



FIRESTOP STANDARD DETAILS

Lee Frost

Government and Firestop Specialist

M +44 7802 205 846

T +44 800 886 100

E lee.frost@hilti.com

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Penetrations	Base material	Type of penetration	Material	Possible solution	Pages
Single Penetration	Flexible wall	Plastic Pipe	PVC	<ul style="list-style-type: none"> • CFS-C P Collar • CFS-C EL Endless collar 	<ul style="list-style-type: none"> • 1.1 • 1.2
Single Penetration	Flexible wall	Plastic Pipe	PE	<ul style="list-style-type: none"> • CFS-C P Collar • CFS-C EL Endless collar 	<ul style="list-style-type: none"> • 2.1 • 2.2
Single Penetration	Flexible wall	Plastic Pipe	ABS	<ul style="list-style-type: none"> • CFS-C P Collar • CFS-C EL Endless collar 	<ul style="list-style-type: none"> • 3.1 • 3.2
Single Penetration	Flexible wall	Plastic Pipe	PP	<ul style="list-style-type: none"> • CFS-C P Collar • CFS-C EL Endless collar 	<ul style="list-style-type: none"> • 3.3 • 3.4
Single Penetration	Flexible wall	Metal Pipe	Cast Iron Pipe (with Insulation)	<ul style="list-style-type: none"> • CFS-S ACR (CP606) Sealant • CFS-CT Coated Board • CP645 Intumescent Sleeve 	<ul style="list-style-type: none"> • 4.1 • 4.2 • 4.3
Single Penetration	Flexible wall	Metal Pipe	Cast Iron Pipe (without Insulation)	<ul style="list-style-type: none"> • CFS-S ACR (CP606) Sealant • CFS-CT Coated Board 	<ul style="list-style-type: none"> • 5.1 • 5.2
Single Penetration	Flexible wall	Metal Pipe	Copper Pipe (with Insulation)	<ul style="list-style-type: none"> • CFS-CT Coated Board • CFS-B Intumescent Bandage • CP645 Intumescent Sleeve 	<ul style="list-style-type: none"> • 6.1 • 6.2 • 6.3
Single Penetration	Flexible wall	Metal Pipe	Copper Pipe (without Insulation)	<ul style="list-style-type: none"> • CFS-S ACR (CP606) Sealant • CFS-CT Coated Board 	<ul style="list-style-type: none"> • 7.1 • 7.2

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Penetrations	Base material	Type of penetration	Material	Possible solution	Pages
Single Penetration	Flexible wall	Cable Basket	Cables	<ul style="list-style-type: none"> • CFS-CT Coated Board • CFS-SL GA Speed Sleeve • CFS-F FX Intumescent Foam 	<ul style="list-style-type: none"> • 8.1 • 8.2 • 8.3
Single Penetration	Flexible wall	Cables, Conduits, Tubes	Cables, Conduits, Tubes	<ul style="list-style-type: none"> • CFS-D 25 Cable Disc • CFS-F FX Intumescent Foam 	<ul style="list-style-type: none"> • 8.4 • 8.5
Single Penetration	Flexible wall	Damper	Duct	<ul style="list-style-type: none"> • CFS-CT Coated board 	<ul style="list-style-type: none"> • 9.1
Multiple Penetration	Flexible Wall	Multiple (Minimum Distances)		<ul style="list-style-type: none"> • CFS-CT Coated board 	<ul style="list-style-type: none"> • 10.1
Multiple Penetration	Flexible Wall	Multiple (Minimum Distances)		<ul style="list-style-type: none"> • CFS-F FX Intumescent Foam 	<ul style="list-style-type: none"> • 10.2

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Penetrations	Base material	Type of penetration	Material	Possible solution	Pages
Single Penetration	Rigid wall	Plastic Pipe	PVC	<ul style="list-style-type: none"> • CFS-C P Collar • CFS-C EL Endless collar 	<ul style="list-style-type: none"> • 11.1 • 11.2
Single Penetration	Rigid wall	Plastic Pipe	PE	<ul style="list-style-type: none"> • CFS-C P Collar • CFS-C EL Endless collar 	<ul style="list-style-type: none"> • 12.1 • 12.2
Single Penetration	Rigid wall	Plastic Pipe	ABS	<ul style="list-style-type: none"> • CFS-C P Collar • CFS-C EL Endless collar 	<ul style="list-style-type: none"> • 13.1 • 13.2
Single Penetration	Rigid wall	Plastic Pipe	PP	<ul style="list-style-type: none"> • CFS-C P Collar • CFS-C EL Endless collar 	<ul style="list-style-type: none"> • 13.3 • 13.4
Single Penetration	Rigid wall	Metal Pipe	Cast Iron Pipe (with Insulation)	<ul style="list-style-type: none"> • CFS-S ACR (CP606) Sealant • CFS-CT Coated Board • CP645 Intumescent Sleeve 	<ul style="list-style-type: none"> • 14.1 • 14.2 • 14.3
Single Penetration	Rigid wall	Metal Pipe	Cast Iron Pipe (without Insulation)	<ul style="list-style-type: none"> • CFS-S ACR (CP606) Sealant • CFS-CT Coated Board 	<ul style="list-style-type: none"> • 15.1 • 15.2
Single Penetration	Rigid wall	Metal Pipe	Copper Pipe (with Insulation)	<ul style="list-style-type: none"> • CFS-CT Coated Board • CFS-B Intumescent Bandage • CP645 Intumescent Sleeve 	<ul style="list-style-type: none"> • 16.1 • 16.2 • 16.3
Single Penetration	Rigid wall	Metal Pipe	Copper Pipe (without Insulation)	<ul style="list-style-type: none"> • CFS-S ACR (CP606) Sealant • CFS-CT Coated Board 	<ul style="list-style-type: none"> • 17.1 • 17.2

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Penetrations	Base material	Type of penetration	Material	Possible solution	Pages
Single Penetration	Rigid wall	Cable Basket	Cables	<ul style="list-style-type: none"> • CFS-CT Coated Board • CFS-SL GA Speed Sleeve • CFS-F FX Intumescent Foam 	<ul style="list-style-type: none"> • 18.1 • 18.2 • 18.3
Single Penetration	Rigid wall	Cables, Conduits, Tubes	Cables, Conduits, Tubes	<ul style="list-style-type: none"> • CFS-D 25 Cable Disc • CFS-F FX Intumescent Foam 	<ul style="list-style-type: none"> • 18.4 • 18.5
Single Penetration	Rigid wall	Damper	Duct	<ul style="list-style-type: none"> • CFS-CT Coated board 	<ul style="list-style-type: none"> • 19.1
Multiple Penetration	Rigid wall	Multiple (Minimum Distances)		<ul style="list-style-type: none"> • CFS-CT Coated board 	<ul style="list-style-type: none"> • 20.1
Multiple Penetration	Rigid wall	Multiple (Minimum Distances)		<ul style="list-style-type: none"> • CFS-F FX Intumescent Foam 	<ul style="list-style-type: none"> • 20.2

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Penetrations	Base material	Type of penetration	Material	Possible solution	Pages
Single Penetration	Rigid floor	Plastic Pipe	PVC	<ul style="list-style-type: none"> • CFS-C P Collar • CFS-C EL Endless collar 	<ul style="list-style-type: none"> • 21.1 • 21.2
Single Penetration	Rigid floor	Plastic Pipe	PE	<ul style="list-style-type: none"> • CFS-C P Collar • CFS-C EL Endless collar 	<ul style="list-style-type: none"> • 22.1 • 22.2
Single Penetration	Rigid floor	Plastic Pipe	ABS	<ul style="list-style-type: none"> • CFS-C P Collar • CFS-C EL Endless collar 	<ul style="list-style-type: none"> • 23.1 • 23.2
Single Penetration	Rigid floor	Plastic Pipe	PP	<ul style="list-style-type: none"> • CFS-C P Collar • CFS-C EL Endless collar 	<ul style="list-style-type: none"> • 23.3 • 23.4
Single Penetration	Rigid floor	Metal Pipe	Cast Iron Pipe (with Insulation)	<ul style="list-style-type: none"> • CFS-S ACR (CP606) Sealant • CFS-CT Coated Board • CP645 Intumescent Sleeve 	<ul style="list-style-type: none"> • 24.1 • 24.2 • 24.3
Single Penetration	Rigid floor	Metal Pipe	Cast Iron Pipe (without Insulation)	<ul style="list-style-type: none"> • CFS-S ACR (CP606) Sealant • CFS-CT Coated Board 	<ul style="list-style-type: none"> • 25.1 • 25.2
Single Penetration	Rigid floor	Metal Pipe	Copper Pipe (with Insulation)	<ul style="list-style-type: none"> • CFS-CT Coated Board • CFS-B Intumescent Bandage • CP645 Intumescent Sleeve 	<ul style="list-style-type: none"> • 26.1 • 26.2 • 26.3
Single Penetration	Rigid floor	Metal Pipe	Copper Pipe (without Insulation)	<ul style="list-style-type: none"> • CFS-S ACR (CP606) Sealant • CFS-CT Coated Board 	<ul style="list-style-type: none"> • 27.1 • 27.2

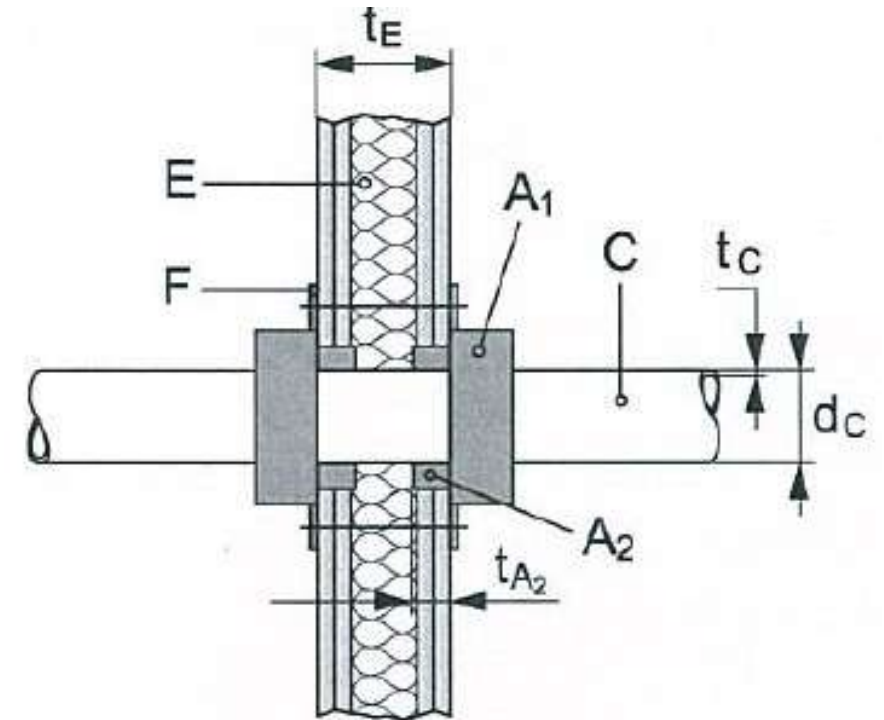
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Penetrations	Base material	Type of penetration	Material	Possible solution	Pages
Single Penetration	Rigid floor	Cable Basket	Cables	<ul style="list-style-type: none"> • CFS-CT Coated Board • CFS-SL GA Speed Sleeve • CFS-F FX Intumescent Foam • CFS-R MG Firestop Mortar 	<ul style="list-style-type: none"> • 28.1 • 28.2 • 28.3 • 28.4
Single Penetration	Rigid floor	Cables, Conduits, Tubes	Cables, Conduits, Tubes	<ul style="list-style-type: none"> • CFS-F FX Intumescent Foam 	<ul style="list-style-type: none"> • 28.5
Multiple Penetration	Rigid floor	Multiple (Minimum Distances)		<ul style="list-style-type: none"> • CFS-CT Coated board 	<ul style="list-style-type: none"> • 30.1
Multiple Penetration	Rigid floor	Multiple (Minimum Distances)		<ul style="list-style-type: none"> • CFS-F FX Intumescent Foam 	<ul style="list-style-type: none"> • 30.2
Multiple Penetration	Rigid floor	Multiple (Minimum Distances)		<ul style="list-style-type: none"> • CFS-R MG Firestop Mortar 	<ul style="list-style-type: none"> • 30.3
Edge of the slab	Rigid floor	Curtain Wall		<ul style="list-style-type: none"> • CFS-SP 	<ul style="list-style-type: none"> • 4.1.1
Cavity Barrier	Rigid floor	Cavity Barrier		<ul style="list-style-type: none"> • CP 674 (Ventilated) • CP 674 (Non Ventilated) 	<ul style="list-style-type: none"> • 4.2.1 • 4.2.2

1.1 PLASTIC PIPE – FLEXIBLE PARTITION WALL

- CFS-C P Firestop Collar for PVC pipe:**

Flexible wall	Steel studs lined on both faces. Minimum 2 layers of 12,5mm thick boards. Refer to Hilti for single-layer partition statement
Minimum thickness of partition	≥ 100mm
Material of pipes	PVC-U According to EN 15493; EN 1452 and DIN 8061/8062; EN 1329-1; EN 1453-1; PVC-C According to EN 1566-1
Sizes of pipes	See table
Spacing between openings	≥ 0mm between adjacent openings
Minimum thickness of sealant	Total thickness of the wall boards
Maximum annular gap	Opening size ≤ Collar diameter
Fixing of the collar	M8 threaded rods through the wall + nuts on both sides
Supports distance	≤ 300mm from face of the wall
Approval reference	ETA-10/0404
Fire Rating	See table



Pipe Diameter d_c (mm)	Pipe wall thickness t_c (mm)	Collar Size (A_1)	Classification (Fire Rating) (minutes)	Maximum size of opening (mm)	Minimum size of opening (mm)
50	2,4 – 5,6	CFS-C P 50/1.5"	EI 120	67	50
63	3,0 - 4,7	CFS-C P 63/2"	EI 120	82	63
75	2,2 – 3,6	CFS-C P 75/2.5"	EI 120		75
90	2,7 – 4,3	CFS-C P 90/3"	EI 120	117	90
110	2,2 – 8,1	CFS-C P 110/4"	EI 120	146	110
125	3,7 – 6,0	CFS-C P 125/5"	EI 120	166	125
160	2,5 – 11,8	CFS-C P 160/6"	EI 120	236	160

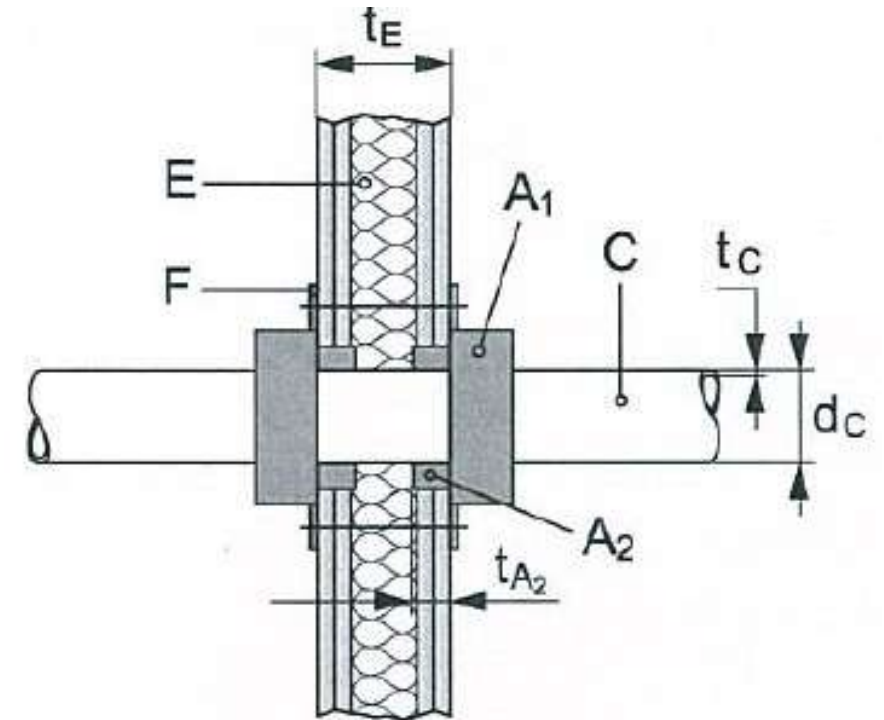
Legend	
A_1	Hilti Firestop Collar CFS-C P
A_2	Annular gap seal with Hilti Acrylic Sealant CFS-S ACR
C	Plastic Pipe
d_c	Pipe diameter (nominal outside diameter)
E	Building element (wall, floor)
F	Fixing of the collar
t_{A2}	Thickness of Hilti Firestop Acrylic Sealant CFS-S ACR (CP606)
t_c	Pipe wall thickness
t_E	Thickness of the building element

1.2 PLASTIC PIPE – FLEXIBLE PARTITION WALL

- CFS-C EL Endless Firestop Collar for PVC pipe:**

Flexible wall	Steel studs lined on both faces. Minimum 2 layers of 12,5mm thick boards. Refer to Hilti for single-layer partition statement
Minimum thickness of partition	≥ 100mm
Material of pipes	PVC According to EN 1452-1; EN 1453-1; BS EN 1329-1; EN 1566-1; EN ISO 15493 and DIN 8061/8062
Sizes of pipes	See table
Spacing between openings	≥ 0mm between adjacent openings
Minimum thickness of sealant	Total thickness of the wall boards
Maximum annular gap	≥ 15mm
Fixing of the collar	M6 or M8 threaded rods through the wall + flat washer & nuts on both sides or Hilti cavity anchors HHD-S
Supports distance	≤ 250mm from face of the wall
Approval reference	ETA-14/0085
Fire Rating	See table

Pipe Diameter d_c (mm)	Pipe wall thickness t_c (mm)	Length of Collar (mm)	Classification (Fire Rating) (minutes)	Number of fixings	Maximum size of opening (mm)	Minimum size of opening (mm)
32	1,8 – 12,3	150	EI 120	2	62	32
40	1,8 – 12,3	180	EI 120	2	70	40
50	1,8 – 12,3	210	EI 120	2	80	50
63	1,9 – 12,3	250	EI 120	3	93	63
75	2,0 – 12,3	290	EI 120	3	105	75
83	2,0 – 12,3	320	EI 120	3	113	83
90	2,1 – 12,3	340	EI 120	3	120	90
110	2,2 – 12,3	400	EI 120	3	140	110

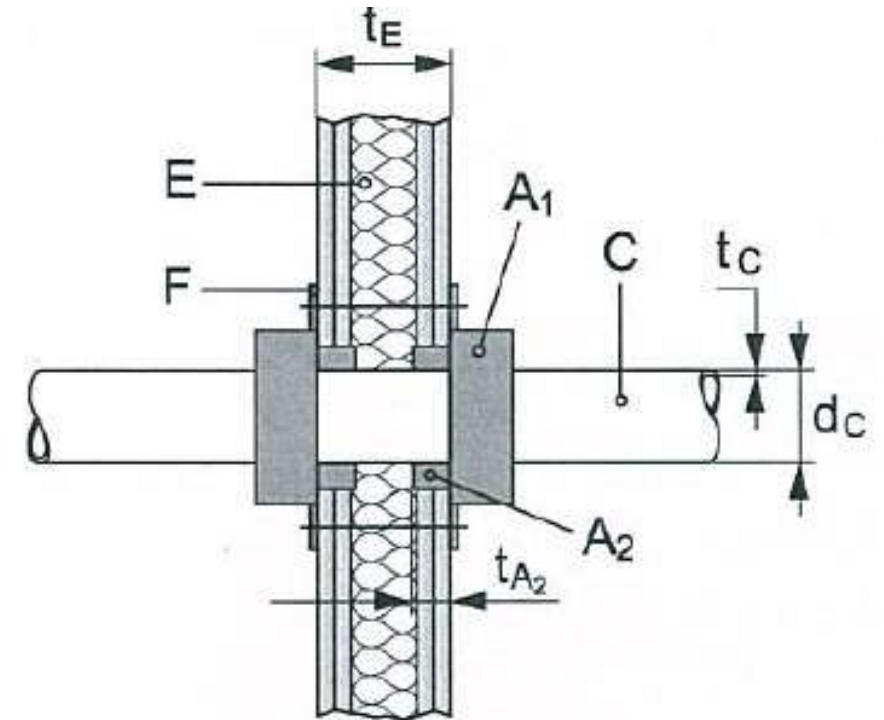


Legend	
A₁	Hilti Firestop Collar CFS-C Endless
A₂	Annular gap seal with Hilti Acrylic Sealant CFS-S ACR
C	Plastic Pipe
d_c	Pipe diameter (nominal outside diameter)
E	Building element (wall, floor)
F	Fixing of the collar
t_{A2}	Thickness of Hilti Firestop Acrylic Sealant CFS-S ACR (CP606)
t_c	Pipe wall thickness
t_E	Thickness of the building element

2.1 PLASTIC PIPE – FLEXIBLE PARTITION WALL

- CFS-C P Firestop Collar for PE pipe:**

Flexible wall	Steel studs lined on both faces. Minimum 2 layers of 12,5mm thick boards. Refer to Hilti for single-layer partition statement
Minimum thickness of partition	≥ 100mm
Material of pipes	PE According to EN 1519; EN 12201-2 and EN 12666-1
Sizes of pipes	See table
Spacing between openings	≥ 0mm between adjacent openings
Minimum thickness of sealant	Total thickness of the wall boards
Maximum annular gap	Opening size ≤ Collar diameter
Fixing of the collar	M8 threaded rods through the wall + nuts on both sides
Supports distance	≤ 300mm from face of the wall
Approval reference	ETA-10/0404
Fire Rating	See table



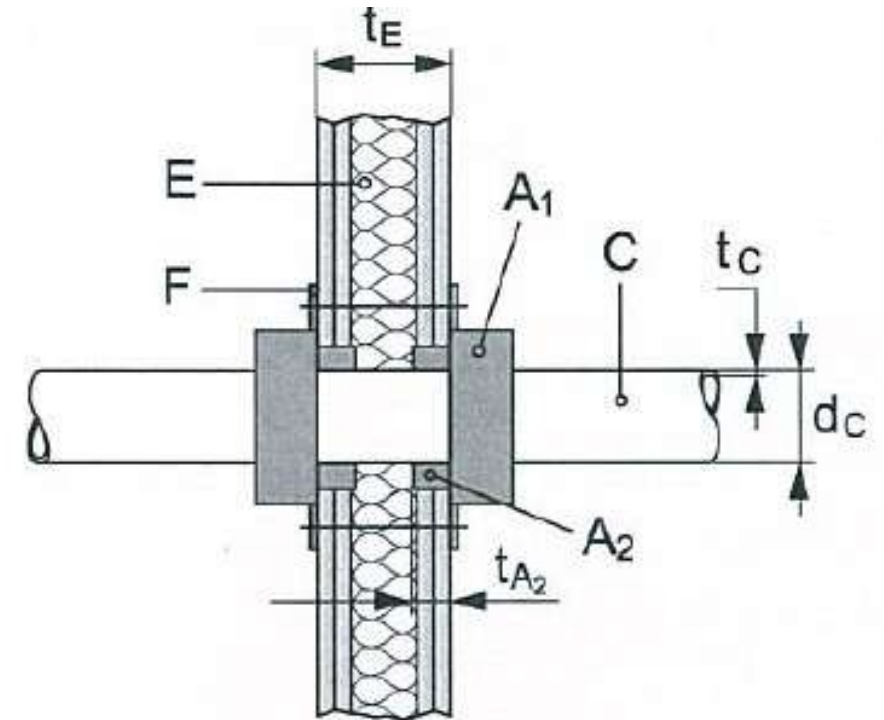
Pipe Diameter d_c (mm)	Pipe wall thickness t_c (mm)	Collar Size (A_1)	Classification (Fire Rating) (minutes)	Maximum size of opening (mm)	Minimum size of opening (mm)
50	3,0	CFS-C P 50/1.5"	EI 120	67	50
63	3,0	CFS-C P 63/2"	EI 120	82	63
75	3,0	CFS-C P 75/2.5"	EI 120		75
90	3,5	CFS-C P 90/3"	EI 120	117	90
110	4,2	CFS-C P 110/4"	EI 120	146	110
125	4,8	CFS-C P 125/5"	EI 120	166	125
160	6,2	CFS-C P 160/6"	EI 120	236	160

Legend	
A_1	Hilti Firestop Collar CFS-C P
A_2	Annular gap seal with Hilti Acrylic Sealant CFS-S ACR
C	Plastic Pipe
d_c	Pipe diameter (nominal outside diameter)
E	Building element (wall, floor)
F	Fixing of the collar
t_{A_2}	Thickness of Hilti Firestop Acrylic Sealant CFS-S ACR (CP606)
t_c	Pipe wall thickness
t_E	Thickness of the building element

2.2 PLASTIC PIPE – FLEXIBLE PARTITION WALL

- CFS-C EL Endless Firestop Collar for PE pipe:**

Flexible wall	Steel studs lined on both faces. Minimum 2 layers of 12,5mm thick boards. Refer to Hilti for single-layer partition statement
Minimum thickness of partition	≥ 100mm
Material of pipes	PE According to EN 1519-1; EN 12201-2 and EN 12666-1
Sizes of pipes	See table
Spacing between openings	≥ 0mm between adjacent openings
Minimum thickness of sealant	Total thickness of the wall boards
Maximum annular gap	≥ 15mm
Fixing of the collar	M6 or M8 threaded rods through the wall + flat washer & nuts on both sides or Hilti cavity anchors HHD-S
Supports distance	≤ 250mm from face of the wall
Approval reference	ETA-14/0085
Fire Rating	See table



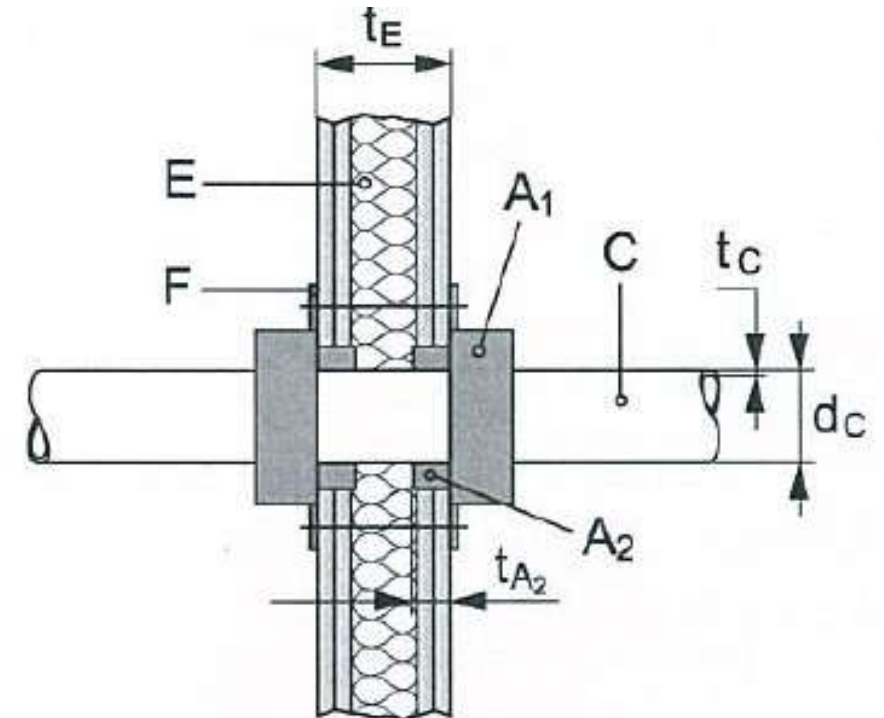
Pipe Diameter d_c (mm)	Pipe wall thickness t_c (mm)	Length of Collar (mm)	Classification (Fire Rating) (minutes)	Number of fixings	Maximum size of opening (mm)	Minimum size of opening (mm)
40	3,0 – 4,2	180	EI 120	2	70	40
50	3,0 – 4,2	210	EI 120	2	80	50
63	3,0 – 4,2	250	EI 120	3	93	63
75	3,2 – 4,2	290	EI 120	3	105	75
83	3,4 – 4,2	320	EI 120	3	113	83
90	3,5 – 4,2	340	EI 120	3	120	90
110	4,2	400	EI 120	3	140	110

Legend	
A₁	Hilti Firestop Collar CFS-C Endless
A₂	Annular gap seal with Hilti Acrylic Sealant CFS-S ACR
C	Plastic Pipe
d_c	Pipe diameter (nominal outside diameter)
E	Building element (wall, floor)
F	Fixing of the collar
t_{A2}	Thickness of Hilti Firestop Acrylic Sealant CFS-S ACR (CP606)
t_c	Pipe wall thickness
t_E	Thickness of the building element

3.1 PLASTIC PIPE – FLEXIBLE PARTITION WALL

- CFS-C P Firestop Collar for ABS pipe:**

Flexible wall	Steel studs lined on both faces. Minimum 2 layers of 12,5mm thick boards. Refer to Hilti for single-layer partition statement
Minimum thickness of partition	≥ 100mm
Material of pipes	ABS pipes+GF+“COOL-FIT”) (ABS/PUR insulations/PE-HD)
Sizes of pipes	See table
Spacing between openings	≥ 0mm between adjacent openings
Minimum thickness of sealant	Total thickness of the wall boards
Maximum annular gap	Opening size ≤ Collar diameter
Fixing of the collar	M8 threaded rods through the wall + nuts on both sides
Supports distance	≤ 300mm from face of the wall
Approval reference	ETA-10/0404
Fire Rating	See table



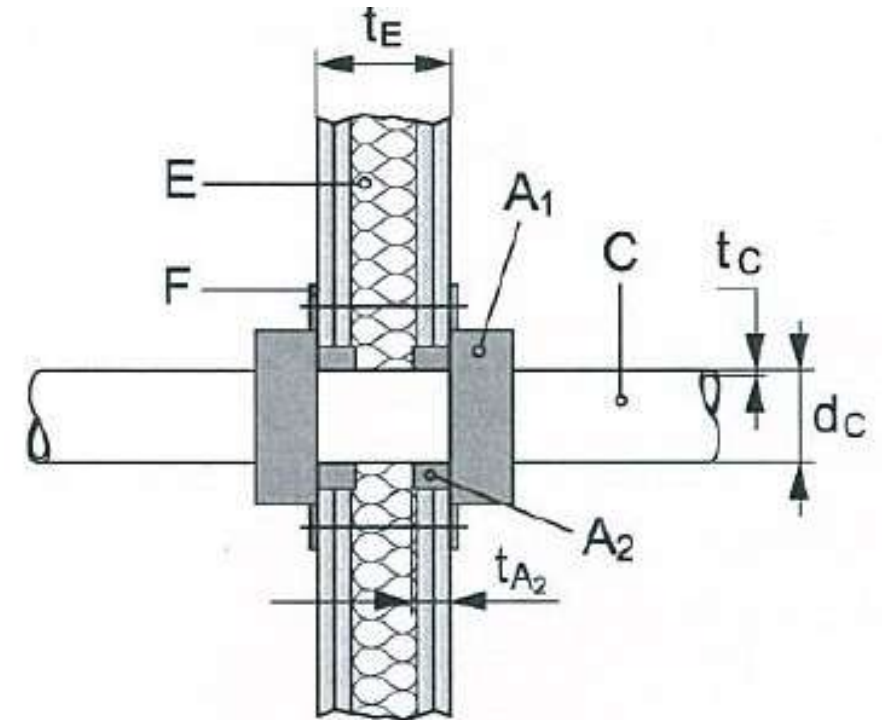
Pipe Diameter d_c (mm)	Inner Pipe diameter (mm)	Collar Size (A_1)	Classification (Fire Rating) (minutes)	Maximum size of opening (mm)	Minimum size of opening (mm)
90	32	CFS-C P 90/3"	EI 120	117	90
110	40	CFS-C P 110/4"	EI 120	146	110
110	50	CFS-C P 110/4"	EI 120	166	110
160	90	CFS-C P 160/6"	EI 120	236	160
180	110	CFS-C P 180/7"	EI 120	228	180
225	140	CFS-C P 225/9"	EI 120	289	225
250	160	CFS-C P 250/10"	EI 60	319	250

Legend	
A_1	Hilti Firestop Collar CFS-C P
A_2	Annular gap seal with Hilti Acrylic Sealant CFS-S ACR
C	Plastic Pipe
d_c	Pipe diameter (nominal outside diameter)
E	Building element (wall, floor)
F	Fixing of the collar
t_{A2}	Thickness of Hilti Firestop Acrylic Sealant CFS-S ACR (CP606)
t_c	Pipe wall thickness
t_E	Thickness of the building element

3.2 PLASTIC PIPE – FLEXIBLE PARTITION WALL

- CFS-C EL Endless Firestop Collar for ABS pipe:**

Flexible wall	Steel studs lined on both faces. Minimum 2 layers of 12,5mm thick boards. Refer to Hilti for single-layer partition statement
Minimum thickness of partition	≥ 100mm
Material of pipes	ABS pipes acc. to EN 1455; EN 15493 and SAN+PVC pipes acc. EN 1565-1
Sizes of pipes	See table
Spacing between openings	≥ 0mm between adjacent openings
Minimum thickness of sealant	Total thickness of the wall boards
Maximum annular gap	≥ 15mm
Fixing of the collar	M6 or M8 threaded rods through the wall + flat washer & nuts on both sides or Hilti cavity anchors HHD-S
Supports distance	≤ 250mm from face of the wall
Approval reference	ETA-14/0085
Fire Rating	See table



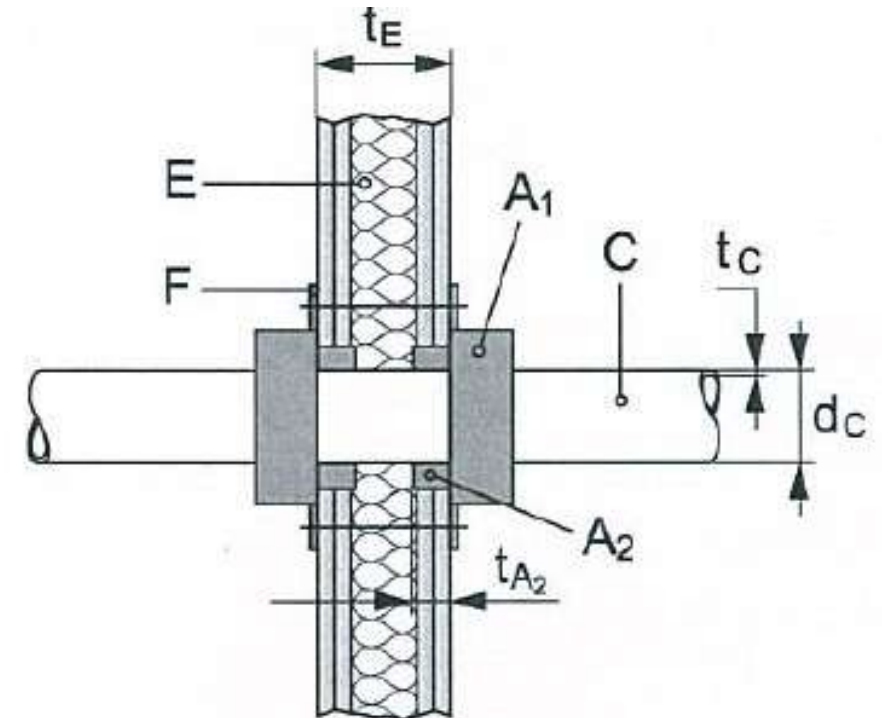
Pipe Diameter d_C (mm)	Pipe wall thickness t_C (mm)	Length of Collar (mm)	Classification (Fire Rating) (minutes)	Number of fixings	Maximum size of opening (mm)	Minimum size of opening (mm)
32	1,9 – 4,2	180	EI 90	2	70	40
90	3,5 – 4,2	340	EI 90	3	120	90
110	4,2	400	EI 90	3	140	110

Legend	
A₁	Hilti Firestop Collar CFS-C Endless
A₂	Annular gap seal with Hilti Acrylic Sealant CFS-S ACR
C	Plastic Pipe
d_C	Pipe diameter (nominal outside diameter)
E	Building element (wall, floor)
F	Fixing of the collar
t_{A2}	Thickness of Hilti Firestop Acrylic Sealant CFS-S ACR (CP606)
t_C	Pipe wall thickness
t_E	Thickness of the building element

3.3 PLASTIC PIPE – FLEXIBLE PARTITION WALL

- CFS-C P Firestop Collar for PP pipe:**

Flexible wall	Steel studs lined on both faces. Minimum 2 layers of 12,5mm thick boards. Refer to Hilti for single-layer partition statement
Minimum thickness of partition	≥ 100mm
Material of pipes	PP According to EN ISO 15874 and/or DIN 8077/8078
Sizes of pipes	See table
Spacing between openings	≥ 0mm between adjacent openings
Minimum thickness of sealant	Total thickness of the wall boards
Maximum annular gap	Opening size ≤ Collar diameter
Fixing of the collar	M8 threaded rods through the wall + nuts on both sides
Supports distance	≤ 300mm from face of the wall
Approval reference	ETA-10/0404
Fire Rating	See table



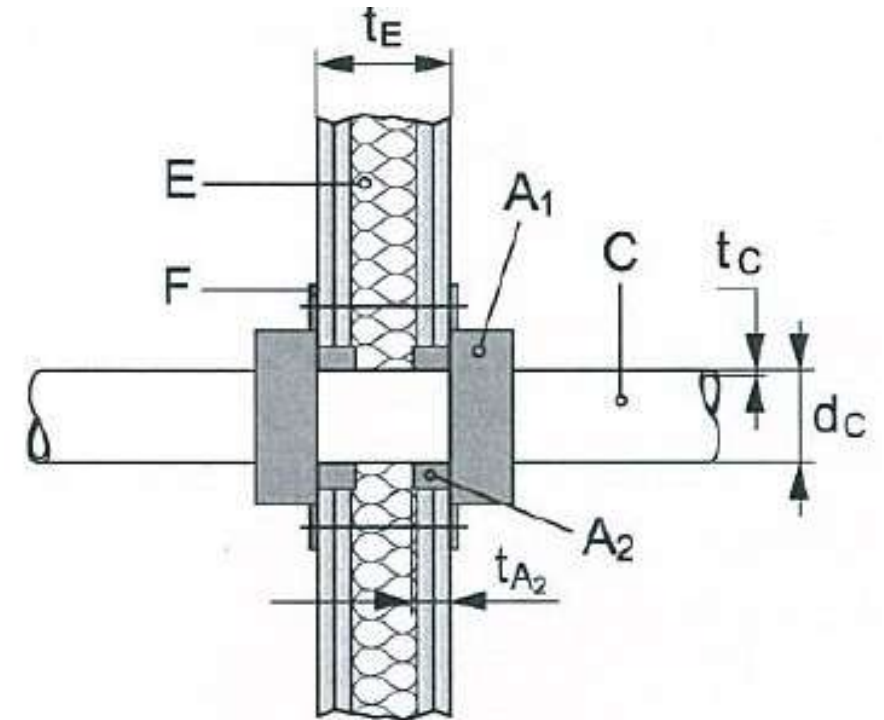
Pipe Diameter d_c (mm)	Pipe wall thickness t_c (mm)	Collar Size (A_1)	Classification (Fire Rating) (minutes)	Maximum size of opening (mm)	Minimum size of opening (mm)
50	1,8 – 2,9	CFS-C P 50/1.5"	EI 90	67	50
63	1,8 – 5,8	CFS-C P 63/2"	EI 60	82	63
75	1,9 – 6,8	CFS-C P 75/2.5"	EI 60		75
75	6,8 – 12,5	CFS-C P 75/2.5"	EI 120		75
90	8,2 – 15,0	CFS-C P 90/3"	EI 120	117	90
110	2,7	CFS-C P 110/4"	EI 120	146	110

Legend	
A_1	Hilti Firestop Collar CFS-C P
A_2	Annular gap seal with Hilti Acrylic Sealant CFS-S ACR
C	Plastic Pipe
d_c	Pipe diameter (nominal outside diameter)
E	Building element (wall, floor)
F	Fixing of the collar
t_{A2}	Thickness of Hilti Firestop Acrylic Sealant CFS-S ACR (CP606)
t_c	Pipe wall thickness
t_E	Thickness of the building element

3.4 PLASTIC PIPE – FLEXIBLE PARTITION WALL

- CFS-C EL Endless Firestop Collar for PP pipe:**

Flexible wall	Steel studs lined on both faces. Minimum 2 layers of 12,5mm thick boards. Refer to Hilti for single-layer partition statement
Minimum thickness of partition	≥ 100mm
Material of pipes	PP According to EN 1451-1 and DIN 8077/8078
Sizes of pipes	See table
Spacing between openings	≥ 0mm between adjacent openings
Minimum thickness of sealant	Total thickness of the wall boards
Maximum annular gap	≥ 15mm
Fixing of the collar	M6 or M8 threaded rods through the wall + flat washer & nuts on both sides or Hilti cavity anchors HHD-S
Supports distance	≤ 250mm from face of the wall
Approval reference	ETA-14/0085
Fire Rating	See table



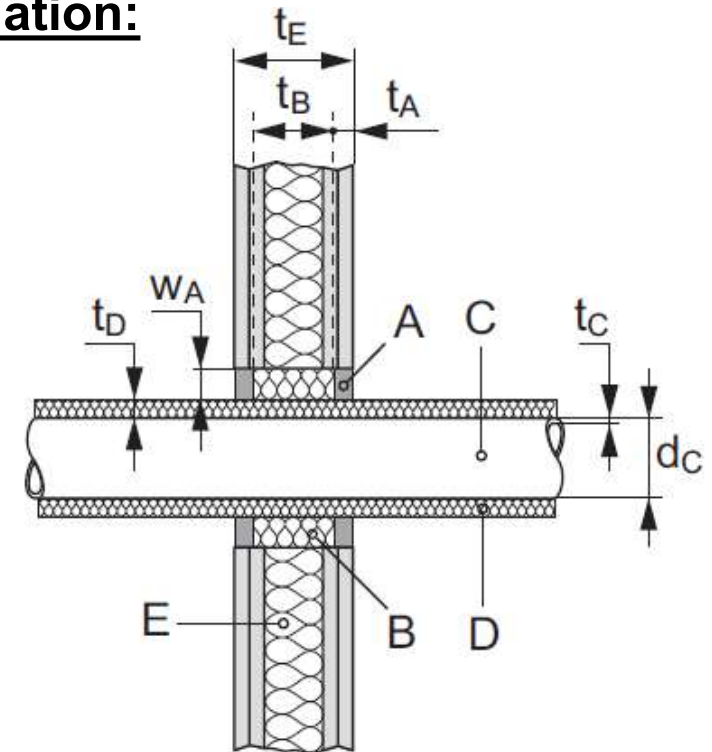
Pipe Diameter d_c (mm)	Pipe wall thickness t_c (mm)	Length of Collar (mm)	Classification (Fire Rating) (minutes)	Number of fixings	Maximum size of opening (mm)	Minimum size of opening (mm)
32	1,8 – 10,0	150	EI 120	2	62	32
40	1,8 – 10,0	180	EI 120	2	70	40
50	1,8 – 10,0	210	EI 120	2	80	50
63	1,8 – 10,0	250	EI 120	3	93	63
75	1,9 – 10,0	290	EI 120	3	105	75
83	2,7 – 10,0	320	EI 120	3	113	83
90	2,7 – 10,0	340	EI 120	3	120	90
110	2,7 – 10,0	400	EI 120	3	140	110

Legend	
A₁	Hilti Firestop Collar CFS-C Endless
A₂	Annular gap seal with Hilti Acrylic Sealant CFS-S ACR
C	Plastic Pipe
d_c	Pipe diameter (nominal outside diameter)
E	Building element (wall, floor)
F	Fixing of the collar
t_{A2}	Thickness of Hilti Firestop Acrylic Sealant CFS-S ACR (CP606)
t_c	Pipe wall thickness
t_E	Thickness of the building element

4.1 CAST IRON PIPE – FLEXIBLE PARTITION WALL

- CFS-S ACR (CP606) Sealant for Cast Iron pipe with continued insulation:**

Flexible wall	Steel studs lined on both faces. Minimum 2 layers of 12,5mm thick boards. Refer to Hilti for single-layer partition statement
Minimum thickness of partition	≥ 100mm
Material of pipes	Metal pipes with lower heat conductivity than unalloyed steel and a melting point of minimum 1100°C, e.g. low alloyed steel, cast iron, stainless steels, Ni alloys (NiCu, NiCr and NiMo alloys)
Sizes of pipes	See table
Spacing between openings	≥ 200mm between adjacent openings
Minimum thickness of sealant	≥ 10mm
Maximum annular gap	≤ 20mm (Binder)
Backfilling material	Loose stone wool or stone wool mats with a minimum density of 45 kg/m ³
Supports distance	≤ 270mm from face of the wall
Approval reference	ETA-10/0292 – (EN1366-3) Firestop Binder CP606 (BS476)
Fire Rating	See table (Higher Fire Rating values can be achieved)



