


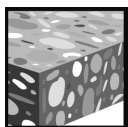


## Hilti HIT-RE 500 with rebar

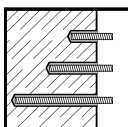
Injection mortar system	Benefits
 <p>Hilti HIT-RE 500 330 ml foil pack (also available as 500 ml and 1400 ml foil pack)</p>  <p>Statik mixer</p>  <p>rebar BSt 500 S</p>	<ul style="list-style-type: none"> <li>- suitable for non-cracked concrete C 20/25 to C 50/60</li> <li>- high loading capacity</li> <li>- suitable for dry and water saturated concrete</li> <li>- under water application</li> <li>- large diameter applications</li> <li>- high corrosion resistant</li> <li>- long working time at elevated temperatures</li> <li>- odourless epoxy</li> <li>- embedment depth range: from 60 ... 160 mm for Ø8 to 128 ... 640 mm for Ø32</li> </ul>



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 <sup>a)</sup>	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

- 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,  $f_{ck,cube} = 25 \text{ N/mm}^2$
- 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

For details see Simplified design method

**Embedment depth <sup>a)</sup> 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 –  $f_{ck,cube} = 25 \text{ N/mm}^2$ , 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 –  $f_{ck,cube} = 25 \text{ N/mm}^2$ , 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 –  $f_{ck,cube} = 25 \text{ N/mm}^2$ , 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 <sup>a)</sup>: concrete C 20/25 –  $f_{ck,cube} = 25 \text{ N/mm}^2$ , 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  $\gamma = 1,4$ . 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  $\gamma_G = 1,35$  for permanent actions and  $\gamma_Q = 1,5$  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

