EN

DECLARATION OF PERFORMANCE

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

Hilti Firestop Module Box CFS-MB

No. Hilti CFS "0761-CPR-0381"

1. Unique identification code of the product-type:
Hilti Firestop Module Box CFS-MB

2. Intended use:
Fire Stopping and Sealing Product for Penetration Seals, see ETA-14/0088 (25.04.2014)

Cable penetrations	Cables, Cable bundles, Conduits	**The field of application has to comply with the content of the ETA-14/0088**

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

4. System of AVCP:
System 1

5. European Assessment Document:
ETAG No. 026-1 and ETAG No. 026-2

European Technical Assessment:
ETA-14/0088 (25.04.2014)

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 717-1 and EN ISO 10140-1,-2. 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:

Martin Althof
Head of Quality
Business Unit Chemicals
Hilti Corporation

Schaan, March 2016

3.3.3 Release of dangerous substances

According to the manufacturer's declaration Hilti Firestop Module Box CFS-MB does not contain dangerous substances detailed in Council Directive 67/548/EEC and Regulation (EC) no 1272/2008.

In addition to the specific clauses relating to dangerous substances contained in this European Technical Assessment, 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 Product Regulation, 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 dealing with noise reduction according to ISO 140-10:2010, EN ISO 10140-1:2010, EN ISO 10140-2:2010 and EN ISO 717-1:2013 have been provided.

The acoustic tests were performed in a flexible wall, both sides attached by a double layer of 12,5 mm gypsum board. The void between the plaster boards was filled with mineral wool insulation.

Hilti Firestop Module Box was tested as blank seal and with cable penetration.

The Box was filled either with Hilti Firestop block CFS-BL P or Hilti Firestop Foam CFS-F FX.

Single number rating is expressed as R_w value, weighted sound reduction index (given with spectrum adaptation terms C and Ctr)

filled with block:

Rw (C; Ctr) = 59 (-3;-5) dB

Inclusive cables: R_w (C; Ctr) = 60 (-2;-6) dB

filled with foam:

Rw (C; Ctr) = 61 (-1;-6) dB

ANNEX 2

RESISTANCE TO FIRE CLASSIFICATION OF PENETRATION SEALS MADE OF HILTI FIRESTOP MODULE BOX CFS-MB

2.1 General Information

2.1.1 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 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 neighbourhood 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 and a minimum of 100 mm insulation of Class A1 or A2 (in accordance with EN 13501-1) in the cavity between stud and seal is necessary.

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 550 kg/m^3.

c) Rigid floor:

The floor must have a minimum thickness of 150 mm and comprise aerated concrete or concrete with a minimum density of 550 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.

2.1.2 Aperture framing / beading

The penetration seal depth is 200 mm (t_A) comprising by at least a wall/floor of 100/150 mm (t_E).
Aperture framing or beading is not necessary.

