



HAC-C Hot rolled Cast-in anchor channel

Technical Datasheet

Update: Jan-23



HAC-C Hot rolled

Cast-in anchor channels in standard sizes and lengths for a variety of applications

Anchor channel version



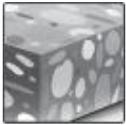
HBC-40/22
HBC-50/30

HAC-C 40/22
HAC-C 50/30
HAC-C 52/34

Benefits

- Hot-rolled anchor channels with thick, robust profiles - high resistance to loads
- LDPE foam filler with grip loop - keeps channel clear of concrete and quickly removes in one piece
- Available in three sizes - HAC-C 40/22, HAC-C 50/30, HAC-C 52/34
- ETA and fire safety documents available
- Available in stainless steel and hot-dip galvanized versions - for optimal corrosion protection depending on the environmental conditions

Base material

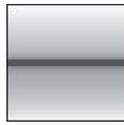


Concrete (non-cracked)

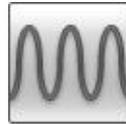


Concrete (cracked)

Load conditions



Static/
quasi-static



Fatigue



Fire
resistance



Static
2D loading



Static
3D loading

Other information



European
Technical
Assessment



CE conformity



PROFIS Anchor
channel design
Software



Corrosion
resistance

Approvals / certificates

Description	Authority / Laboratory	No. / date of issue
European technical assessment ^{a)}	DIBt, Berlin	ETA-17/0336 of 09.11.2020

a) All data given in this section according to ETA-17/0336 of 09.11.2020

Static and quasi-static loading

All data in this section applies to:

- Correct setting (See setting instruction)
- No edge distance and spacing influence
- No influence of bolt type and diameter
- Decisive failure mode – local flexure of channel lips
- Shear load applied perpendicular to the longitudinal axis of the channel

Effective anchorage depth

Anchor channel type		HAC-C		
Anchor channel size		40/22	50/30	52/34
Minimum effective anchorage depth	$h_{ef,min}$ [mm]	79	94	155
Minimum thickness of concrete member	h_{min} [mm]	100	105	165

Characteristic resistance for anchor channels

Anchor channel type		HAC-C		
Anchor channel size		40/22	50/30	52/34
Tension	$N^0_{Rk,s,l}$ [kN]	47,9	50,5	65,0
Shear	$V^0_{Rk,s,l}$ [kN]	55,0	91,7	71,5

Design resistance for anchor channels

Anchor channel type		HAC-C		
Anchor channel size		40/22	50/30	52/34
Tension	$N^0_{Rd,s,l}$ [kN]	26,6	28,1	36,1
Shear	$V^0_{Rd,s,l}$ [kN]	30,6	50,9	39,7

Note: Values shown in table above are representing only limited amount of the possible failure modes and might be used only for comparison of different products. For detailed design of fixing point please use Hilti PROFIS Anchor Channel software, consult ETA-17/0336 or contact Hilti Engineering team.



Characteristic resistance for bolts

Channel bolt diameter		M8	M10	M12	M16	M20
Channel bolt type		HBC-40/22				
Tension	HBC-40/22 4.6	- a)	23,2	- a)		
	HBC-40/22 8.8		- a)	67,4	125,6	- a)
	HBC-40/22 A4-70		20,5	59,0	91,0	
Shear	HBC-40/22 4.6	- a)	13,9	- a)		
	HBC-40/22 8.8		23,2	33,7	62,8	- a)
	HBC-40/22 A4-70		24,4	35,4	65,9	
Channel bolt type		HBC-50/30				
Tension	HBC-50/30 4.6	- a)	- a)			
	HBC-50/30 8.8		- a)	67,4	125,6	147,1
	HBC-50/30 A4-70		- a)	59,0	109,9	121,2
Shear	HBC-50/30 4.6	- a)	- a)			
	HBC-50/30 8.8		- a)	33,7	62,8	101,7
	HBC-50/30 A4-70		- a)	35,4	65,9	102,9

a) Product is not available in standard Hilti portfolio. For additional information please contact Hilti Engineering team.

Design resistance for bolts

Channel bolt diameter		M8	M10	M12	M16	M20
Channel bolt type		HBC-40/22				
Tension	HBC-40/22 4.6	- a)	11,6	- a)		
	HBC-40/22 8.8		- a)	44,9	83,7	- a)
	HBC-40/22 A4-70		11,0	31,6	48,7	
Shear	HBC-40/22 4.6	- a)	8,3	- a)		
	HBC-40/22 8.8		18,6	27,0	50,2	- a)
	HBC-40/22 A4-70		15,6	22,7	42,2	
Channel bolt type		HBC-50/30				
Tension	HBC-50/30 4.6	- a)	- a)			
	HBC-50/30 8.8		- a)	44,9	84,5	98,1
	HBC-50/30 A4-70		- a)	31,6	58,8	64,8
Shear	HBC-50/30 4.6	- a)	- a)			
	HBC-50/30 8.8		- a)	27,0	50,2	81,4
	HBC-50/30 A4-70		- a)	22,7	42,4	66,0

b) Product is not available in standard Hilti portfolio. For additional information please contact Hilti Engineering team.

