



Hilti CFS-D Firestop Putty Disc

Submission Folder

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Firestop cable disc CFS-D 1" **NEW**



APPLICATIONS

- Pre-formed firestopping solution for single cables and small cable bundles in openings up to max. 25 mm
- All cable types currently and commonly used in building practice in Europe (e.g. power, control, signal, telecommunications, emergency and optical fibre cables)
- For use on drywall, masonry and concrete
- Suitable for plastic and metal conduits
- Covers regular and irregular openings (including blank openings)

ADVANTAGES

- Simple – sealant-free installation
- No backfilling material required
- Fast – installed in 10 seconds
- Powerful – broad application range
- Surface-mounted solution
- Minimises waste



Smoke



Mould & Mildew



Acoustic



Low VOC

Technical data	
Colour	Red
Base materials	Concrete, Masonry, Drywall
Application temperature range	0 - 40 °C
Acoustics performance	Test report available
Approx. density	1600 kg/m ³
Mold and mildew performance	Class 0 (EN ISO 846)
Intumescent	No
Approvals	ETA-16/0050
Can be painted	No
Electrical resistance data	Non-conductive
European VOC	Available
Packaging	Box



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Ordering designation	Package contents	Sales pack quantity	Item number
CFS-D 1"	1x Firestop cable disc CFS-D 1"	32 pc	2116245

Please visit Hilti website for the latest item numbers and related products

Subject: Method Statement of - 1 re o b e c
Material: CFS-D 1" Firestop Cable Disc

Setting Operation		
1	<p>Clean the cables and opening. The cables and opening must be dry and free from dust, grease or oil, and installed in compliance with local building and electrical standards.</p>	
2	<p>Remove label from one side of CFS-D cable disc.</p>	
3	<p>Adhere CFS-D cable disc against the penetrating structure. Reshape CFS-D cable disc around cables or cable conduits.</p>	

ASSESSMENT REPORT

The Fire Resistance Performance of Hilti Electrical Services Penetration Sealing Systems

Report No.: R23H15-1A
Issue Date: 29 February, 2024
Date of Review: 28 February, 2027

Report Sponsor

Hilti (Hong Kong) Limited
701-704 & 708B, Tower A Manulife Finance Centre,
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This report only relates to the specimen(s) tested and may only be reproduced by the sponsor in full, without comment, abridgement and modifications.

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REVISION HISTORY

Issue date (DD/MM/YYYY)	Issue number	Remark
29/02/2024	0	Initial version

THE FIRE RESISTANCE PERFORMANCE OF ELECTRICAL SERVICES
PENETRATION SEALING SYSTEMS

1 INTRODUCTION

This assessment report presents an appraisal for the use of the Hilti “CFS-D”, “CP611A with mineral wool”, “CP620”, “CFS-SL GA” and “CP651” for electrical service penetration sealing purpose in either floor mounted or wall mounted situation. The appraisal will be based on the test evidence as shown in section 3 of this report. 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 sealing for the pipe penetration system 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
Primary Test Evidence		
RED test report no. R16L28-1C	4.2	Supporting test evidence for the use of the Hilti 'CFS-D 25' for plastic pipe penetration sealing passing through concrete wall for 120 minutes integrity only fire resistance performance with respect to BS 476: Part 20: 1987.
WFRGENT report no. 17066A	4.2	Supporting test evidence for the use of the Hilti 'CFS-D 25' for electrical cables or conduit penetration sealing passing through partition wall system for up to 90 minutes integrity and insulation performance with respect to 1366-3: 2009.
WFRGENT report no. 17155A	4.2	Supporting test evidence for the use of the Hilti 'CFS-D 25' for electrical cables or conduit penetration sealing passing through partition wall system for up to 132 minutes integrity and insulation performance with respect to 1366-3: 2009.
WFRGENT report no. 17258B	4.2	Supporting test evidence for the use of the Hilti 'CFS-D 25' for metal pipe penetration sealing passing through concrete wall for 120 minutes integrity only fire resistance performance with respect to EN 1366-3: 2009.
WARRES report no. 57312/A	4.3	Supporting indicative test evidence for the use of the Hilti "CP611A" firestop mastic for cables penetration through floor construction achieved 240 minutes integrity performance and various insulation performance with respect to BS 476: Part 20: 1987.
WARRES report no. 101728	4.3	Supporting indicative test evidence for the use of the Hilti "CP611A" firestop mastic for cables penetration through wall construction achieved 240 minutes integrity and various insulation performance with respect to BS 476: Part 20: 1987.
BRE test report no. TE203650	4.4	Supporting ad-hoc fire test evidence for the use of Hilti "CP620" firestop foam for cables or conduit penetration through the drywall partition system achieved 120 minutes integrity and various insulation performance with respect to

		BS 476: Part 20: 1987.
BRE test report no. FG7251	4.4	Supporting test evidence for the use of Hilti 'CP620' firestop foam for cables bundles or piping penetrating through drywall partition system achieved 120 minutes integrity and various insulation performance with respect to BS 476: Part 20: 1987.
RED Test report no. R16L28-1B	4.5	Supporting test evidence for the use of the Hilti 'CFS-SL' for penetration sealing passing through wall for 120 minutes integrity only fire resistance performance with respect to BS 476: Part 20: 1987
RED test report no. R16L28-2A	4.5	Supporting test evidence for the use of the Hilti 'CFS-SL' for penetration sealing passing through flooring for 120 minutes integrity only fire resistance performance with respect to BS 476: Part 20: 1987
WFRGENT test report no. 18116A	4.5	Supporting test evidence for the use of the Hilti 'CFS-SL GA' for penetration sealing passing through wall for 120 minutes integrity only fire resistance performance with respect to EN 1366-3: 2009
WF test report no. 150136	4.6	Supporting test evidence for the use of Hilti CP651 fire stop pillow for the penetration sealing system through masonry wall requires 240 minutes integrity performance.
MPA test report no. 3265/7575	4.6	Supporting test evidence for the use of Hilti CP651 fire stop pillow for the penetration sealing system through drywall partition system requires 120 minutes integrity performance.

3.2 Primary Test Evidence

3.2.1 RED Test Report No. R16L28-1C*

A fire resistance test in accordance with BS 476: Part 20: 1987 on a total of twenty-seven specimens of penetration systems, namely specimens '1a' to '27' was conducted at the Research Engineering Development Façade Consultants Limited (RED) Laboratory on 20 January 2017. In this report, only PVC pipes and conduits, namely specimens '20', '22', '23', '24', '25' and '26', were considered. As requested by the test sponsor, the specimens were mounted within concrete line specimen holder. The specimens '20', '22', and '23' were asymmetrical and the fire side of specimen was determined by the test sponsor. The specimens '24', '25', and '26' were symmetrical and only one side of specimen was tested as per test sponsor's request.

Specimen '20' was comprised of 2 nos. of 50 mm internal diameter by nominal 2.5 mm thick by 1,400 mm long PVC pipes filled with a layer of 20 mm thick 'ROCKWOOL' mineral wool boards with density of 100 kg/m³ with and 'Hilti CP606' sealant. The pipes were protected by 'CFS-CID 50' firestop cast-in device.

Specimen '22' was comprised of 1 no. of 50 mm internal diameter by nominal 2.5 mm thick by 1,400 mm long PVC pipe filled with a layer of 20 mm thick 'ROCKWOOL' mineral wool boards with density of 100 kg/m³ with and 'Hilti CP606' sealant. The pipe was protected by 'CFS-CID 50' firestop cast-in device.

Specimen '23' was comprised of 1 no. of 150 mm internal diameter by nominal 2.5 mm thick by 1,400 mm long PVC pipe filled with a layer of 20 mm thick 'ROCKWOOL' mineral wool boards with density of 100 kg/m³ with and 'Hilti CP606' sealant. The pipe was protected by 'CFS-CID 160' firestop cast-in device.

Specimen '24' was comprised of 1 no. of 32 mm diameter by nominal 2.5 mm thick by 1,400 mm long PVC conduit filled with 'Hilti CP606' sealant. The conduit was protected by 2 nos. of 'CFS-D 25' firestop cable disc.

Specimen '25' was comprised of 1 no. of 25 mm internal diameter by nominal 1.5 mm thick by 1,400 mm long PVC conduit filled with 'Hilti CP606' sealant. The conduit was protected by 1 no. of 'CFS-D 25' firestop cable disc.

Specimen '26' was comprised of 1 no. of 150 mm internal diameter by nominal 5 mm thick by 1,400 mm long PVC pipe filled with a layer of 20 mm thick 'ROCKWOOL' mineral wool boards with density of 100 kg/m³ with and 'Hilti CP606' sealant. The pipe was protected by 2 stacks of 'CFS-C EL' firestop endless collars.

