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Authorised and notified according to Article 29 of the Regulation (EU) No 305/2011 of the European Parliament and of the Council of 9 March 2011

European Technical Assessment ETA-20/1234 of 2020/12/20

I General Part

Technical Assessment Body issuing the ETA and designated according to Article 29 of the Regulation (EU) No 305/2011: ETA-Danmark A/S

Trade name of the construction product:	Hilti Firestop Sleeve CFS-SL GA
Product family to which the above construction product belongs:	Penetration Seals
Manufacturer:	Hilti AG Feldkircherstraße 100 DE-9494 Schaan Liechtenstein Telephone +49 423 234 21 11 Internet: www.hilti.group
Manufacturing plant:	Hilti Plant 4a Hilti Plant 5a Hilti Plant 14
This European Technical Assessment contains:	26 pages including 3 annexes which form an integral part of the document
This European Technical Assessment is issued in accordance with Regulation (EU) No 305/2011, on the basis of:	EAD 350454-00-1104 Fire stopping and fire sealing products, Penetration Seals Issued September 2017
This version replaces:	-

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1 Technical Description of the Product

1.1 Definition of the construction product

1. A detailed specification of the products listed below is given in document "Identification_CFS-SL GA" relating to the European Technical Assessment ETA-17/0081 - Hilti Firestop Sleeve which is a non-public part of this ETA.

2. The Hilti Firestop Sleeve CFS-SL is a maintenance free cable management firestop device (cable box), intended to form a seal to reinstate the fire resistance performance of flexible wall, rigid wall, sandwich panel, rigid floors, and timber walls and floors (solid and engineered) where they have been provided with openings for the penetration of services. Related acronyms following "CFS-SL" are listed below:

Acronym	Full Name	Variation/s
GA	CFS-SL GA	Hilti Firestop Sleeve CFS-SL with Rubber Gasket
S	CFS-SL GA S	Small diameter device
M/L	CFS-SL GA M/L*	• Medium and Long device • Medium and Long device with Foam membrane
ILS	CFS-SL GA M/L ILS*	• Medium and Long device with locking mechanism at one end • Medium and Long device with locking mechanism at one end and Foam membrane

*See Annex A.9 for illustrations of: device with Foam membrane and device with locking mechanism

3. The CFS-SL "sleeve" portion consists of a corrugated steel tube that houses a pair of plastic parts ("tabs") at each end, intumescent wrap strips, and a twistable inner fabric smoke seal. Pressing the tabs allows twisting the fabric smoke seal to close the seal.

4. Two rubber gaskets composed of EPDM, are provided with each sleeve, and are placed on both sides of sleeve - flush to wall/floor surface - to seal the annular gap between edge of opening and perimeter of sleeve. The rubber gaskets are positioned after the sleeve is installed, and pressed against wall/floor by flanges.

5. The two flanges made from steel - also provided with each sleeve - are used to mount the sleeve to the wall or floor (one flange on each side). Flanges are turned clockwise on the threading of the metal housing till tight against rubber gasket and wall/floor surface.

6. For installation details, see Seal Type 1 in Annex A.3. For Fire Resistance Classifications, see Annex B.

1.2 Ancillary products

Acronyms used for ancillary products also follow "CFS-SL" and are listed below:

- GP 40 – The 40 centimeter Gangplate with 3 openings (CFS-SL GP 40)
- GP 60 – The 60 centimeter Gangplate with 4 openings (CFS-SL GP 60)
- GP CAP - The Gangplate CAP for "blank" Gangplate openings (CFS-SL GP CAP)

1.2.1 Hilti Firestop Gangplate CFS-SL GP 40 and CFS-SL GP 60

Both Gangplate variants consist of a sandwich type construction of steel plates, ceramic paper, EPDM rubber seal and EPDM foam sealing strips. Gangplates are used only with the Medium and Long diameter Sleeve variants - CFS-SL GA M/L (flanges and rubber gaskets not required.) Gangplates are surface mounted over pre-formed openings, direct to surface of flexible/rigid wall or sandwich panel by twelve screws (CFS-SL GP 40) or fourteen screws (CFS-SL GP 60).
For installation details - see Seal Type 2 in Annex A.3.

1.2.2 Hilti Firestop Gangplate CAP CFS-SL GP CAP

The Gangplate CAP consists of a zinc coated, steel plate. It allows for the option of having "blank" openings in a Gangplate (openings without sleeves installed.) The CAPs are installed both sides of wall, in Gangplate openings, each by removing four hexagonal nuts and a flange plate, then by inserting the CAP, and reinstalling the flange plate and nuts.
For installation details, see Seal Type 2a in Annex A.4.

Further ancillary products - used as needed - for annular space filling or additional insulation:

1.2.3 Hilti Firestop Acrylic Sealant CFS-S ACR

For Specification, see relevant ETA. For installation details, see Seal Type 1a in Annex A.4.

1.2.4 Hilti Firestop Plug CFS-PL 132

For Specification, see relevant ETA. For installation details, see Seal Type 2a in Annex A.4.

1.2.5 Hilti Firestop Putty Roll CP 619 T

For Specification, see relevant ETA. For installation details, see Seal Type 1b in Annex A.4.

1.2.6 Hilti Firestop Putty Pad CP 617

For Specification, see relevant ETA. For installation details, see Seal Type 1b in Annex A.4.

1.2.7 Hilti Firestop Putty Bandage CFS-P BA

For Specification, see relevant ETA. For installation details, see Seal Type 1b in Annex A.4.

For Fire Resistance Classifications, see Annex B.

Technical product literature
Technical Data Sheet Hilti Firestop Sleeve CFS-SL GA including all ancillary products.

2 Specification of the intended use(s) in accordance with the applicable European Assessment Document (hereinafter EAD)

Detailed information and data is given in Annex A and Annex B.

The intended use of Hilti Firestop Sleeve CFS-SL GA (and ancillary products) is to reinstate the fire resistance performance of flexible or rigid wall, sandwich panel, rigid floors and timber walls and floors (solid and engineered), where they are penetrated by services.

1. Construction elements for use of CFS-SL GA to provide a penetration seal in, are detailed in Annex A.1.

2. The provisions made in this European Technical Assessment are based on an assumed working life of the Hilti Firestop Sleeve of 25 years, provided that the conditions laid down in the manufacturer's datasheet and instructions for the packaging / transport / storage / installation / use / repair are met. The indications given on the working life cannot be interpreted as a guarantee given by the oducer, but are to be regarded only as a means for choosing the right products in relation to the expected economically reasonable working life of the works.

