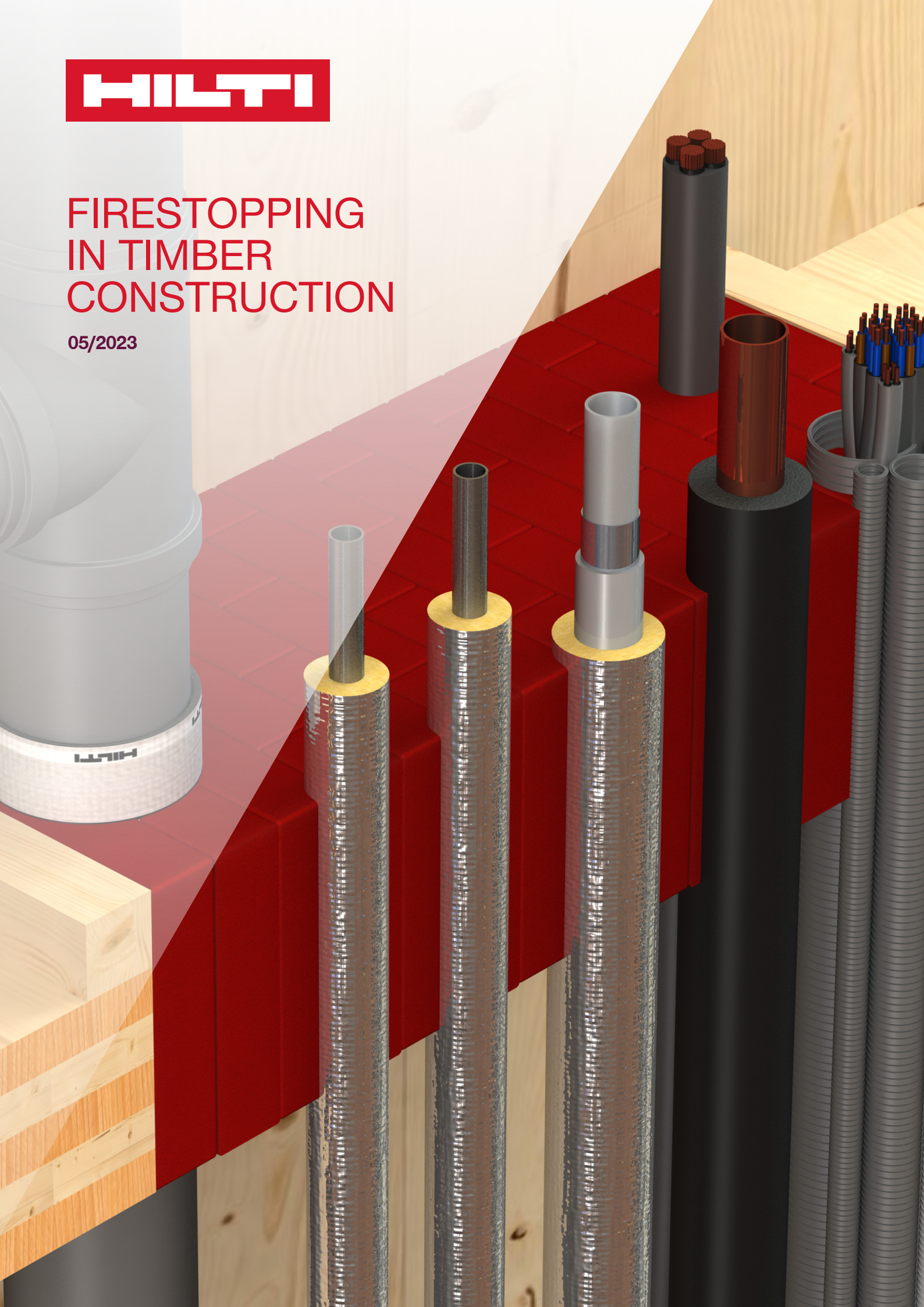
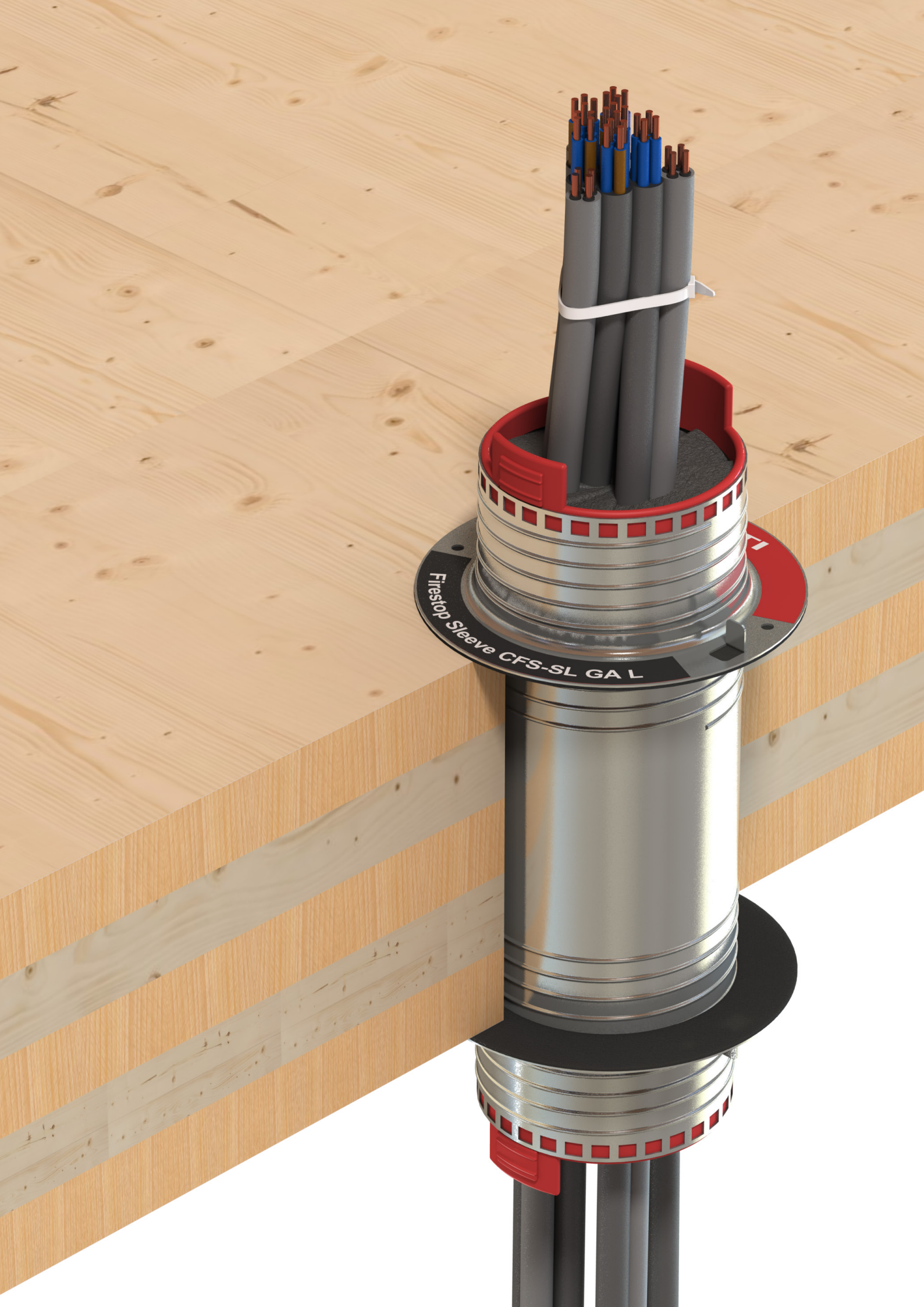




FIRESTOPPING IN TIMBER CONSTRUCTION

05/2023





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INTRODUCTION

RENAISSANCE OF WOOD AS A BUILDING MATERIAL

After centuries of use, wood is experiencing a renaissance as a building material. Architects, builders, and planners are convinced by the many advantages over mineral building materials and construction methods such as sustainability as a renewable raw material, energy efficiency due to good insulation values, high dimensional stability with low dead load, short installation times, or dry construction.

In new construction, timber is increasingly being used in multi-story residential and commercial buildings. During renovation or when adding a floor, users come across old wooden beam floors. Both cases present difficulties for planners, firestopping experts, and building owners, since few tested and approved firestopping systems are available.

With over 30 years of experience in the development, testing, and approval of products for structural firestopping, Hilti is now closing this gap. The well-known product portfolio of firestopping products has been independently tested on various timber base materials, and its performance in timber construction has been confirmed by external reports and expert assessments.

PLANNING IN MULTI-STORY TIMBER CONSTRUCTION

Whether timber frame, solid timber, or hybrid structures with reinforced concrete, in-depth planning must be carried out in order to do justice to the advantages of timber construction. The productivity gains in timber construction through industrial prefabrication of building elements, for example, only come to fruition if aspects of building physics or the specific timber construction competences of the involved contractors are taken into consideration from the start of the planning phase.

The topic of firestopping in timber construction especially requires timely planning of the firestopping concept with the involvement of all relevant planners, selection of suitable firestopping solutions, and documentation of the professional installation.

TIMBER CONSTRUCTION METHODS

The structures to be found in timber construction and their fire resistance are significantly influenced by the timber construction method. Depending on the building project, the advantages of various timber construction methods come into play, which are summarized in a highly simplified form in Table 1.

Both panel and solid construction methods are characterized by a high degree of prefabrication, which goes hand in hand with a high degree of automation of the production processes. In addition, the production of complete room cells (modular construction) is possible. Both require early and highly detailed planning, including all mechanical and electrical and mechanical installations, taking into account applicable firestopping regulations.

Lightweight timber construction		Solid wood construction
Skeleton/truss construction	Frame/panel construction	
• Economical and sustainable due to low material use • High degree of design possibilities • Especially for large-volume structures with large spans	• High prefabrication depth • Prefabricated room cells possible • Space saving vs. solid wood construction • Especially for prefabricated house construction and modular construction	• High building rigidity • Good structural and static properties • High prefabrication depth • Prefabricated room cells possible • Especially for multi-story and modular construction

Table 1: Advantages and areas of application of different timber construction methods

PRODUCTIVITY FOR TIMBER CONSTRUCTION

Hilti supports timber construction with firestopping solutions that have been established for years in classic solid construction. With approvals valid throughout Europe, verification by independent testing institutes, external expert assessments, and our engineering consulting services, Hilti facilitates the planning process in timber construction.

Woodworkers can achieve further productivity gains through prefabricated firestopping and documentation solutions that enable an industrial manufacturing process.

This manual serves as an introduction to the topic of firestopping in timber construction and does not claim to be exhaustive. Due to further developments, current firestopping solutions are always available via Hilti Online or through our Hilti sales consultants.

WE ARE YOUR CONSTRUCTION PARTNER, FROM DESIGN TO ACCEPTANCE.



Plan your firestopping with Hilti. Our specialists are here to assist you, from the first draft to detailed planning and building approval, to implementation and building inspection.



For your CAD design, you will find our firestopping solutions as 2D and 3D BIM objects in the extensive Hilti BIM/CAD library.



Our technical library can provide you with extensive information. For your planning purposes, you can, for example, transfer 2D drawings of the products and download documents such as approvals, specifications, and tender templates.



The Hilti advantage for you: Of course, Hilti's firestopping experts are also happy to support you personally. Just talk to your Hilti team about it.

PROJECT REFERENCES

Walden 48 in Berlin, Germany: firestopping solution for mixed penetrations in cross-laminated timber walls in an apartment building of building class 5

Fire-resistant penetration seals in solid timber walls were required for the floor-by-floor distribution of mechanical and electrical installations. The tested Hilti firestop block CFS-BL P was used as a mixed penetration sealing solution for a design in exposed wood and the joint cable routing within one opening. This dry firestopping solution met additional sound insulation requirements.



HILTI SOLUTION CONCEPTS FOR TIMBER BASE MATERIAL



In almost all European countries, building with wood is experiencing a renaissance. A sustainable raw material and ideal CO₂ store that meets all the requirements for constructing state-of-the-art buildings.

Firestopping need not be an obstacle to a timber builds these days, either. With the right concept, even high-rise buildings made of timber are possible. It is important to consider all the details early on in the planning phase.

With our modular installation systems and our many years of experience in the development, production, and distribution of firestopping seals, you get tested solutions for pipes, ventilation systems, and electrical installations from a single source.

Firestopping from classic to innovative, Hilti offers a solution for almost everything.

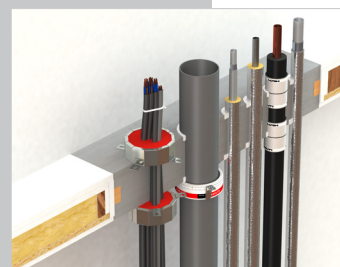
SOLUTION 1:

The classic – firestopping lining in opening reveals with joint offset and mortar.

This solution is a good option for penetration seals in a wide variety of timber base materials.

Shown here with a mortar lock, they can create firesealing similar to existing proofs of applicability for solid base materials.

The disadvantage is that it takes time to create the reveal with joint offset accurately. It requires formwork and curing time, as well as a wooden perimeter strip for the mortar. In addition, the actual firesealing product is still required in the form of a sleeve, cable sealing, or mineral wool shell.

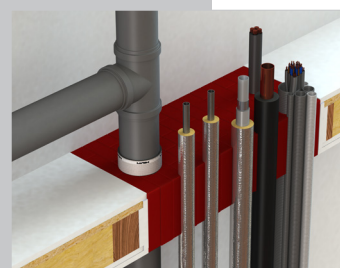


SOLUTION 2:

This solution also uses firestopping lining in the opening reveals and joint offset, with a Hilti firestop block as a firesealing product.

Shown here with the Hilti firestop block as firesealing similar to existing proofs of applicability for solid base materials.

This solution also requires time to create the reveal with joint offset accurately, but does not require formwork, curing time, or a surrounding wooden strip as for the mortar solution. There is no need for additional penetration seal products, as the fire stop block already provides the sealing. The block offers significant time savings during installation.

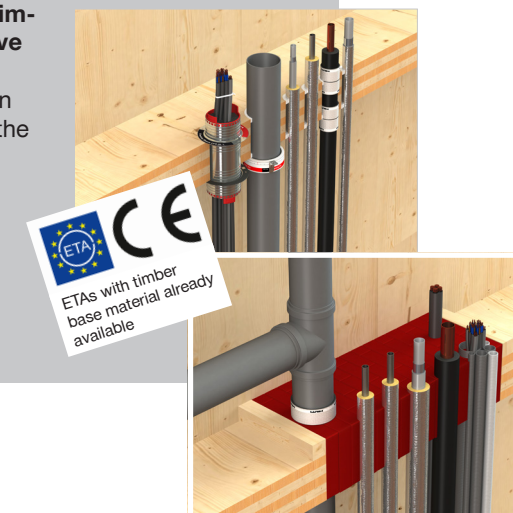


SOLUTION 3 AND 4:

Our officially tested and innovative Hilti solutions in cross-laminated timber. Without complex firestopping lining in opening reveals, irrespective of whether as a mixed penetration sealing or single penetration seal.

Whether as a single opening with narrow spacing or as a mixed penetration sealing, we have the right solution for your project. And most importantly, the performance and functionality of these solutions has been proven in many official tests.

- No reveal with joint offset
- No formwork
- No curing time
- Officially tested



Summary:

Thanks to the large number of official tests that Hilti has carried out at accredited material testing institutes, existing proofs of applicability, expert assessments from the Technical University of Munich, IBS Linz and IBB Nause, we offer building owners, concept developers, planners, and contractors the security they need when it comes to firestopping in timber base materials.

In our "Firestop in timber construction" brochures you will find detailed information, as well as detailed drawings, for the planning and execution of your projects.

BASICS

TIMBER BUILDING MATERIAL

Wood is an extremely efficient building material. Its specific strength properties rival reinforced concrete, timber processing is versatile, timber has a positive effect on the indoor climate and well-being, and it is significantly more sustainable than other building materials.

In recent decades, timber-based materials such as cross-laminated timber have been developed through further processing, making the building material even more efficient and technically predictable. This is the basis for the use of wood in multi-story timber construction.

COMBUSTIBILITY OF TIMBER AS A BUILDING MATERIAL

The building code framework for the use of timber in multi-story building projects can be derived from the flammability of the building material, possible building materials depending on the fire resistance period and the required fire resistance period of the building components depending on the building class.

The flammability or fire behavior of a building material can be classified according to the German (DIN4102-1) or European (EN 13501-1) classification. DIN 4102-1 divides building materials into two general classes: non-combustible and combustible building materials and makes a further differentiation within these classes. While non-combustible building materials are not a fire hazard, combustible building materials can contribute to fire development.

Since 2001, there has been a European classification system for building materials in the form of EN 13501-1. EN 13501-1 defines 6 building material classes from A (no contribution to fire) to F (no properties determined). In addition to fire behavior, the European standard regulates fire side effects: smoke release and dropping. Table 2 compares both classifications.

DIN 4102-1	Building inspection requirement	DIN EN 13501-1	Additional requirements	
			No smoke release	No dropping
A1	Non-combustible	A1	■	■
A2		A2-s1, d0	■	■
B1	Flame retardant	B-s1,d0; C-s1, d0	■	■
		A2-s2,d0; A2-s3,d0		■
		B-s2,d0; B-s3,d0		■
		C-s2,d0; C-s3,d0		■
		A2-s1,d1;A2-s1,d2	■	
		B-s1,d1; B-s1,d2	■	
		C-s1,d1; C-s1,d2	■	
		A2-s3,d2; B-s3,d2; C-s3,d2		
		D-s1,d0; D-s2,d0		■
		D-s3,d0; E		■
B2	Normal flammability	D-s1,d1; D-s2,d1		
		D-s3,d1; D-s1,d2		
		D-s2,d2; D-s3,d2		
		E-d2		
B3	Easily flammable	F		

Table 2: Flammability of building materials according to German and European classification.

¹⁾ DIN 4102-1 "Fire behavior of building materials and elements – Part 1: Building materials; concepts, requirements, and tests", 1998

²⁾ DIN EN 13501-1 "Fire classification of construction products and building elements – Part 1: Classification using data from fire behavior tests", 2019.

The majority of timber building materials are classified according to European classification as follows: D-s2,d0. Timber is normally flammable, has class 2 smoke release, and is not burning dropping (char layer).

FIRE RESISTANCE OF BUILDING COMPONENTS

Timber is a combustible material, but the char layer that forms results in a predictable burn rate. The load-bearing behavior of timber can therefore also be mathematically designed for exposure to fire. Unlike steel and reinforced concrete structures, wooden structures remain load-bearing even at very high temperatures. For the assessment of entire elements such as walls or floor slabs, the fire resistance of the structure must be taken into consideration.

FIRE RESISTANCE AND CLASSIFICATION ACCORDING TO EUROPEAN STANDARDIZATION

The European classification system is based on various fire resistance tests. A selection is shown in . The relevant test standard for the fire resistance period of constructions, including penetration seals is EN1366-3 "Fire resistance tests for service installations – Part 3: Penetration seals".

Test standard	Designation
EN1363-1 to -3	Fire resistance tests
EN1364-1 to -4	Fire resistance tests for non-structural components
EN1365-1 to -6	Fire resistance tests for load-bearing components
EN1366-01 to -10	Fire resistance tests for installations

Table 3: Excerpt from European standards for fire resistance testing



Cross-laminated timber test specimen after a fire resistance test according to EN1366-3

The European system allows classification according to different criteria, each with an indication of the fire resistance period in minutes. The following criteria are primarily relevant for elements and penetration seals.

Criterion	Design	Code
Load capacity or load-bearing capacity	Measurement of the design stability of an element in case of fire	R – Résistance
Flame protection or integrity	Measurement of the ability of an element to prevent exchange of gases and flames in the event of fire	E – Étanchéité
Insulation or heat insulation	Measurement of the insulation capacity of an element, i.e. the period of time during which the side of the element facing away from the fire does not exceed a temperature rise of 180 K relative to the ambient temperature	I – Isolation
Cladding	Firestopping capacity due to additional cladding	K ₁ , K ₂
Direction of the classified fire resistance period		i → o i ← o i ↔ o

Table 4: Excerpt of classification criteria according to EN 13501-2

Classification can be from 15 to 240 minutes in the following increments:
15, 20, 30, 45, 60, 90, 120, 180, 240 minutes.

Building inspection requirement	Load-bearing components		Non-bearing interior walls	Non-load-bearing exterior walls
	Without integrity	With integrity		
Fire retardant	R 30	REI 30	EI 30	EI 30 (i → o) EI 30-ef (i ← o)
Highly fire retardant	R 60	REI 60	EI 60	EI 60 (i → o) EI 60-ef (i ← o)
Fire resistant	R 90	REI 90	EI 90	EI 90 (i → o) EI 90-ef (i ← o)

Table 5: Fire resistance classification in relation to building code requirements

FIRE RESISTANCE AND CLASSIFICATION ACCORDING TO GERMAN STANDARDIZATION

DIN 4102-2 defines the fire resistance for load-bearing or room-enclosing components according to the following time intervals.

Fire resistance	Fire resistance period in minutes.
F30	≥ 30
F60	≥ 60
F90	≥ 90
F120	≥ 120
F180	≥ 180

Table 6: Fire resistance classes according to DIN 4102-2

In addition to fire resistance, the classification also includes the fire behavior of the building materials used. This is reflected in the short designation according to DIN 4102-2, which is supplemented by the fire behavior of the building materials used in construction. The following designations are used:

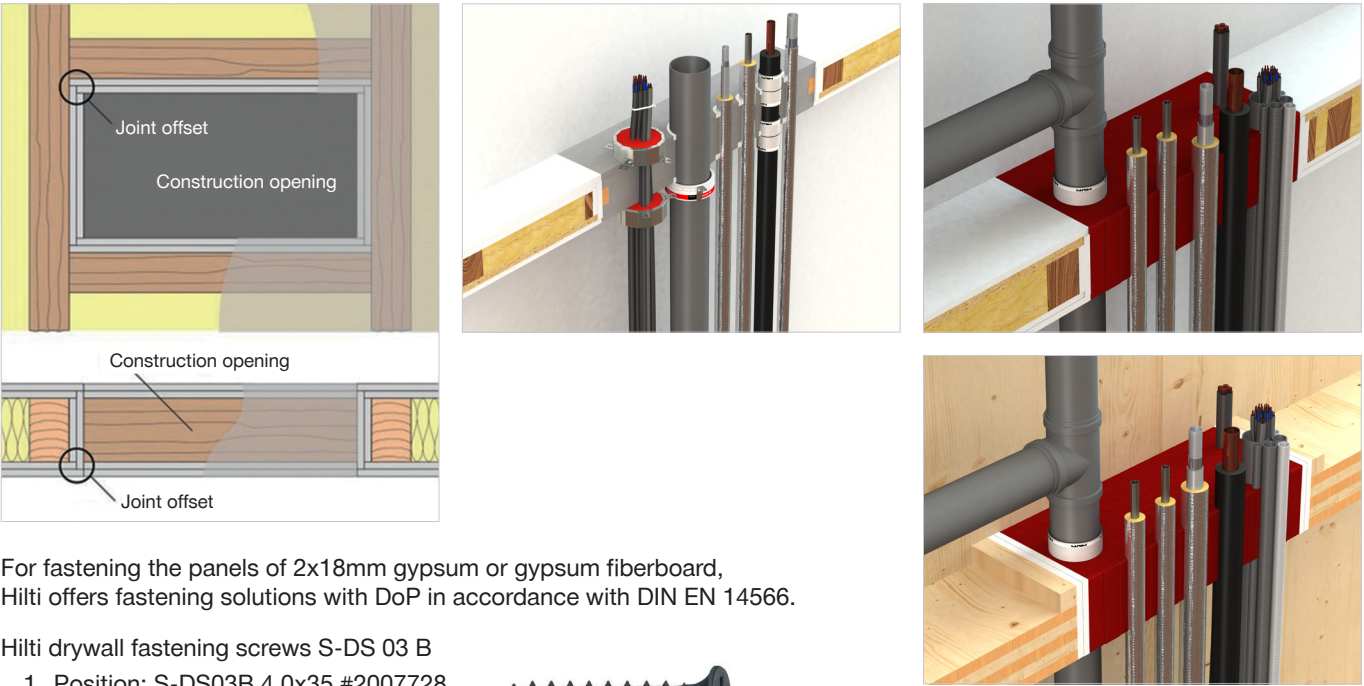
- A – the construction consists exclusively of building materials of class A = non-combustible
- AB – all "essential parts" of the structure are made of class A building materials; other parts may also be made of combustible building materials (class B)
- B – some of the "essential parts" consist of combustible building materials (class B)

Building inspection requirement	Classes according to DIN 4102-2 Table 2	Short designation according to DIN 4102-2
Fire retardant	F30 fire resistance	F30-B
Fire retardant and made of non-combustible building materials	F30 fire resistance class and made of non-combustible building materials	F30-A
Highly fire retardant	F60 fire resistance class and made of non-combustible building materials in the essential parts	F60-AB
	F60 fire resistance class and made of non-combustible building materials	F60-A
Fire resistant	F90 fire resistance class and made of non-combustible building materials in the essential parts	F90-AB
Fire resistant and made of non-combustible building materials	F90 fire resistance class and made of non-combustible building materials	F90-A

Table 7: Building code requirements with respective short designations

PENETRATION SEAL VARIANTS WITH REVEAL LINING

Classical penetration seals with reveal lining can serve as a solution in a variety of wood base materials, e.g. timber frame construction. However, special attention must be paid to important details during implementation. The cladding of the component surfaces within the penetration seal must be accurately implemented with a joint offset.



For fastening the panels of 2x18mm gypsum or gypsum fiberboard, Hilti offers fastening solutions with DoP in accordance with DIN EN 14566.

Hilti drywall fastening screws S-DS 03 B

- 1. Position: S-DS03B 4.0x35 #2007728
- 2. Position: S-DS03B 4.0x55 #2007731



Hilti hardboard screws S-DS22B

- 1. Position: S-DS22B 3.9x37 #2247542
- 2. Position: S-DS22B 3.9x49 #2247543



- You will find simpler, faster, more innovative and tested penetration seal solutions on the following pages.

INNOVATIVE, TESTED APPLICATIONS AND PRODUCTS

CROSS-LAMINATED TIMBER ELEMENTS

Cross-laminated timber (CLT) is a monolithic building material created by gluing individual layers of timber together crosswise. As a solid prefabricated wooden element, it is suitable for applications as wall, floor, or roof elements.



© binderholz cross-laminated timber BBS

Hilti offers penetration seal solutions for exposed timber applications (without additional planking) for fire-retardant (30 minutes), high fire-retardant (60 minutes) and fire-resistant (90 minutes) versions. The application details are based on real fire resistance tests conducted at the Institut für Brandschutztechnik und Sicherheitsforschung (Institute for Fire Protection Technology and Safety Research, IBS) in Linz, Austria. These test results are summarized in classification reports (see Appendix 1, page 187).

The technical drawings, or "Typicals" (see pages 34 to 186), reflect these results to facilitate planning and application. Proofs with additional planking are also available for fire-resistant applications (90 minutes).

For the application of Hilti firestopping systems in the cross-laminated timber (CLT) elements listed below, in addition to the application brochure "Firestopping in timber construction", we provide those responsible for firestopping (concept designers and specialist planners) with expert assessment No. GA-2022/128-Nau of 22.12.2022 on load-bearing structures made of timber, the engineering office for firestopping and construction types IBB Nause, Statement N 319111301-1 on load-bearing structures made of timber from IBS Linz, as well as the Hilti classification reports.

Manufacturer	Product designation	ETA	DIBt	Further evidence
Best Wood Schneider	Best Wood CLT	ETA-21/0568	Z-9.1-874	
binderholz	Cross-laminated timber BBS	ETA-06/0009	Z-9.1-534	CSTB Avis Technique 3.3/14-784 ICC-ES Certificate binderholz CLT BBS ESR-4081 ANSI/APA PRG-320-2019
Derix	X-LAM	ETA-11/0189		
Eugen Decker	ED BSP (CLT) elements	ETA-12/0327		
HASSLACHER	HASSLACHER cross-laminated timber	ETA-12/0281	Z-9.1-905	
HBS	HBS CLT	ETA-20/0860	Z-9.1-576	
HolzBauWerk Schwarzwald	hbwCLT		Z-9.1-908	
Keilhofer GmbH	Solid timber block		Z-9.1-576	
KLH Massivholz	KLH® - CLT	ETA-06/0138		CSTB DTA 3.3/20-1016_V1:2020
Mayr-Melnhof Holz	MM-crosslam	ETA-09/0036		
MMK X-LAM Concrete	XC® timber-concrete composite element			
Pfeifer Timber GmbH	Pfeifer CLT	ETA-20/0023		
Schwarzwald Holzbausysteme SBS (R)	Cross-Laminated Timber Plus		Z-9.1-576	
Schilliger Holz	Schilliger large format panel®/CLT	ETA-19/0675		CSTB Avis Technique 3.3/17-920
Stora Enso	CLT - cross-laminated timber	ETA-14/0349		CSTB Avis Technique 3.3/15-798_V4 ICC-ES Listening Report ESL-1170
THEURL Austrian Premium Timber	CLTPLUS	ETA-20/0843		
Van Roje	Cross-Works BSP (CLT)	ETA-22/0652		
X-LAM Dolomiti	CLT	ETA-12/0347		
ZÜBLIN Timber	LENO®-Cross-laminated timber	ETA-10/0241	Z-9.1-501	

The fire resistance tests we have conducted allow us to make a statement on the functionality of Hilti penetration seal products in terms of integrity (E) and thermal insulation (I) in solid wood (cross-laminated timber). The design of floor or wall elements with the additional load-bearing capacity requirement (R) must be considered separately.



Manufacturer

BEST WOOD SCHNEIDER – BEST WOOD CLT

The thickness and panel structure details in the table are based on the manufacturer's specifications. Despite regular updates, we recommend checking the information on the respective cross-laminated timber elements before starting a project in order to take into account any changes made by the manufacturer.



Layers	Thickness [mm]	Panel structure [mm]							Fire resistance of the Hilti penetration seal (EI)	
									Floor	Wall
3	60	20	20	20					-	-
	80	30	20	30					EI30	EI30
	90	30	30	30					EI30	EI30
	100	40	20	40					EI60	EI60
	120	40	40	40					EI60	EI60*
5	140	40	20	20	20	40			EI60	EI90*
	160	40	20	40	20	40			EI60	EI90
	180	40	30	40	30	40			EI90	EI90
	200	40	40	40	40	40			EI90	EI90
7	220	40	40	20	20	20	40	40	EI90	EI90
	240	40	40	20	40	20	40	40	EI90	EI90
	260	40	40	30	40	30	40	40	EI90	EI90
	280	40	40	40	40	40	40	40	EI90	EI90

* Please contact your Hilti representative for more details.



Want to learn more?

<https://www.schneider-holz.com/holzprodukte/deckensysteme-von-best-wood-schneider/best-wood-clt-decke.html>



Manufacturer

BINDERHOLZ CROSS-LAMINATED TIMBER BBS

The thickness and panel structure details in the table are based on the manufacturer's specifications. Despite regular updates, we recommend checking the information on the respective cross-laminated timber elements before starting a project in order to take into account any changes made by the manufacturer.



Layers	Thickness [mm]	Panel structure [mm]							Fire resistance of the Hilti penetration seal (EI)	
									Floor	Wall
3	60	20	20	20					-	-
	80	20	40	20					EI30	EI30
	90	30	30	30					EI30	EI30
	100	35	30	35					EI60	EI60
	120	40	40	40					EI60	EI60*
5	100	20	20	20	20	20			EI60	EI60
	120	20	30	20	30	20			EI60	EI60*
	140	40	20	20	20	40			EI90	EI90*
	150	40	20	30	20	40			EI90	EI90
	160	40	20	40	20	40			EI90	EI90
	180	40	30	40	30	40			EI90	EI90
	200	40	40	40	40	40			EI90	EI90
	220	60	30	40	30	60			EI90	EI90
	240	60	40	40	40	60			EI90	EI90
	300	80	30	80	30	80			EI90	EI90
7	320	80	40	80	40	80			EI90	EI90
	260	60	20	40	20	40	20	60	EI90	EI90
	280	60	40	20	40	20	40	60	EI90	EI90
	340	80	40	30	40	30	40	80	EI90	EI90

* Please contact your Hilti representative for more details.



Want to learn more?

<https://www.binderholz.com/produkte/brettsperrholz-bbs/>



Manufacturer

DERIX X-LAM

The thickness and panel structure details in the table are based on the manufacturer's specifications. Despite regular updates, we recommend checking the information on the respective cross-laminated timber elements before starting a project in order to take into account any changes made by the manufacturer.



Layers	Designation	Thickness [mm]	Panel structure [mm]											Fire resistance of the Hilti penetration seal (EI)
														Floor
3	L-60/3s	60	20	20	20									-
	L-80/3s	80	30	20	30									EI30
	L-90/3s	90	30	30	30									EI30
	L-100/3s	100	40	20	40									EI60
	L-110/3s	110	40	30	40									EI60
	L-120/3s	120	40	40	40									EI60
5	L-100/5s	100	20	20	20	20	20							EI60
	L-110/5s	110	20	20	30	20	20							EI60
	L-120/5s	120	20	30	20	30	20							EI60*
	L-130/5s	130	30	20	30	20	30							EI90
	L-140/5s	140	40	20	20	20	40							EI90
	L-150/5s	150	30	30	30	30	30							EI90
	L-160/5s	160	40	20	40	20	40							EI90
	L-170/5s	170	40	30	30	30	40							EI90
	L-180/5s	180	40	30	40	30	40							EI90
	L-200/5s	200	40	40	40	40	40							EI90
7	L-220/7s	220	40	20	40	20	40	20	40					EI90
	L-240/7s	240	40	20	40	40	40	20	40					EI90
	L-260/7s	260	40	30	40	40	40	30	40					EI90
	L-280/7s	280	40	40	40	40	40	40	40					EI90
9	L-290/9s	290	40	30	30	30	30	30	30	30	40			EI90
	L-310/9s	310	40	30	40	30	30	30	40	30	40			EI90
	L-320/9s	320	40	30	40	30	40	30	40	30	40			EI90
	L-360/9s	360	40	40	40	40	40	40	40	40	40			EI90
7	LL-190/7s	190	30	30	20	30	20	30	30					EI90
	LL-210/7s	210	30	30	30	30	30	30	30					EI90
	LL-230/7s	230	30	30	40	30	40	30	30					EI90
	LL-240/7s	240	40	40	20	40	20	40	40					EI90
	LL-260/7s	260	40	40	30	40	30	40	40					EI90
	LL-280/7s	280	40	40	40	40	40	40	40					EI90
	LL-300/9s	300	40	40	20	40	20	40	20	40	40			EI90
9	LL-330/9s	330	40	40	30	40	30	40	30	40	40			EI90
	LL-360/9s	360	40	40	40	40	40	40	40	40	40			EI90
11	LL-400/11s	400	40	40	30	40	30	40	30	40	30	40		EI90

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Manufacturer

DERIX X-LAM (continued)

The thickness and panel structure details in the table are based on the manufacturer's specifications. Despite regular updates, we recommend checking the information on the respective cross-laminated timber elements before starting a project in order to take into account any changes made by the manufacturer.



Layers	Designation	Thickness	Panel structure [mm]					Fire resistance of the Hilti penetration seal (EI)
								Wall
3	X-60/3s	60	20	20	20			-
	X-70/3s	70	20	30	20			-
	X-80/3s	80	30	20	30			EI30
	X-90/3s	90	30	30	30			EI30
	X-100/3s	100	30	40	30			EI60
	X-110/3s	110	40	30	40			EI60
	X-120/3s	120	40	40	40			EI60*
	X-100/5s	100	20	20	20	20	20	EI60
5	X-110/5s	110	20	20	30	20	20	EI60
	X-120/5s	120	20	30	20	30	20	EI60*
	X-130/5s	130	30	20	30	20	30	EI60*
	X-140/5s	140	40	20	20	20	40	EI90*
	X-150/5s	150	30	30	30	30	30	EI90
	X-160/5s	160	40	20	40	20	40	EI90
	X-170/5s	170	40	30	30	30	40	EI90
	X-180/5s	180	40	30	40	30	40	EI90
	X-190/5s	190	40	40	30	40	40	EI90
	X-200/5s	200	40	40	40	40	40	EI90

* Please contact your Hilti representative for more details.



Want to learn more?

<https://www.derix.de/de/produkte/x-lam-brettsperrholz>



Manufacturer

EUGEN DECKER ED BSP (CLT)

The thickness and panel structure details in the table are based on the manufacturer's specifications. Despite regular updates, we recommend checking the information on the respective cross-laminated timber elements before starting a project in order to take into account any changes made by the manufacturer.



Layers	Designation	Thickness [mm]	Panel structure [mm]									Fire resistance of the Hilti penetration seal (EI)
												Floor
3	66 L	66	23	20	23							-
	69 L	69	23	23	23							-
	78 L	78	29	20	29							-
	81 L	81	29	23	29							EI30
	87 L	87	29	29	29							EI30
	98 L	98	29	40	29							EI30
	100 L	100	40	20	40							EI60
	103 L	103	40	23	40							EI60
	109 L	109	40	29	40							EI60
	120 L	120	40	40	40							EI60
5	100 L	100	20	20	20	20	20					EI60
	109 L	109	23	20	23	20	23					EI60
	115 L	115	23	23	23	23	23					EI60
	127 L	127	29	20	29	20	29					EI60
	133 L	133	29	23	29	23	29					EI60
	140 L	140	40	20	20	20	40					EI90
	145 L	145	29	29	29	29	29					EI90
	160 L	160	40	20	40	20	40					EI90
	166 L	166	40	23	40	23	40					EI90
	178 L	178	40	29	40	29	40					EI90
7	200 L	200	40	40	40	40	40					EI90
	185 L	185	29	23	29	23	29	23	29			EI90
	203 L	203	29	29	29	29	29	29	29			EI90
	220 L	220	40	20	40	20	40	20	40			EI90
	229 L	229	40	23	40	23	40	23	40			EI90
	240 L	240	40	40	20	40	20	40	40			EI90
	247 L	247	40	29	40	29	40	29	40			EI90
	280 L	280	40	40	40	40	40	40	40			EI90
9	261 L	261	29	29	29	29	29	29	29	29	29	EI90
	292 L	292	40	23	40	23	40	23	40	23	40	EI90

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Manufacturer

EUGEN DECKER ED BSP (CLT)(continued)

The thickness and panel structure details in the table are based on the manufacturer's specifications. Despite regular updates, we recommend checking the information on the respective cross-laminated timber elements before starting a project in order to take into account any changes made by the manufacturer.



Layers	Designation	Thickness [mm]	Panel structure [mm]							Fire resistance of the Hilti penetration seal (EI)
										Wall
3	63 W	63	23	20	23					-
	69 W	69	23	23	23					-
	81 W	81	29	23	29					EI30
	87 W	87	29	29	29					EI30
	98 W	98	29	40	29					EI30
	103 W	103	40	23	40					EI60
	109 W	109	40	29	40					EI60
	120 W	120	40	40	40					EI60*
5	100 W	100	20	20	20	20	20			EI60
	106 W	106	20	23	20	23	20			EI60
	115 W	115	23	23	23	23	23			EI60
	133 W	133	29	23	29	23	29			EI60*
	145 W	145	29	29	29	29	29			EI90*
	160 W	160	40	20	40	20	40			EI90
	166 W	166	40	23	40	23	40			EI90
	178 W	178	40	29	40	29	40			EI90
7	200 W	200	40	40	40	40	40			EI90
	185 W	185	29	23	29	23	29	23	29	EI90
	203 W	203	29	29	29	29	29	29	29	EI90
	220 W	220	40	20	40	20	40	20	40	EI90
	229 W	229	40	23	40	23	40	23	40	EI90
	236 W	236	29	40	29	40	29	40	29	EI90
	280 W	280	40	40	40	40	40	40	40	EI90

* Please contact your Hilti representative for more details.



Want to learn more?
<https://www.eugen-decker.de/de/bsp-brettsper Holz.html>



Manufacturer

HASSLACHER CROSS-LAMINATED TIMBER

The thickness and panel structure details in the table are based on the manufacturer's specifications. Despite regular updates, we recommend checking the information on the respective cross-laminated timber elements before starting a project in order to take into account any changes made by the manufacturer.



From wood to wonders.

Layers	Designation	Thickness [mm]	Panel structure [mm]							Fire resistance of the Hilti penetration seal (EI)	
										Floor	Wall
3s	BSP 80	80	20	40	20					EI30	EI30
	BSP 90	90	30	30	30					EI30	EI30
	BSP 100	100	30	40	30					EI60	EI60
	BSP 120	120	40	40	40					EI60	EI60*
5s	BSP 100	100	20	20	20	20	20			EI60	EI60
	BSP 120	120	30	20	20	20	30			EI60	EI60*
	BSP 140	140	40	20	20	20	40			EI90	EI90*
	BSP 160	160	40	20	40	20	40			EI90	EI90
	BSP 180	180	40	30	40	30	40			EI90	EI90
	BSP 200	200	40	40	40	40	40			EI90	EI90
	BSP 200	200	30	30	30	20	30	30	30	EI90	EI90
	BSP 210	210	30	30	30	30	30	30	30	EI90	EI90
7s / 7ss	BSP 220	220	40	40	20	20	20	40	40	EI90	EI90
	BSP 240	240	40	40	20	40	20	40	40	EI90	EI90
	BSP 260	260	40	40	30	40	30	40	40	EI90	EI90
	BSP 280	280	40	40	40	40	40	40	40	EI90	EI90
	BSP 300	300	40	40	30	40+40	30	40	40	EI90	EI90
8ss	BSP 320	320	40	40	40	40+40	40	40	40	EI90	EI90

ss... Structure with double layers

* Please contact your Hilti representative for more details.



Want to learn more?

<https://www.hasslacher.com/brettsper Holz>



Manufacturer

HBS CLT

The thickness and panel structure details in the table are based on the manufacturer's specifications. Despite regular updates, we recommend checking the information on the respective cross-laminated timber elements before starting a project in order to take into account any changes made by the manufacturer.



x-ply (top ply length-wise or cross-wise)	Designation	Thickness [mm]	Panel structure [mm] (deviating thicknesses and special designs on request)							Fire resistance of the Hilti penetration seal (EI)	
										Floor	Wall
3	HBS CLT	60	20	20	20					-	-
	HBS CLT	70	20	30	20					-	-
	HBS CLT	80	30	20	30					EI30	EI30
	HBS CLT	90	30	30	30					EI30	EI30
	HBS CLT	100	30	40	30					EI60	EI60
	HBS CLT	110	40	30	40					EI60	EI60
	HBS CLT	120	40	40	40					EI60	EI60
	HBS CLT	100	20	20	20	20	20			EI60	EI60
	HBS CLT	110	20	20	30	20	20			EI60	EI60
	HBS CLT	120	30	20	20	20	30			EI60	EI60
	HBS CLT	130	30	20	30	20	30			EI60	EI60
	HBS CLT	140	40	20	20	20	40			EI90	EI90
5	HBS CLT	150	40	20	30	20	40			EI90	EI90
	HBS CLT	160	40	20	40	20	40			EI90	EI90
	HBS CLT	170	40	30	30	30	40			EI90	EI90
	HBS CLT	180	40	30	40	30	40			EI90	EI90
	HBS CLT	190	40	40	30	40	40			EI90	EI90
	HBS CLT	200	40	40	40	40	40			EI90	EI90
	HBS CLT	210	40	30	20	30	20	30	40	EI90	EI90
	HBS CLT	220	40	30	30	20	30	30	40	EI90	EI90
	HBS CLT	230	40	30	30	30	30	30	40	EI90	EI90
	HBS CLT	240	40	30	30	40	30	30	40	EI90	EI90
	HBS CLT	250	40	30	40	30	40	30	40	EI90	EI90
	HBS CLT	260	40	30	40	40	40	30	40	EI90	EI90
7	HBS CLT	270	40	40	40	30	40	40	40	EI90	EI90
	HBS CLT	280	40	40	40	40	40	40	40	EI90	EI90

* Please contact your Hilti representative for more details.



Want to learn more?

<https://www.hbs-berga.de/CLT-Brettsper Holz/>



Manufacturer

HOLZBAUWERK SCHWARZWALD GMBH HBWCLT

The thickness and panel structure details in the table are based on the manufacturer's specifications. Despite regular updates, we recommend checking the information on the respective cross-laminated timber elements before starting a project in order to take into account any changes made by the manufacturer.



Layers	Designation	Thickness [mm]	Panel structure [mm]							Fire resistance of the Hilti penetration seal (EI)	
										Floor	Wall
3	Q3/L3	60	20	20	20					-	-
	Q3/L3	80	20	40	20					EI30	EI30
	Q3/L3	90	30	30	30					EI30	EI30
	Q3/L3	100	30	40	30					EI60	EI60*
	Q3/L3	110	40	30	40					EI60	EI60*
	Q3/L3	120	40	40	40					EI60	EI60*
5	Q5/L5	90	20	20	10	20	20			EI30	EI30
	Q5/L5	100	20	20	20	20	20			EI60	EI60*
	Q5/L5	110	20	20	30	20	20			EI60	EI60*
	Q5/L5	120	20	30	20	30	20			EI60	EI60*
	Q5/L5	130	20	30	30	30	20			EI60	EI60*
	Q5/L5	140	40	20	20	20	40			EI90	EI90
	Q5/L5	150	40	20	30	20	40			EI90	EI90
	Q5/L5	160	40	20	40	20	40			EI90	EI90
	Q5/L5	180	40	30	40	30	40			EI90	EI90
	Q5/L5	200	40	40	40	40	40			EI90	EI90
7	L5-2	160	30-2	40	30-2					EI90	EI90
	L7-2	180	20	40	20	20	20	40	20	EI90	EI90
	L7-2	200	20	40	20	40	20	40	20	EI90	EI90
	L7-2	220	40	30	30	20	30	30	40	EI90	EI90
	L7-2	240	40	30	30	40	30	30	40	EI90	EI90
	L7-2	260	40	40	30	40	30	40	40	EI90	EI90
8	L7-2	280	40	40	40	40	40	40	40	EI90	EI90
	L8-2	300	40	40	30	40	40	30	40	EI90	EI90
	L8-2	320	40	40	40	40	40	40	40	EI90	EI90

* Please contact your Hilti representative for more details.



Want to learn more?

<https://www.holzbauprodukte-schwarzwald.de/brettsperholz/>



Manufacturer

KEILHOFFER GMBH SOLID TIMBER BLOCK

The thickness and panel structure details in the table are based on the manufacturer's specifications. Despite regular updates, we recommend checking the information on the respective cross-laminated timber elements before starting a project in order to take into account any changes made by the manufacturer.



Designation Solid timber block	Layers	Thickness [mm]	Panel structure [mm]							Fire resistance of the Hilti penetration seal (EI)	
										Floor	Wall
60	3	60	20	20	20					-	-
70	3	70	20	30	20					-	-
80	3	80	20	40	20					EI30	EI30
80	4	80	20	20	20	20				EI30	EI30
90	3	90	30	30	30					EI30	EI30
90	4	90	20	30	20	20				EI30	EI30
100	3	100	30	40	30					EI60	EI60
100	4	100	30	20	20	30				EI60	EI60
100	5	100	20	20	20	20	20			EI60	EI60
120	3	120	40	40	40					EI60	EI90*
120	5	120	30	20	20	20	30			EI60	EI90*
130	5	130	30	20	30	20	30			EI60	EI90*
140	5	140	40	20	20	20	40			EI90	EI90
150	5	150	40	20	30	20	40			EI90	EI90
160	5	160	40	20	40	20	40			EI90	EI90
170	5	170	40	30	30	30	40			EI90	EI90
180	5	180	40	30	40	30	40			EI90	EI90
190	5	190	40	40	30	40	40			EI90	EI90
200	5	200	40	40	40	40	40			EI90	EI90
210	7	210	30	30	30	30	30	30	30	EI90	EI90
220	7	220	40	40	20	20	20	40	40	EI90	EI90
230	7	230	30	40	30	30	30	40	30	EI90	EI90
240	7	240	40	40	20	40	20	40	40	EI90	EI90
250	7	250	40	40	30	30	30	40	40	EI90	EI90
260	7	260	40	40	40	20	40	40	40	EI90	EI90
270	7	270	40	40	40	30	40	40	40	EI90	EI90
280	7	280	40	40	40	40	40	40	40	EI90	EI90
290	9	290	40	30	30	30	30	30	30	EI90	EI90
300	9	300	40	40	20	40	20	40	20	EI90	EI90

* Please contact your Hilti representative for more details.



Want to learn more?

<https://keilhofer.com/bauweisen-uebersicht/>



Manufacturer

KLH® – CLT (CROSS-LAMINATED TIMBER)

The thickness and panel structure details in the table are based on the manufacturer's specifications. Despite regular updates, we recommend checking the information on the respective cross-laminated timber elements before starting a project in order to take into account any changes made by the manufacturer.

KLH®

Layers	Designation	Thickness [mm]	Panel structure [mm]							Fire resistance of the Hilti penetration seal (EI)	
										Floor	Wall
3	KLH® 3s 60 DL/DQ	60	20	20	20					-	-
	KLH® 3s 70 DL/DQ	70	20	30	20					EI30	EI30
	KLH® 3s 80 DL/DQ	80	30	20	30					EI30	EI30
	KLH® 3s 90 DL/DQ	90	30	30	30					EI30	EI30
	KLH® 3s 100 DL	100	40	20	40					EI 30	(EI30)
	KLH® 3s 100 DQ	100	30	40	30					(EI60)	EI60
	KLH® 3s 110 DL/DQ	110	40	30	40					EI60	EI60
5	KLH® 3s 120 DL/DQ	120	40	40	40					EI60	EI60*
	KLH® 5s 100 DL/DQ	100	20	20	20	20	20			EI60	EI60
	KLH® 5s 110 DL/DQ	110	20	20	30	20	20			EI60	EI60
	KLH® 5s 120 DL/DQ	120	30	20	20	20	30			EI60	EI60*
	KLH® 5s 130 DL/DQ	130	30	20	30	20	30			EI60	EI60*
	KLH® 5s 140 DL	140	40	20	20	20	40			EI90	EI90*
	KLH® 5s 140 DQ	140	30	20	40	20	30			(EI90)	EI90
5	KLH® 5s 150 DL	150	40	20	30	20	40			EI90	(EI90)
	KLH® 5s 150 DQ	150	30	30	30	30	30			(EI90)	EI90
	KLH® 5s 160 DL/DQ	160	40	20	40	20	40			EI90	EI90
	KLH® 5s 170 DL	170	40	30	30	30	40			EI90	(EI90)
	KLH® 5s 180 DL	180	40	30	40	30	40			EI90	(EI90)
	KLH® 5s 190 DL	190	40	40	30	40	40			EI90	(EI90)
	KLH® 5s 200 DL	200	40	40	40	40	40			EI90	(EI90)
5	KLH® 5ss 160 DL	160	30+30	40	30+30					EI90	(EI90)
7	KLH® 7s 180 DL	180	20	40	20	20	20	40	20	EI90	(EI90)
	KLH® 7s 200 DL	200	20	40	20	40	20	40	20	EI90	(EI90)
	KLH® 7s 220 DL	220	30	40	30	20	30	40	30	EI90	(EI90)
7	KLH® 7s 240 DL	240	30	40	30	40	30	40	30	EI90	(EI90)
	KLH® 7ss 180 DL	180	30+30	20	20	20	30+30			EI90	(EI90)
	KLH® 7ss 200 DL	200	30+30	20	40	20	30+30			EI90	(EI90)
	KLH® 7ss 220 DL	220	40+40	20	20	20	40+40			EI90	(EI90)
	KLH® 7ss 240 DL	240	40+40	20	40	20	40+40			EI90	(EI90)
	KLH® 7ss 260 DL	260	40+40	30	40	30	40+40			EI90	(EI90)
	KLH® 7ss 280 DL	280	40+40	40	40	40	40+40			EI90	(EI90)
8	KLH® 8ss 300 DL	300	40+40	30	40+40	30	40+40			EI90	(EI90)
	KLH® 8ss 320 DL	320	40+40	40	40+40	40	40+40			EI90	(EI90)

KLH® – CLT panel types are typically used as wall (DQ) or floor (DL) elements. It is also permissible to use DQ panels as floor elements or DL panels as wall elements.
KLH® – CLT panels are available up to a total thickness of 360 mm and are suitable for the installation of fire penetration seals.
* Please contact your Hilti representative for more details.



Want to learn more?

<https://www.klh.at/>
Calculation of load-bearing resistance R in the case of fire: <https://www.klhdesigner.at/>
KLH Vertrieb Deutschland: <https://www.aba-holz.de/>



Manufacturer

MAYR-MELNHOF HOLZ MM CROSSLAM

The thickness and panel structure details in the table are based on the manufacturer's specifications. Despite regular updates, we recommend checking the information on the respective cross-laminated timber elements before starting a project in order to take into account any changes made by the manufacturer.



Layers	Designation	Thickness [mm]	Panel structure [mm]									Fire resistance of the Hilti penetration seal (EI)	
												Floor	Wall
3	3s	60	20	20	20						-	-	
	3s	80	30	20	30						EI30	EI30	
	3s	90	30	30	30						EI30	EI30	
	3s	100	40	20	40						EI60	EI60	
	3s	120	40	40	40						EI60	EI60*	
5	5s	100	20	20	20	20	20				EI60	EI60	
	5s	120	30	20	20	20	30				EI60	EI60*	
	5s	140	40	20	20	20	40				EI90	EI90*	
	5s	160	40	20	40	20	40				EI90	EI90	
	5s	180	40	30	40	30	40				EI90	EI90	
7	5s	200	40	40	40	40	40				EI90	EI90	
	7ss	200	20	40	20	40	20	40	20		EI90	EI90	
	7s	220	40	20	40	20	40	20	40		EI90	EI90	
	7ss	220	40	40	20	40	20	40	40		EI90	EI90	
	7s	240	40	20	40	40	40	20	40		EI90	EI90	
	7ss	240	40	40	20	40	20	40	40		EI90	EI90	
	7ss	260	40	40	30	40	30	40	40		EI90	EI90	
9	7ss	280	40	40	40	40	40	40	40		EI90	EI90	
	9ss	300	40	40	20	40	20	40	20	40	EI90	EI90	

Values in bold represent the main bearing direction of the panel.
The main load-bearing direction can be formed in the longitudinal or transverse direction of the panel
* Please contact your Hilti representative for more details.



Want to learn more?

<https://mm-holz.com/produkte/brettsperrholz>
<http://www.mm-holz.com>



Manufacturer

MMK X-LAM CONCRETE XC® TIMBER-CONCRETE COMPOSITE ELEMENT

The thickness and panel structure details in the table are based on the manufacturer's specifications. Despite regular updates, we recommend checking the information on the respective cross-laminated timber elements before starting a project in order to take into account any changes made by the manufacturer.



Designation	h _{Timber}	h _{Concrete}	Component height [mm]	Basis weight [kg/m²]	Fire resistance of the Hilti penetration seal (EI)
XC® living 120 80	120	80	200	250	EI60
XC® living 140 80	140	80	220	260	EI90
XC® living 160 80	160	80	240	270	EI90
XC® living 180 80	180	80	260	280	EI90
XC® living 120 100	120	100	220	300	EI60
XC® living 140 100	140	100	240	310	EI90
XC® living 160 100	160	100	260	320	EI90
XC® living 180 100	180	100	280	330	EI90
XC® living 200 100	200	100	300	340	EI90
XC® living 120 120	120	120	240	340	EI60
XC® living 140 120	140	120	260	360	EI90
XC® living 160 120	160	120	280	370	EI90
XC® living 180 120	180	120	300	375	EI90
XC® living 200 120	200	120	320	380	EI90
XC® living 180 140	180	140	320	420	EI90
XC® living 200 140	200	140	340	430	EI90

* Please contact your Hilti representative for more details.



Want to learn more?

<https://www.holzbetonverbund.at/>



Manufacturer

PFEIFER TIMBER GMBH PFEIFER CLT

The thickness and panel structure details in the table are based on the manufacturer's specifications. Despite regular updates, we recommend checking the information on the respective cross-laminated timber elements before starting a project in order to take into account any changes made by the manufacturer.



Layers	Thickness [mm]	Panel structure [mm]							Fire resistance of the Hilti penetration seal (EI)	
									Floor	Wall
3	60	20	20	20					-	-
	80	30	20	30					EI30	EI30
	90	30	30	30					EI30	EI30
	100	30	40	30					EI60	EI60
	110	40	30	40					EI60	EI60
	120	40	40	40					EI60	EI60*
5	100	20	20	20	20	20			EI60	EI60
	120	30	20	20	20	30			EI60	EI60*
	140	40	20	20	20	40			EI90	EI90*
	150	40	20	30	20	40			EI90	EI90
	160	40	20	40	20	40			EI90	EI90
	180	40	30	40	30	40			EI90	EI90
7	200	40	40	40	40	40			EI90	EI90
	180	30	20	30	20	30	20	30	EI90	EI90
	200	20	40	20	40	20	40	20	EI90	EI90
	220	30	30	30	40	30	30	30	EI90	EI90
	240	30	40	30	40	30	40	30	EI90	EI90
	260	30	40	40	40	40	40	30	EI90	EI90
	280	40	40	40	40	40	40	40	EI90	EI90

* Please contact your Hilti representative for more details.



Want to learn more?

<https://www.pfeifergroup.com/de/produkte/holzbau/clt-brettsperrholz/das-produkt/>



Manufacturer

SCHWARZWALD HOLZBAUSYSTEME SBS® CROSS-LAMINATED TIMBER PLUS

The thickness and panel structure details in the table are based on the manufacturer's specifications. Despite regular updates, we recommend checking the information on the respective cross-laminated timber elements before starting a project in order to take into account any changes made by the manufacturer.



Designation	Layers	Thickness [mm]	Panel structure [mm]										Fire resistance of the Hilti penetration seal (EI)	
													Floor	Wall
SBS-60-3	3	60	20	20	20							-	-	
SBS-80-3	3	80	20	40	20							EI30	EI30	
SBS-90-3	3	90	30	30	30							EI30	EI30	
SBS-100-3	3	100	30	40	30							EI60	EI60	
SBS-120-3	3	120	40	40	40							EI60	EI90*	
SBS-100-5	5	100	20	20	20	20	20					EI60	EI60	
SBS-120-5	5	120	20	30	20	30	20					EI60	EI90*	
SBS-140-5	5	140	40	20	20	20	40					EI90	EI90	
SBS-160-5	5	160	40	20	40	20	40					EI90	EI90	
SBS-180-5	5	180	40	30	40	30	40					EI90	EI90	
SBS-200-5	5	200	40	40	40	40	40					EI90	EI90	
SBS-220-7	7	220	40	20	40	20	40	20	40			EI90	EI90	
SBS-240-7	7	240	40	30	30	40	30	30	40			EI90	EI90	
SBS-260-7	7	260	40	30	40	40	40	30	40			EI90	EI90	
SBS-280-7	7	280	40	40	40	40	40	40	40			EI90	EI90	
SBS-300-7	9	300	40	30	30	30	40	30	30	30	40	EI90	EI90	

* Please contact your Hilti representative for more details.



Want to learn more?

<https://sbselemente.de/das-sbs-element>



Manufacturer

SCHILLIGER LARGE FORMAT PANEL®/CLT

The thickness and panel structure details in the table are based on the manufacturer's specifications. Despite regular updates, we recommend checking the information on the respective cross-laminated timber elements before starting a project in order to take into account any changes made by the manufacturer.



Layers	Designation	Thickness [mm]	Panel structure [mm]							Fire resistance of the Hilti penetration seal (EI)	
										Floor	Wall
3	GFP-3L	60	20	20	20					-	-
	GFP-3L	70	20	30	20					-	-
	GFP-3L	80	30	20	30					EI30	EI30
	GFP-3L	90	30	30	30					EI30	EI30
	GFP-3L	100	30	40	30					EI60	EI60
	GFP-3L	110	40	30	40					EI60	EI60
	GFP-3L	120	40	40	40					EI60	EI60*
	GFP-5L	100	20	20	20	20	20			EI60	EI60
5	GFP-5L	110	20	20	30	20	20			EI60	EI60
	GFP-5L	120	20	30	20	30	20			EI60	EI60*
	GFP-5L	130	30	20	30	20	30			EI60	EI60*
	GFP-5L	140	40	20	20	20	40			EI90	EI90*
	GFP-5L	150	30	30	30	30	30			EI90	EI90
	GFP-5L	160	40	20	40	20	40			EI90	EI90
	GFP-5L	170	30	40	30	40	30			EI90	EI90
	GFP-5L	180	40	30	40	30	40			EI90	EI90
	GFP-5L	200	40	40	40	40	40			EI90	EI90
	GFP-7L	210	30	30	30	30	30	30	30	EI90	EI90
	GFP-7L	220	40	20	40	20	40	20	40	EI90	EI90
	GFP-7L	240	30	40	30	40	30	40	30	EI90	EI90
7	GFP-7L	250	40	30	40	30	40	30	40	EI90	EI90
	GFP-7L	280	40	40	40	40	40	40	40	EI90	EI90
	GFP-5DL	200	60	20	40	20	60			EI90	EI90
	GFP-5DL	220	80	20	20	20	80			EI90	EI90
	GFP-5DL	240	80	20	40	20	80			EI90	EI90
	GFP-5DL	260	80	30	40	30	80			EI90	EI90
	GFP-5DL	280	80	40	40	40	80			EI90	EI90
	GFP-5DLL	300	80	30	80	30	80			EI90	EI90
8	GFP-5DLL	320	80	40	80	40	80			EI90	EI90

* Please contact your Hilti representative for more details.



Want to learn more?

<https://www.schilliger.ch/produkte/platten/>
<https://www.clt-tech.com/>



Manufacturer

STORA ENSO CLT

The thickness and panel structure details in the table are based on the manufacturer's specifications. Despite regular updates, we recommend checking the information on the respective cross-laminated timber elements before starting a project in order to take into account any changes made by the manufacturer.



Layers	Designation	Thickness [mm]	Panel structure [mm]							Fire resistance of the Hilti penetration seal (EI)	
										Floor	Wall
3	C3s/L3s	60	20	20	20					-	-
	C3s/L3s	80	30	20	30					EI30	EI30
	C3s/L3s	90	30	30	30					EI30	EI30
	C3s/L3s	100	30	40	30					EI60	EI60
	C3s/L3s	120	40	40	40					EI60	EI60*
5	C5s/L5s	100	20	20	20	20	20			EI60	EI60
	C5s/L5s	120	30	20	20	20	30			EI60	EI60*
	C5s/L5s	140	40	20	20	20	40			EI90	EI90*
	C5s/L5s	160	40	20	40	20	40			EI90	EI90
	L5s	180	40	30	40	30	40			EI90	EI90
	L5s	200	40	40	40	40	40			EI90	EI90
	L5s-2	160	60	40	60					EI90	EI90
7	L7s	180	30	20	30	20	30	20	30	EI90	EI90
	L7s	200	20	40	20	40	20	40	20	EI90	EI90
	L7s	240	30	40	30	40	30	40	30	EI90	EI90
	L7s-2	220	60	30	40	30	60			EI90	EI90
	L7s-2	240	80	20	40	20	80			EI90	EI90
	L7s-2	260	80	30	40	30	80			EI90	EI90
	L7s-2	280	80	40	40	40	80			EI90	EI90
8	L8s-2	300	80	30	80	30	80			EI90	EI90
	L8s-2	320	80	40	80	40	80			EI90	EI90

* Please contact your Hilti representative for more details.



Want to learn more?

<https://www.storaenso.com/de-de/products/wood-products/massive-wood-construction>
<https://www.storaenso.com/de-de/products/wood-products/massive-wood-construction/clt/brochures-and-downloads>



Manufacturer

THEURL TIMBER STRUCTURES GMBH CLTPLUS

The thickness and panel structure details in the table are based on the manufacturer's specifications. Despite regular updates, we recommend checking the information on the respective cross-laminated timber elements before starting a project in order to take into account any changes made by the manufacturer.



Layers	Designation	Thickness [mm]	Panel structure [mm]							Fire resistance of the Hilti penetration seal (EI)	
										Floor	Wall
3	CLTPLUS 60	60	20	20	20					-	-
	CLTPLUS 80	80	30	20	30					EI30	EI30
	CLTPLUS 90	90	30	30	30					EI30	EI30
	CLTPLUS 100	100	30	40	30					EI60	EI60
	CLTPLUS 120	120	40	40	40					EI60	EI60*
5	CLTPLUS 100	100	20	20	20	20	20			EI60	EI60
	CLTPLUS 120	120	30	20	20	20	30			EI60	EI60*
	CLTPLUS 140	140	30	20	20	20	30			EI90	EI90
	CLTPLUS 160	160	40	20	40	20	40			EI90	EI90
	CLTPLUS 180	180	40	30	40	30	40			EI90	EI90
	CLTPLUS 200	200	40	40	40	40	40			EI90	EI90
	CLTPLUS 160	160	30·2	40	30·2					EI90	EI90
7	CLTPLUS 180	180	30	20	30	20	30	20	30	EI90	EI90
	CLTPLUS 200	200	20	40	20	40	20	40	20	EI90	EI90
	CLTPLUS 220	220	40	20	40	20	40	20	40	EI90	EI90
	CLTPLUS 240	240	30	40	30	40	30	40	30	EI90	EI90
	CLTPLUS 180	180	30·2	20	20	20	30·2			EI90	EI90
7	CLTPLUS 200	200	30·2	30	20	30	30·2			EI90	EI90
	CLTPLUS 220	220	40·2	20	20	20	40·2			EI90	EI90
	CLTPLUS 240	240	40·2	20	40	20	40·2			EI90	EI90
	CLTPLUS 260	260	40·2	30	40	30	40·2			EI90	EI90
	CLTPLUS 280	280	40·2	40	40	40	40·2			EI90	EI90
8	CLTPLUS 300	300	40·2	30	40·2	30	40·2			EI90	EI90
	CLTPLUS 320	320	40·2	40	40·2	40	40·2			EI90	EI90

* Please contact your Hilti representative for more details.

30·2; 40·2 = structures with double layers



Want to learn more?

<https://www.theurl-holz.at/produkte/cltplus>



Manufacturer

VAN ROJE CROSS-WORKS BSP

The thickness and panel structure details in the table are based on the manufacturer's specifications. Despite regular updates, we recommend checking the information on the respective cross-laminated timber elements before starting a project in order to take into account any changes made by the manufacturer.



Layers	Designation	Thickness [mm]	Panel structure [mm]							Fire resistance of the Hilti penetration seal (EI)	
										Floor	Wall
3	Q / L	60	20	20	20					-	-
	Q / L	80	30	20	30					EI30	EI30
	Q / L	90	30	30	30					EI30	EI30
	Q / L	100	30	40	30					EI60	EI60
	Q / L	120	40	40	40					EI60	EI60*
5	Q / L	100	20	20	20	20	20			EI60	EI60
	Q / L	120	30	20	20	20	30			EI60	EI60*
	Q / L	140	30	30	20	30	30			EI90	EI90
	Q / L	160	40	20	40	20	40			EI90	EI90
	Q / L	180	40	30	40	30	40			EI90	EI90
	Q / L	200	40	40	40	40	40			EI90	EI90
5	2-L	160	30	30	40	30	30			EI90	-
7	L	180	30	20	20	30	30	20	30	EI90	-
	L	200	20	40	40	20	20	40	20	EI90	-
	L	220	40	20	20	40	40	20	40	EI90	-
	L	240	30	40	40	30	30	40	30	EI90	-
7	2-L	180	30	30	20	20	20	30	30	EI90	-
	2-L	200	30	30	30	20	30	30	30	EI90	-
	2-L	220	40	40	20	20	20	40	40	EI90	-
	2-L	240	40	40	20	40	20	40	40	EI90	-
	2-L	260	40	40	30	40	30	40	40	EI90	-
	2-L	280	40	40	40	40	40	40	40	EI90	-

* Please contact your Hilti representative for more details.



Want to learn more?

<https://vanroje.de/de/brettsper Holz.html>



X-LAM DOLOMITI CLT

The thickness and panel structure details in the table are based on the manufacturer's specifications. Despite regular updates, we recommend checking the information on the respective cross-laminated timber elements before starting a project in order to take into account any changes made by the manufacturer.



Layers	Designation	Thickness [mm]	Panel structure [mm]							Fire resistance of the Hilti penetration seal (EI)	
										Floor	Wall
3	CLT 57	57	19	19	19					-	-
	CLT 83	83	33	17	33					EI30	EI30
	CLT 90	90	30	30	30					EI30	EI30
	CLT 100	100	33	34	33					EI60	EI60
	CLT 120	120	40	40	40					EI60	EI60
5	CLT 85	85	17	17	17	17	17			-	-
	CLT 100	100	20	20	20	20	20			EI60	EI60
	CLT 120	120	30	20	20	20	30			EI60	EI60
	CLT 124	124	30	17	30	17	30			EI60	EI60
	CLT 130	130	30	20	30	20	30			EI60	EI60
	CLT 137	137	33	19	33	19	33			EI90	EI90
	CLT 140	140	40	20	20	20	40			EI90	EI90
	CLT 158	158	40	19	40	19	40			EI90	EI90
	CLT 160	160	40	20	40	20	40			EI90	EI90
	CLT 172	172	33	33	40	33	33			EI90	EI90
	CLT 179	179	33	40	33	40	33			EI90	EI90
	CLT 186	186	40	33	40	33	40			EI90	EI90
7	CLT 200	200	40	40	40	40	40			EI90	EI90
	CLT 217	217	40	19	40	19	40	19	40	EI90	EI90
	CLT 240	240	40	40	20	40	20	40	40	EI90	EI90
	CLT 252	252	33	40	33	40	33	40	33	EI90	EI90
	CLT 280	280	40	40	40	40	40	40	40	EI90	EI90
8	CLT 300	300	40	40	30	40	40	30	40	EI90	EI90
9	CLT 297	297	33	33	33	33	33	33	33	EI90	EI90

* Please contact your Hilti representative for more details.



Want to learn more?

<https://www.xlamdolomiti.it/de>

ZÜBLIN TIMBER LENO® CROSS-LAMINATED TIMBER

The thickness and panel structure details in the table are based on the manufacturer's specifications. Despite regular updates, we recommend checking the information on the respective cross-laminated timber elements before starting a project in order to take into account any changes made by the manufacturer.



Designation LENO®	Layers	Thickness [mm]	Panel structure [mm]										Fire resistance of the Hilti penetration seal (EI)	
													Floor	Wall
60	3	60	20	20	20							-	-	
70	3	70	20	30	20							-	-	
80	3	80	20	40	20							EI30	EI30	
80	4	80	20	20	20	20						EI30	EI30	
90	3	90	30	30	30							EI30	EI30	
90	4	90	20	30	20	20						EI30	EI30	
100	3	100	30	40	30							EI60	EI60*	
100	4	100	30	20	20	30						EI60	EI60*	
100	5	100	20	20	20	20	20					EI60	EI60*	
120	3	120	40	40	40							EI60	EI60*	
120	5	120	30	20	20	20	30					EI60	EI60*	
130	5	130	30	20	30	20	30					EI60	EI60*	
140	5	140	40	20	20	20	40					EI90	EI90*	
150	5	150	40	20	30	20	40					EI90	EI90	
160	5	160	40	20	40	20	40					EI90	EI90	
170	5	170	40	30	30	30	40					EI90	EI90	
180	5	180	40	30	40	30	40					EI90	EI90	
190	5	190	40	40	30	40	40					EI90	EI90	
200	5	200	40	40	40	40	40					EI90	EI90	
210	7	210	30	30	30	30	30	30	30			EI90	EI90	
220	7	220	40	40	20	20	20	40	40			EI90	EI90	
230	7	230	30	40	30	30	30	40	30			EI90	EI90	
240	7	240	40	40	20	40	20	40	40			EI90	EI90	
250	7	250	40	40	30	30	30	40	40			EI90	EI90	
260	7	260	40	40	40	20	40	40	40			EI90	EI90	
270	7	270	40	40	40	30	40	40	40			EI90	EI90	
280	7	280	40	40	40	40	40	40	40			EI90	EI90	
290	9	290	40	30	30	30	30	30	30	30	40	EI90	EI90	
300	9	300	40	40	20	40	20	40	20	40	40	EI90	EI90	

* Please contact your Hilti representative for more details.



Want to learn more?

<https://www.zueblin-timber.com/leistungen-produkte/zueblin-timber-holzbau-elemente/brettsper Holz-leno.html>

APPLICATIONS AND PRODUCTS

Floor applications: Wastewater and roof drainage

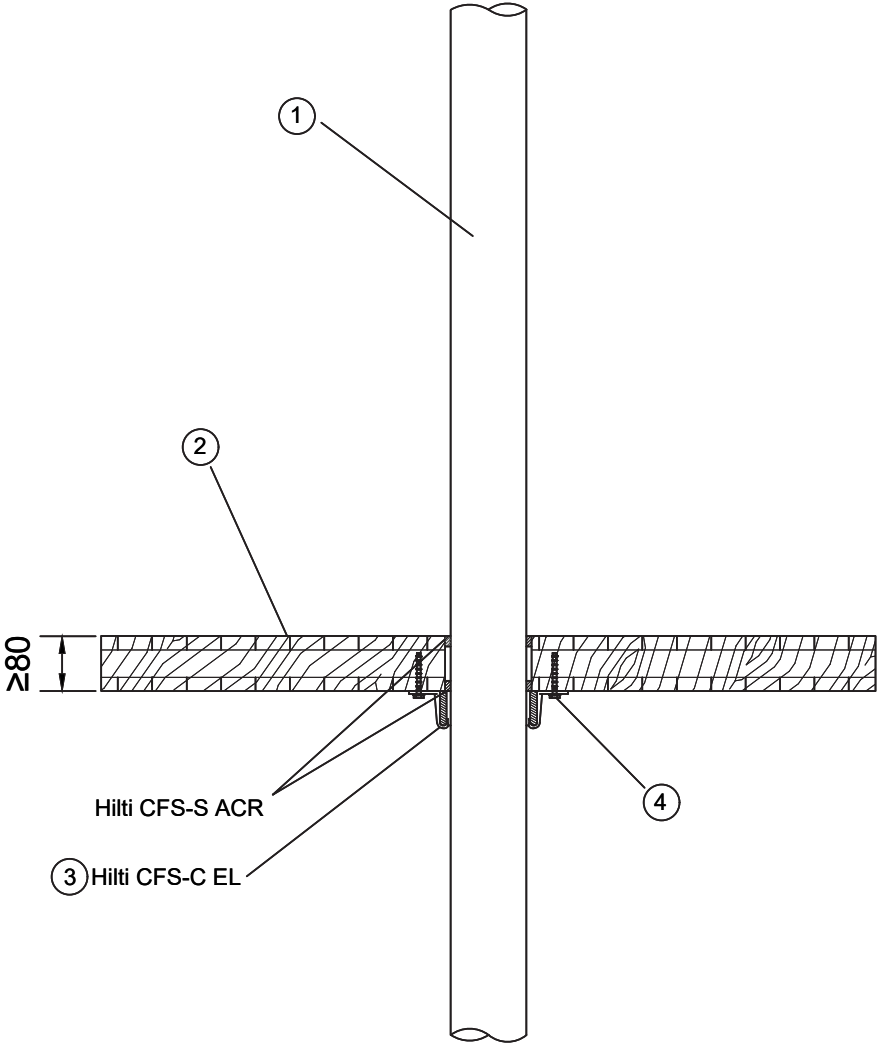


Floor applications: Wastewater and roof drainage

		Product Fire protection seal Hilti Endless Collar CFS-C EL	Building project
ID CFS-C EL_CLTF_CP_8X003		Contents Fire protection seal in cross-laminated timber floors for combustible pipes	
Page 01	Rev 03		

EI30 U/U

Fire resistance 30 min. -
Fire--retardant



Basic documents, which form the respective proof of applicability

- German Approval aBG: Z-19.53-2192
- European Technical Assessment: ETA-14/0085
- Reaction to fire according to EN 13501-1
- Fire resistance according to EN 13501-2
- Installations according to the Hilti installation instructions

Without scale
all units in [mm]

Product

Fire protection seal
Hilti Endless Collar CFS-C EL

Building project

ID CFS-C EL_CLTF_CP_8X003

Contents

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Fire protection seal in cross-laminated timber floors
for combustible pipes

① Installations

Item	Implementation	Description/Type	Dimensions [mm]	Firestop material	Opening size [mm]	Annular gap	Seal thickness [mm]
1a	Combustible pipe	Geberit Silent Pro	50 ≤ Ø ≤ 110 3 ≤ s* ≤ 4.5	CFS-C EL	65 ≤ Ø ≤ 140	CFS S ACR ≤ 15 mm	≥ 80
1b	Combustible pipe	Geberit Silent db 20 (PP)	56 ≤ Ø ≤ 110 3.2 ≤ s* ≤ 6	CFS-C EL	71 ≤ Ø ≤ 140	CFS S ACR ≤ 15 mm	≥ 80
1c	Combustible pipe	Poloplast POLO- KAL NG/ XS (PP)	50 ≤ Ø ≤ 110 2 ≤ s* ≤ 3.4	CFS-C EL	65 ≤ Ø ≤ 140	CFS S ACR ≤ 15 mm	≥ 80
1d	Combustible pipe	Rehau Raupiano Plus (PP)	50 ≤ Ø ≤ 110 1.8 ≤ s* ≤ 2.7	CFS-C EL	65 ≤ Ø ≤ 140	CFS S ACR ≤ 15 mm	≥ 80
1e	Combustible pipe	PE-HD pipe (DIN EN 1519-1, EN 12201-2 or 12666-1), ABS (EN 1455-1),w SAN+PVC (EN 1565-1)	50 ≤ Ø ≤ 110 3 ≤ s* ≤ 4.2	CFS-C EL	65 ≤ Ø ≤ 140	CFS S ACR ≤ 15 mm	≥ 80
1f	Combustible pipe	PP-H pipe (DIN EN 1451-1)	50 ≤ Ø ≤ 110 1.8 ≤ s* ≤ 3	CFS-C EL	65 ≤ Ø ≤ 140	CFS S ACR ≤ 15 mm	≥ 80
1g	Combustible pipe	PVC-U (DIN EN ISO 1452-1, EN 1453-1 or EN 1329-1) PVC-C (EN 1566-1)	50 ≤ Ø ≤ 110 1.8 ≤ s* ≤ 8.1	CFS-C EL	65 ≤ Ø ≤ 140	CFS S ACR ≤ 15 mm	≥ 80
1h	Combustible pipe	Wavin AS	Ø 110s* = 5.3	CFS-C EL	125 ≤ Ø ≤ 140	CFS S ACR ≤ 15 mm	≥ 80

*Wall thickness

② Construction: This application detail applies in conjunction with "Appendix 1: Available evidence and documents"

The firestop functionality and fire resistance period of the floor must be considered separately.
The floor thicknesses shown correspond to minimum thicknesses required by the tested penetration seal.

