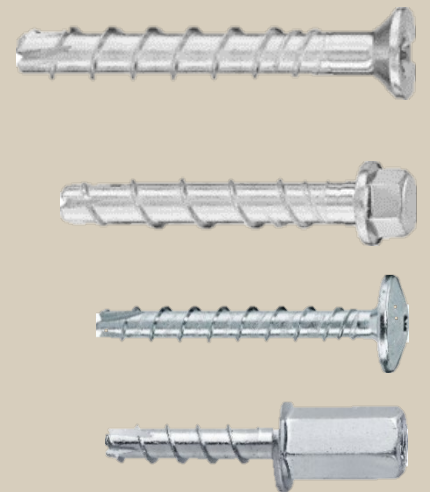




HUS3 Screw anchor

Product Technical Datasheet
Update: Sep 24



Steel-to-concrete

Page no:02

Steel-to-masonry

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Hollow core slabs

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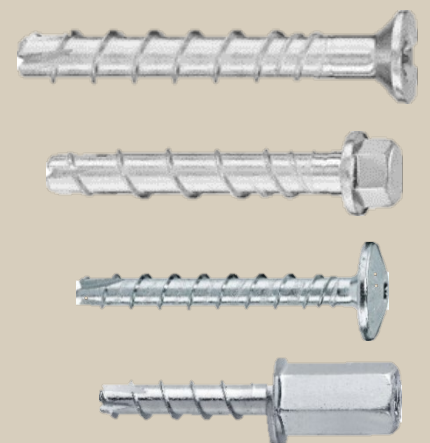
Metal decks

Page no:26



HUS3 Screw anchor


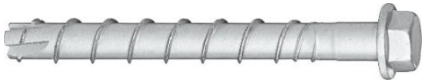







Product Technical Datasheet
Steel-to-concrete
Update: Sep 24





HUS3 Screw anchor for use in concrete

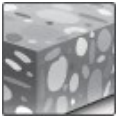
High performance screw anchor for single point fastening

Anchor version		Benefits
	HUS3-H (6-8)	- High productivity - less drilling and fewer operations than with conventional anchors
	HUS3-HF (8)	- ETA approval for cracked and uncracked concrete
	HUS3-C (6-8)	- ETA approval for Seismic C1 and C2
	HUS3-A (6)	- ETA approval for adjustability (unscrew-rescrew)
	HUS3-P (6)	- High loads (Reliable and easy to set anchor)
	HUS3-PL (6)	- Small edge and spacing distance
	HUS3-PS (6)	- Three embedment depths for maximum design flexibility
	HUS3-I (6)	- No cleaning required
	HUS3-I Flex(6)	- HUS3-HF with multilayer coatings for additional corrosion protection
		- Forged-on washer and hexagon head with no protruding thread
		- Through fastening

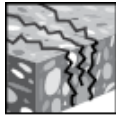


Linked Approvals/Certificates and Instructions for use

Base material

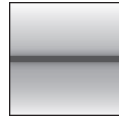


Concrete (uncracked)



Concrete (cracked)

Load conditions



Static / quasi-static

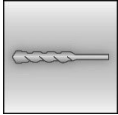


Seismic, C1,C2



Fire resistance

Drilling, cleaning, setting



Hammer drilled holes

Other information



PROFIS Engineering software

Approvals/certificates

Approval no	Application / loading condition	Authority / Laboratory	Date of issue
ETA-13/1038	Static and quasi-static / Seismic / Fire	DIBt, Berlin	28-07-2020

The instructions for use can be viewed using the link in the instructions for use table or the QR code/link in the Hilti webpage table.

Instruction for use (IFU)

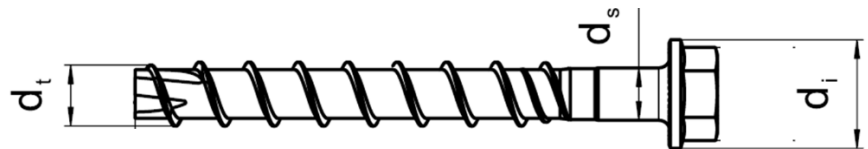
Anchor Type	H	C	A	I	I-flex
HUS3	IFU HUS3-H-6	IFU HUS3-C 6	IFU HUS3-A 6	IFU HUS3-I 6	IFU HUS3-I FLEX 6
	IFU HUS3-H-8	IFU HUS3-C-8	-		
	P	PL	PS		-
	IFU HUS3-P 6	IFU HUS3-PL 6	IFU HUS3-PS 6		
Filling set	IFU Filling set				

Link to Hilti Webpage

HUS3-H	HUS3-C	HUS3-A	HUS3-I	HUS3-I-flex	HUS3-P	HUS3-PL	HUS3-PS

Anchor dimensions

Type	HUS3-	H,C,A,I, I-flex,P,PS,PL	H,C,HF
Anchor size		6	8
Threaded outer diameter	d_t [mm]	7,85	10,30
Shaft diameter	d_s [mm]	6,15	8,45
Diameter of integrated washer	d_i [mm]	16,50	17,50



HUS3: Hilti Universal Screw 3rd generation

H: Hexagonal head

10: Screw diameter

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

Head configuration

Type	Part		
HUS3-H HUS3-HF	Hexagonal head		
HUS3-C	Countersunk head		
HUS3-A	External thread		
HUS3-P	Pan head		
HUS3-PS	Pan head (small)		
HUS3-PL	Pan head (large)		
HUS3-I	Internal thread		
HUS3-I Flex	External thread		

Screw length and thickness of fixture for HUS3

Type	H	C	A	I / I- Flex	P	PS / PL	H	C	A	I / I- Flex	P	PS / PL		
Anchor size	6													
Nominal embedment depth [mm]	h_{nom1}						h_{nom2}							
	40						55							
Thickness of fixture [mm]	t_{fix}													
Length of screw	40	[mm]	-	-	0	0	-	-	-	-	-	-		
	45	[mm]	5	5	5	5	5	5	-	-	-	-		
	55	[mm]	-	-	15	15	-	-	-	-	0	0		
	60	[mm]	20	20	-	-	20	20	5	5	-	-	5	5
	70	[mm]	-	30	-	-	-	-	-	15	-	-	-	-
	80	[mm]	40	-	-	-	45	-	25	-	-	-	25	-
	100	[mm]	60	-	-	-	-	-	45	-	-	-	-	-
	120	[mm]	80	-	-	-	-	-	65	-	-	-	-	-
	135	[mm]	-	-	95	-	-	-	-	-	80	-	-	-
	155	[mm]	-	-	115	-	-	-	-	-	100	-	-	-
	175	[mm]	-	-	135	-	-	-	-	-	120	-	-	-
195	[mm]	-	-	155	-	-	-	-	-	140	-	-	-	