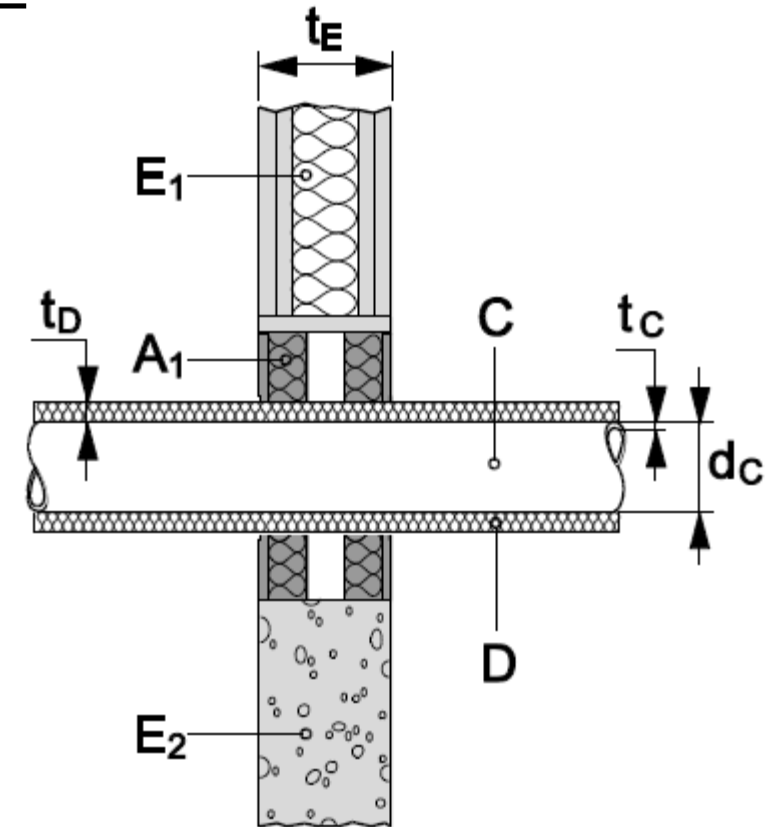
Legend	
A	Hilti Firestop Acrylic Sealant CFS-S ACR (CP606)
B	Backfilling material
C	Penetrating Service - Pipe
d_C	Pipe diameter (nominal outside diameter)
w_A	Width of penetration seal (Annular gap)
D	Insulation (Mineral wool as per ETA)
E	Building element (wall, floor)
t_A	Thickness of Hilti Firestop Acrylic Sealant CFS-S ACR (CP606)
t_B	Thickness of backfilling material
t_C	Pipe wall thickness
t_D	Thickness of insulation
t_E	Thickness of the building element

Pipe Diameter d _C (mm)	Pipe wall thickness t _C (mm)	Continued Insulation thickness t _D (mm)	Classification (Fire Rating) (minutes)	Maximum size of opening (mm)	Minimum size of opening (mm)
26,9 – 48,3	1,4 / 1,6 – 14,2	20	EI 120	d _C + 2xt _D + 2x20	d _C + 2xt _D
26,9 – 168,3	1,4 / 2,6 – 14,2	40	EI 120		

4.2 CAST IRON PIPE – FLEXIBLE PARTITION WALL

- CFS-CT Coated Board for Cast Iron pipe with continued insulation:**

Flexible wall	Steel studs lined on both faces. Minimum 2 layers of 12,5mm thick boards. Refer to Hilti for single-layer partition statement
Minimum thickness of partition	≥ 100mm
Description	Opening to be framed with drywall lining 12,5mm
Material of pipes	Metal pipes with lower heat conductivity than unalloyed steel and a melting point of minimum 1100°C, e.g. low alloyed steel, cast iron, stainless steels, Ni alloys (NiCu, NiCr and NiMo alloys)
Sizes of pipes	See table
Spacing between openings	≥ 200mm between adjacent openings
Spacing between metal pipes	≥ 0mm between adjacent insulations
Maximum opening size	1200 x 1200mm
Distance to seal edge	≥ 3mm
Minimum thickness of sealant	≥ 10mm applied in all edges of the board with Hilti CFS-S ACR (CP606)
Supports distance	≤ 250mm from face of the wall
Approval reference	ETA-11/0429 – (EN1366-3)
Fire Rating	See table (Higher Fire Rating values can be achieved)

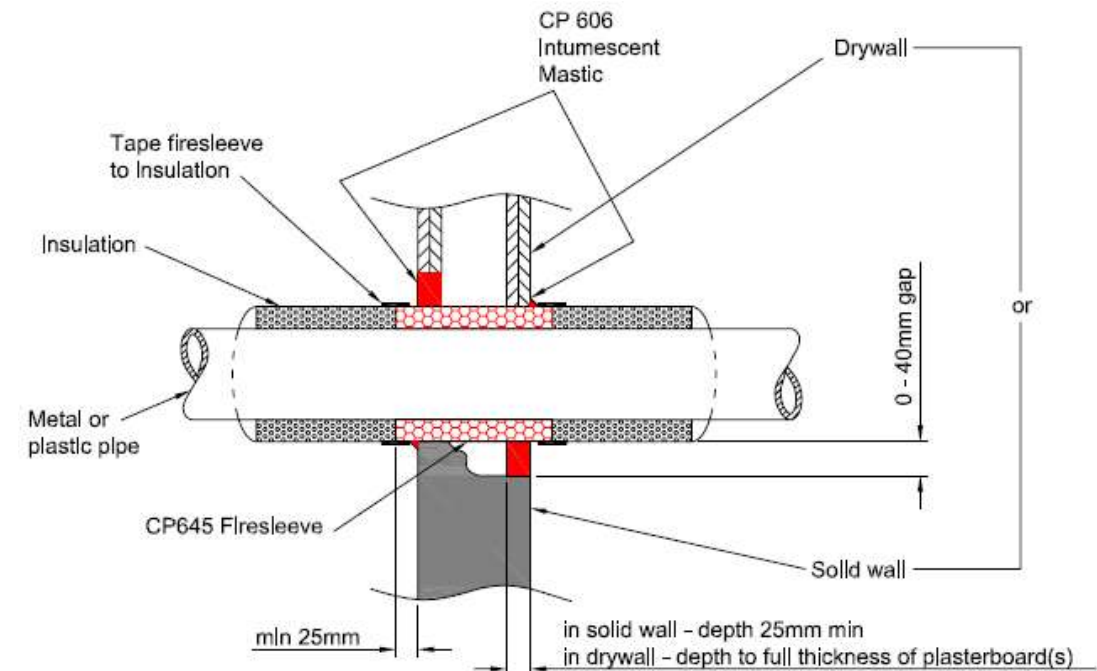


Pipe Diameter d_c (mm)	Pipe wall thickness t_c (mm)	Continued Insulation thickness t_D (mm)	Classification (Fire Rating) (minutes)	Size of opening in board (mm)	Legend	
48.3	1.6 – 14.2	≥ 20	EI 90	d_c	A_1	Hilti Firestop Coated Board CFS-CT
114.3	2.0 – 14.2	≥ 30	EI 60		C	Penetrating Service - Pipe
		≥ 40	EI 120		d_c	Pipe diameter (nominal outside diameter)
114.3 – 159.0	2.0 / 2.6 – 14.2	≥ 40	EI 60		D	Insulation (Mineral wool as per ETA)
159.0	2.6 – 14.2	≥ 40	EI 60		E	Building element (wall, floor)
159.0 – 323.9	2.6 / 4.0 – 14.2	≥ 40	EI 60		t_c	Pipe wall thickness
				t_D	Thickness of insulation	
				t_E	Thickness of the building element	

4.3 CAST IRON PIPE – FLEXIBLE PARTITION WALL

- CP645 Intumescent Sleeve for Cast Iron pipe with continued insulation:**

Flexible wall	Steel studs lined on both faces. Minimum 2 layers of 12,5mm thick boards. Refer to Hilti for single-layer partition statement
Minimum thickness of partition	≥100mm
Material of pipes	Metal pipes with lower heat conductivity than unalloyed steel and a melting point of minimum 1100°C, e.g. low alloyed steel, cast iron, stainless steels, Ni alloys (NiCu, NiCr and NiMo alloys)
Sizes of pipes	See table
Spacing between openings	≥ 200mm between adjacent openings
Minimum thickness of sealant	Total thickness of the wall boards
Maximum annular gap	≤ 20mm (Binder)
Overhang from drywall surface	≥ 25mm
Supports distance	≤ 270mm from face of the wall
Approval reference	Firestop Binder CP645 (BS476 pt20) (BSEN1366-3)
Fire Rating	See table

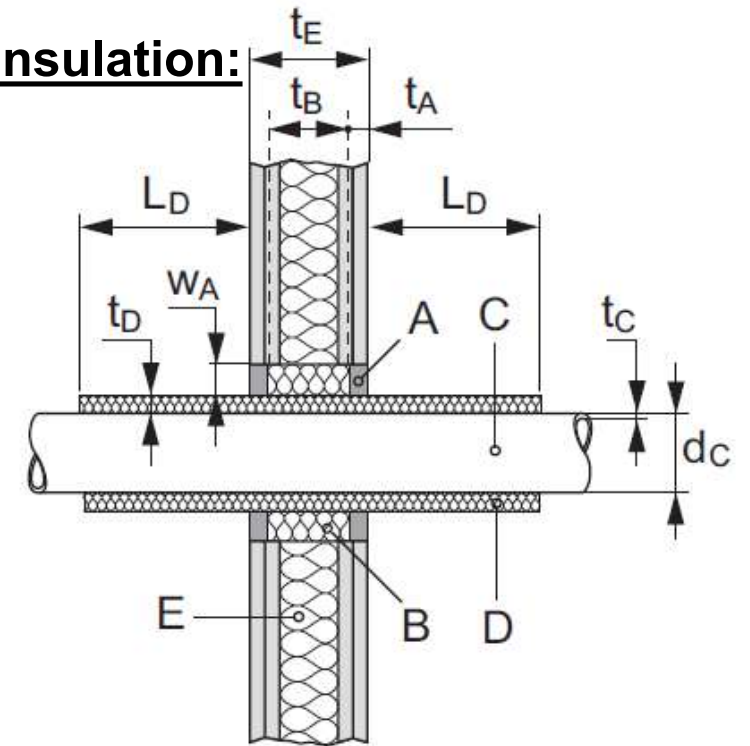


Pipe Diameter d_c (mm)	Pipe wall thickness t_c (mm)	Continued Insulation thickness t_D (mm)	Classification (Fire Rating) (minutes)	Maximum size of opening (mm)	Minimum size of opening (mm)
17 - 169	N/A	N/A	EI 120	$d_c + 2xt_D + 2x20$	$d_c + 2xt_D$

5.1 CAST IRON PIPE – FLEXIBLE PARTITION WALL

• CFS-S ACR (CP606) Sealant for Cast Iron pipe without continued insulation:

Flexible wall	Steel studs lined on both faces. Minimum 2 layers of 12,5mm thick boards. Refer to Hilti for single-layer partition statement
Minimum thickness of partition	≥ 100mm
Material of pipes	Metal pipes with lower heat conductivity than unalloyed steel and a melting point of minimum 1100°C, e.g. low alloyed steel, cast iron, stainless steels, Ni alloys (NiCu, NiCr and NiMo alloys)
Sizes of pipes	See table
Spacing between openings	≥ 200mm between adjacent openings
Minimum thickness of sealant	≥ 10mm
Maximum annular gap	≤ 20mm (Binder)
Backfilling material	Loose stone wool or stone wool mats with a minimum density of 45 kg/m ³
Insulation	Hilti Sleeve CP645 or Mineral wool as per ETA
Supports distance	≤ 270mm from face of the wall
Approval reference	ETA-10/0292 – (EN1366-3) Firestop Binder CP606 (BS476)
Fire Rating	See table (Higher Fire Rating values can be achieved)



Legend	
A	Hilti Firestop Acrylic Sealant CFS-S ACR (CP606)
B	Backfilling material
C	Penetrating Service - Pipe
d_c	Pipe diameter (nominal outside diameter)
w_A	Width of penetration seal (Annular gap)
D	Insulation (Hilti Sleeve CP645 or Mineral wool as per ETA)
E	Building element (wall, floor)
L_D	Length of Insulation
t_A	Thickness of Hilti Firestop Acrylic Sealant CFS-S ACR (CP606)
t_B	Thickness of backfilling material
t_c	Pipe wall thickness
t_D	Thickness of insulation
t_E	Thickness of the building element

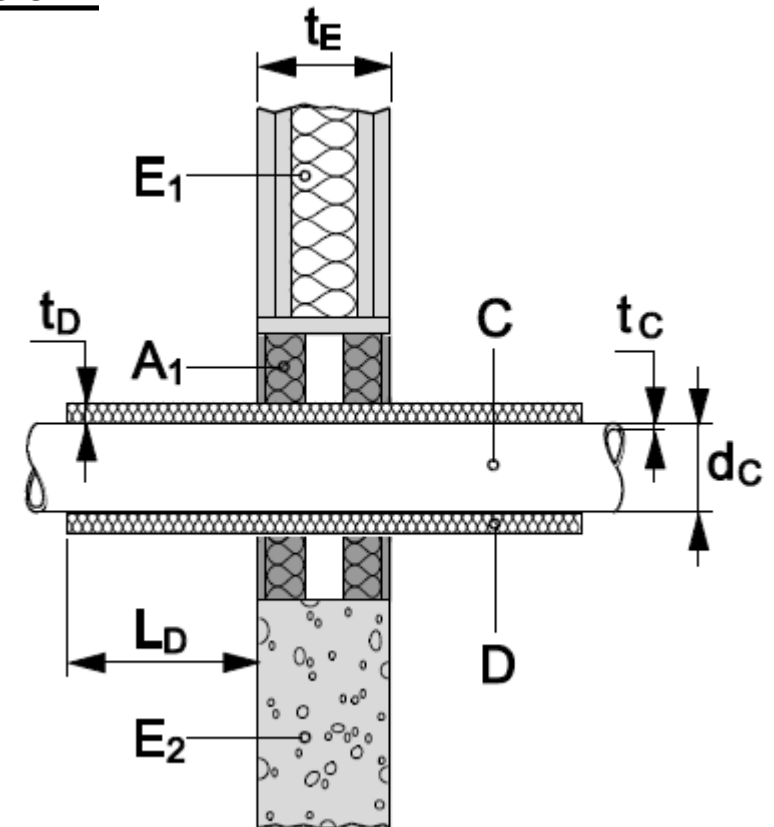
Pipe Diameter d _c (mm)	Pipe wall thickness t _c (mm)	Insulation thickness t _D (mm)	Length of Insulation L _D (mm)	Classification (Fire Rating) (minutes)	Maximum size of opening (mm)	Minimum size of opening (mm)
26,9 – 48,3	1,4 / 1,6 – 14,2	20	≥ 450	EI 120	d _c + 2xt _D + 2x20	d _c + 2xt _D
48,3	1,6 – 14,2	20 - 40	≥ 500	EI 120		
48,3 - 168,3	1,6 / 2,6 – 14,2	40	≥ 450	EI 90		
			≥ 700	EI 120		

5.2 CAST IRON PIPE – FLEXIBLE PARTITION WALL

- CFS-CT Coated Board for Cast Iron pipe without continued insulation:**

Flexible wall	Steel studs lined on both faces. Minimum 2 layers of 12,5mm thick boards. Refer to Hilti for single-layer partition statement
Minimum thickness of partition	≥ 100mm
Description	Opening to be framed with drywall lining 12,5mm
Material of pipes	Metal pipes with lower heat conductivity than unalloyed steel and a melting point of minimum 1100°C, e.g. low alloyed steel, cast iron, stainless steels, Ni alloys (NiCu, NiCr and NiMo alloys)
Sizes of pipes	See table
Spacing between openings	≥ 200mm between adjacent openings
Spacing between metal pipes	≥ 0mm
Maximum opening size	1200 x 1200mm
Minimum thickness of sealant	≥ 10mm applied in all edges of the board with Hilti CFS-S ACR (CP606)
Distance to seal edge	≥ 3mm
Insulation	Hilti Sleeve CP645 or Mineral wool as per ETA
Supports distance	≤ 250mm from face of the wall
Approval reference	ETA-11/0429 – (EN1366-3)
Fire Rating	See table (Higher Fire Rating values can be achieved)

Pipe Diameter d_c (mm)	Pipe wall thickness t_c (mm)	Insulation thickness t_D (mm)	Length of Insulation L_D (mm)	Classification (Fire Rating) (minutes)	Size of opening in batt (mm)
48.3	1.6 – 14.2	20	≥ 450	EI 90	d_c
114.3	2.0 – 14.2	40	≥ 1000	EI 120	
159.0	2.6 – 14.2	40	≥ 1000	EI 60	
114.3 – 159.0	2.0 / 2.6 – 14.2	40	≥ 1000	EI 60	
159.0 – 323.9	2.6 / 4.0 – 14.2	40	≥ 1000	EI 30	

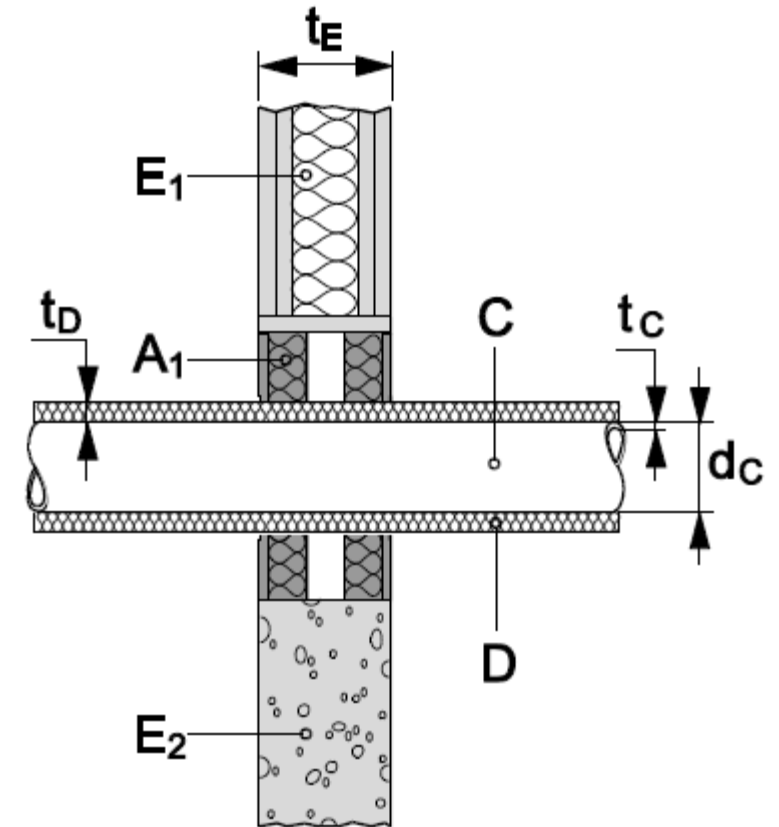


Legend	
A₁	Hilti Firestop Coated Board CFS-CT
C	Penetrating Service - Pipe
d_c	Pipe diameter (nominal outside diameter)
D	Insulation (Hilti Sleeve CP645 or Mineral wool as per ETA)
E	Building element (wall, floor)
L_D	Length of Insulation
t_c	Pipe wall thickness
t_D	Thickness of insulation
t_E	Thickness of the building element

6.1 COPPER PIPE – FLEXIBLE PARTITION WALL

- CFS-CT Coated Board for Copper pipe with continued insulation:**

Flexible wall	Steel studs lined on both faces. Minimum 2 layers of 12,5mm thick boards. Refer to Hilti for single-layer partition statement
Minimum thickness of partition	≥ 100mm
Description	Opening to be framed with drywall lining 12,5mm
Sizes of pipes	See table
Material of pipes	Copper and other metal pipes with lower heat conductivity than copper and a melting point of minimum 1100°C, e.g. unalloyed steel, low alloyed steel, cast iron, stainless steels, Ni alloys (NiCu, NiCr and NiMo alloys) and Ni.
Spacing between openings	≥ 200mm between adjacent openings
Spacing between metal pipes	≥ 0mm between adjacent insulations
Maximum opening size	1200 x 1200mm
Minimum thickness of sealant	≥ 10mm applied in all edges of the board with Hilti CFS-S ACR (CP606)
Distance to seal edge	≥ 3mm
Supports distance	≤ 250mm from face of the wall
Approval reference	ETA-11/0429 – (EN1366-3)
Fire Rating	See table (Higher Fire Rating values can be achieved)



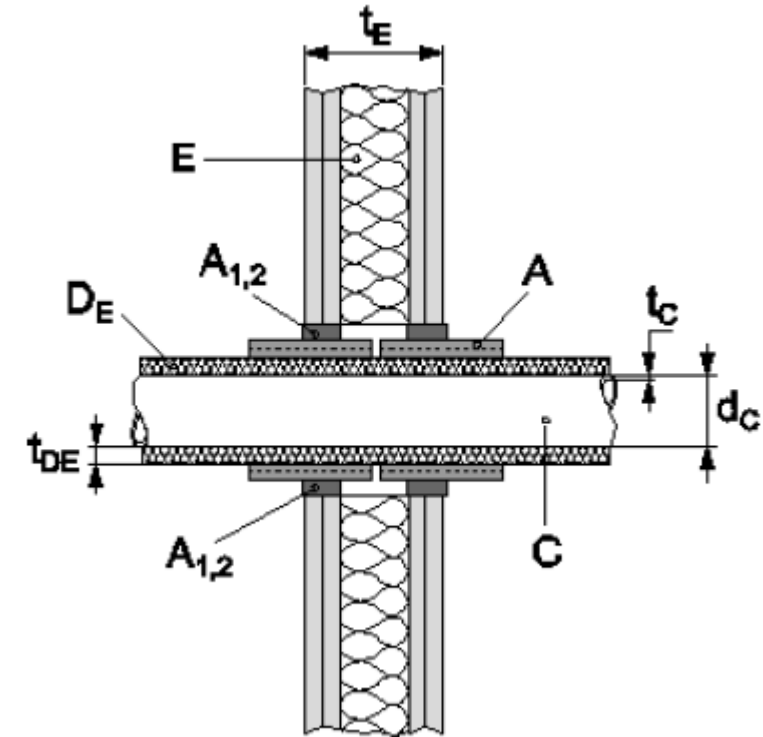
Pipe Diameter d_c (mm)	Pipe wall thickness t_c (mm)	Continued Insulation thickness t_D (mm)	Classification (Fire Rating) (minutes)	Size of opening in batt (mm)
10 – 40	1.0 / 1.5 – 14.2	≥ 20	EI 120	d_c
40 – 88,9	1.5 / 2.0 - 14.2	≥ 40	EI 90	

Legend	
A_1	Hilti Firestop Coated Board CFS-CT
C	Penetrating Service - Pipe
d_c	Pipe diameter (nominal outside diameter)
D	Insulation (Mineral wool as per ETA)
E	Building element (wall, floor)
t_c	Pipe wall thickness
t_D	Thickness of insulation
t_E	Thickness of the building element

6.2 COPPER PIPE – FLEXIBLE PARTITION WALL

- CFS-B Bandage for Copper pipe with continued insulation:**

Flexible wall	Steel studs lined on both faces. Minimum 2 layers of 12,5mm thick boards. Refer to Hilti for single-layer partition statement
Minimum thickness of partition	≥ 100mm
Material of pipes	Copper and other metal pipes with lower heat conductivity than copper and a melting point of minimum 1100°C, e.g. unalloyed steel, low alloyed steel, cast iron, stainless steels, Ni alloys (NiCu, NiCr and NiMo alloys) and Ni.
Sizes of pipes	See table
Spacing between openings	≥ 0mm between adjacent openings
Spacing between pipes	≥ 0mm
Distance to seal edge	≥ 40mm
Minimum thickness of sealant	Total thickness of the wall boards
Maximum annular gap	≤ 15mm
Supports distance	≤ 400mm from face of the wall
Additional Protection	t_{AP} =32mm thick Armaflex ≥ 250mm from face of the board over the CFS-B Bandage
Approval reference	ETA-10/0212 – (EN1366-3)
Fire Rating	See table (Higher Fire Rating values can be achieved)
Installation	CFS-B Bandage in 2 overlapped layers, inserted to the black line, in the middle of the bandage, into the wall. For 100mm thickness walls – 50mm of the bandage inside the wall and 75mm out of the wall.



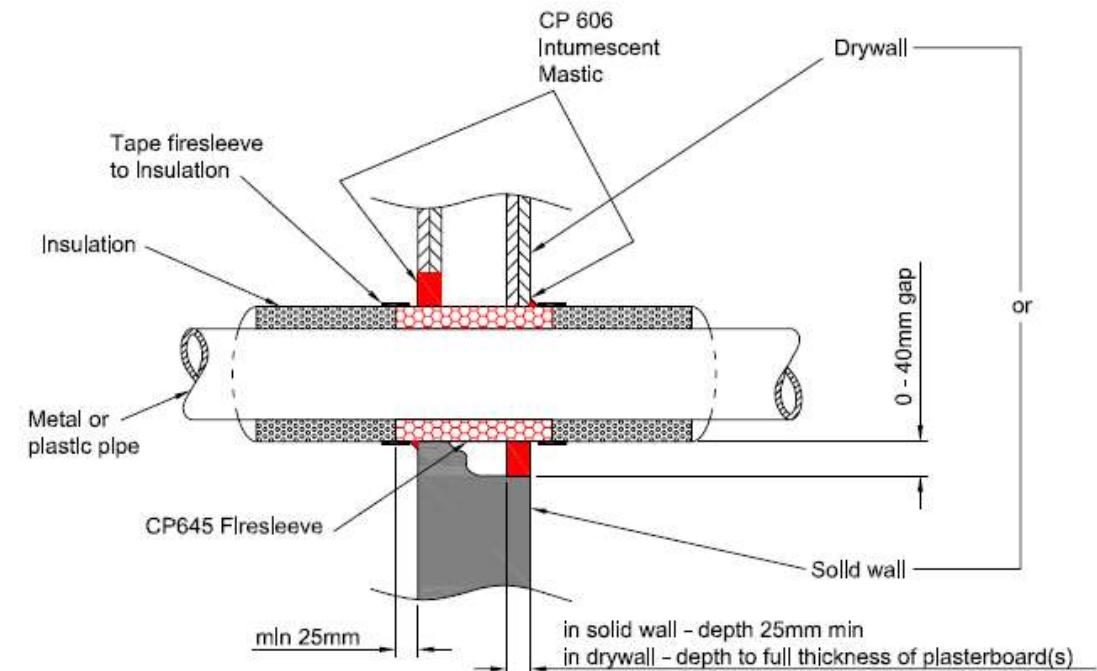
Legend	
A	Hilti Intumescent Bandage CFS-B
A_{1,2}	Hilti Acrylic Sealant CFS-S ACR (CP606)
C	Penetrating Service - Pipe
d_C	Pipe diameter (nominal outside diameter)
D_E	Insulation (Mineral wool as per ETA)
E	Building element (wall, floor)
AP	Additional Protection
t_{AP}	Additional Protection thickness
t_C	Pipe wall thickness
t_{DE}	Thickness of combustible insulation
t_E	Thickness of the building element

Pipe Diameter d_C (mm)	Pipe wall thickness t_C (mm)	Continued Insulation thickness t_D (mm)	Classification (Fire Rating) (minutes)	Maximum size of opening (mm)	Minimum size of opening (mm)
10.0 – 54.0	1.0 – 14.2	30	EI 90	$d_C + 2xt_D + 2x20$	$d_C + 2xt_D$
28.0 – 88.9	1.0 / 2.0 - 14.2	30 + AP	EI90		

6.3 COPPER PIPE – FLEXIBLE PARTITION WALL

- CP645 Intumescent Sleeve for Copper pipe with continued insulation :**

Flexible wall	Steel studs lined on both faces. Minimum 2 layers of 12,5mm thick boards. Refer to Hilti for single-layer partition statement
Minimum thickness of partition	≥ 100mm
Material of pipes	Copper and other metal pipes with lower heat conductivity than copper and a melting point of minimum 1100°C, e.g. unalloyed steel, low alloyed steel, cast iron, stainless steels, Ni alloys (NiCu, NiCr and NiMo alloys) and Ni.
Sizes of pipes	See table
Spacing between openings	≥ 200mm between adjacent openings
Minimum thickness of sealant	≥ 25mm
Maximum annular gap	≤ 20mm (Binder)
Overhang from drywall surface	≥ 25mm
Supports distance	≤ 270mm from face of the wall
Approval reference	Firestop Binder CP645 (BS476 pt20) (BSEN1366-3)
Fire Rating	See table

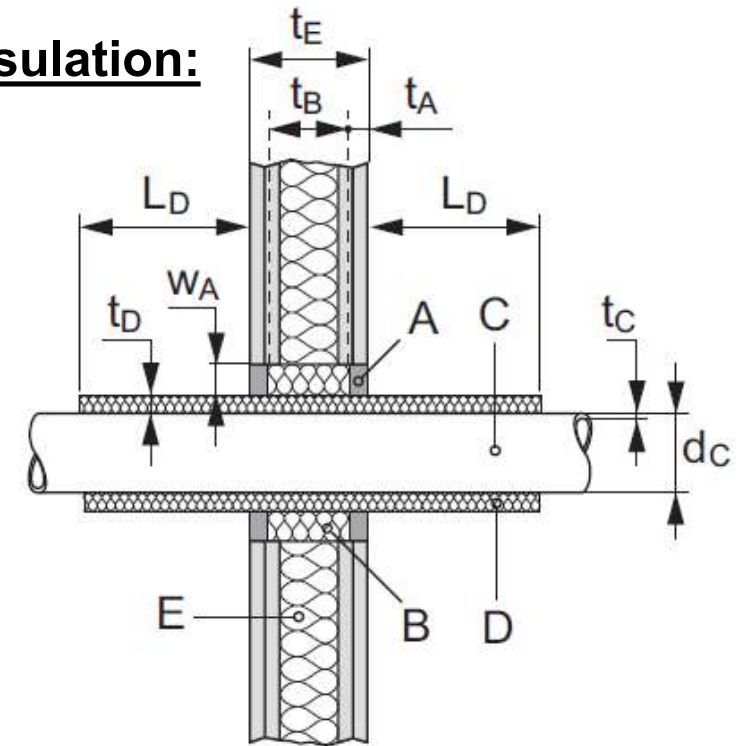


Pipe Diameter d_c (mm)	Pipe wall thickness t_c (mm)	Continued Insulation thickness t_D (mm)	Classification (Fire Rating) (minutes)	Maximum size of opening (mm)	Minimum size of opening (mm)
17 - 75	N/A	N/A	EI 120	$d_c + 2xt_D + 2x20$	$d_c + 2xt_D$

7.1 COPPER PIPE – FLEXIBLE PARTITION WALL

• CFS-S ACR (CP606) Sealant for Copper pipe without continued insulation:

Flexible wall	Steel studs lined on both faces. Minimum 2 layers of 12,5mm thick boards. Refer to Hilti for single-layer partition statement
Minimum thickness of partition	≥ 100mm
Material of pipes	Copper and other metal pipes with lower heat conductivity than copper and a melting point of minimum 1100°C, e.g. unalloyed steel, low alloyed steel, cast iron, stainless steels, Ni alloys (NiCu, NiCr and NiMo alloys) and Ni.
Sizes of pipes	See table
Spacing between openings	≥ 200mm between adjacent openings
Minimum thickness of sealant	≥ 10mm
Maximum annular gap	≤ 20mm (Binder)
Backfilling material	Loose stone wool or stone wool mats with a minimum density of 45 kg/m ³
Insulation	Hilti Sleeve CP645 or Mineral wool as per ETA
Supports distance	≤ 270mm from face of the wall
Approval reference	ETA-10/0292 – (EN1366-3) Firestop Binder CP606 (BS476)
Fire Rating	See table (Higher Fire Rating values can be achieved)



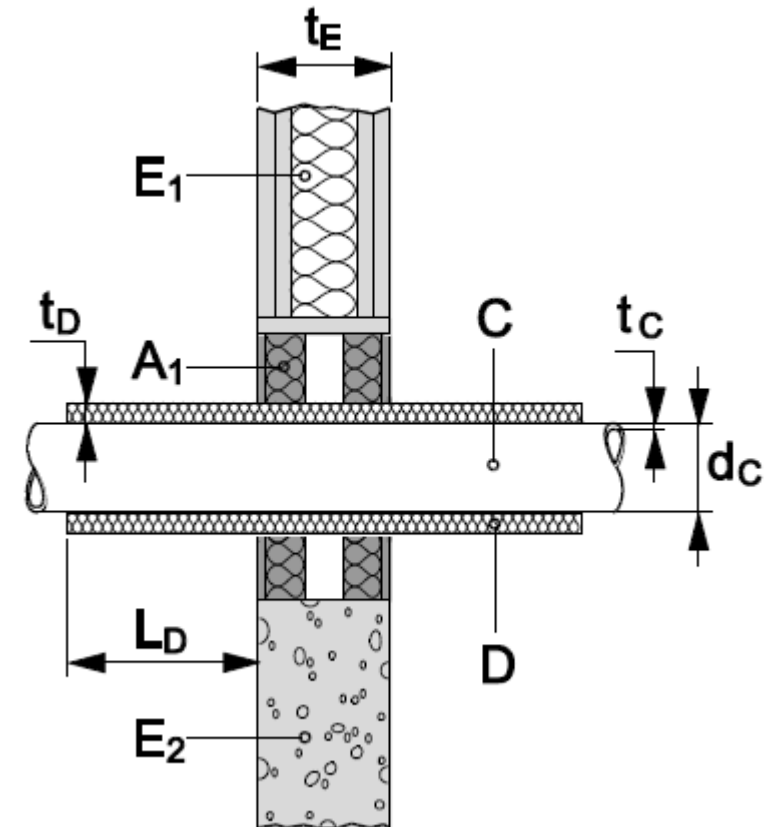
Legend	
A	Hilti Firestop Acrylic Sealant CFS-S ACR (CP606)
B	Backfilling material
C	Penetrating Service - Pipe
d_c	Pipe diameter (nominal outside diameter)
w_A	Width of penetration seal (Annular gap)
D	Insulation (Hilti Sleeve CP645 or Mineral wool as per ETA)
E	Building element (wall, floor)
L_D	Length of Insulation
t_A	Thickness of Hilti Firestop Acrylic Sealant CFS-S ACR (CP606)
t_B	Thickness of backfilling material
t_C	Pipe wall thickness
t_D	Thickness of insulation
t_E	Thickness of the building element

Pipe Diameter d _c (mm)\	Pipe wall thickness t _c (mm)	Insulation thickness t _D (mm)	Length of Insulation L _D (mm)	Classification (Fire Rating) (minutes)	Maximum size of opening (mm)	Minimum size of opening (mm)
28 – 42	1,0 / 1,5 – 14,2	20	≥ 450	EI 120	d _c + 2xt _D + 2x20	d _c + 2xt _D
42	1,5 – 14,2	20 - 40	≥ 500	EI 120		
42 - 88,9	1,5 / 2,0 – 14,2	40	≥ 500	EI 90		
			≥ 700	EI 120		

7.2 COPPER PIPE – FLEXIBLE PARTITION WALL

- CFS-CT Coated Board for Copper pipe without continued insulation:**

Flexible wall	Steel studs lined on both faces. Minimum 2 layers of 12,5mm thick boards. Refer to Hilti for single-layer partition statement
Minimum thickness of partition	≥ 100mm
Description	Opening to be framed with drywall lining 12,5mm
Material of pipes	Copper and other metal pipes with lower heat conductivity than copper and a melting point of minimum 1100°C, e.g. unalloyed steel, low alloyed steel, cast iron, stainless steels, Ni alloys (NiCu, NiCr and NiMo alloys) and Ni.
Sizes of pipes	See table
Spacing between openings	≥ 200mm between adjacent openings
Spacing between metal pipes	≥ 0mm
Maximum opening size	1200 x 1200mm
Minimum thickness of sealant	≥ 10mm applied in all edges of the board with Hilti CFS-S ACR (CP606)
Distance to seal edge	≥ 3mm
Insulation	Hilti Sleeve CP645 or Mineral wool as per ETA
Supports distance	≤ 250mm from face of the wall
Approval reference	ETA-11/0429 – (EN1366-3)
Fire Rating	See table (Higher Fire Rating values can be achieved)



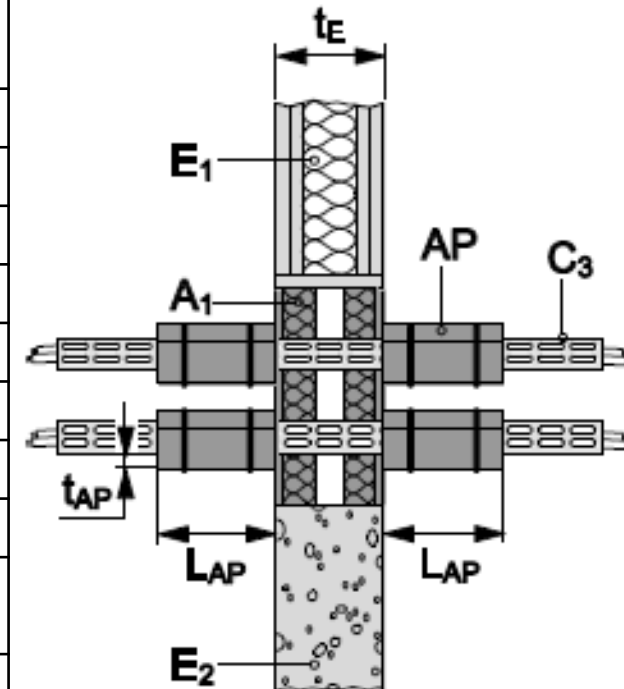
Legend	
A ₁	Hilti Firestop Coated Board CFS-CT
C	Penetrating Service - Pipe
d _c	Pipe diameter (nominal outside diameter)
D	Insulation (Hilti Sleeve CP645 or Mineral wool as per ETA)
E	Building element (wall, floor)
L _D	Length of Insulation
t _c	Pipe wall thickness
t _D	Thickness of insulation
t _E	Thickness of the building element

Pipe Diameter d _c (mm)	Pipe wall thickness t _c (mm)	Insulation thickness t _D (mm)	Length of Insulation L _D (mm)	Classification (Fire Rating) (minutes)	Minimum size of opening (mm)
10	1,0 – 14,2	20 - 30	≥ 500	EI 120	d _c
10 – 40	1,0 / 1,5 – 14,2	20	≥ 500	EI 120	
40 – 88,9	1,5 / 2,0 – 14,2	40	≥ 1000	EI 90	

8.1 CABLES – FLEXIBLE PARTITION WALL

- CFS-CT Coated Board for cables, wires and bundles:**

Flexible wall	Steel studs lined on both faces. Minimum 2 layers of 12,5mm thick boards. Refer to Hilti for single-layer partition statement
Minimum thickness of partition	≥ 100mm
Description	Penetration to be framed with drywall lining 12,5mm
Maximum opening size	1200x1200mm
Minimum thickness of sealant	≥ 10mm applied in all edges of the board with Hilti CFS-S ACR (CP606)
Spacing between openings	≥ 200mm between adjacent openings
Minimum spacing between horizontal baskets	≥ 0mm
Minimum spacing between cables and basket above	≥ 50mm
Supports distance	≤ 250mm from face of the wall
Additional Protection (AP)	≥ 2mm coating with Hilti Firestop Coating CFS-CT over a length of services of 200 mm from the surface of the seal
Approval reference	ETA-11/0429 (EN1366-3)
Fire Rating	See table (Higher Fire Rating values can be achieved)



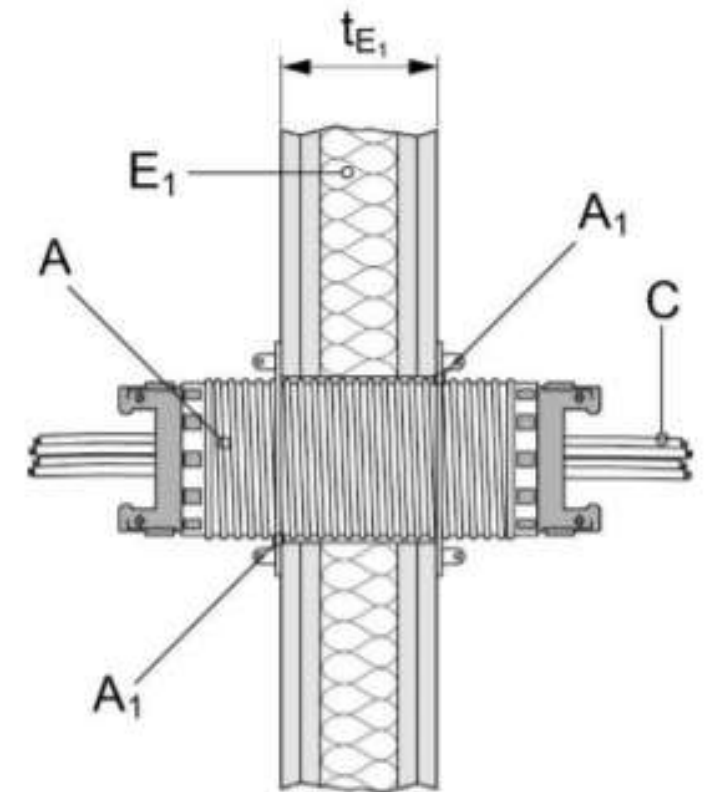
Cable Disposition (mm)	Classification (Fire Rating) (minutes)
All sheathed cable types currently and commonly used in building practice in Europe (e.g. power, control, signal, telecommunication, data, optical fibre cables, with or without cable supports, with a diameter of:	
Ø ≤ 21mm	EI 90
21mm ≤ Ø ≤ 50mm	EI 90
50mm ≤ Ø ≤ 80mm	EI 90
Non-sheathed cables (wires) currently and commonly used in building practice in Europe, with or without cable supports, with a diameter of:	
Ø ≤ 17mm	EI 60
Ø ≤ 24mm	EI 60
Tied cable bundle, maximum diameter of single cable 21 mm, with or without cable supports:	
Ø ≤ 100mm	EI 90

Legend	
A₁	Hilti Firestop Coated Board CFS-CT
C₃	Penetrating Service - Cables
E	Building element (wall, floor)
AP	Additional Protection
L_{AP}	Length of Additional Protection
t_{AP}	Thickness of Additional Protection
t_E	Thickness of the building element

8.2 CABLES – FLEXIBLE PARTITION WALL

- CFS-SL GA Speed sleeve for cables, wires and bundles:**

Flexible wall	Steel studs lined on both faces. Minimum 2 layers of 12,5mm thick boards. Refer to Hilti for single-layer partition statement
Minimum thickness of partition	CFS-S SL GA Small = 100mm CFS-S SL GA Medium/Large = 200mm
Maximum thickness of partition	CFS-S SL GA Small = 200mm CFS-S SL GA Medium/Large = 300mm
Spacing between openings	≥ 200mm (distance between adjacent devices)
Minimum opening size	CFS-S SL GA Small Ø = 63mm CFS-S SL GA Medium/Large Ø = 113mm
Maximum opening size	CFS-S SL GA Small Ø = 73mm CFS-S SL GA Medium/Large Ø = 122mm
Fixing of the collar	No fixing required, flanges hold device in place
Supports distance	≤ 250mm from face of the wall
Approval reference	ETA-17/0081
Fire Rating	See table



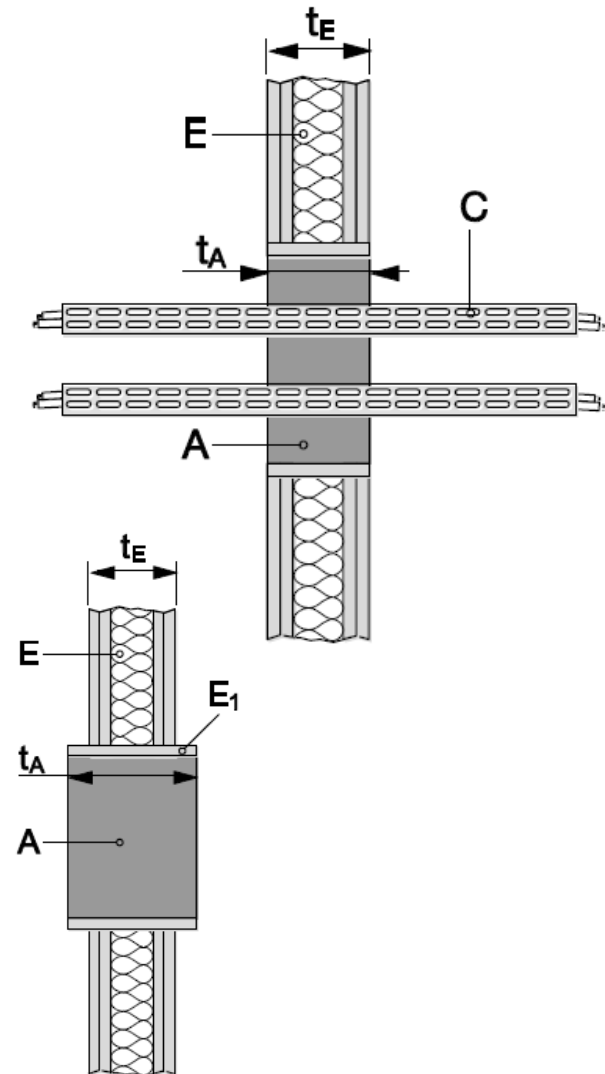
Cable Disposition (mm)	Classification CFS-SL GA S	Classification CFS-SL GA M/L
Blank Device	EI 120	EI 120
All sheathed cables Ø ≤ 21mm	EI 90	EI 90
All sheathed cables Ø ≤ 50mm	-	EI 90
All sheathed cables Ø ≤ 80mm	-	EI 60
Cable bundles Ø ≤ 36mm // All sheathed cables Ø ≤ 21mm	EI 90	-
Cable bundles Ø ≤ 86mm // All sheathed cables Ø ≤ 21mm	-	EI 90
100% filled device with cables Ø ≤ 21mm	EI 60	EI 90
Conduits Ø ≤ 25mm (CFS-SL GA S)	EI 120	-
Conduits Ø ≤ 63mm (CFS-SL GA M/L)	-	EI 90

Legend	
A	Hilti Firestop Sleeve CFS-SL GA
A₁	Rubber Gasket
C₃	Penetrating Service – Cables, conduits
E	Building element (wall, floor)
t_E	Thickness of the building element

