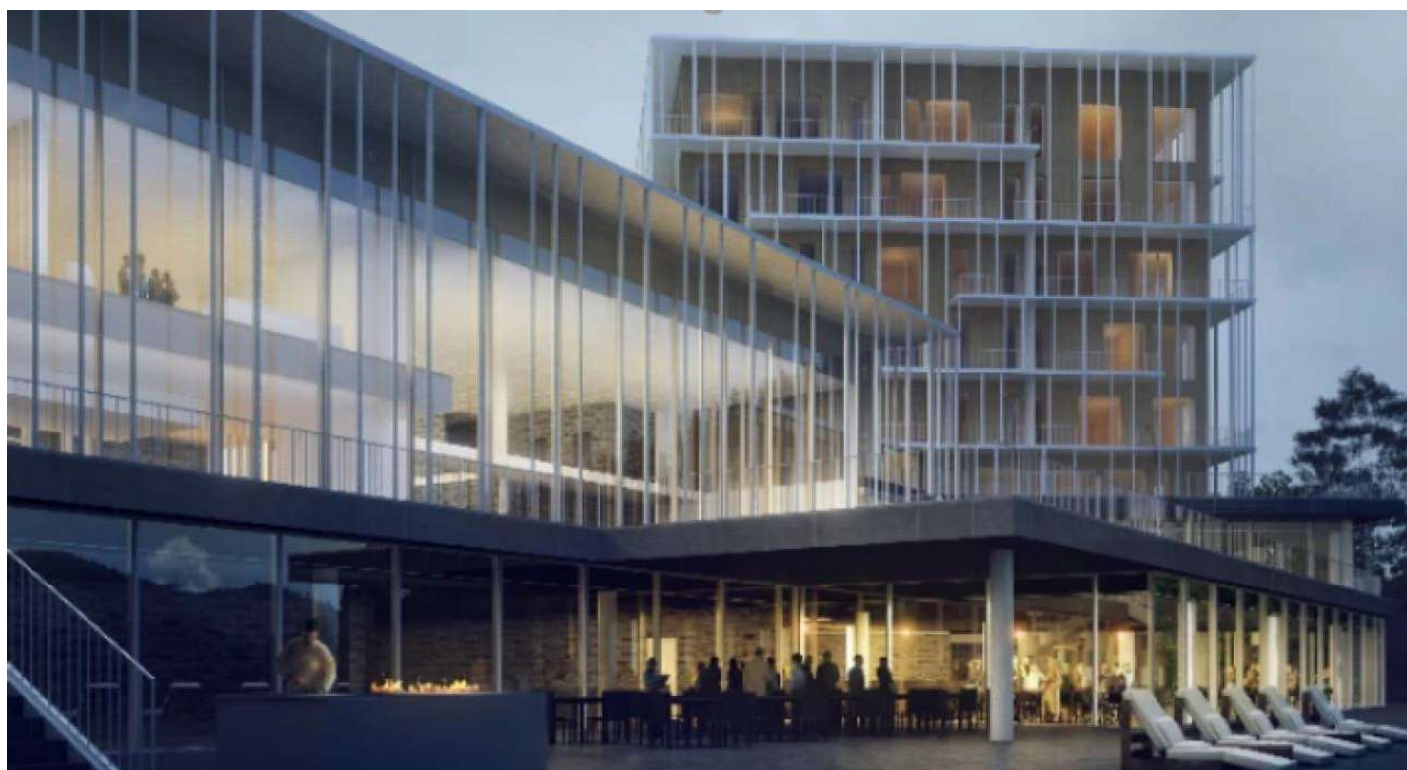


Fire Stop



Passive Fire Protection Report

პასიური ხანძარსაწინააღმდეგო ანგარიში

Project: Fire Protection Report

Abastumani Double Tree By HILTON:

A-Block, B-Block, D-Block All Shafts



**All firestop applications on Abastumani Double Tree By HILTON have
been inspected by Fireshield Georgia and Hilti
representative
and evaluated as suitable to method statement**

10th June 2026

General Contractor: Archtrade LLC

Project consultant/performer: Teimuraz Chkhitudze

პროექტის კონსულტანტ-შემსრულებელი: თეიმურაზ ჩხიტუნიძე



STANDARDS, REGULATIONS AND APPROVALS

UL 1479 ASTM E 84 ASTM E 814-20 BS 476
UL 2079 ASTM E 814 ASTM E 2074 BS 476-20

MATERIAL AND EQUIPMENT

It shall be used by supplying necessary equipments in accordance with the recommendation of passive fire-stop system manufacturers. All safety equipment required to work in the field will be used.

APPLICATION

a. Application rules

- Details will have at least the resistance of the wall where they are.
- The details of the application to be selected from the certificate of approval according to the requested fire resistance period shall be applied as described in the document.
- Applications shall be made by the authorized application dealer of the passive fire-stop system or the applicators certified by the manufacturer.
- Expiry dates of the products to be used will be checked before the application and the product will not be used if the product has expired.

b. Site Decisions

If the penetrations in the application area differ from the details of the approved system in some areas (annular gap, max, size of opening etc.), the applicator shall obtain the approval from the fire-stopping system manufacturer company that the Engineering Judgement (EJ) is provided with sufficient resistance. The approval shall be obtained before the application is made for the Engineering Provision.

c. Labelling

- All fire wall transitions will be labeled.
- The label shall be the material used by the manufacturer and the information such as date and system shall be written upon the application.
- The label will be attached to the visible point next to the pass.

Numbering of Fire Protections Installation According To The Project. Examples:

Lvl1A2	Lvl1B2	Lvl3D3
Lvl0A10	Lvl2B8	Lvl2D11
Lvl-1A2	Lvl0B5	Lvl4D4



DEFINITIONS

Firestopping: Material or combination of materials used to retain integrity of fire-rated construction by maintaining an effective barrier against the spread of flame, smoke, and hot gases through penetrations in fire rated wall and floor assemblies.

GENERAL DESCRIPTION OF THE WORK OF THIS SECTION

Only tested firestop systems shall be used in specific locations as follows:
Penetrations for the passage of duct, cable, cable tray, conduit, piping, electrical busways and raceways through fire-rated vertical barriers (walls and partitions), horizontal barriers (floor/ceiling assemblies), and vertical service shaft walls and partitions.

B. Blank openings through fire-rated vertical barriers (walls and partitions), horizontal barriers (floor/ceiling assemblies), and vertical service shaft walls and partitions.

C. Openings and penetrations in fire-rated partitions or walls containing fire doors.

D. Openings around structural members which penetrate floors or walls.

REFERENCES

A. Test Requirements: ASTM E 814, "Standard Method of Fire Tests of Through Penetration Fire Stops"

B. Test Requirements: UL 1479, "Fire Tests of Through-Penetration Firestops"

C. Underwriters Laboratories (UL) of Northbrook, IL publishes tested systems in their "FIRE RESISTANCE DIRECTORY" that is updated annually.

UL Fire Resistance Directory:

- a. Firestop Devices (XHJI)
- b. Fire Resistance Ratings (BXRH)
- c. Through-Penetration Firestop Systems (XHEZ)
- d. Fill, Voids, or Cavity Material (XHHW)
- e. Forming Materials (XHKU)

D. International Firestop Council Guidelines for Evaluating Firestop Systems Engineering Judgments

E. ASTM E 84, Standard Test Method for Surface Burning Characteristics of Building Materials.

F. Inspection Requirements: ASTM E 2174, "Standard Practice for On-site Inspection of Installed Fire Stops."



INSTALLATION

A. Regulatory Requirements: Install firestop materials in accordance with UL Fire Resistance Directory.

B. Manufacturer's Instructions: Comply with manufacturer's instructions for installation of through-penetration materials.

1. Seal all holes or voids made by penetrations to ensure an air and water resistant seal.
2. Consult with mechanical engineer, project manager, and damper manufacturer prior to installation of UL firestop systems that might hamper the performance of fire dampers as it pertains to duct work.
3. Protect materials from damage on surfaces subjected to traffic.

FIELD QUALITY CONTROL

A. Examine sealed penetration areas to ensure proper installation before concealing or enclosing areas.

B. Keep areas of work accessible until inspection by applicable code authorities.

C. Inspection of through-penetration firestopping shall be performed in accordance with ASTM E 2174, "Standard Practice for On-Site Inspection of Installed Fire Stops" or other recognized standard.

B. Perform under this section patching and repairing of firestopping caused by cutting or penetrating of existing firestop systems already installed by other trades.

E. Manufacturer's Field Services: Contractor to ensure a manufacturer's direct representative is on-site during initial installation of firestop systems to train appropriate contractor personnel in proper selection and installation procedures. Training will be done per manufacturer's written recommendations published in their literature and drawing details.



IDENTIFICATION & DOCUMENTATION

- A. The firestop contractor is to supply documentation for each single application addressed. This documentation is to identify each penetration and joint location on the entire project.
- A.1 The Documentation Form for through penetrations is to include:
1. A Sequential Location Number
 2. The Project Name
 3. Date of Installation
 4. Detailed Description of the Penetration's Location
 5. Tested System or Engineered Judgment Number
 6. Type of Assembly Penetrated
 7. A Detailed Description of the Size and Type of Penetrating Item
 8. Size of Opening
 9. Number of Sides of Assemblies Addressed
 10. Hourly Rating to be Achieved
 11. Installer's Name
- B. Copies of these documents are to be provided to the general contractor at the completion of the project.
- C. Identify through-penetration firestop systems with pressure-sensitive, self-adhesive, preprinted vinyl labels. Attach labels permanently to surfaces of penetrated construction on both sides of each firestop system installation where labels will be visible to anyone seeking to remove penetrating items or firestop systems. Include the following information on labels:
1. The words: "Warning: Through Penetration Firestop System – Do Not Disturb. Notify Building Management of Any Damage."
 2. Contractor's name, address and phone number.
 3. Through-penetration firestop system designation of applicable testing and inspecting agency.
 4. Date of installation.
 5. Through-penetration firestop system manufacturer's name.
 6. Installer's name.

CFS-S SIL/ CP 601S	British Standard BS 476-20	EN 1366-3			
CFS-S ACR/ CP 606	British Standard BS 476-20	EN 1366-3			
CFS-SP-WB/ CP 672	British Standard BS 476-20	EN 1366-4			
CFS-EL		EN 1366-3			
FS ONE Max					
CFS-F SOL/ CP 620	British Standard BS 476-20	EN 1366-4			
CFS-F FX/ CP 660	British Standard BS 476-20	EN 1366-3			
CFS-M RG/ CP 636	British Standard BS 476-20	EN 1366-3			
CP637	British Standard BS 476-20				
CP 638 HS FS	British Standard BS 476-20				
CFS-C/ CP 643N	British Standard BS 476-20	EN 1366-3			
CFS-CP/ CP 644	British Standard BS 476-20	EN 1366-3			
CFS CID/ CP 680	British Standard BS 476-20				
CFS-W/ CP 648	British Standard BS 476-20	EN 1366-3			
CP 658	British Standard BS 476-20				
CP 657	British Standard BS 476-20				
CFS-CU		EN 1366-3			
CFS-P PA/ CP 617	British Standard BS 476-20	EN 1366-3			
CP 670	British Standard BS 476-20	EN 1366-3			
CF 125-50	British Standard BS 476-20				

HILTI

Certificate of Participation for Firestop Specialty Contractor



Hilti Firestop
Saving Lives
through innovation
and education



Other tests include : ASTM E 814 : ASTM C 920 : ASTM E 1399 : ASTM E 90-97 : ASTM E 84-96 : UL 2079 : UL 1479 : ISO 11600

CER.ID: TCFS-966126108-80-0



HILTI FIRESTOP SYSTEMS

CP601S, CP606, CP636, CP637, CP643-N, CP648, CP646, CP657, CP658, CP678,
CP611A, CP617, CP651N, CP673, CP670, CP620, CP660, FS ONE, CP 679 A, CFS-SP WB

Hilti Firestop System Training was completed successfully by the following person.

Participant: Teimuraz Chkhitudidze

Passport ID #: 01022010297

Company : Fire Shield Georgia

Project : Abastumani Double Tree By Hilton

Hilti Trainer: Omer Cagala

Country Manager : Akhmed Alimamedov

Regional HILTI partner: BME HG

Period of Validity: 01.01.2024 – 31.12.2028



Explanations:

1. Hilti aims to teach basic knowledge of products with the training. Competence of participant are provided with practical experience. The following address and telephone is available for technical support when needed.
2. Products has to be installed according to related tests, approvals and application manuals determined by Hilti
3. Responsibility to keep the certificate belongs to participant and the Company. Hilti does not keep the certificates.
2. Hilti has not any liability, in case of accident, injury, damage and loss because of incorrect application. All liability regarding the installing of products belongs to installer company and installers.

HILTI GEORGIAN BME HG (HILTI Exclusive Distributor) A.Tsereteli ave, 12/A / Georgian | Telephone :+995 32 200 12 84



CERTIFICATE

CERTIFICATE OF ACCOMPLISHMENT

Firestop Installation Training for Specifiers

Nesma & Partners

Teimuraz Chkhitudze

Teimuraz Chkhitudze has completed training and met the subsequent testing requirement for SPECIFIER TRAINING

CERTIFICATE # C242542 | EXPIRATION DATE 3/4/2028

Topics covered in this course:

- Basic Fire Protection
- Reading UL Tested Systems for the applicable applications
- Identifying basic applications
- Overview of application specific firestop products
- CP601S, CP606, CP636, CP637, CP643-N, CP648, CP646, CP657, CP658, CP678.
- CP611A, CP617, CP651N, CP673, CP670, CP620, CP660, FS ONE, CP 679 A, CFS-SP WB.

PROGRAM MANAGED THROUGH HILTI ACADEMY Contact the Program Manager at alimakh@hilti.com

Course ID | ZS_FS_ThuPens_EN_WI Course Name | SPECIFIER TRAINING - Firestopping through-penetrations



AGEING RESISTANCE

The question of long-term resistance arises more frequently for fire protection products than for any other construction products. This is to be expected, as fire protection products must retain their functionality throughout the life of a building. Ideally, it would be possible to send the products to an institution, which, after the appropriate tests, could certify them for some 20 to 40 years. Unfortunately, although the aging of plastics and paints, especially colour fastness under the influence of light and temperature or the corrosion of metals, can be easily simulated, there are no basic studies or real-time documentation defining a time-lap test to assess fire protection products. Furthermore, fire protection products are made of very different compounds and therefore cannot be evaluated according to any standardised scheme- for instance, mortar cannot be assessed against the same criteria as silicone sealant. There are standards to evaluate resistance to atmospheric conditions, aging, chemicals, humidity etc. There also are enough institutions ready to test according to these standards, but a statement as to how many years these functions are guaranteed can not be given by any institution. In order to be able to provide our clients with more definite information in this respect, Hilti conducts additional tests of Hilti firestop systems in cooperation with an independent testing institute, simulating an accelerated ageing process. On the basis of the ageing cycles employed in this process as well as experience gained in the field of construction in concrete, it can be assumed that Hilti firestop systems which have passed the above tests have a service life of approximately 30 years from manufacturing date. This expected long-term ageing resistance of Hilti firestop systems, which is given on the basis of the above mentioned tests, depends on a number of factors on which Hilti basically has no influence (e.g. environmental factors such as extreme environmental conditions, chemicals, etc.) and, therefore, are subject to the following conditions which must be strictly observed by the user with regard to the respective Hilti firestop system:

- Strict adherence to the Hilti's operating, setting, installing and other technical instructions
- Rigorous compliance with all other conditions set in the respective specifications during the lifetime of the Hilti firestop systems, in particular with regard to regular control and maintenance as well as to foreseeable use under normal climatic condition in the respective field of application.

30
years

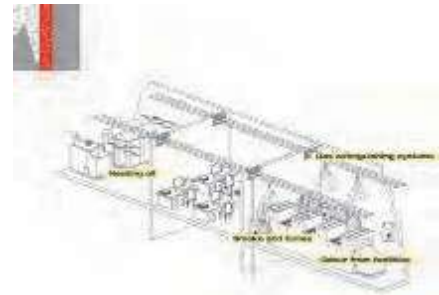
WATER RESISTANCE

Water resistance is understood by Hilti to mean a construction material's ability to withstand the effects on water and moisture not only in the completed, occupied building, but also during the construction phase. During the construction of the carcass of a building, before it is fully sealed and weatherproof, entire floors may be flooded by rainwater. inadequately hardened sealants may therefore be washed out. These products therefore require a certain degree of rain resistance. Once the firestop products have cured, there is a danger of mould or mildew if a great deal of moisture is present in rooms. If mould develops it must not damage the firestop products. But a certain degree of water resistance must also be provided for openings in a fireproof wall to avoid water damage from water pipe breaks or, in case of fire, water used in extinguishing a fire. Water resistance is therefore an important ancillary element of firestop systems. Hilti firestop systems are not merely tested and approved in accordance with international firestop requirements, but have also been tested for their water-resistant properties according to the valid national and international standards.



SMOKE AND GAS TIGHTNESS.

The smoke-and gas-tightness of firestop products is of decisive importance in the event of fire as it may save lives. Moreover, gas-tightness also plays an important role in the thermal insulation of buildings. The requirements to be complied with in terms of smoke-and gas-tightness are laid down in various laws and regulations. Hilti firestop products are not only tested and approved internationally in accordance with the stipulations of passive fire prevention regulations, they are also comprehensively tested to ensure compliance with the standards currently applicable to smoke-and gas-tightness. The Subject of smoke-and gas-tightness is of decisive importance in the following applications.



Smoke-and gas-tightness in the event of fire

The most important point is imperviousness to smoke and fumes. It is the smoke and fumes from fires that cause most deaths and the greatest damage. Accordingly, these must be effectively prevented from spreading in the event of fire. Gas extinguishing systems also have an influence on firestop products. Firstly, these systems cause a significant rise in pressure in the room concerned. Secondly, the extinguishing gas may be harmful to the persons present in the building.

Gas-and air-tightness of buildings

Within the scope of regulations to promote energy conservation, laws in various countries specify that joints and penetrations in buildings must be air-and gas-tight.

Protection from critical gases and odours

In many branches of industry, the spread of odours or critical gases must be prevented through use of impermeable materials.

SOUND INSULATION

Sound insulation in buildings is of great significance to the health and well-being of the occupants. Sound insulation is of particular importance in residential construction because an apartment provides not only a place of rest and relaxation, it also serves to screen off the personal domestic environment from that of neighbours. Specific regulations apply to certain types of buildings such as schools, hospitals, hotels and office accommodation. The sound insulation requirements to be complied with are laid down in directives, standards and regulations throughout the world. Hilti firestop products are not only tested and approved internationally in accordance with the stipulations of passive fire prevention regulations, they are also comprehensively tested to ensure compliance with sound insulation requirements.



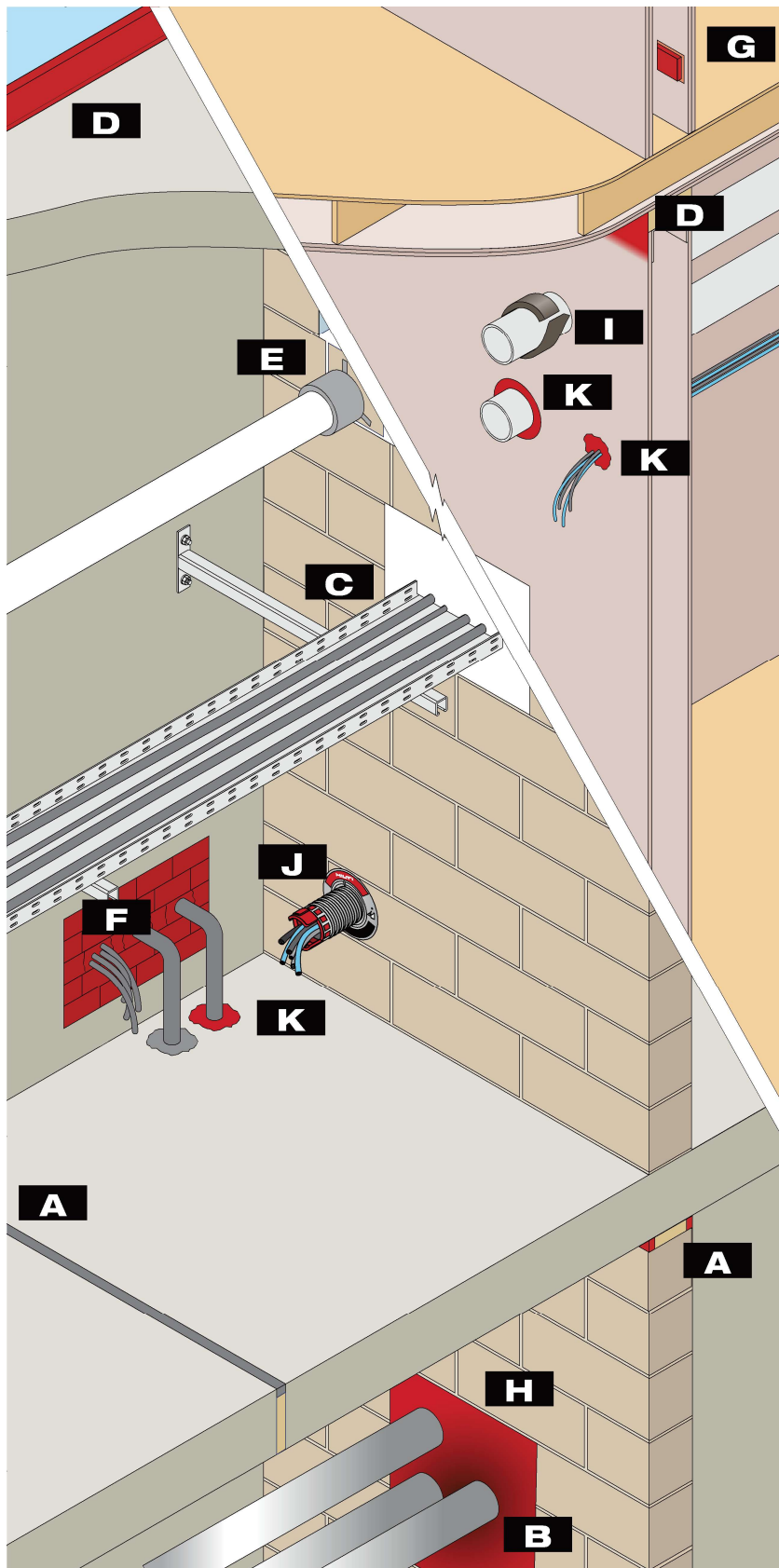
Airborne sound

"Airborne sound" is the term applied to fluctuations in pressure which spread out in a wave pattern and thereby induce oscillation in the objects or parts of a structure they collide with. Airborne sound in buildings is transformed into structure-borne sound as it strikes walls, floors or ceilings and is passed on through the structure in this form before subsequently radiating into neighbouring rooms as airborne sound. At the same time, the sound becomes weaker as it passes through a wall or ceiling.

Structure-borne sound

Sound that carries or spreads through a solid object is known as structure-borne sound. It is usually not perceived as sound or noise but is noticed, if at all, in the form of vibration. It becomes audible, nevertheless, when radiated from the surfaces of the structure and thus transformed into airborne sound. As the energy loss in the transmission of structure-borne sound through solid objects is minimal, the sound can travel over great distances. Accordingly, measures must be taken to isolate living accommodation and other occupied rooms from structure-borne sound.

FIRESTOP AND FIRE PROTECTION SYSTEMS



Hilti Firestop Solutions

The illustration on the left provides a basic guide to the range of Hilti Firestop products available for the applications shown.

Building Construction & Façade Application

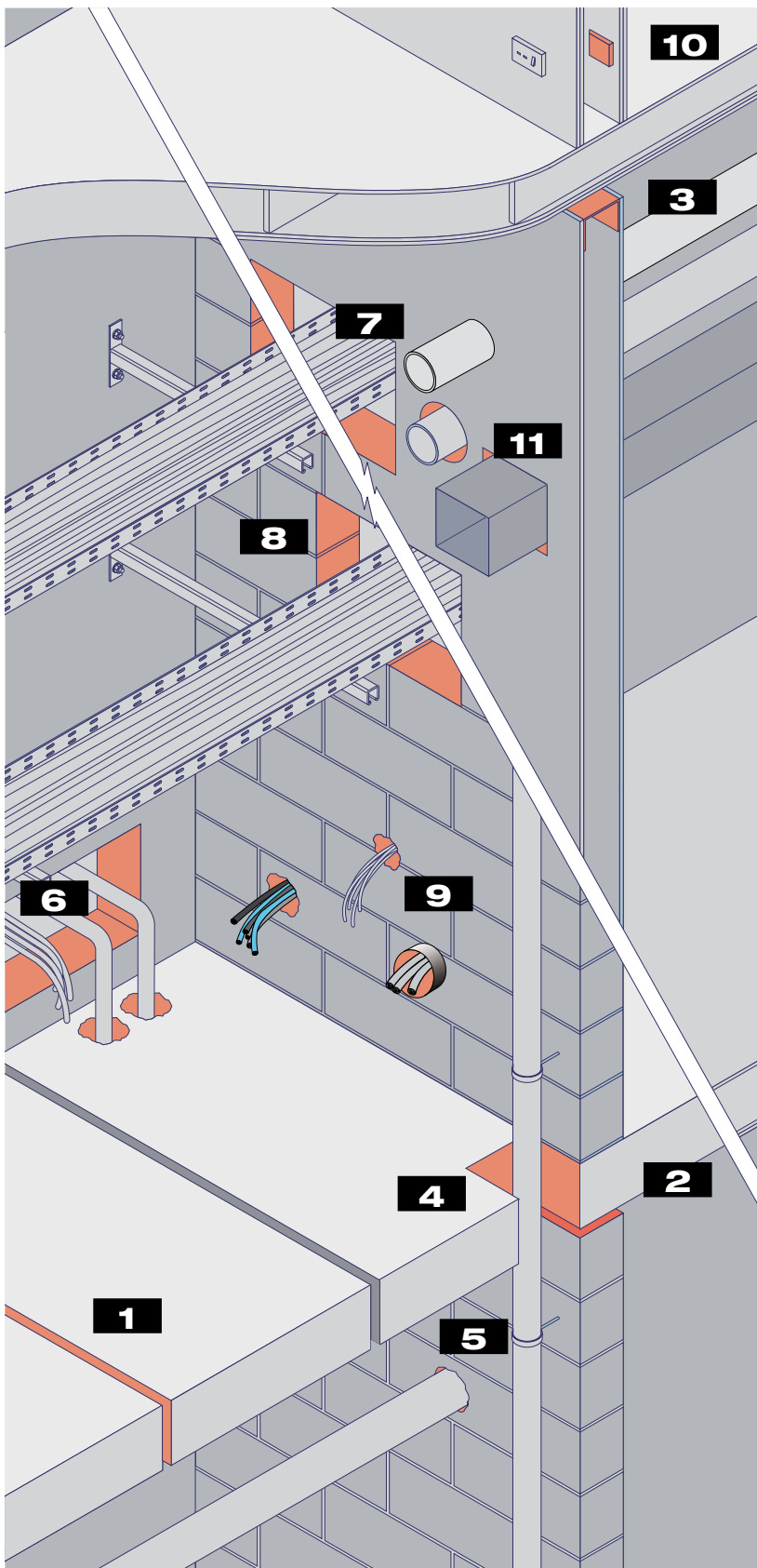
- A** Flexible Firestop Sealant (CP 606/601S)
- B** Firestop Mortar (CP 636)/
Firestop composite sheet (CFS-COS)
- C** Firestop Board (CP 670)
- D** Firestop Joint Spray (CFS-SP WB)

Mechanical & Electrical Application

- E** Firestop Collar (CP 643N/644/CFS-C EL)
- F** Firestop Block (CFS-BL)
- G** Firestop Putty Pad (CP 617)
- H** Fire Foam (CP 620/CFS-F FX)
- I** Firestop Wrap Strip (CP 648-E)
- J** Speed Sleeve (CFS-SL GA)
- K** FS-ONE MAX High Performance
Intumescent Sealant
Firestop intumescent Sealant CP 611A
Firestop cable disc CFS-D 1"



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Saving lives
through innovation
and education



Problem

The illustration on the left indicates a range of typical problems facing the designer.

