



LV

# EKSPLUATĀCIJAS ĪPAŠĪBU DEKLARĀCIJA

Nr. HAC-C\_2451-CPR-EAD-2017.0003

**1. Izstrādājuma veida unikālais identifikācijas kods:**

Hilti HAC-C

**2. Paredzētais lietojums**

Izstrādājums	Paredzētā izmantošana
Ieliekamais enkurprofils	Stiprināšanai un/vai atbalstīšanai betonā, konstrukciju elementos (lai sekmētu ilgu darbu) vai smagos elementos.

**3. Ražotājs:**

Hilti Corporation, Business Unit Anchors, 9494 Schaan, Lihtenšteinas Firstiste

**4. Īpašību noturības novērtēšanas un pārbaudes sistēmas:** 1. sistēma

<b>Eiropas novērtējuma dokuments:</b>	EAD 330008-02-0601 (2016. gada februāra izdevums)
<b>Eiropas tehniskais novērtējums:</b>	ETA-17/0336 (11.07.2017)
<b>Tehniskā novērtējuma iestāde:</b>	DIBt — Deutsches Institut für Bautechnik
<b>Pilnvarotās iestādes:</b>	NB 2451 — DVS Zert GmbH

**6. Deklarētās ekspluatācijas īpašības:****Mehāniskā pretestība un stabilitāte (BWR 1)**

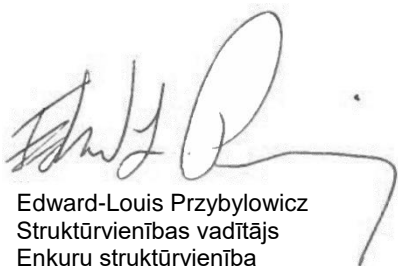
Galvenie raksturlielumi	Ekspluatācijas īpašības
Raksturīgā statiskās un kvazistatiskās slodzes pretestība, nobīdes	Skat. C1–C6 pielikumu

**Drošība ugunsgrēka gadījumā (BWR 2)**

Galvenie raksturlielumi	Ekspluatācijas īpašības
Ugunsreakcija	Enkuri atbilst A1 klases prasībām
Ugunsizturība	Skatīt C7 pielikumu

Iepriekš norādītā izstrādājuma ekspluatācijas īpašības atbilst deklarēto ekspluatācijas īpašību kopumam. Šī ekspluatācijas īpašību deklarācija izdota saskaņā ar Regulu (ES) Nr. 305/2011, un par to ir atbildīgs vienīgi iepriekš norādītais ražotājs.

Parakstīts ražotāja vārdā:



Edward-Louis Przybyłowicz  
Struktūrvienības vadītājs  
Enkuru struktūrvienība



Gunnar Wald  
Kvalitātes vadītājs  
Enkuru struktūrvienība

Hilti Corporation  
Šāna, 28.07.2017

**Table 10: Characteristic resistances under tension load – steel failure of anchor channel**

Anchor channel HAC-C			28/15	38/17	40/25	40/22	49/30	50/30	54/33	52/34
<b>Steel failure: Failure of anchor</b>										
Characteristic resistance	$N_{Rk,s,a}$	[kN]	9	18	20		31		55	
Partial safety factor	$\gamma_{Ms}^{1)}$	[-]	1,8							
<b>Steel failure: Failure of connection between anchor and channel</b>										
Characteristic resistance	$N_{Rk,s,c}$	[kN]	9	18	20		31		55	
Partial safety factor	$\gamma_{Ms,ca}^{1)}$	[-]	1,8							
<b>Steel failure: Local failure by flexure of channel lips</b>										
Characteristic spacing of the channel bolts for $N_{Rk,s,l}$	$s_{l,N}$	[mm]	56	76	80	79	100	98	107	105
Characteristic resistance	$N_{Rk,s,l}^0$	[kN]	9	18	20	35	31	36	55	65
Partial safety factor	$\gamma_{Ms,l}^{1)}$	[-]	1,8							

