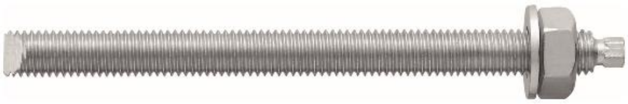
HVU2 adhesive capsule

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

Anchor version

HVU2
Mortar capsule



Anchor rod:
HAS
HAS HDG
HAS A4
HAS HCR
(M8-M30)

Internally threaded sleeve:
HIS-N
HIS-RN
(M8-M20)

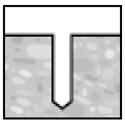
Benefits

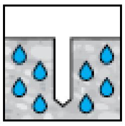
- **SafeSet** technology: Hilti hollow drill bit for automatic cleaning
- Suitable for cracked and non-cracked concrete C20/25 to C50/60 both for hammer drilled and diamond cored holes
- Highly reliable and safe anchor for seismic design with ETA C1/C2 approval. Seismic C1 ETA available even for Diamond 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

Base material

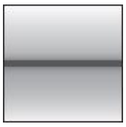

Concrete (non-cracked)


Concrete (cracked)


Dry concrete


Wet concrete

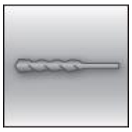
Load conditions


Static/ quasi-static


Fire resistance

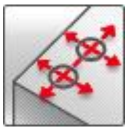

Seismic ETA-C1/C2

Installation conditions


Hammer drilled holes


Diamond drilled holes

SAFESET
Hilti SafeSet technology


Small edge distance and spacing

Other information


European Technical Assessment


CE conformity

PROFIS design Software

Corrosion resistance

High corrosion resistance

Approvals / certificates

Description	Authority / Laboratory	No. / date of issue
European Technical Assessment [a)]	DIBt, Berlin	ETA-16/0515 / 2019-11-13
Fire test assessment	ING.Thiele, Pirmasens	21735 / 2017-08-01

a) All data given in this section according to ETA-16/0515, issue 2019-06-17.

Static and quasi-static resistance (for a single anchor)

All data in this section applies to:
- Correct setting (See setting instructions)
- No edge distance and spacing influence
- *Steel* failure
- Minimum base material thickness
- Concrete C20/25, $f_{ck,cube}$ = 25 N/mm²
- Temperature range I: -40 °C to +40 °C
  (max. long term temperature +24 °C and max. short term temperature +40 °C)
- All data given in this section according ETA-16/0515, issue 2019-11-13.
- Short term loading. For long term loading please apply ψ_{sus}.
  Hammer drilled holes and Hammer drilled holes with Hollow Drill Bit: ψ_{sus} = 1.00
  Diamond cored holes: ψ_{sus} = 0.78

Embedment depth and base material thickness

Anchor size			M8	M10	M12	M16	M20	M24	M27	M30
HAS										
Eff. 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
HIS-N										
Eff. Anchorage depth	h_{ef}	[mm]	90	110	125	170	205	-	-	-
Base material thickness	h_{min}	[mm]	120	150	170	230	270	-	-	-

Hammer drilled holes and hammer drilled holes with hollow drill bit[1]:

Characteristic resistance

Anchor size			M8	M10	M12	M16	M20	M24	M27	M30
Non-cracked concrete										
Tension N_{Rk}	HAS 5.8	[kN]	*18,3*	*29,0*	*42,2*	68,8	109	150	-	-
	HAS 8.8		24,1	42,0	56,8	68,8	109	150	183	218
	HAS A4		24,1	*40,6*	56,8	68,8	109	150	183	218
	HAS HCR		24,1	42,0	56,8	68,8	109	150	-	-
	HIS-N 8.8		*25,0*	*46,0*	*67,0*	109	*116*	-	-	-
	HIS-RN 70		*26,0*	*41,0*	*59,0*	109	144	-	-	-
Shear V_{Rk}	HAS 5.8	[kN]	*9,2*	*14,5*	*21,1*	*39,3*	*61,3*	*88,3*	-	-
	HAS 8.8		*14,6*	*23,2*	*33,7*	*62,8*	*98,0*	*141*	*184*	*224*
	HAS A4		*12,8*	*20,3*	*29,5*	*55,0*	*85,8*	*124*	*115*	*140*
	HAS HCR		*14,6*	*23,2*	*33,7*	*62,8*	*98,0*	*124*	-	-
	HIS-N 8.8		*13,0*	*23,0*	*34,0*	*63,0*	*58,0*	-	-	-
	HIS-RN 70		*13,0*	*20,0*	*30,0*	*55,0*	*83,0*	-	-	-
Cracked concrete										
Tension N_{Rk}	HAS 5.8	[kN]	10,1	24,0	35,2	48,1	76,3	105	-	-
	HAS 8.8		10,1	24,0	35,2	48,1	76,3	105	128	153
	HAS A4		10,1	24,0	35,2	48,1	76,3	105	128	153
	HAS HCR		10,1	24,0	35,2	48,1	76,3	105	-	-
	HIS-N 8.8		23,0	37,1	48,1	76,3	101	-	-	-
	HIS-RN 70		23,0	37,1	48,1	76,3	101	-	-	-
Shear V_{Rk}	HAS 5.8	[kN]	*9,2*	*14,5*	*21,1*	*39,3*	*61,3*	*88,3*	-	-
	HAS 8.8		*14,6*	*23,2*	*33,7*	*62,8*	*98,0*	*141*	*184*	*224*
	HAS A4		*12,8*	*20,3*	*29,5*	*55,0*	*85,8*	*124*	*115*	*140*
	HAS HCR		*14,6*	*23,2*	*33,7*	*62,8*	*98,0*	*124*	-	-
	HIS-N 8.8		*13,0*	*23,0*	*34,0*	*63,0*	*58,0*	-	-	-
	HIS-RN 70		*13,0*	*20,0*	*30,0*	*55,0*	*83,0*	-	-	-

1) Hilti hollow drill bit is available for the element sizes M12 to M30.

