



Institut für Brandschutztechnik
und Sicherheitsforschung

CLASSIFICATION REPORT

in acc. with EN 13501-2:2016

Product name: “**Hilti CFS-CC in timber building components**”

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1. Introduction

This Classification Report defines the fire resistance class assigned to the installation situations of Hilti CFS-CC in timber building components in compliance with the procedures given in EN 13501-2:2016.

2. Details of classified building components and products

2.1. Function type

The function of the Hilti construction products listed in this Classification Report is to resist fire in horizontal and vertical alignments, in solid cross laminated timber constructions in accordance with the characteristic product behaviour defined in section 5 of EN 13501-2:2016.

2.1.1. Hilti CFS-CC

The Hilti CFS-CC Firestop Cable Collar is defined as a small cable penetration seal and is used with single cables as well as cable bundles and conduits.

2.1.2. Hilti CFS-FIL

The Firestop Filler Hilti CFS-FIL is defined as an annular gap seal. In combination with Hilti CFS-CC, the Firestop Filler Hilti CFS-FIL is intended to seal annular gaps of cables, cable bundles and conduits.

2.2. Descriptions

The installation situations of “Hilti CFS-CC in timber building components” are fully described in the test reports referred to in section 3 of this Classification Report.

2.2.1. Products

2.2.1.1. Hilti CFS-CC

The building product Hilti CFS-CC is a round penetration seal based on intumescent material in a steel sheet housing.

Hilti CFS-CC is assigned the following classification with regard to its reaction to fire in accordance with EN 13501-1:

Reaction to fire performance class E

(ETA-13/0704 of 28.06.2018, Austrian Institute of Construction Engineering (OIB))

2.2.1.2. Hilti CFS-FIL

The construction product Hilti CFS-FIL is an acrylic-based firestop filler.

Hilti CFS-FIL is assigned the following classification with regard to its reaction to fire in accordance with EN 13501-1:

Reaction to fire performance class E

(ETA-13/0099 of 01.10.2018, Austrian Institute of Construction Engineering (OIB))

2.2.2. Pipes

2.2.2.1. Electrical conduits:

Fränkische FPKu-EM-F-H0	Application:	Cable protection pipe
	Material:	Special plastic
	Product standard:	DIN EN 61386-21
Fränkische FFKu-EL-F-LS0H	Application:	Cable protection pipe
	Material:	Polyolefin mod.
	Product standard:	DIN EN 61386-22

2.2.3. Test specimen description

2.2.3.1. Key

Test Report No. – Penetration sealant type – test specimen numbers of the current page																							
Test specimen no.	No.	Material	Dimensions (mm) Cable load	Orientation	Pipe-end configuration	Insulation Acc. to EN 1366-3:2009; Table 1				Mixed penetration seal / dimension l x w x h [mm]	Pipe sealing system, as per EN 1366-3 3.12												
						Type	Set-up	Length [mm]	Insulation thickness [mm]		Type	Inside diameter [mm]	Active components			Installation	Joint seal depth [mm]	Fastening					
Plastic or metal type	Manufacturer type designation	Cable group acc. to EN 1366-3:2009 Table A.1/2	Amount x outside diameter / wall thickness Cable designation acc. to EN 1366-3:2009 Table A.1/2	Spec. designation of cables / coaxial cables or waveguides deviating from EN 1366-3:2009	Deviating cables /coaxial cables or waveguides	Angle between test specimen and supporting structure	Pipe-end configuration acc. to EN 1366-3:2009 Table 2	Manufacturer type designation	Pipe insulation acc. to EN 1366-3:2009 Table 1	Length of insulation on both sides of penetration seal	Insulation thickness	Type designation / dimensions	Type designation of pipe sealing system	Inside diameter of pipe sealing system	Amount of active layers				Total thickness of active layers	Length of the active insert according to EN 1366-3:2009 Illustration H.3	E - Fire Exposed side U - Unexposed side 2S - Both sides CEN - Centred	- I – inside - O - outside	Type designation, filling depth



2.2.3.2. Test Report No. 318092507-1,Rev2

Tested in:	80 mm thick cross laminated timber floor (Binderholz BBS XL) with 3-layer structure Lamella thickness per layer 20 / 40 / 20 mm
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TR 318092507-1,Rev2											
No.	Cable type	Amount	Penetration seal	Dimensions OD / L [mm]	Insulation Acc. to EN 1366-3:2009; Table 1				Installation	Joint and gap sealing, depth [mm]	Fastening and Joint and gap sealing Type, depth [mm]
					Type	Set-up	Length [mm]	Insulation thickness [mm]			
P14	A1 A2 A3 B	3 3 3 1	CFS-CC ¹	Ø150 x 50	-	-	-	-	2S-O	CFS-FIL, 25	2 x S-WS 11 Y x 75 - ²
P15	F	30 / Ø100	CFS-CC ³	Ø150 x 50	-	-	-	-	2S-O	CFS-FIL, 25	2 x S-WS 11 Y x 75 - ⁴

¹ The opening in the component had a diameter of Ø108 mm, overlapped for at least 19 mm on a position by the cable collar used.

² No backfilling of annular gaps / residual openings within the floor.

³ The opening in the component had a diameter of Ø108 mm, overlapped for at least 19 mm on a position by the cable collar used.

⁴ No backfilling of annular gaps / residual openings within the floor.



2.2.3.3. Test Report No. 318092507-2,Rev2

Tested in:	140 mm thick cross laminated timber floor (Binderholz BBS XL) with 5-layer structure Lamella thickness per layer 40 / 20 / 20 / 20 / 40 mm
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TR 318092507-2,Rev2											
No.	Cable type	Amount	Penetration seal	Dimensions OD / L [mm]	Insulation Acc. to EN 1366-3:2009; Table 1				Installation	Joint and gap sealing, depth [mm]	Fastening and Joint and gap sealing Type, depth [mm]
					Type	Set-up	Length [mm]	Insulation thickness [mm]			
P15	A1 A2 A3 B	3 3 3 1	CFS-CC ⁵	Ø150 x 50	-	-	-	-	2S-O	CFS-FIL, 25	2 x S-WS 11 Yx75mm _6
P16	F	30 / Ø100	CFS-CC ⁷	Ø150 x 50	-	-	-	-	2S-O	CFS-FIL, 25	2 x HUS3 H 6x100mm _8

⁵ The opening in the component had a diameter of Ø108 mm, overlapped for at least 19 mm on a position by the cable collar used.

⁶ No backfilling of annular gaps / residual openings within the floor.

⁷ The opening in the component had a diameter of Ø108 mm, overlapped for at least 19 mm on a position by the cable collar used.

⁸ No backfilling of annular gaps / residual openings within the floor.



