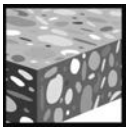
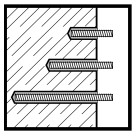
Hilti HIT-RE 500 with rebar

Injection mortar system		Benefits
	Hilti HIT-RE 500 330 ml foil pack (also available as 500 ml and 1400 ml foil pack)	- suitable for non-cracked concrete C 20/25 to C 50/60 - high loading capacity - suitable for dry and water saturated concrete - under water application - large diameter applications - high corrosion resistant - long working time at elevated temperatures - odourless epoxy - embedment depth range: from 60 … 160 mm for Ø8 to 128 … 640 mm for Ø32
	Statik mixer	
	rebar BSt 500 S	


Concrete


Small edge distance and spacing


Variable embedment depth


European Technical Approval

CE conformity

Hilti anchor design software

Approvals / certificates

Description	Authority / Laboratory	No. / date of issue
European technical approval [a)]	DIBt, Berlin	ETA-04/0027 / 2009-05-20

a) All data given in this section according ETA-04/0027, issue 2009-05-20.

Basic loading data (for a single anchor)

All data in this section applies to For details see Simplified design method

- Correct setting (See setting instruction)
- No edge distance and spacing influence
- *Steel* failure
- Base material thickness, as specified in the table
- One typical embedment depth, as specified in the table
- One anchor material, as specified in the tables
- Concrete C 20/25, $f_{ck,cube}$ = 25 N/mm²
- Temperate range I
  (min. base material temperature -40°C, max. long term/short term base material temperature: +24°C/40°C)
- Installation temperature range +5°C to +40°C

Embedment depth [a] and base material thickness for the basic loading data.

Mean ultimate resistance, characteristic resistance, design resistance, recommended loads.

	Data according ETA-04/0027, issue 2009-05-20									Additional Hilti tech. data	
Anchor size	**Ø8**	**Ø10**	**Ø12**	**Ø14**	**Ø16**	**Ø20**	**Ø25**	**Ø28**	**Ø32**	**Ø36**	**Ø40**
Typical embedment depth [mm]	80	90	110	125	125	170	210	270	300	330	360
Base material thickness [mm]	110	120	145	165	165	220	275	340	380	420	470

a) The allowed range of embedment depth is shown in the setting details. The corresponding load values can be calculated according to the simplified design method.

Mean ultimate resistance: concrete C 20/25 – $f_{ck,cube}$ = 25 N/mm², anchor rebar BSt 500S

			Data according ETA-04/0027, issue 2009-05-20									Additional Hilti tech. data	
Anchor size			**Ø8**	**Ø10**	**Ø12**	**Ø14**	**Ø16**	**Ø20**	**Ø25**	**Ø28**	**Ø32**	**Ø36**	**Ø40**
Tensile $N_{Ru,m}$	BSt 500 S	[kN]	*29,4*	*45,2*	*65,1*	*89,3*	94,1	149,2	204,9	298,7	349,9	403,6	459,9
Shear $V_{Ru,m}$	BSt 500 S	[kN]	*14,7*	*23,1*	*32,6*	*44,1*	*57,8*	*90,3*	*141,8*	*177,5*	*232,1*	*293,9*	*362,9*

Characteristic resistance: concrete C 20/25 – $f_{ck,cube}$ = 25 N/mm², anchor rebar BSt 500 S

			Data according ETA-04/0027, issue 2009-05-20									Additional Hilti tech. data	
Anchor size			**Ø8**	**Ø10**	**Ø12**	**Ø14**	**Ø16**	**Ø20**	**Ø25**	**Ø28**	**Ø32**	**Ø36**	**Ø40**
Tensile N_{Rk}	BSt 500 S	[kN]	*28,0*	42,4	58,3	70,6	70,6	111,9	153,7	224,0	262,4	302,7	344,9
Shear V_{Rk}	BSt 500 S	[kN]	*14,0*	*22,0*	*31,0*	*42,0*	*55,0*	*86,0*	*135,0*	*169,0*	*221,0*	*279,9*	*345,6*

Design resistance: concrete C 20/25 – $f_{ck,cube}$ = 25 N/mm², anchor rebar BSt 500 S

			Data according ETA-04/0027, issue 2009-05-20									Additional Hilti tech. data	
Anchor size			**Ø8**	**Ø10**	**Ø12**	**Ø14**	**Ø16**	**Ø20**	**Ø25**	**Ø28**	**Ø32**	**Ø36**	**Ø40**
Tensile N_{Rd}	BSt 500 S	[kN]	14,4	20,2	27,7	33,6	33,6	53,3	73,2	106,7	125,0	144,2	164,3
Shear V_{Rd}	BSt 500 S	[kN]	9,3	14,7	20,7	28,0	36,7	57,3	90,0	112,7	147,3	186,6	230,4

Recommended loads [a]: concrete C 20/25 – $f_{ck,cube}$ = 25 N/mm², anchor rebar BSt 500 S

			Data according ETA-04/0027, issue 2009-05-20									Additional Hilti tech. data	
Anchor size			**Ø8**	**Ø10**	**Ø12**	**Ø14**	**Ø16**	**Ø20**	**Ø25**	**Ø28**	**Ø32**	**Ø36**	**Ø40**
Tensile N_{rec}	BSt 500 S	[kN]	10,3	14,4	19,8	24,0	24,0	38,1	52,3	76,2	89,3	103,0	117,3
Shear V_{rec}	BSt 500 S	[kN]	6,7	10,5	14,8	20,0	26,2	41,0	64,3	80,5	105,2	133,3	164,6

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. According ETAG 001, annex C, the partial safety factor is γ_G = 1,35 for permanent actions and γ_Q = 1,5 for variable actions.

Service temperature range

Hilti HIT-RE 500 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	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 +58 °C	+35 °C	+58 °C
Temperature range III	-40 °C to +70 °C	+43 °C	+70 °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.

Materials

Mechanical properties of rebar BSt 500S

			Data according ETA-04/0027, issue 2009-05-20								Additional Hilti tech. data	
Anchor size			**Ø8**	**Ø10**	**Ø12**	**Ø14**	**Ø16**	**Ø20**	**Ø25**	**Ø28**	**Ø32**	**Ø36**	**Ø40**
Nominal tensile strength f_{uk}	BSt 500 S	[N/mm²]	550	550	550	550	550	550	550	550	550	550	550
Yield strength f_{yk}		[N/mm²]	500	500	500	500	500	500	500	500	500	500	500
Stressed cross-section A_s	BSt 500 S	[mm²]	50,3	78,5	113,1	153,9	201,1	314,2	490,9	615,8	804,2	1018	1257
Moment of resistance W	BSt 500 S	[mm³]	50,3	98,2	169,6	269,4	402,1	785,4	1534	2155	3217	4580	6283

Material quality

Part	Material
rebar BSt 500 S	Geometry and mechanical properties according to DIN 488-2:1986 or E DIN 488-2:2006

