Institut für Brandschutztechnik
und Sicherheitsforschung

CLASSIFICATION REPORT

in acc. with EN 13501-2:2016

Product name: "**Hilti CFS-C EL in timber building components**"

Classification Report No.: 319091602-J / CEL-en
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Notification No.:	1322

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1. Introduction

This Classification Report defines the fire resistance class assigned to the installation situations of Hilti CFS-C EL 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 orientations, in solid timber constructions in accordance with the characteristic product behaviour defined in section 5 of EN 13502-2:2016.

2.1.1. Hilti CFS-C EL

The Firestop Collar Hilti CFS-C EL is defined as a pipe sealing system.

2.1.2. Hilti CFS-S ACR

The firestop acrylic sealant Hilti CFS-S ACR is defined as an annular gap seal. The firestop acrylic sealant Hilti CFS-S ACR is applied alone or in combination with mineral wool (Euro class A1, $\rho \geq 40$ kg/m³, $\Theta > 1000$ °C) to seal annular gaps of pipes, cables and cable bundles.

2.2. Descriptions

The installation situations of “Hilti CFS-C EL 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-C EL

The building product Hilti CFS-C EL is a pipe sealing system with an active inlay.

Hilti CFS-C EL with a nominal thickness of 5.6 mm 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-14/0085 of 28.12.2015, Austrian Institute of Construction Engineering (OIB))

2.2.1.2. Hilti CFS-S ACR

The construction product Hilti CFS-S ACR is an acrylic based firestop sealant.

Hilti CFS-S ACR 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-10/0292 of 31.01.2018, Austrian Institute of Construction Engineering (OIB))

2.2.2. Pipes

2.2.2.1. Single-layer plastic pipes:

PE	Application:	Sewage pipe or pressure pipe
	Material:	PE-HD
	Product standard:	DIN EN 1519-1
PP-H	Application:	Sewage pipe or pressure pipe
	Material:	PP-H
	Product standard:	DIN EN 1451-1
PVC-U	Application:	Sewage pipe or pressure pipe
	Material:	PVC-U
	Product standard:	DIN EN 1452-2
Geberit Silent dB20	Application:	Building drainage
	Material:	PE-S2
	Product standard:	unregulated
Geberit Silent-Pro	Application:	Building drainage
	Material:	PP-Mx
	Product standard:	unregulated
Geberit Silent-PP	Application:	Building drainage
	Material:	PP-MD
	Product standard:	unregulated
GF SYGEF Plus	Application:	Water supply
	Material:	PVDF-HP
	Product standard:	unregulated

2.2.2.2. Multi-layer plastic pipes:

Poloplast POLO-KAL NG	Application:	Building drainage
	Material:	PP/PP-MV/PP
	Product standard:	DIN EN 1519-1
Poloplast POLO-KAL XS	Application:	Building drainage
	Material:	PP/PP-MV/PP
	Product standard:	unregulated
Poloplast POLO-KAL 3S	Application:	Building drainage
	Material:	PP/PP-MV/PP
	Product standard:	unregulated
REHAU RAUPIANO PLUS	Application:	Building drainage
	Material:	PP/PP-MV/PP
	Product standard:	unregulated
Valsir Tri Plus	Application:	Building drainage
	Material:	PP/PP-MV/PP
	Product standard:	unregulated
Wavin SiTech	Application:	Building drainage
	Material:	PP/PP-MV/PP
	Product standard:	unregulated

2.2.3. Test specimen description

2.2.3.1. Key

Test Report No. – Seal type – test specimen numbers of the current page

No.	Material	Dimensions (mm) Cable load	Orientation	Pipe-end configu-ration	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 di-ameter [mm]	Active components			Installation	Joint seal depth [mm]	Fastening
												Layers	Thick-ness [mm]	Length [mm]			
Test specimen no.	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 wave-guides 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 layers according to EN 1366-3:2009 Illustration H.3	- I – inside - O - outside	Type designation, filling depth	Type designation and dimensions
															E - Fire Exposed side U - Unexposed side 2S - Both sides CEN - Centred		

2.2.3.2. Test Report No. 318092507-1,Rev2

Tested in:	80 mm thick cross laminated timber floor (brand Binderholz BBS XL) with 3-layer structure Lamella thickness per layer 20 / 40 / 20 mm

TR 318092507-1,Rev2																
					Insulation Acc. to EN 1366-3:2009; Table 1				Pipe sealing system, as per EN 1366-3 3.12							
											Active components					
No.	Material	Dimensions OD / wall thickness [mm]	Orientation	Pipe-end configuration	Type	Set-up	Length [mm]	Insulation thick-ness [mm]	Type	Inside diameter [mm]	Layers	Thickness [mm]	Length [mm]	Installation	Joint and gap sealing, depth [mm]	Fastening
P22	Geberit Silent dB20	1 x ∅56 / 3.2	90°	U/U	-	-	-	-	CFS-C EL	56	1	5.6	52	E-O	CFS-S ACR[1], 25	HUS H 6x60mm
P23	Geberit Silent dB20	1 x ∅110 / 6	90°	U/U	-	-	-	-	CFS-C EL	110	1	5.6	52	E-O		HUS H 6x60mm
P24	Poloplast POLO-KAL NG	1 x ∅50 / 2	90°	U/U	-	-	-	-	CFS-C EL	50	1	5.6	52	E-O		S-WS 11 Yx75mm
P25	Poloplast POLO-KAL NG	1 x ∅110 / 3.4	90°	U/U	-	-	-	-	CFS-C EL	110	1	5.6	52	E-O		S-WS 11 Yx75mm
P26	Geberit Silent Pro	1 x ∅50 / 3	90°	U/U	-	-	-	-	CFS-C EL	50	1	5.6	52	E-O		S-WS 11 Yx75mm
P27	Geberit Silent Pro	1 x ∅110 / 4.5	90°	U/U	-	-	-	-	CFS-C EL	110	1	5.6	52	E-O		S-WS 11 Yx75mm

[1] No backfilling in the remaining annular gaps; acrylic sealant was applied on both sides of the floor

TR 318092507-1, Rev.2																	
					Insulation Acc. to EN 1366-3:2009; Table 1				Pipe sealing system, acc. to EN1366-3: 3.12								
											Active components						
No.	Material	Dimensions OD / wall thickness [mm]	Orientation	Pipe-end configuration	Type	Set-up	Length [mm]	Insulation thick-ness [mm]	Type	Inside diameter [mm]	Layers	Thickness [mm]	Length [mm]	Installation	Joint and gap sealing, depth [mm]	Fastening
P28	Rehau Raupiano plus	1 x ∅50 / 1.8	90°	U/U	-	-	-	-	CFS-C EL	50	1	5.6	52	E-O	CFS-S ACR[1], 25	Hex head wood screw 6x60 mm
P29	Rehau Raupiano plus	1 x ∅110 / 2.7	90°	U/U	-	-	-	-	CFS-C EL	110	1	5.6	52	E-O		
P30	PE-HD	1 x ∅50 / 3	90°	U/U	-	-	-	-	CFS-C EL	50	1	5.6	52	E-O		HUS H 6x60mm
P31	PE-HD	1 x ∅110 / 4.2	90°	U/U	-	-	-	-	CFS-C EL	110	1	5.6	52	E-O		HUS H 6x60mm
P32	PP-H	1 x ∅50 / 1.8	90°	U/U	-	-	-	-	CFS-C EL	50	1	5.6	52	E-O		S-WS 11 Yx75mm
P33	PP-H	1 x ∅110 / 2.7	90°	U/U	-	-	-	-	CFS-C EL	110	1	5.6	52	E-O		S-WS 11 Yx75mm
P34	PVC-u	1 x ∅50 / 1.8	90°	U/U	-	-	-	-	CFS-C EL	50	1	5.6	52	E-O		S-WS 11 Yx75mm
P35	PVC-u	1 x ∅110 / 8.1	90°	U/U	-	-	-	-	CFS-C EL	110	1	5.6	52	E-O		S-WS 11 Yx75mm

[1] No backfilling in the remaining annular gaps; acrylic sealant was applied on both sides of the floor

2.2.3.3. Test Report No. 318092507-2,Rev2

Tested in:	140 mm thick cross laminated timber floor (brand Binderholz BBS XL) with 5-layer structure Lamella thickness per layer 40 / 20 / 20 / 20 / 40 mm

TR 318092507-2 Rev2																
					Insulation Acc. to EN 1366-3:2009; Table 1				Pipe sealing system, as per EN 1366-3 3.12							
											Active components					
No.	Material	Dimensions OD / wall thickness [mm]	Orientation	Pipe-end configuration	Type	Set-up	Length [mm]	Insulation thickness [mm]	Type	Inside diameter [mm]	Layers	Thickness [mm]	Length [mm]	Installation	Joint and gap sealing, depth [mm]	Fastening
P23	Geberit Silent dB20	1 x ∅56 / 3.2	90°	U/U	-	-	-	-	CFS-C EL	56	1	5.6	52	E-O	CFS-S ACR[1], 25	S-WS 11 Yx85mm
P24	Geberit Silent dB20	1 x ∅110 / 6	90°	U/U	-	-	-	-	CFS-C EL	110	1	5.6	52	E-O		S-WS 11 Yx85mm
P25	Geberit Silent dB20	1 x ∅135 / 6	90°	U/U	-	-	-	-	CFS-C EL	135	1	5.6	104	E-O		S-WS 11 Yx85mm
P26	Poloplast POLO-KAL NG	1 x ∅50 / 2	90°	U/U	-	-	-	-	CFS-C EL	50	1	5.6	52	E-O		S-WS 11 Yx85mm
P27	Poloplast POLO-KAL NG	1 x ∅110 / 3.4	90°	U/U	-	-	-	-	CFS-C EL	110	1	5.6	52	E-O		S-WS 11 Yx85mm

[1] No backfilling in the remaining annular gaps; acrylic sealant was applied on both sides of the floor

TR 318092507-2,Rev2																	
					Insulation Acc. to EN 1366-3:2009; Table 1				Pipe sealing system, as per EN 1366-3 3.12								
											Active components						
No.	Material	Dimensions OD / wall thickness [mm]	Orientation	Pipe-end configuration	Type	Set-up	Length [mm]	Insulation thickness [mm]	Type	Inside diameter [mm]	Layers	Thickness [mm]	Length [mm]	Installation	Joint and gap sealing, depth [mm]	Fastening
P28	Poloplast POLO-KAL NG	1 x ∅125 / 3.9	90°	U/U	-	-	-	-	CFS-C EL	125	1	5.6	104	E-O	CFS-S ACR[1], 25	Hex hoad wood screw 6x100 mm
P29	Geberit Silent Pro	1 x ∅50 / 3	90°	U/U	-	-	-	-	CFS-C EL	50	1	5.6	52	E-O		
P30	Geberit Silent Pro	1 x ∅110 / 4.5	90°	U/U	-	-	-	-	CFS-C EL	110	1	5.6	52	E-O		
P31	Geberit Silent Pro	1 x ∅125 / 5	90°	U/U	-	-	-	-	CFS-C EL	125	1	5.6	104	E-O		HUS H 6x100mm
P32	Rehau Raupiano plus	1 x ∅50 / 1.8	90°	U/U	-	-	-	-	CFS-C EL	50	1	5.6	52	E-O		HUS H 6x100mm
P33	Rehau Raupiano plus	1 x ∅110 / 2.7	90°	U/U	-	-	-	-	CFS-C EL	110	1	5.6	52	E-O		HUS H 6x100mm
P34	Rehau Raupiano plus	1 x ∅125 / 3.1	90°	U/U	-	-	-	-	CFS-C EL	125	1	5.6	104	E-O		S-WS 11 Zx85mm
P35	PE-HD	1 x ∅50 / 3	90°	U/U	-	-	-	-	CFS-C EL	50	1	5.6	52	E-O		S-WS 11 Zx85mm

[1] No backfilling in the remaining annular gaps; acrylic sealant was applied on both sides of the floor

TR 318092507-2, Rev.2

No.	Material	Dimensions OD / wall thickness [mm]	Orientation	Pipe-end configuration	Insulation Acc. to EN 1366-3:2009; Table 1				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
											Layers	Thickness [mm]	Length [mm]			
P36	PE-HD	1 x ∅110 / 4.2	90°	U/U	-	-	-	-	CFS-C EL	110	1	5.6	52	E-O	CFS-S ACR[1], 25	S-WS 11 Zx85mm
P37	PE-HD	1 x ∅160 / 4	90°	U/U	-	-	-	-	CFS-C EL	160	1	5.6	104	E-O		S-WS 11 Yx85mm
P38	PP-H	1 x ∅50 / 1.8	90°	U/U	-	-	-	-	CFS-C EL	50	1	5.6	52	E-O		S-WS 11 Yx85mm
P39	PP-H	1 x ∅110 / 2.7	90°	U/U	-	-	-	-	CFS-C EL	110	1	5.6	52	E-O		S-WS 11 Yx85mm
P40	PP-H	1 x ∅160 / 4	90°	U/U	-	-	-	-	CFS-C EL	160	1	5.6	104	E-O		S-WS 11 Yx85mm
P41	PVC-u	1 x ∅50 / 1.8	90°	U/U	-	-	-	-	CFS-C EL	50	1	5.6	52	E-O		S-WS 11 Zx85mm
P42	PVC-u	1 x ∅110 / 8.1	90°	U/U	-	-	-	-	CFS-C EL	110	1	5.6	52	E-O		S-WS 11 Zx85mm
P43	PVC-u	1 x ∅160 / 3.2	90°	U/U	-	-	-	-	CFS-C EL	160	1	5.6	104	E-O		S-WS 11 Zx85mm

[1] No backfilling in the remaining annular gaps; acrylic sealant was applied on both sides of the floor

2.2.3.4. Test Report No. 318092507-3,Rev2

Tested in:	100 mm thick cross laminated timber floor (brand Binderholz BBS XL) with 5-layer structure Lamella thickness per layer 20 / 20 / 20 / 20 / 20 mm

TR 318092507-3,Rev2

No.	Material	Dimensions OD / wall thickness [mm]	Orientation	Pipe-end configuration	Insulation According to EN1366-3:2009; Table 1				Pipe sealing system, as per EN 1366-3 3.12							
					Type	Set-up	Length [mm]	Insulation thickness [mm]	Type	Inside diameter [mm]	Active components: Layers	Active components: Thickness [mm]	Active components: Length [mm]	Installation	Joint and gap sealing, depth [mm]	Fastening
P19	Geberit Silent dB20	1 x ∅135 / 6	90°	U/U	-	-	-	-	CFS-C EL	135	1	5.6	104	E-O	CFS-S ACR[1], 25	HUS H 6x80mm
P20	Geberit Silent dB20	1 x ∅160 / 7	90°	U/U	-	-	-	-	CFS-C EL	160	1	5.6	104	E-O		HUS H 6x80mm
P21	Poloplast POLO-KAL NG	1 x ∅125 / 3.9	90°	U/U	-	-	-	-	CFS-C EL	125	1	5.6	104	E-O		S-WS Yx85mm
P22	Poloplast POLO-KAL NG	1 x ∅160 / 4.9	90°	U/U	-	-	-	-	CFS-C EL	160	1	5.6	104	E-O		S-WS Yx85mm
P23	Geberit Silent Pro	1 x ∅125 / 5.0	90°	U/U	-	-	-	-	CFS-C EL	125	1	5.6	104	E-O		S-WS Yx85mm

[1] No backfilling in the remaining annular gaps; acrylic sealant was applied on both sides of the floor

TR 318092507-3,Rev2

No.	Material	Dimensions OD / wall thickness [mm]	Orientation	Pipe-end configuration	Insulation Acc. to EN 1366-3:2009; Table 1				Pipe sealing system, acc. to EN1366-3: 3.12							
					Type	Set-up	Length [mm]	Insulation thick-ness [mm]	Type	Inside diameter [mm]	Active components: Layers	Active components: Thickness [mm]	Active components: Length [mm]	Installation	Joint and gap sealing, depth [mm]	Fastening
P24	Geberit Silent Pro	1 x ∅160 / 5.7	90°	U/U	-	-	-	-	CFS-C EL	160	1	5.6	104	E-O	CFS-S ACR[1], 25	Hex hoad wood screw 6x80 mm
P25	Rehau Raupiano plus	1 x ∅125 / 3.1	90°	U/U	-	-	-	-	CFS-C EL	125	1	5.6	104	E-O		
P26	Rehau Raupiano plus	1 x ∅160 / 3.9	90°	U/U	-	-	-	-	CFS-C EL	160	1	5.6	104	E-O		
P27	PE-HD	1 x ∅125 / 4.8	90°	U/U	-	-	-	-	CFS-C EL	125	1	5.6	104	E-O		
P28	PE-HD	1 x ∅160 / 6.2	90°	U/U	-	-	-	-	CFS-C EL	160	1	5.6	104	E-O		S-WS Zx85mm
P29	PP-H	1 x ∅160 / 9.1	90°	U/U	-	-	-	-	CFS-C EL	160	1	5.6	104	E-O		S-WS Zx85mm
P30	PP-H	1 x ∅125 / 3.1	90°	U/U	-	-	-	-	CFS-C EL	125	1	5.6	104	E-O		HUS H 6x80mm
P31	PP-H	1 x ∅160 / 4	90°	U/U	-	-	-	-	CFS-C EL	160	1	5.6	104	E-O		HUS H 6x80mm

[1] No backfilling in the remaining annular gaps; acrylic sealant was applied on both sides of the floor

TR 318092507-3,Rev2

No.	Material	Dimensions OD / wall thickness [mm]	Orientation	Pipe-end configuration	Insulation Acc. to EN 1366-3:2009; Table 1				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
											Layers	Thickness [mm]	Length [mm]			
P32	PVC-u	1 x ∅160 / 11.8	90°	U/U	-	-	-	-	CFS-C EL	160	1	5.6	104	E-O	CFS-S ACR[1], 25	S-WS Zx85mm
P33	PVC-u	1 x ∅160 / 3.2	90°	U/U	-	-	-	-	CFS-C EL	160	1	5.6	104	E-O		S-WS Zx85mm

[1] No backfilling in the remaining annular gaps; acrylic sealant was applied on both sides of the floor

2.2.3.5. Test Report No. 318092507-4

Tested in:	80 mm thick cross laminated timber floor (brand Binderholz BBS XL) with 3-layer structure Lamella thickness per layer 20 / 40 / 20 mm

TR 318092507-4																
					Insulation Acc. to EN 1366-3:2009; Table 1				Pipe sealing system, as per EN 1366-3 3.12							
											Active components					
No.	Material	Dimensions OD / wall thickness [mm]	Orientation	Pipe-end configuration	Type	Set-up	Length [mm]	Insulation thick-ness [mm]	Type	Inside diameter [mm]	Layers	Thickness [mm]	Length [mm]	Installation	Joint and gap sealing, depth [mm]	Fastening
P1	Raupiano plus	1 x ∅75 / 1.9	90°	U/U	-	-	-	-	CFS-C EL	75	1	5.6	52	E-O	CFS-S ACR[1], 25	HUS3 H 6x60mm
P2	Raupiano plus	1 x ∅90 / 2.2	90°	U/U	-	-	-	-	CFS-C EL	90	1	5.6	52	E-O		
P3	Wavin AS	1 x ∅110 / 5.3	90°	U/U	-	-	-	-	CFS-C EL	110	1	5.6	52	E-O		
P4	Silent dB20	1 x ∅75 / 3.6	90°	U/U	-	-	-	-	CFS-C EL	75	1	5.6	52	E-O		Hex head wood screw 6x60mm
P5	PE-HD	1 x ∅63 / 3.0	90°	U/U	-	-	-	-	CFS-C EL	63	1	5.6	52	E-O		
P6	PE-HD	1 x ∅90 / 3.5	90°	U/U	-	-	-	-	CFS-C EL	90	1	5.6	52	E-O		

[1] No backfilling in the remaining annular gaps; acrylic sealant was applied on both sides of the floor

TR 318092507-4																	
					Insulation Acc. to EN 1366-3:2009; Table 1				Pipe sealing system, as per EN 1366-3 3.12								
											Active components						
No.	Material	Dimensions OD / wall thickness [mm]	Orientation	Pipe-end configuration	Type	Set-up	Length [mm]	Insulation thickness [mm]	Type	Inside diameter [mm]	Layers	Thickness [mm]	Length [mm]	Installation	Joint and gap sealing, depth [mm]	Fastening
P7	PP-H	1 x ∅75 / 1.9	90°	U/U	-	-	-	-	CFS-C EL	75	1	5.6	52	E-O	CFS-S ACR[1], 25	Countersunk head screw 5x55mm
P8	PP-H	1 x ∅90 / 2.2	90°	U/U	-	-	-	-	CFS-C EL	90	1	5.6	52	E-O		
P9	PP-H	1 x ∅110 / 3.0	90°	U/U	-	-	-	-	CFS-C EL	110	1	5.6	52	E-O		
P10	PVC-U	1 x ∅110 / 2.2	90°	U/U	-	-	-	-	CFS-C EL	110	1	5.6	52	E-O		

[1] No backfilling in the remaining annular gaps; acrylic sealant was applied on both sides of the floor

2.2.3.6. Test Report No. 318092507-5

Tested in:	100 mm thick cross laminated timber floor (brand Binderholz BBS XL) with 5-layer structure Lamella thickness per layer 20 / 20 / 20 / 20 / 20 mm

TR 318092507-5

No.	Material	Dimensions OD / wall thickness [mm]	Orientation	Pipe-end configuration	Insulation Acc. to EN 1366-3:2009; Table 1				Pipe sealing system, as per EN 1366-3 3.12							
					Type	Set-up	Length [mm]	Insulation thickness [mm]	Type	Inside diameter [mm]	Active components: Layers	Active components: Thickness [mm]	Active components: Length [mm]	Installation	Joint and gap sealing, depth [mm]	Fastening
P1	Silent Pro	1 x ∅50 / 3	90°	U/U	-	-	-	-	CFS-C EL	50	1	5.6	52	E-O	CFS-S ACR[1], 25	Hex head wood screw 6x80mm
P2	Raupiano Plus	1 x ∅75 / 1.9	90°	U/U	-	-	-	-	CFS-C EL	75	1	5.6	52	E-O		
P3	Silenta Premium	1 x ∅78 / 4.5	90°	U/U	-	-	-	-	CFS-C EL	78	1	5.6	52	E-O		
P4	Raupiano Plus	1 x ∅90 / 2.2	90°	U/U	-	-	-	-	CFS-C EL	90	1	5.6	52	E-O		HUS3 H 6x80mm
P5	Wavin SiTech+	1 x ∅110 / 3.4	90°	U/U	-	-	-	-	CFS-C EL	110	1	5.6	52	E-O		
P6	Silent Pro	1 x ∅110 / 4.5	90°	U/U	-	-	-	-	CFS-C EL	110	1	5.6	52	E-O		

[1] No backfilling in the remaining annular gaps; acrylic sealant was applied on both sides of the floor

TR 318092507-5

No.	Material	Dimensions OD / wall thickness [mm]	Orientation	Pipe-end configuration	Insulation Acc. to EN 1366-3:2009; Table 1				Pipe sealing system, as per EN 1366-3 3.12							
					Type	Set-up	Length [mm]	Insulation thickness [mm]	Type	Inside diameter [mm]	Active components: Layers	Active components: Thickness [mm]	Active components: Length [mm]	Installation	Joint and gap sealing, depth [mm]	Fastening
P7	Wavin SiTech+	1 x ∅125 / 3.9	90°	U/U	-	-	-	-	CFS-C EL	125	1	5.6	104	E-O	CFS-S ACR[1], 25	Countersunk head screw 5x85
P8	Silenta Premium	1 x ∅160 / 4	90°	U/U	-	-	-	-	CFS-C EL	160	1	5.6	104	E-O		
P9	Silent Pro	1 x ∅160 / 6	90°	U/U	-	-	-	-	CFS-C EL	160	1	5.6	104	E-O		HUS3 H 6x80
P10	POLO-KAL 3S	1 x ∅160 / 7.5	90°	U/U	-	-	-	-	CFS-C EL	160	1	5.6	104	E-O		Hex head wood screw 6x80
P11	Raupiano plus	1 x ∅160 / 3.9	90°	U/U	-	-	-	-	CFS-C EL	160	1	5.6	104	E-O		Countersunk head screw 5x85
P12	Silent dB20	1 x ∅56 / 3.2	90°	U/U	-	-	-	-	CFS-C EL	56	1	5.6	52	E-O		HUS3 H 6x80
P13	Silent dB20	1 x ∅75 / 3.6	90°	U/U	-	-	-	-	CFS-C EL	75	1	5.6	52	E-O		

[1] No backfilling in the remaining annular gaps; acrylic sealant was applied on both sides of the floor

TR 318092507-5

No.	Material	Dimensions OD / wall thickness [mm]	Orientation	Pipe-end configuration	Insulation Acc. to EN 1366-3:2009; Table 1				Pipe sealing system, as per EN 1366-3 3.12							
					Type	Set-up	Length [mm]	Insulation thickness [mm]	Type	Inside diameter [mm]	Active components: Layers	Active components: Thickness [mm]	Active components: Length [mm]	Installation	Joint and gap sealing, depth [mm]	Fastening
P14	Silent dB20	1 x ∅110 / 6	90°	U/U	-	-	-	-	CFS-C EL	110	1	5.6	52	E-O	CFS-S ACR[1], 25	Countersunk head screw 5x85
P15	PE-HD	1 x ∅63 / 3	90°	U/U	-	-	-	-	CFS-C EL	63	1	5.6	52	E-O		
P16	PE-HD	1 x ∅90 / 3.5	90°	U/U	-	-	-	-	CFS-C EL	90	1	5.6	52	E-O		Hex head wood screw 6x80
P17	PP-H	1 x ∅75 / 1.9	90°	U/U	-	-	-	-	CFS-C EL	75	1	5.6	52	E-O		
P18	PP-H	1 x ∅90 / 2.2	90°	U/U	-	-	-	-	CFS-C EL	90	1	5.6	52	E-O		HUS3 H 6x80
P19	PP-H	1 x ∅110 / 3.0	90°	U/U	-	-	-	-	CFS-C EL	110	1	5.6	52	E-O		
P20	PVC-U	1 x ∅110 / 2.2	90°	U/U	-	-	-	-	CFS-C EL	110	1	5.6	52	E-O		

