



Regulatory information report

Fire resistance performance of Hilti CFS-SL GA speed sleeves protecting cables

Client: Hilti Australia

Product: Hilti CFS-SL GA Speed Sleeves

Report number: FAS200046

Revision: RIR 1.2

Issue date: 19 June 2020

Expiry date: 30 April 2025

Amendment schedule

Version	Date	Information relating to report			
RIR 1.0	Issue: 30/04/2020	Reason for issue	Report issued to Hilti Australia for review and comment.		
	Expiry: 30/04/2025	Name	Alim Rasel	Mahmoud Akl	Mahmoud Akl
RIR1.1	Issue: 15/05/2020	Reason for issue	Revised with the addition of new test data		
	Expiry: 30/04/2025	Name	Alim Rasel	Mahmoud Akl	Mahmoud Akl
RIR1.2	Issue: 19/06/2020	Reason for issue	Revised with inclusion of additional information and general textual amendments		
	Expiry: 30/04/2025	Name	Alim Rasel	Mahmoud Akl	Mahmoud Akl
	Signature				

Contact information

Warringtonfire Australia Pty Ltd – ABN 81 050 241 524

Melbourne – NATA registered laboratory

Unit 2, 409-411 Hammond Road
Dandenong South, VIC 3175
Australia

T: +61 3 9767 1000

Brisbane

Suite 6, Level 12
133 Mary Street
Brisbane, QLD 4000
Australia

T: +61 7 3238 1700

Perth

Unit 22, 22 Railway Road
Subiaco, WA 6008
Australia

T: +61 8 9382 3844

Sydney

Suite 802, Level 8
383 Kent Street
Sydney, NSW 2000
Australia

T: +61 2 9211 4333

Canberra

Unit 2, 11 Murray Crescent
Griffith, ACT 2603
Australia

T: +61 2 6260 8488

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Executive summary

This report contains the minimum information required for regulatory compliance and refers to the Assessment report FAS200046 R1.2. Summaries of the test data on which this assessment is based are provided in the appendices which are only available in the full report.

The analysis conducted in the referenced assessment report outlines the findings of the assessment undertaken to determine the likely fire resistance level (FRL) of cables and conduits protected with Hilti speed sleeves (CFS-SL GA) if tested in accordance with AS 1530.4:2014 and assessed in compliance with AS 4072.1:2005 (as applicable).

The analysis conducted in section 5 of the assessment report found that the proposed variations are likely to achieve the following FRLs as shown in Table 1 to Table 10, if tested in accordance with AS 1530.4:2014 and assessed in compliance with AS 4072.1:2005 (as applicable).

Table 1 FRL of cables through flexible and rigid wall- 200 mm between openings

Separating element	System description	CFS-SL GA S	CFS-SL GA M/L	
Flexible and Rigid Wall (minimum thickness 100 mm)	Blank	-/120/120	-/120/120	
	All sheathed cables ≤21 mm	-/90/90	-/90/90 ¹	
	All sheathed cables ≤61 mm	N/A	-/90/90	
	All sheathed cables ≤80 mm	N/A	-/60/60	
	Cable bundle ≤36 mm All sheathed cables ≤21 mm	-/90/90	N/A	
	Cable bundle ≤86 mm All sheathed cables ≤21 mm	N/A	-/90/90	
	100% filled device with cables ≤21 mm	-/60/60 ²	-/90/90	
	Conduits ≤25 mm with or without cables or Fiber Optics (max. single cable/cable bundle diameter 14.4 mm) Conduits may be single or bundled (max 3) up to diameter ≤ 48 mm	-/120/120	N/A	
	Conduits ≤ 63 mm with or without cables or Fiber Optics (max. single cable/cable bundle diameter 27 mm) Conduits may be single or bundled (max 3) up to diameter ≤ 91 mm	N/A	-/90/90 ³	
	For higher fire classification- follow Figure 2 Seal type 1a (CP606/CFS-S ACR) installation			
	¹⁾ All sheathed cables ≤21 mm	N/A	-/120/120	
	²⁾ 100% filled device with cables with ≤21 mm	-/90/90	N/A	
	³⁾ Conduits ≤ 63 mm with or without cables or Fiber Optics (max. single cable/cable bundle diameter 27 mm) Conduits may be single or bundled (max 3) up to diameter ≤ 91 mm	N/A	-/120/120	

Table 2 FRL of cables through sandwich panel- 200 mm between openings

Separating element	System description	CFS-SL GA S	CFS-SL GA M/L
Sandwich Panel (150 mm thickness)	Blank	-/90/90	-/90/60 ⁴
	All sheathed cables ≤21 mm	-/60/60	-/90/90 ⁴
	All sheathed cables ≤50 mm	N/A	-/90/90
	100% filled device with cables ≤21 mm	-/60/60	N/A
	100% filled device with cables (max conductor size 925 mm ²) ≤50 mm	N/A	-/60/60 ⁴
	Higher classification- follow seal type 1b (putty) installation		
	⁴) 100% filled device with cables <21 mm	N/A	-/120/120

Table 3 FRL of cables through flexible and rigid walls- zero distance between flanges