③ Firestop product info

Hilti Firestop Collar Endless CFS-C EL

- European Technical Assessment: ETA-14/0085

- German Approval aBG: Z-19.53-2192

- Use for combustible pipes

- Fill the remaining annular gap with Hilti CFS-S ACR Firestop Sealant from both sides to a depth of at least 25 mm

Distances between the openings or other installations

Distance of the penetration seal to	size of openings next to each other [mm]	DIN distances between the openings [mm]	EN distances between openings [mm]
other cable or pipe penetration seals	one/both opening(s) > 400 x 400	≥ 200	≥ 200
	both openings ≤ 400 x 400	≥ 100	≥ 200
other openings or installations	one/both opening(s) > 200 x 200	≥ 200	≥ 200
	both openings ≤ 200 x 200	≥ 100	≥ 200

④ Fastening devices – see Appendix 2

A "typical" is a preconfigured fire protection solution consisting of specific components for a specific application, to which an assumed fire resistance period is assigned. Typical are selected according to their fire resistance period and are subject to the technical product documentation and underlying product approvals published by Hilti from time to time, are subject to generic assumptions, and are not selected on a project- or design-specific basis. The proposed typical may therefore not meet the project- or design-specific requirements, and accordingly, they must be evaluated by the customer or by a relevant expert appointed by the customer for their suitability regarding the actual project-specific design criteria and requirements.

Product

Fire protection seal
Hilti Endless Collar CFS-C EL

Building project

ID CFS-C EL_CLTF_CP_8X004/1

Contents

Page 01

Rev 03

Fire protection seal in cross-laminated timber floors
for combustible pipes

EI60 U/U

Fire resistance 60 min. -
Highly fire-retardant

Basic documents, which form the respective proof of applicability

-German Approval aBG: Z-19.53-2192

-European Technical Assessment: ETA-14/0085

-Reaction to fire according to EN 13501-1

-Fire resistance according to EN 13501-2

-Installations according to the Hilti installation instructions

Without scale
all units in [mm]

A "typical" is a preconfigured fire protection solution consisting of specific components for a specific application, to which an assumed fire resistance period is assigned. Typical are selected according to their fire resistance period and are subject to the technical product documentation and underlying product approvals published by Hilti from time to time, are subject to generic assumptions, and are not selected on a project- or design-specific basis. The proposed typical may therefore not meet the project- or design-specific requirements, and accordingly, they must be evaluated by the customer or by a relevant expert appointed by the customer for their suitability regarding the actual project-specific design criteria and requirements.

			Product Fire protection seal Hilti Endless Collar CFS-C EL	Building project
ID CFS-C EL_CLTF_CP_8X004/1			Contents Fire protection seal in cross-laminated timber floors for combustible pipes	
Page 02	Rev 03			

① Installations

Item	Implementa- tion	Description/Type	Dimensions [mm]	Firestop material	Opening size [mm]	Annular gap	Pipe insulation for roof drainage	Penetration seal thickness [mm]
1a	Combustible pipe	Geberit Silent Pro	50 ≤ Ø ≤ 110 3 ≤ s* ≤ 4.5	CFS-C EL	65 ≤ Ø ≤ 172	CFS S ACR ≤ 15 mm	Elastomeric insulation (rubber) Manufacturer: Armaflex AF/EVO T* = 9-16 mm Case CS	≥ 100
1b	Combustible pipe	Geberit Silent db 20 (PP)	56 ≤ Ø ≤ 110 3.2 ≤ s* ≤ 6	CFS-C EL	71 ≤ Ø ≤ 172	CFS S ACR ≤ 15 mm		≥ 100
1c	Combustible pipe	Poloplast POLO- KAL NG/ XS (PP)	50 ≤ Ø ≤ 110 2 ≤ s* ≤ 3.4	CFS-C EL	65 ≤ Ø ≤ 172	CFS S ACR ≤ 15 mm		≥ 100
1d	Combustible pipe	Rehau Raupiano Plus (PP)	50 ≤ Ø ≤ 110 1.8 ≤ s* ≤ 2.7	CFS-C EL	65 ≤ Ø ≤ 172	CFS S ACR ≤ 15 mm		≥ 100
1e	Combustible pipe	PE-HD pipe (DIN EN 1519-1, EN 12201-2 or 12666-1), ABS (EN 1455-1), SAN+PVC (EN 1565-1)	50 ≤ Ø ≤ 110 2 ≤ s* ≤ 4.2	CFS-C EL	65 ≤ Ø ≤ 172	CFS S ACR ≤ 15 mm		≥ 100
1f	Combustible pipe	PP-H pipe (DIN EN 1451-1)	50 ≤ Ø ≤ 110 1.8 ≤ s* ≤ 3	CFS-C EL	65 ≤ Ø ≤ 172	CFS S ACR ≤ 15 mm		≥ 100
1g	Combustible pipe	PVC-U (DIN EN ISO 1452-1, EN 1453-1 or EN 1329-1) PVC-C (EN 1566-1)	50 ≤ Ø ≤ 110 1.8 ≤ s* ≤ 8.1	CFS-C EL	65 ≤ Ø ≤ 172	CFS S ACR ≤ 15 mm		≥ 100
1h	Combustible pipe	Wavin SiTech+	Ø 110s* = 3.4	CFS-C EL	125 ≤ Ø ≤ 172	CFS S ACR ≤ 15 mm		≥ 100
1i	Combustible pipe	GF Silenta Premium	Ø 78s* = 4.5	CFS-C EL	93 ≤ Ø ≤ 110	CFS S ACR ≤ 15 mm		≥ 100

* Wall thickness/insulation thickness

② Construction: This application detail applies in conjunction with "Appendix 1: Available evidence and documents"

The firestop functionality and fire resistance period of the floor must be considered separately.
The floor thicknesses shown correspond to minimum thicknesses required by the tested penetration seal.

③ Firestop product info

Hilti Firestop Collar Endless CFS-C EL

- European Technical Assessment: ETA-14/0085
- German Approval aBG: Z-19.53-2192
- Use for combustible pipes
- Fill the remaining annular gap with Hilti CFS-S ACR Firestop Sealant from both sides to a depth of at least 25 mm

Distances between the openings or other installations

Distance of the penetration seal to	size of openings next to each other [mm]	DIN distances between the openings [mm]	EN distances between openings [mm]
other cable or pipe penetration seals	one/both opening(s) > 400 x 400	≥ 200	≥ 200
	both openings ≤ 400 x 400	≥ 100	≥ 200
other openings or instal- lations	one/both opening(s) > 200 x 200	≥ 200	≥ 200
	both openings ≤ 200 x 200	≥ 100	≥ 200

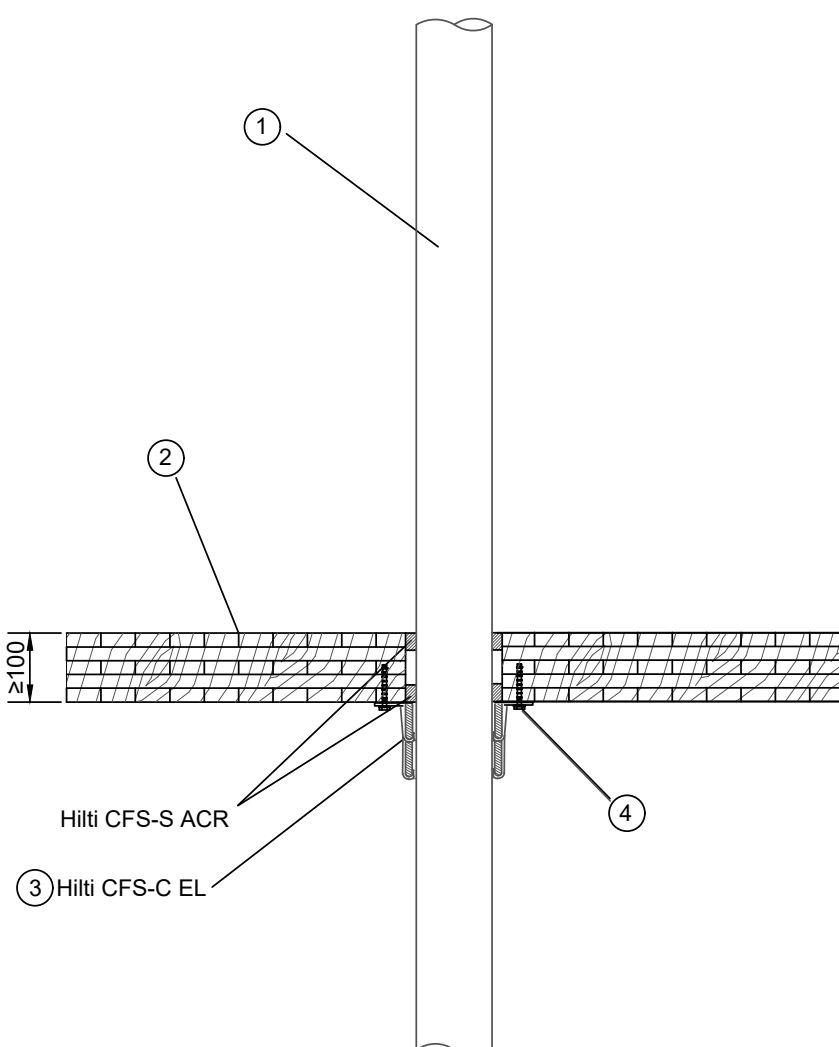
④ Fastening devices – see Appendix 2

A "typical" is a preconfigured fire protection solution consisting of specific components for a specific application, to which an assumed fire resistance period is assigned. Typical is selected according to their fire resistance period and are subject to the technical product documentation and underlying product approvals published by Hilti from time to time, are subject to generic assumptions, and are not selected on a project- or design-specific basis. The proposed typical may therefore not meet the project- or design-specific requirements, and accordingly, they must be evaluated by the customer or by a relevant expert appointed by the customer for their suitability regarding the actual project-specific design criteria and requirements.

		Product Fire protection seal Hilti Endless Collar CFS-C EL	Building project
ID CFS-C EL_CLTF_CP_8X004/2		Contents Fire protection seal in cross-laminated timber floors for combustible pipes	
Page 01	Rev 03		

EI60 U/U

Fire resistance 60 min. -
Highly fire-retardant



①
 ②
 ≥100
 Hilti CFS-S ACR
 ③ Hilti CFS-C EL
 ④

Basic documents, which form the respective proof of applicability

- German Approval aBG: Z-19.53-2192
- European Technical Assessment ETA-14/0085
- Reaction to fire according to EN 13501-1
- Fire resistance according to EN 13501-2
- Installations according to the Hilti installation instructions

Without scale
all units in [mm]

A "typical" is a preconfigured fire protection solution consisting of specific components for a specific application, to which an assumed fire resistance period is assigned. Typical is selected according to their fire resistance period and are subject to the technical product documentation and underlying product approvals published by Hilti from time to time, are subject to generic assumptions, and are not selected on a project- or design-specific basis. The proposed typical may therefore not meet the project- or design-specific requirements, and accordingly, they must be evaluated by the customer or by a relevant expert appointed by the customer for their suitability regarding the actual project-specific design criteria and requirements.

		Product Fire protection seal Hilti Endless Collar CFS-C EL				Building project		
ID CFS-C EL_CLTF_CP_8X004/2		Contents Fire protection seal in cross-laminated timber floors for combustible pipes						
Page 02	Rev 03							
① Installations								
Item	Implementa- tion	Description/Type	Dimensions [mm]	Firestop material	Opening size [mm]	Annular gap	Pipe insulation for roof drainage	Penetration seal thickness [mm]
1a	Combustible pipe	Geberit Silent Pro	125 ≤ Ø ≤ 160 4.5 ≤ s ≤ 6	CFS-C EL	140 ≤ Ø ≤ 222	CFS S ACR ≤ 15 mm	Elastomeric insulation (rubber) Manufacturer: Armaflex AF/EVO T* = 10– 16 mm Case CS	≥ 100
1b	Combustible pipe	Geberit Silent db 20 (PP)	135 ≤ Ø ≤ 160 6 ≤ s ≤ 7	CFS-C EL	150 ≤ Ø ≤ 222	CFS S ACR ≤ 15 mm		≥ 100
1c	Combustible Pipe	Poloplast POLO- KAL NG/XS (PP)	125 ≤ Ø ≤ 160 3.9 ≤ s ≤ 4.9	CFS-C EL	140 ≤ Ø ≤ 222	CFS S ACR ≤ 15 mm		≥ 100
1d	Combustible Pipe	Rehau Raupiano Plus (PP)	125 ≤ Ø ≤ 160 3.1 ≤ s ≤ 3.9	CFS-C EL	140 ≤ Ø ≤ 222	CFS S ACR ≤ 15 mm		≥ 100
1e	Combustible Pipe	PE-HD pipe (DIN EN 1519-1, EN 12201-2 or 12666-1), ABS (EN 1455-1), SAN+PVC (EN 1565-1)	125 ≤ Ø ≤ 160 4.8 ≤ s ≤ 6.2	CFS-C EL	140 ≤ Ø ≤ 222	CFS S ACR ≤ 15 mm		≥ 100
1f	Combustible Pipe	PP-H pipe (DIN EN 1451-1)	125 ≤ Ø ≤ 160 3.1 ≤ s ≤ 9.1	CFS-C EL	140 ≤ Ø ≤ 222	CFS S ACR ≤ 15 mm		≥ 100
1g	Combustible Pipe	PVC-U (DIN EN ISO 1452-1, EN 1453-1 or EN 1329-1) PVC-C (EN 1566-1)	125 ≤ Ø ≤ 160 3.2 ≤ s ≤ 11.8	CFS-C EL	140 ≤ Ø ≤ 222	CFS S ACR ≤ 15 mm		≥ 100
1h	Combustible Pipe	Wavin SiTech+	Ø = 125 s = 3.9	CFS-C EL	140 ≤ Ø ≤ 187	CFS S ACR ≤ 15 mm		≥ 100
1i	Combustible Pipe	GF Silenta Premium	Ø = 160 s = 5.3	CFS-C EL	175 ≤ Ø ≤ 222	CFS S ACR ≤ 15 mm		≥ 100
* Wall thickness/insulation thickness								
② Construction: This application detail applies in conjunction with "Appendix 1: Available evidence and documents"								
The firestop functionality and fire resistance period of the floor must be considered separately. The floor thicknesses shown correspond to minimum thicknesses required by the tested penetration seal.								
③ Firestop product info								
Hilti Firestop Collar Endless CFS-C EL								
- European Technical Assessment: ETA-14/0085								
- German Approval aBG: Z-19.53-2192								
- Use for combustible pipes								
- Fill the remaining annular gap with Hilti CFS-S ACR Firestop Sealant from both sides to a depth of at least 25 mm								
Distances between the openings or other installations								
Distance of the penetration seal to	size of openings next to each other [mm]		DIN distances between the openings [mm]		EN distances between openings [mm]			
other cable or pipe penetration seals	one/both opening(s) > 400 x 400		≥ 200		≥ 200			
	both openings ≤ 400 x 400		≥ 100		≥ 200			
other openings or instal- lations	one/both opening(s) > 200 x 200		≥ 200		≥ 200			
	both openings ≤ 200 x 200		≥ 100		≥ 200			
④ Fastening devices – see Appendix 2								

A "typical" is a preconfigured fire protection solution consisting of specific components for a specific application, to which an assumed fire resistance period is assigned. Typical is selected according to their fire resistance period and are subject to the technical product documentation and underlying product approvals published by Hilti from time to time, are subject to generic assumptions, and are not selected on a project- or design-specific basis. The proposed typical may therefore not meet the project- or design-specific requirements, and accordingly, they must be evaluated by the customer or by a relevant expert appointed by the customer for their suitability regarding the actual project-specific design criteria and requirements.

		Product Fire protection seal Hilti Endless Collar CFS-C EL		Building project	
ID CFS-C EL_CLTF_CP_8X005/1		Contents Fire protection seal in cross-laminated timber floors for combustible pipes			
Page 01	Rev 03				
EI90 U/U Fire resistance 90 min. – Fire--resistant 1 2 3 4 ≥140 Hilti CFS-S ACR Hilti CFS-C EL					
Basic documents, which form the respective proof of applicability					
- German Approval aBG: Z-19.53-2192					
- European Technical Assessment ETA-14/0085					
- Reaction to fire according to EN 13501-1					
- Fire resistance according to EN 13501-2					
- Installations according to the Hilti installation instructions					
Without scale all units in [mm]					

A "typical" is a preconfigured fire protection solution consisting of specific components for a specific application, to which an assumed fire resistance period is assigned. Typical is selected according to their fire resistance period and are subject to the technical product documentation and underlying product approvals published by Hilti from time to time, are subject to generic assumptions, and are not selected on a project- or design-specific basis. The proposed typical may therefore not meet the project- or design-specific requirements, and accordingly, they must be evaluated by the customer or by a relevant expert appointed by the customer for their suitability regarding the actual project-specific design criteria and requirements.

		Product Fire protection seal Hilti Endless Collar CFS-C EL					Building project	
ID CFS-C EL_CLTF_CP_8X004/2		Contents Fire protection seal in cross-laminated timber floors for combustible pipes						
Page 02		Rev 03						
① Installations								
Item	Implementa- tion	Description/Type	Dimensions [mm]	Firestop material	Opening size [mm]	Annular gap	Pipe insulation for roof drainage	Penetration seal thickness [mm]
1a	Combustible pipe	Geberit Silent Pro	50 ≤ Ø ≤ 110 3 ≤ s* ≤ 4.5	CFS-C EL	65 ≤ Ø ≤ 172	CFS S ACR ≤ 15 mm	Elastomeric insulation (rubber) Manufacturer: Armaflex AF/EVO T* = 9–16 mm Case CS	≥ 140
1b	Combustible pipe	Geberit Silent db 20 (PP)	56 ≤ Ø ≤ 110 3.2 ≤ s* ≤ 6	CFS-C EL	71 ≤ Ø ≤ 172	CFS S ACR ≤ 15 mm		≥ 140
1c	Combustible pipe	Poloplast POLO- KAL NG/XS (PP)	50 ≤ Ø ≤ 110 2 ≤ s* ≤ 3.4	CFS-C EL	65 ≤ Ø ≤ 172	CFS S ACR ≤ 15 mm		≥ 140
1d	Combustible pipe	Rehau Raupiano Plus (PP)	50 ≤ Ø ≤ 110 1.8 ≤ s* ≤ 2.7	CFS-C EL	65 ≤ Ø ≤ 172	CFS S ACR ≤ 15 mm		≥ 140
1e	Combustible pipe	PE-HD pipe (DIN EN 1519-1, EN 12201-2 or 12666-1), ABS (EN 1455-1), SAN+PVC (EN 1565-1)	50 ≤ Ø ≤ 110 2 ≤ s* ≤ 4.2	CFS-C EL	65 ≤ Ø ≤ 172	CFS S ACR ≤ 15 mm		≥ 140
1f	Combustible pipe	PP-H pipe (DIN EN 1451-1)	50 ≤ Ø ≤ 110 1.8 ≤ s* ≤ 3	CFS-C EL	65 ≤ Ø ≤ 172	CFS S ACR ≤ 15 mm		≥ 140
1g	Combustible pipe	PVC-U (DIN EN ISO 1452-1, EN 1453-1 or EN 1329-1) PVC-C (EN 1566-1)	50 ≤ Ø ≤ 110 1.8 ≤ s* ≤ 8.1	CFS-C EL	65 ≤ Ø ≤ 172	CFS S ACR ≤ 15 mm		≥ 140
1h	Combustible pipe	Wavin SiTech+	Ø 110s* = 3.4	CFS-C EL	125 ≤ Ø ≤ 172	CFS S ACR ≤ 15 mm		≥ 140
1i	Combustible pipe	GF Silenta Premium	Ø 78s* = 4.5	CFS-C EL	93 ≤ Ø ≤ 140	CFS S ACR ≤ 15 mm		≥ 140
* Wall thickness/insulation thickness								
② Construction: This application detail applies in conjunction with "Appendix 1: Available evidence and documents"								
The firestop functionality and fire resistance period of the floor must be considered separately. The floor thicknesses shown correspond to minimum thicknesses required by the tested penetration seal.								
③ Firestop product info								
Hilti Firestop Collar Endless CFS-C EL								
- European Technical Assessment: ETA-14/0085								
- German Approval aBG: Z-19.53-2192								
- Use for combustible pipes								
- Fill the remaining annular gap with Hilti CFS-S ACR Firestop Sealant from both sides to a depth of at least 25 mm								
Distances between the openings or other installations								
**only with insulation 16–36.5 mm								
Distances to Hilti Single systems [mm] (opening to opening)	CFS-C EL	CFS-B (aluminum composite pipes)	CFS-B** (metal pipes)	CFS-S ACR (metal pipes)	CFS-S ACR (aluminum composite pipes)	CFS-CC (cable)	CFS-DL GA (DE)	
CFS-C EL	50	50	50	50	50	50	50	
CFS-B (aluminum composite pipes)		50	50	50	50	50	50	
CFS-B** (metal pipes)			50	50	50	50	50	
CFS-S ACR (metal pipes)				50	50	50	50	
CFS-S ACR (aluminum composite pipes)					50	50	50	
CFS-CC (cable)						50	50	
CFS-DL GA (DE)							50	
Distance of the penetration seal to	size of openings next to each other [mm]		DIN distances between the openings [mm]		EN distances between openings [mm]			
other cable or pipe penetration seals	one/both opening(s) > 400 x 400		≥ 200		≥ 200			
	both openings ≤ 400 x 400		≥ 100		≥ 200			
other openings or instal- lations	one/both opening(s) > 200 x 200		≥ 200		≥ 200			
	both openings ≤ 200 x 200		≥ 100		≥ 200			
④ Fastening devices – see Appendix 2								

A "typical" is a preconfigured fire protection solution consisting of specific components for a specific application, to which an assumed fire resistance period is assigned. Typical is selected according to their fire resistance period and are subject to the technical product documentation and underlying product approvals published by Hilti from time to time, are subject to generic assumptions, and are not selected on a project- or design-specific basis. The proposed typical may therefore not meet the project- or design-specific requirements, and accordingly, they must be evaluated by the customer or by a relevant expert appointed by the customer for their suitability regarding the actual project-specific design criteria and requirements.

HILTI		Product Fire protection seal Hilti Endless Collar CFS-C EL		Building project
ID CFS-C EL_CLTF_CP_8X005/2		Contents Fire protection seal in cross-laminated timber floors for combustible pipes		
Page 01	Rev 03			

①

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③

④

1

2

3

4

≥140

Hilti CFS-S ACR

Hilti CFS-C EL

EI90 U/U

Fire resistance 90 min. –
Fire--resistant

Basic documents, which form the respective proof of applicability

- German Approval aBG: Z-19.53-2192

- European Technical Assessment ETA-14/0085

- Reaction to fire according to EN 13501-1

- Fire resistance according to EN 13501-2

- Installations according to the Hilti installation instructions

Without scale

all units in [mm]

A "typical" is a preconfigured fire protection solution consisting of specific components for a specific application, to which an assumed fire resistance period is assigned. Typical is selected according to their fire resistance period and are subject to the technical product documentation and underlying product approvals published by Hilti from time to time, are subject to generic assumptions, and are not selected on a project- or design-specific basis. The proposed typical may therefore not meet the project- or design-specific requirements, and accordingly, they must be evaluated by the customer or by a relevant expert appointed by the customer for their suitability regarding the actual project-specific design criteria and requirements.

		Product Fire protection seal Hilti Endless Collar CFS-C EL					Building project	
ID CFS-C EL_CLTF_CP_8X005/2		Contents Fire protection seal in cross-laminated timber floors for combustible pipes						
Page 02		Rev 03						

① Installations

Item	Implementa- tion	Description/Type	Dimensions [mm]	Firestop material	Opening size [mm]	Annular gap	Pipe insulation for roof drainage	Penetration seal thickness [mm]
1a	Combustible pipe	Geberit Silent Pro	125 ≤ Ø ≤ 160 4.5 ≤ s ≤ 6	CFS-C EL	140 ≤ Ø ≤ 222	CFS S ACR ≤ 15 mm	Elastomeric insulation (rubber) Manufacturer: Armaflex AF/EVO T* = 10–16 mm Case CS	≥ 140
1b	Combustible pipe	Geberit Silent db 20 (PP)	135 ≤ Ø ≤ 160 6 ≤ s ≤ 7	CFS-C EL	150 ≤ Ø ≤ 222	CFS S ACR ≤ 15 mm		≥ 140
1c	Combustible pipe	Poloplast POLO- KAL NG/ XS (PP)	125 ≤ Ø ≤ 160 3.9 ≤ s ≤ 4.9	CFS-C EL	140 ≤ Ø ≤ 222	CFS S ACR ≤ 15 mm		≥ 140
1d	Combustible pipe	Rehau Raupiano Plus (PP)	125 ≤ Ø ≤ 160 3.1 ≤ s ≤ 3.9	CFS-C EL	140 ≤ Ø ≤ 222	CFS S ACR ≤ 15 mm		≥ 140
1e	Combustible pipe	PE-HD pipe (DIN EN 1519-1, EN 12201-2 or 12666-1), ABS (EN 1455-1), SAN+PVC (EN 1565-1)	125 ≤ Ø ≤ 160 4.8 ≤ s ≤ 6.2	CFS-C EL	140 ≤ Ø ≤ 222	CFS S ACR ≤ 15 mm		≥ 140
1f	Combustible pipe	PP-H pipe (DIN EN 1451-1)	125 ≤ Ø ≤ 160 3.1 ≤ s ≤ 9.1	CFS-C EL	140 ≤ Ø ≤ 222	CFS S ACR ≤ 15 mm		≥ 140
1g	Combustible pipe	PVC-U (DIN EN ISO 1452-1, EN 1453-1 or EN 1329-1) PVC-C (EN 1566-1)	125 ≤ Ø ≤ 160 3.2 ≤ s ≤ 11.8	CFS-C EL	140 ≤ Ø ≤ 222	CFS S ACR ≤ 15 mm		≥ 140
1h	Combustible pipe	Wavin SiTech+	Ø = 125 s = 3.9	CFS-C EL	140 ≤ Ø ≤ 187	CFS S ACR ≤ 15 mm		≥ 140
1i	Combustible pipe	GF Silenta Premium	Ø = 160 s = 5.3	CFS-C EL	175 ≤ Ø ≤ 222	CFS S ACR ≤ 15 mm		≥ 140

* Wall thickness/insulation thickness

② Construction: This application detail applies in conjunction with "Appendix 1: Available evidence and documents"

The firestop functionality and fire resistance period of the floor must be considered separately.
The floor thicknesses shown correspond to minimum thicknesses required by the tested penetration seal.

③ Firestop product info

Hilti Firestop Collar Endless CFS-C EL
- European Technical Assessment: ETA-14/0085
- German Approval aBG: Z-19.53-2192
- Use for combustible pipes
- Fill the remaining annular gap with Hilti CFS-S ACR Firestop Sealant from both sides to a depth of at least 25 mm

Distances between the openings or other installations

**only with insulation 16–36.5 mm

Distances to Hilti Single systems [mm] (opening to opening)	CFS-C EL	CFS-B (aluminum composite pipes)	CFS-B** (metal pipes)	CFS-S ACR (metal pipes)	CFS-S ACR (aluminum composite pipes)	CFS-CC (cable)	CFS-DL GA (DE)
CFS-C EL	50	50	50	50	50	50	50
CFS-B (aluminum composite pipes)		50	50	50	50	50	50
CFS-B** (metal pipes)			50	50	50	50	50
CFS-S ACR (metal pipes)				50	50	50	50
CFS-S ACR (aluminum composite pipes)					50	50	50
CFS-CC (cable)						50	50
CFS-DL GA (DE)							50

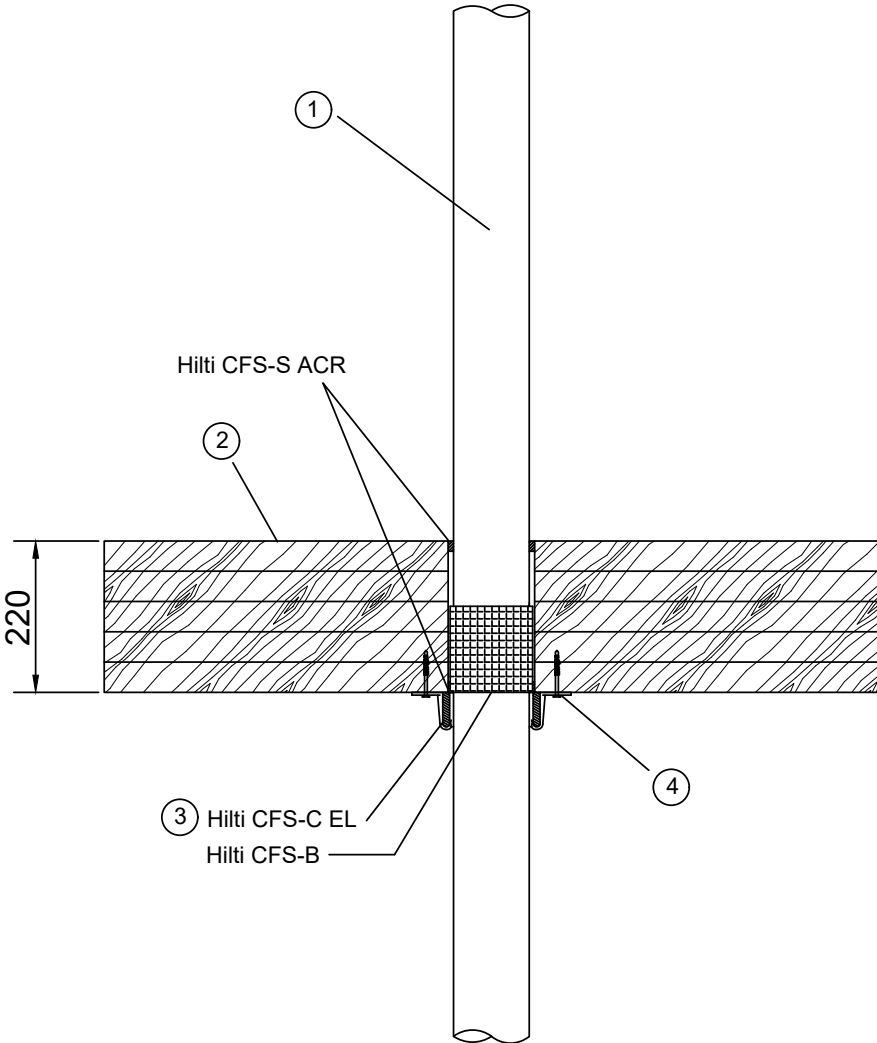
Distance of the penetration seal to	size of openings next to each other [mm]	DIN distances between the openings [mm]	EN distances between openings [mm]
other cable or pipe penetration seals	one/both opening(s) > 400 x 400	≥ 200	≥ 200
	both openings ≤ 400 x 400	≥ 100	≥ 200
other openings or installations	one/both opening(s) > 200 x 200	≥ 200	≥ 200
	both openings ≤ 200 x 200	≥ 100	≥ 200

④ Fastening devices – see Appendix 2

A "typical" is a preconfigured fire protection solution consisting of specific components for a specific application, to which an assumed fire resistance period is assigned. Typical is selected according to their fire resistance period and are subject to the technical product documentation and underlying product approvals published by Hilti from time to time, are subject to generic assumptions, and are not selected on a project- or design-specific basis. The proposed typical may therefore not meet the project- or design-specific requirements, and accordingly, they must be evaluated by the customer or by a relevant expert appointed by the customer for their suitability regarding the actual project-specific design criteria and requirements.

		Product	Building project
Fire protection seal Hilti Endless Collar CFS-C EL			
ID CFS-C EL_CLTF_CP_8X001		Contents	
Page 01		Rev 00	
		Fire protection seal in cross-laminated timber floors for combustible pipes	

EI90 U/U



- German Approval aBG: Z-19.53-2192

- European Technical Assessment ETA-14/0085

- Reaction to fire according to EN 13501-1

- Fire resistance according to EN 13501-1

- Installations according to the Hilti installation instructions

Without scale
all units in [mm]

A "typical" is a preconfigured fire protection solution consisting of specific components for a specific application, to which an assumed fire resistance period is assigned. Typical is selected according to their fire resistance period and are subject to the technical product documentation and underlying product approvals published by Hilti from time to time, are subject to generic assumptions, and are not selected on a project- or design-specific basis. The proposed typical may therefore not meet the project- or design-specific requirements, and accordingly, they must be evaluated by the customer or by a relevant expert appointed by the customer for their suitability regarding the actual project-specific design criteria and requirements.

		Product	Building project	
		Fire protection seal Hilti Endless Collar CFS-C EL		
ID CFS-C EL_CLTF_CP_8X001		Contents Fire protection seal in cross-laminated timber floors for combustible pipes		
Page 02	Rev 00			

① Installations

Item	Implementation	Description/Type	Dimensions [mm]	Firestop material	Opening size [mm]	Annular gap	Seal thickness [mm]
1	Combustible pipe	Geberit Silent PP	Ø 110 x 3.4	CFS-C EL CFS-B	Ø ≤ 120	CFS-S ACR 0-10 mm	220
1	Combustible pipe	Geberit db 20 (PE)	Ø 110 x 6.0	CFS-C EL CFS-B	Ø ≤ 120	CFS-S ACR 0-10 mm	220

② Construction: This typical can be used for the following element types and Dataholz.eu systems

Element type	Leno cross-laminated timber according to ETA-10/0241 or Z-9.1-501 of Merk Timber gmbH, Aichach, Germany
Dataholz.eu	-

③ Firestop product info

Hilti Firestop Collar Endless CFS-C EL

- European Technical Assessment: ETA-14/0085
- German Approval aBG: Z-19.53-2192
 - Use for combustible pipes
 - Fill the remaining annular gap with Hilti CFS-S ACR Firestop Sealant from both sides to a depth of at least 20 mm

Hilti Firestop Wrap CFS-B

- European Technical Assessment: ETA-10/0212
- German Approval aBG: Z-19.53-2210
- Use for combustible and insulated non-combustible pipes
- 2-ply application
- Fill the remaining annular gap with Hilti CFS-S ACR Firestop Sealant from both sides to a depth of at least 20 mm

Distances between the openings or other installations

Distance of the penetration seal to	size of openings next to each other [mm]	DIN distance between openings [mm]	EN distance between openings [mm]
other cable or pipe penetration seals	one/both opening(s) > 400 x 400	≥ 200	≥ 50
	both openings ≤ 400 x 400	≥ 100	≥ 50
other openings or installations	one/both opening(s) > 200 x 200	≥ 200	≥ 200
	both openings ≤ 200 x 200	≥ 100	≥ 100

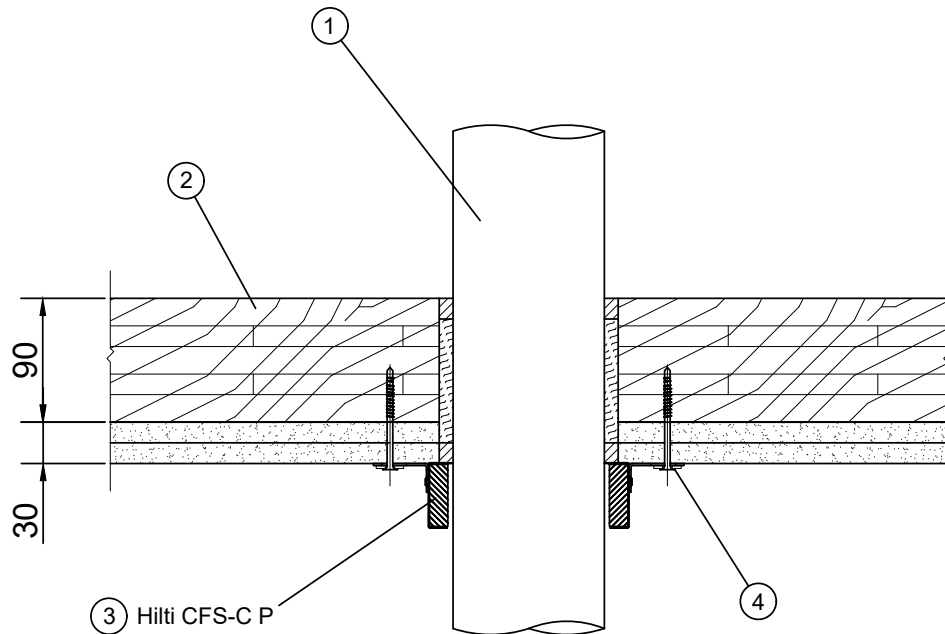
④ Adhesive mortar

Type	Length [mm]
HUS-H 6	≤ 85

A "typical" is a preconfigured fire protection solution consisting of specific components for a specific application, to which an assumed fire resistance period is assigned. Typical is selected according to their fire resistance period and are subject to the technical product documentation and underlying product approvals published by Hilti from time to time, are subject to generic assumptions, and are not selected on a project- or design-specific basis. The proposed typical may therefore not meet the project- or design-specific requirements, and accordingly, they must be evaluated by the customer or by a relevant expert appointed by the customer for their suitability regarding the actual project-specific design criteria and requirements.

		Product	Building project
ID CFS-C P_CLTF_CP_8X002		Contents	
Page 01	Rev 01	Fire protection seal in cross-laminated timber floors for combustible pipes	

EI120 U/U



③ Hilti CFS-C P

④

- German Approval aBG: Z-19.15-1781

- European Technical Assessment: ETA-10/0404

- Reaction to fire according to EN 13501-1

- Fire resistance according to EN 13501-1

- Installations according to the Hilti installation instructions

Without scale
all units in [mm]

A "typical" is a preconfigured fire protection solution consisting of specific components for a specific application, to which an assumed fire resistance period is assigned. Typical is selected according to their fire resistance period and are subject to the technical product documentation and underlying product approvals published by Hilti from time to time, are subject to generic assumptions, and are not selected on a project- or design-specific basis. The proposed typical may therefore not meet the project- or design-specific requirements, and accordingly, they must be evaluated by the customer or by a relevant expert appointed by the customer for their suitability regarding the actual project-specific design criteria and requirements.



		Product Fire protection seal Hilti Firestop Collar CFS-C P	Building project
ID CFS-C P_CLTF_CP_8X002		Contents Fire protection seal in cross-laminated timber floors for combustible pipes	
Page 02	Rev 01		

① Installations

Item	Implementation	Description/Type	Dimensions [mm]	Firestop material	Opening size [mm]	Annular gap	Seal thickness [mm]
1	Combustible Pipe	PE -S2 pipe	Ø 110 x 6.0	CFS-C P 110/4»	Ø 130	CFS-S ACR 0-10 mm	120
1	Combustible Pipe	PE pipe (DIN EN 1519)	Ø 110 x 4.2	CFS-C P 110/4»	Ø 130	CFS-S ACR 0-10 mm	120

② Construction: This typical can be used for the following element types and Dataholz.eu systems

Element type	- BBS 90 according to ETA-06/0009 Binderholz Bausysteme GmbH, Fügen, Austria - Plasterboard 2 x 15 mm according to EN 520
Dataholz.eu	

③ Firestop product info

Hilti Firestop Collar CFS-C P

- European Technical Assessment: ETA-10/0404
- German Approval aBG: Z-19.15-1781
- Use for combustible pipes
- Backfill remaining annular gap with mineral wool and fill with Hilti Firestop Sealant CFS-S ACR from both sides to a depth of at least 15 mm

Distances between the openings or other installations

Distance of the penetration seal to	size of openings next to each other [mm]	DIN distance between openings [mm]	EN distance between openings [mm]
other cable or pipe penetration seals	one/both opening(s) > 400 x 400	≥ 200	≥ 50
	both openings ≤ 400 x 400	≥ 100	≥ 50
other openings or installations	one/both opening(s) > 200 x 200	≥ 200	≥ 200
	both openings ≤ 200 x 200	≥ 100	≥ 100

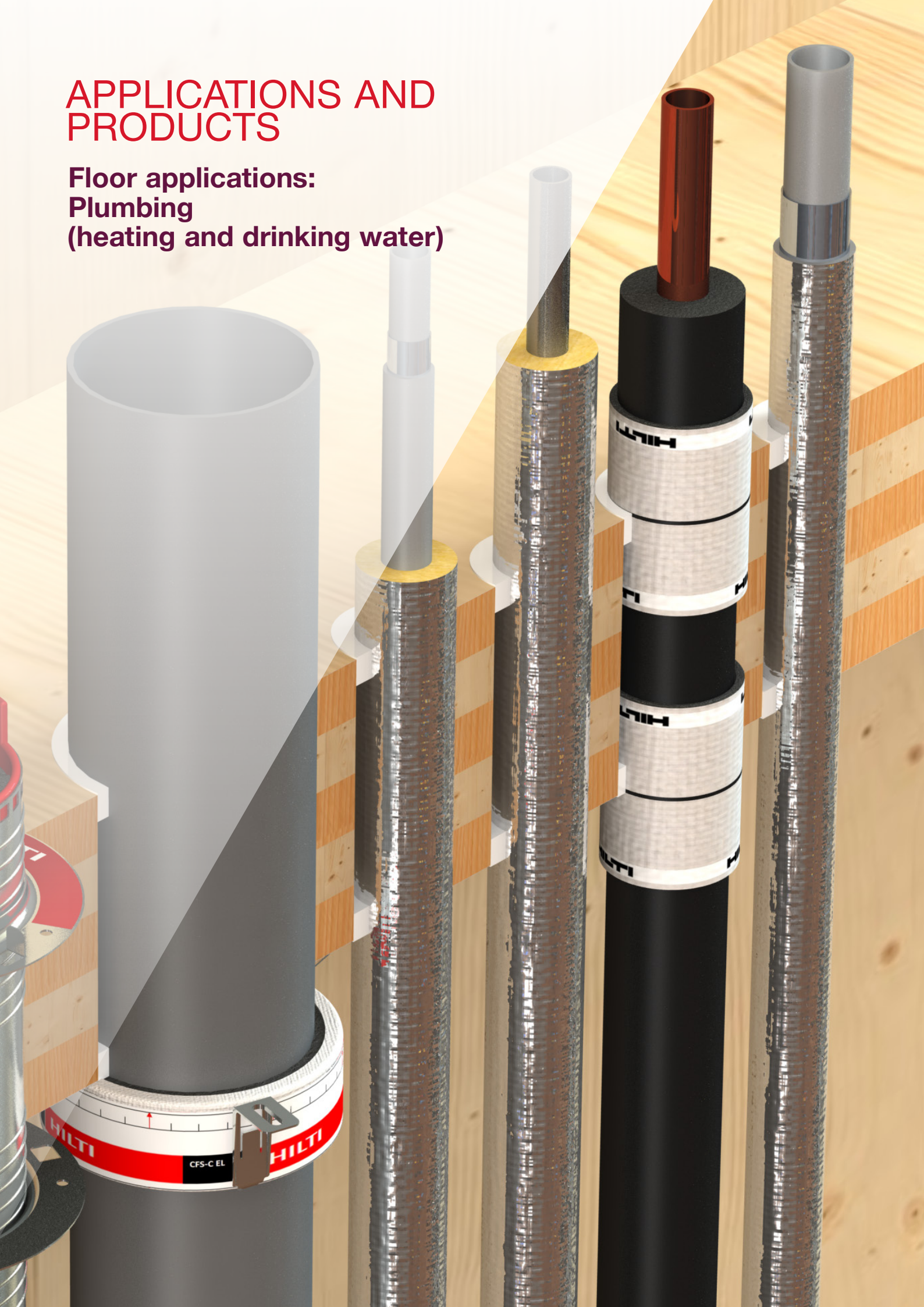
④Adhesive mortar

Type	Length [mm]
HUS-H 6	≥ 85

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APPLICATIONS AND PRODUCTS

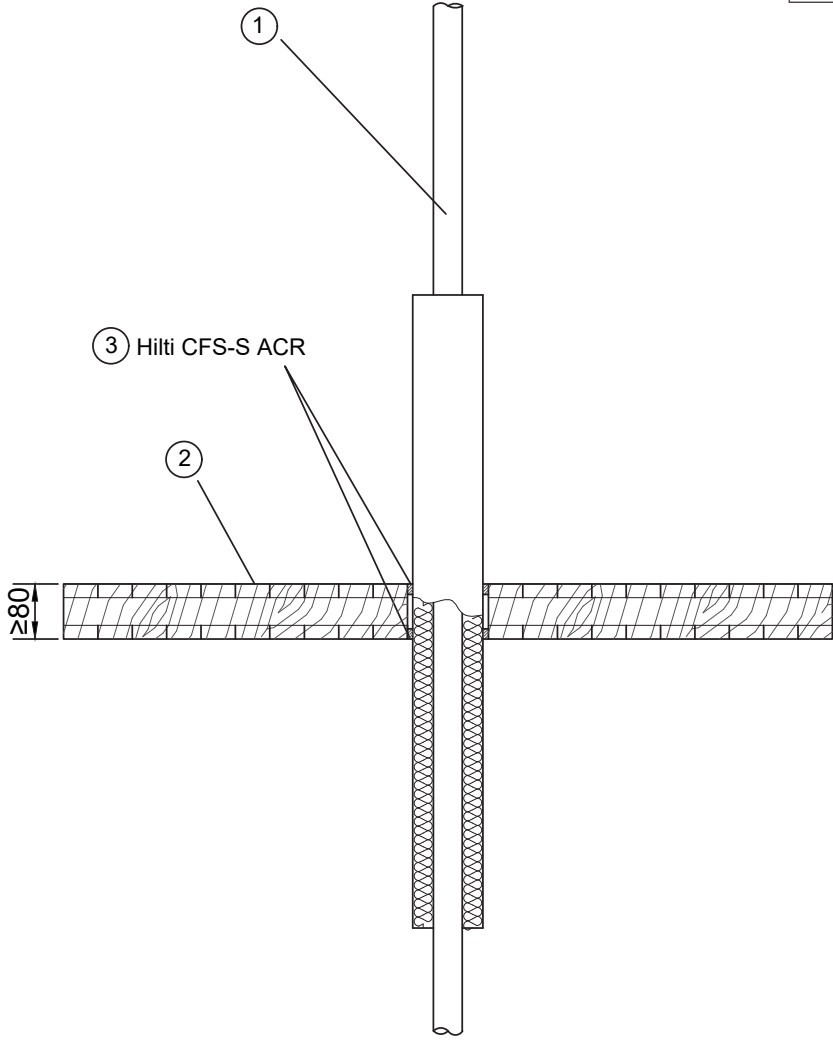
Floor applications:
Plumbing
(heating and drinking water)



Floor applications: Plumbing (heating and drinking water)

		Product Fire protection seal Hilti sealing paste CFS-S ACR	Building project
ID CFS-S ACR_CLTF_NCP_CP_8X003		Contents Fire protection seal in cross-laminated timber floors for non-combustible and combustible pipes	
Page 01	Rev 03		

EI30
Fire resistance 30 min. –
Fire--retardant



Basic documents, which form the respective proof of applicability

- German Approval P-MPA-E-17-010
- European Technical Assessment ETA-10/0292
- Reaction to fire according to EN 13501-1
- Fire resistance according to EN 13501-2
- Installations according to the Hilti installation instructions

Without scale
all units in [mm]

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		Product Fire protection seal Hilti sealing paste CFS-S ACR	Building project
ID CFS-S ACR_CLTF_NCP_CP_8X003		Contents Fire protection seal in cross-laminated timber floors for non-combustible and combustible pipes	
Page 01	Rev 03		

① Installations

Item	Implementation	Description/Type	Dimensions [mm]	Firestop material	Opening size [mm]	Annular gap	Pipe insulation	Penetration seal thickness [mm]
1a	Non-combustible Pipe C/U	Copper, steel, Stainless steel and cast iron	$10 \leq \varnothing \leq 42$ $1 \leq s^* \leq 14.2$	CFS S ACR	$65 \leq \varnothing \leq 112$	CFS S ACR ≤ 15 mm	Euro class mineral wool A1 or A2 Density ≥ 80 kg/m ³ T* = 20 mm Length ≥ 450 mm	≥ 80
1b	Aluminum composite pipes U/C	Geberit Mepla	$16 \leq \varnothing \leq 40$ $2.25 \leq s^* \leq 3$ $\varnothing 40 \times 3.5$	CFS S ACR	$71 \leq \varnothing \leq 110$	CFS S ACR ≤ 15 mm	Euro class mineral wool A1 or A2 Density ≥ 80 kg/m ³ T* = 20 mm Length ≥ 500 mm	≥ 80

* Wall thickness/insulation thickness

② Construction: This application detail applies in conjunction with "Appendix 1: Available evidence and documents"

The firestop functionality and fire resistance period of the floor must be considered separately.
The floor thicknesses shown correspond to minimum thicknesses required by the tested penetration seal.

③ Firestop product info

- Hilti Firestop Sealant CFS-S ACR
- European Technical Assessment: ETA-10/0292
- German Approval P-MPA-E-17-010
- Use for insulated non-combustible and combustible pipes
- Fill the remaining annular gap with Hilti CFS-S ACR Firestop Sealant from both sides to a depth of at least 25 mm

Distances between the openings or other installations

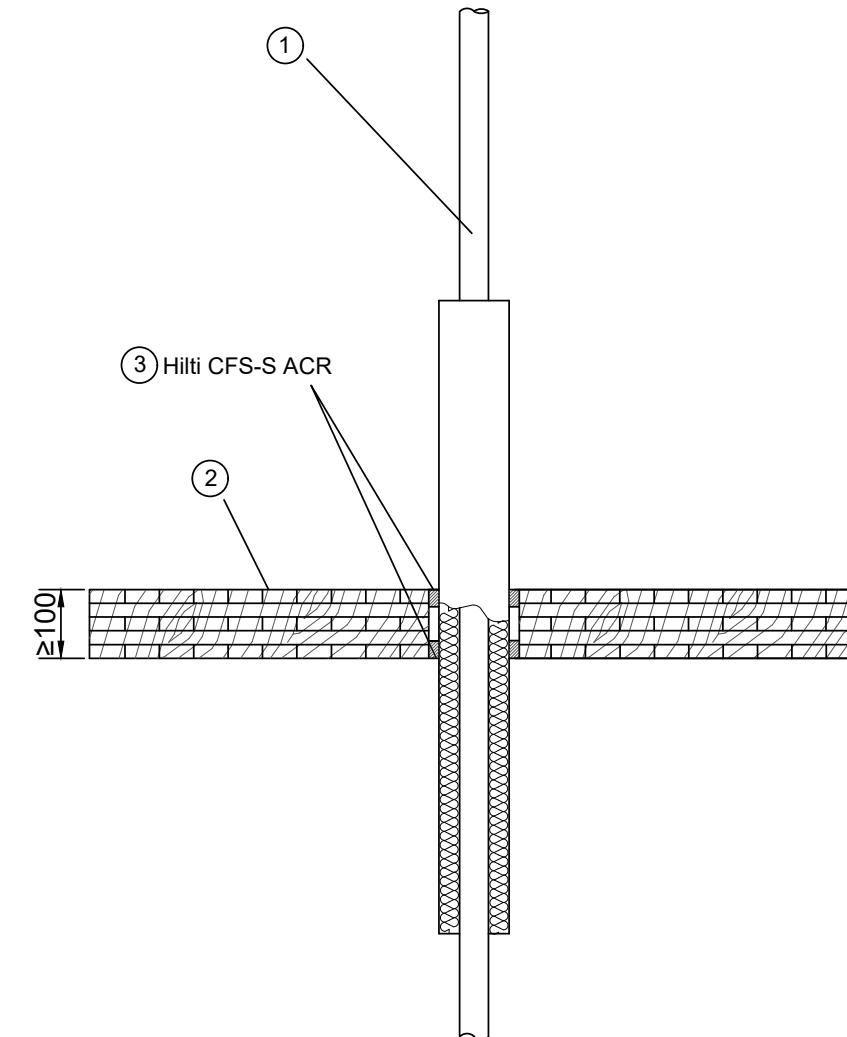
Distance of the penetration seal to	size of openings next to each other [mm]	DIN distances between the openings [mm]	EN distances between openings [mm]
other cable or pipe penetration seals	one/both opening(s) > 400 x 400	≥ 200	≥ 200
	both openings ≤ 400 x 400	≥ 100	≥ 200
other openings or installations	one/both opening(s) > 200 x 200	≥ 200	≥ 200
	both openings ≤ 200 x 200	≥ 100	≥ 200

A "typical" is a preconfigured fire protection solution consisting of specific components for a specific application, to which an assumed fire resistance period is assigned. Typical is selected according to their fire resistance period and are subject to the technical product documentation and underlying product approvals published by Hilti from time to time, are subject to generic assumptions, and are not selected on a project- or design-specific basis. The proposed typical may therefore not meet the project or design-specific requirements, and accordingly, they must be evaluated by the customer or by a relevant expert appointed by the customer for their suitability regarding the actual project-specific design criteria and requirements.

		Product Fire protection seal Hilti sealing paste CFS-S ACR	Building project
ID CFS-S ACR_CLTF_NCP_CP_8X004		Contents Fire protection seal in cross-laminated timber floors for non-combustible and combustible pipes	
Page 01	Rev 03		

EI60

Fire resistance 60 min. -
Highly fire-retardant



- German Approval P-MPA-E-17-010
- European Technical Assessment ETA-10/0292
- Reaction to fire according to EN 13501-1
- Fire resistance according to EN 13501-2
- Installations according to the Hilti installation instructions

Without scale
all units in [mm]

A "typical" is a preconfigured fire protection solution consisting of specific components for a specific application, to which an assumed fire resistance period is assigned. Typical is selected according to their fire resistance period and are subject to the technical product documentation and underlying product approvals published by Hilti from time to time, are subject to generic assumptions, and are not selected on a project- or design-specific basis. The proposed typical may therefore not meet the project or design-specific requirements, and accordingly, they must be evaluated by the customer or by a relevant expert appointed by the customer for their suitability regarding the actual project-specific design criteria and requirements.

		Product Fire protection seal Hilti sealing paste CFS-S ACR		Building project	
ID CFS-S ACR_CLTF_NCP_CP_8X004		Contents Fire protection seal in cross-laminated timber floors for non-combustible and combustible pipes			
Page	02	Rev	03		

① Installations

Item	Implementation	Description/Type	Dimensions [mm]	Firestop material	Opening size [mm]	Annular gap	Pipe insulation for roof drainage	Penetration seal thickness [mm]
1a	Non-combustible pipe C/U	Copper, steel, stainless steel	10 ≤ Ø ≤ 88.9 1 ≤ s* ≤ 14.2	CFS S ACR	65 ≤ Ø ≤ 190	CFS S ACR ≤ 15 mm	Mineral wool of Euro class A1 or A2 Density ≥ 80 kg/m^3 T* = 20–40 mm Length ≥ 450 mm	≥ 100
1b	Aluminum composite pipes U/C	Geberit Mepla	16 ≤ Ø ≤ 63 2.25 ≤ s* ≤ 4.5	CFS S ACR	71 ≤ Ø ≤ 173	CFS S ACR ≤ 15 mm	Euro class A1 or A2 mineral wool Density ≥ 80 kg/m^3 T* = 20–40 mm Ø ≤ 40 mm = length ≥ 170 mm Ø > 40 mm = length ≥ 390 mm	≥ 100
1c	Aluminum composite pipes U/C	Geberit system pipe ML	16 ≤ Ø ≤ 75 2.2 ≤ s* ≤ 4.6	CFS S ACR	71 ≤ Ø ≤ 185	CFS S ACR ≤ 15 mm		≥ 100
1d	Aluminum composite pipes U/C	REHAU Rautitan stable	16 ≤ Ø ≤ 63 2.2 ≤ s* ≤ 6	CFS S ACR	71 ≤ Ø ≤ 173	CFS S ACR ≤ 15 mm		≥ 100
1e	Aluminum composite pipes U/C	REHAU Rautitan flex	16 ≤ Ø ≤ 63 2.2 ≤ s* ≤ 8.6	CFS S ACR	71 ≤ Ø ≤ 173	CFS S ACR ≤ 15 mm		≥ 100
1f	Aluminum composite pipes U/C	Uponor Unipipe Plus/MLC	16 ≤ Ø ≤ 75 2.0 ≤ s* ≤ 7.5	CFS S ACR	71 ≤ Ø ≤ 185	CFS S ACR ≤ 15 mm		≥ 100
1g	Aluminum composite pipes U/C	+GF+ JRG Sanipex	16 ≤ Ø ≤ 63 2.25 ≤ s* ≤ 4.5	CFS S ACR	71 ≤ Ø ≤ 173	CFS S ACR ≤ 15 mm		≥ 100
1h	Aluminum composite pipes U/C	TECE TECEflex	14 ≤ Ø ≤ 63 2.6 ≤ s* ≤ 6	CFS S ACR	49 ≤ Ø ≤ 173	CFS S ACR ≤ 15 mm		≥ 100
1i	Aluminum composite pipes U/C	KeKelit Kelox KM110	25 ≤ Ø ≤ 75 2.5 ≤ s* ≤ 7.5	CFS S ACR	80 ≤ Ø ≤ 185	CFS S ACR ≤ 15 mm		≥ 100
1j	Aluminum composite pipes U/C	Viega Sanfix Fosta	16 ≤ Ø ≤ 20 2.2 ≤ s* ≤ 2.8	CFS S ACR	71 ≤ Ø ≤ 75	CFS S ACR ≤ 15 mm		≥ 100

* Wall thickness/insulation thickness

② Construction: This application detail applies in conjunction with "Appendix 1: Available evidence and documents"

The firestop functionality and fire resistance period of the floor must be considered separately.
The floor thicknesses shown correspond to minimum thicknesses required by the tested penetration seal.

③ Firestop product info

Hilti Firestop Collar Endless CFS-C EL

- European Technical Assessment: ETA-14/0085

- German Approval aBG: Z-19.53-2192

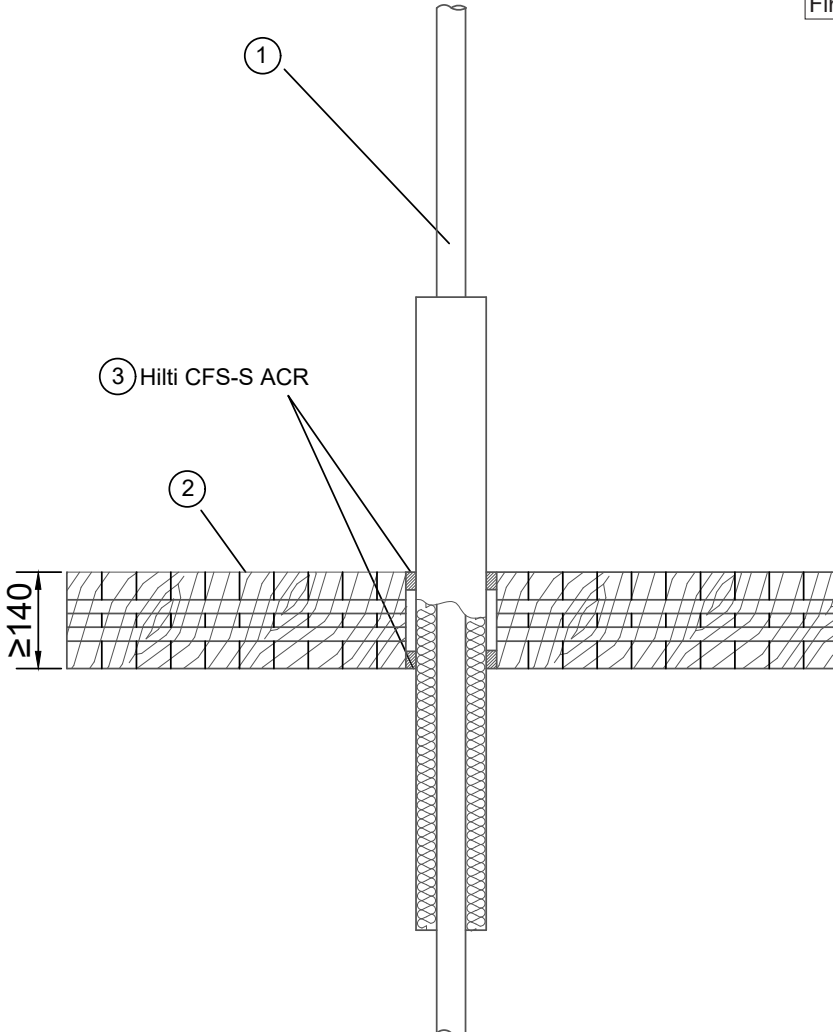
- Use for combustible pipes

- Fill the remaining annular gap with Hilti CFS-S ACR Firestop Sealant from both sides to a depth of at least 25 mm

Distances between the openings or other installations

Distance of the penetration seal to	size of openings next to each other [mm]	DIN distances between the openings [mm]	EN distances between openings [mm]
other cable or pipe penetration seals	one/both opening(s) > 400 x 400	≥ 200	≥ 200
	both openings ≤ 400 x 400	≥ 100	≥ 200
other openings or installations	one/both opening(s) > 200 x 200	≥ 200	≥ 200
	both openings ≤ 200 x 200	≥ 100	≥ 200

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		Product Fire protection seal Hilti sealing paste CFS-S ACR		Building project	
ID CFS-S ACR_CLTF_NCP_CP_8X005		Contents Fire protection seal in cross-laminated timber floors for non-combustible and combustible pipes			
Page	01	Rev	03		
① ② ③ Hilti CFS-S ACR 					
Basic documents, which form the respective proof of applicability					
- German Approval P-MPA-E-17-010					
- European Technical Assessment ETA-10/0292					
- Reaction to fire according to EN 13501-1					
- Fire resistance according to EN 13501-2					
- Installations according to the Hilti installation instructions					
Without scale all units in [mm]					

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		Product Fire protection seal Hilti sealing paste CFS-S ACR	Building project
ID CFS-S ACR_CLTF_NCP_CP_8X005		Contents Fire protection seal in cross-laminated timber floors for non-combustible and combustible pipes	
Page 02	Rev 03		

① Installations

Item	Implementation	Description/Type	Dimensions [mm]	Firestop material	Opening size [mm]	Annular gap	Pipe insulation	Seal thickness [mm]
1a	Non-combustible Pipe C/U	Copper, steel, Stainless steel	$10 \leq \varnothing \leq 88.9$ $1 \leq s^* \leq 14.2$	CFS S ACR	$65 \leq \varnothing \leq 190$	CFS S ACR ≤ 15 mm	Mineral wool of Euro class A1 or A2 Density $\geq 80 \text{ kg/m}^3$ $T^* = 20\text{--}40$ mm Length ≥ 450 mm	≥ 140
1b	Aluminum composite pipes U/C	Geberit Mepla	$16 \leq \varnothing \leq 63$ $2.25 \leq s^* \leq 4.5$	CFS S ACR	$71 \leq \varnothing \leq 173$	CFS S ACR ≤ 15 mm	Mineral wool of Euro class A1 or A2 Density $\geq 80 \text{ kg/m}^3$ $T^* = 20\text{--}40$ mm $\varnothing \leq 40$ mm = length ≥ 170 mm $\varnothing > 40$ mm = Length ≥ 390 mm	≥ 140
1c	Aluminum composite pipes U/C	Geberit System pipe ML	$16 \leq \varnothing \leq 75$ $2.2 \leq s^* \leq 4.6$	CFS S ACR	$71 \leq \varnothing \leq 185$	CFS S ACR ≤ 15 mm		≥ 140
1d	Aluminum composite pipes U/C	REHAU Rautitan stable	$16 \leq \varnothing \leq 40$ $2.2 \leq s^* \leq 6$	CFS S ACR	$71 \leq \varnothing \leq 110$	CFS S ACR ≤ 15 mm		≥ 140
1e	Aluminum composite pipes U/C	REHAU Rautitan flex	$16 \leq \varnothing \leq 63$ $2.2 \leq s^* \leq 8.6$	CFS S ACR	$71 \leq \varnothing \leq 173$	CFS S ACR ≤ 15 mm		≥ 140
1f	Aluminum composite pipes U/C	Uponor Unipipe MLC	$40 \leq \varnothing \leq 75$ $4 \leq s^* \leq 7.5$	CFS S ACR	$95 \leq \varnothing \leq 185$	CFS S ACR ≤ 15 mm		≥ 140
1g	Aluminum composite pipes U/C	+GF+ JRG Sanipex	$16 \leq \varnothing \leq 63$ $2.25 \leq s^* \leq 4.5$	CFS S ACR	$71 \leq \varnothing \leq 173$	CFS S ACR ≤ 15 mm		≥ 140
1h	Aluminum composite pipes U/C	TECE TECeflex	$14 \leq \varnothing \leq 32$; 63 $2.6 \leq s^* \leq 4$; 6	CFS S ACR	$69 \leq \varnothing \leq 173$	CFS S ACR ≤ 15 mm		≥ 140
1i	Aluminum composite pipes U/C	KeKelit Kelox KM110	$25 \leq \varnothing \leq 75$ $2.5 \leq s^* \leq 7.5$	CFS S ACR	$80 \leq \varnothing \leq 185$	CFS S ACR ≤ 15 mm		≥ 140
1j	Aluminum composite pipes U/C	Viega Sanfix Fosta	$16 \leq \varnothing \leq 63$ $2.2 \leq s^* \leq 4.5$	CFS S ACR	$71 \leq \varnothing \leq 173$	CFS S ACR ≤ 15 mm		≥ 140

* Wall thickness/insulation thickness

② Construction: This application detail applies in conjunction with "Appendix 1: Available evidence and documents"

The firestop functionality and fire resistance period of the floor must be considered separately.
The floor thicknesses shown correspond to minimum thicknesses required by the tested penetration seal.

③ Firestop product info

- Hilti Firestop Collar Endless CFS-C EL
- European Technical Assessment: ETA-14/0085
 - German Approval aBG: Z-19.53-2192
 - Use for combustible pipes
 - Fill the remaining annular gap with Hilti CFS-S ACR Firestop Sealant from both sides to a depth of at least 25 mm

Distances between the openings or other installations

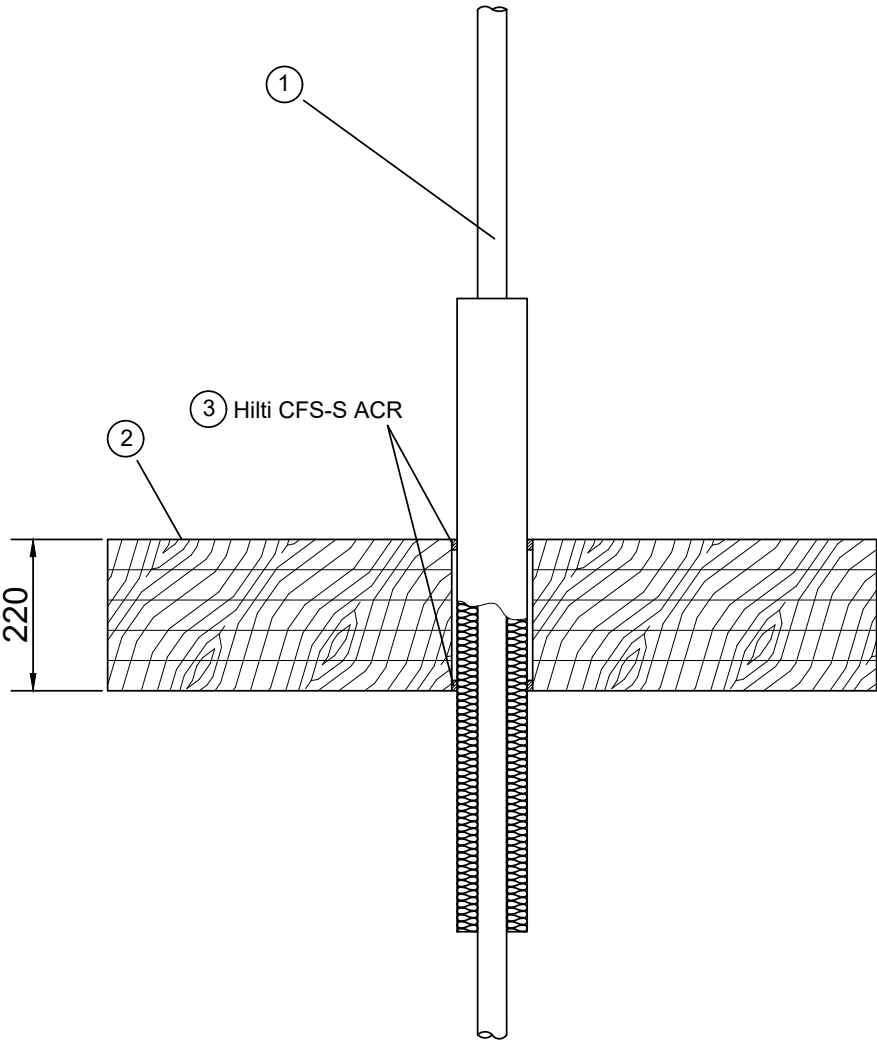
Distances to Hilti Single systems [mm] (opening to opening)	CFS-S ACR (aluminum composite pipes)	CFS-S ACR (metal pipes)	CFS-C EL	CFS-B (metal pipes)**	CFS-B (aluminum composite pipes)	CFS-CC (cable)	CFS-DL GA (DE)
CFS-S ACR (aluminum composite pipes)	50	50	50	50	50	50	50
CFS-S ACR (metal pipes)		50	50	50	50	50	50
CFS-C EL			50	50	50	50	50
CFS-B (metal pipes)**				50	50	50	50
CFS-B (aluminum composite pipes)					50	50	50
CFS-CC (cable)						50	50
CFS-DL GA (DE)							50

Distance of the penetration seal to	size of openings next to each other [mm]	DIN distances between the openings [mm]	EN distances between openings [mm]
other cable or pipe penetration seals	one/both opening(s) $> 400 \times 400$	≥ 200	≥ 200
	both openings $\leq 400 \times 400$	≥ 100	≥ 200
other openings or installations	one/both opening(s) $> 200 \times 200$	≥ 200	≥ 200
	both openings $\leq 200 \times 200$	≥ 100	≥ 200

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		Product Fire protection seal Hilti sealing paste CFS-S ACR	Building project
ID CFS-S ACR_CLTF_NCP_8X001		Contents Fire protection seal in cross-laminated timber floors for non-combustible and combustible pipes	
Page 01	Rev 00		

EI90 U/C



- German Approval aBG: Z-200-2-2_001
- European Technical Assessment: ETA-10/0292
- Reaction to fire according to EN 13501-1
- Fire resistance according to EN 13501-1
- Installations according to the Hilti installation instructions

Without scale
all units in [mm]

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		Product Fire protection seal Hilti sealing paste CFS-S ACR				Building project	
ID CFS-S ACR_CLTF_NCP_8X001		Contents Fire protection seal in cross-laminated timber floors for non-combustible and combustible pipes					
Page 02	Rev 00						

① Installations

Item	Implementation	Description/Type	Dimensions [mm]	Firestop material	Opening size [mm]	Annular gap	Pipe insulation	Penetration seal thickness [mm]
1	Non-combustible Pipe C/U	Copper, steel, Stainless steel	Ø 42 1.5 ≤ s* ≤ 14.2	CFS S ACR	Ø ≤ 86	CFS-S ACR 0-4 mm	Rockwool Conolit 150U, 19 mm insulation thickness, 430 mm per side	220

* Wall thickness

② Construction: This typical can be used for the following element types and Dataholz.eu systems

Element type	Leno cross-laminated timber according to ETA-10/0241 or Z-9.1-501 of Merk Timber GmbH, Aichach, Germany
Dataholz.eu	-

③ Firestop product info

Hilti Firestop Sealant CFS-S ACR

- European Technical Assessment: ETA-10/0292
- German Approval aBG: Z-19.53-2192
- Use for insulated non-combustible pipes
- Fill the remaining annular gap with Hilti CFS-S ACR Firestop Sealant from both sides to a depth of at least 5 mm

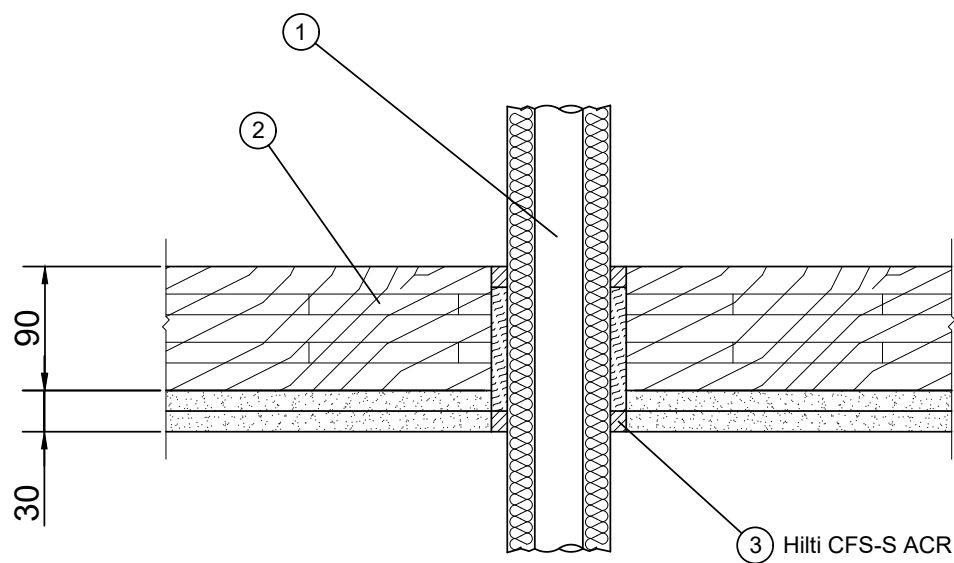
Distances between the openings or other installations

Distance of the penetration seal to	size of openings next to each other [mm]	DIN distance between openings [mm]	EN distance between openings [mm]
other cable or pipe penetration seals	one/both opening(s) > 400 x 400	≥ 200	≥ 50
	one/both opening(s) > 400 x 400	≥ 100	≥ 50
other openings or installations	one/both opening(s) > 200 x 200	≥ 200	≥ 200
	one/both opening(s) > 200 x 200	≥ 100	≥ 100

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HILTI		Product Fire protection seal Hilti Firestop Sealant CFS-S ACR		Building project	
ID CFS-S ACR_CLTF_NCP_8X002		Contents Fire protection seal in cross-laminated timber floors for non-combustible and combustible pipes			
Page 01	Rev 01				

EI90 C/U



1

2

3 Hilti CFS-S ACR

90

30

- German Approval aBG: Z-200-2-2_001

- European Technical Assessment: ETA-10/0292

- Reaction to fire according to EN 13501-1

- Fire resistance according to EN 13501-1

- Installations according to the Hilti installation instructions

Without scale
all units in [mm]

A "typical" is a preconfigured fire protection solution consisting of specific components for a specific application, to which an assumed fire resistance period is assigned. Typical is selected according to their fire resistance period and are subject to the technical product documentation and underlying product approvals published by Hilti from time to time, are subject to generic assumptions, and are not selected on a project- or design-specific basis. The proposed typical may therefore not meet the project or design-specific requirements, and accordingly, they must be evaluated by the customer or by a relevant expert appointed by the customer for their suitability regarding the actual project-specific design criteria and requirements.

