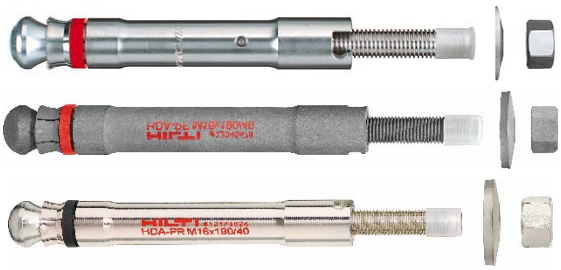
HDA Undercut anchor

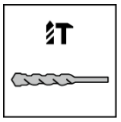
Product Technical Datasheet
Steel-to-concrete
Update: Aug 25

HDA Undercut anchor

Heavy-duty undercut anchor

Anchor version		Benefits
	Anchor for pre-setting HDA-P (M10-M20) HDA-PF (M10-M16) HDA-PR (M10-M16)	- Combines the flexibility and immediate loading capability of a post-installed mechanical anchor with the performance of a cast-in-place headed stud - Close spacing and small edge distances thanks to low expansion forces - Self-undercutting facilitates faster and more reliable installation without need for a separate undercutting tool or additional operations - The resulting keying effect provides a more secure hold even in cracked concrete under dynamic loading - Manufactured under an NQA-1 nuclear quality assurance program with comprehensive approval
	Anchor for through-fastening HDA-T (M10-M20) HDA-TF (M10-M16) HDA-TR (M10-M16)	

Base material		Load conditions				
						
Concrete (uncracked)	Concrete (cracked)	Static/ quasi-static	Seismic, C1, C2	Fatigue	Shock BZS-CH	Fire resistance

Drilling, cleaning, setting	Other information					
						
Hammer drilled holes	Tracefast	ETA Working life 100 years	NQA-1 Nuclear quality assurance	Hilti technical data	PROFIS Engineering Software	Steel to concrete handbook

Linked Approvals/Certificates and Instructions for use

Approvals/certificates

Approval no	Application / loading condition	Authority / Laboratory	Date of issue	Date of expiry
ETA-99/0009	Static and quasi-static / Seismic /Fire	CSTB, Marne-la-Vallèe	06-05-2025	-
ETA-18/0974	Fatigue	DIBt, Berlin	17-07-2025	-
BZS D 09-601	Shockproof fastenings in civil defence installations	Federal Office for Civil Protection, Bern	31-10-2020	31-10-2030
Z-21.1-1987	Nuclear power plants	DIBt, Berlin	16-04-2025	16-04-2030
Hilti Technical Data	Static and quasi-static (HDA –PF and -TF versions)	Hilti Corp.	-	-

Instructions for use (IFU)

Anchor version	M10	M12	M16	M20
P	IFU HDA M10/12-P/PR/PF		IFU HDA M16-P/PR/PF	IFU HDA M20-P
T	IFU HDA M10/M12-T/TR/TF		IFU HDA M16-T/TR/TF	IFU HDA M20-T
Filling set	IFU Filling set			

Link to Hilti Webpage

Anchors					
HDA-P	HDA-T	HDA-PR	HDA-TR	HDA-PF	HDA-TF

Tools					
Setting tool		Stop drill bit		Removal tool	Undercut tool
TE-C-HDA-ST	TE-Y-HDA-ST	TE-C-HDA-B	TE-Y-HDA-B	TE-C-HDA-RT	TE-C-HDA-GT

