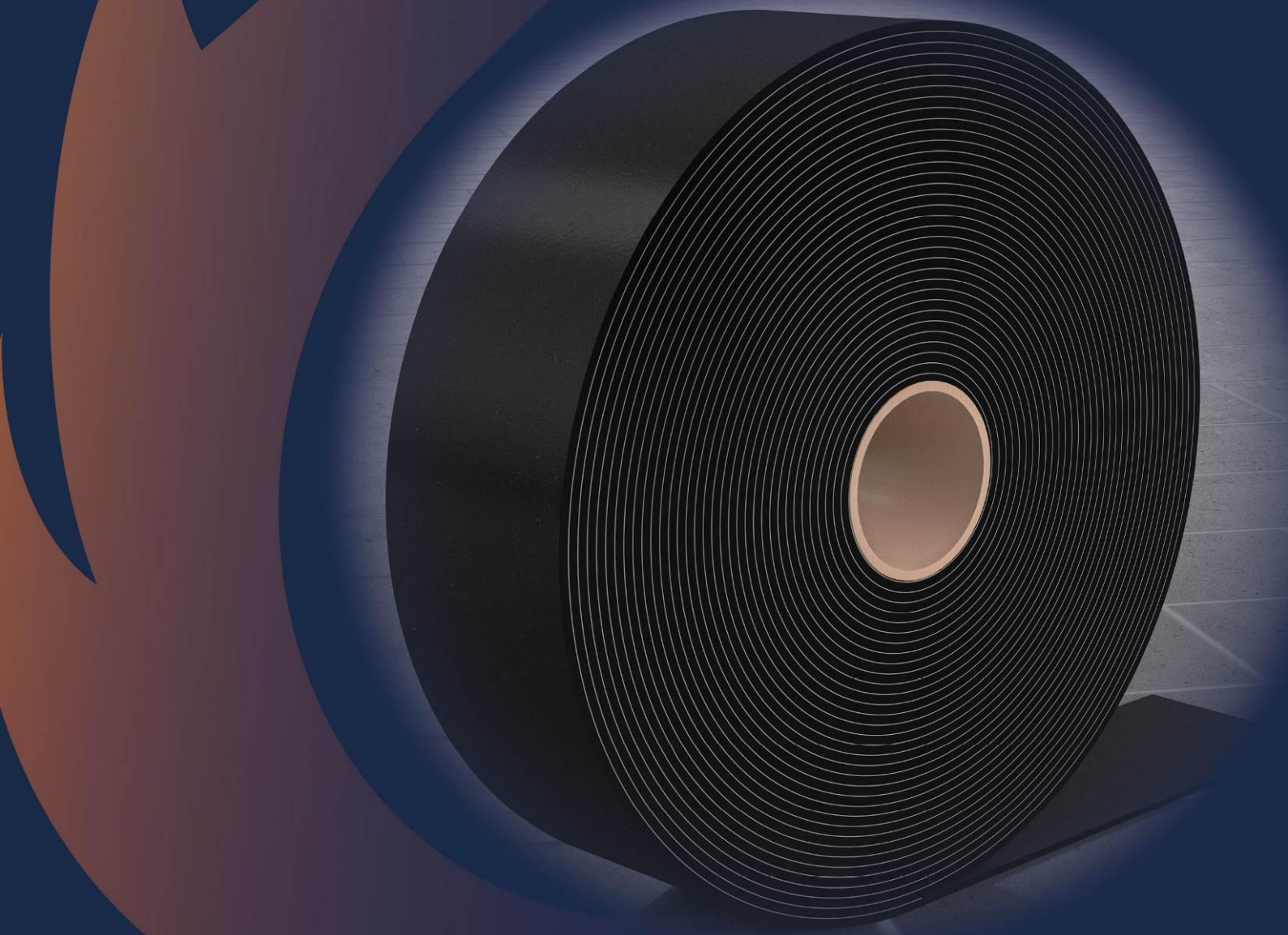
INTU FR WRAP L

Intumescent pipe wrap in roll

TDS TECHNICAL DATA SHEET



EPD

INTU FR WRAP L

Intumescent pipe wrap in roll

TDS TECHNICAL DATA SHEET

PRODUCT DESCRIPTION

INTU FR WRAP L fire protection tape is made of a graphite-based material that swells during a fire, preventing the spread of fire, and creating a barrier that ensures the partition maintains its airtightness and insulation up to EI 240.

APPLICATION

INTU FR WRAP L tape is used for fire protection of plastic, composite, and multilayer composite pipes passing through fire separation barriers individually or in bundles, as well as combustible and non-combustible pipes in insulation.

Flexible wall:	The wall should be at least 100 mm thick. It should be constructed with a double-sided cladding of at least two gypsum board panels.
Rigid wall:	The wall should be at least 100 mm thick. It should be made of concrete or masonry elements with a density of at least 450 kg/m³.
Rigid floor:	The floor slab should be at least 150 mm thick. It should be made of concrete, reinforced concrete, or aerated concrete with a density of no less than 550 kg/m³.

ACCESSIBILITY

Product	Type	Delivery form	Item number
INTU FR WRAP L	60 mm x 10 m	1 pc.	1006010000
	60 mm x 10 m (TS)	1 pc.	1006010001
	60 mm x 25 m	1 pc.	1006025000
	60 mm x 25 m (TS)	1 pc.	1006025001
	100 mm x 10 m	1 pc.	1010010000
	100 mm x 10 m (TS)	1 pc.	1010010001
	100 mm x 25 m	1 pc.	1010025000
	100 mm x 25 m (TS)	1 pc.	1010025001

(TS) – variant of the INTU FR WRAP L product with adhesive tape

COMPLIANCE

European Technical Assessment:
ETA-18/0593
Declaration of Performance:
DoP 11/2019
Certificate of Constancy of Performance:
1488-CPR-0722/W

BREEAM LEED EPD

TRANSPORT AND STORAGE

Transport and store in a dry and cool place at a temperature between +5°C and +35

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➔ INSTALLATION

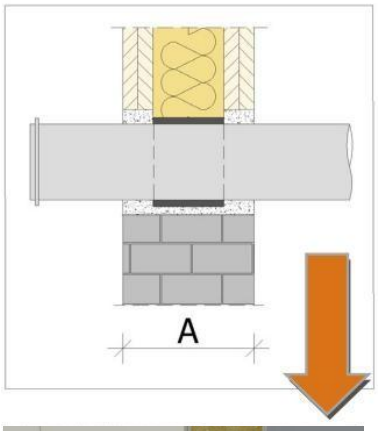
1) Prepare the appropriate length of **INTU FR WRAP L** tape (cut a section of tape from the roll). Wrap the tape around the pipe.

2) Insert the tape into the cavity.

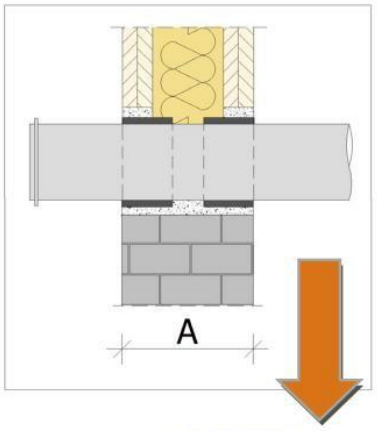
3) Fill the gap with mortar or fire-resistant compound, e.g., **INTU FR MASTIC.**

INSTALLATION DEPENDING ON THE TYPE OF PARTITION

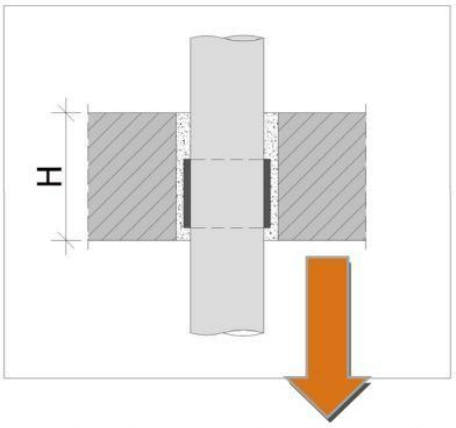
Rigid or flexible wall with a thickness of A ≥ 100 mm
A single row of tape along the wall axis



Rigid or flexible wall with a thickness of A ≥ 125 mm
Two rows of tape on both sides



Rigid floor slab with a thickness of H ≥ 150 mm One row of tape, installed a maximum of 10 mm from the bottom of the floor slab



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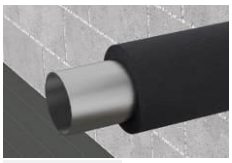
Diameter of pipe Ø [mm]	INTU FR WRAP L Length [cm]	Number layers	Number of wrapped 1 pc. with 10 m tape
32	11.3	1	88
40	13.8	1	72
50	17.0	1	58
55	18.5	1	54
63	21.0	1	47
75	24.8	1	40
90	60.3	2	16
110	72.9	2	13
125	169.6	4	5
160	270.2	5	3
200	547.9	8	1



Pipe Ø [mm]	Insulation thickness [mm]	INTU FR WRAP L Length [cm]	Number of layers	Number of pipes 1 roll 10 m of tape
21.3	9	13.6	1	73
	13	31	2	32
42.4	9	20	1	50
	13	46.7	2	21
88.9	13	76	2	13
	25	138.5	3	7
114.3	25	163.3	3	6
	50	283.8	4	3
168.3	25	214.7	3	4
	50	349.6	4	2
219.1	50	414.5	4	2

➔ Calculation example for INTU FR WRAP L consumption

Uninsulated pipe: $L=\pi \cdot n \cdot (D+2n+2)$
where:
D – pipe diameter (mm),
n – number of wraps.

Example for a Ø50 mm pipe: $L = L=\pi \cdot 1 \cdot (50+2 \cdot 1+2) \approx 170$ mm
Example for a Ø200 mm pipe: $L = \pi \cdot 8 \cdot (200+2 \cdot 8+2) \approx 5476$ mm

Insulated pipe: $L = \pi \times n \times (D + 2g + 2n + 2)$ where:
D – pipe diameter (mm),
g – insulation thickness (mm),
n – number of wraps.

Example for a Ø110 mm pipe with 9 mm thick insulation:
$L = \pi \cdot 2 \cdot (110+2 \cdot 9+2 \cdot 2+2) \approx 842$ mm

➔ TECHNICAL DATA

Color	Graphite
Application category	Type Z2: for indoor use, in environments with humidity below 85% RH, not exposed to temperatures below 0°C, rain, or UV radiation
Fire reaction class	E
Assessment method	EAD 350454-00-1104 "Products for fire containment and fire-resistant sealing. Sealing of service penetrations"
Reaction temperature	The fire-resistant tape swells at a temperature of ~140°C
Degree of swelling of the fire-protective material fire protection	The relative expansion height is up to 32 times the initial thickness of the material.

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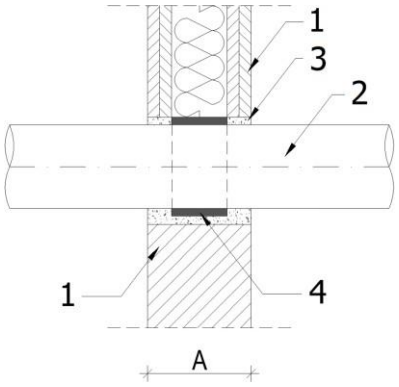
➔ FIRE CLASSIFICATION

1. **Protection of combustible pipe penetrations using a single layer of tape in a rigid wall with a thickness of A ≥ 150 mm**



1. Rigid wall with a thickness of: A ≥ 150 mm;
2. Combustible pipe;
3. Filling the gap with cement mortar;
4. **INTU FR WRAP L** tape, a single row placed along the axis of the partition.

RIGID WALL					
Partition thickness ≥ 150 mm					
Material Pipes	**Pipe diameter [mm]**	**Pipe wall thickness [mm]**	**Insulation thickness [mm]**	**Number of tape rows x intumescent material width [mm] x number of wraps**	**Fire resistance class**
PE-HD/ PE/PE-X/ ABS/ SAN+PVC	D ≤ 32	2.0 – 6.8	-	1 x 60.0 x 1	**EI 240-U/C** **EI 240-C/C**
		6.9 – 10.0	-	1 x 60.0 x 1	**EI 120-U/C** **EI 120-C/C**
	32 < D ≤ 50	2.6 – 6.7	-	1 x 60.0 x 1	**EI 120-U/C** **EI 120-C/C**
		6.8	-	1 x 60.0 x 1	**EI 240-U/C** **EI 240-C/C**
		6.9 – 10.0	-	1 x 60.0 x 1	**EI 120-U/C** **EI 120-C/C**
	50 < D ≤ 63	2.9 – 6.7	-	1 x 60.0 x 1	**EI 120-U/C** **EI 120-C/C**
		6.8	-	1 x 60.0 x 1	**EI 240-U/C** **EI 240-C/C**
		6.9 – 10.0	-	1 x 60.0 x 1	**EI 120-U/C** **EI 120-C/C**
	63 < D ≤ 75	3.3 – 6.7	-	1 x 60.0 x 1	**EI 120-U/C** **EI 120-C/C**
		6.8	-	1 x 60.0 x 1	**EI 240-U/C** **EI 240-C/C**
		6.9 – 10.0	-	1 x 60.0 x 1	**EI 120-U/C** **EI 120-C/C**
	75 < D ≤ 90	3.5 – 4.1	-	1 x 60.0 x 2	**EI 120-U/C** **EI 120-C/C**
		4.2	-	1 x 60.0 x 2	**EI 180-U/C** **EI 180-C/C**
		4.2 – 10.0	-	1 x 60.0 x 1	**EI 120-U/C**

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					EI 120-C/C
	90 < D ≤ 110	4.2	-	1 x 60.0 x 2	**EI 180-U/C** **EI 180-C/C**
		4.2 – 10.0	-	1 x 60.0 x 1	**EI 120-U/C** **EI 120-C/C**
	110 < D ≤ 125	4.8 – 9.5	-	1 x 100.0 x 3	**EI 120-U/C** **EI 120-C/C**
		9.5	-	1 x 100.0 x 5	**EI 180-U/C** **EI 180-C/C**
		9.6 – 10.0	-	1 x 100.0 x 3	**EI 120-U/C** **EI 120-C/C**
	125 < D ≤ 160	6.2 – 9.4	-	1 x 100.0 x 5	**EI 120-U/C** **EI 120-C/C**
		9.5	-	1 x 100.0 x 5	**EI 180-U/C** **EI 180-C/C**
		9.6 – 10.0	-	1 x 100.0 x 5	**EI 120-U/C** **EI 120-C/C**
	160 < D ≤ 200	7.7	-	1 x 100.0 x 8	**EI 90-U/C** **EI 90-C/C**
		7.8 – 11.9	-	1 x 100.0 x 8	**EI 60-U/C** **EI 60-C/C**
PE-RT	D ≤ 20	2.0 – 7.5	-	1 x 60.0 x 1	**EI 240-U/C** **EI 240-C/C**
	20 < D ≤ 25	2.5	-	1 x 60.0 x 1	
	25 < D ≤ 40	4.0	-	1 x 60.0 x 1	
	40 < D ≤ 63	6.3	-	1 x 60.0 x 1	
	63 < D ≤ 75	7.5	-	1 x 60.0 x 1	
PE-X	D ≤ 20	2.0	-	1 x 60.0 x 1	**EI 240-U/C** **EI 240-C/C**
		2.1 – 7.5	-	1 x 60.0 x 1	**EI 180 / E 240-U/C** **EI 180 / E 240-C/C**
	20 < D ≤ 25	2.5	-	1 x 60.0 x 1	**EI 180 / E 240-U/C** **EI 180 / E 240-C/C**
	25 < D ≤ 40	4.0	-	1 x 60.0 x 1	
	40 < D ≤ 63	6.3	-	1 x 60.0 x 1	
	63 < D ≤ 75	7.5	-	1 x 60.0 x 1	
PE-Xa	D ≤ 20	2.0 – 5.8	-	1 x 60.0 x 1	**EI 120-U/C** **EI 120-C/C**
	20 < D ≤ 32	3.0	-	1 x 60.0 x 1	
	32 < D ≤ 40	3.7	-	1 x 60.0 x 1	
	40 < D ≤ 50	4.6	-	1 x 60.0 x 1	
	50 < D ≤ 63	5.8	-	1 x 60.0 x 1	
PP-R	D ≤ 20	2.3 – 3.3	-	1 x 60.0 x 1	**EI 120-U/C** **EI 120-C/C**
		3.4	-	1 x 60.0 x 1	**EI 240-U/C** **EI 240-C/C**
	20 < D ≤ 25	3.2 – 4.1	-	1 x 60.0 x 1	**EI 120-U/C** **EI 120-C/C**
		4.2	-	1 x 60.0 x 1	**EI 240-U/C** **EI 240-C/C**
	25 < D ≤ 32	3.8 – 5.3	-	1 x 60.0 x 1	**EI 120-U/C** **EI 120-C/C**
		5.4	-	1 x 60.0 x 1	**EI 240-U/C** **EI 240-C/C**
	32 < D ≤ 40	4.4 – 6.6	-	1 x 60.0 x 1	**EI 120-U/C** **EI 120-C/C**
		6.7	-	1 x 60.0 x 1	**EI 240-U/C** **EI 240-C/C**

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	40 < D ≤ 50	5.2 – 8.2	-	1 x 60.0 x 1	**EI 120-U/C** **EI 120-C/C**
		8.3	-	1 x 60.0 x 1	**EI 240-U/C** **EI 240-C/C**
	50 < D ≤ 63	6.1–10.4	-	1 x 60.0 x 1	**EI 120-U/C** **EI 120-C/C**
		10.5	-	1 x 60.0 x 1	**EI 240-U/C** **EI 240-C/C**
	63 < D ≤ 75	6.8–12.4	-	1 x 60.0 x 1	**EI 120-U/C** **EI 120-C/C**
		12.5	-	1 x 60.0 x 1	**EI 240-U/C** **EI 240-C/C**
	63 < D ≤ 75	12.6 – 18.3	-	1 x 60.0 x 2	**EI 120-U/C** **EI 120-C/C**
	75 < D ≤ 90	8.2–18.3	-	1 x 60.0 x 2	
	90 < D ≤ 110	10.0 – 18.3	-	1 x 60.0 x 2	
PP	D ≤ 50	1.8 – 12.5	-	1 x 60.0 x 1	**EI 240-U/C** **EI 240-C/C**
	50 < D ≤ 75	1.9 – 12.4	-	1 x 60.0 x 1	**EI 180-U/C** **EI 180-C/C**
		12.5	-	1 x 60.0 x 1	**EI 240-U/C** **EI 240-C/C**
		12.6 – 18.4	-	1 x 60.0 x 1	**EI 180-U/C** **EI 180-C/C**
	75 < D ≤ 90	2.3 – 18.3	-	1 x 60.0 x 1	**EI 120 / E 180-U/C** **EI 120 / E 180-C/C**
		2.3 – 18.3	-	1 x 60.0 x 2	**EI 180-U/C** **EI 180-C/C**
		18.4	-	1 x 60.0 x 1	**EI 180-U/C** **EI 180-C/C**
	90 < D ≤ 110	2.7 – 18.3	-	1 x 60.0 x 1	**EI 120 / E 180-U/C** **EI 120 / E 180-C/C**
		2.7 – 18.3	-	1 x 60.0 x 2	**EI 180-U/C** **EI 180-C/C**
		18.4	-	1 x 60.0 x 1	
	110 < D ≤ 125	3.8 – 16.7	-	1 x 100.0 x 3	**EI 60-U/C** **EI 60-C/C**
	125 < D ≤ 160	5.5 – 12.5	-	1 x 100.0 x 5	
	160 < D ≤ 170	6.1 – 11.3	-	1 x 100.0 x 6	
	170 < D ≤ 185	6.9 – 9.5	-	1 x 100.0 x 7	
	160 < D ≤ 200	7.7	-	1 x 100.0 x 8	
PVC-U/ PVC-C	D ≤ 25	1.5 – 1.7	-	1 x 60.0 x 2	**EI 120-U/C** **EI 120-C/C**
		1.8 – 3.6	-	1 x 60.0 x 1	**EI 240-U/C** **EI 240-C/C**
	D ≤ 25	3.7 – 4.2	-	1 x 60.0 x 1	**EI 180-U/C** **EI 180-C/C**
	25 < D ≤ 50	1.8 – 3.6	-	1 x 60.0 x 1	**EI 240-U/C** **EI 240-C/C**
		3.7 – 4.2	-	1 x 60.0 x 1	**EI 180-U/C** **EI 180-C/C**
		4.3 – 8.1	-	1 x 60.0 x 2	**EI 120-U/C** **EI 120-C/C**
	50 < D ≤ 75	1.9 – 3.5	-	1 x 60.0 x 1	**EI 180-U/C** **EI 180-C/C**
		3.6	-	1 x 60.0 x 1	**EI 240-U/C** **EI 240-C/C**