Separating element	System description	CFS-SL GA S	CFS-SL GA M/L
Flexible and Rigid Wall (minimum thickness 100 mm, max 8 penetrations)	Blank	-/120/120	-/90/90
	All sheathed cables ≤21 mm	-/60/60	-/90/90
	All sheathed cables ≤50 mm	N/A	-/60/60
	All sheathed cables ≤80 mm	N/A	-/60/60
	Cable bundle ≤36 mm All sheathed cable ≤21 mm	-/60/60	N/A
	Cable bundle ≤86 mm All sheathed cable ≤21 mm	N/A	-/60/60
	100% filled device with cables ≤21 mm	-/60/60	-/60/60
	100% filled device with cables (max conductor size 925 mm ²) ≤80 mm	N/A	-/60/60
	Conduits ≤25 mm with (max diameter 14.4 mm) or without cables or Fiber Optics, Single or bundled conduits (max 3) up to diameter ≤ 48 mm)	-/90/90	N/A
	Conduits ≤63 mm with (max diameter 27 mm) or without cables or Fibre optics, single or bundled conduits (max 4) up to diameter ≤ 92 mm)	N/A	-/60/60

Table 4 FRL of cables through sandwich panel-zero distance between flanges

Separating element	System description	CFS-SL GA S	CFS-SL GA M/L
Sandwich Panel (100 mm thickness, max 4 penetrations)	Blank Seal	-/45/45	-/90/90
	All sheathed cables ≤21 mm	-/45/45	-/90/90
	All sheathed cables ≤50 mm	N/A	-/60/60
	100% filled device with cable ≤21 mm	-/45/45	-/60/60
	100% filled device with cables (max conductor size 925 mm ²) ≤50 mm	N/A	-/60/60

Table 5 FRL of cables through concrete slab- zero distance between openings

Separating element	System description	CFS-SL GA S	CFS-SL GA M/L	
Floor (Minimum thickness 150 mm, max 8 penetrations)	Blank	-/180/180	-/180/180	
	All sheathed cables ≤21 mm	-/180/180	-/180/180	
	All sheathed cables ≤45 mm	N/A	-/120/120 ⁵	
	All sheathed cables ≤80 mm	N/A	-/60/60	
	Cable bundle ≤36 mm All sheathed cables ≤21 mm	-/180/180	N/A	
	Cable bundle ≤86 mm All sheathed cables ≤21 mm	N/A	-/120/120	
	100% filled device with cables ≤21 mm	-/120/120	N/A	
	100% filled device with cables (max conductor size 565 mm ² < 45 mm)	N/A	-/120/120	
	Conduits ≤25 mm with (max diameter 14.4 mm) or without cables or Fiber Optics, Single or bundled conduits (max 3) up to diameter ≤ 48 mm)	-/90/90 ⁶	N/A	
	Conduits ≤63 mm with (max diameter 27 mm) or without cables or Fiber Optics, Single or bundled conduits (max 4) up to diameter ≤ 92 mm)	N/A	-/60/60 ⁷	
	Higher classification with increased distance (200 mm)			
	⁵) All sheathed cables <45 mm	N/A	-/120/120	
	⁶) Conduits ≤25 mm with (max diameter 14.4 mm) or without cables or Fiber Optics, single or bundled conduits (max 3) up to diameter ≤ 48 mm)	-/120/120	N/A	
	⁷) Conduits ≤63 mm with (max diameter 27 mm) or without cables or Fiber Optics, single or bundled conduits (max 4) up to diameter ≤ 92 mm)	N/A	-/90/90	

Table 6 FRL of cables penetrating flexible and rigid wall (ganged device)- 200 mm distance between openings

Separating element	System description	FRL
Flexible and Rigid Wall (minimum thickness 100 mm)	Blank Device to 100% filled cables <21 mm	-/120/120
	Blank Seal (cap and plug)	

Table 7 FRL of cables penetrating flexible and rigid wall (double gangplates)- zero distance between gangplates

Separating element	System description	FRL
Flexible and Rigid Wall (minimum thickness 100 mm)	Blank Device to 100% filled cables <21 mm	-/90/90
	Blank Seal (cap and plug)	

Table 8 FRL of cables penetrating flexible and rigid wall (triple gangplates)- zero distance between gangplates

Separating element	System description	FRL
Flexible and Rigid Wall (minimum thickness 100 mm)	Blank Device to 100% filled cables <21 mm	-/60/60
	Blank Seal (cap and plug)	

Table 9 FRL of cables penetrating sandwich panel (double gangplates)- zero distance between openings

Separating element	System description	FRL
Sandwich Panel (100 mm thickness)	Blank Device to 100% filled cables <21 mm	-/60/60
	Blank Seal (cap and plug)	

Table 10 FRL of cables penetrating sandwich panel- 200 distance between openings

Separating element	System description	FRL
Sandwich Panel (150 mm thickness)	Blank Device to 100% filled cables <21 mm	-/90/90
	Blank Seal (cap and plug)	-/120/120

The variations and outcome of the referenced assessment report are subject to the limitations and requirements described in Sections 2, 4 and 6 of this report. The results of this report are valid until 30 April 2025.