[1] No backfilling in the remaining annular gaps; acrylic sealant was applied on both sides of the floor

TR 318092507-5																	
					Insulation Acc. to EN 1366-3:2009; Table 1				Pipe sealing system, as per EN 1366-3 3.12								
											Active components						
No.	Material	Dimensions OD / wall thickness [mm]	Orientation	Pipe-end configuration	Type	Set-up	Length [mm]	Insulation thickness [mm]	Type	Inside diameter [mm]	Layers	Thickness [mm]	Length [mm]	Installation	Joint and gap sealing, depth [mm]	Fastening
P21	PVC-U	1 x ∅110 / 8.1	90°	U/U	-	-	-	-	CFS-C EL	110	1	5.6	52	E-O	CFS-S ACR[1], 25	HUS3 H 6x80
P22	PVC-U	1 x ∅125 / 3.7	90°	U/U	-	-	-	-	CFS-C EL	125	1	5.6	104	E-O		

[1] No backfilling in the remaining annular gaps; acrylic sealant was applied on both sides of the floor

2.2.3.7. Test Report No. 319091602-1,Rev1

Tested in:	100 mm thick cross laminated timber wall (brand Binderholz BBS XL) with 5-layer structure Lamella thickness per layer 20 / 20 / 20 / 20 / 20 mm

TR 319091602-1,Rev1

No.	Material	Dimensions OD / wall thickness [mm]	Orientation	Pipe-end configuration	Insulation According to EN1366-3:2009; Table 1				Pipe sealing system, as per EN 1366-3 3.12							
					Type	Set-up	Length [mm]	Insulation thick-ness [mm]	Type	Inside diameter [mm]	Active components: Layers	Active components: Thickness [mm]	Active components: Length [mm]	Installation	Joint and gap sealing, depth [mm]	Fastening
P11	Geberit Silent dB20	1 x ∅56 / 3.2	90°	U/U	-	-	-	-	CFS-C EL	56	1	5.6	52	2S-O	CFS-S ACR[1], 25	HUS H 6x80mm
P12	Geberit Silent dB20	1 x ∅110 / 6	90°	U/U	-	-	-	-	CFS-C EL	110	1	5.6	52	2S-O		HUS H 6x80mm
P13	Poloplast POLO-KAL NG	1 x ∅160 / 4.9	90°	U/U	-	-	-	-	CFS-C EL	160	1	5.6	104	2S-O		HUS H 6x80mm
P14	Rehau Raupiano plus	1 x ∅50 / 1.8	90°	U/U	-	-	-	-	CFS-C EL	50	1	5.6	52	2S-O		S-WS 11 Yx85mm
P15	Rehau Raupiano plus	1 x ∅110 / 2.7	90°	U/U	-	-	-	-	CFS-C EL	110	1	5.6	52	2S-O		S-WS 11 Yx85mm
P16	Geberit Silent dB20	1 x ∅160 / 7	90°	U/U	-	-	-	-	CFS-C EL	160	1	5.6	104	2S-O		S-WS 11 Yx85mm

[1] No backfilling in the remaining annular gaps; acrylic sealant was applied on both sides of the floor

TR 319091602-1,Rev1																	
					Insulation According to EN1366-3:2009; Table 1				Pipe sealing system, as per EN 1366-3 3.12								
											Active components						
No.	Material	Dimensions OD / wall thickness [mm]	Orientation	Pipe-end configuration	Type	Set-up	Length [mm]	Insulation thickness [mm]	Type	Inside diameter [mm]	Layers	Thickness [mm]	Length [mm]	Installation	Joint and gap sealing, depth [mm]	Fastening
P17	PE-HD	1 x ∅50 / 2	90°	U/U	-	-	-	-	CFS-C EL	50	1	5.6	52	2S-O	CFS-S ACR[1], 25	S-WS 11 Yx85mm
P18	PE-HD	1 x ∅110 / 2.7	90°	U/U	-	-	-	-	CFS-C EL	110	1	5.6	52	2S-O		S-WS 11 Yx85mm
P19	PP-H	1 x ∅160 / 3.9	90°	U/U	-	-	-	-	CFS-C EL	160	1	5.6	104	2S-O		S-WS 11 Yx85mm
P20	PVC-u	1 x ∅50 / 1.8	90°	U/U	-	-	-	-	CFS-C EL	50	1	5.6	52	2S-O		Hex head wood screw 6x80mm
P21	Poloplast POLO-KAL NG	1 x ∅110 / 3.4	90°	U/U	-	-	-	-	CFS-C EL	110	1	5.6	52	2S-O		Hex head wood screw 6x80mm
P22	PVC-u	1 x ∅160 / 11.9	90°	U/U	-	-	-	-	CFS-C EL	160	1	5.6	104	2S-O		Hex head wood screw 6x80mm
P29	Poloplast POLO-KAL NG Elbow 1x87°	1 x ∅110 / 3.4	90°	U/U	-	-	-	-	CFS-C EL U-shaped[2]	110	1	5.6	52	2S-O		Hex head wood screw 6x80mm

[1] No backfilling in the remaining annular gaps; acrylic sealant was applied on both sides of the floor
[2] asymmetrical design, side length was 60 mm

2.2.3.8. Test Report No. 319091602-2,Rev1

Tested in:	100 mm thick cross laminated timber wall (brand Binderholz BBS XL) with 5-layer structure Lamella thickness per layer 20 / 20 / 20 / 20 / 20 mm

TR 319091602-2,Rev1

No.	Material	Dimensions OD / wall thickness [mm]	Orientation	Pipe-end configuration	Insulation Acc. to EN1366-3:2009; Table 1				Pipe sealing system, as per EN 1366-3 3.12							
											Active components					
					Type	Set-up	Length [mm]	Insulation thickness [mm]	Type	Inside diameter [mm]	Layers	Thickness [mm]	Length [mm]	Installation	Joint and gap sealing, depth [mm]	Fastening
P17	Geberit Silent Pro	1 x ∅50 / 3	90°	U/U	-	-	-	-	CFS-C EL	50	1	5.6	52	2S-O	CFS-S ACR[1], 25	HUS H 6x80mm
P18	Geberit Silent Pro	1 x ∅110 / 4.5	90°	U/U	-	-	-	-	CFS-C EL	110	1	5.6	52	2S-O		HUS H 6x80mm
P19	Geberit Silent dB20	1 x ∅160 / 7	90°	U/U	-	-	-	-	CFS-C EL	160	1	5.6	104	2S-O		HUS H 6x80mm
P20	Poloplast POLO-KAL NG	1 x ∅50 / 2	90°	U/U	-	-	-	-	CFS-C EL	50	1	5.6	52	2S-O		HUS H 6x80mm
P21	Poloplast POLO-KAL NG	1 x ∅110 / 3.4	90°	U/U	-	-	-	-	CFS-C EL	110	1	5.6	52	2S-O		HUS H 6x80mm
P22	Poloplast POLO-KAL NG	1 x ∅160 / 4.9	90°	U/U	-	-	-	-	CFS-C EL	160	1	5.6	104	2S-O		HUS H 6x80mm

[1] No backfilling in the remaining annular gaps; acrylic sealant was applied on both sides of the floor

TR 319091602-2,Rev1

No.	Material	Dimensions OD / wall thickness [mm]	Orientation	Pipe-end configuration	Insulation Acc. to EN1366-3:2009; Table 1				Pipe sealing system, as per EN 1366-3 3.12							
					Type	Set-up	Length [mm]	Insulation thickness [mm]	Type	Inside diameter [mm]	Active components: Layers	Active components: Thickness [mm]	Active components: Length [mm]	Installation	Joint and gap sealing, depth [mm]	Fastening
P23	PP-H	1 x ∅50 / 1.8	90°	U/U	-	-	-	-	CFS-C EL	50	1	5.6	52	2S-O	CFS-S ACR[1], 25	HUS H 6x80mm
P24	PP-H	1 x ∅110 / 2.7	90°	U/U	-	-	-	-	CFS-C EL	110	1	5.6	52	2S-O		HUS H 6x80mm
P25	PE-HD	1 x ∅160 / 4	90°	U/U	-	-	-	-	CFS-C EL	160	1	5.6	104	2S-O		HUS H 6x80mm
P26	PVC-u	1 x ∅50 / 5.6	90°	U/U	-	-	-	-	CFS-C EL	50	1	5.6	52	2S-O		HUS H 6x80mm
P27	PVC-u	1 x ∅110 / 12.3	90°	U/U	-	-	-	-	CFS-C EL	110	1	5.6	52	2S-O		HUS H 6x80mm
P28	PVC-u	1 x ∅160 / 3.2	90°	U/U	-	-	-	-	CFS-C EL	160	1	5.6	104	2S-O		HUS H 6x80mm

[1] No backfilling in the remaining annular gaps; acrylic sealant was applied on both sides of the floor

2.2.3.9. Test Report No. 319091602-3,Rev1

Tested in:	80 mm thick cross laminated timber wall (brand Binderholz BBS XL) with 3-layer structure Lamella thickness per layer 20 / 40 / 20 mm

TR 319091602-3,Rev1

No.	Material	Dimensions OD / wall thickness [mm]	Orientation	Pipe-end configuration	Insulation Acc. to EN1366-3:2009; Table 1				Pipe sealing system, as per EN 1366-3 3.12							
					Type	Set-up	Length [mm]	Insulation thickness [mm]	Type	Inside diameter [mm]	Active components: Layers	Active components: Thickness [mm]	Active components: Length [mm]	Installation	Joint and gap sealing, depth [mm]	Fastening
P17	PE-HD	1 x ∅110 / 2.7	90	U/U	-	-	-	-	CFS-C EL	110	1	5.6	52	2S-O	CFS-S ACR[1], 25	HUS H 6x80mm
P18	Poloplast POLO-KAL NG	1 x ∅110 / 3.4	90	U/U	-	-	-	-	CFS-C EL	110	1	5.6	52	2S-O		S-WS Yx85mm
P19	PP-H	1 x ∅110 / 2.7	90	U/U	-	-	-	-	CFS-C EL	110	1	5.6	52	2S-O		Hex head wood screws 6x80mm
P20	Poloplast POLO-KAL NG	1 x ∅160 / 4.9	90°	U/U	-	-	-	-	CFS-C EL	160	1	5.6	104	2S-I		
P21	PP-H	1 x ∅160 / 4	90	U/U	-	-	-	-	CFS-C EL	160	1	5.6	104	2S-O		S-WS Yx85mm

[1] No backfilling in the remaining annular gaps; acrylic sealant was applied on both sides of the floor

TR 319091602-3,Rev1

No.	Material	Dimensions OD / wall thickness [mm]	Orientation	Pipe-end configuration	Insulation Acc. to EN1366-3:2009; Table 1				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
											Layers	Thickness [mm]	Length [mm]			
P22	PE-HD	1 x ∅160 / 4	90	U/U	-	-	-	-	CFS-C EL	160	1	5.6	104	2S-O	CFS-S ACR[1], 25	HUS H 6x80mm
P30	Poloplast POLO-KAL NG Elbow 1x87°	1 x ∅110 / 3.4	90	U/U	-	-	-	-	CFS-C EL U-shaped[2]	160	1	5.6	52	2S-O		Hex head wood screws 6x80mm

[1] No backfilling in the remaining annular gaps; acrylic sealant was applied on both sides of the floor
[2] asymmetrical design, side length was 60 mm

2.2.3.10. Test Report No. 319091602-4,Rev1

Tested in:	80 mm thick cross laminated timber wall (brand Binderholz BBS XL) with 3-layer structure Lamella thickness per layer 20 / 40 / 20 mm

TR 319091602-4,Rev1

No.	Material	Dimensions OD / wall thickness [mm]	Orientation	Pipe-end configuration	Insulation Acc. to EN1366-3:2009; Table 1				Pipe sealing system, as per EN 1366-3 3.12							
					Type	Set-up	Length [mm]	Insulation thickness [mm]	Type	Inside diameter [mm]	Active components: Layers	Active components: Thickness [mm]	Active components: Length [mm]	Installation	Joint and gap sealing, depth [mm]	Fastening
P1	Raupiano plus	1 x ∅50 / 1.8	90°	U/U	-	-	-	-	CFS-C EL	50	1	5.6	52	2S-O	CFS-S ACR[1], 25	2 x hex head wood screws x 60
P2	Raupiano plus	1 x ∅75 / 1.9	90°	U/U	-	-	-	-	CFS-C EL	75	1	5.6	52	2S-O		
P3	Raupiano plus	1 x ∅90 / 2.2	90°	U/U	-	-	-	-	CFS-C EL	90	1	5.6	52	2S-O		
P4	Raupiano plus	1 x ∅110 / 2.7	90°	U/U	-	-	-	-	CFS-C EL	110	1	5.6	52	2S-O		3 x HUS3 H 6x60
P5	Wavin AS	1 x ∅110 / 5.3	90°	U/U	-	-	-	-	CFS-C EL	110	1	5.6	52	2S-O		

[1] No backfilling in the remaining annular gaps; acrylic sealant was applied on both sides of the floor

TR 319091602-4, Rev. 1

No.	Material	Dimensions OD / wall thickness [mm]	Orientation	Pipe-end configuration	Insulation Acc. to EN1366-3:2009; Table 1				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
											Layers	Thickness [mm]	Length [mm]			
P6	Geberit Silent db20	1 x ∅56 / 3.2	90°	U/U	-	-	-	-	CFS-C EL	56	1	5.6	52	2S-O	CFS-S ACR[1], 25	HUS3 H 6x60
P7	Geberit Silent db20	1 x ∅75 / 3.6	90°	U/U	-	-	-	-	CFS-C EL	75	1	5.6	52	2S-O		SWS 11 Y 6x65
P8	Geberit Silent db20	1 x ∅110 / 6	90°	U/U	-	-	-	-	CFS-C EL	110	1	5.6	52	2S-O		
P9	PE-HD	1 x ∅63 / 3	90°	U/U	-	-	-	-	CFS-C EL	63	1	5.6	52	2S-O		
P10	PE-HD	1 x ∅90 / 3.5	90°	U/U	-	-	-	-	CFS-C EL	90	1	5.6	52	2S-O		HUS3 H 6x60
P11	PP-H	1 x ∅75 / 1.9	90°	U/U	-	-	-	-	CFS-C EL	75	1	5.6	52	2S-O		
P12	PP-H	1 x ∅90 / 2.2	90°	U/U	-	-	-	-	CFS-C EL	90	1	5.6	52	2S-O		Hex head wood screw 6x60
P13	PP-H	1 x ∅110 / 3.0	90°	U/U	-	-	-	-	CFS-C EL	110	1	5.6	52	2S-O		

[1] No backfilling in the remaining annular gaps; acrylic sealant was applied on both sides of the floor

2.2.3.11. Test Report No. 319091602-5,Rev1

Tested in:	100 mm thick cross laminated timber wall (brand Binderholz BBS XL) with 5-layer structure Lamella thickness per layer 20 / 20 / 20 / 20 / 20 mm

TR 319091602-5,Rev1

No.	Material	Dimensions OD / wall thickness [mm]	Orientation	Pipe-end configuration	Insulation Acc. to EN1366-3:2009; Table 1				Pipe sealing system, as per EN 1366-3 3.12							
					Type	Set-up	Length [mm]	Insulation thickness [mm]	Type	Inside diameter [mm]	Active components: Layers	Active components: Thickness [mm]	Active components: Length [mm]	Installation	Joint and gap sealing, depth [mm]	Fastening
P1	Geberit Silent Pro	1 x ∅50 / 3	90°	U/U	-	-	-	-	CFS-C EL	50	1	5.6	52	2S-O	CFS-S ACR[1], 25	Hex head wood screws x 80
P2	Raupiano plus	1 x ∅75 / 1.9	90°	U/U	-	-	-	-	CFS-C EL	75	1	5.6	52	2S-O		
P3	Silenta Premium	1 x ∅78 / 4.5	90°	U/U	-	-	-	-	CFS-C EL	78	1	5.6	52	2S-O		
P4	Raupiano plus	1 x ∅90 / 2.2	90°	U/U	-	-	-	-	CFS-C EL	90	1	5.6	52	2S-O		HUS3 H 6x80
P5	Wavin SiTech+	1 x ∅110 / 3.4	90°	U/U	-	-	-	-	CFS-C EL	110	1	5.6	52	2S-O		

[1] No backfilling in the remaining annular gaps; acrylic sealant was applied on both sides of the floor

TR 319091602-5,Rev1

No.	Material	Dimensions OD / wall thickness [mm]	Orientation	Pipe-end configuration	Insulation Acc. to EN1366-3:2009; Table 1				Pipe sealing system, as per EN 1366-3 3.12							
					Type	Set-up	Length [mm]	Insulation thickness [mm]	Type	Inside diameter [mm]	Active components: Layers	Active components: Thickness [mm]	Active components: Length [mm]	Installation	Joint and gap sealing, depth [mm]	Fastening
P6	Silent Pro	1 x ∅110 / 4.5	90°	U/U	-	-	-	-	CFS-C EL	110	1	5.6	52	2S-O	CFS-S ACR[1], 25	3HUS3 H 6x80
P7	Raupinao plus	1 x ∅125 / 3.1	90°	U/U	-	-	-	-	CFS-C EL	125	1	5.6	104	2S-O		
P8	Wavin SiTech+	1 x ∅125 / 3.9	90°	U/U	-	-	-	-	CFS-C EL	125	1	5.6	104	2S-O		
P9	Silenta Premium	1 x ∅160 / 5.3	90°	U/U	-	-	-	-	CFS-C EL	160	1	5.6	104	2S-O		
P10	Raupiano plus	1 x ∅160 / 3.9	90°	U/U	-	-	-	-	CFS-C EL	160	1	5.6	104	2S-O		SWS 11 Y 6x85
P11	POLO-KAL 3S	1 x ∅160 / 7.5	90°	U/U	-	-	-	-	CFS-C EL	160	1	5.6	104	2S-O		
P12	Silent dB20	1 x ∅75 / 3.6	90°	U/U	-	-	-	-	CFS-C EL	75	1	5.6	52	2S-O		
P13	Silent dB20	1 x ∅135 / 6	90°	U/U	-	-	-	-	CFS-C EL	135	1	5.6	104	2S-O		HUS3 H 6x80

[1] No backfilling in the remaining annular gaps; acrylic sealant was applied on both sides of the floor

TR 319091602-5,Rev1																	
					Insulation Acc. to EN1366-3:2009; Table 1				Pipe sealing system, as per EN 1366-3 3.12								
											Active components						
No.	Material	Dimensions OD / wall thickness [mm]	Orientation	Pipe-end configuration	Type	Set-up	Length [mm]	Insulation thickness [mm]	Type	Inside diameter [mm]	Layers	Thickness [mm]	Length [mm]	Installation	Joint and gap sealing, depth [mm]	Fastening
P14	PE-HD	1 x ∅63 / 3	90°	U/U	-	-	-	-	CFS-C EL	63	1	5.6	52	2S-O	CFS-S ACR[1], 25	3 x hex head wood screws 6x80
P15	PE-HD	1 x ∅110 / 3.5	90°	U/U	-	-	-	-	CFS-C EL	110	1	5.6	52	2S-O		
P16	PE-HD	1 x ∅110 / 4.2	90°	U/U	-	-	-	-	CFS-C EL	110	1	5.6	52	2S-O		
P17	PE-HD	1 x ∅125 / 4.8	90°	U/U	-	-	-	-	CFS-C EL	125	1	5.6	104	2S-O		3 x HUS3 H 6x80
P18	PP-H	1 x ∅50 / 1.8	90°	U/U	-	-	-	-	CFS-C EL	50	1	5.6	52	2S-O		
P19	PP-H	1 x ∅75 / 1.9	90°	U/U	-	-	-	-	CFS-C EL	75	1	5.6	52	2S-O		
P20	PP-H	1 x ∅110 / 2.7	90°	U/U	-	-	-	-	CFS-C EL	110	1	5.6	52	2S-O		
P21	PP-H	1 x ∅110 / 3.0	90°	U/U	-	-	-	-	CFS-C EL	110	1	5.6	52	2S-O		

[1] No backfilling in the remaining annular gaps; acrylic sealant was applied on both sides of the floor

TR 319091602-5,Rev1																	
					Insulation Acc. to EN1366-3:2009; Table 1				Pipe sealing system, as per EN 1366-3 3.12								
											Active components						
No.	Material	Dimensions OD / wall thickness [mm]	Orientation	Pipe-end configuration	Type	Set-up	Length [mm]	Insulation thickness [mm]	Type	Inside diameter [mm]	Layers	Thickness [mm]	Length [mm]	Installation	Joint and gap sealing, depth [mm]	Fastening
P22	PP-H	1 x ∅125 / 3.1	90°	U/U	-	-	-	-	CFS-C EL	125	1	5.6	104	2S-O	CFS-S ACR[1], 25	Hex head wood screws x 80
P23	PP-H	1 x ∅160 / 4	90°	U/U	-	-	-	-	CFS-C EL	160	1	5.6	104	2S-O		
P24	PP-H	1 x ∅160 / 9.1	90°	U/U	-	-	-	-	CFS-C EL	160	1	5.6	104	2S-O		
P25	PVC-U	1 x ∅110 / 8.1	90°	U/U	-	-	-	-	CFS-C EL	110	1	5.6	52	2S-O		HUS3 H 6x80
P26	PVC_U	1 x ∅125 / 2.5	90°	U/U	-	-	-	-	CFS-C EL	125	1	5.6	104	2S-O		SWS 11 Y x 85
P27	PVC-U	1 x ∅160 / 3.2	90°	U/U	-	-	-	-	CFS-C EL	160	1	5.6	104	2S-O		
P28	PVC-U	1 x ∅160 / 11.8	90°	U/U	-	-	-	-	CFS-C EL	160	1	5.6	104	2S-O		

[1] No backfilling in the remaining annular gaps; acrylic sealant was applied on both sides of 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	319091602-1,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	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
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

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,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]			
P22	U/U	≥ 60	≥ 60	≥ 60	≥ 60
P23	U/U	≥ 60	≥ 60	≥ 60	≥ 60
P24	U/U	≥ 60	≥ 60	≥ 60	≥ 60
P25	U/U	≥ 60	≥ 60	≥ 60	≥ 60
P26	U/U	≥ 60	≥ 60	≥ 60	≥ 60
P27	U/U	≥ 60	≥ 60	≥ 60	≥ 60
P28	U/U	≥ 60	≥ 60	≥ 60	≥ 60
P29	U/U	≥ 60	≥ 60	≥ 60	≥ 60

Test Report No. 318092507-1,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]			
P30	U/U	≥ 60	≥ 60	≥ 60	≥ 60
P31	U/U	≥ 60	≥ 60	≥ 60	≥ 60
P32	U/U	≥ 60	≥ 60	≥ 60	≥ 60
P33	U/U	≥ 60	≥ 60	≥ 60	≥ 60
P34	U/U	≥ 60	≥ 60	≥ 60	≥ 60
P35	U/U	≥ 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]			
P23	U/U	≥ 120	≥ 120	≥ 120	≥ 120
P24	U/U	≥ 120	≥ 120	≥ 120	≥ 120
P25	U/U	≥ 120	≥ 120	≥ 120	≥ 120
P26	U/U	≥ 120	≥ 120	≥ 120	≥ 120
P27	U/U	≥ 120	≥ 120	≥ 120	≥ 120
P28	U/U	≥ 120	≥ 120	≥ 120	≥ 120
P29	U/U	≥ 120	≥ 120	≥ 120	≥ 120
P30	U/U	≥ 120	≥ 120	≥ 120	≥ 120
P31	U/U	≥ 120	≥ 120	≥ 120	≥ 120
P32	U/U	≥ 120	≥ 120	≥ 120	≥ 120
P33	U/U	≥ 120	≥ 120	≥ 120	≥ 120
P34	U/U	≥ 120	≥ 120	≥ 120	≥ 120
P35	U/U	≥ 120	≥ 120	≥ 120	≥ 120

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]			
P36	U/U	≥ 90	≥ 90	≥ 90	≥ 90
P37	U/U	≥ 120	≥ 120	≥ 120	≥ 120
P38	U/U	≥ 120	≥ 120	≥ 120	≥ 120
P39	U/U	≥ 120	≥ 120	≥ 120	≥ 120
P40	U/U	≥ 120	≥ 120	≥ 120	≥ 120
P41	U/U	≥ 120	≥ 120	≥ 120	≥ 120
P42	U/U	≥ 120	≥ 120	≥ 120	≥ 120
P43	U/U	≥ 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]			
P19	U/U	≥ 90	≥ 90	≥ 90	≥ 90

