




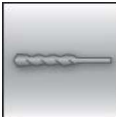


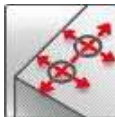
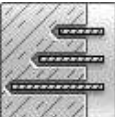
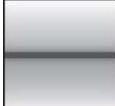











# HIT-RE 500 V4 injection mortar

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

Injection mortar system	Benefits
 <p>Foil pack: HIT-RE 500 V4 (available in 330, 500 and 1400 ml cartridges)</p>	<ul style="list-style-type: none"> <li>- <b>SafeSet</b> technology: Simplified method of borehole preparation using either Hilti hollow drill bit for hammer drilling or Roughening tool for diamond cored applications</li> <li>- Suitable for non-cracked and cracked concrete C 20/25 to C 50/60</li> <li>- High loading capacity</li> <li>- Suitable for dry and water saturated concrete</li> <li>- Hilti Technical Data for under water application</li> <li>- Hilti Technical Data for service life of 100 years</li> <li>- High corrosion resistance</li> <li>- Long working time at elevated temperatures</li> <li>- Cures down to -5 °C</li> <li>- Odourless epoxy</li> </ul>
 <p>Anchor rod: HAS-U HAS-U HDG HAS-U A4 HAS-U HCR AM 8.8 (HDG) (M8-M39)</p>	
 <p>Internally threaded sleeve: HIS-N HIS-RN (M8-M20)</p>	

Base material	Installation conditions
  <p>Concrete (non-cracked)    Concrete (cracked)</p>	     <p>Hammer drilled holes    Diamond drilled holes    Hilti <b>SafeSet</b> technology    Small edge distance and spacing    Variable embedment depth</p>
Load conditions	Other information
  <p>Static/quasi-static    Seismic, ETA-C1, C2</p>	      <p>Service life 100y, Hilti Tech. Data    European Technical Assessment    CE conformity    Corrosion resistance    High corrosion resistance <sup>1)</sup>    PROFIS design Software</p>

<sup>1)</sup> High Corrosion Resistant (HCR) rods available only for HAS-U.

### Approvals / certificates

Description	Authority / Laboratory	No. / date of issue
European Technical Assessment <sup>a)</sup>	CSTB	ETA-20/0541 / 2020-11-21

<sup>a)</sup> All data given in this section according to ETA-20/0541, issue 2020-11-21 (if not stated otherwise).

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

### All data in this section applies to:

- Correct setting (see setting instruction)
- No edge distance and spacing influence
- **Steel** failure
- HAS-U anchor rod with strength class 5.8 and 8.8, AM anchor rod with strength class 8.8, HIS-N internally threaded insert with screw 8.8
- Base material thickness and one typical embedment depth, as specified in the table
- Concrete C 20/25
- Service life: 50 years
- Temperature range I: -40 °C to +40 °C  
(min. base material temperature -40 °C, max. long/short term base material temperature: +24 °C/40 °C)
- Short term loading. For long term loading apply  $\psi_{\text{sus}}$  acc. to EN 1992-4  
Hammer drilled holes, hammer drilled holes with hollow drill bit and diamond cored holes with Hilti roughening tool:  $\psi_{\text{sus}}^0 = 0,88$ ; diamond cored holes:  $\psi_{\text{sus}}^0 = 0,89$

### Embedment depth<sup>a)</sup> and base material thickness

Anchor size	ETA-20/0541, issued 2020-11-21								Hilti tech. data			
	M8	M10	M12	M16	M20	M24	M27	M30	M33	M36	M39	
<b>HAS-U</b>												
Eff. anchorage depth [mm]	80	90	110	125	170	210	240	270	300	330	360	
Base material thickness [mm]	110	120	140	161	214	266	300	340	374	410	444	
<b>HIS-N</b>												
Eff. anchorage depth [mm]	90	110	125	170	205	-	-	-	-	-	-	
Base material thickness [mm]	120	150	170	230	270	-	-	-	-	-	-	

<sup>a)</sup> The allowed range of embedment depth is shown in the setting.

### For hammer drilled holes, hammer drilled holes with hollow drill bit<sup>1)</sup> and diamond cored with Hilti roughening tool TE-YRT<sup>2)</sup>:

#### Characteristic resistance

Anchor size	ETA-20/0541, issued 2020-11-21								Hilti tech. data			
	M8	M10	M12	M16	M20	M24	M27	M30	M33	M36	M39	
<b>Non-cracked concrete</b>												
Tension $N_{Rk}$ [kN]	HAS-U 5.8	18,0	29,0	42,0	76,9	122	167	205	244	286	330	376
	HAS-U 8.8, AM 8.8	29,0	46,0	63,5	76,9	122	167	205	244	286	330	376
	HAS-U A4	26,0	41,0	59,0	76,9	122	167	205	244	286	330	376
	HAS-U HCR	29,0	46,0	63,5	76,9	122	167	205	244	286	330	376
	HIS-N 8.8	25,0	46,0	67,0	122	116	-	-	-	-	-	-
Shear $V_{Rk}$ [kN]	HAS-U 5.8	9,0	15,0	21,0	39,0	61,0	88,0	115	140	174	204	244
	HAS-U 8.8, AM 8.8	15,0	23,0	34,0	63,0	98,0	141	184	224	278	327	390
	HAS-U A4	13,0	20,0	30,0	55,0	86,0	124	115	140	174	204	244
	HAS-U HCR	15,0	23,0	34,0	63,0	98,0	124	161	196	174	204	244
	HIS-N 8.8	13,0	23,0	34,0	63,0	58,0	-	-	-	-	-	-
<b>Cracked concrete</b>												
Tension $N_{Rk}$ [kN]	HAS-U 5.8	15,1	25,4	42,0	53,8	85,3	117	143	171	-	-	-
	HAS-U 8.8, AM 8.8	15,1	25,4	44,4	53,8	85,3	117	143	171	-	-	-
	HAS-U A4	15,1	25,4	44,4	53,8	85,3	117	143	171	-	-	-
	HAS-U HCR	15,1	25,4	44,4	53,8	85,3	117	143	171	-	-	-
	HIS-N 8.8	25,0	44,4	53,8	85,3	113	-	-	-	-	-	-
Shear $V_{Rk}$ [kN]	HAS-U 5.8	9,0	15,0	21,0	39,0	61,0	88,0	115	140	-	-	-
	HAS-U 8.8, AM 8.8	15,0	23,0	34,0	63,0	98,0	141	184	224	-	-	-
	HAS-U A4	13,0	20,0	30,0	55,0	86,0	124	115	140	-	-	-
	HAS-U HCR	15,0	23,0	34,0	63,0	98,0	124	161	196	-	-	-
	HIS-N 8.8	13,0	23,0	34,0	63,0	58,0	-	-	-	-	-	-

<sup>1)</sup> Hilti hollow drill bit available for element size M12-M30.

<sup>2)</sup> Hilti Roughening tools are available for element size M16-M30.