Setting

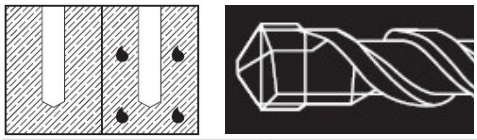
installation equipment

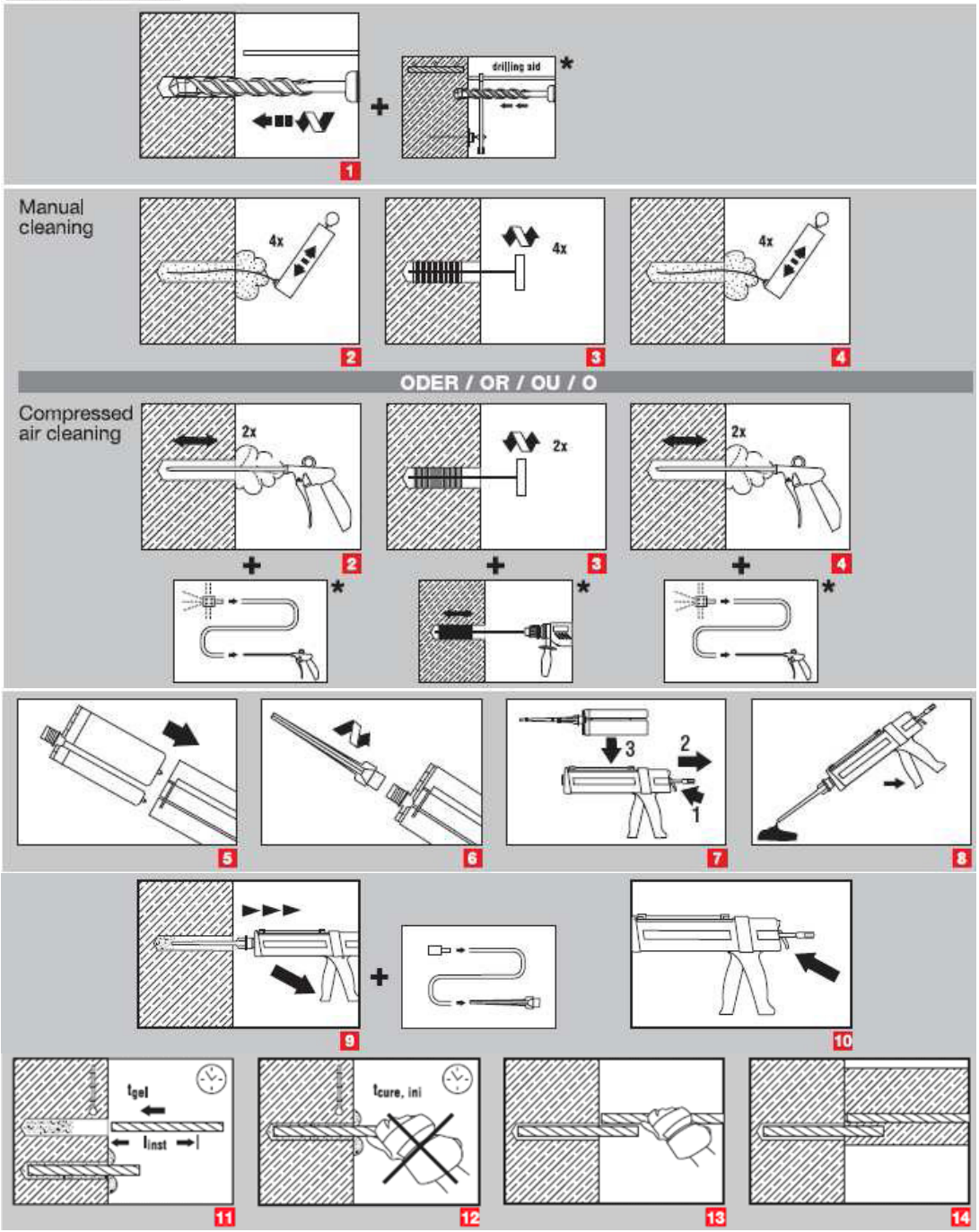
Anchor size	Ø8	Ø10	Ø12	Ø14	Ø16	Ø20	Ø25	Ø28	Ø32	Ø36
Rotary hammer	TE 2 – TE 16					TE 40 – TE 70				
Other tools	compressed air gun or blow out pump, set of cleaning brushes, dispenser									
Additional Hilti recommended tools	DD EC-1, DD 100 … DD xxx [a)]									

a) For anchors in diamond drilled holes load values for combined pull-out and concrete cone resistance have to be reduced (see section “Simplified design method”)

Setting instruction

Dry and water-saturated concrete, hammer drilling

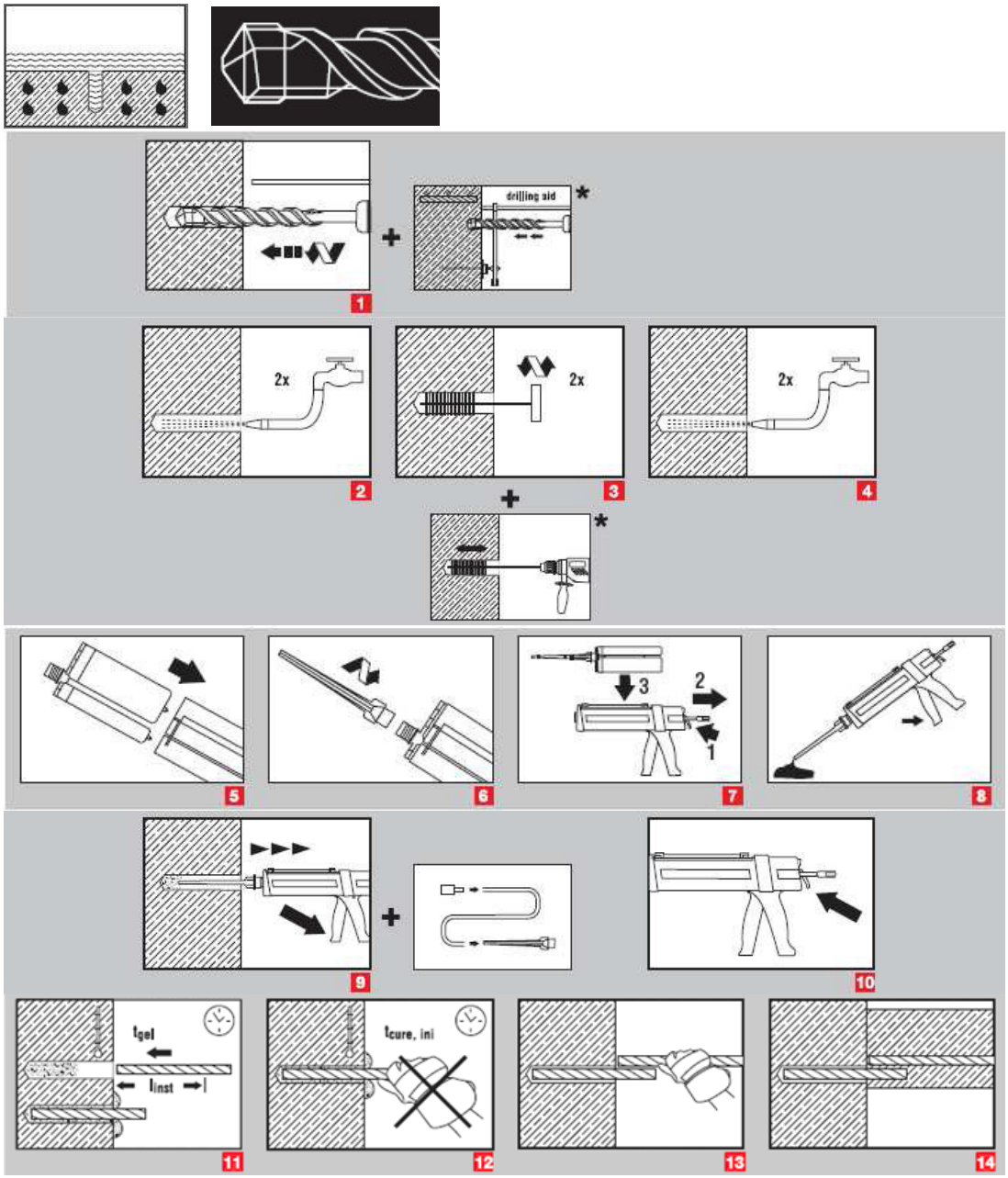




a)

