Hilti HAC Cast-In Anchor Channel

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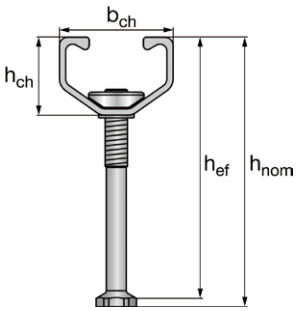
Anchor channel HAC



APPLICATIONS

- Fastening curtain wall brackets
- Fastening elevator guide rail brackets for lift car and counter-weight
- Fastening elevator slide door and landing sill
- Fastening M&E system with demanding requirements in terms of flexibility and dust or noise reduction e.g. data center

Technical data	
Base material	Concrete
Environmental conditions	Indoor, damp conditions
Material composition	Steel, Hot-dip galvanized

ADVANTAGES

- Innovative V-shape provides high load resistance and close edge distances
- Faster installation of building services than with traditional anchor fastening method
- Dustless and noiseless fastening method
- Flexibility of use throughout the whole building life cycle

Order Now

HAC 40

Ordering designation	Length, l_{ch}	Number of anchors	Anchor distance	Standard embedment depth, h_{ef}	Sales pack quantity	Item number
HAC-40 91/200 F	200 mm	2	150 mm	91 mm	1 pc	**2122491**[1)]
HAC-40 91/200 F	250 mm	2	150 mm	91 mm	1 pc	**2122492**[1)]
HAC-40 91/350 F	350 mm	3	150 mm	91 mm	1 pc	**2122493**
HAC-40 91/550 F	550 mm	3	250 mm	91 mm	1 pc	**2122495**
HAC-40 91/800 F	800 mm	4	250 mm	91 mm	1 pc	**2122496**[1)]
HAC-40 91/1050 F	1050 mm	5	250 mm	91 mm	1 pc	**2122497**[1)]
HAC-40 91/1300 F	1300 mm	6	250 mm	91 mm	1 pc	**2122498**[1)]
HAC-40 91/1550 F	1550 mm	7	250 mm	91 mm	1 pc	**2122499**[1)]
HAC-40 91/1800 F	1800 mm	8	250 mm	91 mm	1 pc	**2122530**[1)]
HAC-40 91/2050 F	2050 mm	9	250 mm	91 mm	1 pc	**2122531**[1)]
HAC-40 91/2300 F	2300 mm	10	250 mm	91 mm	1 pc	**2122532**[1)]
HAC-40 91/5800 F	5800 mm	24	250 mm	91 mm	1 pc	**2122536**[1)]

[1)] This is a non-stock item. For detailed lead time information please contact your Hilti representative.

Order Now

HAC 50

Ordering designation	Length, l_{ch}	Number of anchors	Anchor distance	Standard embedment depth, h_{ef}	Sales pack quantity	Item number
HAC-50 106/200 F	200 mm	2	150 mm	106 mm	1 pc	**2122537**[1)]
HAC-50 106/250 F	250 mm	2	150 mm	106 mm	1 pc	**2122538**[1)]
HAC-50 106/300 F	300 mm	2	150 mm	106 mm	1 pc	**2107511**[1)]
HAC-50 106/350 F	350 mm	3	150 mm	106 mm	1 pc	**2122539**
HAC-50 106/450 F	450 mm	3	200 mm	106 mm	1 pc	**2122540**[1)]
HAC-50 106/550 F	550 mm	3	250 mm	106 mm	1 pc	**2122541**[1)]
HAC-50 106/1050 F	1050 mm	5	250 mm	106 mm	1 pc	**2122543**[1)]
HAC-50 106/2300 F	2300 mm	10	250 mm	106 mm	1 pc	**2122548**[1)]
HAC-50 106/5800 F	5800 mm	24	250 mm	106 mm	1 pc	**2122553**[1)]

[1)] This is a non-stock item. For detailed lead time information please contact your Hilti representative.

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

Order Now

HAC 60

Ordering designation	Length, l_{ch}	Number of anchors	Anchor distance	Standard embedment depth, h_{ef}	Sales pack quantity	Item number
HAC-60 148/300 F	300 mm	2	150 mm	148 mm	1 pc	**431850**[1)]
HAC-60 148/350 F	350 mm	3	150 mm	148 mm	1 pc	**431851**
HAC-60 148/450 F	450 mm	3	200 mm	148 mm	1 pc	**431852**[1)]
HAC-60 148/550 F	550 mm	3	250 mm	148 mm	1 pc	**431853**[1)]
HAC-60 148/1050 F	1050 mm	5	250 mm	148 mm	1 pc	**431854**[1)]
HAC-60 148/2300 F	2300 mm	10	250 mm	148 mm	1 pc	**431855**[1)]
HAC-60 148/5800 F	5800 mm	24	250 mm	148 mm	1 pc	**431856**[1)]

[1)] This is a non-stock item. For detailed lead time information please contact your Hilti representative.

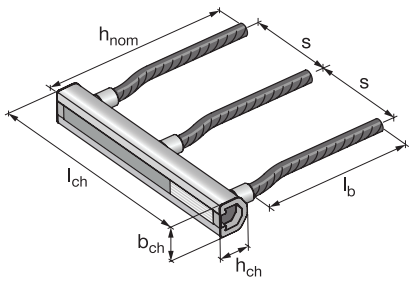
Order Now

HAC 70

Ordering designation	Length, l_{ch}	Number of anchors	Anchor distance	Standard embedment depth, h_{ef}	Sales pack quantity	Item number
HAC-70 175/300 F	300 mm	2	150 mm	175 mm	1 pc	**431860**[1)]
HAC-70 175/350 F	350 mm	3	150 mm	175 mm	1 pc	**431861**
HAC-70 175/450 F	450 mm	3	200 mm	175 mm	1 pc	**431862**
HAC-70 175/550 F	550 mm	3	250 mm	175 mm	1 pc	**431863**[1)]
HAC-70 175/800 F	800 mm	4	250 mm	175 mm	1 pc	**2139027**[1)]
HAC-70 175/1050 F	1050 mm	5	250 mm	175 mm	1 pc	**431864**[1)]
HAC-70 175/2300 F	2300 mm	10	250 mm	175 mm	1 pc	**431865**[1)]
HAC-70 175/5800 F	5800 mm	24	250 mm	175 mm	1 pc	**431866**[1)]

[1)] This is a non-stock item. For detailed lead time information please contact your Hilti representative.

Anchor Channel – Corner Fixing HAC-CRFoS



APPLICATIONS

- Fastening curtain wall brackets in corner

ADVANTAGES

- No welding is required during the installation
- Design in pair for easy installation into formwork (traditional welded corner has difficulty to be inserted into the rebar cage)
- New type of protective, environmentally friendly foam insert (LDPE) and end caps seal the channel effectively, preventing concrete slurry from entering the channel

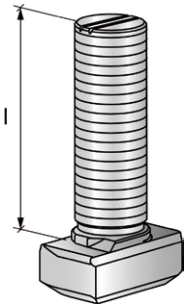
Technical data	
Environmental conditions	Indoor, damp conditions
Material composition	Steel, Hot-dip galvanized (channel)

Order Now

Ordering designation	Channel – Profile Height, h_{ch}	Channel – Profile Width, b_{ch}	Length, l_{ch}	Number of rebar	Rebar Leg Diameter	Rebar length, l_b	Effective embedment depth, h_{nom}	Sales pack quantity	Item number
HAC-70 444/350 F CRFoS	40 mm	45.4 mm	350 mm	3	Y16	380 mm	444 mm	1 pc	**2070268**

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

T-head bolt HBC-C



APPLICATIONS

- For use with HAC-40 to HAC-70 anchor channels

ADVANTAGES

- Simplification of the range available Only one universal bolt type needed to cover HAC-40 to HAC-70 anchor channels
- European approval according to latest technical specifications
- Dustless and noiseless fastening method

Hot-dip galvanized HBC-C

Technical data	
Environmental conditions	Indoor, damp conditions
Material composition	Steel, 8.8 grade, hot-dip galvanized (min. 45 µm)
Material, corrosion	Steel, sherardized / hot-dip galvanized

(e.g. HBC-C 8.8F)

Order Now

Ordering designation	Anchor size	Useable thread length*	Bolt length, l	Sales pack quantity	Item number
HBC-C M12x60 8.8F	M12	35.2 mm	60 mm	100 pc	**2095646**
HBC-C M12x80 8.8F	M12	55.2 mm	80 mm	100 pc	**2095647**
HBC-C M12x100 8.8F	M12	75.2 mm	100 mm	100 pc	**2095648**[1)]
HBC-C M16x60 8.8F	M16	30.7 mm	60 mm	100 pc	**2095650**
HBC-C M16x80 8.8F	M16	50.7 mm	80 mm	50 pc	**2095651**
HBC-C M16x100 8.8F	M16	70.7 mm	100 mm	50 pc	**2095652**
HBC-C M20x60 8.8F	M20	25.5 mm	60 mm	50 pc	**2095653**[1)]
HBC-C M20x80 8.8F	M20	45.5 mm	80 mm	50 pc	**2095654**[1)]
HBC-C M20x100 8.8F	M20	65.5 mm	100 mm	50 pc	**2095655**[1)]

[1)] This is a non-stock item. For detailed lead time information please contact your Hilti representative.
* Usable thread length measures the bolt length protruded after inserted the HBC-C into the HAC channel

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

Hot-dip galvanized notched bolt HBC-C-N

Technical data	
Environmental conditions	Indoor, damp conditions
Tooth configuration	Notched
Material, corrosion	Steel, sherardized / hot-dip galvanized

(e.g. HBC-C-N 8.8F)

Order Now

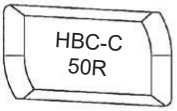
Ordering designation	Anchor size	Useable thread length *	Bolt length, l	Sales pack quantity	Item number
HBC-C-N M16x60 8.8F	M16	35.2 mm	60 mm	1 pc	**2237140**[1)]
HBC-C-N M16x80 8.8F	M16	55.2 mm	80 mm	25 pc	**2237141**
HBC-C-N M16x100 8.8F	M16	75.2 mm	100 mm	25 pc	**2237142**[1)]
HBC-C-N M16x150 8.8F	M16	125.2 mm	150 mm	25 pc	**2237143**[1)]
HBC-C-N M20x60 8.8F	M20	25.5 mm	60 mm	50 pc	**2237144**[1)]
HBC-C-N M20x80 8.8F	M20	45.5 mm	80 mm	50 pc	**2237145**[1)]
HBC-C-N M20x100 8.8F	M20	65.5 mm	100 mm	50 pc	**2237146**[1)]
HBC-C-N M20x150 8.8F	M20	115.5 mm	150 mm	25 pc	**2237137**[1)]

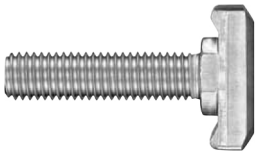
[1)] This is a non-stock item. For detailed lead time information please contact your Hilti representative.
* Usable thread length measures the bolt length protruded after inserted the HBC-C into the HAC channel

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

Stainless steel HBC-C

Technical data	
Environmental conditions	Outdoor
Material composition	Steel, A4-50
Material, corrosion	Steel, stainless





(e.g. HBC-C 50R)

Order Now

Ordering designation	Anchor size	Useable thread length*	Bolt length, l	Sales pack quantity	Item number
HBC-C M12x50 50R	M12	25.2 mm	50 mm	25 pc	**2095685**[1)]
HBC-C M12x80 50R	M12	55.2 mm	80 mm	25 pc	**2095686**[1)]
HBC-C M16x80 50R	M16	50.7 mm	80 mm	25 pc	**2095690**[1)]

[1)] This is a non-stock item. For detailed lead time information please contact your Hilti representative.
* Usable thread length measures the bolt length protruded after inserted the HBC-C into the HAC channel

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

Hilti Anchor Channel Specification

HAC	HAC 40	HAC 50	HAC 60	HAC 70
Material of channel	Carbon steel S235, EN 10025-2	Carbon steel S235, EN 10025-2	Carbon steel S235, EN 10025-2	Carbon steel S235, EN 10025-2
Coating thickness	Hot-dip gal. ≥ 55µm, EN ISO 1461: 2009 -10	Hot-dip gal. ≥ 55µm, EN ISO 1461: 2009 - 10	Hot-dip gal. ≥ 70µm, EN ISO 1461: 2009 - 10	Hot-dip gal. ≥ 70µm, EN ISO 1461: 2009 - 10
Channel width	40.9mm	41.9mm	43.4mm	45.4mm
Channel height	28mm	31mm	35.5mm	40mm
Embedment depth	91mm	106mm	148mm	175mm
Recommended tensile load (1)	Depends on different Edge distance c_1 [mm]	Depends on different Edge distance c_1 [mm]	Depends on different Edge distance c_1 [mm]	Depends on different Edge distance c_1 [mm]
Recommended shear load (1)				

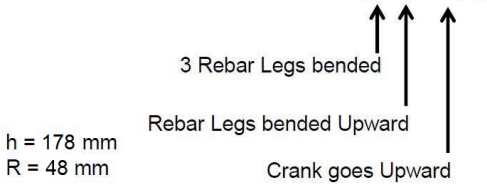
(1) Please refer to P.8-11 to find specific edge distance to get the suitable tensile load and shear load.