8.3 CABLES – FLEXIBLE PARTITION WALL

- CFS-F FX Intumescent Foam for cables, wires and bundles:**

Flexible wall	Steel studs lined on both faces. Minimum 2 layers of 12,5mm thick boards. Refer to Hilti for single-layer partition statement
Minimum thickness of partition	≥ 100mm
Description	Penetration to be framed with drywall lining 12,5mm
Maximum opening size	600x600mm
Minimum thickness of Foam	≥ 150mm (If thickness of wall $t_E \leq t_A$ then see image below)
Spacing between openings	≥ 200mm between adjacent openings
Minimum spacing between horizontal baskets	≥ 0mm
Minimum spacing between cables and basket above	≥ 50mm
Supports distance	≤ 300mm from face of the wall
Approval reference	ETA-10/0109 (EN1366-3)
Fire Rating	See table (Higher Fire Rating values can be achieved)



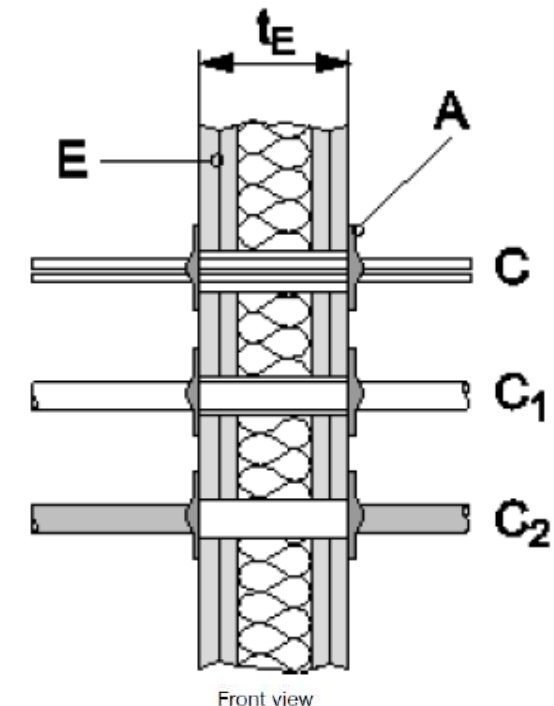
Cable Disposition (mm)	Classification (Fire Rating) (minutes)
All sheathed cable types currently and commonly used in building practice in Europe (e.g. power, control, signal, telecommunication, data, optical fibre cables, with or without cable supports, with a diameter of:	
Ø ≤ 21mm	EI 60
21mm ≤ Ø ≤ 50mm	EI 60
50mm ≤ Ø ≤ 80mm	EI 60
All sheathed single core cables Ø ≤ 21mm	EI 120
Sheathed multi-core halogen free cables according to HD 604.5 Ø ≤ 50mm	EI 90
Single sheathed multi-core rubber cables according to HD 22.4 Ø ≤ 80mm	EI 120
Tied cable bundle, maximum diameter of single cable ≤ 21 mm, with or without cable supports: Ø ≤ 100mm	EI 60

Legend	
A₁	Hilti Firestop Foam CFS-F FX
C₃	Penetrating Service - Cables
E	Building element (wall, floor)
t_A	Thickness of Hilti Firestop Foam CFS-F FX
t_E	Thickness of the building element

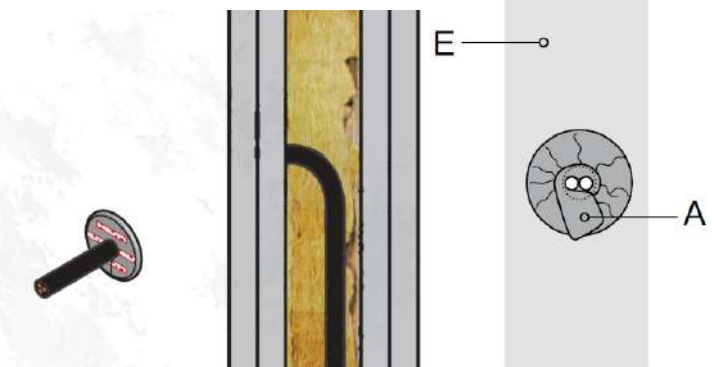
8.4 CABLES, CONDUITS, TUBES – FLEXIBLE PARTITION WALL

- CFS-D 25 Cable Disc for cables, conduits and tubes:**

Flexible wall	Steel studs lined on both faces. Minimum 2 layers of 12,5mm thick boards. Refer to Hilti for single-layer partition statement
Minimum thickness of partition	≥ 100mm
Maximum opening size	25x25mm or Ø≤25mm
Applications (both sides and one side penetration)	Penetrations of cables, which exits or penetrates the wall from one side only, are sealed as standard penetration but at penetration side only.
Spacing between openings	≥ 5mm distance between openings with/without cables or with conduits, to other openings with/without cables. Installation by overlapping discs ≥ 150mm distance between openings with copper pipes to other service)
Supports distance	≤ 500mm from face of the wall
Approval reference	ETA-16/0050
Fire Rating	See table (Higher Fire Rating values can be achieved)



Cable, conduit or tube Disposition (mm)	Classification (Fire Rating) (minutes)
Empty openings	EI 90
Multi-conductor cables Ø ≤ 13 mm (copper content: ≤ 7,5 mm ²)	EI120
Multi-conductor cables Ø ≤ 19 mm (except non sheathed cables (wires)) (copper content: ≤ 40 mm ²)	EI 90
Single-conductor cables Ø ≤ 14 mm (except non sheathed cables (wires)) (copper content: ≤ 1x35 mm ²)	EI 90
All cable types Ø ≤ 21 mm (except non sheathed cables (wires))	EI 60
Plastic conduits, Ø ≤ 16 mm When separation between wall openings of adjacent penetration seals ≥ 150 mm (conduit wall thickness ≥ 1 mm)	EI 90
Plastic conduits, Ø ≤ 16 mm When separation between wall openings of adjacent penetration seals ≥ 5 mm (conduit wall thickness ≥ 1 mm)	EI 60
Copper pipes/tubes, Ø ≤ 16 mm When separation between wall openings of adjacent penetration seals ≥ 150 mm (tube wall thickness ≤ 1 mm)	EI 60

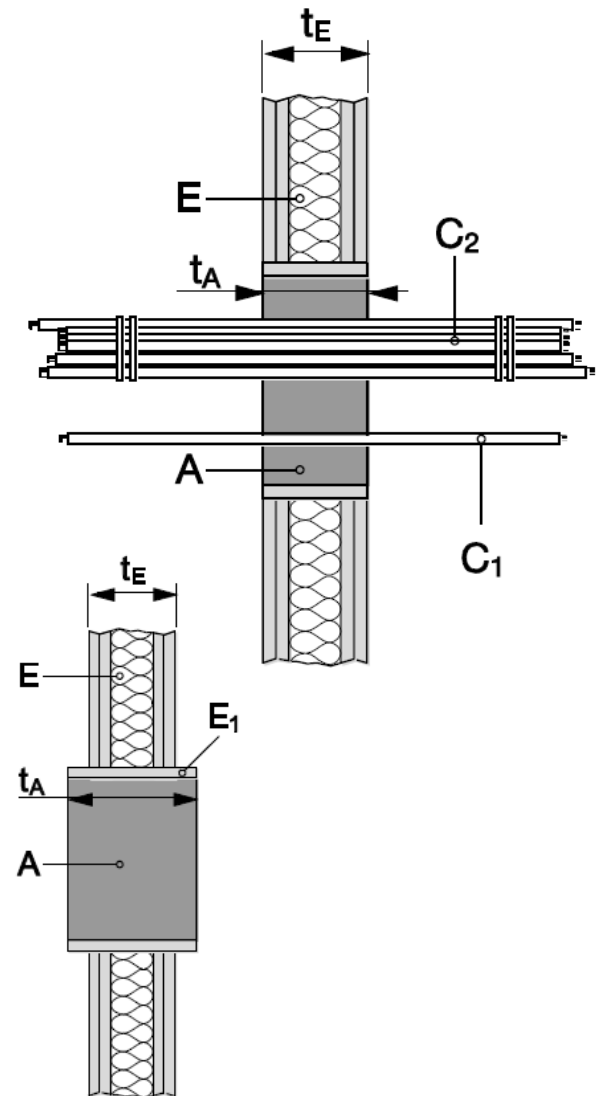


Legend	
A	Hilti Firestop Foam Cable Disc CFS-D 25
E	Building element (wall, floor)
t_E	Thickness of the building element
C	Cables
C₁	Conduit
C₂	Metal pipe / tube

8.5 CABLES, CONDUITS, TUBES – FLEXIBLE PARTITION WALL

- CFS-F FX Intumescent Foam for cables, conduits and tubes:**

Flexible wall	Steel studs lined on both faces. Minimum 2 layers of 12,5mm thick boards. Refer to Hilti for single-layer partition statement
Minimum thickness of partition	≥ 100mm
Description	Penetration to be framed with drywall lining 12,5mm
Maximum opening size	600x600mm
Minimum thickness of Foam	≥ 100mm (If thickness of wall $t_E \leq t_A$ then see image below)
Spacing between openings	≥ 200mm between adjacent openings
Supports distance	≤ 300mm from face of the wall
Approval reference	ETA-10/0109 (EN1366-3)
Fire Rating	See table (Higher Fire Rating values can be achieved)



Conduit or tube Disposition (mm)	Classification (Fire Rating) (minutes)	
	Thickness of Foam CFS-F FX $t_A \geq 100\text{mm}$	Thickness of Foam CFS-F FX $t_A \geq 200\text{mm}$
Steel conduits and tubes, $\varnothing \leq 16\text{ mm}$ (The field of application given above is also valid for other metal conduits or tubes with lower heat conductivity than unalloyed steel and a melting point of minimum 1050°C, e.g. low alloyed steels, stainless steels, Ni alloys (NiCu, NiCr and NiMo alloys)).	EI 90	EI 120
Plastic conduits and tubes, $\varnothing \leq 16\text{ mm}$	EI 120	EI 120
Flexible plastic conduits (Polyolefin, PVC), $16\text{mm} \leq \varnothing \leq 32\text{ mm}$	-	EI 120
Rigid plastic conduits (Polyolefin, PVC), $16\text{mm} \leq \varnothing \leq 32\text{ mm}$	-	EI 120
Bundle of plastic conduits (Polyolefin, PVC), conduits flexible or rigid, $16\text{mm} \leq \varnothing \leq 32\text{ mm}$ $\varnothing \leq 100\text{ mm}$	-	EI 120

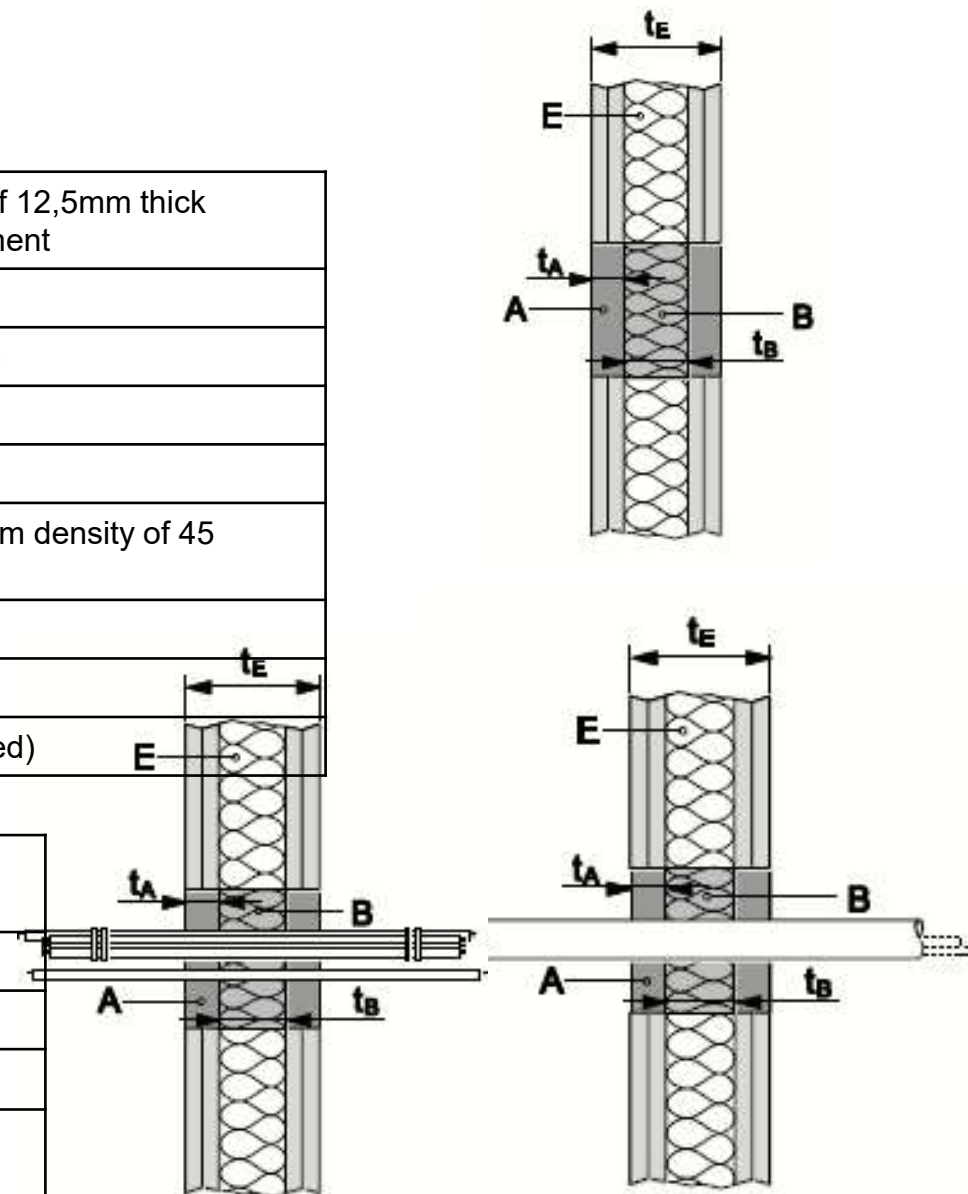
Legend	
A₁	Hilti Firestop Foam CFS-F FX
C₁, C₂	Penetrating Service – Cables, conduits, tubes
E	Building element (wall, floor)
t_A	Thickness of Hilti Firestop Foam CFS-F FX
t_E	Thickness of the building element

8.6 CABLES, CONDUITS, TUBES – FLEXIBLE PARTITION WALL

- **CFS-IS Intumescent sealant for cables, conduits and tubes:**

Flexible wall	Steel studs lined on both faces. Minimum 2 layers of 12,5mm thick boards. Refer to Hilti for single-layer partition statement
Minimum thickness of partition	≥ 100mm
Description	Penetration to be framed with drywall lining 12,5mm
Maximum opening size	150x150mm
Minimum thickness of Sealant	≥ 25mm (t_A)
Backfilling material	Loose stone wool or stone wool mats with a minimum density of 45 kg/m ³
Supports distance	≤ 250mm from face of the wall
Approval reference	ETA-10/01406 (EN1366-3)
Fire Rating	See table (Higher Fire Rating values can be achieved)

Cable, conduit or tube Disposition (mm)	Classification (Fire Rating) (minutes)
Blank seal (no services)	EI 120
All sheathed cables - maximum Ø 21 mm	EI120
All sheathed cables – 21 ≤ Ø ≤ 80 mm	EI 60
Tied cable bundle, maximum diameter of 100 mm, maximum diameter of single cable 21 mm (several cables running in the same direction and bound closely together by mechanical means)	EI 90
Small steel conduits and tubes, Ø ≤ 16 mm, arranged linear, with or without cables	EI 120
Small plastic conduits and tubes, Ø ≤ 16 mm, arranged linear, with or without cables	EI 120
Plastic conduits, 16 ≤ Ø ≤ 32 mm, Wall thickness 1 – 3 mm, arranged linear o in a cluster, with or without cables	EI 120
Rigid, flexible and pliable plastic conduit up to Ø 40 mm with or without cables and Conduit bundles up to Ø 80 mm	EI 120

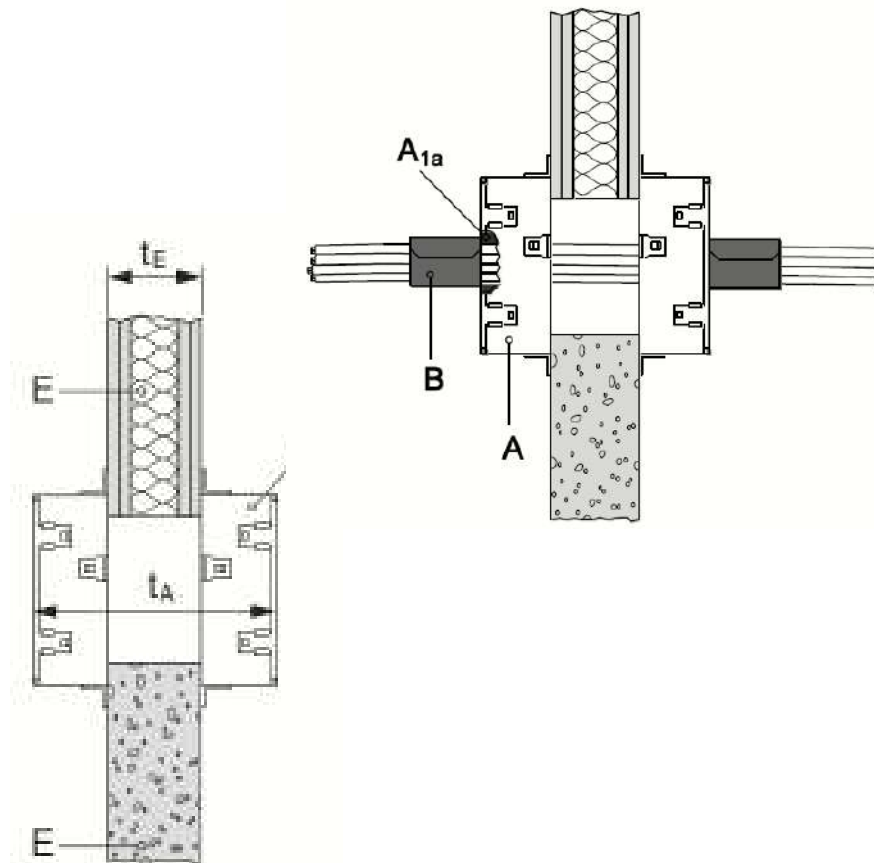


Legend	
A	Hilti Firestop Intumescent Sealant CFS-IS
B	Backfilling material
E	Building element (wall, floor)
t_A	Thickness (depth) of penetration seal
t_B	Thickness (depth) of backfilling material
t_E	Thickness of the building element

8.7 CABLES, CONDUITS, TUBES – FLEXIBLE PARTITION WALL

- CFS-RCC Firestop Rectangular Collar for cables, conduits and tubes:**

Flexible wall	Steel studs lined on both faces. Minimum 2 layers of 12,5mm thick boards. Refer to Hilti for single-layer partition statement
Minimum thickness of partition	≥ 100mm
Description	Penetration to be framed with drywall lining 12,5mm
Maximum opening size	581x181mm
Minimum distance between any two or more services	≥ 20mm
Fixing of the collar	M6 HUS screw anchors or M8 threaded rods through the wall + flat washer & nuts on both sides
Approval reference	ETA-16/0382
Fire Rating	See table (Rates for single CFS-RCC used on both sides)



Cable, conduit or tube Disposition (mm)	Classification (Fire Rating) (minutes)
Blank seal (no services)	EI 120
Small cables $\varnothing \leq 21$ mm	EI 120
Small cables $\varnothing \leq 21$ mm, bended 90°	EI 90
Medium and large cables $21 \leq \varnothing \leq 80$ mm	EI 90
Cable bundles $\varnothing \leq 150$ mm	EI 120
Non sheated cables (wires)	EI 60
Single conduits, $\varnothing \leq 16$ mm	EI 120
Single conduits, $\varnothing \leq 50$ mm	EI 120
Conduit bundle	EI 120

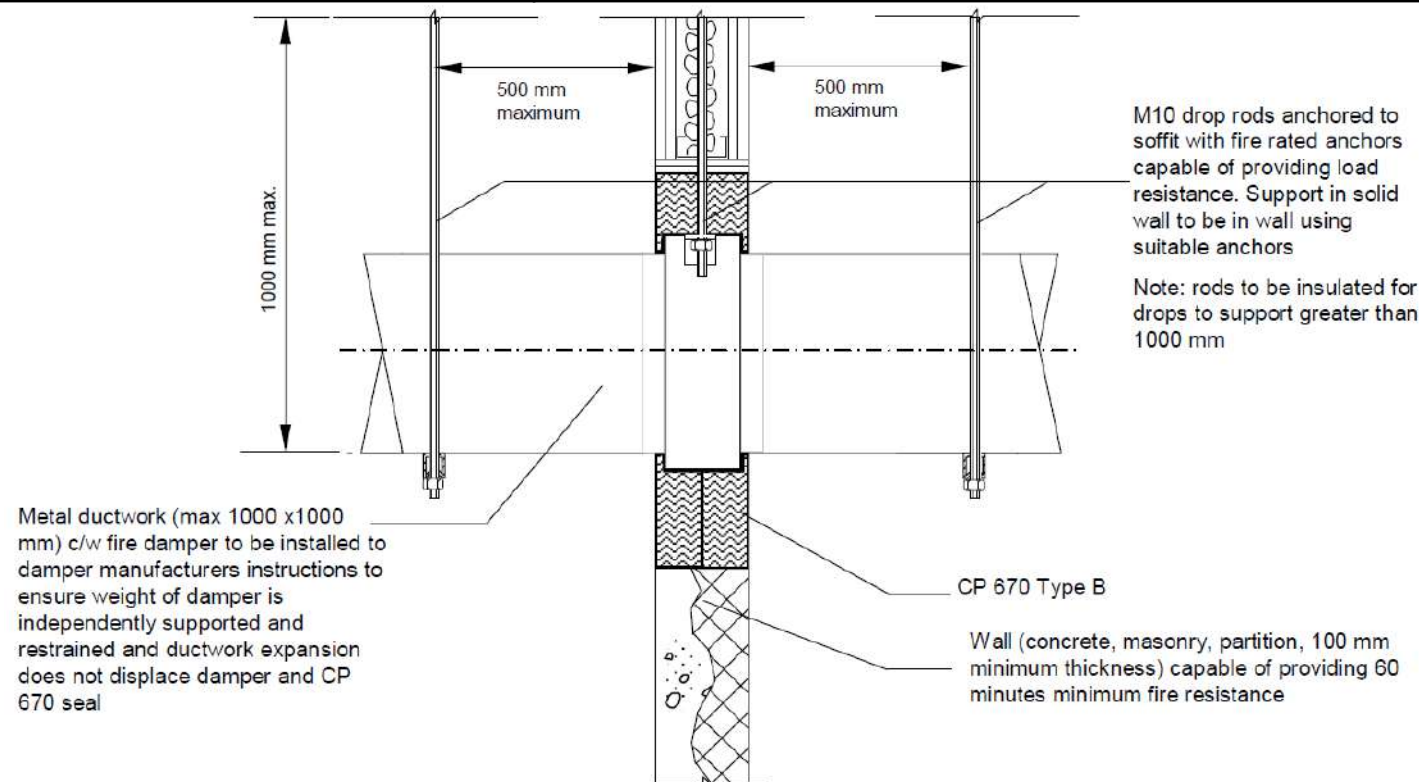
Legend	
A	Hilti Firestop cable collar CFS-RCC
A_{1A}	Hilti Firestop filler CFS-F FX
B	2 payers of Hilti CFS-P BA firestop putty bandage
E	Building element
t_A	Thickness of seal
t_E	Thickness of the building element

9.1 DAMPER (IN LINE) – FLEXIBLE PARTITION WALL

- CFS-CT Coated Board (CP670) :**

Flexible wall	Steel studs lined on both faces. Minimum 2 layers of 12,5mm thick boards. Refer to Hilti for single-layer partition statement
Minimum thickness of partition	≥ 100mm
Fire Damper	To be installed to damper manufacturers instructions to ensure weight of damper is independently supported and restrained and ductwork expansion does not displace damper and sealed opening
Maximum metal ductwork size	≤ 1000 x 1000mm
Maximum opening size	≤ 1000mm height x Any length wide
Spacing between openings	≥ 200mm between adjacent openings
Firestop Coated Boards	Double coated board – 2x50mm CFS-CT Hilti Coated Board
Minimum thickness of sealant	≥ 10mm applied in all edges of the board with Hilti CFS-S ACR (CP606)
Supports distance	≤ 500mm from face of the wall
Approval reference	Firestop Binder CP670 (BS476 pt20) (BSEN1366-3)
Fire Rating	EI 60

Requires specific Engineering Judgement

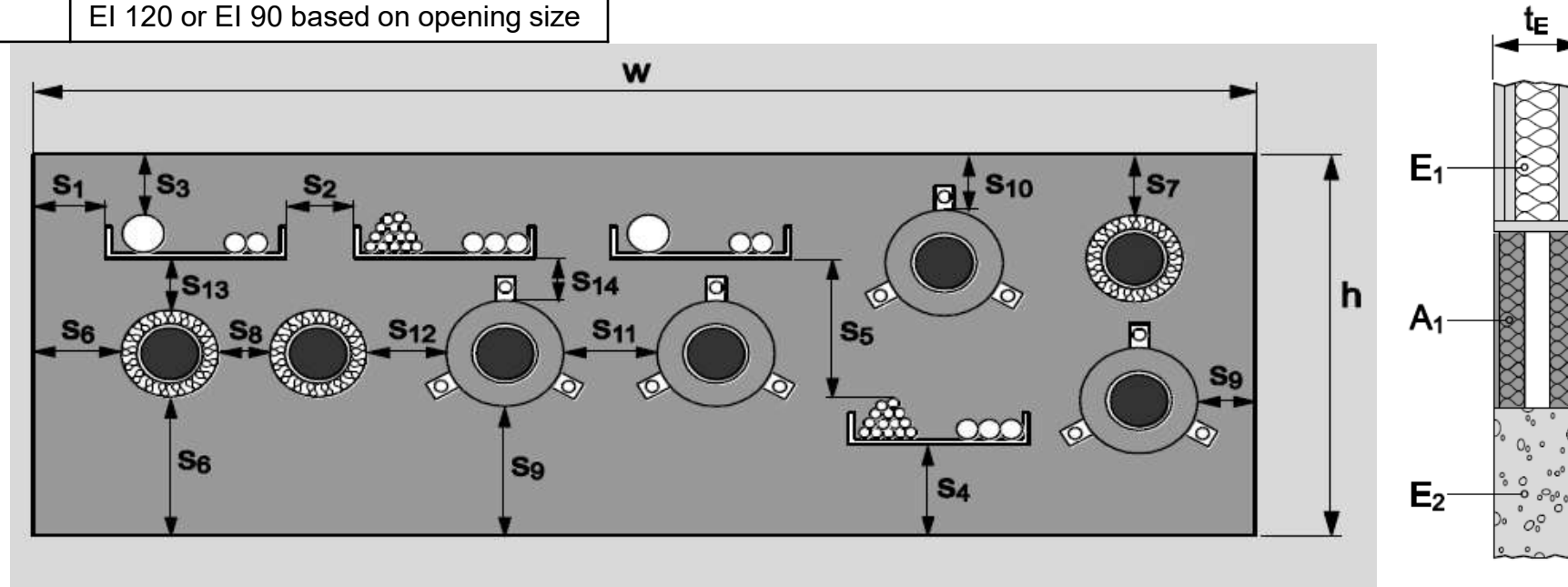


10.1 MULTIPLE PENETRATIONS – FLEXIBLE PARTITION WALL

- CFS-CT Coated Board:**

Flexible wall	Steel studs lined on both faces. Minimum 2 layers of 12,5mm thick boards. Refer to Hilti for single-layer partition statement
Minimum thickness of partition	≥ 100mm
Description	Opening to be framed with drywall lining 12,5mm
Spacing between openings	≥ 200mm between adjacent openings
Firestop Coated Boards	Double coated board – 2x50mm CFS-CT Hilti Coated Board
Minimum thickness of sealant	≥ 10mm applied in all edges of the board with Hilti CFS-S ACR (CP606)
Maximum opening size – Blank Seal	1200mm x 1200mm (width x height) – EI 120 1200mm x 2000mm (width x height) – EI 90
Supports distance	≤ 250mm from face of the wall
Approval reference	ETA-11/0429
Fire Rating	EI 120 or EI 90 based on opening size

Legend
$s_1 = 0$ (distance between cables/cable supports and seal edge)
$s_2 = 0$ (distance between cable supports)
$s_3 = 0$ (distance between cables and upper seal edge)
$s_4 = 0$ (distance between cable supports and bottom seal edge)
$s_5 = 50$ (distance between cables and cable support above)
$s_6 = 3$ (distance between metal pipes and seal edge)
$s_7 = 3$ (distance between metal pipes and upper seal edge)
$s_8 = 0$ (distance between metal pipes)
$s_9 = 17$ (distance between plastic pipes/pipe closure devices and seal edge)
$s_{10} = 17$ (distance between plastic pipes/pipe closure devices and upper seal edge)
$s_{11} = 0$ (distance between plastic pipes/pipe closure devices)
$s_{12} = 30$ (distance between metal pipes and plastic pipes/pipe closure devices)
$s_{13} = 3$ (distance between cables/cable supports and metal pipes)
$s_{14} = 40$ (distance between cables/cable supports and plastic pipes/pipe closure devices)

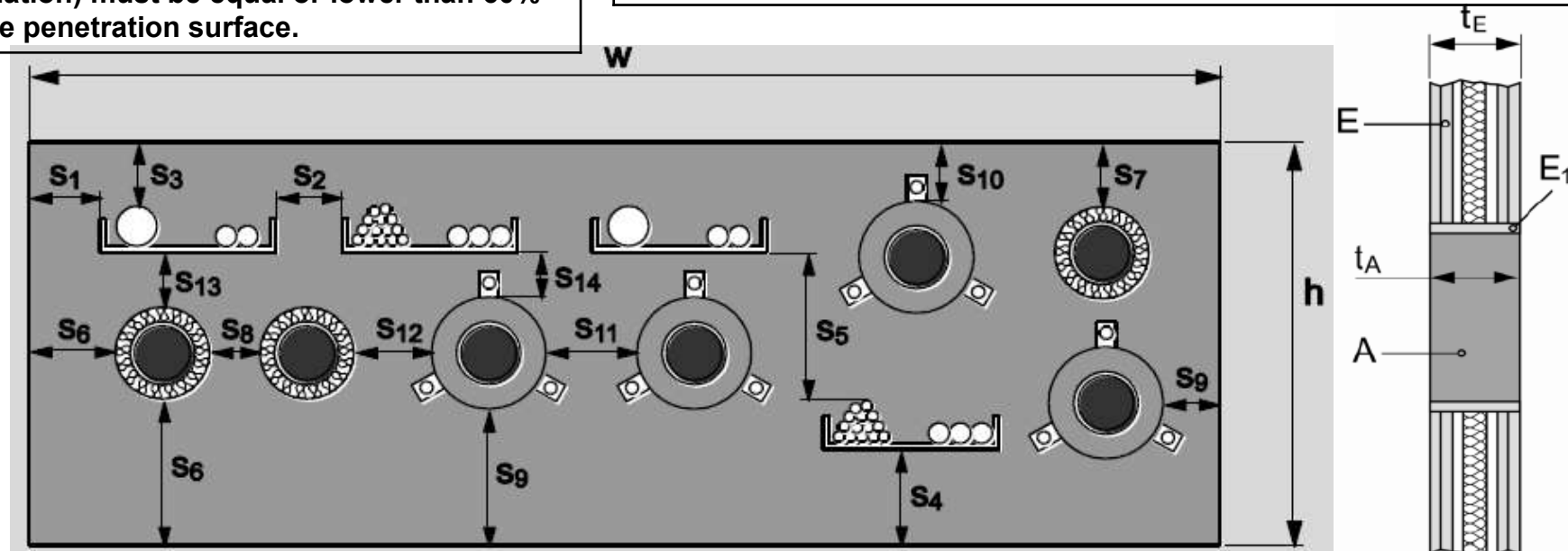


10.2 MULTIPLE PENETRATIONS – FLEXIBLE PARTITION WALL

- CFS-F FX Intumescent Foam:**

Flexible wall	Steel studs lined on both faces. Minimum 2 layers of 12,5mm thick boards. Refer to Hilti for single-layer partition statement
Minimum thickness of partition	≥ 100mm
Description	Opening to be framed with drywall lining 12,5mm
Spacing between openings	≥ 200mm between adjacent openings
Minimum thickness of foam	≥ 100mm
Maximum opening size – Blank Seal	600mm x 600mm (width x height) – EI 120 (For 150mm thickness of foam) 400mm x 400mm (width x height) – EI 90 (For 100mm thickness of foam)
Supports distance	≤ 300mm from face of the wall
Approval reference	ETA-10/0109
Fire Rating	EI 120 or EI 90 based on opening size
Note	Total amount of services (including insulation) must be equal or lower than 60% of the penetration surface.

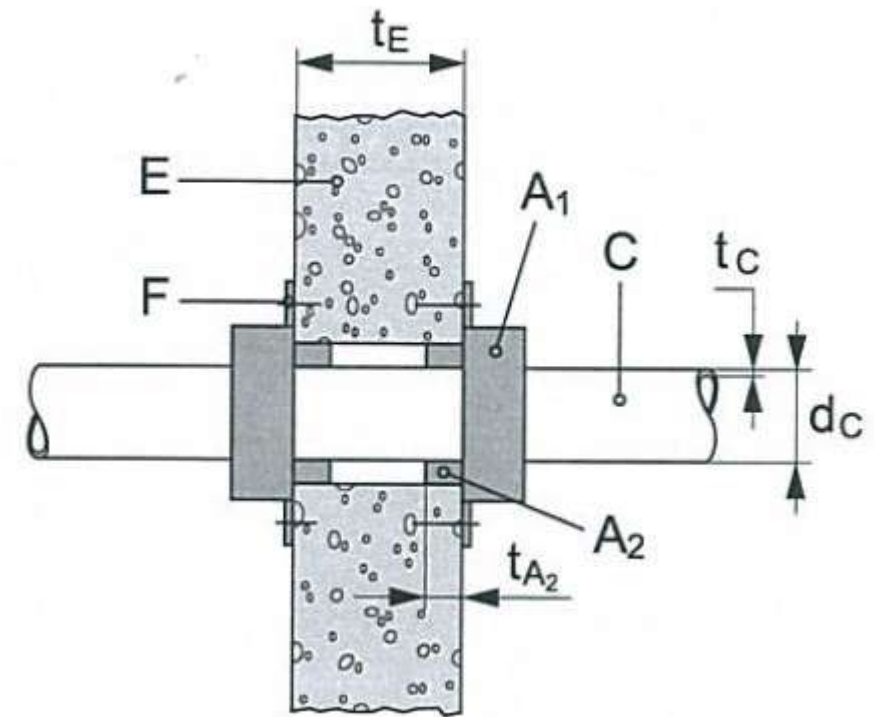
Legend	
s_1	= 0 (distance between cables/cable supports and seal edge)
s_2	= 0 (distance between cable supports)
s_3	= 25 (distance between cables and upper seal edge)
s_4	= 0 (distance between cable supports and bottom seal edge)
s_5	= 50 (distance between cables and cable support above)
s_6	= 0 (distance between metal pipes and seal edge)
s_7	= 20 (distance between metal pipes and upper seal edge)
s_8	= 0 (distance between metal pipes) linear arrangement s_8 = 40 (distance between metal pipes) grouped arrangement
s_9	= 0 (distance between plastic pipes/pipe closure devices and seal edge)
s_{10}	= 20 (distance between plastic pipes/pipe closure devices and upper seal edge)
s_{11}	= 35 (distance between plastic pipes/pipe closure devices)
s_{12}	= 35 (distance between metal pipes and plastic pipes/pipe closure devices)
s_{13}	= 50 (distance between cables/cable supports and metal pipes)
s_{14}	= 50 (distance between cables/cable supports and plastic pipes/pipe closure devices)



11.1 PLASTIC PIPE – RIGID WALL

- CFS-C P Firestop Collar for PVC pipe:**

Rigid wall	Minimum density of 450 kg/m ³ and comprise concrete, aerated concrete or masonry
Minimum thickness of wall	≥ 100mm
Material of pipes	PVC-U According to EN 15493; EN 1452 and DIN 8061/8062; EN 1329-1; EN 1453-1; PVC-C According to EN 1566-1
Sizes of pipes	See table
Spacing between openings	≥ 0mm between adjacent openings
Minimum thickness of sealant	≥ 15mm
Maximum annular gap	Opening size ≤ Collar diameter
Fixing of the collar	Minimum M8 Fire Rated Metal Anchors (Hilti HUS3-H M8)
Supports distance	≤ 300mm from face of the wall
Approval reference	ETA-10/0404
Fire Rating	See table



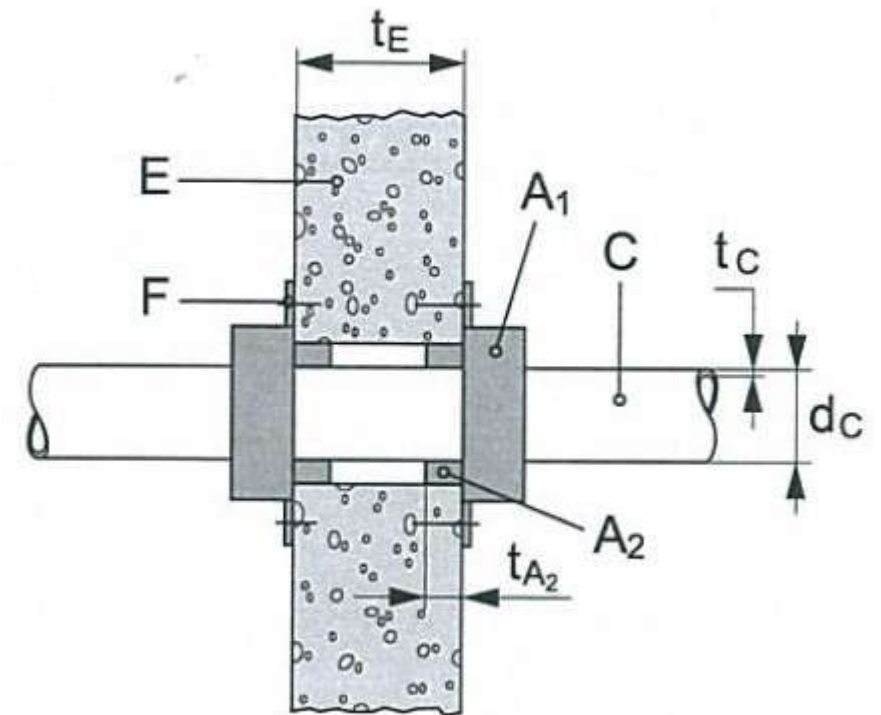
Pipe Diameter d _c (mm)	Pipe wall thickness t _c (mm)	Collar Size (A ₁)	Classification (Fire Rating) (minutes)	Maximum size of opening (mm)	Minimum size of opening (mm)
50	2,4 – 5,6	CFS-C P 50/1.5"	EI 120	67	50
63	3,0 - 4,7	CFS-C P 63/2"	EI 120	82	63
75	2,2 – 3,6	CFS-C P 75/2.5"	EI 120		75
90	2,7 – 4,3	CFS-C P 90/3"	EI 120	117	90
110	2,2 – 8,1	CFS-C P 110/4"	EI 120	146	110
125	3,7 – 6,0	CFS-C P 125/5"	EI 120	166	125
160	2,5 – 11,8	CFS-C P 160/6"	EI 120	236	160

Legend	
A ₁	Hilti Firestop Collar CFS-C P
A ₂	Annular gap seal with Hilti Acrylic Sealant CFS-S ACR
C	Plastic Pipe
d _c	Pipe diameter (nominal outside diameter)
E	Building element (wall, floor)
F	Fixing of the collar
t _{A2}	Thickness of Hilti Firestop Acrylic Sealant CFS-S ACR (CP606)
t _c	Pipe wall thickness
t _E	Thickness of the building element

11.2 PLASTIC PIPE – RIGID WALL

- CFS-C EL Endless Firestop Collar for PVC pipe:**

Rigid wall	Minimum density of 650 kg/m ³ and comprise concrete, aerated concrete or masonry
Minimum thickness of wall	≥ 100mm
Material of pipes	PVC According to EN 1452-1; EN 1453-1; BS EN 1329-1; EN 1566-1; EN ISO 15493 and DIN 8061/8062
Sizes of pipes	See table
Spacing between openings	≥ 0mm between adjacent openings
Minimum thickness of sealant	≥ 25mm
Maximum annular gap	≥ 15mm
Fixing of the collar	Minimum M8 Fire Rated Metal Anchors (Hilti HUS3-H M8)
Supports distance	≤ 250mm from face of the wall
Approval reference	ETA-14/0085
Fire Rating	See table



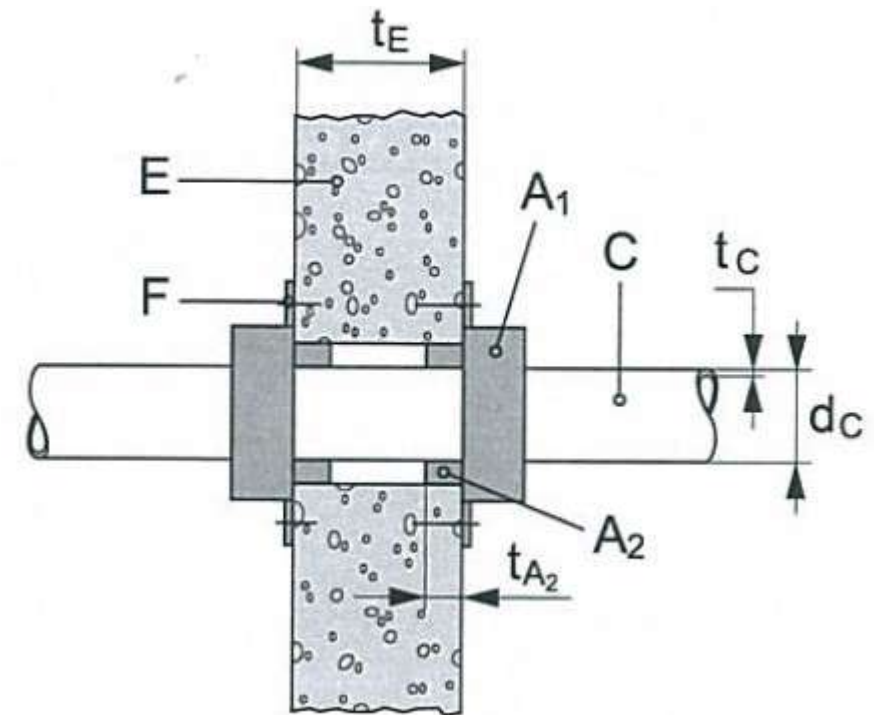
Pipe Diameter d _c (mm)	Pipe wall thickness t _c (mm)	Length of Collar (mm)	Classification (Fire Rating) (minutes)	Number of fixings	Maximum size of opening (mm)	Minimum size of opening (mm)
32	1,8 – 5,3	150	EI 120	2	62	32
40	1,8 – 5,3	180	EI 120	2	70	40
50	1,8 – 5,3	210	EI 120	2	80	50
63	1,9 – 5,3	250	EI 120	3	93	63
75	2,0 – 5,3	290	EI 120	3	105	75
83	2,0 – 5,3	320	EI 120	3	113	83
90	2,1 – 5,3	340	EI 120	3	120	90
110	2,2 – 5,3	400	EI 120	3	140	110

Legend	
A₁	Hilti Firestop Collar CFS-C Endless
A₂	Annular gap seal with Hilti Acrylic Sealant CFS-S ACR
C	Plastic Pipe
d_c	Pipe diameter (nominal outside diameter)
E	Building element (wall, floor)
F	Fixing of the collar
t_{A2}	Thickness of Hilti Firestop Acrylic Sealant CFS-S ACR (CP606)
t_c	Pipe wall thickness
t_E	Thickness of the building element

12.1 PLASTIC PIPE – RIGID WALL

- CFS-C P Firestop Collar for PE pipe:**

Rigid wall	Minimum density of 450 kg/m ³ and comprise concrete, aerated concrete or masonry
Minimum thickness of wall	≥ 100mm
Material of pipes	PE According to EN 1519; EN 12201-2 and EN 12666-1
Sizes of pipes	See table
Spacing between openings	≥ 0mm between adjacent openings
Minimum thickness of sealant	≥ 15mm
Maximum annular gap	Opening size ≤ Collar diameter
Fixing of the collar	Minimum M8 Fire Rated Metal Anchors (Hilti HUS3-H M8)
Supports distance	≤ 300mm from face of the wall
Approval reference	ETA-10/0404
Fire Rating	See table



