



# Hilti HAC-C(-P) Hot-Rolled Anchor Channel

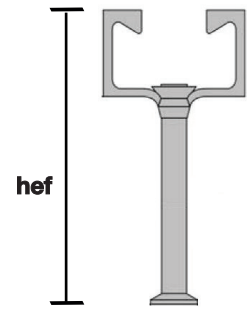
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## Anchor channel HAC-C(-P)



### APPLICATIONS

- Fastening in lift shafts, such as fixing of guiderails, sliding doors or divider beams
- Fastening curtain wall façade brackets to concrete slabs
- Fastening overhead MEP installations and equipment
- Creating adjustable, retrofittable fastening points in concrete

### Technical data

Base material	Concrete
Material composition	Steel, A4 stainless steel ; Steel, hot-dip galvanized

### ADVANTAGES

- Upgraded load capacity - higher static tension and shear values
- Longitudinal load can be catered when using with notched t-bolt
- Engineering and software support - you can use Hilti PROFIS Anchor Channel software and our engineering services team to streamline your design work
- Designed for high-speed installation - end caps with nail holes, one-pull filler foam and many other features help to make these anchor channels faster and easier on-site
- Available in stainless steel and hot-dip galvanized versions - helping to provide corrosion protection as needed for specific environmental conditions

### HAC-C(-P) (A4 stainless steel)

Ordering designation	T-head bolt size	Length, (mm)	Number of anchors	Standard embedment depth, hef, (mm)	Sales pack quantity	Item number
HAC-C-P 40/22-250-A4	40/22	250	2	91	1 pc	2277366 <sup>1)</sup>
HAC-C-P 40/22-300-A4	40/22	300	2	91	1 pc	2277367 <sup>1)</sup>
HAC-C-P 40/22-350-A4	40/22	350	3	91	1 pc	2277368 <sup>1)</sup>
HAC-C-P 40/22-400-A4	40/22	400	3	91	1 pc	2277369 <sup>1)</sup>
HAC-C-P 40/22-450-A4	40/22	450	3	91	1 pc	2277370 <sup>1)</sup>
HAC-C-P 40/22-550-A4	40/22	550	3	91	1 pc	2277371 <sup>1)</sup>
HAC-C-P 40/22-1050-A4	40/22	1050	5	91	1 pc	2277372 <sup>1)</sup>
HAC-C-P 50/30-250-A4	50/30	250	2	106	1 pc	2277387 <sup>1)</sup>
HAC-C-P 50/30-300-A4	50/30	300	2	106	1 pc	2277388 <sup>1)</sup>
HAC-C-P 50/30-350-A4	50/30	350	3	106	1 pc	2277389 <sup>1)</sup>
HAC-C-P 50/30-450-A4	50/30	450	3	106	1 pc	2277390 <sup>1)</sup>
HAC-C-P 50/30-550-A4	50/30	550	3	106	1 pc	2277391 <sup>1)</sup>
HAC-C-P 50/30-1050-A4	50/30	1050	5	106	1 pc	2277392 <sup>1)</sup>
HAC-C 52/34-300-A4	52/34	300	2	155	1 pc	2170256 <sup>1)</sup>
HAC-C 52/34-350-A4	52/34	350	3	155	1 pc	2170257 <sup>1)</sup>
HAC-C 52/34-400-A4	52/34	400	3	155	1 pc	2170258 <sup>1)</sup>
HAC-C 52/34-450-A4	52/34	450	3	155	1 pc	2170259 <sup>1)</sup>
HAC-C 52/34-550-A4	52/34	550	3	155	1 pc	2170410 <sup>1)</sup>
HAC-C 52/34-800-A4	52/34	800	4	155	1 pc	2170411 <sup>1)</sup>
HAC-C 52/34-1050-A4	52/34	1050	5	155	1 pc	2170412 <sup>1)</sup>

<sup>1)</sup> This is non-stock item. For detailed leadtime information, please contact your Hilti representative.

Please visit Hilti website for the latest item numbers and related products



## HAC-C(-P) (Hot-dip galvanized)

Ordering designation	T-head bolt size	Length, (mm)	Number of anchors	Standard embedment depth, hef, (mm)	Sales pack quantity	Item number
HAC-C-P 40/22-250-F	40/22	250	2	91	1 pc	2277351 <sup>1)</sup>
HAC-C-P 40/22-300-F	40/22	300	2	91	1 pc	2277352 <sup>1)</sup>
HAC-C-P 40/22-350-F	40/22	350	3	91	1 pc	2277353 <sup>1)</sup>
HAC-C-P 40/22-400-F	40/22	400	3	91	1 pc	2277354 <sup>1)</sup>
HAC-C-P 40/22-450-F	40/22	450	3	91	1 pc	2277355 <sup>1)</sup>
HAC-C-P 40/22-550-F	40/22	550	3	91	1 pc	2277356
HAC-C-P 40/22-1050-F	40/22	1050	5	91	1 pc	2277358 <sup>1)</sup>
HAC-C-P 40/22-1550-F	40/22	1550	7	91	1 pc	2277360 <sup>1)</sup>
HAC-C-P 50/30-250-F	50/30	250	2	106	1 pc	2277376 <sup>1)</sup>
HAC-C-P 50/30-300-F	50/30	300	2	106	1 pc	2277377 <sup>1)</sup>
HAC-C-P 50/30-350-F	50/30	350	3	106	1 pc	2277378 <sup>1)</sup>
HAC-C-P 50/30-450-F	50/30	450	3	106	1 pc	2277379 <sup>1)</sup>
HAC-C-P 50/30-550-F	50/30	550	3	106	1 pc	2277380
HAC-C-P 50/30-1050-F	50/30	1050	5	106	1 pc	2277382 <sup>1)</sup>
HAC-C 52/34-300-F	52/34	300	2	155	1 pc	2168542 <sup>1)</sup>
HAC-C 52/34-350-F	52/34	350	3	155	1 pc	2168543 <sup>1)</sup>
HAC-C 52/34-400-F	52/34	400	3	155	1 pc	2168544 <sup>1)</sup>
HAC-C 52/34-450-F	52/34	450	3	155	1 pc	2168545 <sup>1)</sup>
HAC-C 52/34-550-F	52/34	550	3	155	1 pc	2168546 <sup>1)</sup>
HAC-C 52/34-800-F	52/34	800	4	155	1 pc	2168547 <sup>1)</sup>
HAC-C 52/34-1050-F	52/34	1050	5	155	1 pc	2168548 <sup>1)</sup>

<sup>1)</sup> This is non-stock item. For detailed leadtime information, please contact your Hilti representative.

Please visit Hilti website for the latest item numbers and related products

## T-head bolt HBC (Suitable for profile HAC-C-P 40/22)



### APPLICATIONS

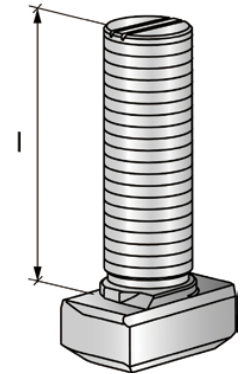
- For use with HAC-C(-P) anchor channels

### ADVANTAGES

- European approval according to latest technical specifications
- Dustless and noiseless fastening method

### Technical data

<b>Material composition</b>	Steel, A4-70 stainless steel ; Steel, Hot-dip galvanized
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### HBC (A4 stainless steel)

Ordering designation	Anchor size	Usable thread length, (mm)	Bolt length, l (mm)	Sales pack quantity	Item number
HBC 40/22-M12x60 A4-70	M12	36.7	60	50 pc	2169081 <sup>1)</sup>
HBC 40/22-M12x80 A4-70	M12	56.7	80	25 pc	2169082 <sup>1)</sup>
HBC 40/22-M16x60 A4-70	M16	32.2	60	25 pc	2169084 <sup>1)</sup>
HBC 40/22-M16x80 A4-70	M16	52.2	80	25 pc	2169085 <sup>1)</sup>

### HBC (Grade 8.8, hot-dip galvanized)

Ordering designation	Anchor size	Usable thread length, (mm)	Bolt length, l (mm)	Sales pack quantity	Item number
HBC 40/22-M12x60 8.8F	M12	36.7	60	50 pc	2169074 <sup>1)</sup>
HBC 40/22-M12x80 8.8F	M12	56.7	80	25 pc	2169075 <sup>1)</sup>
HBC 40/22-M16x60 8.8F	M16	32.2	60	25 pc	2169077 <sup>1)</sup>
HBC 40/22-M16x80 8.8F	M16	52.2	80	25 pc	2169078 <sup>1)</sup>

### Notched T-Bolt HBC (Grade 8.8, hot-dip galvanized)

#### Technical data

<b>Material composition</b>	Steel, Hot-dip galvanized
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Ordering designation	Anchor size	Usable thread length, (mm)	Bolt length, l (mm)	Sales pack quantity	Item number
HBC-40/22-N M16x60 8.8F	M16	32.2	60	100 pc	2169143
HBC-40/22-N M16x80 8.8F	M16	52.2	80	50 pc	2169144

<sup>1)</sup> This is non-stock item. For detailed leadtime information, please contact your Hilti representative.

\*Usable thread length measures the bolt length protruded after inserted the HBC into the anchor channel.

Please visit Hilti website for the latest item numbers and related products

## T-head bolt HBC (Suitable for profile HAC-C-P 50/30 and HAC-C 52/34)



### APPLICATIONS

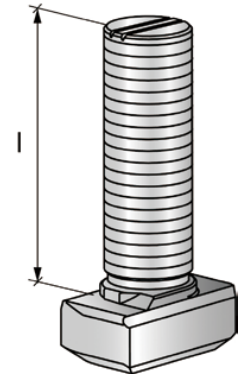
- For use with HAC-C(-P) anchor channels

### ADVANTAGES

- European approval according to latest technical specifications
- Dustless and noiseless fastening method

### Technical data

<b>Material composition</b>	Steel, A4-70 stainless steel ; Steel, Hot-dip galvanized
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### HBC (A4 stainless steel)

Ordering designation	Anchor size	Usable thread length, (mm)	Bolt length, l (mm)	Sales pack quantity	Item number
HBC 50/30-M16x60 A4-70	M16	30.2	60	50 pc	2168809 <sup>1)</sup>
HBC 50/30-M16x80 A4-70	M16	50.2	80	50 pc	2168810 <sup>1)</sup>
HBC 50/30-M20x60 A4-70	M20	45	80	50 pc	2168814 <sup>1)</sup>

### HBC (Grade 8.8, hot-dip galvanized)

Ordering designation	Anchor size	Usable thread length, (mm)	Bolt length, l (mm)	Sales pack quantity	Item number
HBC 50/30-M16x60 8.8F	M16	30.2	60	50 pc	2168746 <sup>1)</sup>
HBC 50/30-M16x80 8.8F	M16	50.2	80	50 pc	2168747 <sup>1)</sup>
HBC 50/30-M20x60 8.8F	M20	45	80	50 pc	2168800 <sup>1)</sup>

### Notched T-Bolt HBC (Grade 8.8, hot-dip galvanized)

#### Technical data

<b>Material composition</b>	Steel, Hot-dip galvanized
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Ordering designation	Anchor size	Usable thread length, (mm)	Bolt length, l (mm)	Sales pack quantity	Item number
HBC-50/30-N M16x60 8.8F	M16	30.2	60	50 pc	2169149
HBC-50/30-N M16x80 8.8F	M16	50.2	80	50 pc	2169160
HBC-50/30-N M20x60 8.8F	M20	25	60	50 pc	2168515
HBC-50/30-N M20x80 8.8F	M20	45	80	50 pc	2168516

<sup>1)</sup> This is non-stock item. For detailed leadtime information, please contact your Hilti representative.

