EN

DECLARATION OF PERFORMANCE

No. Hilti HKD (Part 6)_0672-CPR-0137

1. Unique identification code of the product-type:
Hilti push-in anchor HKD

2. Intended use/es:

Product	Intended use
Metal anchors for use in concrete	For fixing and/or supporting to concrete, structural elements (which contributes to the stability of the works) or heavy units.

3. Manufacturer:
Hilti Corporation, Business Unit Anchors, 9494 Schaan, Principality of Liechtenstein

4. System/s of AVCP: System 2+

5. European Assessment Document: ETAG 001, Part 6 (Edition 04-2013) used as an EAD
European Technical Assessment: ETA-06/0047 (08.02.2016)
Technical Assessment Body: DIBt - Deutsches Institut für Bautechnik
Notified body/ies: NB 0672 - MPA Stuttgart

6. Declared performance/s:

Mechanical resistance and stability (BWR 1)

Essential characteristic	Performance
Characteristic resistance for static and quasi static loads, Displacements	See Annex C1 to C3

Safety in case of fire (BWR 2)

Essential characteristic	Performance
Reaction to fire	Anchorages satisfy requirements for Class A1
Resistance to fire	See Annex C4

The performance of the product identified above is in conformity with the set of declared performance/s. This declaration of performance is issued, in accordance with Regulation (EU) No 305/2011, under the sole responsibility of the manufacturer identified above.

Signed for and on behalf of the manufacturer by:

Raimund Zaggl
Business Unit Head
Business Unit Anchor

Seppo Perämäki
Head of Quality
Business Unit Anchor

Hilti Corporation
Schaan, 09.05.2017

EN

DECLARATION OF PERFORMANCE

No. Hilti HKD_0672-CPR-0036

1. Unique identification code of the product-type:
Hilti push-in anchor HKD

2. Intended use/es:

Product	Intended use
Metal anchors for use in concrete	For fixing and/or supporting to concrete, structural elements (which contributes to the stability of the works) or heavy units.

3. Manufacturer:
Hilti Corporation, Business Unit Anchors, 9494 Schaan, Principality of Liechtenstein

4. System/s of AVCP: System 1

5. European Assessment Document: ETAG 001, Part 4 (Edition 04-2013) used as an EAD
European Technical Assessment: ETA-02/0032 (07.01.2015)
Technical Assessment Body: DIBt - Deutsches Institut für Bautechnik
Notified body/ies: NB 0672 - MPA Stuttgart

6. Declared performance/s:

Mechanical resistance and stability (BWR 1)

Essential characteristic	Performance
Characteristic resistance for static and quasi static loads	See Annex C1, C2, C4 and C5
Displacements	See Annex C3 and C6

Safety in case of fire (BWR 2)

Essential characteristic	Performance
Reaction to fire	Anchorages satisfy requirements for Class A1
Resistance to fire	No performance assessed

The performance of the product identified above is in conformity with the set of declared performance/s. This declaration of performance is issued, in accordance with Regulation (EU) No 305/2011, under the sole responsibility of the manufacturer identified above.

Signed for and on behalf of the manufacturer by:

Raimund Zaggl
Business Unit Head
Business Unit Anchor

Seppo Perämäki
Head of Quality
Business Unit Anchor

Hilti Corporation
Schaan, 09.05.2017

Table C1: Characteristic values of resistance for Hilti push-in anchor HKD-S(R) and HKD-E(R)

HKD-S, HKD-E HKD-SR, HKD-ER			M6x30[2]	M8x30[2]	M8x40	M10x30[2]	M10x40	M12x50
Installation safety factor	γ_2		1,0					
All load directions								
Characteristic resistance in C20/25 to C50/60	F^0_{Rk}	[kN]	3	3	5	4	6	6
Characteristic spacing	s_{cr}	[mm]	90	90	120	90	120	150
Characteristic edge distance	c_{cr}	[mm]	45	45	60	45	60	75
Shear load with lever arm								
Steel grade 4.6	$M^0_{Rk,s}$ [2]	[Nm]	6	15	15	30	30	52
Partial safety factor	γ_{Ms} [1]		1,67					
Steel grade 5.6	$M^0_{Rk,s}$ [2]	[Nm]	8	19	19	37	37	65
Partial safety factor	γ_{Ms} [1]		1,67					
Steel grade 5.8	$M^0_{Rk,s}$ [2]	[Nm]	8	19	19	37	37	65
Partial safety factor	γ_{Ms} [1]		1,25					
Steel grade 8.8	$M^0_{Rk,s}$ [2]	[Nm]	12	30	30	60	60	105
Partial safety factor	γ_{Ms} [1]		1,25					
Steel grade 70	$M^0_{Rk,s}$ [2]	[Nm]	11	26	-	-	52	92
Partial safety factor	γ_{Ms} [1]		1,56		-		1,56	

[1] In absence of other national regulations.

