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Product Name:

Hilti CFS-SL GA (EN) in Timber Structures

Project No.:

4789669807

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1. Introduction

This report defines the classifications assigned to multiple penetration seals including cables in timber floor and wall structures, seal type: Hilti Firestop Sleeve CFS-SL GA (EN), in accordance with the procedures given in EN 13501-2: 2016 Fire classification of products and building elements – Part 2: Classification using data from fire resistance tests.

The classified product is defined as a cable penetration seal, Type: Hilti Firestop Sleeve CFS-SL GA (EN). It is evaluated in respect of the fire performance characteristics given in clause 5 of EN 1366-3:2009.

2. Details of classification product forming perimeter seal

2.1 Penetration Seal

The function of Hilti Firestop Speed Sleeve CFS-SL is to resist fire in horizontal and vertical orientations in solid wood constructions and CLT (cross laminated timber) according to section 5 of EN 13502-2:2016.

The sleeve body is put through the aperture, sealed by means of a rubber gasket or acrylic sealant on both sides of the supporting construction. The Sleeve is then fixed by a screw-on flange on both sides. The services are then put through the sleeve and sealed by twisting the locking rings.

[1] Penetration seal: Hilti Firestop Speed Sleeve CFS-SL GA EN – length: 265 mm.

- position:
- installed in the centre in the foreseen aperture;
- through the supporting construction;

2.1.1. Hilti CFS-SL GA (EN):

Different variations of the Hilti Firestop Sleeve exist and are described below:

CFS-SL GA “S or M or L”+ EN

- o S = small version;
- o M = medium version;
- o L = long version
- o GA = rubber gasket seal between flanges and supporting construction;
- o With designation ACR = Hilti Firestop Acrylic Sealant CFS-S ACR seal between flanges and supporting construction instead of rubber gasket seal

2.1.2. Hilti CFS-S ACR

For certain CFS-SL GA EN applications used to close larger annular gaps, the fire protection sealant Hilti CFS-S ACR is defined as an annular gap closure.



2.2 Description

The penetration seal Hilti Firestop Sleeve CFS-SL GA EN is fully described in the test reports, provided in support of this classification report.

2.2.1. Product

2.2.1.1. Hilti CFS-SL GA (EN)

The building product Hilti CFS-SL GA is a circular cable box with active inlay.

The reaction to fire of Hilti CFS-SL GA corresponds to EN 13501-1:

Reaction to Fire Class E

(ETA-17/0081 dated 08.08.2018, UL International (UK) Ltd)

2.2.1.2. Hilti CFS-S ACR

The building product Hilti CFS-S ACR is an Acrylic based sealant.

The reaction to fire of Hilti CFS-S ACR corresponds to EN 13501-1:

Reaction to Fire Class E

(ETA-10/0292 dated 31.01.2018, OIB)

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 2.2.2. Specimen description

2.2.2.1. Test Report Nr. 318092507-1, Rev. 1

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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PB 318092507-2, Rev. 1											
Nr.	Cable Type	Cable quantity	Product/s	Dimensions Dia x L [mm]	Insulation lt. EN1366-3:2009; Table 1				Installation	Gap filling, Depth [mm]	Fixing
					Manufacturer	Case	Length [mm]	Thickness [mm]			
P17	A1	3	CFS-SL GA M (EN) ACR	Ø110 x 315	-	-	-	-	2S-I	CFS-S ACR, 25	-
	A2	3									
	A3	3									
P19	F	30 / Ø100		Ø110 x 315	-	-	-	-	2S-I		-
P21	A1	3	CFS-SL GA M (EN)	Ø110 x 315	-	-	-	-	2S-I	-	-
	A2	3									
	A3	3									
	B	1									

2.2.2.2. Test Report Nr. 318092507-2, Rev. 1

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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PB 318092507-2, Rev. 1												
Nr.	Cable Type	Quantity	Product/s	Dimensions AD x L [mm]	Insulation lt. EN1366-3:2009; Table 1				Installation	Gap filling, Depth [mm]	Fixing	
					Manufacturer	Config.	Length [mm]	Thickness [mm]				
P18	A1	3	CFS-SL GA M (EN)	Ø110 x 315	-	-	-	-	2S-I	-	-	
	A2	3										
	A3	3										
	B	1										
P20	F	30 / Ø86		Ø110 x 315	-	-	-	-	2S-I	-	-	
P22	A1	3	CFS-SL GA M (EN)	Ø110 x 315	-	-	-	-	2S-I	-	-	
	A2	3										
	A3	3										
	B	1										
P52	-	-	CFS-SL GA M (EN)	Ø110 x 315	-	-	-	-	2S-I	-	-	
P53	A1	3	CFS-SL GA M (EN)	Ø110 x 315	-	-	-	-	2S-I	-	-	
	A2	3										
	A3	3										
	B	1										
P54	F	30 / Ø86	CFS-SL GA M (EN)	Ø110 x 315	-	-	-	-	2S-I	-	-	



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2.2.2.3. Test Report Nr. 318092507-3, Rev. 1

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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PB 318092507-3, Rev. 1											
Nr.	Cable Type	Quantity	Product/s	Dimensions AD x L [mm]	Insulation lt. EN1366-3:2009; Table 1				Installation	Gap filling, Depth [mm]	Fixing
					Manufacturer	Config.	Length [mm]	Thickness [mm]			
P18	A1	1	CFS-SL GA S (EN)	Ø63 x 315	-	-	-	-	2S-I	-	-
	A2	1									
	A3	1									
	B	1									
P17	F	6/ Ø50	CFS-SL GA S (EN)	Ø63 x 315	-	-	-	-	2S-I	-	-

