HUS4-HR / HUS4-CR
Screw anchor

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

HUS4-HR / HUS4-CR Screw anchor for use in concrete

High performance screw anchor for single point fastening

Anchor version

HUS4-HR
(6-14)*

HUS4-CR
(6-10)

Benefits

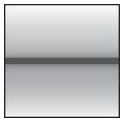
- High productivity - less drilling and fewer operations than with conventional anchors
- ETA approval for cracked and uncracked concrete
- ETA approval for Seismic C1
- Smaller edge and spacing distance
- Through fastening with H and C head
- Compatible with HUS4 Max capsules for chemical bonding performance
- Carbides technology on the tip to ease the setting in tougher concrete materials

Base material

Concrete
(uncracked)

Concrete
(cracked)

Load conditions

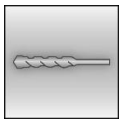


Static / quasi-static

Seismic, C1

Fire resistance

Drilling, cleaning, setting



Hammer drilled holes

Other information

Hilti Technical data

PROFIS Engineering software

Steel to concrete Handbook

Linked Approvals/Certificates and Instructions for use

Approvals/certificates

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

Instructions for use

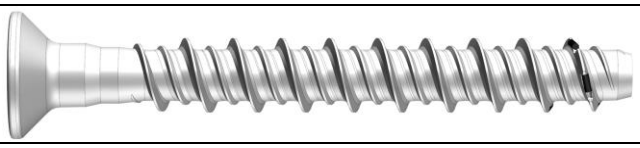
Anchor size	6	8	10	14
HR	IFU HUS4-HR-6	IFU HUS4-HR-8	IFU HUS4-HR-10	IFU HUS4-HR-14
CR	IFU HUS4-CR 6	IFU HUS4-CR-8	IFU HUS4-CR-10	
Filling set (HUS4-HR)	IFU Filling set			

Link to Hilti Webpage (QR codes)

HUS4-HR	HUS4-CR

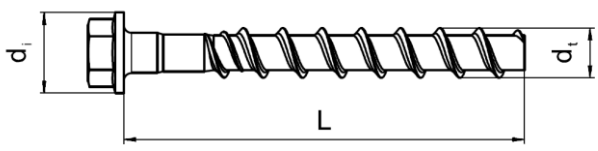
Fastener special dimensions

Head configuration

Type		
HUS4-HR	Hexagonal head	
HUS4-CR	Countersunk head	

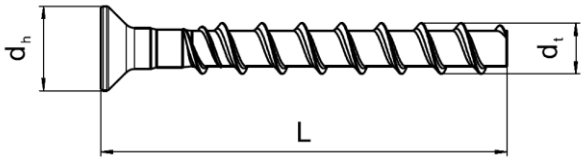
Fastener dimensions

Type		**HUS4-**	**HR**	**HR**	**HR**	**HR**
Anchor size			**6**	**8**	**10**	**14**
Outer diameter of the screw thread	d_t	[mm]	7,55	10,05	12,25	16,56
Diameter of integrated washer	d_i	[mm]	17,00	17,50	20,50	30,00
Length of the screw (min/max)	L	[mm]	60/70	65/105	75/130	80/135



HUS4: Hilti Universal Screw 4th generation
HR: Hexagonal head, stainless steel
10: Nominal screw diameter
x100: total length of the screw

Type		**HUS4-**	**CR**	**CR**	**CR**
Anchor size			**6**	**8**	**10**
Outer diameter of the screw thread	d_t	[mm]	7,55	10,05	12,25
Countersunk head diameter	d_h	[mm]	11,00	18,00	21,00
Length of the screw (min/max)	L	[mm]	60/70	65/95	75/105

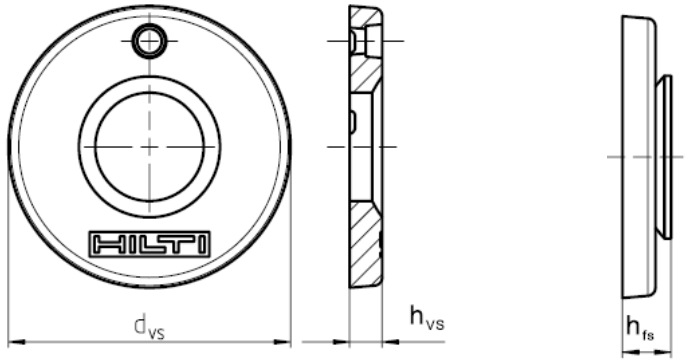


HUS4: Hilti Universal Screw 4th generation
CR: Countersunk head, stainless steel
10: Nominal screw diameter
x100: total length of the screw

Hilti Filling set

Hilti Filling set dimensions

Hilti filling set size			M10	M12	M16
Size of HUS4-HR			8	10	14
Filling washer diameter	d_{vs}	[mm]	42	44	52
Filling washer + spherical washer thickness	h_{fs}	[mm]	7	8	9



Static and quasi-static loading based on ETA-20/0867 and 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 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
- Recommended loads: With overall partial safety factor for action γ = 1,4. The partial safety factors for action depend on the type of loading and shall be taken from national regulations.