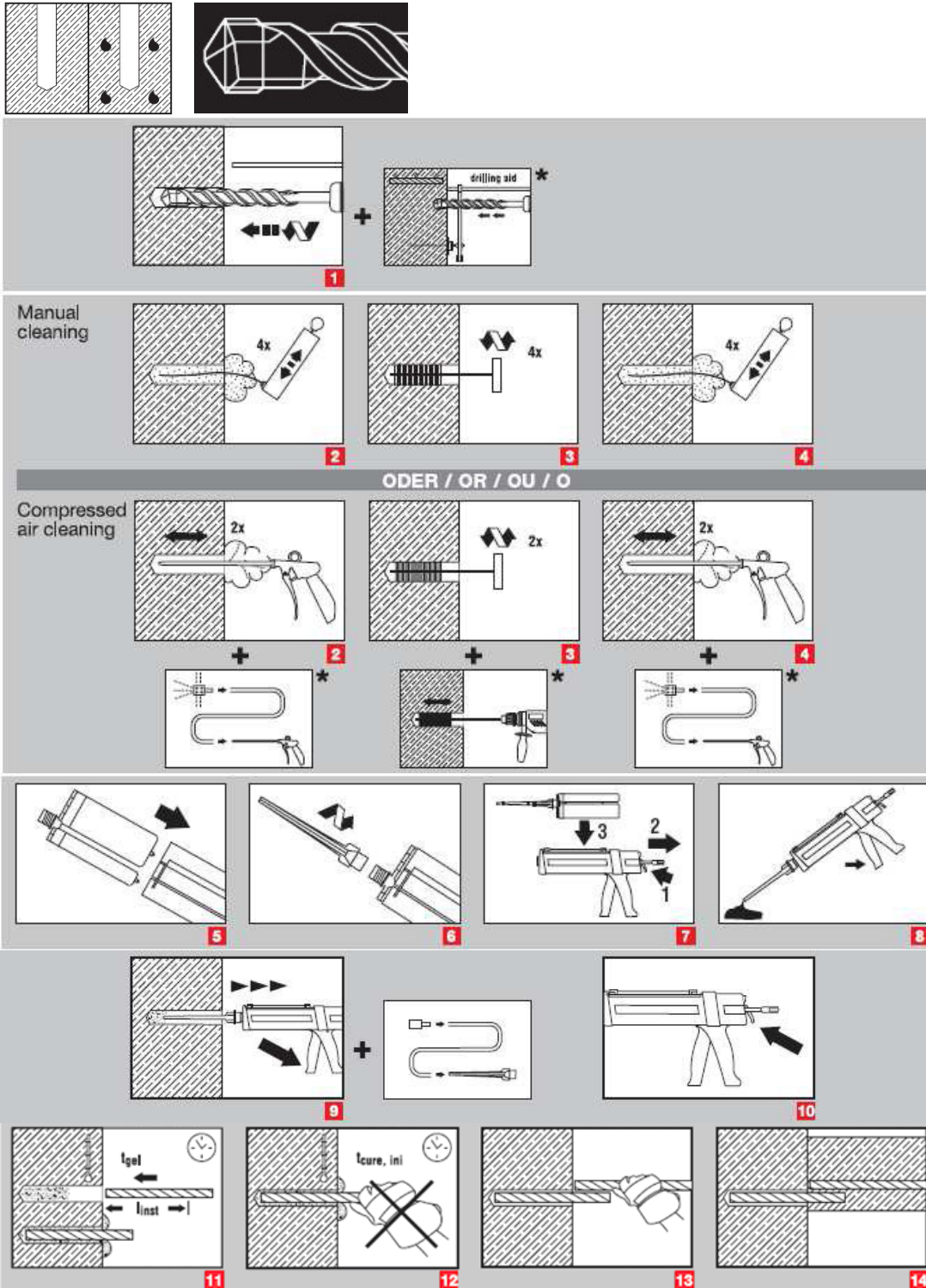
### installation equipment

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 <sup>a)</sup>									

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



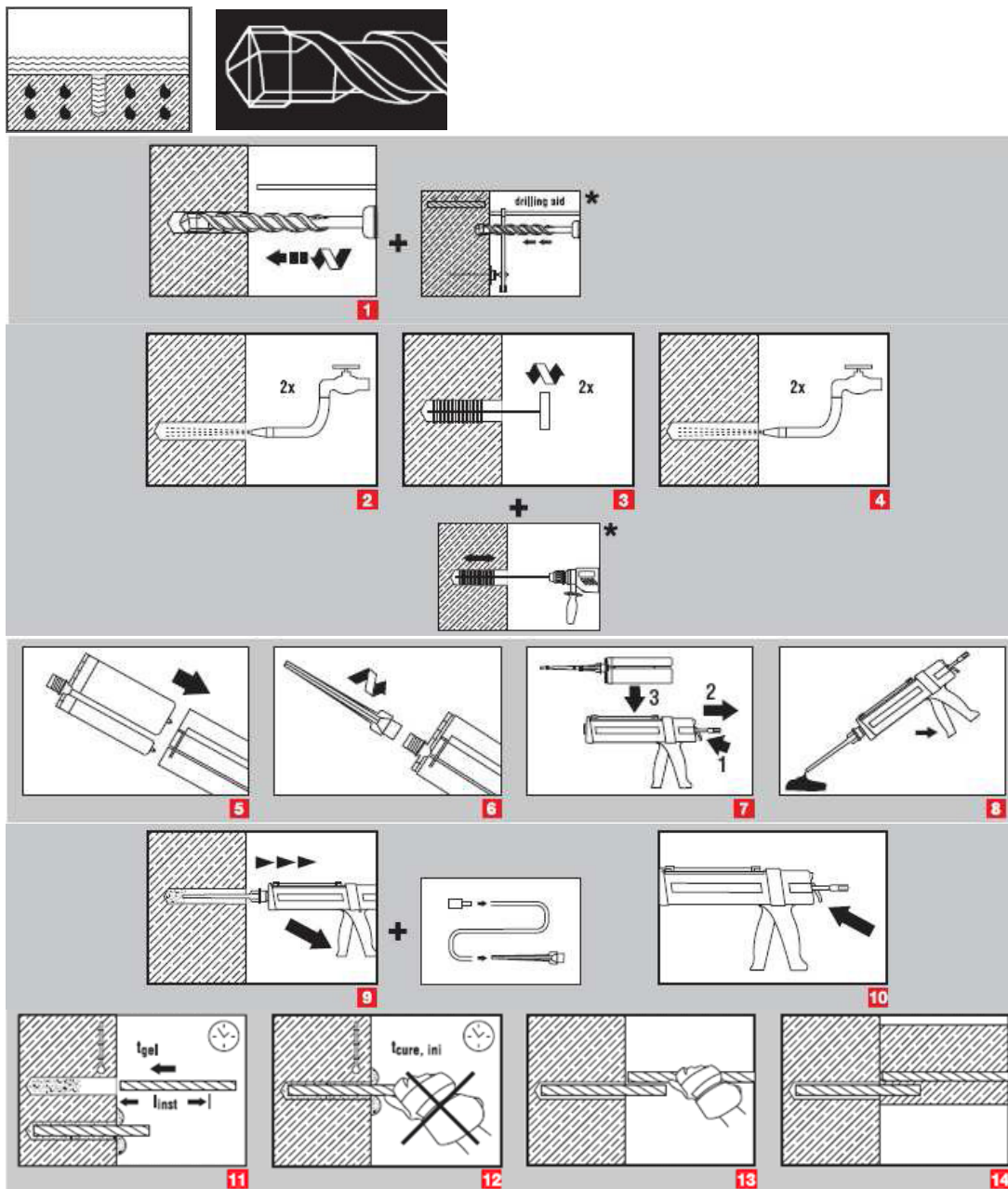
a)