Fastener special dimensions

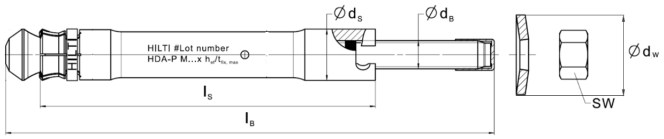
Anchor dimensions

Anchor size				HDA-P / HDA-PR / HDA-T / HDA-TR / HDA-PF / HDA-TF						
				M10	M12		M16		M20[1)]	
				x100/20	x125/30	x125/50	x190/40	x190/60	x250/50	x250/100
Length code letter				I	L	N	R	S	V	X
Total length of bolt		l_B	[mm]	150	190	210	275	295	360	410
Diameter of bolt		d_B	[mm]	10	12		16		20	
Length of sleeve	HDA-P	l_s	[mm]	100	125	125	190	190	250	250
	HDA-T	l_s	[mm]	120	155	175	230	250	300	350
Max. diameter of sleeve		d_S	[mm]	19	21		29		35	
Diameter of washer		d_w	[mm]	27	32		45		50	
Width across flats		SW	[mm]	17	19		24		30	

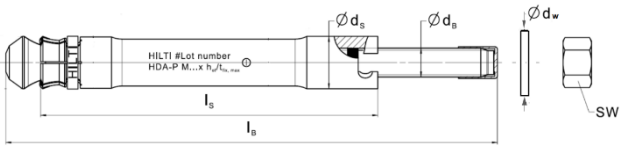
[1)] HDA M20: only galvanized 5µm version is available.

Anchor Type	Material / Coating
HDA-P / HDA-T	Carbon steel, galvanized to min. 5 µm
HDA-PF / HDA-TF	Carbon steel, sherardized
HDA-PR / HDA-TR	Stainless steel A4

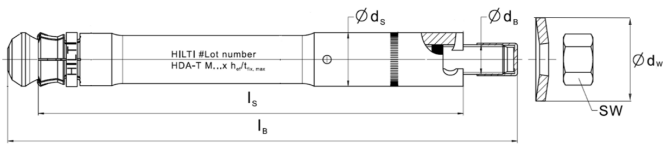
HDA-P / HDA-PF / HDA-PR (M10 / M12 / M16) with Spring washer



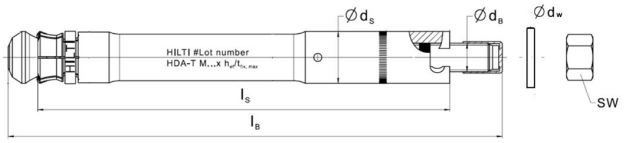
HDA-P (M20) with Flat washer



HDA-T / HDA-TF /HDA-TR (M10 / M12 / M16) with Spring washer



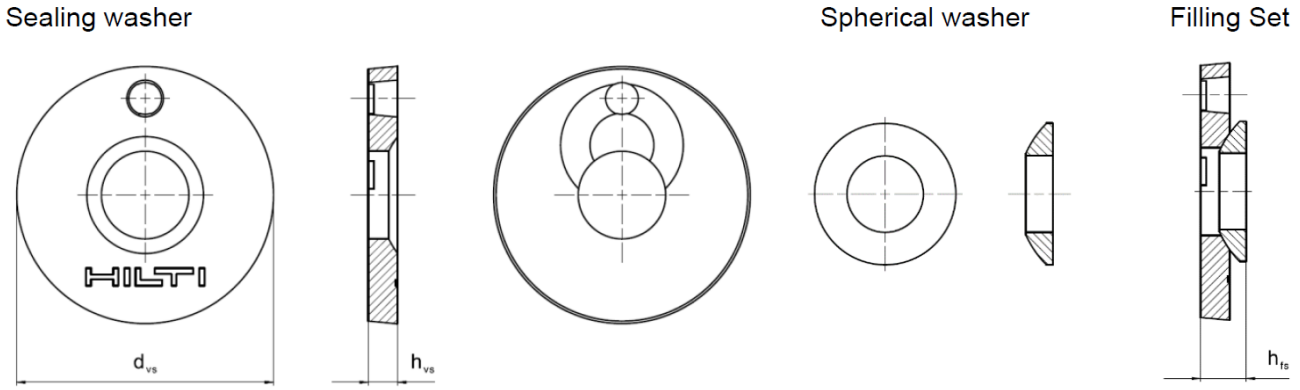
HDA-T (M20) with Flat washer



Hilti filling set with Injection mortar Hilti HIT-HY…

Dimensions of the Filling Set

Anchor type			**HDA-P(R) / HDA-T(R) / HDA-P(F) / HDA-T(F)**			**HDA-P / HDA-T**
Anchor size			**M10**	**M12**	**M16**	**M20**
Diameter	d_{vs}	[mm]	42	44	52	60
Height of filling washer	h_{vs}	[mm]	5	5	6	6
Height of filling washer and spherical washer	h_{fs}	[mm]	9	10	11	13