<sup>1)</sup> In absence of other national regulations

**Table 11: Characteristic flexural resistance of channel under tension load**

Anchor channel HAC-C			28/15	38/17	40/25	40/22	49/30	50/30	54/33	52/34	
<b>Steel failure: Failure by flexure of channel</b>											
Characteristic flexural resistance of channel	carbon steel	$M_{Rk,s,flex}$	[Nm]	316	538	979	1013	1669	2084	2929	3435
	stainless steel				527			1702		2832	
Partial safety factor	$\gamma_{Ms,flex}^{1)}$	[-]	1,15								

<sup>1)</sup> In absence of other national regulations

**Anchor channels (HAC-C) with channel bolts (HBC)**

**Performance Data**

Characteristic resistances of anchor channels under tension load

Annex C1

**Table 12: Characteristic resistances under tension load – concrete failure**

Anchor channel HAC-C			28/15	38/17	40/25	40/22	49/30	50/30	54/33	52/34		
Type of anchor			R	R	R	I	R	I	R	I	R	
<b>Pullout failure</b>												
Characteristic resistance in cracked concrete C12/15	N <sub>Rk,p</sub>	[kN]	7,6	13,6	27,0	13,6	21,2	33,8	21,2	33,2	68,4	33,2
Characteristic resistance in uncracked concrete C12/15			10,7	19,0	37,8	19,0	29,7	47,3	29,7	46,5	95,8	46,5
Amplification factor of N <sub>Rk,p</sub>	C16/20	ψ <sub>c</sub> [-]	1,33									
	C20/25		1,67									
	C25/30		2,08									
	C30/37		2,50									
	C35/45		2,92									
	C40/50		3,33									
	C45/55		3,75									
	C50/60		4,17									
	≥ C55/67		4,58									
≥ C60/75	5,00											
Partial safety factor	γ <sub>Mp</sub> = γ <sub>Mc</sub> <sup>1)</sup>	[-]	1,5									
<b>Concrete cone failure</b>												
Product factor k <sub>1</sub>	cracked concrete	k <sub>cr,N</sub>	[-]	7,2	7,8	7,9		8,1		8,7		
	uncracked concrete	k <sub>ucr,N</sub>	[-]	10,3	11,2	11,2		11,6		12,4		
Partial safety factor	γ <sub>Mc</sub> <sup>1)</sup>	[-]	1,5									
<b>Splitting</b>												
Characteristic edge distance	C <sub>cr,sp</sub>	[mm]	135	228	237		282		465			
Partial safety factor	γ <sub>Msp</sub> = γ <sub>Mc</sub> <sup>1)</sup>	[-]	1,5									

<sup>1)</sup> In absence of other national regulations

**Table 13: Displacements under tension load**

Anchor channel HAC-C			28/15	38/17	40/25	40/22	49/30	50/30	54/33	52/34
Tension load	N	[kN]	3,6	7,1	7,9	13,9	12,3	14,3	21,8	25,8
Short-term displacement <sup>1)</sup>	δ <sub>N0</sub>	[mm]	0,6	1,3	1,4	2,3	1,4	2,2	1,6	1,4
Long-term displacement <sup>1)</sup>	δ <sub>N∞</sub>	[mm]	1,2	2,6	2,8	4,6	2,8	4,4	3,2	2,8

<sup>1)</sup> Displacements in midspan of the anchor channel, including slip of channel bolt, deformation of channel lips, bending of the channel and slip of the anchor channel in concrete

**Anchor channels (HAC-C) with channel bolts (HBC)**

**Performance Data**

Characteristic resistances of anchor channels and displacements under tension load

Annex C2

**Table 14: Characteristic resistances under shear load – steel failure of anchor channel**

Anchor channel HAC-C			28/15	38/17	40/25	40/22	49/30	50/30	54/33	52/34
<b>Steel failure: Failure of anchor</b>										
Characteristic resistance	$V_{Rk,s,a}$	[kN]	9,0	18,0	20,0	26,0	31,0	40,3	55,0	71,5
Partial safety factor	$\gamma_{Ms}^{1)}$	[-]	1,5							
<b>Steel failure: Failure of connection between anchor and channel</b>										
Characteristic resistance	$V_{Rk,s,c}$	[kN]	9,0	18,0	20,0	26,0	31,0	40,3	55,0	71,5
Partial safety factor	$\gamma_{Ms,ca}^{1)}$	[-]	1,8							
<b>Steel failure: Local failure by flexure of channel lips</b>										
Characteristic spacing of channel bolts for $V_{Rk,s,l}$	$s_{l,v}$	[mm]	56	76	80	79	100	98	107	105
Characteristic resistance	$V_{Rk,s,l}^0$	[kN]	9,0	18,0	20,0	26,0	31,0	40,3	55,0	71,5
Partial safety factor	$\gamma_{Ms,l}^{1)}$	[-]	1,8							

