UL-AU Certificate

Certificate
UL-AU-230001 rev1

Issue date
2025-05-08

Expiration date
2033-11-01

www.jasanz.org/register

This is to acknowledge that

Hilti (Aust.) Pty. Ltd

1G Homebush Bay Drive, PO Box 3217, Rhodes, NSW 2138, Australia

has had

Firestopping Block

Model(s):
Hilti Firestop Block CFS-BL
Hilti Firestop Putty Bandage CFS-P BA

evaluated and meets the requirements of the standard(s)

AS 1530.4:2014 and AS 4072.1:2005

The designated Certificate Holder is entitled to use the UL-AU Mark for the Certified Product manufactured at the production site(s) identified on page 2, in accordance with the UL-AU Mark Scheme Service Agreement.
Only those Products bearing the UL-AU Mark for Australia should be considered as being covered by UL's UL-AU Mark Service.

Stuart Foster (Certification Officer)

Certification Body:
UL International New Zealand Limited,
54 Tarndale Grove, Albany, Auckland 0632, New Zealand.

All dates are in Year-Month-Day format (YYYY-MM-DD).

UL Solutions

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Date of Revision: 2025-05-08

Listing Category and File Ref: AUEF.RS5419

Certification Marking: The UL-AU mark shall appear on certified products only and shall be used only in accordance with the UL-AU Mark Scheme Service Terms
Minimum size is not specified, as long as the Mark is legible
The following Supplementary Information shall be placed adjacent to the Certification Mark;
Firestopping - Non-Intumescent Seals and Mortars
AS 1530.4

Manufacturer: Hilti AG,
Feldkircherstrasse 100, FL-9494 Schaan, Liechtenstein Internet: www.hilti.com

Production Sites (Factory): Hilti Plant 4a

Trade Name or Trademark:
Hilti Firestop Block CFS-BL
Hilti Firestop Putty Bandage CFS-P BA

Model Details:
Hilti Firestop Block CFS-BL
Hilti Firestop Putty Bandage CFS-P BA

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Additional Information:
Details of revision: UL-AU certificate template form updated. All information transferred to new form.

This certificate is evidence that prototypes of the nominated products and their configurations as detailed in Appendix A conform to the following parameters:

1. Have been tested to AS 1530.4:2014 and AS 4072.1:2005 or an equivalent or more severe test and the Fire Resistance Level (FRL) nominated in Appendix A was achieved by the prototype for each nominated assembly of service penetration, building element and protection method configuration, without the assistance of an active fire suppression system.

2. Test results are detailed in a confidential test report that may be available from the certificate holder upon request. The information regarding the test parameters is included in the confidential technical file.

(i) the method and conditions of the test;

(ii) form of construction of the tested prototype; and

(iii) that restraint complied with AS 1530.4.

3. Testing was conducted at multiple locations by suitably accredited laboratories that are accredited by a signatory to the International Accreditation Cooperation Mutual Recognition Arrangement (ILAC-MRA) as recognised by NATA who is also a signatory body to this Agreement. The data has been reviewed by UL against the relevant to accreditation schedules.

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Appendix A

Conforming product configurations to achieve nominated FRL's

A.1 Specific Parts for Hilti Firestop CFS-BL:

Technical description of product:

"Hilti Firestop Block CFS-BL" is used as a mixed penetration seal together with "Hilti Firestop Filler CFS-FIL" and in some cases with "Hilti Firestop Putty Bandage CFS-P BA" or with "Hilti Firestop Bandage CFS-B".

Components	Characteristics
Hilti Firestop Block CFS-BL	Brick-shaped block based on a pre-cured, pre-formed PU-based firestop material according to Annex B.1 of the certificate.
Hilti Firestop Filler CFS-FIL	Acrylic based firestop filler mastic according to Annex B.2 of the certificate.
Hilti Firestop Intumescent sealant CP 611A or CFS IS	firestop Intumescent mastic according to Annex B
Hilti Firestop Putty Bandage CFS-P BA	Graphite based pipe wrap according to Annex B.3 of the certificate.
Hilti Firestop Bandage CFS-B	Graphite based pipe wrap according to Annex B.4 of the certificate.

Additional Components	Characteristics
Hilti Firestop Coating CFS-CT	Additional protection for penetration seals for waveguides according to Annex B.5 of the certificate

Intended use:

"Hilti Firestop Block CFS-BL" is intended to be used as a mixed penetration seal to temporarily or permanently reinstate the fire resistance performance of flexible wall constructions, rigid wall constructions and rigid floor constructions where they have been provided with apertures which are penetrated by various cables, conduits, metal pipes, plastic pipes and multi-layer composite pipes.

The maximum opening size of the penetration seal in wall constructions is 1000 x 1000 mm, in floor constructions 1000 x 700 mm. For more details see Annex C of the certificate.

"Hilti Firestop Block CFS-BL" was also tested in a sandwich panel construction.
"Hilti Firestop Block CFS-BL" was also tested in proprietary wall systems such as Dincel and AFS logic wall.

"Hilti Firestop Block CFS-BL" can only be used as penetration seal for cables, metal pipes, plastic pipes or for mixed penetration (combination). Further details are given in Annex C of the certificate. Other parts or service support constructions shall not penetrate the penetration seal.

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"Hilti Firestop Block CFS-BL" can be installed only in types of separating elements as specified in following table. For further details see Annex C of the certificate.

Separating element	Construction	Maximum opening size of the penetration seal (width x height)
Flexible walls	> Steel studs or timber studs lined on both faces with minimum 2 layers of gypsum boards (minimum thickness 12.5 mm) > For steel stud walls the space between lining must not be completely filled with insulation material, especially in the adjacent area of the penetration seal > For timber studs walls there must be a minimum distance of 100 mm of the penetration seal to any timber stud. The cavity between the penetration seal and stud has to be closed with minimum of 100 mm of insulation > Minimum thickness 100 mm	1000 x 1000 mm For details see Annex C of the certificate
Sandwich panel wall	> Paroc® line 200 AST® F+ > Internal sheet made of polyethylene (PE) coated zincified steel with sheet thickness of 0.5 mm and coating thickness of 25 µm > Stone wool core with a thickness of 99 mm and a density of 115 kg/m³ > External sheet made of polyethylene (PE) coated zincified steel with sheet thickness of 0.5 mm and coating thickness of 25 µm > Minimum thickness 100 mm	1000 x 1000 mm For details see Annex C of the certificate
Proprietary wall	> AFS logic wall, minimum thickness 100 mm > Dincel wall, minimum thickness 120 mm > Speedpanel, minimum thickness 78 mm, provided that the wall has been tested or assessed to achieve -/120/120 according to AS 1530.4	1000 x 1000 mm For details see Annex C of the certificate
Rigid walls	> Aerated concrete, concrete, masonry > Minimum density 450 kg/m³ > Minimum thickness 100 mm > The rigid wall shall be classified for the required fire resistance period	1000 x 1000 mm For details see Annex C of the certificate
Rigid floors	> Aerated concrete, concrete > Minimum density 450 kg/m³ > Minimum thickness 150 mm > The rigid floor shall be classified for the required fire resistance period	1000 x 1000 mm For details see Annex C of the certificate

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A.1.1 Abbreviations used in drawings	
Abbreviation	**Description**
A, A_1, A_2,..	Firestop products
C, C_1, C_2,..	Penetrating services
E, E_1, E_2,…	Building elements (wall, floor)
h	Height/length of penetration seal
s_1, s_2, s_n	Distances
t_A	Thickness of penetration seal
t_E	Thickness of the building element
W	Max size of wall penetration
W_1	Max size of floor penetration without support
W_2	Max size of floor penetration with support

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Appendix B

Description of Product(s) & Product Literature

B.1 Hilti Firestop Block CFS-BL
Brick-like shaped blocks with dimensions of 200 x 130 x 50 mm (l x w x t).

B.2 Hilti Firestop Filler CFS-FIL
"Hilti Firestop Filler CFS-FIL" is available as a cartridge of 310 ml or as a foil pack of 580 ml.
Suitable dispensers:
"Hilti CFS-DISP / CS 201-P1" (for 310 ml cartridge)
"Hilti CS 270-P1" (for 580 ml foil pack)
Hilti Firestop Intumescent sealant CP 611A
"Hilti Firestop Intumescent sealant CP 611A" is available as a cartridge of 310 ml
"Hilti Firestop Intumescent sealant CP 611A" is equivalent to "Hilti Firestop Intumescent sealant CFS-IS"

B.3 Hilti Firestop Putty Bandage CFS-P BA
"Hilti Firestop Putty Bandage CFS-P BA" is delivered 100 mm in width, 3 mm in height and 5 m in length on a roll.