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		3.7 – 4.2	-	1 x 60.0 x 1	**EI 180-U/C** **EI 180-C/C**
		4.3 – 8.1	-	1 x 60.0 x 2	**EI 120-U/C** **EI 120-C/C**
	75 < D ≤ 110	2.2–3.5	-	1 x 60.0 x 1	**EI 120-U/C** **EI 120-C/C**
		3.6	-	1 x 60.0 x 1	**EI 120-U/C** **EI 120-C/C**
			-	1 x 60.0 x 2	**EI 240-U/C** **EI 240-C/C**
		3.7 – 4.1	-	1 x 60.0 x 1	**EI 120-U/C** **EI 120-C/C**
			-	1 x 60.0 x 2	**EI 180-U/C** **EI 180-C/C**
		4.2	-	1 x 60.0 x 1	**EI 180-U/C** **EI 180-C/C**
		4.3 – 8.1	-	1 x 60.0 x 2	**EI 120-U/C** **EI 120-C/C**
	110 < D ≤ 125	3.4 – 6.1	-	1 x 100.0 x 4	**EI 120-U/C** **EI 120-C/C**
		6.2	-	1 x 100.0 x 4	**EI 120-U/C** **EI 120-C/C**
			-	1 x 100.0 x 5	**EI 240-U/C** **EI 240-C/C**
		6.3 – 9.5	-	1 x 100.0 x 3	**EI 180-U/C** **EI 180-C/C**
	125 < D ≤ 160	6.2	-	1 x 100.0 x 5	**EI 240-U/C** **EI 240-C/C**
		6.3 – 9.5	-	1 x 100.0 x 5	**EI 180-U/C** **EI 180-C/C**
	160 < D ≤ 200	5.9	-	1 x 100.0 x 8	**EI 180-U/C** **EI 180-C/C**
		6.0 – 7.7	-	1 x 100.0 x 8	**EI 120-U/C** **EI 120-C/C**
PE-RT/AL/ PE-RT	D ≤ 20	2.0	-	1 x 60.0 x 1	**EI 240-U/C** **EI 240-C/C**
	20 < D ≤ 25	2.5	-	1 x 60.0 x 1	
	25 < D ≤ 40	4.0	-	1 x 60.0 x 1	
	40 < D ≤ 63	6.0	-	1 x 60.0 x 1	**EI 120-U/C** **EI 120-C/C**
		6.3	-	1 x 60.0 x 1	**EI 240-U/C** **EI 240-C/C**
	20 < D ≤ 75	7.5	-	1 x 60.0 x 1	
PE-X/AL/ PE-X	D ≤ 20	2.0 – 7.5	-	1 x 60.0 x 1	**EI 120-U/C** **EI 120-C/C**
	20 < D ≤ 25	2.5	-	1 x 60.0 x 1	
	25 < D ≤ 32	3.0	-	1 x 60.0 x 1	
	32 < D ≤ 40	4.0	-	1 x 60.0 x 1	
	40 < D ≤ 50	5.5	-	1 x 60.0 x 1	
	50 < D ≤ 63	6.0	-	1 x 60.0 x 1	
	63 < D ≤ 75	7.5	-	1 x 60.0 x 1	
PP-R/AL/ PP-R	D ≤ 20	3.2 – 3.4	-	1 x 60.0 x 1	**EI 120-U/C** **EI 120-C/C**
	20 < D ≤ 32	4.7 – 5.4	-	1 x 60.0 x 1	
	32 < D ≤ 40	5.7 – 6.7	-	1 x 60.0 x 1	
	40 < D ≤ 50	6.9 – 8.3	-	1 x 60.0 x 1	
	50 < D ≤ 63	8.5 – 10.5	-	1 x 60.0 x 1	
	63 < D ≤ 75	10.0 – 12.5	-	1 x 60.0 x 1	
	75 < D ≤ 90	12.3 – 15.0	-	1 x 60.0 x 2	
	90 < D ≤ 110	15.1 – 18.2	-	1 x 60.0 x 2	
		18.3	-	1 x 60.0 x 2	**EI 240-U/C**

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					EI 240-C/C
PP-R/ PP-R-GF/ PP-R	D ≤ 20	2.8 – 10.0	-	1 x 60.0 x 1	**EI 120-U/C EI 120-C/C**
	20 < D ≤ 32	3.7 – 4.3	-	1 x 60.0 x 2	
		4.4 – 5.4	-	1 x 60.0 x 1	
	32 < D ≤ 40	4.4 – 5.4	-	1 x 60.0 x 2	
		5.5 – 6.7	-	1 x 60.0 x 1	
	20 < D ≤ 50	5.2 – 6.8	-	1 x 60.0 x 2	
		6.9 – 12.5	-	1 x 60.0 x 1	
		12.6 – 18.2	-	1 x 60.0 x 2	
		18.3	-	1 x 60.0 x 2	**EI 180-U/C EI 180-C/C**
	50 < D ≤ 63	6.3 – 8.6	-	1 x 60.0 x 2	**EI 120-U/C EI 120-C/C**
		8.7 – 12.5	-	1 x 60.0 x 1	
		12.6 – 18.2	-	1 x 60.0 x 2	
		18.3	-	1 x 60.0 x 2	**EI 180-U/C EI 180-C/C**
	63 < D ≤ 75	7.2 – 10.2	-	1 x 60.0 x 2	**EI 120-U/C EI 120-C/C**
		10.3 – 12.5	-	1 x 60.0 x 1	
		12.6 – 18.2	-	1 x 60.0 x 2	
		18.3	-	1 x 60.0 x 2	**EI 180-U/C EI 180-C/C**
	75 < D ≤ 90	8.4 – 18.2	-	1 x 60.0 x 2	**EI 120-U/C EI 120-C/C**
		18.3	-	1 x 60.0 x 2	**EI 180-U/C EI 180-C/C**
	90 < D ≤ 110	10.0 – 18.2	-	1 x 60.0 x 2	**EI 120-U/C EI 120-C/C**
		18.3	-	1 x 60.0 x 2	**EI 180-U/C EI 180-C/C**

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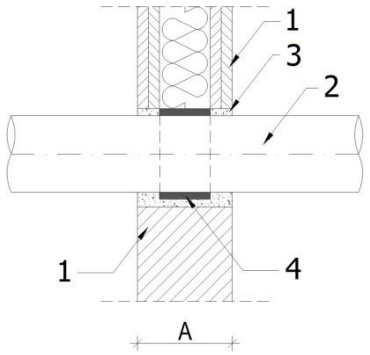
2. **Protection of combustible pipe penetrations using a single row of tape in a rigid or flexible wall with a thickness of A ≥ 100 mm**



1. Rigid or flexible wall with a thickness of: A ≥ 100 mm;
2. Combustible pipe;
3. Filling the gap with cement mortar;
4. **INTU FR WRAP L** tape, a single row placed in the centerline of the partition.

RIGID/FLEXIBLE WALL					
Partition thickness ≥ 100 mm					
Pipe material	**Pipe diameter [mm]**	**Pipe wall thickness [mm]**	**Insulation thickness [mm]**	**Number of tape rows x intumescent material width [mm] x number of wraps**	**Fire resistance class**
PE-RT/AL/PE-RT	D ≤ 20	2.0	-	1 x 60.0 x 1	**EI 120-U/C** **EI 120-C/C**
		2.1 – 7.5	-	1 x 60.0 x 1	**EI 45 / E 90-U/C** **EI 45 / E 90-C/C**
	20 < D ≤ 25	2.5	-	1 x 60.0 x 1	
	25 < D ≤ 40	4.0	-	1 x 60.0 x 1	
	40 < D ≤ 63	6.3	-	1 x 60.0 x 1	
	63 < D ≤ 75	7.5	-	1 x 60.0 x 1	
PE-X/AL/PE-X	D ≤ 20	2.0	-	1 x 60.0 x 1	**EI 120-U/C** **EI 120-C/C**
		2.1 – 7.5	-	1 x 60.0 x 1	**EI 45 / E 120-U/C** **EI 45 / E 120-C/C**
	20 < D ≤ 25	2.5	-	1 x 60.0 x 1	
	25 < D ≤ 40	4.0	-	1 x 60.0 x 1	
	40 < D ≤ 63	6.3	-	1 x 60.0 x 1	
	63 < D ≤ 75	7.5	-	1 x 60.0 x 1	
PP-R/AL/PP-R	D ≤ 20	3.4	-	1 x 60.0 x 1	**EI 120-U/C** **EI 120-C/C**
		3.5 – 10.0	-	1 x 60.0 x 2	
	20 < D ≤ 50	8.3	-	1 x 60.0 x 2	
	50 < D ≤ 63	10.5	-	1 x 60.0 x 2	
	63 < D ≤ 75	12.5	-	1 x 60.0 x 2	
	75 < D ≤ 90	15.0	-	1 x 60.0 x 2	
	90 < D ≤ 110	18.3	-	1 x 60.0 x 2	
PP-M (Magnaplast Ultra dB)	D ≤ 110	3.4	-	1 x 60.0 x 2	**EI 60-U/C** **EI 60-C/C**
PP-R/PP-R-GF/PP-R	D ≤ 20	2.8 – 3.4	-	1 x 60.0 x 1	**EI 120-U/C** **EI 120-C/C**
	20 < D ≤ 32	4.1 – 4.8	-	1 x 60.0 x 2	**EI 60-U/C**

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					EI 60-C/C
		4.9 – 5.4	-	1 x 60.0 x 2	**EI 120-U/C** **EI 120-C/C**
	32 < D ≤ 40	5.0 – 6.1	-	1 x 60.0 x 2	**EI 60-U/C** **EI 60-C/C**
		6.2 – 6.7	-	1 x 60.0 x 2	**EI 120-U/C** **EI 120-C/C**
	40 < D ≤ 50	6.0 – 7.9	-	1 x 60.0 x 2	**EI 60-U/C** **EI 60-C/C**
		8.0 – 8.4	-	1 x 60.0 x 2	**EI 120-U/C** **EI 120-C/C**
	50 < D ≤ 75	8.7 – 12.2	-	1 x 60.0 x 2	**EI 60-U/C** **EI 60-C/C**
		12.3 – 12.5	-	1 x 60.0 x 2	**EI 120-U/C** **EI 120-C/C**
	75 < D ≤ 90	10.3 – 14.8	-	1 x 60.0 x 2	**EI 60-U/C** **EI 60-C/C**
		14.9 – 15.0	-	1 x 60.0 x 2	**EI 120-U/C** **EI 120-C/C**
	90 < D ≤ 110	12.5 – 18.2	-	1 x 60.0 x 2	**EI 60-U/C** **EI 60-C/C**
		18.3	-	1 x 60.0 x 2	**EI 120-U/C** **EI 120-C/C**

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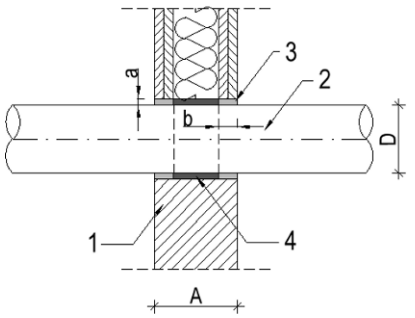
3. Protection of combustible pipe penetrations using a single row of tape in a rigid or flexible wall with a thickness of A ≥ 100 mm



1. Rigid or flexible wall with a thickness of: A ≥ 100 mm;
2. Combustible pipe;
3. **INTU FR MASTIC** gap filler;
4. **INTU FR WRAP L** tape, single row positioned along the partition axis.

RIGID/FLEXIBLE WALL					
Partition thickness ≥ 100 mm					
Material Pipes	**Pipe diameter [mm]**	**Pipe wall thickness [mm]**	**Insulation thickness [mm]**	**Number of tape rows x intumescent material width [mm] x number of wraps**	**Fire resistance class**
PE-HD/ PE/PE-X/ ABS/ SAN+PVC	D ≤ 32	2.0	-	1 x 60.0 x 1	**EI 60-U/C** **EI 60-C/C**
		2.1 – 9.9	-	1 x 60.0 x 2	
		10.0	-	1 x 60.0 x 2	**EI 90-U/C** **EI 90-C/C**
	32 < D ≤ 50	2.5 – 9.9	-	1 x 60.0 x 2	**EI 60-U/C** **EI 60-C/C**
		10.0	-	1 x 60.0 x 2	**EI 90-U/C** **EI 90-C/C**
	50 < D ≤ 75	3.2 – 9.9	-	1 x 60.0 x 2	**EI 60-U/C** **EI 60-C/C**
		10.0	-	1 x 60.0 x 2	**EI 90-U/C** **EI 90-C/C**
	75 < D ≤ 110	4.2 – 9.9	-	1 x 60.0 x 2	**EI 60-U/C** **EI 60-C/C**
		10.0	-	1 x 60.0 x 2	**EI 90-U/C** **EI 90-C/C**
PP	D ≤ 32	1.8	-	1 x 60.0 x 1	**EI 90 / E 120-U/C** **EI 90 / E 120-C/C**
		1.9 – 2.7	-	1 x 60.0 x 2	**EI 60-U/C** **EI 60-C/C**
		2.8 – 16.0	-	1 x 60.0 x 2	**EI 45-U/C** **EI 45-C/C**
	32 < D ≤ 50	2.0 – 2.7	-	1 x 60.0 x 2	**EI 60-U/C** **EI 60-C/C**
		2.8 – 18.3	-	1 x 60.0 x 2	**EI 45-U/C** **EI 45-C/C**
	50 < D ≤ 75	2.3 – 2.7	-	1 x 60.0 x 2	**EI 60-U/C** **EI 60-C/C**
		2.8 – 18.3	-	1 x 60.0 x 2	**EI 45-U/C**

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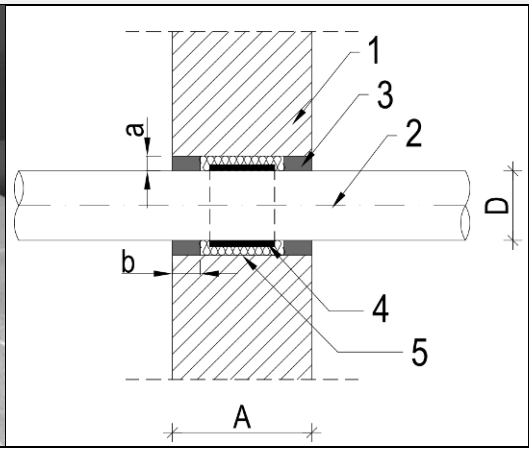
					EI 45-C/C
	75 < D ≤ 110	2.7	-	1 x 60.0 x 2	**EI 60-U/C** **EI 60-C/C**
		2.8 – 18.3	-	1 x 60.0 x 2	**EI 45-U/C** **EI 45-C/C**
PVC-U/ PVC-C	D ≤ 32	1.8	-	1 x 60.0 x 1	**EI 120-U/C** **EI 120-U/C**
		1.9 – 4.2	-	1 x 60.0 x 2	**EI 60-U/C** **EI 60-C/C**
	32 < D ≤ 50	1.9 – 4.1	-	1 x 60.0 x 2	**EI 45-U/C** **EI 45-C/C**
		4.2	-	1 x 60.0 x 2	**EI 60-U/C** **EI 60-C/C**
	50 < D ≤ 75	2.0 – 4.1	-	1 x 60.0 x 2	**EI 45-U/C** **EI 45-C/C**
		4.2	-	1 x 60.0 x 2	**EI 60-U/C** **EI 60-C/C**
	75 < D ≤ 110	2.2 – 4.1	-	1 x 60.0 x 2	**EI 45-U/C** **EI 45-C/C**
		4.2	-	1 x 60.0 x 2	**EI 60-U/C** **EI 60-C/C**

4. **Protection of combustible pipe penetrations using a single layer of tape in a rigid wall with a thickness of A ≥ 150 mm**



1. Rigid wall with a thickness of: A ≥ 150 mm;
2. Combustible pipe;
3. Filling the gap with **INTU FR MASTIC**;
4. **INTU FR WRAP L** tape, a single row placed along the axis of the partition;
5. Mineral wool with a density of: ρ = 100 kg/m^3.

RIGID WALL					
Partition thickness ≥ 150 mm					
Material Pipes	**Pipe diameter [mm]**	**Pipe wall thickness [mm]**	**Insulation thickness [mm]**	**Number of tape rows x intumescent material width [mm] x number of wraps**	**Fire resistance class**
PE-HD/ PE/PE-X/ ABS/ SAN+PVC	D ≤ 110	4.2	-	1 x 60.0 x 2	**EI 120-U/C** **EI 120-C/C**
PP	D ≤ 110	2.7	-	1 x 60.0 x 2	**EI 90-U/C** **EI 90-C/C**

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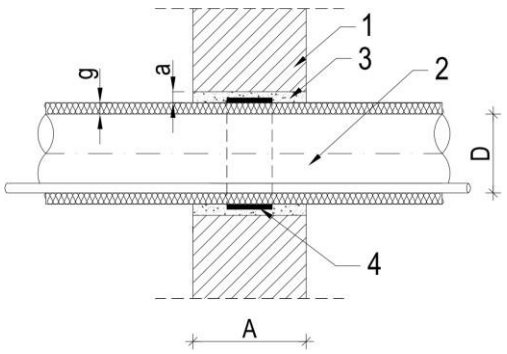
PP-R	D ≤ 110	18.3	-	1 x 60.0 x 2	**EI 120-U/C** **EI 120-C/C**
PVC-U/ PVC-C	D ≤ 110	4.0	-	1 x 60.0 x 2	**EI 120-U/C** **EI 120-C/C**

5. **Protection of insulated combustible pipe penetrations (FEF) using a single row of tape in a rigid wall with a thickness of A ≥ 150 mm**



1. Rigid wall with a thickness of: A ≥ 150 mm;
2. Insulated combustible pipe with or without a heating cable;
3. Filling the gap with cement mortar;
4. **INTU FR WRAP L** tape, a single row placed in the axis of the partition.

RIGID WALL					
Partition thickness ≥ 150 mm					
Material Pipes	**Pipe diameter [mm]**	**Pipe wall thickness [mm]**	**FEF insulation thickness [mm]**	**Number of tape layers × width of intumescent material [mm] × number of wraps**	**Fire resistance class**
PE-HD/ PE/PE-X/ ABS/ SAN+PVC	D ≤ 110	10.0	9	1 x 60.0 x 2	**EI 240-U/C** **EI 240-C/C**
PP	D ≤ 110	2.7	9	1 x 60.0 x 2	**EI 120-U/C** **EI 120-C/C**
PP-R	D ≤ 110	18.3	9	1 x 60.0 x 2	**EI 120-U/C** **EI 120-C/C**
PE-HD/ PE/PE-X/ ABS/ SAN+PVC	D ≤ 110	4.2 – 10.0	13	1 x 60.0 x 3	**EI 120-U/C** **EI 120-C/C**
	110 < D ≤ 125	4.8 – 14.5	13	1 x 100.0 x 4	**EI 60-U/C** **EI 60-C/C**
		14.6	13	1 x 100.0 x 4	**EI 90-U/C** **EI 90-C/C**
	125 < D ≤ 160	6.2 – 14.5	13	1 x 100.0 x 6	**EI 60-U/C** **EI 60-C/C**
		14.6	13	1 x 100.0 x 6	**EI 90-U/C** **EI 90-C/C**
PP	D ≤ 110	2.7 – 18.3	13	1 x 60.0 x 3	**EI 120-U/C** **EI 120-C/C**
PP-R/ PP-R-GF/ PP-R	D ≤ 110	18.3	9	1 x 60.0 x 2	**EI 120-U/C** **EI 120-C/C**

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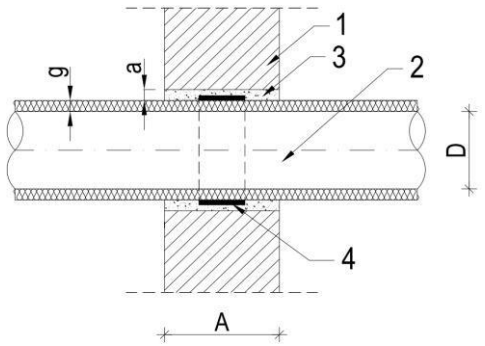
6. **Protection of insulated combustible pipe penetrations (PE) using a single row of tape in a rigid wall with a thickness of A ≥ 150 mm**



1. Rigid wall with a thickness of: A ≥ 150 mm;
2. Insulated combustible pipe;
3. Filling the gap with cement mortar;
4. **INTU FR WRAP L** tape, a single row placed in the axis of the partition.

RIGID WALL					
Partition thickness ≥ 150 mm					
Material Pipes	**Pipe diameter [mm]**	**Pipe wall thickness [mm]**	**PE insulation thickness [mm]**	**Number of tape rows x intumescent material width [mm] x number of wraps**	**Fire resistance class**
PP	D ≤ 75	2.7	9	1 x 60.0 x 1	**EI 60-U/C** **EI 60-C/C**
		12.5	13	1 x 60.0 x 2	
	75 < D ≤ 110	12.5	13	1 x 60.0 x 2	
PVC-U/PVC-C	D ≤ 32	2.0	9	1 x 60.0 x 2	**EI 120 / E 180-U/C** **EI 120 / E 180-C/C**
PE-X/AL/ PE-X	D ≤ 32	3.0	9	1 x 60.0 x 1	**EI 120-U/C**
PE-RT/AL/PE-RT	D ≤ 20	2.0 – 3.0	9	1 x 60.0 x 1	**EI 120-U/C** **EI 120-C/C**
	20 < D ≤ 25	2.5	9	1 x 60.0 x 1	
	25 < D ≤ 32	3.0	9	1 x 60.0 x 1	
PE-X/AL/PE-X	D ≤ 20	2.0	9	1 x 60.0 x 1	**EI 120-U/C** **EI 120-C/C**
PP-R/PP-R-GF/PP-R	D ≤ 50	6.9 – 8.3	9	1 x 60.0 x 1	**EI 120-U/C** **EI 120-C/C**
PP-R/PP-R-GF/PP-R	D ≤ 20	2.8 – 3.4	9	1 x 60.0 x 1	**EI 120-U/C** **EI 120-C/C**

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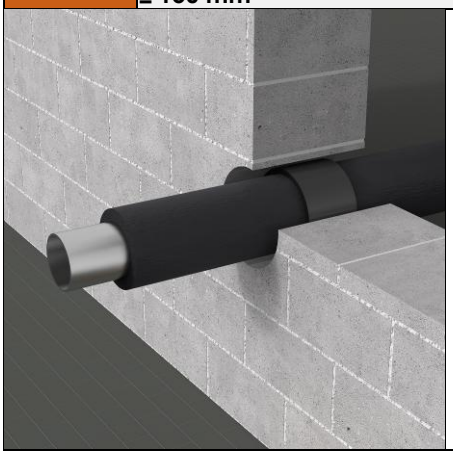
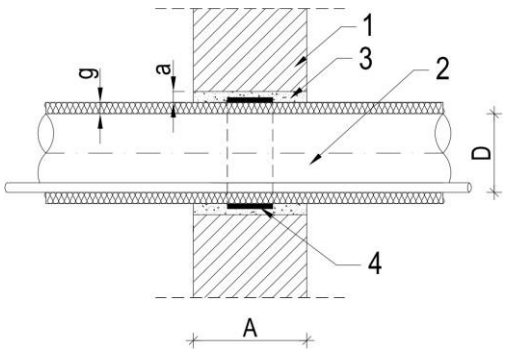
7. **Protection of insulated metal pipe penetrations (FEF) using a single row of tape in a rigid wall with a thickness of A ≥ 150 mm**





1. Rigid wall with a thickness of: A ≥ 150 mm;
2. Insulated metal pipe with or without a heating cable;
3. Filling the gap with cement mortar;
4. **INTU FR WRAP L** tape, a single row placed along the axis of the partition.