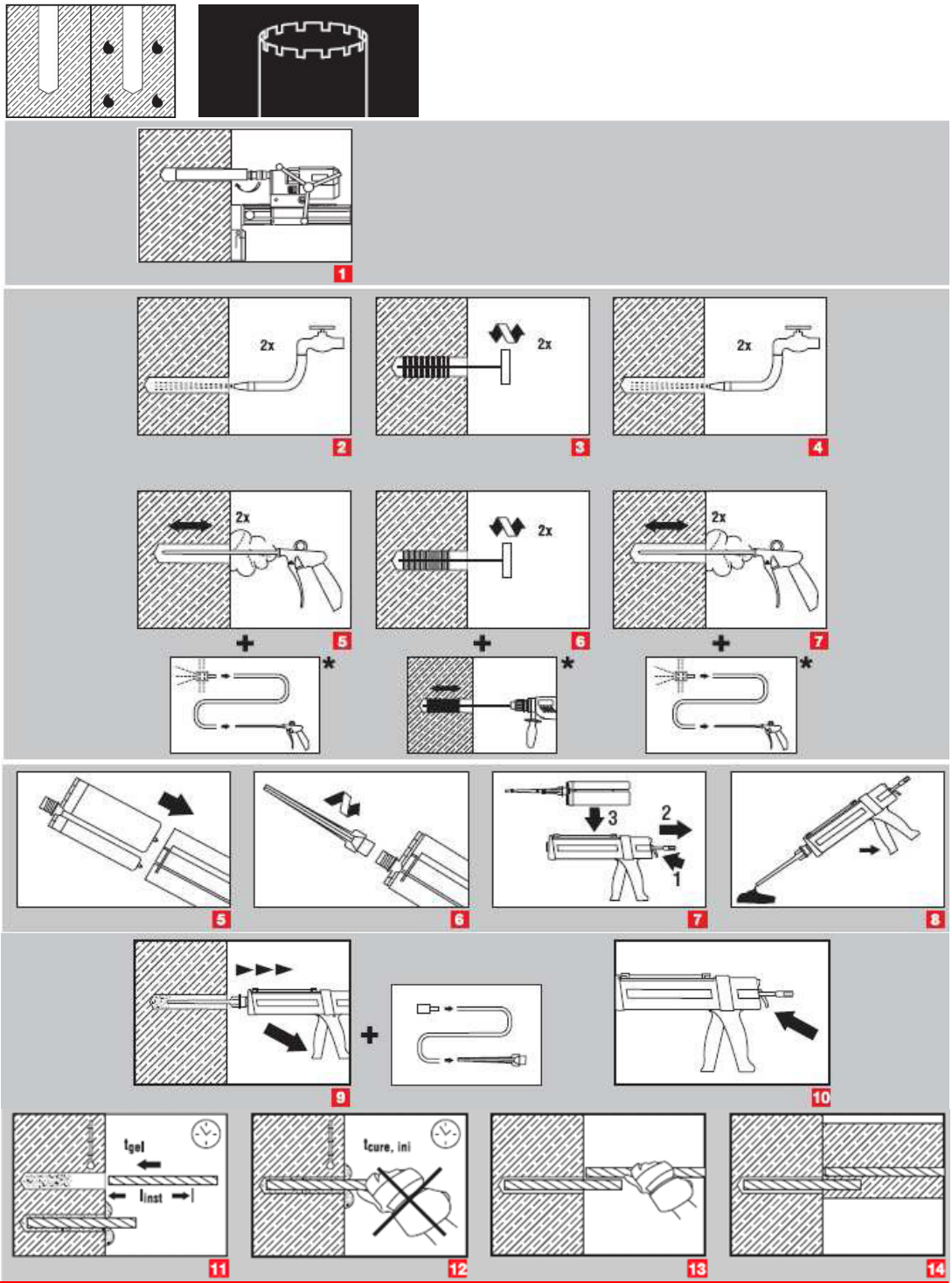
a) Note: Manual cleaning only for h_{ef} ≤ 250 mm and anchor size d ≤ 16mm
Brush bore hole with required steel brush HIT-RB
For detailed information on installation see instruction for use given with the package of the product.

Water filled bore hole or submerged, hammer drilling



Brush bore hole with required steel brush HIT-RB
For detailed information on installation see instruction for use given with the package of the product.

Dry and water-saturated concrete, diamond coring drilling; Hilti technical information only



For anchors in diamond drilled holes load values for combined pull-out and concrete cone resistance have to be reduced. Load reduction factor: 0.7

Brush bore hole with required steel brush HIT-RB

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

Curing time for general conditions

Data according ETA-04/0027, issue 2009-05-20		Additional Hilti technical data		
Temperature of the base material	Curing time before anchor can be fully loaded t_{cure}	Temperature of the base material	Working time in which anchor can be inserted and adjusted t_{gel}	Preparation work may continue. Do not apply design load. $t_{cure, ini}$
40 °C	4 h	40 °C	12 min	2 h
30 °C to 39 °C	8 h	30 °C	20 min	4 h
20 °C to 29 °C	12 h	20 °C	30 min	6 h
15 °C to 19 °C	24 h	15 °C	1 ½ h	8 h
10 °C to 14 °C	48 h	10 °C	2 h	12 h
5 °C to 9 °C	72 h	5 °C	2 ½ h	18 h

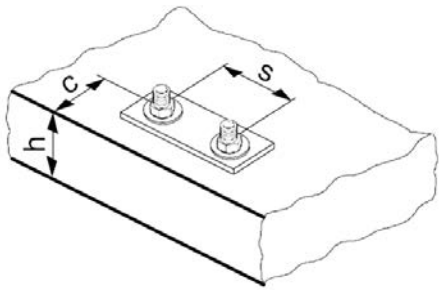
For dry concrete curing times may be reduced according to the following table.
For installation temperatures below +5 °C all load values have to be reduced according to the load reduction factors given below.

Curing time for dry concrete

Additional Hilti technical data			
Temperature of the base material	Reduced curing time before anchor can be fully loaded $t_{cure,dry}$	Working time in which anchor can be inserted and adjusted t_{gel}	Load reduction factor
40 °C	4 h	12 min	1
30 °C	8 h	20 min	1
20 °C	12 h	30 min	1
15 °C	18 h	1 ½ h	1
10 °C	24 h	2 h	1
5 °C	36 h	2 ½ h	1
0 °C	50 h	3 h	0.7
-5 °C	72 h	4 h	0.6

Setting details

			Data according ETA-04/0027, issue 2009-05-20									Additional Hilti tech. data	
Anchor size			**Ø8**	**Ø10**	**Ø12**	**Ø14**	**Ø16**	**Ø20**	**Ø25**	**Ø28**	**Ø32**	**Ø36**	**Ø40**
Nominal diameter of drill bit	d_0	[mm]	12	14	16	18	20	25	32	35	40	45	55
Effective anchorage and drill hole depth range [a]	$h_{ef,min}$	[mm]	60	60	70	75	80	90	100	112	128	144	160
	$h_{ef,max}$	[mm]	160	200	240	280	320	400	500	560	640	720	800
Minimum base material thickness	h_{min}	[mm]	h_{ef} + 30 mm ≥ 100 mm		h_{ef} + 2 d_0								
Minimum spacing	s_{min}	[mm]	40	50	60	70	80	100	125	140	160	180	200
Minimum edge distance	c_{min}	[mm]	40	50	60	70	80	100	125	140	160	180	200
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 · 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:										
Critical spacing for concrete cone failure	$s_{cr,N}$		2 $c_{cr,N}$										
Critical edge distance for concrete cone failure [c]	$c_{cr,N}$		1,5 h_{ef}										



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

a) $h_{ef,min} \le h_{ef} \le h_{ef,max}$ (h_{ef}: embedment depth)

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

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.

Simplified design method

Simplified version of the design method according ETAG 001, TR 029. Design resistance according data given in ETA-04/0027, issue 2009-05-20.

- Influence of concrete strength
- Influence of edge distance

- Influence of spacing
- Valid for a group of two anchors. (The method may also be applied for anchor groups with more than two anchors or more than one edge distance. The influencing factors must then be considered for each edge distance and spacing. The calculated design loads are then on the save side: They will be lower than the exact values according ETAG 001, TR 029. To avoid this, it is recommended to use the anchor design software PROFIS anchor)

The design method is based on the following simplification:

- No different loads are acting on individual anchors (no eccentricity)

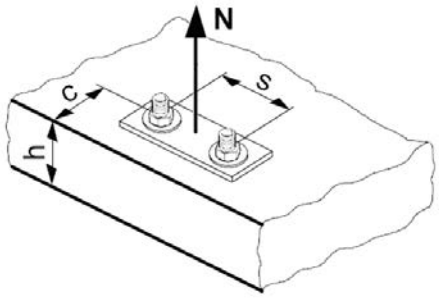
The values are valid for one anchor.