For specific design cases refer to PROFIS Engineering.

Design resistance

Type			**HUS4-**	**HR,CR**	**HR, CR**		**HR, CR**			**HR**	
Anchor size				**6**	**8**		**10**			**14**	
Technical data source				ETA	Hilti	ETA	ETA	Hilti	ETA	ETA	ETA	ETA
Nominal embedment depth	h_{nom}	[mm]		55	50	60	80	60	70	90	70	110
Uncracked concrete												
Tension	N_{Rd}	[kN]		4,3	5,0	8,0	8,9	6,7	8,9	16,7	10,2	21,8
Shear	V_{Rd}	[kN]		11,3	15,4	17,3	17,3	20,5	22,0	22,0	24,6	51,3
Cracked concrete												
Tension	N_{Rd}	[kN]		2,4	2,8	5,7	8,3	4,2	6,7	10,7	6,7	13,9
Shear	V_{Rd}	[kN]		10,4	10,8	14,8	17,3	14,3	18,2	22,0	17,2	36,6

Recommended loads

Type			**HUS4-**	**HR,CR**	**HR, CR**		**HR, CR**			**HR**	
Anchor size				**6**	**8**		**10**			**14**	
Technical data source				ETA	Hilti	ETA	ETA	Hilti	ETA	ETA	ETA	ETA
Nominal embedment depth	h_{nom}	[mm]		55	50	60	80	60	70	90	70	110
Uncracked concrete												
Tension	N_{rec}	[kN]		3,1	3,6	5,7	6,3	4,8	6,3	11,9	7,3	15,6
Shear	V_{rec}	[kN]		8,1	11,0	12,4	12,4	14,6	15,7	15,7	17,6	36,7
Cracked concrete												
Tension	N_{rec}	[kN]		1,7	2,0	4,0	6,0	3,0	4,8	7,6	4,8	9,9
Shear	V_{rec}	[kN]		7,4	7,7	10,6	12,4	10,2	13,0	15,7	12,3	26,2

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
- Hammer drilled holes
- 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
- α_{gap} = 1,0 (using Hilti filling set) or α_{gap} = 0,5 (without using Hilti filling set) accordingly

For specific design cases refer to PROFIS Engineering.

Design resistance in case of seismic performance category C1

with Hilti filling set					
Type		**HUS4-**	**HR**	**HR**	**HR**
Anchor size			**8**	**10**	**14**
Nominal anchorage depth	h_{nom}	[mm]	80	90	110
Tension	$N_{Rd,seis}$	[kN]	4,3	8,3	9,7
Shear	$V_{Rd,seis}$	[kN]	7,4	11,9	31,1
without Hilti filling set					
Type		**HUS4-**	**HR, CR**	**HR, CR**	**HR, CR**
Anchor size			**8**	**10**	**14**
Tension	$N_{Rd,seis}$	[kN]	4,3	8,3	9,7
Shear	$V_{Rd,seis}$	[kN]	3,7	6,0	15,6

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
- Hammer drilled holes
- 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
- 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.