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]			
P20	U/U	≥ 90	≥ 90	≥ 90	≥ 90
P21	U/U	≥ 90	≥ 90	≥ 90	≥ 90
P22	U/U	≥ 90	≥ 90	≥ 90	≥ 90
P23	U/U	≥ 90	≥ 90	≥ 90	≥ 90
P24	U/U	≥ 90	≥ 90	≥ 90	≥ 90
P25	U/U	≥ 90	≥ 90	≥ 90	≥ 90
P26	U/U	≥ 90	≥ 90	≥ 90	≥ 90
P27	U/U	≥ 90	≥ 90	≥ 90	≥ 90
P28	U/U	≥ 90	≥ 90	≥ 90	≥ 90
P29	U/U	≥ 90	≥ 90	≥ 90	≥ 90
P30	U/U	≥ 90	≥ 90	≥ 90	≥ 90
P31	U/U	≥ 90	≥ 90	≥ 90	≥ 90
P32	U/U	≥ 90	≥ 90	≥ 90	≥ 90

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]			
P33	U/U	≥ 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 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]			
P1	U/U	≥ 60	≥ 60	≥ 60	≥ 60
P2	U/U	≥ 60	≥ 60	≥ 60	≥ 60
P3	U/U	≥ 60	≥ 60	≥ 60	≥ 60
P4	U/U	≥ 60	≥ 60	≥ 60	≥ 60
P5	U/U	≥ 60	≥ 60	≥ 60	≥ 60
P6	U/U	≥ 60	≥ 60	≥ 60	≥ 60
P7	U/U	≥ 60	≥ 60	≥ 60	≥ 60

Test report 318092507-4 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]			
P8	U/U	≥ 60	≥ 60	≥ 60	≥ 60
P9	U/U	≥ 60	≥ 60	≥ 60	≥ 60
P10	U/U	≥ 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]			
P1	U/U	≥ 90	≥ 90	≥ 90	≥ 90
P2	U/U	≥ 90	≥ 90	≥ 90	≥ 90
P3	U/U	≥ 90	≥ 90	≥ 90	≥ 90
P4	U/U	≥ 90	≥ 90	≥ 90	≥ 90
P5	U/U	≥ 90	≥ 90	≥ 90	≥ 90
P6	U/U	≥ 90	≥ 90	≥ 90	≥ 90

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]			
P7	U/U	≥ 90	≥ 90	≥ 90	≥ 90
P8	U/U	≥ 90	≥ 90	≥ 90	≥ 90
P9	U/U	≥ 90	≥ 90	≥ 90	≥ 90
P10	U/U	≥ 90	≥ 90	≥ 90	≥ 90
P11	U/U	≥ 90	≥ 90	≥ 90	≥ 90
P12	U/U	≥ 90	≥ 90	≥ 90	≥ 90
P13	U/U	≥ 90	≥ 90	≥ 90	≥ 90
P14	U/U	≥ 90	≥ 90	≥ 90	≥ 90
P15	U/U	≥ 90	≥ 90	≥ 90	≥ 90
P16	U/U	≥ 90	≥ 90	≥ 90	≥ 90
P17	U/U	≥ 90	≥ 90	≥ 90	≥ 90
P18	U/U	≥ 90	≥ 90	≥ 90	≥ 90
P19	U/U	≥ 90	≥ 90	≥ 90	≥ 90

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]			
P20	U/U	≥ 90	≥ 90	≥ 90	≥ 90
P21	U/U	≥ 90	≥ 90	≥ 90	≥ 90
P22	U/U	≥ 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. 319091602-1,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]			
P11	U/U	≥ 90	≥ 90	≥ 90	≥ 90
P12	U/U	≥ 90	≥ 90	≥ 90	≥ 90
P13	U/U	≥ 90	≥ 90	≥ 90	≥ 90
P14	U/U	≥ 90	≥ 90	≥ 90	≥ 90
P15	U/U	≥ 90	≥ 90	≥ 90	≥ 90
P16	U/U	≥ 90	≥ 90	≥ 90	≥ 90
P17	U/U	≥ 90	≥ 90	≥ 90	≥ 90
P18	U/U	≥ 90	≥ 90	≥ 90	≥ 60
P19	U/U	≥ 90	≥ 90	≥ 90	≥ 90
P20	U/U	≥ 90	≥ 90	≥ 90	≥ 90
P21	U/U	≥ 90	≥ 90	≥ 90	≥ 90
P22	U/U	≥ 90	≥ 90	≥ 90	≥ 90
P29	U/U	≥ 60	≥ 60	≥ 60	≥ 60

Test Report No. 319091602-1,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]			
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. 319091602-2,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]			
P17	U/U	≥ 90	≥ 90	≥ 90	≥ 90
P18	U/U	≥ 90	≥ 90	≥ 90	≥ 90
P19	U/U	≥ 90	≥ 90	≥ 90	≥ 90
P20	U/U	≥ 90	≥ 90	≥ 90	≥ 90
P21	U/U	≥ 90	≥ 90	≥ 90	≥ 90
P22	U/U	≥ 90	≥ 90	≥ 90	≥ 90
P23	U/U	≥ 90	≥ 90	≥ 90	≥ 90
P24	U/U	≥ 90	≥ 90	≥ 90	≥ 90
P25	U/U	≥ 90	≥ 90	≥ 90	≥ 90

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]			
P26	U/U	≥ 90	≥ 90	≥ 90	≥ 90
P27	U/U	≥ 90	≥ 90	≥ 90	≥ 90
P28	U/U	≥ 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]			
P17	U/U	≥ 60	≥ 60	≥ 60	≥ 60
P18	U/U	≥ 60	≥ 60	≥ 60	≥ 60
P19	U/U	≥ 60	≥ 60	≥ 60	≥ 60
P20	U/U	≥ 60	≥ 60	≥ 60	≥ 60
P21	U/U	≥ 60	≥ 60	≥ 60	≥ 60

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]			
P22	U/U	≥ 60	≥ 60	≥ 60	≥ 60
P30	U/U	≥ 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]			
P1	U/U	≥ 60	≥ 60	≥ 60	≥ 60
P2	U/U	≥ 60	≥ 60	≥ 60	≥ 60
P3	U/U	≥ 60	≥ 60	≥ 60	≥ 60
P4	U/U	≥ 60	≥ 60	≥ 60	≥ 60
P5	U/U	≥ 60	≥ 60	≥ 60	≥ 60
P6	U/U	≥ 60	≥ 60	≥ 60	≥ 60
P7	U/U	≥ 60	≥ 60	≥ 60	≥ 60

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]			
P8	U/U	≥ 60	≥ 60	≥ 60	≥ 60
P9	U/U	≥ 60	≥ 60	≥ 60	≥ 60
P10	U/U	≥ 60	≥ 60	≥ 60	≥ 60
P11	U/U	≥ 60	≥ 60	≥ 60	≥ 60
P12	U/U	≥ 60	≥ 60	≥ 60	≥ 60
P13	U/U	≥ 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]			
P1	U/U	≥ 90	≥ 90	≥ 90	≥ 90
P2	U/U	≥ 90	≥ 90	≥ 90	≥ 90
P3	U/U	≥ 90	≥ 90	≥ 90	≥ 90
P4	U/U	≥ 90	≥ 90	≥ 90	≥ 90
P5	U/U	≥ 90	≥ 90	≥ 90	≥ 90
P6	U/U	≥ 90	≥ 90	≥ 90	≥ 90
P7	U/U	≥ 90	≥ 90	≥ 90	≥ 90
P8	U/U	≥ 90	≥ 90	≥ 90	≥ 90
P9	U/U	≥ 90	≥ 90	≥ 90	≥ 90
P10	U/U	≥ 90	≥ 90	≥ 90	≥ 90
P11	U/U	≥ 90	≥ 90	≥ 90	≥ 90
P12	U/U	≥ 90	≥ 90	≥ 90	≥ 90
P13	U/U	≥ 90	≥ 90	≥ 90	≥ 90

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]			
P14	U/U	≥ 90	≥ 90	≥ 90	≥ 90
P15	U/U	≥ 90	≥ 90	≥ 90	≥ 90
P16	U/U	≥ 90	≥ 90	≥ 90	≥ 90
P17	U/U	≥ 90	≥ 90	≥ 90	≥ 90
P18	U/U	≥ 90	≥ 90	≥ 90	≥ 90
P19	U/U	≥ 90	≥ 90	≥ 90	≥ 60
P20	U/U	≥ 90	≥ 90	≥ 90	≥ 90
P21	U/U	≥ 90	≥ 90	≥ 90	≥ 60
P22	U/U	≥ 90	≥ 90	≥ 90	≥ 90
P23	U/U	≥ 90	≥ 90	≥ 90	≥ 90
P24	U/U	≥ 90	≥ 90	≥ 90	≥ 60
P25	U/U	≥ 90	≥ 90	≥ 90	≥ 90
P26	U/U	≥ 90	≥ 90	≥ 90	≥ 90

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]			
P27	U/U	≥ 90	≥ 90	≥ 90	≥ 90
P28	U/U	≥ 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.

		Geprüft			
		U/U	C/U	U/C	C/C
Abgedeckt	U/U	J	N	N	N
	C/U	J	J	N	N
	U/C	J	J	J	N
	C/C	J	J	J	J
J = zulässig, N = nicht zulässig					

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-C EL

4.4.1. Installation 90° penetration

The Hilti CFS-C EL Firestop Collar endless is attached to the soffit of floors and to both sides of walls on the surface of the supporting structure using screws.

4.4.2. Installation with 87° pipe elbow on one side

The Hilti CFS-C EL Firestop Collar endless is fixed by screws on both sides of the walls to the surface of the supporting structure, whereby on the elbow pipe side the collar may be U-shape attached. The length of the collar must be increased by ≥ 120 mm and must overlap the opening in the wall by ≥ 60 mm on both sides.

4.4.3. Length and amount of hooks for 90° penetration

Pipe outer diameter	**Mounting hooks**	
	short	long
50	2	-
75	3	-
90	3	-
110	3	-
125 - 160	2	4

4.4.4. Amount of hooks for 87° elbow pipes

Pipe outer diameter	**Mounting hook short**	
	Without pipe elbow	With pipe elbow
50	2	2
75	3	3
90	3	3
110	3	4

4.4.5. Construction groups

The Hilti CFS-C EL Firestop Collar endless can be used in two installation heights (length groups):

Hilti CFS-C EL Installation height	∅ ≤ 110 mm	52 mm	Length group 1
	110 < ∅ ≤ 160 mm	104 mm	Length group 2

4.4.6. Annular gaps

Sealing of annular gap	Hilti CFS-S ACR
Maximum annular gap (width)	Annular gap = 0 - 15 mm
Filling depth	≥ 25 mm, both sides
Backfilling	none

4.4.7. Cross laminated timber floor ≥ 80 mm

4.4.7.1. 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.

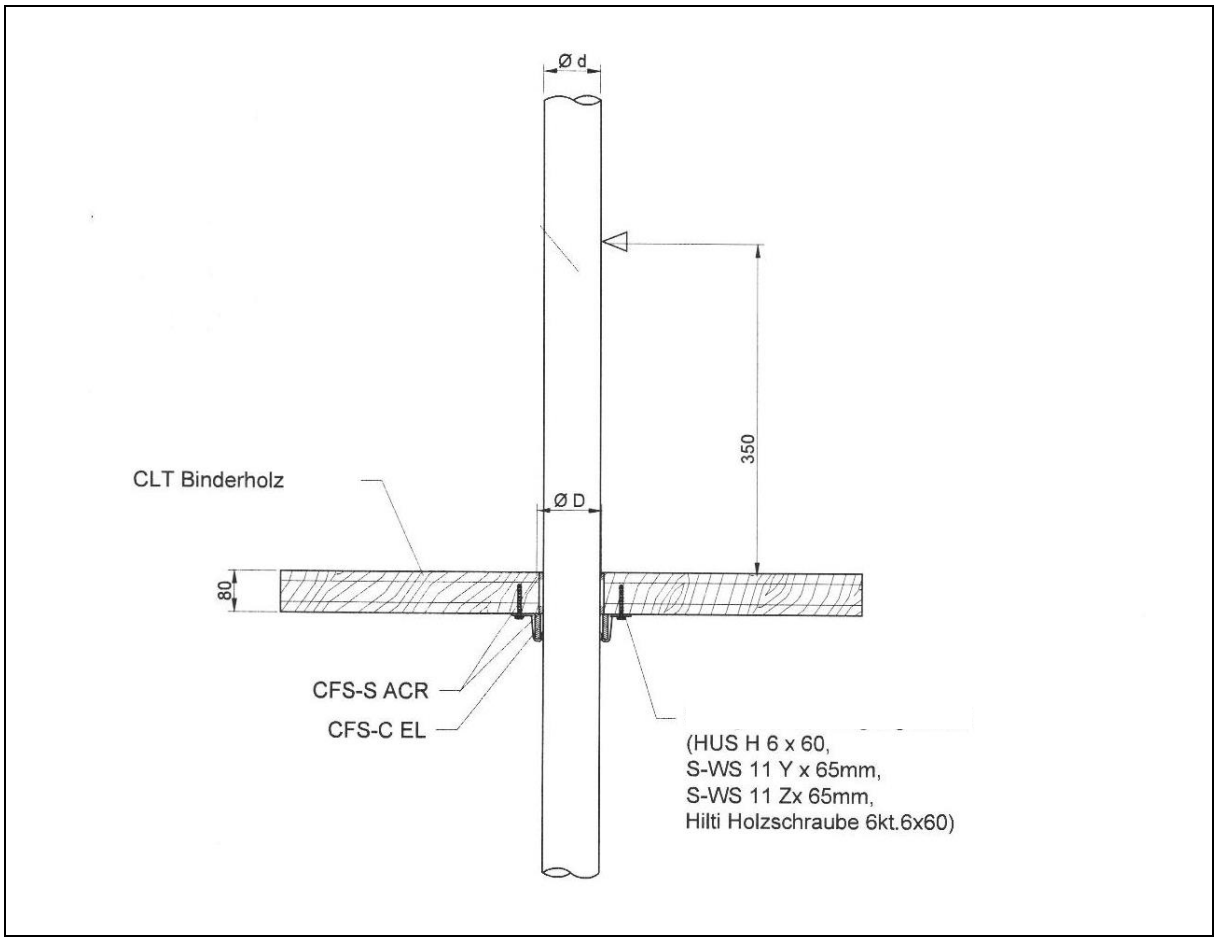
4.4.7.2. Minimum distances

All distances to identical collars as well as to other systems must be ≥ 200 mm.

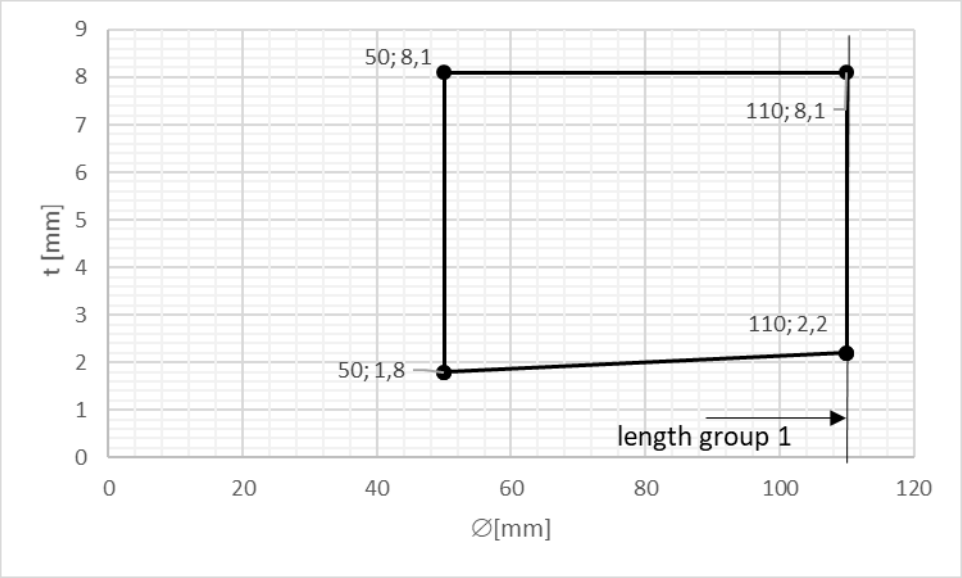
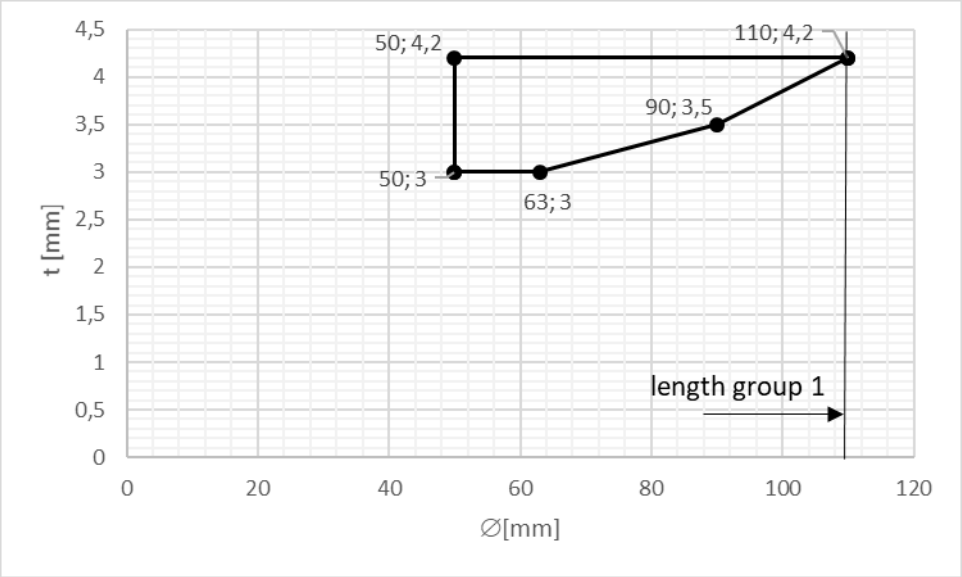
4.4.7.3. Fixings

Hilti HUS3 H 6 x 60 mm Hilti S-WS 11 Y x 75 mm	Hilti S-WS 11 Z x 75 mm Hex head wood screws 6 x 60 mm

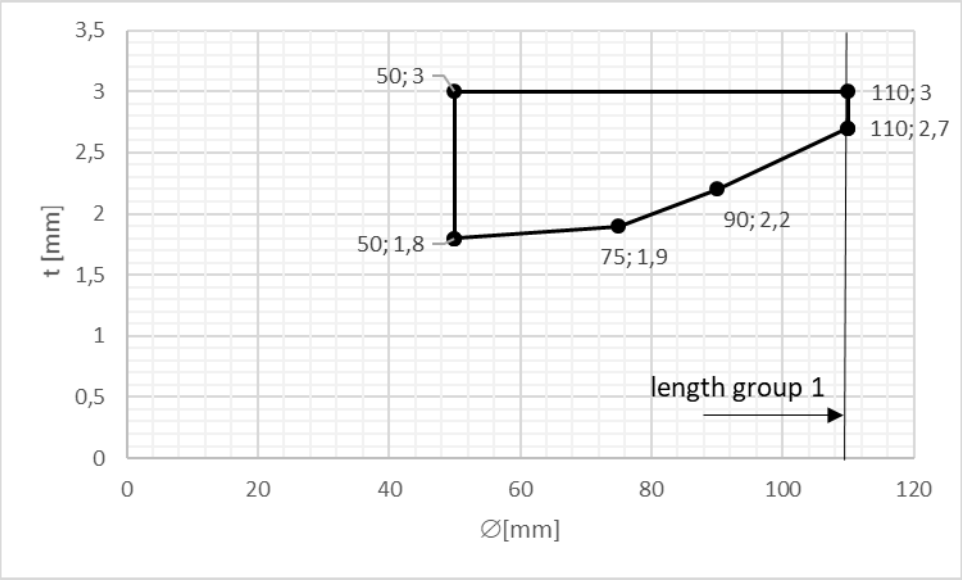
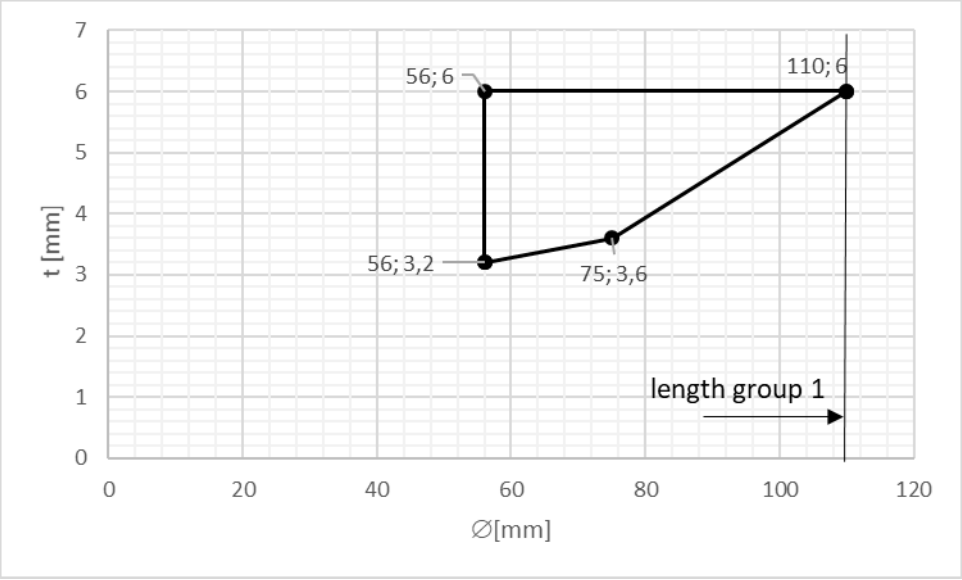
4.4.7.4. Detailed drawing



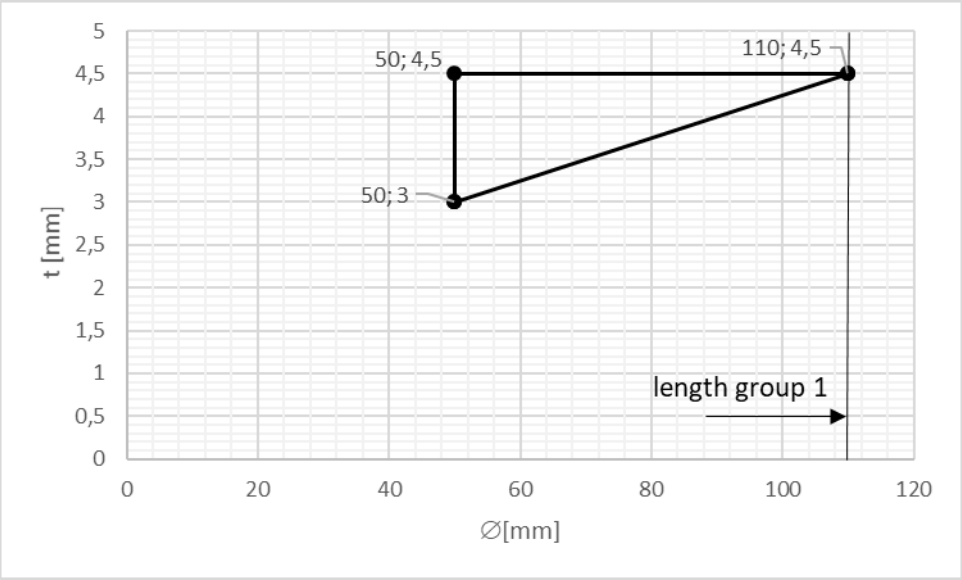
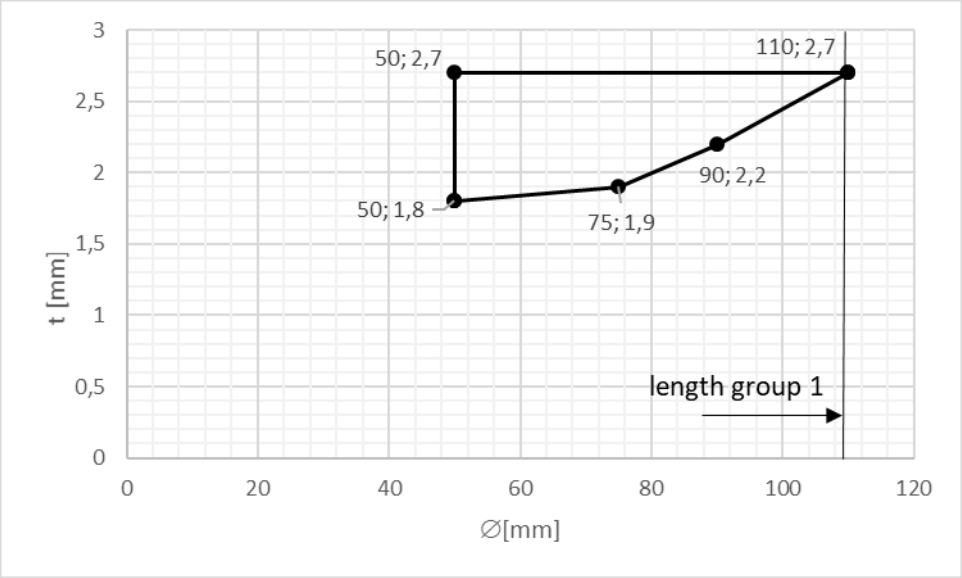
4.4.7.5. Plastic pipes

