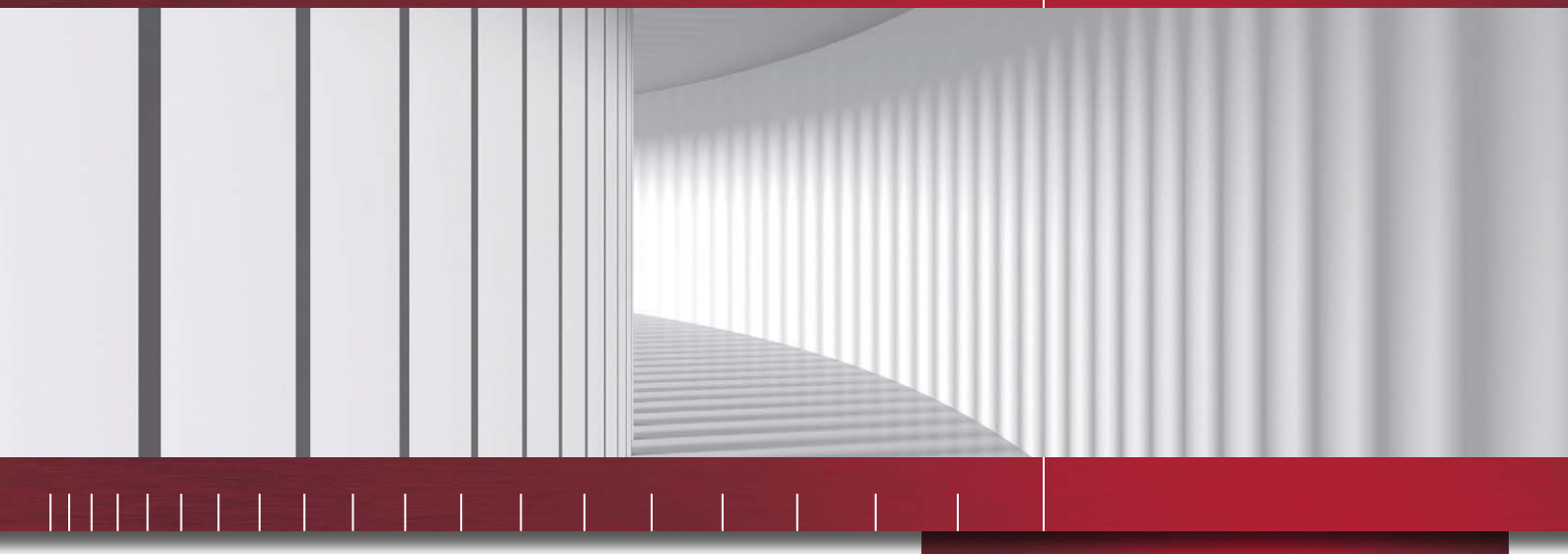
Anchoring Technology



Anchor channels
PEC-TA cold-formed

Technical Datasheet
October 2019

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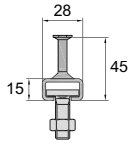
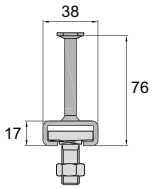
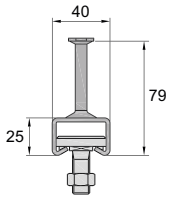
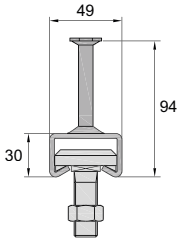
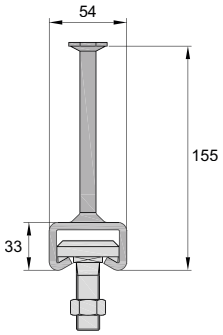
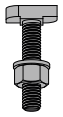
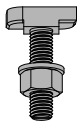
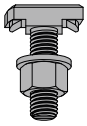
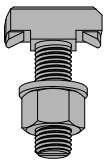
Selector for anchor channels PEC-TA cold-formed

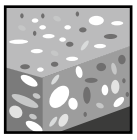
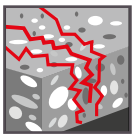
Anchor channels PEC-TA cold-formed						
Type		PEC-TA-CE 28/15	PEC-TA-CE 38/17	PEC-TA-CE 40/25	PEC-TA-CE 49/30	PEC-TA-CE 54/33
						
						
Channel bolt type		HBC-28/15	HBC-38/17	HBC-40/22	HBC-50/30	
Channel bolt size		M10-M20				
Base material	Cracked concrete	■	■	■	■	■
	Uncracked concrete	■	■	■	■	■
	NWC concrete	■	■	■	■	■
	LWC concrete	◪	◪	◪	◪	◪
	Reinforced/unreinforced	■	■	■	■	■
Technical data	European Technical Assessment (ETA)	■	■	■	■	■
	Static/quasi-static 2D	■	■	■	■	■
	Static 3D					
	Seismic					
	Fatigue					
	Fire	■	■	■	■	■
Specification	Hot-dip galvanized (HDG)	■	■	■	■	■
	Stainless steel A4	■	■	■	■	■
	Rip-liner	■	■	■	■	■
	End caps					
PROFIS Anchor Channel software		✔				

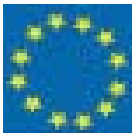
■ ETA approved ◪ Internal tests

PEC Europe GmbH | Obere Kaiserswerther Straße 56 | 47249 Duisburg / Deutschland | Phone: +49 (0) 203 - 45 65 99 0 | Fax: +49 (0) 203 - 45 65 99 25 | sales@pec-europe.com

Product overview

Anchor channels PEC-TA cold-formed				
PEC-TA-CE 28/15	PEC-TA-CE 38/17	PEC-TA-CE 40/25	PEC-TA-CE 49/30	PEC-TA-CE 54/33
				
				
HBC 28/15	HBC 38/17	HBC 40/22	HBC 50/30	

Base material		Load conditions		
				
Concrete (uncracked)	Concrete (cracked)	Static/ quasi-static	Static/ quasi-static 2D	Fire resistance