B.4 Hilti Firestop Bandage CFS-B
"Hilti Firestop Bandage CFS-B" is supplied in roll form, with binding wire used to wrap around pipes and pipe insulation to form a penetration seal. The bandage is cut to a length which suits the overall diameter of pipe or pipe and insulation and wrapped around the penetration twice.
"Hilti Firestop Bandage CFS-B" is supplied in 125 mm width, 2 mm thick and 10 m length.

B.5 Hilti Firestop Coating CFS-CT
"Hilti Firestop Coating CFS-CT" is used as additional protection for penetration seals for waveguides. For details of the application, see Annex C.2.2.d and C.5.2.c of the certificate.

B.6 Technical product literature
Technical data sheet "Hilti Firestop Block CFS-BL" (including all ancillary products).

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Appendix C

RESISTANCE TO FIRE CLASSIFICATION OF PENETRATION SEALS MADE OF HILTI FIRESTOP BLOCK CFS-BL

C.1 General Information

C.1.1 Wall/floor constructions

a) Flexible wall:

The wall must have a minimum thickness of 100 mm and comprise timber or steel studs lined on both faces with minimum 2 layers of 12.5 mm thick gypsum plaster boards.

For timber stud wall constructions there must be a minimum distance of 100 mm of the penetration seal to any stud. The cavity between stud and penetration seal must be closed with minimum of 100 mm of insulation.

b) Rigid wall:

The wall must have a minimum thickness of 100 mm and comprise concrete, aerated concrete or masonry, with a minimum density of 450 kg/m^3.

AFS logic wall, minimum thickness 100 mm

Dincel wall, minimum thickness 120 mm

c) Speedpanel, minimum thickness 78 mm, provided that the wall has been tested or assessed to achieve -/120/120 according to AS 1530.4 Rigid floor:

The floor must have a minimum thickness of 150 mm and comprise aerated concrete or concrete with a minimum density of 450 kg/m^3.

The walls / floors must be classified for the required fire resistance period.

d) Sandwich panel wall:

The partition is constructed of PAROC® line 200 AST panels with a thickness of 100 mm, a width of 1200 mm and a mineral (stone) wool core with a density of 115 kg/m^3.

The sandwich panel construction must be classified for the required fire resistance period and has to be set up according to the conditions related to the required fire resistance period.

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C.1.2 Aperture framing / beading

The penetration seal depth is always 200 mm irrespective of the thickness of the wall or floor. For flexible walls, an aperture framing or a beading must be used such that $t_E \geq 200$ mm. For rigid walls with a thickness of less than 150 mm, an aperture framing, or beading must be used such that $t_E \geq 150$ mm.

Aperture framing: Box frame 200 mm deep, perpendicular to the wall/floor surface, made of fire rated gypsum or calcium silicate board at least 12.5 mm thick, centred in the wall (figure a, d).

Beading: Fire rated gypsum or calcium silicate board strips at least 100 mm wide (W_A, Figure e) are installed around the opening with the necessary number of layers to form a frame on the top side of a floor, or two frames of the same height on both sides of a wall (Figures b, c, e).

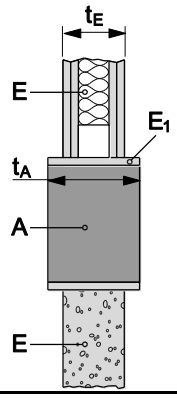
Walls: The penetration seal is installed centred (Figures a, b).
Floors: Flush to the soffit of the floor (Figure c).

Beading: gypsum or calcium silicate board strips with a width of at least 100 mm (w_A, figure 1e) are installed around the opening with the necessary number of layers to form a frame on the top side of a floor or two frames of the same height on both sides of a wall (figure 1b, c, e).

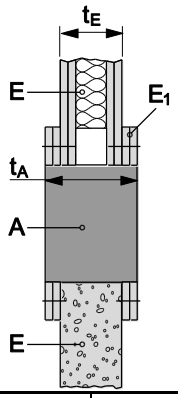
In walls penetration seal is installed centred (figure 1a, b), in floors flush to the soffit of the floor (figure 1c).

The penetration seals in the sandwich panel constructions do not require an aperture frame as described above. Instead, the opening perimeter is finished with 30 x 30 x 2 mm steel profiles fixed onto the panel with Ø3.5 x 30 mm self-drilling screws.

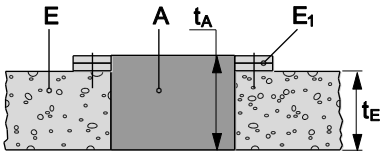
a



b



c



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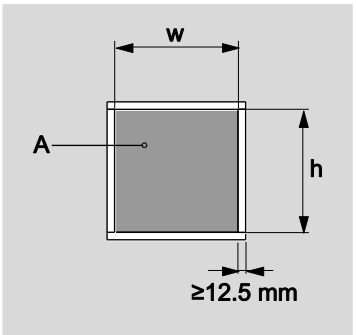

e

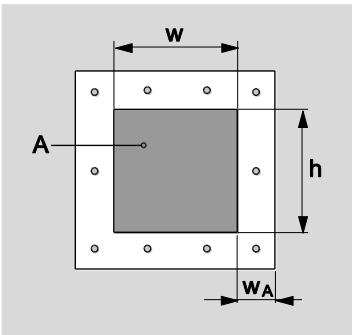

Figure 1: position of the penetration seal in walls / floors
aperture framing / beading

A	Hilti Firestop Block CFS-BL	t_E	Thickness of the separating element
E	Separating element (rigid or flexible wall construction, floor)	w	Width of the penetration seal
		h	Height of the penetration seal
E1	Aperture frame	w_A	Width of the beading
t_A	Thickness of the penetration seal		

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C.1.3 Penetration seal types

C.1.3.1 Penetration seal type 1 (A_1) - blocks and filler

a) <u>Services without cable supports (baskets, ladders, trays) in the area of the penetration seal</u>

- Gaps between services and Hilti Firestop Blocks CFS-BL (A) are filled with Hilti Firestop Filler CFS-FIL or CP 611A or CFS-IS (A_{1a}), depth 20 mm.

b) <u>Services on cable supports (baskets, ladders, trays) running through the penetration</u>

- Gaps between services and Hilti Firestop Blocks CFS-BL (A) are filled with Hilti Firestop Filler CFS-FIL or CP 611A or CFS-IS (A_{1b}) over the entire depth of the seal (200 mm).

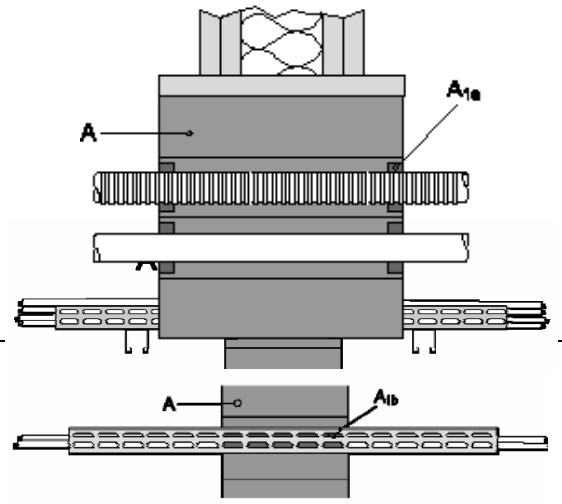

Figure 3: penetration seal type A_{1b}

C.1.3.2 Penetration seal type putty 1 (A_{2a}) - blocks, filler and 1 layer putty bandage

a) <u>Services without cable supports (baskets, ladders, trays) in the area of the penetration seal</u>

- Gaps between services and Hilti Firestop Blocks CFS-BL (A) are filled with Hilti Firestop Filler CFS-FIL or CP 611A or CFS-IS (A1a), depth 20 mm.
- One layer of Hilti Firestop Putty Bandage CFS-P BA (A2) or Hilti Firestop Bandage CFS-B is wrapped around the services or group of services.