2.2.2.4. Test Report Nr. 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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PB 318092507-4												
Nr.	Cable Type	Quantity	Product/s	Dimensions AD x L [mm]	Insulation lt. EN1366-3:2009; Table 1				Installation	Gap filling, Depth [mm]	Fixing	
					Manufacturer	Config.	Length [mm]	Thickness [mm]				
P17	A1 A2 A3 B	3 3 3 1	CFS-SL GA M (EN)	Ø110 x 315	-	-	-	-	2S-I	-	-	
P18	-	Empty	CFS-SL GA M (EN)	Ø110 x 315	-	-	-	-	2S-I	-	-	
P19	F	30 / Ø100	CFS-SL GA M (EN)	Ø110 x 315	-	-	-	-	2S-I	-	-	
P23	A1 A2 A3 B	3 3 3 1	CFS-SL GA M (EN)	Ø110 x 315	-	-	-	-	2S-I	-	-	
P24	-	Empty	CFS-SL GA M (EN)	Ø110 x 315	-	-	-	-	2S-I	-	-	
P25	F	30 / Ø100	CFS-SL GA M (EN)	Ø110 x 315	-	-	-	-	2S-I	-	-	



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2.2.2.5. Test Report Nr. 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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PB 318092507-5											
Nr.	Cable Type	Quantity	Product/s	Dimensions AD x L [mm]	Insulation lt. EN1366-3:2009; Table 1				Installation	Gap filling, Depth [mm]	Fixing
					Manufacturer	Config.	Length [mm]	Thickness [mm]			
P30	A1 A2 A3 B	3 3 3 1	CFS-SL GA M (EN)	Ø110 x 315	-	-	-	-	2S-I	-	-
P31	-	Empty	CFS-SL GA M (EN)	Ø110 x 315	-	-	-	-	2S-I	-	-
P32	F	30 / Ø100	CFS-SL GA M (EN)	Ø110 x 315	-	-	-	-	2S-I	-	-
P36	A1 A2 A3 B	3 3 3 1	CFS-SL GA M (EN)	Ø110 x 315	-	-	-	-	2S-I	-	-
P37	-	Empty	CFS-SL GA M (EN)	Ø110 x 315	-	-	-	-	2S-I	-	-
P38	F	30 / Ø100	CFS-SL GA M (EN)	Ø110 x 315	-	-	-	-	2S-I	-	-

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2.2.2.6. Test Report Nr. 319091602-1, Rev. 1

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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PB 319091602-1, Rev. 1											
Nr.	Cable Type	Quantity	Product/s	Dimensions AD x L [mm]	Insulation lt. EN1366-3:2009; Table 1				Installation	Gap filling, Depth [mm]	Fixing
					Manufacturer	Config.	Length [mm]	Thickness [mm]			
P10	A1	3	CFS-SL GA M (EN)	Ø110 x 315	-	-	-	-	2S-I	-	-
	A2	3									
	A3	3									
	B	1									
P27	A1	3	CFS-SL GA M (EN) ACR	Ø110 x 315	-	-	-	-	2S-I	CFS-S ACR 25	-
	A2	3									
	A3	3									
	B	1									
P28	F	30 / Ø80	CFS-SL GA M (EN) ACR	Ø110 x 315	-	-	-	-	2S-I	CFS-S ACR 25	-

2.2.2.7. Test Report Nr. 319091602-2, Rev. 1

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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PB 319091602-2, Rev. 1											
Nr.	Cable Type	Quantity	Product/s	Dimensions AD x L [mm]	Insulation lt. EN1366-3:2009; Table 1				Installation	Gap filling, Depth [mm]	Fixing
					Manufacturer	Config.	Length [mm]	Thickness [mm]			
P16	F	30 / Ø86	CFS-SL GA M (EN)	Ø110 x 315	-	-	-	-	2S-I	-	-

2.2.2.8. Test Report Nr. 319091602-3, Rev. 1

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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PB 319091602-3, Rev. 1												
Nr.	Cable Type	Quantity	Product/s	Dimensions AD x L [mm]	Insulation lt. EN1366-3:2009; Table 1				Installation	Gap filling, Depth [mm]	Fixing	
					Manufacturer	Config.	Length [mm]	Thickness [mm]				
P16	F	30 / Ø86	CFS-SL GA M (EN)	Ø110 x 315	-	-	-	-	2S-I	-	-	
P28	A1	3	CFS-SL GA M (EN)	Ø110 x 315	-	-	-	-	2S-I	-	-	
	A2	3										
	A3	3										
	B	1										

2.2.2.9. Test Report Nr. 319091602-4

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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PB 319091602-4												
Nr.	Cable Type	Quantity	Product/s	Dimensions AD x L [mm]	Insulation lt. EN1366-3:2009; Table 1				Installation	Gap filling, Depth [mm]	Fixing	
					Manufacturer	Config.	Length [mm]	Thickness [mm]				
P19	A1	3	CFS-SL GA M (EN)	Ø110 x 315	-	-	-	-	2S-I	-	-	
	A2	3										
	A3	3										
	B	1										
	P20	-										Empty
P25	A1	3	CFS-SL GA M (EN)	Ø110 x 315	-	-	-	-	2S-I	-	-	
	A2	3										
	A3	3										
	B	1										
P26	-	Empty	CFS-SL GA M (EN)	Ø110 x 315	-	-	-	-	2S-I	-	-	



2.2.2.10. Test Report Nr. 319091602-5

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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PB 319091602-5												
Nr.	Cable Type	Quantity	Product/s	Dimensions AD x L [mm]	Insulation lt. EN1366-3:2009; Table 1				Installation	Gap filling, Depth [mm]	Fixing	
					Manufacturer	Config.	Length [mm]	Thickness [mm]				
P34	A1 A2 A3 B	3 3 3 1	CFS-SL GA M (EN)	Ø110 x 315	-	-	-	-	2S-I	-	-	
P35	-	Empty	CFS-SL GA M (EN)	Ø110 x 315	-	-	-	-	2S-I	-	-	
P36	F	30 / Ø100	CFS-SL GA M (EN)	Ø110 x 315	-	-	-	-	2S-I	-	-	



