EN

DECLARATION OF PERFORMANCE

according to Annex III of the Regulation (EU) Nr. 305/2011 (Construction Products Regulation)

Hilti Firestop Plug CFS-PL

No. Hilti CFS-PL

1. Unique identification code of the product-type:
Hilti Firestop Plug CFS-PL

2. Intended use:
Fire Stopping and Sealing Product for Penetration Seals, see ETA-13/0125 (16.04.2018)

Cable penetrations	Cables, Cable bundles, Conduits	**The field of application has to comply with the content of the ETA-13/0125**

3. Manufacturer:
HILTI Corporation, Feldkircherstrasse 100, 9494 Schaan, Principality of Liechtenstein

4. System of AVCP:
System 1

5. European Assessment Document:
EAD 350454-00-1104

European Technical Assessment:
ETA-13/0125 (16.04.2018)

Technical Assessment Body:
OIB Austrian Institute of Construction Engineering

Notified body/s:
MPA Braunschweig, No. 0761

6. Declared performance:

Essential characteristic	Declared performance / Harmonised technical specification
Reaction to fire	Class E according to EN 13501-1
Resistance to fire	Resistance to fire performance and field of application in accordance with EN 13501-2. See Annex
Dangerous substances	See Annex
Protection against noise	Tested according to EN ISO 140-3, EN ISO 717-1 and EN ISO 20140-10. See Annex
Thermal properties	Tested according EN 12667, See ETA-13/0125. See Annex
Electrical properties	Tested according to DIN IEC 60093 (VDE 0303 Part 30):1993-12). See Annex
Durability and serviceability	Y_1 in accordance with EOTA Technical Report - TR024
Other	Not applicable / No performance determined

The performance of the product identified above is in conformity with the set of declared performances. This declaration of performance is issued in accordance with Regulation (EU) No 305/2011, under the sole responsibility of the manufacturer identified above.

Signed for and on behalf of the manufacturer by:

Jessica Bello-Salguero
Product Manager
Business Unit Fire Protection
Hilti Corporation

Martin Althof
Head of Quality
Business Unit Fire Protection
Hilti Corporation

Schaan, 16 April 2018

3.3.3 Dangerous substances

Hilti AG have presented a Material Safety Data Sheet according to Regulation 1907/2006/EC, article 31 and a declaration that Hilti Firestop Plug CFS-PL is in compliance with Regulation 1907/2006/EC concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH).

Confirmation has been declared that all dangerous chemical substances have been considered for the classification of the products according to the Regulation 1272/2008/EC (classification, labelling and packaging of substances and mixtures, including amendments).
In addition to the specific clauses relating to dangerous substances contained in this European technical approval, there may be other requirements applicable to the products falling within its scope (e.g. transposed European legislation and national laws, regulations and administrative provisions). In order to meet the provisions of the Construction Products Directive, these requirements need also to be complied with, when and where they apply.

3.5 Protection against noise (BWR 5)

3.5.1 Airborne sound insulation

Test reports from noise reduction according to EN ISO 140-3 have been provided.
The acoustic tests were performed in a flexible wall, both sides attached by a double layer of 15,8 mm (5/8") gypsum board. The void between the plaster boards was filled with 100 mm mineral wool insulation.

Hilti firestop plug CFS-PL was tested as blank seal. The acoustic characteristic of the walls itself has been measured before an opening of Ø 114,5 (4-1/2") with a metal sleeve of Ø 114,5 mm inserted was made. The sleeve was sealed either on one side (single plug) or on both sides (double plug) with a plug. Sound reduction is determined for

Single plug: Rw (C; Ctr) = 54 (0; -6).
Double plug: Rw (C; Ctr) = 54 (-1; -7).
R_w: weighted sound reduction index (given with spectrum adaptation terms C and C_{tr})

3.6.1 Thermal properties

Hilti firestop plug CFS-PL was tested according EN 12667.

Thermal conductivity λ = 0,089 W/mK and thermal resistance R = 0,563 m_2K/W.

