HKD Push-in anchor, single anchor application

Anchor version

HKD
(M8-M20)

HKD-S(R)
(M6-M20)

HKD-E(R)
(M6-M20)

Benefits

- Simple and well proven
- Approved, tested and confirmed by everyday jobsite experience
- Reliable setting thanks to simple visual check
- Versatile
- For medium-duty fastening with bolts or threaded rods
- Available in various materials and sizes for maximized coverage of possible applications

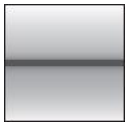
Base material

Concrete (non-cracked)

Concrete (cracked)

Pre-stressed hollow core slabs

Load conditions



Static/ quasi-static

Installation conditions

Hammer drilled holes

Other information

European Technical Assessment

CE conformity

PROFIS Anchor design Software

Corrosion resistance

Approvals / certificates

Description	Authority / Laboratory	No. / date of issue
European Technical Assessment [a)]	CSTB, Marne-la-Vallèe	ETA-02/0032 / 2015-01-07

a) All data given in this section according to ETA-02/0032, issue 2015-01-07.

Static resistance

All data in this section applies to:
- Correct setting (See setting instruction)
- No edge distance and spacing influence
- Concrete as specified in the table
- Steel failure
- Minimum base material thickness
- Concrete C 20/25, $f_{ck,cube}$ = 25 N/mm²
- Screw or rod with steel grade 5.8 (carboon steel) and / or A4-70 (stainless steel)

Effective anchorage depth for static

Anchor size			M6	M8	M10	M12	M16	M8	M8	M10	M10	M12	M16	M20
Eff. anchorage depth range	h_{ef}	[mm]	25	25	25	25	30	30	40	30	40	50	65	80

Mean ultimate resistance

Anchor size			Hilti technical data				ETA-02/0032, issued 2015-01-07							
			M6x25	M8x25	M10x25	M12x25	M6x30	M8x30	M8x40	M10x30	M10x40	M12x50	M16x65	M20x80
Tension $N_{Ru,m}$	HKD	[kN]	8,4	8,4	8,4	8,4	-	11,0	13,1	11,0	17,0	23,8	32,9	48,1
	HKD-S, HKD-E		8,2	-	-	-	10,6	10,8	16,6	10,8	16,6	23,3	34,5	47,1
	HKD-SR, HKD-ER		8,2	-	-	-	10,6	10,8	-	-	16,6	23,3	34,5	47,1
Shear $V_{Ru,m}$	HKD	[kN]	*5,5*	6,9	6,9	6,9	-	*9,4*	*10,1*	*11,0*	*12,2*	*20,1*	*37,1*	*53,9*
	HKD-S, HKD-E		*6,5*	-	-	-	*6,5*	*9,1*	*9,1*	*9,6*	*10,4*	*18,3*	*28,5*	*45,1*
	HKD-SR, HKD-ER		*8,3*	-	-	-	*7,0*	*10,9*	-	-	*13,7*	*24,3*	*41,7*	*66,3*

Characteristic resistance

Anchor size			Hilti technical data				ETA-02/0032, issued 2015-01-07							
			M6x25	M8x25	M10x25	M12x25	M6x30	M8x30	M8x40	M10x30	M10x40	M12x50	M16x65	M20x80
Tension N_{Rk}	HKD	[kN]	6,3	6,3	6,3	6,3	-	8,3	9,0	8,3	12,8	17,8	26,4	36,1
	HKD-S, HKD-E		6,3	-	-	-	8,3	8,3	9,0	8,3	12,8	17,8	26,4	36,1
	HKD-SR, HKD-ER		6,3	-	-	-	8,3	8,3	-	-	12,8	17,8	26,4	36,1
Shear V_{Rk}	HKD	[kN]	*5,0*	6,3	6,3	6,3	-	*8,6*	*9,2*	*10,0*	*11,0*	*18,3*	*33,8*	*49,0*
	HKD-S, HKD-E		*5,0*	-	-	-	*5,0*	*7,0*	*7,0*	*7,4*	*8,0*	*14,1*	*21,9*	*34,7*
	HKD-SR, HKD-ER		*6,2*	-	-	-	*6,4*	*8,4*	-	-	*10,5*	*18,7*	*32,1*	*51,0*

