

EUROPEAN TECHNICAL ASSESSMENT

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UBAtc Assessment Operator:
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Technical Assessment Body issuing the European Technical Assessment: UBAtc.
UBAtc has been designated according to Article 29 of Regulation (EU) No 305/2011
and is member of EOTA (European Organisation for Technical Assessment)

Trade name of the construction product:

Hilti Firestop Putty Disc CFS-D 25

Product family to which the construction product belongs:

35 - Fire Protective Sealant

Manufacturer:

Hilti AG
Feldkircherstrasse 100
FL-9494 Schaan
Liechtenstein

Manufacturing plant(s):

Hilti Werk 22

Website:

www.hilti.com

This European Technical Assessment is issued in accordance with Regulation (EU) No 305/2011, on the basis of:

EAD 350454-00-1104 (2017) Fire stopping and fire Sealing Products - Penetration Seals

This European Technical Assessment contains:

12 pages, including 2 annexes which form an integral part of the document.



**European Organisation
for Technical Assessment**

Legal bases and general conditions

- 1 This European Technical Assessment is issued by UBAtc (Union belge pour l'Agrément technique de la construction, i.e. Belgian Union for technical Approval in construction), in accordance with:
 - Regulation (EU) No 305/2011¹ of the European Parliament and of the Council of 9 March 2011 laying down harmonised conditions for the marketing of construction products and repealing Council Directive 89/106/EEC
 - Commission Implementing Regulation (EU) No 1062/2013² of 30 October 2013 on the format of the European Technical Assessment for construction products
 - EAD-350454-00-1104 (2017) Fire stopping and fire Sealing Products - penetration Seals
- 2 Under the provisions of Regulation (EU) No 305/2011, UBAtc is not authorized to check whether the provisions of this European Technical Assessment are met once the ETA has been issued.
- 3 The responsibility for the conformity of the performances of the products with this European Technical Assessment and the suitability of the products for the intended use remains with the holder of the European Technical Assessment.
- 4 Depending on the applicable Assessment and verification of constancy of performance (AVCP) system, (a) notified body(ies) may carry out third-party tasks in the process of assessment and verification of constancy of performance under this Regulation once the European Technical Assessment has been issued.
- 5 This European Technical Assessment allows the manufacturer of the construction product covered by this ETA to draw up a declaration of performance for the construction product.
- 6 CE marking should be affixed to all construction products for which the manufacturer has drawn up a declaration of performance.
- 7 This European Technical Assessment is not to be transferred to other manufacturers, agents of manufacturers, or manufacturing plants other than those indicated on page 1 of this European Technical Assessment.
- 8 The European Technical Assessment holder confirms to guarantee that the product(-s) to which this assessment relates, is/are produced and marketed in accordance with and comply with all applicable legal and regulatory provisions, including, without limitation, national and European legislation on the safety of products and services. The ETA-holder shall notify the UBAtc immediately in writing of any circumstance affecting the aforementioned guarantee. This assessment is issued under the condition that the aforementioned guarantee by the ETA-holder will be continuously observed.
- 9 According to Article 11(6) of Regulation (EU) No 305/2011, when making a construction product available on the market, the manufacturer shall ensure that the product is accompanied by instructions and safety information in a language determined by the Member State concerned which can be easily understood by users. These instructions and safety information should fully correspond with the technical information about the product and its intended use which the manufacturer has submitted to the responsible Technical Assessment Body for the issuing of the European Technical Assessment.
- 10 Pursuant to Article 11(3) of Regulation (EU) No 305/2011, manufacturers shall adequately take into account changes in the product-type and in the applicable harmonised technical specifications. Therefore, when the contents of the issued European Technical Assessment do not any longer correspond to the product-type, the manufacturer should refrain from using this European Technical Assessment as the basis for their declaration of performance.
- 11 All rights of exploitation in any form and by any means of this European Technical Assessment is reserved for UBAtc and the ETA-holder, subject to the provisions of the applicable UBAtc regulations.
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- 13 Subject to the application introduced, this European Technical Assessment is issued in English and may be issued by the UBAtc in its official languages. The translations correspond fully to the English reference version circulated in EOTA.
- 14 This European Technical Assessment was first issued by UBAtc on 18 March 2016. A second version was issued on 21 April 2016. This third version comprises the changing of the product name and production place and the changing of the reference of the guidance document.