\*Usable thread length measures the bolt length protruded after inserted the HBC into the anchor channel.

Please visit Hilti website for the latest item numbers and related products

Approval body for construction products  
and types of construction

Bautechnisches Prüfamt

An institution established by the Federal and  
Laender Governments



## European Technical Assessment

ETA-17/0336  
of 9 November 2020

English translation prepared by DIBt - Original version in German language

### General Part

Technical Assessment Body issuing the  
European Technical Assessment:

Deutsches Institut für Bautechnik

Trade name of the construction product

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

Product family  
to which the construction product belongs

Anchor channels

Manufacturer

Hilti AG  
Feldkircherstraße 100  
9494 Schaan  
FÜRSTENTUM LIECHTENSTEIN

Manufacturing plant

Hilti Werke

This European Technical Assessment  
contains

31 pages including 3 annexes which form an integral part  
of this assessment

This European Technical Assessment is  
issued in accordance with Regulation (EU)  
No 305/2011, on the basis of

EAD 330008-03-0601

This version replaces

ETA-17/0336 issued on 19 May 2020

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## Specific Part

### 1 Technical description of the product

The anchor channels (HAC-C) with channel bolts (HBC) are a system consisting of C-shaped channel profile of carbon steel or stainless steel and at least two metal anchors non-detachably fixed to the channel back and channel bolts.

The anchor channel is embedded surface-flush in the concrete. Channel bolts (HBC) with appropriate hexagon nuts and washers are fixed to the channel.

The product description is given in Annex A.

### 2 Specification of the intended use in accordance with the applicable European Assessment Document

The performances given in Section 3 are only valid if the anchor channel is used in compliance with the specifications and conditions given in Annex B.

The verifications and assessment methods on which this European Technical Assessment is based lead to the assumption of a working life of the anchor channel of at least 50 years. The indications given on the working life cannot be interpreted as a guarantee given by the producer, but are to be regarded only as a means for choosing the right products in relation to the expected economically reasonable working life of the works.

### 3 Performance of the product and references to the methods used for its assessment

#### 3.1 Mechanical resistance and stability (BWR 1)

Essential characteristic	Performance
Characteristic resistance under tension load (static and quasi-static load)	
- Resistance to steel failure of anchors, connection and channel lips	See Annex C1
- Resistance to steel failure of channel bolt	See Annex C9
- Resistance to steel failure by exceeding the bending strength of the channel	See Annex B5 and C2
- Max. installation torque	See Annex B5
- Resistance to pull-out failure of the anchor and to concrete cone failure	See Annex C3 and C4
- Min. edge distance, spacing and member thickness	See Annex B3
- Characteristic edge distance and spacing to avoid splitting of concrete under load	See Annex C3 and C4
- Resistance to blow-out failure – bearing area of anchor head	See Annex A4



<p>Characteristic resistance under shear load (static and quasi-static load)</p> <ul style="list-style-type: none"> <li>- Resistance to steel failure of channel bolt</li> <li>- Resistance to steel failure of channel lips, connection and anchor (shear load perpendicular to longitudinal axis of channel)</li> <li>- Resistance to steel failure of channel lips, anchor and connection (shear load in direction of longitudinal axis of channel)</li> <li>- Resistance to concrete failure</li> </ul>	<p>See Annex C9 und C10 See Annex C5 und C6  See Annex C5 und C6  See Annex C7</p>
<p>Characteristic resistance under combined tension and shear load (static and quasi-static load)</p>	<p>See Annex C8</p>
<p>Characteristic resistances under cyclic fatigue tension load</p>	<p>See Annex C12 to C13</p>
<p>Displacements (static and quasi-static load)</p>	<p>See Annex C5 and C7 to C8</p>
<p>Durability</p>	<p>See Annex B1</p>

### 3.2 Safety in case of fire (BWR 2)

Essential characteristic	Performance
Reaction to fire	Class A1
Characteristic resistance to fire	See Annex C11

## 4 Assessment and verification of constancy of performance (AVCP) system applied, with reference to its legal base

In accordance with EAD No. 330008-03-0601, the applicable European legal act is: [2000/273/EC].

The system to be applied is: 1

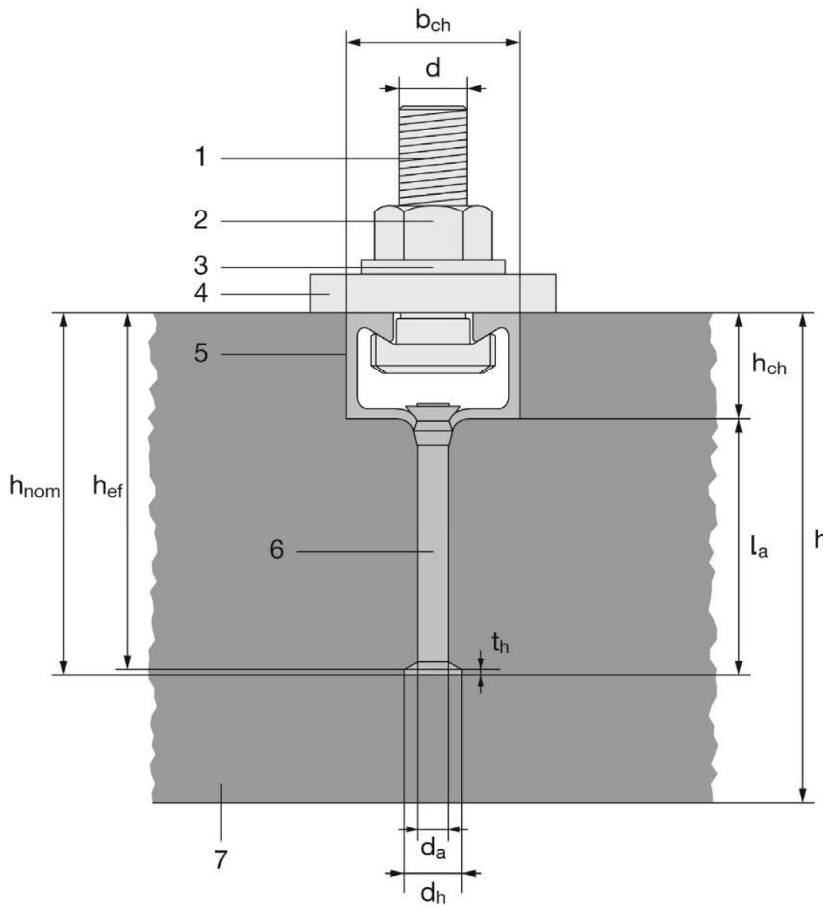
## 5 Technical details necessary for the implementation of the AVCP system, as provided for in the applicable EAD

Technical details necessary for the implementation of the AVCP system are laid down in the control plan deposited with Deutsches Institut für Bautechnik.

Dipl.-Ing. Beatrix Wittstock  
Head of Section

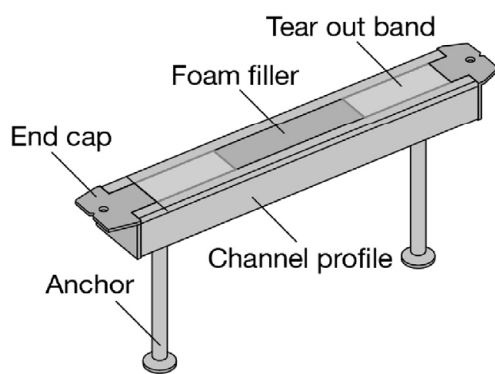
*beglaubigt:*  
Müller

Product and installation condition

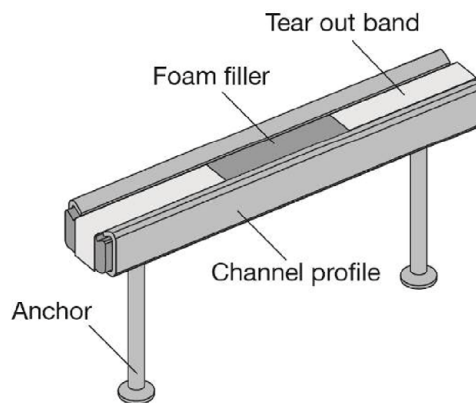


Key

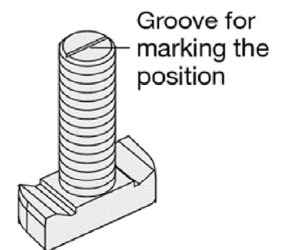
- 1 channel bolt
- 2 hexagonal nut
- 3 washer
- 4 fixture
- 5 channel profile
- 6 anchor
- 7 concrete member



Hot-rolled anchor channel



Cold-formed anchor channel



Channel bolt

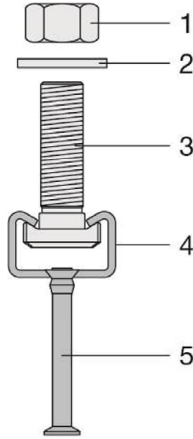
Anchor channels (HAC-C) with channel bolts (HBC)

Product Description  
Installed condition

Annex A1

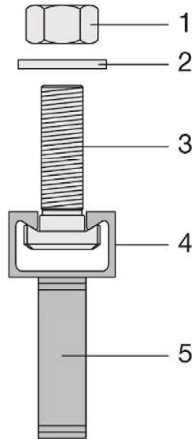
### Anchor channel types

Cold-formed anchor channel

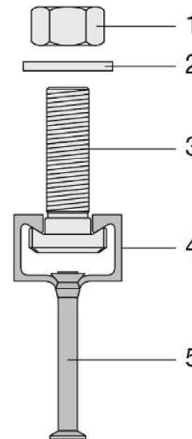


Round anchor

Hot-rolled anchor channel



I-anchor



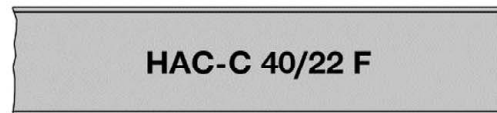
Round anchor

#### Key

- 1 hexagonal nut
- 2 washer
- 3 channel bolt
- 4 channel profile
- 5 anchor

#### Marking of the anchor channels:

HAC-C(-P)(-I) XZ



(e.g. HAC-C 40/22 F)

HAC-C = Identifying mark of the manufacturer

P = Additional marking for premium line

I = Additional marking for I-anchors  
(no marking in the case of round anchors)

X = Size of the channel

Z = Corrosion class / Material

F = Hot-dip galvanized

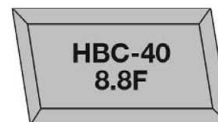
A4 = Stainless steel

40/22 = Anchor channel size 40/22

F = Hot-dip galvanized

#### Marking of the channel bolt:

HBC-X(-N) YZ



(e.g. HBC-40/22 8.8F)