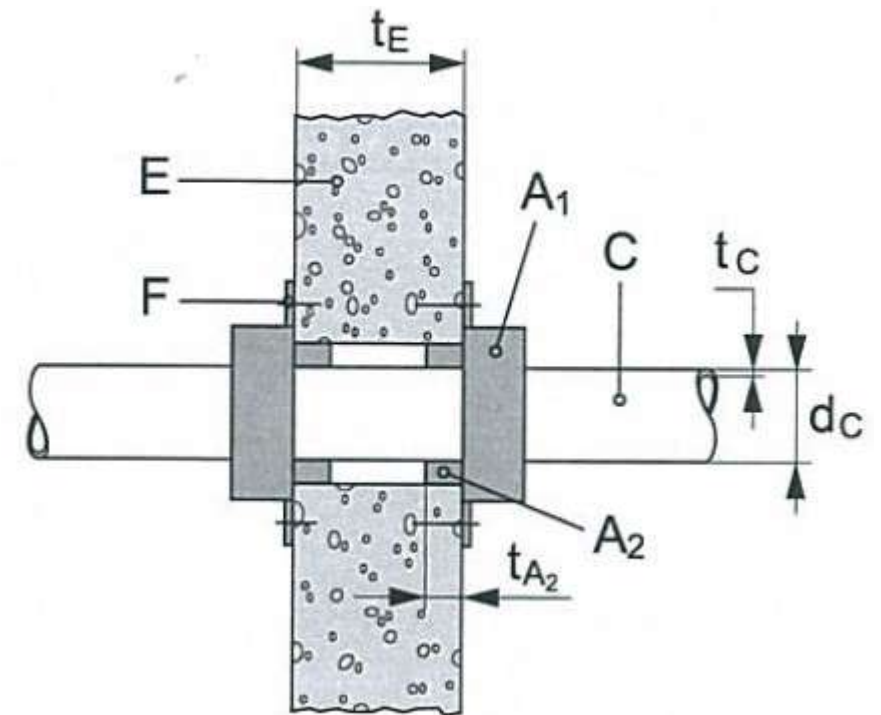
Pipe Diameter d _c (mm)	Pipe wall thickness t _c (mm)	Collar Size (A ₁)	Classification (Fire Rating) (minutes)	Maximum size of opening (mm)	Minimum size of opening (mm)
50	3,0	CFS-C P 50/1.5"	EI 120	67	50
63	3,0	CFS-C P 63/2"	EI 120	82	63
75	3,0	CFS-C P 75/2.5"	EI 120		75
90	3,5	CFS-C P 90/3"	EI 120	117	90
110	4,2	CFS-C P 110/4"	EI 120	146	110
125	4,8	CFS-C P 125/5"	EI 120	166	125
160	6,2	CFS-C P 160/6"	EI 120	236	160

Legend	
A ₁	Hilti Firestop Collar CFS-C P
A ₂	Annular gap seal with Hilti Acrylic Sealant CFS-S ACR
C	Plastic Pipe
d _c	Pipe diameter (nominal outside diameter)
E	Building element (wall, floor)
F	Fixing of the collar
t _{A2}	Thickness of Hilti Firestop Acrylic Sealant CFS-S ACR (CP606)
t _c	Pipe wall thickness
t _E	Thickness of the building element

12.2 PLASTIC PIPE – RIGID WALL

- CFS-C EL Endless Firestop Collar for PE pipe:**

Rigid wall	Minimum density of 650 kg/m ³ and comprise concrete, aerated concrete or masonry
Minimum thickness of wall	≥ 100mm
Material of pipes	PE According to EN 1519-1; EN 12201-2 and EN 12666-1
Sizes of pipes	See table
Spacing between openings	≥ 0mm between adjacent openings
Minimum thickness of sealant	≥ 25mm
Maximum annular gap	≥ 15mm
Fixing of the collar	Minimum M8 Fire Rated Metal Anchors (Hilti HUS3-H M8)
Supports distance	≤ 250mm from face of the wall
Approval reference	ETA-14/0085
Fire Rating	See table



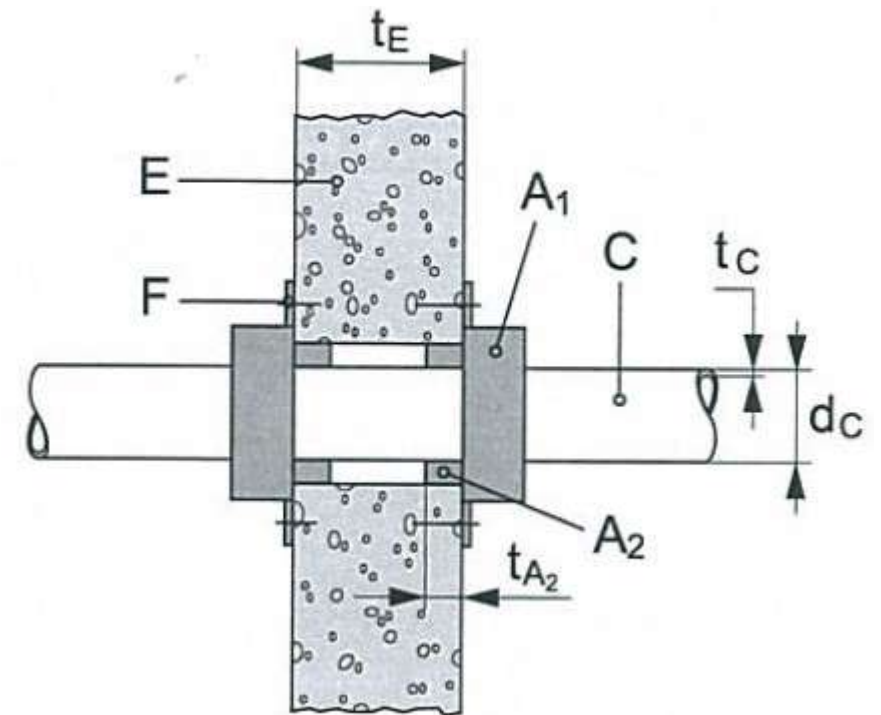
Pipe Diameter d _c (mm)	Pipe wall thickness t _c (mm)	Length of Collar (mm)	Classification (Fire Rating) (minutes)	Number of fixings	Maximum size of opening (mm)	Minimum size of opening (mm)
40	3,0 – 4,2	180	EI 120	2	70	40
50	3,0 – 4,2	210	EI 120	2	80	50
63	3,0 – 4,2	250	EI 120	3	93	63
75	3,2 – 4,2	290	EI 120	3	105	75
83	3,4 – 4,2	320	EI 120	3	113	83
90	3,5 – 4,2	340	EI 120	3	120	90
110	4,2	400	EI 120	3	140	110

Legend	
A ₁	Hilti Firestop Collar CFS-C Endless
A ₂	Annular gap seal with Hilti Acrylic Sealant CFS-S ACR
C	Plastic Pipe
d _c	Pipe diameter (nominal outside diameter)
E	Building element (wall, floor)
F	Fixing of the collar
t _{A2}	Thickness of Hilti Firestop Acrylic Sealant CFS-S ACR (CP606)
t _c	Pipe wall thickness
t _E	Thickness of the building element

13.1 PLASTIC PIPE – RIGID WALL

- CFS-C P Firestop Collar for ABS pipe:**

Rigid wall	Minimum density of 450 kg/m ³ and comprise concrete, aerated concrete or masonry
Minimum thickness of wall	≥ 100mm
Material of pipes	ABS pipes+GF+“COOL-FIT”) (ABS/PUR insulations/PE-HD)
Sizes of pipes	See table
Spacing between openings	≥ 0mm between adjacent openings
Minimum thickness of sealant	≥ 15mm
Maximum annular gap	Opening size ≤ Collar diameter
Fixing of the collar	Minimum M8 Fire Rated Metal Anchors (Hilti HUS3-H M8)
Supports distance	≤ 300mm from face of the wall
Approval reference	ETA-10/0404
Fire Rating	See table



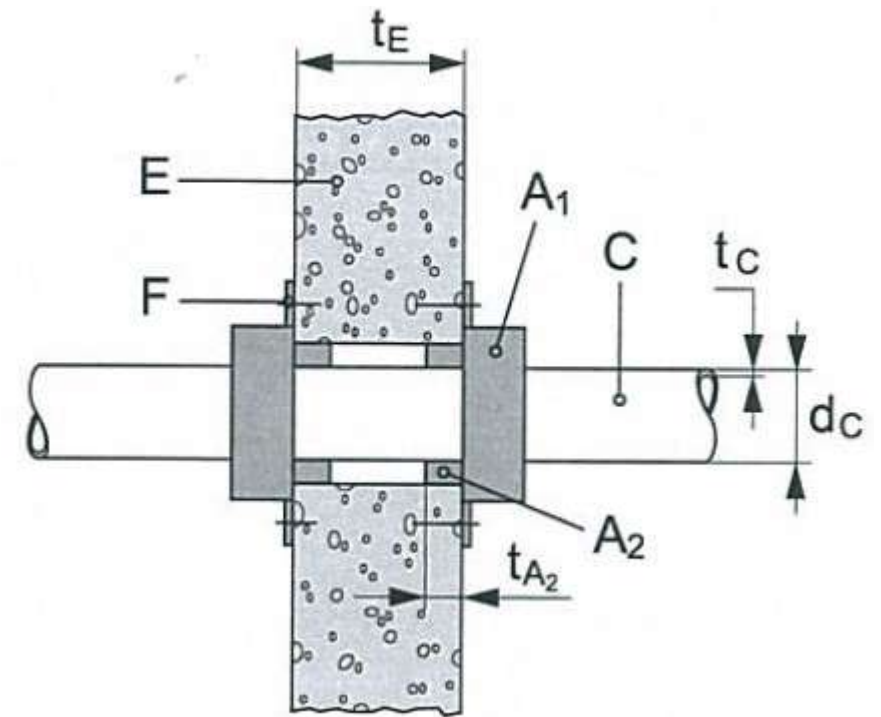
Pipe Diameter d _c (mm)	Inner Pipe diameter (mm)	Collar Size (A ₁)	Classification (Fire Rating) (minutes)	Maximum size of opening (mm)	Minimum size of opening (mm)
90	32	CFS-C P 90/3"	EI 120	117	90
110	40	CFS-C P 110/4"	EI 120	146	110
110	50	CFS-C P 110/4"	EI 120	166	110
160	90	CFS-C P 160/6"	EI 120	236	160
180	110	CFS-C P 180/7"	EI 120	228	180
225	140	CFS-C P 225/9"	EI 120	289	225
250	160	CFS-C P 250/10"	EI 60	319	250

Legend	
A ₁	Hilti Firestop Collar CFS-C P
A ₂	Annular gap seal with Hilti Acrylic Sealant CFS-S ACR
C	Plastic Pipe
d _c	Pipe diameter (nominal outside diameter)
E	Building element (wall, floor)
F	Fixing of the collar
t _{A2}	Thickness of Hilti Firestop Acrylic Sealant CFS-S ACR (CP606)
t _c	Pipe wall thickness
t _E	Thickness of the building element

13.2 PLASTIC PIPE – RIGID WALL

• CFS-C EL Endless Firestop Collar for ABS pipe:

Rigid wall	Minimum density of 650 kg/m ³ and comprise concrete, aerated concrete or masonry
Minimum thickness of wall	≥ 100mm
Material of pipes	ABS pipes acc. to EN 1455-1 and SAN+PVC pipes acc. EN 1565-1
Sizes of pipes	See table
Spacing between openings	≥ 0mm between adjacent openings
Minimum thickness of sealant	≥ 25mm
Maximum annular gap	≥ 15mm
Fixing of the collar	Minimum M8 Fire Rated Metal Anchors (Hilti HUS3-H M8)
Supports distance	≤ 250mm from face of the wall
Approval reference	ETA-14/0085
Fire Rating	See table



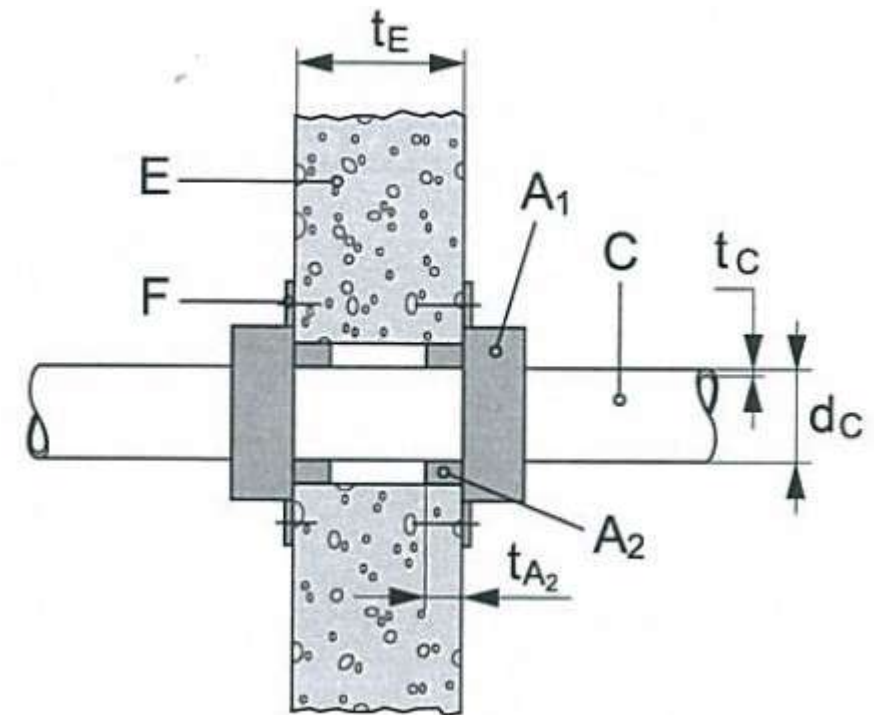
Pipe Diameter d _C (mm)	Pipe wall thickness t _C (mm)	Length of Collar (mm)	Classification (Fire Rating) (minutes)	Number of fixings	Maximum size of opening (mm)	Minimum size of opening (mm)
40	3,0 – 4,2	180	EI 120	2	70	40
63	3,0 – 4,2	250	EI 120	3	93	63
90	3,5 – 4,2	340	EI 120	3	120	90
110	4,2	400	EI 120	3	140	110

Legend	
A₁	Hilti Firestop Collar CFS-C Endless
A₂	Annular gap seal with Hilti Acrylic Sealant CFS-S ACR
C	Plastic Pipe
d_C	Pipe diameter (nominal outside diameter)
E	Building element (wall, floor)
F	Fixing of the collar
t_{A2}	Thickness of Hilti Firestop Acrylic Sealant CFS-S ACR (CP606)
t_C	Pipe wall thickness
t_E	Thickness of the building element

13.3 PLASTIC PIPE – RIGID WALL

- CFS-C P Firestop Collar for PP pipe:**

Rigid wall	Minimum density of 450 kg/m ³ and comprise concrete, aerated concrete or masonry
Minimum thickness of wall	≥ 100mm
Material of pipes	PP According to EN ISO 15874 and/or DIN 8077/8078
Sizes of pipes	See table
Spacing between openings	≥ 0mm between adjacent openings
Minimum thickness of sealant	≥ 15mm
Maximum annular gap	Opening size ≤ Collar diameter
Fixing of the collar	Minimum M8 Fire Rated Metal Anchors (Hilti HUS3-H M8)
Supports distance	≤ 300mm from face of the wall
Approval reference	ETA-10/0404
Fire Rating	See table



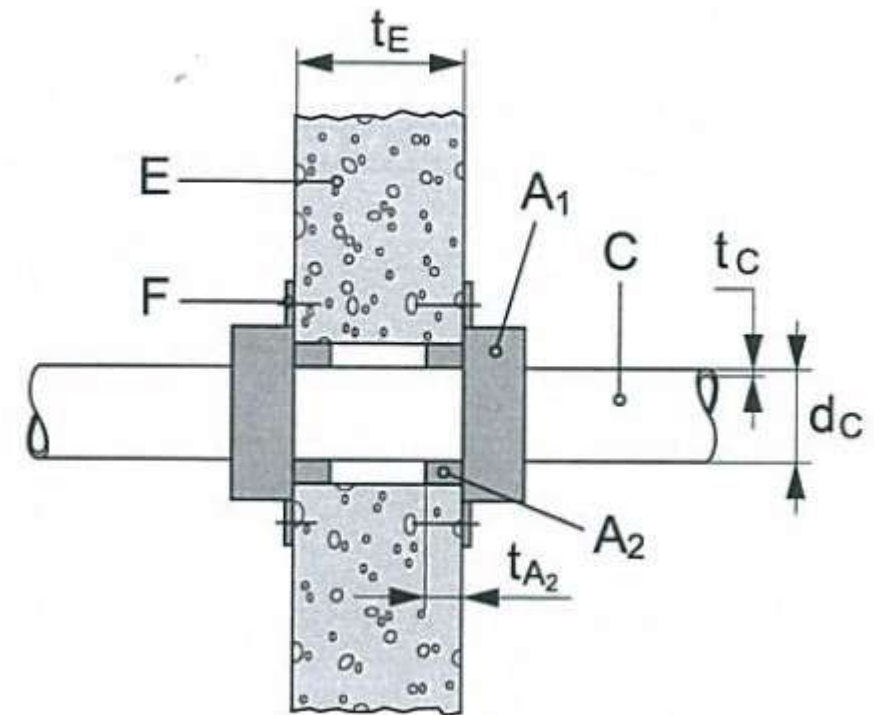
Pipe Diameter d _c (mm)	Pipe wall thickness t _c (mm)	Collar Size (A ₁)	Classification (Fire Rating) (minutes)	Maximum size of opening (mm)	Minimum size of opening (mm)
50	1,8 – 2,9	CFS-C P 50/1.5"	EI 90	67	50
63	1,8 – 5,8	CFS-C P 63/2"	EI 60	82	63
75	1,9 – 6,8	CFS-C P 75/2.5"	EI 60		75
75	6,8 – 12,5	CFS-C P 75/2.5"	EI 120		75
90	8,2 – 15,0	CFS-C P 90/3"	EI 120	117	90
110	2,7	CFS-C P 110/4"	EI 120	146	110

Legend	
A ₁	Hilti Firestop Collar CFS-C P
A ₂	Annular gap seal with Hilti Acrylic Sealant CFS-S ACR
C	Plastic Pipe
d _c	Pipe diameter (nominal outside diameter)
E	Building element (wall, floor)
F	Fixing of the collar
t _{A2}	Thickness of Hilti Firestop Acrylic Sealant CFS-S ACR (CP606)
t _c	Pipe wall thickness
t _E	Thickness of the building element

13.4 PLASTIC PIPE – RIGID WALL

- CFS-C EL Endless Firestop Collar for PP pipe:**

Rigid wall	Minimum density of 650 kg/m ³ and comprise concrete, aerated concrete or masonry
Minimum thickness of wall	≥ 100mm
Material of pipes	PP According to EN 1451-1 and DIN 8077/8078
Sizes of pipes	See table
Spacing between openings	≥ 0mm between adjacent openings
Minimum thickness of sealant	≥ 25mm
Maximum annular gap	≥ 15mm
Fixing of the collar	Minimum M8 Fire Rated Metal Anchors (Hilti HUS3-H M8)
Supports distance	≤ 250mm from face of the wall
Approval reference	ETA-14/0085
Fire Rating	See table



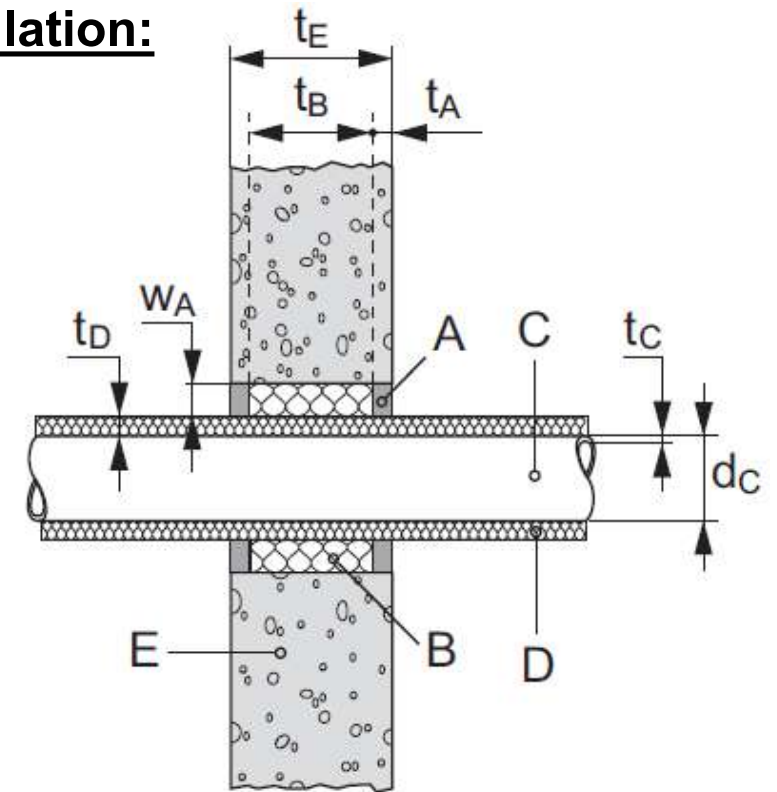
Pipe Diameter d _c (mm)	Pipe wall thickness t _c (mm)	Length of Collar (mm)	Classification (Fire Rating) (minutes)	Number of fixings	Maximum size of opening (mm)	Minimum size of opening (mm)
32	1,8 – 10,0	150	EI 120	2	62	32
40	1,8 – 10,0	180	EI 120	2	70	40
50	1,8 – 10,0	210	EI 120	2	80	50
63	1,8 – 10,0	250	EI 120	3	93	63
75	1,9 – 10,0	290	EI 120	3	105	75
83	2,7 – 10,0	320	EI 120	3	113	83
90	2,7 – 10,0	340	EI 120	3	120	90
110	2,7 – 10,0	400	EI 120	3	140	110

Legend	
A₁	Hilti Firestop Collar CFS-C Endless
A₂	Annular gap seal with Hilti Acrylic Sealant CFS-S ACR
C	Plastic Pipe
d_c	Pipe diameter (nominal outside diameter)
E	Building element (wall, floor)
F	Fixing of the collar
t_{A2}	Thickness of Hilti Firestop Acrylic Sealant CFS-S ACR (CP606)
t_c	Pipe wall thickness
t_E	Thickness of the building element

14.1 CAST IRON PIPE – RIGID WALL

- CFS-S ACR (CP606) Sealant for Cast Iron pipe with continued insulation:**

Rigid wall	Minimum density of 650 kg/m ³ and comprise concrete, aerated concrete or masonry
Minimum thickness of wall	≥ 100mm
Material of pipes	Metal pipes with lower heat conductivity than unalloyed steel and a melting point of minimum 1100°C, e.g. low alloyed steel, cast iron, stainless steels, Ni alloys (NiCu, NiCr and NiMo alloys)
Sizes of pipes	See table
Spacing between openings	≥ 200mm between adjacent openings
Minimum thickness of sealant	≥ 10mm
Maximum annular gap	≤ 20mm (Binder)
Backfilling material	Loose stone wool or stone wool mats with a minimum density of 45 kg/m ³
Supports distance	≤ 270mm from face of the wall
Approval reference	ETA-10/0292 – (EN1366-3) Firestop Binder CP606 (BS476)
Fire Rating	See table (Higher Fire Rating values can be achieved)



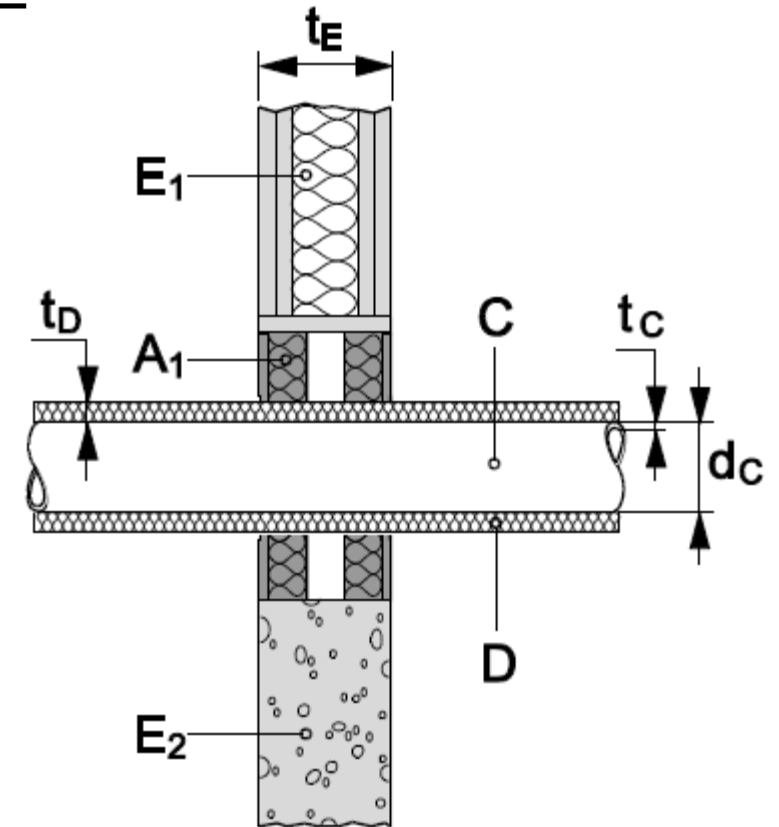
Legend	
A	Hilti Firestop Acrylic Sealant CFS-S ACR (CP606)
B	Backfilling material
C	Penetrating Service - Pipe
d_C	Pipe diameter (nominal outside diameter)
w_A	Width of penetration seal (Annular gap)
D	Insulation (Mineral wool as per ETA)
E	Building element (wall, floor)
t_A	Thickness of Hilti Firestop Acrylic Sealant CFS-S ACR (CP606)
t_B	Thickness of backfilling material
t_C	Pipe wall thickness
t_D	Thickness of insulation
t_E	Thickness of the building element

Pipe Diameter d _C (mm)	Pipe wall thickness t _C (mm)	Continued Insulation thickness t _D (mm)	Classification (Fire Rating) (minutes)	Maximum size of opening (mm)	Minimum size of opening (mm)
26,9 – 48,3	1,4 / 1,6 – 14,2	20	EI 120	d _C + 2xt _D + 2x20	d _C + 2xt _D
26,9 – 168,3	1,4 / 2,6 – 14,2	40	EI 120		

14.2 CAST IRON PIPE – RIGID WALL

- CFS-CT Coated Board for Cast Iron pipe with continued insulation:**

Rigid wall	Minimum density of 650 kg/m ³ and comprise concrete, aerated concrete or masonry
Minimum thickness of wall	≥ 100mm
Material of pipes	Metal pipes with lower heat conductivity than unalloyed steel and a melting point of minimum 1100°C, e.g. low alloyed steel, cast iron, stainless steels, Ni alloys (NiCu, NiCr and NiMo alloys)
Sizes of pipes	See table
Spacing between openings	≥ 200mm between adjacent openings
Spacing between metal pipes	≥ 0mm between adjacent insulations
Maximum opening size	1200 x 1200mm
Minimum thickness of sealant	≥ 10mm applied in all edges of the board with Hilti CFS-S ACR (CP606)
Distance to seal edge	≥ 3mm
Supports distance	≤ 250mm from face of the wall
Approval reference	ETA-11/0429 – (EN1366-3)
Fire Rating	See table (Higher Fire Rating values can be achieved)

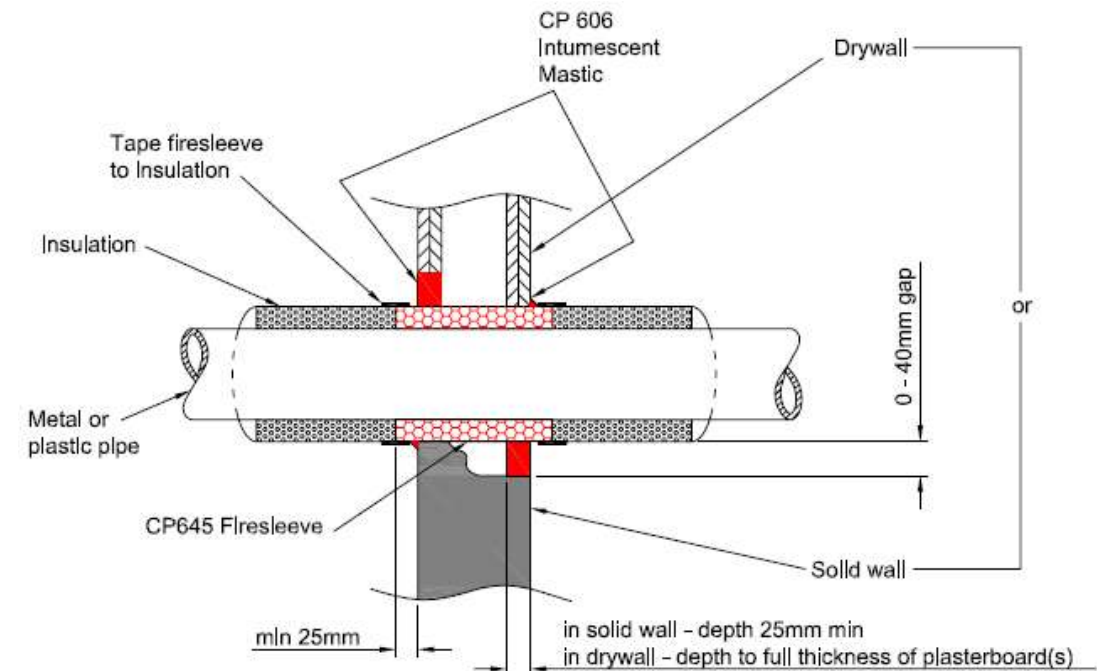


Pipe Diameter d _c (mm)	Pipe wall thickness t _c (mm)	Continued Insulation thickness t _D (mm)	Classification (Fire Rating) (minutes)	Size of opening in board (mm)	Legend	
48.3	1.6 – 14.2	≥ 20	EI 90	d _c	A ₁	Hilti Firestop Coated Board CFS-CT
114.3	2.0 – 14.2	≥ 30	EI 60		C	Penetrating Service - Pipe
		≥ 40	EI 120		d _c	Pipe diameter (nominal outside diameter)
114.3 – 159.0	2.0 / 2.6 – 14.2	≥ 40	EI 60		D	Insulation (Mineral wool as per ETA)
159.0	2.6 – 14.2	≥ 40	EI 60		E	Building element (wall, floor)
159.0 – 323.9	2.6 / 4.0 – 14.2	≥ 40	EI 60		t _c	Pipe wall thickness
				t _D	Thickness of insulation	
				t _E	Thickness of the building element	

14.3 CAST IRON PIPE – RIGID WALL

- CP645 Intumescent Sleeve for Cast Iron pipe with continued insulation:**

Rigid wall	Minimum density of 650 kg/m ³ and comprise concrete, aerated concrete or masonry
Minimum thickness of wall	≥ 100mm
Material of pipes	Metal pipes with lower heat conductivity than unalloyed steel and a melting point of minimum 1100°C, e.g. low alloyed steel, cast iron, stainless steels, Ni alloys (NiCu, NiCr and NiMo alloys)
Sizes of pipes	See table
Spacing between openings	≥ 200mm between adjacent openings
Minimum thickness of sealant	≥ 25mm
Maximum annular gap	≤ 20mm (Binder)
Overhang from wall surface	≥ 25mm
Supports distance	≤ 270mm from face of the wall
Approval reference	Firestop Binder CP645 (BS476 pt20) (BSEN1366-3)
Fire Rating	See table

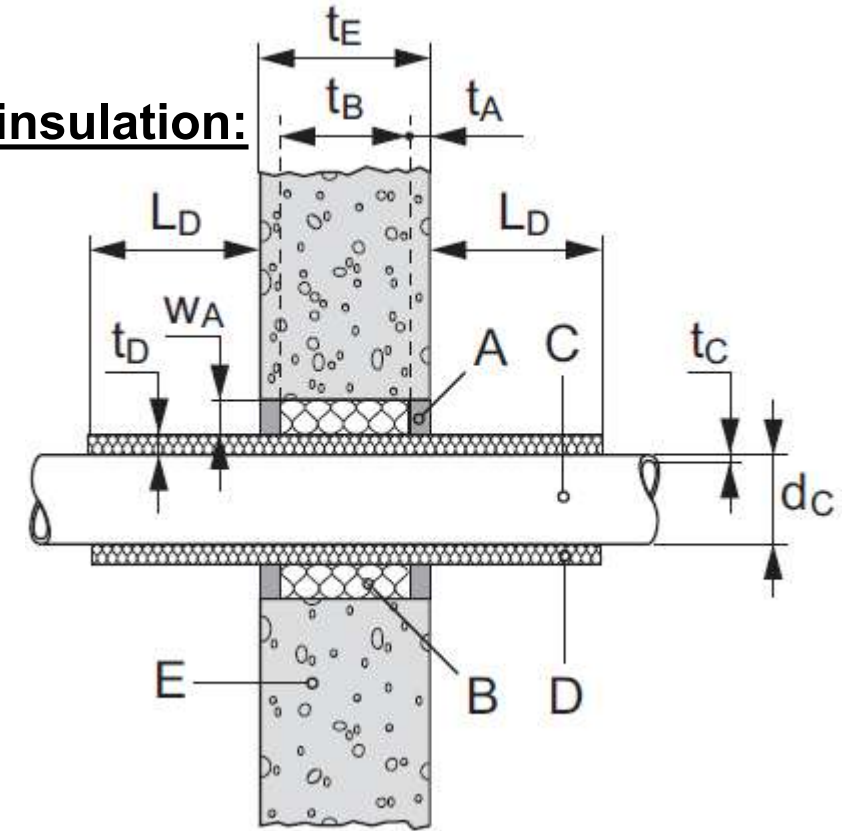


Pipe Diameter d_c (mm)	Pipe wall thickness t_c (mm)	Continued Insulation thickness t_D (mm)	Classification (Fire Rating) (minutes)	Maximum size of opening (mm)	Minimum size of opening (mm)
17 - 169	N/A	N/A	EI 120	$d_c + 2xt_D + 2x20$	$d_c + 2xt_D$

15.1 CAST IRON PIPE – RIGID WALL

• CFS-S ACR (CP606) Sealant for Cast Iron pipe without continued insulation:

Rigid wall	Minimum density of 650 kg/m ³ and comprise concrete, aerated concrete or masonry
Minimum thickness of wall	≥ 100mm
Material of pipes	Metal pipes with lower heat conductivity than unalloyed steel and a melting point of minimum 1100°C, e.g. low alloyed steel, cast iron, stainless steels, Ni alloys (NiCu, NiCr and NiMo alloys)
Sizes of pipes	See table
Spacing between openings	≥ 200mm between adjacent openings
Minimum thickness of sealant	≥ 10mm
Maximum annular gap	≤ 20mm (Binder)
Backfilling material	Loose stone wool or stone wool mats with a minimum density of 45 kg/m ³
Insulation	Hilti Sleeve CP645 or Mineral wool as per ETA
Supports distance	≤ 270mm from face of the wall
Approval reference	ETA-10/0292 – (EN1366-3) Firestop Binder CP606 (BS476)
Fire Rating	See table (Higher Fire Rating values can be achieved)



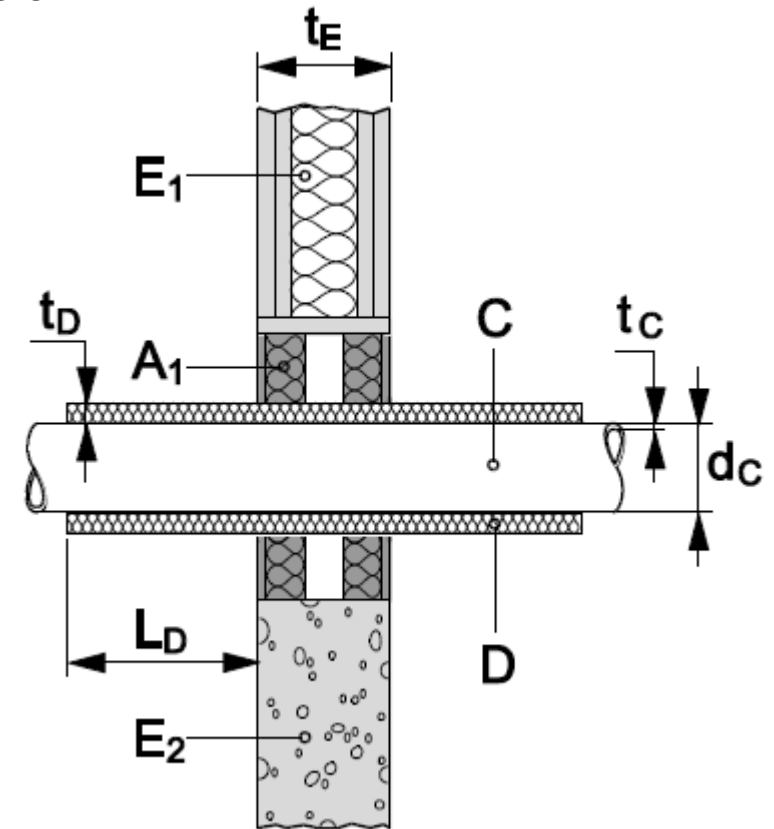
Legend	
A	Hilti Firestop Acrylic Sealant CFS-S ACR (CP606)
B	Backfilling material
C	Penetrating Service - Pipe
d_c	Pipe diameter (nominal outside diameter)
w_A	Width of penetration seal (Annular gap)
D	Insulation (Hilti Sleeve CP645 or Mineral wool as per ETA)
E	Building element (wall, floor)
L_D	Length of Insulation
t_A	Thickness of Hilti Firestop Acrylic Sealant CFS-S ACR (CP606)
t_B	Thickness of backfilling material
t_c	Pipe wall thickness
t_D	Thickness of insulation
t_E	Thickness of the building element

Pipe Diameter d _c (mm)	Pipe wall thickness t _c (mm)	Insulation thickness t _D (mm)	Length of Insulation L _D (mm)	Classification (Fire Rating) (minutes)	Maximum size of opening (mm)	Minimum size of opening (mm)
26,9 – 48,3	1,4 / 1,6 – 14,2	20	≥ 450	EI 120	d _c + 2xt _D + 2x20	d _c + 2xt _D
48,3	1,6 – 14,2	20 - 40	≥ 500	EI 120		
48,3 - 168,3	1,6 / 2,6 – 14,2	40	≥ 450	EI 90		
			≥ 700	EI 120		

15.2 CAST IRON PIPE – RIGID WALL

- CFS-CT Coated Board for Cast Iron pipe without continued insulation:**

Rigid wall	Minimum density of 650 kg/m ³ and comprise concrete, aerated concrete or masonry
Minimum thickness of wall	≥ 100mm
Material of pipes	Metal pipes with lower heat conductivity than unalloyed steel and a melting point of minimum 1100°C, e.g. low alloyed steel, cast iron, stainless steels, Ni alloys (NiCu, NiCr and NiMo alloys)
Sizes of pipes	See table
Spacing between openings	≥ 200mm between adjacent openings
Spacing between metal pipes	≥ 0mm
Maximum size of opening	1200 x 1200mm
Minimum thickness of sealant	≥ 10mm applied in all edges of the board with Hilti CFS-S ACR (CP606)
Distance to seal edge	≥ 3mm
Insulation	Hilti Sleeve CP645 or Mineral wool as per ETA
Supports distance	≤ 250mm from face of the wall
Approval reference	ETA-11/0429 – (EN1366-3)
Fire Rating	See table (Higher Fire Rating values can be achieved)



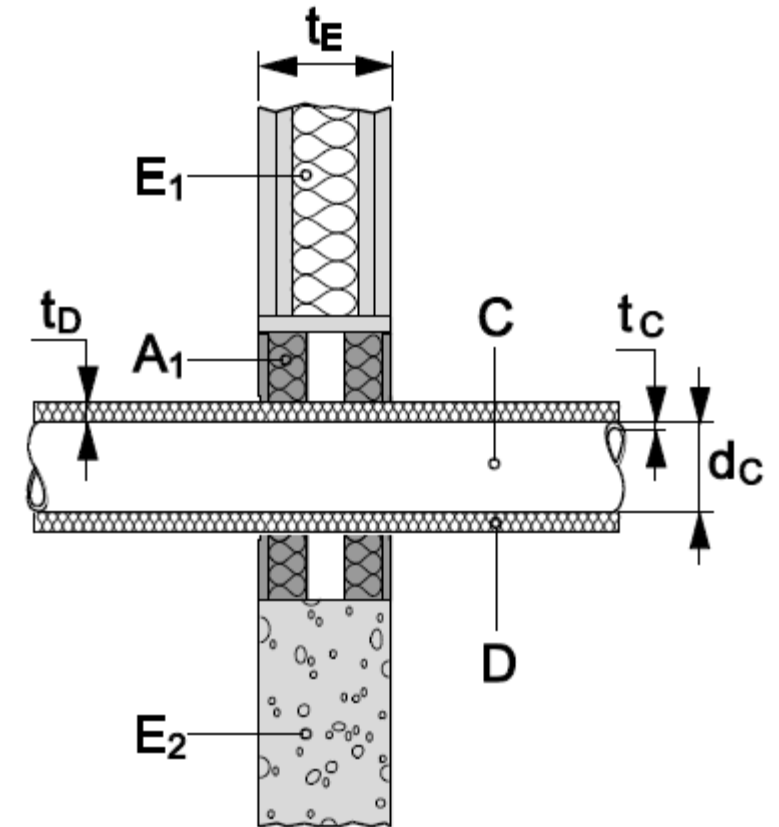
Pipe Diameter d _c (mm)	Pipe wall thickness t _c (mm)	Insulation thickness t _D (mm)	Length of Insulation L _D (mm)	Classification (Fire Rating) (minutes)	Size of opening in batt (mm)
48.3	1.6 – 14.2	20	≥ 450	EI 90	d _c
114.3	2.0 – 14.2	40	≥ 1000	EI 120	
159.0	2.6 – 14.2	40	≥ 1000	EI 60	
114.3 – 159.0	2.0 / 2.6 – 14.2	40	≥ 1000	EI 60	
159.0 – 323.9	2.6 / 4.0 – 14.2	40	≥ 1000	EI 30	

Legend	
A ₁	Hilti Firestop Coated Board CFS-CT
C	Penetrating Service - Pipe
d _c	Pipe diameter (nominal outside diameter)
D	Insulation (Hilti Sleeve CP645 or Mineral wool as per ETA)
E	Building element (wall, floor)
L _D	Length of Insulation
t _c	Pipe wall thickness
t _D	Thickness of insulation
t _E	Thickness of the building element

16.1 COPPER PIPE – RIGID WALL

- CFS-CT Coated Board for Copper pipe with continued insulation:**

Rigid wall	Minimum density of 650 kg/m ³ and comprise concrete, aerated concrete or masonry
Minimum thickness of wall	≥ 100mm
Material of pipes	Copper and other metal pipes with lower heat conductivity than copper and a melting point of minimum 1100°C, e.g. unalloyed steel, low alloyed steel, cast iron, stainless steels, Ni alloys (NiCu, NiCr and NiMo alloys) and Ni.
Sizes of pipes	See table
Spacing between openings	≥ 200mm between adjacent openings
Spacing between metal pipes	≥ 0mm between adjacent insulations
Maximum opening size	1200 x 1200mm
Minimum thickness of sealant	≥ 10mm applied in all edges of the board with Hilti CFS-S ACR (CP606)
Distance to seal edge	≥ 3mm
Supports distance	≤ 250mm from face of the wall
Approval reference	ETA-11/0429 – (EN1366-3)
Fire Rating	See table (Higher Fire Rating values can be achieved)



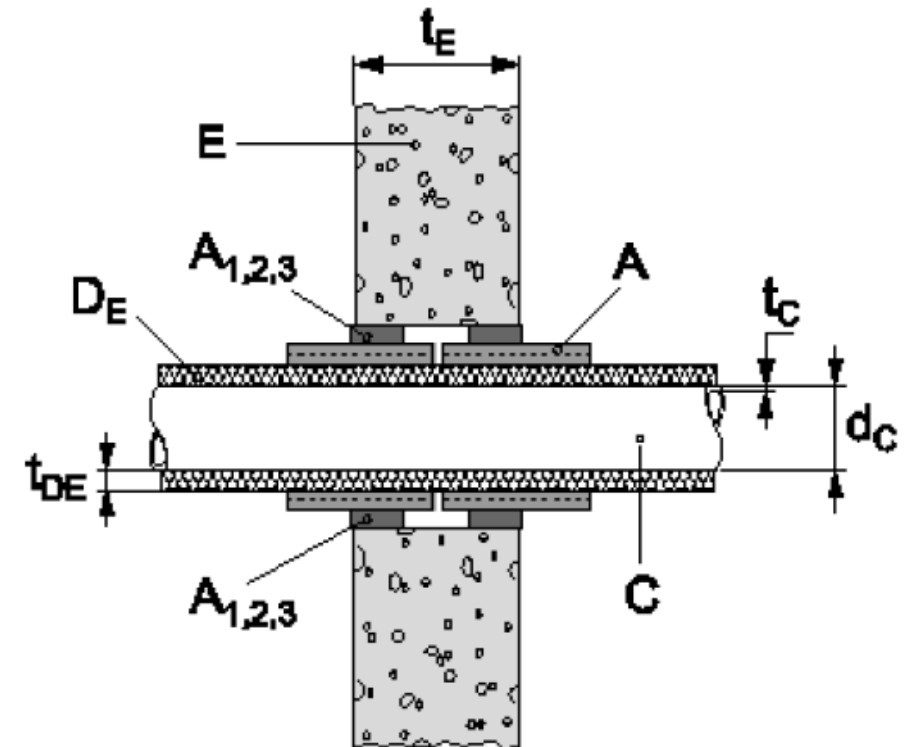
Pipe Diameter d _c (mm)	Pipe wall thickness t _c (mm)	Continued Insulation thickness t _D (mm)	Classification (Fire Rating) (minutes)	Size of opening in batt (mm)
10 – 40	1.0 / 1.5 – 14.2	≥ 20	EI 120	d _c
40 – 88,9	1.5 / 2.0 - 14.2	≥ 40	EI 90	

Legend	
A ₁	Hilti Firestop Coated Board CFS-CT
C	Penetrating Service - Pipe
d _c	Pipe diameter (nominal outside diameter)
D	Insulation (Mineral wool as per ETA)
E	Building element (wall, floor)
t _c	Pipe wall thickness
t _D	Thickness of insulation
t _E	Thickness of the building element

16.2 COPPER PIPE – RIGID WALL

- CFS-B Bandage for Copper pipe with continued insulation:**

Rigid wall	Minimum density of 550 kg/m ³ and comprise concrete, aerated concrete or masonry
Minimum thickness of wall	≥ 100mm
Material of pipes	Copper and other metal pipes with lower heat conductivity than copper and a melting point of minimum 1100°C, e.g. unalloyed steel, low alloyed steel, cast iron, stainless steels, Ni alloys (NiCu, NiCr and NiMo alloys) and Ni.
Sizes of pipes	See table
Spacing between openings	≥ 0mm between adjacent openings
Spacing between pipes	≥ 0mm
Distance to seal edge	≥ 40mm
Minimum thickness of sealant	≥ 25mm
Maximum annular gap	≤ 15mm
Supports distance	≤ 400mm from face of the wall
Additional Protection	t _{AP} =32mm thick Armaflex ≥ 250mm from face of the board over the CFS-B Bandage
Approval reference	ETA-10/0212 – (EN1366-3)
Fire Rating	See table (Higher Fire Rating values can be achieved)
Installation	CFS-B Bandage in 2 overlapped layers, inserted to the black line, in the middle of the bandage, into the wall. For 100mm thickness walls – 50mm of the bandage inside the wall and 75mm out of the wall.