Design resistance

Anchor size			M8	M10	M12	M16	M20	M24	M27	M30
Non-cracked concrete										
Tension N_{Rd}	HAS 5.8	[kN]	12,2	19,3	28,1	45,8	72,7	99,8	-	-
	HAS 8.8		16,1	28,0	37,8	45,8	72,7	99,8	122	145
	HAS A4		15,3	24,2	35,1	45,8	72,7	99,8	80,2	98,1
	HAS HCR		16,1	28,0	37,8	45,8	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 V_{Rd}	HAS 5.8	[kN]	7,3	11,6	16,9	31,4	49,0	70,6	-	-
	HAS 8.8		11,7	18,6	27,0	50,2	78,4	113	147	180
	HAS A4		9,2	14,5	21,1	39,3	55,0	79,2	48,2	58,9
	HAS HCR		11,7	18,6	27,0	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 N_{Rd}	HAS 5.8	[kN]	6,7	16,0	23,5	32,1	50,9	69,9	-	-
	HAS 8.8		6,7	16,0	23,5	32,1	50,9	69,9	85,4	102
	HAS A4		6,7	16,0	23,5	32,1	50,9	69,9	80,2	98,1
	HAS HCR		6,7	16,0	23,5	32,1	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 V_{Rd}	HAS 5.8	[kN]	7,3	11,6	16,9	31,4	49,0	70,6	-	-
	HAS 8.8		11,7	18,6	27,0	50,2	78,4	113	147	180
	HAS A4		9,2	14,5	21,1	39,3	55,0	79,2	48,2	58,9
	HAS HCR		11,7	18,6	27,0	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	-	-	-

1) Hilti hollow drill bit is available for the element sizes M12 to M30.

Recommended loads[2)]

Anchor size			M8	M10	M12	M16	M20	M24	M27	M30
Non-cracked concrete										
Tension N_{Rec}	HAS 5.8	[kN]	8,7	13,8	20,1	32,7	51,9	71,3	-	-
	HAS 8.8		11,5	20,0	27,0	32,7	51,9	71,3	87,1	104
	HAS A4		10,9	17,3	25,1	32,7	51,9	71,3	57,3	70,1
	HAS HCR		11,5	20,0	27,0	32,7	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 V_{Rec}	HAS 5.8	[kN]	5,2	8,3	12,0	22,4	35,0	50,4	-	-
	HAS 8.8		8,4	13,3	19,3	35,9	56,0	80,7	105	128
	HAS A4		6,5	10,4	15,1	28,0	39,3	56,6	34,4	42,1
	HAS HCR		8,4	13,3	19,3	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 N_{Rec}	HAS 5.8	[kN]	4,8	11,4	16,8	22,9	36,3	49,9	-	-
	HAS 8.8		4,8	11,4	16,8	22,9	36,3	49,9	61,0	72,7
	HAS A4		4,8	11,4	16,8	22,9	36,3	49,9	57,3	70,1
	HAS HCR		4,8	11,4	16,8	22,9	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 V_{Rec}	HAS 5.8	[kN]	5,2	8,3	12,0	22,4	35,0	50,4	-	-
	HAS 8.8		8,4	13,3	19,3	35,9	56,0	80,7	105	128
	HAS A4		6,5	10,4	15,1	28,0	39,3	56,6	34,4	42,1
	HAS HCR		8,4	13,3	19,3	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	-	-	-

1) Hlti hollow drill bit is available for the element sizes M12-M30.

2) With overall partial dafety 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.

Diamond cored holes:

Characteristic resistance

Anchor size			M8	M10	M12	M16	M20	M24	M27	M30
Non-cracked concrete										
Tension N_{Rk}	HAS 5.8	[kN]	-	29,0	42,2	68,8	109	150	-	-
	HAS 8.8		-	39,6	56,8	68,8	109	150	183	218
	HAS A4		-	39,6	56,8	68,8	109	150	183	218
	HAS HCR		-	39,6	56,8	68,8	109	150	-	-
	HIS-N 8.8		25,0	46,0	67,0	109	116	-	-	-
	HIS-RN 70		26,0	41,0	59,0	109	144	-	-	-
Shear V_{Rk}	HAS 5.8	[kN]	-	14,5	21,1	39,3	61,3	88,3	-	-
	HAS 8.8		-	23,2	33,7	62,8	98,0	141	184	224
	HAS A4		-	20,3	29,5	55,0	85,8	124	115	140
	HAS HCR		-	23,2	33,7	62,8	98,0	124	-	-
	HIS-N 8.8		13,0	23,0	34,0	63,0	58,0	-	-	-
	HIS-RN 70		13,0	20,0	30,0	55,0	83,0	-	-	-
Cracked concrete										
Tension N_{Rk}	HAS 5.8	[kN]	-	19,8	29,0	44,0	74,8	105	-	-
	HAS 8.8		-	19,8	29,0	44,0	74,8	105	128	153
	HAS A4		-	19,8	29,0	44,0	74,8	105	128	153
	HAS HCR		-	19,8	29,0	44,0	74,8	105	-	-
	HIS-N 8.8		15,9	25,7	36,2	61,0	80,0	-	-	-
	HIS-RN 70		15,9	25,7	36,2	61,0	80,0	-	-	-
Shear V_{Rk}	HAS 5.8	[kN]	-	14,5	21,1	39,3	61,3	88,3	-	-
	HAS 8.8		-	23,2	33,7	62,8	98,0	141	184	224
	HAS A4		-	20,3	29,5	55,0	85,8	124	115	140
	HAS HCR		-	23,2	33,7	62,8	98,0	124	-	-
	HIS-N 8.8		13,0	23,0	34,0	63,0	58,0	-	-	-
	HIS-RN 70		13,0	20,0	30,0	55,0	83,0	-	-	-

