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Authorised and notified according to Article 10 of the Council Directive 89/106/EEC of 21 December 1988 on the approximation of laws, regulations and administrative provisions of Member States relating to construction products.

MEMBER OF EOTA

European Technical Approval ETA-08/0213

Trade name:		**Hilti Firestop Cushion CFS-CU**
Holder of the approval:		HILTI Corporation Feldkircherstrasse 100 9494 Schaan Liechtenstein
Generic type and use of construction product:		Fire Stopping and Sealing Product. Penetration Seals
Valid	from:	2011-04-11
	to:	2016-04-11
Manufacturing plant:		J/022
This European Technical Approval contains:		13 pages and 3 Annexes, 21 pages in total

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Issued by:

For and on behalf of Warrington Certification Limited

European Organisation for Technical Approvals
Europäische Organisation für Technische Zulassungen
Organisation Européenne pour l'Agrément technique

I LEGAL BASES AND GENERAL CONDITIONS

1 This European Technical Approval is issued by Warrington Certification Limited in accordance with:

The Council Directive 89/106/EEC of 21 December 1988 on the approximation of laws, regulations and administrative provisions of Member States relating to construction products[1] modified by Council Directive 93/68/EEC[2] and Regulation (EC) N° 1882/2003 of the European Parliament and of the Council[3];

UK implementation of CPD Statutory Instruments 1991, No 1620 Building and Buildings The Construction Products Regulations 1991- made 15 July 1991, laid before Parliament 22 July 1991, coming into force 27 December 1991, and amended by The Construction Products (Amendment) Regulations 1994 (Statutory Instruments 1994, No 3051);

Common Procedural Rules for Requesting, Preparing and the Granting of European Technical Approvals set out in the Annex to Commission Decision 94/23/EC[4];

Guideline for European Technical Approval of Fire Stopping and Fire Sealing Products: ETAG 026 Part 1: "General" and Part 2: "Penetration Seals".

2 Warrington Certification Limited is authorised to check whether the provisions of this European Technical Approval are met. Checking may take place in the manufacturing plant(s). Nevertheless, the responsibility for the conformity of the products to the European Technical Approval and for their fitness for their intended use remains with the holder of the European Technical Approval.

3 This European Technical Approval 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.

4 This European Technical Approval may be withdrawn by Warrington Certification Limited, in particular pursuant to information by the Commission according to Article 5(1) of Council Directive 89/106/EEC.

5 Reproduction of this European Technical Approval including transmission by electronic means shall be in full. However, partial reproduction can be made with the written consent of Warrington Certification Limited. In this case partial reproduction has to be designated as such. Texts and drawings of advertising brochures shall not contradict or misuse the European Technical Approval.

6 The European Technical Approval is issued by the approval body in its official language. This version should correspond fully to the version circulated within EOTA. Translations into other languages have to be designated as such.

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[1] Official Journal of the European Communities N° L40, 11.2.1989, p. 12

[2] Official Journal of the European Communities N° L 220, 30.08.1993, p. 1

[3] Official Journal of the European Union N° L 284, 31.10.2003, p. 1

[4] Official Journal of the European Communities N° L17, 20.1.1994, p. 34

II SPECIFIC CONDITIONS OF THE EUROPEAN TECHNICAL APPROVAL

1 Definition of product and intended use

1.1.1 Definition of the construction product

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) Installation of the Hilti Firestop Cushion CFS-CU– See 4.2

1.1.2 Additional components

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.

For application details see Annex C.

1.2 Intended Use and Use Category

1.2.1 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 (E_1), 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 150 mm and comprise concrete or masonry, with a minimum density of 650 kg/m^3.

Rigid floors: The floor must have a minimum thickness of 150 mm and comprise concrete with a minimum density of 2200 kg/m^3.

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:

Blank seal	As given in Annex C
Cables/Cable trays/Conduits	Services as given in Annex C
Plastic pipes	Services as given in Annex C

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 sections 4.2/5.1/5.2 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.

1.2.2 Use Category

Type Z_2: Intended for use at internal conditions with humidity classes other than Z_1[5], excluding temperatures below 0°C.

2 Characteristics of the product and methods of verification

The assessment of fitness for use has been made in accordance with EOTA ETAG 026 Part 2: 2008-01-01

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
2.4.7	2.7	Resistance to impact/movement	
2.4.8	2.8	Adhesion	Hard body impact: Energy 10Nm
		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.

