



HVU2 adhesive capsule

Product Technical Datasheet

Steel-to-concrete

Update: Sep 25



HVU2 adhesive capsule

Anchor design (EN 1992-4) / Rods and Sleeves / Concrete

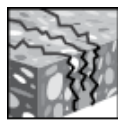
Anchor version	Benefits
 HVU2 Adhesive capsule	- Hilti hollow drill bit for automatic cleaning - Suitable for cracked and non-cracked concrete C20/25 to C50/60 both for hammer drilled and diamond cored holes - Highly reliable anchor for seismic design with ETA C1/C2 approval. Seismic C1 ETA available even for diamond cored holes. - Clean and fast installation that suits hard jobsite conditions - Suitable for dry and water saturated concrete - High loading capacity - Short curing time - In service temperature range up to 120°C short term / 72°C long term
 Anchor rod M8-M30: HAS-U HAS-U HDG HAS-U A4 HAS-U HCR Including P versions	
 Internally threaded sleeve M8-M20: HIS-N HIS-RN	



Base material



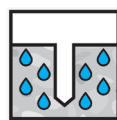
Concrete
(uncracked)



Concrete
(cracked)

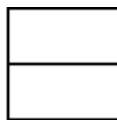


Dry

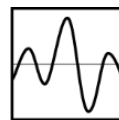


Water-
saturated

Load conditions



Static/
quasi-static



Seismic
C1/C2

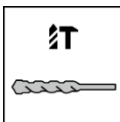


Fatigue

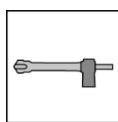


Fire
resistance

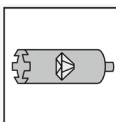
Installation conditions



Hammer
drilled holes



Hollow Drill
Bit drilled
holes



Diamond
cored
holes

Other information



[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	Date of expiry
ETA-16/0515	Static and quasi-static / Seismic / Fire	DIBt, Berlin	14-09-2023	-
21804	Fire exposure acc. ZTC-ING	ING. Thiele, Pirmasens	10-01-2018	03-10-2029
ETA-23/0277 (with HAS-U A4)	Fatigue	DIBt, Berlin	02-07-2025	-

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)

Material	
Injection mortar	IFU HVU2
Accessory	IFU Filling set

Link to Hilti Webpage

Adhesive Capsule / Threaded rod / Filling set				
HVU2	HAS-U	HAS-U A4	HIS-N	Filling set

Mechanical properties and dimensions HAS-U

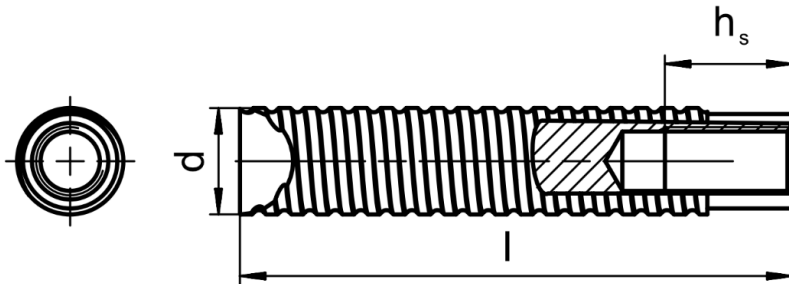
Mechanical properties and dimensions of the threaded rods are standardized and can be taken from the ETA listed in the table Approvals / Certificates.

Mechanical properties HIS-N

Mechanical properties of the internal threaded sleeve can be taken from the ETA listed in the table Approvals / Certificates.