Note: combined effects of loads (tension and shear) must be verified additionally. For detailed design of fixing point please use Hilti PROFIS Anchor Channel software, consult ETA-17/0336 or contact Hilti Engineering team.

Fire resistance

All data in this section applies to:

- Correct setting (See setting instruction)
- No edge distance and spacing influence
- No influence of bolt type and diameter
- Decisive failure mode – steel failure
(one of the following: anchor, connection between anchor and channel, local flexure of channel lip)
- Shear load applied perpendicular to the longitudinal axis of the channel
- Partial safety factor for resistance under fire exposure $\gamma_{M,fi}=1,0$ (in absence of other national regulations)

Effective anchorage depth

Anchor channel type			HAC-C		
Anchor channel size			40/22	50/30	52/34
Minimum effective anchorage depth	$h_{ef,min}$	[mm]	79	94	155
Minimum thickness of concrete member	h_{min}	[mm]	100	105	165

Characteristic resistance

Anchor channel type			HAC-C		
Anchor channel size			40/22	50/30	52/34
Fire exposure R60					
Tension	Bolt M10	$N_{Rk,s,fi}$	1,7	-	-
=	Bolt M12	=	3,5	3,8	3,8
Shear	Bolt \geq M16	$V_{Rk,s,fi}$	3,5	3,9	3,9
Fire exposure R120					
Tension	Bolt M10	$N_{Rk,s,fi}$	0,9	-	-
=	Bolt M12	=	1,5	1,9	1,9
Shear	Bolt \geq M16	$V_{Rk,s,fi}$	1,5	2,4	2,4

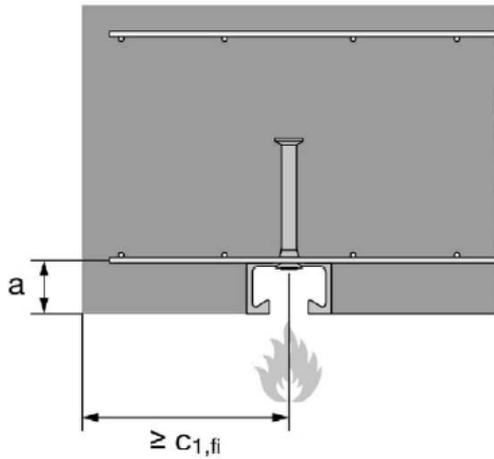
Design resistance

Anchor channel type			HAC-C		
Anchor channel size			40/22	50/30	52/34
Fire exposure R60					
Tension	Bolt M10	$N_{Rd,s,fi}$	1,7	-	-
=	Bolt M12	=	3,5	3,8	3,8
Shear	Bolt \geq M16	$V_{Rd,s,fi}$	3,5	3,9	3,9
Fire exposure R120					
Tension	Bolt M10	$N_{Rd,s,fi}$	0,9	-	-
=	Bolt M12	=	1,5	1,9	1,9
Shear	Bolt \geq M16	$V_{Rd,s,fi}$	1,5	2,4	2,4

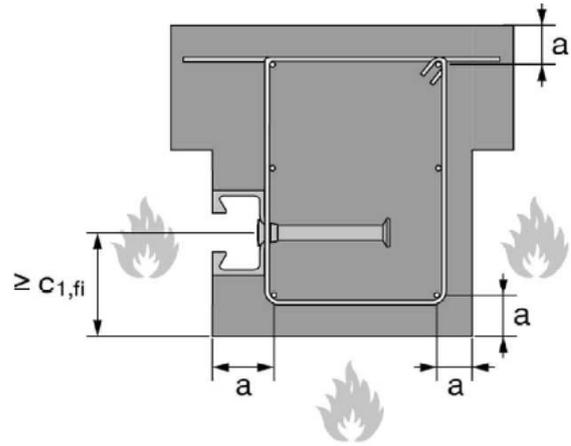
Note: Values shown in table above are representing only limited amount of the possible failure modes and might be used only for comparison of different products. For detailed design of fixing point please use Hilti PROFIS Anchor Channel software, consult ETA-17/0336 or contact Hilti Engineering team.

Minimum axis distance of reinforcement

Anchor channel type		HAC-C		
		40/22	50/30	52/34
Fire exposure R60				
Minimum axis distance	a [mm]	35	50	50
Fire exposure R120				
Minimum axis distance	a [mm]	55	55	55



Fire exposure from one side only



Fire exposure from more than one side

Fatigue resistance

All data in this section applies to:

- Correct setting (See setting instruction)
- No edge distance and spacing influence
- No influence of bolt type and diameter
- Shear load applied perpendicular to the longitudinal axis of the channel