Screw length and thickness of fixture for HUS3-C

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

Screw length and thickness of fixture for HUS3-H and HUS3-HF

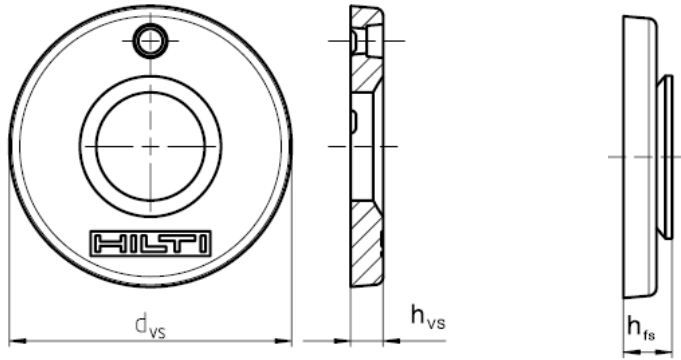
Anchor size	8				
Nominal embedment depth [mm]	h_{nom1}		h_{nom2}		h_{nom3}
	50		60		70
Thickness of fixture [mm]	t_{fix1}		t_{fix2}		t_{fix3}
Length of screw	55	[mm]	5	-	-
	60	[mm]	-	-	-
	65	[mm]	15	5	-
	70	[mm]	-	-	-
	75	[mm]	25	15	5
	80	[mm]	-	-	-
	85	[mm]	35	25	15
	90	[mm]	-	-	-
	100	[mm]	50	40	30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

NOTE: Non-standard lengths, in the similar range of screw length as mentioned in tables are also in the scope of ETA-13/1038.



Hilti Filling set dimensions

Hilti filling set size			M10
Size of HUS3-H			8
Filling washer diameter	d_{vs}	[mm]	42
Filling washer + spherical washer thickness	h_{fs}	[mm]	7



Static and quasi-static loading based on ETA-13/1038. 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 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
- 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	HUS3-	H, C, A, I, I-Flex	P, PS, PL	H, C, A, I, I-Flex	P, PS, PL	H, C, HF		
Anchor size		6				8		
Nominal embedment depth h_{nom} [mm]		h_{nom1}		h_{nom2}		h_{nom1}	h_{nom2}	h_{nom3}
		40		55		50	60	70
Uncracked concrete								
Tension	N_{Rd} [kN]	3,9	3,9	5,0	4,2	6,0	8,0	10,7
Shear	V_{Rd} [kN]	5,4	5,4	8,3	8,3	8,3	12,7	14,7
Cracked concrete								
Tension	N_{Rd} [kN]	1,4	1,4	3,3	3,3	4,0	6,0	8,0
Shear	V_{Rd} [kN]	3,8	3,8	8,3	8,3	5,8	12,7	14,7

Recommended loads

Type	HUS3-	H, C, A, I, I-Flex	P, PS, PL	H, C, A, I, I-Flex	P, PS, PL	H, C, HF		
Anchor size		6				8		
Nominal embedment depth h_{nom} [mm]		h_{nom1}		h_{nom2}		h_{nom1}	h_{nom2}	h_{nom3}
		40		55		50	60	70
Uncracked concrete								
Tension	N_{rec} [kN]	2,8	2,8	3,6	3,0	4,3	5,7	7,6
Shear	V_{rec} [kN]	3,8	3,8	6,0	6,0	5,9	9,1	10,5
Cracked concrete								
Tension	N_{rec} [kN]	1,0	1,0	2,4	2,4	2,9	4,3	5,7
Shear	V_{rec} [kN]	2,7	2,7	6,0	6,0	4,1	9,1	10,5

Seismic loading based on ETA-13/1038. 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 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
- Hammer drilled holes
- $\alpha_{\text{gap}} = 1,0$ (using Hilti seismic filling set) or $\alpha_{\text{gap}} = 0,5$ (without using Hilti seismic filling set) accordingly

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

Design resistance in case of seismic performance category C2

with Hilti filling set			
Type	HUS3		H
Anchor size	8		
Nominal embedment depth	h_{nom}	[mm]	$h_{\text{nom}3}$ 70
Effective anchorage depth	h_{ef}	[mm]	54,9
Tension	$N_{\text{Rd,seis}}$	[kN]	2,1
Shear	$V_{\text{Rd,seis}}$		9,8
without Hilti filling set			
Type	HUS3-		H,C,HF
Anchor size	8		
Nominal embedment depth	h_{nom}	[mm]	$h_{\text{nom}3}$ 70
Effective anchorage depth	h_{ef}	[mm]	54,9
Tension	$N_{\text{Rd,seis}}$	[kN]	2,1
Shear	$V_{\text{Rd,seis}}$		3,6

Design resistance in case of seismic performance category C1

with Hilti filling set					
Type	HUS3		H		H
Anchor size			6		8
Nominal embedment depth	h_{nom}	[mm]	$h_{\text{nom}1}$ 40	$h_{\text{nom}2}$ 55	$h_{\text{nom}2}$ 60 $h_{\text{nom}3}$ 70
Effective anchorage depth	h_{ef}	[mm]	30	42	46,4 54,9
Tension	$N_{\text{Rd,seis}}$	[kN]	-	-	6,0 7,9
Shear	$V_{\text{Rd,seis}}$		-	-	7,9 7,9
without Hilti filling set					
Type	HUS3		H, C, A, I, I-Flex, P, PS, PL		H, C, HF
Anchor size			6		8
Nominal embedment depth	h_{nom}	[mm]	$h_{\text{nom}1}$ 40	$h_{\text{nom}2}$ 55	$h_{\text{nom}2}$ 60 $h_{\text{nom}3}$ 70
Effective anchorage depth	h_{ef}	[mm]	30	42	46,4 54,9
Tension	$N_{\text{Rd,seis}}$	[kN]	1,4	2,2	6,0 7,9
Shear	$V_{\text{Rd,seis}}$		1,7	1,7	4,0 4,0

Fire resistance based on ETA-13/1038. 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 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
- Hammer drilled holes
- With overall partial safety factor for resistance $\gamma_{M,fi} = 1,0$