¹ OJEU, L 88 of 2011/04/04

² OJEU, L 289 of 2013/10/31

Technical Provisions

1 Technical description of the product

The Hilti Firestop Putty Disc CFS-D 25 is a fire sealing device in the form of a built-up self-adhesive flexible fire sealing disk.

The Hilti Firestop Putty Disc CFS-D 25 is intended for uses in environmental conditions type Y₁, Y₂, Z₁ and Z₂ according to EAD 350454-00-1104, i.e. for uses at all indoor conditions but not to rain or other forms of severe wetting.

The Hilti Firestop Putty Disc CFS-D 25 may be wrapped around cables and small tubes to seal the penetration in the construction element to prevent propagation of fire. The inlay of the disk reacts to heat and thereby prevents the spread of smoke and fire.

The, about 60 mm diameter, Hilti Firestop Putty Disc CFS-D 25 consists of a red flexible intumescent inlay, protected on both sides by a foil. The thickness of the disk is 3 mm. When the foil at the backside is removed, the disk may be wrapped around a penetrating service and pasted to the substrate to protect (see details in Annex 1).

The assumed working life of the Hilti Firestop Putty Disc CFS-D 25 is minimum 25 years, provided that the disk is subject to appropriate use and maintenance, in accordance with the manufacturer recommendations.

The Hilti Firestop Putty Discs CFS-D 25 are manufactured at the Hilti Werk 22 (known at UBAtc).

2 Specification of the intended use(s) in accordance with the applicable EAD

2.1 Intended uses

Hilti Firestop Putty Disc CFS-D 25 can be used to protect penetrations through 100 mm rigid or flexible walls, as described in annex 1 of this ETA. These penetrations may be empty or contain cables (single, multi conductor), plastic conduits and metal pipes/tubes. More details can be found in Annex 1. The maximum dimension of the opening is 25 mm (diameter or square side).

This ETA covers construction elements installed in accordance with the provisions given in Annex 1. Other intended uses may be supported by other means at national level but are not covered by this ETA.

2.2 Use Categories

Hilti Firestop Putty Disc CFS-D 25 is intended for uses in environmental condition type Y₁, Y₂, Z₁ and Z₂ according to EAD 350454-00-1104, i.e. for uses at all indoor conditions but not to rain.

The provisions made in this European Technical Assessment are based on an assumed intended working life of 25 years.

Indications given regarding the working life cannot be interpreted as a guarantee given by the producer or the UBAtc, but are to be regarded only as a means for choosing the appropriate product(s) in relation to the expected economically reasonable working life of the construction works.

2.3 Assumptions under which the product was favourably assessed

2.3.1 Manufacturing directives

This European Technical Assessment is being issued for Hilti Firestop Putty Disc CFS-D 25 on the basis of agreed data/information, deposited with the UBAtc, which characterises the product that has been assessed. Changes to the product/production process, which could result in the deposited data/information being incorrect, should be notified to the UBAtc before the changes are introduced. The UBAtc will decide whether or not such changes affect the ETA and if so whether further assessment/alterations to the ETA, shall be necessary.

2.3.2 Installation

The area to be sealed requires the same fire resistance as the complete wall construction. More precise instructions for the installation of Hilti Firestop Putty Disc CFS-D 25 can be found in Annex 1 of this ETA and the technical instructions of the manufacturer.

The installation of Hilti Firestop Putty Disc CFS-D 25 includes:

- the Hilti Firestop Putty Disc CFS D 25 is wrapped around and pasted against the cable, conduit or tube;
- the disk is pasted on the wall surface, so that it covers the whole hole;
- the overlap area in the disk is mainly oriented downward;
- in case of clusters or small intermediate distances between wall opening, disks are pasted on each other;
- the disks are always installed as an entity, and never parts thereof only.