Static and quasi-static loading based on ETA-99/0009 for HDA-P / HDA-PR / HDA-T / HDA-TR and Hilti technical data for HDA-PF and HDA-TF. Design according to EN 1992-4

All data in this section applies to:

- Correct setting (see Instructions for use (IFU))
- For a single anchor
- No edge distance and spacing influence (see setting detail tables with characteristic distances)
- Characteristic spacing and edge distance for splitting failure apply only for uncracked concrete. For cracked concrete only the characteristic spacing and edge distance for concrete cone failure are decisive
- Minimum base material thickness (see setting detail table)
- Embedment depth, as specified in the table of this section
- Anchor material, as specified in the tables of this section
- The data given below are for 50 and 100-year working life
- Concrete C20/25
- Hammer drilled holes
- Recommended loads: With overall partial safety factor for action γ = 1,4.

For specific design cases refer to PROFIS Engineering.

Design resistance: Tension

Anchor size			M10	M12	M16	M20
Effective anchorage depth	h_{ef}	[mm]	100	125	190	250
Uncracked concrete						
HDA-P, HDA-PF HDA-T, HDA-TF	N_{Rd}	[kN]	30,7	44,7	84,0	128,0
HDA-PR, HDA-TR	N_{Rd}	[kN]	28,8	41,9	78,8	-
Cracked concrete						
HDA-P, HDA-PF HDA-T, HDA-TF	N_{Rd}	[kN]	26,5	37,1	69,5	104,9
HDA-PR, HDA-TR	N_{Rd}	[kN]	26,5	37,1	69,5	-

Design resistance: Shear for uncracked and cracked concrete

Anchor size			M10		M12			M16				M20			
Effective anchorage depth	h_{ef}	[mm]	100		125			190				250			
With and Without Hilti filling set															
HDA-T, HDA-TF	$t_{fix,min}$	[mm]	10	15	10	15	20	15	25	30	35	20	25	40	55
	$t_{fix,max}$	[mm]	<15	20	<15	<20	50	<25	<30	<35	60	<25	<40	<55	100
	V_{Rd}	[kN]	40,5	46,7	51,7	53,3	66,7	94,1	103,3	113,3	126,7	121,8	136,7	156,7	166,7
HDA-TR	$t_{fix,min}$	[mm]	10		10		30	15				-			
	$t_{fix,max}$	[mm]	20		<30		50	60				-			
	V_{Rd}	[kN]	58,1		73,2		82,0	128,6				-			
Without Hilti filling set															
HDA-P, HDA-PF	V_{Rd}	[kN]	21,1		30,2			54,2				83,2			
HDA-PR	V_{Rd}	[kN]	18,9		28,6			57,2				-			
With Hilti filling set															
HDA-P, HDA-PF	V_{Rd}	[kN]	23,4		33,8			57,4				88,8			
HDA-PR	V_{Rd}	[kN]	22,6		34,0			63,8				-			

Recommended loads: Tension

Anchor size			M10	M12	M16	M20
Effective anchorage depth	h_{ef}	[mm]	100	125	190	250
Uncracked concrete						
HDA-P, HDA-PF HDA-T, HDA-TF	N_{rec}	[kN]	21,9	31,9	60,0	91,4
HDA-PR, HDA-TR			20,5	29,9	56,3	-
Cracked concrete						
HDA-P, HDA-PF HDA-T, HDA-TF	N_{rec}	[kN]	19,0	26,5	49,6	74,9
HDA-PR, HDA-TR			19,0	26,5	49,6	-

