HILTI (AUST) PTY LTD

REGULATORY INFORMATION REPORT

Hilti CFC-CT B applications to AS 1530.4:2014

Prepared for

Dom Wang
Hilti (AUST) Pty Ltd

Project number: FAS220304
Revision: R1.1 Issued date: 14 May 2025

JENSEN HUGHES

Quality management

Revision	Date	Revision description	
RIR1.0	Issue: 11 Dec 2024	Initial issue	
		Prepared by	**Reviewed by**
		Namrata Moharana	Omar Saad
RIR1.1	Issue: 14 May 2025	Report updated to include HVAC services	
	Expiry: 31 Jan 2029	**Prepared by**	**Reviewed by**
		Namrata Moharana	Omar Saad

Jensen Hughes Fire Testing Pty Ltd
ABN 81 050 241 524
Formerly Warringtonfire Australia Pty Ltd[1]

[1] *Warringtonfire Australia Pty Ltd was acquired by Jensen Hughes in December 2023. Jensen Hughes Fire Testing Pty Ltd is not affiliated, associated, authorised, or endorsed by Warringtonfire Australia Pty Ltd, Warringtonfire Testing and Certification Limited or its "Warringtonfire" or "Certifire" brands.*

1.0 Executive summary

This report contains the minimum information required for regulatory compliance and refers to the referenced assessment report FAS220304 R1.1.

This report may be used as evidence of suitability in accordance with the requirements of the relevant National Construction Code (NCC) to support the use of the material, product, form of construction or design as given within the scope of this assessment report. It also references test evidence for meeting deemed-to-satisfy (DTS) provisions of the NCC that apply to the assessed systems.

The proposed construction consists of blank apertures in flexible or rigid walls or concrete slabs that are protected with two layers of Hilti CFS-CT B batts. The CFS-CT B batts are mineral wool batts pre-coated with Hilti Firestop Coating CFS-CT on either one or both sides. The thickness of the coating is 0.7 mm and the standard batt sizes are 1200 mm × 600 mm or 1000 mm × 600 mm. These batts have a density of 140 Kg/m^3. It is also proposed for these services to be further penetrated by various electrical services.

The analysis in sections 5 to 7 of the referenced assessment report found that the proposed system/s, together with the described variations, will achieve FRL as shown in section 6.0 – in accordance with AS 1530.4:2014 and AS 4072.1:2005 (R2016).

The variations and outcome of this assessment are subject to the limitations and requirements described in sections 3.0, 4.0 and 10.0 of this report. The results of this report are valid until 31 January 2029.

Contents

2.0 Introduction

This report documents the findings of the assessment undertaken to determine the fire hazard properties of aperture seals protected with as well as services installed through Hilti CFS-CT B batts in accordance with AS 1530.4:2014[2].

This report may be used as evidence of suitability in accordance with the requirements of the relevant National Construction Code (NCC) to support the use of the material, product, form of construction or design as given within the scope of this assessment report. It also references test evidence for meeting deemed-to-satisfy (DTS) provisions of the NCC that apply to the assessed systems.

This assessment was carried out at the request of Hilti (AUST) Pty Ltd. The sponsor details are included in Table 1.

Table 1 Sponsor details

Sponsor	Address
Hilti (AUST) Pty Ltd	IG Homebush Bay Drive Rhodes NSW 2138 Australia

3.0 Framework for the assessment

3.1 ASSESSMENT APPROACH

An assessment is a professional opinion about the expected performance of a component or element of structure subjected to a fire test.

No specific framework, methodology, standard or guidance documents exists in Australia for undertaking 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 2021[3].

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 can 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.

This 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 and performance based on the tested constructions and performances obtained. The assessment is an evaluation of the potential fire resistance performance of the elements in accordance with AS 1530.4:2014.

[2] 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.

[3] Passive Fire Protection Forum (PFPF), 2021, Guide to undertaking technical assessments of the fire performance of construction products based on fire test evidence, Passive Fire Protection Forum (PFPF), UK.

This assessment has been written in accordance with the general principles outlined in EN 15725:2023[4] for extended application on the fire performance of construction products and building elements: Principle of EXAP standards and EXAP reports.
This 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.

3.2 COMPLIANCE WITH THE NATIONAL CONSTRUCTION CODE

This assessment report has been prepared to meet the evidence of suitability requirements of the NCC 2022[5] under A5G3(1)(d). It references test evidence for meeting deemed-to-satisfy (DTS) provisions of the NCC under A5G5 for fire resistance level that apply to the assessed systems based on Specifications 1 and 2 for fire resistance for building elements.
The proposed details and systems (building elements) in this report are confirmed to be assessed, without the aid of an active fire suppression system, based on prototype tests that are equivalent to or more severe than a standard fire test as specified in section 5.2, in accordance with NCC 2022 S1C2(b). It is also confirmed that the differences between the proposed systems and details compared to the tested prototypes are considered minor in accordance with NCC 2022 S1C2(c).
This assessment report may also be used to demonstrate compliance with the requirements for evidence of suitability under the relevant sections of previous versions of the NCC.

3.3 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 30 October 2024, Hilti (AUST) Pty Ltd confirmed that:

- To their knowledge, the variations to the component or element of structure, which is the subject of this assessment, have 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.

4.0 Requirements and limitations of this assessment

- The scope of this report is limited to an assessment of the variations to the tested systems described in section 5.2.
- This report details the methods of construction, test conditions and assessed results in accordance with AS 1530.4:2014.
- This assessment applies to floor/ceiling systems exposed to fire from below or wall systems exposed to fire from either side in accordance with the requirements of AS 1530.4:2014. The horizontal elements must be exposed to heat from the underside only, whereas the vertical elements must be exposed to heat from the direction required to resist fire exposure.

[4] European Committee for Standardization, 2023, Extended application on the fire performance of construction products and building elements: Principle of EXAP standards and EXAP reports, EN 15725:2023, European Committee for Standardization, Brussels, Belgium
[5] National Construction Code Volumes One and Two - Building Code of Australia 2022, Australian Building Codes Board, Australia

- This assessment report has been prepared based on the fire resistance performance and condition of the systems at the time they were tested. Any deterioration of fire resistance performance due to external factors including but not limited to passage of time and exposure to elements – is not considered in this report.
- Jensen Hughes has provided this report on the fire performance of building elements in a controlled laboratory setting, strictly within the parameters allowed by the test standards and building regulations. The outcomes of this report are intended to assist in verifying the suitability of the product or system for practical use in specific applications.
- This 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 this report – may invalidate the findings of this assessment. If there are changes to the system, a reassessment will need to be done by an Accredited Testing Laboratory (ATL) that is accredited to the same nominated standards of this report.
- This report has been prepared using information provided by others. Jensen Hughes has not verified the accuracy and/or completeness of that information and will not be responsible for any errors or omissions that may have been incorporated into this report as a result.
- This 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 expert handling, placing and finishing of the products on site. These variables are beyond the control and consideration of this report.

5.0 Description of the specimen and variations

5.1 DESCRIPTION OF ASSESSED SYSTEMS

The proposed construction consists of blank apertures in flexible or rigid walls or concrete slabs that are protected with two layers of Hilti CFS-CT B batts. The CFS-CT B batts are mineral wool batts pre-coated with Hilti Firestop Coating CFS-CT on either one or both sides. The thickness of the coating is 0.7 mm and the standard batt sizes are 1200 mm × 600 mm or 1000 mm × 600 mm. These batts have a density of 140 Kg/m^3. It is also proposed for these services to be further penetrated by various electrical services.

5.2 REFERENCED TEST DATA

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

Table 2 Referenced test data

Report number	Test sponsor	Test date	Testing authority
WF 183384	Hilti A.G.	15/09/2009	Bodycote Warringtonfire UK
WF 183654	Hilti A.G.	21/09/2009	Bodycote Warringtonfire UK
14245A	Hilti A.G.	12/08/2010	Warringtonfiregent
14248A	Hilti A.G.	23/12/2010	Warringtonfiregent
15225A	Hilti A.G.	28/03/2012	Warringtonfiregent
15449A	Hilti A.G.	29/03/2012	Warringtonfiregent
15641A	Hilti A.G.	27/08/2012	Warringtonfire Gent
15761A	Hilti A.G.	30/10/2012	Warringtonfiregent
15796A	Hilti A.G.	5/12/2012	Warringtonfiregent
18116 B	Hilti A.G.	21/12/2016	Warringtonfire Gent

Report number	Test sponsor	Test date	Testing authority
EWFA53390600.1	Hilti Australia Pty Ltd	19/07/2018	Jensen Hughes previously known as Warringtonfire Australia
FRT190338	Hilti (NZ) Limited	31/12/2020	Jensen Hughes previously known as Warringtonfire Australia
FRT220282	Hilti Australia Pty Ltd	11/01/2023	Jensen Hughes previously known as Warringtonfire Australia
FRT220283	Hilti Australia Pty Ltd	13/01/2023	Jensen Hughes previously known as Warringtonfire Australia
22822A	Hilti A.G.	24/07/2023	Warringtonfire Gent
22824A	Hilti A.G.	26/07/2023	Warringtonfire Gent
FRT240028	HILTI Aust Pty Ltd	25/07/2024	Jensen Hughes previously known as Warringtonfire Australia
14924A	Hilti A.G.	3 May 2011	Warringtonfire Gent
14925A	Hilti A.G.	4 May 2011	Warringtonfire Gent
15222A	Hilti A.G.	15 February 2012	Warringtonfire Gent
15224A	Hilti A.G.	30 March 2012	Warringtonfire Gent
FRT220283	Hilti Australia Pty Ltd	11 January 2023	Jensen Hughes

5.3 VARIATIONS TO THE TESTED SYSTEM

The proposed variations to the tested systems have been outlined in Table 4 to Table 14 in section 6.0.

5.4 PRODUCTS

- Hilti Firestop Board CFS-CT B 1S:

Hilti Firestop Board CFS-CT B 1S is a mineral wool board pre-coated on one face with Hilti Firestop Coating CFS-CT. The thickness of the coating is 0.7 mm. The product is in standard size 1200 mm × 600 mm × 50 mm thick or 1000 mm × 600 mm × 50 mm thick.

When Hilti Firestop Board CFS-CT B 1S is used, the coated face must be facing towards the exposed side of the base material.

- Hilti Firestop Board CFS-CT B 2S

Hilti Firestop Board CFS-CT B 2S is a mineral wool board pre-coated on both faces with Hilti Firestop Coating CFS-CT. The thickness of the coating is 0.7 mm. The product is in standard size 1200 mm × 600 mm × 50 mm thick or 1000 mm × 600 mm × 50 mm thick.

5.5 ANCILLARY PRODUCTS

- Hilti Firestop coating CFS-CT
- Hilti Firestop Acrylic Sealant CP 606 / CFS-S ACR
- Hilti Firestop intumescent sealant CP 611A / CFS IS
- Hilti Firestop Collar CFS-C P
- Hilti Firestop Collar Endless CFS-C EL
- Hilti Firestop Bandage CFS-B
- Hilti Firestop Wrap CFS-W
- Hilti Firestop Wrap CFS-W P
- Hilti Firestop Sleeve CFS-SL M and Hilti Firestop Sleeve CFS-SL GA
- Hilti Firestop Coating CFS-P BA
- Hilti Firestop Block CFS-BL

5.6 SEPARATING ELEMENTS

Table 3 summarises the proposed separating elements to be used for the CFS-CT B batt apertures – refer to section 7.0. The overall FRL of the service penetration with firestop installation as per the approval will be limited by the FRL achieved by the separating element.

Table 3 Summary of proposed separating elements

Separating element	Construction
A.1.1 Flexible walls (single layer plasterboard) t_E ≥ 90 mm and rigid wall	Wall types shall be tested or assessed to AS 1530.4 and AS 4072.1 and achieve minimum -/60/60 or 60/60/60, -/90/90 or 90/90/90 FRL. 1. Steel studs or timber studs lined on both faces with minimum one layer of FR board* (minimum thickness 13 mm), Wall cavity insulation between linings is optional. 2. Coated board needs to be installed face mounted if the base material thickness is less than 90 mm.
A.1.2 Flexible walls (double layer plasterboard) and rigid wall t_E ≥ 100 mm	Wall types shall be tested or assessed to AS 1530.4 and AS 4072.1 and achieve minimum -/120/120 or 120/120/120 FRL. 1. Steel studs lined wall, both faces with minimum two layers of Fire Rated (FR) boards* (minimum thickness 13 mm) and achieve 120/120/120 or -/120/120, Wall cavity insulation between linings is optional. Minimum thickness 100 mm; including double stud wall 2. Timber studs lined wall, both faces with minimum 2 layers of FR boards* For timber stud walls there must be a minimum distance of 100 mm from the seal to any stud and the cavity between stud and seal must be filled with minimum 100 mm thick insulation (e.g. mineral wool, minimum 40 kg/m^3 density) in the cavity between stud and seal. 3. For above two types of plasterboard wall, an aperture framing must be installed made of C-studs and boards that have been used for the lining of the wall, minimum thickness of the board must be 13 mm. 4. Rigid wall shall be Aerated concrete, concrete, hollow and solid masonry, with minimum density 650 kg/m³, minimum 100 mm thick
A.1.3 Flexible walls (double layer plasterboard) and rigid wall t_E ≥ 135 mm	Wall types shall be tested or assessed to AS 1530.4 and AS 4072.1 and achieve minimum -/120/120 or 120/120/120 FRL. 1. Steel studs or timber studs lined wall, both faces with minimum two layers of FR boards* (minimum thickness 13 mm) and achieve 120/120/120 or -/120/120, Wall cavity insulation between linings is optional. 2. For timber stud walls there must be a minimum distance of 100 mm from the seal to any stud and the cavity between stud and seal must be filled with minimum 100 mm insulation (e.g. mineral wool, minimum 40 kg/m^3 density) in the cavity between stud and seal. **3.** Minimum thickness 135mm; double stud wall also included.
A.1.4 Rigid wall t_E ≥ 150 mm	The wall must have separately been either tested or assessed to AS 1530.4 and AS 4072.1 to achieve minimum -/120/120 or 120/120/120 or -/180/180 or 180/180/180 FRL by an NATA Accredited Testing Lab Aerated concrete, concrete, hollow and solid masonry, Minimum density 760 kg/m^3, Minimum thickness 150 mm Dincel wall, minimum 155 mm thick with polymer skins, filled with normal-weight concrete.

Separating element	Construction
A.1.5 Proprietary wall systems $t_E \geq 75$ mm	Aerated concrete, concrete, hollow and solid masonry, Minimum density 550 kg/m^3, Minimum thickness 75 mm. Coated board needs to be installed at least one side face mounted if the base material thickness is less than 90 mm. The wall must have separately been either tested or assessed to AS 1530.4 and AS 4072.1 to achieve required FRL. Proprietary wall systems such as Speedpanel, Korok, Walsc, Hebel, Dincel, AFS logic wall included, detailed description as below: 1. Speedpanel wall, minimum 78 mm thickness, achieving FRL -/120/120. 2. Walsc, minimum 75 mm thick with min. 525 kg/m3 dry density, with tongue and groove joints at the edges, achieving FRL -/120/120. 3. Hebel wall, minimum 75 mm with minimum 510 kg/m3 dry density, achieving FRL -/120/120. 4. Dincel wall, minimum 155 mm thick with polymer skins, filled with normal-weight concrete.
A.1.7 Rigid floors $t_E \geq 150$ mm	The floor must have separately been either tested or assessed to AS 1530.4 and AS 4072.1 to achieve minimum -/120/120 or 120/120/120 FRL by an NATA Accredited Testing Lab Aerated concrete, concrete floor, minimum thickness 150 mm and minimum density 670 kg/m^3 The bare Rigid Floor must have a minimum thickness of 120 mm, in this case, aperture framing must be provided to locally build up the floor thickness to 150 mm.
* Fire rated board can optionally be USG Boral, CSR, Siniat, GIB, BGC, Elephant, Midland or other equivalent plasterboards supplied by other manufacturers, which the wall configuration is tested or assessed to AS 1530.4 and AS 4072.1 and achieve required FRL	
Otherwise, stop and start cable tray or support system minimum 100 mm off the separating material from both sides Other parts or service support constructions shall not penetrate the penetration seal.	
Services through 78 mm Speedpanel can achieve the specified FRL given that 78 mm Speedpanel has at least one layer of CFS CT B coated board face mounted The edge of face mounted coated board has minimum 100 mm to the service core hole in all directions. All grooves between the Speedpanel and face mounted coated board is filled with Hilti Firestop Acrylic sealant CP606, min. 30 mm depth.	

5.7 ADDITIONAL PROTECTION FOR CABLE / SMALL CONDUIT PENETRATIONS

Additional protections are needed based on case in order to achieve the specified insulation rating for cables, following specify the minimum material requirement of the additional protection and configuration needed

AP1: Use of CFS CT firestop coating, only applies to cables / conduits, length of coating and thickness to be specified against specific solution. When cable is against cable tray or back of cable tray is against wall or concrete floor ceiling, firestop coating CFS CT AP1 is only required on the exposed sides

AP2: Use of mineral wool mat, the mineral wool mat in the form of mineral wool blanket, minimum 60 kg/m^3, minimum thickness of 25 mm and melting temperature greater than 1000 degrees Celsius, the mineral wool mat must be at least one side AL-faced, AL foil side facing out when install.
Overlap: Insulation material must overlap each other by at least 100 mm

Fixing: Stainless steel tie must be used to secure the mineral wool insulation to pipe, stainless steel tie shall be installed as per the configuration listed below. the maximum distance between cable tie is 300 mm

Mineral wool Insulation length	number of steel tie needed	steel tie 1, distance from surface of the coated board	steel tie 2, distance from opening	steel tie 3, distance from opening
300 mm	2	50 mm	250 mm	none
400 mm	2	50 mm	350 mm	none
500 mm	3	50 mm	250 mm	450 mm

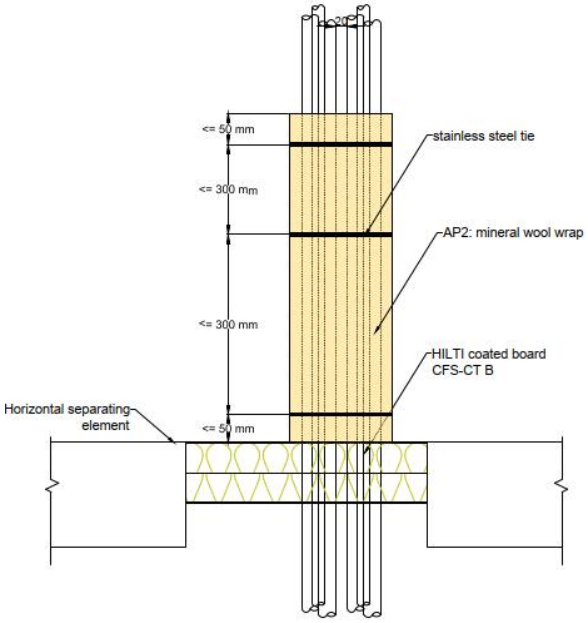


Figure 1 Illustration of AP2 fully wrap around cable and cable tray service

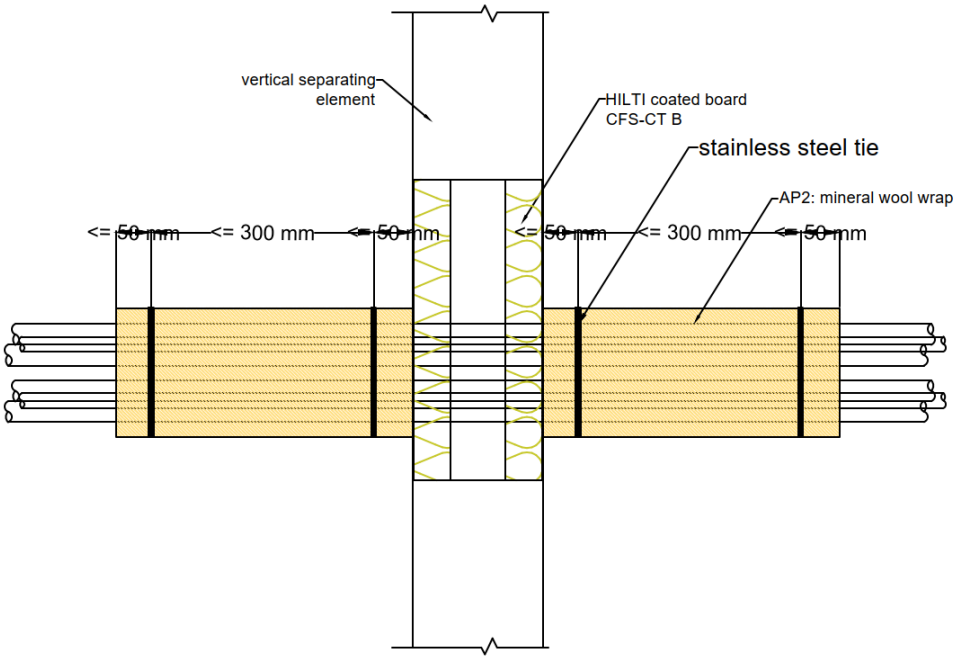
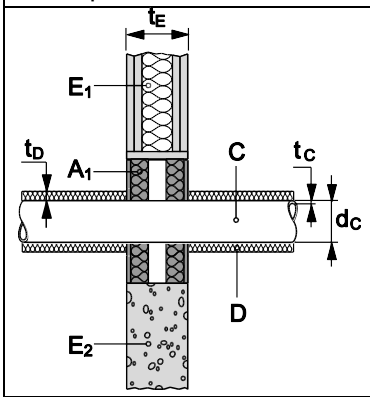
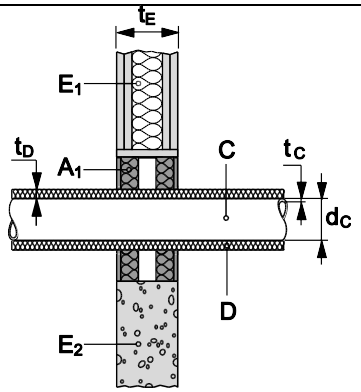


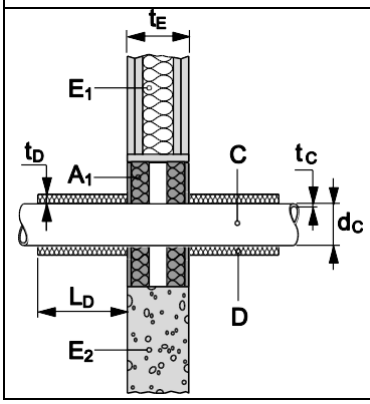
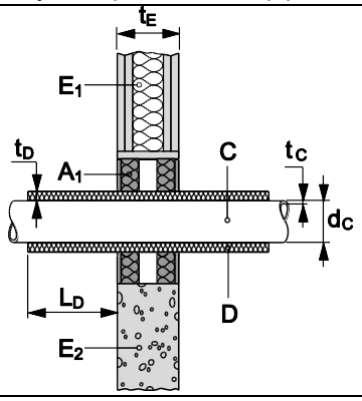
Figure 2 Drawing illustration of AP2 When cable tray going through wall, fixing details refers to section 5.8

AP3: Use of CFS P BA firestop putty bandage, only applies to cables / conduits, the putty bandage needs to be installed tightly around the cable service, white mesh facing out. Putty bandage must overlap by at least 50 mm. No cable tie required on top of putty bandage. Number of wrap and wrap length to be specified against specific solution

5.8 COMPONENTS FOR METAL, INSULATED METAL AND PLASTIC PIPE PENETRATIONS

Four general configurations are covered in the approval

Continued insulation, interrupted (CI) Find in HVAC services section, the specified pipe insulation continuous along the metal pipe and interrupted at the face of base material	**Continued insulation, sustained (CS)** Find in HVAC services section, the specified pipe insulation continuous along the metal pipe penetrating base material
	
Local insulation, interrupted (LI) Find in Plumbing and Sprinkler services sections, bare metal pipe going through base material and	**Local insulation, sustained (LS)** Find in HVAC services section, the specified pipe insulation (minimum L_D to the face of base material) locally along the metal pipe penetrating

specified local pipe insulation is installed to achieve required FRL	base material, the pipe can be then either lagged with any other pipe insulation or left as bare pipe beyond specified local pipe insulation.
	

5.8.1 Pipe insulation

Pipe insulation refers to insulation around copper, steel, stainless steel or other metal pipes to achieve acoustic and thermal insulation in normal building practice

When following solutions under Continued insulation, sustained (CS) configuration, the pipe insulation needs to be complied with specification below and to be continuous wrapped around the metal pipe

When following solutions under Local insulation, sustained (LS) configuration, the pipe insulation needs to be complied with specification below at specified length extending from surface of base material and in this case alternative pipe insulation can be used beyond specified pipe insulation length.

Specification for foamed elastomeric insulation products suitable for being used as pipe insulation, otherwise to be justified as equivalent

Manufacturer	Product designation
Armacell International GmbH	Armaflex AF, Armaflex SH, Armaflex Ultima, Armaflex XG, Armaflex NH, Armaflex HT
NMC Group	Insul-Tube H-Plus (nmc),
Kaimann GmbH	Kaiflex KK plus, Kaiflex KK, Kaiflex HF plus
L'Isolante K-Flex	l'Isolante K-Flex ECO, l'Isolante K-Flex ST Frigo
Aeroflex NMC Deutschland	Aeroflex HF
Solar, Halkida, Greece	3i - Isopipe HAT
HAT Isolierung Cosmo	Conel Flex HT
Union Foam S.p.A.Bellusco, Italia	Eurobatex
Würth	Flexen Kälteschlauch
Isidem Insulation Istanbul, Turkey	Isidem Coolflex AF

Specification for mineral wool products suitable for being used as pipe insulation

Use of mineral wool mat, the mineral wool mat in the form of mineral wool blanket, minimum 80 Kg/m^3, minimum thickness specified in tables and melting temperature greater than 1000 degrees Celsius, the mineral wool mat must be at least one side aluminium foil faced, with the foil side facing out when installing. The insulation material must overlap each other by at least 100 mm

Use of preformed mineral wool pipe section, the pipe section must be minimum 80 kg/m^3, minimum thickness specified in tables and melting temperature greater than 1000 degrees Celsius, the mineral wool pipe section can have one side aluminium foil faced, with the foil side facing out when installing.

When pipe insulation is used in local sustained configuration,

1. Pipe insulation beyond specified length of local pipe insulation can be changed to any other form of pipe insulation commonly used in building practices
2. Local pipe insulation is required to be tied to the pipe as per

Mineral wool Insulation length	number of steel tie needed	steel tie 1, distance from surface of the coated board	steel tie 2, distance from opening	steel tie 3, distance from opening
300 mm	2	50 mm	250 mm	none
400 mm	2	50 mm	350 mm	none
500 mm	3	50 mm	250 mm	450 mm

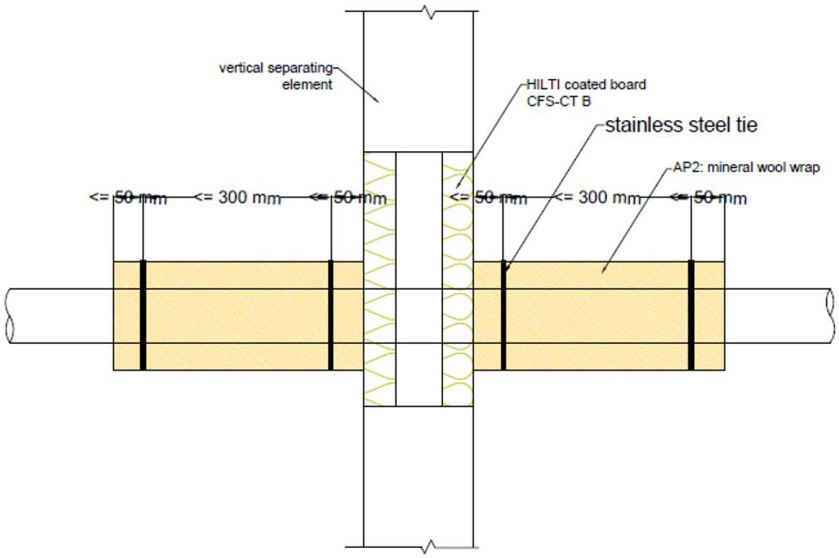


Figure 3 Pipe insulation used in local sustained configuration

5.8.2 Additional protection for metal and insulated metal pipe service

AP2: Use of mineral wool mat
The mineral wool mat in the form of mineral wool blanket, minimum 60 kg/m^3, minimum thickness of 25 mm and melting temperature greater than 1000 degrees Celsius, the mineral wool mat must be at least one side aluminium foil faced, with the foil side facing out when installing.
Overlap: insulation material must overlap each other by at least 100 mm.

AP4: Use of foamed elastomeric insulation
AF/Armaflex pipe insulation wrapped around the bandage/pipe insulation on each side of the seal, fixed with wire, length (LAP) = 300 mm on each side, thickness (tAP) = 19 mm or as specified

AP5: The mineral wool mat can be in the form of mineral wool blanket or preformed mineral wool pipe section, minimum 80 kg/m^3, thickness as specified in the table or otherwise 40 mm melting temperature greater than 1000 degrees Celsius. The mineral wool mat in blanket form must be at least aluminium foil faced, with the foil side facing out when installing. The mineral wool pipe section can have one side aluminium foil faced, with the foil side facing out when installing.

AP6: Reinforced Aluminum foil tape, min width 45 mm

AP7: Duct tape adhesive polyethylene based tape OR reinforced Aluminium foil tape, minimum 45 mm wide and total wrapping length minimum 200 mm. One layer is required.

5.8.3 Additional protection tie configuration

Overlap: Insulation material must overlap each other by at least 100 mm
Fixing: Steel tie can optionally be substituted with stainless steel tie or steel wire, to secure the mineral wool insulation to pipe, stainless steel tie shall be installed as per the configuration listed below. The maximum distance between cable ties is 300 mm.

Mineral wool Insulation length	Number of steel ties needed	Steel tie 1, distance from opening	Steel tie 2, distance from opening	Steel tie 3, distance from opening
300 mm	2	50 mm	250 mm	none
400 mm	3	50 mm	350 mm	none
500 mm	3	50 mm	250 mm	450 mm

5.9 FIXING DETAILS

The table provides fire rated anchoring solutions for fixing coated board (section 7.0) or mineral wool blanket insulation to separating element when needed

Anchoring System		Minimum Size	Flexible Wall (Plasterboard lined)	Aerated Concrete Wall	Solid Concrete Walls & Floors
Hilti Screw Anchor	HUS3-P	M6		✓*	✓
	HUS3-H			✓*	✓
	HUS			✓*	✓
Hilti Expansion Anchor	HSA				✓
	HST				✓
	DBZ 6/45				✓
Hilti Cavity Anchor	HTB-S		✓		
	HHD-S		✓		
Hilti Fire rated insulation dowel	IDMS	8 mm		✓**	✓**
Others	#14/10x65mm Hex Head Type 17 Screw	14 g		✓	
	Laminating / Drywall / Plasterboard Screws, with steel washers of at least 19mm in diameter, length as required.	10 g	✓		
	Threaded Rod with Nuts & Washer	M6	✓	✓	✓

* Minimum length/embedment depth of fixing required for ACC Hebel walls is 60mm
** Insulation mandrel IDMS 3/ 6 for one layer of coated board and Insulation mandrel IDMS 6/ 9 for two layers of coated board

Following fixings or equivalent are to be used to fasten Hilti retrofit collars CFS-C P and CFS-C EL to coated board

- Pigtail screw, minimum 25 mm depth into coated board
- Threaded rods M8, galvanized, minimum strength category 4.6
- Nuts M8, galvanized (e.g. according to EN ISO 4032)
- Washers:
  - at a collar hook: 8.4-28 s = 2 mm, galvanized (e.g. according to EN ISO 7089)
  - at the top side of a floor seal: 8.4-40 s = 3 mm, galvanized (e.g. according to EN ISO 7089)

5.10 SPACING AND DISTANCE REQUIREMENT

Distance requirement between individual openings where CFS CT B coated board solution applies. Penetration seals require a minimum separation of 200 mm.

Note: The spacing requirements may change based on materials, refer to services details for further information.

5.11 SERVICE FILLER SEALANT

Hilti Firestop Joint Sealant CP 606 is stated by the manufacturer to be identical to Hilti Firestop Joint Sealant CFS-S ACR and the only difference is the trade name. For the purpose of this assessment the product will be referred to as CP 606.

Hilti Firestop Intumescent Sealant CP 611A is stated by the manufacturer to be identical to Hilti Firestop Intumescent Sealant CFS IS and the only difference is the trade name. For the purpose of this assessment the product will be referred to as CP 611A.

5.12 LOCAL SEAL SERVICE FILLER SEALANT - ANNULAR GAP, BACKING CONDITION

Backing is optional when annular gap is <= 5 mm.

Mineral wool backing material shall be installed for 5 mm < annular gap <= 15 mm

If annular gap is greater than 15 mm, Hilti CFS CT B board cut off is must be installed within the annular gap with all edges coated with either CP 606 or CFS CT firestop coating.