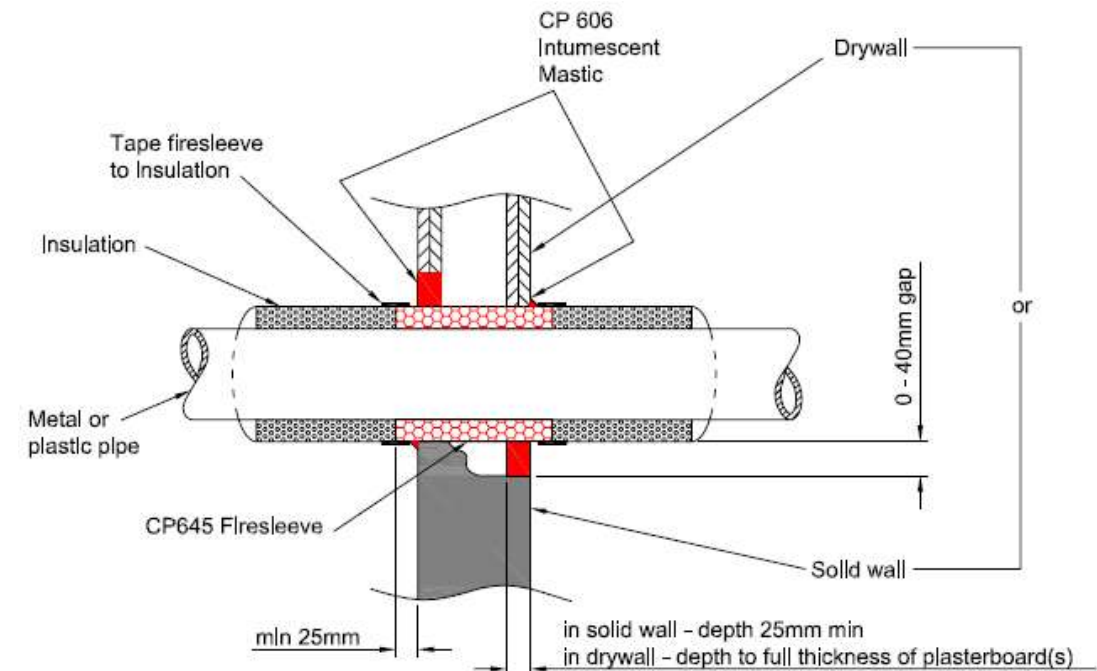
Legend	
A	Hilti Intumescent Bandage CFS-B
A_{1,2}	Hilti Acrylic Sealant CFS-S ACR (CP606)
C	Penetrating Service - Pipe
d_C	Pipe diameter (nominal outside diameter)
D_E	Insulation (Mineral wool as per ETA)
E	Building element (wall, floor)
AP	Additional Protection
t_{AP}	Additional Protection thickness
t_C	Pipe wall thickness
t_{DE}	Thickness of combustible insulation
t_E	Thickness of the building element

Pipe Diameter d _C (mm)	Pipe wall thickness t _C (mm)	Continued Insulation thickness t _D (mm)	Classification (Fire Rating) (minutes)	Maximum size of opening (mm)	Minimum size of opening (mm)
10.0 – 54.0	1.0 – 14.2	30	EI 90	d _C + 2xt _D + 2x20	d _C + 2xt _D
28.0 – 88.9	1.0 / 2.0 - 14.2	30 + AP	EI90		

16.3 COPPER PIPE – RIGID WALL

- CP645 Intumescent Sleeve for Copper pipe with continued insulation:**

Rigid wall	Minimum density of 650 kg/m ³ and comprise concrete, aerated concrete or masonry
Minimum thickness of wall	≥ 100mm
Material of pipes	Copper and other metal pipes with lower heat conductivity than copper and a melting point of minimum 1100°C, e.g. unalloyed steel, low alloyed steel, cast iron, stainless steels, Ni alloys (NiCu, NiCr and NiMo alloys) and Ni.
Sizes of pipes	See table
Spacing between openings	≥ 200mm between adjacent openings
Minimum thickness of sealant	≥ 25mm
Maximum annular gap	≤ 20mm (Binder)
Overhang from drywall surface	≥ 25mm
Supports distance	≤ 270mm from face of the wall
Approval reference	Firestop Binder CP645 (BS476 pt20) (BSEN1366-3)
Fire Rating	See table

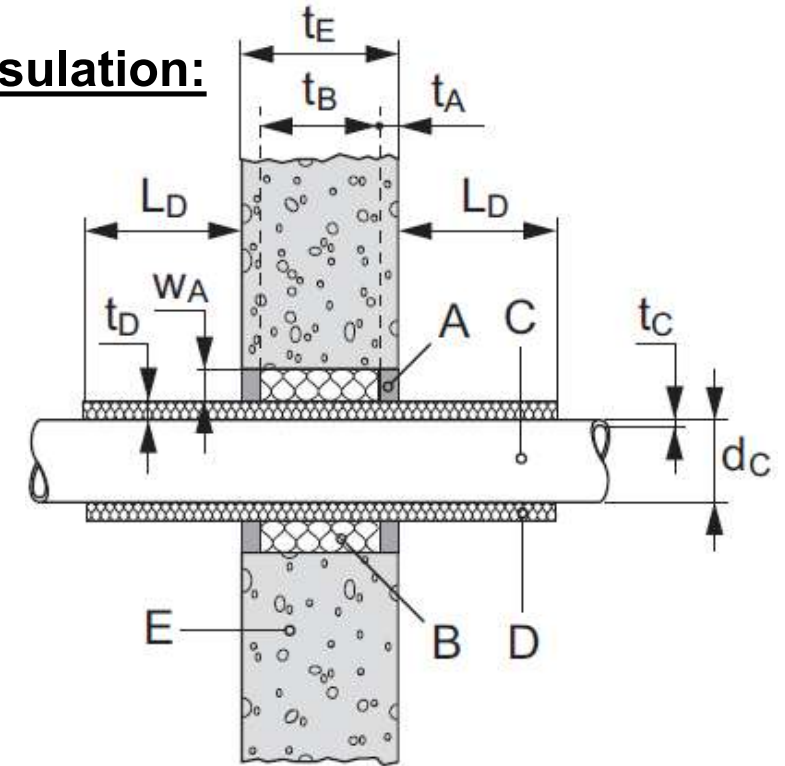


Pipe Diameter d_c (mm)	Pipe wall thickness t_c (mm)	Continued Insulation thickness t_D (mm)	Classification (Fire Rating) (minutes)	Maximum size of opening (mm)	Minimum size of opening (mm)
17 - 75	N/A	N/A	EI 120	$d_c + 2xt_D + 2x20$	$d_c + 2xt_D$

17.1 COPPER PIPE – RIGID WALL

• CFS-S ACR (CP606) Sealant for Copper pipe without continued insulation:

Rigid wall	Minimum density of 650 kg/m ³ and comprise concrete, aerated concrete or masonry
Minimum thickness of wall	≥ 100mm
Material of pipes	Copper and other metal pipes with lower heat conductivity than copper and a melting point of minimum 1100°C, e.g. unalloyed steel, low alloyed steel, cast iron, stainless steels, Ni alloys (NiCu, NiCr and NiMo alloys) and Ni.
Sizes of pipes	See table
Spacing between openings	≥ 200mm between adjacent openings
Minimum thickness of sealant	≥ 10mm
Maximum annular gap	≤ 20mm (Binder)
Backfilling material	Loose stone wool or stone wool mats with a minimum density of 45 kg/m ³
Supports distance	≤ 270mm from face of the wall
Approval reference	ETA-10/0292 – (EN1366-3) Firestop Binder CP606 (BS476)
Fire Rating	See table (Higher Fire Rating values can be achieved)



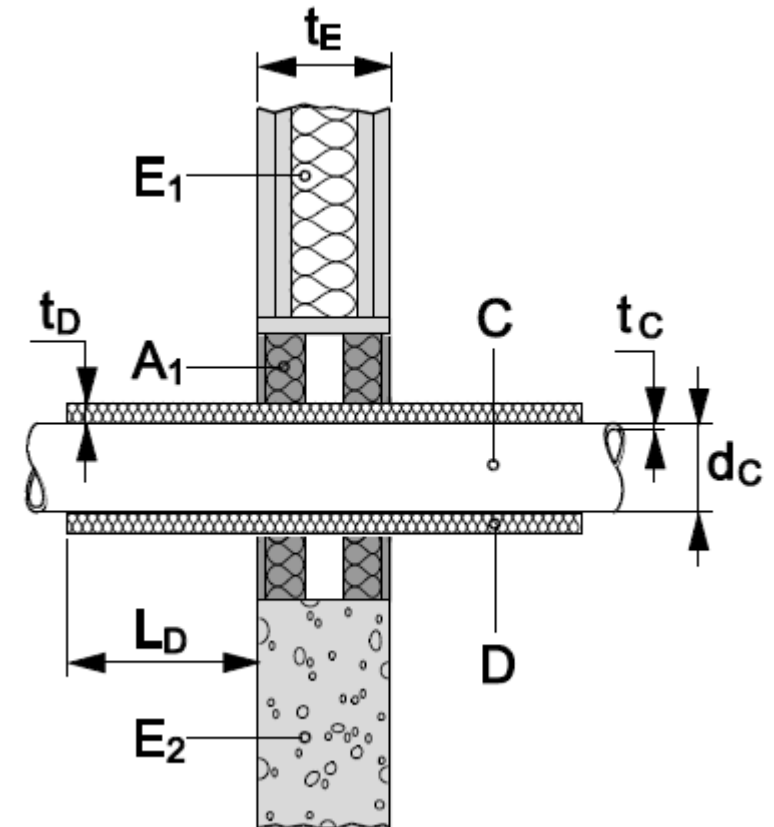
Legend	
A	Hilti Firestop Acrylic Sealant CFS-S ACR (CP606)
B	Backfilling material
C	Penetrating Service - Pipe
d_c	Pipe diameter (nominal outside diameter)
w_A	Width of penetration seal (Annular gap)
D	Insulation (Mineral wool as per ETA)
E	Building element (wall, floor)
L_D	Length of Insulation
t_A	Thickness of Hilti Firestop Acrylic Sealant CFS-S ACR (CP606)
t_B	Thickness of backfilling material
t_c	Pipe wall thickness
t_D	Thickness of insulation
t_E	Thickness of the building element

Pipe Diameter d _c (mm)\	Pipe wall thickness t _c (mm)	Insulation thickness t _D (mm)	Length of Insulation L _D (mm)	Classification (Fire Rating) (minutes)	Maximum size of opening (mm)	Minimum size of opening (mm)
28 – 42	1,0 / 1,5 – 14,2	20	≥ 450	EI 120	d _c + 2xt _D + 2x20	d _c + 2xt _D
42	1,5 – 14,2	20 - 40	≥ 500	EI 120		
42 - 88,9	1,5 / 2,0 – 14,2	40	≥ 500 ≥ 700	EI 90 EI 120		

17.2 COPPER PIPE – RIGID WALL

- CFS-CT Coated Board for Copper pipe without continued insulation:**

Rigid wall	Minimum density of 650 kg/m ³ and comprise concrete, aerated concrete or masonry
Minimum thickness of wall	≥ 100mm
Material of pipes	Copper and other metal pipes with lower heat conductivity than copper and a melting point of minimum 1100°C, e.g. unalloyed steel, low alloyed steel, cast iron, stainless steels, Ni alloys (NiCu, NiCr and NiMo alloys) and Ni.
Sizes of pipes	See table
Spacing between openings	≥ 200mm between adjacent openings
Spacing between metal pipes	≥ 0mm
Maximum opening size	1200 x 1200mm
Minimum thickness of sealant	≥ 10mm applied in all edges of the board with Hilti CFS-S ACR (CP606)
Distance to seal edge	≥ 3mm
Supports distance	≤ 250mm from face of the wall
Approval reference	ETA-11/0429 – (EN1366-3)
Fire Rating	See table (Higher Fire Rating values can be achieved)



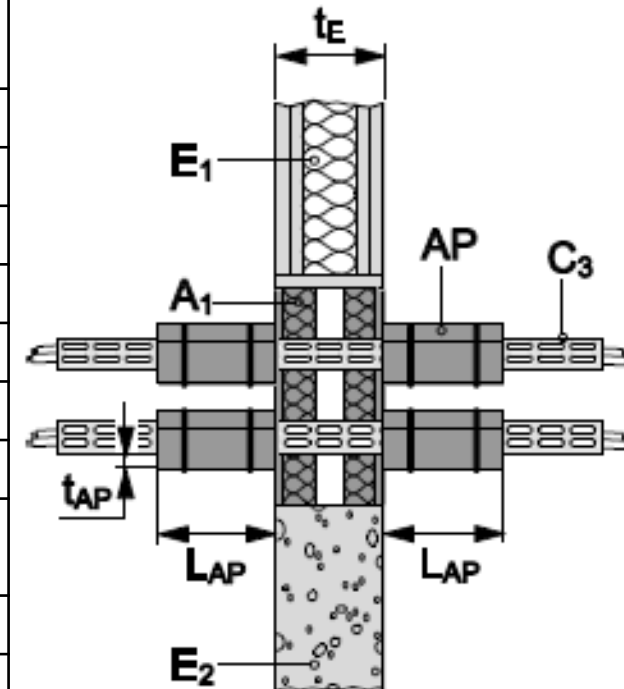
Pipe Diameter d _c (mm)	Pipe wall thickness t _c (mm)	Insulation thickness t _D (mm)	Length of Insulation L _D (mm)	Classification (Fire Rating) (minutes)	Minimum size of opening (mm)
10	1,0 – 14,2	20 - 30	≥ 500	EI 120	d _c
10 – 40	1,0 / 1,5 – 14,2	20	≥ 500	EI 120	
40 – 88,9	1,5 / 2,0 – 14,2	40	≥ 1000	EI 90	

Legend	
A ₁	Hilti Firestop Coated Board CFS-CT
C	Penetrating Service - Pipe
d _c	Pipe diameter (nominal outside diameter)
D	Insulation (Hilti Sleeve CP645 or Mineral wool as per ETA)
E	Building element (wall, floor)
L _D	Length of Insulation
t _c	Pipe wall thickness
t _D	Thickness of insulation
t _E	Thickness of the building element

18.1 CABLES – RIGID WALL

- CFS-CT Coated Board for cables, wires and bundles:**

Rigid wall	Minimum density of 650 kg/m ³ and comprise concrete, aerated concrete or masonry
Minimum thickness of wall	≥ 100mm
Maximum opening size	1200x1200mm
Minimum thickness of sealant	≥ 10mm applied in all edges of the board with Hilti CFS-S ACR (CP606)
Spacing between openings	≥ 200mm between adjacent openings
Minimum spacing between horizontal baskets	≥ 0mm
Minimum spacing between cables and basket above	≥ 50mm
Supports distance	≤ 250mm from face of the wall
Additional Protection (AP)	≥ 2mm coating with Hilti Firestop Coating CFS-CT over a length of services of 200 mm from the surface of the seal
Approval reference	ETA-11/0429 (EN1366-3)
Fire Rating	See table (Higher Fire Rating values can be achieved)



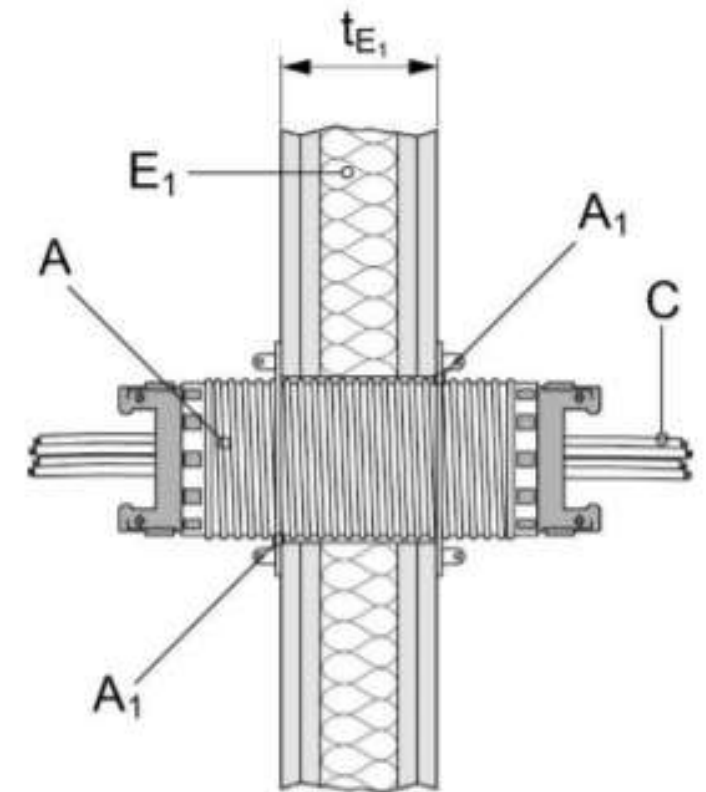
Cable Disposition (mm)	Classification (Fire Rating) (minutes)
All sheathed cable types currently and commonly used in building practice in Europe (e.g. power, control, signal, telecommunication, data, optical fibre cables, with or without cable supports, with a diameter of:	
Ø ≤ 21mm	EI 90
21mm ≤ Ø ≤ 50mm	EI 90
50mm ≤ Ø ≤ 80mm	EI 90
Non-sheathed cables (wires) currently and commonly used in building practice in Europe, with or without cable supports, with a diameter of:	
Ø ≤ 17mm	EI 60
Ø ≤ 24mm	EI 60
Tied cable bundle, maximum diameter of single cable 21 mm, with or without cable supports:	
Ø ≤ 100mm	EI 90

Legend	
A₁	Hilti Firestop Coated Board CFS-CT
C₃	Penetrating Service - Cables
E	Building element (wall, floor)
AP	Additional Protection
L_{AP}	Length of Additional Protection
t_{AP}	Thickness of Additional Protection
t_E	Thickness of the building element

18.2 CABLES – RIGID WALL

- CFS-SL GA Speed sleeve for cables, wires and bundles:**

Rigid wall	Minimum density of 550 kg/m ³ and comprise concrete, aerated concrete or masonry
Minimum thickness of wall	CFS-S SL GA Small = 100mm CFS-S SL GA Medium/Large = 200mm
Maximum thickness of wall	CFS-S SL GA Small = 200mm CFS-S SL GA Medium/Large = 300mm
Spacing between openings	≥ 200mm (distance between adjacent devices)
Minimum opening size	CFS-S SL GA Small Ø = 63mm CFS-S SL GA Medium/Large Ø = 113mm
Maximum opening size	CFS-S SL GA Small Ø = 73mm CFS-S SL GA Medium/Large Ø = 122mm
Fixing of the collar	No fixing required, flanges hold device in place
Supports distance	≤ 250mm from face of the wall
Approval reference	ETA-17/0081
Fire Rating	See table



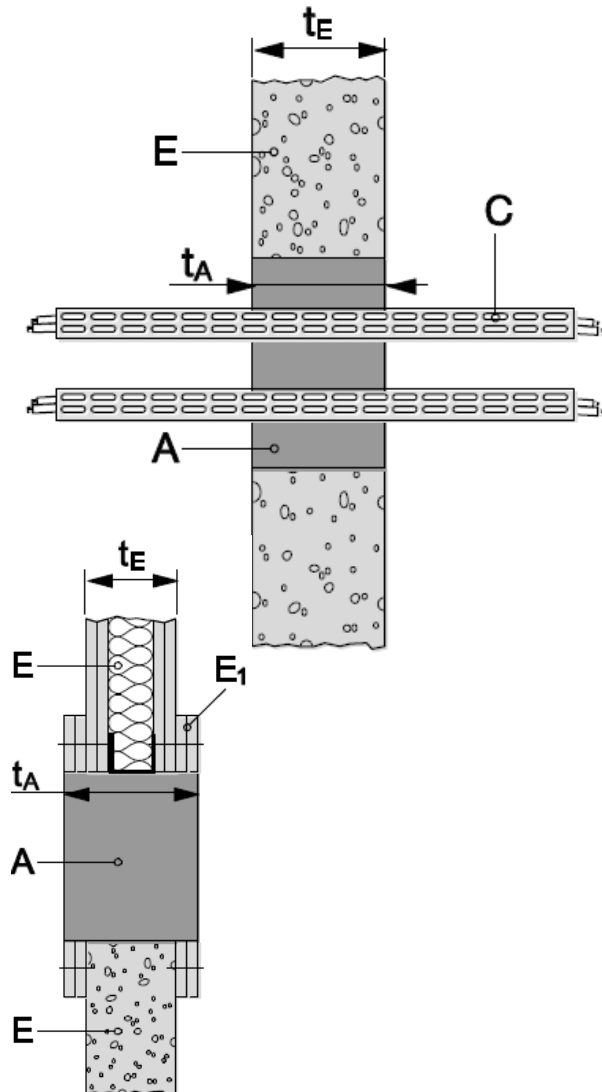
Cable Disposition (mm)	Classification CFS-SL GA S	Classification CFS-SL GA M/L
Blank Device	EI 120	EI 120
All sheathed cables Ø ≤ 21mm	EI 90	EI 90
All sheathed cables Ø ≤ 50mm	-	EI 90
All sheathed cables Ø ≤ 80mm	-	EI 60
Cable bundles Ø ≤ 36mm // All sheathed cables Ø ≤ 21mm	EI 90	-
Cable bundles Ø ≤ 86mm // All sheathed cables Ø ≤ 21mm	-	EI 90
100% filled device with cables Ø ≤ 21mm	EI 60	EI 90
Conduits Ø ≤ 25mm (CFS-SL GA S)	EI 120	-
Conduits Ø ≤ 63mm (CFS-SL GA M/L)	-	EI 90

Legend	
A	Hilti Firestop Sleeve CFS-SL GA
A₁	Rubber Gasket
C₃	Penetrating Service – Cables, conduits
E	Building element (wall, floor)
t_E	Thickness of the building element

18.3 CABLES – RIGID WALL

- CFS-F FX Intumescent Foam for cables, wires and bundles:**

Rigid wall	Minimum density of 650 kg/m ³ and comprise concrete, aerated concrete or masonry
Minimum thickness of wall	≥ 100mm
Maximum opening size	600x600mm
Minimum thickness of Foam	≥ 150mm (If thickness of wall $t_E \leq t_A$ then see image below)
Spacing between openings	≥ 200mm between adjacent openings
Minimum spacing between horizontal baskets	≥ 0mm
Minimum spacing between cables and basket above	≥ 50mm
Supports distance	≤ 300mm from face of the wall
Approval reference	ETA-10/0109 (EN1366-3)
Fire Rating	See table (Higher Fire Rating values can be achieved)



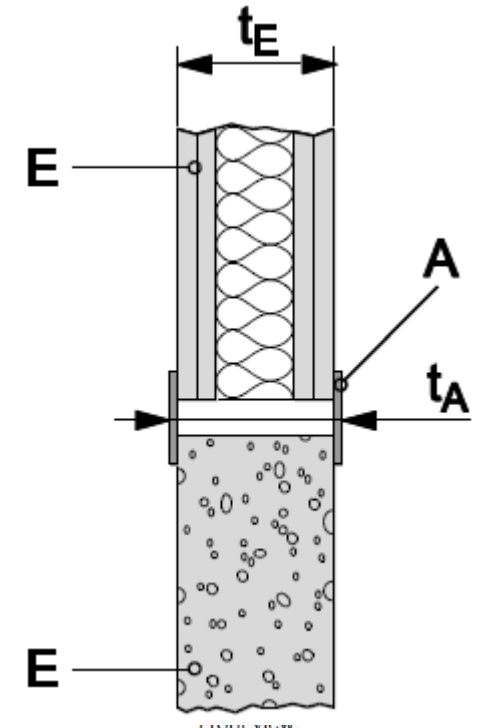
Cable Disposition (mm)	Classification (Fire Rating) (minutes)
All sheathed cable types currently and commonly used in building practice in Europe (e.g. power, control, signal, telecommunication, data, optical fibre cables, with or without cable supports, with a diameter of:	
Ø ≤ 21mm	EI 60
21mm ≤ Ø ≤ 50mm	EI 60
50mm ≤ Ø ≤ 80mm	EI 60
All sheathed single core cables Ø ≤ 21mm	EI 120
Sheathed multi-core halogen free cables according to HD 604.5 Ø ≤ 50mm	EI 90
Single sheathed multi-core rubber cables according to HD 22.4 Ø ≤ 80mm	EI 120
Tied cable bundle, maximum diameter of single cable ≤ 21 mm, with or without cable supports: Ø ≤ 100mm	EI 60

Legend	
A₁	Hilti Firestop Foam CFS-F FX
C₃	Penetrating Service - Cables
E	Building element (wall, floor)
t_A	Thickness of Hilti Firestop Foam CFS-F FX
t_E	Thickness of the building element

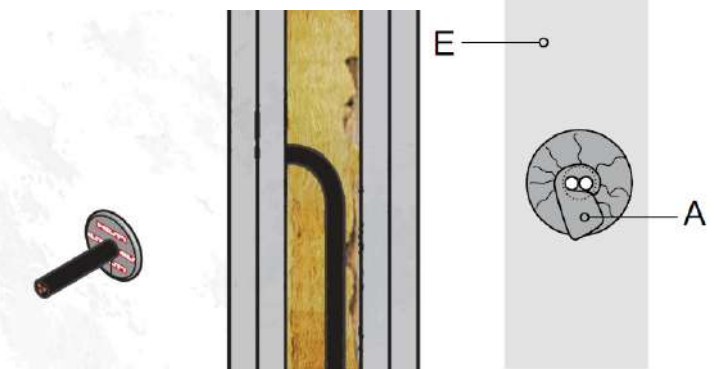
18.4 CABLES, CONDUITS, TUBES – RIGID WALL

- CFS-D 25 Cable Disc for cables, conduits and tubes:**

Rigid wall	Minimum density of 450 kg/m ³ and comprise concrete, aerated concrete or masonry
Minimum thickness of wall	≥ 100mm
Maximum opening size	25x25mm or Ø≤25mm
Applications (both sides and one side penetration)	Penetrations of cables, which exits or penetrates the wall from one side only, are sealed as standard penetration but at penetration side only.
Spacing between openings	≥ 5mm distance between openings with/without cables or with conduits, to other openings with/without cables. Installation by overlapping discs ≥ 150mm distance between openings with copper pipes to other service)
Supports distance	≤ 500mm from face of the wall
Approval reference	ETA-16/0050
Fire Rating	See table (Higher Fire Rating values can be achieved)



Cable Disposition (mm)	Classification (Fire Rating) (minutes)
Empty openings	EI 90
Multi-conductor cables Ø ≤ 13 mm (copper content: ≤ 7,5 mm ²)	EI120
Multi-conductor cables Ø ≤ 19 mm (except non sheathed cables (wires)) (copper content: ≤ 40 mm ²)	EI 90
Single-conductor cables Ø ≤ 14 mm (except non sheathed cables (wires)) (copper content: ≤ 1x35 mm ²)	EI 90
All cable types Ø ≤ 21 mm (except non sheathed cables (wires))	EI 60
Plastic conduits, Ø ≤ 16 mm When separation between wall openings of adjacent penetration seals ≥ 150 mm (conduit wall thickness ≥ 1 mm)	EI 90
Plastic conduits, Ø ≤ 16 mm When separation between wall openings of adjacent penetration seals ≥ 5 mm (conduit wall thickness ≥ 1 mm)	EI 60
Copper pipes/tubes, Ø ≤ 16 mm When separation between wall openings of adjacent penetration seals ≥ 150 mm (tube wall thickness ≤ 1 mm)	EI 60



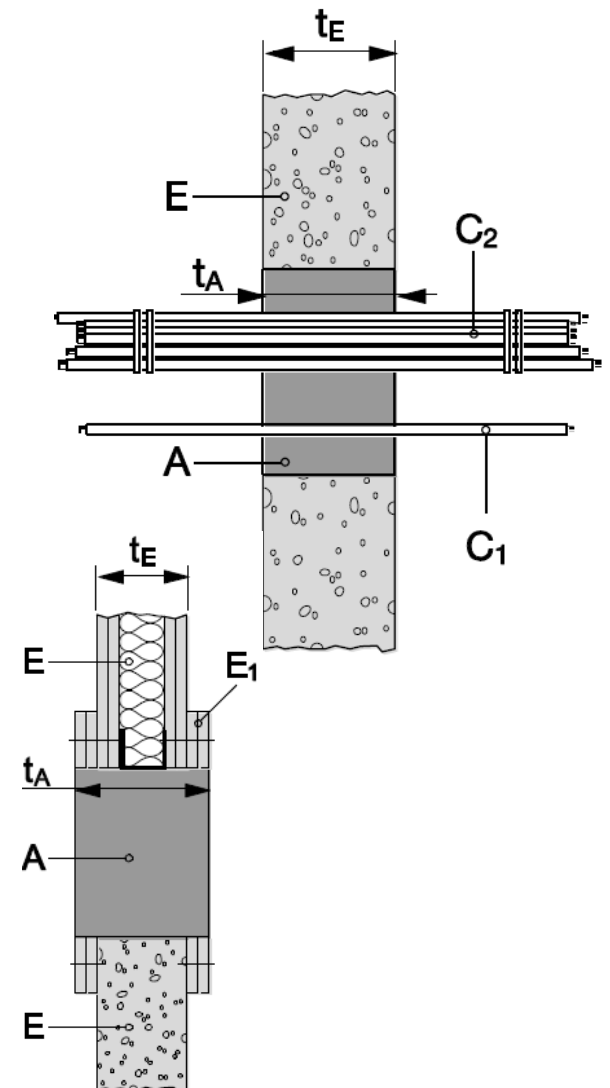
Legend	
A	Hilti Firestop Foam Cable Disc CFS-D 25
E	Building element (wall, floor)
t_E	Thickness of the building element
C	Cables
C₁	Conduit
C₂	Metal pipe / tube

18.5 CABLES, CONDUITS, TUBES – RIGID WALL

- CFS-F FX Intumescent Foam for cables, conduits and tubes:**

Rigid wall	Minimum density of 650 kg/m ³ and comprise concrete, aerated concrete or masonry
Minimum thickness of wall	≥ 100mm
Maximum opening size	600x600mm
Minimum thickness of Foam	≥ 100mm (If thickness of wall $t_E \leq t_A$ then see image below)
Spacing between openings	≥ 200mm between adjacent openings
Supports distance	≤ 300mm from face of the wall
Approval reference	ETA-10/0109 (EN1366-3)
Fire Rating	See table (Higher Fire Rating values can be achieved)

Conduit or tube Disposition (mm)	Classification (Fire Rating) (minutes)	
	Thickness of Foam CFS-F FX $t_A \geq 100\text{mm}$	Thickness of Foam CFS-F FX $t_A \geq 200\text{mm}$
Steel conduits and tubes, $\varnothing \leq 16$ mm (The field of application given above is also valid for other metal conduits or tubes with lower heat conductivity than unalloyed steel and a melting point of minimum 1050°C, e.g. low alloyed steels, stainless steels, Ni alloys (NiCu, NiCr and NiMo alloys)).	EI 90	EI 120
Plastic conduits and tubes, $\varnothing \leq 16$ mm	EI 120	EI 120
Flexible plastic conduits (Polyolefin, PVC), $16\text{mm} \leq \varnothing \leq 32$ mm	-	EI 120
Rigid plastic conduits (Polyolefin, PVC), $16\text{mm} \leq \varnothing \leq 32$ mm	-	EI 120
Bundle of plastic conduits (Polyolefin, PVC), conduits flexible or rigid, $16\text{mm} \leq \varnothing \leq 32$ mm $\varnothing \leq 100$ mm	-	EI 120



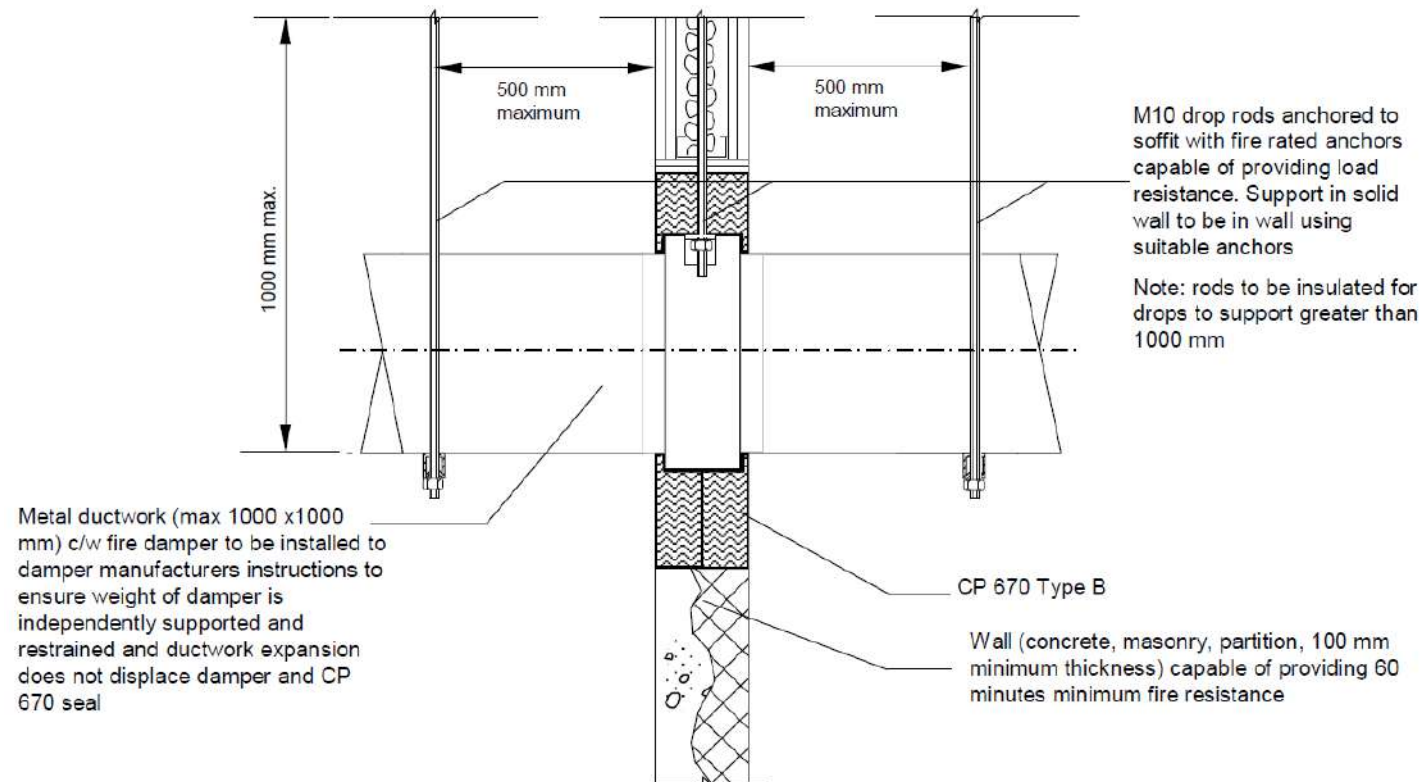
Legend	
A₁	Hilti Firestop Foam CFS-F FX
C₁, C₂	Penetrating Service – Cables, conduits, tubes
E	Building element (wall, floor)
t_A	Thickness of Hilti Firestop Foam CFS-F FX
t_E	Thickness of the building element

19.1 DAMPER (IN LINE) – RIGID WALL

- CFS-CT Coated Board (CP670) :**

Rigid wall	Minimum density of 650 kg/m ³ and comprise concrete, aerated concrete or masonry
Minimum thickness of wall	≥100mm
Fire Damper	To be installed to damper manufacturers instructions to ensure weight of damper is independently supported and restrained and ductwork expansion does not displace damper and sealed opening
Maximum metal ductwork size	≤ 1000 x 1000mm
Maximum opening size	≤ 1000mm height x Any length wide
Spacing between openings	≥ 200mm between adjacent openings
Firestop Coated Boards	Double coated board – 2x50mm CFS-CT Hilti Coated Board
Minimum thickness of sealant	≥ 10mm applied in all edges of the board with Hilti CFS-S ACR (CP606)
Supports distance	≤ 500mm from face of the wall
Approval reference	Firestop Binder CP670 (BS476 pt20) (BSEN1366-3)
Fire Rating	EI 60

Requires specific Engineering Judgement

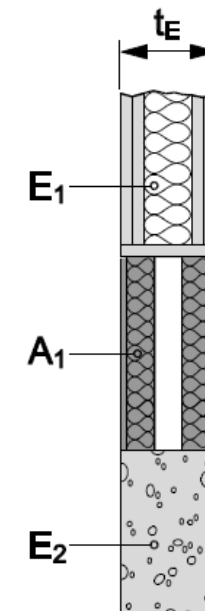
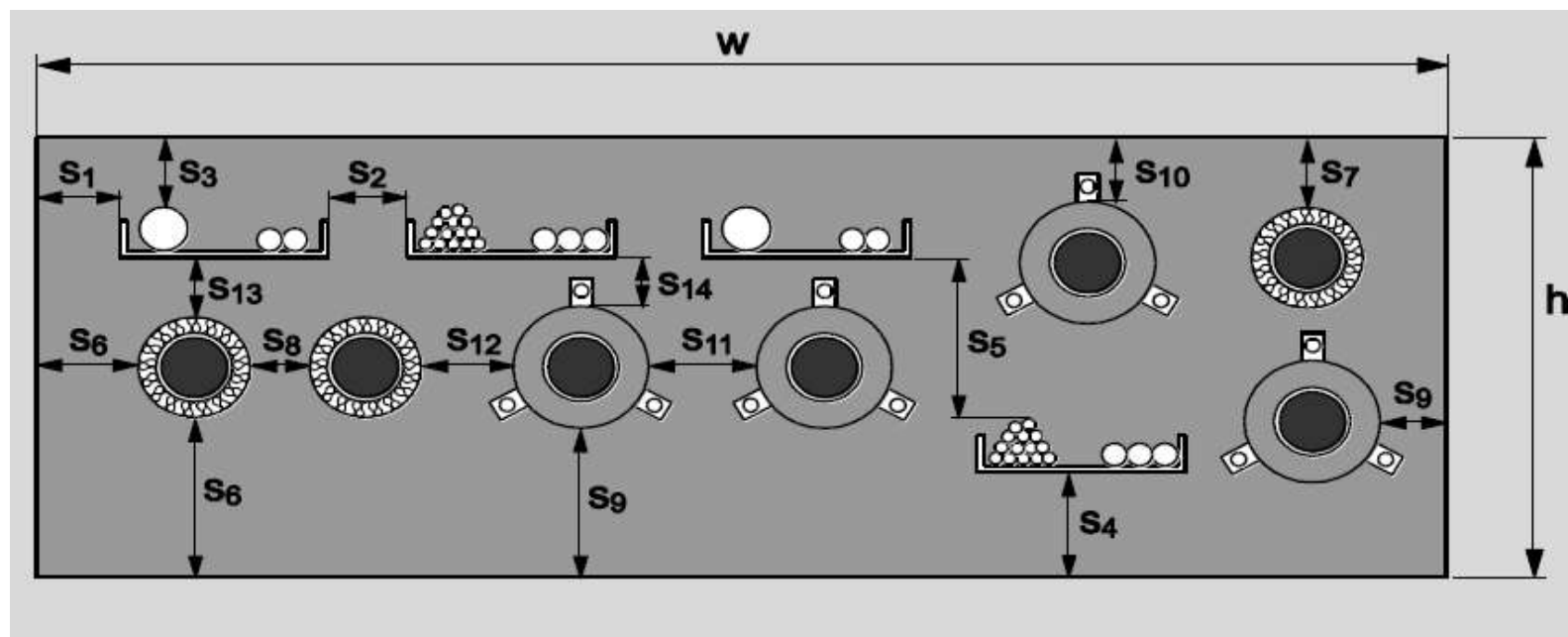


20.1 MULTIPLE PENETRATIONS – RIGID WALL

- CFS-CT Coated Board:**

Rigid wall	Minimum density of 650 kg/m ³ and comprise concrete, aerated concrete or masonry
Minimum thickness of wall	≥ 100mm
Spacing between openings	≥ 200mm between adjacent openings
Firestop Coated Boards	Double coated board – 2x50mm CFS-CT Hilti Coated Board
Minimum thickness of sealant	≥ 10mm applied in all edges of the board with Hilti CFS-S ACR (CP606)
Maximum opening size – Blank Seal	1200mm x1200mm (width x height) – EI 120 1200mm x 2000mm (width x height) – EI 90
Supports distance	≤ 250mm from face of the wall
Approval reference	ETA-11/0429
Fire Rating	EI 120 or EI 90 based on opening size

Legend
$s_1 = 0$ (distance between cables/cable supports and seal edge)
$s_2 = 0$ (distance between cable supports)
$s_3 = 0$ (distance between cables and upper seal edge)
$s_4 = 0$ (distance between cable supports and bottom seal edge)
$s_5 = 50$ (distance between cables and cable support above)
$s_6 = 3$ (distance between metal pipes and seal edge)
$s_7 = 3$ (distance between metal pipes and upper seal edge)
$s_8 = 0$ (distance between metal pipes)
$s_9 = 17$ (distance between plastic pipes/pipe closure devices and seal edge)
$s_{10} = 17$ (distance between plastic pipes/pipe closure devices and upper seal edge)
$s_{11} = 0$ (distance between plastic pipes/pipe closure devices)
$s_{12} = 30$ (distance between metal pipes and plastic pipes/pipe closure devices)
$s_{13} = 3$ (distance between cables/cable supports and metal pipes)
$s_{14} = 40$ (distance between cables/cable supports and plastic pipes/pipe closure devices)

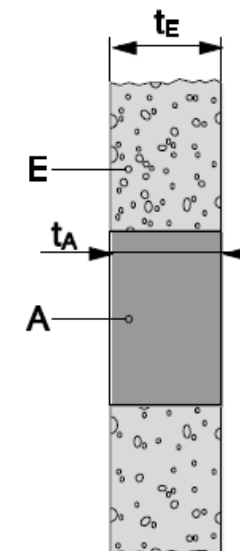
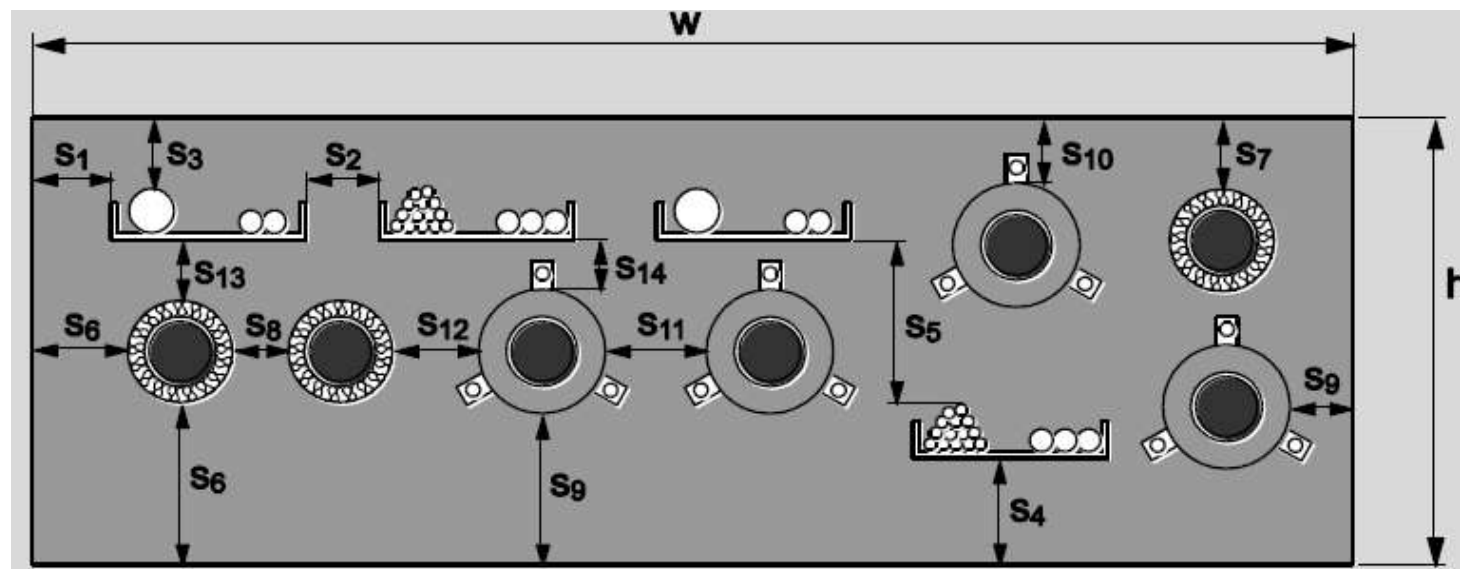


20.2 MULTIPLE PENETRATIONS – RIGID WALL

- CFS-F FX Intumescent Foam:**

Rigid wall	Minimum density of 650 kg/m ³ and comprise concrete, aerated concrete or masonry
Minimum thickness of wall	≥ 100mm
Spacing between openings	≥ 200mm between adjacent openings
Minimum thickness of Foam	≥ 100mm
Maximum opening size – Blank Seal	600mm x600mm (width x height) – EI 120 (For 150mm thickness of foam) 400mm x 400mm (width x height) – EI 90 (For 100mm thickness of foam)
Supports distance	≤ 300mm from face of the wall
Approval reference	ETA-10/0109
Fire Rating	EI 120 or EI 90 based on opening size
Note	Total amount of services (including insulation) must be equal or lower than 60% of the penetration surface.