Recommended loads: Shear for uncracked and cracked concrete

Anchor size			M10		M12			M16				M20			
Effective anchorage depth	h_{ef}	[mm]	100		125			190				250			
with and without Hilti filling set															
HDA-T, HDA-TF	$t_{fix,min}$	[mm]	10	15	10	15	20	15	25	30	35	20	25	40	55
	$t_{fix,max}$	[mm]	<15	20	<15	<20	50	<25	<30	<35	60	<25	<40	<55	100
	V_{rec}	[kN]	29,0	33,3	37,0	38,1	47,6	67,2	73,8	81,0	90,5	87,0	97,6	111,9	119,0
HDA-TR	$t_{fix,min}$	[mm]	10		10		30	15				-			
	$t_{fix,max}$	[mm]	20		<30		50	60				-			
	V_{rec}	[kN]	41,5		52,3		58,5	91,9				-			
without Hilti filling set															
HDA-P, HDA-PF	V_{rec}	[kN]	15,1		21,5			38,7				59,4			
HDA-PR			13,5		20,4			40,9				-			
with Hilti filling set															
HDA-P, HDA-PF	V_{rec}	[kN]	16,7		24,1			41,0				63,4			
HDA-PR			16,2		24,3			45,5				-			

Seismic loading based on ETA-99/0009 for HDA-P / HDA-PR / HDA-T / HDA-TR Design according to EN 1992-4

All data in this section applies to:

- Correct setting (see Instructions for use (IFU))
- For a single anchor
- No edge distance and spacing influence (see setting detail table with characteristic distances)
- Minimum base material thickness (see setting details table)
- Embedment depth, as specified in the table of this section
- Anchor material, as specified in the tables of this section
- The data given below are for 50 and 100-year working life
- Concrete C20/25
- Hammer drilled holes
- α_{gap} = 1,0 (using Hilti filling set) and α_{gap} = 0,5 (without using Hilti filling set) accordingly

For specific design cases refer to PROFIS Engineering.

Design resistance in case of seismic performance category C2: Tension

Anchor size			M10	M12	M16	M20
Effective anchorage depth	h_{ef}	[mm]	100	125	190	250
Cracked concrete						
HDA-P, HDA-T	$N_{Rd,C2}$	[kN]	26,5	37,1	69,5	104,9
HDA-PR, HDA-TR	$N_{Rd,C2}$	[kN]	26,5	37,1	69,5	-

Design resistance in case of seismic performance category C2: Shear

Anchor size			M10		M12			M16				M20			
Effective anchorage depth	h_{ef}	[mm]	100		125			190				250			
Without filling set (α_{gap} = 0,5)															
HDA-T	$t_{fix,min}$	[mm]	10	15	10	15	20	15	25	30	35	20	25	40	55
	$t_{fix,max}$	[mm]	<15	20	<15	<20	50	<25	<30	<35	60	<25	<40	<55	100
	$V_{Rd,C2}$	[kN]	12,2	14,0	18,1	18,7	23,4	28,0	31,0	34,0	38,0	42,7	48,0	55,0	58,4
HDA-TR	$t_{fix,min}$	[mm]	10		10	20	30	15	25	35		-			
	$t_{fix,max}$	[mm]	20		<20	<30	50	<25	<35	60		-			
	$V_{Rd,C2}$	[kN]	16,2		23,0	24,8	28,6	34,2	35,7	38,4		-			
With filling set (α_{gap} = 1,0)															
HDA-T	$t_{fix,min}$	[mm]	10	15	10	15	20	15	25	30	35	20	25	40	55
	$t_{fix,max}$	[mm]	<15	20	<15	<20	50	<25	<30	<35	60	<25	<40	<55	100
	$V_{Rd,C2}$	[kN]	24,3	28,0	36,2	37,3	46,7	56,0	62,0	68,0	76,0	85,3	96,0	110,0	116,7
HDA-TR	$t_{fix,min}$	[mm]	10		10	20	30	15	25	35		-			
	$t_{fix,max}$	[mm]	20		<20	<30	50	<25	<35	60		-			
	$V_{Rd,C2}$	[kN]	32,3		45,9	49,6	57,1	68,4	71,4	76,7		-			
Without filling set (α_{gap} = 0,5)															
HDA-P	$V_{Rd,C2}$	[kN]	9,5		11,1			22,4				33,2			
HDA-PR	$V_{Rd,C2}$	[kN]	8,7		13,6			27,4				-			