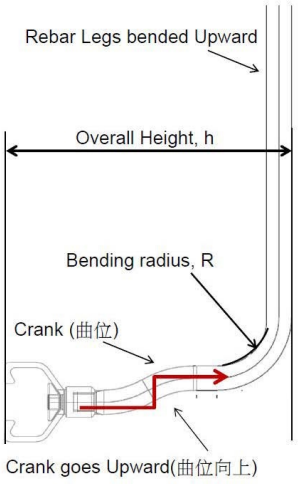
HBC-C & HBC-C-N

	Grade 8.8	Stainless steel, A4-50
Material of T Bolt	Carbon steel grade 8.8, EN ISO 898-1	Stainless steel, A4-50
Coating thickness	hot-dip gal. ≥ 45µm, ISO 1461:1999	N/A

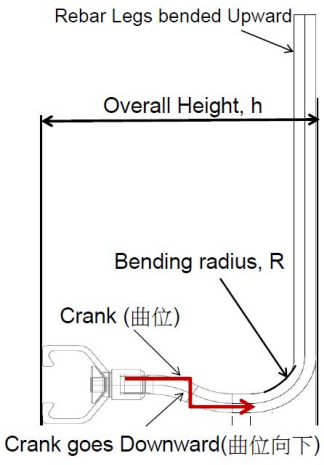
HAC-CRFoS

Item No.: #3534712
HAC-70 444/350 F CRFoS (3Up+Up)





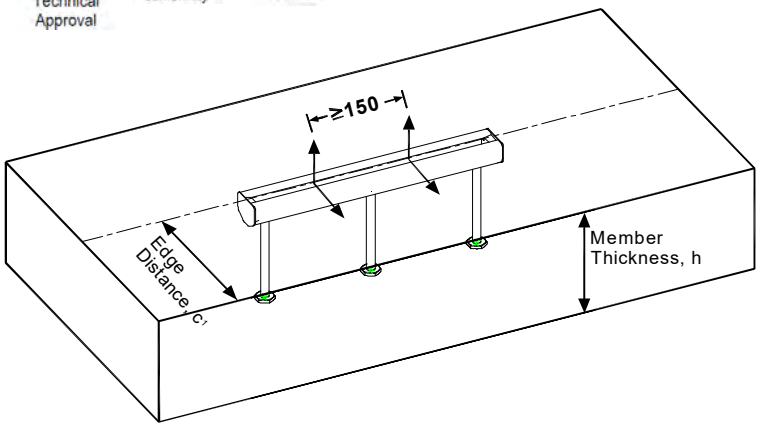
Item No.:#3534913
HAC-70 444/350 F CRFoS (3Up+Down)



Please consult Hilti technical advisory for detail HAC F CRFoS design

HAC-40 Basic Loading Data (Paired Load)

- All data given in this section according ETA-11/0006, issue 2011-02-08 and follow the design code CEN/TS.
- Channel length: 350mm with 3 anchors (legs)
- Embedment depth, h_{ef} = 91mm.
- T-head bolts spacing ≥ 150mm, choose of bolt size according to bolt selection chart.
- Linear interpolation is now allowed. Consult Hilti technical advisory for loading with different edge distance or member thickness.
- Concrete C35/45, Cylindrical strength = 35N/mm^2, Cubic strength = 45N/mm^2, Consult Hilti technical advisory for loading with different concrete grade.
- The recommended load with overall global safety factor γ_{global}, 3. Loads may vary according to the safety factor requirement from national regulations.
- Quick selection of channel only. Consult Hilti technical advisory for combined load checking.
- Parallel paired channel spacing = 2 x edge distance c_1
- For detail design, please see HAC design manual.



HAC 40

Characteristic Resistance in cracked concrete C35/45

		Concrete member thickness, h [mm]					Edge distance, c_1 [mm]
		125	150	200	250	300	
Tension	[kN]	49.5	49.5	49.5	49.5	49.5	200
Shear	[kN]	54.7	60.0	70.0	70.0	70.0	
Tension	[kN]	49.5	49.5	49.5	49.5	49.5	150
Shear	[kN]	42.0	46.0	53.3	59.5	65.0	
Tension	[kN]	49.5	49.5	49.5	49.5	49.5	125
Shear	[kN]	35.7	39.0	45.0	50.5	55.3	
Tension	[kN]	44.7	44.7	44.7	44.7	44.7	100
Shear	[kN]	29.2	32.0	37.0	41.5	42.0	
Tension	[kN]	38.4	38.4	38.4	38.4	38.4	75
Shear	[kN]	22.8	25.0	28.8	29.2	29.2	
Tension	[kN]	31.5	31.5	31.5	31.5	31.5	50
Shear	[kN]	16.1	17.7	18.0	18.0	18.0	

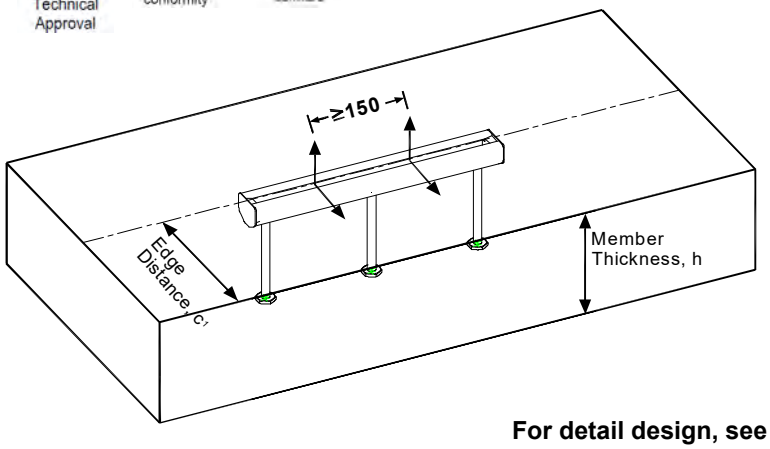
Recommended Load in cracked concrete C35/45

		Concrete member thickness, h [mm]					Edge distance, c_1 [mm]
		125	150	200	250	300	
Tension	[kN]	16.5	16.5	16.5	16.5	16.5	200
Shear	[kN]	18.2	20.0	23.2	23.2	23.2	
Tension	[kN]	16.5	16.5	16.5	16.5	16.5	150
Shear	[kN]	14.0	15.3	17.8	19.8	21.7	
Tension	[kN]	16.5	16.5	16.5	16.5	16.5	125
Shear	[kN]	11.9	13.0	15.0	16.8	18.4	
Tension	[kN]	14.9	14.9	14.9	14.9	14.9	100
Shear	[kN]	9.7	10.7	12.3	13.8	14.0	
Tension	[kN]	12.8	12.8	12.8	12.8	12.8	75
Shear	[kN]	7.6	8.3	9.6	9.7	9.7	
Tension	[kN]	10.5	10.5	10.5	10.5	10.5	50
Shear	[kN]	5.4	5.9	6.0	6.0	6.0	

The above loading data is calculated based on specific design criteria. It is suggested to use Hilti Profis anchor channel software for detail design.
Download link: http://download.hilti.biz/data/techlib/profis_anchorchannel/HiltiPROFISAnchorChannelFullVersion.exe

HAC-50 Basic Loading Data (Paired Load)

- All data given in this section according ETA-11/0006, issue 2011-02-08 and follow the design code CEN/TS.
- Channel length: 350mm with 3 anchors (legs)
- Embedment depth, h_{ef} = 106mm.
- T-head bolts spacing ≥ 150mm, choose of bolt size according to bolt selection chart.
- Linear interpolation is now allowed. Consult Hilti technical advisory for loading with different edge distance or member thickness.
- Concrete C35/45, Cylindrical strength = 35N/mm², Cubic strength = 45N/mm², Consult Hilti technical advisory for loading with different concrete grade.
- The recommended load with overall global safety factor γ_{global}, 3. Loads may vary according to the safety factor requirement from national regulations.
- Quick selection of channel only. Consult Hilti technical advisory for combined load checking.
- Parallel paired channel spacing = 2 x edge distance c_1
- For detail design, please see HAC design manual.



HAC 50

For detail design, see HAC design manual

Characteristic Resistance in cracked concrete C35/45

		Concrete member thickness, h [mm]					Edge distance, c_1 [mm]
		125	150	200	250	300	
Tension	[kN]	69.6	69.6	69.6	69.6	69.6	300
Shear	[kN]	80.4	87.6	101.4	101.4	101.4	
Tension	[kN]	69.6	69.6	69.6	69.6	69.6	200
Shear	[kN]	54.5	59.8	69.0	77.0	84.7	
Tension	[kN]	64.5	64.5	64.5	64.5	64.5	150
Shear	[kN]	41.7	45.8	53.0	59.0	64.8	
Tension	[kN]	59.1	59.1	59.1	59.1	59.1	125
Shear	[kN]	35.4	38.8	44.8	50.0	55.0	
Tension	[kN]	52.8	52.8	52.8	52.8	52.8	100
Shear	[kN]	29.0	31.8	36.7	41.0	42.0	
Tension	[kN]	45.7	45.7	45.7	45.7	45.7	75
Shear	[kN]	22.5	24.6	28.5	29.3	29.3	

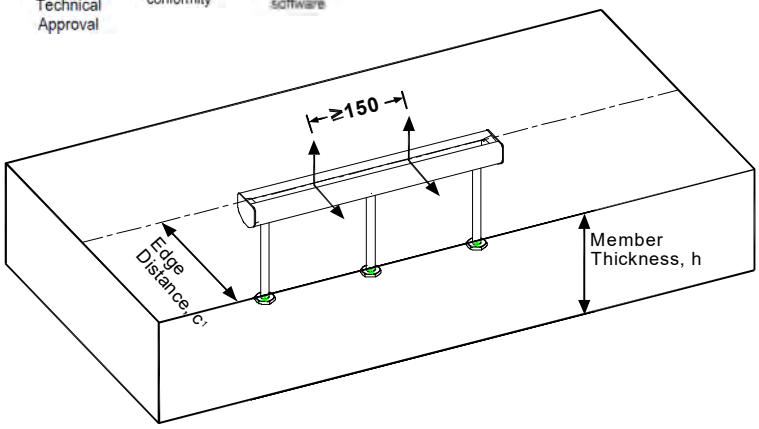
Recommended Load in cracked concrete C35/45

		Concrete member thickness, h [mm]					Edge distance, c_1 [mm]
		125	150	200	250	300	
Tension	[kN]	23.2	23.2	23.2	23.2	23.2	300
Shear	[kN]	26.8	29.2	33.8	33.8	33.8	
Tension	[kN]	23.2	23.2	23.2	23.2	23.2	200
Shear	[kN]	18.2	19.9	23.0	25.7	28.2	
Tension	[kN]	21.5	21.5	21.5	21.5	21.5	150
Shear	[kN]	13.9	15.3	17.7	19.7	21.6	
Tension	[kN]	19.7	19.7	19.7	19.7	19.7	125
Shear	[kN]	11.8	12.9	14.9	16.7	18.3	
Tension	[kN]	17.6	17.6	17.6	17.6	17.6	100
Shear	[kN]	9.7	10.6	12.2	13.7	14.0	
Tension	[kN]	15.2	15.2	15.2	15.2	15.2	75
Shear	[kN]	7.5	8.2	9.5	9.8	9.8	

The above loading data is calculated based on specific design criteria. It is suggested to use Hilti Profis anchor channel software for detail design.
Download link: http://download.hilti.biz/data/techlib/profis_anchorchannel/HiltiPROFISAnchorChannelFullVersion.exe

HAC-60 Basic Loading Data (Paired Load)

- All data given in this section according ETA-11/0006, issue 2011-02-08 and follow the design code CEN/TS.
- Channel length: 350mm with 3 anchors (legs)
- Embedment depth, h_{ef} = 148mm.
- T-head bolts spacing ≥ 150mm, choose of bolt size according to bolt selection chart.
- Linear interpolation is now allowed. Consult Hilti technical advisory for loading with different edge distance or member thickness.
- Concrete C35/45, Cylindrical strength = 35N/mm^2, Cubic strength = 45N/mm^2, Consult Hilti technical advisory for loading with different concrete grade.
- The recommended load with overall global safety factor γ_{global}, 3. Loads may vary according to the safety factor requirement from national regulations.
- Quick selection of channel only. Consult Hilti technical advisory for combined load checking.
- Parallel paired channel spacing = 2 x edge distance c_1
- For detail design, please see HAC design manual.