HBC = Identifying mark of the manufacturer

X = Channel bolt

N = Additional marking for notching bolt

Y = Steel grade (4.6, 8.8, 70)

Z = Corrosion class / Material

F = Hot-dip galvanized

R = Stainless steel

40 = Channel bolt in combination with  
HAC-C 40/22F

8.8 = Steel grade

F = Hot-dip galvanized

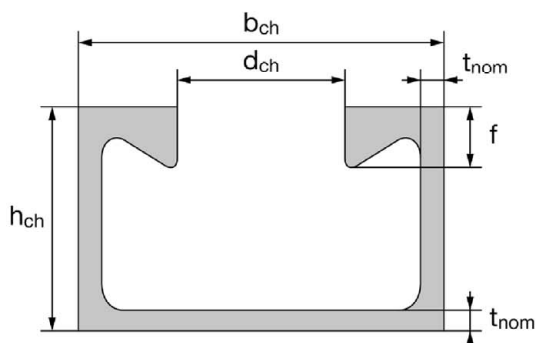
### Anchor channels (HAC-C) with channel bolts (HBC)

#### Product Description

Anchor channel types and marking

Annex A2

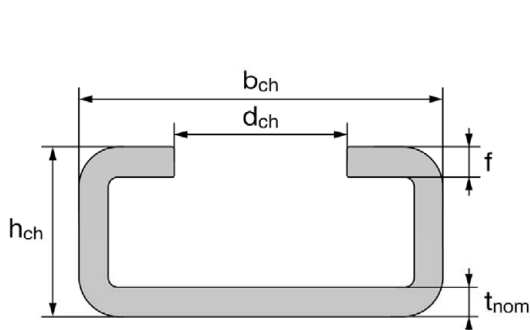
### Channel profiles



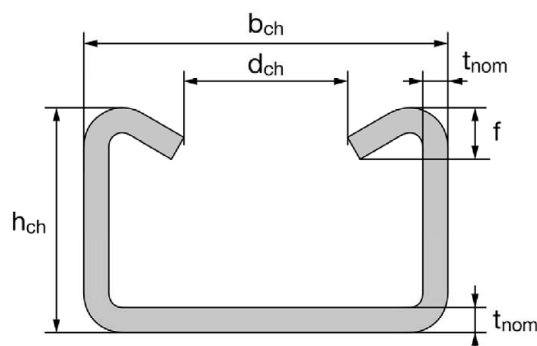
HAC-C(-P) 40/22, HAC-C-P 40L, HAC-C(-P) 50/30, HAC-C-P 50L, HAC-C 52/34

**Table 1: Dimensions of hot-rolled channel profile**

Anchor channel	$b_{ch}$	$h_{ch}$	$t_{nom}$	$d_{ch}$	$f$	$I_y$
	[mm]					[mm <sup>4</sup> ]
HAC-C(-P) 40/22	40,1	23,0	2,7	18,0	6,0	21504
HAC-C-P 40L	40,1	23,0	2,7	18,0	6,0	21504
HAC-C(-P) 50/30	49,6	30,0	3,2	22,5	8,1	57781
HAC-C-P 50L	49,6	30,0	3,2	22,5	8,1	57781
HAC-C 52/34	52,5	34,0	4,0	22,5	11,5	97606



HAC-C 28/15, HAC-C 38/17



HAC-C 40/25, HAC-C 49/30, HAC-C 54/33

**Table 2: Dimensions of cold-formed channel profile**

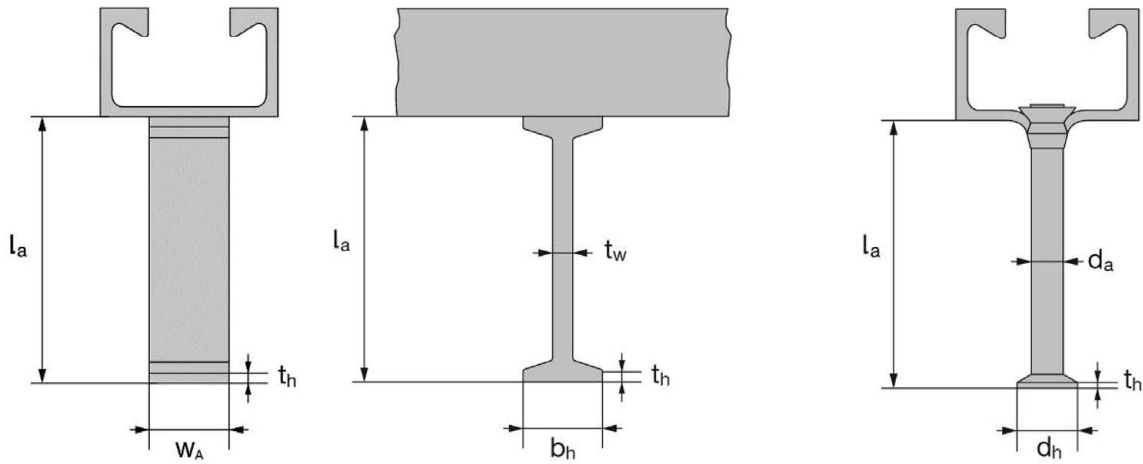
Anchor channel	$b_{ch}$	$h_{ch}$	$t_{nom}$	$d_{ch}$	$f$	$I_y$
	[mm]					[mm <sup>4</sup> ]
HAC-C 28/15	28,0	15,5	2,3	12,0	2,3	4277
HAC-C 38/17	38,0	17,3	3,0	18,0	3,0	8224
HAC-C 40/25	40,0	25,0	2,75	18,0	5,6	20122
HAC-C 49/30	50,0	30,0	3,25	22,0	7,4	43105
HAC-C 54/33	53,5	33,0	5,0	21,5	8,0	74706

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

**Product Description**  
Channel profiles (HAC-C)

Annex A3

### Anchors



**Table 3: Dimensions of anchor  
(welded I-anchor or round anchor)**

Anchor channel	I-anchor						Round anchor				
	min l <sub>a</sub>	t <sub>w</sub>	b <sub>h</sub>	t <sub>h</sub>	w <sub>A</sub>	A <sub>h</sub>	min l <sub>a</sub>	d <sub>a</sub>	d <sub>h</sub>	t <sub>h</sub>	A <sub>h</sub>
	[mm]						[mm <sup>2</sup> ]	[mm]			
HAC-C 28/15	1)						31,0	6,0	12,0	1,3	85
HAC-C 38/17	1)						60,8	8,0	16,0	2,0	151
HAC-C 40/25	1)						56,0				
HAC-C 40/22	62,0	5,0	20,0	5,0	20,0	300	58,0	10,0	21,5	2,2	285
HAC-C-P 40/22	125,0	6,0	25,0	5,0	20,0	380	70,0				
HAC-C-P 40L	1)						83,2	10,0	21,5	2,2	285
HAC-C 49/30	1)						66,0	10,0	20,0	2,2	236
HAC-C 50/30	69,0	5,0	20,0	5,0	25,0	375					
HAC-C-P 50/30	125,0	6,0	25,0	5,0	25,0	475	78,0	11,0	26,0	2,5	436
HAC-C-P 50L	1)						118,3	11,0	26,0	2,5	436
HAC-C 54/33	1)						124,5				
HAC-C 52/34	125,0	6,0	25,0	5,0	40,0	760	123,5	11,0	24,3	2,5	369

1) Product not available

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

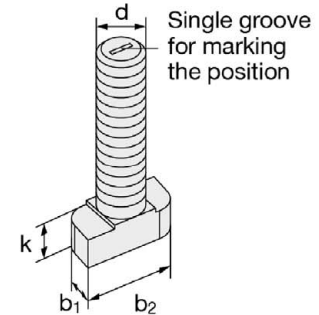
**Product Description**  
Anchors

Annex A4

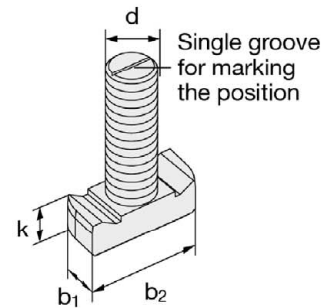
## Channel bolts

Table 4: Dimensions of channel bolt

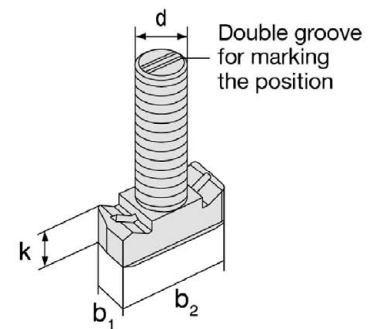
Appropriate anchor channel	Channel bolt	Dimensions			
		b <sub>1</sub>	b <sub>2</sub>	k	d
[mm]					
HAC-C 28/15	HBC-28/15	10,1	22,2	5,0	8
		11,0		6,0	12
HAC-C 38/17	HBC-38/17	13,0	30,5	6,0	10
		16,0		7,0	16
HAC-C(-P) 40/22 HAC-C-P 40L HAC-C 40/25	HBC-40/22	14,0	33,0	10,5	10
		17,0		11,5	16
HAC-C-P 40/22 HAC-C-P 40L	HBC-40/22-N	17,0	33,0	11,5	16
HAC-C 49/30 HAC-C(-P) 50/30 HAC-C-P 50L HAC-C 52/34 HAC-C 54/33	HBC-50/30	17,0	42,0	14,5	12
		21,0		15,5	20
HAC-C-P 50/30 HAC-C-P 50L HAC-C 52/34	HBC-50/30-N	21,0	42,0	15,5	16
					20



HBC-28/15, HBC-38/17



HBC-40/22, HBC-50/30



HBC-40/22-N, HBC-50/30-N

Table 5: Steel grade and corrosion class

Channel Bolt	Carbon steel <sup>1)</sup>		Stainless steel <sup>1)</sup>	
	4.6	8.8	A4-50	A4-70
f <sub>uk</sub> [N/mm <sup>2</sup> ]	400	800 / 830 <sup>2)</sup>	500	700
f <sub>yk</sub> [N/mm <sup>2</sup> ]	240	640 / 660 <sup>2)</sup>	210	450
Corrosion class	G <sup>3)</sup> F <sup>4)</sup>		R <sup>5)</sup>	