		Product Fire protection seal Hilti Firestop Sealant CFS-S ACR	Building project
ID CFS-S ACR_CLTF_NCP_8X002		Contents Fire protection seal in cross-laminated timber floors for non-combustible and combustible pipes	
Page 02	Rev 01		

① Installations

Item	Implementation	Description/Type	Dimensions [mm]	Firestop material	Opening size [mm]	Annular gap	Pipe insulation	Penetration seal thickness [mm]
1	Non-combustible pipe	Stainless steel and cast iron	$\varnothing \leq 35$ $1.5 \leq s^* \leq 14,2$	CFS-S ACR	$\varnothing \leq 98$	CFS-S ACR 0-10 mm	U Protect Pipe Section Alu2, 20 mm	120

* Wall thickness

② **Construction:** This typical can be used for the following element types and Dataholz.eu systems

Element type	- BBS 90 according to ETA-06/0009 Binderholz Bausysteme GmbH, Fügen, Austria - Plasterboard 2 x 15 mm according to EN520
Dataholz.eu	-

③ Firestop product info

Hilti Firestop Sealant CFS-S ACR

- European Technical Assessment: ETA-10/0292
- German Approval aBG: Z-200-2-2_001
- Use for insulated non-combustible pipes
- Backfill remaining annular gap with mineral wool and fill with Hiiti Firestop Sealant CFS-S ACR from both sides to a depth of at least 15 mm

Distances between the openings or other installations

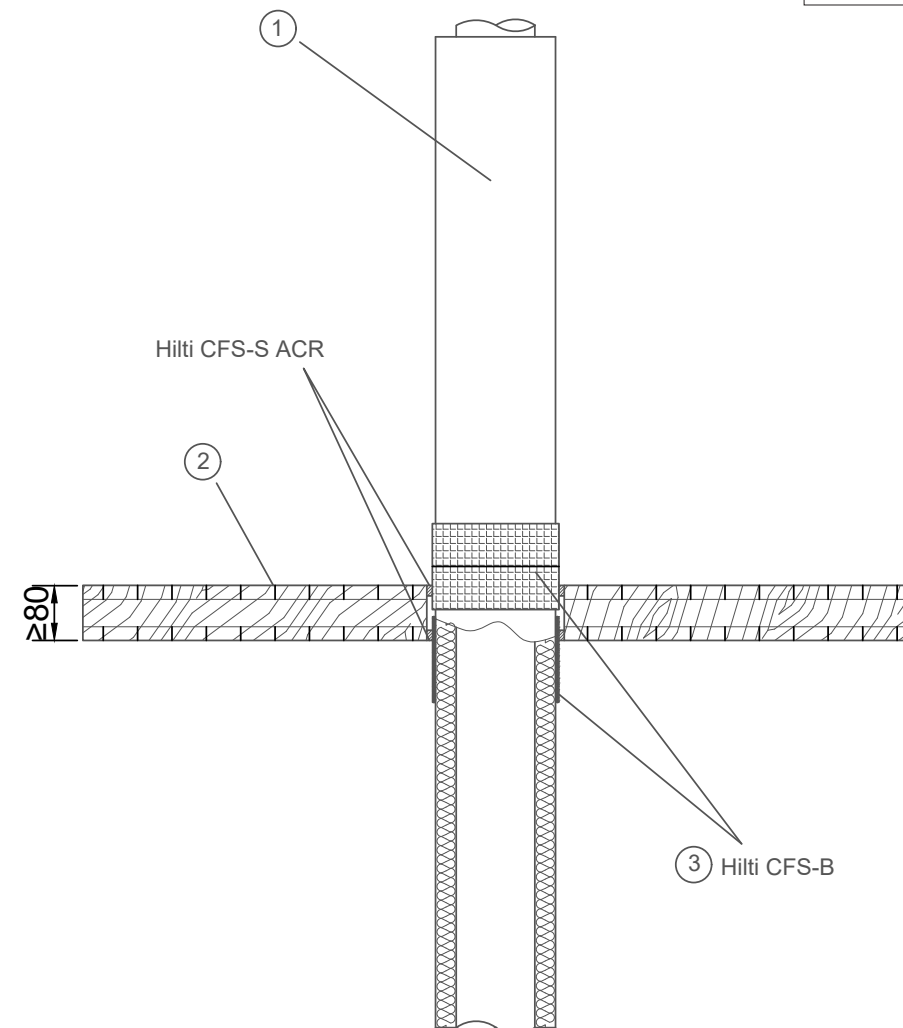
Distance of the penetration seal to	size of openings next to each other [mm]	DIN distance between openings [mm]	EN distance between openings [mm]
other cable or pipe penetration seals	one/both opening(s) > 400 x 400	≥ 200	≥ 50
	one/both opening(s) > 400 x 400	≥ 100	≥ 50
other openings or installations	one/both opening(s) > 200 x 200	≥ 200	≥ 200
	one/both opening(s) > 200 x 200	≥ 100	≥ 100

A "typical" is a preconfigured fire protection solution consisting of specific components for a specific application, to which an assumed fire resistance period is assigned. Typical's are selected according to their fire resistance period and are subject to the technical product documentation and underlying product approvals published by Hilti from time to time, are subject to generic assumptions, and are not selected on a project- or design-specific basis. The proposed typical's may therefore not meet the project or design-specific requirements, and accordingly, they must be evaluated by the customer or by a relevant expert appointed by the customer for their suitability regarding the actual project-specific design criteria and requirements.

		Product Fire protection seal Hilti Firestop Bandage CFS-B	Building project
ID CFS-B_CLTF_NCP_CP_8X003		Contents Fire protection seal in cross-laminated timber floors for non-combustible and combustible pipes	
Page 01	Rev 03		

EI30

Fire resistance 30 min. –
Fire--retardant



Basic documents, which form the respective proof of applicability

- German Approval P-MPA-E-07-029
- German Approval aBG: Z-19.53-2210, Z-19.53-2218
- European Technical Assessment ETA-10/0212
- Reaction to fire according to EN 13501-1
- Fire resistance according to EN 13501-2
- Installations according to the Hilti installation instructions

Without scale
all units in [mm]

A "typical" is a preconfigured fire protection solution consisting of specific components for a specific application, to which an assumed fire resistance period is assigned. Typical is selected according to their fire resistance period and are subject to the technical product documentation and underlying product approvals published by Hilti from time to time, are subject to generic assumptions, and are not selected on a project- or design-specific basis. The proposed typical may therefore not meet the project or design-specific requirements, and accordingly, they must be evaluated by the customer or by a relevant expert appointed by the customer for their suitability regarding the actual project-specific design criteria and requirements.

		Product Fire protection seal Hilti Firestop Bandage CFS-B	Building project
ID CFS-B_CLTF_NCP_CP_8X003		Contents Fire protection seal in cross-laminated timber floors for non-combustible and combustible pipes	
Page 02	Rev 03		

Item	Implementation	Description/Type	Dimensions [mm]	Firestop material	Opening size [mm]	Annular gap	Pipe insulation	Seal thickness [mm]
1a	Non-combustible Pipe C/U	Copper, steel, Stainless steel	$10 \leq \varnothing \leq 42$ $1 \leq s^* \leq 14.2$	CFS-B	$48 \leq \varnothing \leq 113$	CFS S ACR ≤ 15 mm	flexible Elastomeric insulation material according to DIN EN 14304 $7.5 \leq T^* \leq 20.5$	≥ 80
1b	Aluminum composite pipes U/C	Geberit Mepla	$16 \leq \varnothing \leq 26, \varnothing 40$ $2.25 \leq s^* \leq 3.s^* = 3.5$	CFS-B	$54 \leq \varnothing \leq 111$	CFS S ACR ≤ 15 mm	flexible Elastomeric insulation material according to DIN EN 14304 $7.5 \leq T^* \leq 16.5$	≥ 80
1c	Aluminum composite pipes U/C	Geberit Mepla	$16 \leq \varnothing \leq 26, \varnothing 40$ $2.25 \leq s^* \leq 3.s^* = 3.5$	CFS-B	$39 \leq \varnothing \leq 78$	CFS S ACR ≤ 15 mm	without insulation	≥ 80

Distance of the penetration seal to	size of openings next to each other [mm]	DIN distances between the openings [mm]	EN distances between openings [mm]
Mineral wool insulation		≥ 50	≥ 50
CFS-C EL		≥ 50	≥ 50
CFS-CC		≥ 50	≥ 50
other cable or pipe penetration seals	one/both opening(s) > 400 x 400	≥ 200	≥ 100
	both openings ≤ 400 x 400	≥ 100	≥ 100
other openings or installations	one/both opening(s) > 200 x 200	≥ 200	≥ 200
	both openings ≤ 200 x 200	≥ 100	≥ 200

Firestopping in timber construction / cross-laminated timber

		Product Fire protection seal Hilti Firestop Bandage CFS-B	Building project
ID CFS-B_CLTF_NCP_CP_8X004		Contents Fire protection seal in cross-laminated timber floors for non-combustible and combustible pipes	
Page 01	Rev 03		

Firestopping in timber construction / cross-laminated timber

		Product	Building project
ID CFS-B_CLTF_NCP_CP_8X004		Fire protection seal Hilti Firestop Bandage CFS-B	
Page 02	Rev 03	Contents Fire protection seal in cross-laminated timber floors for non-combustible and combustible pipes	

① Installations

Item	Implementation	Description/Type	Dimensions [mm]	Firestop material	Opening size [mm]	Annular gap	Pipe insulation	Penetration seal thickness [mm]
1a	Non-combustible pipe C/U	Copper, steel, Stainless steel	$10 \leq \varnothing \leq 42$ $1 \leq s^* \leq 14.2$	CFS-B	$48 \leq \varnothing \leq 113$	CFS S ACR ≤ 15 mm	flexible Elastomeric insulation $7.5 \leq T^* \leq 16.5$	≥ 100
1b	Aluminum composite pipes U/C	Geberit Mepla	$16 \leq \varnothing \leq 75$ $2.25 \leq s^* \leq 4.7$	CFS-B	$55 \leq \varnothing \leq 147$	CFS S ACR ≤ 15 mm	flexible Elastomeric insulation** $8 \leq T^* \leq 17.5$	≥ 100
1c	Aluminum composite pipes U/C	Geberit System pipe ML	$16 \leq \varnothing \leq 63$ $2 \leq s^* \leq 4$	CFS-B	$67 \leq \varnothing \leq 142$	CFS S ACR ≤ 15 mm	flexible Elastomeric insulation** $14 \leq T^* \leq 20.5$	≥ 100
1d	Aluminum composite pipes U/C	REHAU Rautitan stable	$16 \leq \varnothing \leq 63$ $2.2 \leq s^* \leq 6$	CFS-B	$57 \leq \varnothing \leq 142$	CFS S ACR ≤ 15 mm	flexible Elastomeric insulation** $9 \leq T^* \leq 20.5$	≥ 100
1e	Aluminum composite pipes U/C	REHAU Rautitan flex	$16 \leq \varnothing \leq 63$ $2.2 \leq s^* \leq 8.6$	CFS-B	$57 \leq \varnothing \leq 135$	CFS S ACR ≤ 15 mm	flexible Elastomeric insulation** $9 \leq T^* \leq 17$	≥ 100
1f	Aluminum composite pipes U/C	Uponor Unipipe Plus/MLC	$16 \leq \varnothing \leq 63$ $2 \leq s^* \leq 6$	CFS-B	$57 \leq \varnothing \leq 135$	CFS S ACR ≤ 15 mm	flexible Elastomeric insulation** $9 \leq T^* \leq 17$	≥ 100
1g	Aluminum composite pipes U/C	+GF+ JRG Sanipex	$16 \leq \varnothing \leq 63$ $2.25 \leq s^* \leq 4.5$	CFS-B	$57 \leq \varnothing \leq 135$	CFS S ACR ≤ 15 mm	flexible Elastomeric insulation** $9 \leq T^* \leq 17$	≥ 100
1h	Aluminum composite pipes U/C	TECE TECEflex	$14 \leq \varnothing \leq 63$ $2.6 \leq s^* \leq 6$	CFS-B	$39 \leq \varnothing \leq 135$	CFS S ACR ≤ 15 mm	flexible Elastomeric insulation** $8 \leq T^* \leq 17$	≥ 100
1i	Aluminum composite pipes U/C	KeKelit Kelox KM110	$20 \leq \varnothing \leq 75$ $2.25 \leq s^* \leq 7.5$	CFS-B	$61 \leq \varnothing \leq 147$	CFS S ACR ≤ 15 mm	flexible Elastomeric insulation** $9 \leq T^* \leq 17$	≥ 100

* Wall thickness/insulation thickness **If necessary, also possible without insulation

② Construction: This application detail applies in conjunction with "Appendix 1: Available evidence and documents"

The firestop functionality and fire resistance period of the floor must be considered separately.
The floor thicknesses shown correspond to minimum thicknesses required by the tested penetration seal.

③ Firestop product info

- Hilti Firestop Bandage CFS-B
- European Technical Assessment: ETA-10/0212
 - German Approval aBG: P-MPA-E-07-029
 - German Approval aBG: Z-19.53-2210, Z-19.53-2218
 - Use for insulated non-combustible pipes
 - 2-ply application
 - Fill the remaining annular gap with Hilti CFS-S ACR Firestop Sealant from both sides to a depth of at least 25 mm

Distances between the openings or other installations

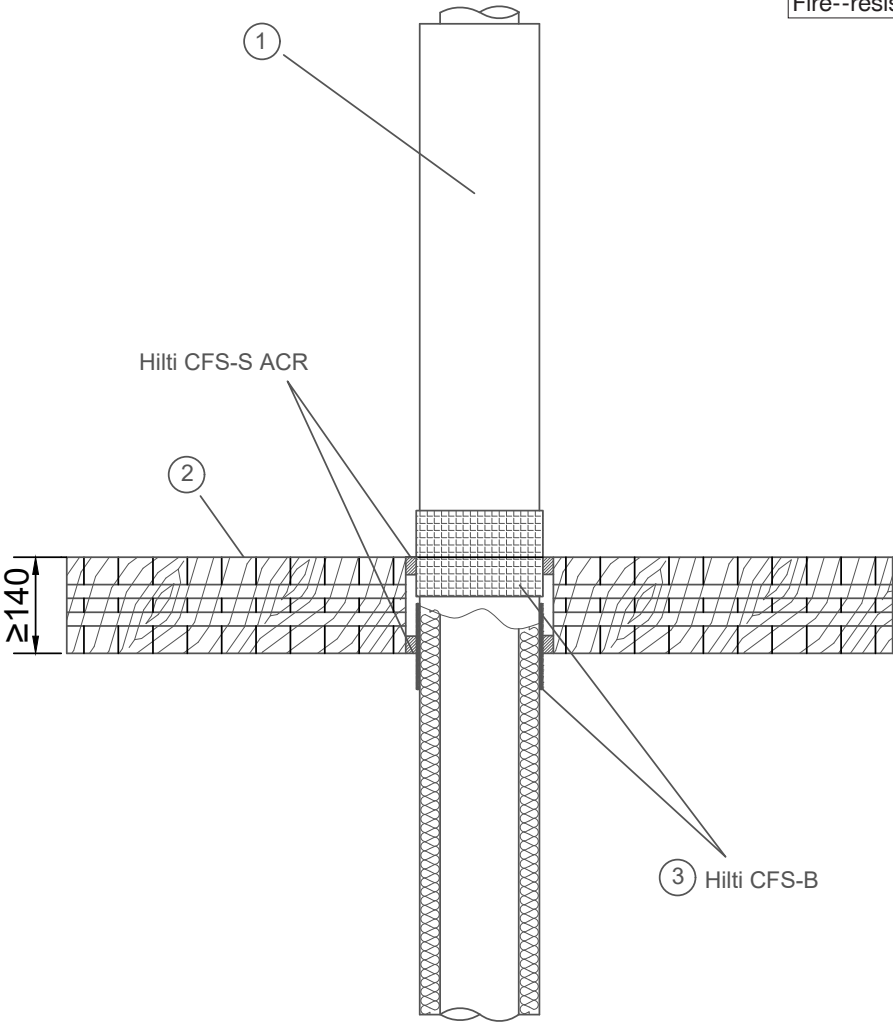
Distance of the penetration seal to	size of openings next to each other [mm]	DIN distances between the openings [mm]	DIN distances between the openings [mm]
Mineral wool insulation		≥ 50	≥ 50
CFS-C EL		≥ 50	≥ 50
CFS-CC		≥ 50	≥ 50
other cable or pipe penetration seals	one/both opening(s) > 400 x 400	≥ 200	≥ 100
	one/both opening(s) > 400 x 400	≥ 100	≥ 100
other openings or installations	one/both opening(s) > 200 x 200	≥ 200	≥ 200
	one/both opening(s) > 200 x 200	≥ 100	≥ 200

A "typical" is a preconfigured fire protection solution consisting of specific components for a specific application, to which an assumed fire resistance period is assigned. Typical are selected according to their fire resistance period and are subject to the technical product documentation and underlying product approvals published by Hilti from time to time, are subject to generic assumptions, and are not selected on a project- or design-specific basis. The proposed typical may therefore not meet the project or design-specific requirements, and accordingly, they must be evaluated by the customer or by a relevant expert appointed by the customer for their suitability regarding the actual project-specific design criteria and requirements.

		Product	Building project
ID CFS-B_CLTF_NCP_CP_8X005		Fire protection seal Hilti Firestop Bandage CFS-B	
Page 01	Rev 03	Contents Fire protection seal in cross-laminated timber floors for non-combustible and combustible pipes	

EI90

Fire resistance 90 min. –
Fire--resistant



- Basic documents, which form the respective proof of applicability
- German Approval P-MPA-E-07-029
 - German Approval aBG: Z-19.53-2210, Z-19.53-2218
 - European Technical Assessment ETA-10/0212
 - Reaction to fire according to EN 13501-1
 - Fire resistance according to EN 13501-2
 - Installations according to the Hilti installation instructions

Without scale
all units in [mm]

A "typical" is a preconfigured fire protection solution consisting of specific components for a specific application, to which an assumed fire resistance period is assigned. Typical are selected according to their fire resistance period and are subject to the technical product documentation and underlying product approvals published by Hilti from time to time, are subject to generic assumptions, and are not selected on a project- or design-specific basis. The proposed typical may therefore not meet the project or design-specific requirements, and accordingly, they must be evaluated by the customer or by a relevant expert appointed by the customer for their suitability regarding the actual project-specific design criteria and requirements.

		Product	Building project				
ID CFS-B_CLTF_NCP_CP_8X005		Fire protection seal Hilti Firestop Bandage CFS-B					
Page 02	Rev 03	Contents Fire protection seal in cross-laminated timber floors for non-combustible and combustible pipes					

① Installations

Item	Implementation	Description/Type	Dimensions [mm]	Firestop material	Opening size [mm]	Annular gap	Pipe insulation	Penetration seal thickness [mm]
1a	Non-combustible pipe C/U	Copper, steel, Stainless steel	10 ≤ Ø ≤ 42 1 ≤ s* ≤ 14.2	CFS-B	48 ≤ Ø ≤ 113	CFS S ACR ≤ 15 mm	flexible Elastomeric insulation 7.5 ≤ T* ≤ 16.5	≥140
1b	Aluminum composite pipes U/C	Geberit Mepla	16 ≤ Ø ≤ 75 2.25 ≤ s* ≤ 4.7	CFS-B	57 ≤ Ø ≤ 147	CFS S ACR ≤ 15 mm	flexible Elastomeric insulation** 9 ≤ T* ≤ 17.5	≥140
1c	Aluminum composite pipes U/C	Geberit System pipe ML	16 ≤ Ø ≤ 63 2 ≤ s* ≤ 4	CFS-B	57 ≤ Ø ≤ 194	CFS S ACR ≤ 15 mm	flexible Elastomeric insulation** 9 ≤ T* ≤ 40	≥140
1d	Aluminum composite pipes U/C	REHAU Rautitan stable	16 ≤ Ø ≤ 63 2.2 ≤ s* ≤ 6	CFS-B	57 ≤ Ø ≤ 181	CFS S ACR ≤ 15 mm	flexible Elastomeric insulation** 9 ≤ T* ≤ 40	≥140
1e	Aluminum composite pipes U/C	REHAU Rautitan flex	16 ≤ Ø ≤ 63 2.2 ≤ s* ≤ 8.6	CFS-B	57 ≤ Ø ≤ 179	CFS S ACR ≤ 15 mm	flexible Elastomeric insulation** 9 ≤ T* ≤ 39	≥140
1f	Aluminum composite pipes U/C	Uponor Unipipe Plus/MLC	16 ≤ Ø ≤ 63 2 ≤ s* ≤ 6	CFS-B	57 ≤ Ø ≤ 179	CFS S ACR ≤ 15 mm	flexible Elastomeric insulation** 9 ≤ T* ≤ 39	≥140
1g	Aluminum composite pipes U/C	+GF+ JRG Sanipex	16 ≤ Ø ≤ 63 2.25 ≤ s* ≤ 4.5	CFS-B	57 ≤ Ø ≤ 165	CFS S ACR ≤ 15 mm	flexible Elastomeric insulation** 9 ≤ T* ≤ 32	≥140
1h	Aluminum composite pipes U/C	TECE TECEflex	14 ≤ Ø ≤ 63 2.6 ≤ s* ≤ 6	CFS-B	53 ≤ Ø ≤ 135	CFS S ACR ≤ 15 mm	flexible Elastomeric insulation** 8 ≤ T* ≤ 17	≥140
1i	Aluminum composite pipes U/C	KeKelit Kelox KM110	20 ≤ Ø ≤ 75 2.25 ≤ s* ≤ 7.5	CFS-B	57 ≤ Ø ≤ 193	CFS S ACR ≤ 15 mm	flexible Elastomeric insulation** 9 ≤ T* ≤ 40	≥140
1j	Aluminum composite pipes U/C	Viega Sanfix Fosta	16 ≤ Ø ≤ 63 2.2 ≤ s* ≤ 4.5	CFS-B	57 ≤ Ø ≤ 179	CFS S ACR ≤ 15 mm	flexible Elastomeric insulation** 9 ≤ T* ≤ 39	≥140

* Wall thickness/insulation thickness **If necessary, also possible without insulation

② Construction: This application detail applies in conjunction with "Appendix 1: Available evidence and documents"

The firestop functionality and fire resistance period of the floor must be considered separately.
The floor thicknesses shown correspond to minimum thicknesses required by the tested penetration seal.

③ Firestop product info

Hilti Firestop Bandage CFS-B

- European Technical Assessment: ETA-10/0212

- German Approval P-MPA-E-07-029

- German Approval aBG: Z-19.53-2210, Z-19.53-2218

- Use for insulated and non-insulated non-combustible pipes

- 2-ply application

- Fill the remaining annular gap with Hilti CFS-S ACR Firestop Sealant from both sides to a depth of at least 25 mm

Distances between the openings or other installations

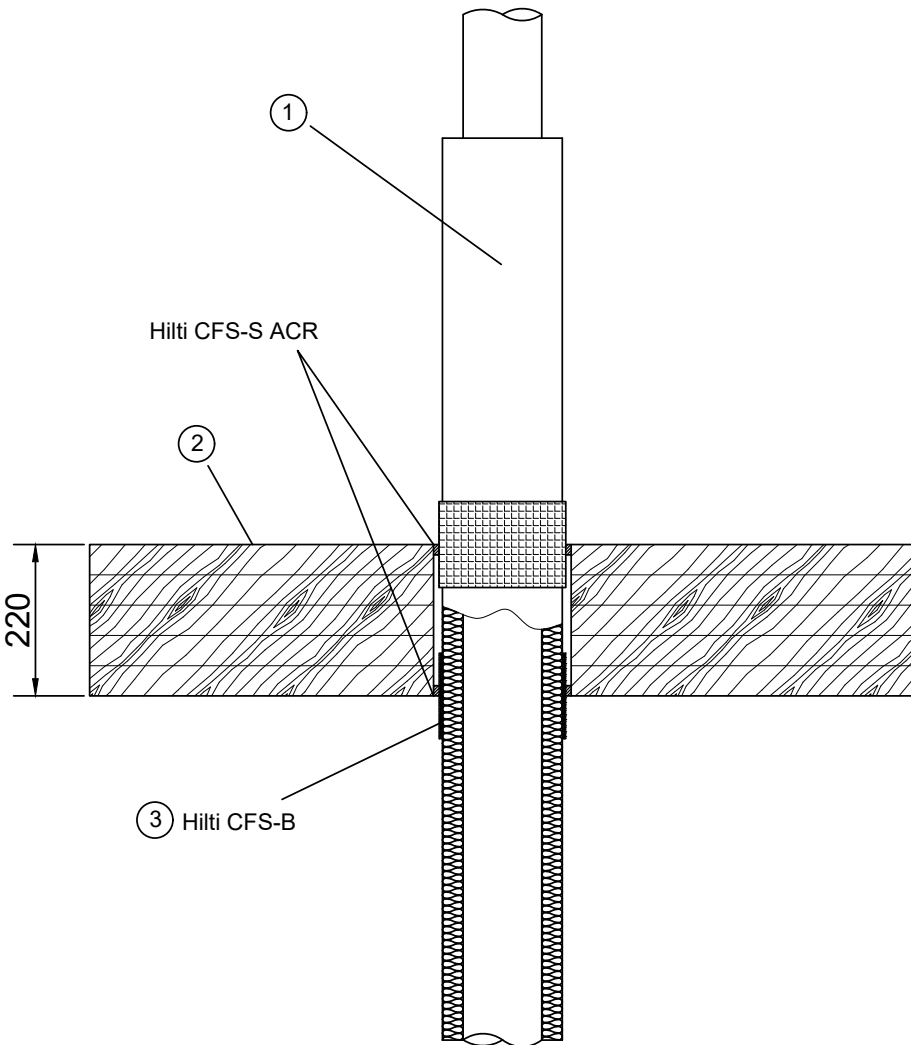
Distances to Hilti Single systems [mm] (opening to opening)	CFS-B (aluminum composite pipes)	CFS-B (metal pipes)	CFS-C EL	CFS-S ACR (metal pipes)	CFS-S ACR (aluminum composite pipes)	CFS-CC (cable)	CFS-DL GA (DE)
CFS-B (aluminum composite pipes)	50	50	50	50	50	50	50
CFS-B (metal pipes)***		50	50	50	50	50	50
CFS-C EL			50	50	50	50	50
CFS-S ACR (metal pipes)				50	50	50	50
CFS-S ACR (aluminum composite pipes)					50	50	50
CFS-CC (cable)						50	50
CFS-DL GA (DE)							50

Distance of the penetration seal to	size of openings next to each other [mm]	DIN distances between the openings [mm]	EN distances between openings [mm]
other cable or pipe penetration seals	one/both opening(s) > 400 x 400	≥ 200	≥ 200
	both openings ≤ 400 x 400	≥ 100	≥ 200
other openings or installations	one/both opening(s) > 200 x 200	≥ 200	≥ 200
	both openings ≤ 200 x 200	≥ 100	≥ 200

A "typical" is a preconfigured fire protection solution consisting of specific components for a specific application, to which an assumed fire resistance period is assigned. Typicals are selected according to their fire resistance period and are subject to the technical product documentation and underlying product approvals published by Hilti from time to time, are subject to generic assumptions, and are not selected on a project- or design-specific basis. The proposed typicals may therefore not meet the project or design-specific requirements, and accordingly, they must be evaluated by the customer or by a relevant expert appointed by the customer for their suitability regarding the actual project-specific design criteria and requirements.

		Product	Building project
ID CFS-B_CLTF_NCP_8X001		Fire protection seal Hilti Firestop Bandage CFS-B	
Page 01	Rev 00	Contents Fire protection seal in cross-laminated timber floors for non-combustible pipes	

EI90 U/C



- German Approval aBG: Z-19.53-2210
- European Technical Assessment ETA-10/0212
- Reaction to fire according to EN 13501-1
- Fire resistance according to EN 13501-1
- Installations according to the Hilti installation instructions

Without scale
all units in [mm]

A "typical" is a preconfigured fire protection solution consisting of specific components for a specific application, to which an assumed fire resistance period is assigned. Typicals are selected according to their fire resistance period and are subject to the technical product documentation and underlying product approvals published by Hilti from time to time, are subject to generic assumptions, and are not selected on a project- or design-specific basis. The proposed typicals may therefore not meet the project or design-specific requirements, and accordingly, they must be evaluated by the customer or by a relevant expert appointed by the customer for their suitability regarding the actual project-specific design criteria and requirements.

		Product	Building project
		Fire protection seal Hilti Firestop Bandage CFS-B	
ID CFS-B_CLTF_NCP_8X001		Contents	
Page 02	Rev 00	Fire protection seal in cross-laminated timber floors for non-combustible pipes	

① Installations

Item	Implementation	Description/Type	Dimensions [mm]	Firestop material	Opening size [mm]	Annular gap	Pipe insulation	Seal thickness [mm]
1	Non-combustible pipe	Copper, steel, Stainless steel and cast iron	$\varnothing 35 \times 1,2 \leq s^* \leq 14,2$	CFS-B	$\varnothing \leq 65$	CFS-S ACR 0-5 mm	Armaflex AF 2 13 mm	220
1	Non-combustible pipe	Copper, steel, Stainless steel and cast iron	$\varnothing 42 \times 1,5 \leq s^* \leq 14,2$	CFS-B	$\varnothing \leq 86$	CFS-S ACR 0-4 mm	Isover lamella mat ML3 20 mm	220

* Wall thickness/insulation thickness

② Construction: This typical can be used for the following element types and Dataholz.eu systems

Element type	Leno cross-laminated timber according to ETA-10/0241 or Z-9.1-501 of Merk Timber GmbH, Aichach, Germany
Dataholz.eu	-

③Firestop product info

Hilti Firestop Bandage CFS-B

- European Technical Assessment: ETA-10/0212
- German Approval aBG: Z-19.53-2210
- Use for insulated non-combustible pipes
- 2-ply application
- Fill the remaining annular gap with Hilti CFS-S ACR Firestop Sealant from both sides to a depth of at least 5 mm

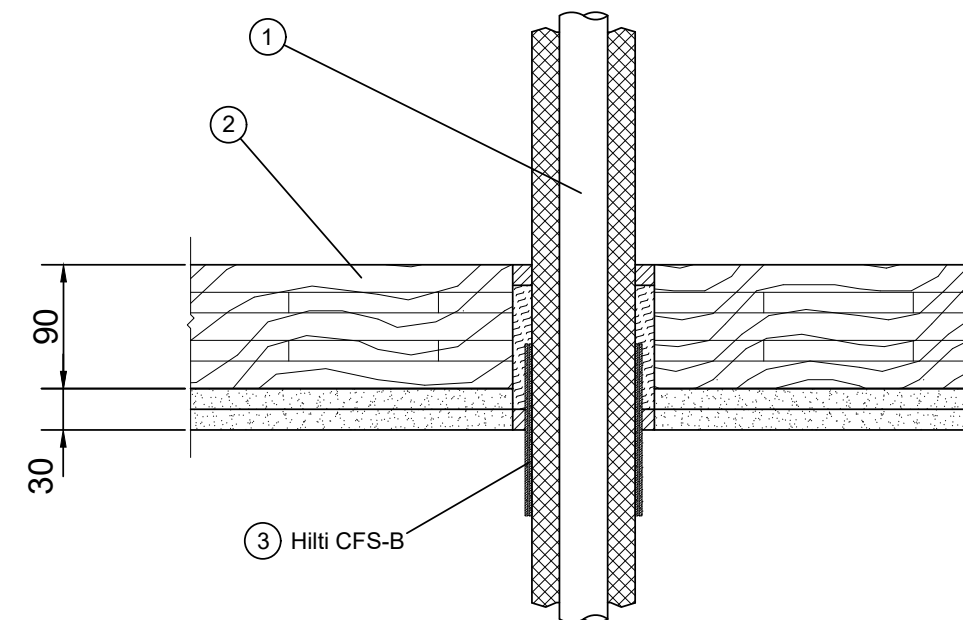
Distances between the openings or other installations

Distance of the penetration seal to	size of openings next to each other [mm]	DIN distance between openings [mm]	EN distance between openings [mm]
other cable or pipe penetration seals	one/both opening(s) > 400 x 400	≥ 200	≥ 50
	one/both opening(s) > 400 x 400	≥ 100	≥ 50
other openings or installations	one/both opening(s) > 200 x 200	≥ 200	≥ 200
	one/both opening(s) > 200 x 200	≥ 100	≥ 100

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		Product Fire protection seal Hilti Firestop Bandage CFS-B	Building project
ID CFS-B_CLTF_NCP_8X002		Contents Fire protection seal in cross-laminated timber floors	
Page 01	Rev 01	for non-combustible pipes	

EI90 C/U



- German Approval aBG: Z-19.53-2192
- European Technical Assessment: ETA-10/0212
- Reaction to fire according to EN 13501-1
- Fire resistance according to EN 13501-1
- Installations according to the Hiilti installation instructions

Without scale
all units in [mm]

A "typical" is a preconfigured fire protection solution consisting of specific components for a specific application, to which an assumed fire resistance period is assigned. Typical is selected according to their fire resistance period and are subject to the technical product documentation and underlying product approvals published by Hilti from time to time, are subject to generic assumptions, and are not selected on a project- or design-specific basis. The proposed typical may therefore not meet the project or design-specific requirements, and accordingly, they must be evaluated by the customer or by a relevant expert appointed by the customer for their suitability regarding the actual project-specific design criteria and requirements.

		Product Fire protection seal Hilti Firestop Bandage CFS-B	Building project
ID	CFS-B_CLTF_NCP_8X002	Contents Fire protection seal in cross-laminated timber floors for non-combustible pipes	
Page	02	Rev 01	

① Installations

Item	Implementation	Description/Type	Dimensions [mm]	Firestop material	Opening size [mm]	Pipe insulation	Penetration seal thickness [mm]
1	Non-combustible Pipe	Geberit Mapress C-steel	Ø 28 x 1.5	CFS-B	Ø 98	K-Flex ST, 19 mm	120
1	Non-combustible Pipe	Stainless steel and cast iron	Ø ≤ 35 x 1.5 ≤ s* ≤ 14.2	CFS-B	Ø ≤ 103	Kingspan Kooltherm FM120, 15-20 mm	120

* Wall thickness

② Construction: This typical can be used for the following element types and Dataholz.eu systems

Element type	- BBS 90 according to ETA-06/0009 Binderholz Bausysteme GmbH, Fügen, Austria - Plasterboard 2 x 15 mm according to EN 520
Dataholz.eu	-

③ Firestop product info
Hilti Firestop Bandage CFS-B
- European Technical Assessment: ETA-10/0212
- German Approval aBG: Z-19.53-2210
- Use for insulated non-combustible pipes
- 2-ply application
- Backfill remaining annular gap with mineral wool and fill with Hilti Firestop Sealant CFS-S ACR from both sides to a depth of at least 15 mm

Distances between the openings or other installations

Distance of the penetration seal to	size of openings next to each other [mm]	DIN distance between openings [mm]	EN distance between openings [mm]
other cable or pipe penetration seals	one/both opening(s) > 400 x 400	≥ 200	≥ 50
	one/both opening(s) > 400 x 400	≥ 100	≥ 50
other openings or installations	one/both opening(s) > 200 x 200	≥ 200	≥ 200
	one/both opening(s) > 200 x 200	≥ 100	≥ 100

A "typical" is a preconfigured fire protection solution consisting of specific components for a specific application, to which an assumed fire resistance period is assigned. Typical is selected according to their fire resistance period and are subject to the technical product documentation and underlying product approvals published by Hilti from time to time. They are subject to generic assumptions, and are not selected on a project or design specific basis. The proposed typical may therefore not meet the project or design-specific requirements, and accordingly, they must be evaluated by the customer or by a relevant expert appointed by the customer for their suitability regarding the actual project-specific design criteria and requirements.

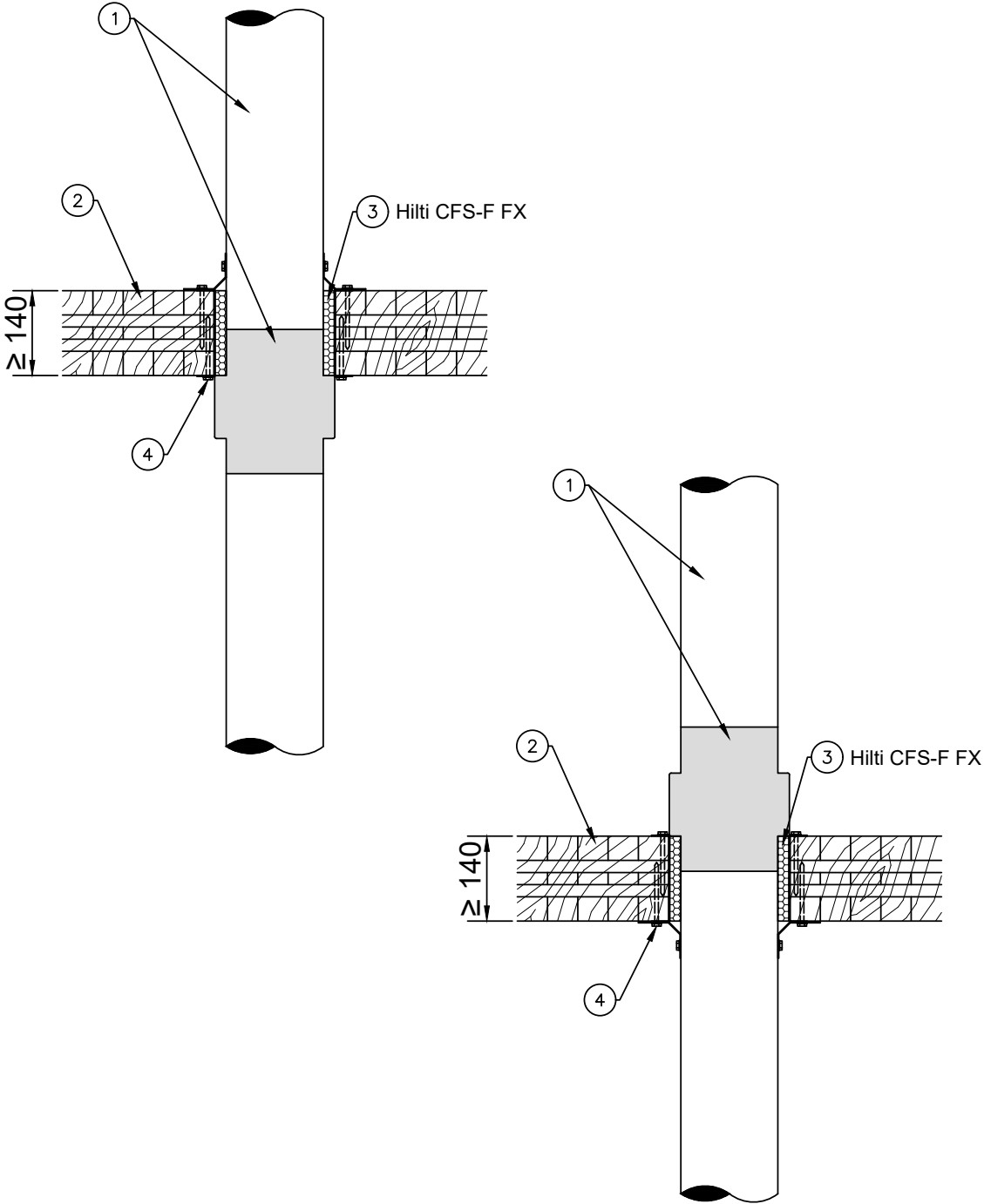
72

Firestopping in timber construction / cross-laminated timber

Floor applications: Plumbing (heating and drinking water)

		Product Application of geba AVR with annular gap filling Hilti firestop foam CFS-F FX	Project
ID	CFS-F FX_CLTF_VDG_8X005	Content Application of geba AVR in cross laminated timber floor with annular gap filling Hilti firestop foam CFS-F FX Installation situation below and above the floor	
Page	01	Rev 01	

K90-18017



Basic documents that form the respective proof of applicability:
- Geba shut-off device type AVR, Z-41.3-686, 30.07.2018 to 30.07.2023
- Declaration of performance "Hilti CFS-F FX", Hilti AG Liechtenstein, dated 26.07.2021
- Fire protection assessment, BB-TUM-007-2021-1, TUM Faculty of Architecture, Chair of Building Technology and Climate Responsive Design, dated 22.03.2023
- Installation according to "geba AVR instruction for use"

without scale
all units in [mm]

A "Typical" is a fire protection solution consisting of specific components preconfigured for a specific application, to which an assumed fire resistance duration is assigned. Typical is selected according to their fire resistance duration and are subject to Technical Product Documentation and Proof of Applicability published by Hilti from time to time. They are subject to generic assumptions and are not selected on a project or design specific basis. The proposed typical may therefore not meet the project or design specific requirements and must therefore be evaluated by the customer or by a relevant expert appointed by the customer for their suitability with regard to the actual, project specific design criteria and requirements.

Firestopping in timber construction / cross-laminated timber

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		Product Application of geba AVR with annular gap filling Hilti firestop foam CFS-F FX		Project	
ID CFS-F FX_CLTF_VDG_8X005		Content Application of geba AVR in cross laminated timber floor with annular gap filling Hilti firestop foam CFS-F FX Installation situation below and above the floor			
Page 02	Rev 01				

① Installations

Pos	Penetrant	Description / Type	Dimensions [mm]	Annular Gap Filling	Annular space	Seal Thickness [mm]
1	Ventilation system according to DIN 18017-3	geba AVR*	Ø = 80 – 200	CFS-F FX	20 mm ± 5 mm	≥ 140

* German approval Z-41.3-686, period of validity from 30.07.2018 - 30.07.2023;
Subject of the approval: Fire and smoke protection device in ventilation ducts according to DIN 18017-3, type AVR; Bartholomäus GmbH

② Supporting Constructions: This application detail applies in conjunction with 'Appendix 1: Available verifications and documents'

The fire protection functionality and fire resistance duration of the floor must be considered separately, and the floor thicknesses shown correspond to the minimum thicknesses required by the tested penetration seal.

③ Annular Gap Filling

Hilti fire protection foam CFS-F FX

- European Technical Assessment ETA-10/0109
- German Approval abZ Z-19.53-2237
- German Approval abZ Z-19.53-2238
- All joints and gaps between the installations must be completely sealed to floor thickness

Distances between the openings or fixtures

Distance of the seal to	Size of openings next to each other [mm]	DIN Distance between the openings [mm]	EN Distance between the openings [mm]
other cable or pipe penetration seals	one/both opening(s) > 400 x 400	≥ 200	≥ 100
	both openings ≤ 400 x 400	≥ 100	≥ 100
other openings or Installations	one/both opening(s) > 200 x 200	≥ 200	≥ 100
	both openings ≤ 200 x 200	≥ 100	≥ 100

④ Fasteners

The fastening set available from geba/ Bartholomäus GmbH, which contains all the necessary fasteners, must be used for fastening.

A "Typical" is a fire protection solution consisting of specific components preconfigured for a specific application, to which an assumed fire resistance duration is assigned. Typical is selected according to their fire resistance duration and are subject to Technical Product Documentation and Proof of Applicability published by Hilti from time to time. They are subject to generic assumptions and are not selected on a project or design specific basis. The proposed typical may therefore not meet the project or design specific requirements and must therefore be evaluated by the customer or by a relevant expert appointed by the customer for their suitability with regard to the actual, project specific design criteria and requirements.

APPLICATIONS AND PRODUCTS

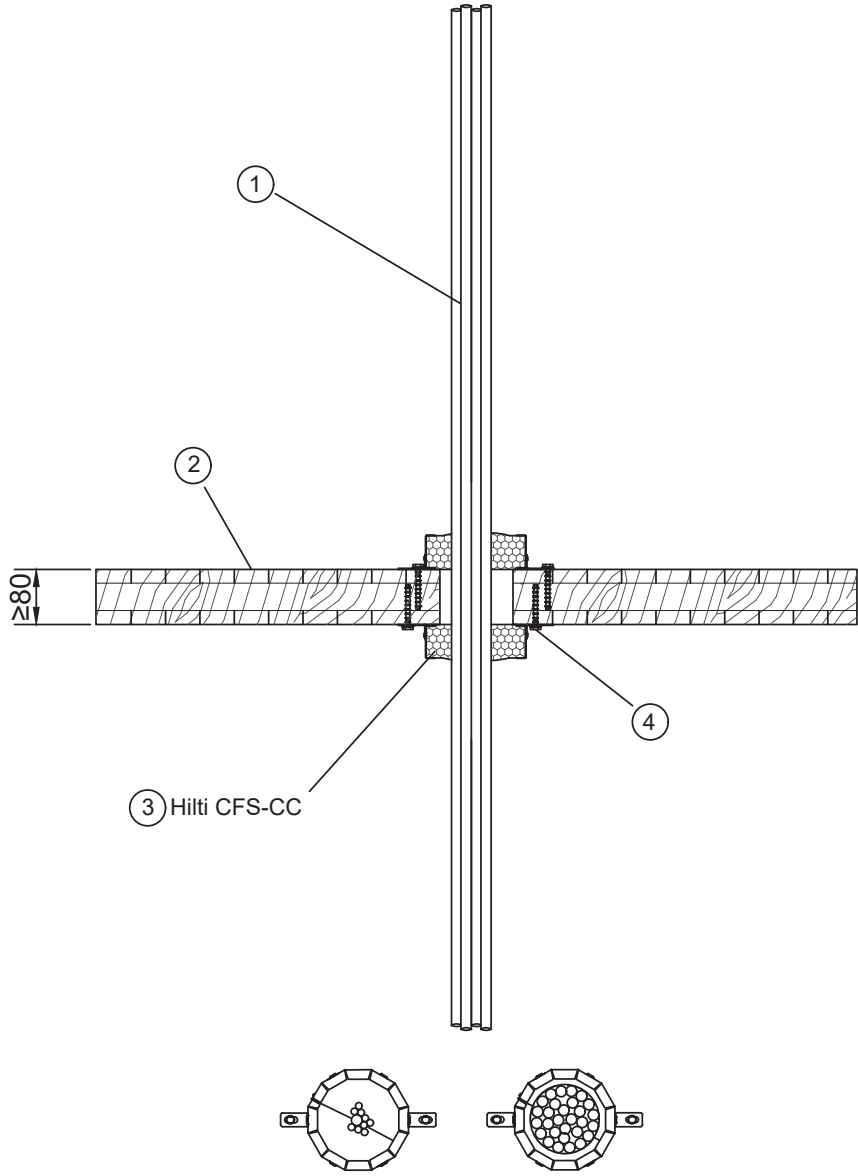
Floor applications: Electrical



Floor applications: Electrical

		Product	Building project
ID CFS-CC_CLTF_E_8X003		Fire protection seal Hilti Firestop Cable Collar CFS-CC	
Page 01	Rev 03	Contents Fire protection seal in cross-laminated timber floors for electrical cables and bundled cables	

EI30
Fire resistance 30 min. –
Fire--retardant



- Basic documents, which form the respective proof of applicability
- German Approval aBG: Z-19.53-2282
 - European Technical Assessment ETA-13/0704
 - Reaction to fire according to EN 13501-1
 - Fire resistance according to EN 13501-2
 - Installations according to the Hilti installation instructions

Without scale
all units in [mm]

A "typical" is a preconfigured fire protection solution consisting of specific components for a specific application, to which an assumed fire resistance period is assigned. Typical is selected according to their fire resistance period and are subject to the technical product documentation and underlying product approvals published by Hilti from time to time, are subject to generic assumptions, and are not selected on a project- or design-specific basis. The proposed typical may therefore not meet the project or design-specific requirements, and accordingly, they must be evaluated by the customer or by a relevant expert appointed by the customer for their suitability regarding the actual project-specific design criteria and requirements.

		Product Fire protection seal Hilti Firestop Cable Collar CFS-CC	Building project
ID CFS-CC_CLTF_E_8X003		Contents Fire protection seal in cross-laminated timber floors for electrical cables and bundled cables	
Page 02	Rev 03		

① Installations

Item	Implementation	Description/Type	Dimensions [mm]	Firestop material	Opening size [mm]	Annular gap	Penetration seal thickness [mm]
1a	All types of electric cables	Also fiber-optic cables, except for waveguide cables	$\varnothing \leq 21$	CFS-CC/ CFS-FIL	$\varnothing 108$	-	≥ 80
1b	bundled cables	tied, stitched or welded cables	$\varnothing \leq 100$	CFS-CC/ CFS-FIL	$\varnothing 108$	-	≥ 80

② **Construction:** This application detail applies in conjunction with "Appendix 1: Available evidence and documents"

The firestop functionality and fire resistance period of the floor must be considered separately.
The floor thicknesses shown correspond to minimum thicknesses required by the tested penetration seal.

③ Firestop product info

- Hilti Firestop Cable Collar CFS-CC
- European Technical Assessment: ETA-13/0704
- German Approval aBG: Z-19.53-2282
- Use for electrical cables and bundled cables
- Fill all joints and gaps between the installations (especially the gussets between the cables) with Hilti CFS-FIL from both sides to a depth of at least 25 mm

Distances between installations [mm]

		Conduits		Cable/cable support structure	Reveal
		Single	Bundle		
Conduits	Single	-	-	-	-
	Bundle	-	-	-	-
Cable/cable support structure		-	-	0	0

Distances between the openings or other installations

Distance of the penetration seal to	size of openings next to each other [mm]	DIN distances between the openings [mm]	DIN distances between the openings [mm]
CFS-CC	max. Ø108	≥ 50	≥ 50
other cable or pipe penetration seals	one/both opening(s) > 400 x 400	≥ 200	≥ 200
	one/both opening(s) > 400 x 400	≥ 100	≥ 200
other openings or installations	one/both opening(s) > 200 x 200	≥ 200	≥ 200
	one/both opening(s) > 200 x 200	≥ 100	≥ 200

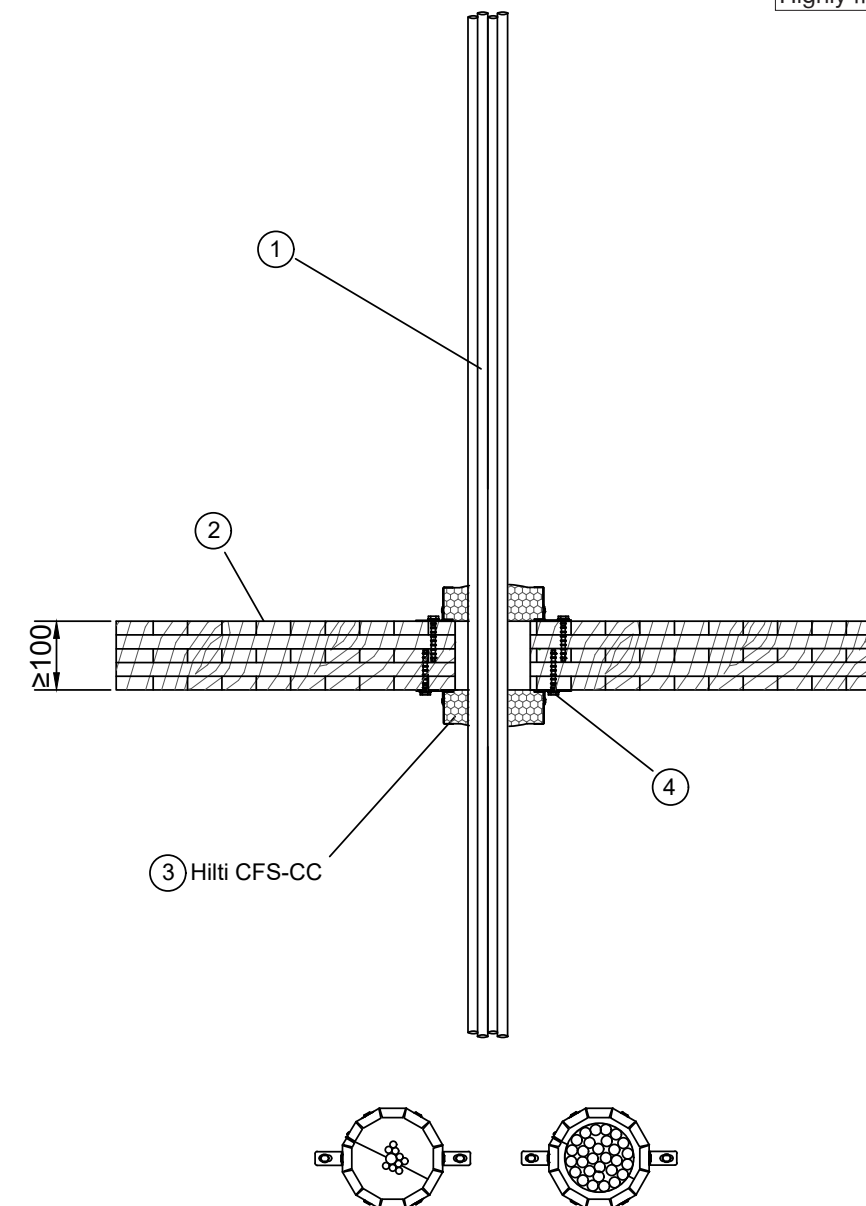
④ Fastening devices – see Appendix 2

A "typical" is a preconfigured fire protection solution consisting of specific components for a specific application, to which an assumed fire resistance period is assigned. Typical is selected according to their fire resistance period and are subject to the technical product documentation and underlying product approvals published by Hilti from time to time, are subject to generic assumptions, and are not selected on a project- or design-specific basis. The proposed typical may therefore not meet the project or design-specific requirements, and accordingly, they must be evaluated by the customer or by a relevant expert appointed by the customer for their suitability regarding the actual project-specific design criteria and requirements.

		Product Fire protection seal Hilti Firestop Cable Collar CFS-CC	Building project
ID CFS-CC_CLTF_E_8X004		Contents Fire protection seal in cross-laminated timber floors for electrical cables and bundled cables	
Page 01	Rev 03		

EI60

Fire resistance 60 min. -
Highly fire-retardant



- German Approval aBG: Z-19.53-2282
- European Technical Assessment ETA-13/0704
- Reaction to fire according to EN 13501-1
- Fire resistance according to EN 13501-2
- Installations according to the Hilti installation instructions

Without scale
all units in [mm]

A "typical" is a preconfigured fire protection solution consisting of specific components for a specific application, to which an assumed fire resistance period is assigned. Typical is selected according to their fire resistance period and are subject to the technical product documentation and underlying product approvals published by Hilti from time to time, are subject to generic assumptions, and are not selected on a project- or design-specific basis. The proposed typical may therefore not meet the project or design-specific requirements, and accordingly, they must be evaluated by the customer or by a relevant expert appointed by the customer for their suitability regarding the actual project-specific design criteria and requirements.

		Product Fire protection seal Hilti Firestop Cable Collar CFS-CC	Building project
ID	CFS-CC_CLTF_E_8X004	Contents Fire protection seal in cross-laminated timber floors for electrical cables and bundled cables	
Page	02	Rev 03	

① Installations

Item	Implementation	Description/Type	Dimensions [mm]	Firestop material	Opening size [mm]	Annular gap	Seal thickness [mm]
1a	All types of electric cables Type	Also fiber-optic cables, except for waveguide cables	$\varnothing \leq 21$	CFS-CC/ CFS-FIL	$\varnothing 108$	-	≥ 100
1b	bundled cables	tied, stitched or welded cables	$\varnothing \leq 100$	CFS-CC/ CFS-FIL	$\varnothing 108$	-	≥ 100
1c	Conduits U/C	Flexible and rigid from PVC or polyolefin according to DIN EN 61386-22	$\varnothing \leq 32$	CFS-CC/ CFS-FIL	$\varnothing 108$	-	≥ 100

② Construction: This typical can be used for the following element types and Dataholz.eu systems

The firestop functionality and fire resistance period of the floor must be considered separately.
The floor thicknesses shown correspond to minimum thicknesses required by the tested penetration seal.

③ Firestop product info

- Hilti Firestop Cable Collar CFS-CC
- European Technical Assessment: ETA-13/0704
 - German Approval aBG: Z-19.53-2282
 - Use for electrical cables and conduits
 - Fill all joints and gaps between the installations (especially the gussets between the cables) with Hilti CFS-FIL from both sides to a depth of at least 25 mm

Distances between installations [mm]

		Conduits		Cable/cable support structure	Reveal
		Single	Bundle		
Conduits	Single	0	-	-	50
	Bundle	-	-	-	-
Cable/cable support structure		-	-	0	0

Distances between the openings or other installations

Distance of the penetration seal to	size of openings next to each other [mm]	DIN distances between the openings [mm]	DIN distances between the openings [mm]
CFS-CC	max. $\varnothing 108$	≥ 50	≥ 50
other cable or pipe penetration seals	one/both opening(s) > 400 x 400	≥ 200	≥ 200
	one/both opening(s) > 400 x 400	≥ 100	≥ 200
other openings or installations	one/both opening(s) > 200 x 200	≥ 200	≥ 200
	one/both opening(s) > 200 x 200	≥ 100	≥ 200

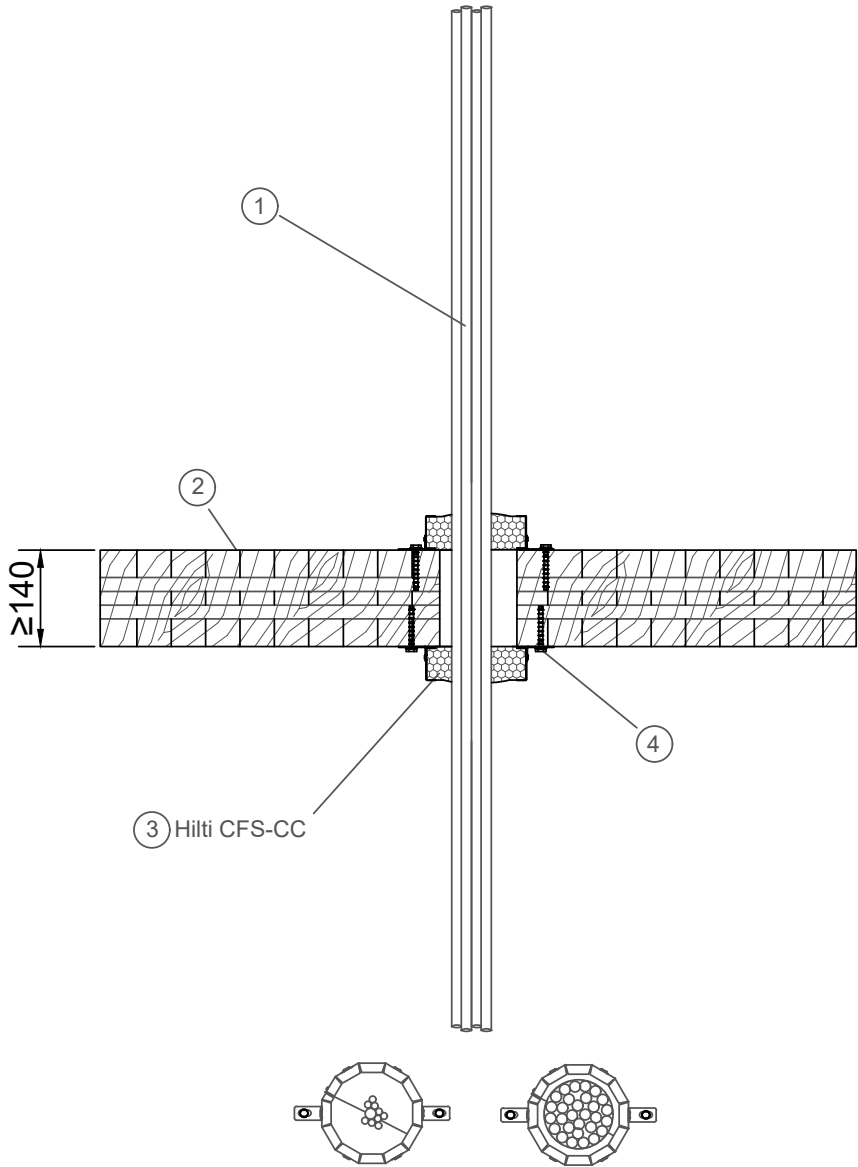
④ Fastening devices – see Appendix 2

A "typical" is a preconfigured fire protection solution consisting of specific components for a specific application, to which an assumed fire resistance period is assigned. Typical are selected according to their fire resistance period and are subject to the technical product documentation and underlying product approvals published by Hilti from time to time, are subject to generic assumptions, and are not selected on a project- or design-specific basis. The proposed typical may therefore not meet the project or design-specific requirements, and accordingly, they must be evaluated by the customer or by a relevant expert appointed by the customer for their suitability regarding the actual project-specific design criteria and requirements.

		Product Fire protection seal Hilti Firestop Cable Collar CFS-CC	Building project
ID	CFS-CC_CLTF_E_8X005	Contents Fire protection seal in cross-laminated timber floors for electrical cables and bundled cables	
Page	01	Rev 03	

EI90

Fire resistance 90 min. –
Fire--resistant



- Basic documents, which form the respective proof of applicability
- German Approval aBG: Z-19.53-2282
 - European Technical Assessment ETA-13/0704
 - Reaction to fire according to EN 13501-1
 - Fire resistance according to EN 13501-2
 - Installations according to the Hilti installation instructions

Without scale
all units in [mm]

A "typical" is a preconfigured fire protection solution consisting of specific components for a specific application, to which an assumed fire resistance period is assigned. Typical are selected according to their fire resistance period and are subject to the technical product documentation and underlying product approvals published by Hilti from time to time, are subject to generic assumptions, and are not selected on a project- or design-specific basis. The proposed typical may therefore not meet the project or design-specific requirements, and accordingly, they must be evaluated by the customer or by a relevant expert appointed by the customer for their suitability regarding the actual project-specific design criteria and requirements.

		Product Fire protection seal Hilti Firestop Cable Collar CFS-CC	Building project
ID	CFS-CC_CLTF_E_8X005	Contents Fire protection seal in cross-laminated timber floors for electrical cables and bundled cables	
Page	02	Rev 03	

① Installations

Item	Implementation	Description/Type	Dimensions [mm]	Firestop material	Opening size [mm]	Annular gap	Penetration seal thickness [mm]
1a	All types of electric cables	Also fiber-optic cables, except for waveguide cables	$\varnothing \leq 21$	CFS-CC/ CFS-FIL	$\varnothing 108$	-	≥ 140
1b	bundled cables	tied, stitched or welded cables	$\varnothing \leq 100$	CFS-CC/ CFS-FIL	$\varnothing 108$	-	≥ 140
1c	Conduits U/C	Flexible and rigid from PVC or polyolefin according to DIN EN 61386-22	$\varnothing \leq 32$	CFS-CC/ CFS-FIL	$\varnothing 108$	-	≥ 140

② Construction: This application detail applies in conjunction with "Appendix 1: Available evidence and documents"

The firestop functionality and fire resistance period of the floor must be considered separately.
The floor thicknesses shown correspond to minimum thicknesses required by the tested penetration seal.

③ Firestop product info

- Hilti Firestop Cable Collar CFS-CC
- European Technical Assessment: ETA-13/0704
 - German Approval aBG: Z-19.53-2282
 - Use for electrical cables and bundled cables
 - Fill all joints and gaps between the installations (especially the gussets between the cables) with Hilti CFS-FIL from both sides to a depth of at least 25 mm

Distances between the openings or other installations

*only with insulation 16–36.5 mm

Distances to Hilti Single systems [mm] (opening to opening)	CFS-CC (cable)	CFS-S ACR (aluminum composite pipes) (U/C)	CFS-S ACR (metal pipes) (C/U)	CFS-C EL (U/U)	CFS-B (metal pipes)* (C/U)	CFS-B (aluminum composite pipes) (U/C)	CFS-SL GA (DE) annular gap
CFS-CC (cable)	50	50	50	50	50	50	50
CFS-S ACR (aluminum composite pipes) (U/C)		50	50	50	50	50	50
CFS-S ACR (metal pipes)* (C/U)			50	50	50	50	50
CFS-C EL (U/U)				50	50	50	50
CFS-B (metal pipes) (C/U)					50	50	50
CFS-B (aluminum composite pipes) (U/C)						50	50
CFS-SL GA (DE) w/o annular gap							50

Distance of the penetration seal to	size of openings next to each other [mm]	DIN distances between the openings [mm]	EN distances between openings [mm]
other cable or pipe penetration seals	one/both opening(s) > 400 x 400	≥ 200	≥ 200
	both openings $\leq 400 \times 400$	≥ 100	≥ 200
other openings or installations	one/both opening(s) > 200 x 200	≥ 200	≥ 200
	both openings $\leq 200 \times 200$	≥ 100	≥ 200

Distances between installations [mm]

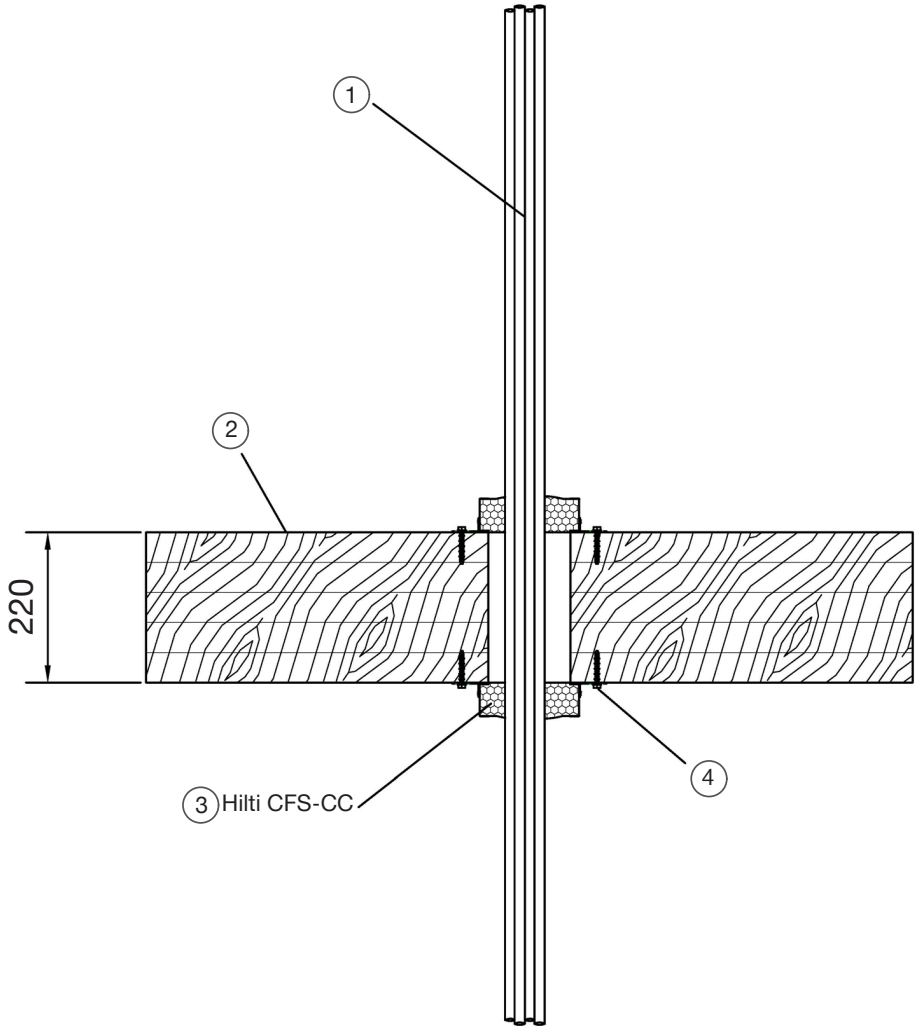
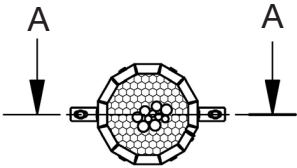
		Conduits		Cable/cable support structure	Reveal
		Single	Bundle		
Conduits	Single	-	-	-	-
	Bundle	-	-	-	-
Cable/cable support structure		-	-	0	0

④ Fastening devices – see Appendix 2

A "typical" is a preconfigured fire protection solution consisting of specific components for a specific application, to which an assumed fire resistance period is assigned. Typical is selected according to their fire resistance period and are subject to the technical product documentation and underlying product approvals published by Hilti from time to time, are subject to generic assumptions, and are not selected on a project- or design-specific basis. The proposed typical may therefore not meet the project or design-specific requirements, and accordingly, they must be evaluated by the customer or by a relevant expert appointed by the customer for their suitability regarding the actual project-specific design criteria and requirements.

		Product Fire protection seal Hilti cable collar CFS-CC	Building project
ID	CFS-CC_CLTF_C_8X001	Contents Fire protection seal in cross-laminated timber floors for electric cables	
Page	01	Rev 00	

EI90



- German Approval aBG: Z-19.53-2282
- European Technical Assessment ETA-13/0704
- Reaction to fire according to EN 13501-1
- Fire resistance according to EN 13501-1
- Installations according to the Hilti installation instructions

Without scale
all units in [mm]

A "typical" is a preconfigured fire protection solution consisting of specific components for a specific application, to which an assumed fire resistance period is assigned. Typical is selected according to their fire resistance period and are subject to the technical product documentation and underlying product approvals published by Hilti from time to time, are subject to generic assumptions, and are not selected on a project- or design-specific basis. The proposed typical may therefore not meet the project or design-specific requirements, and accordingly, they must be evaluated by the customer or by a relevant expert appointed by the customer for their suitability regarding the actual project-specific design criteria and requirements.

HILTI		Product	Building project		
		Fire protection seal Hilti cable collar CFS-CC			
ID		CFS-CC_CLTF_C_8X001		Contents	
Page		02		Rev	
				00	
		Fire protection seal in cross-laminated timber floors for electric cables			

① Installations

Item	Implementation	Description/Type	Dimensions [mm]	Firestop material	Opening size [mm]	Penetration seal thickness [mm]
1	All types of electric cables	Also fiber-optic cables, except for waveguide cables	Ø ≤ 21	CFS-CC/ CFS-FIL	Ø 108	220

② Construction: This typical can be used for the following element types and Dataholz.eu systems

Element type	Leno cross-laminated timber according to ETA-10/0241 or Z-9.1-501 of Merk Timber GmbH, Aichach, Germany
Dataholz.eu	-

③ Firestop product info

Hilti Firestop Cable Collar CFS-CC

- European Technical Assessment: ETA-13/0704

- German Approval aBG: Z-19.53-2282

- Use for electric cables, cable bundles and empty conduits

- Fill all joints and gaps between the installations (especially the gussets between the cables) with Hilti CFS-FIL from both sides to a depth of at least 20 mm

Distances between installations [mm]

		Conduits		Cable/cable support structures	Reveal
		Single	Bundle		
Conduits	Single	-	-	-	-
	Bundle	-	-	-	-
Cable/cable support structures		-	-	0	10

Distances between the openings or other installations

Distance of the penetration seal to	size of openings next to each other [mm]	DIN distance between openings [mm]	EN distance between openings [mm]
other cable or pipe penetration seals	one/both opening(s) > 400 x 400	≥ 200	≥ 50
	one/both opening(s) > 400 x 400	≥ 100	≥ 50
other openings or installations	one/both opening(s) > 200 x 200	≥ 200	≥ 200
	one/both opening(s) > 200 x 200	≥ 100	≥ 100

④ Fastening material

Type	Length [mm]
HUS-H 6	≤ 85

A "typical" is a preconfigured fire protection solution consisting of specific components for a specific application, to which an assumed fire resistance period is assigned. Typical are selected according to their fire resistance period and are subject to the technical product documentation and underlying product approvals published by Hilti from time to time, are subject to generic assumptions, and are not selected on a project- or design-specific basis. The proposed typical may therefore not meet the project or design-specific requirements, and accordingly, they must be evaluated by the customer or by a relevant expert appointed by the customer for their suitability regarding the actual project-specific design criteria and requirements.

HILTI		Product	Building project	
		Fire protection seal Hilti Firestop Sleeve CFS-SL GA		
ID		CFS-SL GA_CLTF_E_8X003		Contents Fire protection seal in cross-laminated timber floors for electrical cables and bundled cables
Page 01		Rev 03		

EI30

Fire resistance 30 min. –
Fire--retardant

Basic documents, which form the respective proof of applicability

- European Technical Assessment ETA-17/0081

- German Approval aBG: Z-19.53-2318

- Reaction to fire according to EN 13501-1

- Fire resistance according to EN 13501-2

- Installations according to the Hilti installation instructions

Without scale
all units in [mm]

A "typical" is a preconfigured fire protection solution consisting of specific components for a specific application, to which an assumed fire resistance period is assigned. Typical are selected according to their fire resistance period and are subject to the technical product documentation and underlying product approvals published by Hilti from time to time, are subject to generic assumptions, and are not selected on a project- or design-specific basis. The proposed typical may therefore not meet the project or design-specific requirements, and accordingly, they must be evaluated by the customer or by a relevant expert appointed by the customer for their suitability regarding the actual project-specific design criteria and requirements.

		Product	Building project
ID CFS-SL GA_CLTF_E_8X003		Fire protection seal Hilti Firestop Sleeve CFS-SL GA	
Page 02	Rev 03	Contents Fire protection seal in cross-laminated timber floors for electrical cables and bundled cables	

① Installations

Item	Implementation	Description/Type	Dimensions [mm]	Firestop material	Opening size [mm]	Annular gap	Penetration seal thickness [mm]
1b	All types of electric cables	Also fiber-optic cables, except for waveguide cables	$\varnothing \leq 21$	CFS-SL GA M DIN / EN	$115 \leq \varnothing \leq 118$	2.5 mm	≥ 80
1d	bundled cables	Also fiber-optic cables, except for waveguide cables	Sleeve filled up to 100%, consisting of individual cables with $\varnothing \leq 21$	CFS-SL GA M DIN / EN	$115 \leq \varnothing \leq 118$	2.5 mm	≥ 80

② Construction: This application detail applies in conjunction with "Appendix 1: Available evidence and documents"

The firestop functionality and fire resistance period of the floor must be considered separately.
The floor thicknesses shown correspond to minimum thicknesses required by the tested penetration seal.

③ Firestop product info

- Hilti Firestop Sleeve CFS-SL GA M
- European Technical Assessment: ETA-17/0081
 - German Approval aBG: Z-19.53-2318
 - Use for electrical cables and bundled cables

Distances between the openings or other installations

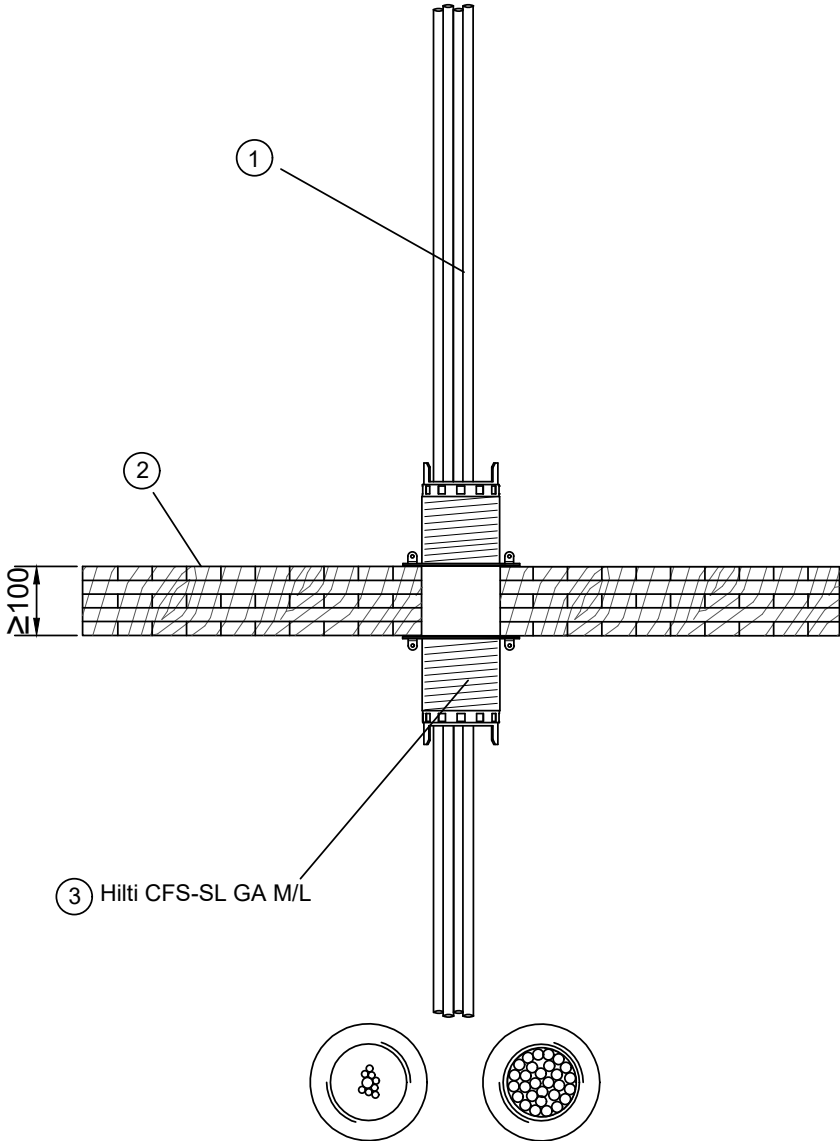
Distance of the penetration seal to	size of openings next to each other [mm]	DIN distances between the openings [mm]	DIN distances between the openings [mm]
CFS-SL GA	one/both opening(s) $115 \leq \varnothing \leq 118$	≥ 50	≥ 50
other cable or pipe penetration seals	one/both opening(s) $> 400 \times 400$	≥ 200	≥ 200
	one/both opening(s) $> 400 \times 400$	≥ 100	≥ 200
other openings or installations	one/both opening(s) $> 200 \times 200$	≥ 200	≥ 200
	one/both opening(s) $> 200 \times 200$	≥ 100	≥ 200

A "typical" is a preconfigured fire protection solution consisting of specific components for a specific application, to which an assumed fire resistance period is assigned. Typical are selected according to their fire resistance period and are subject to the technical product documentation and underlying product approvals published by Hilti from time to time, are subject to generic assumptions, and are not selected on a project- or design-specific basis. The proposed typical may therefore not meet the project or design-specific requirements, and accordingly, they must be evaluated by the customer or by a relevant expert appointed by the customer for their suitability regarding the actual project-specific design criteria and requirements.

		Product	Building project
ID CFS-SL GA_CLTF_E_8X004		Fire protection seal Hilti Firestop Sleeve CFS-SL GA	
Page 01	Rev 03	Contents Fire protection seal in cross-laminated timber floors for electrical cables and bundled cables	

E160

Fire resistance 60 min. -
Highly fire-retardant



- Basic documents, which form the respective proof of applicability
- European Technical Assessment ETA-17/0081
 - German Approval aBG: Z-19.53-2318
 - Reaction to fire according to EN 13501-1
 - Fire resistance according to EN 13501-2
 - Installations according to the Hilti installation instructions

Without scale
all units in [mm]

A "typical" is a preconfigured fire protection solution consisting of specific components for a specific application, to which an assumed fire resistance period is assigned. Typical are selected according to their fire resistance period and are subject to the technical product documentation and underlying product approvals published by Hilti from time to time, are subject to generic assumptions, and are not selected on a project- or design-specific basis. The proposed typical may therefore not meet the project or design-specific requirements, and accordingly, they must be evaluated by the customer or by a relevant expert appointed by the customer for their suitability regarding the actual project-specific design criteria and requirements.