### Design resistance

Anchor size		ETA-20/0541, issued 2020-11-21								Hilti tech. data		
		M8	M10	M12	M16	M20	M24	M27	M30	M33	M36	M39
<b>Non-cracked concrete</b>												
Tension $N_{Rd}$	HAS-U 5.8	12,0	19,3	28,0	45,8	72,7	99,8	122	146	142	164	187
	HAS-U 8.8, AM 8.8	19,3	28,0	37,8	45,8	72,7	99,8	122	146	142	164	187
	HAS-U A4	13,9	21,9	31,6	45,8	72,7	99,8	80,4	98,3	121	143	171
	HAS-U HCR	19,3	28,0	37,8	45,8	72,7	99,8	122	146	142	164	187
	HIS-N 8.8	16,7	30,7	44,7	72,7	77,3	-	-	-	-	-	-
Shear $V_{Rd}$	HAS-U 5.8	7,2	12,0	16,8	31,2	48,8	70,4	92,0	112	139	163	195
	HAS-U 8.8, AM 8.8	12,0	18,4	27,2	50,4	78,4	113	147	179	222	262	312
	HAS-U A4	8,3	12,8	19,2	35,3	55,1	79,5	48,3	58,8	73,1	85,7	103
	HAS-U HCR	12,0	18,4	27,2	50,4	78,4	70,9	92,0	112	87,0	102	122
	HIS-N 8.8	10,4	18,4	27,2	50,4	46,4	-	-	-	-	-	-
<b>Cracked concrete</b>												
Tension $N_{Rd}$	HAS-U 5.8	10,1	17,0	26,5	32,1	50,9	69,9	85,4	102	-	-	-
	HAS-U 8.8, AM 8.8	10,1	17,0	26,5	32,1	50,9	69,9	85,4	102	-	-	-
	HAS-U A4	10,1	17,0	26,5	32,1	50,9	69,9	80,4	98,3	-	-	-
	HAS-U HCR	10,1	17,0	26,5	32,1	50,9	69,9	85,4	102	-	-	-
	HIS-N 8.8	16,7	26,5	32,1	50,9	67,4	-	-	-	-	-	-
Shear $V_{Rd}$	HAS-U 5.8	7,2	12,0	16,8	31,2	48,8	70,4	92,0	112	-	-	-
	HAS-U 8.8, AM 8.8	12,0	18,4	27,2	50,4	78,4	113	147	179	-	-	-
	HAS-U A4	8,3	12,8	19,2	35,3	55,1	79,5	48,3	58,8	-	-	-
	HAS-U HCR	12,0	18,4	27,2	50,4	78,4	70,9	92,0	112	-	-	-
	HIS-N 8.8	10,4	18,4	27,2	50,4	46,4	-	-	-	-	-	-

### Recommended loads<sup>a)</sup>

Anchor size		ETA-20/0541, issued 2020-11-21								Hilti tech. data		
		M8	M10	M12	M16	M20	M24	M27	M30	M33	M36	M39
<b>Non-cracked concrete</b>												
Tension $N_{Rec}$	HAS-U 5.8	8,6	13,8	20,0	32,7	51,9	71,3	87,1	104	101	117	133
	HAS-U 8.8, AM 8.8	13,8	20,0	27,0	32,7	51,9	71,3	87,1	104	101	117	133
	HAS-U A4	9,9	15,7	22,5	32,7	51,9	71,3	57,4	70,2	86,7	102	122
	HAS-U HCR	13,8	20,0	27,0	32,7	51,9	71,3	87,1	104	101	117	133
	HIS-N 8.8	11,9	21,9	31,9	51,9	55,2	-	-	-	-	-	-
Shear $V_{Rec}$	HAS-U 5.8	5,1	8,6	12,0	22,3	34,9	50,3	65,7	80,0	99,4	117	139
	HAS-U 8.8, AM 8.8	8,6	13,1	19,4	36,0	56,0	80,6	105	128	159	187	223
	HAS-U A4	6,0	9,2	13,7	25,2	39,4	56,8	34,5	42,0	52,2	61,2	73,2
	HAS-U HCR	8,6	13,1	19,4	36,0	56,0	50,6	65,7	80,0	62,1	72,9	87,1
	HIS-N 8.8	7,4	13,1	19,4	36,0	33,1	-	-	-	-	-	-
<b>Cracked concrete</b>												
Tension $N_{Rec}$	HAS-U 5.8	7,2	12,1	18,9	22,9	36,3	49,9	61,0	72,7	-	-	-
	HAS-U 8.8, AM 8.8	7,2	12,1	18,9	22,9	36,3	49,9	61,0	72,7	-	-	-
	HAS-U A4	7,2	12,1	18,9	22,9	36,3	49,9	57,4	70,2	-	-	-
	HAS-U HCR	7,2	12,1	18,9	22,9	36,3	49,9	61,0	72,7	-	-	-
	HIS-N 8.8	11,9	18,9	22,9	36,3	48,1	-	-	-	-	-	-
Shear $V_{Rec}$	HAS-U 5.8	5,1	8,6	12,0	22,3	34,9	50,3	65,7	80,0	-	-	-
	HAS-U 8.8, AM 8.8	8,6	13,1	19,4	36,0	56,0	80,6	105	128	-	-	-
	HAS-U A4	6,0	9,2	13,7	25,2	39,4	56,8	34,5	42,0	-	-	-
	HAS-U HCR	8,6	13,1	19,4	36,0	56,0	50,6	65,7	80,0	-	-	-
	HIS-N 8.8	7,4	13,1	19,4	36,0	33,1	-	-	-	-	-	-

<sup>a)</sup> With overall partial safety factor for action  $\gamma=1,4$ . The partial safety factors for action depend on the type of loading and shall be taken from national regulations.

**For diamond drilling:  
Characteristic resistance**

Anchor size		ETA-20/0541, issued 2020-11-21							
		M8	M10	M12	M16	M20	M24	M27	M30
<b>Non-cracked concrete</b>									
Tension $N_{Rk}$	HAS-U 5.8	18,0	29,0	42,0	76,9	122	167	205	244
	HAS-U 8.8, AM 8.8	26,1	36,8	53,9	76,9	122	167	205	244
	HAS-U A4	26,0	36,8	53,9	76,9	122	167	205	244
	HAS-U HCR	26,1	36,8	53,9	76,9	122	167	205	244
	HIS-N 8.8	25,0	46,0	67,0	122	116	-	-	-
Shear $V_{Rk}$	HAS-U 5.8	9,0	15,0	21,0	39,0	61,0	88,0	115	140
	HAS-U 8.8, AM 8.8	15,0	23,0	34,0	63,0	98,0	141	184	224
	HAS-U A4	13,0	20,0	30,0	55,0	86,0	124	115	140
	HAS-U HCR	15,0	23,0	34,0	63,0	98,0	124	161	196
	HIS-N 8.8	13,0	23,0	34,0	63,0	58,0	-	-	-