HAC 60

Characteristic Resistance in cracked concrete C35/45

		Concrete member thickness, h [mm]					Edge distance, c_1 [mm]
		170	200	250	300	350	
Tension	[kN]	103.5	103.5	103.5	103.5	103.5	350
Shear	[kN]	108.0	117.0	130.5	133.5	133.5	
Tension	[kN]	103.5	103.5	103.5	103.5	103.5	250
Shear	[kN]	78.0	84.5	94.5	103.5	112.0	
Tension	[kN]	103.5	103.5	103.5	103.5	103.5	200
Shear	[kN]	63.0	68.5	76.5	84.0	90.5	
Tension	[kN]	98.0	98.0	98.0	98.0	98.0	150
Shear	[kN]	48.3	52.2	58.4	64.0	69.0	
Tension	[kN]	89.5	89.5	89.5	89.5	89.5	125
Shear	[kN]	40.7	44.2	49.5	54.2	56.0	
Tension	[kN]	80.0	80.0	80.0	80.0	80.0	100
Shear	[kN]	33.3	36.0	40.3	42.0	42.0	

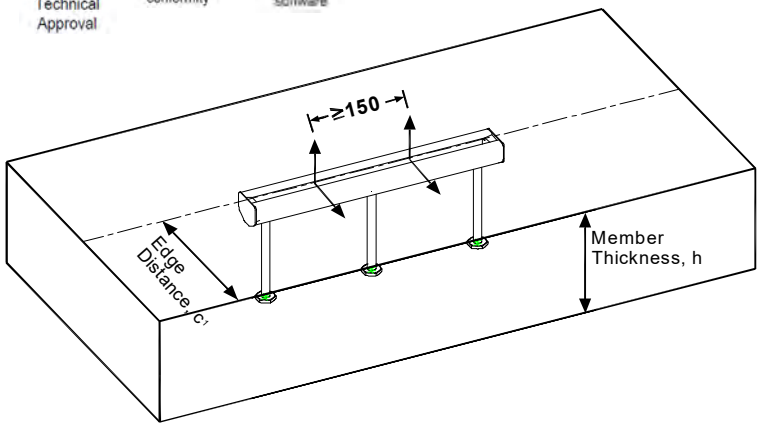
Recommended Load in cracked concrete C35/45

		Concrete member thickness, h [mm]					Edge distance, c_1 [mm]
		170	200	250	300	350	
Tension	[kN]	34.5	34.5	34.5	34.5	34.5	350
Shear	[kN]	36.0	39.0	43.5	44.5	44.5	
Tension	[kN]	34.5	34.5	34.5	34.5	34.5	250
Shear	[kN]	26.0	28.2	31.5	34.5	37.3	
Tension	[kN]	34.5	34.5	34.5	34.5	34.5	200
Shear	[kN]	21.0	22.8	25.5	28.0	30.2	
Tension	[kN]	32.7	32.7	32.7	32.7	32.7	150
Shear	[kN]	16.1	17.4	19.5	21.3	23.0	
Tension	[kN]	29.8	29.8	29.8	29.8	29.8	125
Shear	[kN]	13.6	14.7	16.5	18.1	18.7	
Tension	[kN]	26.7	26.7	26.7	26.7	26.7	100
Shear	[kN]	11.1	12.0	13.4	14.0	14.0	

The above loading data is calculated based on specific design criteria. It is suggested to use Hilti Profis anchor channel software for detail design.
Download link: http://download.hilti.biz/data/techlib/profis_anchorchannel/HiltiPROFISAnchorChannelFullVersion.exe

HAC-70 Basic Loading Data (Paired Load)

- All data given in this section according ETA-11/0006, issue 2011-02-08 and follow the design code CEN/TS.
- Channel length: 350mm with 3 anchors (legs)
- Embedment depth, h_{ef} = 175mm.
- T-head bolts spacing ≥ 150mm, choose of bolt size according to bolt selection chart.
- Linear interpolation is now allowed. Consult Hilti technical advisory for loading with different edge distance or member thickness.
- Concrete C35/45, Cylindrical strength = 35N/mm^2, Cubic strength = 45N/mm^2, Consult Hilti technical advisory for loading with different concrete grade.
- The recommended load with overall global safety factor, γ_{global}, 3. Loads may vary according to the safety factor requirement from national regulations.
- Quick selection of channel only. Consult Hilti technical advisory for combined load checking.
- Parallel paired channel spacing = 2 x edge distance c_1
- For detail design, please see HAC design manual.



HAC 70

Characteristic Resistance in cracked concrete C35/45

		Concrete member thickness, h [mm]					Edge distance, c_1 [mm]
		200	250	300	350	400	
Tension	[kN]	145.5	145.5	145.5	145.5	145.5	350
Shear	[kN]	116.1	129.6	142.5	153.6	156.6	
Tension	[kN]	145.5	145.5	145.5	145.5	145.5	250
Shear	[kN]	84.0	94.5	103.5	111.0	118.5	
Tension	[kN]	145.5	145.5	145.5	145.5	145.5	200
Shear	[kN]	68.1	75.6	83.1	89.4	95.4	
Tension	[kN]	126.0	126.0	126.0	126.0	126.0	150
Shear	[kN]	51.6	57.6	63.3	68.4	71.1	
Tension	[kN]	114.0	114.0	114.0	114.0	114.0	125
Shear	[kN]	43.5	48.9	53.4	56.1	56.1	
Tension	[kN]	102.0	102.0	102.0	102.0	102.0	100
Shear	[kN]	35.4	39.6	42.0	42.0	42.0	

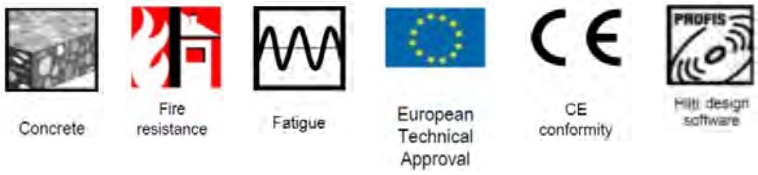
Recommended Load in cracked concrete C35/45

		Concrete member thickness, h [mm]					Edge distance, c_1 [mm]
		200	250	300	350	400	
Tension	[kN]	48.5	48.5	48.5	48.5	48.5	350
Shear	[kN]	38.7	43.2	47.5	51.2	51.2	
Tension	[kN]	48.5	48.5	48.5	48.5	48.5	250
Shear	[kN]	28.0	31.5	34.5	37.0	39.5	
Tension	[kN]	48.5	48.5	48.5	48.5	48.5	200
Shear	[kN]	22.7	25.2	27.7	29.8	31.8	
Tension	[kN]	42.0	42.0	42.0	42.0	42.0	150
Shear	[kN]	17.2	19.2	21.1	22.8	23.7	
Tension	[kN]	38.0	38.0	38.0	38.0	38.0	125
Shear	[kN]	14.5	16.3	17.8	18.7	18.7	
Tension	[kN]	34.0	34.0	34.0	34.0	34.0	100
Shear	[kN]	11.8	13.2	14.0	14.0	14.0	

The above loading data is calculated based on specific design criteria. It is suggested to use Hilti Profis anchor channel software for detail design.
Download link: http://download.hilti.biz/data/techlib/profis_anchorchannel/HiltiPROFISAnchorChannelFullVersion.exe

Hilti Anchor Channel T-Head Bolt Basic Loading Data

- All data for HBC-C & HBC-C-N Bolt given in this section according ETA-11/0006, issue 2011-02-08 and follow the design code CEN/TS
- The recommended load with overall global safety factor,γ_{global}, 3. Loads may vary according to the safety factor requirement from national regulations.
- For detail design, please see HAC design manual

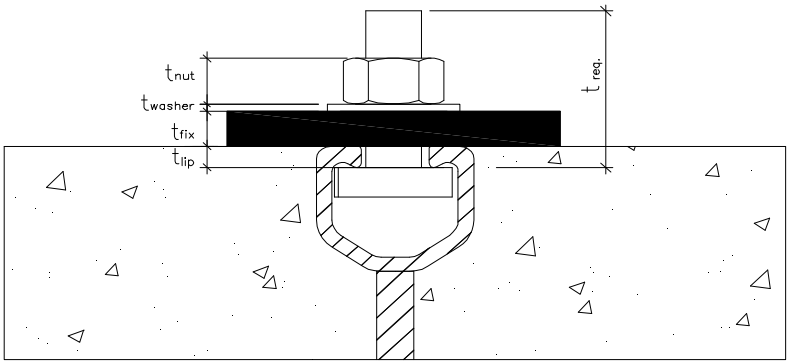


HBC-C & HBC-C-N Bolt
Characteristic Resistance (single bolt)

		M12	M16	M20	Material
Tension	[kN]	67.4	125.6	174.3	8.8
Shear	[kN]	33.7	62.8	101.7	
Tension	[kN]	42.2	78.5	122.5	A4-50
Shear	[kN]	25.3	47.1	73.5	

Recommended Load (single bolt)

		M12	M16	M20	Material
Tension	[kN]	22.5	41.9	65.3	8.8
Shear	[kN]	11.2	20.9	32.6	
Tension	[kN]	14.1	26.2	40.8	A4-50
Shear	[kN]	8.4	15.7	24.5	



$$L_{req.} = t_{lip} + t_{fix} + t_{nut} + t_{washer} + 3 - 5 \text{ no. of threads } *$$

* - 3 - 5 nos. of thread is the common practice.

Model	t_{lip} [mm]
HAC 40	4.5
HAC 50	5.3
HAC 60	6.3
HAC 70	7.4

Nut	t_{nut} [mm]
for M12	9
for M16	14
for M20	17

Washer	t_{washer} [mm]
M12	~ 3
M16	~ 4
M20	~ 6

Deutsches Institut für Bautechnik

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Approval body for construction products and types of construction

Bautechnisches Prüfamt

An institution established by the Federal and Laender Governments

Designated according to Article 29 of Regulation (EU) No 305/2011 and member of EOTA (European Organisation for Technical Assessment)

European Technical Assessment ETA-11/0006 of 27 September 2019

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	Hilti anchor channels (HAC) 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	29 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-11/0006 issued on 18 July 2018

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Specific Part

1 Technical description of the product

The Hilti anchor channel (HAC) with channel bolts (HBC) is a system consisting of V-shaped channel profile of carbon 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. Hilti channel bolts 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)	See Annex C1 to C2 and C6
Characteristic resistance under shear load (static and quasi-static load)	See Annex C3 to C4 and C6 to C7
Characteristic resistance under combined tension and shear load (static and quasi-static load)	See Annex C5
Characteristic resistances under cyclic fatigue tension load	See Annex C10 to C11
Displacements (static and quasi-static load)	See Annex C3 and C5
Durability	See Annex B1

3.2 Safety in case of fire (BWR 2)

Essential characteristic	Performance
Reaction to fire	Class A1
Characteristic resistance to fire	See Annex C8 to C9

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

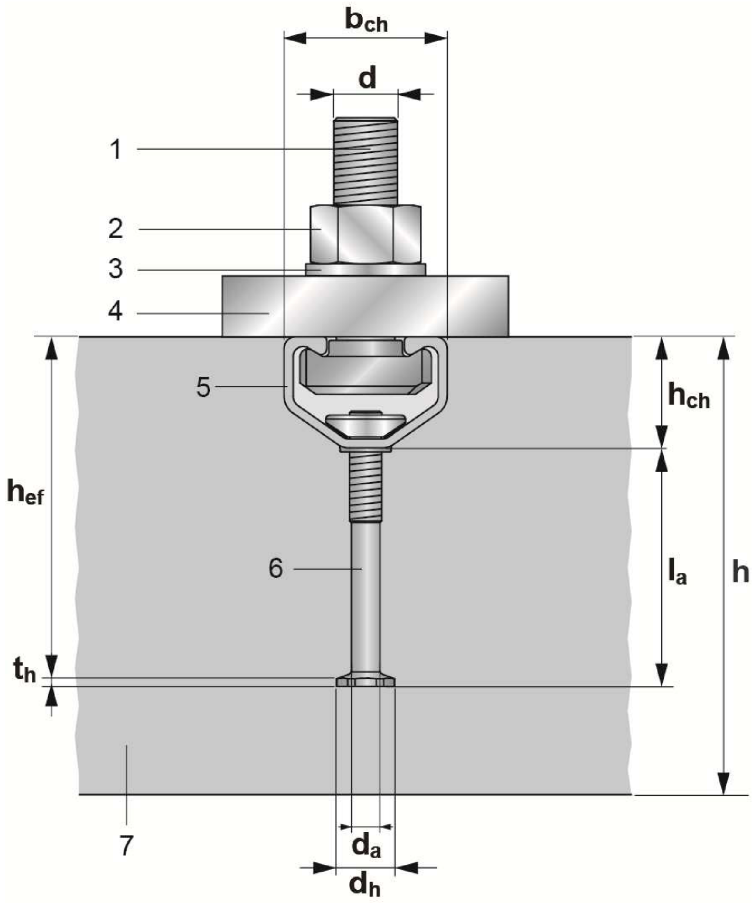
Technical details necessary for the implementation of the AVCP system are laid down in the control plan deposited with Deutsches Institut für Bautechnik.