All specimens were penetrated through a nominal 200 mm thick concrete wall. The PVC pipes and conduits were fixed to 42 mm by 20 mm by 3 mm thick steel channels, located at 500 mm from the concrete wall, by nominal 3 mm thick rings 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:

	Integrity	Insulation
Specimen '20'	121 Minutes (No failure)	N/A
Specimen '22'	121 Minutes (No failure)	N/A
Specimen '23'	121 Minutes (No failure)	96 Minutes
Specimen '24'	121 Minutes (No failure)	N/A
Specimen '25'	121 Minutes (No failure)	N/A
Specimen '26'	121 Minutes (No failure)	48 Minutes

The test was discontinued after a heating period of 121 minutes (See R16L28-1C 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. 17066A#

A fire resistance test stated to be in accordance with BS EN 1366-3: 2009 to evaluate the fire resistance performance of various cables and conduit penetration sealing systems through drywall partition system was performance by the Warringtonfiregent testing laboratory on 19th March, 2015. The report was prepared for Hilti Ag, the Hilti Entwicklungsgesellschaft mbH had given permission to use this data.

The supporting construction was a 100 mm drywall partition composed of 50 mm thick studs and covered with two layers of 12.5 mm thick gypsum boards on each side and infilled with 50 mm thick by 100 kg/m³ mineral wool. There were total 108 nos. of openings with sizes of 20 mm x 20 mm or 25 mm x 25 mm with various electrical cables with PVC, PO, EVA or PE sheath materials with the diameter range of 11 mm to 19 mm penetrating through the partition wall. All the openings with the service penetration are protected with one layer of Hilti Firestop Disc "CFS-D 25" on each side of each opening. The "CFS-D 25" was installed around and pasted against the cable or conduit, pasted on the wall surface and covered the whole hole.

The specimens that as tested generally satisfied the performance requirements specified in EN 1366-3: 2009 for up to 99 minutes integrity and various insulation. The test was discontinued after a heating period of 99 minutes (See WFRGENT report no. 17066A 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: 2009 and found it suitable for this assessment.

3.2.3 Warringtonfire Test Report No. 17155A#

A fire resistance test stated to be in accordance with BS EN 1366-3: 2009 to evaluate the fire resistance performance of various cables and conduit penetration sealing systems through drywall partition system was performance by the Warringtonfiregent testing laboratory on 8th May, 2015. The report was prepared for Hilti Ag, the Hilti Entwicklungsgesellschaft mbH had given permission to use this data.

The supporting construction was a 100 mm drywall partition composed of 50 mm thick studs and covered with two layers of 12.5 mm thick gypsum boards on each side and infilled with 50 mm thick by 100 kg/m³ mineral wool. There were total 9 nos. of openings with sizes of 25 mm x 25 mm with various electrical cables with PVC, PO, EVA or PE sheath materials with the diameter range of 13 mm to 19 mm penetrating through the partition wall. All the openings with the service penetration are protected with one layer of Hilti Firestop Disc "CFS-D 25" on each side of each opening. The "CFS-D 25" was installed around and pasted against the cable or conduit, pasted on the wall surface and covered the whole hole.

The specimens that as tested generally satisfied the performance requirements specified in EN 1366-3: 2009 for up to 132 minutes integrity and various insulation. The test was discontinued after a heating period of 132 minutes (See WFRGENT report no. 17155A 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: 2009 and found it suitable for this assessment.

3.2.4 WFRGENT Test Report No. 17258B#

A fire resistance test stated to be in accordance with EN 1366-3:2009 s number of penetration sealing systems and in this report only three (3) specimens of copper pipe penetration using 'Hilti CFS-D 25' firestop disc sealing systems were reported. The sealing systems were mounted within a drywall partition. The test was performed at the Warringfiregent Laboratory on 15 July 2015. The test sponsor was Hilti AG, who had given permission to use this data.

In this test report, three copper pipe referenced pipe no. 1, 2 and 3 penetration sealing system were considered. The copper pipe with the diameter of 12mm, 16 mm and 20 mm with 1 mm thick pipe wall thickness were penetrating a square opening on the partition wall with the opening sizes of 25 mm by 25 mm. On both ends of the opening, 1 no. of the Hilti 'CFS-D' firestop disc was applied wrapped on the pipe and overlapped the wall of the aperture. The specimen was assessed against the criteria for integrity as stated in BS EN 1366-3: 2009 as shown in the table below as well.

Pipe no.	Pipe Material	Diameter x wall thickness (mm)	Wall Thickness (mm)	Opening Sizes (mm)	Integrity		
					Cotton pad	Sustained flaming	Gap Gauge

1	Cu	12 x 1	100	25 x 25	132 mins	132 mins	132 mins
2	Cu	16 x 1	100	25 x 25	132 mins	132 mins	132 mins
3	Cu	20 x 1	100	25 x 25	132 mins	132 mins	132 mins

The test was discontinued after a heating period of 132 minutes (See WFRGENT report no. 17258B).

*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: 2009 and found it suitable for this assessment.

3.2.5 Warringtonfire Test Report No. 57312/A*

A fire resistance test stated to be in accordance with BS 476: Part 20: 1987 to evaluate the fire resistance performance of four specimens of cables penetration sealing systems through vermiculite cement floor constructions (referenced H1, H2, H3 and H4) was performance by the Warringtonfire testing laboratory on 28th October, 1992. The report was prepared for Hilti (GB) Limited, the Hilti Entwicklungsgesellschaft mbH had given permission to use this data.

The section of floor was of 150 mm thickness. The floor was provided with four apertures and each with cables penetrating through it and sealed with a layer of 40 mm thick Hilti 'CP611A' mastic. The seals were installed flush with the soffit of the floor slab. The specimens 'H1' was an aperture of 120 mm diameter with 3 nos. of two core armoured cables each 23 mm diameter penetrating through it. Specimen 'H2' was an aperture of 120 mm diameter with 1 no. of four core 32 mm diameter armoured cable penetrating through it. Specimen 'H3' was an aperture of 130 mm diameter with 1 no. of four core 40 mm diameter armoured cable penetrating through it. Specimen H4 was an aperture of 90 mm diameter with 10 nos. of sixteen core telecommunication cables each 11 mm diameter penetrating through it.

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

Specimen Ref:	Integrity	Insulation
H1	240 minutes	75 minutes
H2	240 minutes	52 minutes
H3	240 minutes	60 minutes
H4	240 minutes	53 minutes

The test was discontinued after a heating period of 240 minutes (See WARRES no. 57312/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.

3.2.6 Warringtonfire Test Report No. WARRES 101728*

A fire resistance test stated to be in accordance with BS 476: Part 20: 1987 with additional guidelines from prEN 1366-3: 1993 to evaluate the fire resistance performance of eight specimens of electrical cables penetration sealing systems (referenced 1 to 8) was performed by the Warringtonfire testing laboratory on 23rd 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 report, there was one more floor mounted sealing system but that was not within the scope of this assessment.

The section of wall was of nominal thickness 150 mm and was provided with eight circular apertures with sizes of 67 mm or 72 mm respectively, each was penetrated by a service item of single cables, bundled cables, PVC pipe or PP pipe.

The specimens satisfied the performance requirements specified in BS EN 1363-1 and BS EN 1366-3 for the following periods:

Specimen Ref:	Aperture diameter (mm)	Penetrating Service	Integrity (Min)	Insulation (Min)
1	67	Single cable	240	119
2	67	Single cable	240	56
3	67	Single cable	240	58
4	67	Bundled cables	240	190
5	67	Bundled cables	240	240
6	67	Bundled cables	240	240
7	72	PVC pipe	25	19
8	72	PP Pipe	158	158

The test was discontinued after a heating period of 240 minutes (See WF report no. WARRES 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 46: Part 20: 1987 and found it suitable for this assessment.

3.2.7 BRE Test Report No. TE203650*

An ad-hoc fire resistance test stated to be in accordance with BS 476: Part 20: 1987 on four services penetration seals was performed at the BRE laboratory on 2nd March 2001. The test sponsor was Hilt Ag, the Hilti Entwicklungsgesellschaft mbH had given permission to use this data.

The specimen comprised a plasterboard partition, nominally 3,000 mm x 3,000 mm with several penetration sealing systems. The partition comprised a 70 mm thick steel frame lined on each side with two layers of 12.5 mm thick Lafarge Firecheck (Type 5) plasterboard.