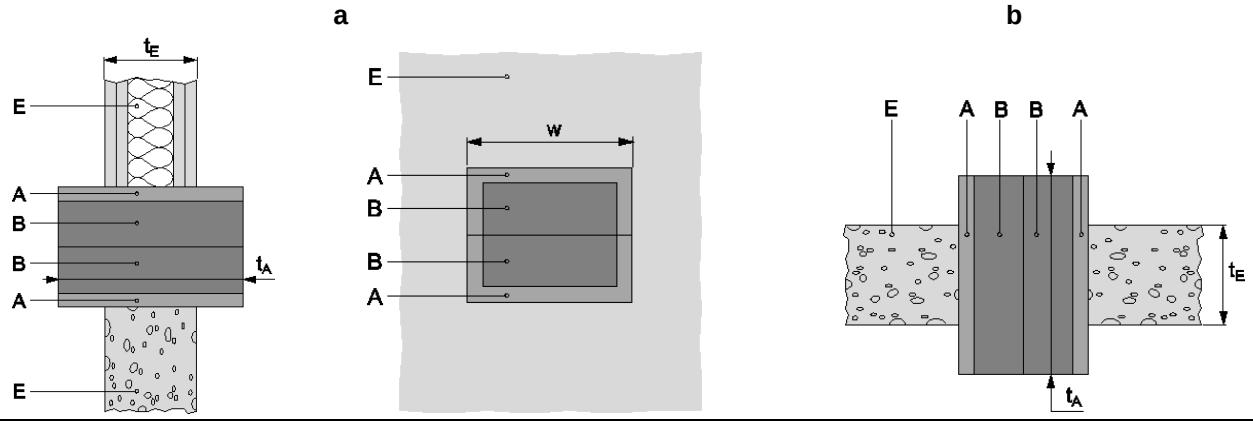


Figure 1: position of the seal in walls a) / floors b)

A	Hilti firestop product	t_E	Thickness of building element
B	Hilti firestop product	w	Width of seal
E	Building element (rigid or flexible wall construction, floor)		
t_A	Thickness of seal		

2.1.3 Maximum Seal Size

- Hilti Firestop Module Box can be used as half or as box (two U halves); box can be clustered.
- The maximum cluster is 3x3 boxes aside which cover an area of approximately 495 to 405 mm (width x height).

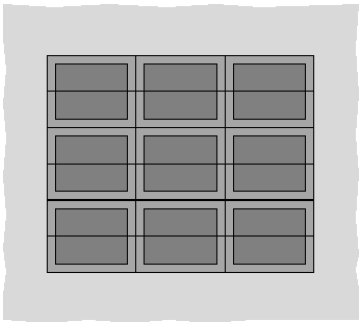


Figure 2

2.1.4 Penetration sealings

2.1.4.1 General installation

- Hilti Firestop Module Box CFS-MB (2xA) or its half (A) is put into a rectangular void of wall or floor; centred within wall/floor. In case only the half is used, the open side has to face a wall or floor.
- The gap between wall/floor and box must not exceed 15 mm (t_F) and can be closed with Hilti Firestop Filler CFS-FIL, Hilti Firestop Sealant CFS-S ACR or plaster.
- See figure 3

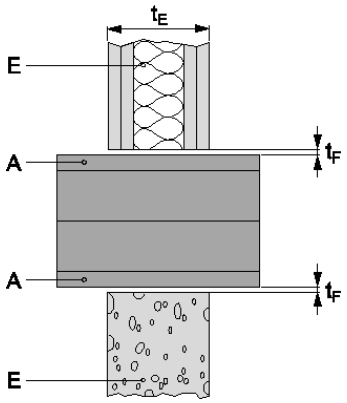


Figure 3

- Gaps between services and Hilti Firestop Module Box CFS-MB (A) or blocks (B) are filled with Hilti Firestop Filler CFS-FIL (A_{1a}), depth 20 mm.
- In case Hilti Firestop Foam CFS-F FX is used instead of blocks to fill the module box cavity CFS-FIL is not applied.

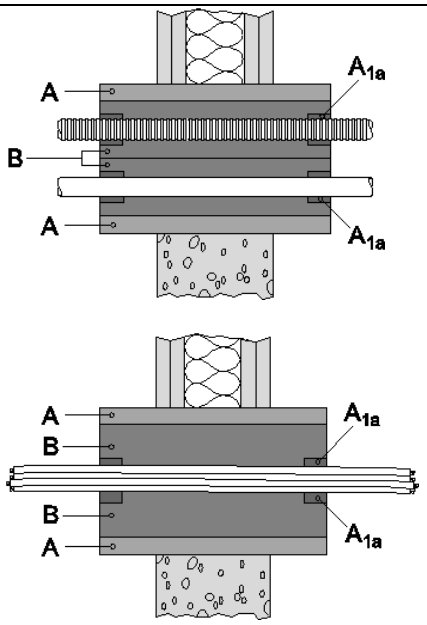


Figure4: basic sealing - A_{1a}

2.1.4.2 Additional protection - Filler coating (A_{1c})

- Gaps between services and Hilti Firestop Module Box CFS-MB (2xA) and blocks (B) are filled with Hilti Firestop Filler CFS-FIL (A_{1a}), depth 20 mm.
- In some cases Filler coating can be used to improve classification. Cables are then covered by Hilti Firestop Filler CFS-FIL at a length of approximately 50 mm (t_{1c}) and 5 mm in thickness (A_{1c}).
- In case foam is used to fill up box, coating (A_{1c}) can be done with foam like as filler at 5 mm thickness, but at a length of 100 mm.