2.2.3.4. Test Report No. 318092507-3,Rev2

Tested in:	100 mm thick cross laminated timber floor (Binderholz BBS XL) with 5-layer structure Lamella thickness per layer 20 / 20 / 20 / 20 / 20 mm
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TR 318092507-3,Rev2																	
No.	Material	Dimensions (mm) Cable load	Orientation	Pipe-end configuration	Insulation Acc. to EN 1366-3:2009; Table 1				Penetration seal / dimension Ø x h [mm]	Pipe sealing system, as per EN 1366-3 3.12							
					Type	Set-up	Length [mm]	Insulation thickness [mm]		Type	Inside diameter [mm]	Active components			Installation	Joint and gap sealing, depth [mm]	Fastening and joint and gap sealing Type, depth [mm]
										Layers	Thickness [mm]	Length [mm]					
P15.1-2	Fränkische FPKu-EM-F-HO	1 x Ø32; occupied	90°	U/C	-	-	-	-	CFS-CC ⁹ / Ø150 x 50	-	-	-	-	-	2S-O	CFS-FIL, 25	2 x S-WS 11 Yx85mm ⁻¹⁰
	Fränkische FFKu- EL-F-LSOH	1 x Ø32; occupied	90°	U/C	-	-	-	-		-	-	-	-	-	-		
P16.1-2	Fränkische FPKu-EM-F-HO	1 x Ø32; empty	90°	U/C	-	-	-	-	CFS-CC ¹¹ / Ø150 x 50	-	-	-	-	-	2S-O	CFS-FIL, 25	2 x HUS H 6x80mm ₋₁₂
	Fränkische FFKu- EL-F-LSOH	1 x Ø32; empty	90°	U/C	-	-	-	-		-	-	-	-	-	-		

⁹ The opening in the component had a diameter of Ø108 mm, overlapped for at least 19 mm on a position by the cable collar used.

¹⁰ No backfilling of annular gaps / residual openings within the floor.

¹¹ The opening in the component had a diameter of Ø108 mm, overlapped for at least 19 mm on a position by the cable collar used.

¹² No backfilling of annular gaps / residual openings within the floor.

2.2.3.5. Test Report No. 318092507-4

Tested in:	80 mm thick cross laminated timber floor (Binderholz BBS XL) with 3-layer structure Lamella thickness per layer 20 / 40 / 20 mm
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TR 318092507-4											
No.	Cable type	Amount	Penetration seal	Dimensions OD / L [mm]	Insulation Acc. to EN 1366-3:2009; Table 1				Installation	Joint and gap sealing, depth [mm]	Fastening and Joint and gap sealing Type, depth [mm]
					Type	Set-up	Length [mm]	Insulation thickness [mm]			
P26	A1 A2 A3 B	3 3 3 1	CFS-CC ¹³	Ø150 x 50	-	-	-	-	2S-O	CFS-FIL, 25	2 x hex head wood screws 6x60. ¹⁴
P27	empty	-	CFS-CC ¹⁵	Ø150 x 50	-	-	-	-	2S-O	-	2 x hex head wood screws 6x60. ¹⁶
P28	F	30 / Ø100	CFS-CC ¹⁷	Ø150 x 50	-	-	-	-	2S-O	CFS-FIL, 25	2 x hex head wood screws 6x60. ¹⁸

¹³ The opening in the component had a diameter of Ø108 mm, overlapped for at least 19 mm on a position by the cable collar used.

¹⁴ No backfilling of annular gaps / residual openings within the floor.

¹⁵ The opening in the component had a diameter of Ø108 mm, overlapped for at least 19 mm on a position by the cable collar used.

¹⁶ No backfilling of annular gaps / residual openings within the floor.

¹⁷ The opening in the component had a diameter of Ø108 mm, overlapped for at least 19 mm on a position by the cable collar used.

¹⁸ No backfilling of annular gaps / residual openings within the floor.

2.2.3.6. Test Report No. 318092507-5

Tested in:	100 mm thick cross laminated timber floor (Binderholz BBS XL) with 5-layer structure Lamella thickness per layer 20 / 20 / 20 / 20 / 20 mm
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TR 318092507-5											
No.	Cable type	Amount	Penetration seal	Dimensions OD / L [mm]	Insulation Acc. to EN 1366-3:2009; Table 1				Installation	Joint and gap sealing, depth [mm]	Fastening and Joint and gap sealing Type, depth [mm]
					Type	Set-up	Length [mm]	Insulation thickness [mm]			
P39	A1 A2 A3 B	3 3 3 1	CFS-CC ¹⁹	Ø150 x 50	-	-	-	-	2S-O	CFS-FIL, 25	2 x hex head wood screws 6x80- ²⁰
P40	empty	-	CFS-CC ²¹	Ø150 x 50	-	-	-	-	2S-O	-	2 x hex head wood screws 6x80- ²²
P41	F	30 / Ø100	CFS-CC ²³	Ø150 x 50	-	-	-	-	2S-O	CFS-FIL, 25	2 x hex head wood screws 6x80- ²⁴

¹⁹ The opening in the component had a diameter of Ø108 mm, overlapped for at least 19 mm on a position by the cable collar used.

²⁰ No backfilling of annular gaps / residual openings within the floor

²¹ The opening in the component had a diameter of Ø108 mm, overlapped for at least 19 mm on a position by the cable collar used.

²² No backfilling of annular gaps / residual openings within the floor.

²³ The opening in the component had a diameter of Ø108 mm, overlapped for at least 19 mm on a position by the cable collar used.

²⁴ No backfilling of annular gaps / residual openings within the floor.



2.2.3.7. Test Report No. 319091602-2,Rev1

Tested in:	100 mm thick cross laminated timber wall (Binderholz BBS XL) with 5-layer structure Lamella thickness per layer 20 / 20 / 20 / 20 / 20 mm
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TR 319091602-2,Rev1											
No.	Cable type	Amount	Penetration seal	Dimensions OD / L [mm]	Insulation Acc. to EN 1366-3:2009; Table 1				Installation	Joint and gap sealing, depth [mm]	Fastening and Joint and gap sealing Type, depth [mm]
					Type	Set-up	Length [mm]	Insulation thickness [mm]			
P13	A1 A2 A3 B	3 3 3 1	CFS-CC ²⁵	Ø150 x 50	-	-	-	-	2S-O	CFS-FIL, 25	2 x S-WS 11 Yx85mm _26
P14	F	30 / Ø100	CFS-CC ²⁷	Ø150 x 50	-	-	-	-	2S-O	CFS-FIL, 25	2 x HUS3 H 6x80mm _28

²⁵ The opening in the component had a diameter of Ø108 mm, overlapped for at least 19 mm on a position by the cable collar used.