RIGID WALL					
Wall thickness ≥ 150 mm					
Pipe material	**Pipe diameter [mm]**	**Pipe wall thickness [mm]**	**FEF insulation thickness [mm]**	**Number of tape rows x width of intumescent material [mm] x number of wraps**	**Fire resistance class**
copper	D ≤ 15.0	1.0 – 1.4	9	1 x 60.0 x 1	**EI 180 / E 240-C/U** **EI 180 / E 240-C/C**
			10 – 22	1 x 60.0 x 2	**EI 180-C/U** **EI 180-C/C**
			23 – 36	1 x 60.0 x 3	
			37 – 50	1 x 60.0 x 4	
		≥ 1.5	9	1 x 60.0 x 1	**EI 240-C/U** **EI 240-C/C**
			10 - 22	1 x 60.0 x 2	**EI 180-C/U** **EI 180-C/C**
			23 – 36	1 x 60.0 x 3	
			37 – 50	1 x 60.0 x 4	
	15.0 < D ≤ 22.0	1.1 – 1.4	9	1 x 60.0 x 1	**EI 180 / E 240-C/U** **EI 180 / E 240-C/C**
			10 – 22	1 x 60.0 x 2	**EI 120-C/U** **EI 120-C/C**
			23 – 36	1 x 60.0 x 3	
			37 – 50	1 x 60.0 x 4	
		≥ 1.5	9	1 x 60.0 x 1	**EI 240-C/U** **EI 240-C/C**
			10 – 22	1 x 60.0 x 2	**EI 120-C/U** **EI 120-C/C**
			23 – 36	1 x 60.0 x 3	
			37 – 50	1 x 60.0 x 4	
	22.0 < D ≤ 28.0	1.2 – 1.4	9	1 x 60.0 x 1	**EI 180 / E 240-C/U** **EI 180 / E 240-C/C**
			10 – 22	1 x 60.0 x 2	**EI 120-C/U** **EI 120-C/C**
			23–36	1 x 60.0 x 3	
			37–50	1 x 60.0 x 4	
		≥ 1.5	9	1 x 60.0 x 1	**EI 240-C/U** **EI 240-C/C**
			10 – 22	1 x 60.0 x 2	**EI 120-C/U** **EI 120-C/C**
			23 – 36	1 x 60.0 x 3	

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			37 – 50	1 x 60.0 x 4	
	28.0 < D ≤ 42.0	1.3 – 1.4	9	1 x 60.0 x 1	**EI 180 / E 240-C/U** **EI 180 / E 240-C/C**
			10 – 22	1 x 60.0 x 2	**EI 120-C/U** **EI 120-C/C**
			23 – 36	1 x 60.0 x 3	
			37 – 50	1 x 60.0 x 4	
	28.0 < D ≤ 42.0	≥ 1.5	9	1 x 60.0 x 1	**EI 240-C/U** **EI 240-C/C**
			10 – 22	1 x 60.0 x 2	**EI 120-C/U** **EI 120-C/C**
			23 – 36	1 x 60.0 x 3	
			37 – 50	1 x 60.0 x 4	
	42.0 < D ≤ 54.0	≥ 1.5	9	1 x 60.0 x 1	**EI 240-C/U** **EI 240-C/C**
			10 – 22	1 x 60.0 x 2	**EI 120-C/U** **EI 120-C/C**
			23 – 36	1 x 60.0 x 3	
			37 – 50	1 x 60.0 x 4	
	54.0 < D ≤ 64.0	≥ 1.6	9	1 x 60.0 x 1	**EI 30 / E 240-C/U** **EI 30 / E 240-C/C**
			10 – 22	1 x 60.0 x 2	**EI 30 / E 60-C/U** **EI 30 / E 60-C/C**
			23 – 36	1 x 60.0 x 3	
			37–49	1 x 60.0 x 4	
			50	1 x 60.0 x 4	**EI 60-C/U** **EI 60-C/C**
	64.0 < D ≤ 76.1	≥ 1.7	9	1 x 60.0 x 1	**EI 30 / E 240-C/U** **EI 30 / E 240-C/C**
			10 – 22	1 x 60.0 x 2	**EI 30 / E 60-C/U EI 30 / E 60-C/C**
			23 – 36	1 x 60.0 x 3	
			37 – 49	1 x 60.0 x 4	
			50	1 x 60.0 x 4	**EI 60-C/U** **EI 60-C/C**
	76.1 < D ≤ 88.9	≥ 1.8	9	1 x 60.0 x 1	**EI 30 / E 240-C/U** **EI 30 / E 240-C/C**
			10 – 22	1 x 60.0 x 2	**EI 30 / E 60-C/U EI 30 / E 60-C/C**
			23 – 36	1 x 60.0 x 3	
			37 – 49	1 x 60.0 x 4	
			50	1 x 60.0 x 4	**EI 60-C/U** **EI 60-C/C**
	88.9 < D ≤ 108.0	≥ 2.0	9	1 x 60.0 x 1	**EI 30 / E 240-C/U** **EI 30 / E 240-C/C**
			10 – 22	1 x 60.0 x 2	**EI 30 / E 60-C/U** **EI 30 / E 60-C/C**
			23 – 36	1 x 60.0 x 3	
			37 – 49	1 x 60.0 x 4	
			50	1 x 60.0 x 4	**EI 60-C/U** **EI 60-C/C**
steel	D ≤ 42.4	2.0 – 2.5	9	1 x 60.0 x 1	**EI 180-C/U** **EI 180-C/C**
			10 – 22	1 x 60.0 x 2	
			23–36	1 x 60.0 x 3	
			37–50	1 x 60.0 x 4	
		≥ 2.6	9	1 x 60.0 x 1	**EI 240-C/U** **EI 240-C/C**
			10 – 22	1 x 60.0 x 2	**EI 180 / E 240-C/U** **EI 180 / E 240-C/C**
			23 – 36	1 x 60.0 x 3	
			37 – 50	1 x 60.0 x 4	
	42.4 < D ≤ 48.3	2.1 – 2.5	9	1 x 60.0 x 1	**EI 180-C/U** **EI 180-C/C**
			10 – 22	1 x 60.0 x 2	
			23–36	1 x 60.0 x 3	

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			37–50	1 x 60.0 x 4	
		≥ 2.6	9	1 x 60.0 x 1	**EI 240-C/U** **EI 240-C/C**
			10 – 22	1 x 60.0 x 2	**EI 180 / E 240-C/U** **EI 180 / E 240-C/C**
			23 – 36	1 x 60.0 x 3	
			37 – 50	1 x 60.0 x 4	
	48.3 < D ≤ 60.3	2.2 – 2.5	9	1 x 60.0 x 1	**EI 180-C/U** **EI 180-C/C**
			10 – 22	1 x 60.0 x 2	
			23 – 36	1 x 60.0 x 3	
			37 – 50	1 x 60.0 x 4	
		≥ 2.6	9	1 x 60.0 x 1	**EI 240-C/U** **EI 240-C/C**
			10 – 22	1 x 60.0 x 2	**EI 180 / E 240-C/U** **EI 180 / E 240-C/C**
			23 – 36	1 x 60.0 x 3	
			37 – 50	1 x 60.0 x 4	
	60.3 < D ≤ 76.1	2.4 – 2.5	9	1 x 60.0 x 1	**EI 180-C/U** **EI 180-C/C**
			10 – 22	1 x 60.0 x 2	
			23 – 36	1 x 60.0 x 3	
			37 – 50	1 x 60.0 x 4	
		≥ 2.6	9	1 x 60.0 x 1	**EI 240-C/U** **EI 240-C/C**
			10 – 22	1 x 60.0 x 2	**EI 180 / E 240-C/U** **EI 180 / E 240-C/C**
			23 – 36	1 x 60.0 x 3	
			37 – 50	1 x 60.0 x 4	
	76.1 < D ≤ 88.9	≥ 2.6	9	1 x 60.0 x 1	**EI 240-C/U** **EI 240-C/C**
			10 – 22	1 x 60.0 x 2	**EI 180 / E 240-C/U** **EI 180 / E 240-C/C**
			23 – 36	1 x 60.0 x 3	
			37 – 50	1 x 60.0 x 4	
	88.9 < D ≤ 114.3	≥ 3.1	9	1 x 60.0 x 1	**EI 90 / E 240-C/U** **EI 90 / E 240-C/C**
			10 – 23	1 x 60.0 x 2	
			24 – 36	1 x 60.0 x 3	**EI 90 / E 180-C/U** **EI 90 / E 180-C/C**
			37 – 49	1 x 60.0 x 4	
			50	1 x 60.0 x 4	**EI 180-C/U** **EI 180-C/C**
	114.3 < D ≤ 139.7	≥ 3.6	9	1 x 60.0 x 1	**EI 90 / E 240-C/U** **EI 90 / E 240-C/C**
			10 – 23	1 x 60.0 x 2	
			24 – 36	1 x 60.0 x 3	**EI 90 / E 180-C/U** **EI 90 / E 180-C/C**
			37 – 49	1 x 60.0 x 4	
			50	1 x 60.0 x 4	**EI 180-C/U** **EI 180-C/C**
	139.7 < D ≤ 159.0	≥ 4.0	9	1 x 60.0 x 1	**EI 90 / E 240-C/U** **EI 90 / E 240-C/C**
			10 – 23	1 x 60.0 x 2	
			24 – 36	1 x 60.0 x 3	**EI 90 / E 180-C/U** **EI 90 / E 180-C/C**
			37 – 49	1 x 60.0 x 4	
			50	1 x 60.0 x 4	**EI 180-C/U** **EI 180-C/C**
	159.0 < D ≤ 168.3	≥ 4.0	50	1 x 60.0 x 1	**EI 90-C/U** **EI 90-C/C**
	168.3 < D ≤ 219.0	≥ 4.0	50	1 x 60.0 x 1	

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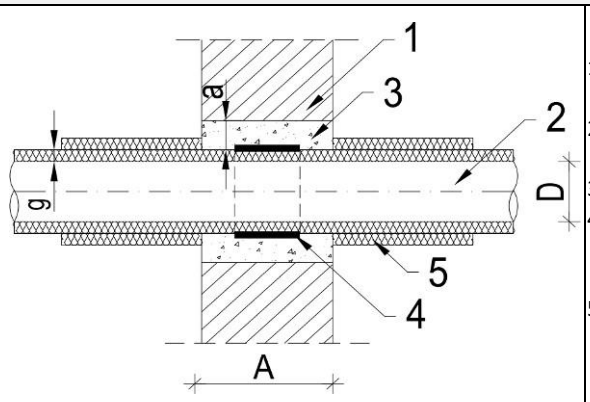
8. Protection of insulated metal pipe penetrations (FEF) using a single row of tape in a rigid wall with a thickness of A ≥ 150 mm



1. Rigid wall with a thickness of: A ≥ 150 mm;
2. Insulated metal pipe with or without a heating cable;
3. Filling the gap with cement mortar;
4. **INTU FR WRAP L** tape, a single row placed along the axis of the partition.
5. Mineral wool with a density of 35 kg/m³.

RIGID WALL					
Partition thickness ≥ 150 mm					
Material pipes	**Pipe diameter [mm]**	**Pipe wall thickness [mm]**	**FEF insulation thickness [mm]**	**Number of tape rows x width of intumescent material [mm] x number of wraps**	**Fire resistance class**
copper	D ≤ 12.7	≥ 0.8	9	1 x 60.0 x 2	**EI 120-C/U EI 120-C/C**
	12.7 < D ≤ 15.0	≥ 0.9	9	1 x 60.0 x 2	
	15.0 < D ≤ 22.23	≥ 1.0	9	1 x 60.0 x 2	
steel	D ≤ 18.0	1.2 – 1.4	9	1 x 60.0 x 1	**EI 120-C/U EI 120-C/C**
			10 – 25	1 x 60.0 x 2	
		≥ 1.5	9	1 x 60.0 x 1	
			10–25	1 x 60.0 x 2	
			26–37	1 x 60.0 x 3	
			38 – 50	1 x 60.0 x 4	
	18.0 < D ≤ 28.0	1.3 – 1.4	9	1 x 60.0 x 1	
			10 – 25	1 x 60.0 x 2	
		≥ 1.5	9	1 x 60.0 x 1	
			10–25	1 x 60.0 x 2	
			26 – 37	1 x 60.0 x 3	
			38 – 50	1 x 60.0 x 4	
	28.0 < D ≤ 48.3	1.4	9	1 x 60.0 x 1	
			10 – 25	1 x 60.0 x 2	
		≥ 1.5	9	1 x 60.0 x 1	
			10–25	1 x 60.0 x 2	
			26 – 37	1 x 60.0 x 3	
			38 – 50	1 x 60.0 x 4	
	48.3 < D ≤	≥ 1.5	9	1 x 60.0 x 1	

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	66.7		10 – 25	1 x 60.0 x 2	
			26 – 37	1 x 60.0 x 3	
			38–50	1 x 60.0 x 4	
	66.7 < D ≤ 76.1	≥ 1.6	25	1 x 60.0 x 2	
			26 – 37	1 x 60.0 x 3	
			38 – 50	1 x 60.0 x 4	
	76.1 < D ≤ 88.9	≥ 1.8	25	1 x 60.0 x 2	
			26 – 37	1 x 60.0 x 3	
			38–50	1 x 60.0 x 4	
	88.9 < D ≤ 108.0	≥ 2.0	25	1 x 60.0 x 2	**EI 120-C/U EI 120-C/C**
			26–37	1 x 60.0 x 3	
			38–50	1 x 60.0 x 4	
	108.0 < D ≤ 114.3	≥ 2.2	50	1 x 60.0 x 4	
	114.3 < D ≤ 139.7	≥ 3.1	50	1 x 60.0 x 4	
	139.7 < D ≤ 168.3	≥ 4.0	50	1 x 60.0 x 4	
	168.3 < D ≤ 219.1	≥ 4.0	50 [1)]	1 x 60.0 x 4	
	219.1 < D ≤ 273.0	≥ 4.6	50 [2)]	1 x 60.0 x 4	
	273.0 < D ≤ 323.9	≥ 5.2	50 [2)]	1 x 60.0 x 4	
	323.9 < D ≤ 355.6	≥ 5.6	50 [2)]	1 x 60.0 x 4	

1) Pipe with additional mineral wool insulation with a density of 35 kg/m³, spot insulation (LI case) with dimensions of 40 x 500 mm (thickness x length)

2) Pipe with additional mineral wool insulation with a density of 35 kg/m³, spot insulation (case LI) with dimensions of 50 x 500 mm (thickness x length)

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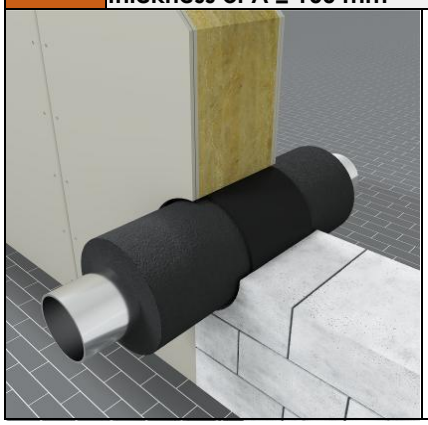
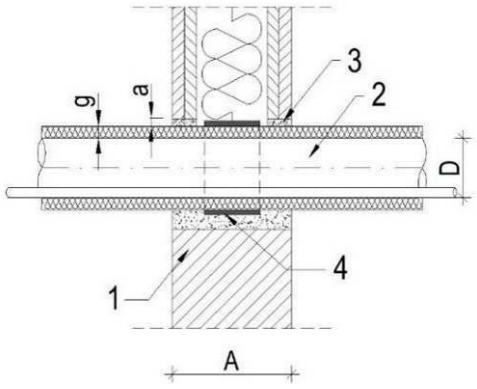
9. Protection of insulated metal pipe penetrations (FEF) using a single row of tape in a rigid or flexible wall with a thickness of A ≥ 100 mm





1. Rigid or flexible wall with a thickness of: A ≥ 100 mm;
2. Insulated metal pipe with or without a heating cable;
3. Filling the gap with cement mortar;
4. **INTU FR WRAP L** tape, single row positioned along the partition axis.

RIGID/FLEXIBLE WALL					
Partition thickness ≥ 100 mm					
Material Pipes	**Pipe diameter [mm]**	**Pipe wall thickness [mm]**	**FEF insulation thickness [mm]**	**Number of tape rows x width of intumescent material [mm] x number of wraps**	**Fire resistance class**
steel	D ≤ 42.4	2.0 – 2.8	9	1 x 60.0 x 1	**EI 120-C/U EI 120-C/C**
			10–22	1 x 60.0 x 2	**EI 90 / E 120-C/U EI 90 / E 120-C/C**
			23 – 36	1 x 60.0 x 3	
			37 – 50	1 x 60.0 x 4	
		≥ 2.9	9	1 x 60.0 x 1	**EI 120-C/U EI 120-C/C**
			10 - 22	1 x 60.0 x 2	
			23 – 36	1 x 60.0 x 3	
			37 – 50	1 x 60.0 x 4	
	42.4 < D ≤ 48.3	≥ 2.1	9	1 x 60.0 x 1	**EI 60 / E 120-C/U EI 60 / E 120-C/C**
			10 - 22	1 x 60.0 x 2	
			23 – 36	1 x 60.0 x 3	
			37 – 49	1 x 60.0 x 4	
			50	1 x 60.0 x 4	**EI 120-C/U EI 120-C/C**
	48.3 < D ≤ 60.3	≥ 2.3	9	1 x 60.0 x 1	**EI 60 / E 120-C/U EI 60 / E 120-C/C**
			10 - 22	1 x 60.0 x 2	
			23 – 36	1 x 60.0 x 3	
			37 – 49	1 x 60.0 x 4	
			50	1 x 60.0 x 4	**EI 120-C/U EI 120-C/C**
	60.3 < D ≤ 76.1	≥ 2.7	9	1 x 60.0 x 1	**EI 60 / E 120-C/U EI 60 / E 120-C/C**
			10 - 22	1 x 60.0 x 2	
	60.3 < D ≤ 76.1	≥ 2.7	23 – 36	1 x 60.0 x 3	**EI 60 / E 120-C/U EI 60 / E 120-C/C**
			37 – 49	1 x 60.0 x 4	
			50	1 x 60.0 x 4	**EI 120-C/U EI 120-C/C**
	76.1 < D ≤ 88.9	≥ 2.9	9	1 x 60.0 x 1	**EI 60 / E 120-C/U EI 60 / E 120-C/C**
			10 – 22	1 x 60.0 x 2	
			23–36	1 x 60.0 x 3	

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			37–49	1 x 60.0 x 4	
			50	1 x 60.0 x 4	**EI 120-C/U** **EI 120-C/C**
	88.9 < D ≤ 114.3	≥ 3.3	9	1 x 60.0 x 1	**EI 45 / E 120-C/U** **EI 45 / E 120-C/C**
			10 – 22	1 x 60.0 x 2	**EI 45 / E 90-C/U** **EI 45 / E 90-C/C**
			23 – 36	1 x 60.0 x 3	
			37–49	1 x 60.0 x 4	
			50	1 x 60.0 x 4	**EI 90-C/U** **EI 90-C/C**
	114.3 < D ≤ 139.7	≥ 3.6	9	1 x 60.0 x 1	**EI 45 / E 120-C/U** **EI 45 / E 120-C/C**
			10 – 22	1 x 60.0 x 2	**EI 45 / E 90-C/U** **EI 45 / E 90-C/C**
			23 – 36	1 x 60.0 x 3	
			37 – 49	1 x 60.0 x 4	
			50	1 x 60.0 x 4	**EI 90-C/U** **EI 90-C/C**
	139.7 < D ≤ 168.3	≥ 4.0	9	1 x 60.0 x 1	**EI 45 / E 120-C/U** **EI 45 / E 120-C/C**
			10 – 22	1 x 60.0 x 2	**EI 45 / E 90-C/U** **EI 45 / E 90-C/C**
			23 – 36	1 x 60.0 x 3	
			37 – 49	1 x 60.0 x 4	
			50	1 x 60.0 x 4	**EI 90-C/U** **EI 90-C/C**

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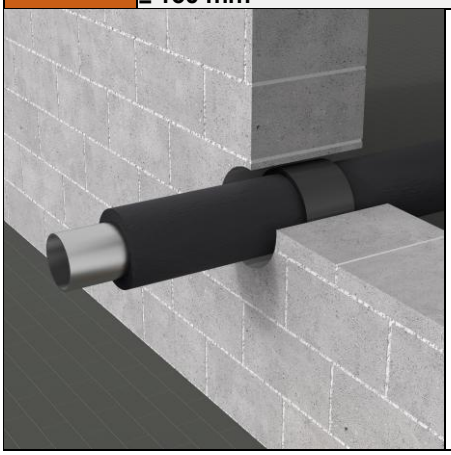
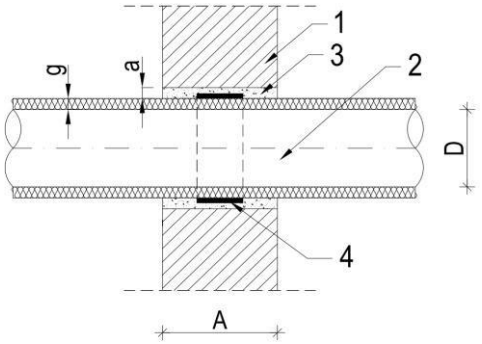
10.	Protection of insulated metal pipe penetrations (PE) using a single row of tape in a rigid wall with a thickness of A ≥ 150 mm





1. Rigid wall with a thickness of: A ≥ 150 mm;
2. Insulated metal pipe;
3. Filling the gap with cement mortar;
4. **INTU FR WRAP L** tape, a single row placed along the axis of the partition.