Other Information			
			
European Technical Assessment (ETA)	CE conformity	PROFIS Anchor Channel software	Corrosion resistance

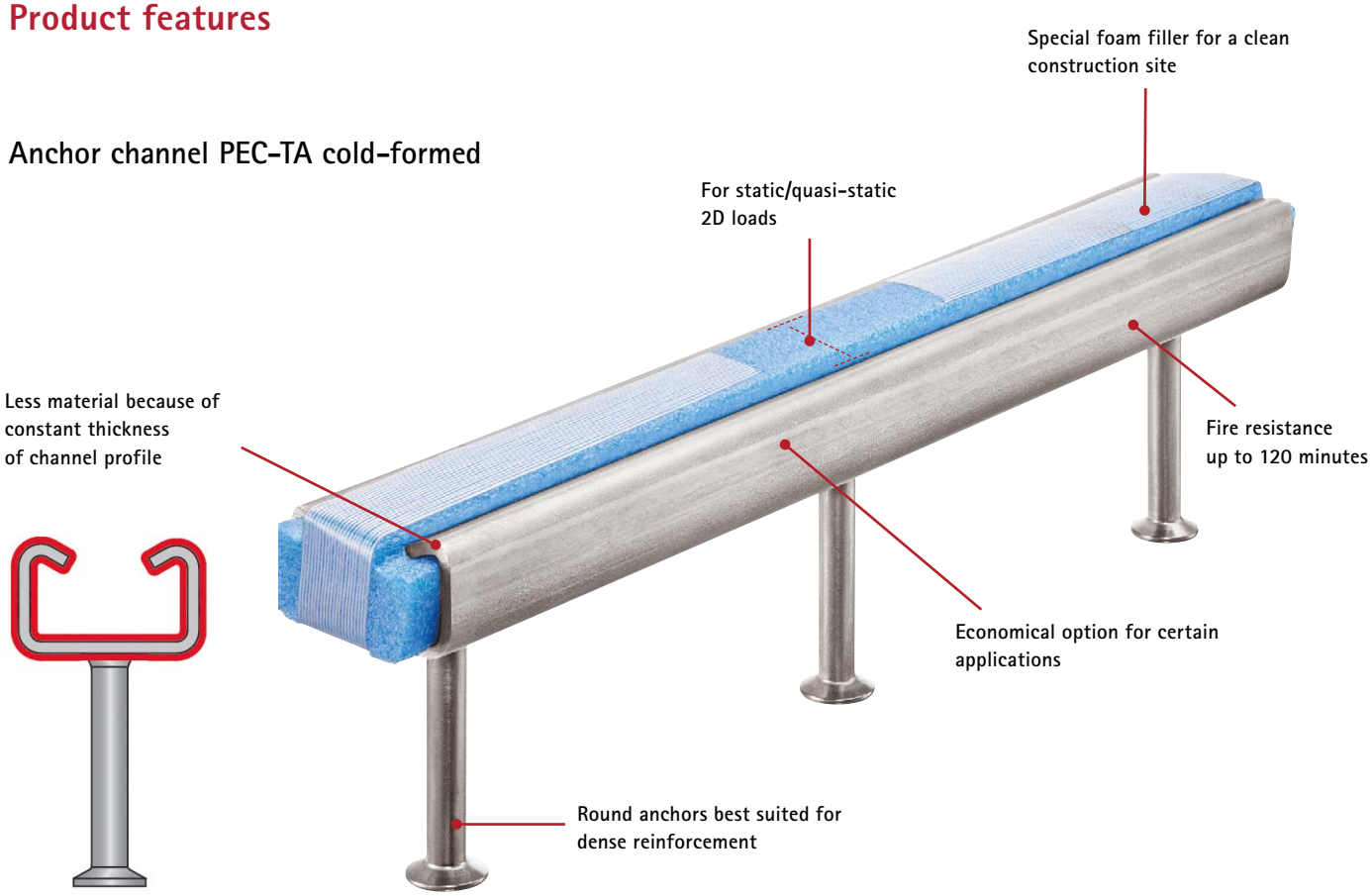
Approvals

Description	Issuing Authority	No. / Date of issue
European Technical Assessment (ETA) covering 2D static/quasi-static 2D and fire loads	DIBt Berlin	ETA-16/0929 09.08.2018

PEC Europe GmbH | Obere Kaiserswerther Straße 56 | 47249 Duisburg / Deutschland | Phone: +49 (0) 203 - 45 65 99 0 | Fax: +49 (0) 203 - 45 65 99 25 | sales@pec-europe.com

Product features

Anchor channel PEC-TA cold-formed

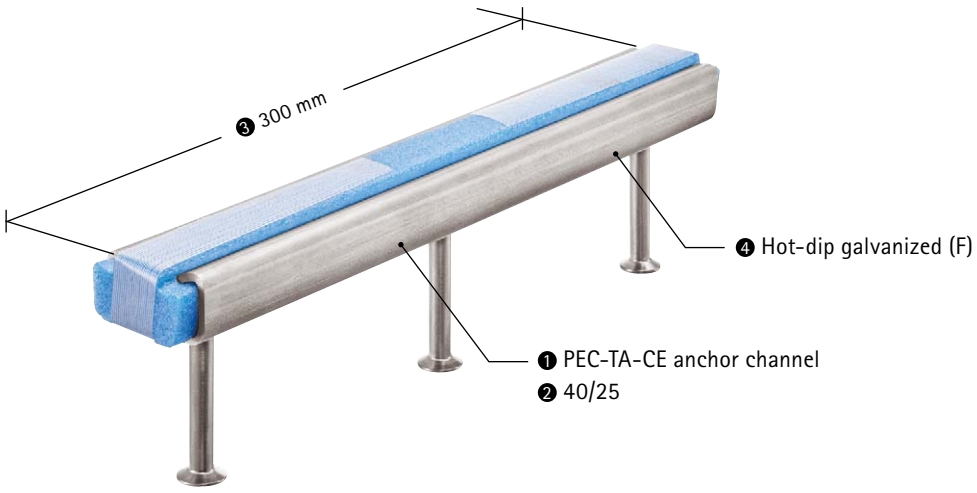


Nomenclature of anchor channels PEC-TA cold-formed

❶ PEC anchor channel	❷ Profile type and size	❸ Anchor channel length [mm]	❹ Material finish
PEC-TA-CE	40/25	300	F (HDG)