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

Design resistance

Type	HUS3-	H, C, A, I, I-Flex, P, PS, PL		H, HF			C
Anchor size		6		8			
Nominal embedment depth	h_{nom} [mm]	h_{nom1}	h_{nom2}	h_{nom1}	h_{nom2}	h_{nom3}	h_{nom1-3}
		40	55	50	60	70	50-70
Fire exposure R30							
Tension	$N_{Rd,fi}$ [kN]	0,5	1,5	1,5	2,3	3,0	0,5
Shear	$V_{Rd,fi}$ [kN]	0,5	1,6	1,7	3,5	3,8	0,5
Fire exposure R60							
Tension	$N_{Rd,fi}$ [kN]	0,5	1,2	1,5	2,3	2,8	0,4
Shear	$V_{Rd,fi}$ [kN]	0,5	1,2	1,5	2,3	2,8	0,4
Fire exposure R90							
Tension	$N_{Rd,fi}$ [kN]	0,5	0,8	1,5	1,6	1,9	0,3
Shear	$V_{Rd,fi}$ [kN]	0,5	0,8	1,5	1,6	1,9	0,3
Fire exposure R120							
Tension	$N_{Rd,fi}$ [kN]	0,4	0,7	1,2	1,2	1,5	0,2
Shear	$V_{Rd,fi}$ [kN]	0,4	0,7	1,2	1,2	1,5	0,2

Setting information

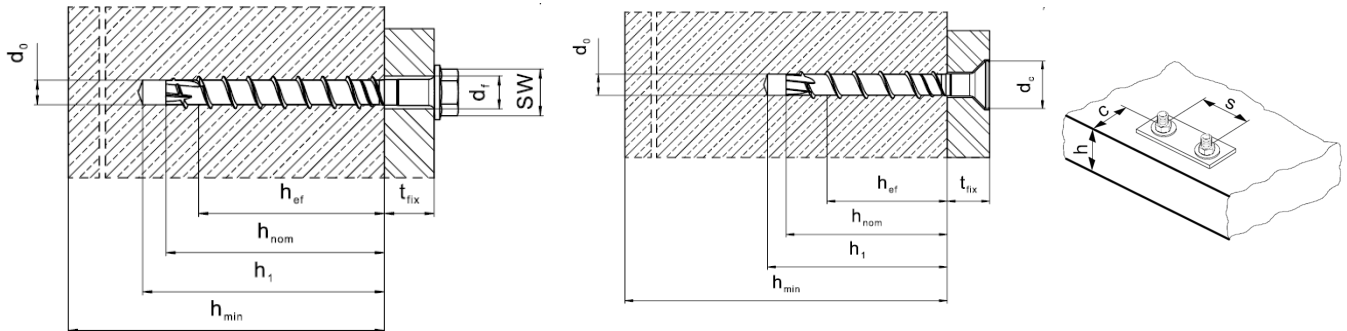
Setting details

Type	HUS3-	H	C	A	P, PS	I, I-Flex	PL
Anchor size		6					
Nominal diameter of drill bit	d ₀ [mm]	6					
Clearance hole diameter	d _{fmax} [mm]	9					10
Wrench size	SW [mm]	13	-	13	-	13	-
Countersunk head diameter	d _h [mm]	-	11,5	-			
Torx size	TX -	-	30	-	30	-	30
Depth of drill hole in floor/wall position	h _{1min} [mm]	h _{nom} + 10 mm					
Depth of drill hole ceiling	h _{1min} [mm]	h _{nom} + 3 mm					
Nominal embedment depth	h _{nom} [mm]	40					
Maximum Installation Torque	T _{inst, max} [Nm]	20					
Minimum base material thickness	h _{min} [mm]	80					
Minimum distances							
Spacing	s _{min} [mm]	35					
Edge distance	c _{min} [mm]	35					
Characteristic distances							
Edge distance for splitting failure	c _{cr,sp} [mm]	60					
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}					

Type	HUS3-	H	C	A	P, PS	I, I-Flex	PL
Anchor size		6					
Nominal diameter of drill bit	d ₀ [mm]	6					
Clearance hole diameter	d _{fmax} [mm]	9					10
Wrench size	SW [mm]	13	-	13	-	13	-
Countersunk head diameter	d _h [mm]	-	11,5	-			
Torx size	TX -	-	30	-	30	-	30
Depth of drill hole in floor/wall position	h _{1min} [mm]	h _{nom} + 10 mm					
Depth of drill hole ceiling	h _{1min} [mm]	h _{nom} + 3 mm					
Nominal embedment depth	h _{nom} [mm]	55					
Maximum Installation Torque	T _{inst, max} [Nm]	25					
Minimum base material thickness	h _{min} [mm]	100					
Minimum distances							
Spacing	s _{min} [mm]	35					
Edge distance	c _{min} [mm]	35					
Characteristic distances							
Edge distance for splitting failure	c _{cr,sp} [mm]	63					
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

Type	HUS3-		H, HF, C		
Anchor size			8		
Nominal embedment depth	[mm]	h_{nom1}	h_{nom2}	h_{nom3}	
		50	60	70	
Nominal diameter of drill bit	d_0	[mm]	8		
Clearance hole diameter	d_{fmax}	[mm]	12		
Wrench size	SW	[mm]	13		
Countersunk head diameter	d_h	[mm]	18		
Torx size	TX	-	45		
Depth of drill hole in floor/wall position	h_{1min}	[mm]	60	70	80
Depth of drill hole (with adjustability setting process)	h_{1min}	[mm]	-	80	90
Minimum base material thickness	h_{min}	[mm]	100	100	120
Minimum distances					
Spacing	s_{min}	[mm]	50	50	50
			40 if $c \geq 50$		
Edge distance	c_{min}	[mm]	40	40	40
Characteristic distances					
Spacing for splitting failure	$s_{cr,sp}$	[mm]	120	140	170
Edge distance for splitting failure	$c_{cr,sp}$	[mm]	60	70	85
Spacing for concrete cone failure	$s_{cr,N}$	[mm]	$3 \cdot h_{ef}$		
Edge distance for concrete cone failure	$c_{cr,N}$	[mm]	$1,5 \cdot h_{ef}$		



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



Drilling and Installation equipment

For detailed setting information on installation ,see instructions for use given with the product.