RIGID WALL					
Partition thickness ≥ 150 mm					
Material Pipes	**Pipe diameter [mm]**	**Pipe wall thickness [mm]**	**PE insulation thickness [mm]**	**Number of tape rows x width of intumescent material [mm] x number of wraps**	**Fire resistance class**
copper	D ≤ 6.35	≥ 0.8	9	1 x 60.0 x 2	**EI 240-C/U** **EI 240-C/C**
	6.35 < D ≤ 15.88	≥ 1.0	9	1 x 60.0 x 2	**EI 180 / E 240-C/U** **EI 180 / E 240-C/C**

RIGID WALL					
Partition thickness ≥ 150 mm					
Material tubes	**Pipe diameter [mm]**	**Pipe wall thickness [mm]**	**PE insulation thickness [mm]**	**Number of tape rows x width of intumescent material [mm] x number of wraps**	**Fire resistance class**
copper	D ≤ 12.7	≥ 0.8	9	1 x 60.0 x 2	**EI 120-C/U** **EI 120-C/C**
	12.7 < D ≤ 22.23	≥ 1.0	9	1 x 60.0 x 2	

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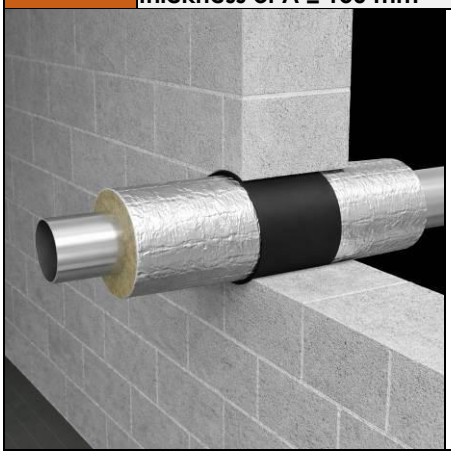
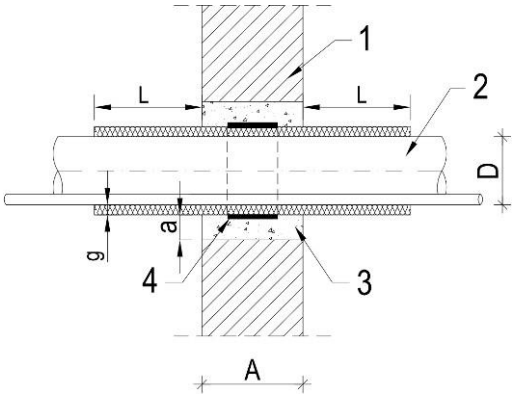
11. **Protection of insulated metal pipe penetrations (mineral wool) using a single row of tape in a rigid wall with a thickness of A ≥ 150 mm**





1. Rigid wall with a thickness of: A ≥ 150 mm;
2. Insulated metal pipe with or without a heating cable;
3. Filling the gap with cement mortar;
4. **INTU FR WRAP L** tape, a single row placed along the axis of the partition.

RIGID WALL					
Partition thickness ≥ 150 mm					
Material Pipes	**Pipe diameter [mm]**	**Pipe wall thickness [mm]**	**Insulation thickness (mineral wool) [mm]**	**Number of tape rows x width of intumescent material [mm] x number of wraps**	**Fire resistance class**
steel	D ≤ 42.4	≥ 1.5	20 x 300	1 x 60.0 x 1	**EI 120-C/U EI 120-C/C**
			(21 – 30) x 500	1 x 60.0 x 1	
		≥ 2.0	(21 – 40) x 600	1 x 60.0 x 1	
	42.4 < D ≤ 66.7	≥ 1.5	30 x 500	1 x 60.0 x 1	
		≥ 2.0	(31–40) x 600	1 x 60.0 x 1	
	66.7 < D ≤ 108.0	≥ 2.0	40 x 600	1 x 60.0 x 1	

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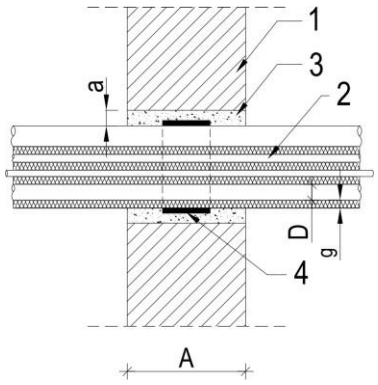
12. Protection of mixed insulated bundle (FEF) penetrations using a single row of tape in a rigid wall with a thickness of A ≥ 150 mm



1. Rigid wall with a thickness of: A ≥ 150 mm;
2. One or two bundles of pipes and cables;
3. Filling the gap with cement mortar;
4. **INTU FR WRAP L** tape, a single row placed in the centerline of the partition.

RIGID WALL					
Partition thickness ≥ 150 mm					
Pipe material	**Pipe diameter [mm]**	**Pipe wall thickness [mm]**	**FEF insulation thickness [mm]**	**Number of tape rows x width of intumescent material [mm] x number of wraps**	**Fire resistance class**
single copper pipe[1)]	D ≤ 12.7	≥ 0.8	9	1 x 60.0 x 2	**EI 120**
	12.7 < D ≤ 22.23	≥ 1.0	9	1 x 60.0 x 2	

[1)] Bundle with a 4 x 1.5 mm² cable and a PVC-U pipe D ≤ 25 mm, wall thickness ≥ 1.5 mm.

RIGID WALL					
Partition thickness ≥ 150 mm					
Pipe material	**Copper pipe No. 1 max. diameter x min. wall thickness [mm]**	**Copper pipe No. 2 max. diameter x min. wall thickness [mm]**	**FEF insulation thickness [mm]**	**Number of tape rows x width of intumescent material [mm] x number of wraps**	**Fire resistance class**
double copper pipe[1)]	12.7 x 0.8	12.7 x 0.8	9	1 x 60.0 x 2	**EI 120**
	12.7 x 0.8	22.23 x 1.0	9	1 x 60.0 x 2	

[1)] Cable bundle with 4 x 1.5 mm² cable and PVC-U pipe D ≤ 25 mm, wall thickness ≥ 1.5 mm.

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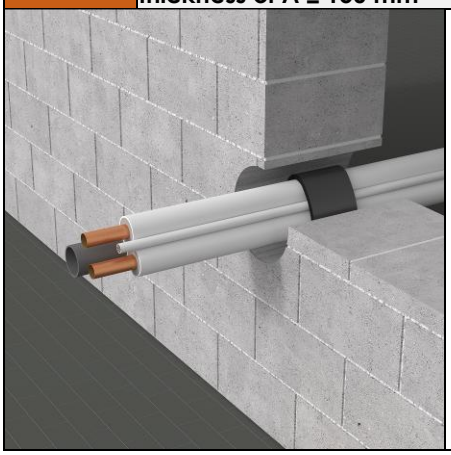
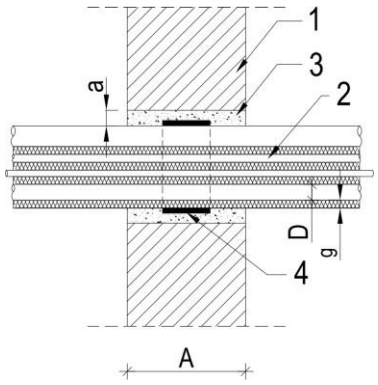
13. Protection of mixed insulated (PE) cable bundle penetrations using a single row of tape in a rigid wall with a thickness of A ≥ 150 mm





1. Rigid wall with a thickness of: A ≥ 150 mm;
2. One or two bundles of pipes and cables;
3. Filling the gap with cement mortar;
4. **INTU FR WRAP L** tape, single row positioned along the partition axis.

RIGID WALL					
Partition thickness ≥ 150 mm					
Pipe material	**Pipe diameter [mm]**	**Pipe wall thickness [mm]**	**PE insulation thickness [mm]**	**Number of tape rows x width of intumescent material [mm] x number of wraps**	**Fire resistance class**
single copper pipe1)	D ≤ 6.35	≥ 0.8	9	1 x 60.0 x 2	**EI 240**
	6.35 < D ≤ 15.88	≥ 1.0	9	1 x 60.0 x 2	**EI 180 / E 240**

1) A bundle consisting of a 5 x 1.5 mm² cable and a PVC-U pipe with a diameter of ≤ 32 mm and a wall thickness of ≥ 2.0 mm.

RIGID WALL					
Partition thickness ≥ 150 mm					
Pipe material	**Copper pipe No. 1 max. diameter x min. wall thickness [mm]**	**Copper pipe No. 2 max. diameter x min. wall thickness [mm]**	**PE insulation thickness [mm]**	**Number of tape rows x width of intumescent material [mm] x number of wraps**	**Fire resistance class**
double copper pipe1)	6.0 x 0.8	6.0 x 0.8	9	1 x 60.0 x 2	**EI 120 / E 180**
	6.0 x 0.8	15.0 x 1.0	9	1 x 60.0 x 2	

1) A bundle containing a 5 x 1.5 mm² cable and a PVC-U pipe with a diameter of ≤ 32 mm and a wall thickness of ≥ 2.0 mm.

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RIGID WALL					
Partition thickness ≥ 150 mm					
Pipe material	**Pipe diameter [mm]**	**Pipe wall thickness [mm]**	**PE insulation thickness [mm]**	**Number of tape rows x width of intumescent material [mm] x number of wraps**	**Fire resistance class**
single copper pipe1)	D ≤ 12.7	≥ 0.8	9	1 x 60.0 x 2	**EI 120**
	12.7 < D ≤ 22.23	≥ 1.0	9	1 x 60.0 x 2	

1) A bundle consisting of a 4 x 1.5 mm² cable and a PVC-U pipe with a diameter of ≤ 25 mm and a wall thickness of ≥ 1.5 mm.

RIGID WALL					
Partition thickness ≥ 150 mm					
Pipe material	**Copper pipe No. 1 max. diameter x min. wall thickness [mm]**	**Copper pipe No. 2 max. diameter x min. wall thickness [mm]**	**PE insulation thickness [mm]**	**Number of tape rows x width of intumescent material [mm] x number of wraps**	**Fire resistance class**
double copper pipe1)	12.7 x 0.8	12.7 x 0.8	9	1 x 60.0 x 2	**EI 120**
	12.7 x 0.8	22.23 x 1.0	9	1 x 60.0 x 2	

1) A bundle with a 4 x 1.5 mm² cable and a PVC-U pipe D ≤ 25 mm, wall thickness ≥ 1.5 mm.

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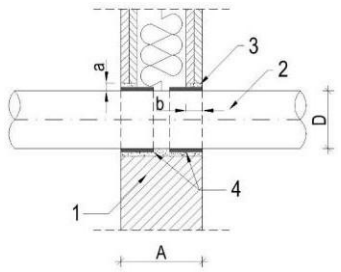
14. **Protection of combustible pipe penetrations using a double row of tape in a rigid wall with a thickness of A ≥ 150 mm**



1. Rigid wall with a thickness of: A ≥ 150 mm;
2. Combustible pipe;
3. Filling the gap with cement mortar;
4. **INTU FR WRAP L** tape, double row placed on both sides, flush with the wall surface.

RIGID WALL					
Partition thickness ≥ 150 mm					
Material Pipes	**Pipe diameter [mm]**	**Pipe wall thickness [mm]**	**Insulation thickness [mm]**	**Number of tape rows x intumescent material width [mm] x number of wraps**	**Fire resistance class**
PP	D ≤ 50	1.8	-	2 x 60.0 x 1	**EI 120-U/C** **EI 120-C/C**
		1.9	-	2 x 60.0 x 1	**EI 120 / E 180-U/C** **EI 120 / E 180-C/C**
		2.0 – 12.5	-	2 x 60.0 x 1	**EI 120-U/C** **EI 120-C/C**
		12.6 – 18.4	-	2 x 60.0 x 2	
	50 < D ≤ 75	1.9	-	2 x 60.0 x 1	**EI 120 / E 180-U/C** **EI 120 / E 180-C/C**
		2.0 – 12.5	-	2 x 60.0 x 1	**EI 120-U/C** **EI 120-C/C**
		12.6 – 18.4	-	2 x 60.0 x 2	
	75 < D ≤ 90	2.2 – 18.4	-	2 x 60.0 x 2	
	90 < D ≤ 110	2.7 – 18.4	-	2 x 60.0 x 2	
	110 < D ≤ 125	3.4 – 14.5	-	2 x 60.0 x 3	**EI 60-U/C** **EI 60-C/C**
		14.6	-	2 x 60.0 x 3	**EI 120-U/C** **EI 120-C/C**
	125 < D ≤ 160	4.9 – 14.5	-	2 x 60.0 x 5	**EI 60-U/C** **EI 60-C/C**
		14.6	-	2 x 60.0 x 5	**EI 120-U/C** **EI 120-C/C**

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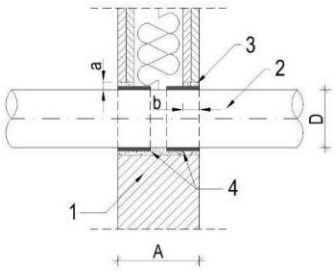
15. **Protection of combustible pipe penetrations using a double layer of tape in a rigid or flexible wall with a thickness of A ≥ 125 mm**



1. Rigid or flexible wall with a thickness of: A ≥ 125 mm;
2. Combustible pipe;
3. Filling the gap with cement mortar;
4. **INTU FR WRAP L** tape, double row applied on both sides, flush with the wall surface.

RIGID/FLEXIBLE WALL					
Partition thickness ≥ 125 mm					
Material Pipes	**Pipe diameter [mm]**	**Pipe wall thickness [mm]**	**Insulation thickness [mm]**	**Number of tape rows x width of intumescent material [mm] x number of wraps**	**Fire resistance class**
PE-HD/ PE/PE-X/ ABS/ SAN+PVC	D ≤ 32	2.0 – 6.8	-	2 x 60.0 x 1	**EI 120-U/C EI 120-C/C**
		6.9 – 10.0	-	2 x 60.0 x 2	
	32 < D ≤ 50	2.4 – 6.8	-	2 x 60.0 x 1	
		6.9 – 10.0	-	2 x 60.0 x 2	
	50 < D ≤ 75	3.0 – 6.8	-	2 x 60.0 x 1	
		6.9 – 10.0	-	2 x 60.0 x 2	
	75 < D ≤ 90	3.5 – 10.0	-	2 x 60.0 x 2	
	90 < D ≤ 110	4.2 – 10.0	-	2 x 60.0 x 2	
PE-Xa	D ≤ 20	2.0 – 5.8	-	2 x 60.0 x 1	**EI 120-U/C EI 120-C/C**
	20 < D ≤ 32	3.0	-	2 x 60.0 x 1	
	32 < D ≤ 40	3.7	-	2 x 60.0 x 1	
	40 < D ≤ 50	4.6	-	2 x 60.0 x 1	
	50 < D ≤ 63	5.8	-	2 x 60.0 x 1	
PP-R	D ≤ 20	2.3 – 10.0	-	2 x 60.0 x 1	**EI 120-U/C EI 120-C/C**
	20 < D ≤ 32	3.3 – 12.5	-	2 x 60.0 x 1	
		12.6 – 16.0	-	2 x 60.0 x 2	
	32 < D ≤ 50	4.8 – 12.5	-	2 x 60.0 x 1	
		12.6 – 18.3	-	2 x 60.0 x 2	
	50 < D ≤ 63	5.8 – 12.5	-	2 x 60.0 x 1	
		12.6 – 18.3	-	2 x 60.0 x 2	
	63 < D ≤ 75	6.8 – 12.5	-	2 x 60.0 x 1	
		12.6 – 18.3	-	2 x 60.0 x 2	
	75 < D ≤ 90	8.2 – 18.3	-	2 x 60.0 x 2	
	90 < D ≤ 110	10.0 – 18.3	-	2 x 60.0 x 2	
PVC-U/ PVC-C	D ≤ 50	1.8 – 3.6	-	2 x 60.0 x 1	**EI 120-U/C EI 120-C/C**
		3.7 – 4.2	-	2 x 60.0 x 2	

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	50 < D ≤ 75	1.9 – 3.6	-	2 x 60.0 x 1	
		3.7 – 4.2	-	2 x 60.0 x 2	
	75 < D ≤ 90	2.0 – 4.2	-	2 x 60.0 x 2	
	90 < D ≤ 110	2.2 – 4.2	-	2 x 60.0 x 2	
PP	D ≤ 50	1.8	-	2 x 60.0 x 1	**EI 120-U/C** **EI 120-C/C**
		1.9	-	2 x 60.0 x 1	**EI 120 / E 180-U/C** **EI 120 / E 180-C/C**
		2.0 – 12.5	-	2 x 60.0 x 1	**EI 120-U/C** **EI 120-C/C**
		12.6 – 18.4	-	2 x 60.0 x 2	
	50 < D ≤ 75	1.9	-	2 x 60.0 x 1	**EI 120 / E 180-U/C** **EI 120 / E 180-C/C**
		2.0 – 12.5	-	2 x 60.0 x 1	**EI 120-U/C** **EI 120-C/C**
		12.6 – 18.4	-	2 x 60.0 x 2	
	75 < D ≤ 90	2.2 – 18.4	-	2 x 60.0 x 2	
	90 < D ≤ 110	2.7 – 18.4	-	2 x 60.0 x 2	
PE-RT/ AL/PE-RT	D ≤ 20	2.0–3.0	-	2 x 60.0 x 1	**EI 120-U/C** **EI 120-C/C**
	20 < D ≤ 25	2.5	-	2 x 60.0 x 1	
	25 < D ≤ 32	3.0	-	2 x 60.0 x 1	
	32 < D ≤ 40	4.0	-	2 x 60.0 x 1	**EI 90 / E 120-U/C** **EI 90 / E 120-C/C**
	40 < D ≤ 63	6.0	-	2 x 60.0 x 1	
PE-X/AL/ PE-X	D ≤ 32	3.0 – 6.0	-	2 x 60.0 x 1	**EI 120-U/C** **EI 120-C/C**
	32 < D ≤ 40	3.8	-	2 x 60.0 x 1	
	40 < D ≤ 63	6.0	-	2 x 60.0 x 1	
PP-R/AL/ PP-R	D ≤ 20	2.8 – 10.0	-	2 x 60.0 x 1	**EI 120-U/C** **EI 120-C/C**
	20 < D ≤ 32	4.4 – 12.5	-	2 x 60.0 x 1	
		12.6 – 16.0	-	2 x 60.0 x 2	
	32 < D ≤ 50	6.9 – 12.5	-	2 x 60.0 x 1	
		12.6 – 18.3	-	2 x 60.0 x 2	
	50 < D ≤ 63	8.7 – 12.5	-	2 x 60.0 x 1	
		12.6 – 18.3	-	2 x 60.0 x 2	
	63 < D ≤ 75	10.3 – 12.5	-	2 x 60.0 x 1	
		12.6 – 18.3	-	2 x 60.0 x 2	
	75 < D ≤ 90	12.4 – 18.3	-	2 x 60.0 x 2	
	90 < D ≤ 110	March 15–18	-	2 x 60.0 x 2	
PP-R/ PP-R-GF/PP-R	D ≤ 20	2.8 – 10.0	-	2 x 60.0 x 1	**EI 120-U/C** **EI 120-C/C**
	20 < D ≤ 32	4.4 – 12.5	-	2 x 60.0 x 1	
		12.6 – 15.1	-	2 x 60.0 x 2	
	32 < D ≤ 50	6.7 – 12.5	-	2 x 60.0 x 1	
		12.6 – 15.1	-	2 x 60.0 x 2	
	50 < D ≤ 63	8.4 – 12.5	-	2 x 60.0 x 1	
		12.6 – 15.1	-	2 x 60.0 x 2	
	63 < D ≤ 75	10.0 – 12.5	-	2 x 60.0 x 1	
		12.6 – 15.1	-	2 x 60.0 x 2	
	75 < D ≤ 110	15.1	-	2 x 60.0 x 2	

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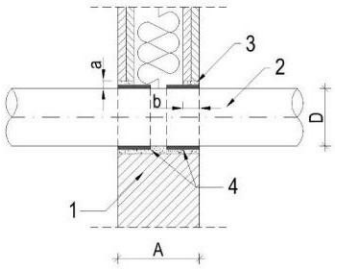
16.	Protection of combustible pipe penetrations using a double row of tape in a rigid or flexible wall with a thickness of A ≥ 125 mm



1. Rigid or flexible wall with a thickness of: A ≥ 125 mm;
2. Combustible pipe;
3. Filling the gap with **INTU FR MASTIC**;
4. **INTU FR WRAP L** tape, double row applied on both sides, flush with the wall surface.