Notes:

- open or closed cell backing rod can optionally be used as backing material for annual gap sealant when annular gap is <= 5 mm
- mineral wool backing can be obtained from mineral wool blanket or slab, minimum 40 kg/m^3 and melting temperature greater than 1000ºC.

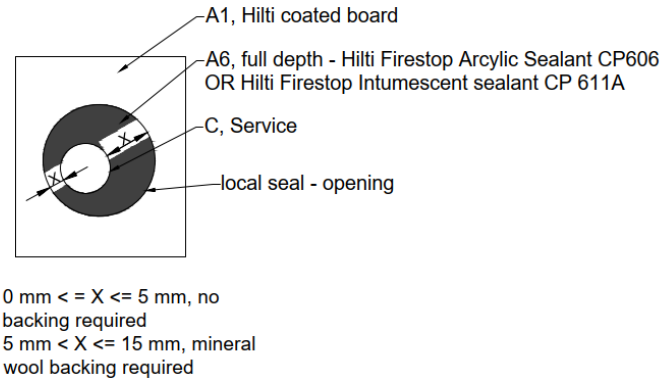


Figure 4Local seal service filler

Local seal sealant can be applied in either of the two following configurations

- 15 mm seal depth seal from both sides of the coated board
- Full depth of the coated board (optionally backed by backing material)

5.13 CABLE TRAY SPECIFICATION AND CONFIGURATION

Cable tray can optionally be fire rated and non fire rated steel cable tray, in the form of below

- Perforated Cable Tray
- Ladder Cable Tray
- Wire Mesh Cable Tray
- Solid-Bottom Cable Tray

Installation configuration of cable tray:

When cable is against cable tray or back of cable tray is against wall or concrete floor ceiling, firestop coating CFS CT AP1 is only required on the exposed sides.

When cable tray running along the wall going through floor, mineral wool wrapping needs to be face fixed to wall material, refers to section 5.7 for AP2 for more details

Wall shall be Aerated concrete, concrete, hollow and solid masonry, minimum density 760 kg/m^3, either tested or assessed to AS 1530.4 and AS 4072.1 to achieve required FRL by an NATA Accredited Testing Lab

When stop and start cable tray is needed (e.g. cable tray width > 600 mm), cable tray should discontinue minimum 100 mm off the surface of the separating material from both sides and rigidly supported.

Cable tray can be positioned against the opening (where the flat tray component has 0 mm distance to the edge of the opening. In this case, acrylic sealant CP 606 is required to be caulked behind the cable tray, either pre-installed or post-installed through the void of cable tray. If ladder cable tray is used, mineral wool must be used as backing.

5.14 RE-PENETRATION / REMOVAL OF SERVICES

If services (cables, pipes) are installed after the initial installation, a hole is drilled through the mineral wool panel and the services passed through; the remaining annular space has to be sealed with service filler sealant in accordance with section 5.12. In case the coating has been damaged during installation of the additional service it must be repaired. Depending on the type of service and the required fire resistance additional firestopping components, e.g. Hilti Firestop Bandage CFS-B or Hilti Firestop Collars CFS-C or CFS-C P, and/or additional protections may be necessary – refer to section 6.0.

In case services are removed, the remaining hole has to be filled with Hilti Firestop coated board CFS CT B offcut. Before coating, any gaps have to be filled with Hilti Firestop Acrylic Sealant CP 606.

5.15 APERTURE FRAMING

Local aperture framing shall be applied to separating base material (wall and floor) which achieved required FRL but the separating base material thickness is below the approved thickness.

Aperture framing / beading shall be constructed from fire rated plasterboard or calcium silicate boards (E1) of a size which will surround the intended aperture by at least 100 mm (WA) installed with the necessary number of layers to achieve total aperture thickness. Specification and fixing as per section 5.8.

5.16 APERTURE LINING

When coated board is to be installed within the flexible wall, ie. steel studs or timber studs lined on both faces with FR board, the aperture (opening in the base material, flexible wall in this case) must be lined with 1 × minimum 13 mm fire rated board cut and fitted tightly against the all four internal

sides of the aperture, joints between 1 × minimum 13 mm fire rated board aperture lining and FR board facing of the wall must be sealed with Hilti firestop Acrylic sealant CP 606.

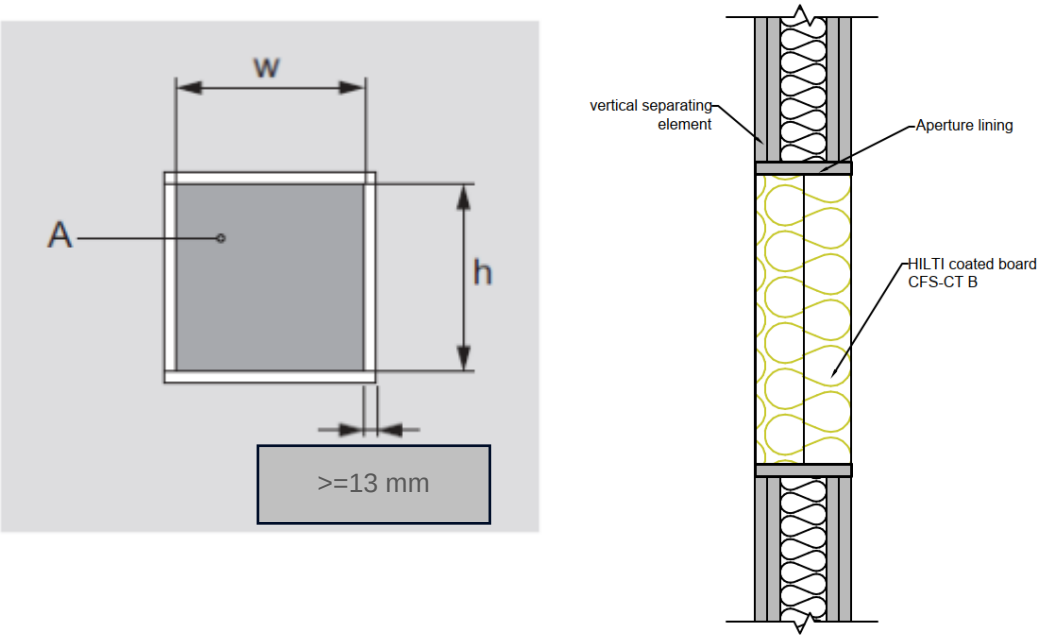


Figure 5 Aperture lining

5.17 COATED BOARD EDGE SEAL

Edge seal must be provided to the 50 mm edge of CFS CT B coated board when

1) Butt Joints between coated boards

Joints between coated board and base material

The edge seal shall be done with either Hilti Firestop Acrylic Sealant CP 606 or Hilti Firestop coating CFS-CT as a thin bead covering the edge of coated board during installation.

Hilti Firestop coating CFS-CT can be pre-coated and cured on all external exposed edges before install in the face mount configurations.

5.18 NON-REGULATED PP PIPES

There is a bigger group of non-regulated polypropylene-pipes, mineral reinforced, mainly used in waste water application. Most of them consist of a three- layer set-up. Those pipes have not been specified according a common pipe standard. The following pipes are considered equal in their fire properties presupposed:

1. pipe diameter and pipe wall thickness are covered by the field of application shown within relevant chapters
2. identical used Hilti penetration seals
3. identical installation details (for instance: gap size, gap filling, basement thickness and density, first support,…)
4. The list of pipes is summarised below:
   a. Rehau Raupiano
   b. Poloplast Polokal NG
   c. Wavin Sitech

d. Geberit Silent PP
e. Coes Blue Power
f. Coes PhoNo Fire
g. Valsir Triplus
h. Pipelife Master 3
i. Marley Silent
j. Poloplast Polokal 3S
k. Poloplast Polokal XS
l. Ostendorf Skolan dB
m. Geberit Silent Pro
n. Valsir Silere
o. Kekelit PhonEx AS
p. Wavin AS
q. Silenta Premium
r. Wavin Sitech +
s. Conel Drain Hausabflußrohr
t. Uponor S&W Decibel

Nominal pipe Outside diameter dR_C (mm)	**Numbers of short hooks Max. insulation thickness (Insulation is an acoustical insulation)**		
	0 mm	4 mm	9 mm
16	---	---	2
32	2	2	2
40	2	2	2
50	2	2	2
56	3	3	3
63	3	3	3
75	3	3	3
90	3	3	3
110	3	3	3

Hooks for CFS-C EL to seal plastic pipes penetrating coated boards CFS-CT B 1S

5.19 CLEAR DISTANCE BETWEEN SERVICE OPENINGS

The clear distance between edge of the opening, where the opening is to be protected by Hilti coated board CFS-CT B 1S / CFS-CT B 2S to other openings shall be minimum 200 mm, this also applies to when Hilti coated board is face mounted, e.g. clear spacing measure from edge of opening irrespective to the face mounted coated.

6.0 Assessment outcomes

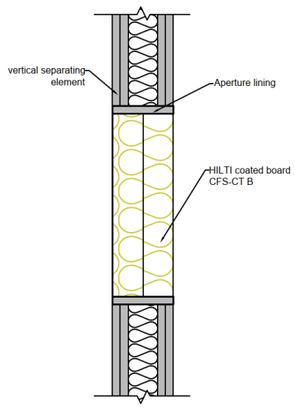
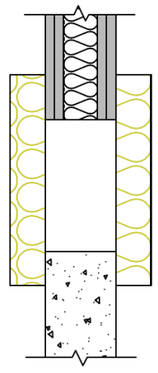
The assessment outcomes for various services have been included in the following sections:

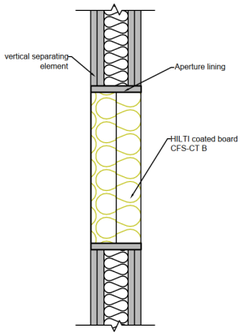
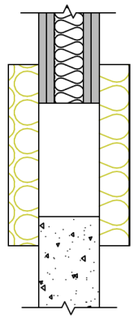
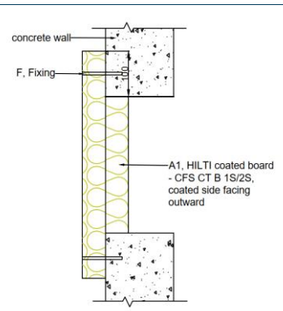
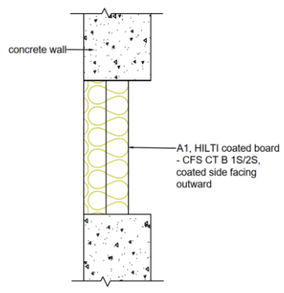
1. Blank apertures – section 7.0
2. Electrical trade solutions – section 8.0
3. HVAC trade solutions– section 9.0

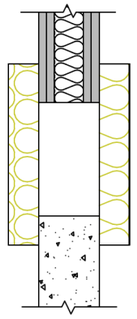
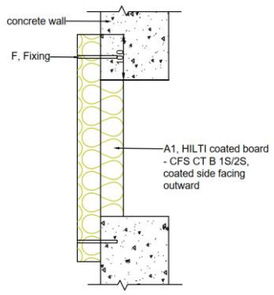
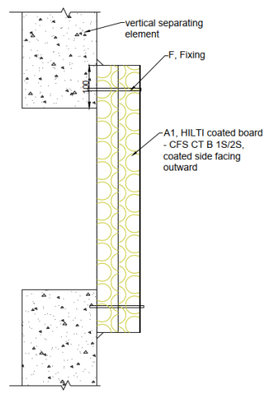
7.0 Blank apertures

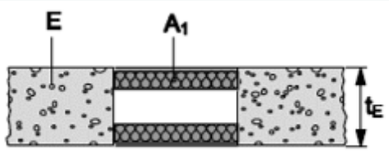
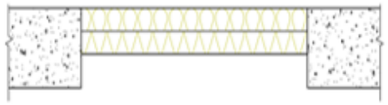
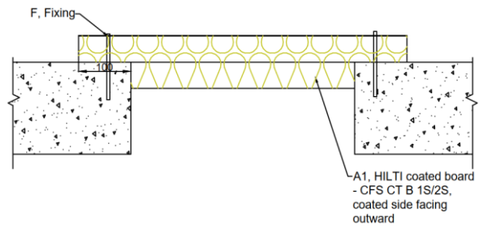
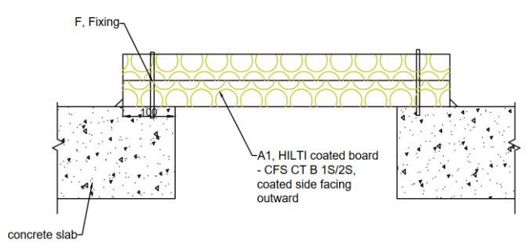
Table 4 Black apertures protected with Hilti CFC-CT B batts in various separating elements

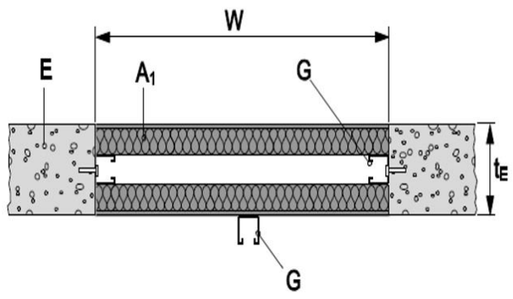
Note: The overall FRL of the blank aperture will be limited by the FRL achieved by the separating element. Refer to section 5.6 for separating element types.

Item	Separating elements	Supporting construction detail	Option no.	Ref. figure	Aperture construction details	Maximum size	Maximum FRL subject to FRL of separating element
1.	A.1.1 Flexible walls $t_E \geq 90$ mm	The wall shall have a minimum thickness of 116 mm (t_E) and comprise of steel stud lined on both faces with minimum 2 × layers of 13 mm or 16 mm thick fire grade plasterboard and has been tested or otherwise assessed to achieve FRL 120/120/120 or FRL -/120/120, with or without cavity insulation.	Option 1		The batts can be installed back to back or flush on either side of the wall with an air cavity between the two batt layers. The coated side CFS-CT batt must be facing the exposed sides of the wall. Apertures larger than 450 mm by 900 mm must be provided with a coating of CFS-CT overlapping the separating element by a minimum of 15 mm and with a minimum wet film thickness of 2 mm.	1200 mm × 1800 mm or equivalent	-/120/120
					The batts can be installed back to back or flush on either side of the wall with an air cavity between the two batt layers. The coated side CFS-CT batt must be facing the exposed sides of the wall.	1200 mm × 1800 mm or equivalent	-/90/90
2.			Option 2		The batts must be fixed using 14 g × 35 mm hex head self drill screws with 31.8 mm washers at nominal 200 mm centres, 30 mm away from the batt edges. In addition, the coated side CFS-CT batt must be facing the exposed sides of the wall.	1200 mm × 1800 mm or equivalent	-/120/120

Item	Separating elements	Supporting construction detail	Option no.	Ref. figure	Aperture construction details	Maximum size	Maximum FRL subject to FRL of separating element
3.	A.1.2 Rigid wall $t_E \geq 150$ mm	The bare wall must have a minimum thickness of 150 mm and comprise of concrete, aerated concrete, solid or hollow masonry with a minimum density of 550 kg/m³. Tested or otherwise assessed to achieve FRL 120/120/120 or FRL -/120/120	Option 1		The batts can be installed back to back or flush on either side of the wall with an air cavity between the two batt layers. The coated side CFS-CT batt must be facing the exposed sides of the wall. Apertures larger than 450 mm by 900 mm must be provided with a coating of CFS-CT overlapping the separating element by a minimum of 15 mm and with a minimum wet film thickness of 2 mm.	1200 mm × 1800 mm or equivalent	-/120/120
					The batts can be installed back to back or flush on either side of the wall with an air cavity between the two batt layers. The coated side CFS-CT batt must be facing the exposed sides of the wall.	1200 mm × 1800 mm or equivalent	-/90/90
4.			Option 2		The batts must be fixed using 14 g × 35 mm hex head self drill screws with 31.8 mm washers at nominal 200 mm centres, 30 mm away from the batt edges. In addition, the coated side CFS-CT batt must be facing the exposed sides of the wall.	1000 mm × 1800 mm or equivalent	-/120/120
5.			Option 3		One layer of batt is friction fit and second layer of batt must be fixed using 14 g × 35 mm hex head self drill screws with 31.8 mm washers at nominal 200 mm centres, 30 mm away from the batt edges. In addition, the coated side CFS-CT batt must be facing the exposed sides of the wall.	900 mm × 450 mm or equivalent	-/120/120
6.			Option 4		The batts are to be installed back to back. The coated side CFS-CT batt must be facing the exposed sides of the wall.	900 mm × 450 mm or equivalent	-/120/120

Item	Separating elements	Supporting construction detail	Option no.	Ref. figure	Aperture construction details	Maximum size	Maximum FRL subject to FRL of separating element
7.	A.1.5 Proprietary wall systems $t_E \geq 75$ mm	Aerated concrete, concrete, hollow and solid masonry, Minimum density 550 kg/m and proprietary wall systems Minimum thickness 75 mm. The wall must have separately been either tested or assessed to AS 1530.4 and AS 4072.1 to achieve required FRL.	Option 1		The batts must be fixed using 14 g × 35 mm hex head self drill screws with 31.8 mm washers at nominal 200 mm centres, 30 mm away from the batt edges. In addition, the coated side CFS-CT batt must be facing the exposed sides of the wall.	1000 mm high × 1800 mm wide	-/120/120
8.			Option 2		One layer of batt is friction fit and second layer of batt must be fixed using 14 g × 35 mm hex head self drill screws with 31.8 mm washers at nominal 200 mm centres, 30 mm away from the batt edges. In addition, the coated side CFS-CT batt must be facing the exposed sides of the wall.	900 mm × 450 mm or equivalent	-/120/120
9.			Option 3		Both layers of the batt must be fixed using 14 g × 35 mm hex head self drill screws with 31.8 mm washers at nominal 200 mm centres, 30 mm away from the batt edges. In addition, the coated side CFS-CT batt must be facing the exposed sides of the wall.	900 mm × 450 mm or equivalent	-/120/120

Item	Separating elements	Supporting construction detail	Option no.	Ref. figure	Aperture construction details	Maximum size	Maximum FRL subject to FRL of separating element
10.	A.1.4 Rigid floors $t_E \geq 150$ mm	The bare concrete floor separating element thickness (t_b, min) shall have a minimum thickness of 150 mm and achieve an FRL of 120/120/120	Option 1		The batts to be installed flush on either side of the slab with an air cavity between the two batt layers. The coated side CFS-CT batt must be facing the exposed sides of the floor.	1000 mm × 600 mm or max width to be kept at 400 mm for max 5 m length	-/180/180
11.			Option 2	 Pigtail screw is optional to fix the batt together @ 200 mm spacing	The batts to be installed back to back flush to the topside of the slab. The coated side CFS-CT batt must be facing the exposed sides of the floor.	1000 mm × 600 mm or max width to be kept at 400 mm for max 5 m length	-/120/120
12.		The bare concrete floor separating element thickness (t_b, min) shall have a minimum thickness of 150 mm and achieve an FRL of 120/120/120	Option 3		One layer of batt is friction fit and second layer of batt must be fixed using 14 g × 35 mm hex head self drill screws with 31.8 mm washers at nominal 200 mm centres, 30 mm away from the batt edges. CP 606 is required on the vertical edge of the top layer of ablative coated mineral wool slab when coated batt meets the corner between the top layer of ablative coated mineral wool slab and the separating element as a fillet. One line on the concrete floor between coated batt and covered concrete floor. For the on top of floor coated batt, up to one edge can be against fire rated rigid wall. Pigtail screw is recommended to fix the batt together @ 200 mm spacing In addition, the coated side CFS-CT batt must be facing the exposed sides of the floor.	1000 mm × 600 mm or max width to be kept at 400 mm for max 5 m length	-/120/120
13.			Option 4		Both layers of the batt must be fixed using 14 g × 35 mm hex head self drill screws with 31.8 mm washers at nominal 200 mm centres, 30 mm away from the batt edges. Pigtail screw is recommended to fix the batt together @ 200 mm spacing CP 606 is required on the horizontal and vertical joints when coated batt meets the corner between the coated batt and the separating element as a fillet. One line on the concrete floor between coated batt and covered concrete floor. For the on top of floor coated batt, up to one edge can be against fire rated rigid wall. In addition, the coated side CFS-CT batt must be facing the exposed sides of the floor.	1000 mm × 600 mm or max width to be kept at 400 mm for max 5 m length	-/120/120

Item	Separating elements	Supporting construction detail	Option no.	Ref. figure	Aperture construction details	Maximum size	Maximum FRL subject to FRL of separating element
14.	Minimum 150 mm concrete slab	The bare concrete floor separating element thickness (t_b, min) shall have a minimum thickness of 150 mm and achieve an FRL of 120/120/120	Option 5		The batts to be installed flush on either side of the slab with an air cavity between the two batt layers. With additional supporting construction: Two steel Hilti MQ-41/3 profiles between the two batts, placed in longitudinal direction in the floor opening) fixed every 450 mm with anchor bolts diameter 6 mm, length 60 mm) and steel Hilti MQ-41/3 profile below the lower batt layer placed in the longitudinal direction of the seal (fixed on the floor at both ends with anchor bolts diameter 6 mm, length 60 mm). In addition, the coated side CFS-CT batt must be facing the exposed sides of the floor.	1200 mm × 1500 mm or max width to be kept at 800 mm for max 5 m length	-/90/90

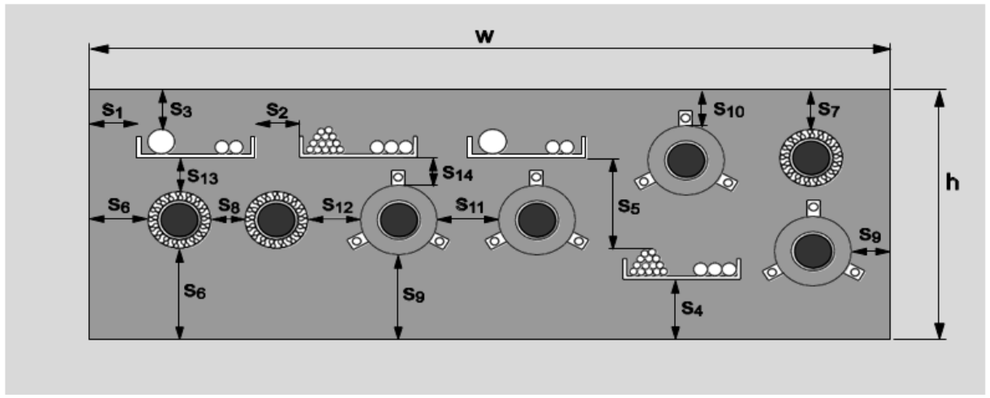
Application coverage navigation:
The approval can be read as two parts

1) Opening fill – Coated board shall be installed as per the configurations specified under the blank seal section, including all relevant variation and specifications under section 5.0.
1) Local seal – where the services going through opening / coated board, local seal to be installed as per specifications according to the approved configurations, including all relevant variations and specifications under section 5.0.

The application coverage is structured as base material (e.g. section 7.0) -> trade (e.g. section 8.0) -> service category (e.g. section 8.1.1).
For detailed specifications of opening fill products covered, refers to section 5.4 – Products.
For detailed specifications of local seal products covered, refers to section 5.5 – Ancillary Products.
For detailed specifications of separating base material covered, refers to section 5.6 – Separating material.
For detailed specifications of additional protections for cable/cable tray/conduits to achieve better insulation rating, refers to section 5.7 – Additional protection for cable/small conduit penetrations.
For detailed specifications of fixings required into separating base material and into Hilti coated board, refers to section 5.8 – Fixing details.
For detailed specifications of spacing the distance between openings and between local seals within the same opening, refers to section 5.10 – Spacing and distance requirement
For clarification of the naming of service filler sealant between service and coated board in local seals, refers to section 5.11 – Service filler sealant.
For variations and detailed specifications of service filler sealant in the local seal regarding annular gap allowance, backing configuration, refers to section 5.12 – Local seal service filler sealant - annular gap, backing condition.
For variations and detailed specifications of cable trays and installation configurations, refers to section 5.13 – cable tray specification and configuration
For detailed specifications of re-penetrate or remove service after initial firestopping installation, refers to section 5.14 – Re-penetration / removal of services
For detailed specifications of Aperture framing to locally build up the separating base material to required thickness, refers to section 5.15 – Aperture framing
For detailed specifications of lining internal sides of flexible wall (e.g. drywall), refers to section 5.16 – Aperture Lining
For detailed specifications of gap filler sealant on coated board edges in opening fill, refers to section 5.17 – Coated board edge seal
For detailed specifications of Aperture framing to locally build up the separating base material to required thickness, refers to section 5.15 – Aperture framing
For detailed specifications of lining internal sides of flexible wall (e.g. drywall), refers to section 5.16 and 5.17 – Aperture Lining
For detailed specifications of approved PP pipes, refers to section 5.18 – Non-regulated PP-pipes

8.0 Electrical trade solutions

8.1 FLEXIBLE OR RIGID WALLS, T_E ≥ 90 MM, APPLIES TO WALL TYPES A.1.1 – A.1.5



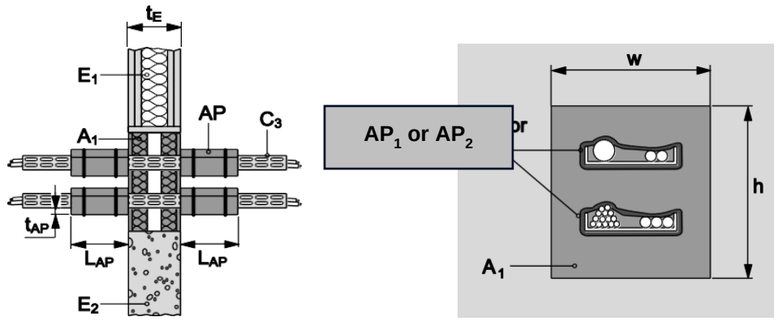
Distance requirement between services within the same opening

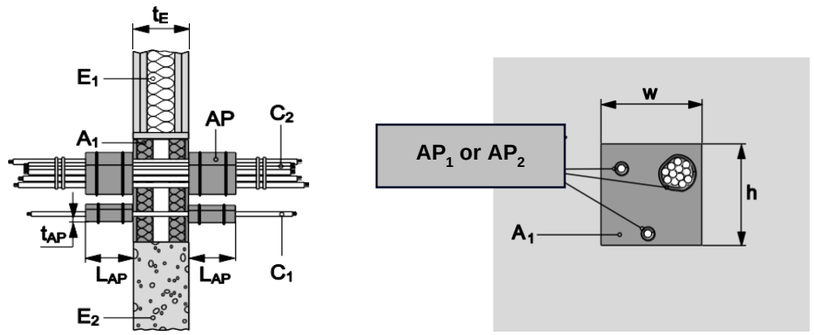
Solutions in the section are only valid under the following minimum distance requirements

s_1 = 0 (distance between cables/cable supports and seal edge
s_2 = 40 (distance between cable supports)
s_3 = 0 (distance between cables and upper seal edge)
s_4 = 0 (distance between cable supports and bottom seal edge)
s_5 = 40 (distance between cables and cable support above)
s_6 = 3 (distance between insulated metal pipes and seal edge)
s_7 = 0 (distance between metal pipes and upper seal edge)
s_8 = 0 (distance between metal pipes)
s_9 = 17 (distance between plastic pipes/pipe closure devices and seal edge)
s_{10} = 17 (distance between plastic pipes/pipe closure devices and upper seal edge)
s_{11} = 0 (distance between plastic pipes/pipe closure devices)
s_{12} = 30 (distance between metal pipes and plastic pipes/pipe closure devices)
s_{13} = 3 (distance between cables/cable supports and metal pipes)
s_{14} = 40 (distance between cables/cable supports and plastic pipes/pipe closure devices)

Clear spacing between cables/cable bundles and conduits, conduits and conduits = minimum 40 mm
other clear spacings where here not specified, minimum 40 mm

8.1.1 D1 and D2 cables





Abbreviation	Description
A_1	Hilti Firestop Coated Board CFS-CT B 1S / CFS-CT B 2S
A_3	Hilti Firestop Collar CFS-C, CFS-C P or CFS-C EL
A_6	Hilti Firestop Acrylic Sealant CP 606 or CP 611A as gap filler
C, C_1, C_2, C_3	Penetrating services
d_c	Pipe diameter
E, E_1, E_2	Building element (wall, floor)
F	Fixing of pipe closure device
t_E	Thickness of the building element
AP_1 to AP_{12}	Additional protection for services
t_{AP}	Thickness of additional protection
L_{AP}	Length of the additional protection

Figure 6D1 and D2 cable arrangement

Table 5 D1 and D2 cable arrangement installed in vertical separating elements through two layers of Hilti CFC-CT B batts – refer to Figure 6 and Table 4

Application reference	Cable tray width and configuration	Service - cable	Local seal – backing	Local seal - Gap filler sealant	Local seal - sealant config	Additional protection (AP)	AP configuration and length along service	FRL
E.1	Up to 600 mm cable tray, with or without cable tray through wall OR Up to 900 mm cable tray, cable tray stop start, minimum 100 mm off base material	D1 set according to AS 1530.4 (copper core TPS, Submain (multicore), single core, earth cable and others) copper or AL core	Backing optional when annular gap is up to 5 mm / mineral wool for up to 15 mm	CP 606	Full depth, with 20 mm high × 10 mm wide coning both sides of the wall	AP1: CFS CT firestop coating 2 mm dry film thick AP2: min. 60 m^3/kg density mineral wool mat	AP1: 200 mm coating length both sides AP2: 200 mm wrapping length both sides	-/90/90
E.2		D1 set according to AS 1530.4 (copper core TPS, Submain (multicore), single core, earth cable and others) copper or AL core		CP 606	full depth, with 20 mm high × 10 mm wide coning both sides of the wall	AP2: min. 60 m^3/kg density mineral wool mat	AP2: 250 mm wrapping length finished with a 20 mm × 20 mm fillet on both sides	-/120/120
E.3		D2 set according to AS 1530.4 (CAT series cable)		CP 606		AP1: CFS CT firestop coating 2 mm dry film thick AP2: min. 60 m^3/kg density mineral wool mat	AP1: 200 mm coating length on both sides AP2: 200 mm wrapping length both sides	-/90/90
E.4		D2 set according to AS 1530.4 (CAT series cable)		CP 606		AP2: min. 60 m^3/kg density mineral wool mat	AP2: 250 mm wrapping length finished with a 20 mm × 20 mm fillet on both sides	-/120/120

Note: Mixed D1 and D2 set is allowed provide minimum 40 mm spacing between cable bundles

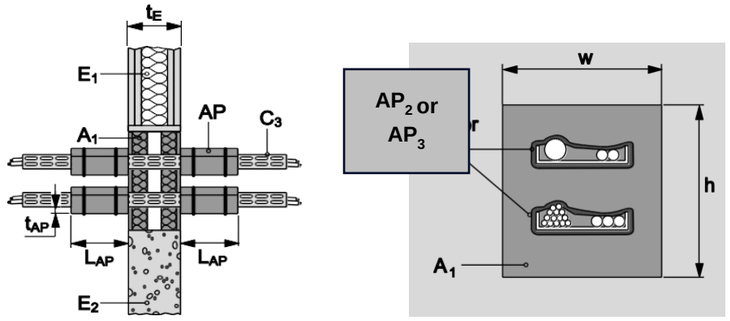
Cable arrangement installed in closer spacing

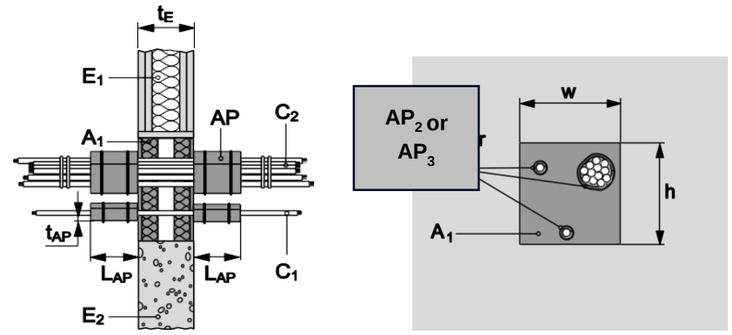
Application reference	cable specification	cable tray config	clear spacing between cable/cable, cable/cable bundle, bundle/bundle	Local seal – backing	local seal - Gap filler sealant	Local seal - sealant config	Additional protection (AP)	AP configuration and length along service	FRL
2E.1	single cable, up to 80 mm diameter, copper or AL core Single cable, non-sheathed cables, up to 24 mm dia, copper or AL core Tied cable bundle, max dia of single cable <=21 mm, bundled up to 100 mm dia, copper and/or AL core	up to 600 mm through opening, otherwise stop and start, 100 mm off base material	min. 0 mm	backing optional when annular gap is up to 5 mm / mineral wool for up to 15 mm, for details refer to 5.12	CP 606	full depth, with 20 mm (base) × 10 mm (high) coning both sides of the wall	AP1: CFS CT firestop coating 2 mm dry film thick AP2: min. 60 density mineral wool mat	AP1: 200 mm coating length both sides AP2: 200 mm wrapping length both sides	-/90/90
2E.2	single cable, up to 80 mm diameter, copper or AL core Single cable, non-sheathed cables, up to 24 mm dia Tied cable bundle, max dia of single cable <=21 mm*, bundled up to 100 mm dia. copper and/or AL core	up to 600 mm through opening, otherwise stop and start, 100 mm off base material	min. 0 mm	backing optional when annular gap is up to 5 mm / mineral wool for up to 15 mm, for details refer to 5.12	CP 606	full depth, with 20 mm (base) × 10 mm (high) coning both sides of the wall	AP2: min. 60 density mineral wool mat	AP2: 300 mm wrapping length both sides	-120/120