Examples: ❶ Channel type ❷ Profile type/size ❸ Length ❹ Material finish

PEC-TA-CE 40/25 300F



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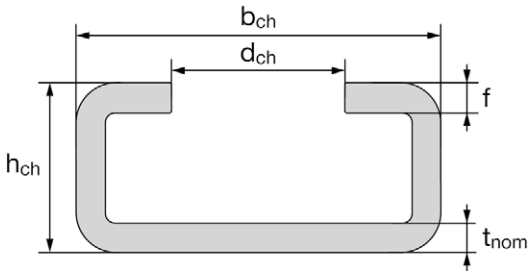
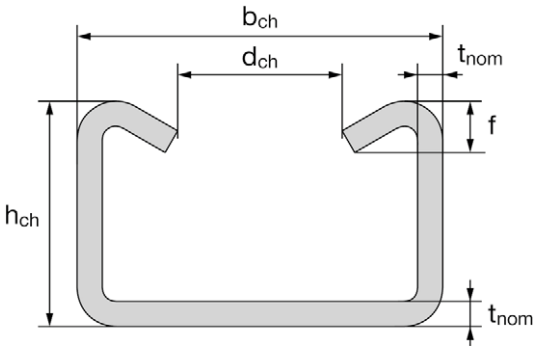
Channel dimensions cold-formed profiles

Anchor channel	b_{ch}	h_{ch}	t_{nom}	d	f	I_y
	[mm]					[mm⁴]
PEC-TA-CE 28/15	28.0	15.5	2.3	12.0	2.3	4277
PEC-TA-CE 38/17	38.0	17.25	3.0	18.0	3.0	8224
PEC-TA-CE 40/25	40.0	25.0	2.75	18.0	5.6	20122
PEC-TA-CE 49/30	50.0	30.0	3.25	22.0	7.4	43105
PEC-TA-CE 54/33	53.5	33.0	5.0	21.5	8.0	74706



PEC-TA-CE 28/15, PEC-TA-CE 38/17



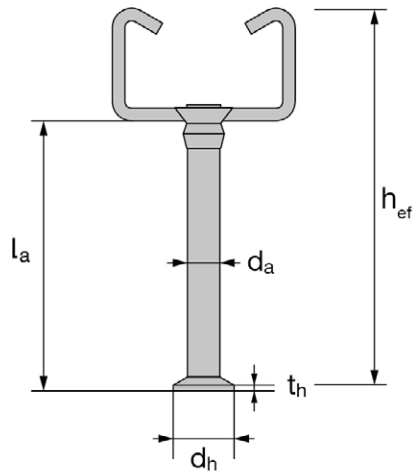
PEC-TA-CE 40/25, PEC-TA-CE 49/30, PEC-TA-CE 54/33

Anchor dimensions

Anchor channel	Round anchor				
	min l_a	d_a	d_h	t_h	A_h
	[mm]				[mm²]
PEC-TA-CE 28/15	31.0	6.0	12.0	1.3	85
PEC-TA-CE 38/17	60.8	8.0	12.0	2.0	151
PEC-TA-CE 40/25	56.0	8.0	16.0	2.0	151
PEC-TA-CE 49/30	66.0	10.0	10.0	2.2	236
PEC-TA-CE 54/33	123.5	11.0	24.3	2.5	369

[1)]Anchor head area

Anchor type



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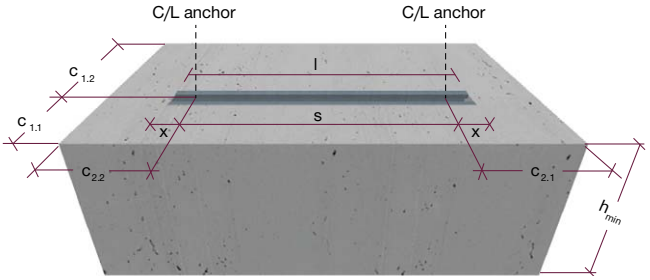
Installation parameters for anchor channel

Anchor channel PEC-TA-CE			28/15	38/17	40/25	49/30	54/33
Minimum effective embedment depth	$h_{ef,min}$	[mm]	45	76	79	94	155
Minimum spacing	s_{min}		50	100			
Maximum spacing	s_{max}		200		250		
End spacing	x		25 [1]				
Minimum channel length	l_{min}		100	150			
Minimum edge distance (c_{11}, $c_{1,2}$ & c_{21}, c_{22})	c_{min}		40	50		75	100
Minimum thickness of concrete member	h_{min}		70	100		120	180

[1] The end spacing may be increased from 25 mm to 35 mm



Material of anchor channels and channel bolts

Component	Carbon steel			Stainless steel
	Mechanical properties	Coating		Mechanical properties
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 ≥ 50 µm 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			
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 ≥ 50 µm according to EN ISO 10684: 2004/ AC: 2009	Grade 50 or 70 according to EN ISO 3506: 2009
Plain washer [1] according to ISO 7089: 2000 and ISO 7093-1: 2000	Hardness class A ≥ 200 HV	Electroplated according to EN ISO 4042: 1999	Hot-dip galvanized ≥ 50 µm 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 [2]	Property class 5 or 8 according to EN ISO 898-2: 2012	Electroplated according to EN ISO 4042: 1999	Hot-dip galvanized ≥ 50 µm according to EN ISO 10684: 2004/ AC: 2009	Property class 50, 70 or 80 according to EN ISO 3506: 2009