²⁶ No backfilling of annular gaps / residual openings within the floor.

²⁷ The opening in the component had a diameter of Ø108 mm, overlapped for at least 19 mm on a position by the cable collar used.

²⁸ No backfilling of annular gaps / residual openings within the floor.



2.2.3.8. Test Report No. 319091602-3,Rev1

Tested in:	80 mm thick cross laminated timber wall (Binderholz BBS XL) with 3-layer structure Lamella thickness per layer 20 / 40 / 20 mm
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TR 319091602-3,Rev1 – cable penetration seals – P13 – P16, P27 – P28											
No.	Cable type	Amount	Penetration seal	Dimensions OD / L [mm]	Insulation Acc. to EN 1366-3:2009; Table 1				Installation	Joint and gap sealing, depth [mm]	Fastening and Joint and gap sealing Type, depth [mm]
					Type	Set-up	Length [mm]	Insulation thickness [mm]			
P13	A1 A2 A3 B	3 3 3 1	CFS-CC ²⁹	Ø150 x 50	-	-	-	-	2S-O	CFS-FIL, 20	2 x S-WS 11 Yx60mm _30
P14	F	30 / Ø100	CFS-CC ³¹	Ø150 x 50	-	-	-	-	2S-O	CFS-FIL, 20	2 x HUS3 H 6x60mm _32

²⁹ The opening in the component had a diameter of Ø108 mm, overlapped for at least 19 mm on a position by the cable collar used.

³⁰ No backfilling of annular gaps / residual openings within the floor.

³¹ The opening in the component had a diameter of Ø108 mm, overlapped for at least 19 mm on a position by the cable collar used.

³² No backfilling of annular gaps / residual openings within the floor.

2.2.3.9. Test Report No. 319091602-4,Rev1

Tested in:	80 mm thick cross laminated timber wall (Binderholz BBS XL) with 3-layer structure Lamella thickness per layer 20 / 40 / 20 mm
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TR 319091602-4,Rev1											
No.	Cable type	Amount	Penetration seal	Dimensions OD / L [mm]	Insulation Acc. to EN 1366-3:2009; Table 1				Installation	Joint and gap sealing, depth [mm]	Fastening and Joint and gap sealing Type, depth [mm]
					Type	Set-up	Length [mm]	Insulation thickness [mm]			
P28	A1 A2 A3 B	3 3 3 1	CFS-CC ³³	Ø150 x 50	-	-	-	-	2S-O	CFS-FIL, 25	2 x hex head wood screws 6x60- ³⁴
P29	empty	-	CFS-CC ³⁵	Ø150 x 50	-	-	-	-	2S-O	-	2 x hex head wood screws 6x60- ³⁶
P30	F	30 / Ø100	CFS-CC ³⁷	Ø150 x 50	-	-	-	-	2S-O	CFS-FIL, 25	2 x hex head wood screws 6x60- ³⁸

³³ The opening in the component had a diameter of Ø108 mm, overlapped for at least 19 mm on a position by the cable collar used.

³⁴ No backfilling of annular gaps / residual openings within the floor.

³⁵ The opening in the component had a diameter of Ø108 mm, overlapped for at least 19 mm on a position by the cable collar used.

³⁶ No backfilling of annular gaps / residual openings within the floor

³⁷ The opening in the component had a diameter of Ø108 mm, overlapped for at least 19 mm on a position by the cable collar used.

³⁸ No backfilling of annular gaps / residual openings within the floor.



TR 319091602-4, Rev1											
No.	Cable type	Amount	Penetration seal	Dimensions OD / L [mm]	Insulation Acc. to EN 1366-3:2009; Table 1				Installation	Joint and gap sealing, depth [mm]	Fastening and Joint and gap sealing Type, depth [mm]
					Type	Set-up	Length [mm]	Insulation thickness [mm]			
P31	A1 A2 A3 B	3 3 3 1	CFS-CC ³⁹	Ø150 x 50	-	-	-	-	2S-O	CFS-FIL, 25	2 x hex head wood screws 6x60- ⁴⁰
P32	empty	-	CFS-CC ⁴¹	Ø150 x 50	-	-	-	-	2S-O	-	2 x hex head wood screws 6x60- ⁴²
P33	F	30 / Ø100	CFS-CC ⁴³	Ø150 x 50	-	-	-	-	2S-O	CFS-FIL, 25	2 x hex head wood screws 6x60- ⁴⁴

³⁹ The opening in the component had a diameter of Ø108 mm, overlapped for at least 19 mm on a position by the cable collar used.

⁴⁰ No backfilling of annular gaps / residual openings within the floor.

⁴¹ The opening in the component had a diameter of Ø108 mm, overlapped for at least 19 mm on a position by the cable collar used.

⁴² No backfilling of annular gaps / residual openings within the floor.

⁴³ The opening in the component had a diameter of Ø108 mm, overlapped for at least 19 mm on a position by the cable collar used.

⁴⁴ No backfilling of annular gaps / residual openings within the floor.

2.2.3.10. Test Report No. 319091602-5,Rev1

Tested in:	100 mm thick cross laminated timber wall (Binderholz BBS XL) with 5-layer structure Lamella thickness per layer 20 / 20 / 20 / 20 / 20 mm
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TR 319091602-5,Rev1											
No.	Cable type	Amount	Penetration seal	Dimensions OD / L [mm]	Insulation Acc. to EN 1366-3:2009; Table 1				Installation	Joint and gap sealing, depth [mm]	Fastening and Joint and gap sealing Type, depth [mm]
					Type	Set-up	Length [mm]	Insulation thickness [mm]			
P39	A1 A2 A3 B	3 3 3 1	CFS-CC ⁴⁵	Ø150 x 50	-	-	-	-	2S-O	CFS-FIL, 25	2 x hex head wood screws 6x80- ⁴⁶
P40	empty	-	CFS-CC ⁴⁷	Ø150 x 50	-	-	-	-	2S-O	-	2 x hex head wood screws 6x80- ⁴⁸
P41	F	30 / Ø100	CFS-CC ⁴⁹	Ø150 x 50	-	-	-	-	2S-O	CFS-FIL, 25	2 x hex head wood screws 6x80- ⁵⁰

⁴⁵ The opening in the component had a diameter of Ø108 mm, overlapped for at least 19 mm on a position by the cable collar used.

⁴⁶ No backfilling of annular gaps / residual openings within the floor.

⁴⁷ The opening in the component had a diameter of Ø108 mm, overlapped for at least 19 mm on a position by the cable collar used.

⁴⁸ No backfilling of annular gaps / residual openings within the floor.

⁴⁹ The opening in the component had a diameter of Ø108 mm, overlapped for at least 19 mm on a position by the cable collar used.