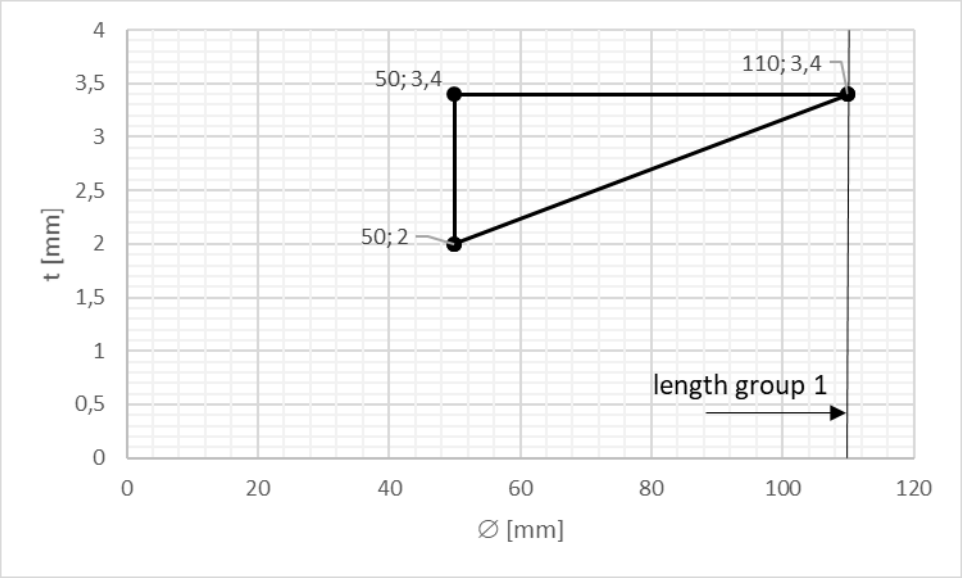
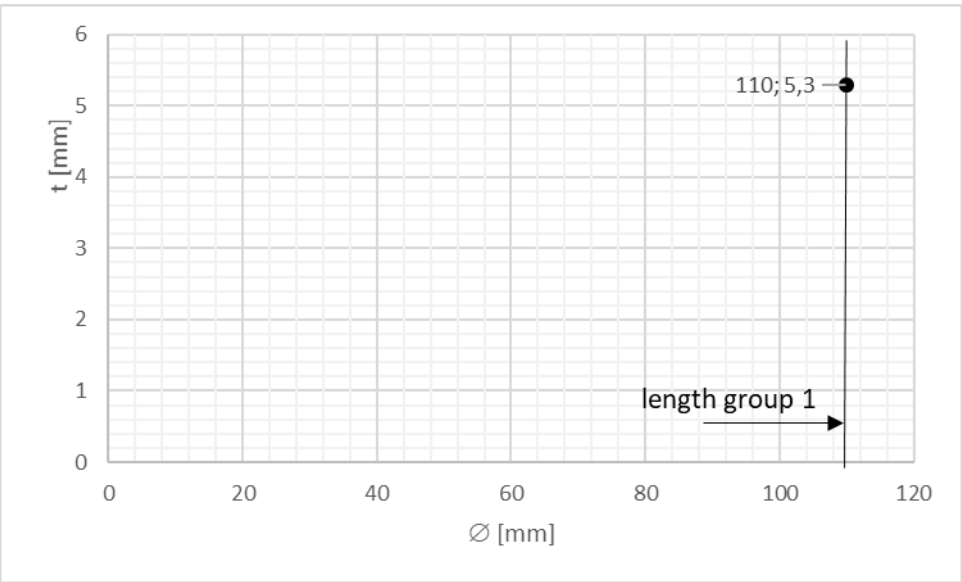
PVC-U[1] PVC-C[2]	∅ = 50 - 110 mm t = 1.8 – 8.1 mm	**EI 60 – U/U**
		318092507-1,Rev2 P34, P35 318092507-4 P10
PE-HD[3] ABS[4] SAN + PVC[5]	∅ = 50 - 110 mm t = 3.0 – 4.2 mm	**EI 60 – U/U**
		318092507-1,Rev2 P30, P31 318092507-4 P5, P6

[1] PVC-U pipe as per EN 1329-1, EN 1453-1 or EN 1452-1
[2] PVC-C pipe as per EN 1566-1
[3] PE-HD pipe as per EN 1519-1, EN 12201-2 or 12666-1
[4] ABS pipe as per EN 1455-1
[5] SAN + PVC pipe as per EN 1565-1

PP-H[6]	∅ = 50 - 110 mm t = 1.8 – 3 mm	**EI 60 – U/U**
		318092507-1,Rev2 P32, P33 318092507-4 P7 – P9
Geberit Silent dB20	∅ = 56 - 110 mm t = 3.2 - 6.0 mm	**EI 60 – U/U**
		318092507-1,Rev2 P22, P23 318092507-4 P4

[6] PP-H pipe as per EN 1451-1

Geberit Silent Pro	∅ = 50 - 110 mm t = 3.0 – 4.5 mm	**EI 60 – U/U**
		318092507-1,Rev2 P26, P27
Rehau Raupiano plus	∅ = 50 - 110 mm t = 1.8 – 2.7 mm	**EI 60 – U/U**
		318092507-1,Rev2 P28, P29 318092507-4 P1, P2

Poloplast POLO-KAL NG / XS	∅ = 50 - 110 mm t = 2.0 - 3.4 mm	**EI 60 – U/U**
		318092507-1,Rev2 P24, P25
Wavin AS	∅ = 110 mm t = 5.3 mm	**EI 60 – U/U**
		318092507-4 P3

4.4.8. Cross laminated timber floor ≥ 100 mm

4.4.8.1. Definition of supporting structure

The floor must be ≥ 100 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.

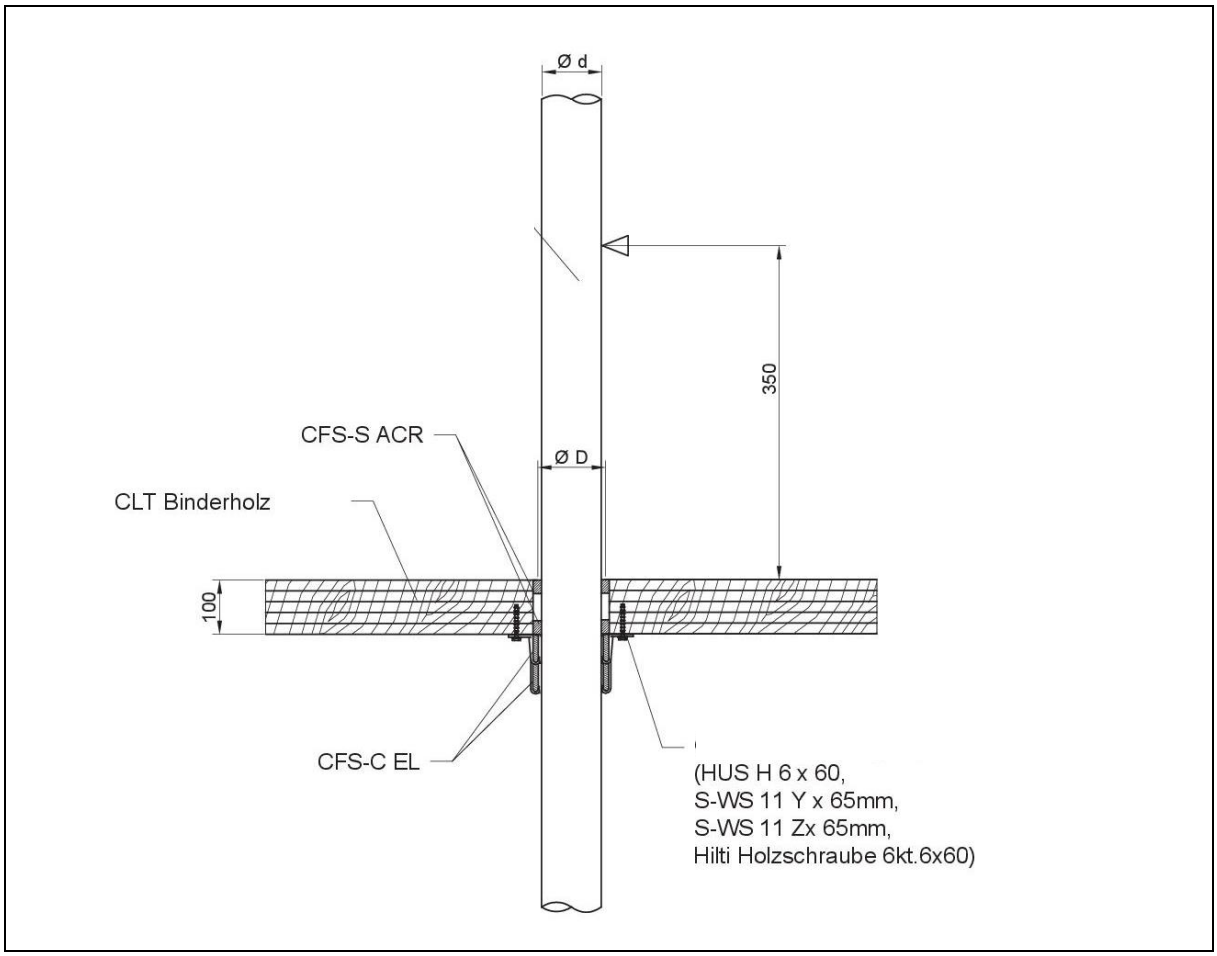
4.4.8.2. Fixings

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 x 80 mm

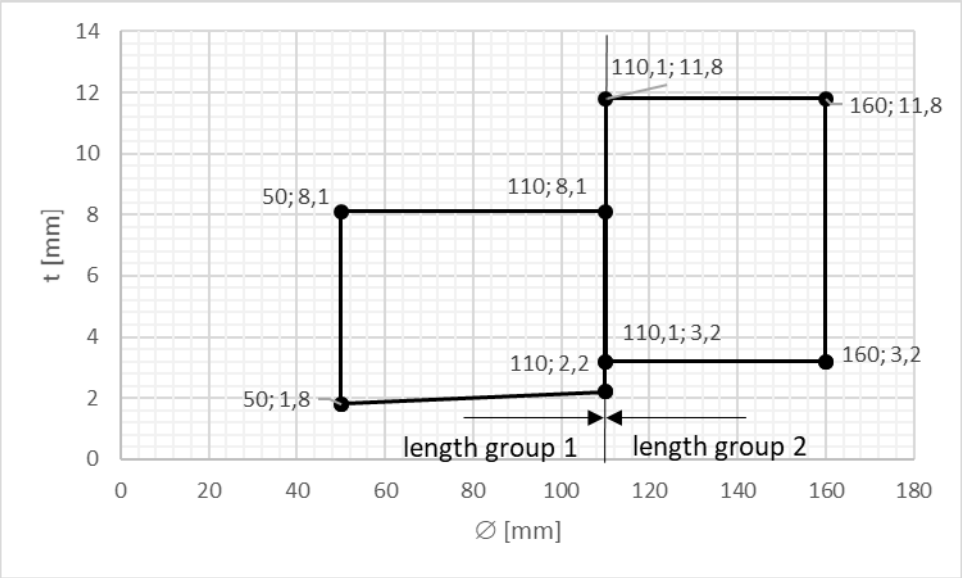
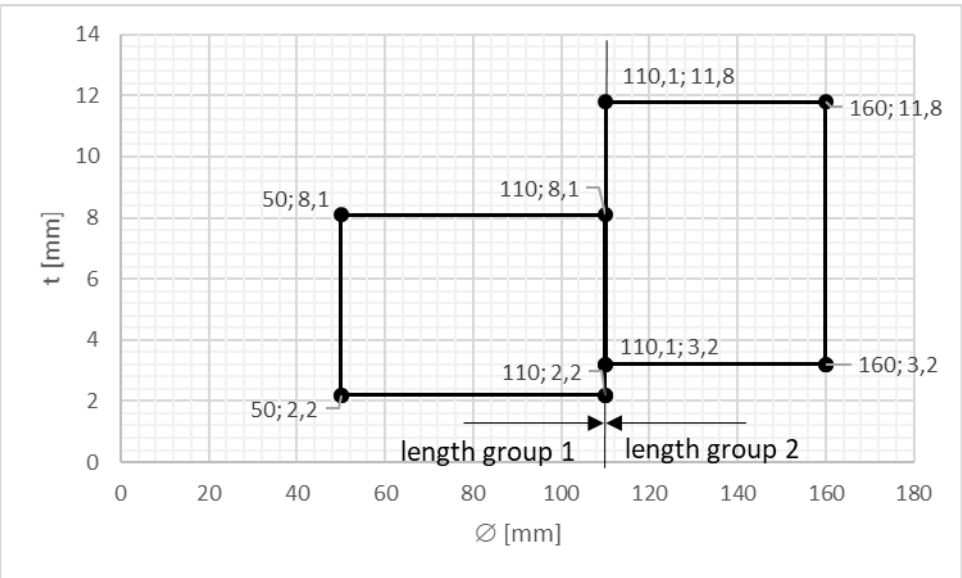
4.4.8.3. Minimum distance

All distances to identical collars as well as to other systems must be ≥ 200 mm.

4.4.8.4. Detailed drawing

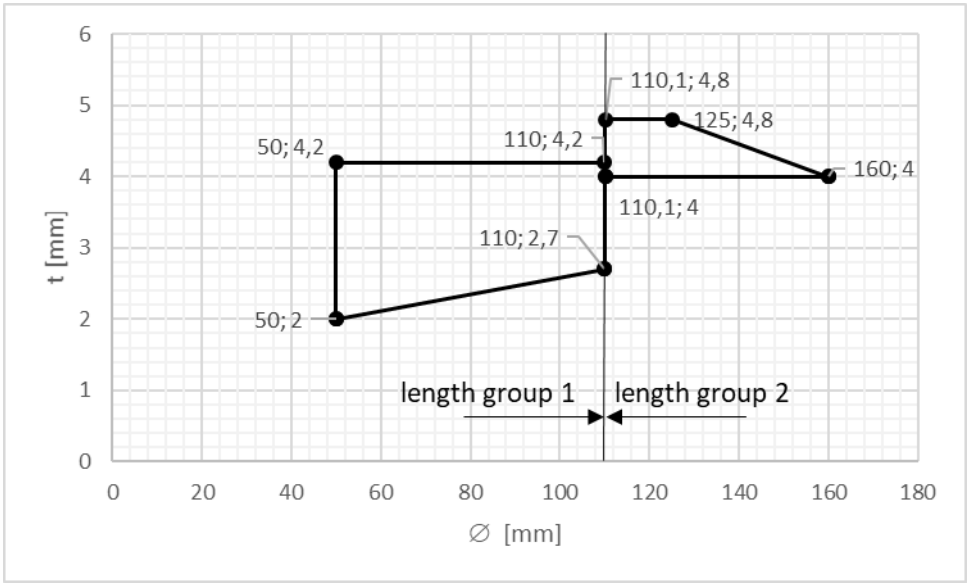


4.4.8.5. Plastic pipes

PVC-U[1] PVC-C[2]	∅ = 50 - 160 mm t = 1.8 – 11.8 mm	**EI 60 – U/U**
		318092507-1,Rev2 P34, P35 318092507-3,Rev2 P32, P33 318092507-4 P10 318092507-5 P20 – P22
PVC-U[1] PVC-C[2]	∅ = 50 - 160 mm t = 2.2 – 11.8 mm	**EI 90 – U/U**
		318092507-3,Rev2 P32, P33 318092507-5 P20 – P22

[1] PVC-U pipe as per EN 1329-1, EN 1453-1 or EN 1452-1
[2] PVC-C pipe as per EN 1566-1

PE-HD[3] ABS[4] SAN + PVC[5]	∅ = 50 - 160 mm t = 3.0 – 6.2 mm	**EI 60 – U/U**

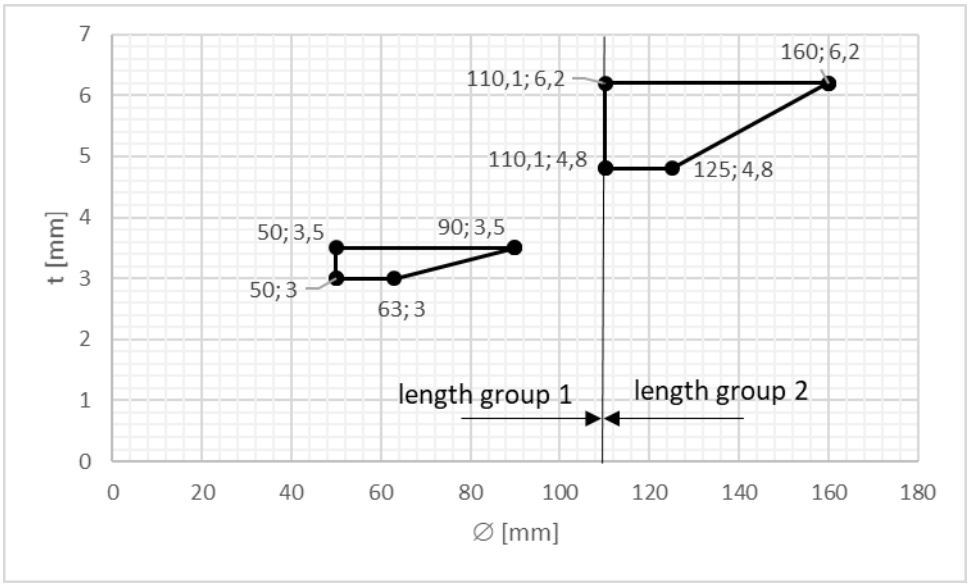


318092507-1,Rev2
P30, P31

318092507-3,Rev2
P27, P28

318092507-4
P5, P6

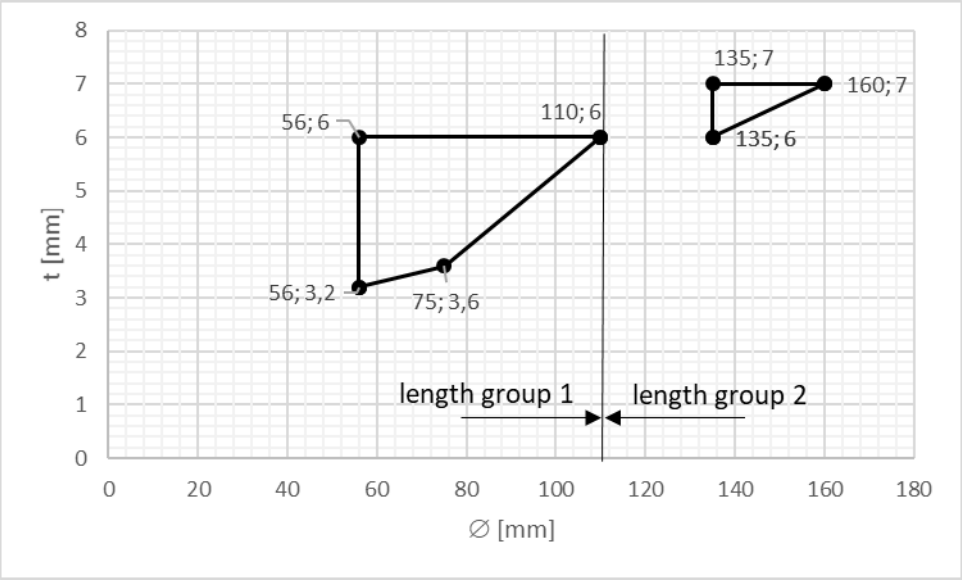
PE-HD[3] ABS[4] SAN + PVC[5]	∅ = 50 - 160 mm t = 3.0 – 6.2 mm	**EI 90 – U/U**

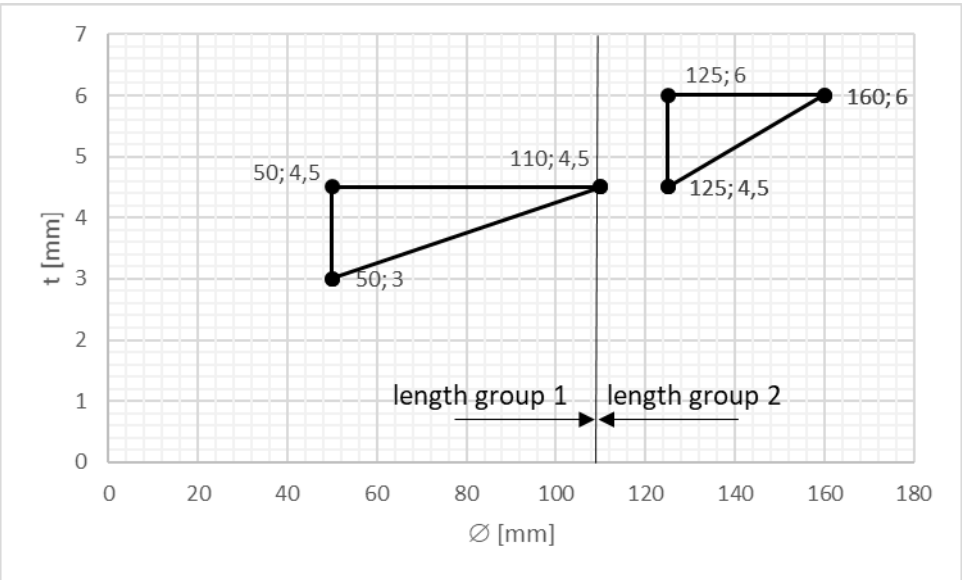


318092507-3,Rev2
P27, P28

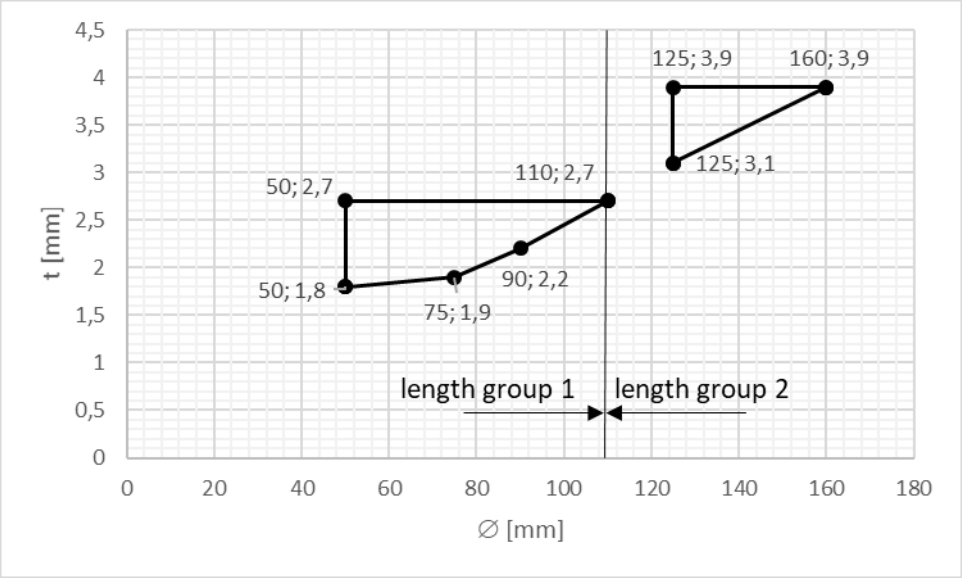
318092507-5
P15, P16

[3] PE-HD pipe as per EN 1519-1, EN 12201-2 or 12666-1
[4] ABS pipe as per EN 1455-1
[5] SAN + PVC pipe as per EN 1565-1

Geberit Silent dB20	∅ = 56 - 160 mm t = 3.2 – 7.0 mm	**EI 90 – U/U**
		318092507-3,Rev2 P19, P20 318092507-5 P12 – P14

Geberit Silent Pro	∅ = 50 - 160 mm t = 3.0 – 6.0 mm	**EI 90 – U/U**
		318092507-3,Rev2 P23, P24 318092507-5 P1, P6, P9