Construction may consist of:

- concrete
- concrete block
- wood
- gypsum

The problem areas are:

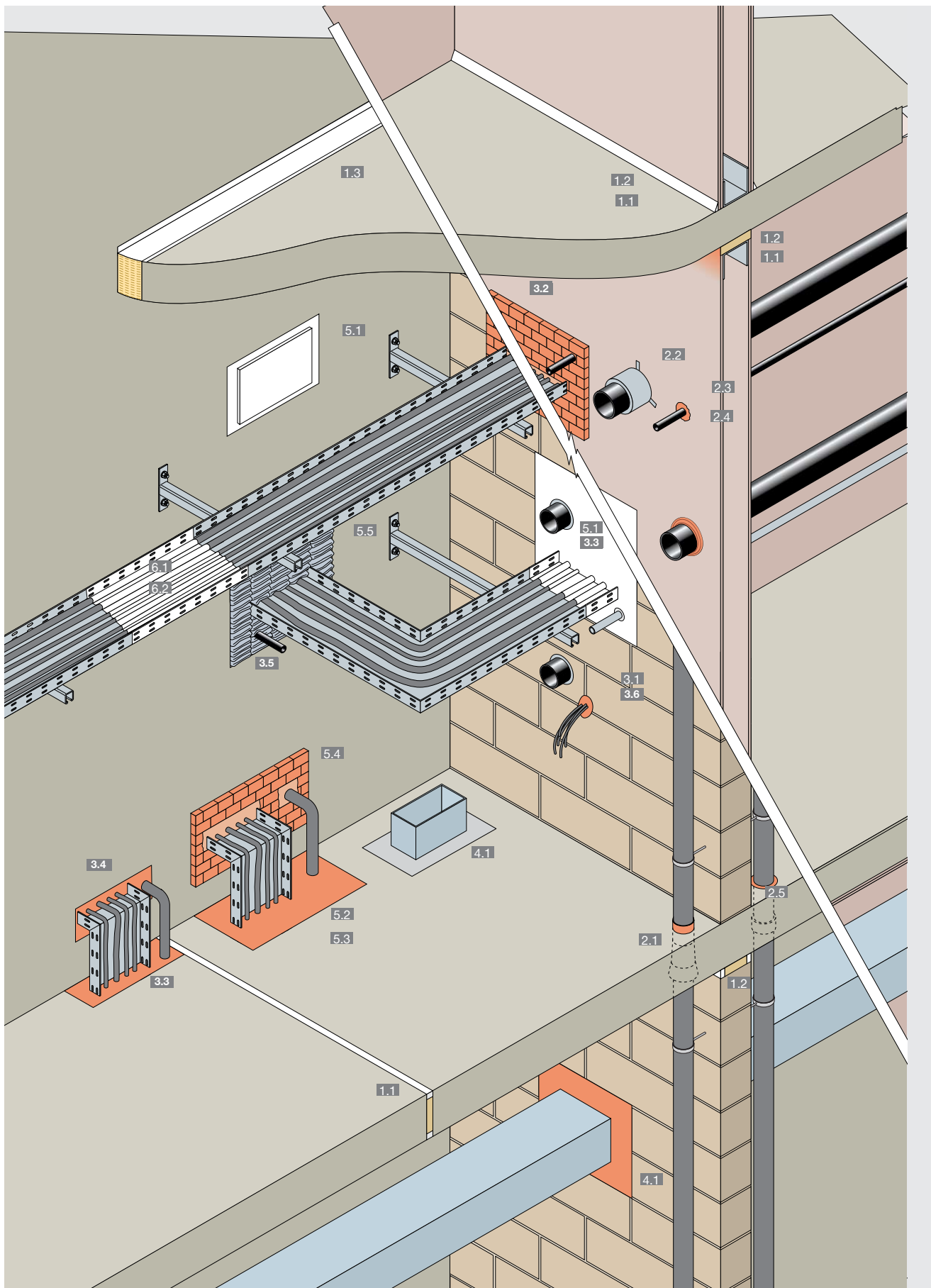
- 1** Movement joints
- 2** Rigid or low movement joints
- 3** Head of wall and perimeter joints
- 4** Metal
- 5** Plastic pipes
- 6** Multiple penetrations, pipes and/or cables
- 7** Cable trays (with permanent sealing of opening during construction, or temporary sealing allowing additional cables to be installed subsequently)
- 8** Cable trays (with permanent sealing of opening during construction)
- 9** Cables (single or bundled)
- 10** Electrical boxes
- 11** Heating/ventilation/air conditioning

Fire resistance rating

To help prevent the rapid spread of fire within a building, certain walls, floors and joints are required to meet a specific fire resistance rating — the period of time during which a building component has been tested to confine a fire or continue to perform a structural function or both. Through-penetrations and joints created during the construction process require the installation of firestop systems in order to bring the wall or floor back up to its or original fire-rating.

Firestopping

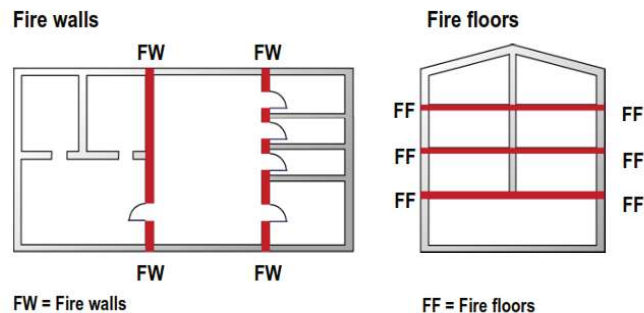
It is essential that every penetration or joint in a fire-rated wall or floor is adequately protected by sealing — or “firestopping” — such that the building component is restored to its original fire-rated condition in order to maintain compartmentalization. The quality and excellence of Hilti Firestop Products help ensure that fire, smoke and toxic gases are contained to reduce the tragic loss of human life and damage to property.





PRINCIPLES OF FIRE PROTECTION THROUGH COMPARTMENTATION

One world-wide rule: **Compartmentation (Fire Compartments)**



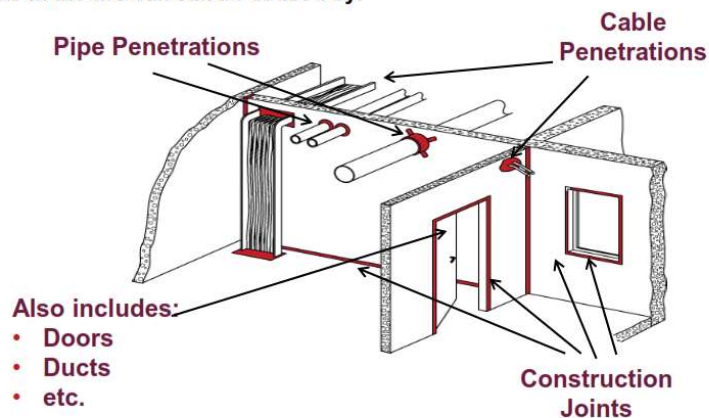
Compartmentation is the principle used to create fire cells, that provide a safe path for people to exit a building during a fire.

Fire cells are made up of a series of fire walls and fire floors, that are used to contain and limit the spread of fire. These FW and FF must stay intact for a set period of time, defined by the National Construction Code and the Fire Engineer's specification.

ALL COMPARTMENTS REQUIRE SERVICES TO OPERATE

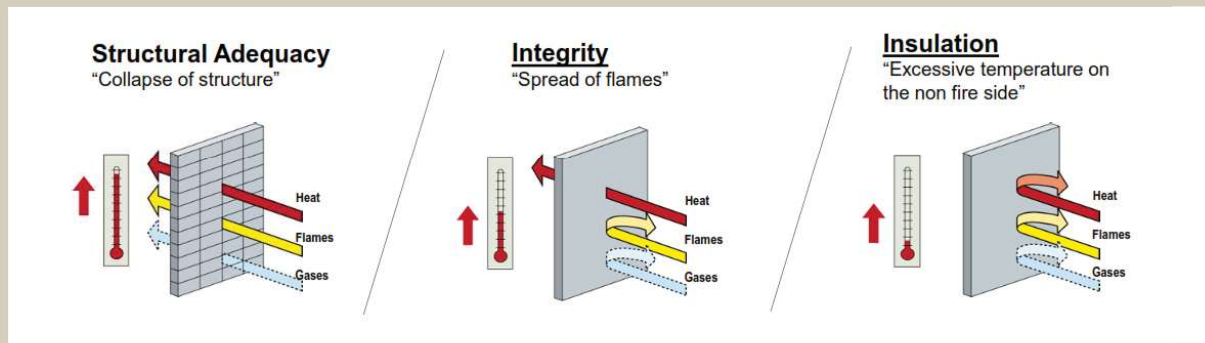
These services provide weak points in the fire cell, where fire spread can occur.

The weak points in the fire cell can be caused by:



These weak points must be fire rated with passive fire products, allowing the fire cell to achieve its required Fire Resistance Level or FRL...

FIRE RESISTANCE LEVEL/RATING (FRL/FRR)



The Fire Resistance Level is always measured in minutes: i.e. **FRL (- / 60 / 60)**

Structural Adequacy	=	- (Meaning not applicable)
Integrity	=	60
Insulation	=	60

SEALING AROUND ELECTRICAL SERVICES – FIRESTOP FOAM PRODUCTS

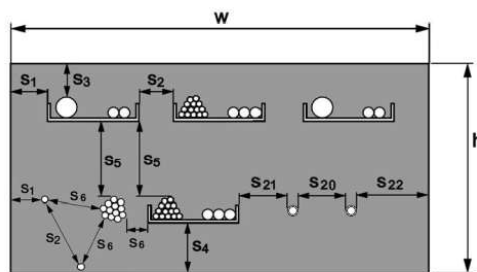


Table 1 - Distance Requirements

Minimum distance valid for installations of services	Wall (mm)	Floor (mm)
Distance between cables/cable supports and seal edge	s1 = 0	s1 = 0
Distance between cables/cable supports	s2 = 0	s2 = 0
Distance between cables and upper seal edge	s3 = 0	s3 = 0
Distance between cable supports and bottom seal edge	s4 = 0	s4 = 0
Distance between cables and cable support above	s5 = 40	s5 = 40
Distance between cables and cable bundle	s6 = 40	s6 = 40
Distance between single or bundle of conduits and other services or seal edges	s20, 21, 22 = 40	s20, 21, 22, 23 = 40
Maximum % of the seal can be penetrated	60%	60%

Table 2 - Seal Size

Max W x h ≤ 400mm x 400mm	Seal Size	Seal Thickness
	Area	Ø
Wall Penetrations	≤ 0.16m²	≤ 400mm
Floor Penetrations	≤ 0.16m²	≤ 400mm

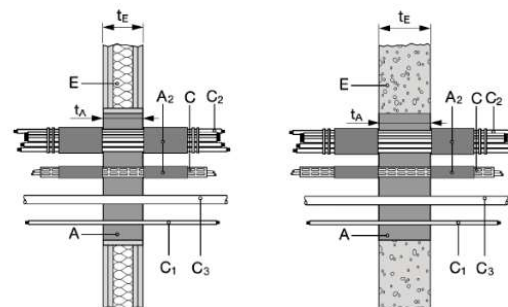
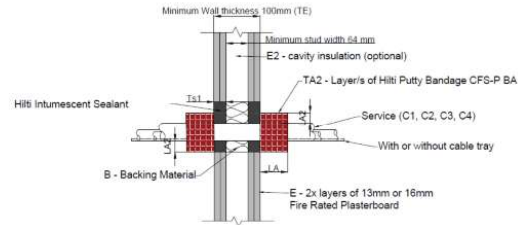
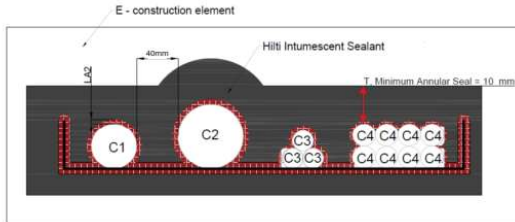


Figure 3 – Individual conduit, cables and cable bundles with or without insulation protection through walls

Item	Description	Item	Description
A	Hilti Flexible Firestop Foam CFS F-FX	C	Service Cables with Cable tray
A2	2 layers of 100mm wide Hilti Firestop Putty Bandage CFS-P BA each side	C1	Single Cables
		C2	Cable Bundle
		C3	Conduit
tA	Thickness of penetration seal	tE	Thickness of the building element
E	Building elements wall/floor (rigid or flexible wall construction, with or without cavity insulation)		

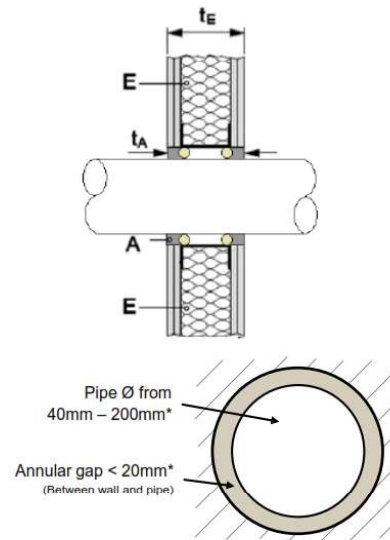
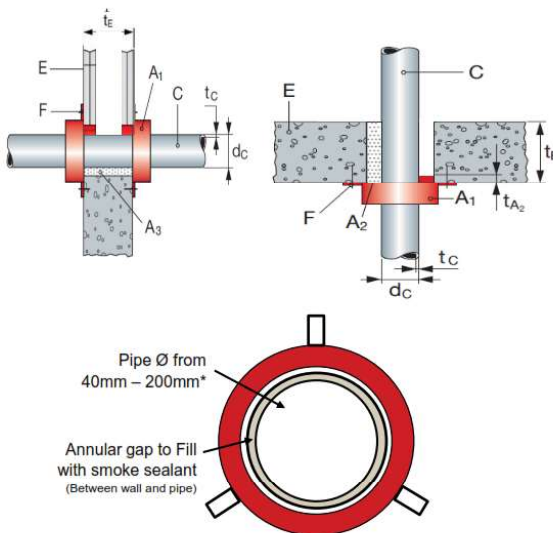


SEALING AROUND D1 CABLE SETS



- Installed in 2hr walls (min 2 x 13mm fire rated plasterboard either side)
- Minimum Annular seal > 10mm
- Minimum space between cable bundles > 40mm
- Minimum total wall thickness > 100mm
- Maximum opening size 150mm x 150mm or equivalent surface area (0.023m²)
- Optional putty bandage;
 - With putty bandage installed FRL of -/120/120 achieved on fire seal
 - Otherwise FRL of -/120/60 achieved

SEALING AROUND MECHANICAL SERVICES





FIRESTOP PRODUCTS

HILTI Brandabschottung

☐ Brandabschottband CP 645
Brandabschottung, 2-18-17-1629

☐ Brandabschottlamelle CP 646
Brandabschottung, 2-18-17-1630

☐ Brandabschottlamelle CP 647-1
Brandabschottung, 2-18-17-1631

☐ Brandabschottlamelle CP 648
Brandabschottung, 2-18-17-1632

☐ Brandabschottlamelle CP 649
Brandabschottung, 2-18-17-1633

☒ Brandabschottlamelle CP 649 SL
Brandabschottung, 2-18-17-1634

☐ Brandabschottlamelle CP 650
Brandabschottung, 2-18-17-1635

☐ Brandabschottlamelle CP 651
Brandabschottung, 2-18-17-1636

Strahlungsquelle: 1702/4 Schnitt-Nr.: 427

Ausführender: Lohar Pöschel

30 40 60 120

1



Firestop joint spray CFS-SP WB

Product description

- A sprayable fire-rated mastic for construction joints where maximum movement is required

Product features

- Sprayable or apply by brush
- Maximum flexibility, meets 500 cycle requirements (Class II and III Approval)(ASTM E 1966 and UL 2079)
- Quicker and easier installation with the Graco Ultra Max II 595 or 695 Sprayers can help save you time and money
- Contains no halogens, solvents or asbestos
- Water based formulation so spills and over-spray clean up quickly and easily
- High degree of elasticity — movement capability of up to 50%
- Excellent sprayability and low slump characteristics
- California State fire marshal approval for joints

Installation instructions

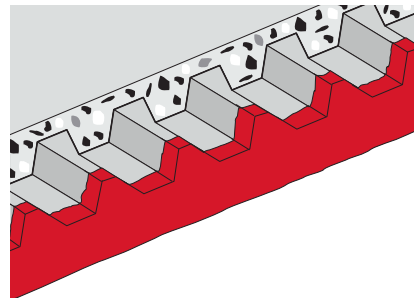
- See Hilti literature or third-party listings for complete application and installation details

Technical Data

Density	Approx. 10.8 lb/gal (1.3 g/cm ³)
Color	Available in red, white and gray
Packaging	5gal Pail (Volume/unit 1,115.3 in ³)
Storage temperature	35°F to 95°F (1.5°C to 35°C)
Shelf life	12 months
Application temperature	39°F to 104°F (4°C to 40°C)
Temperature resistance	-40°F to 176°F (-40°C to 80°C)
Consistency	Sprayable liquid
Chemical basis	Acrylic-water-based-dispersion
Tack free time	3hrs @ 73°F, 50% humidity
Curing time	Approx. 24 hours @ 73°F, 50% humidity for 1/8" depth (1.5mm per day)
Average volume shrinkage (ASTM C1241)	51.1%
Water tightness	Yes
Ph-value	Approx. 8-9
Movement capability	Up to 50%
Seismic resistant	Yes
Mold & mildew (ASTM G21-96)	0 Mold growth
Paintable	Yes
Air leakage (UL 2079 L-Rating)	L-Rating at Ambient = Less than 1 CFM / Lin Ft L-Rating at 400°F = Less than 1 CFM / Lin Ft
Surface burning characteristics (ASTM E84)	Flame spread: 5 Smoke development: 10
Surface burning characteristics (CAN/ULC-S102)	Flame spread: 15 Smoke development: 10
Sound transmission classification (ASTM E 90-99)	59 (per tested construction type)
Tested in accordance with	UL 2079, ASTM E 1966, ASTM E 84, ASTM E 2837, UL 1479, ASTM E 814, ASTM E 2307, ASTM E1399, ASTM E1354, CAN/ULC-S115

*At 73°F (23°C) and 50% relative humidity

Product information



Description	Qty	Item Number
Firestop joint spray CFS-SP WP red	1	2447526
Firestop joint spray CFS-SP WP white	1	2447527
Firestop joint spray CFS-SP WP grey	1	2447528



Additional product information

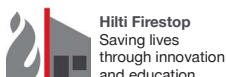
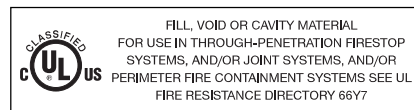
Description	Flute Dimensions L x (Flute) x H	Qty	Item number
CP 777 1.5" Speed Plug	36" x (3.5" x 4.5") x 1.5"	18	371925
CP 777 2" Speed Plug	36" x (4.5" x 5.5") x 2"	18	340998
CP 777 3" Speed Plug	36" x (5" x 7") x 3"	18	340999
CP 767 2" Speed Strips (1 hour)	36" x 0.625" x 2"	84	374507
CP 767 2" Speed Strips (2 hour)	36" x 1.25" x 2"	42	374508
CP 767 4" Speed Strips (1 hour)	36" x 0.625" x 4"	42	374505
CP 767 4" Speed Strips (2 hour)	36" x 1.25" x 4"	21	374506

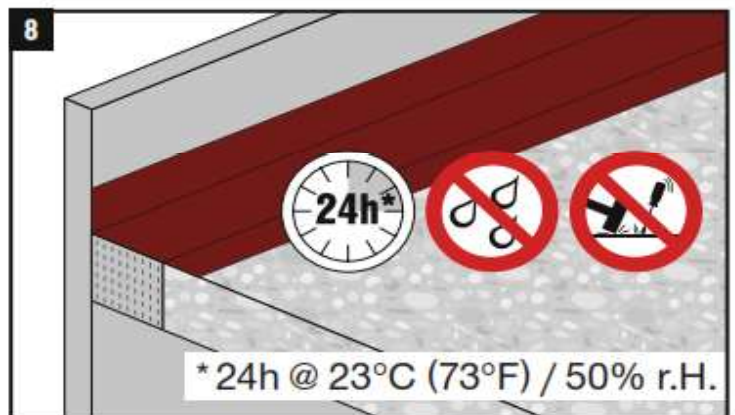
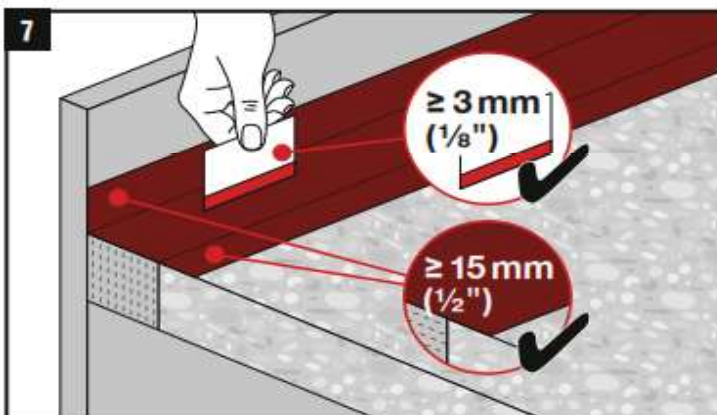
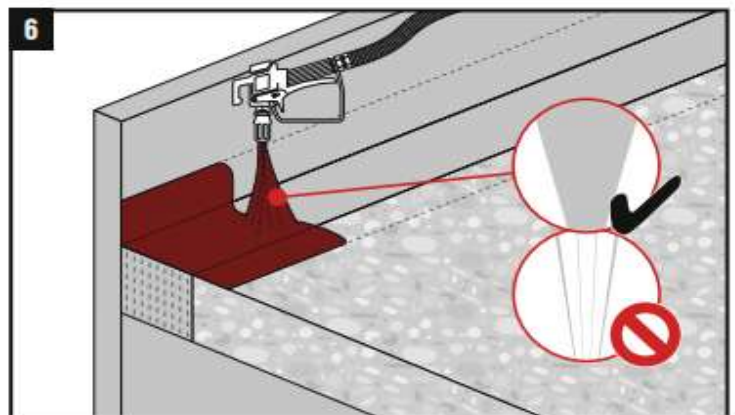
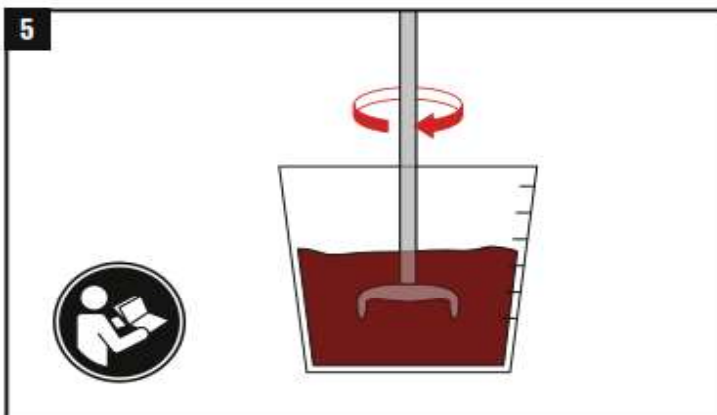
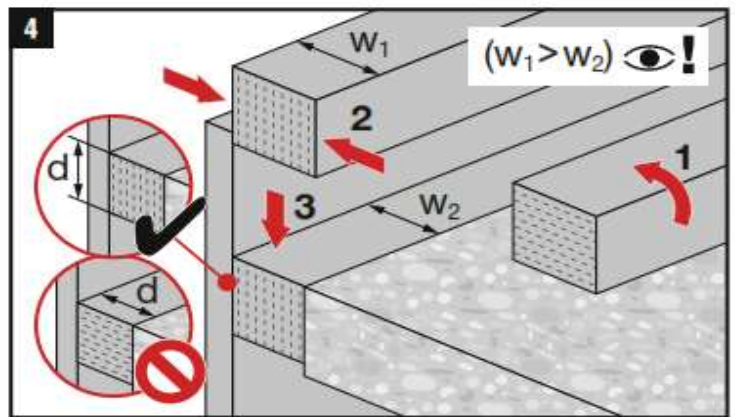
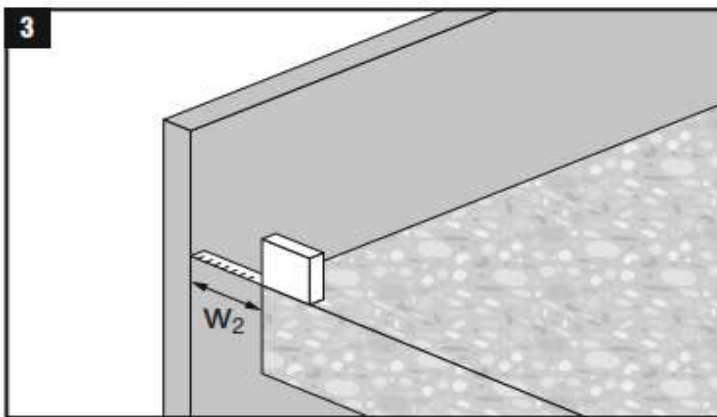
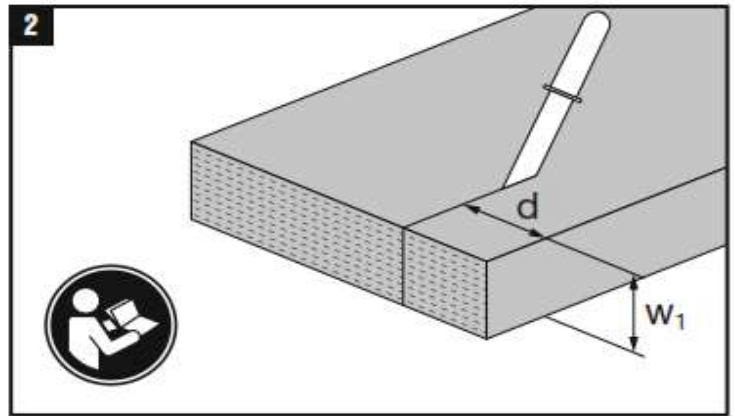
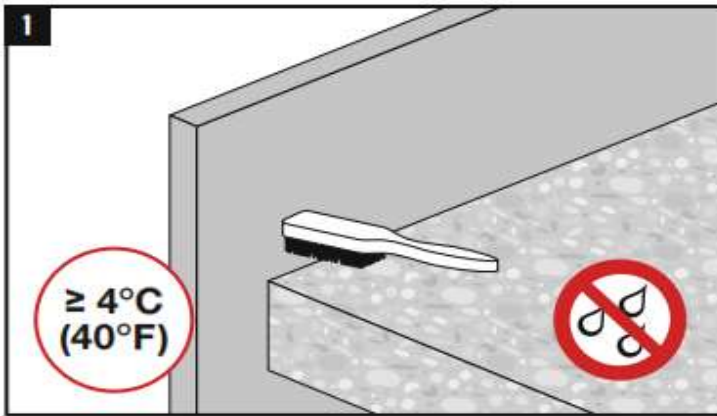


Speed Strips CP 767



CP 777 Speed Plug





* 24h @ 23°C (73°F) / 50% r.H.

CERTIFICATE OF COMPLIANCE

Certificate Number 20170203 – R13240
Report Reference R13240 - 20100527
Issue Date 2017-FEBRUARY-03

Issued to: HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC
7250 Dallas Pky, Legacy Tower Suite 1000
Plano, TX 75024 USA

**This is to certify that
representative samples of**

Fill, Void or Cavity Materials
CFS-SP WB Firestop Joint Spray

Have been investigated by UL in accordance with the
Standard(s) indicated on this Certificate.

Standard(s) for Safety:

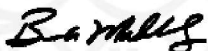
ANSI/UL 1479, "Fire Tests of Penetration Firestops,"
ANSI/UL 2079, "Tests for Fire Resistance of Building Joint
Systems," ANSI/ASTM E2307, "Standard Test Method for
Determining Fire Resistance of Perimeter Fire Barriers
Using Intermediate-Scale, Multi-story Test Apparatus" and
CAN/ULC-S115, "Standard Method of Fire Tests of Firestop
Systems."

Additional Information:

See the UL Online Certifications Directory at
www.ul.com/database for additional information

Only those products bearing the UL Certification Mark should be considered as being covered by UL's
Certification and Follow-Up Service.

Look for the UL Certification Mark on the product.



Bruce Mahrenholz, Director North American Certification Program
UL LLC

Any information and documentation involving UL Mark services are provided on behalf of UL LLC (UL) or any authorized licensee of UL. For questions, please
contact a local UL Customer Service Representative at <http://ul.com/aboutul/locations/>



FIRESTOP FOAM CP 660

Product description

- The ideal solution for installing reliable, smoke-resistant firestop seals in small to medium-sized openings — one product is all that is needed

Product features

- Neat and tidy application
- Quick and easy to install — a reliable firestop seal with only one product
- Easy subsequent installation of additional single cables
- Outstanding sound insulation properties thanks to flexible foam structure
- Smoke resistance and firestopping with one system
- Paintable

Areas of application

- Permanent firestop seals in small- and medium-sized openings (optimum size range: 100 x 100 mm to 300 x 300 mm)
- Cable trays, bunched and single cables
- Plastic pipes (can also be installed as a system in conjunction with Hilti firestop collars and wraps)
- Openings accommodating pipes and cables
- Metal pipes (uninsulated or with flammable or non-flammable insulation)

For use with floor and wall assemblies

- Concrete, drywall and masonry

Installation instructions

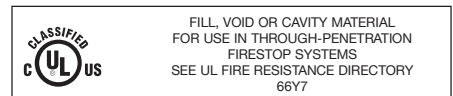
- See Hilti literature or third-party listings for complete application and installation details



Technical Data

Chemical basis	Two component polyurethane foam
Color	Red
Fire foam yield	Up to 128 in ³
Application temperature	Product: 50°F to 95°F (10°C to 35°C)
Curing time*	Tack free: 5 min Cut time: 10 min
Temperature resistance of cured foam	-22°F to 140°F (-30°C to 60°C)
Sound transmission classification (ASTM E90-97)	47 (Relates to specific construction)
Mold and mildew (ASTM G21)	0
Shelf life	9 month from date of manufacture
Recommended storage temperature	40°F to 77°F (4.5°C to 25°C)
Tested in accordance with	UL 1479, ASTM E81, CAN/ULC-S115 Refer to applicable UL listings for specific installation requirements

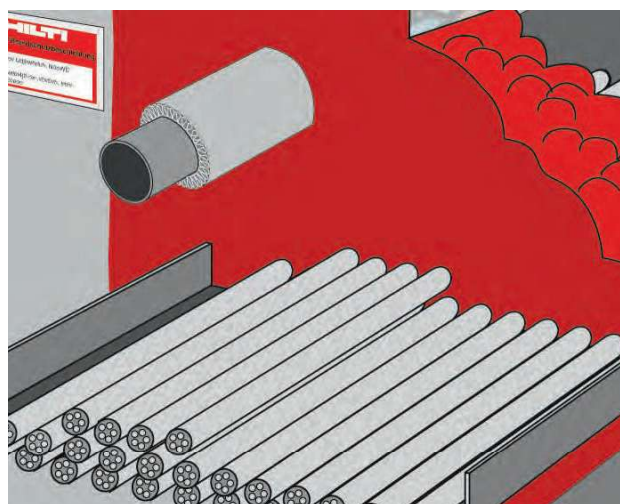
*At 73°F (23°C) and 50% relative humidity



CFS-F FX/CP 660 Expanding Fire Seal

Technical data

Color	Red
Foam Yield	2.1
Max. storage temperature	25°C
Building material class	B2
Shelf life (@73°F/23°C and 50% relative humidity)	9 months
Application temperature range	5°C - 40°C
Temperature resistance temperature range	-30°C - 60°C



Main applications

Trade Electrical

Cable penetrations



- Small and medium-sized openings
- Also suitable for conduits
- Ideal for openings of 150 x 150 mm to 300 x 300 mm

Trade: Plumbing, heating, air conditioning

Pipe penetrations



- Metal pipes without insulation, with non-flammable insulation up to 168 mm and flammable insulation up to 114.3 mm
- Plastic pipes with Hilti firestop jacket or firestop wrap up to 110 mm
- Gap around the pipe can be filled easily without need for backfilling



- Special approvals for openings accommodating pipes and cables and for use with CP 657

Trade: Interior finishing Cable and pipe penetrations



- Penetrations in drywall partitions, 100 mm and larger
- No formwork required

- Ideal for openings in the 100 x 100 mm to 250 x 250 mm range

(National approvals must be observed.)