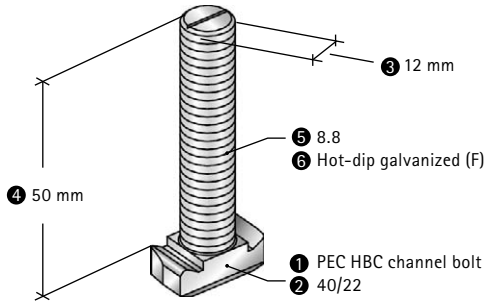
[1] Not in the scope of delivery
[2] Hexagonal nuts according to DIN 934 for channel bolts made from carbon steel (4.6) and stainless steel

Channel bolts nomenclature

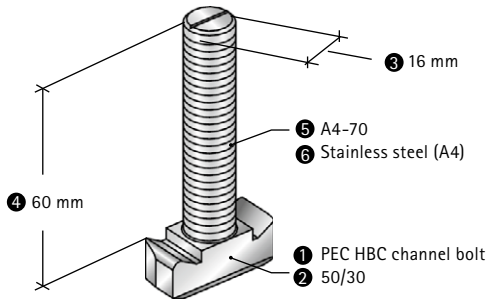
❶ HBC channel bolt	❷ Bolt type		❸ Diameter	❹ Bolt length [mm]	❺ Steel grade	❻ Finish or material
HBC	28/15		M12	50	8.8 & A4-70	F (HDG) A4 (stainless steel)
HBC	38/17		M16	60	8.8 & A4-70	
HBC	40/22		M12	50	8.8 & A4-70	
HBC	50/30		M16	60	8.8 & A4-70	

Examples: ❶ Channel bolt ❷ Bolt type ❸ Diameter ❹ Bolt length ❺ Steel grade ❻ Finish or material

HBC-40/22 M12x50 8.8F

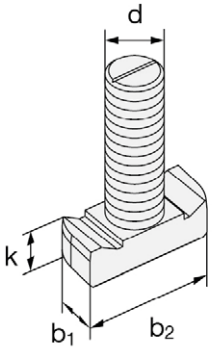


HBC-50/30 M16x60 A4-70



Channel bolts dimensions

Anchor channel	Channel bolt type	Dimensions			
		b_1	b_2	k	d
		[mm]			
PEC-TA-CE 28/15	HBC-28/15	10.1	22.2	5.0	8
					10
		11.0		6.0	12
PEC-TA-CE 38/17	HBC-38/17	13.0	30.5	6.0	10
				7.0	12
		16.0			16
PEC-TA-CE 40/25	HBC-40/22	14.0	33.0	10.5	10
				11.5	12
		17.0			16
PEC-TA-CE 49/30 PEC-TA-CE 54/33	HBC-50/30	17.0	42.0	14.5	12
				15.5	16
		21.0			20



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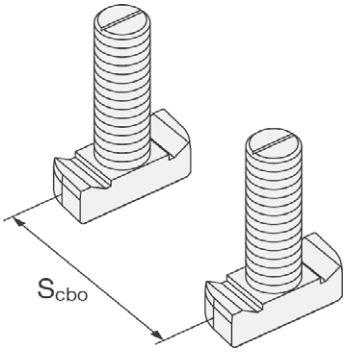
Minimum spacing for channel bolts

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

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



Steel grade and corrosion class

Channel bolt	Carbon steel [1]		Stainless steel [1]	
Steel grade	4.6	8.8	A4-50	A4-70
f_{uk} [N/mm²]	400	800 / 830 [2]	500	700
f_{yk} [N/mm²]	240	640 / 660 [2]	210	450
Corrosion protection	G [3] F [4]		R [5]	

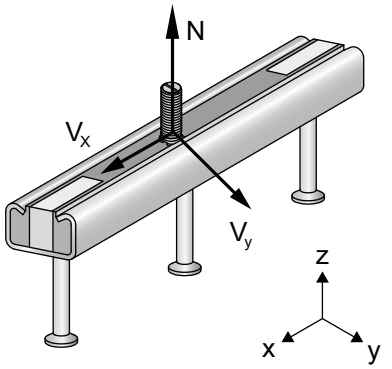
[1] Material properties according to table on page 7
[2] Material properties according to EN ISO 898-1
[3] Electroplated
[4] Hot-dip galvanized
[5] Stainless steel

Definition of load directions in the following tables

Tension load (N)
z-direction (in direction of channel bolt)

Shear load (V_y)
y-direction (perpendicular to longitudinal axis of the channel)

Longitudinal shear load (V_x)
x-direction (in direction of longitudinal axis of the channel)



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Steel failure modes – static resistance under tension and perpendicular shear

Static/ quasi-static

Resistance values under tension load – steel failure

PEC-TA-CE					28/15	38/17	40/25	49/30	54/33
Steel failure: Failure of anchor									
	Characteristic resistance	$N_{Rk,s,a}$	[kN]		9.0	18.0	20.0	31.0	55.0
	Design resistance	$N_{Rd,s,a}$	[kN]		5.0	10.0	11.1	17.2	30.6
Steel failure: Failure of connection between anchor and channel									
	Characteristic resistance	$N_{Rk,s,c}$	[kN]		9.0	18.0	20.0	31.0	55.0
	Design resistance	$N_{Rd,s,c}$	[kN]		5.0	10.0	11.1	17.2	30.6
Steel failure: Local failure by flexure of channel lips									
	Characteristic or design spacing of the channel bolts	$s_{l,N}$	[mm]		56	76	80	100	107
	Characteristic resistance	$N^{0}_{Rk,s,l}$	[kN]		9.0	18.0	20.0	31.0	55.0
	Design resistance	$N^{0}_{Rd,s,l}$	[kN]		5.0	10.0	11.1	17.2	30.6

Resistance values under tension load – steel failure

PEC-TA-CE					28/15	38/17	40/25	49/30	54/33
Steel failure: Failure by flexure of channel									
	Characteristic flexural resistance of channel	carbon steel	$M_{Rk,s,flex}$	[Nm]	316	538	979	1669	2929
		stainless steel				527		1702	2832
	Characteristic flexural resistance of channel	carbon steel	$M_{Rd,s,flex}$	[Nm]	257	468	851	1451	2547
		stainless steel				458		1480	2463