Issued in Berlin on 27 September 2019 by Deutschen Institut für Bautechnik

BD Dipl.-Ing. Andreas Kummerow
Head of Department

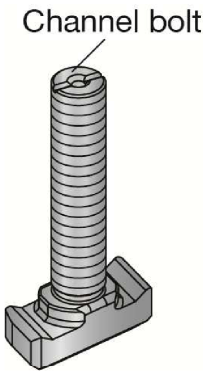
beglaubigt:
Müller

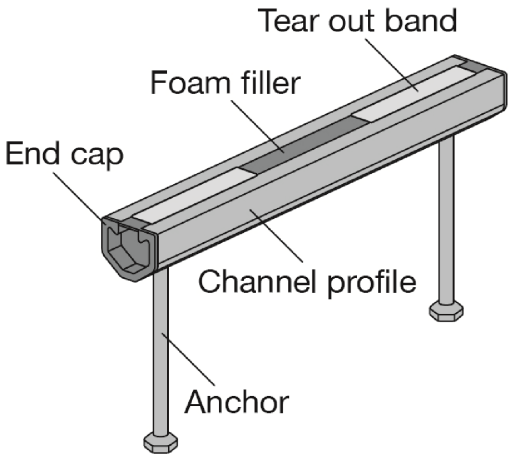
Product and installation condition



Key

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



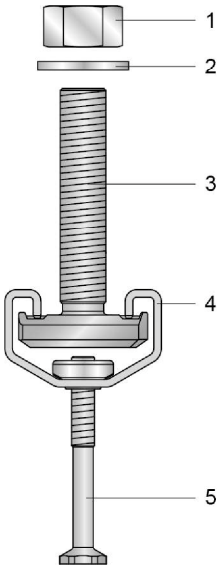


Hilti anchor channels (HAC) with channel bolts (HBC)

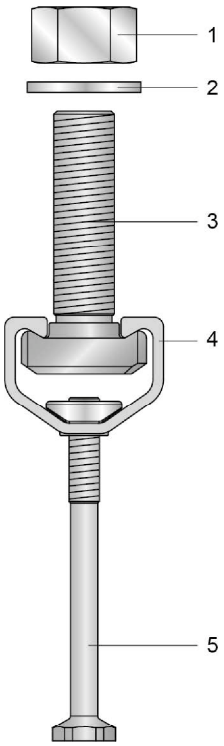
Product Description
Installed condition

Annex A1

Anchor channel types



HAC-30F
with HBC-B



HAC-40F, HAC-(T)50F, HAC-60F, HAC-(T)70F
with HBC-C, HBC-C-E, HBC-C-N and HBC-T

Key

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

Marking of the Hilti anchor channel:
HAC-(T)XZ

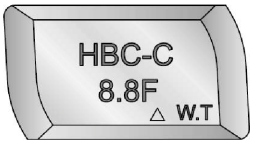
HAC	= Identifying mark of the manufacturer (**H**ilti **A**nchor **C**hannel)
T	= Additional marking for serrated channels
X	= Size of the channel
Z	= Corrosion class

Marking of the Hilti channel bolt:
HBC-X-(N) YZ

HBC	= Identifying mark of the manufacturer (**H**ilti **B**olt **C**hannel)
X	= Type of channel bolt
N	= Additional marking for notching bolt
Y	= Steel grade
Z	= Corrosion class

(e.g. HAC-40F)

40	= Anchor channel size 40
F	= Hot dip galvanized



(e.g. HBC-C 8.8F)

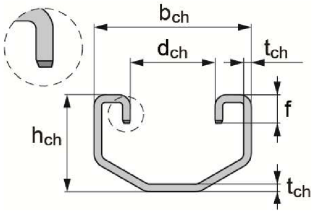
C	= Channel bolt type in combination with HAC-40 to HAC-70
8.8	= Steel grade
F	= Hot dip galvanized

Hilti anchor channels (HAC) with channel bolts (HBC)

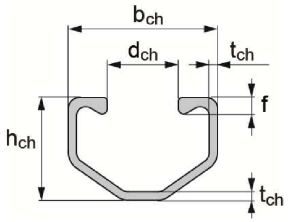
Product Description
Anchor channel types and marking

Annex A2

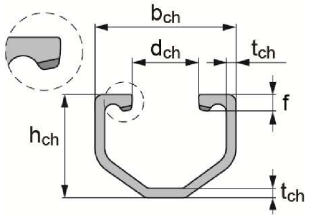
Anchor Channels



HAC-30
(serrated)



HAC-40, HAC-50, HAC-60, HAC-70



HAC-T50, HAC-T70
(serrated)

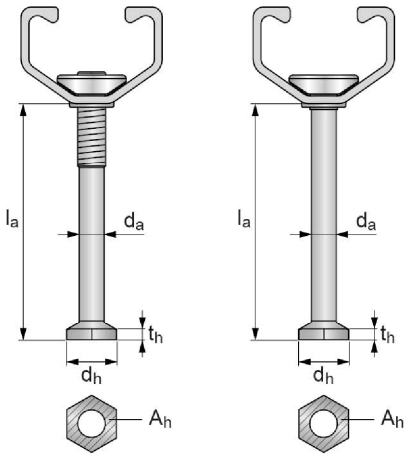
Table 1: Dimensions of channel profile

Anchor channel	b_{ch}	h_{ch}	t_{ch}	d_{ch}	f	I_y
	[mm]					[mm^4]
HAC-30	41,3	25,6	2,00	22,3	7,5	15349
HAC-40	40,9	28,0	2,25	19,5	4,5	21463
HAC-50	41,9	31,0	2,75	19,5	5,3	33125
HAC-T50	41,9	31,0	2,75	19,5	5,2	32049
HAC-60	43,4	35,5	3,50	19,5	6,3	57930
HAC-70	45,4	40,0	4,50	19,5	7,4	95457
HAC-T70	45,4	40,0	4,50	19,5	7,1	92192

Table 2: Dimensions of anchor (welded or bolted to the channel profile)

Anchor channel	d_a	d_h	t_h	min l_a	Head area A_h
	[mm]				[mm^2]
HAC-30	5,4	11,5	2,0	44,4	89
HAC-40	7,2	17,5	3,0	66,0	209
HAC-50	9,0	19,5	3,5	78,5	258
HAC-T50	9,0	19,5	3,5	78,5	258
HAC-60	9,0	19,5	4,5	117,0	258
HAC-70	10,9	23,0	5,0	140,0	356
HAC-T70	10,9	23,0	5,0	140,0	356

bolted anchor **welded anchor**



Hilti anchor channels (HAC) with channel bolts (HBC)

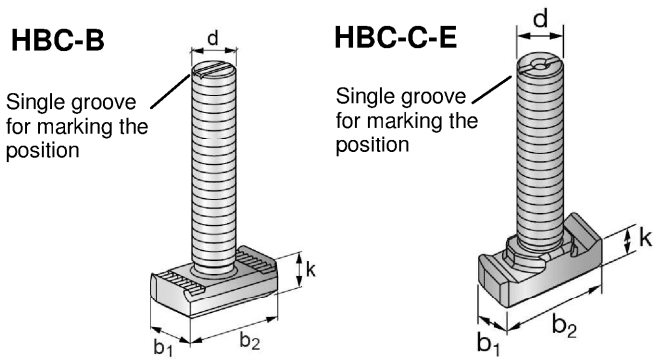
Product Description
Anchor channels (HAC)

Annex A3

Channel bolts

Table 3: Dimensions of channel bolt

Anchor channel	Channel bolt type	Dimensions			
		b_1	b_2	k	d
		[mm]			
HAC-30	HBC-B	19,0	34,0	9,2	10
					12
HAC-40 HAC-50	HBC-C-E	14,0	33,0	10,4	12
		17,0		13,4	16
HAC-40 HAC-50 HAC-60 HAC-70	HBC-C	14,0	33,0	10,4	10
					12
		18,5		11,4	16
				13,9	20
	HBC-C-N	18,5	33,0	11,4	12
					16
				13,9	20
HAC-T50 HAC-T70	HBC-T	18,5	35,4	12,0	12
					16
					20



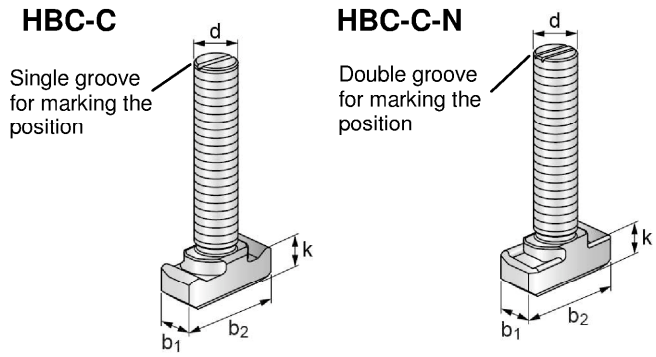
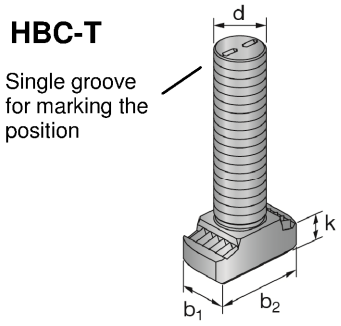


Table 4: Steel grade and corrosion protection

Channel Bolt	Carbon steel [1]		Stainless steel [1]
Steel grade	4.6	8.8	A4-50
f_{uk} [N/mm^2]	400	800 / 830 [2]	500
f_{yk} [N/mm^2]	240	640 / 660 [2]	210
Corrosion protection	G [3] F [4]		R

[1] Material properties according to Annex A5
[2] Material properties according to EN ISO 898-1
[3] Electroplated
[4] Hot dip galvanized



Hilti anchor channels (HAC) with channel bolts (HBC)

Product Description
Channel bolts (HBC)

Annex A4

Table 5: Materials

Component	Carbon steel			Stainless steel
	Material properties	Coating		Material properties
1	2a	2b	2c	3
Channel Profile	Carbon steel according to EN 10025: 2004	Hot dip galvanized ≥ 55 µm [1] Hot dip galvanized ≥ 70 µm [2] according to EN ISO 1461: 2009		-
Rivet	Carbon steel	Hot dip galvanized ≥ 45 µm [5] according to EN ISO 1461: 2009		-
Anchor	Carbon steel	Hot dip galvanized ≥ 45 µm [5] according to EN ISO 1461: 2009		-
Channel bolt	Steel grade 4.6 and 8.8 according to EN ISO 898-1: 2013	Electroplated ≥ 8 µm according to DIN EN ISO 4042: 1999	Hot dip galvanized ≥ 45 µm [5] according to EN ISO 1461: 1999	Steel grade 50 according to EN ISO 3506-1: 2009 1.4401 / 1.4404 / 1.4571 / 1.4362 / 1.4578 / 1.4439
Plain washer [3] according to EN ISO 7089: 2000 and EN ISO 7093-1: 2000	Hardness class A ≥ 200 HV	Electroplated ≥ 8 µm	Hot dip galvanized ≥ 45 µm [5]	Hardness class A ≥ 200 HV 1.4401 / 1.4404 / 1.4571 / 1.4362 / 1.4578 / 1.4439
Hexagonal nut according to EN ISO 4032: 2012 or DIN 934: 1987-10 [4]	Property class 8 according to EN ISO 898-2: 2012	Electroplated ≥ 8 µm	Hot dip galvanized ≥ 45 µm [5]	Property class 70 according to EN ISO 3506-2: 2009 1.4401 / 1.4404 / 1.4571 / 1.4362 / 1.4578 / 1.4439

[1] For HAC-30F, HAC-40F and HAC-(T)50F.
[2] For HAC-60F and HAC-(T)70F.
[3] Not in scope of delivery.
[4] Hexagonal nuts according to DIN 934: 1987-10 for channel bolts made from carbon steel (4.6) and stainless steel.
[5] Hot dip galvanized according to EN ISO 1461: 2009.

Hilti anchor channels (HAC) with channel bolts (HBC)

Product Description
Materials

Annex A5

Specifications of intended use

Anchor channels and channel bolts subject to:

- Static and quasi-static loads in tension and shear perpendicular to the longitudinal axis of the channel for HAC in combination with HBC-C and HBC-C-E as well as 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 of the channel for HAC in combination with HBC-B, HBC-C-N and HAC-T in combination with HBC-T.
- Fatigue cyclic tension loads.
- Fire exposure: only for concrete class C20/25 to C50/60.

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 (e.g. accommodations, bureaus, schools, hospitals, shops, exceptional internal conditions with usual humidity)
  (anchor channels and channel bolts according to Annex A5, Table 5, 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 A5, Table 5, column 2c and 3).
- The stainless steel Hilti channel bolts (HBC), washers and nuts may be used in structures subject to external atmospheric conditions (including industrial and marine environment) or exposure in permanently damp internal conditions, if no particular aggressive conditions (e.g. permanent, alternating immersion in seawater or the splash zone of seawater, chloride atmosphere of indoor swimming pools or atmosphere with chemical pollution e.g. desulphurization plants or road tunnels where de-icing materials are used) exist
  (channel bolts according to Annex A5, Table 5, 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 “Design 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.

Hilti anchor channels (HAC) with channel bolts (HBC)	Annex B1
Intended Use Specifications	

Installation:

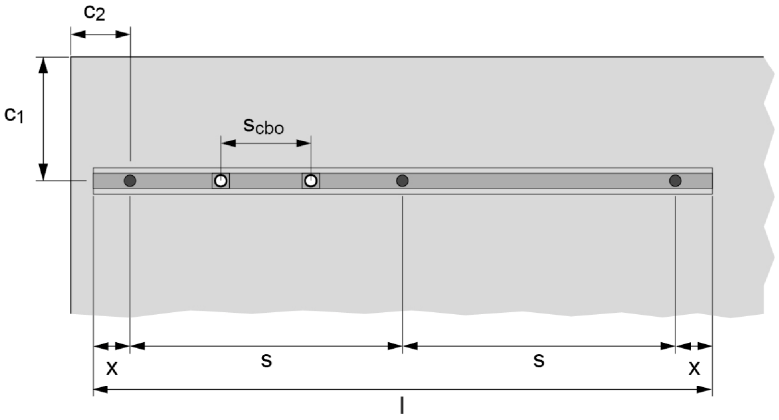
- The installation of anchor channels is carried out by appropriately qualified personnel under the supervision of the person responsible for the technical matters on site.
- Use of the anchor channels only as supplied by the manufacturer - without any manipulations, repositioning or exchanging of channel components.
- Cutting of anchor channels is allowed only if pieces according to Annex B3, Table 6 are generated including end spacing and minimum channel length and only to be used in dry internal conditions.
- Installation in accordance with the installation instructions given in Annexes B5, B6, B7, B8 and B9.
- 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 under 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 A5 and provided separately by the user.
- Orientating the channel bolt (groove according to Annex B6, B7, B8 and B9) rectangular to the channel axis.
- The required installation torques given in Annex B3 and B4 must be applied and must not be exceeded.