Rotary Hammers (Corded and Cordless)		TE 2 - TE 30
Other tools		Impact wrench- SIW (use recommended socket/driver bit)
		Hammer drill bit TE-CX, TE-C
		Blow out pump

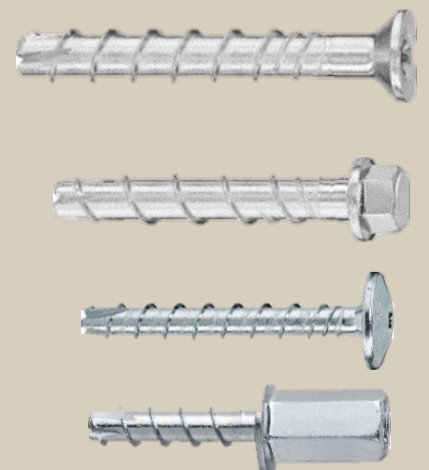


HUS3 Screw anchor

Product Technical Datasheet









Steel-to-masonry

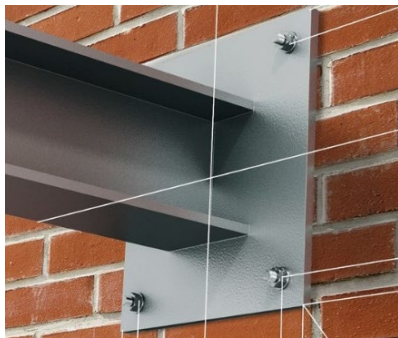
Update: Sep 24

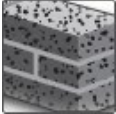
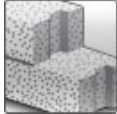

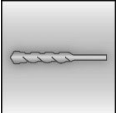



HUS3 Screw anchor for use in masonry

High performance screw anchor for single point fastening

Anchor version	Benefits
	<ul style="list-style-type: none"> - High productivity - less drilling and fewer operations than with conventional anchors - Small edge and spacing distance - No cleaning required - HUS3-HF with multilayer coatings for additional corrosion protection - Forged-on washer and hexagon head with no protruding thread - Through fastening
	
	
	
	
	
	
	



Base material	Load conditions
 <p>Solid brick</p>  <p>Autoclaved aerated concrete</p>	 <p>Static / quasi-static</p>
Drilling, cleaning, setting	Other information
 <p>Hammer drilled holes</p>	 <p>Hilti Technical data</p>

Linked Instructions for use

The instructions for use can be viewed using the link in the instructions for use table or the QR code/link in the Hilti webpage table.

Instruction for use (IFU)

Anchor size	H	C	A	I	I-flex
HUS3	IFU HUS3-H-6	IFU HUS3-C 6	IFU HUS3-A 6	IFU HUS3-I 6	IFU HUS3-I FLEX 6
	IFU HUS3-H-8	IFU HUS3-C-8	-		
	P	PL	PS		-
	IFU HUS3-P 6	IFU HUS3-PL 6	IFU HUS3-PS 6		-

Link to Hilti Webpage




HUS3-H	HUS3-C	HUS3-A	HUS3-I	HUS3-P	HUS3-PL	HUS3-PS
						

Basic loading data and design in solid masonry units based on Hilti Technical data.

All data in this section applies to:

- Load values valid for holes drilled with TE rotary hammers in hammering mode
- Correct anchor setting (see instruction for use, setting details)
- The core/material ratio 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
- For a single anchor

Recommended loads for HUS3

Anchor size		A, H, I, C, P, PS, PL		H, C, HF			
		6		8			
Nominal embedment depth		h_{nom} [mm]		55		60	
		Compressive strength class [N/mm ²]		F_{rec} Tensile and shear loads			
	Solid clay brick Mz 12/2,0 DIN 105 / EN 771-1	≥ 8		0,6		-	
		≥ 10		0,7		-	
		≥ 12		0,8		1,1	
		≥ 16		0,9		-	
		≥ 20		0,9		1,6	
	Solid sand-lime brick Mz 12/2,0 DIN 106/EN 771-2	≥ 8		0,8		-	
		≥ 10		0,9		-	
		≥ 12		1,0		1,3	
		≥ 16		1,1		-	
		≥ 20		1,2		1,7	
	Aerated concrete PPW 6-0,4 DIN 4165/EN 771-4	≥ 6		0,4		0,7	

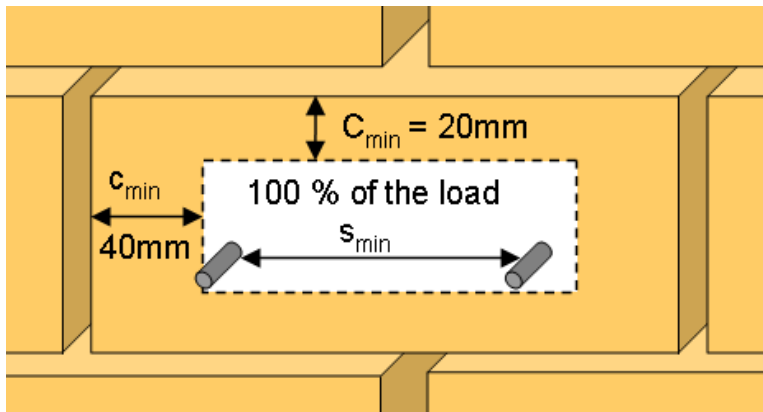
Permissible anchor location in brick and block walls

Edge distance and spacing influence

- The technical data for HUS3 anchors are reference loads for MZ 12, KS 12 and PPW 6. Due to the large variation of natural stone slid bricks, on site anchor testing is recommended to validate technical data
- The HUS3 anchor was installed and tested in center of solid bricks as shown. The HUS3 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 to solid masonry (Mz and KS) units $\geq 200\text{mm}$
- Distance to 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 started 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)



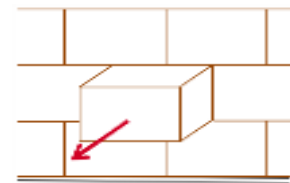
Design tension and shear resistance – Pull out / Pushing out of one brick failure modes

Pull out of one brick (tension):

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

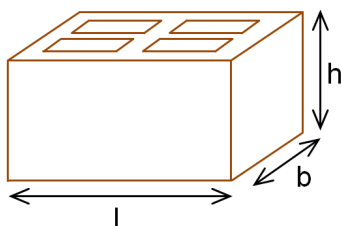
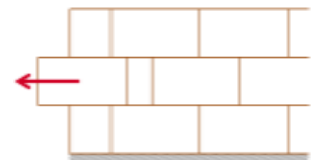
$$N_{\text{Rd,pb}} = (2 \cdot l \cdot b \cdot (0,5 \cdot f_{\text{vko}} + 0,4 \cdot \sigma_d) + b \cdot h \cdot f_{\text{vko}}) / (2,5 \cdot 1000) \quad [\text{kN}]$$

* 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/mm^2)

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



Drilling and Installation equipment

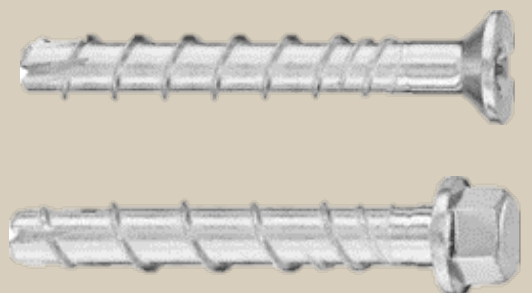
For detailed setting information on installation ,see instructions for use given with the product.