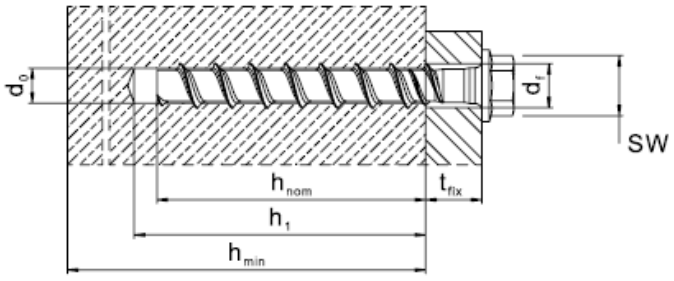
Design resistance

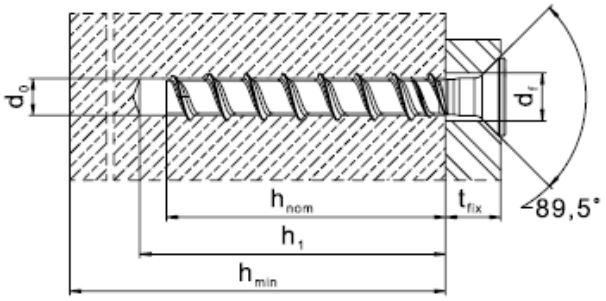
Type			**HUS4-**	**HR**	**CR**	**HR**		**CR**		**HR**		**CR**		**HR**	
Anchor size				**6**		**8**				**10**				**14**	
Nominal anchorage depth	h_{nom}	[mm]		55	55	60	80	60	80	70	90	70	90	70	110
Fire Exposure R30															
Tension	N_{Rd}	[kN]		1,3	0,2	1,5	3,0	0,8	0,8	2,3	4,0	1,4	1,4	3,0	6,3
Shear	V_{Rd}	[kN]		3,5	0,2	5,2	9,3	0,8	0,8	7,4	14,6	1,4	1,4	6,7	23,6
Fire Exposure R60															
Tension	N_{Rd}	[kN]		1,3	0,2	1,5	3,0	0,6	0,6	2,3	4,0	1,1	1,1	3,0	6,3
Shear	V_{Rd}	[kN]		3,3	0,2	5,2	6,3	0,6	0,6	7,4	12,0	1,1	1,1	6,7	23,6
Fire Exposure R90															
Tension	N_{Rd}	[kN]		1,3	0,2	1,5	3,0	0,5	0,5	2,3	4,0	0,9	0,9	3,0	6,3
Shear	V_{Rd}	[kN]		1,8	0,2	3,2	3,2	0,5	0,5	5,4	5,4	0,9	0,9	6,7	12,2
Fire Exposure R120															
Tension	N_{Rd}	[kN]		1,0	0,1	1,2	1,7	0,4	0,4	1,8	2,4	0,8	0,8	2,4	5,0
Shear	V_{Rd}	[kN]		1,0	0,1	1,7	1,7	0,4	0,4	2,4	2,4	0,8	0,8	5,4	5,4

Setting information

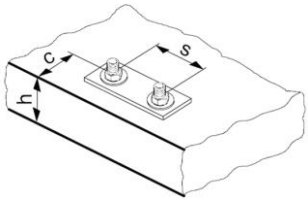
Setting details

Anchor size			6	8			10			14	
Type	**HUS4-**		**HR, CR**	**HR, CR**			**HR, CR**			**HR**	
Nominal embedment depth	h_{nom}	[mm]	55	50	60	80	60	70	90	70	110
Effective anchorage depth	h_{ef}	[mm]	45	38	47	64	46	54	71	52	86
Nominal diameter of drill bit	d_0	[mm]	6	8			10			14	
Maximum diameter of clearance hole in the fixture	d_f	[mm]	9	12			14			18	
Depth drill hole (cleaning)	h_1	[mm]	65	60	70	90	70	80	100	80	120
Depth drill hole (no cleaning)	h_1	[mm]	77	76	86	106	90	100	120	108	148
Wrench size	SW	[mm]	13	13			15			21	
Installation torque hand setting	T_{inst}	[Nm]	-	35	-	-	45 (only for HR)			65	-
Minimum base material thickness	h_{min}	[mm]	100	100	100	120	120			120	140
Minimum distances											
Spacing	s_{min}	[mm]	35	45	45	50	50	50	50	50	60
Edge distance	c_{min}	[mm]	35	45	45	50	50	50	50	50	60
Characteristics distances											
Spacing for splitting failure	$s_{cr,sp}$	[mm]	135	114	114	192	166	194	256	187	310
Edge distance for splitting failure	$c_{cr,sp}$	[mm]	68	57	71	96	83	97	128	94	155
Spacing for concrete cone failure	$s_{cr,N}$	[mm]	135	114	114	192	166	194	256	187	310
Edge distance for concrete cone failure	$c_{cr,N}$	[mm]	68	57	71	96	83	97	128	94	155





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



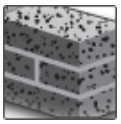
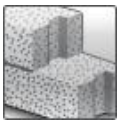
HUS4-HR / HUS4-CR
Screw anchor

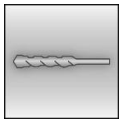
Product Technical Datasheet
Steel-to- masonry
Update: June 24