2.1 Use category

Type Z_2: intended for uses at internal conditions with humidity classes other than Z_1, excluding temperatures below 0° C.

3 Performance of The Product And References To The Methods Used For Its Assessment

Product-type:mixed seal		Intended use: Penetration Seal	
Basic requirement for construction work	Basic Requirement	Performance	
BWR 2 Safety in case of fire			
EN 13501-1	Reaction to fire	Class E	
EN 13501-2	Resistance to fire	Annex B	
BWR 3 Hygiene, health and environment			
EN 1026:2000	Air permeability (Device 0% Filled) (CFS-SL GA M/L)	Pressure	Leakage
		10 Pa	0.24 m^3/(h)
		50 Pa	0.83 m^3/(h)
		100 Pa	1.38 m^3/(h)
		150 Pa	1.83 m^3/(h)
		200 Pa	2.21 m^3/(h)
		250 Pa	2.59 m^3/(h)
		300 Pa	2.95 m^3/(h)
EAD 350454-00-1104 , Annex C	Water permeability (material property)	No performance determined	
EN 16516:2018	Content, emission and/or release of dangerous substances	Clause 3.1.1 of the ETA	
BWR 4 Safety in use			
EOTA TR 001:2003	Mechanical resistance and stability	No performance determined	
EOTA TR 001:2003	Resistance to impact/movement	No performance determined	
EOTA TR 001:2003	Adhesion	No performance determined	
EAD 350454-00-1104, Clause 2.2.9	Durability	Z_2	
BWR 5 Protection against noise			
EN 10140-2/EN ISO 717-1	Airborne sound insulation	No performance determined	
BWR 6 Energy economy and heat retention			
EN 12664, EN 12667, EN 12939, EN ISO 8990, EN ISO 6946, EN ISO 14683, EN ISO 10211, EN ISO 10456	Thermal properties	No performance determined	
EN ISO 12572 EN 12086	Water vapour permeability	No performance determined	

3.1 Hygiene, Health, and the environment.

3.2.1. Content and release of Dangerous Substances

The content of semi-volatile organic compounds (SVOC) and volatile organic compounds (VOC) of "Hilti Firestop Sleeve CFS-SL GA" was assessed according to EN 16516 as required by EAD 350454-00-1104. Reference report: 53824-001II.

The article nature of the product does not allow for a tailored surface area exposure. Therefore, a loading factor of 1 unit/m^3 was used (instead of 0,007m^2/m^3).

Summary of results:

	Concentration after 3 days	*Concentration after 28 days*
Sum of SVOC according to DIN EN 16516	<0,005 mg/m^3	<0,005 mg/m^3
Sum of VOC according to DIN EN 16516	0,018 mg/m^3	<0,005 mg/m^3

4 Assessment and verification of constancy of performance (hereinafter AVCP) system applied, with reference to its legal base

According to the Decision 1999/454/EC, amended by Decision 2001/596/EC of the European Commission, as amended, the system(s) of assessment and verification of constancy of performance AVCP (see Annex V of Regulation (EU) No 305/2011) is 1.

5 Technical details necessary for the implementation of the AVCP system, as provided for in the applicable EAD

Technical details necessary for the implementation of the AVCP system are laid down in the control plan deposited at ETA-Danmark A/S prior to CE marking

Issued in Copenhagen on 2020-12-20 by

Thomas Bruun

Managing Director, ETA-Danmark

ANNEX A

Manufacturer Detailed Installation Information

A.1 Supporting Constructions for CFS-SL GA S/M/L:

Flexible and Rigid walls	Flexible Walls: • CFS-SL GA S/M: Minimum thickness 100mm & maximum thickness 200mm (Maximum thickness: 180mm if CFS-SL GA M in combination with Gangplate) • CFS-SL GA L: Minimum thickness 200mm & maximum thickness 300mm (Maximum thickness: 280mm if CFS-SL GA L in combination with Gangplate) Comprise timber or steel studs lined on both faces to a thickness of 25mm according to EN 520 type F. • For timber stud walls - minimum distance of 100mm of the seal to any stud, the cavity between stud and seal must be closed, and a minimum of 100mm insulation of Class A1 or A2 (in accordance with EN 13501-1) is required in the cavity between stud and seal. Rigid Walls: • Minimum thickness 100mm & maximum thickness 200mm (CFS-SL GA S/M) (Maximum thickness: 180mm if CFS-SL GA M in combination with Gangplate) • Minimum thickness 200mm & maximum thickness 300mm (CFS-SL GA L) (Maximum thickness: 280mm if CFS-SL GA L in combination with Gangplate) Comprise of: concrete, aerated concrete or masonry, with a minimum density of 550 kg/m³.
Sandwich panels:	Tested with 100mm Paroc line 200 AST F 100/99 and 150mm Paroc line 200 AST F. Field of application, based on tested Specimens (in accordance with Standard EN 14509:2013): • Minimum thickness 100mm & maximum thickness 200mm (CFS-SL GA S/M) (Maximum thickness: 180mm if CFS-SL GA M in combination with Gangplate) • Minimum thickness 200mm & maximum thickness 300mm (CFS-SL GA L) (Maximum thickness: 280mm if CFS-SL GA L in combination with Gangplate) • Shall comprise Euroclass A1 structural stone wool core of density between: 100 kg/m^3 and 150kg/m^3, and Reaction to Fire: Euroclass A2-s1,d0 • Steel faced with exposed and unexposed sides between 0.50mm and 1mm • Flat or light profile type • Polyurethane based adhesive • Valid for vertically and horizontally installed panels • PVDF (external) and SP (Internal) steel coating • 1.2m width of panel. Unlimited decrease in width, and increase up to 1.44m
Floors:	• Minimum thickness 150mm & maximum thickness 200mm (CFS-SL GA S/M) Minimum thickness 200mm & maximum thickness 300mm (CFS-SL GA L) • Aerated concrete or concrete with a minimum density of 550kg/m³.

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.