Application reference	cable specification	cable tray config	clear spacing between cable/cable, cable/cable bundle, bundle/bundle	Local seal – backing	local seal - Gap filler sealant	Local seal - sealant config	Additional protection (AP)	AP configuration and length along service	FRL
2E.3	single cable, up to 80 mm diameter, copper or AL core	up to 600 mm through opening, otherwise stop and start, 100 mm off base material	min. 20 mm	backing optional when annular gap is up to 5 mm / mineral wool for up to 15 mm, details refer to 5.12	CP 606	full depth, with 20 mm (base) × 10 mm (high) coning both sides of the wall	AP1: CFS CT firestop coating 2 mm dry film thick	AP1: 200 mm coating length both sides AP2: 200 mm wrapping length both sides	-/90/90
	Single cable, non-sheathed cables, up to 24 mm dia				CP 606				
	Tied cable bundle, max dia of single cable <=21 mm*, bundled up to 100 mm dia. copper and/or AL core				CP 606				
	Tied cable bundle, cable as per E.1 - E.14, bundled up to 80 mm dia. conductor area on single cable does not exceed 400 mm^2 copper and/or AL core				CP 606 / CP 611A depending on cable type E1-E14, CP 611A for mixed cable type	full depth, with 20 (base) x 10 (high) mm coning both sides of the wall			
2E.4	single cable, up to 80 mm diameter, copper or AL core	up to 600 mm through opening, otherwise stop and start, 100 mm off base material	min. 20 mm	backing optional when annular gap is up to 5 mm / mineral wool for up to 15 mm, for details refer to 5.12	CP 606	full depth, with 20 mm (base) × 10 mm (high) coning both sides of the wall	AP2: min. 60 density mineral wool mat	AP2: 300 mm wrapping length both sides	-120/120
	Single cable, non-sheathed cables, up to 24 mm dia				CP 606				
	Tied cable bundle, max dia of single cable <=21 mm*, bundled up to 100 mm dia.				CP 606				
	Tied cable bundle, cable as per E.1 - E.14, bundled up to 80 mm dia. conductor area on single cable does not exceed 400 mm^2, copper and/or AL core				CP 606 / CP 611A depending on cable type E1-E14, CP 611A for mixed cable type				

*All sheathed cable types currently and commonly used in building practices in Australia eg (Power (TPS,Submain),control, signal, telecom, data, optic fibre cables)

8.1.2 Single and bundled cable with or without cable tray





Abbreviation	Description
A_1	Hilti Firestop Coated Board CFS-CT B 1S / CFS-CT B 2S
A_3	Hilti Firestop Collar CFS-C, CFS-C P or CFS-C EL
A_6	Hilti Firestop Acrylic Sealant CP 606 or CP 611A as gap filler
C, C_1, C_2, C_3	Penetrating services
d_c	Pipe diameter
E, E_1, E_2	Building element (wall, floor)
F	Fixing of pipe closure device
t_E	Thickness of the building element
AP_1 to AP_{12}	Additional protection for services
t_{AP}	Thickness of additional protection
L_{AP}	Length of the additional protection

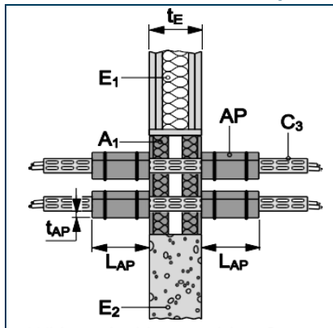
Figure 7Single and bundled cable arrangement

Table 6 Single and bundled cable arrangement installed in the vertical separating elements through two layers of Hilti CFC-CT B batts – refer to Figure 7 and Table 4

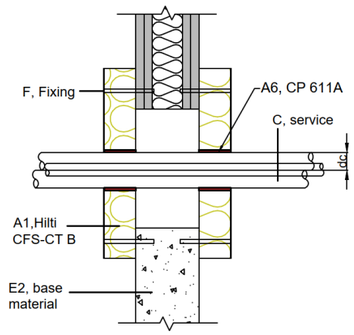
Application reference	Cable tray width and configuration	Service - cable	single cable max spec	cable bundle size	Local seal – backing	Local seal - Gap filler sealant	Local seal - sealant config	Additional protection (AP)	AP configuration and length along service	FRL
E.5	Up to 600 mm cable tray, with or without cable tray through wall OR Up to 900 mm cable tray, cable tray stop start, minimum 100 mm off base material	AL core cable (TPS, Submain (multicore), single core, earth cable and others) Up to: 4 × 400 mm² AL cables 1 × 120 mm² AL earth cable	Up to 400 mm^2	up to 80 mm in a bundle	backing optional when annular gap is up to 5 mm / mineral wool for up to 15 mm	CP 611A	Full depth, with 30 mm high × 10 mm wide coning both sides of the wall	AP2: min. 60 m^3/kg density mineral wool mat	AP2: 200 mm wrapping length both sides	-/90/90
E.6		AL core cable (TPS, Submain (multicore), single core, earth cable and others) Up to: 4 × 400 mm² AL cables 1 × 120 mm² AL earth cable	up to 400 mm^2	up to 80 mm in a bundle		CP 611A	full depth, with 30 mm high × 10 mm wide coning both sides of the wall	AP2: min. 60 m^3/kg density mineral wool mat	AP2: 250 mm wrapping length both sides	-/120/120
E.7		FR cable (single and multicore)	up to 100 mm^2	up to 90 mm in a bundle		CP 606	full depth, with 20 mm high × 10 mm wide coning both sides of the wall	AP2: min. 60 m^3/kg density mineral wool mat	AP2: 200 mm wrapping length both sides	-/90/90
E.8		FR cable (single and multicore)	up to 100 mm^2	up to 90 mm in a bundle		CP 606	full depth, with 20 mm high × 10 mm wide coning both sides of the wall	AP2: min. 60 m^3/kg density mineral wool mat AP3: Hilti putty bandage CFS-P BA	AP2: 250 mm wrapping length finished with a 20 mm × 20 mm fillet on both sides AP3: two layers of CFS-P BA for 100 mm both sides, overlap by minimum 30 mm	-/120/120
E.9		optic fibre cable (single or multi mode)	n/a	up to 80 mm in a bundle		CP 611A	full depth, with 20 mm × 20 mm coning both sides of the wall	n/a	n/a	-/120/120
E.10		coaxial cable or RG6	up to 1-1/4 or 40 mm diameter	up to 80 mm in a bundle		CP 606	Full depth, with 20 mm × 20 mm coning both sides of the wall	AP2: min. 60 m^3/kg density mineral wool mat	AP2: 300 mm wrapping length both sides	-/120/120
E.11	cable tray stop start, up to 900 mm cable tray, minimum 100 mm off base material	TPS cable / Fire Rated cable (single and multicore)	up to 25 mm^2	up to 90 mm in a bundle	backing optional when annular gap is up to 5 mm / mineral wool for up to 15 mm	CP 611A	full depth, with 10 mm × 10 mm coning both sides of the wall	AP3: Hilti putty bandage CFS-P BA	two layers of CFS-P BA for 100 mm both sides, overlap by minimum 30 mm	-/90/90
E.12		TPS cable / Fire Rated cable (single and multicore)	up to 25 mm^2	up to 90 mm in a bundle		CP 611A	full depth, with 20 mm × 20 mm coning both sides of the wall	AP3: Hilti putty bandage CFS-P BA	two layers of CFS-P BA for 125 mm both sides, overlap by minimum 30 mm and finished with a 20 mm × 20 mm fillet	-/120/120
E.13		multicore cable bundle	up to 25 mm^2 4C+E or up to 32 mm^2 3C+E	up to 90 mm in a bundle		CP 611A	full depth, with 10 mm × 10 mm coning both sides of the wall	AP3: Hilti putty bandage CFS-P BA	two layers of CFS-P BA for 100 mm both sides, overlap by minimum 30 mm	-/90/90

Application reference	Cable tray width and configuration	Service - cable	single cable max spec	cable bundle size	Local seal – backing	Local seal - Gap filler sealant	Local seal - sealant config	Additional protection (AP)	AP configuration and length along service	FRL
E.14		CAT series cables (CAT5, CAT5e, CAT6, CAT6e and others) with RG6 cable	up to 7.2 mm diameter	up to 90 mm in a bundle		CP 611A	full depth, with 10 mm ×10 mm coning both sides of the wall	AP3: Hilti putty bandage CFS-P BA	two layers of CFS-P BA for 100 mm both sides, overlap by minimum 30 mm	-/120/120

8.1.3 Cable conduits – plastic in walls



With and without cables Construction details:
Hilti Firestop Collars CFS-C EL are installed on both sides of the seal, fixed together by fixing methods specified in 5.8.



With and without cables Construction details:
Hilti coated board are fixed on both sides of the wall, fixed together by fixing methods specified in 5.8

Abbreviation	Description
A_1	Hilti Firestop Coated Board CFS-CT B 1S / CFS-CT B 2S
A_3	Hilti Firestop Collar CFS-C, CFS-C P or CFS-C EL
A_6	Hilti Firestop Acrylic Sealant CP 606 or CP 611A as gap filler
C, C_1, C_2, C_3	Penetrating services
d_c	Pipe diameter
E, E_1, E_2	Building element (wall, floor)
F	Fixing of pipe closure device
t_E	Thickness of the building element
AP_1 to AP_{12}	Additional protection for services
t_{AP}	Thickness of additional protection
L_{AP}	Length of the additional protection

Figure 8Single and bundled cable arrangement

Table 7 Cable conduits installed in the vertical separating elements through two layers of Hilti CFC-CT B batts – refer to Figure 8 and Table 4

Application reference	Conduit quantity	conduit max spec	cable fill details	Local seal – backing	Local seal - Gap filler sealant	Local seal - sealant config	Use of collar	FRL
E.15	single cable conduit	Rigid PP cable conduit up to 50 mm (including HFT conduit)	empty to fully filled with mix of CAT, RG6, optical fibre cable or electrical with a diameter up to 17 mm	backing optional when annular gap is up to 5 mm / mineral wool for up to 15 mm	CP 606	full depth, both sides of the wall	CFS-C EL collar both sides, fixed to coated board	-/120/120
E.16	single cable conduit	up to 32 mm PVC rigid or corrugated conduit	empty to fully filled with mix of CAT, RG6, optical fibre cable or electrical with a diameter up to 17 mm		CP 611A	full depth, with 20 mm × 20 mm coning both sides of the wall	N/A	-/120/120
E.17	single cable conduit	Rigid uPVC cable conduit, up to 50 mm	empty to fully filled with mix of CAT, RG6, optical fibre cable or electrical with a diameter up to 17 mm		CP 611A	full depth, with 30 mm × 30 mm coning both sides of the wall	N/A	-/120/120
E.18	single cable conduit	Rigid uPVC cable conduit, up to 100 mm	empty to fully filled with mix of CAT, RG6, optical fibre cable or electrical with a diameter up to 17 mm		CP 606	full depth, both sides of the wall	CFS-C EL collar both sides, fixed to coated board	-/90/90
E.19	up to 3 in a bundle	up to 32 mm PVC rigid or corrugated conduit	empty to fully filled with mix of CAT, RG6, optical fibre cable or electrical with a diameter up to 17 mm		CP 611A	full depth, with 20 mm × 20 mm coning both sides of the wall	N/A	-/120/120

When conduit penetrates through wall, no additional wrapping/protection is allowed around conduit

8.1.4 Cable bundle through CFS SL GA speed sleeve

Construction details

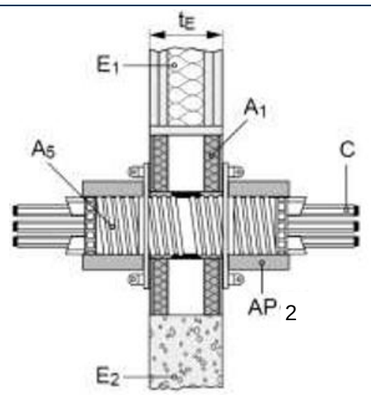
Hilti Firestop Sleeve CFS-SL GA centered in the wall and fixed by means of two flanges delivered together with the sleeve.

For Hilti Firestop Sleeve CFS-SL GA

Use Hilti Firestop Acrylic Sealant CP 606 to seal the gap between the metallic sleeve and the board CFS-CT perimeter seal edge.

Install CP606 onto the CFS-CT surface around the installed Sleeve before screwing the flanges tightly to board surface.

AP: Mineral wool acc. Section 1.5 wrapped around the Hilti Firestop Sleeve CFS-SL GA M on both sides of the seal over the total visible length of the sleeve



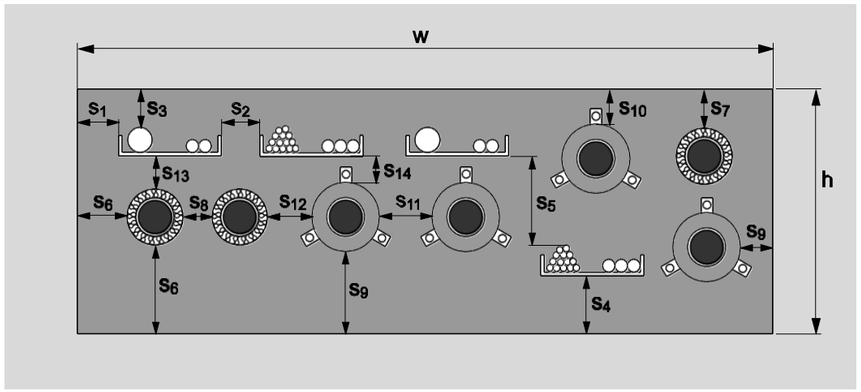
Abbreviation	Description
A_1	Hilti Firestop Coated Board CFS-CT B 1S / CFS-CT B 2S
A_5	Hilti Firestop Sleeve CFS-SL GA
A_6	Hilti Firestop Acrylic Sealant CP 606 or CP 611A as gap filler
AP	Additional protection for services
C, C_1, C_2, C_3	Penetrating services
E, E_1, E_2	Building element (wall, floor)
t_E	Thickness of the building element

Figure 9Cable bundle through CFS SL GA speed sleeve

Table 8 Cable bundle through CFS SL GA speed sleeve installed in the vertical separating elements through two layers of Hilti CFC-CT B batts – refer to Figure 9 and Table 4

Application reference	Local opening size for CFS -SL GA M	Cable fill details	Local seal – backing	Local seal - Gap filler sealant	Local seal - sealant config	Additional protection (A)	AP configuration and length along service	FRL
E.20	113 – 140 mm	empty to fully filled with mix of CAT, RG6, optical fibre cable	Empty to fully filled with mix of all sheathed cable types currently and commonly used in building practice (e.g. power, control, signal, telecommunication, data, optical fibre cables, single cable diameter <=21 mm)	backing optional when annular gap is up to 5 mm / mineral wool for up to 15 mm	CP 606 (full depth, finished flush)	AP2: min. 60 kg/ m^3 density mineral wool mat AP3: Hilti putty bandage CFS-P BA	AP2: 200 mm wrapping on both sides on the sleeve only AP3: two layers of CFS P BA 200mm both sides on the sleeve only	-/120/120

8.2 RIGID WALLS, $T_E \geq 150$ MM, WALL TYPE A.1.4, A.1.5



Solutions in the section are only valid under the following distance requirements

Minimum distances in mm metal pipe penetration seal:

s_6, s_9 = 0 (distance between pipes and lateral seal edge

s_7, s_{10} = 40 (distance between pipes and upper seal edge)

s_8, s_{11}, s_{12} = 30 (distance between pipes)

Minimum distances in mm cable penetration seal:

s_1 = 10 (distance between cables/cable supports and seal edge)

s_2 = 40 (distance between cable supports)

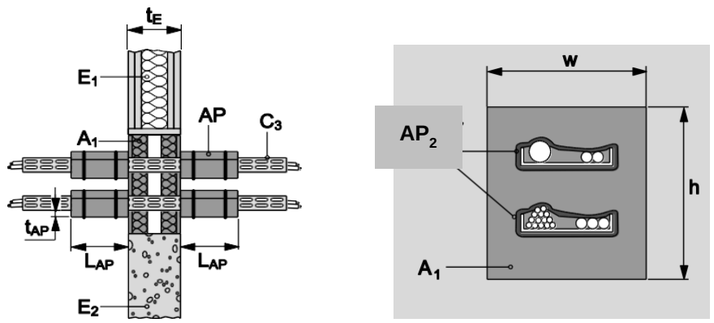
s_3 = 40 (distance between cables and upper seal edge)

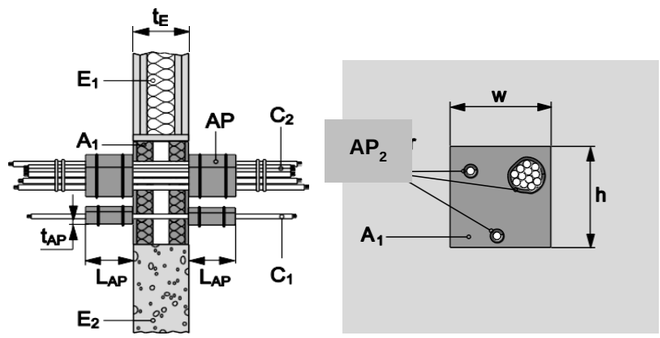
s_4 = 0 (distance between cable supports and bottom seal edge)

s_5 = 40 (distance between cables and cable support above)

Clear spacing between cables/cable bundles and conduits, conduits and conduits = minimum 40 mm
other clear spacings where here not specified, minimum 40 mm

8.2.1 Single and bundled cables in walls (up to 180 minutes)





Abbreviation	Description
A_1	Hilti Firestop Coated Board CFS-CT B 1S / CFS-CT B 2S
A_3	Hilti Firestop Collar CFS-C, CFS-C P or CFS-C EL
A_6	Hilti Firestop Acrylic Sealant CP 606 or CP 611A as gap filler
C, C_1, C_2, C_3	Penetrating services
d_c	Pipe diameter
E, E_1, E_2	Building element (wall, floor)
F	Fixing of pipe closure device
t_E	Thickness of the building element
AP_1 to AP_{12}	Additional protection for services
t_{AP}	Thickness of additional protection
L_{AP}	Length of the additional protection

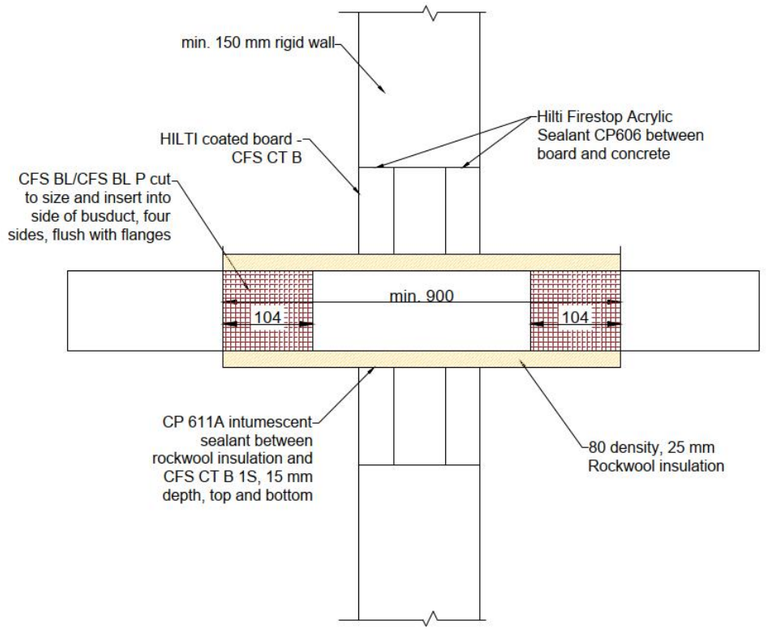
Figure 10 Single and bundled cable arrangement in walls (up to 180 minutes)

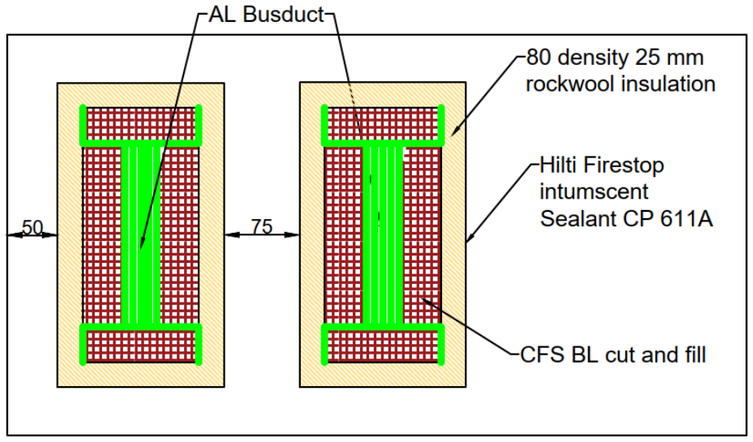
Table 9 Single and bundled cable arrangement in vertical separating elements through two layers of Hilti CFC-CT B batts (up to 180 minutes)– refer to Figure 8 **and** Table 4

Application reference	Cable tray width and configuration	Service - cable	Cable max spec	Cable bundle size	Local seal – backing	Local seal - Gap filler sealant	Local seal - sealant config	Additional protection (AP)	AP configuration and length along service	FRL
E.21	up to 600 mm cable tray, with or without cable tray through wall OR	D2 set according to AS 1530.4 (CAT series cable)	n/a	n/a	backing optional when annular gap is up to 5 mm / mineral wool for up to 15 mm	CP 606	full depth, with 20 mm × 20 mm coning both sides of the wall	AP2: min. 60 m^3/kg density mineral wool mat	AP2: 300 mm wrapping length on both sides for the first layer and 100 mm for the second layer	-/180/180
E.22	up to 900 mm cable tray, cable tray stop start, minimum 100 mm off base material	CAT series cables (CAT5, CAT5e, CAT6, CAT6e and others) with RG6 cable	up to 7 mm diameter	up to 90 mm in a bundle		CP 611A	full depth, with 10 mm × 10 mm coning both sides of the wall	AP2: min. 60 m^3/kg density mineral wool mat	AP2: 300 mm wrapping length on both sides for the first layer and 100 mm for the second layer	-/180/180

Application reference	Cable tray width and configuration	Service - cable	Cable max spec	Cable bundle size	Local seal – backing	Local seal - Gap filler sealant	Local seal - sealant config	Additional protection (AP)	AP configuration and length along service	FRL
E.23		optic fibre cable (single or multi mode)	n/a	up to 60 mm in a bundle		CP 611A	full depth, with 20 mm × 20 mm coning both sides of the wall	N/A	N/A	-/180/180
E.24		coaxial cable or RG6	up to 1-1/4 or 40 mm diameter	up to 80 mm in a bundle		CP 606	full depth, with 20 mm × 20 mm coning both sides of the wall	AP2: min. 60 m^3/kg density mineral wool mat	AP2: 500 mm wrapping length on both sides	-/180/180

8.2.2 Busducts





Aluminium busduct cavity:

Groove in Aluminium busduct needs to be filled with Hilti firestop block CFS BL, 130 mm width, sealed on top with CP 606.

Mineral wool wrapping:

Mineral wool shall be min. 80 kg/m^3 and a minimum thickness of 25 mm. Either mineral wool blanket or preformed section, with or without Aluminium foil.

AL busduct needs to be wrapped within the opening with mineral wool and 600 mm in length each side of the wall

Stainless steel tie:

Stainless steel tie must be used to secure the mineral wool insulation to metal pipe, stainless steel tie shall be installed as per the configuration listed below. the maximum distance between cable tie is 300 mm

Mineral wool Insulation length	number of steel tie needed	steel tie 1, distance from opening	steel tie 2, distance from opening	steel tie 3, distance from opening
300 mm	2	50 mm	250 mm	none
500 mm	3	50 mm	250 mm	450 mm

600 mm	3	50 mm	300 mm	550 mm

CFS CT B 1S/2S installation configuration: Hilti firestop coated board CFS CT B1S/2S needs to be installed to both sides of the separating element and finish flush with the surface of the separating element. The joint between the board and separating element needs to be sealed with Hilti firestop sealant CP 606.

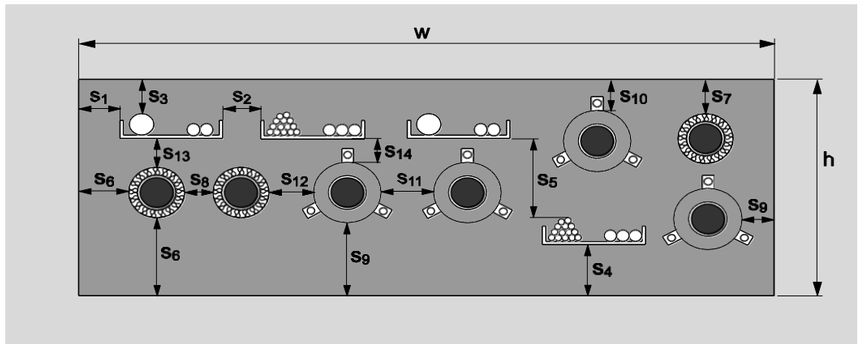
The minimum clear spacing between Aluminium busduct is 125 mm.

Figure 11 Busducts

Table 10 Busducts installed in the vertical separating elements through two layers of Hilti CFC-CT B batts – refer to Figure 9 **and** Table 4

Application reference	services	busduct size	cavity fill	Insulation	Insulation length	Allowable annular seal width with CP 611A (mm)	FRL
E.25	Aluminium busduct	AL Busduct, overall size up to 253 x 117 mm or equivalent and overall amperage up to 2000 amperes	CFS CT B 1S/2S	80 m^3/kg density 25 mm mineral wool blanket	min. 900 mm as per specification	5-15 mm	-/120/120

8.3 RIGID FLOOR, $T_E \geq 150$ MM, WALL TYPE A.1.4



Solutions in the section are only valid under the following distance requirements

Minimum distances in mm metal pipe penetration seal:

s6 = 10 (distance between pipes and lateral seal edge)

s9 = 0 (distance between pipes and lateral seal edge)

s7, s10 = 40 (distance between pipes and upper seal edge)

s8 = 20 (distance between pipes)

s11 = 0 (distance between pipes)

s12 = 30 (distance between pipes)

Minimum distances in mm cable penetration seal:

s1 = 0 (distance between cables/cable supports and seal edge)

s2 = 0 (distance between cable supports)

s3 = 0 (distance between cables and upper seal edge)

s4 = 0 (distance between cable supports and bottom seal edge)

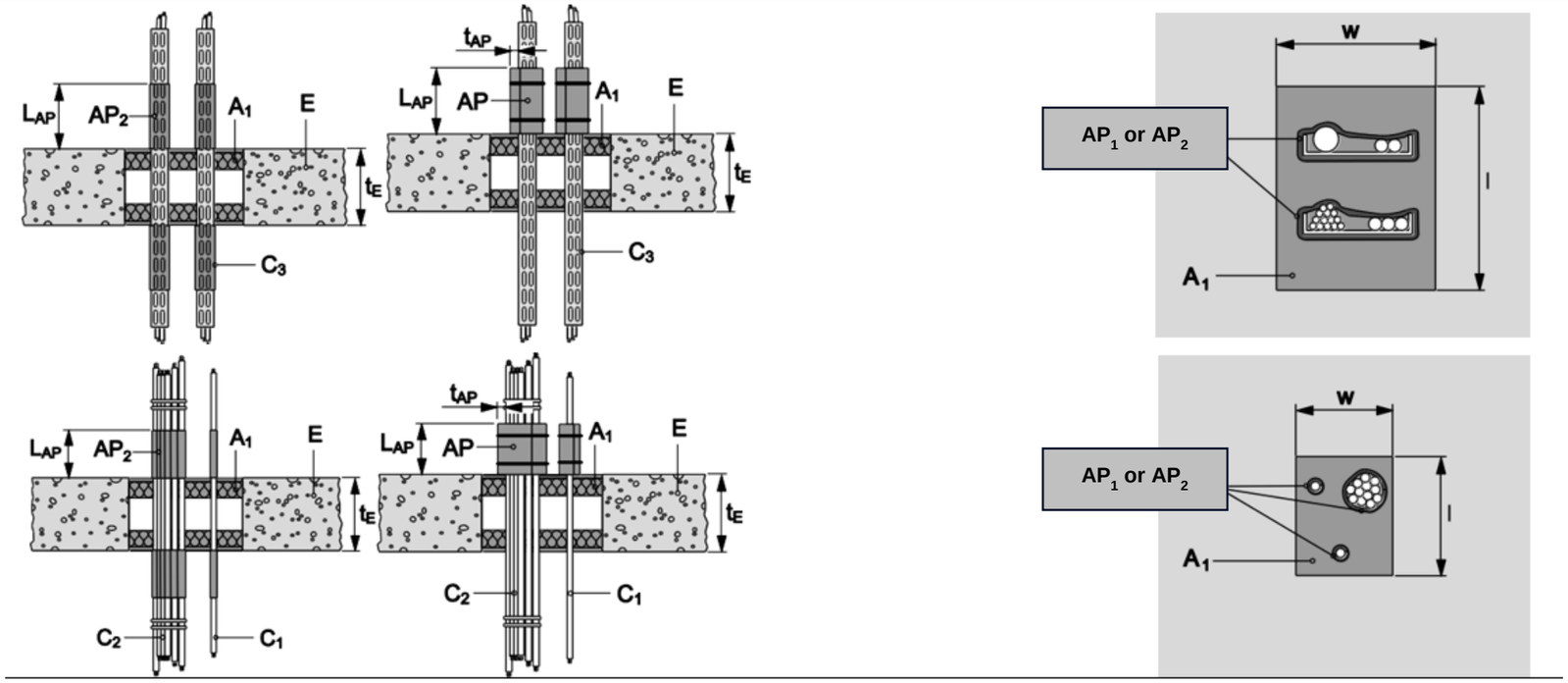
s5 = 40 (distance between cables and cable support above)

s13 = 30 (distance between pipes)

s14 = 32 (distance between pipes)

Clear spacing between cables/cable bundles and conduits, conduits and conduits = minimum 40 mm
other clear spacings where here not specified, minimum 40 mm

8.3.1 D1 and D2 cables and consolidated cable configuration in floor



Abbreviation	Description
A_1	Hilti Firestop Coated Board CFS-CT B 1S / CFS-CT B 2S
A_3	Hilti Firestop Collar CFS-C, CFS-C P or CFS-C EL
A_6	Hilti Firestop Acrylic Sealant CP 606 or CP 611A as gap filler
C, C_1, C_2, C_3	Penetrating services
d_c	Pipe diameter
E, E_1, E_2	Building element (wall, floor)
F	Fixing of pipe closure device
t_E	Thickness of the building element
AP_1 to AP_{12}	Additional protection for services
t_{AP}	Thickness of additional protection
L_{AP}	Length of the additional protection