RIGID/FLEXIBLE WALL					
Partition thickness ≥ 125 mm					
Material Pipes	**Pipe diameter [mm]**	**Pipe wall thickness [mm]**	**Insulation thickness [mm]**	**Number of tape rows x width of intumescent material [mm] x number of wraps**	**Fire resistance class**
PE-HD/ PE/PE-X/ ABS/ SAN+PVC	D ≤ 110	4.2	-	2 x 60.0 x 2	**EI 120-U/C EI 120-C/C**
PP	D ≤ 110	2.7	-	2 x 60.0 x 2	**EI 120-U/C EI 120-C/C**
PP-R	D ≤ 110	18.3	-	2 x 60.0 x 2	**EI 120-U/C EI 120-C/C**
PVC-U/ PVC-C	D ≤ 110	3.2	-	2 x 60.0 x 2	**EI 120-U/C EI 120-C/C**

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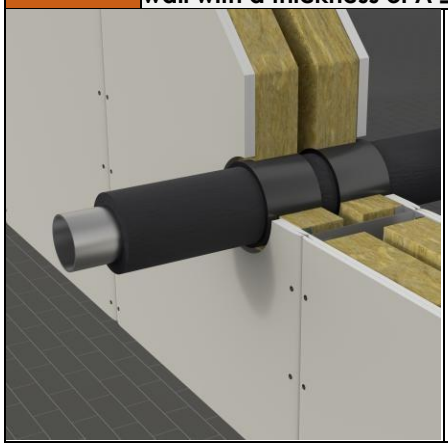
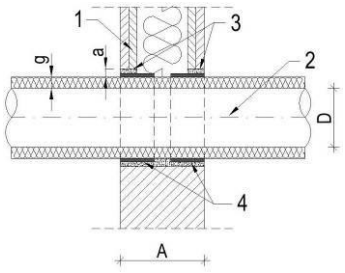
17.	Protection of insulated combustible pipe penetrations (PE) using a double layer of tape in a rigid or flexible wall with a thickness of A ≥ 125 mm





1. Rigid or flexible wall with a thickness of: A ≥ 125 mm;
2. Insulated combustible pipe;
3. Filling the gap with cement mortar;
4. **INTU FR WRAP L** tape, double row applied on both sides, flush with the wall surface.

RIGID/FLEXIBLE WALL					
Partition thickness ≥ 125 mm					
Material Pipes	**Pipe diameter [mm]**	**Pipe wall thickness [mm]**	**PE insulation thickness [mm]**	**Number of tape rows x width of intumescent material [mm] x number of wraps**	**Fire resistance class**
PE-RT/AL/ PE-RT	D ≤ 32	3.0	9	2 x 60.0 x 1	**EI 120-U/C EI 120-C/C**
PE-X/AL/ PE-X	D ≤ 32	3.0	9	2 x 60.0 x 1	**EI 120-U/C EI 120-C/C**
PE-RT/AL/ PE-RT	D ≤ 20	2.0	9	2 x 60.0 x 1	**EI 120-U/C EI 120-C/C**
PE-X/AL/ PE-X	D ≤ 20	2.0	9	2 x 60.0 x 1	**EI 120-U/C EI 120-C/C**
PP-R/PP-R-GF/PP-R	D ≤ 50	5.9 – 8.9	9	2 x 60.0 x 1	**EI 120-U/C EI 120-C/C**
PP-R/PP-R-GF/PP-R	D ≤ 20	2.8 – 3.4	9	2 x 60.0 x 1	**EI 120-U/C EI 120-C/C**

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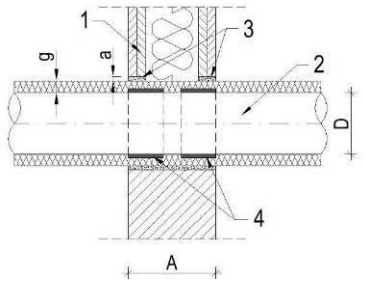
18. Protection of insulated combustible pipe penetrations (mineral wool) using a double row of tape in a rigid or flexible wall with a thickness of A ≥ 125 mm



1. Rigid or flexible wall with a thickness of: A ≥ 125 mm;
2. Insulated combustible pipe;
3. Filling the gap with cement mortar;
4. **INTU FR WRAP L** tape, double row installed on both sides, flush with the wall surface (tape installed on the pipe, under the insulation).

RIGID/FLEXIBLE WALL					
Partition thickness ≥ 125 mm					
Material Pipes	**Pipe diameter [mm]**	**Pipe wall thickness [mm]**	**Mineral wool insulation thickness [mm]**	**Number of tape rows x width of intumescent material [mm] x number of wraps**	**Fire resistance class**
PP-R	D ≤ 20	2.3	20 [1)]	2 x 60.0 x 1	**EI 120-U/C** **EI 120-C/C**
		6.8 – 12.5	30 [1)]	2 x 60.0 x 1	
	20 < D ≤ 75	6.8 – 12.5	30 [1)]	2 x 60.0 x 1	

[1)] **INTU FR WRAP L** tape, applied to the pipe under the insulation.

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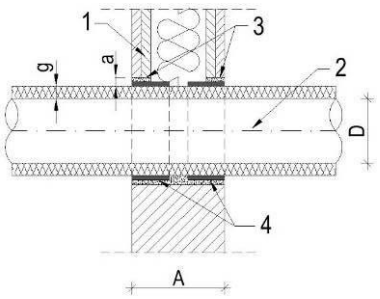
18a.	Protection of insulated combustible pipe penetrations (mineral wool) using a double row of tape in a rigid or flexible wall with a thickness of A ≥ 125 mm



1. Rigid or flexible wall with a thickness of: A ≥ 125 mm;
2. Insulated combustible pipe;
3. Filling the gap with cement mortar;
4. **INTU FR WRAP L** tape, double row placed on both sides, flush with the wall surface (tape placed over the insulation).

RIGID/FLEXIBLE WALL					
Partition thickness ≥ 125 mm					
Material Pipes	**Pipe diameter [mm]**	**Pipe wall thickness [mm]**	**Mineral wool insulation thickness [mm]**	**Number of tape rows x width of intumescent material [mm] x number of wraps**	**Fire resistance class**
PP-R	D ≤ 20	2.3	20 [1)]	2 x 60.0 x 1	**EI 120-U/C** **EI 120-C/C**
		6.8 – 12.5	30 [1)]	2 x 60.0 x 3	
	20 < D ≤ 75	6.8 – 12.5	30 [1)]	2 x 60.0 x 3	

[1)] **INTU FR WRAP L** tape, applied over the insulation.

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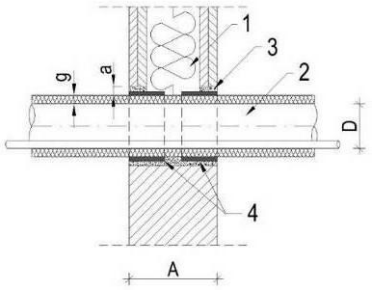
19. **Protection of insulated metal pipe penetrations (FEF) using a double row of tape in a rigid or flexible wall with a thickness of A ≥ 125 mm**



1. Rigid or flexible wall with a thickness of: A ≥ 125 mm;
2. Insulated metal pipe;
3. Filling the gap with cement mortar;
4. **INTU FR WRAP L** tape, double row applied on both sides, flush with the wall surface.

RIGID/FLEXIBLE WALL					
Partition thickness ≥ 125 mm					
Material Pipes	**Pipe diameter [mm]**	**Pipe wall thickness [mm]**	**FEF insulation thickness [mm]**	**Number of tape rows x width of intumescent material [mm] x number of wraps**	**Fire resistance class**
copper	D ≤ 15.0	≥ 1.0	9	2 x 60.0 x 1	**EI 120-C/U** **EI 120-C/C**
			10 – 22	2 x 60.0 x 2	
			23 – 36	2 x 60.0 x 3	
			37 – 50	2 x 60.0 x 4	
	15.0 < D ≤ 22.0	≥ 1.1	9	2 x 60.0 x 1	**EI 30-C/U** **EI 30-C/C**
			10 – 22	2 x 60.0 x 2	
			23 – 36	2 x 60.0 x 3	
			37 – 49	2 x 60.0 x 4	
			50	2 x 60.0 x 4	**EI 90 / E 120-C/U** **EI 90 / E 120-C/C**
	22.0 < D ≤ 28.0	≥ 1.2	9	2 x 60.0 x 1	**EI 30-C/U** **EI 30-C/C**
			10 – 22	2 x 60.0 x 2	
			23 – 36	2 x 60.0 x 3	
			37 – 49	2 x 60.0 x 4	

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			50	2 x 60.0 x 4	**EI 90 / E 120-C/U** **EI 90 / E 120-C/C**
	28.0 < D ≤ 42.0	≥ 1.3	9	2 x 60.0 x 1	**EI 30-C/U** **EI 30-C/C**
			10 – 22	2 x 60.0 x 2	
			23–36	2 x 60.0 x 3	
			37–49	2 x 60.0 x 4	
			50	2 x 60.0 x 4	**EI 90 / E 120-C/U** **EI 90 / E 120-C/C**
	42.0 < D ≤ 54.0	≥ 1.5	9	2 x 60.0 x 1	**EI 30-C/U** **EI 30-C/C**
			10 – 22	2 x 60.0 x 2	
			23 – 36	2 x 60.0 x 3	
			37 – 49	2 x 60.0 x 4	
			50	2 x 60.0 x 4	**EI 90 / E 120-C/U** **EI 90 / E 120-C/C**
steel	D ≤ 42.4	≥ 2.0	9	2 x 60.0 x 1	**EI 120-C/U** **EI 120-C/C**
			10 – 22	2 x 60.0 x 2	
			23 – 36	2 x 60.0 x 3	
			37 – 50	2 x 60.0 x 4	
	42.4 < D ≤ 48.3	≥ 2.1	9	2 x 60.0 x 1	**EI 90 / E 120-C/U** **EI 90 / E 120-C/C**
			10 – 22	2 x 60.0 x 2	
			23–36	2 x 60.0 x 3	
			37–49	2 x 60.0 x 4	
			50	2 x 60.0 x 4	**EI 120-C/U** **EI 120-C/C**
	48.3 < D ≤ 60.3	≥ 2.2	9	2 x 60.0 x 1	**EI 90 / E 120-C/U** **EI 90 / E 120-C/C**
			10 – 22	2 x 60.0 x 2	
			23 – 36	2 x 60.0 x 3	
			37 – 49	2 x 60.0 x 4	

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			50	2 x 60.0 x 4	**EI 120-C/U** **EI 120-C/C**
	60.3 < D ≤ 76.1	≥ 2.4	9	2 x 60.0 x 1	**EI 90 / E 120-C/U** **EI 90 / E 120-C/C**
			10 – 22	2 x 60.0 x 2	
			23 – 36	2 x 60.0 x 3	
			37 – 49	2 x 60.0 x 4	
			50	2 x 60.0 x 4	**EI 120-C/U** **EI 120-C/C**
	76.1 < D ≤ 88.9	≥ 2.6	9	2 x 60.0 x 1	**EI 90 / E 120-C/U** **EI 90 / E 120-C/C**
			10 – 22	2 x 60.0 x 2	
			23 – 36	2 x 60.0 x 3	
			37 – 49	2 x 60.0 x 4	
			50	2 x 60.0 x 4	**EI 120-C/U** **EI 120-C/C**
	88.9 < D ≤ 114.3	≥ 3.1	9	2 x 60.0 x 1	**EI 60 / E 120-C/U** **EI 60 / E 120-C/C**
			10 – 22	2 x 60.0 x 2	**EI 30-** **C/U EI** **30-C/C**
			23–36	2 x 60.0 x 3	
			37–50	2 x 60.0 x 4	
	114.3 < D ≤ 139.7	≥ 3.6	9	2 x 60.0 x 1	**EI 60 / E 120-C/U** **EI 60 / E 120-C/C**
			10 – 22	2 x 60.0 x 2	**EI 30-C/U** **EI 30-C/C**
			23 – 36	2 x 60.0 x 3	
			37 – 50	2 x 60.0 x 4	
	139.7 < D ≤ 159.0	≥ 4.0	9	2 x 60.0 x 1	**EI 60 / E 120-C/U** **EI 60 / E 120-C/C**
			10 – 22	2 x 60.0 x 2	**EI 30-C/U**
			23 – 36	2 x 60.0 x 3	

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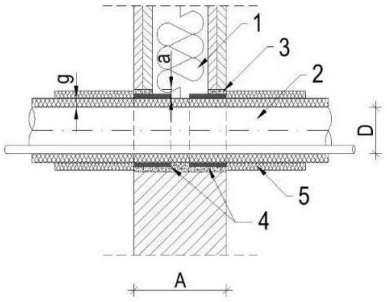
			37–50	2 x 60.0 x 4	**EI 30-C/C**

19a. **Protection of insulated metal pipe penetrations (FEF) using a double row of tape in a rigid or flexible wall with a thickness of A ≥ 125 mm**



1. Rigid or flexible wall with a thickness of: A ≥ 125 mm;
2. Insulated metal pipe;
3. Filling the gap with cement mortar;
4. **INTU FR WRAP L** tape, double row applied on both sides, flush with the wall surface;
5. Mineral wool with a density of 35 kg/m³.

RIGID/FLEXIBLE WALL					
Partition thickness ≥ 125 mm					
Material Pipes	**Pipe diameter [mm]**	**Pipe wall thickness [mm]**	**FEF insulation thickness [mm]**	**Number of tape rows x material width intumescent [mm] x number of wraps**	**Fire resistance class**
copper	D ≤ 12.7	≥ 0.8	9	2 x 60.0 x 2	**EI 90 / E 120-C/U** **EI 90 / E 120-C/C**
			9 [1)]	2 x 60.0 x 2	**EI 120-C/U** **EI 120-C/C**
	12.7 < D ≤ 15.0	≥ 0.9	9	2 x 60.0 x 2	**EI 90 / E 120-C/U** **EI 90 / E 120-C/C**
			9 [1)]	2 x 60.0 x 2	**EI 120-C/U** **EI 120-C/C**
	15.0 < D ≤ 22.23	≥ 1.0	9	2 x 60.0 x 2	**EI 90 / E 120-C/U** **EI 90 / E 120-C/C**
			9 [1)]	2 x 60.0 x 2	**EI 120-C/U** **EI 120-C/C**
steel	D ≤ 18.0	1.2 – 1.4	9	2 x 60.0 x 1	**EI 120-C/U** **EI 120-C/C**
			10 – 25	2 x 60.0 x 2	
		≥ 1.5	9	2 x 60.0 x 1	
			10–25	2 x 60.0 x 2	
			26 – 37	2 x 60.0 x 3	**EI 90 / E 120-C/U** **EI 90 / E 120-C/C**
			38–50	2 x 60.0 x 4	
	18.0 < D ≤ 28.0	1.3 – 1.4	13	2 x 60.0 x 1	**EI 60 / E 120-C/U** **EI 60 / E 120-C/C**
			14 – 24	2 x 60.0 x 2	
			25	2 x 60.0 x 2	**EI 120-C/U** **EI 120-C/C**
			26–37	2 x 60.0 x 3	**EI 90 / E 120-C/U** **EI 90 / E 120-C/C**
			38 – 50	2 x 60.0 x 4	
		≥ 1.5	9	2 x 60.0 x 1	**EI 120-C/U**

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			10 – 25	2 x 60.0 x 2	**EI 120-C/C**
			26 – 37	2 x 60.0 x 3	**EI 90 / E 120-C/U EI 90 / E 120-C/C**
			38 – 50	2 x 60.0 x 4	
	28.0 < D ≤ 48.3	≥ 1.4	13	2 x 60.0 x 1	**EI 60 / E 120-C/U EI 60 / E 120-C/C**
			14 – 24	2 x 60.0 x 2	
			25	2 x 60.0 x 2	**EI 120-C/U EI 120-C/C**
			26 – 37	2 x 60.0 x 3	**EI 90 / E 120-C/U EI 90 / E 120-C/C**
			38 – 50	2 x 60.0 x 4	
	48.3 < D ≤ 66.7	≥ 1.5	13	2 x 60.0 x 1	
			14 – 24	2 x 60.0 x 2	
			25	2 x 60.0 x 2	**EI 120-C/U EI 120-C/C**
			26–37	2 x 60.0 x 3	**EI 90 / E 120-C/U EI 90 / E 120-C/C**
			38 – 50	2 x 60.0 x 4	
	66.7 < D ≤ 76.1	≥ 1.6	13	2 x 60.0 x 1	**EI 45 / E 120-C/U EI 45 / E 120-C/C**
			14 – 24	2 x 60.0 x 2	
			25	2 x 60.0 x 2	**EI 60 / E 120-C/U EI 60 / E 120-C/C**
			26–37	2 x 60.0 x 3	
			38 – 49	2 x 60.0 x 4	
			50	2 x 60.0 x 4	**EI 90 / E 120-C/U EI 90 / E 120-C/C**
	76.1 < D ≤ 88.9	≥ 1.8	13	2 x 60.0 x 1	**EI 45 / E 120-C/U EI 45 / E 120-C/C**
			14 – 24	2 x 60.0 x 2	
			25	2 x 60.0 x 2	**EI 60 / E 120-C/U EI 60 / E 120-C/C**
			26 – 37	2 x 60.0 x 3	
			38 – 49	2 x 60.0 x 4	
			50	2 x 60.0 x 4	**EI 90 / E 120-C/U EI 90 / E 120-C/C**
	88.9 < D ≤ 108.0	≥ 2.0	13	2 x 60.0 x 1	**EI 45 / E 120-C/U EI 45 / E 120-C/C**
			14 – 24	2 x 60.0 x 2	
			25	2 x 60.0 x 2	**EI 60 / E 120-C/U EI 60 / E 120-C/C**
			26–37	2 x 60.0 x 3	
			38–49	2 x 60.0 x 4	
			50	2 x 60.0 x 4	**EI 90 / E 120-C/U EI 90 / E 120-C/C**

[1)] Pipe with additional mineral wool insulation with a density of 35 kg/m³, spot insulation measuring 20 x 200 mm (thickness x length).

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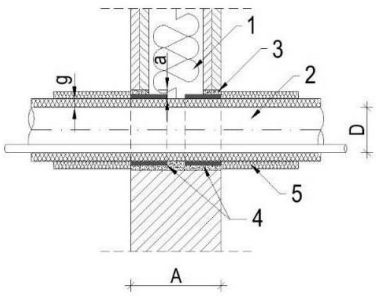
20. Protection of insulated metal pipe penetrations (PE) using a double row of tape in a rigid or flexible wall with a thickness of A ≥ 125 mm



1. Rigid or flexible wall with a thickness of: A ≥ 125 mm;
2. Insulated metal pipe;
3. Filling the gap with cement mortar;
4. **INTU FR WRAP L** tape, double row placed on both sides, flush with the wall surface;
5. Mineral wool with a density of 35 kg/m³.

RIGID/FLEXIBLE WALL					
Partition thickness ≥ 125 mm					
Material Pipes	**Pipe diameter [mm]**	**Pipe wall thickness [mm]**	**PE insulation thickness [mm]**	**Number of tape rows x width of intumescent material [mm] x number of wraps**	**Fire resistance class**
copper	D ≤ 12.7	≥ 0.8	9	2 x 60.0 x 2	**EI 90 / E 120-C/U EI 90 / E 120-C/C**
			9 [1)]	2 x 60.0 x 2	**EI 120-C/U EI 120-C/C**
	12.7 < D ≤ 15.0	≥ 0.9	9	2 x 60.0 x 2	**EI 90 / E 120-C/U EI 90 / E 120-C/C**
			9 [1)]	2 x 60.0 x 2	**EI 120-C/U EI 120-C/C**
	15.0 < D ≤ 22.23	≥ 1.0	9	2 x 60.0 x 2	**EI 90 / E 120-C/U EI 90 / E 120-C/C**
			9 [1)]	2 x 60.0 x 2	**EI 120-C/U EI 120-C/C**

[1)] Pipe with additional mineral wool insulation with a density of 35 kg/m³, spot insulation measuring 20 x 200 mm (thickness x length).