<sup>1)</sup> Material properties according to Annex A6

<sup>2)</sup> Material properties according to EN ISO 898-1: 2013

<sup>3)</sup> Electroplated

<sup>4)</sup> Hot-dip galvanized

<sup>5)</sup> Stainless steel

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

**Product Description**  
Channel bolts (HBC)

Annex A5

**Table 6: Materials**

Component	Carbon steel			Stainless steel
	Mechanical properties	Coating		Mechanical properties
1	2a	2b	2c	3
Channel Profile	1.0038, 1.0044, 1.0045 according to EN 10025: 2005 1.0976, 1.0979 according to EN 10149: 2013	Hot dip galvanized $\geq 50 \mu\text{m}$ according to EN ISO 10684: 2004/AC: 2009		1.4362, 1.4401 1.4404, 1.4571, 1.4578 according to EN 10088: 2005
Anchor	1.0038, 1.0213, 1.0214 according to EN 10025: 2005 1.5523, 1.5535 according to EN 10263: 2002-02	-	Hot dip galvanized $\geq 50 \mu\text{m}$ according to EN ISO 10684: 2004/AC: 2009	1.4362, 1.4401 1.4404, 1.4571, 1.4578 according to EN 10088: 2005 <sup>3)</sup>
Channel bolt	Steel grade 4.6 and 8.8 according to EN ISO 898-1: 2013	Electroplated according to EN ISO 4042: 1999	Hot dip galvanized $\geq 50 \mu\text{m}$ according to EN ISO 10684: 2004/AC: 2009	Grade 50 or 70 according to EN ISO 3506: 2009
Plain washer <sup>1)</sup> according to ISO 7089: 2000 and ISO 7093-1: 2000	Hardness class A $\geq 200 \text{ HV}$	Electroplated according to EN ISO 4042: 1999	Hot dip galvanized $\geq 50 \mu\text{m}$ according to EN ISO 10684: 2004/AC: 2009	1.4401, 1.4404 1.4571, 1.4578 according to EN 10088: 2005
Hexagonal nut according to ISO 4032: 2012 or DIN 934: 1987-10 <sup>2)</sup>	Property class 5 or 8 according to EN ISO 898-2: 2012	Electroplated according to EN ISO 4042: 1999	Hot dip galvanized $\geq 50 \mu\text{m}$ according to EN ISO 10684: 2004/AC: 2009	Property class 50, 70 or 80 according to EN ISO 3506: 2009

<sup>1)</sup> In scope of delivery only for notched bolts

<sup>2)</sup> Hexagonal nuts according to DIN 934: 1987-10 for channel bolts made from carbon steel (4.6) and stainless steel

<sup>3)</sup> Anchors made of carbon steel according column 2a may also be used if they are welded and their concrete cover is more than 50mm and the tempering colors are removed

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

**Product Description**  
Materials

Annex A6

## Specifications of intended use

### Anchor channels and channel bolts subject to:

- Static and quasi-static loads in tension, shear perpendicular to the longitudinal axis of the channel and shear in the direction of the longitudinal axis.
- Fire exposure: only for concrete class C20/25 to C50/60.
- Fatigue cycling tension loads.

### Base materials:

- Reinforced or unreinforced normal weight concrete according to EN 206-1: 2000.
- Strength classes C12/15 to C90/105 according to EN 206-1: 2000.
- Cracked or uncracked concrete.

### Use conditions (Environmental conditions):

- Structures subject to dry internal conditions (anchor channels and channel bolts according to Annex A6, Table 6, column 2 and 3).
- Structures subject to internal conditions with usual humidity (e.g. kitchen, bath and laundry in residential buildings, exceptional permanent damp conditions and application under water) (anchor channels and channel bolts according to Annex A6, Table 6, column 2c and 3).
- According to EN 1993-1-4: 2006 + A2: 2015 relating to corrosion resistance class CRC III (anchor channels, channel bolts according to Annex A6, Table 6, column 3)

### Design:

- Anchor channels are designed under the responsibility of an engineer experienced in anchorages and concrete work.
- Verifiable calculation notes and drawings are prepared taking account of the loads to be anchored. The position of the anchor channel and channel bolts are indicated on the design drawings (e.g. position of the anchor channel relative to the reinforcement or to supports).
- For static and quasi-static loading as well as fire exposure the anchor channels are designed in accordance with EOTA TR 047 "Calculation Method for the Performance of Anchor Channels", March 2018 or EN 1992-4: 2018.
- For fatigue loading the anchor channels are designed in accordance with EOTA TR 050 "Calculation Method for the Performance of Anchor Channels under Fatigue Loading", November 2015.
- The characteristic resistances are calculated with the minimum effective embedment depth.

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

**Intended Use**  
Specifications

Annex B1



**Installation:**

- The installation of anchor channels is carried out by appropriately qualified personnel under the supervision of the person responsible for the technical matters on site.
- Use of the anchor channels only as supplied by the manufacturer - without any manipulations, repositioning or exchanging of channel components.
- Cutting of anchor channels is allowed only if pieces according to Annex B3, Table 7 and Table 8 are generated including end spacing and minimum channel length and in case of hot-dip galvanised anchor channels only to be used in dry internal conditions.
- Installation in accordance with the manufacturer's specifications given in Annexes B6, B7 and B8
- The anchor channels are fixed on the formwork, reinforcement or auxiliary construction such that no movement of the channels will occur during the time of laying the reinforcement and of placing and compacting the concrete.
- The concrete around the head of the anchors are properly compacted. The channels are protected from penetration of concrete into the internal space of the channels.
- Washer may be chosen according to Annex A6 and provided separately by the user.
- Orientating the channel bolt (groove according to Annex B7 and Annex B8) rectangular to the channel axis.
- The required installation torques given in Annex B5 must be applied and must not be exceeded.

<b>Anchor channels (HAC-C) with channel bolts (HBC)</b>	Annex B2
<b>Intended Use Specifications</b>	

**Table 7: Installation parameters for hot-rolled anchor channel**

Anchor channel		HAC-C 40/22	HAC-C-P 40/22	HAC-C-P 40L	HAC-C 50/30	HAC-C-P 50/30	HAC-C-P 50L	HAC-C 52/34
Minimum effective embedment depth	$h_{ef,min}$	79	91	106	94	106	148	155
Minimum spacing	$s_{min}$	100	50	50	100	50 <sup>1)</sup>	50	100
Maximum spacing	$s_{max}$	250						
End spacing	$x$	25 <sup>2)</sup>						35 <sup>3)</sup>
Minimum channel length	$l_{min}$	150	100	100	150	100	100	170 <sup>4)</sup>
Minimum edge distance	$c_{min}$	50			75			75
Minimum thickness of concrete member	$h_{min}$	100	100	120	105	120	162	165

<sup>1)</sup>  $s_{min}$  = 100 mm when used in combination with notched bolts

<sup>2)</sup> The end spacing may be increased from 25 mm to 35 mm

<sup>3)</sup>  $x$  = 25 mm for welded I-anchors

<sup>4)</sup>  $l_{min}$  = 150 mm for welded I-anchors

**Table 8: Installation parameters for cold-formed anchor channel**

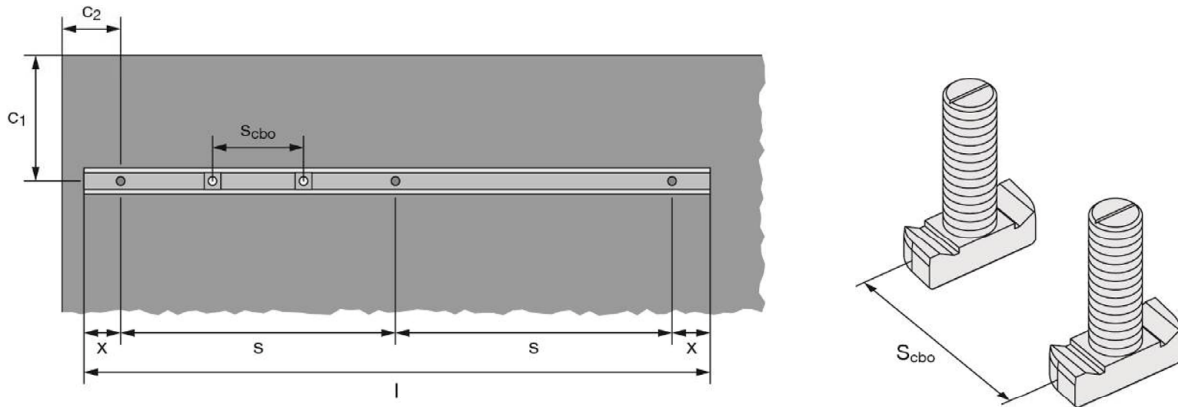
Anchor channel		HAC-C 28/15	HAC-C 38/17	HAC-C 40/25	HAC-C 49/30	HAC-C 54/33
Minimum effective embedment depth	$h_{ef,min}$	45	76	79	94	155
Minimum spacing	$s_{min}$	50	100			
Maximum spacing	$s_{max}$	200		250		
End spacing	$x$	25 <sup>1)</sup>				
Minimum channel length	$l_{min}$	100	150			
Minimum edge distance	$c_{min}$	40	50	75	100	
Minimum thickness of concrete member	$h_{min}$	70	100	120	180	

<sup>1)</sup> The end spacing may be increased from 25 mm to 35 mm

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

**Intended Use**  
Installation parameters for anchor channels (HAC-C)

Annex B3



**Table 9: Minimum spacing for channel bolts**

Channel bolt			M8	M10	M12	M16	M20
Minimum spacing between channel bolts	$s_{cbo, min}$	[mm]	40	50	60	80	100

$s_{cbo}$  = spacing between channel bolts

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

**Intended Use**  
Installation parameters for anchor channels (HAC-C)

Annex B4

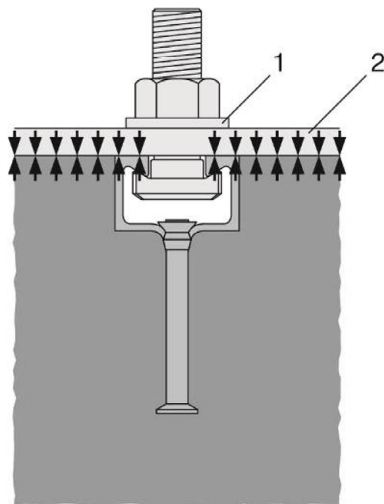
Table 10: Required installation torque  $T_{inst}$

Channel bolt		$T_{inst}^{1)}$ [Nm]					
		General: $T_{inst,g}$	Steel - steel contact: $T_{inst,s}$				
		4.6, 8.8, A4-50, A4-70	4.6	8.8	A4-50	A4-70	
HBC-28/15	M8	7	2)	20	7	15	
	M10	10		40		30	
	M12	13		60		50	
HBC-38/17	M10	15	13	2)	2)	22	
	M12	25	2)	45		50	
	M16	40		100		90	
HBC-40/22	M10	15	13	2)	2)	22	
	M12	25	2)	45		50	
	M16	30		100		90	
HBC-40/22-N	M16	160	2)	160	2)	2)	
HBC-50/30	M12	25		2)		45	50
	M16	55				100	130
	M20	55	360		250		
HBC-50/30-N	M16	185	2)	185	2)	2)	
	M20	320		320			

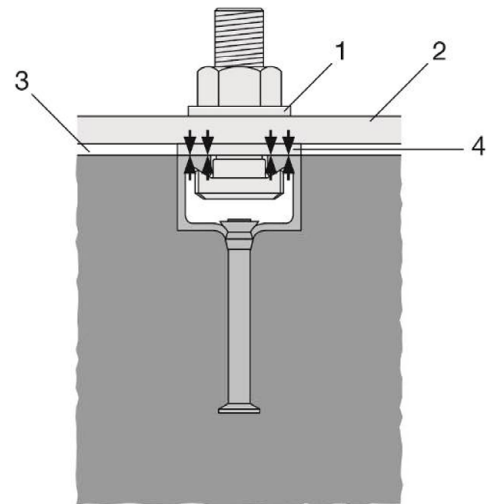
1)  $T_{inst}$  must not be exceeded

2) Product not available

**General:** The fixture is in contact with the channel profile and the concrete surface



**Steel-steel contact:** Fixture is not in contact with the concrete surface. The fixture is fastened to the anchor channel by suitable steel part (e.g. washer)



