



Warrington Certification Ltd
Holmesfield Road
Warrington
WA1 2DS
United Kingdom

T : +44 (0) 1925 646 669
W: www.warringtoncertification.com
E: etass@exova.com



Member of
www.eota.eu

European Technical
Assessment

ETA 08/0213
of 17/03/16

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

Trade name of the construction product	Hilti Firestop Cushion CFS-CU
Product family to which the construction product belongs	Fire Stopping and Sealing Product Penetration Seals
Manufacturer	Hilti Corporation Feldkircherstrasse 100 9494 Schaan Liechtenstein
Manufacturing plant(s)	J/022
This European Technical Assessment contains	21 pages including 3 Annex(es) which form an integral part of this assessment.
This European Technical Assessment is issued in accordance with regulation (EU) No 305/2011, on the basis of	ETAG 026, edition 2011, used as European Assessment Document (EAD)

General Comments

1. This European Technical Assessment is issued by Warrington Certification Limited on the basis of ETAG 026 Fire Protective Products Part 1: General June 2013, and Part 2: Fire Stopping and Fire Sealing Products Aug 2011, Used as European Assessment Document.
2. This European Technical Assessment is not to be transferred to manufacturers or agents of manufacturers other than those indicated on page 1, or manufacturing plants other than those indicated on page 1.



1 SPECIFIC CONDITIONS OF THE EUROPEAN TECHNICAL ASSESSMENT

1 Technical Description of the Product

(Detailed information and data are given in Annexes)

- 1) Hilti Firestop Cushion CFS-CU is a 'Pillow/Cushion' used in combination with further Hilti Firestop Cushion CFS-CU to form a penetration seal to reinstate the fire resistance performance of wall and floor constructions, where they have been provided with apertures for the penetration of services. The Hilti Firestop Cushion CFS-CU is available in three sizes referenced Hilti Firestop Cushion CFS-CU S, Hilti Firestop Cushion CFS-CU M and Hilti Firestop Cushion CFS-CU L.
- 2) Hilti Firestop Cushion CFS-CU Firestop Penetration Seal is a service penetration seal to reinstate the fire resistance performance of wall and floor constructions, where they have been provided with apertures for the penetration of services, constructed from groups of Hilti Firestop Cushions CFS-CU
- 3) Hilti Firestop Acrylic Sealant CFS-S ACR may be used together with Hilti Firestop Cushions CFS-CU (reaction to fire class D-s1 d0 according to EN 13501-1). For a detailed product information see ETA-10/0389.

Internal use- ETAG 026-2 (used as European Assessment Document EAD) Type Z₂.

2 Specification Of The Intended Use In Accordance With The Relevant EAD

2.1 Intended Use

The intended use of Hilti Firestop Cushion CFS-CU is to temporarily or permanently reinstate the fire resistance performance of flexible wall constructions, rigid wall constructions and rigid floor constructions where they are penetrated by various services.

- 1) The specific elements of construction that the Hilti Firestop Cushion CFS-CU may be used to provide a penetration seal in, are as follows:

Flexible walls: 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. The aperture within the wall shall be lined with studs and 12.5 mm board (of the same type as the facings). A 12.5 mm thick Gypsum support board (E₁), 200 mm long shall be fixed within this lining. 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 minimum 100 mm insulation of Class A1 or A2 in the cavity between stud and seal.

Rigid walls: The wall must have a minimum thickness of 100 mm and comprise concrete or masonry, with a minimum density of 650 kg/m³.

Rigid floors: The floor must have a minimum thickness of 150 mm and comprise concrete with a minimum density of 2200 kg/m³.

The supporting construction must be classified in accordance with EN 13501-2 for the required fire resistance period.



- 2) The Hilti Firestop Cushion CFS-CU may be used to provide a penetration seal with the following specific services –single, multiple or in combination:

Cables/Cable trays/Conduits	Services as given in Annex C
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Plastic pipes	Services as given in Annex C
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- 3) Cable trays/ladders and pipes shall be supported at most 250 mm and 500 mm away from the surface of the seal and all cables shall be supported by trays or ladders.

The provisions made in this European Technical Approval are based on an assumed working life of the Hilti Firestop Cushion CFS-CU of 10 years, provided that the conditions laid down in Annex B 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 producer, 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.