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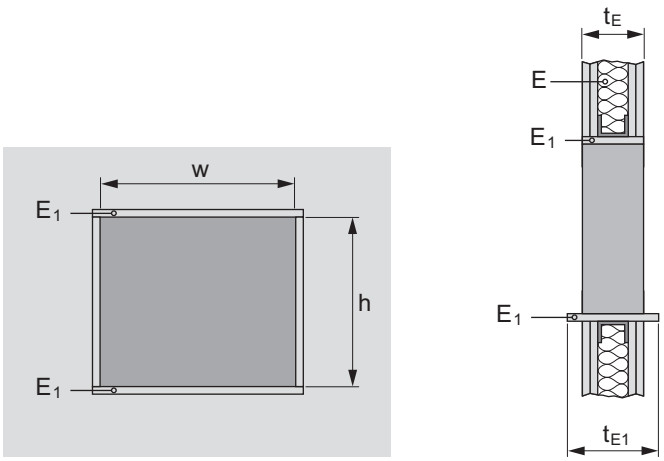
[5] i.e. humidity class other than class 5 in accordance with EN ISO 13788

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 x h = 1200mm x 1500mm, in flexible and rigid walls with minimum thickness tE = 100mm 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/m^2) with mimimum 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.



E	Flexible wall construction
E_1	Aperture framing
t_E	Thickness of the building element
t_{E1}	Length of supporting board
w	Width of the seal
h	Height of the seal

Fig. 1 Aperture framing

2.3 Air permeability

No performance determined

2.4 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 labeling 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 Evaluation of Conformity and CE marking

3.1 Attestation of Conformity system

According to the decision 1999/454/EC of the European Commission the system 1 of attestation of conformity applies.

This system of attestation of conformity is defined as follows:

System 1: Certification of the conformity of the product by a notified certification body on the basis of:

(a) Tasks for the manufacturer:

(1) factory production control;

(2) further testing of samples taken at the factory by the manufacturer in accordance with a prescribed test plan;

(b) Tasks for the notified body

(1) initial type-testing of the product;

(2) initial inspection of factory and of factory production control;

(3) continued surveillance, assessment and approval of factory production control.

3.2 Responsibilities

3.2.1 Tasks for the Manufacturer

3.2.1.1 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 approval.

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

The factory production control shall be in accordance with the Control Plan of (date) relating to the European technical approval ETA-08/0213 which is part of the technical documentation of this European technical approval. 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.

3.2.1.2 Other tasks of manufacturer

Additional information

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

(c) 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.

(d) Installation instruction:

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

The manufacturer shall, on the basis of a contract, involve a body which is approved for the tasks referred to in section 3.1 in the field of penetration seals in order to undertake the actions laid down in section 3.3. For this purpose, the "control plan" referred to in sections 3.2.1.1 and 3.2.2 shall be handed over by the manufacturer to the approved body or bodies involved.

The manufacturer shall make a declaration of conformity, stating that the construction product is in conformity with the provisions of the European technical approval ETA-08/0213.

3.2.2 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 approval ETA-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 approval.

In cases where the provisions of the European technical approval 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.

3.3 CE-Marking

The CE marking shall be affixed on the Hilti Firestop Cushion CFS-CU. The marking "CE" shall be followed by the identification number of the approved certification body and be accompanied by the following additional information:

- identification number of the notified body (as mentioned above)
- the name and address of the ETA holder ,
- the last two digits of the year in which the CE marking was affixed,
- the number of the EC certificate of conformity for the product,
- the number of the European Technical Approval,
- the number of the Guideline for European Technical Approval
- the use category Z_2
- see ETA-08/0213 for other relevant characteristics

CE	**'CE'-marking**
1121	Identification number of approved certification body
Hilti Corporation Feldkircherstrasse 100 9494-Schaan Liechtenstein	Name and address of the producer (legal entity responsible for the manufacturer)
11	Two last digits of year of affixing the CE marking
1121-CPD-EA0001	Number of EC certificate of conformity
ETA-08/0213	Number of European technical approval
ETAG N° 026 part 2	Number of guideline for European technical approval
Penetration Seal 'Hilti Firestop Cushion CFS-CU	Designation of the product (trade name)
Use category Z_2	Use category in accordance with the ETA section 1 and 2
see ETA 08/0213 for other relevant characteristics	Other relevant characteristics see ETA 08/0213