[2] Characteristic bending moment $M^0_{Rk,s}$ for equation (5.5) in ETAG 001, Annex C.

The anchor is to be used only for multiple use for non-structural applications, the definition of multiple use according to the member states is given in the informative Annex 1 of ETAG 001, part 6.

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Table C2: Characteristic values of resistance for Hilti push-in anchor HKD and HKD-woL

HKD **HKD-woL**			**M6x25**	**M8x25**	**M8x30**	**M8x40**	**M10x25**	**M10x30**	**M10x40**	**M12x25**	**M12x50**	**M16x65**
Installation safety factor	γ_2		1,0		1,2	1,0	1,2	1,0				
All load directions												
Characteristic resistance in C20/25 to C50/60	F^0_{Rk}	[kN]	2	3	5	5	4	5	7,5	4	9	16
Characteristic spacing	s_{cr}	[mm]	80	80	90	120	80	90	120	80	150	200
Characteristic edge distance	c_{cr}	[mm]	40	40	45	60	40	45	60	40	75	100
Shear load with lever arm												
Steel grade 4.6	$M^0_{Rk,s}$ [2)]	[Nm]	6	15			30			52		133
Partial safety factor	γ_{Ms} [1)]		1,67									
Steel grade 5.6	$M^0_{Rk,s}$ [2)]	[Nm]	8	19			37			65		166
Partial safety factor	γ_{Ms} [1)]		1,67									
Steel grade 5.8	$M^0_{Rk,s}$ [2)]	[Nm]	8	19			37			65		166
Partial safety factor	γ_{Ms} [1)]		1,25									
Steel grade 8.8	$M^0_{Rk,s}$ [2)]	[Nm]	12	30			60			105		266
Partial safety factor	γ_{Ms} [1)]		1,25									

[1)] In absence of other national regulations.

[2)] Characteristic bending moment $M^0_{Rk,s}$ for equation (5.5) in ETAG 001, Annex C.

The anchor is to be used only for multiple use for non-structural applications, the definition of multiple use according to the member states is given in the informative Annex 1 of ETAG 001, part 6.

Hilti push-in anchor HKD	**Annex C2**
Performances Characteristic values of resistance for Hilti push-in anchor HKD and HKD-woL	

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Table C3: Characteristic values of resistance for Hilti push-in anchor in precast pre-stressed hollow core slabs C30/37 to C50/60

HKD **HKD-woL**			**M6x25**	**M8x25**	**M10x25**
Installation safety factor	γ_2		1,0		1,2
All load directions					
bottom flange thickness	d_b	[mm]	≥ 35	≥ 35	≥ 40
Characteristic resistance in C20/25 to C50/60	F^0_{Rk}	[kN]	2	3	4
Characteristic spacing	s_{cr}	[mm]	400		
Characteristic edge distance	c_{cr}	[mm]	200		
Shear load with lever arm					
Steel grade 4.6	$M^0_{Rk,s}$ [2)]	[Nm]	6	15	30
Partial safety factor	γ_{Ms} [1)]		1,67		
Steel grade 5.6	$M^0_{Rk,s}$ [2)]	[Nm]	8	19	37
Partial safety factor	γ_{Ms} [1)]		1,67		
Steel grade 5.8	$M^0_{Rk,s}$ [2)]	[Nm]	8	19	37
Partial safety factor	γ_{Ms} [1)]		1,25		
Steel grade 8.8	$M^0_{Rk,s}$ [2)]	[Nm]	12	30	60
Partial safety factor	γ_{Ms} [1)]		1,25		

[1)] In absence of other national regulations.

[2)] Characteristic bending moment $M^0_{Rk,s}$ for equation (5.5) in ETAG 001, Annex C.

