fire exposure $\gamma_{M,fi} = 1,0$ (in absence of other national regulations)

Design resistance

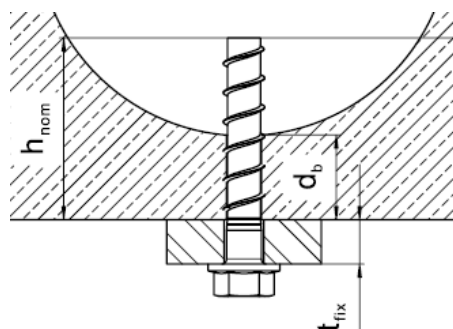
Anchor size		HUS4	8	10	8	10
Concrete strength		C30/37				
Nominal embedment depth	h_{nom} [mm]	d_b+10				
Hollow core slab height	h_{min} [mm]	265			380	
Bottom flange thickness	d_{bmin} [mm]	35			40	
Fire exposure R30	$F_{Rd,fi}$ [kN]	0,26	0,60	0,76	0,80	
Fire exposure R60	$F_{Rd,fi}$ [kN]	0,26	0,60	0,76	0,80	
Fire exposure R90	$F_{Rd,fi}$ [kN]	0,26	0,60	0,76	0,80	
Fire exposure R120	$F_{Rd,fi}$ [kN]	0,26	0,60	0,61	0,80	



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]	$4 * d_b$	



Anchor Type	Size [mm]	Length [mm]	$d_b=30$ [mm]		$d_b=35$ [mm]		$d_b=40$ [mm]		$d_b=50$ [mm]	
			$t_{fix,min}$ [mm]	$t_{fix,max}$ [mm]	$t_{fix,min}$ [mm]	$t_{fix,max}$ [mm]	$t_{fix,min}$ [mm]	$t_{fix,max}$ [mm]	$t_{fix,min}$ [mm]	$t_{fix,max}$ [mm]
HUS4-H(F)	8	45	5	10	5	5	-	-	-	-
		55	15	20	15	15	-	-	-	-
		65	5	30	5	25	5	20	5	10
		75	10	40	10	35	10	30	10	20
		85	20	50	20	45	20	40	20	30
		100	35	65	35	60	35	55	35	45
		120	55	85	55	80	55	75	55	65
		150	85	115	85	110	85	105	85	95
HUS4-H(F)	10	60	5	20	5	15	5	10	-	-
		70	15	30	15	25	15	20	-	-
		80	5	40	5	35	5	30	5	20
		90	10	50	10	45	10	40	10	30
		100	20	60	20	55	20	50	20	40
		110	30	70	30	65	30	60	30	50
		130	50	90	50	85	50	80	50	70
		150	70	110	70	105	70	100	70	90



Basic loading data in pre-stressed Hollow core slab (HCS) for temporary fastening

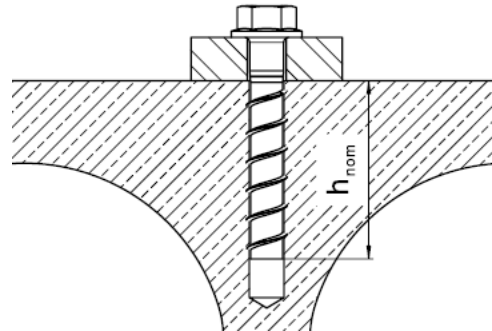
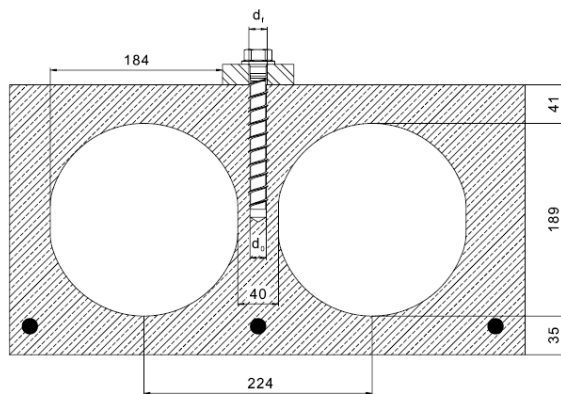
All data in this section applies to

- Correct setting (see setting instruction)
- for single anchor
- Verification of wear of the screw with HUS HRG check gauge is needed
- No edge distance and spacing influence
- Ratio core width / web thickness $w/e \leq 5,3$
- Concrete C30/37 to C50/60, uncracked
- With overall partial safety factor for action $\gamma = 1,4$. The partial safety factors for action depend on the type of loading and shall be taken from national regulations.

Loads recommendation applies also for installation from top position with no restriction of the admissible anchor position in case of no reinforcement in the related area.

Installation position for temporary fastening in HCS:

- Top position of the slab is allowed.
- Anchor to be installed within position of ± 10 mm of the thickest section of the solid part.



Design resistance: Concrete C30/37

Type	HUS4	A, AF, C, H, HF			H			A, AF, H, HF		
Anchor size		10			12			14		
Nominal embedment depth	h_{nom} [mm]	55	75	85	60	80	100	65	85	115
Drill hole depth	h_{1min} [mm]	$h_{nom} + 10$ mm								
Tension	N_{Rd} [kN]	9,6	14,7	15,8	11,2	16,0	20,1	12,1	17,7	25,1
Shear	V_{Rd} [kN]	10,0	16,7	17,6	15,5	18,8	22,2	17,0	20,9	24,7

Recommended load: Concrete C30/37

Type	HUS4	A, AF, C, H, HF			H			A, AF, H, HF		
Anchor size		10			12			14		
Nominal embedment depth	h_{nom} [mm]	55	75	85	60	80	100	65	85	115
Drill hole depth	h_{1min} [mm]	$h_{nom} + 10$ mm								
Tension	N_{rec} [kN]	6,8	10,5	11,3	8,0	11,4	14,3	8,7	12,6	17,9
Shear	V_{rec} [kN]	7,2	12,0	12,6	11,1	13,5	15,9	12,1	15,0	17,6

Design resistance: Concrete C45/55

Type	HUS4	A, AF, C, H, HF			H			A, AF, H, HF		
Anchor size		10			12			14		
Nominal embedment depth	h_{nom} [mm]	55	75	85	60	80	100	65	85	115
Drill hole depth	h_{1min} [mm]	$h_{nom} + 10$ mm								
Tension	N_{Rd} [kN]	11,7	18,1	19,3	13,8	19,6	24,6	14,9	21,7	30,7
Shear	V_{Rd} [kN]	12,3	16,7	17,6	15,5	18,8	22,2	17,3	20,9	24,7

Recommended load: Concrete C45/55

Type	HUS4	A, AF, C, H, HF			H			A, AF, H, HF		
Anchor size		10			12			14		
Nominal embedment depth	h_{nom} [mm]	55	75	85	60	80	100	65	85	115
Drill hole depth	h_{1min} [mm]	$h_{nom} + 10$ mm								
Tension	N_{rec} [kN]	8,4	12,9	13,8	9,8	14,0	17,6	10,6	15,5	21,9
Shear	V_{rec} [kN]	8,8	12,0	12,6	11,1	13,5	15,9	12,3	15,0	17,6

Anchor spacing and edge distance

Type	HUS4	A, AF, C, H, HF			H			A, AF, H, HF		
Anchor size		10			12			14		
Minimum spacing	s_{min} [mm]	40			50			60		
Minimum edge distance	c_{min} [mm]	40			50			60		
Characteristic distances										
Spacing	s_{cr} [mm]				3 h_{ef}					
Edge distance	c_{cr} [mm]				1,5 h_{ef}					

for single anchor