**a) Note:** Manual cleaning only for  $h_{ef} \leq 250$  mm and anchor size  $d \leq 16$  mm

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**

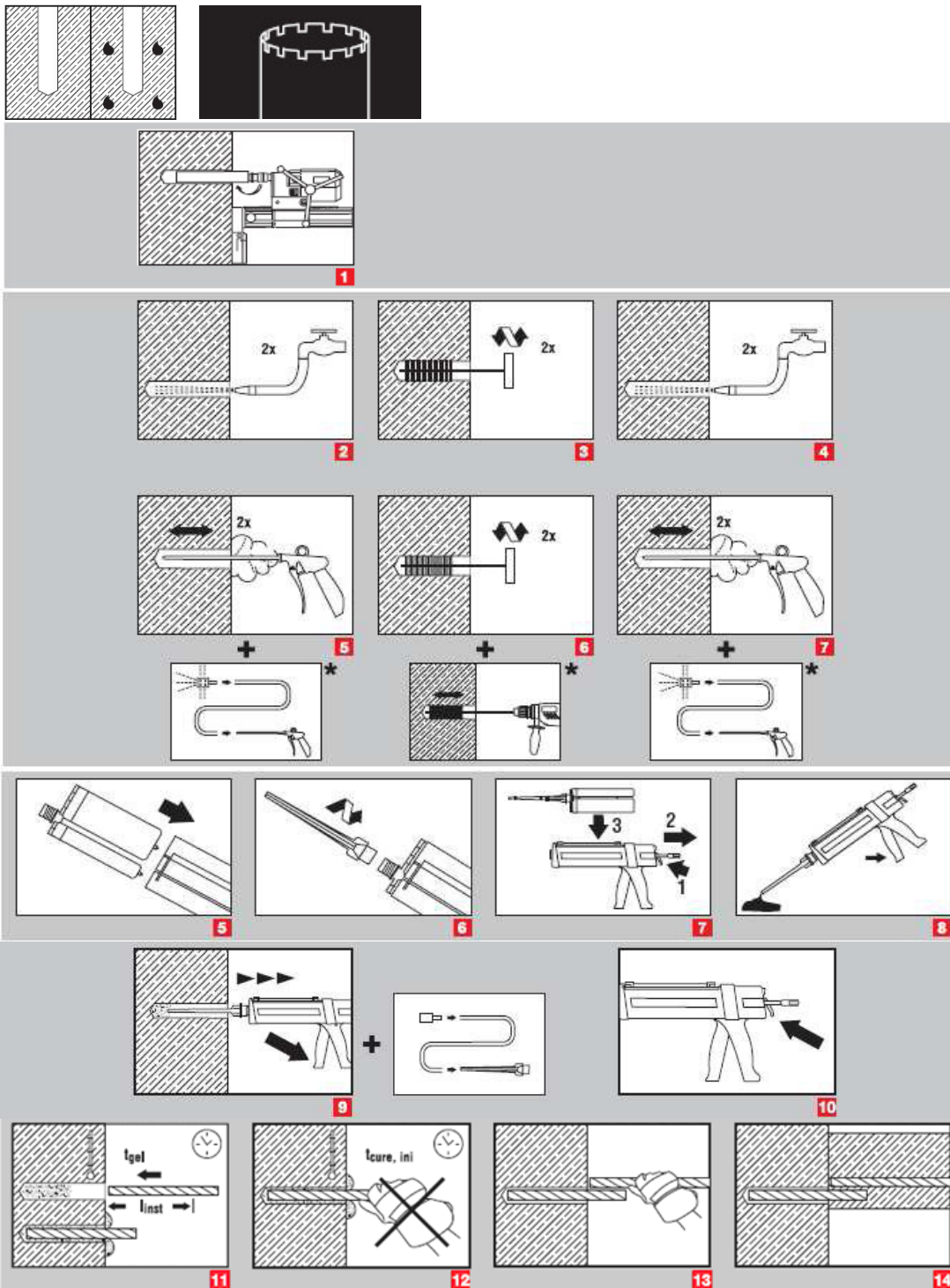


Brush bore hole with required steel brush HIT-RB

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 $t_{\text{cure}}$	Temperature of the base material	Working time in which anchor can be inserted and adjusted $t_{\text{gel}}$	Preparation work may continue. Do not apply design load. $t_{\text{cure, ini}}$
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 $t_{\text{cure, dry}}$	Working time in which anchor can be inserted and adjusted $t_{\text{gel}}$	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 <sub>0</sub>	[mm]	12	14	16	18	20	25	32	35	40	45	55	
Effective anchorage and drill hole depth range <sup>a)</sup>	h <sub>ef,min</sub>	[mm]	60	60	70	75	80	90	100	112	128	144	160	
	h <sub>ef,max</sub>	[mm]	160	200	240	280	320	400	500	560	640	720	800	
Minimum base material thickness	h <sub>min</sub>	[mm]	h <sub>ef</sub> + 30 mm ≥ 100 mm		h <sub>ef</sub> + 2 d <sub>0</sub>									
Minimum spacing	s <sub>min</sub>	[mm]	40	50	60	70	80	100	125	140	160	180	200	
Minimum edge distance	c <sub>min</sub>	[mm]	40	50	60	70	80	100	125	140	160	180	200	
Critical spacing for splitting failure	s <sub>cr,sp</sub>		2 c <sub>cr,sp</sub>											
Critical edge distance for splitting failure <sup>b)</sup>	c <sub>cr,sp</sub>	[mm]	<div><div><div>1,0 · h<sub>ef</sub></div><div>for h / h<sub>ef</sub> ≥ 2,0</div></div><div><div>4,6 h<sub>ef</sub> - 1,8 h</div><div>for 2,0 &gt; h / h<sub>ef</sub> &gt; 1,3:</div></div><div><div>2,26 h<sub>ef</sub></div><div>for h / h<sub>ef</sub> ≤ 1,3:</div></div></div>											
Critical spacing for concrete cone failure	s <sub>cr,N</sub>		2 c <sub>cr,N</sub>											
Critical edge distance for concrete cone failure <sup>c)</sup>	c <sub>cr,N</sub>		1,5 h <sub>ef</sub>											

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

- a)  $h_{ef,min} \leq h_{ef} \leq h_{ef,max}$  ( $h_{ef}$ : embedment depth)
- 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.

### 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 same 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.

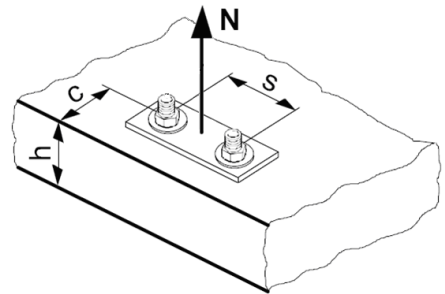
## Tension loading

The design tensile resistance is the lower value of

- Steel resistance:  $N_{Rd,s}$
- Combined pull-out and concrete cone resistance:  

