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European Technical Assessment

ETA-17/1061 of 30/09/2020

General Part

Technical Assessment Body issuing the European Technical Assessment	Instytut Techniki Budowlanej
Trade name of the construction product	PIRO Multitube PM
Product family to which the construction product belongs	Fire Stopping and Fire Sealing Products. Penetration Seals
Manufacturer	PIROSYSTEM Sp. z o.o. ul. Ogrodnicza 3A PL 83-021 Wiślina Poland
Manufacturing plant	Manufacturing plant no. 1
This European Technical Assessment contains	197 pages including 4 Annexes which form an integral part of this Assessment
This European Technical Assessment is issued in accordance with regulation (EU) No 305/2011, on the basis of	European Assessment Document (EAD) 350454-00-1104 “Fire Stopping and Fire Sealing Products. Penetration Seals”
This version replaces	ETA-17/1061 issued on 14/12/2017

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Specific Part

1 Technical description of the product

The PIRO Multitube PM is an intumescent swelling band, based on graphite. It is used to seal installation penetrations. The PIRO Multitube PM seals combustible pipes (with or without insulation), cable bundles and insulated metal pipes (single or bundled) passing through walls or floors. The band is wrapped around a pipe or cable. If necessary, it can be cut to the required length (equal to or greater than the outer circumference of the pipe). Band shall be pushed into the aperture in the separating element or placed on the both sides of it.

The PIRO Multitube PM is supplied in roll form in 60 mm width and thickness of 2,5 and 4,0 mm or in 100 mm width and thickness of 2,4 and 4,8 mm.

Dimensions of the PIRO Multitube PM are given in tables B1 to B3, Annex B. Replacement of the PIRO Multitube PM cross sections are given in tables B1 to B6, Annex B.

Auxiliary products used with PIRO Multitube PM to form single penetration seals are:

- synthetic, flexible elastomeric foam (FEF) in accordance with EN 14304 with reaction to fire class B_L-s3,d0 according to EN 13501-1 and an apparent density of 45 – 70 kg/m^3,
- PE foam with reaction to fire class E according to EN 13501-1 and the nominal density of 30 kg/m^{3,}
- Tubolit PE foam insulation with reaction to fire class E according to EN 13501-1 and the nominal density of 30 kg/m^3,
- PE acoustic mat (Weberfloor 4955 db mat) insulation with reaction to fire class B_{fl}-s1 according to EN 13501-1 and the nominal weight of 12 kg / 30 m^2,
- PiroCoating according to ETA-17/1062,
- PiroCoat A according to ETA-17/1062,
- PiroCoat I according to ETA-17/1062,
- Piro Collar PC according to ETA-17/1063.

Assembly instruction is given in Annex A.

2 Specification of the intended use in accordance with the applicable European Assessment Document (EAD)

2.1 Intended use

The intended use of PIRO Multitube PM is to reinstate the fire resistance performance of flexible wall, rigid wall or rigid floor constructions, where they are penetrated by combustible or metallic pipes (with insulation or not) and cable bundles.

The specific elements of construction that the PIRO Multitube PM may be used to provide a penetration seal in, are as follows:

Rigid walls: The wall must have a minimum thickness of 100, 125 or 150 mm (for details see Annex B) and comprise concrete, reinforced concrete, aerated concrete, ceramic brick, cavity brick or checker brick, with a minimum density of 600 kg/m^3.

Flexible walls: The wall must have a minimum thickness of 100 or 125 mm and comprise timber or steel studs lined on both faces with minimum two layers (with overall board layer thickness on one side equal to or greater than 25 mm) of 'Type F' or 'Type DF' gypsum plasterboards according to EN 520. In timber stud walls, no part of the penetration shall be closer than 100 mm to a stud, the cavity must be closed between the penetration seal and the stud and minimum 100 mm of insulation of reaction to fire class A1 or A2, according to EN 13501-1 is provided within the cavity between the penetration seal and the stud.

Rigid floors: The floor must have a minimum thickness of 150 mm and comprise concrete or reinforced concrete, with a minimum density of 1700 kg/m^3.

The supporting construction shall be classified in accordance with EN 13501-2 for the required fire resistance period (equal to or greater than specified in Annex C).

The PIRO Multitube PM may be used to provide a penetration seal with specific combustible pipes, metal pipes or cable bundles (according to Annex C).

Details of penetration seals are provided in Annex C. Additional provisions are provided in Annex A.

The performances given in this European Technical Assessment are based on an assumed working life of the product of 10 years. The indications given on the working life cannot be interpreted as a guarantee given by the producer or the Technical Assessment Body, but are to be regarded only as a means for choosing the right products in relation to the expected economically reasonable working life of the works.

2.2 Use category

Type Z_2: intended for use in internal conditions with humidity lower than 85% RH, excluding temperatures below 0°C, without exposure to rain or UV.

3 Performance of the product and references to the methods used for its assessment

3.1 Performance of the product

3.1.1 Safety in case of fire (BWR 2)

Essential characteristic	Performance
Reaction to fire	Class B-s2, d0
Resistance to fire	Annex C

3.1.2 Hygiene, health and the environment (BWR 3)

No performance assessed.

3.1.3 Safety and accessibility in use (BWR 4)

Essential characteristic	Performance
Durability	Use category: Type Z_2

3.1.4 Protection against noise (BWR 5)

No performance assessed.

3.1.5 Energy economy and heat retention (BWR 6)

No performance assessed.

3.2 Methods used for the assessment

The assessment of the products has been made in accordance with the EAD 350454-00-1104 “Fire Stopping and Fire Sealing Products. Penetration Seals”.

4 Assessment and verification of constancy of performance (AVCP) system applied, with reference to its legal base

According to Decision 99/454/EC of the European Commission, as amended by Decision 2001/596/EC of the European Commission the system 1 of assessment and verification of constancy of performance applies (see Annex V to Regulation (EU) No 305/2011).

5 Technical details necessary for the implementation of the AVCP system, as provided in the applicable European Assessment Document (EAD)

Technical details necessary for the implementation of the AVCP system are laid down in the control plan deposited in Instytut Techniki Budowlanej.

For type testing the results of the tests performed as part of the assessment for the European Technical Assessment shall be used unless there are changes in the production line or plant. In such cases the necessary type testing has to be agreed between Instytut Techniki Budowlanej and the notified body.

Issued in Warsaw on 30/09/2020 by Instytut Techniki Budowlanej

Anna Panek, MSc
Deputy Director of ITB

Additional provisions:

- PIRO Multitube PM is placed, depending on the intended use, either on the both sides of the wall, in the centre of the wall thickness or in the distance of max. 15 ± 5 mm from the bottom of the floor, in accordance with Annex D.
- Classifications given in Annex C are valid for tied bundles with diameter not greater than 100 mm, made of cables type: NYY-J 5 x 1.5 RE, E-YY-J 5 x 1.5 RE or VV 5 x 1.5.
- Classifications given in Annex C are valid for specific pipes made of:
  - PVC-U according to EN 1329-1, EN 1453-1 or EN 1452-1,
  - PVC-C according to EN 1566-1,
  - PE according to EN 12201-2, EN 1519-1 and EN 12666-1,
  - PE-HD according to EN 1519-1 or EN 12666-1,
  - PE-X according to EN ISO 21003-1,
  - PE-RT according to EN ISO 23391-2,
  - PP according to EN 1451-1,
  - PP-R according to EN ISO 15874-2,
  - PP-R/AL/PP-R according to EN ISO 23391-2,
  - PP-R STABI AL according to EN ISO 21003-2, EN ISO 21003-2,
  - PP-R/GF/PP-R according to EN ISO 15874,
  - PP-R/PP-R+GF/PP-R according to EN ISO 15874,
  - PE-RT/AL/PE-RT according to EN ISO 21003,
  - single and quadruple heating Syncopex pipes according to EN 448,
  - ABS according to EN 1455-1,
  - SAN + PVC according to EN 1565-1,

  and Wavin Wafix PP, Wavin Si Tech+ and Wavin AS+ pipes,
  according to tables in Annex C.
- Classifications given in Annex C for steel, copper and cast iron pipes are also valid for other metal pipes with:
  - thermal conductivity lower than respectively steel, copper or iron, and
  - melting point at least equal to respectively steel, copper or iron, or greater than:
    - 946 °C for the fire resistance class EI 60 and E 60,
    - 1006 °C for the fire resistance class EI 90 and E 90,
    - 1049 °C for the fire resistance class EI 120 and E 120.
- The minimum distance between the penetration seals (between adjacent wraps) in supporting construction shall be:
  - not restricted – in case of plastic pipes made of PE-HD, PVC-U and PE-X, with diameter not greater than 50 mm,
  - not restricted – in case of plastic pipes made of PP, with diameter not greater than 110 mm,
  - not restricted – in case of plastic pipes with PE foam continuous insulation and flexible elastomeric foam continuous insulation (FEF),
  - not restricted – in case of metal pipes with diameter not greater than 63,9 mm and continuous flexible elastomeric foam insulation (FEF), with thickness greater than 32 mm,
  - not restricted – in case of metal pipes in bundles,
  - 20 mm – distance between the adjacent pipe bundles,
  - 30 mm – in case of metal pipes with PE foam continuous insulation,
  - 100 mm – in case of other plastic pipes,
  - 100 mm – in case of metal pipes with diameter greater than 63,9 mm and continuous flexible elastomeric foam insulation (FEF), with thickness greater than 32 mm,
  - 100 mm – in case of cable bundles.
- Pipes shall be supported at maximum 370 mm away from both faces of the wall constructions and from the upper face of floor constructions.
- Classifications given in Annex C for insulated pipes is valid for pipes with sustained and continued insulation made of flexible elastomeric foam (FEF) or PE foam insulation (for details see clause 1 of ETA) and does not cover locally insulated or non-insulated pipes. The thickness, density and reaction to fire class of insulation shall remain in accordance with ETA provisions.
- The PIRO Multitube PM is wrapped around penetrations and does not require a support structure. Bands are mounted directly on pipes or insulation accordingly: in a hole before or during pouring concrete to the floor or part of the floor or erecting parts of the wall or shafts or technical holes. For drilled holes, the PIRO Multitube PM should be wrapped and attached around the pipe outside the hole and pushed it into the hole or placed on both sides.
- Mounting clearance (u = c.a. 25 mm) for seals using the PIRO Multitube PM is only required because of the space necessary for its assembly when drilling holes in the existing supporting construction.

PIRO Multitube PM	**Annex A1** of European Technical Assessment ETA-17/1061
Additional provisions	

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Annex C - Resistance to fire classification:

Annex D – Construction details:

Table B1. PIRO Multitube PM with width of 60 mm.

Width of intumescent band *h* [mm]	Thickness of intumescent band *s* [mm]	Layers of intumescent band thickness [mm]
60	2,5	2,5
60	4,0	4,0
60	5,0	2,5 / 2,5
60	6,5	2,5 / 4,0
60	7,5	2,5 / 2,5 / 2,5
60	8,0	4,0 / 4,0
60	9,0	4,0 / 2,5 / 2,5
60	10,0	2,5 / 2,5 / 2,5 / 2,5
60	10,5	4,0 / 4,0 / 2,5
60	11,5	4,0 / 2,5 / 2,5 / 2,5
60	12,0	4,0 / 4,0 / 4,0
60	12,5	2,5 / 2,5 / 2,5 / 2,5 / 2,5
60	13,0	4,0 / 4,0 / 2,5 / 2,5
60	14,0	2,5 / 2,5 / 2,5/ 2,5 / 4,0
60	14,5	4,0 / 4,0 / 4,0 / 2,5
60	15,0	2,5 / 2,5 / 2,5 / 2,5 / 2,5 / 2,5
60	16,0	4,0 / 4,0 / 4,0 / 4,0
60	18,0	2,5 / 2,5 / 2,5 / 2,5 / 4,0 / 4,0
60	20,0	2,5 / 2,5 / 2,5 / 2,5 / 2,5 / 2,5 / 2,5 / 2,5
60	21,0	4,0 / 4,0 / 4,0 / 4,0 / 2,5 / 2,5
60	23,0	4,0 / 4,0 / 2,5 / 2,5 / 2,5 / 2,5 / 2,5 / 2,5
60	24,0	4,0 / 4,0 / 4,0 / 4,0 / 4,0 / 4,0

Table B2. PIRO Multitube PM with width of 120 mm.

Width of intumescent band *h* [mm]	Thickness of intumescent band *s* [mm]	Layers of intumescent band thickness [mm]
120 (60+60)	2,5	2,5
120 (60+60)	4,0	4,0
120 (60+60)	5,0	2,5 / 2,5
120 (60+60)	6,5	2,5 / 4,0
120 (60+60)	7,5	2,5 / 2,5 / 2,5
120 (60+60)	8,0	4,0 / 4,0
120 (60+60)	9,0	4,0 / 2,5 / 2,5
120 (60+60)	10,0	2,5 / 2,5 / 2,5 / 2,5
120 (60+60)	10,5	4,0 / 4,0 / 2,5
120 (60+60)	11,5	4,0 / 2,5 / 2,5 / 2,5
120 (60+60)	12,0	4,0 / 4,0 / 4,0
120 (60+60)	12,5	2,5 / 2,5 / 2,5 / 2,5 / 2,5
120 (60+60)	13,0	4,0 / 4,0 / 2,5 / 2,5
120 (60+60)	14,0	2,5 / 2,5 / 2,5/ 2,5 / 4,0
120 (60+60)	14,5	4,0 / 4,0 / 4,0 / 2,5
120 (60+60)	15,0	2,5 / 2,5 / 2,5 / 2,5 / 2,5 / 2,5

Table B3. PIRO Multitube PM with width of 100 mm.

Width of intumescent band *h* [mm]	Thickness of intumescent band *s* [mm]	Layers of intumescent band thickness*) [mm]
100	2,4	2,4
100	4,8	4,8
100	7,2	4,8 / 2,4
100	9,6	4,8 / 4,8
100	12,0	4,8 / 4,8 / 2,4
100	14,4	4,8 / 4,8 / 4,8
100	16,8	4,8 / 4,8 / 4,8 / 2,4
100	19,2	4,8 / 4,8 / 4,8 / 4,8

*) instead of one wrap thickness of 4,8 mm, two wraps thickness of 2,4 mm can be used

Table B4. Replacements of PIRO Multitube PM depending on the width of the band – change from bands with width of 120 mm to bands with width of 100 mm.

Width of intumescent band acc. to Table B2 [mm]	Thickness of intumescent band acc. to Table B2 [mm]	Width of replacement intumescent band [mm]	Thickness of replacement intumescent band [mm]
120 (60+60)	2,5	100	4,8
120 (60+60)	4,0	100	4,8
120 (60+60)	5,0	100	7,2
120 (60+60)	6,5	100	9,6
120 (60+60)	7,5	100	9,6
120 (60+60)	8,0	100	9,6
120 (60+60)	9,0	100	12,0
120 (60+60)	10,0	100	12,0
120 (60+60)	10,5	100	14,4
120 (60+60)	11,5	100	14,4
120 (60+60)	12,0	100	14,4
120 (60+60)	12,5	100	16,8
120 (60+60)	13,0	100	16,8
120 (60+60)	14,0	100	16,8
120 (60+60)	14,5	100	19,2
120 (60+60)	15,0	100	19,2

Table B5. Replacements of PIRO Multitube PM depending on the width of the band – change from bands with width of 120 mm to bands with width of 60 mm.

Width of intumescent band acc. to Table B2 [mm]	Thickness of intumescent band acc. to Table B2 [mm]	Width of replacement intumescent band [mm]	Thickness of replacement intumescent band [mm]
120 (60+60)	2,5	60	5,0
120 (60+60)	4,0	60	8,0
120 (60+60)	5,0	60	10,0
120 (60+60)	6,5	60	13,0
120 (60+60)	7,5	60	15,0
120 (60+60)	8,0	60	16,0
120 (60+60)	9,0	60	18,0
120 (60+60)	10,0	60	20,0
120 (60+60)	10,5	60	21,0
120 (60+60)	11,5	60	23,0
120 (60+60)	12,0	60	24,0

Table B6. Replacements of PIRO Multitube PM depending on the width of the band – change from bands with width of 100 mm to bands with width of 60 mm.

Width of intumescent band acc. to Table B3 [mm]	Thickness of intumescent band acc. to Table B3 [mm]	Width of replacement intumescent band [mm]	Thickness of replacement intumescent band [mm]
100	2,4	60	4,0
100	4,8	60	8,0
100	7,2	60	12,0
100	9,6	60	16,0
100	12,0	60	20,0
100	14,4	60	24,0

Table C1. Resistance to fire classification of metal pipes (without insulation) penetration seals in flexible or rigid wall, made with use of PIRO Multitube PM in accordance with Annex A1 and Annex D1.

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Intumescent material length x thickness [mm]	Fire resistance class
Cooper	DN ≤ 10	≥ 10	180 x 4,0	**EI 120-C/U EI 120–C/C**
Steel	DN ≤ 10	≥ 0,8	180 x 4,0	
	10 < DN ≤ 17,2	≥ 2,3	180 x 4,0	
Cast iron	DN ≤ 10	≥ 0,8	180 x 4,0	
	10 < DN ≤ 20	≥ 1,5	180 x 4,0	
	20 < DN ≤ 30	2,2 – 14,2	180 x 4,0	
	30 < DN ≤ 40	2,8 – 14,2	180 x 4,0	
	40 < DN ≤ 50	3,5 – 14,2	180 x 4,0	
wall thickness ≥ 125 mm				

Table C2. Resistance to fire classification of plastic pipes (without insulation) penetration seals in flexible or rigid wall, made with use of PIRO Multitube PM in accordance with Annex A1 and Annex D2.

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Intumescent material length x thickness [mm]	Fire resistance class
PVC-U / PVC-C	DN ≤ 50	0,8 – 2,4	60 x 2,5	**EI 120-U/C EI 120-C/C**
		2,5 – 5,8	60 x 8,0	
			100 x 4,8	
			120 x 4,0	
	50 < DN ≤ 110	1,8 – 5,8	60 x 8,0	
			100 x 4,8	
			120 x 4,0	
PP	DN ≤ 50	1,8 – 2,6	60 x 2,5	
		2,7 – 5,5	60 x 8,0	
			100 x 4,8	
			120 x 4,0	
	50 < DN ≤ 60	2,0 – 5,5	60 x 8,0	
			100 x 4,8	
			120 x 4,0	
	60 < DN ≤ 70	2,1 – 5,5	60 x 8,0	
			100 x 4,8	
			120 x 4,0	
	70 < DN ≤ 80	2,3 – 5,5	60 x 8,0	
			100 x 4,8	
			120 x 4,0	
	80 < DN ≤ 90	2,5 – 5,5	60 x 8,0	
			100 x 4,8	
			120 x 4,0	
	90 < DN ≤ 100	2,6 – 5,5	60 x 8,0	
			100 x 4,8	
			120 x 4,0	
	100 < DN ≤ 110	2,8 – 5,5	60 x 8,0	
			100 x 4,8	
			120 x 4,0	
wall thickness ≥ 100 mm				

Table C2. Resistance to fire classification of plastic pipes (without insulation) penetration seals in flexible or rigid wall, made with use of PIRO Multitube PM in accordance with Annex A1 and Annex D2 (continued).

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Intumescent material length x thickness [mm]	Fire resistance class
PE-HD / PE / ABS / SAN + PVC	DN ≤ 50	1,8 – 2,4	60 x 2,5	**EI 120-U/C EI 120-C/C**
		2,5 – 4,2	60 x 8,0	
			100 x 4,8	
			120 x 4,0	
		4,3 – 6,8	60 x 8,0	**EI 90-U/C EI 90-C/C**
			100 x 4,8	
			120 x 4,0	
	50 < DN ≤ 60	2,2 – 4,2	60 x 8,0	**EI 120-U/C EI 120-C/C**
			100 x 4,8	
			120 x 4,0	
		4,3 – 6,8	60 x 8,0	**EI 90-U/C EI 90-C/C**
			100 x 4,8	
			120 x 4,0	
	60 < DN ≤ 70	2,6 – 4,2	60 x 8,0	**EI 120-U/C EI 120-C/C**
			100 x 4,8	
			120 x 4,0	
		4,3 – 6,8	60 x 8,0	**EI 90-U/C EI 90-C/C**
			100 x 4,8	
			120 x 4,0	
	70 < DN ≤ 80	3,0 – 4,2	60 x 8,0	**EI 120-U/C EI 120-C/C**
			100 x 4,8	
			120 x 4,0	
	70 < DN ≤ 80	4,3 – 6,8	60 x 8,0	**EI 90-U/C EI 90-C/C**
			100 x 4,8	
			120 x 4,0	
	80 < DN ≤ 90	3,4 – 4,2	60 x 8,0	**EI 120-U/C EI 120-C/C**
			100 x 4,8	
			120 x 4,0	
		4,3 – 6,8	60 x 8,0	**EI 90-U/C EI 90-C/C**
			100 x 4,8	
			120 x 4,0	
	90 < DN ≤ 100	3,8 – 4,2	60 x 8,0	**EI 120-U/C EI 120-C/C**
			100 x 4,8	
			120 x 4,0	
		4,3 – 6,8	60 x 8,0	**EI 90-U/C EI 90-C/C**
			100 x 4,8	
			120 x 4,0	
	100 < DN ≤ 110	4,2	60 x 8,0	**EI 120-U/C EI 120-C/C**
			100 x 4,8	
			120 x 4,0	
		4,3 – 6,8	60 x 8,0	**EI 90-U/C EI 90-C/C**
			100 x 4,8	
			120 x 4,0	
wall thickness ≥ 100 mm				

Table C3. Resistance to fire classification of plastic pipes (without insulation) penetration seals in rigid wall, made with use of PIRO Multitube PM in accordance with Annex A1 and Annex D3.

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Intumescent material length x thickness [mm]	Fire resistance class
PVC-U / PVC-C	DN ≤ 50	1,8 – 2,4	60 x 2,5	**EI 120-U/C EI 120-C/C**
		2,5 – 5,8	60 x 8,0	
			100 x 4,8	
			120 x 4,0	
		5,9 – 6,5	60 x 10,0	
			100 x 7,2	
			120 x 5,0	
		6,6 – 7,6	60 x 13,0	
			100 x 9,6	
			120 x 6,5	
		7,7 – 8,4	60 x 15,0	
			100 x 9,6	
			120 x 7,5	
		8,5 – 8,7	60 x 16,0	
			100 x 9,6	
			120 x 8,0	
		8,8 – 9,4	60 x 18,0	
			100 x 12,0	
			120 x 9,0	
		9,5 – 10,3	60 x 20,0	
			100 x 12,0	
			120 x 10,0	
		10,4 – 10,6	60 x 21,0	
			100 x 14,4	
			120 x 10,5	
		10,7 – 11,4	60 x 23,0	
			100 x 14,4	
			120 x 11,5	
		11,5 – 11,7	60 x 24,0	
			100 x 14,4	
			120 x 12,0	
		11,8 – 12,1	100 x 16,8	
			120 x 12,5	
		12,2 – 12,5	100 x 16,8	
			120 x 13,0	
		12,6 – 13,2	100 x 16,8	
			120 x 14,0	
wall thickness ≥ 150 mm				

Table C3. Resistance to fire classification of plastic pipes (without insulation) penetration seals in rigid wall, made with use of PIRO Multitube PM in accordance with Annex A1 and Annex D3 (continued).

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Intumescent material length x thickness [mm]	Fire resistance class
PVC-U / PVC-C	DN ≤ 50	13,3 – 13,5	100 x 19,2	**EI 120-U/C EI 120-C/C**
			120 x 14,5	
		13,6 – 14,0	100 x 19,2	
			120 x 15,0	
	50 < DN ≤ 110	1,8 – 5,8	60 x 8,0	**EI 120-U/C EI 120-C/C**
			100 x 4,8	
			120 x 4,0	
		5,9 – 6,5	60 x 10,0	
			100 x 7,2	
			120 x 5,0	
		6,6 – 7,6	60 x 13,0	
			100 x 9,6	
			120 x 6,5	
		7,7 – 8,4	60 x 15,0	
			100 x 9,6	
			120 x 7,5	
		8,5 – 8,7	60 x 16,0	
			100 x 9,6	
			120 x 8,0	
		8,8 – 9,4	60 x 18,0	
			100 x 12,0	
			120 x 9,0	
		9,5 – 10,3	60 x 20,0	
			100 x 12,0	
			120 x 10,0	
		10,4 – 10,6	60 x 21,0	
			100 x 14,4	
			120 x 10,5	
		10,7 – 11,4	60 x 23,0	
			100 x 14,4	
			120 x 11,5	
		11,5 – 11,7	60 x 24,0	
			100 x 14,4	
			120 x 12,0	
		11,8 – 12,1	100 x 16,8	
			120 x 12,5	
		12,2 – 12,5	100 x 16,8	
			120 x 13,0	
		12,6 – 13,2	100 x 16,8	
			120 x 14,0	
		13,3 – 13,5	100 x 19,2	
			120 x 14,5	
		13,6 – 14,0	100 x 19,2	
			120 x 15,0	
wall thickness ≥ 150 mm				

Table C3. Resistance to fire classification of plastic pipes (without insulation) penetration seals in rigid wall, made with use of PIRO Multitube PM in accordance with Annex A1 and Annex D3 (continued).

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Intumescent material length x thickness [mm]	Fire resistance class
PVC-U / PVC-C	110 < DN ≤ 118	2,1 – 6,5	60 x 10,0	**EI 120-U/C EI 120-C/C**
			100 x 9,6	
			120 x 5,0	
		6,6 – 7,6	60 x 13,0	
			100 x 9,6	
			120 x 6,5	
		7,7 – 8,4	60 x 15,0	
			100 x 9,6	
			120 x 7,5	
		8,5 – 8,7	60 x 16,0	
			100 x 9,6	
			120 x 8,0	
		8,8 – 9,4	60 x 18,0	
			100 x 12,0	
			120 x 9,0	
		9,5 – 10,3	60 x 20,0	
			100 x 12,0	
			120 x 10,0	
		10,4 – 10,6	60 x 21,0	
			100 x 14,4	
			120 x 10,5	
		10,7 – 11,4	60 x 23,0	
			100 x 14,4	
			120 x 11,5	
		11,5 – 11,7	60 x 24,0	
			100 x 14,4	
			120 x 12,0	
		11,8 – 12,1	100 x 16,8	
			120 x 12,5	
		12,2 – 12,5	100 x 16,8	
			120 x 13,0	
		12,6 – 13,2	100 x 16,8	
			120 x 14,0	
		13,3 – 13,5	100 x 19,2	
			120 x 14,5	
		13,6 – 14,0	100 x 19,2	
			120 x 15,0	
	118 < DN ≤ 130	2,6 – 7,6	60 x 13,0	**EI 120-U/C EI 120-C/C**
			100 x 9,6	
			120 x 6,5	
		7,7 – 8,4	60 x 15,0	
			100 x 9,6	
			120 x 7,5	
wall thickness ≥ 150 mm				

Table C3. Resistance to fire classification of plastic pipes (without insulation) penetration seals in rigid wall, made with use of PIRO Multitube PM in accordance with Annex A1 and Annex D3 (continued).

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Intumescent material length x thickness [mm]	Fire resistance class
PVC-U / PVC-C	118 < DN ≤ 130	8,5 – 8,7	60 x 16,0	**EI 120-U/C EI 120-C/C**
			100 x 9,6	
			120 x 8,0	
		8,8 – 9,4	60 x 18,0	
			100 x 12,0	
			120 x 9,0	
		9,5 – 10,3	60 x 20,0	
			100 x 12,0	
			120 x 10,0	
		10,4 – 10,6	60 x 21,0	
			100 x 14,4	
			120 x 10,5	
		10,7 – 11,4	60 x 23,0	
			100 x 14,4	
			120 x 11,5	
		11,5 – 11,7	60 x 24,0	
			100 x 14,4	
			120 x 12,0	
		11,8 – 12,1	100 x 16,8	
			120 x 12,5	
		12,2 – 12,5	100 x 16,8	
			120 x 13,0	
		12,6 – 13,2	100 x 16,8	
			120 x 14,0	
		13,3 – 13,5	100 x 19,2	
			120 x 14,5	
		13,6 – 14,0	100 x 19,2	
			120 x 15,0	
	130 < DN ≤ 138	3,0 – 8,4	60 x 15,0	**EI 120-U/C EI 120-C/C**
			100 x 9,6	
			120 x 7,5	
		8,5 – 8,7	60 x 16,0	
			100 x 9,6	
			120 x 8,0	
		8,8 – 9,4	60 x 18,0	
			100 x 12,0	
			120 x 9,0	
		9,5 – 10,3	60 x 20,0	
			100 x 12,0	
			120 x 10,0	
		10,4 – 10,6	60 x 21,0	
			100 x 14,4	
			120 x 10,5	
wall thickness ≥ 150 mm				

Table C3. Resistance to fire classification of plastic pipes (without insulation) penetration seals in rigid wall, made with use of PIRO Multitube PM in accordance with Annex A1 and Annex D3 (continued).

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Intumescent material length x thickness [mm]	Fire resistance class
PVC-U / PVC-C	130 < DN ≤ 138	10,7 – 11,4	60 x 23,0	**EI 120-U/C EI 120-C/C**
			100 x 14,4	
			120 x 11,5	
		11,5 – 11,7	60 x 24,0	
			100 x 14,4	
			120 x 12,0	
		11,8 – 12,1	100 x 16,8	
			120 x 12,5	
		12,2 – 12,5	100 x 16,8	
			120 x 13,0	
		12,6 – 13,2	100 x 16,8	
			120 x 14,0	
		13,3 – 13,5	100 x 19,2	
			120 x 14,5	
		13,6 – 14,0	100 x 19,2	
			120 x 15,0	
	138 < DN ≤ 142	3,2 – 8,7	60 x 16,0	**EI 120-U/C EI 120-C/C**
			100 x 9,6	
			120 x 8,0	
		8,8 – 10,3	60 x 20,0	
			100 x 12,0	
			120 x 10,0	
		10,4 – 10,6	60 x 21,0	
			100 x 14,4	
			120 x 10,5	
		10,7 – 11,4	60 x 23,0	
			100 x 14,4	
			120 x 11,5	
		11,5 – 11,7	60 x 24,0	
			100 x 14,4	
			120 x 12,0	
		11,8 – 12,1	100 x 16,8	
			120 x 12,5	
		12,2 – 12,5	100 x 16,8	
			120 x 13,0	
		12,6 – 13,2	100 x 16,8	
			120 x 14,0	
		13,3 – 13,5	100 x 19,2	
			120 x 14,5	
		13,6 – 14,0	100 x 19,2	
			120 x 15,0	
wall thickness ≥ 150 mm				

Table C3. Resistance to fire classification of plastic pipes (without insulation) penetration seals in rigid wall, made with use of PIRO Multitube PM in accordance with Annex A1 and Annex D3 (continued).

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Intumescent material length x thickness [mm]	Fire resistance class
PVC-U / PVC-C	142 < DN ≤ 150	3,5 – 9,4	60 x 18,0	**EI 120-U/C EI 120-C/C**
			100 x 12,0	
			120 x 9,0	
		9,5 – 10,3	60 x 20,0	
			100 x 12,0	
			120 x 10,0	
		10,4 – 10,6	60 x 21,0	
			100 x 14,4	
			120 x 10,5	
		10,7 – 11,4	60 x 23,0	
			100 x 14,4	
			120 x 11,5	
		11,5 – 11,7	60 x 24,0	
			100 x 14,4	
			120 x 12,0	
		11,8 – 12,1	100 x 16,8	
			120 x 12,5	
		12,2 – 12,5	100 x 16,8	
			120 x 13,0	
		12,6 – 13,2	100 x 16,8	
			120 x 14,0	
		13,3 – 13,5	100 x 19,2	
			120 x 14,5	
		13,6 – 14,0	100 x 19,2	
			120 x 15,0	
	150 < DN ≤ 159	3,9 – 10,3	60 x 20,0	**EI 120-U/C EI 120-C/C**
			100 x 12,0	
			120 x 10,0	
		10,4 – 10,6	60 x 21,0	
			100 x 14,4	
			120 x 10,5	
		10,7 – 11,4	60 x 23,0	
			100 x 14,4	
			120 x 11,5	
		11,5 – 11,7	60 x 24,0	
			100 x 14,4	
			120 x 12,0	
		11,8 – 12,1	100 x 16,8	
			120 x 12,5	
		12,2 – 12,5	100 x 16,8	
			120 x 13,0	
		12,6 – 13,2	100 x 16,8	
			120 x 14,0	
		13,3 – 13,5	100 x 19,2	
			120 x 14,5	
		13,6 – 14,0	100 x 19,2	
			120 x 15,0	
wall thickness ≥ 150 mm				

Table C3. Resistance to fire classification of plastic pipes (without insulation) penetration seals in rigid wall, made with use of PIRO Multitube PM in accordance with Annex A1 and Annex D3 (continued).

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Intumescent material length x thickness [mm]	Fire resistance class
PVC-U / PVC-C	159 < DN ≤ 163	4,0 – 10,6	60 x 21,0	**EI 120-U/C EI 120-C/C**
			100 x 14,4	
			120 x 10,5	
		10,7 – 11,4	60 x 23,0	
			100 x 14,4	
			120 x 11,5	
		11,5 – 11,7	60 x 24,0	
			100 x 14,4	
			120 x 12,0	
		11,8 – 12,1	100 x 16,8	
			120 x 12,5	
		12,2 – 12,5	100 x 16,8	
			120 x 13,0	
		12,6 – 13,2	100 x 16,8	
			120 x 14,0	
		13,3 – 13,5	100 x 19,2	
			120 x 14,5	
		13,6 – 14,0	100 x 19,2	
			120 x 15,0	
	163 < DN ≤ 171	4,4 – 11,4	60 x 23,0	**EI 120-U/C EI 120-C/C**
			100 x 14,4	
			120 x 11,5	
		11,5 – 11,7	60 x 24,0	
			100 x 14,4	
			120 x 12,0	
		11,8 – 12,1	100 x 16,8	
			120 x 12,5	
		12,2 – 12,5	100 x 16,8	
			120 x 13,0	
		12,6 – 13,2	100 x 16,8	
			120 x 14,0	
		13,3 – 13,5	100 x 19,2	
			120 x 14,5	
		13,6 – 14,0	100 x 19,2	
			120 x 15,0	
	171 < DN ≤ 175	4,5 – 11,7	60 x 24,0	**EI 120-U/C EI 120-C/C**
			100 x 14,4	
			120 x 12,0	
wall thickness ≥ 150 mm				

Table C3. Resistance to fire classification of plastic pipes (without insulation) penetration seals in rigid wall, made with use of PIRO Multitube PM in accordance with Annex A1 and Annex D3 (continued).

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Intumescent material length x thickness [mm]	Fire resistance class
PVC-U / PVC-C	171 < DN ≤ 175	11,8 – 12,1	100 x 16,8	**EI 120-U/C EI 120-C/C**
			120 x 12,5	
		12,2 – 12,5	100 x 16,8	
			120 x 13,0	
		12,6 – 13,2	100 x 16,8	
			120 x 14,0	
		13,3 – 13,5	100 x 19,2	
			120 x 14,5	
		13,6 – 14,0	100 x 19,2	
			120 x 15,0	
	175 < DN ≤ 179	4,7 – 12,1	100 x 16,8	**EI 120-U/C EI 120-C/C**
			120 x 12,5	
		12,2 – 12,5	100 x 16,8	
			120 x 13,0	
		12,6 – 13,2	100 x 16,8	
			120 x 14,0	
		13,3 – 13,5	100 x 19,2	
			120 x 14,5	
		13,6 – 14,0	100 x 19,2	
			120 x 15,0	
	179 < DN ≤ 183	4,9 – 12,5	100 x 16,8	**EI 120-U/C EI 120-C/C**
			120 x 13,0	
		12,6 – 13,2	100 x 16,8	
			120 x 14,0	
		13,3 – 13,5	100 x 19,2	
			120 x 14,5	
		13,6 – 14,0	100 x 19,2	
			120 x 15,0	
	183 < DN ≤ 191	5,2 – 13,2	100 x 16,8	**EI 120-U/C EI 120-C/C**
			120 x 14,0	
		13,3 – 13,5	100 x 19,2	
			120 x 14,5	
		13,6 – 14,0	100 x 19,2	
			120 x 15,0	
	191 < DN ≤ 195	5,4 – 13,5	100 x 19,2	**EI 120-U/C EI 120-C/C**
			120 x 14,5	
		13,6 – 14,0	100 x 19,2	
			120 x 15,0	
	195 < DN ≤ 200	5,6 – 14,0	100 x 19,2	**EI 120-U/C EI 120-C/C**
			120 x 15,0	
wall thickness ≥ 150 mm				

Table C3. Resistance to fire classification of plastic pipes (without insulation) penetration seals in rigid wall, made with use of PIRO Multitube PM in accordance with Annex A1 and Annex D3 (continued).

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Intumescent material length x thickness [mm]	Fire resistance class
PP	DN ≤ 40	1,8 – 4,0	60 x 2,5	**EI 120-U/C EI 120-C/C**
		4,1 – 5,5	60 x 8,0	
			100 x 4,8	
			120 x 4,0	
		5,6 – 6,6	60 x 10,0	
			100 x 7,2	
			120 x 5,0	
		6,7 – 8,2	60 x 13,0	
			100 x 9,6	
			120 x 6,5	
		8,3 – 9,2	60 x 15,0	
			100 x 9,6	
			120 x 7,5	
		9,3 – 9,8	60 x 16,0	
			100 x 9,6	
			120 x 8,0	
		9,9 – 10,8	60 x 18,0	
			100 x 12,0	
			120 x 9,0	
		10,9 – 12,0	60 x 20,0	
			100 x 12,0	
			120 x 10,0	
		12,1 – 12,6	60 x 21,0	
			100 x 14,4	
			120 x 10,5	
		12,7 – 13,6	60 x 23,0	
			100 x 14,4	
			120 x 11,5	
		13,7 – 14,2	60 x 24,0	
			100 x 14,4	
			120 x 12,0	
		14,3 – 14,7	100 x 16,8	
			120 x 12,5	
		14,8 – 15,2	100 x 16,8	
			120 x 13,0	
		15,3 – 16,3	100 x 16,8	
			120 x 14,0	
		16,4 – 16,8	100 x 19,2	
			120 x 14,5	
		16,9 – 17,5	100 x 19,2	
			120 x 15,0	
wall thickness ≥ 150 mm				

Table C3. Resistance to fire classification of plastic pipes (without insulation) penetration seals in rigid wall, made with use of PIRO Multitube PM in accordance with Annex A1 and Annex D3 (continued).

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Intumescent material length x thickness [mm]	Fire resistance class
PP	40 < DN ≤ 50	1,8 – 2,6	60 x 2,5	**EI 120-U/C EI 120-C/C**
		2,7 – 5,5	60 x 8,0	
			100 x 4,8	
			120 x 4,0	
		5,6 – 6,6	60 x 10,0	
			100 x 7,2	
			120 x 5,0	
		6,7 – 8,2	60 x 13,0	
			100 x 9,6	
			120 x 6,5	
		8,3 – 9,2	60 x 13,0	
			100 x 9,6	
			120 x 7,5	
		9,3 – 9,8	60 x 16,0	
			100 x 9,6	
			120 x 8,0	
		9,9 – 10,8	60 x 18,0	
			100 x 12,0	
			120 x 9,0	
		10,9 – 12,0	60 x 20,0	
			100 x 12,0	
			120 x 10,0	
		12,1 – 12,6	60 x 21,0	
			100 x 14,4	
			120 x 10,5	
		12,7 – 13,6	60 x 23,0	
			100 x 14,4	
			120 x 11,5	
		13,7 – 14,2	60 x 24,0	
			100 x 14,4	
			120 x 12,0	
		14,3 – 14,7	100 x 16,8	
			120 x 12,5	
		14,8 – 15,2	100 x 16,8	
			120 x 13,0	
		15,3 – 16,3	100 x 16,8	
			120 x 14,0	
		16,4 – 16,8	100 x 19,2	
			120 x 14,5	
		16,9 – 17,5	100 x 19,2	
			120 x 15,0	
wall thickness ≥ 150 mm				

Table C3. Resistance to fire classification of plastic pipes (without insulation) penetration seals in rigid wall, made with use of PIRO Multitube PM in accordance with Annex A1 and Annex D3 (continued).

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Intumescent material length x thickness [mm]	Fire resistance class
PP	50 < DN ≤ 60	2,0 – 5,5	60 x 8,0	**EI 120-U/C EI 120-C/C**
			100 x 4,8	
			120 x 4,0	
		5,6 – 6,6	60 x 10,0	
			100 x 7,2	
			120 x 5,0	
		6,7 – 8,2	60 x 13,0	
			100 x 9,6	
			120 x 6,5	
		8,3 – 9,2	60 x 15,0	
			100 x 9,6	
			120 x 7,5	
		9,3 – 9,8	60 x 16,0	
			100 x 9,6	
			120 x 8,0	
		9,9 – 10,8	60 x 18,0	
			100 x 12,0	
			120 x 9,0	
		10,9 – 12,0	60 x 20,0	
			100 x 12,0	
			120 x 10,0	
		12,1 – 12,6	60 x 21,0	
			100 x 14,4	
			120 x 10,5	
		12,7 – 13,6	60 x 23,0	
			100 x 14,4	
			120 x 11,5	
		13,7 – 14,2	60 x 24,0	
			100 x 14,4	
			120 x 12,0	
	50 < DN ≤ 60	14,3 – 14,7	100 x 16,8	**EI 120-U/C EI 120-C/C**
			120 x 12,5	
		14,8 – 15,2	100 x 16,8	
			120 x 13,0	
		15,3 – 16,3	100 x 16,8	
			120 x 14,0	
		16,4 – 16,8	100 x 19,2	
			120 x 14,5	
		16,9 – 17,5	100 x 19,2	
			120 x 15,0	
	60 < DN ≤ 70	2,1 – 5,5	60 x 8,0	**EI 120-U/C EI 120-C/C**
			100 x 4,8	
			120 x 4,0	
wall thickness ≥ 150 mm				

Table C3. Resistance to fire classification of plastic pipes (without insulation) penetration seals in rigid wall, made with use of PIRO Multitube PM in accordance with Annex A1 and Annex D3 (continued).