Rehau Raupiano plus	∅ = 50 - 160 mm t = 1.8 – 3.9 mm	**EI 60 – U/U**

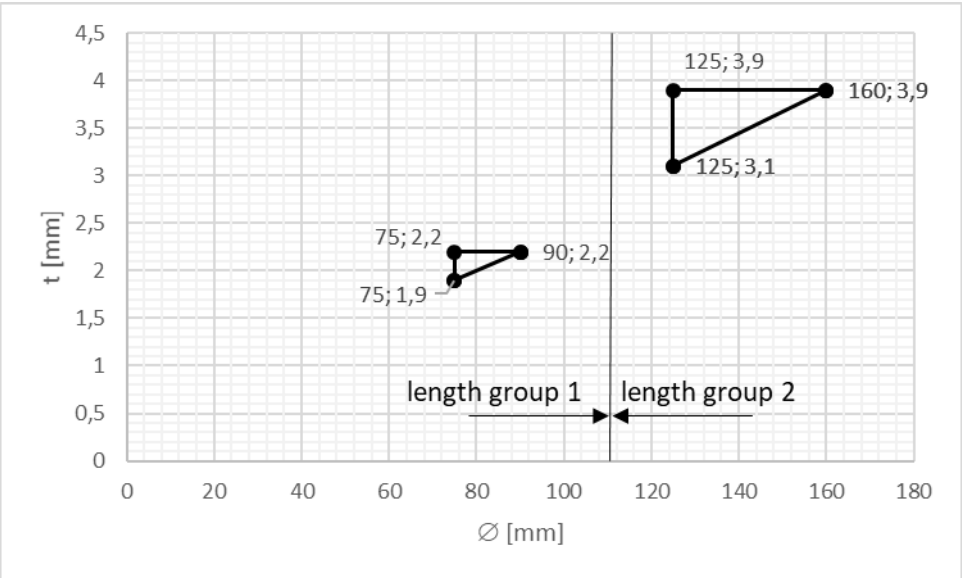


318092507-1,Rev2
P28, P29

318092507-3,Rev2
P25, P26

318092507-5
P2, P4, P11

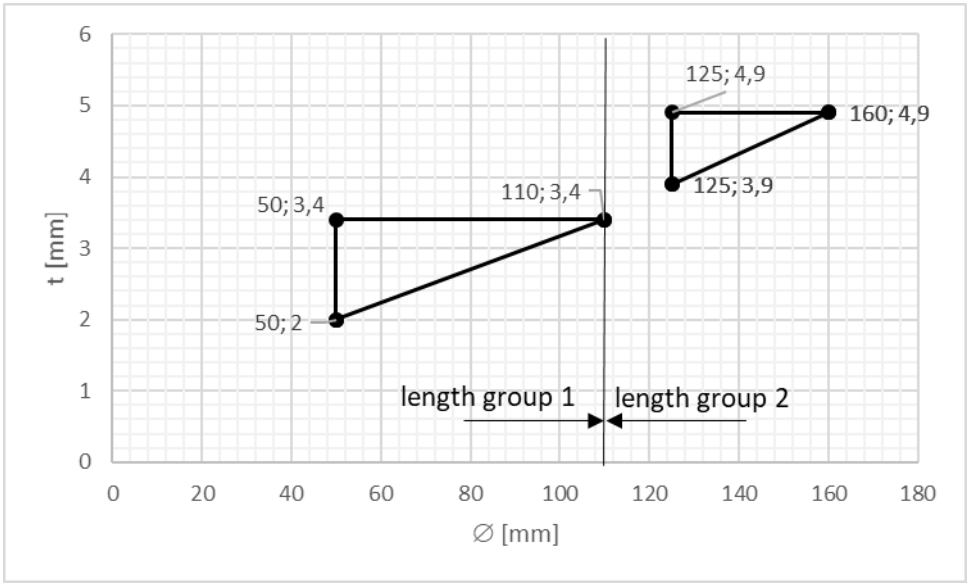
Rehau Raupiano plus	∅ = 75 - 160 mm t = 1.9 – 3.9 mm	**EI 90 – U/U**



318092507-3,Rev2
P25, P26

318092507-5
P2, P4, P11

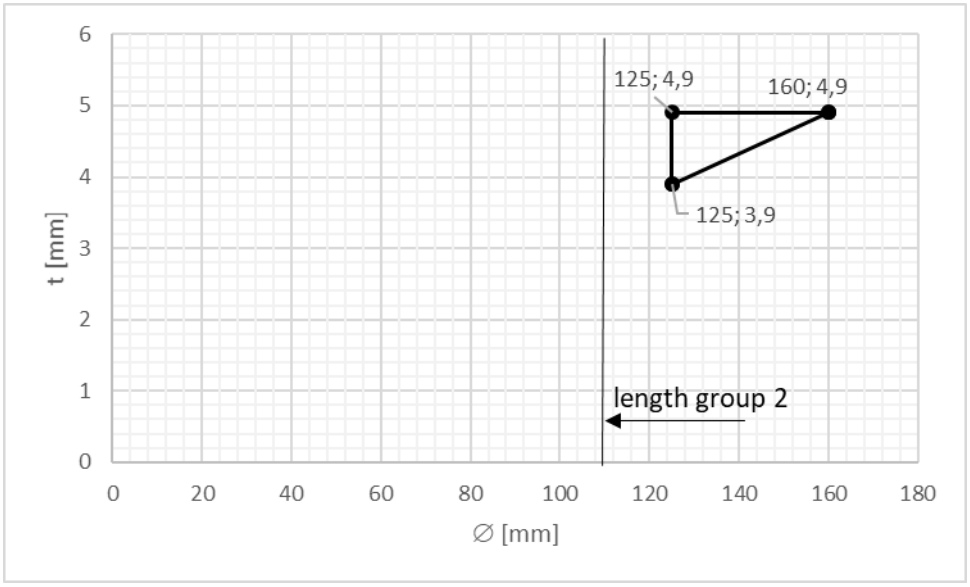
Poloplast POLO-KAL NG / XS	∅ = 50 - 160 mm t = 2.0 - 4.9 mm	**EI 60 – U/U**



318092507-1,Rev2
P24, P25

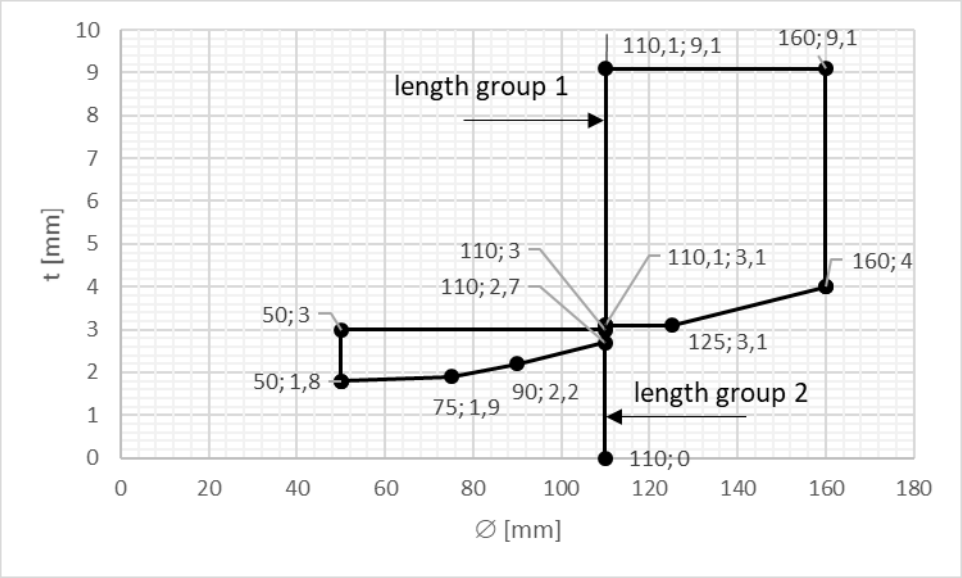
318092507-3,Rev2
P21, P22

Poloplast POLO-KAL NG / XS	∅ = 125 - 160 mm t = 3.9 - 4.9 mm	**EI 90 – U/U**



318092507-3,Rev2
P21, P22

PP-H[6]	∅ = 50 - 160 mm t = 1.8 – 9.1 mm	**EI 60 – U/U**

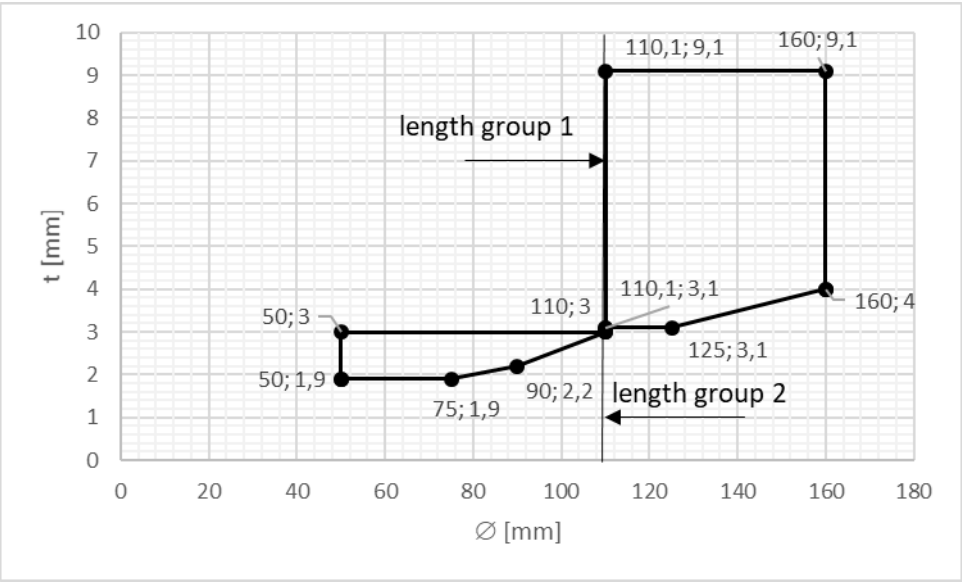


318092507-1,Rev2
P32, P33

318092507-3,Rev2
P29 – P31

318092507-5
P17 – P19

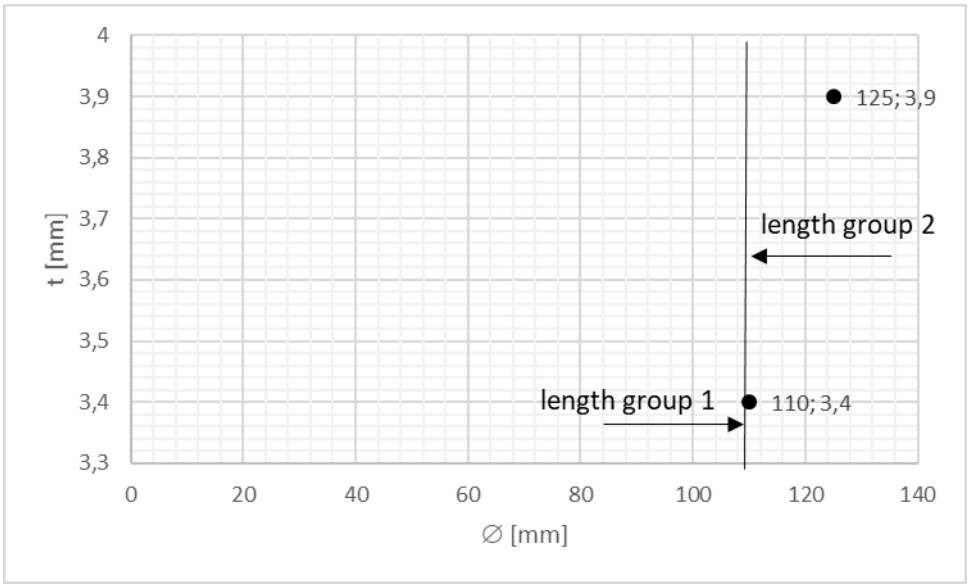
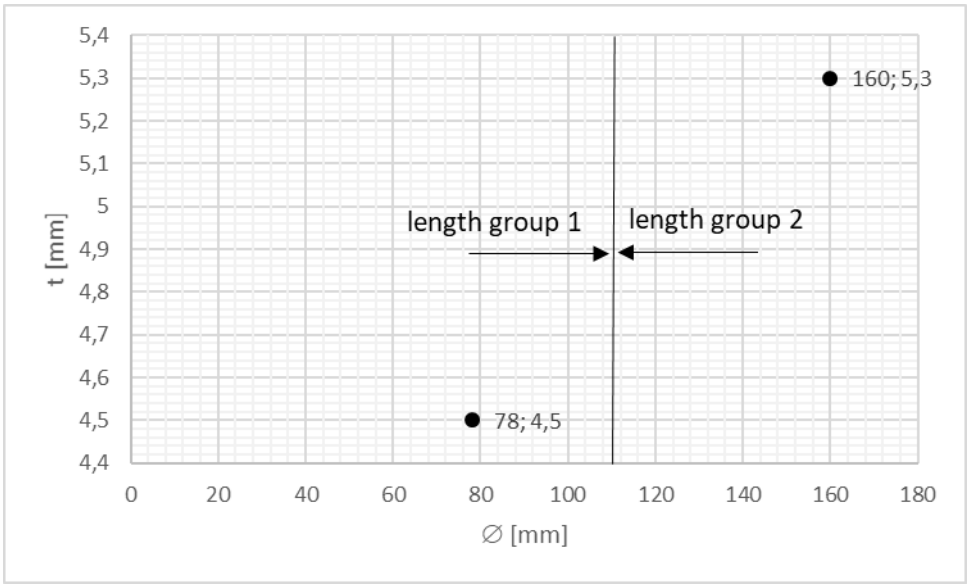
PP-H[6]	∅ = 50 - 160 mm t = 1.9 – 9.1 mm	**EI 90 – U/U**



318092507-3,Rev2
P29 – P31

318092507-5
P17 – P19

[6] PP-H pipe as per EN 1451-1

Wavin SiTech+	∅ = 110 und 125 mm t = 3.4 and 3.9 mm	**EI 90 – U/U**
		318092507-5 P5, P7
GF Silenta Premium	∅ = 78 und 160 mm t = 4.5 and 5.3 mm	**EI 90 – U/U**
		318092507-5 P5, P7

4.4.9. Cross laminated timber floor ≥ 140 mm

4.4.9.1. Definition of supporting structure

The floor must be ≥ 140 mm thick and have ≥ 5 layers of softwood, provided that each outer layer exhibits a thickness of ≥ 40 mm. Both PU and MUF adhesives are permitted. Edge glueing is not required.

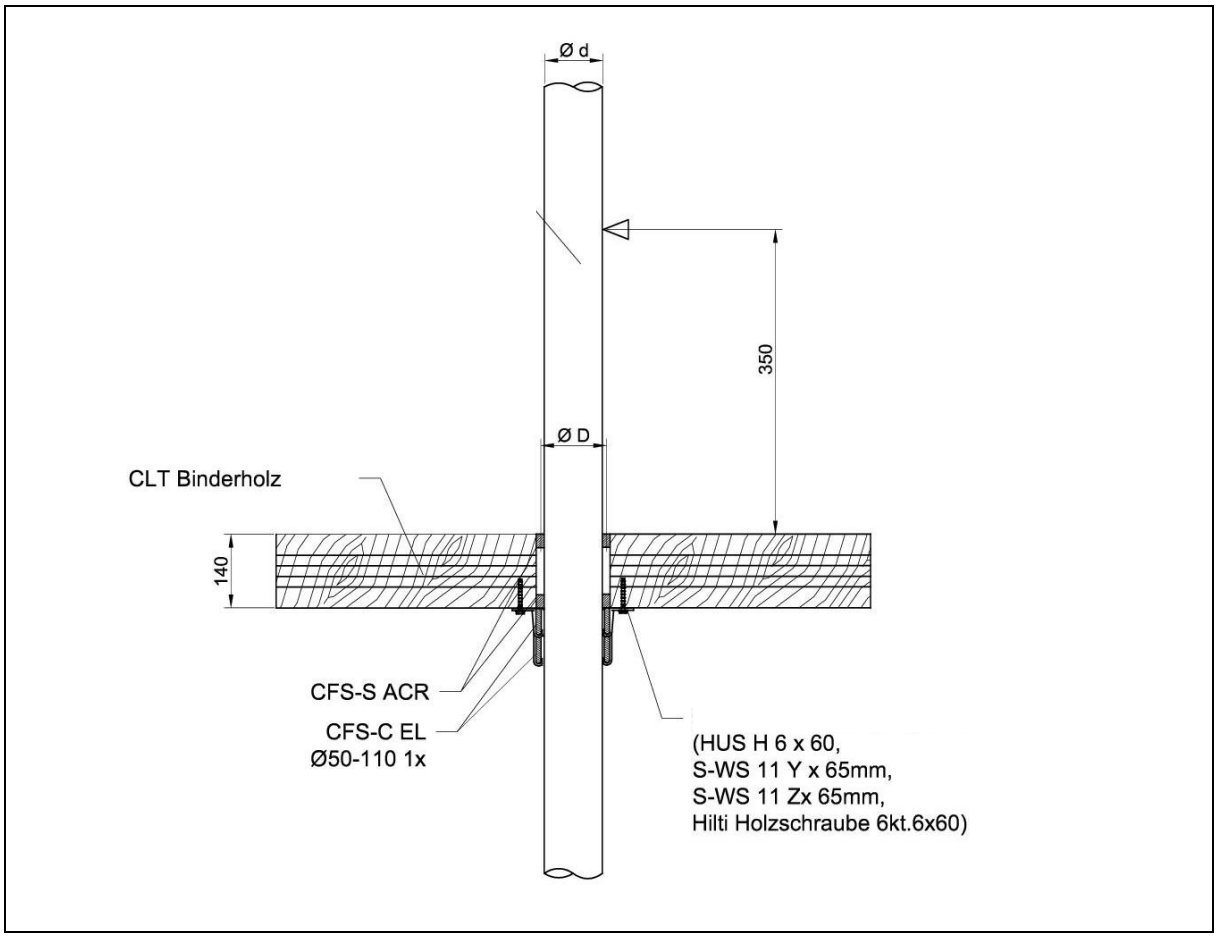
4.4.9.2. Fixings

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

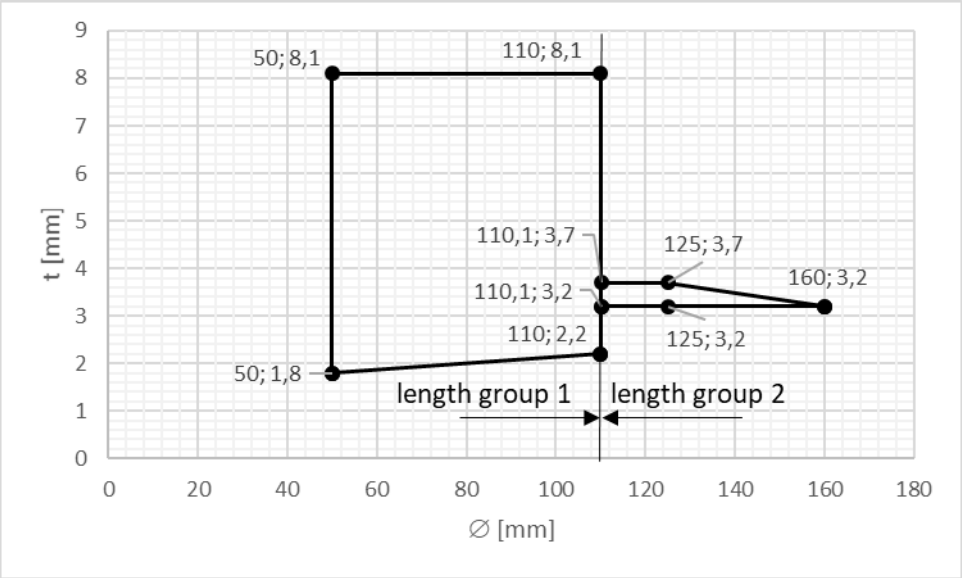
4.4.9.3. Minimum distance

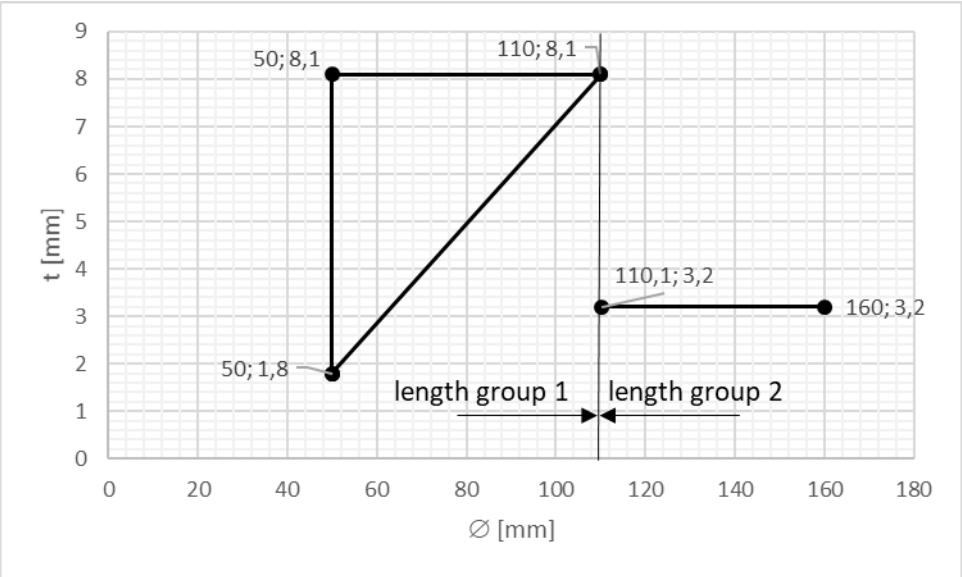
All distances to identical collars as well as to other systems must be ≥ 200 mm.

4.4.9.4. Detailed drawing



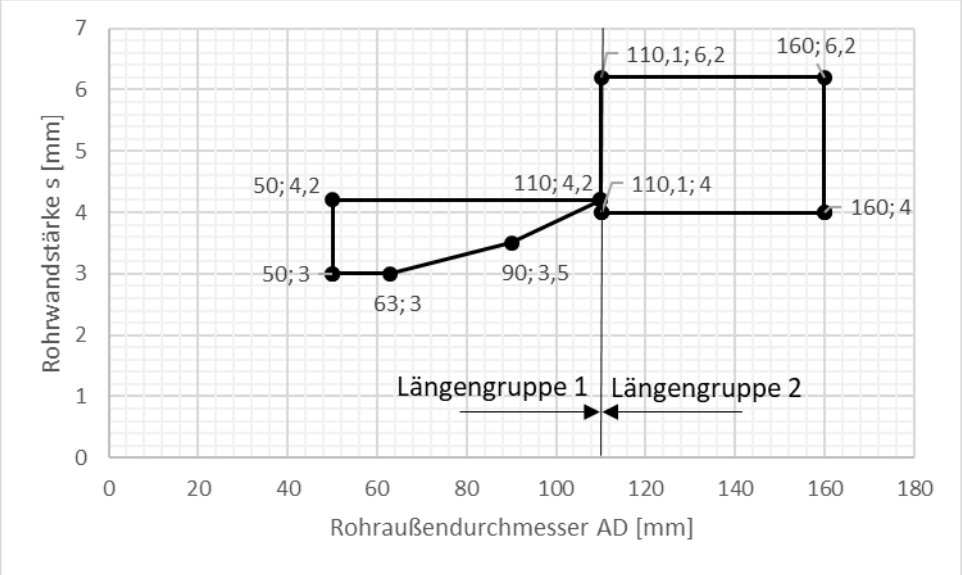
4.4.9.5. Plastic pipes

PVC-U[1] PVC-C[2]	∅ = 50 - 160 mm t = 1.8 – 8.1 mm	**EI 90 – U/U**
		318092507-2,Rev2 P41 – P43 318092507-3,Rev2 P32 – P33 318092507-5 P20 – P22

PVC-U[1] PVC-C[2]	∅ = 50 - 160 mm t = 1.8 – 8.1 mm	**EI 120 – U/U**
		318092507-2,Rev2 P41 – P43

[1] PVC-U pipe as per EN 1329-1, EN 1453-1 or EN 1452-1
[2] PVC-C pipe as per EN 1566-1

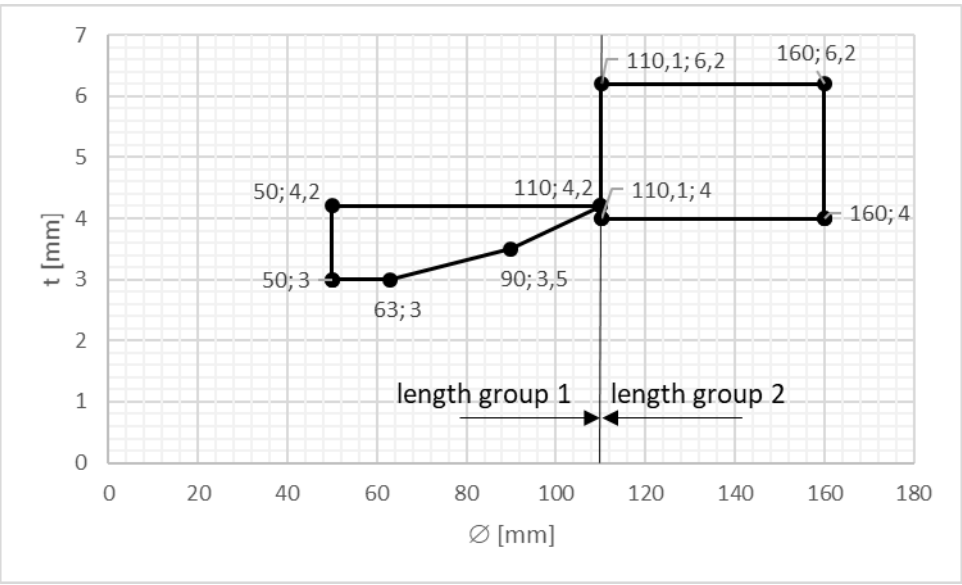
PE-HD[3] ABS[4] SAN + PVC[5]	∅ = 50 - 160 mm t = 3.0 – 6.2 mm	**EI 90 – U/U**