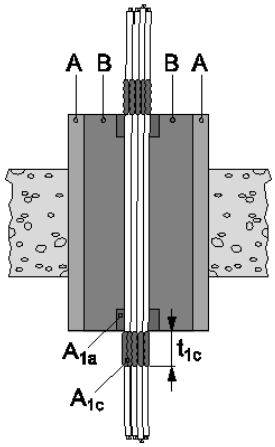


Figure 4: Coating with filler or foam (A_{1c})

2.1.5 Cluster arrangement

Minimum distances in mm (see illustration):

S_a = 0 (distance between module boxes linear)

S_b = 0 (distance between module boxes in cluster arrangement)

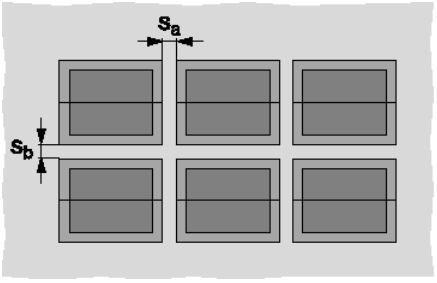


Figure 6

2.1.6 Distance Rule

Distances valid for wall and floor installations.

Minimum distances in mm (see illustration):

s_1 = 0 (distance between cables and box edge)

s_2 = 0 (distance between cables or bundles)

$s_{20,21,22}$ = 0 (conduits Ø≤16 mm)

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

s_{22} = 10 (conduits Ø>16 mm; distance between conduits to box edge)

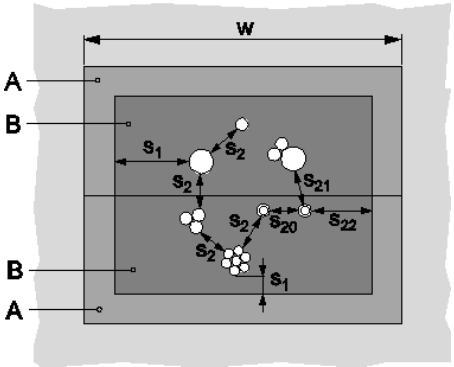


Figure 7

s_{21} = 20 (conduits Ø>16 mm; distance of conduits to other services)	

2.2 Flexible or rigid walls according to 2.1.1 - minimum wall thickness 100 mm

2.2.1 Blank seal (no services) *

- Construction details (for symbols and abbreviations see Annex 4.1):
- Hilti Firestop Module Box (2x U shape).
- Clustered up to 9 boxes in a rectangular manner (495x405 mm / width x height) – see 2.1.5
- Hilti Firestop Module Box half (1x U shape), open side faced towards a surface (wall, floor); integration into wall/floor as for the complete box - see 2.1.4.1