Safety precautions

- Please refer to MSDS data sheet available as a download from the Technical Library on the Hilti web site at www.hilti.co.uk / www.us.hilti.com

3-phase technology.

This intumescent firestop foam is very easy to apply. Installation is a 3-phase procedure:

1. Mixing



The two components are combined as they are dispensed. A specially-designed mixing nozzle ensures even mixing of both components and thus optimum foam quality at all times.

2. Expansion



The firestop foam begins to expand after about 30sec. and reaches approx. 6 times its original volume.

3. Curing



The foam becomes shapeable after approx. 5 min. and can be cut after about 10 min. Thanks to the foam's flexible structure, single cables can be retrofitted easily without drilling or cutting.

eco-INSTITUT, Schanzenstr. 6-20, D-51063 Köln

Hilti Entwicklungsgesellschaft mbH
Mrs. Sarah Kretschmer
Hiltistraße 6
86916 Kaufering

Dear Mrs. Kretschmer,

based on the evaluation of the Test Reports No. 58693-A002-CS-L dated 2024-01-12, the testing results of the products **CP 660** and **CFS-F FX** commissioned by **Hilti Entwicklungsgesellschaft mbH** comply with the requirements of

- VOC product emissions acc. to California Department of Public Health (CDPH) Standard Method v1.2-2017 (California Specification 01350 (01/2017))

These criteria meet the requirements for low-emitting **Adhesives and Sealants** in credit EQc2 of the LEEDv4 Rating System and the LEEDv4.1 Rating System.

Acceptance Criteria and Results Demonstrating Compliance of Product Sample to Referenced Standard:

Exposure Scenario	Individual VOCs of Concern		Formaldehyde		TVOC
	Requirement	Requirement hold	Requirement	Requirement hold	Range
School Classroom	½ CREL	yes	≤ 9 µg/m³	yes	≤ 0.5 mg/m³
Private Office	½ CREL	yes	≤ 9 µg/m³	yes	≤ 0.5 mg/m³

Mass per surface area: not applicable

Cologne, 2024-01-12



Marc-Anton Dobaj, M.Sc. Crystalline Materials
(Project manager)



3.4 Testing

Date March 5th and 6th, 2007
 Test engineer Stefan Bacher

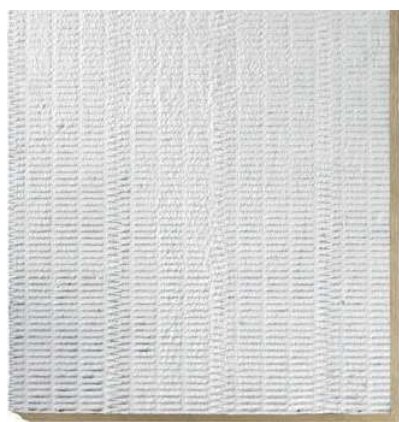
4 Detailed results

The values referring to the measured sound reduction index, sound transmission loss or normalized level difference of the tested specimens are plotted against frequency in the enclosed data sheets and are tabled.

As per EN ISO 717-1 : 1996-12 + A1:2006 for the frequency range 100 Hz to 3150 Hz the weighted sound reduction index R_w (related to test surface $S = 1,88 \text{ m}^2$), the weighted normalized level difference $D_{n,e,w}$ for the opening and the spectrum adaptation terms C and C_{tr} as well acc. to ASTM E 413 – 04 for the frequency range 125 Hz to 4000 Hz, the Sound Transmission Class STC are calculated according to Table 1.

Table 1 Measured results

Data Sheet No.	Record No.	Penetration in stud partition	Filling of penetration	Results in dB		
				$R_w (C; C_{tr})$	$D_{n,e,w} (C; C_{tr})$	STC
1 / 2	Z01	None	None	62 (-2; -8)	--	63
3 / 4	Z02	400 mm x 400 mm	None	10 (0; 0)	--	10
5 / 6 / 7	Z07	400 mm x 400 mm	Firestop foam	47 (-1; -6)	54 (0; -5)	47
	Z05	400 mm x 400 mm	Firestop foam and cables	47 (-1; -6)	54 (-1; -6)	48


Płyta ogniochronna CP 673

System płyt z powłoką ogniochronną, o szerokim zakresie oceny, do uszczelniania średnich lub dużych otworów


Masa uszczelniająca CP 673

System płyt z powłoką ogniochronną, o szerokim zakresie oceny, do uszczelniania średnich lub dużych otworów


Powłoki ogniochronne CP 673

System płyt z powłoką ogniochronną, o szerokim zakresie oceny, do uszczelniania średnich lub dużych otworów

Zastosowania

- uszczelnienie ogniochronne przejść instalacyjnych: rur (rury palne i niepalne), pojedynczych kabli, wiązek kablowych, kabli w korytach i/lub drabinach, szczelin dylatacyjnych
- przejścia instalacyjne mieszane / kombinowane (rury, kable, wiązki)
- zabezpieczenie ogniochronne przejść szynoprzewodów
- zabezpieczenia przejść dużej i średniej wielkości
- uszczelnienie niewypełnionych otworów w przegrodach

Zalety

- szeroki zakres aprobaty - możliwość zabezpieczania przejść instalacyjnych do EI 240
- łatwy montaż i demontaż w przypadku rozbudowy przepustu
- dobre właściwości użytkowe – łatwe rozprowadzanie farby pędzlem, szpachelką, wałkiem lub pistoletem natryskowym
- elastyczna, szybko schnąca powłoka, tworząca rozciągliwą warstwę ochronną
- zastosowanie uszczelnień w ścianach elastycznych i sztywnych

Dane techniczne

Zastosowania ogólne	rury, kable, szynoprzewody, przejścia kombinowane, szczeliny dylatacyjne, kanały wentylacyjne
Kolor	Biały
Maksymalny otwór w ścianie (szer.x wys.)¹⁾	1200 x1500 mm lub 2000 x 1200 mm (zgodnie z KOT)
Maksymalny otwór w stropie (szer. x wys.)¹⁾	1200 x 1200 mm (lub o innych wymiarach, pod warunkiem, że stosunek obwodu uszczelnienia do jego pola powierzchni spełnia warunek z KOT)
Zakres temperatur stosowania²⁾	od -20°C do +70°C
Temperatura przechowywania i transportu	od +5°C do +30°C
Zakres odporności na temperaturę	od -40°C do +100°C
Okres przydatności do użycia³⁾	15 miesięcy
Czas utwardzania ok⁴⁾	1mm / 24h
Krajowa Ocena Techniczna	ITB-KOT-2018/1091 wydanie 5 ITB-KOT-2022/2275 wydanie 1
Klasa odporności ogniowej	do EI240

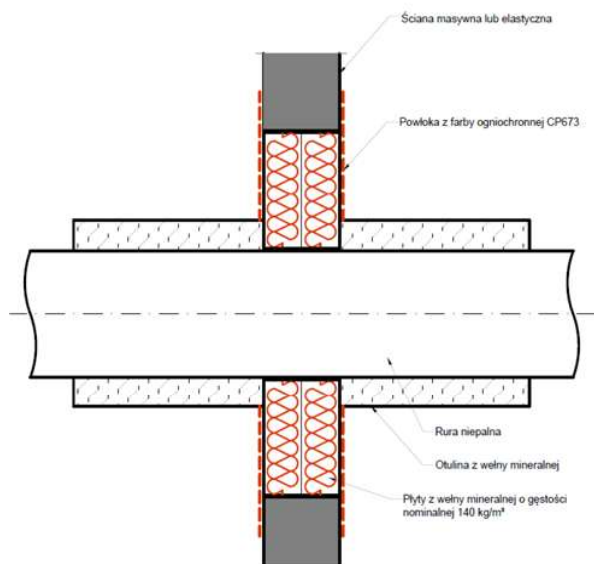
1) sumaryczna powierzchnia przekrojów elementów instalacyjnych (rur, kabli, wiązek kabli etc.) łącznie z izolacją i wspornikami przechodzącymi przez przegrody nie powinna przekraczać 60% całkowitej powierzchni uszczelnienia przejścia instalacyjnego.

2) w środowisku Y₂ wg Raportu Technicznego EOTA TR 024. Spełnienie wymagań Y₂ potwierdza spełnienie wymagań dla kategorii Z₁ i Z₂.
Y₂ – wyroby przeznaczone do zastosowań w temperaturach poniżej 0°C, bez narażenia na działanie UV i deszczu.
Z₁ – wyroby przeznaczone do zastosowań w pomieszczeniach o wysokiej wilgotności (klasa 5 wilgotności wewnętrznej, wg normy PN-EN ISO 13788:2013).
Z₂ – wyroby przeznaczone do zastosowań w pomieszczeniach o wysokiej wilgotności innej niż w kategorii Z₁, z wyłączeniem temperatur poniżej 0°C.

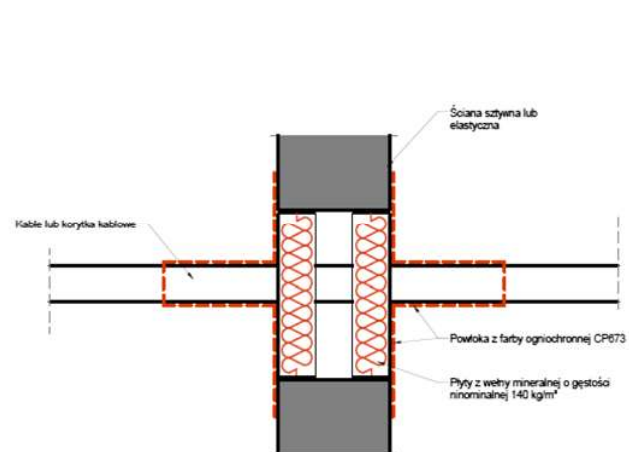
PRZYKŁADOWE ZASTOSOWANIA

Wyciąg z dokumentów Krajowych Ocen Technicznych. Dokładny zakres zastosowania (typy rur / średnice oraz grubość ścianki rury / typy izolacji) należy sprawdzić w treści dokumentu ITB-KOT -2018/0191 wydanie 5. W przypadku złączy liniowych zakres zastosowania należy sprawdzić w treści dokumentu ITB-KOT -2022/2275 wydanie 1.

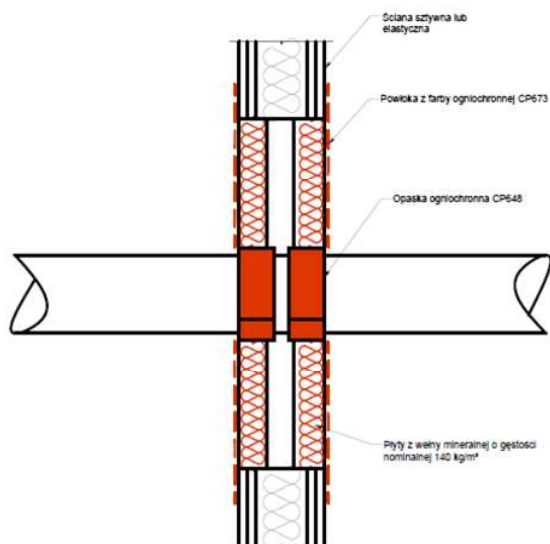
Rury niepalne



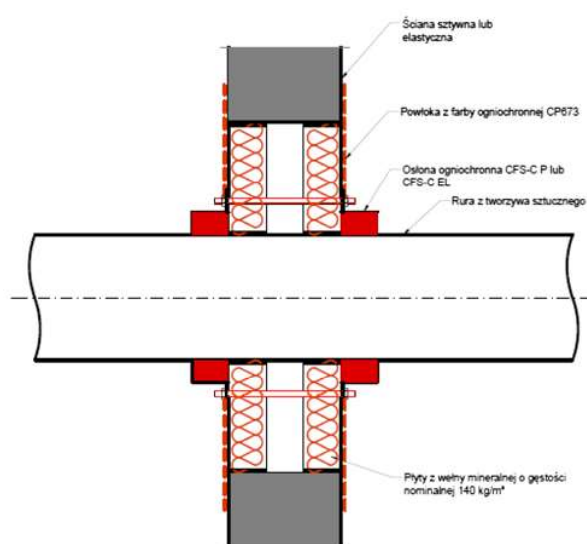
Przejście kablowe

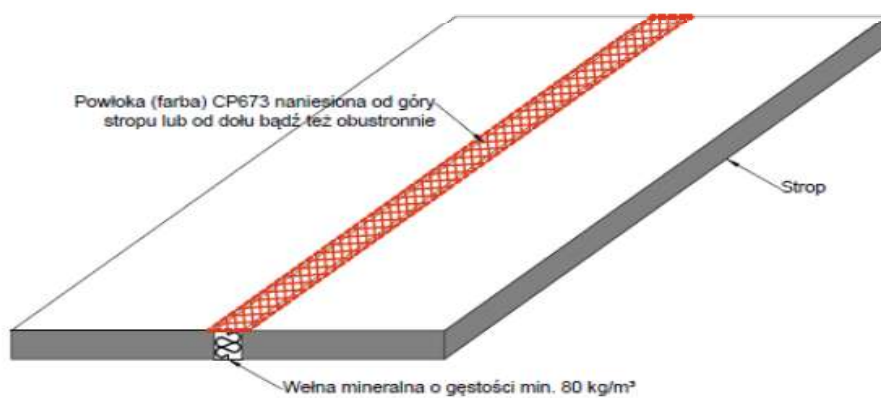
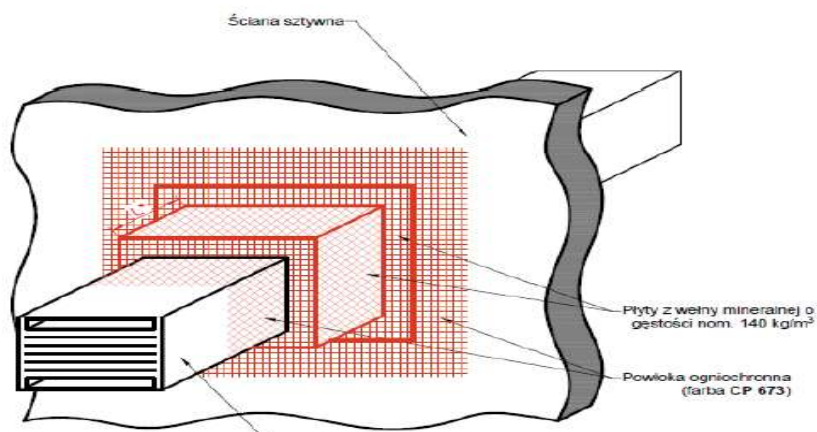


Rury palne CP673 + CP648



Rury palne CP673 + CFS-C EL/CFS-C P





eco-INSTITUT, Schanzenstr. 6-20, D-51063 Köln

Hilti Entwicklungsgesellschaft mbH
Mrs. Cintia Chagas de Oliveira
Hiltistraße 6
86916 Kaufering

Dear Mrs. Chagas de Oliveira,

based on the evaluation of Test Report No. 55493-A004 II and dated 2020-09-29, the testing results of the product **Hilti Firestop Coating CP 673** manufactured by **Hilti Entwicklungsgesellschaft mbH** comply with the requirements of

- VOC content ASTM D 2369 - 10 and South Coast Air Quality Management District (SCAQMD) Rule 1113

This criteria meets the requirements for low-emitting **Paints and Coatings** in credit EQc2 of the LEEDv4 Rating System and the LEEDv4.1 Rating System.

Acceptance Criteria and Results Demonstrating Compliance of Product Sample to Referenced Standard:

VOC content	VOC Limit Value*
27.19 g/L	150 g/L

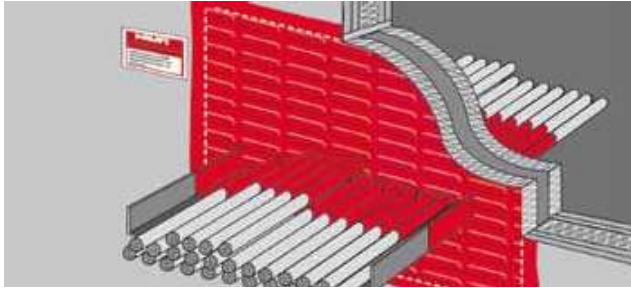
* VOC Limit Value for "Fire-Proofing Coatings" (SCAQMD 1113, 02/2016)

Cologne, 2020-11-13



Marc-Anton Dobaj, M.Sc. Crystalline Materials
(Project manager)

Firestop coating CP 670



Applications

- Permanent firestopping of blank openings, cables, cable trays, non-combustible and combustible pipes in medium-to-large wall and floor openings
- Ideal for large openings

Advantages

- Highly flexible coating dries quickly to form an elastic protective layer
- Dry film thickness 0.7 mm - up to 30% material savings
- Single-layer coating - up to 50% labor savings



Technical data

Base materials	Drywall, Concrete, Masonry
Intumescent	No
Re-penetration	Possible
Application temperature range	5 - 40 °C
Complementary products	CP 606
Fire rating	See Approvals
Temperature resistance range	-40 - 100 °C
Storage and transportation temperature range	5 - 30 °C
Acoustic insulation	Yes
Approvals	BS 476-20, ETA



Ordering designation	Weight	Sales pack quantity	Item number
CP 670 6kg	6 kg	1 pc	376023
CP 670 17,5kg	17.5 kg	1 pc	286955

Please visit our website for the latest item numbers and related products.

CP 670

Fire safety board system

Product description

Hilti CP670 is an innovative system for fast, reliable and cost effective firestopping of wall and floor openings – especially large ones. Tested to both BS476 Part 20 and EN 1366-3.

Areas of application:

- Extended approvals for large diameter cables, dampered penetrations and double board usage
- Single cables, cable bundles, cable tray air ducts and pipes
- Combustible and non combustible pipes
- Large penetrations possible up to 5 meters high by any length

Product features:

- Odourless and solvent free
- Less prone to damage due to pliancy of the material and the resilient elastic coating
- Approved for a wide range of applications
- Fast tight seal, less sealant required for gap filling

Base materials

Drywall, Masonry, Concrete

Storage

- Store only in the original packaging in a location protected from moisture and direct sunlight at a temperature of 5°C to 37°C.
- Observe expiry date on packaging.

Approvals Internationally tested and approved



EN 1366-3

Technical data

Shelf life ¹⁾	Not relevant
Application temperature range	5 - 40 °C
Base materials	Drywall, Concrete, Masonry
Fire rating	See Approvals
Colour	White

¹⁾ at 77°F/25°C and 50% relative humidity; from date of manufacture



Key applications & advantages

- Permanent firestopping of blank openings, cables, cable trays, non-combustible and combustible pipes in medium to large wall and floor openings
- Ideal for large openings
- Solvent and silicone-free
- Fully functional immediately after installation

CP 670 Fire safety board system



Ordering designation	Dimensions (LxWxH)	Sales pack quantity	Item number
CP 670 1200x600x50 white	1200 x 600 x 50 mm	16 pc	236673

eco-INSTITUT, Schanzenstr. 6-20, D-51063 Köln

Hilti Entwicklungsgesellschaft mbH
Mrs. Cintia Chagas de Oliveira
Hiltistraße 6
86916 Kaufering



Dear Mrs. Chagas de Oliveira,

based on the evaluation of Test Report No. 55493-A004 II and dated 2020-09-29, the testing results of the product Hilti Firestop Coating CP 670 manufactured by Hilti Entwicklungsgesellschaft mbH comply with the requirements of

- VOC content ASTM D 2369 - 10 and South Coast Air Quality Management District (SCAQMD) Rule 1113

This criteria meets the requirements for low-emitting Paints and Coatings in credit EQc2 of the LEEDv4 Rating System and the LEEDv4.1 Rating System.

Acceptance Criteria and Results Demonstrating Compliance of Product Sample to Referenced Standard:

VOC content	VOC Limit Value*
27.19 g/L	150 g/L

* VOC Limit Value for "Fire-Proofing Coatings" (SCAQMD 1113, 02/2016)

Cologne, 2020-11-13

A handwritten signature in black ink, reading "M. A. Dobaj".

Marc-Anton Dobaj, M.Sc. Crystalline Materials
(Project manager)

FIRESTOP WRAP STRIP (CP 648-E)

Product description

- An intumescent, flexible firestop wrap strip for plastic and insulated pipe penetrations

Product features

- Highly Intumescent
- Long length avoids waste
- Can be continuously wrapped
- Cost effective
- Quick and easy closure without tools
- Ideal for very tight installations

Areas of application

- Firestopping combustible pipe penetrations
- Difficult applications where space is limited
- Penetrations through concrete over metal deck
- Plastic and insulated penetrations using PVC, CPVC, ABS, FRPP and PEX

For use with

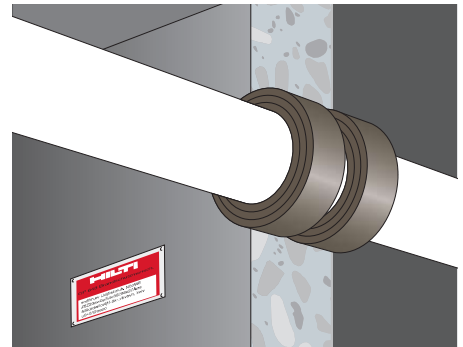
- Concrete, masonry, wood floor and gypsum wall assemblies
- Wall and floor assemblies rated up to 4 hours

Examples

- Waste water pipes
- Fresh water pipes
- Decking penetrations

Installation instructions

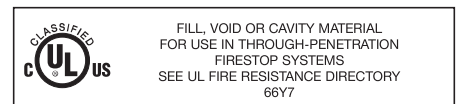
- See Hilti literature or third-party listings for complete application and installation details



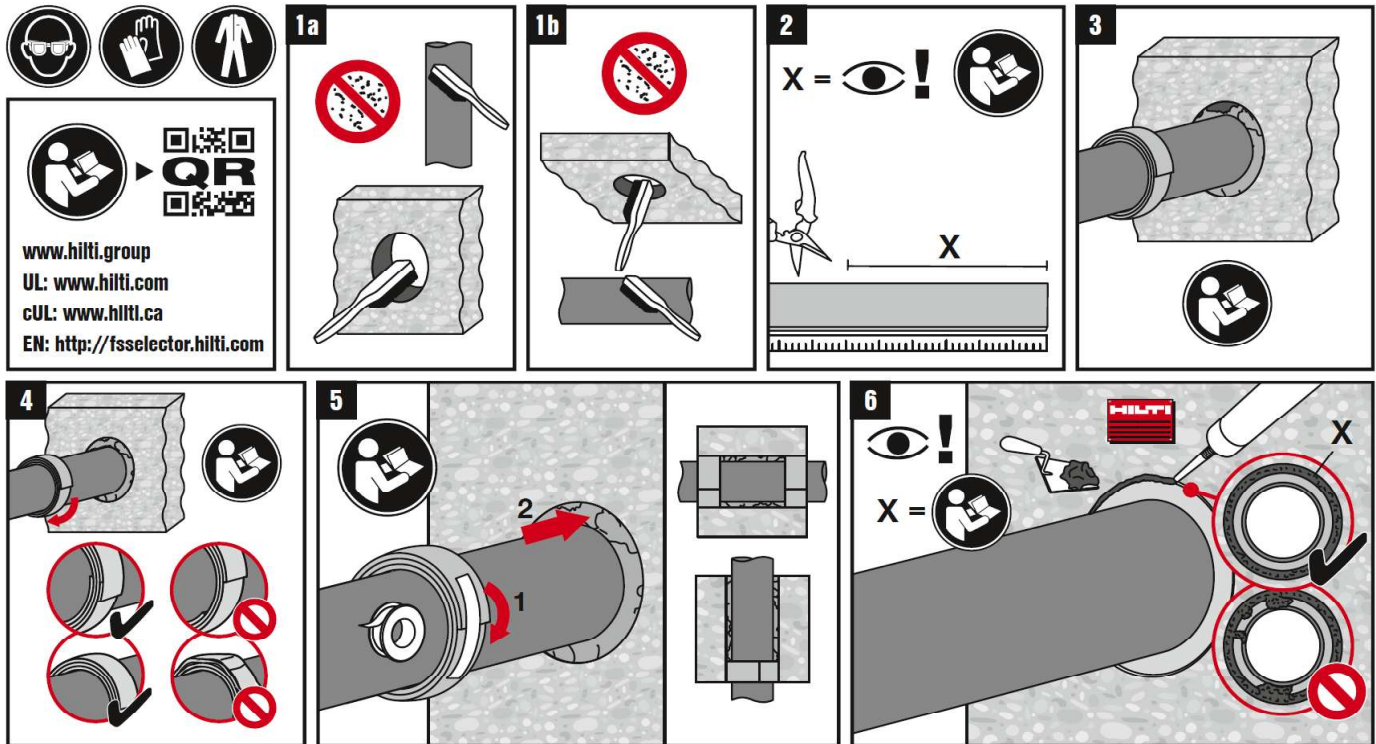
Technical Data*

Density	Approx. 1.35 g/cm ³
Dimensions (approximate)	3/16" x 1" x 33 ft or 3/16" x 1-3/4" x 33 ft
Color	Black with foil backing
Temperature resistance	-22 °F to 212 °F (-30 °C to 100 °C)
Intumescent activation	Approx. 410 °F to 210 °C
Expansion ratio (unrestricted)	1:19
Mold and mildew performance	Class 0
Application temperature	23 °F to 122 °F (-5 °C to 50 °C)
Storage temperature	23 °F to 122 °F (-5 °C to 50 °C)
Shelf life	Not relevant
LEED VOC	7.6 G/L
Tested in accordance with	UL 1479, ASTM E 814, ASTM G21, CAN/ULC-S115

*At 73 °F (23 °C) and 50% relative humidity



Hilti Firestop
Saving lives
through innovation
and education



CP 648-ERetaining collar CP 648-E 1" x 25'



CFS-W EL/CP 648-E Endless wrap strip

Technical data

Color	Black with foil backing
Density	1.35 g/cm³
Intumescent	Yes
Expansion temperature	> 160 °C
Building material class	B2

Application table

Pipe dimension (mm)	No. Layers	Wrap length (cm)	Applications with a 10m roll (No.)	Recommended drill hole X (mm)
50	1	17	58	67*
63	1	21	47	77*
75	1	25	40	92*
90	2	64	15	112*
110	2	75.5	13	132*
125	2	85.5	11	152*
160	3	166	6	202*

*or bigger

Penetration

- Drill through the wall/floor using Hilti diamond drilling equipment and a core bit of suitable size
- Install the plastic pipe

Installation

1. Clean the plastic pipe

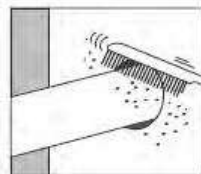
Expansion of the intumescent material during a fire closes the plastic pipe. Very dirty pipes with, for example, remains of mortar, may lead to a delay in this closing action. Badly soiled plastic pipes should, therefore, be cleaned in the area where the CFS-W EL/CP 648-E is to be installed.

2. Cut Wrap to required length

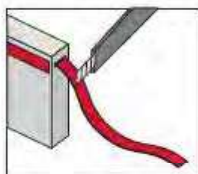
First check the annular space, then cut CFS-W EL/CP 648-E to length according to the outer diameter of the pipe to be installed, taking the required number of layers into consideration. See the measurement table printed in this data sheet or on the product packaging for guidance.

3. Install Wrap

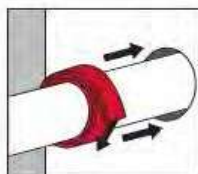
Wrap the CP648-E around the pipe and secure it with a short strip of adhesive tape. Push CFS-W EL/CP 648-E wrap strip into the annular space until flush with the wall.



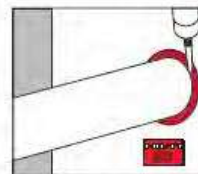
1. Clean the plastic pipe.



2. Cut CP 648-E to the correct length (see measurement table on product packaging for help).

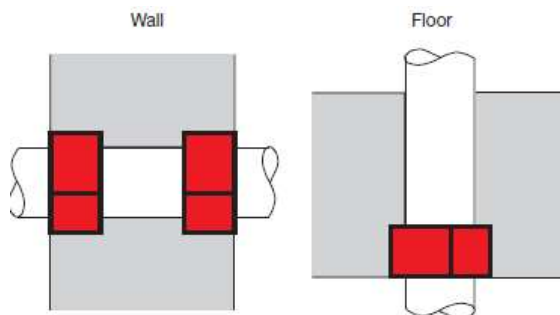


3. Wrap the CP 648-E around the pipe, fasten it with adhesive tape and push it into the annular space.



4. Close remaining gap to ensure smoke and gas tight seal. Fasten installation plate if required.

Dimensions



	Wall	Floor
Pipe diameter	Cellular concrete, Drywall concrete, masonry	Cellular concrete, concrete, masonry
50 - 110 mm	100 100	150
125-160mm	— 100/150*	150
CP648-E	One Wrap strip on each side (with required number of layers)	One Wrap strip on underside (with required number of layers)

*Exact dimensions depending on national approvals

4. Seal against smoke and gas

Seal the remaining gap with Firestop sealant (e.g. CP606). Larger annular spaces should be sealed with mortar (e.g. CP636). In drywall, sealing of the remaining gap also possible with gypsum.

Notice about approvals

- CP648-E is internationally tested and approved.
- When making a pipe seal using Hilti CFS-W EL/CP 648-E, national approvals must be observed in principle. Please refer to these for restrictions regarding opening size, type and wall/floor thickness, maximum pipe diameter etc.
- For maintenance reasons, a penetration seal can be marked permanently using an installation plate.

Safety precautions

- Please refer to MSDS data sheet available as a download from the Technical Library on the Hilti web site at www.hilti.co.za

CERTIFICATE OF COMPLIANCE

Certificate Number R13240
Report Reference R13240-20040518
Issue Date 2020-JANUARY-22

Issued to: HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC
7250 Dallas Pky, Legacy Tower Suite 1000
Plano TX 75024

This certificate confirms that
representative samples of

FILL, VOID OR CAVITY MATERIALS

The product covered by this Section of the Procedure is a one-part wrap strip designated as CP648-E or CP648-S. (The CP 648-S may include an optional "US" suffix.) The material is for use in through-penetration firestop systems in its final form as field installation..

Have been investigated by UL in accordance with the Standard(s) indicated on this Certificate.