System A was a 400 mm wide x 500 mm high opening in the plasterboard partition, sealed with nominally 145 mm thick Hilti CP620 Firestop foam. The following services passed through the seal: a 76 mm (internal diameter) steel pipe, a 100 mm x 100 mm square plastic conduit carrying eleven 12 mm-diameter 5-core cables and a 150 mm wide cable tray carrying twelve 12 mm diameter cables and one 18 mm diameter cable. The space in the conduit above the cables was packed with Hilti CP651 Cushions at the location where the service passed through the partition.

System B was the sealing system using CP 657 blocks which was not within the scope of this assessment.

System C was a 400 mm wide x 400 mm high aperture in the plasterboard partition, sealed with 145 mm thick Hilti CP 620 firestop foam. The plastic cable conduit containing electrical cables and a copper pipe passed through the seal.

System D was a 400 mm x 500 mm aperture in the plasterboard partition, sealed with 150 mm thick Hilti CP620 firestop foam. A plastic conduit containing electrical cables, a steel pipe insulated with Cooltherm phenolic insulation, a PVC pipe and a cable tray carrying electrical cables passed through the seal. Hilti CP 649 pipe wrap was used where the steel and plastic pipe passed through the seal. The space inside conduit was filled with CP 620 foam.

The performance of each specimen assessed against the integrity and insulation (maximum temperature rise) criteria of BS 476: Part 20: 1987, the results were expressed as follow:

Specimen Ref.	Aperture Size (mm x mm)	Sealing Materials	Integrity (Min)	Insulation (Min)
A	400 x 500	CP620	132	44
B	500 x 450	CP657	132	129
C	400 x 400	CP620	132	20
D	400 x 500	CP620	105	86

The test was discontinued after a period of 132 minutes (See BRE report no. TE203650 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 BRE Test Report No. FG7251*

An ad-hoc fire resistance test stated to be in accordance with BS 476: Part 20: 1987 on four services penetration seals was performed at the BRE laboratory on 11th May 2001. The test sponsor was Hilti Ag, the Hilti Entwicklungsgesellschaft mbH had given permission to use this data.

The specimen comprised a plasterboard partition, nominally 3,000 mm x 3,000 mm with 6 nos. of sealing system penetration sealing systems. The partition comprised a 70 mm thick steel frame lined on each side with two layers of 12.5 mm thick Lafarge Firecheck plasterboard.

System 1 was a 440 mm wide x 550 mm high opening in the plasterboard partition with nominally 200 mm thick Hilti CP 620 Firestop foam. A steel pipe insulated with foil-faced mineral wool insulation, a PVC pipe and a cable tray carrying electrical cables passed through the seal. A Hilti CP 643 collar was located around the PVC pipe against the seal on each face. The Hilti CP620 foam extended approximately 25 mm away from the surface of the seal along each service at a thickness of approximately 25 mm on both faces of the seal.

System 2 was a system identical to system 1 with the exception that the 200 mm thick seal was arranged to be flushed with the unexposed face of the partition.

System 3 was a 440 mm x 550 mm high opening in the plasterboard partition, filled with nominally 145 mm thick Hilti CP 620 Firestop foam. A bunch of 36 electrical cables, a single 70 mm diameter electrical cable, a PVC pipe and a steel pipe insulated with foil-faced mineral wool passed through the seal. The Hilti CP620 foam extended 25 mm away from the surface of the seal along each service at the thickness of approximately 25 mm.

System 4 was a 200 mm wide x 180 mm high opening in the plasterboard partition, filled with nominally 200 mm thick Hilti CP620 Firestop foam. One bunch of 41 electrical cables passed centrally through the seal. The Hilti CP620 foam extended approximately 25 mm away from the surface of the seal along the service at a thickness of approximately 25 mm.

System 5 was identical to system 4 except that a single 70 mm diameter electrical cable passed centrally through the seal.

System 6 was identical system 4 except that a single 76 mm-diameter copper pipe passed central through the seal. The pipe was insulated on both sides of the seal with foil faced mineral wool.

The performance of each specimen assessed against the integrity and insulation (maximum temperature rise) criteria of BS 476: Part 20: 1987, the results were expressed as follow:

Specimen Ref:	Aperture Size (mm x mm)	Sealing Materials	Integrity (Min)	Insulation (Min)
1	440 x 550	CP620	151	151
2	440 x 550	CP620	151	149
3	440 x 550	CP620	147	63
4	200 x 180	CP620	151	128
5	200 x 180	CP620	151	137
6	200 x 180	CP620	151	151

The test was discontinued after a period of 151 minutes (See BRE report no. FG7251 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 RED Test Report No. R16L28-1B

A fire resistance test in accordance with BS 476: Part 20: 1987 on a total of twenty-seven specimens of penetration systems, namely specimens '1a' to '27' was conducted at the Research Engineering Development Façade Consultants Limited (RED) Laboratory on 20 January 2017. In this test report, only trunkings, speed sleeve and cable trays, namely specimens '2a', '2b', '3', '6', '8', '9' and '10', seven (7) specimens of penetration systems mounted within a concrete wall was considered. The test sponsor was Hilti (Hong Kong) Limited.

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/m³ 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/m³ 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:

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

The test was discontinued after a heating period of 121 minutes (See R16L28-1B for full details).

3.2.10 RED Test Report No. R16L28-2A

A fire resistance test in accordance with BS 476: Part 20: 1987 on a total of twenty-one specimens of penetration systems was conducted at the Research Engineering Development Façade Consultants Limited (RED) Laboratory on 20 January 2017. In this test report, only trunking, speed sleeve and cable tray, namely specimens '2', '4a', '4b', '5b', '7' and '8', six (6) specimens of penetration systems mounted within a concrete wall was considered. The test sponsor was Hilti (Hong Kong) Limited.

As requested by the test sponsor, the specimens were mounted within concrete line specimen holder as shown in the test sponsor's drawings (see the appendix). 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/m³ 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:

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

The test was discontinued after a heating period of 241 minutes (See R16L28-2A for details).

3.2.11 WFRGENT Test Report No. 18116A

A fire resistance test stated to be in accordance with EN 1366-3: 2009 on Eighteen (18) specimens of Hilti Firestop Speed Sleeve CFS-SL GA penetration sealing systems mounted within an aerated concrete floor was performed at the Exova Warringtonfire Laboratory on 21 December 2016. The test sponsor was Hilti AG, who had given permission to use this data.

In this test report, the eighteen penetration sealing systems was using Hilti Firestop Speed Sleeve CFS-SL GA which allows the penetration of flexible conduit or cables. The term “CFS-SL” described the product Firestop Speed Sleeve, while “GA” is the smoke tight rubber gasket. The specimens were referenced as 1-9 with different configurations. The specimen was assessed against the criteria for integrity and insulation (max. temperature rise only) specified in BS EN 1366-9: 2009 or BS EN 1363-1: 1999 as shown in the table below as well.

Specimen	Configuration	Integrity	Insulation
1	26 x F	132	132
2	6 x F	132	132
3	1 X A1 in flexible Conduit (Ø16) 1 X A2 in flexible Conduit (Ø25)	132	132
4	1 X A1 in flexible Conduit (Ø16) 1 X A2 in flexible Conduit (Ø25) 1 X B in flexible Conduit (Ø32) 2 X A2 + 1 x E in flexible Conduit (Ø63)	132	132
5	2 x flexible Conduit (Ø16) 1 x flexible Conduit (Ø25)	132	132
6	2 x flexible Conduit (Ø16) 2 x flexible Conduit (Ø25) 1 x flexible Conduit (Ø32) 1 x flexible Conduit (Ø63)	71	71
7	26 x F	103	132
8	1 X A1 in flexible Conduit (Ø16) 1 X A2 in flexible Conduit (Ø25) 1 X B in flexible Conduit (Ø32) 2 X A2 + 1 x E in flexible Conduit (Ø63)	132	132
9	1 X A1 in flexible Conduit (Ø16) 1 X A2 in flexible Conduit (Ø25) 1 X B in flexible Conduit (Ø32) 2 X A2 + 1 x E in flexible Conduit (Ø63)	132	132

The test was discontinued after a heating period of 2132 minutes (See WFRGENT no. 18116A for details).

3.2.12 WF Test Report No. 150136#

A fire resistance test stated to be in accordance with prEN 1366-3: Draft 10A on a Hilti 'CP651N' pillow based penetration sealing system, mounted within a lightweight rigid wall supporting construction was performed in the Warringtonfire testing laboratory on 23rd October, 2005. The system was installed within a 1,500 mm high by 1,200 mm wide aperture within the wall and incorporated with 17 cable trays carrying various sizes of cables. The aperture was sealed with barrier cushions referenced "CP651N". All cable trays had additional weights positioned on the exposed face.