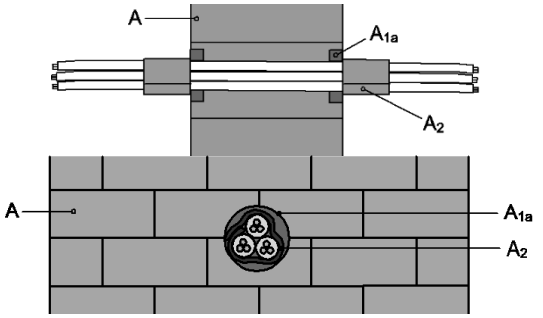

Figure 4: filler (A_{1a}) with 1 layer putty

c) Services on cable supports (baskets, ladders, trays) running through the penetration

- Gaps between services and Hilti Firestop Blocks CFS-BL (A) are filled with Hilti Firestop Filler CFS-FIL or CP 611A or CFS-IS (A1b) over the entire depth of the seal (200 mm).
- Services are additionally covered by a layer of Hilti Firestop Putty Bandage CFS-P BA (A2a).

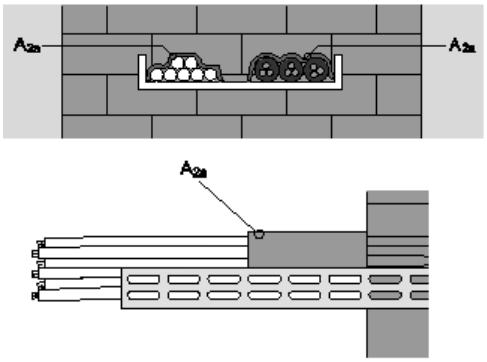

Figure 5: filler (A_{1b}) with 1 layer putty (A_{2a}), support tray

Hilti Firestop Putty Bandage CFS-P BA must be installed with the mesh outside/upside.
For floor applications, Hilti Firestop Putty Bandage CFS-P BA is required on the top side, only.

C.1.3.3 Penetration seal type putty 2 (A2b) – blocks, filler and 2 layers putty bandage

a) Services without cable supports (baskets, ladders, trays) in the area of the penetration seal

- Gaps between services and Hilti Firestop Blocks CFS-BL (A) are filled with Hilti Firestop Filler CFS-FIL or CP 611A or CFS-IS (A1a), depth 20 mm.
- Two layers of Hilti Firestop Putty Bandage CFS-P BA (A2) are wrapped around the services or group of services.

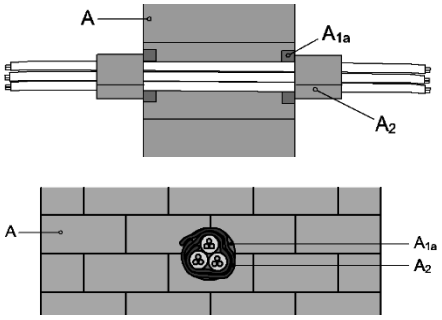

Figure 6: filler (A_{1a}) with 2 layers of putty

b) Services on cable supports (baskets, ladders, trays) running through the penetration

- Gaps between services and Hilti Firestop Blocks CFS-BL (A) are filled with Hilti Firestop Filler CFS-FIL (A_{1b}) over the entire depth of the seal (200 mm).
- Services are additionally covered by a layer of Hilti Firestop Putty Bandage CFS-P BA (A_{2a}) on top of the services in the cable supports.
- A second layer of Hilti Firestop Putty Bandage CFS-P BA (A_{2b}) is laid on top of the first and then wrapped around the services including the cable supports (A_{2b}).
- The overlap of the putty wrapping must be at least 20 mm.

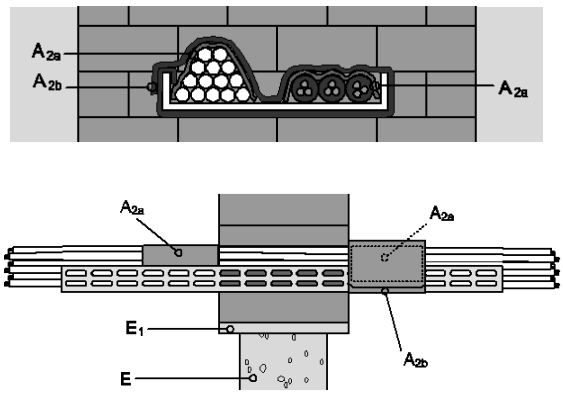

Figure 7: filler (A_{1b}) plus 2 layers of putty, support tray

Hilti Firestop Putty Bandage CFS-P BA must be installed with the mesh outside/upside.
For floor applications, Hilti Firestop Putty Bandage CFS-P BA is required on the top side, only.

C.1.4 Distance Requirements

Distances valid for installations of services in wall and floor penetrations.

Minimum distances in mm (see Figure 8):

$s_1 = 0$	(distance between cables/cable supports and vertical seal edge)
$s_2 = 0$	(distance between cable supports)
$s_3 = 0$	(distance between cables and upper seal edge)
$s_4 = 0$	(distance between cable supports and bottom seal edge)
$s_5 = 50$	(distance between cables and cable support above)
$s_{20} – s_{23}$	= 0 for Ø<16 mm = 50 for Ø>16 mm (distance between conduits/waveguides to each other or to other services or seal edges)

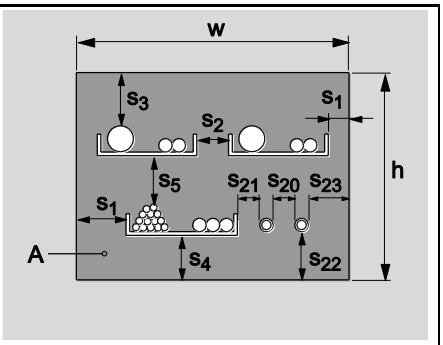

Figure 8: distances

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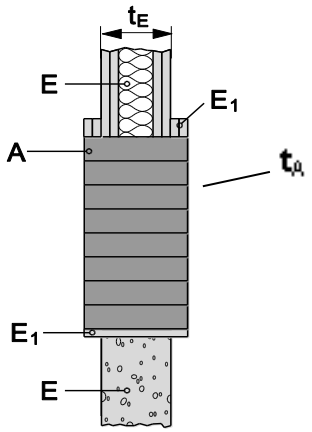
C.2 Flexible or rigid walls according to Annex C.1.1 of the certificate- minimum wall thickness 100 mm	
C.2.1 Blank seal (no services) *	
Maximum seal size: 1000 x 1000 mm or an area of 10 000 cm^2	
Construction details (for symbols and abbreviations see Annex A.3 of the certificate): Hilti Firestop Block CFS-BL (A) of thickness $t_A \geq 200$ mm, centered regarding the thickness of the wall (E); aperture framing or beading (E1) according to Annex C.1.2 of the certificate.	 Figure 9: blank seal
	FRL (Fire Resistance Level)
	–/120/120
* If services are added later on in a blank seal, only the services that fulfill the required classification, listed in the tables below, may be added.	

C.2.2 Penetrating services in walls – 100 mm wall thickness
Maximum seal size: 1000 x 1000 mm Services shall be supported at maximum distance of 250 mm from both sides of wall

Abbreviation	**Description**
A, A_1, A_2, ...	Firestop products: A Hilti Firestop Block CFS-BL A_1 Hilti Firestop Filler CFS-FIL or CP 611A or CFS-IS A_2 Hilti Firestop Putty Bandage CFS-P BA
C_1, C_2, C_3	Penetrating services
E, E_1, E_2, …	Separating elements
t_E	Thickness of the separating element

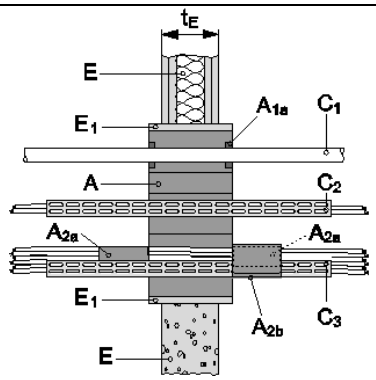


Figure 10: wall penetration

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Construction details (for symbols and abbreviations see Annex C.2.2 of the certificate):

Hilti Firestop Blocks CFS-BL (A) of thickness $t_A \geq 200$ mm, centered regarding the thickness of the wall (E); aperture framing or beading (E_1) according to Annex C.1.2 of the certificate.

Penetrating services (C_1) with or without support tray within the seal, see Figure 10 of the certificate.
Penetrating cables (C_2, C_3) with or without support tray within the seal, see Figure 10 of the certificate.