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

$$N_{Rd,sp} = N_{Rd,c}^0 \cdot f_B \cdot f_{1,sp} \cdot f_{2,sp} \cdot f_{3,sp} \cdot f_{h,N} \cdot f_{re,N}$$



## 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

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

	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
$N_{Rd,p}^0$ 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
$N_{Rd,p}^0$ 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
$N_{Rd,p}^0$ 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**  $N_{Rd,c} = N_{Rd,c}^0 \cdot f_B \cdot f_{1,N} \cdot f_{2,N} \cdot f_{3,N} \cdot f_{h,N} \cdot f_{re,N}$   
**Design splitting resistance**  $N_{Rd,sp} = N_{Rd,c}^0 \cdot f_B \cdot f_{1,sp} \cdot f_{2,sp} \cdot f_{3,sp} \cdot f_{h,N} \cdot f_{re,N}$

	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
$N_{Rd,c}^0$ [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

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

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

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)

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

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

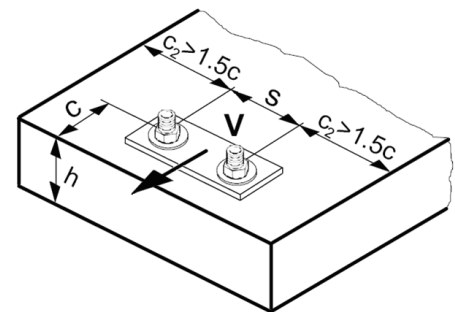
$h_{ef}$ [mm]	40	50	60	70	80	90	≥ 100
$f_{re,N} = 0,5 + h_{ef}/200\text{mm} \leq 1$	0,7 <sup>a)</sup>	0,75 <sup>a)</sup>	0,8 <sup>a)</sup>	0,85 <sup>a)</sup>	0,9 <sup>a)</sup>	0,95 <sup>a)</sup>	1

a) This factor applies only for dense reinforcement. If in the area of anchorage there is reinforcement with a spacing  $\geq 150$  mm (any diameter) or with a diameter  $\leq 10$  mm and a spacing  $\geq 100$  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:  $V_{Rd,cp} = k \cdot \text{lower value of } N_{Rd,p} \text{ and } N_{Rd,c}$
- Concrete edge resistance:  $V_{Rd,c} = V_{Rd,c}^0 \cdot f_B \cdot f_{\beta} \cdot f_h \cdot f_4 \cdot f_{hef} \cdot f_c$



## 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 $V_{Rd,cp} = \text{lower value}^a)$ of $k \cdot N_{Rd,p}$ and $k \cdot N_{Rd,c}$

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

$$k = 2 \text{ for } h_{ef} \geq 60 \text{ mm}$$

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

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

Anchor size	Ø8	Ø10	Ø12	Ø14	Ø16	Ø20	Ø25	Ø28	Ø32	Ø36	Ø40
Non-cracked concrete											
$V_{Rd,c}^0$ [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

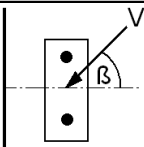
#### Influence of concrete strength

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
$f_B = (f_{ck,cube}/25\text{N/mm}^2)^{1/2 \text{ a)}}$	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 $\beta$	0°	10°	20°	30°	40°	50°	60°	70°	80°	≥ 90°
$f_\beta$	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
$f_h = \{h/(1,5 \cdot c)\}^{1/2} \leq 1$	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 <sup>a)</sup> 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 <sup>a)</sup>

$c/d$	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

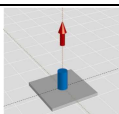
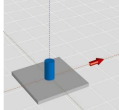
a) The edge distance shall not be smaller than the minimum edge distance  $c_{min}$ .

## Combined tension and shear loading

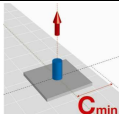
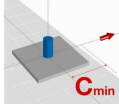
For combined tension and shear loading see section "Anchor Design".