Legend
$s_1 = 0$ (distance between cables/cable supports and seal edge)
$s_2 = 0$ (distance between cable supports)
$s_3 = 25$ (distance between cables and upper seal edge)
$s_4 = 0$ (distance between cable supports and bottom seal edge)
$s_5 = 50$ (distance between cables and cable support above)
$s_6 = 0$ (distance between metal pipes and seal edge)
$s_7 = 20$ (distance between metal pipes and upper seal edge)
$s_8 = 0$ (distance between metal pipes) linear arrangement $s_8 = 40$ (distance between metal pipes) grouped arrangement
$s_9 = 0$ (distance between plastic pipes/pipe closure devices and seal edge)
$s_{10} = 20$ (distance between plastic pipes/pipe closure devices and upper seal edge)
$s_{11} = 35$ (distance between plastic pipes/pipe closure devices)
$s_{12} = 35$ (distance between metal pipes and plastic pipes/pipe closure devices)
$s_{13} = 50$ (distance between cables/cable supports and metal pipes)
$s_{14} = 50$ (distance between cables/cable supports and plastic pipes/pipe closure devices)

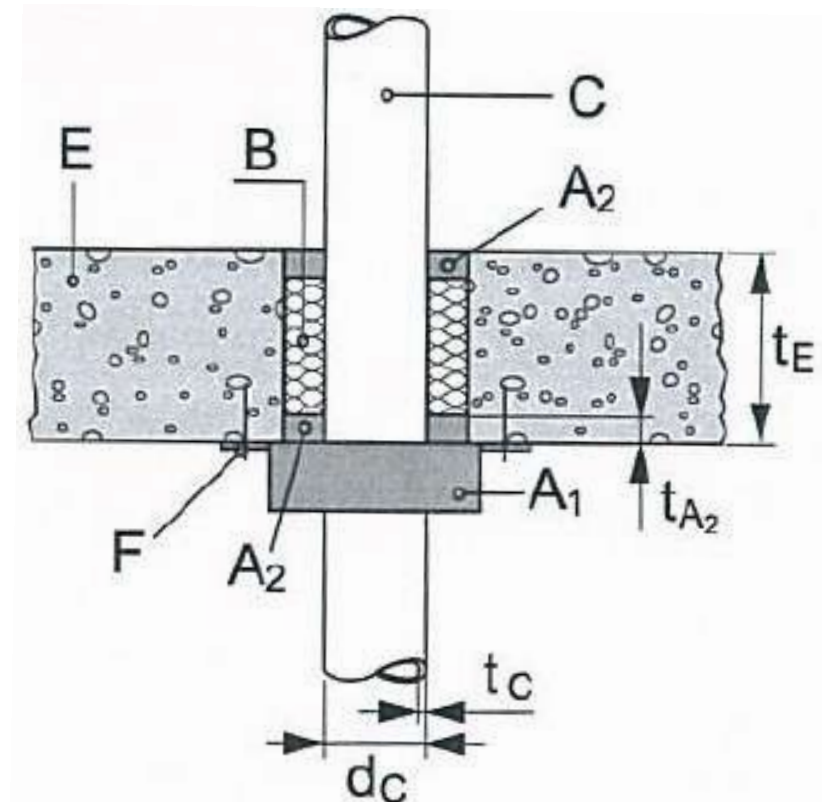


21.1 PLASTIC PIPE – RIGID FLOOR

- CFS-C P Firestop Collar for PVC pipe:**

Rigid floor	Minimum density of 2400 kg/m ³ and comprise concrete.
Minimum thickness of floor	≥ 150mm
Material of pipes	PVC-U According to EN 15493; EN 1452 and DIN 8061/8062; EN 1329-1; EN 1453-1; PVC-C According to EN 1566-1
Sizes of pipes	See table
Spacing between openings	≥ 0mm between adjacent openings
Minimum thickness of sealant	≥ 10mm (top and bottom)
Maximum annular gap	Opening size ≤ Collar diameter
Backfilling material	Mineral wool of minimum 60kg/m ³ density
Fixing of the collar	Minimum M8 Fire Rated Metal Anchors (Hilti HUS3-H M8)
Supports distance	≤ 300mm from face of the floor
Approval reference	ETA-10/0404
Fire Rating	See table

Pipe Diameter d_c (mm)	Pipe wall thickness t_c (mm)	Collar Size (A_1)	Classification (Fire Rating) (minutes)	Maximum size of opening (mm)	Minimum size of opening (mm)
20 – 50	1.5 / 2,4 – 2.2 / 5,6	CFS-C P 50/1.5"	EI 120	67	50
50	2,4 – 5,6	CFS-C P 50/1.5"	EI 120	67	50
63	3,0 - 4,7	CFS-C P 63/2"	EI 120	82	63
75	2,2 – 3,6	CFS-C P 75/2.5"	EI 120		75
90	2,7 – 4,3	CFS-C P 90/3"	EI 120	117	90
110	2,2 – 8,1	CFS-C P 110/4"	EI 120	146	110
125	3,7 – 6,0	CFS-C P 125/5"	EI 120	166	125
160	2,5 – 11,8	CFS-C P 160/6"	EI 120	236	160

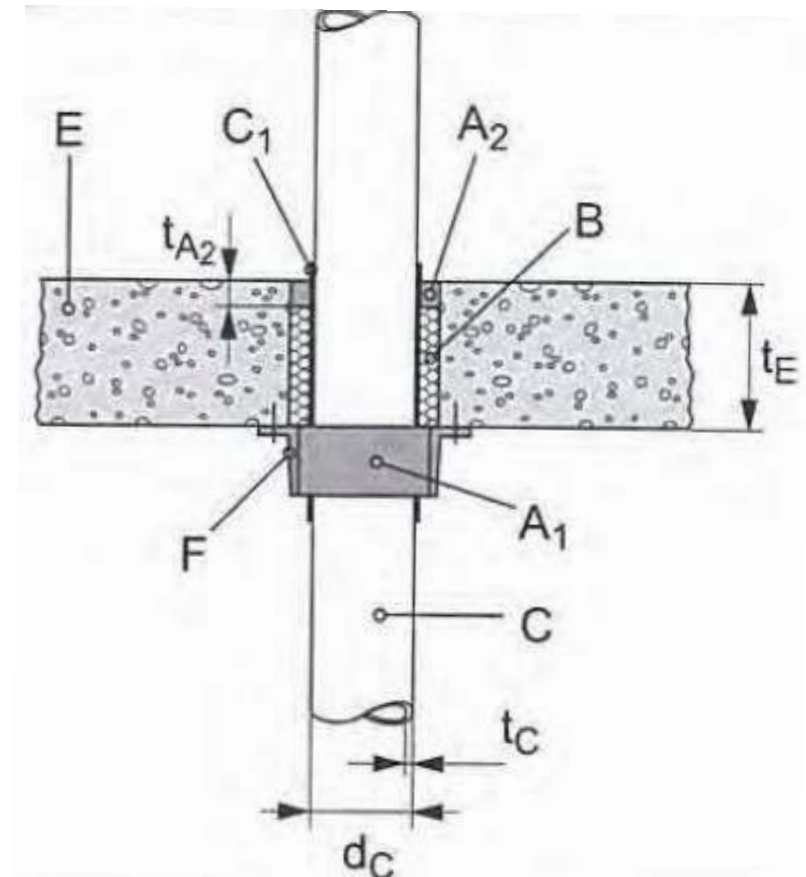


Legend	
A_1	Hilti Firestop Collar CFS-C P
A_2	Annular gap seal with Hilti Acrylic Sealant CFS-S ACR
B	Backfilling material
C	Plastic Pipe
d_c	Pipe diameter (nominal outside diameter)
E	Building element (wall, floor)
F	Fixing of the collar
t_{A2}	Thickness of Hilti Firestop Acrylic Sealant CFS-S ACR (CP606)
t_c	Pipe wall thickness
t_E	Thickness of the building element

21.2 PLASTIC PIPE – RIGID FLOOR

- CFS-C EL Endless Firestop Collar for PVC pipe:**

Rigid floor	Minimum density of 650 kg/m ³ and comprise concrete, aerated concrete
Minimum thickness of floor	≥ 150mm
Material of pipes	PVC According to EN 1452-1; EN 1453-1; BS EN 1329-1; EN 1566-1; EN ISO 15493 and DIN 8061/8062
Sizes of pipes	See table
Spacing between openings	≥ 0mm between adjacent openings
Minimum thickness of sealant	≥ 25mm (Only top if backfilled; If not: top and bottom)
Maximum annular gap	≤ 40mm
Backfilling material	Mineral wool of minimum 60kg/m ³ density
Fixing of the collar	Minimum M8 Fire Rated Metal Anchors (Hilti HUS3-H M8)
Supports distance	≤ 250mm from face of the floor
Approval reference	ETA-14/0085
Fire Rating	See table



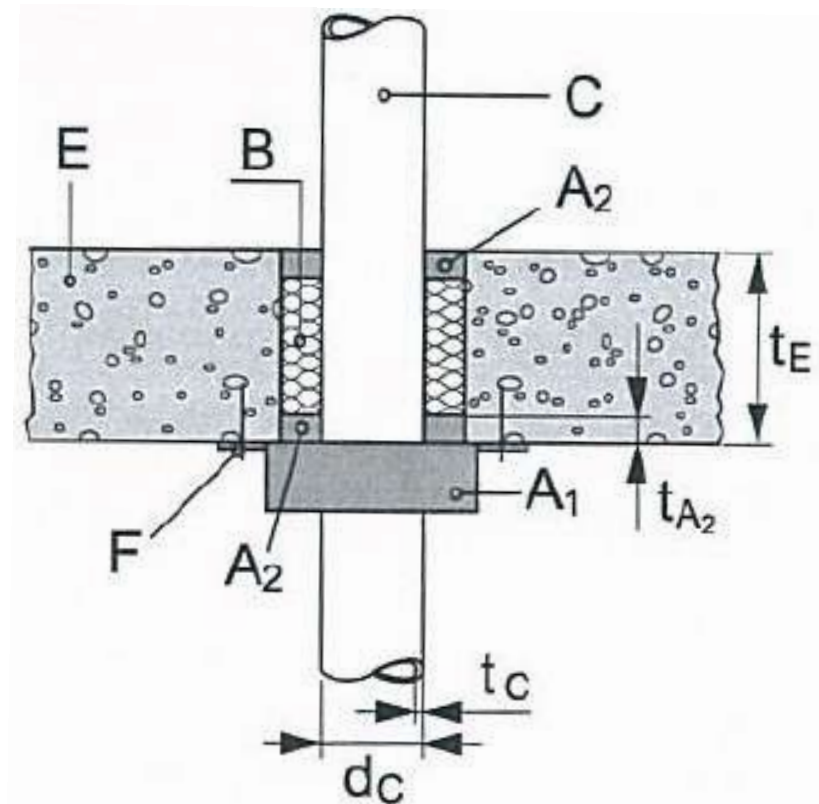
Pipe Diameter d_c (mm)	Pipe wall thickness t_c (mm)	Length of Collar (mm)	Classification (Fire Rating) (minutes)	Number of fixings	Maximum size of opening (mm)	Minimum size of opening (mm)
32	1,8 – 12,3	150	EI 120	2	62	32
40	1,8 – 12,3	180	EI 120	2	70	40
50	1,8 – 12,3	210	EI 120	2	80	50
63	1,9 – 12,3	250	EI 120	3	93	63
75	2,0 – 12,3	290	EI 120	3	105	75
83	2,0 – 12,3	320	EI 120	3	113	83
90	2,1 – 12,3	340	EI 120	3	120	90
110	2,2 – 12,3	400	EI 120	3	140	110

Legend	
A₁	Hilti Firestop Collar CFS-C Endless
A₂	Annular gap seal with Hilti Acrylic Sealant CFS-S ACR
B	Backfilling material
C₁	Plastic Pipe
d_c	Pipe diameter (nominal outside diameter)
E	Building element (wall, floor)
F	Fixing of the collar
t_{A2}	Thickness of Hilti Firestop Acrylic Sealant CFS-S ACR (CP606)
t_c	Pipe wall thickness
t_E	Thickness of the building element

22.1 PLASTIC PIPE – RIGID FLOOR

- CFS-C P Firestop Collar for PE pipe:**

Rigid floor	Minimum density of 2400 kg/m ³ and comprise concrete.
Minimum thickness of floor	≥ 150mm
Material of pipes	PE According to EN 1519; EN 12201-2 and EN 12666-1
Sizes of pipes	See table
Spacing between openings	≥ 0mm between adjacent openings
Minimum thickness of sealant	≥ 10mm (top and bottom)
Maximum annular gap	Opening size ≤ Collar diameter
Backfilling material	Mineral wool of minimum 60kg/m ³ density
Fixing of the collar	Minimum M8 Fire Rated Metal Anchors (Hilti HUS3-H M8)
Supports distance	≤ 300mm from face of the floor
Approval reference	ETA-10/0404
Fire Rating	See table



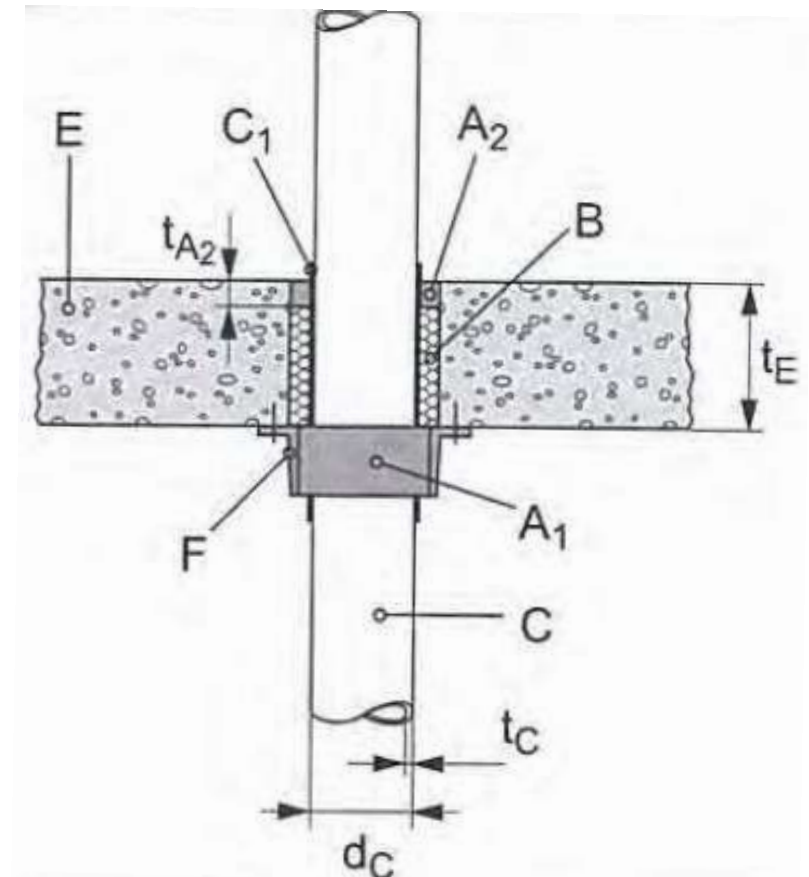
Pipe Diameter d _c (mm)	Pipe wall thickness t _c (mm)	Collar Size (A ₁)	Classification (Fire Rating) (minutes)	Maximum size of opening (mm)	Minimum size of opening (mm)
50	3,0	CFS-C P 50/1.5"	EI 120	67	50
63	3,0	CFS-C P 63/2"	EI 120	82	63
75	3,0	CFS-C P 75/2.5"	EI 120		75
90	3,5	CFS-C P 90/3"	EI 120	117	90
110	4,2	CFS-C P 110/4"	EI 120	146	110
125	4,8	CFS-C P 125/5"	EI 120	166	125
160	6,2	CFS-C P 160/6"	EI 120	236	160
200	6,2	CFS-C P 200/8"	EI 120	250	200

Legend	
A ₁	Hilti Firestop Collar CFS-C P
A ₂	Annular gap seal with Hilti Acrylic Sealant CFS-S ACR
B	Backfilling material
C	Plastic Pipe
d _c	Pipe diameter (nominal outside diameter)
E	Building element (wall, floor)
F	Fixing of the collar
t _{A2}	Thickness of Hilti Firestop Acrylic Sealant CFS-S ACR (CP606)
t _c	Pipe wall thickness
t _E	Thickness of the building element

22.2 PLASTIC PIPE – RIGID FLOOR

- CFS-C EL Endless Firestop Collar for PE pipe:**

Rigid floor	Minimum density of 650 kg/m ³ and comprise concrete, aerated concrete
Minimum thickness of floor	≥ 150mm
Material of pipes	PE According to EN 1519-1; EN 12201-2 and EN 12666-1
Sizes of pipes	See table
Spacing between openings	≥ 0mm between adjacent openings
Minimum thickness of sealant	≥ 25mm (Only top if backfilled; If not: top and bottom)
Maximum annular gap	≤ 40mm
Backfilling material	Mineral wool of minimum 60kg/m ³ density
Fixing of the collar	Minimum M8 Fire Rated Metal Anchors (Hilti HUS3-H M8)
Supports distance	≤ 250mm from side of the floor
Approval reference	ETA-14/0085
Fire Rating	See table



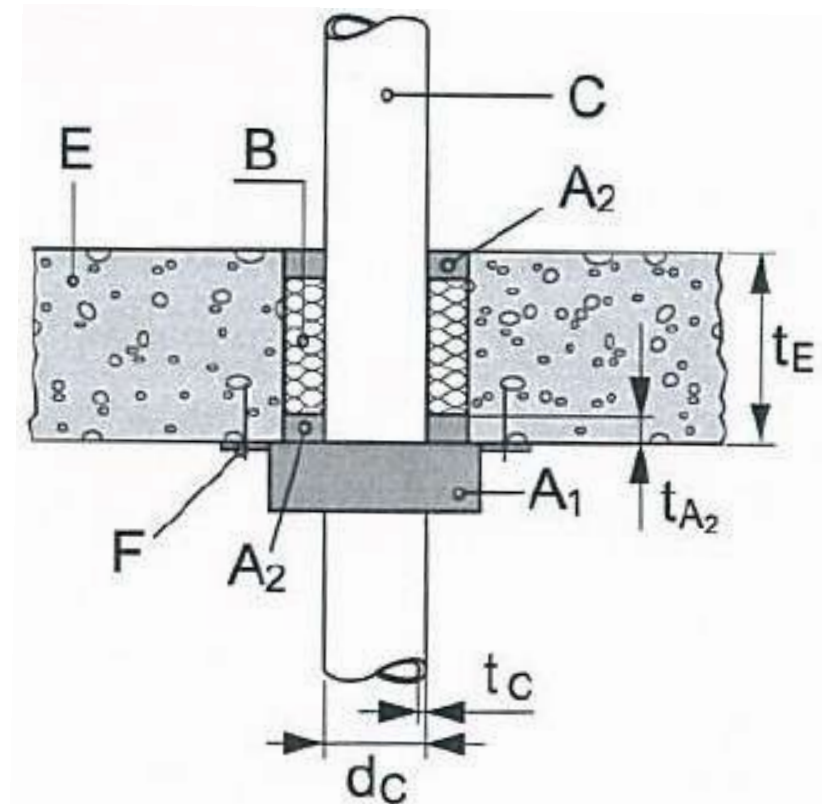
Pipe Diameter d_c (mm)	Pipe wall thickness t_c (mm)	Length of Collar (mm)	Classification (Fire Rating) (minutes)	Number of fixings	Maximum size of opening (mm)	Minimum size of opening (mm)
40	3,0 – 4,8	180	EI 120	2	70	40
50	3,0 – 4,8	210	EI 120	2	80	50
63	3,0 – 4,8	250	EI 120	3	93	63
75	3,2 – 4,8	290	EI 120	3	105	75
83	3,4 – 4,8	320	EI 120	3	113	83
90	3,5 – 4,8	340	EI 120	3	120	90
110	4,8	400	EI 120	3	140	110

Legend	
A₁	Hilti Firestop Collar CFS-C Endless
A₂	Annular gap seal with Hilti Acrylic Sealant CFS-S ACR
B	Backfilling material
C	Plastic Pipe
d_c	Pipe diameter (nominal outside diameter)
E	Building element (wall, floor)
F	Fixing of the collar
t_{A2}	Thickness of Hilti Firestop Acrylic Sealant CFS-S ACR (CP606)
t_c	Pipe wall thickness
t_E	Thickness of the building element

23.1 PLASTIC PIPE – RIGID FLOOR

- CFS-C P Firestop Collar for ABS pipe:**

Rigid floor	Minimum density of 2400 kg/m ³ and comprise concrete.
Minimum thickness of floor	≥ 150mm
Material of pipes	ABS pipes+GF+“COOL-FIT” (ABS/PUR insulations/PE-HD)
Sizes of pipes	See table
Spacing between openings	≥ 0mm between adjacent openings
Minimum thickness of sealant	≥ 10mm (top and bottom)
Maximum annular gap	Opening size ≤ Collar diameter
Backfilling material	Mineral wool of minimum 60kg/m ³ density
Fixing of the collar	Minimum M8 Fire Rated Metal Anchors (Hilti HUS3-H M8)
Supports distance	≤ 300mm from side of the floor
Approval reference	ETA-10/0404
Fire Rating	See table



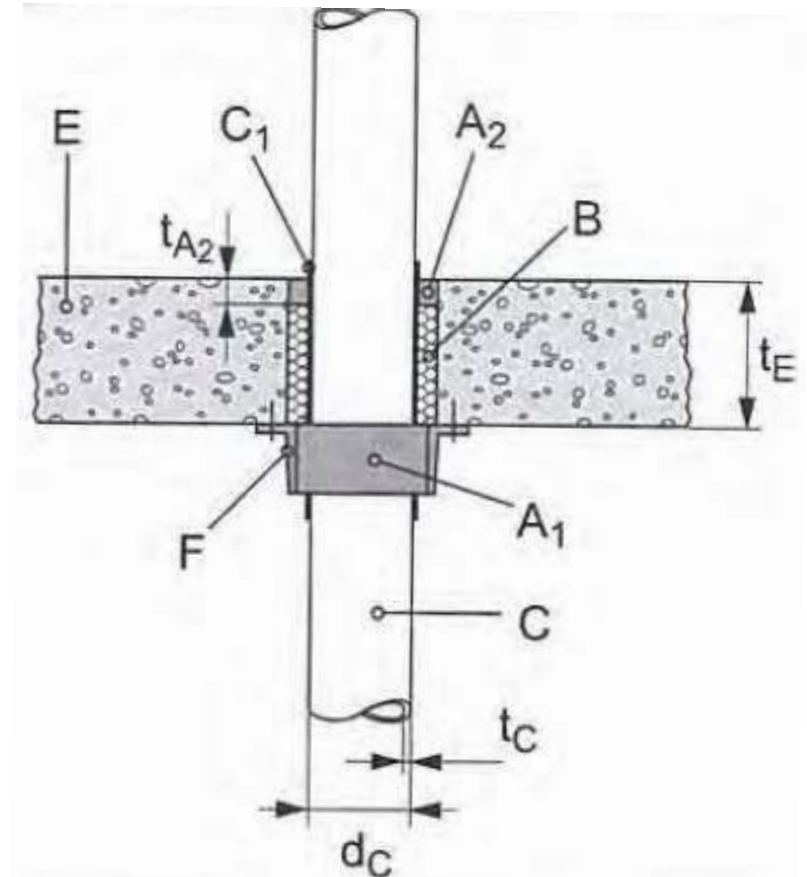
Pipe Diameter d _c (mm)	Inner Pipe diameter (mm)	Collar Size (A ₁)	Classification (Fire Rating) (minutes)	Maximum size of opening (mm)	Minimum size of opening (mm)
90	32	CFS-C P 90/3"	EI 120	117	90
110	40	CFS-C P 110/4"	EI 120	146	110
110	50	CFS-C P 110/4"	EI 120	166	110
160	90	CFS-C P 160/6"	EI 120	236	160
180	110	CFS-C P 180/7"	EI 60	228	180
225	140	CFS-C P 225/9"	EI 120	289	225
250	160	CFS-C P 250/10"	EI 120	319	250

Legend	
A ₁	Hilti Firestop Collar CFS-C P
A ₂	Annular gap seal with Hilti Acrylic Sealant CFS-S ACR
B	Backfilling material
C	Plastic Pipe
d _c	Pipe diameter (nominal outside diameter)
E	Building element (wall, floor)
F	Fixing of the collar
t _{A2}	Thickness of Hilti Firestop Acrylic Sealant CFS-S ACR (CP606)
t _c	Pipe wall thickness
t _E	Thickness of the building element

23.2 PLASTIC PIPE – RIGID WALL

- CFS-C EL Endless Firestop Collar for ABS pipe:**

Rigid floor	Minimum density of 650 kg/m ³ and comprise concrete, aerated concrete
Minimum thickness of floor	≥ 150mm
Material of pipes	ABS pipes acc. to EN 1455; EN 15493 and SAN+PVC pipes acc. EN 1565-1
Sizes of pipes	See table
Spacing between openings	≥ 0mm between adjacent openings
Minimum thickness of sealant	≥ 25mm (Only top if backfilled; If not: top and bottom)
Maximum annular gap	≤ 40mm
Backfilling material	Mineral wool of minimum 60kg/m ³ density
Fixing of the collar	Minimum M8 Fire Rated Metal Anchors (Hilti HUS3-H M8)
Supports distance	≤ 250mm from side of the floor
Approval reference	ETA-14/0085
Fire Rating	See table



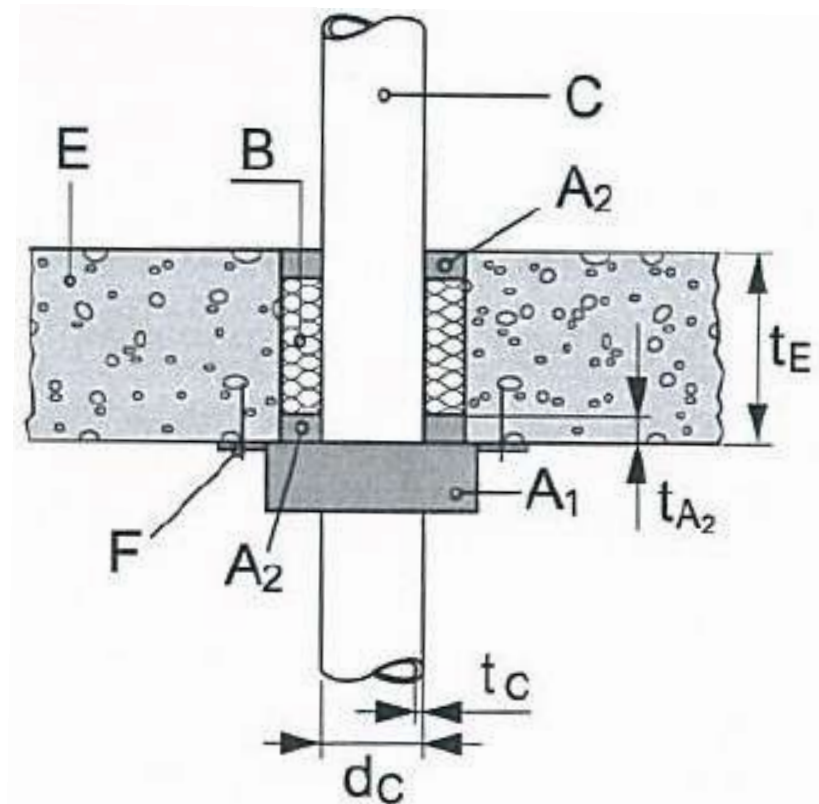
Pipe Diameter d_C (mm)	Pipe wall thickness t_C (mm)	Length of Collar (mm)	Classification (Fire Rating) (minutes)	Number of fixings	Maximum size of opening (mm)	Minimum size of opening (mm)
32	1,9 – 4,8	180	EI 120	2	70	40
63	3,0 – 4,8	250	EI 120	3	93	63
90	3,5 – 4,8	340	EI 120	3	120	90
110	4,2 - 4,8	400	EI 120	3	140	110

Legend	
A₁	Hilti Firestop Collar CFS-C Endless
A₂	Annular gap seal with Hilti Acrylic Sealant CFS-S ACR
B	Backfilling material
C	Plastic Pipe
d_C	Pipe diameter (nominal outside diameter)
E	Building element (wall, floor)
F	Fixing of the collar
t_{A2}	Thickness of Hilti Firestop Acrylic Sealant CFS-S ACR (CP606)
t_C	Pipe wall thickness
t_E	Thickness of the building element

23.3 PLASTIC PIPE – RIGID FLOOR

- CFS-C P Firestop Collar for PP pipe:**

Rigid floor	Minimum density of 2400 kg/m ³ and comprise concrete.
Minimum thickness of floor	≥ 150mm
Material of pipes	PP According to EN ISO 15874 and/or DIN 8077/8078
Sizes of pipes	See table
Spacing between openings	≥ 0mm between adjacent openings
Minimum thickness of sealant	≥ 10mm (top and bottom)
Maximum annular gap	Opening size ≤ Collar diameter
Backfilling material	Mineral wool of minimum 60kg/m ³ density
Fixing of the collar	Minimum M8 Fire Rated Metal Anchors (Hilti HUS3-H M8)
Supports distance	≤ 300mm from face of the floor
Approval reference	ETA-10/0404
Fire Rating	See table



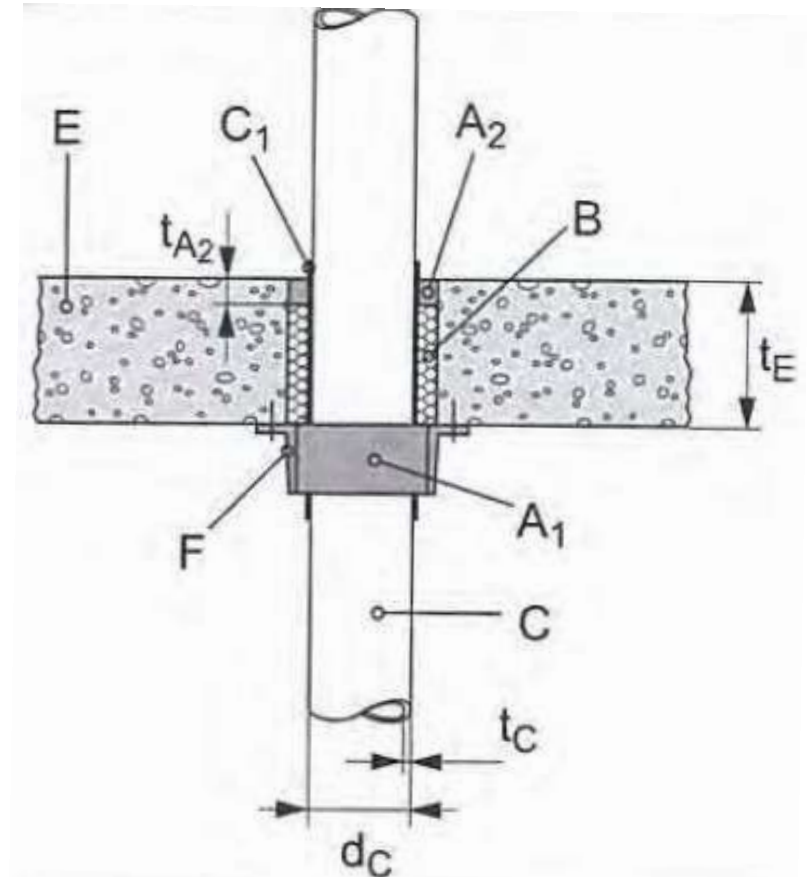
Pipe Diameter d_c (mm)	Pipe wall thickness t_c (mm)	Collar Size (A_1)	Classification (Fire Rating) (minutes)	Maximum size of opening (mm)	Minimum size of opening (mm)
40	3,7 – 5,5	CFS-C P 50/1.5"	EI 180	67	40
50	4,6 – 8,3	CFS-C P 50/1.5"	EI 180	67	50
63	5,8 – 10,5	CFS-C P 63/2"	EI 120	82	63
75	6,8 – 12,5	CFS-C P 75/2.5"	EI 120		75
90	8,2 – 15,0	CFS-C P 90/3"	EI 120	117	90
110	10,0 – 15,1	CFS-C P 110/4"	EI 120	146	110

Legend	
A_1	Hilti Firestop Collar CFS-C P
A_2	Annular gap seal with Hilti Acrylic Sealant CFS-S ACR
B	Backfilling material
C	Plastic Pipe
d_c	Pipe diameter (nominal outside diameter)
E	Building element (wall, floor)
F	Fixing of the collar
t_{A2}	Thickness of Hilti Firestop Acrylic Sealant CFS-S ACR (CP606)
t_c	Pipe wall thickness
t_E	Thickness of the building element

23.4 PLASTIC PIPE – RIGID FLOOR

- CFS-C EL Endless Firestop Collar for PP pipe:**

Rigid floor	Minimum density of 650 kg/m ³ and comprise concrete, aerated concrete
Minimum thickness of floor	≥ 150mm
Material of pipes	PP According to EN 1451-1 and DIN 8077/8078
Sizes of pipes	See table
Spacing between openings	≥ 0mm between adjacent openings
Minimum thickness of sealant	≥ 25mm (Only top if backfilled; If not: top and bottom)
Maximum annular gap	≤ 40mm
Backfilling material	Mineral wool of minimum 60kg/m ³ density
Fixing of the collar	Minimum M8 Fire Rated Metal Anchors (Hilti HUS3-H M8)
Supports distance	≤ 250mm from side of the floor
Approval reference	ETA-14/0085
Fire Rating	See table



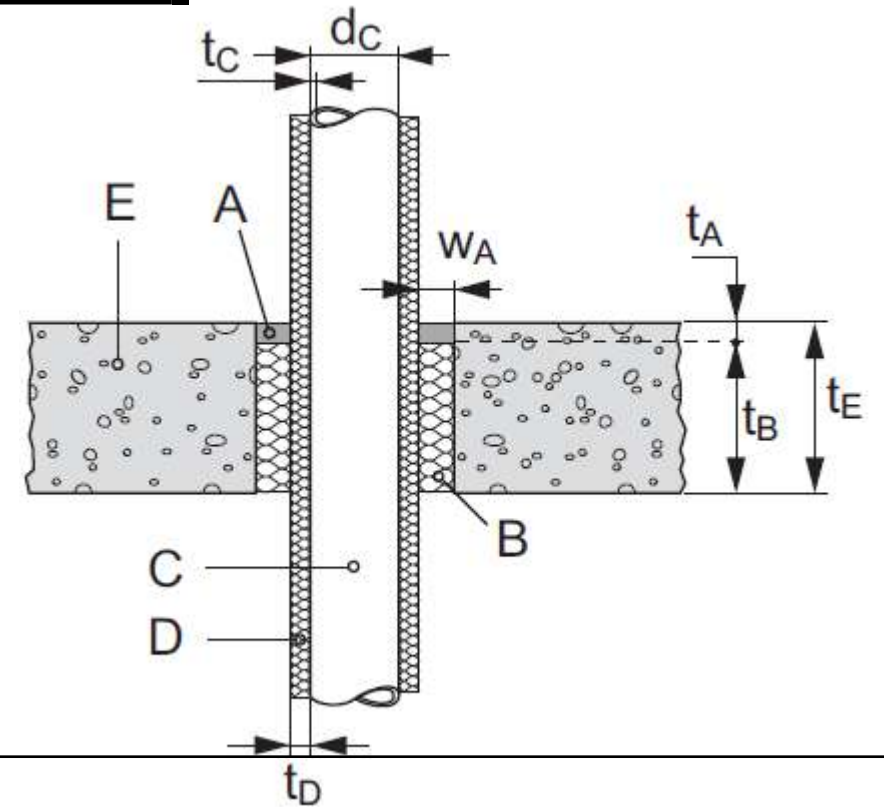
Pipe Diameter d _C (mm)	Pipe wall thickness t _C (mm)	Length of Collar (mm)	Classification (Fire Rating) (minutes)	Number of fixings	Maximum size of opening (mm)	Minimum size of opening (mm)
32	1,8 – 10,0	150	EI 120	2	62	32
40	1,8 – 10,0	180	EI 120	2	70	40
50	1,8 – 10,0	210	EI 120	2	80	50
63	1,8 – 10,0	250	EI 120	3	93	63
75	1,9 – 10,0	290	EI 120	3	105	75
83	2,7 – 10,0	320	EI 120	3	113	83
90	2,7 – 10,0	340	EI 120	3	120	90
110	2,7 – 10,0	400	EI 120	3	140	110

Legend	
A ₁	Hilti Firestop Collar CFS-C Endless
A ₂	Annular gap seal with Hilti Acrylic Sealant CFS-S ACR
B	Backfilling material
C	Plastic Pipe
d _C	Pipe diameter (nominal outside diameter)
E	Building element (wall, floor)
F	Fixing of the collar
t _{A2}	Thickness of Hilti Firestop Acrylic Sealant CFS-S ACR (CP606)
t _C	Pipe wall thickness
t _E	Thickness of the building element

24.1 CAST IRON PIPE – RIGID FLOOR

- CFS-S ACR (CP606) Sealant for Cast Iron pipe with continued insulation:**

Rigid floor	Minimum density of 550 kg/m ³ and comprise concrete, aerated concrete
Minimum thickness of floor	≥ 150mm
Material of pipes	Metal pipes with lower heat conductivity than unalloyed steel and a melting point of minimum 1100°C, e.g. low alloyed steel, cast iron, stainless steels, Ni alloys (NiCu, NiCr and NiMo alloys)
Sizes of pipes	See table
Spacing between openings	≥ 200mm between adjacent openings
Minimum thickness of sealant	≥ 10mm
Maximum annular gap	13mm ≤ Annular gap (w_A) ≤ 48mm
Backfilling material	Loose stone wool or stone wool mats with a minimum density of 45 kg/m ³
Supports distance	≤ 250mm from side of the floor
Approval reference	ETA-10/0292 – (EN1366-3)
Fire Rating	See table (Higher Fire Rating values can be achieved)



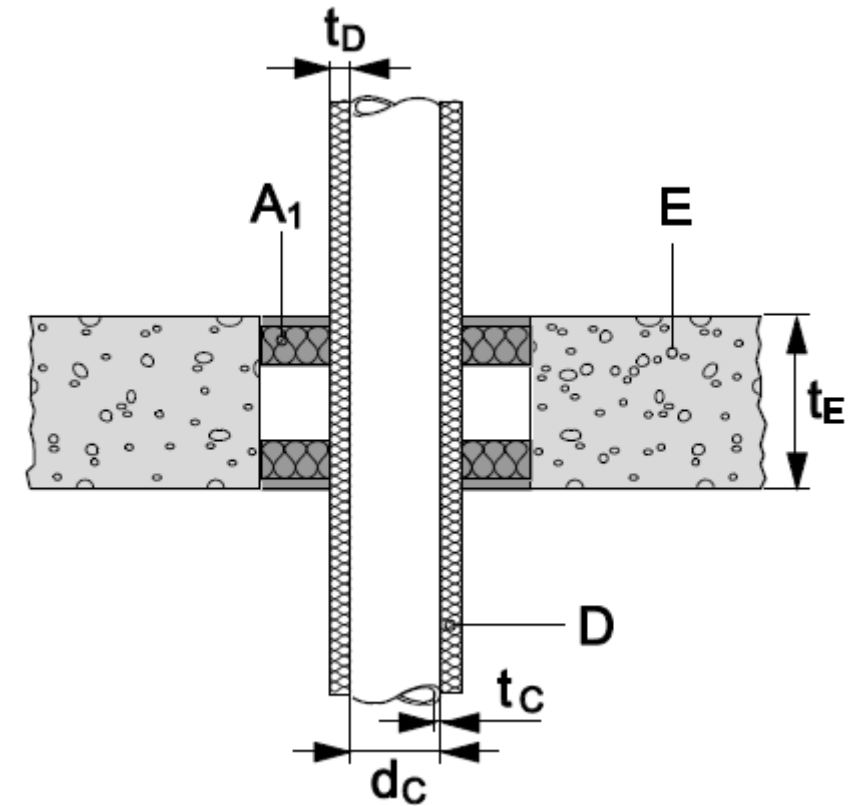
Legend	
A	Hilti Firestop Acrylic Sealant CFS-S ACR (CP606)
B	Backfilling material
C	Penetrating Service - Pipe
d_c	Pipe diameter (nominal outside diameter)
w_A	Width of penetration seal (Annular gap)
D	Insulation (Mineral wool as per ETA)
E	Building element (wall, floor)
t_A	Thickness of Hilti Firestop Acrylic Sealant CFS-S ACR (CP606)
t_B	Thickness of backfilling material
t_C	Pipe wall thickness
t_D	Thickness of insulation
t_E	Thickness of the building element

Pipe Diameter d_c (mm)	Pipe wall thickness t_c (mm)	Continued Insulation thickness t_D (mm)	Classification (Fire Rating) (minutes)	Maximum size of opening (mm)	Minimum size of opening (mm)
26,9 – 48,3	1,4 / 1,6 – 14,2	20	EI 180	$d_c + 2xt_D + 2xw_A$	$d_c + 2xt_D$
26,9 – 168,3	1,4 / 2,6 – 14,2	40	EI 120		

24.2 CAST IRON PIPE – RIGID FLOOR

- CFS-CT Coated Board for Cast Iron pipe with continued insulation:**

Rigid floor	Minimum density of 670 kg/m ³ and comprise concrete, aerated concrete
Minimum thickness of floor	≥ 150mm
Material of pipes	Metal pipes with lower heat conductivity than unalloyed steel and a melting point of minimum 1100°C, e.g. low alloyed steel, cast iron, stainless steels, Ni alloys (NiCu, NiCr and NiMo alloys)
Sizes of pipes	See table
Spacing between openings	≥ 200mm between adjacent openings
Spacing between metal pipes	≥ 20mm between adjacent insulations
Maximum opening size	600 x 1000mm
Minimum thickness of sealant	≥ 10mm applied in all edges of the board with Hilti CFS-S ACR (CP606)
Distance to seal edge	≥ 10mm
Supports distance	≤ 100mm from side of the floor
Approval reference	ETA-11/0429 – (EN1366-3)
Fire Rating	See table (Higher Fire Rating values can be achieved)



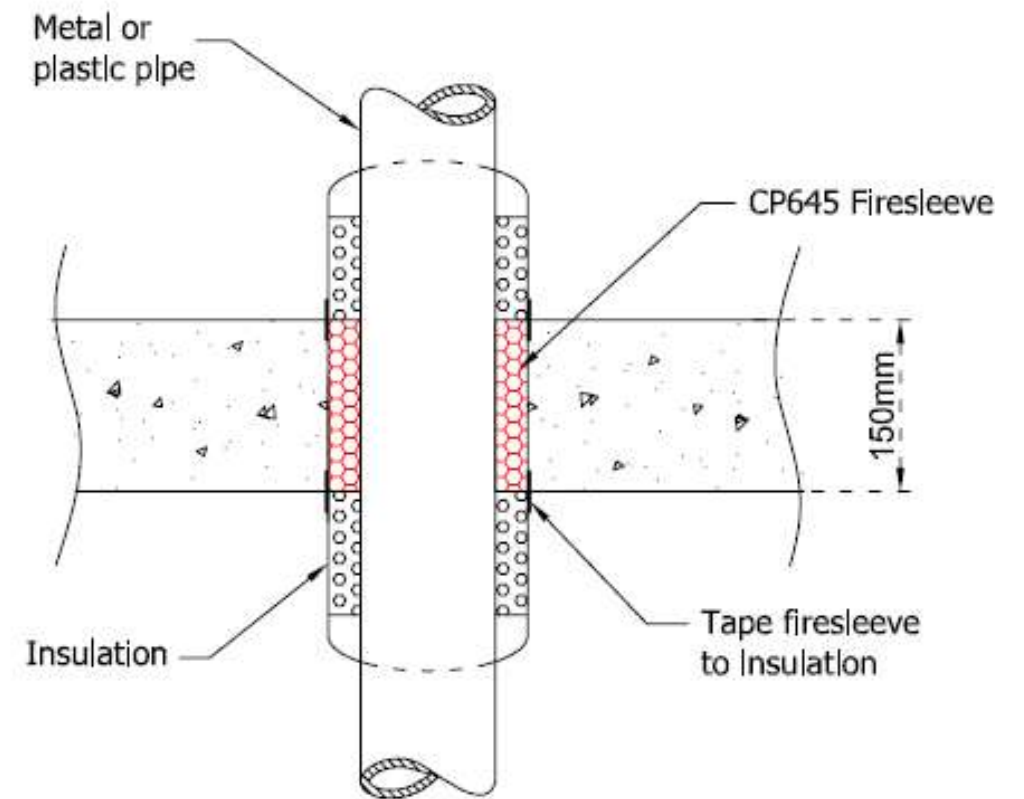
Pipe Diameter d _c (mm)	Pipe wall thickness t _c (mm)	Continued Insulation thickness t _D (mm)	Classification (Fire Rating) (minutes)	Size of opening in batt (mm)
48.3	1.6 – 14.2	≥ 20	EI 180	d _c
114.3	2.0 – 14.2	≥ 30	EI 120	
114.3 – 159.0	2.0 / 2.6 – 14.2	≥ 40	EI 120	
159.03 – 323.9	2.6 / 4.0 – 14.2	≥ 40	EI 90	