		Product	Building project
ID CFS-SL GA_CLTF_E_8X004		Fire protection seal Hilti Firestop Sleeve CFS-SL GA	
Page 02	Rev 03	Contents Fire protection seal in cross-laminated timber floors for electrical cables and bundled cables	

① Installations

Item	Implementation	Description/Type	Dimensions [mm]	Firestop material	Opening size [mm]	Annular gap	Penetration seal thickness [mm]
1a	All types of electric cables	Also fiber-optic cables, except for waveguide cables	$\varnothing \leq 21$	CFS-SL GA M DIN / EN	$\varnothing \leq 115$	2.5 mm	≥ 100
1b	bundled cables	Also fiber-optic cables, except for waveguide cables	Sleeve filled up to 100%, consisting of individual cables with $\varnothing \leq 21$	CFS-SL GA M DIN / EN	$\varnothing \leq 115$	2.5 mm	≥ 100
1c	All types of electric cables	Also fiber-optic cables, except for waveguide cables	$\varnothing \leq 21$	CFS-SL GA L DIN / EN	$\varnothing \leq 115$	≤ 2.5 mm	≥ 100
1d	bundled cables	Also fiber-optic cables, except for waveguide cables	Sleeve filled up to 100%, consisting of individual cables with $\varnothing \leq 21$	CFS-SL GA L DIN / EN	$\varnothing \leq 115$	≤ 2.5 mm	≥ 100

② Construction: This application detail applies in conjunction with "Appendix 1: Available evidence and documents"

The firestop functionality and fire resistance period of the floor must be considered separately.
The floor thicknesses shown correspond to minimum thicknesses required by the tested penetration seal.

③ Firestop product info

- Hilti Firestop Sleeve CFS-SL GA M/L
- European Technical Assessment ETA-17/0081
 - German Approval aBG: Z-19.53-2318
 - Use for electrical cables and bundled cables

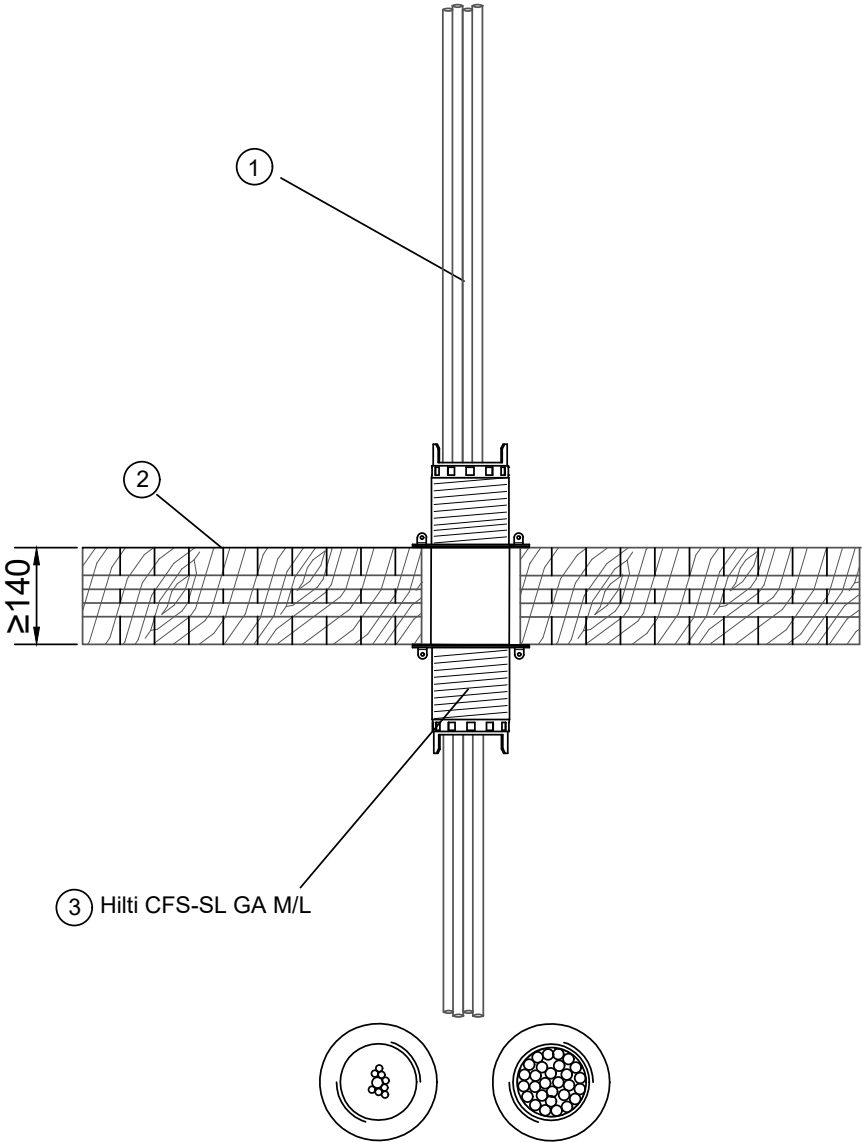
Distances between the openings or other installations

Distance of the penetration seal to	size of openings next to each other [mm]	DIN distances between the openings [mm]	DIN distances between the openings [mm]
CFS-SL GA	one/both opening(s) $115 \leq \varnothing \leq 118$	≥ 50	≥ 50
other cable or pipe penetration seals	one/both opening(s) $> 400 \times 400$	≥ 200	≥ 200
	one/both opening(s) $> 400 \times 400$	≥ 100	≥ 200
other openings or installations	one/both opening(s) $> 200 \times 200$	≥ 200	≥ 200
	one/both opening(s) $> 200 \times 200$	≥ 100	≥ 200

A "typical" is a preconfigured fire protection solution consisting of specific components for a specific application, to which an assumed fire resistance period is assigned. Typical are selected according to their fire resistance period and are subject to the technical product documentation and underlying product approvals published by Hilti from time to time, are subject to generic assumptions, and are not selected on a project- or design-specific basis. The proposed typical may therefore not meet the project or design-specific requirements, and accordingly, they must be evaluated by the customer or by a relevant expert appointed by the customer for their suitability regarding the actual project-specific design criteria and requirements.

		Product	Building project
ID CFS-SL GA_CLTF_E_8X005		Fire protection seal Hilti Firestop Sleeve CFS-SL GA	
Page 01	Rev 03	Contents Fire protection seal in cross-laminated timber floors for electrical cables and bundled cables	

EI90
Fire resistance 90 min. –
Fire--resistant



- Basic documents, which form the respective proof of applicability
- European Technical Assessment ETA-17/0081
 - German Approval aBG: Z-19.53-2318
 - Reaction to fire according to EN 13501-1
 - Fire resistance according to EN 13501-2
 - Installations according to the Hilti installation instructions

Without scale
all units in [mm]

A "typical" is a preconfigured fire protection solution consisting of specific components for a specific application, to which an assumed fire resistance period is assigned. Typical are selected according to their fire resistance period and are subject to the technical product documentation and underlying product approvals published by Hilti from time to time, are subject to generic assumptions, and are not selected on a project- or design-specific basis. The proposed typical may therefore not meet the project or design-specific requirements, and accordingly, they must be evaluated by the customer or by a relevant expert appointed by the customer for their suitability regarding the actual project-specific design criteria and requirements.

		Product Fire protection seal Hilti Firestop Sleeve CFS-SL GA	Building project
ID CFS-SL GA_CLTF_E_8X005		Contents Fire protection seal in cross-laminated timber floors for electrical cables and bundled cables	
Page 02	Rev 32		

① Installations

Item	Implementation	Description/Type	Dimensions [mm]	Firestop material	Opening size [mm]	Annular gap	Penetration seal thickness [mm]
1a	All types of electric cables	Also fiber-optic cables, except for waveguide cables	$\varnothing \leq 21$	CFS-SL GA M DIN / EN	$\varnothing \leq 115$	≤ 2.5 mm	≥ 140
1b	bundled cables	Also fiber-optic cables, except for waveguide cables	Sleeve filled up to 100%, consisting of individual cables with $\varnothing \leq 21$	CFS-SL GA M DIN / EN	$\varnothing \leq 115$	≤ 2.5 mm	≥ 140
1c	All types of electric cables	Also fiber-optic cables, except for waveguide cables	$\varnothing \leq 21$	CFS-SL GA L DIN / EN	$\varnothing \leq 115$	≤ 2.5 mm	≥ 140
1d	bundled cables	Also fiber-optic cables, except for waveguide cables	Sleeve filled up to 100%, consisting of individual cables with $\varnothing \leq 21$	CFS-SL GA L DIN / EN	$\varnothing \leq 115$	≤ 2.5 mm	≥ 140

② Construction: This application detail applies in conjunction with "Appendix 1: Available evidence and documents"

The firestop functionality and fire resistance period of the floor must be considered separately.
The floor thicknesses shown correspond to minimum thicknesses required by the tested penetration seal.

③ Firestop product info

- Hilti Firestop Sleeve CFS-SL GA M/L
- European Technical Assessment: ETA-17/0081
 - German Approval aBG: Z-19.53-2318
 - Use for electrical cables and bundled cables

Distances between the openings or other installations *only with insulation 16–36.5 mm

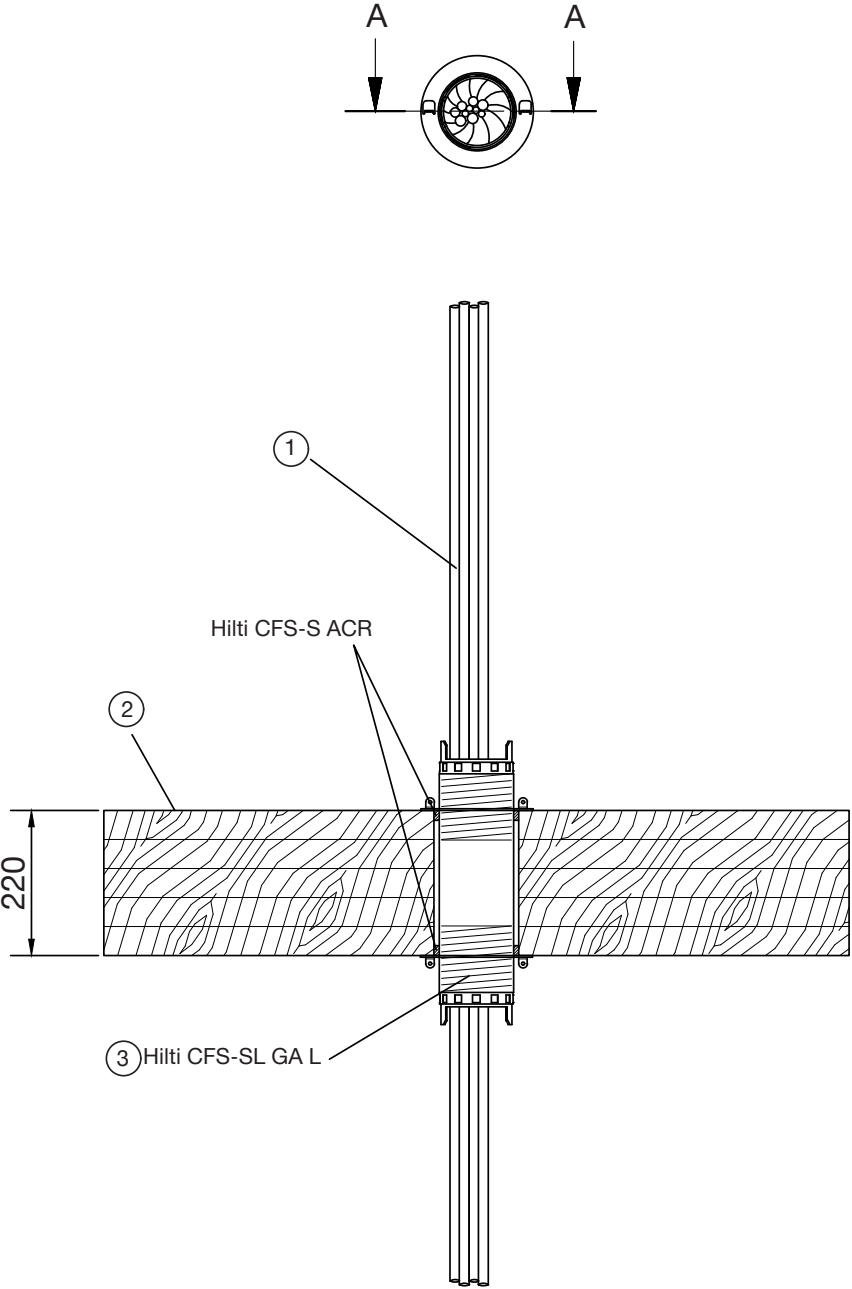
Distances to Hilti Single systems [mm] (opening to opening)	CFS-SL GA (DE)	CFS-S ACR (aluminum composite pipes)	CFS-S ACR (metal pipes)	CFS-C EL	CFS-B (metal pipes)*	CFS-B (aluminum composite pipes)	CFS-CC (cable)
CFS-SL GA (DE)	50	50	50	50	50	50	50
CFS-S ACR (aluminum composite pipes)		50	50	50	50	50	50
CFS-S ACR (metal pipes)			50	50	50	50	50
CFS-C EL				50	50	50	50
CFS-B (metal pipes)*					50	50	50
CFS-B (aluminum composite pipes)						50	50
CFS-CC (cable)							50

Distance of the penetration seal to	size of openings next to each other [mm]	DIN distances between the openings [mm]	DIN distances between the openings [mm]
CFS-SL GA (EN)	one/both opening(s) $115 \leq \varnothing \leq 118$	≥ 50	≥ 50
other cable or pipe penetration seals	one/both opening(s) $> 400 \times 400$	≥ 200	≥ 200
	one/both opening(s) $> 400 \times 400$	≥ 100	≥ 200
other openings or installations	one/both opening(s) $> 200 \times 200$	≥ 200	≥ 200
	one/both opening(s) $> 200 \times 200$	≥ 100	≥ 200

A "typical" is a preconfigured fire protection solution consisting of specific components for a specific application, to which an assumed fire resistance period is assigned. Typical is selected according to their fire resistance period and are subject to the technical product documentation and underlying product approvals published by Hilti from time to time, are subject to generic assumptions, and are not selected on a project- or design-specific basis. The proposed typical may therefore not meet the project or design-specific requirements, and accordingly, they must be evaluated by the customer or by a relevant expert appointed by the customer for their suitability regarding the actual project-specific design criteria and requirements.

		Product Fire protection seal Hilti Firestop Sleeve CFS-SL GA	Building project
ID CFS-SL GA_CLTF_C_8X001		Contents Fire protection seal in cross-laminated timber floors for electric cables	
Page 01	Rev 00		

EI90



- European Technical Assessment ETA-17/0081
- German Approval aBG: Z-19.53-2318
- Reaction to fire according to EN 13501-1
- Fire resistance according to EN 13501-1
- Installations according to the Hilti installation instructions

Without scale
all units in [mm]

A "typical" is a preconfigured fire protection solution consisting of specific components for a specific application, to which an assumed fire resistance period is assigned. Typical is selected according to their fire resistance period and are subject to the technical product documentation and underlying product approvals published by Hilti from time to time, are subject to generic assumptions, and are not selected on a project- or design-specific basis. The proposed typical may therefore not meet the project or design-specific requirements, and accordingly, they must be evaluated by the customer or by a relevant expert appointed by the customer for their suitability regarding the actual project-specific design criteria and requirements.

		Product Fire protection seal Hilti Firestop Sleeve CFS-SL GA	Building project
ID	CFS-SL GA_CLTF_C_8X001	Contents Fire protection seal in cross-laminated timber floors for electrical cables and bundled cables	
Page	02	Rev 00	

① Installations

Item	Implementation	Description/Type	Dimensions [mm]	Firestop material	Opening size [mm]	Annular gap	Penetration seal thickness [mm]
1a	All types of electric cables	Also fiber-optic cables Except for waveguide cables	Ø ≤ 21	CFS-SL GA L	Ø ≤ 120	CFS-S ACR 0-7 mm	220

② Construction: This typical can be used for the following element types and Dataholz.eu systems

Element type	Leno cross-laminated timber according to ETA-10/0241 or Z-9.1-501 of Merk Timber GmbH, Aichach, Germany
Dataholz.eu	-

③ Firestop product info

- Hilti Firestop Sleeve CFS-SL GA L
- European Technical Assessment: ETA-17/0081
 - German Approval aBG: Z-19.53-2318
 - Use for electric cables, cable bundles and empty conduits
 - Fill the remaining annular gap with Hilti CFS-S ACR Firestop Sealant from both sides to a depth of at least 20 mm

Distances between installations [mm]

		Conduits		Cable/cable support structures	Reveal
		Single	Bundle		
Conduits	Single	-	-	-	-
	Bundle	-	-	-	-
Cable/cable support structures		-	-	0	20

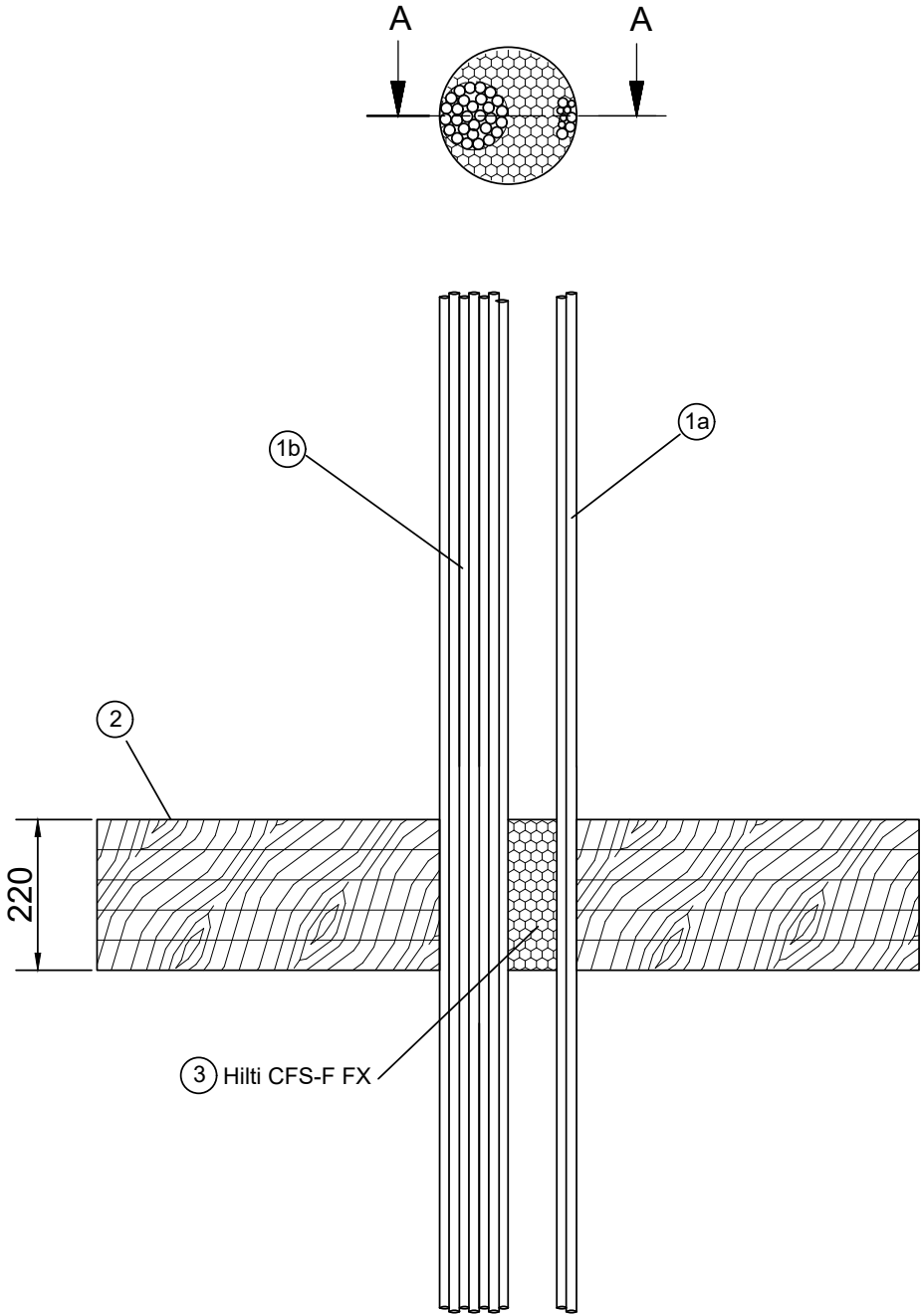
Distances between the openings or other installations

Distance of the penetration seal to	size of openings next to each other [mm]	DIN distance between openings [mm]	EN distance between openings [mm]
other cable or pipe penetration seals	one/both opening(s) > 400 x 400	≥ 200	≥ 50
	one/both opening(s) > 400 x 400	≥ 100	≥ 50
other openings or installations	one/both opening(s) > 200 x 200	≥ 200	≥ 200
	one/both opening(s) > 200 x 200	≥ 100	≥ 100

A "typical" is a preconfigured fire protection solution consisting of specific components for a specific application, to which an assumed fire resistance period is assigned. Typical are selected according to their fire resistance period and are subject to the technical product documentation and underlying product approvals published by Hilti from time to time, are subject to generic assumptions, and are not selected on a project- or design-specific basis. The proposed typical may therefore not meet the project or design-specific requirements, and accordingly, they must be evaluated by the customer or by a relevant expert appointed by the customer for their suitability regarding the actual project-specific design criteria and requirements.

		Product Fire protection seal Hilti Firestop Foam CFS-F FX	Building project
ID	CFS-F FX_CLTF_E_8X001	Contents Fire protection seal in cross-laminated timber floors for electrical cables and bundled cables	
Page	01	Rev 00	

EI90



- German Approval aBG: Z-19.15-1901
- European Technical Assessment ETA-10/0109
- Reaction to fire according to EN 13501-1
- Fire resistance according to EN 13501-1
- Installations according to the Hilti installation instructions

Without scale
all units in [mm]

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		Product Fire protection seal Hilti Firestop Foam CFS-F FX	Building project
ID	CFS-F FX_CLTF_E_8X001	Contents Fire protection seal in cross-laminated timber floors for electrical cables and bundled cables	
Page	02	Rev 00	

① Installations

Item	Implementation	Description/Type	Dimensions [mm]	Firestop material	Opening size [mm]	Penetration seal thickness [mm]
1a	All types of electric cables	Also fiber-optic cables, except for waveguide cables	Ø ≤ 21	CFS-F FX	Ø 200	220
1b	bundled cables		Ø ≤ 100, as single cable Ø ≤ 21	CFS-F FX	Ø 200	220

② Construction: This typical can be used for the following element types and Dataholz.eu systems

Element type	Leno cross-laminated timber according to ETA-10/0241 or Z-9.1-501 of Merk Timber GmbH, Aichach, Germany
Dataholz.eu	-

③ Firestop product info

- Hilti Firestop Foam CFS-F FX
- European Technical Assessment: ETA-10/0109
 - German Approval aBG: Z-19.15-1901
 - Use for electrical cables, bundled cables, cable support structures and cable conduits
 - Total installations max. 60% from opening
 - Fill all joints and gaps between the installations (especially the gussets between the cables) with Hilti CFS-F FX

Distances between installations [mm]

		Conduits		Cable/cable support structures	Reveal
		Single	Bundle		
Conduits	Single	-	-	-	-
	Bundle	-		-	-
Cable/cable support structures		-	-	0	0

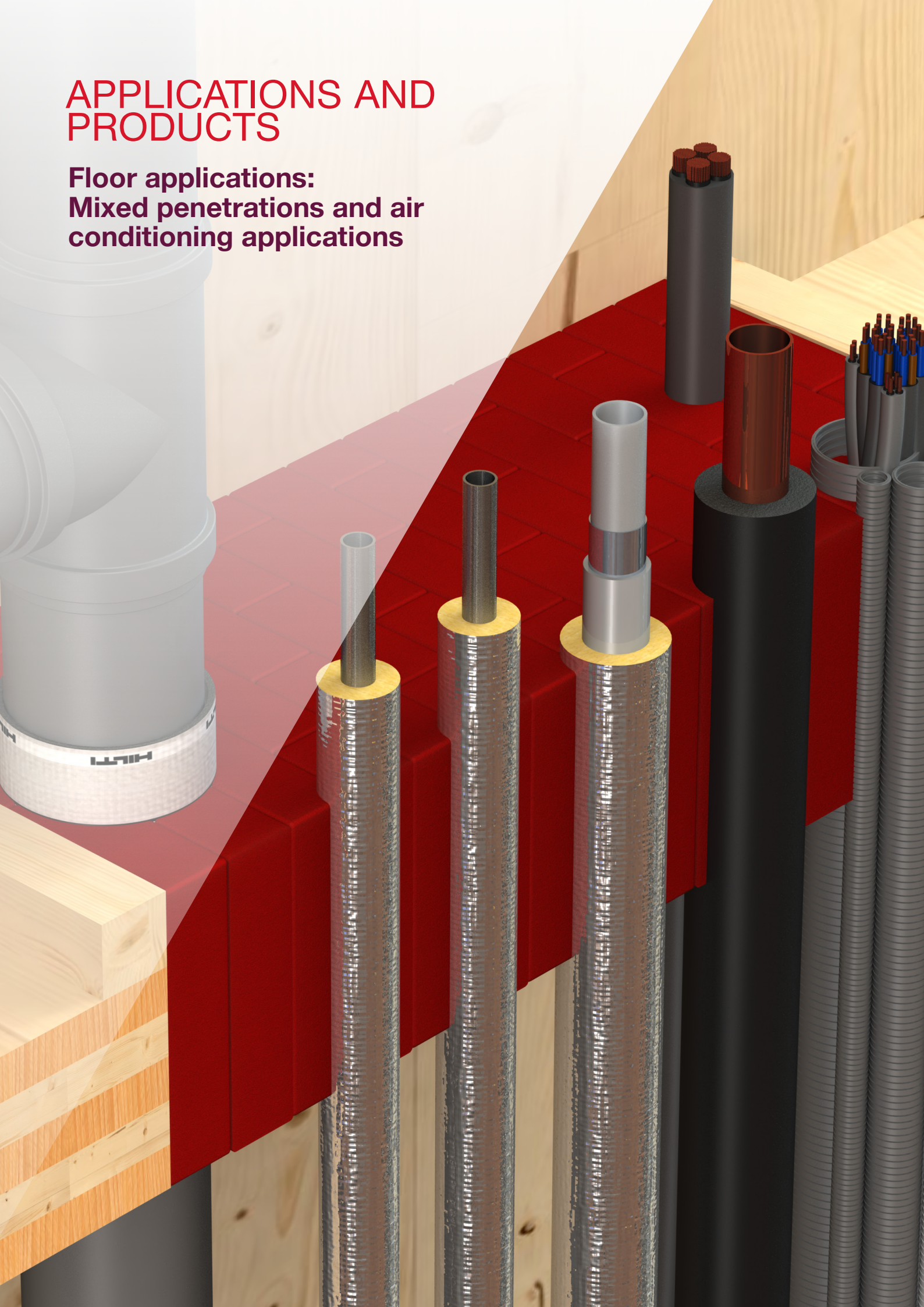
Distances between the openings or other installations

Distance of the penetration seal to	size of openings next to each other [mm]	DIN distance between openings [mm]	EN distance between openings [mm]
other cable or pipe penetration seals	one/both opening(s) > 400 x 400	≥ 200	≥ 50
	one/both opening(s) > 400 x 400	≥ 100	≥ 50
other openings or installations	one/both opening(s) > 200 x 200	≥ 200	≥ 200
	one/both opening(s) > 200 x 200	≥ 100	≥ 100

A "typical" is a preconfigured fire protection solution consisting of specific components for a specific application, to which an assumed fire resistance period is assigned. Typicals are selected according to their fire resistance period and are subject to the technical product documentation and underlying product approvals published by Hilti from time to time, are subject to generic assumptions, and are not selected on a project- or design-specific basis. The proposed typicals may therefore not meet the project or design-specific requirements, and accordingly, they must be evaluated by the customer or by a relevant expert appointed by the customer for their suitability regarding the actual project-specific design criteria and requirements.

APPLICATIONS AND PRODUCTS

Floor applications:
Mixed penetrations and air conditioning applications



Floor applications: Mixed penetrations and air conditioning applications.

		Product Fire protection seal Hilti Firestop Block CFS-BL P	Building project
ID CFS-BL P_CLTF_MX_8X003/1		Contents Fire protection in cross-laminated timber floors for combination penetration seals	
Page 01	Rev 03		

Floor top with wooden strips doubled up 50 mm
Width ≥ 30 mm
Alternatively, timber with a higher F-class or strips of non-combustible components (GKF, gypsum fiber or calcium silicate boards)

130

≥80

130

≥80

400

1000

3 Hilti CFS-BL P

EI30
Fire resistance 30 min. –
Fire--retardant

Basic documents, which form the respective proof of applicability

- German Approval aBG: Z-19.53-2431
- European Technical Assessment ETA-18/1024
- Reaction to fire according to EN 13501-1
- Fire resistance according to EN 13501-2
- Installations according to the Hilti installation instructions

Without scale
all units in [mm]

		Product	Building project
ID CFS-BL P_CLTF_MX_8X003/1		Fire protection seal Hilti Firestop Block CFS-BL P	
Page 02	Rev 03	Contents Fire protection in cross-laminated timber floors for combination penetration seals	

① Installations

Item	Implementation	Description/Type	Dimensions [mm]	Firestop material	Opening size [mm]	Annular gap	Pipe insulation	Penetration seal thickness [mm]
1a	All types of electric cables	Also fiber-optic cables, except for waveguide cables	$\varnothing \leq 80$	CFS-BL P CFS FIL	400 x 1000	-	-	130
1b	Conduits	flexible and rigid PVC or polyolefins according to DIN EN 61386-22	Single $\varnothing \leq 50$ Bundle $\varnothing \leq 100$	CFS-BL P CFS FIL	400 x 1000	-	-	130
1c	Cable support structures	Made of steel, aluminum or plastic profiles	150 x 60 x 1.5 200 x 60 x 1.5	CFS-BL P CFS FIL	400 x 1000	-	-	130
1d	Aluminum composite pipes	Geberit Mepla/ Fränkische Alpex L/ UPONOR Unipipe/ Aquatherm Fusiotherm	See relevant Documents	CFS-BL P CFS FIL	400 x 1000	-	-	130
1e	Non-combustible pipes	Copper, steel, Stainless steel and cast iron	$10 \leq \varnothing \leq 88.9$ $1 \leq s^* \leq 14.2$	CFS-BL P CFS FIL	400 x 1000	-	Euro class mineral wool A1 or A2 Density $\geq 80 \text{ kg/m}^3$ $30 \text{ mm} \leq T^* \leq 40 \text{ mm}$ Length $\geq 800 \text{ mm}$	130
1f	Non-combustible pipes	Copper, steel, Stainless steel and cast iron	$28 \leq \varnothing \leq 54$ $1.5 \leq s^* \leq 14.2$	CFS-BL P CFS FIL	400 x 1000	-	flexible Elastomeric insulation (rubber) $8.5 \leq T^* \leq 31$	130
1g	Combustible pipes	PVC-U/C/ PE-HD/ Geberit Silent PP/ Rehau Raupiano Plus/ etc.	See relevant Documents	CFS-BL P CFS-B CFS FIL	400 x 1000	-	for $> \varnothing 75$ CFS-B 2 Layers centered in the seal	130

* Wall thickness/insulation thickness

② Construction: This application detail applies in conjunction with "Appendix 1: Available evidence and documents"

The firestop functionality and fire resistance period of the floor must be considered separately.
The floor thicknesses shown correspond to minimum thicknesses required by the tested penetration seal.

③ Firestop product info

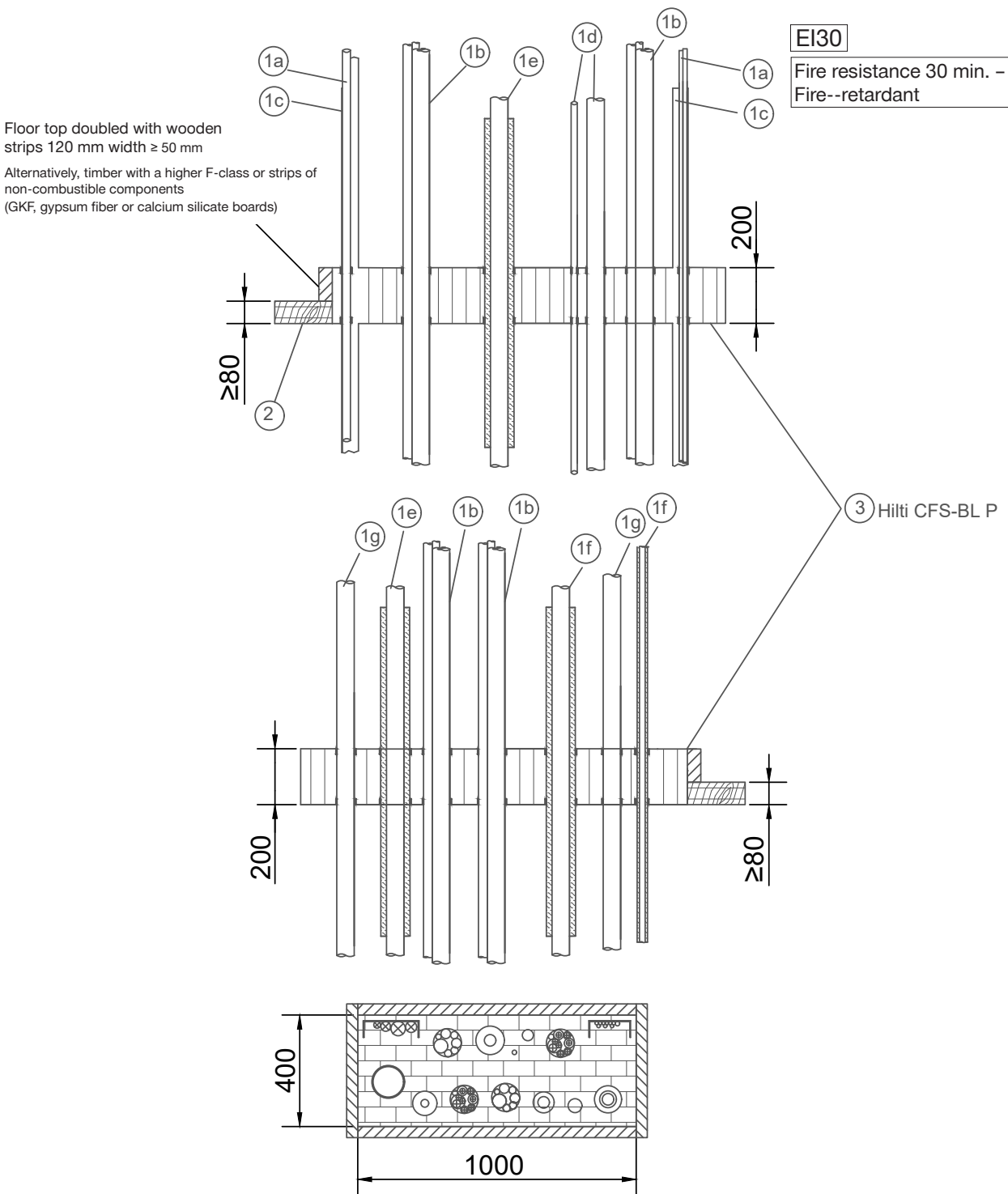
- Hilti Firestop Block CFS-BL P
- German Approval aBG: Z-19.53-2431
 - European Technical Assessment: ETA-18/1024
 - Use for electrical cables, bundled cables, cable support structures and cable conduits
 - Total installations max. 60% from opening
 - Fill all joints and gaps between the installations (especially the gussets between the cables) with Hilti CFS-FIL from both sides to a depth of at least 25 mm

Distances between installations [mm]

Distances to adjacent openings or installations, if not listed in the table, according to DIN EN 1366-3 at least 200 mm or according to regulations of DIBt min. 100 mm or 200 mm		Conduits		Cable/cable support structure	Reveal	non-combustible pipes	combustible pipes		Aluminum composite pipes
		Single	Bundle			Mineral wool insulation	with CFS-B	without measure	
Conduits	Single	50	50	50	50	50	50	100	50
	Bundle	50	50	50	50	50	50	100	50
Cable/cable support structure		50	50	100	20	100	100	100	100
non-combustible pipes	Mineral wool insulation	100	100	100	50	100	100	50	100
	with CFS-B	50	50	100	50	100	50	50	100
combustible pipes	without measure	50	50	100	50	50	50	100	100
Aluminum composite pipes		100	100	100	50	100	100	100	100

A "typical" is a preconfigured fire protection solution consisting of specific components for a specific application, to which an assumed fire resistance period is assigned. Typical is selected according to their fire resistance period and are subject to the technical product documentation and underlying product approvals published by Hilti from time to time, are subject to generic assumptions, and are not selected on a project- or design-specific basis. The proposed typical may therefore not meet the project or design-specific requirements, and accordingly, they must be evaluated by the customer or by a relevant expert appointed by the customer for their suitability regarding the actual project-specific design criteria and requirements.

		Product	Building project
ID CFS-BL P_CLTF_MX_8X003/2		Fire protection seal Hilti Firestop Block CFS-BL P	
Page 01	Rev 03	Contents Fire protection in cross-laminated timber floors for combination penetration seals	



Basic documents, which form the respective proof of applicability

- German Approval aBG: Z-19.53-2431
- European Technical Assessment: ETA-18/1024
- Reaction to fire according to EN 13501-1
- Fire resistance according to EN 13501-2
- Installations according to the Hilti installation instructions

Without scale
all units in [mm]

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		Product Fire protection seal Hilti Firestop Block CFS-BL P	Building project
ID CFS-BL P_CLTF_MX_8X003/2		Contents Fire protection in cross-laminated timber floors for combination penetration seals	
Page 02	Rev 03		

① Installations

Item	Implementation	Description/Type	Dimensions [mm]	Firestop material	Opening size [mm]	Annular gap	Pipe insulation	Penetration seal thickness [mm]
1a	All types of electric cables	Also fiber-optic cables, except for waveguide cables	$\varnothing \leq 80$	CFS-BL P CFS FIL	400 x 1000	-	-	200
1b	Conduits	flexible and rigid PVC or polyolefins according to DIN EN 61386-22	Single $\varnothing \leq 50$ Bundle $\varnothing \leq 100$	CFS-BL P CFS FIL	400 x 1000	-	-	200
1c	Cable support structures	Made of steel, aluminum or plastic profiles	150 x 60 x 1.5 200 x 60 x 1.5	CFS-BL P CFS FIL	400 x 1000	-	-	200
1d	Aluminum composite pipes	Geberit Mepla/ Fränkische Alpex L/ UPONOR Unipipe/ Aquatherm Fusiotherm	See relevant Documents	CFS-BL P CFS FIL	400 x 1000	-	-	200
1e	Non-combustible pipes	Copper, steel, Stainless steel and cast iron	$10 \leq \varnothing \leq 88,9$ $1 \leq s^* \leq 14,2$	CFS-BL P CFS FIL	400 x 1000	-	Euro class mineral wool A1 or A2 Density $\geq 80 \text{ kg/m}^3$ $30 \text{ mm} \leq T^* \leq 40 \text{ mm}$ Length $\geq 800 \text{ mm}$	200
1f	Non-combustible pipes	Copper, steel, Stainless steel and cast iron	$28 \leq \varnothing \leq 54$ $1,5 \leq s^* \leq 14,2$	CFS-BL P CFS FIL	400 x 1000	-	flexible Elastomeric insulation (rubber) $8,5 \leq T^* \leq 31$	200
1g	Combustible pipes	PVC-U/C/ PE-HD/ Geberit Silent PP/ Rehau Raupiano Plus/ etc.	See relevant Documents	CFS-BL P CFS-B CFS FIL	400 x 1000	-	for $> \varnothing 75$ CFS-B 2 Layers centered in the seal	200

* Wall thickness/insulation thickness

② Construction: This application detail applies in conjunction with "Appendix 1: Available evidence and documents"

The firestop functionality and fire resistance period of the floor must be considered separately.
The floor thicknesses shown correspond to minimum thicknesses required by the tested penetration seal.

③ Firestop product info

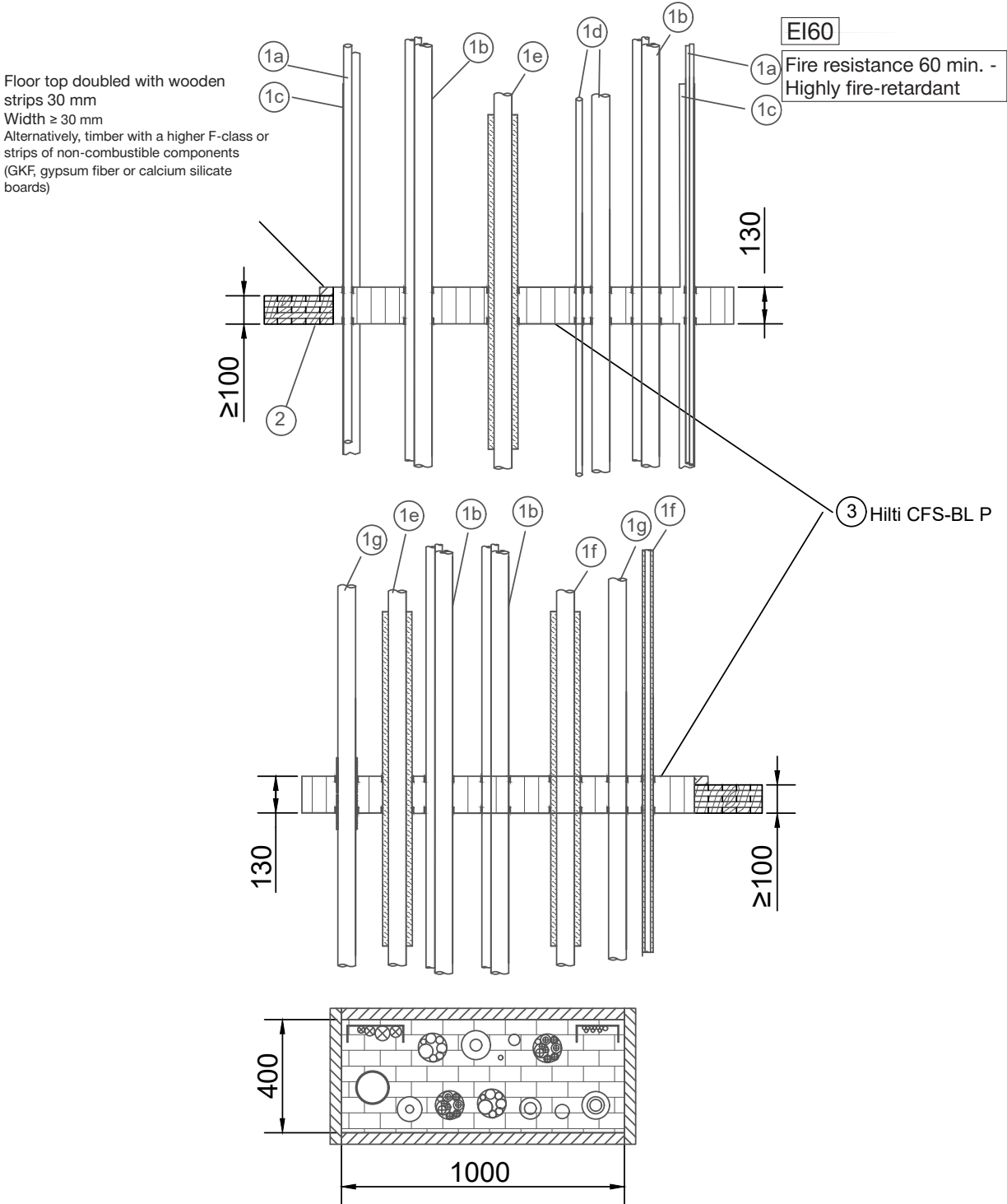
- Hilti Firestop Block CFS-BL P
- German Approval aBG: Z-19.53-2431
 - European Technical Assessment ETA-18/1024
 - Use for electrical cables, bundled cables, cable support structures and cable conduits
 - Total installations max. 60% from opening
 - Fill all joints and gaps between the installations (especially the gussets between the cables) with Hilti CFS-FIL from both sides to a depth of at least 25 mm

Distances between installations [mm]

Distances to adjacent openings or installations, if not listed in the table, according to DIN EN 1366-3 at least 200 mm or according to Regulations of the DIBt min. 100 mm or 200 mm		Conduits		Cable/cable support structure	Reveal	non-combustible pipes	combustible pipes		Aluminum composite pipes
		Single	Bundle			Mineral wool insulation	with CFS-B	without measure	
Conduits	Single	50	50	50	50	50	50	100	50
	Bundle	50	50	50	50	50	50	100	50
Cable/cable support structure		50	50	100	20	100	100	100	100
non-combustible pipes	Mineral wool insulation	100	100	100	50	100	100	50	100
combustible pipes	with CFS-B	50	50	100	50	100	50	50	100
	without measure	50	50	100	50	50	50	100	100
Aluminum composite pipes		100	100	100	50	100	100	100	100

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		Product Fire protection seal Hilti Firestop Block CFS-BL P	Building project
ID CFS-BL P_CLTF_MX_8X004/1		Contents Fire protection in cross-laminated timber floors for combination penetration seals	
Page 01	Rev 03		



Basic documents, which form the respective proof of applicability

- German Approval aBG: Z-19.53-2431
- European Technical Assessment ETA-18/1024
- Reaction to fire according to EN 13501-1
- Fire resistance according to EN 13501-2
- Installations according to the Hilti installation instructions

Without scale
all units in [mm]

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		Product	Building project
ID CFS-BL P_CLTF_MX_8X004/1		Fire protection seal Hilti Firestop Block CFS-BL P	
Page 02	Rev 03	Contents Fire protection in cross-laminated timber floors for combination penetration seals	

① Installations

Item	Implementation	Description/Type	Dimensions [mm]	Firestop material	Opening size [mm]	Annular gap	Pipe insulation	Penetration seal thickness [mm]
1a	All types of electric cables	Also fiber-optic cables, except for waveguide cables	$\varnothing \leq 80$	CFS-BL P CFS FIL	400 x 1000	-	-	130
1b	Conduits pipes	flexible and rigid PVC or polyolefins according to DIN EN 61386-22	Single $\varnothing \leq 50$ Bundle $\varnothing \leq 100$	CFS-BL P CFS FIL	400 x 1000	-	-	130
1c	Cable support structures	Made of steel, aluminum or plastic profiles	150 x 60 x 1.5 200 x 60 x 1.5	CFS-BL P CFS FIL	400 x 1000	-	-	130
1d	Aluminum composite pipes	Geberit Mepla/ Fränkische Alpex L/ UPONOR Unipipe/ Aquatherm Fusiotherm	See relevant Documents	CFS-BL P CFS FIL	400 x 1000	-	-	130
1e	Non-combustible pipes	Copper, steel, Stainless steel and cast iron	$10 \leq \varnothing \leq 88.9$ $1 \leq s^* \leq 14.2$	CFS-BL P CFS FIL	400 x 1000	-	Euro class mineral wool A1 or A2 Density $\geq 80 \text{ kg/m}^3$ $30 \text{ mm} \leq T^* \leq 40 \text{ mm}$ Length $\geq 800 \text{ mm}$	130
1f	Non-combustible pipes	Copper, steel, Stainless steel and cast iron	$28 \leq \varnothing \leq 54$ $1.5 \leq s^* \leq 14.2$	CFS-BL P CFS FIL	400 x 1000	-	flexible Elastomeric insulation (rubber) $8.5 \leq T^* \leq 31$	130
1g	Combustible pipes	PVC-U/C/ PE-HD/ Geberit Silent PP/ Rehau Raupiano Plus/ etc.	See relevant Documents	CFS-BL P CFS-B CFS FIL	400 x 1000	-	for $> \varnothing 75$ CFS-B 2 Layers centered in the seal	130

* Wall thickness/insulation thickness

② Construction: This application detail applies in conjunction with "Appendix 1: Available evidence and documents"

The firestop functionality and fire resistance period of the floor must be considered separately.
The floor thicknesses shown correspond to minimum thicknesses required by the tested penetration seal.

③ Firestop product info

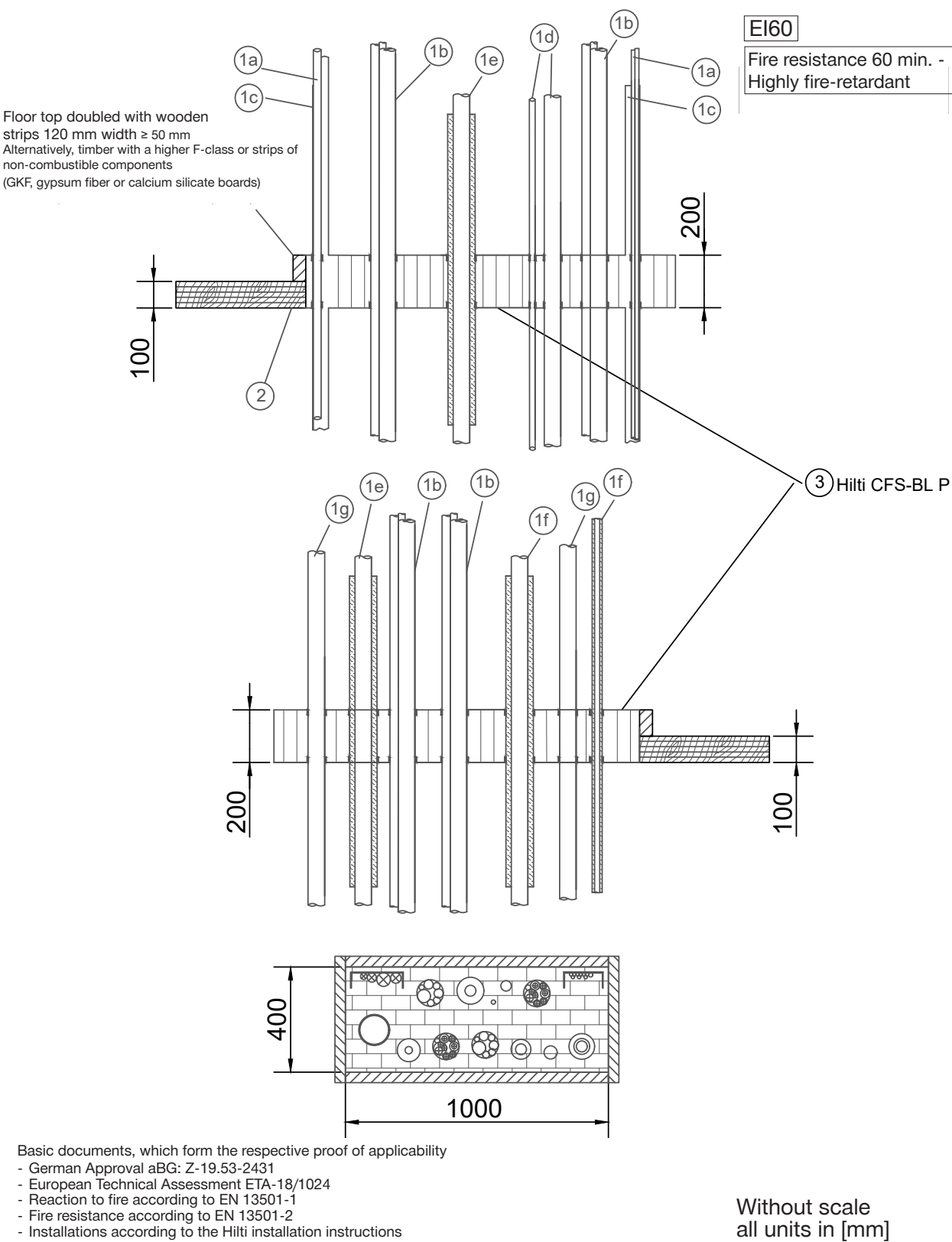
- Hilti Firestop Block CFS-BL P
- German Approval aBG: Z-19.53-2431
 - European Technical Assessment ETA-18/1024
 - Use for electrical cables, bundled cables, cable support structures and cable conduits
 - Total installations max. 60% from opening
 - Fill all joints and gaps between the installations (especially the gussets between the cables) with Hilti CFS-FIL from both sides to a depth of at least 25 mm

Distances between installations [mm]

Distances to adjacent openings or installations, if not listed in the table, according to DIN EN 1366-3 at least 200 mm or according to Regulations of the DIBt min. 100 mm or 200 mm		Conduits		Cable/cable support structure	Reveal	non-combustible pipes	combustible pipes		Aluminum composite pipes
		Single	Bundle			Mineral wool insulation	with CFS-B	without measure	
Conduits	Single	50	50	50	50	50	50	100	50
	Bundle	50	50	50	50	50	50	100	50
Cable/cable support structure		50	50	100	20	100	100	100	100
non-combustible pipes	Mineral wool insulation	100	100	100	50	100	100	50	100
combustible pipes	with CFS-B	50	50	100	50	100	50	50	100
	without measure	50	50	100	50	50	50	100	100
Aluminum composite pipes		100	100	100	50	100	100	100	100

A "typical" is a preconfigured fire protection solution consisting of specific components for a specific application, to which an assumed fire resistance period is assigned. Typical are selected according to their fire resistance period and are subject to the technical product documentation and underlying product approvals published by Hilti from time to time, are subject to generic assumptions, and are not selected on a project- or design-specific basis. The proposed typical may therefore not meet the project or design-specific requirements, and accordingly, they must be evaluated by the customer or by a relevant expert appointed by the customer for their suitability regarding the actual project-specific design criteria and requirements.

		Product	Building project
ID CFS-BL P_CLTF_MX_8X004/2		Fire protection seal Hilti Firestop Block CFS-BL P	
Page 01	Rev 03	Contents Fire protection in cross-laminated timber floors for combination penetration seals	



Floor top doubled with wooden strips 120 mm width ≥ 50 mm
Alternatively, timber with a higher F-class or strips of non-combustible components (GKF, gypsum fiber or calcium silicate boards)

100

200

400

1000

EI60
Fire resistance 60 min. - Highly fire-retardant

3 Hilti CFS-BL P

Basic documents, which form the respective proof of applicability

- German Approval aBG: Z-19.53-2431
- European Technical Assessment ETA-18/1024
- Reaction to fire according to EN 13501-1
- Fire resistance according to EN 13501-2
- Installations according to the Hilti installation instructions

Without scale
all units in [mm]

		Product	Building project
ID CFS-BL P_CLTF_MX_8X004/2		Fire protection seal Hilti Firestop Block CFS-BL P	
Page 02	Rev 03	Contents Fire protection seal in cross-laminated timber floors for Mixed penetrations	

① Installations

Item	Implementation	Description/Type	Dimensions [mm]	Firestop material	Opening size [mm]	Annular gap	Pipe insulation	Penetration seal thickness [mm]
1a	All types of electric cables	Also fiber-optic cables, except for waveguide cables	$\varnothing \leq 80$	CFS-BL P CFS FIL	400 x 1000	-	-	200
1b	Conduits	flexible and rigid PVC or polyolefins according to DIN EN 61386-22	Single $\varnothing \leq 50$ Bundle $\varnothing \leq 100$	CFS-BL P CFS FIL	400 x 1000	-	-	200
1c	Cable support structures	Made of steel, aluminum or plastic profiles	150 x 60 x 1.5 200 x 60 x 1.5	CFS-BL P CFS FIL	400 x 1000	-	-	200
1d	Aluminum composite pipes	Geberit Mepla/ Fränkische Alpex L/ UPONOR Unipipe/ Aquatherm Fusiotherm	See relevant Documents	CFS-BL P CFS FIL	400 x 1000	-	-	200
1e	Non-combustible pipes	Copper, steel, Stainless steel and cast iron	$10 \leq \varnothing \leq 88.9$ $1 \leq s^* \leq 14.2$	CFS-BL P CFS FIL	400 x 1000	-	Euro class mineral wool A1 or A2 Density $\geq 80 \text{ kg/m}^3$ $30 \text{ mm} \leq T^* \leq 40 \text{ mm}$ Length $\geq 800 \text{ mm}$	200
1f	Non-combustible pipes	Copper, steel, Stainless steel and cast iron	$28 \leq \varnothing \leq 54$ $1.5 \leq s^* \leq 14.2$	CFS-BL P CFS FIL	400 x 1000	-	flexible Elastomeric insulation (rubber) $8.5 \leq T^* \leq 31$	200
1g	Combustible pipes	PVC-U/C/ PE-HD/ Geberit Silent PP/ Rehau Raupiano Plus/ etc.	See relevant Documents	CFS-BL P CFS-B CFS FIL	400 x 1000	-	for $> \varnothing 75$ CFS-B 2 Layers centered in the seal	200

* Wall thickness/insulation thickness

② Construction: This application detail applies in conjunction with "Appendix 1: Available evidence and documents"

The firestop functionality and fire resistance period of the floor must be considered separately.
The floor thicknesses shown correspond to minimum thicknesses required by the tested penetration seal.

③ Firestop product info

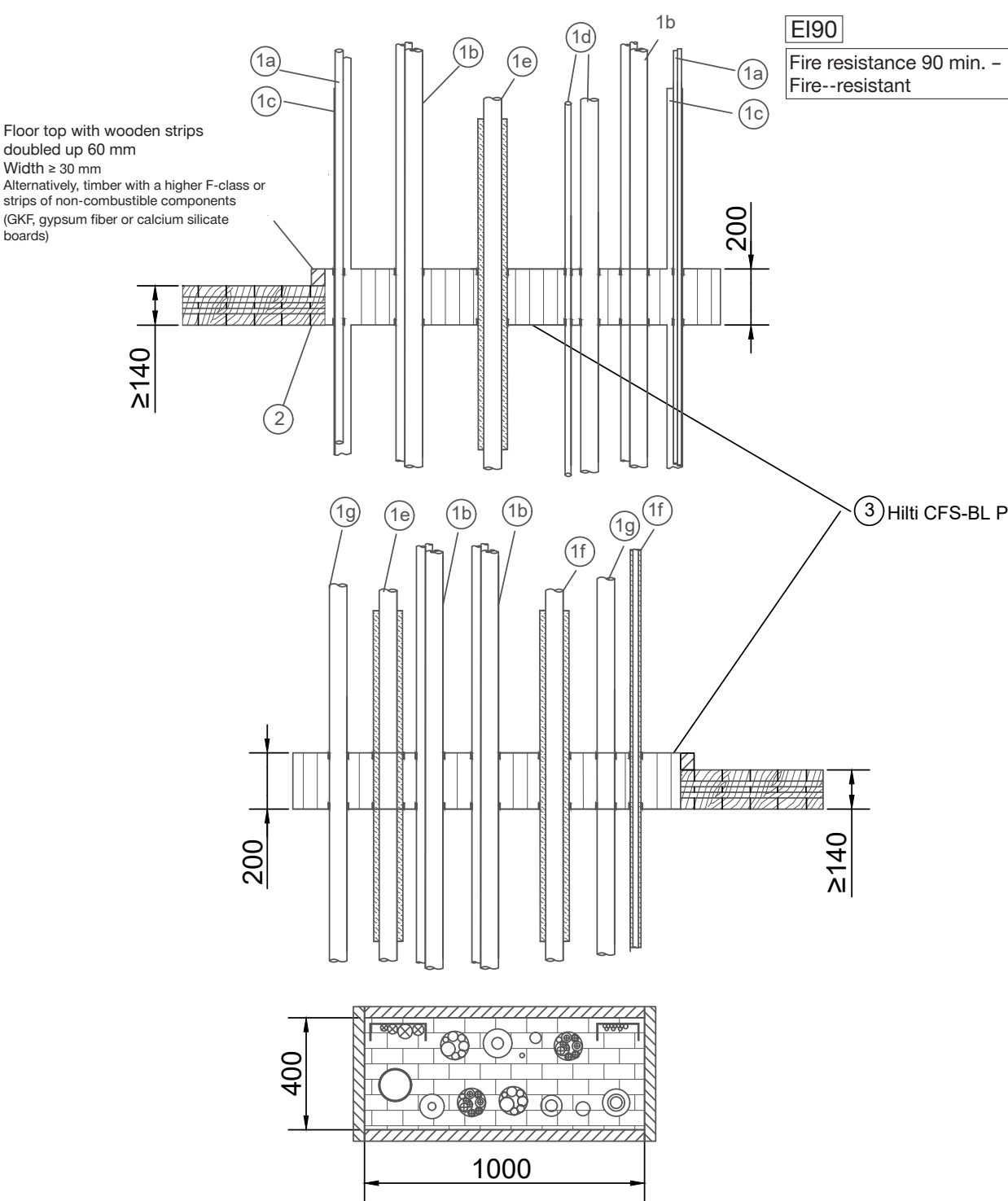
- Hilti Firestop Block CFS-BL P
- German Approval aBG: Z-19.53-2431
 - European Technical Assessment: ETA-18/1024
 - Use for electrical cables, bundled cables, cable support structures and cable conduits
 - Total installations max. 60% from opening
 - Fill all joints and gaps between the installations (especially the gussets between the cables) with Hilti CFS-FIL from both sides to a depth of at least 25 mm

Distances between installations [mm]

Distances to adjacent openings or installations, if not listed in the table, according to DIN EN 1366-3 at least 200 mm or according to Regulations of the DIBt min. 100 mm or 200 mm		Conduits		Cable/cable support structure	Reveal	non-combustible pipes	combustible pipes		Aluminum composite pipes
		Single	Bundle			Mineral wool insulation	with CFS-B	without measure	
Conduits	Single	50	50	50	50	50	50	100	50
	Bundle	50	50	50	50	50	50	100	50
Cable/cable support structure		50	50	100	20	100	100	100	100
non-combustible pipes	Mineral wool insulation	100	100	100	50	100	100	50	100
combustible pipes without	with CFS-B	50	50	100	50	100	50	50	100
	Measure	50	50	100	50	50	50	100	100
Aluminum composite pipes		100	100	100	50	100	100	100	100

A "typical" is a preconfigured fire protection solution consisting of specific components for a specific application, to which an assumed fire resistance period is assigned. Typical is selected according to their fire resistance period and are subject to the technical product documentation and underlying product approvals published by Hilti from time to time, are subject to generic assumptions, and are not selected on a project- or design-specific basis. The proposed typical may therefore not meet the project or design-specific requirements, and accordingly, they must be evaluated by the customer or by a relevant expert appointed by the customer for their suitability regarding the actual project-specific design criteria and requirements.

		Product	Building project
ID CFS-BL P_CLTF_MX_8X005		Fire protection seal Hilti Firestop Block CFS-BL P	
Page 01	Rev 03	Contents Fire protection in cross-laminated timber floors for combination penetration seals	



Basic documents, which form the respective proof of applicability

- German Approval aBG: Z-19.53-2423
- European Technical Assessment ETA-18/1024
- Reaction to fire according to EN 13501-1
- Fire resistance according to EN 13501-2
- Installations according to the Hilti installation instructions

Without scale
all units in [mm]

A "typical" is a preconfigured fire protection solution consisting of specific components for a specific application, to which an assumed fire resistance period is assigned. Typical is selected according to their fire resistance period and are subject to the technical product documentation and underlying product approvals published by Hilti from time to time, are subject to generic assumptions, and are not selected on a project- or design-specific basis. The proposed typical may therefore not meet the project or design-specific requirements, and accordingly, they must be evaluated by the customer or by a relevant expert appointed by the customer for their suitability regarding the actual project-specific design criteria and requirements.

		Product Fire protection seal Hilti Firestop Block CFS-BL P	Building project
ID	CFS-BL P_CLTF_MX_8X005	Contents Fire protection in cross-laminated timber floors for combination penetration seals	
Page	02	Rev 03	

① Installations

Item	Implementation	Description/Type	Dimensions [mm]	Firestop material	Opening size [mm]	Annular gap	Pipe insulation	Penetration seal thickness [mm]
1a	All types of electric cables	Also fiber-optic cables, except for waveguide cables	$\varnothing \leq 80$	CFS-BL P CFS FIL	400 x 1000	-	-	200
1b	Conduits	flexible and rigid PVC or polyolefins according to DIN EN 61386-22	Single $16 \leq \varnothing \leq 40$ Bundle $\varnothing \leq 100$	CFS-BL P CFS FIL	400 x 1000	-	-	200
1c	Cable support structures	Made of steel, aluminum or plastic profiles	150 x 60 x 1.5 200 x 60 x 1.5 300 x 60 x 1.5 500 x 60 x 1.5	CFS-BL P CFS FIL	400 x 1000	-	-	200
1d	Aluminum composite pipes	Geberit Mepla/ Fränkische Alpex L/ UPONOR Unipipe/ Aquatherm Fusiotherm	See relevant Documents	CFS-BL P CFS FIL	400 x 1000	-	-	200
1e	Non-combustible pipes	Copper, steel, Stainless steel and cast iron	$10 \leq \varnothing \leq 88.9$ $1 \leq s^* \leq 14.2$	CFS-BL P CFS FIL	400 x 1000	-	Euro class mineral wool A1 or A2 Density $\geq 80 \text{ kg/m}^3$ $30 \text{ mm} \leq T^* \leq 40 \text{ mm}$ Length $\geq 800 \text{ mm}$	200
1f	Non-combustible pipes	Copper, steel, Stainless steel and cast iron	$28 \leq \varnothing \leq 54$ $1.5 \leq s^* \leq 14.2$	CFS-BL P CFS FIL	400 x 1000	-	flexible Elastomeric insulation (rubber) $8.5 \leq T^* \leq 31$	200
1g	Combustible pipes	PVC-U/C/ PE-HD/ Geberit Silent PP/ Rehau Raupiano Plus/ etc.	See relevant Documents	CFS-BL P CFS-B CFS FIL	400 x 1000	-	for $> \varnothing 75$ CFS-B 2 Layers centered in the seal	200

* Wall thickness/insulation thickness

② Construction: This application detail applies in conjunction with "Appendix 1: Available evidence and documents"

The firestop functionality and fire resistance period of the floor must be considered separately.
The floor thicknesses shown correspond to minimum thicknesses required by the tested penetration seal.

③ Firestop product info

- Hilti Firestop Block CFS-BL P
- German Approval aBG: Z-19.53-2423
 - European Technical Assessment ETA-18/1024
 - Use for electrical cables, bundled cables, cable support structures and cable conduits
 - Total installations max. 60% from opening
 - Fill all joints and gaps between the installations (especially the gussets between the cables) with Hilti CFS-FIL from both sides to a depth of at least 25 mm

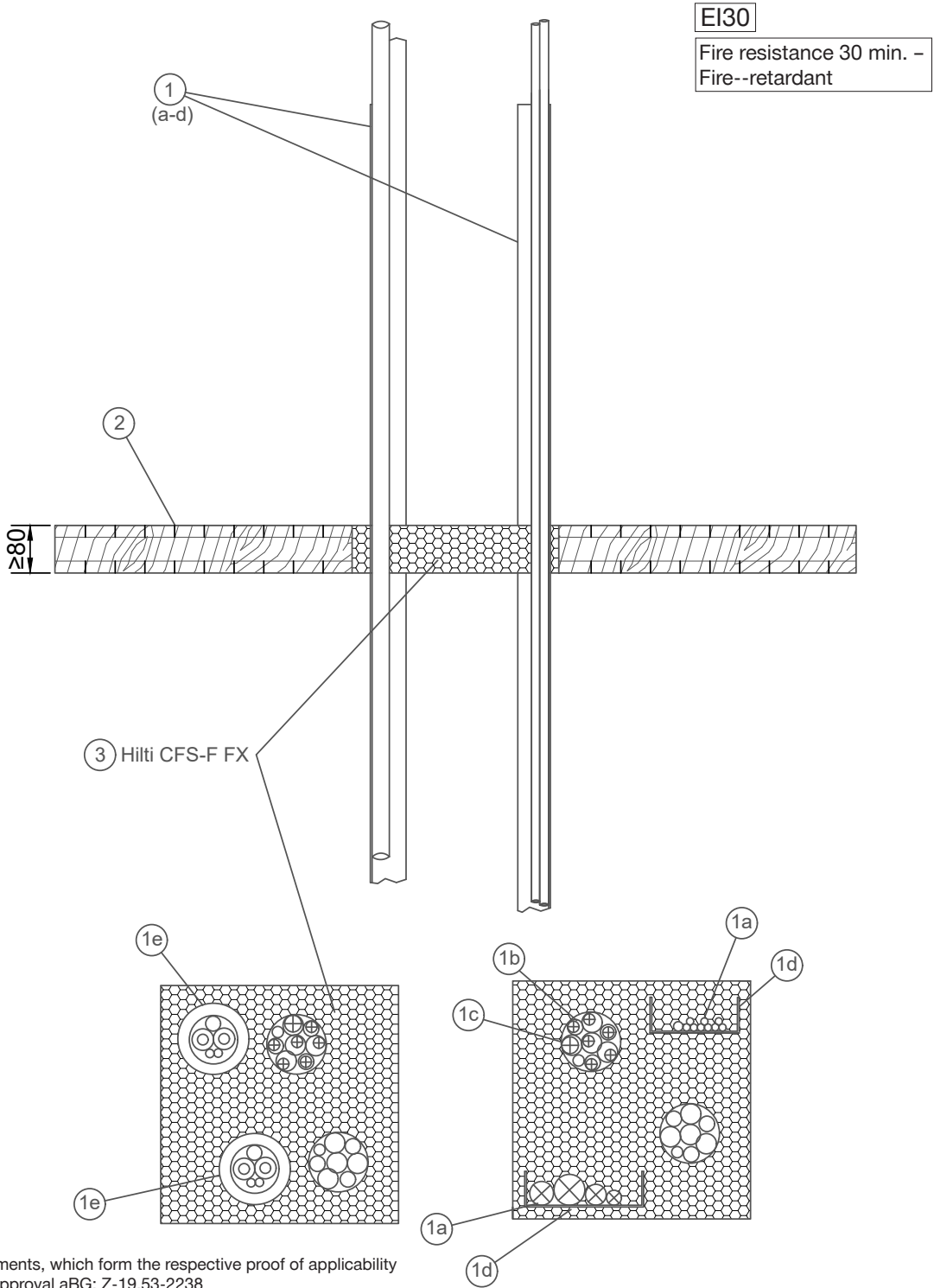
Distances between installations [mm]

** side by side 0 mm / one above the other 50 mm

Distances to neighboring openings or installations, if not listed in the table, according to DIN EN 1366-3 at least 200 mm or according to DIBT regulations, min. 100 mm or 200 mm		Plastic pipes		Metallic pipes			Electrical conduits			Aluminum composite pipes			Cable/cable support structures		
		without additional measures	with Hilti CFS-B	with mineral wool	with rubber	without insulation	$\varnothing \leq 16 \text{ mm};$ Steel and plastic	$\varnothing > 16 \text{ mm};$ Plastic single; multiple	Conduit bundle	without insulation	with rubber	With mineral wool	Individual cables	Bundled cables	Cable support structure **
Sealing reveal		20	0	0	0		35	35	50	50	50	50	20	20	20
Plastic pipes	without additional measures	50	50	50	50	60	50	50		50	50	50		50	50
	with Hilti CFS-B		50	50	50				50				50	50	50
Metallic pipes	with mineral wool			0	0		50	15	15	50			50	50	50
	with rubber					50			50				50	50	50
	without insulation					50									
Electrical conduits	$\varnothing \leq 16 \text{ mm};$ steel and Plastic						50	50		50	50	50	50		
	$\varnothing > 16 \text{ mm};$ plastic single; multiple							0	50	50	50	50	50	50	50
	Conduit bundle								50	50	50	50	50	50	50
Aluminum composite pipes	without insulation									50	50			50	
	with rubber insulation														
	with mineral wool insulation														
Cable / Cable support structures	Individual cables												0	50	0
	Bundled cables														0
	Bundled cables														0/50**

A "typical" is a preconfigured fire protection solution consisting of specific components for a specific application, to which an assumed fire resistance period is assigned. Typical is selected according to their fire resistance period and are subject to the technical product documentation and underlying product approvals published by Hilti from time to time, are subject to generic assumptions, and are not selected on a project- or design-specific basis. The proposed typical may therefore not meet the project or design-specific requirements, and accordingly, they must be evaluated by the customer or by a relevant expert appointed by the customer for their suitability regarding the actual project-specific design criteria and requirements.

		Product Fire protection seal Hilti Firestop Foam CFS-F FX	Building project
ID	CFS-F FX_CLTF_MX_8X003	Contents Fire protection in cross-laminated timber floors for electrical cables and air-conditioning	
Page	01	Rev 03	



Basic documents, which form the respective proof of applicability

- German Approval aBG: Z-19.53-2238
- European Technical Assessment ETA-10/0109
- Reaction to fire according to EN 13501-1
- Fire resistance according to EN 13501-2
- Installations according to the Hilti installation instructions

Without scale
all units in [mm]

A "typical" is a preconfigured fire protection solution consisting of specific components for a specific application, to which an assumed fire resistance period is assigned. Typical is selected according to their fire resistance period and are subject to the technical product documentation and underlying product approvals published by Hilti from time to time, are subject to generic assumptions, and are not selected on a project- or design-specific basis. The proposed typical may therefore not meet the project or design-specific requirements, and accordingly, they must be evaluated by the customer or by a relevant expert appointed by the customer for their suitability regarding the actual project-specific design criteria and requirements.

		Product	Building project
ID CFS-F FX_CLTF_MX_8X003		Fire protection seal Hilti Firestop Foam CFS-F FX	
Page 02	Rev 03	Contents Fire protection in cross-laminated timber floors for electrical cables and air-conditioning	

① Installations

Item	Implementation	Description/Type	Dimensions [mm]	Firestop material	Opening size [mm]	Annular gap	Pipe insulation	Penetration seal thickness [mm]
1a	All types of electric cables	Also fiber-optic cables, except for waveguide cables	$\varnothing \leq 50$	CFS-F FX	400 x 400	-	-	≥ 80
1b	Conduits U/C	flexible and rigid PVC or polyolefin according to DIN EN 61386-22	$\varnothing \leq 32$	CFS-F FX	400 x 400	-	-	≥ 80
1c	Electrical installation bundle U/C	flexible and rigid PVC or polyolefins according to DIN EN 61386-22	$\varnothing \leq 100$	CFS-F FX	400 x 400	-	-	≥ 80
1d	Cable support structures	from unperforated steel, aluminum profiles	150 x 60 x 1.5 200 x 60 x 1.5	CFS-F FX	400 x 400	-	-	≥ 80
1e	Air conditioning pipe bundle	Copper pipe $\leq 2 \times \varnothing \leq 18$ mm (Frigoline 9 mm or Turbolit 9 mm) + PVC-U/-C $\varnothing 25 \times 4.3 + \leq 2 \times$ cables $\varnothing \leq 14$ mm	as bundle $\varnothing 65$	CFS-F FX	400 x 400	-	Elastomeric insulation (rubber) T* = 9 mm Case LI/CI ≥ 250 mm on both sides	≥ 80

* Wall thickness/insulation thickness

② Construction: This application detail applies in conjunction with "Appendix 1: Available evidence and documents"

The firestop functionality and fire resistance period of the floor must be considered separately.
The floor thicknesses shown correspond to minimum thicknesses required by the tested penetration seal.

③ Firestop product info

- Hilti Firestop Foam CFS-F FX
- European Technical Assessment: ETA-10/0109
 - German Approval aBG: Z-19.53-2238
 - Use for electrical cables, bundled cables, cable support structures and cable conduits
 - Total installations max. 60% from opening
 - Fill all joints and gaps between the installations (especially the gussets between the cables) with Hilti CFS-F FX

Distances between installations [mm]

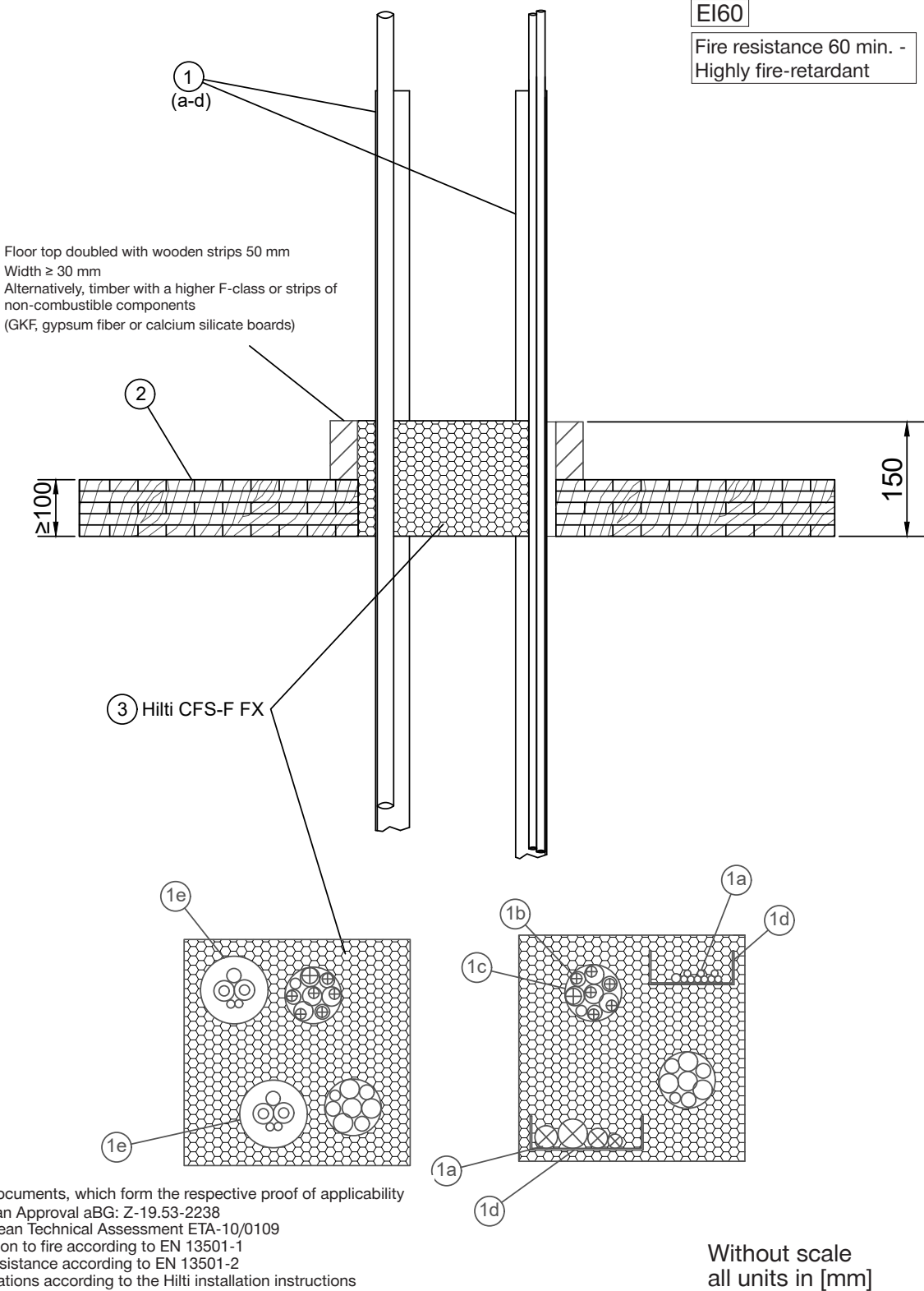
Unless specified, all other distances are ≥ 200		Conduits	Cable/cable support structure		Air conditioning line	Reveal		
		Bundle	Side by side	under one another		by the side	above	below
Conduits	Bundle	20		50	50	50		50
Cable/cable support structure		50	0	50	20	20	20	
Air conditioning line	Bundle	50		≥ 100	20	50		50

Distances between the openings or other installations

Distance of the penetration seal to	size of openings next to each other [mm]	DIN distances between the openings [mm]	EN distances between the openings [mm]
other cable or pipe penetration seals	one/both opening(s) $> 400 \times 400$	≥ 100	≥ 100
	both opening(s) $> 400 \times 400$	≥ 100	≥ 100
other openings or installations	one/both opening(s) $> 200 \times 200$	≥ 200	≥ 200
	both opening(s) $> 200 \times 200$	≥ 100	≥ 200

A "typical" is a preconfigured fire protection solution consisting of specific components for a specific application, to which an assumed fire resistance period is assigned. Typical is selected according to their fire resistance period and are subject to the technical product documentation and underlying product approvals published by Hilti from time to time, are subject to generic assumptions, and are not selected on a project- or design-specific basis. The proposed typical may therefore not meet the project or design-specific requirements, and accordingly, they must be evaluated by the customer or by a relevant expert appointed by the customer for their suitability regarding the actual project-specific design criteria and requirements.