The test demonstrated the ability of the seal to provide 241 minutes integrity and 45 minutes insulation performance. A full breakdown of the insulation performances recorded on each item was included in the original report.

The test was discontinued after a heating period of 241 minutes (See WF test report no. 150136 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 EN 1366-3 and found it suitable for this assessment.

3.2.13 MPA Test Report No. 3265/7575#

A fire resistance test stated to be in accordance with prEN 1366-3: Draft 10A on a Hilti 'CP651N' pillow based penetration sealing system, mounted within a drywall partition supporting construction was performed in the MPA testing laboratory on 20th January, 2006. The system was installed within a 1,505 mm high by 1,200 mm wide aperture within the wall and incorporated with cable trays carrying various sizes of cables. The aperture was sealed with barrier cushions referenced "CP651N". All cable trays had additional weights positioned on the exposed face.

The test demonstrated the ability of the seal to provide 132 minutes integrity and insulation performance. A full breakdown of the insulation performances recorded on each item was included in the original report.

The test was discontinued after a heating period of 132 minutes (See MPA test report no. 3265/7575 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 EN 1366-3 and found it suitable for this assessment.

4 PROPOSAL & DISCUSSION

4.1 *The use of test evidence, which were tested in accordance with BS EN 1366-3: 2009, BS EN 1363-1: 1999, for the assessment of penetration sealing system to BS 476: Part 20: 1987*

Proposal

It is proposed that the test evidence that tested in accordance with BS EN 1366-3: 2009 and with the test principle and methodology refer to the BS EN 1363-1: 1999, is suitable for use in the assessment against BS 476: Part 20: 1987.

Discussion

The fire test on the linear joint seal systems as tested and described in the above test evidence were carried out in accordance with BS EN 1363-1: 1999. In reviewing the tests, 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 tests, it is expected that if these fire tests had been conducted in accordance with BS 476: Part 20: 1987 very similar results would have been achieved.

Fire tests to BS EN 1366-3: 2009 and 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 WF report no. 146725 Issue 2 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, cable bundles or plastic/metal cable conduit wall penetration sealing using Hilti 'CFS-D 25" firestop disc

Proposal

It is proposed that Hilti CFS-D 1" firestop cable disc may be applied for metal pipes penetration sealing with the application method as stated below:

Penetration services	Wall type	Opening sizes	Application of CFS-D 25
Up to 32 mm diameter PVC/metal conduit	Concrete	Up to 40 mm diameter	2 pcs on each side of the penetration opening
Up to 25 mm diameter PVC/metal conduit	Concrete	Up to 35 mm diameter	1 pc on each side of the penetration opening
Up to 25 mm diameter PVC/metal conduit	Drywall Partition	Up to 25 mm x 25 mm or 25 mm diameter	1 pc on each side of the penetration opening

The proposed sealing system using the CFS-D 25" is required to provide the fire resistance performance of up to 120 minutes integrity with respect to BS 476: Part 20: 1987. A typical application detail was as shown in the drawings in the appendix.

It is as declared by the client that the CFS-D 25 and the CFS-D 1" are the same product but with different trade name for different market.

Discussion

The test evidence R16L28-1C described the use of the Hilti CFS-D 1" for PVC piping penetration through wall situation. In the test, the PVC pipes with diameter of 25 mm and 32 mm were installed within the wall penetration with opening sizes of 35 mm and 40 mm respectively. For the 25 mm diameter pipe, 1 no. of Hilti CFS-D 1" was applied on each end of the opening, wrapped the pipe and overlapped on the wall aperture. While for the 35 mm diameter pipe, 2 nos. of Hilti CFS-D 1" were applied on each end of the opening and wrapped the pipe and overlapped on the wall aperture. The systems had achieved 121 minutes integrity performance with respect to the BS 476: Part 20: 1987.

The test evidence WFRGENT Report no. 17258B described the use of the Hilti CFS-D 1" for three copper pipes penetration through drywall situation. In the test, the copper with diameter 12 mm, 16 mm and 20 mm were penetrating through the 25 mm x 25 mm wall opening separately. 1 no. of Hilti CFS-D 1" was applied on both ends on the wall opening wrapped the pipe and overlapped the wall aperture. The system had achieved 132 minutes integrity performance with respect to the BS EN 1366-3: 2009.

The test evidence WFRGENT 17155A described the test of the drywall partition system with various cables or conduit passed through the drywall partition system with opening sizes up to 25 mm x 25 mm.

The services were sealed with the use of 1 pc of Hilti "CFS-D 25" on each side of the wall. For all the individual system, the specimens achieved at least 120 minutes integrity performance.

The proposal is considered as directly adopted the tested configuration. R16L28-1C in which the PVC piping is tested, which simulates the penetration of plastic conduit. From the test evidence WFRGENT report no. 17258B, the copper pipe that applied with the same Hilti CFS-D 1" and within a larger wall opening had achieved 132 minutes integrity. Since the copper metal or ordinary metal pipe shall not melt at the temperature of 1,049 °C. The situation shall be the same when the other metal pipe was applied with the Hilti CFS-D 1", and the metal piping system also simulate the penetration of the metal conduit.

While the test evidence WFRGENT report no. 17155A had tested the penetration through drywall partition system and with the opening sizes of up to 25 mm x 25 mm. Although the test evidence only describe the test of the penetration of cables and plastic conduit through openings within partition system, while considering the integrity performance only, the metal conduit without melting shall represent a less onerous situation compares to the plastic conduit. And in viewing the performance in the concrete wall penetration, the performance of the sealing systems achieve similar performance and achieve 120 minutes integrity performance. Based on these, it is reasonable to believe that the proposal of plastic or metal conduit through drywall partition with the opening sizes up to 25 mm x 25 mm or 25 mm diameter shall be acceptable.

4.3 The fire resistance performance of cables or cable bundles wall penetration sealing using Hilti “CP611A + mineral wool backing”

Proposal

It is proposed that Hilti ‘CP611A’ with the mineral wool backing is used for the purpose of sealing the cables, cable bundles or plastic/metal conduit penetration through the masonry like supporting wall or floor construction. The Hilti “CP611A” is used to seal up the void in between the cables and the aperture may be subjected to the following conditions:

It is assumed that the wall or floor system of the surrounding supporting construction shall carry at least up to the same fire resistance performance in terms of both integrity and insulation as the proposed scenario.

For wall mount situation				
Service penetration	Wall configuration	Opening sizes	Services overall diameter	Sealing configuration
Cables or cable bundles	Masonry type minimum 150 mm thick	Up to 67 mm diameter	Up to 45 mm diameter	10 mm thick CP 611A on both sides flush with the wall surface and fully backed with 100 kg/m ³ mineral
For floor mount situation				
Service penetration	Floor configuration	Opening sizes	Services overall diameter	Sealing configuration
Cables or cable bundles	Masonry type minimum 150 mm thick	Up to 130 mm diameter	Up to nominal 50 mm diameter	40 mm thick CP 611A on unexposed side flush with the floor surface and fully backed with 60 kg/m ³ mineral wool

The sealing systems as proposed above is required to provide 240 minutes integrity and 60 minutes insulation performance with respect to BS 476: Part 20: 1987.

Discussion

For the wall mount situation

The test evidence WARERS no. 101728 was referenced for the proposed scope of the wall mount cables or cable bundles penetration sealing application. In the test, the single cables and cable bundles situation

was demonstrated while passing through a 150 mm thick masonry wall system the aperture sizes on the wall was 67 mm diameter and the overall diameter of the cables or the cable bundles were maximum 45 mm diameter. In all cases, the voids in between the cables/cable bundles and the wall were fitted with 10 to 30 mm thick Hilti "CP611A" on both sides and flush with the wall, the cavities in between the Hilti CP611A were fully infilled with 60 kg/m³ mineral wool. In all cases, the systems had achieved 240 minutes integrity, but depended on the type of cables/cable bundles, the insulation performance varied from below 56 minutes to 240 minutes. As a conservative approach to include the general cable/cable bundles application, it is proposed that the mineral wool shall increase in density to 100 kg/m³ to enhance the insulation performance. In such case, the proposed application is minimum 30mm thick CP 611A on both sides and flushed with the wall surface, and in between the CP611A, the cavity is fully infilled with the 100 kg/m³ mineral wool. The minimum requirement of the wall is 150 mm thick and shall be capable to provide the required FRR.

