



Regulatory information report




Hilti Firestop Cable Collar CFS-CC protecting in accordance with AS 1530.4:2014 and AS 4072.1:2005

Sponsor: Hilti Australia Pty Ltd & Hilti (New Zealand) Limited

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Quality management

Version	Date	Information about the report			
RIR 38022100	Issue: 29/04/2016	Reason for issue	Initial Issue		
		Prepared by	Reviewed by		
		Name	S.Hu	K. Nicholls	
RIR2.0	Issue: 26/03/2021	Reason for issue	Addition of variations and extending validity for 5 years		
		Prepared by	Reviewed by	Authorised by	
		Name	Rami Al-Darwish	Yomal Dias	Imran Ahamed
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		Prepared by	Reviewed by	Authorised by	
	Expiry: 31/03/2026	Name	Rami Al-Darwish	Yomal Dias	Yomal Dias
		Signature			

Executive summary

This report contains the minimum information required for regulatory compliance and refers to the referenced assessment report 38022100 R2.1.

The analysis in section 5 of the referenced assessment report found that the proposed systems together with the described variations are likely to achieve the FRL as shown in Table 10 to Table 14, if tested in accordance with AS 1530.4:2014 and assessed in accordance with AS 4072.1:2005.

The variations and outcome of the referenced assessment report are subject to the limitations and requirements described in sections 2, 3 and 6 of this report. The results of this report are valid until 31 March 2026.

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1. Introduction

This report contains the minimum information sufficient for regulatory compliance and refers to the assessment report 38022100 R2.1.

The analysis conducted in the referenced assessment report presents an assessment of the fire resistance performance of Hilti Firestop Cable Collar CFS-CC protecting service penetrations in walls and floors if tested in accordance with AS 1530.4:2014¹ and assessed in accordance with AS 4072.1:2005 (R2016)².

The referenced assessment was carried out at the request of Hilti Australia Pty Ltd & Hilti (New Zealand) Limited.

The sponsor details are included in Table 1.

Table 1 Sponsor details

Sponsor	Address
Hilti (New Zealand) Limited	1B 525 Great South Road, Penrose Auckland 1061 New Zealand
Hilti (Aust.) Pty Ltd	1G Homebush Bay Drive, Rhodes, NSW, 2138 Australia

2. Framework for the assessment

2.1 Assessment approach

An assessment is an opinion about the likely performance of a component or element of structure if it was subject to a standard fire test.

No specific framework, methodology, standard or guidance documents exists in Australia for doing these assessments. We have therefore followed the 'Guide to undertaking technical assessments of the fire performance of construction products based on fire test evidence' prepared by the Passive Fire Protection Forum (PFPF) in the UK in 2019³.

This guide provides a framework for undertaking assessments in the absence of specific fire test results. Some areas where assessments may be offered are:

- Where a modification is made to a construction which has already been tested
- The interpolation or extrapolation of results of a series of fire resistance tests, or utilisation of a series of fire test results to evaluate a range of variables in a construction design or a product
- Where, for various reasons – eg size or configuration – it is not possible to subject a construction or a product to a fire test.

Assessments will vary from relatively simple judgements on small changes to a product or construction through to detailed and often complex engineering assessments of large or sophisticated constructions.

The referenced assessment uses established empirical methods and our experience of fire testing similar products to extend the scope of application by determining the limits for the design based on

¹ Standards Australia, 2014, Methods for fire tests on building materials, components and structures – Part 4: Fire-resistance tests for elements of construction, AS 1530.4:2014, Standards Australia, NSW.

² Standards Australia, 2005, Components for the protection of openings in fire-resistant separating elements: Service penetrations and control joints (Reconfirmed 2016), AS 4072.1:2005 (R2016), Standards Australia, NSW.

³ Passive Fire Protection Forum (PFPF), 2019, Guide to undertaking technical assessments of the fire performance of construction products based on fire test evidence, Passive Fire Protection Forum (PFPF), UK.

the tested constructions and performances obtained. The assessment is an evaluation of the potential fire resistance performance if the elements were to be tested in accordance with AS 1530.4:2014.

The referenced assessment has been written using appropriate test evidence generated at accredited laboratories to the relevant test standard. The supporting test evidence has been deemed appropriate to support the manufacturer's stated design.

2.2 Compliance with the National Construction Code

The referenced assessment report has been prepared to meet the evidence of suitability requirements of the National Construction Code Volumes One and Two – Building Code of Australia (NCC) 2019 including Amendments⁴ under A5.2 (1) (d).

The referenced assessment has been written in accordance with the general principles outlined in EN 15725:2010⁵ for extended application reports on the fire performance of construction products and building elements. It also references test evidence for meeting a performance requirement or deemed to satisfy (DTS) provisions of the NCC under A5.4 for fire resistance levels, as applicable to the assessed systems.

The referenced assessment report may also be used to demonstrate compliance with the requirements for evidence of suitability under NCC 2016 including Amendments⁶.

2.3 Declaration

The 'Guide to undertaking technical assessments of the fire performance of construction products based on fire test evidence' prepared by the PFPF in the UK requires a declaration from the client. By accepting our fee proposal on 25 February 2021, Hilti Australia Pty Ltd & Hilti (New Zealand) Limited confirmed that:

- To their knowledge the component or element of structure, which is the subject of the referenced assessment, has not been subjected to a fire test to the standard against which the referenced assessment is being made.
- They agree to withdraw the referenced assessment from circulation if the component or element of structure is the subject of a fire test by a test authority in accordance with the standard against which the referenced assessment is being made and the results are not in agreement with the referenced assessment.
- They are not aware of any information that could adversely affect the conclusions of the referenced assessment and – if they subsequently become aware of any such information – they agree to ask the assessing authority to withdraw the assessment.

3. Limitations of the referenced assessment

- The scope of the referenced assessment report is limited to an assessment of the variations to the tested systems described in section 4.3.
- The referenced assessment report details the methods of construction, test conditions and assessed results that are expected if the systems were tested in accordance with AS 1530.4:2014.
- The results of the referenced assessment are applicable to penetrations in walls exposed to fire from either side or floors exposed to fire from underside only.
- The referenced assessment report is only valid for the assessed systems and must not be used for any other purpose. Any changes with respect to size, construction details, loads, stresses, edge or end conditions – other than those identified in the referenced assessment

⁴ National Construction Code Volume One and Two – Building Code of Australia 2019 Amendments, Australian Building Codes Board, Australia.

