

DECLARATION OF PERFORMANCE

Nr: DoP 11/2019

1. Unique identification code of product-type:

INTU FR WRAP L

2. Intended uses:

Reinstate the fire resistance performance of flexible wall, rigid wall or rigid floor constructions, where they are penetrated by combustible pipes (with insulation or not) or insulated metal pipes.

3. Manufacturer:

**INTUSEAL Sp. z o.o.
ul. Kineskopowa 1, 05-500 Piaseczno**

4. Authorized representative:

Not applicable

5. System or systems of Assessment and Verification of Constancy of Performance (AVCP):

System 1

6a. Harmonised standard::

Not applicable

Notified body or bodies:

Not applicable

6b. European Assessment Document

EAD 350454-00-1104

European Technical Assessment:

ETA-18/0593 z dnia 31.12.2018

Technical Assessment Body:

Instytut Techniki Budowlanej, ul. Filtrowa 1, 00-611 Warszawa

Notified body or bodies:

Nr 1488

7. Declared performance:

Table 1.

Basic requirements	Performance characteristics
BWR 2 Safety in case to fire	
Reaction to fire	Class E
Resistance to fire	Tables 2.1 ÷ 6.4

Table 2.1. PVC-U / PVC-C pipes. Plastic pipes penetration seals in rigid wall

Pipe material	Pipe diameter, D [mm]	Pipe wall thickness, t [mm]	Intumescent material width x thickness [mm]	Fire resistance class
PVC-U or PVC-C	D ≤ 32	1,8 – 3,6	60 x 2,0	EI 240 – U/C; EI 240 – C/C
		3,7 – 4,2	60 x 2,0	EI 180 – U/C; EI 180 – C/C
	32 < D ≤ 40	1,8 – 3,6	60 x 2,0	EI 240 – U/C; EI 240 – C/C
		3,7 – 4,2	60 x 2,0	EI 180 – U/C; EI 180 – C/C
	40 < D ≤ 50	1,8 – 3,6	60 x 2,0	EI 240 – U/C; EI 240 – C/C
		3,7 – 4,2	60 x 2,0	EI 180 – U/C; EI 180 – C/C
	50 < D ≤ 75	1,9 – 3,5	60 x 2,0	EI 180 – U/C; EI 180 – C/C
		3,6	60 x 2,0	EI 240 – U/C; EI 240 – C/C
	75 < D ≤ 90	3,7 – 4,2	60 x 2,0	EI 180 – U/C; EI 180 – C/C
		2,1 – 3,5	60 x 2,0	EI 120 – U/C; EI 120 – C/C
		3,6	60 x 4,0	EI 240 – U/C; EI 240 – C/C
		3,6 – 4,1	60 x 4,0	EI 180 – U/C; EI 180 – C/C
	90 < D ≤ 110	4,2	60 x 4,0	EI 180 – U/C; EI 180 – C/C
		2,2 – 3,5	60 x 4,0	EI 120 – U/C; EI 120 – C/C
		3,6	60 x 4,0	EI 240 – U/C; EI 240 – C/C
		3,6 – 4,1	60 x 4,0	EI 180 – U/C; EI 180 – C/C
		4,2	60 x 2,0	EI 180 – U/C; EI 180 – C/C
		3,4 – 6,1	100 x 8,0	EI 120 – U/C; EI 120 – C/C
PVC-U or PVC-C	110 < D ≤ 125	6,2	100 x 8,0	EI 120 – U/C; EI 120 – C/C
		6,3 – 9,5	100 x 10,0	EI 240 – U/C; EI 240 – C/C
		6,2	100 x 10,0	EI 180 – U/C; EI 180 – C/C
		6,3 – 9,5	100 x 10,0	EI 180 – U/C; EI 180 – C/C
	125 < D ≤ 160	6,2	100 x 10,0	EI 240 – U/C; EI 240 – C/C
		6,3 – 9,5	100 x 10,0	EI 180 – U/C; EI 180 – C/C
	160 < D ≤ 170	5,9	100 x 16,0	EI 180 – U/C; EI 180 – C/C
		6,0 – 6,1	100 x 14,0	EI 180 – U/C; EI 180 – C/C
		6,2 – 9,1	100 x 12,0	EI 120 – U/C; EI 120 – C/C
		5,9	100 x 16,0	EI 180 – U/C; EI 180 – C/C
	170 < D ≤ 185	6,0	100 x 14,0	EI 180 – U/C; EI 180 – C/C
		6,1 – 8,4	100 x 12,0	EI 120 – U/C; EI 120 – C/C
		5,9	100 x 16,0	EI 180 – U/C; EI 180 – C/C
	185 < D ≤ 200	5,9 – 7,7	100 x 16,0	EI 120 – U/C; EI 120 – C/C

Table 2.2. PE-HD, PE, ABS or SAN+PVC pipes. Plastic pipes penetration seals in rigid wall

Pipe material	Pipe diameter, D [mm]	Pipe wall thickness, t [mm]	Intumescent material width x thickness [mm]	Fire resistance class
PE-HD / PE / ABS / SAN+PVC	D ≤ 32	2,0 – 6,8	60 x 2,0	EI 240 – U/C; EI 240 – C/C
		6,9 – 10,0	60 x 2,0	EI 120 – U/C; EI 120 – C/C
	32 < D ≤ 40	2,3 – 6,7	60 x 2,0	EI 120 – U/C; EI 120 – C/C
		6,8	60 x 2,0	EI 240 – U/C; EI 240 – C/C
		6,9 – 10,0	60 x 2,0	EI 120 – U/C; EI 120 – C/C
		2,6 – 6,7	60 x 2,0	EI 120 – U/C; EI 120 – C/C
	40 < D ≤ 50	6,8	60 x 2,0	EI 240 – U/C; EI 240 – C/C
		6,9 – 10,0	60 x 2,0	EI 120 – U/C; EI 120 – C/C
	50 < D ≤ 55	2,7 – 6,7	60 x 2,0	EI 120 – U/C; EI 120 – C/C
		6,8	60 x 2,0	EI 240 – U/C; EI 240 – C/C
		6,9 – 10,0	60 x 2,0	EI 120 – U/C; EI 120 – C/C
		2,9 – 6,7	60 x 2,0	EI 120 – U/C; EI 120 – C/C
PE-HD / PE / ABS / SAN+PVC	55 < D ≤ 63	6,8	60 x 2,0	EI 240 – U/C; EI 240 – C/C
		6,9 – 10,0	60 x 2,0	EI 120 – U/C; EI 120 – C/C
		3,3 – 6,7	60 x 2,0	EI 120 – U/C; EI 120 – C/C
		6,8	60 x 2,0	EI 240 – U/C; EI 240 – C/C
	63 < D ≤ 75	6,9 – 10,0	60 x 2,0	EI 120 – U/C; EI 120 – C/C
		3,7 – 10,0	60 x 2,0	EI 120 – U/C; EI 120 – C/C
		4,2 – 10,0	60 x 2,0	EI 120 – U/C; EI 120 – C/C
		4,8 – 9,4	100 x 8,0	EI 120 – U/C; EI 120 – C/C
	110 < D ≤ 125	9,5	100 x 8,0	EI 120 – U/C; EI 120 – C/C
		9,5	100 x 10,0	EI 180 – U/C; EI 180 – C/C
		6,2 – 9,4	100 x 10,0	EI 120 – U/C; EI 120 – C/C
		9,5	100 x 10,0	EI 180 – U/C; EI 180 – C/C
	125 < D ≤ 160	6,6 – 9,1	100 x 12,0	EI 90 – U/C; EI 90 – C/C
		9,2 – 10,1	100 x 12,0	EI 60 – U/C; EI 60 – C/C
		10,2 – 11,0	100 x 14,0	EI 60 – U/C; EI 60 – C/C
		11,1 – 11,9	100 x 16,0	EI 60 – U/C; EI 60 – C/C
	160 < D ≤ 170	7,2 – 8,4	100 x 14,0	EI 90 – U/C; EI 90 – C/C
		8,5 – 11,0	100 x 14,0	EI 60 – U/C; EI 60 – C/C
		11,1 – 11,9	100 x 16,0	EI 60 – U/C; EI 60 – C/C
		7,7	100 x 16,0	EI 90 – U/C; EI 90 – C/C
	185 < D ≤ 200	7,8 – 11,9	100 x 16,0	EI 60 – U/C; EI 60 – C/C