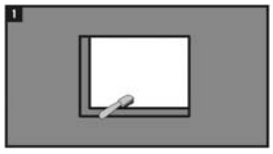
4 Assumptions under which the fitness of the product for the intended use was favorably assessed

4.1 Manufacturing

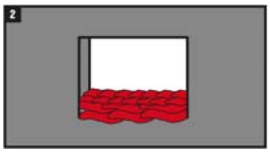
The European technical approval is issued for the product on the basis of agreed data/information, deposited with Warrington Certification Limited, which identifies the product that has been assessed and judged. Changes to the product or production process, which could result in this deposited data/information being incorrect, should be notified to Warrington Certification Limited before the changes are introduced. Warrington Certification Limited will decide whether or not such changes affect the ETA and consequently the validity of the CE marking on the basis of the ETA and if so whether further assessment or alterations to the ETA, shall be necessary.

4.2 Installation

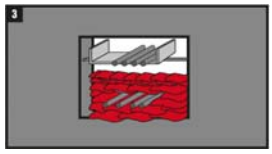
Installation of system Firestop Cushion CFS-CU shall be conducted as follows:



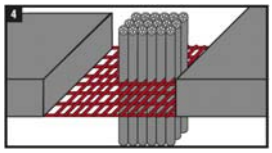
Clean the opening.



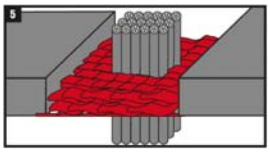
Cushion arrangement without cables running through wall partition. Opening must be framed in drywall applications.



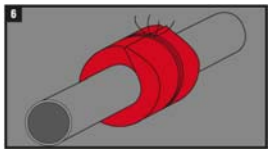
Cushion arrangement with cables/cable trays running through wall partition.



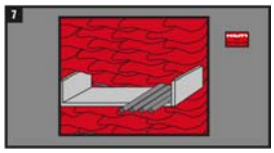
When closing floor openings, fasten wire mesh in place as shown in drawing.



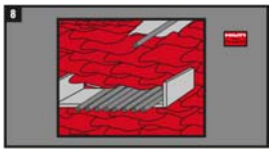
Cushion arrangement in floor. If required, seal gaps between cables and Hilti Firestop Cushions with Hilti Acrylic Sealant CFS-S ACR (please refer to Annex C).

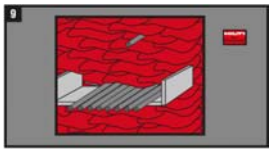


If required, wrap cable/ cable tray resp. pipe with Hilti Firestop Cushion CFS-CU L and fix with wire as shown in drawing (please refer to Annex C).



Fasten identification plate in place if required.





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

- Aperture framing in flexible wall constructions must be fixed. For details see 2.2
- Install 200 mm wide (t_{E1}) calcium silicate/gypsum board at the bottom edge of the aperture for walls less than 200 mm thick and all flexible walls
- Insert the first layer of Hilti Firestop Cushion CFS-CU underneath the services if possible
- Overlap > 20 mm
- Shift next layer 1/2 width of cushion (stretcher bond)
- Openings in floors should have wire mesh (wire > 5 mm dia./mesh ≤ 50x50 mm) secured at the underside with Hilti metal anchors e. g. HEH, DBZ etc. The Hilti Firestop Cushion CFS-CU must be laid on the wire mesh, overlapping by ca. 1/2 width of cushion resulting in an overall installation depth of 150 mm

- Seal off the opening with Hilti Firestop Cushion CFS-CU tightly and gaps between cables with Hilti Firestop Acrylic Sealant CFS-S ACR if required (See Annex C for related classification).

- Wrap Hilti Firestop cushions around cables for an extension of the seal depth of 150mm in walls and floors or for an extension of 300mm in floors, depending upon the required insulation performance. (See Annex C for related classification).

- If the service penetration must carry permanent identification mark in the form of an installation plate, enter the appropriate details on the installation plate and mount it in a visible position beside the service penetration

- Floor seals must be protected from loading using wire mesh

- Do not use damaged cushions

In case of remaining openings around services, including between service and tray and where services have been removed, insert additional cushion/cushions into the gap.