**Key**

- 1 washer
- 2 fixture
- 3 gap
- 4 suitable steel part

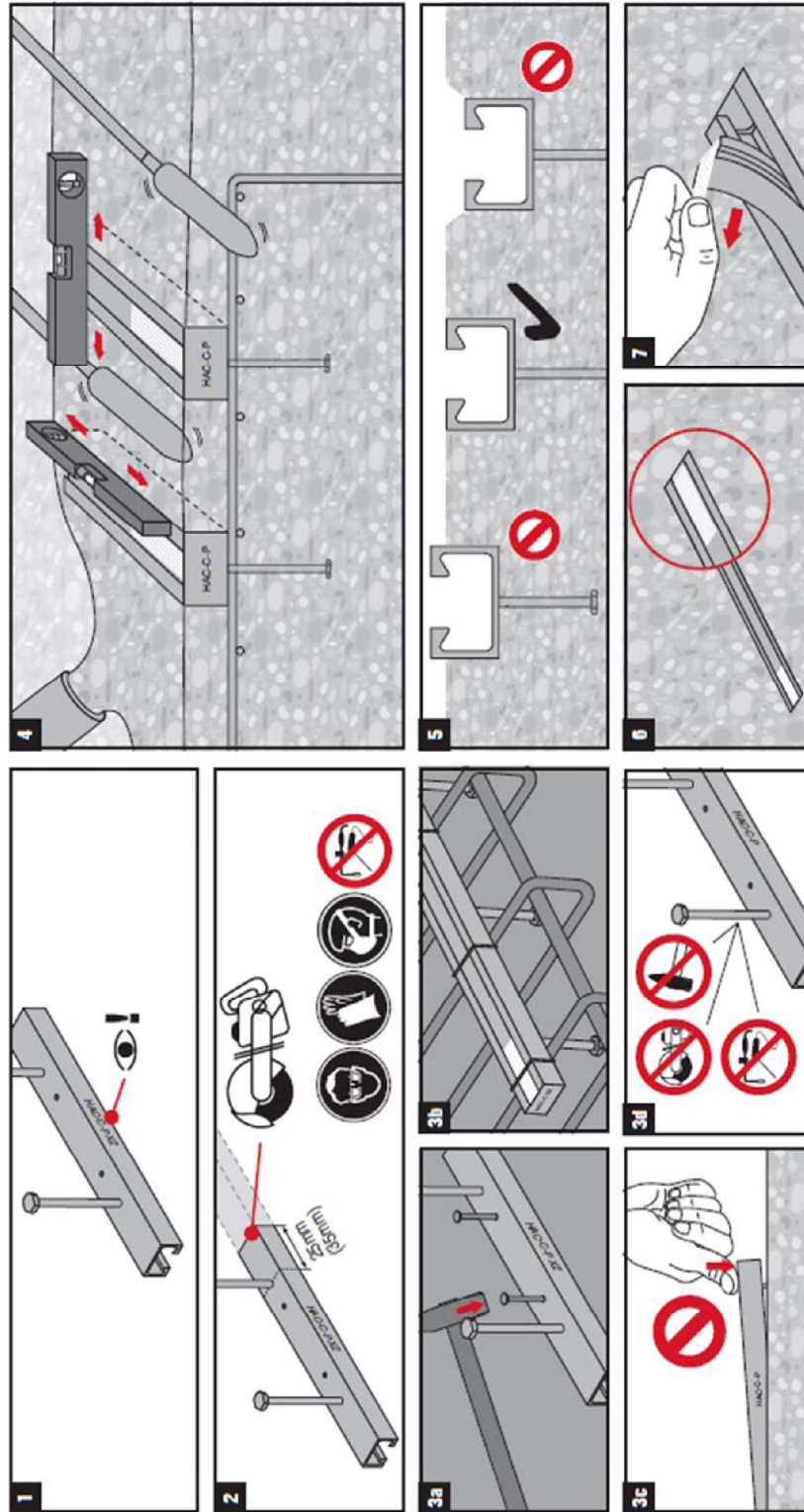
Anchor channels (HAC-C) with channel bolts (HBC)

**Intended Use**  
Installation parameters for channel bolts (HBC)

Annex B5

HAC-C(-P)

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

**Intended Use**  
Installation instructions for anchor channels (HAC-C)

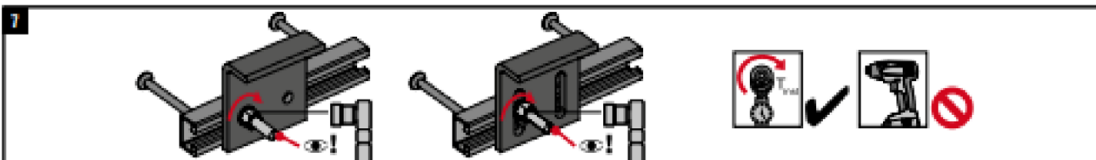
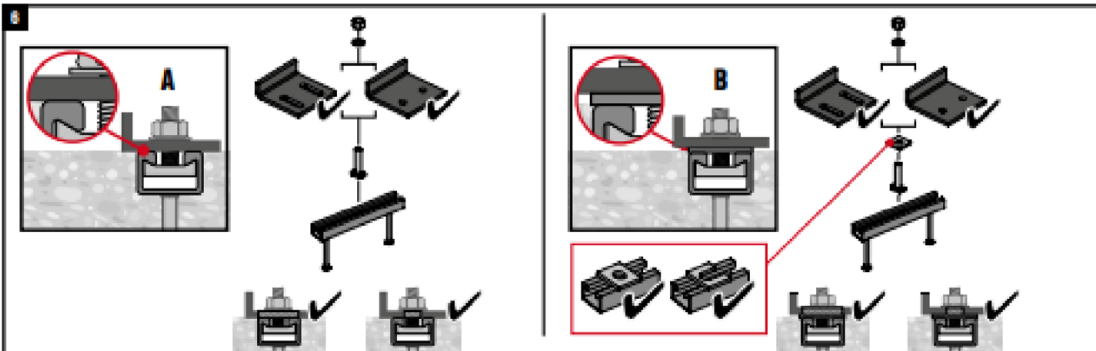
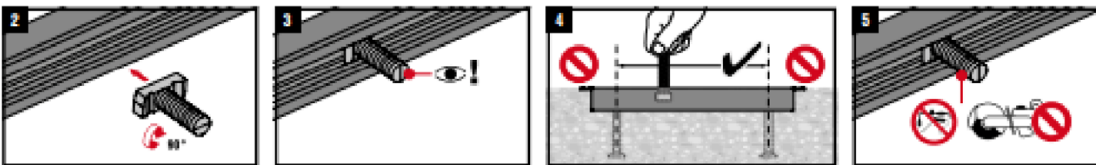
Annex B6



HBC

2194125 A3-08.2020

	HBC-28/15	HAC-C 28/15
	HBC-38/17	HAC-C 38/17
	HBC-40/22	HAC-C-P 40/22, HAC-C-P 40L, HAC-C 40/22, HAC-C 40/25
	HBC-50/30	HAC-C-P 50/30, HAC-C-P 50L, HAC-C 49/30, HAC-C 50/30
	HBC-52/34	HAC-C 52/34, HAC-C 54/33
		HAC-HW53, HAC-C 52/34



Channel bolt		T <sub>inst</sub> [Nm]				
		 4.6, 8.8, A4-50, A4-70				
			4.6	8.8	A4-50	A4-70
HBC-28/15	M8	7	-	20	7	15
	M10	10	-	40	-	30
	M12	13	-	60	-	50
HBC-38/17	M10	15	13	15	-	22
	M12	25	-	45	-	50
	M16	40	-	100	-	90
HBC-40/22	M10	15	13	15	-	22
	M12	25	-	45	-	50
	M16	30	-	100	-	90
HBC-50/30	M12	25	-	45	-	50
	M16	55	-	100	-	130
	M20	55	-	360	-	250
HBC-52/34	M20	55	-	360	-	-

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

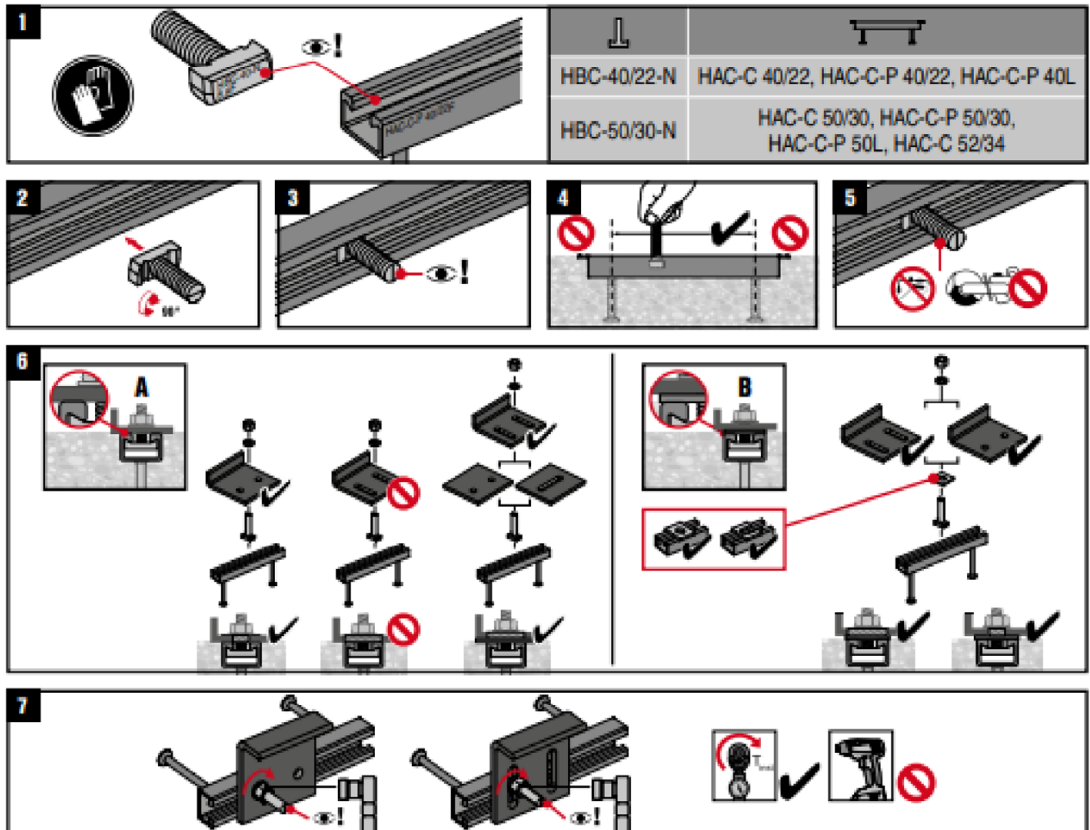
**Intended Use**  
Installation instructions for channel bolts (HBC)