For the floor mount situation

The test evidence WARERS no. 57312/A was referenced for the proposed scope of the floor mount cables or cable bundles penetration sealing application. In the test, the single cables and cable bundles situation was demonstrated while passing through a 150 mm thick masonry floor slab system the aperture sizes on the floor was varied from 90 mm diameter to 130 mm diameter, and the overall diameter of the cables or the cable bundles were approximately 50 mm diameter in overall. In all cases, the voids in between the cables/cable bundles and the wall were fitted with 40 mm thick Hilti "CP611A" flush with the underside of the floor, which was the exposed side of the floor. In all cases, the systems had achieved 240 minutes integrity, but depended on the type of cables/cable bundles, the insulation performance varied from below 52 minutes to 75 minutes.

In this assessment, a conservative approach is proposed, in which the installation of the CP 611A would be flushed with the unexposed face instead of the exposed face. And 60 kg/m³ mineral wool shall be fitted to the full depth as the backing the CP 611A on the exposed side. The fitting the mineral wool shall be adequate to ensure the fixing of the mineral wool remain intact throughout the fire resistance duration. The minimum requirement of the floor slab is 150 mm thick and shall be capable to provide the required FRR.

4.4 The fire resistance performance of cables, cable bundles, plastic/metal conduit wall penetration sealing using Hilti “CP620” firestop foam

Proposal

It is proposed that Hilti ‘CP620’ firestop foam is used for the purpose of sealing the cables, cable bundles, cable trays or plastic/metal conduit penetration through the masonry like supporting wall construction. The Hilti “CP620” shall be used to fully filled up the aperture up to 145 mm or 200 mm thick depends on the type of service penetration as described below:

It is assumed that the wall system of the surrounding supporting construction shall carry at least up to the same fire resistance performance in terms of both integrity and insulation as the proposed scenario.

For wall mount situation				
Service penetration	Wall configuration	Opening sizes	Services overall diameter	Sealing configuration
Cables, cable bundles or cable trays	Masonry or Drywall partition	Up to 400 mm x 500 mm or 400 mm diameter	Bundle of cable up to 30 mm diameter or individual cable up to 18 mm diameter	200 mm thick for system requires 120 minutes insulation; 145 mm thick for system requires integrity only
Metal conduit without insulation		Up to 400 mm x 500 mm or 400 mm diameter	Up to 76 mm diameter	145 mm thick for system requires integrity only
Metal conduit with min 30 mm thick mineral wool insulation		Up to 400 mm x 500 mm or 400 mm diameter	Up to 76 mm	200 mm thick for system requires 120 minutes insulation
Plastic conduit with the use of CP643 Collar		Up to 400 mm x 500 mm or 400 mm diameter	Up to 110 mm diameter with wall thickness up to 7.2 mm	200 mm thick for system requires 120 minutes insulation

The sealing systems as proposed above is required to provide 120 minutes integrity and various insulation performance with respect to BS 476: Part 20: 1987.

Discussion

The test evidence BRE test report no. TE203650 described the test of electrical service penetration through the drywall partition system with overall 120 mm thick incorporated with aperture sizes of nominally 400 mm wide x 500 mm high or 400 mm wide x 400 mm high fully sealed up with nominal 145 mm thick Hilti "CP620" firestop foam and with various electrical services penetration, e.g. the copper pipe, steel conduit a, plastic pipe or cable tray, etc. Based on the test result, all the specimens basically achieved at least 120 minutes integrity and with less than 20 minutes to 44 minutes insulation performance with respect to BS 476: Part 20: 1987. Since the insulation performance was presented as a bulk temperature recording for all the services penetration through one aperture.

The test evidence TE FG7251 described the test of electrical service penetration through the drywall partition system with overall 120 mm thick incorporated with aperture sizes of nominally 440 mm wide x 550 mm high or 200 mm wide x 180 mm high fully sealed up with nominal 145 mm or 200 mm thick Hilti "CP620" firestop foam and with various electrical services penetration, e.g. the metal pipe with insulation, plastic pipe with the use of CP 643 collar, cables or cable tray, etc. Based on the test result, all the specimens basically achieved at least 120 minutes integrity and 120 minutes insulation performance with respect to BS 476: Part 20: 1987.

The proposal scope of application is basically adopt the tested situation, with the modification to include the conservative side.

4.5 *The fire resistance performance electrical service penetration sealing using Hilti 'CFS-SL GA' firestop speed sleeve for masonry wall and floor penetration*

Proposal

It is proposed that Hilti 'CFS-SL GA' firestop speed sleeve may be used in masonry wall and floor penetration application similar to the 'CFS-SL' that tested under R16L28-1B and R16L28-2A. The Hilti 'CFS-SL GA' different from the 'CFS-SL' that the term 'GA' denote the use of a smoke tight rubber gasket as the backing sealing material between the wall/floor aperture and the firestop speed sleeve. The Hilti 'CFS-SL GA' had been tested under the test evidence WFRGETN no. 18116A.

The proposed sealing system using the Hilti 'CFS-SL' and 'CFS-SL GA' filled with up to 60% of 3 mm diameter AV cables is required to provide the fire resistance performance of up to 120 minutes integrity for wall application and 240 minutes for floor application with respect to BS 476: Part 20: 1987. The wall and floor shall have its own test evidence for the required fire resistance performance.

Discussion

The test evidence R16L28-1B, specimen '6', described the use of the Hilti 'CFS-SL' firestop speed sleeve filled with 60% of 3mm diameter AV cables penetrating through the masonry wall and achieve the fire resistance performance of 121 minutes integrity performance with respect to BS 476: Part 20: 1987.

The test evidence R16L28-2A, specimens '7' and '8', described the use of the Hilti 'CFS-SL' penetrating through masonry floor. In both specimens, the speed sleeve was filled with 60% of 3 mm diameter AV cables, while in specimen '8' an extra 25 mm wide Hilti 'CP648-E' fire wrap was used. Both specimens '7' and '8' had achieved the fire resistance performance of 241 minutes integrity with respect to BS 476: Part 20: 1987.

The test evidence WFRGENT Report no. 18116A 17258B described the use of the Hilti 'CFS-SL GA' for a number of penetration configurations through the aerated floor construction. In the test, the smoke tight rubber gasket denoted as 'GA' was used for all the specimens of concern. The specimens with at least 152 mm separation distance from others had achieved 132 minutes integrity performance with respect to the BS EN 1366-3: 2009.

The use of the smoke tight rubber gasket denoted as 'GA' had been proven that it will not cause any sustain flaming during the test duration of 120 minutes nor creating of any gaps due to deterioration. Therefore, the use of the Hilti 'CFS-SL GA' is considered acceptable for the application as described in R16L28-1B and R16L28-2A.

4.6 *The fire resistance performance electrical service penetration sealing using Hilti ‘CP651’ firestop pillow for masonry wall penetration*

Proposal

It is proposed that Hilti ‘CP651’ firestop pillow may be used for the purpose of sealing the cables, cable bundles, cable trays or plastic/metal conduit penetration through the supporting wall or slab construction. The Hilti “CP651” shall be used to fully filled up the aperture depends on the type of service penetration as described below:

It is assumed that the wall or slab system of the surrounding supporting construction shall carry at least up to the same fire resistance performance in terms of both integrity and insulation as the proposed scenario.

For wall mount situation					
Service penetration	Wall configuration	Opening sizes	Services overall diameter	Sealing configuration	FRR Integrity/ insulation
Cables, cable bundles, cable tray	Masonry type minimum 150 mm thick	Up to 1,500 mm high by 1,200 mm wide	Up to 80 mm diameter cables, cable tray width of 1,000 mm	Full filled with “CP651 firestop pillow” with the 300 mm long side against the depth of wall.	240/60
				For system requires 120 minutes insulation performance, additional wrap using the same “CP651 firestop pillow” with either 170 mm long or 300 mm long on both sides as the extended insulation	240/120 [^]
Cables, cable bundles, cable tray	Drywall partition minimum 100 mm thick	Up to 1,500 mm high by 1,200 mm wide	Up to 80 mm diameter cables, cable tray width of 1,000 mm	Full filled with “CP651 firestop pillow” with the 300 mm long side against the depth of wall.	120/60
				For system requires 120 minutes insulation performance, additional wrap using the same “CP651 firestop pillow” with either 170 mm long or 300 mm long on both sides as the extended insulation	120/120

For floor mount situation					
Service penetration	Floor configuration	Opening sizes	Services overall diameter	Sealing configuration	
Cables, cable bundles, cable trays	Masonry type minimum 150 mm thick	Up to 700 mm wide and 1,000 mm long	Up to 80 mm diameter cables, cable tray width of 1,000 mm	The aperture shall be fully filled with "CP651" firestop pillow. The pillows shall be adequately supported from the underside of the slab by the use of wire mesh (Wire > 5mm dia with a grid sizes of maximum 50 mm x 50 mm fixed to the slab by Hilti metal anchor.	120/60
				The penetration shall be further sealed up with the use of Hilti CP 606 up to 30 mm deep from the unexposed side to fill up the cable spaces and gaps between the pillows and the cables. At the unexposed face, wrap the penetration service by the same pillow extended from the slab top surface using either 170 mm long or 300 mm long of the pillow	120/120

[^]Note: System achieved 240 minutes insulation is specific and may refer to the original test evidence

The sealing systems as proposed above is required to provide 120 minutes or 240 minutes integrity and various insulation performance with respect to BS 476: Part 20: 1987.