Rotary Hammers (Corded and Cordless)		TE 2 - TE 30
Other tools		Torque tool (use recommended socket/driver bit/required attachment)
		Hammer drill bit TE-CX, TE-C
		Blow out pump






HUS3 Screw anchor

Product Technical Datasheet
Hollow core slab
Steel-to-concrete
Update: Sep 24





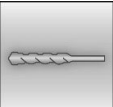

HUS3 Screw anchor for use in hollow core slabs

High performance screw anchor for single point fastening

Anchor version		Benefits
	HUS3-H (8)	<ul style="list-style-type: none"> - High productivity - less drilling and fewer operations than with conventional anchors
	HUS3-HF (8)	<ul style="list-style-type: none"> - Small edge and spacing distance - HUS3-HF with multilayer coatings for additional corrosion protection
	HUS3-C (8)	<ul style="list-style-type: none"> - Forged-on washer and hexagon head with no protruding thread - Through fastening



Base material	Load conditions
 <p data-bbox="124 1406 263 1478">Pre-stressed Hollow core slabs</p>	 <p data-bbox="810 1406 959 1456">Static / quasi- static</p>

Drilling, cleaning, setting	Other information
 <p data-bbox="129 1677 263 1727">Hammer drilled holes</p>	 <p data-bbox="831 1677 938 1749">Hilti Technical data</p>

Linked Instructions for use

Approvals/certificates



Approval no	Application / loading condition	Authority / Laboratory	Date of issue
GS 6.1/21-041-2	Fire assessment for prestressed HCS	MFPA, Leipzig	29-06-2022

The instructions for use can be viewed using the link in the instructions for use table or the QR code/link in the Hilti webpage table.

Instructions for use(IFU)

Anchor size	8
H	IFU HUS3-H-8
C	IFU HUS3-C-8

Link to Hilti Webpage

HUS3-H	HUS3-C
	

Basic loading data and design in Hollow core slab based on Hilti Technical data.

All data in this section applies to

- Correct setting (See setting instruction)
- No edge distance and spacing influence
- For a single anchor
- Ratio core width / web thickness $w/e \leq 4,2$
- Concrete C30/37 to C50/60
- Recommended loads: With overall partial safety factor for action $\gamma = 1,4$.

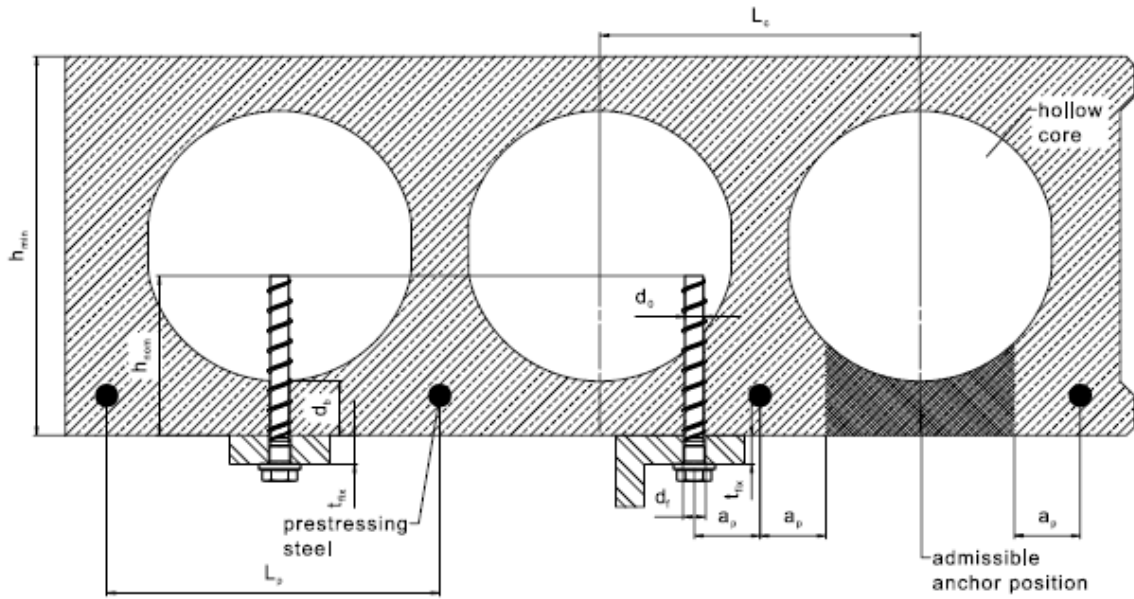
Design resistance

Type	HUS3		C, H, HF
Anchor size			8
Bottom flange thickness	d_{bmin}	[mm]	30
All load directions	F_{Rd}	[kN]	1,3

Recommended loads

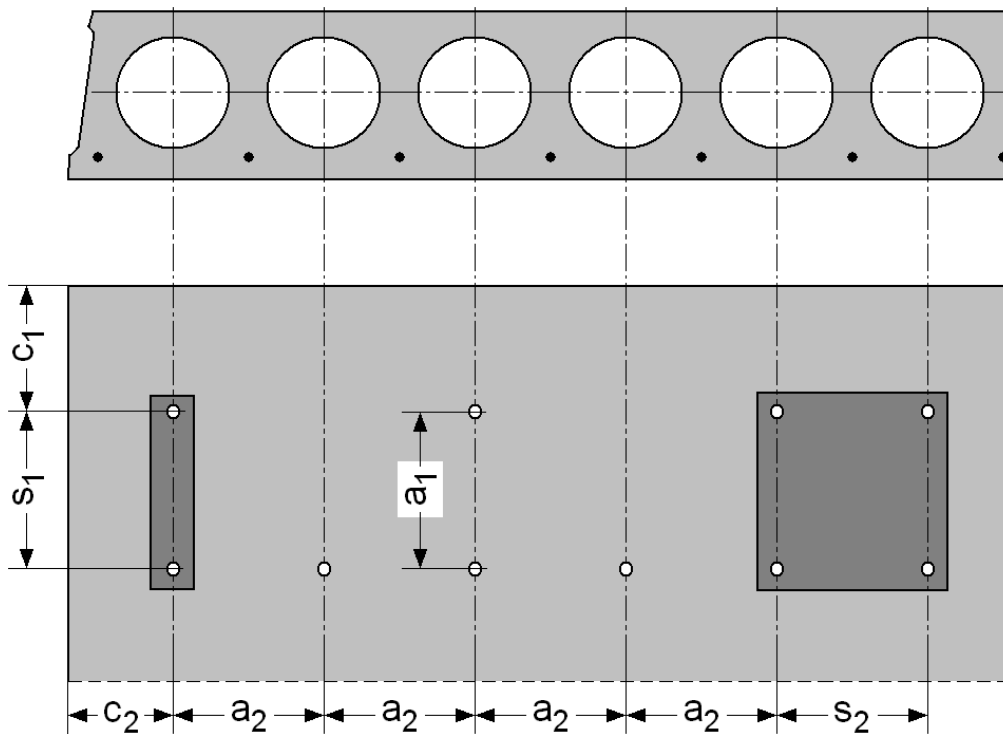
Type	HUS3		C, H, HF
Anchor size			8
Bottom flange thickness	d_{bmin}	[mm]	30
All load directions	F_{rec}	[kN]	0,95