Figure 12 D1 and D2 cables in floor

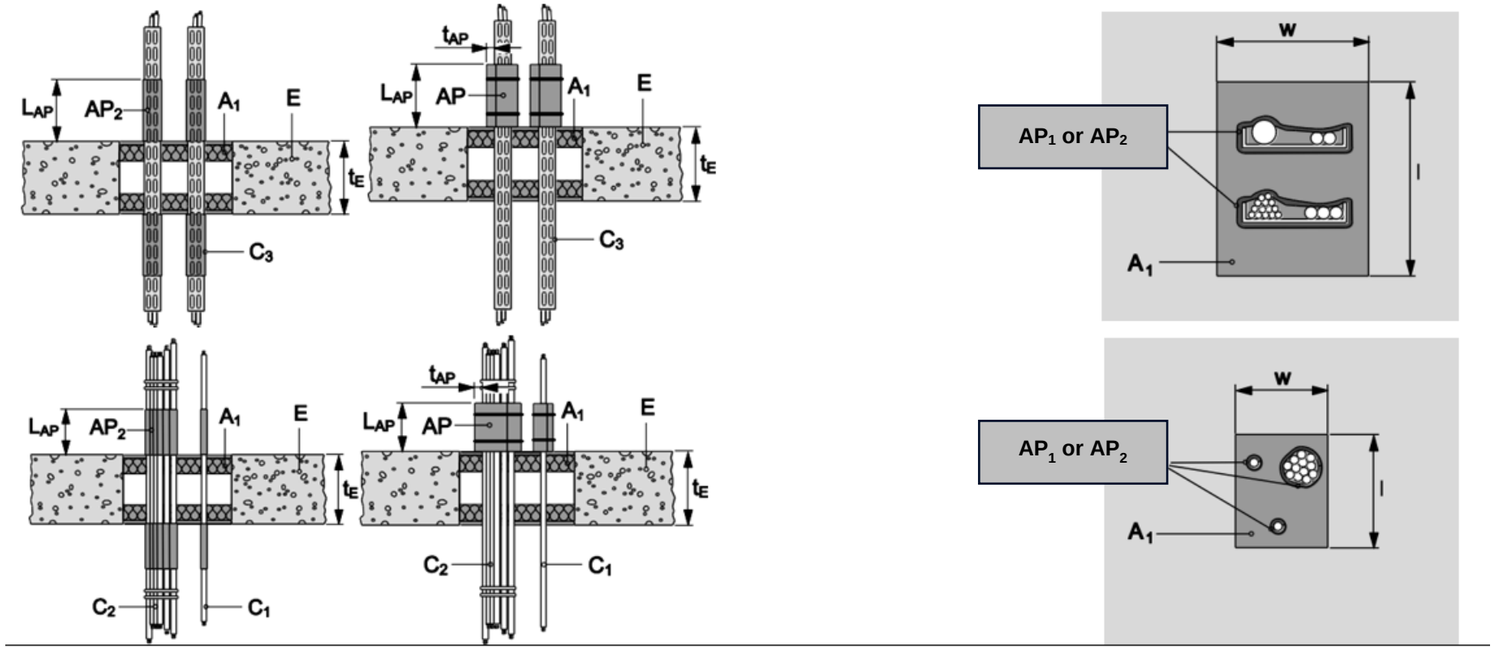
Table 11 D1 and D2 cable arrangement in horizontal separating elements through two layers of Hilti CFC-CT B batts – refer to Figure 12 and Table 4

Application reference	Cable tray width and configuration	Service - cable	Local seal – backing	Local seal - Gap filler sealant	Local seal - sealant config	Additional protection (AP)	AP configuration and length along service	FRL
E.26	Up to 600 mm cable tray, with or without cable tray through floor OR Up to 900 mm cable tray, cable tray stop start, minimum 100 mm off base material	D1 set according to AS 1530.4 (copper core TPS, Submain (multicore), single core, earth cable and others)	Backing optional when annular gap is up to 5 mm / mineral wool for up to 15 mm	CP 606	full depth, with 20 mm high × 10 mm wide coning on the underside	AP1: CFS CT firestop coating AP2: min. 60 m^3/kg density mineral wool mat	AP1: 200 mm coating length on top side only AP2: 200 mm wrapping length top side only	-/60/60
E.27				CP 606	full depth, with 20 mm high × 10 mm wide coning on the underside	AP1: CFS CT firestop coating 2 mm dry film thick AP2: min. 60 m^3/kg density mineral wool mat	AP1: 450 mm coating length on top side only AP2: 450 mm wrapping length top side only	-/90/90
E.28				CP 606	full depth, with 20 mm × 20 mm coning on top	AP2: min. 60 m^3/kg density mineral wool mat	AP2: 550 mm wrapping top side only finished with a 20 mm × 20 mm coning at the base of wrapping to base material	-/120/120
E.29	Up to 600 mm cable tray, with or without cable tray through floor OR up to 900 mm cable tray, cable tray stop start, minimum 100 mm off base material	D2 set according to AS 1530.4 (CAT series cable)	Backing optional when annular gap is up to 5 mm / mineral wool for up to 15 mm	CP 606	full depth, with 20 mm × 20 mm coning on top	AP1: CFS CT firestop coating 2 mm dry film thick AP2: min. 60 m^3/kg density mineral wool mat	AP1: 200 mm coating length on top side only AP2: 200 mm wrapping length top side only	-/60/60
E.30				CP 606	full depth, with 20 mm × 20 mm coning on top	AP1: CFS CT firestop coating 2 mm dry film thick AP2: min. 60 m^3/kg density mineral wool mat	AP1: 300 mm coating length on top side only AP2: 250 mm wrapping length top side only	-/90/90
E.31				CP 606	full depth, with 20 mm × 20 mm coning on top	AP2: min. 60 m^3/kg density mineral wool mat	AP2: 300 mm wrapping length topside only	-/120/120
E.32				CP 606	full depth, with 20 mm × 20 mm coning on top	AP2: min. 60 m^3/kg density mineral wool mat	AP2: 300 mm wrapping length topside only for the first layer and 100 mm for the second layer	-/180/180

Application reference	cable specification	cable tray config	clear spacing between cable/cable, cable/cable bundle, bundle/bundle	Local seal – backing	local seal - Gap filler sealant	Local seal - sealant config	Additional protection (AP)	AP configuration and length along service	FRL
2E.5	single cable, up to 80 mm diameter, copper or AL core	up to 600 mm through opening, stop and start, 100 mm off base material	min. 20 mm	backing optional when annular gap is up to 5 mm / mineral wool for up to 15 mm, details refer to 5.12	CP 606	full depth, with 10 x 10 mm coning top side only	AP1: CFS CT firestop coating 2 mm dry film thick AP2: min. 60 density mineral wool mat	AP1: 450 mm coating top side only AP2: 450 mm wrapping length top side only	-90/90
	Single cable, non-sheathed cables, up to 24 mm dia copper or AL core				CP 606				
	Tied cable bundle, max dia of single cable <=21 mm*, bundled up to 100 mm dia., copper and/or AL core				CP 606				
	Tied cable bundle, cable as per E.1 - E.14, bundled up to 80 mm dia. conductor area on single cable does not exceed 400 mm^2, copper and/or AL core				CP 606 / CP 611A depending on cable type E1-E14, CP 611A for mixed cable type				
2E.6	single cable, up to 80 mm diameter, copper or AL core	up to 600 mm through opening, stop and start, 100 mm off base material	min. 20 mm	backing optional when annular gap is up to 5 mm / mineral wool for up to 15 mm, details refer to 5.12	CP 606	full depth, with 10 x 10 mm coning top side only	AP2: min. 60 density mineral wool mat	AP2: 550 mm wrapping length top side only	-120/120
	Single cable, non-sheathed cables, up to 24 mm dia				CP 606				
	Tied cable bundle, max dia of single cable <=21 mm, bundled up to 100 mm dia., copper and/or AL core				CP 606				
	Tied cable bundle, cable as per E.1 - E.14, bundled up to 80 mm dia. conductor area on single cable does not exceed 400 mm^2, copper and/or AL core				CP 606 / CP 611A depending on cable type E1-E14, CP 611A for mixed cable type				
2E.7	single cable, up to 80 mm diameter, copper or AL core	up to 600 mm through opening, stop and start, 100 mm off base material	min. 0 mm	backing optional when annular gap is up to 5 mm / mineral wool for up to 15 mm, details refer to 5.12	CP 606	full depth, with 10 x 10 mm coning top side only	AP1: CFS CT firestop coating 2 mm dry film thick AP2: min. 60 density mineral wool mat	AP1: 450 mm coating top side only AP2: 450 mm wrapping length top side only	-90/90
	Single cable, non-sheathed cables, up to 24 mm dia, copper or AL core								
	Tied cable bundle, max dia of single cable <=21 mm, bundled up to 100 mm dia., copper and/or AL core								
2E.8	single cable, up to 80 mm diameter, copper or AL core	up to 600 mm through opening, stop and start, 100 mm off base material	min. 0 mm	backing optional when annular gap is up to 5 mm / mineral wool for up to 15 mm, details refer to 5.12	CP 606	full depth, with 10 x 10 mm coning top side only	AP2: min. 60 density mineral wool mat	AP2: 550 mm wrapping length, top side only	-120/120
	Single cable, non-sheathed cables, up to 24 mm dia., copper or AL core								
	Tied cable bundle, max dia of single cable <=21 mm, bundled up to 100 mm dia., copper or AL core								

*All sheathed cable types currently and commonly used in building practices in Australia eg (Power (TPS,Submain),control, signal, telecom, data, optic fibre cables)

8.3.2 Single and bundled cables in floor



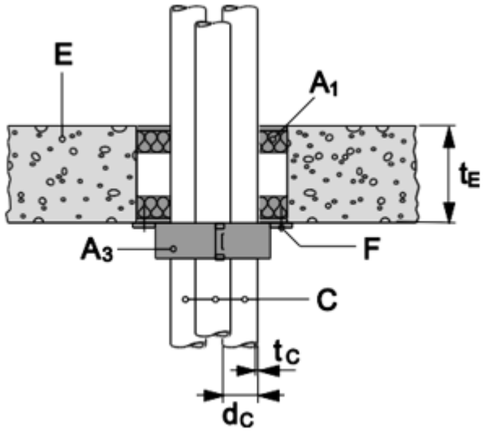
Abbreviation	Description
A_1	Hilti Firestop Coated Board CFS-CT B 1S / CFS-CT B 2S
A_3	Hilti Firestop Collar CFS-C, CFS-C P or CFS-C EL
A_6	Hilti Firestop Acrylic Sealant CP 606 or CP 611A as gap filler
C, C_1, C_2, C_3	Penetrating services
d_c	Pipe diameter
E, E_1, E_2	Building element (wall, floor)
F	Fixing of pipe closure device
t_E	Thickness of the building element
AP_1 to AP_{12}	Additional protection for services
t_{AP}	Thickness of additional protection
L_{AP}	Length of the additional protection

Figure 13 Single and bundled cables in floor

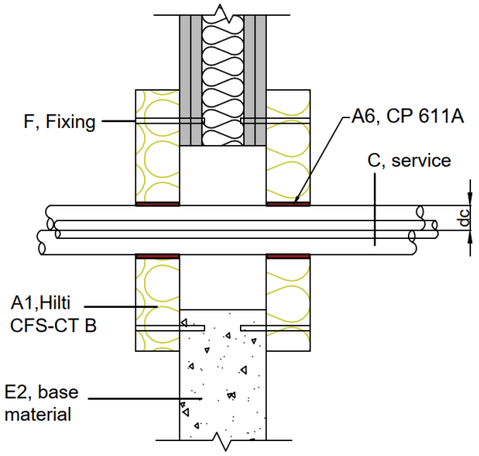
Table 12 Single and bundled cables in horizontal separating elements through two layers of Hilti CFC-CT B batts – refer to Figure 13 and Table 4

Application reference	Cable tray width and configuration	Service - cable	single cable max spec	cable bundle size	Local seal – backing	Local seal - Gap filler sealant	Local seal - sealant config	Additional protection (AP)	AP configuration and length along service	FRL
E.33	up to 600 mm cable tray, with or without cable tray through floor OR up to 900 mm cable tray, cable tray stop start, minimum 100 mm off base material	AL core cable (TPS, Submain (multicore), single core, earth cable and others) Up to: 4 × 400 mm² AL cables 1 × 120 mm² AL earth cable	up to 400 mm^2	up to 80 mm in a bundle	backing optional when annular gap is up to 5 mm / mineral wool for up to 15 mm	CP 611A	Full depth, with 30 mm high × 10 mm wide coning on topside	AP2: min. 60 m^3/kg density mineral wool mat	AP2: 250 mm wrapping length top side only	-/90/90
E.34			up to 400 mm^2	up to 80 mm in a bundle		CP 611A	full depth, with 10 mm × 10 mm coning on topside	AP2: min. 60 m^3/kg density mineral wool mat	AP2: 300 mm wrapping length top side only	-/120/120
E.35		FR cable (single and multicore)	up to 100 mm^2	up to 90 mm in a bundle		CP 606	full depth, with 20 mm × 20 mm coning on top side	AP2: min. 60 m^3/kg density mineral wool mat	AP2: 300 mm wrapping length top side only	-/90/90
E.36			up to 100 mm^2	up to 90 mm in a bundle		CP 606	full depth, with 20 mm × 20 mm coning on top side	AP2: min. 60 m^3/kg density mineral wool mat	AP2: 300 mm wrapping length top side only	-/120/120
E.37	up to 600 mm cable tray, with or without cable tray through floor OR up to 900 mm cable tray, cable tray stop start, minimum 100 mm off base material	optic fibre cable (single or multi mode)	n/a	up to 60 mm in a bundle	backing optional when annular gap is up to 5 mm / mineral wool for up to 15 mm	CP 611A	full depth, with 20 mm × 20 mm coning on topside	n/a	n/a	-/120/120
E.38		coaxial cable or RG6	up to 1-1/4 or 40 mm diameter	up to 80 mm in a bundle		CP 606	Full depth, with 20 mm × 20 mm coning on topside	AP2: min. 60 m^3/kg density mineral wool mat	AP2: 300 mm wrapping length top side only	-/120/120
E.39			up to 1-1/4 or 40 mm diameter	up to 80 mm in a bundle		CP 606	Full depth, with 20 mm × 20 mm coning on topside	AP2: min. 60 m^3/kg density mineral wool mat	AP2: 300 mm wrapping length top side only	-/180/180
E.40	cable tray stop start, up to 900 mm cable tray, minimum 100 mm off base material	TPS cable/ Fire Rated cable (single and multicore)	up to 25 mm^2 TPS	up to 90 mm in a bundle	backing optional when annular gap is up to 5 mm / mineral wool for up to 15 mm	CP 611A	full depth, with 10 mm × 10 mm coning on topside	AP3: Hilti putty bandage CFS-P BA	two layers of CFS-P BA for 100 mm on topside, overlap by minimum 30 mm	-/90/90
E.41			up to 25 mm^2 TPS	up to 90 mm in a bundle		CP 611A	full depth, with 10 mm ×10 mm coning on topside	AP2: min. 60 m^3/kg density mineral wool mat AP3: Hilti putty bandage CFS-P BA	AP2: 200 mm wrapping and finished with 20 mm × 20 mm coning on topside AP3: two layers of CFS-P BA for minimum 200 mm on topside, overlap by minimum 30 mm 20 mm × 20 mm coning on topside	-/120/120
E.42		multicore cable bundle	up to 25 mm^2 4C+E or up to 32mm2 3C+E	up to 90 mm in a bundle		CP 611A	full depth, with 20 mm × 20 mm on topside	AP2: min. 60 m^3/kg density mineral wool mat	AP2: 200 mm wrapping and finished with a 20 mm × 20 mm coning on topside	-/120/120
E.43		CAT series cables (CAT5, CAT5e, CAT6, CAT6e and others) with RG6 cable	up to 7.2 mm diameter	up to 90 mm in a bundle		CP 611A	full depth, with 10 mm ×10 mm coning on topside	AP3: Hilti putty bandage CFS-P BA	two layers of CFS-P BA for 200 mm topside, overlap by minimum 30 mm finished with a 20 mm × 20 mm coning on topside	-/120/120

8.3.3 Cable conduits (plastic) in floor



With and without cables Construction details:
Hilti Firestop Collars CFS-C EL are installed on both sides of the seal, fixed together by fixing methods specified in 1.7



With and without cables Construction details:
Hilti coated board are fixed on both sides of the wall, fixed together by fixing methods specified in 1.7

Abbreviation	Description
A_1	Hilti Firestop Coated Board CFS-CT B 1S / CFS-CT B 2S
A_3	Hilti Firestop Collar CFS-C, CFS-C P or CFS-C EL
A_6	Hilti Firestop Acrylic Sealant CP 606 or CP 611A as gap filler
C, C_1, C_2, C_3	Penetrating services
d_c	Pipe diameter
E, E_1, E_2	Building element (wall, floor)
F	Fixing of pipe closure device
t_E	Thickness of the building element

Figure 14 Cable conduits (plastic) in floor

Table 13 Cable conduits (plastic) in horizontal separating elements through two layers of Hilti CFC-CT B batts – refer to Figure 14 and Table 4

Application reference	Conduit quantity	conduit max spec	cable fill details	Local seal – backing	Local seal - Gap filler sealant	Local seal - sealant config	Additional protection	FRL
E.44	single cable conduit	Rigid PP cable conduit up to 50 mm (including HFT conduit)	empty to fully filled with mix of CAT, RG6, optical fibre cable or electrical with a diameter up to 17 mm	backing optional when annular gap is up to 5 mm / mineral wool for up to 15 mm	CP 606	full depth	CFS-C EL collar fixed to coated board on the underside only	-/120/120
E.45	single cable conduit	up to 32 mm PVC rigid or corrugated conduit	empty to fully filled with mix of CAT, RG6, optical fibre cable or electrical with a diameter up to 17 mm		CP 611A	full depth, with 10 mm × 10 mm coning on the topside only	N/A	-/120/120
E.46	single cable conduit	Rigid uPVC cable conduit, up to 50 mm	empty to fully filled with mix of CAT, RG6, optical fibre cable or electrical with a diameter up to 17 mm		CP 611A	full depth, with 30 mm × 30 mm coning on the topside only	N/A	-/120/120
E.47	single cable conduit	Rigid uPVC cable conduit, up to 100 mm	empty to fully filled with mix of CAT, RG6, optical fibre cable or electrical with a diameter up to 17 mm		CP 606	full depth	CFS-C EL collar fixed to coated board on the underside only	-/60/60
E.48	single cable conduit	Rigid uPVC cable conduit, up to 100 mm	empty to fully filled with mix of CAT, RG6, optical fibre cable or electrical with a diameter up to 17 mm		CP 606	full depth with 20 mm × 20 mm coning on the topside only	CFS-C EL collar fixed to coated board on the underside only.	-/90/90
E.49	up to 3 in a bundle	up to 32 mm PVC rigid or corrugated conduit	empty to fully filled with mix of CAT, RG6, optical fibre cable or electrical with a diameter up to 17 mm		CP 611A	full depth with 20 mm × 20 mm coning on the topside only	N/A	-/120/120

When conduit penetrates through floor, additional wrapping/protection is allowed only on the top side of the floor

8.3.4 Cable bundle with CFS SL GA speed sleeve in floors

Construction details

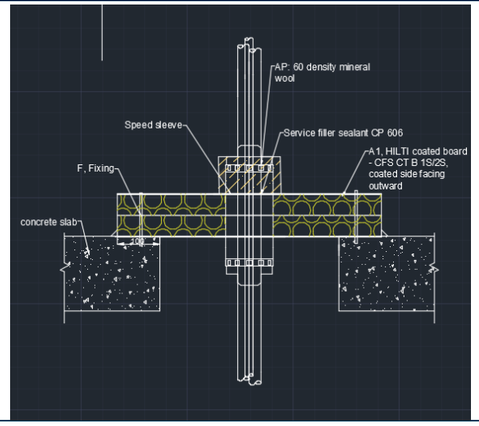
Hilti Firestop Sleeve CFS-SL GA centered in the wall and fixed by means of two flanges delivered together with the sleeve.

For Hilti Firestop Sleeve CFS-SL GA

Use Hilti Firestop Acrylic Sealant CP 606 to seal the gap between the metallic sleeve and the board CFS-CT perimeter seal edge.

Install CP606 onto the CFS-CT surface around the installed Sleeve before screwing the flanges tightly to board surface.

AP: Mineral wool acc. Section 1.5 wrapped around the Hilti Firestop Sleeve CFS-SL GA M on top side of the seal



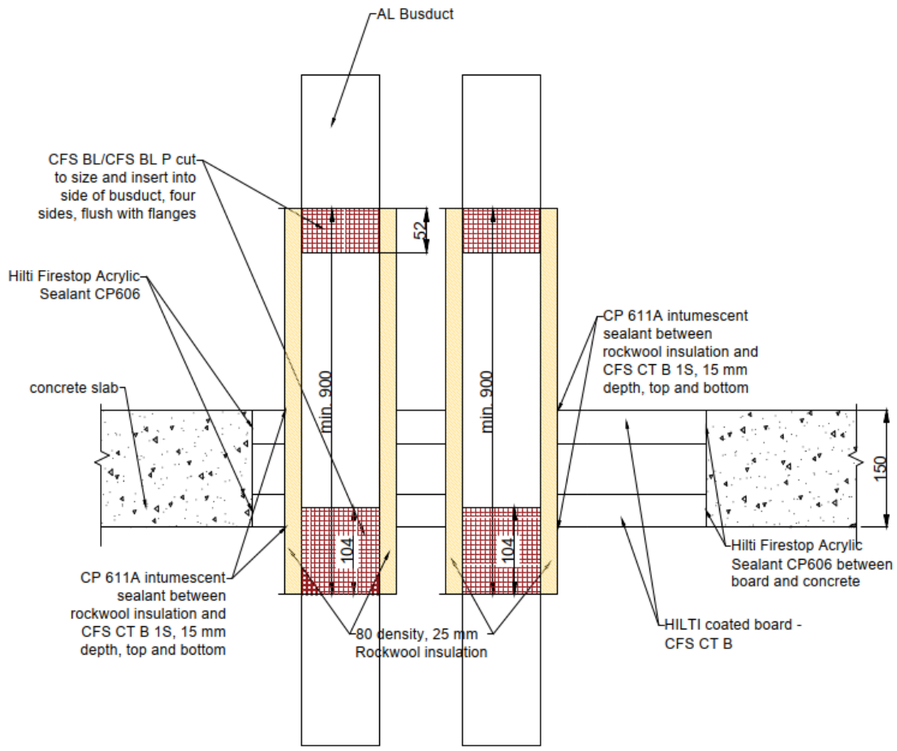
Abbreviation	Description
A_1	Hilti Firestop Coated Board CFS-CT B 1S / CFS-CT B 2S
A_5	Hilti Firestop Sleeve CFS-SL GA
A_6	Hilti Firestop Acrylic Sealant CP 606 or CP 611A as gap filler
AP	Additional protection for services
C, C_1, C_2, C_3	Penetrating services
E, E_1, E_2	Building element (wall, floor)
t_E	Thickness of the building element

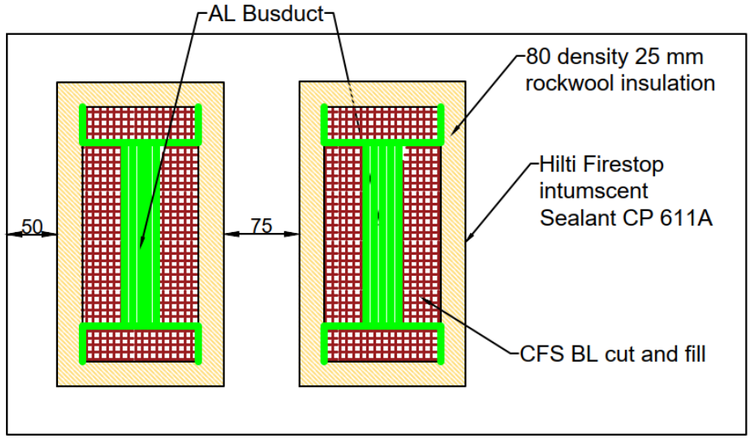
Figure 15 Cable bundle with CFS SL GA speed sleeve in floors

Table 14 Cable bundle with CFS SL GA speed sleeve in horizontal separating elements through two layers of Hilti CFC-CT B batts – refer to Figure 15 and Table 4

Application reference	Local opening size for CFS -SL GA M	cable fill details	Local seal - Gap filler sealant	Local seal - sealant config	Additional protection (A)	AP configuration and length along service	FRL
E.50	113 – 140 mm	empty to fully filled with mix of all sheathed cable types currently and commonly used in building practice (e.g. power, control, signal, telecommunication, data, optical fibre cables, single cable diameter <=21 mm)	backing optional when annular gap is up to 5 mm / mineral wool for up to 15 mm	CP 606 (full depth, finished flush)	AP2: min. 60 m^3/kg density mineral wool mat AP3: Hilti putty bandage CFS-P BA	AP2: 200 mm high wrapping on top side only AP3: 2 layers, total 200 mm high wrapping on top side only	-/120/120

8.3.5 Busducts





Aluminium busduct cavity:

Groove in Aluminium busduct needs to be filled with Hilti firestop block CFS BL, 130 mm width, sealed on top with CP 606.

Mineral wool wrapping:

Mineral wool shall be min. 80 kg/m^3 and a minimum thickness of 25 mm. Either mineral wool blanket or preformed section, with or without Aluminium foil.

AL busduct needs to be wrapped within the opening with mineral wool and 600 mm in length each side of the wall

Stainless steel tie:

Stainless steel tie must be used to secure the mineral wool insulation to metal pipe, stainless steel tie shall be installed as per the configuration listed below. the maximum distance between cable tie is 300 mm

Mineral wool Insulation length	number of steel tie needed	steel tie 1, distance from opening	steel tie 2, distance from opening	steel tie 3, distance from opening
300 mm	2	50 mm	250 mm	none
500 mm	3	50 mm	250 mm	450 mm
600 mm	3	50 mm	300 mm	550 mm

CFS CT B 1S/2S installation configuration: Hilti firestop coated board CFS CT B1S/2S needs to be installed to both sides of the separating element and finish flush with the surface of the separating element. The joint between the board and separating element needs to be sealed with Hilti firestop sealant CP 606.

The minimum clear spacing between Aluminium busduct is 125 mm.

Table 15 Busducts installed in the vertical separating elements through two layers of Hilti CFC-CT B batts – refer to Figure 11 and Table 4

Application reference	services	busduct size	cavity fill	Insulation	Insulation length	Allowable annular seal width with CP 611A (mm)	FRL
E.51	Aluminium busduct	AL Busduct, overall size up to 253 x 117 mm or equivalent and overall amperage up to 2000 amperes	CFS CT B 1S/2S	80 m^3/kg density 25 mm mineral wool blanket	min. 900 mm as per specification	5-15 mm	-/120/120

9.0 *HVAC trade solutions*

9.1 FLEXIBLE OR RIGID WALLS, T_E ≥ 90 MM, APPLIES TO WALL TYPES A.1.1 – A.1.5

Application coverage navigation:

1) Opening fill – Coated board shall be installed as per the configurations specified under the blank seal section, including all relevant variation and specifications under section 5.0.
2) Local seal – where the services going through opening / coated board, local seal to be installed as per specifications according to the approved configurations, including all relevant variations and specifications under section 5.0.

The application coverage is structured as base material (e.g. section 7.0) -> trade (e.g. section 8.0) -> service category (e.g. section 8.1.1).

For detailed specifications of opening fill products covered, refers to section 5.4 – Products.

For detailed specifications of local seal products covered, refers to section 5.5 – Ancillary Products.

For detailed specifications of separating base material covered, refers to section 5.6 – Separating material.

For detailed specifications of additional protections for components and additional protection to HVAC services to achieve better insulation rating, refers to section 5.7 Components for metal, insulated metal and plastic pipe penetrations.

For detailed specifications of fixings required into separating base material and into Hilti coated board, refers to section 5.8 – Fixing details.

For detailed specifications of spacing the distance between openings and between local seals within the same opening, refers to section 5.10 – Spacing and distance requirement

For clarification of the naming of service filler sealant between service and coated board in local seals, refers to section 5.11 – Service filler sealant.

For variations and detailed specifications of service filler sealant in the local seal regarding annular gap allowance, backing configuration, refers to section 5.12 – Local seal service filler sealant - annular gap, backing condition.

For variations and detailed specifications of cable trays and installation configurations, refers to section 5.13 – cable tray specification and configuration

For detailed specifications of re-penetrate or remove service after initial firestopping installation, refers to section 5.14 – Re-penetration / removal of services

For detailed specifications of Aperture framing to locally build up the separating base material to required thickness, refers to section 5.15 – Aperture framing

For detailed specifications of lining internal sides of flexible wall (e.g. drywall), refers to section 5.16 – Aperture Lining

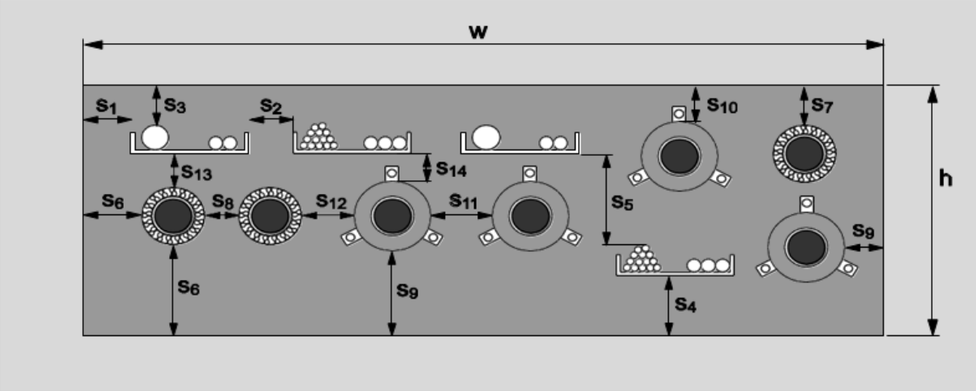
For detailed specifications of gap filler sealant on coated board edges in opening fill, refers to section 5.17 – Coated board edge seal

For detailed specifications of Aperture framing to locally build up the separating base material to required thickness, refers to section 5.15 – Aperture framing

For detailed specifications of lining internal sides of flexible wall (e.g. drywall), refers to section 5.16 and 5.17 – Aperture Lining

For detailed specifications of approved PP pipes, refers to section 5.18 – Non-regulated PP-pipes

For clarification of clear distance between individual openings, refers to section 5.19 - Clear distance between service openings



Distance requirement between services within the same opening

Solutions in the section are only valid under the following distance requirements

s1 = 0 (distance between cables/cable supports and seal edge

s2 = 40 (distance between cable supports)

s3 = 0 (distance between cables and upper seal edge)

s4 = 0 (distance between cable supports and bottom seal edge)

s5 = 40 (distance between cables and cable support above)

s6 = 3 (distance between insulated metal pipes and seal edge)

s7 = 0 (distance between insulated metal pipes and upper seal edge)

s8 = 0 (distance between insulated metal pipes)

s9 = 17 (distance between plastic pipes/pipe closure devices and seal edge)

s10 = 17 (distance between plastic pipes/pipe closure devices and upper seal edge)

s11 = 0 (distance between plastic pipes/pipe closure devices)

s12 = 30 (distance between metal pipes and plastic pipes/pipe closure devices)

s13 = 3 (distance between cables/cable supports and metal pipes)

s14 = 40 (distance between cables/cable supports and plastic pipes/pipe closure devices)

Other clear spacings where here not specified, minimum 40 mm

9.1.1 Copper pipes with foamed elastomeric insulation according to Section 5.8 and Hilti Firestop Bandage CFS-B

For specification of the foamed elastomeric insulation and mineral wool insulation material to be used see Section 5.8

In general, two layers of Firestop Bandage CFS-B (A2) wrapped around the pipe insulation, on each side of the seal. The bandage is positioned with half of its width (62.5 mm) within the seal (central marking line at the surface of the seal) and outside the seal fixed with wire.

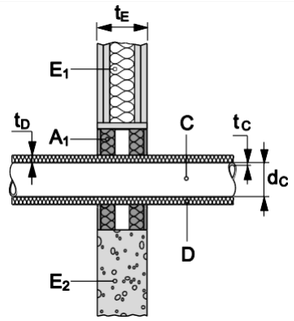
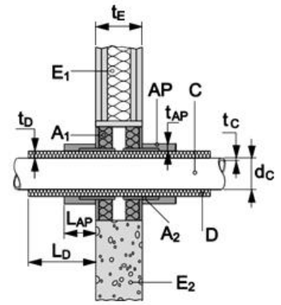
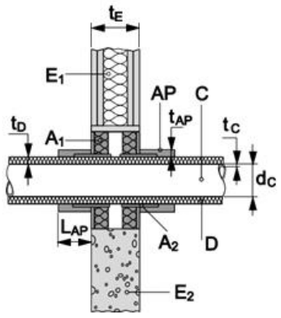
Additional protection:

Over the bandage/pipe insulation an additional protection AP is installed as per below:

AP2: mineral wool mat in the form of mineral wool blanket according to section 5.8

AP4: AF/Armaflex pipe insulation or mineral wool according to Section 5.8.2, wrapped around the bandage/pipe insulation on each side of the seal, fixed with wire, length (LAP) = 300 mm on each side, min. thickness (tAP) = 19 mm.

The field of application given for copper pipes is also valid for other metal pipes with lower heat conductivity than copper and a melting point of minimum 1100°C, e.g. unalloyed steel, low alloyed steel, cast iron, stainless steels, Ni alloys (NiCu, NiCr and NiMo alloys) and Ni.