Design resistance

Anchor size			Hilti technical data				ETA-02/0032, issued 2015-01-07							
			M6x25	M8x25	M10x25	M12x25	M6x30	M8x30	M8x40	M10x30	M10x40	M12x50	M16x65	M20x80
Tension N_{Rd}	HKD	[kN]	4,2	4,2	4,2	4,2	-	5,5	6,0	5,5	8,5	11,9	17,6	24,0
	HKD-S, HKD-E		3,0	-	-	-	4,6	4,6	5,0	4,6	7,1	9,9	17,6	24,0
	HKD-SR, HKD-ER		3,0	-	-	-	4,6	4,6	-	-	7,1	9,9	17,6	24,0
Shear V_{Rd}	HKD	[kN]	*4,0*	4,2	4,2	4,2	-	*6,9*	*7,3*	*8,0*	*8,8*	*14,6*	*27,0*	*39,4*
	HKD-S, HKD-E		*3,9*	-	-	-	*3,9*	*5,5*	*5,5*	*5,9*	*6,4*	*11,3*	*17,5*	*27,8*
	HKD-SR, HKD-ER		*4,1*	-	-	-	*4,2*	*5,5*	-	-	*6,9*	*12,3*	*21,1*	*33,6*

Recommended loads [a)]

Anchor size				Hilti technical data				ETA-02/0032, issued 2015-01-07							
				M6x25	M8x25	M10x25	M12x25	M6x30	M8x30	M8x40	M10x30	M10x40	M12x50	M16x65	M20x80
Tension N_{Rec}	HKD	[kN]		3,0	3,0	3,0	3,0	-	3,9	4,3	3,9	6,1	8,5	12,6	17,2
	HKD-S, HKD-E			2,1	-	-	-	3,3	3,3	3,6	3,3	5,1	7,1	12,6	17,2
	HKD-SR, HKD-ER			2,1	-	-	-	3,3	3,3	-	-	5,1	7,1	12,6	17,2
Shear V_{Rd}	HKD	[kN]		2,9	3,0	3,0	3,0	-	4,9	5,2	5,7	6,3	10,5	19,3	28,3
	HKD-S, HKD-E			2,8	-	-	-	2,8	3,9	4,2	3,9	4,6	8,1	12,5	19,8
	HKD-SR, HKD-ER			2,9	-	-	-	3,0	3,9	-	-	4,9	8,8	15,1	24,0

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.

Materials

Mechanical properties

Anchor size				M6	M8	M10	M10	M12	M16
Nominal tensile strength	f_{uk}	HKD	[N/mm²]	570	570	570	570	640	590
		HKD-S, HKD-E		560	560	510	510	-	460
		HKD-SR, HKD-ER		540	540	540	540	-	540
Yield strength	f_{yk}	HKD	[N/mm²]	460	460	460	480	510	470
		HKD-S, HKD-E		440	440	410	410	-	375
		HKD-SR, HKD-ER		355	355	355	355	-	355
Stressed cross-section	A_s	HKD	[mm²]	20,7	26,7	32,7	60,1	105	167
		HKD-S, HKD-E		20,9	26,1	28,8	58,7	-	163
		HKD-SR, HKD-ER							
Moment of resistance	W	HKD	[mm³]	32,3	54,6	82,9	184	431	850
		HKD-S, HKD-E		50	79	110	264	602	1191
		HKD-SR, HKD-ER							
Char. bending resistance for rod or bolt	$M^0_{Rk,s}$	With 5.8 Gr. Steel	[Nm]	7,6	18,7	37,4	65,5	167	325
		HKD-SR HKD-ER with A4-70		11	26	52	92	187	454

Material quality

Part		Material
Anchor body	HKD	Cold formed steel / galvanised to min. 5 µm
	HKD-S, HKD-E	Steel Fe/Zn5 galvanised to min. 5 µm
	HKD-SR, HKD-ER	Stainless steel, 1.4401, 1.4404, 1.4571
Expansion plug	HKD	Cold formed steel
	HKD-S, HKD-E	Cold formed steel
	HKD-SR, HKD-ER	Stainless steel, 1.4401, 1.4404, 1.4571

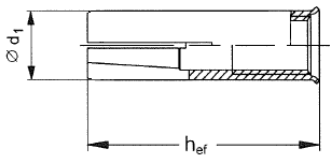
Anchor dimensions of HKD, HKD-S, HKD-E, HKD-SR, HKD-ER

Anchor size			Hilti technical data				ETA-02/0032, issued 2015-01-07							
			M6x25	M8x25	M10x25	M12x25	M6x30	M8x30	M8x40	M10x30	M10x40	M12x50	M16x65	M20x80
Eff. anchorage depth	h_{ef}	[mm]	25	25	25	25	30	30	40	30	40	50	65	80
Anchor diameter	d_1	[mm]	7,9	9,95	11,9	14,9	8	9,95	9,95	11,8	11,95	14,9	19,75	24,75
Plug diameter	d_2	[mm]	5,1	6,35	8,1	9,7	5	6,5	6,35	8,2	8,2	10,3	13,8	16,4
Plug length	l_1	[mm]	10	7	7	7,2	15	12	16	12	16	20	29	30