For more complex fastening applications please use the anchor design software PROFIS Anchor.

Tension loading

The design tensile resistance is the lower value of

- Steel resistance: $N_{Rd,s}$
- Combined pull-out and concrete cone resistance:
  $N_{Rd,p} = N^0_{Rd,p} \cdot f_{B,p} \cdot f_{1,N} \cdot f_{2,N} \cdot f_{3,N} \cdot f_{h,p} \cdot f_{re,N}$
- Concrete cone resistance: $N_{Rd,c} = N^0_{Rd,c} \cdot f_B \cdot f_{1,N} \cdot f_{2,N} \cdot f_{3,N} \cdot f_{h,N} \cdot f_{re,N}$
- Concrete splitting resistance (only non-cracked concrete):
  $N_{Rd,sp} = N^0_{Rd,c} \cdot f_B \cdot f_{1,sp} \cdot f_{2,sp} \cdot f_{3,sp} \cdot f_{h,N} \cdot f_{re,N}$



Basic design tensile resistance

Design steel resistance $N_{Rd,s}$

			Data according ETA-04/0027, issue 2009-05-20									Additional Hilti tech. data	
Anchor size			**Ø8**	**Ø10**	**Ø12**	**Ø14**	**Ø16**	**Ø20**	**Ø25**	**Ø28**	**Ø32**	**Ø36**	**Ø40**
$N_{Rd,s}$	BSt 500 S	[kN]	20,0	30,7	44,3	60,7	79,3	123,6	192,9	242,1	315,7	400	494

Design combined pull-out and concrete cone resistance

$N_{Rd,p} = N^0_{Rd,p} \cdot f_{B,p} \cdot f_{1,N} \cdot f_{2,N} \cdot f_{3,N} \cdot f_{h,p} \cdot f_{re,N}$

			Data according ETA-04/0027, issue 2009-05-20									Additional Hilti tech. data	
Anchor size			**Ø8**	**Ø10**	**Ø12**	**Ø14**	**Ø16**	**Ø20**	**Ø25**	**Ø28**	**Ø32**	**Ø36**	**Ø40**
Typical embedment depth $h_{ef,typ}$ [mm]			**80**	**90**	**110**	**125**	**125**	**170**	**210**	**270**	**300**	**330**	**360**
$N^0_{Rd,p}$	Temperature range I	[kN]	14,4	20,2	29,6	36,7	41,9	71,2	102,1	147,0	186,7	192,8	216,1
$N^0_{Rd,p}$	Temperature range II	[kN]	11,5	16,2	23,7	31,4	32,9	56,0	86,4	113,1	143,6	154,2	172,9
$N^0_{Rd,p}$	Temperature range III	[kN]	6,7	9,4	13,8	18,3	20,9	33,1	51,1	67,9	86,2	92,5	103,7

a) **Additional Hilti technical data (not part of ETA-04/0027, issue 2009-05-20):**
The design values for combined pull-out and concrete cone resistance may be increased by 20 % for anchor installation in dry concrete (concrete not in contact with water before/during installation and curing).

Design concrete cone resistance [a] $N_{Rd,c} = N^0_{Rd,c} \cdot f_B \cdot f_{1,N} \cdot f_{2,N} \cdot f_{3,N} \cdot f_{h,N} \cdot f_{re,N}$
Design splitting resistance $N_{Rd,sp}$ [a] $= N^0_{Rd,c} \cdot f_B \cdot f_{1,sp} \cdot f_{2,sp} \cdot f_{3,sp} \cdot f_{h,N} \cdot f_{re,N}$

	Data according ETA-04/0027, issue 2009-05-20									Additional Hilti tech. data	
Anchor size	**Ø8**	**Ø10**	**Ø12**	**Ø14**	**Ø16**	**Ø20**	**Ø25**	**Ø28**	**Ø32**	**Ø36**	**Ø40**
$N^0_{Rd,c}$ [kN]	17,2	20,5	27,7	33,6	33,6	53,3	73,2	106,7	125,0	144,2	164,3

a) **Additional Hilti technical data (not part of ETA-04/0027, issue 2009-05-20):**
The design values for concrete cone and splitting resistance may be increased by 20 % for anchor installation in dry concrete (concrete not in contact with water before/during installation and curing).

Influencing factors

Influence of concrete strength on combined pull-out and concrete cone resistance

Concrete strength designation (ENV 206)	**C 20/25**	**C 25/30**	**C 30/37**	**C 35/45**	**C 40/50**	**C 45/55**	**C 50/60**
$f_{B,p} = (f_{ck,cube}/25N/mm^2)^{0,1}$ [a]	1	1,02	1,04	1,06	1,07	1,08	1,09

a) $f_{ck,cube}$ = concrete compressive strength, measured on cubes with 150 mm side length

Influence of embedment depth on combined pull-out and concrete cone resistance

$$f_{h,p} = h_{ef}/h_{ef,typ}$$

Influence of concrete strength on concrete cone resistance

Concrete strength designation (ENV 206)	**C 20/25**	**C 25/30**	**C 30/37**	**C 35/45**	**C 40/50**	**C 45/55**	**C 50/60**
$f_B = (f_{ck,cube}/25N/mm^2)^{1/2}$ [a]	1	1,1	1,22	1,34	1,41	1,48	1,55

a) $f_{ck,cube}$ = concrete compressive strength, measured on cubes with 150 mm side length

Influence of edge distance [a]

$c/c_{cr,N}$ / **$c/c_{cr,sp}$**	**0,1**	**0,2**	**0,3**	**0,4**	**0,5**	**0,6**	**0,7**	**0,8**	**0,9**	**1**
$f_{1,N} = 0,7 + 0,3 \cdot c/c_{cr,N}$ / $f_{1,sp} = 0,7 + 0,3 \cdot c/c_{cr,sp}$	0,73	0,76	0,79	0,82	0,85	0,88	0,91	0,94	0,97	1
$f_{2,N} = 0,5 \cdot (1 + c/c_{cr,N})$ / $f_{2,sp} = 0,5 \cdot (1 + c/c_{cr,sp})$	0,55	0,60	0,65	0,70	0,75	0,80	0,85	0,90	0,95	1

a) The the edge distance shall not be smaller than the minimum edge distance c_{min} given in the table with the setting details. These influencing factors must be considered for every edge distance smaller than the critical edge distance.

Influence of anchor spacing [a]

$s/s_{cr,N}$ / **$s/s_{cr,sp}$**	**0,1**	**0,2**	**0,3**	**0,4**	**0,5**	**0,6**	**0,7**	**0,8**	**0,9**	**1**
$f_{3,N} = 0,5 \cdot (1 + s/s_{cr,N})$ / $f_{3,sp} = 0,5 \cdot (1 + s/s_{cr,sp})$	0,55	0,60	0,65	0,70	0,75	0,80	0,85	0,90	0,95	1

a) The anchor spacing shall not be smaller than the minimum anchor spacing s_{min} given in the table with the setting details. This influencing factor must be considered for every anchor spacing.

Influence of embedment depth on concrete cone resistance

$$f_{h,N} = (h_{ef}/h_{ef,typ})^{1,5}$$

Influence of reinforcement

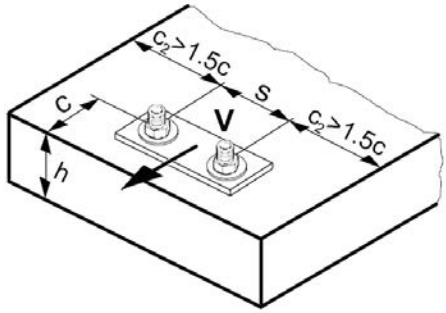
h_{ef} [mm]	40	50	60	70	80	90	≥ 100
$f_{re,N} = 0,5 + h_{ef}/200mm \le 1$	0,7 a)	0,75 a)	0,8 a)	0,85 a)	0,9 a)	0,95 a)	1

a) This factor applies only for dense reinforcement. If in the area of anchorage there is reinforcement with a spacing ≥ 150 mm (any diameter) or with a diameter ≤ 10 mm and a spacing ≥ 100 mm, then a factor $f_{re} = 1$ may be applied.