⁵ European Committee for Standardization, 2010, Extended application reports on the fire performance of construction products and building elements, EN 15725:2010, European Committee for Standardization, Brussels, Belgium.

⁶ National Construction Code Volume One and Two – Building Code of Australia 2019 Amendments, Australian Building Codes Board, Australia.

report – may invalidate the findings of the referenced assessment. If there are changes to the system, a reassessment will need to be done by an Accredited Testing Laboratory (ATL).

- The documentation that forms the basis for the referenced assessment report is listed in Appendix B of the referenced report.
- The referenced assessment report has been prepared based on information provided by others. Warringtonfire has not verified the accuracy and/or completeness of that information and will not be responsible for any errors or omissions that may be incorporated into the referenced assessment report as a result.
- The referenced assessment is based on the proposed systems being constructed under comprehensive quality control practices and following appropriate industry regulations and Australian Standards on quality of materials, design of structures, guidance on workmanship and the expert handling, placing and finishing of the products on site. These variables are beyond the control and consideration of the referenced assessment report.

4. Description of the specimen and variations

4.1 System description

The referenced assessment is based on reference tests N° 08-E-079 and N° 07-E-317 describing tests on

AS 1530.4:2005 Appendix D1 and D2 standard configuration cables and EN1366 configuration cables in a floor construction and sealed with Hilti Intumescent foam CP 660 tested in accordance with EN 1363-1:1999⁷ and EN 1366-3:2006⁸. The tests were sponsored by Hilti and were conducted by EFECTIS France.

The referenced assessment is based on reference tests Nr. 8829/13, Nr. 8828/13, Nr. 8810/12, Nr. 8809/12 and Nr. 8808/12 describing tests on EN standard cables, conduits and copper pipe protected by Hilti Firestop Cable Collar CFS-CC in wall and floor constructions tested in accordance with EN 1366-3: 2009. The tests were sponsored by Hilti AG and were conducted by AFITI LICOF Centre for Fire Testing and Research.

A reference is also made to test report FSV 0917 and R13240/Project 04CA55496 being tests of service penetrations in brick wall and flexible wall systems which were sponsored by Hilti (Aust.) Pty Ltd and Hilti Construction Chemicals.

4.2 Referenced test data

The assessment of the variation to the tested system and the determination of the likely performance is based on the results of the fire tests documented in the reports summarised in Table 2. Further details of the tested system are included in in Appendix B of the referenced report.

Table 2 Referenced test data

Report number	Test sponsor	Test date	Testing authority
Nr. 8829/13	HILTI AG	15 February 2013	AFITI LICOF (Centre for Fire Testing and Research)
N° 08-E-079	HILTI, FL	13 March 2008	EFECTIS France
N° 07-E-317	HILTI, FL	11 October 2007	EFECTIS France
Nr. 8828/13	HILTI AG	13 February 2013	AFITI LICOF (Centre for Fire Testing and Research)
Nr. 8810/12	HILTI AG	15 February 2013	AFITI LICOF (Centre for Fire Testing and Research)
Nr. 8809/12	HILTI AG	11 December 2012	AFITI LICOF (Centre for Fire Testing and Research)

⁷ European Committee for Standardization, 1999, Fire resistance tests – General requirements, BS EN 1363-1:1999, European Committee for Standardization, Brussels, Belgium.

⁸ European Committee for Standardization, 2006, Fire resistance tests for service installations. Penetration seals, BS EN 1366-3:2006, European Committee for Standardization, Brussels, Belgium.

Report number	Test sponsor	Test date	Testing authority
Nr. 8808/12	HILTI AG	26 November 2012	AFITI LICOF (Centre for Fire Testing and Research)
FSV 0917	Hilti (Aust) Pty Ltd	31 August 2002	CSIRO – Manufacturing and Infrastructure Technology
R13240/Project 04CA55496	Hilti Construction Chemicals, div. of Hilti, Inc.	9 and 10 November 2004	Underwriters laboratories Inc®

4.3 Variations to the tested systems

An identical system has not been subject to a standard fire test. We have therefore assessed the system component using baseline test information for similar systems. The variations to the tested systems – together with the referenced standard fire tests – are described in Table 3.

Table 3 Variations to tested systems

Item number	Reference tests	Variations
1	Nr. 8829/13, Nr. 8828/13, Nr. 8810/12, Nr. 8809/12 and Nr. 8808/1	<ul style="list-style-type: none"> Confirm the performance of the AS 1530.4:2014 Appendix D1 and D2 configuration cables if substituted with the tested cables. The tested sealant Hilti Firestop Filler CFS-FIL may be varied to any of the following, <ul style="list-style-type: none"> Hilti Intumescent Sealant FS-ONE Hilti Intumescent Sealant CP 611A (Hilti Firestop Intumescent Sealant CP611a is identical to Hilti Firestop Intumescent Sealant CFS-IS) Confirm the spacing of cable from edge of collar seal. Confirm the maximum cable bundle size Conduits may be filled with cables, optic fibres or empty. Thickness of floor slabs can be reduced to a minimum of 120 mm provided that at least 100 mm wide 13 mm or 16 mm thick fire grade plasterboard strips are installed around the opening with the necessary number of layers to form a frame and ensure the minimum thickness of seal for service in floor is 150 mm thick. Confirmation of performance for services tested uncapped/uncapped or uncapped/capped. For walls, the support construction can optionally be concrete, masonry wall, aerated concrete, or plasterboard lined wall. For 120 minute plasterboard wall application, the plasterboard lined wall must be minimum 100 mm thick and consist of timber or steel studs lined on both faces with a minimum of 2 layers of at least 13 mm or 16 mm thick fire grade plasterboard or be otherwise tested to achieve an FRL of -/120/120 or 120/120/120. For 60 minute plasterboard lined wall application, the plasterboard lined wall must be minimum 90 mm thick and consist of timber or steel studs lined on both faces with a minimum of 1 layer of at least 13 mm or 16 mm thick fire grade plasterboard or with one layer of 13 mm fire resistance plasterboard on one side and two layers of 13 mm fire resistance plasterboard on the second side. Or be otherwise tested to achieve an FRL of -/60/60 or 60/60/60.

4.4 Purpose of the test

AS 1530.4:2014. sets out procedures and methods for fire tests on building materials, components, structures, and fire-resistance tests for elements of construction. Section 10 discusses the procedures and methods service penetrations and control joints.

AS 4072.1:2005 (R2016) sets out the minimum requirements for the construction, installation and application of fire resistance tests to sealing systems around penetrations through separating building elements that are required to have an FRL.