More detailed installation instructions are provided in Annex 1 of this ETA

2.4 Recommendations

2.4.1 Recommendations on packaging, transport and storage

Hilti Firestop Putty Disc CFS-D 25 should be stored in dry conditions and protected from frost.

2.4.2 Recommendations on use, maintenance and repair

The addition of new services is permissible if minimum distances between the penetrations as given in Annex 1 are respected.

Any default of the disk should be immediately repaired by replacement.

3 Performance of the product and references to the methods used for its assessment

3.1 Mechanical resistance and stability

Not relevant.

3.2 Safety in case of Fire

3.2.1 Reaction to fire

The Hilti Firestop Putty Disc CFS-D 25 has a reaction to fire classification class E according to EN 13501-1.

3.2.2 Resistance to fire

The resistance to fire classification of the Hilti Firestop Putty Disc CFS-D 25 according to EN 13501-2 and according to the field of direct application of test results described in EN 1366-3:2009 is given in Annex 1. The mentioned resistance to fire classes however can never be higher than the fire resistance class of the penetrated structure.

Hygiene, Health and the environment

3.2.3 Air permeability

No performance assessed.

3.2.4 Water permeability

No performance assessed.

3.2.5 Release of dangerous substances

The holder of the assessment has submitted a written declaration stating that the Hilti Firestop Putty Disc CFS-D 25 contains no dangerous substances according to EC-database, known at the date of issuing.

In addition to the specific clauses relating to dangerous substances contained in this European Technical Assessment, there may be other requirements applicable to the products falling within its scope (e.g. transposed European legislation and national laws, regulations and administrative provisions). In order to meet the provisions of the EU Construction Products Directive, these requirements need also to be complied with, when and where they apply.

3.3 Safety in Use

3.3.1 Mechanical resistance and stability

No performance assessed.

3.3.2 Resistance to impact / movement

No performance assessed.

3.3.3 Adhesion

No performance assessed.

3.4 Protection against noise

3.4.1 Airborne sound insulation

The obtained single number rating, $RW_{Dn,w}$ in accordance with EN ISO 717-1 is :

- $R_w (C; C_{tr}) = 62 (-2;-7)$ dB (for a sealed penetration without cable)
- $R_w (C; C_{tr}) = 62 (-2;-7)$ dB (for a sealed penetration with cable)

3.5 Energy economy and heat retention

3.5.1 Thermal resistance

No performance assessed.

3.5.2 Water vapour permeability

No performance assessed.

3.6 Aspects of durability and serviceability

The Hilti Firestop Putty Disc CFS-D 25 fire stopping pipe closure device fulfils the environmental conditions type Y_1 requirements.

3.7 Characterisation of the product

A general description of Hilti Firestop Putty Disc CFS-D 25 is given in clause 1 of the ETA.

In addition, the several properties have been determined to characterise the disks according to EAD 350454-00-1104. Results of these determinations are kept in the technical file by the assessment body.

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

In accordance with Regulation (EU) N° 305/2011, Article 65, Directive 89/106/EEC is repealed, but references to the repealed Directive shall be construed as references to the Regulation.

The system of assessment and verification of constancy of performance, specified in the Decision of the Commission 1999/454/EC of 1999/07/14³, as amended, is specified in Table 1.

Table 1– System of assessment and verification of constancy of performance applicable to Hilti Firestop Putty Disc CFS-D 25

Product(s)	Intended use(s)	Level(s) or class(es)	Assessment and verification of constancy of performance system(s)*
Fire Stopping and Fire Sealing Products	For fire compartmentation and/or fire protection or fire performance	Any	1

* See Annex V to Regulation (EU) N° 305/2011

In addition, according to the decision 1999/454/EC of 1999/07/14¹ of the European Commission, as amended, and Commission Delegated Regulation (EU) 2016/364, the systems of assessment and verification of constancy of performance specified in Table 2 apply to fire stopping and fire sealing products with regard to reaction to fire.

