



# Hilti CFS-F FX Flexible Firestop Foam

## Submission Folder

Product Information and Method Statement	2
Test Reports	
RED No. R22H09-1A	5
Letters	
VOC	37
Government Letters	38
Country of Origin	41
LEED Letter	42
Non-CFC and Ozone Confirmation	43
Material Safety Data Sheet	61
Job Reference	62



Recycling one ton of paper saves 17 trees and 7000 gallons of water.  
Please consider your environmental responsibility before using the hard copy version!

Firestop foam CFS-F FX **NEW**

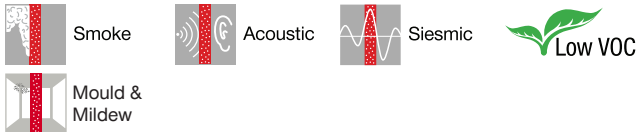


**APPLICATIONS**

- Mechanical: Non-combustible (metal) pipes with mineral wool/ non-flammable insulation, small combustible (plastic) pipes
- No smoke/gastight additional sealing and no backing material required
- Electrical: Single cables, cable bundles, cable tray and trunking

**ADVANTAGES**

- 3-phase technology with optimum application characteristics (easily-shapeable foam)
- Easily applied using a Hilti cordless electric dispenser
- Neat and tidy application
- Very quick and easy to install and provides a reliable firestop seal with only one product
- Maintenance and retrofitting of cables is very easy
- Reliable sound insulation properties, due to the flexible foam structure



**Consumption Guide**

Wall thickness: 150

Surface area of seal (m <sup>2</sup> )	Opening diameter of seal (mm)	Opening size of seal (mm x mm)	Volume (litre), no cable load
0.01	ø 120	100 x 100	1.50
0.02	ø 160	100 x 200	3.00
0.03	ø 200	100 x 300	4.50
0.04	ø 220	200 x 200	6.00
0.05	ø 250	200 x 250	7.50
0.06	ø 280	200 x 300	9.00
0.07	ø 300	200 x 350	10.50
0.08	ø 320	200 x 400	12.00
0.09	ø 340	300 x 300	13.50
0.1	ø 350	300 x 330	14.85
0.16	--	400 x 400	24.00

No. of CFS-F FX foil packs

Wall thickness: 150

Surface area of seal (m <sup>2</sup> )	Cable loading (as % of opening size)			
	0%	10%	30%	60%
0.01	<1	<1	<1	0.5
0.02	<2	<2	1.5	<1
0.03	<3	<2.5	<2	<1.5
0.04	3.5	<3.5	2.5	1.5
0.05	<4.5	<4	3.0	<2
0.06	5.5	<5	<4	<2.5
0.07	6.0	<5.5	<4.5	<2.5
0.08	<7	<6.5	<5	<3
0.09	<8	<7	<5.5	<3.5
0.1	8.5	7.5	6.0	3.5
0.16	<13,5	<12,5	<9,5	<5,5

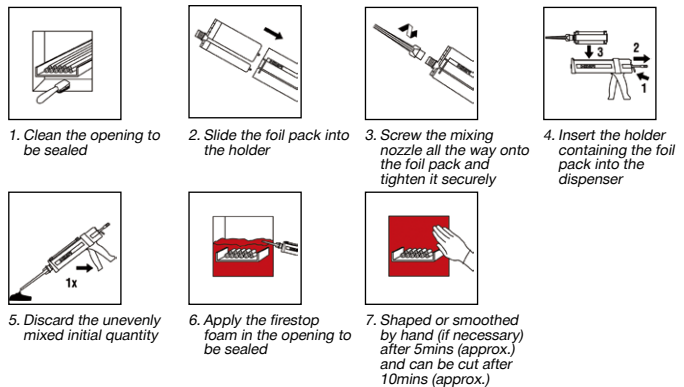
Ordering designation	Volume per unit	Package contents	Sales pack quantity	Item number
CFS-F FX	325 ml	1x Firestop foam CFS-F FX	1 pc	429802

Technical data	
Chemical basis	Two-component polyurethane foam
Colour	Red
Base materials	Concrete, Masonry, Drywall
Volume per unit	325 ml
Foam yield (up to)	2.1 l
Approx. cut time (at 23°C / 50% rel. humidity)	10 min
Application temperature range	10 - 35 °C
Temperature resistance range	-30 - 60 °C
Storage and transportation temperature range	5 - 25 °C
Shelf life <sup>1)</sup>	9 Months

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



**Application Procedure**

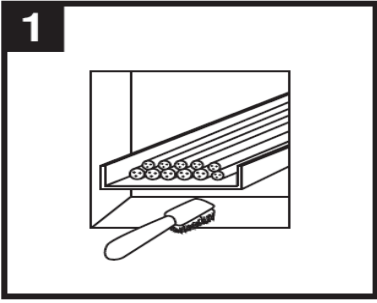
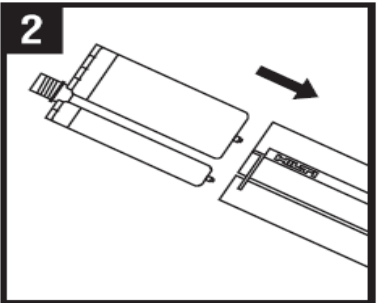
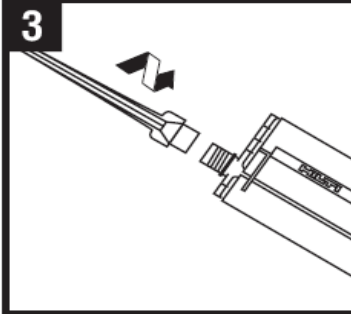
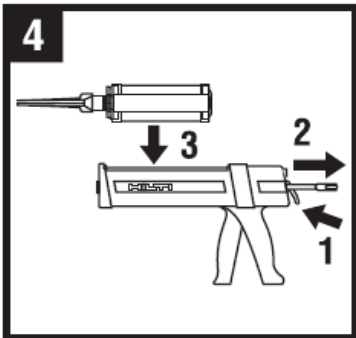


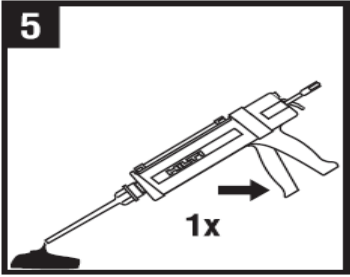
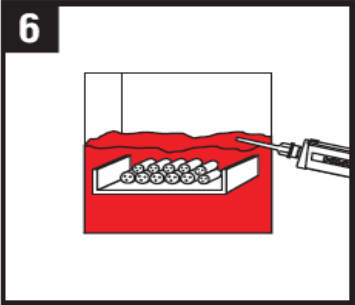
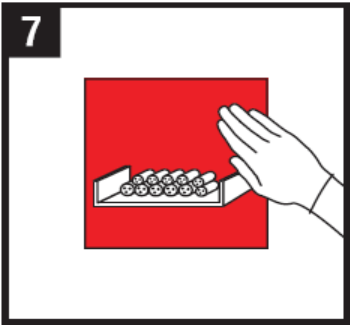
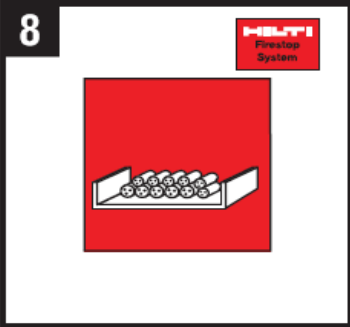
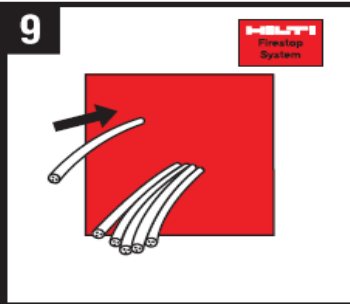
Order Now [Watch Video](#)



Please visit Hilti website for the latest item numbers and related products  
Customer Hotline: Hong Kong 8228 8118, Macau 00800 8228 8118 Email: hksales@hilti.com

**Subject:** Method Statement of CFS-F FX  
**Material:** CFS-F FX Firestop foam  
**Accessory:** Hilti Dispenser HDM 330 CB (BOX), mixer HIT-RE-M and extension pipe CP 660-Ext or equivalent

Setting Operation		
1	Clean the opening to be sealed free from dust or grease.	
2	Slide the foil pack into the holder.	
3	Remove the cap. Screw the mixing nozzle all the way onto the foil pack and tighten it securely.	
4	Insert the holder containing the foil pack into the dispenser	

5	Discard the unevenly mixed initial quantity (the first three pumps).	
6	Apply the firestop foam in the opening to be sealed. The mixed components of the foam react and begin to expand approx. 30 seconds after application (at 23°C). Fill the opening completely with firestop foam, including gaps between individual cables, etc.	
7	The foam can be shaped or smoothed by hand (if necessary) after approx. 5 minutes (at 23°C). Wear protective gloves! After approx. 10 minutes (at 23°C) the foam becomes hard and it can then be cut.	
8	Mount the installation identification plate beside the correctly sealed opening.	
9	Additional cables or pipes can be installed in the opening without difficulty. Do not exceed the approved maximum number and size of cables or pipes. The cable or pipe may be pushed directly through the foam. Where necessary, use a suitable tool (screwdriver or drill bit, etc.) to make a hole in the foam before pushing the cable or pipe through. Seal any remaining caps carefully with CP 660	

**Safety precautions:**

- Store in a cool, dry, dark place at a temperature of 5°C to 25°C.
- Observe expiry date on package



## ASSESSMENT REPORT

The Use of Hilti CP636, CP670, CFS-F FX and CFS-BL for Electrical Services Penetration Sealing Systems

**Report No.:** R22H09-1A  
**Issue Date:** 3 November, 2022  
**Date of Review:** 2 November, 2025

### Report Sponsor

**Hilti (Hong Kong) Limited**  
701-704 & 708B, Tower A Manulife Finance Centre,  
223 Wai Yip Street, Kwun Tong, Kowloon, HK

This report only relates to the specimen(s) tested and may only be reproduced by the sponsor in full, without comment, abridgement and modifications.

## CONTENT

Section	Description	Page
1	INTRODUCTION	3
2	ASSUMPTIONS	3
3	SUPPORTING DATA	4
4	PROPOSAL & DISCUSSION	22
5	CONCLUSION	30
6	DECLARATION BY APPLICANT	30
7	VALIDITY	30
8	SIGNATORIES	30
APPENDIX – DRAWINGS PROVIDED BY THE CLIENT		31

## REVISION HISTORY

Issue date (DD/MM/YYYY)	Issue number	Remark
03/11/2022	0	Initial version

**THE USE OF HILTI CP636, CP670, CFS-F FX AND CFS-BL FOR  
ELECTRICAL SERVICES PENETRATION SEALING SYSTEMS**

## **1 INTRODUCTION**

This assessment report presents an appraisal for the use of the Hilti CP636, CP670, CFS-F FX, and CFS-BL for electrical services penetration sealing systems through concrete, AAC or blockwork like masonry wall or floor supporting construction. This appraisal is based on the substantial test evidence as mentioned in Section 3. This report is prepared for Hilti (Hong Kong) Limited of 701-704 & 708B, Tower A, Manulife Finance Centre, 223 Wai Yip Street, Kwun Tong, Kowloon, HK.

The proposed gap sealing systems used for electrical services penetration are required to provide a fire resistance performance of up to 240 minutes integrity and insulation with respect to BS 476: Part 20: 1987.

## **2 ASSUMPTIONS**

The proposed systems are assumed to be installed in a similar manner to that of the previously tested system by competent installers. It is assumed that the modified systems will be constructed in a similar manner from materials and components of the same manufacture and equivalent quality as tested with supporting test evidence or otherwise appraised by RED. Further assumptions related to the specific modifications will be stated in the report.

It is also assumed that the supporting structures to which the perimeter of the systems will be fixed are capable of supporting the proposed structure effectively.

Assuming that the issue of the original test report is valid, the current testing standard or testing experience has not been changed and the procedures adopted for the original report have been re-examined and reviewed that there have been no changes to the specification of the construction considered in the original report. If contradictory data or any related evidence becomes available to RED, the assessment will be unconditionally withdrawn and the sponsor will be notified. This report is based on the given information, in which is declared by report sponsor that no contradictory data has become available.

### 3 SUPPORTING DATA

#### 3.1 Summary of Supporting Test Evidence

Report no.	Sections	Description
<b>Primary Test Evidence</b>		
WARRES report no. 62305/A	4.2	Supporting test evidence for the use of the Hilti "CP636" Firestop mortar with electrical services penetration through wall. The test was conducted in accordance with BS476: Part 20: 1987.
WARRES report no. 62305/B	4.2	Supporting test evidence for the use of the Hilti "CP636" Firestop mortar with electrical services penetration through wall. The test was conducted in accordance with BS476: Part 20: 1987.
WARRES report no. 62305/C	4.2	Supporting test evidence for the use of the Hilti "CP636" Firestop mortar with electrical services penetration through wall. The test was conducted in accordance with BS476: Part 20: 1987.
WARRES report no. 62320	4.2	Supporting test evidence for the use of the Hilti "CP636" Firestop mortar with electrical services penetration through floor. The test was conducted in accordance with BS476: Part 20: 1987.
WF report no. 101728	4.2	Supporting test evidence for the use of the Hilti "CP636" Firestop mortar with electrical services penetration through floor. The test was conducted in accordance with BS476: Part 20: 1987.
RED report no. R13C05	4.2	Supporting test evidence for the use of the Hilti "CP636" Firestop mortar and Hilti "CP670" fire safety coating with mineral wool system with electrical services penetration through wall. The test was conducted in accordance with BS476: Part 20: 1987.
WARRES report no. 124662	4.3	Supporting test evidence for the use of Hilti "CP670" fire safety coating with mineral wool panel with electrical services penetration through wall. The test was conducted in accordance with BS476: Part 20: 1987.