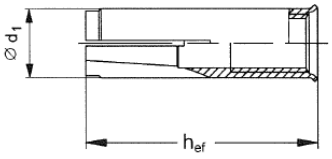
Anchor body

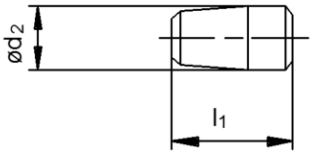
Expansion plugs

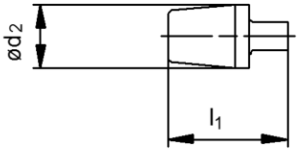
HKD



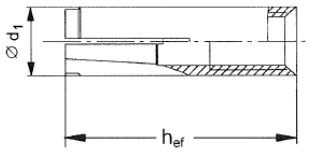
HKD-S and HKD-SR







HKD-E and HKD ER

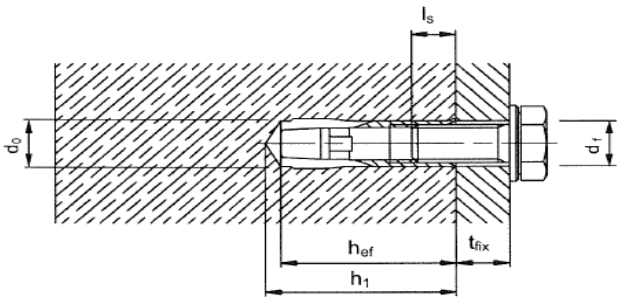


Setting information

Setting details

Anchor size			Hilti technical data				ETA-02/0032, issued 2015-01-07							
			M6x25	M8x25	M10x25	M12x25	M6x30	M8x30	M8x40	M10x30[a)]	M10x40	M12x50	M16x65	M20x80
Effective embedment depth	h_{ef}	[mm]	25	25	25	25	30	30	40	30	40	50	65	80
Nominal diameter of drill bit	d_o	[mm]	8	10	12	15	8	10	10	12	12	15	20	25
Cutting diameter of drill bit	$d_{cut} \leq$	[mm]	8,45	10,5	12,5	15,5	8,45	10,5	10,5	12,5	12,5	15,5	20,5	25,5
Depth of drill hole	$h_1 \geq$	[mm]	27	27	27	27	32	33	43	33	43	54	70	85
Screwing depth	$l_{s,min}$	[mm]	6	8	10	12	6	8	8	10	10	12	16	20
Thread engagement depth	$l_{s,max}$	[mm]	12	11,5	12	12	12,5	14,5	17,5	12,7	18	23,5	30,5	42
Diameter of clearance hole in the fixture	$d_f \leq$	[mm]	7	9	12	14	7	9	9	12	12	14	18	22
Max. torque moment	T_{ins}	[Nm]	4	8	15	35	4	8	8	15	15	35	60	100

a) With anchor size M10x30 only threaded rod is to be used.



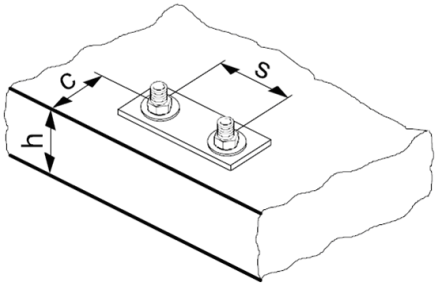
Installation equipment

Anchor size		M6	M8	M10	M10	M12	M16
Rotary hammer for setting		TE 1 – TE 3				TE 16 – TE 50	
Machine setting tool	HSD-M	6x25/30	8x25/30	10x25/30	10x40	12x50	16x65
Hand setting tool	HSD-G HSD-M	6x25/30	8x25/30	10x25/30	10x40	12x50	16x65
Other tools		hammer, torque wrench, blow up pump					