The anchor is to be used only for multiple use for non-structural applications, the definition of multiple use according to the member states is given in the informative Annex 1 of ETAG 001, part 6.

Hilti push-in anchor HKD	**Annex C3**
Performances Characteristic values of resistance for Hilti push-in anchor in precast pre-stressed hollow core slabs	

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Table C4: Characteristic values of resistance for Hilti push-in anchor HKD-SR and HKD-ER under fire exposure in concrete C20/25 to C50/60 for all load directions

Fire resistance class	HKD-SR, HKD-ER		M6x30	M8x30	M10x40	M12x50
R 30	Characteristic resistance	$F^0_{Rk,fi}$ [1)] [kN]	0,5	0,9	1,8	2,3
R 60	Characteristic resistance	$F^0_{Rk,fi}$ [1)] [kN]	0,5	0,9	1,8	2,3
R 90	Characteristic resistance	$F^0_{Rk,fi}$ [1)] [kN]	0,5	0,9	1,8	2,3
R 120	Characteristic resistance	$F^0_{Rk,fi}$ [1)] [kN]	0,3	0,7	1,5	1,8
R 30 to R 120	Spacing	$s_{cr,fi}$ [mm]	120	120	160	200
	Edge distance	$c_{cr,fi}$ [mm]	105	105	140	175
In case of fire attack from more than one side, the minimum edge distance shall be ≥ 300 mm. The anchorage depth has to be increased for wet concrete by at least 30 mm compared to the given value						

[1)] In absence of other national regulations the partial safety factor for resistance under fire exposure $\gamma_{m,fi}$ = 1,0 is recommended.

Table C5: Characteristic values of resistance for Hilti push-in anchor HKD and HKD-woL under fire exposure in concrete C20/25 to C50/60 for all load directions

Fire resistance class	HKD HKD-woL		M6x25	M8x25	M8x30	M8x40	M10x25	M10x30	M10x40	M12x25	M12x50	M16x65
R 30	Characteristic resistance	$F^0_{Rk,fi}$ [1)] [kN]	0,5	0,6	0,9	1,3	0,6	0,9	1,8	0,6	2,3	4,0
R 60	Characteristic resistance	$F^0_{Rk,fi}$ [1)] [kN]	0,4	0,6	0,9	1,3	0,6	0,9	1,8	0,6	2,3	4,0
R 90	Characteristic resistance	$F^0_{Rk,fi}$ [1)] [kN]	0,3	0,6	0,9	1,3	0,6	0,9	1,8	0,6	2,3	4,0
R 120	Characteristic resistance	$F^0_{Rk,fi}$ [1)] [kN]	0,2	0,5	0,7	0,7	0,5	0,7	1,5	0,5	1,8	3,2
R 30 to R 120	Spacing	$s_{cr,fi}$ [mm]	160	160	120	160	120	120	160	160	200	260
	Edge distance	$c_{cr,fi}$ [mm]	140	140	105	140	105	105	140	140	175	230
In case of fire attack from more than one side, the minimum edge distance shall be ≥ 300 mm. The anchorage depth has to be increased for wet concrete by at least 30 mm compared to the given value												

[1)] In absence of other national regulations the partial safety factor for resistance under fire exposure $\gamma_{m,fi}$ = 1,0 is recommended.

[2)] The fire resistance data is only valid for concrete C20/25 to C50/60 with a minimum slab thickness of 80 mm. The data is **not** valid for precast pre-stressed hollow core slabs.

Hilti push-in anchor HKD

Performances
Characteristic values of resistance for Hilti push-in anchor under fire exposure

Annex C4

Deutsches Institut für Bautechnik DIBt

Table C1: Characteristic values of resistance for Hilti push-in anchor HKD-S(R) and HKD-E(R) under tension loads in non-cracked concrete