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1. Introduction

This report contains the minimum information sufficient for regulatory compliance and refers to the Assessment report FAS200046 R1.2.

The analysis conducted in the referenced assessment report documents the findings of the assessment undertaken to determine the likely fire resistance level (FRL) of cables and conduits protected with Hilti speed sleeves (CFS-SL GA) if tested in accordance with AS 1530.4:2014¹ and assessed in compliance with AS 4072.1:2005² (as applicable). This assessment was carried out at the request of Hilti (Aust.) Pty Ltd. The sponsor details are included in Table 11.

Table 11 Sponsor details

Sponsor	Address
Hilti (Aust.) Pty Ltd	1G Homebush Bay Drive Rhodes NSW 2138 Australia

2. Declaration

The guide to undertaking assessments in lieu of fire tests prepared by the PFPF in the UK requires a declaration from the client. By accepting our fee proposal dated 6 April 2020, Hilti (Aust.) Pty Ltd confirmed that

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

3. Description of the specimen and variations

3.1 System description

Cables and conduits penetrating through flexible walls, sandwich panels, rigid walls and floors were previously tested in compliance with EN 1366-3:2009. This report further assesses the EN test data in compliance with AS 1530.4:2014³ and AS 4072.1:2005⁴ (as applicable).

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*, AS 4072.1:2005, Standards Australia, NSW

³ 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.

⁴ Standards Australia 2005, *Components for the protection of openings in fire-resistant separating elements Service penetrations and control joints*, AS 4072.1:2005, Standards Australia, NSW

3.2 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 12.

Table 12 Referenced test data

Report number	Test sponsor	Test date	Testing authority
PB 3.2/09-484	Hilti Entwicklungsgesellschaft mbH	21 October 2009	MFPA Leipzig GmbH
17764A	Hilti AG	14 June 2016	WFRGENT nv
17765A	Hilti AG	14 June 2016	WFRGENT nv
18113A	Hilti AG	20 December 2016	WFRGENT nv
18114A	Hilti AG	21 December 2016	WFRGENT nv
18115A	Hilti AG	22 December 2016	WFRGENT nv
18344A	Hilti AG	5 April 2017	WFRGENT nv

3.3 Variations to tested systems

Identical systems have not been subjected to a standard fire test in accordance with AS 1530.4:2014. We have therefore assessed the systems using baseline test information for similar systems tested in accordance with EN 1366-3:2009. The variations to the tested systems together with the referenced baseline standard fire tests are described in Table 13.

Table 13 Variation to tested systems

Seal type	Seal details	Separating element	Hilti speed sleeves	Sealant	Orientation	Assessment standard	Reference test
1	Single device	Walls (rigid and flexible, sandwich panels) and floors	CFS-SL GA S/M/L	None	≥200 mm distance between opening and zero distance between devices (Flange/Gangplate touching)	Assess EN 1366-3:2009 test data in compliance with AS 1530.4:2014.	18113A, 18114A, 18115A, 18116A, 18322C, 18344A, 17765A, 17764A, 16608A and PB 3-2-09-484
1a				CP 606/CFS-S ACR			
1b				CP 619 T or CP 617 and CFS-P BA			
2	Ganged device	Walls (rigid and flexible, sandwich panels)	CFS-SL GA M/L with CFS-SL GP 40 and 60	None			
2b				CFS-SL GP CAP and CFS-PL 132			

3.4 Purpose of the test

AS 1530.4:2014 sets out the procedure for a fire resistance test for an element of construction. Section 10 of AS 1530.4:2014 further stipulates the test requirements of service penetrations and control joints.

AS 4072.1:2005 further sets out test requirement and assessment procedure of service penetrations and control joints.

3.5 Schedule of components

Table 14 outlines the schedule of components for the assessed systems.