Table 2– Systems of assessment and verification of constancy of performance with respect to the reaction to fire

Product(s)	Intended use(s)	Level(s) or class(es) (reaction to fire)	Assessment and verification of constancy of performance system(s) ^a
Fire Stopping and Fire Sealing Products	For uses subject to regulations on reaction to fire	(A1, A2, B, C)*	1
		(A1, A2, B, C)**, D, E, F	3
		(A1 to F)***, NPD****	4

^a Systems 1, 3 and 4 : See Regulation (EU) N° 305/2011, Annex V
^{*} Products/materials for which a clearly identifiable stage in the production process results in an improvement of the reaction to fire classification (e.g. an addition of fire retardants or a limiting of organic material)
^{**} Products/materials not covered by footnote (*)
^{***} Products/materials that do not require to be tested for reaction to fire (e.g. products/materials of class A1 according to Commission Decision 96/603/EC⁴, as amended)
^{****} 'No Performance Declared' in accordance with Regulation (EU) N° 305/2011, Article 6(f)

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

5.1 Tasks for the ETA-holder

5.1.1 General

The manufacturer exercises permanent internal control of production. All the elements, requirements and provisions adopted by the manufacturer are documented in a systematic manner in the form of written policies and procedures, including records of results performed in accordance with the test plan. This production control system ensures that the product is in conformity with this ETA.

5.1.2 Personnel and equipment

The personnel involved in the production process is identified, sufficiently qualified and trained to operate and maintain the production equipment. Machinery and equipment are regularly maintained and this is documented. All processes and procedures of production are recorded at regular intervals.

5.1.3 Traceability of processes

The manufacturer maintains a traceable documentation of the production process from purchasing or delivery of raw or basic raw materials up to the storage and delivery of finished products.

5.1.4 Non-conforming products

Products that do not comply with requirements as specified in this ETA are separated from the conforming products and marked as such. The manufacturer registers non-compliant production and action(s) taken to prevent further non-conformities. External complaints are also documented, as well as actions taken.

5.1.5 Control of monitoring and measuring devices

Where necessary, measuring equipment is:

- Calibrated or verified at specific intervals, or prior to use, against measurement standards traceable to international or national measurement standards; where no standards exists the basis used for calibration is recorded;
- Adjusted or re-adjusted as necessary;
- Identified to enable calibration to be determined.

When the equipment is found not to conform to requirements the validity of previous measuring results are assessed and recorded. Appropriate actions are taken on the equipment and any product affected.

³ see OJEU L178/52 of 1999/07/14

5.2 Tasks of notified bodies

5.2.1 For fire compartmentation and/or fire protection or fire performance uses

Assessment of the performance

For the assessment of the performance of the product (see Annex V of Regulation (EU) N° 305/2011) the tasks for the notified body are limited to the following characteristics, where relevant:

- Resistance to fire;
- Mechanical resistance and stability;
- Adhesion;
- Resistance to impact/movement;
- Release of dangerous substances.

Assessment tests are conducted by the assessment body or under its responsibility (which may include a proportion conducted by an indicated laboratory or by the manufacturer, witnessed by the assessment body) in accordance with EAD 350454-00-1104, unless the ETA-holder has opted to make use of the possibility not to have the product's performance assessed. The assessment body assessed the results of these tests in accordance with EAD 350454-00-1104, as part of the ETA issuing procedure.

Initial inspection of the manufacturing plant and of the factory production control and continuing surveillance, assessment and evaluation of factory production control

For the initial inspection of the factory and of the factory production control (see Annex V of Regulation (EU) N° 305/2011), and for the continuing surveillance, judgement and assessment of the factory production control (see Annex V of Regulation (EU) N° 305/2011), parameters related to the following characteristics are of interest to the notified body, where relevant:

- Resistance to fire;
- Mechanical resistance and stability;
- Adhesion;
- Resistance to impact/movement.