3. Test reports in support of classification

3.1 Summary of test reports

Name of Test Institute	Owner	Number of Report	Test standard
IBS Linz Petzoldstr. 45, A-4020 Linz	HILTI AG Feldkircher Str. 100 LI-9494 Schaan	319091602-3, Rev.1 date 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 LI-9494 Schaan	319091602-2, Rev. 1 date 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 LI-9494 Schaan	319091602-1, Rev. 1 date 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 LI-9494 Schaan	318092507-3, Rev. 1 date 24.07.2020 (CLT D 100mm)	EN 1363-1: 1999 EN 1366-3: 2009
IBS Linz Petzoldstr. 45, A-4020 Linz	HILTI AG Feldkircher Str. 100 LI-9494 Schaan	318092507-2, Rev. 1 date 24.07.2020 (CLT D 140mm)	EN 1363-1: 1999 EN 1366-3: 2009
IBS Linz Petzoldstr. 45, A-4020 Linz	HILTI AG Feldkircher Str.100 LI-9494 Schaan	318092507-1, Rev. 1 date 24.07.2020 (CLT D 80mm)	EN 1363-1: 1999 EN 1366-3: 2009
IBS Linz Petzoldstr. 45, A-4020 Linz	HILTI AG Feldkircher Str. 100 LI-9494 Schaan	319091602-4, Rev 1 date 23.07.2020 (CLT W 80mm)	EN 1363-1: 1999 EN 1366-3: 2009
IBS Linz Petzoldstr. 45, A-4020 Linz	HILTI AG Feldkircher Str. 100 LI-9494 Schaan	319091602-5, Rev 1 date 22.07.2020 (CLT W 100mm)	EN 1363-1: 1999 EN 1366-3: 2009
IBS Linz Petzoldstr. 45, A-4020 Linz	HILTI AG Feldkircher Str.100 LI-9494 Schaan	318092507-4 date 22.07.2020 (CLT D 80mm)	EN 1363-1: 1999 EN 1366-3: 2009
IBS Linz Petzoldstr. 45, A-4020 Linz	HILTI AG Feldkircher Str. 100 LI-9494 Schaan	318092507-5 date 22.07.2020 (CLT D 100mm)	EN 1363-1: 1999 EN 1366-3: 2009

3.2 Results

Table 1: Exposure conditions

Temperature/Time Curve:	Standard Temperature/time curve acc. EN 1363-1: 2000
Direction of Exposure:	Floor construction: the test specimens were exposed to the fire from below; Wall construction: the test specimens were exposed to the fire from one side and were symmetrical.

Table 2: Test Results

Test Report 318092507-1, Rev. 1 date 24.07.2020 EN 1366-3 : 2009 in accordance with EN 1363-1 : 1999					
Nr.	Pipe End Configuration	E - Integrity			I - Insulation
		Ignition of Cotton pad	Failure with Gap gauge	Spontaneous and Sustained Flaming	Time before the maximum temperature on the cold side exceeded 180 K
[min]					
P17, P19, P21	-	61	61	61	61
Specific supporting structure in accordance with the requirements of EN 1366-3: 2009, Section 7.2.1 Floor construction in cross laminated timber with a total thickness of 80 mm made of spruce					

Test Report 318092507-2, Rev. 1 date 24.07.2020 EN 1366-3 : 2009 in Accordance with EN 1363-1 : 1999					
Nr.	Pipe End Configuration	E - Integrity			I - Insulation
		Ignition of Cotton pad	Failure with Gap gauge	Spontaneous and Sustained Flaming	Time before the maximum temperature on the cold side exceeded 180 K
[min]					
P20, P22	-	122	122	122	122
P52	-	122	122	122	111
P53 - P54	-	122	122	122	122
Specific supporting structure in accordance with the requirements of EN 1366-3: 2009, Section 7.2.1 Floor construction in cross laminated timber with a total thickness of 140 mm made of spruce					



Test Report 318092507-3, Rev. 1 date 24.07.2020					
EN 1366-3 : 2009 in Accordance with EN 1363-1 : 1999					
Nr.	Pipe End Configuration	E - Integrity			I - Insulation
		Ignition of Cotton pad	Failure with Gap gauge	Spontaneous and Sustained Flaming	Time before the maximum temperature on the cold side exceeded 180 K
		[min]			
P17 - P18	-	91	91	91	91
Specific supporting structure in accordance with the requirements of EN 1366-3: 2009, Section 7.2.1 Floor construction in cross laminated timber with a total thickness of 100 mm made of spruce					

Test Report 318092507-4 date 22.07.2020					
EN 1366-3 : 2009 in Accordance with EN 1363-1 : 1999					
Nr.	Pipe End Configuration	E - Integrity			I - Insulation
		Ignition of Cotton pad	Failure with Gap gauge	Spontaneous and Sustained Flaming	Time before the maximum temperature on the cold side exceeded 180 K
		[min]			
P17	-	66	66	66	66
P18	-	66	66	66	66
P19	-	66	66	66	62
P23	-	66	66	66	66
P24	-	66	66	66	66
P25	-	66	66	66	66
Specific supporting structure in accordance with the requirements of EN 1366-3: 2009, Section 7.2.1 Floor construction in cross laminated timber with a total thickness of 80 mm made of spruce					



Test Report 318092507-5 date 22.07.2020					
EN 1366-3 : 2009 in Accordance with EN 1363-1 : 1999					
Nr.	Pipe End Configuration	E - Integrity			I - Insulation
		Ignition of Cotton pad	Failure with Gap gauge	Spontaneous and Sustained Flaming	Time before the maximum temperature on the cold side exceeded 180 K
		[min]			
P30	-	97	97	97	97
P31	-	97	97	97	97
P32	-	97	97	97	86
P36	-	94	94	94	94
P37	-	94	94	94	94
P38	-	97	97	97	78
Specific supporting structure in accordance with the requirements of EN 1366-3: 2009, Section 7.2.1 Floor construction in cross laminated timber with a total thickness of 100 mm made of spruce					

Test Report 319091602-1, Rev. 1 date 24.07.2020					
EN 1366-3 : 2009 in Accordance with EN 1363-1 : 1999					
Nr.	Pipe End Configuration	E - Integrity			I - Insulation
		Ignition of Cotton pad	Failure with Gap gauge	Spontaneous and Sustained Flaming	Time before the maximum temperature on the cold side exceeded 180 K
		[min]			
P10	-	91	91	91	81
P27	-	91	91	91	53



Test Report 319091602-1, Rev. 1 date 24.07.2020 EN 1366-3 : 2009 in Accordance with EN 1363-1 : 1999					
Nr.	Pipe End Configuration	E - Integrity			I - Insulation
		Ignition of Cotton pad	Failure with Gap gauge	Spontaneous and Sustained Flaming	Time before the maximum temperature on the cold side exceeded 180 K
		[min]			
P28	-	91	91	91	91
Specific supporting structure in accordance with the requirements of EN 1366-3: 2009, Section 7.2.1 Wall construction in cross laminated timber with a total thickness of 100 mm made of spruce					