Table 14 Schedule of components of assessed systems

Item	Description															
A	Item name	Hilti speed sleeve CFS-SL GA														
	Specification	<table border="1"> <thead> <tr> <th>Seal type</th> <th>Seal details</th> <th>Devices</th> <th>Opening</th> </tr> </thead> <tbody> <tr> <td rowspan="2">1, 1a, 1b</td> <td rowspan="2">Single device</td> <td>CFS-SL GA S</td> <td>63-73 mm</td> </tr> <tr> <td>CFS-SL GA M/L</td> <td>113-122 mm</td> </tr> <tr> <td>2, 2a</td> <td>Ganged device</td> <td>CFS-SL GP 40 or 60</td> <td>113-122 mm</td> </tr> </tbody> </table>	Seal type	Seal details	Devices	Opening	1, 1a, 1b	Single device	CFS-SL GA S	63-73 mm	CFS-SL GA M/L	113-122 mm	2, 2a	Ganged device	CFS-SL GP 40 or 60	113-122 mm
		Seal type	Seal details	Devices	Opening											
		1, 1a, 1b	Single device	CFS-SL GA S	63-73 mm											
CFS-SL GA M/L	113-122 mm															
2, 2a	Ganged device	CFS-SL GP 40 or 60	113-122 mm													
Installation	Place through opening in flexible and rigid walls, sandwich panels or concrete floor. The penetration slot maybe fitted with PVC sleeves in rigid and walls and floors. CFS-SL GA S and M are for walls and floors 100-200 mm thick. CFS-SL GA L is for walls and floors 200-300 mm thick.															
A ₁	Item name	Rubber gasket														
	Installation	Installed as illustrated in Figure 1 and Figure 2 as part of the sealing system														
B	Item name	Hilti firestop gangplate: CFS-SL GP 40 and 60														
	Specification	<table border="1"> <thead> <tr> <th>Type</th> <th>Details</th> </tr> </thead> <tbody> <tr> <td>CFS-SL GP 40</td> <td>40 cm gangplate with 3 opening</td> </tr> <tr> <td>CFS-SL GP 60</td> <td>60 cm gangplate with 4 opening</td> </tr> </tbody> </table>	Type	Details	CFS-SL GP 40	40 cm gangplate with 3 opening	CFS-SL GP 60	60 cm gangplate with 4 opening								
		Type	Details													
CFS-SL GP 40	40 cm gangplate with 3 opening															
CFS-SL GP 60	60 cm gangplate with 4 opening															
Installation	Installed in the gangplate openings on both sides of the wall. The cap is installed by removing four hexagonal nuts and flange plates, then by inserting the cap, and reinstalling the flange plate and nuts. Further details in Figure 3															
B ₁	Item name	Hilti firestop gangplate Cap: CFS-SL GP CAP														
	Installation	Installed both side of the wall, in gangplate openings, each by removing four hexagonal nuts and flange plates, the by inserting the CAP, and reinstalling the flange plate and nuts. Further details in Figure 3.														
B _{1a}	Item name	Hilti firestop plug: CFS-PL 132														
	Specification	Material: graphite-based polyurethane (PU)foam, density 270 kg/m ³ (Ø132 mm × 75 mm)														
	Installation	Material cut to fit, then squeezed and pushed into the aperture. Centrally placed inside the separating element.														
A _{1a}	Item name	Hilti firestop acrylic sealant CP606/CFS-S ACR														
	Installation	Applied as illustrated in Figure 2														
A _{1b}	Item name	Hilti firestop putty roll CP 619T														
	Installation	Pressed around opening- CP 619 T or CP 617 (cut to 25 mm width) before installing rubber gasket, and CFS-P BA used to wrap first 100 mm of cables as they protect from tabs of sleeve details in Figure 1, Figure 2 and Figure 4														
A _{1c}	Item name	Hilti firestop putty pad CP 617- cut to 25mm width														
	Installation	Applied as illustrated in														
A _{1d}	Item name	Hilti putty bandage CFS-P BA														
	Installation	Applied as illustrated in Figure 4														
C	Item name	Cable/conduit														

Item	Description	
	Type	Cables: circular submains cables, flat TPS, RG6 Quad Shield coax cables, data cables (CAT5, CAT6, CAT7, CAT8), fire-rated cables and other electrical and communication cables (given the diameter range and conductor size is satisfactory) Conduit material: Polyolefin (PO).
E ₁	Item name	Flexible/rigid wall
	Construction	Flexible wall: 2 × 13 mm or 16 mm plasterboard wall on steel or timber studs with or without insulation. For timber stud, minimum distance of 100 mm from the seal to any stud. Plasterboard wall may include but not be limited to USG Boral Firestop, CSR Gyprock Fyrecheck, Elephant Plasterboard, GIB Fyrelite, Knauf Fireshield, Midland fire-resistant plasterboard and BGC/GTEK Fireboard (provided the construction is same). Rigid wall: masonry, concrete, aerated concrete, autoclaved aerated concrete (minimum density 550 kg/m ³), Dintel wall. Hebel wall: 13 mm or 16 mm plasterboard build up (100 mm × 100 mm) on both sides. The FRL is restricted to -/120/120.
E ₂	Item name	Sandwich panel
	Construction	Internal Sheet: zincified steel (PE coated 0.5 mm) Core: Stone wool (Thickness 99/150 mm) External Sheet: zincified steel (PE coated 0.5mm) Density: 115 kg/m ³ The panel should achieve group no 1 through AS ISO 9705-2003 (R2016).
E ₃	Item name	Floor
t _E	Item name	Thickness of separating element
	Specification	As indicated in the relevant section