Report no.	Sections	Description
WARRES report no. 124663	4.3	Supporting test evidence for the use of Hilti "CP670" fire safety coating with mineral wool panel with electrical services penetration through wall. The test was conducted in accordance with BS476: Part 20: 1987.
PAVUS report no. Pr-03-02.086	4.3	Supporting test evidence for the use of the mineral wool boards with Hilti "CP673" fire safety coating for the penetration of cable tray. The test was conducted in accordance with BS EN 1363-1: 1999 and prEN 1366-3: 2003.
RED report no. R16L28-1B	4.3	Supporting test evidence for the use of the mineral wool boards with Hilti "CP670" fire safety coating and the Hilti "CFS-F FX" for the penetration of cable tray. The test was conducted in accordance with BS 476: Part 20: 1987.
RED report no. R16L28-2A	4.3	Supporting test evidence for the use of the mineral wool boards with Hilti "CP670" fire safety coating for the penetration of cable tray through floor. The test was conducted in accordance with BS 476: Part 20: 1987.
RED report no. R16L28-2B	4.3	Supporting test evidence for the use of the mineral wool boards with Hilti "CP670" fire safety coating and the Hilti "CFS-F FX" for the penetration of cable tray through floor. The test was conducted in accordance with BS 476: Part 20: 1987.

### 3.2 Primary Test Evidences

#### 3.2.1 Warringtonfire Test Report No. WARRES 62305/A#

A fire resistance test stated to be utilising the general principles of BS 476: Part 20: 1987 in conjunction with additional guidelines from prEN 1366-3: 1993 to evaluate the fire resistance performance of Hilti CP636 fire prevention mortar with cable trays containing services item penetrating through under a wall mount situation was performance by the Warringtonfire testing laboratory on 1<sup>st</sup> August, 1994. The report was prepared for Hilti AG, the Hilti Entwicklungsgesellschaft mbH had given permission to use this data. In the test, the section of wall contained a 2,000 mm high by 1,200 mm wide aperture which was penetrated by various steel cable trays, either empty or supporting various electrical services. The aperture was sealed with a 150 mm thick layer of Hilti CP 636 Fire Prevention Mortar. The cable trays containing service items in the upper section of the aperture were additionally provided with a 0.5 mm thick coating of Hilti CP 611A fire Prevention Mastic within the thickness of the barrier. In addition three aperture were provided within CP 636 Mortar, and the other sealed with other products irrelevant to this assessment.

The specimens satisfied the performance requirements specified in BS 476: Part 20: 1987 for the following periods:

<b>Integrity:</b>	<b>151 Minutes</b>
<b>Insulation:</b>	<b>121 Minutes</b>

Note: An addendum to this report concludes that if the CP 655 Fire Prevention Bricks were not included in the construction and all serves were coated with CP 611A Fire Prevention Mastic within the thickness of the seal, the expected integrity performance would be 240 minutes.

The test was discontinued after a heating period of 240 minutes (See WARRES report no. 62305/A for full details).

#Note: the test data is more than five years old; we have reviewed this data against the current test procedures as per BS 476: Part 20: 1987 and found it suitable for this assessment.

### 3.2.2 Warringtonfire Test Report No. WARRES 62305/B#

A fire resistance test stated to be utilising the general principles of BS 476: Part 20: 1987 in conjunction with additional guidelines from prEN 1366-3: 1993 to evaluate the fire resistance performance of Hilti CP636 fire prevention mortar with cable trays containing services item penetrating through under a wall mount situation was performance by the Warringtonfire testing laboratory on 16<sup>th</sup> August, 1994. The report was prepared for Hilti AG, the Hilti Entwicklungsgesellschaft mbH had given permission to use this data.

In the test, the section of wall contained a 600 mm high by 600 mm wide aperture which was penetrated one 200 mm wide, one 300 mm wide and one 500 mm wide cable tray. The aperture was sealed with a 100 mm thick layer of Hilti CP 636 Fire Prevention Mortar. The cable trays containing various electrical cables, coated within the thickness of the barrier with additionally 0.5 mm thick coating of Hilti CP 611A fire Prevention Mastic. In addition, three apertures were provided within CP 636 Mortar, and the other sealed with other products irrelevant to this assessment.

The specimens satisfied the performance requirements specified in BS 476: Part 20: 1987 for the following periods:

<b>Integrity:</b>	<b>240 Minutes</b>
<b>Insulation:</b>	<b>86 Minutes</b>

The test was discontinued after a heating period of 240 minutes (See WARRES report no. 62305/B for full details).

#Note: the test data is more than five years old; we have reviewed this data against the current test procedures as per BS 476: Part 20: 1987 and found it suitable for this assessment.



### 3.2.3 WARRES Test Report No. 62305/C#

A fire resistance test stated to be utilising the general principles of BS 476: Part 20: 1987 in conjunction with additional guidelines from prEN 1366-3: 1993 to evaluate the fire resistance performance of Hilti CP636 fire prevention mortar with cable trays containing services item penetrating through under a wall mount situation was performance by the Warringtonfire testing laboratory on 16<sup>th</sup> August, 1994. The report was prepared for Hilti AG, the Hilti Entwicklungsgesellschaft mbH had given permission to use this data.

In the test, the section of wall contained a 600 mm high by 1,200 mm wide aperture which was penetrated one 200 mm wide, one 300 mm wide and one 500 mm wide cable tray. The aperture was sealed with a 185 mm thick layer of Hilti CP 636 Fire Prevention Mortar. The cable trays containing various electrical cables. In addition, three apertures were provided within CP 636 Mortar, and the other sealed with other products irrelevant to this assessment.

The specimens satisfied the performance requirements specified in BS 476: Part 20: 1987 for the following periods:

<b>Integrity:</b>	<b>240 Minutes</b>
<b>Insulation:</b>	<b>81 Minutes</b>

The test was discontinued after a heating period of 240 minutes (See WARRES report no. 62305/C for full details).

#Note: the test data is more than five years old; we have reviewed this data against the current test procedures as per BS 476: Part 20: 1987 and found it suitable for this assessment.

### 3.2.4 WARRES Test Report No. 62320#

A fire resistance test stated to be utilising the general principles of BS 476: Part 20: 1987 in conjunction with additional guidelines from prEN 1366-3: 1993 to evaluate the fire resistance performance of Hilti CP636 fire prevention mortar with cable trays containing services item penetrating through under a floor mount situation was performance by the Warringtonfire testing laboratory on 17<sup>th</sup> August, 1994. The report was prepared for Hilti AG, the Hilti Entwicklungsgesellschaft mbH had given permission to use this data.

In the test, the section of wall contained a 600 mm by 1,000 mm aperture which was penetrated with seven (7) nos. of cable trays. The aperture was sealed with a 150 mm thick layer of Hilti CP 636 Fire Prevention Mortar. The cable trays containing various electrical cables.

The specimens satisfied the performance requirements specified in BS 476: Part 20: 1987 for the following periods:

<b>Integrity:</b>	<b>180 Minutes</b>
<b>Insulation:</b>	<b>112 Minutes</b>

The test was discontinued after a heating period of 180 minutes (See WARRES report no. 62320 for full details).

#Note: the test data is more than five years old; we have reviewed this data against the current test procedures as per BS 476: Part 20: 1987 and found it suitable for this assessment.

### 3.2.5 WARRES Test Report No. 101728#

A fire resistance test stated to be in accordance with BS 476: Part 20: 1987 on eight different specimens of wall mounted sealings and one specimen of floor mounted sealings was performance by the Warringtonfire testing laboratory on 23<sup>rd</sup> April, 1998. The report was prepared for Hilti (Great Britain) Limited, the Hilti Entwicklungsgesellschaft mbH had given permission to use this data. In this assessment, only the floor mounted system was concerned.

The floor mounted specimen was installed within a 600 mm by 600 mm aperture with 150 mm thick autoclaved aerated concrete slabs. The aperture was fitted with the 50 mm thick "RW6" mineral wool on the exposed side and the 75 m thick Hilti CP636" fire prevention mortar on the unexposed side. Two cable trays, referenced "A" and "B", were penetrating through the specimen.

The specimens satisfied the performance requirements specified in BS 476: Part 20: 1987 for the following periods:

<b>Integrity:</b>	<b>240 Minutes</b>
<b>Insulation:</b>	<b>103 Minutes</b>

The test was discontinued after a heating period of 240 minutes (See WARRES report no. 101728 for full details).

#Note: the test data is more than five years old; we have reviewed this data against the current test procedures as per BS 476: Part 20: 1987 and found it suitable for this assessment.



### 3.2.6 RED Test Report No. R13C05#

A fire resistance test be in accordance with BS 476: Part 20: 1987 on seven different specimens of wall mounted penetration sealings was performance by the RED testing laboratory on 18th April, 2013. As requested by the test sponsor, the specimens were mounted within concrete lined specimen holder. Specimens 'A', 'B', 'D' and 'G' were asymmetrical and the fire side of specimens were determined by the test sponsor. Specimens 'C', 'E' and 'F' were symmetrical and only one side of the specimens were tested as per test sponsor's request.

Specimen 'A' had overall dimensions of 600 mm wide by 1,200 mm high. It was comprised of 2 nos. of nominal 110 mm diameter by 3.5 mm thick by 1,800 mm long PVC pipes, namely specimens 'A1' and 'A2', incorporated with 'Hilti 643N/ CP 644' firestop collars at both of the exposed and unexposed sides. The pipes were penetrated through a fire barrier which constructed by 2 layers of 50 mm thick mineral wool boards with density of 160 kg/m<sup>3</sup> with nominal 0.7 mm thick (dry thickness) 'Hilti CP 670' fire safety coating applied on both sides. Each pipe was supported by a pipe ring at unexposed side, which was fixed to a M12 steel rod located at 460 mm and 480 mm from the fire barrier for specimens 'A1' and 'A2' respectively. The M12 steel rods were in turn fixed to an external steel framework by M12 bolts and nuts. The external steel framework was constructed by 40 mm by 40 mm by 2.5 mm thick steel channels and fixed to the concrete lining of test rig by M12 anchor bolts. 'Hilti CP 606' flexible firestop sealant was applied at the gaps between the fire barrier and concrete lining of test rig.

Specimen 'B' had overall dimensions of 600 mm wide by 1,200 mm high. It was comprised of 2 nos. of nominal 150 mm diameter by 4.5 mm thick by 1,770 mm long G.M.S. pipes, namely specimens 'B1' and 'B2'. The pipes were penetrated through a fire barrier which constructed by 2 layers of 50 mm thick mineral wool boards with density of 160 kg/m<sup>3</sup> with nominal 0.7 mm thick (dry thickness) 'Hilti CP 670' fire safety coating applied on both sides. The pipes were supported by pipe rings at both sides, which were fixed to M12 steel. The M12 steel rods were in turn fixed to an external steel framework by M12 bolts and nuts. The external steel framework was constructed by 40 mm by 40 mm by 2.5 mm thick steel channels and fixed to the concrete lining of test rig by M12 anchor bolts. 'Hilti CP 606' flexible firestop sealant was applied at the gaps between the fire barrier and concrete lining of test rig.

Specimen 'C' had overall dimensions of 600 mm wide by 1,200 mm high. It was comprised of 2 layers of 50 mm thick mineral wool boards with density of 160 kg/m<sup>3</sup> with nominal 0.7 mm thick (dry thickness) 'Hilti CP 670' fire safety coating applied on both sides. 'Hilti CP 606' flexible firestop sealant was applied at the gaps between the fire barrier and concrete lining of test rig.

Specimen 'D' had overall dimensions of 600 mm wide by 1,200 mm high. It was comprised of 2 nos. of steel cable trays with electrical cables, namely specimens 'D1' and 'D2'. Specimen 'D1' was comprised of a 200 mm wide steel cable tray placed with 2 nos. of nominal 7 mm diameter electrical cables while specimen 'D2' was comprised of a 300 mm wide steel cable tray placed with 4 nos. of nominal 7 mm diameter electrical cables. The steel cable trays with electrical cables were penetrated through a fire barrier which constructed by 2 layers of 50 mm thick mineral wool boards with density of 160 kg/m<sup>3</sup> with nominal 0.7 mm thick (dry thickness) 'Hilti CP 670' fire safety coating applied on both sides. The steel cable trays with electrical cables were supported by an external steel framework which constructed by 25 mm by 25 mm by 1 mm thick steel angle bars located at 440

mm from the fire barrier. The external steel framework was fixed to the concrete lining of test rig by M12 anchor bolts. Nominal 250 mm coat back of 'Hilti CP 670' fire safety coating was applied on both of the exposed and unexposed sides of the steel cable trays with electrical cables. 'Hilti CP 606' flexible firestop sealant was applied at the gaps between the fire barrier and concrete lining of test rig.

Specimen 'E' had overall dimensions of 1,200 mm wide by 600 mm high. It was comprised of 2 layers of 50 mm thick mineral wool boards with density of 160 kg/m<sup>3</sup> with nominal 0.7 mm thick (dry thickness) 'Hilti CP 670' fire safety coating applied on both sides. 'Hilti CP 606' flexible firestop sealant was applied at the gaps between the fire barrier and concrete lining of test rig.

Specimen 'F' had overall dimensions of 525 mm wide by 295 mm high. It was comprised of 'Hilti FS657/ CP657' intumescent firestop bricks and each brick was with sizes of 130 mm by 50 mm by 200 mm.

Specimen 'G' had overall dimensions of 1,200 mm wide by 1,200 mm high. It was comprised of 2 nos. of steel cable trays with electrical cables, namely specimens 'G1' and 'G2'. Specimen 'G1' was comprised of a 200 mm wide steel cable tray placed with 2 nos. of 7 mm diameter electrical cables while specimen 'G2' was comprised of a 300 mm wide steel cable tray placed with 4 nos. of 7 mm diameter electrical cables. The steel cable trays with electrical cables were penetrated through a fire barrier which constructed by a layer of 50 mm thick mineral wool board with density of 160 kg/m<sup>3</sup> with nominal 35 mm thick 'Hilti CP 636' firestop mortar applied on both sides. The steel cable trays with electrical cables were supported by an external steel framework which constructed by 25 mm by 25 mm by 1 mm thick steel angle bars located at 440 mm from the fire barrier. The external steel framework was fixed to the concrete lining of test rig by M12 anchor bolts.