**Design resistance**

Anchor size		ETA-20/0541, issued 2020-11-21							
		M8	M10	M12	M16	M20	M24	M27	M30
<b>Non-cracked concrete</b>									
Tension $N_{Rd}$	HAS-U 5.8	12,0	19,3	28,0	32,7	51,9	71,3	87,1	104
	HAS-U 8.8, AM 8.8	14,5	20,4	29,9	32,7	51,9	71,3	87,1	104
	HAS-U A4	13,9	20,4	29,9	32,7	51,9	71,3	80,4	98,3
	HAS-U HCR	14,5	20,4	29,9	32,7	51,9	71,3	87,1	104
	HIS-N 8.8	16,7	24,4	32,7	51,9	68,8	-	-	-
Shear $V_{Rd}$	HAS-U 5.8	7,2	12,0	16,8	31,2	48,8	70,4	92,0	112
	HAS-U 8.8, AM 8.8	12,0	18,4	27,2	50,4	78,4	113	147	179
	HAS-U A4	8,3	12,8	19,2	35,3	55,1	79,5	48,3	58,8
	HAS-U HCR	12,0	18,4	27,2	50,4	78,4	70,9	92,0	112
	HIS-N 8.8	10,4	18,4	27,2	50,4	46,4	-	-	-

**Recommended loads<sup>a)</sup>**

Anchor size		ETA-20/0541, issued 2020-11-21							
		M8	M10	M12	M16	M20	M24	M27	M30
<b>Non-cracked concrete</b>									
Tension $N_{Rec}$	HAS-U 5.8	8,6	13,8	20,0	23,4	37,1	50,9	62,2	74,2
	HAS-U 8.8, AM 8.8	10,4	14,6	21,4	23,4	37,1	50,9	62,2	74,2
	HAS-U A4	9,9	14,6	21,4	23,4	37,1	50,9	57,4	70,2
	HAS-U HCR	10,4	14,6	21,4	23,4	37,1	50,9	62,2	74,2
	HIS-N 8.8	11,9	17,5	23,4	37,1	49,1	-	-	-
Shear $V_{Rec}$	HAS-U 5.8	5,1	8,6	12,0	22,3	34,9	50,3	65,7	80,0
	HAS-U 8.8, AM 8.8	8,6	13,1	19,4	36,0	56,0	80,6	105	128
	HAS-U A4	6,0	9,2	13,7	25,2	39,4	56,8	34,5	42,0
	HAS-U HCR	8,6	13,1	19,4	36,0	56,0	50,6	65,7	80,0
	HIS-N 8.8	7,4	13,1	19,4	36,0	33,1	-	-	-

<sup>a)</sup> With overall partial safety factor for action  $\gamma=1,4$ . The partial safety factors for action depend on the type of loading and shall be taken from national regulations.

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

### All data in this section applies to:

- Correct setting (see setting instruction)
- No edge distance and spacing influence
- *Steel* failure
- HAS-U anchor rod with strength class 5.8 and 8.8, AM anchor rod with strength class 8.8, HIS-N internally threaded insert with screw 8.8
- Base material thickness and one typical embedment depth, as specified in the table
- Concrete C 20/25
- Service life: 100 years
- Temperature range I: -40 °C to +40 °C  
(min. base material temperature -40 °C, max. long/short term base material temperature: +24 °C/40 °C)
- Short term loading. For long term loading apply  $\psi_{SUS}$  acc. to EN 1992-4

### Embedment depth<sup>a)</sup> and base material thickness

Anchor size	Hilti technical data							
	M8	M10	M12	M16	M20	M24	M27	M30
<b>HAS-U</b>								
Eff. anchorage depth [mm]	80	90	110	125	170	210	240	270
Base material thickness [mm]	110	120	140	161	214	266	300	340
<b>HIS-N</b>								
Eff. anchorage depth [mm]	90	110	125	170	205	-	-	-
Base material thickness [mm]	120	150	170	230	270	-	-	-

<sup>a)</sup> The allowed range of embedment depth is shown in the setting.

### For hammer drilled holes, hammer drilled holes with hollow drill bit<sup>1)</sup> and diamond cored with Hilti roughening tool<sup>2)</sup>:

#### Characteristic resistance

Anchor size	Hilti technical data								
	M8	M10	M12	M16	M20	M24	M27	M30	
<b>Non-cracked concrete</b>									
Tension $N_{Rk}$ [kN]	HAS-U 5.8	18,0	29,0	42,0	76,9	122	167	205	244
	HAS-U 8.8, AM 8.8	29,0	46,0	63,5	76,9	122	167	205	244
	HAS-U A4	26,0	41,0	59,0	76,9	122	167	205	244
	HAS-U HCR	29,0	46,0	63,5	76,9	122	167	205	244
	HIS-N 8.8	25,0	46,0	67,0	122	116	-	-	-
Shear $V_{Rk}$ [kN]	HAS-U 5.8	9,0	15,0	21,0	39,0	61,0	88,0	115	140
	HAS-U 8.8, AM 8.8	15,0	23,0	34,0	63,0	98,0	141	184	224
	HAS-U A4	13,0	20,0	30,0	55,0	86,0	124	115	140
	HAS-U HCR	15,0	23,0	34,0	63,0	98,0	124	161	196
	HIS-N 8.8	13,0	23,0	34,0	63,0	58,0	-	-	-
<b>Cracked concrete</b>									
Tension $N_{Rk}$ [kN]	HAS-U 5.8	11,1	18,4	29,0	40,8	69,4	95,0	112	140
	HAS-U 8.8, AM 8.8	11,1	18,4	29,0	40,8	69,4	95,0	112	140
	HAS-U A4	11,1	18,4	29,0	40,8	69,4	95,0	112	140
	HAS-U HCR	11,1	18,4	29,0	40,8	69,4	95,0	112	140
	HIS-N 8.8	19,4	31,4	44,3	81,4	107	-	-	-
Shear $V_{Rk}$ [kN]	HAS-U 5.8	9,0	15,0	21,0	39,0	61,0	88,0	115	140
	HAS-U 8.8, AM 8.8	15,0	23,0	34,0	63,0	98,0	141	184	224
	HAS-U A4	13,0	20,0	30,0	55,0	86,0	124	115	140
	HAS-U HCR	15,0	23,0	34,0	63,0	98,0	124	161	196
	HIS-N 8.8	13,0	23,0	34,0	63,0	58,0	-	-	-

<sup>1)</sup> Hilti hollow drill bit available for element size M12-M30.

<sup>2)</sup> Hilti Roughening tools are available for element size M16-M30.