Design resistance

Anchor size			M8	M10	M12	M16	M20	M24	M27	M30
Non-cracked concrete										
Tension N_{Rd}	HAS 5.8	[kN]	-	19,3	28,1	45,8	72,7	99,8	-	-
	HAS 8.8		-	26,4	37,8	45,8	72,7	99,8	122	145
	HAS A4		-	24,2	35,1	45,8	72,7	99,8	80,2	98,1
	HAS HCR		-	26,4	37,8	45,8	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 V_{Rd}	HAS 5.8	[kN]	-	11,6	16,9	31,4	49,0	70,6	-	-
	HAS 8.8		-	18,6	27,0	50,2	78,4	113	147	180
	HAS A4		-	14,5	21,1	39,3	55,0	79,2	48,2	58,9
	HAS HCR		-	18,6	27,0	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 N_{Rd}	HAS 5.8	[kN]	-	13,2	19,4	29,3	49,8	69,9	-	-
	HAS 8.8		-	13,2	19,4	29,3	49,8	69,9	85,4	102
	HAS A4		-	13,2	19,4	29,3	49,8	69,9	80,2	98,1
	HAS HCR		-	13,2	19,4	29,3	49,8	69,9	-	-
	HIS-N 8.8		10,6	17,1	24,2	40,7	53,3	-	-	-
	HIS-RN 70		10,6	17,1	24,2	40,7	53,3	-	-	-
Shear V_{Rd}	HAS 5.8	[kN]	-	11,6	16,9	31,4	49,0	70,6	-	-
	HAS 8.8		-	18,6	27,0	50,2	78,4	113	147	180
	HAS A4		-	14,5	21,1	39,3	55,0	79,2	48,2	58,9
	HAS HCR		-	18,6	27,0	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 [a)]

Anchor size			M8	M10	M12	M16	M20	M24	M27	M30
Non-cracked concrete										
Tension N_{Rec}	HAS 5.8	[kN]	-	13,8	20,1	32,7	51,9	71,3	-	-
	HAS 8.8		-	18,8	27,0	32,7	51,9	71,3	87,1	104
	HAS A4		-	17,3	25,1	32,7	51,9	71,3	57,3	70,1
	HAS HCR		-	18,8	27,0	32,7	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 V_{Rec}	HAS 5.8	[kN]	-	8,3	12,0	22,4	35,0	50,4	-	-
	HAS 8.8		-	13,3	19,3	35,9	56,0	80,7	105	128
	HAS A4		-	10,4	15,1	28,0	39,3	56,6	34,4	42,1
	HAS HCR		-	13,3	19,3	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 N_{Rec}	HAS 5.8	[kN]	-	9,4	13,8	20,9	35,6	49,9	-	-
	HAS 8.8		-	9,4	13,8	20,9	35,6	49,9	61,0	72,7
	HAS A4		-	9,4	13,8	20,9	35,6	49,9	57,3	70,1
	HAS HCR		-	9,4	13,8	20,9	35,6	49,9	-	-
	HIS-N 8.8		7,6	12,2	17,3	29,1	38,1	-	-	-
	HIS-RN 70		7,6	12,2	17,3	29,1	38,1	-	-	-
Shear V_{Rec}	HAS 5.8	[kN]	-	8,3	12,0	22,4	35,0	50,4	-	-
	HAS 8.8		-	13,3	19,3	35,9	56,0	80,7	105	128
	HAS A4		-	10,4	15,1	28,0	39,3	56,6	34,4	42,1
	HAS HCR		-	13,3	19,3	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	-	-	-

a) 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.

Seismic resistance

All data in this section applies to:
- Hammer drilled holes and hammer drilled holes with hollow drill bit
- Correct setting (See setting instructions)
- No edge distance and spacing influence
- *Steel* failure
- Minimum base material thickness
- Concrete C20/25, $f_{ck,cube}$ = 25 N/mm²
- $α_{gap}$ = 0,5 if no clearance hole was filled
- Temperature range I: -40 °C to +40 °C
  (max. long term temperature +24 °C and max. short term temperature +40 °C)
- All data given in this section according ETA-16/0515, issue 2019-11-13

Embedment depth and base material thickness

Anchor size			M8	M10	M12	M16	M20	M24	M27	M30
HAS										
Eff. 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