The specimens satisfied the performance requirements specified in BS 476: Part 20: 1987, for the following periods:

Specimens	Penetration services	Integrity	Insulation	Integrity	Insulation
Specimen 'A'	A1	264 Minutes	162 Minutes	264 Minutes	162 Minutes
	A2	264 Minutes	162 Minutes		
Specimen 'B'	B1	264 Minutes	18 Minutes	264 Minutes	18 Minutes
	B2	264 Minutes	19 Minutes		
Specimen 'C'	--	264 Minutes	151 Minutes	264 Minutes	151 Minutes
Specimen 'D'	D1	264 Minutes	198 Minutes	264 Minutes	60 Minutes
	D2	264 Minutes	60 Minutes		
Specimen 'E'	--	264 Minutes	155 Minutes	264 Minutes	155 Minutes
Specimen 'F'	--	229 Minutes	209 Minutes	229 Minutes	209 Minutes
Specimen 'G'	G1	264 Minutes	100 Minutes	264 Minutes	100 Minutes
	G2	264 Minutes	104 Minutes		

The test was discontinued after a period of 264 minutes (See RED report no. R13C05 for full details)

#Note: the test data is more than five years old; we have reviewed this data against the current test procedures as per BS 476: Part 20: 1987 and found it suitable for this assessment.



### 3.2.7 WARRES Test Report No. 124662#

A fire resistance test stated to be utilising the general principles of BS 476: Part 20: 1987 in conjunction with additional guidelines from prEN 1366-3: 1993 to evaluate the fire resistance performance of Hilti CP670 coating on both sides of mineral wool panel with cable trays penetrating through under a wall mount situation was performance by the Warringtonfire testing laboratory on 20<sup>th</sup> June, 2002. The report was prepared for Hilti Entwicklungsgesellschaft mbH, who had given permission to use this data.

In the test, the section of wall contained a 1,200 mm high by 1,800 mm wide aperture which was penetrating through various services. The aperture was sealed with two mineral wool panels with sizes of 600 mm wide by 1,200 mm high and 1,200 mm wide x 1,200 mm high, respectively. A vertical butt joint was incorporated. The mineral wool panel was 50 mm thick by 160 kg/m<sup>3</sup> coated with nominal 1 mm thick Hitli "CP670" fire safety coating on both sides. In the test, various services were penetrating through it, whilst only the results for the cable trays were concerned.

The specimens satisfied the performance requirements specified in BS 476: Part 20: 1987 for the following periods:

<b>Integrity:</b>	<b>125 Minutes</b> (for cable trays position only)
<b>Insulation:</b>	<b>60 Minutes</b> (for cable trays position only)

The test was discontinued after a heating period of 125 minutes (See WARRES report no. 124662 for full details).

#Note: the test data is more than five years old; we have reviewed this data against the current test procedures as per BS 476: Part 20: 1987 and found it suitable for this assessment.

### 3.2.8 WARRES Test Report No. 124663#

A fire resistance test stated to be utilising the general principles of BS 476: Part 20: 1987 in conjunction with additional guidelines from prEN 1366-3: 1993 to evaluate the fire resistance performance of Hilti CP670 coating on both sides of mineral wool panel with cable trays penetrating through under a wall mount situation was performance by the Warringtonfire testing laboratory on 4<sup>th</sup> July, 2002. The report was prepared for Hilti Entwicklungsgesellschaft mbH, who had given permission to use this data.

In the test, the wall assembly was formed by the internal steel channel section framework (30 mm thick) clad on both sides with 50 mm thick mineral wool panels coated with Hilti CP670 fire safety coating. The mineral wool panel was 50 mm thick by 160 kg/m<sup>3</sup> coated with nominal 1 mm thick Hilti "CP670" fire safety coating on both sides. In the test, various services were penetrating through it, whilst only the results for the cable trays (Specimens F, G, H, I, J, K and L) were concerned.

The specimens satisfied the performance requirements specified in BS 476: Part 20: 1987 for the following periods:

Specimen	Integrity	Insulation
F, G	211	136
H	213	146
I	213	108
J	213	105
K	213	123
L	213	101

The test was discontinued after a heating period of 240 minutes (See WARRES report no. 124663 for full details).

#Note: the test data is more than five years old; we have reviewed this data against the current test procedures as per BS 476: Part 20: 1987 and found it suitable for this assessment.



### 3.2.9 PAVUS Test Report No. Pr-03-02.086\*

Two fire resistance tests stated to be in accordance with BS EN 1363-1: 1999 and BS EN 1366-3: 2003 on a number of penetration services through the overall 100 mm thick mineral wool boards coated with dry thickness of 1 mm minimum Hilti CP 673 were performance by the Pavus testing laboratory on 21<sup>st</sup> and 22<sup>nd</sup> October, 2003. The report was prepared for Hilti AG, the Hilti Entwicklungsgesellschaft mbH had given permission to use this data.

In the test both the wall and floor supporting construction are identical. They are composed of two layers of 50 mm thick by 150 kg/m<sup>3</sup> mineral wool boards coated with dry thick 1mm of Hitli CP 673, it is as declared by the applicant, the Hilti CP 673 and CP 670 are the same product but with different brand name in different market. For the CP 673 with the mineral wool boards system, a total of 15 nos. of services were penetrating through it. This includes 5 cable trays and a number of individual cables.

The specimen satisfied the performance requirements specified in BS EN 1363-1: 1999 for the following periods:

<b>Integrity:</b>	<b>Cotton pad</b>	<b>125 Minutes</b>
	<b>Gap gauge</b>	<b>125 Minutes</b>
	<b>Sustained flaming</b>	<b>125 Minutes</b>
<b>Insulation:</b>		<b>122 Minutes</b>

The test was discontinued after a heating period of 125 minutes (See Pavus test report no. Pr-03-02.086 for full details).

\*Note: The test data is more than five years old; we have reviewed this data against the current test procedures as per BS EN 1366-3: 2003 and BS EN 1363-1: 1999 and found it suitable for this assessment.

### 3.2.10 RED Test Report No. R16L28-1#

A fire resistance test in accordance with BS 476: Part 20: 1987 on 7 nos, of penetration systems was performance by the RED testing laboratory on 20<sup>th</sup> January, 2017. The report was prepared for Hilti (Hong Kong) Limited. In this test report, only trunkings, speed sleeve and cable trays, namely specimens '2a', '2b', '3', '6', '8', '9' and '10', were considered. As requested by the test sponsor, the specimens were mounted within concrete line specimen holder. The specimens were symmetrical and only one side of specimen was tested as per test sponsor's request.

Specimen '2a' was comprised of a 100 mm by 100 mm by nominal 1 mm thick by 1,400 mm long trunking filled with 60% of 5 mm diameter 'CAT 6' cables. The cables were protected by 'CFS-BL' firestop blocks and 'CFS-F FX' firestop foam.

Specimen '2b' was comprised of a 100 mm by 100 mm by nominal 1 mm thick by 1,400 mm long trunking filled with 60% of 5 mm diameter 'CAT 6' cables. The cables were protected by 'CFS-BL' firestop blocks.

Specimen '3' was comprised of a 200 mm by 200 mm by nominal 1.2 mm thick by 1,400 mm long trunking filled with 60% of 5 mm diameter 'CAT 6' cables. The cables were protected by 'CFS-F FX' firestop foam.

Specimen '6' was comprised of a nominal 110 mm diameter 'CFS-SL' speed sleeve filled with 60% of 3 mm diameter AV cables.

Specimens '8', '9' and '10' were comprised of a fire barrier with sizes of 600 mm wide by 600 mm high, upper and lower cable trays with electrical cables. The upper and lower cable trays were with a separation of 250 mm. The upper and lower cable tray had a 250 mm wide by 1.2 mm thick and a 150 mm wide by 1.2 mm thick cable trays respectively. 3 nos. of 30 mm diameter 'Armoured Cable 35' and 3 nos. of 40 mm diameter 'Armoured Cable 70' electrical cables were incorporated into the upper and lower 250 mm wide by 1.2 mm thick cable tray respectively. The electrical cables were fixed to the cable tray by nominal 3 mm thick rings with 2 nos. of M5 bolts and nuts on both sides.

For specimen '8', the cable trays with electrical cables were penetrated through a fire barrier which constructed by a layer of 50 mm thick 'ROCKWOOL' mineral wool boards with density of 160 kg/m<sup>3</sup> with nominal 0.7 mm thick (dry thickness) 'Hilti CP 670' fire safety coating applied on both sides. For specimen '9', the cable trays with electrical cables were penetrated through a fire barrier which constructed by nominal 100 mm thick 'CFS-F FX' firestop foam. While for specimen '10', the cable trays with electrical cables were penetrated through a fire barrier which constructed by a layer of 50 mm thick 'ROCKWOOL' mineral wool boards with density of 100 kg/m<sup>3</sup> with nominal 15 mm thick 'FS-ONE MAX' intumescent firestop sealant applied on both sides.

The trunkings of specimens '2a', '2b' and '3', AV cables of specimen '6' and cable trays of specimen '8', '9' and '10' were fixed to 42 mm by 20 mm by 3 mm thick steel channels, located at 500 mm from the concrete wall, by M5 bolts and nuts on both sides. The steel channels were supported by an external steel framework constructed by 50 mm by 50 mm by 3 mm steel L-angles which in turn fixed to the concrete lining of test rig by 2 nos. of M10 anchor bolts.

The specimens satisfied the performance requirements specified in BS 476: Part 20: 1987 for the following periods:

	<b>Integrity</b>	<b>Insulation</b>
<b>Specimen '2a'</b>	<b>121 Minutes (No failure)</b>	N/A
<b>Specimen '2b'</b>	<b>121 Minutes (No failure)</b>	N/A
<b>Specimen '3'</b>	<b>121 Minutes (No failure)</b>	N/A
<b>Specimen '6'</b>	<b>121 Minutes (No failure)</b>	N/A
<b>Specimen '8'</b>	<b>121 Minutes (No failure)</b>	<b>38 Minutes</b>
<b>Specimen '9'</b>	<b>121 Minutes (No failure)</b>	<b>61 Minutes</b>
<b>Specimen '10'</b>	<b>121 Minutes (No failure)</b>	<b>42 Minutes</b>

The test was discontinued after a heating period of 121 minutes (See RED report no. R16L28-1B for full details).

#Note: the test data is more than five years old; we have reviewed this data against the current test procedures as per BS 476: Part 20: 1987 and found it suitable for this assessment.



### 3.2.11 RED Test Report No. R16L28-2A#

A fire resistance test in accordance with BS 476: Part 20: 1987 on 6 nos, of penetration systems was performance by the RED testing laboratory on 10<sup>th</sup> May, 2017. The report was prepared for Hilti (Hong Kong) Limited. In this test report, only trunking, speed sleeve and cable tray, namely specimens '2', '4a', '4b', '5b', '7' and '8', were considered. As requested by the test sponsor, the specimens were mounted within concrete line specimen holder. The specimens were symmetrical and only one side of specimens was tested as per test sponsor's request.

Specimen '2' was comprised of a fire barrier with sizes of 600 mm wide by 600 mm high, left and right cable trays with electrical cables. The left and right cable trays were with a separation of 200 mm. The left and right cable tray had a 250 mm wide by 1.2 mm thick and a 150 mm wide by 1.2 mm thick cable trays respectively. 3 nos. of 40 mm diameter 'Armoured Cable 70' and 3 nos. of 30 mm diameter 'Armoured Cable 35' electrical cables were incorporated into the left and right 250 mm wide by 1.2 mm thick cable tray respectively. The electrical cables were fixed to the cable tray by nominal 3 mm thick rings with 2 nos. of M5 bolts and nuts on both sides. The cable trays with electrical cables were penetrated through a fire barrier which constructed by 2 layers of 50 mm thick 'ROCKWOOL' mineral wool boards with density of 160 kg/m<sup>3</sup> with nominal 0.7 mm thick (dry thickness) 'Hilti CP 670' fire safety coating applied on both sides.

Specimen '4a' was comprised of a 200 mm by 200 mm by nominal 1.2 mm thick by 1,000 mm long trunking filled with 60% of 5 mm diameter 'CAT 6' cables. The cables were protected by nominal 200 mm thick 'CFS-F FX' firestop foam.

Specimen '4b' was comprised of a 200 mm by 200 mm by nominal 1.2 mm thick by 1,000 mm long trunking filled with 60% of 5 mm diameter 'CAT 6' cables. The cables were protected by nominal 150 mm thick 'CFS-F FX' firestop foam.

Specimen '5b' was comprised of a 100 mm by 100 mm by nominal 1 mm thick by 1,000 mm long trunking filled with 60% of 5 mm diameter 'CAT 6' cables. The cables were protected by nominal 150 mm thick 'CFS-F FX' firestop foam.

Specimen '7' was comprised of a nominal 110 mm diameter 'CFS-SL' speed sleeve filled with 60% of 3 mm diameter AV cables.

Specimen '8' was comprised of a nominal 110 mm diameter 'CFS-SL' speed sleeve and 25 mm wide 'CP648-E' fire wrap, filled with 60% of 3 mm diameter AV cables.

The trunkings of specimens '4a', '4b' and '5b', AV cables of specimens '7' and '8' and cable trays of specimen '2' were fixed to 50 mm by 50 mm by 3 mm thick steel brackets, located at 300 mm from the concrete floor, by M5 bolts and nuts on both sides. The steel brackets were supported by an external steel framework constructed by 50 mm by 50 mm by 3 mm steel brackets which in turn fixed to the concrete lining of test rig by 2 nos. of M10 anchor bolts.

The specimens satisfied the performance requirements specified in BS 476: Part 20: 1987 for the following periods:

	<b>Integrity</b>	<b>Insulation</b>
<b>Specimen '2'</b>	<b>241 Minutes (No failure)</b>	<b>85 Minutes</b>
<b>Specimen '4a'</b>	<b>241 Minutes (No failure)</b>	N/A
<b>Specimen '4b'</b>	<b>241 Minutes (No failure)</b>	N/A
<b>Specimen '5b'</b>	<b>241 Minutes (No failure)</b>	N/A
<b>Specimen '7'</b>	<b>241 Minutes (No failure)</b>	N/A
<b>Specimen '8'</b>	<b>241 Minutes (No failure)</b>	N/A

The test was discontinued after a heating period of 241 minutes (See RED report no. R16L28-2A for full details).

#Note: the test data is more than five years old; we have reviewed this data against the current test procedures as per BS 476: Part 20: 1987 and found it suitable for this assessment.