<sup>1)</sup> In absence of other national regulations

**Anchor channels (HAC-C) with channel bolts (HBC)**

**Performance Data**

Characteristic resistances of anchor channels under shear load

Annex C3

**Table 15: Characteristic resistances under shear load – concrete failure**

Anchor channel HAC-C			28/15	38/17	40/25	40/22	49/30	50/30	54/33	52/34
<b>Pry out failure</b>										
Product factor	$k_8$	[-]	1,0	2,0						
Partial safety factor	$\gamma_{Mc}^{1)}$	[-]	1,5							
<b>Concrete edge failure</b>										
Product factor $k_{12}$	cracked concrete	$k_{cr,V}$	[-]	6,9	7,5					
	uncracked concrete	$k_{ucr,V}$	[-]	9,6	10,5					
Partial safety factor	$\gamma_{Mc}^{1)}$	[-]	1,5							

<sup>1)</sup> In absence of other national regulations

**Table 16: Displacements under shear load**

Anchor channel HAC-C			28/15	38/17	40/25	40/22	49/30	50/30	54/33	52/34
Shear load	V	[kN]	3,6	7,1	7,9	10,3	12,3	16,0	21,8	28,4
Short-term displacement <sup>1)</sup>	$\delta_{V0}$	[mm]	0,6	1,3	1,4	2,1	1,4	2,6	1,6	3,7
Long-term displacement <sup>1)</sup>	$\delta_{V\infty}$	[mm]	0,9	2,0	2,1	3,1	2,1	3,9	2,4	5,5

<sup>1)</sup> Displacements in midspan of the anchor channel, including slip of channel bolt, deformation of channel lips and slip of the anchor channel in concrete

**Table 17: Characteristic resistances under combined tension and shear load**

Anchor channel HAC-C			28/15	38/17	40/25	40/22	49/30	50/30	54/33	52/34
<b>Steel failure: Local failure by flexure of channel lips and failure by flexure of channel</b>										
Product factor	$k_{13}$	[-]	1,0 <sup>1)</sup>							
<b>Steel failure: Failure of anchor and connection between anchor and channel</b>										
Product factor	$k_{14}$	[-]	1,0 <sup>2)</sup>							

<sup>1)</sup>  $k_{13}$  can be taken as 2,0 if  $V_{Rd,s,l}$  is limited to  $N_{Rd,s,l}$

<sup>2)</sup>  $k_{14}$  can be taken as 2,0 if  $\max(V_{Rd,s,a}; V_{Rd,s,c})$  is limited to  $\min(N_{Rd,s,a}; N_{Rd,s,c})$

**Anchor channels (HAC-C) with channel bolts (HBC)**

**Performance Data**

Characteristic resistances of anchor channels and displacements under shear load  
Characteristic resistances under combined tension and shear load