### Precalculated values

Design resistance: concrete C 20/25 –  $f_{ck,cube} = 25 \text{ N/mm}^2$ , Temperature range I

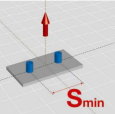
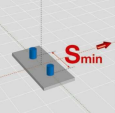
	Data according ETA-04/0027, issue 2009-05-20									Additional Hilti tech. data	
Anchor size	Ø8	Ø10	Ø12	Ø14	Ø16	Ø20	Ø25	Ø28	Ø32	Ø36	Ø40
Embedment depth $h_{ef,1}$ = [mm]	60	60	72	84	96	120	150	168	192	216	240
Base material thickness $h_{min}$ = [mm]	100	100	104	120	136	170	214	238	272	306	350
	Tensile $N_{Rd}$ : 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
	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

Design resistance: concrete C 20/25 –  $f_{ck,cube} = 25 \text{ N/mm}^2$ , Temperature range I

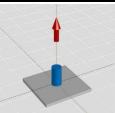
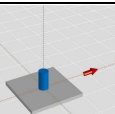
	Data according ETA-04/0027, issue 2009-05-20										Additional Hilti tech. data	
Anchor size	Ø8	Ø10	Ø12	Ø14	Ø16	Ø20	Ø25	Ø28	Ø32	Ø36	Ø40	
Embedment depth $h_{ef,1} =$ [mm]	60	60	72	84	96	120	150	168	192	216	240	
Base material thickness $h_{min}=$ [mm]	100	100	104	120	136	170	214	238	272	306	350	
Edge 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



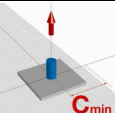
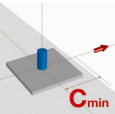
**Design resistance: concrete C 20/25 –  $f_{ck,cube} = 25 \text{ N/mm}^2$ , Temperature range I**  
(load values are valid for single anchor)

	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 $h_{ef,1} = [\text{mm}]$	60	60	72	84	96	120	150	168	192	216	240	
Base material thickness $h_{min} = [\text{mm}]$	100	100	104	120	136	170	214	238	272	306	350	
Spacing $s = s_{min} = [\text{mm}]$	40	50	60	70	80	100	125	140	160	180	200	
	<b>Tensile <math>N_{Rd}</math>: double anchor, no edge effects, min. spacing (<math>s = s_{min}</math>)</b>											
	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
	<b>Shear <math>V_{Rd}</math>: double anchor, no edge effects, min. spacing (<math>s = s_{min}</math>), without lever arm</b>											
	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

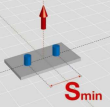
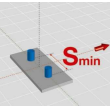
**Design resistance: concrete C 20/25 –  $f_{ck,cube} = 25 \text{ N/mm}^2$ , Temperature range I**

	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 $h_{ef,typ} = [\text{mm}]$	80	90	110	125	125	170	210	270	300	330	360	
Base material thickness $h_{min} = [\text{mm}]$	110	120	142	161	165	220	274	340	380	420	470	
	<b>Tensile <math>N_{Rd}</math>: single anchor, no edge effects</b>											
	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
	<b>Shear <math>V_{Rd}</math>: single anchor, no edge effects, without lever arm</b>											
	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

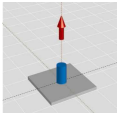
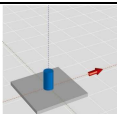
**Design resistance: concrete C 20/25 –  $f_{ck,cube} = 25 \text{ N/mm}^2$ , Temperature range I**

	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 $h_{ef,typ} = [\text{mm}]$	80	90	110	125	125	170	210	270	300	330	360	
Base material thickness $h_{min} = [\text{mm}]$	110	120	142	161	165	220	274	340	380	420	470	
Edge distance $c = c_{min} = [\text{mm}]$	40	50	60	70	80	100	125	140	160	180	200	
	<b>Tensile <math>N_{Rd}</math>: single anchor, min. edge distance (<math>c = c_{min}</math>)</b>											
	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
	<b>Shear <math>V_{Rd}</math>: single anchor, min. edge distance (<math>c = c_{min}</math>), without lever arm</b>											
	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

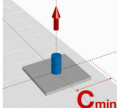
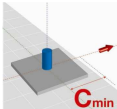
**Design resistance: concrete C 20/25 –  $f_{ck,cube} = 25 \text{ N/mm}^2$ , Temperature range I**  
(load values are valid for single anchor)

	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

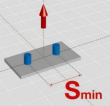
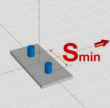
**Design resistance: concrete C 20/25 –  $f_{ck,cube} = 25 \text{ N/mm}^2$ , Temperature range I**