Anchor Type	Size	Length	$d_b=30$ [mm]		$d_b=35$ [mm]		$d_b=40$ [mm]		$d_b=50$ [mm]	
	[mm]	[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]
HUS3-H	8	55	5	15	5	10	5	5	5	5
		65	5	25	5	20	5	15	5	5
		75	5	35	5	30	5	25	5	15
		85	15	45	15	40	15	35	15	25
		100	30	60	30	55	30	50	30	40
		120	50	80	50	75	50	70	50	60
HUS3-HF	8	65	5	25	5	20	5	15	5	5
		75	5	35	5	30	5	25	5	15
		85	15	45	15	40	15	35	15	25
		100	30	60	30	55	30	50	30	40
HUS3-C	8	65	15	25	15	20	15	15	15	5
		75	15	35	15	30	15	25	15	15
		85	15	45	15	40	15	35	15	25



Anchor spacing and edge distance


Type	HUS3	C, H, HF
Anchor size		8
Minimum edge distance	c_{min} [mm]	100
Minimum anchor spacing	s_{min} [mm]	100
Minimum distance between anchor groups	a_{min} [mm]	100





Drilling and Installation equipment

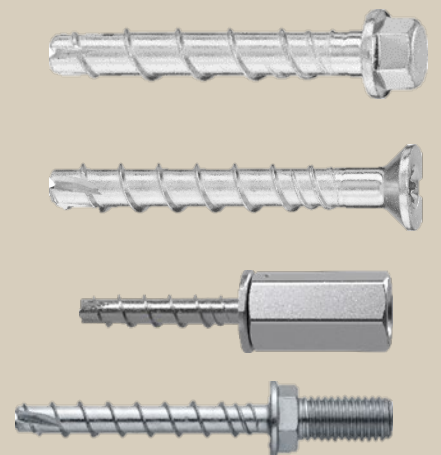
For detailed setting information on installation ,see instructions for use given with the product.

Rotary Hammers (Corded and Cordless)		TE 2 - TE 30
Other tools		Impact wrench- SIW (use recommended socket/driver bit)
		Hammer drill bit TE-CX, TE-C
		Blow out pump



HUS3 Screw anchor


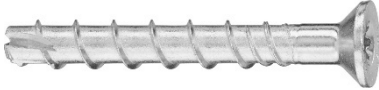




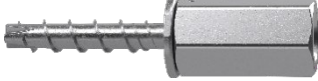


Product Technical Datasheet
Metal deck
Steel-to-concrete
Update: Sep 24





HUS3 Screw anchor for use in concrete

High performance screw anchor for-metal deck fastening

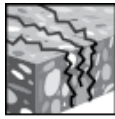
Anchor version		Benefits
	HUS3-H(6-10)	<ul style="list-style-type: none">- Faster installation with less drilling and fewer operations than with conventional anchors- simpler installation with a 2 steps installation: drill and drive in- smaller edge and spacing than traditional expansion anchors- Removable- ETA approval for cracked and uncracked concrete- Through-fastening and pre-setting (based on the head configuration),
	HUS3-C (6-10)	
	HUS3-A (6)	
	HUS3-PL (6)	
	HUS3-P (6)	
	HUS3-PS (6)	
	HUS3-IQ (6)	
	HUS3-I (6)	
	HUS3-I Flex (6)	



Base material

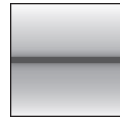


Concrete (uncracked)



Concrete (cracked)

Load conditions

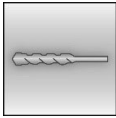


Static / quasi-static



Seismic, C1

Drilling, cleaning, setting



Hammer drilled holes

Other information



Hilti Technical data

Instructions for use

The instructions for use can be viewed using the link in the instructions for use table or the QR code/link in the Hilti webpage table

Instruction for use (IFU)

Anchor Type	Size	H	C	A	I	I-flex
HUS3	6	IFU HUS3-H	IFU HUS3-C	IFU HUS3-A	IFU HUS3-I	IFU HUS3-I FLEX
	8	IFU HUS3-H	IFU HUS3-C	-		
	10	IFU HUS3-H	IFU HUS3-C			
	Size	P	PL	PS	IQ	
	6	IFU HUS3-P	IFU HUS3-PL	IFU HUS3-PS	IFU HUS3-IQ	
Filling set		IFU Filling set				

Link to Hilti Webpage

HUS3-H	HUS3-C	HUS3-A	HUS3-P	HUS3-PL	HUS3-I	HUS3-I-flex	HUS3-PS	HUS3-IQ
Filling set								

Static and quasi-static loading based on Hilti technical data. Design according to EN 1992-4

All data in this section applies to:

- Correct setting (See setting instruction)
- For a single anchor
- Hammer drilled holes
- No edge distance and spacing influence (see setting detail tables with characteristic distances). Only one anchor can be used in the lower flute at a time with the min.spacing between anchors along the length of the flute to be at least $s = 3 \text{ hef}$. This datasheet does not give information for the design of fasteners in a group.
- Minimum base material thickness (see setting detail table)
- Embedment depth, as specified in the table of this section
- Concrete from C30/37 without steel fibre. For higher compressive strengths, the tension resistance may be increased by $(f_c / 30)^{0.5}$
- for HUS3 size 8 and 10 resistance is calculated as a minimum value based on the Hilti technical data and ETA-13/1038
- Recommended loads: With overall partial safety factor for action $\gamma = 1,4$.

For anchoring into the upper flute, either use data below conservatively or refer to ETA-10/0005 and ETA-13/1038. In this case the minimum required slab thickness h_{\min} must be larger than the deck thickness $h_{\min, \text{deck}}$.