HKD-S (R) HKD-E (R)			M6x30 [2]	M8x30 [2]	M8x40	M10x30 [2]	M10x40	M12x50	M16x65	M20x80
Installation safety factor	γ_2		1,0		1,2	1,0				
Steel failure										
Steel grade 4.6	$N_{Rk,s}$	[kN]	8,0	14,6	14,6	23,2	23,2	33,7	62,8	98,0
Partial safety factor	γ_{Ms} [1]		2,0							
Steel grade 5.6	$N_{Rk,s}$	[kN]	10,1	18,3	18,3	18,5	19,9	42,2	54,7	86,9
Partial safety factor	γ_{Ms} [1]		2,0			1,49		2,0	1,47	
Steel grade 5.8	$N_{Rk,s}$	[kN]	10,1	17,4	17,4	18,5	19,9	35,3	54,7	86,9
Partial safety factor	γ_{Ms} [1]		1,50	1,53		1,49			1,47	
Steel grade 8.8	$N_{Rk,s}$	[kN]	13,4	17,4	17,4	18,5	19,9	35,3	54,7	86,9
Partial safety factor	γ_{Ms} [1]		1,53			1,49			1,47	
Steel grade 70	$N_{Rk,s}$	[kN]	12,8	16,8	-	-	21,1	37,3	64,2	102,0
Partial safety factor	γ_{Ms} [1]		1,83		-	1,83				
Pullout failure										
Characteristic resistance C20/25	$N_{Rk,p}$	[kN]	-- [3]		9,0	-- [3]				
Increasing factors for $N_{Rk,p}$	ψ_c	C30/37	1,22							
		C40/50	1,41							
		C50/60	1,55							
Concrete cone and splitting failure										
Effective embedment depth	h_{ef}	[mm]	30 [2]	30 [2]	40	30 [2]	40	50	65	80
Spacing	$s_{cr,N}$	[mm]	90	90	120	90	120	150	195	240
Edge distance	$c_{cr,N}$	[mm]	45	45	60	45	60	75	97	120
Spacing	$s_{cr,sp}$	[mm]	210	210	280	210	280	350	455	560
Edge distance	$c_{cr,sp}$	[mm]	105	105	140	105	140	175	227	280

[1] In absence of other national regulations

[2] For application with statically indeterminate structural components only

[3] Pull-out failure mode is not decisive

Hilti push-in anchor HKD

Performances
Characteristic values of resistance for Hilti push-in anchor HKD-S(R) and HKD-E(R) under tension loads in non-cracked concrete

Annex C1

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Table C2: Characteristic values of resistance for Hilti push-in anchor HKD-S(R) and HKD-E(R) under shear loads in non-cracked

HKD-S (R) HKD-E (R)			M6x30[2]	M8x30[2]	M8x40	M10x30[2]	M10x40	M12x50	M16x65	M20x80
Steel failure without lever arm										
Steel grade 4.6	$V_{Rk,s}$	[kN]	4,0	7,3	7,3	7,4	8,0	16,9	21,9	34,7
Partial safety factor	γ_{Ms} [1]		1,67			1,25		1,67	1,25	
Steel grade 5.6	$V_{Rk,s}$	[kN]	5,0	7,0	7,0	7,4	8,0	14,1	21,9	34,7
Partial safety factor	γ_{Ms} [1]		1,67	1,27		1,25				
Steel grade 5.8	$V_{Rk,s}$	[kN]	5,0	7,0	7,0	7,4	8,0	14,1	21,9	34,7
Partial safety factor	γ_{Ms} [1]		1,25	1,27		1,25				
Steel grade 8.8	$V_{Rk,s}$	[kN]	5,3	7,0	7,0	7,4	8,0	14,1	21,9	34,7
Partial safety factor	γ_{Ms} [1]		1,27			1,25				
Steel grade 70	$V_{Rk,s}$	[kN]	6,4	8,4	-	-	10,5	18,7	32,1	51,0
Partial safety factor	γ_{Ms} [1]		1,52		-		1,52			
Steel failure with lever arm										
Steel grade 4.6	$M^0_{Rk,s}$	[Nm]	6	15	15	30	30	52	133	260
Partial safety factor	γ_{Ms} [1]		1,67							
Steel grade 5.6	$M^0_{Rk,s}$	[Nm]	8	19	19	37	37	65	166	325
Partial safety factor	γ_{Ms} [1]		1,67							
Steel grade 5.8	$M^0_{Rk,s}$	[Nm]	8	19	19	37	37	65	166	325
Partial safety factor	γ_{Ms} [1]		1,25							
Steel grade 8.8	$M^0_{Rk,s}$	[Nm]	12	30	30	60	60	105	266	519
Partial safety factor	γ_{Ms} [1]		1,25							
Steel grade 70	$M^0_{Rk,s}$	[Nm]	11	26	-	-	52	92	233	454
Partial safety factor	γ_{Ms} [1]		1,56		-		1,56			
Concrete pry-out failure										
Factor in equation (5.6) ETAG Annex C, §5.2.3.3	k		2,0							
Concrete edge failure										
Effective length of anchor	l_f	[mm]	30	30	40	30	40	50	65	80
External diameter of anchor	d_{nom}	[mm]	8	10	10	12	12	15	20	25