### Design resistance

Anchor size		Hilti technical data							
		M8	M10	M12	M16	M20	M24	M27	M30
<b>Non-cracked concrete</b>									
Tension $N_{Rd}$	HAS-U 5.8	12,0	19,3	28,0	45,8	72,7	99,8	122	146
	HAS-U 8.8, AM 8.8	19,3	28,0	37,8	45,8	72,7	99,8	122	146
	HAS-U A4	13,9	21,9	31,6	45,8	72,7	99,8	80,4	98,3
	HAS-U HCR	19,3	28,0	37,8	45,8	72,7	99,8	122	146
	HIS-N 8.8	16,7	30,7	44,7	72,7	77,3	-	-	-
Shear $V_{Rd}$	HAS-U 5.8	7,2	12,0	16,8	31,2	48,8	70,4	92,0	112
	HAS-U 8.8, AM 8.8	12,0	18,4	27,2	50,4	78,4	113	147	179
	HAS-U A4	8,3	12,8	19,2	35,3	55,1	79,5	48,3	58,8
	HAS-U HCR	12,0	18,4	27,2	50,4	78,4	70,9	92,0	112
	HIS-N 8.8	10,4	18,4	27,2	50,4	46,4	-	-	-
<b>Cracked concrete</b>									
Tension $N_{Rd}$	HAS-U 5.8	7,4	12,3	19,4	27,2	46,3	63,3	74,6	93,3
	HAS-U 8.8, AM 8.8	7,4	12,3	19,4	27,2	46,3	63,3	74,6	93,3
	HAS-U A4	7,4	12,3	19,4	27,2	46,3	63,3	74,6	93,3
	HAS-U HCR	7,4	12,3	19,4	27,2	46,3	63,3	74,6	93,3
	HIS-N 8.8	13,0	20,9	29,5	50,9	67,4	-	-	-
Shear $V_{Rd}$	HAS-U 5.8	7,2	12,0	16,8	31,2	48,8	70,4	92,0	112
	HAS-U 8.8, AM 8.8	12,0	18,4	27,2	50,4	78,4	113	147	179
	HAS-U A4	8,3	12,8	19,2	35,3	55,1	79,5	48,3	58,8
	HAS-U HCR	12,0	18,4	27,2	50,4	78,4	70,9	92,0	112
	HIS-N 8.8	10,4	18,4	27,2	50,4	46,4	-	-	-

### Recommended loads<sup>a)</sup>

Anchor size		Hilti technical data							
		M8	M10	M12	M16	M20	M24	M27	M30
<b>Non-cracked concrete</b>									
Tension $N_{Rec}$	HAS-U 5.8	8,6	13,8	20,0	32,7	51,9	71,3	87,1	104
	HAS-U 8.8, AM 8.8	13,8	20,0	27,0	32,7	51,9	71,3	87,1	104
	HAS-U A4	9,9	15,7	22,5	32,7	51,9	71,3	57,4	70,2
	HAS-U HCR	13,8	20,0	27,0	32,7	51,9	71,3	87,1	104
	HIS-N 8.8	11,9	21,9	31,9	51,9	55,2	-	-	-
Shear $V_{Rec}$	HAS-U 5.8	5,1	8,6	12,0	22,3	34,9	50,3	65,7	80,0
	HAS-U 8.8, AM 8.8	8,6	13,1	19,4	36,0	56,0	80,6	105	128
	HAS-U A4	6,0	9,2	13,7	25,2	39,4	56,8	34,5	42,0
	HAS-U HCR	8,6	13,1	19,4	36,0	56,0	50,6	65,7	80,0
	HIS-N 8.8	7,4	13,1	19,4	36,0	33,1	-	-	-
<b>Cracked concrete</b>									
Tension $N_{Rec}$	HAS-U 5.8	5,3	8,8	13,8	19,4	33,1	45,2	53,3	66,6
	HAS-U 8.8, AM 8.8	5,3	8,8	13,8	19,4	33,1	45,2	53,3	66,6
	HAS-U A4	5,3	8,8	13,8	19,4	33,1	45,2	53,3	66,6
	HAS-U HCR	5,3	8,8	13,8	19,4	33,1	45,2	53,3	66,6
	HIS-N 8.8	9,3	14,9	21,1	36,3	48,1	-	-	-
Shear $V_{Rec}$	HAS-U 5.8	5,1	8,6	12,0	22,3	34,9	50,3	65,7	80,0
	HAS-U 8.8, AM 8.8	8,6	13,1	19,4	36,0	56,0	80,6	105	128
	HAS-U A4	6,0	9,2	13,7	25,2	39,4	56,8	34,5	42,0
	HAS-U HCR	8,6	13,1	19,4	36,0	56,0	50,6	65,7	80,0
	HIS-N 8.8	7,4	13,1	19,4	36,0	33,1	-	-	-

<sup>a)</sup> With overall partial safety factor for action  $\gamma=1,4$ . The partial safety factors for action depend on the type of loading and shall be taken from national regulations.



**For diamond coring:**

**Characteristic resistance**

Anchor size		Hilti technical data							
		M8	M10	M12	M16	M20	M24	M27	M30
<b>Non-cracked concrete</b>									
Tension $N_{Rk}$	HAS-U 5.8	18,0	29,0	42,0	76,9	122	167	205	244
	HAS-U 8.8, AM 8.8	26,1	36,8	53,9	76,9	122	167	205	244
	HAS-U A4	26,0	36,8	53,9	76,9	122	167	205	244
	HAS-U HCR	26,1	36,8	53,9	76,9	122	167	205	244
	HIS-N 8.8	25,0	46,0	67,0	122	116	-	-	-
Shear $V_{Rk}$	HAS-U 5.8	9,0	15,0	21,0	39,0	61,0	88,0	115	140
	HAS-U 8.8, AM 8.8	15,0	23,0	34,0	63,0	98,0	141	184	224
	HAS-U A4	13,0	20,0	30,0	55,0	86,0	124	115	140
	HAS-U HCR	15,0	23,0	34,0	63,0	98,0	124	161	196
	HIS-N 8.8	13,0	23,0	34,0	63,0	58,0	-	-	-

**Design resistance**

Anchor size		Hilti technical data							
		M8	M10	M12	M16	M20	M24	M27	M30
<b>Non-cracked concrete</b>									
Tension $N_{Rd}$	HAS-U 5.8	12,0	19,3	28,0	32,7	51,9	71,3	87,1	104
	HAS-U 8.8, AM 8.8	14,5	20,4	29,9	32,7	51,9	71,3	87,1	104
	HAS-U A4	13,9	20,4	29,9	32,7	51,9	71,3	80,4	98,3
	HAS-U HCR	14,5	20,4	29,9	32,7	51,9	71,3	87,1	104
	HIS-N 8.8	16,7	24,4	32,7	51,9	68,8	-	-	-
Shear $V_{Rd}$	HAS-U 5.8	7,2	12,0	16,8	31,2	48,8	70,4	92,0	112
	HAS-U 8.8, AM 8.8	12,0	18,4	27,2	50,4	78,4	113	147	179
	HAS-U A4	8,3	12,8	19,2	35,3	55,1	79,5	48,3	58,8
	HAS-U HCR	12,0	18,4	27,2	50,4	78,4	70,9	92,0	112
	HIS-N 8.8	10,4	18,4	27,2	50,4	46,4	-	-	-