Shear loading

The design shear resistance is the lower value of

- Steel resistance: $V_{Rd,s}$
- Concrete pryout resistance: $V_{Rd,cp} = k \cdot$ lower value of $N_{Rd,p}$ and $N_{Rd,c}$
- Concrete edge resistance: $V_{Rd,c} = V^0_{Rd,c} \cdot f_B \cdot f_{ß} \cdot f_h \cdot f_4 \cdot f_{hef} \cdot f_c$



Basic design shear resistance

Design steel resistance $V_{Rd,s}$

		Data according ETA-04/0027, issue 2009-05-20									Additional Hilti technical data	
Anchor size		**Ø8**	**Ø10**	**Ø12**	**Ø14**	**Ø16**	**Ø20**	**Ø25**	**Ø28**	**Ø32**	**Ø36**	**Ø40**
$V_{Rd,s}$ BSt 500 S	[kN]	9,3	14,7	20,7	28,0	36,7	57,3	90,0	112,7	147,3	186,6	230,4

Design concrete pryout resistance $V_{Rd,cp}$ = lower value[a)] of $k \cdot N_{Rd,p}$ and $k \cdot N_{Rd,c}$

$$k = 1 \text{ for } h_{ef} < 60 \text{ mm}$$
$$k = 2 \text{ for } h_{ef} \ge 60 \text{ mm}$$

a) $N_{Rd,p}$: Design combined pull-out and concrete cone resistance
$N_{Rd,c}$: Design concrete cone resistance

Design concrete edge resistance $V_{Rd,c} = V^0_{Rd,c} \cdot f_B \cdot f_{ß} \cdot f_h \cdot f_4 \cdot f_{hef} \cdot f_c$

Anchor size		**Ø8**	**Ø10**	**Ø12**	**Ø14**	**Ø16**	**Ø20**	**Ø25**	**Ø28**	**Ø32**	**Ø36**	**Ø40**
Non-cracked concrete												
$V^0_{Rd,c}$	[kN]	5,9	8,6	11,6	15,0	18,7	27,0	39,2	47,3	59,0	71,7	85,5

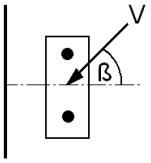
Influencing factors

Influence of concrete strength

Concrete strength designation (ENV 206)	C 20/25	C 25/30	C 30/37	C 35/45	C 40/50	C 45/55	C 50/60
$f_B = (f_{ck,cube}/25N/mm^2)^{1/2}$ a)	1	1,1	1,22	1,34	1,41	1,48	1,55

a) $f_{ck,cube}$ = concrete compressive strength, measured on cubes with 150 mm side length

Influence of angle between load applied and the direction perpendicular to the free edge

Angle ß	0°	10°	20°	30°	40°	50°	60°	70°	80°	≥ 90°
f_β 	1	1,01	1,05	1,13	1,24	1,40	1,64	1,97	2,32	2,50

Influence of base material thickness

h/c	0,15	0,3	0,45	0,6	0,75	0,9	1,05	1,2	1,35	≥ 1,5
$f_h = \{h/(1,5 \cdot c)\}^{1/2} \le 1$	0,32	0,45	0,55	0,63	0,71	0,77	0,84	0,89	0,95	1,00

Influence of anchor spacing and edge distance [a)] for concrete edge resistance: f_4

$f_4 = (c/h_{ef})^{1,5} \cdot (1 + s / [3 \cdot c]) \cdot 0,5$

c/h_{ef}	Single anchor	Group of two anchors s/h_{ef}														
		0,75	1,50	2,25	3,00	3,75	4,50	5,25	6,00	6,75	7,50	8,25	9,00	9,75	10,50	11,25
0,50	0,35	0,27	0,35	0,35	0,35	0,35	0,35	0,35	0,35	0,35	0,35	0,35	0,35	0,35	0,35	0,35
0,75	0,65	0,43	0,54	0,65	0,65	0,65	0,65	0,65	0,65	0,65	0,65	0,65	0,65	0,65	0,65	0,65
1,00	1,00	0,63	0,75	0,88	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00
1,25	1,40	0,84	0,98	1,12	1,26	1,40	1,40	1,40	1,40	1,40	1,40	1,40	1,40	1,40	1,40	1,40
1,50	1,84	1,07	1,22	1,38	1,53	1,68	1,84	1,84	1,84	1,84	1,84	1,84	1,84	1,84	1,84	1,84
1,75	2,32	1,32	1,49	1,65	1,82	1,98	2,15	2,32	2,32	2,32	2,32	2,32	2,32	2,32	2,32	2,32
2,00	2,83	1,59	1,77	1,94	2,12	2,30	2,47	2,65	2,83	2,83	2,83	2,83	2,83	2,83	2,83	2,83
2,25	3,38	1,88	2,06	2,25	2,44	2,63	2,81	3,00	3,19	3,38	3,38	3,38	3,38	3,38	3,38	3,38
2,50	3,95	2,17	2,37	2,57	2,77	2,96	3,16	3,36	3,56	3,76	3,95	3,95	3,95	3,95	3,95	3,95
2,75	4,56	2,49	2,69	2,90	3,11	3,32	3,52	3,73	3,94	4,15	4,35	4,56	4,56	4,56	4,56	4,56
3,00	5,20	2,81	3,03	3,25	3,46	3,68	3,90	4,11	4,33	4,55	4,76	4,98	5,20	5,20	5,20	5,20
3,25	5,86	3,15	3,38	3,61	3,83	4,06	4,28	4,51	4,73	4,96	5,18	5,41	5,63	5,86	5,86	5,86
3,50	6,55	3,51	3,74	3,98	4,21	4,44	4,68	4,91	5,14	5,38	5,61	5,85	6,08	6,31	6,55	6,55
3,75	7,26	3,87	4,12	4,36	4,60	4,84	5,08	5,33	5,57	5,81	6,05	6,29	6,54	6,78	7,02	7,26
4,00	8,00	4,25	4,50	4,75	5,00	5,25	5,50	5,75	6,00	6,25	6,50	6,75	7,00	7,25	7,50	7,75
4,25	8,76	4,64	4,90	5,15	5,41	5,67	5,93	6,18	6,44	6,70	6,96	7,22	7,47	7,73	7,99	8,25
4,50	9,55	5,04	5,30	5,57	5,83	6,10	6,36	6,63	6,89	7,16	7,42	7,69	7,95	8,22	8,49	8,75
4,75	10,35	5,45	5,72	5,99	6,27	6,54	6,81	7,08	7,36	7,63	7,90	8,17	8,45	8,72	8,99	9,26
5,00	11,18	5,87	6,15	6,43	6,71	6,99	7,27	7,55	7,83	8,11	8,39	8,66	8,94	9,22	9,50	9,78
5,25	12,03	6,30	6,59	6,87	7,16	7,45	7,73	8,02	8,31	8,59	8,88	9,17	9,45	9,74	10,02	10,31
5,50	12,90	6,74	7,04	7,33	7,62	7,92	8,21	8,50	8,79	9,09	9,38	9,67	9,97	10,26	10,55	10,85

a) The anchor spacing and the edge distance shall not be smaller than the minimum anchor spacing s_{min} and the minimum edge distance c_{min}.

Influence of embedment depth

h_{ef}/d	4	4,5	5	6	7	8	9	10	11
$f_{hef} = 0,05 \cdot (h_{ef} / d)^{1,68}$	0,51	0,63	0,75	1,01	1,31	1,64	2,00	2,39	2,81
h_{ef}/d	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
$f_{hef} = 0,05 \cdot (h_{ef} / d)^{1,68}$	3,25	3,72	4,21	4,73	5,27	5,84	6,42	7,04	7,67

Influence of edge distance [a)]

c/d	4	6	8	10	15	20	30	40
$f_c = (d / c)^{0,19}$	0,77	0,71	0,67	0,65	0,60	0,57	0,52	0,50

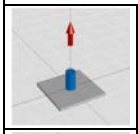
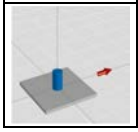
a) The edge distance shall not be smaller than the minimum edge distance c_{min}.