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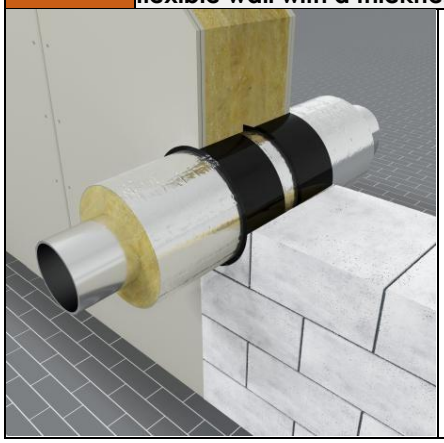
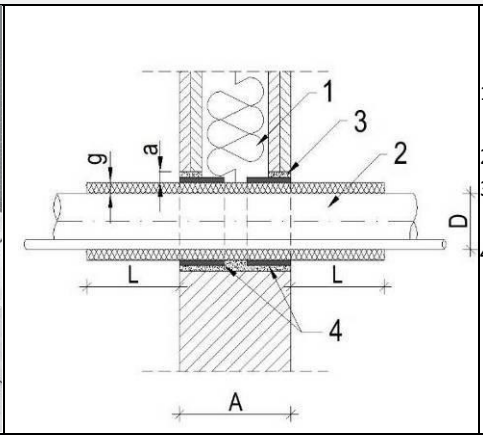
21. **Protection of insulated metal pipe penetrations (mineral wool) using a double row of tape in a rigid or flexible wall with a thickness of A ≥ 125 mm**





1. Rigid or flexible wall with a thickness of: A ≥ 125 mm;
2. Insulated metal pipe;
3. Filling the gap with cement mortar;
4. **INTU FR WRAP L** tape, double row applied on both sides, flush with the wall surface.

RIGID/FLEXIBLE WALL					
Partition thickness ≥ 125 mm					
Material Pipes	**Pipe diameter [mm]**	**Pipe wall thickness [mm]**	**Thickness of mineral wool insulation [mm]**	**Number of tape rows × width of intumescent material [mm] × number of wraps**	**Fire resistance class**
steel	D ≤ 42.4	≥ 1.5	20 x 300	2 x 60.0 x 1	**EI 120-C/U EI 120-C/C**
			(21 – 30) x 500	2 x 60.0 x 1	
		≥ 2.0	(21 – 40) x 600	2 x 60.0 x 1	
		≥ 4.0	(41–50) x 600	2 x 60.0 x 1	**EI 90 / E 120-C/U EI 90 / E 120-C/C**
		≥ 5.6	(41–50) x 750	2 x 60.0 x 1	**EI 120-C/U EI 120-C/C**
	42.4 < D ≤ 66.7	≥ 1.5	30 x 500	2 x 60.0 x 1	
		≥ 2.0	(31–40) x 600	2 x 60.0 x 1	
		≥ 4.0	(41–50) x 600	2 x 60.0 x 1	**EI 90 / E 120-C/U EI 90 / E 120-C/C**
		≥ 5.6	(41–50) x 750	2 x 60.0 x 1	**EI 120-C/U EI 120-C/C**
	66.7 < D ≤ 108.0	≥ 2.0	40 x 600	2 x 60.0 x 1	
		≥ 4.0	(41–50) x 600	2 x 60.0 x 1	**EI 90 / E 120-C/U EI 90 / E 120-C/C**
		≥ 5.6	(41–50) x 750	2 x 60.0 x 1	**EI 120-C/U EI 120-C/C**
	108.0 < D ≤ 114.3	≥ 3.6	40 x 600	2 x 60.0 x 1	
			(41 – 50) x 600	2 x 60.0 x 1	**EI 90 / E 120-C/U EI 90 / E 120-C/C**
			(41 – 50) x 750	2 x 60.0 x 1	**EI 120-C/U EI 120-C/C**
	114.3 < D ≤ 168.3	≥ 4.0	50 x 600	2 x 60.0 x 1	**EI 90 / E 120-C/U EI 90 / E 120-C/C**
		≥ 5.6	50 x 750	2 x 60.0 x 1	**EI 120-C/U**

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					EI 120-C/C
	168.3 < D ≤ 219.1	≥ 4.0	50 x 600	2 x 60.0 x 1	**EI 90 / E 120-C/U** **EI 90 / E 120-C/C**
		≥ 5.6	50 x 750	2 x 60.0 x 1	**EI 120-C/U EI 120-C/C**
	219.1 < D ≤ 273.0	≥ 5.6	50 x 750	2 x 60.0 x 1	
	273.0 < D ≤ 323.9	≥ 5.6	50 x 750	2 x 60.0 x 1	
	323.9 < D ≤ 355.6	≥ 5.6	50 x 750	2 x 60.0 x 1	

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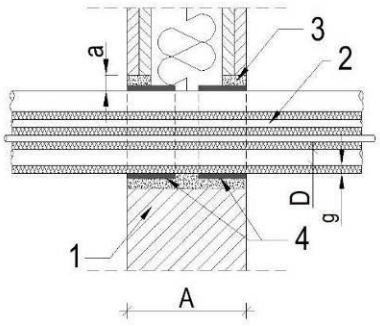
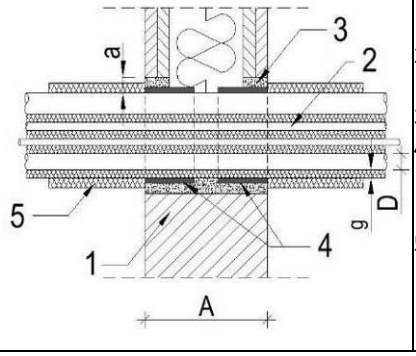
22.	Protection of mixed insulated cable runs (FEF or PE) using a single row of tape in a rigid wall with a thickness of A ≥ 150 mm

a)



b)



1. Rigid or flexible wall with a thickness of: A ≥ 125 mm;
2. One or two bundles of pipes and cables;
3. Filling the gap with cement mortar;
4. **INTU FR WRAP L** tape, a single row placed along the axis of the partition;
5. Mineral wool with a density of 35 kg/m³.

RIGID/FLEXIBLE WALL						
Partition thickness ≥ 125 mm						
Material of the pipe	**Copper pipe diameter [mm]**	**Pipe wall thickness [mm]**	**FEF insulation thickness [mm]**	**Number of tape rows x intumescent material width [mm] x number of wraps**	**Fire resistance class**	**Fig.**
Single copper pipe[1)]	D ≤ 12.7	≥ 0.8	9	2 x 60.0 x 2	**EI 60**	a
			9	2 x 60.0 x 2	**EI 90**	
			9 [2)]	2 x 60.0 x 2	**EI 120**	b
	12.7 < D ≤ 22.23	≥ 1.0	9	2 x 60.0 x 2	**EI 60**	a
			9	2 x 60.0 x 2	**EI 90**	
			9 [2)]	2 x 60.0 x 2	**EI 120**	b

RIGID/FLEXIBLE WALL						
Partition thickness ≥ 125 mm						
Material Pipes	**Copper pipe No. 1 max. diameter x min. wall thickness [mm]**	**Copper pipe No. 2 max. diameter x min. wall thickness [mm]**	**FEF insulation thickness [mm]**	**Number of tape rows x intumescent material width [mm] x number of wraps**	**Fire resistance class Fire**	**Fig.**
Single copper pipe[1)]	12.7 x 0.8	12.7 x 0.8	9	2 x 60.0 x 2	**EI 60**	a
			9	2 x 60.0 x 2	**EI 90**	
			9 [2)]	2 x 60.0 x 2	**EI 120**	b
	12.7 x 0.8	22.23 x 1.0	9	2 x 60.0 x 2	**EI 60**	a
			9	2 x 60.0 x 2	**EI 90**	
			9 [2)]	2 x 60.0 x 2	**EI 120**	b

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RIGID/FLEXIBLE WALL						
Partition thickness ≥ 125 mm						
Material Pipes	**Copper pipe diameter [mm]**	**Pipe wall thickness [mm]**	**PE insulation thickness [mm]**	**Number of tape rows x expanding material width [mm] x number of wraps**	**Fire resistance class**	**Fig.**
Single copper pipe[1)]	D ≤ 12.7	≥ 0.8	9	2 x 60.0 x 2	**EI 90**	a
			9 [2)]	2 x 60.0 x 2	**EI 120**	b
	12.7 < D ≤ 22.23	≥ 1.0	9	2 x 60.0 x 2	**EI 90**	a
			9 [2)]	2 x 60.0 x 2	**EI 120**	b

RIGID/FLEXIBLE WALL						
Partition thickness ≥ 125 mm						
Material Pipes	**Copper pipe No. 1 max. diameter x min. wall thickness [mm]**	**Copper pipe No. 2 max. diameter x min. wall thickness [mm]**	**PE insulation thickness [mm]**	**Number of tape rows x intumescent material width [mm] x number of wraps**	**Fire resistance class Fire**	**Fig.**
Single copper pipe[1)]	12.7 x 0.8	12.7 x 0.8	9	2 x 60.0 x 2	**EI 90**	a
			9 [2)]	2 x 60.0 x 2	**EI 120**	b
	12.7 x 0.8	22.23 x 1.0	9	2 x 60.0 x 2	**EI 90**	a
			9 [2)]	2 x 60.0 x 2	**EI 120**	b

1) Cable bundle with 4 x 1.5 mm² cable and PVC-U pipe D ≤ 25 mm, wall thickness ≥ 1.5 mm.

2) Mixed bundle with additional mineral wool insulation with a density of 35 kg/m³ spot insulation measuring 20 x 200 mm (thickness x length).

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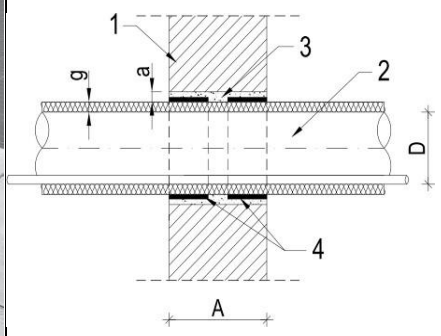
23.	Protection of insulated combustible pipe penetrations (FEF) using a double row of tape in a rigid wall with a thickness of A ≥ 150 mm



1. Rigid wall with a thickness of: A ≥ 150 mm;
2. Insulated combustible pipe with or without a heating cable;
3. Filling the gap with cement mortar;
4. **INTU FR WRAP L** tape, double row placed on both sides, flush with the wall surface.

RIGID WALL					
Partition thickness ≥ 150 mm					
Material Pipes	**Pipe diameter [mm]**	**Pipe wall thickness [mm]**	**FEF insulation thickness [mm]**	**Number of tape rows x width of intumescent material [mm] x number of wraps**	**Fire resistance class**
PP	D ≤ 160	4.9 – 14.5	13	2 x 60.0 x 6	**EI 30-U/C** **EI 30-C/C**
		14.6	13	2 x 60.0 x 6	**EI 120-U/C** **EI 120-C/C**

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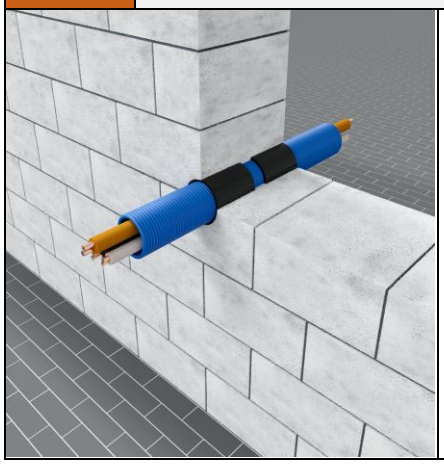
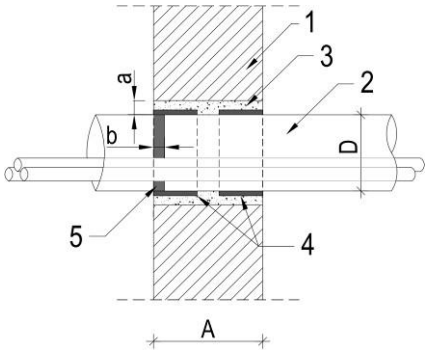
24. **Protection of cable penetrations using a double row of tape in a rigid wall with a thickness of A ≥ 150 mm**





1. Rigid wall with a thickness of: A ≥ 150 mm;
2. Cable conduit;
3. Filling the gap with cement mortar;
4. **INTU FR WRAP L** tape, double row applied on both sides, flush with the wall surface;
5. **INTU FR MASTIC** sealing compound on one side of the wall, depth: b ≥ 15 mm.

RIGID WALL					
Partition thickness ≥ 150 mm					
Cable duct material	**Cable conduit diameter [mm]**	**Cable conduit wall thickness [mm]**	**Internal filling**	**Number of tape rows x width of intumescent material [mm] x number of wraps**	**Fire resistance class**
AROT DVK	D ≤ 110	3.0	hollow	2 x 60.0 x 2	**EI 120-U/U** **EI 120-U/C EI 120-C/U** **EI 120-C/C**
			small cables: cable diameter ≤ 21 mm	2 x 60.0 x 2	**EI 120-U/C** **EI 120-C/C**
			cable bundle: øbundle ≤ 100 mm øcable ≤ 21 mm	2 x 60.0 x 2	**EI 120-U/C** **EI 120-C/C**

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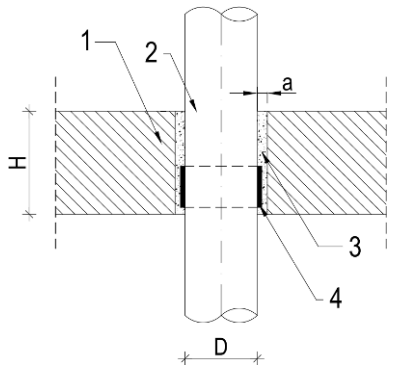
25. Protection of combustible pipe penetrations using a single row of tape in a rigid floor slab with a thickness of H ≥ 150 mm



1. Rigid floor slab with a thickness of: H ≥ 150 mm;
2. Combustible pipe;
3. Filling the gap with cement mortar;
4. **INTU FR WRAP L** tape – inside the slab, on the underside of the slab at a maximum distance of 10 mm from its surface.

RIGID FLOOR					
Partition thickness ≥ 150 mm					
Material Pipes	**Pipe diameter [mm]**	**Pipe wall thickness [mm]**	**Insulation thickness [mm]**	**Number of tape rows x width of intumescent material [mm] x number of wraps**	**Fire resistance class**
PP-HT	D ≤ 50	1.8 – 1.9	-	1 x 60.0 x 1	**EI 120-U/C** **EI 120-C/C**
		2.0 – 2.7	-	1 x 60.0 x 2	
		2.8 – 3.9	-	1 x 100.0 x 5	
	50 < D ≤ 75	1.9	-	1 x 60.0 x 1	
		2.0 – 2.7	-	1 x 60.0 x 2	
		2.8 – 3.9	-	1 x 100.0 x 5	
	75 < D ≤ 110	2.7	-	1 x 60.0 x 2	
		2.8 – 3.9	-	1 x 100.0 x 5	
	110 < D ≤ 125	3.9	-	1 x 100.0 x 5	
	125 < D ≤ 160	3.9	-	1 x 100.0 x 5	
PP-M Magnaplast Ultra dB	D ≤ 50	2.0	-	1 x 60.0 x 1	**EI 120-U/C** **EI 120-C/C**
		2.1 – 3.4	-	1 x 60.0 x 2	
		3.5 – 4.9	-	1 x 100.0 x 5	**EI 60-U/C** **EI 60-C/C**
	50 < D ≤ 75	2.6	-	1 x 60.0 x 2	**EI 120-U/C** **EI 120-C/C**
		2.7 – 4.9	-	1 x 100.0 x 5	**EI 60-U/C** **EI 60-C/C**
	75 < D ≤ 110	3.4	-	1 x 60.0 x 2	**EI 120-U/C** **EI 120-C/C**
		3.5 – 4.9	-	1 x 100.0 x 5	**EI 60-U/C** **EI 60-C/C**
	110 < D ≤ 160	4.9	-	1 x 100.0 x 5	
PE-HD/ PE/PE-X/ ABS/ SAN+PVC	D ≤ 32	2.0 – 6.8	-	1 x 60.0 x 1	**EI 240-U/C** **EI 240-C/C**
		6.9 – 10.0	-	1 x 60.0 x 2	**EI 120-U/C** **EI 120-C/C**
	32 < D ≤ 50	2.5 – 6.8	-	1 x 60.0 x 1	**EI 240-U/C** **EI 240-C/C**
		6.9 – 10.0	-	1 x 60.0 x 2	**EI 120-U/C**

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					EI 120-C/C
	50 < D ≤ 63	2.8 – 6.8	-	1 x 60.0 x 1	**EI 240-U/C** **EI 240-C/C**
		6.9 – 10.0	-	1 x 60.0 x 2	**EI 120-U/C** **EI 120-C/C**
	63 < D ≤ 75	3.0 – 6.8	-	1 x 60.0 x 1	**EI 240-U/C** **EI 240-C/C**
		6.9 – 10.0	-	1 x 60.0 x 2	**EI 120-U/C** **EI 120-C/C**
	75 < D ≤ 90	3.5 – 4.1	-	1 x 60.0 x 2	
		4.2	-	1 x 60.0 x 2	**EI 240-U/C** **EI 240-C/C**
		4.3 – 9.5	-	1 x 60.0 x 2	**EI 120-U/C** **EI 120-C/C**
		4.3 – 9.5	-	1 x 100.0 x 5	**EI 240-U/C** **EI 240-C/C**
		9.6 – 10.0	-	1 x 60.0 x 2	**EI 120-U/C** **EI 120-C/C**
	90 < D ≤ 110	4.2	-	1 x 60.0 x 2	**EI 240-U/C** **EI 240-C/C**
		4.3 – 9.5	-	1 x 60.0 x 2	**EI 120-U/C** **EI 120-C/C**
		4.3 – 9.5	-	1 x 100.0 x 5	**EI 240-U/C** **EI 240-C/C**
		9.6 – 10.0	-	1 x 60.0 x 2	**EI 120-U/C** **EI 120-C/C**
	110 < D ≤ 125	4.8 – 5.8	-	1 x 100.0 x 3	**EI 240-U/C** **EI 240-C/C**
		5.9 – 6.2	-	1 x 100.0 x 3	**EI 120-U/C** **EI 120-C/C**
		5.9 – 6.2	-	1 x 100.0 x 5	**EI 240-U/C** **EI 240-C/C**
		6.3 – 9.5	-	1 x 100.0 x 3	**EI 120-U/C** **EI 120-C/C**
		6.3 – 9.5	-	1 x 100.0 x 5	**EI 240-U/C** **EI 240-C/C**
		9.6 – 9.9	-	1 x 100.0 x 3	**EI 120-U/C** **EI 120-C/C**
	125 < D ≤ 160	6.2 – 9.5	-	1 x 100.0 x 5	**EI 240-U/C** **EI 240-C/C**
	160 < D ≤ 200	6.3 – 11.9	-	1 x 100.0 x 8	**EI 120-U/C** **EI 120-C/C**
PE-Xa	D ≤ 20	2.0 – 5.8	-	1 x 60.0 x 1	**EI 120-U/C** **EI 120-C/C**
	20 < D ≤ 32	3.0	-	1 x 60.0 x 1	
	32 < D ≤ 40	3.7	-	1 x 60.0 x 1	
	40 < D ≤ 50	4.6	-	1 x 60.0 x 1	
	50 < D ≤ 63	5.8	-	1 x 60.0 x 1	
PP	D ≤ 50	1.5 – 12.5	-	1 x 60.0 x 1	**EI 240-U/C** **EI 240-C/C**
		12.6 – 18.4	-	1 x 60.0 x 2	
	50 < D ≤ 75	1.9 – 12.5	-	1 x 60.0 x 1	
		12.6 – 18.4	-	1 x 60.0 x 2	
	75 < D ≤ 90	2.3 – 18.4	-	1 x 60.0 x 2	
	90 < D ≤ 110	2.7 – 18.4	-	1 x 60.0 x 2	
	110 < D ≤ 125	3.1 – 15.2	-	1 x 100.0 x 3	**EI 120-U/C** **EI 120-C/C**
	125 < D ≤ 160	4.0 – 7.7	-	1 x 100.0 x 5	
	160 < D ≤ 200	7.7	-	1 x 100.0 x 8	**EI 45-U/C**