HUS4-HR / HUS4-CR Screw anchor for use in masonry

High performance screw anchor for single point fastening

Anchor version		Benefits
	HUS4-HR (6-10)*	- High productivity - less drilling and fewer operations than with conventional anchors - Smaller edge and spacing distance - Through fastening with H and C head
	HUS4-CR (6-10)	

Base material		Load conditions
		
Solid brick	Autoclaved aerated concrete	Static / quasi-static

Drilling, cleaning, setting	Other information	
		
Hammer drilled holes	Hilti Technical data	PROFIS Engineering software

Linked Instructions for use

Instructions for use

Anchor size	6	8	10
HR	IFU HUS4-HR-6	IFU HUS4-HR-8	IFU HUS4-HR-10
CR	IFU HUS4-CR 6	IFU HUS4-CR-8	IFU HUS4-CR-10

Link to Hilti Webpage (QR codes)

HUS4-HR	HUS4-CR

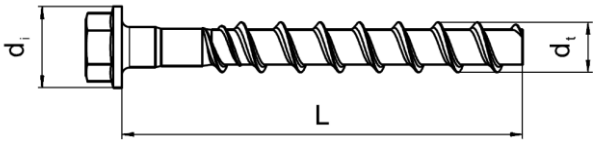
Fastener special dimensions

Head configuration

Type		
HUS4-HR	Hexagonal head	
HUS4-CR	Countersunk head	

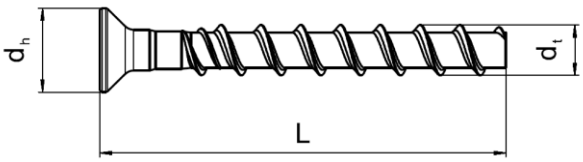
Fastener dimensions

Type		HUS4-	HR	HR	HR
Anchor size			**6**	**8**	**10**
Outer diameter of the screw thread	d_t	[mm]	7,55	10,05	12,25
Diameter of integrated washer	d_i	[mm]	17,00	17,50	20,50
Length of the screw (min/max)	L	[mm]	60/70	65/105	75/130



HUS4: Hilti Universal Screw 4th generation
HR: Hexagonal head, stainless steel
10: Nominal screw diameter
x100: total length of the screw

Type		HUS4-	CR	CR	CR
Anchor size			**6**	**8**	**10**
Outer diameter of the screw thread	d_t	[mm]	7,55	10,05	12,25
Countersunk head diameter	d_h	[mm]	11,00	18,00	21,00
Length of the screw (min/max)	L	[mm]	60/70	65/95	75/105



HUS4: Hilti Universal Screw 4th generation
CR: Countersunk head, stainless steel
10: Nominal screw diameter
x100: total length of the screw

Basic loading data in solid masonry units based on Hilti technical data. Design according to EOTA TR 055, design method A

All data in this section applies to:

- Load values valid for holes drilled with TE rotary hammers in hammering mod
- For a single anchor
- 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

Recommended loads for HUS4-HR / HUS4-CR

Anchor size					**6**	**8**	**10**
Nominal embedmenth depth			h_{nom} [mm]		55	60	70
Brick type		**Compressive strength, f_b**	**Loads**				
	Solid clay brick Mz 12/2,0 DIN 105 / EN 771-1	≥ 12 [N/mm²]	Tension	N_{rec} [kN]	0,9	1,0	1,1
			Shear	V_{rec} [kN]	1,4	2,0	2,3
	Solid sand-lime brick Mz 12/2,0 DIN 106/EN 771-2	≥ 12 [N/mm²]	Tension	N_{rec} [kN]	0,6	0,6	1,0
			Shear	V_{rec} [kN]	0,9	1,1	1,7
	Aerated concrete PPW 6-0,4 DIN 4165/EN 771-4	≥ 6 [N/mm²]	Tension	N_{rec} [kN]	0,2	0,2	0,4
			Shear	V_{rec} [kN]	0,4	0,4	0,9

Permissible anchor location in brick and block walls

Edge distance and spacing influence

- The technical data for HUS4-HR anchors are reference loads for MZ 12 and KS 12. Due to the large variation of natural stone solid bricks, on site anchor testing is recommended to validate technical data
- The HUS4-HR anchor was installed and tested in center of solid bricks as shown. The HUS4-HR 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 and KS) units ≥ 170mm
- 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 ≥ 2*c_{min}

Limits

- Applied load to individual bricks may not exceed 1,0 kN without compression or 1,4 kN with compression
- 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