Characteristic resistance

Anchor size			M8	M10	M12	M16	M20	M24	M27	M30
Seismic performance C1										
Tension $N_{Rk,seis}$	HAS 5.8	[kN]	-	24,0	33,8	40,9	64,9	89,1	-	-
	HAS 8.8		-	24,0	33,8	40,9	64,9	89,1	109	130
	HAS A4		-	24,0	33,8	40,9	64,9	89,1	109	130
	HAS HCR		-	24,0	33,8	40,9	64,9	89,1	-	-
Shear $V_{Rk,seis}$	HAS 5.8	[kN]	-	*11,0*	*15,0*	*27,0*	*43,0*	*62,0*	-	-
	HAS 8.8		-	*16,0*	*24,0*	*44,0*	*69,0*	*99,0*	*129*	*157*
	HAS A4		-	*14,0*	*21,0*	*39,0*	*60,0*	*87,0*	*81,0*	*98,0*
	HAS HCR		-	*16,0*	*24,0*	*44,0*	*69,0*	*87,0*	-	-
Seismic performance C2										
Tension $N_{Rd,seis}$	HAS 8.8		-	-	-	18,2	27,8	-	-	-
Shear $V_{Rd,seis}$	HAS 8.8		-	-	-	*40,0*	*71,0*	-	-	-

Design resistance

Anchor size			M8	M10	M12	M16	M20	M24	M27	M30
Seismic performance C1										
Tension $N_{Rd,seis}$	HAS 5.8	[kN]	-	16,0	22,5	27,3	43,3	59,4	-	-
	HAS 8.8		-	16,0	22,5	27,3	43,3	59,4	72,6	86,6
	HAS A4		-	16,0	22,5	27,3	43,3	59,4	72,6	86,6
	HAS HCR		-	16,0	22,5	27,3	43,3	59,4	-	-
Shear $V_{Rd,seis}$	HAS 5.8	[kN]	-	8,8	12,0	21,6	34,4	49,6	-	-
	HAS 8.8		-	12,8	19,2	35,2	55,2	79,2	103	126
	HAS A4		-	10,0	15,0	27,9	38,5	55,8	34,0	41,2
	HAS HCR		-	12,8	19,2	35,2	55,2	49,7	-	-
Seismic performance C2										
Tension $N_{Rd,seis}$	HAS 8.8		-	-	-	12,1	18,5	-	-	-
Shear $V_{Rd,seis}$	HAS 8.8		-	-	-	32,0	56,8	-	-	-

Fire resistance

All data in this section applies to:
- Correct setting (See setting instruction)
- No edge distance and spacing influence
- *Steel* failure
- Minimum base material thickness
- Concrete C20/25, $f_{ck,cube}$ = 25 N/mm²
- All data given in this section according to Fire test assessment from Ing. Thiele, Pirmasens 21735 / 2017-08-01

Embedment depth and base material thickness

Anchor size			M8	M10	M12	M16	M20	M24	M27	M30
HAS										
Eff. 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
HIS-N										
Eff. Anchorage depth	h_{ef}	[mm]	90	110	125	170	205	-	-	-
Base material thickness	h_{min}	[mm]	120	150	170	230	270	-	-	-

Characteristic/design[1] resistance in uncracked concrete

Anchor size			M8	M10	M12	M16	M20	M24	M27	M30
Fire Exposure R30										
Tension $N_{Rk,fi}$	HAS 8.8	[kN]	*1,83*	*2,90*	*4,22*	*7,85*	12,2	*17,6*	23,0	28,0
	HAS A4		*4,19*	*6,64*	*9,65*	*17,1*	*28,0*	*40,4*	*52,5*	*64,2*
	HIS-N 8.8		*1,83*	*2,90*	*4,22*	*7,85*	*12,2*	-	-	-
	HIS-RN 70		*4,19*	*6,64*	*9,65*	*18,0*	*28,0*	-	-	-
Shear $V_{Rk,fi}$	HAS 8.8	[kN]	*1,83*	*2,90*	*4,22*	*7,85*	12,2	*17,6*	23,0	28,0
	HAS A4		*4,19*	*6,64*	*9,65*	*17,1*	*28,0*	*40,4*	*52,5*	*64,2*
	HIS-N 8.8		*1,83*	*2,90*	*4,22*	*7,85*	*12,2*	-	-	-
	HIS-RN 70		*4,19*	*6,64*	*9,65*	*18,0*	*28,0*	-	-	-
Fire Exposure R120										
Tension $N_{Rk,fi}$	HAS 8.8	[kN]	0,28	0,47	1,31	2,22	*4,41*	*6,35*	*8,26*	*10,1*
	HAS A4		0,28	0,47	1,31	2,22	*7,11*	*10,2*	*13,3*	*16,3*
	HIS-N 8.8		0,43	1,02	1,52	2,83	*4,41*	-	-	-
	HIS-RN 70		0,43	1,02	1,75	*4,55*	*7,11*	-	-	-
Shear $V_{Rk,fi}$	HAS 8.8	[kN]	0,28	0,47	1,31	2,22	*4,41*	*6,35*	*8,26*	*10,1*
	HAS A4		0,28	0,47	1,31	2,22	*7,11*	*10,2*	*13,3*	*16,3*
	HIS-N 8.8		0,43	1,02	1,52	2,83	*4,41*	-	-	-
	HIS-RN 70		0,43	1,02	1,75	*4,55*	*7,11*	-	-	-