Design resistance for all loads directions

Type	HUS3	H, PL, P, PS, I, I-Flex, IQ, A, C	H, C		H, C		
Fastener size		6	8		10		
Fastening		Redundant	Single Point				
Nominal embedment depth	h_{nom} [mm]	35 ¹⁾	40	60	70	75	85
Uncracked concrete							
Resistance in all load directions	F_{Rd}^0 [kN]	1,3 ¹⁾	-	-	-	-	-
Tension	N_{Rd} [kN]	-	3,9	8,0	10,7	11,1	17,7
Shear	V_{Rd} [kN]	-	5,4	7,6	11,2	13,5	13,5
Cracked concrete							
Resistance in all load directions	F_{Rd}^0 [kN]	1,3 ¹⁾	-	-	-	-	-
Tension	N_{Rd} [kN]	-	1,4	6,0	8,0	8,3	10,5
Shear	V_{Rd} [kN]	-	2,9	4,7	6,1	7,5	7,5

¹⁾ Please refer "Requirements for redundant fastening " section

Recommended loads for all loads directions

Type	HUS3	H, PL, P, PS, I, I-Flex, IQ, A, C	H, C		H, C		
Fastener size		6	8		10		
Fastening		Redundant	Single Point				
Nominal embedment depth	h_{nom} [mm]	35 ¹⁾	40	60	70	75	85
Uncracked concrete							
Resistance in all load directions	F_{rec}^0 [kN]	1,0 ¹⁾	-	-	-	-	-
Tension	N_{rec} [kN]	-	2,8	5,7	7,6	7,9	12,7
Shear	V_{rec} [kN]	-	3,9	5,4	8,0	9,6	9,6
Cracked concrete							
Resistance in all load directions	F_{rec}^0 [kN]	1,0 ¹⁾	-	-	-	-	-
Tension	N_{rec} [kN]	-	1,0	4,3	5,7	6,0	7,5
Shear	V_{rec} [kN]	-	2,0	3,4	4,3	5,4	5,4

¹⁾. Please refer "Requirements for redundant fastening " section

Requirements for redundant fastening

The definition of redundant fastening according to Member States is given in EN 1992-4 and CEN/TR 17079. In Absence of a definition by a Member State the following default values may be taken.		
Minimum number of fixing points	Minimum number of anchors per fixing point	Maximum design load of action N_{Sd} per fixing point
3	1	2 kN
4	1	3 kN

The value for maximum design load of actions per fastening point N_{Sd} is valid in general that means all fastening points are considered in the design of the redundant structural system. The value N_{Sd} may be increased if the failure of one (=most unfavourable) fixing point is taken into account in the design (serviceability and ultimate limit state) of the structural system e.g. suspended ceiling.

Seismic loading based on Hilti technical data. Design according to EN 1992-4

All data in this section applies to:

- Correct setting (See setting instruction)
- For a single anchor
- Hammer drilled holes
- No edge distance and spacing influence (see setting detail tables with characteristic distances). Only one anchor can be used in the lower flute at a time with the min.spacing between anchors along the length of the flute to be at least $s = 3 \text{ hef}$. This datasheet does not give information for the design of fasteners in a group.
- Minimum base material thickness (see setting details table)
- Embedment depth, as specified in the table of this section
- Concrete with $f'c = 30 \text{ MPa}$ without steel fibre. For higher compressive strengths, the tension resistance may be increased by $(f'c / 30)^{0,5}$
- for HUS3 size 8 and 10 resistance is calculated as a minimum value based on the Hilti technical data and ETA-13/1038
- $\alpha_{\text{gap}} = 0,5$ (without using Hilti filling set) and $\alpha_{\text{gap}} = 1,0$ (using Hilti filling set) accordingly

For anchoring into the upper flute, either use data below conservatively or refer to ETA-10/0005 and ETA-13/1038. In this case the minimum required slab thickness h_{min} must be larger than the deck thickness $h_{\text{min,deck}}$.

Design resistance

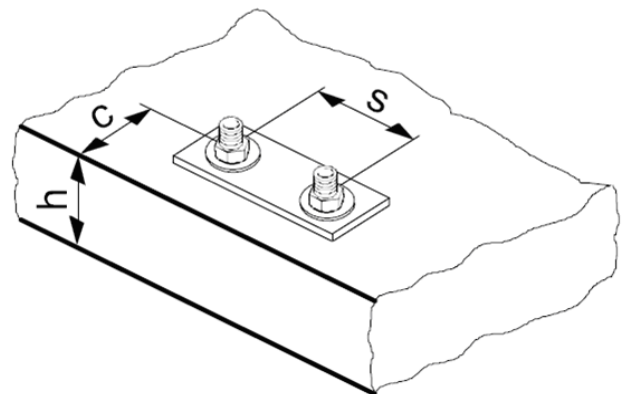
Type	HUS3	H, PL, P, PS, I, I-Flex, IQ, A, C	H, C		H, C	
Fastener size		6	8		10	
Nominal embedment depth	h_{nom} [mm]	40	60	70	75	85
with and without Hilti filling set						
Tension	$N_{\text{Rd,C1}}$ [kN]	1,4	6	7,9	8,8	10,7
with Hilti filling set ($\alpha_{\text{gap}} = 1,0$)						
Shear	$V_{\text{Rd,C1}}$ [kN]	-	7,9	7,9	11,2	11,8
without Hilti filling set ($\alpha_{\text{gap}} = 0,5$)						
Shear	$V_{\text{Rd,C1}}$ [kN]	1,6	4,0	4,0	5,6	5,9

Setting information

Setting details

Type	HUS3	H	C	A I I-Flex	P PL PS	IQ	H	C	A I I-Flex	P PL PS	IQ
Fastener size		6 all lengths									
Nominal embedment depth	h_{nom} [mm]	35					40				
Effective embedment depth	h_{ef} [mm]	25					30				
Nominal diameter of drill bit	d_0 [mm]	6									
Maximum diameter of clearance hole in the fixture	$d_{f,max}$ [mm]	9									
Wrench size	SW [mm]	13	-	13	-	17	13	-	13	-	17
Countersunk diameter	d_h [mm]	-	11,5	-	-	-	-	11,5	-	-	-
Torx size	TX [-]	T30	T30	-	T30	-	T30	T30	-	T30	-
Depth of drill hole for cleaned or uncleaned hole overhead	$h_{1,min}$ [mm]	38					43				
Minimum base material thickness	h_{min} [mm]	80									
Minimum concrete thickness over upper flute	$h_{min,deck}$ [mm]	70									
Minimum distances											
Spacing	s_{min} [mm]	35									
Edge distance	c_{min} [mm]	35									
Minimum distance to edge of lower flute	$c_{min,deck}$ [mm]	45									
Characteristic distances											
Spacing	s_{cr} [mm]	$3 \cdot h_{ef}$									
Edge distance	c_{cr} [mm]	$1,5 \cdot h_{ef}$									

