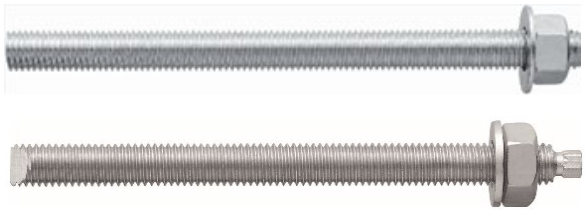
HIT-HY 170
INJECTION MORTAR

Product Technical Datasheet
Steel-to-concrete
Update: Jan 25

HIT-HY 170 injection mortar

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

Injection mortar system		Benefits
	Hilti HIT-HY 170 500 ml foil pack (also available as 330 ml foil pack)	- Suitable for non-cracked and cracked concrete C 20/25 to C 50/60. - Suitable for dry and water saturated concrete. - Small edge distance and anchor spacing possible. - High corrosion / corrosion resistant. - In service temperature range up to 80ºC short term / 50ºC long term.
	Anchor rod:M8-M24 HAS, HAS HDG, HAS A4, HAS-U, HAS-U HDG, HAS-U A4, HAS-U HCR	
	Internally threaded sleeve: HIS-N HIS-RN (M8-M16)	
	Rebar(Ø8 -Ø25)	

Application condition

Base material

Concrete (non-cracked)

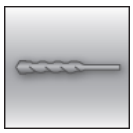
Concrete (cracked)

Load conditions

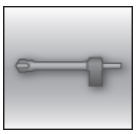
Static/ quasi-static

Seismic, ETA-C2

Installation conditions



Hammer drilled holes



Hollow drill-bit drilling

Other information

Hilti Technical Data

Linked Approvals/Certificates and Instructions for use.

Approvals/certificates

Approval no.	Application / loading condition	Authority / Laboratory	Date of issue
ETA-19/0465 (HAS, HAS-U)	Static and quasi-static / Seismic	DIBt, Berlin	10-09-2024
ETA-14/0457 HIS-(R)N	Static and quasi-static	DIBt, Berlin	14-12-2017
Hilti Technical data	Static and quasi-static	Hilti	-

Instructions for use(IFU)

Material			
Injection mortar/ Fastener	IFU HIT-HY 170		
Dispenser	IFU HDM	IFU HDE 500 A12	IFU HDE 500 22
Accessory	IFU Filling set		

Link to Hilti Webpage

Injection mortars / Dispenser / Accessories				
Hilti HIT-HY 170	HDE 500-22	HDE 500-A12	HDM 500	Filling set

Fastener: Threaded rod		
HAS-U	HAS	HIS-N

Fastener special dimensions

Mechanical properties and dimensions HAS and HAS-U

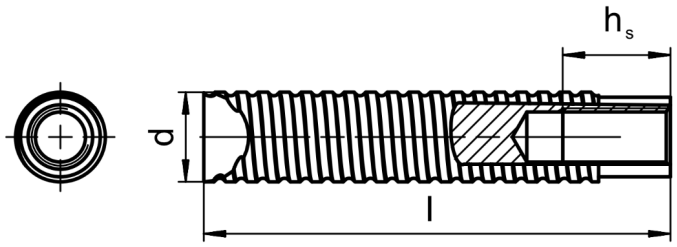
Mechanical properties and dimensions of the threaded rods are standardized and can be taken from the ETA listed in the table Approvals / Certificates.

Mechanical properties and dimensions HIS-N and HIS-RN

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

Dimensions for HIS-N and HIS-RN

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



Mechanical properties and dimensions rebar

Mechanical properties and dimensions of the rebars B500 B are standardized

Material quality

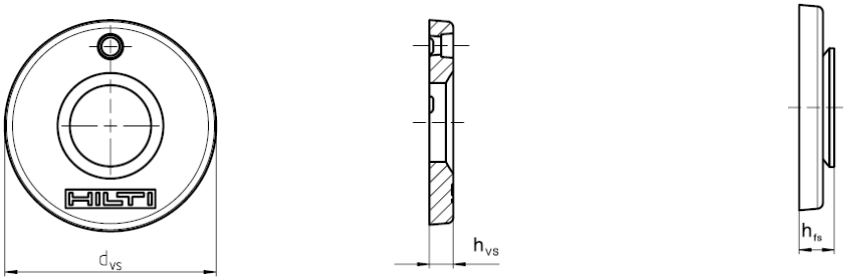
Part	Material
Rebar	Bars and de-coiled rods class B or C according to NDP or NCL of EN 1992-1-1

Mechanical properties and dimensions filling washer for use with standard nut

Mechanical properties of the filling washer can be taken from the ETA's listed in the table Approvals / Certificates.