1) The safety factor is γ=1.0 for all load cases

Characteristic/design[1] resistance in cracked concrete

Anchor size			M8	M10	M12	M16	M20	M24	M27	M30
Fire Exposure R30										
Tension $N_{Rk,fi}$	HAS 8.8	[kN]	-	*2,90*	*4,22*	*7,85*	12,2	*16,6*	23,0	*28,0*
	HAS A4		-	*5,00*	*9,00*	*12,8*	*28,0*	*40,4*	*52,5*	*64,2*
	HIS-N 8.8		*1,83*	*2,90*	*4,22*	*7,85*	*12,2*	-	-	-
	HIS-RN 70		*4,19*	*6,64*	*9,65*	*18,00*	*28,0*	-	-	-
Shear $V_{Rk,fi}$	HAS 8.8	[kN]	-	*2,90*	*4,22*	*7,85*	12,2	*16,6*	23,0	*28,0*
	HAS A4		-	*5,00*	*9,00*	*12,8*	*28,0*	*40,4*	*52,5*	*64,2*
	HIS-N 8.8		*1,83*	*2,90*	*4,22*	*7,85*	*12,2*	-	-	-
	HIS-RN 70		*4,19*	*6,64*	*9,65*	*18,00*	*28,0*	-	-	-
Fire Exposure R120										
Tension $N_{Rk,fi}$	HAS 8.8	[kN]	-	0,35	0,99	1,66	*4,40*	*6,35*	*8,26*	*10,1*
	HAS A4		-	0,35	1,00	*1,66*	6,90	*10,2*	*13,3*	*16,3*
	HIS-N 8.8		0,33	0,76	1,30	2,80	*4,40*	-	-	-
	HIS-RN 70		0,33	0,76	1,31	*4,55*	*7,11*	-	-	-
Shear $V_{Rk,fi}$	HAS 8.8	[kN]	-	0,35	0,99	1,66	*4,40*	*6,35*	*8,26*	*10,1*
	HAS A4		-	0,35	1,00	*1,66*	6,90	*10,2*	*13,3*	*16,3*
	HIS-N 8.8		0,33	0,76	1,30	2,80	*4,40*	-	-	-
	HIS-RN 70		0,33	0,76	1,31	*4,55*	*7,11*	-	-	-

1) The safety factor is γ=1.0 for all load cases

Materials

Mechanical properties for HAS

Anchor size			M8	M10	M12	M16	M20	M24	M27	M30
Nominal tensile strength f_{uk}	HAS 5.8	[N/mm²]	500	500	500	500	500	500	-	-
	HAS 8.8		800	800	800	800	800	800	800	800
	HAS A4		700	700	700	700	700	700	500	500
	HAS HCR		800	800	800	800	800	700	-	-
Yield strength f_{yk}	HAS 5.8	[N/mm²]	440	440	440	440	400	400	-	-
	HAS 8.8		640	640	640	640	640	640	640	640
	HAS A4		450	450	450	450	450	450	210	210
	HAS HCR		640	640	640	640	640	400	-	-
Stressed cross-section A_s	HAS	[mm²]	36,6	58,0	84,3	157	245	353	459	561
Moment of resistance W	HAS	[mm³]	31,2	62,3	109	277	541	935	1387	1874

Mechanical properties for HIS-N

Anchor size			M8	M10	M12	M16	M20
Nominal tensile strength f_{uk}	HIS-N	[N/mm²]	490	490	490	490	490
	Screw 8.8		800	800	800	800	800
	HIS-RN		700	700	700	700	700
	Screw 70		700	700	700	700	700
Yield strength f_{yk}	HIS-N	[N/mm²]	390	390	390	390	390
	Screw 8.8		640	640	640	640	640
	HIS-RN		350	350	350	350	350
	Screw 70		450	450	450	450	450
Stressed cross-section A_s	HIS-(R)N	[mm²]	51,5	108	169	256	238
	Screw		36,6	58,0	84,3	157	245
Moment of resistance W	HIS-(R)N	[mm³]	145	430	840	1595	1543
	Screw		31,2	62,3	109	277	541

Material quality for HAS

Part	Material
Metal parts made of zinc coated steel	
HAS	M8 to M24 Strength class 5.8: - Rupture elongation (l_0 = 5d) > 8% ductile M8 to M30: Strength class 8.8: - Rupture elongation (l_0 = 5d) > 12% ductile Electroplated zinc coated ≥5 µm; (F) hot dip galvanized ≥45 µm
Washer	Electroplated zinc coated ≥5 µm; hot dip galvanized ≥45 µm
Nut	Strength class adapted to strength class of threaded rod. Electroplated zinc coated ≥5 µm; hot dip galvanized ≥45 µm
Metal parts made of stainless steel	
HAS A4	M8 to M24 Strength class 70: M27 to M30 Strength class 50: - Rupture elongation (l_0=5d) > 8% ductile - Stainless steel A4 according to EN 10088-1:2014
Washer	Stainless steel A4 according to EN 10088-1:2014
Nut	Strength class adapted to strength class of threaded rod. Stainless steel A4 according to EN 10088-1:2014
Metal parts made of high corrosion resistant steel	
HAS HCR	M8 to M20 Strength class 70: M24 Strength class 80: Rupture elongation (l_0 = 5d) > 8% ductile High corrosion resistant steel according to EN 10088-1:2014
Washer	High corrosion resistant steel according to EN 10088-1:2014
Nut	Strength class adapted to strength class of threaded rod High corrosion resistant steel according to EN 10088-1:2014