### 3.2.12 RED Test Report No. R16L28-2B#

A fire resistance test in accordance with BS 476: Part 20: 1987 on 4 nos, of penetration systems was performed by the RED testing laboratory on 10<sup>th</sup> May, 2017. The report was prepared for Hilti (Hong Kong) Limited. In this test report, only trunking and cable tray, namely specimens '1', '3a', '3b' and '6', were considered. As requested by the test sponsor, the specimens were mounted within concrete line specimen holder. The specimens were symmetrical and only one side of specimens was tested as per test sponsor's request.

Specimen '1' was comprised of a fire barrier with sizes of 1,000 mm wide by 1,000 mm high, left and right cable trays with electrical cables. The left and right cable trays were with a separation of 400 mm and had 2 nos. of 250 mm wide by 1.2 mm thick cable trays. 3 nos. of 40 mm diameter 'Armoured Cable 70' and 3 nos. of 30 mm diameter 'Armoured Cable 35' electrical cables were incorporated into one of the left and right 250 mm wide by 1.2 mm thick cable tray respectively. The electrical cables were fixed to the cable tray by nominal 3 mm thick rings with 2 nos. of M5 bolts and nuts on both sides. The cable trays with electrical cables were penetrated through a fire barrier which constructed by 2 layers of nominal 50 mm thick 'ROCKWOOL' mineral wool boards with density of 160 kg/m<sup>3</sup> with nominal 0.7 mm thick (dry thickness) 'Hilti CP 670' fire safety coating applied on both sides.

Specimen '3a' was comprised of a fire barrier with sizes of 600 mm wide by 600 mm high, left and right cable trays with electrical cables. The left and right cable trays were with a separation of 200 mm. The left and right cable tray had a 250 mm wide by 1.2 mm thick and a 150 mm wide by 1.2 mm thick cable trays respectively. 3 nos. of 40 mm diameter 'Armoured Cable 70' and 3 nos. of 30 mm diameter 'Armoured Cable 35' electrical cables were incorporated into the left and right 250 mm wide by 1.2 mm thick cable tray respectively. The electrical cables were fixed to the cable tray by nominal 3 mm thick rings with 2 nos. of M5 bolts and nuts on both sides. The cable trays with electrical cables were penetrated through a fire barrier which constructed by a layer of nominal 150 mm thick 'CFS-F FX' firestop foam at the unexposed side and a layer of nominal 50 mm thick 'ROCKWOOL' mineral wool boards with density of 100 kg/m<sup>3</sup> at the exposed side.

Specimen '3b' was comprised of a fire barrier with sizes of 600 mm wide by 600 mm high, left and right cable trays with electrical cables. The left and right cable trays were with a separation of 200 mm. The left and right cable tray had a 250 mm wide by 1.2 mm thick and a 150 mm wide by 1.2 mm thick cable trays respectively. 3 nos. of 40 mm diameter 'Armoured Cable 70' and 3 nos. of 30 mm diameter 'Armoured Cable 35' electrical cables were incorporated into the left and right 250 mm wide by 1.2 mm thick cable tray respectively. The electrical cables were fixed to the cable tray by nominal 3 mm thick rings with 2 nos. of M5 bolts and nuts on both sides. The cable trays with electrical cables were penetrated through a fire barrier which constructed by a layer of nominal 150 mm thick 'ROCKWOOL' mineral wool boards with density of 100 kg/m<sup>3</sup> with nominal 15 mm thick 'FS-ONE MAX' intumescent firestop sealant applied at the



unexposed side.

Specimen '6' was comprised of a 100 mm by 100 mm by nominal 1 mm thick by 1,000 mm long trunking filled with 60% of 5 mm diameter 'CAT 6' cables. The cables were protected by 'CFS-BL' firestop blocks and 'CFS-F FX' firestop foam.

The trunkings of specimen '6' and cable trays of specimens '1', '3a' and '3b' were fixed to 50 mm by 50 mm by 3 mm thick steel brackets, located at 300 mm from the concrete floor, by M5 bolts and nuts on both sides. The steel brackets were supported by an external steel framework constructed by 50 mm by 50 mm by 3 mm steel brackets which in turn fixed to the concrete lining of test rig by 2 nos. of M10 anchor bolts.

The specimens satisfied the performance requirements specified in BS 476: Part 20: 1987 for the following periods:

	<b>Integrity</b>	<b>Insulation</b>
<b>Specimen '1'</b>	<b>174 Minutes</b>	<b>82 Minutes</b>
<b>Specimen '3a'</b>	<b>177 Minutes</b>	<b>101 Minutes</b>
<b>Specimen '3b'</b>	<b>173 Minutes</b>	<b>96 Minutes</b>
<b>Specimen '6'</b>	<b>130 Minutes</b>	N/A

The test was discontinued after a heating period of 241 minutes (See RED report no. R16L28-2A for full details).

#Note: the test data is more than five years old; we have reviewed this data against the current test procedures as per BS 476: Part 20: 1987 and found it suitable for this assessment.



## 4 PROPOSAL & DISCUSSION

### 4.1 *The use of test evidence, which was tested in accordance with BS EN 1363-1: 1999, for the assessment of linear joint sealing system to BS 476: Part 20: 1987*

#### Proposal

It is proposed that the test evidence of PAVUS test report no. Pr-03-02.086 for the penetration seal systems, which were tested in accordance with BS EN 1363-1: 1999, is suitable for use in the assessment against BS 476: Part 20: 1987.

#### Discussion

The fire test on the penetration seal systems as tested and described in the above test evidence was carried out in accordance with BS EN 1363-1: 1999. In reviewing the test, we have considered the design and installation of the specimens, the surrounding construction, the initial furnace temperature, the pressure in the furnace, the changes in the integrity criteria and the behaviour of the fire test, it is expected that if this fire test had been conducted in accordance with BS 476: Part 20: 1987 very similar results would have been achieved.

Fire tests to BS EN 1363-1: 1999 and BS 476: Part 20: 1987 have the same furnace temperature-time curve, i.e., the standard ISO temperature time curve represented by  $T = 345 \log_{10}(8t + 1) + 20$ , where T is the furnace temperature rise and t is the time of heating conditions. However, a more severe overpressure requirement of 5 Pa required by BS EN 1363-1: 1999 was used, which was normally deemed to be more onerous. The passing criteria for the standards of BS EN 1363-1: 1999 and BS 476: Part 20: 1987 are summarised as follows:

**Integrity.** Monitor the unexposed face of the specimen for evaluation of integrity. A failure of the test construction to maintain integrity occurs when collapse or sustained flaming on the unexposed face occurs or impermeability is exceeded.

**Insulation.** Failure occurs when (a) the mean unexposed face temperature increases by more than 140 °C above its initial value; or (b) the temperature recorded at any position on the unexposed face is in excess of 180 °C above its initial value; or (c) when integrity failure occurs.

Having stated these criteria, there is no significant difference between the tests to BS EN and British standards. Since the integrity and insulation criteria of BS EN 1363-1: 1999 are basically the same, we can conservatively conclude that the linear joint sealing system as tested and described in PAVUS report no. Pr-03-02.086 will achieve fire resistance performance not worse than tested if test to BS 476: Part 20: 1987.

#### 4.2 The fire resistance performance of cable tray penetration sealing system through the Hilti CP636 firestop mortar with respect to BS 476: Part 20: 1987.

##### Proposal

It is proposed that Hilti CP636 firestop mortar may be used for the purpose of cable tray penetration sealing purpose under either the wall mounted or floor mounted situation. The required condition of the use of Hilti CP636 firestop mortar for various situation are as stated in the table below:

Table 1: Summary of the required condition of Hilti CP 636 for various FRR

Wall	Thickness	Aperture size		Integrity	Insulation
		Width	Height		
	100 mm	600 mm	600 mm	240	60
	150 mm	1,200 mm	2,000 mm	240	60
	150 mm	1,200 mm	2,000 mm	240	120 <sup>Note 1</sup>
	50 mm x 160 kg/m <sup>3</sup> mineral wool with 35 mm thick CP 636 on both sides (overall 120 mm thick)	1,200 mm	1,200 mm	240	60
Floor	150 mm	1,000 mm	600 mm	180	60
	75 mm CP 636 + 50 mm x 160 kg/m <sup>3</sup> wool on exposed side	600 mm	600 mm	240	60

Note1: Coat with 0.5 mm thickness of Hilti CP 611A intumescent firestop mastic around the cables over a distance of 30 mm length at the middle of the penetration.

The clear distance between the top and bottom of the cable trays within one aperture shall be at least 100 mm apart from each other, and there is no limitation impose to the cable trays arranged side by side at the same height level. In all cases, the cable tray shall be adequately supported same as that tested, such that the weight of the cables together with the cable tray will not be added to the penetration sealing.

The assessment is conducted against the integrity and insulation criteria with respect to BS 476: Part 20: 1987.

##### Discussion

The Hilti CP636 firestop mortar had been substantially tested under various evidence. In the test evidence WARRES 62305/B, the 100 mm thick Hilti CP636 had been used to seal up a 600 mm by 600 mm masonry wall aperture penetrated with three cable trays penetrating through, the cables are applied with 30 mm wide by 0.5 mm thick Hilti CP611A firestop intumescent sealant at the mid-depth of the aperture. The WARRES 62305/A describe the test of the 150 mm thick Hilti CP636 used to seal up a 1,200 mm wide by 2,000 mm high aperture with various services penetrating through it. The cable trays



at the upper section of the aperture were applied with 0.5 mm thick Hilti CP611A while the cable trays at the lower section of the aperture was not applied with the Hilti CP611A. The test result stated the integrity failed at 151 minutes and the insulation failed at 121 minutes.

In the test evidence WARRES 62304/C the 185 mm thick Hilti CP 636 had been used to seal up a 1,200 mm wide by 600 mm high masonry wall aperture penetrated with 5 cable trays. All the cable trays were not applied with the Hilti CP611A and the system had achieved 240 minutes integrity and 86 minutes insulation with respect to BS 476: Part 22: 1987.

The test evidence R13C05 described the test for various penetration sealing, while among these, the Specimen "G" was the sealing system composed of a 50 mm thick by 160 k/m<sup>3</sup> mineral wool system sandwiched by the 35 mm thick Hilti CP636 firestop mortar on both sides. The aperture sizes were 1,200 mm by 1,200 mm with two cable trays penetrating through it. The system had achieved 264 minutes integrity and 100 minutes.

In the test evidence WARRES 62320, the floor mounted specimen was constructed by the 150 mm thick Hilti CP636 firestop mortar within a 150 mm thick masonry floor. The aperture sizes for the Hilti CP636 mortar was 600 mm by 1,000 and a totally of 7 nos. of cable trays were penetrating though it. The system had achieved the fire resistance performance of 180 minutes integrity and 112 minutes insulation.

In the test evidence WARRES 101728, the floor mounted specimen was constructed by the 75 mm thick Hilti CP636 firestop mortar on the unexposed side backed with the 50 mm thick by mineral wool within a 600 mm by 600 mm masonry floor aperture. Immediately after the test, an evenly distributed dead load of approximately 150 kg was placed on the upper face of the floor mounted seal and left in place for a period of approximately 10 minutes without collapse. In this test report, no density of the mineral wool had been mentioned, therefore, it is assumed to be the same as that used in R13C05.

For the proposed conditions of the use of Hilti CP636 firestop mortar for various aperture sizes and fire resistance performance as given in Table 1 are referenced to the direct test evidence and the appraisal is therefore considered as positive. In all the tests, the cable trays are penetrating though the Hilti CP636 firestop mortar in various configuration, and most of them did not have significant deterioration of the fire resistance performance, except that the clear distance between the two height level of cable trays shall be at least 100 mm apart from each other is imposed as the only condition.

**4.3 The fire resistance performance of cable tray penetration sealing system through the mineral wool panel coated with Hilti CP670 fire safety coating with respect to BS 476: Part 20: 1987.**

Proposal

It is proposed that mineral wool panel coated with Hilti CP670 fire safety coating may be used for the purpose of cable tray penetration sealing purpose under either the wall mounted or floor mounted situation. The required condition of the use of Hilti CP670 fire safety coating and the required thickness of the mineral wool panel for various situation are as stated in the table below:

Table 2: Summary of the required condition of Hilti CP670 and mineral wool panel for various FRR

Wall	Thickness	Aperture size		Cables remark	Integrity	Insulation
		Width	Height			
	50 mm x 160 kg/m <sup>3</sup> with 0.7 mm thick CP670 on both sides	3,600 mm	2,000 mm	Nil	120	30
	50 mm x 160 kg/m <sup>3</sup> with 0.7 mm thick CP670 on both sides	3,600 mm	2,000 mm	Coated with CP670, 150 mm long extend from wall on both sides	120	60
	2 x 50 mm x 160 kg/m <sup>3</sup> with 0.7 mm thick CP 670 on both sides	3,600 mm	2,000 mm	Coated with CP670, 150 mm long extend from wall on both sides	240	120
Floor	2 x 50 mm x 160 kg/m <sup>3</sup> with 0.7 mm thick CP 670 on both sides	3,600 mm	2,000 mm	Nil	120	60
	2 x 50 mm x 160 kg/m <sup>3</sup> with 0.7 mm thick CP 670 on both sides	3,600 mm	2,000 mm	Coated with CP670, 150 mm long extend from wall on both sides	120	120
	2 x 50 mm x 160 kg/m <sup>3</sup> with 0.7 mm thick CP 670 on both sides	600 mm	600 mm	Nil	240	60

The clear distance between the top and bottom of the cable trays within one aperture shall be at least 100 mm apart from each other, and there is no limitation impose to the cable trays arranged side by side at the same height level. In all cases, the cable tray shall be adequately supported same as that tested,



such that the weight of the cables together with the cable tray will not be added to the penetration sealing.

The assessment is conducted against the integrity and insulation criteria with respect to BS 476: Part 20: 1987.

#### Discussion

The system composed of the mineral wool panel coated with the Hilti CP670 fire safety coating had been substantially tested under various evidence. In the test evidence WARRES 124662, the 50 mm thick by 160 kg/m<sup>3</sup> mineral wool panel coated with nominal 1 mm thick Hilti CP670 fire safety coating was used to seal up the 1,800 mm wide by 1,200 mm high wall aperture. Two mineral wool panels, one 600 mm wide by 1,200 mm high and one 1,200 mm wide by 1,200 mm high were butt jointed side by side. Three cable trays penetrated through it and the system had achieved 120 minutes integrity and 60 minutes insulation performance.