⁵⁰ No backfilling of annular gaps / residual openings within the floor.

3. Test reports and results

3.1. Test reports

Name of testing laboratory	Customer	Test Report No.	Test method
IBS Linz Petzoldstr. 45, A-4020 Linz	HILTI AG Feldkircher Str. 100 FL-9494 Schaan	319091602-3,Rev1 of 24.07.2020 (CLT W 80mm)	EN 1363-1: 1999 EN 1366-3: 2009
IBS Linz Petzoldstr. 45, A-4020 Linz	HILTI AG Feldkircher Str. 100 FL-9494 Schaan	319091602-2,Rev1 of 24.07.2020 (CLT W 100mm)	EN 1363-1: 1999 EN 1366-3: 2009
IBS Linz Petzoldstr. 45, A-4020 Linz	HILTI AG Feldkircher Str. 100 FL-9494 Schaan	318092507-3,Rev2 of 12.10.2020 (CLT C 100mm)	EN 1363-1: 1999 EN 1366-3: 2009
IBS Linz Petzoldstr. 45, A-4020 Linz	HILTI AG Feldkircher Str. 100 FL-9494 Schaan	318092507-2,Rev2 of 12.10.2020 (CLT C 140mm)	EN 1363-1: 1999 EN 1366-3: 2009
IBS Linz Petzoldstr. 45, A-4020 Linz	HILTI AG Feldkircher Str.100 FL-9494 Schaan	318092507-1,Rev2 of 12.10.2020 (CLT C 80mm)	EN 1363-1: 1999 EN 1366-3: 2009
IBS Linz Petzoldstr. 45, A-4020 Linz	HILTI AG Feldkircher Str.100 FL-9494 Schaan	318092507-4 of 22.07.2020 (CLT C 80mm)	EN 1363-1: 1999 EN 1366-3: 2009
IBS Linz Petzoldstr. 45, A-4020 Linz	HILTI AG Feldkircher Str. 100 FL-9494 Schaan	318092507-5 of 22.07.2020 (CLT C 100mm)	EN 1363-1: 1999 EN 1366-3: 2009
IBS Linz Petzoldstr. 45, A-4020 Linz	HILTI AG Feldkircher Str. 100 FL-9494 Schaan	319091602-4,Rev1 of 12.10.2020 (CLT W 80mm)	EN 1363-1: 1999 EN 1366-3: 2009
IBS Linz Petzoldstr. 45, A-4020 Linz	HILTI AG Feldkircher Str. 100 FL-9494 Schaan	319091602-5,Rev1 of 12.10.2020 (CLT W 100mm)	EN 1363-1: 1999 EN 1366-3: 2009

3.2. Resistance to fire performance

Table 1: Terms of loading

Temperature-time curve:	Standard temperature-time curve (STTC) as specified in subsection 5.1.1 of EN 1363-1:2000. 2000.
Fire load:	Horizontal penetration seal (floor) Vertical penetration seal (wall)

Table 2: Test results

Test Report No. 318092507-1, Rev2 of 12.10.2020 EN 1366-3: 2009 in connection with EN 1363-1: 1999					
No.	Pipe-end configuration	E - Integrity			I - Thermal insulation
		Time until cotton wool pad ignition	Time until failure of gap gauge criteria	Time until occurrence of sustained flaming	Time until the maximum temperature rise exceeds 180 K on cold side
		[min]			
P14 - P15	-	≥ 60	≥ 60	≥ 60	≥ 60
Specific supporting structure according to the specifications of EN 1366-3:2009, subsection 7.2.1 Floor construction in cross laminated timber made from spruce with a total thickness of 80 mm					



Test Report No. 318092507-2, Rev2 of 12.10.2020 EN 1366-3: 2009 in connection with EN 1363-1: 1999					
No.	Pipe-end configuration	E - Integrity			I - Thermal insulation
		Time until cotton wool pad ignition	Time until failure of gap gauge criteria	Time until occurrence of sustained flaming	Time until the maximum temperature rise exceeds 180 K on cold side
		[min]			
P15 - P16	-	≥ 120	≥ 120	≥ 120	≥ 120
Specific supporting structure according to the specifications of EN 1366-3:2009, subsection 7.2.1 Floor construction in cross laminated timber made from spruce with a total thickness of 140 mm					

Test Report No. 318092507-3, Rev2 of 12.10.2020 EN 1366-3: 2009 in connection with EN 1363-1: 1999					
No.	Pipe-end configuration	E - Integrity			I - Thermal insulation
		Time until cotton wool pad ignition	Time until failure of gap gauge criteria	Time until occurrence of sustained flaming	Time until the maximum temperature rise exceeds 180 K on cold side
		[min]			
P15 - P16	U/C	≥ 90	≥ 90	≥ 90	≥ 90
Specific supporting structure according to the specifications of EN 1366-3:2009, subsection 7.2.1 Floor construction in cross laminated timber made from spruce with a total thickness of 100 mm					



Test report 318092507-4 of 24.07.2020 EN 1366-3: 2009 in connection with EN 1363-1: 1999					
No.	Pipe-end configuration	E - Integrity			I - Thermal insulation
		Time until cotton wool pad ignition	Time until failure of gap gauge criteria	Time until occurrence of sustained flaming	Time until the maximum temperature rise exceeds 180 K on cold side
		[min]			
P26 - P28	-	≥ 60	≥ 60	≥ 60	≥ 60
Specific supporting structure according to the specifications of EN 1366-3:2009, subsection 7.2.1 Floor construction in cross laminated timber made from spruce with a total thickness of 80 mm					

Test report 318092507-5 of 22.07.2020 EN 1366-3: 2009 in connection with EN 1363-1: 1999					
No.	Pipe-end configuration	E - Integrity			I - Thermal insulation
		Time until cotton wool pad ignition	Time until failure of gap gauge criteria	Time until occurrence of sustained flaming	Time until the maximum temperature rise exceeds 180 K on cold side
		[min]			
P39 - P41	-	≥ 90	≥ 90	≥ 90	≥ 90
Specific supporting structure according to the specifications of EN 1366-3:2009, subsection 7.2.1 Floor construction in cross laminated timber made from spruce with a total thickness of 100 mm					



Test Report No. 319091602-2, Rev1 of 24.07.2020 EN 1366-3: 2009 in connection with EN 1363-1: 1999					
No.	Pipe-end configuration	E - Integrity			I - Thermal insulation
		Time until cotton wool pad ignition	Time until failure of gap gauge criteria	Time until occurrence of sustained flaming	Time until the maximum temperature rise exceeds 180 K on cold side
[min]					
P13 - P14	-	≥ 90	≥ 90	≥ 90	≥ 90
Specific supporting structure according to the specifications of EN 1366-3:2009, subsection 7.2.1 Wall constructions in cross laminated timber made from spruce with a total thickness of 100 mm					