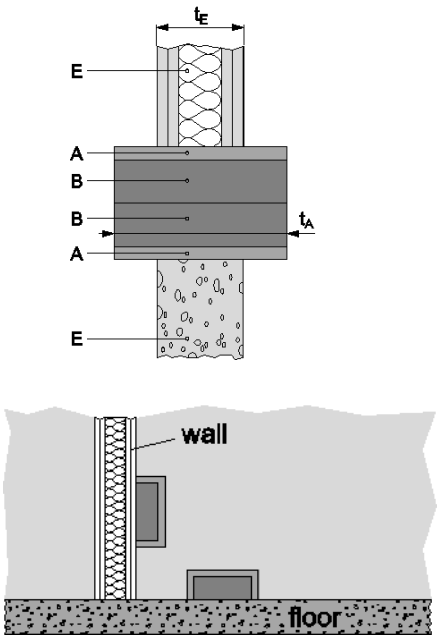


Figure 8: blank seal

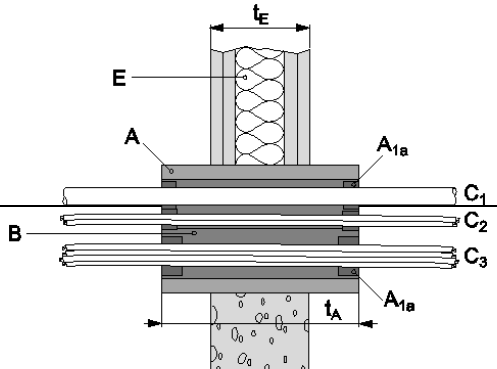
	Classification
Seal Size box: aprox. 160 x 130 mm (width x height) or half shell 160x70 (width x height)	EI 90

* If services are added later on in a blank seal only these services listed in the tables below may be added that fulfill the required classification.

2.2.2 Penetrating services

Services have to be supported at ≤ 300 mm from both faces of wall.

Abbreviation	**Description**
A, A_1, A_2,..	Firestop products: A: Module Box B: Block, Foam A_{1a}: Filler



C_1, C_2, C_3,..	Penetrating services C1 – wave guides, conduits (with /without calbles) C2,3 – cable, cable bundle	Figure 9: wall penetration
E, E_1, E_2,…	Building elements	
t_A	Thickness of the penetration	
t_E	Thickness of the building element	

2.2.2.a) Cables

Construction details	
• Hilti Firestop Module Box (2xA), seal thickness t_A of approximately. 200 mm. • Centered regarding to thickness of wall (E); • Abbreviations see figure 9 (C_2,C_3)	• Filler A_{1a} (2.1.4.1)

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)

		Classification
All sheathed cable:	**Box Insert**	
Ø ≤ 21 mm	CFS-BL P / CFS-F FX	EI 90
21 ≤ Ø ≤ 50 mm	CFS-BL P / CFS-F FX	EI 90
Tied cable bundle ≤ Ø 100 mm; Ø single cable ≤ 21 mm;	CFS-BL P / CFS-F FX	EI 90
100% filled penetration with Ø single cables ≤ 21 mm	-	EI 90
Non-sheathed cables (wires) Ø ≤ 24 mm	CFS-BL P / CFS-F FX	EI 30

Construction details	
• Hilti Firestop Module Box half (A), seal thickness t_A of approximately. 200 mm; open side facing surface. • Centered regarding to thickness of wall (E); • Abbreviations see figure 9 (C_2,C_3)	• Filler A_{1a} (2.1.4.1)

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)

		Classification
All sheathed cable:	**Box Insert**	
Ø ≤ 21 mm	CFS-BL P / CFS-F FX	EI 90
21 ≤ Ø ≤ 50 mm	CFS-BL P / CFS-F FX	EI 90
Tied cable bundle ≤ Ø 100 mm; Ø single cable ≤ 21 mm;	CFS-BL P / CFS-F FX	EI 90
100% filled penetration with Ø single cables ≤ 21 mm	-	EI 90

Non-sheathed cables (wires) Ø ≤ 24 mm	CFS-BL P / CFS-F FX	EI 30

2.2.2.b) Small conduits / pipes and tubes

Construction details	
• Illustration figure 9 • Services – C_1	• Filler – A_{1a} (2.1.4.1)

Ø ≤ 16 mm, wall thickness ≥ 1 mm, arranged linear or clustered, with or without cables, with or without cable supports, minimum distance to each other = 0 mm	**Classification**
Plastic conduits / pipes and tubes	EI 90 U/U
Steel conduits / pipes and tubes	EI 90 C/U

2.2.2.c) Conduits

Construction details	
• Illustration figure 9 • Services – C_1 • Wall thickness of rigid conduits: PO: 1,2 to 2,30 mm PVC: 1,80 to 2 mm	• Filler – A_{1a} (2.1.4.1)

		Diameter [mm]		**Classification**
		PO	PVC	
Flexible conduits	with and without cable	16 - 32	16 - 32	EI 90 U/U
Rigid conduits	with and without cable	16 - 32	16 - 32	EI 90 U/U
Bundle of rigid or flexible conduits, Ø of single conduits ≤ 32 mm	with cable	≤ 100		EI 90 U/U
	without cable			
PO: Polyolefin (PE, PP, PPE, PPO, ...); PVC: Polyvinylchloride				