		Product	Building project
ID CFS-F FX_CLTF_MX_8X003		Fire protection seal Hilti Firestop Foam CFS-F FX	
Page 01	Rev 03	Contents Fire protection in cross-laminated timber floors for electrical cables and air-conditioning	



A "typical" is a preconfigured fire protection solution consisting of specific components for a specific application, to which an assumed fire resistance period is assigned. Typical is selected according to their fire resistance period and are subject to the technical product documentation and underlying product approvals published by Hilti from time to time, are subject to generic assumptions, and are not selected on a project- or design-specific basis. The proposed typical may therefore not meet the project or design-specific requirements, and accordingly, they must be evaluated by the customer or by a relevant expert appointed by the customer for their suitability regarding the actual project-specific design criteria and requirements.

		Product Fire protection seal Hilti Firestop Foam CFS-F FX	Building project
ID	CFS-F FX_CLTF_MX_8X004	Contents Fire protection in cross-laminated timber floors for electrical cables and air-conditioning	
Page	02	Rev 03	

① Installations

Item	Implementation	Description/Type	Dimensions [mm]	Firestop material	Opening size [mm]	Annular gap	Pipe insulation	Seal thickness [mm]
1a	All types of electric cables	Also fiber-optic cables, except for waveguide cables	$\varnothing \leq 21$	CFS-F FX	400 x 400	-	-	≥ 150
1b	Conduits U/C	flexible and rigid PVC or polyolefin according to DIN EN 61386-22	$\varnothing \leq 32$	CFS-F FX	400 x 400	-	-	≥ 150
1c	Conduits bundle U/C	flexible and rigid PVC or polyolefins according to DIN EN 61386-22	$\varnothing \leq 100$	CFS-F FX	400 x 400	-	-	≥ 150
1d	Cable support structures	from unperforated steel, aluminum profiles	150 x 60 x 1.5 200 x 60 x 1.5	CFS-F FX	400 x 400	-	-	≥ 150
1e	Air conditioning pipe bundle	Copper pipe $\leq 2x$ $\varnothing \leq 18$ mm (Frigoline 9 mm or Turbolit 9 mm) + PVC-U/-C $\varnothing 25 \times 4,3$ + $\leq 2x$ cables $\varnothing \leq 14$ mm	As bundle $\varnothing 65$	CFS-F FX	400 x 400	-	Elastomeric insulation (rubber) T* = 9 mm Case LI/CI ≥ 250 mm on both sides	≥ 150

* Wall thickness/insulation thickness

② Construction: This application detail applies in conjunction with "Appendix 1: Available evidence and documents"

The firestop functionality and fire resistance period of the floor must be considered separately.
The floor thicknesses shown correspond to minimum thicknesses required by the tested penetration seal.

③ Firestop product info

- Hilti Firestop Foam CFS-F FX
- European Technical Assessment: ETA-10/0109
 - German Approval aBG: Z-19.53-2238
 - Use for electrical cables, bundled cables, cable support structures and cable conduits
 - Total installations max. 60% from opening
 - Fill all joints and gaps between the installations (especially the gussets between the cables) with Hilti CFS-F FX

Distances between installations [mm]

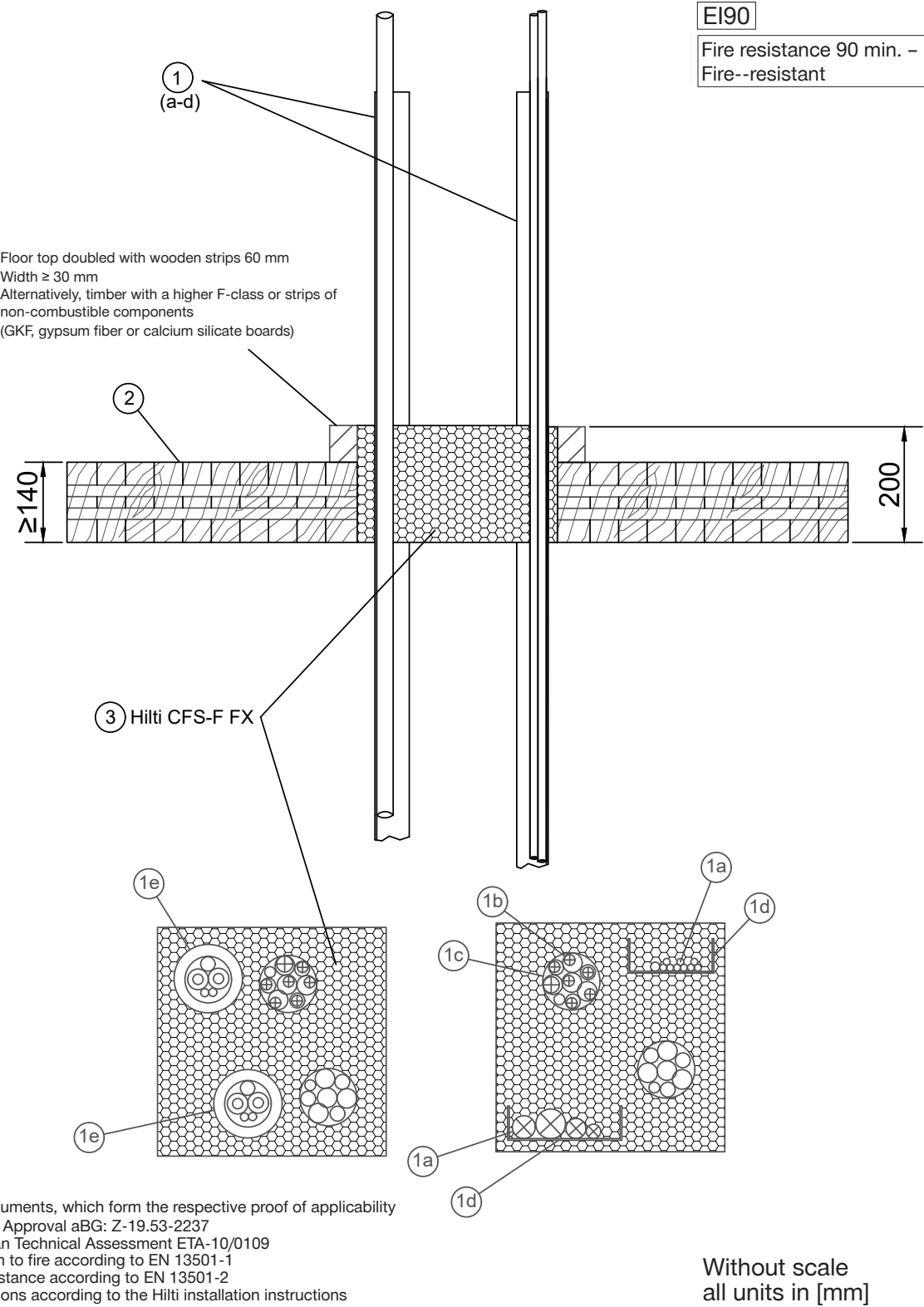
Unless specified, all other distances are ≥ 200		Conduits	Cable/cable support structure		Air conditioning line	Reveal		
		Bundle	Side by side	under one another		by the side	above	below
Conduits	Bundle	20		50	50	50		50
Cable/cable support structure		50	0	50	20	20	20	
Air conditioning line	Bundle	50		≥ 100	20	50		50

Distances between the openings or other installations

Distance of the penetration seal to	size of openings next to each other [mm]	DIN distances between the openings [mm]	EN distances between the openings [mm]
other cable or pipe penetration seals	one/both opening(s) $> 400 \times 400$	≥ 100	≥ 100
	both opening(s) $> 400 \times 400$	≥ 100	≥ 100
other openings or installations	one/both opening(s) $> 200 \times 200$	≥ 200	≥ 200
	both opening(s) $> 200 \times 200$	≥ 100	≥ 200

A "typical" is a preconfigured fire protection solution consisting of specific components for a specific application, to which an assumed fire resistance period is assigned. Typical is selected according to their fire resistance period and are subject to the technical product documentation and underlying product approvals published by Hilti from time to time, are subject to generic assumptions, and are not selected on a project- or design-specific basis. The proposed typical may therefore not meet the project or design-specific requirements, and accordingly, they must be evaluated by the customer or by a relevant expert appointed by the customer for their suitability regarding the actual project-specific design criteria and requirements.

		Product Fire protection seal Hilti Firestop Foam CFS-F FX	Building project
ID	CFS-F FX_CLTF_MX_8X005	Contents Fire protection in cross-laminated timber floors for electrical cables and air-conditioning	
Page	01	Rev 03	



A "typical" is a preconfigured fire protection solution consisting of specific components for a specific application, to which an assumed fire resistance period is assigned. Typical is selected according to their fire resistance period and are subject to the technical product documentation and underlying product approvals published by Hilti from time to time, are subject to generic assumptions, and are not selected on a project- or design-specific basis. The proposed typical may therefore not meet the project or design-specific requirements, and accordingly, they must be evaluated by the customer or by a relevant expert appointed by the customer for their suitability regarding the actual project-specific design criteria and requirements.

		Product Fire protection seal Hilti Firestop Foam CFS-F FX					Building project	
ID CFS-F FX_CLTF_MX_8X005		Contents Fire protection in cross-laminated timber floors for electrical cables and air-conditioning						
Page 02	Rev 03							

① Installations

Item	Implementation	Description/Type	Dimensions [mm]	Firestop material	Opening size [mm]	Annular gap	Pipe insulation	Penetration seal thickness [mm]
1a	All types of electric cables	Also fiber-optic cables, except for waveguide cables	Ø ≤ 21	CFS-F FX	400 x 400	-	-	≥200
1b	Conduits U/C	flexible and rigid PVC or polyolefin according to DIN EN 61386-22	Ø ≤ 32	CFS-F FX	400 x 400	-	-	≥200
1c	Conduits bundle U/C	flexible and rigid PVC or polyolefins according to DIN EN 61386-22	Ø ≤ 100	CFS-F FX	400 x 400	-	-	≥200
1d	Cable support structures	from unperforated steel, aluminum profiles	150 x 60 x 1.5 200 x 60 x 1.5	CFS-F FX	400 x 400	-	-	≥200
1e	Air conditioning pipe bundle	Copper pipe ≤ 2x Ø ≤ 18 mm (Frigoline 9 mm or Turbolit 9 mm) + PVC-U/-C Ø 25 x 4.3 + ≤ 2 x cable Ø ≤ 14 mm	As bundle Ø 65	CFS-F FX	400 x 400	-	Elastomeric insulation (rubber) T* = 9 mm Case LI/CI ≥ 250 mm on both sides	≥200

* Wall thickness/insulation thickness

② Construction: This application detail applies in conjunction with "Appendix 1: Available evidence and documents"

The firestop functionality and fire resistance period of the floor must be considered separately.
The floor thicknesses shown correspond to minimum thicknesses required by the tested penetration seal.

③ Firestop product info

Hilti Firestop Foam CFS-F FX

- European Technical Assessment: ETA-10/0109

- German Approval aBG: Z-19.53-2237

- Use for electrical cables, bundled cables, cable support structures and cable conduits

- Total installations max. 60% from opening

- Fill all joints and gaps between the installations (especially the gussets between the cables) with Hilti CFS-F FX

Distances between installations [mm]

Unless specified, all other distances are ≥ 200		Conduits	Cable/cable support structure		Air conditioning line	Reveal		
		Bundle	Side by side	under one another		by the side	above	below
Conduits	Bundle	20		50	50	50		50
Cable/cable support structure		50	0	50	20	20	20	
Air conditioning line	Bundle	50		≥ 100	20	50		50

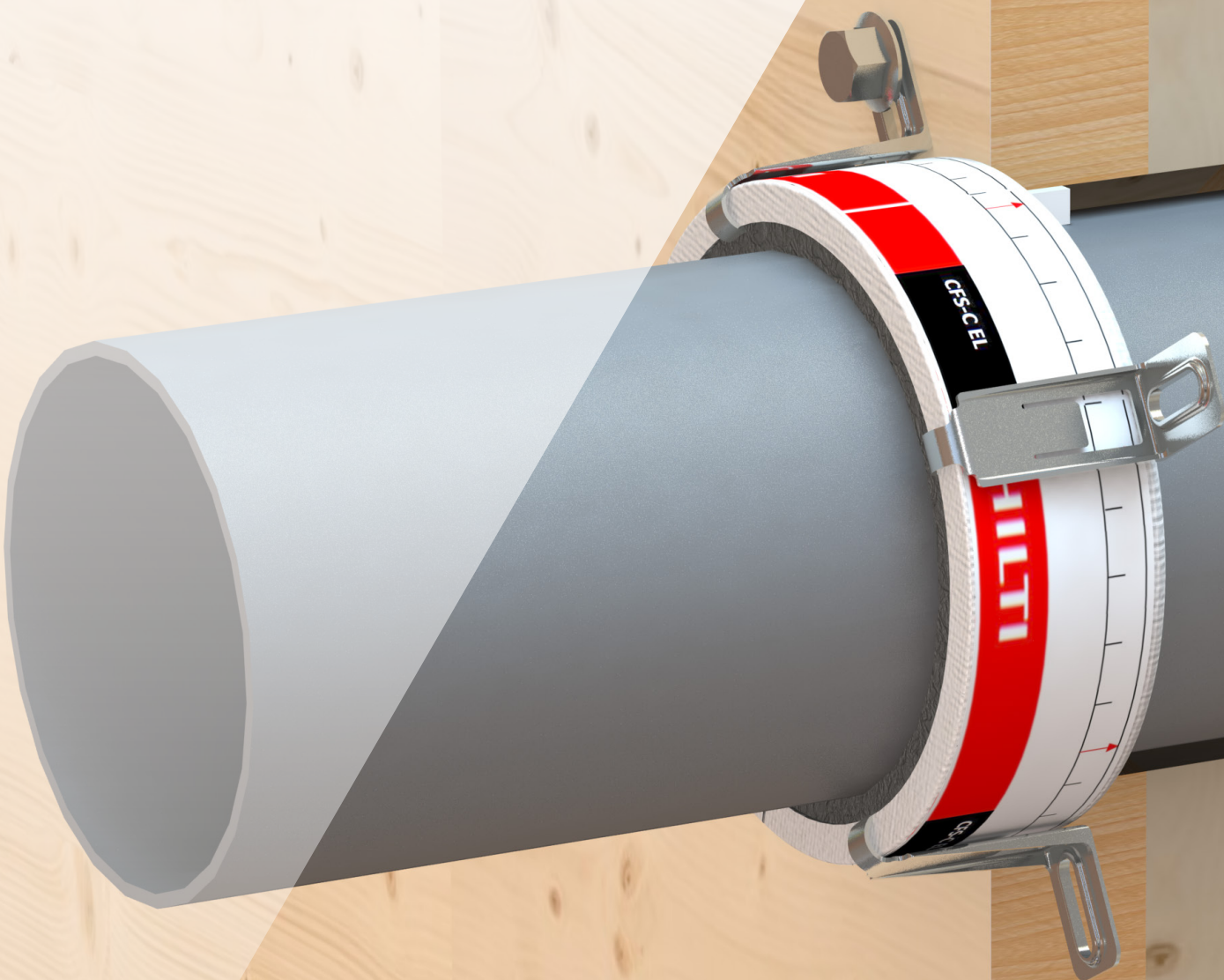
Distances between the openings or other installations

Distance of the penetration seal to	size of openings next to each other [mm]	DIN distances between the openings [mm]	DIN distances between the openings [mm]
other cable or pipe penetration seals	one/both opening(s) > 400 x 400	≥ 100	≥ 100
	one/both opening(s) > 400 x 400	≥ 100	≥ 100
other openings or installations	one/both opening(s) > 200 x 200	≥ 200	≥ 200
	one/both opening(s) > 200 x 200	≥ 100	≥ 200

A "typical" is a preconfigured fire protection solution consisting of specific components for a specific application, to which an assumed fire resistance period is assigned. Typicals are selected according to their fire resistance period and are subject to the technical product documentation and underlying product approvals published by Hilti from time to time, are subject to generic assumptions, and are not selected on a project- or design-specific basis. The proposed typicals may therefore not meet the project or design-specific requirements, and accordingly, they must be evaluated by the customer or by a relevant expert appointed by the customer for their suitability regarding the actual project-specific design criteria and requirements.

APPLICATIONS AND PRODUCTS

Wall applications:
Wastewater and roof drainage

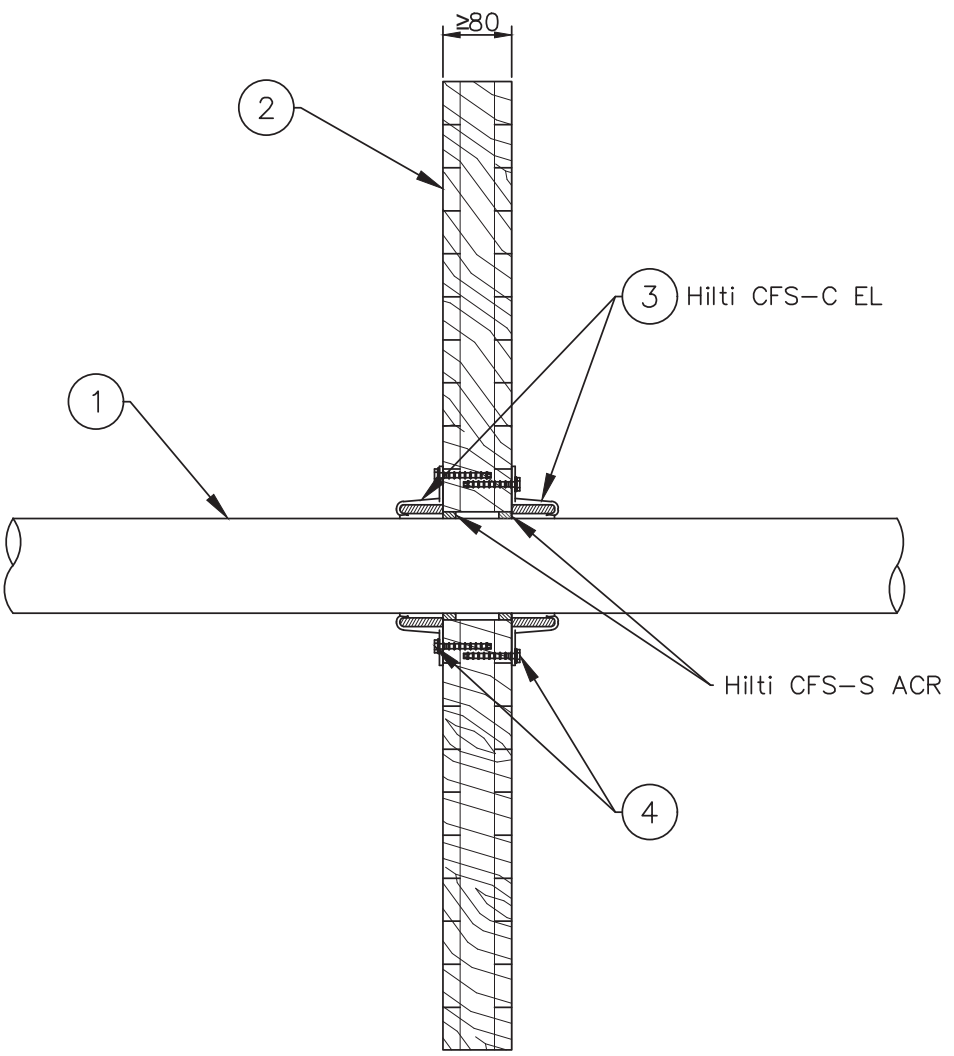


Wall applications: Wastewater and roof drainage

		Product Fire protection seal Hilti Endless Collar CFS-C EL	Building project
ID CFS-C EL_CLTW_CP_8X003/1		Contents Fire protection seal in cross-laminated timber walls for combustible pipes	
Page 01	Rev 03		

El30 U/U

Fire resistance 30 min. -
Fire-retardant



Basic documents, which form the respective proof of applicability

- German Approval aBG: Z-19.53-2192
- European Technical Assessment: ETA-14/0085
- Reaction to fire according to EN 13501-1
- Fire resistance according to EN 13501-2
- Installations according to the Hilti installation instructions

Not to scale
All units in [mm]

A "typical" is a preconfigured firestopping solution consisting of specific components for a specific application, to which an assumed fire rating/integrity is assigned. Typical is selected according to their fire rating/integrity and are subject to the technical product documentation and underlying product approvals published by Hilti from time to time, are subject to generic assumptions, and are not selected on a project- or design-specific basis. The proposed typical may therefore not meet the project- or design-specific requirements, and accordingly must be evaluated by the customer or by a relevant expert appointed by the customer for their suitability regarding the actual project-specific design criteria and requirements.

		Product Fire protection seal Hilti Endless Collar CFS-C EL	Building project
ID CFS-C EL_CLTW_CP_8X003/1		Contents Fire protection seal in cross-laminated timber walls for combustible pipes	
Page 02	Rev 03		

① Installations

Item	Implementation	Description/Type	Dimensions [mm]	Firestopping material	Opening size [mm]	Annular gap	Penetration seal thickness [mm]
1a	Combustible pipe	Geberit Silent db 20 (PE)	$56 \leq \varnothing \leq 110$ $3.2 \leq s^* \leq 6$	CFS-C EL	$71 \leq \varnothing \leq 140$	CFS S ACR ≤ 15 mm	≥ 80
1b	Combustible pipe	Wavin AS (PP)	$\varnothing = 110$ $s^* = 5.3$	CFS-C EL	$125 \leq \varnothing \leq 140$	CFS S ACR ≤ 15 mm	≥ 80
1c	Combustible pipe	Poloplast POLO-KAL NG/XS (PP)	$\varnothing = 110$ $s^* = 3.4$	CFS-C EL	$125 \leq \varnothing \leq 140$	CFS S ACR ≤ 15 mm	≥ 80
1d	Combustible pipe	Rehau Raupiano Plus (PP)	$50 \leq \varnothing \leq 110$ $1.9 \leq s^* \leq 2.7$	CFS-C EL	$65 \leq \varnothing \leq 140$	CFS S ACR ≤ 15 mm	≥ 80
1e	Combustible pipe	PE-HD pipe (DIN EN 1519-1, EN 12201-2 or 12666-1), ABS (EN 1455-1), SAN+PVC (EN 1565-1)	$50 \leq \varnothing \leq 90$ $2.7 \leq s^* \leq 3.5$ $\varnothing 110 \times 2.7$	CFS-C EL	$65 \leq \varnothing \leq 140$	CFS S ACR ≤ 15 mm	≥ 80
1f	Combustible pipe	PP-H pipe (DIN EN 1451-1)	$50 \leq \varnothing \leq 110$ $1.9 \leq s^* \leq 3$	CFS-C EL	$65 \leq \varnothing \leq 140$	CFS S ACR ≤ 15 mm	≥ 80

* Wall thickness

② Construction: This application detail applies in conjunction with "Appendix 1: Available approvals and documents"

The firestop functionality and fire rating/integrity of the wall must be considered separately.
The wall thicknesses shown correspond to the minimum thicknesses required by the tested penetration seal.

③ Firestop product info

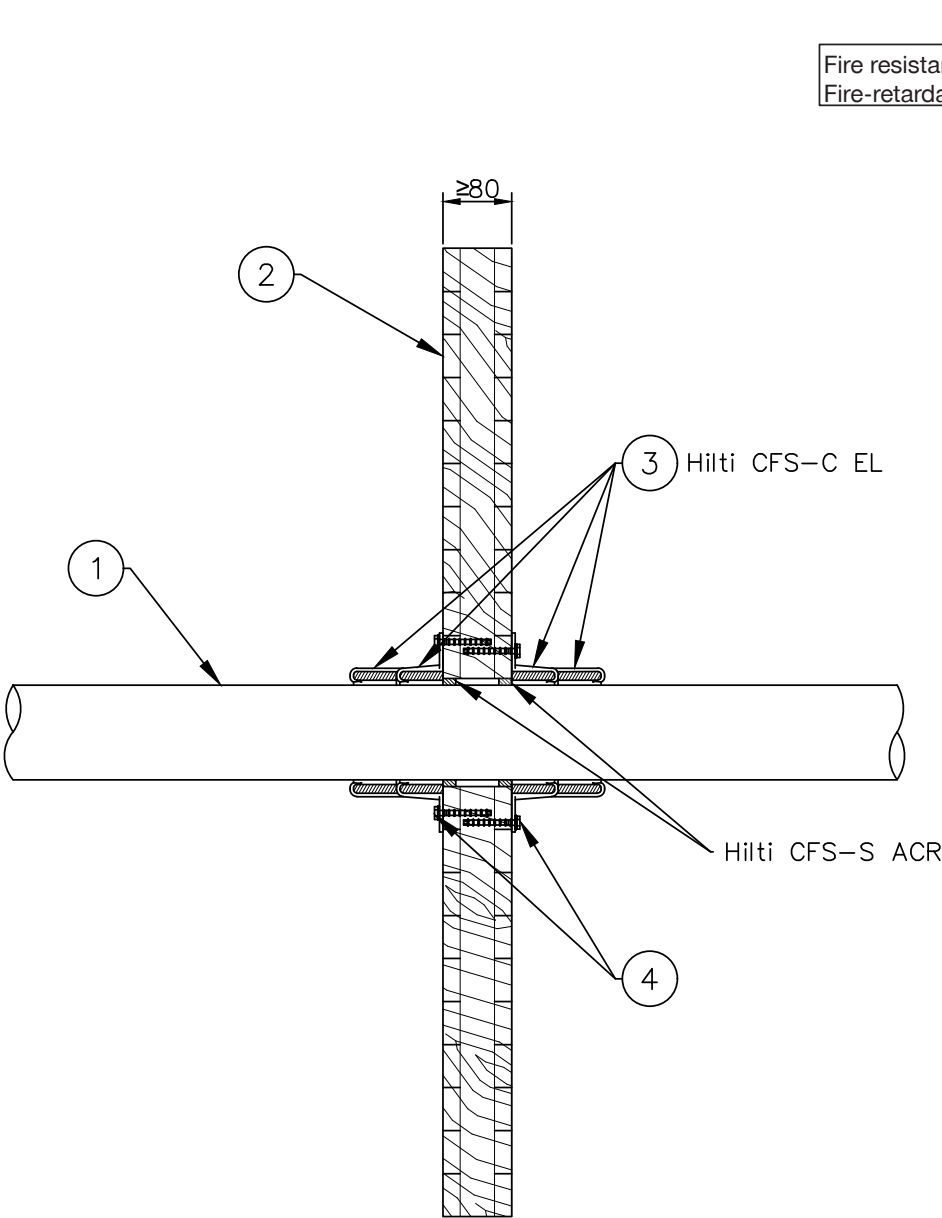
- Hilti Endless Collar CFS-C EL
- European Technical Assessment: ETA-14/0085
 - German Approval aBG: Z-19.53-2192
 - Use for combustible pipes
 - Fill the remaining annular gap with Hilti CFS-S ACR Firestop Sealant from both sides to a depth of at least 25 mm

Distance between the openings or other installations

Distance of the penetration seal to	Size of openings next to each other [mm]	DIN distances between the openings [mm]	EN distances between the openings [mm]
Other cable or pipe penetration seals	One/both opening(s) > 400 x 400	≥ 200	≥ 200
	Both openings $\leq 400 \times 400$	≥ 100	≥ 200
Other openings or installations	One/both opening(s) > 200 x 200	≥ 200	≥ 200
	Both openings $\leq 200 \times 200$	≥ 100	≥ 200

④ Fastening devices – see Appendix 2

		Product Fire protection seal Hilti Endless Collar CFS-C EL	Building project
ID CFS-C EL_CLTW_CP_8X003/2		Contents Fire protection seal in cross-laminated timber walls for combustible pipes	
Page 01	Rev 03		



Basic documents, which form the respective proof of applicability

- German Approval aBG: Z-19.53-2192
- European Technical Assessment: ETA-14/0085
- Reaction to fire according to EN 13501-1
- Fire resistance according to EN 13501-2
- Installations according to the Hilti installation instructions

Not to scale
All units in [mm]

A "typical" is a preconfigured firestopping solution consisting of specific components for a specific application, to which an assumed fire rating/integrity is assigned. Typical is selected according to their fire rating/integrity and are subject to the technical product documentation and underlying product approvals published by Hilti from time to time, are subject to generic assumptions, and are not selected on a project- or design-specific basis. The proposed typical may therefore not meet the project- or design-specific requirements, and accordingly must be evaluated by the customer or by a relevant expert appointed by the customer for their suitability regarding the actual project-specific design criteria and requirements.

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		Product Fire protection seal Hilti Endless Collar CFS-C EL	Building project
ID CFS-C EL_CLTW_CP_8X003/2		Contents Fire protection seal in cross-laminated timber walls for combustible pipes	
Page 02	Rev 03		

① Installations

Item	Implementation	Description/Type	Dimensions [mm]	Firestopping material	Opening size [mm]	Annular gap	Penetration seal thickness [mm]
1a	Combustible pipe	Geberit Silent Pro	Ø = 160 s* = 6	CFS-C EL	175 ≤ Ø ≤ 190	CFS S ACR ≤ 15 mm	≥ 80
1b	Combustible pipe	Poloplast POLO-KAL NG/XS (PP)	Ø = 160 s* = 4.9	CFS-C EL	175 ≤ Ø ≤ 190	CFS S ACR ≤ 15 mm	≥ 80
1c	Combustible pipe	PP-H pipe (DIN EN 1451-1)	125 ≤ Ø ≤ 160 s* = 4	CFS-C EL	140 ≤ Ø ≤ 190	CFS S ACR ≤ 15 mm	≥ 80
1d	Combustible pipe	PE-HD pipe (DIN EN 1519-1, EN 12201-2 or 12666-1), ABS (EN 1455-1), SAN+PVC (EN 1565-1)	125 ≤ Ø ≤ 160 s* = 4	CFS-C EL	140 ≤ Ø ≤ 190	CFS S ACR ≤ 15 mm	≥ 80
1e	Combustible pipe	PVC-U (DIN EN ISO 1452-1, EN 1453-1 or EN 1329-1) PVC-C (EN 1566-1)	Ø = 160 s* = 11.8	CFS-C EL	175 ≤ Ø ≤ 190	CFS S ACR ≤ 15 mm	≥ 80

* Wall thickness

② Construction: This application detail applies in conjunction with "Appendix 1: Available approvals and documents"

The firestop functionality and fire rating/integrity of the wall must be considered separately.
The wall thicknesses shown correspond to the minimum thicknesses required by the tested penetration seal.

③ Firestop product info

- Hilti Endless Collar CFS-C EL
- European Technical Assessment: ETA-14/0085
 - German Approval aBG: Z-19.53-2192
 - Use for combustible pipes
 - Fill the remaining annular gap with Hilti CFS-S ACR Firestop Sealant from both sides to a depth of at least 25 mm

Distance between the openings or other installations

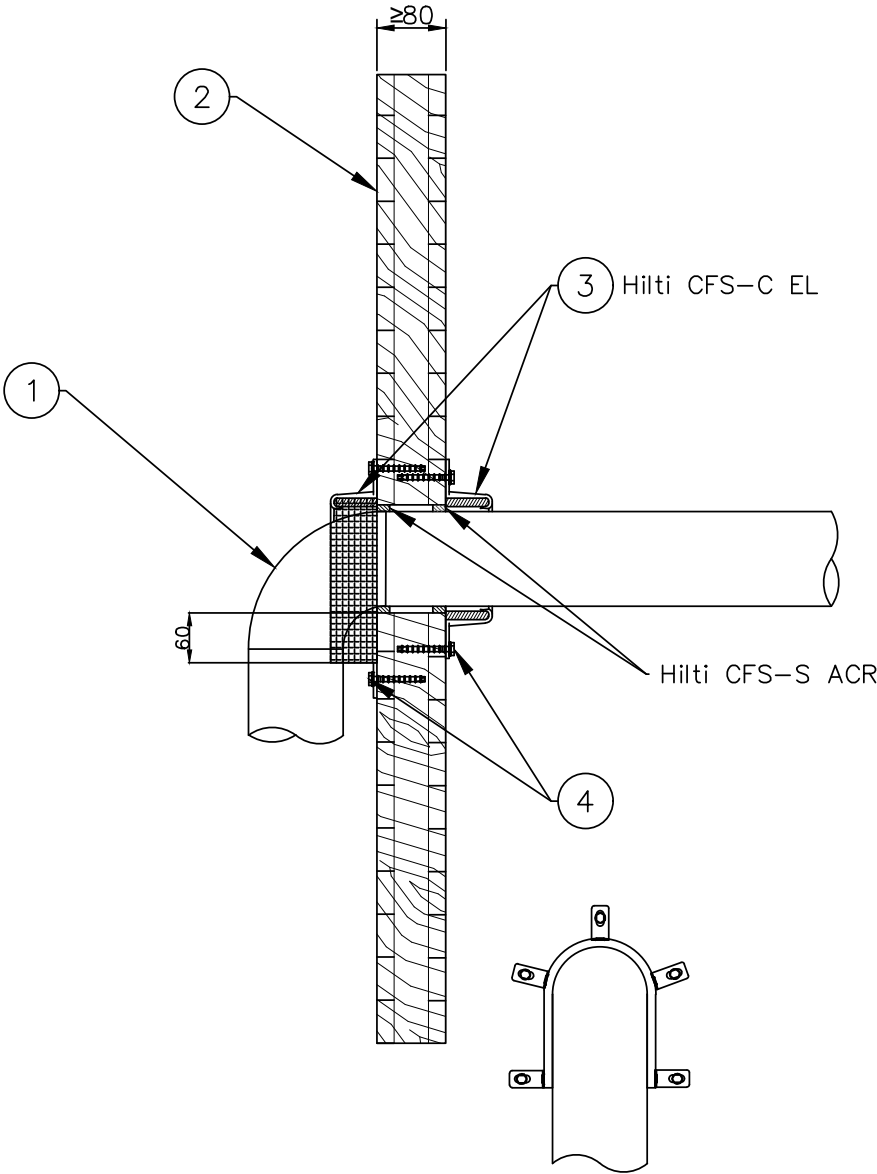
Distance of the penetration seal to	Size of openings next to each other [mm]	DIN distances between the openings [mm]	EN distances between the openings [mm]
Other cable or pipe penetration seals	One/both opening(s) > 400 x 400	≥ 200	≥ 200
	Both openings ≤ 400 x 400	≥ 100	≥ 200
Other openings or installations	One/both opening(s) > 200 x 200	≥ 200	≥ 200
	Both openings ≤ 200 x 200	≥ 100	≥ 200

④ Fastening devices – see Appendix 2

		Product Fire protection seal Hilti Endless Collar CFS-C EL	Building project
ID CFS-C EL_CLTW_CP_8X003/3		Contents Fire protection seal in cross-laminated timber walls for combustible pipes/U-shaped	
Page 01	Rev 02		

EI30 U/U

Fire resistance 30 min. -
Fire-retardant



Basic documents, which form the respective proof of applicability

- German Approval aBG: Z-19.53-2192
- European Technical Assessment: ETA-14/0085
- Reaction to fire according to EN 13501-1
- Fire resistance according to EN 13501-2
- Installations according to the Hilti installation instructions

Not to scale
All units in [mm]

A "typical" is a preconfigured firestopping solution consisting of specific components for a specific application, to which an assumed fire rating/integrity is assigned. Typical is selected according to their fire rating/integrity and are subject to the technical product documentation and underlying product approvals published by Hilti from time to time, are subject to generic assumptions, and are not selected on a project- or design-specific basis. The proposed typical may therefore not meet the project- or design-specific requirements, and accordingly must be evaluated by the customer or by a relevant expert appointed by the customer for their suitability regarding the actual project-specific design criteria and requirements.

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		Product Fire protection seal Hilti Endless Collar CFS-C EL	Building project
ID CFS-C EL_CLTW_CP_8X003/3		Contents Fire protection seal in cross-laminated timber walls for combustible pipes/U-shaped	
Page 02	Rev 02		

① Installations

Item	Implementation	Description/Type	Dimensions [mm]	Firestopping material	Opening size [mm]	Annular gap	Penetration seal thickness [mm]
1a	Combustible pipe	Poloplast Polo Kal NG 87° pipe bend (PP)	Ø110x 3.4	CFS-C EL	Ø ≤ 130 (U-shaped side)	CFS S ACR ≤ 15 mm (side from straight piece) CFS S ACR ≤ 20 mm (U-shaped side)	≥80

② Construction: This application detail applies in conjunction with "Appendix 2: Available approvals and documents"

The firestop functionality and fire rating/integrity of the wall must be considered separately.
The wall thicknesses shown correspond to the minimum thicknesses required by the tested penetration seal.

③ Firestop product info

Hilti Endless Collar CFS-C EL

- European Technical Assessment: ETA-14/0085
- German Approval aBG: Z-19.53-2192
- Use for combustible pipes
- Fill the remaining annular gap with Hilti CFS-S ACR Firestop Sealant from both sides to a depth of at least 25 mm

Distance between the openings or other installations

Distance of the penetration seal to	Size of openings next to each other [mm]	DIN distances between the openings [mm]	EN distances between the openings [mm]
Other cable or pipe penetration seals	One/both opening(s) > 400 x 400	≥ 200	≥ 200
	Both openings ≤ 400 x 400	≥ 100	≥ 200
Other openings or installations	One/both opening(s) > 200 x 200	≥ 200	≥ 200
	Both openings ≤ 200 x 200	≥ 100	≥ 200

④ Fastening device

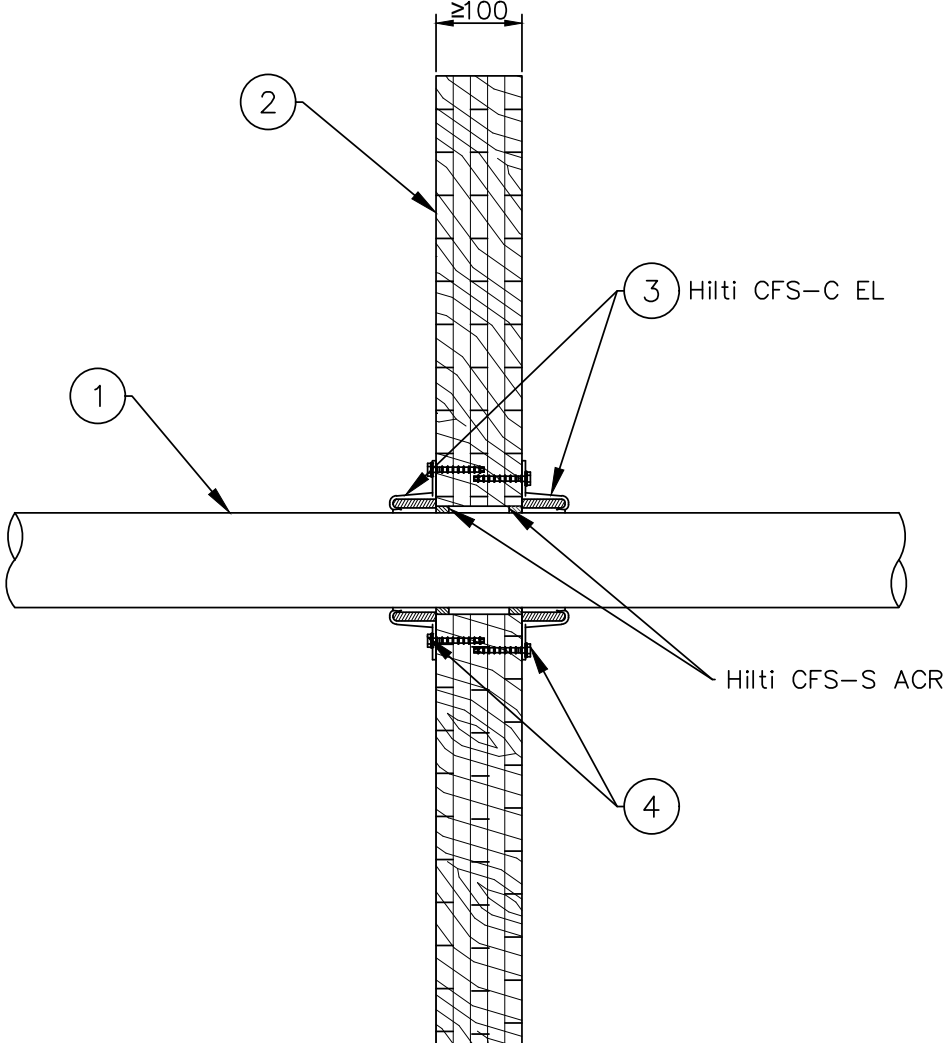
Type	Length [mm]
a) Hilti HUS3-H/P 6	≥ 60 mm
b) Hilti S-WS 11 Y	
c) Hex timber screw Ø6	

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		Product Fire protection seal Hilti Endless Collar CFS-C EL	Building project
ID CFS-C EL_CLTW_CP_8X004/1		Contents Fire protection seal in cross-laminated timber walls for combustible pipes	
Page 01	Rev 03		

EI60 U/U

Fire resistance 60 min.
Highly fire-retardant



1

2

3 Hilti CFS-C EL

4

Hilti CFS-S ACR

≥100

Basic documents, which form the respective proof of applicability

- German Approval aBG: Z-19.53-2192
- European Technical Assessment: ETA-14/0085
- Reaction to fire according to EN 13501-1
- Fire resistance according to EN 13501-2
- Installations according to the Hilti installation instructions

Not to scale

All units in [mm]

A "typical" is a preconfigured firestopping solution consisting of specific components for a specific application, to which an assumed fire rating/integrity is assigned. Typical is selected according to their fire rating/integrity and are subject to the technical product documentation and underlying product approvals published by Hilti from time to time, are subject to generic assumptions, and are not selected on a project- or design-specific basis. The proposed typical may therefore not meet the project- or design-specific requirements, and accordingly must be evaluated by the customer or by a relevant expert appointed by the customer for their suitability regarding the actual project-specific design criteria and requirements.

		Product Fire protection seal Hilti Endless Collar CFS-C EL	Building project
ID CFS-C EL_CLTW_CP_8X004/1		Contents Fire protection seal in cross-laminated timber walls for combustible pipes	
Page 02	Rev 03		

① Installations								
Item	Implementation	Description/Type	Dimensions [mm]	Firestopping material	Opening size [mm]	Annular gap	Pipe insulation for roof drainage	Penetration seal thickness [mm]
1a	Combustible pipe	Geberit Silent Pro	$50 \leq \varnothing \leq 110$ $3 \leq s^* \leq 4.5$	CFS-C EL	$65 \leq \varnothing \leq 172$	CFS S ACR ≤ 15 mm	Elastomeric insulation (rubber) Manufacturer: Armaflex AF/EVO T* = 9–16 mm Case CS	≥ 100
1b	Combustible pipe	Geberit Silent db 20 (PP)	$56 \leq \varnothing \leq 110$ $3.2 \leq s^* \leq 6$	CFS-C EL	$71 \leq \varnothing \leq 172$	CFS S ACR ≤ 15 mm		≥ 100
1c	Combustible pipe	Poloplast POLO-KAL NG/ XS(PP)	$50 \leq \varnothing \leq 110$ $2 \leq s^* \leq 3.4$	CFS-C EL	$65 \leq \varnothing \leq 172$	CFS S ACR ≤ 15 mm		≥ 100
1d	Combustible pipe	Rehau Raupiano Plus (PP)	$50 \leq \varnothing \leq 110$ $1.8 \leq s^* \leq 2.7$	CFS-C EL	$65 \leq \varnothing \leq 172$	CFS S ACR ≤ 15 mm		≥ 100
1e	Combustible pipe	PE-HD pipe (DIN EN 1519-1, EN 12201-2 or 12666-1), ABS (EN 1455-1), SAN+PVC (EN 1565-1)	$50 \leq \varnothing \leq 110$ $2 \leq s^* \leq 4.2$	CFS-C EL	$65 \leq \varnothing \leq 172$	CFS S ACR ≤ 15 mm		≥ 100
1f	Combustible pipe	PP-H pipe (DIN EN 1451-1)	$50 \leq \varnothing \leq 110$ $1.8 \leq s^* \leq 3$	CFS-C EL	$65 \leq \varnothing \leq 172$	CFS S ACR ≤ 15 mm		≥ 100
1g	Combustible pipe	PVC-U (DIN EN ISO 1452-1, EN 1453-1 or EN 1329-1) PVC-C (EN 1566-1)	$50 \leq \varnothing \leq 110$ $1.8 \leq s^* \leq 8.1$	CFS-C EL	$65 \leq \varnothing \leq 172$	CFS S ACR ≤ 15 mm		≥ 100
1h	Combustible pipe	Wavin SiTech+	$\varnothing 110$ $s^* = 3.4$	CFS-C EL	$125 \leq \varnothing \leq 172$	CFS S ACR ≤ 15 mm		≥ 100
1i	Combustible pipe	GF Silenta Premium	$\varnothing 78$ $s^* = 4.5$	CFS-C EL	$93 \leq \varnothing \leq 110$	CFS S ACR ≤ 15 mm		≥ 100

* Wall thickness/insulation thickness

② **Construction:** This application detail applies in conjunction with "Appendix 1: Available approvals and documents"

The firestop functionality and fire rating/integrity of the wall must be considered separately.

The wall thicknesses shown correspond to the minimum thicknesses required by the tested penetration seal.

③ Firestop product info

Hilti Endless Collar CFS-C EL

- European Technical Assessment: ETA-14/0085
- German Approval aBG: Z-19.53-2192
- Use for combustible pipes
- Fill the remaining annular gap with Hilti CFS-S ACR Firestop Sealant from both sides to a depth of at least 25 mm

Distance between the openings or other installations

Distances to Hilti single systems [mm] (opening to opening)	CFS-C EL (U/U and KG1**)	CFS-B (aluminum composite pipes)	CFS-B (metal pipes)	CFS-S ACR (metal pipes)	CFS-S ACR (aluminum composite pipes)	CFS-CC (cable)	CFS-DL GA (DE)
CFS-C EL (U/U and KG1**)	50	50	50	50	50	50	50
CFS-B (aluminum composite pipes)		50	50	50	50	50	50
CFS-B (metal pipes)			50	50	50	50	50
CFS-S ACR (metal pipes)				50	50	50	50
CFS-S ACR (aluminum composite pipes)					50	50	50
CFS-CC (cable)						50	50
CFS-DL GA (DE)							50

Distance of the penetration seal to	Size of openings next to each other [mm]	DIN distances between the openings [mm]	EN distances between the openings [mm]	**Construction group 1
Other cable or pipe penetration seals	One/both opening(s) > 400 x 400	≥ 200	≥ 200	
	Both openings ≤ 400 x 400	≥100	≥ 200	
Other openings or installations	One/both opening(s) > 200 x 200	≥ 200	≥ 200	
	Both openings ≤ 200 x 200	≥ 100	≥ 200	

④ **Fastening devices** – see Appendix 2

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		Product Fire protection seal Hilti Endless Collar CFS-C EL	Building project
ID CFS-C EL_CLTW_CP_8X004/2		Contents Fire protection seal in cross-laminated timber walls for combustible pipes	
Page 01	Rev 03		

①

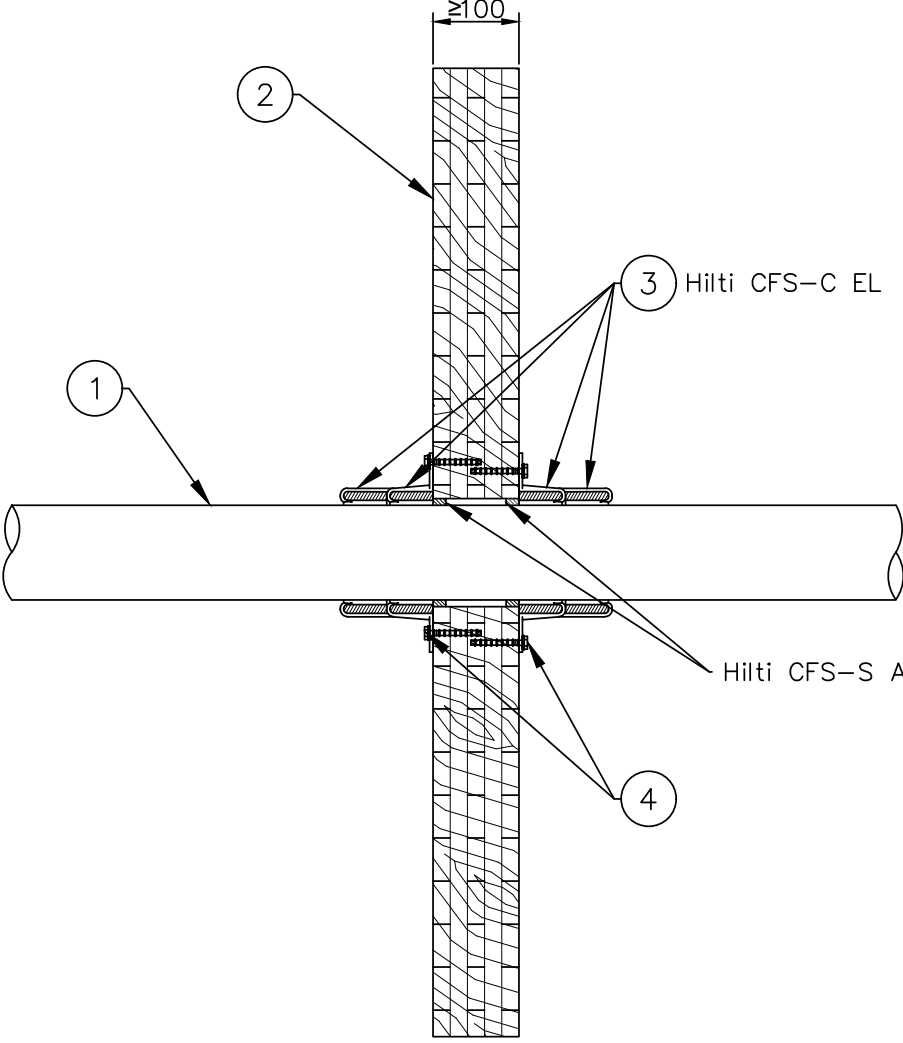
②

③

④

EI60 U/U

Fire resistance 60 min.
Highly fire-retardant



Basic documents, which form the respective proof of applicability

- German Approval aBG: Z-19.53-2192

- European Technical Assessment: ETA-14/0085

- Reaction to fire according to EN 13501-1

- Fire resistance according to EN 13501-2

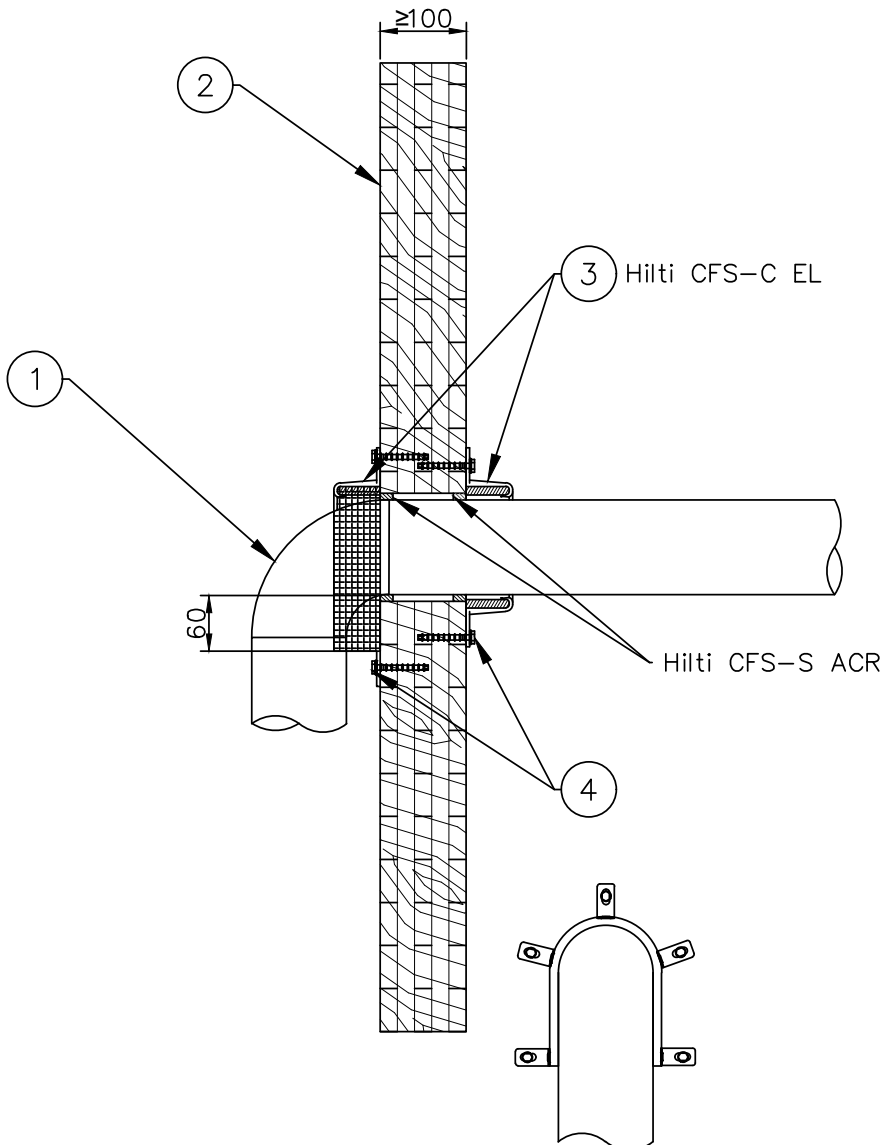
- Installations according to the Hilti installation instructions

Not to scale
All units in [mm]

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HILTI		Product Fire protection seal Hilti Endless Collar CFS-C EL					Building project	
ID CFS-C EL_CLTW_CP_8X004/2			Contents Fire protection seal in cross-laminated timber walls for combustible pipes					
Page 02		Rev 03						
① Installations								
Item	Implementation	Description/Type	Dimensions [mm]	Firestopping material	Opening size [mm]	Annular gap	Pipe insulation for roof drainage	Penetration seal thickness [mm]
1a	Combustible pipe	Geberit Silent Pro	125 ≤ Ø ≤ 160 4.5 ≤ s ≤ 6	CFS-C EL	140 ≤ Ø ≤ 222	CFS S ACR ≤ 15 mm	Elastomeric insulation (rubber) Manufacturer: Armaflex AF/EVO T* = 10 mm 16 mm Case CS	≥ 100
1b	Combustible pipe	Geberit Silent db 20 (PP)	135 ≤ Ø ≤ 160 6 ≤ s ≤ 7	CFS-C EL	150 ≤ Ø ≤ 222	CFS S ACR ≤ 15 mm		≥ 100
1c	Combustible pipe	Poloplast POLO-KAL NG/XS (PP)	125 ≤ Ø ≤ 160 3.9 ≤ s ≤ 4.9	CFS-C EL	140 ≤ Ø ≤ 222	CFS S ACR ≤ 15 mm		≥ 100
1d	Combustible pipe	Rehau Raupiano Plus (PP)	125 ≤ Ø ≤ 160 3.1 ≤ s ≤ 3.9	CFS-C EL	140 ≤ Ø ≤ 222	CFS S ACR ≤ 15 mm		≥ 100
1e	Combustible pipe	PE-HD pipe (DIN EN 1519-1, EN 12201-2 or 12666-1), ABS (EN 1455-1), SAN+PVC (EN 1565-1)	125 ≤ Ø ≤ 160 4.8 ≤ s ≤ 6.2	CFS-C EL	140 ≤ Ø ≤ 222	CFS S ACR ≤ 15 mm		≥ 100
1f	Combustible pipe	PP-H pipe (DIN EN 1451-1)	125 ≤ Ø ≤ 160 3.1 ≤ s ≤ 9.1	CFS-C EL	140 ≤ Ø ≤ 222	CFS S ACR ≤ 15 mm		≥ 100
1g	Combustible pipe	PVC-U (DIN EN ISO 1452-1, EN 1453-1 or EN 1329-1) PVC-C (EN 1566-1)	125 ≤ Ø ≤ 160 3.2 ≤ s ≤ 11.8	CFS-C EL	140 ≤ Ø ≤ 222	CFS S ACR ≤ 15 mm		≥ 100
1h	Combustible pipe	Wavin SiTech+	Ø = 125 s = 3.9	CFS-C EL	140 ≤ Ø ≤ 187	CFS S ACR ≤ 15 mm		≥ 100
1i	Combustible pipe	+GF+ Silenta Premium	Ø = 160 s = 5.3	CFS-C EL	175 ≤ Ø ≤ 222	CFS S ACR ≤ 15 mm		≥ 100
1j	Combustible pipe	Poloplast POLO-KAL 3S	Ø = 160 s = 7.5	CFS-C EL	175 ≤ Ø ≤ 222	CFS S ACR ≤ 15 mm		≥ 100
* Wall thickness/insulation thickness								
② Construction: This application detail applies in conjunction with "Appendix 1: Available approvals and documents"								
The firestop functionality and fire rating/integrity of the wall must be considered separately. The wall thicknesses shown correspond to the minimum thicknesses required by the tested penetration seal.								
③ Firestop product info								
Hilti Endless Collar CFS-C EL - European Technical Assessment: ETA-14/0085 - German Approval aBG: Z-19.53-2192 - Use for combustible pipes - Fill the remaining annular gap with Hilti CFS-S ACR Firestop Sealant from both sides to a depth of at least 25 mm								
Distance between the openings or other installations								
Distances to Hilti single systems [mm] (opening to opening)	CFS-C EL (U/U and KG1**)	CFS-B (aluminum composite pipes)	CFS-B (metal pipes)	CFS-S ACR (metal pipes)	CFS-S ACR (aluminum composite pipes)	CFS-CC (cable)	CFS-DL GA (DE)	
CFS-C EL (U/U and KG1**)	50	50	50	50	50	50	50	
CFS-B (aluminum composite pipes)		50	50	50	50	50	50	
CFS-B (metal pipes)			50	50	50	50	50	
CFS-S ACR (metal pipes)				50	50	50	50	
CFS-S ACR (aluminum composite pipes)					50	50	50	
CFS-CC (cable)						50	50	
CFS-DL GA (DE)							50	
Distance of the penetration seal to	Size of openings next to each other [mm]	DIN distances between the openings [mm]		EN distances between openings [mm]				
Other cable or pipe penetration seals	One/both opening(s) > 400 x 400	≥ 200		≥ 200				
	Both openings ≤ 400 x 400	≥ 100		≥ 200				
Other openings or installations	One/both opening(s) > 200 x 200	≥ 200		≥ 200				
	Both openings ≤ 200 x 200	≥ 100		≥ 200				
④ Fastening devices – see Appendix 2								

A "typical" is a preconfigured firestopping solution consisting of specific components for a specific application, to which an assumed fire rating/integrity is assigned. Typical are selected according to their fire rating/integrity and are subject to the technical product documentation and underlying product approvals published by Hilti from time to time, are subject to generic assumptions, and are not selected on a project- or design-specific basis. The proposed typical may therefore not meet the project- or design-specific requirements, and accordingly must be evaluated by the customer or by a relevant expert appointed by the customer for their suitability regarding the actual project-specific design criteria and requirements.

HILTI		Product Fire protection seal Hilti Endless Collar CFS-C EL		Building project	
ID CFS-C EL_CLTW_CP_8X004/3		Contents Fire protection seal in cross-laminated timber walls for combustible pipes/U-shaped			
Page 01	Rev 03				
EI60 U/U Fire resistance 60 min. Highly fire-retardant  Basic documents, which form the respective proof of applicability - German Approval aBG: Z-19.53-2192 - European Technical Assessment: ETA-14/0085 - Reaction to fire according to EN 13501-1 - Fire resistance according to EN 13501-2 - Installations according to the Hilti installation instructions Not to scale All units in [mm]					

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		Product Fire protection seal Hilti Endless Collar CFS-C EL	Building project
ID CFS-C EL_CLTW_CP_8X004/3		Contents Fire protection seal in cross-laminated timber walls for combustible pipes/U-shaped	
Page 02	Rev 03		

① Installations

Item	Implementation	Description/Type	Dimensions [mm]	Firestopping material	Opening size [mm]	Annular gap	Penetration seal thickness [mm]
1a	Combustible pipe	Poloplast POLO-KAL NG 87° pipe bend (PP)	Ø110x 3.4	CFS-C EL	Ø ≤ 130 (U-shaped side)	CFS S ACR ≤ 15 mm (side from straight piece) CFS S ACR ≤ 20 mm (U-shaped side)	≥ 100

② Construction: This application detail applies in conjunction with "Appendix 1: Available approvals and documents"

The firestop functionality and fire rating/integrity of the wall must be considered separately.
The wall thicknesses shown correspond to the minimum thicknesses required by the tested penetration seal.

③ Firestop product info

- Hilti Endless Collar CFS-C EL
- European Technical Assessment: ETA-14/0085
 - German Approval aBG: Z-19.53-2192
 - Use for combustible pipes
 - Fill the remaining annular gap with Hilti CFS-S ACR Firestop Sealant from both sides to a depth of at least 25 mm

Distance between the openings or other installations

Distances to Hilti single systems [mm] (opening to opening)	CFS-C EL	CFS-B (aluminum composite pipes)	CFS-B (metal pipes)	CFS-S ACR (metal pipes)	CFS-S ACR (aluminum composite pipes)	CFS-CC (cable)	CFS-DL GA (DE)
CFS-C EL	50	50	50	50	50	50	50
CFS-B (aluminum composite pipes)		50	50	50	50	50	50
CFS-B (metal pipes)			50	50	50	50	50
CFS-S ACR (metal pipes)				50	50	50	50
CFS-S ACR (aluminum composite pipes)					50	50	50
CFS-CC (cable)						50	50
CFS-DL GA (DE)							50

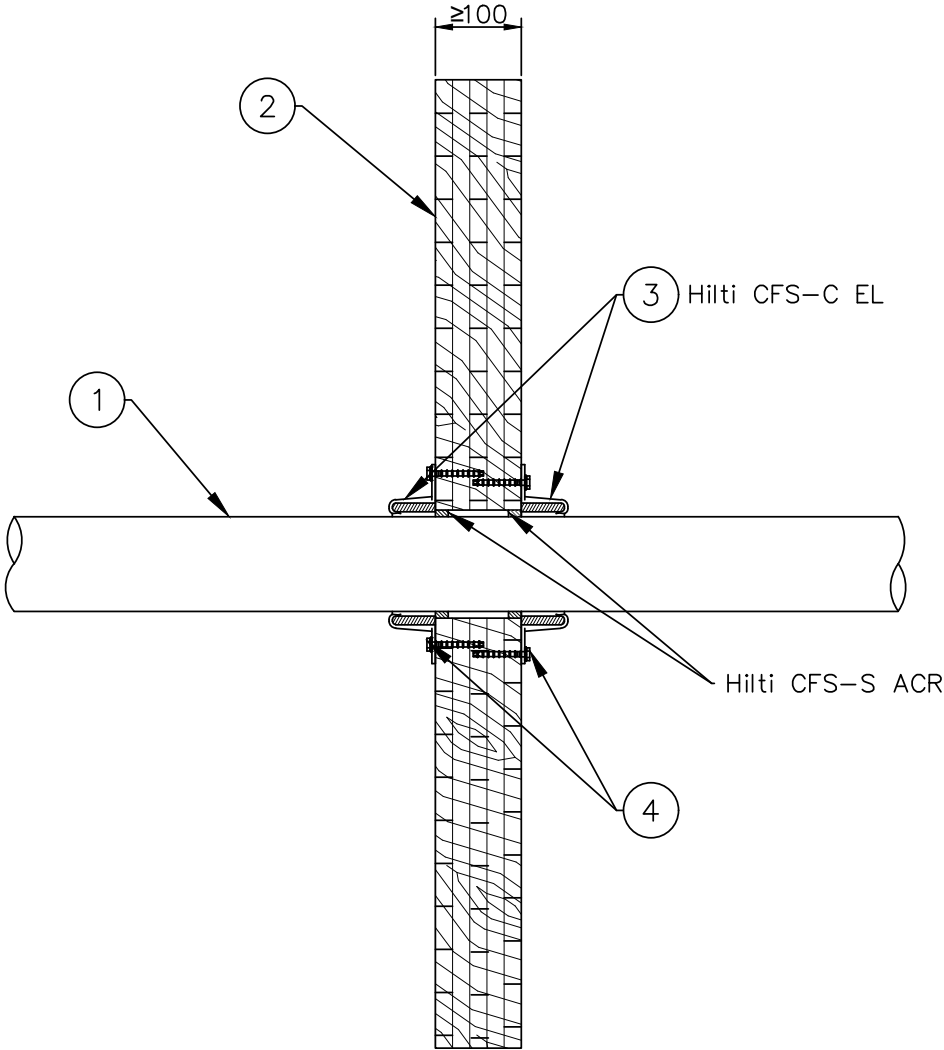
Distance of the penetration seal to	Size of openings next to each other [mm]	DIN distances between the openings [mm]	EN distances between the openings [mm]
Other cable or pipe penetration seals	One/both opening(s) > 400 x 400	≥ 200	≥ 200
	Both openings ≤ 400 x 400	≥ 100	≥ 200
Other openings or installations	One/both opening(s) > 200 x 200	≥ 200	≥ 200
	Both openings ≤ 200 x 200	≥ 100	≥ 200

④ Fastening devices – see Appendix 2

		Product Fire protection seal Hilti Endless Collar CFS-C EL	Building project
ID CFS-C EL_CLTW_CP_8X904/1		Contents Fire protection seal in cross-laminated timber walls for combustible pipes	
Page 01	Rev 03		

EI90 U/U

Fire resistance 90 min. -
Fire-resistant



Basic documents, which form the respective proof of applicability

- German Approval aBG: Z-19.53-2192
- European Technical Assessment: ETA-14/0085
- Reaction to fire according to EN 13501-1
- Fire resistance according to EN 13501-2
- Installations according to the Hilti installation instructions

Not to scale
All units in [mm]

A "typical" is a preconfigured firestopping solution consisting of specific components for a specific application, to which an assumed fire rating/integrity is assigned. Typical are selected according to their fire rating/integrity and are subject to the technical product documentation and underlying product approvals published by Hilti from time to time, are subject to generic assumptions, and are not selected on a project- or design-specific basis. The proposed typical may therefore not meet the project- or design-specific requirements, and accordingly must be evaluated by the customer or by a relevant expert appointed by the customer for their suitability regarding the actual project-specific design criteria and requirements.

A "typical" is a preconfigured firestopping solution consisting of specific components for a specific application, to which an assumed fire rating/integrity is assigned. Typical are selected according to their fire rating/integrity and are subject to the technical product documentation and underlying product approvals published by Hilti from time to time, are subject to generic assumptions, and are not selected on a project- or design-specific basis. The proposed typical may therefore not meet the project- or design-specific requirements, and accordingly must be evaluated by the customer or by a relevant expert appointed by the customer for their suitability regarding the actual project-specific design criteria and requirements.

		Product Fire protection seal Hilti Endless Collar CFS-C EL					Building project
ID CFS-C EL_CLTW_CP_8X904/1		Contents Fire protection seal in cross-laminated timber walls for combustible pipes					
Page 02	Rev 03						

① Installations

Item	Implementation	Description/Type	Dimensions [mm]	Firestopping material	Opening size [mm]	Annular gap	Pipe insulation for roof drainage	Penetration seal thickness [mm]
1a	Combustible pipe	Geberit Silent Pro	50 ≤ Ø ≤ 110 3 ≤ s* ≤ 4.5	CFS-C EL	65 ≤ Ø ≤ 172	CFS S ACR ≤15 mm	Elastomeric insulation material (rubber) Manufacturer: Armaflex AF/EVO T* = 16 mm Case CS	≥ 100
1b	Combustible pipe	Geberit Silent db 20 (PP)	56 ≤ Ø ≤ 110 3.2 ≤ s* ≤ 6	CFS-C EL	71 ≤ Ø ≤ 172	CFS S ACR ≤15 mm		≥ 100
1c	Combustible pipe	Poloplast POLO-KAL NG/ XS(PP)	50 ≤ Ø ≤ 110 2 ≤ s* ≤ 3.4	CFS-C EL	65 ≤ Ø ≤ 172	CFS S ACR ≤15 mm		≥ 100
1d	Combustible pipe	Rehau Raupiano Plus (PP)	50 ≤ Ø ≤ 110 1.8 ≤ s* ≤ 2.7	CFS-C EL	65 ≤ Ø ≤ 172	CFS S ACR ≤15 mm		≥ 100
1e	Combustible pipe	PE-HD pipe (DIN EN 1519-1, EN 12201-2 or 12666-1), ABS (EN 1455-1), SAN+PV C (EN 1565-1)	50 ≤ Ø ≤ 110 2 ≤ s* ≤ 4.2	CFS-C EL	65 ≤ Ø ≤ 172	CFS S ACR ≤15 mm		≥ 100
1f	Combustible pipe	PP-H pipe (DIN EN 1451-1)	50 ≤ Ø ≤ 110 1.8 ≤ s* ≤ 3	CFS-C EL	65 ≤ Ø ≤ 172	CFS S ACR ≤15 mm		≥ 100
1g	Combustible pipe	PVC-U (DIN EN ISO 1452-1, EN 1453-1 or EN 1329-1) PVC-C (EN 1566-1)	50 ≤ Ø ≤ 110 1.8 ≤ s* ≤ 8.1	CFS-C EL	65 ≤ Ø ≤ 172	CFS S ACR ≤15 mm		≥ 100
1h	Combustible pipe	Wavin SiTech+	Ø 110s* = 3.4	CFS-C EL	125 ≤ Ø ≤ 172	CFS S ACR ≤15 mm		≥ 100
1i	Combustible pipe	GF Silenta Premium	Ø 78s* = 4.5	CFS-C EL	93 ≤ Ø ≤ 110	CFS S ACR ≤15 mm		≥ 100

* Wall thickness/insulation thickness

② Construction: This application detail applies in conjunction with "Appendix 1: Available approvals and documents"

The firestop functionality and fire rating/integrity of the wall must be considered separately.
The wall thicknesses shown correspond to the minimum thicknesses required by the tested penetration seal.

③ Firestop product info

Hilti Endless Collar CFS-C EL

- European Technical Assessment: ETA-14/0085
- German Approval aBG: Z-19.53-2192
- Use for combustible pipes
- Fill the remaining annular gap with Hilti CFS-S ACR Firestop Sealant from both sides to a depth of at least 25 mm

Distance between the openings or other installations

Distance of the penetration seal to	Size of openings next to each other [mm]	DIN distances between the openings [mm]	EN distances between the openings [mm]
Other cable or pipe penetration seals	One/both opening(s) > 400 x 400	≥ 200	≥ 200
	Both openings ≤ 400 x 400	≥ 100	≥ 200
Other openings or installations	One/both opening(s) > 200 x 200	≥ 200	≥ 200
	Both openings ≤ 200 x 200	≥ 100	≥ 200

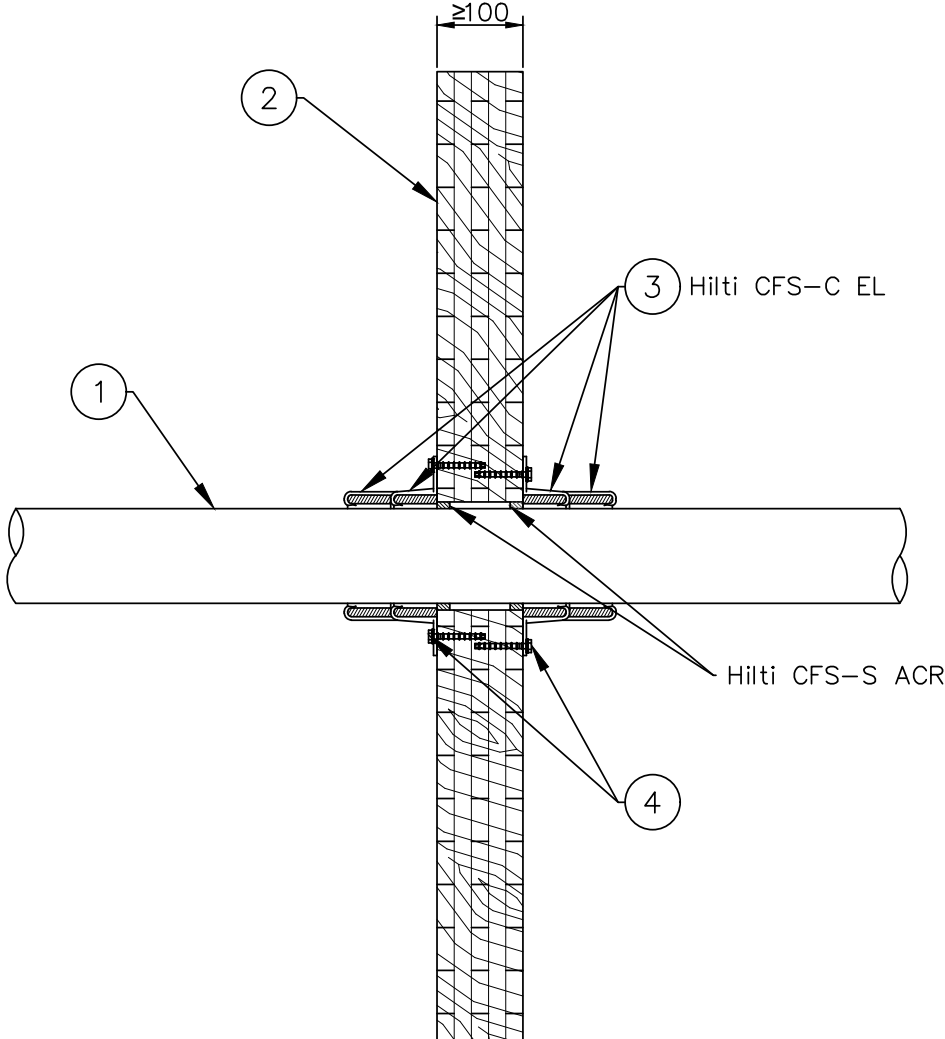
④ Fastening devices – see Appendix 2

A "typical" is a preconfigured firestopping solution consisting of specific components for a specific application, to which an assumed fire rating/integrity is assigned. Typical is selected according to their fire rating/integrity and are subject to the technical product documentation and underlying product approvals published by Hilti from time to time, are subject to generic assumptions, and are not selected on a project- or design-specific basis. The proposed typical may therefore not meet the project- or design-specific requirements, and accordingly must be evaluated by the customer or by a relevant expert appointed by the customer for their suitability regarding the actual project-specific design criteria and requirements.

		Product	Building project
		Fire protection seal Hilti Endless Collar CFS-C EL	
ID CFS-C EL_CLTW_CP_8X904/2		Contents	
		Fire protection seal in cross-laminated timber walls for combustible pipes	
Page 01	Rev 03		

EI90 U/U

Fire resistance 90 min. -
Fire-resistant



1

2

3 Hilti CFS-C EL

4

Hilti CFS-S ACR

≥100

Basic documents, which form the respective proof of applicability

- German Approval aBG: Z-19.53-2192

- European Technical Assessment: ETA-14/0085

- Reaction to fire according to EN 13501-1

- Fire resistance according to EN 13501-2

- Installations according to the Hilti installation instructions

Not to scale
All units in [mm]

A "typical" is a preconfigured firestopping solution consisting of specific components for a specific application, to which an assumed fire rating/integrity is assigned. Typical is selected according to their fire rating/integrity and are subject to the technical product documentation and underlying product approvals published by Hilti from time to time, are subject to generic assumptions, and are not selected on a project- or design-specific basis. The proposed typical may therefore not meet the project- or design-specific requirements, and accordingly must be evaluated by the customer or by a relevant expert appointed by the customer for their suitability regarding the actual project-specific design criteria and requirements.

		Product Fire protection seal Hilti Endless Collar CFS-C EL	Building project
ID CFS-C EL_CLTW_CP_8X001		Contents Fire protection seal in cross-laminated timber walls for combustible pipes	
Page 01	Rev 00		

E190 U/U

Fire side

1

2

3 Hilti CFS-S ACR

4 Hilti CFS-B

5 Hilti CFS-C EL

148

- German Approval aBG: Z-19.53-2192
- European Technical Assessment: ETA-14/0085
- Reaction to fire according to EN 13501-1
- Fire resistance according to EN 13501-2
- Installations according to the Hilti installation instructions

Not to scale
All units in [mm]

A "typical" is a preconfigured firestopping solution consisting of specific components for a specific application, to which an assumed fire rating/integrity is assigned. Typical is selected according to their fire rating/integrity and are subject to the technical product documentation and underlying product approvals published by Hilti from time to time, are subject to generic assumptions, and are not selected on a project- or design-specific basis. The proposed typical may therefore not meet the project- or design-specific requirements, and accordingly must be evaluated by the customer or by a relevant expert appointed by the customer for their suitability regarding the actual project-specific design criteria and requirements.