Table 2.3. PP. Plastic pipes penetration seals in rigid wall

Pipe material	Pipe diameter, D [mm]	Pipe wall thickness, t [mm]	Intumescent material width x thickness [mm]	Fire resistance class
PP	D ≤ 32	1,8	60 x 2,0	EI 240 – U/C; EI 240 – C/C
		1,9 – 18,4	60 x 2,0	EI 180 – U/C; EI 180 – C/C
	32 < D ≤ 40	1,8	60 x 2,0	EI 240 – U/C; EI 240 – C/C
		1,9 – 18,4	60 x 2,0	EI 180 – U/C; EI 180 – C/C
	40 < D ≤ 50	1,8	60 x 2,0	EI 240 – U/C; EI 240 – C/C
		1,9 – 18,4	60 x 2,0	EI 180 – U/C; EI 180 – C/C
	50 < D ≤ 55	1,9 – 18,4	60 x 2,0	EI 180 – U/C; EI 180 – C/C
		1,9 – 18,4	60 x 2,0	EI 180 – U/C; EI 180 – C/C
	55 < D ≤ 63	1,9 – 18,4	60 x 2,0	EI 180 – U/C; EI 180 – C/C
		1,9 – 18,4	60 x 2,0	EI 180 – U/C; EI 180 – C/C
	63 < D ≤ 75	1,9 – 18,4	60 x 2,0	EI 180 – U/C; EI 180 – C/C
		2,3 – 18,3	60 x 4,0	EI 180 – U/C; EI 180 – C/C
	75 < D ≤ 90	18,4	60 x 4,0	EI 180 – U/C; EI 180 – C/C
		2,7 – 18,3	60 x 4,0	EI 180 – U/C; EI 180 – C/C
	90 < D ≤ 110	18,4	60 x 4,0	EI 180 – U/C; EI 180 – C/C

	110 < D ≤ 125	3,8 – 16,7	100 x 8,0	EI 60 – U/C; EI 60 – C/C
	125 < D ≤ 160	5,5 – 12,5	100 x 10,0	EI 60 – U/C; EI 60 – C/C
	160 < D ≤ 170	6,1 – 11,3	100 x 12,0	EI 60 – U/C; EI 60 – C/C
	170 < D ≤ 185	6,9 – 9,5	100 x 14,0	EI 60 – U/C; EI 60 – C/C
	185 < D ≤ 200	7,7	100 x 16,0	EI 60 – U/C; EI 60 – C/C

Table 2.4. PE-RT pipes. Plastic pipes penetration seals in rigid wall

Pipe material	Pipe diameter, D [mm]	Pipe wall thickness, t [mm]	Intumescent material width x thickness [mm]	Fire resistance class
PE-RT	D ≤ 20	2,0	60 x 2,0	EI 240 – U/C; EI 240 – C/C

Table 2.5. PE-RT/Al/PE-RT pipes. Plastic pipes penetration seals in rigid wall

Pipe material	Pipe diameter, D [mm]	Pipe wall thickness, t [mm]	Intumescent material width x thickness [mm]	Fire resistance class
PE-RT/Al/PE-RT	D ≤ 20	2,0 – 7,5	60 x 2,0	EI 240 – U/C; EI 240 – C/C
	20 < D ≤ 75	7,5	60 x 2,0	EI 240 – U/C; EI 240 – C/C

Table 2.6. PE-X pipes. Plastic pipes penetration seals in rigid wall

Pipe material	Pipe diameter, D [mm]	Pipe wall thickness, t [mm]	Intumescent material width x thickness [mm]	Fire resistance class
PE-X	D ≤ 20	2,0	60 x 2,0	EI 240 – U/C; EI 240 – C/C

Table 2.7. PE-X/Al/PE-X pipes. Plastic pipes penetration seals in rigid wall

Pipe material	Pipe diameter, D [mm]	Pipe wall thickness, t [mm]	Intumescent material width x thickness [mm]	Fire resistance class
PE-X/Al/PE-X	D ≤ 75	7,5	60 x 2,0	EI 120 – U/C; EI 120 – C/C

Table 2.8. PP-R pipes. Plastic pipes penetration seals in rigid wall

Pipe material	Pipe diameter, D [mm]	Pipe wall thickness, t [mm]	Intumescent material width x thickness [mm]	Fire resistance class
PP-R	D ≤ 20	3,4	60 x 2,0	EI 240 – U/C; EI 240 – C/C

Table 2.9. PP-R/Al/PP-R pipes. Plastic pipes penetration seals in rigid wall

Pipe material	Pipe diameter, D [mm]	Pipe wall thickness, t [mm]	Intumescent material width x thickness [mm]	Fire resistance class
PP-R/Al/PP-R	D ≤ 110	18,3	60 x 2,0	EI 240 – U/C; EI 240 – C/C

Table 2.10. PP-R/PP-R-GF/PP-R pipes. Plastic pipes penetration seals in rigid wall

Pipe material	Pipe diameter, D [mm]	Pipe wall thickness, t [mm]	Intumescent material width x thickness [mm]	Fire resistance class
PP-R/PP-R-GF/PP-R	D ≤ 110	18,3	60 x 2,0	EI 180 – U/C; EI 180 – C/C

Table 3.1. Copper pipes with flexible elastomeric foam (FEF) insulation. Metal pipes penetration seals in rigid wall

Pipe material	Pipe diameter, D [mm]	Pipe wall thickness, t [mm]	Pipe insulation thickness, b [mm]	Intumescent material width x thickness [mm]	Fire resistance class
Copper	D ≤ 15,0	1,0 – 1,4	9	60 x 2,0	EI 180 – C/U; EI 180 – C/C
			10 – 19	60 x 4,0	EI 180 – C/U; EI 180 – C/C
			20 – 22	60 x 4,0	EI 180 – C/U; EI 180 – C/C
			23 – 36	60 x 6,0	EI 180 – C/U; EI 180 – C/C
			37 – 49	60 x 8,0	EI 180 – C/U; EI 180 – C/C
			50	60 x 8,0	EI 180 – C/U; EI 180 – C/C
		≥ 1,5	9	60 x 2,0	EI 240 – C/U; EI 240 – C/C
			10 – 19	60 x 4,0	EI 180 – C/U; EI 180 – C/C
			20 – 22	60 x 4,0	EI 180 – C/U; EI 180 – C/C
			23 – 36	60 x 6,0	EI 180 – C/U; EI 180 – C/C
			37 – 49	60 x 8,0	EI 180 – C/U; EI 180 – C/C