Dimensions filling washer

Anchor size			M12	M16
Diameter	d_{vs}	[mm]	44	52
Height of filling washer	h_{vs}	[mm]	5	6
Height of filling washer and spherical washer	h_{fs}	[mm]	10	11



Static and quasi-static loading based on ETA-19/0465, ETA-14/0457 , Hilti technical data and Design according to EN 1992-4

All data in this section applies to:

- Correct setting (see setting instruction)
- No edge distance and spacing influence (see setting detail tables with characteristic distances)
- Base material thickness as specified in the table
- Hammer drilled holes
- hammer drilled holes with Hilti hollow drill bit (TE-CD, TE-YD)-Applicable for anchor rod
- Embedment depth, as specified in the table
- Concrete C20/25
- Design values of the bond strength for a working life of 50 Years
- Anchor material, as specified in the tables of this section (HIS-N with screw grade 8.8 and HIS-RN with screw grade 70)
- In-servce temperature range I:
  (max. long term temperature +24 °C and max. short term temperature +40 °C)
- The following data are valid for short term loading with a $\psi_{sus} = 1$
  For long term loading apply ψ_{sus} acc. to EN 1992-4 with ψ^0_{sus} value take from relevant ETA
- Recommended loads: with overall partial safety factor for action γ = 1,4

Embedment depth and base material thickness

Anchor size			**M8**	**M10**	**M12**	**M16**	**M20**	**M24**
HAS, HAS-U								
Embedment depth	h_{ef}	[mm]	80	90	110	125	170	210
Base material thickness	h	[mm]	110	120	140	160	220	270
HIS-N								
Embedment depth	h_{ef}	[mm]	90	110	125	170	-	-
Base material thickness	h	[mm]	120	150	170	230	-	-

Embedment depth and base material thickness

Rebar B500B size			**ϕ8**	**ϕ10**	**ϕ12**	**ϕ14**	**ϕ16**	**ϕ18**	**ϕ20**	**ϕ22**	**ϕ24**	**ϕ25**
Embedment depth	h_{ef}	[mm]	80	90	110	125	145	155	170	185	200	210
Base material thickness	h	[mm]	110	120	140	161	185	199	220	237	256	274

Design resistance

Anchor size				**M8**	**M10**	**M12**	**M16**	**M20**	**M24**
Non-cracked concrete									
Tension	HAS-U 5.8 HAS 5.8	N_{Rd}	[kN]	12,2	19,3	28,1	45,6	72,7	99,8
	HAS-U 8.8 HAS 8.8			14,6	20,5	30,1	45,6	72,7	99,8
	HAS-U A4 HAS A4			13,7	20,5	30,1	45,6	72,7	99,8
	HAS-U HCR			14,6	20,5	30,1	45,6	72,7	99,8
	HIS-N 8.8			16,7	30,7	44,7	72,7	-	-
	HIS-RN			13,9	21,9	31,6	58,8	-	-
Shear	HAS-U 5.8 HAS 5.8	V_{Rd}	[kN]	8,8	13,9	20,2	37,7	58,8	84,7
	HAS-U 8.8 HAS 8.8			11,7	18,6	27,0	50,2	78,4	113,0
	HAS-U A4 HAS A4			8,2	13,0	18,9	35,2	55,0	79,2
	HAS-U HCR			11,7	18,6	27,0	50,2	78,4	70,6
	HIS-N 8.8			10,4	18,4	27,2	50,4	-	-
	HIS-RN			8,3	12,8	19,2	35,3	-	-

Design resistance

Cracked concrete									
Tension	HAS-U 5.8 HAS 5.8	N_{Rd}	[kN]	-	10,9	16,0	24,3	44,1	65,4
	HAS-U 8.8 HAS 8.8			-	10,9	16,0	24,3	44,1	65,4
	HAS-U A4 HAS A4			-	10,9	16,0	24,3	44,1	65,4
	HAS-U HCR			-	10,9	16,0	24,3	44,1	65,4
Shear	HAS-U 5.8 HAS 5.8	V_{Rd}	[kN]	-	13,9	20,2	37,7	58,8	84,7
	HAS-U 8.8 HAS 8.8			-	18,6	27,0	48,6	78,4	113,0
	HAS-U A4 HAS A4			-	13,0	18,9	35,2	55,0	79,2
	HAS-U HCR			-	18,6	27,0	48,6	78,4	70,6