		Product Fire protection seal Hilti Endless Collar CFS-C EL	Building project
ID	CFS-C EL_CLTW_CP_8X001	Contents Fire protection seal in cross-laminated timber walls for combustible pipes	
Page	02	Rev 00	

① Installations

Item	Implementation	Description/Type	Dimensions [mm]	Firestopping material	Opening size [mm]	Annular gap	Penetration seal thickness [mm]
1	Combustible pipe	Geberit Silent PP	Ø 110 x 3.4	CFS-C EL CFS-B	Ø ≤ 120	CFS-S ACR 0-10 mm	148
1	Combustible pipe	Geberit db 20 (PE)	Ø 110 x 6.0	CFS-C EL CFS-B	Ø ≤ 120	CFS-S ACR 0-10 mm	148

② Construction: This typical can be used for the following element types and Dataholz.eu systems

Element type	Leno cross-laminated timber according to ETA-10/0241 or Z-9.1-501 of Merk Timber GmbH, Aichach, Germany
Dataholz.eu	-

③ Firestop product info

- Hilti Endless Collar CFS-C EL
- European Technical Assessment: ETA-14/0085
 - German Approval aBG: Z-19.53-2192
 - Use for combustible pipes
 - Fill the remaining annular gap with Hilti CFS-S ACR Firestop Sealant from both sides to a depth of at least 20 mm

- Hilti Firestop Bandage CFS-B
- European Technical Assessment: ETA-10/0212
 - German Approval aBG: Z-19.53-2210
 - Use for insulated non-combustible and combustible pipes
 - 2-ply application
 - Fill the remaining annular gap with Hilti CFS-S ACR Firestop Sealant from both sides to a depth of at least 20 mm

Distance between the openings or other installations

Distance of the penetration seal to	Size of openings next to each other [mm]	DIN distance between openings [mm]	EN distance between openings [mm]
Other cable or pipe penetration seals	One/both opening(s) > 400 x 400	≥ 200	≥ 50
	both openings ≤ 400 x 400	≥ 100	≥ 50
Other openings or installations	One/both opening(s) > 200 x 200	≥ 200	≥ 200
	both openings ≤ 200 x 200	≥ 100	≥ 100

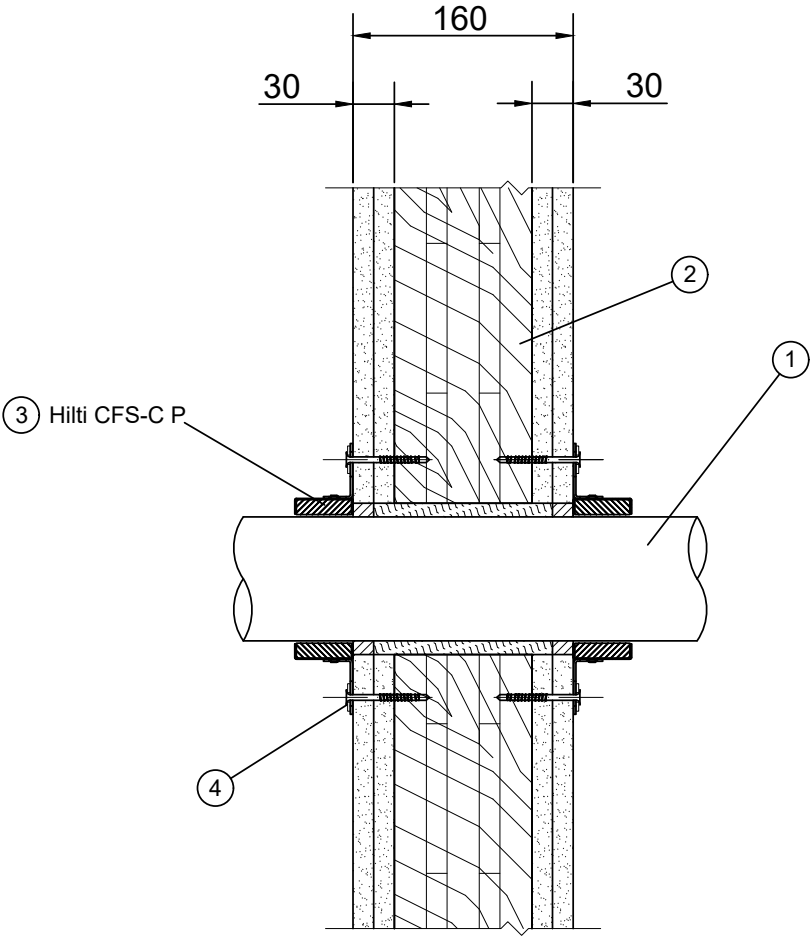
④ Fastening device

Type	Length [mm]
HUS-H 6	≤ 85

A "typical" is a preconfigured firestopping solution consisting of specific components for a specific application, to which an assumed fire rating/integrity is assigned. Typical is selected according to their fire rating/integrity and are subject to the technical product documentation and underlying product approvals published by Hilti from time to time, are subject to generic assumptions, and are not selected on a project- or design-specific basis. The proposed typical may therefore not meet the project- or design-specific requirements, and accordingly must be evaluated by the customer or by a relevant expert appointed by the customer for their suitability regarding the actual project-specific design criteria and requirements.

		Product Fire protection seal Hilti firestop collar CFS-C P	Building project
ID	CFS-C P_CLTW_CP_8X002	Contents Fire protection seal in cross-laminated timber walls for combustible pipes	
Page	01	Rev 01	

EI120U/U



- European Technical Assessment: ETA-10/0404
- Reaction to fire according to EN 13501-1
- Fire resistance according to EN 13501-1
- Installations according to the Hilti installation instructions

Not to scale
All units in [mm]

A "typical" is a preconfigured firestopping solution consisting of specific components for a specific application, to which an assumed fire rating/integrity is assigned. Typical is selected according to their fire rating/integrity and are subject to the technical product documentation and underlying product approvals published by Hilti from time to time, are subject to generic assumptions, and are not selected on a project- or design-specific basis. The proposed typical may therefore not meet the project- or design-specific requirements, and accordingly must be evaluated by the customer or by a relevant expert appointed by the customer for their suitability regarding the actual project-specific design criteria and requirements.

		Product Fire protection seal Hilti firestop collar CFS-C P	Building project
ID CFS-C P_CLTW_CP_8X002		Contents Fire protection seal in cross-laminated timber walls for combustible pipes	
Page 02	Rev 01		

① Installations

Item	Implementation	Description/Type	Dimensions [mm]	Firestopping material	Opening size [mm]	Annular gap	Penetration seal thickness [mm]
1	Combustible pipe	PE -S2 pipe	$\varnothing 110 \times 4.2 \leq s^* \leq 6.0$	CFS-C P 110/4"	$\varnothing 130$	CFS-S ACR 0-10 mm	160
1	Combustible pipe	PE pipe (DIN EN 1519)	$\varnothing 90 \times 5.5$	CFS-C P 110/4"	$\varnothing 130$	CFS-S ACR 0-10 mm	160

* Wall thickness

② Construction: This typical can be used for the following element types and Dataholz.eu systems

Element type	BBS 100 according to ETA-06/0009 Binderholz Bausysteme GmbH, Fügen, Austria Plasterboard 2 x 15 mm according to EN 520
Dataholz.eu	-

③ Firestop product info

Hilti firestop collar CFS-C P

- European Technical Assessment: ETA-10/0404
- German Approval aBG: Z-19.15-1781
- Use for combustible pipes
- Backfill remaining annular gap with mineral wool and fill with Hilti Firestop Sealant CFS-S ACR from both sides to a depth of at least 15 mm

Distance between the openings or other installations

Distance of the penetration seal to	Size of openings next to each other [mm]	DIN distance between openings [mm]	EN distance between openings [mm]
Other cable or pipe penetration seals	One/both opening(s) > 400 x 400	≥ 200	≥ 50
	both openings ≤ 400 x 400	≥ 100	≥ 50
Other openings or installations	One/both opening(s) > 200 x 200	≥ 200	≥ 200
	both openings ≤ 200 x 200	≥ 100	≥ 100

④Fastening device

Type	Length [mm]
HUS-H 6	≥ 85

A "typical" is a preconfigured firestopping solution consisting of specific components for a specific application, to which an assumed fire rating/integrity is assigned. Typical's are selected according to their fire rating/integrity and are subject to the technical product documentation and underlying product approvals published by Hilti from time to time, are subject to generic assumptions, and are not selected on a project- or design-specific basis. The proposed typical's may therefore not meet the project- or design-specific requirements, and accordingly must be evaluated by the customer or by a relevant expert appointed by the customer for their suitability regarding the actual project-specific design criteria and requirements.

APPLICATIONS AND PRODUCTS

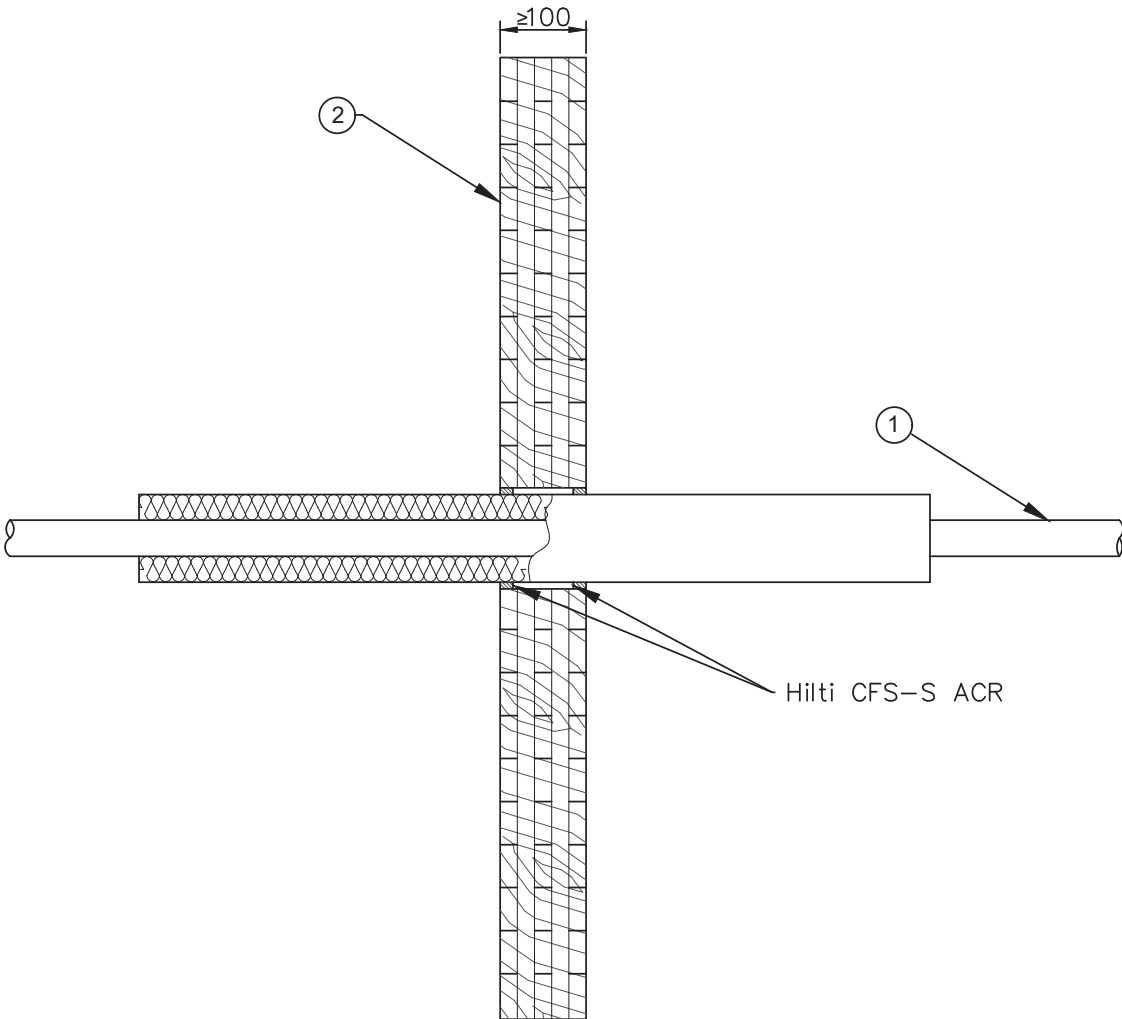
Wall applications: Plumbing (heating and drinking water)

Wall applications: Plumbing (heating and drinking water)

		Product Fire protection seal Hilti Firestop Sealant CFS-S ACR	Building project
ID CFS-S ACR_CLTW_NCP_CP_8X004		Contents Fire protection seal in cross-laminated timber walls for non-combustible and combustible pipes	
Page 01	Rev 03		

EI60

Fire resistance 60 min.
Highly fire-retardant



Not to scale
All units in [mm]

Basic documents, which form the respective proof of applicability

- German Approval P-MPA-E-17-010
- European Technical Assessment: ETA-10/0212
- Reaction to fire according to EN 13501-1
- Fire resistance according to EN 13501-2
- Installations according to the Hilti installation instructions

A "typical" is a preconfigured firestopping solution consisting of specific components for a specific application, to which an assumed fire rating/integrity is assigned. Typical is selected according to their fire rating/integrity and are subject to the technical product documentation and underlying product approvals published by Hilti from time to time, are subject to generic assumptions, and are not selected on a project- or design-specific basis. The proposed typical may therefore not meet the project- or design-specific requirements, and accordingly must be evaluated by the customer or by a relevant expert appointed by the customer for their suitability regarding the actual project-specific design criteria and requirements.

		Product Fire protection seal Hilti Firestop Sealant CFS-S ACR	Building project
ID CFS-S ACR_CLTW_NCP_CP_8X004		Contents Fire protection seal in cross-laminated timber floors for non-combustible and combustible pipes	
Page 01	Rev 03		

① Installations

Item	Implementation	Description/Type	Dimensions [mm]	Firestopping material	Opening size [mm]	Annular gap	Pipe insulation	Seal thickness [mm]
1a	Non-combustible pipe C/U	Copper, steel, Stainless steel and cast iron	$10 \leq \varnothing \leq 88.9$ $1 \leq s^* \leq 14.2$	CFS S ACR	$65 \leq \varnothing \leq 199$	CFS S ACR ≤ 15 mm	Euro class mineral wool A1 or A2 Density $\geq 80 \text{ kg/m}^3$ $\varnothing \leq 54 \text{ mm}$ $T^* = 20 \text{ mm}$ Length $\geq 450 \text{ mm}$ $\varnothing \geq 54 \text{ mm}$ $T^* = 40 \text{ mm}$ Length $\geq 800 \text{ mm}$	≥ 100
1b	Aluminum composite pipe U/C	Geberit Mepla	$16 \leq \varnothing \leq 75$ $2.25 \leq s^* \leq 4.7$	CFS S ACR	$71 \leq \varnothing \leq 185$	CFS S ACR ≤ 15 mm	Mineral wool of Euro class A1 or A2 Density $\geq 80 \text{ kg/m}^3$ $T^* = 20\text{--}40 \text{ mm}$ $\varnothing \leq 40 \text{ mm} = \text{length} \geq 170 \text{ mm}$ $\varnothing > 40 \text{ mm} = \text{Length} \geq 390 \text{ mm}$	≥ 100
1c	Aluminum composite pipes U/C	Geberit System pipe ML	$16 \leq \varnothing \leq 75$ $2 \leq s^* \leq 4.6$	CFS S ACR	$71 \leq \varnothing \leq 185$	CFS S ACR ≤ 15 mm		≥ 100
1d	Aluminum composite pipes U/C	REHAU Rautitan stable	$16 \leq \varnothing \leq 40$ $2.2 \leq s^* \leq 6$	CFS S ACR	$71 \leq \varnothing \leq 150$	CFS S ACR ≤ 15 mm		≥ 100
1e	Aluminum composite pipes U/C	REHAU Rautitan flex	$16 \leq \varnothing \leq 63$ $2.2 \leq s^* \leq 8.6$	CFS S ACR	$71 \leq \varnothing \leq 173$	CFS S ACR ≤ 15 mm		≥ 100
1f	Aluminum composite pipes U/C	TECE TECeflex	$14 \leq \varnothing \leq 63$ $2.6 \leq s^* \leq 6$	CFS S ACR	$69 \leq \varnothing \leq 173$	CFS S ACR ≤ 15 mm		≥ 100
1g	Aluminum composite pipes U/C	Viega SANFIX Fosta	$16 \leq \varnothing \leq 63$ $2.2 \leq s^* \leq 4.5$	CFS S ACR	$71 \leq \varnothing \leq 173$	CFS S ACR ≤ 15 mm		≥ 100
1h	Aluminum composite pipes U/C	KeKelit Kelox KM 110	$25 \leq \varnothing \leq 75$ $2.5 \leq s^* \leq 7.5$	CFS S ACR	$80 \leq \varnothing \leq 185$	CFS S ACR ≤ 15 mm		≥ 100
1i	Aluminum composite pipes U/C	Uponor Unipipe Plus/MLC	$16 \leq \varnothing \leq 75$ $2 \leq s^* \leq 7.5$	CFS S ACR	$71 \leq \varnothing \leq 185$	CFS S ACR ≤ 15 mm		≥ 100

* Wall thickness/insulation thickness

② Construction: This application detail applies in conjunction with "Appendix 1: Available approvals and documents"

The firestop functionality and fire rating/integrity of the floor must be considered separately.
The floor thicknesses shown correspond to the minimum thicknesses required by the tested penetration seal.

③ Firestop product info

Hilti Firestop Sealant CFS-S ACR
- European Technical Assessment: ETA-10/0292
- German Approval P-MPA-E-17-010
- Use for insulated non-combustible pipes
- Fill the annular gap with Hilti CFS-S ACR Firestop Sealant from both sides to a depth of at least 25 mm

Distance between the openings or other installations

Distances to Hilti individual systems [mm] (opening to opening)	CFS-S ACR (aluminum composite pipes) (U/C)	CFS-S ACR (metal pipes) (C/U)	CFS-CC (cable)	CFS-C EL (U/U and KG1**)	CFS-B (aluminum composite pipes) (U/C)	CFS-SL GA (DE)
CFS-S ACR (aluminum composite pipes) (U/C)	50	50	50	50	50	50
CFS-S ACR (metal pipes) (C/U)		50	50	50	50	50
CFS-CC (cable)			50	50	50	50
CFS-C EL (U/U and KG1**)				50	50	50
CFS-B (aluminum composite pipes) (U/C)					50	50
CFS-SL GA (DE)						50

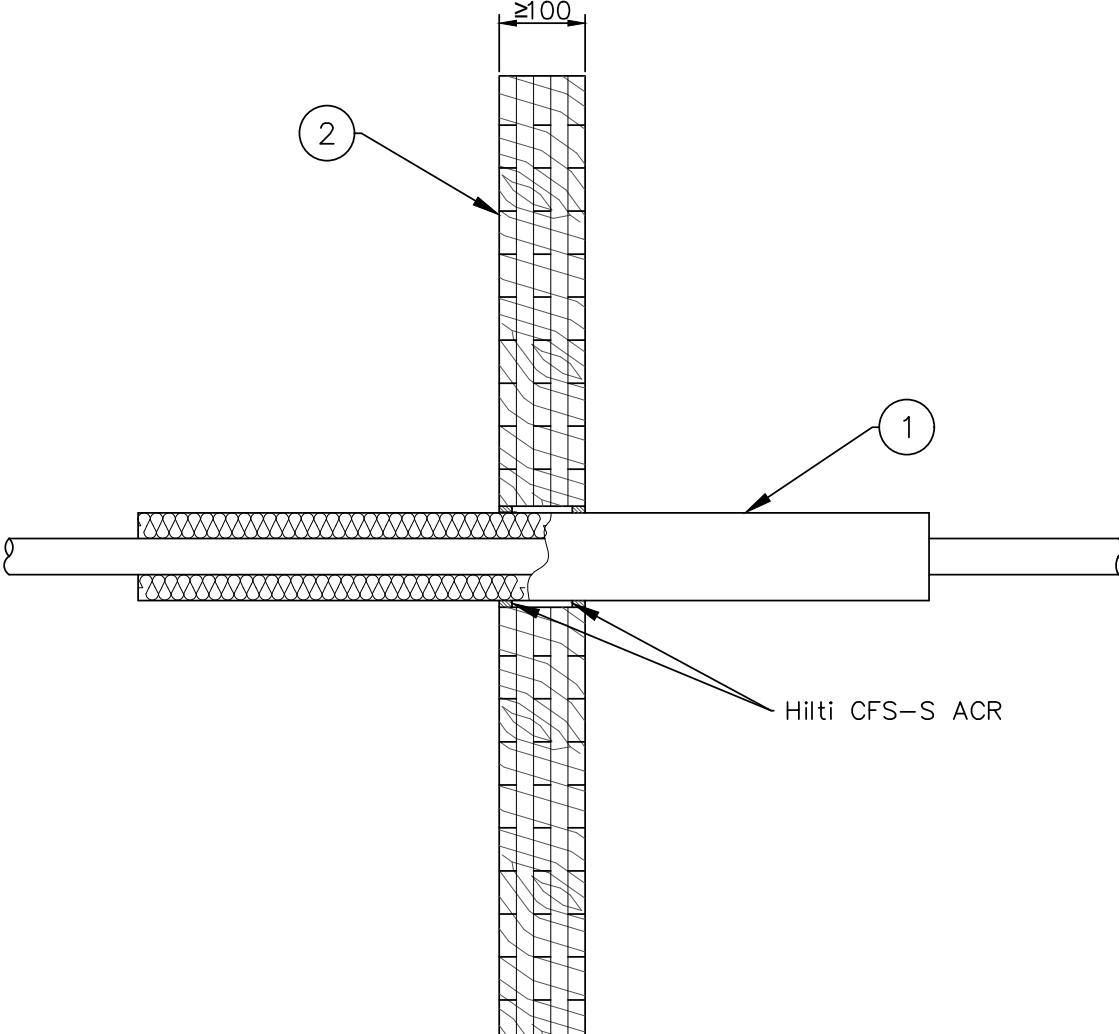
Distance of the penetration seal to	Size of openings next to each other [mm]	DIN distances between the openings [mm]	EN distances between the openings [mm]	**Construction group 1
Other cable or pipe penetration seals	One/both opening(s) > 400 x 400	≥ 200	≥ 200	
	Both openings $\leq 400 \times 400$	≥ 100	≥ 200	
Other openings or installations	One/both opening(s) > 200 x 200	≥ 200	≥ 200	
	Both openings $\leq 200 \times 200$	≥ 100	≥ 200	

A "typical" is a preconfigured firestopping solution consisting of specific components for a specific application, to which an assumed fire rating/integrity is assigned. Typical is selected according to their fire rating/integrity and are subject to the technical product documentation and underlying product approvals published by Hilti from time to time, are subject to generic assumptions, and are not selected on a project- or design-specific basis. The proposed typical may therefore not meet the project- or design-specific requirements, and accordingly must be evaluated by the customer or by a relevant expert appointed by the customer for their suitability regarding the actual project-specific design criteria and requirements.

		Product Fire protection seal Hilti Firestop Sealant CFS-S ACR	Building project
ID CFS-S_ACR_CLTW_NCP_CP_8X904		Contents Fire protection seal in cross-laminated timber walls for non-combustible and combustible pipes	
Page 01	Rev 03		

E190

Fire resistance 90 min. -
Fire-resistant



Basic documents, which form the respective proof of applicability
- German Approval P-MPA-E-17-010
- European Technical Assessment: ETA-10/0212
- Reaction to fire according to EN 13501-1
- Fire resistance according to EN 13501-2
- Installations according to the Hilti installation instructions

Not to scale
All units in [mm]

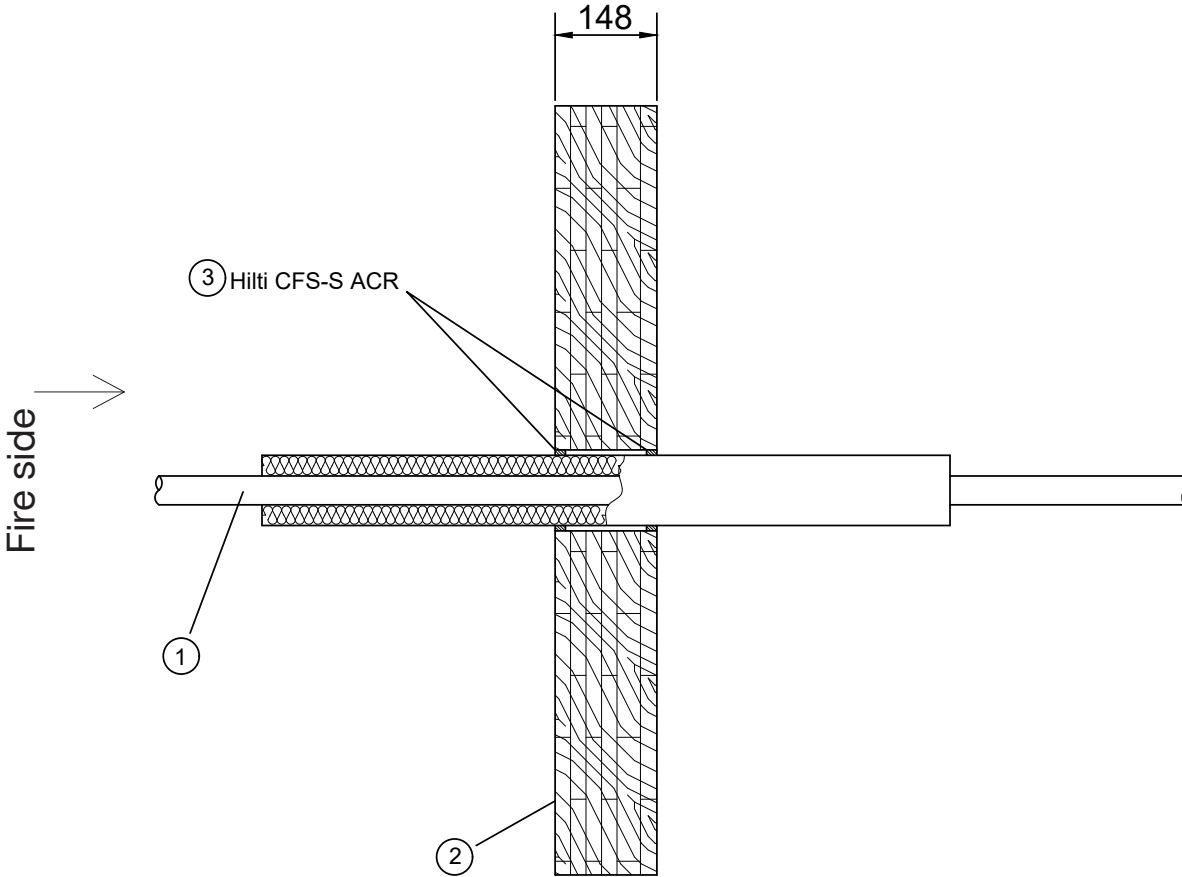
A "typical" is a preconfigured firestopping solution consisting of specific components for a specific application, to which an assumed fire rating/integrity is assigned. Typical is selected according to their fire rating/integrity and are subject to the technical product documentation and underlying product approvals published by Hilti from time to time, are subject to generic assumptions, and are not selected on a project- or design-specific basis. The proposed typical may therefore not meet the project- or design-specific requirements, and accordingly must be evaluated by the customer or by a relevant expert appointed by the customer for their suitability regarding the actual project-specific design criteria and requirements.

		Product Fire protection seal Hilti Firestop Sealant CFS-S ACR		Building project				
ID CFS-S ACR_CLTW_NCP_CP_8X904		Contents Fire protection seal in cross-laminated timber walls for non-combustible and combustible pipes						
Page 02	Rev 03							
① Installations								
Item	Implementation	Description/Type	Dimensions [mm]	Fire protection material	Opening size [mm]	Annular gap	Pipe insulation	Seal thickness [mm]
1a	Non-combustible pipe C/U	Copper, steel, Stainless steel and cast iron	10 ≤ Ø ≤ 88.9 1 ≤ s* ≤ 14.2	CFS S ACR	65 ≤ Ø ≤ 199	CFS S ACR ≤15 mm	Euro class mineral wool A1 or A2 Density ≥ 80 kg/m³ Ø ≤ 54 mm T* = 20 mm Length ≥ 450 mm Ø ≥ 54 mm T* = 40 mm Length ≥ 800 mm	≥100
1b	Aluminum composite pipes U/C	Geberit Mepla	16 ≤ Ø ≤ 75 2.25 ≤ s* ≤ 4.7	CFS S ACR	71 ≤ Ø ≤ 185	CFS S ACR ≤15 mm	Mineral wool of Euro class A1 or A2 Density ≥ 80 kg/m³ T* = 20–40 mm Ø ≤ 40 mm = length ≥ 170 mm Ø > 40 mm = Length ≥ 390 mm	≥100
1c	Aluminum composite pipes U/C	Geberit System pipe ML	16 ≤ Ø ≤ 75 2 ≤ s* ≤ 4.6	CFS S ACR	71 ≤ Ø ≤ 185	CFS S ACR ≤15 mm		≥100
1d	Aluminum composite pipes U/C	REHAU Rautitan stable	16 ≤ Ø ≤ 40 2.2 ≤ s* ≤ 6	CFS S ACR	71 ≤ Ø ≤ 150	CFS S ACR ≤15 mm		≥100
1e	Aluminum composite pipes U/C	REHAU Rautitan flex	16 ≤ Ø ≤ 63 2.2 ≤ s* ≤ 8.6	CFS S ACR	71 ≤ Ø ≤ 173	CFS S ACR ≤15 mm		≥100
1f	Aluminum composite pipes U/C	TECE TECEflex	14 ≤ Ø ≤ 63 2.6 ≤ s* ≤ 6	CFS S ACR	69 ≤ Ø ≤ 173	CFS S ACR ≤15 mm		≥100
1g	Aluminum composite pipes U/C	Viega SANFIX Fosta	16 ≤ Ø ≤ 63 2.2 ≤ s* ≤ 4.5	CFS S ACR	71 ≤ Ø ≤ 173	CFS S ACR ≤15 mm		≥100
1h	Aluminum composite pipes U/C	KeKelit Kelox KM 110	25 ≤ Ø ≤ 75 2.5 ≤ s* ≤ 7.5	CFS S ACR	80 ≤ Ø ≤ 185	CFS S ACR ≤15 mm		≥100
1i	Aluminum composite pipes U/C	Uponor Unipipe Plus/MLC	16 ≤ Ø ≤ 75 2 ≤ s* ≤ 7.5	CFS S ACR	71 ≤ Ø ≤ 185	CFS S ACR ≤15 mm		≥100
* Wall thickness/insulation thickness								
② Construction: This application detail applies in conjunction with "Appendix 1: Available approvals and documents"								
The firestop functionality and fire rating/integrity of the wall must be considered separately. The wall thicknesses shown correspond to the minimum thicknesses required by the tested penetration seal.								
③ Firestop product info								
Hilti Firestop Sealant CFS-S ACR - European Technical Assessment: ETA-10/0292 - German Approval P-MPA-E-17-010 - Use for insulated non-combustible pipes - Fill the annular gap with Hilti CFS-S ACR Firestop Sealant from both sides to a depth of at least 25 mm								
Distance between the openings or other installations								
Distance of the penetration seal to	Size of openings next to each other [mm]	DIN distances between the openings [mm]		EN Distances between the openings [mm]				
Other cable or pipe penetration seals	One/both opening(s) > 400 x 400	≥ 200		≥ 200				
	Both openings ≤ 400 x 400	≥ 100		≥ 200				
Other openings or installations	One/both opening(s) > 200 x 200	≥ 200		≥ 200				
	Both openings ≤ 200 x 200	≥ 100		≥ 200				

A "typical" is a preconfigured firestopping solution consisting of specific components for a specific application, to which an assumed fire rating/integrity is assigned. Typical is selected according to their fire rating/integrity and are subject to the technical product documentation and underlying product approvals published by Hilti from time to time, are subject to generic assumptions, and are not selected on a project- or design-specific basis. The proposed typical may therefore not meet the project- or design-specific requirements, and accordingly must be evaluated by the customer or by a relevant expert appointed by the customer for their suitability regarding the actual project-specific design criteria and requirements.

		Product	Building project
ID CFS-S ACR_CLTW_NCP_8X001		Fire protection seal Hilti Firestop Sealant CFS-S ACR	
Page 01	Rev 00	Contents Fire protection seal in cross-laminated timber walls for non-combustible pipes	

EI90 U/C



Technical cross-section diagram of a firestop installation. A horizontal pipe (1) passes through a wall. The wall has a vertical section (2) showing the internal structure. The pipe is surrounded by a firestop sealant (3) Hilti CFS-S ACR. The sealant is applied from both sides of the wall to a depth of at least 25 mm. The wall thickness is 148 mm. The diagram is labeled "Fire side" on the left.

- German Approval aBG: Z-200-2-2_001

- European Technical Assessment: ETA-10/0292

- Reaction to fire according to EN 13501-1

- Fire resistance according to EN 13501-1

- Installations according to the Hilti installation instructions

Not to scale
All units in [mm]

A "typical" is a preconfigured firestopping solution consisting of specific components for a specific application, to which an assumed fire rating/integrity is assigned. Typical is selected according to their fire rating/integrity and are subject to the technical product documentation and underlying product approvals published by Hilti from time to time, are subject to generic assumptions, and are not selected on a project- or design-specific basis. The proposed typical may therefore not meet the project- or design-specific requirements, and accordingly must be evaluated by the customer or by a relevant expert appointed by the customer for their suitability regarding the actual project-specific design criteria and requirements.

		Product Fire protection seal Hilti Firestop Sealant CFS-S ACR	Building project
ID CFS-S ACR_CLTW_NCP_8X001		Contents Fire protection seal in cross-laminated timber walls for non-combustible pipes	
Page 02	Rev 00		

① Installations

Item	Implementation	Description/Type	Dimensions [mm]	Firestopping material	Opening size [mm]	Annular gap	Pipe insulation	Penetration seal thickness [mm]
1	Non-combustible pipe	Copper, steel, stainless steel and cast iron	$\varnothing \leq 42 \times 1.5 \leq s^* \leq 14.2$	CFS-S ACR	$\varnothing \leq 86$	CFS-S ACR 0-4 mm	Rockwool Conolit 150U, 19 mm insulation thickness, 430 mm per side	148

* Wall thickness

② Construction: This typical can be used for the following element types and Dataholz.eu systems

Element type	Leno cross-laminated timber according to ETA-10/0241 or Z-9.1-501 of Merk Timber GmbH, Aichach, Germany
Dataholz.eu	-

③ Firestop product info

Hilti Firestop Sealant CFS-S ACR

- European Technical Assessment: ETA-10/0292
- German Approval aBG: Z-19.53-2192
- Use for insulated non-combustible pipes
- Backfill remaining annular gap with mineral wool and fill with Hilti Firestop Sealant CFS-S ACR from both sides to a depth of at least 5 mm

Distance between the openings or other installations

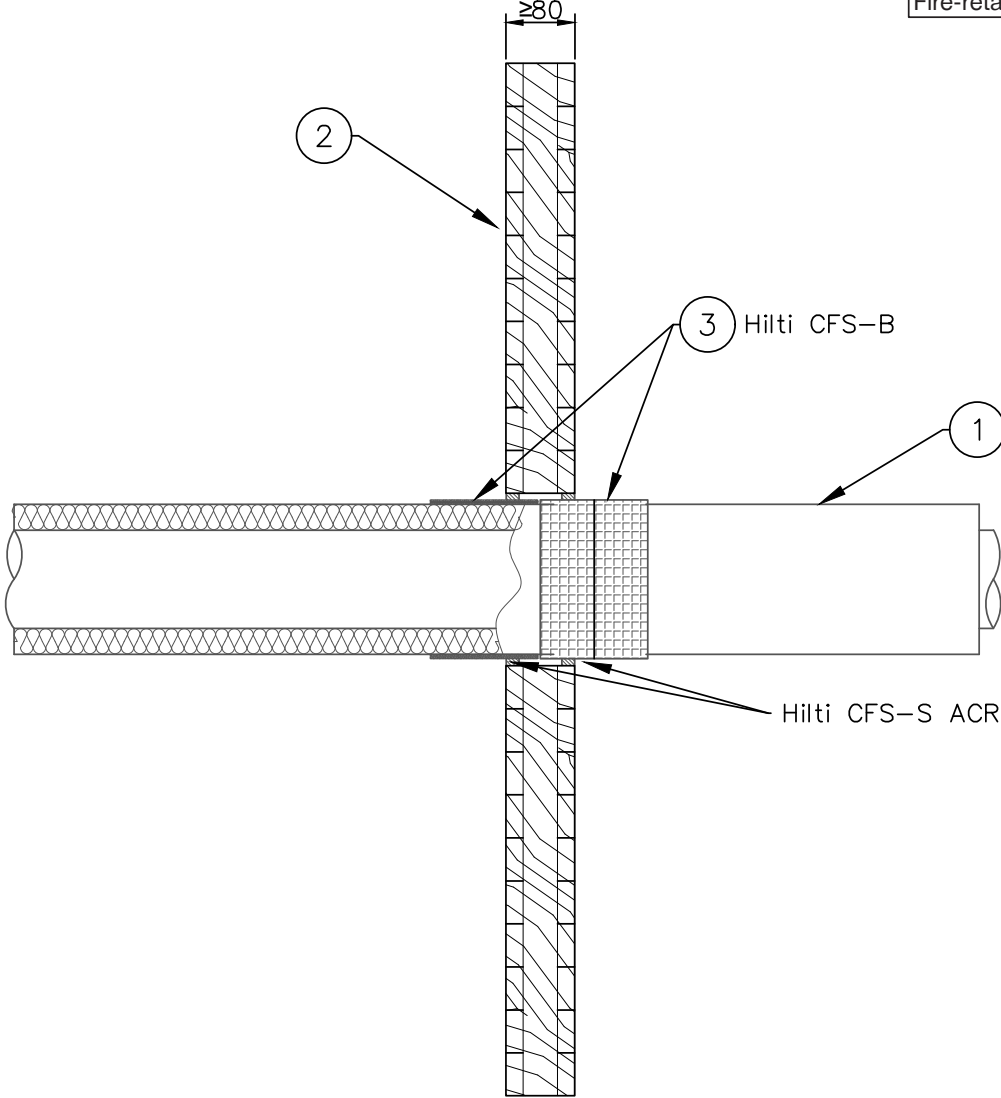
Distance of the penetration seal to	Size of openings next to each other [mm]	DIN distance between openings [mm]	EN distance between openings [mm]
other cable or pipe penetration seals	One/both opening(s) > 400 x 400	≥ 200	≥ 50
	both openings ≤ 400 x 400	≥ 100	≥ 50
Other openings or installations	One/both opening(s) > 200 x 200	≥ 200	≥ 200
	both openings ≤ 200 x 200	≥ 100	≥ 100

A "typical" is a preconfigured firestopping solution consisting of specific components for a specific application, to which an assumed fire rating/integrity is assigned. Typical is selected according to their fire rating/integrity and are subject to the technical product documentation and underlying product approvals published by Hilti from time to time, are subject to generic assumptions, and are not selected on a project- or design-specific basis. The proposed typical may therefore not meet the project- or design-specific requirements, and accordingly must be evaluated by the customer or by a relevant expert appointed by the customer for their suitability regarding the actual project-specific design criteria and requirements.

		Product	Building project
		Fire protection seal Hilti firestop wrap	
ID CFS-B_CLTW_NCP_CP_8X003		Contents Fire protection seal in cross-laminated timber walls for non-combustible and combustible pipes	
Page 01	Rev 03		

EI30

Fire resistance 30 min. -
Fire-retardant



≥80

2

3 Hilti CFS-B

1

Hilti CFS-S ACR

Basic documents, which form the respective proof of applicability

- German Approval P-MPA-E-07-029
- German Approval aBG: Z-19.53-2210, Z-19.53-2218
- European Technical Assessment: ETA-10/0212
- Reaction to fire according to EN 13501-1
- Fire resistance according to EN 13501-2
- Installations according to the Hilti installation instructions

Not to scale

All units in [mm]

A "typical" is a preconfigured firestopping solution consisting of specific components for a specific application, to which an assumed fire rating/integrity is assigned. Typical is selected according to their fire rating/integrity and are subject to the technical product documentation and underlying product approvals published by Hilti from time to time, are subject to generic assumptions, and are not selected on a project- or design-specific basis. The proposed typical may therefore not meet the project- or design-specific requirements, and accordingly must be evaluated by the customer or by a relevant expert appointed by the customer for their suitability regarding the actual project-specific design criteria and requirements.

		Product Fire protection seal Hilti Firestop Bandage CFS-B	Building project
ID CFS-B_CLTW_NCP_CP_8X003		Contents Fire protection seal in cross-laminated timber walls for non-combustible and combustible pipes	
Page 02	Rev 03		

① Installations

Item	Implementation	Description/Type	Dimensions [mm]	Firestopping material	Opening size [mm]	Annular gap	Pipe insulation	Penetration seal thickness [mm]
1a	Non-combustible Pipe C/U	Copper, steel, Stainless steel	$10 \leq \varnothing \leq 42$ $1 \leq s^* \leq 14.2$	CFS-B	$48 \leq \varnothing \leq 121$	CFS S ACR ≤ 15 mm	flexible Elastomeric insulation $7.5 \leq T^* \leq 20.5$	≥ 80
1b	Aluminum composite pipes U/C	Geberit Mepla	$16 \leq \varnothing \leq 40$ $2.25 \leq s^* \leq 3.5$	CFS-B	$55 \leq \varnothing \leq 96$	CFS S ACR ≤ 15 mm	flexible Elastomeric insulation $8 \leq T^* \leq 16.5$	≥ 80
1c	Aluminum composite pipes U/C	Geberit System pipe ML	$16 \leq \varnothing \leq 75$ $2.0 \leq s^* \leq 4.6$	CFS-B	$55 \leq \varnothing \leq 147$	CFS S ACR ≤ 15 mm	flexible Elastomeric insulation $8 \leq T^* \leq 17$	≥ 80
1d	Aluminum composite pipes U/C	REHAU Rautitan stable	$16 \leq \varnothing \leq 40$ $2.2 \leq s^* \leq 6$	CFS-B	$55 \leq \varnothing \leq 119$	CFS S ACR ≤ 15 mm	flexible Elastomeric insulation $8 \leq T^* \leq 20.5$	≥ 80
1e	Aluminum composite pipes U/C	REHAU Rautitan flex	$16 \leq \varnothing \leq 63$ $2.2 \leq s^* \leq 8.6$	CFS-B	$55 \leq \varnothing \leq 135$	CFS S ACR ≤ 15 mm	flexible Elastomeric insulation $8 \leq T^* \leq 17$	≥ 80
1f	Aluminum composite pipes U/C	Viega SANFIX Fosta	$16 \leq \varnothing \leq 63$ $2.2 \leq s^* \leq 4.5$	CFS-B	$55 \leq \varnothing \leq 135$	CFS S ACR ≤ 15 mm	flexible Elastomeric insulation $8 \leq T^* \leq 17$	≥ 80
1g	Aluminum composite pipes U/C	TECE TECEflex	$14 \leq \varnothing \leq 32$; $63 \leq 2.6 \leq s^* \leq 4$; 6	CFS-B	$52 \leq \varnothing \leq 135$	CFS S ACR ≤ 15 mm	flexible Elastomeric insulation $7.5 \leq T^* \leq 17$	≥ 80

* Wall thickness/insulation thickness

② Construction: This application detail applies in conjunction with "Appendix 1: Available approvals and documents"

The firestop functionality and fire rating/integrity of the wall must be considered separately.
The wall thicknesses shown correspond to the minimum thicknesses required by the tested penetration seal.

③ Firestop product info

- Hilti Firestop Bandage CFS-B
- European Technical Assessment: ETA-10/0212
 - German Approval P-MPA-E-07-029
 - German Approval aBG: Z-19.53-2210, Z-19.53-2218
 - Use for insulated non-combustible pipes
 - 2-ply application
 - Fill the remaining annular gap with Hilti CFS-S ACR Firestop Sealant from both sides to a depth of at least 25 mm

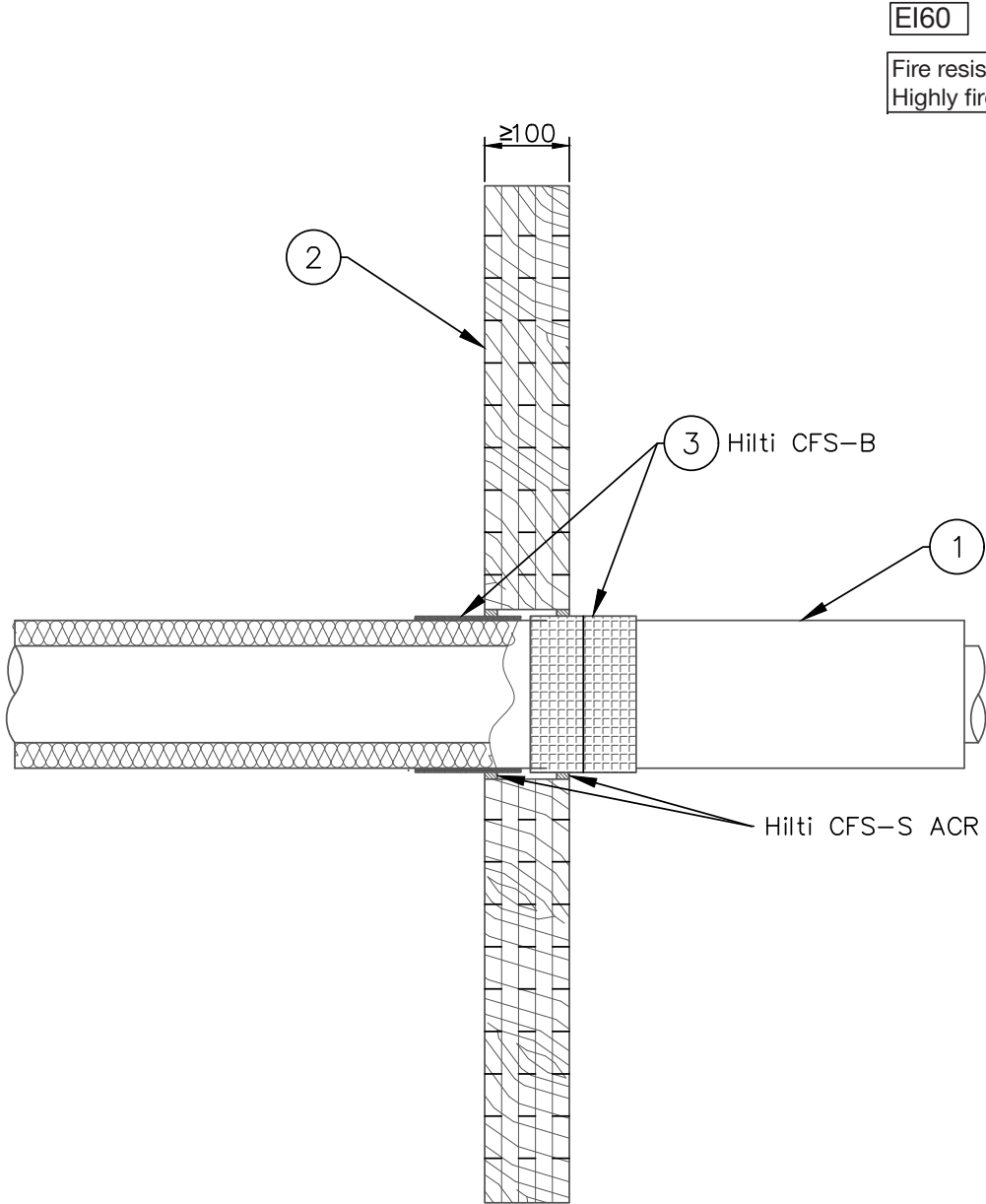
Distance between the openings or other installations

**only with Geberit Mepla

Distance of the penetration seal to	Size of openings next to each other [mm]	DIN distances between the openings [mm]	EN distances between the openings [mm]
Mineral wool insulation**		≥ 50	≥ 50
CFS-C EL**		≥ 50	≥ 50
CFS-CC**		≥ 50	≥ 50
Other cable or pipe penetration seals	One/both opening(s) > 400 x 400	≥ 200	≥ 100
	Both openings ≤ 400 x 400	≥ 100	≥ 100
Other openings or installations	One/both opening(s) > 200 x 200	≥ 200	≥ 200
	Both openings ≤ 200 x 200	≥ 100	≥ 200

A "typical" is a preconfigured firestopping solution consisting of specific components for a specific application, to which an assumed fire rating/integrity is assigned. Typical is selected according to their fire rating/integrity and are subject to the technical product documentation and underlying product approvals published by Hilti from time to time, are subject to generic assumptions, and are not selected on a project- or design-specific basis. The proposed typical may therefore not meet the project- or design-specific requirements, and accordingly must be evaluated by the customer or by a relevant expert appointed by the customer for their suitability regarding the actual project-specific design criteria and requirements.

		Product Fire protection seal Hilti Firestop Bandage CFS-B	Building project
ID CFS-B_CLTW_NCP_CP_8X004		Contents Fire protection seal in cross-laminated timber walls for non-combustible and combustible pipes	
Page 01	Rev 03		



EI60

Fire resistance 60 min.
Highly fire-retardant

- Basic documents, which form the respective proof of applicability
- German Approval P-MPA-E-07-029
 - German Approval aBG: Z-19.53-2210, Z-19.53-2218
 - European Technical Assessment: ETA-10/0212
 - Reaction to fire according to EN 13501-1
 - Fire resistance according to EN 13501-2
 - Installations according to the Hilti installation instructions

Not to scale
All units in [mm]

A "typical" is a preconfigured firestopping solution consisting of specific components for a specific application, to which an assumed fire rating/integrity is assigned. Typical is selected according to their fire rating/integrity and are subject to the technical product documentation and underlying product approvals published by Hilti from time to time, are subject to generic assumptions, and are not selected on a project- or design-specific basis. The proposed typical may therefore not meet the project- or design-specific requirements, and accordingly must be evaluated by the customer or by a relevant expert appointed by the customer for their suitability regarding the actual project-specific design criteria and requirements.

		Product Fire protection seal Hilti Firestop Bandage CFS-B	Building project
ID CFS-B_CLTW_NCP_CP_8X004		Contents Fire protection seal in cross-laminated timber walls for non-combustible and combustible pipes	
Page 02	Rev 03		

① Installations

Item	Implementation	Description/Type	Dimensions [mm]	Firestopping material	Opening size [mm]	Annular gap	Pipe insulation	Penetration seal thickness [mm]
1a	Non-combustible pipe C/U	Copper, steel, stainless steel	$10 \leq \varnothing \leq 42$ $1 \leq s^* \leq 14.2$	CFS-B	$48 \leq \varnothing \leq 121$	CFS S ACR ≤ 15 mm	flexible elastomeric insulating material $7.5 \leq T^* \leq 20.5$	≥ 100
1b	Aluminum composite pipes U/C	Geberit Mepla	$16 \leq \varnothing \leq 75$ $2.25 \leq s^* \leq 4.7$	CFS-B	$55 \leq \varnothing \leq 147$	CFS S ACR ≤ 15 mm	flexible elastomeric insulating material** $8 \leq T^* \leq 40$	≥ 100
1c	Aluminum composite pipes U/C	Geberit System pipe ML	$16 \leq \varnothing \leq 75$ $2 \leq s^* \leq 4.6$	CFS-B	$55 \leq \varnothing \leq 193$	CFS S ACR ≤ 15 mm	flexible elastomeric insulating material** $8 \leq T^* \leq 40$	≥ 100
1d	Aluminum composite pipes U/C	REHAU Rautitan stabile	$16 \leq \varnothing \leq 63$ $2.2 \leq s^* \leq 6$	CFS-B	$55 \leq \varnothing \leq 179$	CFS S ACR ≤ 15 mm	flexible elastomeric insulating material** $8 \leq T^* \leq 39$	≥ 100
1e	Aluminum composite pipes U/C	REHAU Rautitan flex	$16 \leq \varnothing \leq 63$ $2.2 \leq s^* \leq 8.6$	CFS-B	$55 \leq \varnothing \leq 179$	CFS S ACR ≤ 15 mm	flexible elastomeric insulating material** $8 \leq T^* \leq 39$	≥ 100
1f	Aluminum composite pipes U/C	Uponor Unipipe Plus/MLC	$16 \leq \varnothing \leq 75$ $2 \leq s^* \leq 7.5$	CFS-B	$55 \leq \varnothing \leq 147$	CFS S ACR ≤ 15 mm	flexible elastomeric insulating material** $8 \leq T^* \leq 17$	≥ 100
1g	Aluminum composite pipes U/C	Viega SANFIX Fosta	$16 \leq \varnothing \leq 63$ $2.2 \leq s^* \leq 4.5$	CFS-B	$55 \leq \varnothing \leq 179$	CFS S ACR ≤ 15 mm	flexible elastomeric insulating material** $8 \leq T^* \leq 39$	≥ 100
1h	Aluminum composite pipes U/C	TECE TECEflex	$14 \leq \varnothing \leq 63$ $2.6 \leq s^* \leq 6$	CFS-B	$38 \leq \varnothing \leq 144$	CFS S ACR ≤ 15 mm	flexible elastomeric insulating material** $7.5 \leq T^* \leq 21.5$	≥ 100
1i	Aluminum composite pipes U/C	KeKelit Kelox KM110	$16 \leq \varnothing \leq 75$ $2 \leq s^* \leq 7.5$	CFS-B	$55 \leq \varnothing \leq 193$	CFS S ACR ≤ 15 mm	flexible elastomeric insulating material** $8 \leq T^* \leq 40$	≥ 100
1j	Aluminum composite pipes U/C	Fränkische Rohrwerke Alplex F50 Profi / L	$16 \leq \varnothing \leq 75$ $2 \leq s^* \leq 5$	CFS-B	$55 \leq \varnothing \leq 193$	CFS S ACR ≤ 15 mm	flexible elastomeric insulating material** $8 \leq T^* \leq 40$	≥ 100

* Wall thickness/insulation thickness **If necessary, also possible without insulation

② Construction: This application detail applies in conjunction with "Appendix 1: Available approvals and documents"

The firestop functionality and fire rating/integrity of the wall must be considered separately.
The wall thicknesses shown correspond to the minimum thicknesses required by the tested penetration seal.

③ Firestop product info

- Hilti Firestop Bandage CFS-B
- European Technical Assessment: ETA-10/0212
 - German Approval P-MPA-E-07-029
 - German Approval aBG: Z-19.53-2210, Z-19.53-2218
 - Use for insulated non-combustible pipes
 - 2-ply application
 - Fill the remaining annular gap with Hilti CFS-S ACR Firestop Sealant from both sides to a depth of at least 25 mm

Distances to Hilti individual systems [mm] (opening to opening)	CFS-B (aluminum composite pipes) (U/C)	CFS-S ACR (aluminum composite pipes) (U/C)	CFS-S ACR (metal pipes) (C/U)	CFS-C EL (U/U and KG1**)	CFS-CC (cable)	CFS-SL GA (DE) w/ CFS-S ACR
CFS-B (aluminum composite pipes) (U/C)	50	50	50	50	50	50
CFS-S ACR (aluminum composite pipes) (U/C)		50	50	50	50	50
CFS-S ACR (metal pipes) (C/U)			50	50	50	50
CFS-C EL (U/U and KG1**)				50	50	50
CFS-CC (cable)					50	50
CFS-SL GA (DE) w/ CFS-S ACR						50

Distance of the penetration seal to	Size of openings next to each other [mm]	DIN distances between the openings [mm]	EN distances between the openings [mm]
Other cable or pipe penetration seals	One/both opening(s) > 400 x 400	≥ 200	≥ 200
	Both openings $\leq 400 \times 400$	≥ 100	≥ 200
Other openings or installations	One/both opening(s) > 200 x 200	≥ 200	≥ 200
	Both openings $\leq 200 \times 200$	≥ 100	≥ 200

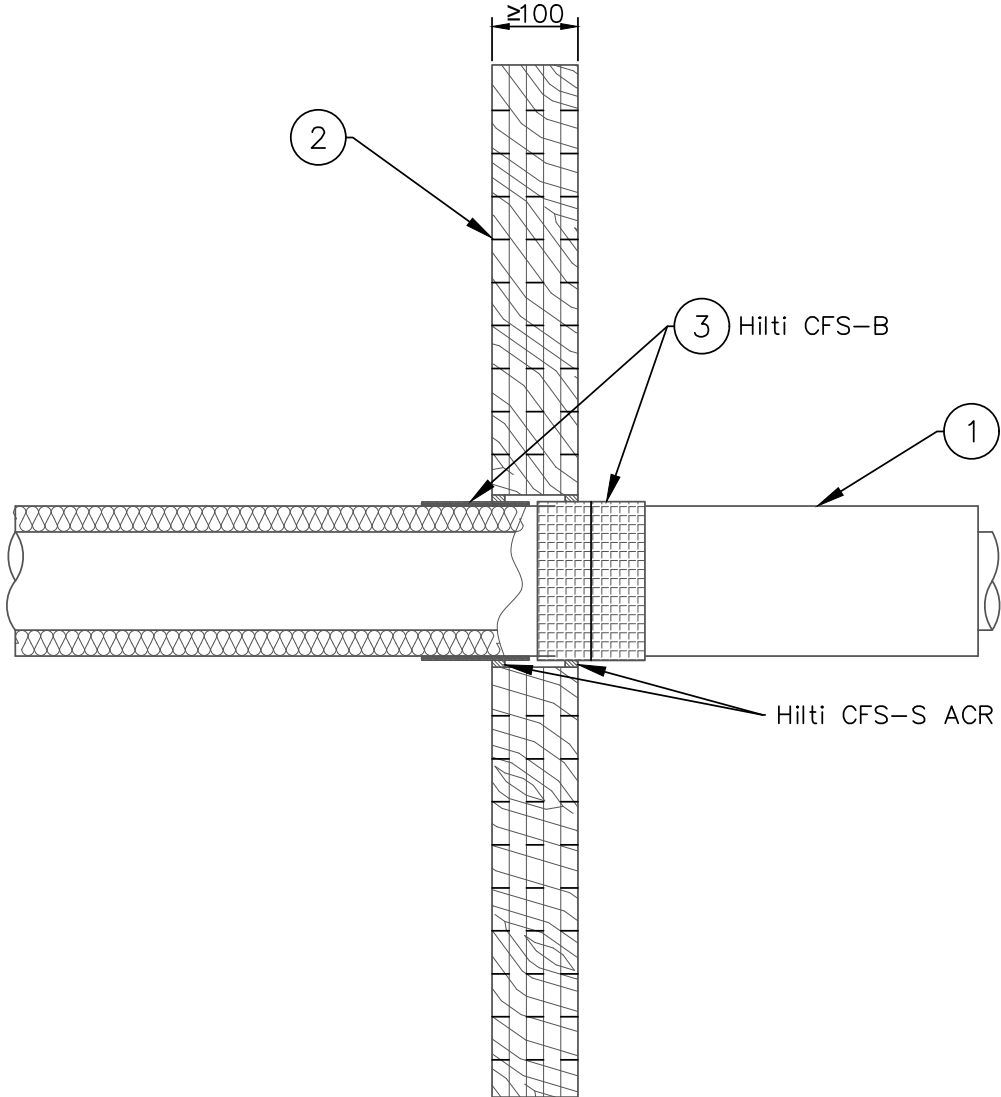
**Construction group 1

A "typical" is a preconfigured firestopping solution consisting of specific components for a specific application, to which an assumed fire rating/integrity is assigned. Typical is selected according to their fire rating/integrity and are subject to the technical product documentation and underlying product approvals published by Hilti from time to time, are subject to generic assumptions, and are not selected on a project- or design-specific basis. The proposed typical may therefore not meet the project- or design-specific requirements, and accordingly must be evaluated by the customer or by a relevant expert appointed by the customer for their suitability regarding the actual project-specific design criteria and requirements.

		Product Fire protection seal Hilti Firestop Bandage CFS-B	Building project
ID CFS-B_CLTW_NCP_CP_8X904		Contents Fire protection seal in cross-laminated timber walls for non-combustible and combustible pipes	
Page 01	Rev 03		

EI90

Fire resistance 90 min. -
Fire-resistant



Basic documents, which form the respective proof of applicability

- German Approval P-MPA-E-07-029
- German Approval aBG: Z-19.53-2210, Z-19.53-2218
- European Technical Assessment: ETA-10/0212
- Reaction to fire according to EN 13501-1
- Fire resistance according to EN 13501-2
- Installations according to the Hilti installation instructions

Not to scale
All units in [mm]

A "typical" is a preconfigured firestopping solution consisting of specific components for a specific application, to which an assumed fire rating/integrity is assigned. Typical is selected according to their fire rating/integrity and are subject to the technical product documentation and underlying product approvals published by Hilti from time to time, are subject to generic assumptions, and are not selected on a project- or design-specific basis. The proposed typical may therefore not meet the project- or design-specific requirements, and accordingly must be evaluated by the customer or by a relevant expert appointed by the customer for their suitability regarding the actual project-specific design criteria and requirements.

		Product Fire protection seal Hilti Firestop Bandage CFS-B	Building project
ID CFS-B_CLTW_NCP_CP_8X904		Contents Fire protection seal in cross-laminated timber walls for non-combustible and combustible pipes	
Page 02	Rev 03		

① Installations

Item	Implementation	Description/Type	Dimensions [mm]	Firestopping material	Opening size [mm]	Annular gap	Pipe insulation	Penetration seal thickness [mm]
1a	Non-combustible pipe C/U	Copper, steel, stainless steel	$10 \leq \varnothing \leq 42$ $1 \leq s^* \leq 14.2$	CFS-B	$48 \leq \varnothing \leq 121$	CFS S ACR ≤ 15 mm	flexible elastomeric insulating material $7.5 \leq T^* \leq 20.5$	≥ 100
1b	Aluminum composite pipes U/C	Geberit Mepla	$16 \leq \varnothing \leq 50$ $2.25 \leq s^* \leq 4.5$	CFS-B	$55 \leq \varnothing \leq 121$	CFS S ACR ≤ 15 mm	flexible elastomeric insulating material** $8 \leq T^* \leq 16.5$	≥ 100
1c	Aluminum composite pipes U/C	Geberit System pipe ML	$16 \leq \varnothing \leq 63$ $2 \leq s^* \leq 4$	CFS-B	$55 \leq \varnothing \leq 135$	CFS S ACR ≤ 15 mm	flexible elastomeric insulating material** $8 \leq T^* \leq 17$	≥ 100
1d	Aluminum composite pipes U/C	REHAU Rautitan stable	$16 \leq \varnothing \leq 63$ $2.2 \leq s^* \leq 6$	CFS-B	$55 \leq \varnothing \leq 179$	CFS S ACR ≤ 15 mm	flexible elastomeric insulating material** $8 \leq T^* \leq 39$	≥ 100
1e	Aluminum composite pipes U/C	REHAU Rautitan flex	$16 \leq \varnothing \leq 63$ $2.2 \leq s^* \leq 8.6$	CFS-B	$55 \leq \varnothing \leq 179$	CFS S ACR ≤ 15 mm	flexible elastomeric insulating material** $8 \leq T^* \leq 39$	≥ 100
1f	Aluminum composite pipes U/C	Uponor Unipipe Plus/MLC	$16 \leq \varnothing \leq 75$ $2 \leq s^* \leq 7.5$	CFS-B	$55 \leq \varnothing \leq 147$	CFS S ACR ≤ 15 mm	flexible elastomeric insulating material** $16.5 \leq T^* \leq 17$	≥ 100
1g	Aluminum composite pipes U/C	Viega SANFIX Fosta	$16 \leq \varnothing \leq 63$ $2.2 \leq s^* \leq 4.5$	CFS-B	$55 \leq \varnothing \leq 179$	CFS S ACR ≤ 15 mm	flexible elastomeric insulating material** $8 \leq T^* \leq 39$	≥ 100
1h	Aluminum composite pipes U/C	TECE TECEflex	$14 \leq \varnothing \leq 50$ $2.6 \leq s^* \leq 4.5$	CFS-B	$38 \leq \varnothing \leq 163$	CFS S ACR ≤ 15 mm	flexible elastomeric insulating material** $7.5 \leq T^* \leq 37.5$	≥ 100
1i	Aluminum composite pipes U/C	KeKelit Kelox KM110	$16 \leq \varnothing \leq 32$ $2 \leq s^* \leq 3$	CFS-B	$55 \leq \varnothing \leq 134$	CFS S ACR ≤ 15 mm	flexible elastomeric insulating material** $8 \leq T^* \leq 32$	≥ 100
1j	Aluminum composite pipes U/C	Fränkische Rohrwerke Alpex F50 Profi / L	$16 \leq \varnothing \leq 75$ $2 \leq s^* \leq 5$	CFS-B	$55 \leq \varnothing \leq 193$	CFS S ACR ≤ 15 mm	flexible elastomeric insulating material** $8 \leq T^* \leq 40$	≥ 100

* Wall thickness/insulation thickness **If necessary, also possible without insulation

② Construction: This application detail applies in conjunction with "Appendix 1: Available approvals and documents"

The firestop functionality and fire rating/integrity of the wall must be considered separately.
The wall thicknesses shown correspond to the minimum thicknesses required by the tested penetration seal.

③ Firestop product info

- Hilti Firestop Bandage CFS-B
- European Technical Assessment: ETA-10/0212
 - German Approval P-MPA-E-07-029
 - German Approval aBG: Z-19.53-2210, Z-19.53-2218
 - Use for insulated non-combustible pipes
 - 2-ply application
 - Fill the remaining annular gap with Hilti CFS-S ACR Firestop Sealant from both sides to a depth of at least 25 mm

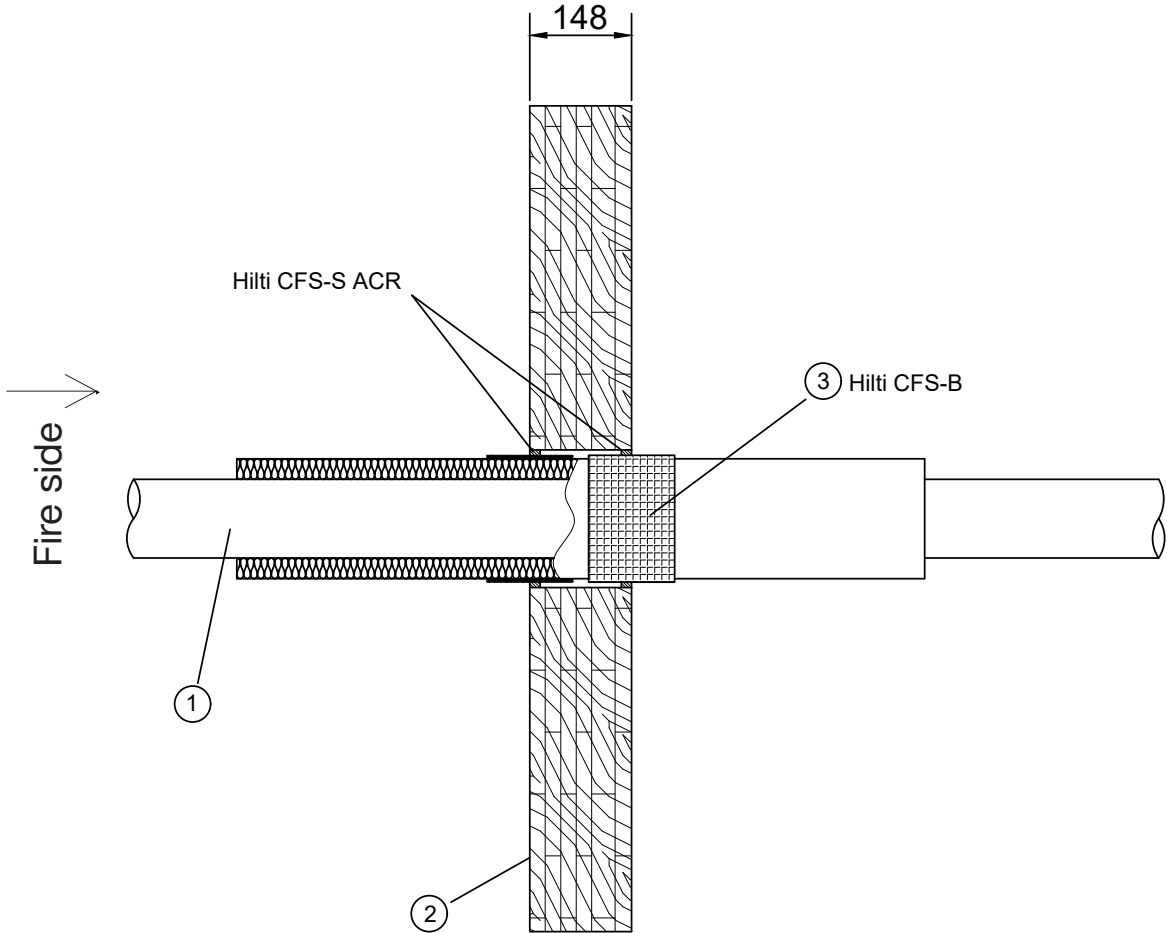
Distance between the openings or other installations

Distance of the penetration seal to	Size of openings next to each other [mm]	DIN distances between the openings [mm]	EN distances between the openings [mm]
Mineral wool insulation		≥ 50	≥ 50
CFS-C EL		≥ 50	≥ 50
CFS-CC		≥ 50	≥ 50
Other cable or pipe penetration seals	One/both opening(s) $> 400 \times 400$	≥ 200	≥ 100
	Both openings $\leq 400 \times 400$	≥ 100	≥ 100
Other openings or installations	One/both opening(s) $> 200 \times 200$	≥ 200	≥ 200
	Both openings $\leq 200 \times 200$	≥ 100	≥ 200

A "typical" is a preconfigured firestopping solution consisting of specific components for a specific application, to which an assumed fire rating/integrity is assigned. Typical is selected according to their fire rating/integrity and are subject to the technical product documentation and underlying product approvals published by Hilti from time to time, are subject to generic assumptions, and are not selected on a project- or design-specific basis. The proposed typical may therefore not meet the project- or design-specific requirements, and accordingly must be evaluated by the customer or by a relevant expert appointed by the customer for their suitability regarding the actual project-specific design criteria and requirements.

		Product Fire protection seal Hilti Firestop Bandage CFS-B	Building project
ID CFS-B_CLTW_NCP_8X001		Contents Fire protection seal in cross-laminated timber walls for non-combustible pipes	
Page 01	Rev 00		

EI90 U/C



- German Approval aBG: Z-19.53-2210
- European Technical Assessment: ETA-10/0212
- Reaction to fire according to EN 13501-1
- Fire resistance according to EN 13501-1
- Installations according to the Hilti installation instructions

Not to scale
All units in [mm]

A "typical" is a preconfigured firestopping solution consisting of specific components for a specific application, to which an assumed fire rating/integrity is assigned. Typical is selected according to their fire rating/integrity and are subject to the technical product documentation and underlying product approvals published by Hilti from time to time, are subject to generic assumptions, and are not selected on a project- or design-specific basis. The proposed typical may therefore not meet the project- or design-specific requirements, and accordingly must be evaluated by the customer or by a relevant expert appointed by the customer for their suitability regarding the actual project-specific design criteria and requirements.

		Product Fire protection seal Hilti Firestop Bandage CFS-B	Building project
ID CFS-B_CLTW_NCP_8X001		Contents Fire protection seal in cross-laminated timber walls for non-combustible pipes	
Page 02	Rev 00		

① Installations

Item	Implementation	Description/Type	Dimensions [mm]	Firestopping material	Opening size [mm]	Annular gap	Pipe insulation	Penetration seal thickness [mm]
1	Non-combustible pipe	Copper, steel, stainless steel and cast iron	$\varnothing \leq 35 \times 1.2 \leq s^* \leq 14.2$	CFS-B	$\varnothing \leq 65$	CFS-S ACR 0-5 mm	Armaflex AF 2 13 mm	148
1	Non-combustible pipe	Copper, steel, stainless steel and cast iron	$\varnothing \leq 42 \times 1.5 \leq s^* \leq 14.2$	CFS-B	$\varnothing \leq 86$	CFS-S ACR 0-4 mm	Isover lamella matre ML3 20 mm	148

* Wall thickness

② Construction: This typical can be used for the following element types and Dataholz.eu systems

Element type	Leno cross-laminated timber according to ETA-10/0241 or Z-9.1-501 of Merk Timber GmbH, Aichach, Germany
Dataholz.eu	-

③ Firestop product info

- Hilti Firestop Bandage CFS-B
- European Technical Assessment: ETA-10/0212
 - German Approval aBG: Z-19.53-2210
 - Use for insulated non-combustible pipes
 - 2-ply application
 - Fill the remaining annular gap with Hilti CFS-S ACR Firestop Sealant from both sides to a depth of at least 5 mm

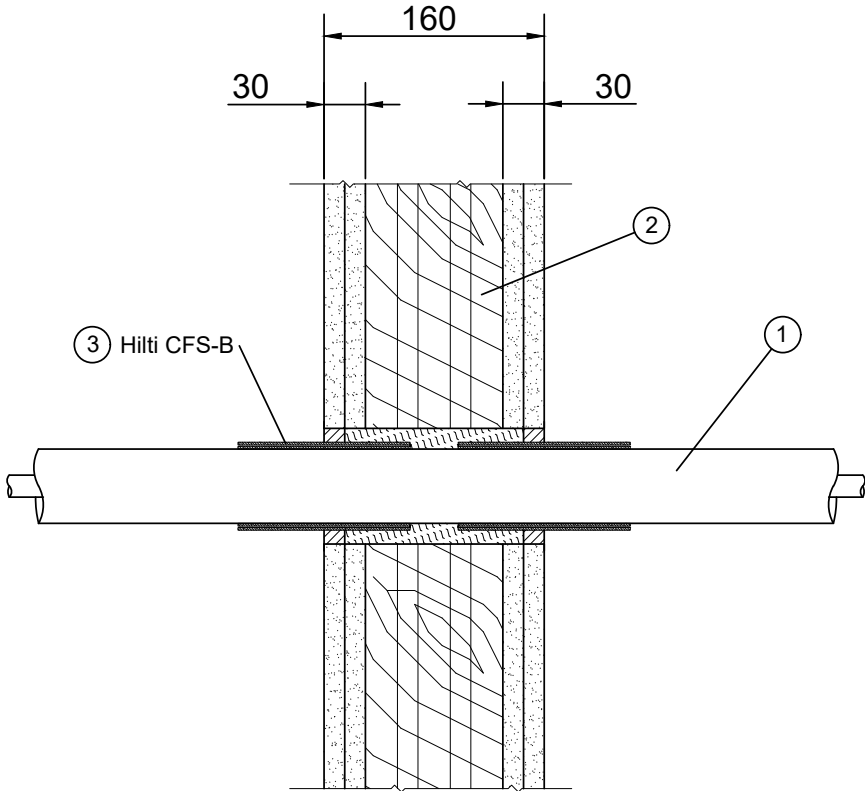
Distance between the openings or other installations

Distance of the penetration seal to	Size of openings next to each other [mm]	DIN distance between openings [mm]	EN distance between openings [mm]
Other cable or pipe penetration seals	One/both opening(s) > 400 x 400	≥ 200	≥ 50
	both openings ≤ 400 x 400	≥ 100	≥ 50
Other openings or installations	One/both opening(s) > 200 x 200	≥ 200	≥ 200
	both openings ≤ 200 x 200	≥ 100	≥ 100

A "typical" is a preconfigured firestopping solution consisting of specific components for a specific application, to which an assumed fire rating/integrity is assigned. Typical are selected according to their fire rating/integrity and are subject to the technical product documentation and underlying product approvals published by Hilti from time to time, are subject to generic assumptions, and are not selected on a project- or design-specific basis. The proposed typical may therefore not meet the project- or design-specific requirements, and accordingly must be evaluated by the customer or by a relevant expert appointed by the customer for their suitability regarding the actual project-specific design criteria and requirements.

		Product Fire protection seal Hilti Firestop Bandage CFS-B	Building project
ID CFS-B_CLTW_NCP_8X002		Contents Fire protection seal in cross-laminated timber walls for non-combustible pipes	
Page 01	Rev 01		

EI90 U/C



- German Approval aBG: Z-19.53-2210
- European Technical Assessment: ETA-10/0212
- Reaction to fire according to EN 13501-1
- Fire resistance according to EN 13501-1
- Installations according to the Hilti installation instructions

Not to scale
all units in [mm]

A "typical" is a preconfigured firestopping solution consisting of specific components for a specific application, to which an assumed fire rating/integrity is assigned. Typical are selected according to their fire rating/integrity and are subject to the technical product documentation and underlying product approvals published by Hilti from time to time, are subject to generic assumptions, and are not selected on a project- or design-specific basis. The proposed typical may therefore not meet the project- or design-specific requirements, and accordingly must be evaluated by the customer or by a relevant expert appointed by the customer for their suitability regarding the actual project-specific design criteria and requirements.