3.8.2 Electrical resistivity

Electrical volume resistivity: 2,17E+9 (± 0.5)Ωcm;

Electrical surface resistivity: 49,6E+9 (± 10)Ω

A1.1 Abbreviations used in drawings

Abbreviation	Description	Abbreviation	Description
A, A1, A2,..	Firestop products	tA	Thickness of penetration seal
C, C1, C2,..	Penetrating services	tE	Thickness of the building element
E, E1, E2,…	Building elements (wall, floor)		
w	Ø of penetration seal		
s1, s2, sn	Distances		

ANNEX 3

RESISTANCE TO FIRE CLASSIFICATION OF PENETRATION SEALS MADE OF HILTI FIRESTOP PLUG CFS-PL, HILTI FIRESTOP FILLER CFS-FIL AND HILTI FIRESTOP PUTTY BANDAGE CSF-P BA

a) A3.1 General Information
A3.1.1 Wall/floor constructions
b) Flexible wall: The wall must have a minimum thickness of 100 mm and comprise of timber or steel studs lined on both faces with minimum 2 layers of 12,5 mm thick boards according EN 520 type F. In steel stud construction the space between linings has not to be completely filled with insulation material, especially in the vicinity to the seal. Nevertheless the wall has to be set up according requirements. For timber stud walls there must be a minimum distance of 100 mm of the seal to any stud and the cavity between stud and seal must be closed by a minimum of 100 mm insulation of Class A1 or A2 (in accordance with EN 13501-1). c) Rigid wall: The wall must have a minimum thickness of 100 mm and comprise of concrete, aerated concrete or masonry, with a minimum density of 600 kg/m^3. d) Rigid floor: The floor must have a minimum thickness of 150 mm and comprise of aerated concrete or concrete with a minimum density of 600 kg/m^3. The walls / floors must be classified in accordance with EN 13501-2 for the required fire resistance period or fulfil the requirements of the relevant Eurocode. This ETA does not cover use of the product as a penetration seal in sandwich panel constructions.

A3.1.2 Beading

The penetration seal depth is minimum 150 mm (figure 1a, t_A) independent of the thickness of the wall or floor. In case of walls or floors with a thickness of less than 150 mm a beading has to be used.

Beading: square plates made of gypsum or Calcium Silicate board at a size of 2x W_A (100 mm) plus W (figure 1c, diameter of plug), are installed around the opening at the necessary number of layers. Two frames of the same height on both sides of a wall (figure 1a) have to be built.

It was proofed that no aperture framing is necessary.

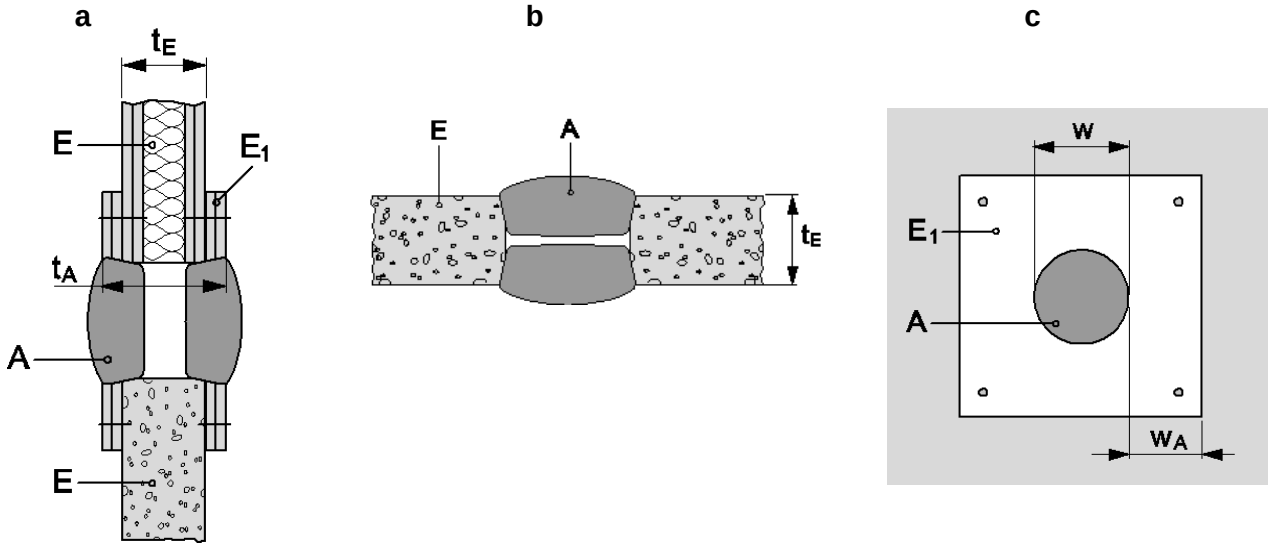


Figure 1: beading and position of the seal in walls / floors

A	Hilti firestop product	t_E	Thickness of the building element
E	Building element (rigid or flexible wall construction, floor)	w	Ø of the seal
E1	Support frame	w_A	Width of the frame, 100 mm
t_A	Thickness of the seal		

A3.1.3 Penetration seal types

A3.1.3.1 Penetration seal type: Filler

- Gaps between services and Hilti Firestop Plugs CFS-PL (A) are filled with Hilti Firestop Filler CFS-FIL (A_1), depth 20 mm.