For penetrations without support trays the following seal types apply:

- Penetration seal type 1 – blocks and filler (A_{1a}) according to Annex C.1.3.1a of the certificate
- Penetration seal type putty 1 – blocks, filler and 1 layer putty bandage, according to Annex C.1.3.2a of the certificate
- Penetration seal type putty 2 – blocks, filler and 2 layers putty bandage, according to Annex C.1.3.3a of the certificate

For penetrations with support trays the following seal types apply:

- Penetration seal type 1 – blocks and filler (A_{1b}) according to Annex C.1.3.1b of the certificate
- Penetration seal type putty 1 – blocks, filler and 1 layer putty bandage, according to Annex C.1.3.2b of the certificate
- Penetration seal type putty 2 – blocks, filler and 2 layers putty bandage, according to Annex C.1.3.1b of the certificate

C.2.2.a) Cables

– All types of cables currently and commonly used in building practice (e.g. power, control, signal, telecommunication, data, optical fibre cables, with or without cable supports)

Penetration seal type:	**Type 1 (Blocks + Filler)**	**Type Putty 1 (Blocks, Filler + 1x Putty)**	**Type Putty 2 (Blocks, Filler + 2x Putty)**
All sheathed cables:	**FRL (Fire Resistance Level)**		
Ø ≤ 25 mm	–/120/90	–/120/90	–/120/120
25 ≤ Ø ≤ 50 mm			
50 ≤ Ø ≤ 80 mm			
Tied cable bundle ≤ Ø 100 mm; Ø single cable ≤ 21 mm	–/120/120	–/120/120	
PVC or XLPE insulated D1 Power Cable included but not limited to Submian, TPS, SDI, Fire rated cable, security cable and earth cable with or without cable tray (Standard D1 cable set, in accordance with AS 1530.4: 2014 Appendix D	–/120/90	-	
PVC or XLPE insulated D2 Communication Cable included but not limited to Data cable, CAT 6, Optic fibre, with or without cable tray (Standard D2 cable set, in accordance with AS 1530.4: 2014 Appendix D	–/120/90	-	
Non-sheathed cables (wires) Ø ≤ 24 mm	–/120/60	–/120/90	

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C.2.2.b) Small conduits and tubes			
– Ø ≤ 16 mm, wall thickness ≥ 1 mm, arranged linear, with or without cables, with or without cable supports, minimum distance to each other = 0 mm			
Penetration seal type:	**Type 1 (Blocks + Filler)**	**Type Putty 1 (Blocks, Filler + 1x Putty)**	**Type Putty 2 (Blocks, Filler + 2x Putty)**
	FRL (Fire Resistance Level)		
Plastic conduits and tubes Ø ≤ 16 mm	–/120/120		
Steel conduits and tubes Ø ≤ 16 mm	–/120/120		

C.2.2.c) Conduits			
– Hilti Firestop Blocks CFS-BL (A) of thickness t_A ≥ 200 mm, centered regarding the thickness of the wall (E); aperture framing or beading (E_1) according to Annex C.1.2 of the certificate. – Conduits / tubes (C_1) without support tray within the seal, see Figure 10 of the certificate. – Wall thickness of polyolefin conduits: 1.55 to 2.30 mm – Wall thickness of PVC conduits: 1.90 to 2.80 mm			
Penetration seal type:	**Type 1 (Blocks + Filler)**	**Type Putty 1 (Blocks, Filler + 1x Putty)**	**Type Putty 2 (Blocks, Filler + 2x Putty)**
Plastic conduits:	**FRL (Fire Resistance Level)**		
Hegler HP-EPKS 16 ≤ Ø ≤ 40 mm Hegler HP-EPKMH 20 ≤ Ø ≤ 40 mm Hegler HP-EL 16 ≤ Ø ≤ 20 mm HFXP and HFX 25 ≤ Ø ≤ 32 mm * HFIRM 32 ≤ Ø ≤ 40 mm * FXPM Ø = 20 mm FXPYF Ø = 32 mm	–/120/120	---	---
Single plastic conduits and tubes: Rigid and flexible: PE, PP, PPE, PPO; Rigid: PVC, up to 40 mm dia filled with cables or optic fibres or empty			
Bundle Ø ≤ 100 mm of rigid or flexible conduits - Ø of single conduits ≤ 20 mm			
* In case of conduits HFIRM (Ø 40 mm) without cables inside there is no FRL (Fire Resistance Level) available, and for conduits HFX (Ø 25 mm) FRL (Fire Resistance Level) is –/30/30			

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C.2.2.d) Waveguides (coaxial)

- Hilti Firestop Blocks CFS-BL (A) of thickness tA ≥ 200 mm, centered regarding the thickness of the wall (E); aperture framing or beading (E1) according to Annex C.1.2 of the certificate.
- Waveguides 27.8 mm ≤ Ø ≤ 59.9 mm (C1) without support tray within the seal, see Figure 10 of the certificate.
- Additional protection: 0.7 mm thick “Hilti Firestop Coating CFS-CT” over a length of 150 mm from the surface of the penetration seal on each side of the wall.

Penetration seal type:	**Type 1 (Blocks + Filler) + Coating**	**Type Putty 1 (Blocks, Filler + 1x Putty)**	**Type Putty 2 (Blocks, Filler + 2x Putty)**
Waveguides (coaxial):	**FRL (Fire Resistance Level)**		
RFS Cellflex LCF 78-50 JA Ø 27.8 mm RFS Cellflex LCF 214-50 J Ø 59.9 mm RFS Heliflex HCA 78-50 JFNA Ø 28.0 mm RFS Heliflex HCA 158J Ø 59.9 mm RFS Radialflex RLKW 78-50 Ø 28.5 mm RFS Radialflex RLKU 158-50 JFLA Ø 48.2 mm		---	-/120/120

C.2.2.e) Bus bar

- Hilti Firestop Blocks CFS-BL (A) of thickness t_A ≥ 200 mm, centered regarding the thickness of the wall (E); aperture framing or beading (E_1) according to Annex C.1.2 of the certificate.
- Bus bars (C_1) with or without support tray within the seal, see Figure 10 of the certificate.

Penetration seal type:	**Type 1 (Blocks + Filler)**	**Type Putty 1 (Blocks, Filler + 1x Putty)**	**Type Putty 2 (Blocks, Filler + 2x Putty)**
	FRL (Fire Resistance Level)		
EAE ELEKTRIK – Type: E-Line KXC 40505-B; up to 4000A – Maximum outer dimension of the section: 372 mm x 150 mm – Conductor material: Copper – Maximum number of conductors: 10 – Maximum section of the conductors: 140 mm x 6 mm	---	---	–/120/120

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C.2.2.f) Metal pipes (with insulation)

- Hilti Firestop Blocks CFS-BL (A) of thickness $t_A \geq 200$ mm, centered regarding the thickness of the wall (E); aperture framing or beading (E_1) according to Annex C.1.2 of the certificate.
- Metal pipes (C_1), see Figure 10 of the certificate.
- Metal pipes with mineral wool insulation, minimum density 85 kg/m[3], minimum thickness 20 mm (up to Ø 54 mm) or 30 mm (Ø > 54 mm)
- Additional insulation, mineral wool mat wrapped around the service, minimum density 85 kg/m3, minimum thickness 20 mm (up to Ø 54 mm) or 40 mm (Ø > 54 mm) over a length of 300 mm (up to Ø 54 mm) or 500 mm (Ø > 54 mm)

Penetration seal type:	**Type 1 (Blocks + Filler) + Mineral wool**	**Type Putty 1 (Blocks, Filler + 1x Putty)**	**Type Putty 2 (Blocks, Filler + 2x Putty)**
Mineral wool insulated metal pipes:	**FRL (Fire Resistance Level)**		
Copper pipes, up to Ø 54 mm, wall thickness 1.0/1.5 mm[3] – 14.2 mm[4], insulation LS mineral wool, minimum length 1200 mm or CS	–/120/120	---	---
Steel pipes, up to Ø 114 mm, wall thickness 1.0/2.0[5] mm – 14.2[4] mm, insulation LS mineral wool, minimum length 1200 mm (up to Ø 54 mm) or 1800 mm (Ø > 54 mm), or CS	–/120/120	---	---
Steel pipes, up to Ø 159 mm, wall thickness 2.0 mm – 14.2 mm[4], insulation LS mineral wool, with minimum length 1800 mm	–/120/60	---	---