Hilti anchor channels (HAC) with channel bolts (HBC)	Annex B2
Intended Use Specifications	

Table 6: Installation parameters for anchor channel

Anchor channel			HAC-30	HAC-40	HAC-50	HAC-T50	HAC-60	HAC-70	HAC-T70
Min. effective embedment depth	$h_{ef,min}$	[mm]	68	91	106	106	148	175	175
Min. spacing	s_{min}		50	100					
Maximum spacing	s_{max}		250						
End spacing	x		25						
Min. channel length	l_{min}		100	150					
Min edge distance	c_{min}		50				75		
Minimum thickness of concrete member	h_{min}		80	105	125	125	168	196	196
			$h_{ef} + t_h + c_{nom}$ [1)]						

[1)] c_{nom} according to EN 1992-1-1:2004 + AC: 2010



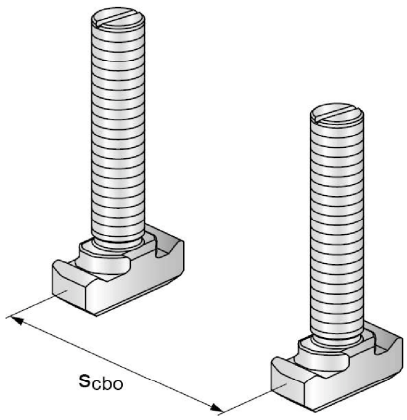


Table 7: Minimum spacing for channel bolts

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

s_{cbo} = center to center spacing between channel bolts ($s_{cbo,min}$ = 5d)

Table 8: Required installation torque T_{inst} for HBC-B

Channel bolt		T_{inst} [Nm] [1)]	
		General	Steel-steel contact
		HAC-30	HAC-30
M10	4.6, A4-50	15	15
M12	4.6, A4-50	25	25

Hilti anchor channels (HAC) with channel bolts (HBC)

Intended Use
Installation parameters for anchor channels (HAC) and channel bolts (HBC)

Annex B3

Table 9: Required installation torque T_{inst} for HBC-C and HBC-C-E

Channel bolt		T_{inst} [Nm] [1]							
		General				Steel-steel contact			
		HAC-40	HAC-50	HAC-60	HAC-70	HAC-40	HAC-50	HAC-60	HAC-70
M10	4.6, A4-50	15				15			
	8.8	15				48			
M12	4.6, A4-50	25				25			
	8.8	25				75			
M16	4.6, A4-50	60				60			
	8.8	60				185			
M20	4.6, A4-50	70	105	120		120			
	8.8	70	105	120		320			

Table 10: Required installation torque T_{inst} for HBC-C-N

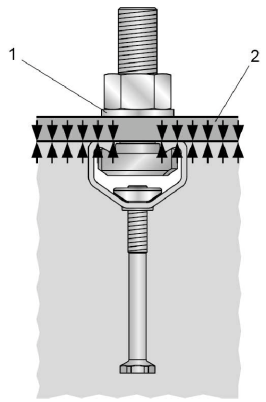
Channel bolt		T_{inst} [Nm] [1]							
		General				Steel-steel contact			
		HAC-40	HAC-50	HAC-60	HAC-70	HAC-40	HAC-50	HAC-60	HAC-70
M12	8.8	75				75			
M16	8.8	185				185			
M20	8.8	-	320			-	320		

Table 11: Required installation torque T_{inst} for HBC-T

Channel bolt		T_{inst} [Nm] [1]			
		General		Steel-steel contact	
		HAC-T50	HAC-T70	HAC-T50	HAC-T70
M12	8.8	75		75	
M16	8.8	100		185	
M20	8.8	120		320	

[1] T_{inst} must not be exceeded.

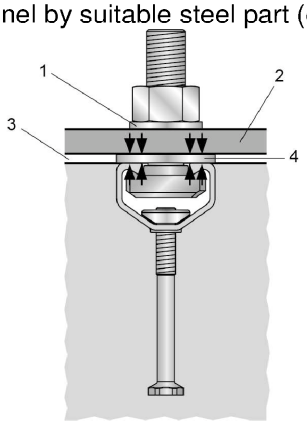
General: The fixture is in contact with the channel profile and the concrete surface



Key

1 washer
2 fixture
3 gap
4 suitable steel part

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



Hilti anchor channels (HAC) with channel bolts (HBC)

Intended Use
Installation parameters for channel bolts (HBC)

Annex B4

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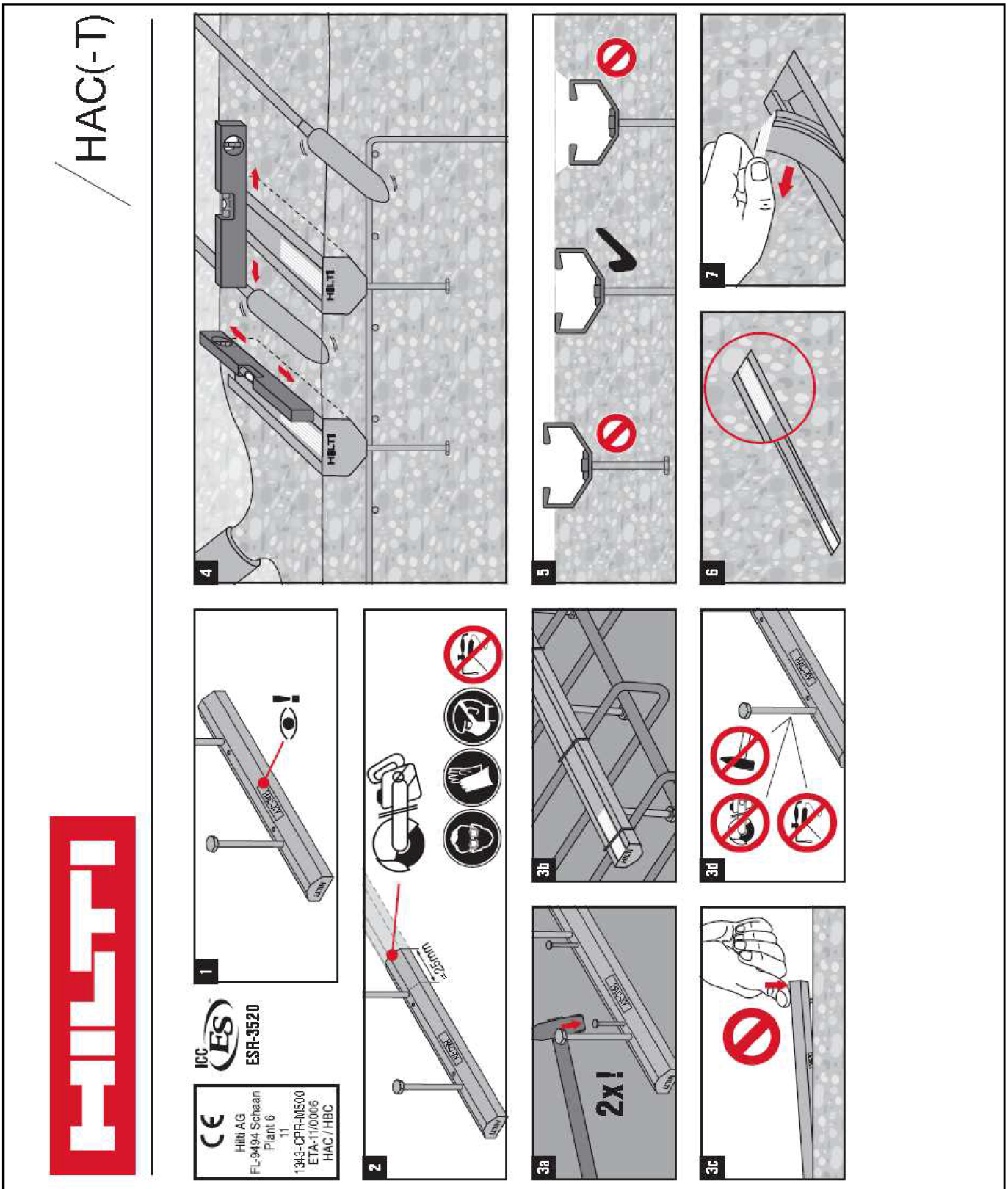

Hilti anchor channels (HAC) with channel bolts (HBC)

Intended Use
Installation instructions for anchor channels (HAC and HAC-T)

Annex B5

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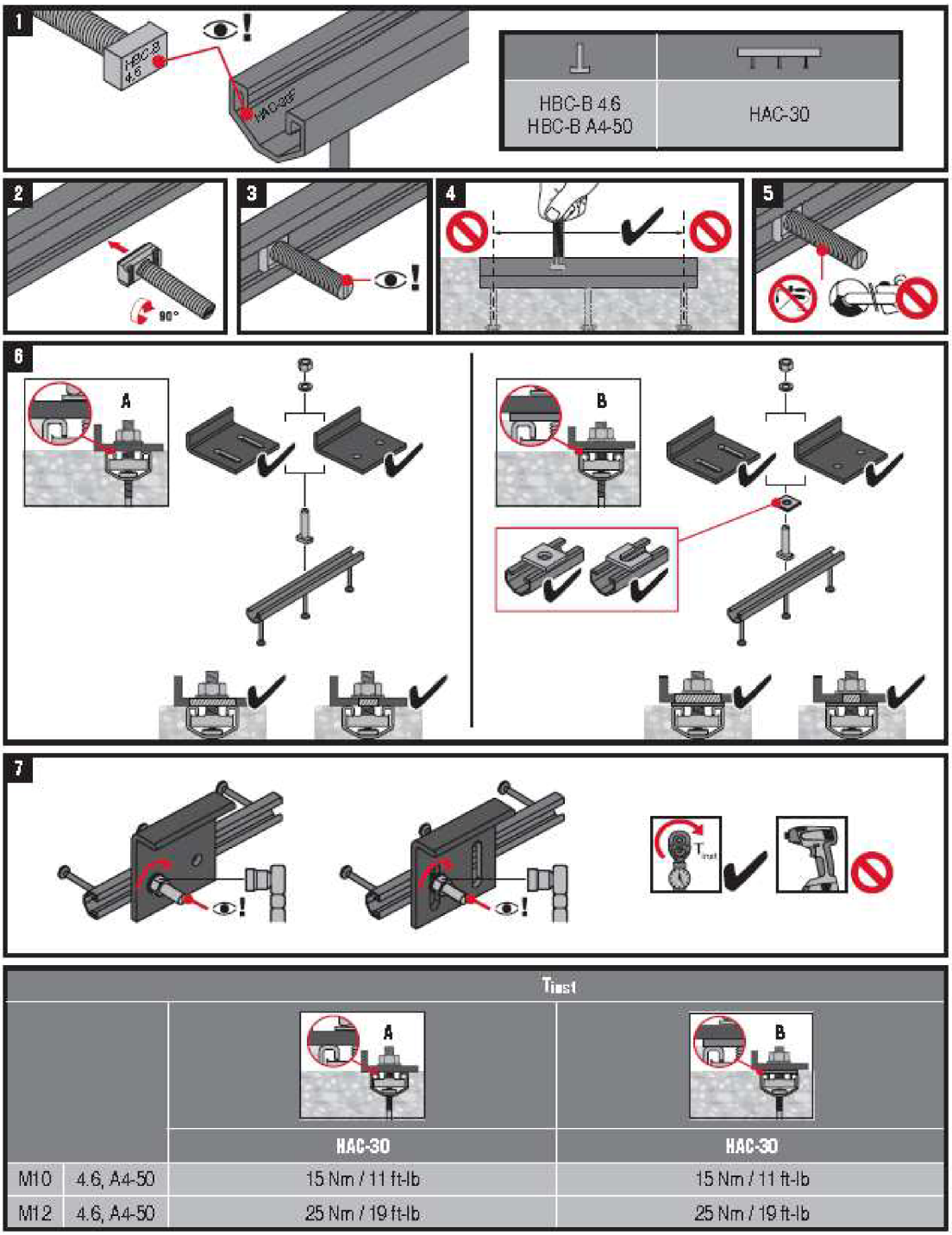
HILTI

HBC-B



		T_{inst}	
		A	B
		HAC-30	HAC-30
M10	4.6, A4-50	15 Nm / 11 ft-lb	15 Nm / 11 ft-lb
M12	4.6, A4-50	25 Nm / 19 ft-lb	25 Nm / 19 ft-lb

T_{inst} is the installation torque that shall be applied with a torque wrench and must not be exceeded.