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Intumescent material length x thickness [mm]	Fire resistance class
PP	60 < DN ≤ 70	5,6 – 6,6	60 x 10,0	**EI 120-U/C EI 120-C/C**
			100 x 7,2	
			120 x 5,0	
		6,7 – 8,2	60 x 13,0	
			100 x 9,6	
			120 x 6,5	
		8,3 – 9,2	60 x 15,0	
			100 x 9,6	
			120 x 7,5	
		9,3 – 9,8	60 x 16,0	
			100 x 9,6	
			120 x 8,0	
		9,9 – 10,8	60 x 18,0	
			100 x 12,0	
			120 x 9,0	
		10,9 – 12,0	60 x 20,0	
			100 x 12,0	
			120 x 10,0	
		12,1 – 12,6	60 x 21,0	
			100 x 14,4	
			120 x 10,5	
		12,7 – 13,6	60 x 23,0	
			100 x 14,4	
			120 x 11,5	
		13,7 – 14,2	60 x 24,0	
			100 x 14,4	
			120 x 12,0	
		14,3 – 14,7	100 x 16,8	
			120 x 12,5	
		14,8 – 15,2	100 x 16,8	
			120 x 13,0	
		15,3 – 16,3	100 x 16,8	
			120 x 14,0	
		16,4 – 16,8	100 x 19,2	
			120 x 14,5	
		16,9 – 17,5	100 x 19,2	
			120 x 15,0	
	70 < DN ≤ 80	2,3 – 5,5	60 x 8,0	**EI 120-U/C EI 120-C/C**
			100 x 4,8	
			120 x 4,0	
		5,6 – 6,6	60 x 10,0	
			100 x 7,2	
			120 x 5,0	
wall thickness ≥ 150 mm				

Table C3. Resistance to fire classification of plastic pipes (without insulation) penetration seals in rigid wall, made with use of PIRO Multitube PM in accordance with Annex A1 and Annex D3 (continued).

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Intumescent material length x thickness [mm]	Fire resistance class
PP	70 < DN ≤ 80	6,7 – 8,2	60 x 13,0	**EI 120-U/C** **EI 120-C/C**
			100 x 9,6	
			120 x 6,5	
		8,3 – 9,2	60 x 15,0	
			100 x 9,6	
			120 x 7,5	
		9,3 – 9,8	60 x 16,0	
			100 x 9,6	
			120 x 8,0	
		9,9 – 10,8	60 x 18,0	
			100 x 12,0	
			120 x 9,0	
		10,9 – 12,0	60 x 20,0	
			100 x 12,0	
			120 x 10,0	
		12,1 – 12,6	60 x 21,0	
			100 x 14,4	
			120 x 10,5	
		12,7 – 13,6	60 x 23,0	
			100 x 14,4	
			120 x 11,5	
		13,7 – 14,2	60 x 24,0	
			100 x 14,4	
			120 x 12,0	
		14,3 – 14,7	100 x 16,8	
			120 x 12,5	
		14,8 – 15,2	100 x 16,8	
			120 x 13,0	
		15,3 – 16,3	100 x 16,8	
			120 x 14,0	
		16,4 – 16,8	100 x 19,2	
			120 x 14,5	
		16,9 – 17,5	100 x 19,2	
			120 x 15,0	
	80 < DN ≤ 90	2,5 – 5,5	60 x 8,0	**EI 120-U/C** **EI 120-C/C**
			100 x 4,8	
			120 x 4,0	
		5,6 – 6,6	60 x 10,0	
			100 x 7,2	
			120 x 5,0	
		6,7 – 8,2	60 x 13,0	
			100 x 9,6	
			120 x 6,5	
wall thickness ≥ 150 mm				

Table C3. Resistance to fire classification of plastic pipes (without insulation) penetration seals in rigid wall, made with use of PIRO Multitube PM in accordance with Annex A1 and Annex D3 (continued).

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Intumescent material length x thickness [mm]	Fire resistance class
PP	80 < DN ≤ 90	8,3 – 9,2	60 x 15,0	**EI 120-U/C EI 120-C/C**
			100 x 9,6	
			120 x 7,5	
		9,3 – 9,8	60 x 16,0	
			100 x 9,6	
			120 x 8,0	
		9,9 – 10,8	60 x 18,0	
			100 x 12,0	
			120 x 9,0	
		10,9 – 12,0	60 x 20,0	
			100 x 12,0	
			120 x 10,0	
		12,1 – 12,6	60 x 21,0	
			100 x 14,4	
			120 x 10,5	
		12,7 – 13,6	60 x 23,0	
			100 x 14,4	
			120 x 11,5	
		13,7 – 14,2	60 x 24,0	
			100 x 14,4	
			120 x 12,0	
		14,3 – 14,7	100 x 16,8	
			120 x 12,5	
		14,8 – 15,2	100 x 16,8	
			120 x 13,0	
		15,3 – 16,3	100 x 16,8	
			120 x 14,0	
		16,4 – 16,8	100 x 19,2	
			120 x 14,5	
		16,9 – 17,5	100 x 19,2	
			120 x 15,0	
	90 < DN ≤ 100	2,6 – 5,5	60 x 8,0	**EI 120-U/C EI 120-C/C**
			100 x 4,8	
			120 x 4,0	
		5,6 – 6,6	60 x 10,0	
			100 x 7,2	
			120 x 5,0	
		6,7 – 8,2	60 x 13,0	
			100 x 9,6	
			120 x 6,5	
		8,3 – 9,2	60 x 15,0	
			100 x 9,6	
			120 x 7,5	
wall thickness ≥ 150 mm				

Table C3. Resistance to fire classification of plastic pipes (without insulation) penetration seals in rigid wall, made with use of PIRO Multitube PM in accordance with Annex A1 and Annex D3 (continued).

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Intumescent material length x thickness [mm]	Fire resistance class
PP	90 < DN ≤ 100	9,3 – 9,8	60 x 16,0	**EI 120-U/C EI 120-C/C**
			100 x 9,6	
			120 x 8,0	
		9,9 – 10,8	60 x 18,0	
			100 x 12,0	
			120 x 9,0	
		10,9 – 12,0	60 x 20,0	
			100 x 12,0	
			120 x 10,0	
		12,1 – 12,6	60 x 21,0	
			100 x 14,4	
			120 x 10,5	
		12,7 – 13,6	60 x 23,0	
			100 x 14,4	
			120 x 11,5	
		13,7 – 14,2	60 x 24,0	
			100 x 14,4	
			120 x 12,0	
		14,3 – 14,7	100 x 16,8	
			120 x 12,5	
		14,8 – 15,2	100 x 16,8	
			120 x 13,0	
		15,3 – 16,3	100 x 16,8	
			120 x 14,0	
		16,4 – 16,8	100 x 19,2	
			120 x 14,5	
		16,9 – 17,5	100 x 19,2	
			120 x 15,0	
	100 < DN ≤ 110	2,7 – 5,5	60 x 8,0	**EI 120-U/C EI 120-C/C**
			100 x 4,8	
			120 x 4,0	
		5,6 – 6,6	60 x 10,0	
			100 x 7,2	
			120 x 5,0	
		6,7 – 8,2	60 x 13,0	
			100 x 9,6	
			120 x 6,5	
		8,3 – 9,2	60 x 15,0	
			100 x 9,6	
			120 x 7,5	
		9,3 – 9,8	60 x 16,0	
			100 x 9,6	
			120 x 8,0	
wall thickness ≥ 150 mm				

Table C3. Resistance to fire classification of plastic pipes (without insulation) penetration seals in rigid wall, made with use of PIRO Multitube PM in accordance with Annex A1 and Annex D3 (continued).

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Intumescent material length x thickness [mm]	Fire resistance class
PP	100 < DN ≤ 110	9,9 – 10,8	60 x 18,0	**EI 120-U/C EI 120-C/C**
			100 x 12,0	
			120 x 9,0	
		10,9 – 12,0	60 x 20,0	
			100 x 12,0	
			120 x 10,0	
		12,1 – 12,6	60 x 21,0	
			100 x 14,4	
			120 x 10,5	
		12,7 – 13,6	60 x 23,0	
			100 x 14,4	
			120 x 11,5	
		13,7 – 14,2	60 x 24,0	
			100 x 14,4	
			120 x 12,0	
		14,3 – 14,7	100 x 16,8	
			120 x 12,5	
		14,8 – 15,2	100 x 16,8	
			120 x 13,0	
		15,3 – 16,3	100 x 16,8	
			120 x 14,0	
		16,4 – 16,8	100 x 19,2	
			120 x 14,5	
		16,9 – 17,5	100 x 19,2	
			120 x 15,0	
	110 < DN ≤ 118	3,4 – 6,6	60 x 10,0	**EI 120-U/C EI 120-C/C**
			100 x 7,2	
			120 x 5,0	
		6,7 – 8,2	60 x 13,0	
			100 x 9,6	
			120 x 6,5	
		8,3 – 9,2	60 x 15,0	
			100 x 9,6	
			120 x 7,5	
		9,3 – 9,8	60 x 16,0	
			100 x 9,6	
			120 x 8,0	
		9,9 – 10,8	60 x 18,0	
			100 x 12,0	
			120 x 9,0	
		10,9 – 12,0	60 x 20,0	
			100 x 12,0	
			120 x 10,0	
wall thickness ≥ 150 mm				

Table C3. Resistance to fire classification of plastic pipes (without insulation) penetration seals in rigid wall, made with use of PIRO Multitube PM in accordance with Annex A1 and Annex D3 (continued).

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Intumescent material length x thickness [mm]	Fire resistance class
PP	110 < DN ≤ 118	12,1 – 12,6	60 x 21,0	**EI 120-U/C EI 120-C/C**
			100 x 14,4	
			120 x 10,5	
		12,7 – 13,6	60 x 23,0	
			100 x 14,4	
			120 x 11,5	
		13,7 – 14,2	60 x 24,0	
			100 x 14,4	
			120 x 12,0	
		14,3 – 14,7	100 x 16,8	
			120 x 12,5	
		14,8 – 15,2	100 x 16,8	
			120 x 13,0	
		15,3 – 16,3	100 x 16,8	
			120 x 14,0	
		16,4 – 16,8	100 x 19,2	
			120 x 14,5	
		16,9 – 17,5	100 x 19,2	
			120 x 15,0	
	118 < DN ≤ 130	4,2 – 8,2	60 x 13,0	**EI 120-U/C EI 120-C/C**
			100 x 9,6	
			120 x 6,5	
		8,3 – 9,2	60 x 15,0	
			100 x 9,6	
			120 x 7,5	
		9,3 – 9,8	60 x 16,0	
			100 x 9,6	
			120 x 8,0	
		9,9 – 10,8	60 x 18,0	
			100 x 12,0	
			120 x 9,0	
		10,9 – 12,0	60 x 20,0	
			100 x 12,0	
			120 x 10,0	
		12,1 – 12,6	60 x 21,0	
			100 x 14,4	
			120 x 10,5	
		12,7 – 13,6	60 x 23,0	
			100 x 14,4	
			120 x 11,5	
		13,7 – 14,2	60 x 24,0	
			100 x 14,4	
			120 x 12,0	
wall thickness ≥ 150 mm				

Table C3. Resistance to fire classification of plastic pipes (without insulation) penetration seals in rigid wall, made with use of PIRO Multitube PM in accordance with Annex A1 and Annex D3 (continued).

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Intumescent material length x thickness [mm]	Fire resistance class
PP	118 < DN ≤ 130	14,3 – 14,7	100 x 16,8	**EI 120-U/C EI 120-C/C**
			120 x 12,5	
		14,8 – 15,2	100 x 16,8	
			120 x 13,0	
		15,3 – 16,3	100 x 16,8	
			120 x 14,0	
		16,4 – 16,8	100 x 19,2	
			120 x 14,5	
		16,9 – 17,5	100 x 19,2	
			120 x 15,0	
	130 < DN ≤ 138	4,7 – 9,2	60 x 15,0	**EI 120-U/C EI 120-C/C**
			100 x 9,6	
			120 x 7,5	
		9,3 – 9,8	60 x 16,0	
			100 x 9,6	
			120 x 8,0	
		9,9 – 10,8	60 x 18,0	
			100 x 12,0	
			120 x 9,0	
		10,9 – 12,0	60 x 20,0	
			100 x 12,0	
			120 x 10,0	
		12,1 – 12,6	60 x 21,0	
			100 x 14,4	
			120 x 10,5	
		12,7 – 13,6	60 x 23,0	
			100 x 14,4	
			120 x 11,5	
		13,7 – 14,2	60 x 24,0	
			100 x 14,4	
			120 x 12,0	
		14,3 – 14,7	100 x 16,8	
			120 x 12,5	
		14,8 – 15,2	100 x 16,8	
			120 x 13,0	
		15,3 – 16,3	100 x 16,8	
			120 x 14,0	
		16,4 – 16,8	100 x 19,2	
			120 x 14,5	
		16,9 – 17,5	100 x 19,2	
			120 x 15,0	
wall thickness ≥ 150 mm				

Table C3. Resistance to fire classification of plastic pipes (without insulation) penetration seals in rigid wall, made with use of PIRO Multitube PM in accordance with Annex A1 and Annex D3 (continued).

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Intumescent material length x thickness [mm]	Fire resistance class
PP	138 < DN ≤ 142	5,0 – 9,8	60 x 16,0	**EI 120-U/C EI 120-C/C**
			100 x 9,6	
			120 x 8,0	
		9,9 – 10,8	60 x 18,0	
			100 x 12,0	
			120 x 9,0	
		10,9 – 12,0	60 x 20,0	
			100 x 12,0	
			120 x 10,0	
		12,1 – 12,6	60 x 21,0	
			100 x 14,4	
			120 x 10,5	
		12,7 – 13,6	60 x 23,0	
			100 x 14,4	
			120 x 11,5	
		13,7 – 14,2	60 x 24,0	
			100 x 14,4	
			120 x 12,0	
		14,3 – 14,7	100 x 16,8	
			120 x 12,5	
		14,8 – 15,2	100 x 16,8	
			120 x 13,0	
		15,3 – 16,3	100 x 16,8	
			120 x 14,0	
		16,4 – 16,8	100 x 19,2	
			120 x 14,5	
		16,9 – 17,5	100 x 19,2	
			120 x 15,0	
	142 < DN ≤ 150	5,6 – 10,8	60 x 18,0	**EI 120-U/C EI 120-C/C**
			100 x 12,0	
			120 x 9,0	
		10,9 – 12,0	60 x 20,0	
			100 x 12,0	
			120 x 10,0	
		12,1 – 12,6	60 x 21,0	
			100 x 14,4	
			120 x 10,5	
		12,7 – 13,6	60 x 23,0	
			100 x 14,4	
			120 x 11,5	
		13,7 – 14,2	60 x 24,0	
			100 x 14,4	
			120 x 12,0	
	142 < DN ≤ 150	14,3 – 14,7	100 x 16,8	**EI 120-U/C EI 120-C/C**
			120 x 12,5	
		14,8 – 15,2	100 x 16,8	
			120 x 13,0	
		15,3 – 16,3	100 x 16,8	
			120 x 14,0	
		16,4 – 16,8	100 x 19,2	
			120 x 14,5	
wall thickness ≥ 150 mm				

Table C3. Resistance to fire classification of plastic pipes (without insulation) penetration seals in rigid wall, made with use of PIRO Multitube PM in accordance with Annex A1 and Annex D3 (continued).

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Intumescent material length x thickness [mm]	Fire resistance class
PP	142 < DN ≤ 150	16,9 – 17,5	100 x 19,2	**EI 120-U/C EI 120-C/C**
			120 x 15,0	
	150 < DN ≤ 159	6,2 – 12,0	60 x 20,0	**EI 120-U/C EI 120-C/C**
			100 x 12,0	
			120 x 10,0	
		12,1 – 12,6	60 x 21,0	
			100 x 14,4	
			120 x 10,5	
		12,7 – 13,6	60 x 23,0	
			100 x 14,4	
			120 x 11,5	
		13,7 – 14,2	60 x 24,0	
			100 x 14,4	
			120 x 12,0	
		14,3 – 14,7	100 x 16,8	
			120 x 12,5	
		14,8 – 15,2	100 x 16,8	
			120 x 13,0	
		15,3 – 16,3	100 x 16,8	
			120 x 14,0	
		16,4 – 16,8	100 x 19,2	
			120 x 14,5	
		16,9 – 17,5	100 x 19,2	
			120 x 15,0	
	159 < DN ≤ 163	6,5 – 12,6	60 x 21,0	**EI 120-U/C EI 120-C/C**
			100 x 14,4	
			120 x 10,5	
		12,7 – 13,6	60 x 23,0	
			100 x 14,4	
			120 x 11,5	
		13,7 – 14,2	60 x 24,0	
			100 x 14,4	
			120 x 12,0	
		14,3 – 14,7	100 x 16,8	
			120 x 12,5	
	159 < DN ≤ 163	14,8 – 15,2	100 x 16,8	**EI 120-U/C EI 120-C/C**
			120 x 13,0	
		15,3 – 16,3	100 x 16,8	
			120 x 14,0	
		16,4 – 16,8	100 x 19,2	
			120 x 14,5	
		16,9 – 17,5	100 x 19,2	
			120 x 15,0	
wall thickness ≥ 150 mm				

Table C3. Resistance to fire classification of plastic pipes (without insulation) penetration seals in rigid wall, made with use of PIRO Multitube PM in accordance with Annex A1 and Annex D3 (continued).

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Intumescent material length x thickness [mm]	Fire resistance class
PP	163 < DN ≤ 171	7,0 – 13,6	60 x 23,0	**EI 120-U/C EI 120-C/C**
			100 x 14,4	
			120 x 11,5	
		13,7 – 14,2	60 x 24,0	
			100 x 14,4	
			120 x 12,0	
		14,3 – 14,7	100 x 16,8	
			120 x 12,5	
		14,8 – 15,2	100 x 16,8	
			120 x 13,0	
		15,3 – 16,3	100 x 16,8	
			120 x 14,0	
		16,4 – 16,8	100 x 19,2	
			120 x 14,5	
		16,9 – 17,5	100 x 19,2	
			120 x 15,0	
	171 < DN ≤ 175	7,3 – 14,2	60 x 24,0	**EI 120-U/C EI 120-C/C**
			100 x 14,4	
			120 x 12,0	
		14,3 – 14,7	100 x 16,8	
			120 x 12,5	
		14,8 – 15,2	100 x 16,8	
			120 x 13,0	
		15,3 – 16,3	100 x 16,8	
			120 x 14,0	
		16,4 – 16,8	100 x 19,2	
			120 x 14,5	
		16,9 – 17,5	100 x 19,2	
			120 x 15,0	
	175 < DN ≤ 179	7,6 – 14,7	100 x 16,8	**EI 120-U/C EI 120-C/C**
			120 x 12,5	
		14,8 – 15,2	100 x 16,8	
			120 x 13,0	
		15,3 – 16,3	100 x 16,8	
			120 x 14,0	
	175 < DN ≤ 179	16,4 – 16,8	100 x 19,2	**EI 120-U/C EI 120-C/C**
			120 x 14,5	
		16,9 – 17,5	100 x 19,2	
			120 x 15,0	
	179 < DN ≤ 183	7,8 – 15,2	100 x 16,8	**EI 120-U/C EI 120-C/C**
			120 x 13,0	
		15,3 – 16,3	100 x 16,8	
			120 x 14,0	
		16,4 – 16,8	100 x 19,2	
			120 x 14,5	
		16,9 – 17,5	100 x 19,2	
			120 x 15,0	
wall thickness ≥ 150 mm				

Table C3. Resistance to fire classification of plastic pipes (without insulation) penetration seals in rigid wall, made with use of PIRO Multitube PM in accordance with Annex A1 and Annex D3 (continued).

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Intumescent material length x thickness [mm]	Fire resistance class
PP	183 < DN ≤ 191	8,4 – 16,3	100 x 16,8	**EI 120-U/C EI 120-C/C**
			100 x 16,8	
		16,4 – 16,8	100 x 19,2	
			120 x 14,5	
		16,9 – 17,5	100 x 19,2	
			120 x 15,0	
	191 < DN ≤ 195	8,7 – 16,8	100 x 19,2	**EI 120-U/C EI 120-C/C**
			120 x 14,5	
		16,9 – 17,5	100 x 19,2	
			120 x 15,0	
	195 < DN ≤ 200	9,0 – 17,5	100 x 19,2	**EI 120-U/C EI 120-C/C**
			120 x 15,0	
PE-HD / PE / ABS / SAN + PVC	DN ≤ 40	1,8 – 8,0	60 x 2,5	**EI 120-U/C EI 120-C/C**
		8,1 – 8,4	60 x 8,0	
			100 x 4,8	
			120 x 4,0	
		8,5 – 8,8	60 x 10,0	
			100 x 7,2	
			120 x 5,0	
		8,9 – 9,7	60 x 13,0	
			100 x 9,6	
			120 x 6,5	
		9,8 – 10,1	60 x 15,0	
			100 x 9,6	
			120 x 7,5	
		10,2 – 10,5	60 x 16,0	
			100 x 9,6	
			120 x 8,0	
		10,6 – 11,1	60 x 18,0	
			100 x 12,0	
			120 x 9,0	
		11,2 – 11,6	60 x 20,0	
			100 x 12,0	
			120 x 10,0	
		11,7 – 11,8	60 x 21,0	
			100 x 14,4	
			120 x 10,5	
		11,9 – 12,3	60 x 23,0	
			100 x 14,4	
			120 x 11,5	
		12,4 – 12,6	60 x 24,0	
			100 x 14,4	
			120 x 12,0	
		12,7 – 12,8	100 x 16,8	
			120 x 12,5	
		12,9 – 13,0	100 x 16,8	
			120 x 13,0	
		13,1 – 13,5	100 x 16,8	
			120 x 14,0	
		13,6 – 13,8	100 x 19,2	
			120 x 14,5	
wall thickness ≥ 150 mm				

Table C3. Resistance to fire classification of plastic pipes (without insulation) penetration seals in rigid wall, made with use of PIRO Multitube PM in accordance with Annex A1 and Annex D3 (continued).

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Intumescent material length x thickness [mm]	Fire resistance class
PE-HD / PE / ABS / SAN + PVC	DN ≤ 40	13,9 – 14,0	100 x 19,2	**EI 120-U/C** **EI 120-C/C**
			120 x 15,0	
	40 < DN ≤ 50	1,8 – 7,5	60 x 2,5	**EI 120-U/C** **EI 120-C/C**
		7,6 – 7,8	60 x 8,0	
			100 x 4,8	
			120 x 4,0	
		7,9 – 8,4	60 x 8,0	
			100 x 4,8	
			120 x 4,0	
		8,5 – 8,8	60 x 10,0	
			100 x 7,2	
			120 x 5,0	
		8,9 – 9,7	60 x 13,0	
			100 x 9,6	
			120 x 6,5	
		9,8 – 10,1	60 x 15,0	
			100 x 9,6	
			120 x 7,5	
		10,2 – 10,5	60 x 16,0	
			100 x 9,6	
			120 x 8,0	
		10,6 – 11,1	60 x 18,0	
			100 x 12,0	
			120 x 9,0	
		11,2 – 11,6	60 x 20,0	
			100 x 14,4	
			120 x 10,0	
		11,7 – 11,8	60 x 21,0	
			100 x 14,4	
			120 x 10,5	
		11,9 – 12,3	60 x 23,0	
			100 x 14,4	
			120 x 11,5	
		12,4 – 12,6	60 x 24,0	
			100 x 14,4	
			120 x 12,0	
		12,7 – 12,8	100 x 16,8	
			120 x 12,5	
		12,9 – 13,0	100 x 16,8	
			120 x 13,0	
		13,1 – 13,5	100 x 16,8	
			120 x 14,0	
		13,6 – 13,8	100 x 19,2	
			120 x 14,5	
		13,9 – 14,0	100 x 19,2	
			120 x 15,0	
wall thickness ≥ 150 mm				

Table C3. Resistance to fire classification of plastic pipes (without insulation) penetration seals in rigid wall, made with use of PIRO Multitube PM in accordance with Annex A1 and Annex D3 (continued).

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Intumescent material length x thickness [mm]	Fire resistance class
PE-HD / PE / ABS / SAN + PVC	50 < DN ≤ 60	2,2 – 6,9	60 x 8,0	**EI 120-U/C EI 120-C/C**
			100 x 4,8	
			120 x 4,0	
		7,0 – 7,7	60 x 8,0	**EI 90-U/C EI 90-C/C**
			100 x 4,8	
			120 x 4,0	
			60 x 10,0	**EI 120-U/C EI 120-C/C**
			100 x 9,6	
			120 x 5,0	
		7,8 – 8,8	60 x 10,0	
			100 x 7,2	
			120 x 5,0	
		8,9 – 9,7	60 x 13,0	
			100 x 9,6	
			120 x 6,5	
		9,8 – 10,1	60 x 15,0	
			100 x 9,6	
			120 x 7,5	
		10,2 – 10,5	60 x 16,0	
			100 x 9,6	
			120 x 8,0	
		10,6 – 11,1	60 x 18,0	
			100 x 12,0	
			120 x 9,0	
		11,2 – 11,6	60 x 20,0	
			100 x 12,0	
			120 x 10,0	
		11,7 – 11,8	60 x 21,0	
			100 x 14,4	
			120 x 10,5	
		11,9 – 12,3	60 x 23,0	
			100 x 14,4	
			120 x 11,5	
		12,4 – 12,6	60 x 24,0	
			100 x 14,4	
			120 x 12,0	
		12,7 – 12,8	100 x 16,8	
			120 x 12,5	
		12,9 – 13,0	100 x 16,8	
			120 x 13,0	
		13,1 – 13,5	100 x 16,8	
			120 x 14,0	
		13,6 – 13,8	100 x 19,2	
			120 x 14,5	
		13,9 – 14,0	100 x 19,2	
			120 x 15,0	
	60 < DN ≤ 70	2,6 – 6,4	60 x 8,0	**EI 120-U/C EI 120-C/C**
			100 x 4,8	
			120 x 4,0	
wall thickness ≥ 150 mm				

Table C3. Resistance to fire classification of plastic pipes (without insulation) penetration seals in rigid wall, made with use of PIRO Multitube PM in accordance with Annex A1 and Annex D3 (continued).

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Intumescent material length x thickness [mm]	Fire resistance class
PE-HD / PE / ABS / SAN + PVC	60 < DN ≤ 70	6,5 – 7,5	60 x 8,0	**EI 90-U/C EI 90-C/C**
			100 x 4,8	
			120 x 4,0	
			60 x 13,0	**EI 120-U/C EI 120-C/C**
			100 x 9,6	
			120 x 6,5	
		7,6 – 9,2	60 x 13,0	
			100 x 9,6	
			120 x 6,5	
		9,3 – 9,7	60 x 15,0	
			100 x 9,6	
			120 x 6,5	
		9,8 – 10,1	60 x 15,0	
			100 x 9,6	
			120 x 7,5	
		10,2 – 10,5	60 x 16,0	
			100 x 9,6	
			120 x 8,0	
		10,6 – 11,1	60 x 18,0	
			100 x 12,0	
			120 x 9,0	
		11,2 – 11,6	60 x 20,0	
			100 x 12,0	
			120 x 10,0	
		11,7 – 11,8	60 x 21,0	
			100 x 14,4	
			120 x 10,5	
		11,9 – 12,3	60 x 23,0	
			100 x 14,4	
			120 x 11,5	
		12,4 – 12,6	60 x 24,0	
			100 x 14,4	
			120 x 12,0	
		12,7 – 12,8	100 x 16,8	
			120 x 12,5	
		12,9 – 13,0	100 x 16,8	
			120 x 13,0	
		13,1 – 13,5	100 x 16,8	
			120 x 14,0	
		13,6 – 13,8	100 x 19,2	
			120 x 14,5	
		13,9 – 14,0	100 x 19,2	
			120 x 15,0	
wall thickness ≥ 150 mm				

Table C3. Resistance to fire classification of plastic pipes (without insulation) penetration seals in rigid wall, made with use of PIRO Multitube PM in accordance with Annex A1 and Annex D3 (continued).

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Intumescent material length x thickness [mm]	Fire resistance class
PE-HD / PE / ABS / SAN + PVC	70 < DN ≤ 80	3,0 – 5,8	60 x 8,0	**EI 120-U/C EI 120-C/C**
			100 x 4,8	
			120 x 4,0	
		5,9 – 7,3	60 x 8,0	**EI 90-U/C EI 90-C/C**
			100 x 4,8	
			120 x 4,0	
			60 x 13,0	**EI 120-U/C EI 120-C/C**
			100 x 9,6	
			120 x 6,5	
		7,4 – 9,7	60 x 13,0	**EI 120-U/C EI 120-C/C**
			100 x 9,6	
			120 x 6,5	
		9,8 – 10,1	60 x 15,0	
			100 x 9,6	
			120 x 7,5	
		10,2 – 10,5	60 x 16,0	
			100 x 9,6	
			120 x 8,0	
		10,6 – 11,1	60 x 18,0	
			100 x 12,0	
			120 x 9,0	
		11,2 – 11,6	60 x 20,0	
			100 x 12,0	
			120 x 10,0	
		11,7 – 11,8	60 x 21,0	
			100 x 14,4	
			120 x 10,5	
		11,9 – 12,3	60 x 23,0	
			100 x 14,4	
			120 x 11,5	
		12,4 – 12,6	60 x 24,0	
			100 x 14,4	
			120 x 12,0	
		12,7 – 12,8	100 x 16,8	
			120 x 12,5	
		12,9 – 13,0	100 x 16,8	
			120 x 13,0	
		13,1 – 13,5	100 x 16,8	
			120 x 14,0	
		13,6 – 13,8	100 x 19,2	
			120 x 14,5	
		13,9 – 14,0	100 x 19,2	
			120 x 15,0	
wall thickness ≥ 150 mm				

Table C3. Resistance to fire classification of plastic pipes (without insulation) penetration seals in rigid wall, made with use of PIRO Multitube PM in accordance with Annex A1 and Annex D3 (continued).

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Intumescent material length x thickness [mm]	Fire resistance class
PE-HD / PE / ABS / SAN + PVC	80 < DN ≤ 90	3,4 – 5,3	60 x 8,0	**EI 120-U/C EI 120-C/C**
			100 x 4,8	
			120 x 4,0	
		5,4 – 7,1	60 x 8,0	**EI 90-U/C EI 90-C/C**
			100 x 4,8	
			120 x 4,0	
			60 x 15,0	**EI 120-U/C EI 120-C/C**
			100 x 9,6	
			120 x 7,5	
		7,2 – 10,1	60 x 15,0	**EI 120-U/C EI 120-C/C**
			100 x 9,6	
			120 x 7,5	
		10,2 – 10,5	60 x 16,0	
			100 x 9,6	
			120 x 8,0	
		10,6 – 11,1	60 x 18,0	
			100 x 12,0	
			120 x 9,0	
		11,2 – 11,6	60 x 20,0	
			100 x 12,0	
			120 x 10,0	
		11,7 – 11,8	60 x 21,0	
			100 x 14,4	
			120 x 10,5	
		11,9 – 12,3	60 x 23,0	
			100 x 14,4	
			120 x 11,5	
		12,4 – 12,6	60 x 24,0	
			100 x 14,4	
			120 x 12,0	
		12,7 – 12,8	100 x 16,8	
			120 x 12,5	
		12,9 – 13,0	100 x 16,8	
			120 x 13,0	
		13,1 – 13,5	100 x 16,8	
			120 x 14,0	
		13,6 – 13,8	100 x 19,2	
			120 x 14,5	
		13,9 – 14,0	100 x 19,2	
			120 x 15,0	
	90 < DN ≤ 100	3,8 – 4,7	60 x 8,0	**EI 120-U/C EI 120-C/C**
			100 x 4,8	
			120 x 4,0	
wall thickness ≥ 150 mm				

Table C3. Resistance to fire classification of plastic pipes (without insulation) penetration seals in rigid wall, made with use of PIRO Multitube PM in accordance with Annex A1 and Annex D3 (continued).

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Intumescent material length x thickness [mm]	Fire resistance class
PE-HD / PE / ABS / SAN + PVC	90 < DN ≤ 100	4,8 – 7,0	60 x 8,0	**EI 90-U/C EI 90-C/C**
			100 x 4,8	
			120 x 4,0	
			60 x 16,0	**EI 120-U/C EI 120-C/C**
			100 x 9,6	
			120 x 8,0	
		7,1 – 10,5	60 x 16,0	**EI 120-U/C EI 120-C/C**
			100 x 9,6	
			120 x 8,0	
		10,6 – 11,1	60 x 18,0	
			100 x 12,0	
			120 x 9,0	
		11,2 – 11,6	60 x 20,0	
			100 x 12,0	
			120 x 10,0	
		11,7 – 11,8	60 x 21,0	
			100 x 14,4	
			120 x 10,5	
		11,9 – 12,3	60 x 23,0	
			100 x 14,4	
			120 x 11,5	
		12,4 – 12,6	60 x 24,0	
			100 x 14,4	
			120 x 12,0	
		12,7 – 12,8	100 x 16,8	
			120 x 12,5	
		12,9 – 13,0	100 x 16,8	
			120 x 13,0	
		13,1 – 13,5	100 x 16,8	
			120 x 14,0	
		13,6 – 13,8	100 x 19,2	
			120 x 14,5	
		13,9 – 14,0	100 x 19,2	
			120 x 15,0	
	100 < DN ≤ 110	4,2	60 x 8,0	**EI 120-U/C EI 120-C/C**
			100 x 4,8	
			120 x 4,0	
		4,3 – 6,8	60 x 8,0	**EI 90-U/C EI 90-C/C**
			100 x 4,8	
			120 x 4,0	
			60 x 18,0	**EI 120-U/C EI 120-C/C**
			100 x 14,4	
			120 x 9,0	
wall thickness ≥ 150 mm				

Table C3. Resistance to fire classification of plastic pipes (without insulation) penetration seals in rigid wall, made with use of PIRO Multitube PM in accordance with Annex A1 and Annex D3 (continued).

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Intumescent material length x thickness [mm]	Fire resistance class
PE-HD / PE / ABS / SAN + PVC	100 < DN ≤ 110	6,9 – 11,1	60 x 18,0	**EI 120-U/C EI 120-C/C**
			100 x 14,4	
			120 x 9,0	
		11,2 – 11,6	60 x 20,0	
			100 x 12,0	
			120 x 10,0	
		11,7 – 11,8	60 x 21,0	
			100 x 14,4	
			120 x 10,5	
		11,9 – 12,3	60 x 23,0	
			100 x 14,4	
			120 x 11,5	
		12,4 – 12,6	60 x 24,0	
			100 x 14,4	
			120 x 12,0	
		12,7 – 12,8	100 x 16,8	
			120 x 12,5	
		12,9 – 13,0	100 x 16,8	
			120 x 13,0	
		13,1 – 13,5	100 x 16,8	
			120 x 14,0	
		13,6 – 13,8	100 x 19,2	
			120 x 14,5	
		13,9 – 14,0	100 x 19,2	
			120 x 15,0	
	110 < DN ≤ 115	4,9 – 11,1	60 x 18,0	**EI 120-U/C EI 120-C/C**
			100 x 12,0	
			120 x 9,0	
		11,2 – 11,6	60 x 18,0	
			100 x 12,0	
			120 x 10,0	
		11,7 – 11,8	60 x 23,0	
			100 x 14,4	
			120 x 10,5	
		11,9 – 12,3	60 x 23,0	
			100 x 14,4	
			120 x 11,5	
		12,4 – 12,6	60 x 24,0	
			100 x 14,4	
			120 x 12,0	
		12,7 – 12,8	100 x 16,8	
			120 x 12,5	
wall thickness ≥ 150 mm				

Table C3. Resistance to fire classification of plastic pipes (without insulation) penetration seals in rigid wall, made with use of PIRO Multitube PM in accordance with Annex A1 and Annex D3 (continued).

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Intumescent material length x thickness [mm]	Fire resistance class
PE-HD / PE / ABS / SAN + PVC	110 < DN ≤ 115	12,9 – 13,0	100 x 16,8	**EI 120-U/C EI 120-C/C**
			120 x 13,0	
		13,1 – 13,5	100 x 16,8	
			120 x 14,0	
		13,6 – 13,8	100 x 19,2	
			120 x 14,5	
		13,9 – 14,0	100 x 19,2	
			120 x 15,0	
	115 < DN ≤ 127	6,4 – 11,6	60 x 20,0	**EI 120-U/C EI 120-C/C**
			100 x 12,0	
			120 x 10,0	
		11,7 – 11,8	60 x 21,0	
			100 x 14,4	
			120 x 10,5	
		11,9 – 12,3	60 x 23,0	
			100 x 14,4	
			120 x 11,5	
		12,4 – 12,6	60 x 24,0	
			100 x 14,4	
			120 x 12,0	
		12,7 – 12,8	100 x 16,8	
			120 x 12,5	
		12,9 – 13,0	100 x 16,8	
			120 x 13,0	
		13,1 – 13,5	100 x 16,8	
			120 x 14,0	
		13,6 – 13,8	100 x 19,2	
			120 x 14,5	
		13,9 – 14,0	100 x 19,2	
			120 x 15,0	
	127 < DN ≤ 132	7,1 – 11,8	60 x 21,0	**EI 120-U/C EI 120-C/C**
			100 x 14,4	
			120 x 10,5	
		11,9 – 12,3	60 x 23,0	
			100 x 14,4	
			120 x 11,5	
		12,4 – 12,6	60 x 24,0	
			100 x 14,4	
			120 x 12,0	
		12,7 – 12,8	100 x 16,8	
			120 x 12,5	
		12,9 – 13,0	100 x 16,8	
			120 x 13,0	
	127 < DN ≤ 132	13,1 – 13,5	100 x 16,8	**EI 120-U/C EI 120-C/C**
			120 x 14,0	
		13,6 – 13,8	100 x 19,2	
			120 x 14,5	
		13,9 – 14,0	100 x 19,2	
			120 x 15,0	
wall thickness ≥ 150 mm				

Table C3. Resistance to fire classification of plastic pipes (without insulation) penetration seals in rigid wall, made with use of PIRO Multitube PM in accordance with Annex A1 and Annex D3 (continued).

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Intumescent material length x thickness [mm]	Fire resistance class
PE-HD / PE / ABS / SAN + PVC	132 < DN ≤ 144	8,6 – 12,3	60 x 23,0	**EI 120-U/C EI 120-C/C**
			100 x 14,4	
			120 x 11,5	
		12,4 – 12,6	60 x 24,0	
			100 x 14,4	
			120 x 12,0	
		12,7 – 12,8	100 x 16,8	
			120 x 12,5	
		12,9 – 13,0	100 x 16,8	
			120 x 13,0	
		13,1 – 13,5	100 x 16,8	
			120 x 14,0	
		13,6 – 13,8	100 x 19,2	
			120 x 14,5	
		13,9 – 14,0	100 x 19,2	
			120 x 15,0	
	144 < DN ≤ 150	9,4 – 12,6	60 x 24,0	**EI 120-U/C EI 120-C/C**
			100 x 14,4	
			120 x 12,0	
		12,7 – 12,8	100 x 16,8	
			120 x 12,5	
		12,9 – 13,0	100 x 16,8	
			120 x 13,0	
		13,1 – 13,5	100 x 16,8	
			120 x 14,0	
		13,6 – 13,8	100 x 19,2	
			120 x 14,5	
		13,9 – 14,0	100 x 19,2	
			120 x 15,0	
	150 < DN ≤ 156	10,2 – 12,8	100 x 16,8	**EI 120-U/C EI 120-C/C**
			120 x 12,5	
		12,9 – 13,0	100 x 16,8	
			120 x 13,0	
		13,1 – 13,5	100 x 16,8	
			120 x 14,0	
		13,6 – 13,8	100 x 19,2	
			120 x 14,5	
	150 < DN ≤ 156	13,9 – 14,0	100 x 19,2	**EI 120-U/C EI 120-C/C**
			120 x 15,0	
	156 < DN ≤ 161	10,9 – 13,0	100 x 16,8	**EI 120-U/C EI 120-C/C**
			120 x 13,0	
		13,1 – 13,5	100 x 16,8	
			120 x 14,0	
		13,6 – 13,8	100 x 19,2	
			120 x 14,5	
		13,9 – 14,0	100 x 19,2	
			120 x 15,0	
wall thickness ≥ 150 mm				

Table C3. Resistance to fire classification of plastic pipes (without insulation) penetration seals in rigid wall, made with use of PIRO Multitube PM in accordance with Annex A1 and Annex D3 (continued).

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Intumescent material length x thickness [mm]	Fire resistance class
PE-HD / PE / ABS / SAN + PVC	161 < DN ≤ 173	12,4 – 13,5	100 x 16,8	**EI 120-U/C EI 120-C/C**
			120 x 14,0	
		13,6 – 13,8	100 x 19,2	
			120 x 14,5	
		13,9 – 14,0	100 x 19,2	
			120 x 15,0	
	173 < DN ≤ 179	13,2 – 13,8	100 x 19,2	**EI 120-U/C EI 120-C/C**
			120 x 14,5	
		13,9 – 14,0	100 x 19,2	
			120 x 15,0	
	179 < DN ≤ 185	14,0	100 x 19,2	**EI 120-U/C EI 120-C/C**
			120 x 15,0	
PE-X	DN ≤ 17	3,0	60 x 4,0	**EI 120-U/C EI 120-C/C**
			100 x 4,8	
			120 x 2,5	
		5,0	60 x 7,5	
			100 x 4,8	
			120 x 4,0	
	17 < DN ≤ 50	5,0	60 x 7,5	
			100 x 4,8	
			120 x 4,0	
wall thickness ≥ 150 mm				

Table C4. Resistance to fire classification of plastic pipes (with PE foam insulation) penetration seals in flexible or rigid wall, made with use of PIRO Multitube PM in accordance with Annex A1 and Annex D4.