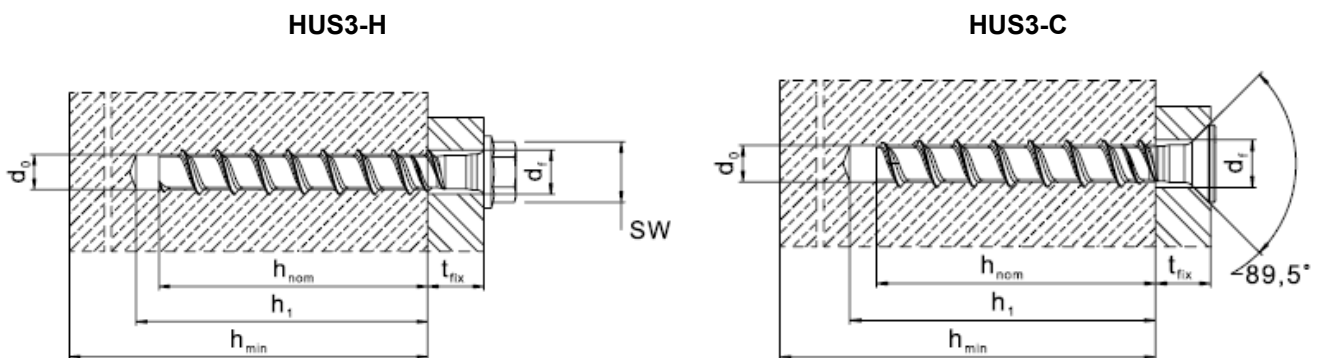
For spacing (edge distance) smaller than characteristic spacing (characteristic edge distance) the design loads have to be reduced.



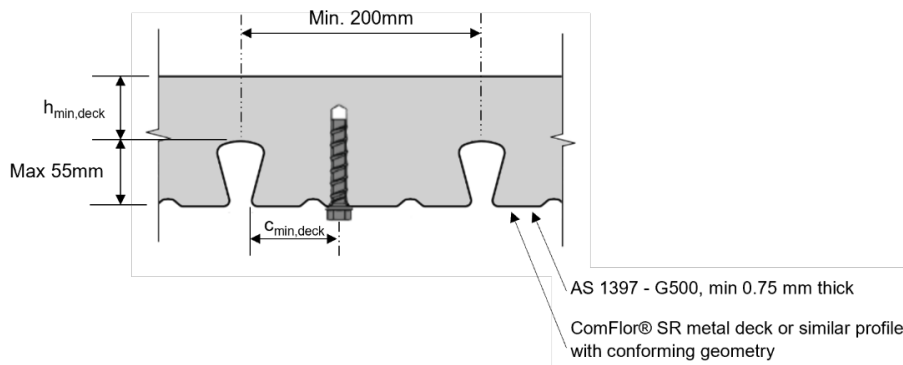
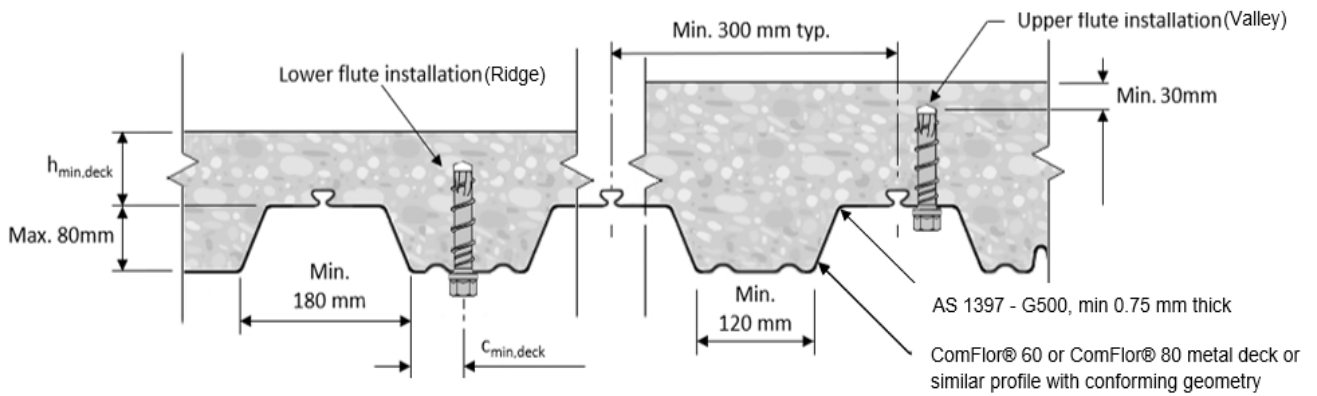
Setting details

Type	HUS3	H, C		H,C	
Fastener size		8		10	
Nominal embedment depth	[mm]	60	70	75	85
Effective embedment depth	h_{ef} [mm]	46,4	54,9	58,6	67,1
Nominal diameter of drill bit	d_0 [mm]	8		10	
Clearance hole diameter	$d_{f,max}$ [mm]	12		14	
Wrench size HUS3-H	SW1 [mm]	13		15	
Torx size for HUS3-C	TX -	45		50	
Countersunk head diameter	d_h [mm]	18		21	
Depth of drill hole for cleaned or uncleaned hole overhead	$h_{1,min}$ [mm]	70	80	85	95
Minimum base material thickness	h_{min} [mm]	100	120	130	140
Minimum concrete thickness over upper flute	$h_{min,deck}$ [mm]	70	70	70	70
Minimum distances					
Spacing	s_{min} [mm]	50		50	
Edge distance	c_{min} [mm]	40		50	
Minimum distance to edge of lower flute	$c_{min,deck}$ [mm]	45		47	
Characteristics distances					
Spacing for splitting failure	$s_{cr,sp}$ [mm]	$3 h_{ef}$		$3,3 h_{ef}$	
Edge distance for splitting	$c_{cr,sp}$ [mm]	$1,5 h_{ef}$		$1,65 h_{ef}$	
Spacing for concrete cone failure	$s_{cr,N}$ [mm]	$3 h_{ef}$			
Edge distance for concrete cone failure	$c_{cr,N}$ [mm]	$1,5 h_{ef}$			

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



Installation position for HUS3 anchor in metal decks :





Drilling and Installation equipment

For detailed setting information on installation ,see instructions for use given with the product.

Rotary Hammers (Corded and Cordless)		TE 2 - TE 30
Other tools		Impact wrench- SIW (use recommended socket/driver bit)
		Hammer drill bit TE-CX, TE-C
		Blow out pump