Hilti anchor channels (HAC) with channel bolts (HBC)

Intended Use
Installation parameters for channel bolts (HBC-B)

Annex B6

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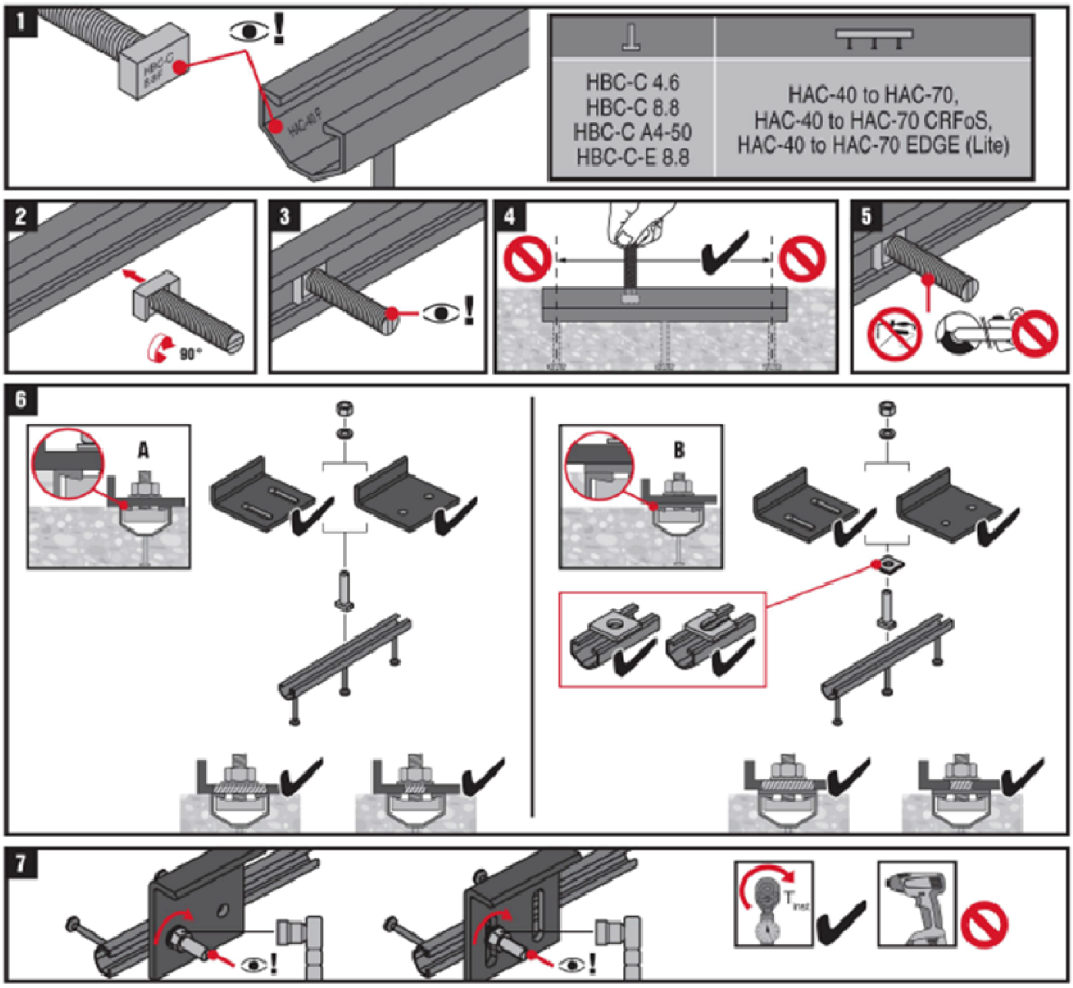
HILTI

HBC-C(-E)



		T_{inst}							
		A				B			
		HAC-40	HAC-50	HAC-60	HAC-70	HAC-40	HAC-50	HAC-60	HAC-70
M10	4.6, A4-50	15 Nm / 11 ft-lb				15 Nm / 11 ft-lb			
	8.8	15 Nm / 11 ft-lb				48 Nm / 35 ft-lb			
M12	4.6, A4-50	25 Nm / 19 ft-lb				25 Nm / 19 ft-lb			
	8.8	25 Nm / 19 ft-lb				75 Nm / 55 ft-lb			
M16	4.6, A4-50	60 Nm / 44 ft-lb				60 Nm / 44 ft-lb			
	8.8	60 Nm / 44 ft-lb				185 Nm / 136 ft-lb			
M20	4.6, A4-50	70 Nm / 52 ft-lb	105 Nm / 78 ft-lb	120 Nm / 89 ft-lb		120 Nm / 89 ft-lb			
	8.8	70 Nm / 52 ft-lb	105 Nm / 78 ft-lb	120 Nm / 89 ft-lb		320 Nm / 236 ft-lb			

T_{inst} is the installation torque that shall be applied with a torque wrench and must not be exceeded.

Hilti anchor channels (HAC) with channel bolts (HBC)	Annex B7
Intended Use Installation parameters for channel bolts (HBC-C and HBC-C-E)	

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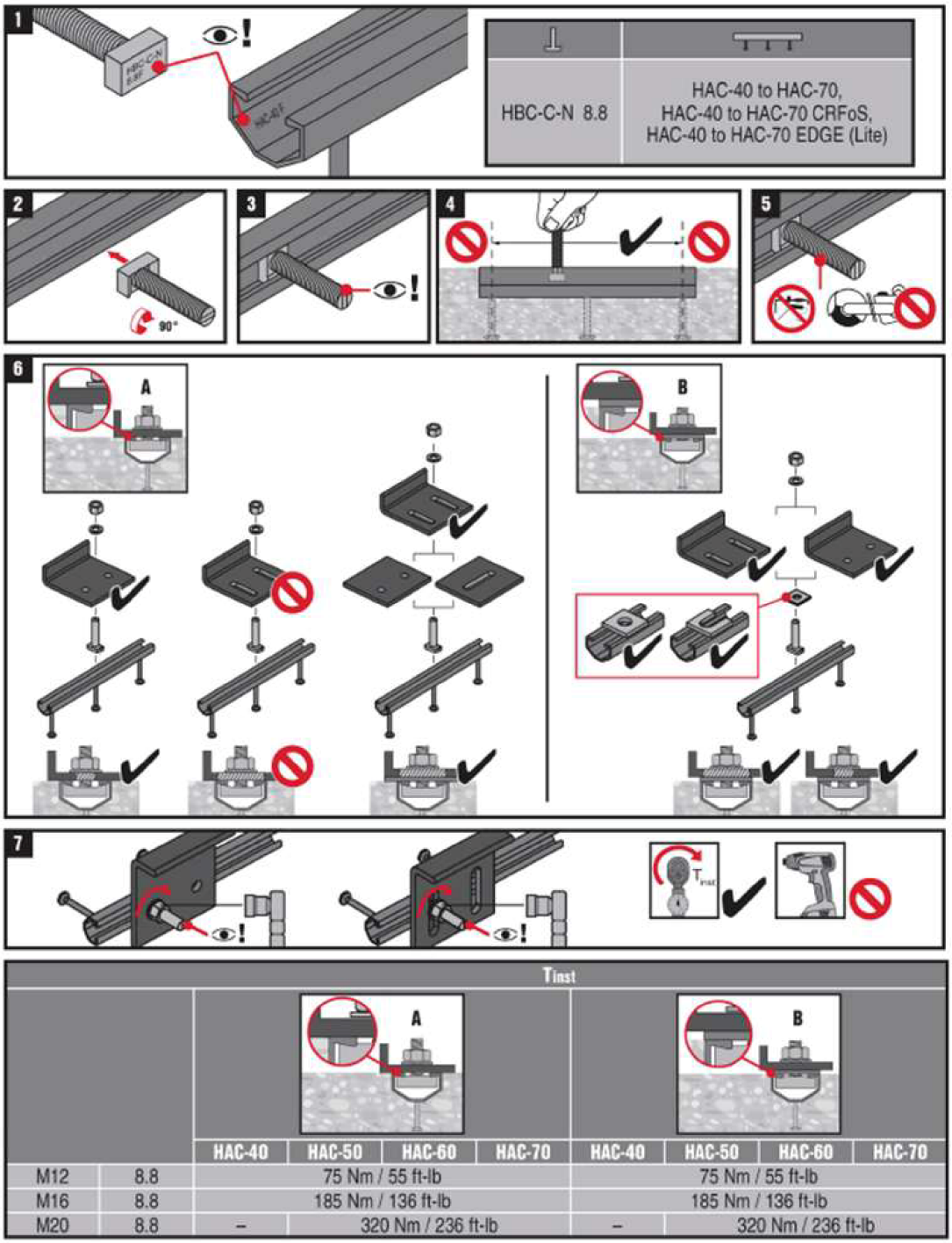
HILTI / HBC-C-N



T_{inst}								
		A				B		
		HAC-40	HAC-50	HAC-60	HAC-70	HAC-40	HAC-50	HAC-60	HAC-70
M12	8.8	75 Nm / 55 ft-lb				75 Nm / 55 ft-lb			
M16	8.8	185 Nm / 136 ft-lb				185 Nm / 136 ft-lb			
M20	8.8	–	320 Nm / 236 ft-lb			–	320 Nm / 236 ft-lb		

T_{inst} is the installation torque that shall be applied with a torque wrench and must not be exceeded.

Hilti anchor channels (HAC) with channel bolts (HBC)	Annex B8
Intended Use Installation instructions for channel bolts (HBC-C-N)	

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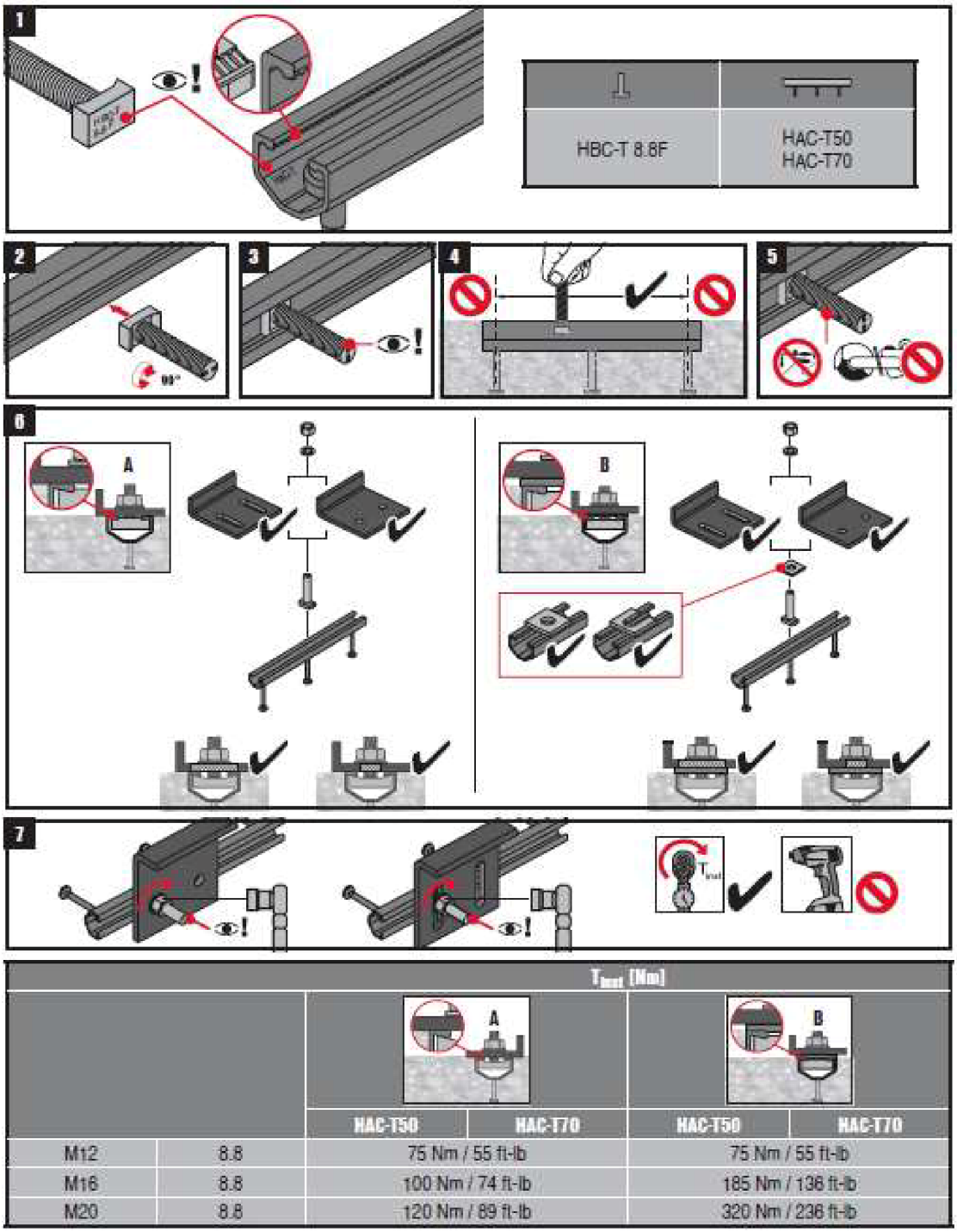
HILTI / HBC-T



		T_{inst} [Nm]			
		A		B	
		HAC-T50	HAC-T70	HAC-T50	HAC-T70
M12	8.8	75 Nm / 55 ft-lb		75 Nm / 55 ft-lb	
M16	8.8	100 Nm / 74 ft-lb		185 Nm / 136 ft-lb	
M20	8.8	120 Nm / 89 ft-lb		320 Nm / 236 ft-lb	

T_{inst} is the installation torque that shall be applied with a torque wrench and must not be exceeded.