2.2 Use Category

Type Z₂: Intended for use at internal conditions with humidity classes other than Z₁, excluding temperatures below 0°C.



2 Performance Of The Product And References To The Methods Used For Its Assessment

The assessment of fitness for use has been made in accordance with EOTA ETAG 026 Part 2: 2011-08-08 (used as European Assessment Document, EAD)

ETAG Clause No.	ETA Clause No.	Characteristic	Assessment of characteristic
		Mechanical resistance and stability	Not relevant
		Safety in case of fire	
2.4.1	2.1	Reaction to fire	B – s1, d0
2.4.2	2.2	Resistance to fire	See clause 2.1.2
		Hygiene, Health and the Environment	
2.4.3	2.3	Air permeability	No performance determined
2.4.4	2.4	Water permeability	No performance determined
2.4.5	2.5	Dangerous substances	See clause 2.5
		Safety in use	
2.4.6	2.6	Mechanical resistance and stability	Soft body impact: Energy 300 Nm Hard body impact: Energy 10Nm
2.4.7	2.7	Resistance to impact/movement	
2.4.8	2.8	Adhesion	
		Protection against noise	
2.4.9	2.9	Airborne sound insulation	$R_w(C;C_{tr})= 50(-1;-5)$ $D_{n,e,w}(C;C_{tr})= 58(-2;-6)$
		Energy, Economy and Heat Retention	
2.4.10	2.10	Thermal properties	No performance determined
2.4.11	2.11	Water vapour permeability	No performance determined
		General aspects relating to fitness for use	
2.4.12	2.12	Durability and serviceability	Z ₂ , see clause 2.12

2.1 Reaction to fire

The reaction to fire classification for Hilti Firestop Cushion CFS-CU is class B – s1, d0 according to EN 13501-1.



2.2 Resistance to fire

Hilti Firestop Cushion CFS-CU have been tested in accordance with prEN 1366-3, installed within apertures in flexible walls (drywalls), rigid walls (masonry) and concrete floors.

The classification of the resistance to fire performance has been carried out in accordance with clause 7.5.8 in EN 13501-2:2007. Penetration seals made from Hilti Firestop Cushion CFS-CU with additional materials and services are classified according to combinations of performance parameters and classes as shown in Annex C. The classifications are valid for services running through openings of maximum dimensions $w \times h = 1200\text{mm} \times 1500\text{mm}$, in flexible and rigid walls with minimum thickness $t_E = 100\text{mm}$ and concrete floors up to 700 mm wide (length may be unlimited subject to a minimum length to seal area ratio of 4.86:1 m^2/m^2) with minimum thickness of 150mm.

The classifications are not valid for sandwich panel constructions.

An aperture framing made from gypsum board must be fixed inside openings in flexible wall constructions. The frame must be made of gypsum boards 12,5 mm thick on each side of the opening fixed by minimum 2 metal screws per side.