Surveillance inspections should be conducted respecting the frequencies given in EAD 350454-00-1104.

5.2.2 For uses subject to reaction to fire regulations

Assessment of the performance

For fire stopping and fire sealing products under systems 1 and 3, regarding the assessment of the performance of the product (see Annex V of Regulation (EU) N° 305/2011), the task of the notified laboratory is limited to the assessment of the reaction to fire class, as indicated in the Commission Decision 94/611/EC.

Initial inspection of the manufacturing plant and of the factory production control and continuing surveillance, assessment, and evaluation of factory production control

For fire stopping and fire sealing products under system 1, for the initial inspection of the factory and of the factory production control (see Annex V of Regulation (EU) N° 305/2011), and for the continuing surveillance, judgement and assessment of the factory production control (see Annex V of Regulation (EU) N° 305/2011), parameters related to the reaction to fire class, as indicated in the Commission Decision 94/611/EC are of interest of the notified body.

Surveillance inspections are conducted respecting the frequencies given in EAD 350454-00-1104.

UBATc asbl is a non-profit organization according to Belgian law. It is a Technical Assessment Body notified by the Belgian notifying authority, the Federal Public Services Economy, SMEs, Self-Employed and Energy, on 17 July 2013 in the framework of Regulation (EU) No 305/2011 of the European Parliament and of the Council of 9 March 2011 laying down harmonised conditions for the marketing of construction products and repealing Council Directive 89/106/EEC and is member of the European Organisation for Technical Assessment, EOTA (www.eota.eu).

This European Technical Assessment has been issued by UBATc asbl on the basis of the technical work carried out by the Assessment Operator, BCCA.

On behalf of UBATc asbl,



Peter Wouters,
director

On behalf of the Assessment Operator, BCCA,
responsible for the technical content of the ETA,



Benny De Blaere,
director general

The most recent version of this European Technical Assessment may be consulted on the UBATc website (www.ubatc.be).

Annexes

ANNEX 1: Fire resistance classification of Hilti Firestop Putty Disc CFS-D 25 use on penetrations in rigid and flexible walls

A1.0 Performance Overview			
For detailed information please refer to A1.1 and following paragraphs			
PENETRATION TYPES		Fire Resistance Classification	
		Flexible wall (100 mm)	Rigid wall (100 mm)
Empty openings When separation between wall openings of adjacent penetration seals ≥ 5 mm		EI 90 E 90	
Multi-conductor cables $\varnothing \leq 13$ mm When separation between wall openings of adjacent penetration seals ≥ 5 mm	copper content: $\leq 7,5 \text{ mm}^2$	EI 120 E 120	
Multi-conductor cables $\varnothing \leq 19$ mm (except non sheathed cables (wires)) When separation between wall openings of adjacent penetration seals ≥ 5 mm	copper content: $\leq 40 \text{ mm}^2$	EI 90 E 90	
Single-conductor cables $\varnothing \leq 14$ mm (except non sheathed cables (wires)) When separation between wall openings of adjacent penetration seals ≥ 5 mm	copper content: $\leq 1 \times 35 \text{ mm}^2$	EI 90 E 90	
All cable types $\varnothing \leq 21$ mm (except non sheathed cables (wires)) When separation between wall openings of adjacent penetration seals ≥ 5 mm		EI 60 E 90	
Plastic conduits, $\varnothing \leq 16$ mm When separation between wall openings of adjacent penetration seals ≥ 150 mm	wall thickness ≥ 1 mm	EI 90 C/U E 90 C/U	
Plastic conduits, $\varnothing \leq 16$ mm When separation between wall openings of adjacent penetration seals ≥ 5 mm	wall thickness ≥ 1 mm	EI 60 C/U E 90 C/U	
Copper pipes / tubes, $\varnothing \leq 16$ mm When separation between wall openings of adjacent penetration seals ≥ 150 mm	wall thickness ≤ 1 mm	EI 60 U/U E 120 U/U	