Discussion

The test evidence WF 150136 described the test of the use of "Hilti CP651N" firestop pillow penetration sealing system to seal up the penetration gaps within a 150 mm thick lightweight rigid wall supporting construction. The aperture sizes within the wall was 1,500 mm high by 1,200 mm wide and incorporated with various cable serve penetration within the wall. The test had demonstrated the sealing systems achieve 241 minutes integrity and generally 45 minutes insulation performance. A full breakdown of the

insulation performance for individual service penetration shall refer to the original test report.

The test evidence MPA report no. 3265/3575 described the test of the use of "Hilti CP651N" firestop pillow penetration sealing system to seal up the penetration gaps within a 100 mm thick drywall partition supporting construction. The aperture sizes within the wall was 1,500 mm high by 1,200 mm wide and incorporated with various cable serve penetration within the wall. The test had demonstrated the sealing systems achieved 120 minutes integrity and insulation performance. A full breakdown of the insulation performance for individual service penetration shall refer to the original test report.

The test evidence of CTICM no. 05-E-331-A described the test of the use of Hilti "CP651N" firestop pillow to seal up the penetration of the plastic pipes within a 1,000 mm by 700 mm wide aperture within the concrete floor supporting construction. The penetration sealing incorporated additional sealing of CP 606 mastic and the CP 648 wrap to achieve the fire resistance performance of 135 minutes integrity, 94 minutes and 85 minutes insulation performance respectively.

Since the application of the Hilti "CP651" firestop pillow is based on limited test evidence, the applications of the sealing systems in different supporting construction situations are basically adopt the tested scenarios directly.

In the masonry wall application, the test evidence WF 151036 demonstrated the ability of the sealing system to provide 240 minutes integrity performance and generally 60 minutes insulation with the use of the Hilti "CP651" firestop pillow to seal up the wall apertures with the penetration of the cable trays. While with reference to the test evidence MPA report no. 3265/3575 this give the evidence that with the additional wrapping of the same Hilti "CP651" below extended from the wall surface for either 170 mm or 300 mm is effective in enhancing the insulation performance and capable to achieve 120 minutes insulation. With this consideration, it is reasonable to believe that in the wall situation, the use of additional wrap of the pillow on both sides of the sealing system is capable to enhance the insulation performance up to 120 minutes insulation.

The situation for drywall partition is basically adopt the same principle, but the test evidence for drywall application only up to 132 minutes integrity and therefore the scope of application for drywall partition is confined to 120 minutes integrity.

In the masonry floor application, the test evidence CTICM no. 05-E-331-A is referenced, the key concern from this test is the maximum aperture sizes and the methodology that used to ensure the fire pillow are adequately supported. By directly adopting the tested situation and supplement with the use of the additional pillow wrap according to the test evidence MPA report no. 3265/3575, the scope of application for the floor mounted situation is worked out.

5 CONCLUSION

The proposed use of Hilti pipe penetration sealing systems in both floor mounted and wall mounted 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:



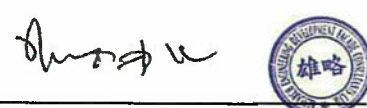
Dr. SZE Lip-kit

Test Consultant

Research Engineering Development

Façade Consultants Limited

Reviewed by:



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

Authorized Signature

Research Engineering Development

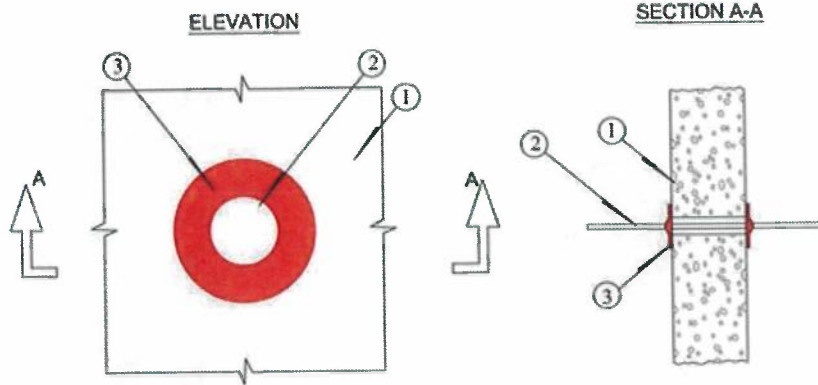
Façade Consultants Limited

APPENDIX A – SUMMARY OF PENTRATION SEALING IN DIFFERENT SCENARIOS

Drawing refers to Section 4.2 on electrical service penetration application by using CFS-D

FIRE RESISTANCE RATING: UP TO -J120/-

Concrete Wall Case:

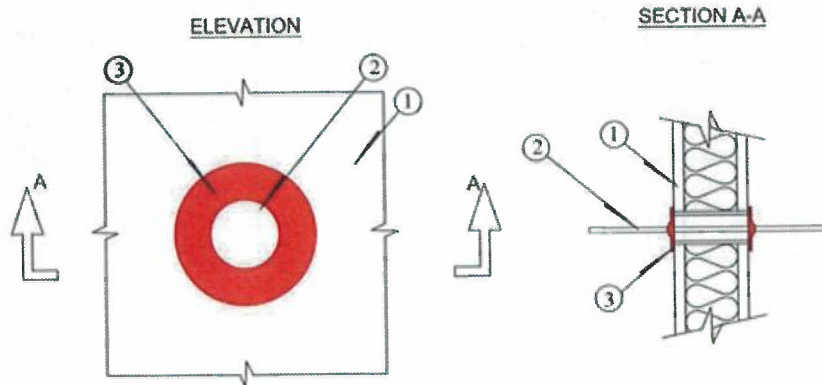


1. CONCRETE WALL OR FIRE-RATED BLOCKWALL.
2. CABLE / PVC CABLE CONDUITS/ METAL CONDUITS.
3. CFS-D CABLE DISC AOOPLIED AT BOTH SIDES OF A WALL ASSEMBLY.

Application Details:

Type of penetrants	Wall type	Max diameter of opening	Max diameter of penetrants	No. of CFS-D
PVC / Metal Conduits Cable / Cable Bundles	Concrete	40mm	32mm	2
	Concrete	35mm	25mm	1

Drywall Case:



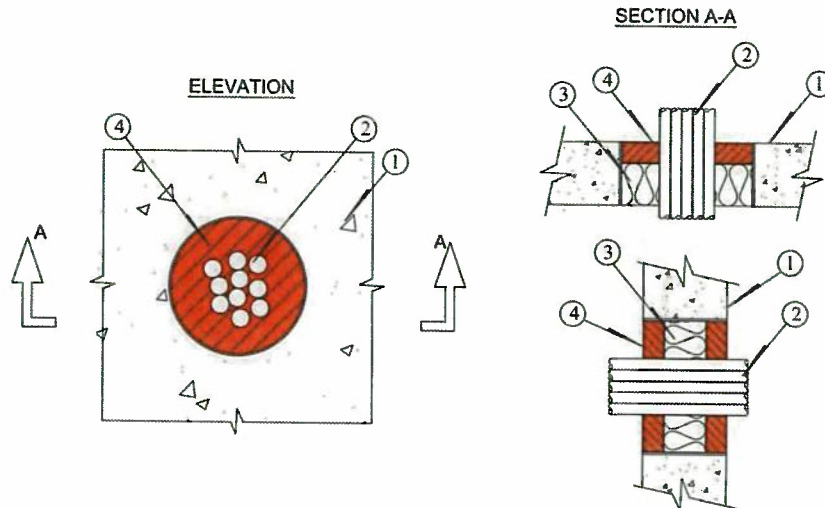
1. DRYWALL ASSEMBLY
2. CABLE/ PVC CABLE CONDUITS/ METAL CONDUITS
3. CFS-D CABLE DISC AOOPLIED AT BOTH SIDES OF A DRYWALL ASSEMBLY