Timber Walls & Floors: (Solid and Engineered)

Timber wall and floor constructions should comprise of:

1. Solid timber

- Softwoods such as: spruce/fir, pine, larch, stone pine

2. Engineered timber

- Glued solid timber boards
- Glued laminated timber (glulam) with or without finger joints
- Cross laminated timber (CLT, X-Lam) with or without finger joints according EN 16351, with Resistance to Fire Classification (REI) according EN ISO 13501

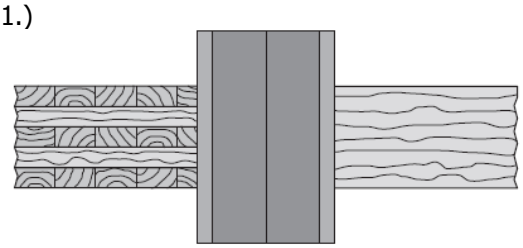
Characteristics of Engineered timber:

- Softwoods such as: spruce/fir, pine, larch, stone pine
- Number of layers ≥ 3
- Thickness of layers: $t_l \geq 20$mm
- Polyurethane and/or MUF (phenolic and amino plastic) based adhesives
- With or without grooves and edge bonds acc. EN 16351:2015, chapter 5.2.2.4

General Field of Application:

- Minimum thickness 80mm & maximum thickness 200mm (CFS-SL GA M)
- Minimum thickness 200mm & maximum thickness 300mm (CFS-SL GA L)
- Thickness of Solid Timber must be ≥ total thickness of Engineered Timber
- Thicknesses of Engineered Timber layers may be:
  - Identical, see images 1 & 2:

1.)



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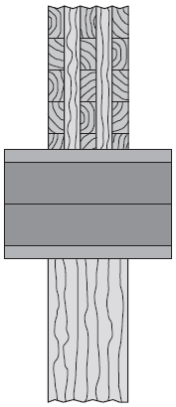
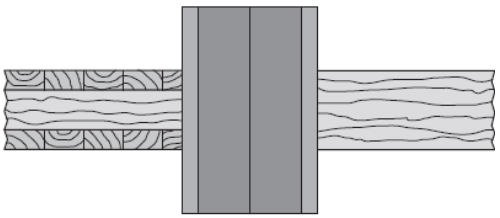


  - Or non-identical, see images 3 & 4:

3.)



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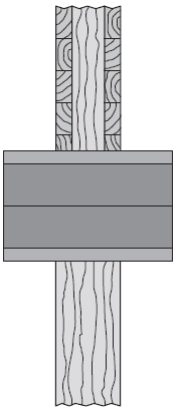


A.2 Illustration Abbreviations:

A	Hilti Firestop Sleeve CFS-SL GA
A_1	Rubber Gasket
B	Hilti Firestop Gangplate: CFS-SL GP 40 or 60
B_1	Hilti Firestop Gangplate CAP: CFS-SL GP CAP
B_{1a}	Hilti Firestop Plug: CFS-PL 132
A_{1a}	Hilti Firestop Acrylic Sealant CFS-S ACR
A_{1b}	Hilti Firestop Putty Roll CP 619 T
A_{1c}	Hilti Firestop Putty Pad CP 617 – cut to 25mm width
A_{1d}	Hilti Firestop Putty Bandage CFS-P BA
C	Cables/Conduits
E_1	Building Element Flexible/Rigid Wall
E_2	Building Element Sandwich Panel
E_3	Building Element Floor
E_4	Building Element Timber Walls and Floors (Solid and Engineered)
t_E	Thickness of Building Element – refer to A.1

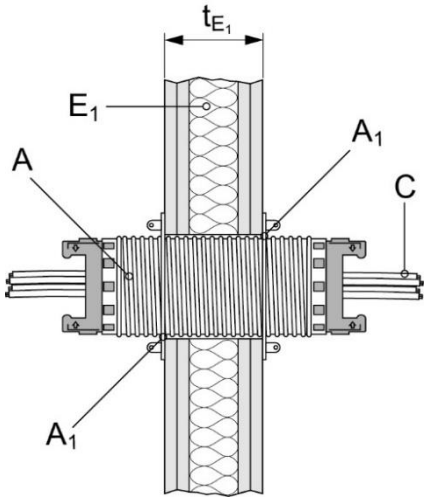
A.3 Seal Type Details and Installation:

There are two primary Seal Types:

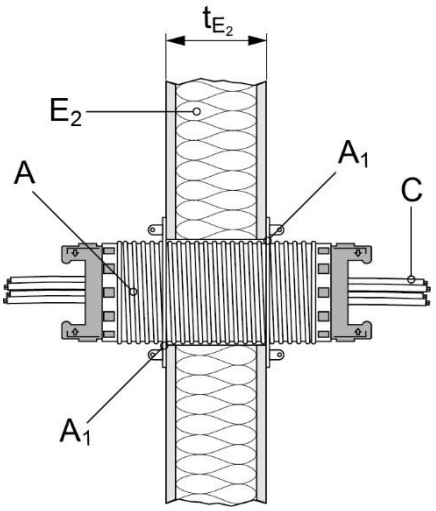
Seal Type	Seal Detail	Device/s	
		Wall	Floor
1	Single Devices	CFS-SL GA S/M/L	CFS-SL GA S/M/L
2	Ganged Devices	CFS-SL GA M/L & CFS-SL GP 40 or 60	N/A

A.3.1 Seal Type 1 Details:

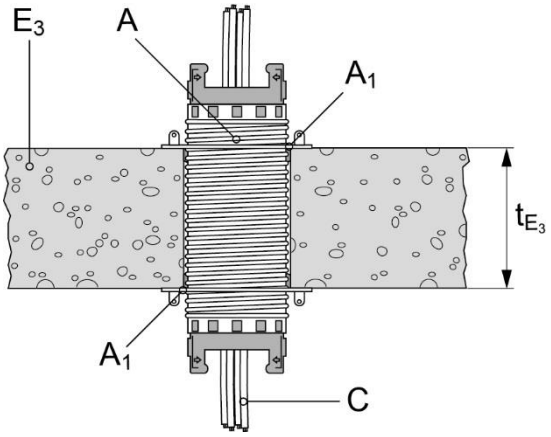
Section –
CFS-SL GA S/M/L
in Flexible or Rigid
Wall



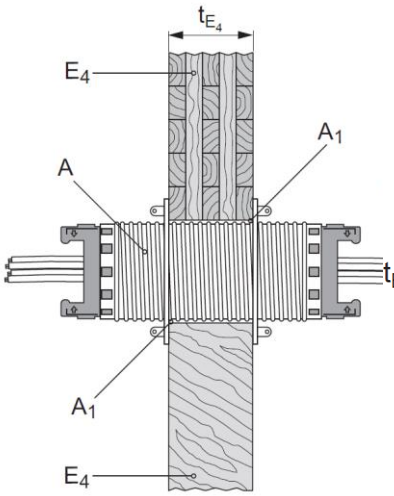
Section –
CFS-SL GA S/M/L
in Sandwich Panel