Pipe material	Pipe diameter, D [mm]	Pipe wall thickness, t [mm]	Pipe insulation thickness, b [mm]	Intumescent material width x thickness [mm]	Fire resistance class
Copper	15,0 < D ≤ 42,4	1,4	50	60 x 8,0	EI 180 – C/U; EI 180 – C/C
			9	60 x 2,0	EI 180 – C/U; EI 180 – C/C
			10 – 19	60 x 4,0	EI 180 – C/U; EI 180 – C/C
			20 – 22	60 x 4,0	EI 180 – C/U; EI 180 – C/C
			23 – 36	60 x 6,0	EI 120 – C/U; EI 120 – C/C
			37 – 50	60 x 8,0	EI 120 – C/U; EI 120 – C/C
		1,5 – 14,2	50	60 x 8,0	EI 120 – C/U; EI 120 – C/C
			9	60 x 2,0	EI 240 – C/U; EI 240 – C/C
			10 – 19	60 x 4,0	EI 180 – C/U; EI 180 – C/C
			20 – 22	60 x 4,0	EI 180 – C/U; EI 180 – C/C
			23 – 36	60 x 6,0	EI 120 – C/U; EI 120 – C/C
			37 – 50	60 x 8,0	EI 120 – C/U; EI 120 – C/C
	42,4 < D ≤ 44,5	1,4	50	60 x 8,0	EI 120 – C/U; EI 120 – C/C
			9	60 x 2,0	EI 240 – C/U; EI 240 – C/C
			10 – 19	60 x 4,0	EI 180 – C/U; EI 180 – C/C
			20 – 22	60 x 4,0	EI 120 – C/U; EI 120 – C/C
			23 – 36	60 x 6,0	EI 120 – C/U; EI 120 – C/C
			37 – 50	60 x 8,0	EI 120 – C/U; EI 120 – C/C
		1,5 – 14,2	50	60 x 8,0	EI 120 – C/U; EI 120 – C/C
			9	60 x 2,0	EI 240 – C/U; EI 240 – C/C
			10 – 19	60 x 4,0	EI 180 – C/U; EI 180 – C/C
			20 – 22	60 x 4,0	EI 120 – C/U; EI 120 – C/C
			23 – 36	60 x 6,0	EI 120 – C/U; EI 120 – C/C
			37 – 50	60 x 8,0	EI 120 – C/U; EI 120 – C/C
44,5 < D ≤ 54,0	1,5 – 14,2	50	60 x 8,0	EI 120 – C/U; EI 120 – C/C	
		9	60 x 2,0	EI 240 – C/U; EI 240 – C/C	
		10 – 19	60 x 4,0	EI 120 – C/U; EI 120 – C/C	
		20 – 22	60 x 4,0	EI 120 – C/U; EI 120 – C/C	
		23 – 36	60 x 6,0	EI 120 – C/U; EI 120 – C/C	
		37 – 50	60 x 8,0	EI 120 – C/U; EI 120 – C/C	
	54,0 < D ≤ 57,0	1,6 – 14,2	50	60 x 8,0	EI 120 – C/U; EI 120 – C/C
			9	60 x 2,0	EI 30 / E 60 – C/U; EI 30 / E 60 – C/C
			10 – 11	60 x 4,0	EI 30 / E 60 – C/U; EI 30 / E 60 – C/C
			12 – 16	60 x 4,0	EI 60 – C/U; EI 60 – C/C
			17 – 22	60 x 4,0	EI 60 – C/U; EI 60 – C/C
			23 – 25	60 x 6,0	EI 60 – C/U; EI 60 – C/C
54,0 < D ≤ 57,0	1,6 – 14,2	26 – 30	60 x 6,0	EI 60 – C/U; EI 60 – C/C	
		31 – 36	60 x 6,0	EI 60 – C/U; EI 60 – C/C	
		37 – 45	60 x 8,0	EI 60 – C/U; EI 60 – C/C	
		46 – 49	60 x 8,0	EI 60 – C/U; EI 60 – C/C	
		50	60 x 8,0	EI 60 – C/U; EI 60 – C/C	
		9	60 x 2,0	EI 30 / E 60 – C/U; EI 30 / E 60 – C/C	
	57,0 < D ≤ 63,5	1,6 – 14,2	10 – 11	60 x 4,0	EI 30 / E 60 – C/U; EI 30 / E 60 – C/C
			12 – 16	60 x 4,0	EI 30 / E 60 – C/U; EI 30 / E 60 – C/C
			17 – 22	60 x 4,0	EI 60 – C/U; EI 60 – C/C
			23 – 25	60 x 6,0	EI 60 – C/U; EI 60 – C/C
			26 – 30	60 x 6,0	EI 60 – C/U; EI 60 – C/C
			31 – 36	60 x 6,0	EI 60 – C/U; EI 60 – C/C
Copper	57,0 < D ≤ 63,5	1,6 – 14,2	37 – 45	60 x 8,0	EI 60 – C/U; EI 60 – C/C
			46 – 49	60 x 8,0	EI 60 – C/U; EI 60 – C/C
			50	60 x 8,0	EI 60 – C/U; EI 60 – C/C
			9	60 x 2,0	EI 60 – C/U; EI 60 – C/C

Pipe material	Pipe diameter, D [mm]	Pipe wall thickness, t [mm]	Pipe insulation thickness, b [mm]	Intumescent material width x thickness [mm]	Fire resistance class
			24 – 31	60 x 6,0	EI 90 / E 180 – C/U; EI 90 / E 180 – C/C
			32 – 34	60 x 6,0	EI 90 / E 180 – C/U; EI 90 / E 180 – C/C
			35 – 38	60 x 8,0	EI 90 / E 180 – C/U; EI 90 / E 180 – C/C
			39 – 46	60 x 8,0	EI 180 – C/U; EI 180 – C/C
			47 – 49	60 x 8,0	EI 180 – C/U; EI 180 – C/C
			50	60 x 8,0	EI 180 – C/U; EI 180 – C/C
			9	60 x 2,0	EI 60 / E 240 – C/U; EI 60 / E 240 – C/C
			10 – 16	60 x 4,0	EI 60 / E 180 – C/U; EI 60 / E 180 – C/C
			17 – 20	60 x 4,0	EI 60 / E 180 – C/U; EI 60 / E 180 – C/C
			21 – 23	60 x 4,0	EI 60 / E 180 – C/U; EI 60 / E 180 – C/C
	139,7< D ≤ 152,4	3,9 – 14,2	24 – 31	60 x 6,0	EI 90 / E 180 – C/U; EI 90 / E 180 – C/C
			32 – 34	60 x 6,0	EI 90 / E 180 – C/U; EI 90 / E 180 – C/C
			35 – 38	60 x 8,0	EI 90 / E 180 – C/U; EI 90 / E 180 – C/C
			39 – 46	60 x 8,0	EI 90 / E 180 – C/U; EI 90 / E 180 – C/C
			47 – 49	60 x 8,0	EI 180 – C/U; EI 180 – C/C
			50	60 x 8,0	EI 180 – C/U; EI 180 – C/C
			9	60 x 2,0	EI 60 / E 240 – C/U; EI 60 / E 240 – C/C
			10 – 16	60 x 4,0	EI 60 / E 180 – C/U; EI 60 / E 180 – C/C
			17 – 20	60 x 4,0	EI 60 / E 180 – C/U; EI 60 / E 180 – C/C
			21 – 23	60 x 4,0	EI 60 / E 180 – C/U; EI 60 / E 180 – C/C
	152,4< D ≤ 159	4,0 – 14,2	24 – 31	60 x 6,0	EI 90 / E 180 – C/U; EI 90 / E 180 – C/C
			32 – 34	60 x 6,0	EI 90 / E 180 – C/U; EI 90 / E 180 – C/C
			35 – 38	60 x 8,0	EI 90 / E 180 – C/U; EI 90 / E 180 – C/C
			39 – 46	60 x 8,0	EI 90 / E 180 – C/U; EI 90 / E 180 – C/C
			47 – 49	60 x 8,0	EI 90 / E 180 – C/U; EI 90 / E 180 – C/C
			50	60 x 8,0	EI 180 – C/U; EI 180 – C/C
			9	60 x 2,0	EI 60 / E 240 – C/U; EI 60 / E 240 – C/C
			10 – 16	60 x 4,0	EI 60 / E 180 – C/U; EI 60 / E 180 – C/C
			17 – 20	60 x 4,0	EI 60 / E 180 – C/U; EI 60 / E 180 – C/C
			21 – 23	60 x 4,0	EI 60 / E 180 – C/U; EI 60 / E 180 – C/C
	159 < D ≤ 169	4,0 – 14,2	24 – 31	60 x 6,0	EI 90 / E 180 – C/U; EI 90 / E 180 – C/C
			32 – 34	60 x 6,0	EI 90 / E 180 – C/U; EI 90 / E 180 – C/C
			35 – 38	60 x 8,0	EI 90 / E 180 – C/U; EI 90 / E 180 – C/C
			39 – 46	60 x 8,0	EI 90 / E 180 – C/U; EI 90 / E 180 – C/C
			47 – 49	60 x 8,0	EI 90 / E 180 – C/U; EI 90 / E 180 – C/C
			50	60 x 8,0	EI 180 – C/U; EI 180 – C/C
			16 – 23	60 x 4,0	EI 60 / E 90 – C/U; EI 60 / E 90 – C/C
			24 – 36	60 x 6,0	EI 60 / E 90 – C/U; EI 60 / E 90 – C/C
			37 – 49	60 x 8,0	EI 60 / E 90 – C/U; EI 60 / E 90 – C/C
			50	60 x 8,0	EI 90 – C/U; EI 90 – C/C
	169 < D ≤ 180	4,0 – 14,2	24 – 36	60 x 6,0	EI 60 / E 90 – C/U; EI 60 / E 90 – C/C
			37 – 49	60 x 8,0	EI 60 / E 90 – C/U; EI 60 / E 90 – C/C
			50	60 x 8,0	EI 90 – C/U; EI 90 – C/C
	180 < D ≤ 200	4,0 – 14,2	38 – 49	60 x 8,0	EI 60 / E 90 – C/U; EI 60 / E 90 – C/C
			50	60 x 8,0	EI 90 – C/U; EI 90 – C/C
	200 < D ≤ 219	4,0 – 14,2	50	60 x 8,0	EI 90 – C/U; EI 90 – C/C