Legend	
A ₁	Hilti Firestop Coated Board CFS-CT
C	Penetrating Service - Pipe
d _c	Pipe diameter (nominal outside diameter)
D	Insulation (Mineral wool as per ETA)
E	Building element (wall, floor)
t _c	Pipe wall thickness
t _D	Thickness of insulation
t _E	Thickness of the building element

24.3 CAST IRON PIPE – RIGID FLOOR

- CP645 Intumescent Sleeve for Cast Iron pipe with continued insulation:**

Rigid floor	Minimum density of 650 kg/m ³ and comprise concrete, aerated concrete
Minimum thickness of floor	≥ 150mm
Material of pipes	Metal pipes with lower heat conductivity than unalloyed steel and a melting point of minimum 1100°C, e.g. low alloyed steel, cast iron, stainless steels, Ni alloys (NiCu, NiCr and NiMo alloys)
Sizes of pipes	See table
Spacing between openings	≥ 200mm between adjacent openings
Minimum thickness of sealant	≥ 25mm
Maximum annular gap	≤ 20mm (Binder)
Overhang from floor surface	≥ 0mm
Supports distance	≤ 270mm from side of the floor
Approval reference	Firestop Binder CP645 (BS476 pt20) (BSEN1366-3)
Fire Rating	See table

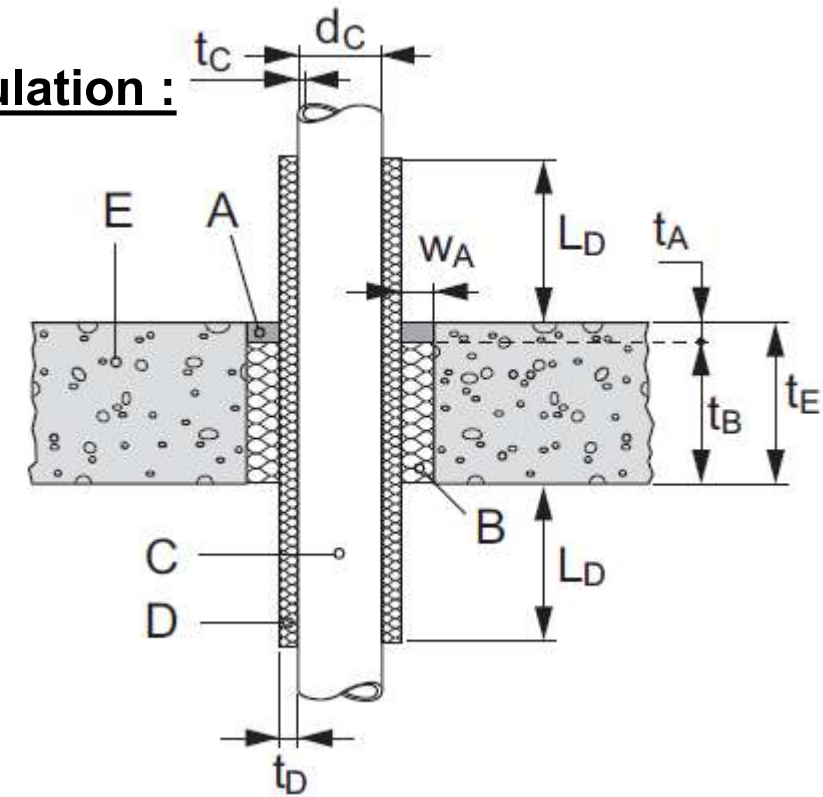


Pipe Diameter d_c (mm)	Pipe wall thickness t_c (mm)	Continued Insulation thickness t_D (mm)	Classification (Fire Rating) (minutes)	Maximum size of opening (mm)	Minimum size of opening (mm)
17 - 169	N/A	N/A	EI 120	$d_c + 2xt_D + 2x20$	$d_c + 2xt_D$

25.1 CAST IRON PIPE – RIGID FLOOR

• CFS-S ACR (CP606) Sealant for Cast Iron pipe without continued insulation :

Rigid floor	Minimum density of 550 kg/m ³ and comprise concrete, aerated concrete
Minimum thickness of floor	≥ 150mm
Material of pipes	Metal pipes with lower heat conductivity than unalloyed steel and a melting point of minimum 1100°C, e.g. low alloyed steel, cast iron, stainless steels, Ni alloys (NiCu, NiCr and NiMo alloys)
Sizes of pipes	See table
Spacing between openings	≥ 200mm between adjacent openings
Minimum thickness of sealant	≥ 10mm
Maximum annular gap	13mm ≤ Annular gap (w_A) ≤ 48mm
Backfilling material	Loose stone wool or stone wool mats with a minimum density of 45 kg/m ³
Insulation	Hilti Sleeve CP645 or Mineral wool as per ETA
Supports distance	≤ 250mm from side of the floor
Approval reference	ETA-10/0292 – (EN1366-3)
Fire Rating	See table (Higher Fire Rating values can be achieved)



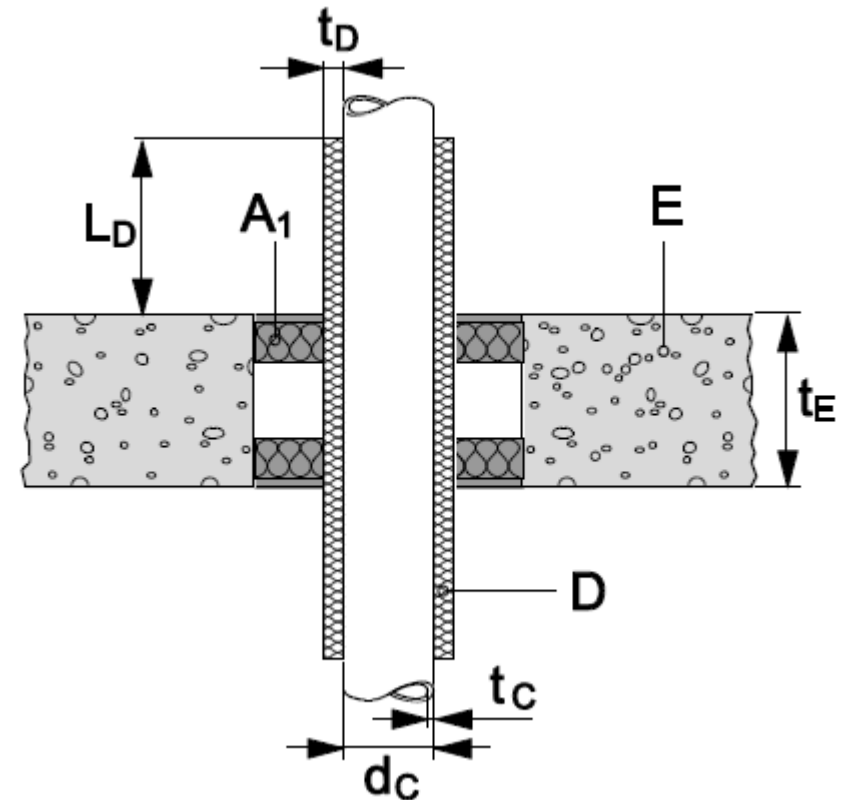
Legend	
A	Hilti Firestop Acrylic Sealant CFS-S ACR (CP606)
B	Backfilling material
C	Penetrating Service - Pipe
d_c	Pipe diameter (nominal outside diameter)
w_A	Width of penetration seal (Annular gap)
D	Insulation (Hilti Sleeve CP645 or Mineral wool as per ETA)
E	Building element (wall, floor)
L_D	Length of Insulation
t_A	Thickness of Hilti Firestop Acrylic Sealant CFS-S ACR (CP606)
t_B	Thickness of backfilling material
t_C	Pipe wall thickness
t_D	Thickness of insulation
t_E	Thickness of the building element

Pipe Diameter d_c (mm)	Pipe wall thickness t_c (mm)	Continued Insulation thickness t_D (mm)	Length of Insulation L_D (mm)	Classification (Fire Rating) (minutes)	Maximum size of opening (mm)	Minimum size of opening (mm)
26.9 – 48.3	1.4 / 1.6 – 14.2	20	≥ 450	EI 180	$d_c + 2xt_D + 2xw_A$	$d_c + 2xt_D$
48.3 – 168.3	1.6 / 2.6 – 14.2	40	≥ 500	EI 90		

25.2 CAST IRON PIPE – RIGID FLOOR

- CFS-CT Coated Board for Cast Iron pipe without continued insulation:**

Rigid floor	Minimum density of 670 kg/m ³ and comprise concrete, aerated concrete
Minimum thickness of floor	≥ 150mm
Material of pipes	Metal pipes with lower heat conductivity than unalloyed steel and a melting point of minimum 1100°C, e.g. low alloyed steel, cast iron, stainless steels, Ni alloys (NiCu, NiCr and NiMo alloys)
Sizes of pipes	See table
Spacing between openings	≥ 200mm between adjacent openings
Spacing between metal pipes	≥ 20mm between adjacent insulations
Maximum opening size	600 x 1000mm
Minimum thickness of sealant	≥ 10mm applied in all edges of the board with Hilti CFS-S ACR (CP606)
Distance to seal edge	≥ 10mm
Insulation	Hilti Sleeve CP645 or Mineral wool as per ETA
Supports distance	≤ 100mm from side of the floor
Approval reference	ETA-11/0429 – (EN1366-3)
Fire Rating	See table (Higher Fire Rating values can be achieved)



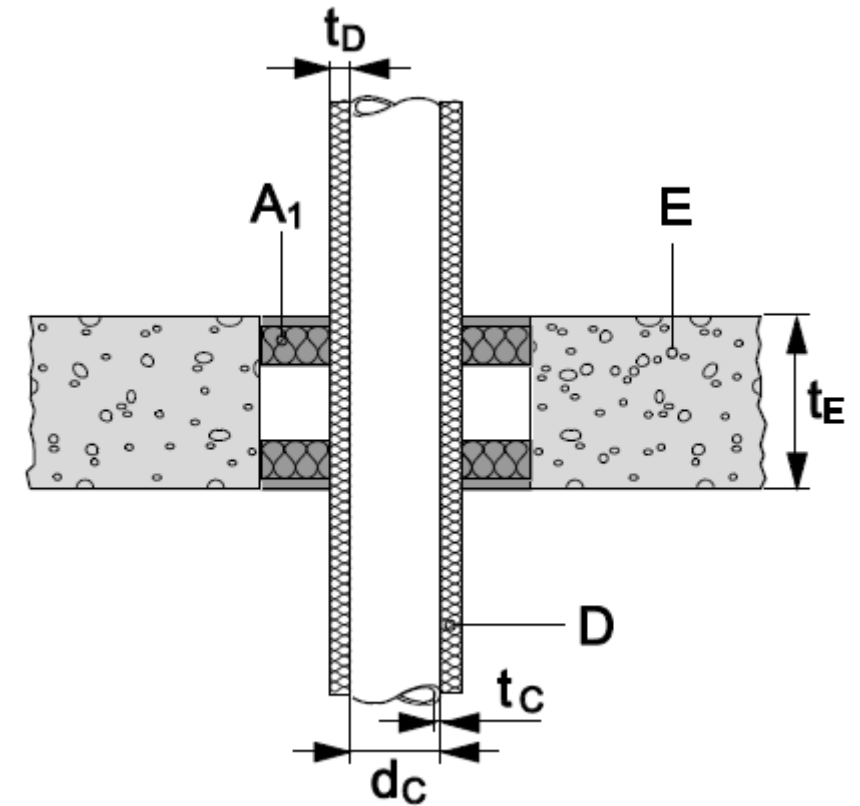
Pipe Diameter d _c (mm)	Pipe wall thickness t _c (mm)	Continued Insulation thickness t _D (mm)	Length of Insulation L _D (mm)	Classification (Fire Rating) (minutes)	Size of opening in batt (mm)
48.3	1.6 – 14.2	20	≥ 450	EI 180	d _c
114.3	2.0 – 14.2	30 – 40	≥ 500	EI 120	
114.3 – 159.0	2.0 / 2.6 – 14.2	40	≥ 500	EI 90	
159.0 – 323.9	2.6 / 4.0 – 14.2	40	≥ 1000	EI 60	

Legend	
A ₁	Hilti Firestop Coated Board CFS-CT
C	Penetrating Service - Pipe
d _c	Pipe diameter (nominal outside diameter)
D	Insulation (Hilti Sleeve CP645 or Mineral wool as per ETA)
E	Building element (wall, floor)
L _D	Length of Insulation
t _c	Pipe wall thickness
t _D	Thickness of insulation
t _E	Thickness of the building element

26.1 COPPER PIPE – RIGID FLOOR

- CFS-CT Coated Board for Copper pipe with continued insulation:**

Rigid floor	Minimum density of 670 kg/m ³ and comprise concrete, aerated concrete
Minimum thickness of floor	≥ 150mm
Material of pipes	Copper and other metal pipes with lower heat conductivity than copper and a melting point of minimum 1100°C, e.g. unalloyed steel, low alloyed steel, cast iron, stainless steels, Ni alloys (NiCu, NiCr and NiMo alloys) and Ni.
Sizes of pipes	See table
Spacing between openings	≥ 200mm between adjacent openings
Spacing between metal pipes	≥ 20mm between adjacent insulations
Maximum opening size	600 x 1000mm
Minimum thickness of sealant	≥ 10mm applied in all edges of the board with Hilti CFS-S ACR (CP606)
Distance to seal edge	≥ 10mm
Supports distance	≤ 100mm from side of the floor
Approval reference	ETA-11/0429 – (EN1366-3)
Fire Rating	See table (Higher Fire Rating values can be achieved)



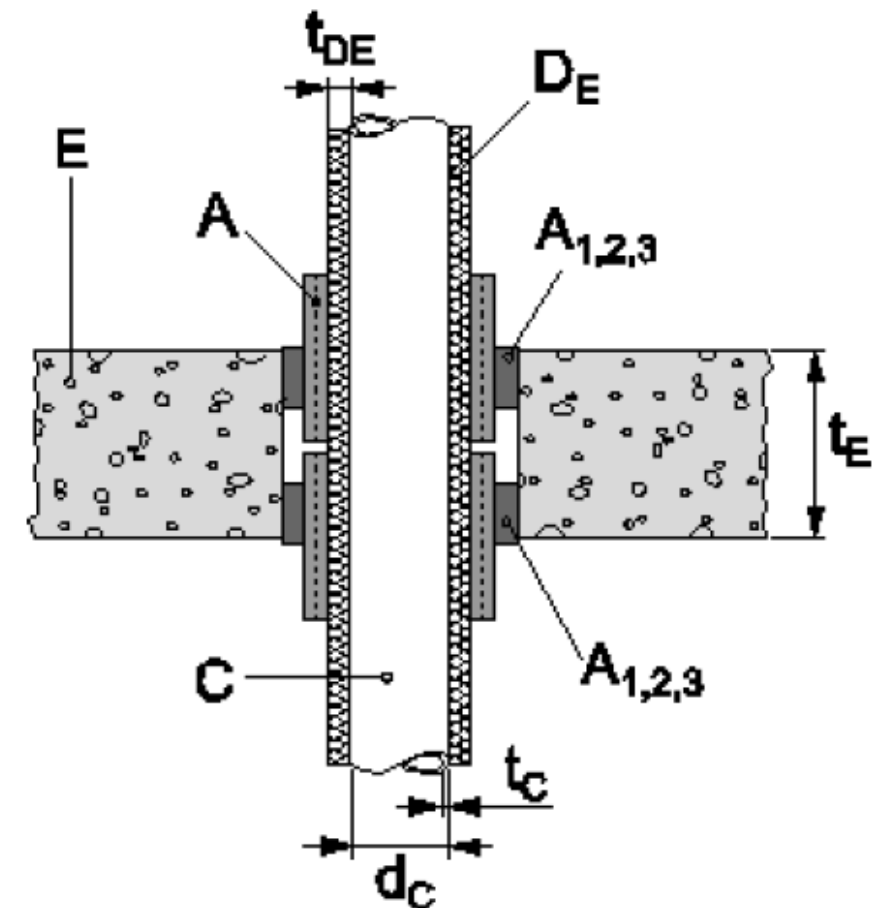
Pipe Diameter d _C (mm)	Pipe wall thickness t _C (mm)	Continued Insulation thickness t _D (mm)	Classification (Fire Rating) (minutes)	Size of opening in batt (mm)
10 – 40	1.0 / 1.5 – 14.2	≥ 20	EI 120	d _C
40 – 88,9	1.5 / 2.0 - 14.2	≥ 40	EI 120	

Legend	
A ₁	Hilti Firestop Coated Board CFS-CT
C	Penetrating Service - Pipe
d _C	Pipe diameter (nominal outside diameter)
D	Insulation (Mineral wool as per ETA)
E	Building element (wall, floor)
t _C	Pipe wall thickness
t _D	Thickness of insulation
t _E	Thickness of the building element

26.2 COPPER PIPE – RIGID FLOOR

- CFS-B Bandage for Copper pipes with continued insulation:**

Rigid floor	Minimum density of 550 kg/m ³ and comprise concrete, aerated concrete
Minimum thickness of floor	≥ 150mm
Material of pipes	Copper and other metal pipes with lower heat conductivity than copper and a melting point of minimum 1100°C, e.g. unalloyed steel, low alloyed steel, cast iron, stainless steels, Ni alloys (NiCu, NiCr and NiMo alloys) and Ni.
Sizes of pipes	See table
Spacing between openings	≥ 100mm between adjacent openings
Spacing between pipes	≥ 100mm
Distance to seal edge	≥ 40mm
Minimum thickness of sealant	≥ 25mm
Maximum annular gap	≤ 15mm
Supports distance	≤ 400mm from side of the floor
Approval reference	ETA-10/0212 – (EN1366-3)
Fire Rating	See table (Higher Fire Rating values can be achieved)
Installation	CFS-B Bandage in 2 overlapped layers, inserted to the black line, in the middle of the bandage, into the floor.



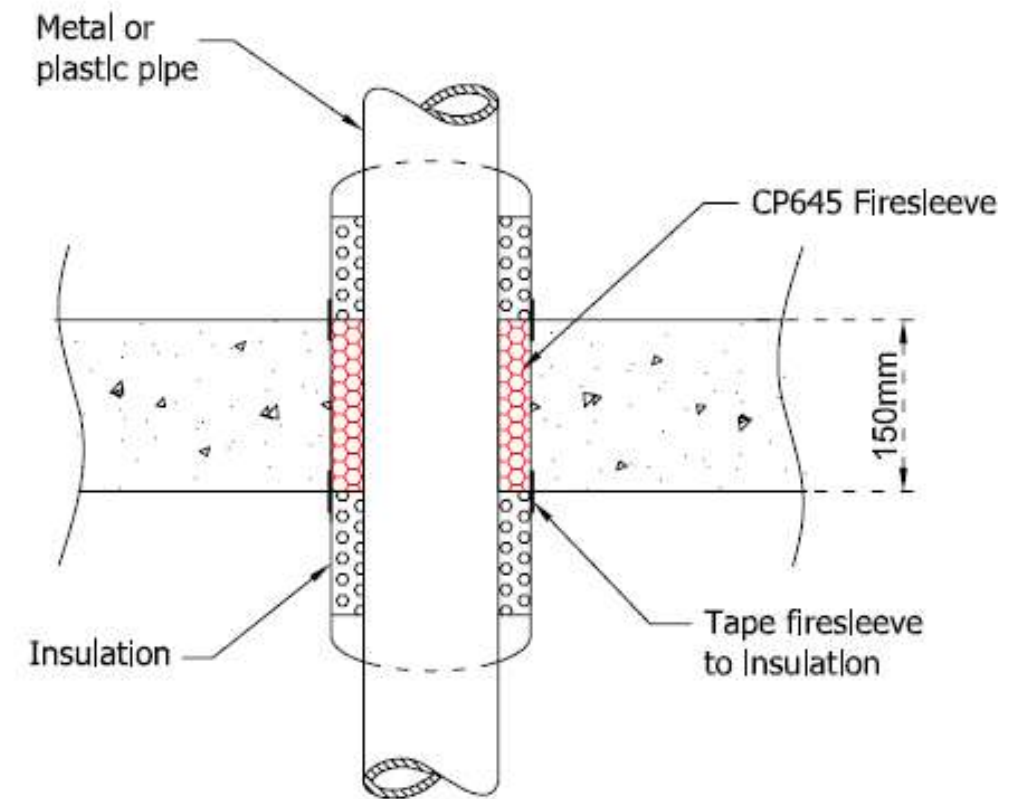
Legend	
A	Hilti Intumescent Bandage CFS-B
A_{1,2}	Hilti Acrylic Sealant CFS-S ACR (CP606)
C	Penetrating Service - Pipe
d_C	Pipe diameter (nominal outside diameter)
D_E	Insulation (Mineral wool as per ETA)
E	Building element (wall, floor)
t_{AP}	Additional Protection thickness
t_C	Pipe wall thickness
t_{DE}	Thickness of combustible insulation
t_E	Thickness of the building element

Pipe Diameter d _C (mm)	Pipe wall thickness t _C (mm)	Continued Insulation thickness t _D (mm)	Classification (Fire Rating) (minutes)	Maximum size of opening (mm)	Minimum size of opening (mm)
10.0 – 35.0	1.0 – 14.2	7.5 – 35.0	EI 120	d _C + 2xt _D + 2x20	d _C + 2xt _D
28.0 – 88.9	1.0 / 2.0 - 14.2	10 – 100	EI90		

26.3 COPPER PIPE – RIGID FLOOR

- **CP645 Intumescent Sleeve for Copper pipes with continued insulation:**

Rigid floor	Minimum density of 650 kg/m ³ and comprise concrete, aerated concrete
Minimum thickness of floor	≥ 150mm
Material of pipes	Copper and other metal pipes with lower heat conductivity than copper and a melting point of minimum 1100°C, e.g. unalloyed steel, low alloyed steel, cast iron, stainless steels, Ni alloys (NiCu, NiCr and NiMo alloys) and Ni.
Sizes of pipes	See table
Spacing between openings	≥ 200mm between adjacent openings
Minimum thickness of sealant	≥ 25mm
Maximum annular gap	≤ 20mm (Binder)
Overhang from floor surface	≥ 0mm
Supports distance	≤ 270mm from side of the floor
Approval reference	Firestop Binder CP645 (BS476 pt20) (BSEN1366-3)
Fire Rating	See table

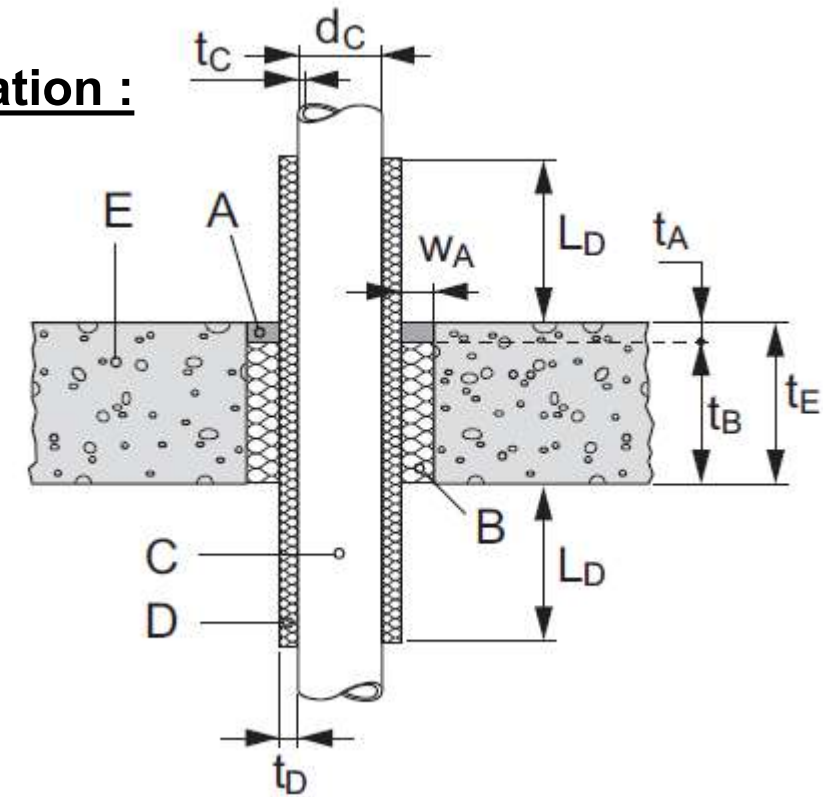


Pipe Diameter d_c (mm)	Pipe wall thickness t_c (mm)	Continued Insulation thickness t_D (mm)	Classification (Fire Rating) (minutes)	Maximum size of opening (mm)	Minimum size of opening (mm)
17 - 75	N/A	N/A	EI 120	$d_c + 2xt_D + 2x20$	$d_c + 2xt_D$

27.1 COPPER PIPE – RIGID FLOOR

• CFS-S ACR (CP606) Sealant for Copper pipe without continued insulation :

Rigid floor	Minimum density of 550 kg/m ³ and comprise concrete, aerated concrete
Minimum thickness of floor	≥ 150mm
Material of pipes	Copper and other metal pipes with lower heat conductivity than copper and a melting point of minimum 1100°C, e.g. unalloyed steel, low alloyed steel, cast iron, stainless steels, Ni alloys (NiCu, NiCr and NiMo alloys) and Ni.
Sizes of pipes	See table
Spacing between openings	≥ 200mm between adjacent openings
Minimum thickness of sealant	≥ 10mm
Maximum annular gap	13mm ≤ Annular gap (w_A) ≤ 48mm
Backfilling material	Loose stone wool or stone wool mats with a minimum density of 45 kg/m ³
Insulation	Hilti Sleeve CP645 or Mineral wool as per ETA
Supports distance	≤ 250mm from side of the floor
Approval reference	ETA-10/0292 – (EN1366-3)
Fire Rating	See table (Higher Fire Rating values can be achieved)



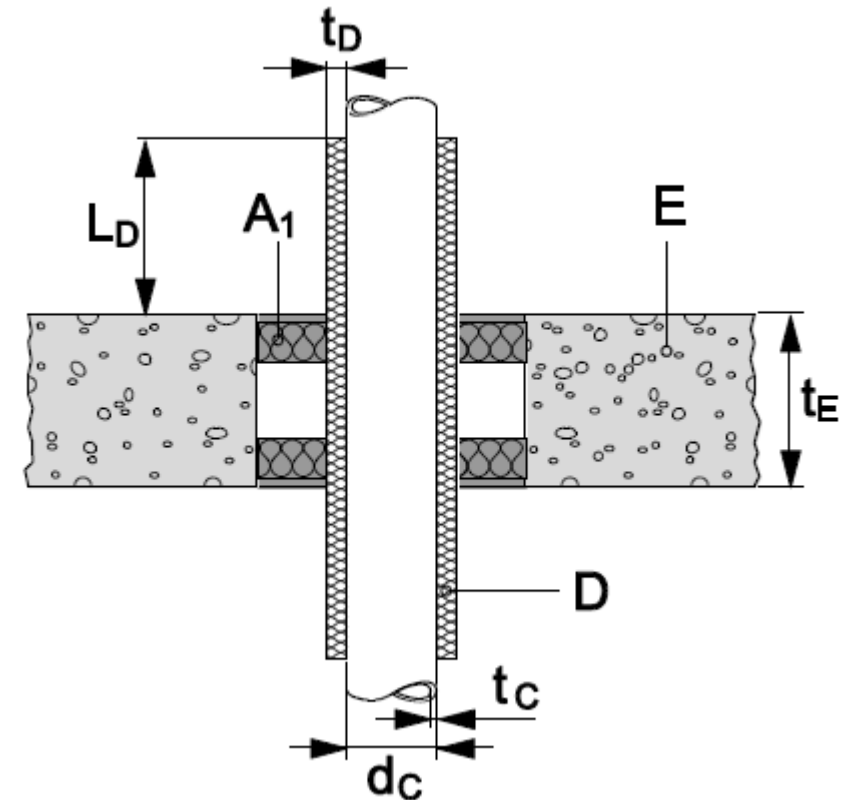
Legend	
A	Hilti Firestop Acrylic Sealant CFS-S ACR (CP606)
B	Backfilling material
C	Penetrating Service - Pipe
d_c	Pipe diameter (nominal outside diameter)
w_A	Width of penetration seal (Annular gap)
D	Insulation (Hilti Sleeve CP645 or Mineral wool as per ETA)
E	Building element (wall, floor)
L_D	Length of Insulation
t_A	Thickness of Hilti Firestop Acrylic Sealant CFS-S ACR (CP606)
t_B	Thickness of backfilling material
t_C	Pipe wall thickness
t_D	Thickness of insulation
t_E	Thickness of the building element

Pipe Diameter d_c (mm)	Pipe wall thickness t_c (mm)	Continued Insulation thickness t_D (mm)	Length of Insulation L_D (mm)	Classification (Fire Rating) (minutes)	Maximum size of opening (mm)	Minimum size of opening (mm)
42.0	1.5 – 14.2	20	≥ 450	EI 120	$d_c + 2xt_D + 2xw_A$	$d_c + 2xt_D$
42.0	1.5 – 14.2	20 - 40	≥ 700	EI 120		
42.0 – 88.9	1.5 / 2.0 – 14.2	40	≥ 500	EI 90		
			≥ 700	EI 120		

27.2 COPPER PIPE – RIGID FLOOR

- CFS-CT Coated Board for Copper pipe without continued insulation:**

Rigid floor	Minimum density of 670 kg/m ³ and comprise concrete, aerated concrete
Minimum thickness of floor	≥ 150mm
Material of pipes	Copper and other metal pipes with lower heat conductivity than copper and a melting point of minimum 1100°C, e.g. unalloyed steel, low alloyed steel, cast iron, stainless steels, Ni alloys (NiCu, NiCr and NiMo alloys) and Ni.
Sizes of pipes	See table
Spacing between openings	≥ 200mm between adjacent openings
Spacing between metal pipes	≥ 20mm between adjacent insulations
Maximum opening size	600 x 1000mm
Minimum thickness of sealant	≥ 10mm applied in all edges of the board with Hilti CFS-S ACR (CP606)
Distance to seal edge	≥ 10mm
Insulation	Hilti Sleeve CP645 or Mineral wool as per ETA
Supports distance	≤ 100mm from side of the floor
Approval reference	ETA-11/0429 – (EN1366-3)
Fire Rating	See table (Higher Fire Rating values can be achieved)



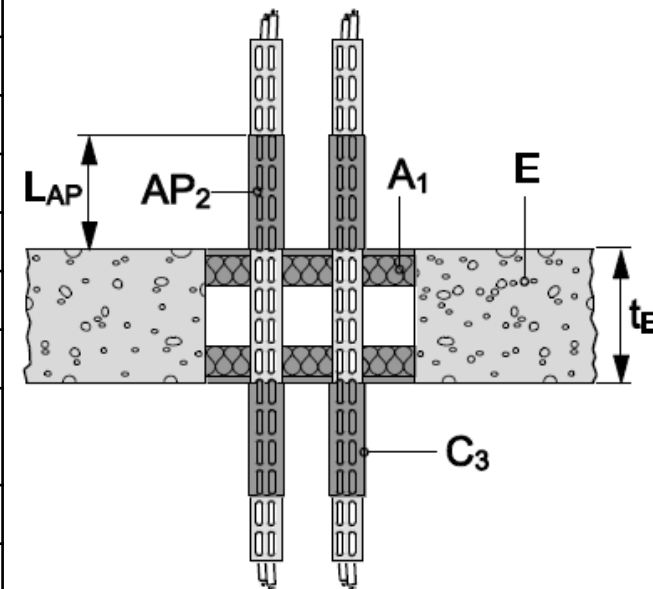
Pipe Diameter d _C (mm)	Pipe wall thickness t _C (mm)	Continued Insulation thickness t _D (mm)	Length of Insulation L _D (mm)	Classification (Fire Rating) (minutes)	Size of opening in batt (mm)
10 – 40	1,0 / 1,5 – 14,2	20	≥ 500	EI 120	d _C
40	1,5 – 14,2	40	≥ 1000	EI 120	
40 – 88,9	1,5 / 2,0 – 14,2	40	≥ 1000	EI 60	

Legend	
A ₁	Hilti Firestop Coated Board CFS-CT
C	Penetrating Service - Pipe
d _C	Pipe diameter (nominal outside diameter)
D	Insulation (Hilti Sleeve CP645 or Mineral wool as per ETA)
E	Building element (wall, floor)
L _D	Length of Insulation
t _C	Pipe wall thickness
t _D	Thickness of insulation
t _E	Thickness of the building element

28.1 CABLES – RIGID FLOOR

- CFS-CT Coated Board for cables, wires and bundles:**

Rigid floor	Minimum density of 670 kg/m ³ and comprise concrete, aerated concrete
Minimum thickness of floor	≥ 150mm
Maximum opening size	600x1000mm
Minimum thickness of sealant	≥ 10mm applied in all edges of the board with Hilti CFS-S ACR (CP606)
Spacing between openings	≥ 200mm between adjacent openings
Minimum spacing between parallel baskets	≥ 0mm (Drawing 30.1 – s ₂ = 0mm)
Minimum spacing between cable and closest basket	≥ 50mm (Drawing 30.1 – s ₅ = 50mm)
Supports distance	≤ 250mm from side of the floor
Additional Protection (AP)	≥ 2mm coating with Hilti Firestop Coating CFS-CT over a length of services of 200 mm from the surface of the seal
Approval reference	ETA-11/0429 (EN1366-3)
Fire Rating	See table (Higher Fire Rating values can be achieved)



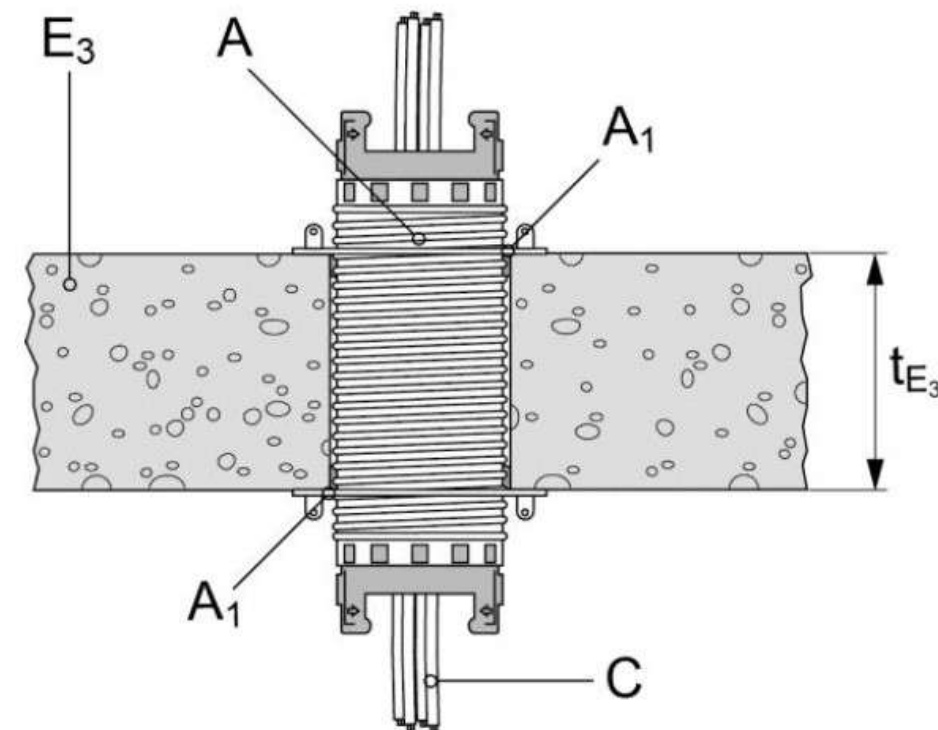
Cable Disposition (mm)	Classification (Fire Rating) (minutes)
All sheathed cable types currently and commonly used in building practice in Europe (e.g. power, control, signal, telecommunication, data, optical fibre cables, with or without cable supports, with a diameter of:	
Maximum $\varnothing \leq 21\text{mm}$	EI 90
$21\text{mm} \leq \varnothing \leq 50\text{mm}$	EI 60
$50\text{mm} \leq \varnothing \leq 80\text{mm}$	EI 60
Non-sheathed cables (wires) currently and commonly used in building practice in Europe, with or without cable supports, with a diameter of:	
Maximum $\varnothing \leq 24\text{mm}$	EI 60
Tied cable bundle, maximum diameter of single cable $\leq 21\text{ mm}$, with or without cable supports:	
Maximum $\varnothing \leq 100\text{mm}$	EI 90

Legend	
A₁	Hilti Firestop Coated Board CFS-CT
C₃	Penetrating Service - Cables
E	Building element (wall, floor)
AP	Additional Protection
L_{AP}	Length of Additional Protection
t_{AP}	Thickness of Additional Protection
t_E	Thickness of the building element

28.2 CABLES – RIGID FLOOR

- CFS-SL GA Speed sleeve for cables, wires and bundles:**

Rigid floor	Minimum density of 550 kg/m ³ and comprise concrete, aerated concrete.		
Minimum thickness of floor	CFS-S SL GA Small = 150mm CFS-S SL GA Medium/Large = 200mm		
Maximum thickness of floor	CFS-S SL GA Small = 200mm CFS-S SL GA Medium/Large = 300mm		
Spacing between openings	≥ 0mm (distance between adjacent devices' flanges)		
Minimum opening size	CFS-S SL GA Small Ø = 63mm CFS-S SL GA Medium/Large Ø = 113mm		
Maximum opening size	CFS-S SL GA Small Ø = 73mm CFS-S SL GA Medium/Large Ø = 122mm		
Fixing of the collar	No fixing required, flanges hold device in place		
Supports distance	≤ 250mm from side of the floor		
Approval reference	ETA-17/0081		
Fire Rating	See table (Higher Fire Rating values can be achieved)		
	Cable Disposition (mm)	Classification CFS-SL GA S	Classification CFS-SL GA M/L
	Blank Device	EI 180	EI 180
	All sheathed cables Ø ≤ 21mm	EI 180	EI 180
	All sheathed cables Ø ≤ 50mm	-	EI 120
	All sheathed cables Ø ≤ 80mm	-	EI 60
	Cable bundles Ø ≤ 36mm // All sheathed cables Ø ≤ 21mm	EI 180	-
	Cable bundles Ø ≤ 86mm // All sheathed cables Ø ≤ 21mm	-	EI 120
	100% filled device with cables Ø ≤ 21mm	EI 120	-
	100% filled device with cables Ø ≤ 50mm	-	EI 120
	Conduits Ø ≤ 25mm (CFS-SL GA S)	EI 120	-
	Conduits Ø ≤ 63mm (CFS-SL GA M/L)	-	EI 60

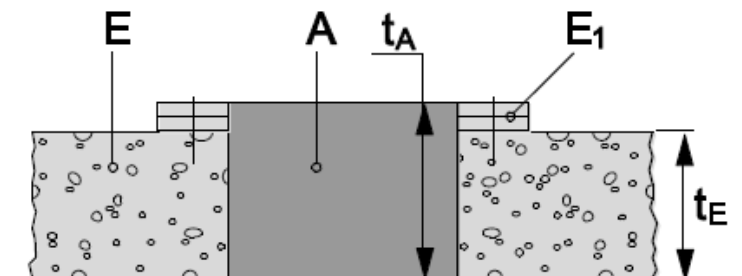
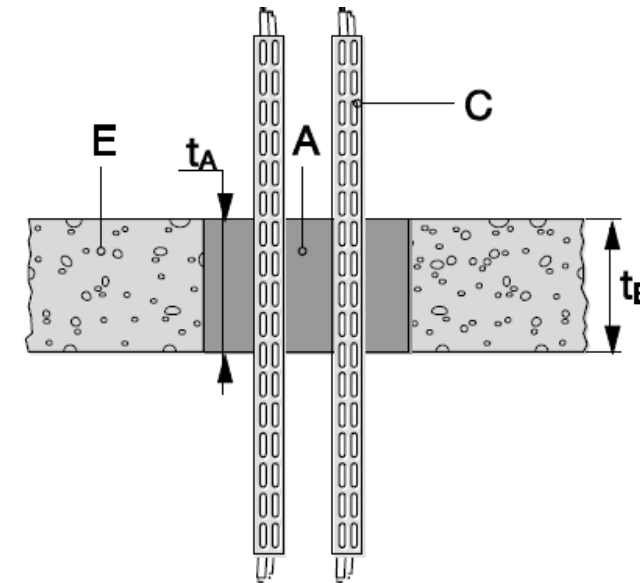


Legend	
A	Hilti Firestop Sleeve CFS-SL GA
A₁	Rubber Gasket
C₃	Penetrating Service – Cables, conduits
E	Building element (wall, floor)
t_E	Thickness of the building element

28.3 CABLES – RIGID FLOOR

- CFS-F FX Intumescent Foam for cables, wires and bundles:**

Rigid floor	Minimum density of 2200 kg/m ³ and comprise concrete or aerated concrete
Minimum thickness of floor	≥ 150mm
Maximum opening size	400x400mm
Minimum thickness of Foam	≥ 150mm (If thickness of wall $t_E \leq t_A$ then see image below)
Spacing between openings	≥ 200mm between adjacent openings
Supports distance	≤ 300mm from face of the wall
Approval reference	ETA-10/0109 (EN1366-3)
Fire Rating	See table (Higher Fire Rating values can be achieved)



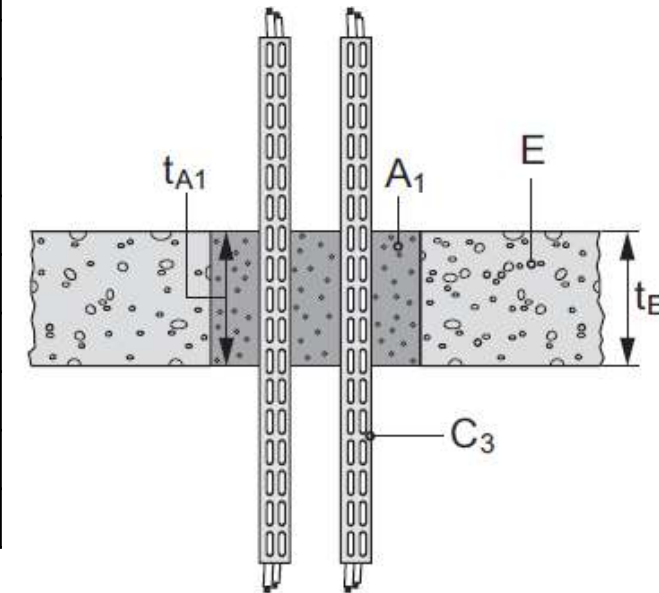
Cable Disposition (mm)	Classification (Fire Rating) (minutes)
All sheathed cable types currently and commonly used in building practice in Europe (e.g. power, control, signal, telecommunication, data, optical fibre cables, with or without cable supports, with a diameter of:	
$\varnothing \leq 21\text{mm}$	EI 60
$21\text{mm} \leq \varnothing \leq 50\text{mm}$	EI 60
$50\text{mm} \leq \varnothing \leq 80\text{mm}$	EI 60
Tied cable bundle, maximum diameter of single cable $\leq 21\text{ mm}$, with or without cable supports: $\varnothing \leq 100\text{mm}$	EI 60

Legend	
A₁	Hilti Firestop Foam CFS-F FX
C	Penetrating Service - Cables
E	Building element (wall, floor)
t_A	Thickness of Hilti Firestop Foam CFS-F FX
t_E	Thickness of the building element

28.4 CABLES – RIGID FLOOR

- CFS-M RG Firestop Mortar for cables, wires and bundles:**

Rigid floor	Minimum density of 550 kg/m ³ and comprise concrete, aerated concrete
Minimum thickness of floor	≥ 150mm
Maximum opening size	600x2000mm
Minimum thickness of sealant	≥ 150mm
Spacing between openings	≥ 200mm between adjacent openings
Minimum spacing between parallel baskets	≥ 0mm (Drawing 30.1 – s ₂ = 0mm)
Minimum spacing between cable and closest basket	≥ 50mm (Drawing 30.1 – s ₅ = 50mm)
Supports distance	≤ 300mm from side of the floor
Approval reference	ETA-12/0101
Fire Rating	See table (Higher Fire Rating values can be achieved)



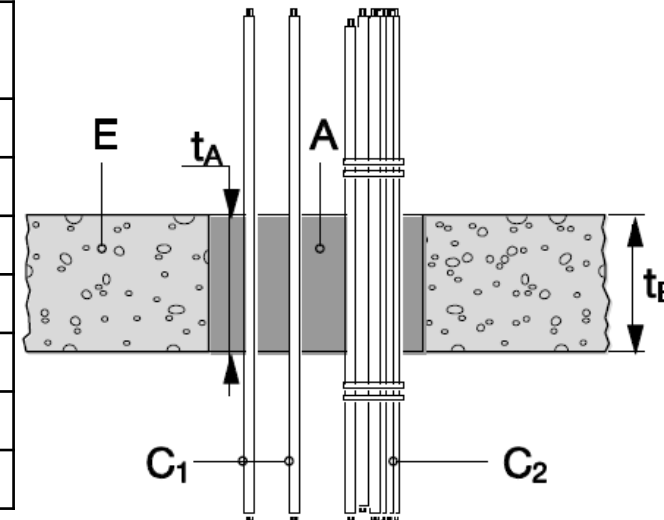
Cable Disposition (mm)	Classification (Fire Rating) (minutes)
All sheathed cable types currently and commonly used in building practice in Europe (e.g. power, control, signal, telecommunication, data, optical fibre cables, with or without cable supports, with a diameter of:	
Maximum Ø ≤ 21mm	EI 90
21mm ≤ Ø ≤ 50mm	EI 60
50mm ≤ Ø ≤ 80mm	EI 60
Non-sheathed cables (wires) currently and commonly used in building practice in Europe, with or without cable supports, with a diameter of:	
Maximum Ø ≤ 17mm	EI 45
Maximum Ø ≤ 24mm	EI 45
Tied cable bundle, maximum diameter of single cable ≤ 21 mm, with or without cable supports:	
Maximum Ø ≤ 100mm	EI 90