Combined tension and shear loading

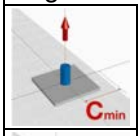
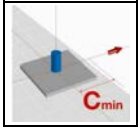
For combined tension and shear loading see section “Anchor Design”.

Precalculated values

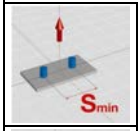
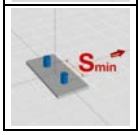
Design resistance: concrete C 20/25 – $f_{ck,cube}$ = 25 N/mm², Temperature range I

		Data according ETA-04/0027, issue 2009-05-20									Additional Hilti tech. data	
Anchor size		**Ø8**	**Ø10**	**Ø12**	**Ø14**	**Ø16**	**Ø20**	**Ø25**	**Ø28**	**Ø32**	**Ø36**	**Ø40**
Embedment depth	$h_{ef,1}$ = [mm]	60	60	72	84	96	120	150	168	192	216	240
Base material thickness	h_{min}= [mm]	100	100	104	120	136	170	214	238	272	306	350
	**Tensile N_{Rd}: single anchor, no edge effects**											
	BSt 500 S [kN]	10,8	11,2	14,7	18,5	22,6	31,6	44,2	52,4	64,0	76,3	89,4
	**Shear V_{Rd}: single anchor, no edge effects, without lever arm**											
	BSt 500 S [kN]	9,3	14,7	20,7	28,0	36,7	57,3	90,0	112,7	147,3	186,6	230,4

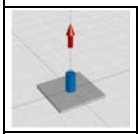
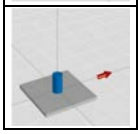
Design resistance: concrete C 20/25 – $f_{ck,cube}$ = 25 N/mm², Temperature range I

		Data according ETA-04/0027, issue 2009-05-20									Additional Hilti tech. data	
Anchor size		**Ø8**	**Ø10**	**Ø12**	**Ø14**	**Ø16**	**Ø20**	**Ø25**	**Ø28**	**Ø32**	**Ø36**	**Ø40**
Embedment depth	$h_{ef,1}$ = [mm]	60	60	72	84	96	120	150	168	192	216	240
Base material thickness	h_{min}= [mm]	100	100	104	120	136	170	214	238	272	306	350
Edge distance	c = c_{min}= [mm]	40	50	60	70	80	100	125	140	160	180	200
	**Tensile N_{Rd}: single anchor, min. edge distance (c = c_{min})**											
	BSt 500 S [kN]	6,5	7,3	8,6	10,8	13,1	18,3	25,6	30,3	37,0	44,1	52,5
	**Shear V_{Rd}: single anchor, min. edge distance (c = c_{min}) , without lever arm**											
	BSt 500 S [kN]	3,5	4,9	6,7	8,6	10,8	15,7	22,9	27,7	34,6	42,2	50,4

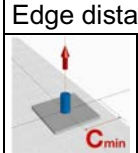
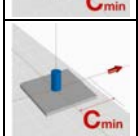
Design resistance: concrete C 20/25 – $f_{ck,cube}$ = 25 N/mm², Temperature range I (load values are valid for single anchor)

		Data according ETA-04/0027, issue 2009-05-20									Additional Hilti tech. data	
Anchor size		**Ø8**	**Ø10**	**Ø12**	**Ø14**	**Ø16**	**Ø20**	**Ø25**	**Ø28**	**Ø32**	**Ø36**	**Ø40**
Embedment depth	$h_{ef,1}$ = [mm]	60	60	72	84	96	120	150	168	192	216	240
Base material thickness	h_{min}= [mm]	100	100	104	120	136	170	214	238	272	306	350
Spacing	s = s_{min}= [mm]	40	50	60	70	80	100	125	140	160	180	200
	**Tensile N_{Rd}: double anchor, no edge effects, min. spacing (s = s_{min})**											
	BSt 500 S [kN]	6,7	7,0	8,9	11,2	13,6	19,0	26,6	31,5	38,5	45,9	54,1
	**Shear V_{Rd}: double anchor, no edge effects, min. spacing (s = s_{min}) , without lever arm**											
	BSt 500 S [kN]	9,3	14,7	20,7	28,0	36,7	56,5	79,0	93,7	114,4	136,6	159,9

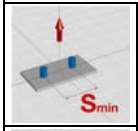
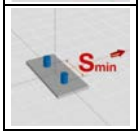
Design resistance: concrete C 20/25 – $f_{ck,cube}$ = 25 N/mm², Temperature range I

		Data according ETA-04/0027, issue 2009-05-20									Additional Hilti tech. data	
Anchor size		**Ø8**	**Ø10**	**Ø12**	**Ø14**	**Ø16**	**Ø20**	**Ø25**	**Ø28**	**Ø32**	**Ø36**	**Ø40**
Embedment depth	$h_{ef,typ}$ = [mm]	80	90	110	125	125	170	210	270	300	330	360
Base material thickness	h_{min}= [mm]	110	120	142	161	165	220	274	340	380	420	470
	**Tensile N_{Rd}: single anchor, no edge effects**											
	BSt 500 S [kN]	14,4	20,2	27,7	33,6	33,6	53,3	73,2	106,7	125,0	144,2	164,3
	**Shear V_{Rd}: single anchor, no edge effects, without lever arm**											
	BSt 500 S [kN]	9,3	14,7	20,7	28,0	36,7	57,3	90,0	112,7	147,3	186,6	230,4

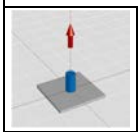
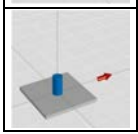
Design resistance: concrete C 20/25 – $f_{ck,cube}$ = 25 N/mm², Temperature range I

		Data according ETA-04/0027, issue 2009-05-20									Additional Hilti tech. data	
Anchor size		**Ø8**	**Ø10**	**Ø12**	**Ø14**	**Ø16**	**Ø20**	**Ø25**	**Ø28**	**Ø32**	**Ø36**	**Ø40**
Embedment depth	$h_{ef,typ}$ = [mm]	80	90	110	125	125	170	210	270	300	330	360
Base material thickness	h_{min}= [mm]	110	120	142	161	165	220	274	340	380	420	470
Edge distance	c = c_{min}= [mm]	40	50	60	70	80	100	125	140	160	180	200
	**Tensile N_{Rd}: single anchor, min. edge distance (c = c_{min})**											
	BSt 500 S [kN]	7,8	10,0	13,3	16,2	17,0	26,1	36,1	50,4	59,5	69,1	79,3
	**Shear V_{Rd}: single anchor, min. edge distance (c = c_{min}) , without lever arm**											
	BSt 500 S [kN]	3,7	5,3	7,3	9,5	11,5	17,2	25,0	31,6	39,3	47,8	56,9

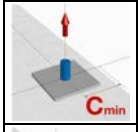
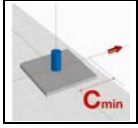
Design resistance: concrete C 20/25 – $f_{ck,cube}$ = 25 N/mm², Temperature range I (load values are valid for single anchor)

		Data according ETA-04/0027, issue 2009-05-20									Additional Hilti tech. data	
Anchor size		**Ø8**	**Ø10**	**Ø12**	**Ø14**	**Ø16**	**Ø20**	**Ø25**	**Ø28**	**Ø32**	**Ø36**	**Ø40**
Embedment depth	$h_{ef,typ}$ = [mm]	80	90	110	125	125	170	210	270	300	330	360
Base material thickness	h_{min}= [mm]	110	120	142	161	165	220	274	340	380	420	470
Spacing	s = s_{min}= [mm]	40	50	60	70	80	100	125	140	160	180	200
	**Tensile N_{Rd}: double anchor, no edge effects, min. spacing (s = s_{min})**											
	BSt 500 S [kN]	8,9	11,6	15,5	18,9	19,2	30,1	41,4	59,5	69,8	80,8	92,3
	**Shear V_{Rd}: double anchor, no edge effects, min. spacing (s = s_{min}) , without lever arm**											
	BSt 500 S [kN]	9,3	14,7	20,7	28,0	36,7	57,3	90,0	112,7	147,3	186,6	230,4