4.5 Schedule of components

4.5.1 Distance requirements

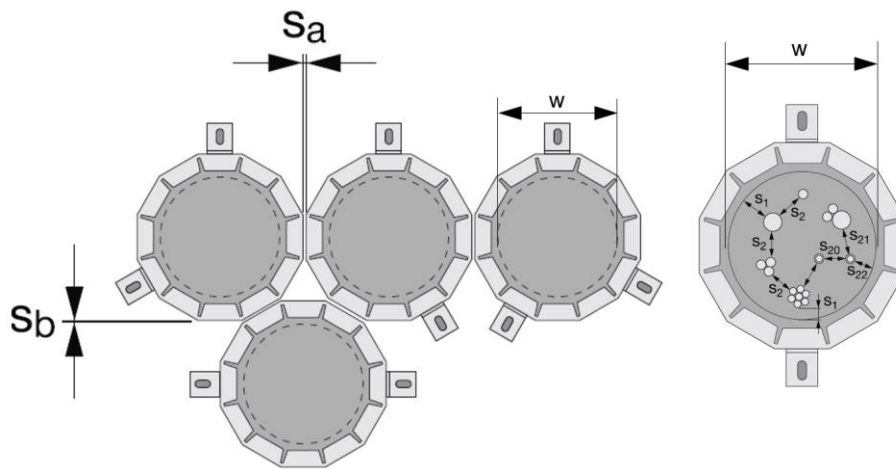


Figure 1 Distance requirements for penetrations for Ø150 mm collars

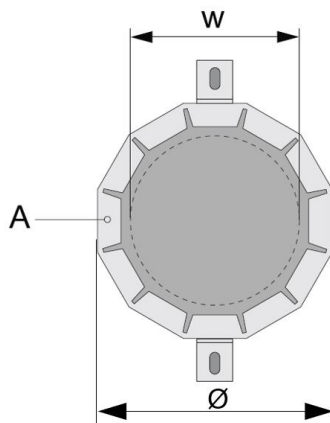


Figure 2 Maximum aperture Cut (w)

Table 4 Distance requirements

Minimum distance valid for installations of services	Wall (mm)	Floor (mm)
Distance between cable collars linear	$S_a = 0$	$S_a = 0$
Distance between cable collars in cluster arrangement	$S_b = 0$	$S_b = 0$
Distance between single, or bundled cables ($\varnothing \leq 21$ mm) and aperture edge	$S_1 = 0$	$S_1 = 0$
Distance between single or bundled cables (21 mm $\leq \varnothing \leq 50$ mm) and aperture edge	$S_1 = 5$	$S_1 = 5$
Distance between cables or bundles	$S_2 = 0$	$S_2 = 0$
Distance between conduit ($\varnothing \leq 16$ mm) to each other	$S_{20} = 0$	$S_{20} = 0$
Distance between cable and conduit ($\varnothing \leq 16$ mm) to each other	$S_{21} = 0$	$S_{21} = 0$
Distance between conduits ($\varnothing \leq 16$ mm) to aperture edge	$S_{22} = 10$	$S_{22} = 10$
Distance between conduit ($\varnothing \geq 16$ mm) to each other	$S_{20} = 30$	$S_{20} = 30$
Distance between cable and conduit ($\varnothing \geq 16$ mm) to each other	$S_{21} = 15$	$S_{21} = 15$

Minimum distance valid for installations of services	Wall (mm)	Floor (mm)
Distance between conduits ($\varnothing \geq 16$ mm) to aperture edge	S ₂₂ = 15	S ₂₂ = 15

Table 5 Seal and service sizes

Collar Size (\varnothing)	150 mm
Maximum aperture size (w)	108 mm
Maximum % of the seal can be penetrated	60%
Maximum Conduit Bundle Size	$\varnothing 80$ mm
Maximum Cable Bundle Size	$\varnothing 90$ mm

Protection of Collar Edge

A rubber protection strip can optionally be used on circular edge of collar, in case where a damage of cable be risked.



Figure 3 Optional rubber protection strip on edge of collar

Installation of part Hilti FireStop Cable Collar CFS-CC

To fit cable collar to corner of wall, wall to floor, wall to wall or wall to floor edge, up to 6 metal segments of cable collar can be taken out (up to $\frac{1}{2}$ size of metal cage). The cable collar is mounted with compression against the corner by pushing the tailored form inlay. The inlay may comprise of two parts. At least two fixing hooks must be used at sufficient distance to each other.

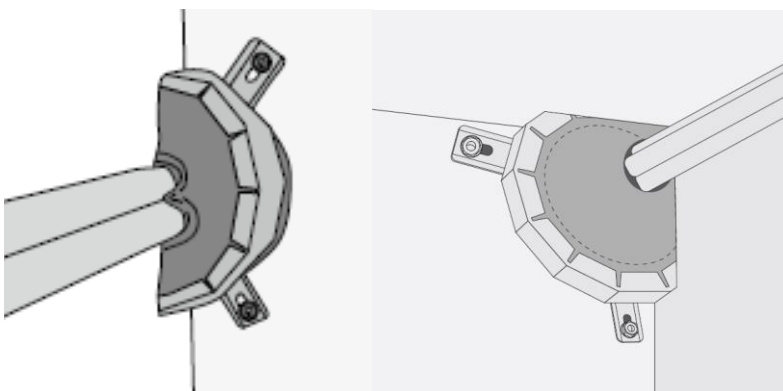


Figure 4 Installation of $\frac{1}{2}$ and $\frac{3}{4}$ of Hilti Firestop Cable Collar CFS-CC

Table 6 Hilti anchor types for Hilti retrofit Firestop Collar

Anchoring solution		Minimum size	Flexible Walls (Plasterboard lined)	Aerated concrete wall (Hebel)	Solid concrete walls
Screw anchors	HUS	M6	x	x	x
Expansion anchors	HSA				x
	HST				x
	DBZ 6/45				x
Internally threaded anchor	HKD				x
Hollow core	HTB-S		x		
	HHD-S		x		
Other Fixings	Laminating/ Drywall/ Plasterboard Screws, at least 38mm in length, with steel washers of at least 19mm in diameter	10g	x		
	Threaded rods with nuts and washer	M8	x	x	x

4.5.2 Beading details for walls and floors

The minimum penetration seal depth is 200 mm (t_A) in single or multiple layer plasterboard lined wall and rigid wall constructions comprising by at least a wall of 100 mm thick (t_E) and two times the thickness of the cable collar (50 mm deep).