5 Indications to the manufacturer

5.1 Packaging, transport and storage

The following measures should be adopted with regard to handling and storage of the Hilti Firestop Foam 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

5.2 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 bandages.

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 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 ISO 140-3	Acoustics – Measurement of sound insulation in buildings and of building elements – Part 3: Laboratory measurements of airborne sound insulation of building elements

Other reference documents:

EOTA TR 024	Characterisation, Aspects of Durability and Factory Production Control for Reactive Materials, Components and Products
EOTA TR 001	Determination of impact resistance of panels and panel assemblies

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	Supporting board
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 ...(date) 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

Annex C
Resistance to Fire Classification of Hilti Firestop Cushion CFS-CU

C.1 Flexible wall constructions and rigid wall constructions according to 1.2.1 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 1.1.1 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	---

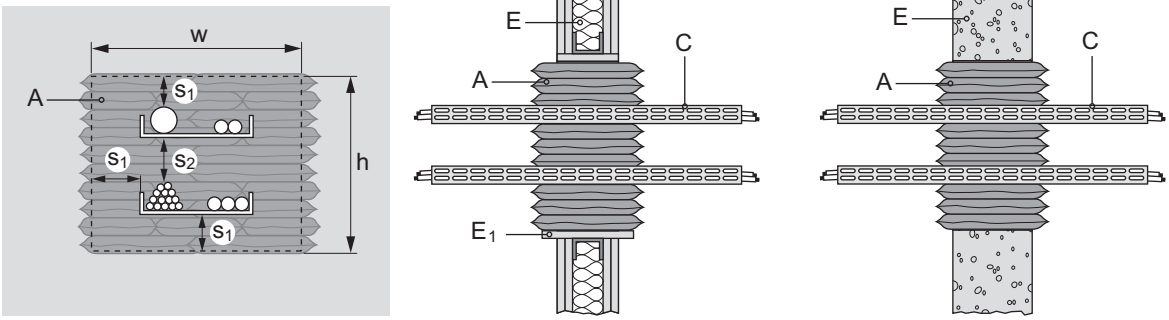
Construction details:

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.

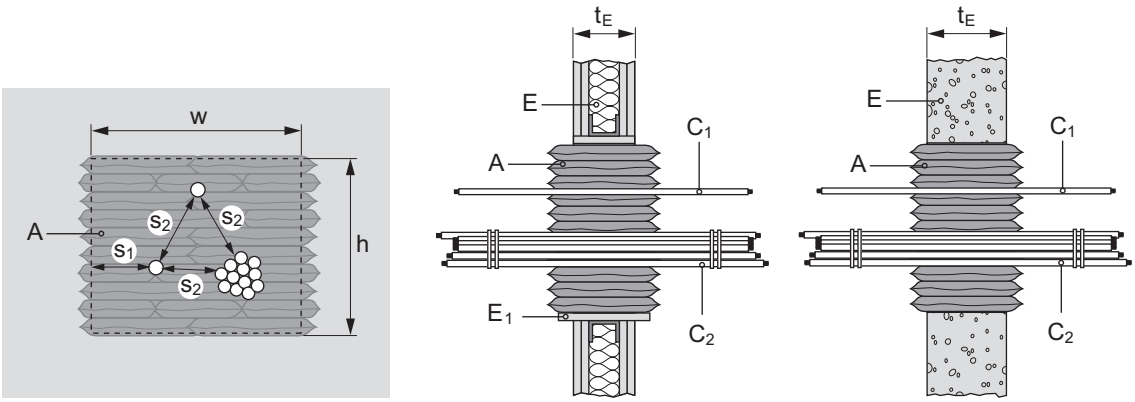
Minimum distance (mm):

Cables/cable tray to seal edge (s_1):	40	Cables without tray:	
Cables to cable tray (s_2):	80		
Plastic pipe to seal edge (s_1):	100	Cable to seal edge (s_1):	40
Plastic pipe to plastic pipe: (s_2):	100	Cable to cable (s_2):	0
Plastic pipe to cable tray (s_2):	175	Cable to cable bundle (s_2):	80