Table 3.3. Copper pipes with PE foam insulation. Metal pipes penetration seals in rigid wall

Pipe material	Pipe diameter, D [mm]	Pipe wall thickness, t [mm]	Pipe insulation thickness, b [mm]	Intumescent material width x thickness [mm]	Fire resistance class
Copper	D ≤ 6,35	≥ 0,8	9	60 x 4,0	EI 240 – C/U EI 240 – C/C
	6,35 < D ≤ 15,88	≥ 1,0	9	60 x 4,0	EI 180 / E 240 – C/U EI 180 / E 240 – C/C

Pipe material	Pipe diameter, D [mm]	Pipe wall thickness, t [mm]	Intumescent material width x thickness [mm]	Fire resistance class
	55 < D ≤ 63	2,8 – 6,8	60 x 2,0	EI 240 – U/C; EI 240 – C/C
		6,9 – 10,0	60 x 4,0	EI 120 – U/C; EI 120 – C/C
	63 < D ≤ 75	3,0 – 6,8	60 x 2,0	EI 240 – U/C; EI 240 – C/C
		6,9 – 10,0	60 x 4,0	EI 120 – U/C; EI 120 – C/C
	75 < D ≤ 90	3,6 – 5,7	60 x 4,0	EI 240 – U/C; EI 240 – C/C
		5,8 – 10,0	60 x 4,0	EI 120 – U/C; EI 120 – C/C
	90 < D ≤ 110	5,7	60 x 4,0	EI 240 – U/C; EI 240 – C/C
		5,8 – 10,0	60 x 4,0	EI 120 – U/C; EI 120 – C/C
	110 < D ≤ 125	4,8 – 5,8	100 x 8,0	EI 240 – U/C; EI 240 – C/C
		5,9 – 6,2	100 x 8,0	EI 120 – U/C; EI 120 – C/C
		5,9 – 6,2	100 x 10,0	EI 240 – U/C; EI 240 – C/C
		6,3 – 9,5	100 x 8,0	EI 120 – U/C; EI 120 – C/C
		6,3 – 9,5	100 x 10,0	EI 240 – U/C; EI 240 – C/C
		9,6 – 9,9	100 x 8,0	EI 120 – U/C; EI 120 – C/C
	125 < D ≤ 160	6,2 – 9,5	100 x 10,0	EI 240 – U/C; EI 240 – C/C
		6,6 – 10,1	100 x 12,0	EI 90 – U/C; EI 90 – C/C
	160 < D ≤ 170	10,2 – 11,0	100 x 14,0	EI 90 – U/C; EI 90 – C/C
		11,1 – 11,9	100 x 16,0	EI 90 – U/C; EI 90 – C/C
	170 < D ≤ 185	7,2 – 11,0	100 x 14,0	EI 90 – U/C; EI 90 – C/C
		11,1 – 11,9	100 x 16,0	EI 90 – U/C; EI 90 – C/C
	185 < D ≤ 200	7,7 – 11,9	100 x 16,0	EI 90 – U/C; EI 90 – C/C
	PE-HD, PE, ABS or SAN+PVC			

Table 4.3. PP pipes. Plastic pipes penetration seals in rigid floor

Pipe material	Pipe diameter, D [mm]	Pipe wall thickness, t [mm]	Intumescent material width x thickness [mm]	Fire resistance class
	D ≤ 32	1,8 – 12,5	60 x 2,0	EI 240 – U/C; EI 240 – C/C
		12,6 – 18,4	60 x 4,0	EI 240 – U/C; EI 240 – C/C
	32 < D ≤ 40	1,8 – 12,5	60 x 2,0	EI 240 – U/C; EI 240 – C/C
		12,6 – 18,4	60 x 4,0	EI 240 – U/C; EI 240 – C/C
	40 < D ≤ 50	1,8 – 12,5	60 x 2,0	EI 240 – U/C; EI 240 – C/C
		12,6 – 18,4	60 x 4,0	EI 240 – U/C; EI 240 – C/C
	50 < D ≤ 55	1,9 – 12,5	60 x 2,0	EI 240 – U/C; EI 240 – C/C
		12,6 – 18,4	60 x 4,0	EI 240 – U/C; EI 240 – C/C
	55 < D ≤ 63	1,9 – 12,5	60 x 2,0	EI 240 – U/C; EI 240 – C/C
		12,6 – 18,4	60 x 4,0	EI 240 – U/C; EI 240 – C/C
	63 < D ≤ 75	1,9 – 12,5	60 x 2,0	EI 240 – U/C; EI 240 – C/C
		12,6 – 18,4	60 x 4,0	EI 240 – U/C; EI 240 – C/C
	75 < D ≤ 90	2,3 – 18,4	60 x 4,0	EI 240 – U/C; EI 240 – C/C
		2,7 – 18,4	60 x 4,0	EI 240 – U/C; EI 240 – C/C
	90 < D ≤ 110	3,6 – 3,7	100 x 8,0	EI 45 – U/C; EI 45 – C/C
		3,8 – 14,8	100 x 8,0	EI 90 – U/C; EI 90 – C/C
	110 < D ≤ 125	14,9 – 16,7	100 x 8,0	EI 45 – U/C; EI 45 – C/C
		5,5 – 6,1	100 x 10,0	EI 45 – U/C; EI 45 – C/C
	125 < D ≤ 160	6,2	100 x 10,0	EI 90 – U/C; EI 90 – C/C
		6,3 – 12,5	100 x 10,0	EI 45 – U/C; EI 45 – C/C
	160 < D ≤ 170	6,1 – 11,3	100 x 12,0	EI 45 – U/C; EI 45 – C/C
		6,9 – 9,5	100 x 14,0	EI 45 – U/C; EI 45 – C/C
	185 < D ≤ 200	7,7	100 x 16,0	EI 45 – U/C; EI 45 – C/C

Table 3.4. Copper pipes bundle with PE foam. Plastic or metal pipes bundles penetration seals in rigid wall.
- bundle of max. 2 pipes with diameter of D ≤ 6,35 mm and pipe wall thickness of t = 0,8 mm and max. 1 pipe with diameter of D ≤ 15,88 mm and pipe wall thickness of t = 3,0 mm,
- PE foam insulation thickness of 9 mm,
- intumescent material of INTU FR WRAP L (width x thickness): 60 x 4,0 mm

Fire resistance class: EI 180 – C/U Fire resistance class: EI 180 – C/C
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Table 3.5. Plastic pipes bundle. Plastic or metal pipes bundles penetration seals in rigid wall.

- bundle of max. 2 PE-HD, PE, ABS or SAN+PVC pipes with diameter of D ≤ 32 mm and pipe wall thickness of t = 2,0 mm and max. 1 PVC-U or PVC-C pipe with diameter of D ≤ 50 mm and pipe wall thickness t = 1,8 mm,
- intumescent material of INTU FR WRAP L (width x thickness): 60 x 2,0 mm

Fire resistance class: EI 240 – C/U Fire resistance class: EI 240 – C/C
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Table 4.1. PVC-U / PVC-C pipes. Plastic pipes penetration seals in rigid floor