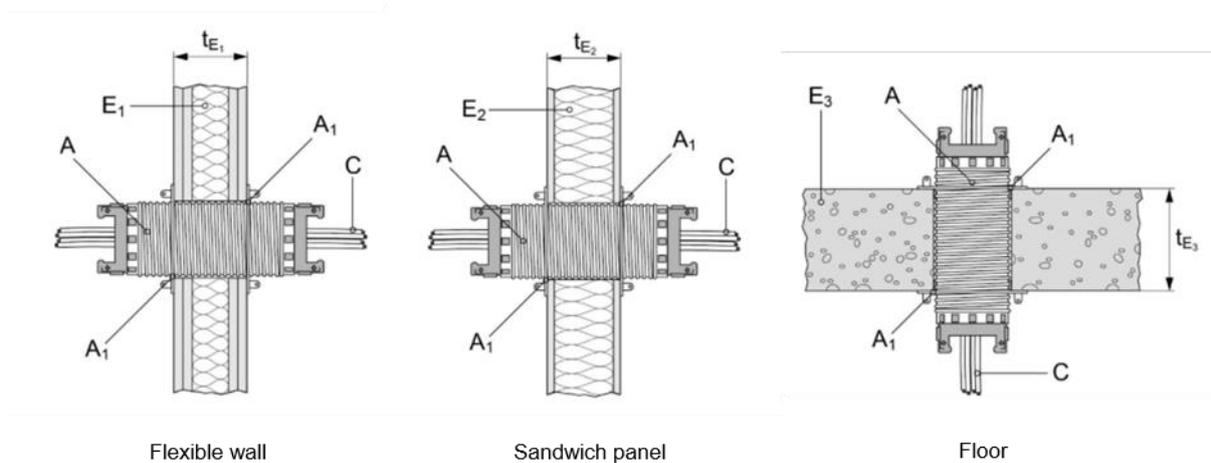


Figure 1 Seal type 1 details (image reproduced from ETA 17/0081)

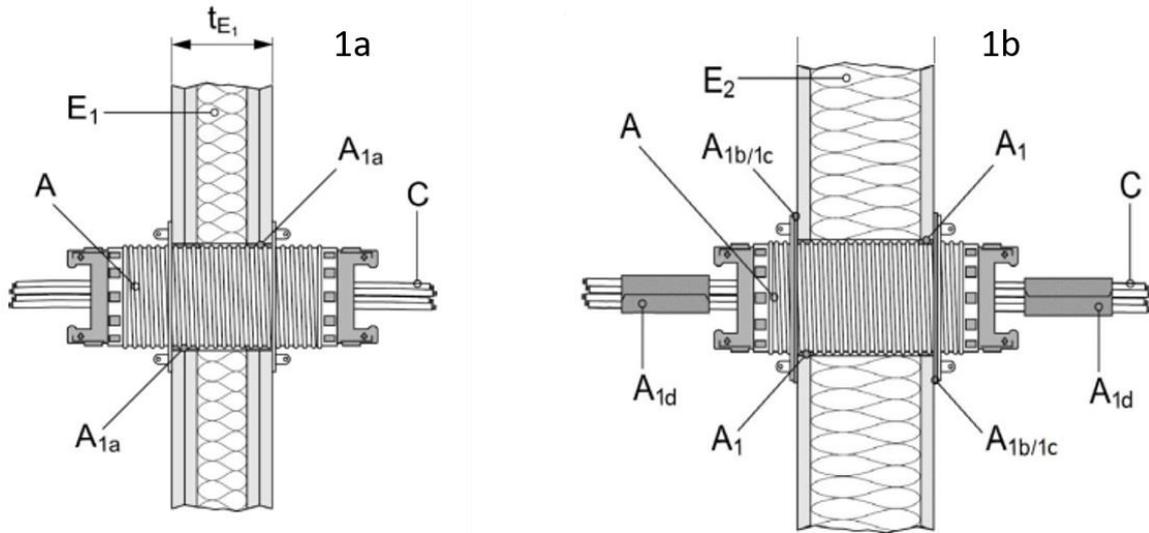


Figure 2 Seal type 1a and 1b details (image reproduced from ETA 17/0081)

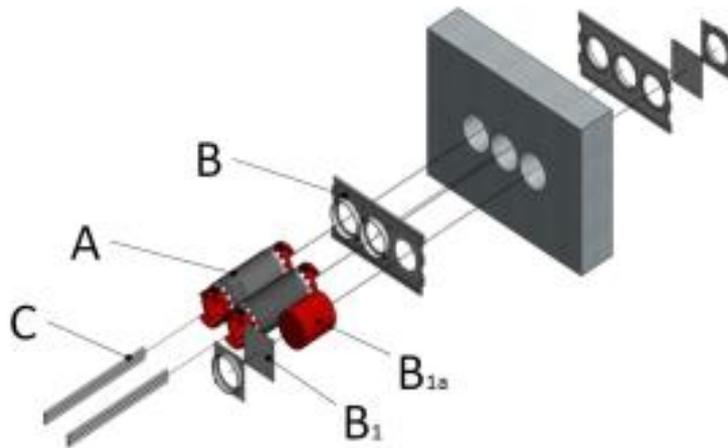


Figure 3 Ganged device installation details flexible and rigid wall and sandwich panels (image reproduced from ETA 17/0081)