Test Report 319091602-2, Rev. 1 date 24.07.2020 EN 1366-3 : 2009 in Accordance with EN 1363-1 : 1999					
Nr.	Pipe End Configuration	E - Integrity			I - Insulation
		Ignition of Cotton pad	Failure with Gap gauge	Spontaneous and Sustained Flaming	Time before the maximum temperature on the cold side exceeded 180 K
		[min]			
P16	-	91	91	91	91
Specific supporting structure in accordance with the requirements of EN 1366-3: 2009, Section 7.2.1 Wall construction in cross laminated timber with a total thickness of 100 mm made of spruce					

Test Report 319091602-3, Rev. 1 date 24.07.2020 EN 1366-3 : 2009 in Accordance with EN 1363-1 : 1999					
Nr.	Pipe End Configuration	E - Integrity			I - Insulation
		Ignition of Cotton pad	Failure with Gap gauge	Spontaneous and Sustained Flaming	Time before the maximum temperature on the cold side exceeded 180 K
		[min]			
P16	-	67	67	67	67
P28	-	67	67	67	67
Specific supporting structure in accordance with the requirements of EN 1366-3: 2009, Section 7.2.1 Wall construction in cross laminated timber with a total thickness of 80 mm made of spruce					



Test Report 319091602-4 date 23.07.2020 EN 1366-3 : 2009 in Accordance with EN 1363-1 : 1999					
Nr.	Pipe End Configuration	E - Integrity			I - Insulation
		Ignition of Cotton Pad	Failure with Gap gauge	Spontaneous and Sustained Flaming	Time before the maximum temperature on the cold side exceeded 180 K
		[min]			
P19	-	66	66	66	66
P20	-	66	66	66	66
P25	-	66	66	66	66
P26	-	66	66	66	66
Specific supporting structure in accordance with the requirements of EN 1366-3: 2009, Section 7.2.1 Wall construction in cross laminated timber with a total thickness of 80 mm made of spruce					

Test Report 319091602-5 date 22.07.2020 EN 1366-3 : 2009 in Accordance with EN 1363-1 : 1999					
Nr.	Pipe End Configuration	E - Integrity			I - Insulation
		Ignition of Cotton Pad	Failure with Gap gauge	Spontaneous and Sustained Flaming	Time before the maximum temperature on the cold side exceeded 180 K
		[min]			
P34	-	99	99	99	99
P35	-	99	99	99	99
P36	-	99	99	99	91
Specific supporting structure in accordance with the requirements of EN 1366-3: 2009, Section 7.2.1 Wall construction in cross laminated timber with a total thickness of 100 mm made of spruce					



4. Classification and field of application

4.1 Reference of classification

This classification has been carried out in compliance with section 7 of EN 13501-2: 2016.

4.2 Classification

The direct classification is carried out according to EN 1366-3:2009.

The extended classification is carried out according EN 15882-3:2009.

4.3 Definition

4.3.1 Support

Cables must be supported on both sides of wall constructions at a distance of ≤ 250 mm or on the top of the floor construction at a distance of ≤ 350 mm.

4.3.2 Supporting Construction (Wall/Floor)

Test results that include a specific supporting construction apply to applications made of the same material and composition with at least the same thickness and density as tested.

Covering of a horizontal supporting construction with inorganic materials (e.g. concrete cover) is permissible.

The components (supporting construction) must be classified according to EN 13501-2 for the required fire resistance.



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Hilti CFS-SL GA (EN), Length ≥ 315 mm

4.3.3 Sleeve Variants

Hilti CFS-SL GA M (EN)

4.3.4 CLT Floor ≥ 80 mm

4.3.4.1 Definition of the Supporting Construction

The floor must be ≥ 80 mm thick and must have ≥ 3 layers of softwood, whereby the outer layer must be ≥ 20 mm thick. Both PU and MUF adhesives are permissible. Gluing of the edges is not required.

4.3.4.2 Annular gap of opening in supporting construction

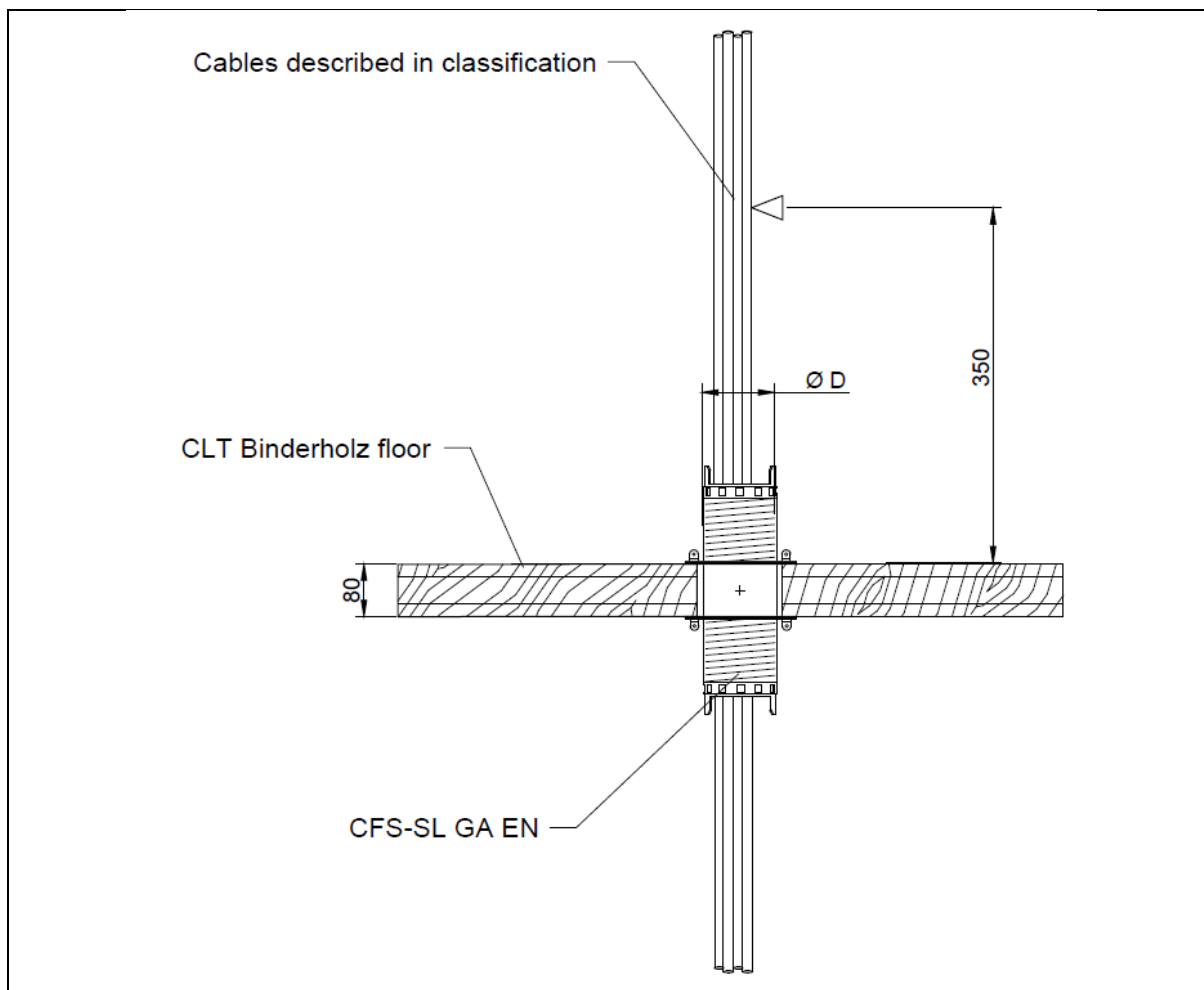
4.3.4.2.1 Annular gap closure without additional material