Dimensions for HIS-N

Anchor size		M8	M10	M12	M16	M20
Diameter of element	d [mm]	12,5	16,5	20,5	25,4	27,6
Length of element	l [mm]	90	110	125	170	205
Thread engagement length; min - max	h_s [mm]	8-20	10-25	12-30	16-40	20-50

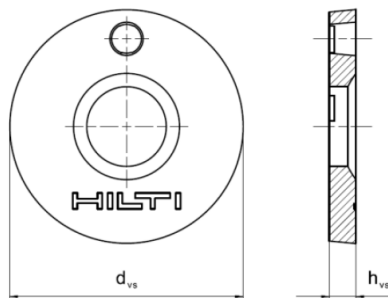


Hilti filling set

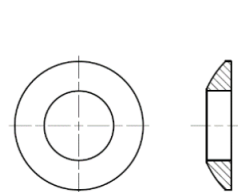
Dimensions filling washer

Anchor size		M8	M10	M12	M16	M20
Diameter	d_{vs} [mm]	38	42	44	52	60
Height filling washer	h_{vs} [mm]	5	5	5	6	6
Height filling washer and spherical washer	h_{fs} [mm]	8	9	10	11	13

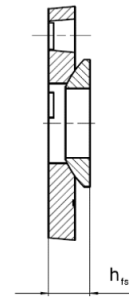
Sealing washer



Spherical washer



Filling Set



Static and quasi-static resistance loading based on ETA-16/0515. Design according to EN 1992-4

All data in this section applies to:

- Correct setting (see Instructions for use (IFU))
- For a single anchor
- Concrete C20/25
- Hammer drilled holes, hammer drilled holes with Hilti hollow drill bit (TE-CD, TE-YD)
- No edge distance and spacing influence (see setting detail tables with characteristic distances)
- Minimum base material thickness, as specified in the table of this section
- Embedment depth, as specified in the table of this section
- Anchor material, as specified in the tables of this section
- In-service temperature range I: -40 °C to +40 °C
(max. long term temperature +24 °C and max. short term temperature +40 °C)
- Short term loading. For long-term loading please apply ψ_{SUS} .
Hammer drilled holes and Hammer drilled holes with Hollow Drill Bit: $\psi_{\text{SUS}} = 1,0$
- Recommended loads: With overall partial safety factor for action $\gamma = 1,4$

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

Embedment depth and base material thickness

Anchor size			M8	M10	M12		M16		M20	M24	M27	M30	
HAS-U(-P)													
Effective anchorage depth	h_{ef}	[mm]	80	90	135	110	165	125	190	170	210	240	270
Base material thickness	h_{min}	[mm]	110	120	165	140	195	160	230	220	270	300	340
HIS-N													
Effective anchorage depth	h_{ef}	[mm]	90	110		125		170		205	-	-	-
Base material thickness	h_{min}	[mm]	120	150		170		230		270	-	-	-

Design resistance

Anchor size		M8	M10		M12		M16		M20	M24	M27	M30		
Uncracked concrete														
Tension	HAS-U(-P) 5.8	N _{Rd}	[kN]	12,2	19,3	19,3	28,1	28,1	45,8	52,3	72,7	99,8	-	-
	HAS-U(-P) 8.8			16,1	28,0	30,9	37,8	45,0	45,8	83,9	72,7	99,8	121,9	145,5
	HAS-U(-P) A4			13,7	21,7	21,7	31,6	31,6	45,8	58,8	72,7	99,8	80,2	98,1
	HAS-U(-P) HCR			16,1	28,0	30,9	37,8	45,0	45,8	83,7	72,7	99,8	-	-
	HIS-N 8.8			16,7	30,7		44,7		72,7		77,3	-	-	-
	HIS-RN 70			13,9	21,9		31,6		58,8		69,2	-	-	-
Shear	HAS-U(-P) 5.8	V _{Rd}	[kN]	7,3	11,6	11,6	16,9	16,9	31,4	31,4	49,0	70,6	-	-
	HAS-U(-P) 8.8			11,7	18,6	18,6	27,0	27,0	50,2	50,2	78,4	113,0	146,9	179,5
	HAS-U(-P) A4			9,2	14,5	14,5	21,1	21,1	39,3	39,3	55,0	79,2	48,2	58,9
	HAS-U(-P) HCR			11,7	18,6	18,6	27,0	27,0	50,2	50,2	78,4	70,6	-	-
	HIS-N 8.8			10,4	18,4		27,2		50,4		46,4	-	-	-
	HIS-RN 70			8,3	12,8		19,2		35,3		41,5	-	-	-
Cracked concrete														
Tension	HAS-U(-P) 5.8	N _{Rd}	[kN]	6,7	16,0	19,3	23,5	28,1	32,1	52,3	50,9	69,9	-	-
	HAS-U(-P) 8.8			6,7	16,0	24,0	23,5	35,2	32,1	54,1	50,9	69,9	85,4	102
	HAS-U(-P) A4			6,7	16,0	21,7	23,5	31,6	32,1	54,1	50,9	69,9	80,2	98,1
	HAS-U(-P) HCR			6,7	16,0	24,0	23,5	35,2	32,1	54,1	50,9	69,9	-	-
	HIS-N 8.8			15,3	24,7		32,1		50,9		67,4	-	-	-
	HIS-RN 70			13,9	21,9		31,6		50,9		67,4	-	-	-
Shear	HAS-U(-P) 5.8	V _{Rd}	[kN]	7,3	11,6	11,6	16,9	16,9	31,4	31,4	49,0	70,6	-	-
	HAS-U(-P) 8.8			11,7	18,6	18,6	27,0	27,0	50,2	50,2	78,4	113,0	146,9	179,5
	HAS-U(-P) A4			9,2	14,5	14,5	21,1	21,1	39,3	39,3	55,0	79,2	48,2	58,9
	HAS-U(-P) HCR			11,7	18,6	18,6	27,0	27,0	50,2	50,2	78,4	70,6	-	-
	HIS-N 8.8			10,4	18,4		27,2		50,4		46,4	-	-	-
	HIS-RN 70			8,3	12,8		19,2		35,3		41,5	-	-	-