Annex B7



HBC-N

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Anchor Channel	Channel Bolt	T <sub>inst</sub> [Nm]	
		A	B
HAC-C-P 40/22	HBC-40/22-N M16	8.8	8.8
HAC-C-P 40L		160	160
HAC-C 40/22		60	160
HAC-C-P 50/30	HBC-50/30-N M16	185	185
HAC-C-P 50L		185	185
HAC-C 50/30		185	185
HAC-C 52/34	HBC-50/30-N M20	320	320
HAC-C-P 50/30		320	320
HAC-C 50/30		320	320
HAC-C 52/34			

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

**Intended Use**  
Installation instructions for channel bolts (HBC)

Annex B8

**Table 11: Characteristic resistances under tension load – steel failure of hot-rolled anchor channels**

Anchor channel			HAC-C 40/22	HAC-C-P 40/22	HAC-C-P 40L	HAC-C 50/30	HAC-C-P 50/30	HAC-C-P 50L	HAC-C 52/34
<b>Steel failure: Anchor</b>									
Characteristic resistance	$N_{Rk,s,a}$ [kN]		20,0	40,0	40,0	31,0	57,0	57,0	55,0
Partial factor	$\gamma_{Ms}^{1)}$ [-]		1,8						
<b>Steel failure: Connection between anchor and channel</b>									
Characteristic resistance	$N_{Rk,s,c}$ [kN]		20,0	39,6	39,6	31,0	50,6	50,6	55
Partial factor	$\gamma_{Ms,ca}^{1)}$ [-]		1,8						
<b>Steel failure: Local flexure of channel lips</b>									
Characteristic spacing of the channel bolts for $N_{Rk,s,l}$	$s_{l,N}$ [mm]		79	79	79	98	98	98	105
Characteristic resistance	$N_{Rk,s,l}^0$ [kN]		47,9	47,9	47,9	50,5	50,5	50,5	65,0
Partial factor	$\gamma_{Ms,l}^{1)}$ [-]		1,8						

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

**Table 12: Characteristic resistances under tension load – steel failure of cold-formed anchor channels**

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

Annex C1



**Table 13: Characteristic flexural resistance of hot-rolled anchor channels under tension load**

Anchor channel			HAC-C 40/22	HAC-C-P 40/22	HAC-C-P 40L	HAC-C 50/30	HAC-C-P 50/30	HAC-C-P 50L	HAC-C 52/34
<b>Steel failure: Flexure of channel</b>									
Characteristic flexural resistance of channel	$M_{Rk,s,flex}$	[Nm]	1013	1704	1704	2084	3448	3448	3435
Partial factor	$\gamma_{Ms,flex}$	<sup>1)</sup> [-]	1,15						

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

**Table 14: Characteristic flexural resistance of cold-formed anchor channels under tension load**

Anchor channel				HAC-C 28/15	HAC-C 38/17	HAC-C 40/25	HAC-C 49/30	HAC-C 54/33
<b>Steel failure: Flexure of channel</b>								
Characteristic flexural resistance of channel	carbon steel	$M_{Rk,s,flex}$	[Nm]	316	538	979	1669	2929
	stainless steel				527		1702	2832
Partial factor	$\gamma_{Ms,flex}$	<sup>1)</sup> [-]	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 C2

**Table 15: Characteristic resistances under tension load – concrete failure of hot-rolled anchor channels**

Anchor channel			HAC-C 40/22		HAC-C-P 40/22		HAC-C-P 40L		HAC-C 50/30		HAC-C-P 50/30		HAC-C-P 50L		HAC-C 52/34	
			I	R	I	R	I	R	I	R	I	R	I	R	I	R
<b>Concrete failure: Pull-out</b>																
Characteristic resistance in cracked concrete C12/15	$N_{Rk,p}$	[kN]	27,0	13,6	34,2	25,6	<sup>1)</sup>	25,6	33,8	21,2	42,8	39,2	<sup>1)</sup>	39,2	68,4	33,2
			37,8	19,0	47,9	35,8	<sup>1)</sup>	35,8	47,3	29,7	59,9	54,9	<sup>1)</sup>	54,9	95,8	46,5
Factor for $N_{Rk,p}$ $N_{Rk,p} = N_{Rk,p(C12/15)} \cdot \psi_c$	C16/20	$\psi_c$ [-]	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													
	$\geq C60/75$		5,00													
Partial factor	$\gamma_{Mp} = \gamma_{Mc}^{2)}$	[-]	1,5													
<b>Concrete failure: Concrete cone</b>																
Product factor $k_1$	cracked concrete	$k_{cr,N}$	[-]	7,9	8,0	8,2	8,1	8,2	8,6	8,7						
	uncracked concrete	$k_{ucr,N}$	[-]	11,2	11,5	11,7	11,6	11,7	12,3	12,4						
Partial factor	$\gamma_{Mc}^{2)}$	[-]	1,5													
<b>Concrete failure: Splitting</b>																
Characteristic edge distance	$c_{cr,sp}$	[mm]	237	273	318	282	318	444	465							
Characteristic spacing	$s_{cr,sp}$	[mm]	474	546	636	564	636	888	930							
Partial factor	$\gamma_{Msp} = \gamma_{Mc}^{2)}$	[-]	1,5													

<sup>1)</sup> Product not available

<sup>2)</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 C3

**Table 16: Characteristic resistances under tension load – concrete failure of cold-formed anchor channels**

Anchor channel				HAC-C 28/15	HAC-C 38/17	HAC-C 40/25	HAC-C 49/30	HAC-C 54/33
Type of anchor				R	R	R	R	R
<b>Concrete failure: Pull-out</b>								
Characteristic resistance in cracked concrete C12/15	$N_{Rk,p}$	[kN]	7,6	13,6	13,6	21,2	33,2	
Characteristic resistance in uncracked concrete C12/15			10,7	19,0	19,0	29,7	46,5	
Factor for $N_{Rk,p}$ $N_{Rk,p} = N_{Rk,p(C12/15)} \cdot \psi_c$	C16/20	$\psi_c$ [-]	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					
	$\geq C60/75$		5,00					
Partial factor	$\gamma_{Mp} = \gamma_{Mc}^{1)}$	[-]	1,5					
<b>Concrete failure: Concrete cone</b>								
Product factor $k_1$	cracked concrete	$k_{cr,N}$	[-]	7,2	7,8	7,9	8,1	8,7
	uncracked concrete	$k_{ucr,N}$	[-]	10,3	11,2	11,2	11,6	12,4
Partial factor	$\gamma_{Mc}^{1)}$	[-]	1,5					
<b>Concrete failure: Splitting</b>								
Characteristic edge distance	$c_{cr,sp}$	[mm]	135	228	237	282	465	
Characteristic spacing	$s_{cr,sp}$	[mm]	270	456	474	564	930	
Partial factor	$\gamma_{Msp} = \gamma_{Mc}^{1)}$	[-]	1,5					

<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 C4

**Table 17: Displacements of hot-rolled anchor channels under tension load**

Anchor channel			HAC-C 40/22	HAC-C-P 40/22	HAC-C-P 40L	HAC-C 50/30	HAC-C-P 50/30	HAC-C-P 50L	HAC-C 52/34
Tension load	N	[kN]	13,9	15,3	15,3	14,3	25,8	25,8	25,8
Short-term displacement <sup>1)</sup>	$\delta_{N0}$	[mm]	2,3	1,1	1,1	2,2	1,4	1,4	1,4
Long-term displacement <sup>1)</sup>	$\delta_{N\infty}$	[mm]	4,6	2,2	2,2	4,4	2,8	2,8	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

**Table 18: Displacements of cold-formed anchor channels under tension load**

Anchor channel			HAC-C 28/15	HAC-C 38/17	HAC-C 40/25	HAC-C 49/30	HAC-C 54/33
Tension load	N	[kN]	3,6	7,1	7,9	12,3	21,8
Short-term displacement <sup>1)</sup>	$\delta_{N0}$	[mm]	0,6	1,3	1,4	1,4	1,6
Long-term displacement <sup>1)</sup>	$\delta_{N\infty}$	[mm]	1,2	2,6	2,8	2,8	3,2

<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

**Table 19: Characteristic resistances under shear load – steel failure of hot-rolled anchor channel**

Anchor channel			HAC-C 40/22	HAC-C-P 40/22	HAC-C-P 40L	HAC-C 50/30	HAC-C-P 50/30	HAC-C-P 50L	HAC-C 52/34
<b>Steel failure: Anchor</b>									
Characteristic resistance	$V_{Rk,s,a,y}$	[kN]	26,0	58,1	58,1	40,3	100,0	100,0	121,5
Characteristic resistance	$V_{Rk,s,a,x}$	[kN]	<sup>2)</sup>	24,0	24,0	<sup>2)</sup>	34,2	34,2	33,1
Partial factor	$\gamma_{Ms}$	<sup>1)</sup> [-]	1,5						
<b>Steel failure: Connection between anchor and channel</b>									
Characteristic resistance	$V_{Rk,s,c,y}$	[kN]	26,0	58,1	58,1	40,3	100,0	100,0	121,5
Characteristic resistance	$V_{Rk,s,c,x}$	[kN]	<sup>2)</sup>	23,8	23,8	<sup>2)</sup>	30,4	30,4	28,1
Partial factor	$\gamma_{Ms,ca}$	<sup>1)</sup> [-]	1,8						
<b>Steel failure: Local flexure of channel lips under shear load perpendicular to the longitudinal axis of the channel</b>									
Characteristic spacing of channel bolts for $V_{Rk,s,l}$	$s_{l,v}$	[mm]	80	80	80	99	99	99	105
Characteristic resistance	$V_{Rk,s,l,y}^0$	[kN]	55,0	55,0	55,0	91,7	91,7	91,7	71,5
Partial factor	$\gamma_{Ms,l}$	<sup>1)</sup> [-]	1,8						

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

<sup>2)</sup> No performance assessed

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

**Performance Data**

Displacements under tension load.  
Characteristic resistances of anchor channels under shear load

Annex C5

**Table 20: Characteristic resistances under shear load in direction of the longitudinal axis of the channel – steel failure of hot-rolled anchor channel**

Anchor channel			HAC-C 40/22	HAC-C-P 40/22	HAC-C-P 40L	HAC-C 50/30	HAC-C-P 50/30	HAC-C-P 50L	HAC-C 52/34
<b>Steel failure: Connection between channel lips and channel bolt</b>									
Characteristic resistance	$V_{RK,sl,x}^0$ [kN]	HBC-40/22-N M16 8.8F	2)	12,5	12,5	2)	1)		
		HBC-50/30-N M16 8.8F		2)			8,3	8,3	8,3
		HBC-50/30-N M20 8.8F		2)			8,3	8,3	8,3
Installation factor	$\gamma_{inst}$	[-]		1,4			1,0		