CFS-SL GA M	
Maximum Opening size	≤ 115 mm
Maximum annular gap	≤ 2,5 mm
Annular gap filling	-

4.3.4.3 Minimum distances (Cluster)

Product A	Product B	Distance (Openings)	318092507-4
Hilti CFS-SL GA M EN	Hilti CFS-SL GA M	≥ 50 mm	P17 – P19
All other distances		≥ 200 mm	-

4.3.4.4 Detailed drawing



4.3.4.4.1 Cables and classification

<p>CFS-SL GA M EN Cluster</p>	<p>Cables $\leq 21\text{mm}^1$ Empty sleeve to 100%² filled</p>	<p>EI 60</p>	<p>318092507-4 P17 – P19</p>
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¹ All sheathed cable types currently and commonly used in building practice in Europe (e.g. power cables, control cables, data cables, telecom cables, optical fibre cables) except tied bundles, waveguides and non-sheathed cables (wires) up to a maximum cable diameter of 21 mm;

² Cable bundle composed of cables up to $\leq 21\text{mm}$ diameter



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4.3.5 CLT Floor \geq 100 mm

4.3.5.1 Definition of the Supporting Construction

The floor must be \geq 100 mm thick and must have \geq 3 layers of softwood, whereby the outer layer must be \geq 20 mm thick. Both PU and MUF adhesives are permissible. Gluing of the edges is not required.

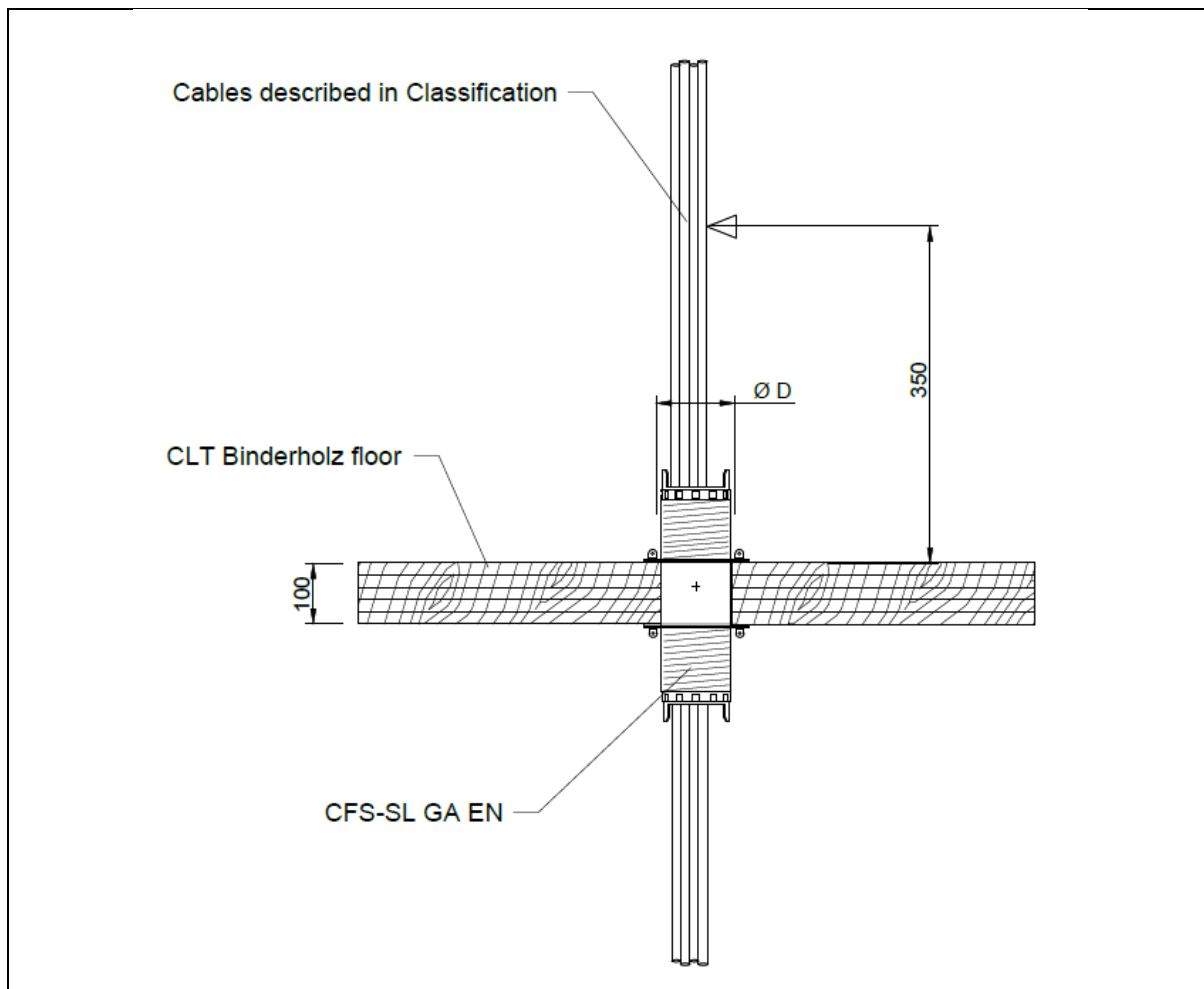
4.3.5.2 Annular gap of opening in supporting construction