All assigned classifications cover lower classification as described in clause 7 of EN 13501-2

A1.1 General Information

A1.1.1 Wall constructions

Description of a rigid wall:

The fire classification results may be applied to concrete or masonry walls with a thickness equal or greater than 100 mm and a density equal or greater than 450 kg/m³

Description of a flexible wall:

The fire classification results may be applied to all flexible wall constructions with an appropriate fire resistance classification provided:

- The construction is classified in accordance with EN 13501-2;
- The construction has an overall thickness equal or greater than 100;
- Two layers of gypsum boards – overall board thickness: 12,5 mm - are applied on both sides of the construction
- Flexible walls with timber studs are constructed with two layers of gypsum boards on both sides, no part of the penetration seal is closer than 100 mm to a stud, the cavity is closed between the penetration seal and the stud, and minimum 100 mm of insulation of class A1 or A2 according to EN 130501-1 is provided within the cavity between the penetration seal and the stud

The classification covers applications with or without aperture framing

The classification does not cover sandwich panel constructions and flexible walls where the lining does not cover the studs on both sides

A 1.1.2 Penetration

The overall seal depth (t_A) is ≥ 100 mm. The wall has a minimum thickness of 100mm (t_E).

None or several cables may be included in the wall opening as it will fit in the 625 mm² opening.

The distance from the wall to the first service supporting construction is 500 mm on both sides of the wall.

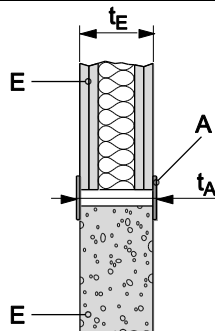


Figure A1: wall application and dimensions

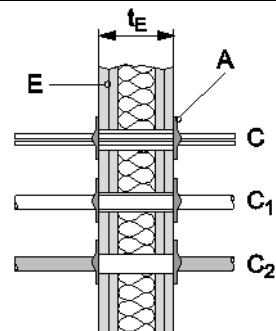


Figure A2: typical services

A Hilti Firestop Putty Disc CFS-D 25

E Building element
(rigid or flexible wall construction)

t_A Overall seal depth

t_E Thickness of building element

C: Cables

C₁: Conduit

C₂: Metal pipe/tube

A 1.1.2.1 Maximum opening size

Maximum opening size in the wall = 625mm² with maximum outer dimensions of 25mm x 25mm.

All wall openings / shapes covered by a square of 25mm may be used.

W_P : (max. opening diameter): 25 mm

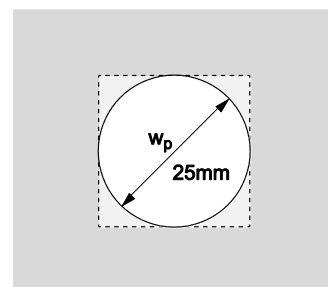


Figure A3: Maximum opening size

A 1.1.2.2 Sealing of penetration

- Gap between services and wall is closed by wrapping the Hilti Firestop Putty Disc CFS-D 25 around services and adhering residual disk to wall.
- Opening has to be completely covered by the Hilti Firestop Putty Disc CFS-D 25
- Penetrations of cables, which exit/ penetrate wall from one side only, are sealed as standard penetration but at penetration side only.

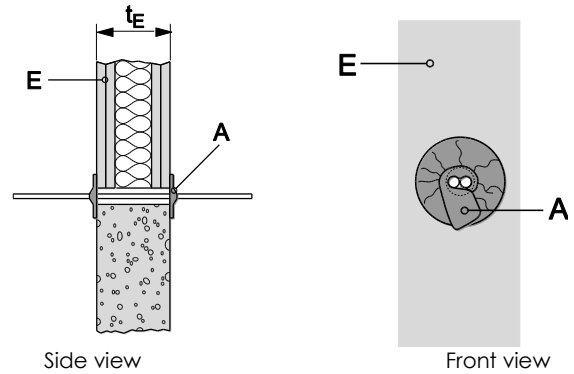


Figure A4: Hilti Firestop Putty Disc CFS-D 25 application

A 1.1.2.3 Distances inside opening

Distances valid for wall installations.