Characteristic resistance under fatigue load

Anchor channel type		HAC-C	
Anchor channel size		52/34	
Characteristic resistance under fatigue tension load after n load cycles without static preload ($N_{Ed} = 0$)	$\leq 10^4$	$\Delta N_{Rk,s,0,n}$ [kN]	24,3
	$\leq 10^5$		12,5
	$\leq 10^6$		7,1
	$\leq 2 \cdot 10^6$		6,4
	$\leq 5 \cdot 10^6$		5,9
	$\leq 10^8$		5,7
	$> 10^8$		5,5
Reduction factor after n load cycles without static preload ($N_{Ed} = 0$) for: $\Delta N_{Rk,p,0,n} = \eta_{c,fat} \cdot N_{Rk,p}$ $\Delta N_{Rk,c,0,n} = \eta_{c,fat} \cdot N_{Rk,c}$	$\leq 10^4$	$\eta_{c,fat}$ [-]	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
	$> 10^7$		0,500
Characteristic fatigue limit resistance without static preload ($N_{Ed} = 0$)	$(n \rightarrow \infty)$	$\Delta N_{Rk,s,0,\infty}$ [kN]	5,5
Reduction factor for fatigue limit resistance without static preload ($N_{Ed} = 0$) for: $\Delta N_{Rk,p,0,n} = \eta_{c,fat} \cdot N_{Rk,p}$ $\Delta N_{Rk,c,0,n} = \eta_{c,fat} \cdot N_{Rk,c}$	$(n \rightarrow \infty)$	$\eta_{c,fat}$ [-]	0,5

Note: Values shown in table above are representing only limited amount of the possible failure modes and might be used only for comparison of different products. For detailed design of fixing point please use Hilti PROFIS Anchor Channel software, consult ETA-17/0336 or contact Hilti Engineering team.

Materials

Material quality for anchor channels

Part		Material
Channel profile	HAC-C	Carbon steel 1.0038, 1.0044, 1.0045 according to EN 10025:2005 Carbon steel 1.0976, 1.0979 according to EN 10139:2013 Hot-dip galvanized $\geq 50 \mu\text{m}$ according to EN ISO 10684:2004/AC:2009
	HAC-C A4	Stainless steel 1.4362, 1.4401, 1.4404, 1.4571, 1.4578 according to EN 10088:2005
Anchor	HAC-C	Carbon steel 1.0038, 1.0213, 1.0214 according to EN 10025:2005 Carbon steel 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
	HAC-C A4 ^{a)}	Stainless steel 1.4362, 1.4401, 1.4404, 1.4571, 1.4578 according to EN 10088:2005

a) Anchors made of carbon steel may also be used if they are welded and their concrete cover is more than 50 mm and the tempering colors are removed

Material quality for channel bolts

Part		Material
Channel bolts	HBC	Carbon steel grade 4.6 and 8.8 according to ISO 898-1:2013 Electroplated according to EN ISO 4042:1999
	HBC F	Carbon steel grade 4.6 and 8.8 according to ISO 898-1:2013 Hot-dip galvanized $\geq 50 \mu\text{m}$ according to EN ISO 10684:2004/AC:2009
	HBC A4	Stainless steel grade 50 or 70 according to EN ISO 3506:2009
Plain washer	Galvanized	Carbon steel, hardness class A $\geq 200 \text{ HV}$ Electroplated according to EN ISO 4042:1999
	F	Carbon steel, hardness class A $\geq 200 \text{ HV}$ Hot-dip galvanized $\geq 50 \mu\text{m}$ according to EN ISO 10684:2004/AC:2009
	A4	Stainless steel 1.4401, 1.4404, 1.4571, 1.4578 according to EN 10088:2005
Hexagonal nut ^{a)}	Galvanized	Property class 5 or 8 according to EN ISO 898-2:2012 Electroplated according to EN ISO 4042:1999
	F	Property class 5 or 8 according to EN ISO 898-2:2012 Hot-dip galvanized $\geq 50 \mu\text{m}$ according to EN ISO 10684:2004/AC:2009
	A4	Property class 50, 70 or 80 according to EN ISO 3506:2009

a) Hexagonal nuts according to DIN 934: 1987-10 for channel bolts made from carbon steel (4.6) and stainless steel

Mechanical properties

Part		HAC-C / HBC		
Nominal tensile strength	Carbon steel 4.6	f_{uk}	[N/mm ²]	400
	Carbon steel 8.8			800 / 830 ^{a)}
	Stainless steel A4-50			500
	Stainless steel A4-70			700
Yield strength	Carbon steel 4.6	f_{yk}	[N/mm ²]	240
	Carbon steel 8.8			640 / 660 ^{a)}
	Stainless steel A4-50			210
	Stainless steel A4-70			450

a) Material properties according to EN ISO 898-1

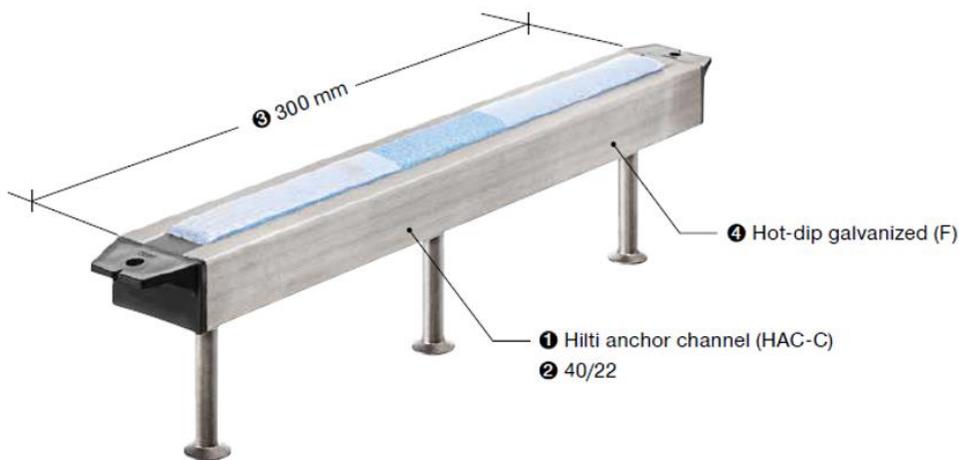
Corrosion class

Class / Mark	Material / Coating type
G	Carbon steel, electroplated
F (HDG)	Carbon steel, hot-dip galvanized
R (A4)	Stainless steel