Setting paramaters

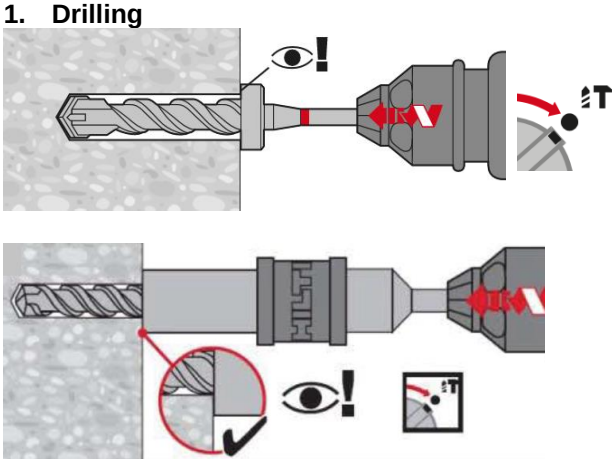
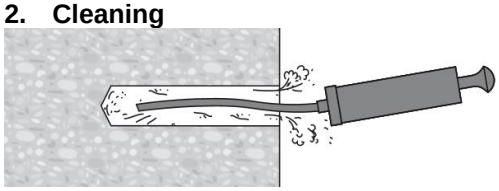
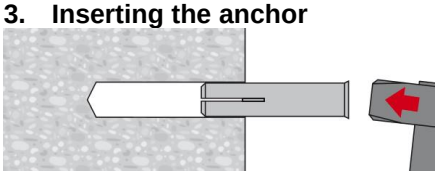
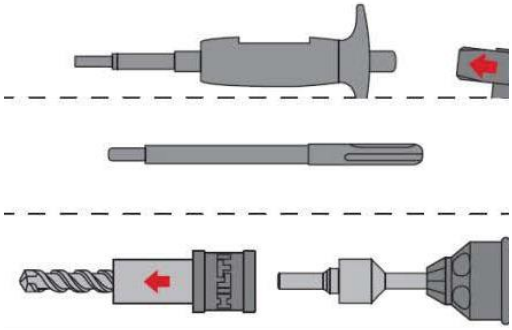
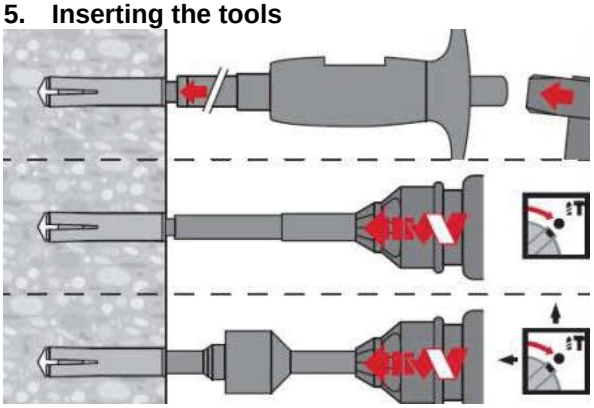
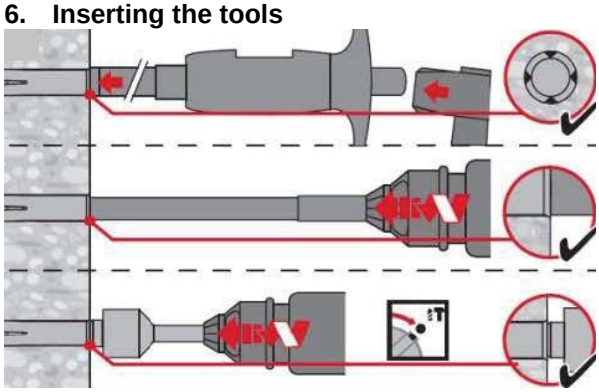
		Hilti technical data				ETA-02/0032, issued 2015-01-07							
Anchor size		M6x25	M8x25	M10x25	M12x25	M6x30	M8x30	M8x40	M10x30	M10x40	M12x50	M16x65	M20x80
Minimum base material thickness	h_{min} [mm]	100	100	100	100	100	100	100	100	100	100	130	160
Minimum spacing and minimum edge distance HKD-S (R) / HKD-E (R)	s_{min} [mm]	60	60	60	60	60	60	80	60	80	125	130	160
	c_{min} [mm]	88	88	88	88	105	105	140	105	140	175	230	280
Minimum spacing HKD	s_{min} [mm]	80	80	80	80	60	60	80	60	80	125	130	160
	$c \geq$ [mm]	140	140	140	140	105	105	140	105	140	175	230	280
Minimum edge distance HKD	c_{min} [mm]	100	100	100	100	80	80	140	80	140	175	230	280
	$s \geq$ [mm]	150	150	150	150	120	120	80	120	80	125	130	160
Critical spacing and edge distance for splitting failure HKD	$s_{cr,sp}$ [mm]	200	200	200	200	210	210	280	210	280	350	455	560
	$c_{cr,N}$ [mm]	100	100	100	100	105	105	140	105	140	175	227	280
Critical spacing and edge distance for concrete cone failure HKD / HKDS-(R) / HKD-E(R)	$s_{cr,N}$ [mm]	80	80	80	80	90	90	120	90	120	150	195	240
	$c_{cr,N}$ [mm]	40	40	40	40	45	45	60	45	60	75	97	120
Critical spacing and edge distance for splitting failure HKD-S(R) / HKD-E(R)	$s_{cr,sp}$ [mm]	176	176	176	176	210	210	280	210	280	350	455	560
	$c_{cr,N}$ [mm]	88	88	88	88	105	105	140	105	140	175	227	280

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



Setting instruction

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

Setting instruction	
1. Drilling 	**2. Cleaning** 
3. Inserting the anchor 	**4. Setting tools** 
5. Inserting the tools 	**6. Inserting the tools** 
7. Attaching the belonging washer