Minimum distances in mm (see illustration):

- $s_1 \geq 0$ (distance cables to seal edge)
- $s_2 \geq 0$ (distance between cables)
- $s_3 \geq 0$ (distance copper pipe to seal edge)
- $s_{20} \geq 0$ (conduits to seal edge)

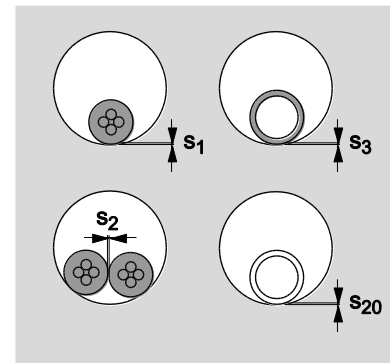


Figure A5: distances within penetration

A.1.1.2.4 Cluster arrangement (distances between openings)

Minimum distances in mm (see illustration):

- $S_a \geq 5$ (distance between openings (with/without cables, to other openings with/without cables)
- $S_b \geq 5$ (distance of openings with conduits to other openings with/without cables)
- $S_c \geq 150$ (distance of openings with copper pipes to other services)

Hilti Firestop Putty Discs CFS-D 25 from nearby openings are installed by overlap.

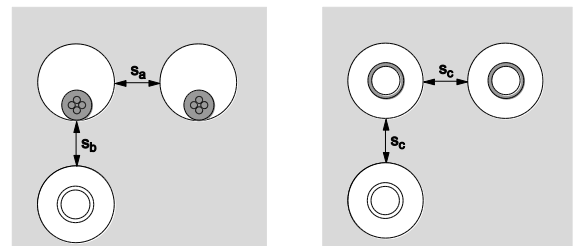
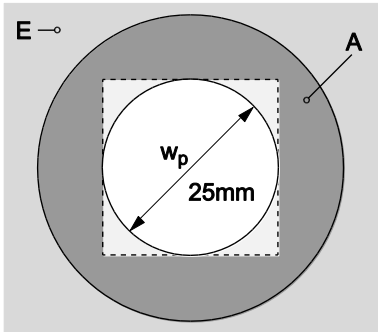


Figure A6: Cluster Arrangement

A 1.2 Flexible or rigid walls according to A1.1.1 - minimum wall thickness 100 mm	
A 1.2.1 Blank seal (no services) *	
Construction details (for symbols and abbreviations see A.1.3) - With two Hilti Firestop Putty Discs CFS-D 25, each on one side of the wall, an overall seal depth t_A of > 100mm is formed W_p: 25 mm (max. opening diameter – 25 mm)	 Figure A 7: blank seal
	Classification
Opening Size: 25 x 25 mm	EI 90 E 90
* If services are added later on in a blank seal only the services listed in the tables below may be added that fulfil the required classification.	

A 1.2.2. Cables		
Construction details see 1.1.2.2 None or several cables may be included in the wall opening		
All cable types currently and commonly used in building practice in Europe (e.g. power, control, signal, telecommunication, data, optical fibre cables)		
All sheathed cables:		Classification
Multi- conductor cables $\leq \varnothing 13$ mm	copper content $\leq 7,5 \text{ mm}^2$ (e.g. 5x1,5 mm ²) (cable density $\leq 5,6\%$)	EI 120 E 120
Multi- conductor cables $\varnothing \leq 19$ mm	copper content: $\leq 40 \text{ mm}^2$ (e.g. 4x10 mm ² ; 5x8 mm ²); 10x4 mm ² or information cables (20x2x0,8 mm ²) (cable density $\leq 14\%$)	EI 90 E 90
Single- conductor cables $\varnothing \leq 14$ mm	copper content: $\leq 35 \text{ mm}^2$ (e.g. 1x35 mm ²); (cable density $\leq 23\%$)	EI 90 E 90
Cables $\varnothing \leq 21$ mm		EI 60 E 90