Nomenclature of HAC-C anchor channels (example)

Hilti anchor channel type	Profile type and size	Channel length	Finish or material
①	②	③	④
HAC-C	40/22	300	F (HDG)

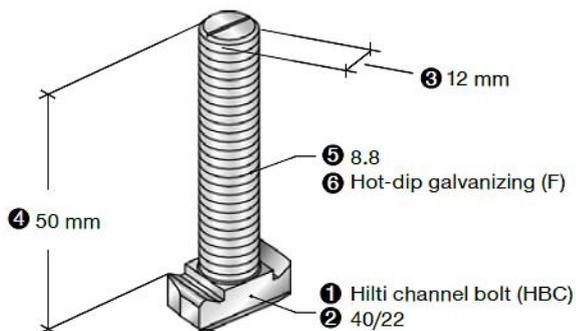
HAC-C 40/22 300F



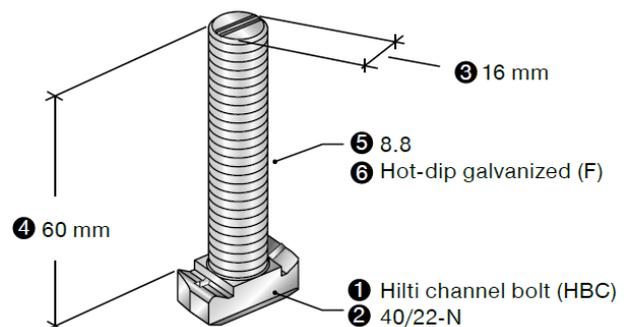
Nomenclature of HBC channel bolts (example)

Hilti channel bolt	Bolt type	Diameter	Bolt length	Steel grade	Finish or material
①	②	③	④	⑤	⑥
HBC	40/22	M12	50	8.8	F (HDG)
HBC	40/22-N	M16	60	8.8	F (HDG)

HBC-40/22 M12x50 8.8 F (standard bolt)



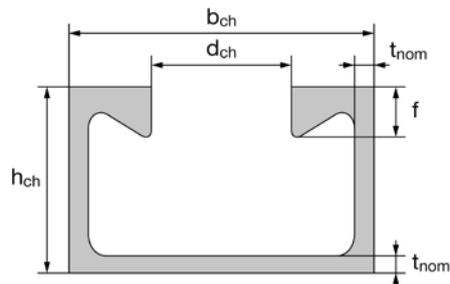
HBC-40/22 M16x60 8.8 F (notched bolt)



Dimensions of anchor channels

Dimensions of channel profile

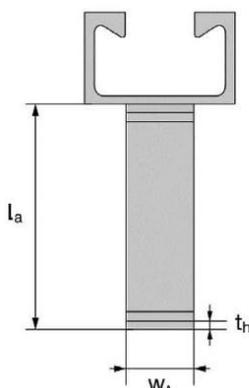
Anchor channel type		HAC-C		
Anchor channel size		40/22	50/30	52/34
Channel width	b_{ch} [mm]	40,1	49,6	52,5
Channel height	h_{ch} [mm]	23,0	30,0	34,0
Nominal thickness	t_{nom} [mm]	2,7	3,2	4,0
Width of channel opening	d_{ch} [mm]	18,0	22,5	22,5
Height of channel lips	f [mm]	6,0	8,1	11,5
Moment of inertia	I_y [mm ⁴]	21504	57781	97606



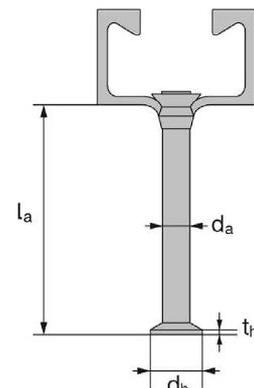
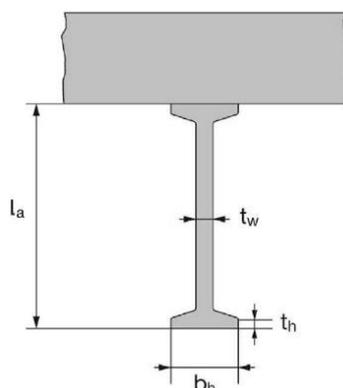
HAC-C 40/22, HAC-C 50/30, HAC-C 52/34