Material quality for HIS-N

Part		Material
Metal parts made of zinc coated steel		
HIS-N	Internal threaded sleeve	Electroplated zinc coated ≥5 µm
	Screw 8.8	Strength class 8.8, A5 > 8 % Ductile Steel galvanized ≥ 5 µm
Metal parts made of stainless steel		
HIS-RN	Internal threaded sleeve	Stainless steel A4 according to EN 10088-1:2014
	Screw 70	Strength class 70, A5 > 8 % Ductile Stainless steel 1.4401; 1.4404, 1.4578; 1.4571; 1.4439; 1.4362

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

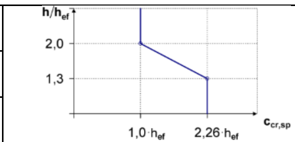
Temperature range	Base material temperature	Maximum long term base material temperature	Maximum short term base material temperature
Temperature range I	-40 °C to +40 °C	+24 °C	+40 °C
Temperature range II	-40 °C to +80 °C	+50 °C	+80 °C
Temperature range III	-40 °C to +120 °C	+72 °C	+120 °C

Max 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.
Max 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_{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

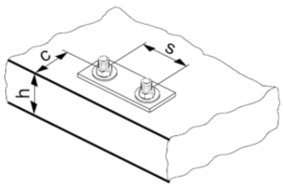
Anchor size			M8	M10	M12	M16	M20	M24	M27	M30
Foil capsule HVU2			**8x80**	**10x90**	**12x110**	**16x125**	**20x170**	**24x210**	**27x240**	**30x270**
Diameter of element	$d_1=d_{nom}$	[mm]	8	10	12	16	20	24	27	30
Nom. diameter of drill	d_0	[mm]	10	12	14	18	22	28	30	35
Eff. Embedment depth and drill hole in the fixture	$h_{ef}=h_0$	[mm]	80	90	110	125	170	210	240	270
Max. diameter of clearance hole in the fixture	d_f	[mm]	9	12	14	18	22	26	30	33
Min. thickness of concrete member	h_{min}	[mm]	110	120	140	160	220	270	300	340
Max. torque moment a)	T_{max}	[Nm]	10	20	40	80	150	200	270	300
Min. spacing	s_{min}	[mm]	40	50	60	75	90	115	120	140
Min. edge distance	c_{min}	[mm]	40	45	45	50	55	60	75	80
Critical spacing for splitting failure	$s_{cr,sp}$		$2\ c_{cr,sp}$							
Critical edge distance for splitting failure b)	$c_{cr,sp}$	[mm]	**$1{,}0 \cdot h_{ef}$**		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 $h / h_{ef} \leq 1{,}3$					
Critical spacing for concrete cone failure	$s_{cr,N}$	[mm]	$2\ c_{cr,N}$					$3\ h_{ef}$		
Critical edge distance for concrete cone	$c_{cr,N}$	[mm]	$1{,}5\ h_{ef}$							

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

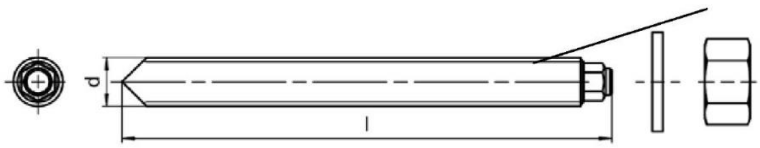
a) Max. recommended torque moment to avoid splitting failure during installation with min. spacing and/or edge distance

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

c) The critical 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 save side.



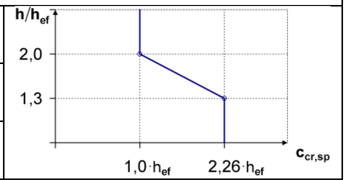
HAS-U-…



Marking:

Steel grade number and length identification letter: e.g. 8L

Setting details for HIS-N

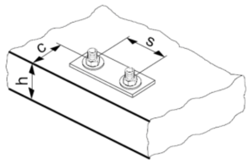
Anchor size			**M8**	**M10**	**M12**	**M16**	**M20**
Foil capsule HVU2			**10x90**	**12x110**	**16x125**	**20x170**	**24x210**
Diameter of element	$d_1=d_{nom}$	[mm]	12,5	16,5	20,5	25,4	27,8
Nominal diameter of drill bit	d_0	[mm]	14	18	22	28	32
Eff. Embedment depth and drill hole in fixture	$h_{ef}=h_0$	[mm]	90	110	125	170	205
Max. diameter of clearance hole in the	d_f	[mm]	9	12	14	18	22
Min. thickness of concrete member	h_{min}	[mm]	120	150	170	230	270
Max. torque moment[a)]	T_{max}	[Nm]	10	20	40	80	150
Thread engagement	h_s	[mm]	8-20	10-25	12-30	16-40	20-50
Min. spacing	s_{min}	[mm]	60	75	90	115	130
Min. edge distance	c_{min}	[mm]	40	45	55	65	90
Critical spacing for	$s_{cr,sp}$		$2\ c_{cr,sp}$				
Critical edge distance for splitting failure [b)]	$c_{cr,sp}$	[mm]	$\mathbf{1{,}0 \cdot h_{ef}}$		for $h / h_{ef} \geq 2{,}0$		
			$\mathbf{4{,}6\ h_{ef}-1{,}8\ h}$		for $2{,}0 > h/h_{ef} > 1{,}3$		
			$\mathbf{2{,}26\ h_{ef}}$		for $h / h_{ef} \leq 1{,}3$		
Critical spacing for concrete cone failure	$s_{cr,N}$	[mm]	$2\ c_{cr,N}$				$1{,}5\ h_{ef}$
Critical edge distance for concrete cone	$c_{cr,N}$	[mm]	$1{,}5\ h_{ef}$				

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

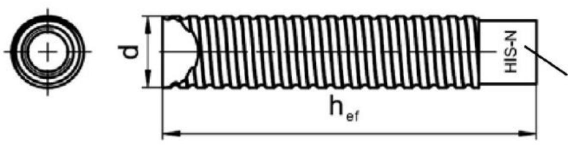
a) Max. recommended torque moment to avoid splitting failure during installation with min. spacing and/or edge distance

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

c) The critical 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.