Test Report No. 319091602-3, Rev1 of 24.07.2020 EN 1366-3: 2009 in connection with EN 1363-1: 1999					
No.	Pipe-end configuration	E - Integrity			I - Thermal insulation
		Time until cotton wool pad ignition	Time until failure of gap gauge criteria	Time until occurrence of sustained flaming	Time until the maximum temperature rise exceeds 180 K on cold side
[min]					
P13 - P14	-	≥ 60	≥ 60	≥ 60	≥ 60
Specific supporting structure according to the specifications of EN 1366-3:2009, subsection 7.2.1 Wall constructions in cross laminated timber made from spruce with a total thickness of 80 mm					



Test Report No. 319091602-4, Rev1 of 12.10.2020 EN 1366-3: 2009 in connection with EN 1363-1: 1999					
No.	Pipe-end configuration	E - Integrity			I - Thermal insulation
		Time until cotton wool pad ignition	Time until failure of gap gauge criteria	Time until occurrence of sustained flaming	Time until the maximum temperature rise exceeds 180 K on cold side
[min]					
P28 - P33	-	≥ 60	≥ 60	≥ 60	≥ 60
Specific supporting structure according to the specifications of EN 1366-3:2009, subsection 7.2.1 Wall constructions in cross laminated timber made from spruce with a total thickness of 80 mm					

Test Report No. 319091602-5, Rev1 of 12.10.2020 EN 1366-3: 2009 in connection with EN 1363-1: 1999					
No.	Pipe-end configuration	E - Integrity			I - Thermal insulation
		Time until cotton wool pad ignition	Time until failure of gap gauge criteria	Time until occurrence of sustained flaming	Time until the maximum temperature rise exceeds 180 K on cold side
[min]					
P37 - P39	-	≥ 90	≥ 90	≥ 90	≥ 90
Specific supporting structure according to the specifications of EN 1366-3:2009, subsection 7.2.1 Wall constructions in cross laminated timber made from spruce with a total thickness of 100 mm					



4. Classification and field of application

4.1. Reference for classification

This Classification is based on the normative reference EN 13501-2: 2016, section 7.

4.2. Reference for field of application

The field of direct application is based on the normative reference EN 1366-3:2009.

The extended field of application is based on the normative reference EN 15882-3:2009.

4.3. Definitions

4.3.1. Pipe orientation

4.3.1.1. Plastic pipes

When a pipe is tested perpendicular and at an angle to the supporting structure, all angles between 90° and the tested angle shall be covered in accordance with EN 1366-3:2009 E.2.7.6.

4.3.2. Pipe support

Pipes and cables must be supported on both sides of the wall constructions or on the surface of the floor constructions at a distance of ≤ 350 mm.

4.3.3. Pipe-end configuration

Tests performed with pipe-end configuration U/U shall also cover the configurations C/U, U/C and C/C.

Tests performed with pipe-end configuration C/U shall also cover the configurations U/C and C/C.

Tests performed with pipe-end configuration U/C shall also cover the configuration C/C.

		Tested			
		U/U	U/C	C/U	C/C
Covered	U/U	Y	N	N	N
	U/C	Y	Y	N	N
	C/U	Y	Y	Y	N
	C/C	Y	Y	Y	Y
Y = acceptable, N = not acceptable					

4.3.4. Supporting structure (wall/floor)

Test results that include a specific supporting structure shall apply to separating building components made of the same material and with the same composition, at least with the same thickness and density, as the tested ones.

The covering of a horizontal supporting structure with inorganic materials (e.g. concrete covering) is acceptable.

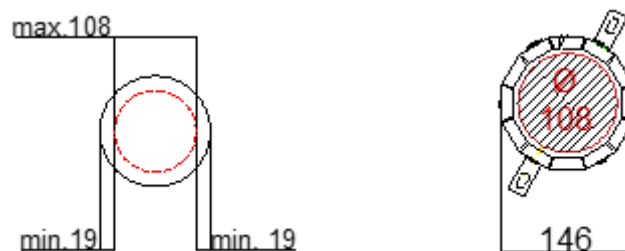
Building components (supporting structures) shall be classified in relation to their fire resistance in compliance with EN 13501-2.

4.4. Hilti CFS-CC

4.4.1. Annular gaps

The opening in the load-bearing component must not exceed a diameter of $D = 108$ mm. Penetrating cables or cable ducts may be routed at "0" distance from the reveal. Backfilling of the residual apertures within the component opening is not required.

The Hilti CFS-CC cable collar must overlap the component opening by at least 19 mm.



4.4.1.1. Hilti CFS-CC

Maximum annular gap	≤ 5 mm
Sealing of annular gap	Hilti CFS-FIL
Filling depth	≥ 25 mm

4.4.2. Cross laminated timber floor ≥ 80 mm

4.4.2.1. Definition of supporting structure

The floor must be ≥ 80 mm thick and have ≥ 3 layers of softwood, provided that each outer layer exhibits a thickness of ≥ 20 mm. Both PU and MUF adhesives are permitted. Edge glueing is not required.