Annex C4

**Table 18: Characteristic resistances under tension and shear load – steel failure of channel bolts**

Channel bolt					M8	M10	M12	M16	M20			
<b>Steel failure</b>												
Characteristic tension resistance	$N_{Rk,s}^{1)}$	[kN]	HBC-28/15	4.6	-							
				8.8	22,4	35,4	44,3	-				
				A4-50 <sup>2)</sup>	17,2	-						
			HBC-38/17	A4-70 <sup>2)</sup>	25,6	38,9	51,3	-				
				4.6	-		23,2	-				
				8.8	-		-	35,4	55,8	-		
			HBC-40/22	A4-70 <sup>2)</sup>	20,5	47,2	53,0	-				
				4.6	-		23,2	-				
				8.8	-		-	35,4	55,8	-		
			HBC-50/30	A4-70 <sup>2)</sup>	20,5	58,6	91,0	-				
				4.6	-		-					
				8.8	-		-	35,4	55,8	183,1		
			Partial safety factor	$\gamma_{Ms}^{3)}$	[-]	HBC-28/15	4.6	2,00				
						HBC-38/17	8.8	1,50				
						HBC-40/22	A4-50 <sup>2)</sup>	2,86				
HBC-50/30	A4-70 <sup>2)</sup>	1,87										
Characteristic shear resistance	$V_{Rk,s}^{1)}$	[kN]	HBC-28/15	4.6	-							
				8.8	14,6	23,2	33,7	-				
				A4-50 <sup>2)</sup>	11,0	-						
			HBC-38/17	A4-70	15,4	24,4	35,4	-				
				4.6	-		13,9	-				
				8.8	-		-	33,7	62,8	-		
			HBC-40/22	A4-70 <sup>2)</sup>	24,4	35,4	65,9	-				
				4.6	-		13,9	-				
				8.8	-		-	33,7	62,8	-		
			HBC-50/30	A4-70 <sup>2)</sup>	24,4	35,4	65,9	-				
				4.6	-		-					
				8.8	-		-	33,7	62,8	98,0		
Partial safety factor	$\gamma_{Ms}^{3)}$	[-]	HBC-28/15	4.6	1,67							
			HBC-38/17	8.8	1,25							
			HBC-40/22	A4-50 <sup>2)</sup>	2,38							
			HBC-50/30	A4-70	1,56							

<sup>1)</sup> In conformity to EN ISO 898-1:1999

<sup>2)</sup> Materials according to Table 6, Annex A6

<sup>3)</sup> In absence of other national regulations

**Anchor channels (HAC-C) with channel bolts (HBC)**

**Performance Data**

Characteristic resistances of channel bolts under tension and shear load

Annex C5

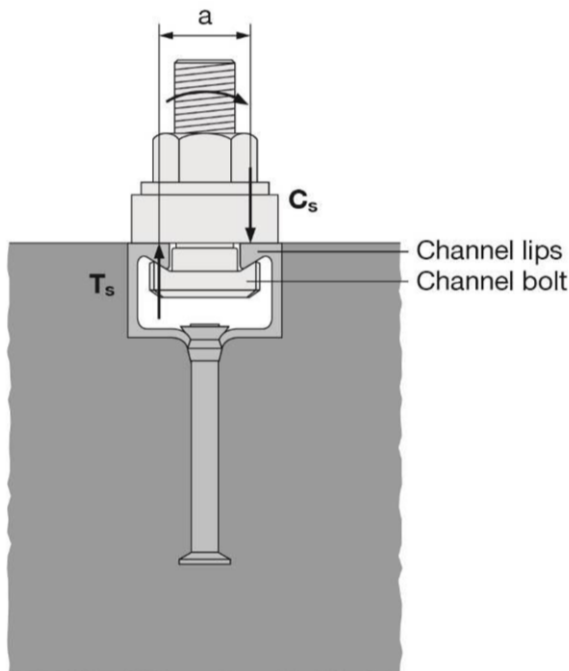
**Table 19: Characteristic resistances under shear load with lever arm – steel failure of channel bolts**

Channel bolt <sup>1)</sup>				M8	M10	M12	M16	M20		
<b>Steel failure</b>										
Characteristic flexural resistance	$M^{0}_{Rk,s}$	[Nm]	HBC-28/15	4.6	-	29,9 <sup>3)</sup>	-			
			HBC-38/17	8.8	30,0	59,8	104,8	266,4	519,3	
			HBC-40/22	A4-50 <sup>2)</sup>	18,7	-				
			HBC-50/30	A4-70 <sup>2)</sup>	26,2	52,3	91,7	233,1	454,4	
Partial safety factor	$\gamma_{Ms}^{1)}$	[-]	HBC-28/15	4.6	1,67					
			HBC-38/17	8.8	1,25					
			HBC-40/22	A4-50 <sup>2)</sup>	2,38					
			HBC-50/30	A4-70 <sup>2)</sup>	1,56					
Internal lever arm	a	[mm]	HBC-28/15	28/15	17,3	18,7	20,0	-		
			HBC-38/17	38/17	-	23,0	24,3	26,3	-	
			HBC-40/22	40/22		24,3	25,7	27,3		
			HBC-50/30	50/30	-	-	29,9	31,7	33,9	