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Insulation thickness [mm]	Intumescent material length x thickness [mm]	Fire resistance class
PVC-U / PVC-C	DN ≤ 40	1,8 – 2,8	9,0	60 x 4,0	**EI 120-U/C EI 120-C/C**
				100 x 4,8	
				120 x 2,5	
		2,9 – 3,5	9,0	60 x 10,0	**EI 90-U/C EI 90-C/C**
				100 x 7,2	
				120 x 5,0	
		3,6 – 4,6	9,0	60 x 13,0	
				100 x 9,6	
				120 x 6,5	
		4,7 – 5,4	9,0	60 x 15,0	
				100 x 9,6	
				120 x 7,5	
		5,5 – 5,8	9,0	60 x 16,0	
				100 x 9,6	
				120 x 8,0	
	40 < DN ≤ 57	1,8 – 3,5	9,0	60 x 10,0	**EI 90-U/C EI 90-C/C**
				100 x 7,2	
				120 x 5,0	
		3,6 – 4,6	9,0	60 x 13,0	
				100 x 9,6	
				120 x 6,5	
		4,7 – 5,4	9,0	60 x 15,0	
				100 x 9,6	
				120 x 7,5	
		5,5 – 5,8	9,0	60 x 16,0	
				100 x 9,6	
				120 x 8,0	
	57 < DN ≤ 83	1,8 – 4,6	9,0	60 x 13,0	**EI 90-U/C EI 90-C/C**
				100 x 9,6	
				120 x 6,5	
		4,7 – 5,4	9,0	60 x 15,0	
				100 x 9,6	
				120 x 7,5	
		5,5 – 5,8	9,0	60 x 16,0	
				100 x 9,6	
				120 x 8,0	
	83 < DN ≤ 101	1,8 – 5,4	9,0	60 x 15,0	**EI 90-U/C EI 90-C/C**
				100 x 9,6	
				120 x 7,5	
	83 < DN ≤ 101	5,5 – 5,8	9,0	60 x 16,0	**EI 90-U/C EI 90-C/C**
				100 x 9,6	
				120 x 8,0	
	101 < DN ≤ 110	5,5 – 5,8	9,0	60 x 16,0	**EI 90-U/C EI 90-C/C**
				100 x 9,6	
				120 x 8,0	
wall thickness ≥ 100 mm					

Table C4. Resistance to fire classification of plastic pipes (with PE foam insulation) penetration seals in flexible or rigid wall, made with use of PIRO Multitube PM in accordance with Annex A1 and Annex D4 (continued).

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Insulation thickness [mm]	Intumescent material length x thickness [mm]	Fire resistance class
PP	DN ≤ 40	1,8 – 2,6	9,0	60 x 4,0	**EI 120-U/C EI 120-C/C**
				100 x 4,8	
				120 x 2,5	
		2,7 – 3,3	9,0	60 x 10,0	
				100 x 7,2	
				120 x 5,0	
		3,4 – 4,4	9,0	60 x 13,0	
				100 x 9,6	
				120 x 6,5	
		4,5 – 5,1	9,0	60 x 15,0	
				100 x 9,6	
				120 x 7,5	
		5,2 – 5,5	9,0	60 x 16,0	
				100 x 9,6	
				120 x 8,0	
	40 < DN ≤ 57	2,7 – 3,3	9,0	60 x 10,0	**EI 120-U/C EI 120-C/C**
				100 x 7,2	
				120 x 5,0	
		3,4 – 4,4	9,0	60 x 13,0	
				100 x 9,6	
				120 x 6,5	
		4,5 – 5,1	9,0	60 x 15,0	
				100 x 9,6	
				120 x 7,5	
		5,2 – 5,5	9,0	60 x 16,0	
				100 x 9,6	
				120 x 8,0	
	57 < DN ≤ 83	4,1 – 4,4	9,0	60 x 13,0	**EI 120-U/C EI 120-C/C**
				100 x 9,6	
				120 x 6,5	
		4,5 – 5,1	9,0	60 x 15,0	
				100 x 9,6	
				120 x 7,5	
		5,2 – 5,5	9,0	60 x 16,0	
				100 x 9,6	
				120 x 8,0	
	83 < DN ≤ 101	5,0 – 5,1	9,0	60 x 15,0	**EI 120-U/C EI 120-C/C**
				100 x 9,6	
				120 x 7,5	
		5,2 – 5,5	9,0	60 x 16,0	
				100 x 9,6	
				120 x 8,0	
	101 < DN ≤ 110	5,5	9,0	60 x 16,0	**EI 120-U/C EI 120-C/C**
				100 x 9,6	
				120 x 8,0	
PE-HD / PE / ABS / SAN + PVC	DN ≤ 50	1,8 – 2,4	9,0	60 x 4,0	**EI 120-U/C EI 120-C/C**
				100 x 4,8	
				120 x 2,5	
wall thickness ≥ 100 mm					

Table C5. Resistance to fire classification of plastic pipes (with flexible elastomeric foam (FEF) insulation) penetration seals in rigid wall, made with use of PIRO Multitube PM in accordance with Annex A1 and Annex D5.

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Insulation thickness [mm]	Intumescent material length x thickness [mm]	Fire resistance class
PP	DN ≤ 40	1,8	32,0	60 x 8,0	**EI 120-U/C EI 120-C/C**
				100 x 4,8	
				120 x 4,0	
	DN ≤ 40	1,9 – 2,2	32,0	60 x 10,0	**EI 60-U/C EI 60-C/C**
				100 x 7,2	
				120 x 5,0	
		2,3 – 2,9	32,0	60 x 13,0	
				100 x 9,6	
				120 x 6,5	
		3,0 – 3,4	32,0	60 x 15,0	
				100 x 9,6	
				120 x 7,5	
		3,4 – 3,7	32,0	60 x 16,0	
				100 x 9,6	
				120 x 8,0	
		3,8 – 4,1	32,0	60 x 18,0	
				100 x 12,0	
				120 x 9,0	
		4,2 – 4,5	32,0	60 x 20,0	
				100 x 12,0	
				120 x 10,0	
		4,6 – 4,8	32,0	60 x 21,0	
				100 x 14,4	
				120 x 10,5	
		4,9 – 5,2	32,0	60 x 23,0	
				100 x 14,4	
				120 x 11,5	
		5,3 – 5,4	32,0	60 x 24,0	
				100 x 14,4	
				120 x 12,0	
		5,5	32,0	60 x 24,0	**EI 90-U/C EI 90-C/C**
				100 x 14,4	
				120 x 12,0	
	40 < DN ≤ 48	1,9 – 2,2	32,0	60 x 10,0	**EI 60-U/C EI 60-C/C**
				100 x 7,2	
				120 x 5,0	
		2,3 – 2,9	32,0	60 x 13,0	
				100 x 9,6	
				120 x 6,5	
		3,0 – 3,4	32,0	60 x 15,0	
				100 x 9,6	
				120 x 7,5	
		3,4 – 3,7	32,0	60 x 16,0	
				100 x 9,6	
				120 x 8,0	
wall thickness ≥ 100 mm					

Table C5. Resistance to fire classification of plastic pipes (with flexible elastomeric foam (FEF) insulation) penetration seals in rigid wall, made with use of PIRO Multitube PM in accordance with Annex A1 and Annex D5 (continued).

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Insulation thickness [mm]	Intumescent material length x thickness [mm]	Fire resistance class
PP	40 < DN ≤ 48	3,8 – 4,1	32,0	60 x 18,0	**EI 60-U/C EI 60-C/C**
				100 x 12,0	
				120 x 9,0	
		4,2 – 4,5	32,0	60 x 20,0	
				100 x 12,0	
				120 x 10,0	
		4,6 – 4,8	32,0	60 x 21,0	
				100 x 14,4	
				120 x 10,5	
		4,9 – 5,2	32,0	60 x 23,0	
				100 x 14,4	
				120 x 11,5	
		5,3 – 5,4	32,0	60 x 24,0	
				100 x 14,4	
				120 x 12,0	
		5,5	32,0	60 x 24,0	**EI 90-U/C EI 90-C/C**
				100 x 14,4	
				120 x 12,0	
	48 < DN ≤ 61	2,1 – 2,9	32,0	60 x 13,0	**EI 60-U/C EI 60-C/C**
				100 x 9,6	
				120 x 6,5	
		3,0 – 3,4	32,0	60 x 15,0	
				100 x 9,6	
				120 x 7,5	
		3,4 – 3,7	32,0	60 x 16,0	
				100 x 9,6	
				120 x 8,0	
		3,8 – 4,1	32,0	60 x 18,0	
				100 x 12,0	
				120 x 9,0	
		4,2 – 4,5	32,0	60 x 20,0	
				100 x 12,0	
				120 x 10,0	
		4,6 – 4,8	32,0	60 x 21,0	
				100 x 14,4	
				120 x 10,5	
		4,9 – 5,2	32,0	60 x 23,0	
				100 x 14,4	
				120 x 11,5	
		5,3 – 5,4	32,0	60 x 24,0	
				100 x 14,4	
				120 x 12,0	
		5,5	32,0	60 x 24,0	**EI 90-U/C EI 90-C/C**
				100 x 14,4	
				120 x 12,0	
wall thickness ≥ 100 mm					

Table C5. Resistance to fire classification of plastic pipes (with flexible elastomeric foam (FEF) insulation) penetration seals in rigid wall, made with use of PIRO Multitube PM in accordance with Annex A1 and Annex D5 (continued).

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Insulation thickness [mm]	Intumescent material length x thickness [mm]	Fire resistance class
PP	61 < DN ≤ 70	2,2 – 3,4	32,0	60 x 15,0	**EI 60-U/C EI 60-C/C**
				100 x 9,6	
				120 x 7,5	
		3,4 – 3,7	32,0	60 x 16,0	
				100 x 9,6	
				120 x 8,0	
		3,8 – 4,1	32,0	60 x 18,0	
				100 x 12,0	
				120 x 9,0	
		4,2 – 4,5	32,0	60 x 20,0	
				100 x 12,0	
				120 x 10,0	
		4,6 – 4,8	32,0	60 x 21,0	
				100 x 14,4	
				120 x 10,5	
		4,9 – 5,2	32,0	60 x 23,0	
				100 x 14,4	
				120 x 11,5	
		5,3 – 5,4	32,0	60 x 24,0	
				100 x 14,4	
				120 x 12,0	
		5,5	32,0	60 x 24,0	**EI 90-U/C EI 90-C/C**
				100 x 14,4	
				120 x 12,0	
	70 < DN ≤ 75	2,3 – 3,7	32,0	60 x 16,0	**EI 60-U/C EI 60-C/C**
				100 x 9,6	
				120 x 8,0	
		3,8 – 4,1	32,0	60 x 18,0	
				100 x 12,0	
				120 x 9,0	
		4,2 – 4,5	32,0	60 x 20,0	
				100 x 12,0	
				120 x 10,0	
		4,6 – 4,8	32,0	60 x 21,0	
				100 x 14,4	
				120 x 10,5	
		4,9 – 5,2	32,0	60 x 23,0	
				100 x 14,4	
				120 x 11,5	
		5,3 – 5,4	32,0	60 x 24,0	
				100 x 14,4	
				120 x 12,0	
		5,5	32,0	60 x 24,0	**EI 90-U/C EI 90-C/C**
				100 x 14,4	
				120 x 12,0	
wall thickness ≥ 100 mm					

Table C5. Resistance to fire classification of plastic pipes (with flexible elastomeric foam (FEF) insulation) penetration seals in rigid wall, made with use of PIRO Multitube PM in accordance with Annex A1 and Annex D5 (continued).

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Insulation thickness [mm]	Intumescent material length x thickness [mm]	Fire resistance class
PP	75 < DN ≤ 83	2,4 – 4,1	32,0	60 x 18,0	**EI 60-U/C EI 60-C/C**
				100 x 12,0	
				120 x 9,0	
		4,2 – 4,5	32,0	60 x 20,0	
				100 x 12,0	
				120 x 10,0	
		4,6 – 4,8	32,0	60 x 21,0	
				100 x 14,4	
				120 x 10,5	
		4,9 – 5,2	32,0	60 x 23,0	
				100 x 14,4	
				120 x 11,5	
		5,3 – 5,4	32,0	60 x 24,0	
				100 x 14,4	
				120 x 12,0	
		5,5	32,0	60 x 24,0	**EI 90-U/C EI 90-C/C**
				100 x 14,4	
				120 x 12,0	
	83 < DN ≤ 92	2,5 – 4,5	32,0	60 x 20,0	**EI 60-U/C EI 60-C/C**
				100 x 12,0	
				120 x 10,0	
		4,6 – 4,8	32,0	60 x 21,0	
				100 x 14,4	
				120 x 10,5	
		4,9 – 5,2	32,0	60 x 23,0	
				100 x 14,4	
				120 x 11,5	
		5,3 – 5,4	32,0	60 x 24,0	
				100 x 14,4	
				120 x 12,0	
		5,5	32,0	60 x 24,0	**EI 90-U/C EI 90-C/C**
				100 x 14,4	
				120 x 12,0	
wall thickness ≥ 100 mm					

Table C5. Resistance to fire classification of plastic pipes (with flexible elastomeric foam (FEF) insulation) penetration seals in rigid wall, made with use of PIRO Multitube PM in accordance with Annex A1 and Annex D5 (continued).

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Insulation thickness [mm]	Intumescent material length x thickness [mm]	Fire resistance class
PP	92 < DN ≤ 96	2,6 – 4,8	32,0	60 x 21,0	**EI 60-U/C EI 60-C/C**
				100 x 14,4	
				120 x 10,5	
		4,9 – 5,2	32,0	60 x 23,0	
				100 x 14,4	
				120 x 11,5	
		5,3 – 5,4	32,0	60 x 24,0	
				100 x 14,4	
				120 x 12,0	
		5,5	32,0	60 x 24,0	**EI 90-U/C EI 90-C/C**
				100 x 14,4	
				120 x 12,0	
	96 < DN ≤ 105	2,7 – 5,2	32,0	60 x 23,0	**EI 60-U/C EI 60-C/C**
				100 x 14,4	
				120 x 11,5	
		5,3 – 5,4	32,0	60 x 24,0	
				100 x 14,4	
				120 x 12,0	
		5,5	32,0	60 x 24,0	**EI 90-U/C EI 90-C/C**
				100 x 14,4	
				120 x 12,0	
	105 < DN ≤ 110	2,8 – 5,4	32,0	60 x 24,0	**EI 60-U/C EI 60-C/C**
				100 x 14,4	
				120 x 12,0	
		5,5	32,0	60 x 24,0	**EI 90-U/C EI 90-C/C**
				100 x 14,4	
				120 x 12,0	
wall thickness ≥ 100 mm					

Table C6. Resistance to fire classification of metal pipes (with flexible elastomeric foam (FEF) insulation) penetration seals in rigid wall, made with use of PIRO Multitube PM in accordance with Annex A1 and Annex D6.

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Insulation thickness [mm]	Intumescent material length x thickness [mm]	Fire resistance class
steel	DN ≤ 17,1	1,8 – 1,9	32,0	60 x 8,0	**EI 120-C/U EI 120-C/C**
				100 x 4,8	
				120 x 4,0	
			33,0 – 37,0	60 x 10,0	**EI 60-C/U EI 60-C/C**
				100 x 7,2	
				120 x 5,0	
			38,0 – 41,0	60 x 13,0	
				100 x 9,6	
				120 x 6,5	
	DN ≤ 17,1	1,8 – 1,9	42,0 – 43,0	60 x 13,0	**EI 60-C/U EI 60-C/C**
				100 x 9,6	
				120 x 6,5	
			44,0 – 48,0	60 x 15,0	
				100 x 9,6	
				120 x 7,5	
			49,0 – 50,0	60 x 16,0	
				100 x 9,6	
				120 x 8,0	
		≥ 2,0	32,0	60 x 8,0	**EI 120-C/U EI 120-C/C**
				100 x 4,8	
				120 x 4,0	
			33,0 – 37,0	60 x 10,0	**EI 60-C/U EI 60-C/C**
				60 x 18,0	**EI 120-C/U EI 120-C/C**
				100 x 7,2	**EI 60-C/U EI 60-C/C**
				100 x 12,0	**EI 120-C/U EI 120-C/C**
				120 x 5,0	**EI 60-C/U EI 60-C/C**
				120 x 9,0	**EI 120-C/U EI 120-C/C**
			38,0 – 41,0	60 x 13,0	**EI 60-C/U EI 60-C/C**
				60 x 20,0	**EI 120-C/U EI 120-C/C**
				100 x 9,6	**EI 60-C/U EI 60-C/C**
				100 x 12,0	**EI 120-C/U EI 120-C/C**
				120 x 6,5	**EI 60-C/U EI 60-C/C**
				120 x 10,0	**EI 120-C/U EI 120-C/C**
			42,0 – 43,0	60 x 13,0	**EI 60-C/U EI 60-C/C**
				60 x 21,0	**EI 120-C/U EI 120-C/C**
				100 x 9,6	**EI 60-C/U EI 60-C/C**
wall thickness ≥ 100 mm					

Table C6. Resistance to fire classification of metal pipes (with flexible elastomeric foam (FEF) insulation) penetration seals in rigid wall, made with use of PIRO Multitube PM in accordance with Annex A1 and Annex D6 (continued).

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Insulation thickness [mm]	Intumescent material length x thickness [mm]	Fire resistance class
steel	DN ≤ 17,1	≥ 2,0	42,0 – 43,0	100 x 14,4	**EI 120-C/U EI 120-C/C**
				120 x 6,5	**EI 60-C/U EI 60-C/C**
				120 x 10,5	**EI 120-C/U EI 120-C/C**
			44,0 – 48,0	60 x 15,0	**EI 60-C/U EI 60-C/C**
				60 x 23,0	**EI 120-C/U EI 120-C/C**
				100 x 9,6	**EI 60-C/U EI 60-C/C**
				100 x 14,4	**EI 120-C/U EI 120-C/C**
				120 x 7,5	**EI 60-C/U EI 60-C/C**
				120 x 11,5	**EI 120-C/U EI 120-C/C**
			49,0 – 50,0	60 x 16,0	**EI 60-C/U EI 60-C/C**
				60 x 24,0	**EI 120-C/U EI 120-C/C**
				100 x 9,6	**EI 60-C/U EI 60-C/C**
				100 x 14,4	**EI 120-C/U EI 120-C/C**
				120 x 8,0	**EI 60-C/U EI 60-C/C**
				120 x 12,0	**EI 120-C/U EI 120-C/C**
	17,1 < DN ≤ 28,8	1,9	32,0	60 x 10,0	**EI 120-C/U EI 120-C/C**
				100 x 7,2	
				120 x 5,0	
		2,0 – 14,2	32,0	60 x 16,0	
				100 x 9,6	
				120 x 8,0	
			33,0 – 37,0	60 x 18,0	
				100 x 12,0	
				120 x 9,0	
			38,0 – 41,0	60 x 20,0	
				100 x 12,0	
				120 x 10,0	
			42,0 – 43,0	60 x 21,0	
				100 x 14,4	
				120 x 10,5	
			44,0 – 48,0	60 x 23,0	
				100 x 14,4	
				120 x 11,5	
			49,0 – 50,0	60 x 14,0	
				100 x 14,4	
				120 x 12,0	
	28,8 < DN ≤ 46,4	1,9	32,0	60 x 13,0	**EI 120-C/U EI 120-C/C**
				100 x 9,6	
				120 x 6,5	
wall thickness ≥ 100 mm					

Table C6. Resistance to fire classification of metal pipes (with flexible elastomeric foam (FEF) insulation) penetration seals in rigid wall, made with use of PIRO Multitube PM in accordance with Annex A1 and Annex D6 (continued).

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Insulation thickness [mm]	Intumescent material length x thickness [mm]	Fire resistance class
steel	28,8 < DN ≤ 46,4	2,0 – 14,2	32,0	60 x 16,0	**EI 120-C/U EI 120-C/C**
				100 x 9,6	
				120 x 8,0	
			33,0 – 37,0	60 x 18,0	
				100 x 12,0	
				120 x 9,0	
			38,0 – 41,0	60 x 20,0	
				100 x 12,0	
				120 x 10,0	
			42,0 – 43,0	60 x 21,0	
				100 x 14,4	
				120 x 10,5	
			44,0 – 48,0	60 x 23,0	
				100 x 14,4	
				120 x 11,5	
			49,0 – 50,0	60 x 24,0	
				100 x 14,4	
				120 x 12,0	
	46,4 < DN ≤ 58,1	2,0 – 14,2	32,0	60 x 15,0	**EI 120-C/U EI 120-C/C**
				100 x 9,6	
				120 x 7,5	
			33,0 – 37,0	60 x 18,0	
				100 x 12,0	
				120 x 9,0	
			38,0 – 41,0	60 x 20,0	
				100 x 12,0	
				120 x 10,0	
			42,0 – 43,0	60 x 21,0	
				100 x 14,4	
				120 x 10,5	
			44,0 – 48,0	60 x 23,0	
				100 x 14,4	
				120 x 11,5	
			49,0 – 50,0	60 x 24,0	
				100 x 14,4	
				120 x 12,0	
	58,1 < DN ≤ 63,9	2,0 – 14,2	32,0	60 x 16,0	**EI 120-C/U EI 120-C/C**
				100 x 9,6	
				120 x 8,0	
			33,0 – 37,0	60 x 18,0	
				100 x 12,0	
				120 x 9,0	
			38,0 – 41,0	60 x 20,0	
				100 x 12,0	
				120 x 10,0	
			42,0 – 43,0	60 x 21,0	
				100 x 14,4	
				120 x 10,5	
			44,0 – 48,0	60 x 23,0	
				100 x 14,4	
				120 x 11,5	
wall thickness ≥ 100 mm					

Table C6. Resistance to fire classification of metal pipes (with flexible elastomeric foam (FEF) insulation) penetration seals in rigid wall, made with use of PIRO Multitube PM in accordance with Annex A1 and Annex D6 (continued).

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Insulation thickness [mm]	Intumescent material length x thickness [mm]	Fire resistance class
steel	58,1 < DN ≤ 63,9	2,0 – 14,2	49,0 – 50,0	60 x 24,0	**EI 120-C/U EI 120-C/C**
				100 x 14,4	
				120 x 12,0	
cast iron	DN ≤ 17,1	1,8 – 1,9	32,0	60 x 8,0	**EI 120-C/U EI 120-C/C**
				100 x 4,8	
				120 x 4,0	
			33,0 – 37,0	60 x 10,0	**EI 60-C/U EI 60-C/C**
				100 x 7,2	
				120 x 5,0	
			38,0 – 41,0	60 x 13,0	**EI 60-C/U EI 60-C/C**
				100 x 9,6	
				120 x 6,5	
			42,0 – 43,0	60 x 13,0	
				100 x 9,6	
				120 x 6,5	
			44,0 – 48,0	60 x 15,0	
				100 x 9,6	
				120 x 7,5	
			49,0 – 50,0	60 x 16,0	
				100 x 9,6	
				120 x 8,0	
		≥ 2,0	32,0	60 x 8,0	**EI 120-C/U EI 120-C/C**
				100 x 4,8	
				120 x 4,0	
			33,0 – 37,0	60 x 10,0	**EI 60-C/U EI 60-C/C**
				60 x 18,0	**EI 120-C/U EI 120-C/C**
				100 x 7,2	**EI 60-C/U EI 60-C/C**
				100 x 12,0	**EI 120-C/U EI 120-C/C**
				120 x 5,0	**EI 60-C/U EI 60-C/C**
				120 x 9,0	**EI 120-C/U EI 120-C/C**
			38,0 – 41,0	60 x 13,0	**EI 60-C/U EI 60-C/C**
				60 x 20,0	**EI 120-C/U EI 120-C/C**
				100 x 9,6	**EI 60-C/U EI 60-C/C**
				100 x 12,0	**EI 120-C/U EI 120-C/C**
				120 x 6,5	**EI 60-C/U EI 60-C/C**
				120 x 10,0	**EI 120-C/U EI 120-C/C**
			42,0 – 43,0	60 x 13,0	**EI 60-C/U EI 60-C/C**
				60 x 21,0	**EI 120-C/U EI 120-C/C**
				100 x 9,6	**EI 60-C/U EI 60-C/C**

wall thickness ≥ 100 mm

Table C6. Resistance to fire classification of metal pipes (with flexible elastomeric foam (FEF) insulation) penetration seals in rigid wall, made with use of PIRO Multitube PM in accordance with Annex A1 and Annex D6 (continued).

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Insulation thickness [mm]	Intumescent material length x thickness [mm]	Fire resistance class
cast iron	DN ≤ 17,1	≥ 2,0	42,0 – 43,0	100 x 14,4	**EI 120-C/U EI 120-C/C**
				120 x 6,5	**EI 60-C/U EI 60-C/C**
				120 x 10,5	**EI 120-C/U EI 120-C/C**
			44,0 – 48,0	60 x 15,0	**EI 60-C/U EI 60-C/C**
				60 x 23,0	**EI 120-C/U EI 120-C/C**
				100 x 9,6	**EI 60-C/U EI 60-C/C**
				100 x 14,4	**EI 120-C/U EI 120-C/C**
				120 x 7,5	**EI 60-C/U EI 60-C/C**
				120 x 11,5	**EI 120-C/U EI 120-C/C**
			49,0 – 50,0	60 x 16,0	**EI 60-C/U EI 60-C/C**
				60 x 24,0	**EI 120-C/U EI 120-C/C**
				100 x 9,6	**EI 60-C/U EI 60-C/C**
				100 x 14,4	**EI 120-C/U EI 120-C/C**
				120 x 8,0	**EI 60-C/U EI 60-C/C**
				120 x 12,0	**EI 120-C/U EI 120-C/C**
	17,1 < DN ≤ 28,8	1,9	32,0	60 x 10,0	**EI 120-C/U EI 120-C/C**
				100 x 7,2	
				120 x 5,0	
		2,0 – 14,2	32,0	60 x 16,0	
				100 x 9,6	
				120 x 8,0	
			33,0 – 37,0	60 x 18,0	
				100 x 12,0	
				120 x 9,0	
			38,0 – 41,0	60 x 20,0	
				100 x 12,0	
				120 x 10,0	
			42,0 – 43,0	60 x 21,0	
				100 x 14,4	
				120 x 10,5	
			44,0 – 48,0	60 x 23,0	
				100 x 14,4	
				120 x 11,5	
			49,0 – 50,0	60 x 24,0	
				100 x 14,4	
				120 x 12,0	
	28,8 < DN ≤ 46,4	1,9	32,0	60 x 13,0	**EI 120-C/U EI 120-C/C**
				100 x 9,6	
				120 x 6,5	
wall thickness ≥ 100 mm					

Table C6. Resistance to fire classification of metal pipes (with flexible elastomeric foam (FEF) insulation) penetration seals in rigid wall, made with use of PIRO Multitube PM in accordance with Annex A1 and Annex D6 (continued).

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Insulation thickness [mm]	Intumescent material length x thickness [mm]	Fire resistance class
cast iron	28,8 < DN ≤ 46,4	2,0 – 14,2	32,0	60 x 16,0	**EI 120-C/U EI 120-C/C**
				100 x 9,6	
				120 x 8,0	
			33,0 – 37,0	60 x 18,0	
				100 x 12,0	
				120 x 9,0	
			38,0 – 41,0	60 x 20,0	**EI 120-C/U EI 120-C/C**
				100 x 12,0	
				120 x 10,0	
			42,0 – 43,0	60 x 21,0	
				100 x 14,4	
				120 x 10,5	
			44,0 – 48,0	60 x 23,0	
				100 x 14,4	
				120 x 11,5	
			49,0 – 50,0	60 x 24,0	
				100 x 14,4	
				120 x 12,0	
	46,4 < DN ≤ 58,1	2,0 – 14,2	32,0	60 x 15,0	**EI 120-C/U EI 120-C/C**
				100 x 9,6	
				120 x 7,5	
			33,0 – 37,0	60 x 18,0	
				100 x 14,4	
				120 x 9,0	
			38,0 – 41,0	60 x 20,0	
				100 x 14,4	
				120 x 10,0	
			42,0 – 43,0	60 x 21,0	
				100 x 14,4	
				120 x 10,5	
			44,0 – 48,0	60 x 23,0	
				100 x 14,4	
				120 x 11,5	
			49,0 – 50,0	60 x 24,0	
				100 x 14,4	
				120 x 12,0	
	58,1 < DN ≤ 63,9	2,0 – 14,2	32,0	60 x 16,0	**EI 120-C/U EI 120-C/C**
				100 x 9,6	
				120 x 8,0	
			33,0 – 37,0	60 x 18,0	
				100 x 12,0	
				120 x 9,0	
			38,0 – 41,0	60 x 20,0	
				100 x 12,0	
				120 x 10,0	
			42,0 – 43,0	60 x 21,0	
				100 x 14,4	
				120 x 10,5	
wall thickness ≥ 100 mm					

Table C6. Resistance to fire classification of metal pipes (with flexible elastomeric foam (FEF) insulation) penetration seals in rigid wall, made with use of PIRO Multitube PM in accordance with Annex A1 and Annex D6 (continued).

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Insulation thickness [mm]	Intumescent material length x thickness [mm]	Fire resistance class
cast iron	58,1 < DN ≤ 63,9	2,0 – 14,2	44,0 – 48,0	60 x 23,0	**EI 120-C/U EI 120-C/C**
				100 x 14,4	
				120 x 11,5	
			49,0 – 50,0	60 x 24,0	
				100 x 14,4	
				120 x 12,0	
wall thickness ≥ 100 mm					

Table C7. Resistance to fire classification of metal pipes (with flexible elastomeric foam (FEF) insulation) penetration seals in rigid wall, made with use of PIRO Multitube PM in accordance with Annex A1 and Annex D7.

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Insulation thickness [mm]	Intumescent material length x thickness [mm]	Fire resistance class
copper	DN ≤ 10,0	≥ 0,8	17,0	60 x 2,5	**EI 120 C/U** **EI 120-C/C**
				100 x 2,4	
		2,5 – 2,8	18,0 – 25,0	60 x 24,0	**EI 60 / E 120-C/U** **EI 60 / E 120-C/C**
				100 x 14,4	
				120 x 12,0	
		≥ 2,9	18,0 – 25,0	60 x 6,5	**EI 120-C/U** **EI 120-C/C**
				100 x 4,8	
				120 x 4,0	
	10,0 < DN ≤ 54,0	2,5 – 2,8	25,0	60 x 24,0	**EI 60 / E 120-C/U** **EI 60 / E 120-C/C**
				100 x 14,4	
				120 x 12,0	
		2,9 – 14,2	25,0	60 x 6,5	**EI 120-C/U** **EI 120-C/C**
				100 x 4,8	
				120 x 4,0	
	54,0 < DN ≤ 63,8	2,5 – 14,2	25,0	60 x 15,0	**EI 60 / E 120-C/U** **EI 60 / E 120-C/C**
				100 x 9,6	
				120 x 7,5	
	63,8 < DN ≤ 68,7	2,5 – 14,2	25,0	60 x 16,0	
				100 x 9,6	
				120 x 8,0	
	68,7 < DN ≤ 78,5	2,5 – 14,2	25,0	60 x 18,0	
				100 x 12,0	
				120 x 9,0	
	78,5 < DN ≤ 88,4	2,5 – 14,2	25,0	60 x 20,0	
				100 x 12,0	
				120 x 10,0	
	88,4 < DN ≤ 93,3	2,5 – 14,2	25,0	60 x 21,0	**EI 60 / E 120-C/U** **EI 60 / E 120-C/C**
				100 x 14,4	
				120 x 10,5	
	93,3 < DN ≤ 103,1	2,5 – 14,2	25,0	60 x 23,0	
				100 x 14,4	
				120 x 11,5	
	103,1 < DN ≤ 108,0	2,5 – 14,2	25,0	60 x 24,0	
				100 x 14,4	
				120 x 12,0	
wall thickness ≥ 150 mm					

Table C7. Resistance to fire classification of metal pipes (with flexible elastomeric foam (FEF) insulation) penetration seals in rigid wall, made with use of PIRO Multitube PM in accordance with Annex A1 and Annex D7 (continued).

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Insulation thickness [mm]	Intumescent material length x thickness [mm]	Fire resistance class
steel	DN ≤ 17,1	1,8 – 1,9	32,0	60 x 8,0	**EI 120-C/U EI 120-C/C**
				100 x 4,8	
				120 x 4,0	
			33,0 – 37,0	60 x 10,0	**EI 60-C/U EI 60-C/C**
				100 x 7,2	
				120 x 5,0	
			38,0 – 41,0	60 x 13,0	
				100 x 9,6	
				120 x 6,5	
			42,0 – 43,0	60 x 13,0	
				100 x 9,6	
				120 x 6,5	
			44,0 – 48,0	60 x 15,0	
				100 x 9,6	
				120 x 7,5	
			49,0 – 50,0	60 x 16,0	
				100 x 9,6	
				120 x 8,0	
		2,0 – 5,1	32,0	60 x 8,0	**EI 120-C/U EI 120-C/C**
				100 x 4,8	
				120 x 4,0	
			33,0 – 37,0	60 x 10,0	**EI 60-C/U EI 60-C/C**
				60 x 18,0	**EI 120-C/U EI 120-C/C**
				100 x 7,2	**EI 60-C/U EI 60-C/C**
				100 x 12,0	**EI 120-C/U EI 120-C/C**
				120 x 5,0	**EI 60-C/U EI 60-C/C**
	DN ≤ 17,1	2,0 – 5,1	33,0 – 37,0	120 x 9,0	**EI 120-C/U EI 120-C/C**
			38,0 – 41,0	60 x 13,0	**EI 60-C/U EI 60-C/C**
				60 x 20,0	**EI 120-C/U EI 120-C/C**
				100 x 9,6	**EI 60-C/U EI 60-C/C**
				100 x 12,0	**EI 120-C/U EI 120-C/C**
				120 x 6,5	**EI 60-C/U EI 60-C/C**
				120 x 10,0	**EI 120-C/U EI 120-C/C**
			42,0 – 43,0	60 x 13,0	**EI 60-C/U EI 60-C/C**
				60 x 21,0	**EI 120-C/U EI 120-C/C**
				100 x 9,6	**EI 60-C/U EI 60-C/C**
wall thickness ≥ 150 mm					

Table C7. Resistance to fire classification of metal pipes (with flexible elastomeric foam (FEF) insulation) penetration seals in rigid wall, made with use of PIRO Multitube PM in accordance with Annex A1 and Annex D7 (continued).

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Insulation thickness [mm]	Intumescent material length x thickness [mm]	Fire resistance class
steel	DN ≤ 17,1	2,0 – 5,1	42,0 – 43,0	100 x 14,4	**EI 120-C/U EI 120-C/C**
				120 x 6,5	**EI 60-C/U EI 60-C/C**
				120 x 10,5	**EI 120-C/U EI 120-C/C**
			44,0 – 48,0	60 x 15,0	**EI 60-C/U EI 60-C/C**
				60 x 23,0	**EI 120-C/U EI 120-C/C**
				100 x 9,6	**EI 60-C/U EI 60-C/C**
				100 x 14,4	**EI 120-C/U EI 120-C/C**
				120 x 7,5	**EI 60-C/U EI 60-C/C**
				120 x 11,5	**EI 120-C/U EI 120-C/C**
			49,0 – 50,0	60 x 16,0	**EI 60-C/U EI 60-C/C**
				60 x 24,0	**EI 120-C/U EI 120-C/C**
				100 x 9,6	**EI 60-C/U EI 60-C/C**
				100 x 14,4	**EI 120-C/U EI 120-C/C**
				120 x 8,0	**EI 60-C/U EI 60-C/C**
				120 x 12,0	**EI 120-C/U EI 120-C/C**
		≥ 5,2	10,0	60 x 2,5	
			11,0 – 32,0	60 x 8,0	
				100 x 4,8	
				120 x 4,0	
			33,0 – 37,0	60 x 10,0	**EI 60-C/U EI 60-C/C**
				60 x 18,0	**EI 120-C/U EI 120-C/C**
				100 x 7,2	**EI 60-C/U EI 60-C/C**
				100 x 12,0	**EI 120-C/U EI 120-C/C**
				120 x 5,0	**EI 60-C/U EI 60-C/C**
				120 x 9,0	**EI 120-C/U EI 120-C/C**
			38,0 – 41,0	60 x 13,0	**EI 60-C/U EI 60-C/C**
				60 x 20,0	**EI 120-C/U EI 120-C/C**
				100 x 9,6	**EI 60-C/U EI 60-C/C**
wall thickness ≥ 150 mm					

Table C7. Resistance to fire classification of metal pipes (with flexible elastomeric foam (FEF) insulation) penetration seals in rigid wall, made with use of PIRO Multitube PM in accordance with Annex A1 and Annex D7 (continued).

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Insulation thickness [mm]	Intumescent material length x thickness [mm]	Fire resistance class
steel	DN ≤ 17,1	2,0 – 5,1	38,0 – 41,0	100 x 12,0	**EI 120-C/U EI 120-C/C**
				120 x 6,5	**EI 60-C/U EI 60-C/C**
				120 x 10,0	**EI 120-C/U EI 120-C/C**
			42,0 – 43,0	60 x 13,0	**EI 60-C/U EI 60-C/C**
				60 x 21,0	**EI 120-C/U EI 120-C/C**
	DN ≤ 17,1	≥ 5,2	42,0 – 43,0	100 x 9,6	**EI 60-C/U EI 60-C/C**
				100 x 14,4	**EI 120-C/U EI 120-C/C**
				120 x 6,5	**EI 60-C/U EI 60-C/C**
				120 x 10,5	**EI 120-C/U EI 120-C/C**
			44,0 – 48,0	60 x 15,0	**EI 60-C/U EI 60-C/C**
				60 x 23,0	**EI 120-C/U EI 120-C/C**
				100 x 9,6	**EI 60-C/U EI 60-C/C**
				100 x 14,4	**EI 120-C/U EI 120-C/C**
				120 x 7,5	**EI 60-C/U EI 60-C/C**
				120 x 11,5	**EI 120-C/U EI 120-C/C**
			49,0 – 50,0	60 x 16,0	**EI 60-C/U EI 60-C/C**
				60 x 24,0	**EI 120-C/U EI 120-C/C**
				100 x 9,6	**EI 60-C/U EI 60-C/C**
				100 x 14,4	**EI 120-C/U EI 120-C/C**
				120 x 8,0	**EI 60-C/U EI 60-C/C**
				120 x 12,0	**EI 120-C/U EI 120-C/C**
wall thickness ≥ 150 mm					

Table C7. Resistance to fire classification of metal pipes (with flexible elastomeric foam (FEF) insulation) penetration seals in rigid wall, made with use of PIRO Multitube PM in accordance with Annex A1 and Annex D7 (continued).

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Insulation thickness [mm]	Intumescent material length x thickness [mm]	Fire resistance class
steel	17,1 < DN ≤ 28,8	1,9	32,0	60 x 10,0	**EI 120-C/U EI 120-C/C**
				100 x 7,2	
				120 x 5,0	
		2,0 – 4,7	32,0	60 x 16,0	
				100 x 9,6	
				120 x 8,0	
			33,0 – 37,0	60 x 18,0	
				100 x 12,0	
				120 x 9,0	
			38,0 – 41,0	60 x 20,0	
				100 x 12,0	
				120 x 10,0	
			42,0 – 43,0	60 x 21,0	
				100 x 14,4	
				120 x 10,5	
		2,0 – 4,7	44,0 – 48,0	60 x 23,0	**EI 120-C/U EI 120-C/C**
				100 x 14,4	
				120 x 11,5	
			49,0 – 50,0	60 x 24,0	
				100 x 14,4	
				120 x 12,0	
		4,8 – 5,1	25,0 – 31,0	100 x 16,8	**EI 90-C/U EI 90-C/C**
				120 x 13,0	
			32,0	60 x 16,0	**EI 120-C/U EI 120-C/C**
				100 x 9,6	
				120 x 8,0	
	17,1 < DN ≤ 28,8	4,8 – 5,1	33,0 – 37,0	60 x 18,0	
				100 x 12,0	
				120 x 9,0	
			38,0 – 41,0	60 x 20,0	
				100 x 12,0	
				120 x 10,0	
			42,0 – 43,0	60 x 21,0	
				100 x 14,4	
				120 x 10,5	
			44,0 – 48,0	60 x 23,0	
				100 x 14,4	
				120 x 11,5	
			49,0 – 50,0	60 x 24,0	
				100 x 14,4	
wall thickness ≥ 150 mm					

Table C7. Resistance to fire classification of metal pipes (with flexible elastomeric foam (FEF) insulation) penetration seals in rigid wall, made with use of PIRO Multitube PM in accordance with Annex A1 and Annex D7 (continued).

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Insulation thickness [mm]	Intumescent material length x thickness [mm]	Fire resistance class
steel	17,1 < DN ≤ 28,8	5,2 – 14,2	25,0	60 x 6,5	**EI 120-C/U EI 120-C/C**
				100 x 4,8	
			25,0 – 32,0	60 x 16,0	
				100 x 9,6	
				120 x 8,0	
			33,0 – 37,0	60 x 18,0	
				100 x 12,0	
				120 x 9,0	
			38,0 – 41,0	60 x 20,0	
				100 x 12,0	
				120 x 10,0	
			42,0 – 43,0	60 x 21,0	
				100 x 14,4	
				120 x 10,5	
			44,0 – 48,0	60 x 23,0	
				100 x 14,4	
				120 x 11,5	
			49,0 – 50,0	60 x 24,0	
				100 x 14,4	
				120 x 12,0	
	28,8 < DN ≤ 46,4	1,9	32,0	60 x 13,0	**EI 120-C/U EI 120-C/C**
				100 x 9,6	
				120 x 6,5	
		2,0 – 4,7	32,0	60 x 16,0	
				100 x 9,6	
				120 x 8,0	
			33,0 – 37,0	60 x 18,0	
				100 x 12,0	
	28,8 < DN ≤ 46,4	2,0 – 4,7	33,0 – 37,0	120 x 9,0	
			38,0 – 41,0	60 x 20,0	
				100 x 12,0	
				120 x 10,0	
			42,0 – 43,0	60 x 21,0	
				100 x 14,4	
				120 x 10,5	
			44,0 – 48,0	60 x 23,0	
				100 x 14,4	
				120 x 11,5	
wall thickness ≥ 150 mm					

Table C7. Resistance to fire classification of metal pipes (with flexible elastomeric foam (FEF) insulation) penetration seals in rigid wall, made with use of PIRO Multitube PM in accordance with Annex A1 and Annex D7 (continued).