[3] Interpolation of minimum pipe wall thickness between 1.0 mm for diameter 28 mm and 1.5 mm for 54 mm for pipe diameters in between. The results are also valid for pipe diameters < 28 mm
[4] 14.2 mm is the maximum value covered. This value may be limited by the particular pipe dimensions available in practice.
[5] Interpolation of minimum pipe wall thickness between 1.0 mm for diameter 28 mm (Cu pipe) and 2.0 mm for 114 mm for pipe diameters in between. The results are also valid for pipe diameters < 28 mm

– Hilti Firestop Blocks CFS-BL (A) of thickness $t_A \geq 200$ mm, centered regarding the thickness of the wall (E); aperture framing or beading (E_1) according to Annex C.1.2 of the certificate.
– Metal pipes (C_1), see Figure 10 of the certificate.
– Metal pipes with flexible elastomeric foam insulation, thickness 8.5 to 43 mm.
– Additional insulation, Armaflex mat wrapped around the service, thickness 19 mm, over a length of 300 mm or 500 mm

Penetration seal type:	Type 1 (Blocks + Filler) + Armaflex	Type Putty 1 (Blocks, Filler + 1x Putty)	Type Putty 2 (Blocks, Filler + 2x Putty)
Elastomeric foam insulated metal pipes:	FRL (Fire Resistance Level)		
Copper pipes, up to Ø 54 mm, wall thickness 1.0/1.5 mm[3] – 14.2 mm[4], Armaflex insulation CS, thickness 8.5 – 43 mm[6]	–/120/120	---	---
Steel pipes, up to Ø 114 mm, wall thickness 1.0/2.0 mm – 14.2 mm, Armaflex insulation CS, thickness 8.5 – 43 mm[7]	–/120/90	---	---

– Hilti Firestop Blocks CFS-BL (A) of thickness $t_A \geq 200$ mm, centered regarding the thickness of the wall (E); aperture framing or beading (E_1) according to Annex C.1.2 of the certificate.
– Metal pipes (C_1), see Figure 10 of the certificate.
– Metal pipes with flexible elastomeric foam insulation, thickness 8.5 to 43 mm.
– Additional insulation, mineral wool mat wrapped around the service, minimum density 85 kg/m[3], minimum thickness 40 mm over a length of 500 mm.

Penetration seal type:	Type 1 (Blocks + Filler) + Mineral wool	Type Putty 1 (Blocks, Filler + 1x Putty)	Type Putty 2 (Blocks, Filler + 2x Putty)
Elastomeric foam insulated metal pipes:	FRL (Fire Resistance Level)		
Steel pipes, Ø 159 mm, wall thickness 2.0 mm – 14.2 mm[4], insulation CS Armaflex, thickness 19 mm	–/120/90	---	---

The field of application given above for copper pipes is also valid for other metal pipes with lower heat conductivity than copper and a melting point of minimum 1100°C, e.g. unalloyed steel, low alloyed steel, cast iron, stainless steels, Ni alloys (NiCu, NiCr and NiMo alloys) and Ni.

The field of application given above for steel pipes is also valid for other metal pipes with lower heat conductivity than unalloyed steel and a melting point of minimum 1100°C, e.g. low alloyed steel, cast iron, stainless steels, Ni alloys (NiCu, NiCr and NiMo alloys)

[6] Interpolation of insulation thickness 8.5/9 mm and 38 mm for pipe diameter 28 mm and 54 mm for insulation thicknesses and pipe diameters in between.
[7] Interpolation of insulation thickness 8.5/15 mm and 38/43 mm for pipe diameter 28 mm (Cu pipe) and 114 mm for insulation thicknesses and pipe diameters in between.

C.3 Flexible, rigid or proprietary walls according to Annex C.1.1 of the certificate- minimum wall thickness 150 mm

C.3.1 Penetrating services (single, multiple)

Construction details (for symbols and abbreviations see Annex C.2.2 of the certificate):

Hilti Firestop Blocks CFS-BL (A) of thickness $t_A \geq 200$ mm, centered regarding the thickness of the wall (E); aperture framing or beading (E_1) is not required for rigid and proprietary walls. For flexible wall, aperture framing or beading (E_1) according to Annex C.1.2 of the certificate.

Penetrating services (C_1) with or without support tray within the seal, see Figure 10 of the certificate.
Penetrating cables (C_2, C_3) with or without support tray within the seal, see Figure 10 of the certificate.

For penetrations without support trays the following seal types apply:

- Penetration seal type 1 – blocks and filler (A_{1a}) according to Annex C.1.3.1a of the certificate
- Penetration seal type putty 1 – blocks, filler and 1 layer putty bandage, according to Annex C.1.3.2a of the certificate
- Penetration seal type putty 2 – blocks, filler and 2 layer putty bandage, according to Annex C.1.3.3a of the certificate

For penetrations with support trays the following seal types apply:

- Penetration seal type 1 – blocks and filler (A_{1b}) according to Annex C.1.3.1b of the certificate
- Penetration seal type putty 1 – blocks, filler and 1 layer putty bandage, according to Annex C.1.3.2b of the certificate
- Penetration seal type putty 2 – blocks, filler and 2 layers putty bandage, according to Annex C.1.3.1b of the certificate

Services shall be supported at maximum 250 mm away from both faces of wall constructions.
Maximum seal size: 1000 x 1000 mm

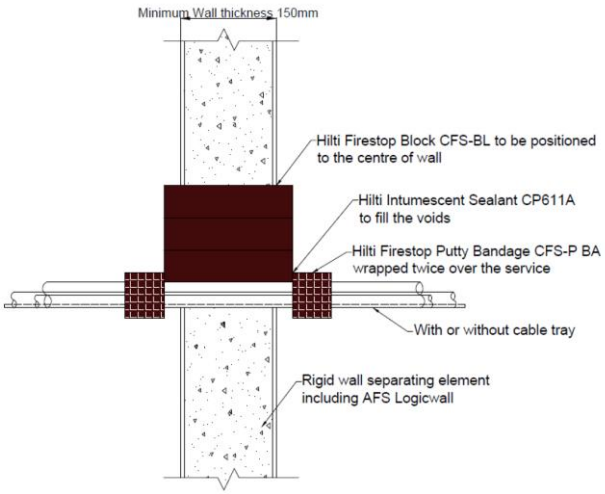

Figure 11: Service penetrations in AFS walls

C.3.1.1 Cables

– All types of cables currently and commonly used in building practice (e.g. power, control, signal, telecommunication, data, optical fibre cables, with or without cable supports)

Penetration seal type:	Type 1 (Blocks + Filler)	Type Putty 1 (Blocks, Filler + 1x Putty)	Type Putty 2 (Blocks, Filler + 2x Putty)
All sheathed cables:	**FRL (Fire Resistance Level)**		
Ø ≤ 25 mm	–/120/90	–/120/120	–/120/120
25 ≤ Ø ≤ 50 mm			
50 ≤ Ø ≤ 80 mm	–/120/90	–/120/90	

Tied cable bundle ≤ Ø 100 mm; Ø single cable ≤ 21 mm	–/120/120	–/120/120	
PVC or XLPE insulated D1 Power Cable included but not limited to Submian, TPS, SDI, Fire rated cable, security cable and earth cable with or without cable tray (Standard D1 cable set, in accordance with AS 1530.4: 2014 Appendix D	–/120/90	-	
PVC or XLPE insulated D2 Communication Cable included but not limited to Data cable, CAT 6, Optic fibre, with or without cable tray (Standard D2 cable set, in accordance with AS 1530.4: 2014 Appendix D	–/120/90	-	
Non-sheathed cables (wires) Ø ≤ 24 mm	–/120/60	–/120/90	