1) Product not available

2) No performance assessed

**Table 21: Characteristic resistances under shear load – steel failure of cold-formed anchor channel**

Anchor channel			HAC-C 28/15	HAC-C 38/17	HAC-C 40/25	HAC-C 49/30	HAC-C 54/33
<b>Steel failure: Anchor</b>							
Characteristic resistance	$V_{RK,s,a,y}$	[kN]	9,0	18,0	20,0	31,0	55,0
Partial factor	$\gamma_{Ms}$ 1)	[-]	1,5				
<b>Steel failure: Connection between anchor and channel</b>							
Characteristic resistance	$V_{RK,s,c,y}$	[kN]	9,0	18,0	20,0	31,0	55,0
Partial factor	$\gamma_{Ms,ca}$ 1)	[-]	1,8				
<b>Steel failure: Local flexure of channel lips under shear load perpendicular to the longitudinal axis of the channel</b>							
Characteristic spacing of channel bolts for $V_{RK,s,l}$	$s_{l,v}$	[mm]	56	76	80	100	107
Characteristic resistance	$V_{RK,s,l,y}^0$	[kN]	9,0	18,0	20,0	31,0	55,0
Partial factor	$\gamma_{Ms,l}$ 1)	[-]	1,8				

1) 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 C6

**Table 22: Characteristic resistances under shear load – concrete failure of hot-rolled anchor channel**

Anchor channel			HAC-C 40/22	HAC-C-P 40/22	HAC-C-P 40L	HAC-C 50/30	HAC-C-P 50/30	HAC-C-P 50L	HAC-C 52/34		
<b>Concrete failure: Pry out</b>											
Product factor	$k_8$	[-]					2,0				
Partial factor	$\gamma_{Mc}^{1)}$	[-]					1,5				
<b>Concrete failure: Concrete edge</b>											
Product factor $k_{12}$	cracked concrete	$k_{cr,V}$	[-]					7,5			
	uncracked concrete	$k_{ucr,V}$	[-]					10,5			
Partial factor	$\gamma_{Mc}^{1)}$	[-]					1,5				

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

**Table 23: Characteristic resistances under shear load – concrete failure of cold-formed anchor channel**

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

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

**Table 24: Displacements under shear load of hot-rolled anchor channel**

Anchor channel			HAC-C 40/22	HAC-C-P 40/22	HAC-C-P 40L	HAC-C 50/30	HAC-C-P 50/30	HAC-C-P 50L	HAC-C 52/34
Shear load	$V_y$	[kN]	10,3	29,0	29,0	16,0	39,7	28,4	28,4
Short-term displacement <sup>1)</sup>	$\delta_{V0,y}$	[mm]	2,1	2,0	2,0	2,6	2,7	3,7	3,7
Long-term displacement <sup>1)</sup>	$\delta_{V\infty,y}$	[mm]	3,1	3,5	3,5	3,9	4,0	5,5	5,5
Shear load	$V_x$	[kN]	<sup>2)</sup>	5,2	5,2	<sup>2)</sup>	3,3	3,3	7,9
Short-term displacement <sup>1)</sup>	$\delta_{V0,x}$	[mm]	<sup>2)</sup>	0,1	0,1	<sup>2)</sup>	0,1	0,1	1,4
Long-term displacement <sup>1)</sup>	$\delta_{V\infty,x}$	[mm]	<sup>2)</sup>	0,2	0,2	<sup>2)</sup>	0,2	0,2	2,0

<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

<sup>2)</sup> No performance assessed

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

**Performance Data**

Characteristic resistances and displacements of anchor channels under shear load

Annex C7

**Table 25: Displacements under shear load of cold-formed anchor channel**

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

<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 26: Characteristic resistances under combined tension and shear load of hot-rolled anchor channel**

Anchor channel			HAC-C 40/22	HAC-C-P 40/22	HAC-C-P 40L	HAC-C 50/30	HAC-C-P 50/30	HAC-C-P 50L	HAC-C 52/34
<b>Steel failure: Local flexure of channel lips and flexure of channel</b>									
Product factor	$k_{13}$	[-]	Values according to EN 1992-4:2018, Section 7.4.3.1						
<b>Steel failure: Anchor and connection between anchor and channel</b>									
Product factor	$k_{14}$	[-]	Values according to EN 1992-4:2018, Section 7.4.3.1						

**Table 27: Characteristic resistances under combined tension and shear load of cold-formed anchor channel**

Anchor channel			HAC-C 28/15	HAC-C 38/17	HAC-C 40/25	HAC-C 49/30	HAC-C 54/33
<b>Steel failure: Local flexure of channel lips and flexure of channel</b>							
Product factor	$k_{13}$	[-]	Values according to EN 1992-4:2018, Section 7.4.3.1				
<b>Steel failure: Anchor and connection between anchor and channel</b>							
Product factor	$k_{14}$	[-]	Values according to EN 1992-4:2018, Section 7.4.3.1				

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

**Performance Data**

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

Annex C8

**Table 28: Characteristic resistances under tension and shear load – steel failure of channel bolts**

Channel bolt					M8	M10	M12	M16	M20			
<b>Steel failure</b>												
Characteristic resistance (tension load)	$N_{Rk,s}$	[kN]	HBC-28/15	4.6	1)							
				8.8	22,4	35,4	44,3	1)				
				A4-50 <sup>2)</sup>	17,2	1)						
				A4-70 <sup>2)</sup>	25,6	38,9	51,3	1)				
			HBC-38/17	4.6	1)	23,2		1)				
				8.8		1)	35,4	55,8	1)			
				A4-70 <sup>2)</sup>		20,5	47,2	53,0	1)			
			HBC-40/22	4.6		23,2		1)				
				8.8		1)	67,4	125,6	1)			
				A4-70 <sup>2)</sup>		20,5	59,0	91,0	1)			
			HBC-40/22-N	8.8		1)		125,6	1)			
			HBC-50/30	4.6		1)						
				8.8		1)	67,4	125,6	147,1	1)		
				A4-70 <sup>2)</sup>			59,0	109,9	121,2	1)		
			HBC-50/30-N	8.8	1)		125,6	1)				
			HBC-52/34	8.8	1)			203,4	1)			
			Partial 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				
						1)						
Characteristic resistance (shear load)	$V_{Rk,s}$	[kN]	HBC-28/15	4.6	1)							
				8.8	14,6	23,2	33,7	1)				
				A4-50 <sup>2)</sup>	11,0	1)						
			HBC-38/17	A4-70	15,4	24,4	35,4	1)				
				4.6	1)	13,9		1)				
				8.8		1)	33,7	62,8	1)			
			A4-70 <sup>2)</sup>	24,4		35,4	65,9	1)				
			HBC-40/22	4.6		13,9		1)				
				8.8		23,2	33,7	62,8	1)			
				A4-70 <sup>2)</sup>		24,4	35,4	65,9	1)			
			HBC-40/22-N	8.8		1)		62,8	1)			
			HBC-50/30	4.6		1)						
				8.8		1)	33,7	62,8	101,7	1)		
A4-70 <sup>2)</sup>	35,4	65,9		102,9			1)					
HBC-50/30-N	8.8	1)		62,8	1)							
HBC-52/34	8.8	1)			101,7	1)						
Partial 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							
							1)					

<sup>1)</sup> Product not available

<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 resistance of channel bolts under tension and shear load

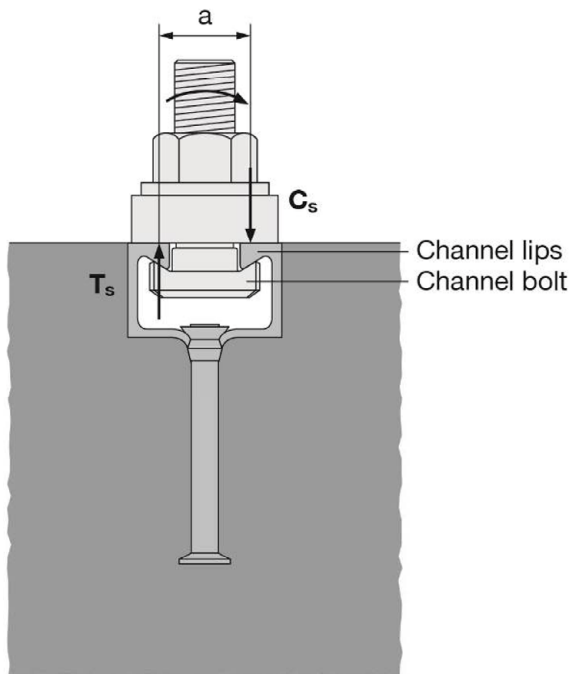
Annex C9



**Table 29: Characteristic resistances under shear load with lever arm – steel failure of channel bolts**

Channel bolt				M8	M10	M12	M16	M20		
<b>Steel failure</b>										
Characteristic flexural resistance	$M^{0}_{RK,s}{}^{5)}$	[Nm]	HBC-28/15	4,6	4)	29,9 <sup>3)</sup>	4)			
			HBC-38/17	8,8	30,0	59,8	104,8	266,4	538,7	
			HBC-40/22(-N)	A4-50 <sup>2)</sup>	18,7	4)				
			HBC-50/30(-N)	A4-70 <sup>2)</sup>	26,2	52,3	91,7	233,1	454,4	
			HBC-52/34							
Partial factor	$\gamma_{Ms}{}^{1)}$	[-]	HBC-28/15	4,6	1,67					
			HBC-38/17	8,8	1,25					
			HBC-40/22(-N)	A4-50 <sup>2)</sup>	2,38					
			HBC-50/30(-N)	A4-70 <sup>2)</sup>	1,56					
			HBC-52/34							
Internal lever arm	a	[mm]	HBC-28/15	28/15	17,3	18,7	20,0	4)		
			HBC-38/17	38/17	4)	23,0	24,3	26,3	4)	
			HBC-40/22(-N)	40/22		24,3	25,7	27,3		
			HBC-50/30(-N)	50/30		4)	29,9	31,7	33,9	
			HBC-52/34	52/34		4)			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  
 4) Product not available



5) The characteristic flexure resistance according to Table 29 is limited as follows:

$$M^{0}_{RK,s} \leq 0,5 \cdot N_{RK,s,l} \cdot a \quad (N_{RK,s,l} \text{ according to Table 11 and Table 12})$$

$$M^{0}_{RK,s} \leq 0,5 \cdot N_{RK,s} \cdot a \quad (N_{RK,s} \text{ according to Table 29})$$

a = internal lever arm according to Table 29

$T_s$  = tension force acting on the channel lip

$C_s$  = compression force acting on the channel lip

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

**Performance Data**

Characteristic flexural resistances of channel bolts under shear load with lever arm

Annex C10

**Table 30: Characteristic resistance  $F_{Rd,s,fi}$  [kN] of anchor channels under fire exposure**

Channel bolt				M10	M12	≥ M16		
<b>Steel failure: 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		2)	
		R90			0,6			
		R120			0,5			
	HAC-C 38/17	R60			2)		1,9	
		R90			2)		1,3	
		R120			2)		1,0	
	HAC-C 40/25 HAC-C(-P) 40/22 HAC-C-P 40L	R60			1,7		3,5	
		R90			1,2		2,2	
		R120			0,9		1,5	
	HAC-C 49/30 HAC-C(-P) 50/30 HAC-C 52/34 HAC-C-P 50L	R60			2)		3,8	3,9
		R90			2)		2,5	2,9
		R120			2)		1,9	2,4
Partial factor			$\gamma_{Ms,fi}$ 1)	[-]		1,0		