Application Details:

Type of Penetrants	Wall Type	Max size of opening	Max diameter of penetrants	No. of CFS-D
PVC / Metal Conduits Cable / Cable Bundles	Drywall Partition	25mm x 25mm or 25mm diameter	16mm	1

Drawing refers to Section 4.3 on cables or cable bundles application by using CP611A + mineral wool backing

FIRE RESISTANCE RATING: UP TO -/240/60

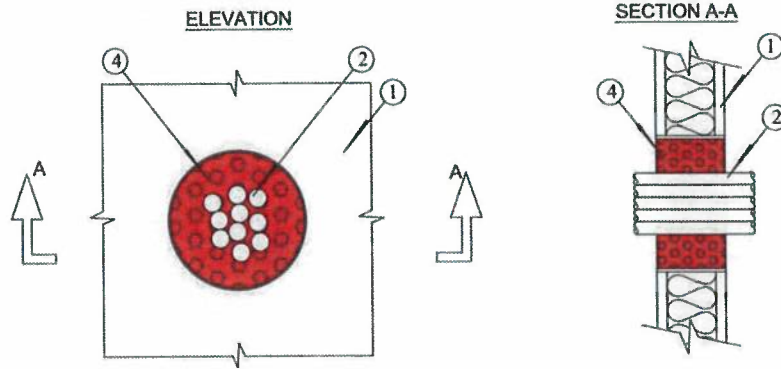


1. CONCRETE FLOOR OR WALL ASSEMBLY:
 - A. CONCRETE WALL OR FIRE-RATED BLOCKWALL.
 - B. CONCRETE FLOOR.
2. CABLE / CABLE BUNDLE.
3. MINERAL WOOL (MINIMUM 60kg/m³) TIGHTLY PACKED AS BACKING MATERIAL.
4. (FLOOR) MINIMUM 30mm THICKNESS CP 611A FIRESTOP INTUMESCENT SEALANT.
(WALL) MINIMUM 30mm THICKNESS CP 611A FIRESTOP INTUMESCENT SEALANT.
APPLIED ON BOTH SIDES OF A WALL ASSEMBLY.

Application Details:

Penetrants	Type	Max diameter of opening	Max diameter of penetrants	Sealing configuration
Cable / Cable Bundles	Wall mount	67mm	45mm	30mm thick CP 611A on both sides flush with the wall surface and fully backed with 60kg/m ³ mineral
	Floor mount	130mm	40mm	40mm thick CP 611A on unexposed side flush with the floor surface and fully backed with 60kg/m ³ mineral

Drawing refers to Section 4.4 on electrical service penetration application by using CP 620
FIRE RESISTANCE RATING: UP TO -J120/120



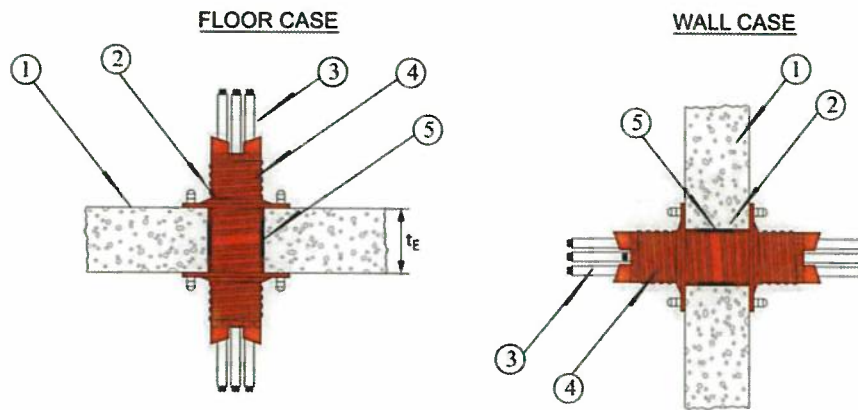
1. DRYWALL ASSEMBLY.
2. CABLE / uPVC.
3. METAL SLEEVE (OPTIONAL).
4. MINIMUM 145mm THICK CP 620 FIRESTOP FOAM.

NOTES	
1.	MAXIMUM SIZE OF WALL OPENING = 400mm x 400mm or 400mm dia.
2.	CABLES TO FILL MAXIMUM 60% OF CROSS-SECTIONAL AREA OF OPENING.

Application Details:

Type of penetrants	Wall type	Max size of opening	Max diameter of penetrants	Sealing Configuration
Cable / Cable bundles / Cable trays	Masonry / Drywall partition	400mm x 500mm or 400mm diameter	Bundles of cable up to 30mm diameter or individual cable up to 18mm diameter	200mm thick for 120min insulation, 145mm thick for integrity only
Metal conduit without insulation		400mm x 500mm or 400mm diameter	Up to 76mm diameter	145mm thick for integrity only
Metal conduit with min 30mm thick mineral wool insulation		400mm x 500mm or 400mm diameter	Up to 76mm	200mm thick for 120min insulation
Plastic conduit with the use of CP 643 Collar		400mm x 500mm or 400mm diameter	Up to 110 mm diameter with wall thickness up to 7.2 mm	200mm thick for 120min insulation

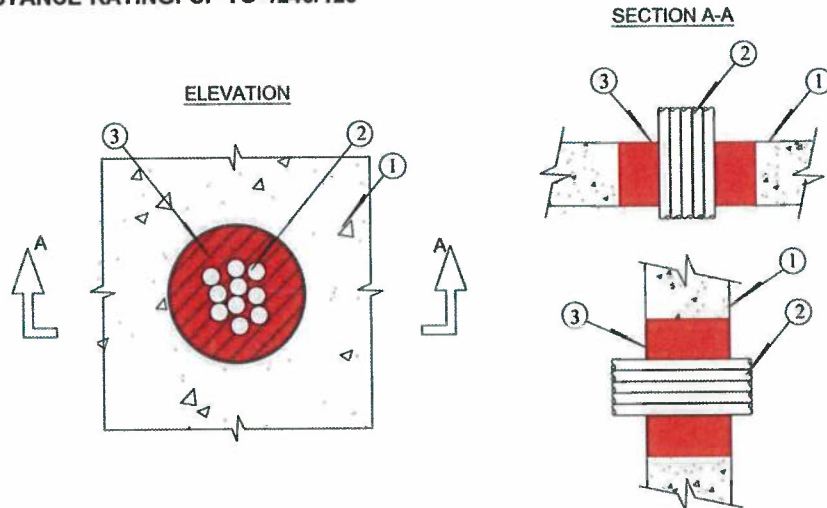
Drawing refers to Section 4.5 on electrical service penetration application by using CFS-SL GA
FIRE RESISTANCE RATING: UP TO -/240/-



1. CONCRETE FLOOR OR WALL ASSEMBLY.
2. MAX.OPENING SIZE Ø120mm.
3. AGGREGATE CROSS-SECTIONAL AREA OF CABLE INSIDE TRUNKING TO BE MAXIMUM 60% OF THE CROSS-SECTIONAL AREA OF CABLE PASS.
4. CFS-SL FIRESTOP SLEEVE.
5. FOR ANNULAR SPACE $\leq 30\text{mm}$, FILL THE VOID UP BY MINERAL WOOL WITH MINIMUM 15mm DEPTH CP 606 FIRESTOP ACRYLIC SEALANT.

Drawing refers to Section 4.6 on electrical service penetration application by using CP 651

FIRE RESISTANCE RATING: UP TO -J240/120



1. CONCRETE FLOOR OR WALL ASSEMBLY:
A. CONCRETE WALL OR FIRE-RATED BLOCKWALL.
B. CONCRETE FLOOR.
2. CABLE / CABLE BUNDLE / CABLE TRAY
3. CP 651 FIRESTOP CUSHION.

Application Details: (Wall mount)

Wall	Max size of opening	Max diameter of penetrants	Sealing configuration	FRR
Masonry min 150mm thick	1500mm x 1200mm	80mm diameter cable, cable tray width of 1000mm	Full filled with 300mm long side against depth of the wall	240/60*
			Full filled with 300mm long side against depth of the wall, wrap with CP651 on both sides extended from wall	240/120
Drywall partition min 100mm thick	1500mm x 1200mm	80mm diameter cable, cable tray width of 1000mm	Full filled with 300mm long side against depth of the wall,	120/60*
			Full filled with 300mm long side against depth of the wall, wrap with CP651 on both sides extended from wall	120/120

*A full breakdown of insulation performance for individual service penetration shall refer to the original test report.