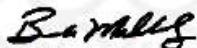
Standard(s) for Safety: ANSI/UL 1479, Fire Tests of Penetration Firestops
CAN/ULC-S115, Standard Method of Fire Tests of Firestop Systems

Additional Information: See the UL Online Certifications Directory at <https://iq.ulprospector.com> for additional information.

This *Certificate of Compliance* does not provide authorization to apply the UL Mark. Only the UL Follow-Up Services Procedure provides authorization to apply the UL Mark.

Only those products bearing the UL Mark should be considered as being UL Certified and covered under UL's Follow-Up Services.

Look for the UL Certification Mark on the product.



Bruce Mahrenholz, Director North American Certification Program
UL LLC

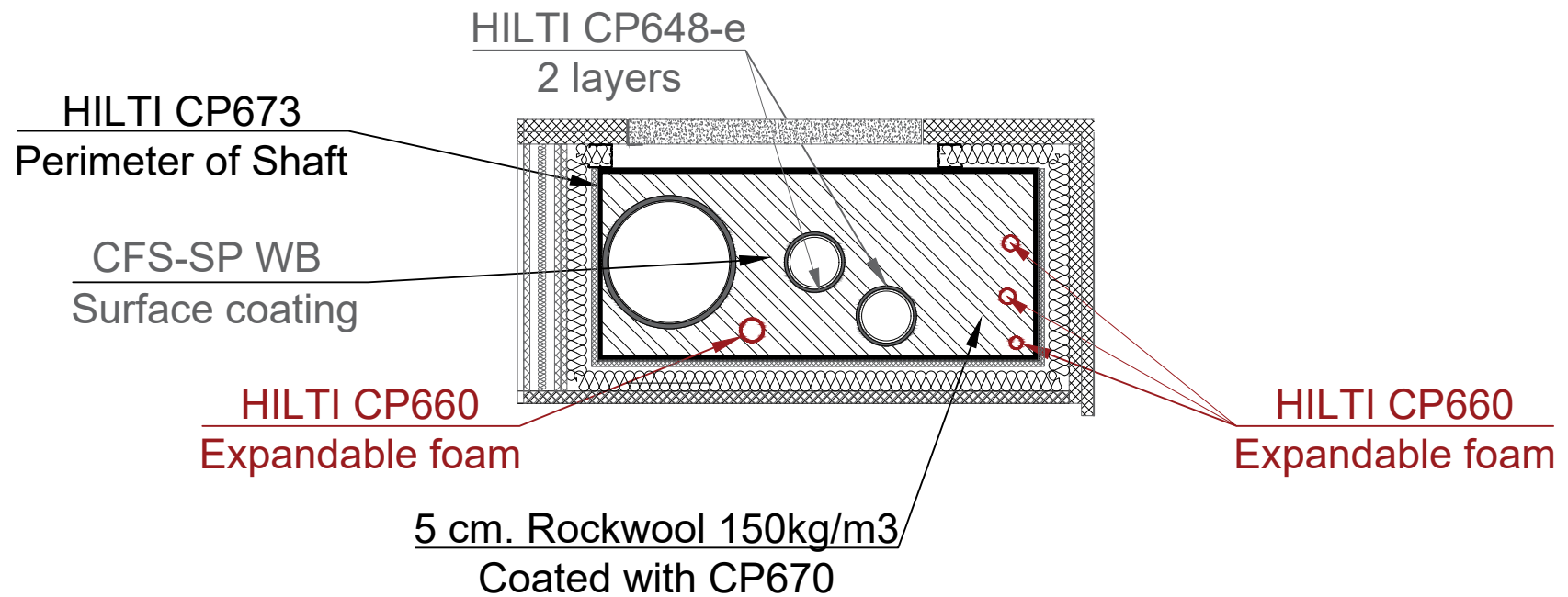
Any information and documentation involving UL Mark services are provided on behalf of UL LLC (UL) or any authorized licensee of UL. For questions, please contact a local UL Customer Service Representative at <http://ul.com/aboutul/certification>



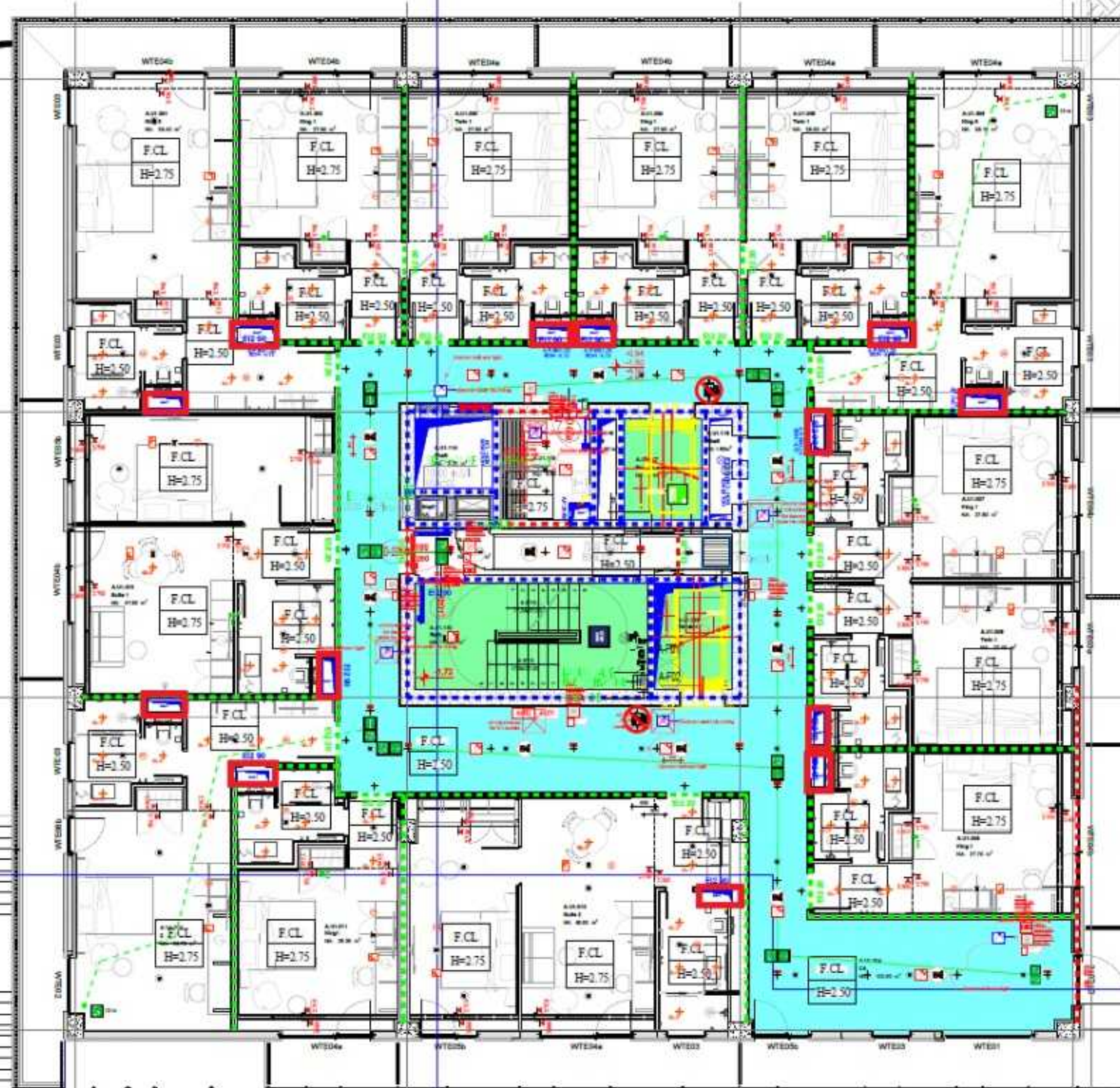
Firestop products additional testing

CFS-S SIL/ CP 601S		Fire		Smoke		Air-seal		Acoustic		Age Tested
CFS-S ACR/ CP 606		Fire		Smoke		Air-seal		Acoustic		Age Tested
CFS-SP-WB/ CP 672		Fire		Smoke		Air-seal		Acoustic		Age Tested
FS ONE Max		Fire		Smoke		Air-seal		Acoustic		Age Tested
CFS-F SOL/ CP 620		Fire		Smoke		Air-seal		Acoustic		Age Tested
CFS-F FX/ CP 660		Fire		Smoke		Air-seal		Acoustic		Age Tested
CFS-MRG/ CP 636		Fire		Smoke		Air-seal		Acoustic		Age Tested
CP637		Fire		Smoke		Air-seal		Acoustic		
CFS-EL		Fire	WITH MASTIC	NOT APPLICABLE	NOT APPLICABLE					
CP 638 HS FS		Fire		Smoke		Air-seal		Acoustic		
CFS-C/ CP 643N		Fire	WITH MASTIC	NOT APPLICABLE	NOT APPLICABLE					Age Tested
CFS-CP/ CP 644		Fire	WITH MASTIC	NOT APPLICABLE	NOT APPLICABLE					Age Tested
CFS CID/ CP 680		Fire		Smoke		Air-seal		Acoustic		Age Tested
CFS-W/ CP 648		Fire	WITH MASTIC	NOT APPLICABLE			Acoustic			Age Tested
CP 658		Fire		Smoke						Age Tested
CP 657		Fire		Smoke		Air-seal		Acoustic		Age Tested
CFS-CU		Fire	WITH MASTIC	NOT APPLICABLE				PLANNED		Age Tested
CFS-P PA/ CP 617		Fire					Acoustic			
CP 670		Fire		Smoke		Air-seal		Acoustic		Age Tested
CF 125-50		Fire	WITH MASTIC		Air-seal		Acoustic			

Shaft installation details



A block Guestroom shafts



SPRINKLER TYPES & ACTIVATION TEMPERATURES

RELATED AREAS	SYMBOLS	K VALUE	TEMP. CLASS	RESPONSE TIME
Guestrooms, Offices, Restaurant, Meeting room, Fitness, Commercial, Kitchen, Circulations, Public restrooms, Staff rooms		80	68°	Quick response
Mechanical rooms, Storage		80	68°	Quick response
Electrical room		80	68°	Quick response
Hot kitchen areas		80	93°	Quick response
Cold rooms		80	68°	Quick response
Swimming pool (Corrosion resistant sprinkler)		80	68°	Quick response
Sauna (Corrosion resistant sprinkler)		80	141°	Quick response
Loading deck (Dry type)		80	68°	Quick response
Clean agent sprinkler				Wall type extended cover sprinkler
Wall type sprinkler				Fire hose cabinet with ABC type dry portable extinguisher (5kg), DN25, 30m

FIRE-FIGHTING MECHANICAL EQUIPMENTS

	Expansion joint compensator		Check - Valve
	Fire extinguisher		Butterfly valve c/w supervisory switch
	Fire extinguisher		Landing valve
	Main fire pipe		Fire hydrant
	Test & Drain valve group		Damper connection 2xDN65
	Flow switch		Fire pipe column
	Manometer		Mec_FCU drainage

SMOKE EXHAUST SYSTEM

	Pressurization air		Motorized fire damper
	Smoke exhaust air		Relief damper
	Exhaust air (E/A)		Back draft damper
	Fresh air (F/A)		Pressure sensor
	Smoke exhaust duct section		Fresh air louver
	Pressurization air section		Exhaust air louver
	Fresh air duct section		Location of smoke exhaust fan
	Pressurization supply grille		Location of pressurization fan
	Smoke exhaust grille		Location of smoke exhaust fan
	Motorized smoke damper		

FIRE-RESISTANCE RATINGS FOR WALLS / DOORS

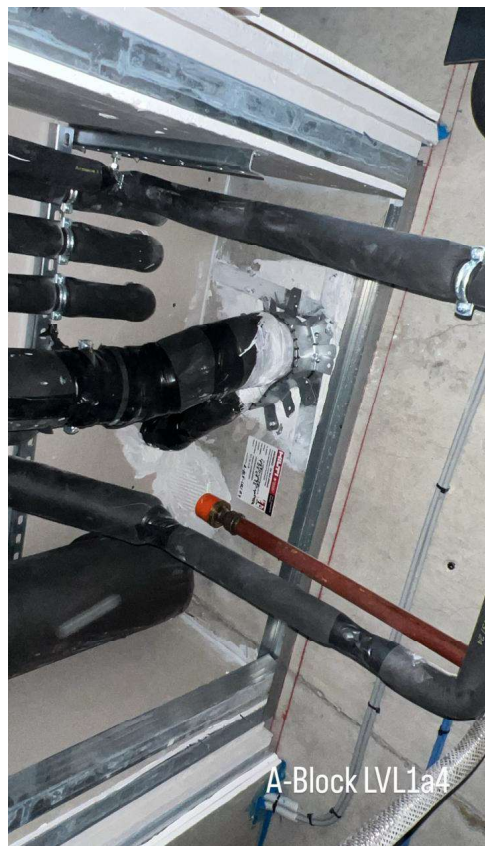
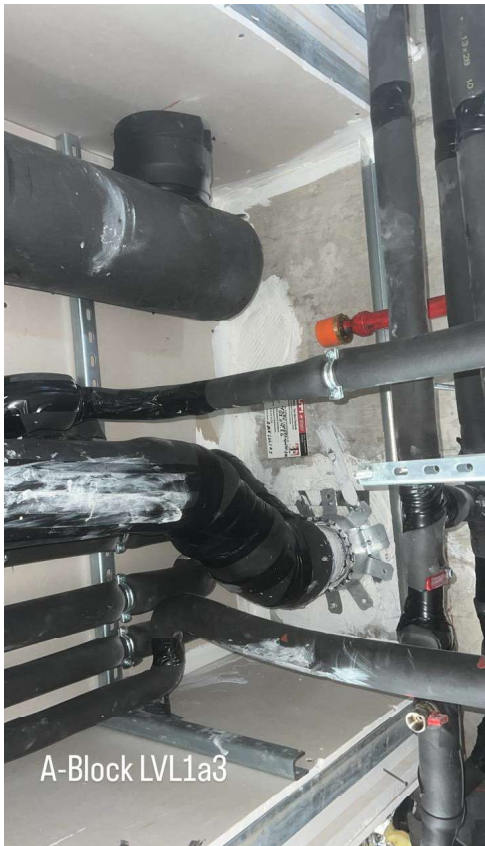
	Fire separation (EI30 wall)		Fire rated door (EI2 20)
	Fire separation (EI60 wall)		Fire rated door (EI2 45)
	Fire separation (EI120 wall)		Fire rated door (EI2 60)
	Fire rated elevator shaft landing door (EI 90)		Fire rated door (EI2 90)

EMERGENCY EXIT / ACTION SIGNS

	Emergency exit sign		Panic bar
	Assembly point direction		Common path of travel or dead end corridor distance
	Assembly point		Travel distance
	Stair sign		Exit path start and end points
	Ambulance stretcher elevator		Final exit
	Emergency pull cord		Fire alarm panel
	Emergency gas/emergency shut-off button		Exit stairway
	Don't use elevator in case of fire		Smoke control zones

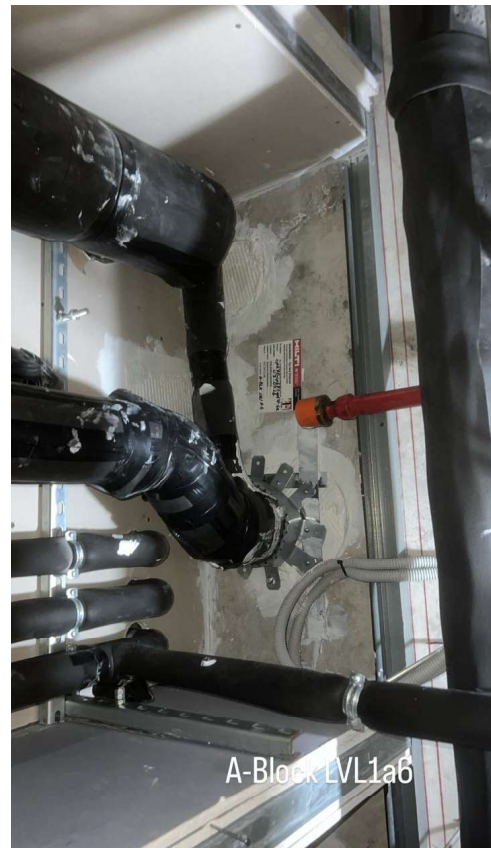
LIGHTING SYSTEMS

	Distribution board		LED Lamp - (36W, IP65, 4000K)
	One gang switch		LED Lamp (15W, with emergency battery)
	LED Lamp (15W, 3000K)		Floor Lamp (15W 3000K)
	Spotlight, Mounted in Tree (7W, 3000K, 900mm)		Emergency block
	Rack		Pendant luminaire (30W, 3000K, 2500mm)
	Two gang switch		Horizontal light gas in wall surface uplighter (30W, 3000K, 1500mm)
	Lighting control panel		Recessed circular light fixture (10W, 4000K, 1000mm)
	LED Lamp (6W)		Ceiling recessed light fixture (10W, 3000K, 1500mm)
	Technical Lighting (36W, 4000K) (600x600mm)		Pendant track system (6W, 3000K, 750mm)
	Downlight (9W, 3000K, 790mm)		Floor lamp (15W 3000K)
	LED Lamp (15W, 3000K, 740mm)		Illuminated wall object (15W, 3000K, 1500mm)
	LED Lamp (15W, 3000K, 740mm)		Ceiling-mounted, linear luminaire (10W, 3000K, 1500mm)
	LED Lamp (15W, 3000K, 740mm)		Contour spotlight (18W 3000K, 1500mm)





A-Block LVL1a5



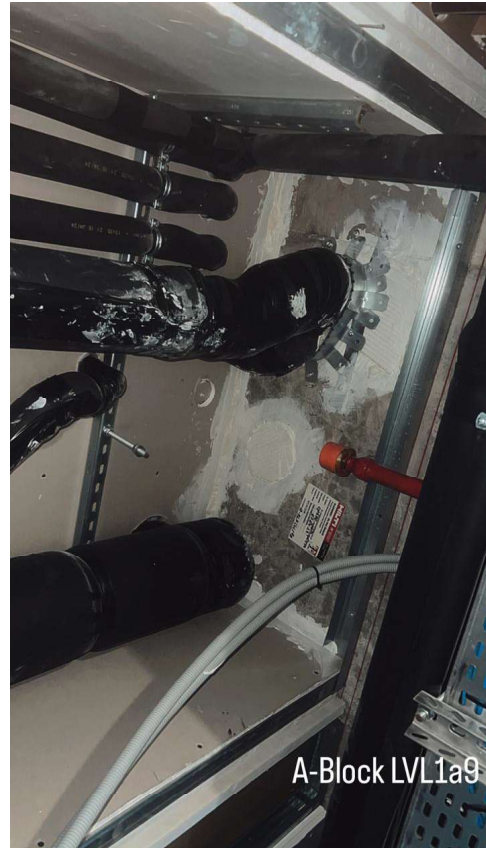
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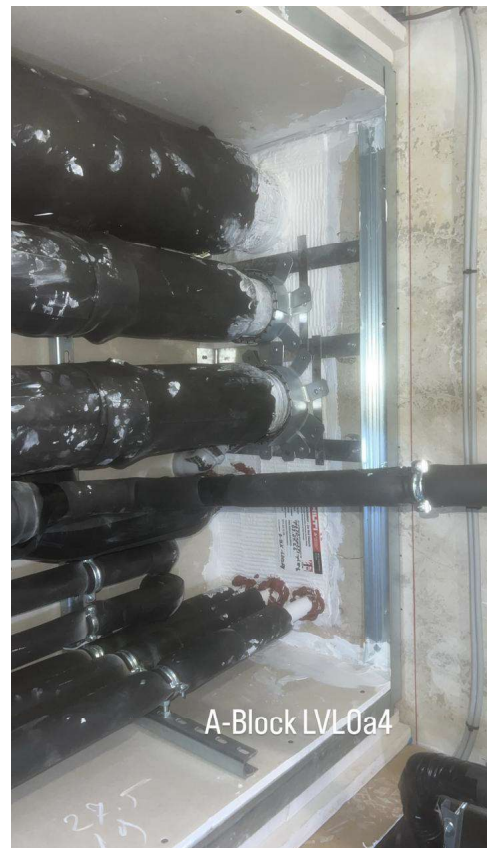
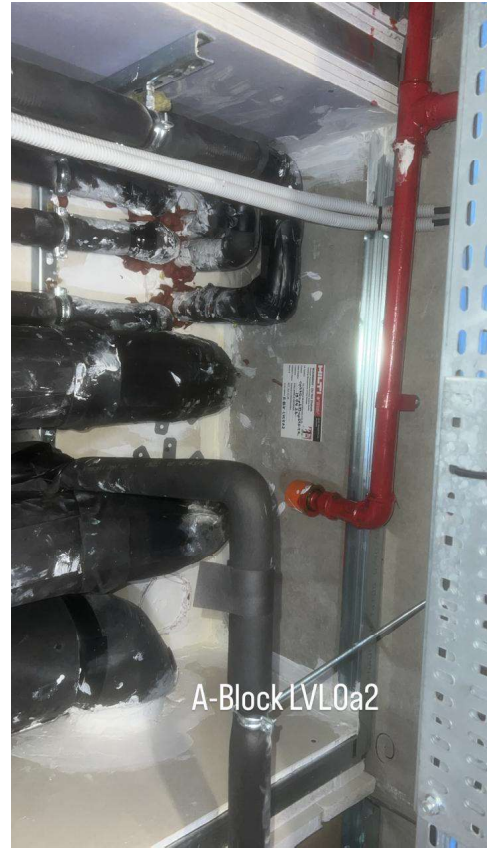
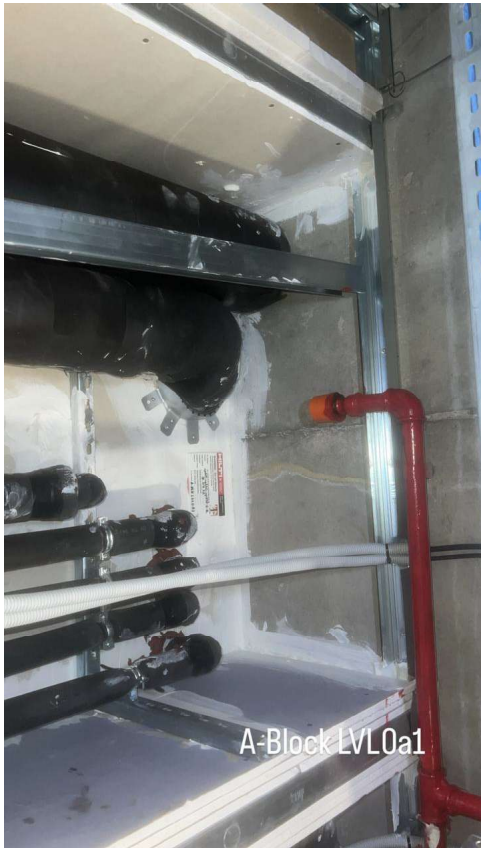
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A-Block LVL1a8

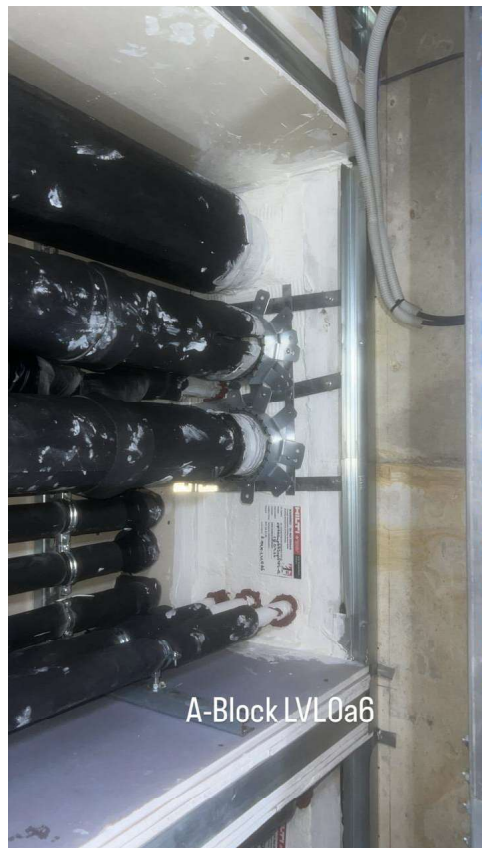


A-Block LVL1a9





A-Block LVL0a5



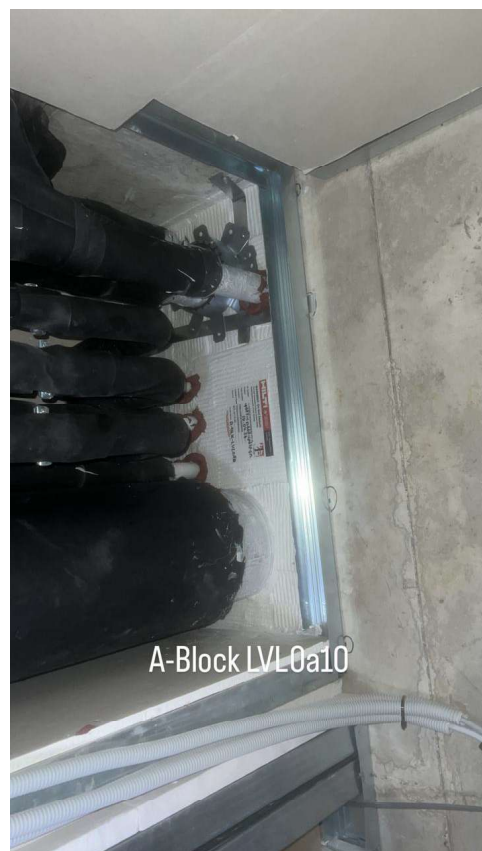
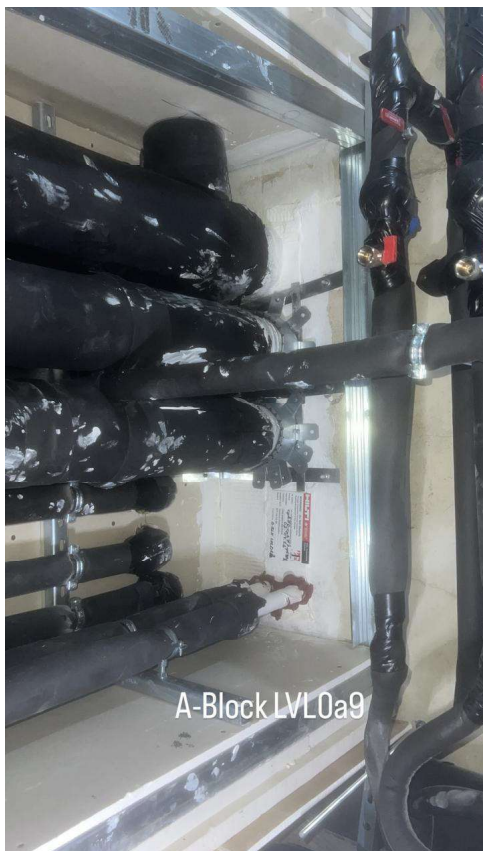
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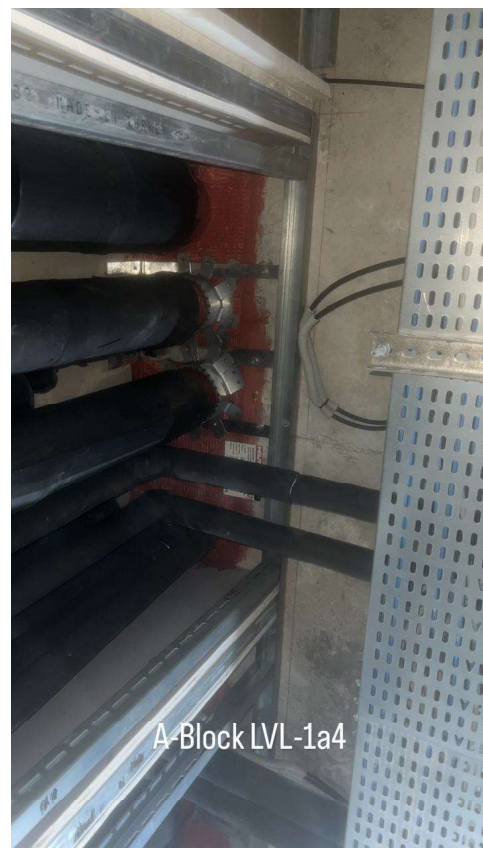