		Product Fire protection seal Hilti Firestop Bandage CFS-B	Building project
ID CFS-B_CLTW_NCP_8X002		Contents Fire protection seal in cross-laminated timber walls for non-combustible pipes	
Page 02	Rev 01		

① Installations

Item	Implementation	Description/Type	Dimensions [mm]	Firestopping material	Opening size [mm]	Annular gap	Pipe insulation	Penetration seal thickness [mm]
1	Aluminum composite pipe	Geberit Melpa	Ø 16 x 2.25	CFS-B	Ø 84	CFS-S ACR 0-15 mm	K-Flex ST, 19 mm	160
1	Non-combustible pipe	JRG Saniplex	Ø 16 x 2.2	CFS-B	Ø 45	CFS-S ACR 0-10 mm	PE foam with PE-protective layer, 6 mm	160

② Construction: This typical can be used for the following element types and Dataholz.eu systems

Element type	- BBS 100 according to ETA-06/0009 Binderholz Bausysteme GmbH, Fügen, Austria - Plasterboard 2 x 15 mm according to EN 520
Dataholz.eu	-

③ Firestop product info

- Hilti Firestop Bandage CFS-B
- European Technical Assessment: ETA-10/0212
 - German Approval aBG: Z-19.53-2210
 - Use for insulated non-combustible pipes
 - 2-ply application
 - Backfill remaining annular gap with mineral wool and fill with Hilti Firestop Sealant CFS-S ACR from both sides to a depth of at least 15 mm

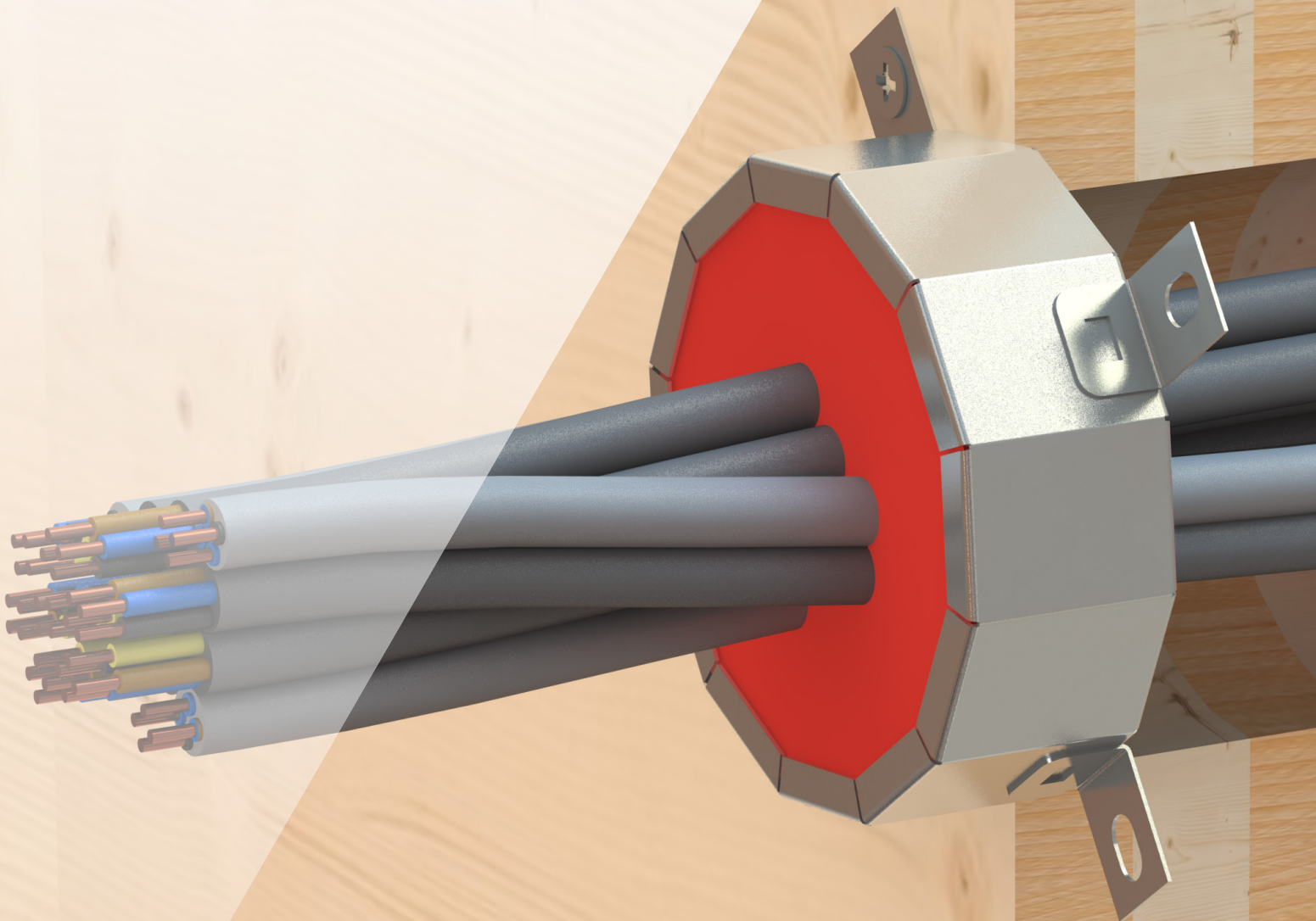
Distance between the openings or other installations

Distance of the penetration seal to	Size of openings next to each other [mm]	DIN distance between openings [mm]	EN distance between openings [mm]
Other cable or pipe penetration seals	One/both opening(s) > 400 x 400	≥ 200	≥ 50
	both openings ≤ 400 x 400	≥ 100	≥ 50
Other openings or installations	One/both opening(s) > 200 x 200	≥ 200	≥ 200
	both openings ≤ 200 x 200	≥ 100	≥ 100

A "typical" is a preconfigured firestopping solution consisting of specific components for a specific application, to which an assumed fire rating/integrity is assigned. Typical is selected according to their fire rating/integrity and are subject to the technical product documentation and underlying product approvals published by Hilti from time to time, are subject to generic assumptions, and are not selected on a project- or design-specific basis. The proposed typical may therefore not meet the project- or design-specific requirements, and accordingly must be evaluated by the customer or by a relevant expert appointed by the customer for their suitability regarding the actual project-specific design criteria and requirements.

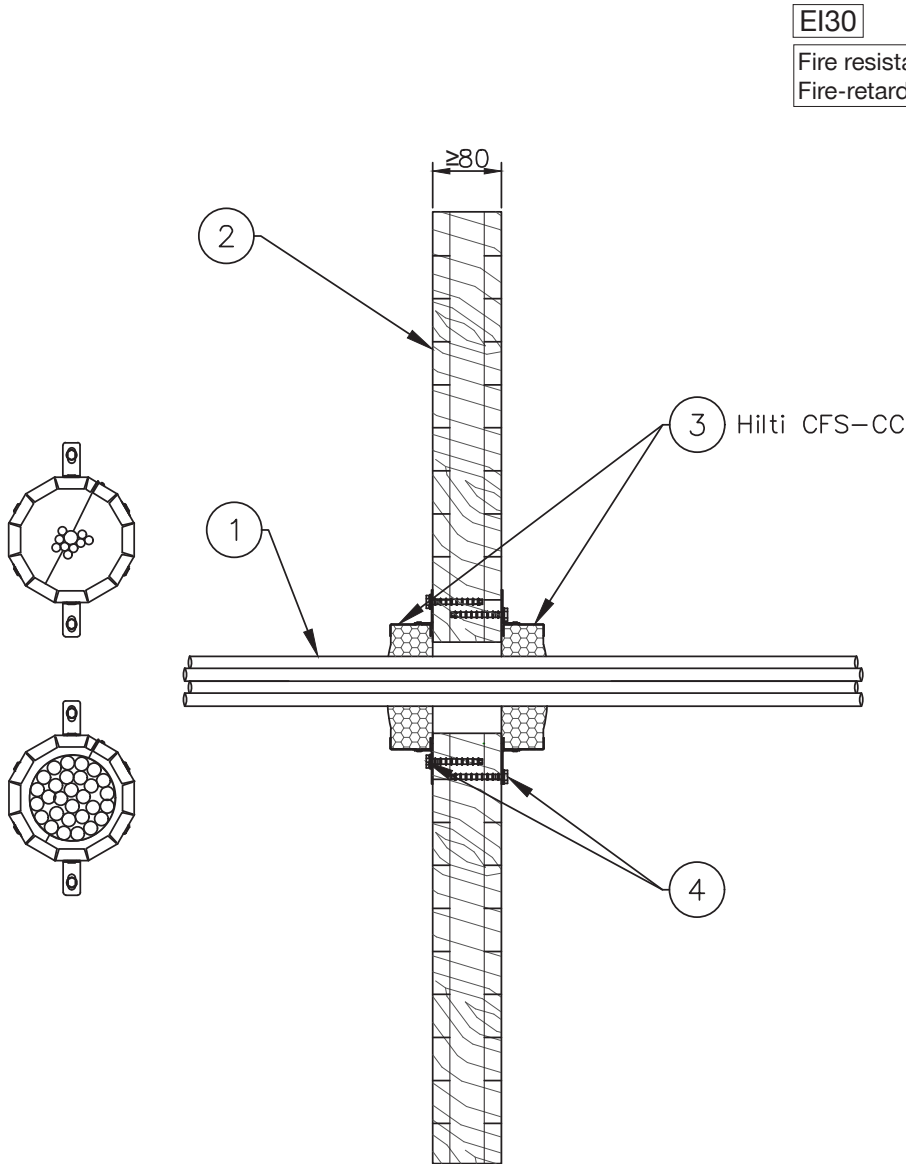
APPLICATIONS AND PRODUCTS

Wall applications: Electrical



Wall applications: Electrical

		Product Fire protection seal Hilti Firestop Cable Collar CFS-CC	Building project
ID	CFS-CC_CLTW_E_8X003	Contents Fire protection seal in cross-laminated timber walls for electrical cables and bundled cables	
Page	01	Rev	



EI30

Fire resistance 30 min. -
Fire-retardant

- German Approval aBG: Z-19.53-2282
- European Technical Assessment: ETA-13/0704
- Reaction to fire according to EN 13501-1
- Fire resistance according to EN 13501-2
- Installations according to the Hilti installation instructions

Not to scale
all units in [mm]

A "typical" is a preconfigured firestopping solution consisting of specific components for a specific application, to which an assumed fire rating/integrity is assigned. Typical are selected according to their fire rating/integrity and are subject to the technical product documentation and underlying product approvals published by Hilti from time to time, are subject to generic assumptions, and are not selected on a project- or design-specific basis. The proposed typical may therefore not meet the project- or design-specific requirements, and accordingly must be evaluated by the customer or by a relevant expert appointed by the customer for their suitability regarding the actual project-specific design criteria and requirements.

		Product Fire protection seal Hilti Firestop Cable Collar CFS-CC		Building project
ID CFS-CC_CLTW_E_8X003		Contents Fire protection seal in cross-laminated timber walls for electrical cables and bundled cables		
Page 02	Rev 03			

① Installations

Item	Implementation	Description/Type	Dimensions [mm]	Firestopping material	Opening size [mm]	Annular gap	Penetration seal thickness [mm]
1a	All kinds of electric cables	also fiber-optic cable outer waveguide cable	Ø ≤ 21	CFS-CC CFS-FIL	Ø 108	-	≥80
1b	bundled cables	also fiber-optic cable outer waveguide cable	Ø ≤ 100	CFS-CC CFS-FIL	Ø 108	-	≥80

② Construction: This application example applies in conjunction with "Appendix 1: Available approvals and documents"

The firestop functionality and fire rating/integrity of the wall must be considered separately.
The wall thicknesses shown correspond to the minimum thicknesses required by the tested penetration seal.

③ Firestop product info

Hilti Firestop Cable Collar CFS-CC

- European Technical Assessment: ETA-13/0704
- German Approval aBG: Z-19.53-2282
- Use for electric cables, cable bundles and empty conduits
- Fill all joints and gaps between the installations (especially the gussets between the cables) with Hilti CFS-FIL from both sides to a depth of at least 25 mm

Distances between installations [mm]

		Conduits		Cable/cable support structure	Reveal
		Single	Bundle		
Conduits	Single	-	-	-	-
	Bundle	-	-	-	-
Cable/cable support structure		-	-	0	0

Distance between the openings or installations

Distance of the penetration seal to	Size of openings next to each other [mm]	DIN distances between the openings [mm]	DIN distances between the openings [mm]
CFS-CC	max. Ø108	≥ 50	≥ 50
other cable or pipe penetration seals	One/both opening(s) > 400 x 400	≥ 200	≥ 200
	Both openings ≤ 400 x 400	≥100	≥ 200
Other openings or other installations	One/both opening(s) > 200 x 200	≥ 200	≥ 200
	Both openings ≤ 200 x 200	≥ 100	≥ 200

④ Fastening devices – see Appendix 2

A "typical" is a preconfigured firestopping solution consisting of specific components for a specific application, to which an assumed fire rating/integrity is assigned. Typical is selected according to their fire rating/integrity and are subject to the technical product documentation and underlying product approvals published by Hilti from time to time, are subject to generic assumptions, and are not selected on a project- or design-specific basis. The proposed typical may therefore not meet the project- or design-specific requirements, and accordingly must be evaluated by the customer or by a relevant expert appointed by the customer for their suitability regarding the actual project-specific design criteria and requirements.

HILTI		Product	Building project
		Fire protection seal Hilti Firestop Cable Collar CFS-CC	
ID CFS-CC_CLTW_E_8X004		Contents	
Page 02	Rev 03	Fire protection seal in cross-laminated timber walls for electrical cables and bundled cables	
EI60 Fire resistance 60 min. Highly fire-retardant Technical drawing illustrating the installation of the Hilti Firestop Cable Collar (CFS-CC) in a cross-laminated timber wall. The drawing shows a cross-section of the wall and the cable bundle. The cable bundle (1) is shown passing through the wall. The firestop collar (3) is installed around the cable bundle, secured with fasteners (4). The drawing also shows a cross-section of the collar (2) and a detail of the collar (4). Labels: 1: Cable bundle 2: Cross-section of the collar 3: Hilti CFS-CC 4: Fasteners Dimensions: ≥100 mm (width of the collar) Performance: - EI60 - Fire resistance 60 min. - Highly fire-retardant Not to scale all units in [mm]			

- German Approval aBG: Z-19.53-2282
- European Technical Assessment: ETA-13/0704
- Reaction to fire according to EN 13501-1
- Fire resistance according to EN 13501-2
- Installations according to the Hilti installation instructions

A "typical" is a preconfigured firestopping solution consisting of specific components for a specific application, to which an assumed fire rating/integrity is assigned. Typical is selected according to their fire rating/integrity and are subject to the technical product documentation and underlying product approvals published by Hilti from time to time, are subject to generic assumptions, and are not selected on a project- or design-specific basis. The proposed typical may therefore not meet the project- or design-specific requirements, and accordingly must be evaluated by the customer or by a relevant expert appointed by the customer for their suitability regarding the actual project-specific design criteria and requirements.

		Product Fire protection seal Hilti Firestop Cable Collar CFS-CC	Building project
ID	CFS-CC_CLTW_E_8X004	Contents Fire protection seal in cross-laminated timber walls for electrical cables and bundled cables	
Page	02	Rev 03	

① Installations

Item	Implementation	Description/Type	Dimensions [mm]	Firestopping material	Opening size [mm]	Annular gap	Penetration seal thickness [mm]
1a	All kinds of electric cables	also fiber-optic cable outer waveguide cable	Ø ≤ 21	CFS-CC CFS-FIL	Ø 108		≥100
1b	bundled cables	also fiber-optic cable outer waveguide cable	Ø ≤ 100	CFS-CC CFS-FIL	Ø 108		≥100

② Construction: This application detail applies in conjunction with "Appendix 1: Available approvals and documents"

The firestop functionality and fire rating/integrity of the wall must be considered separately.
The wall thicknesses shown correspond to the minimum thicknesses required by the tested penetration seal.

③ Firestop product info

Hilti Firestop Cable Collar CFS-CC

- European Technical Assessment: ETA-13/0704
- German Approval aBG: Z-19.53-2282
- Use for electric cables, cable bundles and empty conduits
- Fill all joints and gaps between the installations (especially the gussets between the cables) with Hilti CFS-FIL from both sides to a depth of at least 25 mm

Distances to Hilti individual systems [mm] (opening to opening)	CFS-CC (cable)	CFS-S ACR (aluminum composite pipes) (U/C)	CFS-S ACR (metal pipes) (C/U)	CFS-C EL (U/U and KG1*)	CFS-B (aluminum composite pipes) (U/C)	CFS-SL GA (DE)
CFS-CC (cable)	50	50	50	50	50	50
CFS-S ACR (aluminum composite pipes) (U/C)		50	50	50	50	50
CFS-S ACR (metal pipes) (C/U)			50	50	50	50
CFS-C EL (U/U and KG1*)				50	50	50
CFS-B (aluminum composite pipes) (U/C)					50	50
CFS-SL GA (DE)						50

Distance of the penetration seal to	Size of openings next to each other [mm]	DIN distances between the openings [mm]	DIN distances between the openings [mm]
CFS-CC	max. Ø108	≥ 50	≥ 50
Other cable or pipe penetration seals	One/both opening(s) > 400 x 400	≥ 200	≥ 200
	Both openings ≤ 400 x 400	≥100	≥ 200
Other openings or other installations	One/both opening(s) > 200 x 200	≥ 200	≥ 200
	Both openings ≤ 200 x 200	≥100	≥ 200

*Construction group 1

Distances between installations [mm]

	Conduits		Cable/cable support structure	Reveal
	Single	Bundle		
Conduits	Single	-	-	-
	Bundle	-	-	-
Cable/cable support structure		-	0	0

④ Fastening devices – see Appendix 2

A "typical" is a preconfigured firestopping solution consisting of specific components for a specific application, to which an assumed fire rating/integrity is assigned. Typical is selected according to their fire rating/integrity and are subject to the technical product documentation and underlying product approvals published by Hilti from time to time, are subject to generic assumptions, and are not selected on a project- or design-specific basis. The proposed typical may therefore not meet the project- or design-specific requirements, and accordingly must be evaluated by the customer or by a relevant expert appointed by the customer for their suitability regarding the actual project-specific design criteria and requirements.

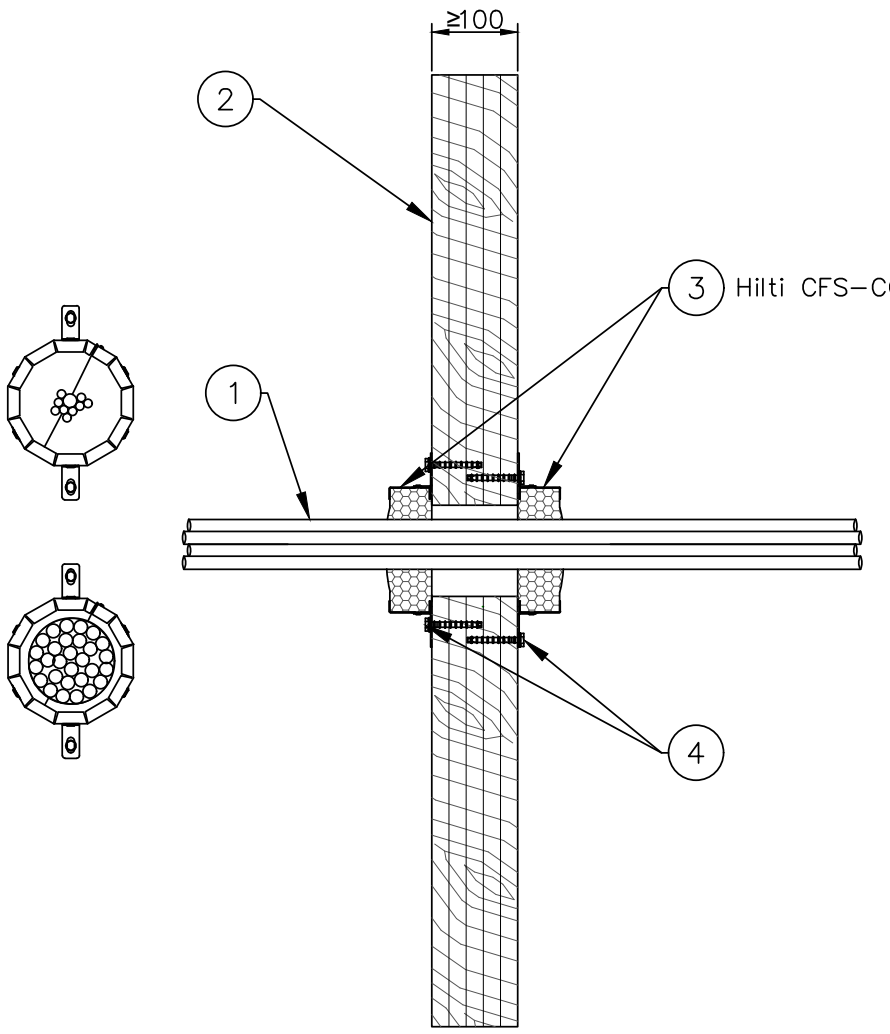
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Fire protection in timber construction / cross-laminated timber

Wall applications: Electrical

		Product Fire protection seal Hilti Firestop Cable Collar CFS-CC	Building project
ID	CFS-CC_CLTW_E_8X904	Contents Fire protection seal in cross-laminated timber walls for electrical cables and bundled cables	
Page	01	Rev 03	

EI90
Fire resistance 90 min. -
Fire-resistant



Basic documents, which form the respective proof of applicability

- German Approval aBG: Z-19.53-2282
- European Technical Assessment: ETA-13/0704
- Reaction to fire according to EN 13501-1
- Fire resistance according to EN 13501-2
- Installations according to the Hilti installation instructions

Not to scale
all units in [mm]

A "typical" is a preconfigured firestopping solution consisting of specific components for a specific application, to which an assumed fire rating/integrity is assigned. Typical is selected according to their fire rating/integrity and are subject to the technical product documentation and underlying product approvals published by Hilti from time to time, are subject to generic assumptions, and are not selected on a project- or design-specific basis. The proposed typical may therefore not meet the project- or design-specific requirements, and accordingly must be evaluated by the customer or by a relevant expert appointed by the customer for their suitability regarding the actual project-specific design criteria and requirements.

Fire protection in timber construction / cross-laminated timber

159

		Product Fire protection seal Hilti Firestop Cable Collar CFS-CC	Building project
ID	CFS-CC_CLTW_E_8X904	Contents Fire protection seal in cross-laminated timber walls for electrical cables and bundled cables	
Page	01	Rev 03	

① Installations

Item	Implementation	Description/Type	Dimensions [mm]	Firestopping material	Opening size [mm]	Annular gap	Penetration seal thickness [mm]
1a	All kinds of electric cables	also fiber-optic cable outer waveguide cable	Ø ≤ 21	CFS-CC CFS-FIL	Ø 108		≥100
1b	bundled cables	also fiber-optic cable outer waveguide cable	Ø ≤ 100	CFS-CC CFS-FIL	Ø 108		≥100

② Construction: This application detail applies in conjunction with "Appendix 1: Available approvals and documents"

The firestop functionality and fire rating/integrity of the wall must be considered separately.
The wall thicknesses shown correspond to the minimum thicknesses required by the tested penetration seal.

③ Firestop product info

- Hilti Firestop Cable Collar CFS-CC
- European Technical Assessment: ETA-13/0704
 - German Approval aBG: Z-19.53-2282
 - Use for electric cables, cable bundles and empty conduits
 - Fill all joints and gaps between the installations (especially the gussets between the cables) with Hilti CFS-FIL from both sides to a depth of at least 25 mm

Distances between installations [mm]

		Conduits		Cable/cable support structure	Reveal
		Single	Bundle		
Conduits	Single	-	-	-	-
	Bundle	-	-	-	-
Cable/cable support structure		-	-	0	0

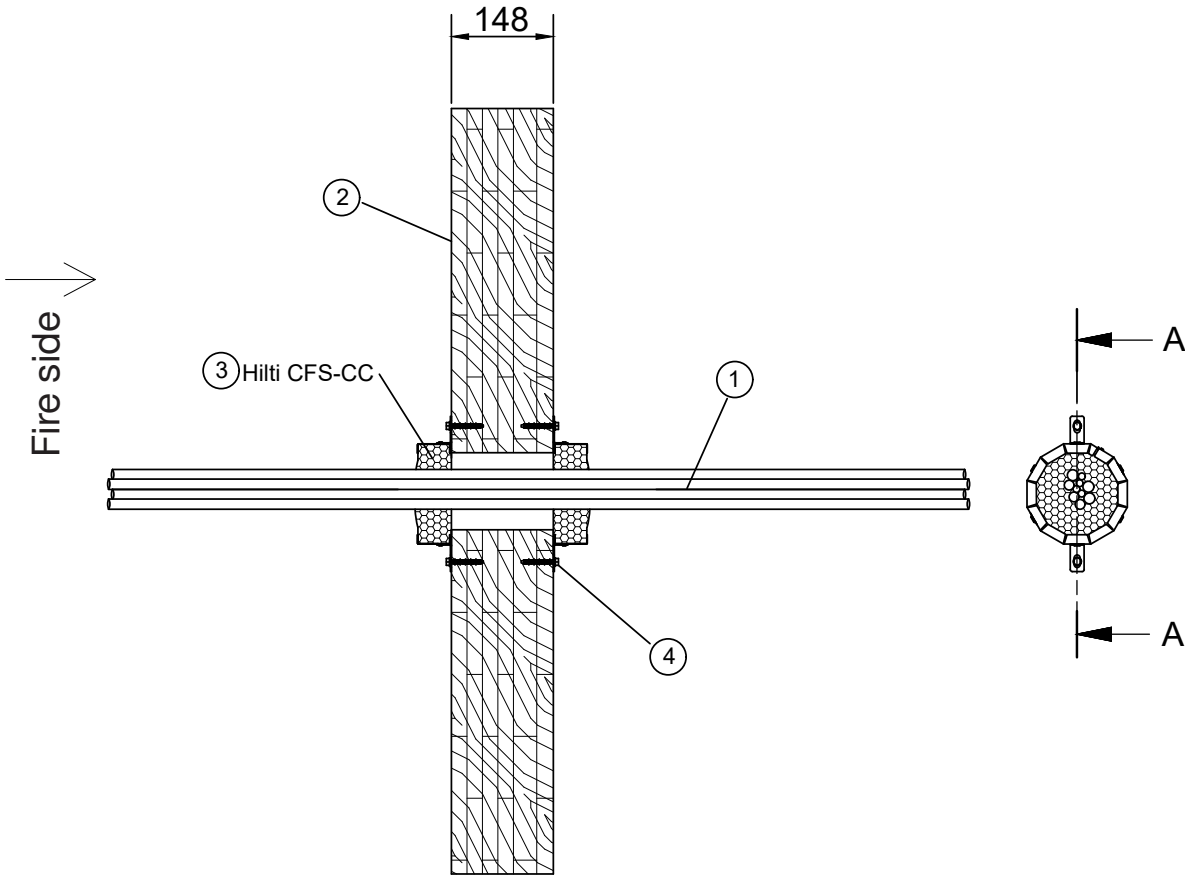
Distance between the openings or installations

Distance of the penetration seal to	Size of openings next to each other [mm]	DIN distances between the openings [mm]	EN distances between the openings [mm]
CFS-CC	max. Ø108	≥ 50	≥ 50
other cable or pipe penetration seals	One/both opening(s) > 400 x 400	≥ 200	≥ 200
	Both openings ≤ 400 x 400	≥100	≥ 200
Other openings or other installations	One/both opening(s) > 200 x 200	≥ 200	≥ 200
	Both openings ≤ 200 x 200	≥ 100	≥ 200

④ Fastening device with attachment 2

		Product Fire protection seal Hilti cable collar CFS-CC	Building project
ID	CFS-CC_CLTW_C_8X001	Contents Firestopping in cross-laminated timber walls for electrical cables	
Page	01	Rev 00	

E190



- German Approval aBG: Z-19.53-2282
- European Technical Assessment: ETA-13/0704
- Reaction to fire according to EN 13501-1
- Fire resistance according to EN 13501-1
- Installations according to the Hilti installation instructions

Not to scale
all units in [mm]

A "typical" is a preconfigured firestopping solution consisting of specific components for a specific application, to which an assumed fire rating/integrity is assigned. Typical is selected according to their fire rating/integrity and are subject to the technical product documentation and underlying product approvals published by Hilti from time to time, are subject to generic assumptions, and are not selected on a project- or design-specific basis. The proposed typical may therefore not meet the project- or design-specific requirements, and accordingly must be evaluated by the customer or by a relevant expert appointed by the customer for their suitability regarding the actual project-specific design criteria and requirements.

A "typical" is a preconfigured firestopping solution consisting of specific components for a specific application, to which an assumed fire rating/integrity is assigned. Typical is selected according to their fire rating/integrity and are subject to the technical product documentation and underlying product approvals published by Hilti from time to time, are subject to generic assumptions, and are not selected on a project- or design-specific basis. The proposed typical may therefore not meet the project- or design-specific requirements, and accordingly must be evaluated by the customer or by a relevant expert appointed by the customer for their suitability regarding the actual project-specific design criteria and requirements.

HILTI		Product Fire protection seal Hilti cable collar CFS-CC		Building project
ID CFS-CC_CLTW_C_8X001		Contents Firestopping in cross-laminated timber walls for electrical cables		
Page 02	Rev 00			

① Installations

Item	Implementation	Description/Type	Dimensions [mm]	Firestopping material	Opening size [mm]	Penetration seal thickness [mm]
1	Electric cables type	also fiber-optic cable outer waveguide cable	Ø ≤ 21	CFS-CC / CFS-FIL	Ø 108	148

② Construction: This typical can be used for the following element types and Dataholz.eu systems

Element type	Leno cross-laminated timber according to ETA-10/0241 or Z-9.1-501 of Merk Timber GmbH, Aichach, Germany
Dataholz.eu	-

③ Firestop product info

Hilti Firestop Cable Collar CFS-CC

- European Technical Assessment: ETA-13/0704

- German Approval aBG: Z-19.53-2282

- Use for electric cables, cable bundles and empty conduits

- Fill all joints and gaps between the installations (especially the gussets between the cables) with Hilti CFS-FIL from both sides to a depth of at least 20 mm

Distances between installations [mm]

		Conduits		Cable/cable support structures	Reveal
		Single	Bundle		
Conduits	Single	-	-	-	-
	Bundle	-	-	-	-
Cable/cable support structures		-	-	0	10

Distance between the openings or installations

Distance of the penetration seal to	Size of openings next to each other [mm]	DIN distance between openings [mm]	EN distance between openings [mm]
other cable or pipe penetration seals	One/both opening(s) > 400 x 400	≥ 200	≥ 50
	Both openings ≤ 400 x 400	≥ 100	≥ 50
Other openings or other installations	One/both opening(s) > 200 x 200	≥ 200	≥ 200
	Both openings ≤ 200 x 200	≥ 100	≥ 100

④ Fastening material

Type	Length [mm]
HUS-H 6	≤ 85

A "typical" is a preconfigured firestopping solution consisting of specific components for a specific application, to which an assumed fire rating/integrity is assigned. Typical is selected according to their fire rating/integrity and are subject to the technical product documentation and underlying product approvals published by Hilti from time to time, are subject to generic assumptions, and are not selected on a project- or design-specific basis. The proposed typical may therefore not meet the project- or design-specific requirements, and accordingly must be evaluated by the customer or by a relevant expert appointed by the customer for their suitability regarding the actual project-specific design criteria and requirements.

HILTI		Product Fire protection seal Hilti firestop sleeve CFS-SL GA	Building project
ID CFS-SL GA_CLTW_E_8X003		Contents Fire protection seal in cross-laminated timber walls for electrical cables and bundled cables	
Page 01	Rev 03		
			EI30 Fire resistance 30 min. - Fire-retardant
1 2 3 ≥80 Hilti CFS-SL GA M/L			
- German Approval aBG: Z-19.53-2318 - European Technical Assessment: ETA-17/0081 - Reaction to fire according to EN 13501-1 - Fire resistance according to EN 13501-2 - Installations according to the Hilti installation instructions Not to scale all units in [mm]			

A "typical" is a preconfigured firestopping solution consisting of specific components for a specific application, to which an assumed fire rating/integrity is assigned. Typical is selected according to their fire rating/integrity and are subject to the technical product documentation and underlying product approvals published by Hilti from time to time, are subject to generic assumptions, and are not selected on a project- or design-specific basis. The proposed typical may therefore not meet the project- or design-specific requirements, and accordingly must be evaluated by the customer or by a relevant expert appointed by the customer for their suitability regarding the actual project-specific design criteria and requirements.

		Product Fire protection seal Hilti firestop sleeve CFS-SL GA	Building project
ID CFS-SL GA_CLTW_E_8X003		Contents Fire protection seal in cross-laminated timber walls for electrical cables and bundled cables	
Page 02	Rev 03		

① Installations

Item	Implementation	Description/Type	Dimensions [mm]	Firestopping material	Opening size [mm]	Annular gap	Penetration seal thickness [mm]
1a	Electric cables type	also fiber-optic cable outer waveguide cable	$\varnothing \leq 21$	CFS-SL GA M DIN / EN	$\varnothing \leq 115$	≤ 2.5 mm	≥ 80
1b	bundled cables	also fiber-optic cable outer waveguide cable	Sleeve filled up to 100%, consisting of: Single cables with $\varnothing \leq 21$	CFS-SL GA M DIN / EN	$\varnothing \leq 115$	≤ 2.5 mm	≥ 80
1c	Electric cables type	also fiber-optic cable outer waveguide cable	$\varnothing \leq 21$	CFS-SL GA L DIN / EN	$\varnothing \leq 115$	≤ 2.5 mm	≥ 80
1d	bundled cables	also fiber-optic cable outer waveguide cable	Sleeve filled up to 100%, consisting of: Single cables with $\varnothing \leq 21$	CFS-SL GA L DIN / EN	$\varnothing \leq 115$	≤ 2.5 mm	≥ 80

② Construction: This application detail applies in conjunction with "Appendix 1: Available approvals and documents"

The firestop functionality and fire rating/integrity of the wall must be considered separately.
The wall thicknesses shown correspond to the minimum thicknesses required by the tested penetration seal.

③ Firestop product info

- Hilti firestop sleeve CFS-SL GA M/L
- European Technical Assessment: ETA-17/0081
 - German Approval aBG: Z-19.53-2318
 - Use for electrical cables and bundled cables

Distance between the openings or installations

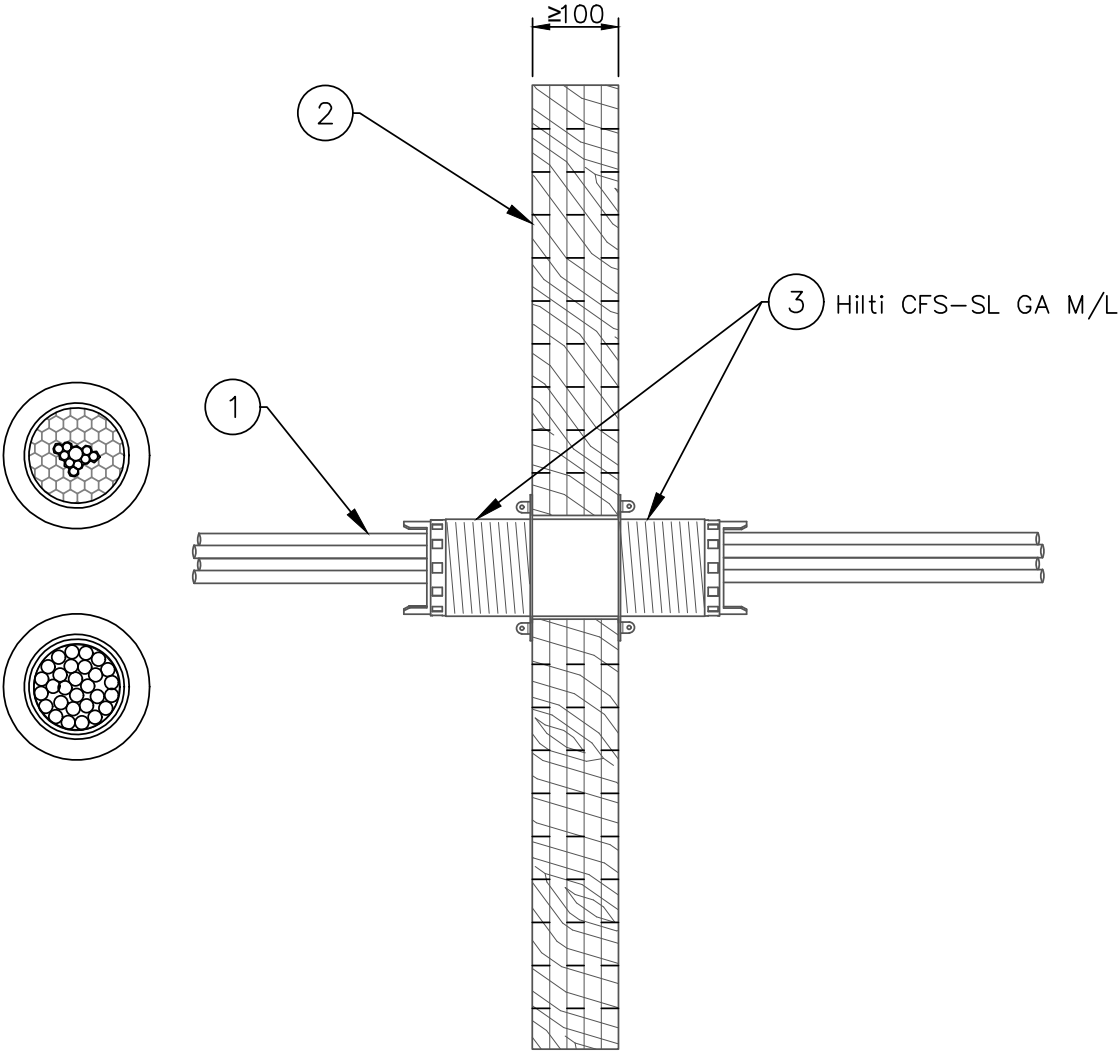
Distance of the penetration seal to	Size of openings next to each other [mm]	DIN distances between the openings [mm]	EN distances between the openings [mm]
CFS-SL GA	One/both opening(s) $\varnothing \leq 115$	≥ 50	≥ 50
other cable or pipe penetration seals	One/both opening(s) $> 400 \times 400$	≥ 200	≥ 200
	Both openings $\leq 400 \times 400$	≥ 100	≥ 200
Other openings or other installations	One/both opening(s) $> 200 \times 200$	≥ 200	≥ 200
	Both openings $\leq 200 \times 200$	≥ 100	≥ 200

A "typical" is a preconfigured firestopping solution consisting of specific components for a specific application, to which an assumed fire rating/integrity is assigned. Typical is selected according to their fire rating/integrity and are subject to the technical product documentation and underlying product approvals published by Hilti from time to time, are subject to generic assumptions, and are not selected on a project- or design-specific basis. The proposed typical may therefore not meet the project- or design-specific requirements, and accordingly must be evaluated by the customer or by a relevant expert appointed by the customer for their suitability regarding the actual project-specific design criteria and requirements.

		Product Fire protection seal Hilti firestop sleeve CFS-SL GA	Building project
ID CFS-SL GA_CLTW_E_8X004		Contents Fire protection seal in cross-laminated timber walls for electrical cables and bundled cables	
Page 01	Rev 03		

EI60

Fire resistance 30 min.
Highly fire-retardant



- German Approval aBG: Z-19.53-2318
- European Technical Assessment ETA-17/0081
- Reaction to fire according to EN 13501-1
- Fire resistance according to EN 13501-2
- Installations according to the Hilti installation instructions

Not to scale
all units in [mm]

A "typical" is a preconfigured firestopping solution consisting of specific components for a specific application, to which an assumed fire rating/integrity is assigned. Typical is selected according to their fire rating/integrity and are subject to the technical product documentation and underlying product approvals published by Hilti from time to time, are subject to generic assumptions, and are not selected on a project- or design-specific basis. The proposed typical may therefore not meet the project- or design-specific requirements, and accordingly must be evaluated by the customer or by a relevant expert appointed by the customer for their suitability regarding the actual project-specific design criteria and requirements.

		Product Fire protection seal Hilti firestop sleeve CFS-SL GA	Building project
ID CFS-SL GA_CLTW_E_8X004		Contents Fire protection seal in cross-laminated timber walls for electrical cables and bundled cables	
Page 02	Rev 03		

① Installations

Item	Implementation	Description/Type	Dimensions [mm]	Firestopping material	Opening size [mm]	Annular gap	Penetration seal thickness [mm]
1a	Electric cables type	also fiber-optic cable outer waveguide cable	$\varnothing \leq 21$	CFS-SL GA M DIN / EN	$\varnothing \leq 115$	2.5 mm	≥ 100
1b	bundled cables	also fiber-optic cable outer waveguide cable	Sleeve filled up to 100%, consisting of: Single cables with $\varnothing \leq 21$	CFS-SL GA M DIN / EN	$\varnothing \leq 115$	≤ 2.5 mm	≥ 100
1c	Electric cables type	also fiber-optic cable outer waveguide cable	$\varnothing \leq 21$	CFS-SL GA L DIN / EN	$\varnothing \leq 115$	≤ 2.5 mm	≥ 100
1d	bundled cables	also fiber-optic cable outer waveguide cable	Sleeve filled up to 100%, consisting of: Single cables with $\varnothing \leq 21$	CFS-SL GA L DIN / EN	$\varnothing \leq 115$	≤ 2.5 mm	≥ 100

② Construction: This application detail applies in conjunction with "Appendix 1: Available approvals and documents"

The firestop functionality and fire rating/integrity of the wall must be considered separately.
The wall thicknesses shown correspond to the minimum thicknesses required by the tested penetration seal.

③ Firestop product info

- Hilti firestop sleeve CFS-SL GA M/L
- European Technical Assessment: ETA-17/0081
 - German Approval aBG: Z-19.53-2318
 - Use for electrical cables and bundled cables

Distance between the openings or installations

Distances to Hilti individual systems [mm] (opening to opening)	CFS-CC (cable)	CFS-S ACR (aluminum composite pipes) (U/C)	CFS-S ACR (metal pipes) (C/U)	CFS-C EL (U/U and KG1*)	CFS-B (aluminum composite pipes) (U/C)	CFS-SL GA (DE)
CFS-CC (cable)	50	50	50	50	50	50
CFS-S ACR (aluminum composite pipes) (U/C)		50	50	50	50	50
CFS-S ACR (metal pipes) (C/U)			50	50	50	50
CFS-C EL (U/U and KG1*)				50	50	50
CFS-B (aluminum composite pipes) (U/C)					50	50
CFS-SL GA (DE)						50

*Construction group 1

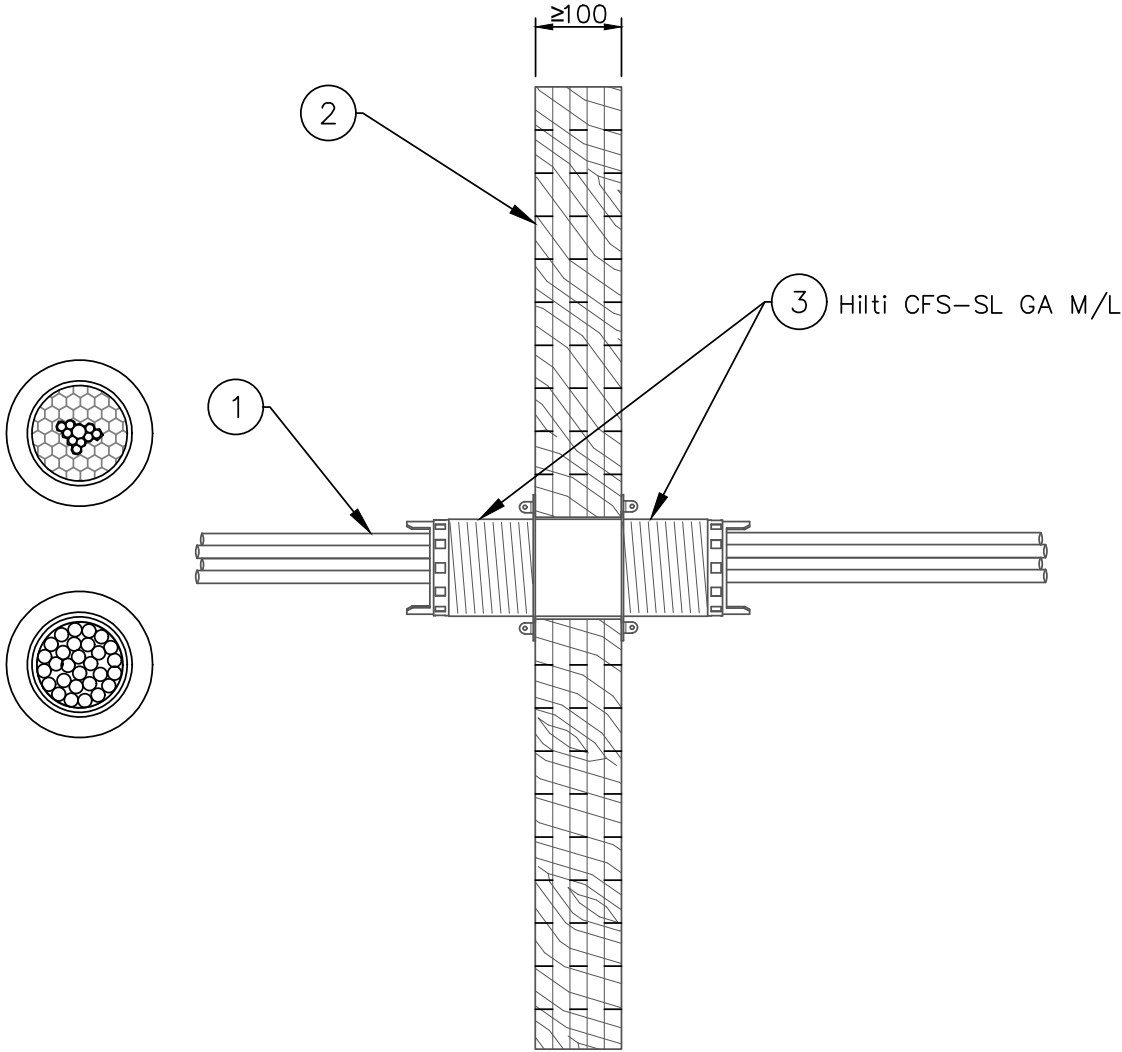
Distance of the penetration seal to	Size of openings next to each other [mm]	DIN distances between the openings [mm]	EN distances between the openings [mm]
other cable or pipe penetration seals	One/both opening(s) > 400 x 400	≥ 200	≥ 200
	Both openings $\leq 400 \times 400$	≥ 100	≥ 200
Other openings or other installations	One/both opening(s) > 200 x 200	≥ 200	≥ 200
	Both openings $\leq 200 \times 200$	≥ 100	≥ 200

A "typical" is a preconfigured firestopping solution consisting of specific components for a specific application, to which an assumed fire rating/integrity is assigned. Typical is selected according to their fire rating/integrity and are subject to the technical product documentation and underlying product approvals published by Hilti from time to time, are subject to generic assumptions, and are not selected on a project- or design-specific basis. The proposed typical may therefore not meet the project- or design-specific requirements, and accordingly must be evaluated by the customer or by a relevant expert appointed by the customer for their suitability regarding the actual project-specific design criteria and requirements.

		Product Fire protection seal Hilti firestop sleeve CFS-SL GA	Building project
ID CFS-SL GA DE_CLTW_E_8X904		Contents Fire protection seal in cross-laminated timber walls for electrical cables and bundled cables	
Page 01	Rev 03		

EI90

Fire resistance 90 min.
fire-resistant



- German Approval aBG: Z-19.53-2318
- European Technical Assessment: ETA-17/0081
- Reaction to fire according to EN 13501-1
- Fire resistance according to EN 13501-2
- Installations according to the Hilti installation instructions

Not to scale
all units in [mm]

A "typical" is a preconfigured firestopping solution consisting of specific components for a specific application, to which an assumed fire rating/integrity is assigned. Typical is selected according to their fire rating/integrity and are subject to the technical product documentation and underlying product approvals published by Hilti from time to time, are subject to generic assumptions, and are not selected on a project- or design-specific basis. The proposed typical may therefore not meet the project- or design-specific requirements, and accordingly must be evaluated by the customer or by a relevant expert appointed by the customer for their suitability regarding the actual project-specific design criteria and requirements.

		Product Fire protection seal Hilti firestop sleeve CFS-SL GA	Building project
ID CFS-SL GA DE_CLTW_E_8X904		Contents Fire protection seal in cross-laminated timber walls for electrical cables and bundled cables	
Page 02	Rev 03		

① Installations

Item	Implementation	Description/Type	Dimensions [mm]	Firestopping material	Opening size [mm]	Annular gap	Penetration seal thickness [mm]
1a	Electric cables type	also fiber-optic cable outer waveguide cable	$\varnothing \leq 21$	CFS-SL GA M DIN / EN	$\varnothing \leq 115$	2.5 mm	≥ 100
1b	bundled cables	also fiber-optic cable outer waveguide cable	Sleeve filled up to 100%, consisting of: Single cables with $\varnothing \leq 21$	CFS-SL GA M DIN / EN	$\varnothing \leq 115$	≤ 2.5 mm	≥ 100
1c	Electric cables type	also fiber-optic cable outer waveguide cable	$\varnothing \leq 21$	CFS-SL GA L DIN / EN	$\varnothing \leq 115$	≤ 2.5 mm	≥ 100
1d	bundled cables	also fiber-optic cable outer waveguide cable	Sleeve filled up to 100%, consisting of: Single cables with $\varnothing \leq 21$	CFS-SL GA L DIN / EN	$\varnothing \leq 115$	≤ 2.5 mm	≥ 100

② Construction: This application detail applies in conjunction with "Appendix 1: Available approvals and documents"

The firestop functionality and fire rating/integrity of the wall must be considered separately.
The wall thicknesses shown correspond to the minimum thicknesses required by the tested penetration seal.

③ Firestop product info

- Hilti firestop sleeve CFS-SL GA M/L
- European Technical Assessment: ETA-17/0081
 - German Approval aBG: Z-19.53-2318
 - Use for electrical cables and bundled cables

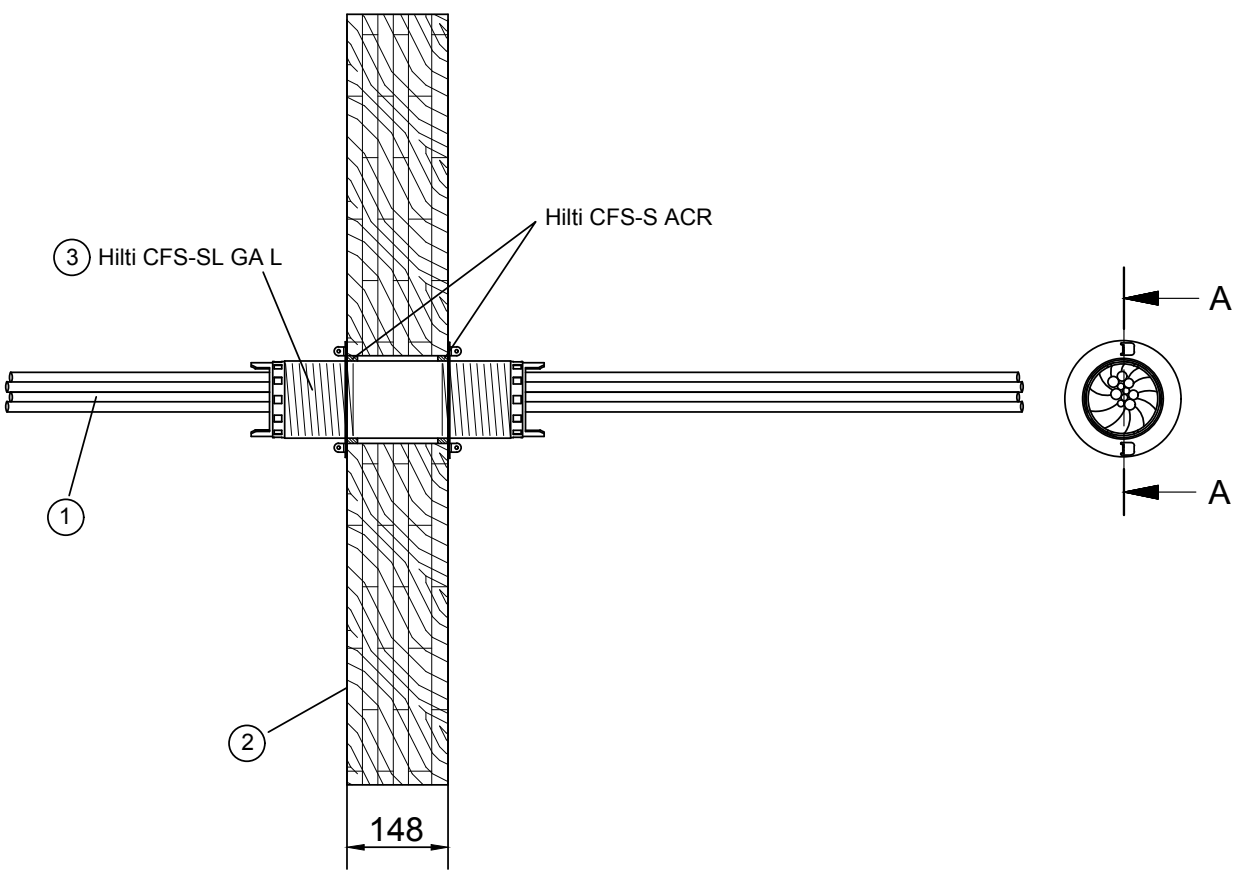
Distance between the openings or installations

Distance of the penetration seal to	Size of openings next to each other [mm]	DIN distances between the openings [mm]	EN distances between the openings [mm]
CFS-SL GA	One/both opening(s) $\varnothing \leq 115$	≥ 50	≥ 50
other cable or pipe penetration seals	One/both opening(s) $> 400 \times 400$	≥ 200	≥ 200
	Both openings $\leq 400 \times 400$	≥ 100	≥ 200
Other openings or other installations	One/both opening(s) $> 200 \times 200$	≥ 200	≥ 200
	Both openings $\leq 200 \times 200$	≥ 100	≥ 200

A "typical" is a preconfigured firestopping solution consisting of specific components for a specific application, to which an assumed fire rating/integrity is assigned. Typical is selected according to their fire rating/integrity and are subject to the technical product documentation and underlying product approvals published by Hilti from time to time, are subject to generic assumptions, and are not selected on a project- or design-specific basis. The proposed typical may therefore not meet the project- or design-specific requirements, and accordingly must be evaluated by the customer or by a relevant expert appointed by the customer for their suitability regarding the actual project-specific design criteria and requirements.

		Product Fire protection seal Hilti firestop sleeve CFS-SL GA	Building project
ID CFS-SL GA_CLTW_C_8X001		Contents Fire protection seal in cross-laminated timber walls for electrical cables and bundled cables	
Page 01	Rev 00		

EI90



- European Technical Assessment: ETA-17/0081
- German Approval aBG: Z-19.53-2318
- Reaction to fire according to EN 13501-1
- Fire resistance according to EN 13501-1
- Installations according to the Hilti installation instructions

Not to scale
all units in [mm]

A "typical" is a preconfigured firestopping solution consisting of specific components for a specific application, to which an assumed fire rating/integrity is assigned. Typical is selected according to their fire rating/integrity and are subject to the technical product documentation and underlying product approvals published by Hilti from time to time, are subject to generic assumptions, and are not selected on a project- or design-specific basis. The proposed typical may therefore not meet the project- or design-specific requirements, and accordingly must be evaluated by the customer or by a relevant expert appointed by the customer for their suitability regarding the actual project-specific design criteria and requirements.

		Product Fire protection seal Hilti firestop sleeve CFS-SL GA	Building project
ID CFS-SL GA_CLTW_C_8X001		Contents Firestopping in cross-laminated timber walls for electrical cables	
Page 02	Rev 00		

① Installations

Item	Implementation	Description/Type	Dimensions [mm]	Firestopping material	Opening size [mm]	Annular gap	Penetration seal thickness [mm]
1	Electric cables type	also fiber-optic cable outer waveguide cable	$\varnothing \leq 21$	CFS-SL GA L	$\varnothing 120$	CFS-S ACR 0-7 mm	148

② Construction: This typical can be used for the following element types and Dataholz.eu systems

Element type	Leno cross-laminated timber according to ETA-10/0241 or Z-9.1-501 of Merk Timber GmbH, Aichach, Germany
Dataholz.eu	-

③ Firestop product info

- European Technical Assessment: ETA-17/0081
- German Approval aBG: Z-19.53-2318
- Use for electric cables, cable bundles and empty conduits
- Fill the remaining annular gap with Hilti CFS-S ACR Firestop Sealant from both sides to a depth of at least 20 mm

Distances between installations [mm]

		Conduits		Cable/cable support structures	Reveal
		Single	Bundle		
Conduits	Single	-	-	-	-
	Bundle	-	-	-	-
Cable/cable support structures		-	-	0	20

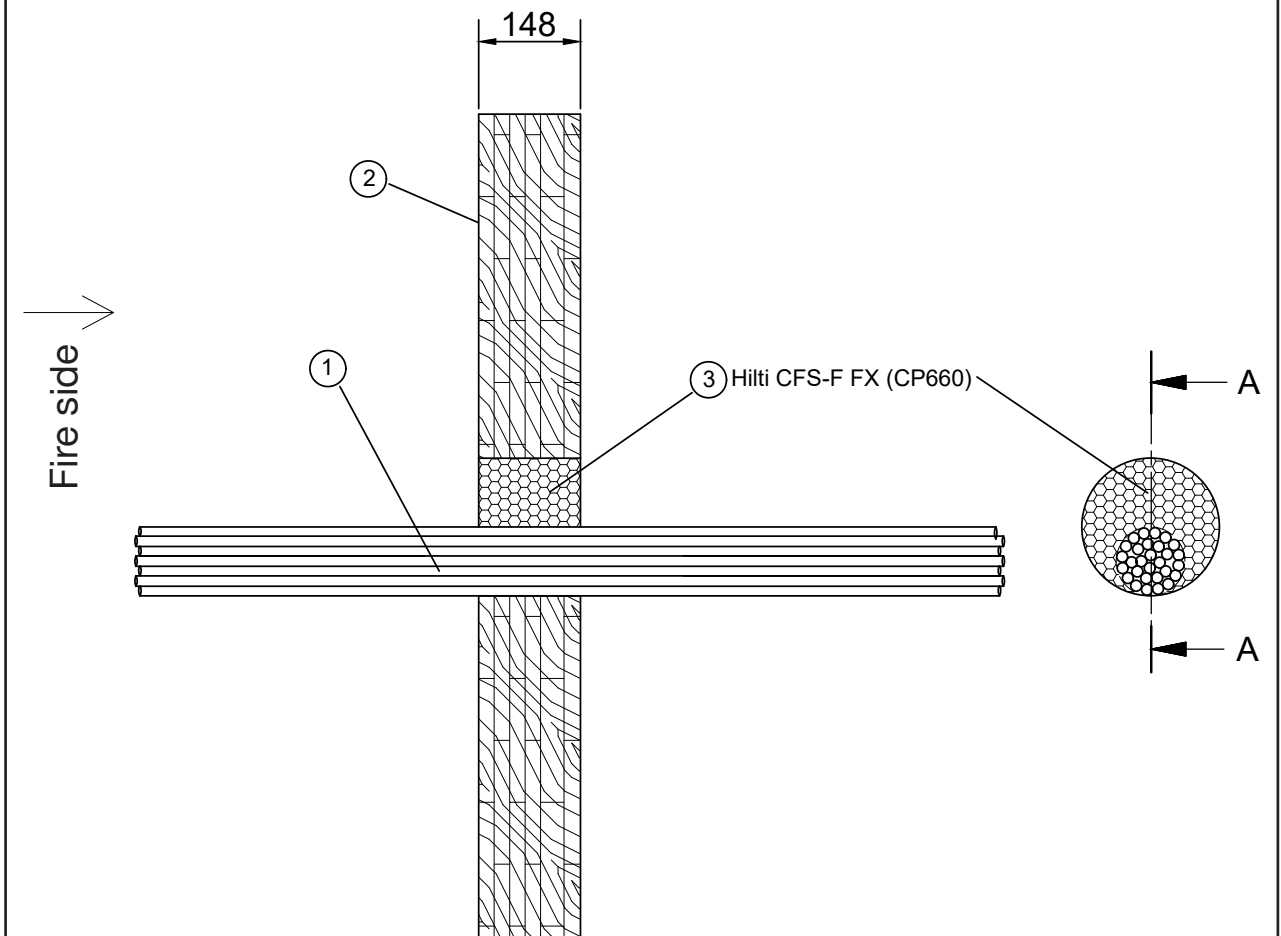
Distance between the openings or installations

Distance of the penetration seal to	Size of openings next to each other [mm]	DIN distance between openings [mm]	EN distance between openings [mm]
other cable or pipe penetration seals	One/both opening(s) > 400 x 400	≥ 200	≥ 50
	Both openings ≤ 400 x 400	≥ 100	≥ 50
Other openings or other installations	One/both opening(s) > 200 x 200	≥ 200	≥ 200
	Both openings ≤ 200 x 200	≥ 100	≥ 100

A "typical" is a preconfigured firestopping solution consisting of specific components for a specific application, to which an assumed fire rating/integrity is assigned. Typical's are selected according to their fire rating/integrity and are subject to the technical product documentation and underlying product approvals published by Hilti from time to time, are subject to generic assumptions, and are not selected on a project- or design-specific basis. The proposed typical's may therefore not meet the project- or design-specific requirements, and accordingly must be evaluated by the customer or by a relevant expert appointed by the customer for their suitability regarding the actual project-specific design criteria and requirements.

		Product Fire protection seal Hilti Firestop Foam CFS-F FX	Building project
ID CFS-F FX_CLTW_E_8X001		Contents Fire protection seal in cross-laminated timber walls for electrical cables and bundled cables	
Page 01	Rev 00		

E160



- German Approval aBG: Z-19.15-1901
- European Technical Assessment: ETA-10/0109
- Reaction to fire according to EN 13501-1
- Fire resistance according to EN 13501-1
- Installations according to the Hilti installation instructions

Not to scale
all units in [mm]

A "typical" is a preconfigured firestopping solution consisting of specific components for a specific application, to which an assumed fire rating/integrity is assigned. Typical's are selected according to their fire rating/integrity and are subject to the technical product documentation and underlying product approvals published by Hilti from time to time, are subject to generic assumptions, and are not selected on a project- or design-specific basis. The proposed typical's may therefore not meet the project- or design-specific requirements, and accordingly must be evaluated by the customer or by a relevant expert appointed by the customer for their suitability regarding the actual project-specific design criteria and requirements.

		Product Fire protection seal Hilti Firestop Foam CFS-F FX	Building project
ID	CFS-F FX_CLTW_E_8X001	Contents Fire protection seal in cross-laminated timber walls for electrical cables and bundled cables	
Page	02	Rev 00	

① Installations

Item	Implementation	Description/Type	Dimensions [mm]	Firestopping material	Opening size [mm]	Penetration seal thickness [mm]
1a	Electric cables type	also fiber-optic cable outer waveguide cable	$\varnothing \leq 21$	CFS-F FX	$120 \leq \varnothing \leq 200$	148
1b	bundled cables		$\varnothing \leq 100$, as single cable $\varnothing \leq 21$	CFS-F FX	$120 \leq \varnothing \leq 200$	148

② Construction: This typical can be used for the following element types and Dataholz.eu systems

Element type	Leno cross-laminated timber according to ETA-10/0241 or Z-9.1-501 of Merk Timber GmbH, Aichach, Germany
Dataholz.eu	-

③ Firestop product info

- Hilti Firestop Foam CFS-F FX
- European Technical Assessment: ETA-10/0109
 - German Approval aBG: Z-19.15-1901
 - Use for electric cables, cable bundles and empty conduits
 - Total installations max. 60% from opening
 - Fill all joints and gaps between the installations (especially the gussets between the cables) with Hilti CFS-F FX

Distances between installations [mm]

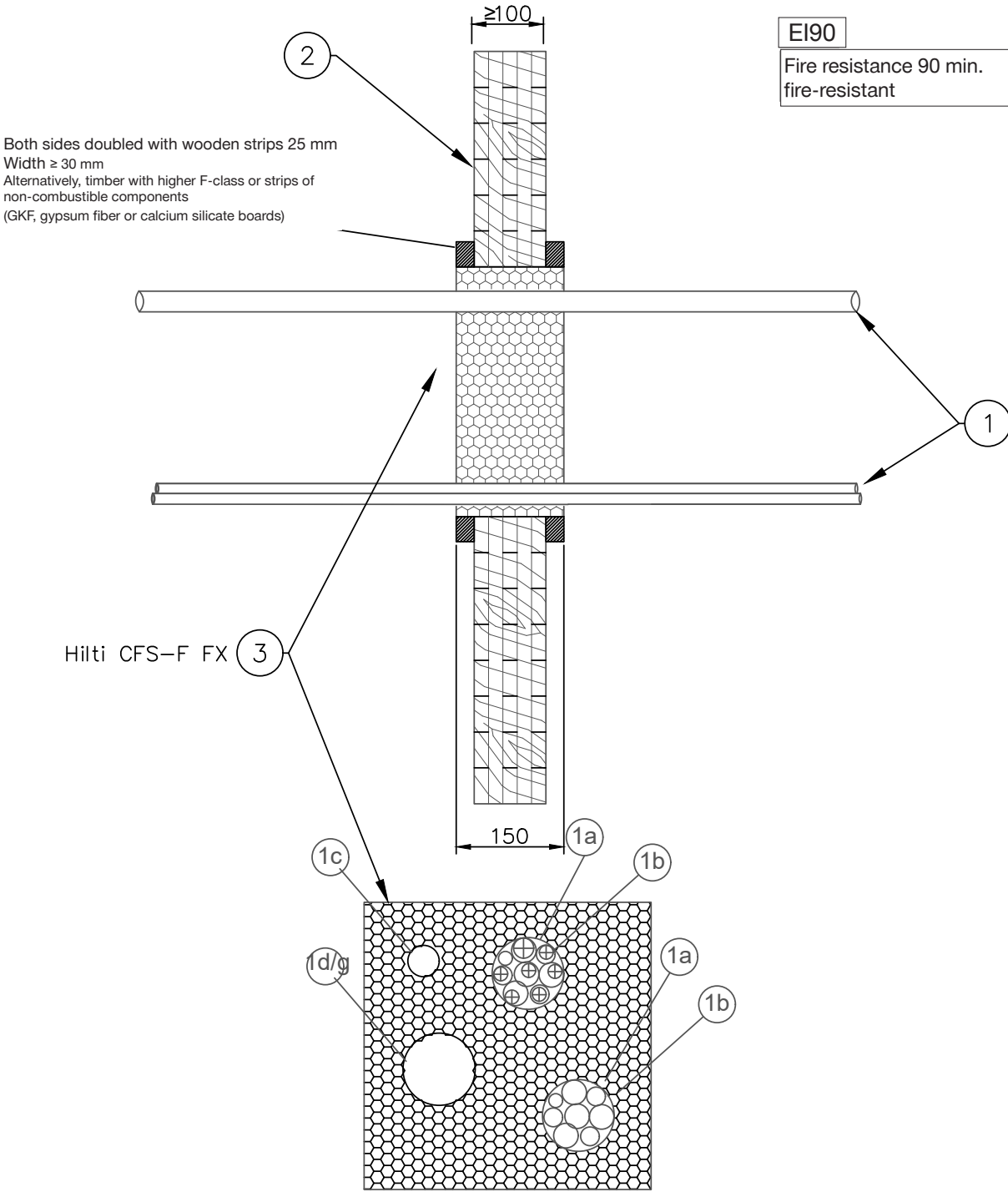
		Conduits		Cable/cable support structures	Reveal
		Single	Bundle		
Conduits	Single	-	-	-	-
	Bundle	-	-	-	-
Cable/cable support structures		-	-	0	0

Distance between the openings or installations

Distance of the penetration seal to	Size of openings next to each other [mm]	DIN distance between openings [mm]	EN distance between openings [mm]
other cable or pipe penetration seals	One/both opening(s) > 400 x 400	≥ 200	≥ 50
	Both openings $\leq 400 \times 400$	≥ 100	≥ 50
Other openings or other installations	One/both opening(s) > 200 x 200	≥ 200	≥ 200
	Both openings $\leq 200 \times 200$	≥ 100	≥ 100

A "typical" is a preconfigured firestopping solution consisting of specific components for a specific application, to which an assumed fire rating/integrity is assigned. Typical is selected according to their fire rating/integrity and are subject to the technical product documentation and underlying product approvals published by Hilti from time to time, are subject to generic assumptions, and are not selected on a project- or design-specific basis. The proposed typical may therefore not meet the project- or design-specific requirements, and accordingly must be evaluated by the customer or by a relevant expert appointed by the customer for their suitability regarding the actual project-specific design criteria and requirements.

		Product Fire protection seal Hilti Firestop Foam CFS-F FX	Building project
ID	CFS-F FX_CLTW_MX_8X904	Contents Fire protection in cross-laminated timber walls for electrical cables and combustible pipes	
Page	01	Rev 03	



- Basic documents, which form the respective proof of applicability
- German Approval aBG: Z-19.53-2238
 - European Technical Assessment: ETA-10/0109
 - Reaction to fire according to EN 13501-1
 - Fire resistance according to EN 13501-2
 - Installations according to the Hilti installation instructions

Not to scale
all units in [mm]

A "typical" is a preconfigured firestopping solution consisting of specific components for a specific application, to which an assumed fire rating/integrity is assigned. Typical is selected according to their fire rating/integrity and are subject to the technical product documentation and underlying product approvals published by Hilti from time to time, are subject to generic assumptions, and are not selected on a project- or design-specific basis. The proposed typical may therefore not meet the project- or design-specific requirements, and accordingly must be evaluated by the customer or by a relevant expert appointed by the customer for their suitability regarding the actual project-specific design criteria and requirements.

HILTI

Product

Fire protection seal

Hilti Firestop Foam CFS-F FX

Building project

ID

CFS-F FX_CLTW_MX_8X904

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Contents

Fire protection in cross-laminated timber walls for electrical cables and combustible pipes

① Installations

Item	Implementation	Description/Type	Dimensions [mm]	Firestopping material	Opening size [mm]	Pipe insulation	Seal thickness [mm]
1a	Electrical Installation pipes (U/C)	Rigid, from PVC or polyolefin according to DIN EN 61386-22	Ø ≤ 32	CFS-F FX	400 x 400	-	≥150
1b	Electrical Installation bundle (U/C)	Rigid, from PVC or polyolefins according to DIN EN 61386-22	Ø ≤ 100	CFS-F FX	400 x 400	-	≥150
1c	Aluminum composite pipe	Geberit Mepla (rod)	Ø 32x3	CFS-F FX	400 x 400	-	≥150
1d	Combustible pipes	PVC-U according to EN 1452-1	Ø 50 1.8 ≤ s* ≤ 5.6	CFS-F FX	400 x 400	-	≥150
1e	Combustible pipes	PP-H according to EN1451-1	Ø 50x 1.8	CFS-F FX	400 x 400	-	≥150

* Wall thickness

② Construction:

This application detail applies in conjunction with "Appendix 1: Available approvals and documents"

The firestop functionality and fire rating/integrity of the wall must be considered separately.

The wall thicknesses shown correspond to the minimum thicknesses required by the tested penetration seal.

③ Firestop product info

Hilti Firestop Foam CFS-F FX

- European Technical Assessment: ETA-10/0109

- German Approval aBG: Z-19.53-2238

- Use for electrical cables, bundled cables, cable support structures and cable conduits

- Total installations max. 60% from opening

- Fill all joints and gaps between the installations (especially the gussets between the cables) with Hilti CFS-F FX

Distances between installations [mm]

		Conduits		Cable/cable support structure	combustible pipes	Reveal
		Single	Bundle			
Conduits	Single	50	50	-	50	20
	Bundle	50	50	-	50	20
Cable/cable support structure		-	-	-	-	-
combustible pipes		100	100	-	100	20

Distance between the openings or installations

Distance of the penetration seal to	Size of openings next to each other [mm]	DIN distances between the openings [mm]	EN distances between the openings [mm]
other cable or pipe penetration seals	One/both opening(s) > 400 x 400	≥ 100	≥ 100
	Both openings ≤ 400 x 400	≥ 100	≥ 100
Other openings or other installations	One/both opening(s) > 200 x 200	≥ 200	≥ 200
	Both openings ≤ 200 x 200	≥ 100	≥ 200

A "typical" is a preconfigured firestopping solution consisting of specific components for a specific application, to which an assumed fire rating/integrity is assigned. Typical's are selected according to their fire rating/integrity and are subject to the technical product documentation and underlying product approvals published by Hilti from time to time, are subject to generic assumptions, and are not selected on a project- or design-specific basis. The proposed typical's may therefore not meet the project- or design-specific requirements, and accordingly must be evaluated by the customer or by a relevant expert appointed by the customer for their suitability regarding the actual project-specific design criteria and requirements.

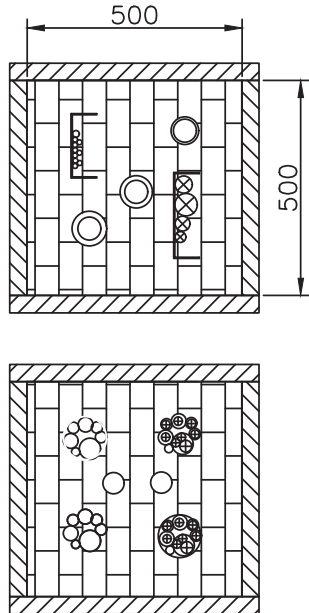
APPLICATIONS AND PRODUCTS

Wall applications: Mixed penetrations

Wall applications: Mixed penetrations

		Product Fire protection seal Hilti Firestop Block CFS-BL P	Building project
ID CFS-BL P_CLTW_MX_8X003		Contents Firestopping in cross-laminated timber walls for mixed penetration	
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Both sides doubled with wooden strips 25 mm
Width ≥ 50 mm
Alternatively, timber with higher F-class or strips of non-combustible components (GKF, gypsum fiber or calcium silicate boards)

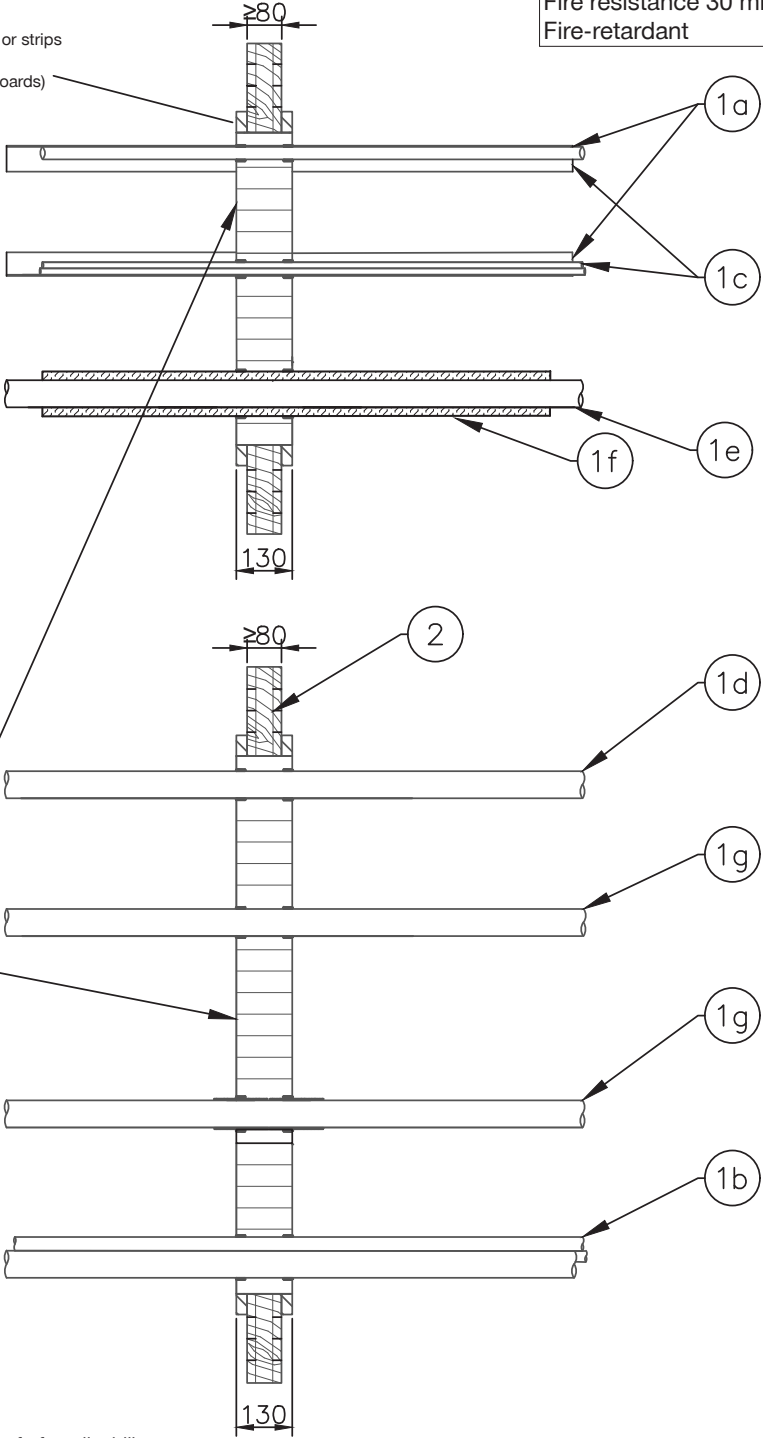


500

500

130

Hilti CFS-BL P 3



≥80

1a

1c

1f

1e

130

2

1d

1g

1g

1b

130

Not to scale
all units in [mm]

Basic documents, which form the respective proof of applicability

- German Approval aBG: Z-19.53-2431
- European Technical Assessment: ETA-18/1024
- Reaction to fire according to EN 13501-1
- Fire resistance according to EN 13501-2
- Installations according to the Hilti installation instructions

A "typical" is a preconfigured firestopping solution consisting of specific components for a specific application, to which an assumed fire rating/integrity is assigned. Typical is selected according to their fire rating/integrity and are subject to the technical product documentation and underlying product approvals published by Hilti from time to time, are subject to generic assumptions, and are not selected on a project- or design-specific basis. The proposed typical may therefore not meet the project- or design-specific requirements, and accordingly must be evaluated by the customer or by a relevant expert appointed by the customer for their suitability regarding the actual project-specific design criteria and requirements.