The test evidence WARRES 124663, the 30 mm thick steel frame clad with 50 mm thick by 160 kg/m<sup>3</sup> mineral wool on each side of the steel frame the exposed face of the panel was coated with nominal 1 mm thick Hilti CP670 fire safety coating. For the cable tray penetration, the specimen generally achieved the fire resistance of not less than 180 minutes integrity and 60 minutes insulation.

Test evidence PAVUS report no. Pr-03-02.086 described the test of the penetrating sealing system with aperture sizes of 1,000 mm x 2,000 mm for both the wall mounted and floor mounted situation. The system composed of two layers of 50 mm thick by 150 kg/m<sup>3</sup> mineral wool panels coated with 0.7 mm thick Hilti CP670 fire safety coating. The system had achieved an overall 125 minutes integrity and 122 minutes insulation performance.

In the test evidence of R16L28-1B, specimen 8 was the cable trays penetrating through a 600 mm by 600 mm system composed of 50 mm thick by 160 kg/m<sup>3</sup> mineral panel coated with nominal 0.7 mm thick Hilti CP670 on both sides. The system had achieved 121 minutes integrity and 38 minutes insulation.

The evidence R16L28-2A described the test of a specimen (referenced '2'), which was the cable tray penetrated through a 600 mm x 600 mm floor mounted Hilti CP670 system. The system composed of two layers of 50 mm thick by 160 kg/m<sup>3</sup> mineral wool panel coated with nominal 0.7 mm thick Hilti CP670 fire safety coating had achieved the fire resistance performance of 240 minutes integrity and 60 minutes insulation performance. While the test evidence R16L28-2B described the test on the specimen (referenced '1'), which was the cable tray penetrated through a 1,000 mm x 1,000 mm floor mounted Hilti CP 670 system, which was the same as the one that in R16L28-2A. The system had achieved the fire resistance performance of 174 minutes integrity and 82 minutes insulation.

In the proposed design of the CP670 systems, for the wall application, the sizes of the system is assessed to become 3,600 mm wide by 2,000 mm high. From the test evidence of wall application, the system with various configuration had been tested. The 2,000 high system was tested in the PAVUS report no. Pr-03-02.086. While the regarding the width of the system, the test evidence WARRES 124662, had been tested with the single layer mineral wool panels incorporation of the vertical butt joints. The test

evidence proved the present of the butt joint shall not deteriorate the tested fire resistance performance. The proposal to increase the width to 3,600 mm which involves three mineral panels of 1,200 mm wide incorporated with two vertical butt joints are still considered as the reasonable proven in the test evidence. The height of 2,000 mm are the tested maximum height and since the height would be a more critical dimension in terms of this type of sealing, therefore the proposed height shall remain the same as that tested. While regarding the insulation performance, the overall thickness of the mineral wool panels, and the application of extended coating on the cables are considered as improvement of the insulation performance as reflected in the test results. Therefore, for the system that requires 120 minutes, only the cables coated with the Hilti CP670 can achieved the 120 minutes insulation. For the system that requires 240 minutes and with the larger aperture sizes, minimum two layers of the 50 mm thick x 160 kg/m<sup>3</sup> mineral wool panels is suggested as referenced to the flooring situation in test evidence R16L28-2B. For the system in floor mounted situation, again, the maximum aperture sizes of 1,000 mm by 2,000 mm had been proven in the test evidence Pr-03-02.086, while the test evidence R16L28-2A and R16L28-2A also described the same systems achieved the fire resistance performance for floor-mounted situation. While in case the sealing aperture exceed 1,200 mm in width, additional framing shall be incorporated to provide adequate support to the system such that the short span of the system shall not exceed 1,200 mm. For all the floor system, two layers of 50 mm thick x 160 kg/m<sup>3</sup> mineral wool panels shall be used, and the two layers shall be staggered to each other with the overlapping distance of 400 mm. For the system requires 120 minutes insulation, the Hilti CP670 shall be applied to the cables as well. While in the floor situation, the aperture sizes of 600 mm x 600 mm sealed with two layers of 50 mm thick x 160 kg/m<sup>3</sup> mineral wool panels and coated with Hilti CP670 on both sides to achieve 240 minutes integrity and 60 minutes insulation is the application direct adopted the tested configuration.



#### 4.4 The fire resistance performance of cable tray penetration sealing system through the Hilti CFS-F FX firestop foam with respect to BS 476: Part 20: 1987.

##### Proposal

It is proposed that Hilti CFS-F FX firestop foam may be used for the purpose of cable tray penetration sealing purpose under either the wall mounted or floor mounted situation. The required condition of the use of Hilti CFS-F FX firestop foam for various situation are as stated in the table below:

Table 3: Summary of the required condition of Hilti CFS-F FX and mineral wool panel for various FRR

Wall	Thickness	Aperture size		Integrity	Insulation
		Width	Height		
	100 mm thick CFS-F FX firestop foam	600 mm	600 mm	120	60
Floor	150 mm thick CFS-F FX firestop foam on unexposed side and 50 mm x 100 kg/m <sup>3</sup> mineral wool on exposed side.	600 mm	600 mm	120	60

The clear distance between the top and bottom of the cable trays within one aperture shall be at least 100 mm apart from each other, and there is no limitation impose to the cable trays arranged side by side at the same height level. In all cases, the cable tray shall be adequately supported same as that tested, such that the weight of the cables together with the cable tray will not be added to the penetration sealing.

The assessment is conducted against the integrity and insulation criteria with respect to BS 476: Part 20: 1987.

##### Discussion

The system that used the Hilti CFS-F FX firestop foam for the sealing of apertures on the floor and wall application are as described in the test evidence RED report nos. R16L28-1B and R16L28-2B. In R16L28-1B, specimen '9' was the use of the Hilti CFS-F FX firestop foam sealing up the 600 mm x 600 mm aperture with the present of the cable trays penetrating through it. The system had achieved the fire resistance performance of 121 minutes integrity and 61 minutes insulation. While in the test R16L28-2B, the specimen 3a was the aperture sealing with overall sizes of 600 mm x 600 mm and constructed by 150 mm thick Hilti CFS-F FX firestop foam on the unexposed side and backed with a layer of 50 mm x 100 kg/m<sup>3</sup> mineral wool panel on the exposed side. The system had achieved the fire resistance performance of 177 minutes integrity and 101 minutes insulation.

For the proposed conditions of the use of Hilti FS-F FX firestop foam as given in Table 3, the applications are referenced to the direct test evidence and since there were no significant performance buffer achieved in the test. The appraisal scope is therefore directly adopted the tested condition only. In all the tests, the cable trays are penetrating though the system, and most of them did not have significant deterioration of the fire resistance performance, except that the clear distance between the two height level of cable trays shall be at least 100 mm apart from each other is imposed as the only condition.



*4.5 The fire resistance performance of cable trunking application penetrating through masonry wall with respect to BS 476: Part 20: 1987.*

Proposal

It is proposed that for the cable trunking penetration through masonry wall, the void inside the trunking may be filled by the use of Hilti CFS-F FX firestop foam or CFS-BL firestop block with the following conditions:

- (a) The maximum sizes of the trunking are up to 200 mm x 200 mm and shall be made of minimum 1mm thick steel, the sizes of the aperture may be up to 20 mm larger than the trunking. The clearance between the trunking and the supporting construction shall be sealed with minimum 10 mm deep Hilti "CP606" sealant on both sides of the wall, or at the unexposed side only for the floor mount situation;
- (b) For the use of Hilti CFS-BL firestop block, the filling of the cables may be up to 60% of the trunking sectional area only. The Hilti CFS-BL will be filled the rest of nominal 40% of the sectional area;
- (c) For the use of Hilti CFS-F FX firestop foam, the filling of the cables may be up to 60% of the trunking sectional area only. The Hilti CFS-F FX will be applied to the cables and filled up the rest of nominal 40% of the sectional area;

The cable trunking shall be supported by separate supporting system such that the weight of the trunking shall not be added to the sealant. The system shall be capable to satisfy 120 minutes integrity only performance with respect to BS 476: Part 20: 1987.

Discussion

The cable trunking systems penetrating through wall were tested under the test evidence R16L28-1B. Specimen referenced '2a', '2b' and '3' were the trunking specimen using either the Hilti CFS-BL and the CFS-F FX, the sizes of the trunkings were 100 mm x 100 mm and 200 mm x 200 mm. In all the specimens, the cables are filled up to 60% of the sectional area, and the rest of the 40% were filled with the Hilti CFS-BL and the CFS-F FX. The clearance between the trunking and the supporting construction shall be sealed with minimum 10 mm deep Hilti CP606 sealant on both sides of the wall. All three specimens had achieved the fire resistance performance of 120 minutes integrity with respect to BS476: Part 20: 1987.

The cable trunking systems penetrating through floor were tested under the test evidence R16L28-2B, in which the specimen '6' was a 100 mm x 100 mm cable trunking system. In the trunking, the cables are filled up to 60% of the sectional area, and the rest of the 40% were filled with the Hilti CFS-BL. The system had achieved 130 minutes integrity performance with respect to BS 476: Part 20: 1987.

For the performance that requires only the integrity performance, the expansion of the sealant to fill up the void for the required fire resistance duration is critical. In this case the 1 mm thick trunking is the metal that provide a rigid area for the forming for the expansion of the cable. The perimeter sealing with the use of the fire rated sealant is adequate as well. Based on this, the proposed design for the trunking sealing purpose is considered as acceptable.

## 5 CONCLUSION

The proposed use of Hilti CP636, CP670, CFS-F FX, and CFS-BL for electrical services penetration sealing systems through masonry wall or floor supporting construction as discussed in Section 4 of this report, are capable to maintain the fire resistance performance of up to 240 minutes integrity and various insulation performance with respect to BS 476: Part 20: 1987.

## 6 DECLARATION BY APPLICANT

We, Hilti (Hong Kong) Limited, confirm that the material, component or element of structure, which is the subject of the test report being reviewed, has not to our knowledge been subjected to another test to the standard against which the assessment is being made.

We agree to withdraw this assessment from circulation should the component or element of structure be the subject of another test to the standard against which the assessment is being made.

We are not aware of any information that could affect the conclusions of this assessment.

If we subsequently become aware of any such information we agree to ask the assessing authority to withdraw the assessment.

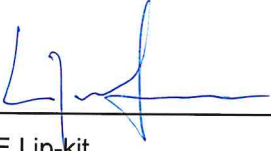
## 7 VALIDITY

This assessment is based on test data, experience and the information supplied. The assessment will be invalidated if the assessed construction is subsequently tested since actual test data is deemed to take precedence over an expressed opinion. Any changes in the specification of product will invalidate this assessment. This assessment relates only to the specimen assessed and does not by itself infer that the product is approved under any other endorsements, approval or certification scheme. Since the appraisal method is under development, the laboratory reserved the right to supersede this assessment in case the appraisal method had been changed.

This report only relates to the specimen(s) tested and may only be reproduced by the sponsor in full, without comment, abridgement and modifications.

## 8 SIGNATORIES

Assessment by:



---


Dr. SZE Lip-kit

Test Consultant

Research Engineering Development

Façade Consultants Limited

Reviewed by:



---

Ir Dr. YUEN Sai-wing, MHKIE (Fire)

Authorized Signature

Research Engineering Development

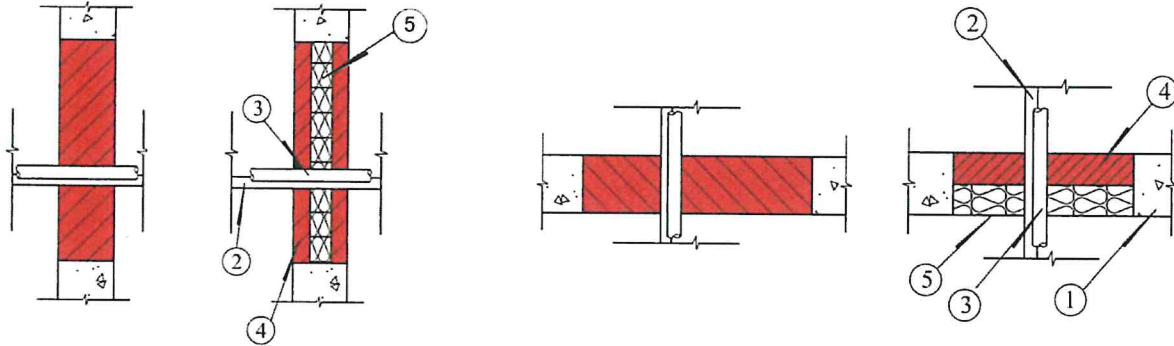
Façade Consultants Limited

**APPENDIX – DRAWINGS PROVIDED BY THE CLIENT**

Drawing refers to Table 1 on cable tray penetration application by using CP636

FLOOR CASE

WALL CASE

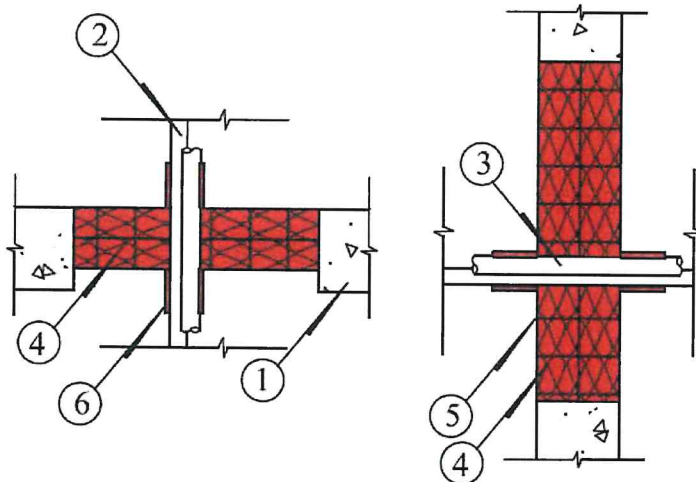


1. Concrete floor or wall assembly or fire-rated blockwall
2. Metal cable tray(s)
3. Cables
4. CP636
5. 50mm mineral wool board in 160 kg/m<sup>3</sup>
6. Minimum 150mm coat back of CP670 applied on both sides of the cable and cable tray penetration