Pipe material	Pipe diameter, D [mm]	Pipe wall thickness, t [mm]	Intumescent material width x thickness [mm]	Fire resistance class
PVC-U or PVC-C	D ≤ 32	1,8 – 4,2	60 x 2,0	EI 240 – U/C; EI 240 – C/C
	32 < D ≤ 40	1,8 – 4,2	60 x 2,0	EI 240 – U/C; EI 240 – C/C
	40 < D ≤ 50	1,8 – 4,2	60 x 2,0	EI 240 – U/C; EI 240 – C/C
PVC-U or PVC-C	50 < D ≤ 55	1,9 – 4,2	60 x 2,0	EI 240 – U/C; EI 240 – C/C
		55 < D ≤ 63	1,9 – 4,2	EI 240 – U/C; EI 240 – C/C
	63 < D ≤ 75	1,9 – 4,2	60 x 2,0	EI 240 – U/C; EI 240 – C/C
		75 < D ≤ 90	2,1 – 3,4 3,5 – 4,2	EI 240 – U/C; EI 240 – C/C EI 180 – U/C; EI 180 – C/C
	90 < D ≤ 110	2,2	60 x 4,0	EI 240 – U/C; EI 240 – C/C
		2,2 – 4,2	60 x 4,0	EI 180 – U/C; EI 180 – C/C
	110 < D ≤ 125	2,5 – 3,9	100 x 8,0	EI 120 – U/C; EI 120 – C/C
		4,0 – 5,3	100 x 8,0	EI 240 – U/C; EI 240 – C/C
	125 < D ≤ 160	5,4 – 7,7	100 x 10,0	EI 240 – U/C; EI 240 – C/C
		3,2 – 7,6	100 x 10,0	EI 120 – U/C; EI 120 – C/C
	160 < D ≤ 170	7,7	100 x 10,0	EI 240 – U/C; EI 240 – C/C
		4,4 – 7,6	100 x 12,0	EI 120 – U/C; EI 120 – C/C
	170 < D ≤ 185	7,7	100 x 12,0	EI 240 – U/C; EI 240 – C/C
		6,1 – 7,6	100 x 14,0	EI 120 – U/C; EI 120 – C/C
	185 < D ≤ 200	7,7	100 x 14,0	EI 240 – U/C; EI 240 – C/C
	200 < D ≤ 219	7,7	100 x 16,0	EI 240 – U/C; EI 240 – C/C

Table 4.2. PE-HD, PE, ABS or SAN+PVC pipes. Plastic pipes penetration seals in rigid floor

Pipe material	Pipe diameter, D [mm]	Pipe wall thickness, t [mm]	Intumescent material width x thickness [mm]	Fire resistance class
PE-HD, PE, ABS or SAN+PVC	D ≤ 32	2,0 – 6,8	60 x 2,0	EI 240 – U/C; EI 240 – C/C
		6,9 – 10,0	60 x 4,0	EI 120 – U/C; EI 120 – C/C
	32 < D ≤ 40	2,2 – 6,8	60 x 2,0	EI 240 – U/C; EI 240 – C/C
		6,9 – 10,0	60 x 4,0	EI 120 – U/C; EI 120 – C/C
PE-HD, PE, ABS or SAN+PVC	40 < D ≤ 50	2,5 – 6,8	60 x 2,0	EI 240 – U/C; EI 240 – C/C
		6,9 – 10,0	60 x 4,0	EI 120 – U/C; EI 120 – C/C
	50 < D ≤ 55	2,6 – 6,8	60 x 2,0	EI 240 – U/C; EI 240 – C/C
		6,9 – 10,0	60 x 4,0	EI 120 – U/C; EI 120 – C/C

Table 4.4. PE-RT/Al/PE-RT pipes. Plastic pipes penetration seals in rigid floor

Pipe material	Pipe diameter, D [mm]	Pipe wall thickness, t [mm]	Intumescent material width x thickness [mm]	Fire resistance class
PE-RT/Al/PE-RT	D ≤ 20	2,0	60 x 2,0	EI 240 – U/C; EI 240 – C/C
		2,1 – 7,5	60 x 2,0	EI 180 / E 240 – U/C; EI 180 / E 240 – C/C
	20 < D ≤ 75	7,5	60 x 2,0	EI 180 / E 240 – U/C; EI 180 / E 240 – C/C

Table 4.5. PE-X/Al/PE-X pipes. Plastic pipes penetration seals in rigid floor

Pipe material	Pipe diameter, D [mm]	Pipe wall thickness, t [mm]	Intumescent material width x thickness [mm]	Fire resistance class
PE-X/Al/PE-X	D ≤ 20	2,0 – 7,5	60 x 2,0	EI 240 – U/C; EI 240 – C/C
	20 < D ≤ 75	7,5	60 x 2,0	EI 240 – U/C; EI 240 – C/C

Table 4.6. PP-R/Al/PP-R pipes. Plastic pipes penetration seals in rigid floor

Pipe material	Pipe diameter, D [mm]	Pipe wall thickness, t [mm]	Intumescent material width x thickness [mm]	Fire resistance class
PP-R/Al/PP-R	D ≤ 20	3,4 – 12,5	60 x 2,0	EI 240 – U/C; EI 240 – C/C
		12,6 – 18,4	60 x 4,0	EI 240 – U/C; EI 240 – C/C
	20 < D ≤ 75	12,5	60 x 2,0	EI 240 – U/C; EI 240 – C/C
		12,6 – 18,4	60 x 4,0	EI 240 – U/C; EI 240 – C/C
	20 < D ≤ 110	18,4	60 x 4,0	EI 240 – U/C; EI 240 – C/C

Table 5.4. PP-R/PP-R-GF/PP-R pipes with flexible elastomeric foam (FEF) insulation. Insulates plastic or metal pipes penetration seals in

Pipe material	Pipe diameter, D [mm]	Pipe wall thickness, t [mm]	Insulation thickness, b [mm]	Intumescent material width x thickness [mm]	Fire resistance class
Copper	D ≤ 15,0	≥ 1,0	9	60 x 2,0	EI 240 – C/U; EI 240 – C/C
			10 – 22	60 x 4,0	EI 240 – C/U; EI 240 – C/C
			23 – 36	60 x 6,0	EI 240 – C/U; EI 240 – C/C
			37 – 38	60 x 8,0	EI 240 – C/U; EI 240 – C/C
			39 – 40	60 x 8,0	EI 240 – C/U; EI 240 – C/C
			41 – 49	60 x 8,0	EI 240 – C/U; EI 240 – C/C
	15,0 < D ≤ 42,4	1,4 – 14,4	50	60 x 8,0	EI 240 – C/U; EI 240 – C/C
			9	60 x 2,0	EI 120 / E 180 – C/U; EI 120 / E 180 – C/C
			10 – 22	60 x 4,0	EI 120 / E 180 – C/U; EI 120 / E 180 – C/C
			23 – 36	60 x 6,0	EI 120 / E 180 – C/U; EI 120 / E 180 – C/C
			37 – 38	60 x 8,0	EI 120 / E 180 – C/U; EI 120 / E 180 – C/C
			39 – 40	60 x 8,0	EI 180 – C/U; EI 180 – C/C
			41 – 49	60 x 8,0	EI 180 – C/U; EI 180 – C/C
			50	60 x 8,0	EI 180 – C/U; EI 180 – C/C
	42,4 < D ≤ 44,5	1,4 – 14,4	9	60 x 2,0	EI 120 / E 180 – C/U; EI 120 / E 180 – C/C
			10 – 22	60 x 4,0	EI 120 / E 180 – C/U; EI 120 / E 180 – C/C
			23 – 36	60 x 6,0	EI 120 / E 180 – C/U; EI 120 / E 180 – C/C
			37 – 38	60 x 8,0	EI 120 / E 180 – C/U; EI 120 / E 180 – C/C
			39 – 40	60 x 8,0	EI 120 / E 180 – C/U; EI 120 / E 180 – C/C
			41 – 49	60 x 8,0	EI 180 – C/U; EI 180 – C/C
			50	60 x 8,0	EI 180 – C/U; EI 180 – C/C
	44,5 < D ≤ 54,0	1,5 – 14,4	9	60 x 2,0	EI 120 / E 180 – C/U; EI 120 / E 180 – C/C
			10 – 22	60 x 4,0	EI 120 / E 180 – C/U; EI 120 / E 180 – C/C
Copper	44,5 < D ≤ 54,0	1,5 – 14,4	23 – 36	60 x 6,0	EI 120 / E 180 – C/U; EI 120 / E 180 – C/C

Table 5.6. Steel pipes with flexible elastomeric foam (FEF) insulation. Insulates plastic or metal pipes penetration seals in rigid floor