Internally threaded sleeve HIS-(R)N...



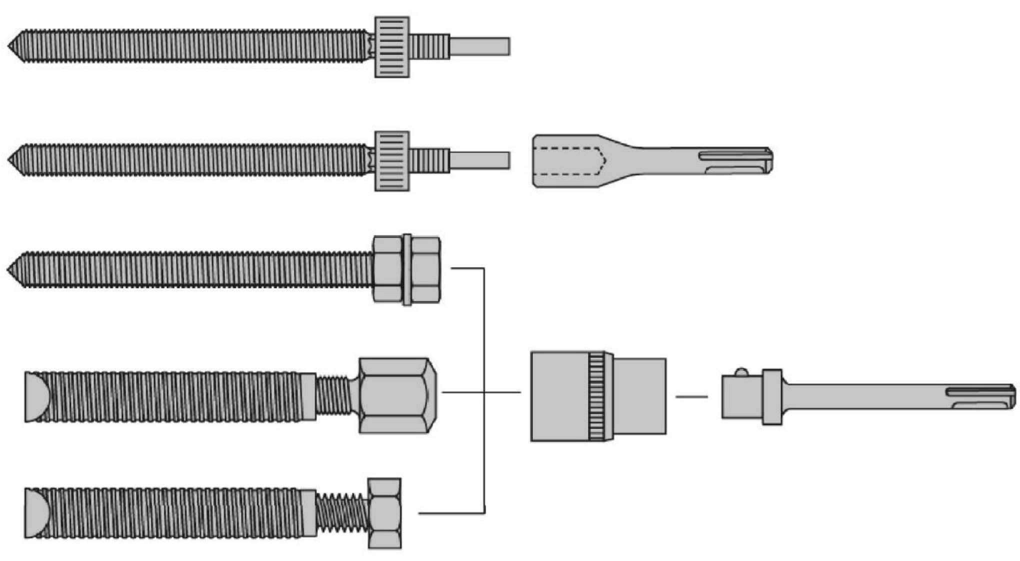
Marking:
Identifying mark - HILTI and
embossing “HIS-N” (for zinc coated steel)
embossing “HIS-RN” (for stainless steel)

Drilling and cleaning parameters

HAS	HIS-N	Hammer drilling	Hollow Drill Bit	Diamond coring	Brush HIT-RB
		d_0 [mm]			size [mm]
M8	**-**	10	-	-	-
M10	**-**	12	-	12	12
M12	**M8**	14	14	14	14
M16	**M10**	18	18	18	18
M20	**M12**	22	22	22	22
M24	**M16**	28	28	28	28
M27	**-**	30	-	30	30
-	**M20**	32	32	32	32
M30	**-**	35	35	35	35

Setting tools parameters

HAS	HIS-N	TE (A)	SID 4 A-22	SIW 22T-A	SF(H)	RPM
					or	
M8	**-**	1…7	+	+	2, 6, 8, 10, 14, 22	450…1300
M10	**M8**	1…7	+	+	6, 8, 10, 14, 22	450…1300
M12	**M10**	1…40	+	+	6, 8, 10, 14, 22	450…1300
M16	**M12**	1…40	+	-	6, 8, 10, 14, 22	450…1300
M20	**-**	50…60	-	-	-	-
-	**M16**	40…80	-	-	-	-
M24	**-**	50…80	-	-	-	-
-	**M20**	40…80	-	-	-	-
M27	**-**	60…80	-	-	-	-
M30	**-**	60…80	-	-	-	-



Setting tool		Article number	TE (A) 1…40	TE 50…80	SF (H)	SID 4-A22	HIS-S
-		-	-	-	+	-	-
TE-C HVU2		#2181356	+	-	-	-	-
TE-Y HVU2		#2230162…5	-	+	-	-	-
TE-C ½"		#32220	+	-	-	-	+
TE-Y ¾"		#32221	-	+	-	-	+
SI-SA ¼"-½"		#2077174	-	-	+	+	+
SI-SA 7/16"		#2134075	-	-	+	-	+

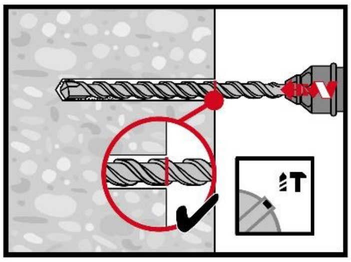
Setting instructions

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

Safety regulations.

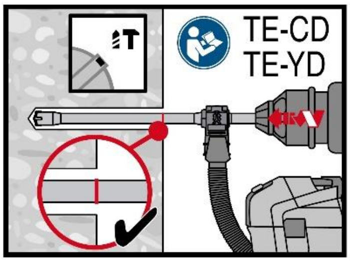
Review the Material Safety Data Sheet (MSDS) before use for proper and safe handling! Wear well-fitting protective goggles and protective gloves when working with Hilti HVU2.