Dimensions of anchors

Anchor channel type		HAC-C		
Anchor channel size		40/22	50/30	52/34
Version with welded I-anchor				
Minimum anchor length	min. l_a [mm]	62,0	69,0	125,0
Web thickness	t_w [mm]	5,0	5,0	6,0
Width of the head	b_h [mm]	20,0	20,0	25,0
Head thickness	t_h [mm]	5,0	5,0	5,0
Width (cutting length)	w_A [mm]	20,0	25,0	40,0
Area of the head	A_h [mm]	300	375	760
Version with round anchor				
Minimum anchor length	min. l_a [mm]	58,0	65,0	123,5
Diameter of anchor	d_a [mm]	8,0	10,0	11,0
Diameter of round anchor head	d_h [mm]	16,0	20,0	24,3
Thickness of round anchor head	t_h [mm]	2,0	2,2	2,5
Area of round anchor head	A_h [mm]	151	236	369



Version with welded I-Anchor



Version with round anchor

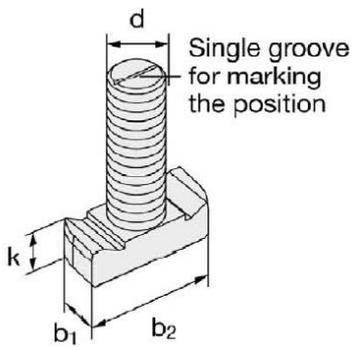
Dimensions of channel bolts

Dimensions of channel bolts

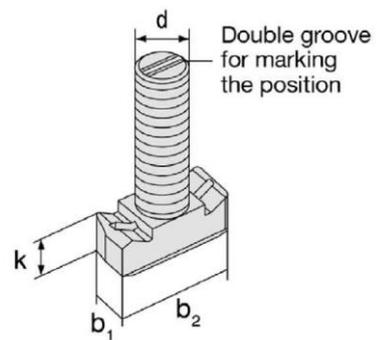
Channel bolt type			HBC-40/22			HBC-40/22-N	
Appropriate anchor channel			HAC-C 40/22				
Nominal diameter	d	[mm]	10,0	12,0	16,0	16,0	
Width (1)	b ₁	[mm]	14,0	14,0	17,0	17,0	
Width (2)	b ₂	[mm]	33,0	33,0	33,0	33,0	
Thickness	k	[mm]	10,5	11,5	11,5	11,5	

Dimensions of channel bolts

Channel bolt type			HBC-50/30			HBC-50/30-N	
Appropriate anchor channel			HAC-C 50/30 ; HAC-C 52/34				
Nominal diameter	d	[mm]	12,0	16,0	20,0	16,0	20,0
Width (1)	b ₁	[mm]	17,0	17,0	21,0	21,0	21,0
Width (2)	b ₂	[mm]	42,0	42,0	42,0	42,0	42,0
Thickness	k	[mm]	14,5	15,5	15,5	15,5	15,5



HBC-40/22, HBC-50/30



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

Setting information

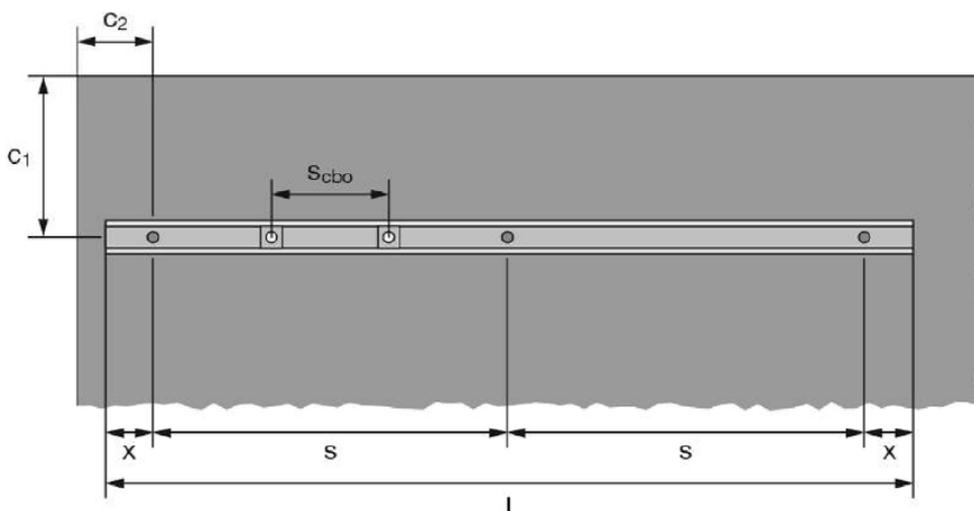
Setting details for anchor channels

Anchor channel type			HAC-C		
Anchor channel size			40/22	50/30	52/34
Minimum effective embedment depth	$h_{ef,min}$	[mm]	79	94	155
Nominal embedment depth	h_{nom}	[mm]	81	96,2	157,5
Minimum spacing	s_{min}	[mm]	100		
Maximum spacing	s_{max}	[mm]	250		
End spacing	x	[mm]	25 ^{a)}	35 ^{b)}	
Minimum channel length	l_{min}	[mm]	150	150	170 ^{c)}
Minimum edge distance	c_{min}	[mm]	50	75	
Minimum thickness of concrete member	h_{min}	[mm]	100	105	165