318092507-2, Rev. 2
P35 – P37

318092507-3,Rev2
P27 – P28

PP-H[6]	∅ = 50 - 160 mm t = 1.8 – 9.1 mm	**EI 90 – U/U**

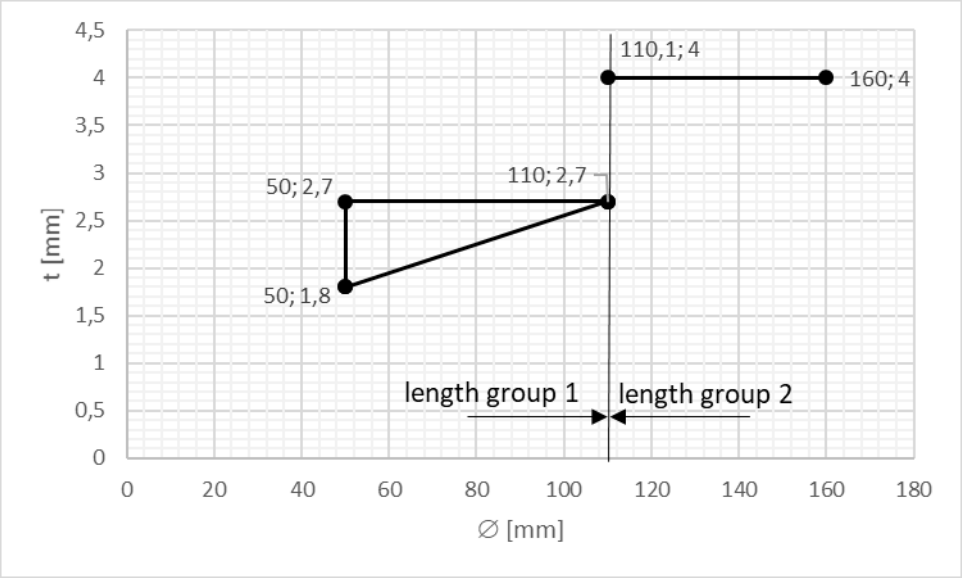


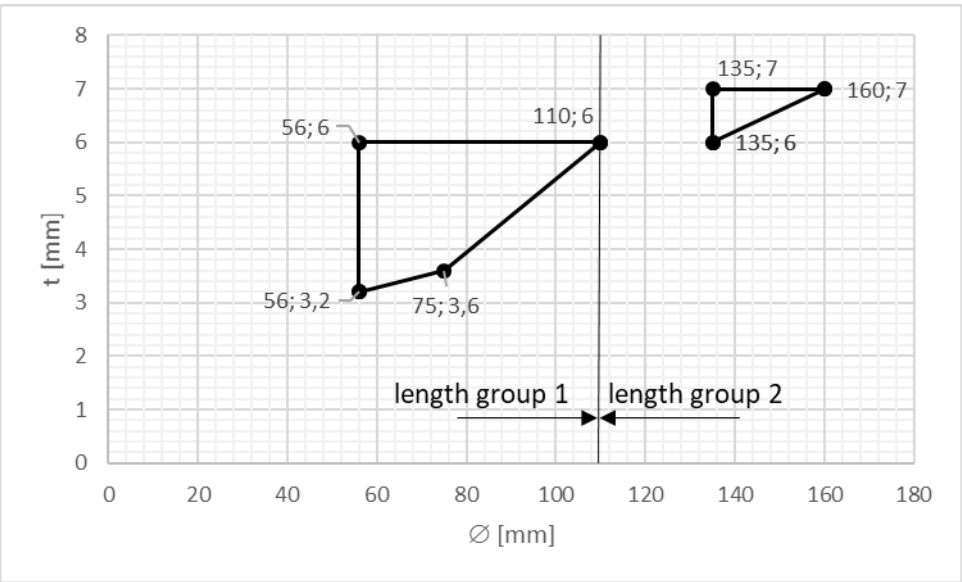
318092507-3,Rev2
P29 – P31

318092507-2,Rev2
P38 – P40

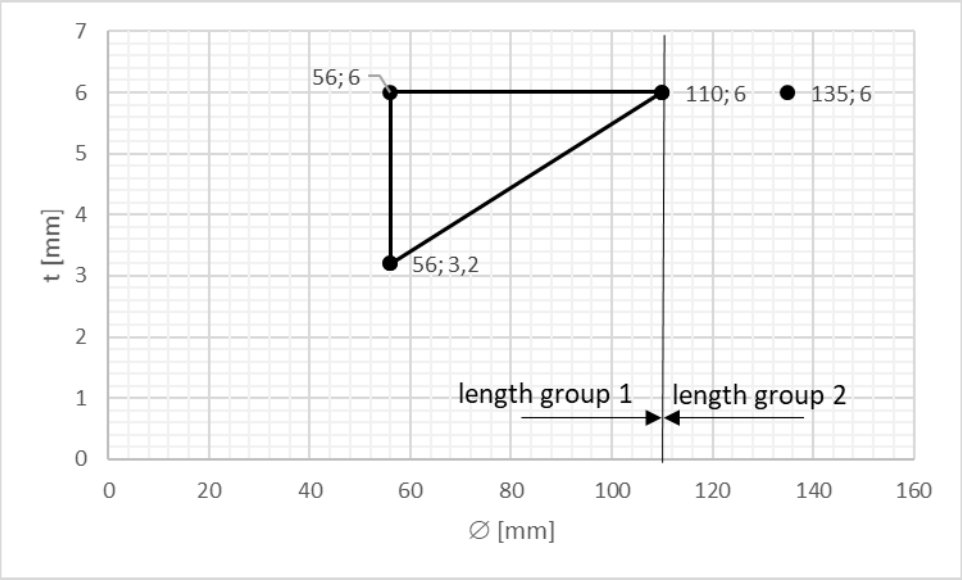
318092507-5
P17 – P19

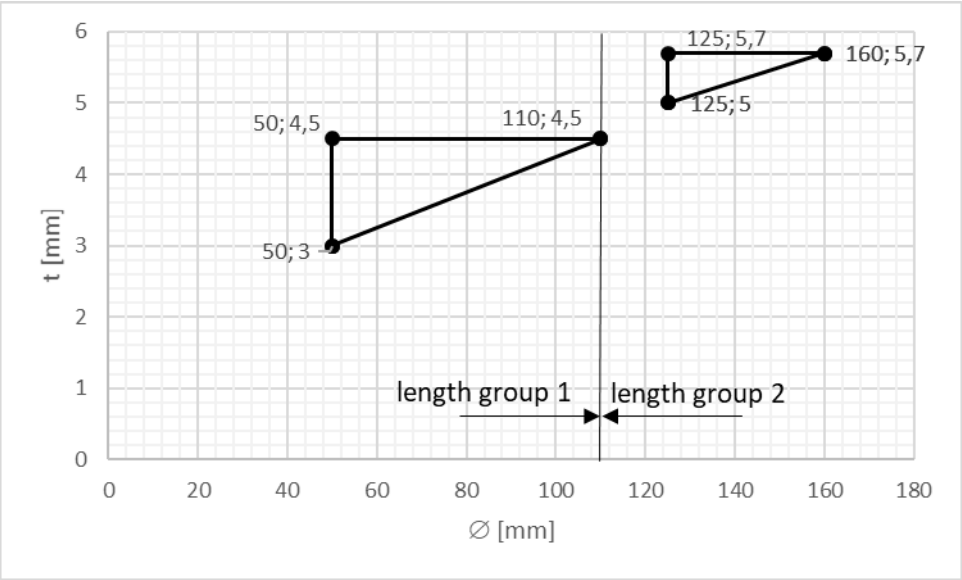
[3] PE-HD pipe as per EN 1519-1, EN 12201-2 or 12666-1
[4] ABS pipe as per EN 1455-1
[5] SAN + PVC pipe as per EN 1565-1
[6] PP-H pipe as per EN 1451-1

PP-H[6]	∅ = 50 - 160 mm t = 1.8 – 4.0 mm	**EI 120 – U/U**
		318092507-2,Rev2 P38 – P40

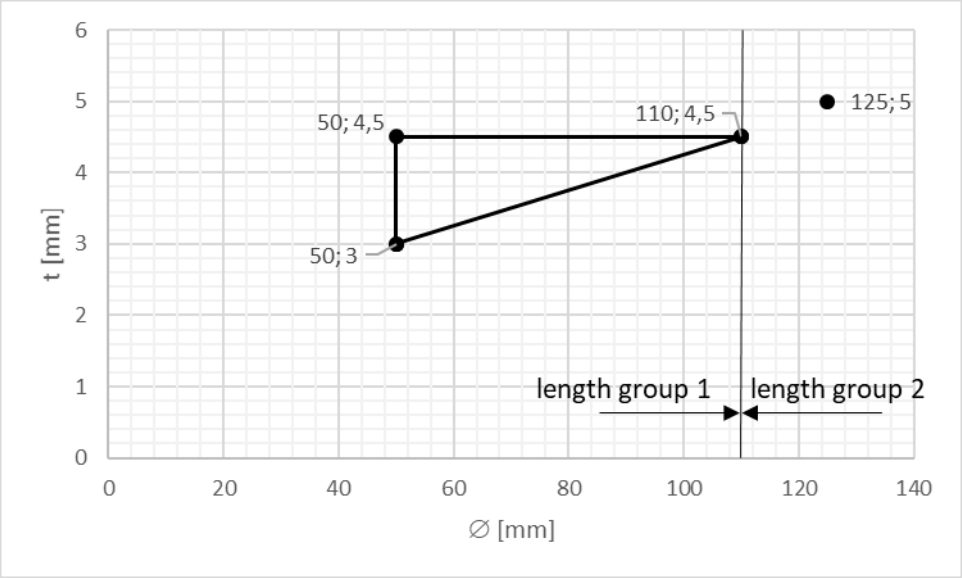
Geberit Silent dB20	∅ = 56 - 160 mm t = 3.2 – 7.0 mm	**EI 90 – U/U**
		318092507-3,Rev2 P19 – P20 318092507-2,Rev2 P23 – P25 318092507-5 P12 – P14

[6] PP-H pipe as per EN 1451-1

Geberit Silent dB20	∅ = 56 - 135 mm t = 3.2 – 6.0 mm	**EI 120 – U/U**
		318092507-2,Rev2 P23 – P25

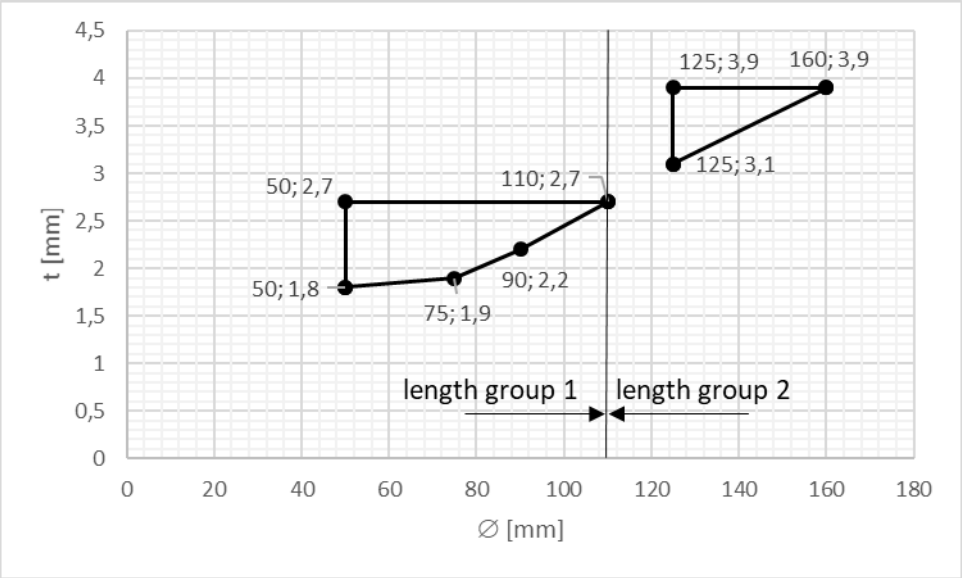
Geberit Silent Pro	∅ = 50 - 160 mm t = 3.0 – 5.7 mm	**EI 90 – U/U**
		318092507-3,Rev2 P23 – P24 318092507-2,Rev2 P29 – P31

Geberit Silent Pro	∅ = 50 - 125 mm t = 3.0 – 5.0 mm	**EI 120 – U/U**



318092507-2,Rev2
P29 – P31

Rehau Raupiano plus	∅ = 50 - 160 mm t = 1.8 – 3.9 mm	**EI 90 – U/U**

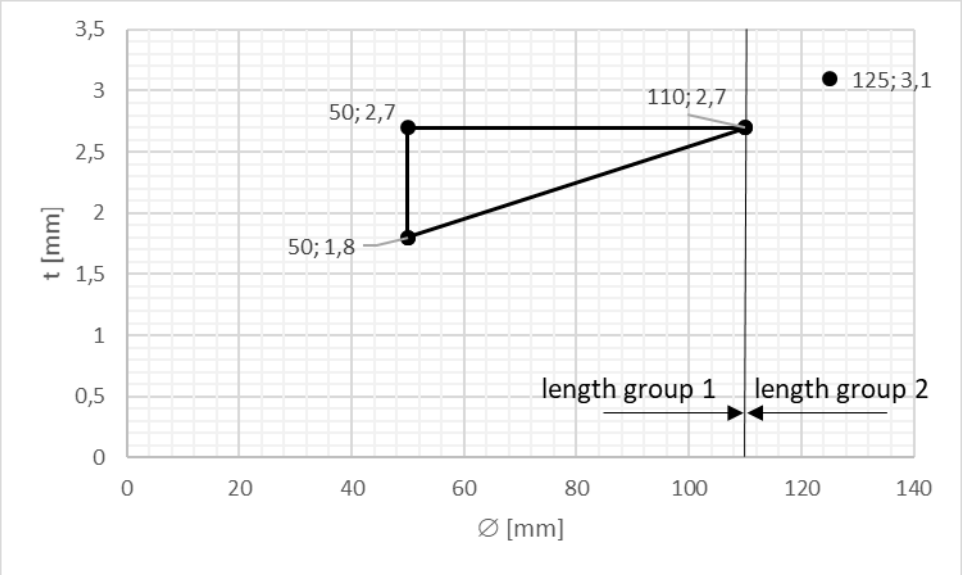


318092507-3,Rev2
P25 – P26

318092507-2,Rev2
P32 – P34

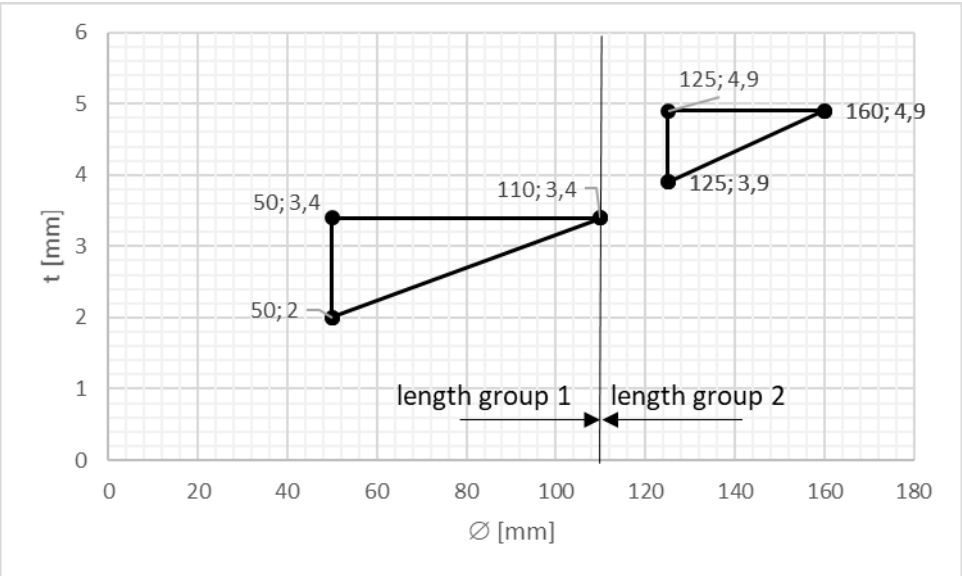
318092507-5
P2, P4, P11

Rehau Raupiano plus	∅ = 50 - 125 mm t = 1.8 – 3.1 mm	**EI 120 – U/U**



318092507-2,Rev2
P32 – P34

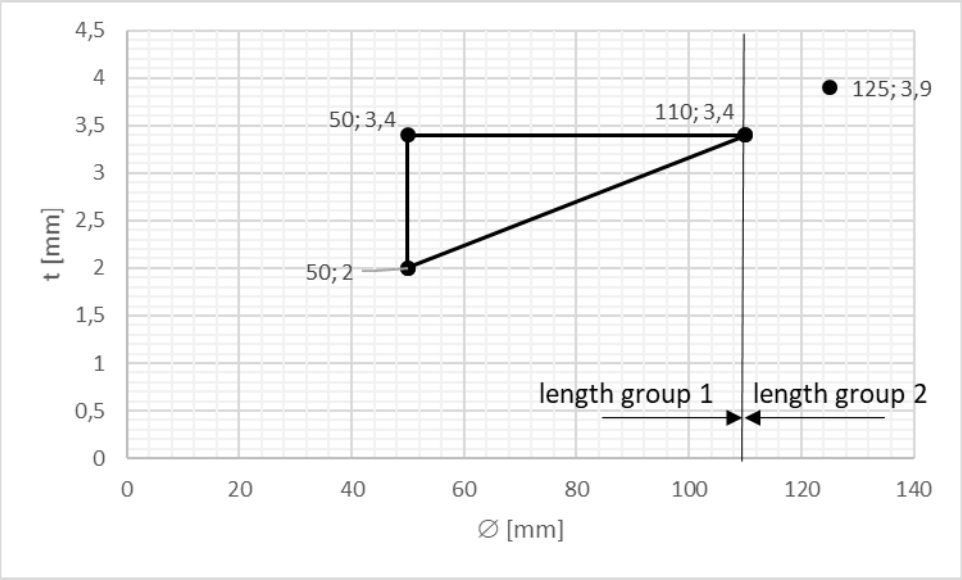
Poloplast POLO-KAL NG / XS	∅ = 50 - 160 mm t = 2.0 – 4.9 mm	**EI 90 – U/U**



318092507-3,Rev2
P21 – P22

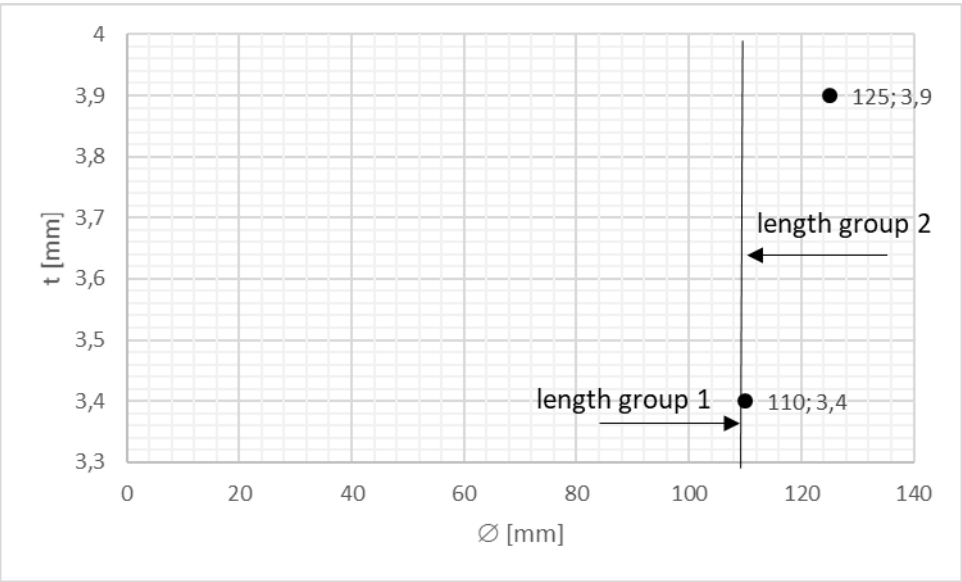
318092507-2,Rev2
P26 – P28, P51

Poloplast POLO-KAL NG / XS	∅ = 50 - 125 mm t = 2.0 – 3.9 mm	**EI 120 – U/U**

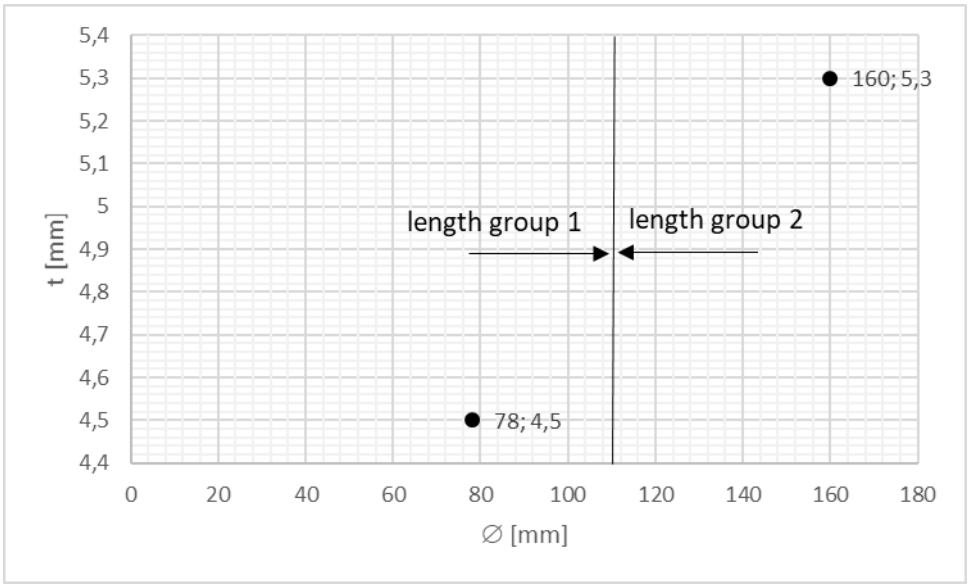


318092507-2,Rev2
P26 – P28, P51

Wavin SiTech+	∅ = 110 und 125 mm t = 3.4 and 3.9 mm	**EI 90 – U/U**



318092507-5
P5, P7

GF Silenta Premium	∅ = 78 und 160 mm t = 4.5 and 5.3 mm	**EI 90 – U/U**
		318092507-5 P5, P7

4.4.10. Cross laminated timber wall ≥ 80 mm

4.4.10.1. Definition of supporting structure

The wall 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.

4.4.10.2. Fixings

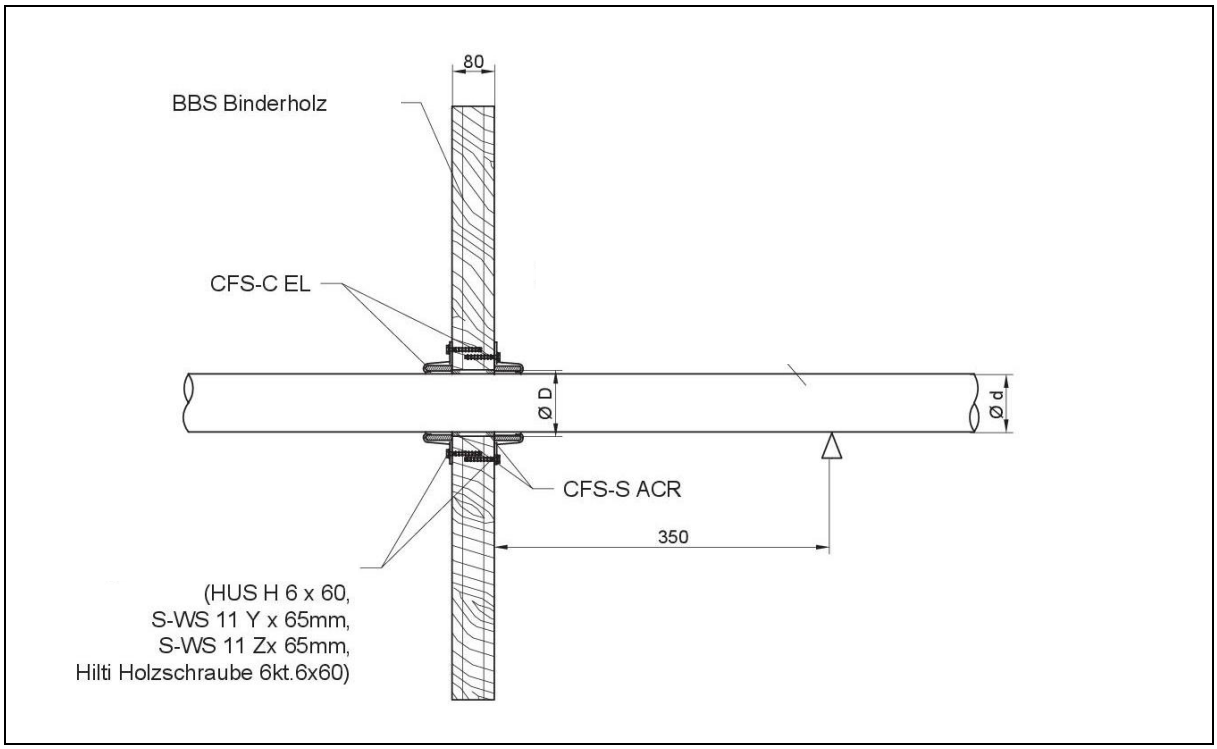
Hilti HUS H 6 x 60 mm Hilti SWS 11 Y x 75 mm	Hilti SWS 11 Z x 75 mm Hex head wood screws 6 x 60 mm

4.4.10.3. Minimum distance

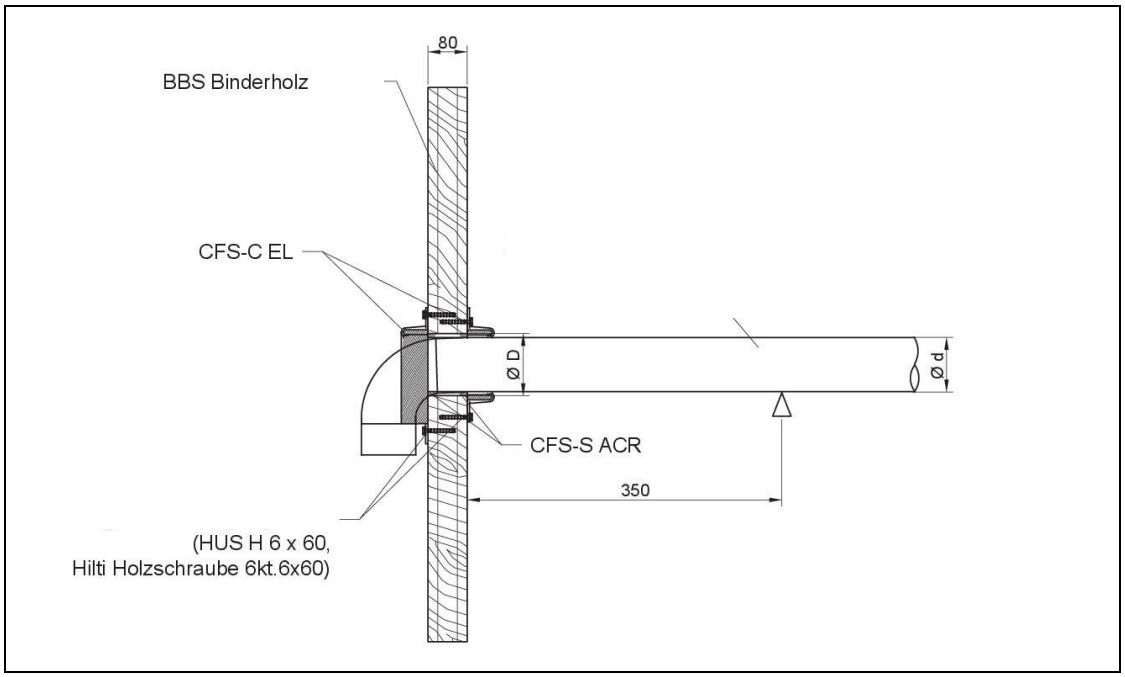
All distances to identical collars as well as to other systems must be ≥ 200 mm.