The minimum penetration seal depth is 200 mm (t_A) in floor constructions comprising by at least a floor of 120 mm thick (t_E) and one or two times the thickness of the cable collar (50 mm deep).

In case of the penetration seal depth is less than required, a beading must be used (E_1).

Beading is a square plate made of fire rated plasterboard board with a size of $2 \times W_A$ (at least 100 mm wide) plus diameter of cable collar, is installed around the opening in the necessary number of layers. Two frames of the same height on both sides of the wall must be built.

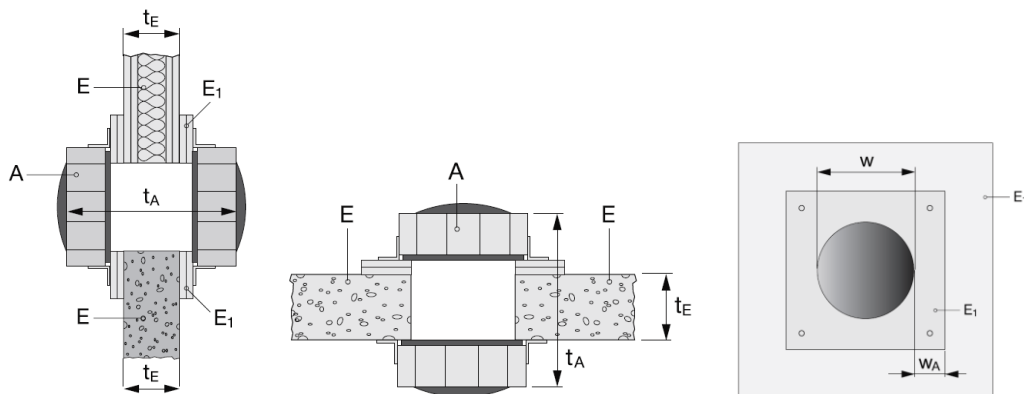


Figure 5 Aperture Framing/Beading and Position of the Seal in Walls/Floors

Table 7 Item description

Item	Description
A	Hilti Firestop Cable Collar CFS-CC
E	Building element (rigid or flexible wall construction, floor)
E ₁	Aperture beading, single or multiple layers of 13 mm or 16 mm fire grade plasterboard
w	Diameter of aperture
t _E	Thickness of the building element
∅	Diameter of Cable Collar
w _A	Width of the beading frame
t _A	Thickness of the seal, min. 200 mm

4.5.3 Wall Penetrations

The walls must be tested or otherwise assessed in accordance with AS 1530.4:2014 for the required fire resistance period.

Flexible wall

1 hour plasterboard lined wall construction

The wall must have a minimum thickness of 90 mm (t_E) and comprise of steel studs lined on both faces with a minimum of one layer of at least 13 mm or 16 mm thick fire grade plasterboard and be tested or otherwise assessed to achieve an FRL of -/60/60 or 60/60/60. The plasterboard wall construction must include minimum 50 mm thick mineral wool with density of 100 kg/m³ as wall cavity insulation for timber stud wall.

2 hour plasterboard lined wall construction

The wall must have a minimum thickness of 100 mm (t_E) and comprise of steel studs lined on both faces with a minimum of two layers of at least 13 mm or 16 mm thick fire grade plasterboard and be tested or otherwise assessed to achieve an FRL of -/120/120 or 120/120/120. The plasterboard wall construction must include minimum 50 mm thick mineral wool with density of 100 kg/m³ as wall cavity insulation for timber stud wall.

Rigid wall

The wall must have a minimum thickness of 75 mm (t_E) and comprise of concrete, aerated concrete, masonry, with a minimum density of 550 kg/m³ or Hebel wall systems with a minimum density of 510kg/m³. For wall thickness is less than 100 mm thick, a beading (E₁) must be used around aperture on each side of wall to make the seal thickness (t_A) ≥ 200 mm.

Blank wall seal, no services, Figure 6

Maximum opening size 108 mm, and up 60% of the seal area can be penetrated. Seal thickness (t_A) ≥ 200 mm

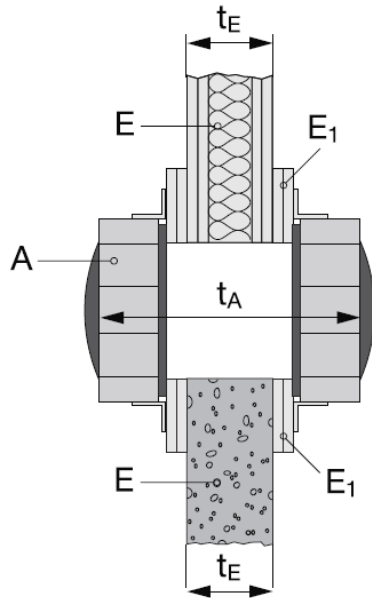


Figure 6 Blank wall seal, no service

Wall seal with services, Figure 7

Maximum opening size 108 mm, and up to 60% of the seal area can be penetrated. Seal thickness (t_A) \geq 200 mm

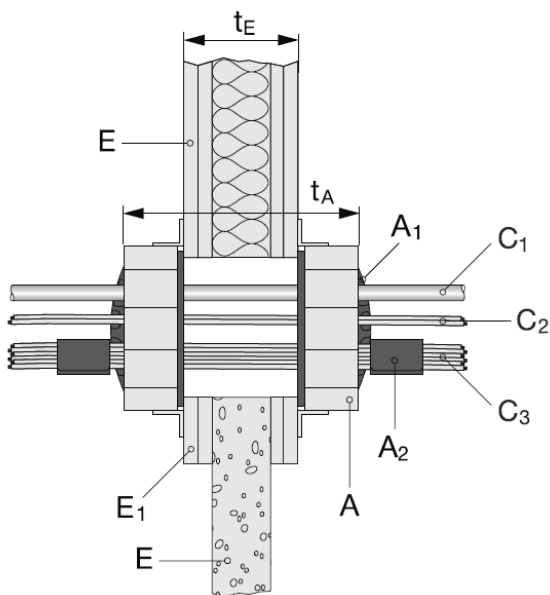


Figure 7 Details of filler (A_1), cable collar (A) and 2 \times Putty Bandage (A_2) on each side of multiple layer plasterboard and rigid walls