Pipe material	Pipe diameter, D [mm]	Pipe wall thickness, t [mm]	Pipe insulation thickness, b [mm]	Intumescent material width x thickness [mm]	Fire resistance class
Steel	D ≤ 42,4	2,0 – 14,2	9	60 x 2,0	EI 240 – C/U; EI 240 – C/C
			10 – 22	60 x 4,0	EI 240 – C/U; EI 240 – C/C
			23 – 36	60 x 6,0	EI 240 – C/U; EI 240 – C/C
			37 – 49	60 x 8,0	EI 240 – C/U; EI 240 – C/C
			50	60 x 8,0	EI 240 – C/U; EI 240 – C/C
	42,4 < D ≤ 44,5	2,1 – 2,5	9	60 x 2,0	EI 120 – C/U; EI 120 – C/C
			10 – 22	60 x 4,0	EI 120 – C/U; EI 120 – C/C
			23 – 36	60 x 6,0	EI 120 – C/U; EI 120 – C/C
			37 – 49	60 x 8,0	EI 120 – C/U; EI 120 – C/C
			50	60 x 8,0	EI 120 – C/U; EI 120 – C/C
		2,6 – 14,2	9	60 x 2,0	EI 120 – C/U; EI 120 – C/C
			10 – 12	60 x 2,0	EI 120 – C/U; EI 120 – C/C
			13	60 x 2,0	EI 180 / E 240 – C/U; EI 180 / E 240 – C/C
			14 – 22	60 x 4,0	EI 120 – C/U; EI 120 – C/C
			24 – 36	60 x 6,0	EI 120 – C/U; EI 120 – C/C
Steel	42,4 < D ≤ 44,5	2,6 – 14,2	37 – 49	60 x 8,0	EI 120 – C/U; EI 120 – C/C
			50	60 x 8,0	EI 120 – C/U; EI 120 – C/C
		2,2 – 2,5	9	60 x 2,0	EI 120 – C/U; EI 120 – C/C
			10 – 22	60 x 4,0	EI 120 – C/U; EI 120 – C/C
			23 – 36	60 x 6,0	EI 120 – C/U; EI 120 – C/C
			37 – 49	60 x 8,0	EI 120 – C/U; EI 120 – C/C
	44,5 < D ≤ 54,0		50	60 x 8,0	EI 120 – C/U; EI 120 – C/C
			9	60 x 2,0	EI 120 – C/U; EI 120 – C/C
			10 – 12	60 x 2,0	EI 120 – C/U; EI 120 – C/C
			13	60 x 2,0	EI 180 / E 240 – C/U; EI 180 / E 240 – C/C
			14 – 22	60 x 4,0	EI 120 – C/U; EI 120 – C/C
		2,6 – 14,2	24 – 36	60 x 6,0	EI 120 – C/U; EI 120 – C/C
			37 – 49	60 x 8,0	EI 120 – C/U; EI 120 – C/C
			50	60 x 8,0	EI 120 – C/U; EI 120 – C/C
			9	60 x 2,0	EI 120 – C/U; EI 120 – C/C
			10 – 12	60 x 2,0	EI 120 – C/U; EI 120 – C/C
	54,0 < D ≤ 57,0	2,3 – 2,5	13	60 x 2,0	EI 180 / E 240 – C/U; EI 180 / E 240 – C/C
			14 – 22	60 x 4,0	EI 120 – C/U; EI 120 – C/C
			23 – 36	60 x 6,0	EI 120 – C/U; EI 120 – C/C
			37 – 49	60 x 8,0	EI 120 – C/U; EI 120 – C/C
			50	60 x 8,0	EI 120 – C/U; EI 120 – C/C
		2,6 – 14,2	9	60 x 2,0	EI 120 – C/U; EI 120 – C/C
			10 – 12	60 x 2,0	EI 120 – C/U; EI 120 – C/C
			13	60 x 2,0	EI 180 / E 240 – C/U; EI 180 / E 240 – C/C
			14 – 22	60 x 4,0	EI 120 – C/U; EI 120 – C/C
			24 – 36	60 x 6,0	EI 120 – C/U; EI 120 – C/C

Pipe material	Pipe diameter, D [mm]	Pipe wall thickness, t [mm]	Pipe insulation thickness, b [mm]	Intumescent material width x thickness [mm]	Fire resistance class		
Steel	88,9 < D ≤ 101,6	3,1 – 14,2	10 – 22	60 x 4,0	EI 120 – C/U; EI 120 – C/C		
			23 – 36	60 x 6,0	EI 120 – C/U; EI 120 – C/C		
			37 – 49	60 x 8,0	EI 120 – C/U; EI 120 – C/C		
			50	60 x 8,0	EI 120 – C/U; EI 120 – C/C		
	101,6 < D ≤ 108	3,2 – 14,2	9	60 x 2,0	EI 120 – C/U; EI 120 – C/C		
			10 – 22	60 x 4,0	EI 120 – C/U; EI 120 – C/C		
			23 – 36	60 x 6,0	EI 120 – C/U EI 120 – C/C		
			37 – 49	60 x 8,0	EI 120 – C/U; EI 120 – C/C		
	108 < D ≤ 114,3	3,3 – 14,2	50	60 x 8,0	EI 120 – C/U; EI 120 – C/C		
			9	60 x 2,0	EI 120 – C/U; EI 120 – C/C		
			10 – 22	60 x 4,0	EI 120 – C/U; EI 120 – C/C		
			23 – 36	60 x 6,0	EI 120 – C/U; EI 120 – C/C		
	114,3 < D ≤ 127	3,5 – 14,2	37 – 49	60 x 8,0	EI 120 – C/U; EI 120 – C/C		
			50	60 x 8,0	EI 120 – C/U; EI 120 – C/C		
			9	60 x 2,0	EI 120 – C/U; EI 120 – C/C		
			10 – 22	60 x 4,0	EI 120 – C/U; EI 120 – C/C		
	127 < D ≤ 133	3,6 – 14,2	23 – 36	60 x 6,0	EI 120 – C/U; EI 120 – C/C		
			37 – 49	60 x 8,0	EI 120 – C/U; EI 120 – C/C		
			50	60 x 8,0	EI 120 – C/U; EI 120 – C/C		
			9	60 x 2,0	EI 120 – C/U; EI 120 – C/C		
	Steel	133 < D ≤ 139,7	3,7 – 14,2	10 – 22	60 x 4,0	EI 120 – C/U; EI 120 – C/C	
				23 – 36	60 x 6,0	EI 120 – C/U; EI 120 – C/C	
				37 – 49	60 x 8,0	EI 120 – C/U; EI 120 – C/C	
				50	60 x 8,0	EI 120 – C/U; EI 120 – C/C	
139,7 < D ≤ 152,4		3,9 – 14,2	9	60 x 2,0	EI 120 – C/U; EI 120 – C/C		
			10 – 22	60 x 4,0	EI 120 – C/U; EI 120 – C/C		
			23 – 36	60 x 6,0	EI 120 – C/U; EI 120 – C/C		
			37 – 49	60 x 8,0	EI 120 – C/U; EI 120 – C/C		
152,4 < D ≤ 159		4,0 – 14,2	50	60 x 8,0	EI 120 – C/U EI 120 – C/C		
			9	60 x 2,0	EI 120 – C/U; EI 120 – C/C		
			10 – 22	60 x 4,0	EI 120 – C/U; EI 120 – C/C		
			23 – 36	60 x 6,0	EI 120 – C/U; EI 120 – C/C		
159 < D ≤ 169		4,1 – 14,2	37 – 49	60 x 8,0	EI 120 – C/U; EI 120 – C/C		
			50	60 x 8,0	EI 120 – C/U; EI 120 – C/C		
			169 < D ≤ 180	4,2 – 14,2	16 – 23	60 x 4,0	EI 45 – C/U; EI 45 – C/C
					24 – 36	60 x 6,0	EI 45 – C/U; EI 45 – C/C
37 – 49		60 x 8,0			EI 45 – C/U; EI 45 – C/C		
50		60 x 8,0			EI 45 – C/U; EI 45 – C/C		
180 < D ≤ 200		4,4 – 14,2	24 – 36	60 x 6,0	EI 45 – C/U; EI 45 – C/C		
			37 – 49	60 x 8,0	EI 45 – C/U; EI 45 – C/C		
			50	60 x 8,0	EI 45 – C/U; EI 45 – C/C		
			38 – 49	60 x 8,0	EI 45 – C/U; EI 45 – C/C		
Steel		200 < D ≤ 219	4,5 – 14,2	50	60 x 8,0	EI 45 – C/U; EI 45 – C/C	

Table 5.7. Copper pipes with PE foam insulation. Insatulates platric or metal pipes penetration seals in rigid floor

Pipe material	Pipe diameter, D [mm]	Pipe wall thickness, t [mm]	Pipe insulation thickness, b [mm]	Intumescent material width x thickness [mm]	Fire resistance class
Copper	D ≤ 6,35	≥ 0,8	9	60 x 4,0	El 240 – C/U; El 240 – C/C
	6,35 < D ≤ 15,88	≥ 1,0	9	60 x 4,0	El 240 – C/U; El 240 – C/C

Table 5.8. Copper pipes bundle with PE foam. Plastic or metal pipes bundles penetration seals in rigid floor.

