EN

DECLARATION OF PERFORMANCE

No. HVU_1343-CPR-M 500-19_07.14

1. Unique identification code of the product-type:
Hilti HVU with HAS and HIS elements

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 5 (Edition 04-2013) used as an EAD
European Technical Assessment: ETA-05/0255 (19.01.2016)
Technical Assessment Body: DIBt - Deutsches Institut für Bautechnik
Notified body/ies: NB 1343 - MPA Darmstadt

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 C6

Safety in case of fire (BWR 2)

Essential characteristic	Performance
Reaction to fire	Anchorages satisfy requirements for Class A1

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:

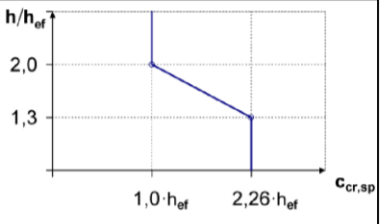
Raimund Zaggl
Business Unit Head
Business Unit Anchor

Seppo Perämäki
Head of Quality
Business Unit Anchor

Hilti Corporation
Schaan, 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

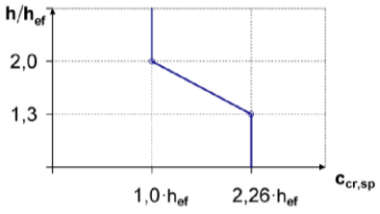
Performances
Displacements

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

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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