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Insulation thickness [mm]	Intumescent material length x thickness [mm]	Fire resistance class
steel	28,8 < DN ≤ 46,4	2,0 – 4,7	49,0 – 50,0	60 x 24,0	**EI 120-C/U EI 120-C/C**
				100 x 14,4	
				120 x 12,0	
		4,8 – 5,1	25,0 – 31,0	100 x 16,8	**EI 90-C/U EI 90-C/C**
				120 x 13,0	
			32,0	60 x 16,0	**EI 120-C/U EI 120-C/C**
				100 x 9,6	
				120 x 8,0	
		4,8 – 5,1	33,0 – 37,0	60 x 18,0	**EI 120-C/U EI 120-C/C**
				100 x 12,0	
				120 x 9,0	
			38,0 – 41,0	60 x 20,0	
				100 x 12,0	
				120 x 10,0	
			42,0 – 43,0	60 x 21,0	
				100 x 14,4	
				120 x 10,5	
			44,0 – 48,0	60 x 23,0	
				100 x 14,4	
				120 x 11,5	
			49,0 – 50,0	60 x 24,0	
				100 x 14,4	
				120 x 12,0	
		5,2 – 14,2	25,0	60 x 6,5	
				100 x 4,8	
			25,0 – 32,0	60 x 16,0	
				100 x 9,6	
				120 x 8,0	
			33,0 – 37,0	60 x 18,0	
				100 x 12,0	
				120 x 9,0	
	28,8 < DN ≤ 46,4	5,2 – 14,2	38,0 – 41,0	60 x 20,0	**EI 120-C/U EI 120-C/C**
				100 x 12,0	
				120 x 10,0	
			42,0 – 43,0	60 x 21,0	
				100 x 14,4	
				120 x 10,5	
			44,0 – 48,0	60 x 23,0	
				100 x 14,4	
				120 x 11,5	
			49,0 – 50,0	60 x 24,0	
				100 x 14,4	
				120 x 12,0	
wall thickness ≥ 150 mm					

Table C7. Resistance to fire classification of metal pipes (with flexible elastomeric foam (FEF) insulation) penetration seals in rigid wall, made with use of PIRO Multitube PM in accordance with Annex A1 and Annex D7 (continued).

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Insulation thickness [mm]	Intumescent material length x thickness [mm]	Fire resistance class
steel	46,4 < DN ≤ 58,1	2,0 – 4,7	32,0	60 x 15,0	**EI 120-C/U EI 120-C/C**
				100 x 9,6	
				120 x 7,5	
			33,0 – 37,0	60 x 18,0	
				100 x 12,0	
				120 x 9,0	
			38,0 – 41,0	60 x 20,0	
				100 x 12,0	
				120 x 10,0	
			42,0 – 43,0	60 x 21,0	
				100 x 14,4	
				120 x 10,5	
			44,0 – 48,0	60 x 23,0	
				100 x 14,4	
				120 x 11,5	
			49,0 – 50,0	60 x 24,0	
				100 x 14,4	
				120 x 12,0	
		4,8 – 5,1	25,0 – 31,0	100 x 16,8	**EI 90-C/U EI 90-C/C**
				120 x 13,0	
			32,0	60 x 16,0	**EI 120-C/U EI 120-C/C**
				100 x 9,6	
				120 x 8,0	
			33,0 – 37,0	60 x 18,0	
				100 x 14,4	
				120 x 9,0	
			38,0 – 41,0	60 x 20,0	
				100 x 14,4	
				120 x 10,0	
	46,4 < DN ≤ 58,1	4,8 – 5,1	42,0 – 43,0	60 x 21,0	**EI 120-C/U EI 120-C/C**
				100 x 14,4	
				120 x 10,5	
			44,0 – 48,0	60 x 23,0	
				100 x 14,4	
				120 x 11,5	
			49,0 – 50,0	60 x 24,0	
				100 x 14,4	
				120 x 12,0	
		5,2 – 14,2	25,0	60 x 6,5	
				100 x 4,8	
			25,0 – 32,0	60 x 16,0	
				100 x 9,6	
				120 x 8,0	
			33,0 – 37,0	60 x 18,0	
				100 x 12,0	
				120 x 9,0	
			38,0 – 41,0	60 x 20,0	
				100 x 12,0	
				120 x 10,0	
wall thickness ≥ 150 mm					

Table C7. Resistance to fire classification of metal pipes (with flexible elastomeric foam (FEF) insulation) penetration seals in rigid wall, made with use of PIRO Multitube PM in accordance with Annex A1 and Annex D7 (continued).

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Insulation thickness [mm]	Intumescent material length x thickness [mm]	Fire resistance class
steel	46,4 < DN ≤ 58,1	5,2 – 14,2	42,0 – 43,0	60 x 21,0	**EI 120-C/U EI 120-C/C**
				100 x 14,4	
				120 x 10,5	
			44,0 – 48,0	60 x 23,0	
				100 x 14,4	
				120 x 11,5	
			49,0 – 50,0	60 x 24,0	
				100 x 14,4	
				120 x 12,0	
	58,1 < DN ≤ 63,9	2,0 – 4,7	32,0	60 x 16,0	**EI 120-C/U EI 120-C/C**
				100 x 9,6	
				120 x 8,0	
			33,0 – 37,0	60 x 18,0	
				100 x 12,0	
				120 x 9,0	
			38,0 – 41,0	60 x 20,0	
				100 x 12,0	
				120 x 10,0	
			42,0 – 43,0	60 x 21,0	
				100 x 14,4	
				120 x 10,5	
	58,1 < DN ≤ 63,9	2,0 – 4,7	44,0 – 48,0	60 x 23,0	**EI 120-C/U EI 120-C/C**
				100 x 14,4	
				120 x 11,5	
			49,0 – 50,0	60 x 24,0	
				100 x 14,4	
				120 x 12,0	
		4,8 – 5,1	25,0 – 31,0	100 x 16,8	**EI 90-C/U EI 90-C/C**
				120 x 13,0	
			32,0	60 x 16,0	**EI 120-C/U EI 120-C/C**
				100 x 9,6	
				120 x 8,0	
			33,0 – 37,0	60 x 18,0	
				100 x 12,0	
				120 x 9,0	
			38,0 – 41,0	60 x 20,0	
				100 x 12,0	
				120 x 10,0	
			42,0 – 43,0	60 x 21,0	
				100 x 14,4	
				120 x 10,5	
			44,0 – 48,0	60 x 23,0	
				100 x 14,4	
				120 x 11,5	
			49,0 – 50,0	60 x 24,0	
				100 x 14,4	
				120 x 12,0	
wall thickness ≥ 150 mm					

Table C7. Resistance to fire classification of metal pipes (with flexible elastomeric foam (FEF) insulation) penetration seals in rigid wall, made with use of PIRO Multitube PM in accordance with Annex A1 and Annex D7 (continued).

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Insulation thickness [mm]	Intumescent material length x thickness [mm]	Fire resistance class
steel	58,1 < DN ≤ 63,9	5,2 – 14,2	25,0	60 x 6,5	**EI 120-C/U EI 120-C/C**
				100 x 4,8	
			25,0 – 32,0	60 x 16,0	
				100 x 9,6	
				120 x 8,0	
			33,0 – 37,0	60 x 18,0	
				100 x 12,0	
				120 x 9,0	
			38,0 – 41,0	60 x 20,0	
				100 x 12,0	
				120 x 10,0	
			42,0 – 43,0	60 x 21,0	
				100 x 14,4	
				120 x 10,5	
			44,0 – 48,0	60 x 23,0	
				100 x 14,4	
				120 x 11,5	
			49,0 – 50,0	60 x 24,0	
				100 x 14,4	
				120 x 12,0	
	63,9 < DN ≤ 78,0	4,8 – 4,9	25,0	100 x 16,8	**EI 90-C/U EI 90-C/C**
				120 x 13,0	
		5,0 – 5,1	25,0	100 x 19,2	**EI 120-C/U EI 120-C/C**
				120 x 14,5	
		5,2 – 14,2	25,0	60 x 15,0	
				100 x 9,6	
				120 x 7,5	
	78,0 < DN ≤ 88,1	4,8 – 4,9	25,0	100 x 16,8	**EI 90-C/U EI 90-C/C**
				120 x 13,0	
		5,0 – 5,1	25,0	100 x 19,2	**EI 120-C/U EI 120-C/C**
				120 x 14,5	
		5,2 – 14,2	25,0	60 x 16,0	
				100 x 9,6	
				120 x 8,0	
	88,1 < DN ≤ 108,2	4,8 – 4,9	25,0	100 x 16,8	**EI 90-C/U EI 90-C/C**
				120 x 13,0	
		5,0 – 5,1	25,0	100 x 19,2	**EI 120-C/U EI 120-C/C**
				120 x 14,5	
		5,2 – 14,2	25,0	60 x 18,0	
				100 x 12,0	
				120 x 9,0	
	108,2 < DN ≤ 128,4	4,8 – 4,9	25,0	100 x 16,8	**EI 90-C/U EI 90-C/C**
				120 x 13,0	
		5,0 – 5,1	25,0	100 x 19,2	**EI 120-C/U EI 120-C/C**
				120 x 14,5	
		5,2 – 14,2	25,0	60 x 20,0	
				100 x 12,0	
				120 x 10,0	
wall thickness ≥ 150 mm					

Table C7. Resistance to fire classification of metal pipes (with flexible elastomeric foam (FEF) insulation) penetration seals in rigid wall, made with use of PIRO Multitube PM in accordance with Annex A1 and Annex D7 (continued).

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Insulation thickness [mm]	Intumescent material length x thickness [mm]	Fire resistance class
steel	128,4 < DN ≤ 138,5	4,8 – 4,9	25,0	100 x 16,8	**EI 90-C/U EI 90-C/C**
				120 x 13,0	
		5,0 – 5,1	25,0	100 x 19,2	**EI 120-C/U EI 120-C/C**
				120 x 14,5	
		5,2 – 14,2	25,0	60 x 21,0	
				100 x14,4	
				120 x 10,5	
	138,5 < DN ≤ 158,6	4,8 – 4,9	25,0	100 x 16,8	**EI 90-C/U EI 90-C/C**
				120 x 13,0	
		5,0 – 5,1	25,0	100 x 19,2	**EI 120-C/U EI 120-C/C**
				120 x 14,5	
		5,2 – 14,2	25,0	60 x 23,0	
				100 x 14,4	
				120 x 11,5	
	158,6 < DN ≤ 168,7	5,0 – 5,1	25,0	100 x 19,2	**EI 120-C/U EI 120-C/C**
				120 x 14,5	
		5,2 – 14,2	25,0	60 x 24,0	
				100 x 14,4	
				120 x 12,0	
	168,7 < DN ≤ 178,7	5,0 – 5,1	25,0	100 x 19,2	**EI 120-C/U EI 120-C/C**
				120 x 14,5	
		5,2 – 14,2	25,0	100 x 16,8	
				120 x 12,5	
	178,7 < DN ≤ 188,8	5,0 – 5,1	25,0	100 x 19,2	
				120 x 14,5	
		5,2 – 14,2	25,0	100 x 16,8	
				120 x 13,0	
	188,8 < DN ≤ 208,9	5,0 – 5,1	25,0	100 x 19,2	
				120 x 14,5	
		5,2 – 14,2	25,0	100 x 16,8	
				120 x 14,0	
	208,9 < DN ≤ 225,0	5,0 – 5,1	25,0	100 x 19,2	
				120 x 14,5	
		5,2 – 14,2	25,0	100 x 19,2	
				120 x 14,5	
wall thickness ≥ 150 mm					

Table C7. Resistance to fire classification of metal pipes (with flexible elastomeric foam (FEF) insulation) penetration seals in rigid wall, made with use of PIRO Multitube PM in accordance with Annex A1 and Annex D7 (continued).

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Insulation thickness [mm]	Intumescent material length x thickness [mm]	Fire resistance class
cast iron	DN ≤ 60	3,5 – 14,2	13,0	60 x 8,0	**EI 120-C/U EI 120-C/C**
				100 x 4,8	
				120 x 4,0	
	60 < DN ≤ 70	3,6 – 14,2	13,0	60 x 8,0	**EI 60 / E 120-C/U EI 60 / E 120-C/C**
				100 x 4,8	
				120 x 4,0	
	70 < DN ≤ 80	3,8 – 14,2	13,0	60 x 8,0	
				100 x 4,8	
				120 x 4,0	
	80 < DN ≤ 90	3,9 – 14,2	13,0	60 x 8,0	**EI 60 / E 120-C/U EI 60 / E 120-C/C**
				100 x 4,8	
				120 x 4,0	
	90 < DN ≤ 100	4,1 – 14,2	13,0	60 x 8,0	
				100 x 4,8	
				120 x 4,0	
	100 < DN ≤ 110	4,2 – 14,2	13,0	60 x 8,0	
				100 x 4,8	
				120 x 4,0	
	110 < DN ≤ 120	4,3 – 14,2	13,0	60 x 8,0	
				100 x 4,8	
				120 x 4,0	
	120 < DN ≤ 130	4,5 – 14,2	13,0	60 x 8,0	
				100 x 4,8	
				120 x 4,0	
	130 < DN ≤ 140	4,6 – 14,2	13,0	60 x 8,0	
				100 x 4,8	
				120 x 4,0	
	140 < DN ≤ 150	4,8 – 14,2	13,0	60 x 8,0	
				100 x 4,8	
				120 x 4,0	
	150 < DN ≤ 160	4,9 – 14,2	13,0	60 x 8,0	
				100 x 4,8	
				120 x 4,0	
wall thickness ≥ 150 mm					

Table C7. Resistance to fire classification of metal pipes (with flexible elastomeric foam (FEF) insulation) penetration seals in rigid wall, made with use of PIRO Multitube PM in accordance with Annex A1 and Annex D7 (continued).

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Insulation thickness [mm]	Intumescent material length x thickness [mm]	Fire resistance class
cast iron	160 < DN ≤ 170	5,0 – 14,2	13,0	60 x 8,0	**EI 60 / E 120-C/U EI 60 / E 120-C/C**
				100 x 4,8	
				120 x 4,0	
	170 < DN ≤ 180	5,2 – 14,2	13,0	60 x 8,0	
				100 x 4,8	
				120 x 4,0	
	180 < DN ≤ 190	5,3 – 14,2	13,0	60 x 8,0	
				100 x 4,8	
				120 x 4,0	
	190 < DN ≤ 200	5,5 – 14,2	13,0	60 x 8,0	
				100 x 4,8	
				120 x 4,0	
	200 < DN ≤ 210	5,6 – 14,2	13,0	60 x 8,0	
				100 x 4,8	
				120 x 4,0	
	210 < DN ≤ 220	5,8 – 14,2	13,0	60 x 8,0	
				100 x 4,8	
				120 x 4,0	
	220 < DN ≤ 230	5,9 – 14,2	13,0	60 x 8,0	**EI 60 / E 120-C/U EI 60 / E 120-C/C**
				100 x 4,8	
				120 x 4,0	
	230 < DN ≤ 240	6,0 – 14,2	13,0	60 x 8,0	
				100 x 4,8	
				120 x 4,0	
	240 < DN ≤ 250	6,2 – 14,2	13,0	60 x 8,0	
				100 x 4,8	
				120 x 4,0	
	250 < DN ≤ 260	6,3 – 14,2	13,0	60 x 8,0	
				100 x 4,8	
				120 x 4,0	
	260 < DN ≤ 273	6,5 – 14,2	13,0	60 x 8,0	
				100 x 4,8	
				120 x 4,0	
wall thickness ≥ 150 mm					

Table C8. Resistance to fire classification of metal pipes (with flexible elastomeric foam (FEF) insulation) and PiroCoat I penetration seals in rigid wall, made with use of PIRO Multitube PM in accordance with Annex A1 and Annex D8.

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Insulation thickness [mm]	Intumescent material length x thickness [mm]	Fire resistance class
copper	DN ≤ 35	1,5 – 14,2	0,1 – 32,0	60 x 8,0 100 x 4,8 120 x 4,0	**EI 120 C/U** **EI 120-C/C**
steel	DN ≤ 35	1,5 – 14,2	0,1 – 32,0	60 x 8,0 100 x 4,8 120 x 4,0	**EI 120 C/U** **EI 120-C/C**
cast iron	DN ≤ 35	1,5 – 14,2	0,1 – 32,0	60 x 8,0 100 x 4,8 120 x 4,0	**EI 120 C/U** **EI 120-C/C**
wall thickness ≥ 100 mm					

Table C9. Resistance to fire classification of cable bundle ($ø_{bundle}$ ≤ 100 mm) penetration seals (without insulation) in rigid wall, made with use of PIRO Multitube PM dimensions of (width x thickness): 60 x 10,0 mm or 100 x 7,2 mm or 120 x 5,0 mm, in accordance with Annex A1 and Annex D9.

Fire resistance class: EI 120
wall thickness ≥ 150 mm

Table C10. Resistance to fire classification of cable bundle (max. 5 cables, $ø_{cable}$ ≤ 13 mm) placed in PVC-U pipe diameter of max. 110 mm and pipe wall thickness of 2,8 mm penetration seals (without insulation) in flexible or rigid wall, made with use of PIRO Multitube PM dimenstions of: (width x thickness): 60 x 16,0 mm or 100 x 9,6 mm or 120 x 8,0 mm, in accordance with Annex A1 and Annex D10.

Fire resistance class: EI 120
wall thickness ≥ 100 mm

Table C11. Resistance to fire classification of metal pipes (with flexible elastomeric foam (FEF) insulation), made with use of PIRO Multitube PM with additional single small cable (ø ≤ 13 mm) penetration sealed with use of PiroCoating length of 300 mm, dry layer thickness of 1,2 mm, penetration seals in rigid wall, in accordance with Annex A1 and Annex D11.

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Insulation thickness [mm]	Intumescent material length x thickness [mm]	Fire resistance class
copper	DN ≤ 10	≥ 0,8	32,0	60 x 8,0	**EI 120-C/U EI 120-C/C**
				100 x 4,8	
				120 x 4,0	
	10 < DN ≤ 20	1,1 – 14,2	32,0	60 x 8,0	**EI 60 / E 120-C/U EI 60 / E 120-C/C**
				100 x 4,8	
				120 x 4,0	
	20 < DN ≤ 30	1,4 – 14,2	32,0	60 x 8,0	
				100 x 4,8	
				120 x 4,0	
	30 < DN ≤ 35	1,5 – 14,2	32,0	60 x 8,0	
				100 x 4,8	
				120 x 4,0	
wall thickness ≥ 100 mm					

Table C12. Resistance to fire classification of PE-X pipe bundle (max. 3 pipes – 3 x diameter of max. 20 mm and pipe wall thickness of 2,0 – 4,5 mm or 2 x diameter of max. 20 mm and pipe wall thickness of 2,0 – 4,5 mm and 1 x diameter of max 50 mm and pipe wall thickness of 4,5 mm) penetration seals in flexible or rigid wall, made with use of PIRO Multitube PM dimensions of (width x thickness): 60 x 5,0 mm or 120 x 2,5 mm or 100 x 4,8 mm, in accordance with Annex A1 and Annex D12.

Fire resistance class: **EI 120-U/C** **EI 120-C/C**
wall thickness ≥ 100 mm

Table C13. Resistance to fire classification of PE-X pipe bundle (max. 4 pipes – 4 x diameter of max. 20 mm and pipe wall thickness of 2,0 mm) penetration seals in flexible or rigid wall, made with use of PIRO Multitube PM dimensions of (width x thickness): 60 x 5,0 mm or 120 x 2,5 mm or 100 mm x 4,8 mm, in accordance with Annex A1 and Annex D13.

Fire resistance class: **EI 120-U/C** **EI 120-C/C**
wall thickness ≥ 100 mm

Table C14. Resistance to fire classification of plastic pipes (without insulation) penetration seals in rigid floor, made with use of PIRO Multitube PM, in accordance with Annex A1 and Annex D14.

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Intumescent material length x thickness [mm]	Fire resistance class
PVC-U / PVC-C	DN ≤ 50	1,8	60 x 4,0	**EI 120-U/C EI 120-C/C**
			100 x 2,4	
			120 x 2,5	
		1,9 – 2,1	60 x 8,0	
			100 x 4,8	
			120 x 4,0	
		1,9 – 2,1	60 x 4,0	**EI 90-U/C EI 90-C/C**
			100 x 2,4	
			120 x 2,5	
	50 < DN ≤ 65	1,9 – 2,1	60 x 8,0	**EI 120-U/C EI 120-C/C**
			100 x 4,8	
			120 x 4,0	
		1,9 – 2,1	60 x 4,0	**EI 90-U/C EI 90-C/C**
			100 x 2,4	
			120 x 2,5	
	65 < DN ≤ 80	2,0 – 2,1	60 x 8,0	**EI 120-U/C EI 120-C/C**
			100 x 4,8	
			120 x 4,0	
		2,0– 2,1	60 x 4,0	**EI 90-U/C EI 90-C/C**
			100 x 2,4	
			120 x 2,5	
			120 x 4,0	
	80 < DN ≤ 95	2,1	60 x 8,0	**EI 120-U/C EI 120-C/C**
			100 x 4,8	
			120 x 4,0	
		2,1	60 x 4,0	**EI 90-U/C EI 90-C/C**
			100 x 2,4	
			120 x 2,5	
	DN ≤ 110	2,2 – 6,4	60 x 4,0	**EI 120-U/C EI 120-C/C**
			100 x 4,8	
			120 x 4,0	
floor thickness ≥ 150 mm				

Table C14. Resistance to fire classification of plastic pipes (without insulation) penetration seals in rigid floor, made with use of PIRO Multitube PM, in accordance with Annex A1 and Annex D14 (continued).

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Intumescent material length x thickness [mm]	Fire resistance class
PVC-U / PVC-C	DN ≤ 40	1,6 – 2,1	60 x 2,5	**EI 120-U/C EI 120-C/C**
			100 x 4,8	
		6,5 – 6,9	60 x 13,0	
			100 x 9,6	
			120 x 6,5	
		7,0 – 7,6	60 x 15,0	
			100 x 9,6	
			120 x 7,5	
		7,7 – 8,0	60 x 16,0	
			100 x 9,6	
			120 x 8,0	
		8,1 – 8,7	60 x 18,0	
			100 x 12,0	
			120 x 9,0	
		8,8 – 9,4	60 x 20,0	
			100 x 12,0	
			120 x 10,0	
		9,5 – 9,8	60 x 21,0	
			100 x 14,4	
			120 x 10,5	
		9,9 – 10,5	60 x 23,0	
			100 x 14,4	
			120 x 11,5	
		10,6 – 10,8	60 x 24,0	
			100 x 14,4	
			120 x 12,0	
		10,9 – 11,2	100 x 16,8	
			120 x 12,5	
		11,3 – 11,6	100 x 16,8	
			120 x 13,0	
		11,7 – 12,3	100 x 16,8	
			120 x 14,0	
		12,4 – 12,6	100 x 19,2	
			120 x 14,5	
		12,7 – 13,0	100 x 19,2	
			120 x 15,0	
floor thickness ≥ 150 mm				

Table C14. Resistance to fire classification of plastic pipes (without insulation) penetration seals in rigid floor, made with use of PIRO Multitube PM, in accordance with Annex A1 and Annex D14 (continued).

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Intumescent material length x thickness [mm]	Fire resistance class
PVC-U / PVC-C	40 < DN ≤ 59	6,4 – 6,9	60 x 13,0	**EI 120-U/C EI 120-C/C**
			100 x 9,6	
			120 x 6,5	
		7,0 – 7,6	60 x 15,0	
			100 x 9,6	
			120 x 7,5	
		7,7 – 8,0	60 x 16,0	
			100 x 9,6	
			120 x 8,0	
		8,1 – 8,7	60 x 18,0	
			100 x 12,0	
			120 x 9,0	
		8,8 – 9,4	60 x 20,0	
			100 x 12,0	
			120 x 10,0	
		9,5 – 9,8	60 x 21,0	
			100 x 14,4	
			120 x 10,5	
		9,9 – 10,5	60 x 23,0	
			100 x 14,4	
			120 x 11,5	
		10,6 – 10,8	60 x 24,0	
			100 x 14,4	
			120 x 12,0	
		10,9 – 11,2	100 x 16,8	
			120 x 12,5	
		11,3 – 11,6	100 x 16,8	
			120 x 13,0	
		11,7 – 12,3	100 x 16,8	
			120 x 14,0	
		12,4 – 12,6	100 x 19,2	
			120 x 14,5	
		12,7 – 13,0	100 x 19,2	
			120 x 15,0	
floor thickness ≥ 150 mm				

Table C14. Resistance to fire classification of plastic pipes (without insulation) penetration seals in rigid floor, made with use of PIRO Multitube PM, in accordance with Annex A1 and Annex D14 (continued).

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Intumescent material length x thickness [mm]	Fire resistance class
PVC-U / PVC-C	59 < DN ≤ 72	6,4 – 6,9	60 x 13,0	**EI 120-U/C EI 120-C/C**
			100 x 9,6	
			120 x 6,5	
		7,0 – 7,6	60 x 15,0	
			100 x 9,6	
			120 x 7,5	
		7,7 – 8,0	60 x 16,0	
			100 x 9,6	
			120 x 8,0	
		8,1 – 8,7	60 x 18,0	
			100 x 12,0	
			120 x 9,0	
		8,8 – 9,4	60 x 20,0	
			100 x 12,0	
			120 x 10,0	
		9,5 – 9,8	60 x 21,0	
			100 x 14,4	
			120 x 10,5	
		9,9 – 10,5	60 x 23,0	
			100 x 14,4	
			120 x 11,5	
		10,6 – 10,8	60 x 24,0	
			100 x 14,4	
			120 x 12,0	
		10,9 – 11,2	100 x 16,8	
			120 x 12,5	
		11,3 – 11,6	100 x 16,8	
			120 x 13,0	
		11,7 – 12,3	100 x 16,8	
			120 x 14,0	
		12,4 – 12,6	100 x 19,2	
			120 x 14,5	
		12,7 – 13,0	100 x 19,2	
			120 x 15,0	
floor thickness ≥ 150 mm				

Table C14. Resistance to fire classification of plastic pipes (without insulation) penetration seals in rigid floor, made with use of PIRO Multitube PM, in accordance with Annex A1 and Annex D14 (continued).

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Intumescent material length x thickness [mm]	Fire resistance class
PVC-U / PVC-C	72 < DN ≤ 91	6,4 – 6,9	60 x 13,0	**EI 120-U/C EI 120-C/C**
			100 x 9,6	
			120 x 6,5	
		7,0 – 7,6	60 x 15,0	
			100 x 9,6	
			120 x 7,5	
		7,7 – 8,0	60 x 16,0	
			100 x 9,6	
			120 x 8,0	
		8,1 – 8,7	60 x 18,0	
			100 x 12,0	
			120 x 9,0	
		8,8 – 9,4	60 x 20,0	
			100 x 12,0	
			120 x 10,0	
		9,5 – 9,8	60 x 21,0	
			100 x 14,4	
			120 x 10,5	
		9,9 – 10,5	60 x 23,0	
			100 x 14,4	
			120 x 11,5	
		10,6 – 10,8	60 x 24,0	
			100 x 14,4	
			120 x 12,0	
		10,9 – 11,2	100 x 16,8	
			120 x 12,5	
		11,3 – 11,6	100 x 16,8	
			120 x 13,0	
		11,7 – 12,3	100 x 16,8	
			120 x 14,0	
		12,4 – 12,6	100 x 19,2	
			120 x 14,5	
		12,7 – 13,0	100 x 19,2	
			120 x 15,0	
floor thickness ≥ 150 mm				

Table C14. Resistance to fire classification of plastic pipes (without insulation) penetration seals in rigid floor, made with use of PIRO Multitube PM, in accordance with Annex A1 and Annex D14 (continued).

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Intumescent material length x thickness [mm]	Fire resistance class
PVC-U / PVC-C	91 < DN ≤ 104	6,4 – 7,6	60 x 15,0	**EI 120-U/C EI 120-C/C**
			100 x 9,6	
			120 x 7,5	
		7,7 – 8,0	60 x 16,0	
			100 x 9,6	
			120 x 8,0	
		8,1 – 8,7	60 x 18,0	
			100 x 12,0	
			120 x 9,0	
		8,8 – 9,4	60 x 20,0	
			100 x 12,0	
			120 x 10,0	
		9,5 – 9,8	60 x 21,0	
			100 x 14,4	
			120 x 10,5	
		9,9 – 10,5	60 x 23,0	
			100 x 14,4	
			120 x 11,5	
		10,6 – 10,8	60 x 24,0	
			100 x 14,4	
			120 x 12,0	
		10,9 – 11,2	100 x 16,8	
			120 x 12,5	
		11,3 – 11,6	100 x 16,8	
			120 x 13,0	
		11,7 – 12,3	100 x 16,8	
			120 x 14,0	
		12,4 – 12,6	100 x 19,2	
			120 x 14,5	
		12,7 – 13,0	100 x 19,2	
			120 x 15,0	
floor thickness ≥ 150 mm				

Table C14. Resistance to fire classification of plastic pipes (without insulation) penetration seals in rigid floor, made with use of PIRO Multitube PM, in accordance with Annex A1 and Annex D14 (continued).

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Intumescent material length x thickness [mm]	Fire resistance class
PVC-U / PVC-C	104 < DN ≤ 110	6,4 – 8,0	60 x 16,0	**EI 120-U/C EI 120-C/C**
			100 x 9,6	
			120 x 8,0	
		8,1 – 8,7	60 x 18,0	
			100 x 12,0	
			120 x 9,0	
		8,8 – 9,4	60 x 20,0	
			100 x 12,0	
			120 x 10,0	
		9,5 – 9,8	60 x 21,0	
			100 x 14,4	
			120 x 10,5	
		9,9 – 10,5	60 x 23,0	
			100 x 14,4	
			120 x 11,5	
		10,6 – 10,8	60 x 24,0	
			100 x 14,4	
			120 x 12,0	
		10,9 – 11,2	100 x 16,8	
			120 x 12,5	
		11,3 – 11,6	100 x 16,8	
			120 x 13,0	
		11,7 – 12,3	100 x 16,8	
			120 x 14,0	
		12,4 – 12,6	100 x 19,2	
			120 x 14,5	
		12,7 – 13,0	100 x 19,2	
			120 x 15,0	
floor thickness ≥ 150 mm				

Table C14. Resistance to fire classification of plastic pipes (without insulation) penetration seals in rigid floor, made with use of PIRO Multitube PM, in accordance with Annex A1 and Annex D14 (continued).

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Intumescent material length x thickness [mm]	Fire resistance class
PVC-U / PVC-C	110 < DN ≤ 123	4,1 – 8,7	60 x 18,0	**EI 120-U/C EI 120-C/C**
			100 x 12,0	
			120 x 9,0	
		8,8 – 9,4	60 x 20,0	
			100 x 12,0	
			120 x 10,0	
		9,5 – 9,8	60 x 21,0	
			100 x 14,4	
			120 x 10,5	
		9,9 – 10,5	60 x 23,0	
			100 x 14,4	
			120 x 11,5	
		10,6 – 10,8	60 x 24,0	
			100 x 14,4	
			120 x 12,0	
		10,9 – 11,2	100 x 16,8	
			120 x 12,5	
		11,3 – 11,6	100 x 16,8	
			120 x 13,0	
		11,7 – 12,3	100 x 16,8	
			120 x 14,0	
		12,4 – 12,6	100 x 19,2	
			120 x 14,5	
		12,7 – 13,0	100 x 19,2	
			120 x 15,0	
	123 < DN ≤ 136	4,5 – 9,4	60 x 20,0	**EI 120-U/C EI 120-C/C**
			100 x 12,0	
			120 x 10,0	
		9,5 – 9,8	60 x 21,0	
			100 x 14,4	
			120 x 10,5	
		9,9 – 10,5	60 x 23,0	
			100 x 14,4	
			120 x 11,5	
		10,6 – 10,8	60 x 24,0	
			100 x 14,4	
			120 x 12,0	
		10,9 – 11,2	100 x 16,8	
			120 x 12,5	
		11,3 – 11,6	100 x 16,8	
			120 x 13,0	
		11,7 – 12,3	100 x 16,8	
			120 x 14,0	
		12,4 – 12,6	100 x 19,2	
			120 x 14,5	
		12,7 – 13,0	100 x 19,2	
			120 x 15,0	
floor thickness ≥ 150 mm				

Table C14. Resistance to fire classification of plastic pipes (without insulation) penetration seals in rigid floor, made with use of PIRO Multitube PM, in accordance with Annex A1 and Annex D14 (continued).

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Intumescent material length x thickness [mm]	Fire resistance class
PVC-U / PVC-C	136 < DN ≤ 142	4,7 – 9,8	60 x 21,0	**EI 120-U/C EI 120-C/C**
			100 x 14,4	
			120 x 10,5	
		9,9 – 10,5	60 x 23,0	
			100 x 14,4	
			120 x 11,5	
		10,6 – 10,8	60 x 24,0	
			100 x 14,4	
			120 x 12,0	
		10,9 – 11,2	100 x 16,8	
			120 x 12,5	
		11,3 – 11,6	100 x 16,8	
			120 x 13,0	
		11,7 – 12,3	100 x 16,8	
			120 x 14,0	
		12,4 – 12,6	100 x 19,2	
			120 x 14,5	
		12,7 – 13,0	100 x 19,2	
			120 x 15,0	
	142 < DN ≤ 155	5,1 – 10,5	60 x 23,0	**EI 120-U/C EI 120-C/C**
			100 x 14,4	
			120 x 11,5	
		10,6 – 10,8	60 x 24,0	
			100 x 14,4	
			120 x 12,0	
		10,9 – 11,2	100 x 16,8	
			120 x 12,5	
		11,3 – 11,6	100 x 16,8	
			120 x 13,0	
		11,7 – 12,3	100 x 16,8	
			120 x 14,0	
		12,4 – 12,6	100 x 19,2	
			120 x 14,5	
		12,7 – 13,0	100 x 19,2	
			120 x 15,0	
floor thickness ≥ 150 mm				

Table C14. Resistance to fire classification of plastic pipes (without insulation) penetration seals in rigid floor, made with use of PIRO Multitube PM, in accordance with Annex A1 and Annex D14 (continued).

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Intumescent material length x thickness [mm]	Fire resistance class
PVC-U / PVC-C	155 < DN ≤ 161	5,3 – 10,8	60 x 24,0	**EI 120-U/C EI 120-C/C**
			100 x 14,4	
			120 x 12,0	
		10,9 – 11,2	100 x 16,8	
			120 x 12,5	
		11,3 – 11,6	100 x 16,8	
			120 x 13,0	
		11,7 – 12,3	100 x 16,8	
			120 x 14,0	
		12,4 – 12,6	100 x 19,2	
			120 x 14,5	
		12,7 – 13,0	100 x 19,2	
			120 x 15,0	
	161 < DN ≤ 168	5,5 – 11,2	100 x 16,8	**EI 120-U/C EI 120-C/C**
			120 x 12,5	
		11,3 – 11,6	100 x 16,8	
			120 x 13,0	
		11,7 – 12,3	100 x 16,8	
			120 x 14,0	
		12,4 – 12,6	100 x 19,2	
			120 x 14,5	
		12,7 – 13,0	100 x 19,2	
			120 x 15,0	
	168 < DN ≤ 174	5,7 – 11,6	100 x 16,8	**EI 120-U/C EI 120-C/C**
			120 x 13,0	
		11,7 – 12,3	100 x 16,8	
			120 x 14,0	
		12,4 – 12,6	100 x 19,2	
			120 x 14,5	
		12,7 – 13,0	100 x 19,2	
			120 x 15,0	
	174 < DN ≤ 187	6,1 – 12,3	100 x 16,8	**EI 120-U/C EI 120-C/C**
			120 x 14,0	
		12,4 – 12,6	100 x 19,2	
			120 x 14,5	
		12,7 – 13,0	100 x 19,2	
			120 x 15,0	
	187 < DN ≤ 193	6,3 – 12,6	100 x 19,2	**EI 120-U/C EI 120-C/C**
			120 x 14,5	
		12,7 – 13,0	100 x 19,2	
			120 x 15,0	
	193 < DN ≤ 200	6,5 – 13,0	100 x 19,2	**EI 120-U/C EI 120-C/C**
			120 x 15,0	
floor thickness ≥ 150 mm				

Table C14. Resistance to fire classification of plastic pipes (without insulation) penetration seals in rigid floor, made with use of PIRO Multitube PM, in accordance with Annex A1 and Annex D14 (continued).

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Intumescent material length x thickness [mm]	Fire resistance class
PP	DN ≤ 50	1,8	60 x 4,0	**EI 180-U/C EI 180-C/C**
			100 x 2,4	
			120 x 2,5	
		1,9 – 5,4	60 x 8,0	**EI 120-U/C EI 120-C/C**
			100 x 4,8	
			120 x 4,0	
			60 x 4,0	**EI 90-U/C EI 90-C/C**
			100 x 2,4	
			120 x 2,5	
	50 < DN ≤ 65	1,9 – 5,4	60 x 8,0	**EI 120-U/C EI 120-C/C**
			100 x 4,8	
			120 x 4,0	
			60 x 4,0	**EI 90-U/C EI 90-C/C**
			100 x 2,4	
			120 x 2,5	
	65 < DN ≤ 80	2,1 – 5,4	60 x 8,0	**EI 120-U/C EI 120-C/C**
			100 x 4,8	
			120 x 4,0	
			60 x 4,0	**EI 90-U/C EI 90-C/C**
			100 x 2,4	
			120 x 2,5	
	80 < DN ≤ 95	2,1 – 5,4	60 x 8,0	**EI 120-U/C EI 120-C/C**
			100 x 4,8	
			120 x 4,0	
			60 x 4,0	**EI 90-U/C EI 90-C/C**
			100 x 2,4	
			120 x 2,5	
	95 < DN ≤ 110	2,2 – 5,4	60 x 8,0	**EI 120-U/C EI 120-C/C**
			100 x 4,8	
			120 x 4,0	
			60 x 4,0	**EI 90-U/C EI 90-C/C**
			100 x 2,4	
			120 x 2,5	
floor thickness ≥ 150 mm				

Table C14. Resistance to fire classification of plastic pipes (without insulation) penetration seals in rigid floor, made with use of PIRO Multitube PM, in accordance with Annex A1 and Annex D14 (continued).

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Intumescent material length x thickness [mm]	Fire resistance class
PP	DN ≤ 40	1,8 – 4,0	60 x 2,5	**EI 120-U/C** **EI 120-C/C**
			100 x 4,8	
		4,1 – 5,5	60 x 8,0	
			100 x 4,8	
			120 x 4,0	
		5,6 – 6,6	60 x 10,0	
			100 x 7,2	
			120 x 5,0	
		6,7 – 8,1	60 x 13,0	
			100 x 9,6	
			120 x 6,5	
		8,2 – 9,1	60 x 15,0	
			100 x 9,6	
			120 x 7,5	
		9,2 – 9,6	60 x 16,0	
			100 x 9,6	
			120 x 8,0	
		9,7 – 10,7	60 x 18,0	
			100 x 12,0	
			120 x 9,0	
		10,8 – 11,7	60 x 20,0	
			100 x 12,0	
			120 x 10,0	
		11,8 – 12,2	60 x 21,0	
			100 x 14,4	
			120 x 10,5	
		12,3 – 13,2	60 x 23,0	
			100 x 14,4	
			120 x 11,5	
		13,3 – 13,8	60 x 24,0	
			100 x 14,4	
			120 x 12,0	
		13,9 – 14,3	100 x 16,8	
			120 x 12,5	
		14,4 – 14,8	100 x 16,8	
			120 x 13,0	
		14,9 – 15,9	100 x 16,8	
			120 x 14,0	
		16,0 – 16,5	100 x 19,2	
			120 x 14,5	
		16,6 – 17,0	100 x 19,2	
			120 x 15,0	
floor thickness ≥ 150 mm				

Table C14. Resistance to fire classification of plastic pipes (without insulation) penetration seals in rigid floor, made with use of PIRO Multitube PM, in accordance with Annex A1 and Annex D14 (continued).

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Intumescent material length x thickness [mm]	Fire resistance class
PP	40 < DN ≤ 58	2,6 – 5,5	60 x 8,0	**EI 120-U/C** **EI 120-C/C**
			100 x 4,8	
			120 x 4,0	
		5,6 – 6,6	60 x 10,0	
			100 x 7,2	
			120 x 5,0	
		6,7 – 8,1	60 x 13,0	
			100 x 9,6	
			120 x 6,5	
		8,2 – 9,1	60 x 15,0	
			100 x 9,6	
			120 x 7,5	
		9,2 – 9,6	60 x 16,0	
			100 x 9,6	
			120 x 8,0	
		9,7 – 10,7	60 x 18,0	
			100 x 12,0	
			120 x 9,0	
		10,8 – 11,7	60 x 20,0	
			100 x 12,0	
			120 x 10,0	
		11,8 – 12,2	60 x 21,0	
			100 x 14,4	
			120 x 10,5	
		12,3 – 13,2	60 x 23,0	
			100 x 14,4	
			120 x 11,5	
		13,3 – 13,8	60 x 24,0	
			100 x 14,4	
			120 x 12,0	
		13,9 – 14,3	100 x 16,8	
			120 x 12,5	
		14,4 – 14,8	100 x 16,8	
			120 x 13,0	
		14,9 – 15,9	100 x 16,8	
			120 x 14,0	
		16,0 – 16,5	100 x 19,2	
			120 x 14,5	
		16,6 – 17,0	100 x 19,2	
			120 x 15,0	
floor thickness ≥ 150 mm				

Table C14. Resistance to fire classification of plastic pipes (without insulation) penetration seals in rigid floor, made with use of PIRO Multitube PM, in accordance with Annex A1 and Annex D14 (continued).

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Intumescent material length x thickness [mm]	Fire resistance class
PP	58 < DN ≤ 71	3,1 – 6,6	60 x 10,0	**EI 120-U/C** **EI 120-C/C**
			100 x 7,2	
			120 x 5,0	
		6,7 – 8,1	60 x 13,0	
			100 x 9,6	
			120 x 6,5	
		8,2 – 9,1	60 x 15,0	
			100 x 9,6	
			120 x 7,5	
		9,2 – 9,6	60 x 16,0	
			100 x 9,6	
			120 x 8,0	
		9,7 – 10,7	60 x 18,0	
			100 x 12,0	
			120 x 9,0	
		10,8 – 11,7	60 x 20,0	
			100 x 12,0	
			120 x 10,0	
		11,8 – 12,2	60 x 21,0	
			100 x 14,4	
			120 x 10,5	
		12,3 – 13,2	60 x 23,0	
			100 x 14,4	
			120 x 11,5	
		13,3 – 13,8	60 x 24,0	
			100 x 14,4	
			120 x 12,0	
		13,9 – 14,3	100 x 16,8	
			120 x 12,5	
		14,4 – 14,8	100 x 16,8	
			120 x 13,0	
		14,9 – 15,9	100 x 16,8	
			120 x 14,0	
		16,0 – 16,5	100 x 19,2	
			120 x 14,5	
		16,6 – 17,0	100 x 19,2	
			120 x 15,0	
floor thickness ≥ 150 mm				

Table C14. Resistance to fire classification of plastic pipes (without insulation) penetration seals in rigid floor, made with use of PIRO Multitube PM, in accordance with Annex A1 and Annex D14 (continued).