**Recommended loads<sup>a)</sup>**

Anchor size		Hilti technical data							
		M8	M10	M12	M16	M20	M24	M27	M30
<b>Non-cracked concrete</b>									
Tension $N_{Rd}$	HAS-U 5.8	8,6	13,8	20,0	23,4	37,1	50,9	62,2	74,2
	HAS-U 8.8, AM 8.8	10,4	14,6	21,4	23,4	37,1	50,9	62,2	74,2
	HAS-U A4	9,9	14,6	21,4	23,4	37,1	50,9	57,4	70,2
	HAS-U HCR	10,4	14,6	21,4	23,4	37,1	50,9	62,2	74,2
	HIS-N 8.8	11,9	17,5	23,4	37,1	49,1	-	-	-
Shear $V_{Rd}$	HAS-U 5.8	5,1	8,6	12,0	22,3	34,9	50,3	65,7	80,0
	HAS-U 8.8, AM 8.8	8,6	13,1	19,4	36,0	56,0	80,6	105	128
	HAS-U A4	6,0	9,2	13,7	25,2	39,4	56,8	34,5	42,0
	HAS-U HCR	8,6	13,1	19,4	36,0	56,0	50,6	65,7	80,0
	HIS-N 8.8	7,4	13,1	19,4	36,0	33,1	-	-	-

<sup>a)</sup> With overall partial safety factor for action  $\gamma=1,4$ . The partial safety factors for action depend on the type of loading and shall be taken from national regulations.



## Seismic resistance (for a single anchor)

### All data in this section applies to:

- Correct setting (see setting instruction)
- No edge distance and spacing influence
- **Steel** failure
- HAS-U anchor rod with strength class 8.8, AM anchor rod with strength class 8.8, HIS-N internally threaded insert with screw 8.8
- Base material thickness and one typical embedment depth, as specified in the table
- Concrete C 20/25
- Temperature range I  
(min. base material temperature -40 °C, max. long/short term base material temperature: +24 °C/40 °C)
- $\alpha_{\text{gap}}=1,0$  (using Hilti seismic filling set)

### Embedment depth and base material thickness for seismic C2<sup>a)</sup> and C1

Anchor size	ETA-20/0541, issued 2020-11-21							
	M8	M10	M12	M16	M20	M24	M27	M30
<b>HAS-U</b>								
Eff. Anchorage depth [mm]	80	90	110	125	170	210	240	270
Base material thickness [mm]	110	120	140	161	214	266	300	340
<b>HIS-N</b>								
Eff. Anchorage depth [mm]	90	110	125	170	205	-	-	-
Base material thickness [mm]	120	146	169	226	269	-	-	-

<sup>a)</sup> C2 seismic approval only available for HAS-U rods.

### For hammer drilled holes and hammer drilled holes with Hilti hollow drill bit<sup>1)</sup>:

#### Characteristic resistance in case of seismic performance category C2

Anchor size	ETA-20/0541, issued 2020-11-21							
	M8	M10	M12	M16	M20	M24	M27	M30
Tension $N_{Rk,seis}$ HAS-U 8.8, AM 8.8 [kN]	-	-	13,7	40,8	62,0	95,0	102	132
Shear $V_{Rk,seis}$ HAS-U 8.8, AM 8.8 w/ filling set [kN]	-	-	28,0	46,0	77	103	-	-
	-	-	24,0	40,0	71,0	90,0	121	135

<sup>1)</sup> Hilti hollow drill bit available for element size M12-M30.

#### Design resistance in case of seismic performance category C2

Anchor size	ETA-20/0541, issued 2020-11-21							
	M8	M10	M12	M16	M20	M24	M27	M30
Tension $N_{Rd,seis}$ HAS-U 8.8, AM 8.8 [kN]	-	-	9,1	27,2	41,3	63,3	67,9	88,2
Shear $V_{Rd,seis}$ HAS-U 8.8, AM 8.8 w/ filling set [kN]	-	-	22,4	36,8	61,6	82,4	-	-
	-	-	19,2	32,0	56,8	72,0	96,8	108





For hammer drilled holes and hammer drilled holes with Hilti hollow drill bit<sup>1)</sup>:

**Characteristic resistance in case of seismic performance category C1**

Anchor size		ETA-20/0541, issued 2020-11-21							
		M8	M10	M12	M16	M20	M24	M27	M30
Tension $N_{Rk,seis}$	HAS-U 8.8, AM 8.8	13,7	23,2	37,8	45,7	72,5	99,6	122	145
	HIS-N 8.8	25,0	37,8	45,7	72,5	96,1	-	-	-
Shear $V_{Rk,seis}$	HAS-U 8.8, AM 8.8	15,0	23,0	34,0	53,0	98,0	141	184	224
	HIS-N 8.8	9,0	16,0	24,0	44,0	41,0	-	-	-

<sup>1)</sup> Hilti hollow drill bit available for element size M12-M30.

**Design resistance in case of seismic performance category C1**

Anchor size		ETA-20/0541, issued 2020-11-21							
		M8	M10	M12	M16	M20	M24	M27	M30
Tension $N_{Rd,seis}$	HAS-U 8.8, AM 8.8	9,1	15,5	25,2	30,5	48,4	66,4	81,1	96,8
	HIS-N 8.8	16,7	25,2	30,5	48,4	64,0	-	-	-
Shear $V_{Rd,seis}$	HAS-U 8.8, AM 8.8	12,0	18,4	27,2	50,4	78,4	113	147	179
	HIS-N 8.8	7,2	12,8	19,2	35,2	32,8	-	-	-

**Materials**

**Mechanical properties for HAS-U**

Anchor size		ETA-20/0541, issued 2020-11-21								Hilti tech. data		
		M8	M10	M12	M16	M20	M24	M27	M30	M33	M36	M39
Nominal tensile strength $f_{uk}$	HAS-U 5.8(F)	500	500	500	500	500	500	500	500	500	500	500
	HAS-U 8.8(F)	800	800	800	800	800	800	800	800	800	800	800
	AM 8.8(HDG)	800	800	800	800	800	800	800	800	800	800	800
	HAS-U A4	700	700	700	700	700	700	500	500	500	500	500
	HAS-U HCR	800	800	800	800	800	700	700	700	500	500	500
Yield strength $f_{yk}$	HAS-U 5.8(F)	400	400	400	400	400	400	400	400	400	400	400
	HAS-U 8.8(F)	640	640	640	640	640	640	640	640	640	640	640
	AM 8.8(HDG)	640	640	640	640	640	640	640	640	640	640	640
	HAS-U A4	450	450	450	450	450	450	210	210	210	210	210
	HAS-U HCR	640	640	640	640	640	400	400	400	250	250	250
Stressed cross-section $A_s$	HAS-U AM 8.8	36,6	58,0	84,3	157	245	353	459	561	694	817	976
Moment of resistance $W$	HAS-U AM 8.8	31,2	62,3	109	277	541	935	1387	1874	2579	3294	4301