Recommended loads

Anchor size				**M8**	**M10**	**M12**	**M16**	**M20**	**M24**
Non-cracked concrete									
Tension	HAS-U 5.8 HAS 5.8	N_{Rec}	[kN]	8,7	13,8	20,1	32,6	51,9	71,3
	HAS-U 8.8 HAS 8.8			10,4	14,7	21,5	32,6	51,9	71,3
	HAS-U A4 HAS A4			9,8	14,7	21,5	32,6	51,9	71,3
	HAS-U HCR			10,4	14,7	21,5	32,6	51,9	71,3
	HIS-N 8.8			11,9	21,9	31,9	51,9	-	-
	HIS-RN			9,9	15,7	22,5	42,0	-	-
Shear	HAS-U 5.8 HAS 5.8	V_{Rec}	[kN]	6,3	9,9	14,5	26,9	42,0	60,5
	HAS-U 8.8 HAS 8.8			8,4	13,3	19,3	35,9	56,0	80,7
	HAS-U A4 HAS A4			5,9	9,3	13,5	25,2	39,3	56,6
	HAS-U HCR			8,4	13,3	19,3	35,9	56,0	50,4
	HIS-N 8.8			7,4	13,1	19,4	36,0	-	-
	HIS-RN			6,0	9,2	13,7	25,2	-	-
Cracked concrete									
Tension	HAS-U 5.8 HAS 5.8	N_{Rec}	[kN]	-	7,8	11,4	17,3	31,5	46,7
	HAS-U 8.8 HAS 8.8			-	7,8	11,4	17,3	31,5	46,7
	HAS-U A4 HAS A4			-	7,8	11,4	17,3	31,5	46,7
	HAS-U HCR			-	7,8	11,4	17,3	31,5	46,7
Shear	HAS-U 5.8 HAS 5.8	V_{Rec}	[kN]	-	9,9	14,5	26,9	42,0	60,5
	HAS-U 8.8 HAS 8.8			-	13,3	19,3	34,7	56,0	80,7
	HAS-U A4 HAS A4			-	9,3	13,5	25,2	39,3	56,6
	HAS-U HCR			-	13,3	19,3	34,7	56,0	50,4

Design resistance

Uncracked concrete			Hilti Technical data									
Rebar B500B size			**ϕ8**	**ϕ10**	**ϕ12**	**ϕ14**	**ϕ16**	**ϕ18**	**ϕ20**	**ϕ22**	**ϕ24**	**ϕ25**
Tensile	N_{Rd}	[kN]	13,4	18,8	27,6	36,6	48,6	58,4	71,2	82,5	92,8	99,8
Shear	V_{Rd}	[kN]	11,2	17,6	24,8	33,6	44,0	56,0	68,8	83,2	99,2	108,0

Recommended loads

Uncracked concrete			Hilti Technical data									
Rebar B500B size			**ϕ8**	**ϕ10**	**ϕ12**	**ϕ14**	**ϕ16**	**ϕ18**	**ϕ20**	**ϕ22**	**ϕ24**	**ϕ25**
Tensile	N_{rec}	[kN]	9,6	13,5	19,7	26,2	34,7	41,7	50,9	58,9	66,3	71,3
Shear	V_{rec}	[kN]	8,0	12,6	17,7	24,0	31,4	40,0	49,1	59,4	70,9	77,1

Seismic loading based on ETA-19/465 and design according to EN 1992-4

All data in this section applies to:

- Correct setting (see setting instruction)
- No edge distance and spacing influence (see setting detail tables with characteristic distances)
- Base material thickness as specified in the table
- Hammer drilled holes, hammer drilled holes with Hilti hollow drill bit (TE-CD, TE-YD)
- Embedment depth, as specified in the table
- Concrete C20/25
- Design values of the bond strength for a working life of 50 Years
- Anchor material, as specified in the tables of this section
- In-servce temperature range I: -40 °C to +40 °C
- (max. long term temperature +24 °C and max. short term temperature +40 °C)
- α_{gap} = 1,0 (using Hilti seismic filling set) or α_{gap} = 0,5 (without using Hilti seismic filling set) accordingly