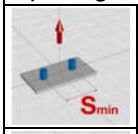
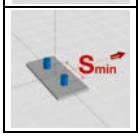
Design resistance: concrete C 20/25 – $f_{ck,cube}$ = 25 N/mm², Temperature range I

		Data according ETA-04/0027, issue 2009-05-20									Additional Hilti tech. data	
Anchor size		**Ø8**	**Ø10**	**Ø12**	**Ø14**	**Ø16**	**Ø20**	**Ø25**	**Ø28**	**Ø32**	**Ø36**	**Ø40**
Embedment depth	$h_{ef,2}$ = [mm]	96	120	144	168	192	240	300	336	384	432	480
Base material thickness	h_{min}= [mm]	126	150	176	204	232	290	364	406	464	522	590
	**Tensile N_{Rd}: single anchor, no edge effects**											
	BSt 500 S [kN]	17,2	26,9	38,8	49,3	64,0	89,4	125,0	148,1	181,0	215,9	252,9
	**Shear V_{Rd}: single anchor, no edge effects, without lever arm**											
	BSt 500 S [kN]	9,3	14,7	20,7	28,0	36,7	57,3	90,0	112,7	147,3	186,6	230,4

Design resistance: concrete C 20/25 – $f_{ck,cube}$ = 25 N/mm², Temperature range I

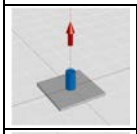
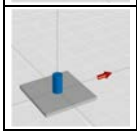
		Data according ETA-04/0027, issue 2009-05-20									Additional Hilti tech. data	
Anchor size		**Ø8**	**Ø10**	**Ø12**	**Ø14**	**Ø16**	**Ø20**	**Ø25**	**Ø28**	**Ø32**	**Ø36**	**Ø40**
Embedment depth	$h_{ef,2}$ = [mm]	96	120	144	168	192	240	300	336	384	432	480
Base material thickness	h_{min}= [mm]	126	150	176	204	232	290	364	406	464	522	590
Edge distance	c = c_{min}= [mm]	40	50	60	70	80	100	125	140	160	180	200
	**Tensile N_{Rd}: single anchor, min. edge distance (c = c_{min})**											
	BSt 500 S [kN]	9,4	14,1	18,6	23,4	28,6	40,0	55,9	66,2	80,9	96,6	113,1
	**Shear V_{Rd}: single anchor, min. edge distance (c = c_{min}) , without lever arm**											
	BSt 500 S [kN]	3,9	5,7	7,8	10,2	12,9	18,9	27,8	33,9	42,6	52,3	62,7

Design resistance: concrete C 20/25 – $f_{ck,cube}$ = 25 N/mm², Temperature range I (load values are valid for single anchor)

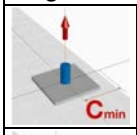
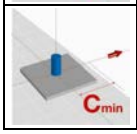
		Data according ETA-04/0027, issue 2009-05-20									Additional Hilti tech. data	
Anchor size		**Ø8**	**Ø10**	**Ø12**	**Ø14**	**Ø16**	**Ø20**	**Ø25**	**Ø28**	**Ø32**	**Ø36**	**Ø40**
Embedment depth	$h_{ef,2}$ = [mm]	96	120	144	168	192	240	300	336	384	432	480
Base material thickness	h_{min}= [mm]	126	150	176	204	232	290	364	406	464	522	590
Spacing	s = s_{min}= [mm]	40	50	60	70	80	100	125	140	160	180	200
	**Tensile N_{Rd}: double anchor, no edge effects, min. spacing (s = s_{min})**											
	BSt 500 S [kN]	10,9	16,6	22,7	28,6	34,9	48,8	68,2	80,9	98,8	117,9	138,1
	**Shear V_{Rd}: double anchor, no edge effects, min. spacing (s = s_{min}) , without lever arm**											
	BSt 500 S [kN]	9,3	14,7	20,7	28,0	36,7	57,3	90,0	112,7	147,3	186,6	230,4

Precalculated values

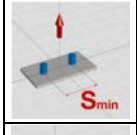
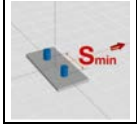
Recommended loads: concrete C 20/25 – $f_{ck,cube}$ = 25 N/mm², Temperature range I

		Data according ETA-04/0027, issue 2009-05-20									Additional Hilti tech. data	
Anchor size		**Ø8**	**Ø10**	**Ø12**	**Ø14**	**Ø16**	**Ø20**	**Ø25**	**Ø28**	**Ø32**	**Ø36**	**Ø40**
Embedment depth	$h_{ef,1}$ = [mm]	60	60	72	84	96	120	150	168	192	216	240
Base material thickness	h_{min}= [mm]	100	100	104	120	136	170	214	238	272	306	350
	**Tensile N_{rec}: single anchor, no edge effects**											
	BSt 500 S [kN]	7,7	8,0	10,5	13,2	16,2	22,6	31,6	37,4	45,7	54,5	63,9
	**Shear V_{rec}: single anchor, no edge effects, without lever arm**											
	BSt 500 S [kN]	6,7	10,5	14,8	20,0	26,2	41,0	64,3	80,5	105,2	133,3	164,6

Recommended loads: concrete C 20/25 – $f_{ck,cube}$ = 25 N/mm², Temperature range I

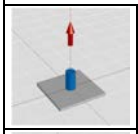
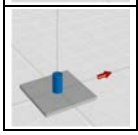
		Data according ETA-04/0027, issue 2009-05-20									Additional Hilti tech. data	
Anchor size		**Ø8**	**Ø10**	**Ø12**	**Ø14**	**Ø16**	**Ø20**	**Ø25**	**Ø28**	**Ø32**	**Ø36**	**Ø40**
Embedment depth	$h_{ef,1}$ = [mm]	60	60	72	84	96	120	150	168	192	216	240
Base material thickness	h_{min}= [mm]	100	100	104	120	136	170	214	238	272	306	350
Edge distance	c = c_{min}= [mm]	40	50	60	70	80	100	125	140	160	180	200
	**Tensile N_{rec}: single anchor, min. edge distance (c = c_{min})**											
	BSt 500 S [kN]	4,6	5,4	7,1	8,9	10,9	15,2	21,3	25,2	30,8	36,8	43,0
	**Shear V_{rec}: single anchor, min. edge distance (c = c_{min}) , without lever arm**											
	BSt 500 S [kN]	2,5	3,5	4,8	6,2	7,7	11,2	16,3	19,8	24,7	30,2	36,0

Recommended loads: concrete C 20/25 – $f_{ck,cube}$ = 25 N/mm², Temperature range I (load values are valid for single anchor)

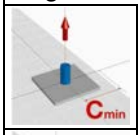
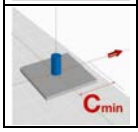
		Data according ETA-04/0027, issue 2009-05-20									Additional Hilti tech. data	
Anchor size		**Ø8**	**Ø10**	**Ø12**	**Ø14**	**Ø16**	**Ø20**	**Ø25**	**Ø28**	**Ø32**	**Ø36**	**Ø40**
Embedment depth	$h_{ef,1}$ = [mm]	60	60	72	84	96	120	150	168	192	216	240
Base material thickness	h_{min}= [mm]	100	100	104	120	136	170	214	238	272	306	350
Spacing	s = s_{min}= [mm]	40	50	60	70	80	100	125	140	160	180	200
	**Tensile N_{rec}: double anchor, no edge effects, min. spacing (s = s_{min})**											
	BSt 500 S [kN]	4,8	5,0	6,3	8,0	9,7	13,6	19,0	22,5	27,5	32,8	38,7
	**Shear V_{rec}: double anchor, no edge effects, min. spacing (s = s_{min}) , without lever arm**											
	BSt 500 S [kN]	6,7	10,5	14,8	20,0	26,2	41,0	64,3	80,5	105,2	133,3	164,6

For the recommended loads an overall partial safety factor for action γ = 1,4 is considered. The partial safety factors for action depend on the type of loading and shall be taken from national regulations. According ETAG 001, annex C, the partial safety factor is γ_G = 1,35 for permanent actions and γ_Q = 1,5 for variable actions.