A-Block LVL0a7



A-Block LVL0a8







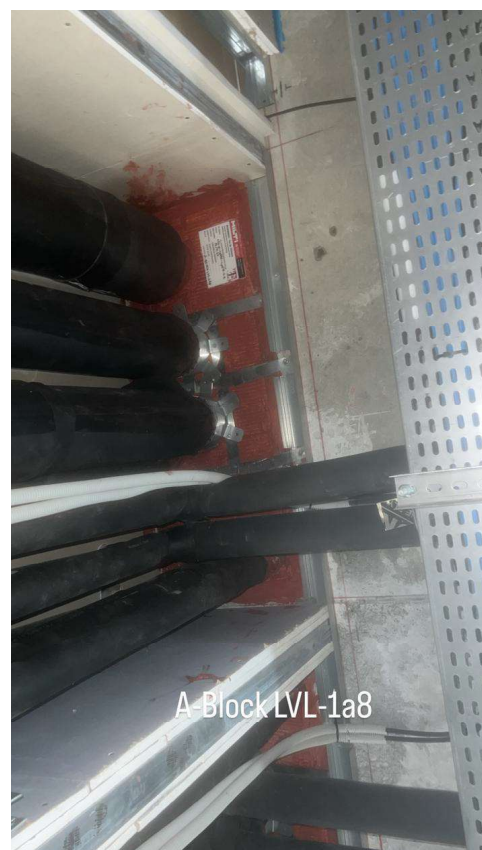
A-Block LVL-1a5



A-Block LVL-1a6



A-Block LVL-1a7



A-Block LVL-1a8



A-Block LVL-1a9



A-Block LVL-1a10

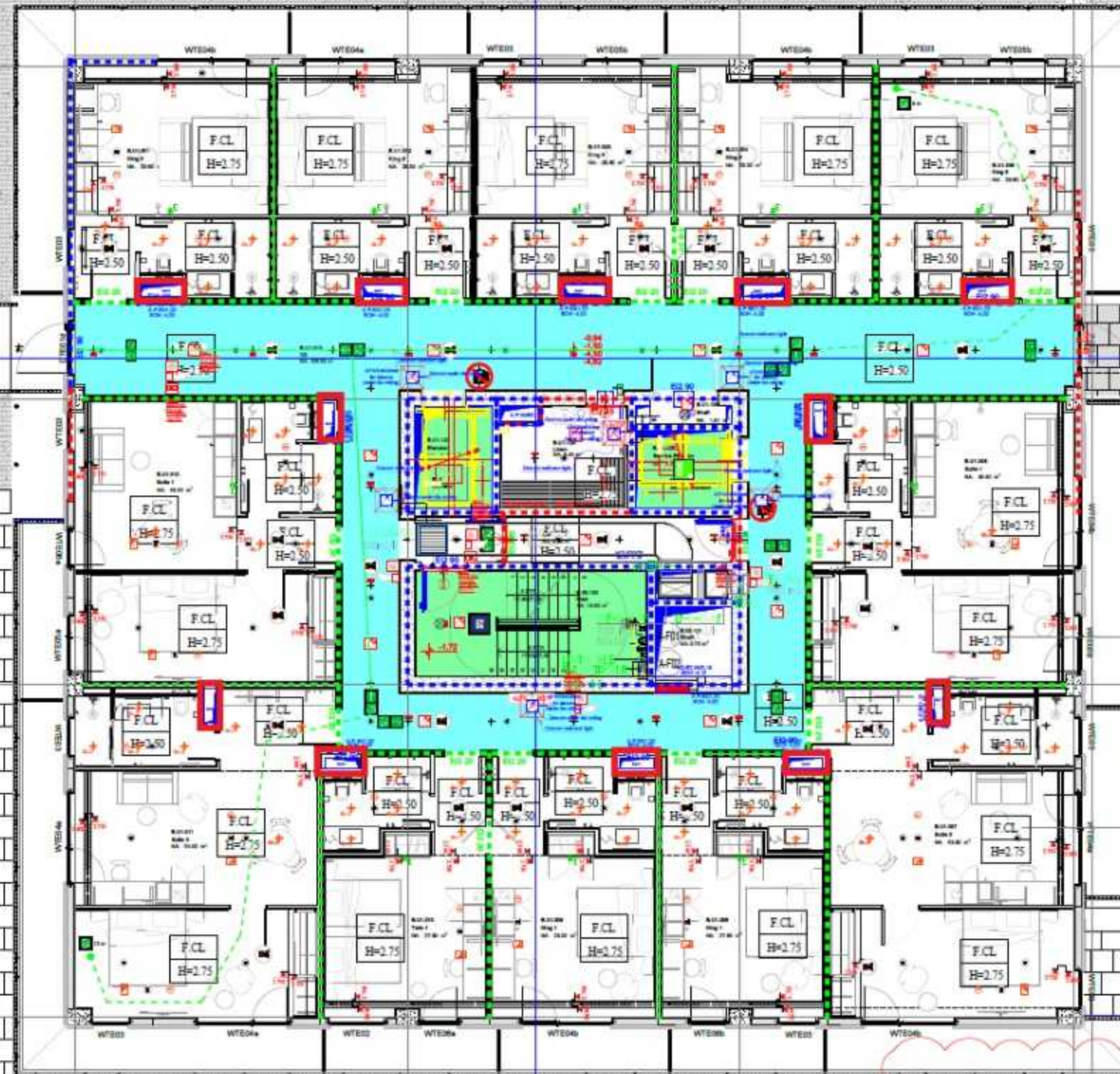








B block Guestroom shafts



BBO PAVILLION
To Be Confirmed

SPRINKLER TYPES & ACTIVATION TEMPERATURES

RELATED AREAS	SYMBOLS	K VALUE	TEMP. CLASS	RESPONSE TIME
Guestrooms, Offices, Restaurant, Meeting room, Fitness, Commercial, Kitchen, Circulations, Public restrooms, Staff rooms		80	68°	Quick response
Mechanical rooms, Storage		80	68°	Quick response
Electrical room		80	68°	Quick response
Hot kitchen areas		80	57°	Quick response
Cold rooms		80	68°	Quick response
Swimming pool (Corrosion resistant sprinkler)		80	68°	Quick response
Sauna (Corrosion resistant sprinkler)		80	141°	Quick response
Loading deck (Dry type)		80	68°	Quick response
Clean agent sprinkler				Wall type extended cover sprinkler
Wall type sprinkler				Fire hose cabinet with ABC type dry portable exting. tube (5kg), DN25, 30m

FIRE-FIGHTING MECHANICAL EQUIPMENTS

	Expansion joint compensator		Check - Valve
	Fire extinguisher		Butterfly valve c/w supervisory switch
	Fire extinguisher		Landing valve
	Main fire pipe		Fire hydrant
	Test & Drain valve group		Stemless connection 2xDN25
	Flow switch		Fire pipe column
	Manometer		Mec_FCU drainage

SMOKE EXHAUST SYSTEM

	Pressurization air		Motorized fire damper
	Smoke exhaust air		Relief damper
	Exhaust air (E/A)		Back draft damper
	Fresh air (F/A)		Pressure sensor
	Smoke exhaust duct section		Fresh air louver
	Pressurization air section		Exhaust air louver
	Fresh air duct section		
	Pressurization supply grille		
	Smoke exhaust grille		
	Motorized smoke damper		

FIRE-RESISTANCE RATINGS FOR WALLS / DOORS

	Fire separation (EI30 wall)		Fire rated door (EI2 20)
	Fire separation (EI60 wall)		Fire rated door (EI2 45)
	Fire separation (EI120 wall)		Fire rated door (EI2 60)
	Fire rated elevator shaft landing door (E 90)		Fire rated door (EI2 90)

EMERGENCY EXIT / ACTION SIGNS

	Emergency exit sign		Panic bar
	Assembly point direction		Common path of travel or dead end corridor distance
	Assembly point		Travel distance
	Stair sign		Exit path start and end points
	Ambulance stretcher elevator		Final exit
	Emergency pull cord		Fire alarm panel
	Emergency gas/energy shut-off button		Exit stairway
	Don't use elevator in case of fire		Smoke control zones

LIGHTING SYSTEMS

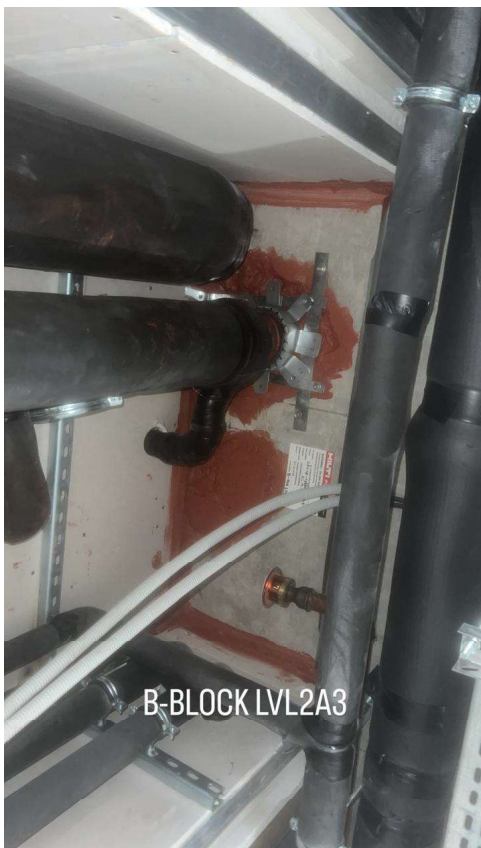
	Distribution board		(L21d) Cove Lighting Wall IP65
	LED Lamp - (36W, IP65, 4000K)		(L27) Led - Downlight IP65 (5W, IP44, 750mm, Dali)
	One gang switch		(L28) Floor lighting IP68 (85W, 4000m, 3000K)
	(LT1) LED Lamp (16W, with emergency battery)		(X03) Lighting pole IP68 (15W, 900mm, 3000K)
	(L28) Floor Lamp (16W 3000K)		(X07) Floor Lamp / Exterior lighting object
	(X01) Spotlight, Mounted in Tree (7W, 3000K, 900mm)		Emergency block
	Rack		(L15a) Pendant luminaire (30W, 3000K, 2500mm)
	Two gang switch		(L25a) Horizontal sign in wall with self-closing door of ceiling (400mm, 3000K, 1500mm)
	Lighting control panel		(L24) recessed circular lightfield (800mm, 4000K, 1000mm)
	(L12a) LED Lamp (5W)		(L25b) Circular ceiling panel with small downlight (20W, 3000K, 140mm)
	Technical Lighting (36W, 4000K) (800x600mm)		(L25) Pendant track system (6W, 3000K, 750mm)
	(L00) Downlight (8W, 3000K, 750mm)		(L26) Floor lamp (16W 3000K)
	(L01a) Cove Lighting Wall (12.8W/m, 3000K, 743mm)		(L30) Illuminated wall object (15W/m, 3000K, 1500mm)
	(L01b) Cove Lighting Ceiling (12.8W/m, 3000K, 743mm)		(L31) Ceiling-recessed linear luminaire (15W/m, 3000K, 1000mm)
	(L01d) Cove Lighting Wall IP65 (11W/m, 3000K, 810mm)		(L32) Contour spotlight (18W 3000K, 1658mm)



B-BLOCK LVL2A1



B-BLOCK LVL2A2



B-BLOCK LVL2A3



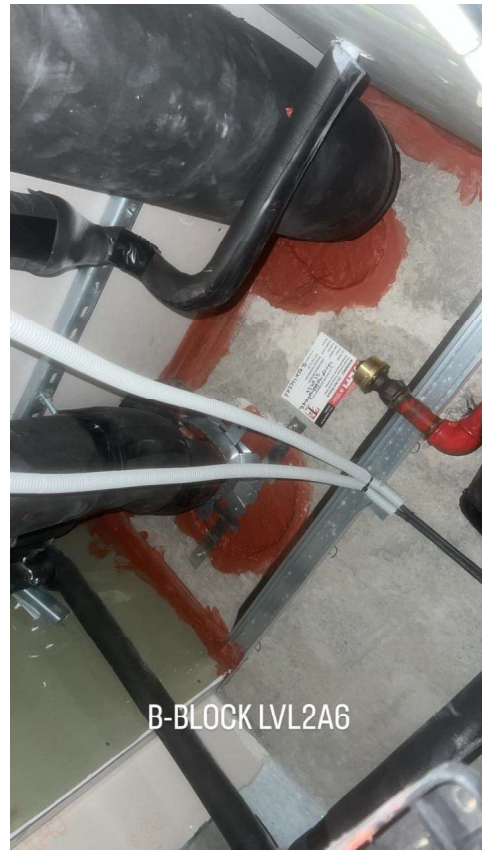
B-BLOCK LVL2A4



FIRESHIELD
GEORGIA



B-BLOCK LVL2A5



B-BLOCK LVL2A6



B-BLOCK LVL2A7



B-BLOCK LVL2A8



FIRESHIELD
GEORGIA







FIRESHIELD
GEORGIA



B-BLOCK LVL1A5



B-BLOCK LVL1A6



B-BLOCK LVL1A7



B-BLOCK LVL1A8





B-BLOCK LVLOA1



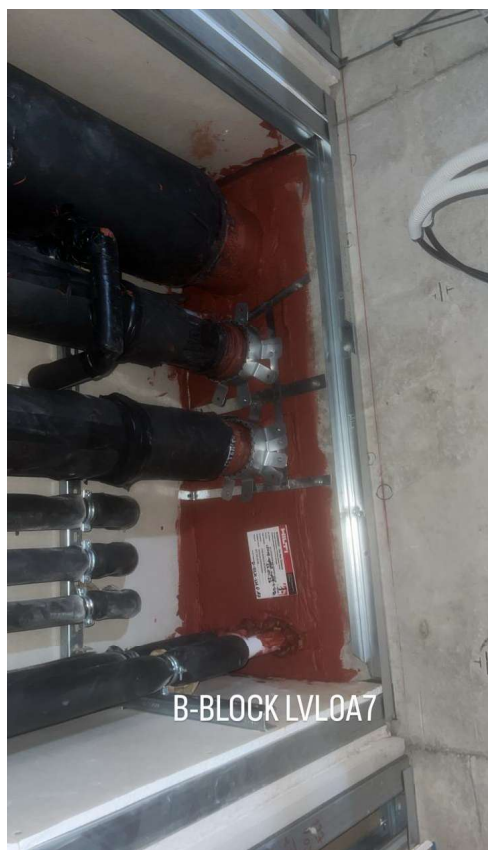
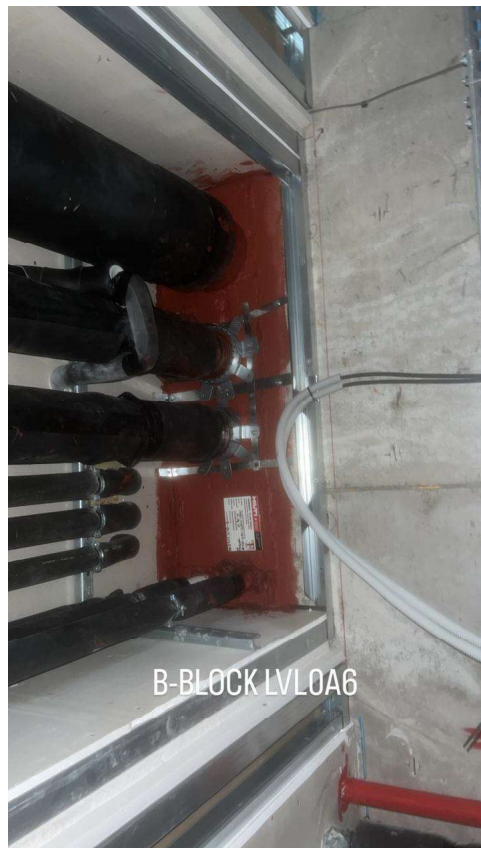
B-BLOCK LVLOA2

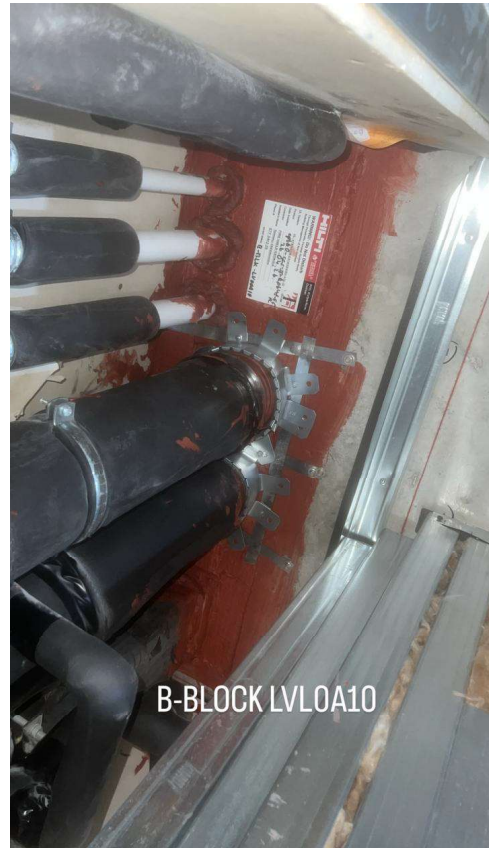


B-BLOCK LVLOA3



B-BLOCK LVLOA4



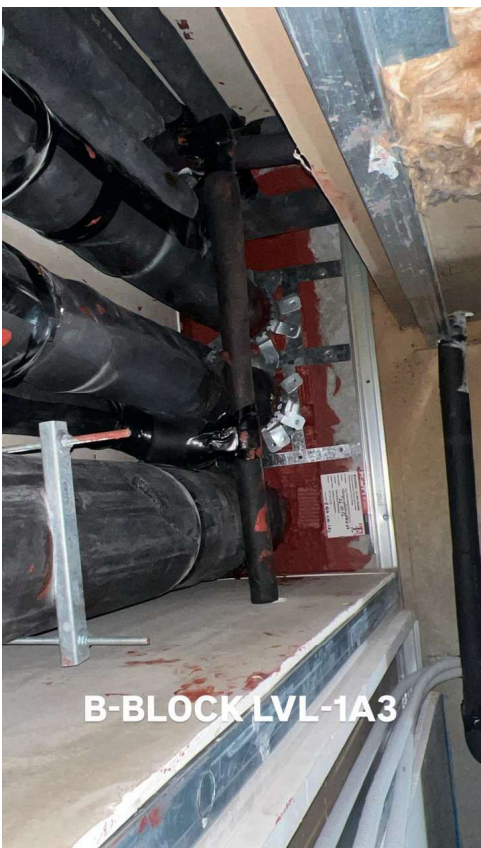




B-BLOCK LVL-1A1



B-BLOCK LVL-1A2



B-BLOCK LVL-1A3



B-BLOCK LVL-1A4



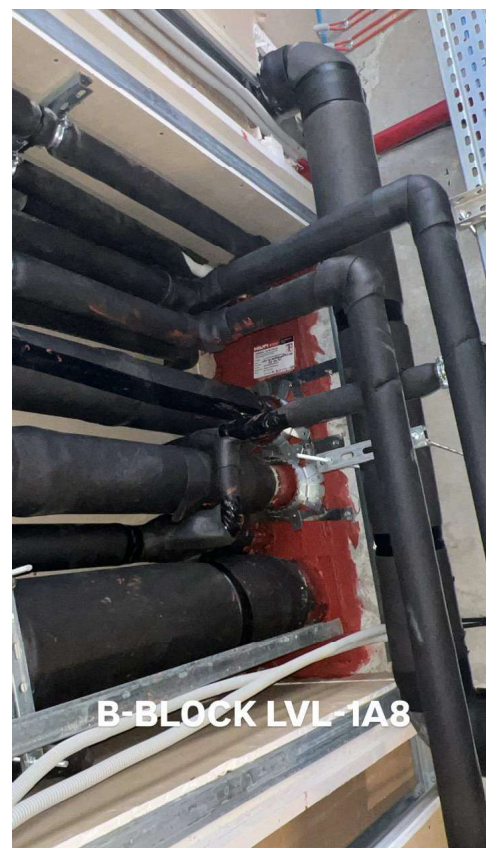
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B-BLOCK LVL-1A6



B-BLOCK LVL-1A7



B-BLOCK LVL-1A8



B-BLOCK LVL-1A9



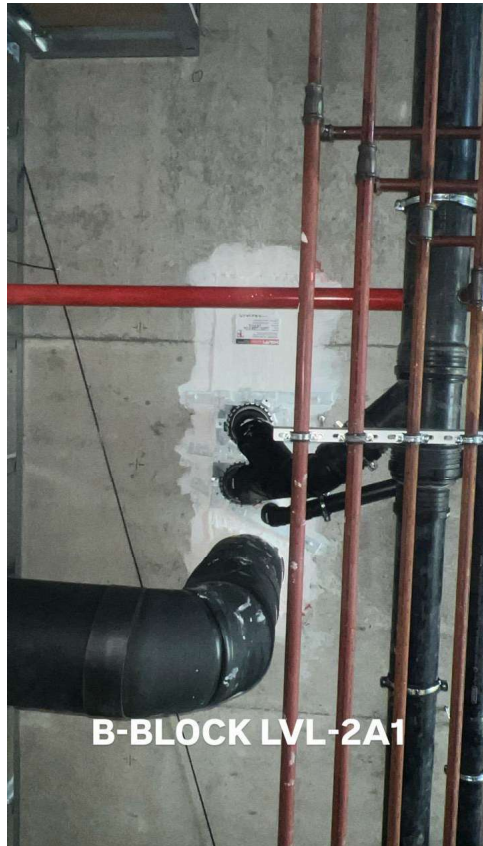
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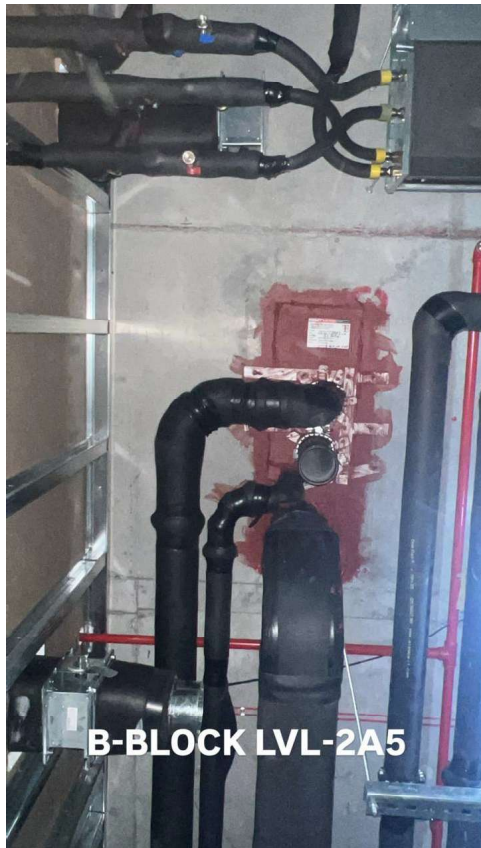


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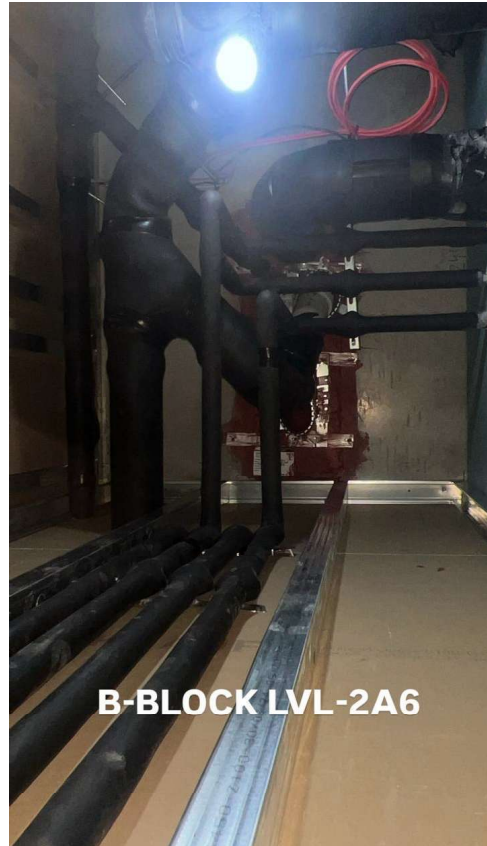


B-BLOCK LVL-1A12





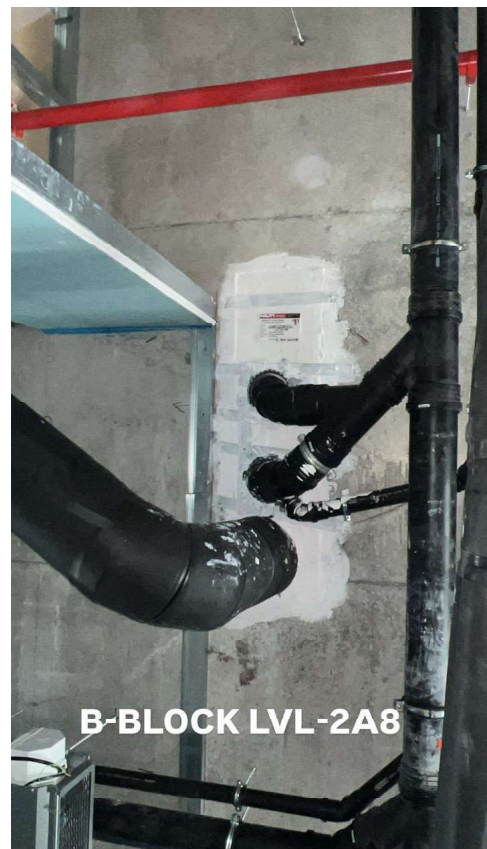
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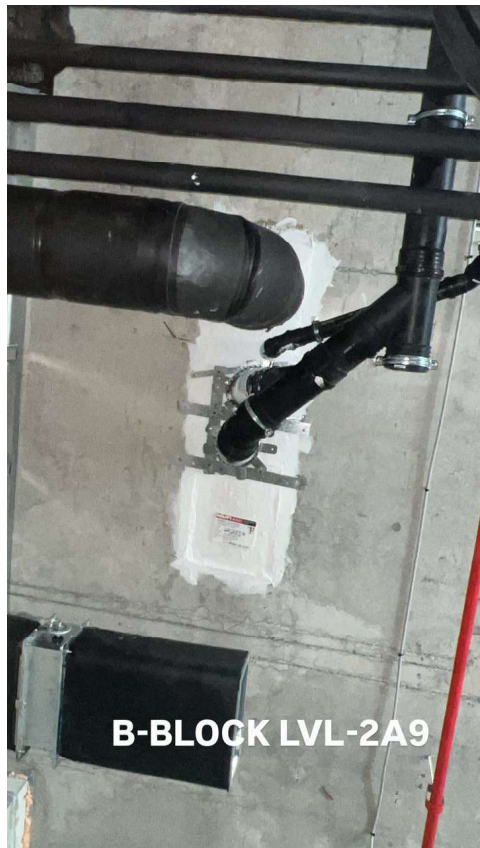
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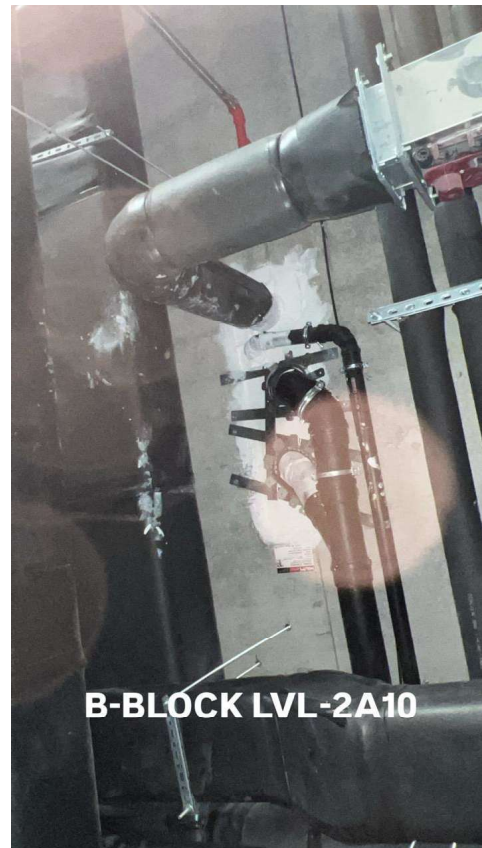
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B-BLOCK LVL-2A8



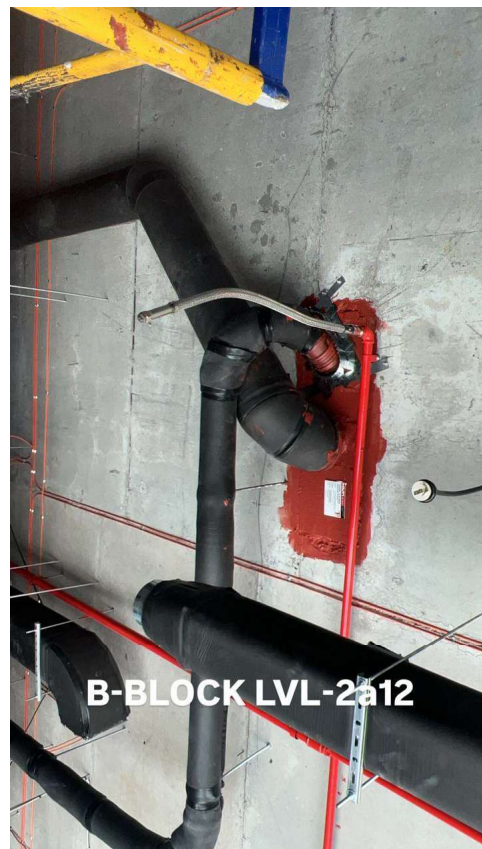
B-BLOCK LVL-2A9



B-BLOCK LVL-2A10



B-BLOCK LVL-2a11



B-BLOCK LVL-2a12

D block Guestroom Shafts

SPRINKLER TYPES & ACTIVATION TEMPERATURES

RELATED AREAS	SYMBOLS	K VALUE	TEMP. CLASS	RESPONSE TIME
Guestrooms, Offices, Restaurant, Meeting room, Fitness, Commercial, Kitchen, Circulations, Public restrooms, Staff rooms		80	68°	Quick response
Mechanical rooms, Storage		80	68°	Quick response
Electrical room		80	68°	Quick response
Hot kitchen areas		80	55°	Quick response
Cold rooms		80	68°	Quick response
Swimming pool (Corrosion resistant sprinkler)		80	68°	Quick response
Sauna (Corrosion resistant sprinkler)		80	141°	Quick response
Loading deck (Dry type)		80	68°	Quick response
Clean agent sprinkler				Wall type extended cover sprinkler
Wall type sprinkler				Fire hose cabinet with ABC type dry portable exting. tube (5kg), DN25, 30m

FIRE-FIGHTING MECHANICAL EQUIPMENTS

	Expansion joint compensator		Check - Valve
	Fire extinguisher		Butterfly valve c/w supervisory switch
	Fire extinguisher		Landing valve
	Main fire pipe		Fire hydrant
	Test & Drain valve group		Biamese connection 2xDN65
	Flow switch		Fire pipe column
	Manometer		Mec_FCU drainage

SMOKE EXHAUST SYSTEM

	Pressurization air		Motorized fire damper
	Smoke exhaust air		Relief damper
	Exhaust air (E/A)		Back draft damper
	Fresh air (F/A)		Pressure sensor
	Smoke exhaust duct section		Fresh air louver
	Pressurization duct section		Exhaust air louver
	Fresh air duct section		
	Pressurization supply grille		
	Smoke exhaust grille		
	Motorized smoke damper		

FIRE-RESISTANCE RATINGS FOR WALLS / DOORS

	Fire separation (EI30 wall)		Fire rated door (EI2 20)
	Fire separation (EI60 wall)		Fire rated door (EI2 45)
	Fire separation (EI120 wall)		Fire rated door (EI2 60)
	Fire rated elevator shaft landing door (E 90)		Fire rated door (EI2 90)