**Mechanical properties for HIS-N**

Anchor size		ETA-20/0541, issued 2020-11-21				
		M8	M10	M12	M16	M20
Nominal tensile strength $f_{uk}$	HIS-N	490	490	460	460	460
	Screw 8.8	800	800	800	800	800
	HIS-RN	700	700	700	700	700
	Screw A4-70	700	700	700	700	700
Yield strength $f_{yk}$	HIS-N	410	410	375	375	375
	Screw 8.8	640	640	640	640	640
	HIS-RN	350	350	350	350	350
	Screw A4-70	450	450	450	450	450
Stressed cross-section $A_s$	HIS-(R)N	51,5	108	169	256	238
	Screw	36,6	58	84,3	157	245
Moment of resistance $W$	HIS-(R)N	145	430	840	1595	1543
	Screw	31,2	62,3	109	277	541

### Material quality for HAS-U

Part	Material
<b>Zinc coated steel</b>	
Threaded rod, HAS-U 5.8 (HDG)	Strength class 5.8; Elongation at fracture A5 > 8% ductile Electroplated zinc coated $\geq 5\mu\text{m}$ ; (F) hot dip galvanized $\geq 50\mu\text{m}$
Threaded rod, HAS-U 8.8 (HDG)	Strength class 8.8; Elongation at fracture A5 > 12% ductile Electroplated zinc coated $\geq 5\mu\text{m}$ ; (F) hot dip galvanized $\geq 50\mu\text{m}$
Hilti Meter rod, AM 8.8 (HDG)	Strength class 8.8; Elongation at fracture A5 > 12% ductile Electroplated zinc coated $\geq 5\mu\text{m}$ (HDG) hot dip galvanized $\geq 50\mu\text{m}$
Washer	Electroplated zinc coated $\geq 5\mu\text{m}$ , hot dip galvanized $\geq 50\mu\text{m}$
Nut	Strength class of nut adapted to strength class of threaded rod. Electroplated zinc coated $\geq 5\mu\text{m}$ , hot dip galvanized $\geq 50\mu\text{m}$
<b>Stainless Steel</b>	
Threaded rod, HAS-U A4	Strength class 70 for $\leq \text{M}24$ and strength class 50 for $> \text{M}24$ ; Elongation at fracture A5 > 8% ductile Stainless steel 1.4401; 1.4404; 1.4578; 1.4571; 1.4439; 1.4362
Washer	Stainless steel 1.4401, 1.4404, 1.4578, 1.4571, 1.4439, 1.4362 EN 10088-1:2014
Nut	Stainless steel 1.4401, 1.4404, 1.4578, 1.4571, 1.4439, 1.4362 EN 10088-1:2014
<b>High corrosion resistant steel</b>	
Threaded rod, HAS-U HCR	Strength class 80 for $\leq \text{M}20$ and class 70 for $> \text{M}20$ , Elongation at fracture A5 > 8% ductile High corrosion resistance steel 1.4529; 1.4565;
Washer	High corrosion resistant steel 1.4529, 1.4565 EN 10088-1:2014
Nut	High corrosion resistant steel 1.4529, 1.4565 EN 10088-1:2014

### Material quality for HIS-N

Part	Material	
HIS-N	Internal threaded sleeve	C-steel 1.0718; Steel galvanized $\geq 5\mu\text{m}$
	Screw 8.8	Strength class 8.8, A5 > 8 % ductile; Steel galvanized $\geq 5\mu\text{m}$
HIS-RN	Internal threaded sleeve	Stainless steel 1.4401, 1.4571
	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

-5 °C to +40 °C

#### Service temperature range

Hilti HIT-RE 500 V4 injection mortar 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	Max. long term base material temperature	Max. short term base material temperature
Temperature range I	-40 °C to +40 °C	+24 °C	+40 °C
Temperature range II	-40 °C to +55 °C	+43 °C	+55 °C
Temperature range III	-40 °C to +75 °C	+55 °C	+75 °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.

### Working time and curing time

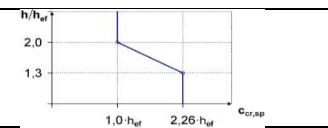
Temperature of the base material $T^2)$	Working time $t_{work}$	Minimum curing time $t_{cure}^1)$
-5 °C to -1 °C	2 h	168 h
0 °C to 4 °C	2 h	48 h
5 °C to 9 °C	2 h	24 h
10 °C to 14 °C	1,5 h	16 h
15 °C to 19 °C	1 h	12 h
20 °C to 24 °C	30 min	7 h
25 °C to 29 °C	20 min	6 h
30 °C to 34 °C	15 min	5 h
35 °C to 39 °C	12 min	4,5 h
40 °C	10 min	4 h

<sup>1)</sup> The curing time data are valid for dry base material only. In wet base material, the curing times must be doubled.

<sup>2)</sup> The minimum temperature of the foil pack is +5° C.

### Setting details for HAS-U

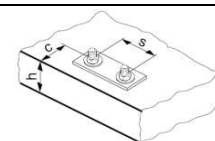
Anchor size			ETA-20/0541, issue 2020-11-21							Hilti tech. data			
			M8	M10	M12	M16	M20	M24	M27	M30	M33	M36	M39
Nominal diameter of drill bit	$d_0$	[mm]	10	12	14	18	22	28	30	35	37	40	42
Effective anchorage and drill hole depth range <sup>a)</sup>	$h_{ef,min}$	[mm]	60	60	70	80	90	96	108	120	132	144	156
	$h_{ef,max}$	[mm]	160	200	240	320	400	480	540	600	660	720	780
Minimum base material thickness	$h_{min}$	[mm]	$h_{ef} + 30 \text{ mm} \geq 100 \text{ mm}$				$h_{ef} + 2 d_0$						
Max. installation torque	max. $T_{inst}$	[Nm]	10	20	40	80	150	200	270	300	330	360	390
Min. spacing	$s_{min}$	[mm]	40	50	60	75	90	115	120	140	165	180	195
Min. edge distance	$c_{min}$	[mm]	40	45	45	50	55	60	75	80	165	180	195
Critical spacing for splitting failure	$s_{cr,sp}$	[mm]	$2 C_{cr,sp}$										
Critical edge distance for splitting failure <sup>b)</sup>	$c_{cr,sp}$	[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]	$2 C_{cr,N}$										
Critical edge distance for concrete cone failure	$c_{cr,N}$	[mm]	$1,5 h_{ef}$										



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

<sup>a)</sup>  $h_{ef,min} \leq h_{ef} \leq h_{ef,max}$  ( $h_{ef}$ : embedment depth)

<sup>b)</sup>  $h$ : base material thickness ( $h \geq h_{min}$ )