CFS-SL GA M	
Maximum Opening size	\leq 115 mm
Maximum annular gap	\leq 2,5 mm
Annular gap filling	-

4.3.5.3 Minimum distances (Cluster)

Product A	Product B	Distance (Openings)	318092507-5
Hilti CFS-SL GA M EN	Hilti CFS-SL GA M	\geq 50 mm	P30 – P32
All other distances		\geq 200 mm	-

4.3.5.4 Detailed drawing



4.3.5.5 Cables and Classification

CFS-SL GA M EN Cluster	Blank Sleeve	EI 90	318092507-5 P30, P31, P32
	Cables $\leq 21\text{mm}^1$		
	Cable Bundle ² ($\varnothing \leq 100 \text{ mm}$)	E 90 / EI 60	

¹ Empty sleeve to 60% filled with one or more sheathed cable types currently and commonly used in building practice in Europe (e.g. power cables, control cables, data cables, telecom cables, optical fibre cables) except tied bundles, waveguides and non-sheathed cables (wires) up to a maximum cable diameter of 21 mm;

² Empty sleeve to 100% filled with Telecommunications cable (up to $\leq 17 \text{ mm}$ diameter)



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4.3.6 CLT Floor \geq 140 mm

4.3.6.1 Definition of the Supporting Construction

The floor must be \geq 140 mm thick and must have \geq 3 layers of softwood, whereby the outer layer must be \geq 20 mm thick. Both PU and MUF adhesives are permissible. Gluing of the edges is not required.

4.3.6.2 Annular gap of opening in supporting construction

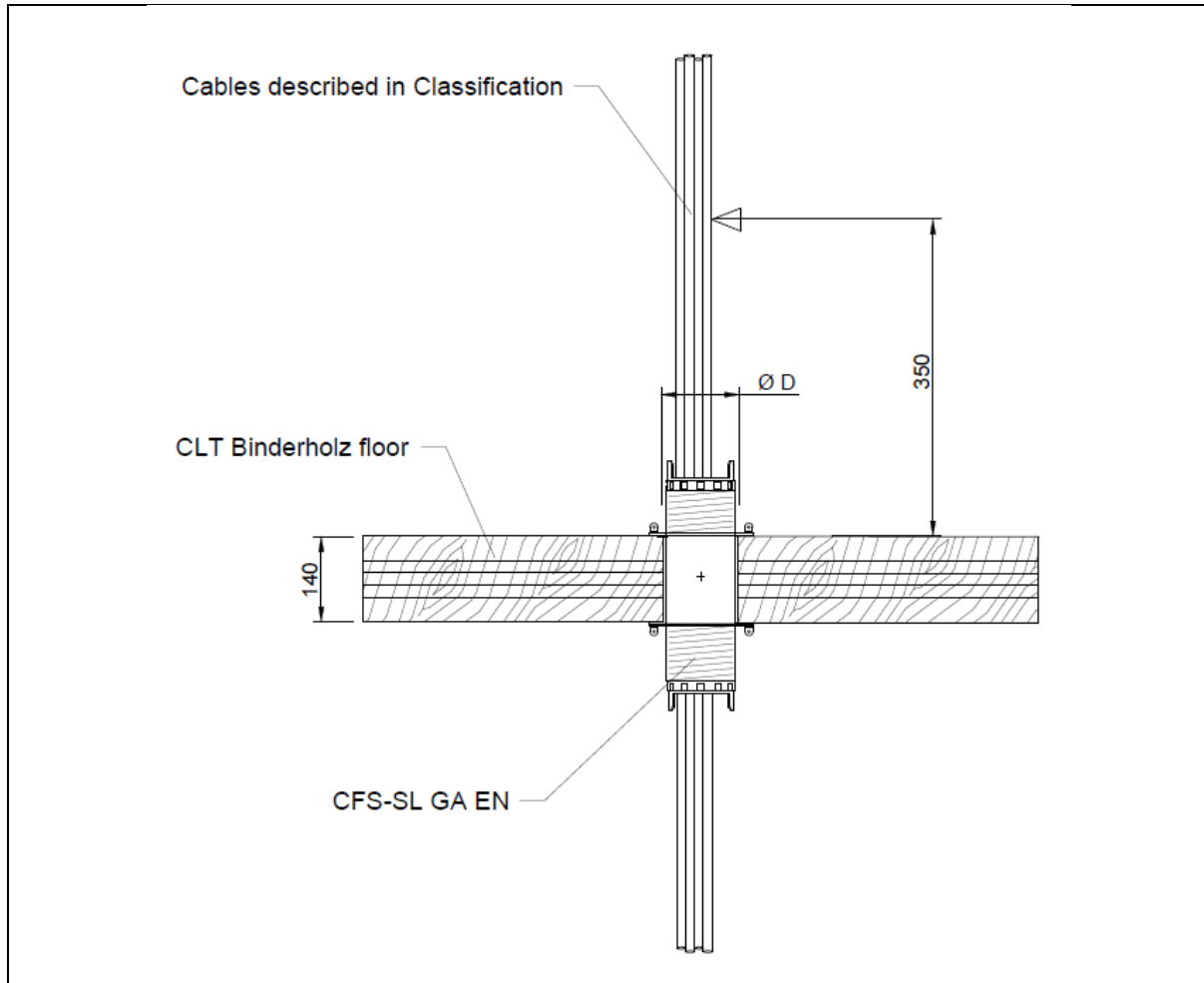
4.3.6.2.1 Annular gap closure without additional material