a) The end spacing may be increased from 25 mm to 35 mm

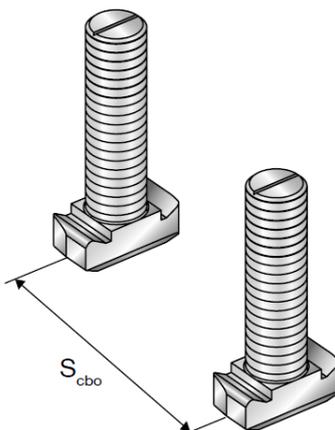
b) $x = 25$ mm for welded I-anchors

c) $l_{min} = 150$ mm for welded I-anchors



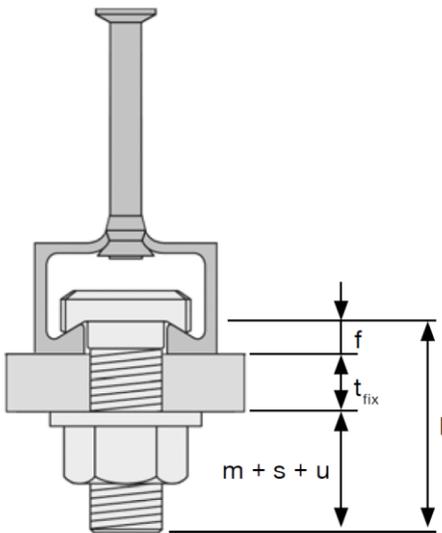
Setting details for channel bolts

Anchor channel size		M10	M12	M16	M20	
Minimum spacing between channel bolts	$s_{cbo,min}$	[mm]	50	60	80	100



Determination of the minimum required T-bolt length

Anchor channel type		HAC-C				
		40/22		50/30		52/34
Anchor channel size		HBC 40/22	HBC 40/22-N	HBC 50/30	HBC 50/30-N	HBC 50/30
Height of channel lip	f [mm]	6,0	6,0	8,0	8,0	11,5
Thickness of nut, washer and channel bolt projection	Bolt M10	13,9	-	-	-	-
	Bolt M12	17,3	-	17,3	-	17,3
	Bolt M16	21,8	21,8	21,8	21,8	21,8
	Bolt M20	-	-	27,0	27,0	27,0



Dimensions

l	[mm]	nominal length of channel bolt
t _{fix}	[mm]	fastenable thickness (thickness of the attached part)
f	[mm]	height of channel lip
m	[mm]	thickness of the nut (ISO 4032)
s	[mm]	thickness of the washer
u	[mm]	channel bolt projection

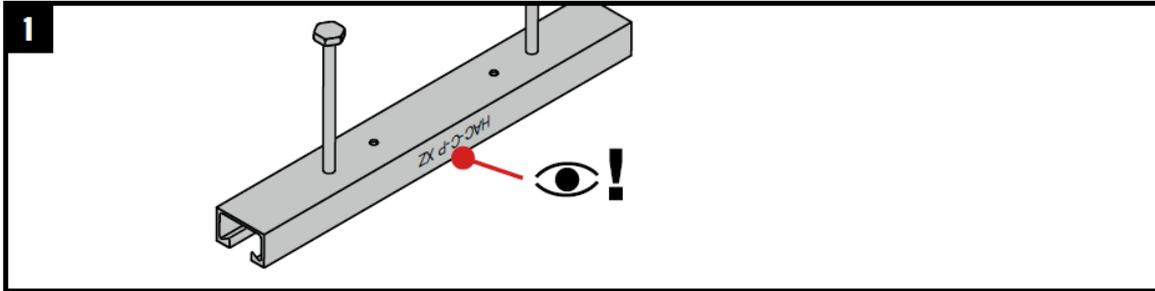
Required T-Bolt length : $l = t_{fix} + f + (m + s + u)$

Setting instructions

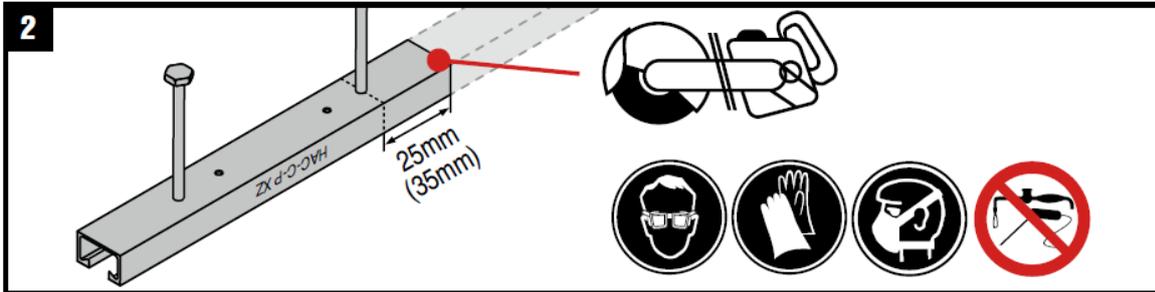
*For detailed information on installation see instruction for use given with the package of the product