1) In absence of other national regulations

2) Materials according to Table 6, Annex A6

3) Not applicable for HBC-28/15 and HBC-50/30



3) The characteristic flexure resistance according to Table 19 is limited as follows:

$$M^{0}_{Rk,s} \leq 0,5 \cdot N_{Rk,s,l} \cdot a \quad (N_{Rk,s,l} \text{ according to Table 10})$$

$$M^{0}_{Rk,s} \leq 0,5 \cdot N_{Rk,s} \cdot a \quad (N_{Rk,s} \text{ according to Table 18})$$

a = internal lever arm according to Table 19

$T_s$  = tension force acting on the channel lips

$C_s$  = compression force acting on the channel lips

**Anchor channels (HAC-C) with channel bolts (HBC)**

**Performance Data**

Characteristic flexural resistances of channel bolts under shear load

Annex C6

**Table 20: Characteristic resistance  $F_{Rd,s,fi}$  [kN] of anchor channels under fire exposure**

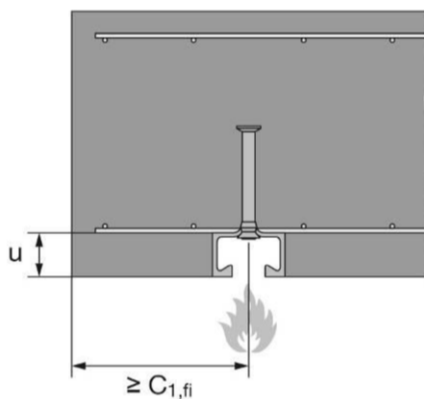
Channel bolt				M10	M12	≥ M16	
<b>Steel failure of anchor, connection between anchor and channel, local flexure of channel lip</b>							
Characteristic resistance in cracked concrete C20/25	HAC-C 28/15	R60	$N_{Rk,s,fi}$ = $V_{Rk,s,fi}$	[kN]	0,8		-
		R90			0,6		
		R120			0,5		
	HAC-C 38/17	R60			-		1,9
		R90			-		1,3
		R120			-		1,0
	HAC-C 40/25 HAC-C 40/22	R60			1,7	3,5	
		R90			1,2	2,2	
		R120			0,9	1,5	
	HAC-C 49/30 HAC-C 50/30 HAC-C 52/34	R60			-	3,8	3,9
		R90			-	2,5	2,9
		R120			-	1,9	2,4
Partial safety factor			$\gamma_{Ms,fi}$ <sup>1)</sup>	[-]	1,0		

<sup>1)</sup> In absence of other national regulations

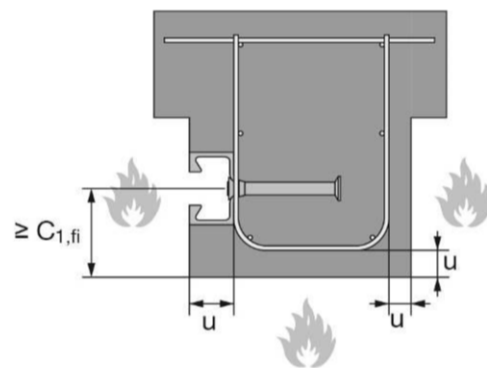
**Table 21: Minimum concrete cover**

Anchor channel HAC-C				28/15	38/17	40/25	40/22	49/30	50/30	54/33	52/34
Concrete cover	R60	u	[mm]	35				50	50	50	50
	R90			45							
	R120			55							

**Fire exposure from one side only**



**Fire exposure from more than one side**



**Anchor channels (HAC-C) with channel bolts (HBC)**

**Performance Data**

Characteristic resistances of anchor channels and channel bolts under fire exposure

Annex C7