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C.3.1.2 Plastic pipe penetration, flexible and rigid walls at least 100 mm thick with build up to 150 mm rigid walls and 200 m for flexible walls			
Sealing System	**System Description**	**Pipe Details**	**FRL (Fire Resistance Level)**
• Block seal – material: Brick-shaped block based on a pre-cured, pre-formed polyurethane (PU) based firestop material - type: Hilti Firestop Blocks CFS-BL density: 270 kg/m^3 (NV) – thickness: 130 mm, width: 200 mm, height: 50 mm • Annular sealant – Hilti Firestop sealant CP 611A – material: graphite-based acrylic dispersion – gap width: 0.5 mm – layer thickness: 20 mm • Elastomeric rubber foam insulation – brand and type: Armaflex Tube AF Microban – material: flexible elastomeric rubberlike foam • PE-foam insulation - Thermaflex® ThermaCompact TF – material: polyethylene (PE) foam with low density polyethylene (LDPE) jacket – thickness: 4 mm • PE-foam insulation - Thermaflex® ThermaEco FRZ – material: polyethylene (PE) foam, thickness: 13 mm • Maximum seal size: 1000 x 1000 mm or an area of 10,000 cm^2	Blank seal	No services	-/120/120
	PE-100 or HDPE	Outer Ø: 50 mm Wall thickness: 3 mm Insulation: none	-/120/120
	PVC-U	Outer Ø: 50 mm Wall thickness: 1.5 mm – 2.4 mm Insulation: none	-/120/120
	PP-C	Outer Ø: 58 mm Wall thickness: 4 mm Insulation: none	-/120/120
	PE-S2	Outer Ø: 56 mm Wall thickness: 3.2 mm Insulation: none	-/120/120
	PE-RT II/AI/PE-RT II	Outer Ø: 16 mm – 40 mm Wall thickness: 2.25 mm – 3.5 mm Insulation: Armaflex Tube AF, thickness 8 mm – 20.5 mm	-/120/120
	PE-Xa	Outer Ø: 16 mm – 32 mm Wall thickness: 2.2 mm – 4.5 mm Insulation: Armaflex Tube AF, thickness 17 mm – 19.5 mm	-/120/120
	PP-MD	Outer Ø: 50 mm Wall thickness: 1.8 mm Insulation: none	-/120/120
	PE-RT II/AI/PE-RT II	Outer Ø: 16 mm – 32 mm Wall thickness: 2.25 mm – 3.0 mm Insulation: Thermaflex® ThermaCompact TF, thickness 4 mm or Thermaflex® ThermaEco FRZ, thickness 13 mm	-/120/120

C.4 Sandwich panel partitions according to Annex C.1.1 of the certificate- minimum wall thickness 100 mm

C.4.1 Penetrating services (single, multiple)

Construction details (for symbols and abbreviations see Annex C.2.2 of the certificate):

Hilti Firestop Blocks CFS-BL (A) of thickness $t_A \geq 200$ mm, centered regarding the thickness of the wall (E); aperture framing or beading (E_1) according to Annex C.1.2 of the certificate.

For penetrations without support trays the following seal types apply:

- Penetration seal type putty 2 – blocks, filler and 2 layer putty bandage, according to Annex C.1.3.3a of the certificate

For penetrations with support trays the following seal types apply:

- Penetration seal type putty 2 – blocks, filler and 2 layers putty bandage, according to Annex C.1.3.1b of the certificate

Services shall be supported at maximum 250 mm away from both faces of wall constructions.
Maximum seal size: 1000 x 1000 mm

C.4.1.1 Cables

– All types of cables currently and commonly used in building practice (e.g. power, control, signal, telecommunication, data, optical fibre cables, with or without cable supports)
– Penetrating cables (C_2) without support tray within the seal, see Figure 10 of the certificate.

Penetration seal type:	Type 1 (Blocks + Filler)	Type Putty 1 (Blocks, Filler + 1x Putty)	Type Putty 2 (Blocks, Filler + 2x Putty)
All sheathed cables:	FRL (Fire Resistance Level)		
Ø ≤ 25 mm	---	---	–/120/90
25 ≤ Ø ≤ 50 mm			
50 ≤ Ø ≤ 80 mm			
Tied cable bundle ≤ Ø 100 mm			

C.4.1.2 Small conduits and tubes

– Ø ≤ 16 mm, wall thickness ≥ 1 mm, arranged linear, with or without cables, with or without cable supports, minimum distance to each other = 0 mm
– Penetrating services (C_1) with or without support tray within the seal, see Figure 10 of the certificate.

Penetration seal type:	Type 1 (Blocks + Filler)	Type Putty 1 (Blocks, Filler + 1x Putty)	Type Putty 2 (Blocks, Filler + 2x Putty)
	FRL (Fire Resistance Level)		
Plastic conduits and tubes Ø ≤ 16 mm	---	---	–/120/90
Steel conduits and tubes Ø ≤ 16 mm			

C.4.1.3 Bus bar

– Bus bars (C_1) with or without support tray within the seal, see Figure 10 of the certificate.

Penetration seal type:	Type 1 (Blocks + Filler)	Type Putty 1 (Blocks, Filler + 1x Putty)	Type Putty 2 (Blocks, Filler + 2x Putty)
	FRL (Fire Resistance Level)		

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EAE ELEKTRIK – Type: E-Line KXC 40505-B; up to 4000A – Maximum outer dimension of the section: 372 mm x 150 mm – Conductor material: Copper – Maximum number of conductors: 10 – Maximum section of the conductors: 140 mm x 6 mm	---	---	–/120/90

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C.5 Rigid floors according to Annex C.1.1 of the certificate- minimum floor thickness 150 mm

C.5.1 Blank seal (no services) *

Maximum seal size: 1000 x 700 mm or an area of 7000 cm²

Construction details (for symbols and abbreviations see Annex A.3 of the certificate):

Hilti Firestop Blocks CFS-BL (A) of thickness t_A ≥ 200 mm, flush with the soffit of the floor (E); aperture framing or beading (E_1) according to Annex C.1.2 of the certificate.
Additional support construction for large seal size: metal band of 30 mm width and of 2 mm thickness.

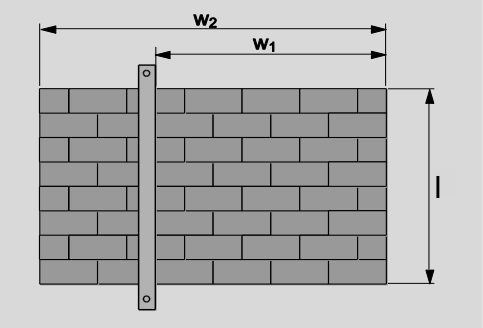

Figure 11: blank seal in floors

Blank seal measurements in floors:	FRL (Fire Resistance Level)
without support construction (w_2 x l): 1000 x 700 mm	–/60/60
with support construction (w_2 x l): 1000 x 700 mm	–/120/120
without support construction (w_1 x l): 500 x 700 mm	

* If services are added later on in a blank seal only the services listed in the tables below may be added that fulfill the required FRL (Fire Resistance Level).

C.5.2 Penetrating services in floors – 150 mm floor thickness

For floor installation maximum distance of 1st service support: 230 mm.

Abbreviation	Description
A, A_1, A_2, ...	Firestop products: A Hilti Firestop Block CFS-BL A_1 Hilti Firestop Filler CFS-FIL A_2 Hilti Firestop Putty Bandage CFS-P BA
C, C_1, C_2, ...	Penetrating services
E, E_1, E_2, …	Separating elements
t_E	Thickness of the building element

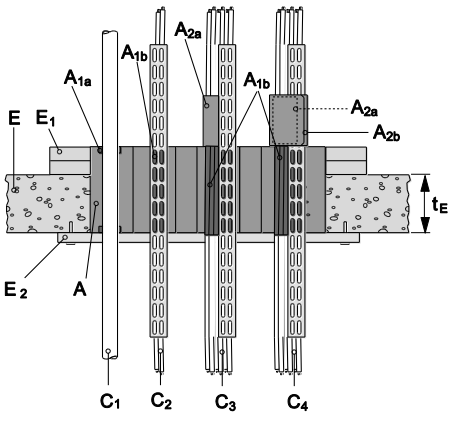

Figure 12: floor penetration

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Construction details (for symbols and abbreviations see Annex C.5.2 of the certificate):

Hilti Firestop Blocks CFS-BL (A) of thickness $t_A \geq 200$ mm, flush with the soffit of the floor (E); aperture framing or beading (E_1) according to Annex C.1.2 of the certificate.

Penetrating services (C_1) with or without support tray within the seal, see Figure 12 of the certificate.
Penetrating cables (C_2, C_3, C_4) with or without support tray within the seal, see Figure 12 of the certificate.