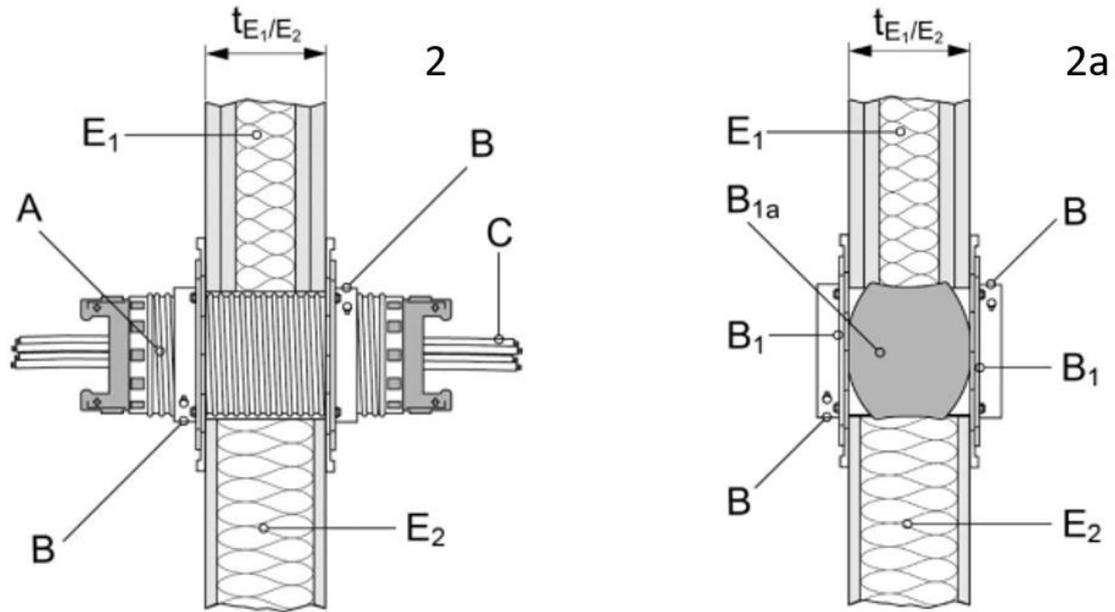
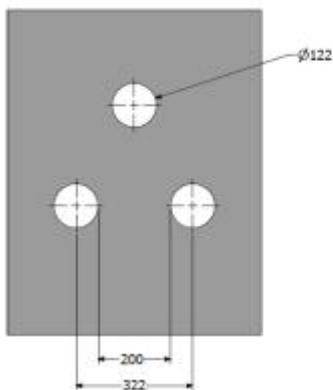


Figure 4 Seal type 2 and 2a details (image reproduced from ETA 17/0081)

200mm (horizontal/vertical distance between openings linear or cluster)



Zero distance (horizontal/vertical distance between flanges linear or cluster)

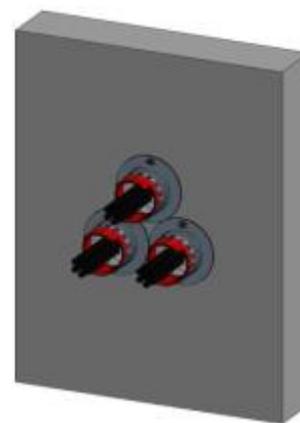
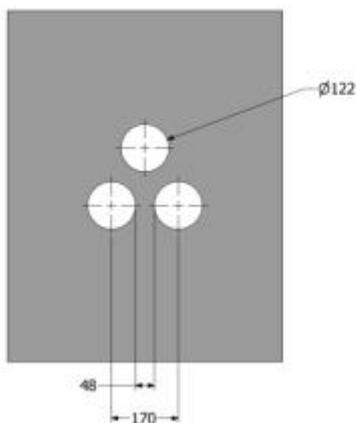
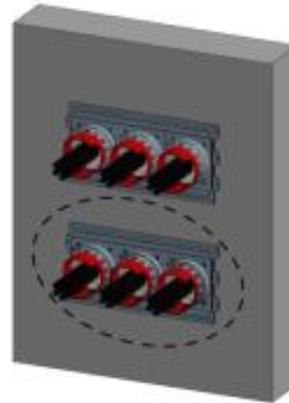
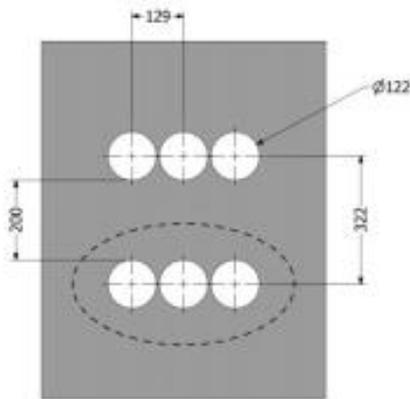


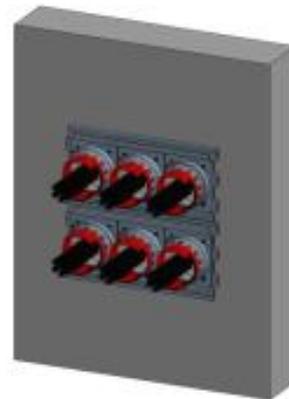
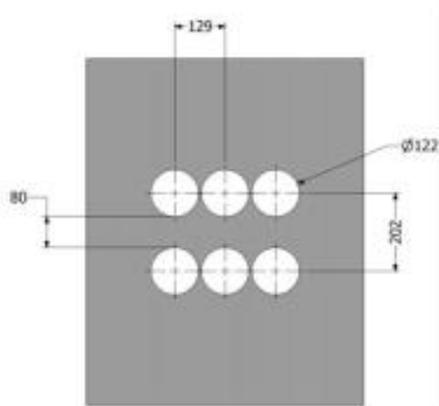
Figure 5 Orientation details of seal 1, 1a and 1b (image reproduced from ETA 17/0081)

