DA

YDEEVNEERKLÆRING

Nr. HVU_1343-CPR-M 500-19_07.14

1. Varetypens unikke identifikationskode:
Hilti HVU med HAS- og HIS-elementer

2. Tilsigtet anvendelse/r:

Produkt	**Beregnet anvendelse**
Metalankre til brug i beton	Til fastgørelse og/eller understøttelse i beton, konstruktionselementer (som bidrager til arbejdets stabilitet) eller kraftige enheder.

3. Fabrikant:
Hilti Corporation, Business Unit Anchors, 9494 Schaan, Fyrstendømmet Liechtenstein

4. System/er til vurdering og kontrol af konstansen af ydeevnen: System 1

5. Europæisk vurderingsdokument: ETAG 001, del 5 (udgave 04-2013) anvendt som EAD
Europæisk teknisk vurdering: ETA-05/0255 (19.01.2016)
Teknisk vurderingsinstitut: DIBt - Deutsches Institut für Bautechnik
Bemyndiget organ/er: NB 1343 - MPA Darmstadt

6. Oplyst ydeevne/r:

Mekanisk styrke og stabilitet (BWR 1)

Vigtige egenskaber	**Ydeevne**
Karakteristisk modstand for statisk og kvasistatisk belastning, forskydninger	Se bilag C1 til C6

Sikkerhed i tilfælde i brand (BWR 2)

Vigtige egenskaber	**Ydeevne**
Reaktion ved brand	Ankertilfredshedskrav for klasse A1

Ydeevnen for den vare, der er anført ovenfor, er i overensstemmelse med den deklarerede ydeevne. Denne ydeevnedeklaration er udarbejdet i overensstemmelse med forordning (EU) nr. 305/2011 på eneansvar af den fabrikant, der er anført ovenfor.

Underskrevet for fabrikanten og på dennes vegne af:

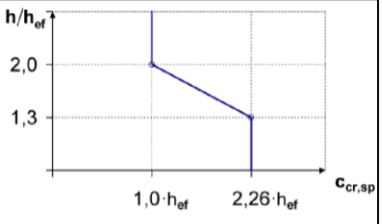
Raimund Zaggl
Leder af forretningsområde
Forretningsområde ankre

Seppo Perämäki
Leder af kvalitet
Forretningsområde ankre

Hilti Corporation
Schaan, 03.04.2017

Table C1: Characteristic resistance for threaded rod HAS-(E)... under tension load in case of static and quasi static loading

HAS-(E)...			M8	M10	M12	M16	M20	M24	M27	M30
Effective anchorage depth	h_{ef}	[mm]	80	90	110	125	170	210	240	270
Installation safety factor	γ_2 [1] = γ_{inst} [2]	[-]	1,0							
Steel failure										
Characteristic resistance HAS-5.8	$N_{Rk,s}$	[kN]	16,6	26,4	38,1	72,1	112	160	-	-
Characteristic resistance HAS-8.8	$N_{Rk,s}$	[kN]	26,5	42,2	61,0	115	179	256	347	421
Characteristic resistance HAS-R	$N_{Rk,s}$	[kN]	23,2	37,0	53,3	101	157	224	217	263
Characteristic resistance HAS-HCR	$N_{Rk,s}$	[kN]	26,5	42,0	61,0	115	179	224	-	-
Combined pullout and concrete cone failure										
Characteristic resistance in non-cracked concrete C20/25										
Temperature range I: 40 °C/24 °C	$N_{Rk,p,ucr}$	[kN]	25	35	50	60	115	140	200	250
Temperature range II: 80 °C/50 °C	$N_{Rk,p,ucr}$	[kN]	20	25	40	50	75	115	140	170
Temperature range III: 120 °C/72 °C	$N_{Rk,p,ucr}$	[kN]	9	12	16	25	40	60	75	75
Factor acc. to section 6.2.2.3 of CEN/TS 1992-4:2009 part 5	k_8 = k_{ucr} [2]	[-]	10,1							
Increasing factors for τ_{Rk} in concrete	ψ_c	C30/37	1,06							
		C40/50	1,10							
		C50/60	1,13							
Splitting failure										
Edge distance $c_{cr,sp}$ [mm] for	$h / h_{ef} \geq 2,0$		$1,0 \cdot h_{ef}$							
	$2,0 > h / h_{ef} > 1,3$		$4,6\ h_{ef} - 1,8\ h$							
	$h / h_{ef} \leq 1,3$		$2,26\ h_{ef}$							
Spacing	$s_{cr,sp}$	[mm]	$2 \cdot c_{cr,sp}$							