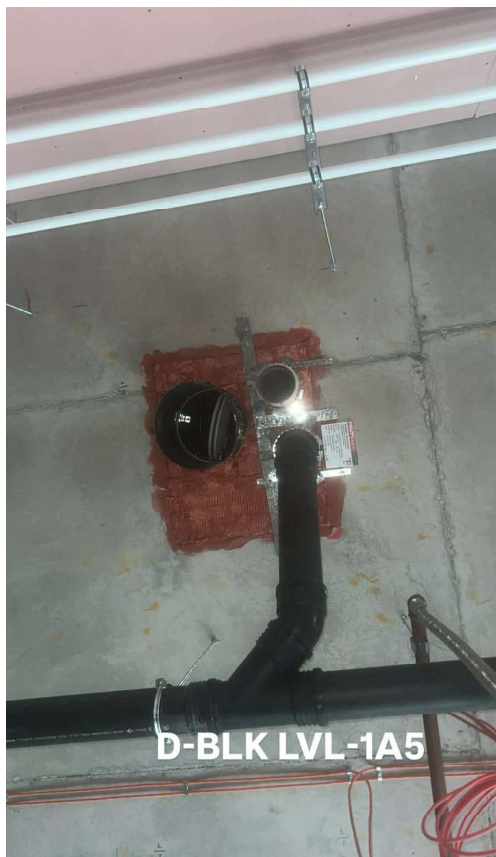
EMERGENCY EXIT / ACTION SIGNS

	Emergency exit sign		Panic bar
	Assembly point direction		Common path of travel or dead end corridor distance
	Assembly point		Travel distance
	Stair sign		Exit path start and end points
	Ambulance stretcher elevator		Final exit
	Emergency pull cord		Exit stairway
	Emergency gas/energy shut-off button		Smoke control zones
	Don't use elevator in case of fire		

LIGHTING SYSTEMS

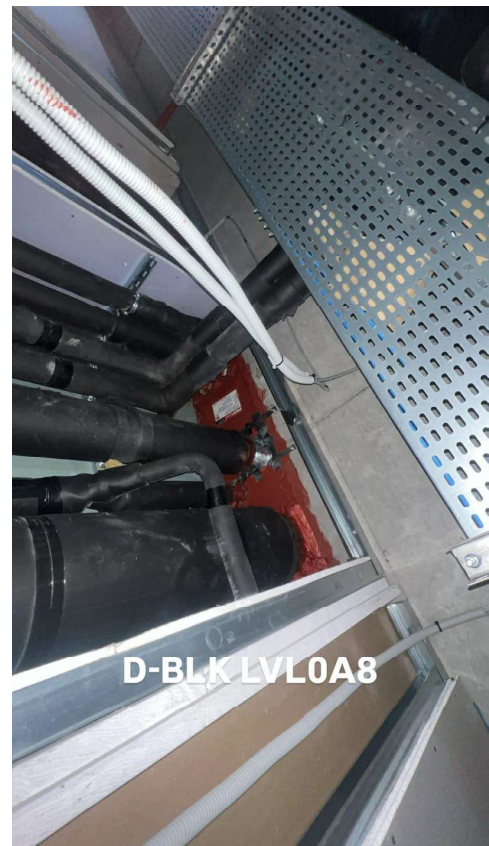
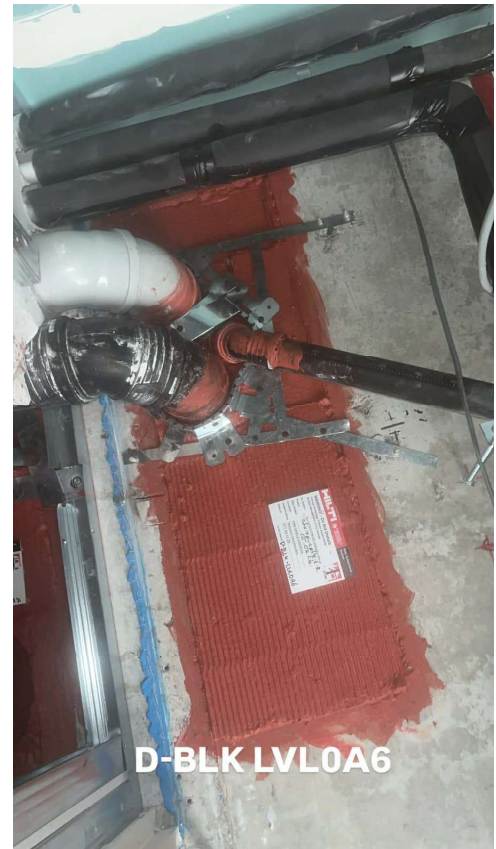
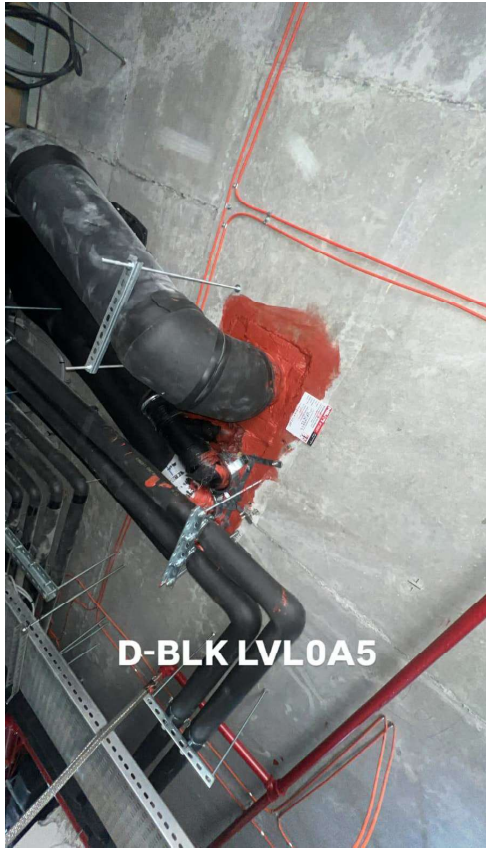
	Distribution board		LED Lamp (136W, IP65, 4000K)
	One gang switch		(L71) LED Lamp (16W, with emergency battery)
	Floor Lamp (16W 3000K)		(X.01) Spotlight, mounted in Tree (7W, 3000K, 900mm)
	Rack		Two gang switch
	Lighting control panel		(L.12a) LED Lamp (6W)
	Technical Lighting (36W, 4000K) (500x500mm)		(L.06) Downlight (9W, 3000K, 790mm)
	(L.01a) Cove Lighting Wall (12.8W/m, 3000K, 743mm)		(L.01b) Cove Lighting Ceiling (12.8W/m, 3000K, 743mm)
	(L.01c) Cove Lighting Wall IP65 (11.6W/m, 3000K, 818mm)		(L.01d) Cove Lighting Wall IP65
	(L.27) Led - Downlight IP65 (9W, IP44, 790mm, 4000K)		(L.28) Pool lighting IP68 (85W, 4000m, 3000K)
	(X.03) Lighting pole IP68 (10W, 900mm, 3000K)		(X.07) Floor Lamp / Exterior lighting object
	Emergency block		(L.15a) Pendant luminaire (30W, 3000K, 2500mm)
	(L.25a) Horizontal light pole in wall surface-uplight luminaire of ceiling (30W/m, 3000K, 1500mm)		(L.26) Pendant track system (6W, 3000K, 790mm)
	(L.26) recessed circular lightfield (30W/m, 4000K, 1500mm)		(L.28) Floor lamp (16W 3000K)
	(L.28a) (linear ceiling channel with small downlight) (20W, 3000K, 1400mm)		(L.30) Illuminated wall object (1.6W/m, 3000K, 1500mm)
	(L.26) Pendant track system (6W, 3000K, 790mm)		(L.31) Ceiling-recessed, linear luminaire (100mm, 3000K, 1500mm)
	(L.32) Contour spotlight (18W 3000K, 1688mm)		



















D-BLK LVL+1A9



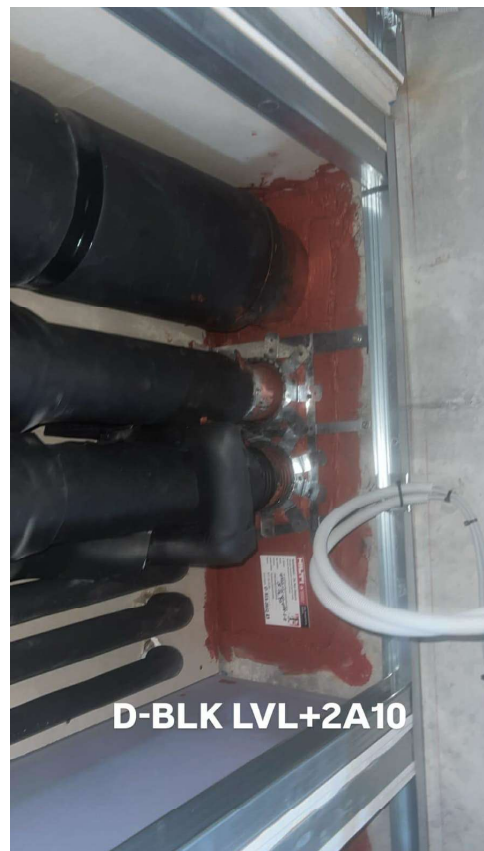
D-BLK LVL+1A10



D-BLK LVL+1A11









D-BLK+3A1



D-BLK+3A2



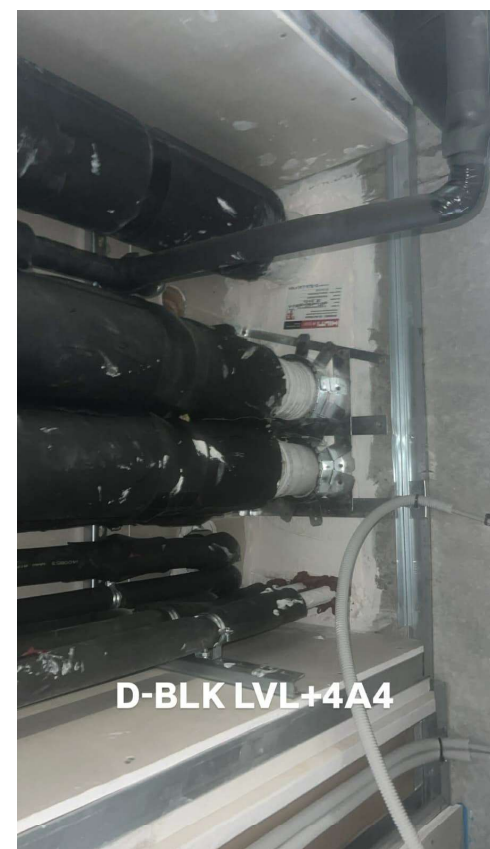
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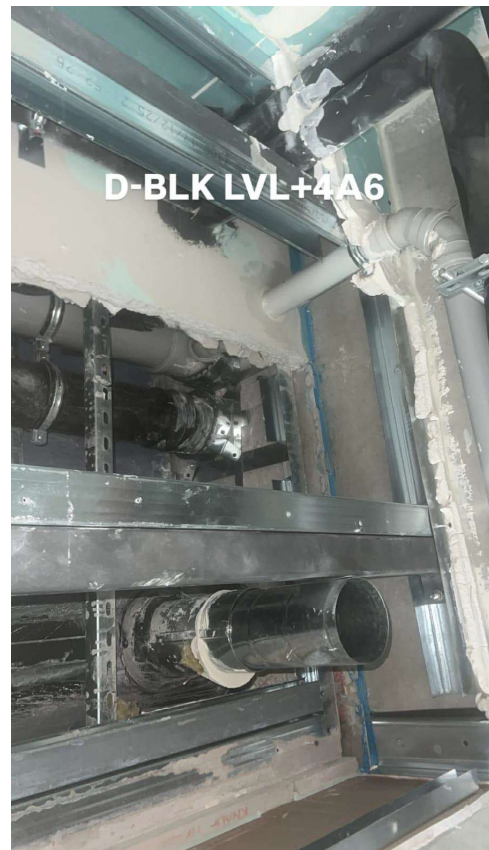


D-BLK+3A4





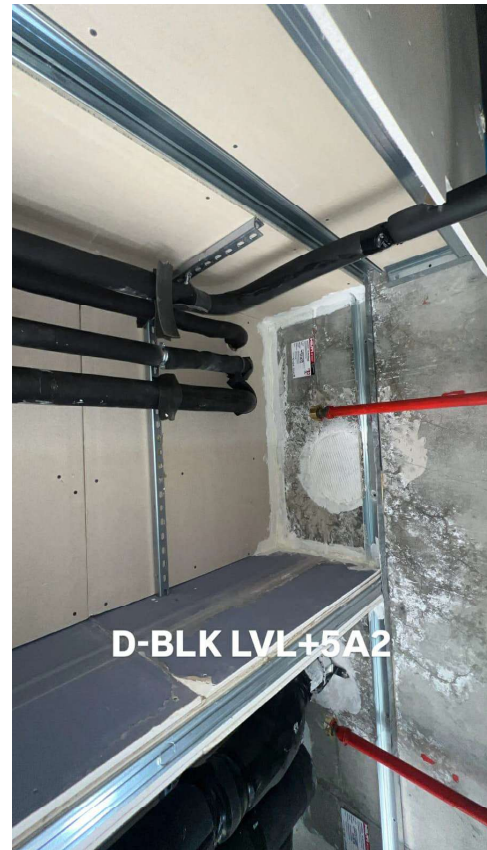






**FIRESHIELD
GEORGIA**





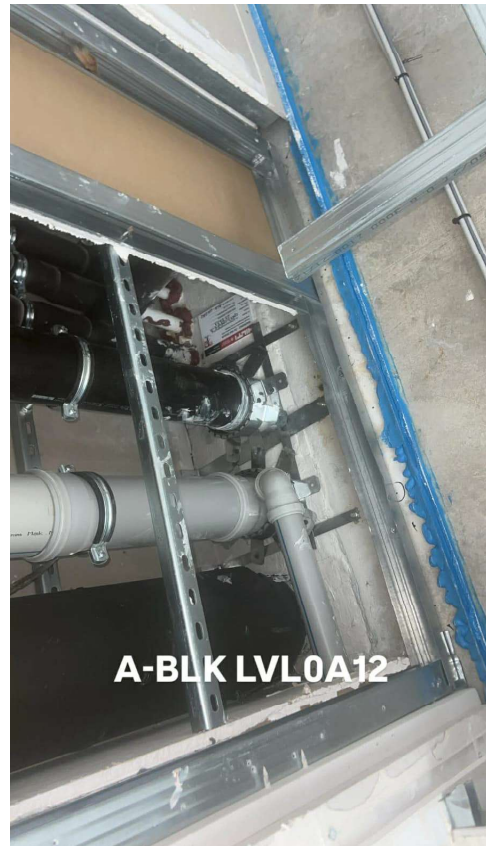








A-BLK LVL0A11



A-BLK LVL0A12



A-BLK LVL-1A12



Certificate of Compliance

This certificate is issued for the following:

Cable Transit System CFS-T Frame and Sealing Modules	CFS-CID MD M Cast-In Firestop Device
CFS-BL Firestop Block	CFS-CID MD P Cast-In Firestop Device
CFS-BTS	CFS-CID P 8" or 10" Firestop Device
CFS-C Firestop Collar	CFS-CID P Cast-In Firestop Device
CFS-CID Cast-In Firestop Device	CFS-CID U 2"
CFS-CID M 8" or 10" Firestop Device	CFS-CID U 3"
CFS-CID M Cast-In Firestop Device	CFS-CID U 4"
	CFS-CID U 6"

Prepared for:

Hilti Inc
3701 West Royal Lane
Suite 100
Irving, TX 75063, United States

FM Approvals Class: 4990

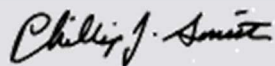
Approval Identification:

0Y6A7.AM, 0Z4A5.AM, 2X3A6.AM, 3006434, 3009626, 3010517, 3027928, 3040612, 3041683, 3043569, 3046888, 3051456, 3054773, 3058446, 3060256, 3060712, PR449317, PR449914, PR451633, PR453106, PR462744, RR246159

Approval Granted: 9 June 2025

To verify the availability of the Approved product, please refer to www.approvalguide.com

Said Approval is subject to satisfactory field performance, continuing Surveillance Audits, and strict conformity to the constructions as shown in the Approval Guide, an online resource of FM Approvals.



Phillip J. Smith
VP - Manager of Materials
FM Approvals
One Technology Way
Norwood, MA 02062



Certificate of Compliance

This certificate is issued for the following:

CFS-DID Firestop Drop-in Device	CFS-MSL P S 3x2"
CFS-F FX Flexible Firestop Foam	Firestop Speed Sleeve CFS-SL S or M
CFS-F SOL Firestop Foam	CFS-P ST Firestop Putty
CFS-IS High Performance Intumescent Firestop Sealant	CFS-PL 2" or CFS-PL 4"
CFS-MSL L 6x4"	CFS-S ACR Flexible Firestop Sealant
CFS-MSL M 3x4"	CFS-S SIL GG
CFS-MSL S 3x2"	CFS-S SIL SL
CFS-MSL P L 6x4"	CFS-SP WB Firestop Joint Spray
CFS-MSL P M 3x4"	

Prepared for:

Hilti Inc
3701 West Royal Lane
Suite 100
Irving, TX 75063, United States

FM Approvals Class: 4990

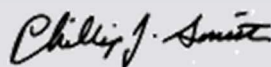
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Phillip J. Smith
VP - Manager of Materials
FM Approvals
One Technology Way
Norwood, MA 02062



Certificate of Compliance

This certificate is issued for the following:

CFS-TTS 212, CFS-TTS 358, CFS-TTS 600, CFS-TTS R OS	CP 618 Firestop Putty Stick
CFS-TTS MD C3, CFS-TTS MD C2 or CFS-TTS MD C1.5	CP 619T Putty Roll
CFS-TTS MD OS or CFS-TTS MD 600	CP 620 Firestop Foam
CFS-TTS MD P3, CFS-TTS MD P2 or CFS-TTS MD P1.5	CFS-F SOL Firestop Foam
CFS-W EL Wrap Strip	CP 643 N Firestop Collar
CFS-W SG Wrap Strip	CP 648-E Wrap Strip
CP 606 Flexible Firestop Sealant	CP 648-S Wrap Strip
CP 617 Firestop Putty Pad	CP 660 Flexible Firestop Foam

Prepared for:

Hilti Inc
3701 West Royal Lane
Suite 100
Irving, TX 75063, United States

FM Approvals Class: 4990

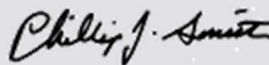
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Phillip J. Smith
VP - Manager of Materials
FM Approvals
One Technology Way
Norwood, MA 02062



Certificate of Compliance

This certificate is issued for the following:

CP 670 Coated Board	Firestop Box Insert
CP 670 Firestop Coating	Firestop Speed Sleeve CFS-SL GA M ILS or GA L ILS
CP 672 Firestop Joint Spray	Firestop Speed Sleeve CP 653 2" BA
CP 673 Firestop Coating	Firestop Speed Sleeve CP 653 2" or 4" BA M ILS or L ILS
CP 680 Cast-In Firestop Device	FS-ONE MAX Intumescent Firestop Sealant
CP 680-M Cast-In Firestop Device	Hilti CFS-COS Firestop Composite Sheet
CP 680-P Cast-In Firestop Device	

Prepared for:

Hilti Inc
3701 West Royal Lane
Suite 100
Irving, TX 75063, United States

FM Approvals Class: 4990

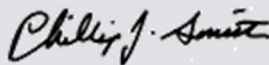
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Approval Granted: 9 June 2025

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Norwood, MA 02062



ENVIRONMENTAL PRODUCT DECLARATION

as per ISO 14025 and EN 15804+A2

Owner of the Declaration	HILTI AG
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Publisher	Institut Bauen und Umwelt e.V. (IBU)
Declaration number	EPD-HIL-20220211-ICA1-EN
Issue date	21/09/2022
Valid to	20/09/2027

Hilti CFS-F-FX
HILTI AG

www.ibu-epd.com | <https://epd-online.com>



1. General Information

HILTI Programme holder IBU – Institut Bauen und Umwelt e.V. Hegelplatz 1 10117 Berlin Germany Declaration number EPD-HIL-20220211-ICA1-EN This declaration is based on the product category rules: Reaction resin products, 01.2019 (PCR checked and approved by the SVR) Issue date 21/09/2022 Valid to 20/09/2027	Hilti CFS-F-FX Owner of the declaration Hilti AG Feldkircher Str. 100 FL-9494 Schaan Liechtenstein Declared product / declared unit The declared product is a HILTI firestop foam CFS-F-FX. The declared unit is one kilogram of reaction resin product in the mixing ratio of the two components necessary for processing. The packaging is also included in the calculation. The declared unit is stated in [kg]. Scope: This document refers to the CFS-F-FX firestop foam with its packaging. Specific data from 2021 were collected from Hilti's manufacturing plant in Kaufering, Germany and used for this environmental Life Cycle Assessment. The owner of the declaration shall be liable for the underlying information and evidence; the IBU shall not be liable with respect to manufacturer information, life cycle assessment data and evidences. The EPD was created according to the specifications of <i>EN 15804+A2</i> . In the following, the standard will be simplified as <i>EN 15804</i> . The owner of the declaration shall be liable for the underlying information and evidence; the IBU shall not be liable with respect to manufacturer information, life cycle assessment data and evidences. The EPD was created according to the specifications of <i>EN 15804+A2</i> . In the following, the standard will be simplified as <i>EN 15804</i> . Verification The standard <i>EN 15804</i> serves as the core PCR Independent verification of the declaration and data according to <i>ISO 14025:2011</i> ☐ internally ☒ externally  Dipl. Ing. Hans Peters (chairman of Institut Bauen und Umwelt e.V.)  Dr. Alexander Röder (Managing Director Institut Bauen und Umwelt e.V.)
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2. Product

2.1 Product description/Product definition

The declared product of CFS-F FX is a two-component system. These are: a polyol based Component A and a diisocyanate based Component B. Mixing the 2 components A and B in the static mixer initiates the curing (hardening) reaction of both systems to form a cured Polyurethane Foam in the application. Composite foils are used for the two-component foil pack of CFS-F FX. This kind of packaging serves the

following purposes: waste volume reduction, easy storage and transport, and less packaging material. Through legislation and increased public awareness users have increasingly become discerned towards the use of styrene and other highly volatile components with their resulting unpleasant odour and low flash point (flammability). The reaction resins used in the product contain no styrene, are practically odourless and have a considerably higher flash point, i.e. higher than 100 °C in comparison to 34 °C for styrene-based products.

CFS-F FX is the ultimate easy-to-install flexible firestop foam to help create a fire and smoke barrier around cable and mixed penetrations.

For the placing of the product on the market in the European Union European Free Trade Association EU/EFTA) (with the exception of Switzerland) *Regulation (EU) No. 305/2011 (CPR)* applies. The product needs a declaration of performance taking into consideration the following European Technical Approval: *ETA-10/0109* and the CE-marking. For the application and use the respective national provisions apply.

2.2 Application

Hilti CFS-F FX serves to form a penetration seal, which is used to maintain the fire resistance of a concrete, masonry or drywall separating element (wall or floor) when and where services (cables, metal or plastic pipes, etc.) pass through.

2.3 Technical Data

Constructional data

Name	Value	Unit
Density EN ISO 1183-1	1260	kg/m ³

Hilti CFS-F FX displays the following characteristics:

Performance data of the product in accordance with the declaration of performance with respect to its essential characteristics according to *ETA-10/0109*

Shelf life of 9 months:

Substrate temperature during installation 0 to +40 °C (internal method).

Curing time: approx. 10 min

2.4 Delivery status

The product Hilti CFS-F-FX is available in foil-packages with 325 ml injectable foam in the corresponding mixing ratio. 1 package of CFS-F FX contains 0.41 kg of reaction resin.

2.5 Base materials/Ancillary materials

Hilti CFS-F FX is supplied in the form of a dual component film-wrapped pack comprising a component A and component B at a weight ratio of 3:1. The mixing ratio of resin and curing agent components is automatically set during the injection process. Product curing commences directly after the components are mixed.

The product reviewed in this EPD contains the following component volumes:

Component A:

Polyol: 30-40 %

Intumescent Flame Retardant: 15-25 %

Polymer dispersion: 25-35 %

Fungicide: ≤ 5 %

Manufacturing agent: ≤ 5 %

Other: ≤ 5 %

Component B:

Diisocyanate: 85-95 %

Other: 5-15 %

This product article contains substances listed in the candidate list (date: 07.04.2022) exceeding 0.1 percentage by mass: no.

This product contains other carcinogenic, mutagenic, reprotoxic (CMR) substances in categories 1A or 1B which are not on *the candidate list*, exceeding 0.1 percentage by mass: no.

Biocide products were added to this construction product or it has been treated with biocide products (this then concerns a treated product as defined by the (EU) *Ordinance on Biocide Products No. 528/2012*): no.

2.6 Manufacture

Most raw materials are sourced in Europe. The transport is exclusively by truck for the European raw materials, and by truck and by ship for the others. The production of the chemical firestop foam consists of a mixing process and a filling process of the respective single components (A and B) and their subsequent combination in a two-component system (packaging). Here process control technology is used to weigh and mix solid and liquid compounds according to the specification. In the next step both well-mixed components run through an automated filling line in which each of the processed masses is filled into a tubular foil bag. Finally, the single components are combined in one packaging unit. The two-pack foil bags are packed into cardboard boxes and then finally shipped. The manufacturing plant of CFS-F FX, Hilti GmbH Industriegesellschaft für Befestigungstechnik, Hiltistr. 6, 86916 Kaufering, Germany, is certified according to *ISO 9001*. The guideline defines international standards for quality and process management.

The following flowcharts illustrate the underlying production process

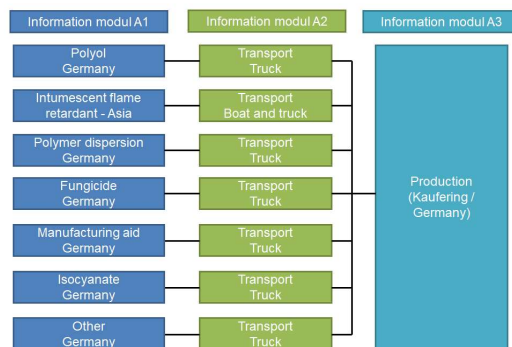


Illustration: Production process of the reaction resin mixture

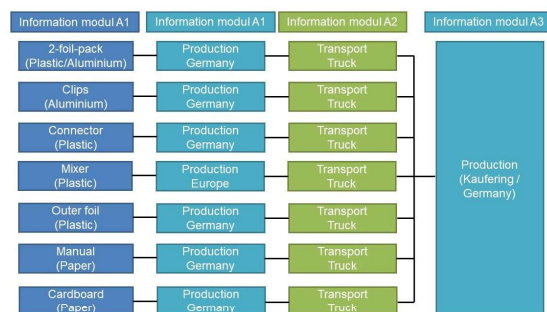


Illustration: Production process of the packaging

2.7 Environment and health during manufacturing

The manufacturing plant of CFS-F FX, Hilti GmbH Industriegesellschaft für Befestigungstechnik, Hiltistr. 6, 86916 Kaufering, Germany, is certified according to *ISO 14001* which defines international standards for sustainable environmental management. The production site is also certified in accordance with *DIN EN ISO 50001* Energy Management Systems.

2.8 Product processing/Installation

The product is delivered with Instructions for Use explaining the basic steps for installation:

- 1) For safe handling the precautionary measures described in the Safety Data Sheet (SDS) (e.g. hand and eye protection) must be adhered to
- 2) Insert the cartridge into the black cassette
- 3) Screw on the mixing nozzle
- 4) Put the cassette into the dispenser system
- 5) Inject the foam in the opening to be sealed
- 6) If necessary, shape the foam by hand

After the curing time, described in Instructions for Use, the application is complete. Foam excesses can be cut and placed in further openings to be sealed.

2.9 Packaging

Hilti CFS-F FX is supplied in the form of a 2-foil-pack system and thus leads to very little waste remaining after use on the construction site. After curing, the product can be disposed of with household waste. Full or only partially emptied cartridges must be disposed of as special waste in accordance with official regulations.

The outer packaging consisting of plastic / aluminium foil and cardboard boxes designed according to the product size can be recycled. Packaging contaminated by the product must be disposed in a safe manner in accordance with local/national regulations.

2.10 Condition of use

During the installation the temperature of the base material must be between 0° C and +40° C. The temperature of the product should be between 5 and 25° C during storage and 10 and 35° C during usage.

Hilti literature and official approvals must always be considered. The two components of CFS-F FX are only for use in combination with the defined volume ratio and under the conditions mentioned above.

2.11 Environment and health during use

Refer to the Safety Data Sheet (SDS) for detailed information on handling, storage as well as first aid, firefighting and accidental release measures and disposal considerations. Following the given instructions helps to minimize the risk to health and the environment.

2.12 Reference service life

Hilti CFS-F FX is exposed to a wide variety of environmental factors during the use phase. The anticipated Reference Service Life depends on the specific installation situation and the product exposure scenarios. The main factors influencing the period of use involve weathering as well as mechanical loads and chemical exposure.

2.13 Extraordinary effects

Fire

The CFS-F FX (at cured state) complies with the requirements of the *DIN EN 13501-1* standard for fire classes E and Efl. The product's resistance to fire is detailed in Annex 2 of *ETA 10/0109* approval document.

Fire protection

Name	Value
Building material class	E/Efl
Burning droplets	No performance assessed
Smoke gas development	No performance assessed

Water

The cured product is chemically inert and insoluble in water.

Mechanical destruction

It is recommended to use dust protection during the demolition of the cured foam.

2.14 Re-use phase

The product cannot be re-used. After usage the product can be removed by demolition.

2.15 Disposal

Uncured Hilti CFS-F-FX can be disposed of according to the European waste code 08 04 09* or 20 01 27*.

2.16 Further information

Further information is available on the Hilti website: www.hilti.group

3. LCA: Calculation rules

3.1 Declared Unit

The declared product is a HILTI firestop foam CFS-F FX. The declared unit refers to one kilogram of reaction resin product in the required mixing ratio of the two components. The packaging of 0,267 kg/kg of

product is also included in the calculation. 1 package of CFS-F FX contains 0,41kg of reaction resin. The following table shows the data of the declared unit.

Declared unit

Name	Value	Unit
Declared unit	1	kg

3.2 System boundary

The type of EPD is cradle to grave. The following information modules are defined as system boundaries in this study:

A1 – Raw material supply:

Production and packaging of the raw materials to be supplied to the manufacturer. All processes are included from cradle to gate.