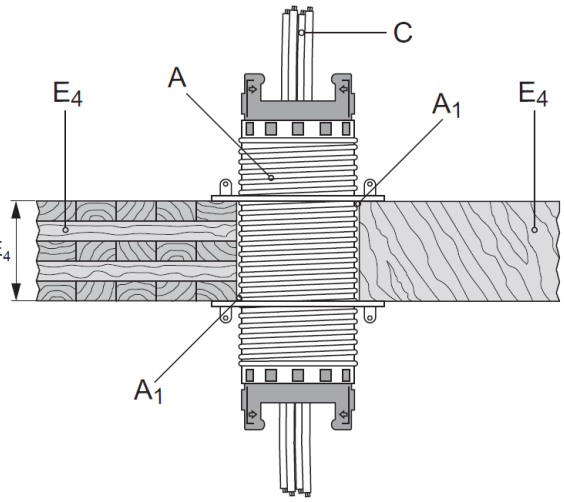


Section –
CFS-SL GA S/M/L
in Floor



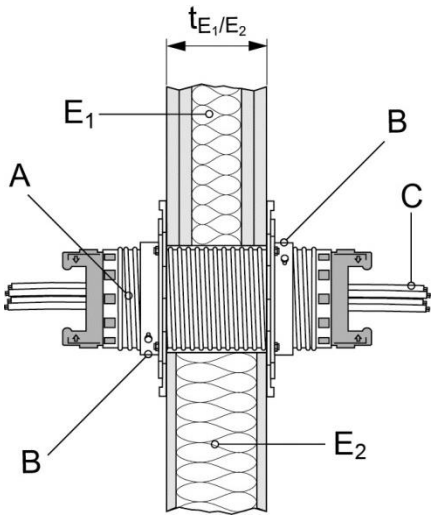
Section –
CFS-SL GA M/L
in Timber Walls
and Floors





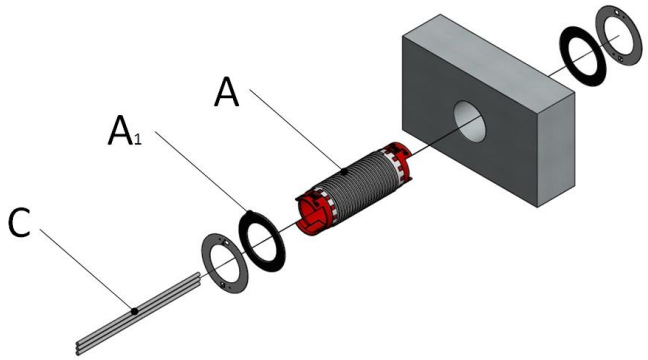
A.3.2 Seal Type 2 Detail:

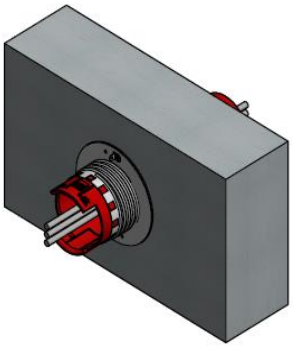
Section –
CFS-SL GA M/L and
CFS-SL GP 40 or 60
in Flexible or Rigid
Wall or Sandwich
Panel



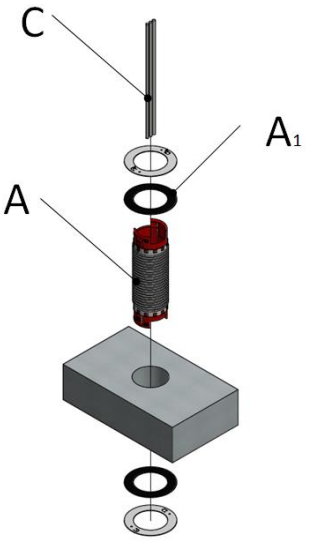
A.3.3 Seal Type 1 Application Information (CFS-SL GA S/M/L)

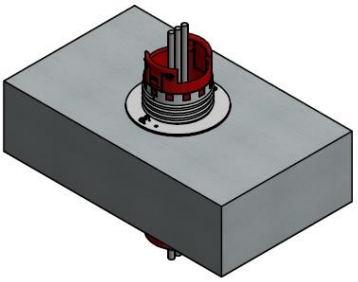
Walls:





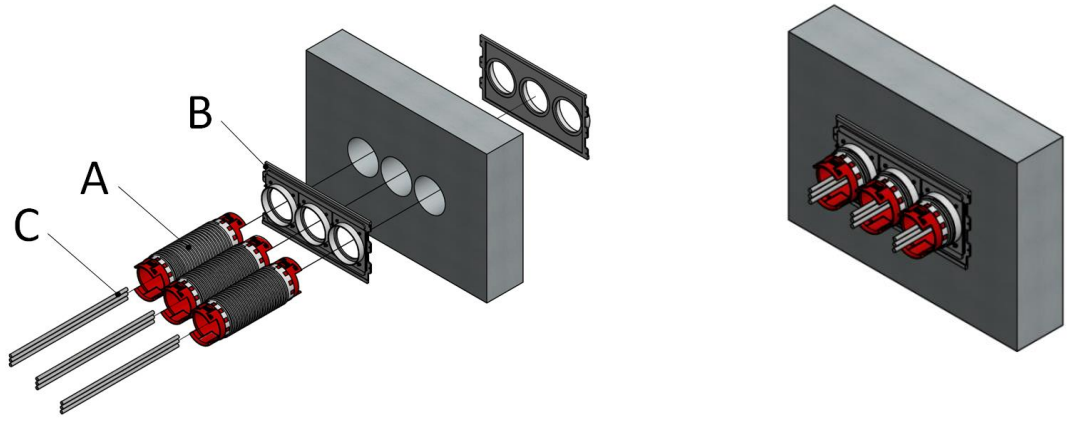
Floors:





A.3.4 Seal Type 2 Application Information (CFS-SL GP 40 or 60)

Walls and Sandwich Panels:



A.4 Variations on Seal Type

As variations to Seal Type 1 and 2, further ancillary products can be installed to provide:

- Higher Fire Classification ratings in specific flexible or rigid wall applications: Hilti Firestop Acrylic Sealant CFS-S ACR can be applied to seal annular gaps in place of Rubber Gaskets. (See Seal Type 1a for installation)

- Higher Fire Classifications for CFS-SL GA M/L in 150mm thick Sandwich Panels: Hilti Firestop Putty is pressed around opening - CP 619 T or CP 617 (cut to 25mm width) before installing rubber gasket, and CFS-P BA used to wrap first 100mm of cables as they project from tabs of sleeve.