Embedment depth and base material thickness for seismic C2

Anchor size			M12	M16
HAS-U				
Embedment depth	h_{ef}	[mm]	110	125
Base material thickness	h	[mm]	140	160

Design resistance in case of seismic performance category C2

Anchor size				M12	M16
Tensile	HAS 8.8,HAS-U 8.8,	$N_{Rd,seis}$	[kN]	5,5	8,0
	HAS 8.8 HDG, HAS-U 8.8 HDG,			5,5	8,0
with Hilti filling set					
Shear	HAS 8.8 ,HAS-U 8.8,	$V_{Rd,seis}$	[kN]	22,4	36,8
	HAS 8.8 HDG ,HAS-U 8.8 HDG			14,4	24,0
without Hilti filling set					
Shear	HAS 8.8 ,HAS-U 8.8	$V_{Rd,seis}$	[kN]	19,2	32,0
	HAS 8.8 HDG ,HAS-U 8.8 HDG			7,2	12,0

Setting information

Installation temperature range
-5 ºC to +40ºC

In service temperature range

Hilti HIT-HY 170 injection mortar with anchor rod may be applied in the temperature ranges given below. An elevated base material temperature leads to a reduction of the design bond resistance.

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

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

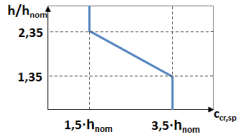
Maximum long term base material temperature
Long-term elevated base material temperatures are roughly constant over significant periods of time.

Curing and working time [a)]

Temperature of the base material [b)]	Maximum working time	Minimum curing time [a)]
T_{BM}	t_{work}	t_{cure}
--5 °C to 0 °C[C)]	10 min	12 h
>0 °C to 5 °C	10 min	5 h
>5 °C to 10 °C	8 min	2,5 h
>10°C to 20 °C	5 min	1,5 h
>20 °C to 30 °C	3 min	45 min
>30 °C to 40 °C	2 min	30 min

a) The curing time data are valid for dry base material only. In wet base material the curing times must be doubled.
b) The minimum temperature of the injection mortar Hilti HIT-HY 170 during installation is + 5 °C

Setting details for HAS, HAS-U

Anchor size			M8	M10	M12	M16	M20	M24
Nominal diameter of drill bit	d_0	[mm]	10	12	14	18	22	28
Diameter of the element	d	[mm]	8	10	12	16	20	24
Effective embedment depth	$h_{ef,min} = h_0$	[mm]	60	60	70	80	90	96
(=drill hole depth) [a]	$h_{ef,max} = h_0$	[mm]	96	120	144	192	240	288
Minimum thickness of concrete member	h_{min}	[mm]	h_{ef} + 30 mm ≥100 mm			h_{ef} + 2 d_0		
Maximum diameter of clearance hole in the fixture	d_f	[mm]	9	12	14	18	22	26
Maximum torque moment[b]	T_{max}	[Nm]	10	20	40	80	150	200
Minimum spacing	s_{min}	[mm]	40	50	60	75	90	115
Minimum edge distance	c_{min}	[mm]	40	45	45	50	55	60
Characteristic distances								
spacing for splitting failure	$s_{cr,sp}$	[mm]	2 $c_{cr,sp}$					
edge distance for splitting failure [c]	$c_{cr,sp}$	[mm]	**1,0 · h_{ef}** for h / h_{ef} ≥ 2,00 **4,6 h_{ef} – 1,8 h** for 2,00 > h / h_{ef} > 1,3 **2,26 h_{ef}** for h / h_{ef} ≤ 1,3					
spacing for concrete cone failure	$s_{cr,N}$	[mm]	2 $c_{cr,sp}$					
edge distance for concrete cone failure [d]	$c_{cr,N}$	[mm]	1,5 h_{ef}					

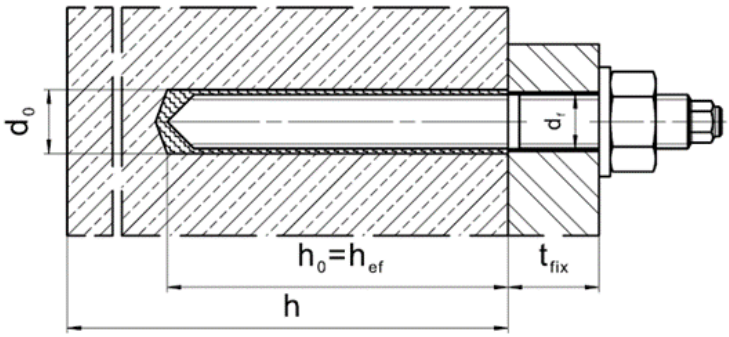
For spacing (edge distance) smaller than characteristic spacing (characteristic edge distance) the design loads must be reduced.