Continued insulation, sustained (CS)	Local insulation, sustained (LS)
	With additional protection, AP4 
With additional protection, sealant coning **Note**: Additional drawing showing sealant to be provided	
With additional protection, APx 	

Single insulated pipe, Continued insulation, sustained (CS)

Application reference	Pipe material	pipe dia - OD	pipe wall thickness	Pipe insulation	pipe insulation thickness (mm)	local firestop bandage installation	local seal	additional protection	FRL
H.1	copper	10-42	1.0/1.5 – 14.2	CS, FR Section 5.8 insulation including Armaflex	18 - 38	Two layers of Firestop Bandage CFS-B (A2) wrapped around the pipe insulation, on each side of the seal. The bandage is positioned with half of its width (62.5 mm) within the seal (central marking line at the surface of the seal) and outside the seal fixed with wire	CP 606 between CFS-B and CFS-CT B coated board according to section 1.10	not required	-/90/90
H.2	copper	10-42	1.0/1.5 – 14.2		18 - 38			20 × 20 mm sealant cone outside of CFS B bandage at the base of CFS CT B coated board, each side	-/120/120
H.3	copper	42 – 88.9	1.0/1.5 – 14.2		15 – 47.5			AP2, mineral wool wrap length (LAP) = 300 mm on each side	-/60/60
H.4	copper	42 – 88.9	1.0/1.5 – 14.2		45.5 - 50			AP2 or AP4, wrap length (LAP) = 300 mm on each	-/120/120

Single pair coil with or without cable, Continued insulation, sustained (CS)

Use of CP 611A only, clear distance between services then shall be kept to 40 mm

Application reference	Pair coil tube size		Insulation thickness (mm)	Pipe insulation	With or without cables	local firestop bandage installation	local seal	FRL
H.5	mm	Inch						
H.6	6.35-9.52	1/4-3/8	13 or 19	CS, FR Section 5.8 insulation including Armaflex	1 × power cable up to 2.5 mm^2 1 × cat data cable up to 1 mm^2	NO local CFS-B firestop bandage is needed	CP 611A, min. 25 mm seal depth between CFS-CT B coated board and service according to section 1.10, with 15 x 15 mm coning, both sides	-/120/120
H.7	6.35-12.7	1/4-1/2	13 or 19					
H.8	6.35-15.88	1/4-5/8	13 or 19					
H.9	9.5-15.99	3/8-5/8	13 or 19					
H.10	9.5-19.05	3/8-3/4	13 or 19					

Note: The table above also applies to two single insulated copper pipe which pipe sizes are smaller to 9.5 mm and 15.99 mm respectively and insulation size between 13-19 mm bundled together

Application reference	Pair coil tube size		Insulation thickness (mm)	Pipe insulation	With or without cables	local firestop bandage installation	local seal	FRL	FRL
	mm	Inch							
H.11	6.35-9.52	1/4-3/8	13 or 19	CS, FR Section 5.8 insulation including Armaflex	1 × power cable up to 2.5 mm^2 1 × cat data cable up to 1 mm^2	Two layers of Firestop Bandage CFS-B (A2) wrapped around the pipe insulation, on each side of the seal. The bandage is positioned with half of its width (62.5 mm) within the seal (central marking line at the surface of the seal) and outside the seal fixed with wire, CP 611A needed in gap between CFS B bandage and pair coil, 20 mm depth	CP 606 between CFS-B and CFS-CT B coated board according to section 1.10	-/90/90 (only one layer of CFS-B each side of seal)	-/120/120
H.12	6.35-12.7	1/4-1/2	13 or 19						
H.13	6.35-15.88	1/4-5/8	13 or 19						
H.14	9.5-15.99	3/8-5/8	13 or 19						
H.15	9.5-19.05	3/8-3/4	13 or 19						

Note: The table above also applies to two single insulated copper pipe which pipe sizes are smaller to 9.5 mm and 15.99 mm respectively and insulation size between 13-19 mm bundled together

Multiple single insulated pipe in a bundle, Continued insulation, sustained (CS)

Application reference	Pipe material	pipe dia - OD	pipe wall thickness	Pipe insulation	pipe insulation thickness (mm)	number of insulated pipe in a bundle	local firestop bandage installation	local seal	additional protection	FRL
H.16	Copper	10-40	1.0/1.5 – 14.2	CS, FR Section 5.8 insulation including Armaflex	18 - 38, the insulation thickness adds up must be less than 64 mm	2	Two layers of Firestop Bandage CFS-B (A2) wrapped around the pipe insulation, on each side of the seal. The bandage is positioned with half of its width (62.5 mm) within the seal (central marking line at the surface of the seal) and outside the seal fixed with wire, CP 606 / CP 611A needed in gap between CFS B bandage and pair coil, 20 mm depth	CP 606 between CFS-B and CFS-CT B coated board according to section 1.10	not required	-/90/90
H.17									20 × 20 mm coning outside of CFS B bandage at the base of CFS CT B coated board, each side	-/120/120

Multiple pair coil in a bundle, Local insulation, sustained (LS)

Application reference	Pair coil tube size		Insulation thickness (mm)	Pipe insulation	number of insulated pair coil in a bundle	With or without cable	local firestop bandage installation	local seal	FRL
	mm	Inch							
H.18	up to 9.5-19.05	up to 3/8-3/4	13 or 19	CS, FR Section 5.8 insulation including Armaflex	3	for each pair coil, 1 x power cable up to 2.5 mm2 1 x cat data cable up to 1 mm2	Two layers of Firestop Bandage CFS-B (A2) wrapped around the pipe insulation, on each side of the seal. The bandage is positioned with half of its width (62.5 mm) within the seal (central marking line at the surface of the seal) and outside the seal fixed with wire, CP 606 / CP 611A needed in gap between CFS B bandage and pair coil, 20 mm depth	CP 606 between CFS-B and CFS-CT B coated board according to section 1.10	-/120/120

Note: The table above also applies to multiple single insulated copper pipe which pipe sizes are smaller to 9.5 mm and 15.99 mm respectively and insulation size between 13-19 mm bundled together, up to 6 insulated copper pipes

9.1.2 Copper pipes with foamed elastomeric insulation according to Section 5.8 and Hilti firestop wrap CFS-W P

For specification of the foamed elastomeric insulation and mineral wool insulation material to be used see Section 5.8

General installation configuration, layers of Hilti firestop wrap CFS-W P wrapped around the pipe insulation, on each side of the seal. The wrap can be taped and slide along the service to the required location, as shown in the drawings

Hilti Firestop Wrap CFS-W P to be mounted on both sides of the Hilti Firestop Double Board Seal CFS-CT B. Annular gap between the pipe sealing and the double board sealed with Hilti Firestop Acrylic Sealant CP 606. The wrap comes 5 mm out of board surface (projecting length), identical on both sides of the wall .

Annular gap between the pipe sealing and the double board sealed with Hilti Firestop Acrylic Sealant CP 606

Number of layers of Hilti firestop wrap CFS-W P is based on the diameter of the metal pipe, as below

Layer group	Diameter range (mm)	Number of layers
1	10 to 42	1
2	> 42 to 114	2
3	> 114 to 219	3

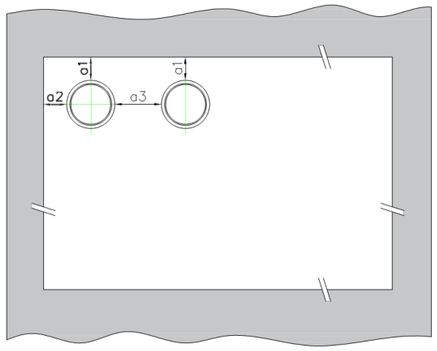
The field of application given to copper pipes is also valid for other metal pipes with lower heat conductivity than copper and a melting point of minimum 1100°C, e.g. unalloyed steel, low alloyed steel, cast iron, stainless steels, Ni alloys (NiCu, NiCr and NiMo alloys) and Ni.

For the solution coverage in this section, separation distance shall comply with below

a_1 >= 25 (distance between cables/cable supports and seal edge

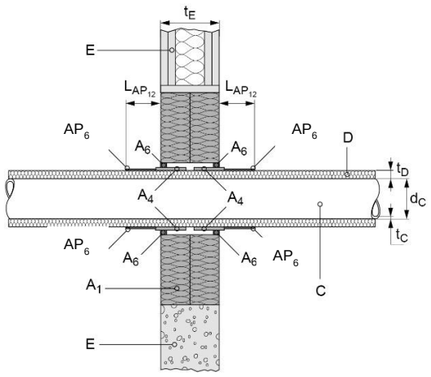
a_2 >= 25 (distance between cable supports)

a_3 >= 50 (distance between cables and upper seal edge)

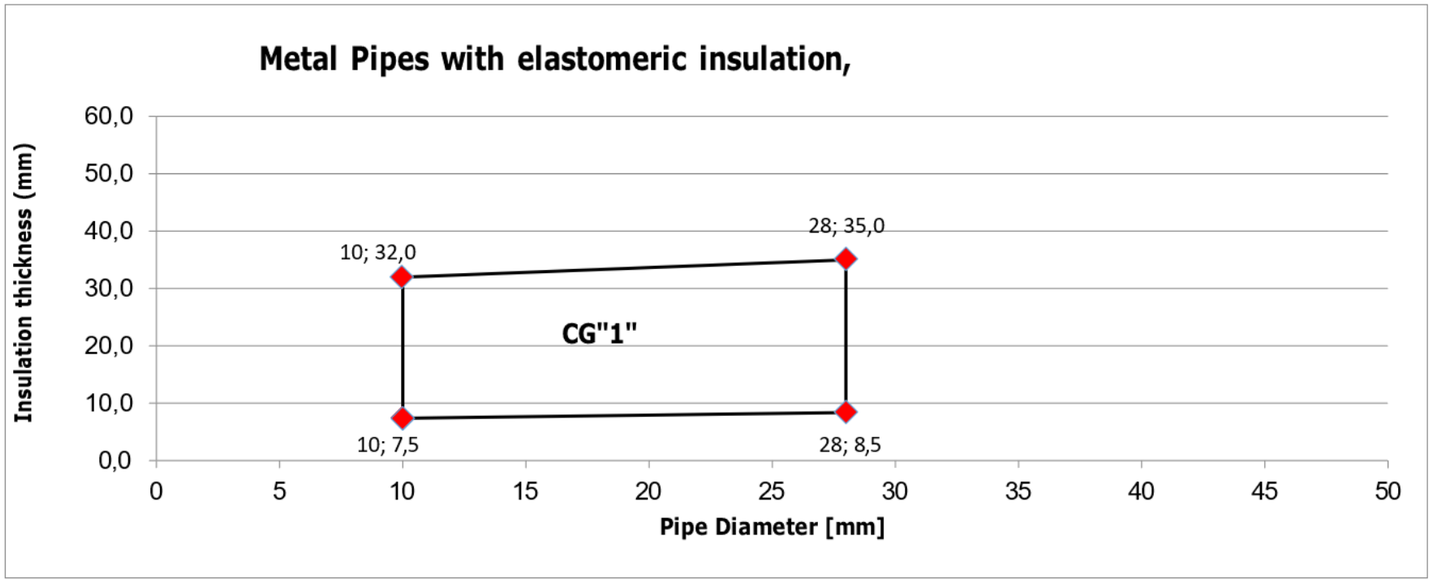


Continued insulation, sustained (CS)

add. protection AP6(ID1=50 mm), AP6 is reinforced Aluminium foil tape, minimum 45 mm wide

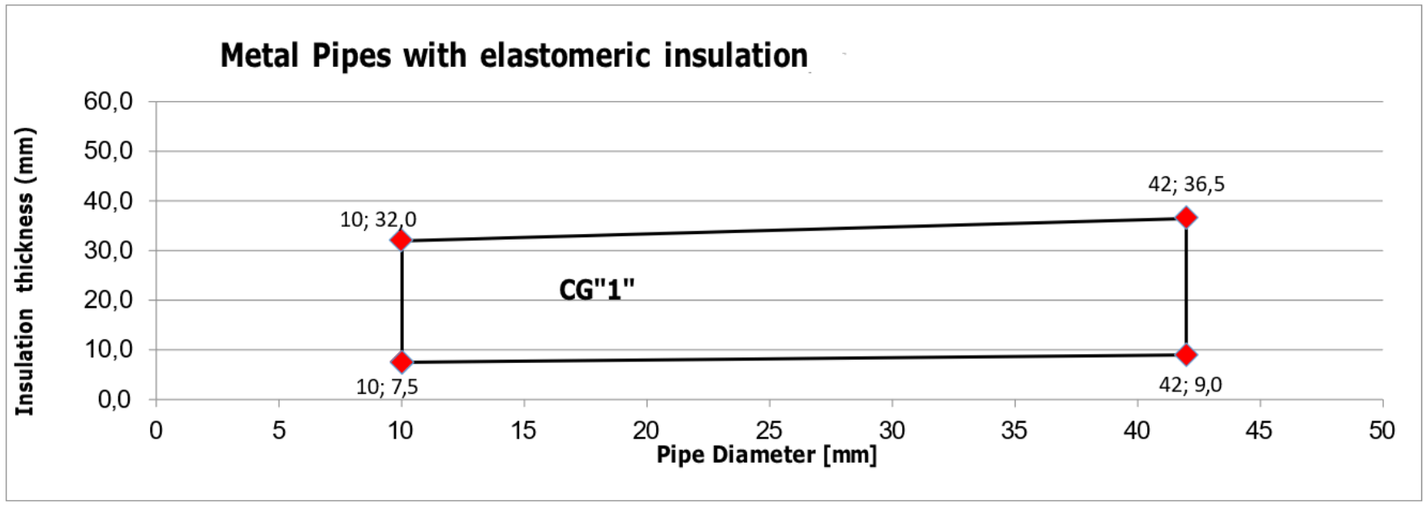


Application reference	Pipe material	pipe dia - OD	pipe wall thickness	Pipe insulation	pipe insulation thickness (mm)	Number of layers of CFS-WP	local seal	Additional protection	FRL
H.19	copper	10	1.0	CS, FR Section 5.8 insulation including Armaflex	7.5 - 32	1	CP 606 between CFS-B and CFS-CT B coated board according to section 1.10	AP6, reinforced Aluminium foil tape, minimum 45 mm wide, wrapped around the elastomeric pipe insulation in a length of 50 mm	-/120/120
H.20		28	1.0		8.5 - 35	1			-/120/120



Continued insulation, sustained (CS)

Application reference	Pipe material	pipe dia - OD	pipe wall thickness	Pipe insulation	pipe insulation thickness (mm)	Number of layers of CFS-W P	local seal	Additional protection	FRL
H.21	copper	10	1.0 – 1.2	CS, FR Section 5.8 insulation including Armaflex	7.5 - 32	1	CP 606 between CFS-W P and CFS-CT B coated board according to section 1.10	AP6, Reinforced Aluminum foil tape, min width 45 mm, wrapped around the elastomeric pipe insulation in a length of 50 mm	-/120/90
H.22		42	1.0 – 1.2		9 – 36.5	1			-/120/90



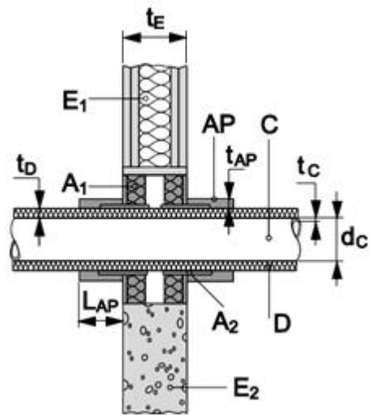
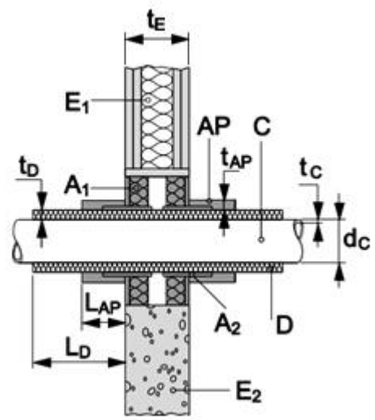
9.1.3 Steel and Stainless Steel pipes with foamed elastomeric insulation according to Section 5.8 and Hilti Firestop Bandage CFS-B

For specification of the foamed elastomeric insulation and mineral wool insulation material to be used see Section 5.8

General installation configuration, Two layers of Firestop Bandage CFS-B (A_2) wrapped around the pipe insulation, on each side of the seal. The bandage is positioned with half of its width (62.5 mm) within the seal (central marking line at the surface of the seal) and outside the seal fixed with wire.

AP4: AF/Armaflex pipe insulation or mineral wool according to Section 5.8.2, wrapped around the bandage/pipe insulation on each side of the seal, fixed with wire, length (LAP) = 300 mm on each side, min. thickness (tAP) = 19 mm.

The field of application given steel pipes is also valid for other metal pipes with lower heat conductivity than copper and a melting point of minimum 1100°C, e.g. unalloyed steel, low alloyed steel, cast iron, stainless steels, Ni alloys (NiCu, NiCr and NiMo alloys) and Ni.

Continued insulation, sustained (CS)	Local insulation, sustained (LS)
	

Continued insulation, sustained (CS)

Application reference	Pipe material	pipe dia - OD	pipe wall thickness	Pipe insulation	pipe insulation thickness (mm)	local firestop bandage installation	local seal	Additional protection	FRL
H.23	Steel	60.3	3.6 - 14.210	CS, FR Section 5.8 insulation including Armaflex	21.5 - 39	Two layers of Firestop Bandage CFS-B (A2) wrapped around the pipe insulation, on each side of the seal. The bandage is positioned with half of its width (62.5 mm) within the seal (central marking line at the surface of the seal) and outside the seal fixed with wire	CP 606/ CFS-S-ACR between CFS-B and CFS-CT B coated board according to section 1.10	AP4: AF/Armaflex pipe insulation or mineral wool according to Section 5.8.2, wrapped around the bandage/pipe insulation on each side of the seal, fixed with wire, length (LAP) = 300 mm on each side, thickness (tAP) = 19 mm.	-/90/90
H.24		60.3 - 114.3	3.6 - 14.210		21.5 - 39				-/60/60
H.25		114.3	3.6 - 14.2		9 - 43				-/90/90
H.26		114.3 – 159.0	2.0/2.6 – 14.2		9 - 10				-/60/60
H.27		159	2.6 – 14.2		10 - 45				-/60/60

Local insulation, sustained (LS)

Application reference	Pipe material	pipe dia - OD	pipe wall thickness	Pipe insulation	pipe insulation thickness (mm)	local insulation length each side (LD, mm)	local firestop bandage installation	local seal	Additional Protection	FRL
H.28	Steel	60.3	3.6 - 14.210	LS, FR Section 5.8 insulation including Armaflex	21.5 - 39	≥ 500	Two layers of Firestop Bandage CFS-B (A2) wrapped around the pipe insulation, on each side of the seal. The bandage is positioned with half of its width (62.5 mm) within the seal (central marking line at the surface of the seal) and outside the seal fixed with wire	CP 606 between CFS-B and CFS-CT B coated board according to section 1.10	AP4: AF/Armaflex pipe insulation or mineral wool according to Section 5.8.2, wrapped around the bandage/pipe insulation on each side of the seal, fixed with wire, length (LAP) = 300 mm on each side, thickness (tAP) = 19 mm.	-/90/90
H.29		60.3 - 114.3	3.6 - 14.210		21.5 - 39					-/60/60
H.30		114.3	3.6 - 14.2		43					-/90/90

Application reference	Pipe material	pipe dia - OD	pipe wall thickness	Pipe insulation	pipe insulation thickness (mm)	local insulation length each side (LD, mm)	local firestop bandage installation	local seal	Additional Protection	FRL
H.31	Stainless Steel	Up to 60.3	2 - 14.2	CS, FR Section 5.8 insulation including Armaflex	21.5 - 39	≥ 500	Two layers of Firestop Bandage CFS-B (A2) wrapped around the pipe insulation, on each side of the seal. The bandage is positioned with half of its width (62.5 mm) within the seal (central marking line at the surface of the seal) and outside the seal fixed with wire	CP 606 between CFS-B and CFS-CT B coated board according to section 1.10	AP4: AF/Armaflex pipe insulation or mineral wool according to Section 5.8.2, wrapped around the bandage/pipe insulation on each side of the seal, fixed with wire, length (LAP) = 300 mm on each side, thickness (tAP) = 19 mm.	-/120/120

9.1.4 Steel and Stainless Steel pipes with foamed elastomeric insulation according to Section 5.8 and Hilti firestop wrap CFS-W P

For specification of the foamed elastomeric insulation and mineral wool insulation material to be used see Section 5.8

General installation configuration, layers of Hilti firestop wrap CFS-W P wrapped around the pipe insulation, on each side of the seal. The wrap can be taped and slide along the service to the required location, as shown in the drawings

Hilti Firestop Wrap CFS-W P to be mounted on both sides of the Hilti Firestop Double Board Seal CFS-CT B. Annular gap between the pipe sealing and the double board sealed with Hilti Firestop Acrylic Sealant CP 606. The wrap comes 5 mm out of board surface (projecting length), identical on both sides of the wall .

Annular gap between the pipe sealing and the double board sealed with Hilti Firestop Acrylic Sealant CP 606

Number of layers of Hilti firestop wrap CFS-W P is based on the diameter of the metal pipe, as below

Layer group	Diameter range (mm)	Number of layers
1	10 to 42	1
2	> 42 to 114	2
3	> 114 to 219	3

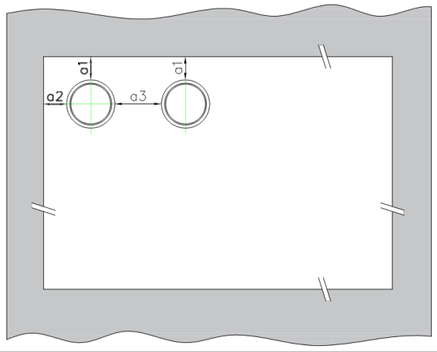
The field of application given steel pipes is also valid for other metal pipes with lower heat conductivity than copper and a melting point of minimum 1100°C, e.g. unalloyed steel, low alloyed steel, cast iron, stainless steels, Ni alloys (NiCu, NiCr and NiMo alloys) and Ni.

For the solution coverage in this section, separation distance shall comply with below

a_1 >= 25 (distance between cables/cable supports and seal edge

a_2 >= 25 (distance between cable supports)

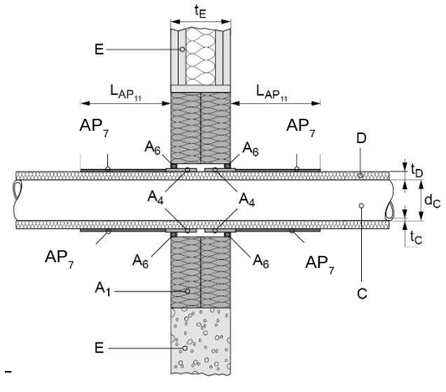
a_3 >= 50 (distance between cables and upper seal edge)



Continued insulation, sustained (CS)

add. protection AP7(ID2=200mm),

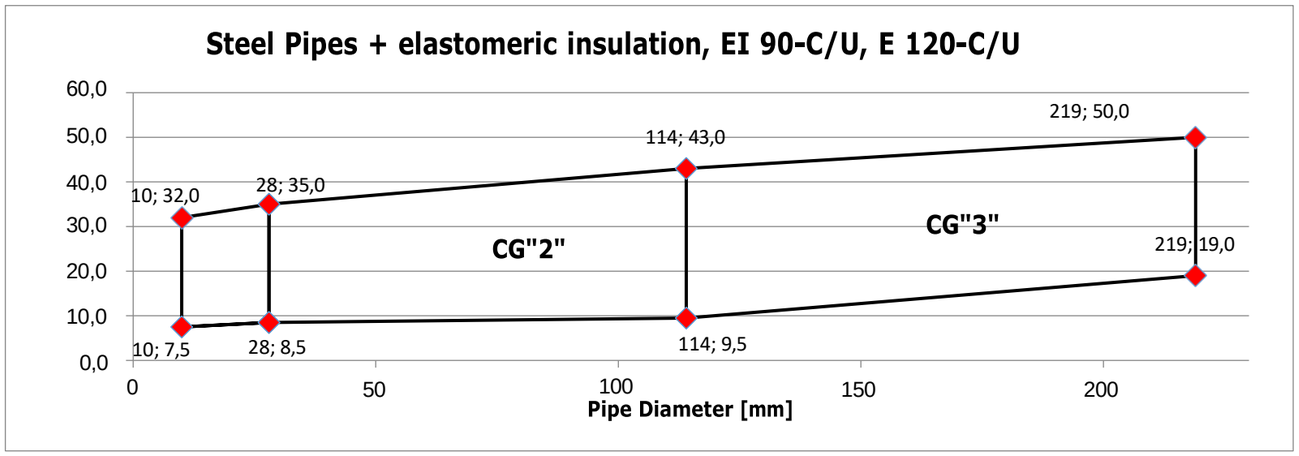
AP7 is Duct tape adhesive polyethylene based tape OR reinforced Aluminium foil tape, minimum 45 mm wide and total wrapping length minimum 200 mm. One layer is required.



Application reference	Pipe material	pipe dia - OD	Minimum pipe wall thickness	Pipe insulation	pipe insulation thickness (mm)	Number of layers of CFS-W P	local seal	Additional protection	FRL
H.32	steel	10 - 28	1.0 – 1.2	CS, FR Section 5.8 insulation including Armaflex	7.5/8.5 – 32/35	1	CP 606 between CFS-W P and CFS-CT B coated board according to section 1.10	AP7, Duct tape adhesive polyethylene based tape OR reinforced Aluminium foil tape, minimum 45 mm wide and total wrapping length minimum 200 mm. One layer is required.	-/120/120
H.33		28 - 114	3.4		8.5/9.5 – 35/43	2			-/120/90
H.34		114 - 219	6.3		9.5/19 – 43/50	3			-/120/90

With additional protection

Application reference	Pipe material	pipe dia - OD	pipe wall thickness	Pipe insulation	pipe insulation thickness (mm)	Number of layers of CFS-W P	Additional pipe insulation thickness (mm)	Additional pipe insulation length (mm)	local seal	Additional protection	FRL
H.35	steel	66.7	1.5	CS, FR Section 5.8 insulation including Armaflex	17.5 – 40	2	Not required	Not required	CP 606 between CFS-W P and CFS-CT B coated board according to section 1.10	AP7, Duct tape adhesive polyethylene based tape OR reinforced Aluminium foil tape, minimum 45 mm wide and total wrapping length minimum 200 mm. One layer is required.	-/90/90
H.36		28 - 114	3.4		8.5/9.5 – 35/43	2	Mineral wool mat min. 60 density, 30 mm thick	250			-/120120
H.37		114 - 219	6.3		9.5/19 – 43/50	3	Mineral wool mat min. 60 density, 30 mm thick	250			-/120120



9.1.5 Copper pipes with mineral wool insulation according to Section 5.8

For specification of the foamed elastomeric insulation and mineral wool insulation material to be used see Section 5.8

Additional protection:

Mineral wool insulation for sustained and interrupted configuration refers to Section 5.8.1

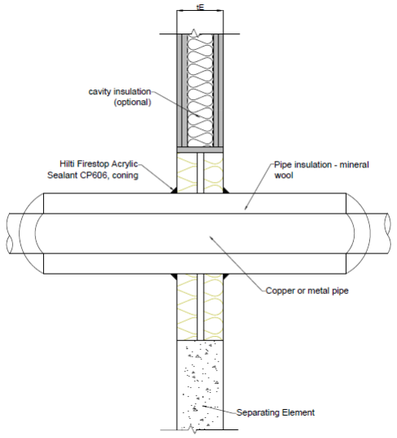
Over the pipe insulation an additional protection AP according to Section 5.8is installed:

mineral wool wrapped around the pipe insulation on both sides of the seal, fixed with wire, length along the pipe 250 mm, thickness 40 mm.

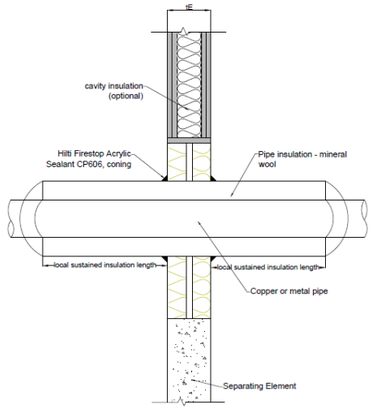
The field of application given for copper pipes is also valid for other metal pipes with lower heat conductivity than copper and a melting point of minimum 1100°C, e.g. unalloyed steel, low alloyed steel, cast iron, stainless steels, Ni alloys (NiCu, NiCr and NiMo alloys) and Ni.

Spacing between mineral wool insulated copper or metal pipe can disregard the coning size, however, spacing between services needs to comply with the spacing requirements in general. Coning is needed at the perimeter of the services

Continued insulation, sustained (CS) with CP 606 local coning



Local insulation, sustained (LS) with CP 606 local coning



Continued insulation, sustained (CS)

Application reference	Pipe material	pipe dia - OD	pipe wall thickness	Pipe insulation	pipe insulation thickness (mm)	local seal	additional protection	FRL
H.38	Copper	10 - 42	1.0/1.5 - 14.2	CS, mineral wool insulation 80 Kg/m^3 density	≥ 20	CP 606 between insulated pipe and CFS-CT B coated board according to section 1.10	15 x 15 mm CP 606 sealant coning, both sides	-/120/120
H.39		42 – 88.9	1.5/2.0 - 14.2		≥ 40		15 x 15 mm CP 606 sealant coning, both sides	-/90/90
H.40		42 – 88.9	1.5/2.0 - 14.2		≥ 40		15 x 15 mm CP 606 sealant coning, both sides	-/120/120

Local insulation, sustained (LS)

Application reference	Pipe material	pipe dia - OD	pipe wall thickness	Pipe insulation	pipe insulation thickness (mm)	local insulation length each side (LD, mm)	local seal	FRL
H.41	Copper	10 - 40	1.0/1.5 - 14.2	LS, mineral wool insulation 80 Kg/m^3 density	20	≥ 500	CP 606 between insulated pipe and CFS-CT B coated board according to section 1.10 15 x 15 mm CP 606 sealant coning, both sides	-/120/120
H.42		40 – 88.9	1.5/2.0 - 14.2		40	≥ 1000		-/120/120

9.1.6 Steel and Stainless Steel pipes with mineral wool insulation according to Section 5.8

For specification of the foamed elastomeric insulation and mineral wool insulation material to be used see Section 5.8

Additional protection:

Mineral wool insulation for sustained and interrupted configuration refers to Section 5.8.1

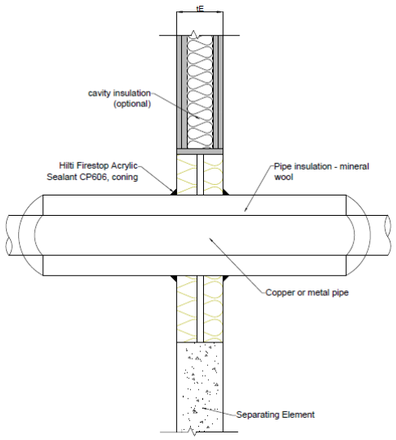
Over the pipe insulation an additional protection AP according to Section 5.8 is installed:

mineral wool wrapped around the pipe insulation on both sides of the seal, fixed with wire, length along the pipe 250 mm, thickness 40 mm.

The field of application given steel pipes is also valid for other metal pipes with lower heat conductivity than steel and a melting point of minimum 1100°C, e.g. unalloyed steel, low alloyed steel, cast iron, stainless steels, Ni alloys (NiCu, NiCr and NiMo alloys) and Ni.