In all cases, putty is installed in 2 layers with minimum 5mm overlap. (See Seal Type 1b for installation)

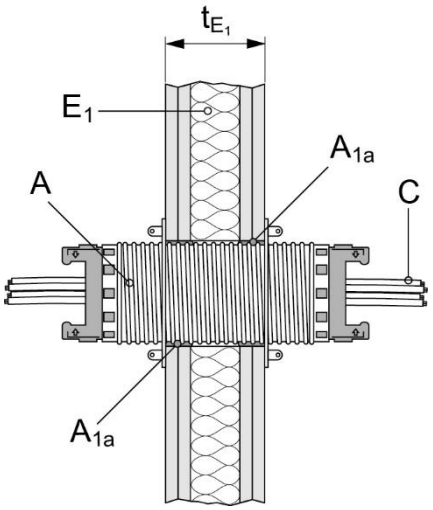
- Blank openings (no sleeve) in Gangplates: Hilti CFS-SL GP CAP & CFS-PL 132 are required. (See Seal Type 2a for installation)

Seal Type Variation	Seal Detail	Ancillary product		
		Wall	100mm Sandwich Panel	150mm Sandwich Panel
1a	Single Devices	CFS-S ACR	-	-
1b	Single Devices	-	-	CP 619 T or CP 617. And CFS-P BA
2a	Ganged Devices	CFS-SL GP 40 or 60, CFS-SL GP CAP & CFS-PL 132		

A.4.1 Seal Type 1a Detail:

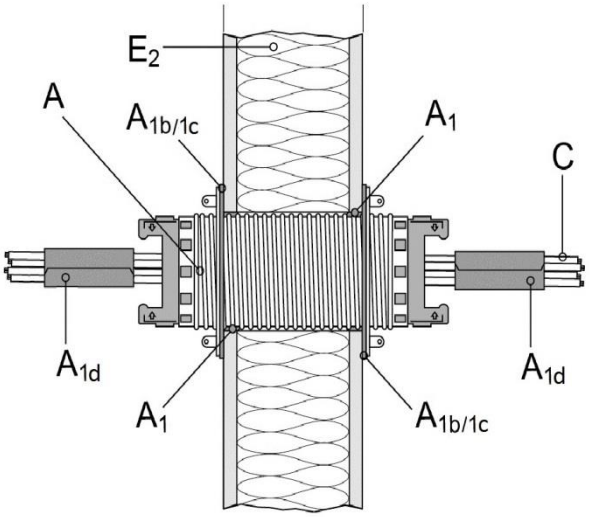
Section –
CFS-SL GA S/M/L
and CFS-S ACR
in Flexible or Rigid
Wall

Recommended A_{1a}
(CFS-S ACR) installed
to 25mm depth into
wall



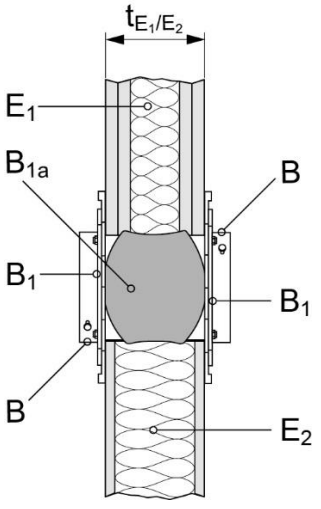
A.4.2 Seal Type 1b Detail:

Section –
CFS-SL GA M/L with
CP 619 T or CP 617
behind flanges and
CFS-P BA around
Cables - in
150mm Sandwich
Panel



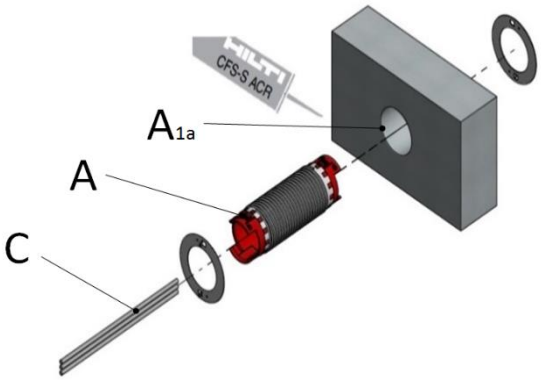
A.4.3 Seal Type 2a Detail:

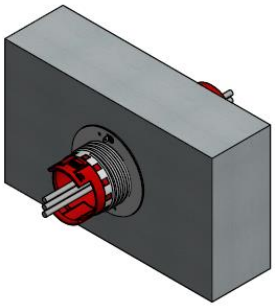
Section –
CFS-SL GA M/L and
CFS-SL GP 40 or 60
with CFS-SL GP CAP
and CFS-PL 132
in Flexible or Rigid
Wall or Sandwich
Panel



A.4.4 Seal Type 1a Application Information (CFS-SL GA S/M/L and CFS-S ACR)

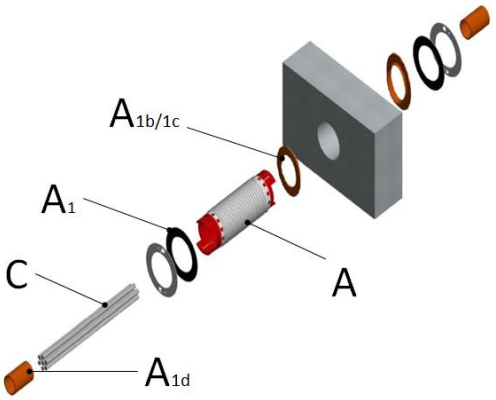
Flexible and Rigid Walls





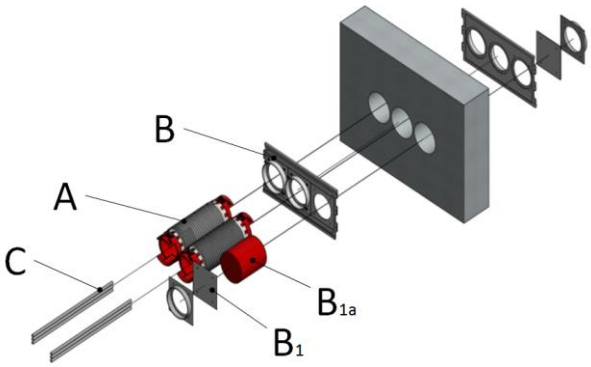
A.4.5 Seal Type 1b Application Information (CFS-SL GA M/L & CP 619 T/CP 617 and CFS-P BA)

