



SK

VYHLÁSENIE O PARAMETROCH

č. HAC-C_2451-CPR-EAD-2017.0003

1. Jedinečný identifikačný kód typu výrobku:

Hilti HAC-C

2. Zamýšľané použitie/použitia:

| Produkt | Zamýšľané použitie |
|----------------|---|
| Kotevný nosník | Na upevnenie a/alebo podoprenie do betónu, stavebných prvkov (čo prispieva k stabilite prác) alebo ťažkých jednotiek. |

3. Výrobca:

Hilti Corporation, Business Unit Anchors, 9494 Schaan, Lichtenštajnské kniežatstvo

4. Systém/systémy posudzovania a overovania nemennosti parametrov: systém 1**5. Európsky hodnotiaci dokument:** EAD 330008-02-0601 (vydanie 02-2016)**Európske technické posúdenie:** ETA-17/0336 (11.07.2017)**Orgán technického posudzovania:** DIBt – Deutsches Institut für Bautechnik**Notifikovaná osoba/osoby:** NB 2451 – DVS Zert GmbH**6. Deklarované parametre:****Mechanická pevnosť a odolnosť (BWR 1)**

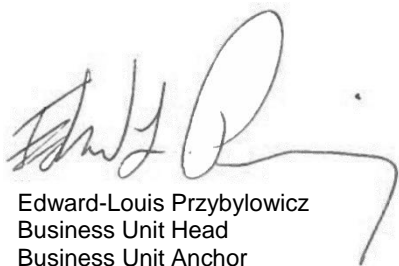
| Základné charakteristiky | Parametre |
|---|------------------------|
| Charakteristická únosnosť pri statickom a kvázistatickom zaťažení, posuny | Pozri prílohy C1 až C6 |

Bezpečnosť v prípade požiaru (BWR 2)

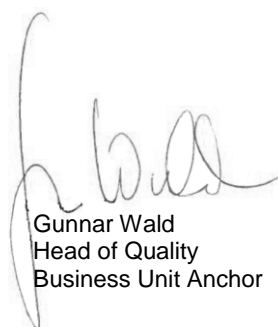
| Základná charakteristika | Parametre |
|--------------------------|---|
| Reakcia na oheň | Kotvenia spĺňajú požiadavky pre triedu A1 |
| Požiarne odolnosť | Pozri prílohu C7 |

Uvedené parametre výrobku sú v zhode so súborom deklarováných parametrov. Toto vyhlásenie o parametroch sa v súlade s nariadením (EÚ) č. 305/2011 vydáva na výhradnú zodpovednosť uvedeného výrobcu.

Podpísal(-a) za a v mene výrobcu:



Edward-Louis Przybylowicz
Business Unit Head
Business Unit Anchor



Gunnar Wald
Head of Quality
Business Unit Anchor

Hilti Corporation
Schaan, 28.07.2017



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

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

¹⁾ In absence of other national regulations

Table 11: Characteristic flexural resistance of channel under tension load

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

¹⁾ In absence of other national regulations

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

Performance Data

Characteristic resistances of anchor channels under tension load

Annex C1

Table 12: Characteristic resistances under tension load – concrete failure

| Anchor channel HAC-C | | | 28/15 | 38/17 | 40/25 | 40/22 | 49/30 | 50/30 | 54/33 | 52/34 | | |
|--|---|-----------------------|-------|-------|-------|-------|-------|-------|-------|-------|------|------|
| Type of anchor | | | R | R | R | I | R | R | I | R | | |
| Pullout failure | | | | | | | | | | | | |
| Characteristic resistance in cracked concrete C12/15 | N _{Rk,p} | [kN] | 7,6 | 13,6 | 27,0 | 13,6 | 21,2 | 33,8 | 21,2 | 33,2 | 68,4 | 33,2 |
| Characteristic resistance in uncracked concrete C12/15 | | | 10,7 | 19,0 | 37,8 | 19,0 | 29,7 | 47,3 | 29,7 | 46,5 | 95,8 | 46,5 |
| Amplification factor of N _{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 safety factor | γ _{Mp} = γ _{Mc} ¹⁾ | [-] | 1,5 | | | | | | | | | |
| Concrete cone failure | | | | | | | | | | | | |
| Product factor k ₁ | cracked concrete | k _{cr,N} | [-] | 7,2 | 7,8 | 7,9 | | 8,1 | | 8,7 | | |
| | uncracked concrete | k _{ucr,N} | [-] | 10,3 | 11,2 | 11,2 | | 11,6 | | 12,4 | | |
| Partial safety factor | γ _{Mc} ¹⁾ | [-] | 1,5 | | | | | | | | | |
| Splitting | | | | | | | | | | | | |
| Characteristic edge distance | C _{cr,sp} | [mm] | 135 | 228 | 237 | | 282 | | 465 | | | |
| Partial safety factor | γ _{Msp} = γ _{Mc} ¹⁾ | [-] | 1,5 | | | | | | | | | |