CFS-SL GA M	
Maximum Opening size	\leq 115 mm
Maximum annular gap	\leq 2,5 mm
Annular gap filling	-

4.3.6.3 Minimum distances (Cluster)

Product A	Product B	Distance (Openings)	318092507-2
Hilti CFS-SL GA M EN	Hilti CFS-SL GA M	\geq 50 mm	P20, P22, P52
All other distances		\geq 200 mm	-

4.3.6.4 Detailed drawing



4.6.3.5 Cables and Classification

CFS-SL GA M EN Cluster	Cables $\leq 21\text{mm}^1$ Empty sleeve to 100% ² filled	EI 90	318092507-2 P20, P22, P52
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¹ All sheathed cable types currently and commonly used in building practice in Europe (e.g. power cables, control cables, data cables, telecom cables, optical fibre cables) except tied bundles, waveguides and non-sheathed cables (wires) up to a maximum cable diameter of 21 mm;

² Cable bundle composed of cables up to $\leq 21\text{mm}$ diameter



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4.3.17 CLT Wall \geq 80 mm

4.3.7.1 Definition of the Supporting Construction

The wall must be \geq 80 mm thick and must have \geq 3 layers of softwood, whereby the outer layer must be \geq 20 mm thick. Both PU and MUF adhesives are permissible. Gluing of the ends is not required.

4.3.7.2 Annular gap of opening in supporting construction

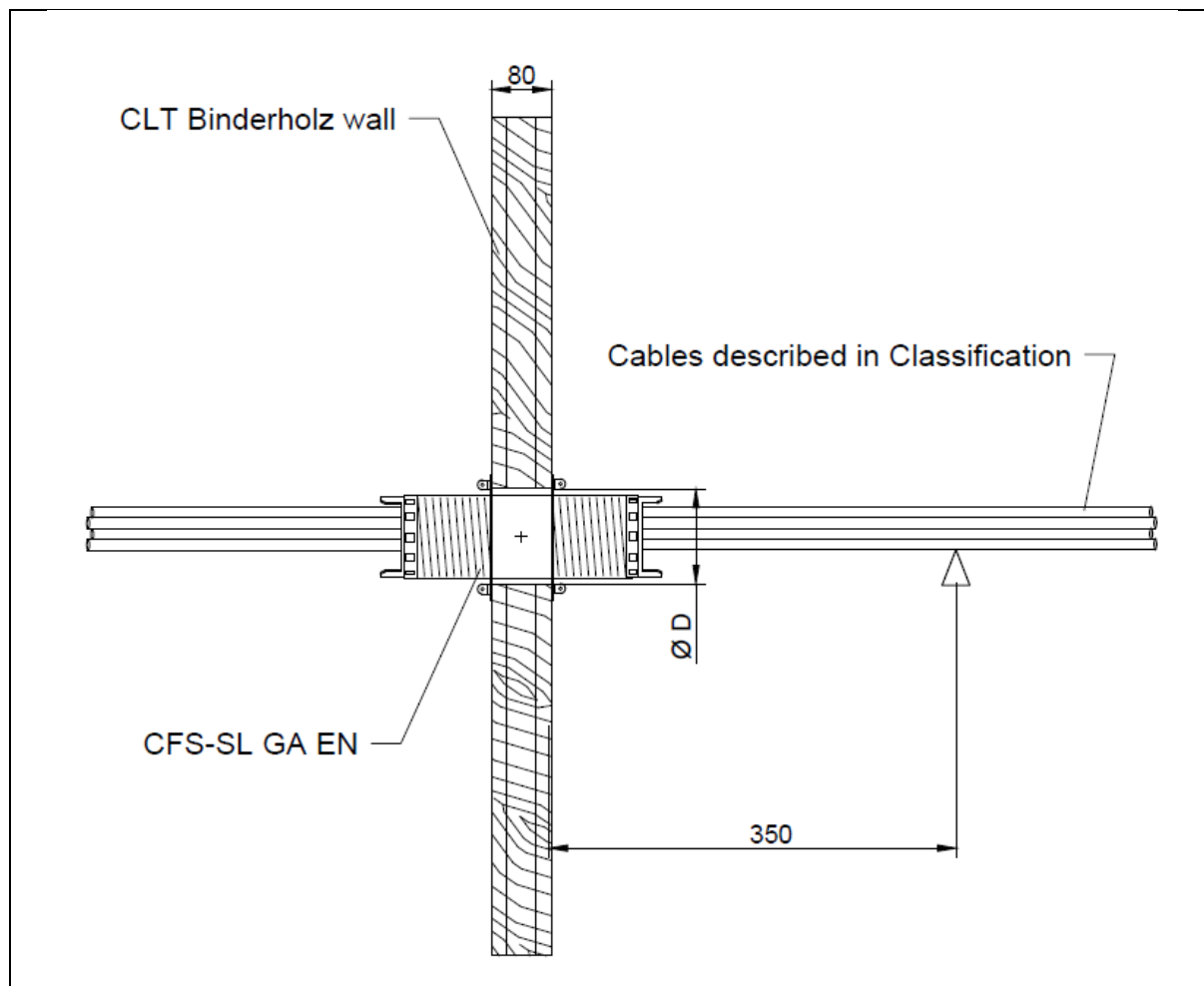
4.3.7.2.1 Annular gap closure without additional material

CFS-SL GA M	
Maximum Opening size	\leq 115 mm
Maximum annular gap	\leq 2,5 mm
Annular gap filling	-

4.3.7.3 Minimum distances (Linear)

Product A	Product B	Distance (Openings)	319091602-3 319091602-4
Hilti CFS-SL GA M EN	Hilti CFS-SL GA M	\geq 50 mm	P16 (602-3) P19, P20 (602-4)
All other distances		\geq 200 mm	-

4.3.7.4 Detailed drawing



4.3.7.5 Cables and Classification

<p>CFS-SL GA M EN Linear</p>	<p>Cables $\leq 21\text{mm}^1$ Empty sleeve to 100%² filled</p>	<p>EI 60</p>	<p>319091602-3 P16 319091602-4 P19, P20</p>
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¹ All sheathed cable types currently and commonly used in building practice in Europe (e.g. power cables, control cables, data cables, telecom cables, optical fibre cables) except tied bundles, waveguides and non-sheathed cables (wires) up to a maximum cable diameter of 21 mm;

² Cable bundle composed of cables up to $\leq 21\text{mm}$ diameter



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4.3.8 CLT Wall \geq 100 mm

4.3.8.1 Definition of the Supporting Construction

The wall must be \geq 100 mm thick and must have \geq 3 layers of softwood, whereby the outer layer must be \geq 20 mm thick. Both PU and MUF adhesives are permissible. Gluing of the ends is not required.