Design resistance in case of seismic performance category C2: Shear

Anchor size			M10	M12	M16	M20
With filling set (α_{gap} = 1,0)						
HDA-P	$V_{Rd,C2}$	[kN]	19,0	27,0	49,3	74,1
HDA-PR	$V_{Rd,C2}$	[kN]	17,4	27,1	54,7	-

Design resistance in case of seismic performance category C1: Tension

Anchor size			M10	M12	M16	M20
Effective anchorage depth	h_{ef}	[mm]	100	125	190	250
Cracked concrete						
HDA-P, HDA-T	$N_{Rd,C1}$	[kN]	26,5	37,1	69,5	104,9
HDA-PR, HDA-TR	$N_{Rd,C1}$	[kN]	26,5	37,1	69,5	-

Design resistance in case of seismic performance category C1: Shear

Anchor size			M10		M12			M16				M20			
Effective anchorage depth	h_{ef}	[mm]	100		125			190				250			
Without filling set (α_{gap} = 0,5)															
HDA-T	$t_{fix,min}$	[mm]	10	15	10	15	20	15	25	30	35	20	25	40	55
	$t_{fix,max}$	[mm]	<15	20	<15	<20	50	<25	<30	<35	60	<25	<40	<55	100
	$V_{Rd,C1}$	[kN]	20,3	23,4	25,9	26,7	33,4	47,1	51,7	56,7	63,4	61,0	68,4	78,4	83,4
HDA-TR	$t_{fix,min}$	[mm]	10		10		30	15				-			
	$t_{fix,max}$	[mm]	20		<30		50	60				-			
	$V_{Rd,C1}$	[kN]	29,1		36,6		41,0	64,3				-			
With filling set (α_{gap} = 1,0)															
HDA-T	$t_{fix,min}$	[mm]	10	15	10	15	20	15	25	30	35	20	25	40	55
	$t_{fix,max}$	[mm]	<15	20	<15	<20	50	<25	<30	<35	60	<25	<40	<55	100
	$V_{Rd,C1}$	[kN]	40,5	46,7	51,7	53,3	66,7	94,1	103,3	113,3	126,7	121,8	136,7	156,7	166,7
HDA-TR	$t_{fix,min}$	[mm]	10		10		30	15				-			
	$t_{fix,max}$	[mm]	20		<30		50	60				-			
	$V_{Rd,C1}$	[kN]	58,1		73,2		82,0	128,6				-			
Without filling set (α_{gap} = 0,5)															
HDA-P	$V_{Rd,C1}$	[kN]	10,6		15,1			27,1				41,6			
HDA-PR	$V_{Rd,C1}$	[kN]	9,5		14,3			28,6				-			
With filling set (α_{gap} = 1,0)															
HDA-P	$V_{Rd,C1}$	[kN]	23,4		33,8			57,4				88,8			
HDA-PR	$V_{Rd,C1}$	[kN]	22,6		34,0			63,8				-			

Fire loading based on ETA-99/0009. Design according to EN 1992-4

All data in this section applies to:

- Correct setting (see Instructions for use (IFU))
- For a single anchor
- No edge distance and spacing influence (see setting detail tables with characteristic distances)
- Minimum base material thickness (See setting details table)
- Embedment depth, as specified in the table of this section
- Anchor material, as specified in the tables of this section
- Concrete C20/25
- Hammer drilled holes
- Partial safety factor for resistance under fire exposure $\gamma_{M,fi} = 1{,}0$

For specific design cases refer to PROFIS Engineering.