4.4.10.4. Detailed drawings

4.4.10.5. Installed on both sides

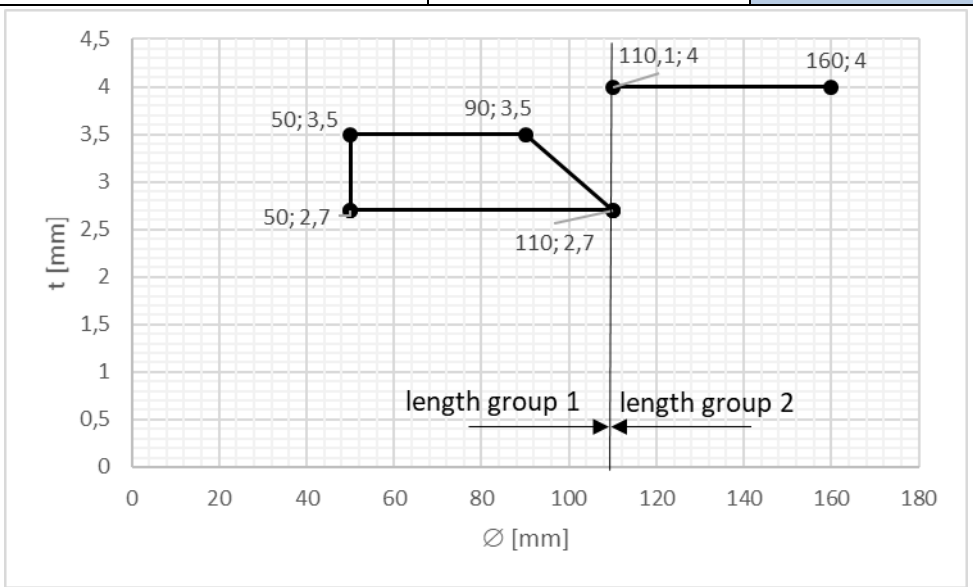


4.4.10.6. U-shaped installation on one side



4.4.10.7. Plastic pipes

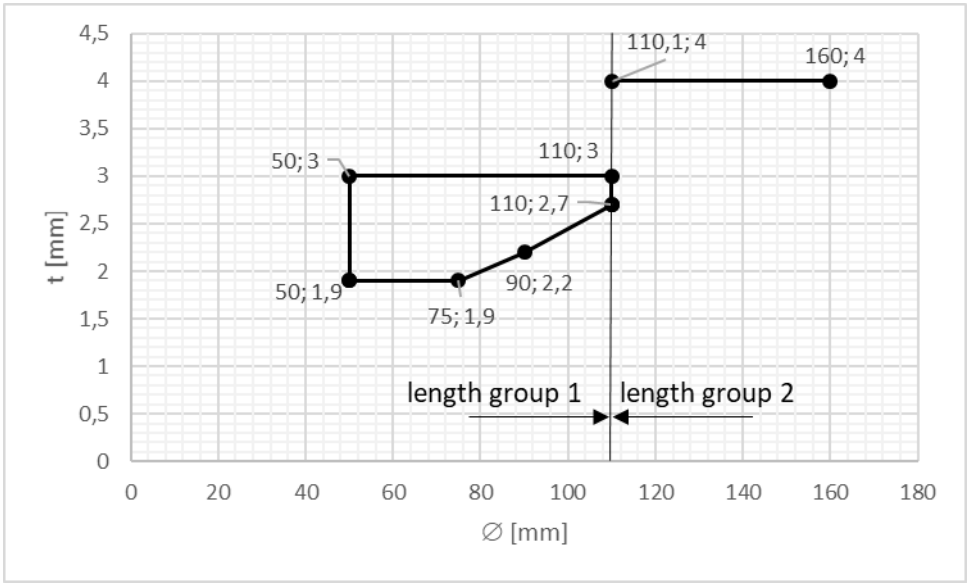
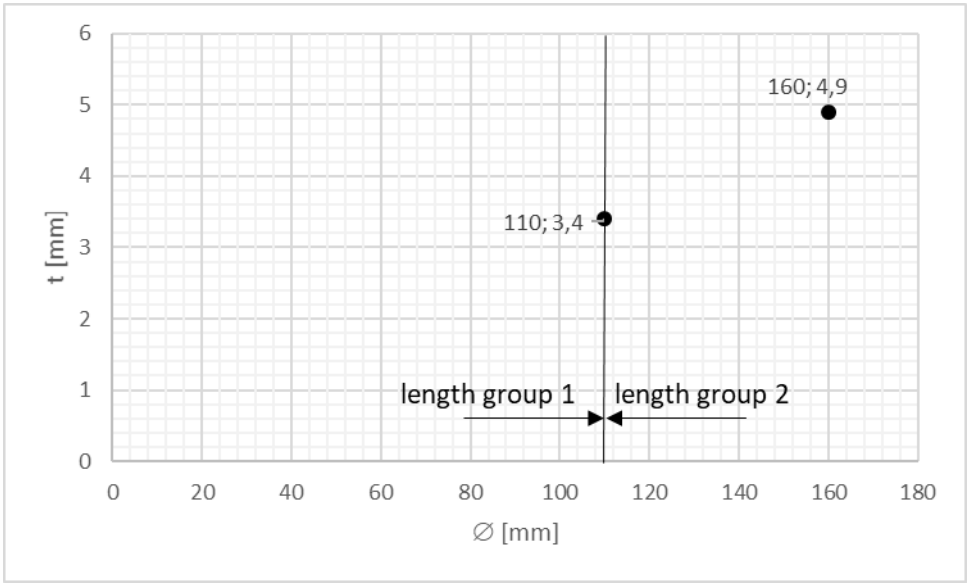
PE-HD[3] ABS[4] SAN + PVC[5]	∅ = 50 - 160 mm t = 2.7 – 4.0 mm	**EI 60 – U/U**



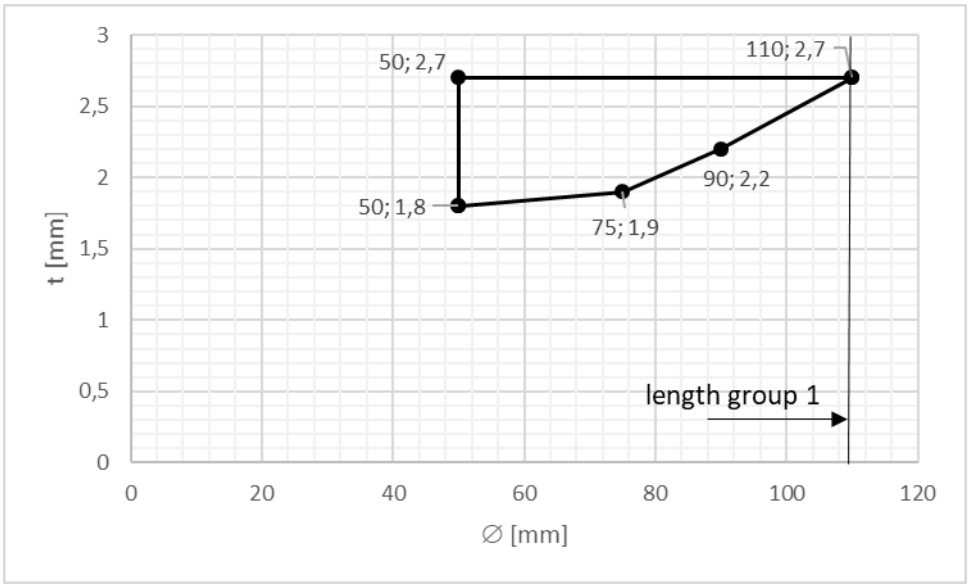
319021602-3
P17, P22

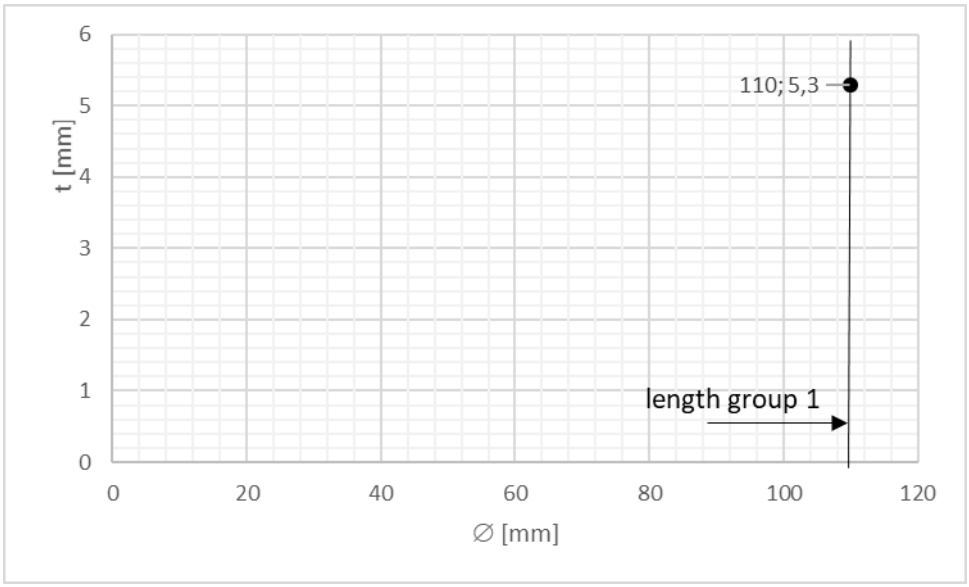
319021602-4
P9, P10

[3] PE-HD pipe as per EN 1519-1, EN 12201-2 or 12666-1
[4] ABS pipe as per EN 1455-1
[5] SAN + PVC pipe as per EN 1565-1

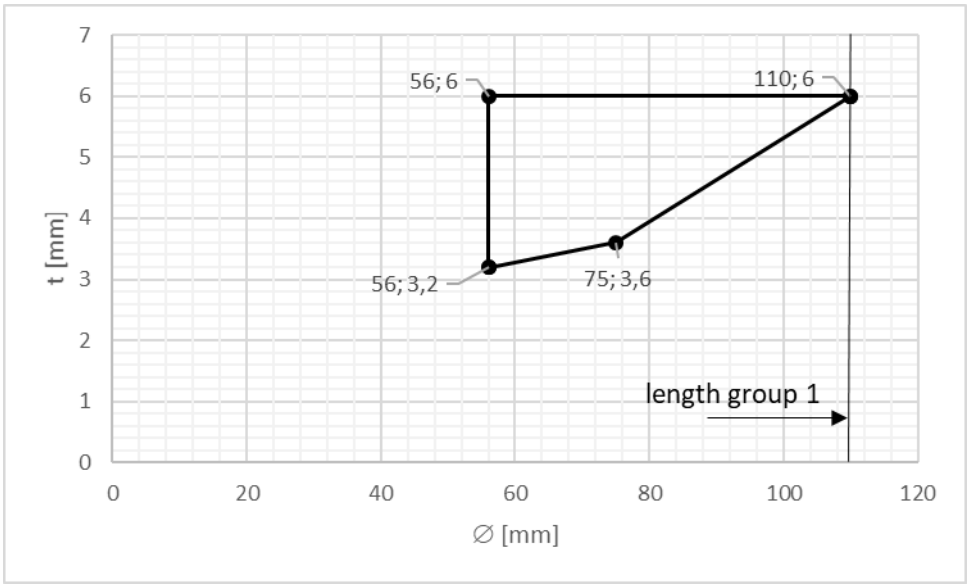
PP-H[6]	∅ = 50 - 160 mm t = 1.9 – 4.0 mm	**EI 60 – U/U**
		319021602-3 P19, P21 319021602-4 P11 – P13
Poloplast POLO-KAL NG / XS	∅ = 110 und 160 mm t = 3.0 and 4.9 mm	**EI 60 – U/U**
		319021602-3 P18, P20

[6] PP-H pipe as per EN 1451-1

Rehau Raupiano plus	∅ = 50 - 110 mm t = 1.8 - 2.7 mm	**EI 60 – U/U**
		319021602-4 P1 – P4

Wavin AS	∅ = 110 mm t = 5.3 mm	**EI 60 – U/U**
		319021602-4 P5

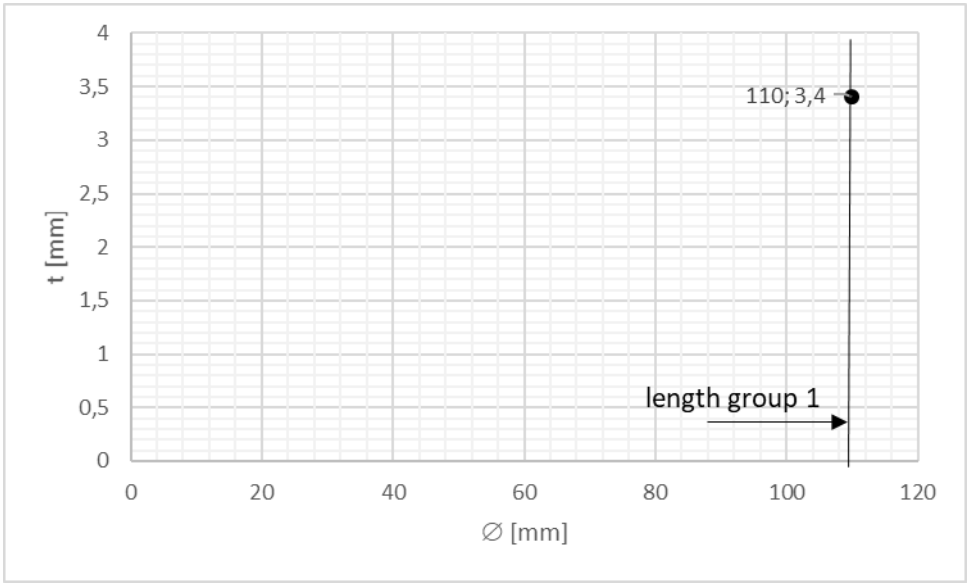
Geberit Silent dB20	∅ = 56 - 110 mm t = 3.2 - 6 mm	**EI 60 – U/U**



319021602-4
P6 – P8

Hilti CFS-C EL U-shaped installed via elbow pipes
Asymmetrical - elbow pipe on fire exposed face

Poloplast POLO-KAL NG Pipe elbow 87°	∅ = 110 mm t = 3.4 mm	**EI 60 – U/U**



319021602-3
P30

4.4.11. Cross laminated timber wall ≥ 100 mm

4.4.11.1. Definition of supporting structure

The wall must be ≥ 100 mm thick and have ≥ 5 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.

4.4.11.2. Fixings

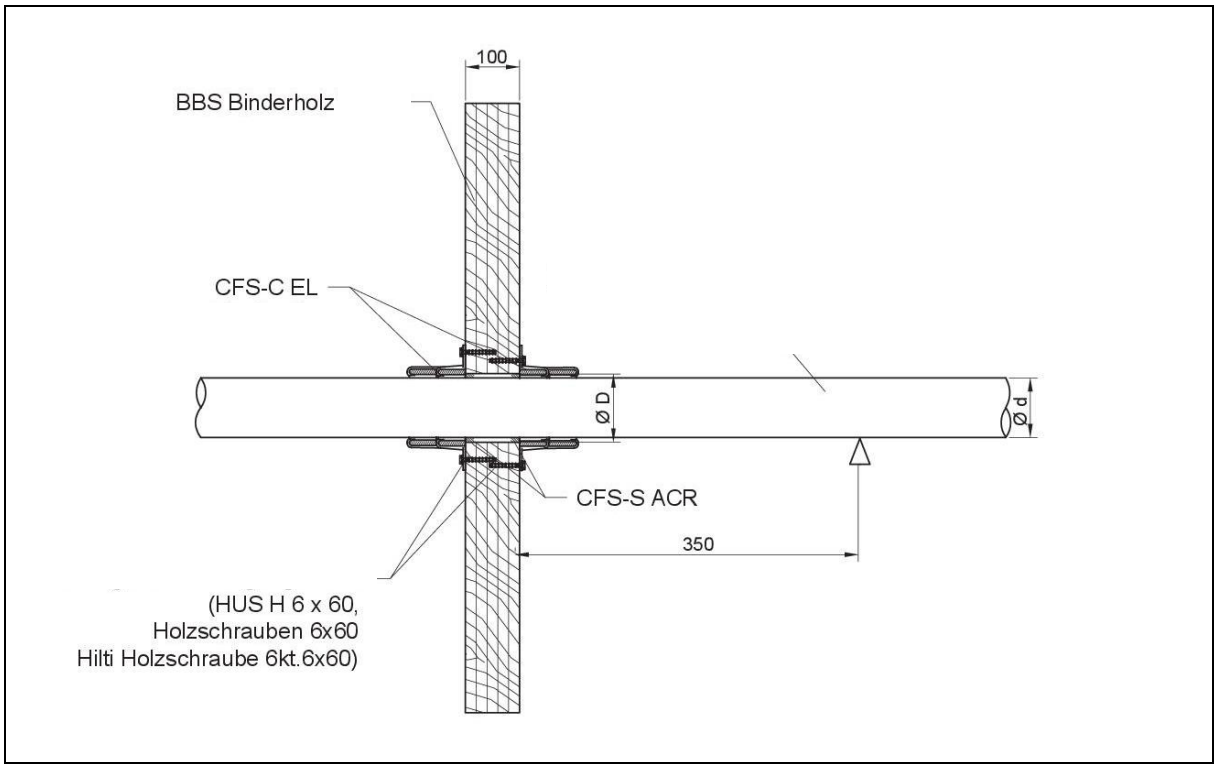
Hilti HUS H 6 x 80 mm Hilti SWS 11 Y x 85 mm	Hilti SWS 11 Z x 85 mm Hex head wood screws 6 x 80 mm

4.4.11.3. Minimum distances

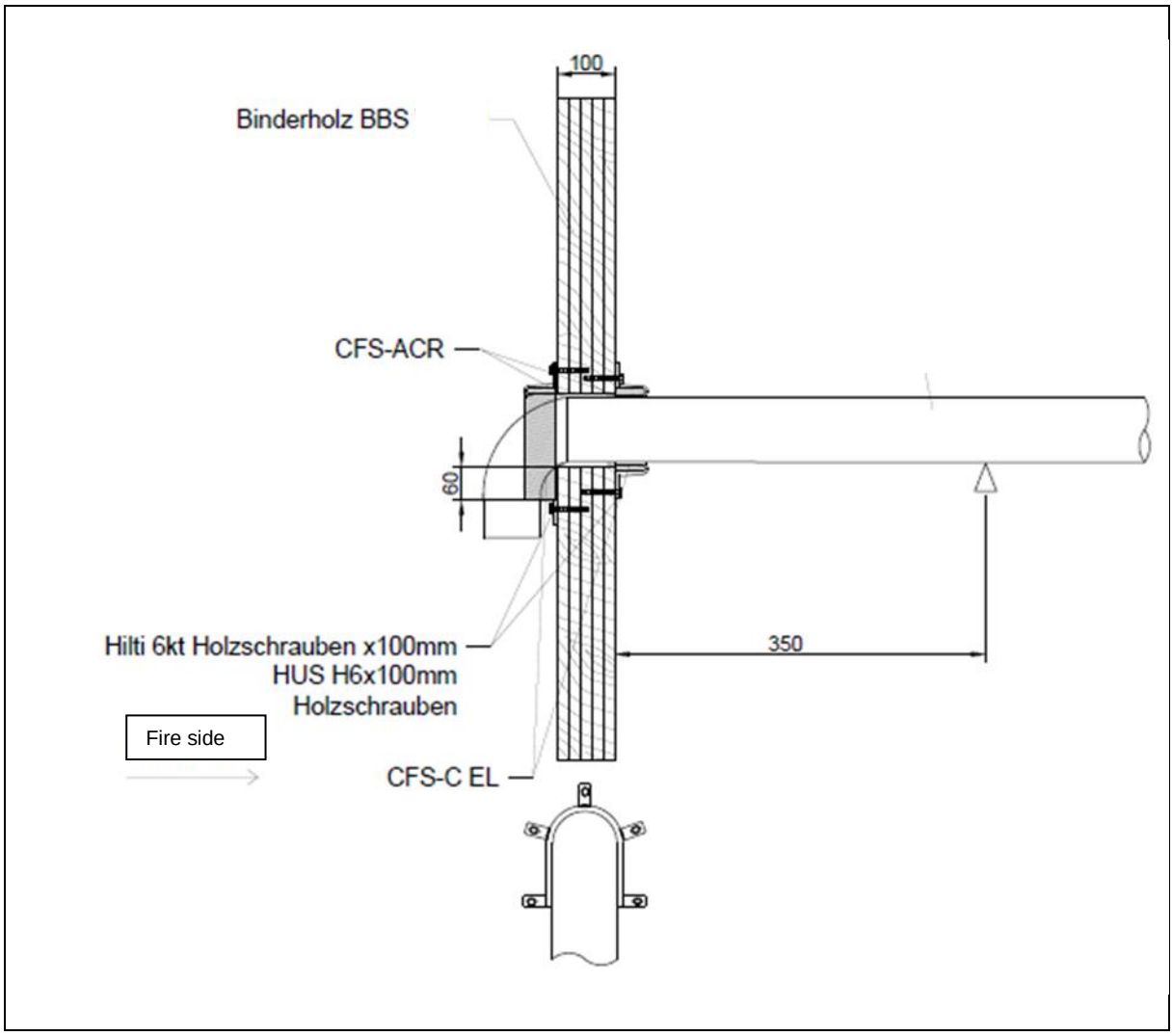
All distances to identical collars as well as to other systems must be ≥ 200 mm.