		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 –  $f_{ck,cube} = 25 \text{ N/mm}^2$ , Temperature range I**

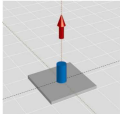
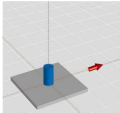
		Data according ETA-04/0027, issue 2009-05-20									Additional Hilti tech. data	
Anchor size		Ø8	Ø10	Ø12	Ø14	Ø16	Ø20	Ø25	Ø28	Ø32	Ø36	Ø40
Embedment depth $h_{ef,2} =$ [mm]		96	120	144	168	192	240	300	336	384	432	480
Base material thickness $h_{min} =$ [mm]		126	150	176	204	232	290	364	406	464	522	590
Edge distance $c = c_{min} =$ [mm]		40	50	60	70	80	100	125	140	160	180	200
	<b>Tensile <math>N_{Rd}</math>: single anchor, min. edge distance (<math>c = c_{min}</math>)</b>											
	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
	<b>Shear <math>V_{Rd}</math>: single anchor, min. edge distance (<math>c = c_{min}</math>) , without lever arm</b>											
	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 –  $f_{ck,cube} = 25 \text{ N/mm}^2$ , Temperature range I**  
(load values are valid for single anchor)

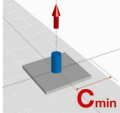
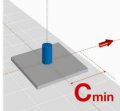
		Data according ETA-04/0027, issue 2009-05-20								Additional Hilti tech. data		
Anchor size		Ø8	Ø10	Ø12	Ø14	Ø16	Ø20	Ø25	Ø28	Ø32	Ø36	Ø40
Embedment depth $h_{ef,2} =$ [mm]		96	120	144	168	192	240	300	336	384	432	480
Base material thickness $h_{min} =$ [mm]		126	150	176	204	232	290	364	406	464	522	590
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

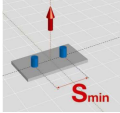
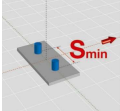
Recommended loads: concrete C 20/25 –  $f_{ck,cube} = 25 \text{ N/mm}^2$ , Temperature range I

		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	$h_{ef,1} = [\text{mm}]$	60	60	72	84	96	120	150	168	192	216	240
Base material thickness	$h_{min} = [\text{mm}]$	100	100	104	120	136	170	214	238	272	306	350
	<b>Tensile <math>N_{rec}</math>: single anchor, no edge effects</b>											
	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
	<b>Shear <math>V_{rec}</math>: single anchor, no edge effects, without lever arm</b>											
	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 –  $f_{ck,cube} = 25 \text{ N/mm}^2$ , Temperature range I

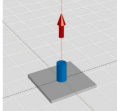
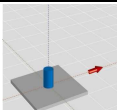
		Data according ETA-04/0027, issue 2009-05-20									Additional Hilti tech. data	
Anchor size		Ø8	Ø10	Ø12	Ø14	Ø16	Ø20	Ø25	Ø28	Ø32	Ø36	Ø40
Embedment depth	$h_{ef,1} = [\text{mm}]$	60	60	72	84	96	120	150	168	192	216	240
Base material thickness	$h_{min} = [\text{mm}]$	100	100	104	120	136	170	214	238	272	306	350
Edge distance	$c = c_{min} = [\text{mm}]$	40	50	60	70	80	100	125	140	160	180	200
	<b>Tensile <math>N_{rec}</math>: single anchor, min. edge distance (<math>c = c_{min}</math>)</b>											
	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
	<b>Shear <math>V_{rec}</math>: single anchor, min. edge distance (<math>c = c_{min}</math>), without lever arm</b>											
	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 –  $f_{ck,cube} = 25 \text{ N/mm}^2$ , Temperature range I  
(load values are valid for single anchor)