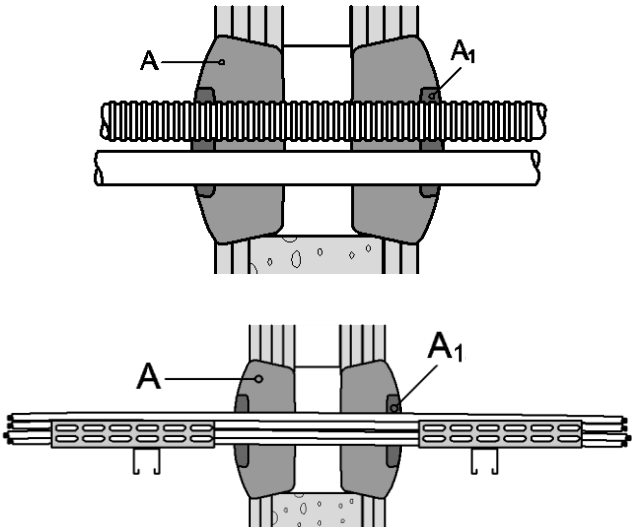


Figure 2: seal type A1

A3.1.3.2 Penetration seal type: Putty 2x

- Gaps between services and Hilti Firestop Plugs CFS-PL (A) are filled with Hilti Firestop Filler CFS-FIL (A_1), depth 20 mm.
- Two layers of Hilti Firestop Putty Bandage CFS-P BA (A_2) are wrapped around the services or group of services.

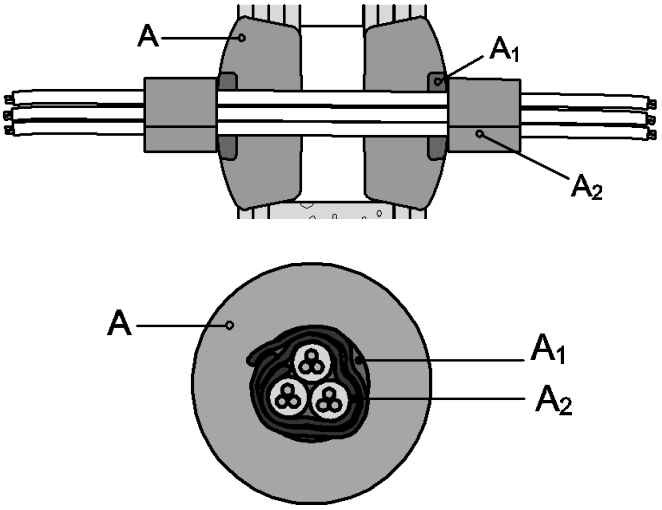


Figure 3: filler (A_1) plus 2 layers of putty bandage (A_2)

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.

A3.1.3.3 Distance Requirements

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

Minimum distances in mm (see illustration):

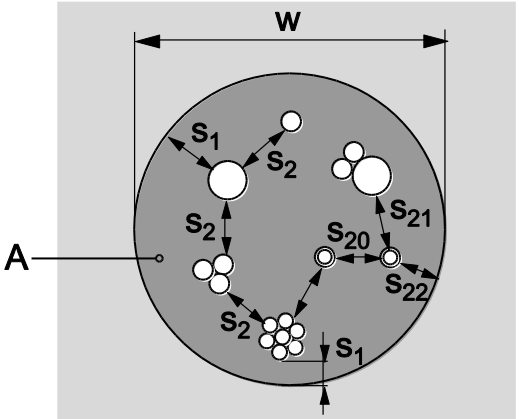
s_1 = 0 (distance between cables and seal edge)

s_2 = 0 (distance between cables)

$s_{20,21,22}$ = 0 Ø≤16 mm

s_{20} = 0 Ø>16 mm (distance between conduits to each other)

$s_{21,22}$ = 20 Ø>16 mm (distance between conduits and other services or seal edges)



A3.2 Flexible or rigid walls according to A3.1.1 - minimum wall thickness 100 mm

A3.2.1 Blank seal (no services) *

- Construction details (for symbols and abbreviations see figure 1 and Annex 4.1):
- Hilti firestop plugs CFS-PL (A) of seal thickness $t_A \geq$ 150 mm, centered regarding the thickness of the wall (E); beading (E1) according to 2.1.2.
- Hilti firestop plug can be installed in the round opening directly or alternatively in a fitted plastic sleeve (PVC, 2 mm wall thickness, 150 mm length, flush to wall). Last one can be also used according below mentioned cable sealing classifications.