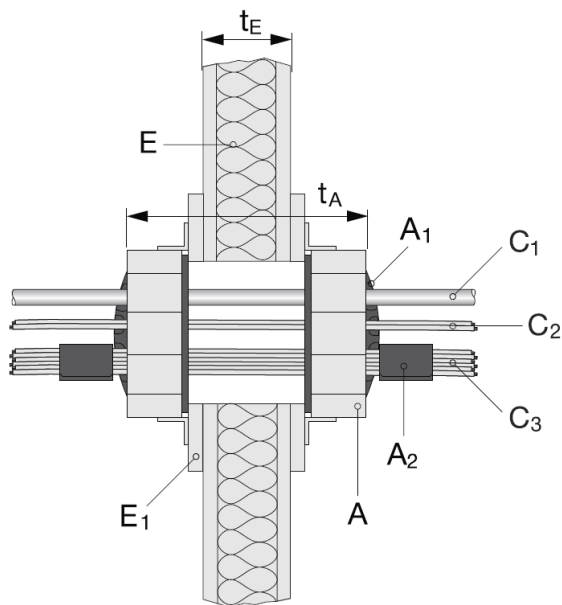


Figure 8 Details of filler (A₁), cable collar (A) and 2 × Putty Bandage (A₂) on each side of single layer plasterboard wall with beading (E₁)

Table 8 Item description

Item	Description
A	Hilti Firestop Cable Collar CFS-CC
C, C ₁ , C ₂ , C ₃	C: Service penetrations C ₁ : Conduit C ₂ : Single cables C ₃ : Cable bundle
E, E ₁	E: Support Construction elements (wall, floor) E ₁ : Aperture Beading, single or multiple layers of 13 mm or 16 mm fire grade plasterboard
t _A	Thickness of penetration seal, minimum 200 mm
A ₁	Hilti Intumescent Sealant FS-ONE Hilti Firestop Filler CFS-FIL Hilti Firestop Intumescent Sealant CP 611A at a minimum depth of 20 mm
A ₂	2 layers of 100 mm wide Hilti Firestop Putty Bandage CFS-P BA on each side
t _E	Thickness of the building element

4.5.4 Floor Penetrations

Rigid Floors (E)

The floor must have a minimum thickness of 150 mm (t_E) and comprise of aerated concrete with a minimum density of 550 kg/m³ or normal concrete. Refer to Figure 11

The floor can have a minimum thickness of 120 mm (t_E) and comprise of aerated concrete with a beading (E_1) used on the topside of the floor to make the seal thickness (t_A) \geq 200 mm. Refer to Figure 9 and Figure 10.

Blank floor seal, no services, figure 9

Maximum opening size 108 mm and 60% of the seal area can be penetrated. Seal thickness (t_A) \geq 250 mm.

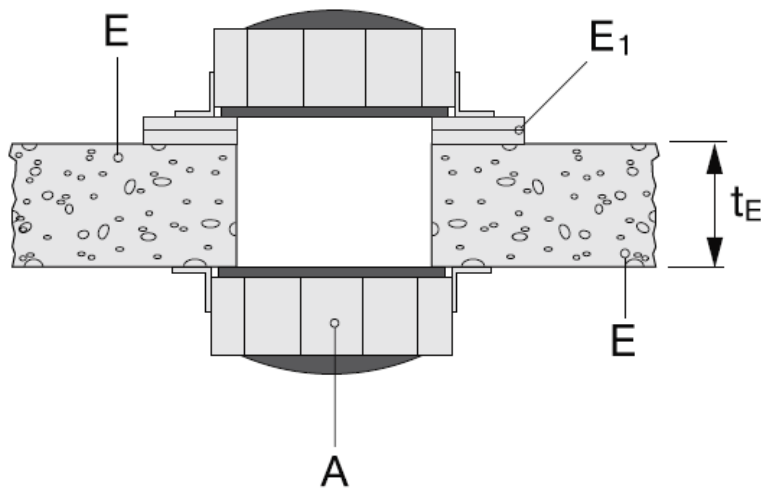


Figure 9 Blank floor seal in floor $t_E \geq 120$ mm, No service

Floor seal with services, Figure 10 and Figure 11

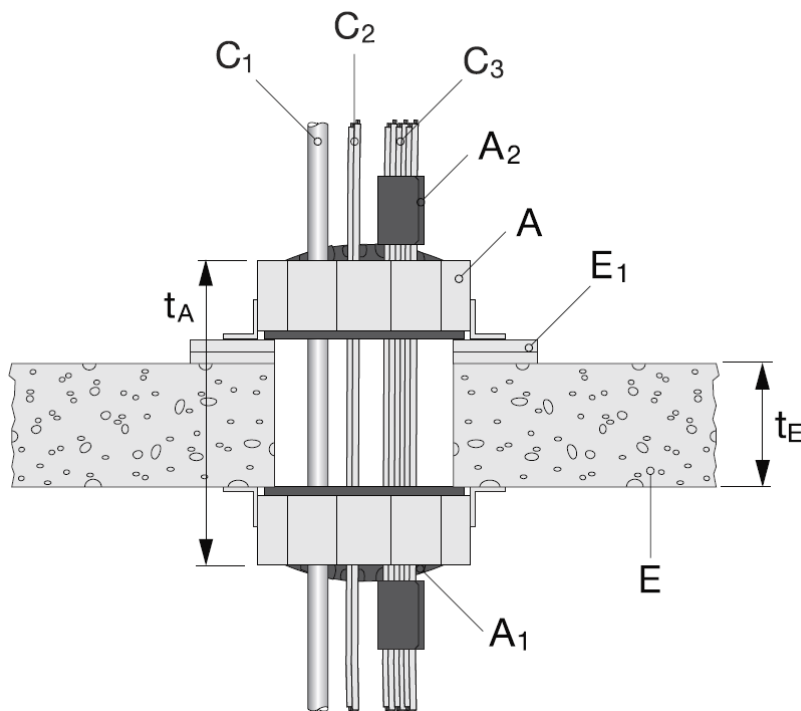


Figure 10 Details of cable collars (A), Filler (A₁) and 2 × Putty Bandage (A₂) on both sides of floor, t_E ≥ 120 mm