Application Details: (Floor mount)

Wall	Max size of opening	Max diameter of penetrants	Sealing configuration	FRR
Masonry min 150mm thick Drywall partition min 100mm thick	700mm x 1000mm	80mm diameter cable, cable tray width of 1000mm	Fully filled with CP651, supported by wire	120/60
			Fully filled with CP651 supported by wire, seal 30mm CP606 on unexposed side, wrap with CP651 on both sides extended from slab top surface	120/120

- End of Report -



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

VOC Content Test Certificate

November 12, 2020

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

Sample Description: Hilti CFS-D 1" Firestop Putty Disc

Date Tested: November 4, 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
LEED 4.1 Low-Emitting Materials – Adhesives and Sealants	CFS-D 1" Firestop Putty Disc
Green Building Council of Australia Green Star Office Design 3.0, IEQ-13 Green Star Office Design 2.0, IEQ-13 Green Star Office Interiors 1.1, IEQ-11	
All Other Sealants VOC Limit: 420 g/L	Product contains: 5 g/L of VOC

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 numbers: 26, 33, 21

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.

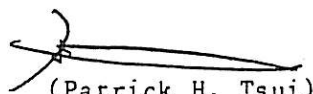
The Buildings Department has a list of recognized laboratories. This is available for reference at our office :

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,
Hunghom, Kowloon.

Dear Sirs,

"HILTI" Fire Prevention System

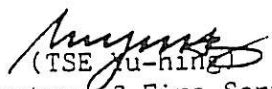
I refer to your letter of 30.3.92 and the enclosures attached thereto.

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. : 099/FP/DY/23

Subject : Country of Origin- Hilti CFS-D Firestop Putty Disc

Dear Sir / Madam,

Enclosed please find the information of Hilti CFS-D Firestop Putty Disc.

Brand Name : Hilti

Model Name : Hilti CFS-D Firestop Putty Disc

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 : Romania

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.

Yours faithfully,



Dennis Yeung
Head of Product Leadership Strategy, F&P

To whom it may concern

Date: 14th Feb 2018

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 products, CFS-D Firestop Cable Disc 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-P BA, CP 617, CP 618, CP 619, CFS-D 1", CFS-D 25

Safety Data Sheet

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

Date of issue: 12/12/2019

Version: 3.2

Revision date: 12/12/2019

Supersedes: 07/10/2019

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

1.1. Product identifier

Product form	Mixture
Trade name	CFS-P BA, CP 617, CP 618, CP 619, CFS-D 1", CFS-D 25
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 putty pad
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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

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

Department issuing data specification sheet

Hilti AG
Feldkircherstraße 100
9494 Schaan - Liechtenstein
T +423 234 2111
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
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SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

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

Not classified

2.2. Label elements

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

No labelling applicable

2.3. Other hazards

No additional information available

CFS-P BA, CP 617, CP 618, CP 619, CFS-D 1", CFS-D 25

Safety Data Sheet

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

SECTION 3: Composition/information on ingredients

3.1. Substances

Not applicable

3.2. Mixtures

This mixture does not contain any substances to be mentioned according to the applicable regulations

SECTION 4: First aid measures

4.1. Description of first aid measures

First-aid measures general	Never give anything by mouth to an unconscious person. If you feel unwell, seek medical advice (show the label where possible).
First-aid measures after skin contact	Wash skin with plenty of water. If skin irritation 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. Obtain medical attention if pain, blinking or redness persists.
First-aid measures after ingestion	Rinse mouth. Do NOT induce vomiting. Obtain emergency medical attention.

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

Symptoms/effects	Not expected to present a significant hazard under anticipated conditions of normal use.
Potential adverse human health effects and symptoms	Based on available data, the classification criteria are not met.

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	Foam. Dry powder. Carbon dioxide. Water spray. Sand.
Unsuitable extinguishing media	Do not use a heavy water stream.

5.2. Special hazards arising from the substance or mixture

No additional information available

5.3. Advice for firefighters

Firefighting instructions	Use water spray or fog for cooling exposed containers. Exercise caution when fighting any chemical fire. Prevent fire fighting water from entering the environment.
Protection during firefighting	Self-contained breathing apparatus. Complete protective clothing. Do not enter fire area without proper protective equipment, including respiratory protection.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

6.1.1. For non-emergency personnel

Emergency procedures	Evacuate unnecessary personnel.
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CFS-P BA, CP 617, CP 618, CP 619, CFS-D 1", CFS-D 25

Safety Data Sheet

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

6.1.2. For emergency responders

Protective equipment

For further information refer to section 8: "Exposure controls/personal protection". Equip cleanup crew with proper protection.

Emergency procedures

Ventilate area.

6.2. Environmental precautions

Prevent entry to sewers and public waters.

6.3. Methods and material for containment and cleaning up

Methods for cleaning up

On land, sweep or shovel into suitable containers.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling

Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work.

Hygiene measures

Do not eat, drink or smoke when using this product. Always wash hands after handling the product. Wash contaminated clothing before reuse.

7.2. Conditions for safe storage, including any incompatibilities

Storage conditions

Store at ambient temperature.

Incompatible products

Strong bases. Strong acids.

Incompatible materials

Sources of ignition. Direct sunlight.

Storage temperature

-5 - 40 °C

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Additional information

The product has a pasty consistency. Exposure limit values for respirable dusts are not relevant for this product.

8.2. Appropriate engineering controls

Other information

Do not eat, drink or smoke during use.

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

Hand protection

Wear protective gloves.

Eye protection

Chemical goggles or safety glasses

Skin and body protection

Wear suitable protective clothing



8.4. Exposure limit values for the other components

No additional information available

CFS-P BA, CP 617, CP 618, CP 619, CFS-D 1", CFS-D 25

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	Solid
Appearance	Pasty.
Molecular mass	Not determined
Colour	red.
Odour	characteristic.
Odour threshold	Not determined
pH	Not relevant
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, Non flammable.
Vapour pressure	No data available
Relative vapour density at 20 °C	No data available
Relative density	No data available
Density	1.6 g/cm ³
Solubility	Water: Insoluble
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. Not established.

10.3. Possibility of hazardous reactions

No dangerous reactions known under normal conditions of use. Not established.

10.4. Conditions to avoid

None under recommended storage and handling conditions (see section 7). Direct sunlight. Extremely high or low temperatures.

10.5. Incompatible materials

Strong acids. Strong bases.

CFS-P BA, CP 617, CP 618, CP 619, CFS-D 1", CFS-D 25

Safety Data Sheet

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

10.6. Hazardous decomposition products

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

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
	pH: Not relevant
Serious eye damage/irritation	Not classified
	pH: Not relevant
Respiratory or skin sensitisation	Not classified
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
Potential adverse human health effects and symptoms	Based on available data, the classification criteria are not met.

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.
Hazardous to the aquatic environment, short-term (acute)	Not classified
Hazardous to the aquatic environment, long-term (chronic)	Not classified

12.2. Persistence and degradability

CFS-P BA, CP 617, CP 618, CP 619, CFS-D 1", CFS-D 25	
Persistence and degradability	Not established.

12.3. Bioaccumulative potential

CFS-P BA, CP 617, CP 618, CP 619, CFS-D 1", CFS-D 25	
Bioaccumulative potential	Not established.

12.4. Mobility in soil

No additional information available

12.5. Other adverse effects

CFS-P BA, CP 617, CP 618, CP 619, CFS-D 1", CFS-D 25

Safety Data Sheet

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

Ozone	Not classified
Other adverse effects	No additional information available
Other information	Avoid release to the environment.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Waste treatment methods	Dispose in a safe manner in accordance with local/national regulations.
Product/Packaging disposal recommendations	Dispose in a safe manner in accordance with local/national regulations.
Ecology - waste materials	Avoid release to the environment.

SECTION 14: Transport information

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

ADR	IMDG	IATA	RID
14.1. UN number			
Not regulated	Not regulated	Not regulated	Not regulated
14.2. UN proper shipping name			
Not regulated	Not regulated	Not regulated	Not regulated
14.3. Transport hazard class(es)			
Not regulated	Not regulated	Not regulated	Not regulated
14.4. Packing group			
Not regulated	Not regulated	Not regulated	Not regulated
14.5. Environmental hazards			
Not regulated	Not regulated	Not regulated	Not regulated
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 and the IBC Code



CFS-P BA, CP 617, CP 618, CP 619, CFS-D 1", CFS-D 25

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 12/12/2019
Revision date 12/12/2019
Supersedes 07/10/2019

Indication of changes:

Section	Changed item	Change	Comments
			general update

Other information None.

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.