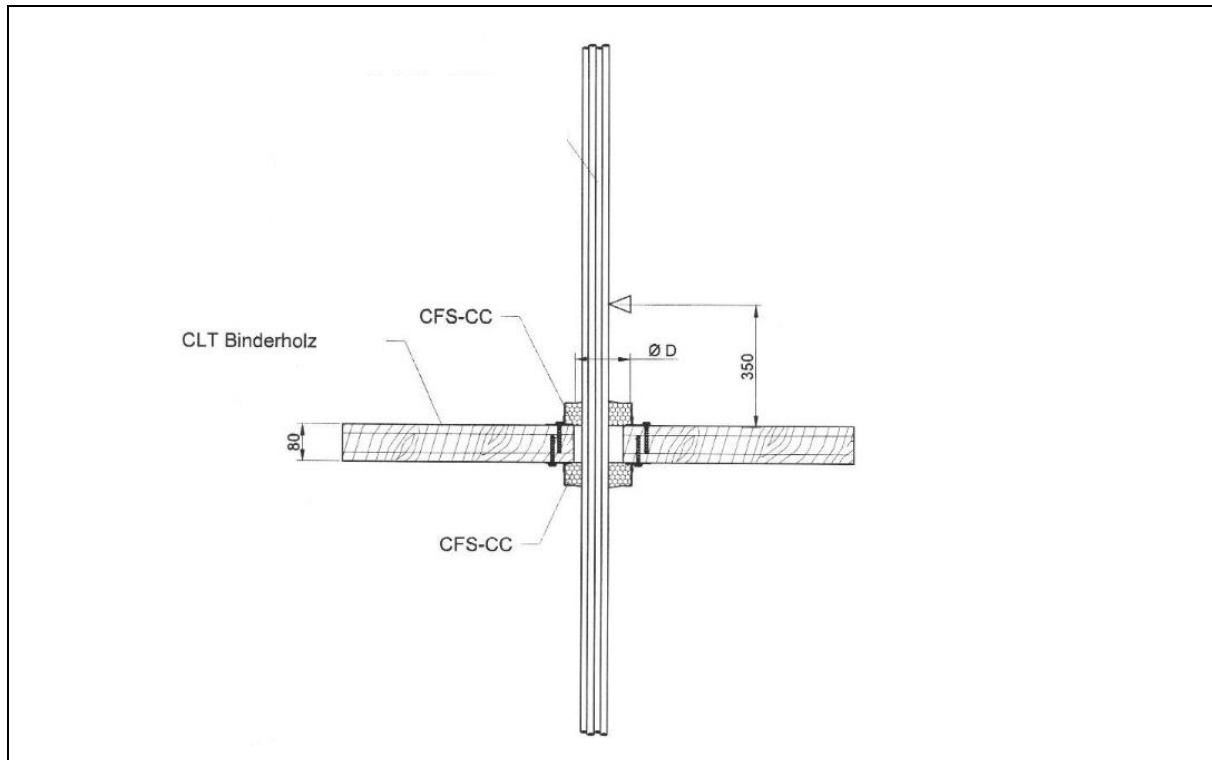
4.4.2.2. Minimum distance (linear and non-linear)

Product A	Product B	Distance	318092507-4
Hilti CFS-CC	Hilti CFS-CC	≥ 15 mm	P26 – P28
All other distances		≥ 200 mm	-

4.4.2.3. Fixings

Hilti HUS3 H 6 x 60 mm Hilti S-WS 11 Y x 75 mm	Hex head wood screws 6 x 60 mm
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4.4.2.4. Detailed drawing



4.4.2.5. Cables and conduits

Single cable ¹	$\varnothing \leq 21 \text{ mm}$	EI 60	318092507-1,Rev2 + 318092507-4
Cable bundle ²	$\varnothing \leq 100 \text{ mm}$		P14 - P15

4.4.3. Cross laminated timber floor $\geq 100 \text{ mm}$

4.4.3.1. Definition of supporting structure

The floor must be $\geq 100 \text{ mm}$ thick and have ≥ 5 layers of softwood, provided that each outer layer exhibits a thickness of $\geq 20 \text{ mm}$. Both PU and MUF adhesives are permitted. Edge glueing is not required.

4.4.3.2. Minimum distance (linear and non-linear)

Product A	Product B	Distance	318092507-5
Hilti CFS-CC	Hilti CFS-CC	$\geq 15 \text{ mm}$	P39 – P41
All other distances		$\geq 200 \text{ mm}$	-

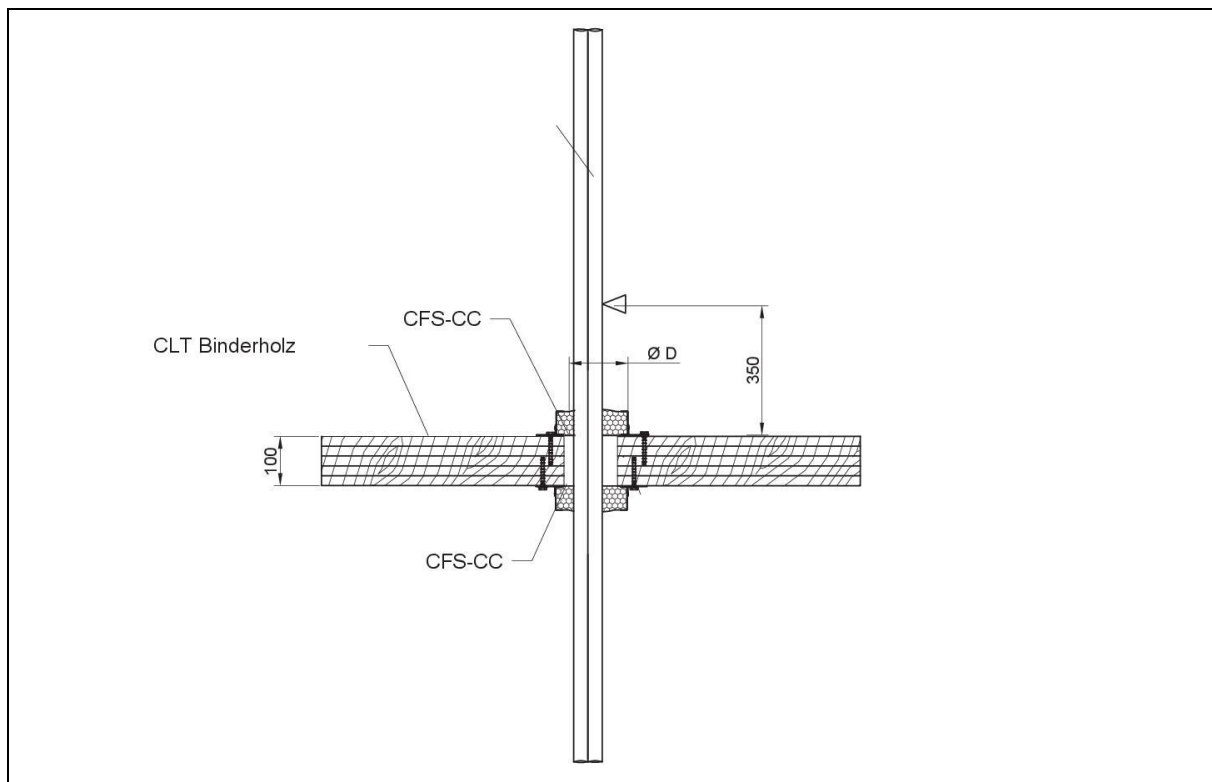
¹ Single or multi-core conduits with individual insulation and an additional protection sleeve for the cable bundle. Optical fibre cables are covered.

² Laced cable bundle consisting of single cables of $\varnothing \leq 21 \text{ mm}$

4.4.3.3. Fixings

Hilti HUS H 6 x 80 mm Hilti SWS 11 Y x 85 mm	Hilti SWS 11 Z x 85 mm Hex head wood screws 6 x80mm
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4.4.3.4. Detailed drawing



4.4.3.5. Cables and conduits

Conduit ³	$\varnothing \leq 32 \text{ mm}$	EI 90 – U/C	318092507-3,Rev2 P15.1, P16.1
Flexible conduit ⁴	$\varnothing \leq 32 \text{ mm}$	EI 90 – U/C	318092507-3,Rev2 P15.2, P16.2

³ Rigid conduit according to EN 61386-1:2009 and EN 61386-21:2011

⁴ Flexible conduit according to EN 61386-1:2009 and EN 61386-22:2011

4.4.4. Cross laminated timber floor ≥ 140 mm

4.4.4.1. Definition of supporting structure

The floor must be ≥ 140 mm thick and have ≥ 3 layers of softwood, provided that each outer layer exhibits a thickness of ≥ 40 mm. Both PU and MUF adhesives are approved. Edge glueing is not required.