Hilti anchor channels (HAC) with channel bolts (HBC)	Annex B9
Intended Use Installation instructions for channel bolts (HBC-T)	

Table 12: Characteristic resistances under tension load – steel failure of anchor channel

Anchor channel		HAC-30	HAC-40	HAC-50	HAC-T50	HAC-60	HAC-70	HAC-T70
Steel failure: Anchor								
Characteristic resistance	$N_{Rk,s,a}$ [kN]	18,2	33,1	52,5	52,5	52,5	76,3	76,3
Partial factor	γ_{Ms} [1)]	1,8						
Steel failure: Connection between anchor and channel								
Characteristic resistance	$N_{Rk,s,c}$ [kN]	18,2	25,0	35,0	35,0	50,1	71,0	71,0
Partial factor	$\gamma_{Ms,ca}$ [1)]	1,8						
Steel failure: Local flexure of channel lips								
Characteristic spacing of channel bolts for $N_{Rk,s,l}$	$s_{l,N}$ [mm]	83	82	84	84	87	91	91
Characteristic resistance	$N^0_{Rk,s,l}$ [kN]	19,9	25,0	35,0	35,0	50,1	71,0	71,0
Partial factor	$\gamma_{Ms,l}$ [1)]	1,8						

[1)] In absence of other national regulations.

Table 13: Characteristic flexural resistance of channel under tension load

Anchor channel			HAC-30	HAC-40	HAC-50	HAC-T50	HAC-60	HAC-70	HAC-T70
Steel failure: Flexure of channel									
Characteristic flexural resistance of channel	$M_{Rk,s,flex}$ [Nm]	HBC-B	755	-	-	-	-	-	-
		HBC-C	-	1136	1596	-	2187	3160	-
		HBC-C-E	-	1136	1596	-	-	-	-
		HBC-C-N	-	980	1345	-	2156	3005	-
		HBC-T	-	-	-	1596	-	-	2975
Partial factor		$\gamma_{Ms,flex}$ [1)]	1,15						

[1)] In absence of other national regulations.

Hilti anchor channels (HAC) with channel bolts (HBC)

Performance
Characteristic resistances of anchor channels under tension load

Annex C1

Table 14: Characteristic resistances under tension load – concrete failure

Anchor channel			**HAC-30**	**HAC-40**	**HAC-50**	**HAC-T50**	**HAC-60**	**HAC-70**	**HAC-T70**
Concrete failure: Pull-out failure									
Characteristic resistance in cracked concrete C12/15		$N_{Rk,p}$ [kN]	8,0	18,8	23,2	23,2	23,2	32,0	32,0
Characteristic resistance in uncracked concrete C12/15			11,2	26,3	32,5	32,5	32,5	44,9	44,9
Factor for $N_{Rk,p}$	C16/20	Ψ_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						
	≥ C60/75		5,00						
Partial factor		$\gamma_{Mp} = \gamma_{Mc}$ [1)]	1,5						
Concrete failure: Concrete cone failure									
Product factor k_1	cracked	$k_{cr,N}$	7,7	8,0	8,2	8,2	8,6	8,9	8,9
	un-cracked	$k_{ucr,N}$	11,0	11,5	11,7	11,7	12,3	12,7	12,7
Partial factor		γ_{Mc} [1)]	1,5						
Concrete failure: Splitting									
Characteristic edge distance		$c_{cr,sp}$ [mm]	204	273	318	318	444	525	525
Characteristic spacing		$s_{cr,sp}$ [mm]	$2,0 \cdot c_{cr,sp}$						
Partial factor		$\gamma_{Msp} = \gamma_{Mc}$ [1)]	1,5						

[1)] In absence of other national regulations.

Hilti anchor channels (HAC) with channel bolts (HBC)

Performance
Characteristic resistances of anchor channels under tension load

Annex C2

Table 15: Displacements under tension load

Anchor channel		HAC-30	HAC-40	HAC-50	HAC-T50	HAC-60	HAC-70	HAC-T70
Tension load	N [kN]	6,6	11,3	14,3	14,7	18,8	26,6	25,2
Short-term displacement [1)]	δ_{N0} [mm]	1,6	1,7	1,1	1,7	1,1	1,0	1,5
Long-term displacement [1)]	$\delta_{N\infty}$ [mm]	3,2	3,4	2,2	3,4	2,2	2,0	3,0

[1)] 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 16: Characteristic resistances under shear load – steel failure of anchor channel

Anchor channel		HAC-30	HAC-40	HAC-50	HAC-T50	HAC-60	HAC-70	HAC-T70
Steel failure: Anchor								
Characteristic resistance	$V_{Rk,s,a,y}$ [kN]	23,7	39,6	53,6	53,6	77,3	114,8	114,8
	$V_{Rk,s,a,x}$ [kN]	10,2	18,4	29,0	29,0	29,0	41,9	41,9
Partial factor	γ_{Ms} [1)]	1,5						
Steel failure: Connection between anchor and channel								
Characteristic resistance	$V_{Rk,s,c,y}$ [kN]	23,7	39,6	53,6	53,6	77,3	114,8	114,8
	$V_{Rk,s,c,x}$ [kN]	9,1	12,5	17,5	17,5	25,1	35,5	35,5
Partial factor	$\gamma_{Ms,ca}$ [1)]	1,8						
Steel failure: Local flexure of channel lips under shear load perpendicular to the longitudinal axis of the channel								
Characteristic spacing of channel bolts for $V_{Rk,s,l}$	$s_{l,V}$ [mm]	83	82	84	84	87	91	91
Characteristic resistance	$V^0_{Rk,s,l,y}$ [kN]	23,7	34,9	47,5	47,5	72,2	95,8	95,8
Partial factor	$\gamma_{Ms,l}$ [1)]	1,8						

[1)] In absence of other national regulations.

Hilti anchor channels (HAC) with channel bolts (HBC)

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

Annex C3

Table 17: Characteristic resistances under shear load in direction of the longitudinal axis of the channel – steel failure of anchor channel

Anchor channel			HAC-30	HAC-40	HAC-50	HAC-T50	HAC-60	HAC-70	HAC-T70
Steel failure: Connection between channel lips and channel bolt									
Characteristic resistance	$V_{Rk,s,l,x}$ [kN]	HBC-B M12 4.6	3,5	-		-	-		-
		HBC-C-N M12 8.8	-	8,5	8,5		8,5	8,5	
		HBC-C-N M16 8.8		19,7	19,7		19,7	19,7	
		HBC-C-N M20 8.8		-	24,1		24,1	24,1	
		HBC-T M12 8.8		-	-	15,1	-	-	15,1
		HBC-T M16 8.8				20,1			20,1
		HBC-T M20 8.8				20,1			20,1
Installation factor		γ_{inst}	1,4			1,2	1,4		1,2

Table 18: Characteristic resistances under shear load – concrete failure

Anchor channel			HAC-30	HAC-40	HAC-50	HAC-T50	HAC-60	HAC-70	HAC-T70
Concrete failure: Pry out failure									
Product factor		k_8	2,0						
Partial factor		γ_{Mc} [1)]	1,5						
Concrete failure: Concrete edge failure									
Product factor k_{12}	cracked concrete	$k_{cr,V}$	7,5	7,5	7,5	7,5	7,5	7,5	7,5
	un-cracked concrete	$k_{ucr,V}$	10,5	10,5	10,5	10,5	10,5	10,5	10,5
Partial factor		γ_{Mc} [1)]	1,5						

[1)] In absence of other national regulations

Hilti anchor channels (HAC) with channel bolts (HBC)	Annex C4
Performance Characteristic resistances of anchor channels under shear load	

Table 19: Displacements under shear load perpendicular to longitudinal axis of the channel

Anchor channel		HAC-30	HAC-40	HAC-50	HAC-T50	HAC-60	HAC-70	HAC-T70
Shear load	V_y [kN]	8,0	13,9	18,9	21,0	29,0	38,0	45,6
Short-term displacement [1]	$\delta_{V,y,0}$ [mm]	1,0	1,0	1,5	2,7	1,5	1,5	2,4
Long-term displacement [1]	$\delta_{V,y,\infty}$ [mm]	1,5	1,5	2,3	4,1	2,3	2,3	3,6

[1] 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 20: Displacements under shear load in direction of the longitudinal axis of the channel

Anchor channel			HAC-30	HAC-40	HAC-50	HAC-T50	HAC-60	HAC-70	HAC-T70
Channel bolt			**HBC-B**	**HBC-C-N**		**HBC-T**	**HBC-C-N**		**HBC-T**
Shear load	V_x [kN]	M12	1,4	3,4		6,7	3,4		6,7
		M16	-	7,8		8,9	7,8		8,9
		M20		-	9,6	8,9	9,6		8,9
Short-term displacement [1]	$\delta_{V,x,0}$ [mm]	M12	0,1	0,05		1,4	0,05		1,4
		M16	-	0,4		1,7	0,4		1,7
		M20		-	0,1	1,7	0,1		1,7
Short-term displacement [1]	$\delta_{V,x,\infty}$ [mm]	M12	0,2	0,1		2,1	0,1		2,1
		M16	-	0,6		2,5	0,6		2,5
		M20		-	0,2	2,5	0,2		2,5

[1] Displacements of the anchor channel, including slip of channel bolt, deformation of channel lips and slip of the anchor channel in concrete.

Table 21: Characteristic resistances under combined tension and shear load

Anchor channel		HAC-30	HAC-40	HAC-50	HAC-T50	HAC-60	HAC-70	HAC-T70
Steel failure: Local flexure of channel lips and flexure of channel								
Product factor	k_{13}	Values according to EN 1992-4: 2018, Section 7.4.3.1 or EOTA TR 047, Section B.6.3.1.3						
Steel failure: Anchor and connection between anchor and channel								
Product factor	k_{14}	Values according to EN 1992-4: 2018, Section 7.4.3.1 or EOTA TR 047, Section B.6.3.1.4						

Hilti anchor channels (HAC) with channel bolts (HBC)

Performance
Displacements under shear load.
Characteristic resistances under combined tension and shear load

Annex C5

Table 22: Characteristic resistances under tension and shear load – steel failure of Hilti channel bolts HBC-B, HBC-C, HBC-C-E, HBC-C-N and HBC-T

Channel bolt diameter					**M10**	**M12**	**M16**	**M20**
Steel failure								
Characteristic resistance	$N_{Rk,s}$ [2]	[kN]	HBC-B	4.6	23,2	33,7	-	-
				A4-50 [1]	29,0	42,2	-	-
			HBC-C HBC-C-E	4.6	23,2	33,7	62,8	98,0
				8.8	46,4	67,4	125,6	174,3
				A4-50 [1]	29,0	42,2	78,5	122,5
			HBC-C-N	8.8	-	67,4	125,6	174,3
			HBC-T	8.8	-	67,4	125,6	177,4
Partial factor		γ_{Ms} [3]		4.6	2,0			
				8.8	1,5			
				A4-50 [1]	2,86			
Characteristic resistance	$V_{Rk,s}$ [2]	[kN]	HBC-B	4.6	13,9	20,2	-	-
				A4-50 [1]	17,4	25,3	-	-
			HBC-C HBC-C-E	4.6	13,9	20,2	37,7	58,8
				8.8	23,2	33,7	62,8	101,7
				A4-50 [1]	17,4	25,3	47,1	73,5
			HBC-C-N	8.8	-	33,7	62,8	101,7
			HBC-T	8.8	-	33,7	62,8	101,7
Partial factor		γ_{Ms} [3]		4.6	1,67			
				8.8	1,25			
				A4-50 [1]	2,38			

[1] Materials according to Table 5, Annex A5
[2] In conformity with EN ISO 898-1
[3] In absence of other national regulations

Hilti anchor channels (HAC) with channel bolts (HBC)

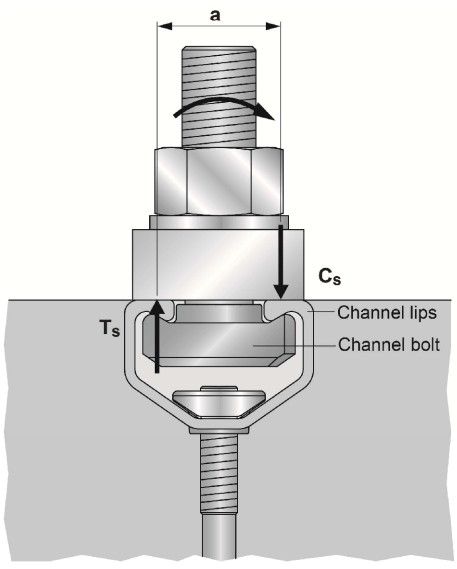
Performance
Characteristic resistances of channel bolts under tension and shear load

Annex C6

Table 23: Characteristic resistances under shear load with lever arm – steel failure of Hilti channel bolts HBC-B, HBC-C, HBC-C-E, HBC-C-N and HBC-T

Channel bolt diameter					**M10**	**M12**	**M16**	**M20**
Steel failure								
Characteristic flexure resistance	$M^0_{Rk,s}$ [3]	[Nm]	HBC-B	4.6	29,9	52,4	-	-
				A4-50 [1]	37,4	65,5	-	-
			HBC-C HBC-C-E	4.6	29,9	52,4	133,2	259,6
				8.8	59,8	104,8	266,4	538,7
				A4-50 [1]	37,4	65,5	166,5	324,5
			HBC-C-N	8.8	-	104,8	266,4	538,7
			HBC-T	8.8	-	104,8	266,4	538,7
Partial factor		γ_{Ms} [2]		4.6	1,67			
				8.8	1,25			
				A4-50 [1]	2,38			
Internal lever arm	a	[mm]	HBC-B	4.6, A4-50	25	27	-	-
			HBC-C HBC-C-E	4.6, 8.8, A4-50	24	26	28	30
			HBC-C-N	8.8	-	26	28	30
			HBC-T	8.8	-	26	28	30

[1] Materials according to Table 5, Annex A5.
[2] In absence of other national regulations.