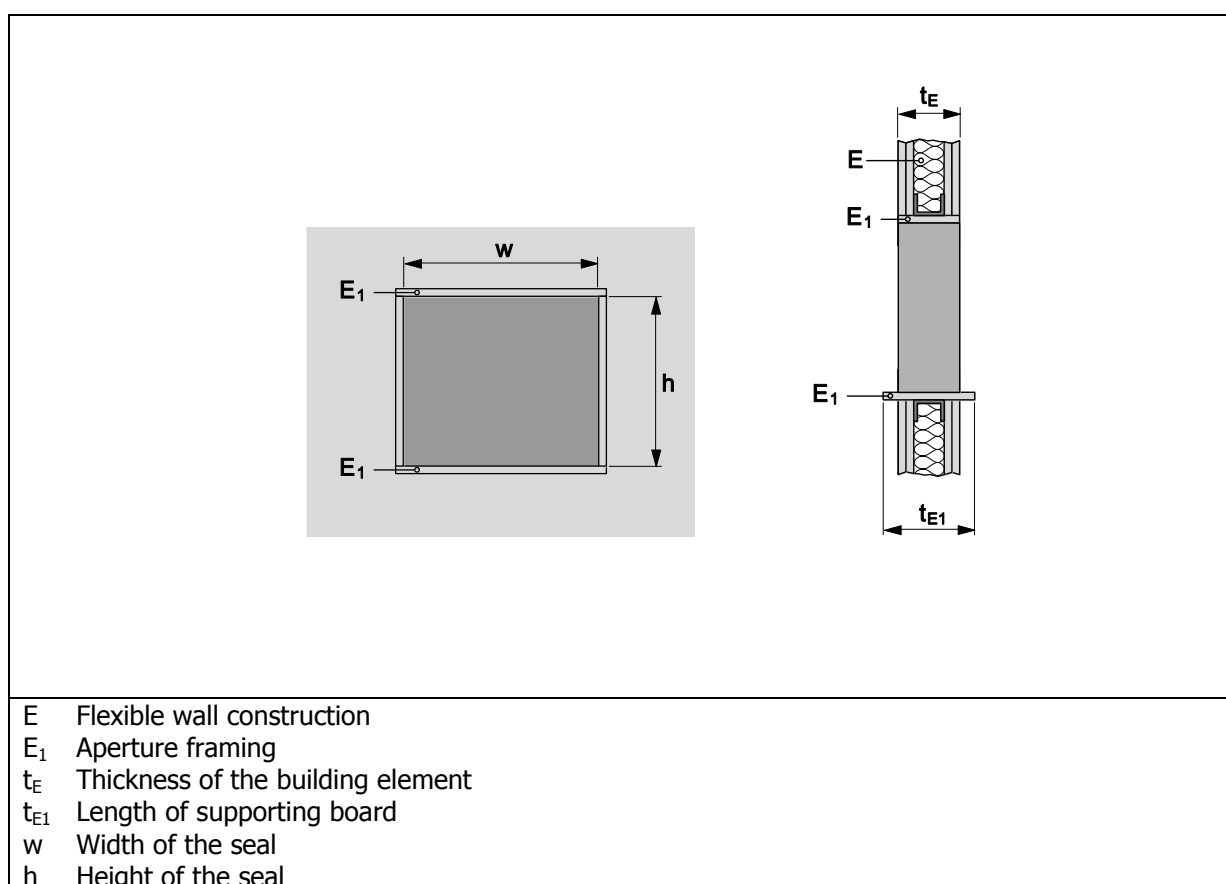


Fig. 1 Aperture framing

3.3 Air permeability

No performance determined

3.4 Water permeability

No performance determined



2.5 Dangerous substances

Hilti AG have presented a Material Safety Data Sheet according to 91/155 EEC and a declaration that Hilti Firestop Cushion CFS-CU is in compliance with Council Directive 76/769/EEC of 27th July 1976 on the approximation of the laws, regulations and administrative provisions of the Member States relating to restrictions on the marketing and use of certain dangerous substances and preparations (incl. All amendments and adaptations).

Confirmation has further been declared that all dangerous chemical substances ≥ 1.0 % w/w as well as all toxic, carcinogenic, toxic for reproduction and mutagenic chemical substances ≥ 0.1 % w/w (Status: 29. adaption – 2004/73/EG – of the EU directive 67/548/EEC - classification, packaging and labelling of dangerous substances) are stated in Hilti safety data sheets (according to 91/155/EEC including amendments) and have been considered for the classification of the products according to the directive 1999/45/EG (classification of preparations, including amendments).

Dangerous chemical substances below the classification limits of 67/548/EEC: None

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.

2.6 Mechanical resistance and stability

It is assumed that the impact test described in cl. 2.7 covers both static and dynamic loads

2.7 Resistance to impact/movement

Hilti Firestop Cushion CFS-CU have been tested in accordance with EOTA Technical Report - TR001 – Edition February 2003 at dimensions of 1500 mm x 1200 mm and without penetrating services.

The results demonstrate suitability for the following foreseen applications in accordance with EOTA Technical Report - TR001: A.1:

- Zones accessible primarily to those with high incentive to exercise care. Small risk of accidents occurring and of misuse.
- Zones accessible primarily to those with some incentive to exercise care. Some risk of accidents occurring and of misuse.
- Zones readily accessible to public and others with little incentive to exercise care. Risk of accidents occurring and of misuse.

2.8 Adhesion

It is assumed that verification of adequate adhesion is covered by the impact tests described in cl. 2.7

2.9 Airborne sound insulation

A test was conducted in accordance with EN ISO 140-3: 2005-03 and EN ISO 140-10: 1992-09, including classification in accordance with EN ISO 717-1: 1997-01. The test was conducted without services, as required by EOTA ETAG N° 026: Part 2.