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Intumescent material length x thickness [mm]	Fire resistance class
PP	71 < DN ≤ 90	3,9 – 8,1	60 x 13,0	**EI 120-U/C** **EI 120-C/C**
			100 x 9,6	
			120 x 6,5	
		8,2 – 9,1	60 x 15,0	
			100 x 9,6	
			120 x 7,5	
		9,2 – 9,6	60 x 16,0	
			100 x 9,6	
			120 x 8,0	
		9,7 – 10,7	60 x 18,0	
			100 x 12,0	
			120 x 9,0	
		10,8 – 11,7	60 x 20,0	
			100 x 12,0	
			120 x 10,0	
		11,8 – 12,2	60 x 21,0	
			100 x 14,4	
			120 x 10,5	
		12,3 – 13,2	60 x 23,0	
			100 x 14,4	
			120 x 11,5	
		13,3 – 13,8	60 x 24,0	
			100 x 14,4	
			120 x 12,0	
		13,9 – 14,3	100 x 16,8	
			120 x 12,5	
		14,4 – 14,8	100 x 16,8	
			120 x 13,0	
		14,9 – 15,9	100 x 16,8	
			120 x 14,0	
		16,0 – 16,5	100 x 19,2	
			120 x 14,5	
		16,6 – 17,0	100 x 19,2	
			120 x 15,0	
floor thickness ≥ 150 mm				

Table C14. Resistance to fire classification of plastic pipes (without insulation) penetration seals in rigid floor, made with use of PIRO Multitube PM, in accordance with Annex A1 and Annex D14 (continued).

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Intumescent material length x thickness [mm]	Fire resistance class
PP	90 < DN ≤ 103	4,4 – 9,1	60 x 15,0	**EI 120-U/C EI 120-C/C**
			100 x 9,6	
			120 x 7,5	
		9,2 – 9,6	60 x 16,0	
			100 x 9,6	
			120 x 8,0	
		9,7 – 10,7	60 x 18,0	
			100 x 12,0	
			120 x 9,0	
		10,8 – 11,7	60 x 20,0	
			100 x 12,0	
			120 x 10,0	
		11,8 – 12,2	60 x 21,0	
			100 x 14,4	
			120 x 10,5	
		12,3 – 13,2	60 x 23,0	
			100 x 14,4	
			120 x 11,5	
		13,3 – 13,8	60 x 24,0	
			100 x 14,4	
			120 x 12,0	
		13,9 – 14,3	100 x 16,8	
			120 x 12,5	
		14,4 – 14,8	100 x 16,8	
			120 x 13,0	
		14,9 – 15,9	100 x 16,8	
			120 x 14,0	
		16,0 – 16,5	100 x 19,2	
			120 x 14,5	
		16,6 – 17,0	100 x 19,2	
			120 x 15,0	
floor thickness ≥ 150 mm				

Table C14. Resistance to fire classification of plastic pipes (without insulation) penetration seals in rigid floor, made with use of PIRO Multitube PM, in accordance with Annex A1 and Annex D14 (continued).

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Intumescent material length x thickness [mm]	Fire resistance class
PP	103 < DN ≤ 109	4,6 – 9,6	60 x 16,0	**EI 120-U/C** **EI 120-C/C**
			100 x 9,6	
			120 x 8,0	
		9,7 – 10,7	60 x 18,0	
			100 x 12,0	
			120 x 9,0	
		10,8 – 11,7	60 x 20,0	
			100 x 12,0	
			120 x 10,0	
		11,8 – 12,2	60 x 21,0	
			100 x 14,4	
			120 x 10,5	
		12,3 – 13,2	60 x 23,0	
			100 x 14,4	
			120 x 11,5	
		13,3 – 13,8	60 x 24,0	
			100 x 14,4	
			120 x 12,0	
		13,9 – 14,3	100 x 16,8	
			120 x 12,5	
		14,4 – 14,8	100 x 16,8	
			120 x 13,0	
		14,9 – 15,9	100 x 16,8	
			120 x 14,0	
		16,0 – 16,5	100 x 19,2	
			120 x 14,5	
		16,6 – 17,0	100 x 19,2	
			120 x 15,0	
floor thickness ≥ 150 mm				

Table C14. Resistance to fire classification of plastic pipes (without insulation) penetration seals in rigid floor, made with use of PIRO Multitube PM, in accordance with Annex A1 and Annex D14 (continued).

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Intumescent material length x thickness [mm]	Fire resistance class
PP	109 < DN ≤ 122	5,2 – 10,7	60 x 18,0	**EI 120-U/C EI 120-C/C**
			100 x 12,0	
			120 x 9,0	
		10,8 – 11,7	60 x 20,0	
			100 x 12,0	
			120 x 10,0	
		11,8 – 12,2	60 x 21,0	
			100 x 14,4	
			120 x 10,5	
		12,3 – 13,2	60 x 23,0	
			100 x 14,4	
			120 x 11,5	
		13,3 – 13,8	60 x 24,0	
			100 x 14,4	
			120 x 12,0	
		13,9 – 14,3	100 x 16,8	
			120 x 12,5	
		14,4 – 14,8	100 x 16,8	
			120 x 13,0	
		14,9 – 15,9	100 x 16,8	
			120 x 14,0	
		16,0 – 16,5	100 x 19,2	
			120 x 14,5	
		16,6 – 17,0	100 x 19,2	
			120 x 15,0	
	122 < DN ≤ 134	5,7 – 11,7	60 x 20,0	**EI 120-U/C EI 120-C/C**
			100 x 12,0	
			120 x 10,0	
		11,8 – 12,2	60 x 21,0	
			100 x 14,4	
			120 x 10,5	
		12,3 – 13,2	60 x 23,0	
			100 x 14,4	
			120 x 11,5	
		13,3 – 13,8	60 x 24,0	
			100 x 14,4	
			120 x 12,0	
		13,9 – 14,3	100 x 16,8	
			120 x 12,5	
		14,4 – 14,8	100 x 16,8	
			120 x 13,0	
		14,9 – 15,9	100 x 16,8	
			120 x 14,0	
		16,0 – 16,5	100 x 19,2	
			120 x 14,5	
		16,6 – 17,0	100 x 19,2	
			120 x 15,0	
floor thickness ≥ 150 mm				

Table C14. Resistance to fire classification of plastic pipes (without insulation) penetration seals in rigid floor, made with use of PIRO Multitube PM, in accordance with Annex A1 and Annex D14 (continued).

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Intumescent material length x thickness [mm]	Fire resistance class
PP	134 < DN ≤ 141	5,9 – 12,2	60 x 21,0	**EI 120-U/C** **EI 120-C/C**
			100 x 14,4	
			120 x 10,5	
		12,3 – 13,2	60 x 23,0	
			100 x 14,4	
			120 x 11,5	
		13,3 – 13,8	60 x 24,0	
			100 x 14,4	
			120 x 12,0	
		13,9 – 14,3	100 x 16,8	
			120 x 12,5	
		14,4 – 14,8	100 x 16,8	
			120 x 13,0	
		14,9 – 15,9	100 x 16,8	
			120 x 14,0	
		16,0 – 16,5	100 x 19,2	
			120 x 14,5	
		16,6 – 17,0	100 x 19,2	
			120 x 15,0	
	141 < DN ≤ 153	6,4 – 13,2	60 x 23,0	**EI 120-U/C** **EI 120-C/C**
			100 x 14,4	
			120 x 11,5	
		13,3 – 13,8	60 x 24,0	
			100 x 14,4	
			120 x 12,0	
		13,9 – 14,3	100 x 16,8	
			120 x 12,5	
		14,4 – 14,8	100 x 16,8	
			120 x 13,0	
		14,9 – 15,9	100 x 16,8	
			120 x 14,0	
		16,0 – 16,5	100 x 19,2	
			120 x 14,5	
		16,6 – 17,0	100 x 19,2	
			120 x 15,0	
floor thickness ≥ 150 mm				

Table C14. Resistance to fire classification of plastic pipes (without insulation) penetration seals in rigid floor, made with use of PIRO Multitube PM, in accordance with Annex A1 and Annex D14 (continued).

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Intumescent material length x thickness [mm]	Fire resistance class
PP	153 < DN ≤ 160	6,7 – 13,8	60 x 24,0	**EI 120-U/C EI 120-C/C**
			100 x 14,4	
			120 x 12,0	
		13,9 – 14,3	100 x 16,8	
			120 x 12,5	
		14,4 – 14,8	100 x 16,8	
			120 x 13,0	
		14,9 – 15,9	100 x 16,8	
			120 x 14,0	
		16,0 – 16,5	100 x 19,2	
			120 x 14,5	
		16,6 – 17,0	100 x 19,2	
			120 x 15,0	
	160 < DN ≤ 166	8,4 – 14,3	100 x 16,8	**EI 120-U/C EI 120-C/C**
			120 x 12,5	
		14,4 – 14,8	100 x 16,8	
			120 x 13,0	
		14,9 – 15,9	100 x 16,8	
			120 x 14,0	
		16,0 – 16,5	100 x 19,2	
			120 x 14,5	
		16,6 – 17,0	100 x 19,2	
			120 x 15,0	
	166 < DN ≤ 173	10,1 – 14,8	100 x 16,8	**EI 120-U/C EI 120-C/C**
			120 x 13,0	
		14,9 – 15,9	100 x 16,8	
			120 x 14,0	
		16,0 – 16,5	100 x 19,2	
			120 x 14,5	
		16,6 – 17,0	100 x 19,2	
			120 x 15,0	
	173 < DN ≤ 186	14,9 – 15,9	100 x 16,8	**EI 120-U/C EI 120-C/C**
			120 x 14,0	
		16,0 – 16,5	100 x 19,2	
			120 x 14,5	
		16,6 – 17,0	100 x 19,2	
			120 x 15,0	
	186 < DN ≤ 193	15,3 – 16,5	100 x 19,2	**EI 120-U/C EI 120-C/C**
			120 x 14,5	
		16,6 – 17,0	100 x 19,2	
			120 x 15,0	
	193 < DN ≤ 200	17,0	100 x 19,2	**EI 120-U/C EI 120-C/C**
			120 x 15,0	
PE-HD / PE / ABS / SAN + PVC	DN ≤ 110	4,5 – 7,8	60 x 4,0	**EI 90-U/C EI 90-C/C**
			100 x 2,4	
			120 x 2,5	
			60 x 8,0	**EI 120-U/C EI 120-C/C**
			100 x 4,8	
			120 x 4,0	
floor thickness ≥ 150 mm				

Table C14. Resistance to fire classification of plastic pipes (without insulation) penetration seals in rigid floor, made with use of PIRO Multitube PM, in accordance with Annex A1 and Annex D14 (continued).

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Intumescent material length x thickness [mm]	Fire resistance class
PE-HD / PE / ABS / SAN + PVC	DN ≤ 40	2,7 – 7,4	60 x 2,5	**EI 120-U/C EI 120-C/C**
			100 x 4,8	
		7,5 – 8,0	60 x 8,0	
			100 x 4,8	
			120 x 4,0	
		8,1 – 8,4	60 x 10,0	
			100 x 7,2	
			120 x 5,0	
		8,5 – 9,0	60 x 13,0	
			100 x 9,6	
			120 x 6,5	
		9,1 – 9,4	60 x 15,0	
			100 x 9,6	
			120 x 7,5	
		9,5 – 9,6	60 x 16,0	
			100 x 9,6	
			120 x 8,0	
		9,7 – 10,1	60 x 18,0	
			100 x 12,0	
			120 x 9,0	
		10,2 – 10,5	60 x 20,0	
			100 x 12,0	
			120 x 10,0	
		10,6 – 10,7	60 x 21,0	
			100 x 14,4	
			120 x 10,5	
		10,8 – 11,1	60 x 23,0	
			100 x 14,4	
			120 x 11,5	
		11,2 – 11,3	60 x 24,0	
			100 x 14,4	
			120 x 12,0	
		11,4 – 11,5	100 x 16,8	
			120 x 12,5	
		11,6 – 11,7	100 x 16,8	
			120 x 13,0	
		11,8 – 12,1	100 x 16,8	
			120 x 14,0	
		12,2 – 12,3	100 x 19,2	
			120 x 14,5	
		12,4 – 12,5	100 x 19,2	
			120 x 15,0	
floor thickness ≥ 150 mm				

Table C14. Resistance to fire classification of plastic pipes (without insulation) penetration seals in rigid floor, made with use of PIRO Multitube PM, in accordance with Annex A14 and Annex D14 (continued).

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Intumescent material length x thickness [mm]	Fire resistance class
PE-HD / PE / ABS / SAN + PVC	40 < DN ≤ 59	3,0 – 8,0	60 x 8,0	**EI 120-U/C EI 120-C/C**
			100 x 4,8	
			120 x 4,0	
		8,1 – 8,4	60 x 10,0	
			100 x 7,2	
			120 x 5,0	
		8,5 – 9,0	60 x 13,0	
			100 x 9,6	
			120 x 6,5	
		9,1 – 9,4	60 x 15,0	
			100 x 9,6	
			120 x 7,5	
		9,5 – 9,6	60 x 16,0	
			100 x 9,6	
			120 x 8,0	
		9,7 – 10,1	60 x 18,0	
			100 x 12,0	
			120 x 9,0	
		10,2 – 10,5	60 x 20,0	
			100 x 12,0	
			120 x 10,0	
		10,6 – 10,7	60 x 21,0	
			100 x 14,4	
			120 x 10,5	
		10,8 – 11,1	60 x 23,0	
			100 x 14,4	
			120 x 11,5	
		11,2 – 11,3	60 x 24,0	
			100 x 14,4	
			120 x 12,0	
		11,4 – 11,5	100 x 16,8	
			120 x 12,5	
		11,6 – 11,7	100 x 16,8	
			120 x 13,0	
		11,8 – 12,1	100 x 16,8	
			120 x 14,0	
		12,2 – 12,3	100 x 19,2	
			120 x 14,5	
		12,4 – 12,5	100 x 19,2	
			120 x 15,0	
floor thickness ≥ 150 mm				

Table C14. Resistance to fire classification of plastic pipes (without insulation) penetration seals in rigid floor, made with use of PIRO Multitube PM, in accordance with Annex A1 and Annex D14 (continued).

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Intumescent material length x thickness [mm]	Fire resistance class
PE-HD / PE / ABS / SAN + PVC	59 < DN ≤ 72	3,3 – 8,4	60 x 10,0	**EI 120-U/C EI 120-C/C**
			100 x 7,2	
			120 x 5,0	
		8,5 – 9,0	60 x 13,0	
			100 x 9,6	
			120 x 6,5	
		9,1 – 9,4	60 x 15,0	
			100 x 9,6	
			120 x 7,5	
		9,5 – 9,6	60 x 16,0	
			100 x 9,6	
			120 x 8,0	
		9,7 – 10,1	60 x 18,0	
			100 x 12,0	
			120 x 9,0	
		10,2 – 10,5	60 x 20,0	
			100 x 12,0	
			120 x 10,0	
		10,6 – 10,7	60 x 21,0	
			100 x 14,4	
			120 x 10,5	
		10,8 – 11,1	60 x 23,0	
			100 x 14,4	
			120 x 11,5	
		11,2 – 11,3	60 x 24,0	
			100 x 14,4	
			120 x 12,0	
		11,4 – 11,5	100 x 16,8	
			120 x 12,5	
		11,6 – 11,7	100 x 16,8	
			120 x 13,0	
		11,8 – 12,1	100 x 16,8	
			120 x 14,0	
		12,2 – 12,3	100 x 19,2	
			120 x 14,5	
		12,4 – 12,5	100 x 19,2	
			120 x 15,0	
floor thickness ≥ 150 mm				

Table C14. Resistance to fire classification of plastic pipes (without insulation) penetration seals in rigid floor, made with use of PIRO Multitube PM, in accordance with Annex A1 and Annex D14 (continued).

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Intumescent material length x thickness [mm]	Fire resistance class
PE-HD / PE / ABS / SAN + PVC	72 < DN ≤ 91	3,6 – 9,0	60 x 13,0	**EI 120-U/C EI 120-C/C**
			100 x 9,6	
			120 x 6,5	
		9,1 – 9,4	60 x 15,0	
			100 x 9,6	
			120 x 7,5	
		9,5 – 9,6	60 x 16,0	
			100 x 9,6	
			120 x 8,0	
		9,7 – 10,1	60 x 18,0	
			100 x 12,0	
			120 x 9,0	
		10,2 – 10,5	60 x 20,0	
			100 x 12,0	
			120 x 10,0	
		10,6 – 10,7	60 x 21,0	
			100 x 14,4	
			120 x 10,5	
		10,8 – 11,1	60 x 23,0	
			100 x 14,4	
			120 x 11,5	
		11,2 – 11,3	60 x 24,0	
			100 x 14,4	
			120 x 12,0	
		11,4 – 11,5	100 x 16,8	
			120 x 12,5	
		11,6 – 11,7	100 x 16,8	
			120 x 13,0	
		11,8 – 12,1	100 x 16,8	
			120 x 14,0	
		12,2 – 12,3	100 x 19,2	
			120 x 14,5	
		12,4 – 12,5	100 x 19,2	
			120 x 15,0	
floor thickness ≥ 150 mm				

Table C14. Resistance to fire classification of plastic pipes (without insulation) penetration seals in rigid floor, made with use of PIRO Multitube PM, in accordance with Annex A1 and Annex D14 (continued).

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Intumescent material length x thickness [mm]	Fire resistance class
PE-HD / PE / ABS / SAN + PVC	91 < DN ≤ 104	3,8 – 9,4	60 x 15,0	**EI 120-U/C EI 120-C/C**
			100 x 9,6	
			120 x 7,5	
		9,5 – 9,6	60 x 16,0	
			100 x 9,6	
			120 x 8,0	
		9,7 – 10,1	60 x 18,0	
			100 x 12,0	
			120 x 9,0	
		10,2 – 10,5	60 x 20,0	
			100 x 12,0	
			120 x 10,0	
		10,6 – 10,7	60 x 21,0	
			100 x 14,4	
			120 x 10,5	
		10,8 – 11,1	60 x 23,0	
			100 x 14,4	
			120 x 11,5	
		11,2 – 11,3	60 x 24,0	
			100 x 14,4	
			120 x 12,0	
		11,4 – 11,5	100 x 16,8	
			120 x 12,5	
		11,6 – 11,7	100 x 16,8	
			120 x 13,0	
		11,8 – 12,1	100 x 16,8	
			120 x 14,0	
		12,2 – 12,3	100 x 19,2	
			120 x 14,5	
		12,4 – 12,5	100 x 19,2	
			120 x 15,0	
floor thickness ≥ 150 mm				

Table C14. Resistance to fire classification of plastic pipes (without insulation) penetration seals in rigid floor, made with use of PIRO Multitube PM, in accordance with Annex A1 and Annex D14 (continued).

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Intumescent material length x thickness [mm]	Fire resistance class
PE-HD / PE / ABS / SAN + PVC	104 < DN ≤ 110	3,9 – 9,6	60 x 16,0	**EI 120-U/C EI 120-C/C**
			100 x 9,6	
			120 x 8,0	
		9,7 – 10,1	60 x 18,0	
			100 x 12,0	
			120 x 9,0	
		10,2 – 10,5	60 x 20,0	
			100 x 12,0	
			120 x 10,0	
		10,6 – 10,7	60 x 21,0	
			100 x 14,4	
			120 x 10,5	
		10,8 – 11,1	60 x 23,0	
			100 x 14,4	
			120 x 11,5	
		11,2 – 11,3	60 x 24,0	
			100 x 14,4	
			120 x 12,0	
		11,4 – 11,5	100 x 16,8	
			120 x 12,5	
		11,6 – 11,7	100 x 16,8	
			120 x 13,0	
		11,8 – 12,1	100 x 16,8	
			120 x 14,0	
		12,2 – 12,3	100 x 19,2	
			120 x 14,5	
		12,4 – 12,5	100 x 19,2	
			120 x 15,0	
floor thickness ≥ 150 mm				

Table C14. Resistance to fire classification of plastic pipes (without insulation) penetration seals in rigid floor, made with use of PIRO Multitube PM, in accordance with Annex A1 and Annex D14 (continued).

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Intumescent material length x thickness [mm]	Fire resistance class
PE-HD / PE / ABS / SAN + PVC	110 < DN ≤ 123	4,2 – 10,1	60 x 18,0	**EI 120-U/C EI 120-C/C**
			100 x 12,0	
			120 x 9,0	
		10,2 – 10,5	60 x 20,0	
			100 x 12,0	
			120 x 10,0	
		10,6 – 10,7	60 x 21,0	
			100 x 14,4	
			120 x 10,5	
		10,8 – 11,1	60 x 23,0	
			100 x 14,4	
			120 x 11,5	
		11,2 – 11,3	60 x 24,0	
			100 x 14,4	
			120 x 12,0	
		11,4 – 11,5	100 x 16,8	
			120 x 12,5	
		11,6 – 11,7	100 x 16,8	
			120 x 13,0	
		11,8 – 12,1	100 x 16,8	
			120 x 14,0	
		12,2 – 12,3	100 x 19,2	
			120 x 14,5	
		12,4 – 12,5	100 x 19,2	
			120 x 15,0	
	123 < DN ≤ 136	4,4 – 10,5	60 x 20,0	**EI 120-U/C EI 120-C/C**
			100 x 12,0	
			120 x 10,0	
		10,6 – 10,7	60 x 21,0	
			100 x 14,4	
			120 x 10,5	
		10,8 – 11,1	60 x 23,0	
			100 x 14,4	
			120 x 11,5	
		11,2 – 11,3	60 x 24,0	
			100 x 14,4	
			120 x 12,0	
		11,4 – 11,5	100 x 16,8	
			120 x 12,5	
		11,6 – 11,7	100 x 16,8	
			120 x 13,0	
		11,8 – 12,1	100 x 16,8	
			120 x 14,0	
		12,2 – 12,3	100 x 19,2	
			120 x 14,5	
		12,4 – 12,5	100 x 19,2	
			120 x 15,0	
floor thickness ≥ 150 mm				

Table C14. Resistance to fire classification of plastic pipes (without insulation) penetration seals in rigid floor, made with use of PIRO Multitube PM, in accordance with Annex A1 and Annex D14 (continued).

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Intumescent material length x thickness [mm]	Fire resistance class
PE-HD / PE / ABS / SAN + PVC	136 < DN ≤ 142	4,5 – 10,7	60 x 21,0	**EI 120-U/C EI 120-C/C**
			100 x 14,4	
			120 x 10,5	
		10,8 – 11,1	60 x 23,0	
			100 x 14,4	
			120 x 11,5	
		11,2 – 11,3	60 x 24,0	
			100 x 14,4	
			120 x 12,0	
		11,4 – 11,5	100 x 16,8	
			120 x 12,5	
		11,6 – 11,7	100 x 16,8	
			120 x 13,0	
		11,8 – 12,1	100 x 16,8	
			120 x 14,0	
		12,2 – 12,3	100 x 19,2	
			120 x 14,5	
		12,4 – 12,5	100 x 19,2	
			120 x 15,0	
	142 < DN ≤ 155	4,7 – 11,1	60 x 23,0	**EI 120-U/C EI 120-C/C**
			100 x 14,4	
			120 x 11,5	
		11,2 – 11,3	60 x 24,0	
			100 x 14,4	
			120 x 12,0	
		11,4 – 11,5	100 x 16,8	
			120 x 12,5	
		11,6 – 11,7	100 x 16,8	
			120 x 13,0	
		11,8 – 12,1	100 x 16,8	
			120 x 14,0	
		12,2 – 12,3	100 x 19,2	
			120 x 14,5	
		12,4 – 12,5	100 x 19,2	
			120 x 15,0	
floor thickness ≥ 150 mm				

Table C14. Resistance to fire classification of plastic pipes (without insulation) penetration seals in rigid floor, made with use of PIRO Multitube PM, in accordance with Annex A1 and Annex D14 (continued).

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Intumescent material length x thickness [mm]	Fire resistance class
PE-HD / PE / ABS / SAN + PVC	155 < DN ≤ 161	4,8 – 11,3	60 x 24,0	**EI 120-U/C EI 120-C/C**
			100 x 14,4	
			120 x 12,0	
		11,4 – 11,5	100 x 16,8	
			120 x 12,5	
		11,6 – 11,7	100 x 16,8	
			120 x 13,0	
		11,8 – 12,1	100 x 16,8	
			120 x 14,0	
		12,2 – 12,3	100 x 19,2	
			120 x 14,5	
		12,4 – 12,5	100 x 19,2	
			120 x 15,0	
	161 < DN ≤ 168	4,9 – 11,5	100 x 16,8	**EI 120-U/C EI 120-C/C**
			120 x 12,5	
		11,6 – 11,7	100 x 16,8	
			120 x 13,0	
		11,8 – 12,1	100 x 16,8	
			120 x 14,0	
		12,2 – 12,3	100 x 19,2	
			120 x 14,5	
		12,4 – 12,5	100 x 19,2	
			120 x 15,0	
	168 < DN ≤ 174	5,1 – 11,7	100 x 16,8	**EI 120-U/C EI 120-C/C**
			120 x 13,0	
		11,8 – 12,1	100 x 16,8	
			120 x 14,0	
		12,2 – 12,3	100 x 19,2	
			120 x 14,5	
		12,4 – 12,5	100 x 19,2	
			120 x 15,0	
	174 < DN ≤ 187	5,3 – 12,1	100 x 16,8	**EI 120-U/C EI 120-C/C**
			120 x 14,0	
		12,2 – 12,3	100 x 19,2	
			120 x 14,5	
		12,4 – 12,5	100 x 19,2	
			120 x 15,0	
	187 < DN ≤ 193	5,4 – 12,3	100 x 19,2	**EI 120-U/C EI 120-C/C**
			120 x 14,5	
		12,4 – 12,5	100 x 19,2	
			120 x 15,0	
	193 < DN ≤ 200	5,5 – 12,5	100 x 19,2	**EI 120-U/C EI 120-C/C**
			120 x 15,0	
PE-X	DN ≤ 17	3,5	60 x 8,0	**EI 120-U/C EI 120-C/C**
			100 x 4,8	
			120 x 4,0	
		3,6 – 4,5	60 x 15,0	
			100 x 9,6	
			120 x 7,5	
	17 < DN ≤ 50	4,5	60 x 15,0	
			100 x 9,6	
			120 x 7,5	

floor thickness ≥ 150 mm

Table C15. Resistance to fire classification of metal pipes (with flexible elastomeric foam (FEF) insulation) penetration seals in rigid floor, made with use of PIRO Multitube PM, in accordance with Annex A1 and Annex D15.

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Insulation thickness [mm]	Intumescent material length x thickness [mm]	Fire resistance class
copper	DN ≤ 10	0,9 – 1,4	19,0	60 x 2,5	**EI 120-C/U EI 120-C/C**
				100 x 4,8	
		≥ 1,5	19,0	60 x 2,5	
				100 x 4,8	
			20,0 – 24,0	60 x 4,0	
				100 x 4,8	
				120 x 2,5	
			25,0 – 27,0	60 x 5,0	
				100 x 4,8	
				120 x 2,5	
			28,0 – 32,0	60 x 6,5	
				100 x 4,8	
				120 x 4,0	
	10 < DN ≤ 54	1,5 – 14,2	32,0	60 x 6,5	
				100 x 4,8	
				120 x 4,0	
	54 < DN ≤ 68,7	1,6 – 14,2	32,0	60 x 15,0	
				100 x 9,6	
				120 x 7,5	
	68,7 < DN ≤ 76	1,7 – 14,2	32,0	60 x 16,0	
				100 x 9,6	
				120 x 8,0	
	76 < DN ≤ 84	1,8 – 14,2	32,0	60 x 18,0	
				100 x 12,0	
				120 x 9,0	
	76 < DN ≤ 84	2,0 – 14,2	32,0	60 x 20,0	
				100 x 12,0	
				120 x 10,0	
	92 < DN ≤ 96	2,0 – 14,2	32,0	60 x 21,0	
				100 x 14,4	
				120 x 10,5	
	96 < DN ≤ 104	2,1 – 14,2	32,0	60 x 23,0	
				100 x 14,4	
				120 x 11,5	
	104 < DN ≤ 108	2,2 – 14,2	32,0	60 x 24,0	
				100 x 14,4	
				120 x 12,0	
floor thickness ≥ 150 mm					

Table C15. Resistance to fire classification of metal pipes (with flexible elastomeric foam (FEF) insulation) penetration seals in rigid floor, made with use of PIRO Multitube PM, in accordance with Annex A1 and Annex D15 (continued).

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Insulation thickness [mm]	Intumescent material length x thickness [mm]	Fire resistance class
steel	DN ≤ 17,2	2,5 – 3,5	9,0	60 x 2,5	**EI 120-C/U**
				100 x 4,8	
		3,6 – 4,2	9,0	60 x 2,5	
				100 x 4,8	
	DN ≤ 17,2	3,6 – 4,2	10,0 – 15,0	60 x 4,0	**EI 120-C/U** **EI 120-C/C**
				100 x 4,8	
				120 x 2,5	
			16,0 – 19,0	60 x 5,0	
				100 x 4,8	
				120 x 2,5	
			20,0 – 25,0	60 x 6,5	
				100 x 4,8	
				120 x 4,0	
		≥ 4,3	9,0	60 x 2,5	
				100 x 4,8	
				120 x 2,5	
			10,0 – 15,0	60 x 4,0	
				100 x 4,8	
				100 x 2,5	
			16,0 – 19,0	60 x 5,0	
				100 x 4,8	
				120 x 2,5	
			20,0 – 25,0	60 x 6,5	
				100 x 4,8	
				120 x 4,0	
			26,0	60 x 15,0	
				100 x 9,6	
				120 x 7,5	
			27,0	60 x 16,0	
				100 x 9,6	
				120 x 8,0	
			28,0	60 x 18,0	
				100 x 12,0	
				120 x 9,0	
			29,0	60 x 20,0	
				100 x 12,0	
				120 x 10,0	
			30,0	60 x 21,0	
				100 x 14,4	
				120 x 10,5	
			31,0	60 x 23,0	
				100 x 14,4	
				120 x 11,5	
			32,0	60 x 24,0	
				100 x 14,4	
				120 x 12,0	
floor thickness ≥ 150 mm					

Table C15. Resistance to fire classification of metal pipes (with flexible elastomeric foam (FEF) insulation) penetration seals in rigid floor, made with use of PIRO Multitube PM, in accordance with Annex A1 and Annex D15 (continued).

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Insulation thickness [mm]	Intumescent material length x thickness [mm]	Fire resistance class
steel	17,2 < DN ≤ 57,9	3,6 – 4,2	25,0	60 x 6,5	**EI 120-C/U EI 120-C/C**
				100 x 4,8	
				120 x 4,0	
		4,3 – 14,2	25,0	60 x 6,5	
				100 x 4,8	
				120 x 4,0	
			26,0	60 x 15,0	
				100 x 9,6	
				120 x 7,5	
			27,0	60 x 16,0	
				100 x 9,6	
				120 x 8,0	
			28,0	60 x 18,0	
				100 x 12,0	
				120 x 9,0	
			29,0	60 x 20,0	
				100 x 12,0	
				120 x 10,0	
			30,0	60 x 21,0	
				100 x 14,4	
				120 x 10,5	
			31,0	60 x 23,0	
				100 x 14,4	
				120 x 11,5	
			32,0	60 x 24,0	
				100 x 14,4	
				120 x 12,0	
	57,9 < DN ≤ 78,0	3,9 – 4,2	25,0	60 x 15,0	**EI 120-C/U EI 120-C/C**
				100 x 9,6	
				120 x 7,5	
		4,3 – 14,2	25,0	60 x 15,0	
				100 x 9,6	
				120 x 7,5	
			26,0 – 32,0	60 x 24,0	
				100 x 14,4	
				120 x 12,0	
	78,0 < DN ≤ 88,1	4,1 – 4,2	25,0	60 x 16,0	**EI 120-C/U EI 120-C/C**
				100 x 9,6	
				120 x 8,0	
		4,3 – 14,2	25,0	60 x 16,0	
				100 x 9,6	
				120 x 8,0	
	78,0 < DN ≤ 88,1	4,3 – 14,2	26,0 – 32,0	60 x 24,0	**EI 120-C/U EI 120-C/C**
				100 x 14,4	
				120 x 12,0	
floor thickness ≥ 150 mm					

Table C15. Resistance to fire classification of metal pipes (with flexible elastomeric foam (FEF) insulation) penetration seals in rigid floor, made with use of PIRO Multitube PM, in accordance with Annex A1 and Annex D15 (continued).

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Insulation thickness [mm]	Intumescent material length x thickness [mm]	Fire resistance class
steel	88,1 < DN ≤ 108,2	4,3	32,0	60 x 24,0	**EI 120-C/U EI 120-C/C**
				100 x 14,4	
				120 x 12,0	
		4,4 – 14,2	25,0	60 x 18,0	
				100 x 12,0	
				120 x 9,0	
			26,0 – 32,0	60 x 24,0	
				100 x 14,4	
				120 x 12,0	
	108,2 < DN ≤ 125,0	4,3 – 4,5	32,0	60 x 24,0	**EI 120-C/U EI 120-C/C**
				100 x 12,0	
				120 x 12,0	
		4,6 – 14,2	25,0	60 x 20,0	
				100 x 12,0	
				120 x 10,0	
			26,0 – 32,0	60 x 24,0	
				100 x 14,4	
				120 x 12,0	
	125,0 < DN ≤ 138,5	4,5 – 4,8	32,0	100 x 16,8	**EI 120-C/U EI 120-C/C**
				120 x 13,0	
		4,9 – 14,2	25,0	60 x 21,0	
				100 x 14,4	
				120 x 10,5	
			26,0 – 32,0	100 x 16,8	
				120 x 13,0	
	138,5 < DN ≤ 159,0	4,5 – 5,1	32,0	100 x 16,8	**EI 120-C/U EI 120-C/C**
				120 x 13,0	
		5,2 – 14,2	25,0	60 x 23,0	
				100 x 14,4	
				120 x 11,5	
			26,0 – 32,0	100 x 16,8	
				120 x 13,0	
	159,0 < DN ≤ 168,7	5,3 – 14,2	25,0	60 x 24,0	**EI 120-C/U EI 120-C/C**
				100 x 14,4	
				120 x 12,0	
	168,7 < DN ≤ 178,7	5,5 – 14,2	25,0	100 x 16,8	**EI 120-C/U EI 120-C/C**
				120 x 12,5	
	178,7 < DN ≤ 188,8	5,6 – 14,2	25,0	100 x 16,8	**EI 120-C/U EI 120-C/C**
				120 x 13,0	
	188,8 < DN ≤ 208,9	5,9 – 14,2	25,0	100 x 16,8	**EI 120-C/U EI 120-C/C**
				120 x 14,0	
	208,8 < DN ≤ 219,0	6,1 – 14,2	25,0	100 x 19,2	**EI 120-C/U EI 120-C/C**
				120 x 14,5	
floor thickness ≥ 150 mm					

Table C15. Resistance to fire classification of metal pipes (with flexible elastomeric foam (FEF) insulation) penetration seals in rigid floor, made with use of PIRO Multitube PM, in accordance with Annex A1 and Annex D15 (continued).

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Insulation thickness [mm]	Intumescent material length x thickness [mm]	Fire resistance class
cast iron	DN ≤ 57,9	3,6 – 14,2	25,0	60 x 6,5	**EI 120-C/U EI 120-C/C**
				100 x 4,8	
				120 x 4,0	
	57,9 < DN ≤ 84	3,8 – 14,2	25,0	60 x 15,0	
				100 x 9,6	
				120 x 7,5	
	84 < DN ≤ 98	4,0 – 14,2	25,0	60 x 16,0	
				100 x 9,6	
				120 x 8,0	
	98 < DN ≤ 125	4,2 – 14,2	25,0	60 x 18,0	
				100 x 12,0	
				120 x 9,0	
	125 < DN ≤ 152	4,4 – 14,2	25,0	60 x 20,0	
				100 x 12,0	
				120 x 10,0	
	152 < DN ≤ 165	4,6 – 14,2	25,0	60 x 21,0	
				100 x 14,4	
				120 x 10,5	
	165 < DN ≤ 192	4,8 – 14,2	25,0	60 x 23,0	
				100 x 14,4	
				120 x 11,5	
	192 < DN ≤ 206	4,9 – 14,2	25,0	60 x 24,0	
				100 x 14,4	
				120 x 12,0	
	206 < DN ≤ 219	5,0 – 14,2	25,0	100 x 16,8	
				120 x 12,5	
	219 < DN ≤ 233	5,1 – 14,2	25,0	100 x 16,8	
				120 x 13,0	
	233 < DN ≤ 260	5,4 – 14,2	25,0	100 x 16,8	
				120 x 14,0	
	260 < DN ≤ 274	5,5 – 14,2	25,0	100 x 19,2	
				120 x 14,5	
floor thickness ≥ 150 mm					

Table C16. Resistance to fire classification of cable bundle ($ø_{bundle}$ ≤ 100 mm) penetration seals (without insulation) in rigid floor, made with use of PIRO Multitube PM dimensions of (width x thickness): 60 x 10,0 mm or 120 x 5,0 mm or 100 x 9,6 mm, in accordance with Annex A1 and Annex D16.

Fire resistance class: EI 120
floor thickness ≥ 150 mm

Table C17. Resistance to fire classification of plastic pipes (without insulation) penetration seals in rigid floor, made with use of PIRO Multitube PM, in accordance with Annex A1 and Annex D17.

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Intumescent material length x thickness [mm]	Fire resistance class
PE-HD pipes with pipe elbow 87,5°	DN ≤ 160[1)]	6,2	60 x 16,0	**EI 90-U/C EI 90-C/C**
			100 x 9,6	
			120 x 8,0	
[1)] Diameter of pipe elbow is 187 mm for pipe with diameter of 160 and for smaller pipes shall be proportionally reduced, the pipe wall thickness of the pipe elbow is 6,2 mm				
floor thickness ≥ 150 mm				

Table C18. Resistance to fire classification of plastic pipes (with PE acoustic mat insulation) penetration seals in rigid floor, made with use of PIRO Multitube PM, in accordance with Annex A1 and Annex D18.

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Insulation thickness [mm]	Intumescent material length x thickness [mm]	Fire resistance class
PVC-U / PVC-C	DN ≤ 110	2,2 – 3,1	6,0	60 x 8,0	**EI 90 / E 120-U/C**
				100 x 4,8	
				120 x 4,0	
		3,2 – 4,2	6,0	60 x 8,0	**EI 90 / E 120-U/C**
				100 x 4,8	
				120 x 4,0	
		3,2 – 4,2	6,0	60 x 16,0	**EI 120-U/C EI 120-C/C**
				100 x 9,6	
				120 x 8,0	
		4,3 – 5,3	6,0	60 x 16,0	**EI 90 / E 120-U/C**
				100 x 4,8	
				120 x 8,0	
				60 x 12,0	**EI 120-U/C EI 120-C/C**
				100 x 7,2	
				120 x 6,5	
		5,4	6,0	60 x 8,0	**EI 120-U/C EI 120-C/C**
				100 x 4,8	
				120 x 4,0	
		5,5 – 5,8	6,0	60 x 12,0	**EI 120-U/C EI 120-C/C**
				100 x 7,2	
				120 x 6,5	
		5,9 – 6,2	6,0	60 x 16,0	**EI 120-U/C EI 120-C/C**
				100 x 9,6	
				120 x 8,0	
	110 < DN ≤ 135	2,7 – 3,1	6,0	60 x 12,0	**EI 90 / E 120-U/C**
				100 x 7,2	
				120 x 6,5	
		3,2 – 4,2	6,0	60 x 12,0	**EI 90 / E 120-U/C**
				100 x 7,2	
				120 x 6,5	
				60 x 16,0	**EI 120-U/C EI 120-C/C**
				100 x 9,6	
				120 x 8,0	
		4,3 – 5,8	6,0	60 x 12,0	**EI 120-U/C EI 120-C/C**
				100 x 7,2	
				120 x 6,5	
		5,9 – 6,2	6,0	60 x 16,0	**EI 120-U/C EI 120-C/C**
				100 x 9,6	
				120 x 8,0	
	110 < DN ≤ 160	3,2 – 6,2	6,0	60 x 16,0	**EI 120-U/C EI 120-C/C**
				100 x 9,6	
				120 x 8,0	
floor thickness ≥ 150 mm					

Table C18. Resistance to fire classification of plastic pipes (with PE acoustic mat insulation) penetration seals in rigid floor, made with use of PIRO Multitube PM, in accordance with Annex A1 and Annex D18 (continued).