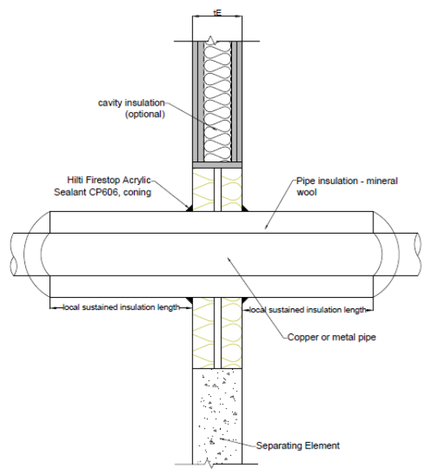
Spacing between mineral wool insulated copper or metal pipe can disregard the coning size, however, spacing between services needs to comply with the spacing requirements in general. Coning is needed at the perimeter of the services

Continued insulation, sustained (CS) with CP 606 local coning

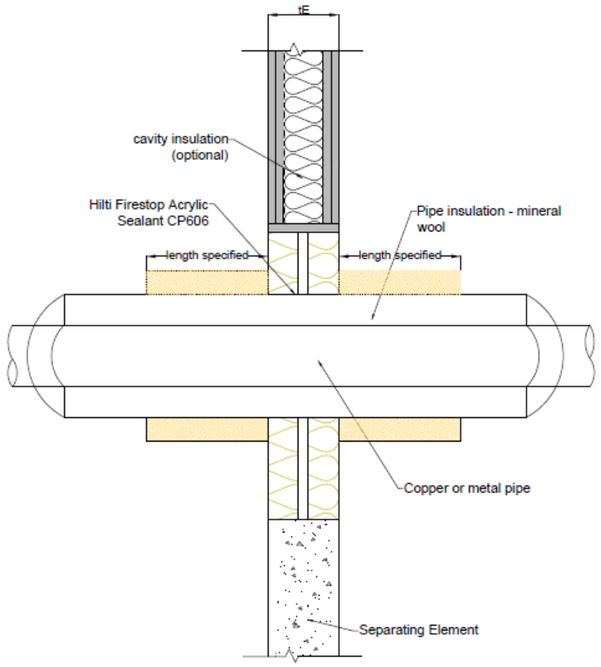


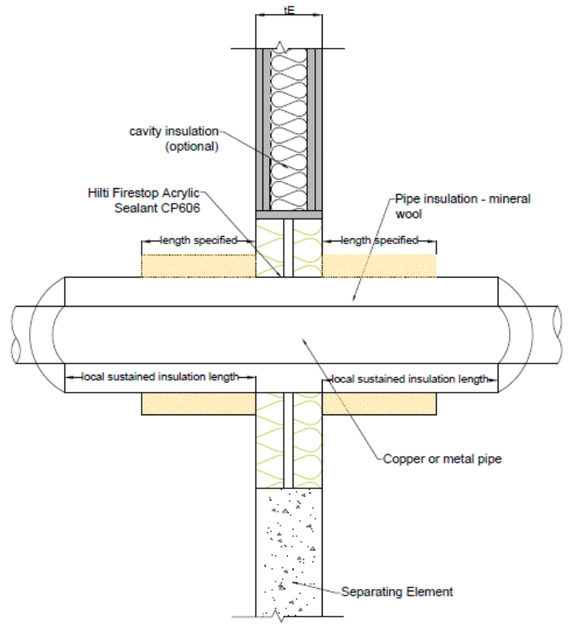
Continued insulation, sustained (CS) with additional mineral wool wrapping

Local insulation, sustained (LS) with CP 606 local coning



Continued insulation, sustained (CS) with additional mineral wool wrapping





Continued insulation, sustained (CS)

Application reference	Pipe material	pipe dia - OD	pipe wall thickness	Pipe insulation	pipe insulation thickness (mm)	local seal	additional protection	FRL
H.43	Steel	101.6 – 114.3	2.0 - 14.2	CS, mineral wool insulation 80 Kg/m^3 density	>=40	CP 606 between insulated pipe and CFS-CT B coated board according to section 1.10	15 x 15 mm CP 606 sealant coning, both sides	-/120/120
H.44		114.3 – 323.9	2.6 – 14.2		>=40		15 x 15 mm CP 606 sealant coning, both sides	-/60/60
H.45		114.3 – 159.0	2.6 – 14.2		>=40		Mineral wool blanket, min. 60 density, wrapped around the pipe insulation on both sides of the seal, fixed according to Section 5.8, length along the pipe 250 mm, thickness 40 mm	-/120/120
H.46		159 - 219	2.6 – 14.2		>=40	3 layers of CFS-W P each side with CP 606 as gap filler		-/120/120

Local insulation, sustained (LS)

Application reference	Pipe material	pipe dia - OD	pipe wall thickness	Pipe insulation	pipe insulation thickness (mm)	local insulation length each side (LD, mm)	local seal	additional protection	FRL
H.47	Steel	Up to 114.3	2.0 – 14.2	LS, mineral wool insulation 80 Kg/m^3 density	40	≥ 500	CP 606 between insulated pipe and CFS-CT B coated board according to section 1.10	15 x 15 mm CP 606 sealant coning, both sides	-/60/60
H.48		Up to 114.3	2.0 – 14.2		40	≥ 1000		15 x 15 mm CP 606 sealant coning, both sides	-/120/120
H.49		114.3 – 323.9	2.0/2.6 – 14.2		40	≥ 1000		15 x 15 mm CP 606 sealant coning, both sides	-/60/60

Application reference	Pipe material	pipe dia - OD	pipe wall thickness	Pipe insulation	pipe insulation thickness (mm)	local insulation length each side (LD, mm)	local seal	additional protection	FRL
H.50		114.3 – 159.0	2.0/2.6 – 14.2		40	≥ 1000		Mineral wool blanket, min. 40 density, wrapped around the pipe insulation on both sides of the seal, fixed according to Section 5.8, length along the pipe 250 mm, thickness 40 mm	-/90/90
H.51		114.3 - 219	2.6 – 14.2		40	≥ 1000	3 layers of CFS-W P each side with CP 606 as gap filler	Mineral wool blanket, min. 60 density, wrapped around the pipe insulation on both sides of the seal, fixed according to Section 5.8, length along the pipe 250 mm, thickness 40 mm	-/120120
H.52		219 - 323.9	2.6 – 14.2		40	≥ 1000	CP 606 between insulated pipe and CFS-CT B coated board according to section 1.10	Mineral wool blanket, min. 60 density, wrapped around the pipe insulation on both sides of the seal, fixed according to Section 5.8, length along the pipe 250 mm, thickness 40 mm	-/90/90

9.1.7 AL composite and plastic pipe with foamed elastomeric insulation according to Section 5.8 and Hilti firestop wrap CFS-W P

For specification of the foamed elastomeric insulation and mineral wool insulation material to be used see Section 5.8

General installation configuration, layers of Hilti firestop wrap CFS-W P wrapped around the pipe insulation, on each side of the seal. The wrap can be taped and slide along the service to the required location, as shown in the drawings

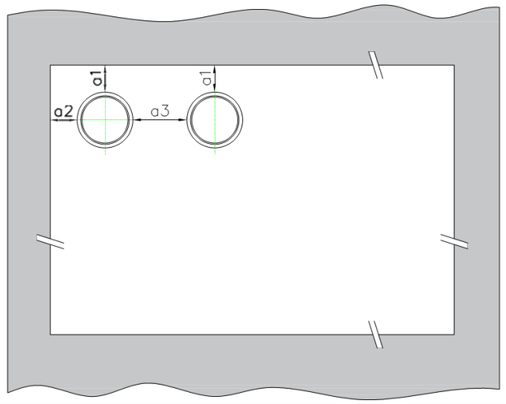
Hilti Firestop Wrap CFS-W P (A_1) to be mounted on both sides of the Hilti Firestop Double Board Seal CFS-CT B. Annular gap between the pipe sealing and the double board sealed with Hilti Firestop Acrylic Sealant CFS-S ACR – material (A_2): water based acrylic sealant. The wrap comes 5 mm out of board surface (projecting length), identical on both sides of the wall .

Annular gap between the pipe sealing and the double board sealed with Hilti Firestop Acrylic Sealant CP 606

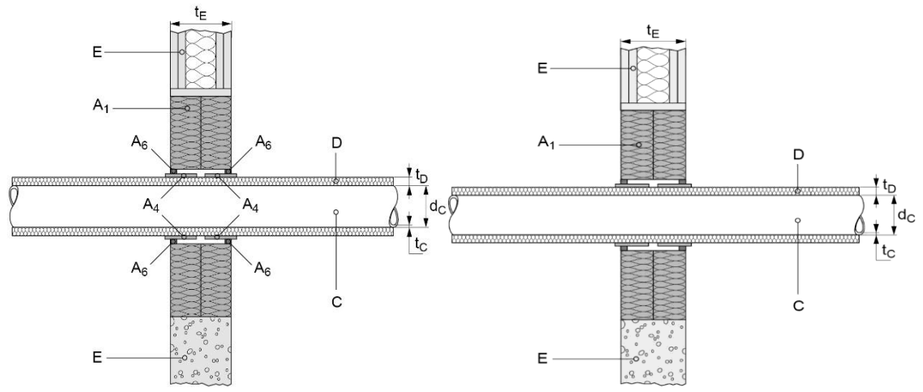
Number of layers of Hilti firestop wrap CFS-W P is based on the diameter of the metal pipe, as below, The wrap can be taped and slide along the service to the required location,

Layer group	Diameter range (mm)	Number of layers
1	10 to 42	1
2	> 42 to 114	2
3	> 114 to 219	3

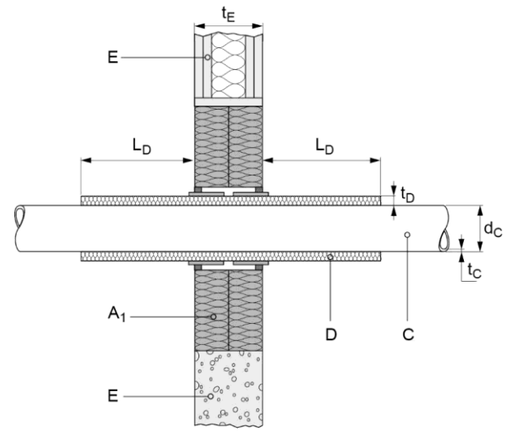
For the solution coverage in this section, separation distance shall comply with below
a_1 >= 25 (distance between cables/cable supports and seal edge
a_2 >= 0 (distance between cable supports), unless otherwise specified
a_3 >= 0 (distance between cables and upper seal edge), unless otherwise specified



Continued insulation, sustained (CS)



Local insulation, sustained (LS)



Application reference	Material: PE-Xa/AL/PE-HD (e.g. Rehau Rautitan Stabil)					
	Layers	Pipe diameter Ø dc (mm)	Pipe wall thickness tc (mm)	Pipe insulation	Pipe insulation thickness (mm)	FRL
H.53	1	16	2.6	CS, FR Section 5.8 insulation including Armaflex	8.0 to 32.0	-/120/90
H.54	1	20	2.9		8.5 to 33.5	
H.55	1	25	3.7		8.5 to 35.0	
H.56	1	32	4.7		9.0 to 35.0	
H.57	1	40	6.0		9.0 to 35.0	

Application reference	Material: PE-Xa/AL/PE-HD (e.g. Rehau Rautitan Stabil)								
	Layers	Pipe diameter Ø dc (mm)	Pipe wall thickness tc (mm)	Pipe insulation	Pipe insulation thickness (mm)	Separation a1 (mm)	Separation a2 (mm)	Separation a3 (mm)	FRL
H.58	1	16	2.6	CS, FR Section 5.8 insulation including Armaflex	8.0 to 32.0	213	50	50	-/120/120
H.59	1	20	2.9		8.5 to 33.5	213	50	50	
H.60	1	25	3.7		8,5 to 35.0	213	50	50	
H.61	1	32	4.7		9.0 to 35.0	213	50	50	
H.62	1	40	6.0		9.0 to 35.0	213	50	50	

Application reference	Material: PE-RT/AL/PE-RT (e.g. Uponor MLC)					
	Layers	Pipe diameter Ø dc (mm)	Pipe wall thickness tc (mm)	Pipe insulation	Pipe insulation thickness (mm)	FRL
H.63	1	16	2.0	CS, FR Section 5.8 insulation including Armaflex	8.0 to 32.0	-/120/90
H.64	1	20	2.25		8.5 to 33.5	
H.65	1	25	2.5		8.5 to 35.0	
H.66	1	32	3.0		9.0 to 35.0	
H.67	2	50	4.5		9.0 to 38.0	
H.68	2	63	6.0		9.5 to 39.5	
H.69	2	75	7.5		9.5 to 40.5	

Application reference	Material: PE-RT/AL/PE-RT (e.g. Uponor MLC)								
	Layers	Pipe diameter Ø dc (mm)	Pipe wall thickness tc (mm)	Pipe insulation	Pipe insulation thickness (mm)	Separation a1 (mm)	Separation a2 (mm)	Separation a3 (mm)	FRL
H.70	1	16	2.0	CS, FR Section 5.8 insulation including Armaflex	8.0 to 32.0	213	50	0	-/120/120
H.71	1	20	2.25		8.5 to 33.5	213	50	0	
H.72	1	25	2.5		8.5 to 35.0	213	50	0	
H.73	1	32	3.0		9.0 to 35.0	213	50	0	
H.74	2	50	4.5		9.0 to 38.0	109	0	0	
H.75	2	63	6.0		9.5 to 39.5	109	0	0	
H.76	2	75	7,5		9,5 to 40,5	109	0	0	

Application reference	Material: PE-X/AL/PE-X (e.g. Kekelit Kelox)					
	Layers	Pipe diameter Ø dc (mm)	Pipe wall thickness tc (mm)	Pipe insulation	Pipe insulation thickness (mm)	FRL
H.77	1	16	2.0	CS, FR Section 5.8 insulation including Armaflex	8.0 – 32.0	-/120/90
H.78	1	20	2.25		8.5 – 33.5	
H.79	1	25	2.5		8.5 – 35.0	
H.80	1	32	3.0		9.0 – 35.0	
H.81	2	> 32 to < 75	> 3.0 to < 7.5		9.0 – 35.0	
H.82	2	75	7.5		9.5 – 35.0	

Application reference	Material: PE-Xb/AL/PE-HD (e.g. Geberit Mepla)					
	Layers	Pipe diameter Ø dc (mm)	Pipe wall thickness tc (mm)	Pipe insulation	Pipe insulation thickness (mm)	*FRL*
H.83	1	16	2,3	CS, FR Section 5.8 insulation including Armaflex	8.0 to 32.0	-/120/90
H.84	1	20	2,5		8.5 to 33.5	
H.85	1	26	3,0		8.5 to 35.0	
H.86	1	32	3,0		9.0 to 35.0	
H.87	2	> 32 to < 75	> 3,0 to < 7,5		9.0 to 36.0	
H.88	2	75	7,5		9.5 to 40.5	

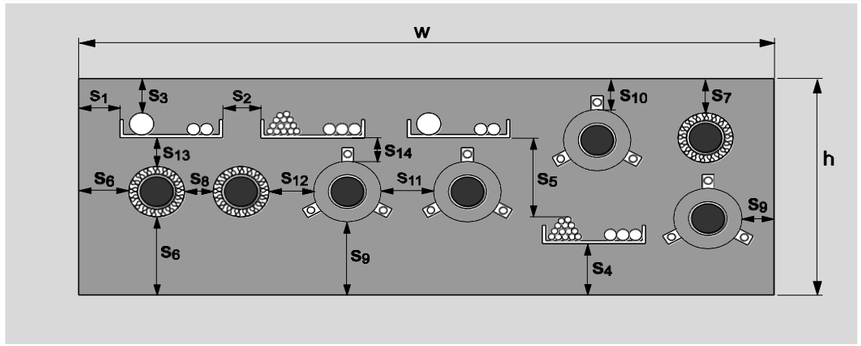
Application reference	Material: PE-Xb/AL/PE-HD (e.g. Geberit Mepla)								
	Layers	Pipe diameter Ø dc (mm)	Pipe wall thickness tc (mm)	Pipe insulation thickness (mm)	Pipe insulation	Separation a1 (mm)	Separation a2 (mm)	Separation a3 (mm)	FRL
H.89	1	16	2,3	8,0 to 32,0	CS, FR Section 5.8 insulation including Armaflex	212	107	50	-/120/120
H.90	1	20	2,5	8,5 to 33,5		212	107	50	
H.91	1	26	3,0	8,5 to 35,0		212	107	50	
H.92	1	32	3,0	9,0 to 35,0		140	103	50	

Application reference	Material: PE-Xc/AL/PE-Xc, e.g. Viega Sanfix Fosta and Viega Raxofix distances: S8 ≥ 100 mm, S6 ≥50 mm (see 1.8) Additional Protect Insulation (LI, 250 mm): flexible elastomeric insulation and mineral wool specification see section 5.8.2							
	Layers	Pipe diameter Ø dc (mm)	Pipe wall thickness tc (mm)	Pipe insulation	Pipe insulation thickness (mm)	Additional Protect Insulation Material:	Additional Protect Insulation thickness (mm)	FRL
H.93	1	16	2.2	CS, FR Section 5.8 insulation including Armaflex	8.0 – 32.0	none	0	-/120/120
H.94	1	20	2.8		8.5 – 33.5	none	0	-/120/120
H.95	1	25	2.7		8.5 – 35.0	none	0	-/120/120
H.96	1	32	3.2		9.0 – 35.0	none	0	-/120/120
H.97	1	40	3.5		9.0 – 36.5	none	0	-/120/120
H.98	2	50	4.0		9.0 – 38.0	none	0	-/60/60
H.99	2	63	4.5		9.5 – 39.5	none	0	-/60/60
H.100	2	63	4.5		9.5 – 39.5	Elastomer, see details for AP4	19	-/120/120
H.101	2	63	4,5		9.5 – 39.5	AP2 Mineral wool	30	-/120/120

Application reference	Material: PE-Xc/AL/PE-Xc, e.g. Viega Sanfix Fosta and Viega Raxofix distances: S8 > 100 mm, S6 >50 mm (see 1.8) pipe insulation (CS): mineral wool specification see section 5.8.1						
	Layers	Pipe diameter Ø dc (mm)	Pipe wall thickness tc (mm)	Pipe insulation Material:	Pipe insulation thickness (mm)	Additional Protect Insulation Material:	FRL
H.102	0	16	2.2	Mineral wool	20 - 40	none	*-/120/120*
H.103	0	20	2.8	Mineral wool	20 - 50	none	
H.104	0	25	2.7	Mineral wool	20 - 60	none	
H.105	0	32	3.2	Mineral wool	20 - 60	none	
H.106	0	40	3.5	Mineral wool	20 - 60	none	
H.107	0	50	4.0	Mineral wool	20 - 60	none	
H.108	0	63	4.5	Mineral wool	20 - 60	none	

Application reference	Material: PE-HD/AL/PE-HD (e.g. Geberit PushFit ML), Approved pipe insulation material (CS): flexible elastomeric insulation see 1.6.1 Distances: S8 > 100 mm, S6 >50 mm (see 1.8)							
	Layers	**Pipe diameter Ø dc (mm)**	**Pipe wall thickness tc (mm)**	**Pipe insulation Material:**	**Pipe insulation thickness (mm)**	**Additional Protect Insulation Material:**	**Additional Protect Insulation thickness (mm)**	**FRL**
H.109	1	20	2.0	Elastomer	8.5 – 33.5	none	0	-/120/120
H.110	1	25	2.5	Elastomer	8.5 – 35.0	none	0	
H.111	0	20	2.0	Mineral wool	20 - 40	none	0	
H.112	0	25	2.5	Mineral wool	20 - 60	none	0	
H.113		Approved pipe insulation material (LS, total length: > 650mm): flexible PE isolation						
H.114	1	20	2.0	PE-foam	6	none	0	-/120/120
H.115	1	25	2.5	PE-foam	6	none	0	-/120/120

9.2 FLEXIBLE OR RIGID WALLS, T_E ≥ 135 MM, WALL TYPE A.1.3, A.1.4, A.1.5



Solutions in the section are only valid under the following distance requirements

s6 =	0	(distance between insulated metal pipes and seal edge)
s8 =	0	(distance between insulated metal pipes)
s9 =	15	(distance between plastic pipes/pipe closure devices and seal edge)
s11 =	0	(distance between plastic pipes/pipe closure devices)
s12 =	0	(distance between insulated metal pipes and plastic pipes/pipe closure devices)
s13 =	40	(distance between cables/cable supports and metal pipes)
s14 =	40	(distance between cables/cable supports and plastic pipes/pipe closure devices)

Other clear spacings where here not specified, minimum 40 mm

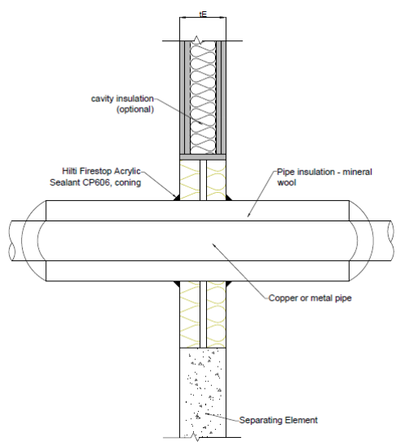
9.2.1 Copper pipes with mineral wool insulation according to Section 5.8

For specification of the foamed elastomeric insulation to be used see Section 5.8.1

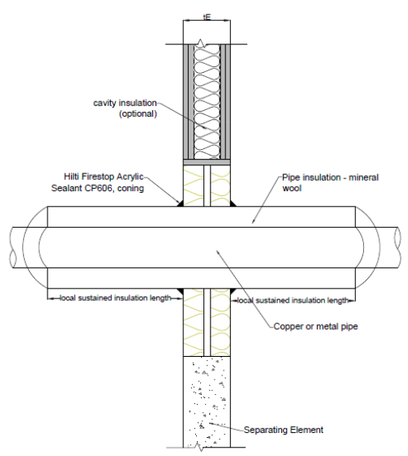
The field of application given for copper pipes is also valid for other metal pipes with lower heat conductivity than copper and a melting point of minimum 1100°C, e.g. unalloyed steel, low alloyed steel, cast iron, stainless steels, Ni alloys (NiCu, NiCr and NiMo alloys) and Ni.

Spacing between mineral wool insulated copper or metal pipe can disregard the coning size, however, spacing between services needs to comply with the spacing requirements in general. Coning is needed at the perimeter of the services

Continued insulation, sustained (CS)



Local insulation, sustained (LS)



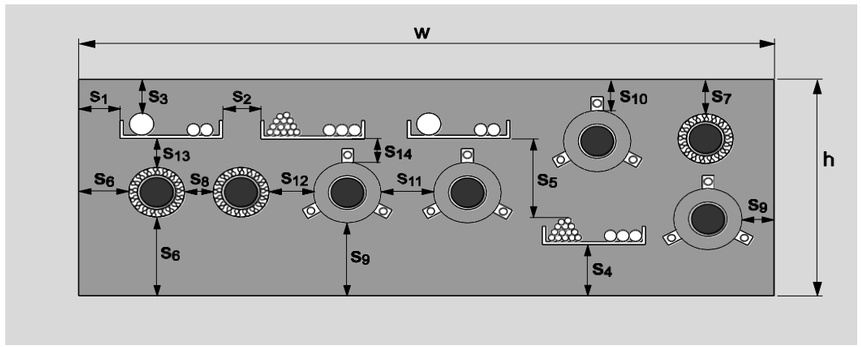
Continued insulation, sustained (CS)

Application reference	Pipe material	pipe dia - OD	pipe wall thickness	Pipe insulation	pipe insulation thickness (mm)	local seal	additional protection	FRL
H.116	copper	Up to 88.9	1.8 - 14.2	CS, mineral wool insulation 80 Kg/m^3 density	≥ 40	CP 606 between insulated pipe and CFS-CT B coated board according to section 1.10	15 x 15 mm CP 606 sealant coning, both sides	-/120/120

Local insulation, sustained (LS)

Application reference	Pipe material	pipe dia - OD	pipe wall thickness	Pipe insulation	pipe insulation thickness (mm)	local insulation length each side (LD, mm)	local seal	additional protection	FRL
H.117	copper	Up to 88.9	1.8 - 14.2	LS, mineral wool insulation 80 Kg/m^3 density	40	≥ 800	CP 606 between insulated pipe and CFS-CT B coated board according to section 1.10	15 x 15 mm CP 606 sealant coning, both sides	-/120/120

9.3 RIGID WALLS, $T_E \geq 150$ MM, WALL TYPE A.1.4, A.1.5



Solutions in the section are only valid under the following distance requirements

Minimum distances in mm metal pipe penetration seal:
s6, s9 = 0 (distance between pipes and lateral seal edge
s7, s10 = 45 (distance between pipes and upper seal edge)
s8, s11, s12 = 30 (distance between pipes)

Minimum distances in mm cable penetration seal:

s1 =	10	(distance between cables/cable supports and seal edge)
s2 =	40	(distance between cable supports)
s3 =	40	(distance between cables and upper seal edge)
s4 =	0	(distance between cable supports and bottom seal edge)
s5 =	40	(distance between cables and cable support above)

Other clear spacings where here not specified, minimum 40 mm

9.3.1 Copper pipes with foamed elastomeric insulation according to Section 5.8 and Hilti Firestop Bandage CFS-B

For specification of the foamed elastomeric insulation and mineral wool insulation material to be used see Section 5.8

In general, Two layers of Firestop Bandage CFS-B (A_2) wrapped around the pipe insulation, on each side of the seal. The bandage is positioned with half of its width (62.5 mm) within the seal (central marking line at the surface of the seal) and outside the seal fixed with wire.

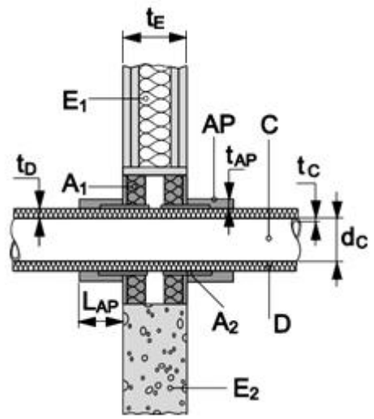
Additional protection:

Over the bandage/pipe insulation an additional protection AP according to Section 5.8 is installed:

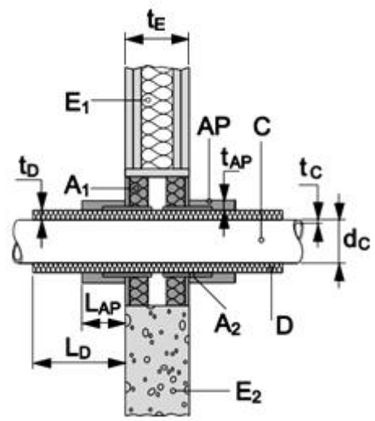
AF/Armaflex pipe insulation or mineral wool according to Section 5.8 wrapped around the bandage/pipe insulation on each side of the seal, fixed with wire, length (L_{AP}) = 300 mm on each side, thickness (t_{AP}) = 19 mm.

The field of application given for copper pipes is also valid for other metal pipes with lower heat conductivity than copper and a melting point of minimum 1100°C, e.g. unalloyed steel, low alloyed steel, cast iron, stainless steels, Ni alloys (NiCu, NiCr and NiMo alloys) and Ni.

Continued insulation, sustained (CS)



Local insulation, sustained (LS)



Single insulated pipe, Local insulation, sustained (LS)

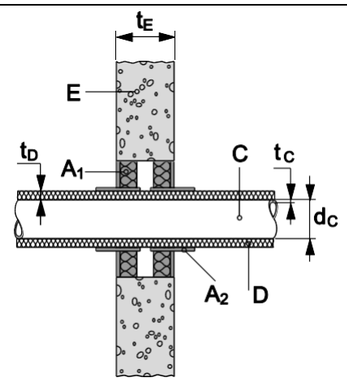
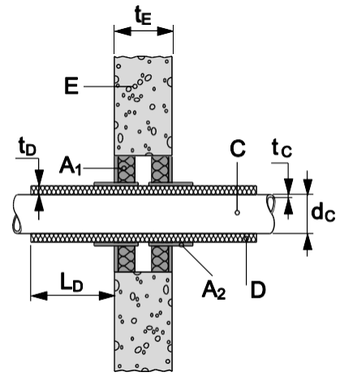
Application reference	Pipe material	pipe dia - OD	pipe wall thickness	Pipe insulation	pipe insulation thickness (mm)	local insulation length each side (LD, mm)	local firestop bandage install	local seal	additional protection	FRL
H.118	copper	Up to 28	1.0 – 14.2	LS, FR Section 5.8 insulation including Armaflex	19 - 35	≥ 500	Two layers of Firestop Bandage CFS-B (A2) wrapped around the pipe insulation, on each side of the seal. The bandage is positioned with half of its width (62.5 mm) within the seal (central marking line at the surface of the seal) and outside the seal fixed with wire	CP 606 between CFS-B and CFS-CT B coated board according to section 1.10	not required	-/60/60
H.119	copper	Up to 28	1.0 – 14.2		35	≥ 500				-/120/120

9.3.2 Steel and Stainless Steel pipes with foamed elastomeric insulation according to Section 5.8 and Hilti Firestop Bandage CFS-B

For specification of the foamed elastomeric insulation and mineral wool insulation material to be used see Section 5.8

General installation configuration, Two layers of Firestop Bandage CFS-B (A_2) wrapped around the pipe insulation, on each side of the seal. The bandage is positioned with half of its width (62.5 mm) within the seal (central marking line at the surface of the seal) and outside the seal fixed with wire.

The field of application given steel pipes is also valid for other metal pipes with lower heat conductivity than steel and a melting point of minimum 1100°C, e.g. unalloyed steel, low alloyed steel, cast iron, stainless steels, Ni alloys (NiCu, NiCr and NiMo alloys) and Ni.

Continued insulation, sustained (CS)	Local insulation, sustained (LS)
	

Continued insulation, sustained (CS)

Application reference	Pipe material	pipe dia - OD	pipe wall thickness	Pipe insulation	pipe insulation thickness (mm)	local firestop bandage installation	local seal	FRL
H.120	Steel	Up to 60.3	3.6 - 14.2	CS, FR Section 5.8 insulation including Armaflex	21.5 - 39	Two layers of Firestop Bandage CFS-B (A2) wrapped around the pipe insulation, on each side of the seal. The bandage is positioned with half of its width (62.5 mm) within the seal (central marking line at the surface of the seal) and outside the seal fixed with wire	CP 606/ CFS-S-ACR between CFS-B and CFS-CT B coated board according to section 1.10	-/90/90
H.121		Up to 60.3	3.6 - 14.2		39			-/120/120
H.122		60.3 - 114.3	3.6 – 14.2		21.5 - 39			-/60/60
H.123		Up to 114.3	3.6 – 14.2		43			-/90/90

Application reference	Pipe material	pipe dia - OD	pipe wall thickness	Pipe insulation	pipe insulation thickness (mm)	local firestop bandage installation	local seal	FRL
H.124	Stainless Steel	Up to 60.3	2 - 14.2	CS, FR Section 5.8 insulation including Armaflex	21.5 - 39	Two layers of Firestop Bandage CFS-B (A2) wrapped around the pipe insulation, on each side of the seal. The bandage is positioned with half of its width (62.5 mm) within the seal (central marking line at the surface of the seal) and outside the seal fixed with wire	CP 606 between CFS-B and CFS-CT B coated board according to section 1.10	-/90/90
H.125		Up to 60.3	2 - 14.2		39			-/120/120

Local insulation, sustained (LS)

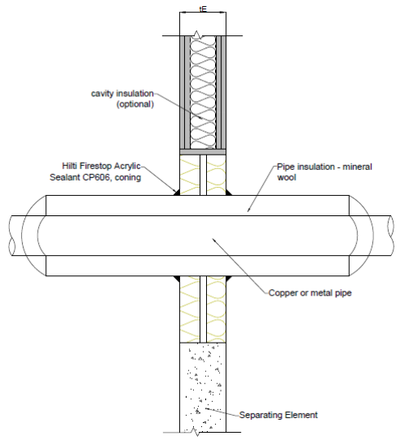
Application reference	Pipe material	pipe dia - OD	pipe wall thickness	Pipe insulation	pipe insulation thickness (mm)	local insulation length each side (LD, mm)	local firestop bandage installation	local seal	FRL
H.126	Steel	Up to 60.3	3.6 - 14.2	LS, FR Section 5.8 insulation including Armaflex	21.5 - 39	≥ 500	Two layers of Firestop Bandage CFS-B (A2) wrapped around the pipe insulation, on each side of the seal. The bandage is positioned with half of its width (62.5 mm) within the seal (central marking line at the surface of the seal) and outside the seal fixed with wire	CP 606 between CFS-B and CFS-CT B coated board according to section 1.10	-/90/90
H.127		Up to 60.3	3.6 - 14.2		39				-/120/120
H.128		60.3 - 114.3	3.6 – 14.2		21.5 - 39				-/60/60
H.129		Up to 114.3	3.6 – 14.2		43				-/90/90

Application reference	Pipe material	pipe dia - OD	pipe wall thickness	Pipe insulation	pipe insulation thickness (mm)	local insulation length each side (LD, mm)	local firestop bandage installation	local seal	FRL
H.130	Stainless Steel	Up to 60.3	2 - 14.2	CS, FR Section 5.8 insulation including Armaflex	21.5 - 39	≥ 500	Two layers of Firestop Bandage CFS-B (A2) wrapped around the pipe insulation, on each side of the seal. The bandage is positioned with half of its width (62.5 mm) within the seal (central marking line at the surface of the seal) and outside the seal fixed with wire	CP 606 between CFS-B and CFS-CT B coated board according to section 1.10	-/90/90
H.131		Up to 60.3	2 - 14.2		39				-/120/120

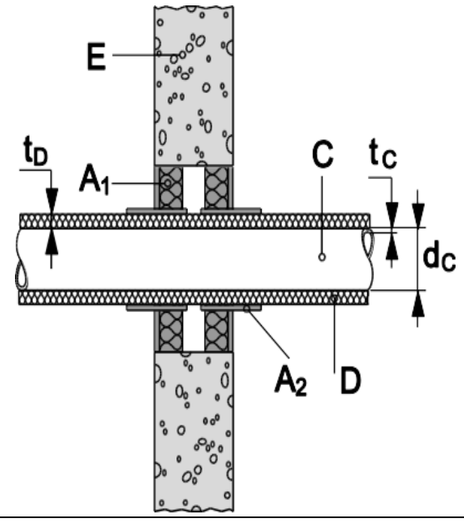
9.3.3 Copper pipes with mineral wool insulation according to Section 5.8

For specification of the foamed elastomeric insulation and mineral wool insulation material to be used see Section 5.8
Spacing between mineral wool insulated copper or metal pipe can disregard the coning size, however, spacing between services needs to comply with the spacing requirements in general. Coning is needed at the perimeter of the services
Additional protection:
Mineral wool insulation for sustained and interrupted configuration refers to Section 5.8.1
Over the pipe insulation an additional protection AP according to Section 5.8 is installed:
mineral wool wrapped around the pipe insulation on both sides of the seal, fixed with wire, length along the pipe 250 mm, thickness 40 mm.
The field of application given for copper pipes is also valid for other metal pipes with lower heat conductivity than copper and a melting point of minimum 1100°C, e.g. unalloyed steel, low alloyed steel, cast iron, stainless steels, Ni alloys (NiCu, NiCr and NiMo alloys) and Ni.