(Lower, dashed Gangplate illustrates correct placement of 200mm distance)



Zero Distance between Devices - For Double Gangplate installation:

(Outside of Double Constellation, 200mm to next Gangplate/Constellation /Device opening)



Zero Distance between Devices - For Triple Gangplates to any number of installations:

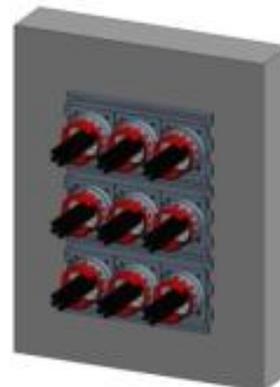
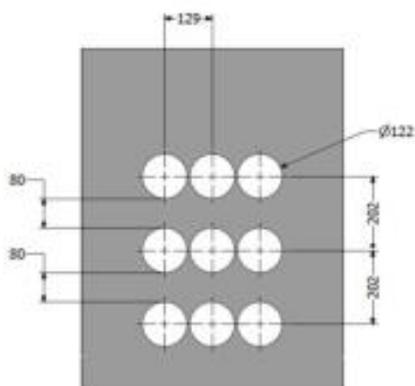


Figure 6 Orientation details of seal 2 and 2a (image reproduced from ETA 17/0081)

4. Scope, objective and assumptions

- The scope of this report is limited to an assessment of the variations to the tested systems described in section 3.3.
- This report details the methods of construction, test conditions and assessed results that would have been expected if the specific elements of construction described here had been tested in accordance with AS 1530.4:2014.
- The results of this assessment are applicable to electrical and communication cables, and conduits.
- This report is only valid for the assessed system/s. Any changes with respect to size, construction details, loads, stresses, edge or end conditions, other than those identified in this report, may invalidate the findings of this assessment. If there are changes to the system, a reassessment will be needed to verify consistency with the assessment in this report.
- The data, methodologies, calculations and conclusions documented in this report specifically relate to the assessed system/s and must not be used for any other purpose.
- This 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 this report as a result.

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 15 to Table 24.

Table 15 FRL of cables through flexible and rigid wall- 200 mm between openings

Separating element	System description	CFS-SL GA S	CFS-SL GA M/L
Flexible and Rigid Wall (minimum thickness 100 mm)	Blank	-/120/120	-/120/120
	All sheathed cables ≤21 mm	-/90/90	-/90/90 ¹
	All sheathed cables ≤61 mm	N/A	-/90/90
	All sheathed cables ≤80 mm	N/A	-/60/60
	Cable bundle ≤36 mm All sheathed cables ≤21 mm	-/90/90	N/A
	Cable bundle ≤86 mm All sheathed cables ≤21 mm	N/A	-/90/90
	100% filled device with cables ≤21 mm	-/60/60 ²	-/90/90
	Conduits ≤25 mm with or without cables or Fiber Optics (max. single cable/cable bundle diameter 14.4 mm) Conduits may be single or bundled (max 3) up to diameter ≤ 48 mm	-/120/120	N/A
	Conduits ≤ 63 mm with or without cables or Fiber Optics (max. single cable/cable bundle diameter 27 mm) Conduits may be single or bundled (max 3) up to diameter ≤ 91 mm	N/A	-/90/90 ³
	For higher fire classification- follow Figure 2 Seal type 1a (CP606/CFS-S ACR) installation		
	¹ All sheathed cables ≤21 mm	N/A	-/120/120

	2) 100% filled device with cables with ≤ 21 mm	-/90/90	N/A
	3) Conduits ≤ 63 mm with or without cables or Fiber Optics (max. single cable/cable bundle diameter 27 mm) Conduits may be single or bundled (max 3) up to diameter ≤ 91 mm	N/A	-/120/120

Table 16 FRL of cables through sandwich panel- 200 mm between openings

Separating element	System description	CFS-SL GA S	CFS-SL GA M/L
Sandwich Panel (150 mm thickness)	Blank	-/90/90	-/90/60 ⁴
	All sheathed cables ≤ 21 mm	-/60/60	-/90/90 ⁴
	All sheathed cables ≤ 50 mm	N/A	-/90/90
	100% filled device with cables ≤ 21 mm	-/60/60	N/A
	100% filled device with cables (max conductor size 925 mm^2) ≤ 50 mm	N/A	-/60/60 ⁴
	Higher classification- follow seal type 1b (putty) installation		
	4) 100% filled device with cables < 21 mm	N/A	-/120/120

Table 17 FRL of cables through flexible and rigid walls- zero distance between flanges