[1] In absence of other national regulations

[2] For application with statically indeterminate structural components only

Hilti push-in anchor HKD	**Annex C2**
Performances Characteristic values of resistance for Hilti push-in anchor HKD-S(R) and HKD-E(R) under shear loads in non-cracked concrete	

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Table C3: Displacement under tension load for HKD-S(R) and HKD-E(R)

HKD-S (R) HKD-E (R)			M6x30	M8x30	M8x40	M10x30	M10x40	M12x50	M16x65	M20x80
Tension load in C20/25 to C50/60 non-cracked concrete	N	[kN]	3,3	3,3	3,6	3,3	5,1	7,1	12,6	17,2
Displacement	δ_{N0}	[mm]	0,1	0,1	0,1	0,1	0,1	0,1	0,1	0,1
	$\delta_{N\infty}$	[mm]	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2

Table C4: Displacement under shear load for HKD-S(R) and HKD-E(R)

HKD-S HKD-E			M6x30	M8x30	M8x40	M10x30	M10x40	M12x50	M16x65	M20x80
Shear load in C20/25 to C50/60 non-cracked concrete	V	[kN]	1,7	3,1	3,1	4,3	4,6	7,2	12,5	19,8
Displacement	δ_{V0}	[mm]	0,35	0,35	0,40	0,35	0,40	0,45	0,75	0,75
	$\delta_{V\infty}$	[mm]	0,50	0,50	0,60	0,50	0,60	0,70	1,1	1,1

Table C5: Displacement under shear load for HKD-S(R) and HKD-E(R)

HKD-SR HKD-ER			M6x30	M8x30	M10x40	M12x50	M16x65	M20x80
Shear load in C20/25 to C50/60 non-cracked concrete	V	[kN]	1,7	3,9	4,9	8,8	15,1	24,0
Displacement	δ_{V0}	[mm]	0,35	0,45	0,45	0,55	0,9	0,9
	$\delta_{V\infty}$	[mm]	0,50	0,65	0,65	0,85	1,3	1,3

Hilti push-in anchor HKD

Performance
Displacement under tension load and under shear load for HKD-S(R) and HKD-E(R)

Annex C3

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Table C6: Characteristic values of resistance for Hilti push-in anchor HKD and HKD-woL under tension loads in non-cracked concrete

HKD HKD-woL			M8x30 [2]	M8x40	M10x30 [2]	M10x40	M12x50	M16x65	M20x80
Installation safety factor	γ_2		1,0	1,2	1,0				
Steel failure									
Steel grade 4.6	$N_{Rk,s}$	[kN]	14,6	14,6	19,9	22,1	33,7	62,8	98,0
Partial safety factor	γ_{Ms} [1]		2,0		1,5		2,0		
Steel grade 5.6	$N_{Rk,s}$	[kN]	17,1	19,4	19,9	22,1	36,6	67,5	99,0
Partial safety factor	γ_{Ms} [1]		1,5						
Steel grade 5.8	$N_{Rk,s}$	[kN]	17,1	19,4	19,9	22,1	36,6	67,5	99,0
Partial safety factor	γ_{Ms} [1]		1,5						
Steel grade 8.8	$N_{Rk,s}$	[kN]	17,1	19,4	19,9	22,1	36,6	67,5	99,0
Partial safety factor	γ_{Ms} [1]		1,5						
Pullout failure									
Characteristic resistance C20/25	$N_{Rk,p}$	[kN]	-- [3]	9,0	-- [3]				
Increasing factors for $N_{Rk,p}$	ψ_c	C30/37	1,22						
		C40/50	1,41						
		C50/60	1,55						
Concrete cone and splitting failure									
Effective embedment depth	h_{ef}	[mm]	30 [2]	40	30 [2]	40	50	65	80
Spacing	$s_{cr,N}$	[mm]	90	120	90	120	150	195	240
Edge distance	$c_{cr,N}$	[mm]	45	60	45	60	75	97	120
Spacing	$s_{cr,sp}$	[mm]	210	280	210	280	350	455	560
Edge distance	$c_{cr,sp}$	[mm]	105	140	105	140	175	227	280