The test was conducted on a steel stud, drywall assembly with overall dimensions of 1230 x 1480 x 155 mm, which incorporated a 600 x 500 mm aperture filled with the Hilti Firestop Cushion CFS-CU.



Briefly the wall comprised a 50 x 50 mm steel stud framework, faced on both sides with 2 layers of 12.5 mm Knauf Piano sound insulation board F and with a core of 40 mm thick Termarock 40 mineral wool insulation. The aperture for the penetration seal was lined with 2 layers of the Knauf board.

The cushions were tightly packed into the aperture in the wall and projected in to the source room by approximately 80 mm and into the receiving room by approximately 60 mm.

The specimen was mounted into the window test rig ("Z-wall").

The test conditions were as follows:

Boundary conditions	:	As specified in the standards
Test noise	:	Pink noise
Measuring filter	:	One-third-octave band filter
Measurement limits		
Background noise level	:	The background noise level of the receiving room was determined during measurement and the receiving room level L_2 was corrected by calculation as set out by EN 20140-3: 1995 + A1: 2004 Clause 6.5
Maximum sound insulation	:	Maximum sound insulation of the test set-up was $R_{w,Max} = 62$ dB. It was not corrected by calculation.
Measurement of reverberation time Arithmetic mean	:	Six measurements each of 2 loudspeaker and 6 microphone positions (total of 12 measurements)
Measurement of sound level difference	:	Minimum of 2 loudspeaker positions and rotating microphones

The results of the test provided the following single number ratings:

$$R_w (C;C_{tr}) = 50(-1;-5)$$

$$D_{n,e,w} (C;C_{tr}) = 58(-2;-6)$$

2.10 Thermal Properties

No performance determined.

2.11 Water vapour permeability

No performance determined.

2.12 Durability and serviceability

Hilti Firestop Cushion CFS-CU have been tested in accordance with EOTA Technical Report - TR024 – Edition November 2006 for the Z_2 use category specified in EOTA ETAG N° 026: Part 2 and the results of the test have demonstrated suitability for penetration seals intended for use at internal conditions with humidity classes excluding high humidity and excluding temperatures below 0°C



3 Assessment And Verification Of Constancy Of Performance (Hereinafter AVCP) System Applied, With References To Its Legal base

According to the decision 1999/454/EC of the European Commission the system of assessment and verification of constancy of performance (see Annex V to the Regulation (EU) No 305/2011) given in the following table apply:

Products	Intended uses	Level or Class	System
Fire stopping and fire sealing products	For fire compartmentation and / or fire protection or fire performance	Any	System 1

4 Technical Details Necessary For The Implementation Of The AVCP System, As Provided For In The Applicable EAD.

Tasks for the Manufacturer

Factory production control

The manufacturer shall exercise permanent internal control of production. All the elements, requirements and provisions adopted by the manufacturer shall be documented in a systematic manner in the form of written policies and procedures, including records of results performed. This production control system shall ensure that the product is in conformity with this European Technical Assessment.

The manufacturer may only use constituent materials stated in the technical documentation of this European Technical Assessment.

The factory production control shall be in accordance with the Control Plan relating to the European technical assessment ETA 08/0213 which is part of the technical documentation of this European technical assessment. The "Control Plan" is laid down in the context of the factory production control system operated by the manufacturer and deposited at Warrington Certification Limited.

The results of factory production control shall be recorded and evaluated in accordance with the provisions of the Control Plan.



Other tasks of manufacturer

Additional information

The manufacturer shall provide a technical data sheet and an installation instruction with the following minimum information:

(a) Technical data sheet:

- Field of application:
- Building elements for which the penetration seal is suitable, type and properties of the building elements like minimum thickness, density, and - in case of lightweight constructions – the construction requirements.
- Services for which the penetration seal is suitable, type and properties of the services like material, diameter, thickness etc. in case of pipes including insulation materials; necessary/allowed supports/fixings (e.g. cable trays)
- Limits in size, minimum thickness etc. of the penetration seal
- Construction of the penetration seal including the necessary components and additional products (e.g. backfilling material) with clear indication whether they are generic or specific.

(b) Installation instruction:

- Steps to be followed
- Procedure in case of retrofitting.