Setting instruction for anchor channel

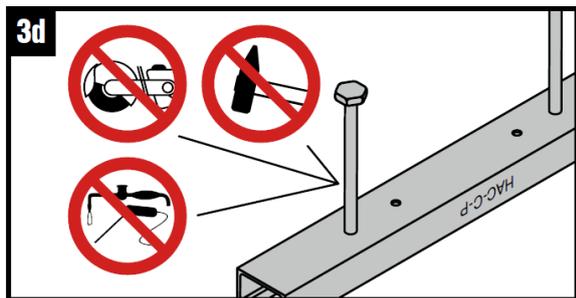
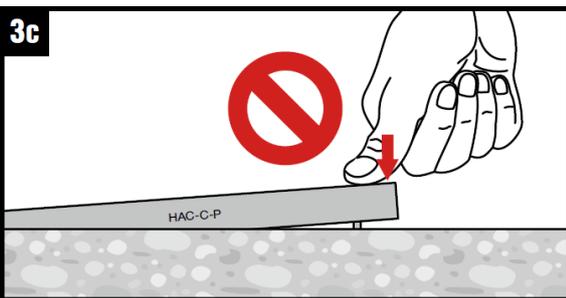
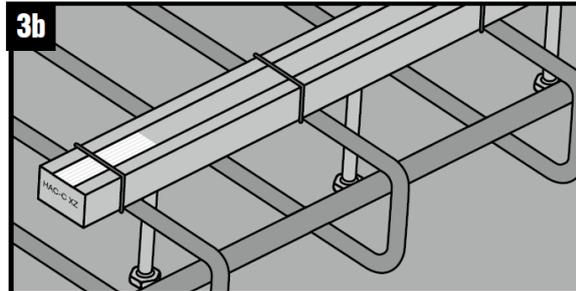
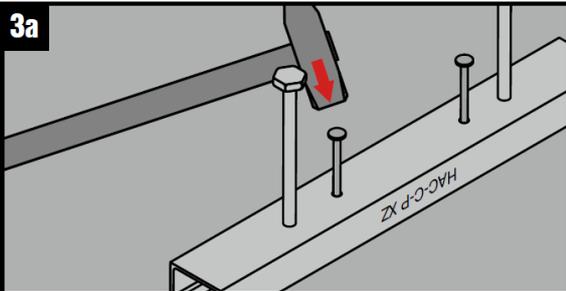
1. Correct selection of anchor channel



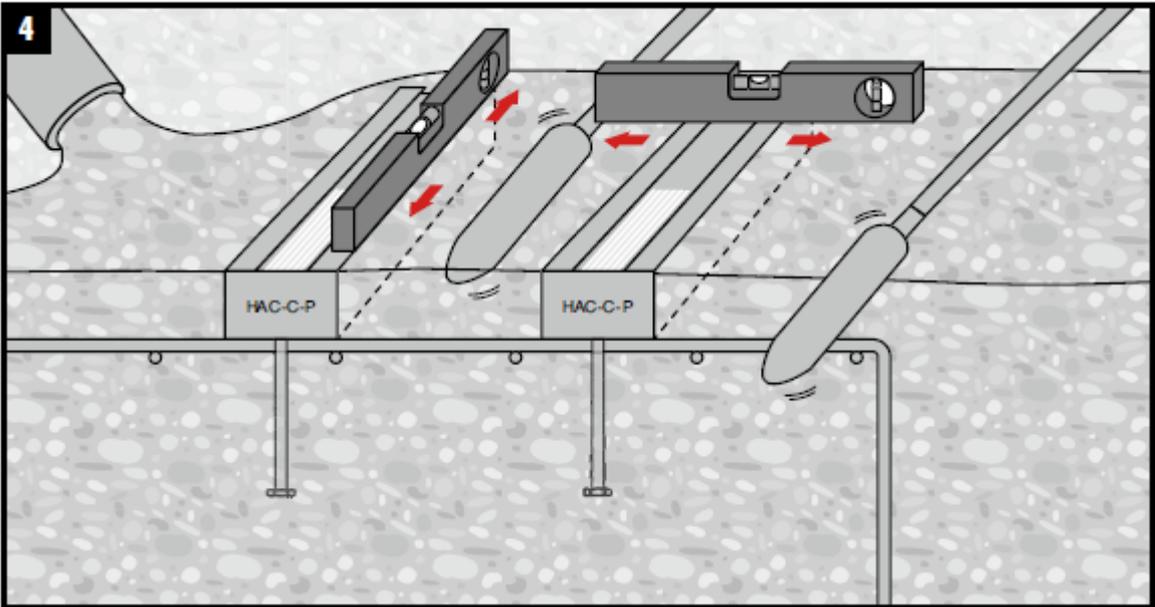
2. Cut the anchor channel (if necessary) with required end spacing



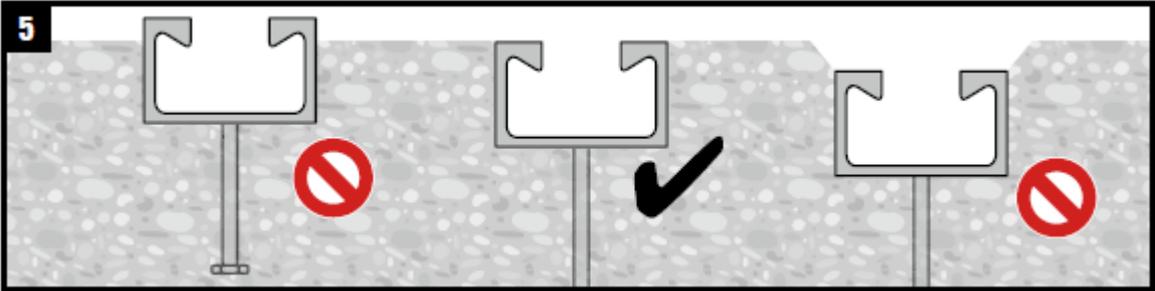
3. Position of anchor channel flush with the surface