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Insulation thickness [mm]	Intumescent material length x thickness [mm]	Fire resistance class
PE-HD / PE / ABS / SAN + PVC	DN ≤ 40	3,2	6,0	60 x 2,5 100 x 2,4 120 x 2,5	**EI 120-U/C** **EI 120-C/C**
		3,3 – 6,0	6,0	60 x 16,0 100 x 9,6 120 x 8,0	**EI 120-U/C** **EI 120-C/C**
	40 < DN ≤ 160	6,0	6,0	60 x 16,0 100 x 9,6 120 x 8,0	**EI 120-U/C** **EI 120-C/C**
		6,1 – 6,6	6,0	60 x 20,0 100 x 12,0 120 x 10,0	**EI 90-U/C** **EI 90-C/C**
		6,7 – 7,3	6,0	60 x 20,0 100 x 12,0 120 x 10,0	**EI 60-U/C** **EI 60-C/C**
				60 x 24,0 100 x 14,4 120 x 12,0	**EI 90-U/C** **EI 90-C/C**
		7,4 – 8,1	6,0	60 x 24,0 100 x 14,4 120 x 12,0	**EI 60-U/C** **EI 60-C/C**
	160 < DN ≤ 205	6,6 – 7,3	6,0	60 x 20,0 100 x 12,0 120 x 10,0	**EI 90-U/C** **EI 90-C/C**
		7,4 – 8,1	6,0	60 x 24,0 100 x 14,4 120 x 12,0	**EI 60-U/C** **EI 60-C/C**
	205 < DN ≤ 250	7,3	6,0	60 x 24,0 100 x 14,4 120 x 12,0	**EI 90-U/C** **EI 90-C/C**
		7,4 – 8,1	6,0	60 x 24,0 100 x 14,4 120 x 12,0	**EI 60-U/C** **EI 60-C/C**
PE-RT	DN ≤ 50	5,5	6,0	60 x 2,5 100 x 2,4 120 x 2,5	**EI 180-U/C** **EI 180-C/C**
PP	DN ≤ 110	2,2 – 6,8	6,0	60 x 8,0 100 x 4,8 120 x 4,0	**EI 120-U/C** **EI 120-C/C**
	110 < DN ≤ 135	3,1 – 7,0	6,0	60 x 12,0 100 x 7,2 120 x 6,5	**EI 120-U/C** **EI 120-C/C**
		7,1 – 7,2	6,0	60 x 16,0 100 x 9,6 120 x 8,0	**EI 120-U/C** **EI 120-C/C**
	135 < DN ≤ 160	4,0 – 7,2	6,0	60 x 16,0 100 x 9,6 120 x 8,0	**EI 120-U/C** **EI 120-C/C**
floor thickness ≥ 150 mm					

Table C18. Resistance to fire classification of plastic pipes (with PE acoustic mat insulation) penetration seals in rigid floor, made with use of PIRO Multitube PM, in accordance with Annex A1 and Annex D18 (continued).

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Insulation thickness [mm]	Intumescent material length x thickness [mm]	Fire resistance class
PP-R	DN ≤ 63	10,5	6,0	60 x 2,5 100 x 2,4 120 x 2,5	**EI 120-U/C** **EI 120-C/C**
PP-R/AL/PP-R	DN ≤ 320	5,4	6,0	60 x 2,5 100 x 2,4 120 x 2,5	**EI 120-U/C** **EI 120-C/C**
PP-R STABI AL	DN ≤ 42	8,5	6,0	60 x 8,0 100 x 4,8 120 x 4,0	**EI 180-U/C** **EI 180-C/C**
		8,6 – 18,3	6,0	60 x 16,0 100 x 9,6 120 x 8,0	**EI 180-U/C** **EI 180-C/C**
	42 < DN ≤ 110	18,3	6,0	60 x 16,0 100 x 9,6 120 x 8,0	**EI 180-U/C** **EI 180-C/C**
PP-R/GF/PP-R	DN ≤ 20	3,2	6,0	60 x 2,5 100 x 2,4 120 x 2,5	**EI 180-U/C** **EI 180-C/C**
		3,3 – 10,5	6,0	60 x 16,0 100 x 9,6 120 x 8,0	**EI 120-U/C** **EI 120-C/C**
	20 < DN ≤ 75	10,5	6,0	60 x 16,0 100 x 9,6 120 x 8,0	**EI 120-U/C** **EI 120-C/C**
floor thickness ≥ 150 mm					

Table C19. Resistance to fire classification of plastic pipes (with flexible elastomeric foam (FEF) insulation) penetration seals in rigid floor, made with use of PIRO Multitube PM, in accordance with Annex A1 and Annex D19.

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Insulation thickness [mm]	Intumescent material length x thickness [mm]	Fire resistance class
PE-HD / PE / ABS / SAN + PVC	DN ≤ 110	4,2 – 10,0	12,0	60 x 8,0	**EI 180-U/C EI 180-C/C**
				100 x 4,8	
				120 x 4,0	
PE-RT	DN ≤ 50	6,7	32,0	60 x 16,0	**EI 120-U/C EI 120-C/C**
				100 x 9,6	
				120 x 8,0	
PP-R STABI AL	DN ≤ 63	10,5	19,0 – 24,0	60 x 16,0	**EI 120-U/C EI 120-C/C**
				100 x 9,6	
				120 x 8,0	
			25,0	60 x 16,0	**EI 180-U/C EI 180-C/C**
				100 x 9,6	
				120 x 8,0	
PP-R/GF/PP-R	DN ≤ 75	10,3	12,0	60 x 24,0	**EI 120 / E 180-U/C EI 120 / E 180-C/C**
				100 x 14,4	
				120 x 12,0	
PP-R/PP-R+GF/PP-R	DN ≤ 20	4,0	9,0	60 x 6,5	**EI 180-U/C EI 180-C/C**
				100 x 4,8	
				120 x 4,0	
floor thickness ≥ 150 mm					

Table C20. Resistance to fire classification of plastic pipes (with mineral wool insulation) penetration seals in rigid floor, made with use of PIRO Multitube PM and PiroCoat A, in accordance with Annex A1 and Annex D20.

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Insulation thickness [mm]	Intumescent material length x thickness [mm]	Fire resistance class
PP-R STABI AL	DN ≤ 110	18,3	25,0	60 x 16,0 100 x 9,6 120 x 8,0	**EI 180-U/C** **EI 180-C/C**
PP-R/GF/PP-R	DN ≤ 75	10,3	30,0	60 x 16,0 100 x 9,6 120 x 8,0	**EI 180-U/C** **EI 180-C/C**
		18,3	25,0	60 x 16,0 100 x 9,6 120 x 8,0	**EI 180-U/C** **EI 180-C/C**
	75 < DN ≤ 110	18,3	25,0	60 x 16,0 100 x 9,6 120 x 8,0	**EI 180-U/C** **EI 180-C/C**
floor thickness ≥ 150 mm					

Table C21. Resistance to fire classification of single heating pipe type Syncopex C.O. PN6/95 C, C.W. PN10/70C (PE-X pipe diameter of max. 41 mm and pipe wall thickness of 4,0 mm in PE insulation thickness of 32 mm placed in corrugated pipe made of PE-HD diameter of max. 110 mm and pipe wall thickness of 0,5 mm) penetration seals in rigid floor, made with use of PIRO Multitube PM dimensions of (thickness x width): 16,0 x 60 mm or 9,6 x 100 mm or 8,0 x 120 mm, in accordance with Annex A1 and Annex D21.

Fire resistance class: **EI 120-U/C** **EI 120-C/C**
floor thickness ≥ 150 mm

Table C22. Resistance to fire classification of quadruple heating pipe type Syncopex C.O. PN6/95 C, C.W. PN10/70C (PE-X pipes with following dimensions: 50 x 3,0 mm, 32 x 2,5 mm, 20 x 2,1 mm, 50 x 5,0 mm (max. diameter x constant pipe wall thickness) in PE insulation thickness of 32 mm placed in corrugated pipe made of PE-HD diameter of max. 160 mm and pipe wall thickness of 0,5 mm) penetration seals in rigid floor, made with use of PIRO Multitube PM dimensions of (thickness x width): 16,0 x 60 mm or 9,6 x 100 mm or 8,0 x 120 mm and Piro Collar PC with intumescent material dimensions of 16,0 x 60 mm (thickness x width), in accordance with Annex A1 and Annex D22.

Fire resistance class: **EI 180-U/C** **EI 180-C/C**
floor thickness ≥ 150 mm

Table C23. Resistance to fire classification of bundle of small cable (ø ≤ 14 mm) in PVC-U cable tubes diameter of max. 28 mm and pipe wall thickness of 1,0 mm (max. 4 pcs. in bundle) penetration seals (without insulation) in rigid floor, made with use of PIRO Multitube PM dimensions of (thickness x width): 7,5 x 60 mm or 4,8 x 100 mm or 4,0 x 120 mm, in accordance with Annex A1 and Annex D23.

Fire resistance class: **EI 180-U/C** **EI 180-C/C**
floor thickness ≥ 150 mm

Table C24. Resistance to fire classification of bundle of plastic pipes (max. 4 pipes in the bundle) consisting of max. 2 x PP-R/PP-R+GF/PP-R pipes diameter of max. 20 mm and pipe wall thickness of 4,0 mm and 2 x PE-RT/AL/PE-RT pipes diameter of max. 50 mm and pipe wall thickness of 5,5 mm, with additional small cable (ø ≤ 14 mm) outside the bundle (without insulation) penetration seals in rigid floor, made with use of PIRO Multitube PM dimensions of (thickness x width): 16,0 x 60 mm or 9,6 x 100 mm or 8,0 x 120 mm and PiroCoating, in accordance with Annex A1 and Annex D24.

Fire resistance class: **EI 180-U/C** **EI 180-C/C**
floor thickness ≥ 150 mm

Table C25. Resistance to fire classification of single or double copper pipe (with PE Tubolit insulation) with additionall small cable (ø ≤ 14 mm) outside the bundle penetration seals in rigid floor, made with use of PIRO Multitube PM dimensions of 4,0 x 60 mm (thickness x width), PiroCoating and PiroCoat I, in accordance with Annex A1 and Annex D25.

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Insulation thickness [mm]	Intumescent material length x thickness [mm]	Fire resistance class
copper	DN ≤ 6,4	t ≥ 0,8	9,0	60 x 4,0	**EI 180-U/C EI 180-C/C**
				100 x 2,4	
				120 x 2,5	
	6,4 < DN ≤ 9,6	t ≥ 0,9	9,0	60 x 4,0	**EI 120 / E 180-U/C EI 120 / E 180-C/C**
				100 x 2,4	
				120 x 2,5	
	9,6 < DN ≤ 22,2	t ≥ 1,0	9,0	60 x 4,0	**EI 120 / E 180-U/C EI 120 / E180-C/C**
				100 x 2,4	
				120 x 2,5	
floor thickness ≥ 150 mm					

Table C26. Resistance to fire classification of bundle of PVC-U pipes (max. 2 pipes in bundle) with diameter of max. 20 mm and pipe wall thickness of 2,0 mm (with PE Tubolit insulation) penetration seals in rigid floor, made with use of PIRO Multitube PM dimensions of (thickness x width): 2,5 x 60 mm or 2,4 x 100 mm or 2,5 x 120 mm, in accordance with Annex A1 and Annex D25.

Fire resistance class: **EI 180-U/C** **EI 180-C/C**
floor thickness ≥ 150 mm

Table C27. Resistance to fire classification of Wavin plastic pipes (without insulation) penetration seals in flexible or rigid wall, made with use of PIRO Multitube PM, in accordance with Annex A1 and Annex D26.

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Intumescent material length x thickness, [mm]	Fire resistance class
Wavin Wafix PP	DN ≤ 50	1,8 – 2,6	60 x 2,5	**EI 120-U/C EI 120-C/C**
		2,7 – 5,5	60 x 8,0	
			100 x 4,8	
			120 x 4,0	
	50 < DN ≤ 60	2,0 – 5,5	60 x 8,0	
			100 x 4,8	
			120 x 4,0	
	60 < DN ≤ 70	2,1 – 5,5	60 x 8,0	
			100 x 4,8	
			120 x 4,0	
	70 < DN ≤ 80	2,3 – 5,5	60 x 8,0	
			100 x 4,8	
			120 x 4,0	
	80 < DN ≤ 90	2,5 – 5,5	60 x 8,0	
			100 x 4,8	
			120 x 4,0	
	90 < DN ≤ 100	2,6 – 5,5	60 x 8,0	
			100 x 4,8	
			120 x 4,0	
	100 < DN ≤ 110	2,8 – 5,5	60 x 8,0	
			100 x 4,8	
			120 x 4,0	
Wavin Si Tech+	32	2,0	60 x 2,5	**EI 120-U/C EI 120-C/C**
			100 x 4,8	
			120 x 4,0	
	40	2,0	60 x 2,5	
			100 x 4,8	
			120 x 4,0	
	50	2,1	60 x 2,5	
			100 x 4,8	
			120 x 4,0	
	75	2,6	60 x 8,0	
			100 x 4,8	
			120 x 4,0	
	90	3,1	60 x 8,0	
			100 x 4,8	
			120 x 4,0	
	110	3,6	60 x 8,0	
			100 x 4,8	
			120 x 4,0	
Wavin AS+	50	3,0	60 x 8,0	**EI 120-U/C EI 120-C/C**
			100 x 4,8	
			120 x 4,0	
	75	3,5	60 x 8,0	
			100 x 4,8	
			120 x 4,0	
	90	4,6	60 x 8,0	
			100 x 4,8	
			120 x 4,0	
	110	5,3	60 x 8,0	
			100 x 4,8	
			120 x 4,0	
wall thickness ≥ 100 mm				

Table C28. Resistance to fire classification of Wavin plastic pipes (without insulation) penetration seals in rigid wall, made with use of PIRO Multitube PM, in accordance with Annex A1 and Annex D27.

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Intumescent material length x thickness, [mm]	Fire resistance class
Wavin Wafix PP	DN ≤ 40	1,8 – 4,0	60 x 2,5	**EI 120-U/C EI 120-C/C**
		4,1 – 5,5	60 x 8,0	
			100 x 4,8	
			120 x 4,0	
		5,6 – 6,6	60 x 10,0	
			100 x 7,2	
			120 x 5,0	
		6,7 – 8,2	60 x 13,0	
			100 x 9,6	
			120 x 6,5	
		8,3 – 9,2	60 x 15,0	
			100 x 9,6	
			120 x 7,5	
		9,3 – 9,8	60 x 16,0	
			100 x 9,6	
			120 x 8,0	
		9,9 – 10,8	60 x 18,0	
			100 x 12,0	
			120 x 9,0	
		10,9 – 12,0	60 x 20,0	
			100 x 12,0	
			120 x 10,0	
		12,1 – 12,6	60 x 21,0	
			100 x 14,4	
			120 x 10,5	
		12,7 – 13,6	60 x 23,0	
			100 x 14,4	
			120 x 11,5	
		13,7 – 14,2	60 x 24,0	
			100 x 14,4	
			120 x 12,0	
		14,3 – 14,7	100 x 16,8	
			120 x 12,5	
		14,8 – 15,2	100 x 16,8	
			120 x 13,0	
		15,3 – 16,3	100 x 16,8	
			120 x 14,0	
		16,4 – 16,8	100 x 19,2	
			120 x 14,5	
		16,9 – 17,5	100 x 19,2	
			120 x 15,0	
wall thickness ≥ 150 mm				

Table C28. Resistance to fire classification of Wavin plastic pipes (without insulation) penetration seals in rigid wall, made with use of PIRO Multitube PM, in accordance with Annex A1 and Annex D27 (continued).

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Intumescent material length x thickness, [mm]	Fire resistance class
Wavin Wafix PP	40 < DN ≤ 50	1,8 – 2,6	60 x 2,5	**EI 120-U/C EI 120-C/C**
		2,7 – 5,5	60 x 8,0	
			100 x 4,8	
			120 x 4,0	
		5,6 – 6,6	60 x 10,0	
			100 x 7,2	
			120 x 5,0	
		6,7 – 8,2	60 x 13,0	
			100 x 9,6	
			120 x 6,5	
		8,3 – 9,2	60 x 13,0	
			100 x 9,6	
			120 x 7,5	
		9,3 – 9,8	60 x 16,0	
			100 x 9,6	
			120 x 8,0	
		9,9 – 10,8	60 x 18,0	
			100 x 12,0	
			120 x 9,0	
		10,9 – 12,0	60 x 20,0	
			100 x 12,0	
			120 x 10,0	
		12,1 – 12,6	60 x 21,0	
			100 x 14,4	
			120 x 10,5	
		12,7 – 13,6	60 x 23,0	
			100 x 14,4	
			120 x 11,5	
		13,7 – 14,2	60 x 24,0	
			100 x 14,4	
			120 x 12,0	
		14,3 – 14,7	100 x 16,8	
			120 x 12,5	
		14,8 – 15,2	100 x 16,8	
			120 x 13,0	
		15,3 – 16,3	100 x 16,8	
			120 x 14,0	
		16,4 – 16,8	100 x 19,2	
			120 x 14,5	
		16,9 – 17,5	100 x 19,2	
			120 x 15,0	
wall thickness ≥ 150 mm				

Table C28. Resistance to fire classification of Wavin plastic pipes (without insulation) penetration seals in rigid wall, made with use of PIRO Multitube PM, in accordance with Annex A1 and Annex D27 (continued).

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Intumescent material length x thickness, [mm]	Fire resistance class
Wavin Wafix PP	50 < DN ≤ 60	2,0 – 5,5	60 x 8,0	**EI 120-U/C** **EI 120-C/C**
			100 x 4,8	
			120 x 4,0	
		5,6 – 6,6	60 x 10,0	
			100 x 7,2	
			120 x 5,0	
		6,7 – 8,2	60 x 13,0	
			100 x 9,6	
			120 x 6,5	
		8,3 – 9,2	60 x 15,0	
			100 x 9,6	
			120 x 7,5	
		9,3 – 9,8	60 x 16,0	
			100 x 9,6	
			120 x 8,0	
		9,9 – 10,8	60 x 18,0	
			100 x 12,0	
			120 x 9,0	
		10,9 – 12,0	60 x 20,0	
			100 x 12,0	
			120 x 10,0	
		12,1 – 12,6	60 x 21,0	
			100 x 14,4	
			120 x 10,5	
		12,7 – 13,6	60 x 23,0	
			100 x 14,4	
			120 x 11,5	
		13,7 – 14,2	60 x 24,0	
			100 x 14,4	
			120 x 12,0	
		14,3 – 14,7	100 x 16,8	
			120 x 12,5	
		14,8 – 15,2	100 x 16,8	
			120 x 13,0	
		15,3 – 16,3	100 x 16,8	
			120 x 14,0	
		16,4 – 16,8	100 x 19,2	
			120 x 14,5	
		16,9 – 17,5	100 x 19,2	
			120 x 15,0	
wall thickness ≥ 150 mm				

Table C28. Resistance to fire classification of Wavin plastic pipes (without insulation) penetration seals in rigid wall, made with use of PIRO Multitube PM, in accordance with Annex A1 and Annex D27 (continued).

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Intumescent material length x thickness, [mm]	Fire resistance class
Wavin Wafix PP	60 < DN ≤ 70	2,1 – 5,5	60 x 8,0	**EI 120-U/C** **EI 120-C/C**
			100 x 4,8	
			120 x 4,0	
		5,6 – 6,6	60 x 10,0	
			100 x 7,2	
			120 x 5,0	
		6,7 – 8,2	60 x 13,0	
			100 x 9,6	
			120 x 6,5	
		8,3 – 9,2	60 x 15,0	
			100 x 9,6	
			120 x 7,5	
		9,3 – 9,8	60 x 16,0	
			100 x 9,6	
			120 x 8,0	
		9,9 – 10,8	60 x 18,0	
			100 x 12,0	
			120 x 9,0	
		10,9 – 12,0	60 x 20,0	
			100 x 12,0	
			120 x 10,0	
		12,1 – 12,6	60 x 21,0	
			100 x 14,4	
			120 x 10,5	
		12,7 – 13,6	60 x 23,0	
			100 x 14,4	
			120 x 11,5	
		13,7 – 14,2	60 x 24,0	
			100 x 14,4	
			120 x 12,0	
		14,3 – 14,7	100 x 16,8	
			120 x 12,5	
		14,8 – 15,2	100 x 16,8	
			120 x 13,0	
		15,3 – 16,3	100 x 16,8	
			120 x 14,0	
		16,4 – 16,8	100 x 19,2	
			120 x 14,5	
		16,9 – 17,5	100 x 19,2	
			120 x 15,0	
wall thickness ≥ 150 mm				

Table C28. Resistance to fire classification of Wavin plastic pipes (without insulation) penetration seals in rigid wall, made with use of PIRO Multitube PM, in accordance with Annex A1 and Annex D27 (continued).

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Intumescent material length x thickness, [mm]	Fire resistance class
Wavin Wafix PP	70 < DN ≤ 80	2,3 – 5,5	60 x 8,0	**EI 120-U/C** **EI 120-C/C**
			100 x 4,8	
			120 x 4,0	
		5,6 – 6,6	60 x 10,0	
			100 x 7,2	
			120 x 5,0	
		6,7 – 8,2	60 x 13,0	
			100 x 9,6	
			120 x 6,5	
		8,3 – 9,2	60 x 15,0	
			100 x 9,6	
			120 x 7,5	
		9,3 – 9,8	60 x 16,0	
			100 x 9,6	
			120 x 8,0	
		9,9 – 10,8	60 x 18,0	
			100 x 12,0	
			120 x 9,0	
		10,9 – 12,0	60 x 20,0	
			100 x 12,0	
			120 x 10,0	
		12,1 – 12,6	60 x 21,0	
			100 x 14,4	
			120 x 10,5	
		12,7 – 13,6	60 x 23,0	
			100 x 14,4	
			120 x 11,5	
		13,7 – 14,2	60 x 24,0	
			100 x 14,4	
			120 x 12,0	
		14,3 – 14,7	100 x 16,8	
			120 x 12,5	
		14,8 – 15,2	100 x 16,8	
			120 x 13,0	
		15,3 – 16,3	100 x 16,8	
			120 x 14,0	
		16,4 – 16,8	100 x 19,2	
			120 x 14,5	
		16,9 – 17,5	100 x 19,2	
			120 x 15,0	
wall thickness ≥ 150 mm				

Table C28. Resistance to fire classification of Wavin plastic pipes (without insulation) penetration seals in rigid wall, made with use of PIRO Multitube PM, in accordance with Annex A1 and Annex D27 (continued).

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Intumescent material length x thickness, [mm]	Fire resistance class
Wavin Wafix PP	80 < DN ≤ 90	2,5 – 5,5	60 x 8,0	**EI 120-U/C** **EI 120-C/C**
			100 x 4,8	
			120 x 4,0	
		5,6 – 6,6	60 x 10,0	
			100 x 7,2	
			120 x 5,0	
		6,7 – 8,2	60 x 13,0	
			100 x 9,6	
			120 x 6,5	
		8,3 – 9,2	60 x 15,0	
			100 x 9,6	
			120 x 7,5	
		9,3 – 9,8	60 x 16,0	
			100 x 9,6	
			120 x 8,0	
		9,9 – 10,8	60 x 18,0	
			100 x 12,0	
			120 x 9,0	
		10,9 – 12,0	60 x 20,0	
			100 x 12,0	
			120 x 10,0	
		12,1 – 12,6	60 x 21,0	
			100 x 14,4	
			120 x 10,5	
		12,7 – 13,6	60 x 23,0	
			100 x 14,4	
			120 x 11,5	
		13,7 – 14,2	60 x 24,0	
			100 x 14,4	
			120 x 12,0	
		14,3 – 14,7	100 x 16,8	
			120 x 12,5	
		14,8 – 15,2	100 x 16,8	
			120 x 13,0	
		15,3 – 16,3	100 x 16,8	
			120 x 14,0	
		16,4 – 16,8	100 x 19,2	
			120 x 14,5	
		16,9 – 17,5	100 x 19,2	
			120 x 15,0	
wall thickness ≥ 150 mm				

Table C28. Resistance to fire classification of Wavin plastic pipes (without insulation) penetration seals in rigid wall, made with use of PIRO Multitube PM, in accordance with Annex A1 and Annex D27 (continued).

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Intumescent material length x thickness, [mm]	Fire resistance class
Wavin Wafix PP	90 < DN ≤ 100	2,6 – 5,5	60 x 8,0	**EI 120-U/C** **EI 120-C/C**
			100 x 4,8	
			120 x 4,0	
		5,6 – 6,6	60 x 10,0	
			100 x 7,2	
			120 x 5,0	
		6,7 – 8,2	60 x 13,0	
			100 x 9,6	
			120 x 6,5	
		8,3 – 9,2	60 x 15,0	
			100 x 9,6	
			120 x 7,5	
		9,3 – 9,8	60 x 16,0	
			100 x 9,6	
			120 x 8,0	
		9,9 – 10,8	60 x 18,0	
			100 x 12,0	
			120 x 9,0	
		10,9 – 12,0	60 x 20,0	
			100 x 12,0	
			120 x 10,0	
		12,1 – 12,6	60 x 21,0	
			100 x 14,4	
			120 x 10,5	
		12,7 – 13,6	60 x 23,0	
			100 x 14,4	
			120 x 11,5	
		13,7 – 14,2	60 x 24,0	
			100 x 14,4	
			120 x 12,0	
		14,3 – 14,7	100 x 16,8	
			120 x 12,5	
		14,8 – 15,2	100 x 16,8	
			120 x 13,0	
		15,3 – 16,3	100 x 16,8	
			120 x 14,0	
		16,4 – 16,8	100 x 19,2	
			120 x 14,5	
		16,9 – 17,5	100 x 19,2	
			120 x 15,0	
wall thickness ≥ 150 mm				

Table C28. Resistance to fire classification of Wavin plastic pipes (without insulation) penetration seals in rigid wall, made with use of PIRO Multitube PM, in accordance with Annex A1 and Annex D27 (continued).

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Intumescent material length x thickness, [mm]	Fire resistance class
Wavin Wafix PP	100 < DN ≤ 110	2,7 – 5,5	60 x 8,0	**EI 120-U/C** **EI 120-C/C**
			100 x 4,8	
			120 x 4,0	
		5,6 – 6,6	60 x 10,0	
			100 x 7,2	
			120 x 5,0	
		6,7 – 8,2	60 x 13,0	
			100 x 9,6	
			120 x 6,5	
		8,3 – 9,2	60 x 15,0	
			100 x 9,6	
			120 x 7,5	
		9,3 – 9,8	60 x 16,0	
			100 x 9,6	
			120 x 8,0	
		9,9 – 10,8	60 x 18,0	
			100 x 12,0	
			120 x 9,0	
		10,9 – 12,0	60 x 20,0	
			100 x 12,0	
			120 x 10,0	
		12,1 – 12,6	60 x 21,0	
			100 x 14,4	
			120 x 10,5	
		12,7 – 13,6	60 x 23,0	
			100 x 14,4	
			120 x 11,5	
		13,7 – 14,2	60 x 24,0	
			100 x 14,4	
			120 x 12,0	
		14,3 – 14,7	100 x 16,8	
			120 x 12,5	
		14,8 – 15,2	100 x 16,8	
			120 x 13,0	
		15,3 – 16,3	100 x 16,8	
			120 x 14,0	
		16,4 – 16,8	100 x 19,2	
			120 x 14,5	
		16,9 – 17,5	100 x 19,2	
			120 x 15,0	
wall thickness ≥ 150 mm				

Table C28. Resistance to fire classification of Wavin plastic pipes (without insulation) penetration seals in rigid wall, made with use of PIRO Multitube PM, in accordance with Annex A1 and Annex D27 (continued).

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Intumescent material length x thickness, [mm]	Fire resistance class
Wavin Wafix PP	110 < DN ≤ 118	3,6 – 6,6	60 x 10,0	**EI 120-U/C EI 120-C/C**
			100 x 7,2	
			120 x 5,0	
		6,7 – 8,2	60 x 13,0	
			100 x 9,6	
			120 x 6,5	
		8,3 – 9,2	60 x 15,0	
			100 x 9,6	
			120 x 7,5	
		9,3 – 9,8	60 x 16,0	
			100 x 9,6	
			120 x 8,0	
		9,9 – 10,8	60 x 18,0	
			100 x 12,0	
			120 x 9,0	
		10,9 – 12,0	60 x 20,0	
			100 x 12,0	
			120 x 10,0	
		12,1 – 12,6	60 x 21,0	
			100 x 14,4	
			120 x 10,5	
		12,7 – 13,6	60 x 23,0	
			100 x 14,4	
			120 x 11,5	
		13,7 – 14,2	60 x 24,0	
			100 x 14,4	
			120 x 12,0	
		14,3 – 14,7	100 x 16,8	
			120 x 12,5	
		14,8 – 15,2	100 x 16,8	
			120 x 13,0	
		15,3 – 16,3	100 x 16,8	
			120 x 14,0	
		16,4 – 16,8	100 x 19,2	
			120 x 14,5	
		16,9 – 17,5	100 x 19,2	
			120 x 15,0	
wall thickness ≥ 150 mm				

Table C28. Resistance to fire classification of Wavin plastic pipes (without insulation) penetration seals in rigid wall, made with use of PIRO Multitube PM, in accordance with Annex A1 and Annex D27 (continued).

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Intumescent material length x thickness, [mm]	Fire resistance class
Wavin Wafix PP	118 < DN ≤ 130	4,2 – 8,2	60 x 13,0	**EI 120-U/C EI 120-C/C**
			100 x 9,6	
			120 x 6,5	
		8,3 – 9,2	60 x 15,0	
			100 x 9,6	
			120 x 7,5	
		9,3 – 9,8	60 x 16,0	
			100 x 9,6	
			120 x 8,0	
		9,9 – 10,8	60 x 18,0	
			100 x 12,0	
			120 x 9,0	
		10,9 – 12,0	60 x 20,0	
			100 x 12,0	
			120 x 10,0	
		12,1 – 12,6	60 x 21,0	
			100 x 14,4	
			120 x 10,5	
		12,7 – 13,6	60 x 23,0	
			100 x 14,4	
			120 x 11,5	
		13,7 – 14,2	60 x 24,0	
			100 x 14,4	
			120 x 12,0	
		14,3 – 14,7	100 x 16,8	
			120 x 12,5	
		14,8 – 15,2	100 x 16,8	
			120 x 13,0	
		15,3 – 16,3	100 x 16,8	
			120 x 14,0	
		16,4 – 16,8	100 x 19,2	
			120 x 14,5	
		16,9 – 17,5	100 x 19,2	
			120 x 15,0	
wall thickness ≥ 150 mm				

Table C28. Resistance to fire classification of Wavin plastic pipes (without insulation) penetration seals in rigid wall, made with use of PIRO Multitube PM, in accordance with Annex A1 and Annex D27 (continued).

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Intumescent material length x thickness, [mm]	Fire resistance class
Wavin Wafix PP	130 < DN ≤ 138	4,7 – 9,2	60 x 15,0	**EI 120-U/C EI 120-C/C**
			100 x 9,6	
			120 x 7,5	
		9,3 – 9,8	60 x 16,0	
			100 x 9,6	
			120 x 8,0	
		9,9 – 10,8	60 x 18,0	
			100 x 12,0	
			120 x 9,0	
		10,9 – 12,0	60 x 20,0	
			100 x 12,0	
			120 x 10,0	
		12,1 – 12,6	60 x 21,0	
			100 x 14,4	
			120 x 10,5	
		12,7 – 13,6	60 x 23,0	
			100 x 14,4	
			120 x 11,5	
		13,7 – 14,2	60 x 24,0	
			100 x 14,4	
			120 x 12,0	
		14,3 – 14,7	100 x 16,8	
			120 x 12,5	
		14,8 – 15,2	100 x 16,8	
			120 x 13,0	
		15,3 – 16,3	100 x 16,8	
			120 x 14,0	
		16,4 – 16,8	100 x 19,2	
			120 x 14,5	
		16,9 – 17,5	100 x 19,2	
			120 x 15,0	
wall thickness ≥ 150 mm				

Table C28. Resistance to fire classification of Wavin plastic pipes (without insulation) penetration seals in rigid wall, made with use of PIRO Multitube PM, in accordance with Annex A1 and Annex D27 (continued).

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Intumescent material length x thickness, [mm]	Fire resistance class
Wavin Wafix PP	138 < DN ≤ 142	5,0 – 9,8	60 x 16,0	**EI 120-U/C** **EI 120-C/C**
			100 x 9,6	
			120 x 8,0	
		9,9 – 10,8	60 x 18,0	
			100 x 12,0	
			120 x 9,0	
		10,9 – 12,0	60 x 20,0	
			100 x 12,0	
			120 x 10,0	
		12,1 – 12,6	60 x 21,0	
			100 x 14,4	
			120 x 10,5	
		12,7 – 13,6	60 x 23,0	
			100 x 14,4	
			120 x 11,5	
		13,7 – 14,2	60 x 24,0	
			100 x 14,4	
			120 x 12,0	
		14,3 – 14,7	100 x 16,8	
			120 x 12,5	
		14,8 – 15,2	100 x 16,8	
			120 x 13,0	
		15,3 – 16,3	100 x 16,8	
			120 x 14,0	
		16,4 – 16,8	100 x 19,2	
			120 x 14,5	
		16,9 – 17,5	100 x 19,2	
			120 x 15,0	
wall thickness ≥ 150 mm				

Table C28. Resistance to fire classification of Wavin plastic pipes (without insulation) penetration seals in rigid wall, made with use of PIRO Multitube PM, in accordance with Annex A1 and Annex D27 (continued).

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Intumescent material length x thickness, [mm]	Fire resistance class
Wavin Wafix PP	142 < DN ≤ 150	5,6 – 10,8	60 x 18,0	**EI 120-U/C EI 120-C/C**
			100 x 12,0	
			120 x 9,0	
		10,9 – 12,0	60 x 20,0	
			100 x 12,0	
			120 x 10,0	
		12,1 – 12,6	60 x 21,0	
			100 x 14,4	
			120 x 10,5	
		12,7 – 13,6	60 x 23,0	
			100 x 14,4	
			120 x 11,5	
		13,7 – 14,2	60 x 24,0	
			100 x 14,4	
			120 x 12,0	
		14,3 – 14,7	100 x 16,8	
			120 x 12,5	
		14,8 – 15,2	100 x 16,8	
			120 x 13,0	
		15,3 – 16,3	100 x 16,8	
			120 x 14,0	
		16,4 – 16,8	100 x 19,2	
			120 x 14,5	
		16,9 – 17,5	100 x 19,2	
			120 x 15,0	
	150 < DN ≤ 159	6,2 – 12,0	60 x 20,0	**EI 120-U/C EI 120-C/C**
			100 x 12,0	
			120 x 10,0	
		12,1 – 12,6	60 x 21,0	
			100 x 14,4	
			120 x 10,5	
		12,7 – 13,6	60 x 23,0	
			100 x 14,4	
			120 x 11,5	
		13,7 – 14,2	60 x 24,0	
			100 x 14,4	
			120 x 12,0	
		14,3 – 14,7	100 x 16,8	
			120 x 12,5	
		14,8 – 15,2	100 x 16,8	
			120 x 13,0	
		15,3 – 16,3	100 x 16,8	
			120 x 14,0	
		16,4 – 16,8	100 x 19,2	
			120 x 14,5	
		16,9 – 17,5	100 x 19,2	
			120 x 15,0	
wall thickness ≥ 150 mm				

Table C28. Resistance to fire classification of Wavin plastic pipes (without insulation) penetration seals in rigid wall, made with use of PIRO Multitube PM, in accordance with Annex A1 and Annex D27 (continued).

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Intumescent material length x thickness, [mm]	Fire resistance class
Wavin Wafix PP	159 < DN ≤ 163	6,5 – 12,6	60 x 21,0	**EI 120-U/C EI 120-C/C**
			100 x 14,4	
			120 x 10,5	
		12,7 – 13,6	60 x 23,0	
			100 x 14,4	
			120 x 11,5	
		13,7 – 14,2	60 x 24,0	
			100 x 14,4	
			120 x 12,0	
		14,3 – 14,7	100 x 16,8	
			120 x 12,5	
		14,8 – 15,2	100 x 16,8	
			120 x 13,0	
		15,3 – 16,3	100 x 16,8	
			120 x 14,0	
		16,4 – 16,8	100 x 19,2	
			120 x 14,5	
		16,9 – 17,5	100 x 19,2	
			120 x 15,0	
	163 < DN ≤ 171	7,0 – 13,6	60 x 23,0	**EI 120-U/C EI 120-C/C**
			100 x 14,4	
			120 x 11,5	
		13,7 – 14,2	60 x 24,0	
			100 x 14,4	
			120 x 12,0	
		14,3 – 14,7	100 x 16,8	
			120 x 12,5	
		14,8 – 15,2	100 x 16,8	
			120 x 13,0	
		15,3 – 16,3	100 x 16,8	
			120 x 14,0	
		16,4 – 16,8	100 x 19,2	
			120 x 14,5	
		16,9 – 17,5	100 x 19,2	
			120 x 15,0	
	171 < DN ≤ 175	7,3 – 14,2	60 x 24,0	**EI 120-U/C EI 120-C/C**
			100 x 14,4	
			120 x 12,0	
		14,3 – 14,7	100 x 16,8	
			120 x 12,5	
		14,8 – 15,2	100 x 16,8	
			120 x 13,0	
		15,3 – 16,3	100 x 16,8	
			120 x 14,0	
		16,4 – 16,8	100 x 19,2	
			120 x 14,5	
		16,9 – 17,5	100 x 19,2	
			120 x 15,0	
wall thickness ≥ 150 mm				

Table C28. Resistance to fire classification of Wavin plastic pipes (without insulation) penetration seals in rigid wall, made with use of PIRO Multitube PM, in accordance with Annex A1 and Annex D27 (continued).

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Intumescent material length x thickness, [mm]	Fire resistance class
Wavin Wafix PP	175 < DN ≤ 179	7,6 – 14,7	100 x 16,8	**EI 120-U/C EI 120-C/C**
			120 x 12,5	
		14,8 – 15,2	100 x 16,8	
			120 x 13,0	
		15,3 – 16,3	100 x 16,8	
			120 x 14,0	
		16,4 – 16,8	100 x 19,2	
			120 x 14,5	
		16,9 – 17,5	100 x 19,2	
			120 x 15,0	
	179 < DN ≤ 183	7,8 – 15,2	100 x 16,8	**EI 120-U/C EI 120-C/C**
			120 x 13,0	
		15,3 – 16,3	100 x 16,8	
			120 x 14,0	
		16,4 – 16,8	100 x 19,2	
			120 x 14,5	
		16,9 – 17,5	100 x 19,2	
			120 x 15,0	
	183 < DN ≤ 191	8,4 – 16,3	100 x 16,8	**EI 120-U/C EI 120-C/C**
			120 x 14,0	
		16,4 – 16,8	100 x 19,2	
			120 x 14,5	
		16,9 – 17,5	100 x 19,2	
			120 x 15,0	
	191 < DN ≤ 195	8,7 – 16,8	100 x 19,2	**EI 120-U/C EI 120-C/C**
			120 x 14,5	
		16,9 – 17,5	100 x 19,2	
			120 x 15,0	
	195 < DN ≤ 200	9,0 – 17,5	100 x 19,2	**EI 120-U/C EI 120-C/C**
			120 x 15,0	
Wavin Si Tech+	32	2,0	60 x 2,5	**EI 120-U/C EI 120-C/C**
			100 x 4,8	
			120 x 4,0	
	40	2,0	60 x 2,5	
			100 x 4,8	
			120 x 4,0	
	50	2,1	60 x 2,5	
			100 x 4,8	
			120 x 4,0	
	75	2,6	60 x 8,0	
			100 x 4,8	
			120 x 4,0	
	90	3,1	60 x 8,0	
			100 x 4,8	
			120 x 4,0	
	110	3,6	60 x 8,0	
			100 x 4,8	
			120 x 4,0	
	125	4,0	60 x 13,0	
			100 x 9,6	
			120 x 6,5	
wall thickness ≥ 150 mm				

Table C28. Resistance to fire classification of Wavin plastic pipes (without insulation) penetration seals in rigid wall, made with use of PIRO Multitube PM, in accordance with Annex A1 and Annex D27 (continued).

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Intumescent material length x thickness, [mm]	Fire resistance class
Wavin AS+	50	3,0	60 x 8,0	**EI 120-U/C EI 120-C/C**
			100 x 4,8	
			120 x 4,0	
	75	3,5	60 x 8,0	
			100 x 4,8	
			120 x 4,0	
	90	4,6	60 x 8,0	
			100 x 4,8	
			120 x 4,0	
	110	5,3	60 x 8,0	
			100 x 4,8	
			120 x 4,0	
	125	5,3	60 x 13,0	
			100 x 9,6	
			120 x 6,5	
wall thickness ≥ 150 mm				

Table C29. Resistance to fire classification of Wavin plastic pipes (with PE foam insulation) penetration seals in rigid wall, made with use of PIRO Multitube PM, in accordance with Annex A1 and Annex D28.

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Insulation thickness [mm]	Intumescent material length x thickness, [mm]	Fire resistance class
Wavin Wafix PP	DN ≤ 40	1,8 – 2,6	9,0	60 x 4,0	**EI 120-U/C EI 120-C/C**
				100 x 4,8	
				120 x 2,5	
		2,7 – 3,3	9,0	60 x 10,0	
				100 x 7,2	
				120 x 5,0	
		3,4 – 4,4	9,0	60 x 13,0	
				100 x 9,6	
				120 x 6,5	
		4,5 – 5,1	9,0	60 x 15,0	
				100 x 9,6	
				120 x 7,5	
		5,2 – 5,5	9,0	60 x 16,0	
				100 x 9,6	
				120 x 8,0	
	40 < DN ≤ 57	2,7 – 3,3	9,0	60 x 10,0	
				100 x 7,2	
				120 x 5,0	
		3,4 – 4,4	9,0	60 x 13,0	
				100 x 9,6	
				120 x 6,5	
		4,5 – 5,1	9,0	60 x 15,0	
				100 x 9,6	
				120 x 7,5	
		5,2 – 5,5	9,0	60 x 16,0	
				100 x 9,6	
				120 x 8,0	
	57 < DN ≤ 83	4,1 – 4,4	9,0	60 x 13,0	
				100 x 9,6	
				120 x 6,5	
		4,5 – 5,1	9,0	60 x 15,0	
				100 x 9,6	
				120 x 7,5	
		5,2 – 5,5	9,0	60 x 16,0	
				100 x 9,6	
				120 x 8,0	
	83 < DN ≤ 101	5,0 – 5,1	9,0	60 x 15,0	
				100 x 9,6	
				120 x 7,5	
		5,2 – 5,5	9,0	60 x 16,0	
				100 x 9,6	
				120 x 8,0	
	101 < DN ≤ 110	5,5	9,0	60 x 16,0	
				100 x 9,6	
				120 x 8,0	
wall thickness ≥ 100 mm					

Table C29. Resistance to fire classification of Wavin plastic pipes (with PE foam insulation) penetration seals in rigid wall, made with use of PIRO Multitube PM, in accordance with Annex A and Annex D28 (continued).

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Insulation thickness [mm]	Intumescent material length x thickness, [mm]	Fire resistance class
Wavin SiTech+	32	2,0	9,0	60 x 4,0	**EI 120-U/C EI 120-C/C**
				100 x 4,8	
				120 x 2,5	
	40	2,0	9,0	60 x 4,0	
				100 x 4,8	
				120 x 2,5	
Wavin AS+	50	3,0	9,0	60 x 10,0	
				100 x 7,2	
				120 x 5,0	
wall thickness ≥ 100 mm					

Table C30. Resistance to fire classification of Wavin plastic pipes (with flexible elastomeric foam (FEF) insulation) penetration seals in rigid wall, made with use of PIRO Multitube PM, in accordance with Annex A1 and Annex D29.