A 1.2.3 Small plastic conduits and tubes		
Construction details see 1.1.2.2 None or several plastics conduits or plastic tubes may be included in the wall opening		
$\varnothing \leq 16 \text{ mm}$, wall thickness $\geq 1 \text{ mm}$	Distance of nearby penetrations [s _c]	Classification
Plastic conduits and plastic tubes	$\geq 5 \text{ mm}$	EI 60 C/U E 90 C/U
Plastic conduits and plastic tubes	$\geq 150 \text{ mm}$	EI 90 C/U E90 C/U

A 1.2.4 Metal pipes		
Construction details see 1.1.2.2 Maximum one metal pipe or conduit may be included per wall opening.		
$\varnothing \leq 16 \text{ mm}$, wall thickness $\leq 1 \text{ mm}$,	Distance of nearby penetrations [s _c]	Classification
Metal pipes and conduits	$\geq 150 \text{ mm}$	EI 60 U/U E 120 U/U

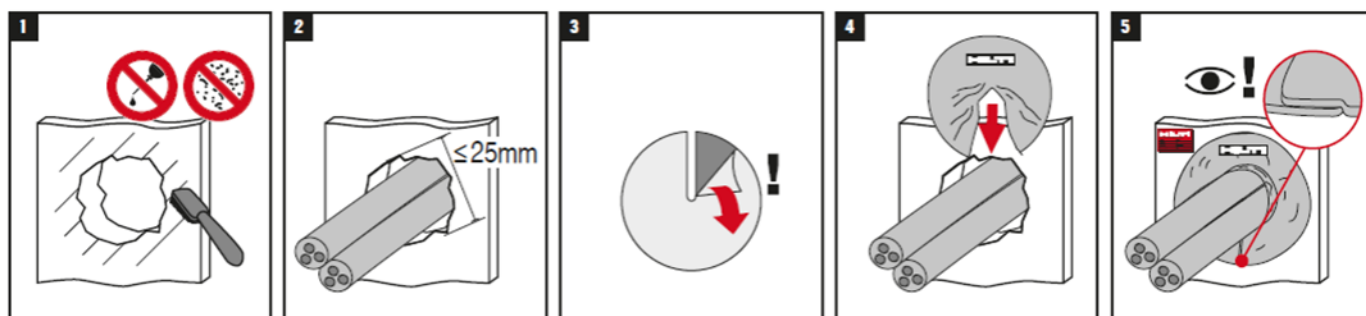


Figure A 8: Graphical presentation of the installations instructions

A.1.3 Abbreviations used in drawings			
Abbreviation	Description	Abbreviation	Description
A, A ₁ , A ₂ , ...	Firestop products	t _A	Overall seal depth
C, C ₁ , C ₂ , ...	Penetrating services	t _E	Thickness of the building element
E, E ₁ , E ₂ , ...	Building elements (wall, floor)	W _P	Max opening diameter
S ₁ , S ₂ , S _n	Distances		
Cable Density	Ratio of copper area to cable area	Copper Content	Max. copper content at given insulation thickness

ANNEX 2: Reference documents

EN 1366-3:2009	Fire resistance tests for service installations – Part 3: Penetration seals
EN 13501-1+A1:2010	Fire classification of construction products and building elements - Part 1: Classification using data from reaction to fire tests
EN 13501-2+A1:2010	Fire classification of construction products and building elements - Part 2: Classification using data from fire resistance tests, excluding ventilation services
EN ISO 717-1	Acoustics - Rating of sound insulation in buildings and of building elements - Part 1: Airborne sound insulation
EN ISO 2811-1	Paints and varnishes - Determination of density - Part 1: Pyknometer method
EOTA TR 024 (July 2009)	Characterisation, Aspects of Durability and Factory Production Control for Reactive Materials, Components and Products