- bundle of max. 2 pipes with diameter of D ≤ 6,35 mm and pipe wall thickness of t = 0,8 mm and max. 1 pipe with diameter of D ≤ 15,88 mm and pipe wall thickness of t = 1,0 mm,
- PE foam insulation thickness of 9 mm,
- intumescent material of INTU FR WRAP L (width x thickness): 60 x 4,0 mm

Fire resistance class: El 180 / E 240 – C/U Fire resistance class: El 180 / E 240 – C/C					
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Table 6.1. PVC-U / PVC-C pipes. Plastic pipes penetration seals in flexible or rigid wall

Pipe material	Pipe diameter, D [mm]	Pipe wall thickness, t [mm]	Intumescent material width x thickness [mm]	Fire resistance class
PVC-U / PVC-C	D ≤ 32	1,8 – 3,6	60 x 2,0	El 120 – U/C; El 120 – C/C
		3,7 – 4,2	60 x 4,0	El 120 – U/C; El 120 – C/C
	32 < D ≤ 40	1,8 – 3,6	60 x 2,0	El 120 – U/C; El 120 – C/C
		3,7 – 4,2	60 x 4,0	El 120 – U/C; El 120 – C/C
	40 < D ≤ 50	1,8 – 3,6	60 x 2,0	El 120 – U/C; El 120 – C/C
		3,7 – 4,2	60 x 4,0	El 120 – U/C; El 120 – C/C
	50 < D ≤ 55	1,9 – 3,6	60 x 2,0	El 120 – U/C; El 120 – C/C
		3,7 – 4,2	60 x 4,0	El 120 – U/C; El 120 – C/C
	55 < D ≤ 63	1,9 – 3,6	60 x 2,0	El 120 – U/C; El 120 – C/C
		3,7 – 4,2	60 x 4,0	El 120 – U/C; El 120 – C/C
	63 < D ≤ 75	1,9 – 3,6	60 x 2,0	El 120 – U/C; El 120 – C/C
		3,7 – 4,2	60 x 4,0	El 120 – U/C; El 120 – C/C
PVC-U / PVC-C	75 < D ≤ 90	2,1 – 4,2	60 x 4,0	El 120 – U/C; El 120 – C/C
	90 < D ≤ 110	2,2 – 4,2	60 x 4,0	El 120 – U/C; El 120 – C/C

Table 6.2. PE-HD, PE, ABS or SAN+PVC pipes. Plastic pipes penetration seals in flexible or rigid wall

Pipe material	Pipe diameter, D [mm]	Pipe wall thickness, t [mm]	Intumescent material width x thickness [mm]	Fire resistance class
PE-HD / PE / ABS / SAN+PVC	D ≤ 32	2,0 – 3,0	60 x 2,0	El 120 – U/C; El 120 – C/C
		3,1 – 6,8	60 x 2,0	El 90 / E 120 – U/C; El 90 / E 120 – C/C
		3,1 – 6,8	60 x 4,0	El 120 – U/C; El 120 – C/C
		6,9 – 10,0	60 x 4,0	El 120 – U/C; El 120 – C/C
	32 < D ≤ 40	2,2 – 3,0	60 x 2,0	El 120 – U/C; El 120 – C/C
		3,1 – 6,8	60 x 2,0	El 90 / E 120 – U/C; El 90 / E 120 – C/C
		3,1 – 6,8	60 x 4,0	El 120 – U/C; El 120 – C/C
		6,9 – 10,0	60 x 4,0	El 120 – U/C; El 120 – C/C
	40 < D ≤ 50	2,5 – 3,0	60 x 2,0	El 120 – U/C; El 120 – C/C
		3,1 – 6,8	60 x 2,0	El 90 / E 120 – U/C; El 90 / E 120 – C/C
		3,1 – 6,8	60 x 4,0	El 120 – U/C; El 120 – C/C
		6,9 – 10,0	60 x 4,0	El 120 – U/C; El 120 – C/C
	50 < D ≤ 55	2,6 – 3,0	60 x 2,0	El 120 – U/C; El 120 – C/C
		3,1 – 6,8	60 x 2,0	El 90 / E 120 – U/C; El 90 / E 120 – C/C
		3,1 – 6,8	60 x 4,0	El 120 – U/C; El 120 – C/C
		6,9 – 10,0	60 x 4,0	El 120 – U/C; El 120 – C/C
	55 < D ≤ 63	2,8 – 3,0	60 x 2,0	El 120 – U/C; El 120 – C/C

Pipe material	Pipe diameter, D [mm]	Pipe wall thickness, t [mm]	Intumescent material width x thickness [mm]	Fire resistance class
PE-HD / PE / ABS / SAN+PVC	55 < D ≤ 63	3,1 – 6,8	60 x 2,0	El 90 / E 120 – U/C; El 90 / E 120 – C/C
		3,1 – 6,8	60 x 4,0	El 120 – U/C; El 120 – C/C
	63 < D ≤ 75	6,9 – 10,0	60 x 4,0	El 120 – U/C; El 120 – C/C
		3,0	60 x 2,0	El 120 – U/C; El 120 – C/C
		3,1 – 6,8	60 x 2,0	El 90 / E 120 – U/C; El 90 / E 120 – C/C
		3,1 – 6,8	60 x 4,0	El 120 – U/C; El 120 – C/C
	75 < D ≤ 90	6,9 – 10,0	60 x 4,0	El 120 – U/C; El 120 – C/C
		3,6 – 10,0	60 x 4,0	El 120 – U/C; El 120 – C/C
	90 < D ≤ 110	4,2 – 10,0	60 x 4,0	El 120 – U/C; El 120 – C/C

Table 6.3. PP pipes. Plastic pipes penetration seals in flexible or rigid wall

Pipe material	Pipe diameter, D [mm]	Pipe wall thickness, t [mm]	Intumescent material width x thickness [mm]	Fire resistance class
PP	D ≤ 32	1,8 – 12,5	60 x 2,0	El 120 – U/C; El 120 – C/C
		12,6 – 18,4	60 x 4,0	El 90 / E 120 – U/C; El 90 / E 120 – C/C
	32 < D ≤ 40	1,8 – 12,5	60 x 2,0	El 120 – U/C; El 120 – C/C
		12,6 – 18,4	60 x 4,0	El 90 / E 120 – U/C; El 90 / E 120 – C/C
	40 < D ≤ 50	1,8 – 12,5	60 x 2,0	El 120 – U/C; El 120 – C/C
		12,6 – 18,4	60 x 4,0	El 90 / E 120 – U/C; El 90 / E 120 – C/C
	50 < D ≤ 55	1,9 – 12,5	60 x 2,0	El 120 – U/C; El 120 – C/C
		12,6 – 18,4	60 x 4,0	El 90 / E 120 – U/C; El 90 / E 120 – C/C
	55 < D ≤ 63	1,9 – 12,5	60 x 2,0	El 120 – U/C; El 120 – C/C
		12,6 – 18,4	60 x 4,0	El 90 / E 120 – U/C; El 90 / E 120 – C/C
	63 < D ≤ 75	1,9 – 12,5	60 x 2,0	El 120 – U/C; El 120 – C/C
		12,6 – 18,4	60 x 4,0	El 90 / E 120 – U/C; El 90 / E 120 – C/C
	75 < D ≤ 90	2,3 – 8,3	60 x 4,0	El 120 – U/C; El 120 – C/C
		8,4 – 18,4	60 x 4,0	El 90 / E 120 – U/C; El 90 / E 120 – C/C
PP	90 < D ≤ 110	2,7	60 x 4,0	El 120 – U/C; El 120 – C/C
	90 < D ≤ 110	2,8 – 18,4	60 x 4,0	El 90 / E 120 – U/C; El 90 / E 120 – C/C

Table 6.4. Steel pipes with flexible elastomeric foam (FEF) insulation. Metal pipes penetration seals in flexible or rigid wall