Tasks of approved bodies

The approved body shall perform the

- initial type-testing of the product,
- initial inspection of factory and of factory production control,
- continuous surveillance, assessment and approval of factory production control,

In accordance with the provisions laid down in the "Control Plan" relating to the European Technical Assessment 08/0213.

The approved body shall retain the essential points of its actions referred to above and state the results obtained and conclusions drawn in a written report.

The approved certification body involved by the manufacturer shall issue an EC certificate of conformity of the product stating the conformity with the provisions of this European technical assessment.

In cases where the provisions of the European technical assessment and its "Control Plan" are no longer fulfilled the certification body shall withdraw the certificate of conformity and inform the Warrington Certification Limited without delay.



Signatories



Responsible Officer

C. Abbott* - Principal Certification Engineer



Approved

A. Kearns* - Technical Manager

* For and on behalf of Warrington Certification Limited.



Annex A

Reference Documents and LIST OF ABBREVIATIONS

References to standards mentioned in the ETA:

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 1366-3	Fire resistance tests for service installations - Part 3: Penetration seals

Other reference documents:

EOTA TR 024	Characterisation, Aspects of Durability and Factory Production Control for Reactive Materials, Components and Products
ETAG No. 026: Part 2	Guideline For European Technical Approval of Fire Stopping and Fire Sealing Products, Part 3: Penetration Seals (used as European Assessment Document, EAD)

Abbreviations used in drawings

Abbreviation	Description
A, A ₁ , A ₂ , ..	Firestop product
C, C ₁ , C ₂	Penetration Service
E	Building element (wall, floor)
E ₁	Supporting board
E ₂	Wire mesh
t _E	Thickness of building element (wall, floor)
t _{E1}	Length of supporting board
w	width
h	height
l _A	length Firestop product (additional)



Annex B

Description of Product and Product Literature

Hilti Firestop Cushion CFS-CU

Hilti Firestop Cushion CFS-CU is a ready-to-use Firestop Cushion made of an intumescent material contained in a fibre glass bag.

A detailed specification of the product is contained in document "Identification / Product Specification and Control Plan of date... relating to the European Technical Approval ETA – 08/0213 issued on 12/2/16 Hilti Firestop Cushion CFS-CU" which is a non-public part of this ETA.

Hilti Firestop Cushion CFS-CU :

- **Hilti Firestop Cushion CFS-CU S (small) :**
(300mm x 40mm x 30mm)



- **Hilti Firestop Cushion CFS-CU M (medium) :**
(300mm x 80mm x 30mm)



- **Hilti Firestop Cushion CFS-CU L (large) :**
(300mm x 170mm x 30mm)

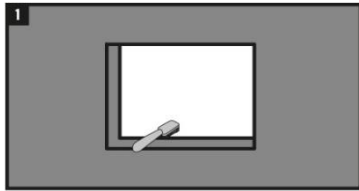


Technical product literature:

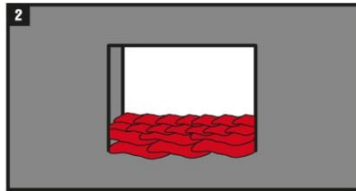
- Technical data sheet and instructions for use Hilti Firestop Cushion CFS-CU



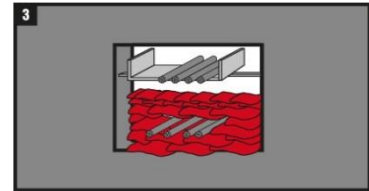
Installation of system Firestop Cushion CFS-CU shall be conducted as follows:



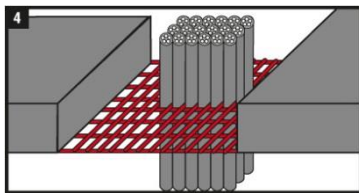
1 Clean the opening.



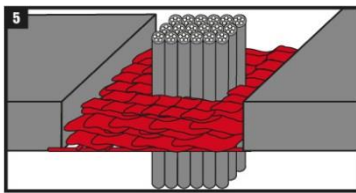
2 Cushion arrangement without cables running through wall partition. Opening must be framed in drywall applications.