### HAS-U...



#### Marking:

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

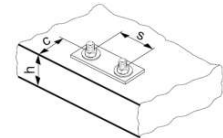
### Setting details for HIS-N

			ETA-20/0541, issue 2020-11-21				
Anchor size			M8	M10	M12	M16	M20
Nominal diameter of drill bit	$d_0$	[mm]	14	18	22	28	32
Diameter of element	$d$	[mm]	12,5	16,5	20,5	25,4	27,6
Effective anchorage and drill hole depth	$h_{ef}$	[mm]	90	110	125	170	205
Min. material thickness	$h_{min}$	[mm]	120	150	170	230	270
Diameter of clearance hole in the fixture	$d_f$	[mm]	9	12	14	18	22
Thread engagement length; min - max	$h_s$	[mm]	8-20	10-25	12-30	16-40	20-50
Min. spacing	$s_{min}$	[mm]	60	70	90	115	130
Min. edge distance	$c_{min}$	[mm]	40	45	55	65	90
Critical spacing for splitting failure	$s_{cr,sp}$	[mm]	$2 c_{cr,sp}$				
Critical edge distance for splitting failure <sup>b)</sup>	$c_{cr,sp}$	[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]	$2 c_{cr,N}$				
Critical edge distance for concrete cone failure	$c_{cr,N}$	[mm]	$1,5 h_{ef}$				
Max. installation torque	max. $T_{inst}$	[Nm]	10	20	40	80	150

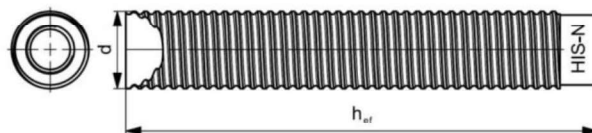
For spacing (edge distance) smaller than critical spacing (critical edge distance) the design loads have to be reduced.

<sup>a)</sup>  $h_{ef,min} \leq h_{ef} \leq h_{ef,max}$  ( $h_{ef}$ : embedment depth)

<sup>b)</sup>  $h$ : base material thickness ( $h \geq h_{min}$ )



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



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

### Installation equipment

Anchor size		M8	M10	M12	M16	M20	M24	M27	M30	M36	M39	
Rotary hammer	HAS-U	TE 2 – TE 16				TE 40 – TE 80						
	HIS-N	TE 2 – TE 16		TE 40 – TE 80			-					
Other tools	compressed air gun, set of cleaning brushes, dispenser											
	roughening tools TE-YRT										-	
Additional Hilti recommended tools		DD EC-1, DD 100 ... DD 160									-	

### Parameters of cleaning and setting tools

HAS-U	HIS-N	Drill bit diameters d <sub>0</sub> [mm]				Installation	
		Hammer drill (HD)	Hollow Drill Bit (HDB) <sup>a)</sup>	Diamond coring		Brush HIT-RB	Piston plug HIT-SZ
				Diamond coring (DD)	with roughening tool (RT)		
M8	-	10	-	10	-	10	-
M10	-	12	-	12	-	12	12
M12	M8	14	14	14	-	14	14
M16	M10	18	18	18	18	18	18
M20	M12	22	22	22	22	22	22
M24	M16	28	28	28	28	28	28
M27	-	30	-	30	30	30	30
-	M20	32	32	32	32	32	32
M30	-	35	35	35	35	35	35
M33	-	37 <sup>b)</sup>	-	-	-	37 <sup>b)</sup>	37 <sup>b)</sup>
M36	-	40 <sup>b)</sup>	-	-	-	40 <sup>b)</sup>	40 <sup>b)</sup>
M39	-	42 <sup>b)</sup>	-	-	-	42 <sup>b)</sup>	42 <sup>b)</sup>

a) No cleaning required.

b) Additional Hilti technical data

### Associated components for the use of Hilti Roughening tool TE-YRT

Diamond coring		Roughening tool TE-YRT		Wear gauge RTG...
d <sub>0</sub> [mm]		d <sub>0</sub> [mm]		size
nominal	measured			
18	17,9 to 18,2	18		18
20	19,9 to 20,2	20		20
22	21,9 to 22,2	22		22
25	24,9 to 25,2	25		25
28	27,9 to 28,2	28		28
30	29,9 to 30,2	30		30
32	31,9 to 32,2	32		32
35	34,9 to 35,2	35		35

### Minimum roughening time t<sub>roughen</sub> (t<sub>roughen</sub> [sec] = h<sub>ef</sub> [mm] / 10)

h <sub>ef</sub> [mm]	t <sub>roughen</sub> [sec]
0 to 100	10
101 to 200	20
201 to 300	30
301 to 400	40
401 to 500	50
501 to 600	60

## Setting instructions

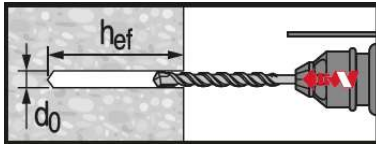
\*For detailed information on installation see instruction for use given with the package of the product.



### Safety regulations

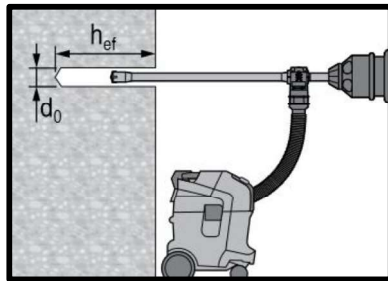
Review the Material Safety Data Sheet (MSDS) before use for proper and safe handling! Wear well-fitting protective goggles and protective gloves when working with Hilti HIT-RE 500 V4.

## Drilling



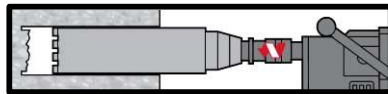
### Hammer drilled hole

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



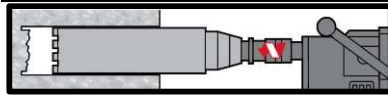
### Hammer drilled hole with Hollow Drilled Bit (HDB)

No cleaning required.  
For dry and wet concrete, only.



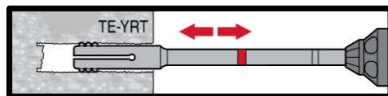
### Diamond Coring

For dry and wet concrete, only.

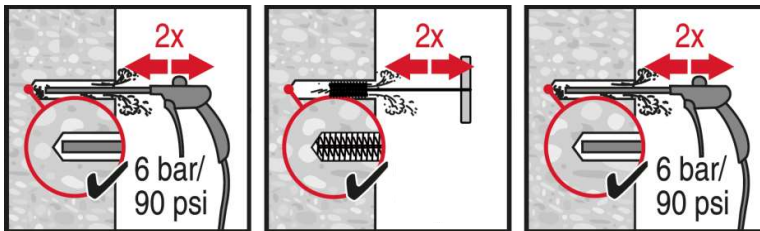


### Diamond Coring + Roughening Tool

For dry and wet concrete only.  
Before roughening, the borehole needs to be dry.