Pipe material	Pipe diameter, D [mm]	Pipe wall thickness, t [mm]	Pipe insulation thickness, b [mm]	Intumescent material width x thickness [mm]	Fire resistance class
Steel	D ≤ 42,4	2,0 – 14,2	9	60 x 2,0	El 120 – C/U; El 120 – C/C
			10 – 11	60 x 4,0	El 120 – C/U; El 120 – C/C
			12 – 20	60 x 4,0	El 120 – C/U; El 120 – C/C
			21 – 22	60 x 4,0	El 120 – C/U; El 120 – C/C
			23 – 28	60 x 6,0	El 120 – C/U; El 120 – C/C
			29 – 34	60 x 6,0	El 120 – C/U; El 120 – C/C
			35 – 39	60 x 8,0	El 120 – C/U; El 120 – C/C
			40 – 45	60 x 8,0	El 120 – C/U; El 120 – C/C
			46 – 49	60 x 8,0	El 120 – C/U; El 120 – C/C
			50	60 x 8,0	El 120 – C/U; El 120 – C/C
	42,4 < D ≤ 44,5	2,1 – 14,2	9	60 x 2,0	El 90 / E 120 – C/U; El 90 / E 120 – C/C
			10 – 11	60 x 4,0	El 90 / E 120 – C/U; El 90 / E 120 – C/C
			12 – 20	60 x 4,0	El 120 – C/U; El 120 – C/C
			21 – 22	60 x 4,0	El 120 – C/U; El 120 – C/C
			23 – 28	60 x 6,0	El 120 – C/U; El 120 – C/C
			29 – 34	60 x 6,0	El 120 – C/U; El 120 – C/C
			35 – 39	60 x 8,0	El 120 – C/U; El 120 – C/C

Pipe material	Pipe diameter, D [mm]	Pipe wall thickness, t [mm]	Pipe insulation thickness, b [mm]	Intumescent material width x thickness [mm]	Fire resistance class
Steel	44,5 < D ≤ 54,0	2,2 – 14,2	40 – 45	60 x 8,0	El 120 – C/U; El 120 – C/C
			46 – 49	60 x 8,0	El 120 – C/U; El 120 – C/C
			50	60 x 8,0	El 120 – C/U; El 120 – C/C
			9	60 x 2,0	El 90 / E 120 – C/U; El 90 / E 120 – C/C
			10 – 11	60 x 4,0	El 90 / E 120 – C/U; El 90 / E 120 – C/C
			12 – 20	60 x 4,0	El 90 / E 120 – C/U; El 90 / E 120 – C/C
	54,0 < D ≤ 57,0	2,2 – 14,2	21 – 22	60 x 4,0	El 120 – C/U; El 120 – C/C
			23 – 28	60 x 6,0	El 120 – C/U; El 120 – C/C
			29 – 34	60 x 6,0	El 120 – C/U; El 120 – C/C
			35 – 39	60 x 8,0	El 120 – C/U; El 120 – C/C
			40 – 45	60 x 8,0	El 120 – C/U; El 120 – C/C
			46 – 49	60 x 8,0	El 120 – C/U; El 120 – C/C
	57,0 < D ≤ 63,5	2,3 – 14,2	50	60 x 8,0	El 120 – C/U; El 120 – C/C
			9	60 x 2,0	El 90 / E 120 – C/U; El 90 / E 120 – C/C
			10 – 11	60 x 4,0	El 90 / E 120 – C/U; El 90 / E 120 – C/C
			12 – 20	60 x 4,0	El 90 / E 120 – C/U; El 90 / E 120 – C/C
			21 – 22	60 x 4,0	El 90 / E 120 – C/U; El 90 / E 120 – C/C
			23 – 28	60 x 6,0	El 90 / E 120 – C/U; El 90 / E 120 – C/C
Steel	63,5 < D ≤ 70,0	2,4 – 14,2	29 – 34	60 x 6,0	El 120 – C/U; El 120 – C/C
			35 – 39	60 x 8,0	El 120 – C/U; El 120 – C/C
			40 – 45	60 x 8,0	El 120 – C/U; El 120 – C/C
			46 – 49	60 x 8,0	El 120 – C/U; El 120 – C/C
			50	60 x 8,0	El 120 – C/U; El 120 – C/C
			9	60 x 2,0	El 90 / E 120 – C/U; El 90 / E 120 – C/C
	70,0 < D ≤ 76,1	2,5 – 14,2	10 – 11	60 x 4,0	El 90 / E 120 – C/U; El 90 / E 120 – C/C
			12 – 20	60 x 4,0	El 90 / E 120 – C/U; El 90 / E 120 – C/C
			21 – 22	60 x 4,0	El 90 / E 120 – C/U; El 90 / E 120 – C/C
			23 – 28	60 x 6,0	El 90 / E 120 – C/U; El 90 / E 120 – C/C
			29 – 34	60 x 6,0	El 90 / E 120 – C/U; El 90 / E 120 – C/C
			35 – 39	60 x 8,0	El 90 / E 120 – C/U; El 90 / E 120 – C/C

Pipe material	Pipe diameter, D [mm]	Pipe wall thickness, t [mm]	Pipe insulation thickness, b [mm]	Intumescent material width x thickness [mm]	Fire resistance class
Steel	70,0 < D ≤ 76,1	2,5 – 14,2	40 – 45	60 x 8,0	EI 120 – C/U; EI 120 – C/C
			46 – 49	60 x 8,0	EI 120 – C/U; EI 120 – C/C
			50	60 x 8,0	EI 120 – C/U; EI 120 – C/C
	76,1 < D ≤ 82,5	2,6 – 14,2	9	60 x 2,0	EI 90 / E 120 – C/U; EI 90 / E 120 – C/C
			10 – 11	60 x 4,0	EI 90 / E 120 – C/U; EI 90 / E 120 – C/C
			12 – 20	60 x 4,0	EI 90 / E 120 – C/U; EI 90 / E 120 – C/C
			21 – 22	60 x 4,0	EI 90 / E 120 – C/U; EI 90 / E 120 – C/C
			23 – 28	60 x 6,0	EI 90 / E 120 – C/U; EI 90 / E 120 – C/C
			29 – 34	60 x 6,0	EI 90 / E 120 – C/U; EI 90 / E 120 – C/C
			35 – 39	60 x 8,0	EI 90 / E 120 – C/U; EI 90 / E 120 – C/C
			40 – 45	60 x 8,0	EI 90 / E 120 – C/U; EI 90 / E 120 – C/C
			46 – 49	60 x 8,0	EI 120 – C/U; EI 120 – C/C
			50	60 x 8,0	EI 120 – C/U; EI 120 – C/C
	82,5 < D ≤ 88,9	2,6 – 14,2	9	60 x 2,0	EI 90 / E 120 – C/U; EI 90 / E 120 – C/C
			10 – 11	60 x 4,0	EI 90 / E 120 – C/U; EI 90 / E 120 – C/C
			12 – 20	60 x 4,0	EI 90 / E 120 – C/U; EI 90 / E 120 – C/C
			21 – 22	60 x 4,0	EI 90 / E 120 – C/U; EI 90 / E 120 – C/C
			23 – 28	60 x 6,0	EI 90 / E 120 – C/U; EI 90 / E 120 – C/C
			29 – 34	60 x 6,0	EI 90 / E 120 – C/U; EI 90 / E 120 – C/C
			35 – 39	60 x 8,0	EI 90 / E 120 – C/U; EI 90 / E 120 – C/C
			40 – 45	60 x 8,0	EI 90 / E 120 – C/U; EI 90 / E 120 – C/C
			46 – 49	60 x 8,0	EI 90 / E 120 – C/U; EI 90 / E 120 – C/C
			50	60 x 8,0	EI 120 – C/U; EI 120 – C/C

BWR 3 Hygiene, health and the environment	
Air permeability	NPD
Water permeability	NPD
Content, emission, release of dangerous substances	NPD
BWR 4 Safety and accessibility in use	
Mechanical resistance and stability	NPD
Resistance to impact/movement	NPD
Adhesion	NPD
Durability	Z ₂
BWR 5 Protection against noise	
Airborne sound insulation	NPD
BWR 6 Energy economy and heat retention	
Thermal properties	NPD
Water vapour permeability	NPD

8. Appropriate technical documentation or special technical documentation:

Not applicable

The performance of the product identified above is in conformity with the set of declared performance/s. This declaration of performance is issued, in accordance with Regulation (EU) No 305/2011, under the sole responsibility of the manufacturer identified above.

Signed for and on behalf of the manufacturer by:

Name: Michał Szykowski

Position: Vice-President of the Management Board

Piaseczno, 16.11.2022

Place, date

INTUSEAL Sp. z o.o.
V-ce Prezes Zarządu
.....Michał Szykowski.....
Signature