Recommended loads

Anchor size		M8	M10		M12		M16		M20	M24	M27	M30		
Uncracked concrete														
Tension	HAS-U(-P) 5.8	N _{rec}	[kN]	8,7	13,8	13,8	20,1	20,1	32,7	37,4	51,9	71,3	-	-
	HAS-U(-P) 8.8			11,5	20,0	22,1	27,0	32,1	32,7	59,8	51,9	71,3	87,1	103,9
	HAS-U(-P) A4			9,8	15,5	15,5	22,5	22,5	32,7	42,0	51,9	71,3	57,3	70,1
	HAS-U(-P) HCR			11,5	20,0	22,1	27,0	32,1	32,7	59,8	51,9	71,3	-	-
	HIS-N 8.8			11,9	21,9		31,9		51,9		55,2	-	-	-
	HIS-RN 70			9,9	15,7		22,5		42,0		49,4	-	-	-
Shear	HAS-U(-P) 5.8	V _{rec}	[kN]	5,2	8,3	8,3	12,0	12,0	22,4	22,4	35,0	50,4	-	-
	HAS-U(-P) 8.8			8,4	13,3	13,3	19,3	19,3	35,9	35,9	56,0	80,7	104,9	128,2
	HAS-U(-P) A4			6,5	10,4	10,4	15,1	15,1	28,0	28,0	39,3	56,6	34,4	42,1
	HAS-U(-P) HCR			8,4	13,3	13,3	19,3	19,3	35,9	35,9	56,0	50,4	-	-
	HIS-N 8.8			7,4	13,1		19,4		36,0		33,1	-	-	-
	HIS-RN 70			6,0	9,2		13,7		25,2		29,6	-	-	-
Cracked concrete														
Tension	HAS-U(-P) 5.8	N _{rec}	[kN]	4,8	11,4	13,8	16,8	20,1	22,9	37,4	36,3	49,9	-	-
	HAS-U(-P) 8.8			4,8	11,4	17,2	16,8	25,2	22,9	38,7	36,3	49,9	61,0	72,7
	HAS-U(-P) A4			4,8	11,4	15,5	16,8	22,5	22,9	38,7	36,3	49,9	57,3	70,1
	HAS-U(-P) HCR			4,8	11,4	17,2	16,8	25,2	22,9	38,7	36,3	49,9	-	-
	HIS-N 8.8			10,9	17,6		22,9		36,3		48,1	-	-	-
	HIS-RN 70			9,9	15,7		22,5		36,3		48,1	-	-	-
Shear	HAS-U(-P) 5.8	V _{rec}	[kN]	5,2	8,3	8,3	12,0	12,0	22,4	22,4	35,0	50,4	-	-
	HAS-U(-P) 8.8			8,4	13,3	13,3	19,3	19,3	35,9	35,9	56,0	80,7	104,9	128,2
	HAS-U(-P) A4			6,5	10,4	10,4	15,1	15,1	28,0	28,0	39,3	56,6	34,4	42,1
	HAS-U(-P) HCR			8,4	13,3	13,3	19,3	19,3	35,9	35,9	56,0	50,4	-	-
	HIS-N 8.8			7,4	13,1		19,4		36,0		33,1	-	-	-
	HIS-RN 70			6,0	9,2		13,7		25,2		29,6	-	-	-