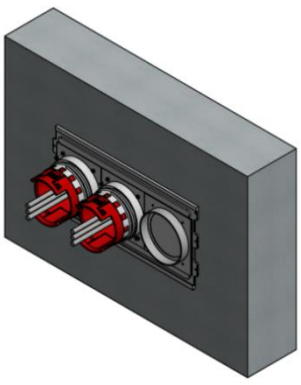
Sandwich Panels



A.4.6 Seal Type 2a Application Information (CFS-SL GA M/L, CFS-SL GP 40 or 60, CFS-SL GP CAP & CFS-PL 132)

Flexible and Rigid Walls and Sandwich Panels





A.5 Seal Type Opening Sizes:

Seal Type	Seal Detail	Device	Opening Ø
1, 1a & 1b	Single Devices	CFS-SL GA S CFS-SL GA M/L	**63 – 73mm** **113 - 122mm**
2 & 2a	Ganged Devices	CFS-SL GP 40 or 60	**113 - 122mm**

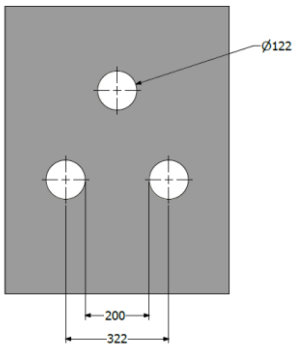
A.6. Distances between openings

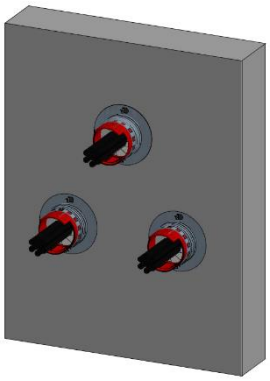
A.6.1 Seal Type 1 including 1a and 1b

Depending on Fire Classification and space requirements, the Hilti Firestop Sleeve CFS-SL GA can be installed with:

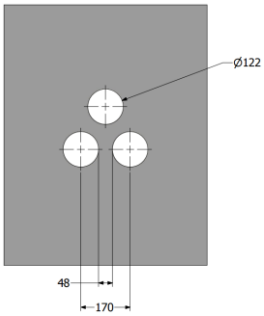
- ≥ 200mm distance between openings, or
- Clustered or Linear with flanges touching (zero distance between devices)

200mm (horizontal/vertical distance between openings)

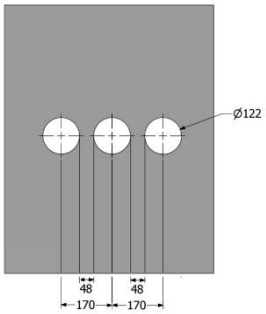




Zero distance (horizontal/vertical distance between flanges cluster or linear)



Cluster



Linear

Note: dimensions above relate to Ø122mm (CFS-SL GA M/L) – using smaller diameters will alter the distances between opening centres.

(For CFS-SL GA S – use diameter Ø63-73mm as in Section A.5.)

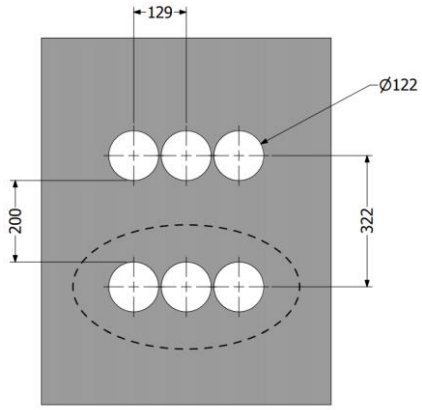
A.6.2 Seal Type 2 including 2a

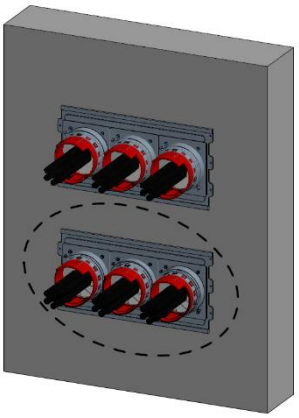
Depending on Fire Classification and space requirements, the Hilti Firestop Sleeve CFS-SL GP can be installed with:

- ≥ 200mm distance between openings, or
- Gangplates touching or slight overlap (zero distance)

200mm from Opening to nearest Opening - For Single to any number of installations:

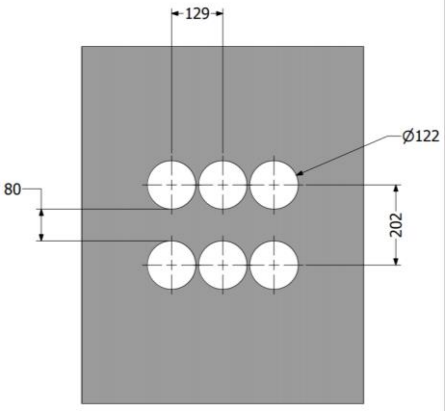
(Lower, dashed Gangplate illustrates correct placement of 200mm distance)

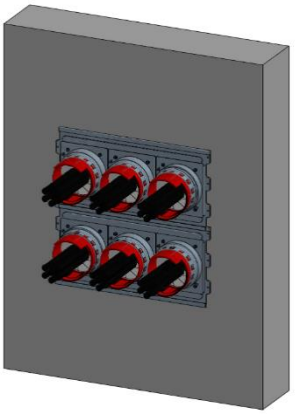




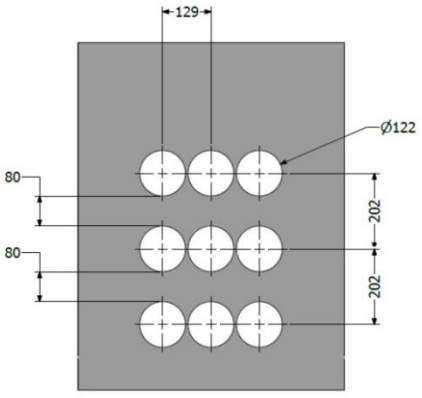
Zero Distance between Devices - For Double Gangplate installation:

(Outside of Double Constellation, 200mm to next Gangplate/Constellation /Device opening)





Zero Distance between Devices - For Triple Gangplates to any number of installations:



A.6.3 Guideline for Gangplate fixing elements

Anchoring solution	Anchor Indication	Drywall	Aerated Concrete wall	Sandwich Panel	Concrete
Drywall Screws:	Diameter: 3.5mm Length: ≥ 35mm	x	x		
Self-drilling Screws:	Diameter: 3.5mm Length: ≥ 19mm			x	
Screw Anchor (Hilti HUS3-PS 6)	Diameter: 6mm Length: ≥ 40mm				x*

*Minimum 4 anchors required. Edge distances to be considered.