¹⁾ In absence of other national regulations

Table 13: Displacements under tension load

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

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

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

Performance Data

Characteristic resistances of anchor channels and displacements under tension load

Annex C2

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

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

¹⁾ In absence of other national regulations

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

Performance Data

Characteristic resistances of anchor channels under shear load

Annex C3

Table 15: Characteristic resistances under shear load – concrete failure

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

¹⁾ In absence of other national regulations

Table 16: Displacements under shear load

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

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 17: Characteristic resistances under combined tension and shear load

| Anchor channel HAC-C | | | 28/15 | 38/17 | 40/25 | 40/22 | 49/30 | 50/30 | 54/33 | 52/34 |
|--|----------|-----|-------------------|-------|-------|-------|-------|-------|-------|-------|
| 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 $\min(N_{Rd,s,a}; N_{Rd,s,c})$

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

Performance Data

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

Annex C4

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

| Channel bolt | | | | | M8 | M10 | M12 | M16 | M20 | | | |
|-----------------------------------|---------------------|------|-----------|---------------------|-------|------|-------|-------|------|-------|--|--|
| Steel failure | | | | | | | | | | | | |
| Characteristic tension resistance | $N_{Rk,s}^{1)}$ | [kN] | HBC-28/15 | 4.6 | - | | | | | | | |
| | | | | 8.8 | 22,4 | 35,4 | 44,3 | - | | | | |
| | | | | A4-50 ²⁾ | 17,2 | - | | | | | | |
| | | | HBC-38/17 | A4-70 ²⁾ | 25,6 | 38,9 | 51,3 | - | | | | |
| | | | | 4.6 | - | | 23,2 | - | | | | |
| | | | | 8.8 | - | | - | 35,4 | 55,8 | - | | |
| | | | HBC-40/22 | A4-70 ²⁾ | 20,5 | 47,2 | 53,0 | - | | | | |
| | | | | 4.6 | - | | 23,2 | - | | | | |
| | | | | 8.8 | - | | - | 35,4 | 55,8 | - | | |
| | | | HBC-50/30 | A4-70 ²⁾ | 20,5 | 58,6 | 91,0 | - | | | | |
| | | | | 4.6 | - | | - | | | | | |
| | | | | 8.8 | - | | - | 35,4 | 55,8 | 183,1 | | |
| | | | HBC-50/30 | A4-70 ²⁾ | - | 58,6 | 109,0 | 129,0 | - | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| Partial safety factor | $\gamma_{Ms}^{3)}$ | [-] | HBC-28/15 | 4.6 | 2,00 | | | | | | | |
| | | | HBC-38/17 | 8.8 | 1,50 | | | | | | | |
| | | | HBC-40/22 | A4-50 ²⁾ | 2,86 | | | | | | | |
| | | | HBC-50/30 | A4-70 ²⁾ | 1,87 | | | | | | | |
| Characteristic shear resistance | $V_{Rk,s}^{1)}$ | [kN] | HBC-28/15 | 4.6 | - | | | | | | | |
| | | | | 8.8 | 14,6 | 23,2 | 33,7 | - | | | | |
| | | | | A4-50 ²⁾ | 11,0 | - | | | | | | |
| | | | HBC-38/17 | A4-70 | 15,4 | 24,4 | 35,4 | - | | | | |
| | | | | 4.6 | - | | 13,9 | - | | | | |
| | | | | 8.8 | - | | - | 33,7 | 62,8 | - | | |
| | | | HBC-40/22 | A4-70 ²⁾ | 24,4 | 35,4 | 65,9 | - | | | | |
| | | | | 4.6 | - | | 13,9 | - | | | | |
| | | | | 8.8 | - | | - | 33,7 | 62,8 | - | | |
| | | | HBC-50/30 | A4-70 ²⁾ | 24,4 | 35,4 | 65,9 | - | | | | |
| | | | | 4.6 | - | | - | | | | | |
| | | | | 8.8 | - | | - | 33,7 | 62,8 | 98,0 | | |
| HBC-50/30 | A4-70 ²⁾ | - | 35,4 | 65,9 | 102,9 | - | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| Partial safety factor | $\gamma_{Ms}^{3)}$ | [-] | HBC-28/15 | 4.6 | 1,67 | | | | | | | |
| | | | HBC-38/17 | 8.8 | 1,25 | | | | | | | |
| | | | HBC-40/22 | A4-50 ²⁾ | 2,38 | | | | | | | |
| | | | HBC-50/30 | A4-70 | 1,56 | | | | | | | |