Separating element	System description	CFS-SL GA S	CFS-SL GA M/L
Flexible and Rigid Wall (minimum thickness 100 mm, max 8 penetrations)	Blank	-/120/120	-/90/90
	All sheathed cables ≤ 21 mm	-/60/60	-/90/90
	All sheathed cables ≤ 50 mm	N/A	-/60/60
	All sheathed cables ≤ 80 mm	N/A	-/60/60
	Cable bundle ≤ 36 mm All sheathed cable ≤ 21 mm	-/60/60	N/A
	Cable bundle ≤ 86 mm All sheathed cable ≤ 21 mm	N/A	-/60/60
	100% filled device with cables ≤ 21 mm	-/60/60	-/60/60
	100% filled device with cables (max conductor size 925 mm^2) ≤ 80 mm	N/A	-/60/60
	Conduits ≤ 25 mm with (max diameter 14.4 mm) or without cables or Fiber Optics, Single or bundled conduits (max 3) up to diameter ≤ 48 mm)	-/90/90	N/A
	Conduits ≤ 63 mm with (max diameter 27 mm) or without cables or Fibre optics, single or bundled conduits (max 4) up to diameter ≤ 92 mm)	N/A	-/60/60

Table 18 FRL of cables through sandwich panel-zero distance between flanges

Separating element	System description	CFS-SL GA S	CFS-SL GA M/L
Sandwich Panel (100 mm thickness, max 4 penetrations)	Blank Seal	-/45/45	-/90/90
	All sheathed cables ≤21 mm	-/45/45	-/90/90
	All sheathed cables ≤50 mm	N/A	-/60/60
	100% filled device with cable ≤21 mm	-/45/45	-/60/60
	100% filled device with cables (max conductor size 925 mm ²)≤50 mm	N/A	-/60/60

Table 19 FRL of cables through concrete slab- zero distance between openings

Separating element	System description	CFS-SL GA S	CFS-SL GA M/L	
Floor (Minimum thickness 150 mm, max 8 penetrations)	Blank	-/180/180	-/180/180	
	All sheathed cables ≤21 mm	-/180/180	-/180/180	
	All sheathed cables ≤45 mm	N/A	-/120/120 ⁵	
	All sheathed cables ≤80 mm	N/A	-/60/60	
	Cable bundle ≤36 mm All sheathed cables ≤21 mm	-/180/180	N/A	
	Cable bundle ≤86 mm All sheathed cables ≤21 mm	N/A	-/120/120	
	100% filled device with cables ≤21 mm	-/120/120	N/A	
	100% filled device with cables (max conductor size 565 mm ²) < 45 mm	N/A	-/120/120	
	Conduits ≤25 mm with (max diameter 14.4 mm) or without cables or Fiber Optics, Single or bundled conduits (max 3) up to diameter ≤ 48 mm)	-/90/90 ⁶	N/A	
	Conduits ≤63 mm with (max diameter 27 mm) or without cables or Fiber Optics, Single or bundled conduits (max 4) up to diameter ≤ 92 mm)	N/A	-/60/60 ⁷	
	Higher classification with increased distance (200 mm)			
	⁵) All sheathed cables < 45 mm	N/A	-/120/120	
	⁶) Conduits ≤25 mm with (max diameter 14.4 mm) or without cables or Fiber Optics, single or bundled conduits (max 3) up to diameter ≤ 48 mm)	-/120/120	N/A	
	⁷) Conduits ≤63 mm with (max diameter 27 mm) or without cables or Fiber Optics, single or bundled conduits (max 4) up to diameter ≤ 92 mm)	N/A	-/90/90	

Table 20 FRL of cables penetrating flexible and rigid wall (ganged device)- 200 mm distance between openings

Separating element	System description	FRL
Flexible and Rigid Wall (minimum thickness 100 mm)	Blank Device to 100% filled cables <21 mm	-/120/120
	Blank Seal (cap and plug)	

Table 21 FRL of cables penetrating flexible and rigid wall (double gangplates)- zero distance between gangplates

Separating element	System description	FRL
Flexible and Rigid Wall (minimum thickness 100 mm)	Blank Device to 100% filled cables <21 mm	-/90/90
	Blank Seal (cap and plug)	

Table 22 FRL of cables penetrating flexible and rigid wall (triple gangplates)- zero distance between gangplates

Separating element	System description	FRL
Flexible and Rigid Wall (minimum thickness 100 mm)	Blank Device to 100% filled cables <21 mm	-/60/60
	Blank Seal (cap and plug)	

Table 23 FRL of cables penetrating sandwich panel (double gangplates)- zero distance between openings

Separating element	System description	FRL
Sandwich Panel (100 mm thickness)	Blank Device to 100% filled cables <21 mm	-/60/60
	Blank Seal (cap and plug)	

Table 24 FRL of cables penetrating sandwich panel- 200 distance between openings

Separating element	System description	FRL
Sandwich Panel (150 mm thickness)	Blank Device to 100% filled cables <21 mm	-/90/90
	Blank Seal (cap and plug)	-/120/120

6. Validity

Warringtonfire Australia does not endorse the tested or assessed product in any way. The conclusions of this 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.

This 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 this report be reviewed on or before, the stated expiry date.

This 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 this report.

This assessment is provided to the Hilti (Aust.) Pty Ltd for its own purposes and we cannot express an opinion on whether it will be accepted by building certifiers or any other third parties for any purpose.