Seismic loading based on ETA-16/0515.Design according to EN 1992-4

All data in this section applies to:

- Correct setting (see Instructions for use (IFU))
- For a single anchor
- Concrete C20/25
- Hammer drilled holes, hammer drilled holes with Hilti hollow drill bit (TE-CD, TE-YD)
- No edge distance and spacing influence (see setting detail tables with characteristic distances)
- Minimum base material thickness, as specified in the table of this section
- Embedment depth, as specified in the table of this section
- Anchor material, as specified in the tables of this section
- In-service temperature range I: -40 °C to +40 °C
(max. long term temperature +24 °C and max. short term temperature +40 °C)
- Short term loading. For long-term loading please apply ψ_{sus} .
Hammer drilled holes and Hammer drilled holes with Hollow Drill Bit: $\psi_{\text{sus}} = 1,0$
- $\alpha_{\text{gap}} = 1,0$ (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](#).

Embedment depth and base material thickness

Anchor size			M10		M12		M16		M20	M24	M27	M30
HAS-U(-P)												
Effective anchorage depth	h_{ef}	[mm]	90	135	110	165	125	190	170	210	240	270
Base material thickness	h_{min}	[mm]	120	165	140	195	160	230	220	270	300	340

Design resistance in case of seismic performance category C1

Anchor size			M10		M12		M16		M20	M24	M27	M30
Tension	HAS-U(-P) 5.8	N _{Rd,seis} [kN]	16,0	19,3	22,5	28,1	27,3	51,1	43,3	59,4	-	-
	HAS-U(-P) 8.8		16,0	24,0	22,5	35,2	27,3	51,1	43,3	59,4	72,6	86,6
	HAS-U(-P) A4		16,0	21,7	22,5	31,6	27,3	51,1	43,3	59,4	72,6	86,6
	HAS-U(-P) HCR		16,0	24,0	22,5	35,2	27,3	51,1	43,3	59,4	-	-
with Hilti filling set (α _{gap} = 1,0)												
Shear	HAS-U(-P) 5.8	V _{Rd,seis} [kN]	8,8	8,8	12,0	12,0	21,6	21,6	34,4	49,6	-	-
	HAS-U(-P) 8.8		12,8	12,8	19,2	19,2	35,2	35,2	55,2	79,2	103,2	125,6
	HAS-U(-P) A4		9,0	9,0	13,5	13,5	25,0	25,0	38,5	55,8	34,0	41,2
	HAS-U(-P) HCR		12,8	12,8	19,2	19,2	35,2	35,2	55,2	49,7	-	-
without Hilti filling set (α _{gap} = 0,5)												
Shear	HAS-U(-P) 5.8	V _{Rd,seis} [kN]	4,4	4,4	6,0	6,0	10,8	10,8	17,2	24,8	-	-
	HAS-U(-P) 8.8		6,4	6,4	9,6	9,6	17,6	17,6	27,6	39,6	51,6	62,8
	HAS-U(-P) A4		4,5	4,5	6,7	6,7	12,5	12,5	19,2	27,9	17,0	20,6
	HAS-U(-P) HCR		6,4	6,4	9,6	9,6	17,6	17,6	27,6	24,9	-	-