Displacements under tension load

PEC-TA-CE			28/15	38/17	40/25	49/30	54/33
Tension load	N	[kN]	3.6	7.1	7.9	12.3	21.8
Short-term displacement [1]	δ_{N0}	[mm]	0.6	1.3	1.4	1.4	1.6
Long-term displacement [1]	$\delta_{N\infty}$	[mm]	1.2	2.6	2.8	2.8	3.2

[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

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Static/ quasi-static

Resistance values under perpendicular shear load – steel failure

PEC-TA-CE				28/15	38/17	40/25	49/30	54/33
Steel failure: Failure of anchor								
	Characteristic resistance	$V_{Rk,s,a,y}$	[kN]	9.0	18.0	20.0	31.0	55.0
	Design resistance	$V_{Rd,s,a,y}$	[kN]	6.0	12.0	13.3	20.7	36.7
Steel failure: Failure of connection between anchor and channel								
	Characteristic resistance	$V_{Rk,s,c,y}$	[kN]	9.0	18.0	20.0	31.0	55.0
	Design resistance	$V_{Rd,s,c,y}$	[kN]	5.0	10.0	11.1	17.2	30.6
Steel failure: Local failure by flexure of channel lips								
	Spacing of the channel bolts for shear	$s_{l,V}$	[mm]	56	76	80	100	107
	Characteristic resistance	$V^0_{Rk,s,l,y}$	[kN]	9.0	18.0	20.0	31.0	55.0
	Design resistance	$V^0_{Rd,s,l,y}$	[kN]	5.0	10.0	11.1	17.2	30.6

Displacements under perpendicular shear load

PEC-TA-CE			28/15	38/17	40/25	49/30	54/33
Shear load	N	[kN]	3.6	7.1	7.9	12.3	21.8
Short-term displacement [1]	δ_{N0}	[mm]	0.6	1.3	1.4	1.4	1.6
Long-term displacement [1]	$\delta_{N\infty}$	[mm]	0.9	2.0	2.1	2.1	2.4

[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

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Static resistance under tension and perpendicular shear load

Static/
quasi-static

Resistance values under tension load – steel failure of channel bolts

HBC channel bolt					M8	M10	M12	M16	M20
Steel failure									
	Characteristic tension resistance	$N_{Rk,s}$ [kN]	HBC-28/15	4.6	-				
				8.8	22.4	35.4	44.3	-	
				A4-50	17.2	-			
				A4-70	25.6	38.9	51.3	-	
			HBC-38/17	4.6	-	23.2	-		
				8.8		-	35.4	55.8	-
				A4-70		20.5	47.2	53.0	
			HBC-40/22	4.6		23.2	-		
				8.8		-	35.4	55.8	-
				A4-70		20.5	58.6	91.0	
			HBC-50/30	4.6		-			
				8.8		-	35.4	55.8	183.1
				A4-70			58.6	109.0	129.0
	Design tension resistance	$N_{Rd,s}$ [kN]	HBC-28/15	4.6	-				
				8.8	14.9	23.6	29.5	-	
				A4-50	6.0	-			
				A4-70	13.7	20.8	27.4	-	
			HBC-38/17	4.6	-	11.6	-		
				8.8		-	25.2	28.3	-
				A4-70		11.0	31.3	43.3	
			HBC-40/22	4.6		11.6	-		
				8.8		-	23.6	37.2	-
				A4-70		10.9	31.3	48.7	
			HBC-50/30	4.6		-			
				8.8		-	23.6	37.2	122.1
				A4-70			31.3	58.3	69.0

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Static/ quasi-static

Resistance values under perpendicular shear load – steel failure of channel bolts

HBC channel bolt					M8	M10	M12	M16	M20
Steel failure									
	Characteristic shear resistance	$V_{Rk,s}$ [kN]	HBC-28/15	4.6			-		
				8.8	14.6	23.2	33.7	-	
				A4-50	11.0		-		
				A4-70	15.4	24.4	35.4	-	
			HBC-38/17	4.6		13.9		-	
				8.8		-	33.7	62.8	-
				A4-70		24.4	35.4	65.9	
			HBC-40/22	4.6		13.9		-	
				8.8	-	-	33.7	62.8	-
				A4-70		24.4	35.4	65.9	
			HBC-50/30	4.6			-		
				8.8		-	33.7	62.8	98.0
				A4-70			35.4	65.9	102.9
	Design shear resistance	$V_{Rd,s}$ [kN]	HBC-28/15	4.6			-		
				8.8	11.7	18.5	26.7	-	
				A4-50	4.6		-		
				A4-70	9.8	15.6	22.7	-	
			HBC-38/17	4.6		8.3		-	
				8.8		-	26.9	50.2	-
				A4-70		15.6	22.7	42.2	
			HBC-40/22	4.6		8.3		-	
				8.8	-	-	26.9	50.2	-
				A4-70		15.6	22.7	42.3	
			HBC-50/30	4.6			-		
				8.8		-	26.9	50.2	78.4
				A4-70			22.7	42.3	65.9

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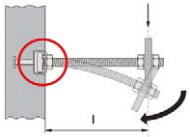
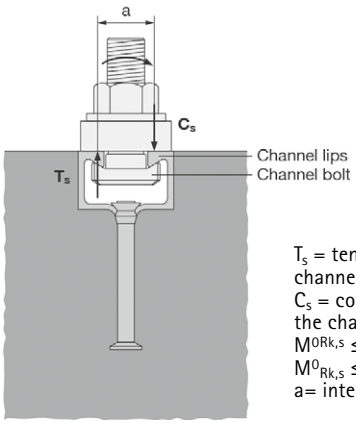
Static/ quasi-static

Resistance values under perpendicular shear load with lever arm – steel failure of channel bolts