[3] The characteristic flexure resistance according to Table 23 is limited as follows:

$M^0_{Rk,s} \le 0{,}5 \cdot N_{Rk,s,l} \cdot a$ ($N_{Rk,s,l}$ according to Table 12) and

$M^0_{Rk,s} \le 0{,}5 \cdot N_{Rk,s} \cdot a$ ($N_{Rk,s}$ according to Table 22)

a = internal lever arm according Table 23

T_s = tension force acting on the channel lips

C_s = compression force acting on the channel lips

Hilti anchor channels (HAC) with channel bolts (HBC)

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

Annex C7

Table 24: Characteristic resistance under fire exposure – steel failure

Channel bolt					**M10**	**M12**	**M16**	**M20**
Steel failure of anchor, connection between anchor and channel, local flexure of channel lip								
Characteristic resistance under fire exposure	HAC-30	R60	$N_{Rk,s,fi}$ = $V_{Rk,s,fi}$	[kN]	1,3	1,8	-	-
		R90			0,9	1,1		
		R120			0,7	0,8		
	HAC-40	R60			1,7	2,4	2,4	2,4
		R90			1,3	1,8	1,8	1,8
		R120			1,0	1,5	1,5	1,5
	HAC-50	R60			1,7	2,4	4,0	4,0
		R90			1,3	1,8	2,4	2,4
		R120			1,0	1,5	1,6	1,6
	HAC-60	R60			1,7	2,4	4,0	4,7
		R90			1,3	1,8	2,4	3,0
		R120			1,0	1,5	1,6	2,1
	HAC-70	R60			1,7	2,4	4,0	4,7
		R90			1,3	1,8	2,4	3,0
		R120			1,0	1,5	1,6	2,1
Partial safety factor			$\gamma_{Ms,fi}$ [1)]	[-]	1,0			

[1)] In absence of other national regulations

Hilti anchor channels (HAC) with channel bolts (HBC)

Performance
Characteristic resistances of anchor channels and channel bolts under fire exposure

Annex C8

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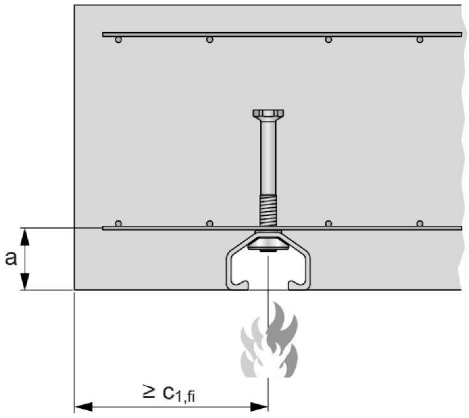
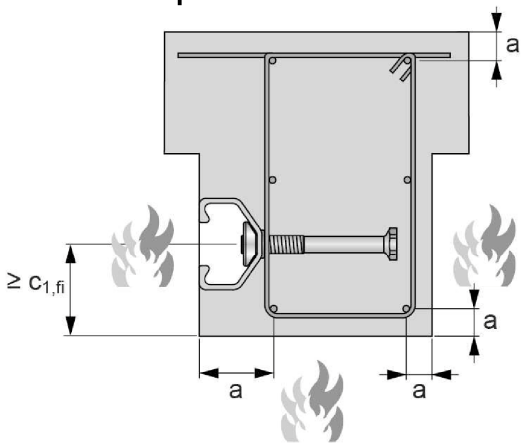
Table 25: Minimum axis distance

Anchor channel				HAC-30	HAC-40	HAC-50	HAC-60	HAC-70
Min. axis distance	R60	a	[mm]	35	35	50	50	50
	R90			45	45			
	R120			60	60	60	65	70

Fire exposure from one side only



Fire exposure from more than one side



Hilti anchor channels (HAC) with channel bolts (HBC)

Performance
Characteristic resistances of anchor channels and channel bolts under fire exposure

Annex C9

Table 26: Combination of anchor channels and channel bolts under fatigue tension load

Anchor channel	Channel bolt type	Diameter	Steel grade	Corrosion protection
HAC-30	HBC-B	M10	4.6	G [1] F [2]
		M12		
HAC-40	HBC-C	M12	4.6	
		M16	8.8	
		M20		
HAC-50		M16	4.6	
		M20	8.8	
HAC-60		M16	4.6	
		M20	8.8	
HAC-70		M20	4.6	
			8.8	

[1] Electroplated
[2] Hot-dip galvanized

Table 27: Characteristic resistances under fatigue tension load - steel failure with n load cycles without static preload (N_{Ed} = 0) (Design method I according to EOTA TR 050)

Anchor channel		HAC-30	HAC-40	HAC-50	HAC-60	HAC-70
Steel failure	n	$\Delta N_{Rk,s,0,n}$ [kN]				
Characteristic resistances under fatigue tension load without static preload	$\leq 10^6$	1,76	1,57	2,66	3,54	6,44
	$\leq 3 \cdot 10^6$	1,60	1,50	2,60	3,50	6,40
	$\leq 10^7$					
	$\leq 3 \cdot 10^7$					
	$\leq 6 \cdot 10^7$					
	$> 6 \cdot 10^7$					

Hilti anchor channels (HAC) with channel bolts (HBC)

Performance
Characteristic resistances under fatigue cyclic tension load

Annex C10

Table 28: Reduction factor $\eta_{c,fat}$ with n load cycles without static preload (N_{Ed} = 0) (Design method I according to EOTA TR 050)

Anchor channel		HAC-30	HAC-40	HAC-50	HAC-60	HAC-70
Pull-out failure **Concrete cone failure**	n	$\eta_{c,fat}$ [-]				
Reduction factor 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 $N_{Rk,p}$ according to Annex C2 and $N_{Rk,c}$ calculated according to EOTA TR 047, March 2018 or EN 1992-4: 2018	$\leq 10^6$	0,600				
	$\leq 3 \cdot 10^6$	0,571				
	$\leq 10^7$	0,542				
	$\leq 3 \cdot 10^7$	0,516				
	$\leq 6 \cdot 10^7$	0,500				
	$> 6 \cdot 10^7$					

Table 29: Characteristic resistances under fatigue tension load with n → ∞ load cycles without static preload (N_{Ed} = 0) (Design method II according to EOTA TR 050)

Anchor channel		HAC-30	HAC-40	HAC-50	HAC-60	HAC-70
Steel failure						
$\Delta N_{Rk,s;0;\infty}$	[kN]	1,6	1,5	2,6	3,5	6,4
Concrete cone and pull-out failure						
$\eta_{c,fat}$	[-]	0,5				

For the reduction of the characteristic resistances given in Tables 27 and 28 in the transition zone from the static resistance to the fatigue limit resistance the partial safety factors are calculated as follows:

$$\gamma_{M,fat,n} = \gamma_{M,fat} + (\gamma_M - \gamma_{M,fat}) \cdot (\Delta N_{Rk,n} - \Delta N_{Rk,\infty}) / (N_{Rk} - \Delta N_{Rk,\infty})$$

In absence of other national regulations the following safety factors γ_M and $\gamma_{M,fat}$ are recommended for design method I according to EOTA TR 050:

γ_M according Annex C1

$\gamma_{M,fat}$ = 1,35

In absence of other national regulations the following safety factor $\gamma_{M,fat}$ is recommended for design method II (Table 29) according to EOTA TR 050:

$\gamma_{M,fat}$ = 1,35

Hilti anchor channels (HAC) with channel bolts (HBC)	Annex C11
Performance Characteristic resistances under fatigue cyclic tension load	

Attn. : To whom it may concern

Date : 26 September 2023
Ref. : 078/AN/DY/23

Subject : Country of Origin – Hilti HAC Anchor Channel

Dear Sir / Madam,

Enclosed please find the information of Hilti HAC Anchor Channel.

Brand Name : Hilti

Model Name : Hilti HAC-30/ HAC-40/ HAC-50/ HAC-60/ HAC-70

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 : Germany

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.

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 I **F** +852-2954 1751
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.

Yours faithfully,

Dennis Yeung
Head of Product Leadership Strategy, F&P

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Hilti HAC Cast-In Anchor Channel Job Reference

Year	Project Name	Customer Name	Project type
2022	KWAI CHUNG HOSPITAL PH2 & 3	SHUI ON FACADE COMPANY LIMITED	Health
2022	53-55A KWUN TONG RD	FAR EAST FACADE (HONG KONG) LIMITED	Residential
2022	KAI TAK AREA 4B, SITE 1, NKIL 6576	FAR EAST FACADE (HONG KONG) LIMITED	Residential
2022	SIU HONG, AREA 54 DD 132 TMTL 483	MILLION HOPE INDUSTRIES LIMITED	Residential
2022	DRAINAGE SERVICES DEPT (DSD) OFFICE BUILDING	JANGHO CURTAIN WALL ENGINEERING	Office
2022	KAI TAK AREA 1F1 (6568) ELDERLY	FAR EAST FACADE (HONG KONG) LIMITED	Residential
2022	350 KWUN TONG RD - EAST 350	FORERUNNER SPECIALIST LIMITED	Office
2022	TPTL 244, YAU KING LANE & POK YIN RD	HACELY FACADE ENGINEERING LIMITED	Residential
2022	4A-4P SEYMOUR RD	FAR EAST FACADE (HONG KONG) LIMITED	Residential
2022	LUNG CHEUNG RD, NKIL 6579	MILLION HOPE INDUSTRIES LIMITED	Residential
2022	KAI TAK SPORTS PARK	FAR EAST FACADE (HONG KONG) LIMITED	Sport & Recreation
2023	KAI TAK AREA 4A, SITE 1, NKIL 6577	FAR EAST FACADE (HONG KONG) LIMITED	Residential
2023	KWAI CHUNG HOSPITAL PH2 & 3	SHUI ON FACADE COMPANY LIMITED	Health
2023	XRL WEST KLN TERMINUS PROPERTY DEVELOPMEI	CHEVALIER (ALUMINIUM ENGINEERING)	Office
2023	TKO LOHAS PARK PH12 (SITE D)	FAR EAST FACADE (HONG KONG) LIMITED	Residential
2023	NKIL 6593 (OPPOSITE TO KO CHIU RD /KO CHEUNG	FORERUNNER SPECIALIST LIMITED	Residential
2023	HO MAN TIN STATION RES PACKAGE 1	MILLION HOPE INDUSTRIES LIMITED	Residential
2023	KAM SHEUNG RD STATION PH1, LOT 1040 DD 103	FORERUNNER SPECIALIST LIMITED	Residential
2023	14 Wang Tai Road Office	CHEVALIER (ALUMINIUM ENGINEERING)	Office
2023	KAI TAK AREA 1F1 (6568) ELDERLY	FAR EAST FACADE (HONG KONG) LIMITED	Residential
2023	HO MAN TIN STATION RES (PACKAGE 2)	WAH TUNG FACADE COMPANY LIMITED	Residential
2024	CASTLE PEAK RD – CASTLE PEAK BAY SEC (NEAR K	CHEVALIER (ALUMINIUM ENGINEERING)	Residential
2024	HKIA 3408 3RW CONCOURSE	CHEVALIER (ALUMINIUM ENGINEERING)	Transport
2024	14 Wang Tai Road Office	CHEVALIER (ALUMINIUM ENGINEERING)	Office
2024	KAI TAK AREA 4B, SITE 4, NKIL 6591	PYROTECH ENGINEERING (ASIA) LIMITED	Residential
2024	550-556 CASTLE PEAK RD	WELL STATE ASIA LIMITED	Industrial
2024	KAM SHEUNG RD STATION PH1, LOT 1040 DD 103	FORERUNNER SPECIALIST LIMITED	Residential
2024	DRAINAGE SERVICES DEPT (DSD) OFFICE BUILDING	JANGHO CURTAIN WALL ENGINEERING	Office
2024	XRL WEST KLN TERMINUS PROPERTY DEVELOPMEI	CHEVALIER (ALUMINIUM ENGINEERING)	Office
2024	HO MAN TIN STATION RES PACKAGE 1	MILLION HOPE INDUSTRIES LIMITED	Residential
2024	TKO LOHAS PARK PH11 (SITE C2)	FORERUNNER SPECIALIST LIMITED	Residential