4.4.11.4. Detailed drawings

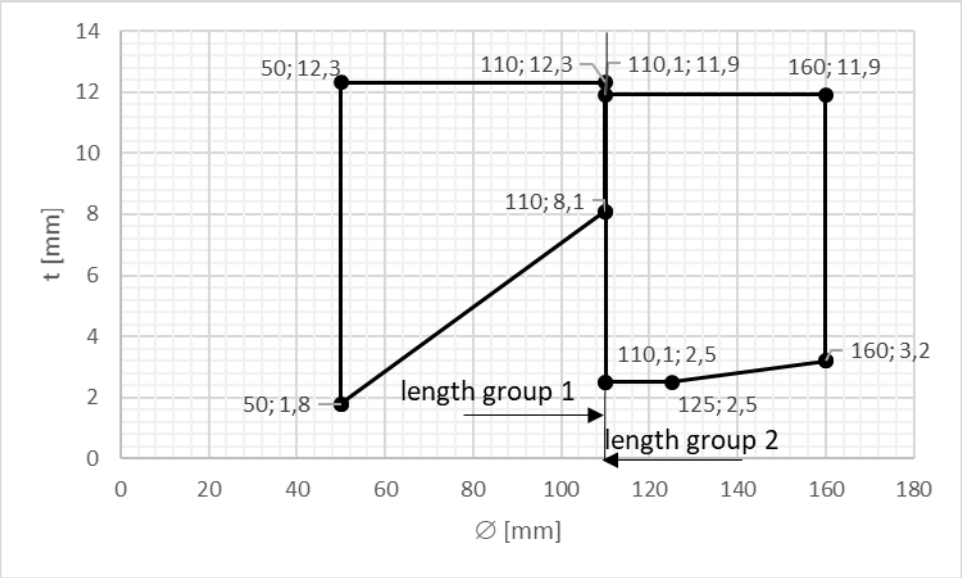
4.4.11.5. Installed on both sides



4.4.11.6. U-shaped installation on one side



4.4.11.7. Plastic pipes

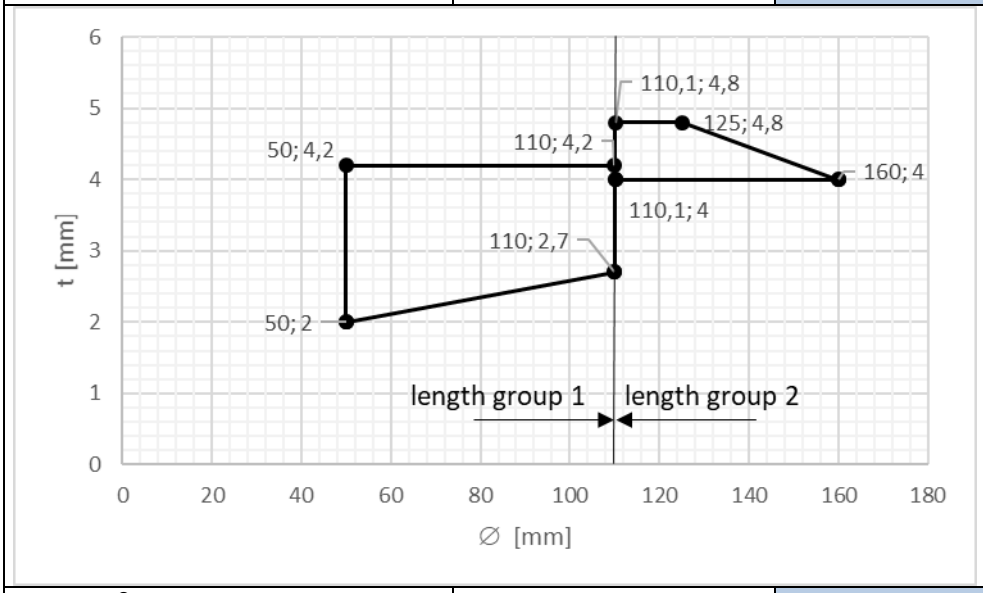
<table>
<tr><td>PVC-U[1]
PVC-C[2]</td><td>∅ = 50 - 160 mm
t = 1.8 – 11.9 mm</td><td colspan="2">EI 90 – U/U</td></tr>
<tr><td colspan="3"> 
</td><td>319091602-1, Rev1
P20, P22

319091602-2, Rev1
P26 – P28

319091602-5, Rev1
P25 – P27</td></tr>
</table>

[1] PVC-U pipe as per EN 1329-1, EN 1453-1 or EN 1452-1
[2] PVC-C pipe as per EN 1566-1

PE-HD[3] ABS[4] SAN + PVC[5]	∅ = 50 - 160 mm t = 2.0 – 4.8 mm	**EI 60 – U/U**



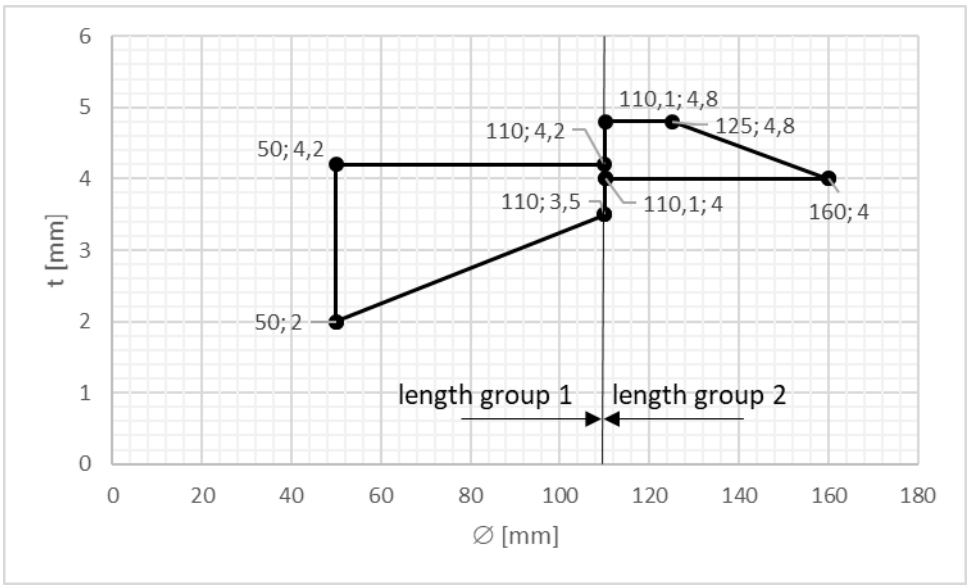
319091602-1, Rev1
P17, P18, P25

319091602-3, Rev1
P17, P22

319091602-4, Rev1
P9, P10

319091602-5, Rev1
P14 – P17

PE-HD[3] ABS[4] SAN + PVC[5]	∅ = 50 - 160 mm t = 2.0 – 4.8 mm	**EI 90 – U/U**



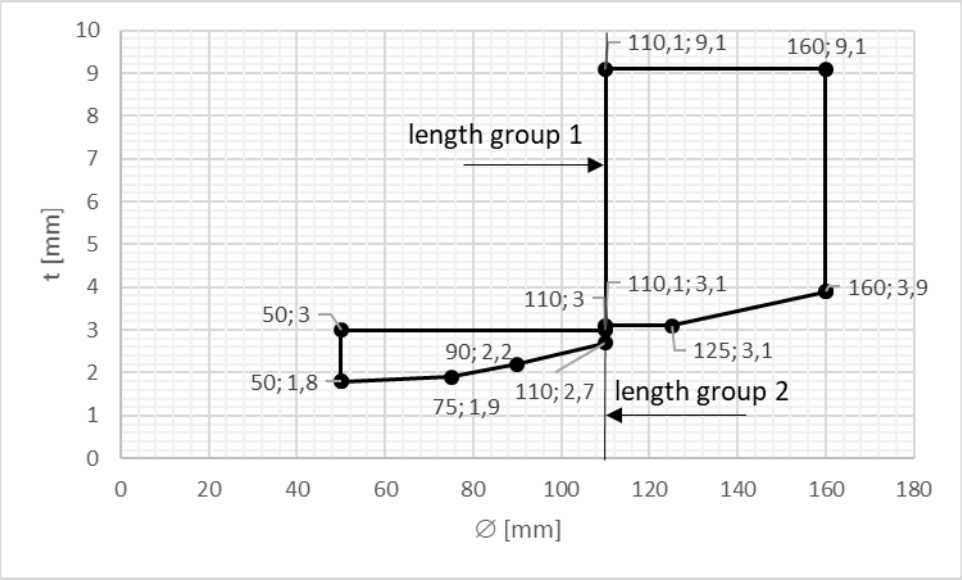
319091602-1, Rev1
P17

319091602-2, Rev1
P25

319091602-5, Rev1
P14 – P17

[3] PE-HD pipe as per EN 1519-1, EN 12201-2 or 12666-1
[4] ABS pipe as per EN 1455-1
[5] SAN + PVC pipe as per EN 1565-1
[3] PE-HD pipe as per EN 1519-1, EN 12201-2 or 12666-1
[4] ABS pipe as per EN 1455-1
[5] SAN + PVC pipe as per EN 1565-1

PP-H[6]	∅ = 50 - 160 mm t = 1.8 – 9.1 mm	**EI 60 – U/U**



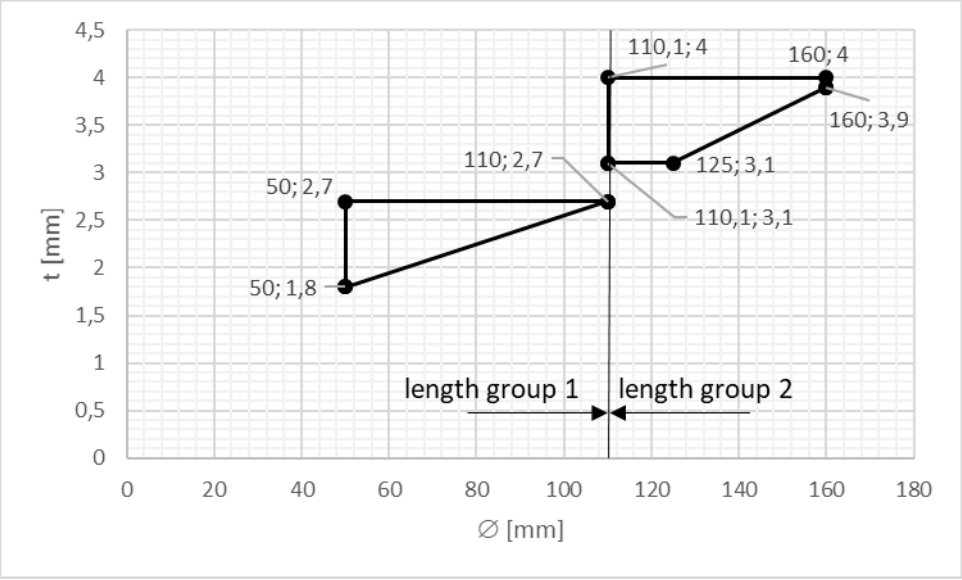
319091602-1, Rev1
P19

319091602-2, Rev1
P23 – P24

319091602-4, Rev1
P11 – P13

319091602-5, Rev1
P18 – P24

PP-H[6]	∅ = 50 - 160 mm t = 1.8 – 4.0 mm	**EI 90 – U/U**

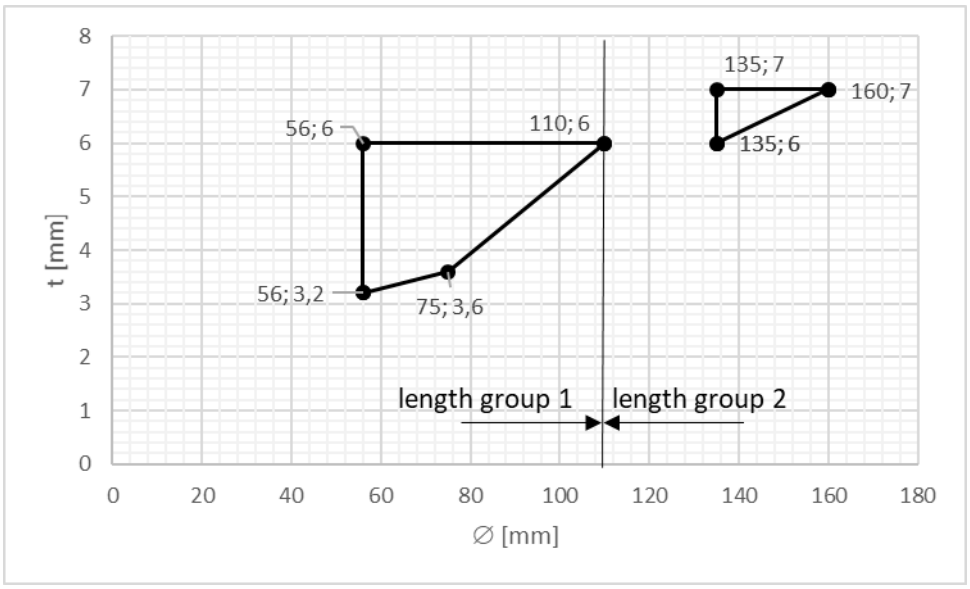
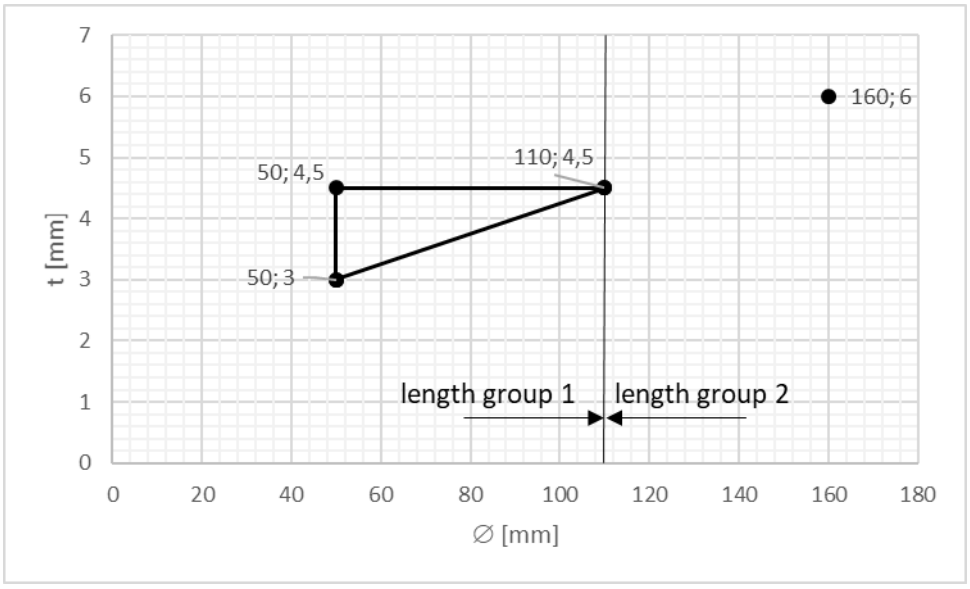


319091602-1, Rev1
P19

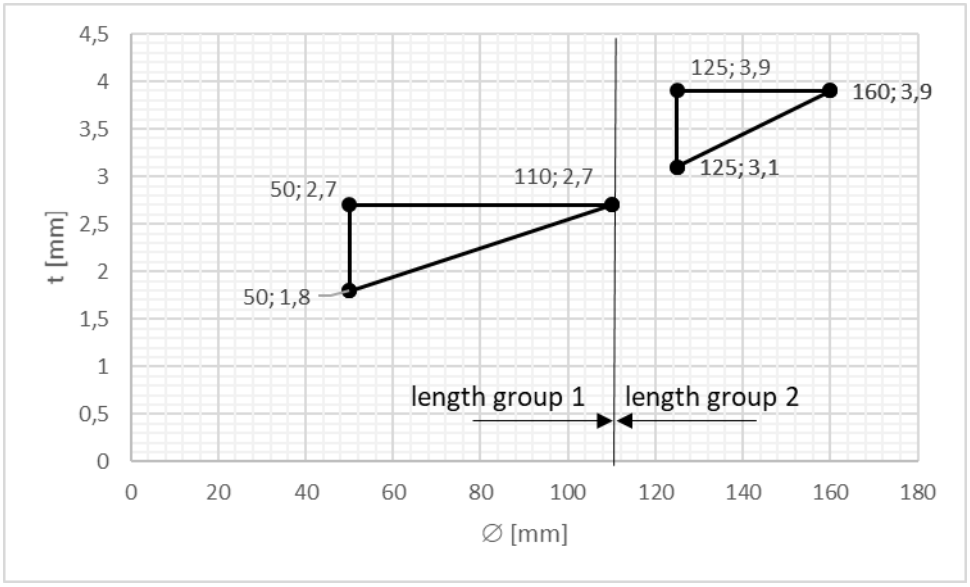
319091602-2, Rev1
P23 – P24

319091602-5, Rev1
P18, P20, P22, P23

[6] PP-H pipe as per EN 1451-1
[6] PP-H pipe as per EN 1451-1

Geberit Silent dB20	∅ = 56 - 160 mm t = 3.2 – 7.0 mm	**EI 90 – U/U**
		319091602-1, Rev1 P11, P12, P16 319091602-5, Rev1 P12, P13
Geberit Silent Pro	∅ = 50 - 110 mm and 160 mm t = 3.0 – 4.5 mm and 6.0 mm	**EI 90 – U/U**
		319091602-2, Rev1 P17 – P19 319091602-5, Rev1 P1, P6

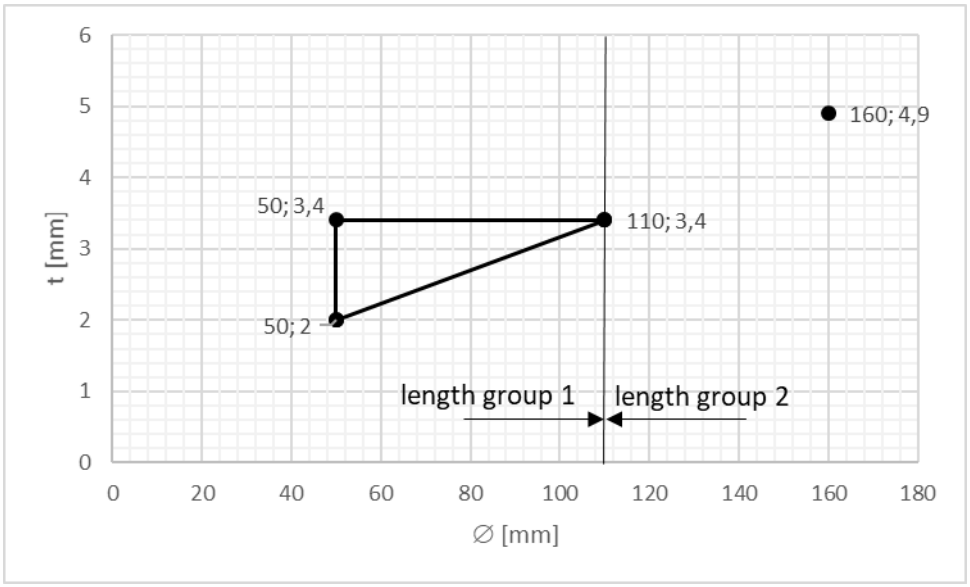
Rehau Raupiano plus	∅ = 50 - 160 mm t = 1.8 – 3.9 mm	**EI 90 – U/U**



319091602-1, Rev1
P14, P15

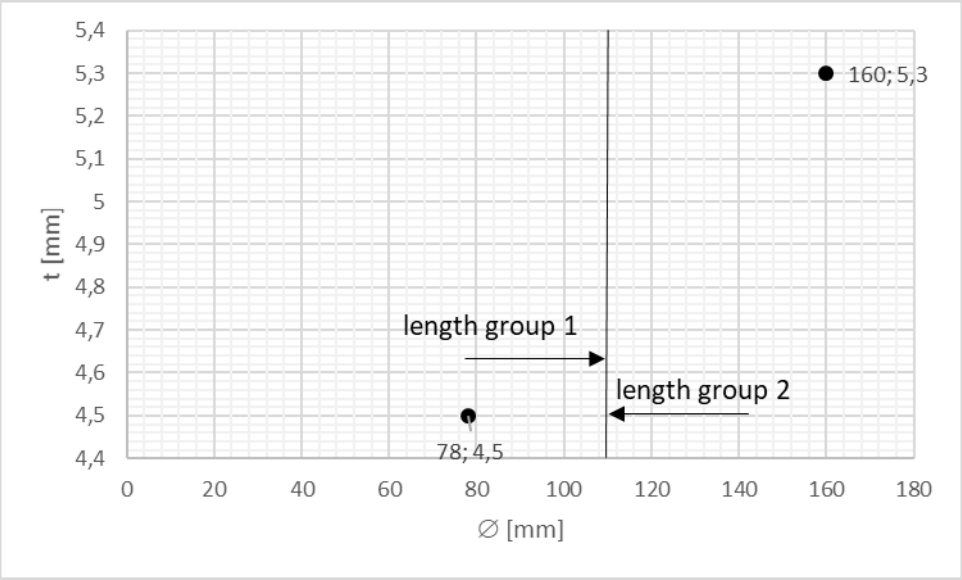
319091602-5, Rev1
P2, P4, P7, P10

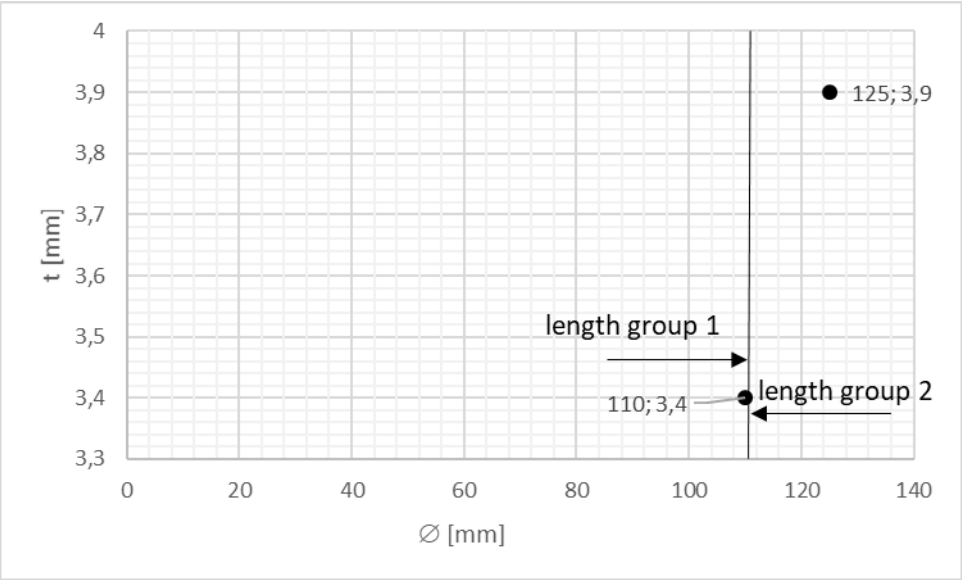
Poloplast POLO-KAL NG / XS	∅ = 50 - 110 mm and 160 mm t = 1.8 - 3.4 and 4.9 mm	**EI 90 – U/U**



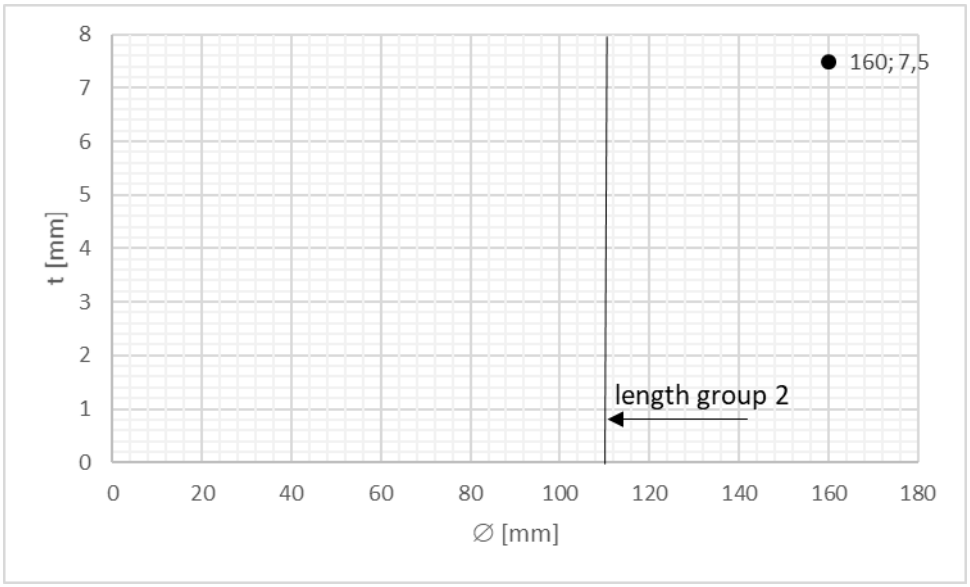
319091602-1, Rev1
P13, P21

319091602-2, Rev1
P20 – P22

GF Silenta Premium	∅ = 78 and 160 mm t = 4.5 and 5.3 mm	**EI 90 – U/U**
		319091602-5, Rev1 P3, P9

Wavin SiTech+	∅ = 110 and 125 mm t = 3.4 and 3.9 mm	**EI 90 – U/U**
		319091602-5, Rev1 P5, P8

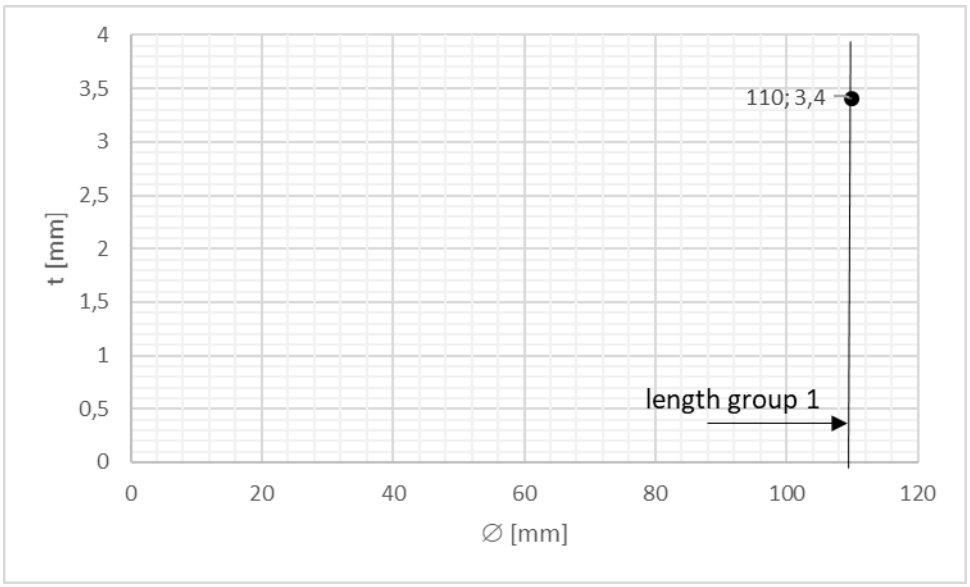
Poloplast POLO-KAL 3S	∅ = 160 mm t = 7.5mm	**EI 90 – U/U**



319091602-5, Rev1
P11

Hilti CFS-C EL U-shaped installed via elbow pipes
Asymmetrical - elbow pipe on fire exposed face

Poloplast POLO-KAL NG Pipe elbow 87°	∅ = 110 mm t = 3.4 mm	**EI 60 – U/U**



319021602-3, Rev1
P30

319091602-1, Rev1
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5. Limitations

The classification given above result from the field of direct application according to EN 1366-3: 2009-05 for Hilti CFS-C EL 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

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Mr Manfred EGLAUER
Engineer

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NR: 0002

Mr Ulrich STÖCKL
Monitoring

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