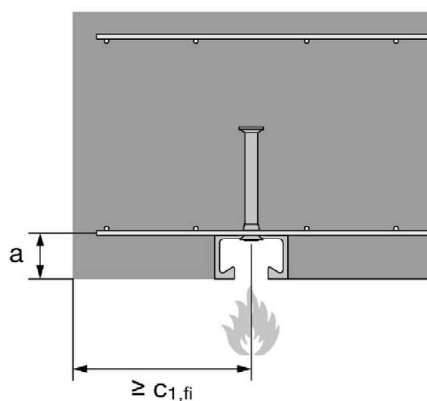
1) In absence of other national regulations

2) No performance assessed

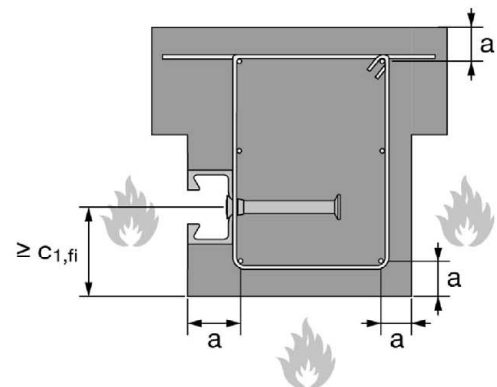
**Table 31: Minimum axis distance of reinforcement**

Anchor channel			HAC-C 28/15	HAC-C 38/17	HAC-C 40/25	HAC-C(-P) 40/22	HAC-C-P 40L	HAC-C 49/30	HAC-C(-P) 50/30	HAC-C-P 50L	HAC-C 54/33	HAC-C 52/34
Min. axis distance	R60	a [mm]	35					50	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 C11

**Table 32: Combination of anchor channels and channel bolts under fatigue tension load**

Anchor channel			Channel bolt			
Channel profile	Anchor type	Corrosion protection	Channel bolt	Diameter	Steel grade	Corrosion protection
HAC-C-P 40/22 HAC-C-P 40L	R	F	HBC-40/22	M12	8.8	G F
				M16		
HAC-C-P 50/30 HAC-C-P 50L			HBC-50/30	M16		
				M20		
HAC-C 52/34			HBC-50/30	M16		
				M20		

**Table 33: Characteristic resistances under fatigue tension load – steel failure after n load cycles without static preload ( $N_{Ed} = 0$ ) (Design method I according to EOTA TR 050)**

Anchor channel		HAC-C-P 40/22	HAC-C-P 40L	HAC-C-P 50/30	HAC-C-P 50L	HAC-C 52/34
<b>Steel failure</b>	n	$\Delta N_{Rk,s,0,n}$ [kN]				
Characteristic resistance under fatigue tension load after n load cycles without static preload ( $N_{Ed} = 0$ )	$\leq 10^4$	16,4		20,9		24,3
	$\leq 10^5$	7,7		9,0		12,5
	$\leq 10^6$	3,2		4,2		7,1
	$\leq 2 \cdot 10^6$	2,6		3,7		6,4
	$\leq 5 \cdot 10^6$	2,2		3,4		5,9
	$\leq 10^8$	2,0		3,3		5,7
	$> 10^8$	1,8		3,2		5,5

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

**Performance Data**  
Characteristic resistances under fatigue tension load

Annex C12

**Table 34: Reduction factor  $\eta_{c,fat}$  of characteristic fatigue resistance - concrete failure after n load cycles without static preload ( $N_{Ed} = 0$ ) (Design method I according to EOTA TR 050)**

Anchor channel		HAC-C-P 40/22	HAC-C-P 40L	HAC-C-P 50/30	HAC-C-P 50L	HAC-C 52/34
<b>Pull-out and Concrete cone failure</b>	n	$\eta_{c,fat}$ [-]				
Reduction factor after n load cycles without static preload ( $N_{Ed} = 0$ ) for:  $\Delta N_{Rk,p,0,n} = \eta_{c,fat} \cdot N_{Rk,p}$ $\Delta N_{Rk,c,0,n} = \eta_{c,fat} \cdot N_{Rk,c}$  with $N_{Rk,p}$ calculated according to Annex C3 and $N_{Rk,c}$ calculated according to EOTA TR047, March 2018 or EN 1992-4: 2018	$\leq 10^4$	0,736				
	$\leq 10^5$	0,665				
	$\leq 10^6$	0,600				
	$\leq 2 \cdot 10^6$	0,582				
	$\leq 5 \cdot 10^6$	0,559				
	$\leq 6 \cdot 10^7$	0,500				
$> 6 \cdot 10^7$	0,500					

**Table 35: Characteristic resistances under fatigue tension load – steel failure with  $n \rightarrow \infty$  load cycles without static preload ( $N_{Ed} = 0$ ) (Design method II according to EOTA TR 050)**

Anchor channel	HAC-C-P 40/22	HAC-C-P 40L	HAC-C-P 50/30	HAC-C-P 50L	HAC-C 52/34
<b>Steel failure</b>	$\Delta N_{Rk,s,0,\infty}$ [kN]				
Characteristic fatigue limit resistance ( $n \rightarrow \infty$ ) without static preload ( $N_{Ed} = 0$ )	1,8		3,2		5,5

**Table 36: Reduction factor  $\eta_{c,fat}$  of characteristic fatigue limit resistance - concrete failure with  $n \rightarrow \infty$  load cycles without static preload ( $N_{Ed} = 0$ ) (Design method II according to EOTA TR 050)**

Anchor channel		HAC-C-P 40/22	HAC-C-P 40L	HAC-C-P 50/30	HAC-C-P 50L	HAC-C 52/34
<b>Pull-out and Concrete cone failure</b>		$\eta_{c,fat}$ [-]				
Reduction factor for fatigue limit resistance ( $n \rightarrow \infty$ ) without static preload ( $N_{Ed} = 0$ ) for:  $\Delta N_{Rk,p,0,n} = \eta_{c,fat} \cdot N_{Rk,p}$ $\Delta N_{Rk,c,0,n} = \eta_{c,fat} \cdot N_{Rk,c}$  with $N_{Rk,p}$ calculated according to Annex C3 and $N_{Rk,c}$ calculated according to EOTA TR047, March 2018 or EN 1992-4: 2018	0,5					

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

**Performance Data**

Characteristic resistances under fatigue tension load

Annex C13

Attn. : To whom it may concern

Date : 26 September 2023  
Ref. : 076/FP/DY/23

Subject : Country of Origin – Hilti HAC-C(-P) Hot-Rolled Anchor Channel

Dear Sir / Madam,

Enclosed please find the information of Hilti HAC-C(-P) Hot-Rolled Anchor Channel.

Brand Name : Hilti

Model Name : Hilti HAC-C/ HAC-C A4/ HAC-C-P/ HAC-C-P A4

Manufacturer : Hilti Corporation

Address of Manufacturer : FL-9494, Principality of Liechtenstein.

Manufacturer Contact Person : Dennis Yeung

Supplier : Hilti (Hong Kong) Ltd

Address of Supplier : 701-704, 7/F, Tower A, Manulife Financial Centre,  
223 Wai Yip Street, Kwun Tong, Kowloon, Hong Kong

Supplier Contact Person : Dennis Yeung (+852 9723 4621)

Country of Origin : China

Should you have further questions, please do not hesitate to contact our Technical Representatives, Customer Service Hotline at 8228-8118, or email us at [hksales@hilti.com](mailto:hksales@hilti.com).

Yours faithfully,



Dennis Yeung  
Head of Product Leadership Strategy, F&P

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[www.hilti.com.hk](http://www.hilti.com.hk)

Attn. : To whom it may concern

Date : 26 September 2023  
Ref. : 077/AN/DY/23

Subject : Country of Origin – Hilti HBC T-Head Bolt

Dear Sir / Madam,

Enclosed please find the information of Hilti HBC T-Head Bolt.

Brand Name : Hilti

Model Name : Hilti HBC/ HBC A4/ HBC-C/ HBC-C-N/ HBC-N T-Head Bolts

Manufacturer : Hilti Corporation

Address of Manufacturer : FL-9494, Principality of Liechtenstein.

Manufacturer Contact Person : Dennis Yeung

Supplier : Hilti (Hong Kong) Ltd

Address of Supplier : 701-704, 7/F, Tower A, Manulife Financial Centre,  
223 Wai Yip Street, Kwun Tong, Kowloon, Hong Kong

Supplier Contact Person : Dennis Yeung (+852 9723 4621)

Country of Origin : Taiwan

Should you have further questions, please do not hesitate to contact our Technical Representatives, Customer Service Hotline at 8228-8118, or email us at [hksales@hilti.com](mailto:hksales@hilti.com).

Yours faithfully,



Dennis Yeung  
Head of Product Leadership Strategy, F&P

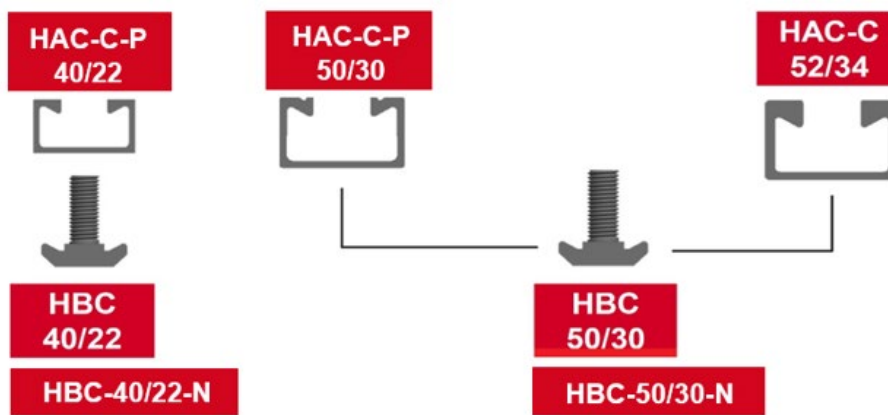
**Hilti (Hong Kong) Ltd.**  
701-704 | Tower A | Manulife Financial Centre  
223 Wai Yip Street | Kwun Tong  
Kowloon | Hong Kong  
P +852-8228 8118 | F +852-2954 1751  
[www.hilti.com.hk](http://www.hilti.com.hk)

21 Sep 2022  
REF: 082/FP/SC/22

To whom it may concern,

**Subject: Hilti HAC-C-P Anchor Channel – New product upgraded from HAC-C**

Hilti has always been devoted in innovating and improving our products. We are pleased to introduce you anchor channel HAC-C-P 40/22 and 50/30, which replaced HAC-C 40/22 and 50/30. Both products are hot-rolled anchor channel with hot dip galvanized and stainless steel available. The hot-rolled anchor channel HAC-C-P is with better performance and upgraded features. Below are the overview of the current hot-rolled anchor channel portfolio and the highlighted features that they shared:



- Qualified for catering longitudinal load when pair with notch bolt base on ETA-17/0336
- Improved tensile and shear loading performance allow downsizing of channels
- Available in PROFIS Anchor Channel software which design standard according to EN1992-4

We thank you for the confidence in Hilti quality and you can be certain to specify and install HAC-C(-P). Should you have further information or support, please do not hesitate to contact us at 8228-8118.

Yours Faithfully,



Sabrina Chow  
Senior Marketing Specialist