	CFS-SL GP 40	CFS-SL GP 60
Total Number of fixations	12	14

A.7 Penetrating services

A.7.1 Cables

Penetrating services	**Description**
Small Cables Ø ≤ 21mm: (CFS-SL GA S/M/L)	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) with a **diameter Ø ≤21mm.**
Medium and Large Cables (CFS-SL GA M/L)	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) with a **diameter up to Ø ≤ 80mm**.
Cable Fills:	All Fire Classifications in Annex B allow sleeves to be left blank or filled with cables to up to 60% of the total sleeve cross section/area. For fills higher than 60%, there are classifications with: - 36mm bundles (CFS-SL GA S) and 86mm bundles (CFS-SL GA M/L) or, - 100% fills (CFS-SL GA S/M/L) Note that all cables with Ø ≤21mm are covered, and in cases cables up to Ø ≤80mm.

A.7.2 Conduits

Penetrating services	**Description**
Single conduits Ø ≤ 25mm: (CFS-SL GA S):	Rigid, flexible and pliable plastic conduits and metal conduits with a **diameter Ø ≤ 25mm** with or without cables.
Single conduits Ø ≤ 63mm (CFS-SL GA M/L):	Rigid, flexible and pliable plastic conduits and metal conduits with a **diameter Ø ≤ 63mm** with or without cables.
Conduit bundle (CFS-SL GA S):	Conduits with a **max. single conduit diameter Ø ≤ 25mm** with or without cables can be bundled to a **diameter Ø ≤ 48mm**.
Conduit bundle (CFS-SL GA M/L):	Conduits with a **max. single conduit diameter Ø ≤ 63mm** with or without cables can be bundled to a **diameter Ø ≤ 92mm.**

A.8 Distances for all cable support constructions

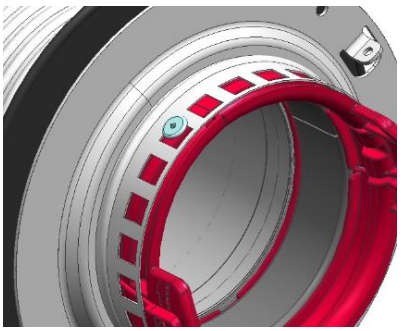
The distances from the surface of the separating element to the first supporting construction:

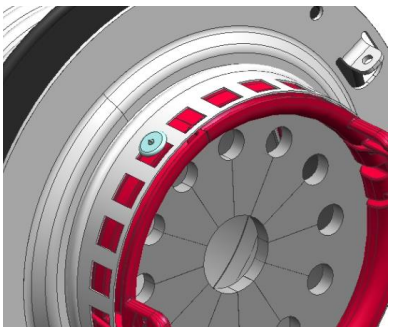
a) Wall (distance from the face of the wall on both sides): ≤ 250mm
b) Floor (distance from upper side of floor): ≤ 250mm

A.9 Illustrations of device with Foam membrane and locking mechanism

Illustration – CFS-SL GA M/L with Foam membrane at opening

Illustration – CFS-SL GA M/L ILS with Locking rivet for variant without* and with foam membrane.





* Note – classifications for CFS-SL GA M/L in following Annex B of ETA cover:

CFS-SL GA M/L ILS without Foam membrane.

ANNEX B

Resistance to Fire Classifications

B.1 Seal Type 1 (Including 1a and 1b)

B.1.1 200mm between openings (See A.6.1):

	Description	(CFS-SL GA S)	(CFS-SL GA M/L)
Flexible & Rigid wall	Blank Device	**EI 120**	**EI 120**
	All sheathed cables ≤ 21mm	**EI 90**	**EI 90** [1)]
	All sheathed cables ≤ 50mm	**-**	**EI 90**
	All sheathed cables ≤ 80mm	**-**	**EI 60**
	Cable bundles ≤ 36mm All sheathed cables ≤ 21mm	**EI 90**	**-**
	Cable bundles ≤ 86mm All sheathed cables ≤ 21mm	**-**	**EI 90**
	100% filled device with cables ≤ 21mm	**EI 60** [2)]	**EI 90**
	Conduits ≤ 25mm (CFS-SL GA S)	**EI 120**	**-**
	Conduits ≤ 63mm (CFS-SL GA M/L)	**-**	**EI 90** [3)]
	For higher Fire Classifications – follow Seal Type 1a (ACR) installation:		
	[1)] All sheathed cables ≤ 21mm	**-**	**EI 120**
	[2)] 100% filled device with cables ≤ 21mm	**EI 90**	**-**
	[3)] Conduits ≤ 63mm (CFS-SL GA M/L)	**-**	**EI 120**

Sandwich Panel 150mm thickness	Blank Device	**EI 90**	**EI 90** [4)]
	All sheathed cables ≤ 21mm	**EI 60**	**EI 90** [4)]
	All sheathed cables ≤ 50mm	**-**	**EI 90**
	100% filled device with cables ≤ 21mm	**EI 60**	**-**
	100% filled device with cables ≤ 50mm	**-**	**EI 60** [4)]
	For higher Fire Classifications – follow Seal Type 1b (Putty) installation:		
	[4)] 100% filled device with cables ≤ 21mm (CFS-SL GA M/L)	**-**	**EI 120**

B.1.2 Zero distance between flanges (See A.6.1):