Design resistance in case of seismic performance category C2

Anchor size			M10		M12		M16		M20	M24	M27	M30
Tension	HAS-U(-P) 8.8	$N_{\text{Rd,seis}}$ [kN]	-	-	-	-	12,1	18,5	18,5	-	-	-
with Hilti filling set ($\alpha_{\text{gap}} = 1,0$)												
Shear	HAS-U(-P) 8.8	$V_{\text{Rd,seis}}$ [kN]	-	-	-	-	32,0	32,0	56,8	-	-	-
without Hilti filling set ($\alpha_{\text{gap}} = 0,5$)												
Shear	HAS-U(-P) 8.8	$V_{\text{Rd,seis}}$ [kN]	-	-	-	-	16,0	16,0	28,4	-	-	-

Fatigue loading based on ETA-23/0277.Design according to EN 1992-4 and TR 061

Please refer to the corresponding Product Technical Datasheet link for fatigue loading detail

HVU2 adhesive capsule with HAS-U A4

	Product Technical Datasheet HAS-U A4 Fatigue
---	--

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

Fire loading based on ETA-16/0515. Design according to EOTA TR 082

All data in this section applies to:

- Correct setting (see Instructions for use (IFU))
- For a single anchor
- Concrete C20/25
- Hammer drilled holes, hammer drilled holes with Hilti hollow drill bit
- No edge distance and spacing influence (see setting detail tables with characteristic distances)
- Minimum base material thickness, as specified in the table of this section
- Embedment depth, as specified in the table of this section
- Anchor material, as specified in the tables of this section
- Fire attack from side only
- In case of fire a partial safety factor $\gamma_{M,fi} = 1,0$ is taken (in absence of other national recommendations)

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

Embedment depth and base material thickness

Anchor size		M8	M10	M12	M16	M20	M24	M27	M30
HAS-U (-P)									
Effective anchorage depth	h_{ef} [mm]	80	90	110	125	170	210	240	270
Base material thickness	h_{min} [mm]	110	120	140	160	220	270	300	340

Design resistance in case of fire

Anchor size				M8	M10	M12	M16	M20	M24	M27	M30
Fire Exposure R30											
Tension	HAS-U(-P) 8.8	N _{Rk,fi}	[kN]	0,56	1,53	3,48	5,14	12,4	17,9	23,4	28,6
	HAS-U(-P) A4			0,99	2,98	8,05	14,5	34,8	50,2	65,3	79,8
Shear	HAS-U(-P) 8.8	V _{Rk,fi}	[kN]	1,58	2,76	4,29	8,00	12,4	17,9	23,4	28,6
	HAS-U(-P) A4			1,98	6,57	12,0	22,3	34,8	50,2	65,3	79,8
Fire Exposure R120											
Tension	HAS-U(-P) 8.8	N _{Rk,fi}	[kN]	0,02	0,10	0,35	0,54	2,25	5,37	8,66	10,5
	HAS-U(-P) A4			0,05	0,18	0,53	0,95	4,46	12,3	18,5	22,6
Shear	HAS-U(-P) 8.8	V _{Rk,fi}	[kN]	0,04	0,20	0,71	1,08	4,50	6,66	8,66	10,5
	HAS-U(-P) A4			0,10	0,38	1,07	1,90	8,92	14,2	18,5	22,6

Setting information

Installation temperature range:

-10°C to +40°C for the standard variation of temperature and rapid variation of temperature after installation.

In service temperature range

Hilti HVU2 adhesive capsule may be applied in the temperature ranges given below. An elevated base material temperature may lead to a reduction of the design bond resistance.

Temperature range	Base material temperature	Maximum long term base material temperature	Maximum short term base material temperature
Temperature range I	-40 °C to +40 °C	+24 °C	+40 °C
Temperature range II	-40 °C to +80 °C	+50 °C	+80 °C
Temperature range III	-40 °C to +120 °C	+72 °C	+120 °C

Maximum short term base material temperature

Short-term elevated base material temperatures are those that occur over brief intervals, e.g. as a result of diurnal cycling.