A2 – Transport (to manufacturing site):

Transportation of all the raw materials and their packaging between their production site and the manufacturing site, for all transport modes (sea, road).

A3 – Manufacturing:

Production, supply and use of energy sources at the manufacturing sites (electricity, biomass and natural gas). Green electricity from wind turbines is considered for the whole manufacturing process. Production and transport of production losses, final product packaging and other inputs. End-of-life of production waste (hazardous, non-hazardous and recyclable), production losses and raw material packaging, including waste and losses transportation, processing and disposal.

A4 – Transport (to construction site)

Transportation of packaged products from the manufacturing site to the construction site, including potential in-between (retailer, workshop, etc.).

A5 – Installation-Construction

Electricity consumption for injecting (in case of injection with electrical dispenser).

Production of the construction losses.

Provision and end-of-life of tools and accessories for injectable mortars (manual or electrical dispenser with or without battery and with cartridge holder).

End-of-life of hazardous construction losses and packaging (uncured resin and soiled packaging) and non-hazardous construction losses (cured foam and unsoiled packaging): including waste transportation, processing and disposal.

C1 – Deconstruction/demolition

Diesel for building demolition.

C2 – Transport (to waste processing)

Transportation to waste processing facility.

C4 – Waste disposal

Treatment and disposal of plastic to sanitary landfill.

For the environmental impact, the use of green electricity (stage A3) was calculated taking into account the residual electricity mix for the remaining electricity. The proportion of the electricity demand covered by green electricity in the total electricity demand is 100%.

3.3 Estimates and assumptions

In general, background data and electricity mixes are chosen and calculated country-specifically for the

production processes. In some cases, assumptions were made because of a lack of primary or secondary data, in particular for the following aspects:

- The synthesis way of raw materials which were not available on the *Ecoinvent* database was used to reconstruct these material's impact
- Some raw material's packaging composition and transportation distances were estimated
- Estimations were made to calculate the energy consumption during installation
- The transportation scenario to the building site is based on french transportation companies' statistics.

3.4 Cut-off criteria

All information modules considered were included in the calculation in such detail that all requirements of *EN 15804* are met. The consumption of additional inputs such as lubricants, oils or solvents used for manufacture is less than 5 % by weight and therefore falls below the cut-off criterion of the total calculation.

3.5 Background data

The source for background data for the LCA calculations is the *ecoinvent 3.8* database.

3.6 Data quality

For the compilation of the life cycle assessment, specific data were collected from the factory Kaufering, in Germany, of the HILTI AG from the year 2018. The background data from the *ecoinvent 3.8* database used was updated in the year 2021. The mass of the different components of the reactive resin mixture come from the information in the recipe. The data quality is classified as appropriate.

3.7 Period under review

Data from the year 2021 are used, which correspond to the annual average.

3.8 Allocation

The used operating tools (stage A5), which are Hilti's manual or electrical dispenser can be used to inject the CFS-F FX as well as other Hilti products. The part of the dispenser's impact allocated to the current product is based on the estimated total mass of injected product each dispenser can be used for. This can be considered a mass allocation.

3.9 Comparability

Basically, a comparison or an evaluation of EPD data is only possible if all the data sets to be compared were created according to *EN 15804* and the building context, respectively the product-specific characteristics of performance, are taken into account.

The used background database is given by *ecoinvent 3.8* database, to which this study refers.

4. LCA: Scenarios and additional technical information

Characteristic product properties

Information on biogenic Carbon

The declared product contains 90 g of paper and cardboard (outer packaging and user manual). Since



only these materials contain biogenic carbon, in addition to a neglectable part contained in the raw materials' packaging, all the biogenic carbon capture and release were cancelled to simplify the model. The cancelled emission corresponds to 0,012 kg of biogenic carbon (0,0438 kg of CO₂) for a cancelled capture of 0,022 kg of biogenic carbon (0,0818 kg of CO₂).

The following scenarios were considered for the LCA calculations:

Transport to the building site (A4)

Name	Value	Unit
Transport distance	900	km
Vehicle type	lorry 16-32 metric ton	-
Effective load	21	t
Maximum capacity	24	t
Consumption when unloaded	0,25	L/km
Consumption at full capacity	0,38	L/km
Empty return rate	14	%
Effective consumption	0,019	L/tkm

Installation into the building (A5)

Name	Value	Unit
Water consumption	-	m ³
Electricity consumption	0.0004	kWh
Uncured foam loss	0.04	kg
Cured foam loss	0.00	kg
Total foam loss	0.04	kg
Hazardous waste (soiled packaging)	0.177	kg
Non-hazardous waste for recycling (unsoiled packaging)	0.090	kg

End of life (C1-C4)

Name	Value	Unit
Fuel for building demolition	0,0437	MJ
Distance to sanitary landfill	50	km
Landfilling	1	kg

5. LCA: Results

DESCRIPTION OF THE SYSTEM BOUNDARY (X = INCLUDED IN LCA; ND = MODULE OR INDICATOR NOT DECLARED; MNR = MODULE NOT RELEVANT)

PRODUCT STAGE			CONSTRUCTION PROCESS STAGE	USE STAGE								END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARIES
Raw material supply	Transport	Manufacturing	Transport from the gate to the site	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	X	X	ND	ND	MNR	MNR	MNR	ND	ND	X	X	X	X	X

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT according to EN 15804+A2: 1 kg CFS-F-FX

Core Indicator	Unit	A1	A2	A3	A4	A5	C1	C2	C3	C4	D
GWP-total	[kg CO ₂ -Eq.]	3.35E+0	4.03E-2	8.87E-1	7.89E-2	7.56E-1	4.02E-3	4.84E-3	0.00E+0	1.14E-1	0.00E+0
GWP-fossil	[kg CO ₂ -Eq.]	3.26E+0	4.01E-2	8.72E-1	7.86E-2	7.50E-1	4.02E-3	4.82E-3	0.00E+0	1.14E-1	0.00E+0
GWP-biogenic	[kg CO ₂ -Eq.]	8.23E-2	1.08E-4	1.35E-2	2.73E-4	5.84E-3	3.65E-6	1.67E-5	0.00E+0	2.85E-4	0.00E+0
GWP-luluc	[kg CO ₂ -Eq.]	3.01E-3	2.10E-5	1.24E-3	3.14E-5	3.32E-4	4.00E-7	1.93E-6	0.00E+0	2.15E-6	0.00E+0
ODP	[kg CFC11-Eq.]	2.63E-5	8.95E-9	3.13E-7	1.82E-8	1.13E-6	8.59E-10	1.12E-9	0.00E+0	3.10E-9	0.00E+0
AP	[mol H ⁺ -Eq.]	2.64E-2	3.74E-4	4.57E-3	2.23E-4	2.69E-3	4.17E-5	1.37E-5	0.00E+0	7.63E-5	0.00E+0
EP-freshwater	[kg P-Eq.]	1.55E-3	2.45E-6	2.80E-4	5.38E-6	2.43E-4	1.27E-7	3.30E-7	0.00E+0	8.58E-7	0.00E+0
EP-marine	[kg N-Eq.]	4.74E-3	8.24E-5	9.27E-4	4.56E-5	4.61E-4	1.85E-5	2.79E-6	0.00E+0	2.14E-3	0.00E+0
EP-terrestrial	[mol N-Eq.]	3.48E-2	9.13E-4	8.39E-3	4.95E-4	5.84E-3	2.03E-4	3.03E-5	0.00E+0	3.07E-4	0.00E+0
POCP	[kg NMVOC-Eq.]	1.29E-2	2.64E-4	2.79E-3	1.90E-4	1.25E-3	5.57E-5	1.17E-5	0.00E+0	1.12E-4	0.00E+0
ADPE	[kg Sb-Eq.]	7.55E-5	1.26E-7	4.51E-6	2.84E-7	8.69E-6	2.04E-9	1.74E-8	0.00E+0	3.11E-8	0.00E+0
ADPF	[MJ]	6.74E+1	5.74E-1	1.93E+1	1.17E+0	6.57E+0	5.41E-2	7.17E-2	0.00E+0	2.22E-1	0.00E+0
WDP	[m ³ world-Eq deprived]	2.52E+0	2.53E-3	3.67E-1	5.48E-3	2.13E-1	1.45E-4	3.36E-4	0.00E+0	2.30E-3	0.00E+0

Caption GWP = Global warming potential; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential of land and water; EP = Eutrophication potential; POCP = Formation potential of tropospheric ozone photochemical oxidants; ADPE = Abiotic depletion potential for non-fossil resources; ADPF = Abiotic depletion potential for fossil resources; WDP = Water (user) deprivation potential

RESULTS OF THE LCA - INDICATORS TO DESCRIBE RESOURCE USE according to EN 15804+A2: 1 kg CFS-F-FX

Indicator	Unit	A1	A2	A3	A4	A5	C1	C2	C3	C4	D
PERE	[MJ]	4.14E+0	7.53E-3	1.08E+0	1.70E-2	3.45E-1	3.09E-4	1.04E-3	0.00E+0	1.17E-2	0.00E+0
PERM	[MJ]	1.32E-2	0.00E+0	7.33E-1	0.00E+0	2.98E-2	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
PERT	[MJ]	4.16E+0	7.53E-3	1.81E+0	1.70E-2	3.74E-1	3.09E-4	1.04E-3	0.00E+0	1.17E-2	0.00E+0
PENRE	[MJ]	4.73E+1	5.74E-1	1.39E+1	1.17E+0	5.51E+0	5.41E-2	7.17E-2	0.00E+0	2.22E-1	0.00E+0
PENRM	[MJ]	2.46E+1	0.00E+0	5.46E+0	0.00E+0	1.24E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
PENRT	[MJ]	7.19E+1	5.74E-1	1.94E+1	1.17E+0	6.75E+0	5.41E-2	7.17E-2	0.00E+0	2.22E-1	0.00E+0
SM	[kg]	2.52E-2	2.22E-4	9.04E-2	3.98E-4	6.62E-3	2.12E-5	2.44E-5	0.00E+0	8.41E-5	0.00E+0
RSF	[MJ]	4.93E-4	1.86E-6	8.42E-3	4.38E-6	3.90E-4	6.91E-8	2.69E-7	0.00E+0	3.83E-6	0.00E+0
NRSF	[MJ]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
FW	[m ³]	7.13E-2	6.64E-5	1.01E-2	1.49E-4	5.59E-3	3.28E-6	9.14E-6	0.00E+0	2.92E-4	0.00E+0

Caption PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water

RESULTS OF THE LCA - WASTE CATEGORIES AND OUTPUT FLOWS according to EN 15804+A2: 1 kg CFS-F-FX

Indicator	Unit	A1	A2	A3	A4	A5	C1	C2	C3	C4	D
HWD	[kg]	5.59E-1	7.10E-4	6.17E-2	1.33E-3	3.46E-1	7.23E-5	8.16E-5	0.00E+0	3.46E-4	0.00E+0
NHWD	[kg]	6.84E+0	1.07E-2	1.43E+0	2.37E-2	5.40E-1	5.08E-4	1.45E-3	0.00E+0	1.00E+0	0.00E+0
RWD	[kg]	1.54E-4	3.97E-6	3.20E-5	8.05E-6	2.51E-5	3.81E-7	4.93E-7	0.00E+0	1.47E-6	0.00E+0
CRU	[kg]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
MFR	[kg]	4.69E-4	1.88E-5	3.59E-2	3.67E-6	9.51E-2	7.20E-8	2.25E-7	0.00E+0	1.21E-6	0.00E+0
MER	[kg]	7.17E-6	1.48E-8	5.93E-7	2.95E-8	4.94E-7	1.15E-9	1.81E-9	0.00E+0	5.85E-9	0.00E+0
EEE	[MJ]	4.07E-2	1.15E-4	1.08E-2	2.55E-4	3.58E-3	2.12E-5	1.56E-5	0.00E+0	4.53E-4	0.00E+0
EET	[MJ]	1.42E-1	5.68E-4	3.40E-2	1.06E-3	1.21E-2	2.15E-4	6.49E-5	0.00E+0	1.22E-3	0.00E+0

Caption HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EET = Exported thermal energy

RESULTS OF THE LCA – additional impact categories according to EN 15804+A2-optional: 1 kg CFS-F-FX

Indicator	Unit	A1	A2	A3	A4	A5	C1	C2	C3	C4	D
PM	[Disease Incidence]	1.96E-7	2.74E-9	4.66E-8	6.34E-9	2.44E-8	1.12E-9	3.88E-10	0.00E+0	1.62E-9	0.00E+0
IRP	[kBq U235-Eq.]	4.19E-1	2.93E-3	7.83E-2	6.14E-3	4.06E-2	2.48E-4	3.76E-4	0.00E+0	1.48E-3	0.00E+0
ETP-fw	[CTUe]	2.35E+2	4.57E-1	1.55E+1	9.76E-1	2.40E+1	3.25E-2	5.98E-2	0.00E+0	4.83E-1	0.00E+0
HTP-c	[CTUh]	2.87E-8	1.85E-11	6.67E-10	3.00E-11	1.58E-9	1.25E-12	1.84E-12	0.00E+0	7.12E-12	0.00E+0
HTP-nc	[CTUh]	2.84E-7	4.21E-10	1.18E-8	9.56E-10	1.69E-8	2.35E-11	5.86E-11	0.00E+0	1.81E-10	0.00E+0
SQP	[–]	1.22E+1	3.37E-1	6.87E+0	8.31E-1	1.57E+0	7.03E-3	5.09E-2	0.00E+0	5.83E-1	0.00E+0
Caption	PM = Potential incidence of disease due to PM emissions; IR = Potential Human exposure efficiency relative to U235; ETP-fw = Potential comparative Toxic Unit for ecosystems; HTP-c = Potential comparative Toxic Unit for humans (cancerogenic); HTP-nc = Potential comparative Toxic Unit for humans (not cancerogenic); SQP = Potential soil quality index										

Disclaimer 1 – for the indicator “Potential Human exposure efficiency relative to U235”. This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure or radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, radon and from some construction materials is also not measured by this indicator.

Disclaimer 2 – for the indicators “abiotic depletion potential for non-fossil resources”, “abiotic depletion potential for fossil resources”, “water (user) deprivation potential, deprivation-weighted water consumption”, “potential comparative toxic unit for ecosystems”, “potential comparative toxic unit for humans – cancerogenic”, “Potential comparative toxic unit for humans - not cancerogenic”, “potential soil quality index”. The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high as there is limited experience with the indicator.

6. LCA: Interpretation

The dominance analysis shows that the main causes of environmental impacts and indicators can be found in information module A1. This shows the global warming potential for the provision of material with more than 50 %, based on all information modules. Modules A3 and A5 also represent important parts of the final impact.

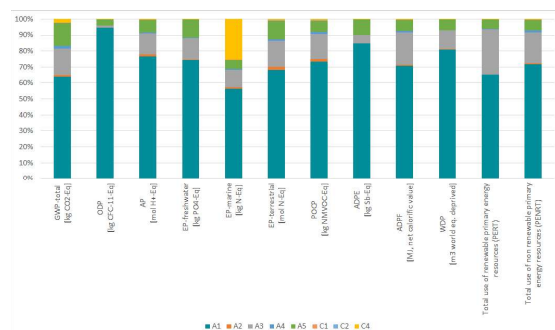


Illustration: Dominance analysis A1- C4

Module A1 is detailed below. Module A3's global warming impact is mostly constituted by the final product packaging (13 % of the total impact) but also the energy consumption (2 % of the final impact). Most of the global warming impact from module A5 is caused by the product losses (3 % of the final impact) the end-of-life of the soiled product packaging, and treated as hazardous waste (9 % of the final impact).

In the information module A1, the material supply of the reaction resin mixture causes more than 90 % of the global warming potential.

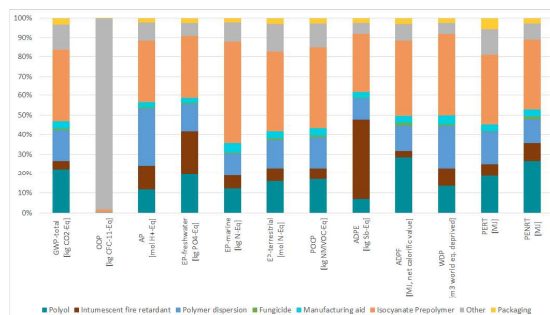


Illustration: Dominance analysis A1

The mass of the individual components of the reaction resin mixture come from the recipe information provided by the manufacturer. According to the manufacturer, this information can be assumed to be highly accurate.

The relevant datasets used to calculate the material availability of the product are highly topical since the raw materials were detailed as much as necessary to find corresponding data in the latest *Ecoinvent* database (2021). The locations were also respected. Since these datasets strongly influence the results, as shown by the dominance analysis, so does the overall computation.

7. Requisite evidence

Hilti CFS-F-FX complies with the requirements of

- AgBB-Scheme for the health evaluation of construction products (2018), in accordance

with the eco-Institute test report no. 55493-C006

- Emission class A+ according to the French VOC Labelling regulation and CMR emissions regulation in accordance with the eco-Institute test report no. 55493-C006 III
- Belgian Royal Decree establishing threshold levels for the emissions to the indoor environment from construction products for specific purposes in accordance with the eco-Institute test report no. 55493-C006 II
- CDPH Standard Method V1.2-2017 according to the eco-institut test report no. B55493-B006) from 11.11.2020.

AgBB overview of results (28 days [$\mu\text{g}/\text{m}^3$])

Name	Value	Unit
TVOC (C6 - C16)	46	$\mu\text{g}/\text{m}^3$
Sum SVOC (C16 - C22)	0 - 5	$\mu\text{g}/\text{m}^3$
R (dimensionless)	0.08	-
VOC without NIK	26	$\mu\text{g}/\text{m}^3$
Carcinogenic Substances	0 - 1	$\mu\text{g}/\text{m}^3$

AgBB overview of results (3 days [$\mu\text{g}/\text{m}^3$])

Name	Value	Unit
TVOC (C6 - C16)	120	$\mu\text{g}/\text{m}^3$
Carcinogenic Substances	0 - 1	$\mu\text{g}/\text{m}^3$

8. References

Standards

EN 13501-1

DIN EN 13501-1 : 2018 Fire classification of construction products and building elements.

EN 14293

DIN EN 14293 : 2006 Adhesives - Adhesives for bonding parquet to subfloor - Test methods and minimum requirements

EN 15804

EN 15804:2012+A2:2019, Sustainability of construction works — Environmental Product Declarations — Core rules for the product category of construction products.

EN ISO 604

DIN EN ISO 604:2003-12: Determination of compressive properties

EN ISO 1183-1

DIN 51757:2011-01 Plastics - Methods for determining the density of non-cellular plastics - Part 1: Immersion method, liquid pycnometer method and titration method

EN ISO 50001

DIN EN ISO 50001: 2018 Energy management systems - Requirements with guidance for use

IBU 2021

Institut Bauen und Umwelt e.V.: General Instructions for the EPD programme of Institut Bauen und Umwelt e.V., Version 2.0, Berlin: Institut Bauen und Umwelt e.V., 2021
www.ibu-epd.com

ISO 9001

ISO 9001:2015 Quality management systems - Requirements

ISO 14001

ISO 14001:2015 Environmental management systems - Requirements with guidance for use

ISO 14025

EN ISO 14025:2011, Environmental labels and declarations — Type III environmental declarations — Principles and procedures.

PCR Part A

Institut Bauen und Umwelt e.V, Berlin (pub.):
Product Category Rules for Construction Products from the range of Environmental Product Declarations for Institut Bauen und Umwelt (IBU), Part A: Calculation Rules for the Life Cycle Assessment and Requirements on the Project Report according to EN 15804+A2:2019, 2021-04

PCR Part B

Institut Bauen und Umwelt e.V, Berlin (pub.):
Product Category Rules for Construction Products from the range of Environmental Product Declarations for Institut Bauen und Umwelt (IBU), Part B: Requirements on the EPD for Reaction resin products, 2019-01

Further References

AFNOR, «FD P01-015» 2006

Qualité environnementale des produits de construction - Fascicule de données énergie et transport

AgBB (2018)

Vorgehensweise bei der gesundheitlichen Bewertung der Emissionen von flüchtigen organischen Verbindungen (VVOC, VOC und SVOC) aus Bauprodukten (2018)

Candidate List of substances of very high concern for Authorisation

European Chemicals Agency (ECHA), in accordance with Article 50(10) of the REACH regulation

CDPH/EHLB/Standard Method V1.2

California CDPH Standard Method is a US standard for evaluating and restricting VOC emissions to indoor air. Developed in California as "Section 01350" Specification, several systems in the US refer to CDPH Standard Method

Comité National Routier (CNR)

Enquête longue distance, PARIS, 2019

CPR

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

DIBt (2010)

Grundsätze zur gesundheitlichen Bewertung von Bauprodukten in Innenräumen (Oktober 2010)

Eco-Institute (2020)

Test reports no. 55493-C006, 55493-C006 II and 55493-C006 III

European Waste code

in accordance with the European Waste Catalogue (EWC) (EWC 2014/955/EU) Commission Decision amending Decision 2000/532/EC on the list of waste pursuant to Directive 2008/98/EC of the European Parliament and of the Council

ETA-10/0109

European Technical Approval Hilti CFS-F-FX

French VOC Directives

Décret no 2011-321 du 23 mars 2011 relatif à l'étiquetage des produits de construction ou de revêtement de mur ou de sol et des peintures et vernis sur leurs émissions de polluants volatils
Arrêté du 19 avril 2011 relatif à l'étiquetage des produits de construction ou de revêtement de mur ou de sol et des peintures et vernis sur leurs émissions de polluants volatils

ICC ESR-4878

International code council (ICC), Evaluation report ESR-4878 HILTI HIT-HY 200 V3 (November 2021)

ICC ESR-4868

International code council (ICC), Evaluation report ESR-4868 HILTI HIT-HY 200 V3 (March 2022)

NSF

NSF/ANSI/CAN 61 Drinking Water System Components - Health Effects

Ordinance on Biocide Products

Regulation (EU) No 528/2012 of the European Parliament and of the Council of 22 May 2012 concerning the making available on the market and use of biocidal products.

Umwelt Bundesamt 2021

Umwelt Bundesamt: Herkunftsnachweisregister (HKNR) — Entwertungsnachweis durch GETECH ENERGIE GMBH für HILTI

Database

Ecoinvent 3.8

ecoinvent Version 3
Wernet, G., Bauer, C., Steubing, B., Reinhard, J., Moreno-Ruiz, E., and Weidema, B., 2016. The ecoinvent database version 3 (part I): overview and methodology. The International Journal of Life Cycle Assessment, [online] 21(9), pp.1218–1230. Available at: <<http://link.springer.com/10.1007/s11367-016-1087-8>> [Accessed in 2021/2022].

**Publisher**

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COMPLIANCE TESTED by berkeley analytical

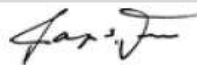
VOC Emission Test Certificate

Product Name: CP 648 - E&S

Product Sample Information

Company: Hilti Inc.
Company Website: www.hilti.com
Product Type: Fire protection Pipe Collar
Date Produced: 2/28/2022

Certificate Information

Certificate No: 220713-02
Certified By: 
Raja S. Tannous, Laboratory Director
Date: July 13, 2022

Reference Standard: California Department of Public Health CDPH/EHLB/Standard Method Version 1.2, 2017
(Emission testing method for CA Specification 01350)

Acceptance Criteria and Results Demonstrating Compliance of Product Sample to Referenced Standard:

Exposure Scenario ¹	Individual VOCs of Concern ²		Formaldehyde ³		TVOC ⁴
	Criterion	Compliant?	Criterion	Compliant?	Range
School Classroom	≤½ Chronic REL	YES	≤9.0 µg/m ³	YES	≤ 0.5 mg/m ³
Private Office	≤½ Chronic REL	YES	≤9.0 µg/m ³	YES	≤ 0.5 mg/m ³

Product Coverage⁵: See manufacturer's letter attached for loading calculations

1. Exposure scenarios & product quantities for classroom & office are defined in Tables 4-2 – 4-5 (CDPH Std. Mtd. V1.2-2017)
2. Maximum allowable concentrations of individual target VOCs are specified in Table 4-1 (*ibid.*)
3. Maximum allowable formaldehyde concentration is ≤9 µg/m³, effective Jan 1, 2012; previous limit was ≤16.5 µg/m³ (*ibid.*)
4. Informative only; predicted TVOC Range in three categories, i.e., ≤0.5 mg/m³, >0.5 – 4.9 mg/m³, and ≥5.0 mg/m³
5. Informative and applicable only to tests of wet-applied products; grams of sample applied per square meter of substrate

Standards & Codes Recognizing CDPH Standard Method V1.2 (partial list)

- USGBC LEED Version 4/4.1, BD&C, ID&C, Residential BD&C Multifamily
- The WELL Building Standard, WELL v2, Feature X06
- ANSI/GBI 01-2019 Green Globes Assessment Protocol

Narrative: Hilti Inc. selected a sample representative of its CP 648 - E&S - a firestop wrap strip product and submitted it on 5/4/2022 for testing. Berkeley Analytical measured and evaluated the emissions of VOCs from this sample following CDPH/EHLB/Standard Method V1.2-2017. The results of the test are presented in Berkeley Analytical report, 1031-013-01A-Jul1322.

Berkeley Analytical is an independent, third-party laboratory specializing in the analysis of organic chemicals emitted by and contained in building products, finishes, furniture, and consumer products. We are an ISO/IEC 17025 accredited laboratory (IAS, [TL-383](#)); all standards used in performing this test are in Berkeley Analytical's scope of accreditation.

DISCLAIMER: THIS CERTIFICATE OF COMPLIANCE AFFIRMS THAT: 1) A SAMPLE OF THE LISTED PRODUCT WAS TESTED ACCORDING TO THE REFERENCED STANDARD; 2) THE MEASURED VOC EMISSIONS FROM THE SAMPLE WERE EVALUATED FOR THE DEFINED EXPOSURE SCENARIO(S); AND 3) THE RESULTS MEET THE ACCEPTANCE CRITERIA OF THE REFERENCED STANDARD(S). BERKELEY ANALYTICAL IS NOT RESPONSIBLE FOR ANY CLAIMS REGARDING A PRODUCT OR PRODUCTS ENTERED INTO COMMERCE THAT MAY BE BASED ON THIS TEST. BERKELEY ANALYTICAL PROVIDES THIS CERTIFICATE OF COMPLIANCE "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR ANY PURPOSE.



Certificate of Compliance

This certificate is issued for the following:

Cable Transit System CFS-T Frame and Sealing Modules	CFS-CID MD M Cast-In Firestop Device
CFS-BL Firestop Block	CFS-CID MD P Cast-In Firestop Device
CFS-BTS	CFS-CID P 8" or 10" Firestop Device
CFS-C Firestop Collar	CFS-CID P Cast-In Firestop Device
CFS-CID Cast-In Firestop Device	CFS-CID U 2"
CFS-CID M 8" or 10" Firestop Device	CFS-CID U 3"
CFS-CID M Cast-In Firestop Device	CFS-CID U 4"
	CFS-CID U 6"

Prepared for:

Hilti Inc
3701 West Royal Lane
Suite 100
Irving, TX 75063, United States

FM Approvals Class: 4990

Approval Identification:

Approval Granted: 9 June 2025

0Y6A7.AM, 0Z4A5.AM, 2X3A6.AM, 3006434, 3009626, 3010517, 3027928, 3040612, 3041683, 3043569, 3046888, 3051456, 3054773, 3058446, 3060256, 3060712, PR449317, PR449914, PR451633, PR453106, PR462744, RR246159

To verify the availability of the Approved product, please refer to www.approvalguide.com

Said Approval is subject to satisfactory field performance, continuing Surveillance Audits, and strict conformity to the constructions as shown in the Approval Guide, an online resource of FM Approvals.

Phillip J. Smith
VP - Manager of Materials
FM Approvals
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European Technical Assessment

ETA-11/0343
of 26.11.2020

General part

Technical Assessment Body issuing the European Technical Assessment

Österreichisches Institut für Bautechnik (OIB)
Austrian Institute of Construction Engineering

Trade name of the construction product

Hilti Firestop Joint Spray CFS-SP WB

Product family to which the construction product belongs

Fire Stopping and Fire Sealing Products:
Linear Joint and Gap Seals

Manufacturer

Hilti AG
Feldkircherstrasse 100
9494 Schaan
LIECHTENSTEIN

Manufacturing plant

Hilti production plant 4a

This European Technical Assessment contains

14 pages including Annexes 1 to 4 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

European Assessment Document
EAD 350141-00-1106 "Fire stopping and fire
sealing products – Linear Joint and Gap Seals"

This European Technical Assessment replaces

European Technical Assessment ETA-11/0343,
issued on 27.07.2016

This European Technical Assessment is not to be transferred to manufacturers or agents of manufacturer other than those indicated on page 1, or manufacturing plants other than those laid down in the context of this European Technical Assessment.

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Specific parts

1 Technical description of the product

"Hilti Firestop Joint Spray CFS-SP WB" is a membrane-forming coating used to form a perimeter seal between rigid floor slabs and curtain walls with mineral wool as backfilling material. In facade constructions the coating is normally only applied on the top side. Very porous joint edges are treated with "Hilti Firestop Joint Spray CFS-SP WB" diluted with water, to achieve better adhesion. For details of the seal design depending on orientation, building elements forming the joint/gap or backfilling material and the related classifications see Annex 3 of the ETA.

For further details on "Hilti Firestop Joint Spray CFS-SP WB" see Annex 2 of the ETA. For a specification of suitable mineral wool as backfilling material see Annex 2, clause 2.2 of the ETA.

For a description of the installation procedure see Annex 3 of the ETA.

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

2.1 Intended use

"Hilti Firestop Joint Spray CFS-SP WB" is intended to be used as a linear joint and gap seal to provide fire resistance performance in the area of the perimeter joint between a curtain wall and rigid floor slabs.