Continued insulation, sustained (CS) with CP 606 local coning



Local insulation, sustained (LS) with CP 606 local coning



Continued insulation, sustained (CS)

Application reference	Pipe material	pipe dia - OD	pipe wall thickness	Pipe insulation	pipe insulation thickness (mm)	local seal	additional protection	FRL
H.132	copper	Up to 42	1.8 - 14.2	CS, mineral wool insulation 80 Kg/m^3 density	≥ 20	CP 606 between insulated pipe and CFS-CT B coated board according to section 1.10	15 x 15 mm CP 606 sealant coning, both sides	-/120/120
H.133	copper	Up to 88.9	1.8 - 14.2	CS, mineral wool insulation 80 Kg/m^3 density	≥ 40	CP 606 between insulated pipe and CFS-CT B coated board according to section 1.10	15 x 15 mm CP 606 sealant coning, both sides	-/120/120

Local insulation, sustained (LS)

Application reference	Pipe material	pipe dia - OD	pipe wall thickness	Pipe insulation	pipe insulation thickness (mm)	local insulation length each side (LD, mm)	local seal	Additional protection	FRL
H.134	copper	Up to 42	1.5 - 14.2	LS, mineral wool insulation 80 Kg/m^3 density	≥40	≥ 500	CP 606 between insulated pipe and CFS-CT B coated board according to section 1.10	15 x 15 mm CP 606 sealant coning, both sides	-/120/120
H.135	copper	Up to 88.9	1.8 - 14.2	LS, mineral wool insulation 80 Kg/m^3 density	≥40	≥ 800	CP 606 between insulated pipe and CFS-CT B coated board according to section 1.10	15 x 15 mm CP 606 sealant coning, both sides	-/120/120

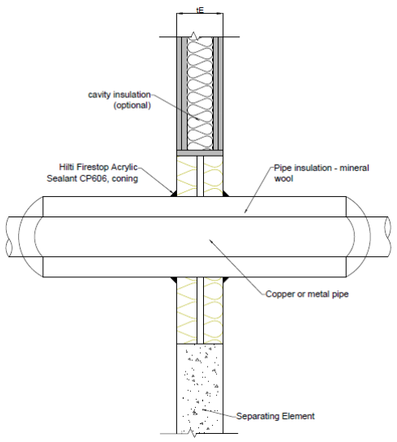
9.3.4 Steel and Stainless Steel pipes with mineral wool insulation according to Section 5.8

For specification of the mineral wool pipe insulation material to be used see Section 5.8.1

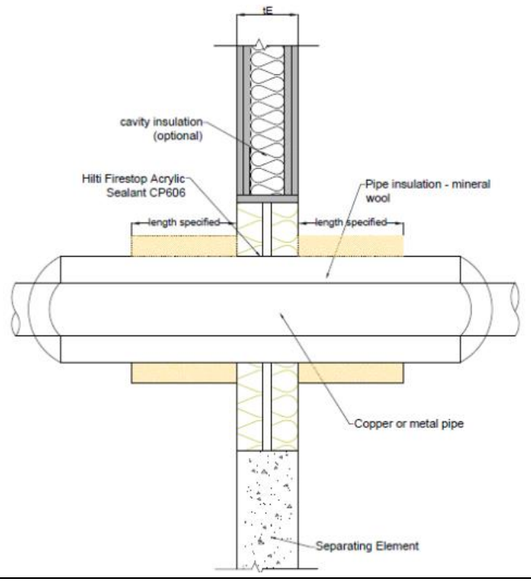
The field of application given steel pipes is also valid for other metal pipes with lower heat conductivity than steel and a melting point of minimum 1100°C, e.g. unalloyed steel, low alloyed steel, cast iron, stainless steels, Ni alloys (NiCu, NiCr and NiMo alloys) and Ni.

Spacing between mineral wool insulated copper or metal pipe can disregard the coning size, however, spacing between services needs to comply with the spacing requirements in general. Coning is needed at the perimeter of the services

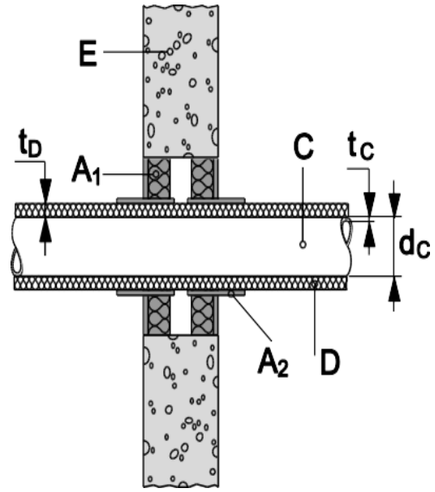
Continued insulation, sustained (CS) with CP 606 local coning



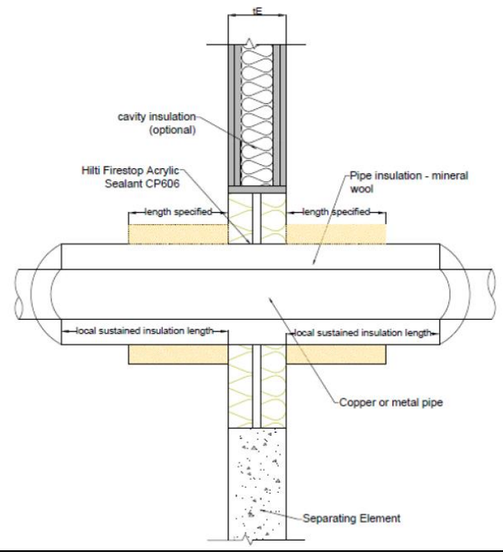
Continued insulation, sustained (CS) with additional mineral wool wrapping



Local insulation, sustained (LS) with CP 606 local coning



Continued insulation, sustained (CS) with additional mineral wool wrapping



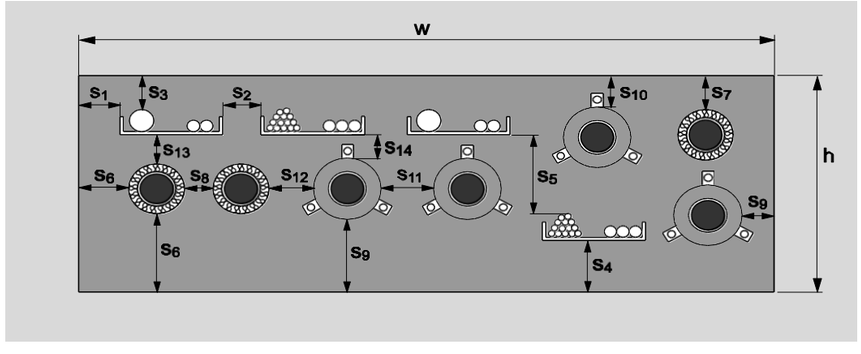
Continued insulation, sustained (CS)

Application reference	Pipe material	pipe dia - OD	pipe wall thickness	Pipe insulation	pipe insulation thickness (mm)	local seal	additional protection	FRL
H.136	Steel	Up to 48.3	1.6 - 14.2	CS, mineral wool insulation 80 Kg/m^3 density	>=20	CP 606 between insulated pipe and CFS-CT B coated board according to section 1.10	15 x 15 mm CP 606 sealant coning, both sides	-/180/180
H.137		32 – 114.3	2.0 - 14.2		>=30		15 x 15 mm CP 606 sealant coning, both sides	-/120/120
H.138		114.3 – 159.0	2.6 – 14.2		>=40		15 x 15 mm CP 606 sealant coning, both sides	-/120/120
H.139		159.0 - 323.9	2.6 – 14.2		>=40		15 x 15 mm CP 606 sealant coning, both sides	-/90/90
H.140		159.0 - 323.9	2.6 – 14.2		>=40		AP2 Mineral wool blanket, min. 60 density, wrapped around the pipe insulation on both sides of the seal, fixed according to Section 5.8, length along the pipe 250 mm, thickness 40 mm	-/120/120

Local insulation, sustained (LS)

Application reference	Pipe material	pipe dia - OD	pipe wall thickness	Pipe insulation	pipe insulation thickness (mm)	local insulation length each side (LD, mm)	local seal	additional protection	FRL
H.141	Steel	Up to 48.3	1.6 - 14.2	LS, mineral wool insulation 80 Kg/m^3 density	>=20	≥ 500	CP 606 between insulated pipe and CFS-CT B coated board according to section 1.10	15 x 15 mm CP 606 sealant coning, both sides	-/120/120
H.142		32 – 114.3	2.0 – 14.2		>=30	≥ 500		15 x 15 mm CP 606 sealant coning, both sides	-/120/120
H.143		114.3 – 159.0	2.0/2.6 – 14.2		>=40	≥ 500		15 x 15 mm CP 606 sealant coning, both sides	-/90/90
H.144		114.3 – 159.0	2.0/2.6 – 14.2		>=40	≥ 1000		15 x 15 mm CP 606 sealant coning, both sides	-/120/120
H.145		159.0 – 323.9	2.6/4.0 – 14.2		>=40	≥ 1000		15 x 15 mm CP 606 sealant coning, both sides	-/90/90
H.146		159.0 – 323.9	2.6/4.0 – 14.2		>=40	≥ 1000		AP2 Mineral wool blanket, min. 60 density, wrapped around the pipe insulation on both sides of the seal, fixed according to Section 5.8, length along the pipe 250 mm, thickness 40 mm	-/120/120

9.4 RIGID FLOOR , T_E ≥ 150 MM, FLOOR TYPE A.1.7



Solutions in the section are only valid under the following distance requirements

Minimum distances in mm metal pipe penetration seal:

s6 = 10 (distance between pipes and lateral seal edge)

s9 = 0 (distance between pipes and lateral seal edge)

s7, s10 = 40 (distance between pipes and upper seal edge)

s8 = 20 (distance between pipes)

s11 = 0 (distance between pipes)

s12 = 30 (distance between pipes)

Minimum distances in mm cable penetration seal:

s1 = 0 (distance between cables/cable supports and seal edge)

s2 = 0 (distance between cable supports)

s3 = 0 (distance between cables and upper seal edge)

s4 = 0 (distance between cable supports and bottom seal edge)

s5 = 40 (distance between cables and cable support above)

s13 = 30 (distance between pipes)

s14 = 32 (distance between pipes)

Other clear spacings where here not specified, minimum 40 mm

9.4.1 Copper pipes with foamed elastomeric insulation according to Section 5.8 and Hilti Firestop Bandage CFS-B

For specification of the foamed elastomeric insulation and mineral wool insulation material to be used see Section 5.8

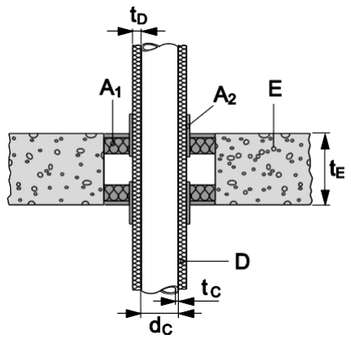
In general, two layers of Firestop Bandage CFS-B (A_2) wrapped around the pipe insulation, on each side of the seal. The bandage is positioned with half of its width (62.5 mm) within the seal (central marking line at the surface of the seal) and outside the seal fixed with wire.

Additional protection:

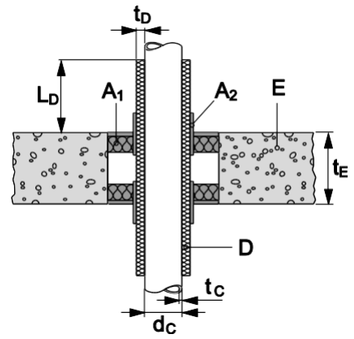
Over the bandage/pipe insulation an additional protection AP according to Section 5.8 is installed:

The field of application given for copper pipes is also valid for other metal pipes with lower heat conductivity than copper and a melting point of minimum 1100°C, e.g. unalloyed steel, low alloyed steel, cast iron, stainless steels, Ni alloys (NiCu, NiCr and NiMo alloys) and Ni.

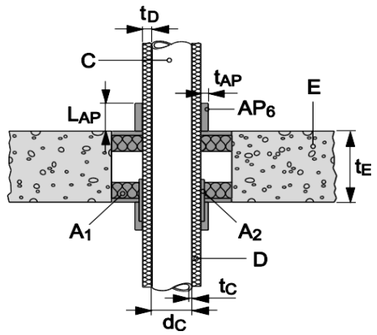
Continued insulation, sustained (CS)



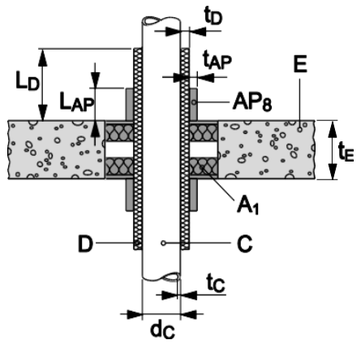
Local insulation, sustained (LS)



With addtional protection



With addtional protection



Single insulated pipe, Continued insulation, sustained (CS)

Application reference	Pipe material	pipe dia - OD	pipe wall thickness	Pipe insulation	thickness (mm)	local firestop bandage installation	local seal	Additional protection	FRL
H.147	copper	10-42	1.0/1.5 – 14.2	CS, FR Section 5.8 insulation including Armaflex	18 - 38	Two layers of Firestop Bandage CFS-B (A2) wrapped around the pipe insulation, on each side of the seal. The bandage is positioned with half of its width (62.5 mm) within the seal (central marking line at the surface of the seal) and outside the seal fixed with wire	CP 606 between CFS-B and CFS-CT B coated board according to section 1.10	not required	-/90/90
H.148	copper	10-42	1.0/1.5 – 14.2		18 - 38			20 × 20 mm coning outside of CFS B bandage at the base of CFS CT B coated board, each side	-/120/120
H.149	copper	10-42	1.0/1.5 – 14.2		45.5 – 47.5			AP2: 60 density 25 mm MW mat or AP4: 32 mm thick wrapped around 250 mm on each side	-/90/90
H.150	copper	40-88.9	1.0/1.5 – 14.2		7.5 - 9				-/120/120
H.151	copper	42 – 88.9	1.0/1.5 – 14.2		15 – 47.5			AP2: 60 density 25 mm MW mat or AP4: 32 mm thick wrapped around 250 mm on each side	-/60/60

Single pair coil with or without cable, Continued insulation, sustained (CS)

Application reference	Pair coil tube size		Insulation thickness (mm)	Pipe insulation	With or without cable	local firestop bandage installation	local seal	FRL	FRL
	mm	Inch							
H.152	6.35-9.52	1/4-3/8	13 or 19	CS, FR Section 5.8 insulation including Armaflex	1 x power cable up to 2.5 mm^2 1 x cat data cable up to 1 mm_2	Two layers of Firestop Bandage CFS-B (A2) wrapped around the pipe insulation, on each side of the seal. The bandage is positioned with half of its width (62.5 mm) within the seal (central marking line at the surface of the seal) and outside the seal fixed with wire, CP 606 / CP 611A needed in gap between CFS B bandage and pair coil, 20 mm depth	CP 606 between CFS-B and CFS-CT B coated board according to section 1.10	-/90/90 (only one layer of CFS-B each side of seal)	-/120/120
H.153	6.35-12.7	1/4-1/2	13 or 19						
H.154	6.35-15.88	1/4-5/8	13 or 19						
H.155	9.5-15.99	3/8-5/8	13 or 19						
H.156	9.5-19.05	3/8-3/4	13 or 19						

Note: The table above also applies to two single insulated copper pipe which pipe sizes are smaller to 9.5 mm and 15.99 mm respectively and insulation size between 13-19 mm bundled together

Multiple single insulated pipe in a bundle, Continued insulation, sustained (CS)

Application reference	Pipe material	pipe dia - OD	pipe wall thickness	Pipe insulation	pipe insulation thickness (mm)	number of insulated pipe in a bundle	local firestop bandage installation	local seal	additional protection	FRL
H.157	copper	10-42	1.0/1.5 – 14.2	CS, FR Section 5.8 insulation including Armaflex	18 - 38, the insulation thickness between the two pipes adds up must be less than 64 mm	2	Two layers of Firestop Bandage CFS-B (A2) wrapped around the pipe insulation, on each side of the seal. The bandage is positioned with half of its width (62.5 mm) within the seal (central marking line at the surface of the seal) and outside the seal fixed with wire, CP 611A needed in gap between CFS B bandage and pair coil, 20 mm depth	CP 606 between CFS-B and CFS-CT B coated board according to section 1.10	not required	-/90/90
H.158									20 x 20 mm coning outside of CFS B bandage at the base of CFS CT B coated board, each side	-/120/120

Multiple pair coil in a bundle, Continued insulation, sustained (CS)

Application reference	air coil tube size		Insulation thickness (mm)	Pipe insulation	With or without cable	number of insulated pipe in a bundle	local firestop bandage installation	local seal	FRL
	mm	Inch							
H.159	up to 9.5-19.05	up to 3/8-3/4	13 or 19	CS, FR Section 5.8 insulation including Armaflex	1 x power cable up to 2.5 mm^2 1 x cat data cable up to 1 mm^2	3	Two layers of Firestop Bandage CFS-B (A2) wrapped around the pipe insulation, on each side of the seal. The bandage is positioned with half of its width (62.5 mm) within the seal (central marking line at the surface of the seal) and outside the seal fixed with wire, CP 611A needed in gap between CFS B bandage and pair coil, 20 mm depth	CP 606 between CFS-B and CFS-CT B coated board according to section 1.10	-/120/120

Note: The table above also applies to multiple single insulated copper pipe which pipe sizes are smaller to 9.5 mm and 15.99 mm respectively and insulation size between 13-19 mm bundled together, up to 6 insulated copper pipes

9.4.2 Copper pipes with foamed elastomeric insulation according to Section 5.8 and Hilti firestop wrap CFS-W P

Hilti Firestop Wrap CFS-W P (A_1) to be mounted on soffit of the Hilti Firestop Double Board Seal CFS-CT,

Hilti Firestop Wrap CFS-W P has to be installed from bottom and top side. The bottom side wrap comes 5 mm further than the bottom surface of the board seal, and on top side the Hilti Firestop Wrap CFS-W P has to be installed flush with the top surface of the board seal.

Annular gap between the pipe sealing and the double board sealed with Hilti Firestop Acrylic Sealant CP 606

For specification of the foamed elastomeric insulation and mineral wool insulation material to be used see Section 5.8

General installation configuration, layers of Hilti firestop wrap CFS-W P wrapped around the pipe insulation, on each side of the seal. The wrap can be taped and slide along the service to the required location, as shown in the drawings

Number of layers of Hilti firestop wrap CFS-W P is based on the diameter of the metal pipe, as below

Layer group	Diameter range (mm)	Number of layers
1	10 to 42	1
2	> 42 to 114	2
3	> 114 to 219	3

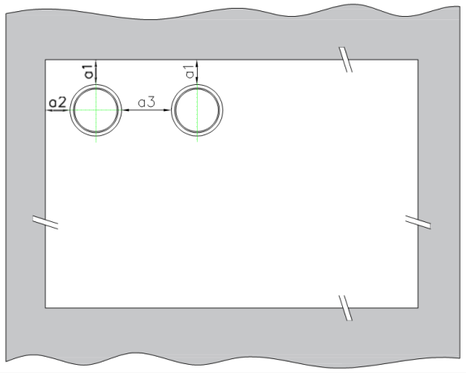
The field of application given to copper pipes is also valid for other metal pipes with lower heat conductivity than copper and a melting point of minimum 1100°C, e.g. unalloyed steel, low alloyed steel, cast iron, stainless steels, Ni alloys (NiCu, NiCr and NiMo alloys) and Ni.

For the solution coverage in this section, separation distance shall comply with below

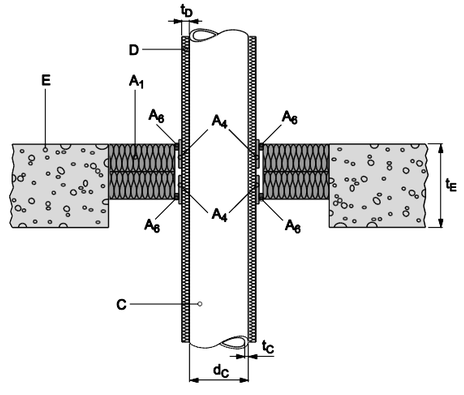
a_1 >= 25 (distance between cables/cable supports and seal edge

a_2 >= 25 (distance between cable supports)

a_3 >= 50 (distance between cables and upper seal edge)

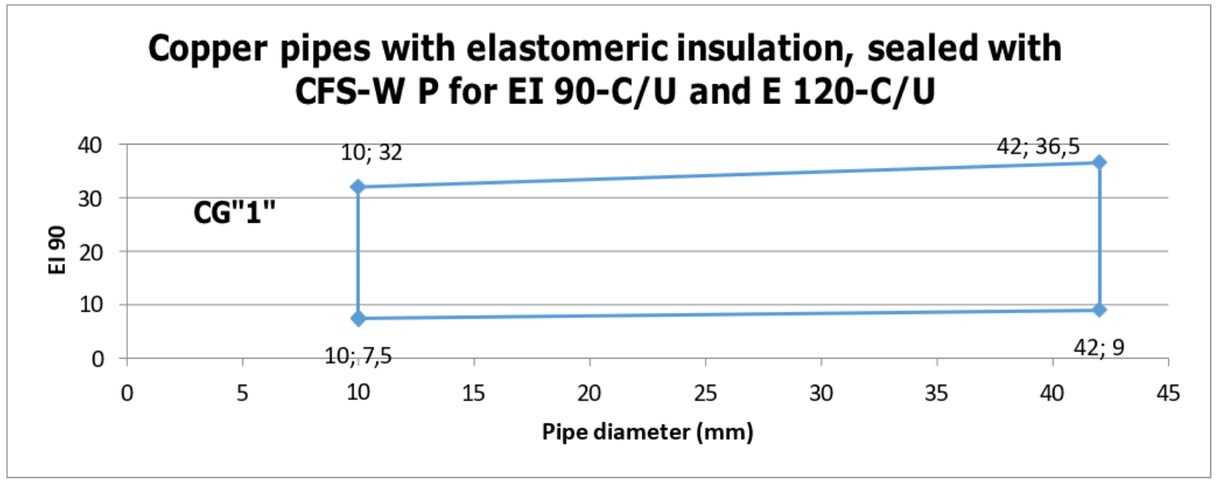


Continued insulation, sustained (CS)



Continued insulation, sustained (CS)

Application reference	Pipe material	pipe dia - OD	pipe wall thickness	Pipe insulation	pipe insulation thickness (mm)	Number of layers of CFS-W P	Seal type	local seal	FRL
H.160	copper	10	1.0	CS, FR Section 4.8 insulation including Armaflex	7.5 - 32	1		CP 606 between CFS-B and CFS-CT B coated board according to section 1.10	-/120/90
H.161		10 - 42	1.0 – 1.2		7.5/9 – 32/36.5	2			-/120/90



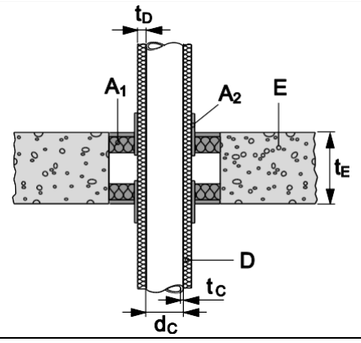
9.4.3 Steel and Stainless Steel pipes with foamed elastomeric insulation according to Section 5.8 and Hilti Firestop Bandage CFS-B

For specification of the foamed elastomeric insulation and mineral wool insulation material to be used see Section 5.8

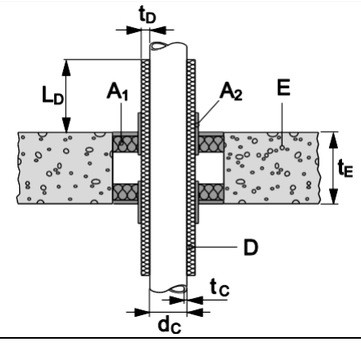
General installation configuration, Two layers of Firestop Bandage CFS-B (A_2) wrapped around the pipe insulation, on each side of the seal. The bandage is positioned with half of its width (62.5 mm) within the seal (central marking line at the surface of the seal) and outside the seal fixed with wire.

The field of application given steel pipes is also valid for other metal pipes with lower heat conductivity than copper and a melting point of minimum 1100°C, e.g. unalloyed steel, low alloyed steel, cast iron, stainless steels, Ni alloys (NiCu, NiCr and NiMo alloys) and Ni.

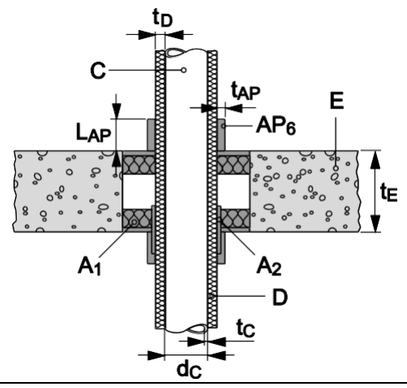
Continued insulation, sustained (CS)



Local insulation, sustained (LS)



With additional protection



Continued insulation, sustained (CS)

Application reference	Pipe material	pipe dia - OD	pipe wall thickness	Pipe insulation	pipe insulation thickness (mm)	local firestop bandage installation	local seal	Additional protection	FRL
H.162	Steel	Up to 60.3	3.6 - 14.210	CS, FR Section 5.8 insulation including Armaflex	21.5 - 39	Two layers of Firestop Bandage CFS-B (A2) wrapped around the pipe insulation, on each side of the seal. The bandage is positioned with half of its width (62.5 mm) within the seal (central marking line at the surface of the seal) and outside the seal fixed with wire	CP 606/ CFS-S-ACR between CFS-B and CFS-CT B coated board according to section 1.10	Not required	-/90/90
H.163		60.3 - 114.3	3.6 - 14.210		21.5 - 39			Not required	-/90/90
H.164		114.3	2.0 – 14.2		9 - 42			AP6, AF/Armaflex pipe insulation wrapped around the bandage/pipe insulation on each side of the seal, fixed with wire, length (LAP) = 250 mm on each side, thickness (tAP) = 26 mm, min 60 density	-/90/90
H.165		Up to 159	2.6 – 14.2		10				-/90/90

Application reference	Pipe material	pipe dia - OD	pipe wall thickness	Pipe insulation	pipe insulation thickness (mm)	local firestop bandage installation	local seal	FRL
H.166	Stainless Steel	Up to 60.3	2 - 14.2	CS, FR Section 5.8 insulation including Armaflex	21.5 - 39	Two layers of Firestop Bandage CFS-B (A2) wrapped around the pipe insulation, on each side of the seal. The bandage is positioned with half of its width (62.5 mm) within the seal (central marking line at the surface of the seal) and outside the seal fixed with wire	CP 606 between CFS-B and CFS-CT B coated board according to section 1.10	-/90/90
H.167					39			-/120/120

Local insulation, sustained (LS)

Application reference	Pipe material	pipe dia - OD	pipe wall thickness	Pipe insulation	pipe insulation thickness (mm)	local insulation length each side (LD, mm)	local firestop bandage installation	local seal	FRL
H.168	Steel	60.3	3.6 - 14.210	CS, FR Section 5.8 insulation including Armaflex	21.5 - 39	≥ 500	Two layers of Firestop Bandage CFS-B (A2) wrapped around the pipe insulation, on each side of the seal. The bandage is positioned with half of its width (62.5 mm) within the seal (central marking line at the surface of the seal) and outside the seal fixed with wire	CP 606/ CFS-S-ACR between CFS-B and CFS-CT B coated board according to section 1.10	-/90/90
H.169		60.3 - 114.3	3.6 - 14.210		21.5 - 39				-/90/90

9.4.4 Steel and Stainless Steel pipes with foamed elastomeric insulation according to Section 5.8 and Hilti firestop wrap CFS-W P

Hilti Firestop Wrap CFS-W P (A_1) to be mounted on soffit of the Hilti Firestop Double Board Seal CFS-CT,

Hilti Firestop Wrap CFS-W P has to be installed from bottom and top side.

The bottom side wrap comes 5 mm further than the bottom surface of the board seal, and on top side the Hilti Firestop Wrap CFS-W P has to be installed flush with the top surface of the board seal.

Annular gap between the pipe sealing and the double board sealed with Hilti Firestop Acrylic Sealant CP 606

For specification of the foamed elastomeric insulation and mineral wool insulation material to be used see Section 5.8

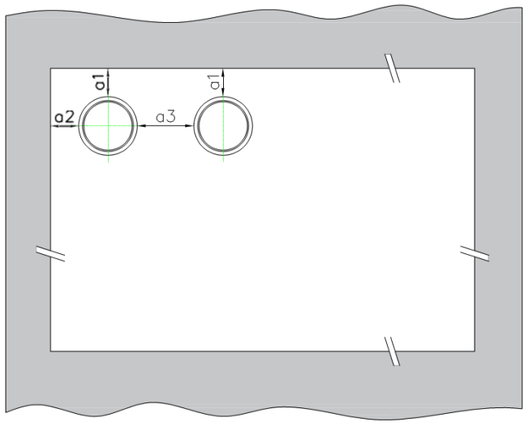
General installation configuration, layers of Hilti firestop wrap CFS-W P wrapped around the pipe insulation, on each side of the seal. The wrap can be taped and slide along the service to the required location, as shown in the drawings

Number of layers of Hilti firestop wrap CFS-W P is based on the diameter of the metal pipe, as below

Layer group	Diameter range (mm)	Number of layers
1	10 to 42	1
2	> 42 to 114	2
3	> 114 to 219	3

The field of application given steel pipes is also valid for other metal pipes with lower heat conductivity than steel and a melting point of minimum 1100°C, e.g. unalloyed steel, low alloyed steel, cast iron, stainless steels, Ni alloys (NiCu, NiCr and NiMo alloys) and Ni.

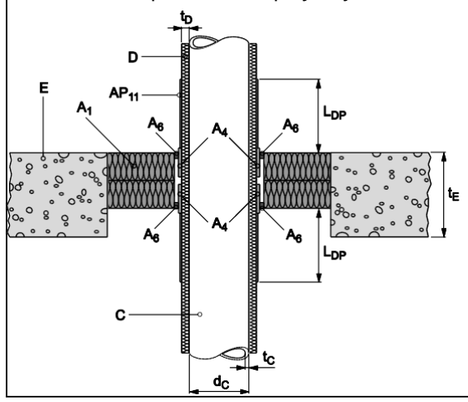
For the solution coverage in this section, separation distance shall comply with below
a_1 >= 25 (distance between cables/cable supports and seal edge
a_2 >= 25 (distance between cable supports)
a_3 >= 50 (distance between cables and upper seal edge)



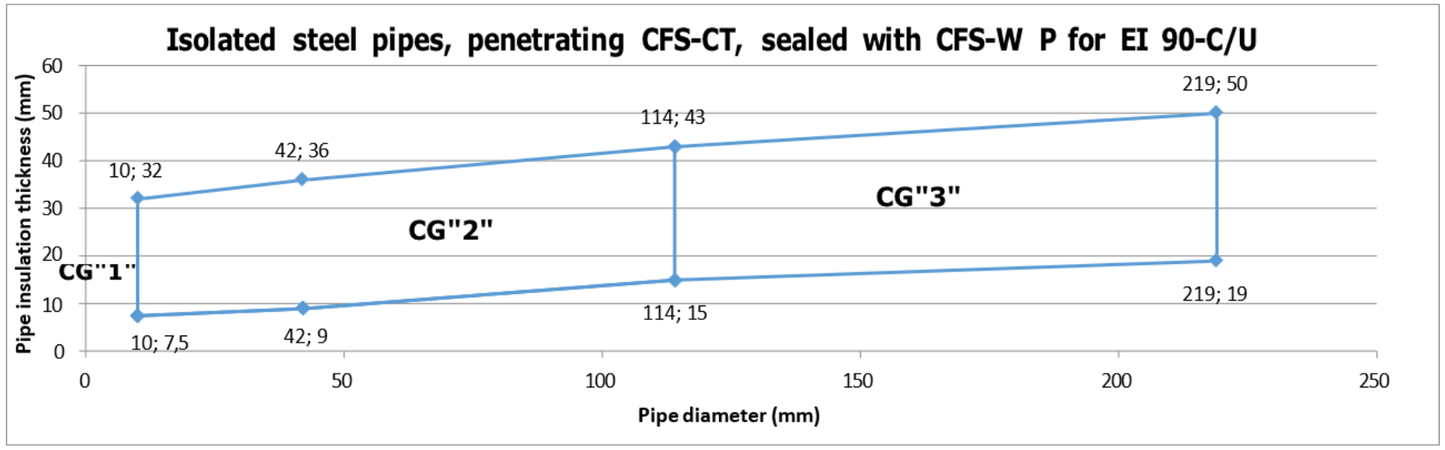
Continued insulation, sustained (CS)

add. protection AP7(ID2=200mm),

AP7 is Duct tape adhesive polyethylene based tape OR reinforced Aluminium foil tape, minimum 45 mm wide and total wrapping length minimum 200 mm, both sides of the floor. One layer is required.