HBC channel bolt						M8	M10	M12	M16	M20
Steel failure										
	Characteristic flexural resistance	$M^0_{Rk,s}$	[Nm]	HBC-28/15 HBC-38/17 HBC-40/22 HBC-50/30	4.6	-	29.9 [1]	-		
					8.8	30.0	59.8	104.8	266.4	519.3
					A4-50	18.7	-			
					A4-70	26.2	52.3	91.7	233.1	454.4
	Design flexural resistance	$M^0_{Rd,s}$	[Nm]	HBC-28/15 HBC-38/17 HBC-40/22 HBC-50/30	4.6	-	17.9	-		
					8.8	24.0	47.8	83.8	213.1	415.4
					A4-50	7.8	-			
					A4-70	16.8	33.5	58.8	149.4	291.3
	Internal lever arm	a	[mm]	HBC-28/15	28/15	17.3	18.7	20.0	-	
				HBC-38/17	38/17	-	23.0	24.3	26.3	-
				HBC-40/22	40/22		24.3	25.7	27.3	
					50/30		-	29.9	31.7	33.9

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



T_s = tension force acting on the channel lips
C_s = compression force acting on the channel lips
$M^{0Rk,s} \leq 0.5 . N_{Rk,s,l} . a$
$M^0_{Rk,s} \leq 0.5 . N_{Rk,s,} . a$
a= internal lever arm

Displacements under perpendicular shear load

PEC-TA-CE			28/15	38/17	40/25	49/30	54/33
Shear load	V	[kN]	3.6	7.1	7.9	12.3	21.8
Short-term displacement [1]	δ_{V0}	[mm]	0.6	1.3	1.4	1.4	1.6
Long-term displacement [1]	$\delta_{V\infty}$	[mm]	0.9	2.0	2.1	2.1	2.4

[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

Recommended loads for anchor channels PEC-TA cold-formed [1]

Anchor channel		PEC-TA-CE 28/15	PEC-TA-CE 38/17	PEC-TA-CE 40/25	PEC-TA-CE 49/30	PEC-TA-CE 54/33
Recommended loads [2]						
Tension	N_{Rec} [kN]	3.0	5.9	6.4	9.8	16.8
Shear y-direction	$V_{Rec,y}$ [kN]	3.0	5.9	5.9	9.8	16.2
Shear x-direction	$V_{Rec,x}$ [kN]	-	-	-	-	-

[1] As per load direction on page 9
[2] Recommended load per bolt N_{Rec} = min ($N_{Rd,s,a}$, $N_{Rd,s,c}$, $N_{Rd,s,l}$, $N_{Rd,s,flex}$, $N_{Rd,s}$)/1.4 or $V_{Rec,y}$ = min ($V_{Rd,s,a,y}$, $V_{Rd,s,c,y}$, $V_{Rd,s,l,y}$, $V_{Rd,s}$)/1.4.
Concrete failure modes not taken into account. The minimum bolt spacing is considered which is 5d where d is minimum diameter of the bolt.

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Concrete failure modes – static resistance under tension and perpendicular shear

Static/ quasi-static

Resistance values under tension load – concrete failure

PEC-TA-CE					28/15	38/17	40/25	49/30	54/33
Type of anchor (R-Round anchor)					R	R	R	R	R
Pull-out failure									
	Characteristic resistance in cracked concrete C12/15		$N_{Rk,p}$	[kN]	5.1	9.1	9.1	14.1	22.1
	Characteristic resistance in uncracked concrete C12/15		$N_{Rk,p}$	[kN]	7.1	12.7	12.7	19.8	31.0
	Design resistance in cracked concrete C12/15		$N_{Rd,p}$	[kN]	3.4	6.1	6.1	9.4	14.7
	Design resistance in uncracked concrete C12/15		$N_{Rd,p}$	[kN]	4.7	8.5	8.5	13.2	20.7
	Amplification factor for other concrete grades		Ψ_c		$\Psi_c = \frac{f_{c,specified}}{12\ (MPa)}$				
Concrete cone failure									
	Product factor k_1 for characteristic resistance	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
	Product factor k_1 for design resistance	cracked concrete	$k_{cr,N}$	[-]	4.8	5.2	5.3	5.4	5.8
		uncracked concrete	$k_{ucr,N}$	[-]	6.9	7.5	7.5	7.7	8.3
Splitting									
	Characteristic edge distance		$c_{cr,sp}$	[mm]	135	228	237	282	465

R= round anchors

Resistance values under perpendicular shear load – concrete failure

PEC-TA-CE					28/15	38/17	40/25	49/30	54/33
Pry out failure									
	Product factor		k_8	[-]	2				
Concrete edge failure									
	Product factor k_{12} for characteristic loads	cracked concrete	$k_{cr,V}$	[-]	6.9		7.5		
		uncracked concrete	$k_{ucr,V}$	[-]	9.6		10.5		
	Product factor k_{12} for design loads	cracked concrete	$k_{cr,V}$	[-]	4.6		5.0		
		uncracked concrete	$k_{ucr,V}$	[-]	6.4		3.3		

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Steel failure – combined loading

Static/ quasi-static

Resistances under combined tension and shear load

PEC-TA-CE			28/15	38/17	40/25	49/30	54/33
Steel failure: Local failure by flexure of channel lips and failure by flexure of channel							
Product factor	k_{13}	[-]			1.0[1)]		
Steel failure: Failure of anchor and connection between anchor and channel							
Product factor	k_{14}	[-]			1.0[2)]		

[1)] k_{13} can be taken as 2.0 if $V_{Rd,s,l}$ is limited to $N_{Rd,s,l}$
[2)] k_{14} can be taken as 2.0 if max($V_{Rd,s,a}$; $V_{Rd,s,c}$) is limited to min($N_{Rd,s,a}$; $N_{Rd,s,c}$)