	Description	**(CFS-SL GA S)**	**(CFS-SL GA M/L)**
Flexible & Rigid wall	Blank Device	**EI 120**	**EI 90**
	All sheathed cables ≤ 21mm	**EI 60**	**EI 90**
	All sheathed cables ≤ 50mm	**-**	**EI 60**
	All sheathed cables ≤ 80mm	**-**	**EI 60**
	Cable bundles ≤ 36mm All sheathed cables ≤ 21mm	**EI 90**	**-**
	Cable bundles ≤ 86mm All sheathed cables ≤ 21mm	**-**	**EI 60**
	100% filled device with cables ≤ 21mm	**EI 60**	**EI 60**
	100% filled device with cables ≤ 80mm	**-**	**EI 60**
	Conduits ≤ 25mm (CFS-SL GA S)	**EI 90**	**-**
	Conduits ≤ 63mm (CFS-SL GA M/L)	**-**	**EI 60**

Sandwich Panel 100mm thickness	Blank Seal	**EI 45**	**EI 90**
	All sheathed cables ≤ 21mm	**EI 45**	**EI 90**
	All sheathed cables ≤ 50mm	**-**	**EI 60**
	100% filled device with cables ≤ 21mm	**EI 45**	**EI 60**
	100% filled device with cables ≤ 50mm	**-**	**EI 60**

	Description	**(CFS-SL GA S)**	**(CFS-SL GA M/L)**
Floors	Blank Device	**EI 180**	**EI 180**
	All sheathed cables ≤ 21mm	**EI 180**	**EI 180**
	All sheathed cables ≤ 50mm	**-**	**EI 120** [5)]
	All sheathed cables ≤ 80mm	**-**	**EI 60**
	Cable bundles ≤ 36mm All sheathed cables ≤ 21mm	**EI 180**	**-**
	Cable bundles ≤ 86mm All sheathed cables ≤ 21mm	**-**	**EI 120**
	100% filled device with cables ≤ 21mm	**EI 120**	**-**
	100% filled device with cables ≤ 50mm	**-**	**EI 120**
	Conduits ≤ 25mm (CFS-SL GA S)	**EI 120**	**-**
	Conduits ≤ 63mm (CFS-SL GA M/L)	**-**	**EI 60** [6)]
	For higher Fire Classifications – increase distances between openings - 200mm:		
	[5)] All sheathed cables ≤ 50mm	**-**	**EI 180**
	[6)] Conduits ≤ 63mm (CFS-SL GA M/L)	**-**	**EI 120**

B.1.3 Zero distance between flanges.

Devices installed Linear (See A.6.1).

	Description	**(CFS-SL GA M/L)**
Timber Walls Thickness ≥80 mm	Blank Device to 100% filled Cables ≤ 21mm	**EI 60**
Timber Walls Thickness ≥100 mm	Blank Device to 100% filled Cables ≤ 21mm	**EI 90**

B.1.3.1 Zero distance between flanges.

Devices installed Cluster (See A.6.1).

Timber Floors Thickness ≥80 mm	Blank Device to 100% filled Cables ≤ 21mm	**EI 60**
Timber Floors Thickness ≥100 mm	Blank Device to 60% filled Cables ≤ 21mm	**EI 90**
	Blank device to 100% filled Telecommunications cables (≤ 17 mm dia.)	**E 90 / EI 60**
Timber Floors Thickness ≥140 mm	Blank Device to 100% filled Cables ≤ 21mm	**EI 90**

B.2 Seal Type 2 (Multiple/Ganged devices)

B.2.1 Flexible/Rigid Walls:

B.2.1.1 ≥ 200mm Distance between Openings (See A.6.2):

Flexible & Rigid wall	Blank Device to 100% filled Cables ≤ 21mm	**EI120**
	Blank Seal (CAP and Plug)	

B.2.1.2 Double Gangplate Zero Distance between Devices (See A.6.2):

Flexible & Rigid wall	Blank Device to 100% filled Cables ≤ 21mm	**EI90**
	Blank Seal (CAP and Plug)	

B.2.1.3 Triple Gangplate (or more) Zero Distance between Devices (See A.6.2):

Flexible & Rigid wall	Blank Device to 100% filled Cables ≤ 21mm	**EI60**
	Blank Seal (CAP and Plug)	

B.2.2 Sandwich Panel – 100mm thick:

B.2.2.1 Double Gangplate Zero Distance between Devices (See A.6.2):

Sandwich Panel 100mm thickness	Blank Device to 100% filled Cables ≤ 21mm	**EI60**
	Blank Seal (CAP and Plug)	

B.2.3 Sandwich Panel – 150mm thick:

B.2.3.1 ≥ 200mm Distance between Openings (See A.6.2):

Sandwich Panel 150mm thickness	Blank Device to 100% filled Cables ≤ 21mm	**EI120**
	Blank Seal (CAP and Plug)	

ANNEX C

Abbreviations and referenced documents

C.1 References to standards mentioned in the ETA

Norm	**Description**
EN 1366-3	Fire resistance tests for service installations - Part 3: Penetration seals
EN ISO 717-1	Acoustics – Rating of sound insulation of buildings and of building elements – Part 1: Airborne sound insulation
EN 10140-2	Acoustics - Laboratory measurement of sound insulation of building elements - Part 2: Measurement of airborne sound insulation
EN 1026	Windows and doors - Air permeability - Test method
EN 12086	Thermal insulating products for building applications - Determination of water vapour transmission properties
EN ISO 12572	Hygrothermal performance of building materials and products - Determination of water vapour transmission properties (ISO 12572:2001);
EN 12664	Thermal performance of building materials and products - Determination of thermal resistance by means of guarded hot plate and heat flow meter methods - Dry and moist products with medium and low thermal resistance
EN 12667	Thermal performance of building materials and products – Determination of thermal resistance by means of guarded hot plate and heat flow meter methods – Products of high and medium thermal resistance
EN 12939	Thermal performance of building materials and products - Determination of thermal resistance by means of guarded hot plate and heat flow meter methods - Thick products of high and medium thermal resistance;
EN 13501-1	Fire classification of construction products and building elements – Part 1: Classification using test data from reaction to fire tests
EN 13501-2	Fire classification of construction products and building elements – Part 2: Classification using test data from fire resistance tests
EN 14509	Self-supporting double skin metal faced insulating panels - Factory made products
EN 520	Gypsum plasterboards - Definitions, requirements and test methods;
EOTA TR 001	Determination of impact resistance of panels and panel assemblies
EOTA TR 024	Characterization, Aspects of Durability and Factory Production Control for Reactive Materials, Components and Products
EAD 350454-00- 1104	Fire Stopping and Fire Sealing Products