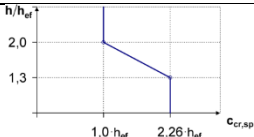
Maximum long term base material temperature

Long-term elevated base material temperatures are roughly constant over significant periods of time.

Curing time

Temperature of the base material	Minimum curing time
T	t _{cure}
-10 °C to -6 °C	5 hours
-5 °C to -1 °C	3 hours
0 °C to 4 °C	40 min
5 °C to 9 °C	20 min
10 °C to 19 °C	10 min
20 °C to 40 °C	5 min

Setting details for HAS-U (-P)

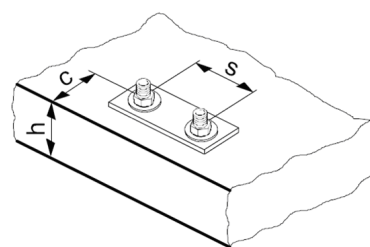
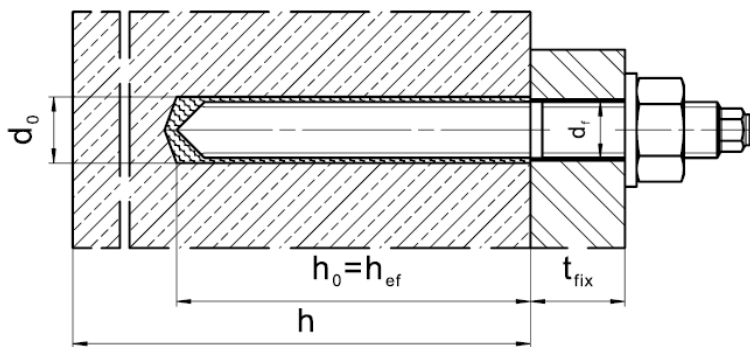
Anchor size		M8	M10	M12	M16	M20	M24	M27	M30
Adhesive capsule HVU2	h_{ef1} [mm]	8x80	10x90	12x110	16x125	20x170	24x210	27x240	30x270
	h_{ef2} [mm]	-	10x135	12x165	16x190	-	-	-	-
Diameter of element	$d_1=d_{nom}$ [mm]	8	10	12	16	20	24	27	30
Nominal diameter of drill bit	[mm]	10	12	14	18	22	28	30	35
Effective embedment depth (= drill hole depth)	$h_{ef1}=h_{0,1}$ [mm]	80	90	110	125	170	210	240	270
	$h_{ef2}=h_{0,2}$ [mm]	-	135	165	190	-	-	-	-
Maximum diameter of clearance hole in the fixture	d_f [mm]	9	12	14	18	22	26	30	33
Minimum thickness of concrete member	h_{min1} [mm]	110	120	140	160	220	270	300	340
	h_{min2} [mm]	-	165	195	230	-	-	-	-
Maximum torque moment ^{a)}	T_{max} [Nm]	10	20	40	80	150	200	270	300
Minimum spacing	s_{min} [mm]	40	50	60	75	90	115	120	140
Minimum edge distance	c_{min} [mm]	40	45	45	50	55	60	75	80
Characteristic distances									
Spacing for splitting failure	$s_{cr,sp}$	$2\ c_{cr,sp}$							
Edge distance for splitting failure ^{b)}	$c_{cr,sp}$ [mm]	1,0·h_{ef}		for $h / h_{ef} \geq 2,0$					
		4,6 h_{ef}-1,8 h		for $2,0 > h/h_{ef} > 1,3$					
		2,26 h_{ef}		for $h / h_{ef} \leq 1,3$					
Spacing for concrete cone failure	$s_{cr,N}$ [mm]	$2\ c_{cr,N}$							
Edge distance for concrete cone failure ^{c)}	$c_{cr,N}$ [mm]	$1,5\ h_{ef}$							

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

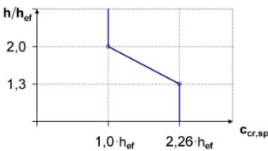
a) Maximum torque moment to avoid splitting failure during installation with minimum spacing and edge distance

b) h : base material thickness ($h \geq h_{min}$)

c) The characteristic edge distance for concrete cone failure depends on the embedment depth h_{ef} and the design bond resistance. The simplified formula given in this table is on the safe side.