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Insulation thickness [mm]	Intumescent material length x thickness, [mm]	Fire resistance class
Wavin Wafix PP	DN ≤ 40	1,8	32,0	60 x 8,0	**EI 120-U/C EI 120-C/C**
				100 x 4,8	
				120 x 4,0	
		1,9 – 2,2	32,0	60 x 10,0	**EI 60-U/C EI 60-C/C**
				100 x 7,2	
				120 x 5,0	
		2,3 – 2,9	32,0	60 x 13,0	
				100 x 9,6	
				120 x 6,5	
		3,0 – 3,4	32,0	60 x 15,0	
				100 x 9,6	
				120 x 7,5	
		3,4 – 3,7	32,0	60 x 16,0	
				100 x 9,6	
				120 x 8,0	
		3,8 – 4,1	32,0	60 x 18,0	
				100 x 12,0	
				120 x 9,0	
		4,2 – 4,5	32,0	60 x 20,0	
				100 x 12,0	
				120 x 10,0	
		4,6 – 4,8	32,0	60 x 21,0	
				100 x 14,4	
				120 x 10,5	
		4,9 – 5,2	32,0	60 x 23,0	
				100 x 14,4	
				120 x 11,5	
		5,3 – 5,4	32,0	60 x 24,0	
				100 x 14,4	
				120 x 12,0	
		5,5	32,0	60 x 24,0	**EI 90-U/C EI 90-C/C**
				100 x 14,4	
				120 x 12,0	
wall thickness ≥ 100 mm					

Table C30. Resistance to fire classification of Wavin plastic pipes (with flexible elastomeric foam (FEF) insulation) penetration seals in rigid wall, made with use of PIRO Multitube PM, in accordance with Annex A1 and Annex D29 (continued).

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Insulation thickness [mm]	Intumescent material length x thickness, [mm]	Fire resistance class
Wavin Wafix PP	40 < DN ≤ 48	1,9 – 2,2	32,0	60 x 10,0	**EI 120-U/C EI 120-C/C**
				100 x 7,2	
				120 x 5,0	
		2,3 – 2,9	32,0	60 x 13,0	**EI 60-U/C EI 60-C/C**
				100 x 9,6	
				120 x 6,5	
		3,0 – 3,4	32,0	60 x 15,0	
				100 x 9,6	
				120 x 7,5	
		3,4 – 3,7	32,0	60 x 16,0	
				100 x 9,6	
				120 x 8,0	
		3,8 – 4,1	32,0	60 x 18,0	
				100 x 12,0	
				120 x 9,0	
		4,2 – 4,5	32,0	60 x 20,0	
				100 x 12,0	
				120 x 10,0	
		4,6 – 4,8	32,0	60 x 21,0	
				100 x 14,4	
				120 x 10,5	
		4,9 – 5,2	32,0	60 x 23,0	
				100 x 14,4	
				120 x 11,5	
		5,3 – 5,4	32,0	60 x 24,0	
				100 x 14,4	
				120 x 12,0	
		5,5	32,0	60 x 24,0	**EI 90-U/C EI 90-C/C**
				100 x 14,4	
				120 x 12,0	
wall thickness ≥ 100 mm					

Table C30. Resistance to fire classification of Wavin plastic pipes (with flexible elastomeric foam (FEF) insulation) penetration seals in rigid wall, made with use of PIRO Multitube PM, in accordance with Annex A1 and Annex D29 (continued).

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Insulation thickness [mm]	Intumescent material length x thickness, [mm]	Fire resistance class
Wavin Wafix PP	48 < DN ≤ 61	2,1 – 2,9	32,0	60 x 13,0	**EI 60-U/C EI 60-C/C**
				100 x 9,6	
				120 x 6,5	
		3,0 – 3,4	32,0	60 x 15,0	
				100 x 9,6	
				120 x 7,5	
		3,4 – 3,7	32,0	60 x 16,0	
				100 x 9,6	
				120 x 8,0	
		3,8 – 4,1	32,0	60 x 18,0	
				100 x 12,0	
				120 x 9,0	
		4,2 – 4,5	32,0	60 x 20,0	
				100 x 12,0	
				120 x 10,0	
		4,6 – 4,8	32,0	60 x 21,0	
				100 x 14,4	
				120 x 10,5	
		4,9 – 5,2	32,0	60 x 23,0	
				100 x 14,4	
				120 x 11,5	
		5,3 – 5,4	32,0	60 x 24,0	
				100 x 14,4	
				120 x 12,0	
		5,5	32,0	60 x 24,0	**EI 90-U/C EI 90-C/C**
				100 x 14,4	
				120 x 12,0	
wall thickness ≥ 100 mm					

Table C30. Resistance to fire classification of Wavin plastic pipes (with flexible elastomeric foam (FEF) insulation) penetration seals in rigid wall, made with use of PIRO Multitube PM, in accordance with Annex A1 and Annex D29 (continued).

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Insulation thickness [mm]	Intumescent material length x thickness, [mm]	Fire resistance class
Wavin Wafix PP	61 < DN ≤ 70	2,2 – 3,4	32,0	60 x 15,0	**EI 60-U/C EI 60-C/C**
				100 x 9,6	
				120 x 7,5	
		3,4 – 3,7	32,0	60 x 16,0	
				100 x 9,6	
				120 x 8,0	
		3,8 – 4,1	32,0	60 x 18,0	
				100 x 12,0	
				120 x 9,0	
		4,2 – 4,5	32,0	60 x 20,0	
				100 x 12,0	
				120 x 10,0	
		4,6 – 4,8	32,0	60 x 21,0	
				100 x 14,4	
				120 x 10,5	
		4,9 – 5,2	32,0	60 x 23,0	
				100 x 14,4	
				120 x 11,5	
		5,3 – 5,4	32,0	60 x 24,0	
				100 x 14,4	
				120 x 12,0	
		5,5	32,0	60 x 24,0	**EI 90-U/C EI 90-C/C**
				100 x 14,4	
				120 x 12,0	
	70 < DN ≤ 75	2,3 – 3,7	32,0	60 x 16,0	**EI 60-U/C EI 60-C/C**
				100 x 9,6	
				120 x 8,0	
		3,8 – 4,1	32,0	60 x 18,0	
				100 x 12,0	
				120 x 9,0	
		4,2 – 4,5	32,0	60 x 20,0	
				100 x 12,0	
				120 x 10,0	
		4,6 – 4,8	32,0	60 x 21,0	
				100 x 14,4	
				120 x 10,5	
		4,9 – 5,2	32,0	60 x 23,0	
				100 x 14,4	
				120 x 11,5	
		5,3 – 5,4	32,0	60 x 24,0	
				100 x 14,4	
				120 x 12,0	
		5,5	32,0	60 x 24,0	**EI 90-U/C EI 90-C/C**
				100 x 14,4	
				120 x 12,0	
wall thickness ≥ 100 mm					

Table C30. Resistance to fire classification of Wavin plastic pipes (with flexible elastomeric foam (FEF) insulation) penetration seals in rigid wall, made with use of PIRO Multitube PM, in accordance with Annex A1 and Annex D29 (continued).

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Insulation thickness [mm]	Intumescent material length x thickness, [mm]	Fire resistance class
Wavin Wafix PP	75 < DN ≤ 83	2,4 – 4,1	32,0	60 x 18,0	**EI 60-U/C EI 60-C/C**
				100 x 12,0	
				120 x 9,0	
		4,2 – 4,5	32,0	60 x 20,0	
				100 x 12,0	
				120 x 10,0	
		4,6 – 4,8	32,0	60 x 21,0	
				100 x 14,4	
				120 x 10,5	
		4,9 – 5,2	32,0	60 x 23,0	
				100 x 14,4	
				120 x 11,5	
		5,3 – 5,4	32,0	60 x 24,0	
				100 x 14,4	
				120 x 12,0	
		5,5	32,0	60 x 24,0	**EI 90-U/C EI 90-C/C**
				100 x 14,4	
				120 x 12,0	
	83 < DN ≤ 92	2,5 – 4,5	32,0	60 x 20,0	**EI 60-U/C EI 60-C/C**
				100 x 12,0	
				120 x 10,0	
		4,6 – 4,8	32,0	60 x 21,0	
				100 x 14,4	
				120 x 10,5	
		4,9 – 5,2	32,0	60 x 23,0	
				100 x 14,4	
				120 x 11,5	
		5,3 – 5,4	32,0	60 x 24,0	
				100 x 14,4	
				120 x 12,0	
		5,5	32,0	60 x 24,0	**EI 90-U/C EI 90-C/C**
				100 x 14,4	
				120 x 12,0	
	92< DN ≤ 96	2,6 – 4,8	32,0	60 x 21,0	**EI 60-U/C EI 60-C/C**
				100 x 14,4	
				120 x 10,5	
		4,9 – 5,2	32,0	60 x 23,0	
				100 x 14,4	
				120 x 11,5	
		5,3 – 5,4	32,0	60 x 24,0	
				100 x 14,4	
				120 x 12,0	
		5,5	32,0	60 x 24,0	**EI 90-U/C EI 90-C/C**
				100 x 14,4	
				120 x 12,0	
wall thickness ≥ 100 mm					

Table C30. Resistance to fire classification of Wavin plastic pipes (with flexible elastomeric foam (FEF) insulation) penetration seals in rigid wall, made with use of PIRO Multitube PM, in accordance with Annex A1 and Annex D29 (continued).

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Insulation thickness [mm]	Intumescent material length x thickness, [mm]	Fire resistance class
Wavin Wafix PP	96 < DN ≤ 105	2,7 – 5,2	32,0	60 x 23,0	**EI 60-U/C EI 60-C/C**
				100 x 14,4	
				120 x 11,5	
		5,3 – 5,4	32,0	60 x 24,0	
				100 x 14,4	
				120 x 12,0	
		5,5	32,0	60 x 24,0	**EI 90-U/C EI 90-C/C**
				100 x 14,4	
				120 x 12,0	
	105 < DN ≤ 110	2,8 – 5,4	32,0	60 x 24,0	**EI 60-U/C EI 60-C/C**
				100 x 14,4	
				120 x 12,0	
		5,5	32,0	60 x 24,0	**EI 90-U/C EI 90-C/C**
				100 x 14,4	
				120 x 12,0	
Wavin SiTech+	32	2,0	32,0	60 x 10,0	**EI 60-U/C EI 60-C/C**
				100 x 7,2	
				120 x 5,0	
	40	2,0	32,0	60 x 10,0	
				100 x 7,2	
				120 x 5,0	
	50	2,1	32,0	60 x 13,0	
				100 x 9,6	
				120 x 6,5	
	75	2,6	32,0	60 x 16,0	
				100 x 9,6	
				120 x 8,0	
	90	3,1	32,0	60 x 20,0	
				100 x 12,0	
				120 x 10,0	
	110	3,6	32,0	60 x 24,0	
				100 x 14,4	
				120 x 12,0	
Wavin AS+	50	3,0	32,0	60 x 15,0	**EI 60-U/C EI 60-C/C**
				100 x 9,6	
				120 x 7,5	
	75	3,5	32,0	60 x 16,0	
				100 x 9,6	
				120 x 8,0	
	90	4,6	32,0	60 x 21,0	
				100 x 14,4	
				120 x 10,5	
	110	5,3	32,0	60 x 24,0	
				100 x 14,4	
				120 x 12,0	
wall thickness ≥ 100 mm					

Table C31. Resistance to fire classification of Wavin plastic pipes (without insulation) penetration seals in rigid floor, made with use of PIRO Multitube PM, in accordance with Annex A1 and Annex D30.

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Intumescent material length x thickness, [mm]	Fire resistance class
Wavin Wafix PP	DN ≤ 40	1,8 – 4,0	60 x 2,5	**EI 120-U/C EI 120-C/C**
			100 x 4,8	
		4,1 – 5,5	60 x 8,0	
			100 x 4,8	
			120 x 4,0	
		5,6 – 6,6	60 x 10,0	
			100 x 7,2	
			120 x 5,0	
		6,7 – 8,1	60 x 13,0	
			100 x 9,6	
			120 x 6,5	
		8,2 – 9,1	60 x 15,0	
			100 x 9,6	
			120 x 7,5	
		9,2 – 9,6	60 x 16,0	
			100 x 9,6	
			120 x 8,0	
		9,7 – 10,7	60 x 18,0	
			100 x 12,0	
			120 x 9,0	
		10,8 – 11,7	60 x 20,0	
			100 x 12,0	
			120 x 10,0	
		11,8 – 12,2	60 x 21,0	
			100 x 14,4	
			120 x 10,5	
		12,3 –13,2	60 x 23,0	
			100 x 14,4	
			120 x 11,5	
		13,3 – 13,8	60 x 24,0	
			100 x 14,4	
			120 x 11,5	
		13,9 – 14,3	100 x 16,8	
			120 x 12,5	
		14,4 – 14,8	100 x 16,8	
			120 x 13,0	
		14,9 – 15,9	100 x 16,8	
			120 x 14,0	
		16,0 – 16,5	100 x 19,2	
			120 x 14,5	
		17,0	100 x 19,2	
			120 x 15,0	
floor thickness ≥ 150 mm				

Table C31. Resistance to fire classification of Wavin plastic pipes (without insulation) penetration seals in rigid floor, made with use of PIRO Multitube PM, in accordance with Annex A1 and Annex D30 (continued).

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Intumescent material length x thickness, [mm]	Fire resistance class
Wavin Wafix PP	40 < DN ≤ 58	2,6 – 5,5	60 x 8,0	**EI 120-U/C EI 120-C/C**
			100 x 4,8	
			120 x 4,0	
		5,6 – 6,6	60 x 10,0	
			100 x 7,2	
			120 x 5,0	
		6,7 – 8,1	60 x 13,0	
			100 x 9,6	
			120 x 6,5	
		8,2 – 9,1	60 x 15,0	
			100 x 9,6	
			120 x 7,5	
		9,2 – 9,6	60 x 16,0	
			100 x 9,6	
			120 x 8,0	
		9,7 – 10,7	60 x 18,0	
			100 x 12,0	
			120 x 9,0	
		10,8 – 11,7	60 x 20,0	
			100 x 12,0	
			120 x 10,0	
		11,8 – 12,2	60 x 21,0	
			100 x 14,4	
			120 x 10,5	
		12,3 –13,2	60 x 23,0	
			100 x 14,4	
			120 x 11,5	
		13,3 – 13,8	60 x 24,0	
			100 x 14,4	
			120 x 11,5	
		13,9 – 14,3	100 x 16,8	
			120 x 12,5	
		14,4 – 14,8	100 x 16,8	
			120 x 13,0	
		14,9 – 15,9	100 x 16,8	
			120 x 14,0	
		16,0 – 16,5	100 x 19,2	
			120 x 14,5	
		17,0	100 x 19,2	
			120 x 15,0	
floor thickness ≥ 150 mm				

Table C31. Resistance to fire classification of Wavin plastic pipes (without insulation) penetration seals in rigid floor, made with use of PIRO Multitube PM, in accordance with Annex A1 and Annex D30 (continued).

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Intumescent material length x thickness, [mm]	Fire resistance class
Wavin Wafix PP	58 < DN ≤ 71	3,1 – 6,6	60 x 10,0	**EI 120-U/C EI 120-C/C**
			100 x 7,2	
			120 x 5,0	
		6,7 – 8,1	60 x 13,0	
			100 x 9,6	
			120 x 6,5	
		8,2 – 9,1	60 x 15,0	
			100 x 9,6	
			120 x 7,5	
		9,2 – 9,6	60 x 16,0	
			100 x 9,6	
			120 x 8,0	
		9,7 – 10,7	60 x 18,0	
			100 x 12,0	
			120 x 9,0	
		10,8 – 11,7	60 x 20,0	
			100 x 12,0	
			120 x 10,0	
		11,8 – 12,2	60 x 21,0	
			100 x 14,4	
			120 x 10,5	
		12,3 –13,2	60 x 23,0	
			100 x 14,4	
			120 x 11,5	
		13,3 – 13,8	60 x 24,0	
			100 x 14,4	
			120 x 11,5	
		13,9 – 14,3	100 x 16,8	
			120 x 12,5	
		14,4 – 14,8	100 x 16,8	
			120 x 13,0	
		14,9 – 15,9	100 x 16,8	
			120 x 14,0	
		16,0 – 16,5	100 x 19,2	
			120 x 14,5	
		17,0	100 x 19,2	
			120 x 15,0	
floor thickness ≥ 150 mm				

Table C31. Resistance to fire classification of Wavin plastic pipes (without insulation) penetration seals in rigid floor, made with use of PIRO Multitube PM, in accordance with Annex A1 and Annex D30 (continued).

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Intumescent material length x thickness, [mm]	Fire resistance class
Wavin Wafix PP	71 < DN ≤ 90	3,9 – 8,1	60 x 13,0	**EI 120-U/C EI 120-C/C**
			100 x 9,6	
			120 x 6,5	
		8,2 – 9,1	60 x 15,0	
			100 x 9,6	
			120 x 7,5	
		9,2 – 9,6	60 x 16,0	
			100 x 9,6	
			120 x 8,0	
		9,7 – 10,7	60 x 18,0	
			100 x 12,0	
			120 x 9,0	
		10,8 – 11,7	60 x 20,0	
			100 x 12,0	
			120 x 10,0	
		11,8 – 12,2	60 x 21,0	
			100 x 14,4	
			120 x 10,5	
		12,3 –13,2	60 x 23,0	
			100 x 14,4	
			120 x 11,5	
		13,3 – 13,8	60 x 24,0	
			100 x 14,4	
			120 x 11,5	
		13,9 – 14,3	100 x 16,8	
			120 x 12,5	
		14,4 – 14,8	100 x 16,8	
			120 x 13,0	
		14,9 – 15,9	100 x 16,8	
			120 x 14,0	
		16,0 – 16,5	100 x 19,2	
			120 x 14,5	
		17,0	100 x 19,2	
			120 x 15,0	
floor thickness ≥ 150 mm				

Table C31. Resistance to fire classification of Wavin plastic pipes (without insulation) penetration seals in rigid floor, made with use of PIRO Multitube PM, in accordance with Annex A1 and Annex D30 (continued).

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Intumescent material length x thickness, [mm]	Fire resistance class
Wavin Wafix PP	90 < DN ≤ 103	4,4 – 9,1	60 x 15,0	**EI 120-U/C EI 120-C/C**
			100 x 9,6	
			120 x 7,5	
		9,2 – 9,6	60 x 16,0	
			100 x 9,6	
			120 x 8,0	
		9,7 – 10,7	60 x 18,0	
			100 x 12,0	
			120 x 9,0	
		10,8 – 11,7	60 x 20,0	
			100 x 12,0	
			120 x 10,0	
		11,8 – 12,2	60 x 21,0	
			100 x 14,4	
			120 x 10,5	
		12,3 –13,2	60 x 23,0	
			100 x 14,4	
			120 x 11,5	
		13,3 – 13,8	60 x 24,0	
			100 x 14,4	
			120 x 11,5	
		13,9 – 14,3	100 x 16,8	
			120 x 12,5	
		14,4 – 14,8	100 x 16,8	
			120 x 13,0	
		14,9 – 15,9	100 x 16,8	
			120 x 14,0	
		16,0 – 16,5	100 x 19,2	
			120 x 14,5	
		17,0	100 x 19,2	
			120 x 15,0	
floor thickness ≥ 150 mm				

Table C31. Resistance to fire classification of Wavin plastic pipes (without insulation) penetration seals in rigid floor, made with use of PIRO Multitube PM, in accordance with Annex A1 and Annex D30 (continued).

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Intumescent material length x thickness, [mm]	Fire resistance class
Wavin Wafix PP	103 < DN ≤ 109	4,6 – 9,6	60 x 16,0	**EI 120-U/C EI 120-C/C**
			100 x 9,6	
			120 x 8,0	
		9,7 – 10,7	60 x 18,0	
			100 x 12,0	
			120 x 9,0	
		10,8 – 11,7	60 x 20,0	
			100 x 12,0	
			120 x 10,0	
		11,8 – 12,2	60 x 21,0	
			100 x 14,4	
			120 x 10,5	
		12,3 –13,2	60 x 23,0	
			100 x 14,4	
			120 x 11,5	
		13,3 – 13,8	60 x 24,0	
			100 x 14,4	
			120 x 11,5	
		13,9 – 14,3	100 x 16,8	
			120 x 12,5	
		14,4 – 14,8	100 x 16,8	
			120 x 13,0	
		14,9 – 15,9	100 x 16,8	
			120 x 14,0	
		16,0 – 16,5	100 x 19,2	
			120 x 14,5	
		17,0	100 x 19,2	
			120 x 15,0	
floor thickness ≥ 150 mm				

Table C31. Resistance to fire classification of Wavin plastic pipes (without insulation) penetration seals in rigid floor, made with use of PIRO Multitube PM, in accordance with Annex A1 and Annex D30 (continued).

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Intumescent material length x thickness, [mm]	Fire resistance class
Wavin Wafix PP	109 < DN ≤ 122	5,2 – 10,7	60 x 18,0	**EI 120-U/C EI 120-C/C**
			100 x 12,0	
			120 x 9,0	
		10,8 – 11,7	60 x 20,0	
			100 x 12,0	
			120 x 10,0	
		11,8 – 12,2	60 x 21,0	
			100 x 14,4	
			120 x 10,5	
		12,3 –13,2	60 x 23,0	
			100 x 14,4	
			120 x 11,5	
		13,3 – 13,8	60 x 24,0	
			100 x 14,4	
			120 x 11,5	
		13,9 – 14,3	100 x 16,8	
			120 x 12,5	
		14,4 – 14,8	100 x 16,8	
			120 x 13,0	
		14,9 – 15,9	100 x 16,8	
			120 x 14,0	
		16,0 – 16,5	100 x 19,2	
			120 x 14,5	
		17,0	100 x 19,2	
			120 x 15,0	
	122 < DN ≤ 134	5,7 – 11,7	60 x 20,0	**EI 120-U/C EI 120-C/C**
			100 x 12,0	
			120 x 10,0	
		11,8 – 12,2	60 x 21,0	
			100 x 14,4	
			120 x 10,5	
		12,3 –13,2	60 x 23,0	
			100 x 14,4	
			120 x 11,5	
		13,3 – 13,8	60 x 24,0	
			100 x 14,4	
			120 x 11,5	
		13,9 – 14,3	100 x 16,8	
			120 x 12,5	
		14,4 – 14,8	100 x 16,8	
			120 x 13,0	
		14,9 – 15,9	100 x 16,8	
			120 x 14,0	
		16,0 – 16,5	100 x 19,2	
			120 x 14,5	
		17,0	100 x 19,2	
			120 x 15,0	
floor thickness ≥ 150 mm				

Table C31. Resistance to fire classification of Wavin plastic pipes (without insulation) penetration seals in rigid floor, made with use of PIRO Multitube PM, in accordance with Annex A1 and Annex D30 (continued).

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Intumescent material length x thickness, [mm]	Fire resistance class
Wavin Wafix PP	134 < DN ≤ 141	5,9 – 12,2	60 x 21,0	**EI 120-U/C EI 120-C/C**
			100 x 14,4	
			120 x 10,5	
		12,3 –13,2	60 x 23,0	
			100 x 14,4	
			120 x 11,5	
		13,3 – 13,8	60 x 24,0	
			100 x 14,4	
			120 x 11,5	
		13,9 – 14,3	100 x 16,8	
			120 x 12,5	
		14,4 – 14,8	100 x 16,8	
			120 x 13,0	
		14,9 – 15,9	100 x 16,8	
			120 x 14,0	
		16,0 – 16,5	100 x 19,2	
			120 x 14,5	
		17,0	100 x 19,2	
			120 x 15,0	
	141 < DN ≤ 153	6,4 –13,2	60 x 23,0	**EI 120-U/C EI 120-C/C**
			100 x 14,4	
			120 x 11,5	
		13,3 – 13,8	60 x 24,0	
			100 x 14,4	
			120 x 11,5	
		13,9 – 14,3	100 x 16,8	
			120 x 12,5	
		14,4 – 14,8	100 x 16,8	
			120 x 13,0	
		14,9 – 15,9	100 x 16,8	
			120 x 14,0	
		16,0 – 16,5	100 x 19,2	
			120 x 14,5	
		17,0	100 x 19,2	
			120 x 15,0	
	153 < DN ≤ 160	6,7 – 13,8	60 x 24,0	**EI 120-U/C EI 120-C/C**
			100 x 14,4	
			120 x 11,5	
		13,9 – 14,3	100 x 16,8	
			120 x 12,5	
		14,4 – 14,8	100 x 16,8	
			120 x 13,0	
		14,9 – 15,9	100 x 16,8	
			120 x 14,0	
		16,0 – 16,5	100 x 19,2	
			120 x 14,5	
		17,0	100 x 19,2	
			120 x 15,0	
floor thickness ≥ 150 mm				

Table C31. Resistance to fire classification of Wavin plastic pipes (without insulation) penetration seals in rigid floor, made with use of PIRO Multitube PM, in accordance with Annex A1 and Annex D30 (continued).

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Intumescent material length x thickness, [mm]	Fire resistance class
Wavin Wafix PP	160 < DN ≤ 166	8,4 – 14,3	100 x 16,8	**EI 120-U/C EI 120-C/C**
			120 x 12,5	
		14,4 – 14,8	100 x 16,8	
			120 x 13,0	
		14,9 – 15,9	100 x 16,8	
			120 x 14,0	
		16,0 – 16,5	100 x 19,2	
			120 x 14,5	
		17,0	100 x 19,2	
			120 x 15,0	
	166 < DN ≤ 173	10,1 – 14,8	100 x 16,8	**EI 120-U/C EI 120-C/C**
			120 x 13,0	
		14,9 – 15,9	100 x 16,8	
			120 x 14,0	
		16,0 – 16,5	100 x 19,2	
			120 x 14,5	
		17,0	100 x 19,2	
			120 x 15,0	
	173 < DN ≤ 186	14,9 – 15,9	100 x 16,8	**EI 120-U/C EI 120-C/C**
			120 x 14,0	
		16,0 – 16,5	100 x 19,2	
			120 x 14,5	
		17,0	100 x 19,2	
			120 x 15,0	
	186 < DN ≤ 193	15,3 – 16,5	100 x 19,2	**EI 120-U/C EI 120-C/C**
			120 x 14,5	
		17,0	100 x 19,2	
			120 x 15,0	
	193 < DN ≤ 200	17,0	100 x 19,2	**EI 120-U/C EI 120-C/C**
			120 x 15,0	
Wavin SiTech+	32	2,0	60 x 2,5	**EI 120-U/C EI 120-C/C**
			100 x 4,8	
			120 x 4,0	
	40	2,0	60 x 2,5	
			100 x 4,8	
			120 x 4,0	
Wavin AS+	50	3,0	60 x 8,0	**EI 120-U/C EI 120-C/C**
			100 x 4,8	
			100 x 4,0	
	75	3,4	60 x 13,0	
			100 x 9,6	
			120 x 6,5	
	90	4,6	60 x 13,0	
			100 x 9,6	
			120 x 6,5	
	110	5,3	60 x 18,0	
			100 x 12,0	
			120 x 9,0	
	125	5,3	60 x 20,0	
			100 x 12,0	
			120 x 10,0	
floor thickness ≥ 150 mm				

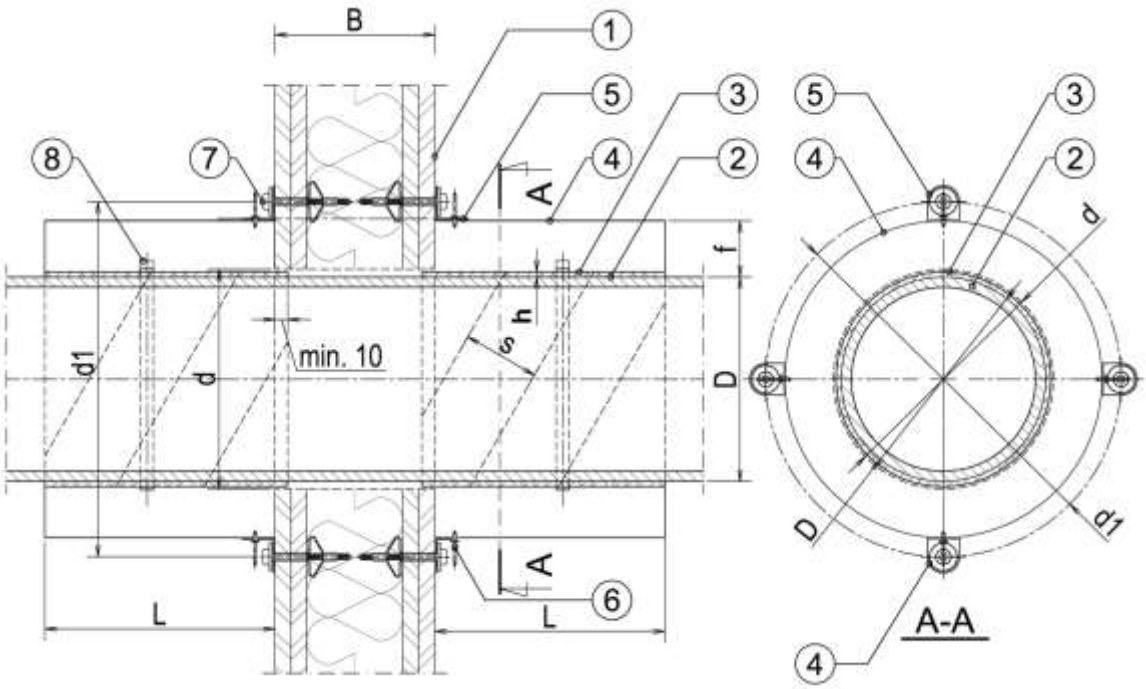
Table C32. Resistance to fire classification of Wavin plastic pipes (with PE acoustic mat insulation) penetration seals in rigid floor, made with use of PIRO Multitube PM, in accordance with Annex A1 and Annex D31.

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Insulation thickness [mm]	Intumescent material length x thickness, [mm]	Fire resistance class
Wavin Wafix PP	DN ≤ 110	2,2 –6,8	6,0	60 x 8,0 100 x 4,8 120 x 4,0	**EI 120-U/C** **EI 120-C/C**
	110 < DN ≤ 135	3,1 – 7,0	6,0	60 x 12,0 100 x 7,2 120 x 6,5	**EI 120-U/C** **EI 120-C/C**
		7,1 – 7,2	6,0	60 x 16,0 100 x 9,6 120 x 8,0	
	135 < DN ≤ 160	4,0 – 7,2	6,0	60 x 16,0 100 x 9,6 120 x 8,0	**EI 120-U/C** **EI 120-C/C**
Wavin SiTech+	32	2,0	6,0	60 x 8,0 100 x 4,8 120 x 4,0	**EI 120-U/C** **EI 120-C/C**
	40	2,0	6,0	60 x 8,0 100 x 4,8 120 x 4,0	
	50	2,1	6,0	60 x 8,0 100 x 4,8 120 x 4,0	
	75	2,6	6,0	60 x 8,0 100 x 4,8 120 x 4,0	
	90	3,1	6,0	60 x 8,0 100 x 4,8 120 x 4,0	
	110	3,6	6,0	60 x 8,0 100 x 4,8 120 x 4,0	
	125	4,0	6,0	60 x 12,0 100 x 7,2 120 x 6,5	
	160	5,0	6,0	60 x 16,0 100 x 9,6 120 x 8,0	
floor thickness ≥ 150 mm					

Table C32. Resistance to fire classification of Wavin plastic pipes (with PE acoustic mat insulation) penetration seals in rigid floor, made with use of PIRO Multitube PM, in accordance with Annex A1 and Annex D31 (continued).

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Insulation thickness [mm]	Intumescent material length x thickness, [mm]	Fire resistance class
Wavin AS+	50	3,0	6,0	60 x 8,0	**EI 120-U/C EI 120-C/C**
				100 x 4,8	
				120 x 4,0	
	75	3,5	6,0	60 x 8,0	
				100 x 4,8	
				120 x 4,0	
	90	4,6	6,0	60 x 8,0	
				100 x 4,8	
				120 x 4,0	
	110	5,3	6,0	60 x 8,0	
				100 x 4,8	
				120 x 4,0	
	125	5,3	6,0	60 x 12,0	
				100 x 7,2	
				120 x 6,5	
	160	5,6	6,0	60 x 16,0	
				100 x 9,6	
				120 x 8,0	
floor thickness ≥ 150 mm					

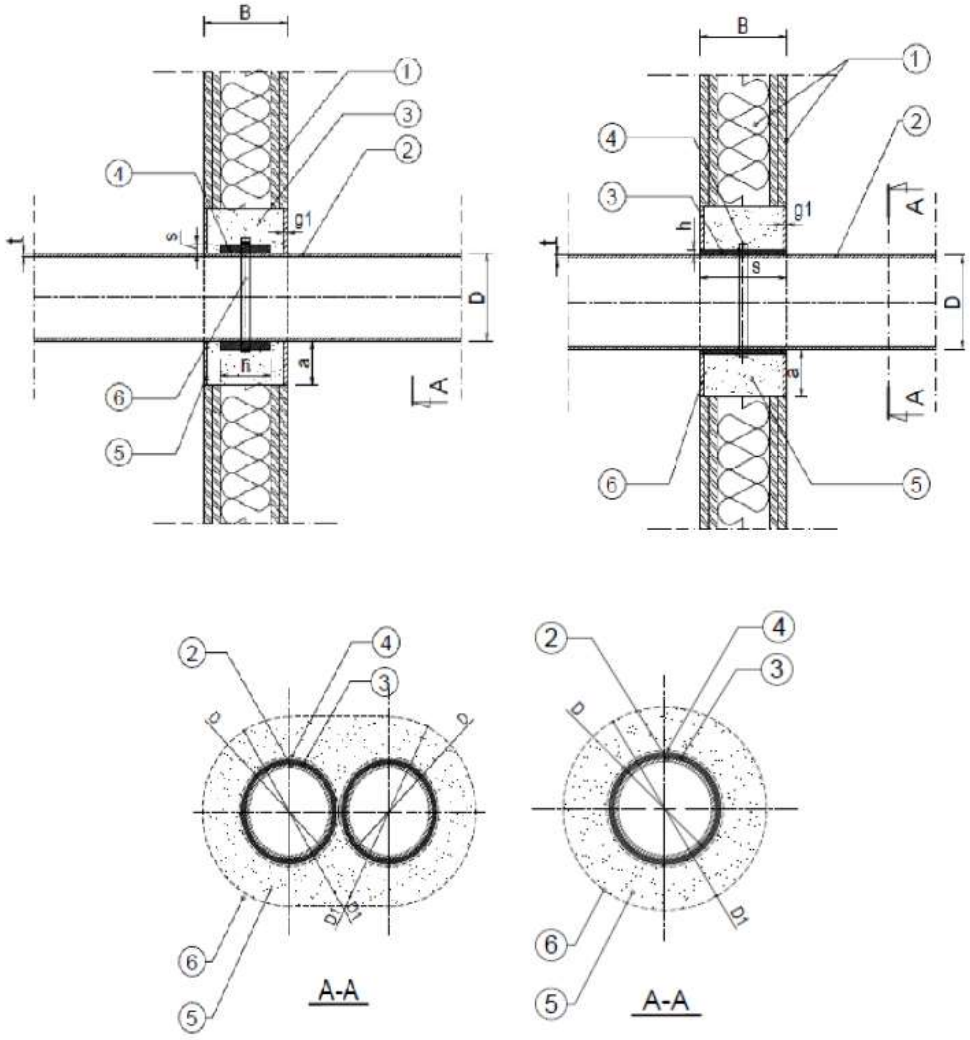
Fig D1. Metal pipes penetration seal in flexible or rigid wall, made with use of PIRO Multitube PM (without insulation).



1 Flexible or rigid wall supporting construction thickness of B = min. 125 mm
2 Metal pipe, diameter of “D” and pipe wall thickness of “t”
3 PIRO Multitube PM (outside), width of 180 mm (3 x 60 mm), thickness of 4 mm
4 Steel sleeve (length of L = 180 mm, wall thickness of 0,54 mm, f = 45 mm)
5 Varnished steel handle, thickness of 0,6 mm
6 Steel rivet
7 Steel fixing dowel M8 x 80, number of fixing dowels: 2 for sleeve diameter d1 ≤ 55 mm, 4 for sleeve diameter 55 mm < d1 ≤ 145 mm, 6 for sleeve diameter 145 mm < d1 ≤ 310 mm
8 Electrically clamped band or self-adhesive tape
note Gap between the pipe and supporting construction maximum width of 15 mm, filled with mineral wool density of min. 50 kg/m^3 and closed by means of gypsum mortar thickness of min. 5 mm, or filled with cement or gypsum mortar

PIRO Multitube PM	**Annex D1** of European Technical Assessment ETA-17/1061
Construction details Non-insulated metal pipes penetration seals in flexible or rigid wall	

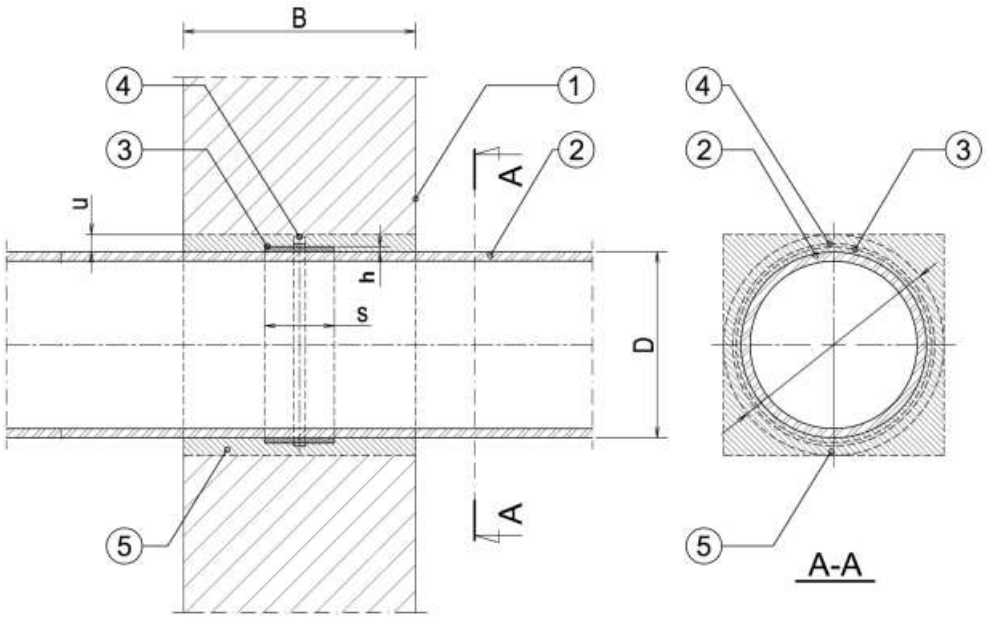
Fig. D2. Plastic pipes penetration seals in flexible or rigid wall, made with use of PIRO Multitube PM (without insulation).



1 Flexible or rigid wall supporting construction thickness of B = min. 100 mm
2 Plastic pipe, diameter of “D” and pipe wall thickness of “t”
3 PIRO Multitube PM (inside) dimensions of [h x s], placed centrally inside the wall
4 Electrically clamped band or self-adhesive tape
5 Gap between the pipe insulation and supporting construction, maximum width of a = 30 mm, filled with mineral wool density of min. 60 kg/m^3
6 Gypsum mortar thickness of g1 = 5 mm

PIRO Multitube PM	**Annex D2** of European Technical Assessment ETA-17/1061
Construction details Non-insulated plastic pipes penetration seals in flexible or rigid wall	

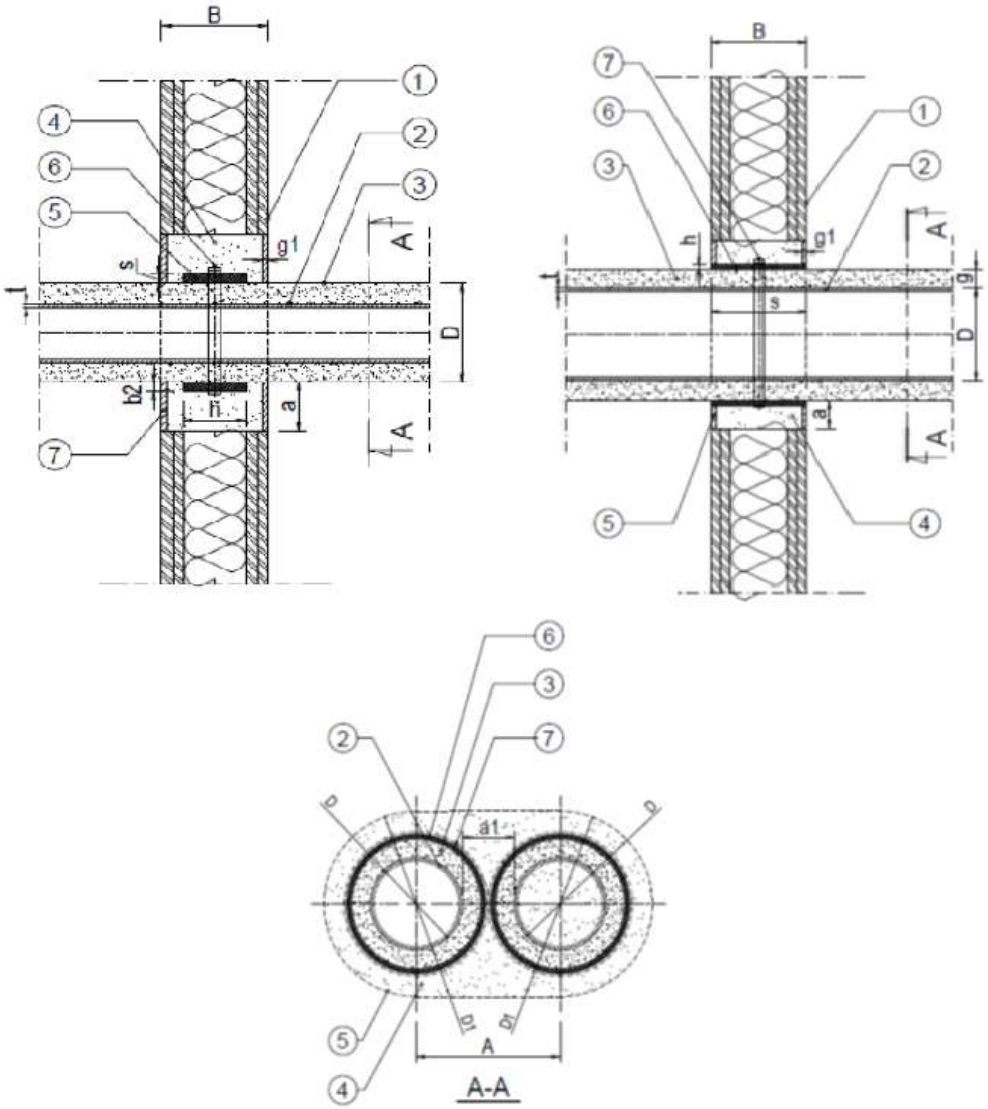
Fig. D3. Plastic pipes penetration seals in rigid wall, made with use of PIRO Multitube PM (without insulation).



