

PT

DECLARAÇÃO DE DESEMPENHO

Nº. HVU_1343-CPR-M 500-19_07.14

1. Código de identificação único do tipo de produto:

Hilti HVU com elementos HAS e HIS

2. Utilização(ões) prevista(s):

| Produto | Utilização prevista |
|---|--|
| Ancoragens metálicas para utilizar em betão | Para fixação e/ou sustentação a betão, elementos estruturais (que contribuem para a estabilidade dos trabalhos) ou unidades pesadas. |

3. Fabricante:

Hilti Corporation, Business Unit Anchors, 9494 Schaan, Principado do Liechtenstein

4. Sistema(s) de avaliação e verificação da regularidade do desempenho (AVCP): Sistema 1**5. Documento Europeu de Avaliação:** ETAG 001, Parte 5 (Edição 04-2013) utilizada como EAD**Avaliação Técnica Europeia:** ETA-05/0255 (19.01.2016)**Órgão de Avaliação Técnica:** DIBt - Deutsches Institut für Bautechnik**Organismo(s) notificado(s):** NB 1343 - MPA Darmstadt**6. Desempenho(s) declarado(s):****Resistência mecânica e estabilidade (BWR 1)**

| Característica essencial | Desempenho |
|---|----------------------------|
| Resistência característica para cargas estáticas e quase estáticas, Deslocações | Consulte os Anexos C1 a C6 |

Segurança em caso de incêndio (BWR 2)

| Característica essencial | Desempenho |
|--------------------------|---|
| Reação ao fogo | As ancoragens satisfazem os requisitos da Classe A1 |

O desempenho do produto identificado acima está em conformidade com o conjunto de desempenhos declarados. A presente declaração de desempenho é emitida, em conformidade com o Regulamento (UE) N.º. 305/2011, sob a exclusiva responsabilidade do fabricante identificado acima.

Assinado por e em nome do fabricante por:



Raimund Zaggi
Diretor da Unidade de Negócios
Unidade de Negócios de Ancoragens



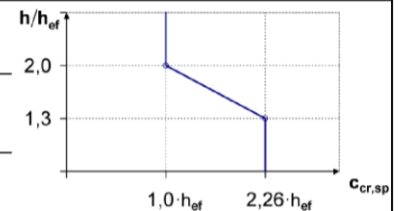
Seppo Perämäki
Diretor da Qualidade
Unidade de Negócios de Ancoragens

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 | $\gamma_2^{1)} = \gamma_{inst}^{2)}$ [-] | 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 | $k_B = k_{ucr}^{2)}$ [-] | 10,1 | | | | | | | |
| Increasing factors for τ_{Rk} in concrete | ψ_c | C30/37 | | | | | | | |
| | | C40/50 | | | | | | | |
| | | C50/60 | | | | | | | |
| 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

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 | $M_{Rk,s}^0$ | [Nm] | 16 | 33 | 56 | 147 | 284 | 486 | - | - |
| Characteristic resistance HAS-8.8 | $M_{Rk,s}^0$ | [Nm] | 26 | 53 | 90 | 234 | 455 | 777 | 1223 | 1637 |
| Characteristic resistance HAS-R | $M_{Rk,s}^0$ | [Nm] | 23 | 45 | 79 | 205 | 398 | 680 | 764 | 1023 |
| Characteristic resistance HAS-HCR | $M_{Rk,s}^0$ | [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

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

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 | $\gamma_2^{2)} = \gamma_{inst}^{3)}$ [-] | 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

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

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 C5

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 |

Hilti bonded anchor HVA, HVA R and HVA HCR

Performances
Displacements

Annex C6