¹⁾ In conformity to EN ISO 898-1:1999

²⁾ Materials according to Table 6, Annex A6

³⁾ In absence of other national regulations

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

Performance Data

Characteristic resistances of channel bolts under tension and shear load

Annex C5

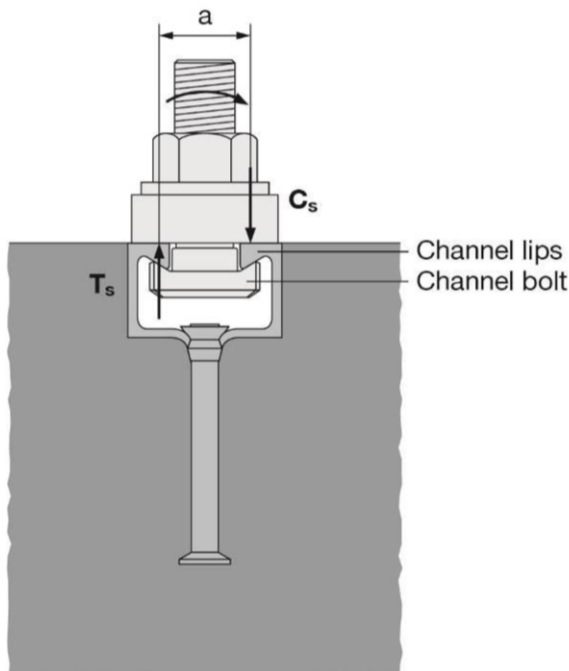
Table 19: Characteristic resistances under shear load with lever arm – steel failure of channel bolts

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

1) In absence of other national regulations

2) Materials according to Table 6, Annex A6

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



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

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

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

a = internal lever arm according to Table 19

T_s = tension force acting on the channel lips

C_s = compression force acting on the channel lips

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

Performance Data

Characteristic flexural resistances of channel bolts under shear load

Annex C6

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

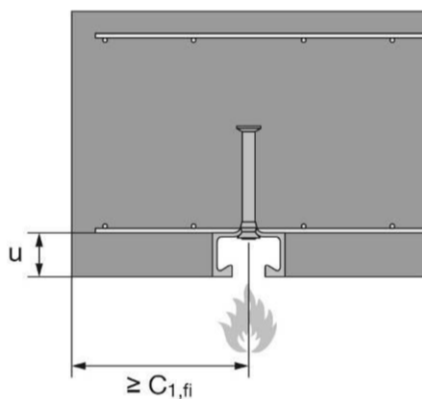
| Channel bolt | | | | M10 | M12 | ≥ M16 | | | |
|---|---|------|-------------------------------------|------|--------------------------------|-------|-----|--|--|
| Steel failure of anchor, connection between anchor and channel, local flexure of channel lip | | | | | | | | | |
| Characteristic resistance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

¹⁾ In absence of other national regulations

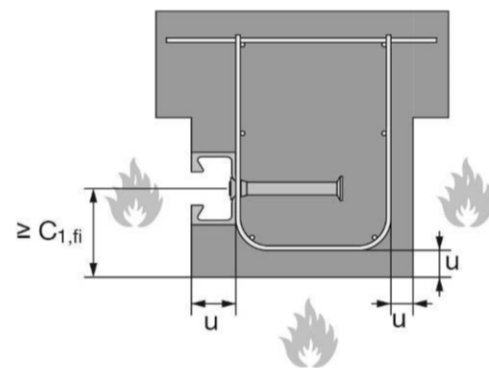
Table 21: Minimum concrete cover

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

Fire exposure from one side only



Fire exposure from more than one side



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

Performance Data

Characteristic resistances of anchor channels and channel bolts under fire exposure

Annex C7