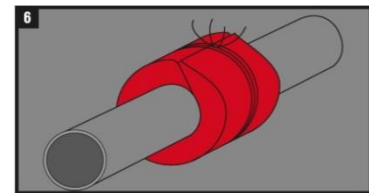
3 Cushion arrangement with cables/cable trays running through wall



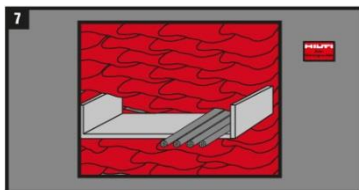
4 When closing floor openings, fasten wire mesh in place as shown in drawing.



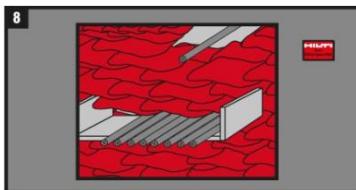
5 Cushion arrangement in floor. If required, seal gaps between cables and Hilti Firestop Cushions with Hilti Acrylic Sealant CFS-S ACR (please refer to Annex C).



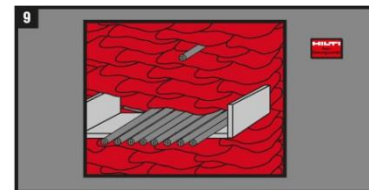
6 If required, wrap cable/ cable tray resp. pipe with Hilti Firestop Cushion CFS-CU L and fix with wire as shown in drawing (please refer to Annex C).



7 Fasten identification plate in place if required.



8 Re-installing cables : Remove a Hilti Firestop Cushion from the seal and install the cable or pipe. Close the opening with Hilti Firestop Cushions.



Indications to the manufacturer

Packaging, transport and storage

The following measures should be adopted with regard to handling and storage of the Hilti Firestop Cushion CFS-CU:

For safe handling the provisions of the Material Safety Data Sheet for the product shall be followed

Storage and transport temperatures are -20 °C to +40 °C

Use, maintenance, repair

The system Hilti Firestop Cushion CFS-CU should be installed and used as described earlier in this document.

System Hilti Firestop Cushion CFS-CU seals which are damaged should not be used or if damaged after installation, should be removed and replaced with undamaged cushions.

In the area covered by the ETA when the set up recommendation have been followed there is no maintenance protocol to be followed. The product does not need any maintenance in the life time indicated in the ETA.



Annex C

Resistance to Fire Classification of Hilti Firestop Cushion CFS-CU

C.1 Flexible wall constructions and rigid wall constructions according to 2.1 with wall thickness t_E of minimum 100 mm

Penetration seal / Services	Classification	
		with additional cable wrapping Additional Hilti Firestop cushion wrapped around cables for an extension of the seal depth by 150 mm on both sides of the seal
All sheathed cable types currently and commonly used in building practice in Europe (e.g. power, control, signal, telecommunication, data, optical fibre cables up to 80 mm diameter	EI 45 / E 120	EI 120
Tied bundles of up to 80 mm overall diameter containing up to 21 mm diameter sheathed electrical/telecommunication/optical fibre cables	EI 45 / E 120	EI 120
All non-sheathed electrical cables up to 24 mm diameter	EI 45 / E 120	EI 120
All steel or plastic conduits up to 16 mm diameter	EI 45 / E 120 U/U	EI 120 U/U
PVC-U pipes according to EN 1452-1 and DIN 8061/8062 arranged linear, diameter Ø50 mm with wall thickness between 1,8 mm and 5,3 mm.	EI 120 U/C	



C.2 Rigid wall constructions according to 2.1 with wall thickness t_E of minimum 150 mm

Penetration seal / Services	Classification	
		with additional cable wrapping Additional Hilti Firestop cushion wrapped around cables for an extension of the seal depth by 150 mm on both sides of the seal
All sheathed cable types currently and commonly used in building practice in Europe (e.g. power, control, signal, telecommunication, data, optical fibre cables up to 80 mm diameter	EI 60 / E 240	EI 120 / E 240
Bundles of up to 80 mm overall diameter containing up to 21 mm diameter sheathed electrical/telecommunication/optical fibre cables	EI 60 / E 240	EI 120 / E 240
All non-sheathed electrical cables up to 24 mm diameter	EI 60 / E 240	EI 120 / E 240
All steel or plastic conduits up to 16 mm diameter	EI 45 / E 240 U/U	EI 120 / E 240 U/U
PVC-U pipes according to EN 1452-1 and DIN 8061/8062 arranged linear, diameter Ø50 mm with wall thickness between 1,8 mm and 5,3 mm.	EI 240 U/C	---