[1] In absence of other national regulations

[2] For application with statically indeterminate structural components only

[3] Pull-out failure mode is not decisive

Hilti push-in anchor HKD

Performances
Characteristic values of resistance under tension loads in non-cracked concrete

Annex C4

Deutsches Institut für Bautechnik DIBt

Table C7: Characteristic values of resistance for Hilti push-in anchor HKD and HKD-woL under shear loads in non-cracked concrete

HKD HKD-woL			M8x30[2)]	M8x40	M10x30[2)]	M10x40	M12x50	M16x65	M20x80
Steel failure without lever arm									
Steel grade 4.6	$V_{Rk,s}$	[kN]	7,3	7,3	10,0	11,0	16,9	31,4	49
Partial safety factor	γ_{Ms} [1)]		1,67		1,25		1,67		
Steel grade 5.6	$V_{Rk,s}$	[kN]	8,6	9,2	10,0	11,0	18,3	33,8	49,5
Partial safety factor	γ_{Ms} [1)]		1,25	1,67	1,25				
Steel grade 5.8	$V_{Rk,s}$	[kN]	8,6	9,2	10,0	11,0	18,3	33,8	49,5
Partial safety factor	γ_{Ms} [1)]		1,25						
Steel grade 8.8	$V_{Rk,s}$	[kN]	8,6	9,2	10,0	11,0	18,3	33,8	49,5
Partial safety factor	γ_{Ms} [1)]		1,25						
Steel failure with lever arm									
Steel grade 4.6	$M^0_{Rk,s}$	[Nm]	15	15	30	30	52	133	260
Partial safety factor	γ_{Ms} [1)]		1,67						
Steel grade 5.6	$M^0_{Rk,s}$	[Nm]	19	19	37	37	65	166	325
Partial safety factor	γ_{Ms} [1)]		1,67						
Steel grade 5.8	$M^0_{Rk,s}$	[Nm]	19	19	37	37	65	166	325
Partial safety factor	γ_{Ms} [1)]		1,25						
Steel grade 8.8	$M^0_{Rk,s}$	[Nm]	30	30	60	60	105	266	519
Partial safety factor	γ_{Ms} [1)]		1,25						
Concrete pry-out failure									
Factor in equation (5.6) ETAG Annex C, §5.2.3.3	k		2,0						
Concrete edge failure									
Effective length of anchor	l_f	[mm]	30	40	30	40	50	65	80
External diameter of anchor	d_{nom}	[mm]	10	10	12	12	15	20	25

[1)] In absence of other national regulations

[2)] For application with statically indeterminate structural components only

Hilti push-in anchor HKD	**Annex C5**
Performances Characteristic values of resistance for Hilti push-in anchor HKD and HKD-woL under shear loads in non-cracked concrete	

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Table C8: Displacement under tension load for HKD and HKD-woL

HKD HKD-woL			M8x30	M8x40	M10x30	M10x40	M12x50	M16x65	M20x80
Tension load in C20/25 to C50/60 non-cracked concrete	N	[kN]	4,0	4,3	4,0	6,1	8,5	12,6	17,2
Displacement	δ_{N0}	[mm]	0,1	0,1	0,1	0,1	0,1	0,1	0,1
	$\delta_{N\infty}$	[mm]	0,3	0,3	0,3	0,3	0,3	0,2	0,2

Table C9: Displacement under shear load for HKD and HKD-woL

HKD HKD-woL			M8x30	M8x40	M10x30	M10x40	M12x50	M16x65	M20x80
Shear load in C20/25 to C50/60 non-cracked concrete	N	[kN]	3,1	3,1	4,3	4,6	7,2	12,5	19,8
Displacement	δ_{N0}	[mm]	0,35	0,40	0,35	0,40	0,45	0,75	0,75
	$\delta_{N\infty}$	[mm]	0,50	0,60	0,50	0,60	0,70	1,1	1,1

Hilti push-in anchor HKD

Performance
Displacement under tension load and under shear load for HKD and HKD-woL

Annex C6