Drawing refers to Table 2 on cable tray penetration application by using CP670

FLOOR CASE

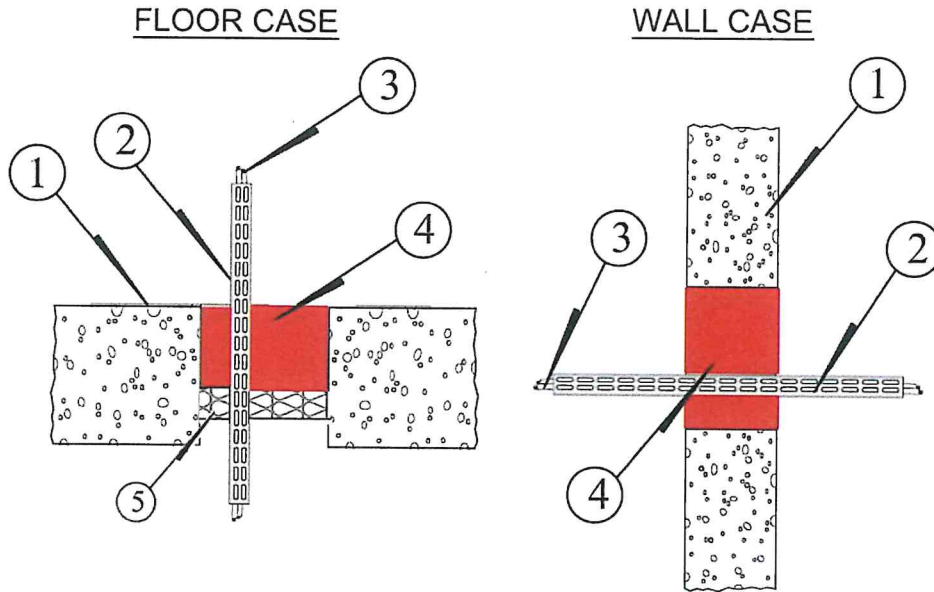
WALL CASE



1. Concrete floor or wall assembly or fire-rated blockwall
2. Metal cable tray(s)
3. Cables
4. Double layer (50mm thickness each) mineral wool board in 160 kg/m<sup>3</sup>
5. Minimum 0.7mm dry thickness of CP670 applied on both sides of the mineral wool board
6. Minimum 150mm coat back of CP670 applied on both sides of the cable and cable tray penetration

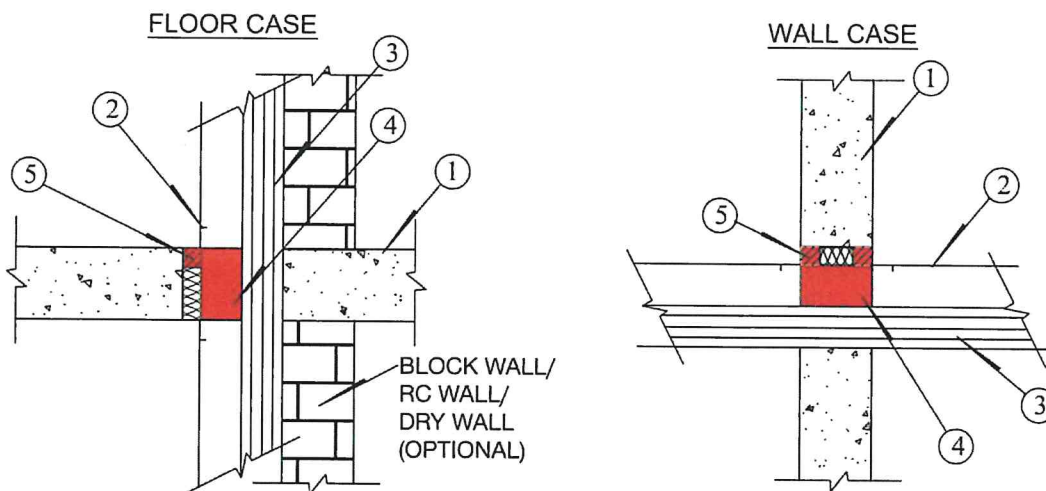


Drawing refers to Table 3 on cable tray penetration application by using CFS-F FX



1. Concrete floor or wall assembly or fire-rated blockwall
2. Metal cable tray(s)
3. Cables
4. CFS-F FX
5. 50 mm mineral wool in 100 kg/m<sup>3</sup> on exposed side

Drawing refers to Section 4.5 on cable trunking application by using CFS-BL or CFS-F FX



1. Concrete floor or wall assembly or fire-rated blockwall
2. 200mm x 200mm metal trunking
3. Filling of the cables up to 60% of the trunking sectional area only
4. CFS-F FX or CFS-BL
5. Fill the void by mineral wool with CP606 when annular space ≤ 30mm

- End of Report -





88 Empire Drive • St. Paul, Minnesota • 55103  
(651) 642-1150 • fax (651) 642-1239

## VOC Content Test Certificate

August 25, 2020

Supplier: Hilti Entwicklungsgesellschaft mbH  
BU Chemicals  
Hiltistrasse 6  
86916 Kaufering  
GERMANY

Sample Description: Hilti CFS-F FX

Date Tested: August 20, 2020

Test Method: SCAQMD method 304-91 "Determination of Volatile Organic Compounds (VOC) in Various Materials" as referenced by South Coast Air Quality Management District (SCAQMD) Rule 1168. The values also comply with the requirements of EPA test method #24.

Test Data:

Specification	Product
<b>LEED 4.1</b> Low-Emitting Materials – Adhesives and Sealants	<b>CFS-F FX</b>
<b>Green Building Council of Australia</b> Green Star Office Design 3.0, IEQ-13 Green Star Office Design 2.0, IEQ-13 Green Star Office Interiors 1.1, IEQ-11	
<b>Foam Sealant</b> <b>VOC Limit: 250 g/L</b>	<b>Product contains: 26 g/L of VOC</b>

---

Tom Barrett  
*Vice President/Strategic Analytical Services*

Hilti (Hong Kong) Ltd.  
Unit 3 5/F Harbour Centre Tower 2  
8 Hok Cheung Street Hung Hom  
Kowloon

26 May 1994  
Handwritten initials and marks

Dear Sirs,

Fire Resisting Penetration Sealing System  
As Supplied By Hilti (GB) Ltd.

Thank you for your letters dated 4.3.94 and 27.4.94 and the accompanying test/assessment reports on the above. You are asking for comments on the acceptability of the fire resisting product in the context of relevant provisions of the Buildings Ordinance, Chapter 123 of the Law of Hong Kong and its subsidiary legislation.

Under the Buildings Ordinance, "authorized persons" (i.e. architects, engineers or surveyors registered with the Building Authority) are required to supervise building works including the selection and installation of fire resisting products and to certify compliance with the Buildings Ordinance upon completion of works. Authorized persons are therefore responsible for ensuring the safety requirements inter alia of fire resisting products in the building projects which they have been appointed by the developer to coordinate and supervise.

In establishing the acceptability of fire resisting products, reference may be made to the performance standards laid down in Building (Construction) Regulation 90, the current Code of Practice for Fire Resisting Construction issued by the Building Authority and British Standard 476: Parts 20 to 24. Reliance may also be placed on the test/assessment report prepared by a recognized laboratory or an equivalent establishment.

The Buildings Department has a list of recognized laboratories. This is available for reference at our office :

Technical Administration (Building) Unit  
Buildings Department  
11/F Murray Building  
Garden Road Hong Kong

Before fire resisting products are installed in a building project, the authorized person appointed for the project should be approached for advice and guidance.

Your test/assessment reports are returned herewith. In this respect, please note that paragraph 3 of my letter dated 25 January 1994 is no longer applicable. The delay in replying is regretted.

Yours faithfully,

(Patrick H. Tsui)  
Technical Secretary/Building  
for Director of Buildings

消防處  
防火組  
香港九龍尖沙咀東部康莊道1號  
消防總部大廈



FIRE SERVICES DEPARTMENT,  
FIRE PROTECTION BUREAU,  
FIRE SERVICES HEADQUARTERS BUILDING,  
No. 1 Hong Chong Road,  
Tsim Sha Tsui, East, Kowloon,  
Hong Kong.

本處檔號 Our Ref.: FPB 207/0005  
來函檔號 Your Ref.: L026/92HK  
電訊掛號 Telex: 39607 HKFSD HX } (24 小時 Hours)  
圖文傳真 Fax: 852-3110066 }  
852-3689744 }  
電話 Tel. No.: 733 7596

29 April 1992

Hilti (Hong Kong) Ltd.,  
Unit 3, 5/F, Harbour Centre,  
Tower 2,  
8 Hok Cheung Street,  
Hung Hom, Kowloon.

Dear Sirs,

"HILTI" Fire Prevention System

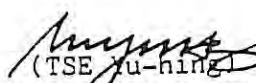
I refer to your letter of 30.3.92 and the enclosures attached thereto.

Based on the information contained in your letter under reference and the given test report, I understand that the captioned product is a building material which should be approved by the Director of Buildings and Lands. As such, I am not in a position to process your application and you are advised to refer your enquiry to the Director of Buildings and Lands, whose address is listed hereunder :-

The Director of Buildings and Lands,  
(Attn.: Technical Secretary/Building, B.O.O.)  
Murray Building,  
Garden Road,  
Central,  
Hong Kong.

Please feel free to contact us should you have any other question in this matter.

Yours faithfully,

  
(TSE Yu-hing)  
for Director of Fire Services

TYH/jt





# ARCHITECTURAL SERVICES DEPARTMENT 建築署

QUEENSWAY GOVERNMENT OFFICES, 66 QUEENSWAY, HONG KONG. 香港金鐘道六十六號金鐘道政府合署  
FAX 852-2869 0289

Our Ref : ASD 16/92101/AML/APP  
Your Ref. : -----  
Tel. No. : 2867 3631  
Fax No. : 2877 0594

06 June 1997

Hilti (HK) Ltd  
17/F, Tower 6, China HK City,  
33 Canton Rd., TST

Dear Sirs,

**Architectural Services Department**  
**List of Acceptable Materials**  
**Hilti Firestop Products**  
**Ref. no. 0001P**

I am pleased to inform you that approval has been given to include the above product/material in this Department's List of Acceptable Materials. Initially, this listing is for a probationary status and this will be reviewed after the submission of satisfactory performance reports on completion of projects undertaken by this Department where your product has been used.

The Architectural Services Department List of Acceptable Materials is a restricted internal document. This letter should not be used for commercial or marketing purposes and failure to comply with this may result in the removal of the product from the List.

Yours faithfully,

( W.M. TANG )  
Technical Secretary/2  
for Chief Architect/ Central Management Branch  
Architectural Services Department

Attn. : To whom it may concern

Date : 26 September 2023  
Ref. : 100/FP/DY/23

Subject : Country of Origin- Hilti CFS-F FX Flexible Firestop Foam

Dear Sir / Madam,

Enclosed please find the information of Hilti CFS-F FX Flexible Firestop Foam.

Brand Name : Hilti

Model Name : Hilti CFS-F FX Flexible Firestop Foam

Manufacturer : Hilti Corporation

Address of Manufacturer : FL-9494, Principality of Liechtenstein.

Manufacturer Contact Person : Dennis Yeung

Supplier : Hilti (Hong Kong) Ltd

Address of Supplier : 701-704, 7/F, Tower A, Manulife Financial Centre,  
223 Wai Yip Street, Kwun Tong, Kowloon, Hong Kong

Supplier Contact Person : Dennis Yeung (+852 9723 4621)

Country of Origin : Germany

Should you have further questions, please do not hesitate to contact our Technical Representatives, Customer Service Hotline at 8228-8118, or email us at [hksales@hilti.com](mailto:hksales@hilti.com).

Yours faithfully,



Dennis Yeung  
Head of Product Leadership Strategy, F&P

**Hilti (Hong Kong) Ltd.**  
701-704 | Tower A | Manulife Financial Centre  
223 Wai Yip Street | Kwun Tong  
Kowloon | Hong Kong  
P +852-8228 8118 | F +852-2954 1751  
[www.hilti.com.hk](http://www.hilti.com.hk)

Ref. no : 040/FP/HY/24  
Date : 14 Mar 2024

**Subject : Hilti CFS-F FX Flexible Firestop Foam – LEED Information**

To whom it may concern,

- The Hilti CFS-F FX Flexible Firestop Foam is manufactured in Germany.
- The Package of the Hilti CFS-F FX Flexible Firestop Foam can be completely recycled.
- There is no recycled content in the Hilti CFS-F FX Flexible Firestop Foam and it cannot be recycled.
- The Hilti CFS-F FX Flexible Firestop Foam does not share any rapidly renewable materials.
- The VOC content of the Hilti CFS-F FX Flexible Firestop Foam is 26 g/l.

If you would like to know more about Hilti solutions for LEED buildings or should you have any further questions, please do not hesitate to contact our Customer Service Hotline at 8228-8118 or email us at [hksales@hilti.com](mailto:hksales@hilti.com).

Yours faithfully,



Howard Yip  
Assistant Product Portfolio Manager  
Hilti (Hong Kong) Ltd.



**To whom it may concern**

Date: 8<sup>th</sup> March 2017

Ref: 023/FPDW/17

Attention: To whom it may concern

Dear Sir / Madam,

**Subject: Hilti Firestop Products non-CFC and Ozone Confirmation**

Referring to your enquiry about the captioned subject, please be advised that:

Hilti firestop product, CFS-F FX Firestop Foam is free of CFC, HCFC nor other ozone depletion elements.

CFC, HCFC and ozone depletion elements were not used during the product process neither.

Should you have further questions, please do not hesitate to contact our Technical Representatives or Customer Service Hotline at 8228-8118.