[1] Parameter for design according to EOTA Technical Report TR 029.
[2] Parameter for design according to CEN/TS 1992-4:2009.

Hilti bonded anchor HVA, HVA R and HVA HCR

Performances
Characteristic values of resistance under tension loading.
Design according to „EOTA Technical Report TR 029, 09/2010“or “CEN/TS 1992-4:2009”

Annex C1

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Table C2: Characteristic resistance for threaded rod HAS-(E)... under shear load in case of static and quasi static loading

HAS-(E)…			M8	M10	M12	M16	M20	M24	M27	M30
Steel failure without lever arm										
Factor according to section 6.3.2.1 of CEN/TS 1992-4: 2009 part 5	k_2 [2)]	[-]	1,0							
Characteristic resistance HAS-5.8	$V_{Rk,s}$	[kN]	8,3	13,2	19,1	36,1	56,1	80,1	-	-
Characteristic resistance HAS-8.8	$V_{Rk,s}$	[kN]	13,3	21,1	30,5	57,7	89,7	128	174	211
Characteristic resistance HAS-R	$V_{Rk,s}$	[kN]	11,6	18,5	26,7	50,5	78,5	112	108	132
Characteristic resistance HAS-HCR	$V_{Rk,s}$	[kN]	13,3	21,1	30,5	57,7	89,7	112	-	-
Steel failure with lever arm										
Characteristic resistance HAS-5.8	$M^0_{Rk,s}$	[Nm]	16	33	56	147	284	486	-	-
Characteristic resistance HAS-8.8	$M^0_{Rk,s}$	[Nm]	26	53	90	234	455	777	1223	1637
Characteristic resistance HAS-R	$M^0_{Rk,s}$	[Nm]	23	45	79	205	398	680	764	1023
Characteristic resistance HAS-HCR	$M^0_{Rk,s}$	[Nm]	26	52	90	234	455	680	-	-
Concrete pry-out failure										
Factor acc. to equation (5.7) of TR 029 or acc. to equation (27) of CEN/TS 1992-4: 2009 part 5	$k^{1)} = k_3$ [2)]	[-]	2,0							
Concrete edge failure										
Effective length of anchor in shear loading	l_f	[mm]	80	90	110	125	170	210	240	270
Diameter of anchor	$d^{1)} = d_{nom}$ [2)]	[mm]	8	10	12	16	20	24	27	30

[1)] Parameter for design according to EOTA Technical Report TR 029.
[2)] Parameter for design according to CEN/TS 1992-4:2009.

Hilti bonded anchor HVA, HVA R and HVA HCR

Performances
Characteristic values of resistance under shear loading.
Design according to „EOTA Technical Report TR 029, 09/2010“or “CEN/TS 1992-4:2009”

Annex C2

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Table C3: Displacements under tension load for threaded rod HAS-(E)... in case of static and quasi static loading