Hole drilling



Hammer drilled hole

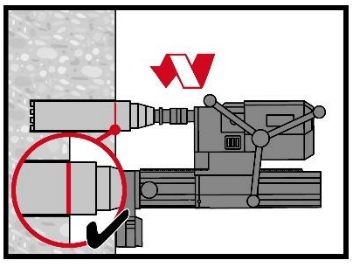
For dry or wet concrete and installation in flooded holes (no sea water).



Hammer drilled hole with Hollow drill bit

For dry and wet concrete, only.

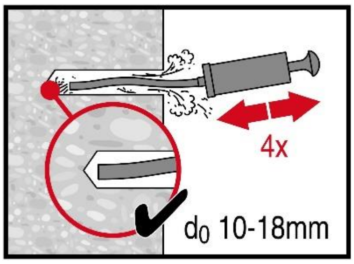
No cleaning required.



Diamond Coring

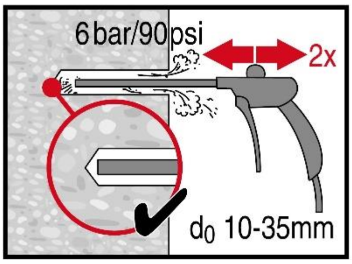
For dry or wet concrete only.

Hole cleaning



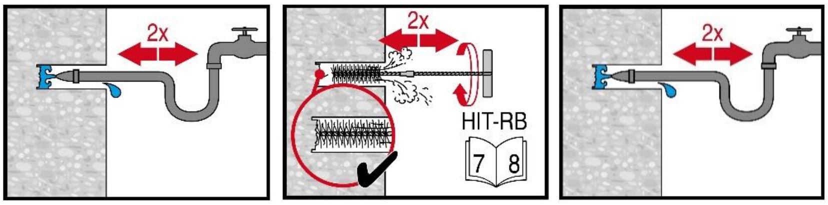
Manual cleaning for hammer drilled hole

for drill hole diameters $d_0 \leq 18$ mm and drill hole depths $h_0 \leq 10 \cdot d$.



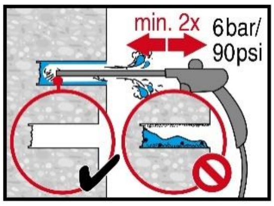
Compressed air cleaning (CAC) for hammer drilled hole

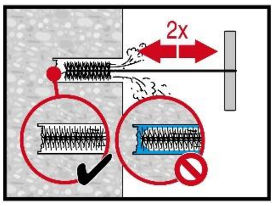
for all drill hole diameters d_0 and all drill hole depths h_0.

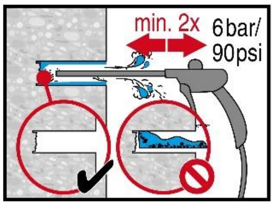


Hammer drilled flooded holes and diamond cored holes:

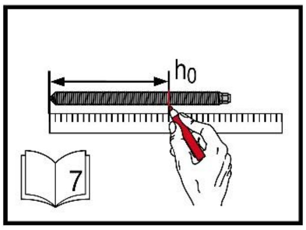
for all drill hole diameters d_0 and all drill hole depths h_0.

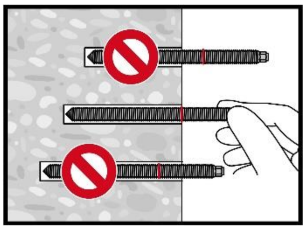




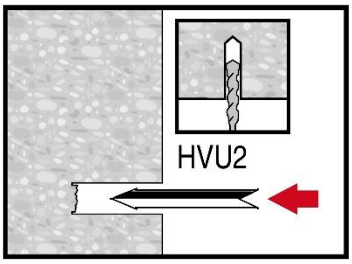


Setting the element

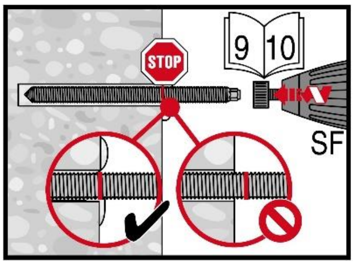


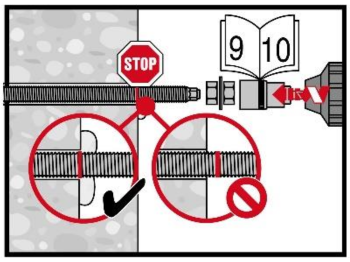


Check setting depth.

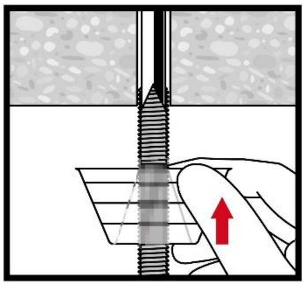


Insert the foil capsule with the peak ahead to the back of the hole.



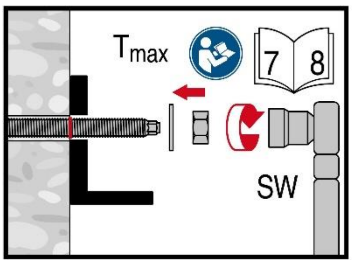


Drive the anchor rod with the plugged tool into the hole.



Overhead installation

For HVU2 M8 to M24.



Loading the anchor after required curing time $t_{cure.}$