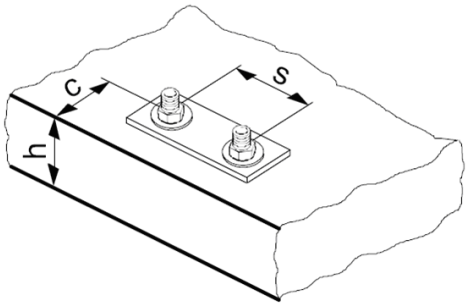
a) $h_{ef,min} \le h_{ef} \le h_{ef,max}$ (h_{ef}: embedment depth)

b) Maximum recommended torque moment to avoid splitting failure during instalation with minimum spacing and edge distance

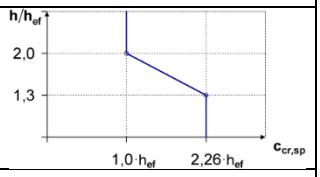
c) h: base material thickness ($h \ge h_{min}$)

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





Setting details for HIS-(R)N

Anchor size			M8	M10	M12	M16
Nominal diameter of drill bit	d_0	[mm]	14	18	22	28
Diameter of element	d	[mm]	12,5	16,5	20,5	25,4
Effective embedment depth (=drill hole depth) a)	h_{ef}	[mm]	90	110	125	170
Minimum base material thickness	h_{min}	[mm]	120	150	170	230
Maximum diameter of clearance hole in the fixture	d_f	[mm]	9	12	14	18
Thread engagement length min-max	h_s	[mm]	8-20	10-25	12-30	16-40
Maximum torque moment b)	T_{max}	[Nm]	10	20	40	80
Minimum spacing	s_{min}	[mm]	60	75	90	115
Minimum edge distance	c_{min}	[mm]	40	45	55	65
Characteristic distances						
spacing for splitting failure	$s_{cr,sp}$	[mm]	$2\ c_{cr,sp}$			
edge distance for splitting failure c)	$c_{cr,sp}$	[mm]	**$1,0 \cdot h_{ef}$**	for $h / h_{ef} \geq 2,0$		
			$4,6\ h_{ef} - 1,8\ h$	for $2,0 > h / h_{ef} > 1,3$		
			$2,26\ h_{ef}$	for $h / h_{ef} \leq 1,3$		
spacing for concrete cone failure	$s_{cr,N}$	[mm]	$2\ c_{cr,N}$			
edge distance for concrete cone failure d)	$c_{cr,N}$	[mm]	$1,5\ h_{ef}$			

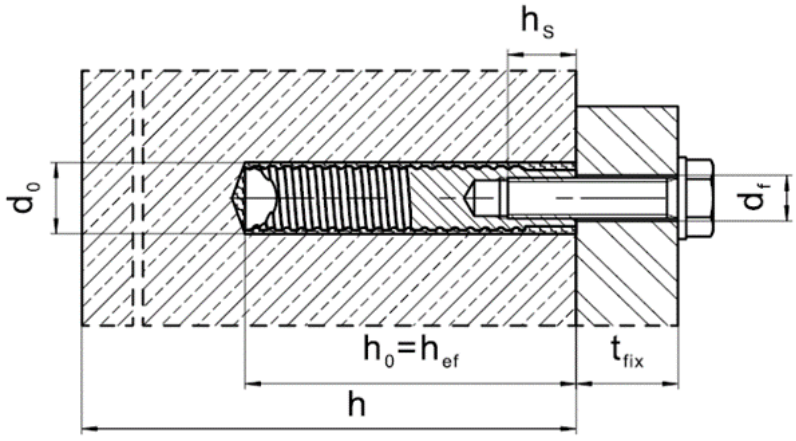
For spacing (edge distance) smaller than characteristic spacing (characteristic edge distance) the design loads must be reduced.