Anchor size HDA-P			M10	M12	M16	M20
Effective anchorage depth	h_{ef}	[mm]	100	125	190	250
Fire Exposure R30						
Tension	$N_{Rd,fi}$	[kN]	0,87	1,69	3,14	4,81
Shear	$V_{Rd,fi}$	[kN]	0,87	1,69	3,14	4,81
Fire Exposure R60						
Tension	$N_{Rd,fi}$	[kN]	0,75	1,26	2,36	3,61
Shear	$V_{Rd,fi}$	[kN]	0,75	1,26	2,36	3,61
Fire Exposure R90						
Tension	$N_{Rd,fi}$	[kN]	0,58	1,10	2,04	3,13
Shear	$V_{Rd,fi}$	[kN]	0,58	1,10	2,04	3,13
Fire Exposure R120						
Tension	$N_{Rd,fi}$	[kN]	0,46	0,84	1,57	2,41
Shear	$V_{Rd,fi}$	[kN]	0,46	0,84	1,57	2,41

Anchor size HDA-PR			M10	M12	M16
Effective anchorage depth	h_{ef}	[mm]	100	125	190
Fire Exposure R30					
Tension	$N_{Rd,fi}$	[kN]	1,45	2,53	4,71
Shear	$V_{Rd,fi}$	[kN]	1,45	2,53	4,71
Fire Exposure R60					
Tension	$N_{Rd,fi}$	[kN]	1,16	2,11	3,93
Shear	$V_{Rd,fi}$	[kN]	1,16	2,11	3,93
Fire Exposure R90					
Tension	$N_{Rd,fi}$	[kN]	0,93	1,69	3,14
Shear	$V_{Rd,fi}$	[kN]	0,93	1,69	3,14
Fire Exposure R120					
Tension	$N_{Rd,fi}$	[kN]	0,81	1,35	2,51
Shear	$V_{Rd,fi}$	[kN]	0,81	1,35	2,51

Anchor size HDA-T			M10	M12	M16	M20
Effective anchorage depth	h_{ef}	[mm]	100	125	190	250
Fire Exposure R30						
Tension	$N_{Rd,fi}$	[kN]	0,87	1,69	3,14	4,81
Shear	$V_{Rd,fi}$	[kN]	3,88	6,23	12,12	17,77
Fire Exposure R60						
Tension	$N_{Rd,fi}$	[kN]	0,75	1,26	2,36	3,61
Shear	$V_{Rd,fi}$	[kN]	3,36	4,67	9,09	13,32
Fire Exposure R90						
Tension	$N_{Rd,fi}$	[kN]	0,58	1,10	2,04	3,13
Shear	$V_{Rd,fi}$	[kN]	2,59	4,05	7,88	11,55
Fire Exposure R120						
Tension	$N_{Rd,fi}$	[kN]	0,46	0,84	1,57	2,41
Shear	$V_{Rd,fi}$	[kN]	2,07	3,12	6,06	8,88

Anchor size HDA-TR			M10	M12	M16
Effective anchorage depth	h_{ef}	[mm]	100	125	190
Fire Exposure R30					
Tension	$N_{Rd,fi}$	[kN]	1,45	2,53	4,71
Shear	$V_{Rd,fi}$	[kN]	6,47	9,35	18,18
Fire Exposure R60					
Tension	$N_{Rd,fi}$	[kN]	1,16	2,11	3,93
Shear	$V_{Rd,fi}$	[kN]	5,18	7,79	15,15
Fire Exposure R90					
Tension	$N_{Rd,fi}$	[kN]	0,93	1,69	3,14
Shear	$V_{Rd,fi}$	[kN]	4,14	6,23	12,12
Fire Exposure R120					
Tension	$N_{Rd,fi}$	[kN]	0,81	1,35	2,51
Shear	$V_{Rd,fi}$	[kN]	3,62	4,98	9,69

Fatigue loading based on ETA-18/0974. Design according to EN 1992-4

All data in this section applies to:

- Correct setting using Hilti seismic filling set (See setting details)
- For a single anchor
- No edge distance and spacing influence (see table with characteristic distances).
- Characteristic spacing and edge distance for splitting failure apply only for uncracked concrete.
  For cracked concrete only the characteristic spacing and edge distance for concrete cone failure are decisive
- Minimum base material thickness (See setting details)
- Embedment depth, as specified in the table of this section
- Anchor material, as specified in the tables of this section
- Concrete C 20/25
- Hammer drilled holes

For specific design cases refer to PROFIS Engineering.