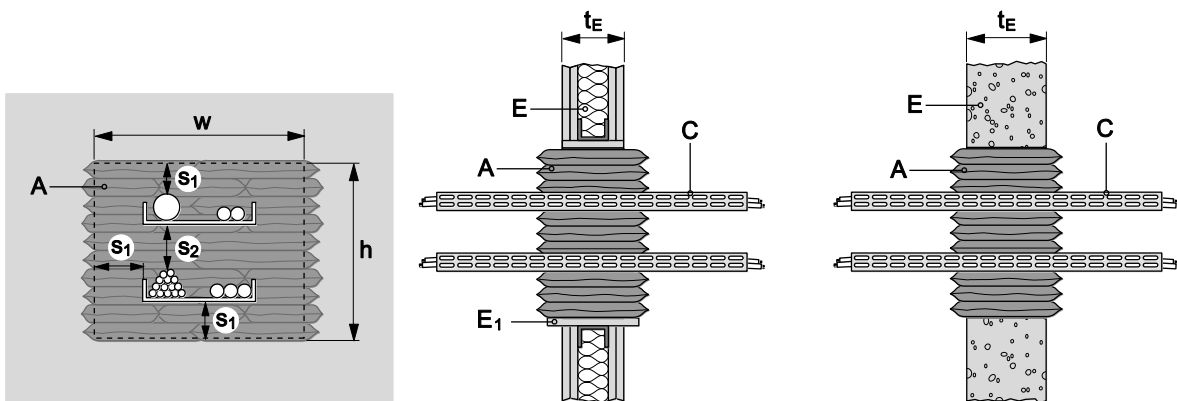
Construction details:

Cable support construction: Perforated metal cable trays with a melting point higher than 1100°C (e.g. galvanised steel, stainless steel). Trays with organic coatings are covered if their overall classification is minimum A2 according to EN 13501-1.

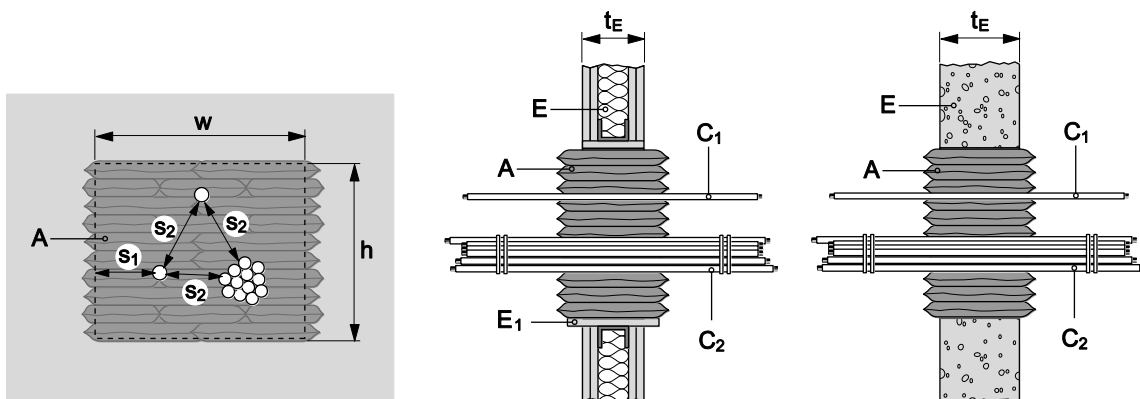
Minimum distance (mm):

Cables/cable tray to seal edge (s_1):	40	Cable to seal edge (s_1):	40
Cables to cable tray (s_2):	80	Cable to cable (s_2):	0
Plastic pipe to seal edge (s_1):	100	Cable to cable bundle (s_2):	80
Plastic pipe to plastic pipe (s_2):	100		
Plastic pipe to cable tray (s_2):	175		

Cables/conduits on cable trays:

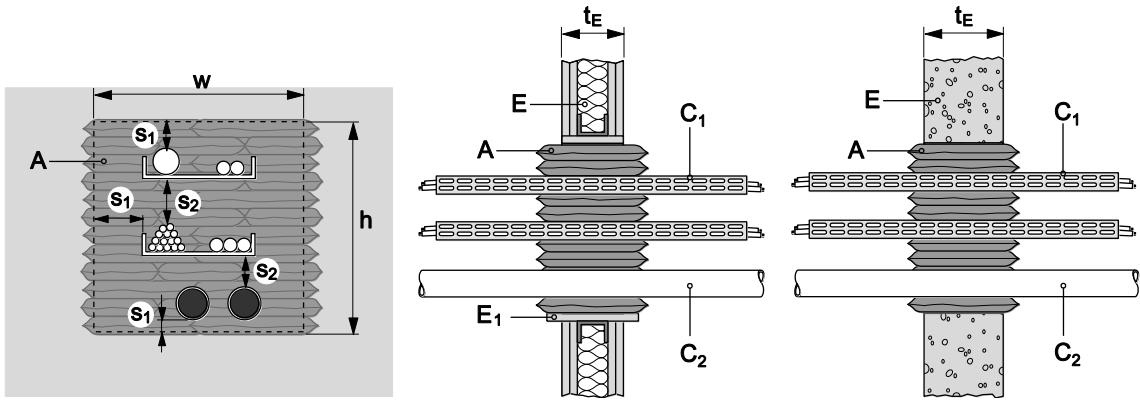


Cables/cable bundles/conduits without cable tray:

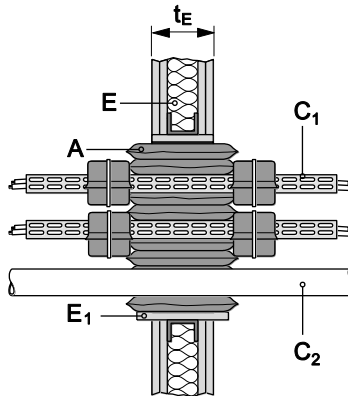


Cable trays/plastic pipes:





Additional cable wrapping
 (see Installation Instructions for details):



For explanation of abbreviations see the related text and Annex A



C.3 Rigid floor constructions according to 2.1 with floor thickness t_E of minimum 150 mm

Penetration seal / Services	Classification	
	with additional cable wrapping ($l_A = 150\text{mm}$)	with additional cable wrapping ($l_A = 150\text{mm}$) 1) ($l_A = 300\text{mm}$) + Hilti Firestop Acrylic Sealant CFS-S ACR (A_1)
All sheathed cable types currently and commonly used in building practice in Europe (e.g. power, control, signal, telecommunication, data, optical fibre cables with a diameter of:		
Maximum \varnothing 21 mm	EI 120	EI 120
$21 \leq \varnothing \leq 90$ mm	EI 60 / E 120	EI 90 EI 120 ¹⁾
Bundles of up to 80 mm overall diameter containing up to 21 mm diameter sheathed electrical/telecommunication/optical fibre cables	EI 60 / E 120	EI 90 / E 120
All non-sheathed electrical cables up to 24 mm diameter	EI 60 / E 120	EI 120 / E 240
All steel or plastic conduits up to 16 mm diameter	EI 60 / E 120 U/U	EI 120 / E 240 U/U
PVC-U pipes (C) according to EN 1452-1 and DIN 8061/8062 arranged linear, diameter \varnothing 50 mm with wall thickness between 1,8 mm and 5,3 mm.	EI 120 U/C	

(see Installation Instructions for details)

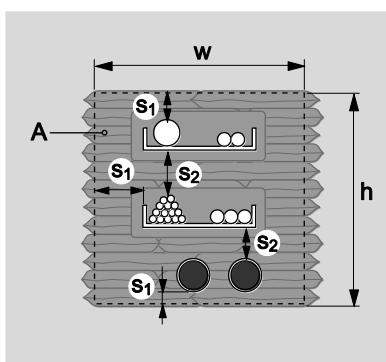


Construction details:

Cable support construction: Perforated metal cable trays with a melting point higher than 1100°C (e.g. galvanised steel, stainless steel). Trays with organic coatings are covered if their overall classification is minimum A2 according to EN 13501-1.

Minimum distance (mm):

Cables/cable tray to seal edge (s_1):	40	Cable to seal edge (s_1):	40
Cables to cable tray (s_2):	80	Cable to cable (s_2):	0
Plastic pipe to seal edge (s_1):	40	Cable to cable bundle (s_2):	80
Plastic pipe to plastic pipe: (s_2):	100		
Plastic pipe to cable tray (s_2):	50		



For explanation of abbreviations see the related text and Annex A