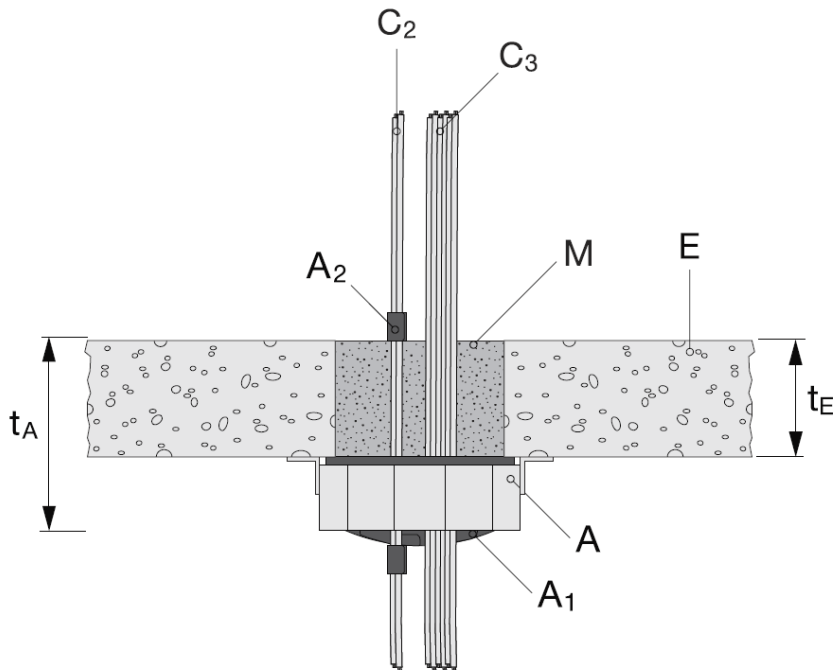


Figure 11 Details of filler (A₁) and cable collars (A) on underside of floor only, t_E ≥ 150 mm

Floor seal with cable service perpendicular out-bending on topside of floor, Figure 12

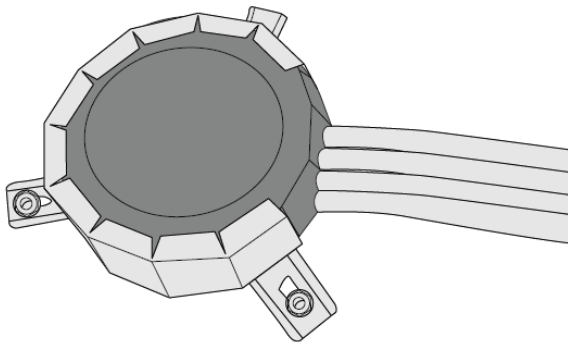


Figure 12 Details of cable service perpendicular out-bending on topside of floor, t_E ≥ 150 mm

Table 9 Item description

Item	Description
A	A: Hilti Firestop Cable Collar CFS-CC
C, C ₁ , C ₂ , C ₃	C: Service penetrations C ₁ : Conduit C ₂ : Single cables C ₃ : Cable bundle
E, E ₁	E: Support Construction elements (wall, floor) E ₁ : Aperture Beading, single or multiple layers of 13 mm or 16 mm fire grade plasterboard

Item	Description
t _A	Thickness of penetration seal, min. 200 mm
A ₁	Hilti Intumescent Sealant FS-ONE Hilti Firestop Filler CFS-FIL Hilti Firestop Intumescent Sealant CP 611A, at a depth of min. 20 mm
A ₂	2 layers of 100 mm wide Hilti Firestop Putty Bandage CFS-P BA on each side
t _E	Thickness of the building element
M	Hilti Mortar CP 633, fully filled the gap in the upper part of collar

5. Conclusion

Details of the assessment and discussion are only available in the referenced main assessment report. A summary of the assessment outcome is outlined in Table 10 to Table 14.

The referenced assessment demonstrates that the proposed systems together with the described variations are likely to achieve the FRL as shown in Table 10 to Table 14, if tested in accordance with AS 1530.4:2014 and assessed in accordance with AS 4072.1:2005.

Table 10 Service penetrations, 2hr flexible wall, at least 100 mm thick, Refer to Figure 6 and Figure 7

Description of Services	FRL	
Blank Opening without Hilti Firestop Intumescent Fillers (A₁) and without Hilti Firestop Putty Bandage CFS-P BA (A₂)	Note: Refer to beading details for walls and floors, and ensure that seal thickness (t_A) ≥ 200 mm	
Blank opening: w ≤ 108 mm	-/120/120	
Standard Cable Services	With Hilti Firestop Intumescent Fillers (A₁)	With Hilti Firestop Intumescent Fillers (A₁) & Hilti Firestop Putty Bandage (A₂)
PVC insulated Power Cables (Standard D1 cable set, in accordance with AS 1530.4:2014 Appendix D)	-/120/60	-/120/90
PVC insulated Communication Cables (Standard D2 cable set, in accordance with AS 1530.4:2014 Appendix D)		
Steel conduits and tubes up to 16 mm filled with cables, optic fibres or empty	-/120/120	
Non-Standard Cable Services	With Hilti Firestop Intumescent Fillers (A₁)	With Hilti Firestop Intumescent Filler (A₁) & Hilti Firestop Putty Bandage (A₂)
PVC insulated Power Cables (Standard D1 cable set, in accordance with AS 1530.4:2014 Appendix D) up to Ø50 mm may be bundled up to 90 mm in diameter.	-/120/60	-/120/90
PVC insulated Communication Cables (Standard D2 cable set, in accordance with AS 1530.4:2014 Appendix D) up to Ø50 mm may be bundled up to 90 mm in diameter.		
Single Plastic Conduits and tubes: Rigid and Flexible PO: polyolefin (PE, PP, PPE, PPO); Rigid PVC: polyvinyl chloride	With Hilti Firestop Intumescent Fillers (A₁)	
Single Conduit up to 32 mm filled with cables, optic fibres or empty	-/120/120	
Bundle Plastic Conduits and tubes: Rigid and Flexible PO: polyolefin (PE, PP, PPE, PPO); Rigid and Flexible PVC: polyvinyl chloride	With Hilti Firestop Intumescent Fillers (A₁)	
Conduits up to 16 mm filled with cables, optic fibres or empty. Conduits may be bundled up to 80 mm in diameter	-/120/90 without cables -/120/120 with cables	

Description of Services	FRL
Coaxial cables: 27.8 mm ≤ Ø ≤ 59.9 mm	With Hilti Firestop Intumescent Filler (A₁)
RFS Radiaflex: RLKW 78-50 Ø28.5 mm RFS Radiaflex: RLKU 158-50 JFLA Ø48.2 mm	-/120/120
RFS Cellflex: LCF 78-50 JA Ø 27.8 mm RFS Cellflex: LCF 214-50 JA Ø 59.9 mm RFS Helifex: HCA 78-50 JA Ø 28.0 mm RFS Helifex: HCA 158J Ø 59.9 mm	-/120/90
Insulated Copper Pipe	With Hilti Firestop Intumescent Filler (A₁)
Ø22 mm × 1mm Copper pipe insulated with 20 mm thick Rockwool RS800 continuous through the seal with 200 mm extension on each side	-/120/90
2× copper pipes 6/12 mm or 1/2" & 1/4" combo protected with insulation PEP "Sangi twin pipes".	-/120/120