For penetrations without support trays the following seal types apply:

- Penetration seal type 1 – blocks and filler (A_{1a}) according to Annex C.1.3.1a of the certificate
- Penetration seal type putty 1 – blocks, filler and 1 layer putty bandage, according to Annex C.1.3.2a of the certificate– on the top side only
- Penetration seal type putty 2 – blocks, filler and 2 layers putty bandage, according to Annex C.1.3.3a of the certificate– on the top side only

For penetrations with support trays the following seal types apply:

- Penetration seal type 1 – blocks and filler (A_{1b}) according to Annex C.1.3.1b of the certificate
- Penetration seal type putty 1 – blocks, filler and 1 layer putty bandage, according to Annex C.1.3.2b of the certificate– on the top side only
- Penetration seal type putty 2 – blocks, filler and 2 layers putty bandage, according to Annex C.1.3.1b of the certificate– on the top side only

C.5.2.a) Cables

– All types of cables currently and commonly used in building practice (e.g. power, control, signal, telecommunication, data, optical fibre cables, with or without cable supports)

Penetration seal type:	**Type 1 (Blocks +Filler)**	**Type Putty 1 (Blocks, Filler + 1x Putty)**	**Type Putty 2 (Blocks, Filler + 2x Putty)**
All sheathed cables:	**FRL (Fire Resistance Level)**		
Ø ≤ 25 mm	–/120/90	–/120/90	–/120/120
25 ≤ Ø ≤ 50 mm			
50 ≤ Ø ≤ 80 mm			
PVC or XLPE insulated D1 Power Cable included but not limited to Submian, TPS, SDI, Fire rated cable, security cable and earth cable with or without cable tray (Standard D1 cable set, in accordance with AS 1530.4: 2014 Appendix D	–/120/90	-	
PVC or XLPE insulated D2 Communication Cable included but not limited to Data cable, CAT 6, Optic fibre, with or without cable tray (Standard D2 cable set, in accordance with AS 1530.4: 2014 Appendix D	–/120/90	-	
Tied cable bundle ≤ Ø 100 mm; Ø single cable ≤ 21 mm	–/120/120	–/120/120	
Non-sheathed cables (wires) Ø ≤ 17 mm	–/120/90	–/120/90	
Non-sheathed cables (wires) Ø ≤ 24 mm	–/120/90	–/120/60	

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C.5.2.b) Small conduits and tubes

- Ø ≤ 16 mm, wall thickness ≥ 1 mm, arranged linear, with or without cables, with or without cable supports, minimum distance to each other = 0 mm
- Penetrating services (C_1) with or without support tray within the seal, see Figure 12 of the certificate

Penetration seal type:	**Type 1 (Blocks +Filler)**	**Type Putty 1 (Blocks, Filler + 1x Putty)**	**Type Putty 2 (Blocks, Filler + 2x Putty)**
	FRL (Fire Resistance Level)		
Plastic conduits and tubes Ø ≤ 16 mm	–/120/120	---	---
Steel conduits and tubes Ø ≤ 16 mm	–/120/120	---	---
Single plastic conduits and tubes: Rigid and flexible: PE, PP, PPE, PPO; Rigid: PVC, up to 40 mm dia filled with cables or optic fibres or empty	–/120/120	---	---
Bundle Ø ≤ 100 mm of rigid or flexible conduits - Ø of single conduits ≤ 20 mm	–/120/120	---	---

C.5.2.c) Waveguides (coaxial)

- Hilti Firestop Blocks CFS-BL (A) of thickness tA ≥ 200 mm, centered regarding the thickness of the floor (E); aperture framing or beading (E1) according to Annex C.1.2 of the certificate.
- Waveguides 27.8 mm ≤ Ø ≤ 59.9 mm (C1) without support tray within the seal, see Figure ~~10~~ 12 of the certificate.
- Additional protection: 0.7 mm thick “Hilti Firestop Coating CFS-CT” over a length of 150 mm from the surface of the penetration seal on each side of the floor.

Penetration seal type:	**Type 1 (Blocks + Filler) + Coating**	**Type Putty 1 (Blocks, Filler + 1x Putty)**	**Type Putty 2 (Blocks, Filler + 2x Putty)**
Waveguides (coaxial):	**FRL (Fire Resistance Level)**		
RFS Cellflex LCF 78-50 JA Ø 27.8 mm RFS Cellflex LCF 214-50 J Ø 59.9 mm RFS Heliflex HCA 78-50 JFNA Ø 28.0 mm RFS Heliflex HCA 158J Ø 59.9 mm RFS Radialflex RLKW 78-50 Ø 28.5 mm RFS Radialflex RLKU 158-50 JFLA Ø 48.2 mm	---	---	-/120/120

C.5.2.d) Metal pipes (with insulation)

- Hilti Firestop Blocks CFS-BL (A) of thickness t_A ≥ 200 mm, flush with the soffit of the floor (E); aperture framing or beading (E_1) according to Annex C.1.2 of the certificate.
- Metal pipes (C_1), see Figure 12 of the certificate.
- Metal pipes with mineral wool insulation, minimum density 85 kg/m^3, minimum thickness 20 mm (up to Ø 54 mm) or 30 mm (Ø > 54 mm)
- Additional insulation, mineral wool mat wrapped around the service, minimum density 85 kg/m^3, minimum thickness 20 mm (up to Ø 54 mm) or 40 mm (Ø > 54 mm) over a length of 300 mm (up to Ø 54 mm) or 500 mm (Ø > 54 mm)

Penetration seal type:	**Type 1 (Blocks + Filler) + Mineral wool**	**Type Putty 1 (Blocks, Filler + 1x Putty)**	**Type Putty 2 (Blocks, Filler + 2x Putty)**
Mineral wool insulated metal pipes:	**FRL (Fire Resistance Level)**		
Copper pipes, up to Ø 54 mm, wall thickness 1.0/1.5 mm[8] – 14.2 mm[4], insulation CS mineral wool	–/120/120	---	---
Steel pipes, up to Ø 159 mm, wall thickness 1.0/2.0 mm[9] – 14.2 mm[2], insulation LS mineral wool, minimum length 1200 mm (up to Ø 54 mm) or 1800 mm (Ø > 54 mm), or CS	–/120/120	---	---

[8] Interpolation of minimum pipe wall thickness between 1.0 mm for diameter 28 mm and 1.5 mm for 54 mm for pipe diameters in between. The results are also valid for pipe diameters < 28 mm
[9] Minimum pipe wall thickness between 1.0 mm for diameter 28 – 54 mm (Cu pipe) and 2.0 mm for pipe diameters up to 159 mm. The results are also valid for pipe diameters < 28 mm

- Hilti Firestop Blocks CFS-BL (A) of thickness t_A ≥ 200 mm, flush with the soffit of the floor (E); aperture framing or beading (E_1) according to Annex C.1.2 of the certificate.
- Metal pipes (C_1), see Figure 12 of the certificate.
- Metal pipes with flexible elastomeric foam insulation, thickness 8.5 to 43 mm.
- Additional insulation, Armaflex mat wrapped around the service, thickness 19 mm, over a length of 300 mm or 500 mm

Penetration seal type:	**Type 1 (Blocks + Filler) + Armaflex**	**Type Putty 1 (Blocks, Filler + 1x Putty)**	**Type Putty 2 (Blocks, Filler + 2x Putty)**
Elastomeric foam insulated metal pipes:	**FRL (Fire Resistance Level)**		
Copper pipes, up to Ø 54 mm, wall thickness 1.0/1.5 mm[3] – 14.2 mm[4], Armaflex insulation CS, thickness 8.5 – 43 mm[6]	–/120/120	---	---

The field of application given above is also valid for other metal pipes with lower heat conductivity than copper and a melting point of minimum 1100°C, e.g. unalloyed steel, low alloyed steel, cast iron, stainless steels, Ni alloys (NiCu, NiCr and NiMo alloys) and Ni.