HAS-(E)…			M8	M10	M12	M16	M20	M24	M27	M30
Non-cracked concrete										
Temperature range I: 40 °C / 24 °C										
Tension load	N	[kN]	8,1	12,4	18,1	28,6	53,3	66,7	95,2	119
Displacement	δ_{N0}	[mm]	0,15	0,2	0,2	0,2	0,3	0,3	0,4	0,45
Displacement	$\delta_{N\infty}$	[mm]	0,4	0,45	0,5	0,55	0,8	0,8	1,0	1,1
Temperature range II: 80 °C / 50 °C										
Tension load	N	[kN]	8,1	11,9	18,1	23,8	35,7	54,8	66,7	81
Displacement	δ_{N0}	[mm]	0,15	0,15	0,2	0,2	0,2	0,25	0,25	0,3
Displacement	$\delta_{N\infty}$	[mm]	0,4	0,4	0,5	0,5	0,55	0,65	0,65	0,7
Temperature range III: 120 °C / 72 °C										
Tension load	N	[kN]	4,3	5,7	7,6	11,9	19,0	28,6	35,7	35,7
Displacement	δ_{N0}	[mm]	0,1	0,1	0,1	0,1	0,1	0,15	0,15	0,15
Displacement	$\delta_{N\infty}$	[mm]	0,2	0,2	0,2	0,25	0,3	0,35	0,35	0,35

Table C4: Displacements under shear load for threaded rod HAS-(E)... in case of static and quasi static loading

HAS-(E)…			M8	M10	M12	M16	M20	M24	M27	M30
Shear load	V	[kN]	4,9	7,4	10,9	20,6	32,0	45,7	99,4	120,6
Displacement	δ_{V0}	[mm]	0,4	0,6	0,7	0,9	1,1	1,3	2,8	3,4
Displacement	$\delta_{V\infty}$	[mm]	0,6	0,9	1,1	1,4	1,7	2,0	4,2	5,1

Hilti bonded anchor HVA, HVA R and HVA HCR

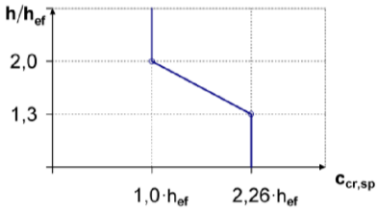
Performances
Displacements

Annex C3

Deutsches Institut für Bautechnik DIBt

Table C5: Characteristic resistance for internal threaded sleeve HIS-N... under tension load in case of static and quasi static loading

HIS-(R)N			**M8**	**M10**	**M12**	**M16**	**M20**
Effective anchorage depth	h_{ef}	[mm]	90	110	125	170	205
Installation safety factor	γ_2 [2] = γ_{inst} [3]	[-]	1,0				
Steel failure							
Characteristic steel resistance HIS-N with screw grade 8.8	$N_{Rk,s}$	[kN]	25	46	67	125	116
Partial safety factor	$\gamma_{Ms,N}$ [1]	[-]	1,5				
Characteristic steel resistance HIS-RN with with screw grade 70	$N_{Rk,s}$	[kN]	26	41	59	110	166
Partial safety factor	$\gamma_{Ms,N}$ [1]	[-]	1,87				2,4
Combined pullout and concrete failure							
Characteristic resistance in non-cracked concrete C20/25							
Temperature range I: 40 °C/24 °C	$N_{Rk,p,ucr}$	[kN]	25	40	60	95	140
Temperature range II: 80 °C/50 °C	$N_{Rk,p,ucr}$	[kN]	20	35	50	75	95
Temperature range III: 120 °C/72 °C	$N_{Rk,p,ucr}$	[kN]	9	16	20	40	50
Factor acc. to section 6.2.2.3 of CEN/TS 1992-4:2009 part 5	$k_8 = k_{ucr}$ [3]	[-]	10,1				
Increasing factors for τ_{Rk} in concrete	ψ_c	C30/37	1,12				
		C40/50	1,21				
		C50/60	1,28				
Splitting failure							
Edge distance $c_{cr,sp}$ [mm] for	$h / h_{ef} \geq 2,0$		$1,0 \cdot h_{ef}$				
	$2,0 > h / h_{ef} > 1,3$		$4,6\ h_{ef} - 1,8\ h$				
	$h / h_{ef} \leq 1,3$		$2,26\ h_{ef}$				
Spacing	$s_{cr,sp}$	[mm]	$2 \cdot c_{cr,sp}$				



[1] In absence of national regulations.
[2] Parameter for design according to EOTA Technical Report TR 029.
[3] Parameter for design according to CEN/TS 1992-4:2009.