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					EI 45-C/C
PP-R	D ≤ 20	2.3 – 4.1	-	1 x 60.0 x 1	**EI 120-U/C** **EI 120-C/C**
		4.2	-	1 x 60.0 x 1	**EI 180-U/C** **EI 180-C/C**
		4.3 – 10.0	-	1 x 60.0 x 1	**EI 120-U/C** **EI 120-C/C**
	20 < D ≤ 32	2.7 – 4.1	-	1 x 60.0 x 1	
		4.2	-	1 x 60.0 x 1	**EI 180-U/C** **EI 180-C/C**
		4.3 – 12.5	-	1 x 60.0 x 1	**EI 120-U/C** **EI 120-C/C**
	32 < D ≤ 40	3.0 – 4.1	-	1 x 60.0 x 1	
		4.2	-	1 x 60.0 x 1	**EI 180-U/C** **EI 180-C/C**
		4.3 – 12.5	-	1 x 60.0 x 1	**EI 120-U/C** **EI 120-C/C**
	40 < D ≤ 50	3.3 – 4.1	-	1 x 60.0 x 1	
		4.2	-	1 x 60.0 x 1	**EI 180-U/C** **EI 180-C/C**
		4.3 – 12.5	-	1 x 60.0 x 1	**EI 120-U/C** **EI 120-C/C**
	50 < D ≤ 63	3.8 – 4.1	-	1 x 60.0 x 1	
		4.2	-	1 x 60.0 x 1	**EI 180-U/C** **EI 180-C/C**
		4.3 – 12.5	-	1 x 60.0 x 1	**EI 120-U/C** **EI 120-C/C**
		12.4 – 18.3	-	1 x 60.0 x 2	**EI 120-U/C** **EI 120-C/C**
	63 < D ≤ 75	4.2	-	1 x 60.0 x 1	**EI 180-U/C** **EI 180-C/C**
		4.3 – 12.5	-	1 x 60.0 x 1	**EI 120-U/C** **EI 120-C/C**
	75 < D ≤ 90	6.7 – 7.6	-	1 x 60.0 x 2	
		7.7 – 12.2	-	1 x 60.0 x 2	**EI 180-U/C** **EI 180-C/C**
		12.3	-	1 x 60.0 x 2	**EI 240-U/C** **EI 240-C/C**
		12.4 – 18.3	-	1 x 60.0 x 2	**EI 120-U/C** **EI 120-C/C**
	90 < D ≤ 110	10.0 – 12.2	-	1 x 60.0 x 2	
		12.3	-	1 x 60.0 x 2	**EI 240-U/C** **EI 240-C/C**
		12.4 – 18.3	-	1 x 60.0 x 2	**EI 120-U/C** **EI 120-C/C**
PVC-U/PVC-C	D ≤ 25	1.5	-	1 x 60.0 x 2	**EI 120-U/U** **EI 120-U/C** **EI 120-C/U** **EI 120-C/C**
		1.5 – 4.2	-	1 x 60.0 x 1	**EI 240-U/C** **EI 240-C/C**
	25 < D ≤ 32	1.5 – 4.2	-	1 x 60.0 x 1	
	32 < D ≤ 50	1.8 – 4.2	-	1 x 60.0 x 1	
	50 < D ≤ 75	1.9 – 4.2	-	1 x 60.0 x 1	
	75 < D ≤ 90	2.1 – 3.4	-	1 x 60.0 x 2	
		3.5 – 4.2	-	1 x 60.0 x 2	**EI 180-U/C** **EI 180-C/C**
	90 < D ≤ 110	2.2	-	1 x 60.0 x 2	**EI 240-U/C** **EI 240-C/C**
		2.3 – 4.2	-	1 x 60.0 x 2	**EI 180-U/C** **EI 180-C/C**
	110 < D ≤ 125	2.5 – 3.9	-	1 x 100.0 x 3	**EI 120-U/C** **EI 120-C/C**
		4.0 – 5.3	-	1 x 100.0 x 3	**EI 240-U/C**

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		5.4 – 7.7	-	1 x 100.0 x 5	**EI 240-C/C**
	125 < D ≤ 160	3.2 – 7.6	-	1 x 100.0 x 5	**EI 120-U/C** **EI 120-C/C**
		7.7	-	1 x 100.0 x 5	**EI 240-U/C** **EI 240-C/C**
	160 < D ≤ 170	4.4 – 7.6	-	1 x 100.0 x 6	**EI 120-U/C** **EI 120-C/C**
		7.7	-	1 x 100.0 x 6	**EI 240-U/C** **EI 240-C/C**
	170 < D ≤ 185	6.1 – 7.6	-	1 x 100.0 x 7	**EI 120-U/C** **EI 120-C/C**
		7.7	-	1 x 100.0 x 7	**EI 240-U/C** **EI 240-C/C**
	185 < D ≤ 200	7.7	-	1 x 100.0 x 8	
PE-RT/AL/ PE-RT	D ≤ 20	2.0	-	1 x 60.0 x 1	**EI 240-U/C** **EI 240-C/C**
		2.1 – 7.5	-	1 x 60.0 x 1	**EI 180 / E 240-U/C** **EI 180 / E 240-C/C**
	20 < D ≤ 25	2.5	-	1 x 60.0 x 1	
	25 < D ≤ 32	3.2	-	1 x 60.0 x 1	
	32 < D ≤ 40	4.0	-	1 x 60.0 x 1	
	40 < D ≤ 63	6.0	-	1 x 60.0 x 1	**EI 120-U/C** **EI 120-C/C**
		6.3	-	1 x 60.0 x 1	**EI 180 / E 240-U/C** **EI 180 / E 240-C/C**
	63 < D ≤ 75	7.5	-	1 x 60.0 x 1	
PE-X/AL/ PE-X	D ≤ 20	2.0– 7.5	-	1 x 60.0 x 1	**EI 240-U/C** **EI 240-C/C**
	20 < D ≤ 32	3.0 – 7.4	-	1 x 60.0 x 1	**EI 120-U/C** **EI 120-C/C**
		7.5	-	1 x 60.0 x 1	**EI 240-U/C** **EI 240-C/C**
	32 < D ≤ 40	4.0	-	1 x 60.0 x 1	**EI 120-U/C** **EI 120-C/C**
	40 < D ≤ 63	6.0 – 7.4	-	1 x 60.0 x 1	
		7.5	-	1 x 60.0 x 1	**EI 240-U/C** **EI 240-C/C**
	63 < D ≤ 75	7.5	-	1 x 60.0 x 1	
PP-R/AL/ PP-R	D ≤ 20	2.8 – 3.3	-	1 x 60.0 x 1	**EI 120-U/C** **EI 120-C/C**
		3.4 – 10.0	-	1 x 60.0 x 1	**EI 240-U/C** **EI 240-C/C**
	20 < D ≤ 32	4.4 – 12.4	-	1 x 60.0 x 1	**EI 120-U/C** **EI 120-C/C**
		12.5	-	1 x 60.0 x 1	**EI 240-U/C**
		12.6 – 18.4	-	1 x 60.0 x 2	**EI 240-C/C**
	32 < D ≤ 50	6.9 – 12.4	-	1 x 60.0 x 1	**EI 120-U/C** **EI 120-C/C**
		12.5	-	1 x 60.0 x 1	**EI 240-U/C**
		12.6 – 18.4	-	1 x 60.0 x 2	**EI 240-C/C**
	50 < D ≤ 63	8.7 – 12.4	-	1 x 60.0 x 1	**EI 120-U/C** **EI 120-C/C**
		12.5	-	1 x 60.0 x 1	**EI 240-U/C**
		12.6 – 18.4	-	1 x 60.0 x 2	**EI 240-C/C**
	63 < D ≤ 75	10.3 – 12.4	-	1 x 60.0 x 1	**EI 120-U/C** **EI 120-C/C**
		12.5	-	1 x 60.0 x 1	**EI 240-U/C**
		12.6 – 18.4	-	1 x 60.0 x 2	**EI 240-C/C**
	75 < D ≤ 90	12.4 – 18.3	-	1 x 60.0 x 2	**EI 120-U/C** **EI 120-C/C**

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		18.4	-	1 x 60.0 x 2	**EI 240-U/C** **EI 240-C/C**
	90 < D ≤ 110	15.1 – 18.3	-	1 x 60.0 x 2	**EI 120-U/C** **EI 120-C/C**
		18.4	-	1 x 60.0 x 2	**EI 240-U/C** **EI 240-C/C**
PP-R/ PP-R-GF/ PP-R	D ≤ 20	2.8 – 10.0	-	1 x 60.0 x 1	**EI 240-U/C** **EI 240-C/C**
	20 < D ≤ 32	4.4 – 12.4	-	1 x 60.0 x 1	**EI 120-U/C** **EI 120-C/C**
		12.5	-	1 x 60.0 x 1	**EI 240-U/C** **EI 240-C/C**
	20 < D ≤ 32	12.6 – 18.3	-	1 x 60.0 x 2	**EI 120-U/C** **EI 120-C/C**
		18.4	-	1 x 60.0 x 2	**EI 240-U/C** **EI 240-C/C**
	32 < D ≤ 50	6.9 – 12.4	-	1 x 60.0 x 1	**EI 120-U/C** **EI 120-C/C**
		12.5	-	1 x 60.0 x 1	**EI 240-U/C** **EI 240-C/C**
		12.6 – 18.3	-	1 x 60.0 x 2	**EI 120-U/C** **EI 120-C/C**
		18.4	-	1 x 60.0 x 2	**EI 240-U/C** **EI 240-C/C**
	50 < D ≤ 63	8.7 – 12.5	-	1 x 60.0 x 1	**EI 120-U/C** **EI 120-C/C**
		12.5	-	1 x 60.0 x 1	**EI 240-U/C** **EI 240-C/C**
		12.6 – 18.3	-	1 x 60.0 x 2	**EI 120-U/C** **EI 120-C/C**
		18.4	-	1 x 60.0 x 2	**EI 240-U/C** **EI 240-C/C**
	63 < D ≤ 75	10.3 – 12.5	-	1 x 60.0 x 1	**EI 120-U/C** **EI 120-C/C**
		12.5	-	1 x 60.0 x 1	**EI 240-U/C** **EI 240-C/C**
		12.6 – 18.3	-	1 x 60.0 x 2	**EI 120-U/C** **EI 120-C/C**
		18.4	-	1 x 60.0 x 2	**EI 240-U/C** **EI 240-C/C**
	75 < D ≤ 90	11.2 – 18.3	-	1 x 60.0 x 2	**EI 120-U/C** **EI 120-C/C**
		18.4	-	1 x 60.0 x 2	**EI 240-U/C** **EI 240-C/C**
	90 < D ≤ 110	12.3 – 18.3	-	1 x 60.0 x 2	**EI 120-U/C** **EI 120-C/C**
		18.4	-	1 x 60.0 x 2	**EI 240-U/C** **EI 240-C/C**

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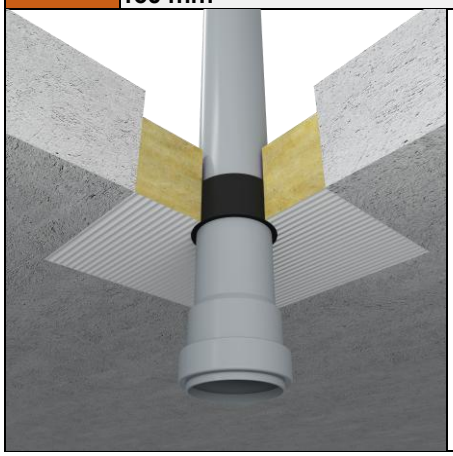
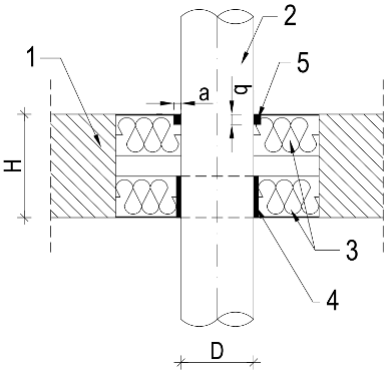
26. Protection of combustible pipe penetrations using a single row of tape in a rigid floor slab with a thickness of H ≥ 150 mm





1. Rigid floor slab with a thickness of: H ≥ 150 mm;
2. Combustible pipe;
3. **INTU FR BOARD A** mineral wool board;
4. **INTU FR WRAP L** tape – on the pipe, inside the lower mineral wool board;
5. Filling the gap with **INTU FR MASTIC**.

RIGID FLOOR					
Partition thickness ≥ 150 mm					
Material Pipes	**Pipe diameter [mm]**	**Pipe wall thickness [mm]**	**Insulation thickness [mm]**	**Number of tape rows x Expanding material [mm] x number of wraps**	**Fire resistance class**
PVC-U PVC-C	D ≤ 110	4.2	-	1 x 60.0 x 2	**EI 120-U/C** **EI 120-C/C**

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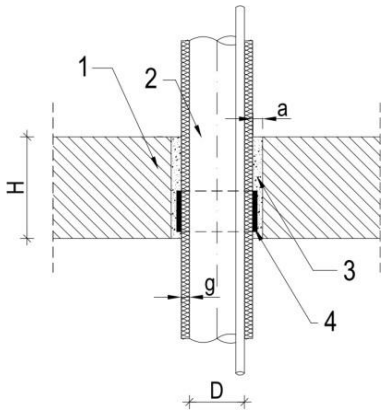
27. Protection of insulated combustible pipe penetrations (FEF) using a single row of tape in a rigid floor slab with a thickness of H ≥ 150 mm



1. Rigid floor slab with a thickness of: H ≥ 150 mm;
2. Insulated combustible pipe with or without a heating cable;
3. Filling the gap with cement mortar;
4. **INTU FR WRAP L** tape – inside the slab, on the underside of the slab at a maximum distance of 10 mm from its surface.

RIGID FLOOR					
Partition thickness ≥ 150 mm					
Material Pipes	**Pipe diameter [mm]**	**Pipe wall thickness [mm]**	**FEF insulation thickness [mm]**	**Number of tape rows x width of intumescent material [mm] x number of wraps**	**Fire resistance class**
PE-HD/ PE/PE-X/ ABS/ SAN+PVC	D ≤ 110	6.2	23	1 x 60.0 x 8	**EI 120-U/C** **EI 120-C/C**
		10.0	9 – 13	1 x 60.0 x 4	
	110 < D ≤ 160	6.2	23	1 x 60.0 x 8	
PP	D ≤ 110	2.7	9	1 x 60.0 x 4	**EI 120-U/C** **EI 120-C/C**
PP-R	D ≤ 110	18.3	9	1 x 60.0 x 4	**EI 120-U/C** **EI 120-C/C**
PP-R/ PP-R-GF/ PP-R	D ≤ 110	15.1	9	1 x 60.0 x 4	**EI 120-U/C** **EI 120-C/C**
PE-HD/ PE/PE-X/ ABS/ SAN+PVC	D ≤ 110	4.2	13	1 x 60.0 x 3	**EI 120-U/C** **EI 120-C/C**
		4.3 – 10.0	13	1 x 60.0 x 3	**EI 90-U/C** **EI 90-C/C**

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	110 < D ≤ 125	4.8 – 14.5	13	1 x 100.0 x 4	**EI 45-U/C** **EI 45-C/C**
		14.6	13	1 x 100.0 x 4	**EI 90-U/C** **EI 90-C/C**
	125 < D ≤ 160	6.2 – 14.5	13	1 x 100.0 x 6	**EI 45-U/C** **EI 45-C/C**
		14.6	13	1 x 100.0 x 6	**EI 90-U/C** **EI 90-C/C**
PP	D ≤ 160	4.0 – 14.5	13	1 x 100.0 x 6	**EI 30-U/C** **EI 30-C/C**
		14.6	13	1 x 100.0 x 6	**EI 60-U/C** **EI 60-C/C**

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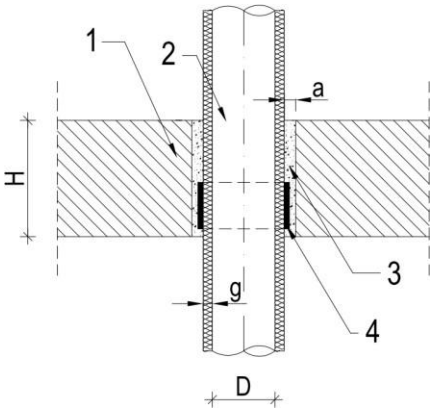
28. **Protection of insulated combustible pipe penetrations (PE) using a single row of tape in a rigid floor slab with a thickness of H ≥ 150 mm**



1. Rigid floor slab with a thickness of: H ≥ 150 mm;
2. Insulated combustible pipe;
3. Filling the gap with cement mortar;
4. **INTU FR WRAP L** tape – inside the slab, on the underside of the slab at a maximum distance of 10 mm from its surface.

RIGID FLOOR					
Partition thickness ≥ 150 mm					
Material Pipes	**Pipe diameter [mm]**	**Pipe wall thickness [mm]**	**PE insulation thickness [mm]**	**Number of tape rows x Expanding material [mm] x number of wraps**	**Fire resistance class**
PP	D ≤ 75	12.5	9	1 x 60.0 x 2	**EI 240-U/C** **EI 240-C/C**
PVC-U/ PVC-C	D ≤ 32	2.0	9	1 x 60.0 x 2	**EI 240-U/C** **EI 240-C/C**
PE-RT/AL/ PE-RT	D ≤ 20	2.0 – 3.0	9	1 x 60.0 x 1	**EI 120-U/C** **EI 120-C/C**
	20 < D ≤ 32	3.0	9	1 x 60.0 x 1	
PE-X/AL/ PE-X	D ≤ 20	2.0 – 3.0	9	1 x 60.0 x 1	**EI 120-U/C** **EI 120-C/C**
PP-R/ PP-R-GF/ PP-R	D ≤ 20	2.8	9	1 x 60.0 x 1	**EI 120-U/C** **EI 120-C/C**
		6.9 – 8.3	13	1 x 60.0 x 1	
	20 < D ≤ 50	6.9 – 8.3	13	1 x 60.0 x 1	

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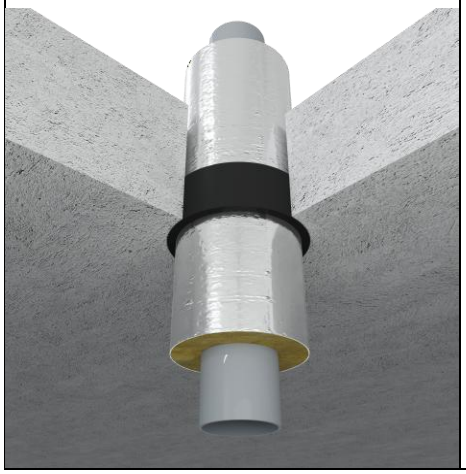
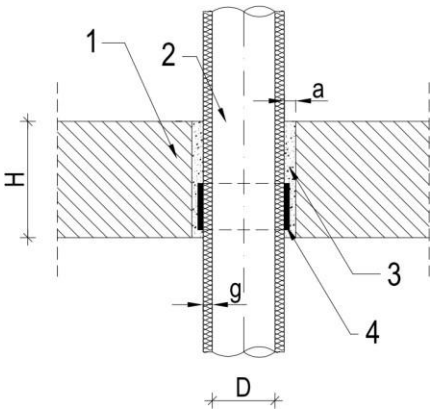
29.	Protection of insulated combustible pipe penetrations (mineral wool) using a single row of tape in a rigid ceiling with a thickness of H ≥ 150 mm





1. Rigid floor slab with a thickness of: H ≥ 150 mm;
2. Insulated combustible pipe;
3. Filling the gap with cement mortar;
4. **INTU FR WRAP L** tape – inside the slab, on the underside of the slab at a maximum distance of 10 mm from its surface.

RIGID FLOOR					
Partition thickness ≥ 150 mm					
Material Pipes	**Pipe diameter [mm]**	**Pipe wall thickness [mm]**	**Mineral wool insulation thickness [mm]**	**Number of tape rows x Expanding material [mm] x number of wraps**	**Fire resistance class**
PP-R	D ≤ 20	2.3 – 3.4	20	1 x 60.0 x 1	**EI 120-U/C** **EI 120-C/C**
		6.8 – 12.5	30	1 x 60.0 x 3	
	20 < D ≤ 75	6.8 – 12.5	30	1 x 60.0 x 3	

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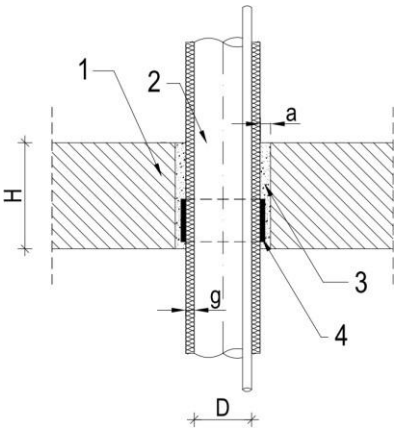
30. Protection of insulated metal pipe penetrations (FEF) using a single row of tape in a rigid floor slab with a thickness of H ≥ 150 mm



1. Rigid slab with a thickness of: H ≥ 150 mm;
2. Insulated metal pipe with or without a heating cable;
3. Filling the gap with cement mortar;
4. **INTU FR WRAP L** tape – inside the slab, on the underside of the slab at a maximum distance of 10 mm from its surface.