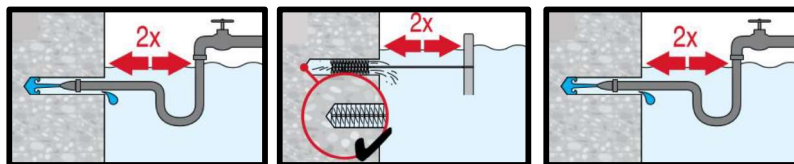
## Cleaning (Inadequate hole cleaning=poor load values.)



### Hammer Drilling:

#### Compressed air cleaning (CAC)

For all drill hole diameters  $d_0$  and all drill hole depths  $h_0$ .

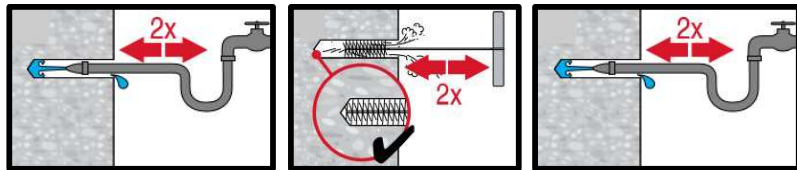


### Hammer drilling:

#### Cleaning for under water:

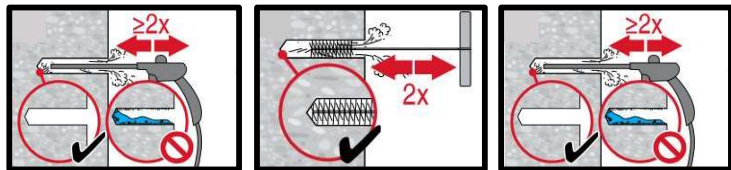
For all bore hole diameters  $d_0$  and all bore hole depth  $h_0$ .





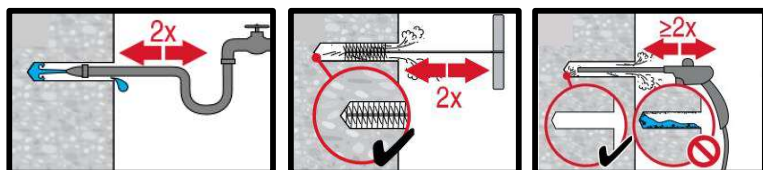
**Hammer drilled flooded holes and diamond cored holes:**

For all drill hole diameters  $d_0$  and drill hole depths  $h_0$ .

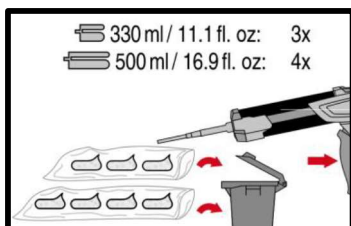
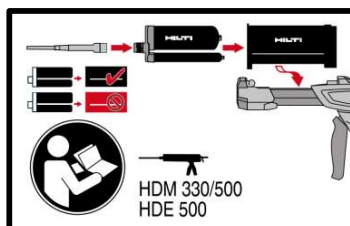


**Diamond cored holes with Hilti roughening tool:**

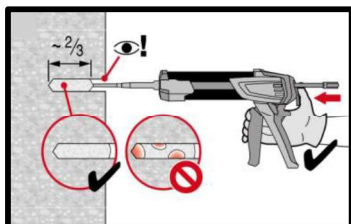
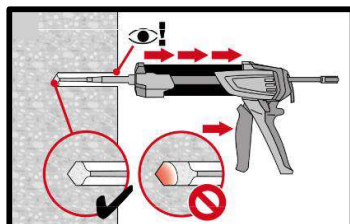
For all drill hole diameters  $d_0$  and drill hole depths  $h_0$ .



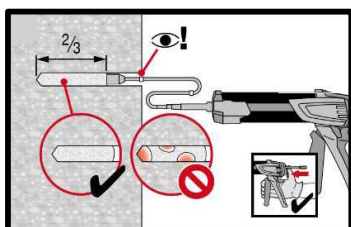
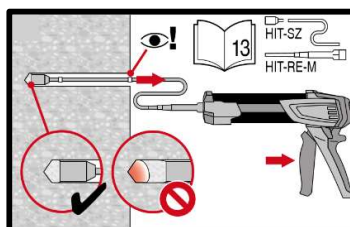
**Injection preparation**



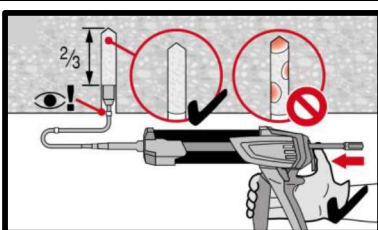
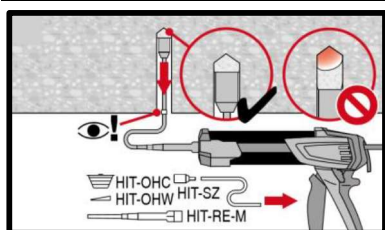
**Injection system preparation.**



**Injection method for drill hole depth  $h_{ef} \leq 250$  mm.**



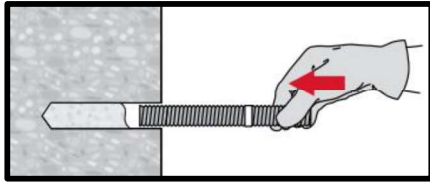
**Injection method for drill hole depth  $h_{ef} > 250$  mm.**



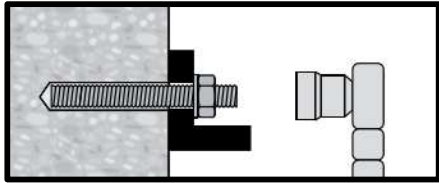
**Injection method for overhead application.**



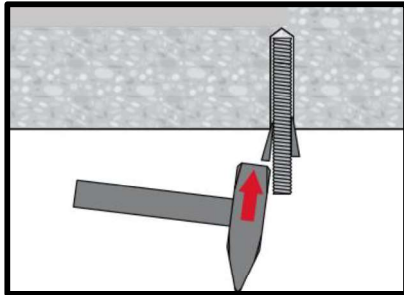
## Setting the element



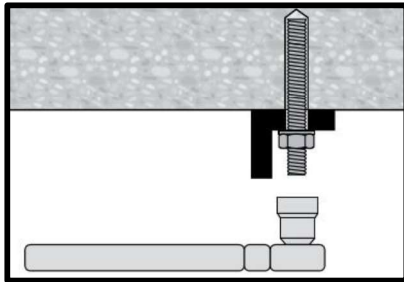
**Setting element**, observe working time " $t_{work}$ ".



**Loading the anchor** after required curing time  $t_{cure}$  the anchor can be loaded. The applied installation torque shall not exceed  $max. T_{inst}$ .



**Setting element** for overhead applications, observe working time " $t_{work}$ ".



**Loading the anchor** after required curing time  $t_{cure}$  the anchor can be loaded. The applied installation torque shall not exceed  $max. T_{inst}$ .