Fire resistance

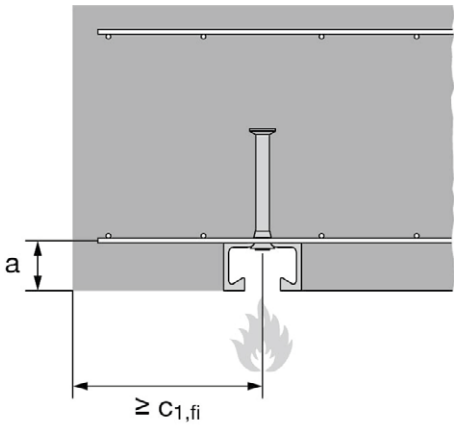
Fire resistance

Resistance values under tension and perpendicular shear load – fire exposure

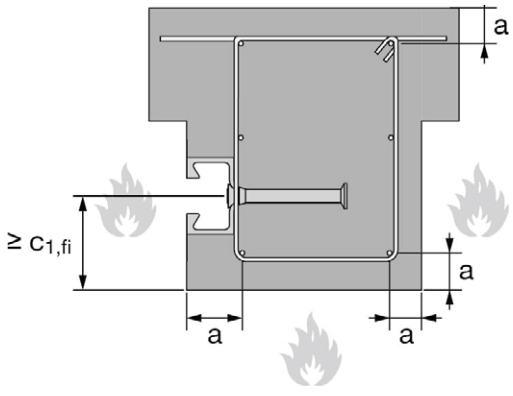
HBC channel bolt					M10	M12	≥ M16
Steel failure of anchor, connection between anchor and channel, local flexure of channel lip							
Characteristic and design resistance in cracked concrete C20/25	PEC-TA-CE 28/15	R60	$N_{Rk,s,fi}$ = $V_{Rk,s,fi}$ or $N_{Rd,s,fi}$ = $V_{Rd,s,fi}$	[kN]	0.8		-
		R90			0.6		
		R120			0.5		
	PEC-TA-CE 38/17	R60			-		1.9
		R90			-		1.3
		R120			-		1.0
	PEC-TA-CE 40/25	R60			1.7	3.5	
		R90			1.2	2.2	
		R120			0.9	1.5	
	PEC-TA-CE 49/30 PEC-TA-CE 54/33	R60			-	3.8	3.9
		R90				2.5	2,9
		R120				1.9	2.4

Minimum concrete cover

PEC-TA-CE				28/15	38/17	40/25	49/30	54/33
Concrete cover	R60	u	[mm]	35			50	50 50
	R90			45				
	R120			55				



Fire exposure from one side only



Fire exposure from more than one side

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Installation instructions

Installation instructions for anchor channels PEC-TA cold-formed

1) Correct selection of anchor channel in accordance with the design specification.

2) If cutting of the anchor channel is necessary, cut the channel with an end spacing

x = 25 or 35 mm for
28/15
38/17
40/25
49/30
54/33

x = 25 or 35 mm for round or welded anchors with profile:
40/22
50/30

x = 35 mm for round anchor with profile 52/34

x = 25 mm for welded I-anchors with profile 52/34

Minimum two anchors per channel!

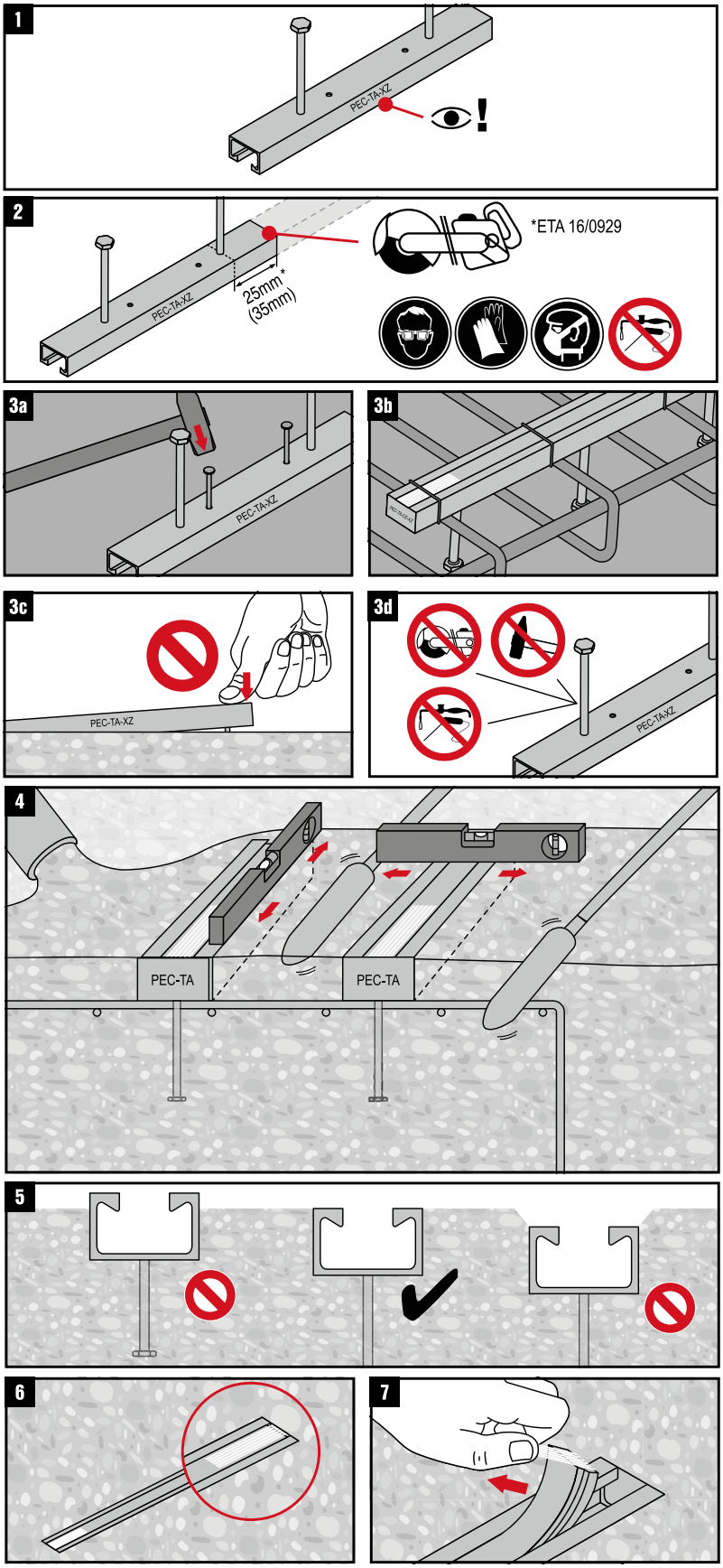
3) Position the anchor channel such that the channel lips will be flush with the surface of the concrete. Secure anchor channels to formwork (3a) or adjoining reinforcing steel (3b) with nails, staples, rivets, or wire ties as appropriate. Supports and attachments shall be adequate to ensure that anchor channels remain in position during concrete pouring. Anchor channels shall not be pushed into fresh concrete (3c). Anchors shall not be bent, cut or otherwise modified (3d).