Yours sincerely,



Dorothy Wai  
Product Manger

# CFS-F FX / CP 660

## Safety information for 2-Component-products

Date of issue: 18/12/2017

Revision date: 18/12/2017

Supersedes: 08/11/2017

Version: 6.0

### SECTION 1: Kit identification

#### 1.1 Product identifier

Trade name

CFS-F FX / CP 660



Product code

BU Fire Protection

#### 1.2 Details of the supplier of the Safety information for 2-Component-products

Hilti (Hong Kong) Ltd.  
701-704, 7/F, Tower A, Manulife Financial Centre  
223 Wai Yip Street, Kwun Tong  
Kowloon - Hong Kong  
T +852 27734 700  
[hksales@hilti.com](mailto:hksales@hilti.com)

### SECTION 2: General information

A SDS for each of these components is included. Please do not separate any component SDS from this cover page

### SECTION 3:

#### Classification of the Product

##### Classification according to the United Nations GHS (Rev. 4, 2011)

Acute Tox. 4 (Inhalation)	H332
Skin Irrit. 2	H315
Eye Irrit. 2A	H319
Resp. Sens. 1	H334
Skin Sens. 1	H317
Carc. 2	H351
STOT SE 3	H335
STOT RE 2	H373

#### Label elements

##### Labelling according to the United Nations GHS (Rev. 4, 2011)

Hazard pictograms (GHS-UN)



GHS07

GHS08

Signal word (GHS-UN)

Danger

Hazardous ingredients

4,4'-diphenylmethanediisocyanate, isomeres and homologues; 2-octyl-2H-isothiazol-3-one; Ethylenediamine, ethoxylated and propoxylated

Hazard statements (GHS-UN)

H315 - Causes skin irritation.  
H317 - May cause an allergic skin reaction.  
H319 - Causes serious eye irritation.  
H332 - Harmful if inhaled.

# CFS-F FX / CP 660

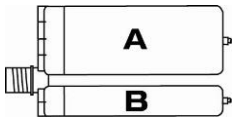
## Safety information for 2-Component-products

### Precautionary statements (GHS-UN)

H334 - May cause allergy or asthma symptoms or breathing difficulties if inhaled.  
 H335 - May cause respiratory irritation.  
 H351 - Suspected of causing cancer.  
 H373 - May cause damage to organs through prolonged or repeated exposure.

P260 - Do not breathe vapours.  
 P280 - Wear eye protection, protective clothing, protective gloves.  
 P284 - [In case of inadequate ventilation] wear respiratory protection.  
 P302+P352 - IF ON SKIN: Wash with plenty of water.  
 P305+P351+P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.  
 P342+P311 - If experiencing respiratory symptoms: Call a doctor, a POISON CENTER.

### Additional information



Name	General description	Quantity	Unit	Classification according to the United Nations GHS
CFS-F FX, B / CP 660, B		1	pcs	Acute Tox. 4 (Inhalation:dust,mist), H332 Skin Irrit. 2, H315 Eye Irrit. 2A, H319 Resp. Sens. 1, H334 Skin Sens. 1, H317 Carc. 2, H351 STOT SE 3, H335 STOT RE 2, H373
CFS-F FX, A / CP 660, A		1	pcs	Skin Sens. 1, H317

### SECTION 4: General advice

General advice For professional users only

### SECTION 5: Safe handling advice

Environmental precautions Avoid release to the environment.  
 Storage conditions Store in a well-ventilated place.  
 Keep cool.  
 Precautions for safe handling Do not handle until all safety precautions have been read and understood.  
 Wear personal protective equipment  
 Do not breathe vapours.  
 Use only outdoors or in a well-ventilated area.  
 Avoid contact with skin and eyes  
 In case of inadequate ventilation wear respiratory protection.  
 Methods for cleaning up Take up liquid spill into absorbent material  
 Notify authorities if product enters sewers or public waters

### SECTION 6: First aid measures

First-aid measures after eye contact Rinse cautiously with water for several minutes.  
 Remove contact lenses, if present and easy to do. Continue rinsing.  
 If eye irritation persists: Get medical advice/attention.  
 First-aid measures after ingestion Call a poison center or a doctor if you feel unwell  
 First-aid measures after inhalation Remove person to fresh air and keep comfortable for breathing.  
 Call a poison center or a doctor if you feel unwell  
 First-aid measures after skin contact Wash with plenty of water/...  
 If skin irritation or rash occurs: Get medical advice/attention.  
 Take off contaminated clothing.

# CFS-F FX / CP 660

## Safety information for 2-Component-products

---

First-aid measures general	If you feel unwell, seek medical advice (show the label where possible)
Symptoms/effects after eye contact	Eye irritation
Symptoms/effects after inhalation	May cause respiratory irritation. May cause allergy or asthma symptoms or breathing difficulties if inhaled.
Symptoms/effects after skin contact	Irritation May cause an allergic skin reaction.
Other medical advice or treatment	Treat symptomatically

### SECTION 7: Fire fighting measures

Protection during firefighting	Self-contained breathing apparatus Complete protective clothing
Hazardous decomposition products in case of fire	Toxic fumes may be released Carbon dioxide Carbon monoxide

### SECTION 8: Other information

No data available



# CFS-F FX, A / CP 660, A

## Safety Data Sheet

according to the United Nations GHS (Rev. 4, 2011)

Date of issue: 19/12/2017

Version: 6.0

Revision date: 19/12/2017

Supersedes: 08/11/2017

### SECTION 1: Identification of the substance/mixture and of the company/undertaking

#### 1.1. Product identifier

Product form	Mixture
Trade name	CFS-F FX, A / CP 660, A
Product code	BU Fire Protection

#### 1.2. Relevant identified uses of the substance or mixture and uses advised against

Use of the substance/mixture	Firestop foam
------------------------------	---------------

#### 1.3. Details of the supplier of the safety data sheet

Hilti (Hong Kong) Ltd.  
701-704, 7/F, Tower A, Manulife Financial Centre  
223 Wai Yip Street, Kwun Tong  
Kowloon - Hong Kong  
T +852 27734 700  
[hksales@hilti.com](mailto:hksales@hilti.com)

#### Supplier

Hilti (Hong Kong) Ltd.  
701-704, 7/F, Tower A, Manulife Financial Centre  
223 Wai Yip Street, Kwun Tong  
Kowloon - Hong Kong  
T +852 27734 700  
[hksales@hilti.com](mailto:hksales@hilti.com)

#### Department issuing data specification sheet

Hilti AG  
Feldkircherstraße 100  
9494 Schaan - Liechtenstein  
T +423 234 2111  
[chemicals.hse@hilti.com](mailto:chemicals.hse@hilti.com)

#### 1.4. Emergency telephone number

Emergency number	Schweizerisches Toxikologisches Informationszentrum – 24h Service +41 44 251 51 51 (international) +852 27734 700
------------------	---

### SECTION 2: Hazards identification

#### 2.1. Classification of the substance or mixture

##### Classification according to the United Nations GHS (Rev. 4, 2011)

Skin Sens. 1	H317
Full text of hazard classes and H-statements : see section 16	

#### 2.2. Label elements

##### Labelling according to the United Nations GHS (Rev. 4, 2011)

Hazard pictograms (GHS-UN)



GHS07

Signal word (GHS-UN)

Warning

Hazardous ingredients

Ethylenediamine, ethoxylated and propoxylated

Hazard statements (GHS-UN)

H317 - May cause an allergic skin reaction.

Precautionary statements (GHS-UN)

P280 - Wear eye protection, protective clothing, protective gloves.  
P302+P352 - IF ON SKIN: Wash with plenty of water.

# CFS-F FX, A / CP 660, A

## Safety Data Sheet

according to the United Nations GHS (Rev. 4, 2011)

### 2.3. Other hazards

No additional information available

## SECTION 3: Composition/information on ingredients

### 3.1. Substances

Not applicable

### 3.2. Mixtures

Name	Product identifier	%	Classification according to the United Nations GHS
Ethylenediamine, propoxylated	(CAS-No.) 25214-63-5	2.5 - 5	Eye Irrit. 2A, H319
Ethylenediamine, ethoxylated and propoxylated	(CAS-No.) 26316-40-5	2.5 - 5	Eye Irrit. 2A, H319 Skin Sens. 1, H317

Full text of H-statements: see section 16

## SECTION 4: First aid measures

### 4.1. Description of first aid measures

First-aid measures after inhalation	Remove person to fresh air and keep comfortable for breathing.
First-aid measures after skin contact	Wash skin with plenty of water. Take off contaminated clothing. If skin irritation or rash occurs: Get medical advice/attention.
First-aid measures after eye contact	Remove contact lenses, if present and easy to do. Continue rinsing. Rinse cautiously with water for several minutes. If eye irritation persists: Get medical advice/attention.
First-aid measures after ingestion	Call a poison center or a doctor if you feel unwell.

### 4.2. Most important symptoms and effects, both acute and delayed

Symptoms/effects after skin contact	May cause an allergic skin reaction.
-------------------------------------	--------------------------------------

### 4.3. Indication of any immediate medical attention and special treatment needed

Treat symptomatically.

## SECTION 5: Firefighting measures

### 5.1. Extinguishing media

Suitable extinguishing media	Water spray. Dry powder. Foam. Carbon dioxide.
------------------------------	--

### 5.2. Special hazards arising from the substance or mixture

No additional information available

### 5.3. Advice for firefighters

Protection during firefighting	Self-contained breathing apparatus. Complete protective clothing.
--------------------------------	---



# CFS-F FX, A / CP 660, A

## Safety Data Sheet

according to the United Nations GHS (Rev. 4, 2011)

Skin and body protection

Wear suitable protective clothing

Respiratory protection

Not necessary with sufficient ventilation



### 8.4. Exposure limit values for the other components

No additional information available

## SECTION 9: Physical and chemical properties

### 9.1. Information on basic physical and chemical properties

Physical state	Liquid
Colour	red.
Odour	No data available
Odour threshold	No data available
pH	Not determined
Relative evaporation rate (butylacetate=1)	No data available
Melting point	Not applicable
Freezing point	No data available
Boiling point	No data available
Flash point	Not applicable.
Auto-ignition temperature	No data available
Decomposition temperature	No data available
Flammability (solid, gas)	Not applicable
Vapour pressure	No data available
Relative vapour density at 20 °C	No data available
Relative density	No data available
Density	≈ 1.17 g/cm <sup>3</sup>
Solubility	No data available
Log Pow	No data available
Viscosity, kinematic	No data available
Viscosity, dynamic	No data available
Explosive properties	No data available
Oxidising properties	No data available
Explosive limits	No data available

### 9.2. Other information

No additional information available

## SECTION 10: Stability and reactivity

### 10.1. Reactivity

The product is non-reactive under normal conditions of use, storage and transport.

### 10.2. Chemical stability

Stable under normal conditions.



# CFS-F FX, A / CP 660, A

## Safety Data Sheet

according to the United Nations GHS (Rev. 4, 2011)

### 10.3. Possibility of hazardous reactions

No dangerous reactions known under normal conditions of use.

### 10.4. Conditions to avoid

None under recommended storage and handling conditions (see section 7).

### 10.5. Incompatible materials

No additional information available

### 10.6. Hazardous decomposition products

Under normal conditions of storage and use, hazardous decomposition products should not be produced.

## SECTION 11: Toxicological information

### 11.1. Information on toxicological effects

Acute toxicity (oral)	Not classified
Acute toxicity (dermal)	Not classified
Acute toxicity (inhalation)	Not classified
Skin corrosion/irritation	Not classified
Serious eye damage/irritation	pH: Not determined Not classified pH: Not determined
Respiratory or skin sensitisation	May cause an allergic skin reaction.
Germ cell mutagenicity	Not classified
Carcinogenicity	Not classified
Reproductive toxicity	Not classified
STOT-single exposure	Not classified
STOT-repeated exposure	Not classified
Aspiration hazard	Not classified

## SECTION 12: Ecological information

### 12.1. Toxicity

Ecology - general	The product is not considered harmful to aquatic organisms nor to cause long-term adverse effects in the environment.
Acute aquatic toxicity	Not classified
Chronic aquatic toxicity	Not classified

### 12.2. Persistence and degradability

No additional information available

### 12.3. Bioaccumulative potential

No additional information available

### 12.4. Mobility in soil

No additional information available

# CFS-F FX, A / CP 660, A

## Safety Data Sheet

according to the United Nations GHS (Rev. 4, 2011)

### 12.5. Other adverse effects

Ozone Not classified  
 Other adverse effects No additional information available

## SECTION 13: Disposal considerations

### 13.1. Waste treatment methods

Product/Packaging disposal recommendations Dispose in a safe manner in accordance with local/national regulations.

## SECTION 14: Transport information

In accordance with ADR / RID / IMDG / IATA / ADN

ADR	IMDG	IATA	RID
<b>14.1. UN number</b>			
Not regulated for transport			
<b>14.2. UN proper shipping name</b>			
Not applicable	Not applicable	Not applicable	Not applicable
<b>14.3. Transport hazard class(es)</b>			
Not applicable	Not applicable	Not applicable	Not applicable
Not applicable	Not applicable	Not applicable	Not applicable
<b>14.4. Packing group</b>			
Not applicable	Not applicable	Not applicable	Not applicable
<b>14.5. Environmental hazards</b>			
Dangerous for the environment : No	Dangerous for the environment : No Marine pollutant : No	Dangerous for the environment : No	Dangerous for the environment : No
No supplementary information available			

### 14.6. Special precautions for user

- Overland transport

- Transport by sea

No data available

- Air transport

No data available

- Rail transport

Carriage prohibited (RID) No

### 14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code



# CFS-F FX, A / CP 660, A

## Safety Data Sheet

according to the United Nations GHS (Rev. 4, 2011)

### SECTION 15: Regulatory information

#### 15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

No additional information available

### SECTION 16: Other information

SDS Major/Minor	None
Date of issue	19/12/2017
Revision date	19/12/2017
Supersedes	08/11/2017

Indication of changes:

Section	Changed item	Change	Comments
2.2	Precautionary statements (GHS-UN)	Modified	

Full text of H-statements:

H317	May cause an allergic skin reaction.
H319	Causes serious eye irritation.