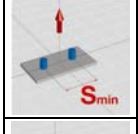
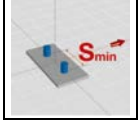
Recommended loads: concrete C 20/25 – $f_{ck,cube}$ = 25 N/mm², Temperature range I

		Data according ETA-04/0027, issue 2009-05-20									Additional Hilti tech. data	
Anchor size		**Ø8**	**Ø10**	**Ø12**	**Ø14**	**Ø16**	**Ø20**	**Ø25**	**Ø28**	**Ø32**	**Ø36**	**Ø40**
Embedment depth	$h_{ef,typ}$ = [mm]	80	90	110	125	125	170	210	270	300	330	360
Base material thickness	h_{min}= [mm]	110	120	142	161	165	220	274	340	380	420	470
	**Tensile N_{rec}: single anchor, no edge effects**											
	BSt 500 S [kN]	10,3	14,4	19,8	24,0	24,0	38,1	52,3	76,2	89,3	103,0	117,3
	**Shear V_{rec}: single anchor, no edge effects, without lever arm**											
	BSt 500 S [kN]	6,7	10,5	14,8	20,0	26,2	41,0	64,3	80,5	105,2	133,3	164,6

Recommended loads: concrete C 20/25 – $f_{ck,cube}$ = 25 N/mm², Temperature range I

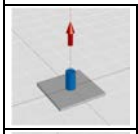
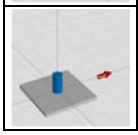
		Data according ETA-04/0027, issue 2009-05-20									Additional Hilti tech. data	
Anchor size		**Ø8**	**Ø10**	**Ø12**	**Ø14**	**Ø16**	**Ø20**	**Ø25**	**Ø28**	**Ø32**	**Ø36**	**Ø40**
Embedment depth	$h_{ef,typ}$ = [mm]	80	90	110	125	125	170	210	270	300	330	360
Base material thickness	h_{min}= [mm]	110	120	142	161	165	220	274	340	380	420	470
Edge distance	c = c_{min}= [mm]	40	50	60	70	80	100	125	140	160	180	200
	**Tensile N_{rec}: single anchor, min. edge distance (c = c_{min})**											
	BSt 500 S [kN]	5,6	8,0	10,9	13,4	14,2	21,7	29,9	41,2	48,8	56,8	65,2
	**Shear V_{rec}: single anchor, min. edge distance (c = c_{min}) , without lever arm**											
	BSt 500 S [kN]	2,7	3,8	5,2	6,8	8,2	12,3	17,9	22,6	28,1	34,1	40,6

Recommended loads: concrete C 20/25 – $f_{ck,cube}$ = 25 N/mm², Temperature range I (load values are valid for single anchor)

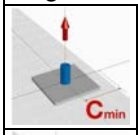
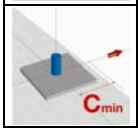
		Data according ETA-04/0027, issue 2009-05-20									Additional Hilti tech. data	
Anchor size		**Ø8**	**Ø10**	**Ø12**	**Ø14**	**Ø16**	**Ø20**	**Ø25**	**Ø28**	**Ø32**	**Ø36**	**Ø40**
Embedment depth	$h_{ef,typ}$ = [mm]	80	90	110	125	125	170	210	270	300	330	360
Base material thickness	h_{min}= [mm]	110	120	142	161	165	220	274	340	380	420	470
Spacing	s = s_{min}= [mm]	40	50	60	70	80	100	125	140	160	180	200
	**Tensile N_{rec}: double anchor, no edge effects, min. spacing (s = s_{min})**											
	BSt 500 S [kN]	6,4	8,3	11,1	13,5	13,7	21,5	29,6	42,5	49,9	57,7	65,9
	**Shear V_{rec}: double anchor, no edge effects, min. spacing (s = s_{min}) , without lever arm**											
	BSt 500 S [kN]	6,7	10,5	14,8	20,0	26,2	41,0	64,3	80,5	105,2	133,3	164,6

For the recommended loads an overall partial safety factor for action γ = 1,4 is considered. The partial safety factors for action depend on the type of loading and shall be taken from national regulations. According ETAG 001, annex C, the partial safety factor is γ_G = 1,35 for permanent actions and γ_Q = 1,5 for variable actions.

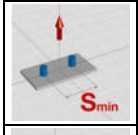
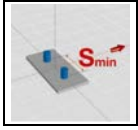
Recommended loads: concrete C 20/25 – $f_{ck,cube}$ = 25 N/mm², Temperature range I

		Data according ETA-04/0027, issue 2009-05-20									Additional Hilti tech. data	
Anchor size		**Ø8**	**Ø10**	**Ø12**	**Ø14**	**Ø16**	**Ø20**	**Ø25**	**Ø28**	**Ø32**	**Ø36**	**Ø40**
Embedment depth	$h_{ef,2}$ = [mm]	96	120	144	168	192	240	300	336	384	432	480
Base material thickness	h_{min}= [mm]	126	150	176	204	232	290	364	406	464	522	590
	**Tensile N_{rec}: single anchor, no edge effects**											
	BSt 500 S [kN]	12,3	19,2	27,7	35,2	45,7	63,9	89,3	105,8	129,3	154,2	180,6
	**Shear V_{rec}: single anchor, no edge effects, without lever arm**											
	BSt 500 S [kN]	6,7	10,5	14,8	20,0	26,2	41,0	64,3	80,5	105,2	133,3	164,6

Recommended loads: concrete C 20/25 – $f_{ck,cube}$ = 25 N/mm², Temperature range I

		Data according ETA-04/0027, issue 2009-05-20									Additional Hilti tech. data	
Anchor size		**Ø8**	**Ø10**	**Ø12**	**Ø14**	**Ø16**	**Ø20**	**Ø25**	**Ø28**	**Ø32**	**Ø36**	**Ø40**
Embedment depth	$h_{ef,2}$ = [mm]	96	120	144	168	192	240	300	336	384	432	480
Base material thickness	h_{min}= [mm]	126	150	176	204	232	290	364	406	464	522	590
Edge distance	c = c_{min}= [mm]	40	50	60	70	80	100	125	140	160	180	200
	**Tensile N_{rec}: single anchor, min. edge distance (c = c_{min})**											
	BSt 500 S [kN]	6,7	10,5	14,9	18,7	22,9	32,0	44,7	52,9	64,7	77,2	90,4
	**Shear V_{rec}: single anchor, min. edge distance (c = c_{min}) , without lever arm**											
	BSt 500 S [kN]	2,8	4,1	5,6	7,3	9,2	13,5	19,9	24,2	30,5	37,3	44,8

Recommended loads: concrete C 20/25 – $f_{ck,cube}$ = 25 N/mm², Temperature range I (load values are valid for single anchor)

		Data according ETA-04/0027, issue 2009-05-20									Additional Additional Hilti tech. data	
Anchor size		**Ø8**	**Ø10**	**Ø12**	**Ø14**	**Ø16**	**Ø20**	**Ø25**	**Ø28**	**Ø32**	**Ø36**	**Ø40**
Embedment depth	$h_{ef,2}$ = [mm]	96	120	144	168	192	240	300	336	384	432	480
Base material thickness	h_{min}= [mm]	126	150	176	204	232	290	364	406	464	522	590
Spacing	s = s_{min}= [mm]	40	50	60	70	80	100	125	140	160	180	200
	**Tensile N_{rec}: double anchor, no edge effects, min. spacing (s = s_{min})**											
	BSt 500 S [kN]	7,8	11,9	16,2	20,4	25,0	34,9	48,7	57,8	70,6	84,2	98,6
	**Shear V_{rec}: double anchor, no edge effects, min. spacing (s = s_{min}) , without lever arm**											
	BSt 500 S [kN]	6,7	10,5	14,8	20,0	26,2	41,0	64,3	80,5	105,2	133,3	164,6

For the recommended loads an overall partial safety factor for action γ = 1,4 is considered. The partial safety factors for action depend on the type of loading and shall be taken from national regulations. According ETAG 001, annex C, the partial safety factor is γ_G = 1,35 for permanent actions and γ_Q = 1,5 for variable actions.