RIGID FLOOR					
Partition thickness ≥ 150 mm					
Material Pipes	**Pipe diameter [mm]**	**Pipe wall thickness [mm]**	**FEF insulation thickness [mm]**	**Number of tape rows x width expandable material [mm] x number of wraps**	**Fire resistance class**
copper	D ≤ 15.0	≥ 1.0	9	1 x 60.0 x 1	**EI 240-C/U EI 240-C/C**
			10 – 22	1 x 60.0 x 2	
			23 – 36	1 x 60.0 x 3	
			37 – 50	1 x 60.0 x 4	
	15.0 < D ≤ 22.0	≥ 1.1	9	1 x 60.0 x 1	**EI 120 / E 240-C/U EI 120 / E 240-C/C**
			10 – 22	1 x 60.0 x 2	**EI 120 / E 180-C/U EI 120 / E 180-C/C**
			23 – 36	1 x 60.0 x 3	
			37 – 49	1 x 60.0 x 4	
			50	1 x 60.0 x 4	**EI 180-C/U EI 180-C/C**
	22.0 < D ≤ 28.0	≥ 1.2	9	1 x 60.0 x 1	**EI 120 / E 240-C/U EI 120 / E 240-C/C**
			10 – 22	1 x 60.0 x 2	**EI 120 / E 180-C/U EI 120 / E 180-C/C**
			23 – 36	1 x 60.0 x 3	
			37–49	1 x 60.0 x 4	
			50	1 x 60.0 x 4	**EI 180-C/U EI 180-C/C**
	28.0 < D ≤ 42.0	≥ 1.3	9	1 x 60.0 x 1	**EI 120 / E 240-C/U EI 120 / E 240-C/C**
			10 – 22	1 x 60.0 x 2	**EI 120 / E 180-C/U EI 120 / E 180-C/C**
			23 – 36	1 x 60.0 x 3	
			37 – 49	1 x 60.0 x 4	
			50	1 x 60.0 x 4	**EI 180-C/U EI 180-C/C**
	42.0 < D ≤	≥ 1.5	9	1 x 60.0 x 1	**EI 120 / E 240-C/U**

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	54.0		10 – 22	1 x 60.0 x 2	**EI 120 / E 180-C/U**
			23 – 36	1 x 60.0 x 3	
			37 – 49	1 x 60.0 x 4	**EI 120 / E 180-C/C**
			50	1 x 60.0 x 4	**EI 180-C/U** **EI 180-C/C**
steel	D ≤ 42.4	≥ 2.0	9	1 x 60.0 x 1	**EI 240-C/U** **EI 240-C/C**
			10 – 22	1 x 60.0 x 2	
			23 – 36	1 x 60.0 x 3	
			37 – 50	1 x 60.0 x 4	
	42.4 < D ≤ 48.3	2.1 – 2.5	9	1 x 60.0 x 1	**EI 120 / E 240-C/U** **EI 120 / E 240-C/C**
			10 – 22	1 x 60.0 x 2	**EI 120-C/U** **EI 120-C/C**
			23 – 36	1 x 60.0 x 3	
			37 – 50	1 x 60.0 x 4	
		≥ 2.6	9–12	1 x 60.0 x 1	**EI 120 / E 240-C/U** **EI 120 / E 240-C/C**
			13	1 x 60.0 x 1	**EI 180 / E 240-C/U** **EI 180 / E 240-C/C**
			14 – 22	1 x 60.0 x 2	**EI 120-C/U** **EI 120-C/C**
			24 – 36	1 x 60.0 x 3	
			37–50	1 x 60.0 x 4	
	48.3 < D ≤ 60.3	2.3 – 2.5	9	1 x 60.0 x 1	**EI 120 / E 240-C/U** **EI 120 / E 240-C/C**
			10 – 22	1 x 60.0 x 2	**EI 120-C/U** **EI 120-C/C**
			23 – 36	1 x 60.0 x 3	
			37 – 50	1 x 60.0 x 4	
	48.3 < D ≤ 60.3	≥ 2.6	9 – 12	1 x 60.0 x 1	**EI 120 / E 240-C/U** **EI 120 / E 240-C/C**
			13	1 x 60.0 x 1	**EI 180 / E 240-C/U** **EI 180 / E 240-C/C**
			14 – 22	1 x 60.0 x 2	**EI 120-C/U** **EI 120-C/C**
			24 – 36	1 x 60.0 x 3	
			37–50	1 x 60.0 x 4	
	60.3 < D ≤ 76.1	≥ 2.6	9 – 12	1 x 60.0 x 1	**EI 120 / E 240-C/U** **EI 120 / E 240-C/C**
			13	1 x 60.0 x 1	**EI 180 / E 240-C/U** **EI 180 / E 240-C/C**
			14–22	1 x 60.0 x 2	**EI 120-C/U** **EI 120-C/C**
			24 – 36	1 x 60.0 x 3	
			37 – 50	1 x 60.0 x 4	
	76.1 < D ≤ 88.9	2.6 – 2.7	13	1 x 60.0 x 1	**EI 180 / E 240-C/U** **EI 180 / E 240-C/C**
		≥ 2.8	9 – 12	1 x 60.0 x 1	**EI 120 / E 240-C/U** **EI 120 / E 240-C/C**
			13	1 x 60.0 x 1	**EI 180 / E 240-C/U** **EI 180 / E 240-C/C**
			14 – 22	1 x 60.0 x 2	**EI 120-C/U** **EI 120-C/C**
			24 – 36	1 x 60.0 x 3	
			37–50	1 x 60.0 x 4	
	88.9 < D ≤ 114.3	≥ 3.2	9	1 x 60.0 x 1	**EI 120 / E 240-C/U** **EI 120 / E 240-C/C**
			10 – 22	1 x 60.0 x 2	**EI 120-C/U**

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			23 – 36	1 x 60.0 x 3	**EI 120-C/C**
			37–50	1 x 60.0 x 4	
	114.3 < D ≤ 139.7	≥ 3.7	9	1 x 60.0 x 1	**EI 120 / E 240-C/U EI 120 / E 240-C/C**
			10 – 22	1 x 60.0 x 2	**EI 120-C/U EI 120-C/C**
			23 – 36	1 x 60.0 x 3	
			37 – 50	1 x 60.0 x 4	
	139.7 < D ≤ 159.0	≥ 4.0	9	1 x 60.0 x 1	**EI 120 / E 240-C/U EI 120 / E 240-C/C**
			10 – 22	1 x 60.0 x 2	**EI 120-C/U EI 120-C/C**
			23 – 36	1 x 60.0 x 3	
			37 – 50	1 x 60.0 x 4	
	159.0 < D ≤ 168.3	≥ 4.1	9	1 x 60.0 x 1	**EI 90-C/U EI 90-C/C**
			10 – 22	1 x 60.0 x 2	**EI 60 / E 90-C/U EI 60 / E 90-C/C**
			23 – 36	1 x 60.0 x 3	
			37–49	1 x 60.0 x 4	
			50	1 x 60.0 x 4	**EI 60 / E 120-C/U EI 60 / E 120-C/C**
	168.3 < D ≤ 219.0	≥ 4.5	9	1 x 60.0 x 1	**EI 90-C/U EI 90-C/C**
			10 – 22	1 x 60.0 x 2	**EI 60 / E 90-C/U EI 60 / E 90-C/C**
			23 – 36	1 x 60.0 x 3	
			37 – 49	1 x 60.0 x 4	
			50	1 x 60.0 x 4	**EI 60 / E 120-C/U EI 60 / E 120-C/C**

RIGID FLOOR					
Partition thickness ≥ 150 mm					
Material Pipes	**Pipe diameter [mm]**	**Pipe wall thickness [mm]**	**FEF insulation thickness [mm]**	**Number of tape rows x width of intumescent material [mm] x number of wraps**	**Fire resistance class**
steel	D ≤ 168.3	≥ 4.0	23	1 x 60.0 x 2	**EI 60-C/U EI 60-C/C**

RIGID FLOOR					
Partition thickness ≥ 150 mm					
Material Pipes	**Pipe diameter [mm]**	**Pipe wall thickness [mm]**	**FEF insulation thickness [mm]**	**Number of tape rows x intumescent material width [mm] x number of wraps**	**Fire resistance class**
copper	D ≤ 12.7	≥ 0.8	9	1 x 60.0 x 2	**EI 120-C/U EI 120-C/C**
	12.7 < D ≤ 15.0	≥ 0.9	9	1 x 60.0 x 2	
	15.0 < D ≤ 22.23	≥ 1.0	9	1 x 60.0 x 2	

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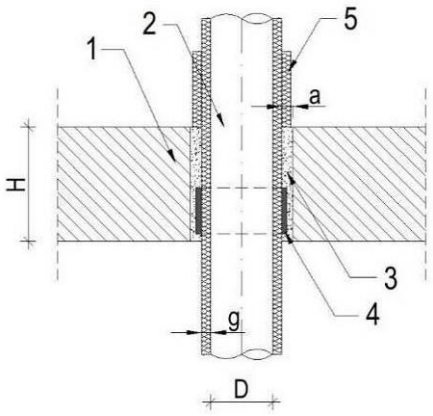
31. Protection of insulated metal pipe penetrations (FEF) using a single row of tape in a rigid floor slab with a thickness of H ≥ 150 mm



1. Rigid slab with a thickness of: H ≥ 150 mm;
2. Insulated metal pipe with or without a heating cable;
3. Filling the gap with cement mortar;
4. **INTU FR WRAP L** tape – inside the slab, on the underside of the slab at a maximum distance of 10 mm from its surface;
5. Mineral wool with a density of 35 kg/m³.

RIGID FLOOR					
Partition thickness ≥ 150 mm					
Material Pipe	**Pipe diameter [mm]**	**Pipe wall thickness [mm]**	**FEF insulation thickness [mm]**	**Number of tape rows x width of intumescent material [mm] x number wraps**	**Fire resistance class**
steel	D ≤ 18.0	1.2 – 1.4	9	1 x 60.0 x 1	**EI 120-C/U** **EI 120-C/C**
			10–25	1 x 60.0 x 2	
	D ≤ 18.0	≥ 1.5	9	1 x 60.0 x 1	
			10–25	1 x 60.0 x 2	
			26 – 37	1 x 60.0 x 3	
			38–50	1 x 60.0 x 4	
	18.0 < D ≤ 28.0	1.3 – 1.4	9	1 x 60.0 x 1	
			10–25	1 x 60.0 x 2	
		≥ 1.5	9	1 x 60.0 x 1	
			10–25	1 x 60.0 x 2	
			26 – 37	1 x 60.0 x 3	
			38–50	1 x 60.0 x 4	
	28.0 < D ≤ 48.3	1.4	9	1 x 60.0 x 1	
			10–25	1 x 60.0 x 2	
		≥ 1.5	9	1 x 60.0 x 1	
			10–25	1 x 60.0 x 2	
			26–37	1 x 60.0 x 3	
			38–50	1 x 60.0 x 4	
	48.3 < D ≤	≥ 1.5	9	1 x 60.0 x 1	

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	66.7		10–25	1 x 60.0 x 2	
			26 – 37	1 x 60.0 x 3	
			38–50	1 x 60.0 x 4	
	66.7 < D ≤ 76.1	≥ 1.6	25	1 x 60.0 x 2	
			26 – 37	1 x 60.0 x 3	
			38–50	1 x 60.0 x 4	
	76.1 < D ≤ 88.9	≥ 1.8	25	1 x 60.0 x 2	
			26 – 37	1 x 60.0 x 3	
			38–50	1 x 60.0 x 4	
	88.9 < D ≤ 108.0	≥ 2.0	25	1 x 60.0 x 2	
			26 – 37	1 x 60.0 x 3	
			38–50	1 x 60.0 x 4	
steel	108.0 < D ≤ 114.3	≥ 2.2	50	1 x 60.0 x 4	**EI 120-C/U** **EI 120-C/C**
	114.3 < D ≤ 139.7	≥ 3.1	50	1 x 60.0 x 4	
	139.7 < D ≤ 168.3	≥ 4.0	50	1 x 60.0 x 4	
	168.3 < D ≤ 219.1	≥ 4.4	50 [1)]	1 x 60.0 x 4	**EI 90 / E 120-C/U** **EI 90 / E 120-C/C**
	219.1 < D ≤ 273.0	≥ 4.9	50 [1)]	1 x 60.0 x 4	
	273.0 < D ≤ 323.9	≥ 5.3	50 [1)]	1 x 60.0 x 4	
	323.9 < D ≤ 355.6	≥ 5.6	50 [1)]	1 x 60.0 x 4	

[1)] Pipe with additional insulation made mineral mineral with density 35 kg/m³, local localized insulation measuring 50 x 700 mm (thickness x length).

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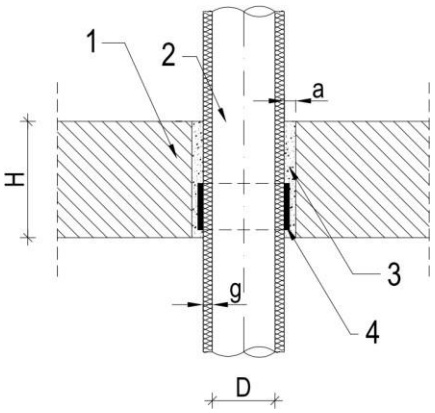
32. **Protection of insulated metal pipe penetrations (PE) using a single row of tape in a rigid floor slab with a thickness of H ≥ 150 mm**



1. Rigid slab with a thickness of: H ≥ 150 mm;
2. Insulated metal pipe;
3. Filling the gap with cement mortar;
4. **INTU FR WRAP L** tape – inside the slab, on the underside of the slab at a maximum distance of 10 mm from its surface.

RIGID FLOOR					
Partition thickness ≥ 150 mm					
Material pipes	**Pipe diameter [mm]**	**Pipe wall thickness [mm]**	**PE insulation thickness [mm]**	**Number of tape rows x width of intumescent material expanding [mm] x number wraps**	**Fire resistance class**
copper	D ≤ 6.0	≥ 0.8	9	1 x 60.0 x 1	**EI 240-C/U** **EI 240-C/C**
	6.0 < D ≤ 15.88	≥ 1.0	9	1 x 60.0 x 1	
	D ≤ 12.7	≥ 0.8	9 x 400	1 x 60.0 x 2	**EI 120-C/U** **EI 120-C/C**
	12.7 < D ≤ 22.23	≥ 1.0	9 x 400	1 x 60.0 x 2	
steel	D ≤ 42.4	2.1 – 2.8	20	1 x 60.0 x 1	**EI 180 / E 240-C/U** **EI 180 / E 240-C/C**
		≥ 2.9	20	1 x 60.0 x 1	
			21 – 25	1 x 60.0 x 2	
	42.4 < D ≤ 48.3	≥ 2.1	25	1 x 60.0 x 2	
	48.3 < D ≤ 60.3	≥ 2.3	25	1 x 60.0 x 2	
	60.3 < D ≤ 76.1	≥ 2.7	25	1 x 60.0 x 2	
	76.1 < D ≤ 88.9	≥ 2.9	25	1 x 60.0 x 2	
	88.9 < D ≤ 108.0	≥ 4.0	25	1 x 60.0 x 2	**EI 60-C/U** **EI 60-C/C**

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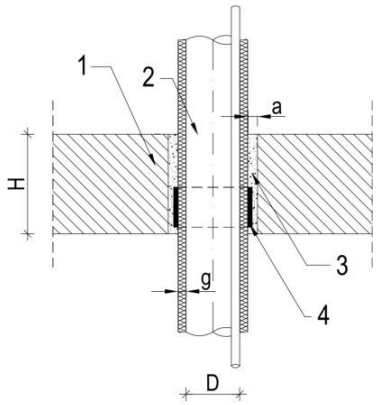
33. Protection of insulated metal pipe penetrations (mineral wool) using a single row of tape in a rigid floor slab with a thickness of H ≥ 150 mm



1. Rigid floor slab with a thickness of: H ≥ 150 mm;
2. Insulated metal pipe with or without a heating cable;
3. Filling the gap with cement mortar;
4. **INTU FR WRAP L** tape – inside the ceiling, on the underside of the ceiling at a maximum distance of 10 mm from its surface.

RIGID FLOOR					
Partition thickness ≥ 150 mm					
Material Pipes	**Pipe diameter [mm]**	**Pipe wall thickness [mm]**	**Thickness of mineral wool insulation [mm]**	**Number of tape rows x width of intumescent material [mm] x number of wraps**	**Fire resistance class**
steel	D ≤ 42.4	≥ 1.5	20 x 300	1 x 60.0 x 1	**EI 120-C/U** **EI 120-C/C**
			(21 – 30) x 400	1 x 60.0 x 1	
		≥ 2.0	(21 – 40) x 600	1 × 60.0 × 1	
		≥ 4.0	(21 – 50) x 600	1 x 60.0 x 1	
	42.4 < D ≤ 66.7	≥ 1.5	30 x 500	1 x 60.0 x 1	
		≥ 2.0	(31 – 40) x 600	1 x 60.0 x 1	
		≥ 4.0	(31 – 50) x 600	1 x 60.0 x 1	
	66.7 < D ≤ 108.0	≥ 2.0	40 x 600	1 x 60.0 x 1	
		≥ 4.0	(41–50) x 600	1 x 60.0 x 1	
	108.0 < D ≤ 114.3	≥ 4.0	50 x 600	1 x 60.0 x 1	
	114.3 < D ≤ 139.7	≥ 4.0	50 x 600	1 x 60.0 x 1	
	139.7 < D ≤ 168.3	≥ 4.0	50 x 600	1 x 60.0 x 1	

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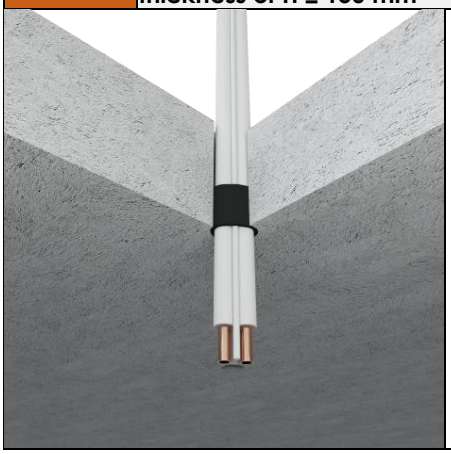
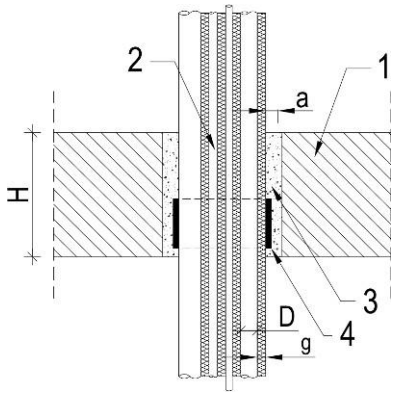
34. Protection of mixed insulated cable (PE/FEF) penetrations using a single row of tape in a rigid ceiling with a thickness of H ≥ 150 mm





1. Rigid floor slab with a thickness of: H ≥ 150 mm;
2. One or two bundles of pipes and cables;
3. Filling the gap with cement mortar;
4. **INTU FR WRAP L** tape – inside the slab, on the underside of the slab at a maximum distance of 10 mm from its surface.

RIGID FLOOR					
Partition thickness ≥ 150 mm					
Material pipes	**Pipe diameter [mm]**	**Pipe wall thickness [mm]**	**FEF insulation thickness [mm]**	**Number of tape rows x intumescent material width [mm] x number of wraps**	**Fire resistance class**
copper[1)]	D ≤ 12.7	≥ 0.8	9	1 x 60.0 x 2	**EI 120**
	12.7 < D ≤ 22.23	≥ 1.0	9	1 x 60.0 x 2	

RIGID FLOOR					
Partition thickness ≥ 150 mm					
Material pipes	**Copper pipe No. 1 max. diameter x min. wall thickness [mm]**	**Copper pipe No. 2 max. diameter x min. wall thickness [mm]**	**FEF insulation thickness [mm]**	**Number of tape rows x width of intumescent material [mm] x number wraps**	**Fire resistance class**
copper[1)]	12.7 x 0.8	12.7 x 0.8	9	1 x 60.0 x 2	**EI 120**
	12.7 x 0.8	22.23 x 1.0	9	1 x 60.0 x 2	

1) Cable bundle with 4 x 1.5 mm² cable and PVC-U pipe D ≤ 25 mm, wall thickness ≥ 1.5 mm.

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RIGID FLOOR					
Partition thickness ≥ 150 mm					
Material pipes	**Copper pipe No. 1 max. diameter x min. wall thickness [mm]**	**Copper pipe No. 2 max. diameter x min. wall thickness [mm]**	**PE insulation thickness [mm]**	**Number of tape rows x width of intumescent material [mm] x number of wraps**	**Fire resistance class**
Copper[2)]	6.0 x 0.8	6.0 x 0.8	9	1 x 60.0 x 1	**EI 240**
	6.0 x 0.8	15.6 x 1.0	9	1 x 60.0 x 1	

2) Cable harness with 5 x 1.5 mm² cable.

RIGID FLOOR					
Partition thickness ≥ 150 mm					
Material pipes	**Pipe diameter [mm]**	**Pipe wall thickness [mm]**	**PE insulation thickness [mm]**	**Number of tape rows x width of intumescent material [mm] x number of wraps**	**Fire resistance class**
Copper[3)]	D ≤ 6.0	≥ 0.8	9	1 x 60.0 x 2	**EI 240**
	6.4 < D ≤ 15.6	≥ 1.0	9	1 x 60.0 x 2	

RIGID FLOOR					
Partition thickness ≥ 150 mm					
Material pipes	**Copper pipe No. 1 max. diameter x min. wall thickness [mm]**	**Copper pipe No. 2 max. diameter x min. wall thickness [mm]**	**PE insulation thickness [mm]**	**Number of tape rows x width of intumescent material [mm] x number of wraps**	**Fire resistance class**
Copper[3)]	6.0 x 0.8	6.0 x 0.8	9	1 x 60.0 x 2	**EI 240**
	6.0 x 0.8	15.6 x 1.0	9	1 x 60.0 x 2	

3) Cable bundle with 5 x 1.5 mm² cable and PVC-U pipe D ≤ 32 mm, wall thickness ≥ 2.0 mm.

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RIGID FLOOR					
Partition thickness ≥ 150 mm					
Material pipes	**Pipe diameter [mm]**	**Pipe wall thickness [mm]**	**PE insulation thickness [mm]**	**Number of tape rows x intumescent material width [mm] x number of wraps**	**Fire resistance class**
Copper[4)]	D ≤ 12.7	≥ 0.8	9 x 400	1 x 60.0 x 2	**EI 120**
	12.7 < D ≤ 22.23	≥ 1.0	9 x 400	1 x 60.0 x 2	

RIGID FLOOR					
Partition thickness ≥ 150 mm					
Material pipes	**Copper pipe No. 1 max. diameter x min. wall thickness [mm] [mm]**	**Copper pipe No. 2 max. diameter x min. wall thickness [mm]**	**PE insulation thickness [mm]**	**Number of tape rows x width of intumescent material [mm] x number of wraps**	**Fire resistance class**
Copper[4)]	12.7 x 0.8	12.7 x 0.8	9 x 400	1 x 60.0 x 2	**EI 120**
	12.7 x 0.8	22.23 x 1.0	9 x 400	1 x 60.0 x 2	

4) A bundle consisting of a 4 x 1.5 mm² cable and a PVC-U pipe with a diameter of ≤ 25 mm and a wall thickness of ≥ 1.5 mm.

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