Table 11 Service penetrations, rigid wall, at least 75 mm thick (+ Aperture Beading), Refer to Figure 6 and Figure 7

Description of Services	FRL	
Blank Opening without Hilti Firestop Intumescent Fillers (A₁) and without Hilti Firestop Putty Bandage CFS-P BA (A₂)	Note: Refer to beading details for walls and floors, and ensure that seal thickness (t_A) ≥ 200 mm	
Blank opening: w ≤ 108 mm	-/120/120	
Standard Cable Services	With Hilti Firestop Intumescent Fillers (A₁)	With Hilti Firestop Intumescent Fillers (A₁) & Hilti Firestop Putty Bandage (A₂)
PVC insulated Power Cables (Standard D1 cable set, in accordance with AS 1530.4:2014 Appendix D)	-/120/60	-/120/90
PVC insulated Communication Cables (Standard D2 cable set, in accordance with AS 1530.4:2014 Appendix D)		
Steel conduits and tubes up to 16 mm filled with cables, optic fibres or empty	-/120/120	
Non-Standard Cable Services	With Hilti Firestop Intumescent Fillers (A₁)	With Hilti Firestop Intumescent Filler (A₁) & Hilti Firestop Putty Bandage (A₂)
PVC insulated Power Cables (Standard D1 cable set, in accordance with AS 1530.4:2014 Appendix D) up to Ø50 mm may be bundled up to 90 mm in diameter.	-/120/60	-/120/90

Description of Services	FRL	
PVC insulated Communication Cables (Standard D2 cable set, in accordance with AS 1530.4:2014 Appendix D) up to Ø50 mm may be bundled up to 90 mm in diameter.		
Single Plastic Conduits and tubes: Rigid and Flexible PO: polyolefin (PE, PP, PPE, PPO); Rigid PVC: polyvinyl chloride	With Hilti Firestop Intumescent Fillers (A₁)	
Single Conduit up to 32 mm filled with cables, optic fibres or empty	-/120/120	
Bundle Plastic Conduits and tubes: Rigid and Flexible PO: polyolefin (PE, PP, PPE, PPO); Rigid and Flexible PVC: polyvinyl chloride	With Hilti Firestop Intumescent Fillers (A₁)	
Conduits up to 16 mm filled with cables, optic fibres or empty. Conduits may be bundled up to 80 mm in diameter	-/120/90 without cables -/120/120 with cables	
Coaxial cables: 27.8 mm ≤ Ø ≤ 59.9 mm	With Hilti Firestop Intumescent Filler (A₁)	
RFS Radiaflex: RLKW 78-50 Ø28.5 mm RFS Radiaflex: RLKU 158-50 JFLA Ø48.2 mm	-/120/120	
RFS Cellflex: LCF 78-50 JA Ø 27.8 mm RFS Cellflex: LCF 214-50 JA Ø 59.9 mm RFS Helifex: HCA 78-50 JA Ø 28.0 mm RFS Helifex: HCA 158J Ø 59.9mm	-/120/90	
Insulated Copper Pipe	With Hilti Firestop Intumescent Filler (A₁)	
Ø22 mm × 1mm Copper pipe insulated with 20 mm thick Rockwool RS800 continuous through the seal with 200 mm extension on each side	-/120/90	
2× copper pipes 6/12 mm or 1/2" & 1/4" combo protected with insulation PEP "Sangi twin pipes".	-/120/120	

Table 12 Service penetrations, 1hr flexible wall, at least 90 mm thick (+ Aperture Beading). Refer to Figure 6 and Figure 8

Description of Services	FRL	
Blank Opening without Hilti Firestop Intumescent Fillers (A₁) and without Hilti Firestop Putty Bandage CFS-P BA (A₂)	Note: Refer to beading details for walls and floors, and ensure that seal thickness (t_A) ≥ 200 mm	
Blank opening: w ≤ 108 mm	-/60/60	
Standard Cable Services	With Hilti Firestop Intumescent Fillers (A₁)	With Hilti Firestop Intumescent Fillers (A₁) & Hilti Firestop Putty Bandage (A₂)
PVC insulated Power Cables (Standard D1 cable set, in accordance with AS 1530.4:2014 Appendix D)	-/60/60	
PVC insulated Communication Cables (Standard D2 cable set, in accordance with AS 1530.4:2014 Appendix D)		
Steel conduits and tubes up to 16 mm filled with cables, optic fibres or empty	-/60/60	
Non-Standard Cable Services	With Hilti Firestop Intumescent Fillers (A₁)	With Hilti Firestop Intumescent Filler (A₁) & Hilti Firestop Putty Bandage (A₂)
PVC insulated Power Cables (Standard D1 cable set, in accordance with AS 1530.4:2014 Appendix D) up to Ø50 mm may be bundled up to 90 mm in diameter.	-/60/60	
PVC insulated Communication Cables (Standard D2 cable set, in accordance with AS 1530.4:2014 Appendix D) up to Ø50 mm may be bundled up to 90 mm in diameter.		
Single Plastic Conduits and tubes: Rigid and Flexible PO: polyolefin (PE, PP, PPE, PPO); Rigid PVC: polyvinyl chloride	With Hilti Firestop Intumescent Fillers (A₁)	
Single Conduit up to 32 mm filled with cables, optic fibres or empty	-/60/60	
Bundle Plastic Conduits and tubes: Rigid and Flexible PO: polyolefin (PE, PP, PPE, PPO); Rigid and Flexible PVC: polyvinyl chloride	With Hilti Firestop Intumescent Fillers (A₁)	
Conduits up to 16 mm filled with cables, optic fibres or empty. Conduits may be bundled up to 80 mm in diameter	-/60/60	
Coaxial cables: 27.8 mm ≤ Ø ≤ 59.9 mm	With Hilti Firestop Intumescent Filler (A₁)	
RFS Radiaflex: RLKW 78-50 Ø28.5 mm RFS Radiaflex: RLKU 158-50 JFLA Ø48.2 mm	-/60/60	
RFS Cellflex: LCF 78-50 JA Ø 27.8 mm RFS Cellflex: LCF 214-50 JA Ø 59.9 mm RFS Helifex: HCA 78-50 JA Ø 28.0 mm RFS Helifex: HCA 158J Ø 59.9 mm	-/60/60	