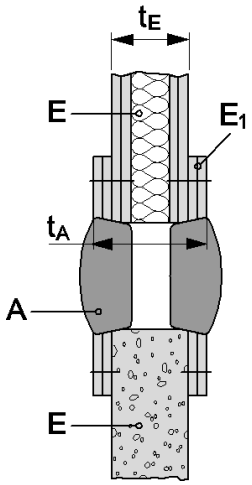


Figure 4: blank seal

	Classification
Seal size Ø: 52 to 250 mm	EI 120

* 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 classification.

A3.2.2 Penetrating services

- Seal size Ø: 52 to 250 mm
- Hilti firestop plugs CFS-PL (A) of thickness $t_A \geq 150$ mm,
- centered regarding the thickness of the wall (E);
- beading (E1) according to A3.1.2.

Maximum distance of 1st service support ≤ 250 mm (measured from the beading).

Abbreviation	**Description**
A, A_1, A_2,..	Firestop products: A Plug A_1 Filler A_2 Putty bandage
C_1, C_2, C_3	C_1 conduits C_2 single cables C_3 cable bundle
E, E_1, E_2,…	Building elements
t_E	Thickness of the building element

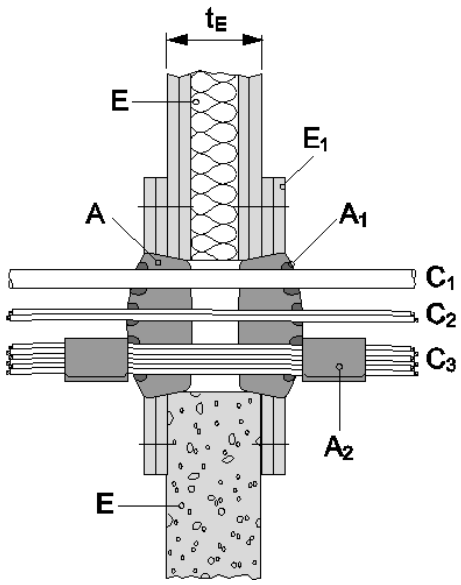


Figure 6: wall penetration

A3.2.2.a) Cables

Construction details

• Illustration figure 6 • Penetrating services C_2, C_3	Penetration seal type: • Filler (A_1, A3.1.3.1) • Putty 2x (A_2, A3.1.3.3)

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

Penetration Seal Type	**Filler**	**Filler + Putty 2x**
	Classification	
Sheathed cables:		
Ø ≤ 21 mm	EI 120	-
Tied cable bundle ≤ Ø 100 mm; Ø single cable ≤ 21 mm		
21 < Ø ≤ 50 mm	EI 90	EI 120
50 < Ø ≤ 80 mm	EI 90 / E 120	-
Non-sheathed cables (wires): Ø ≤ 24 mm	EI 60 / E 120	-

A3.2.2.b) Small conduits and tubes			
Construction details			
• Illustration figure 6 • Services – C_1		Penetration seal type: • Filler (A_1, A3.1.3.1)	
		Penetration Seal Type	**Filler**
			Classification
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			
Plastic conduits and tubes			EI 120 U/U
Steel conduits and tubes			EI 120 C/U

A3.2.2.c) Conduits				
Construction details				
• Illustration figure 6 • Services – C_1		Penetration seal type: • Filler (A_1, A3.1.3.1)		
				Filler
		Diameter [mm]		**Classification**
		*PO	*PVC	
Flexible conduits	with and without cable	16 - 40	16 - 32	EI 120 U/U
Rigid conduits • Wall thickness: *PO: 1,55 to 2,30 mm *PVC: 1,90 to 2,80 mm	with and without cable	16 - 40	16 - 40	
Bundle of rigid or flexible conduits, single conduits: Ø ≤ 20 mm	with and without cable	≤ 100		
*PO: Polyolefin (PE, PP, PPE, PPO); *PVC: Polyvinylchloride				

A3.3 Rigid floor according to A3.1.1, minimum floor thickness 150 mm

A3.3.1 Blank seal (no services) *

- Hilti Firestop Plugs CFS-PL (A) of thickness $t_A \geq 150$ mm, flush with the soffit of the floor (E);
- beading (E1) according to A3.1.2.