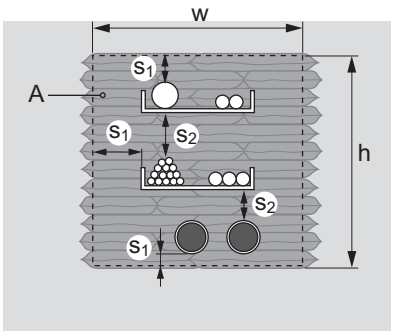
Cables/conduits on cable trays:

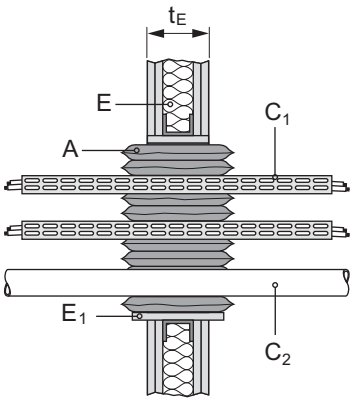


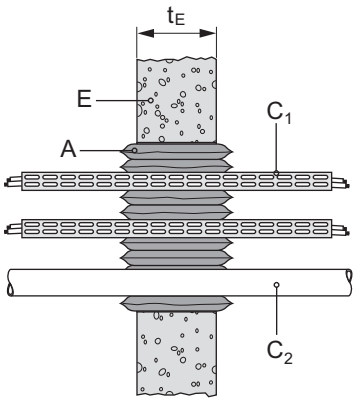
Cables/cable bundles/conduits without cable tray:



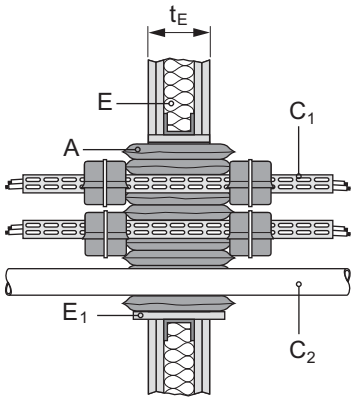
Cable trays/plastic pipes:





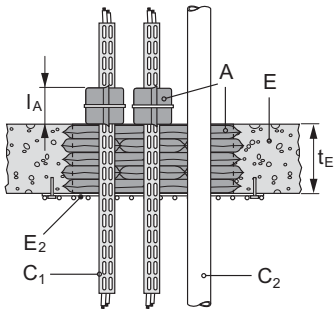
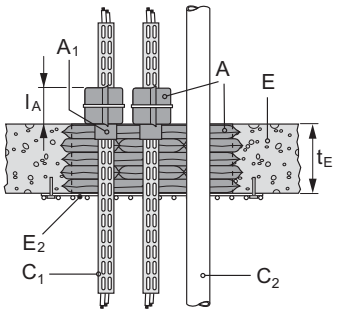


Additional cable wrapping
(see Installation Instructions for details):



For explanation of abbreviations see the related text and Annex A

C.3 Rigid floor constructions according to 1.1.1 with floor thickness t_E of minimum 150 mm

Penetration seal / Services	Classification	
	with additional cable wrapping (l_A = 150mm) 	**with additional cable wrapping (l_A = 150mm)** [1] **(l_A = 300mm)** **+ 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 Ø 21 mm	EI 120	EI 120
21 ≤ Ø ≤ 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 Ø50 mm with wall thickness between 1,8 mm and 5,3 mm.	EI 120 U/C	

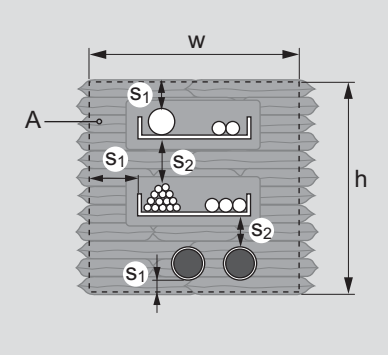
(see Installation Instructions for details)

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	Cables without tray:	
Cables to cable tray (s_2):	80		
Plastic pipe to seal edge (s_1):	40	Cable to seal edge (s_1):	40
Plastic pipe to plastic pipe: (s_2):	100	Cable to cable (s_2):	0
Plastic pipe to cable tray (s_2):	50	Cable to cable bundle (s_2):	80



For explanation of abbreviations see the related text and Annex A