Description of Services	FRL
Insulated Copper Pipe	With Hilti Firestop Intumescent Filler (A₁)
Ø22 mm × 1 mm Copper pipe insulated with 20 mm thick Rockwool RS800 continuous through the seal with 200 mm extension on each side	-/60/60
2× copper pipes 6/12 mm or 1/2" & 1/4" combo protected with insulation PEP "Sangi twin pipes".	-/60/60

Table 13 Service penetrations, rigid floor, at least 120 mm thick (+ Aperture Beading), Refer to Figure 9 and Figure 10

Description of Services	FRL	
Blank Opening without Hilti Firestop Intumescent Fillers (A₁) and without Hilti Firestop Putty Bandage CFS-P BA (A₂)	Note: Refer to beading details for walls and floors, and ensure that seal thickness (t_A) ≥ 200 mm	
Blank opening: w ≤ 108 mm	-/120/120	
Standard Cable Services	With Hilti Firestop Intumescent Fillers (A₁)	With Hilti Firestop Intumescent Fillers (A₁) & Hilti Firestop Putty Bandage (A₂)
PVC insulated Power Cables (Standard D1 cable set, in accordance with AS 1530.4:2014 Appendix D)	-/120/90	-/120/120
PVC insulated Communication Cables (Standard D2 cable set, in accordance with AS 1530.4:2014 Appendix D)		
Steel conduits and tubes up to 16 mm filled with cables, optic fibres or empty	-/120/120	
Non-Standard Cable Services	With Hilti Firestop Intumescent Fillers (A₁)	With Hilti Firestop Intumescent Filler (A₁) & Hilti Firestop Putty Bandage (A₂)
PVC insulated Power Cables (Standard D1 cable set, in accordance with AS 1530.4:2014 Appendix D) up to Ø50 mm may be bundled up to 90 mm in diameter.	-/120/90	-/120/120
PVC insulated Communication Cables (Standard D2 cable set, in accordance with AS 1530.4:2014 Appendix D) up to Ø50 mm may be bundled up to 90 mm in diameter.	-/120/90	-/120/120
Single Plastic Conduits and tubes: Rigid and Flexible PO: polyolefin (PE, PP, PPE, PPO); Rigid PVC: polyvinyl chloride	With Hilti Firestop Intumescent Fillers (A₁)	
Single Conduit up to 32 mm filled with cables, optic fibres or empty	-/120/120	
Bundle Plastic Conduits and tubes: Rigid and Flexible PO: polyolefin (PE, PP, PPE, PPO); Rigid and Flexible PVC: polyvinyl chloride	With Hilti Firestop Intumescent Fillers (A₁)	

Description of Services	FRL
Conduits up to 16mm filled with cables, optic fibres or empty. Conduits may be bundled up to 80 mm in diameter	-/120/120
Coaxial cables: 27.8 mm ≤ Ø ≤ 59.9 mm	With Hilti Firestop Intumescent Filler (A₁)
RFS Radiaflex: RLKW 78-50 Ø28.5 mm RFS Radiaflex: RLKU 158-50 JFLA Ø48.2 mm RFS Cellflex: LCF 78-50 JA Ø 27.8 mm RFS Cellflex: LCF 214-50 JA Ø 59.9 mm	-/120/120
RFS Helifex: HCA 78-50 JA Ø 28.0 mm RFS Helifex: HCA 158J Ø 59.9 mm	-/120/90
Insulated Copper Pipe	With Hilti Firestop Intumescent Filler (A₁)
Ø22 mm × 1 mm Copper pipe insulated with 20 mm thick Rockwool RS800 continuous through the seal with 200 mm extension on each side	-/120/120
2× copper pipes 6/12 mm or 1/2" & 1/4" combo protected with insulation PEP "Sangi twin pipes".	-/120/120

Table 14 Service penetrations, rigid floor, at least 150 mm thick. Refer to Figure 11

Description of Services	FRL	
Standard Cable Services	With Hilti Firestop Intumescent Fillers (A₁)	With Hilti Firestop Intumescent Fillers (A₁) & Hilti Firestop Putty Bandage (A₂)
PVC insulated Power Cables (Standard D1 cable set, in accordance with AS 1530.4:2014 Appendix D).	-/120/60	-/120/120
PVC insulated Communication Cables (Standard D2 cable set, in accordance with AS 1530.4:2014 Appendix D)		
Non-Standard Cable Services	With Hilti Firestop Intumescent Fillers (A₁)	With Hilti Firestop Intumescent Filler (A₁) & Hilti Firestop Putty Bandage (A₂)
PVC insulated Power Cables (Standard D1 cable set, in accordance with AS 1530.4:2014 Appendix D) up to Ø50 mm may be bundled up to 90 mm in diameter.	-/120/60	-/120/120
PVC insulated Communication Cables (Standard D2 cable set, in accordance with AS 1530.4:2014 Appendix D) up to Ø50 mm may be bundled up to 90 mm in diameter.	-/120/60	-/120/120
PVC insulated Power or Communication Cables up to Ø21 mm may be bundle up to 50 mm in diameter, are phased out in a perpendicular manner though cable collar along topside of floor as shown in figure 12	-/120/120	

6. Validity

Warringtonfire Australia does not endorse the tested or assessed product in any way. The conclusions of the referenced assessment may be used to directly assess fire hazard, but it should be recognised that a single test method will not provide a full assessment of fire hazard under all conditions.

Due to the nature of fire testing and the consequent difficulty in quantifying the uncertainty of measurement, it is not possible to provide a stated degree of accuracy. The inherent variability in test procedures, materials and methods of construction, and installation may lead to variations in performance between elements of similar construction.

The referenced assessment is based on information and experience available at the time of preparation. The published procedures for the conduct of tests and the assessment of test results are subject to constant review and improvement. It is therefore recommended that the referenced assessment report be reviewed on, or before, the stated expiry date.

The referenced assessment represents our opinion about the performance likely to be demonstrated on a test in accordance with AS 1530.4:2014, based on the evidence referred to in the referenced assessment report.

The referenced assessment is provided to Hilti Australia Pty Ltd & Hilti (New Zealand) Limited for their own specific purposes. Building certifiers and other third parties are responsible for deciding if they accept the referenced assessment in a particular context.

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