4) Anchor channels shall be protected from intrusion of concrete and slurry into the channel during concrete pouring. Place and consolidate concrete around anchor channels to mitigate voids.

Make sure that channels are leveled.

5) Installed anchor channels must be flush with the concrete surface.

6 and 7) Remove the foam filler after hardening of concrete and striking the formwork.



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Installation instructions for HBC channel bolts

1) Select PEC channel bolt type HBC in accordance with the design specification.

2) Place the channel bolt in the channel and lock the channel bolt in the channel by turning it 90 degrees.

3) Verify alignment of the bolt with the groove.

4) Verify that the channel bolt is not located outside of that portion of the channel bounded by the outermost anchors.

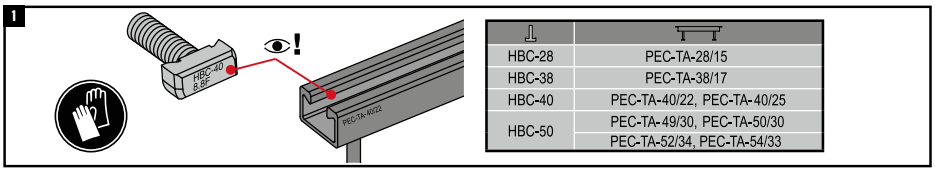
5) Do not cut channel bolts.

6) Install the fixture distinguishing between installation type A and installation type B.

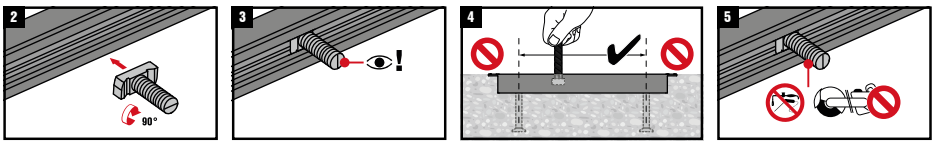
- for installation type A the fixture is in contact with the concrete surface and the channel profile.
- for installation type B suitable steel element e.g. square plate washer is used to avoid introducing forces into the concrete during application of the installation torque T_{inst}. The steel element shall have a sufficient stiffness to avoid deformation of the channel lips

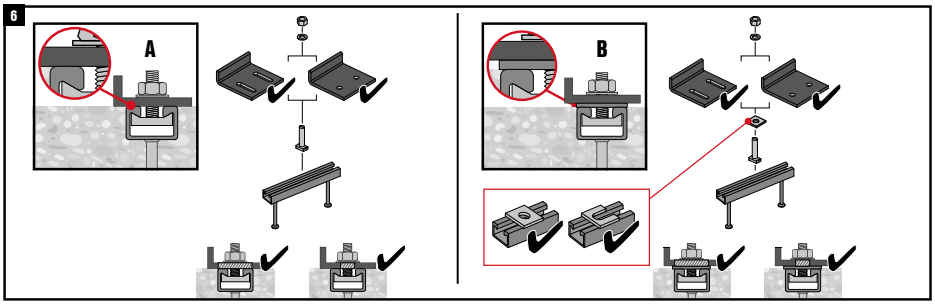
7) Apply the installation torque T_{inst} to the channel bolt with a calibrated torque wrench. Do not exceed the value T_{inst} distinguishing between installation type A and installation type B.

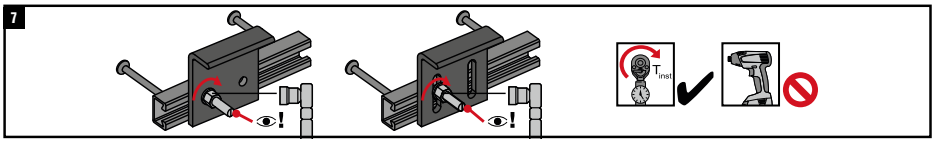
Select the correct installation torque T_{inst} according to material, channel type, channel bolt diameter, and installation type.



HBC-28	PEC-TA-28/15
HBC-38	PEC-TA-38/17
HBC-40	PEC-TA-40/22, PEC-TA-40/25
HBC-50	PEC-TA-49/30, PEC-TA-50/30 PEC-TA-52/34, PEC-TA-54/33







Channel bolt		T_{inst} (Nm)				
		A	B			
		4.6, 8.8, A4-50, A4-70	4.6	8.8	A4-50	A4-70
28/15	M8	7	–	20	7	15
	M10	10		40	–	30
	M12	13		60		50
38/17	M10	15	13	15		22
	M12	25	–	45		50
	M16	40		100		90
40/22	M10	15	13	15	–	22
	M12	25	–	45		50
	M16	30		100		90
50/30	M12	25		45		50
	M16	60		100		130
	M20	75		360		250

Instructions for Use (IFU) for PEC HBC channel bolts

PEC Europe GmbH | Obere Kaiserswerther Straße 56 | 47249 Duisburg / Deutschland | Phone: +49 (0) 203 - 45 65 99 0 | Fax: +49 (0) 203 - 45 65 99 25 | sales@pec-europe.com

www.pec-europe.com

PEC Europe GmbH

Obere Kaiserswerther Straße 56
47249 Duisburg / Germany
Phone: +49 (0) 203 - 45 65 99 0
Fax: +49 (0) 203 - 45 65 99 25
sales@pec-europe.com

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