- Hilti Firestop Blocks CFS-BL (A) of thickness t_A ≥ 200 mm, flush with the soffit of the floor (E); aperture framing or beading (E_1) according to Annex C.1.2 of the certificate.
- Metal pipes (C_1), see Figure 12 of the certificate.
- Metal pipes with flexible elastomeric foam insulation, thickness 8.5 to 43 mm.
- Additional insulation, mineral wool mat wrapped around the service, thickness 30 mm, over a length of 500 mm

Penetration seal type:	**Type 1 (Blocks + Filler) + Mineral wool**	**Type Putty 1 (Blocks, Filler + 1x Putty)**	**Type Putty 2 (Blocks, Filler + 2x Putty)**

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Elastomeric foam insulated metal pipes:	**FRL (Fire Resistance Level)**		
Steel pipes, up to Ø 159 mm, wall thickness 2.0 mm – 14.2 mm[4], insulation CS mineral wool, thickness 30 mm or more	–/120/120	---	---
The field of application given above is also valid for other metal pipes with lower heat conductivity than unalloyed steel and a melting point of minimum 1100°C, e.g. low alloyed steel, cast iron, stainless steels, Ni alloys (NiCu, NiCr and NiMo alloys)			

- Hilti Firestop Blocks CFS-BL (A) of thickness tA ≥ 200 mm, flush with the soffit of the floor (E); aperture framing or beading (E1) according to Annex C.1.2 of the certificate.
- Metal pipes (C1), see Figure 12 of the certificate.
- Metal pipes with flexible elastomeric foam insulation, thickness 8.5 to 43 mm.
- Additional insulation, mineral wool mat wrapped around the service, minimum density 85 kg/m^3, minimum thickness 20 mm (up to Ø 114 mm) or 40 mm (Ø > 114 mm) over a length of 300 mm (up to Ø 114 mm) or 500 mm (Ø > 114 mm)
- Additional protection, 2 layer of Hilti Firestop Putty Bandage CFS-B (A_2) is wrapped around the tube with insulation.

Penetration seal type:	**Type 1 (Blocks + Filler)**	**Type Putty 1 (Blocks, Filler + 1x Putty)**	**Type Putty 2 (Blocks, Filler + 2x Putty) + Mineral wool**
Elastomeric foam insulated metal pipes:	**FRL (Fire Resistance Level)**		
Steel pipes, up to Ø 114 mm, wall thickness 1.0/2.0 mm[5] – 14.2 mm[4], insulation CS Armaflex, thickness 15 – 43 mm	---	---	–/120/90
Steel pipes, Ø 114 – 159 mm, wall thickness 2.0 mm – 14.2 mm[4], insulation CS Armaflex, thickness 15 – 19 mm[10]	---	---	–/120/90
Steel pipes, Ø 114 mm, wall thickness 2,0 mm – 14.2 mm[4], insulation CS Armaflex, thickness 15 – 43 mm[6]	---	---	–/120/90
Steel pipes, Ø 114 mm, wall thickness 2,0 mm – 14.2 mm[4], insulation CS Armaflex, thickness 43 mm	---	---	–/120/120
Steel pipes, Ø 159 mm, wall thickness 2,0 mm – 14.2 mm[4], insulation CS Armaflex, thickness 19 mm	---	---	–/120/120
The field of application given above is also valid for other metal pipes with lower heat conductivity than unalloyed steel and a melting point of minimum 1100°C, e.g. low alloyed steel, cast iron, stainless steels, Ni alloys (NiCu, NiCr and NiMo alloys)			

[10] Interpolation of insulation thickness 15 mm and 19 mm for pipe diameter 114 mm and 159 mm for insulation thicknesses and pipe diameters in between.

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C.6 Combination of Hilti Firestop Block CFS-BL with other Hilti Firestop products

Hilti Firestop Block CFS-BL may be combined with other Hilti Firestop products. In cases where services are only running through the area of products used in addition, the certificate specifications of this product have to be followed.	
Hilti Firestop Foam CFS-F FX	a) Hilti Firestop Foam CFS-F FX is used in area without services as gap filling of upper space of penetration where otherwise a Hilti Firestop Block CFS-BL has to be cut to close the aperture of the penetration seal. Blank seal with a seal depth of 200 mm is FRL (Fire Resistance Level) -/120/120. b) Service penetrations within foam penetration seal– maximum size of foam area 400x400 mm: • Hilti Firestop Blocks CFS-BL are installed in the aperture partially for e.g. in the lower part only or • building a frame. This frame can be built also after applying the foam, around the foam seal. • Services running through the opening or the block frame are sealed with Hilti Firestop Foam CFS-F FX • Distance rules are applied to seal frames (no block in between) or to block frame to aperture frame or services.
Hilti Firestop Plug CFS-PL Ø 110 within a plastic sleeve	Hilti Firestop Plug CFS-PL Ø 110 can be used in a wall or floor penetration sealed by Hilti Firestop Blocks CFS-BL. • The plug has to be placed in a PVC pipe sleeve (wall thickness of pipe: 2 to 6 mm) of 200 mm in length, installed flush with the block seal. • The distances to other services or edges are at least 50 mm. • The sleeve is closed by Hilti Firestop Plug CFS-PL Ø 110 on each side.

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Test Reports:

Name of Test Institute	Owner	Number of Report	Date of Test	Test standard
EFECTIS France	**HILTI AG** Feldkircher Str. 100 LI-9494 Schaan	08-E-079-F date 11.08.2008	13/03/2008	prEN 1366-3: 2006
EFECTIS France	**HILTI AG** Feldkircher Str. 100 LI-9494 Schaan	07-E-317 date 10.04.2008	11/10/2007	prEN 1366-3: 2006
AFITI LICOF Centre for Fire Testing and Research	**HILTI AG** Feldkircher Str. 100 LI-9494 Schaan	Nr 8686/12 date 23.07.2012	28/03/2012	EN 1366-3: 2009
AFITI LICOF Centre for Fire Testing and Research	**HILTI AG** Feldkircher Str. 100 LI-9494 Schaan	Nr 8717/12 date 03.08.2012	09/05/2012	EN 1366-3: 2009
AFITI LICOF Centre for Fire Testing and Research	**HILTI AG** Feldkircher Str. 100 LI-9494 Schaan	Nr 8718/12 date 29.10.2012	23/05/2012	EN 1366-3: 2009
AFITI LICOF Centre for Fire Testing and Research	**HILTI AG** Feldkircher Str. 100 LI-9494 Schaan	Nr 8688/12 date 29.10.2012	19/04/2012	EN 1366-3: 2009
CSIRO – Manufacturing and Infrastructure Technology	**HILTI (Aust.) Pty Ltd** 23 Egerton Road, Silverwater NSW Australia	FSV 0917 date 30/09/2002	31/08/2002	AS1530.4-1997
CSIRO – Manufacturing and Infrastructure Technology	**HILTI (Aust.) Pty Ltd** 23 Egerton Road, Silverwater NSW Australia	FSV 0857 date 04/09/2001	15/06/2001	AS1530.4-1997
WFRGENT nv	**HILTI AG** Feldkircher Str. 100 LI-9494 Schaan	19928A, date 05.02.2015	10/04/2020	EN 1366-3: 2009
WFRGENT nv	**HILTI AG** Feldkircher Str. 100 LI-9494 Schaan	19929A, date 10.04.2020	15/10/2019	EN 1366-3: 2009
WFRGENT nv	**HILTI AG** Feldkircher Str. 100 LI-9494 Schaan	19691A, date 24.04.2020	27/05/2019	EN 1366-3: 2009
WFRGENT nv	**HILTI (Aust.) Pty Ltd** P.O. Box 3217, Rhodes NSW 2138 Australia	FRT190130, date 31.07.2019	11.07.2019	AS1530.4-2014
WFRGENT nv	**HILTI AG** Feldkircher Str. 100 LI-9494 Schaan	19692A, date 24.04.2020	28/05/2019	EN 1366-3: 2009
WFRGENT nv	**HILTI AG** Feldkircher Str. 100 LI-9494 Schaan	19930A, date 10.04.2020	15/10/2019	EN 1366-3: 2009

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Test Reports (continued):

Name of Test Institute	Owner	Number of Report	Date of Test	Test standard
WFRGENT nv	**HILTI AG** Feldkircher Str. 100 LI-9494 Schaan	21500A, date 05.04.2022	22/10/2021	EN 1366-3: 2009
IBS – Institut für Brandschutztechnik und Sicherheitsforschung Gesellschaft m.b.H.	**HILTI AG** Feldkircher Str. 100 LI-9494 Schaan	320040703-5, date 27.01.2021	16/09/2020	EN 1366-3: 2009
WFRGENT nv	**HILTI AG** Feldkircher Str. 100 LI-9494 Schaan	18322A, date 13.06.2017	04/04/2017	EN 1366-3: 2009
MFPA Leipzig GmbH	**Hilti Entwicklungsgesellschaft GmbH** Hiltistraße 6, 86916 Kaufering, Germany	PB 3.2/17-163-1, date 03.11.2017	15/02/2018	EN 1366-3: 2009
MFPA Leipzig GmbH	**Hilti Entwicklungsgesellschaft GmbH** Hiltistraße 6, 86916 Kaufering, Germany	PB 3.2/17-163-2, date 23.11.2017	15/02/2018	EN 1366-3: 2009