Design resistance

Anchor size				**M10**	**M12**	**M16**	**M20**
Effective anchorage depth		h_{ef}	[mm]	100	125	190	250
Uncracked concrete							
Tension	HDA-P	$\Delta N_{Rd,0,\infty}$	[kN]	6,8	12,1	16,8	19,8
	HDA-T			6,8	12,1	16,8	19,8
Shear	HDA-P	$\Delta V_{Rd,0,\infty}$	[kN]	1,9	4,4	6,7	13,0
	HDA-T			6,3	11,1	17,0	13,0
Cracked concrete							
Tension	HDA-P	$\Delta N_{Rd,0,\infty}$	[kN]	6,8	12,1	16,8	19,8
	HDA-T			6,8	12,1	16,8	19,8
Shear	HDA-P	$\Delta V_{Rd,0,\infty}$	[kN]	1,9	4,4	6,7	13,0
	HDA-T			6,3	11,1	17,0	13,0

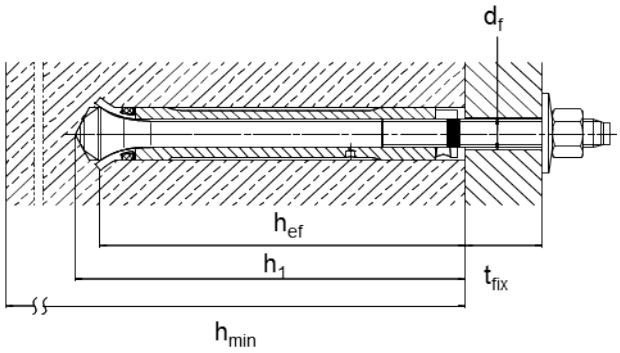
Setting information

Setting details

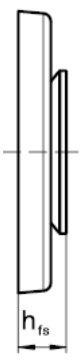
Anchor size			HDA-P / HDA-PR / HDA-PF						
			M10	M12		M16		M20	
			x100/20	x125/30	x125/50	x190/40	x190/60	x250/50	x250/100
Length code letter			I	L	N	R	S	V	X
Nominal diameter of drill bit	d_0	[mm]	20	22		30		37	
Depth of drill hole	h_1	[mm]	107	133		203		266	
Effective anchorage depth	h_{ef}	[mm]	100	125		190		250	
Sleeve recess [1]	$h_{s,min}$	[mm]	2	2		2		2	
	$h_{s,max}$	[mm]	6	7		8		8	
Torque moment	T_{inst}	[Nm]	50	80		120		300	
Max. diameter of clearance hole in the fixture	d_f	[mm]	12	14		18		22	
Minimum base material thickness	h_{min}	[mm]	180	200		270[2]		350	
Minimum spacing	s_{min}	[mm]	80	90		120		150	
Minimum edge distance	c_{min}	[mm]	80	90		120		150	
Fixture thicknesses (Minimum fixture thickness is 10 mm under cyclic loads according to ETA-18/0974)									
Minimum fixture thickness	$t_{fix,min}$	[mm]	0	0		0		0	
Thickness of Hilti filling set	h_{fs}	[mm]	9	10		11		13	
Effective fixture thickness with Hilti filling set	$t_{fix,ef}$	[mm]	$t_{fix} - h_{fs}$						
Characteristic distances									
Spacing for splitting failure	$s_{cr,sp}$	[mm]	300	375		570		750	
Edge distance for splitting failure	$c_{cr,sp}$	[mm]	150	190		285		375	
Spacing for concrete cone failure	$s_{cr,N}$	[mm]	300	375		570		750	
Edge distance for concrete cone failure	$c_{cr,N}$	[mm]	150	190		285		375	

[1] Please see IFU for more information

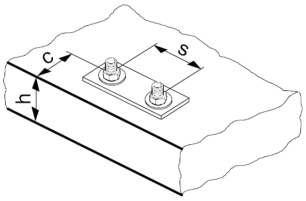
[2] With TE 70-(04) Rotary Hammers: $h_{min} \geq 300$ mm, please see the IFU section for more details.