Hilti bonded anchor HVA, HVA R and HVA HCR

Performances
Characteristic values of resistance under tension loading.
Design according to „EOTA Technical Report TR 029, 09/2010“or “CEN/TS 1992-4:2009”

Annex C4

Deutsches Institut für Bautechnik DIBt

Table C6: Characteristic resistance for internal threaded sleeve HIS-N... under shear load in case of static and quasi static loading

HIS-(R)N			M8	M10	M12	M16	M20
Steel failure without lever arm							
Factor according to section 6.3.2.1 of CEN/TS 1992-4: 2009 part 5	k_2 [3]	[-]	1,0				
Characteristic resistance HIS-N with screw grade 8.8	$V_{Rk,s}$	[kN]	13	23	34	63	58
Partial safety factor	$\gamma_{Ms,V}$ [1]	[-]	1,25				
Characteristic resistance HIS-RN with screw grade 70	$V_{Rk,s}$	[kN]	13	20	30	55	83
Partial safety factor	$\gamma_{Ms,V}$ [1]	[-]	1,56				2,0
Steel failure with lever arm							
Characteristic resistance HIS-N / screw strength class 8.8	$M_{Rk,s}$	[Nm]	30	60	105	266	519
Partial safety factor	$\gamma_{Ms,V}$ [1]	[-]	1,25				
Characteristic resistance HIS-RN / screw strength class 70	$M_{Rk,s}$	[Nm]	26	52	92	233	454
Partial safety factor	$\gamma_{Ms,V}$ [1]	[-]	1,56				
Concrete pry-out failure							
Factor acc. to equation (5.7) of TR 029 or acc. to equation (27) of CEN/TS 1992-4: 2009 part 5	$k^{2)} = k_3$ [3]	[-]	2,0				
Concrete edge failure							
Effective length of anchor in shear loading	l_f	[mm]	90	110	125	170	205
Diameter of anchor	$d^{2)} = d_{nom}$ [3]	[mm]	12,5	16,5	20,5	25,4	27,6

[1] In absence of national regulations.
[2] Parameter for design according to EOTA Technical Report TR 029.
[3] Parameter for design according to CEN/TS 1992-4:2009.

Hilti bonded anchor HVA, HVA R and HVA HCR	**Annex C5**
Performances Characteristic values of resistance under shear loading. Design according to „EOTA Technical Report TR 029, 09/2010“or “CEN/TS 1992-4:2009”	

Deutsches Institut für Bautechnik DIBt

Table C7: Displacements under tension load for internal threaded sleeve HIS-N... in case of static and quasi static loading

HIS-(R)N			M8	M10	M12	M16	M20
Non-cracked concrete							
Temperature range I: 40 °C / 24 °C							
Tension load	N	[kN]	11,9	19,0	28,6	45,2	53,0
Displacement	δ_{N0}	[mm]	0,2	0,2	0,25	0,3	0,35
Displacement	$\delta_{N\infty}$	[mm]	0,5	0,55	0,65	0,8	0,85
Temperature range II: 80 °C / 50 °C							
Tension load	N	[kN]	9,5	15,7	22,5	35,7	45,2
Displacement	δ_{N0}	[mm]	0,15	0,2	0,2	0,25	0,3
Displacement	$\delta_{N\infty}$	[mm]	0,4	0,45	0,5	0,65	0,7
Temperature range III: 120 °C / 72 °C							
Tension load	N	[kN]	4,3	7,6	9,5	19,0	23,8
Displacement	δ_{N0}	[mm]	0,1	0,1	0,1	0,15	0,15
Displacement	$\delta_{N\infty}$	[mm]	0,2	0,2	0,2	0,35	0,4

Table C8: Displacements under shear load for internal threaded sleeve HIS-N... in case of static and quasi static loading

HIS-(R)N			M8	M10	M12	M16	M20
Shear load	V	[kN]	7,2	13,2	19,3	35,8	33,3
Displacement	δ_{N0}	[mm]	0,7	1,0	1,1	2,0	2,5
Displacement	$\delta_{N\infty}$	[mm]	1,1	1,5	1,7	3,0	3,8