2.2.2.d) Waveguides (coaxial)

• Illustration figure 9 • Services – C_1	• Filler – A_{1a} (2.1.4.1)

Waveguides (coaxial): 27,8 mm ≤ Ø 59,9 mm	**Classification**
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	EI 90 U/C

2.3 Floor according to 2.1.1, minimum floor thickness 150 mm
2.3.1 Blank seal (no services) *

- Hilti Firestop Module Box (2xU shapes, 2xA).
- Clustered up to 9 boxes in a rectangular manner – see 2.1.5.
- Hilti Firestop Module Box half (1xU shape,1xA)), open side faced towards a surface (wall, floor); integration into wall/floor as for the complete box (2.1.4.1).
- for abbreviations see 2.1.2 Figure 1.

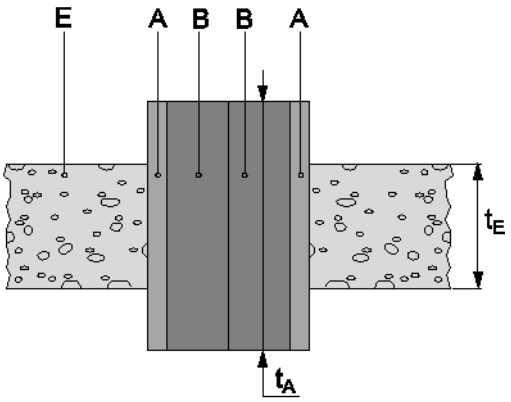


Figure 10: blank seal floor

	Classification
All tested products (CFS-BL P, CFS-F FX)	EI 90

* 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.

2.3.2 Penetrating services – floor application - 150 mm

Services have to be supported at ≤ 300 mm from top of floor.

Abbreviation	**Description**
A, A_1, A_2,..	Firestop products: A: Module Box B: Blocks, Foam A_{1a}: Filler A_2: Putty bandage
C_1, C_2, C_3,..	Penetrating services
E, E_1, E_2,…	Building elements
t_E	Thickness of the building element

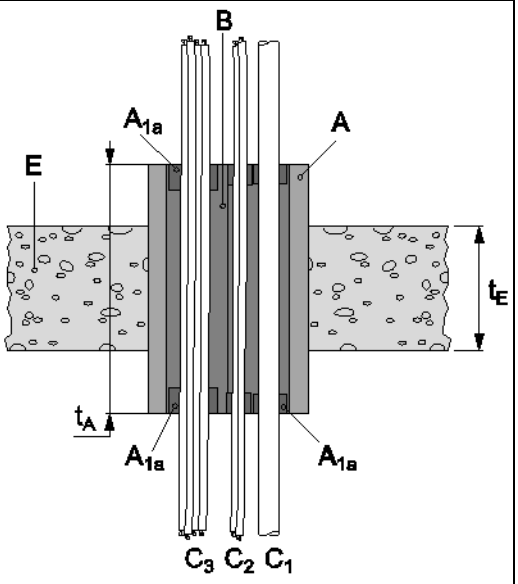


Figure 11: floor penetration

2.3.2.a) Cables

Construction details

• Hilti Firestop Module Box (2x U shapes; 2xA); Seal thickness t_A of approximately 200 mm, centered to floor (E). • Hilti Firestop Module Box Half (1xU shape; 1xA); open side facing surface; seal thickness t_A of approximately 200 mm, centered to floor (E). • Putty Bandage CFS-P BA is applied on upper side of floor only. • Services see figure 11 (C_2,C_3)	• Filler A_{1a} (2.1.4.1) • Filler Coating A_{1c} (2.1.4.2)

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)