HDA-P / HDA-PR



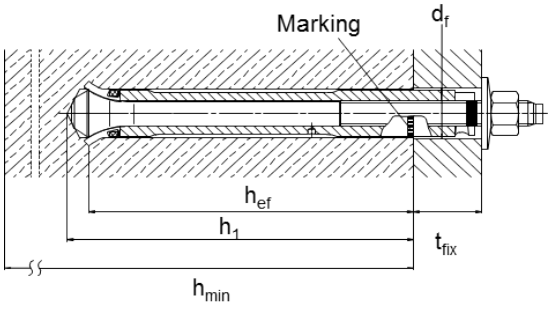
Filling set



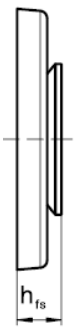
Setting details

Anchor size			HDA-T / HDA-TR / HDA-TF						
			M10	M12		M16		M20	
			x100/20	x125/30	x125/50	x190/40	x190/60	x250/50	x250/100
Length code letter			I	L	N	R	S	V	X
Nominal diameter of drill bit diameter	d_0	[mm]	20	22		30		37	
Depth of drill hole	$h_{1,min}$	[mm]	107	133		203		266	
Effective anchorage depth	h_{ef}	[mm]	100	125		190		250	
Sleeve recess [1]	$h_{s,min}$	[mm]	2	2		2		2	
	$h_{s,max}$	[mm]	6	7		8		8	
Torque moment	T_{inst}	[Nm]	50	80		120		300	
Max. diameter of clearance hole in the fixture	d_f	[mm]	21	23		32		40	
Minimum base material thickness	h_{min}	[mm]	200-t_{fix}	230-t_{fix}	250-t_{fix}	310-t_{fix}	330-t_{fix}	400-t_{fix}	450-t_{fix}
Minimum spacing	s_{min}	[mm]	80	90		120		150	
Minimum edge distance	c_{min}	[mm]	80	90		120		150	
Fixture thicknesses (Minimum fixture thickness is 10 mm under cyclic loads according to ETA-18/0974)									
Minimum fixture thickness	$t_{fix,min}$	[mm]	10	10		15		20	
Max. fixture thickness	$t_{fix,max}$	[mm]	20	30	50	40	60	50	100
Thickness of Hilti filling set	h_{fs}	[mm]	9	10		11		13	
Effective fixture thickness with Hilti filling set	$t_{fix,ef}$	[mm]	t_{fix} - h_{fs}						
Characteristic distances									
Spacing for splitting failure	$s_{cr,sp}$	[mm]	300	375		570		750	
Edge distance for splitting failure	$c_{cr,sp}$	[mm]	150	190		285		375	
Spacing for concrete cone failure	$s_{cr,N}$	[mm]	300	375		570		750	
Edge distance for concrete cone failure	$c_{cr,N}$	[mm]	150	190		285		375	

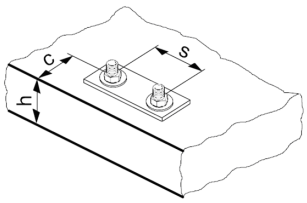
[1] Please see IFU for more information



HDA-T / HDA-TR



Filling set



Drilling and Installation equipment

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

Rotary Hammers (Corded and Cordless)		TE 30 - TE 70
		Torque Tool
		Stop drill bit TE-C-HDA-B / TE-Y-HDA-B
		Setting Tool TE-C-HDA-ST / TE-Y-HDA-ST
		Blow out pump
		Anchor removal tool TE-C-HDA-RT
		Grinding tool TE-C-HDA-GT