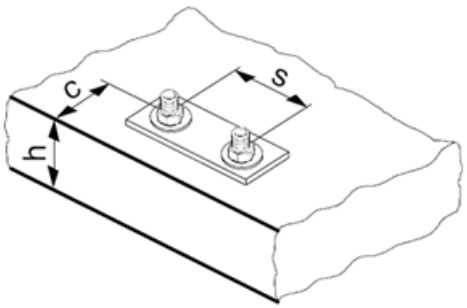
a) $h_{ef,min} \leq h_{ef} \leq h_{ef,max}$ (h_{ef}: embedment depth)

b) Maximum recommended torque moment to avoid splitting failure during instalation with minimum spacing and edge distance

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

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





Setting details

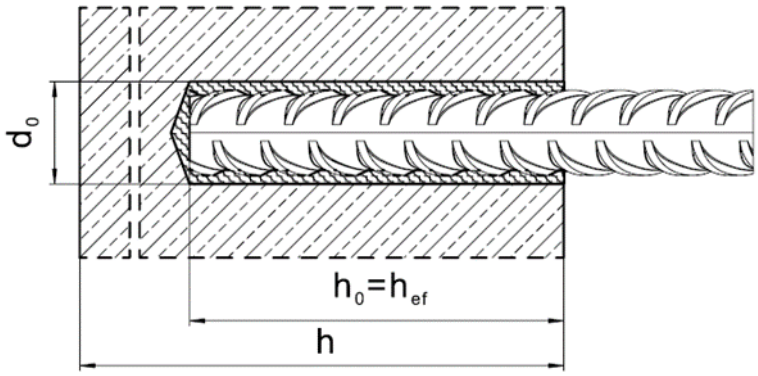
Rebar size			Ø8	Ø10	Ø12		Ø14	Ø16	Ø18	Ø20	Ø22	Ø24	Ø25
Nominal diameter of element	d	[mm]	8	10	12		14	16	18	20	22	24	25
Nominal diameter of drill bit	d_0	[mm]	10 / 12 a)	12 / 14 a)	14 a)	16 a)	18	20	22	25	26	28	32
Effective anchorage depth (=drill hole depth) a)	$h_{ef,min} = h_{0,min}$	[mm]	60	60	70	70	75	80	85	90	95	100	100
	$h_{ef,max} = h_{0,max}$	[mm]	96	120	144	144	168	192	216	240	264	288	300
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	60	70	80	90	100	110	120	125
Minimum edge distance	c_{min}	[mm]	40	50	60	60	70	80	90	100	110	120	125
Characteristic distances													
Spacing for splitting failure	$s_{cr,sp}$	[mm]	2 $c_{cr,sp}$										
Edge distance for splitting failure b)	$c_{cr,sp}$	[mm]	**1,0 · h_{ef}** for h / h_{ef} ≥ 2,0 **4,6 h_{ef} - 1,8 h** for 2,0 > h / h_{ef} > 1,3 **2,26 h_{ef}** for h / h_{ef} ≤ 1,3										
Spacing for concrete cone failure	$s_{cr,N}$	[mm]	2 $c_{cr,N}$										
Edge distance for concrete cone failure c)	$c_{cr,N}$	[mm]	1,5 h_{ef}										

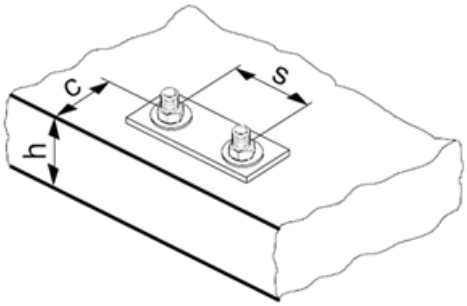
For spacing (edge distance) smaller than characteristic spacing (characteristic edge distance) the design loads must be reduced.

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

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

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





Drilling and Installation equipment

For detailed setting information on installation see instructions for use given with the product.

Rotary Hammers (Corded and Cordless)		TE 2 - TE 70
Dispenser		HDE HDM
Other tools		Blow out pump, Compressed air gun, Set of cleaning brushes
		Hammer drill bit TE-CX, TE-YX, TE-C, TE-Y
		Hollow drill bit TE-CD, TE-YD
		Piston plug