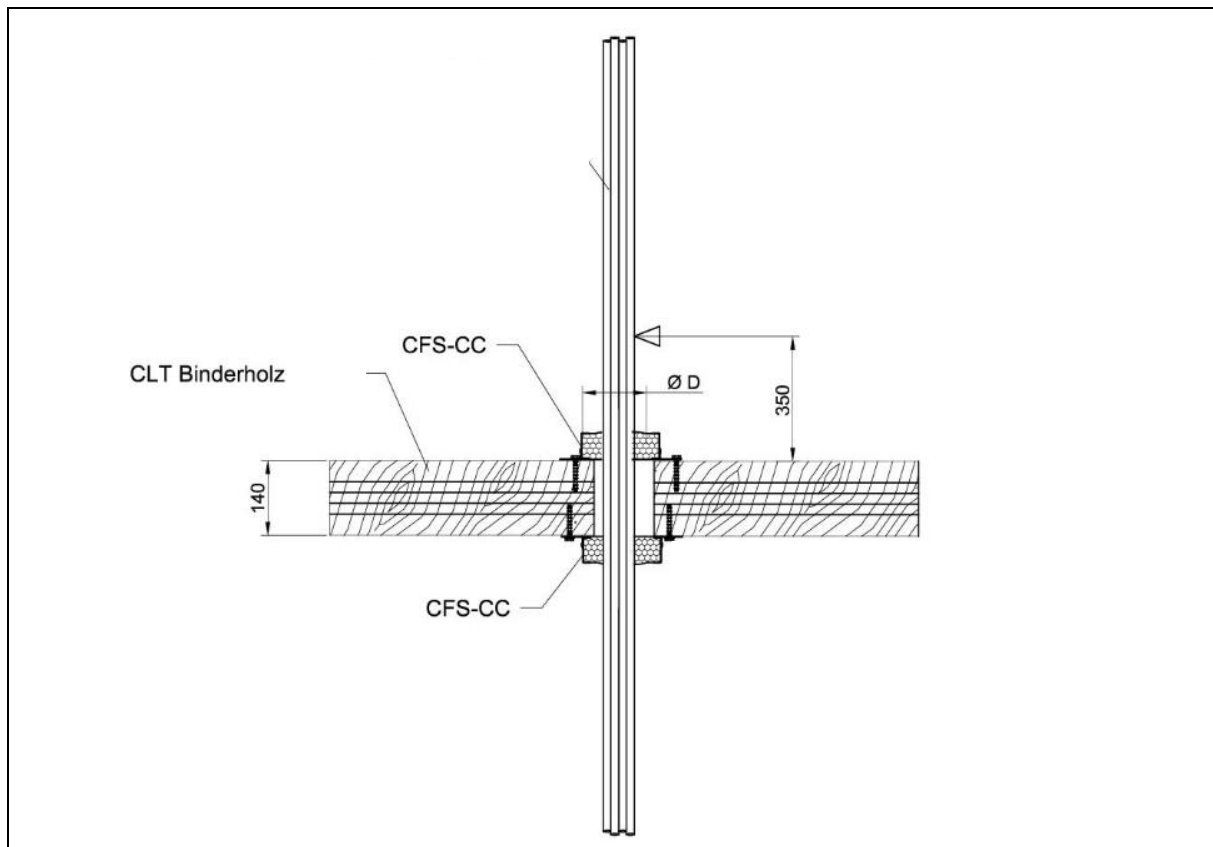
4.4.4.2. Minimum distance (linear and non-linear)

Product A	Product B	Distance	318092507-5
Hilti CFS-CC	Hilti CFS-CC	≥ 15 mm	P39 – P41
All other distances		≥ 200 mm	-

4.4.4.3. Fixings

Hilti HUS H 6 x 100 mm Hilti SWS 11 Y x 85 mm	Hilti SWS 11 Z x 85 mm Hex head wood screws 6 x 100 mm
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4.4.4.4. Detailed drawing



4.4.4.5. Cables and conduits

Single cable ¹	$\varnothing \leq 21 \text{ mm}$	EI 120	318092507-2,Rev2 P15 - P16
Cable bundle ²	$\varnothing \leq 100 \text{ mm}$		

4.4.5. Cross laminated timber wall $\geq 80 \text{ mm}$

4.4.5.1. Definition of supporting structure

The wall must be $\geq 80 \text{ mm}$ thick and have ≥ 3 layers of softwood, provided that each outer layer exhibits a thickness of $\geq 20 \text{ mm}$. Both PU and MUF adhesives are permitted. Edge glueing is not required.

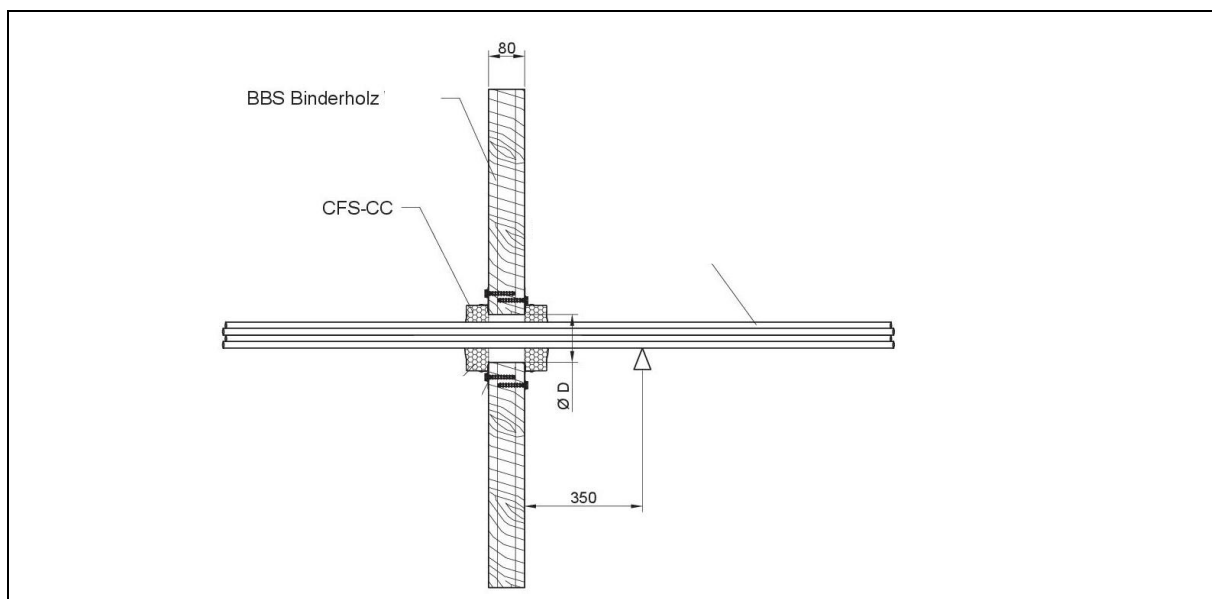
4.4.5.2. Minimum distance (linear and non-linear)