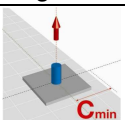
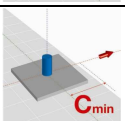
		Data according ETA-04/0027, issue 2009-05-20									Additional Hilti tech. data	
Anchor size		Ø8	Ø10	Ø12	Ø14	Ø16	Ø20	Ø25	Ø28	Ø32	Ø36	Ø40
Embedment depth	$h_{ef,1} = [\text{mm}]$	60	60	72	84	96	120	150	168	192	216	240
Base material thickness	$h_{min} = [\text{mm}]$	100	100	104	120	136	170	214	238	272	306	350
Spacing	$s = s_{min} = [\text{mm}]$	40	50	60	70	80	100	125	140	160	180	200
	<b>Tensile <math>N_{rec}</math>: double anchor, no edge effects, min. spacing (<math>s = s_{min}</math>)</b>											
	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
	<b>Shear <math>V_{rec}</math>: double anchor, no edge effects, min. spacing (<math>s = s_{min}</math>), without lever arm</b>											
	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  $\gamma = 1,4$  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  $\gamma_G = 1,35$  for permanent actions and  $\gamma_Q = 1,5$  for variable actions.

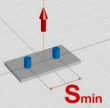
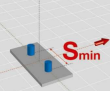
## Recommended loads: concrete C 20/25 – $f_{ck,cube} = 25 \text{ N/mm}^2$ , Temperature range I

	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 – $f_{ck,cube} = 25 \text{ N/mm}^2$ , 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

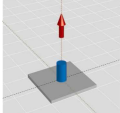
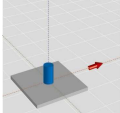
## Recommended loads: concrete C 20/25 – $f_{ck,cube} = 25 \text{ N/mm}^2$ , Temperature range I (load values are valid for single anchor)

	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

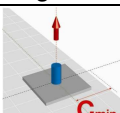
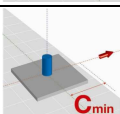
For the recommended loads an overall partial safety factor for action  $\gamma = 1,4$  is considered. The partial safety factors for action depend on the type of loading and shall be taken from national regulations. According ETAG 001, annex C, the partial safety factor is  $\gamma_G = 1,35$  for permanent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



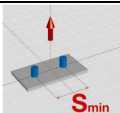
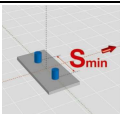
**Recommended loads: concrete C 20/25 –  $f_{ck,cube} = 25 \text{ N/mm}^2$ , Temperature range I**

	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 $h_{ef,2} = [\text{mm}]$	96	120	144	168	192	240	300	336	384	432	480
Base material thickness $h_{min} = [\text{mm}]$	126	150	176	204	232	290	364	406	464	522	590
 <b>Tensile <math>N_{rec}</math>: single anchor, no edge effects</b>											
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
 <b>Shear <math>V_{rec}</math>: single anchor, no edge effects, without lever arm</b>											
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 –  $f_{ck,cube} = 25 \text{ N/mm}^2$ , 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 $h_{ef,2} = [\text{mm}]$	96	120	144	168	192	240	300	336	384	432	480
Base material thickness $h_{min} = [\text{mm}]$	126	150	176	204	232	290	364	406	464	522	590
Edge distance $c = c_{min} = [\text{mm}]$	40	50	60	70	80	100	125	140	160	180	200
 <b>Tensile <math>N_{rec}</math>: single anchor, min. edge distance (<math>c = c_{min}</math>)</b>											
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
 <b>Shear <math>V_{rec}</math>: single anchor, min. edge distance (<math>c = c_{min}</math>), without lever arm</b>											
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 –  $f_{ck,cube} = 25 \text{ N/mm}^2$ , 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 $h_{ef,2} = [\text{mm}]$	96	120	144	168	192	240	300	336	384	432	480
Base material thickness $h_{min} = [\text{mm}]$	126	150	176	204	232	290	364	406	464	522	590
Spacing $s = s_{min} = [\text{mm}]$	40	50	60	70	80	100	125	140	160	180	200
 <b>Tensile <math>N_{rec}</math>: double anchor, no edge effects, min. spacing (<math>s = s_{min}</math>)</b>											
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
 <b>Shear <math>V_{rec}</math>: double anchor, no edge effects, min. spacing (<math>s = s_{min}</math>), without lever arm</b>											
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  $\gamma = 1,4$  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  $\gamma_G = 1,35$  for permanent actions and  $\gamma_Q = 1,5$  for variable actions.