		Product Fire protection seal Hilti Firestop Block CFS-BL P	Building project
ID CFS-BL P_CLTW_MX_8X003		Contents Firestopping in cross-laminated timber walls for mixed penetration	
Page 02	Rev 03		

① Installations

Item	Implementation	Description/Type	Dimensions [mm]	Firestopping material	Opening size [mm]	Annular gap	Pipe insulation	Penetration seal thickness [mm]
1a	All kinds of electric cables	also fiber-optic cable outer waveguide cable	$\varnothing \leq 50$	CFS-BL P CFS-FIL	400x1000	-	-	130
1b	Conduits	Flexible and rigid PVC or polyolefins according to DIN EN 61386-22	Single $\varnothing \leq 50$ Bundle $\varnothing \leq 100$	CFS-BL P CFS-FIL	400x1000	-	-	130
1c	Cable support structures	Made of steel, aluminum or plastic profiles	150 x 60 x 1.5 200 x 60 x 1.5	CFS-BL P CFS-FIL	400x1000	-	-	130
1d	Aluminum composite pipes	Geberit Mepla (rod)	$\varnothing = 50 \times 4$	CFS-BL P CFS-FIL	400x1000	-	-	130
1e	Non-combustible pipes	Copper, steel, stainless steel and cast iron	$28 \leq \varnothing \leq 54$ $1.5 \leq s^* \leq 14.2$	CFS-BL P CFS-FIL	400x1000	-	Euro class mineral wool A1 or A2 Density $\geq 80 \text{ kg/m}^3$ $T^* = 30 \text{ mm}$ Length $\geq 800 \text{ mm}$	130
1f	Non-combustible pipes	Copper, steel, stainless steel and cast iron	$28 \leq \varnothing \leq 54$ $1.5 \leq s^* \leq 14.2$	CFS-BL P CFS-FIL	400x1000	-	Flexible elastomeric insulating material (rubber) $8.5 \leq T^* \leq 16.5$	130
1g	Combustible pipes	Rehau Raupiano Plus PP-H	$\varnothing = 50 \times 1.8$ $\varnothing = 100 \times 2.7$	CFS-BL P CFS-B CFS-FIL	400x1000	-	for $> \varnothing 75$ CFS-B 2 Layers centered in the sealing	130

* Wall thickness/insulation thickness

② Construction: This application detail applies in conjunction with "Appendix 1: Available approvals and documents"

The firestop functionality and fire rating/integrity of the wall must be considered separately.
The wall thicknesses shown correspond to the minimum thicknesses required by the tested penetration seal.

③ Firestop product info

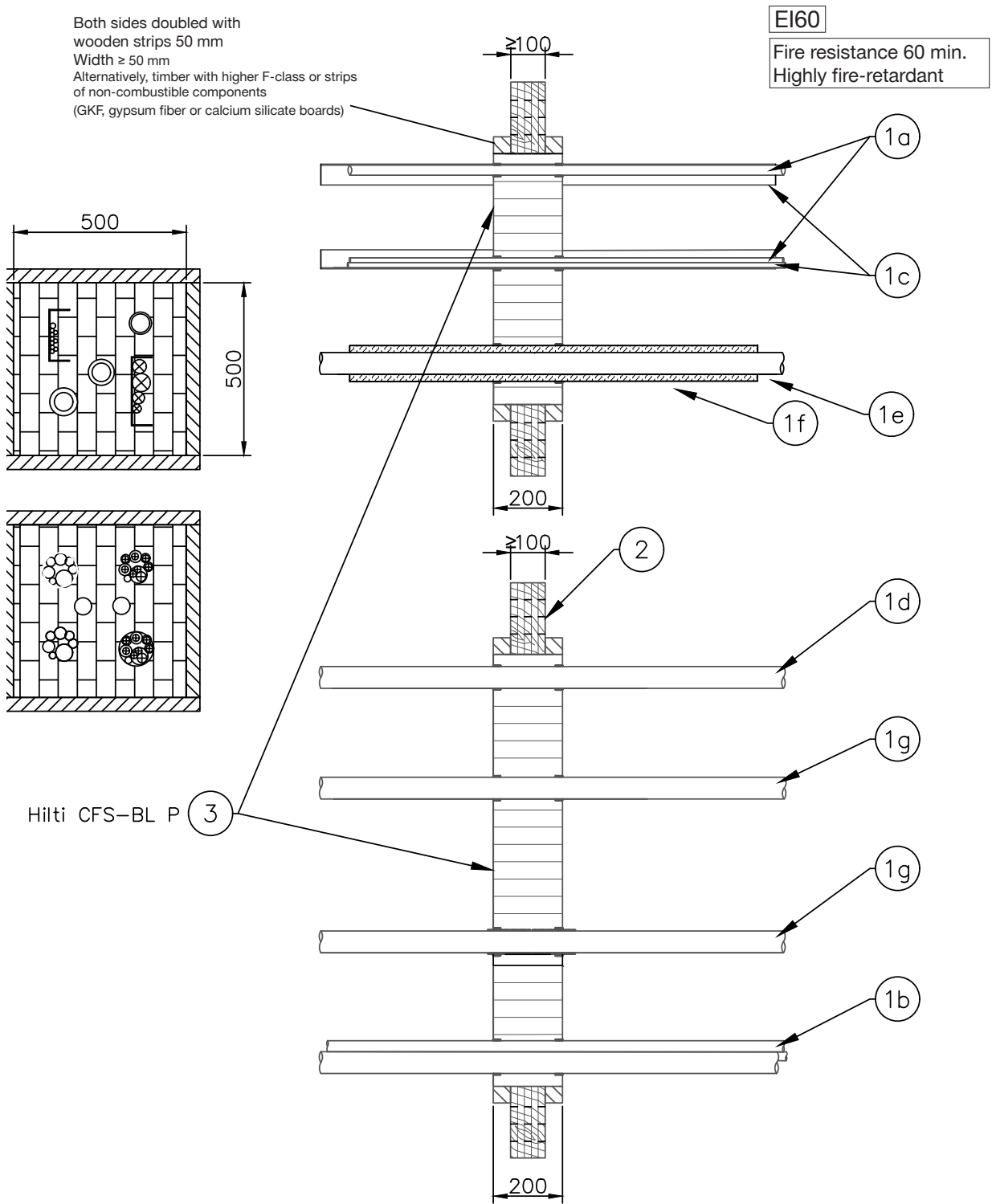
- Hilti Firestop Block CFS-BL P
- German Approval aBG: Z-19.53-2431
 - European Technical Assessment: ETA-18/1024
 - Use for electrical cables, bundled cables, cable support structures and cable conduits
 - Total installations max. 60% from opening
 - Fill all joints and gaps between the installations (especially the gussets between the cables) with Hilti CFS-FIL from both sides to a depth of at least 25 mm

Distances between installations [mm]

Clearance to adjacent openings or installations – if not listed in the table – according to DIN EN 1366-3 at least 200 mm or according to DIBt regulations at least 200 mm. 100 mm or 200 mm		Conduits		Cable/cable support structure	Reveal	combustible pipes			
		Single	Bundle			Mineral wool insulation	CFS-B	Aluminum composite pipes	Plastic pipes
Conduits	Single	50	50	50	50	50	50	50	100
	Bundle	50	50	50	50	50	50	50	100
Cable/cable support structure		50	50	100	20	100	100	100	100
combustible pipes	Mineral wool insulation	100	100	100	50	100	100	100	50
	CFS-B	50	50	100	50	100	50	100	50
	Aluminum composite pipes	50	50	100	50	100	100	100	100
	Plastic pipes	100	100	100	50	50	50	100	100

A "typical" is a preconfigured firestopping solution consisting of specific components for a specific application, to which an assumed fire rating/integrity is assigned. Typical is selected according to their fire rating/integrity and are subject to the technical product documentation and underlying product approvals published by Hilti from time to time, are subject to generic assumptions, and are not selected on a project- or design-specific basis. The proposed typical may therefore not meet the project- or design-specific requirements, and accordingly must be evaluated by the customer or by a relevant expert appointed by the customer for their suitability regarding the actual project-specific design criteria and requirements.

		Product Fire protection seal Hilti Firestop Block CFS-BL P	Building project
ID CFS-BL P_CLTW_MX_8X004		Contents Firestopping in cross-laminated timber walls for mixed penetration	
Page 01	Rev 03		



Basic documents, which form the respective proof of applicability

- German Approval aBG: Z-19.53-2431
- European Technical Assessment: ETA-18/1024
- Reaction to fire according to EN 13501-1
- Fire resistance according to EN 13501-2
- Installations according to the Hilti installation instructions

Not to scale
all units in [mm]

A "typical" is a preconfigured firestopping solution consisting of specific components for a specific application, to which an assumed fire rating/integrity is assigned. Typical is selected according to their fire rating/integrity and are subject to the technical product documentation and underlying product approvals published by Hilti from time to time, are subject to generic assumptions, and are not selected on a project- or design-specific basis. The proposed typical may therefore not meet the project- or design-specific requirements, and accordingly must be evaluated by the customer or by a relevant expert appointed by the customer for their suitability regarding the actual project-specific design criteria and requirements.

		Product Fire protection seal Hilti Firestop Block CFS-BL P	Building project
ID CFS-BL P_CLTW_MX_8X004		Contents Firestopping in cross-laminated timber walls for mixed penetration	
Page 02	Rev 03		

① Installations

Item	Implementation	Description/Type	Dimensions [mm]	Firestopping material	Opening size [mm]	Annular gap	Pipe insulation	Penetration seal thickness [mm]
1a	All kinds of electric cables	also fiber-optic cable outer waveguide cable	$\varnothing \leq 50$	CFS-BL P CFS-FIL	400x1000	-	-	200
1b	Conduits	Flexible and rigid PVC or polyolefins according to DIN EN 61386-22	Single $16 \leq \varnothing \leq 40$ Bundle $\varnothing \leq 100$	CFS-BL P CFS-FIL	400x1000	-	-	200
1c	Cable support structures	Made of steel, aluminum or plastic profiles	150 x 60 x 1.5 200 x 60 x 1.5 500 x 60 x 1.5	CFS-BL P CFS-FIL	400x1000	-	-	200
1d	Aluminum composite pipes	Geberit Mepla (rod)	$16 \leq \varnothing \leq 63$ $2.25 \leq s^* \leq 4.5$	CFS-BL P CFS-FIL	400x1000	-	-	200
1e	Non-combustible pipes	Copper, steel, stainless steel and cast iron	$10 \leq \varnothing \leq 88.9$ $1.2 \leq s^* \leq 14.2$	CFS-BL P CFS-FIL	400x1000	-	Euro class mineral wool A1 or A2 Density $\geq 80 \text{ kg/m}^3$ $20 \text{ mm} \geq T^* \geq 30 \text{ mm}$ Length $\geq 500 \text{ mm}$	200
1f	Non-combustible pipes	Copper, steel, stainless steel and cast iron	$10 \leq \varnothing \leq 54$ $1.2 \leq s^* \leq 14.2$	CFS-BL P CFS-FIL	400x1000	-	Flexible elastomeric insulating material (rubber) $9 \leq T^* \leq 16.5$	200
1g	Combustible pipes	PP-H	$\varnothing = 100 \times 2.7$	CFS-BL P CFS-B CFS-FIL	400x1000	-	for $> \varnothing 75$ CFS-B 2 Layers centered in the sealing	200

* Wall thickness/insulation thickness

② Construction: This application detail applies in conjunction with "Appendix 1: Available approvals and documents"

The firestop functionality and fire rating/integrity of the wall must be considered separately.
The wall thicknesses shown correspond to the minimum thicknesses required by the tested penetration seal.

③ Firestop product info

- Hilti Firestop Block CFS-BL P
- German Approval aBG: Z-19.53-2431
 - European Technical Assessment: ETA-18/1024
 - Use for electrical cables, bundled cables, cable support structures and cable conduits
 - Total installations max. 60% from opening
 - Fill all joints and gaps between the installations (especially the gussets between the cables) with Hilti CFS-FIL from both sides to a depth of at least 25 mm

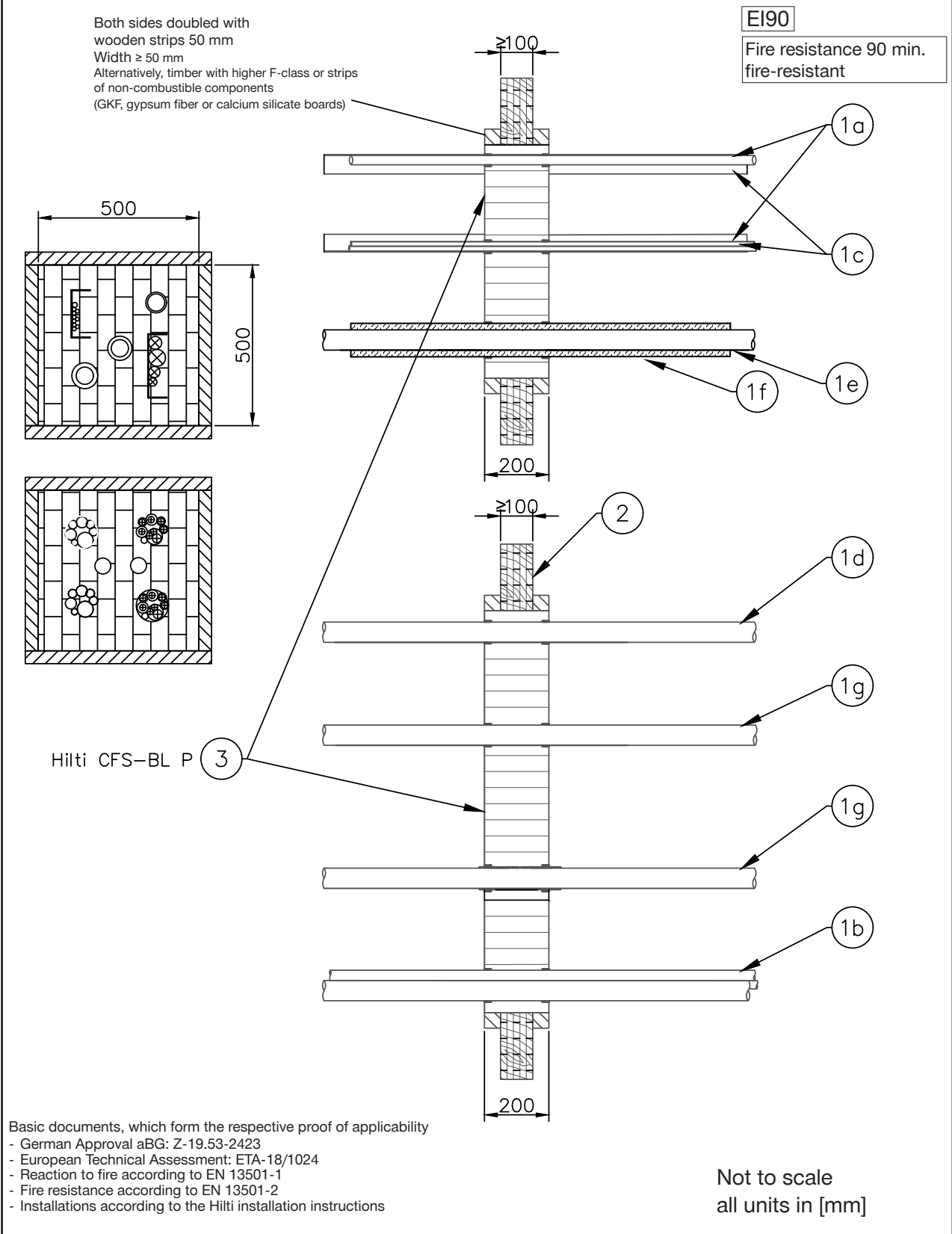
Distances between installations [mm] ** side by side 0 mm / one above the other 50 mm

Clearance to adjacent openings or installations – if not listed in the table – according to DIN EN 1366-3 at least 200 mm or according to DIBt regulations at least 100 mm or 200 mm		Plastic pipes		Metallic pipes			Electrical conduits			Aluminum composite pipes			Cable/cable support structures		
		without additional measures	with Hilti CFS-B	with mineral wool	with rubber	without insulation	$\varnothing \leq 16 \text{ mm}$; Steel and Plastic	$\varnothing > 16 \text{ mm}$; plastic single; multiple	Conduit bundle	without insulation	with rubber	with mineral wool	Individual cables	bundled cables	Cable support structure **
Sealing reveal		20	0	0	0			40	40	50	50	50	20	20	20
Plastic pipes	without additional measures	50	50	50	50	60	50	50		50	50	50	50	50	50
	with Hilti CFS-B		50	50	50				50				50	50	50
Metallic pipes	with mineral wool			0	0		50	15	15	50			50	50	50
	with rubber				50					50			50	50	50
	without insulation					50									
Electrical conduits	$\varnothing \leq 16 \text{ mm}$; steel and Plastic						50	50		50	50	50	50		
	$\varnothing > 16 \text{ mm}$; plastic single; multiple							0		50	50	50	50	50	50
	Conduit bundle									50	50	50	50	50	50
Aluminum composite pipes	without insulation									50			50	50	50
	with rubber insulation														
	with mineral wool insulation														
Cable / Cable support structures	Individual cables												0	50	0
	Bundled cables														0
	Bundled cables														0/50**

A "typical" is a preconfigured firestopping solution consisting of specific components for a specific application, to which an assumed fire rating/integrity is assigned. Typical is selected according to their fire rating/integrity and are subject to the technical product documentation and underlying product approvals published by Hilti from time to time, are subject to generic assumptions, and are not selected on a project- or design-specific basis. The proposed typical may therefore not meet the project- or design-specific requirements, and accordingly must be evaluated by the customer or by a relevant expert appointed by the customer for their suitability regarding the actual project-specific design criteria and requirements.

		Product Fire protection seal Hilti Firestop Block CFS-BL P	Building project
ID CFS-BL P_CLTW_MX_8X904		Contents Firestopping in cross-laminated timber walls for mixed penetration	
Page 01	Rev 03		

Both sides doubled with wooden strips 50 mm
Width $\geq 50 \text{ mm}$
Alternatively, timber with higher F-class or strips of non-combustible components (GKF, gypsum fiber or calcium silicate boards)



E190
Fire resistance 90 min. fire-resistant

Hilti CFS-BL P 3

Basic documents, which form the respective proof of applicability

- German Approval aBG: Z-19.53-2423
- European Technical Assessment: ETA-18/1024
- Reaction to fire according to EN 13501-1
- Fire resistance according to EN 13501-2
- Installations according to the Hilti installation instructions

Not to scale
all units in [mm]

A "typical" is a preconfigured firestopping solution consisting of specific components for a specific application, to which an assumed fire rating/integrity is assigned. Typical is selected according to their fire rating/integrity and are subject to the technical product documentation and underlying product approvals published by Hilti from time to time, are subject to generic assumptions, and are not selected on a project- or design-specific basis. The proposed typical may therefore not meet the project- or design-specific requirements, and accordingly must be evaluated by the customer or by a relevant expert appointed by the customer for their suitability regarding the actual project-specific design criteria and requirements.

		Product Fire protection seal Hilti Firestop Block CFS-BL P				Building project	
ID CFS-BL P_CLTW_MX_8X904		Contents Firestopping in cross-laminated timber walls for mixed penetration					
Page 02	Rev 03						

① Installations

Item	Implementation	Description/Type	Dimensions [mm]	Firestopping material	Opening size [mm]	Annular gap	Pipe insulation	Penetration seal thickness [mm]
1a	All kinds of electric cables	also fiber-optic cable outer waveguide cable	$\varnothing \leq 21$	CFS-BL P CFS-FIL	400x1000	-	-	200
1b	Conduits	Flexible and rigid PVC or polyolefins according to DIN EN 61386-22	Single $16 \leq \varnothing \leq 40$ Bundle $\varnothing \leq 100$	CFS-BL P CFS-FIL	400x1000	-	-	200
1c	Cable support structures	Made of steel, aluminum or plastic profiles	$150 \times 60 \times 1.5$ $200 \times 60 \times 1.5$ $500 \times 60 \times 1.5$	CFS-BL P CFS-FIL	400x1000	-	-	200
1d	Aluminum composite pipes	e.g. Geberit Mepla, etc.	See relevant Documents	CFS-BL P CFS-FIL	400x1000	-	-	200
1e	Non-combustible pipes	Copper, steel, stainless steel and cast iron	$10 \leq \varnothing \leq 88.9$ $1.2 \leq s^* \leq 14.2$	CFS-BL P CFS-FIL	400x1000	-	Euro class mineral wool A1 or A2 Density $\geq 80 \text{ kg/m}^3$ $20 \text{ mm} \geq T^* \geq 30 \text{ mm}$ Length $\geq 500 \text{ mm}$	200
1f	Non-combustible pipes	Copper, steel, stainless steel and cast iron	$10 \leq \varnothing \leq 54$ $1.2 \leq s^* \leq 14.2$	CFS-BL P CFS-FIL	400x1000	-	Flexible elastomeric insulating material (rubber) $9 \leq T^* \leq 16.5$	200
1g	Combustible pipes	e.g. PP-H; PVC-U, etc.	see relevant Documents	CFS-BL P CFS-B CFS-FIL	400x1000	-	for $> \varnothing 75$ CFS-B 2 layers centered in the sealing	200

* Wall thickness/insulation thickness

② Construction: This application detail applies in conjunction with "Appendix 1: Available approvals and documents"

The firestop functionality and fire rating/integrity of the wall must be considered separately.
The wall thicknesses shown correspond to the minimum thicknesses required by the tested penetration seal.

③ Firestop product info

Hilti Firestop Block CFS-BL P

- German Approval aBG: Z-19.53-2423

- European Technical Assessment: ETA-18/1024

- Use for electrical cables, bundled cables, cable support structures and cable conduits

- Total installations max. 60% from opening

- Fill all joints and gaps between the installations (especially the gussets between the cables) with Hilti CFS-FIL from both sides to a depth of at least 25 mm

Distances between installations [mm]

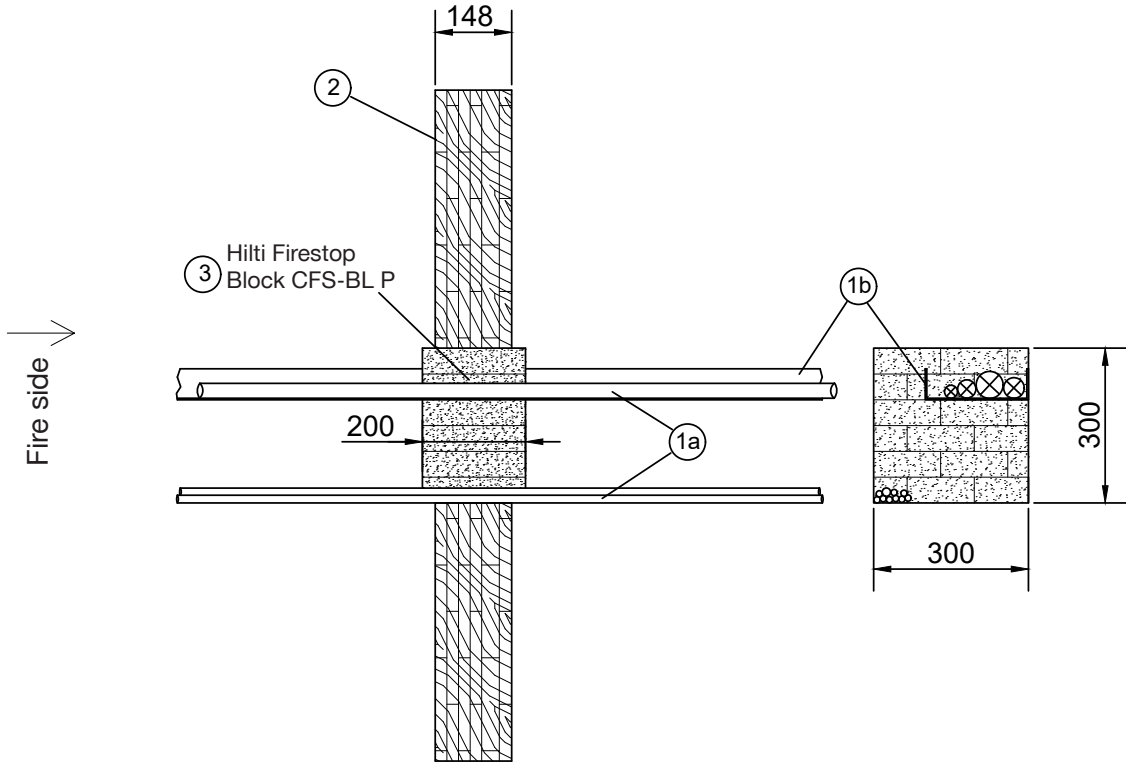
Clearance to adjacent openings or installations – if not listed in the table – according to DIN EN 1366-3 at least 200 mm or according to DIBt regulations at least 100 mm or 200 mm		Conduits		Cable/cable support structure	Reveal	non-combustible pipes Mineral wool insulation	combustible pipes		Aluminum composite pipes
		Single	Bundle				with CFS-B	without measure	
Conduits	Single	50	50	50	50	50	50	100	50
	Bundle	50	50	50	50	50	50	100	50
Cable/cable support structure		50	50	100	20	100	100	100	100
non-combustible pipes	Mineral wool insulation	100	100	100	50	100	100	50	100
combustible pipes	with CFS-B	50	50	100	50	100	50	50	100
	without measure	50	50	100	50	50	50	100	100
Aluminum composite pipes		100	100	100	50	100	100	100	100

A "typical" is a preconfigured firestopping solution consisting of specific components for a specific application, to which an assumed fire rating/integrity is assigned. Typical is selected according to their fire rating/integrity and are subject to the technical product documentation and underlying product approvals published by Hilti from time to time, are subject to generic assumptions, and are not selected on a project- or design-specific basis. The proposed typical may therefore not meet the project- or design-specific requirements, and accordingly must be evaluated by the customer or by a relevant expert appointed by the customer for their suitability regarding the actual project-specific design criteria and requirements.

		Product	Building project
		Fire protection seal Hilti Firestop Block CFS-BL P	
ID CFS-BL P_CLTW_E_8X001		Contents	
		Fire protection seal in cross-laminated timber walls for electrical cables and cable constructions	
Page 01	Rev 00		

EI90

Fire side



- German Approval aBG: Z-19.15-2083

- Reaction to fire according to EN 13501-1

- Fire resistance according to EN 13501-1

- Installations according to the Hilti installation instructions

Not to scale
all units in [mm]

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		Product Fire protection seal Hilti Firestop Block CFS-BL P	Building project
ID	CFS-BL P_CLTW_E_8X001	Contents Fire protection seal in cross-laminated timber walls for electrical cables and cable constructions	
Page	02	Rev 00	

① Installations

Item	Implementation	Description/Type	Dimensions [mm]	Firestopping material	Opening size [mm]	Penetration seal thickness [mm]
1a	Electric cables type	also fiber-optic cable outer waveguide cable	$\varnothing \leq 21$	CFS-BL P / CFS-FIL	300 x 300	200
1b	Cable support structures	made of steel, aluminum or plastic profiles	200 x 60 x 1.5	CFS-BL P / CFS-FIL	300 x 300	200

② Construction: This typical can be used for the following element types and Dataholz.eu systems

Element type	Leno cross-laminated timber according to ETA-10/0241 or Z-9.1-501 of Merk Timber GmbH, Aichach, Germany
Dataholz.eu	-

③ Firestop product info

- Hilti Firestop Block CFS-BL P
- German Approval aBG: Z-19.15-2083
 - Use for electrical cables, bundled cables, cable conduits and cable support structures
 - Total installations max. 60% from opening
 - Fill all joints and gaps between the installations (especially the gussets between the cables) with Hilti CFS-FIL from both sides to a depth of at least 20 mm deep backfill

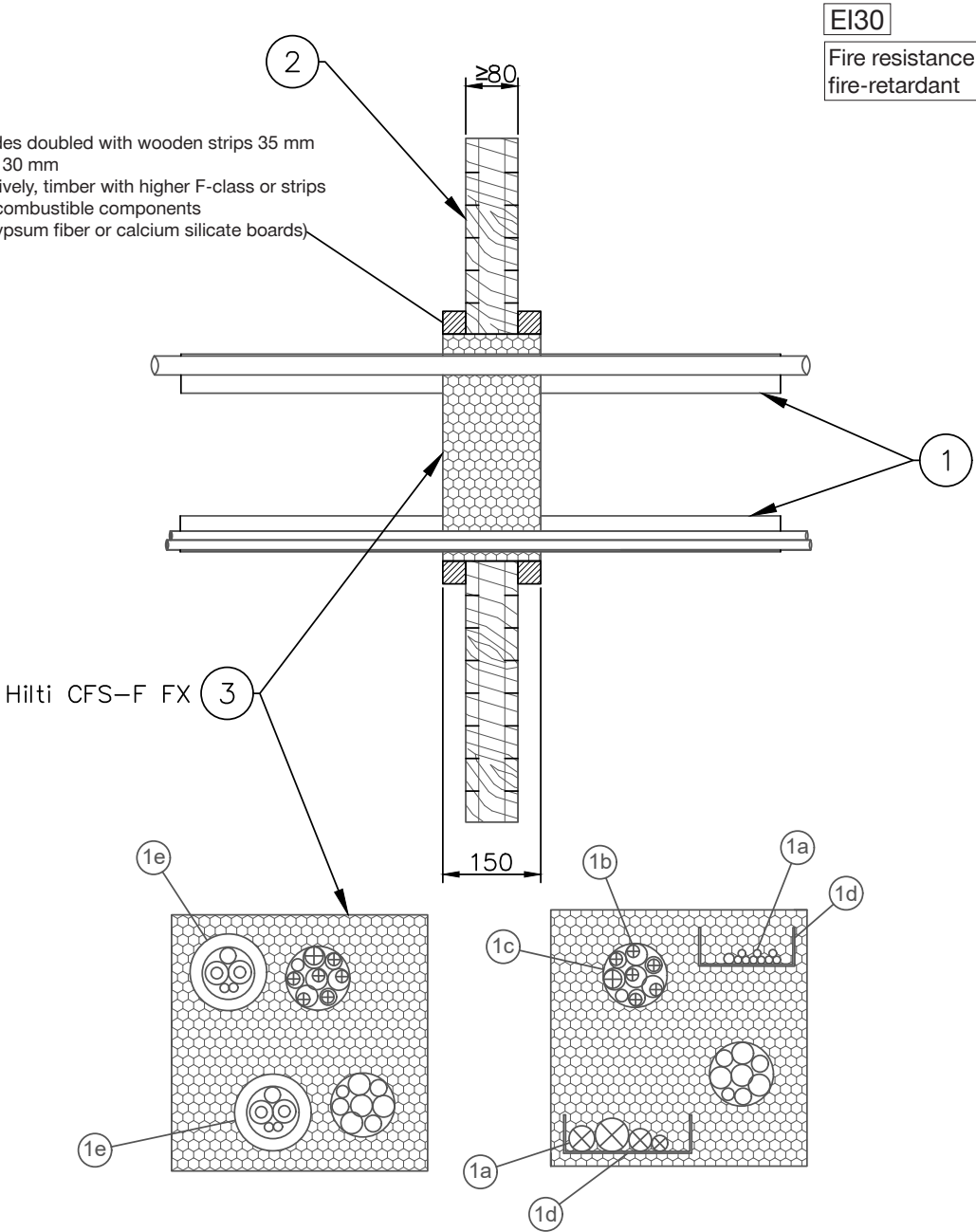
Distances between installations [mm]

		Conduits		Cable/cable support structures	Reveal
		Single	Bundle		
Conduits	Single	-	-	-	-
	Bundle	-	-	-	-
Cable/cable support structures		-	-	0	0

Distance between the openings or installations

Distance of the penetration seal to	Size of openings next to each other [mm]	DIN distance between openings [mm]	EN distance between openings [mm]
Other cable or pipe penetration seals	One/both opening(s) > 400 x 400	≥ 200	≥ 50
	Both openings $\leq 400 \times 400$	≥ 100	≥ 50
Other openings or other installations	One/both opening(s) > 200 x 200	≥ 200	≥ 200
	Both openings $\leq 200 \times 200$	≥ 100	≥ 100

		Product Fire protection seal Hilti Firestop Foam CFS-F FX	Building project
ID	CFS-F FX_CLTW_MX_8X003	Contents Fire protection in cross-laminated timber floors for electrical cables and air-conditioning	
Page	01	Rev 03	



- Basic documents, which form the respective proof of applicability
- German Approval aBG: Z-19.53-2238
 - European Technical Assessment: ETA-10/0109
 - Reaction to fire according to EN 13501-1
 - Fire resistance according to EN 13501-2
 - Installations according to the Hilti installation instructions

Not to scale
all units in [mm]

A "typical" is a preconfigured firestopping solution consisting of specific components for a specific application, to which an assumed fire rating/integrity is assigned. Typical is selected according to their fire rating/integrity and are subject to the technical product documentation and underlying product approvals published by Hilti from time to time, are subject to generic assumptions, and are not selected on a project- or design-specific basis. The proposed typical may therefore not meet the project- or design-specific requirements, and accordingly must be evaluated by the customer or by a relevant expert appointed by the customer for their suitability regarding the actual project-specific design criteria and requirements.

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		Product Fire protection seal Hilti Firestop Foam CFS-F FX	Building project
ID CFS-F FX_CLTW_MX_8X003		Contents Fire protection in cross-laminated timber floors for electrical cables and air-conditioning	
Page 02	Rev 03		

① Installations

Item	Implementation	Description/Type	Dimensions [mm]	Firestopping material	Opening size [mm]	Annular gap	Pipe insulation	Penetration seal thickness [mm]
1a	All kinds of electric cables	also fiber-optic cable outer waveguide cable	Ø ≤ 50	CFS-F FX	400 x 400	-	-	≥150
1b	Conduits U/C	Flexible and rigid PVC or polyolefin according to DIN EN 61386-22	Ø ≤ 32	CFS-F FX	400 x 400	-	-	≥150
1c	Electrical installation bundle U/C	Flexible and rigid PVC or polyolefins according to DIN EN 61386-22	Ø ≤ 100	CFS-F FX	400 x 400	-	-	≥150
1d	Cable support structures	from unperforated steel, aluminum profiles	150 x 60 x 1.5 200 x 60 x 1.5	CFS-F FX	400 x 400	-	-	≥150
1e	Air conditioning line bundle	Copper pipe ≤ 2x Ø ≤ 18 mm (Frigoline 9 mm or Turbolit 9 mm) + PVC-U/-C Ø25x4.3 + ≤ 2 x cable Ø ≤ 14 mm	As bundle Ø 65	CFS-F FX	400 x 400	-	Elastomeric insulation material (rubber) T* = 9 mm case L/CI ≥ 250 mm on both sides	≥150

* Wall thickness/insulation thickness

② Construction: This application detail applies in conjunction with "Appendix 1: Available approvals and documents"

The firestop functionality and fire rating/integrity of the floor must be considered separately.
The floor thicknesses shown correspond to the minimum thicknesses required by the tested penetration seal.

③ Firestop product info

- Hilti Firestop Foam CFS-F FX
- European Technical Assessment: ETA-10/0109
 - German Approval aBG: Z-19.53-2238
 - Use for electrical cables, bundled cables, cable support structures and cable conduits
 - Total installations max. 60% from opening
 - Fill all joints and gaps between the installations (especially the gussets between the cables) with Hilti CFS-F FX

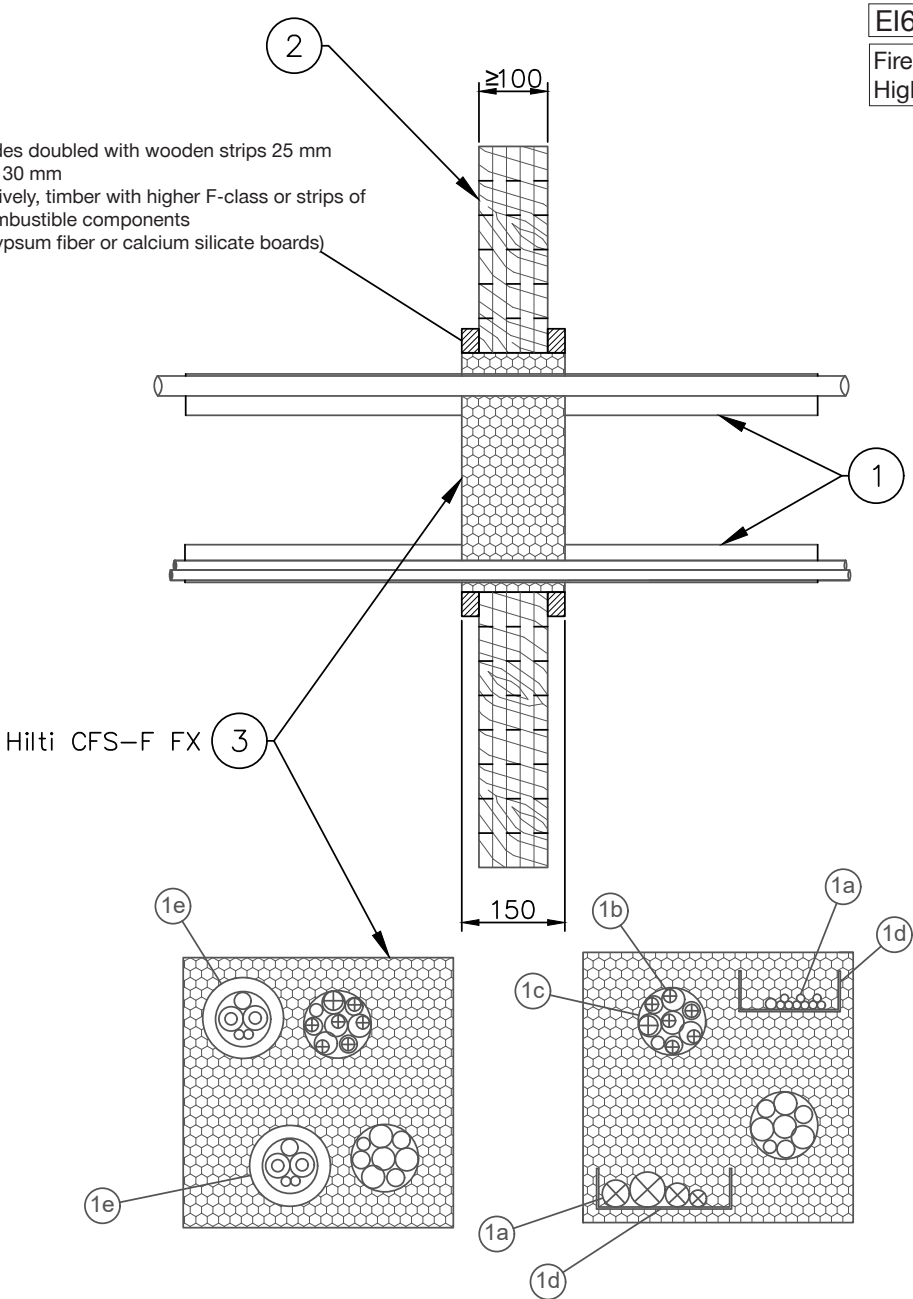
Distances between installations [mm]

Unless specified, all other distances are ≥ 200		Conduits	Cable/cable support structure		Air conditioning line	Reveal		
		Bundle	Side by side	under one another		by the side	above	below
Conduits	Bundle	20		50	50	50		50
Cable/cable support structure		50	0	50	20	20	20	
Air conditioning line	Bundle	50		≥ 100	20	50		50

Distance between the openings or installations

Distance of the penetration seal to	Size of openings next to each other [mm]	DIN distances between the openings [mm]	EN distances between the openings [mm]
Other cable or pipe penetration seals	One/both opening(s) > 400 x 400	≥ 100	≥ 100
	Both openings ≤ 400 x 400	≥ 100	≥ 100
Other openings or other installations	One/both opening(s) > 200 x 200	≥ 200	≥ 200
	Both openings ≤ 200 x 200	≥ 100	≥ 200

		Product Fire protection seal Hilti Firestop Foam CFS-F FX	Building project
ID CFS-F FX_CLTW_MX_8X004/1		Contents Fire protection in cross-laminated timber floors for electrical cables and air-conditioning	
Page 01	Rev 03		



Basic documents, which form the respective proof of applicability

- German Approval aBG: Z-19.53-2238
- European Technical Assessment: ETA-10/0109
- Reaction to fire according to EN 13501-1
- Fire resistance according to EN 13501-2
- Installations according to the Hilti installation instructions

Not to scale
all units in [mm]

A "typical" is a preconfigured firestopping solution consisting of specific components for a specific application, to which an assumed fire rating/integrity is assigned. Typical is selected according to their fire rating/integrity and are subject to the technical product documentation and underlying product approvals published by Hilti from time to time, are subject to generic assumptions, and are not selected on a project- or design-specific basis. The proposed typical may therefore not meet the project- or design-specific requirements, and accordingly must be evaluated by the customer or by a relevant expert appointed by the customer for their suitability regarding the actual project-specific design criteria and requirements.

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		Product Fire protection seal Hilti Firestop Foam CFS-F FX	Building project
ID CFS-F FX_CLTW_MX_8X004/1		Contents Fire protection in cross-laminated timber floors for electrical cables and air-conditioning	
Page 01	Rev 03		

① Installations

Item	Implementation	Description/Type	Dimensions [mm]	Firestopping material	Opening size [mm]	Annular gap	Pipe insulation	Penetration seal thickness [mm]
1a	All kinds of electric cables	also fiber-optic cable outer waveguide cable	$\varnothing \leq 50$	CFS-F FX	400 x 400	-	-	≥ 150
1b	Conduits U/C	Flexible and rigid PVC or polyolefin according to DIN EN 61386-22	$\varnothing \leq 32$	CFS-F FX	400 x 400	-	-	≥ 150
1c	Electrical installation bundle U/C	Flexible and rigid PVC or polyolefins according to DIN EN 61386-22	$\varnothing \leq 100$	CFS-F FX	400 x 400	-	-	≥ 150
1d	Cable support structures	from unperforated steel, aluminum profiles	150 x 60 x 1.5 200 x 60 x 1.5	CFS-F FX	400 x 400	-	-	≥ 150
1e	Air conditioning line bundle	Copper pipe $\leq 2x$ $\varnothing \leq 18$ mm (Frigoline 9 mm or Turbolit 9 mm) + PVC-U/-C $\varnothing 25x4.3$ + ≤ 2 x cable $\varnothing \leq 14$ mm	As bundle $\varnothing 65$	CFS-F FX	400 x 400	-	Elastomeric insulation (rubber) T* = 9 mm case LI/CI ≥ 250 mm on both sides	≥ 150

* Wall thickness/insulation thickness

② Construction: This application detail applies in conjunction with "Appendix 1: Available approvals and documents"

The firestop functionality and fire rating/integrity of the floor must be considered separately.
The floor thicknesses shown correspond to the minimum thicknesses required by the tested penetration seal.

③ Firestop product info

- Hilti Firestop Foam CFS-F FX
- European Technical Assessment: ETA-10/0109
 - German Approval aBG: Z-19.53-2238
 - Use for electrical cables, bundled cables, cable support structures and cable conduits
 - Total installations max. 60% from opening
 - Fill all joints and gaps between the installations (especially the gussets between the cables) with Hilti CFS-F FX

Distances between installations [mm]

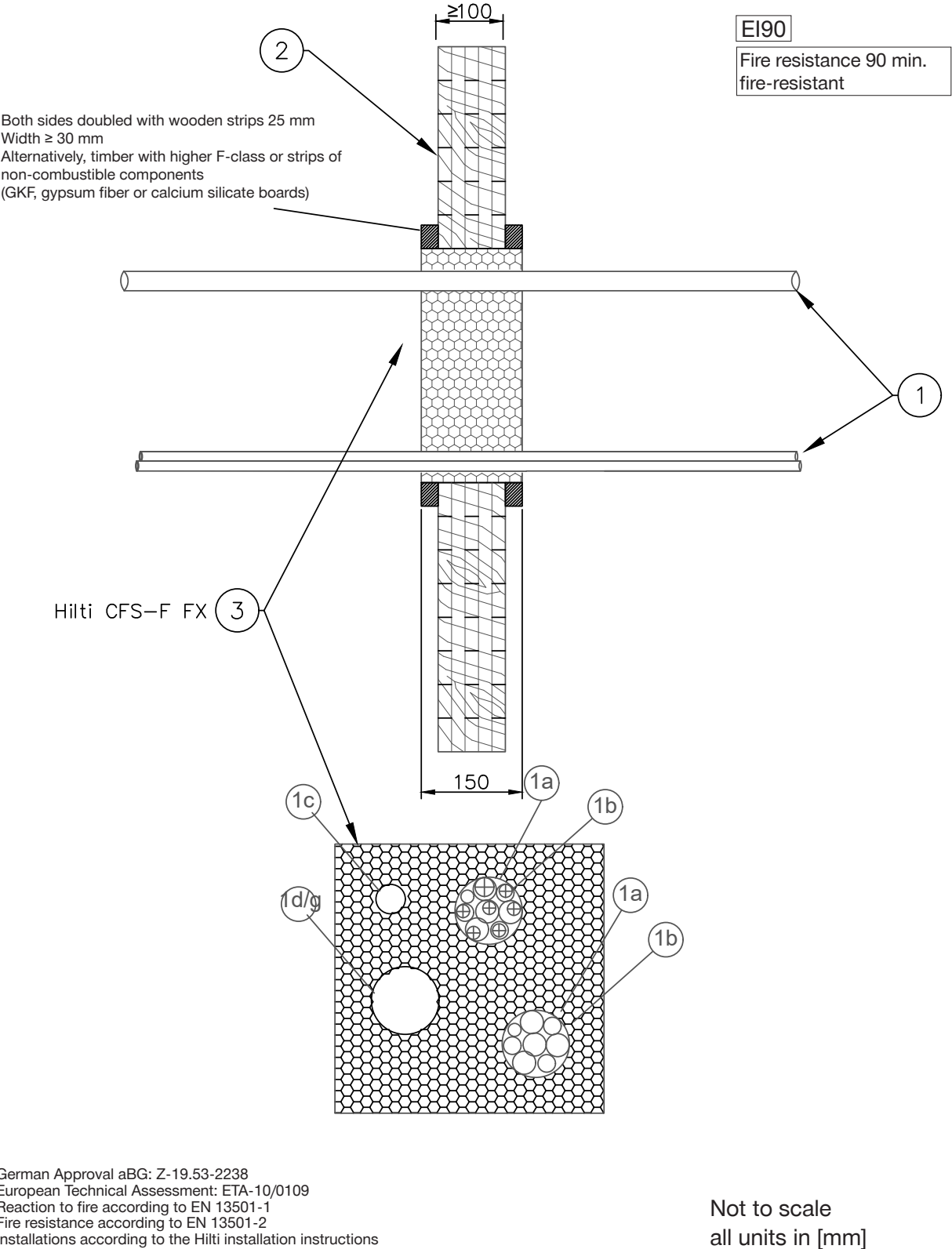
Unless specified, all other distances are ≥ 200		Conduits	Cable/cable support structure		Air conditioning line	Reveal		
		Bundle	Side by side	under one another		by the side	above	below
Conduits	Bundle	20		50	50	50		50
Cable/cable support structure		50	0	50	20	20	20	
Air conditioning line	Bundle	50		≥ 100	20	50		50

Distance between the openings or installations

Distance of the penetration seal to	Size of openings next to each other [mm]	DIN distances between the openings [mm]	EN distances between the openings [mm]
Other cable or pipe penetration seals	One/both opening(s) $> 400 \times 400$	≥ 100	≥ 100
	Both openings $\leq 400 \times 400$	≥ 100	≥ 100
Other openings or other installations	One/both opening(s) $> 200 \times 200$	≥ 200	≥ 200
	Both openings $\leq 200 \times 200$	≥ 100	≥ 200

A "typical" is a preconfigured firestopping solution consisting of specific components for a specific application, to which an assumed fire rating/integrity is assigned. Typical is selected according to their fire rating/integrity and are subject to the technical product documentation and underlying product approvals published by Hilti from time to time, are subject to generic assumptions, and are not selected on a project- or design-specific basis. The proposed typical may therefore not meet the project- or design-specific requirements, and accordingly must be evaluated by the customer or by a relevant expert appointed by the customer for their suitability regarding the actual project-specific design criteria and requirements.

		Product Fire protection seal Hilti Firestop Foam CFS-F FX	Building project
ID CFS-F FX_CLTW_MX_8X904		Contents Fire protection in cross-laminated timber walls for electrical cables and combustible pipes	
Page 01	Rev 02		



A "typical" is a preconfigured firestopping solution consisting of specific components for a specific application, to which an assumed fire rating/integrity is assigned. Typical is selected according to their fire rating/integrity and are subject to the technical product documentation and underlying product approvals published by Hilti from time to time, are subject to generic assumptions, and are not selected on a project- or design-specific basis. The proposed typical may therefore not meet the project- or design-specific requirements, and accordingly must be evaluated by the customer or by a relevant expert appointed by the customer for their suitability regarding the actual project-specific design criteria and requirements.

		Product Fire protection seal Hilti Firestop Foam CFS-F FX				Building project
ID CFS-F FX_CLTW_MX_8X904		Contents Fire protection in cross-laminated timber walls for electrical cables and combustible pipes				
Page 01	Rev 02					

① Installations

Item	Implementation	Description/Type	Dimensions [mm]	Firestopping material	Opening size [mm]	Pipe insulation	Penetration seal thickness [mm]
1a	Conduits U/C	Rigid, made of PVC or polyolefin according to DIN EN 61386-22	Ø ≤ 32	CFS-F FX	400 x 400	-	≥150
1b	Electrical installation bundle (U/C)	Rigid, from PVC or polyolefins according to DIN EN 61386-22	Ø ≤ 100	CFS-F FX	400 x 400	-	≥150
1c	Aluminum composite pipe	Geberit Mepla (rod)	Ø 32x3	CFS-F FX	400 x 400	-	≥150
1d	Combustible pipes	PVC-U according to EN 1452-1	Ø 50 1.8 ≤ s* ≤ 5.6	CFS-F FX	400 x 400	-	≥150
1e	Combustible pipes	PP-H according to EN1451-1	Ø 50x 1.8	CFS-F FX	400 x 400	-	≥150

* Wall thickness

② Construction: This typical can be used for the following element types and Dataholz.eu systems

The firestop functionality and fire rating/integrity of the wall must be considered separately. The wall thicknesses shown correspond to minimum thicknesses required by the tested penetration seal.	
Element type	All cross-laminated timber (CLT) and glued laminate timber according to EN 14080 with the following specifications are covered: Wood type: softwood, such as spruce, fir, redwood, larch, pine / Min. element thickness: 80 mm/ Minimum thickness of the first layer: 20 mm / Min. number of layers: 3 / Adhesive types: melamine and polyurethane based (MUF, PU)
Manufacturer:	Binderholz BBS (ETA-06/0009), Stora Enso CLT (ETA-14/0349), KLH Massivholz KLH® CLT (ETA-06/0138), Pfeifer Holz CLT (ETA-20/0023), HASSLACHER CLT (ETA-12/0281), Mayr-Melnhof Holz MM-Crosslam (ETA-09/0036), HOISKO CLT (ETA-18/0621), Eugen Decker ED BSP-CLT (ETA-12/0327), ZÜBLIN Timber LENO®-CLT (ETA-10/0241), XLam Dolomiti XLAM (ETA-12/0347), Best Wood Schneider CLT (Z-9.1-874), Derix X-LAM (ETA-11/0189)* without claim to completeness
Dataholz.eu	List: iwmxxi03a, iwmxxo01a, iwmxxo01b,iwmxxi01b iwmxxo02a, iwmxxi02b, iwmxxo04a, iwmxxo05b

③ Firestop product info

Hilti Firestop Foam CFS-F FX

- European Technical Assessment: ETA-10/0109

- German Approval aBG: Z-19.53-2238

- Use for electrical cables, bundled cables, cable support structures and cable conduits

- Total installations max. 60% from opening

- Fill all joints and gaps between the installations (especially the gussets between the cables) with Hilti CFS-F FX

Distances between installations [mm]

		Conduits		Cable/cable support structure	Combustible pipes	Reveal
		Single	Bundle			
Conduits	Single	50	50	-	50	20
	Bundle	50	50	-	50	20
Cable/cable support structure		-	-	-	-	-
Combustible pipes		100	100	-	100	20

Distance between the openings or installations

Distance of the penetration seal to	Size of openings next to each other [mm]	DIN distances between the openings [mm]	EN distances between the openings [mm]
other cable or pipe penetration seals	One/both opening(s) > 400 x 400	≥ 100	≥ 100
	Both openings ≤ 400 x 400	≥ 100	≥ 100
Other openings or other installations	One/both opening(s) > 200 x 200	≥ 200	≥ 200
	Both openings ≤ 200 x 200	≥ 100	≥ 200

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		Appendix 1	
ID General CLT		Inhalt Available approvals and documents	
Seite 01	Rev 3		

The details previously listed in Typicals reflect applications that have been verified by fire resistance tests at certified testing institutes and summarized in classification reports. They serve to simplify planning and implementation. Designs up to 90 minutes fire rating (fire-resistant) are possible in cross-laminated timber elements.

Until the ABG Approvals and ETAs are updated, the following documents may be used to demonstrate applications:

For deviating designs and base materials, please contact the Hilti firestop specialists.

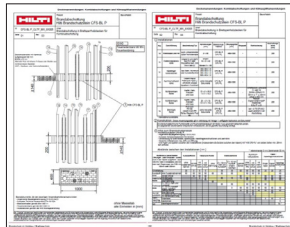
Basis: Proof of applicability of firestop products in Germany:

Application	Designation	Proof of applicability
Mixed penetrations	System CFS-F FX 150	Z-19.53-2238
Mixed penetrations	System CFS-F FX 200	Z-19.53-2237
pipe penetration seal	Hilti Firestop Sealant CFS-S ACR	P-MPA-E-17-010
Mixed penetrations	System CFS-BL P Kombi S30	Z-19.53-2431
Mixed penetrations	System CFS-BL P Kombi S90	Z-19.53-2423
Cable penetration	System CFS-MB	Z-19.53-2246
pipe penetration seal	System CFS-C EL combust. pipes	Z-19.53-2192
pipe penetration seal	System CFS-B combust. pipes	Z-19.53-2218
pipe penetration seal	System CFS-B non-combust. pipes	Z-19.53-2210
Pipe penetration seal	System CFS-B solid wall	P-MPA-E-07-029
Cable penetration	System CFS-CC	Z-19.53-2282
Cable penetration	System CFS-SL GA	Z-19.53-2318

Basis: ETA fire protection products for other European countries:

Application	Designation	Proof of applicability
Pipe penetration seal	System CFS-C EL combust. pipes	ETA-14/0085
Mixed penetrations S90	System CFS-BL P timber base material	ETA-18/1024
Cable penetration	System CFS-CC	ETA-13/0704
Cable penetration	System CFS-SL GA	ETA-17/0081
Mixed penetrations	System CFS-F FX	ETA-10/0109
Pipe penetration seal R30-R120	Hilti Firestop Sealant CFS-S ACR	ETA-10/0292
Pipe penetration seal	System CFS-B	ETA-10/0212

Typicals: The preceding drawings (Typicals), show the application details proven and classified in fire protection tests.



Classification reports (basis of typical):		
319091602-B / B, Rev.3	319091602-G / ALD, Rev.3	
"Product CFS-B in timber components"	Product CFS-SL GA in timber components	
319091602-C / ACR, Rev.3	319091602-H / BLP200, Rev.3	
Product CFS-S ACR in timber components	Product CFS-BL P in timber components	
319091602-D/MB, Rev.3	319091602-I / BLP130, Rev.3	
Product CFS-MB in timber components	Product CFS-BL P in timber components	
319091602-E / CC, Rev.3	319091602-J / CEL, Rev.3	
"Product CFS-CC in timber components"	Product CFS-C EL in timber components	
319091602-F/ FX, Rev.3		
Product CFS-F FX in timber components		

Expert assessments / statements:

Statement No. 319111301-1on supporting structures made of timber by IBS Linz

Expert statement No. GA-2022/128-Nau of 22.12.2022 on supporting structures made of timber IBB

Expert statement No. GS 3.2 /17-035-1of MFPA Leipzig

Expert statement No. (2400/584/17-2) of the IBMB Braunschweig

Expert statement of the Technical University of Munich on the annular gap closure of Geba AVR fire protection shut-off device

		Appendix 2	
ID General CLT		Inhalt Fasteners/firestopping products for timber base material	
Seite 02	Rev 3		

Hilti firestopping systems:

Cable penetration	System cable sleeve CFS-CC
Pipe penetration seal	System wastewater pipe sleeve CFS-C
Pipe penetration seal	System wastewater pipe sleeve CFS-C-P

Must be fastened to the timber base material with tested fasteners.

For the corresponding fasteners and lengths, please refer to the table below:

Product	Designation	Fire rating / integrity
	Hilti HUS3-H/P 6	30 min / ≥ 60 mm 60 min / ≥ 80 mm 90 min / ≥ 100 mm
	Hilti S-WWP-S 6	30 min / ≥ 60 mm 60 min / ≥ 80 mm 90 min / ≥ 100 mm

For cables that are routed through penetration seals, the fastening distances (before and after a penetration seal) of the respective basic applicability approvals apply.

Please refer to the table below for the corresponding distances:

Pipe penetration seal

Product	pipe	Implementation requirement
CFS-C EL	≤ 25 cm	Wall: Building material class non-combustible A (DIN 4102-4)
CFS-B	≤ 320 mm ≤ 520 mm (pipes ≥ 159 mm ≤ 813 mm)	Wall: Building material class non-combustible A (DIN 4102-4) Covering: Building material class non-combustible A (DIN 4102-4)
CP 647-I	≤ 65 cm	Wall: Building material class non-combustible A (DIN 4102-4)

Mixed penetrations

Product	Cable	pipe	Implementation requirement
CFS-F FX 200	≤ 45 cm	≤ 200	Cables and combustible pipes: Building material class non-combustible A (Building Rules List A Part 1. Appendix 0.2.1 or 0.2.2) non-combustible pipes: 90 minutes functional
CFS-F FX 150	≤ 45 cm	≤ 200	Cables and combustible pipes: Building material class non-combustible A (Building Rules List A Part 1. Appendix 0.2.1 or 0.2.2) non-combustible pipes: 90 minutes functional
CFS-BL P	≤ 50 cm	combustible pipe ≤ 50 cm non-combustible pipe ≤ 50 cm	In general: Building material class non-combustible A (DIN 4102-4)

Cable penetration

Product	Cable	Implementation requirement
CFS-CC	≤ 30 cm	Building material class non-combustible A (DIN 4102-4)
CFS-SL	≤ 32 cm	Wall: Building material class non-combustible A (DIN 4102-4)
	≤ 25 cm	Covering: Building material class non-combustible A (DIN 4102-4)

Firestop Block CFS-BL P (transverse installation 90 minutes)



APPLICATIONS

- Partitioning of cables, cable bundles max. Ø 100 mm and cable trays of all types and diameters
- Partitioning of waveguide cables (coaxial cables) up to Ø 50.4 mm
- Partitioning of empty electrical conduits up to Ø 63 mm
- Partitioning of non-combustible pipes made of steel, stainless steel, cast iron up to Ø 168.3 mm, copper pipes up to Ø 88.9 mm and copper pipes Ø 54 mm
- Joint lead-through of cables, pipes made of steel, copper, cast iron in one sealing
- Ideally suited for rooms that are highly sensitive to fibres and dust and locations with frequently changing electrical installations, such as in data centres, IT rooms, hospitals, and laboratories.
- Examples: Office buildings, hospitals, shopping centers as well as industrial buildings, fire wall systems in drywall construction.

ADVANTAGES

- Plastic label can remain on the stone (easier installation)
- Particularly suitable for reassignment of cables
- Can be combined with CFS-F FX fire protection foam (mixed penetration)
- Economical due to short installation time
- Implementation of empty electrical conduits with and without wiring
- Easy processing, no special tools required
- Completely dust and fiber free



Ordering designation	Package content	LxWxH	Sales pack quantity	Item number
CFS-BL P	Includes 1x Firestop Block 200 x 130 x 50 mm	200 x 130 x 50 mm	1 pc.	2058959
CFS-BL P (20) Set	Includes 20 Firestop Blocks, in a box	200 x 130 x 50 mm	1 pc.	2073754
CFS-BL P (360) Set	Includes 360 Firestop Blocks, on a pallet	200 x 130 x 50 mm	1 pc.	2073755

Additional components

Ordering designation	Package content	Sales pack quantity	Item number
Firestop Filler CFS-FIL	310 ml	1 pc.	2052899
Firestop Putty Tape CP 619	5 m roll	1 pc.	378940
Firestop Bandage CFS-B	10 m	1 pc.	429557

Note: Order an identification plate for each penetration seal.
For installation, please observe the relevant approval/test report and the processing instructions contained therein!

Firestop Block CFS-BL P (longitudinal installation 90 minutes fire resistance + transverse installation 30 minutes fire resistance)



APPLICATIONS

- Partitioning of cables, cable bundles max. Ø 100 mm and cable trays of all types and diameters
- Partitioning of waveguide cables (coaxial cables) up to Ø 59.9 mm
- Partitioning of empty electrical conduits up to Ø 50 mm, bundled up to Ø 100 mm (bundle diameter)
- Partitioning of non-combustible pipes made of steel, stainless steel, cast iron up to Ø 168.3 mm, copper pipes up to Ø 88.9 mm and copper pipes Ø 54 mm with synthetic rubber insulation
- Partitioning of combustible pipes up to Ø 160 mm from Ø 75 mm with Firestop Bandage CFS-B
- Joint lead-through of cables, pipes made of steel, copper, cast iron and plastic in one sealing
- Ideally suited for rooms that are highly sensitive to fibres and dust and locations with frequently changing electrical installations, such as in data centres, IT rooms, hospitals, and laboratories.
- Examples: Office buildings, hospitals, shopping centers as well as industrial buildings, fire wall systems in drywall construction.

ADVANTAGES

- Plastic label can remain on the stone (easier installation)
- Particularly suitable for reassignment of cables
- Can be combined with CP 660 Firestop Foam (mixed penetration)
- Economical due to short installation time
- Implementation of empty electrical conduits with and without wiring
- Easy processing, no special tools required
- Completely dust and fiber free



Ordering designation	Package content	LxWxH	Sales pack quantity	Item number
CFS-BL P	Includes 1x Firestop Block 200 x 130 x 50 mm	200 x 130 x 50 mm	1 pc.	2058959
CFS-BL P (20) Set	Includes 20 Firestop Blocks, in a box	200 x 130 x 50 mm	1 pc.	2073754
CFS-BL P (360) Set	Includes 360 Firestop Blocks, on a pallet	200 x 130 x 50 mm	1 pc.	2073755

Firestop Filler CFS-FIL

Ordering designation	Package content	Sales pack quantity	Item number
CFS-FIL	310 ml	1 pc.	2052899

Note: Order an identification plate for each penetration seal.
For installation, please observe the relevant approval/test report and the processing instructions contained therein!

Firestop Bandage CFS-B



APPLICATIONS

- Firestop around (heat/cold) insulated non-combustible pipes
- Pipe materials: copper, steel and other metals with thermal conductivity lower than copper (e.g. cast iron, stainless steel, etc.)
- Various insulation materials
- Suitable for use in openings in concrete, masonry block or lightweight walls
- Aluminum composite pipes

ADVANTAGES

- Versatile – one product for a wide range of insulation materials, pipe materials and pipe diameters
- Quick and easy to install – no drilling or additional tools required
- No need to interrupt the pipe insulation material inside the wall/floor penetration
- Minimal thickness for easy installation in narrow gaps
- Good elasticity for optimum flexibility

Technical data	
General applications	pipes
Working temperature range	-5 - 50 °C
Temperature resistance range	-20 - 100 °C
Storage and transport temperature range	-5 - 50 °C
Shelf life ¹⁾	At 25 °C and 50 % relative humidity, from date of manufacture.
Additional products	CP 636, CP 633, CFS-S ACR
Reaction temperature (approximate)	210 °C
Expansion ratio (unrestricted)	1:14
Building material class (EN 13501-1)	E
Approvals	Z-19.53-2210, Z-19.53-2218



Ordering designation	Sales pack quantity	Article number
Firestop Bandage CFS-B	1 pc.	429557

Firestop Sealant (acrylic) CFS-S ACR

APPLICATIONS

- Between lightweight partitions
- Vertical joints between solid walls
- Horizontal joints (wall-wall, wall-floor, wall-floor)
- Partitioning of non-combustible pipes



Ordering designation	Color	Volume per unit	Sales pack quantity	Item number
CFS-S ACR CG	Gray	310 ml	1 pc.	435862
CFS-S ACR CW	White	310 ml	1 pc.	435859

Note: Order an identification plate for each penetration seal.
For installation, please observe the relevant approval/test report and the processing instructions contained therein!

Firestop Endless Collar CFS-C EL



APPLICATIONS

- Suitable for use on shaft walls, soft sealings, lightweight walls, foamed concrete, masonry and concrete
- Approved for designs in PVC, PP, PE and a wide range of different low-noise pipes
- Low-noise pipes tested with insulation and sound decoupling
- Tested configurations: pipe bends, sloping pipes, pipes with little wall distance
- No minimum distance required to Firestop Bandage CFS-B, Firestop Endless Collar CFS-C EL and Conlit

ADVANTAGES

- Flexible solution for wastewater pipes, roof drainage and pneumatic pipe lines
- Endless solution: One product for all applications
- Problem solver for non-standard applications
- Simple assembly

Technical data	
Pipe diameter (range)	16 – 160 mm
L x W x H	2580 x 52 x 17 mm
Reaction temperature (approximate)	210 °C
Working temperature	-5 – 50 °C
Temperature resistance	-30 – 80 °C
Storage and transport temperature	-30 – 50 °C
Building material class (EN 13501-1)	E
Expansion ratio (unlimited to max.)	1:19
Additional products	CFS-S ACR, CFS-FIL
Approval	Z-19.53-2192



Ordering designation	Package content	Sales pack quantity	Item number
CFS-C EL	1x Firestop Endless Collar CFS-C EL, 18 closure plates, 22 short hooks	1 pc.	2075120

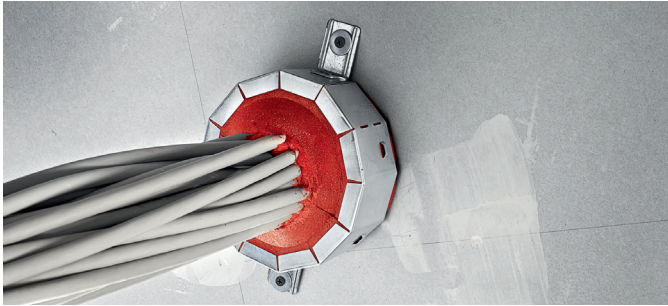
Accessories



Ordering designation		Sales pack quantity	Item number
Closure plate CFS-C EL	①	18 pcs.	2075121
Hooks CFS-C EL short	②	22 pcs.	2075122
Hooks CFS-C EL long	③	20 pcs.	2075123
CFS-S ACR CG	④	1 pc.	435862
CFS-S ACR CW	④	1 pc.	435859

Note: Order an identification plate for each penetration seal.
For installation, please observe the relevant approval/test report and the processing instructions contained therein!

Firestop Cable Collar CFS-CC

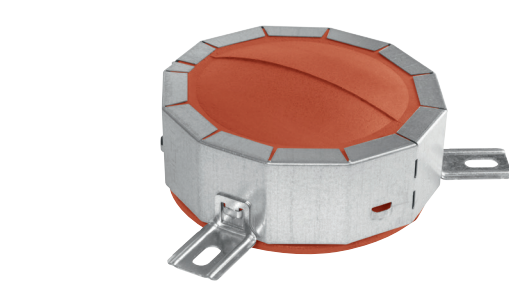


APPLICATIONS

- Single cables and cable bundles in floors and walls
- For new and existing cable installations
- Electric conduits up to 32 mm
- Coaxial waveguide cable up to Ø 59.9 mm

ADVANTAGES

- Quick and easy fire protection solution for openings with max. diameter (with and without sleeves)
- Simple fire protection solution for openings that are 100% occupied
- Problem solver for difficult cable penetrations
- Quick and easy solution, no mineral wool and no sealant required
- Immediately functional after assembly
- Simple reassignment of cables



Technical data

General applications	Cable, electrical conduits
Max. opening (diameter)	108 mm
Working temperature range	5 - 40 °C
Temperature resistance range	-15 - 60 °C
Storage and transport temperature range	-5 - 40 °C
Additional products	CFS-FIL
Reaction temperature (approximate)	200 °C
Building material class	E
Proof of applicability	Z-19.53-2282



Ordering designation	Package Content	Sales pack quantity	Item number
CFS-CC	Firestop collar CFS-CC 4"	2 pcs.	2079667

Accessories

Ordering designation	Package Content	Sales pack quantity	Item number
fastening hook	30 fastening hooks	1 pc.	304345

Note: Order an identification plate for each penetration seal.
For installation, please observe the relevant approval/test report and the processing instructions contained therein!

Firestop Foam CFS-F FX 200



APPLICATIONS

- Cables, cable bundles, cable trays and electrical conduits
- Pipelines and combined sealings
- Combined approvals with firestop blocks especially for large openings or applications in special application areas (telecommunications, industry)
- Penetration seal of air-conditioning lines

ADVANTAGES

- Very quick and easy to install, as only one product is required, which also provides a reliable firestop coating
- Maintenance and retrofitting of lines are extremely simple
- Smoke tightness and fire protection in one system
- Ideal for closing irregular openings
- Foam can be easily shaped during the curing process
- Easy to squeeze out with a Hilti battery dispenser



Technical data

Color	Red
Foil pack content	325 ml
Foam yield up to	2.1 l
Application temperature	+10°C - +35°C
Storage and transport temperature	+5°C - +25°C
Curing times	Can be reshaped for approx. 5 min. Can be cut after approx. 10 min.
Building material class (EN 13501-1)	Class E
Temperature resistance range	-30°C - +60°C
Minimum installation depth	200 mm
Shelf life	9 months with dry storage*
Proof of applicability	Z-19.53-2237 FX 200

* At 23 °C and 50% relative humidity



Ordering designation	Package content	Sales pack quantity	Item number
CFS-F FX	1x Firestop foam CFS-F FX incl. 1x mixer	1 pc.	429802

Dispenser

Ordering designation		Sales pack quantity	Item number
Manual squeezer HDM 330	Manual squeezer with 2 cassettes for foil packs, in impact-resistant Hilti plastic case	1 pc.	2036319
Cordless dispenser HDE 500-A22 Set	Battery-powered dispenser with 2 cassettes for foil packs, battery charger C 4/36-ACS, battery B22/3.3 Ah, in impact-resistant Hilti plastic case	1 pc.	2044198



Note: Order an identification plate for each penetration seal.
For installation, please observe the relevant approval/test report and the processing instructions contained therein!

Firestop Sleeve CFS-SL GA



APPLICATIONS

- Cable penetration for single cables and cable bundles
Max. cable diameter 21 mm
- Installation in drywall, solid walls and floors
- Ideal solution when cable configurations are changed regularly, such as server rooms, data centers, hospitals and industrial sites
- Firestop sleeve can be used together with the multiple mounting plate to build multiple bushings in a space-saving way

ADVANTAGES

- Quick and easy work processes
- Fully functional immediately after installation
- Cable assignment up to 100%
- Easy subsequent installation of additional cables

Technical data	
Base material	Drywall, solid wall and rigid floor
Proof of applicability	Z-19.53-2318
Simple	retrofitting
Air permeability	Test report
Working temperature range	-5 – 50°C
Temperature resistance range	-30°C – 75°C
Building material class according to DIN EN 13501-1	E
Opening size	Ø 113-122 mm



Ordering designation	Outer diameter	Opening size	Wall / floor thickness	Sales pack quantity	Item number
CFS-SL GA M	110 mm	113-122 mm	100-200 mm	1 pc.	2212767
CFS-SL GA L	110 mm	113-122 mm	200-300 mm	1 pc.	2212768

Note: Order an identification plate for each penetration seal.
For installation, please observe the relevant approval/test report and the processing instructions contained therein!

Intumescent Firestop Sealant CP 611A / CFS-IS



APPLICATIONS

- Partitioning of single cables and bundled cables with max. Ø 100 mm according to DIN 4102 for a fire rating/integrity of 90 minutes (S 90)
- Partitioning of combustible pipes up to Ø 50 mm according to DIN 4102 for a fire rating/integrity of 90 or 120 minutes (R 90 / R120)
- Implementation of empty pipes with and without occupancy: All plastic pipes according to DIN EN 50086 up to DN 40, all steel pipes according to DIN EN 50086 up to DN 50.
- Installation also possible in PVC sheathing pipes routed through wall or floor (cable)
- Ideally suited for broken, irregular or round openings in fire walls and floors
- Partitioning of pipelines according to LAR (Leistungsanlagen-Richtlinie) for combustible pipes up to Ø 32 mm and for non-combustible pipes up to Ø 160 mm

ADVANTAGES

- Versatile range of applications (approval for cables and empty pipes, approval for combustible pipes up to Ø50 mm)
- Quick sealing of residual openings
- Implementation of empty cable conduits with and without wiring
- Particularly suitable for retrofitting (e.g. single cable)
- Floor sealing on only one side from above
- Installation possible according to approval or LAR (Line Installation Guideline)



Ordering designation	Color	Volume per unit	Sales pack quantity	Item number
CP 611A INT	Anthracite	310 ml	1 pc.	220351

Note: Order an identification plate for each penetration seal.
For installation, please observe the relevant approval/test report and the processing instructions contained therein!

Hilti Firestop Sealant CFS-S ACR

Acrylic-based firestop sealant with movement capability for sealing off Geberit Mepla non-combustible pipes and aluminum composite pipes



APPLICATIONS

- Partitioning of non-combustible pipes made of steel, stainless steel, cast iron and copper with non-combustible insulation Rockwool 800
- Concrete, masonry and lightweight partition walls
- Partition seals in concrete floors
- Partitioning in cross-laminated timber floors
- 0 distances

ADVANTAGES

- Easy to dispense, apply and process
- Strong adhesion to various base materials
- Low shrinkage after curing
- Excellent airborne sound insulation

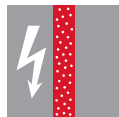
The German Approval P-MPA-E-017-010 test certificate is available at www.hilti.de.



Smokeproof



Sound insulation

Electrical
resistance

Waterproof

Technical data

Chemical base	Acrylic dispersion on water base
Volume shrinkage	< 20 %
Movement	12.5 % (ISO 11600)
Curing time (at 23 °C / 50 % RH)	~ 3 mm / 72 h
Working temperature range	5°C – 40°C
Storage and transport temperature range	5°C – 25°C
Shelf life (at 23 °C and 50 % relative humidity)	24 months
Fire behavior class	D-s1d0 (EN 13501-1)
Proof of applicability	ABP_P-MPA-E-017-010

Ordering designation	Packaging	Volume	Color	Sales pack quantity	Item number
Hilti Firestop Sealant (acrylic) CFS-S ACR CG	Cartridge	310 ml	Gray	1 pc.	2025237
Hilti Firestop Sealant (acrylic) CFS-S ACR CW	Cartridge	310 ml	White	1 pc.	435859
Hilti Firestop Sealant (acrylic) CFS-S ACR PW	Bucket	5,000 ml	White	1 pc.	435864
Hilti Firestop Sealant (acrylic) CFS-S ACR PW 10 L	Bucket	10,000 ml	White	1 pc.	2046766

Note: Order an identification plate for each penetration seal.
For installation, please observe the relevant approval/test report and the processing instructions contained therein!

FIRE PROTECTION SOLUTIONS AT THE CLICK OF A MOUSE

Hilti Firestop Documentation Manager

When it comes to passive fire protection, the reliable implementation of all necessary measures is essential. The requirements for complete documentation from fire protection planning to inspection by fire protection experts are correspondingly high. With the Hilti Documentation Manager, you have building fire protection safely under control.

With Hilti Typical, you define the planned penetration seals. After installation, the Hilti Fire Protection Documentation Manager can be used for a complete comparison of the installation situation with the planning. Everything digital and available at any time.

We provide you with the software solution in the Hilti Cloud. This allows you to access your fire protection documentation at any time from your PC, smartphone or tablet using the associated smartphone app. Project plans and documents can be exchanged and jointly edited in real time between the office and the construction site. Your effort for meetings, e-mail contact and phone calls can be reduced considerably.

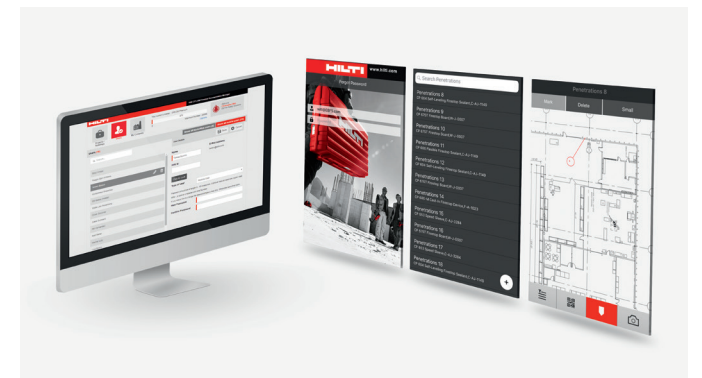


APPLICATIONS

- Designed to efficiently create overviews of all your fire protection equipment and systems
- Saves time on documentation
- Simplifies acceptance and can help demonstrate compliance with applicable laws
- Enables more efficient coordination between installer, client, architect and building supervisor
- Cloud-based data storage with continuous synchronization – current documentation is accessible from virtually any location

ADVANTAGES

- Taking photos before and after assembly with a mobile device
- Marking fire protection points in 2D plans
- Upload approvals, directories and other documents for each implementation
- Create reports and project files in PDF and Excel format
- QR code scanning for cable/pipe penetration handling and maintenance





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