Product A	Product B	Distance	319091602-4,Rev1 319091602-3,Rev1
Hilti CFS-CC	Hilti CFS-CC	$\geq 15 \text{ mm}$	P28 – P33
All other distances		$\geq 200 \text{ mm}$	-

4.4.5.3. Fixings

Hilti HUS H 6 x 60 mm Hilti SWS 11 Y x 75 mm	Hex head wood screws 6 x 60 mm
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4.4.5.4. Detailed drawing



¹ Single or multi-core conduits with individual insulation and an additional protection sleeve for the cable bundle. Optical fibre cables are covered.

² Laced cable bundle consisting of single cables of $\varnothing \leq 21 \text{ mm}$

4.4.5.5. Cables and conduits

Single cable ¹	$\varnothing \leq 21 \text{ mm}$	EI 60	319091602-3,Rev1 P13 - P14
Cable bundle ²	$\varnothing \leq 100 \text{ mm}$		

4.4.6. Cross laminated timber wall $\geq 100 \text{ mm}$

4.4.6.1. Definition of supporting structure

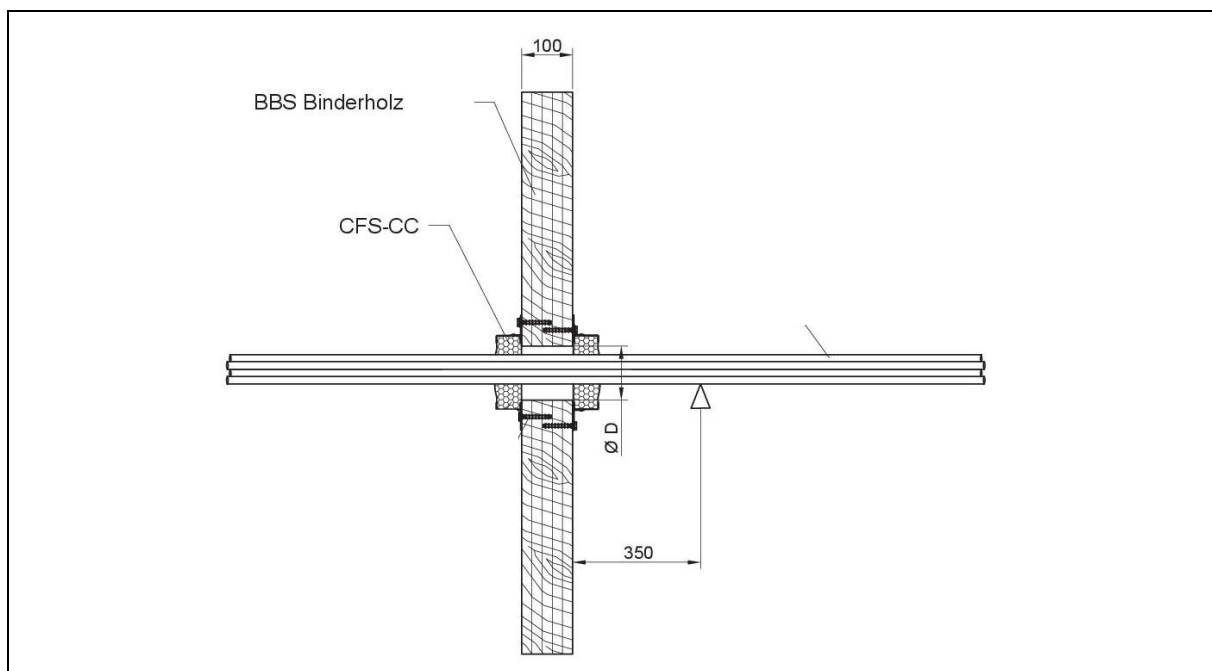
The wall must be $\geq 100 \text{ mm}$ thick and have ≥ 3 layers of softwood, provided that each outer layer exhibits a thickness of $\geq 20 \text{ mm}$. Both PU and MUF adhesives are covered. Edge glueing is not required.

Product A	Product B	Distance	319091602-5,Rev1 319091602-2,Rev1
Hilti CFS-CC	Hilti CFS-CC	$\geq 15 \text{ mm}$	P37 – P39
All other distances		$\geq 200 \text{ mm}$	-

4.4.6.2. Fixings

Hilti HUS H 6 x 80mm Hilti SWS 11 Y x 85 mm	Hilti SWS 11 Z x 85 mm Hex head wood screws 6 x 80mm
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4.4.6.3. Detailed drawing



¹ Single or multi-core conduits with individual insulation and an additional protection sleeve for the cable bundle. Optical fibre cables are covered.

² Laced cable bundle consisting of single cables of $\varnothing \leq 21 \text{ mm}$



4.4.6.4. Cables and conduits

Single cable ¹	$\varnothing \leq 21 \text{ mm}$	EI 90	319091602-2, Rev1 P13 - P14
Cable bundle ²	$\varnothing \leq 100 \text{ mm}$		

5. Limitations

The classification given above result from the direct field of application according to EN 1366-3:2009-05 and from the extended field of application according to EN 13882-3:2009-05 for Hilti CFS-CC in timber building components in timber building components.

5.1. Warning

This report does not constitute any type approval or certification of the tested product.

**IBS-INSTITUT FÜR BRANDSCHUTZTECHNIK UND
SICHERHEITSFORSCHUNG GESELLSCHAFT M.B.H.
Akkreditierte Prüf-, Inspektions- und Zertifizierungsstelle**

Mr Manfred EGLAUER
Engineer

Information on multiple electronic signatures on documents can be found [here!](#)

Mr Ulrich STÖCKL
Monitoring

¹ Single or multi-core conduits with individual insulation and an additional protection sleeve for the cable bundle. Optical fibre cables are covered.

² Laced cable bundle consisting of single cables of $\varnothing \leq 21 \text{ mm}$