Application reference	Pipe material	pipe dia - OD	pipe wall thickness	Pipe insulation	pipe insulation thickness (mm)	Number of layers of CFS-W P	local seal	Additional protection	FRL
H.170	steel	10 - 42	1.0 – 1.2	CS, FR Section 5.8 insulation including Armaflex	7.5/9 – 32/36	1	CP 606 between CFS-B and CFS-CT B coated board according to section 1.10	**AP7**, Duct tape adhesive polyethylene based tape OR reinforced Aluminium foil tape, minimum 45 mm wide and total wrapping length minimum 200 mm, both sides of the floor, one layer.	-/120/90
H.171		42 - 114	3.4		8.5/9.5 – 35/43	2			-/120/90
H.172		114 - 219	3.4 - 6.3		9.5/19 – 43/50	3			-/120/90



With additional pipe insulation

Application reference	Pipe material	pipe dia - OD	pipe wall thickness	Pipe insulation	pipe insulation thickness (mm)	Number of layers of CFS-W P	Additional pipe insulation thickness (mm)	local seal	FRL
H.173	steel	66.7	1.5	CS, FR Section 5.8 insulation including Armaflex	17.5 - 40	2	Not required	CP 606 between CFS-B and CFS-CT B coated board according to section 1.10	-/90/90
H.174		66.7	1.5		9.5 – 40	2	Mineral wool mat min. 60 density, 25 mm thick, 250 mm length each side		-/120/120
H.175		108	2.0		18.0 – 42.5	2	Mineral wool mat min. 60 density, 30 mm thick, 250 mm length each side		-/120/120

9.4.5 Copper pipes with mineral wool insulation according to Section 4.8

For specification of the foamed elastomeric insulation and mineral wool insulation material to be used see Section 4.8

Additional protection:

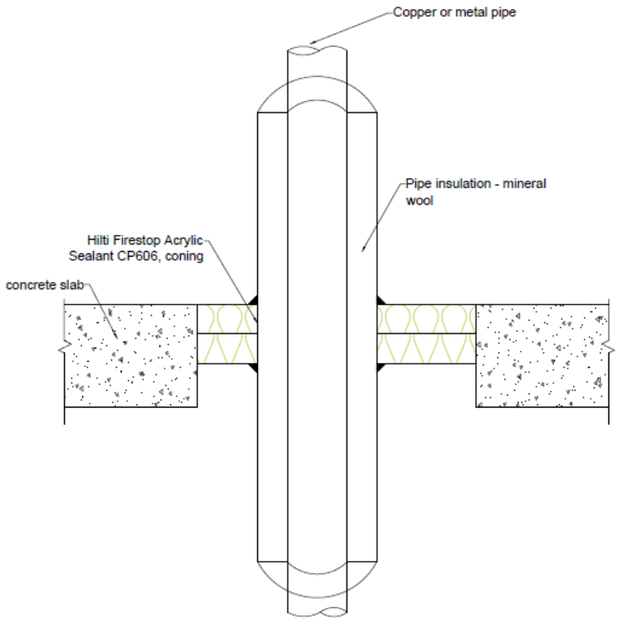
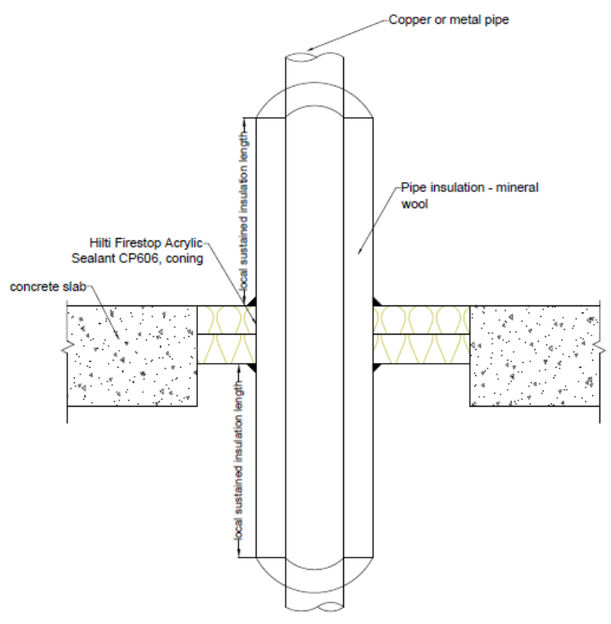
Mineral wool insulation for sustained and interrupted configuration refers to Section 4.8.1

Over the pipe insulation an additional protection AP according to Section 4.8 is installed:

mineral wool wrapped around the pipe insulation on both sides of the seal, fixed with wire, length along the pipe 250 mm, thickness 40 mm.

The field of application given for copper pipes is also valid for other metal pipes with lower heat conductivity than copper and a melting point of minimum 1100°C, e.g. unalloyed steel, low alloyed steel, cast iron, stainless steels, Ni alloys (NiCu, NiCr and NiMo alloys) and Ni.

Spacing between mineral wool insulated copper or metal pipe can disregard the coning size, however, spacing between services needs to comply with the spacing requirements in general. Coning is needed at the perimeter of the services

Continued insulation, sustained (CS) with CP 606 coning	Local insulation, sustained (LS) with CP 606 coning
	

Continued insulation, sustained (CS)

Application reference	Pipe material	pipe dia - OD	pipe wall thickness	Pipe insulation	pipe insulation thickness (mm)	local seal	additional protection	FRL
H.176	copper	10 - 42	1.0/1.5 - 14.2	CS, mineral wool insulation 80 Kg/m^3 density	≥ 20	CP 606 between insulated pipe and CFS-CT B coated board according to section 1.10	not required	-/120/120
H.177		42 – 88.9	1.5/2.0 - 14.2		≥ 40		not required	-/90/90

Local insulation, sustained (LS)

	Pipe material	pipe dia - OD	pipe wall thickness	Pipe insulation	pipe insulation thickness (mm)	local insulation length each side (LD, mm)	local seal	Additional protection	FRL
H.178	copper	10 - 42	1.0/1.5 - 14.2	LS, mineral wool insulation 80 Kg/m^3 density	≥ 20	≥ 500	CP 606 between insulated pipe and CFS-CT B coated board according to section 1.10	15 x 15 mm CP 606 sealant coning, top side only	-/120/120
H.179		42 – 88.9	1.5 - 14.2		≥ 40	≥ 800		15 x 15 mm CP 606 sealant coning, top side only	-/120/120

9.4.6 Steel and Stainless Steel pipes with mineral wool insulation according to Section 4.8

For specification of the foamed elastomeric insulation and mineral wool insulation material to be used see Section 5.8

Additional protection:

Mineral wool insulation for sustained and interrupted configuration refers to Section 5.8.1

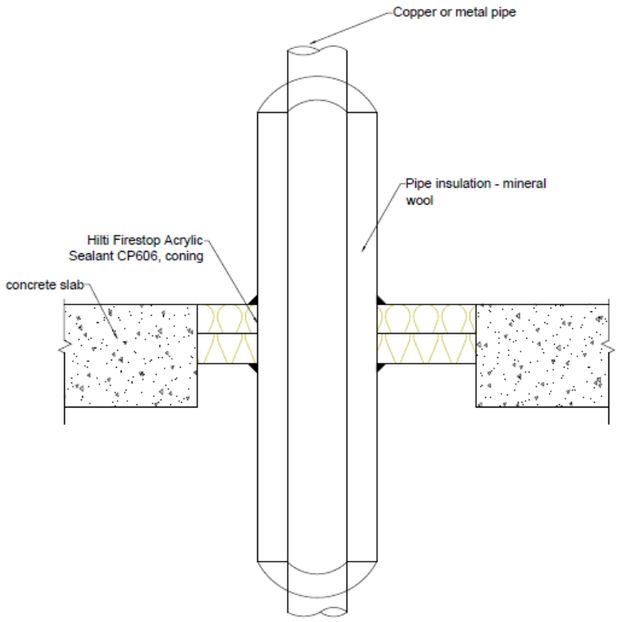
Over the pipe insulation an additional protection AP according to Section 5.8 is installed:

Mineral wool wrapped around the pipe insulation on both sides of the seal, fixed with wire, length along the pipe 250 mm, thickness 40 mm.

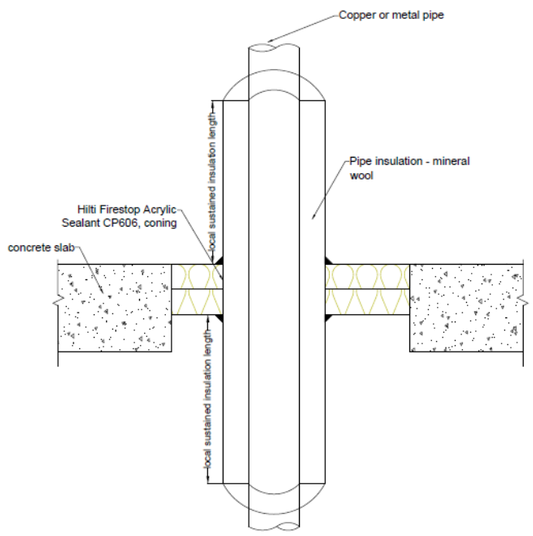
The field of application given steel pipes is also valid for other metal pipes with lower heat conductivity than copper and a melting point of minimum 1100°C, e.g. unalloyed steel, low alloyed steel, cast iron, stainless steels, Ni alloys (NiCu, NiCr and NiMo alloys) and Ni.

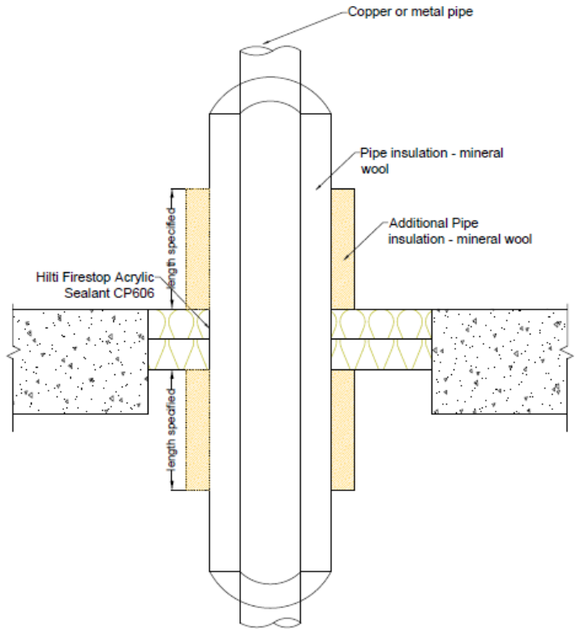
Spacing between mineral wool insulated copper or metal pipe can disregard the coning size, however, spacing between services needs to comply with the spacing requirements in general. Coning is needed at the perimeter of the services

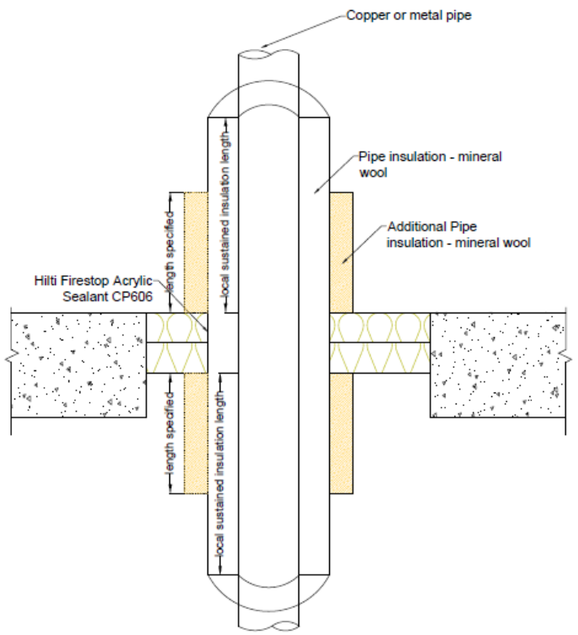
Continued insulation, sustained (CS) with CP 606 coning



Local insulation, sustained (LS) with CP 606 coning







Continued insulation, sustained (CS)

Application reference	Pipe material	pipe dia - OD	pipe wall thickness	Pipe insulation	pipe insulation thickness (mm)	local seal	additional protection	FRL
H.180	Steel	Up to 48.3	1.6 - 14.2	CS, mineral wool insulation 80 Kg/m^3 density	>=20	CP 606 between insulated pipe and CFS-CT B coated board according to section 1.10	15 x 15 mm CP 606 sealant coning, top side only	-/180/180
H.181		Up to 114.3	3.6		>=40		15 x 15 mm CP 606 sealant coning, top side only	-/120/120
H.182		101.6 – 114.3	2.0 - 14.2		>=30		15 x 15 mm CP 606 sealant coning, top side only	-/120/120
H.183		114.3 – 159.0	2.6 – 14.2		>=40		15 x 15 mm CP 606 sealant coning, top side only	-/120/120
H.184		159.0 - 323.9	2.6 – 14.2		>=40		15 x 15 mm CP 606 sealant coning, top side only	-/90/90
H.185		159.0 - 323.9	2.6 – 14.2		>=40		AP2 Mineral wool blanket, min. 60 density, wrapped around the pipe insulation on both sides of the seal, fixed according to Section 4.8, length along the pipe 250 mm, thickness 40 mm	-/120/120

Local insulation, sustained (LS)

Application reference	Pipe material	pipe dia - OD	pipe wall thickness	Pipe insulation	pipe insulation thickness (mm)	local insulation length each side (LD, mm)	local seal	additional protection	FRL
H.186	Steel	Up to 48.3	1.6 - 14.2	LS, mineral wool insulation 80 Kg/m^3 density	20	≥ 450	CP 606 between insulated pipe and CFS-CT B coated board according to section 1.10	15 x 15 mm CP 606 sealant coning, top side only	-/120/120
H.187		Up to 114.3	2.0 – 14.2		30 - 40	≥ 500		15 x 15 mm CP 606 sealant coning, top side only	-/120/120
H.188		114.3 – 159.0	2.0/2.6 – 14.2		40	≥ 500		15 x 15 mm CP 606 sealant coning, top side only	-/90/90
H.189		114.3 – 159.0	2.0/2.6 – 14.2		40	≥ 1000		15 x 15 mm CP 606 sealant coning, top side only	-/120/120
H.190		159.0 – 323.9	2.6/4.0 – 14.2		40	≥ 1000		15 x 15 mm CP 606 sealant coning, top side only	-/90/90
H.191		159.0 – 323.9	2.6/4.0 – 14.2		40	≥ 1000		AP2 Mineral wool blanket, min. 60 density, wrapped around the pipe insulation on both sides of the seal, fixed according to Section 4.8, length along the pipe 250 mm, thickness 40 mm	-/120/120

9.4.7 AL composite and plastic pipe with foamed elastomeric insulation according to Section 4.8, With Hilti Firestop collar CFS-C P

For specification of the foamed elastomeric insulation and mineral wool insulation material to be used see Section 4.8

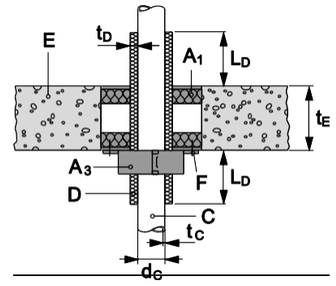
Hilti Firestop Collar CFS-C P (A3) is installed on bottom side of the seal, fixed by threaded rods, washers and nuts as specified in Annex 1.2.

For all solutions covered under this section, CFS CT B must be installed back to back

Additional protection:

The field of application given steel pipes is also valid for other metal pipes with lower heat conductivity than copper and a melting point of minimum 1100°C, e.g. unalloyed steel, low alloyed steel, cast iron, stainless steels, Ni alloys (NiCu, NiCr and NiMo alloys) and Ni.

Local insulation, sustained (LS)



Local insulation, sustained (LS)

Application reference	PE-Xb/Al/PE-HD "Geberit Mepla", Manufacturer: Geberit						
	Pipe		Insulation		Collar size	No. of hooks	FRL
	diameter (dc) [mm]	wall thickness (tc) [mm]	thickness (tD) [mm]	length (LD) [mm]			
H.192	40	3.5	9	≥ 250	CFS-C P 63/2"	2	-/90/90
H.193	63	4.5	9	≥ 250	CFS-C P 75/2.5"	3	-/90/90
H.194	75	4.7	9	≥ 250	CFS-C P 90/3"	3	-/90/90

Application reference	PE-X/Al/PE "KELOX KM 110" Manufacturer: KeKelit Kunststoffwerk						
	Pipe		Insulation		Collar size	No. of hooks	FRL
	diameter (dc) [mm]	wall thickness (tc) [mm]	thickness (tD) [mm]	length (LD) [mm]			
H.195	40	4	9	≥ 250	CFS-C P 50/1.5"	2	-/90/90
H.196	63	6	9	≥ 250	CFS-C P 75/2.5"	3	-/90/90

Application reference	PE-Xb/Al/PE-HD "Geberit Mepla" Manufacturer: Geberit					
	Pipe		Insulation	Collar size	No. of hooks	FRL
	diameter (dc) [mm]	wall thickness (tc) [mm]	thickness (tD) [mm]			
H.197	16	2.3	8.0 (AF1)	CFS-C P 50/1.5"	2	*-/120/120*
H.198	16	2.3	32.0 (AF6)	CFS-C P 90/3"	3	*-/120/120*
H.199	32	3.0	9.0 (AF1)	CFS-C P 50/1.5"	2	*-/120/120*
H.200	32	3.0	35.0 (AF6)	CFS-C P 110/4"	4	-/120/120

Application reference	PE-X/Al/PE "KELOX KM 110" Manufacturer: KeKelit Kunststoffwerk					
	Pipe		Insulation	Collar size	No. of hooks	FRL
	diameter (dc) [mm]	wall thickness (tc) [mm]	thickness (tD) [mm]			
H.201	16	2.0	8.0	CFS-C P 50/1.5”	2	*-/120/120*
H.202	16	2.0	32.0	CFS-C P 90/3”	3	*-/120/120*
H.203	32	3.0	9.0	CFS-C P 50/1.5”	2	*-/120/120*
H.204	32	3.0	35.0	CFS-C P 110/4”	4	-/120/120

9.4.8 AL composite and plastic pipe with foamed elastomeric insulation according to Section 5.8 and Hilti firestop wrap CFS-W P

Hilti Firestop Wrap CFS-W P (A_1) to be mounted on soffit of the Hilti Firestop Double Board Seal CFS-CT,

Hilti Firestop Wrap CFS-W P has to be installed from bottom and top side.

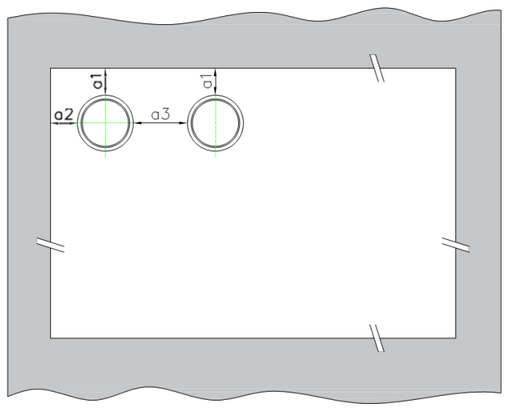
The bottom side wrap comes 5 mm further than the bottom surface of the board seal, and on top side the Hilti Firestop Wrap CFS-W P has to be installed flush with the top surface of the board seal.

Annular gap between the pipe sealing and the double board sealed with Hilti Firestop Acrylic Sealant CP 606

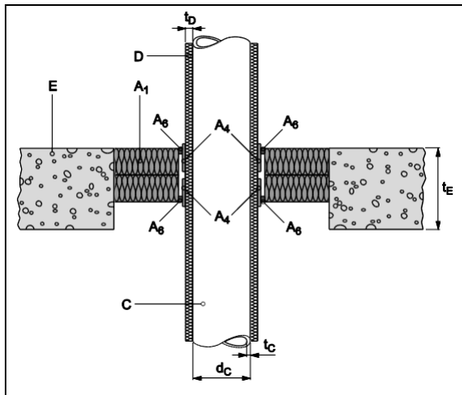
For specification of the foamed elastomeric insulation and mineral wool insulation material to be used see Section 5.8

General installation configuration, layers of Hilti firestop wrap CFS-W P wrapped around the pipe insulation, on each side of the seal. The wrap can be taped and slide along the service to the required location, as shown in the drawings

For the solution coverage in this section, separation distance shall comply with below
a_1 >= 25 (distance between cables/cable supports and seal edge
a_2 >= 25 (distance between cable supports) , unless otherwise specified
a_3 >= 50 (distance between cables and upper seal edge), unless otherwise specified



Continued insulation, sustained (CS)



Application reference	Material: PE-Xa/AL/PE-HD (e.g. Rehau Rautitan Stabil)						
	Layers	Pipe diameter Ø dc (mm)	Pipe wall thickness tc (mm)	Pipe insulation	Pipe insulation thickness (mm)	Separation a3 (mm)	FRL
H.205	1	16	2.6	CS, FR Section 5.8 insulation including Armaflex	8.0 to 32.0	0	-/120/90
H.206	1	20	2.9		8.5 to 33.5	0	
H.207	1	25	3.7		8.5 to 35.0	0	
H.208	1	32	4.7		9.0 to 35.0	0	
H.209	1	40	6.0		9.0 to 35.0	0	

Application reference	Material: PE-Xa/AL/PE-HD (e.g. Rehau Rautitan Stabil)						
	Layers	Pipe diameter Ø dc (mm)	Pipe wall thickness tc (mm)	Pipe insulation	Pipe insulation thickness (mm)	Separation a2 (mm)	FRL
H.210	1	16	2.6	CS, FR Section 5.8 insulation including Armaflex	8.0 to 32.0	50	-/120/120
H.211	1	20	2.9		8.5 to 33.5	50	
H.212	1	25	3.7		8.5 to 35.0	50	
H.213	1	32	4.7		9.0 to 35.0	50	
H.214	1	40	6.0		9.0 to 35.0	50	

Application reference	Material: PE-RT/AL/PE-RT (e.g. Uponor MLC)						
	Layers	Pipe diameter Ø dc (mm)	Pipe wall thickness tc (mm)	Pipe insulation	Pipe insulation thickness (mm)	Separation a3 (mm)	FRL
H.215	1	16	2.0	CS, FR Section 5.8 insulation including Armaflex	8.0 to 32.0	0	-/120/90
H.216	1	20	2.25		8.5 to 33.5	0	
H.217	1	25	2.5		8.5 to 35.0	0	
H.218	1	32	3.0		9.0 to 35.0	0	
H.219	2	50	4.5		9.0 to 38.0	0	
H.220	2	63	6.0		9.5 to 39.5	0	
H.221	2	75	7.5		9.5 to 40.5	0	

Application reference	Material: PE-RT/AL/PE-RT (e.g. Uponor MLC)							
	Layers	Pipe diameter Ø dc (mm)	Pipe wall thickness tc (mm)	Pipe insulation	Pipe insulation thickness (mm)	Separation a2 (mm)	Separation a3 (mm)	FRL
H.222	1	16	2.0	CS, FR Section 5.8 insulation including Armaflex	8.0 to 32.0	50	50	-/120/120
H.223	1	20	2.25		8.5 to 33.5	50	50	
H.224	1	25	2.5		8.5 to 35.0	50	50	
H.225	1	32	3.0		9.0 to 35.0	50	50	
H.226	2	50	4.5		9.0 to 38.0	25	0	
H.227	2	63	6.0		9.5 to 39.5	25	0	
H.228	2	75	7.5		9.5 to 40.5	25	0	

Application reference	Material: PE-X/AL/PE-X (e.g. Kekelit Kelox)						
	Layers	Pipe diameter Ø dc (mm)	Pipe wall thickness tc (mm)	Pipe insulation	Pipe insulation thickness (mm)	Separation a3 (mm)	FRL
H.229	1	16	2.0	CS, FR Section 5.8 insulation including Armaflex	8.0 – 32.0	0	-/120/90
H.230	1	20	2.25		8.5 - 33.5	0	
H.231	1	25	2.5		8.5 – 35.0	0	
H.232	1	32	3.0		9.0 – 35.0	0	
H.233	2	> 32 to < 75	> 3.0 to < 7.5		9.0 – 35.0	0	
H.234	2	75	7.5		9.5 – 35.0	0	

Application reference	Material: PE-X/AL/PE-X (e.g. Kekelit Kelox)						
	Layers	Pipe diameter Ø dc (mm)	Pipe wall thickness tc (mm)	Pipe insulation	Pipe insulation thickness (mm)	Separation a3 (mm)	FRL
H.235	1	16	2.0	CS, FR Section 5.8 insulation including Armaflex	8.0 – 32.0	0	-/120/120
H.236	1	20	2.25		8.5 – 33.5	0	
H.237	1	25	2.5		8.5 – 35.0	0	
H.238	1	32	3.0		9.0 – 35.0	0	
H.239	2	32 - 75	3.0 – 7.5		9.0 – 35.0	0	

Application reference	Material: PE-Xb/AL/PE-HD (e.g. Geberit Mepla)						
	Layers	Pipe diameter Ø dc (mm)	Pipe wall thickness tc (mm)	Pipe insulation	Pipe insulation thickness (mm)	Separation a3 (mm)	FRL
H.240	1	16	2.3	CS, FR Section 5.8 insulation including Armaflex	8.0 – 32.0	0	-/120/90
H.241	1	20	2.5		8.5 – 33.5	0	
H.242	1	26	3.0		8.5 – 35.0	0	
H.243	1	32	3.0		9.0 – 35.0	0	
H.244	2	40	3.5		9.0 – 36.5	0	
H.245	2	50	4.0		9.0 - 38.0	0	
H.246	2	63	4.5		9.5 – 39.5	0	
H.247	2	75	4.7		9.5 – 40.5	0	

Application reference	Material: PE-Xc/AL/PE-Xc, e.g. Viega Sanfix Fosta and Viega Raxofix distances: S8 > 100 mm, S6 >50 mm (see 1.8) Additional Protect Insulation (LI, 250 mm): flexible elastomeric insulation and mineral wool specification see section 5.8.2							
	Layers	Pipe diameter Ø dc (mm)	Pipe wall thickness tc (mm)	Pipe insulation	Pipe insulation thickness (mm)	Additional Protect Insulation Material:	Additional Protect Insulation thickness (mm)	FRL
H.248	1	16	2.2	CS, FR Section 5.8 insulation including Armaflex	8.0 – 32.0	none	0	-/120/120
H.249	1	20	2.8		8.5 – 33.5	none	0	-/120/120
H.250	1	25	2.7		8.5 – 35.0	none	0	-/120/120
H.251	1	32	3.2		9.0 – 35.0	none	0	-/120/120
H.252	1	40	3.5		9.0 – 36.5	none	0	-/120/120
H.253	2	50	4.0		9.0 – 38.0	none	0	-/60/60
H.254	2	63	4.5		9.5 – 39.5	none	0	-/60/60
H.255	2	63	4.5		9.5 – 39.5	Elastomer, see Annex 1 - 1.2.12 table 4	19	-/120/120
H.256	2	63	4.5		9.5 – 39.5	Mineral wool	30	-/120/120

Application reference	Material: PE-Xc/AL/PE-Xc, e.g. Viega Sanfix Fosta and Viega Raxofix distances: S8 > 100 mm, S6 >50 mm (see 1.8) pipe insulation (CS): mineral wool specification see section 5.8.1						
	Layers	Pipe diameter Ø dc (mm)	Pipe wall thickness tc (mm)	Pipe insulation Material:	Pipe insulation thickness (mm)	Additional Protect Insulation Material:	FRL
H.257	0	16	2.2	Mineral wool	20 - 40	none	-/120/120
H.258	0	20	2.8	Mineral wool	20 - 50	none	
H.259	0	25	2.7	Mineral wool	20 - 60	none	
H.260	0	32	3.2	Mineral wool	20 - 60	none	
H.261	0	40	3.5	Mineral wool	20 - 60	none	
H.262	0	50	4.0	Mineral wool	20 - 60	none	
H.263	0	63	4.5	Mineral wool	20 - 60	none	

Application reference	Material: PE-HD/AL/PE-HD (e.g. Geberit PushFit ML), Approved pipe insulation material (CS): flexible elastomeric insulation see 1.6.1 Distances: $S_8 \geq 100$ mm, $S_6 \geq 50$ mm (see 1.8)							
	Layers	Pipe diameter Ø dc (mm)	Pipe wall thickness tc (mm)	Pipe insulation Material:	Pipe insulation thickness (mm)	Additional Protect Insulation Material:	Additional Protect Insulation thickness (mm)	FRL
H.264	1	20	2.0	Elastomer	8.5 – 33.5	none	0	-/120/120
H.265	1	25	2.5	Elastomer	8.5 – 35.0	none	0	
H.266	0	20	2.0	Mineral wool	20 - 40	none	0	
H.267	0	25	2.5	Mineral wool	20 - 60	none	0	
Approved pipe insulation material (LS, total length: > 650mm): flexible PE isolation								
H.268	1	20	2.0	PE-foam	6	none	0	-/120/120
H.269	1	25	2.5	PE-foam	6	none	0	-/120/120

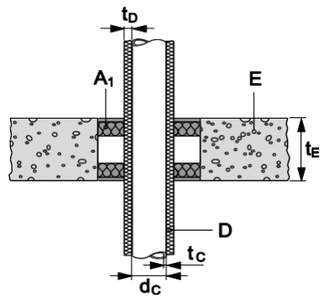
9.4.9 AL composite and plastic pipe with mineral wool insulation according to Section 5.8

For specification of the mineral wool insulation material to be used see Section 5.8

CP 606 is used as service gap filler

Mineral wool pipe insulation refers to Section 5.8.1

Continued insulation, sustained (CS)



Application reference	*PE-Xb/Al/PE-HD pipes „Geberit Mepla“* *Manufacturer: Geberit*				
	Pipe diameter (dC) [mm]	Pipe wall thickness (tC) [mm]	Pipe insulation Material	MW Insulation thickness (tD) [mm]	FRL
H.270	16	2.3	Mineral wool	≥ 20	-/180/180
H.271	32	3.0	Mineral wool	≥ 20	-/180/180
H.272	75	4.7	Mineral wool	≥ 20	-/180/180

Application reference	*VPE/Al/VPE pipes „Kelox KM 110“* *Manufacturer: KeKelit*				
	Pipe diameter (dC) [mm]	Pipe wall thickness (tC) [mm]	Pipe insulation Material	MW Insulation thickness (tD) [mm]	FRL
H.273	16	2.0	Mineral wool	≥ 20	-/180/180
H.274	32	3.0	Mineral wool	≥ 20	-/180/180
H.275	75	7.5	Mineral wool	≥ 20	-/180/180

Application reference	*PE-Xa pipes “Rautitan flex “* *Manufacturer: Rehau*				
	Pipe diameter (dC) [mm]	Pipe wall thickness (tC) [mm]	Pipe insulation Material	MW Insulation thickness (tD) [mm]	FRL
H.276	16	2.2	Mineral wool	≥ 20	-/180/180
H.277	32	4.4	Mineral wool	≥ 20	-/180/180
H.278	63	8.6	Mineral wool	≥ 20	-/180/180

10.0 Validity

Jensen Hughes does not endorse the tested or assessed products and systems in any way. The conclusions of this assessment may be used to directly assess fire resistance, but it should be recognised that a single test method will not provide a full assessment of fire resistance 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 test data, information and experience available at the time of preparation. If contradictory evidence becomes available to the assessing authority, the assessment will be unconditionally withdrawn and the report sponsor will be notified in writing. Similarly, the assessment should be re-evaluated, if the assessed construction is subsequently tested since actual test data is deemed to take precedence.

The sponsor is responsible for formally notifying Jensen Hughes of any additional testing performed on their product/system. This obligation applies regardless of where the test was conducted, the results of the test, or whether it was initially considered part of Jensen Hughes' ongoing assessment. The primary goal of this notification is to allow Jensen Hughes to review the changes and determine whether they require re-evaluation or re-testing to determine whether the changes have affected the product's performance. It is important that the client promptly notify Jensen Hughes if any such changes are implemented.

The procedures for the conduct of tests and the assessment of test results are subject to constant review and improvement. The sponsor is therefore recommended that this report be reviewed on, or before, the stated expiry date.

This assessment represents our opinion about the performance of the proposed systems that is expected to be demonstrated when subjected to test conditions in accordance with AS 1530.4:2014, based on the evidence referred to in this report.

This assessment is provided to Hilti (AUST) Pty Ltd for their own specific purposes. This report may be used as evidence of suitability in accordance with the requirements of the relevant National Construction Code. Building certifiers and other third parties must determine the suitability of the systems described in this report for a specific installation.