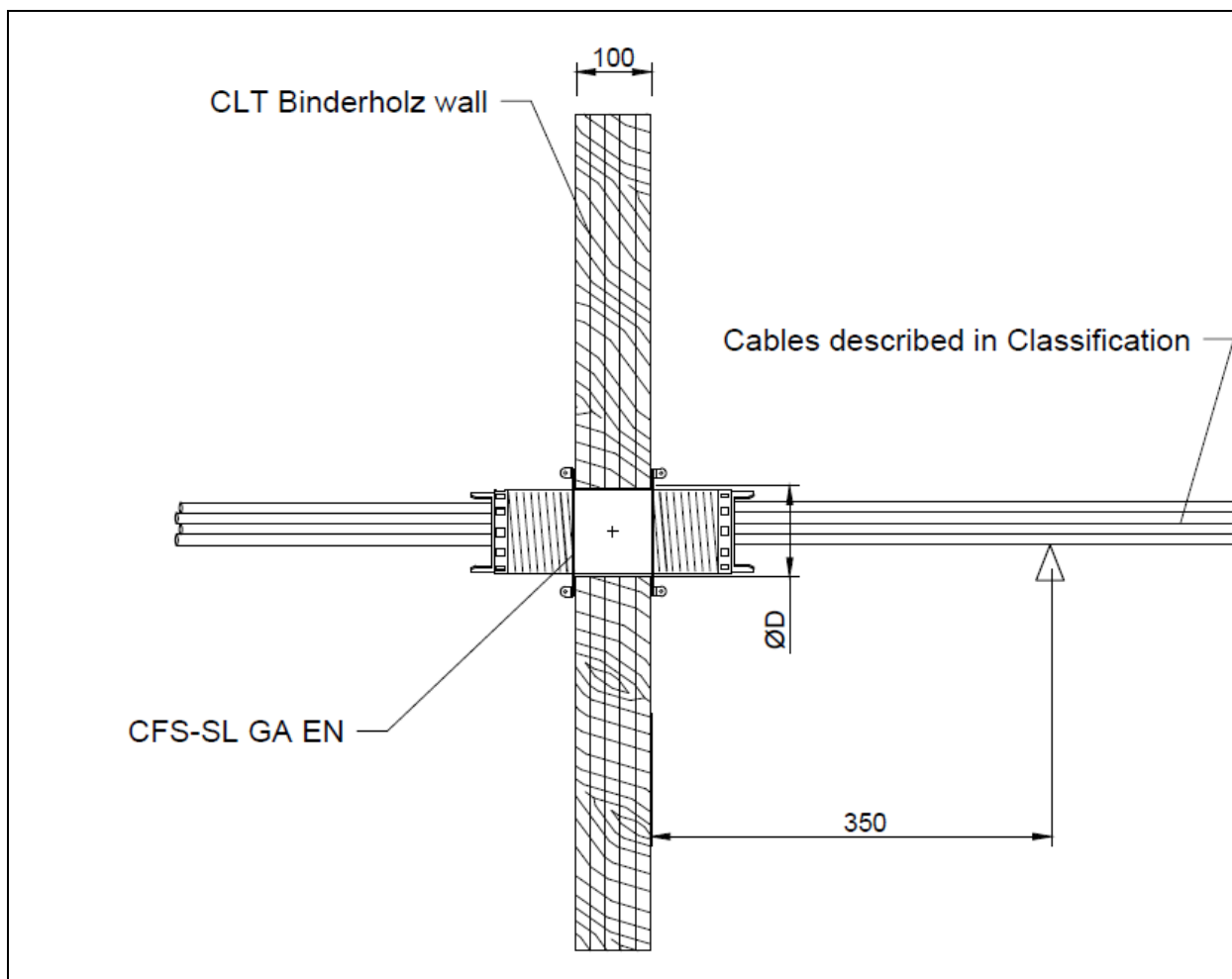
4.3.8.2 Annular gap of opening in supporting construction

CFS-SL GA M	
Maximum Opening size	\leq 115 mm
Maximum annular gap	\leq 2,5 mm
Annular gap filling	-

4.3.8.3 Minimum distances (Linear)

Product A	Product B	Distance (Openings)	319091602-5
Hilti CFS-SL GA M EN	Hilti CFS-SL GA M	\geq 50 mm	P34, P35, P36
All other distances		\geq 200 mm	-

4.3.8.4 Detailed drawing



4.3.8.5 Cables and Classification

<p>CFS-SL GA M EN Linear</p>	<p>Cables $\leq 21\text{mm}^1$ Empty sleeve to 100%² filled</p>	<p>EI 90</p>	<p>319091602-5 P34, P35, P36</p>
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¹ All sheathed cable types currently and commonly used in building practice in Europe (e.g. power cables, control cables, data cables, telecom cables, optical fibre cables) except tied bundles, waveguides and non-sheathed cables (wires) up to a maximum cable diameter of 21 mm;

² Cable bundle composed of cables up to $\leq 21\text{mm}$ diameter



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5. Limitations

This classification report is not a type approval or certification of the product.

6. Signatories

Report by:

Reviewed by:

A handwritten signature in blue ink, appearing to be 'Chris Johnson'.

A handwritten signature in blue ink, appearing to be 'David Yates'.

Chris Johnson*
Staff Engineer
Building and Life Safety Technologies

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Senior Project Engineer
Building and Life Safety Technologies

*For and on behalf of UL International (UK) Ltd