"Hilti Firestop Joint Spray CFS-SP WB" may be used between the following construction elements:

Construction-element	Construction	
1. Rigid floors	1.a) Concrete	
	> Minimum density 2400 kg/m³ > Minimum thickness 150 mm > The rigid floor shall be classified in accordance with EN 13501-2 for the required fire resistance period	
2. Curtain wall	2.a) Steel framed (transoms, mullions)	
	2.b) Aluminium framed (transoms, mullions)	
	> The cavity formed by the spandrel panel and the framing filled with stone wool or stone wool board of a nominal density of minimum:	
	> ~70 kg/m³ (with calcium silicate boards and/or steel or aluminium sheet)	> ~120 kg/m³ (foil faced) (without calcium silicate boards and/or steel or aluminium sheet)

2.2 Use conditions

"Hilti Firestop Joint Spray CFS-SP WB" is intended for use at temperatures below 0°C with casual exposure to UV but no exposure to rain, and can therefore – according to EAD 350141-00-1106, clause 2.1 – be categorized as Type Y₁. Since the requirements for Type Y₁ are met, also the requirements for Type Y₂, Z₁ and Z₂ are fulfilled.

2.3 Working life

The provisions made in this European Technical Assessment are based on an assumed working life of "Hilti Firestop Joint Spray CFS-SP WB" of 25 years, provided the conditions laid down in the technical literature of the manufacturer relating to packaging, transport, storage, installation, use and repair are met.

The indications given on the intended working life cannot be interpreted as a guarantee given by the producer or the Technical Assessment Body, but are to be regarded only as a means for selecting the appropriate product in relation to the expected economically reasonable working life of the works.

The real working life might be, in normal use conditions, considerably longer without major degradation affecting the Basic requirements for construction works.

2.4 General assumptions

It is assumed that damages to the perimeter seal are repaired accordingly.

2.5 Manufacturing

The European Technical Assessment is issued for the product on the basis of agreed data / information, deposited with the Österreichisches Institut für Bautechnik, 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 the Österreichisches Institut für Bautechnik before the changes are introduced.

The Österreichisches Institut für Bautechnik will decide whether or not such changes affect the European Technical Assessment and consequently the validity of the CE marking on the basis of the European Technical Assessment and if so whether further assessment or alterations to the European Technical Assessment, shall be necessary.

2.6 Installation

The product shall be installed and used as described in this European Technical Assessment.

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

Basic requirements for construction works	Essential characteristic	Method of verification	Performance
BWR 2	Reaction to fire	EN 13501-1:2010	Clause 3.1.1 of the ETA
	Resistance to fire	EN 13501-2:2016	Clause 3.1.2 of the ETA
BWR 3	Air permeability (material property)	EN 1026:2000	Clause 3.2.1 of the ETA
	Water permeability (material property)	EAD 350141-00-1106, Annex C	Clause 3.2.2 of the ETA
	Content, emission and/or release of dangerous substances	EN 16516:2018	Clause 3.2.3 of the ETA
BWR 4	Mechanical resistance and stability	EAD 350141-00-1106, clause 2.2.6	Clause 3.3.1 of the ETA
	Resistance to impact / movement	EOTA TR 001:2003	Clause 3.3.2 of the ETA
	Adhesion	EAD 350141-00-1106, clause 2.2.8	Clause 3.3.3 of the ETA
	Durability	EOTA TR 024:2009	Clause 3.3.4 of the ETA
	Movement capability	No performance assessed	
	Cycling of perimeter seals for curtain walls	EAD 350141-00-1106, clause 2.2.14	Clause 3.3.6 of the ETA
BWR 5	Airborne sound insulation	EN ISO 10140-1:2010	Clause 3.4.1 of the ETA
BWR 6	Thermal properties	No performance assessed	
	Water vapour permeability	No performance assessed	

3.1 Safety in case of fire (BWR 2)

3.1.1 Reaction to fire

"Hilti Firestop Joint Spray CFS-SP WB" was assessed according to EAD 350141-00-1106, clause 2.2.1 and classified according to EN 13501-1:2010.

Component	Class according to EN 13501-1:2010
Hilti Firestop Joint Spray CFS-SP WB	E

3.1.2 Resistance to fire

"Hilti Firestop Joint Spray CFS-SP WB" was tested according to EAD 350141-00-1106, clause 2.2.2 and EN 1364-4:2007.

Based upon the gained test results and the field of application specified within EN 1364-4:2007 "Hilti Firestop Joint Spray CFS-SP WB" has been classified according to EN 13501-2:2010, as shown in Annex 2 of the ETA.

For details of suitable floor constructions and curtain wall constructions see clause 2.1 of the ETA.

3.2 Hygiene, health and the environment (BWR 3)

3.2.1 Air permeability

The air permeability of the "Hilti Firestop Joint Spray CFS-SP WB" was tested in a joint set up with dimension 1030 x 80 according to EAD 350141-00-1106, clause 2.2.3 by applying the test principle of EN 1026.

Pressure Pa	50	250	300	450	600
q/A air [m³/(h m²)]	No representative air flow measured				

3.2.2 Water permeability

The water permeability has been tested using the principles of the test procedure according to Annex C of EAD 350141-00-1106. The specimen consisted of 2 mm "Hilti Firestop Joint Spray CFS-SP WB" (dry film thickness) on mineral wool. Test result: Water tight to 1000 mm head of water for a period of max 10 days.

3.2.3 Content, emission and/or release of dangerous substances

"Hilti Firestop Joint Spray CFS-SP WB" was tested for SVOC and VOC according EAD 350141-00-1106, clause 2.2.3, in accordance with EN 16516 with a loading factor of 0,007 m²/m³. Release scenario IA1 and IA2 have been tested.

The concentration of SVOC after 3 days and after 28 days was < 0,005 mg/m³. The concentration of the total emission of VOC after 3 days was 0,21 mg/m³ and after 28 days the concentration was 0,08 mg/m³.

3.3 Safety and accessibility in use (BWR 4)

3.3.1 Mechanical resistance and stability

According to EAD 350141-00-1106, clause 2.2.6 the mechanical resistance and stability is covered by tests carried out for the assessment of resistance to impact / movement (see clause 3.3.2 of the ETA)

3.3.2 Resistance to impact / movement

The resistance to impact / movement has been tested using the test procedure according to EAD 350141-00-1106. Due to the maximum seal width of 200 mm the method according to EOTA TR 001, clause 3 of hard body impact had to be used. The hard body impact test simulates the impact, resulting from an object accidentally falling against the seal.

Safety in Use: The requirement of withstanding a 10 Nm impact was fulfilled without damages.

Serviceability: The requirement of withstanding a 10 Nm impact was fulfilled without damages.

3.3.3 Adhesion

Adhesion is covered by the resistance to impact / movement tests described in clause 3.3.2 of the ETA.

3.3.4 Durability

"Hilti Firestop Joint Spray CFS-SP WB" has been tested in accordance with EOTA TR 024, Table 4.1 for the Y₁ use category specified in EAD 350141-00-1106 and the results of the test have demonstrated suitability for perimeter seals intended for use at temperatures between -20°C and +70°C (Y₁, (-20/+70)°C).

"Hilti Firestop Joint Spray CFS-SP WB" may be painted over with Acrylic paint systems.

The compatibility test showed no negative influence of "Hilti Firestop Joint Spray CFS-SP WB" on steel and aluminium surfaces.

3.3.5 Movement capability

No performance assessed

3.3.6 Cycling of perimeter seals for curtain walls

Before the fire test was carried out, a cycling test according to EAD 350141-00-1106, clause 2.2.14 has been performed - in order to show the ability of the sealing system to accommodate movement ("mechanical ageing") without losing its fire resistance the frequency designated "seismic" (30 cycles per minute and 500 changes between minimum and maximum joint width) was used at an amplitude of $\pm 25\%$.

3.4 Protection against noise (BWR 5)

3.4.1 Airborne sound insulation

Test reports from noise reduction according to EN 20140-10, EN ISO 140-1, EN 20140-3, EN ISO 10140-1, EN ISO 10140-2, EN ISO 10140-5 and EN ISO 717-1 have been provided.

A special test set-up was used to simulate the conditions of a perimeter seal of a curtain wall.

The reached values for the airborne sound insulation are given in the following table.

Joint width [mm]	Seal depth [mm]	Coating	R _{w(C;Ctr)} [dB]	D _{n,e,w (C; Ctr)} [dB]
200	200	Both sides	40 (-1; -5) ^{a)}	55 (0; -4) ^{b)}
200	200	Top side	37 (-1; -4) ^{a)}	52 (-1; -4) ^{b)}

^{a)} where S = 0,3 m²

^{b)} where A₀ = 10 m²

3.5 Energy economy and heat retention (BWR 6)

3.5.1 Thermal properties

No performance assessed

3.5.2 Water vapour permeability

No performance assessed

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

According to the Decision 1999/454/EC¹, amended by Decision 2001/596/EC² of the European Commission the system(s) of assessment and verification of constancy of performance (see Annex V of Regulation (EU) No 305/2011) is given in the following table.

¹ Official Journal of the European Communities no. L 178, 14.7.1999, p. 52

² Official Journal of the European Communities no. L 209, 2.8.2001, p. 33

Product(s)	Intended use(s)	Level(s) or class(es) (resistance to fire)	System of assessment and verification of constancy of performance
Fire Stopping and Fire Sealing Products	for fire compartmentation and/or fire protection or fire performance	any	1

In addition, according to the Decision 1999/454/EC, amended by Decision 2001/596/EC of the European Commission the system(s) of assessment and verification of constancy of performance, with regard to reaction to fire, is given in the following table.

Product(s)	Intended use(s)	Level(s) or class(es) (reaction to fire)	System of assessment and verification of constancy of performance
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	3
		(A1 to E)***, F	4
* 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/EC, as amended)			

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

Technical details necessary for the implementation of the AVCP system are laid down in the control plan deposited with the Technical Assessment Body Österreichisches Institut für Bautechnik.

The notified product certification body shall visit the factory at least twice a year for surveillance of the manufacturer.

Issued in Vienna on 26.11.2020
by Österreichisches Institut für Bautechnik

The original document is signed by:

Rainer Mikulits
Managing Director

ANNEX 1 - DESCRIPTION OF PRODUCT & ANCILLARY PRODUCT(S)

1.1 Hilti Firestop Joint Spray CFS-SP WB

"Hilti Firestop Joint Spray CFS-SP WB" is a water based 1-component product and is composed essentially of filling substances and an acrylic binder. It is delivered in various colours.

"Hilti Firestop Joint Spray CFS-SP WB" is supplied in 19 Litre buckets.

A detailed specification of the product is contained in document "Identification / Product Specification relating to the European technical approval ETA-11/0343 - Hilti Firestop Joint Spray CFS-SP WB" which is a non-public part of this ETA.

The Control Plan is defined in document "Control Plan related to the European Technical Approval ETA-11/0343 - Hilti Firestop Joint Spray CFS-SP WB" which is a non-public part of this ETA.

Technical product literature:

- Technical Data Sheet "Hilti Firestop Joint Spray CFS-SP WB"
- Safety Data Sheet according to 1907/2006/EC, Article 31, for "Hilti Firestop Joint Spray CFS-SP WB"

1.2 Mineral wool

"Termarock 40" (from manufacturer DEUTSCHE ROCKWOOL Mineralwoll GMBH & Co. OHG) or "Termarock 40" with a higher bulk density has to be used as a backfilling material for the perimeter seal as long as it can be compressed by $\geq 50\%$. The valid compression direction is A-A.

No.	Characteristics	Specification
1	Mineral / Stone wool	EN 13162 or EN 14303
2	Density	40 to 70 kg/m ³
3	Facing	No Al-facing, no other facing
4	Combustibility class	A1 according EN 13501-1
5	Melting point	$\geq 1000^{\circ}\text{C}$

ANNEX 2 - RESISTANCE TO FIRE CLASSIFICATION OF HILTI FIRESTOP JOINT SPRAY CFS-SP WB

2.1 Specific characteristics for rigid floor and curtain wall construction

Construction-element	Construction	
1. Rigid floors	1.a) Concrete	
	> Minimum density 2400 kg/m³ > Minimum thickness 150 mm > The rigid floor shall be classified in accordance with EN 13501-2 for the required fire resistance period	
2. Curtain wall	2.a) Steel framed (transoms, mullions)	
	2.b) Aluminium framed (transoms, mullions)	
	> The cavity formed by the spandrel panel and the framing filled with stone wool or stone wool board of a nominal density of minimum:	
	> ~70 kg/m³ (with calcium silicate boards and/or steel or aluminium sheet)	> ~120 kg/m³ (foil faced) (without calcium silicate boards and/or steel or aluminium sheet)

2.2 Perimeter seal installation specifics

"Hilti Firestop Joint Spray CFS-SP WB" (A) must be applied with a $t_A = \sim 3\text{-}5$ mm wet film thickness, resulting in ~ 2 mm dry film thickness. Application of "Hilti Firestop Joint Spray CFS-SP WB" (A) should overlap the floor construction and curtain wall (L₁) a minimum of 15 mm. As backfilling material, a mineral wool product (B₁) as specified in Annex 1.2 should be installed. This mineral wool must be compressed by $\geq 50\%$ during installation to a depth $t_B \geq 150$ mm.

Splice distances:

- For curtain wall 2.a) (steel framed according to clause 2.1 of the ETA) = 1000mm
- For curtain wall 2.b) (aluminium framed according to clause 2.1 of the ETA) = 200mm

Nominal joint width (w): 10 to 200 mm

Movement capability: max. $\pm 25\%$

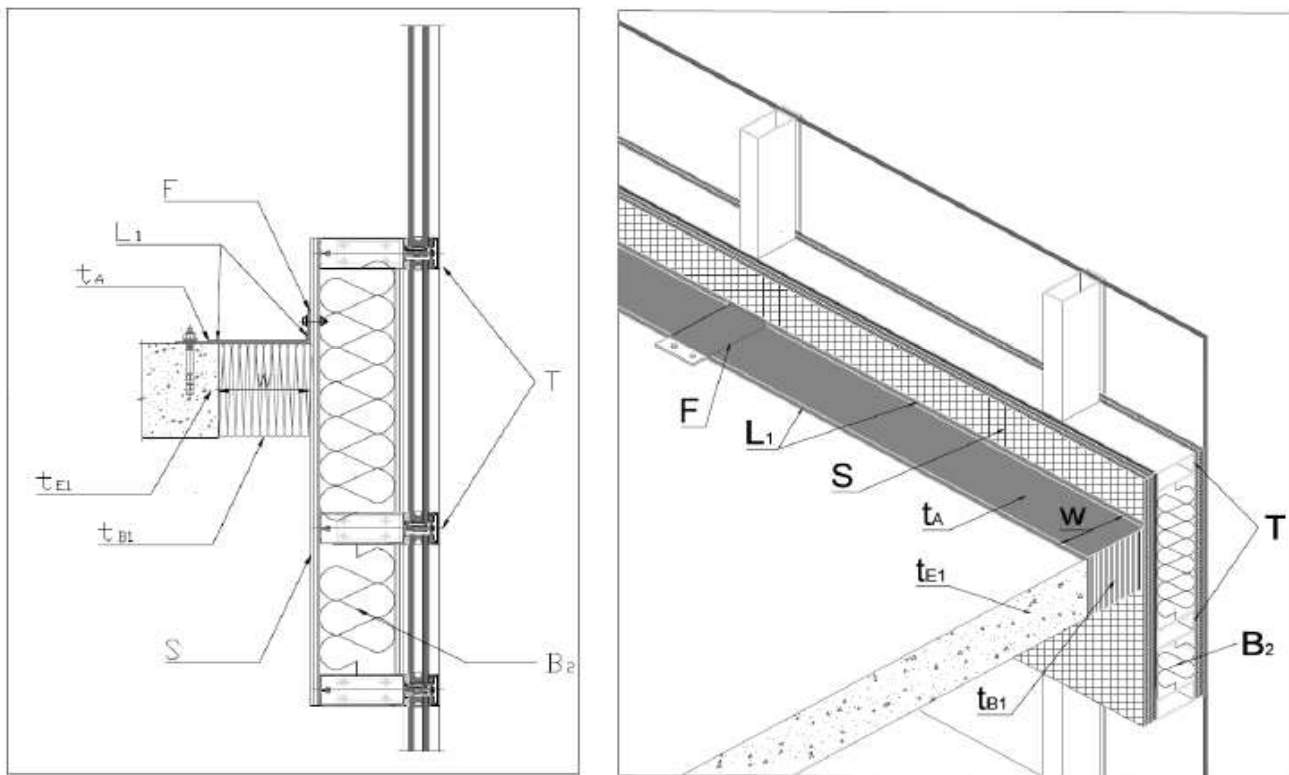
2.3 Classification for perimeter seal

This perimeter seal as described in Annex 2, clause 2.2 of the ETA with

- a joint width (w) of 10 to 200 mm and
- a maximum movement capability of $\pm 25\%$ has a classification of:

Steel Framed Curtain Wall
EI 90 – H – F – M25 – W 10 to W 200
Aluminium Framed Curtain Wall
EI 180 – H – F – M25 – W 10 to W 200

2.4 Typical Installation Detail for Floor slab to external façade:



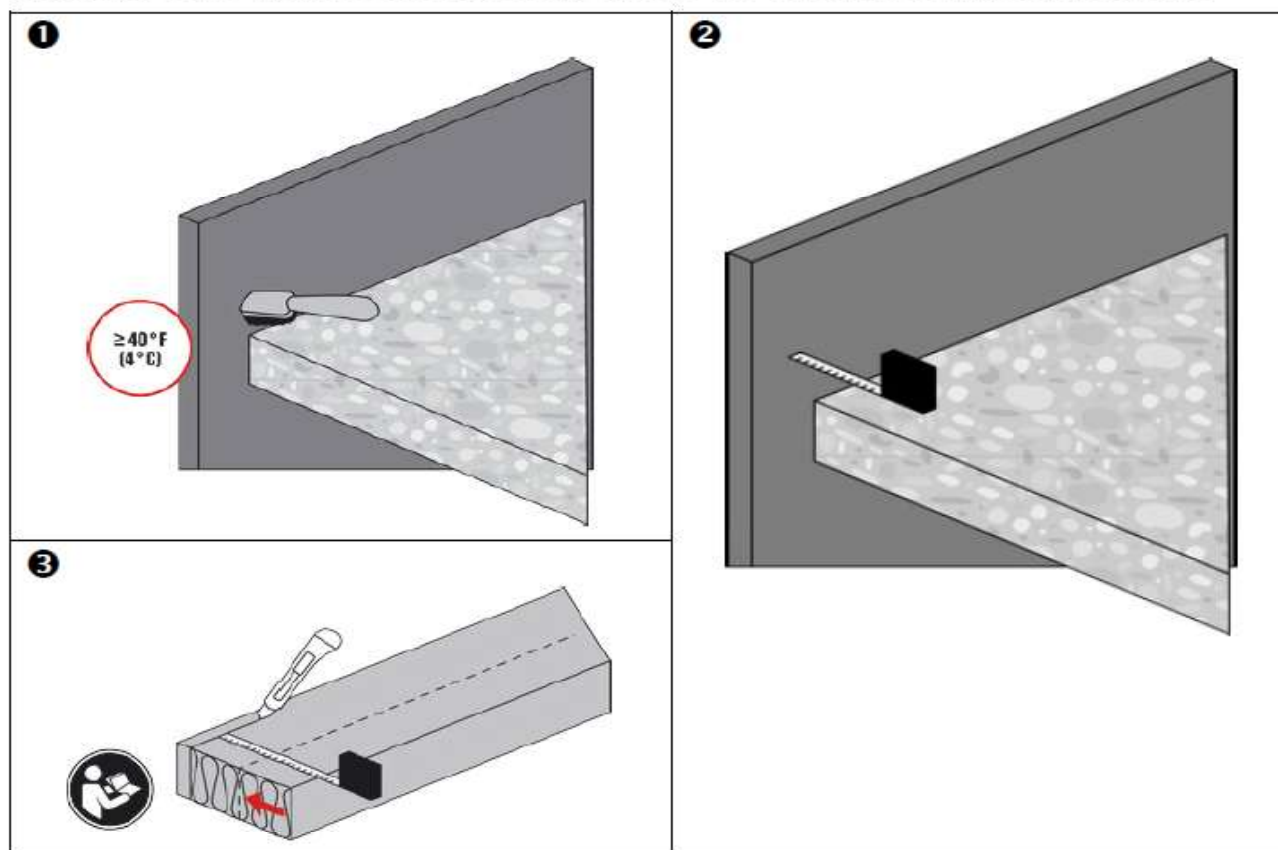
2.5 Abbreviations used in Drawing

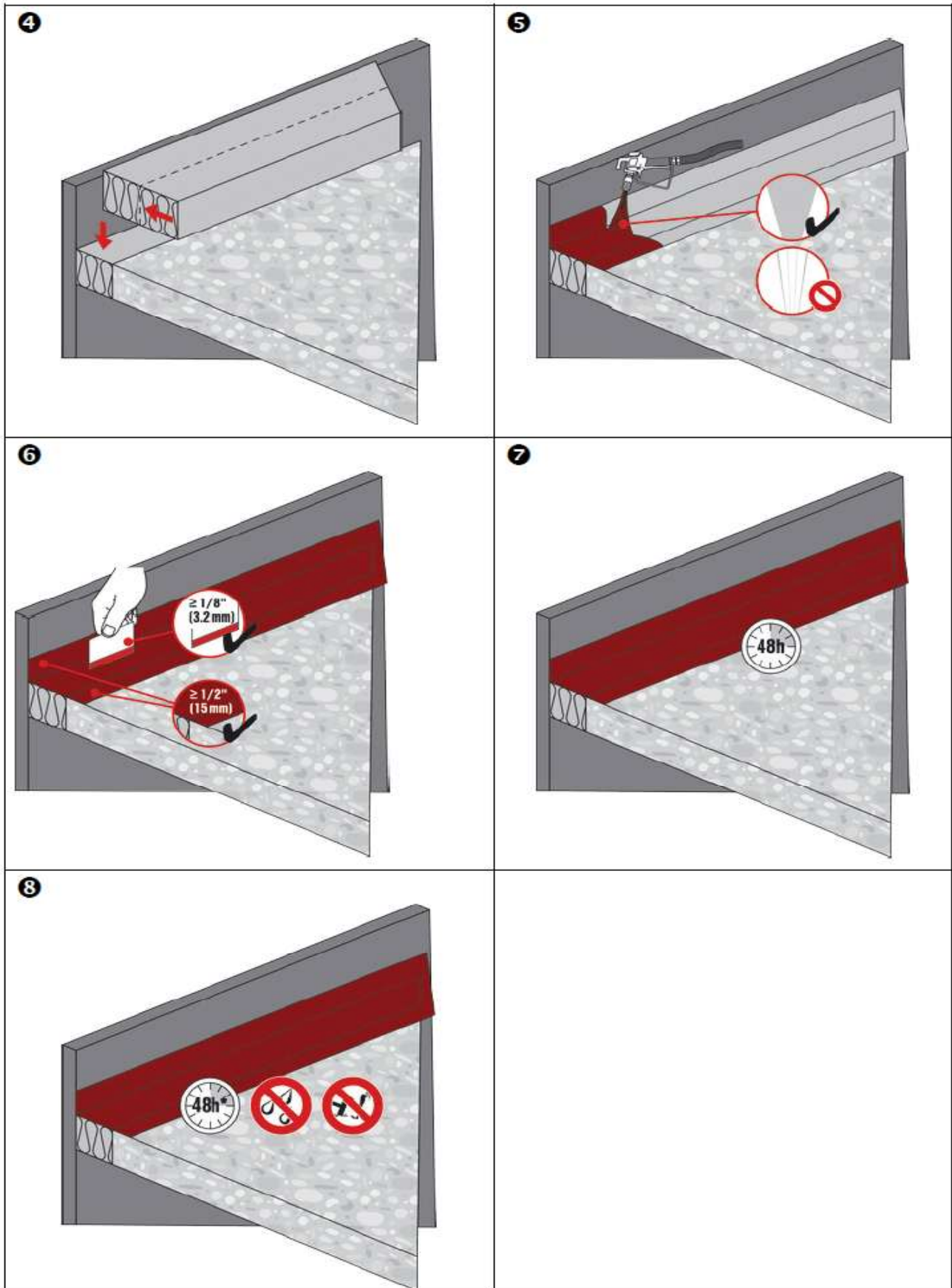
Label	Description
A	Hilti Firestop Joint Spray CFS-SP WB
B ₁	Backfilling material (mineral wool) of perimeter seal
B ₂	Backfilling material (mineral wool) of curtain wall
E ₁	Rigid floor construction
F	Fixing Bracket
L ₁	Overlap of Hilti Firestop Joint Spray CFS-SP WB
S	Steel or Aluminium Sheet
T	Transom
t _A	Thickness of Hilti Firestop Joint Spray CFS-SP WB
t _{B1}	Thickness of backfilling material
t _{E1}	Thickness of the rigid floor construction / joint depth
w	Joint width

ANNEX 3 - INSTALLATION INSTRUCTION OF HILTI FIRESTOP JOINT SPRAY CFS-SP WB

3.1 Installation instruction "Hilti Firestop Joint Spray CFS-SP WB"

Installation of the "Hilti Firestop Joint Spray CFS-SP WB" should be conducted as follows:





ANNEX 4 - REFERENCE DOCUMENTS

4.1 References to standards mentioned in the ETA:

EN 1364-4	Fire resistance tests for non-loadbearing elements – Part 4: Curtain walling – Part configuration
EN 13162	Thermal insulation products for buildings – Factory made mineral wool (MW) products – Specification
EN 13501	Fire classification of construction products and building elements – Part 1: Classification using test data from reaction to fire tests Part 2: Classification using test data from fire resistance tests
EN 16516	Construction products: Assessment of release of dangerous substances – Determination of emissions into indoor air
EN ISO 140-1	Measurement of sound insulation in buildings and of building elements – Part 1: Requirements for laboratory test facilities with suppressed flanking transmission
EN 20140	Acoustics – Measurement of sound insulation in buildings and of building elements Part 3: Laboratory measurements of airborne sound insulation of building elements Part 10: Laboratory measurement of airborne sound insulation of small building elements
EN ISO 10140	Acoustics – Laboratory measurement of sound insulation of building elements - Part 1: Application rules for specific products Part 2: Measurement of airborne sound insulation Part 5: Requirements for test facilities and equipment
EN ISO 717-1	Acoustics – Rating of sound insulation of buildings and of building elements – Part 1: Airborne sound insulation

4.2 Other reference documents:

EAD 350141-00-1106	Fire stopping and fire sealing products – Linear Joint and Gap Seals
EOTA TR 001	Determination of impact resistance of panels and panel assemblies
EOTA TR 024	Characterisation, Aspects of Durability and Factory Production Control for Reactive Materials, Components and Products

Hilti Entwicklungsgesellschaft mbH
Mrs. Sarah Kretschmer
Hiltistraße 6
86916 Kaufering

Dear Mrs. Kretschmer,

based on the evaluation of the Test Reports No. 59083-A001-CS-L dated 2024-05-21 and 59083-A001-L dated 2024-04-15, the testing results of the products **CP 673**, **CP 670** and **CFS-CT** commissioned by **Hilti Entwicklungsgesellschaft mbH** comply with the requirements of

- VOC product emissions acc. to California Department of Public Health (CDPH) Standard Method v1.2-2017 (California Specification 01350 (01/2017))
- VOC content ASTM D 2369 - 20 and South Coast Air Quality Management District (SCAQMD) Rule 1113

These criteria meet the requirements for low-emitting **Paints and Coatings** in credit EQc2 of the LEEDv4 Rating System and the LEEDv4.1 Rating System.

Acceptance Criteria and Results Demonstrating Compliance of Product Sample to Referenced Standard:

Exposure Scenario	Individual VOCs of Concern		Formaldehyde		TVOC
	Requirement	Requirement hold	Requirement	Requirement hold	Range
School Classroom	½ CREL	yes	≤ 9 µg/m³	yes	< 0.5 mg/m³
Private Office	½ CREL	yes	≤ 9 µg/m³	yes	< 0.5 mg/m³

Mass per surface area: not applicable

VOC content	VOC Limit Value*
61 g/L	150 g/L

* VOC Limit Value for "Fire-Proofing Coatings" (SCAQMD 1113, 02/2016)

Cologne, 2024-05-21



Marc-Anton Dobaj, M.Sc. Crystalline Materials
(Project manager)

eco-INSTITUT, Schanzenstr. 6-20, D-51063 Köln

Hilti Entwicklungsgesellschaft mbH
Frau Cintia Chagas de Oliveira
Hiltistraße 6
86916 Kaufering

Sehr geehrte Frau Chagas de Oliveira / Dear Mrs. Chagas de Oliveira,

basierend auf dem Prüfbericht / based on the test reports / Sur base des rapports d'essais,

Nr. 55493-B004 vom / from / en date du 29.09.2020
Nr. 55493-B004 II vom / from / en date du 29.09.2020
Nr. 55493-B004 III vom / from / en date du 29.09.2020

erfüllt das Produkt / the product / le produit

Hilti Firestop Coating CP 670

hergestellt von / manufactured by / fabriqué par

Hilti Entwicklungsgesellschaft mbH

die Anforderungen / complies with the requirements of / correspond aux exigences de

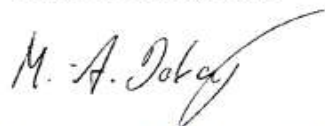
- AgBB-Schema / Ausschuss für die gesundheitliche Bewertung von Bauprodukten (Stand: 2018)
- Klasse / Class / Classe A+
Französische VOC Klassifizierungsverordnung und KMR Emissionsverordnung
French VOC labelling regulation and CMR emissions regulation

„Décret n° 2011-321“ and „Arrêté relatif à l'étiquetage des produits de construction ou de revêtement de mur ou de sol et des peintures et vernis sur leurs émissions de polluants volatils“

„Arrêté du 28 mai 2009 modifiant l'arrêté du 30 avril 2009 relatif aux conditions de mise sur le marché des produits de construction et de décoration contenant des substances cancérigènes, mutagènes ou reprotoxiques de catégorie 1 ou 2“

- Königlicher Erlass zur Festlegung der Schwellenwerte für Innenraumemissionen aus Bauprodukten für bestimmte Verwendungszwecke
Belgian Royal Decree establishing threshold levels for the emissions to the indoor environment from construction products for specific purposes.
Arrêté royal établissant les niveaux seuils pour les émissions dans l'environnement intérieur de produits de construction pour certains usages prévus.

Köln / Cologne, 12.11.2020
eco-INSTITUT Germany GmbH



Marc-Anton Dobaj, M.Sc. Crystalline Materials
(Projektleiter / Project Manager / Chef de projet)

THANK YOU

HILTI