		Classification	
	Additional Protection:		**Filler Coating**
All sheathed cable:	**Box Insert**		
Ø ≤ 21 mm	CFS-BL P	EI 90	
	CFS-F FX	EI 90	
21 ≤ Ø ≤ 50 mm	CFS-BL P	EI 60	EI 90 (50 mm in length coated with filler)
	CFS-F FX	EI 60	EI 90 (100 mm in length; coated with foam)
Tied cable bundle ≤ Ø 100 mm; Ø single cable ≤ 21 mm;	all	EI 90	
100% filled penetration with Ø single cables ≤ 21 mm	-	EI 90	
Non-sheathed cables (wires) Ø ≤ 24 mm	all	EI 30	

Construction details	
• Hilti Firestop Module Box half (A), seal thickness t_A of approximately. 200 mm; open side facing surface. • Centered regarding to thickness of wall (E); • Abbreviations see figure 9 (C_2,C_3)	• Filler A_{1a} (2.1.4.1)

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)

		Classification	
	Additional Protection:		**Filler Coating**
All sheathed cable:	**Box Insert**		
Ø ≤ 21 mm	CFS-BL P	EI 90	
	CFS-F FX	EI 90	
21 ≤ Ø ≤ 50 mm	CFS-BL P	EI 60	EI 90
	CFS-F FX	EI 60	EI 90 (100 mm in length; coated with foam)

Tied cable bundle ≤ Ø 100 mm; Ø single cable ≤ 21 mm;	all	EI 90	
Non-sheathed cables (wires) Ø ≤ 24 mm	all	EI 30	

2.3.2.b) Small conduits / pipes and tubes	
Construction details	
• Illustration figure 11 • Services – C_1	• Filler – A_{1a} (2.1.4.1)
Ø ≤ 16 mm, wall thickness ≥ 1 mm, arranged linear, with or without cables, minimum distance to each other = 0 mm	**Classification**
Plastic conduits / pipes and tubes	EI 90 U/U
Steel conduits / pipes and tubes	EI 90 C/U

2.3.2.c) Conduits				
Construction details				
• Illustration figure 11 • Services – C_1 • Wall thickness of rigid conduits: PO: 1,55 to 2,30 mm PVC: 1,90 to 2,80 mm		• Filler – A_{1a} (2.1.4.1)		
		Diameter [mm]		**Classification**
		PO	PVC	
Flexible conduits	with and without cable	16 - 32	16 - 32	EI 90 U/U
Rigid conduits	with and without cable	16 - 32	16 - 32	
Bundle of rigid or flexible conduits Ø of single conduits ≤ 32 mm	with and without cable	Ø ≤ 100		EI 90 U/U

PO: Polyolefin (PE, PP, PPE, PPO, ...); PVC: Polyvinylchloride

2.3.2.d) Waveguides (coaxial)	
• Illustration figure 11 • Services – C_1	• Filler – A_{1a} (2.1.4.1)
Waveguides (coaxial): 27,8 mm ≤ Ø ≤ 59,9 mm	**Classification**
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	EI 90 U/C

2.4 Aditional Applications	
Following additional applications are tested and proved to reach classification as stated above for both wall or floor applications. Deviations from before mentioned conditions or classifications are described.	
2.4.1 Fire rating of air conditioner services	
• Split-type air conditioner	• Insolated copper pipes including plastic condenser water tubes of split-type air conditioner are fire-rated: Wall: EI 90 (copper pipe C/U; condenser water tube U/U, cables) Floor: EI 90 (C/U copper pipe, U/U condenser water tube, cables). • Constellation: ○ Sangi twin copper pipe 12/6 mm x 1,0 mm, preinsulated by PEP insulation of 9mm thickness (Ø 30 or 24 mm) ○ plastic condenser tube Ø 24 mm x 4,3mm (Rehau Rauflame-E, flex PVC) ○ electrical lines: two lines, each 5 x 1,5 mm² ○ all services are bundled together with no distance in between

4.1 Abbreviations used in drawings

Abbreviation	Description	Abbreviation	Description
A, A_1, A_2,..	Firestop products	t_A	Thickness of penetration seal
C_1, C_2, C_3,..	Penetrating services	t_E	Thickness of the building element
E, E_1, E_2,…	Building elements (wall, floor)	W_P	Max diameter of seal penetration
s_1, s_2, s_n	Distances	W_A	Width of frame