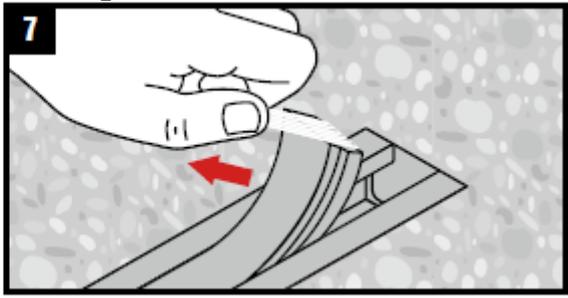
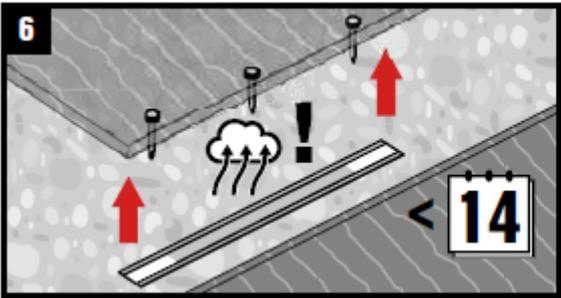
4. Pouring the concrete



5. Check anchor channels position



6. Remove the formwork and foam filler after hardening of concrete





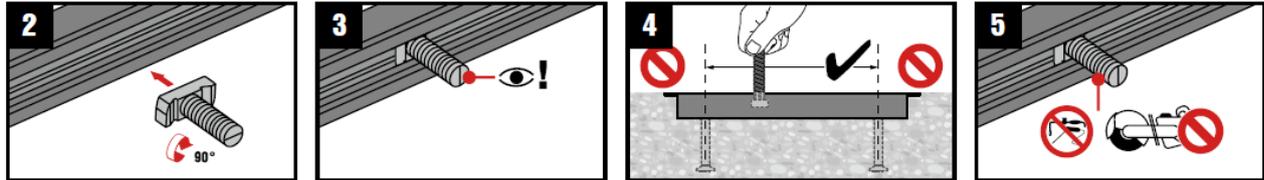
*For detailed information on installation see instruction for use given with the package of the product

Setting instruction for channel bolts

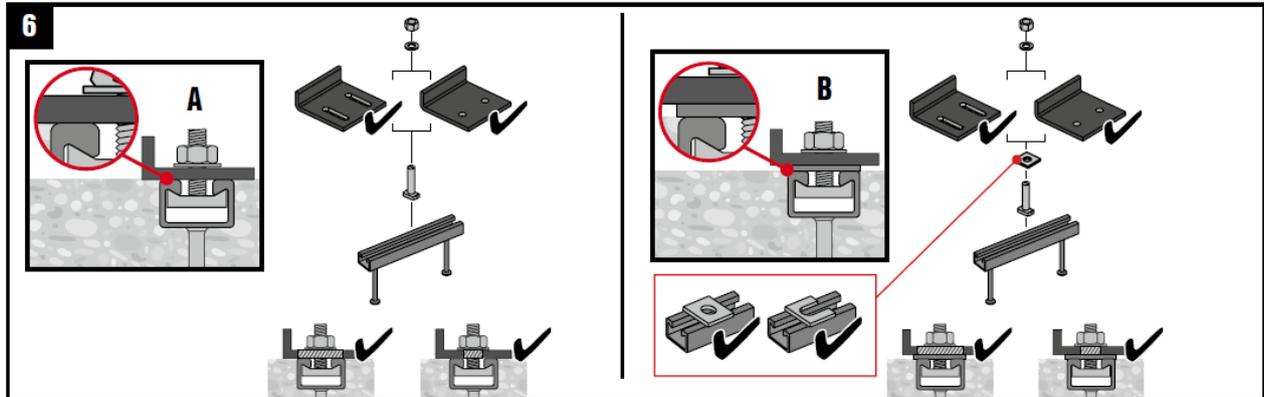
1. Correct selection of channel bolt

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

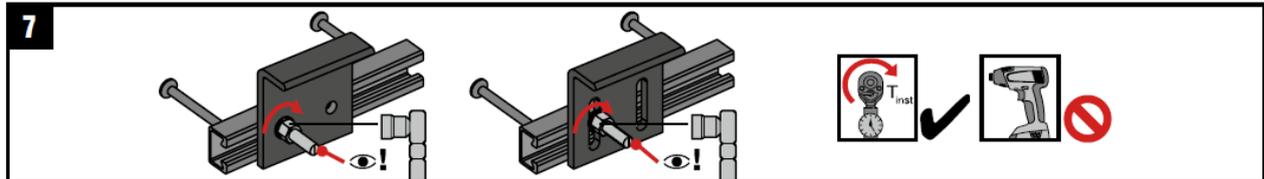
2-5. Installation of the channel bolt



6. Installation of the fixture



7. Apply the installation torque T_{inst}



Channel bolt		T_{inst} [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	-	-