- Hilti firestop plugs CFS-PL (A) on each side.
- seal thickness $t_A \geq 150$ mm .
- for abbreviations see A3.1.2 Figure 1
- W: Ø of penetration, seal size

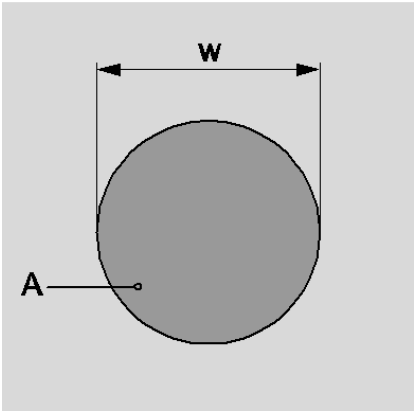


Figure 7: blank seal floor

	Classification
Seal size Ø: 52 to 250 mm	EI 120

* 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 classification.

A3.3.2 Penetrating services

- Seal size: Ø 52 to Ø 250 mm

Abbreviation	**Description**
A, A_1, A_2,..	Firestop products: A: Plug A_1: Filler A_2: Putty bandage
C_1, C_2, C_3	C_1 conduits C_2 single cables C_3 cable bundle
E, E_1, E_2,…	Building elements
t_E	Thickness of the building element

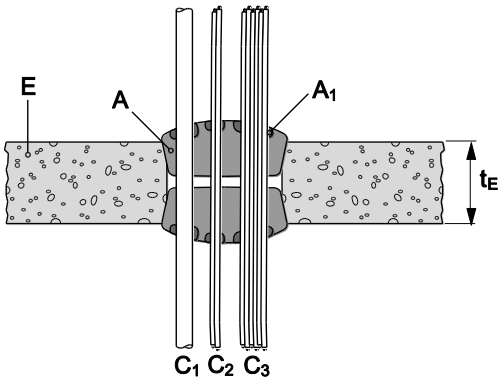


Figure 8: floor penetration

A3.3.2.a) Cables		
Construction details		
• Illustration figure 8 • Penetrating services C_2, C_3	Penetration seal type: Filler (A_1, A3.1.3.1)	
All cable types currently and commonly used in building practice in Europe (e.g. power, control, signal, telecommunication, data, optical fibre cables, with or without cable supports		
Penetration Seal Type Sheathed cables:	**Filler** **Classification**	
Ø ≤ 21 mm	EI 120	
Tied cable bundle ≤ Ø 100 mm; Ø single cable ≤ 21 mm		
21 < Ø ≤ 50 mm		
50 < Ø ≤ 80 mm	E 120	
Non-sheathed cables (wires): Ø ≤ 24 mm	EI 30 / E 120	
A3.3.2.b) Small conduits and tubes		
Construction details		
• Illustration figure 8 • Services – C_1	Penetration seal type: • Filler (A_1, A3.1.3.1)	
	Penetration Seal Type	**Filler**
		Classification
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		
Plastic conduits and tubes		EI 120 U/U
Steel conduits and tubes		EI 120 C/U

<table>
<tr><td colspan="4">A3.3.2.c) Conduits</td></tr>
<tr><td colspan="4">Construction details</td></tr>
<tr><td colspan="2">Illustration figure 8
Services – C_1</td><td colspan="2">Penetrations - seal type:
Filler (A_1, A3.1.3.1)</td></tr>
<tr><td colspan="2" rowspan="3"></td><td colspan="2"></td><td>Filler</td></tr>
<tr><td colspan="2">Diameter [mm]</td><td>Classification</td></tr>
<tr><td>*PO</td><td>*PVC</td><td rowspan="4">EI 120 U/U</td></tr>
<tr><td>Flexible conduits</td><td>with and without cable</td><td>16 - 40</td><td>16 - 32</td></tr>
<tr><td>Rigid conduits
Wall thickness:
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<tr><td>Bundle
of rigid or flexible conduits,
single conduits: Ø ≤ 20 mm</td><td>with and without cable</td><td colspan="2">≤ 100</td></tr>
<tr><td colspan="5">*PO: Polyolefin (PE, PP, PPE, PPO); *PVC: Polyvinylchloride</td></tr>
</table>