Legend	
A₁	Hilti Firestop Mortar CFS-M RG
C₃	Penetrating Service - Cables
E	Building element (wall, floor)
t_{A1}	Thickness of Hilti Firestop Mortar CFS-M RG
t_E	Thickness of the building element

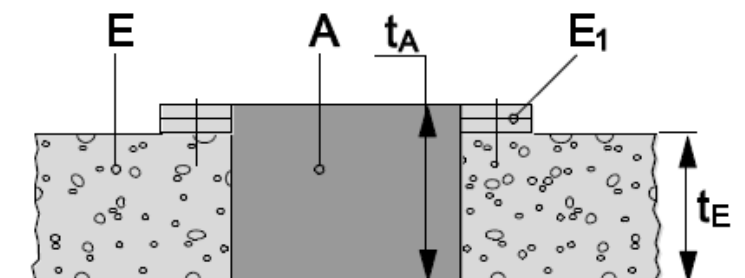
28.5 CABLES, CONDUITS, TUBES – RIGID FLOOR

- CFS-F FX Intumescent Foam for cables, conduits and tubes:**

Rigid floor	Minimum density of 2200 kg/m ³ and comprise concrete or aerated concrete
Minimum thickness of floor	≥ 150mm
Maximum opening size	400x400mm
Minimum thickness of Foam	≥ 150mm (If thickness of wall $t_E \leq t_A$ then see image below)
Spacing between openings	≥ 200mm between adjacent openings
Supports distance	≤ 300mm from face of the wall
Approval reference	ETA-10/0109 (EN1366-3)
Fire Rating	See table (Higher Fire Rating values can be achieved)



Conduit or tube Disposition (mm)	Classification (Fire Rating) (minutes)	
	Thickness of Foam CFS-F FX $t_A \geq 150\text{mm}$	Thickness of Foam CFS-F FX $t_A \geq 200\text{mm}$
Steel conduits and tubes, $\varnothing \leq 16$ mm (The field of application given above is also valid for other metal conduits or tubes with lower heat conductivity than unalloyed steel and a melting point of minimum 1050°C, e.g. low alloyed steels, stainless steels, Ni alloys (NiCu, NiCr and NiMo alloys)).	EI 120	EI 120
Plastic conduits and tubes, $\varnothing \leq 16$ mm	EI 120	EI 120
Flexible plastic conduits (Polyolefin, PVC), $16\text{mm} \leq \varnothing \leq 32$ mm	-	EI 120
Rigid plastic conduits (Polyolefin, PVC), $16\text{mm} \leq \varnothing \leq 32$ mm	-	EI 120
Bundle of plastic conduits (Polyolefin, PVC), conduits flexible or rigid, $16\text{mm} \leq \varnothing \leq 32$ mm $\varnothing \leq 100$ mm	-	EI 120



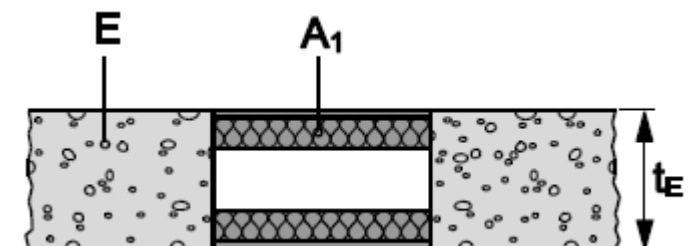
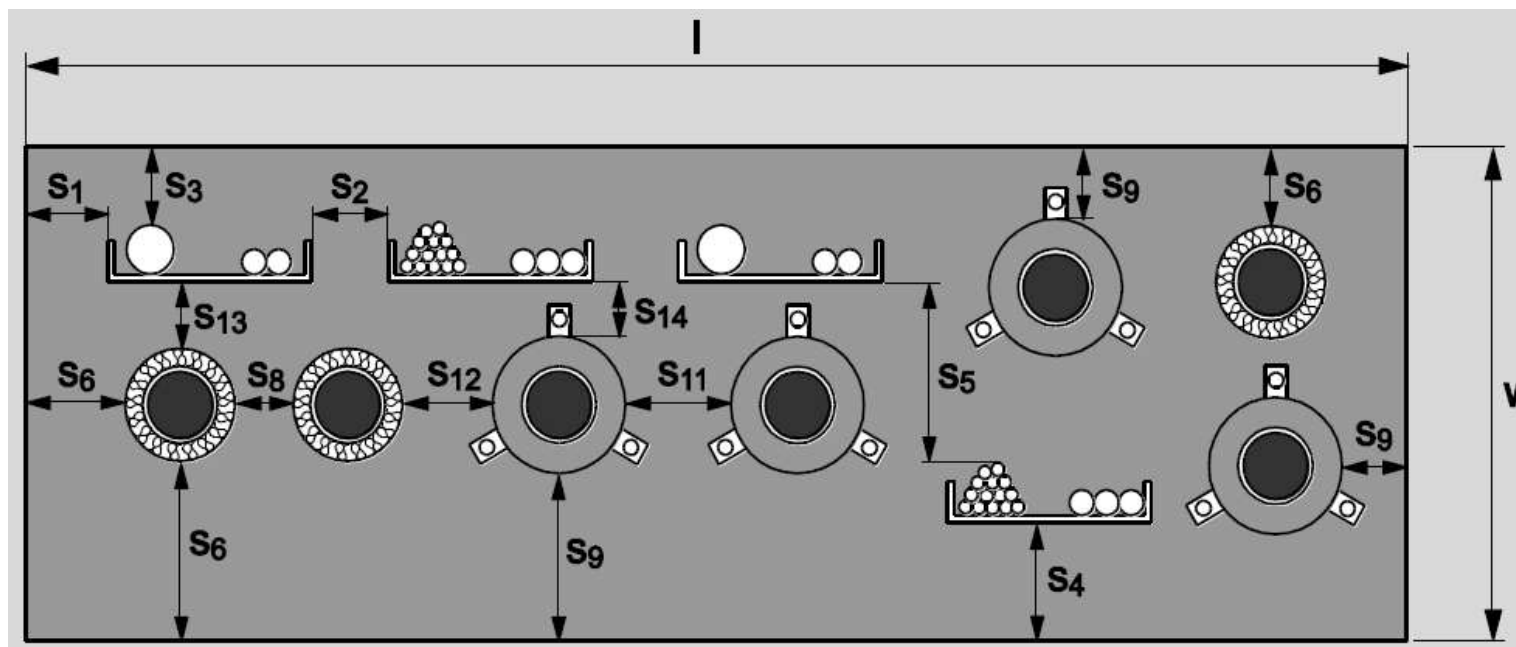
Legend	
A₁	Hilti Firestop Foam CFS-F FX
C₁, C₂	Penetrating Service – Cables, conduits, tubes
E	Building element (wall, floor)
t_A	Thickness of Hilti Firestop Foam CFS-F FX
t_E	Thickness of the building element

30.1 MULTIPLE PENETRATIONS – RIGID FLOOR

- CFS-CT Coated Board:**

Rigid floor	Minimum density of 670 kg/m ³ and comprise concrete, aerated concrete
Minimum thickness of floor	≥ 150mm
Spacing between openings	≥ 200mm between adjacent openings
Firestop Coated Boards	Double coated board – 2x50mm CFS-CT Hilti Coated Board
Minimum thickness of sealant	≥ 10mm applied in all edges of the board with Hilti CFS-S ACR (CP606)
Maximum opening size – Blank Seal	600mm x1000mm (width x height) – EI 180 1200mm x 1500mm (width x height) – EI 90 (Requires additional supports)
Supports distance	≤ 100mm from side of the floor
Approval reference	ETA-11/0429
Fire Rating	EI 180 or EI 90 based on opening size

Legend
s₁ = 0 (distance between cables/cable supports and seal edge)
s₂ = 0 (distance between cable supports)
s₃ = 0 (distance between cables and upper seal edge)
s₄ = 0 (distance between cable supports and bottom seal edge)
s₅ = 50 (distance between cables and cable support above)
s₆ = 10 (distance between metal pipes and seal edge)
s₈ = 20 (distance between metal pipes)
s₉ = 0 (distance between plastic pipes/pipe closure devices and seal edge)
s₁₁ = 0 (distance between plastic pipes/pipe closure devices)
s₁₂ = 30 (distance between metal pipes and plastic pipes/pipe closure devices)
s₁₃ = 30 (distance between cables/cable supports and metal pipes)
s₁₄ = 32 (distance between cables/cable supports and plastic pipes/pipe closure devices)

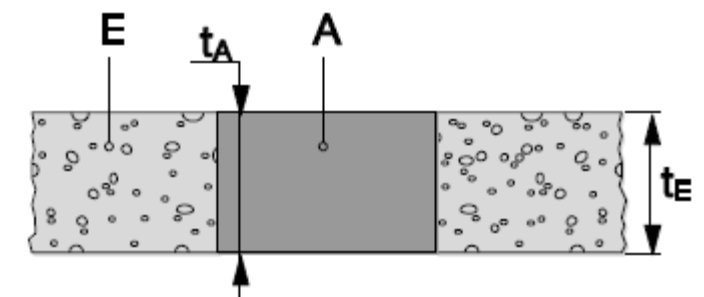
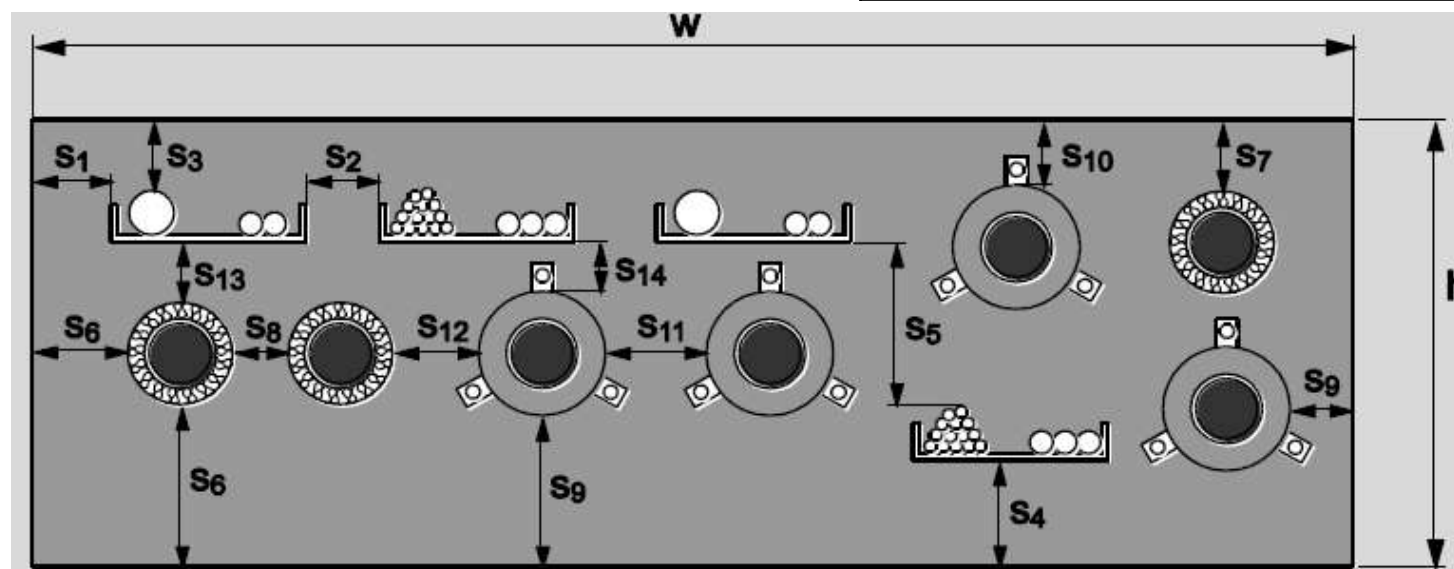


30.2 MULTIPLE PENETRATIONS – RIGID FLOOR

- CFS-F FX Intumescent Foam:**

Rigid floor	Minimum density of 2200 kg/m ³ and comprise concrete, aerated concrete
Minimum thickness of floor	≥ 150mm
Spacing between openings	≥ 200mm between adjacent openings
Minimum thickness of Foam	≥ 150mm
Maximum opening size – Blank Seal	400mm x 400mm (width x height) – EI 120 (For 150mm thickness of foam)
Supports distance	≤ 250mm from side of the floor
Approval reference	ETA-10/0109
Fire Rating	EI 120
Note	Total amount of services (including insulation) must be equal or lower than 60% of the penetration surface.

Legend	
s₁	= 0 (distance between cables/cable supports and seal edge)
s₂	= 0 (distance between cable supports)
s₃	= 0 (distance between cables and upper seal edge)
s₄	= 0 (distance between cable supports and bottom seal edge)
s₅	= 50 (distance between cables and cable support above)
s₆	= 20 (distance between metal pipes and seal edge)
s₇	= - (distance between metal pipes and upper seal edge)
s₈	= 15 (distance between metal pipes) linear arrangement = 20 (distance between metal pipes) grouped arrangement
s₉	= 20 (distance between plastic pipes/pipe closure devices and seal edge)
s₁₀	= - (distance between plastic pipes/pipe closure devices and upper seal edge)
s₁₁	= 20 (distance between plastic pipes/pipe closure devices)
s₁₂	= 20 (distance between metal pipes and plastic pipes/pipe closure devices)
s₁₃	= 80 (distance between cables/cable supports and metal pipes)
s₁₄	= 80 (distance between cables/cable supports and plastic pipes/pipe closure devices)

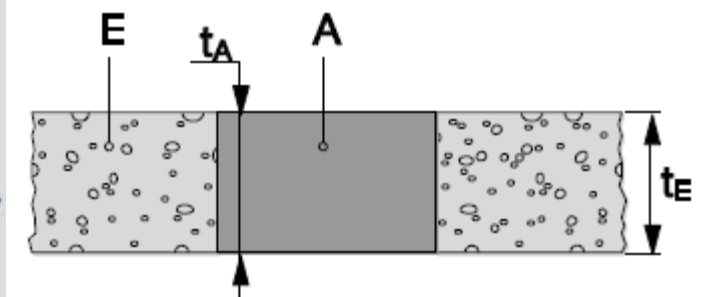
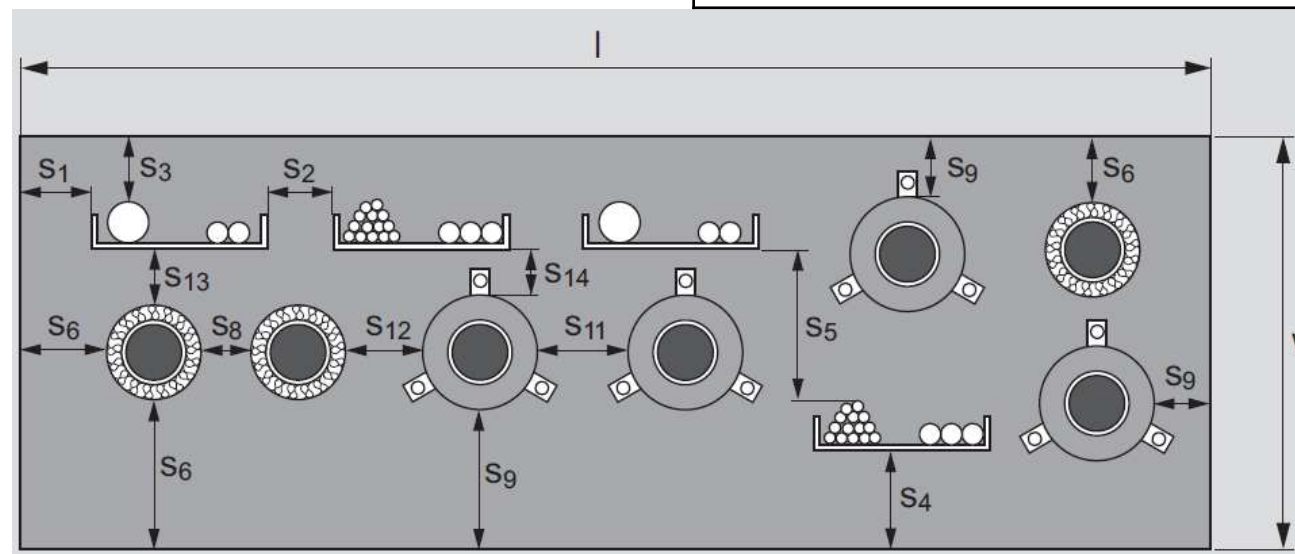


30.3 MULTIPLE PENETRATIONS – RIGID FLOOR

- CFS-M RG Firestop Mortar:**

Rigid floor	Minimum density of 550 kg/m ³ and comprise concrete, aerated concrete
Minimum thickness of floor	≥ 150mm
Spacing between openings	≥ 200mm between adjacent openings
Minimum thickness of Mortar	≥ 150mm
Maximum opening size – Blank Seal	600mm x 2000mm (width x height) – EI 120
Supports distance	≤ 300mm from side of the floor
Approval reference	ETA-12/0101
Fire Rating	EI 120
Note	Total amount of services (including insulation) must be equal or lower than 60% of the penetration surface.

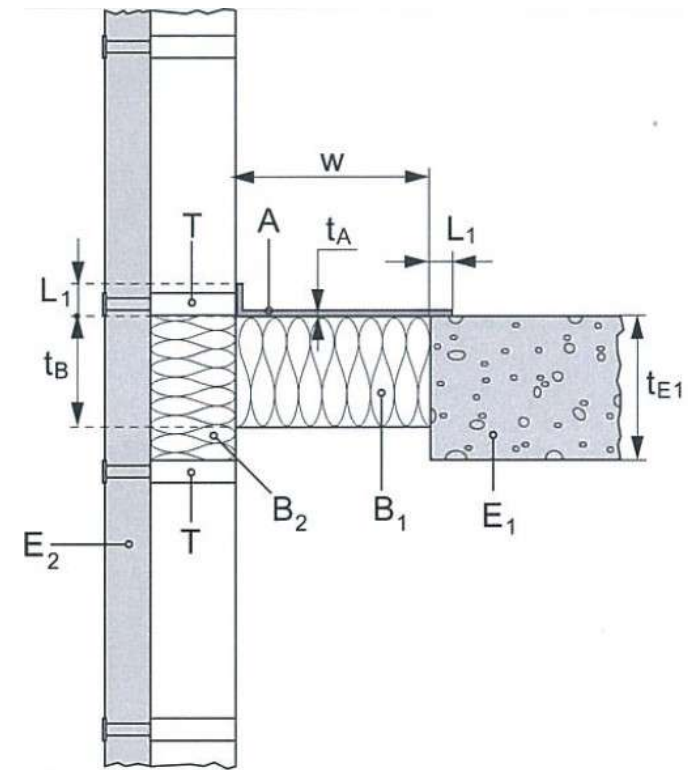
Legend
$s_1 = 0$ (distance between cables/cable supports and seal edge)
$s_2 = 0$ (distance between cable supports)
$s_3 = 0$ (distance between cables and upper seal edge)
$s_4 = 0$ (distance between cable supports and bottom seal edge)
$s_5 = 50$ (distance between cables and cable support above)
$s_6 = 0$ (distance between metal pipes and seal edge)
$s_8 = 0$ (distance between metal pipes) mineral wool insulation and linear arrangement or $s_8 = 100$ (distance between metal pipes) grouped arrangement
$s_8 = 12$ (distance between metal pipes) Armaflex insulation and linear arrangement or $s_8 = 100$ (distance between metal pipes) grouped arrangement
$s_9 = 0$ (distance between plastic pipes/pipe closure devices and seal edge)
$s_{11} = 20$ (distance between plastic pipes/pipe closure devices) linear arrangement $s_{11} = 100$ (distance between plastic pipes/pipe closure devices) grouped arrangement
$s_{12} = 30$ (distance between metal pipes and plastic pipes/pipe closure devices)
$s_{13} = 30$ (distance between cables/cable supports and metal pipes)
$s_{14} = 18$ (distance between cables/cable supports and plastic pipes/pipe closure devices)



4.1.1 EDGE OF SLAB – CURTAIN WALL

• CFS-SP WB Speed Spray for Curtain Wall:

Rigid floor	Minimum density of 2400 kg/m ³ and comprise concrete
Minimum thickness of floor	≥ 150mm
Curtain Wall	Curtain walls with steel framing (transoms T , mullions), the cavity formed by the spandrel panel (E₂) and the framing filled with mineral wool board of a density of minimum 120 kg/m ³ to form the perimeter joint edge, the transom forming the substrate for the “Hilti Joint Spray CFS-SP WB”
Minimum Perimeter joint width (w)	≥ 10mm
Maximum Perimeter joint width (w)	≥ 200mm
Maximum movement capability of the joint	± 25% of the Perimeter joint width
Minimum thickness of Joint Spray CFS-SP WB	≥ 3-5mm wet film thickness (Resulting into a ≥ 2mm dry film thickness)
Minimum overlapping of spray over floor construction and curtain wall (L₁)	≥ 15mm
Backfilling material (B₁)	Mineral / Stone Wool – EN 13162 Density – ≥ 45 kg/m ³ Combustible class – A1 according to EN 13501-1 Melting Point – ≥ 1000°C
Mineral wool Installation	Compressed by ≥ 55% Depth t_B ≥ 150mm Splice distance ≥ 1000mm
Approval reference	ETA-11/0343
Fire Rating	EI 90 (Integrity and Thermal Insulation) (Higher Fire Rating values can be achieved)



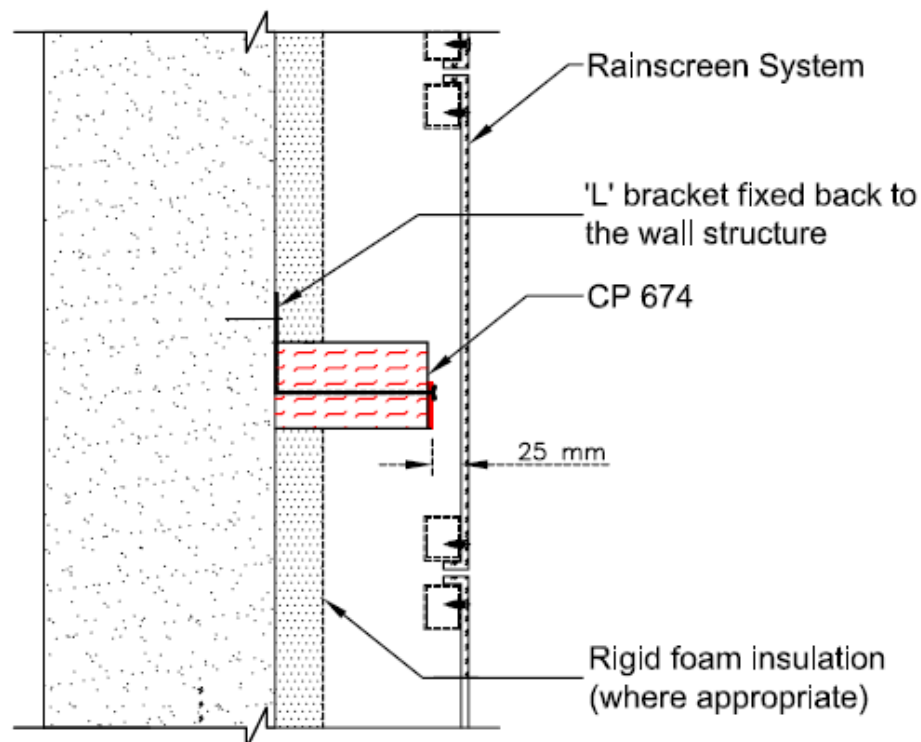
Legend	
A	Hilti Firestop Joint Spray CFS-SP WB
B₁	Backfilling material (mineral wool) of perimeter seal
B₂	Mineral wool in cavity between transoms and panel
E₁	Rigid floor construction
E₂	Spandrel Panel
L₁	Overlap of Hilti Firestop Joint Spray CFS-SP WB
T	Transom
t_A	Thickness of Hilti Firestop Joint Spray CFS-SP WB
t_B	Thickness of backfilling material
t_{E1}	Thickness of the rigid floor construction / joint depth
w	Joint width

4.2.1 CAVITY BARRIER – RIGID FLOOR

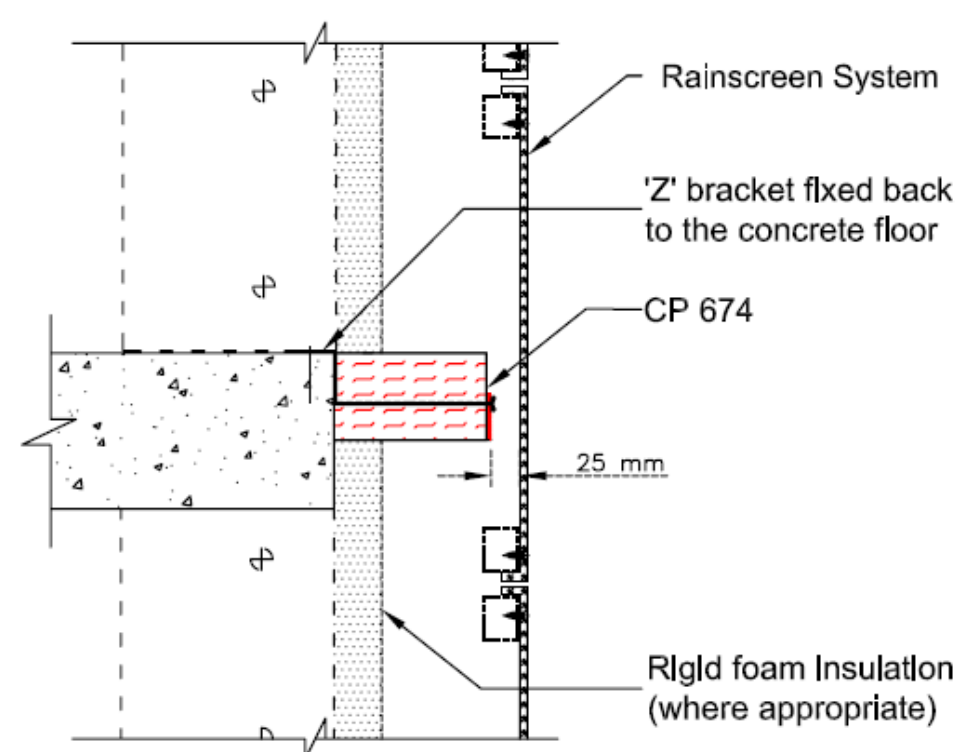
- **CP674 Cavity Closure (Ventilated) for rainscreen and cladding systems:**

Rigid floor	Minimum density of 650 kg/m ³ and comprise concrete
Minimum thickness of floor	≥ 150mm
Maximum size of the ventilation gap	≤ 25mm
Fixing of the brackets	Minimum M8 Fire Rated Metal Anchors (Hilti HUS3-H M8)
Brackets spacing per linear meter	≤ 340mm
Age Testing	30 years
Approval reference	Firestop Binder CP674 (BS476 pt20)
Fire Rating	EI 30

Wall mounted



Floor mounted

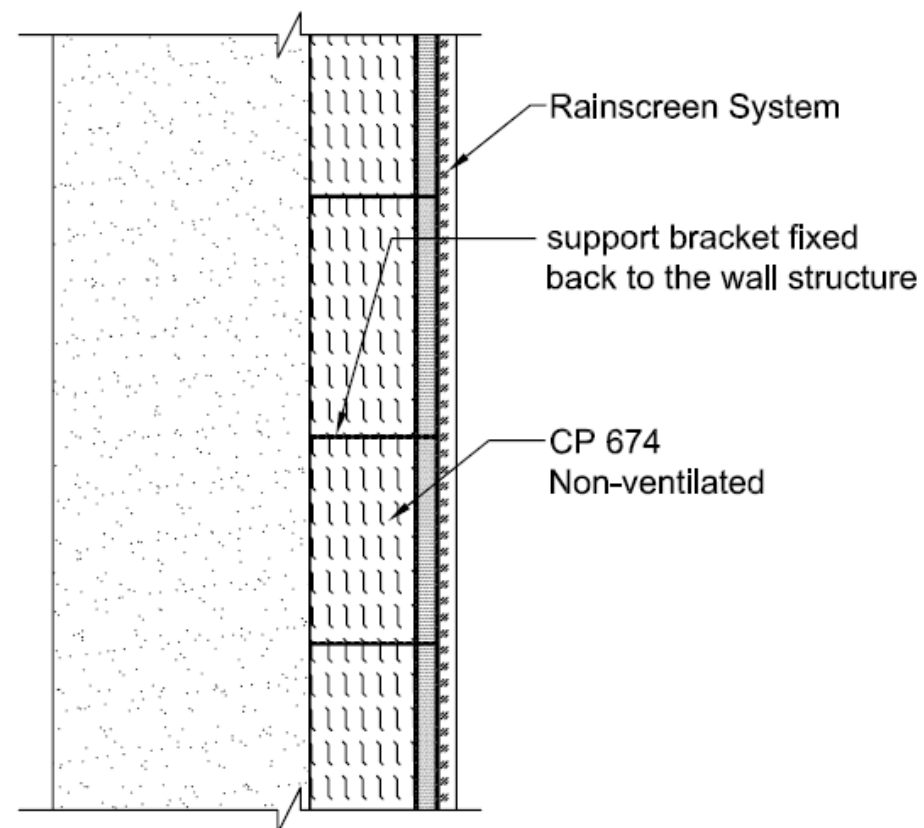


4.2.2 CAVITY BARRIER – RIGID FLOOR

- **CP674 Cavity Closure (Non-Ventilated) for rainscreen and cladding systems:**

Rigid floor	Minimum density of 650 kg/m ³ and comprise concrete
Minimum thickness of floor	≥ 150mm
Maximum size of the ventilation gap	≤ 25mm
Fixing of the brackets	Minimum M8 Fire Rated Metal Anchors (Hilti HUS3-H M8)
Brackets spacing per linear meter	≤ 340mm
Age Testing	30 years
Approval reference	Firestop Binder CP674 (BS476 pt20)
Fire Rating	EI 120

Wall mounted non ventilated

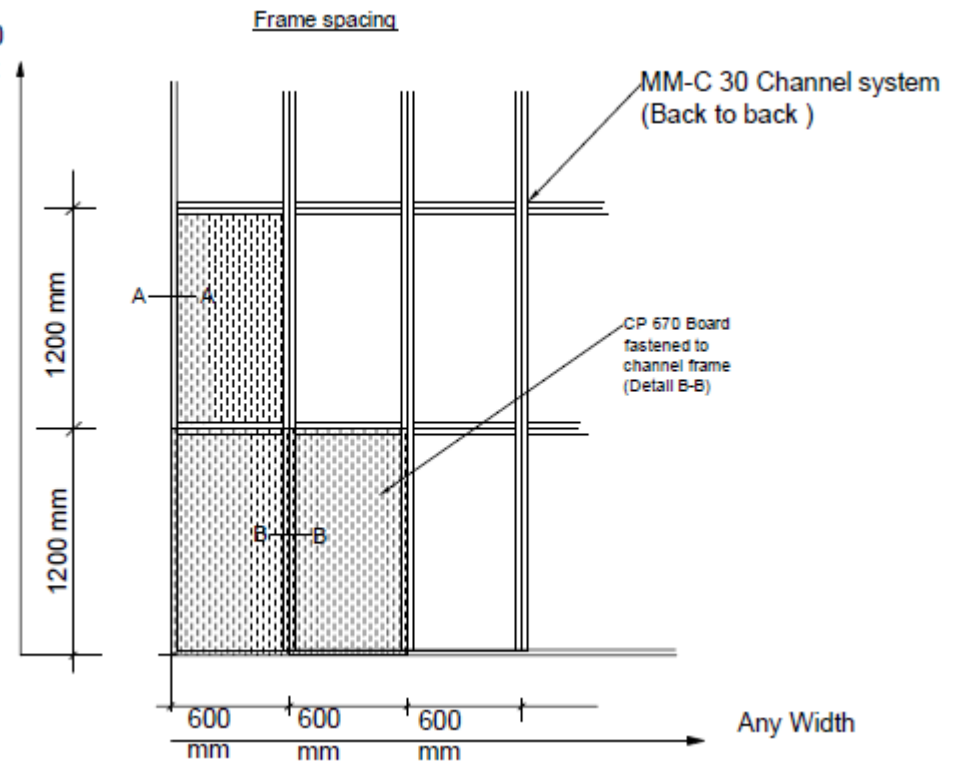


X.X.X INSTALLATION CHANNELS SYSTEMS

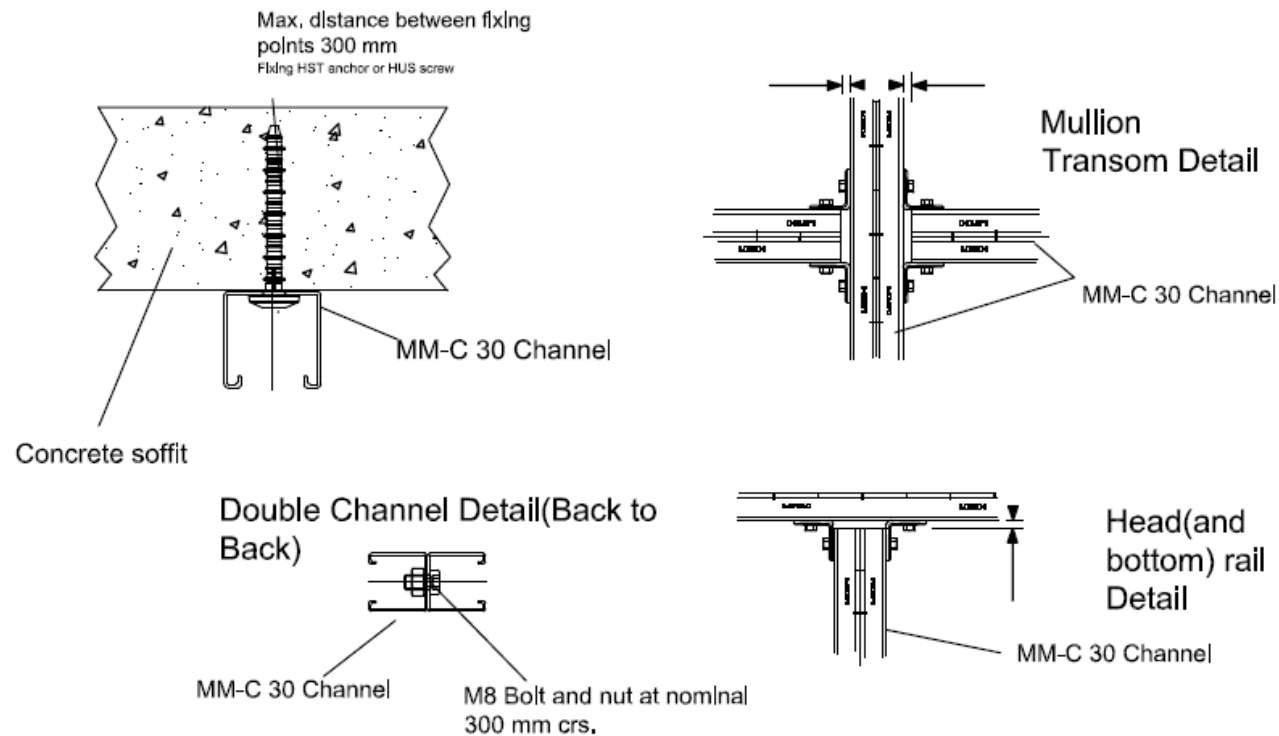
- Installation Channels System for CFS-CT Coated Board applications (1/3):**

Type of channel system	Hilti MM-C 30
Maximum spacing between channels	≤ 1200mm(vertical) x 600mm (horizontal)
Minimum spacing between channels	≥ 200mm
System	Double side Coated Board CP670 – Type C
Approval reference	Firestop Binder CP670 (BS476 pt20) – Damper not covered
Services Configuration	Services configuration according to ETA-11/0429 Flexible Wall
Fire Rating	EI 180 (Blank seal) – EI 60 (Sketch)

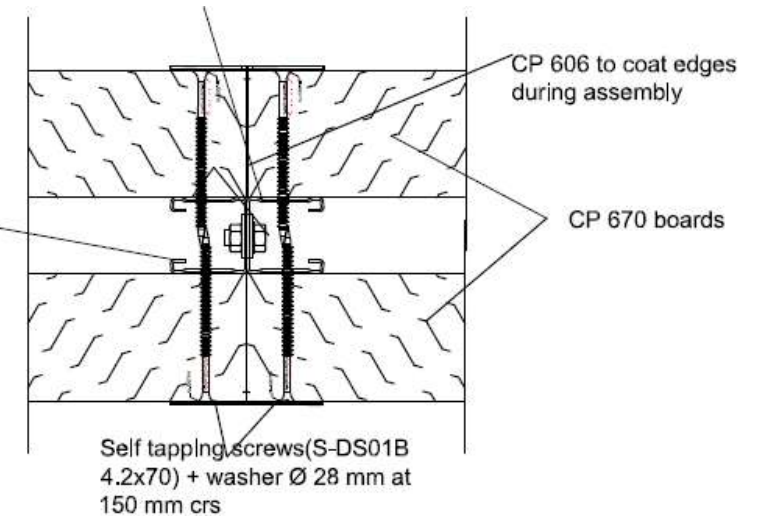
Up to 5000 mm height



Details: Details of MMC 30 frame assembly.



MM-C 30 channels, back to back, connected with screws and nuts M 8

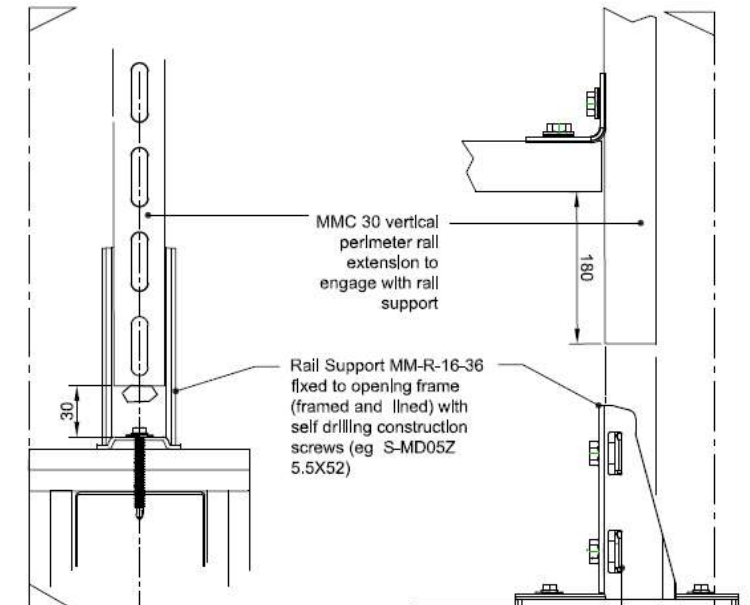


X.X.X INSTALLATION CHANNELS SYSTEMS

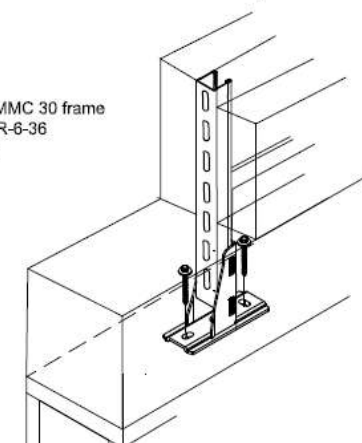
• Installation Channels System for CFS-CT Coated Board applications (2/3):

Type of channel system	Hilti MM-C 30
Maximum spacing between channels	≤ 1200mm(vertical) x 600mm (horizontal)
Minimum spacing between channels	≥ 200mm
System	Double side Coated Board CP670 – Type C
Approval reference	Firestop Binder CP670 (BS476 pt20) – Damper not covered
Services Configuration	Services configuration according to ETA-11/0429 Flexible Wall
Fire Rating	EI 180 (Blank seal) – EI 60 (Sketch)

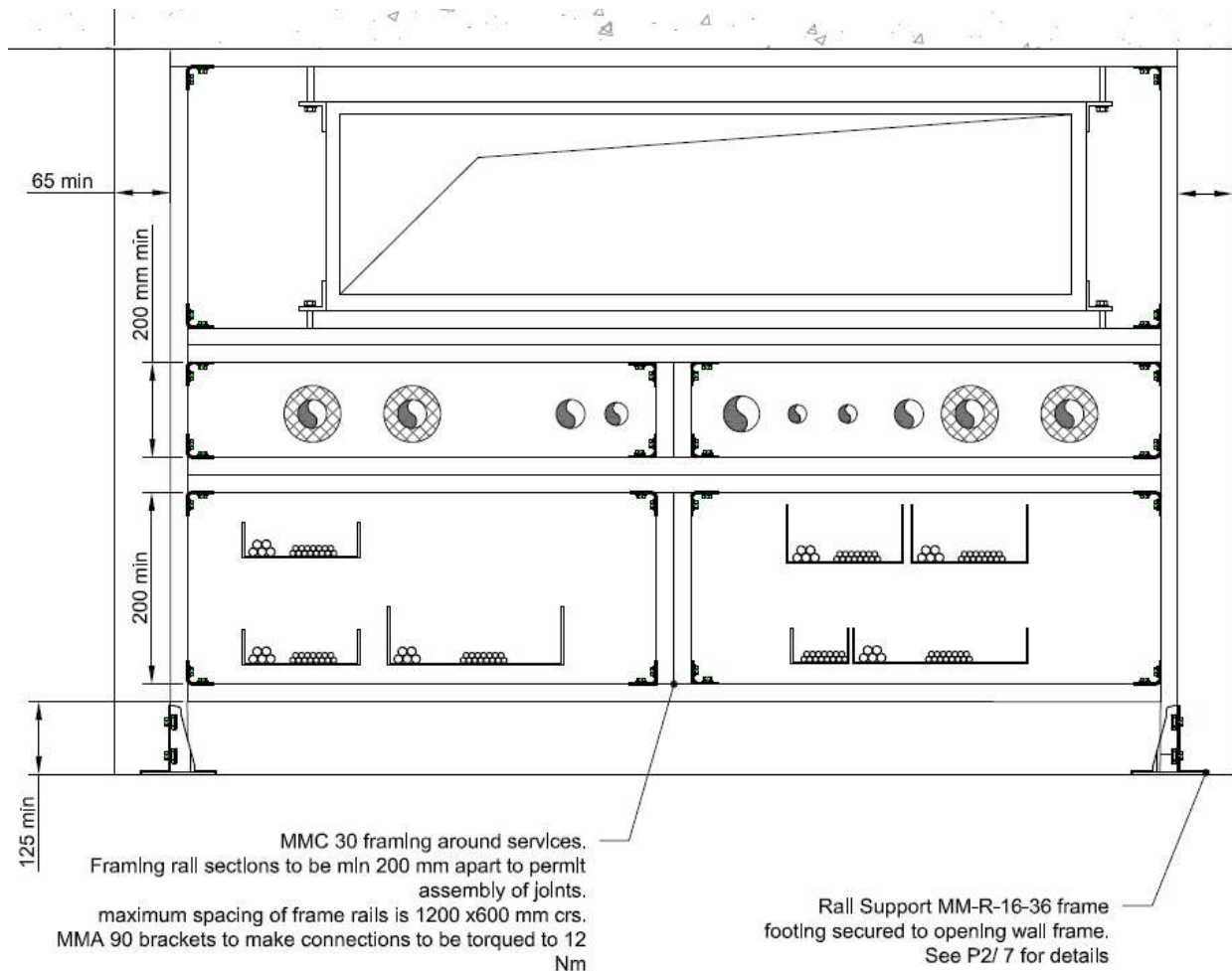
Details:
MMC 30 frame
footing restraint
details



Isometric of MMC 30 frame rail and MM-R-16-36 arrangement



Note: vertical MMC 30 rail to engage with rail fixings. Torque rail connection bolts hand tight only



X.X.X INSTALLATION CHANNELS SYSTEMS

• Installation Channels System for CFS-CT Coated Board applications – List of Materials (3/3):

ITEM	CODE	QUANTITY	COMMENTS
MM C 30 x 3m	418776	40 lengths	Installation channel
MM A 90	418757	150	Pre-assembled right angled connector
MM-R-16-36	418762	150	Rail support
M8 X 16 set screw	216446	200	For assembling back to back channels
M8 nuts	216465	200	
M8 washers	282850	200	
CFS-CT B / CP 670	376024	2 PC	(40 Boards per PC)
CFS-S ACR / CP 606	209625	200* approx	310ml Cartridge
CP 670 coating	376023	1 bucket	6kg bucket
Screws S-DS01B 4.2 x 70 (single)	2007710	1500 no. approx	Attaching board to frame Washer under the head of the screw
M6 x 28mm washers	282860	1500 no. approx	
S-MD55GZ 5.5x65	2054831		
S-NSD 13L Drive socket (for fixing to substrate)	318364	1	(Hex drive for 3 jaw chuck or direct to SID 121-A driver)
SW 13 Drive socket	423767	1	(1/2" drive for direct fitting to SIW 121-A driver)
* Note that the number of pieces of CFS-S ACR / CP 606 may need to be increased due to number and type of penetrations			
General Notes: <ul style="list-style-type: none"> • The quantities may be use pro rata as an indicator for other size openings. • Quantities provided for 25m² of penetration • Other materials may be required but exact items will depend on the size and type of penetrations and the rating required. • Quantities are approximate 			

Fixing depending on substrate type:	
Concrete	HUS H 6x40 // HST3 M8/M10
Brick/block	HUS H 6x35
Steel	M8 DX Stud
Other additions to schedule	
	M8 threaded rod
	M8 saddles for fixing rod holding pipe clamps, etc
	M6 saddles for taking roofing bolts for fixing tray
	Pipe rings for holding pipes integral to framed system
	MM Channel bases