Setting details for HIS-N

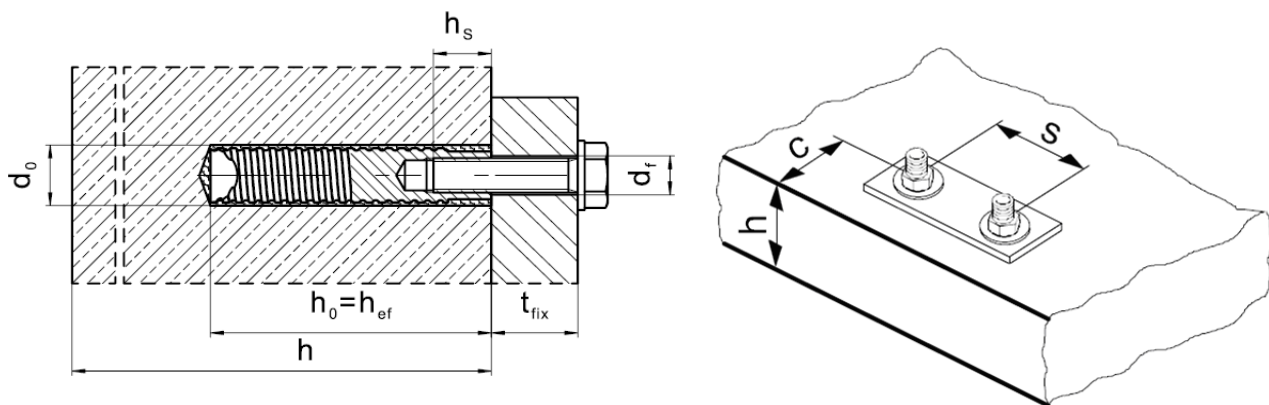
Anchor size			M8	M10	M12	M16	M20
Adhesive capsule HVU2			10x90	12x110	16x125	20x170	24x210
Diameter of element	d ₁ =d _{nom}	[mm]	12,5	16,5	20,5	25,4	27,8
Nominal diameter of drill bit	d ₀	[mm]	14	18	22	28	32
Effective embedment depth (= drill hole depth)	h _{ef} =h ₀	[mm]	90	110	125	170	205
Maximum diameter of clearance hole in the fixture	d _f	[mm]	9	12	14	18	22
Minimum thickness of concrete member	h _{min}	[mm]	120	150	170	230	270
Maximum torque moment ^{a)}	T _{max}	[Nm]	10	20	40	80	150
Thread engagement length min-	h _s	[mm]	8-20	10-25	12-30	16-40	20-50
Minimum spacing	s _{min}	[mm]	60	75	90	115	130
Minimum edge distance	c _{min}	[mm]	40	45	55	65	90
Characteristic distances							
Spacing for splitting failure			2 c _{Cr,sp}				
Edge distance for splitting failure ^{b)}	c _{Cr,sp}	[mm]	1,0·h _{ef} for h / h _{ef} ≥ 2,0				
			4,6 h _{ef} -1,8 h for 2,0 > h/h _{ef} > 1,3				
			2,26 h _{ef} for h / h _{ef} ≤ 1,3				
Spacing for concrete cone failure			2 c _{Cr,N}				
Edge distance for concrete cone failure ^{c)}			1,5 h _{ef}				

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

a) Maximum recommended torque moment to avoid splitting failure during installation with minimum spacing and/or edge distance

b) h : base material thickness ($h \geq h_{min}$)

c) The characteristic edge distance for concrete cone failure depends on the embedment depth h_{ef} and the design bond resistance. The simplified formula given in this table is on the safe side.



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 70
Diamond Coring Machines		DD EC-1, DD 100 ... DD 160
Other tools		Blow out pump, Compressed air gun, Set of cleaning brushes
		Hammer drill bit TE-CX, TE-YX, TE-C, TE-Y
		Hollow drill bit TE-CD, TE-YD
		Diamond core bit
		Setting tool