SDS\_UN\_Hilti

*This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product*

# CFS-F FX, B / CP 660, B

## Safety Data Sheet

according to the United Nations GHS (Rev. 4, 2011)

Date of issue: 18/12/2017

Version: 6.0

Revision date: 18/12/2017

Supersedes: 08/11/2017

### SECTION 1: Identification of the substance/mixture and of the company/undertaking

#### 1.1. Product identifier

Product form	Mixture
Trade name	CFS-F FX, B / CP 660, B
Product code	BU Fire Protection

#### 1.2. Relevant identified uses of the substance or mixture and uses advised against

Use of the substance/mixture	Firestop foam
------------------------------	---------------

#### 1.3. Details of the supplier of the safety data sheet

Hilti (Hong Kong) Ltd.  
701-704, 7/F, Tower A, Manulife Financial Centre  
223 Wai Yip Street, Kwun Tong  
Kowloon - Hong Kong  
T +852 27734 700  
[hksales@hilti.com](mailto:hksales@hilti.com)

#### Supplier

Hilti (Hong Kong) Ltd.  
701-704, 7/F, Tower A, Manulife Financial Centre  
223 Wai Yip Street, Kwun Tong  
Kowloon - Hong Kong  
T +852 27734 700  
[hksales@hilti.com](mailto:hksales@hilti.com)

#### Department issuing data specification sheet

Hilti AG  
Feldkircherstraße 100  
9494 Schaan - Liechtenstein  
T +423 234 2111  
[chemicals.hse@hilti.com](mailto:chemicals.hse@hilti.com)

#### 1.4. Emergency telephone number

Emergency number	Schweizerisches Toxikologisches Informationszentrum – 24h Service +41 44 251 51 51 (international) +852 27734 700
------------------	---

### SECTION 2: Hazards identification

#### 2.1. Classification of the substance or mixture

##### Classification according to the United Nations GHS (Rev. 4, 2011)

Acute Tox. 4 (Inhalation:dust,mist)	H332
Skin Irrit. 2	H315
Eye Irrit. 2A	H319
Resp. Sens. 1	H334
Skin Sens. 1	H317
Carc. 2	H351
STOT SE 3	H335
STOT RE 2	H373

Full text of hazard classes and H-statements : see section 16



# CFS-F FX, B / CP 660, B

## Safety Data Sheet

according to the United Nations GHS (Rev. 4, 2011)

### 2.2. Label elements

#### Labelling according to the United Nations GHS (Rev. 4, 2011)

Hazard pictograms (GHS-UN)



GHS07

GHS08

Signal word (GHS-UN)

Danger

Hazardous ingredients

4,4'-diphenylmethanediisocyanate, isomeres and homologues; 4,4'-methylenediphenyl diisocyanate, diphenylmethane-4,4'-diisocyanate

Hazard statements (GHS-UN)

H315 - Causes skin irritation.  
 H317 - May cause an allergic skin reaction.  
 H319 - Causes serious eye irritation.  
 H332 - Harmful if inhaled.  
 H334 - May cause allergy or asthma symptoms or breathing difficulties if inhaled.  
 H335 - May cause respiratory irritation.  
 H351 - Suspected of causing cancer.  
 H373 - May cause damage to organs through prolonged or repeated exposure.

Precautionary statements (GHS-UN)

P260 - Do not breathe vapours.  
 P280 - Wear protective gloves/protective clothing/eye protection/face protection.  
 P284 - [In case of inadequate ventilation] wear respiratory protection.  
 P302+P352 - IF ON SKIN: Wash with plenty of water.  
 P305+P351+P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.  
 P342+P311 - If experiencing respiratory symptoms: Call a doctor, a POISON CENTER.

### 2.3. Other hazards

No additional information available

## SECTION 3: Composition/information on ingredients

### 3.1. Substances

Not applicable

### 3.2. Mixtures

Name	Product identifier	%	Classification according to the United Nations GHS
4,4'-diphenylmethanediisocyanate, isomeres and homologues	(CAS-No.) 9016-87-9	< 100	Acute Tox. 4 (Inhalation), H332 Skin Irrit. 2, H315 Eye Irrit. 2A, H319 Resp. Sens. 1, H334 Skin Sens. 1, H317 Carc. 2, H351 STOT SE 3, H335 STOT RE 2, H373
4,4'-methylenediphenyl diisocyanate, diphenylmethane-4,4'-diisocyanate	(CAS-No.) 101-68-8	25 - 45	Acute Tox. 4 (Inhalation), H332 Skin Irrit. 2, H315 Eye Irrit. 2A, H319 Resp. Sens. 1, H334 Skin Sens. 1, H317 Carc. 2, H351 STOT SE 3, H335 STOT RE 2, H373

Full text of H-statements: see section 16

# CFS-F FX, B / CP 660, B

## Safety Data Sheet

according to the United Nations GHS (Rev. 4, 2011)

### SECTION 4: First aid measures

#### 4.1. Description of first aid measures

First-aid measures after inhalation	Remove person to fresh air and keep comfortable for breathing. Call a poison center or a doctor if you feel unwell.
First-aid measures after skin contact	Wash skin with plenty of water. Take off contaminated clothing. If skin irritation or rash occurs: Get medical advice/attention.
First-aid measures after eye contact	Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention.
First-aid measures after ingestion	Call a poison center or a doctor if you feel unwell.

#### 4.2. Most important symptoms and effects, both acute and delayed

Symptoms/effects after inhalation	May cause respiratory irritation. May cause allergy or asthma symptoms or breathing difficulties if inhaled.
Symptoms/effects after skin contact	Irritation. May cause an allergic skin reaction.
Symptoms/effects after eye contact	Eye irritation.

#### 4.3. Indication of any immediate medical attention and special treatment needed

Treat symptomatically.

### SECTION 5: Firefighting measures

#### 5.1. Extinguishing media

Suitable extinguishing media Water spray. Dry powder. Foam. Carbon dioxide.

#### 5.2. Special hazards arising from the substance or mixture

No additional information available

#### 5.3. Advice for firefighters

Protection during firefighting Self-contained breathing apparatus. Complete protective clothing.

### SECTION 6: Accidental release measures

#### 6.1. Personal precautions, protective equipment and emergency procedures

##### 6.1.1. For non-emergency personnel

Emergency procedures Ventilate spillage area. Do not breathe vapours. Avoid contact with skin and eyes.

##### 6.1.2. For emergency responders

Protective equipment Use personal protective equipment as required. For further information refer to section 8: "Exposure controls/personal protection".

#### 6.2. Environmental precautions

Avoid release to the environment.

#### 6.3. Methods and material for containment and cleaning up

Methods for cleaning up	Take up liquid spill into absorbent material.
Other information	Dispose of materials or solid residues at an authorized site.

# CFS-F FX, B / CP 660, B

## Safety Data Sheet

according to the United Nations GHS (Rev. 4, 2011)

### SECTION 7: Handling and storage

#### 7.1. Precautions for safe handling

Precautions for safe handling	Do not handle until all safety precautions have been read and understood. Wear personal protective equipment. Do not eat, drink or smoke when using this product. Avoid contact with skin and eyes.
Hygiene measures	Wash contaminated clothing before reuse. Do not eat, drink or smoke when using this product. Always wash hands after handling the product.

#### 7.2. Conditions for safe storage, including any incompatibilities

Storage conditions	Store in a well-ventilated place. Keep cool.
Storage temperature	5 - 25 °C

### SECTION 8: Exposure controls/personal protection

#### 8.1. Control parameters

No additional information available

#### 8.2. Appropriate engineering controls

Appropriate engineering controls	Ensure good ventilation of the work station.
Environmental exposure controls	Avoid release to the environment.

#### 8.3. Individual protection measures, such as personal protective equipment (PPE)

Hand protection Protective gloves. EN 374

Type	Material	Permeation	Thickness (mm)	Penetration	Standard
Disposable gloves	Nitrile rubber (NBR)	3 (> 60 minutes)			EN 374

Eye protection Chemical goggles or safety glasses. EN 166. EN 170

Type	Use	Characteristics	Standard
Safety glasses	Droplet		EN 166, EN 170

Skin and body protection Wear suitable protective clothing

Respiratory protection In case of insufficient ventilation, wear suitable respiratory equipment. Not necessary with sufficient ventilation

Device	Filter type	Condition	Standard
	Filter AX (brown)		



#### 8.4. Exposure limit values for the other components

No additional information available

# CFS-F FX, B / CP 660, B

## Safety Data Sheet

according to the United Nations GHS (Rev. 4, 2011)

### SECTION 9: Physical and chemical properties

#### 9.1. Information on basic physical and chemical properties

Physical state	Liquid
Colour	amber.
Odour	No data available
Odour threshold	No data available
pH	No data available
Relative evaporation rate (butylacetate=1)	No data available
Melting point	Not applicable
Freezing point	No data available
Boiling point	No data available
Flash point	No data available
Auto-ignition temperature	No data available
Decomposition temperature	No data available
Flammability (solid, gas)	Not applicable
Vapour pressure	No data available
Relative vapour density at 20 °C	No data available
Relative density	No data available
Solubility	No data available
Log Pow	No data available
Viscosity, kinematic	No data available
Viscosity, dynamic	No data available
Explosive properties	No data available
Oxidising properties	No data available
Explosive limits	No data available

#### 9.2. Other information

No additional information available

### SECTION 10: Stability and reactivity

#### 10.1. Reactivity

The product is non-reactive under normal conditions of use, storage and transport.

#### 10.2. Chemical stability

Stable under normal conditions.

#### 10.3. Possibility of hazardous reactions

No dangerous reactions known under normal conditions of use.

#### 10.4. Conditions to avoid

None under recommended storage and handling conditions (see section 7).

#### 10.5. Incompatible materials

No additional information available

#### 10.6. Hazardous decomposition products

Under normal conditions of storage and use, hazardous decomposition products should not be produced.



# CFS-F FX, B / CP 660, B

## Safety Data Sheet

according to the United Nations GHS (Rev. 4, 2011)

### SECTION 11: Toxicological information

#### 11.1. Information on toxicological effects

Acute toxicity (oral)	Not classified
Acute toxicity (dermal)	Not classified
Acute toxicity (inhalation)	Inhalation:dust,mist: Harmful if inhaled.
ATE CLP (gases)	4500 ppmv/4h
ATE CLP (vapours)	11 mg/l/4h
ATE CLP (dust,mist)	1.5 mg/l/4h
<b>4,4'-diphenylmethanediisocyanate, isomeres and homologues (9016-87-9)</b>	
LD50 oral rat	> 10000 mg/kg (Rat; Literature study)
LD50 dermal rabbit	> 5000 mg/kg (Rabbit; Literature study)
<b>4,4'-methylenediphenyl diisocyanate, diphenylmethane-4,4'-diisocyanate (101-68-8)</b>	
LD50 oral rat	> 2000 mg/kg
Skin corrosion/irritation	Causes skin irritation.
Serious eye damage/irritation	Causes serious eye irritation.
Respiratory or skin sensitisation	May cause allergy or asthma symptoms or breathing difficulties if inhaled. May cause an allergic skin reaction.
Germ cell mutagenicity	Not classified
Carcinogenicity	Suspected of causing cancer.
Reproductive toxicity	Not classified
STOT-single exposure	May cause respiratory irritation.
STOT-repeated exposure	May cause damage to organs through prolonged or repeated exposure.
Aspiration hazard	Not classified

### SECTION 12: Ecological information

#### 12.1. Toxicity

Ecology - general	The product is not considered harmful to aquatic organisms nor to cause long-term adverse effects in the environment.
Acute aquatic toxicity	Not classified
Chronic aquatic toxicity	Not classified

<b>4,4'-diphenylmethanediisocyanate, isomeres and homologues (9016-87-9)</b>	
LC50 other aquatic organisms 1	> 1000 mg/l (96 h)
Threshold limit other aquatic organisms 1	> 1000 mg/l (96 h)

#### 12.2. Persistence and degradability

<b>4,4'-diphenylmethanediisocyanate, isomeres and homologues (9016-87-9)</b>	
Persistence and degradability	Not readily biodegradable in water. Hydrolysis in water. No (test)data on mobility of the substance available.

#### 12.3. Bioaccumulative potential

<b>4,4'-diphenylmethanediisocyanate, isomeres and homologues (9016-87-9)</b>	
BCF fish 1	1 (Pisces)
Bioaccumulative potential	Not bioaccumulative.

#### 12.4. Mobility in soil

No additional information available

# CFS-F FX, B / CP 660, B

## Safety Data Sheet

according to the United Nations GHS (Rev. 4, 2011)

### 12.5. Other adverse effects

Ozone Not classified  
 Other adverse effects No additional information available

## SECTION 13: Disposal considerations

### 13.1. Waste treatment methods

Waste treatment methods Dispose of contents/container in accordance with licensed collector's sorting instructions.  
 Product/Packaging disposal recommendations Dispose in a safe manner in accordance with local/national regulations.

## SECTION 14: Transport information

In accordance with ADR / RID / IMDG / IATA / ADN

ADR	IMDG	IATA	RID
<b>14.1. UN number</b>			
Not regulated for transport			
<b>14.2. UN proper shipping name</b>			
Not applicable	Not applicable	Not applicable	Not applicable
<b>14.3. Transport hazard class(es)</b>			
Not applicable	Not applicable	Not applicable	Not applicable
Not applicable	Not applicable	Not applicable	Not applicable
<b>14.4. Packing group</b>			
Not applicable	Not applicable	Not applicable	Not applicable
<b>14.5. Environmental hazards</b>			
Dangerous for the environment : No	Dangerous for the environment : No Marine pollutant : No	Dangerous for the environment : No	Dangerous for the environment : No
No supplementary information available			

### 14.6. Special precautions for user

- Overland transport

- Transport by sea

No data available

- Air transport

No data available

- Rail transport

Carriage prohibited (RID) No

### 14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

# CFS-F FX, B / CP 660, B

## Safety Data Sheet

according to the United Nations GHS (Rev. 4, 2011)

### SECTION 15: Regulatory information

#### 15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

No additional information available

### SECTION 16: Other information

SDS Major/Minor	None
Date of issue	18/12/2017
Revision date	18/12/2017
Supersedes	08/11/2017

Indication of changes:

Section	Changed item	Change	Comments
			Layout Change
2.1	Classification (GHS-UN)	Modified	
3	Composition/information on ingredients	Modified	

Full text of H-statements:

H315	Causes skin irritation.
H317	May cause an allergic skin reaction.
H319	Causes serious eye irritation.
H332	Harmful if inhaled.
H334	May cause allergy or asthma symptoms or breathing difficulties if inhaled.
H335	May cause respiratory irritation.
H351	Suspected of causing cancer.
H373	May cause damage to organs through prolonged or repeated exposure.

SDS\_UN\_Hilti

*This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product*