1 Rigid wall supporting construction thickness of B = min. 150 mm
2 Plastic pipe, diameter of “D” and pipe wall thickness of “t”
3 PIRO Multitube PM (inside) dimensions of [h x s], placed centrally inside the wall
4 Electrically clamped band or self-adhesive tape
5 Gap between the pipe and supporting construction maximum width of 25 mm filled with cement mortar or with mineral wool density of min. 50 kg/m^3 and closed by means of gypsum mortar thickness of min. 5 mm

PIRO Multitube PM	**Annex D3** of European Technical Assessment ETA-17/1061
Construction details Non-insulated plastic pipes penetration seals in rigid wall	

Fig. D4. Plastic pipes penetration seals in flexible or rigid wall, made with use of PIRO Multitube PM (with PE foam insulation).



1 Flexible or rigid wall supporting construction thickness of B = min. 100 mm

2 Plastic pipe, diameter of “D” and pipe wall thickness of “t”

3 PE foam insulation, thickness of “g”; nominal density of 30 kg/m^3 and reaction to fire class E in accordance with EN 13501-1

4 Gap between the pipe insulation and supporting construction, maximum width of a = 30 mm, filled with mineral wool density of min. 60 kg/m^3

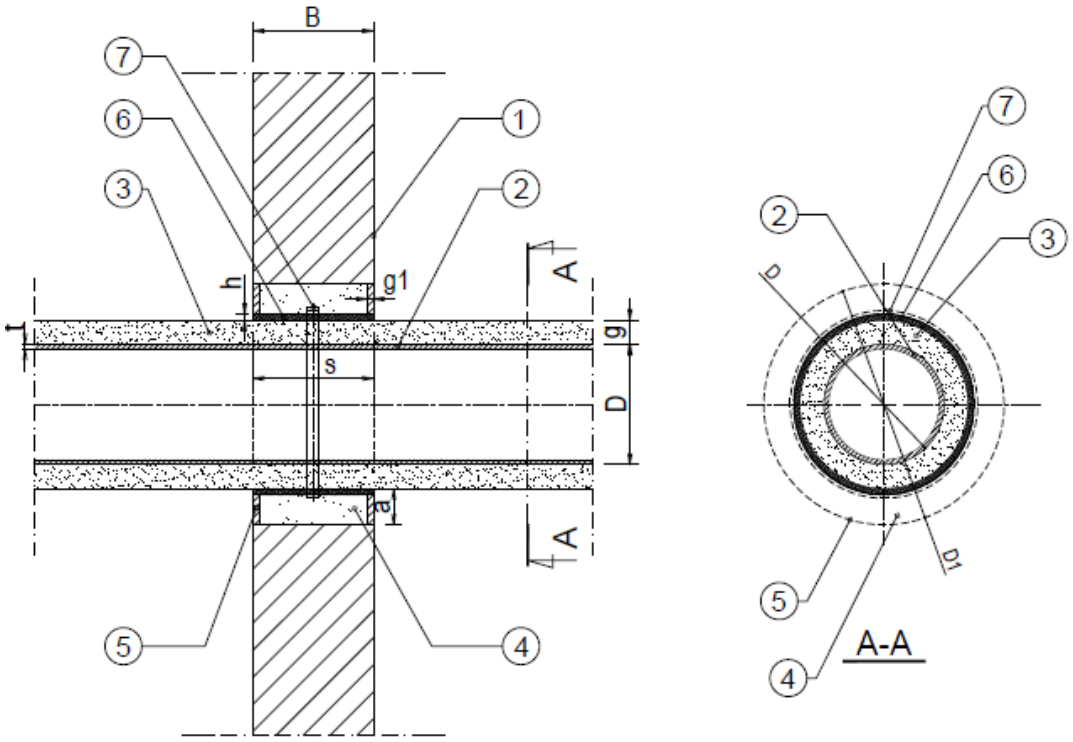
5 Gypsum mortar thickness of g1 = min. 5 mm

6 PIRO Multitube PM (inside) dimensions of [h x s], placed centrally inside the wall

7 Electrically clamped band or self-adhesive tape

PIRO Multitube PM	**Annex D4** of European Technical Assessment ETA-17/1061
Construction details Insulated plastic pipes penetration seals in flexible or rigid wall	

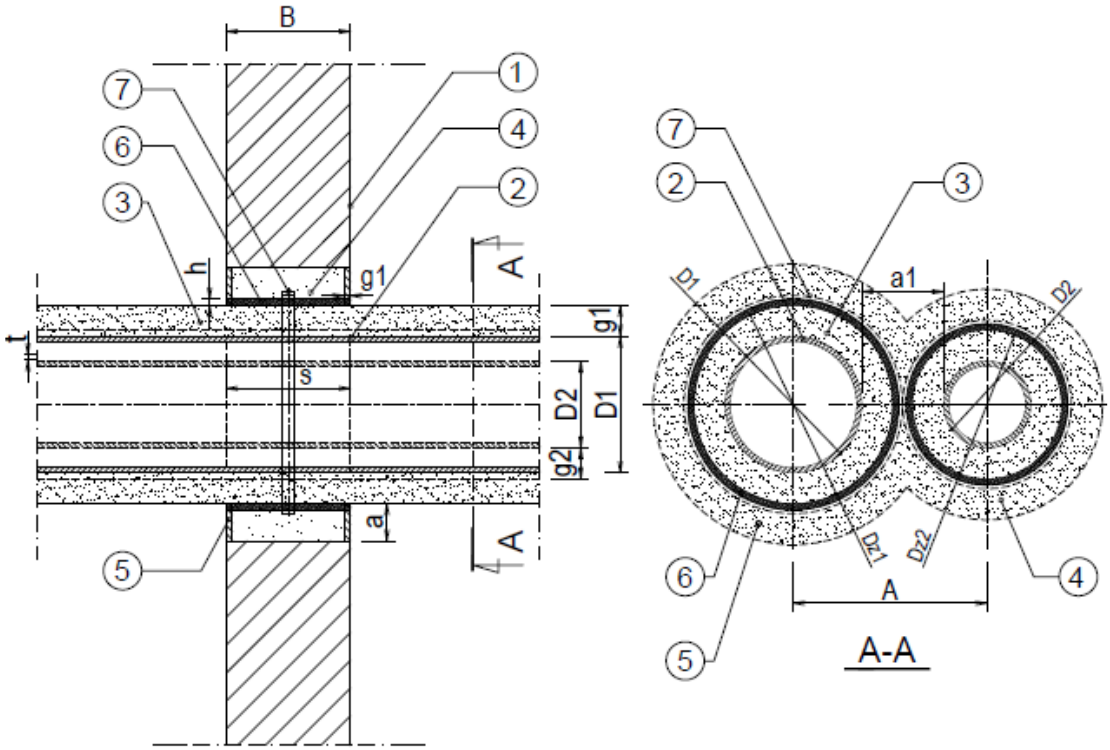
Fig. D5. Plastic pipes penetration seals in rigid wall, made with use of PIRO Multitube PM (with flexible elastomeric foam (FEF) insulation).



1 Rigid wall supporting construction thickness of B = min. 100 mm
2 Plastic pipe, diameter of “D” and pipe wall thickness of “t”
3 Flexible elastomeric foam (FEF) continuous insulation, thickness of “g”, nominal density of 45 – 70 kg/m^3 and reaction to fire class B_L-s2, d0 in accordance with EN 13501-1
4 Gap between the pipe insulation and supporting construction, maximum width of a = 30 mm, filled with mineral wool density of min. 60 kg/m^3
5 Gypsum mortar thickness of g1 = min. 5 mm
6 PIRO Multitube PM (inside) dimensions of [h x s], placed centrally inside the wall
7 Electrically clamped band or self-adhesive tape

PIRO Multitube PM	**Annex D5** of European Technical Assessment ETA-17/1061
Construction details Insulated plastic pipes penetration seals in rigid wall	

Fig. D6. Metal pipes penetration seals in rigid wall, made with use of PIRO Multitube PM (with flexible elastomeric foam (FEF) insulation).



1 Rigid wall supporting construction thickness of B = min. 100 mm

2 Metal pipe, diameter of “D” (D1 and D2) and pipe wall thickness of “t” (t1 and t2)

3 Flexible elastomeric foam (FEF) continuous insulation, thickness of “g”, nominal density of 45 – 70 kg/m^3 and reaction to fire class B_L-s2, d0 in accordance with EN 13501-1

4 Gap between the pipe insulation and supporting construction, maximum width of a = 30 mm, filled with mineral wool density of min. 60 kg/m^3

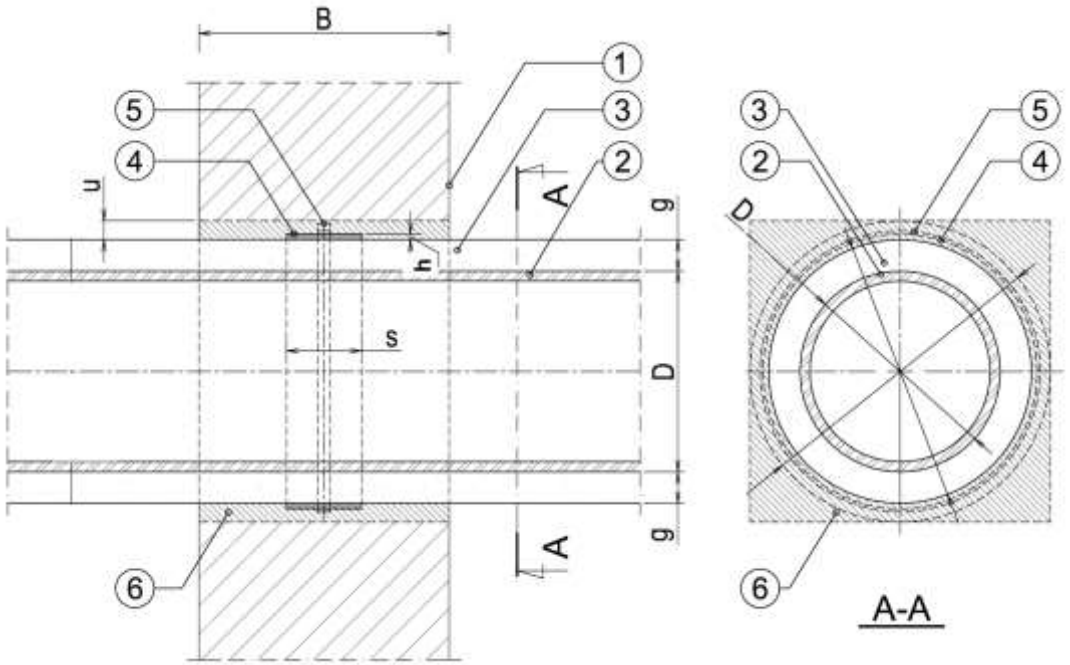
5 Gypsum mortar thickness of g1 = min. 5 mm

6 PIRO Multitube PM (inside) dimensions of [h x s], placed centrally inside the wall

7 Electrically clamped band or self-adhesive tape

PIRO Multitube PM	**Annex D6** of European Technical Assessment ETA-17/1061
Construction details Insulated metal pipes penetration seals in rigid wall	

Fig. D7. Metal pipes penetration seals in rigid wall, made with use of PIRO Multitube PM (with flexible elastomeric foam (FEF) insulation).



1 Rigid wall supporting construction thickness of B = min. 150 mm

2 Plastic pipe, diameter of “D” and pipe wall thickness of “t”

3 Flexible elastomeric foam (FEF) continuous insulation, thickness of “g”, nominal density of 45 – 70 kg/m^3 and reaction to fire class B_L-s2, d0 in accordance with EN 13501-1

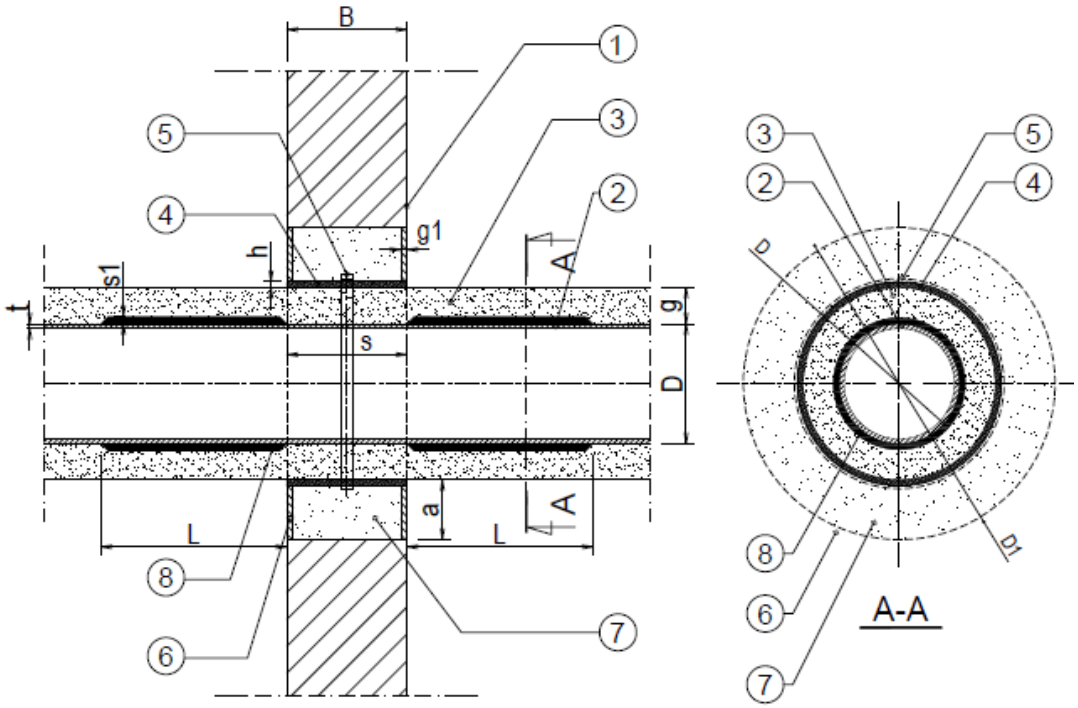
4 PIRO Multitube PM (inside) dimensions of [h x s], placed centrally inside the wall

5 Electrically clamped band or self-adhesive tape

6 Gap between the pipe insulation and supporting construction maximum width of u = 25 mm, filled with mineral wool density of min. 60 kg/m^3 and closed by means of gypsum mortar thickness of min. 5 mm, or filled with cement mortar

PIRO Multitube PM	**Annex D7** of European Technical Assessment ETA-17/1061
Construction details Insulated metal pipes penetration seals in rigid wall	

Fig. D8. Metal or plastic pipes penetration seals in rigid wall, made with use of PIRO Multitube PM and PiroCoat I (with PE foam insulation).



1 Rigid wall supporting construction thickness of B = min. 100 mm

2 Metal pipe, diameter of “D” and pipe wall thickness of “t”

3 PE foam insulation, thickness of “g”; nominal density of 30 kg/m^3 and reaction to fire class E in accordance with EN 13501-1

4 PIRO Multitube PM (inside) dimensions of [h x s], placed centrally inside the wall

5 Electrically clamped band or self-adhesive tape

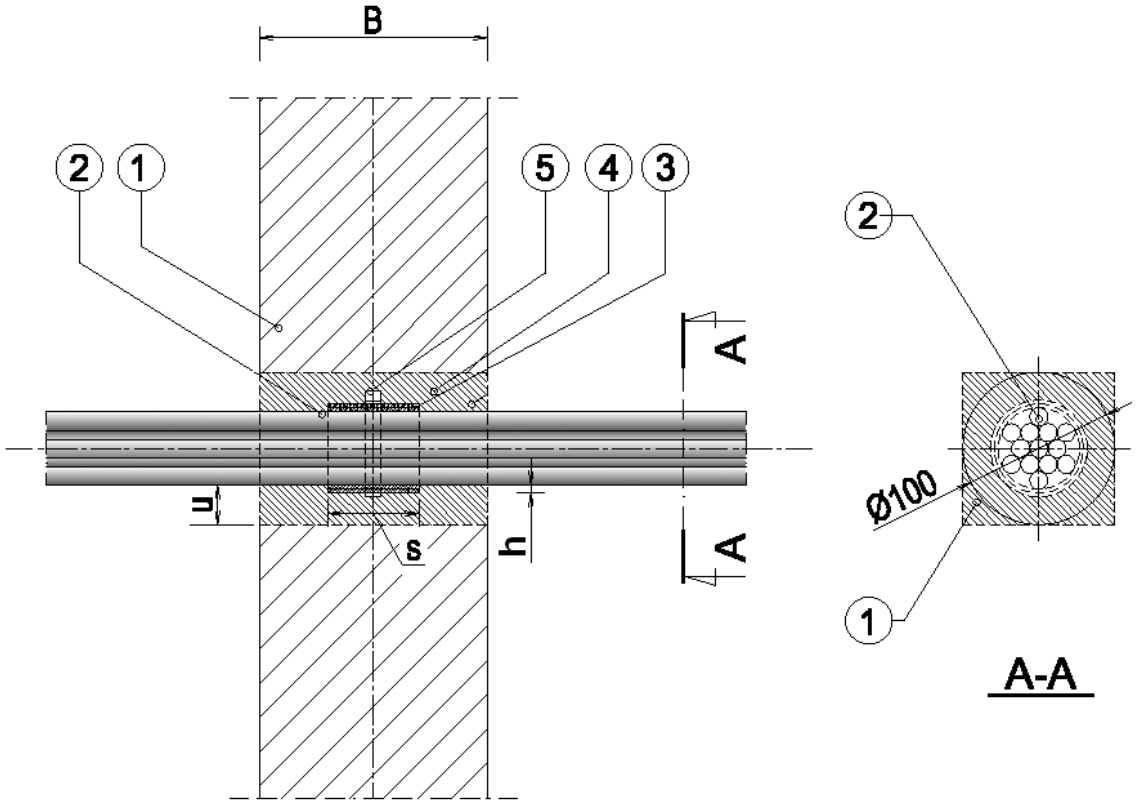
6 Gypsum mortar thickness of g1 = min. 5 mm

7 Gap between the pipe insulation and supporting construction, maximum width of a = 30 mm, filled with mineral wool density of min. 60 kg/m^3

8 PiroCoat I, dimensions of: length L = min. 500 mm, thickness s1 = min. 1,2 mm

PIRO Multitube PM	**Annex D8** of European Technical Assessment ETA-17/1061
Construction details Insulated metal pipes penetration seals in rigid wall	

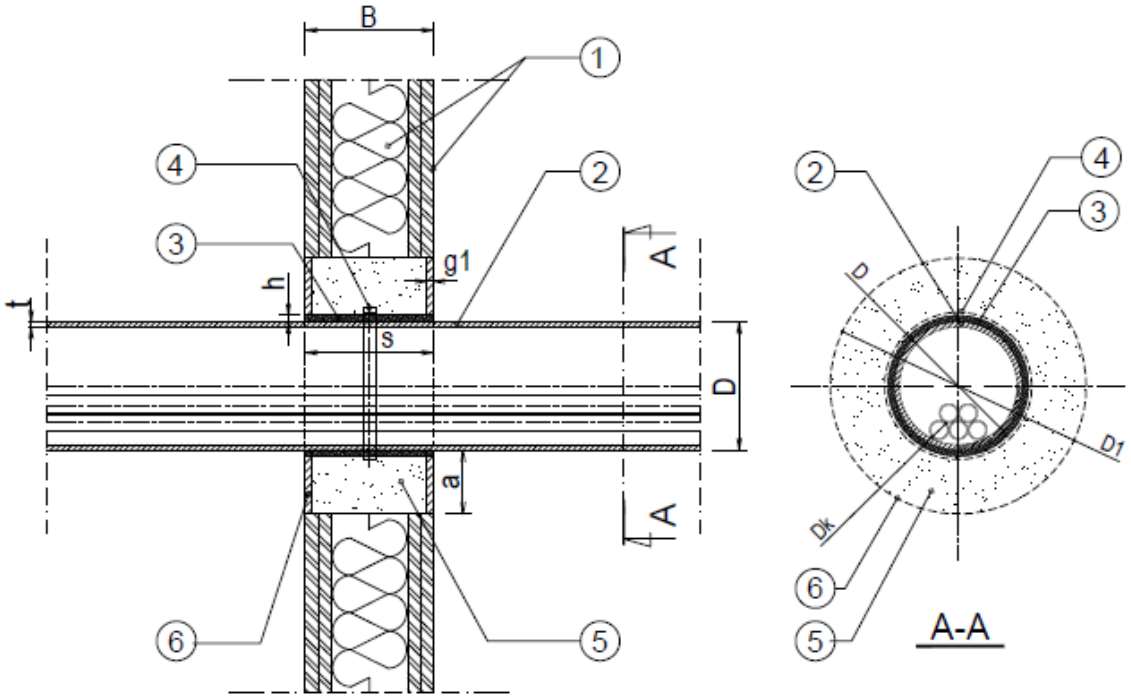
Fig. D9. Cable bundle penetration seals in rigid wall, made with use of PIRO Multitube PM (without insulation).



1 Rigid wall supporting construction thickness of B = min. 150 mm
2 Cable bundle, diameter ≤ 100 mm, made of cables diameter not greater than 14 mm
3 PIRO Multitube PM (inside) [h x s], placed centrally inside the wall
4 Gap between the cables and supporting construction maximum width of u = 25 mm, filled with cement mortar
5 Electrically clamped band or self-adhesive tape

PIRO Multitube PM	**Annex D9** of European Technical Assessment ETA-17/1061
Construction details Non-insulated cable bundle penetration seals in rigid wall	

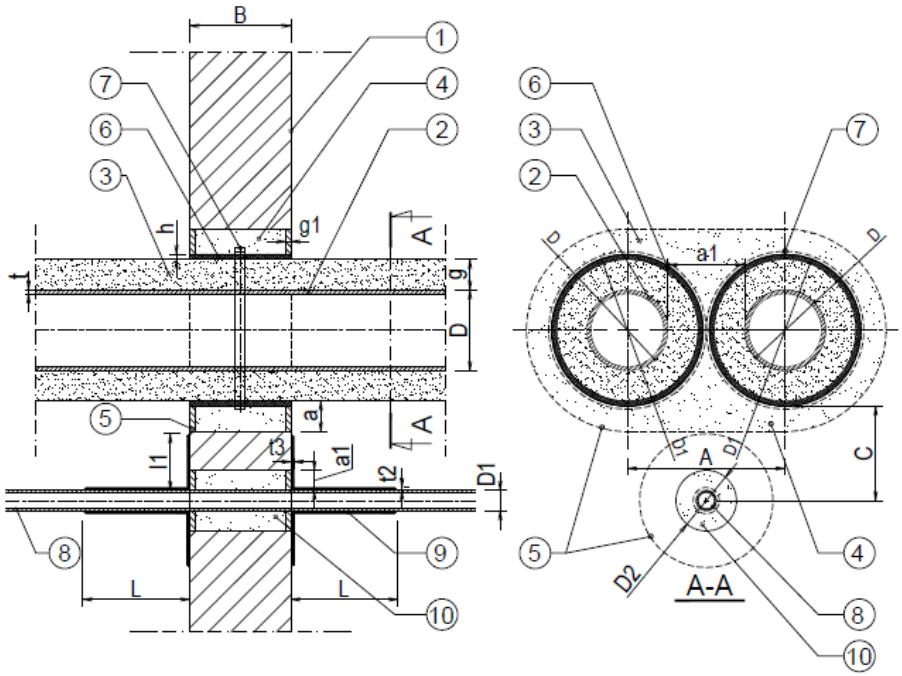
Fig. D10. Plastic pipes and cable bundle penetration seals in flexible or rigid wall, made with use of PIRO Multitube PM (without insulation).



1 Flexible or rigid wall supporting construction thickness of B = min. 100 mm
2 Plastic pipe, diameter of “D” and pipe wall thickness of “t” with cable bundle diameter of 60 mm inside, made of max. 5 cables diameter not greater than 13 mm
3 PIRO Multitube PM dimensions of [h x s], placed centrally inside the wall
4 Electrically clamped band or self-adhesive tape
5 Gap between the pipe insulation and supporting construction, width of “a”, filled with mineral wool density of min. 60 kg/m^3
6 Gypsum mortar thickness of g1 = min. 5 mm

PIRO Multitube PM	**Annex D10** of European Technical Assessment ETA-17/1061
Construction details Non-insulated cable bundle penetration seals in flexible or rigid wall	

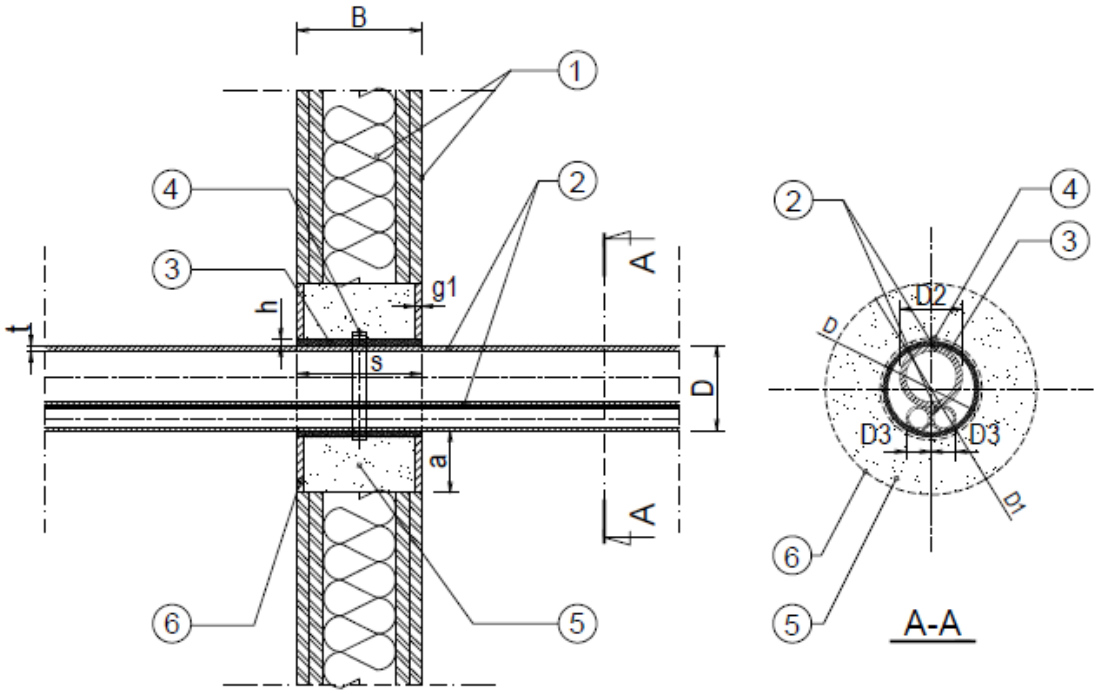
Fig. D11. Metal pipes penetration seals (two pipes placed in min. 30 mm distance between the pipes) with additional cable penetration seal placed in distance of C = min. 50 mm in rigid wall, made with use of PIRO Multitube PM (with flexible elastomeric foam (FEF) insulation).



1 Rigid wall supporting construction thickness of B = min. 100 mm
2 Metal pipe, diameter of “D” and pipe wall thickness of “t”
3 Flexible elastomeric foam (FEF) continuous insulation, thickness of “g”, nominal density of 45 – 70 kg/m^3 and reaction to fire class B_L-s2, d0 in accordance with EN 13501-1
4 Gap between the pipe insulation and supporting construction, maximum width of a = 30 mm, filled with mineral wool density of min. 60 kg/m^3
5 Gypsum mortar minimum thickness of g1 = 5 mm
6 PIRO Multitube PM dimensions of [h x s], placed centrally inside the wall
7 Electrically clamped band or self-adhesive tape
8 Single cable diameter of max. 13 mm, placed in the distance of min. 50 mm from the PIRO Multitube PMs
9 PiroCoating dimensions of: length L = min. 300 mm, thickness t2 = min. 1,2 mm, length l1 = min. 50 mm, thickness t3 = min. 0,6 mm
10 Gap between the pipe insulation and supporting construction, maximum width of a1 = 30 mm, filled with mineral wool density of min. 60 kg/m^3

PIRO Multitube PM	**Annex D11** of European Technical Assessment ETA-17/1061
Construction details Insulated metal pipes penetration seals in rigid wall	

Fig. D12. Bundle of plastic pipes (max. 3 pipes) penetration seals with use of PIRO Multitube PM in flexible or rigid wall (without insulation).



1 Flexible or rigid wall supporting construction thickness of B = min. 100 mm

2 Bundle of plastic pipes: 3 x PE-X pipes, 3 x diameter of max. 20 mm and pipe wall thickness of 2,0 – 4,5 mm or 2 x diameter of max. 20 mm and pipe wall thickness of 2,0 – 4,5 mm and 1 x diameter of max. 50 mm and pipe wall thickness of 4,5 mm

3 PIRO Multitube PM dimensions of [h x s], placed centrally inside the wall

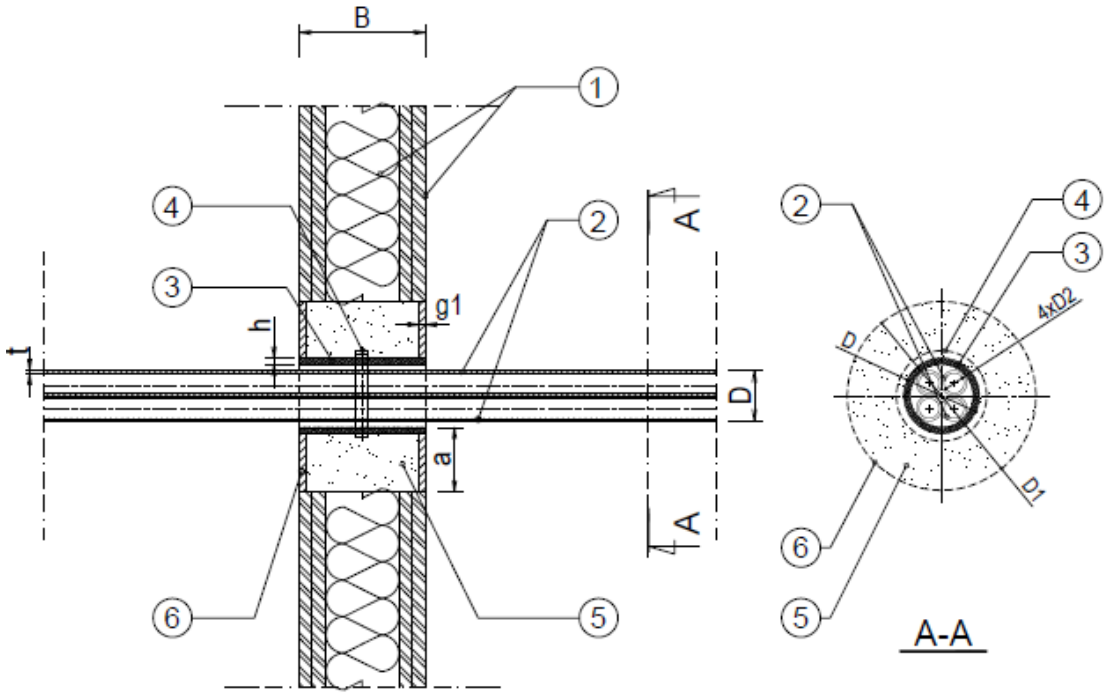
4 Electrically clamped band or self-adhesive tape

5 Gap between the pipe insulation and supporting construction, width of “a”, filled with mineral wool density of min. 60 kg/m^3

6 Gypsum mortar thickness of g1 = min. 5 mm

PIRO Multitube PM	**Annex D12** of European Technical Assessment ETA-17/1061
Construction details Non-insulated plastic pipes bundle penetration seals in flexible of rigid wall	

Fig. D13. Bundle of plastic pipes (max. 4 pipes) penetration seals with use of PIRO Multitube PM in flexible or rigid wall (without insulation).



1 Flexible or rigid wall supporting construction thickness of B = min. 100 mm

2 Bundle of plastic pipes: 4 x PE-X pipes, diameter of max. 20 mm and pipe wall thickness of 2,0 mm

3 PIRO Multitube PM dimensions of [h x s], placed centrally inside the wall

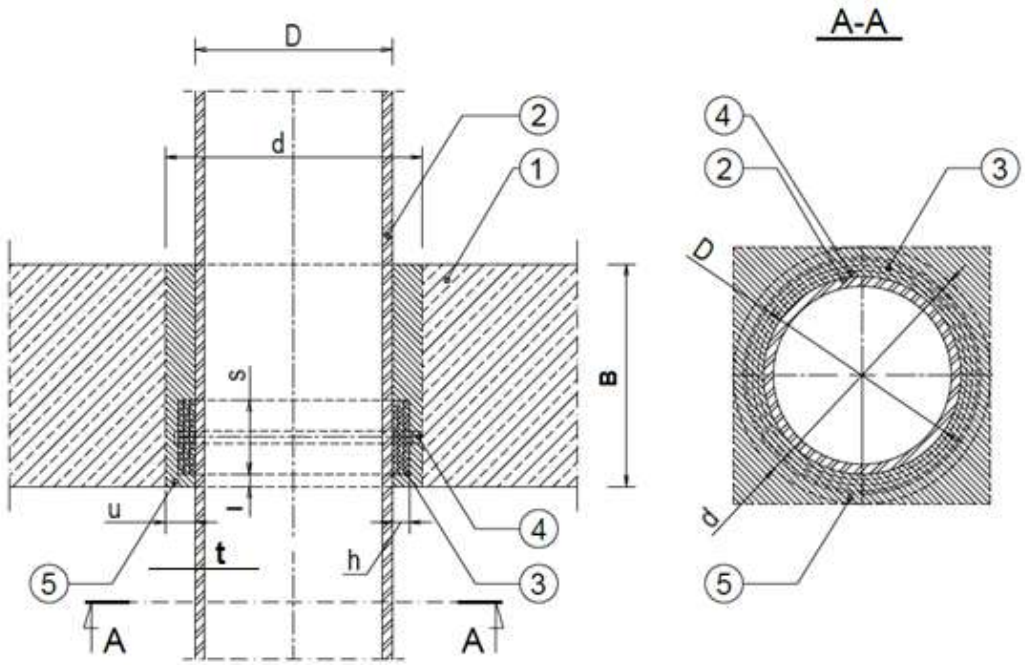
4 Electrically clamped band or self-adhesive tape

5 Gap between the pipe insulation and supporting construction, width of “a”, filled with mineral wool density of min. 60 kg/m^3

6 Gypsum mortar thickness of g1 = min. 5 mm

PIRO Multitube PM	**Annex D13** of European Technical Assessment ETA-17/1061
Construction details Non-insulated plastic pipes bundle penetration seals in flexible or rigid floor	

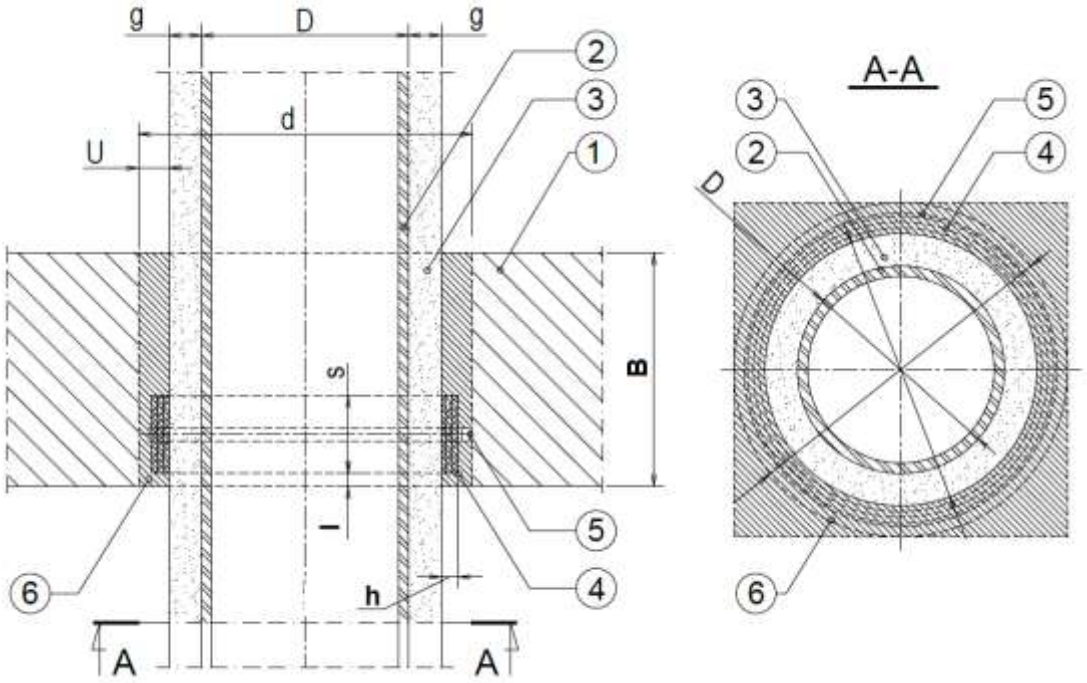
Fig. D14. Plastic pipes penetration seal in rigid floor, made with use of PIRO Multitube PM (without insulation).



1 Reinforced concrete floor thickness of B = min. 150 mm
2 Plastic pipe, diameter of “D”, pipe wall thickness of “t”
3 PIRO Multitube PM (inside) [h x s] mm; placed in the distance of l = 15 ± 5 mm from the bottom of the floor
4 Electrically clamped band or self-adhesive tape
5 Gap between the pipe and supporting construction, maximum width of u = 25 mm, filled with cement mortar

PIRO Multitube PM	**Annex D14** of European Technical Assessment ETA-17/1061
Construction details Non-insulated plastic pipes penetration seals in rigid floor	

Fig. D15. Metal pipes penetration seals in rigid floor, made with use of PIRO Multitube PM (with continuous flexible elastomeric foam (FEF) insulation).



1 Reinforced concrete floor thickness of B = min. 150 mm

2 Metal pipe; diameter of “D”, pipe wall thickness of “t”

3 Flexible elastomeric foam (FEF) continuous insulation, thickness of “g”, nominal density of 45 – 70 kg/m^3 and reaction to fire class B_L-s2, d0 in accordance with EN 13501-1

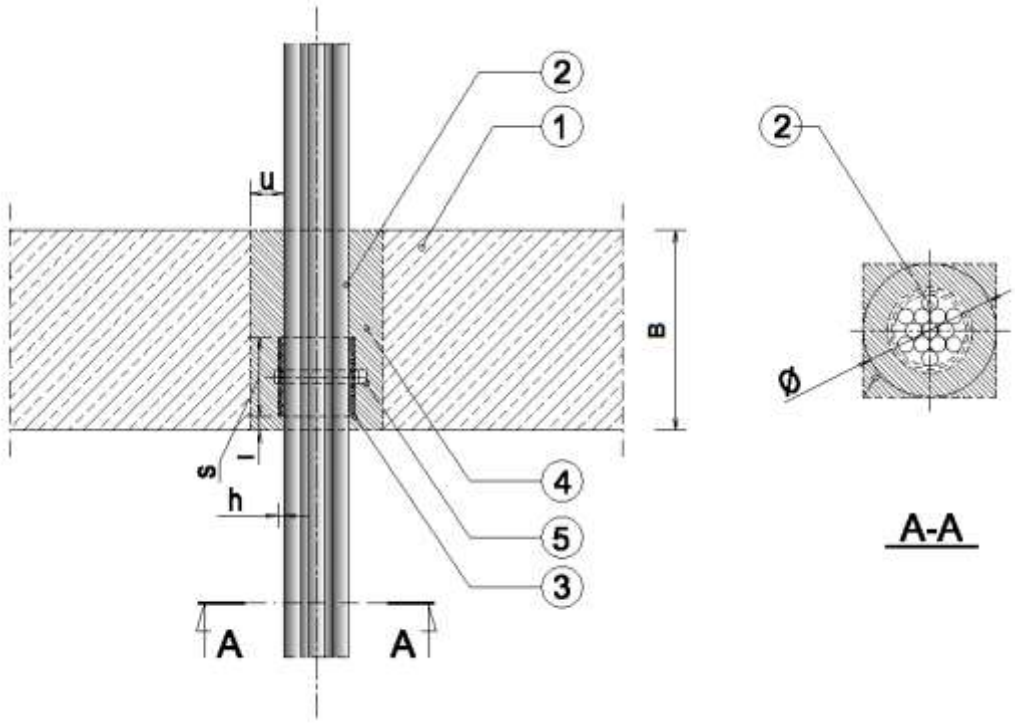
4 PIRO Multitube PM (inside) [h x s] mm; placed in the distance l = 15 ± 5 mm from the bottom of the floor

5 Electrically clamped band or self-adhesive tape

6 Gap between the pipe insulation and supporting construction, maximum width of u = 25 mm, filled with cement mortar

PIRO Multitube PM	**Annex D15** of European Technical Assessment ETA-17/1061
Construction details Insulated metal pipes penetration seals in rigid floor	

Fig. D16. Cable bundle penetration seals with use of PIRO Multitube PM in rigid floor (without insulation).



1 Reinforced concrete floor thickness of B = min. 150 mm

2 Cable bundle, diameter of ≤ 100 mm, made of cables diameter not greater than 14 mm

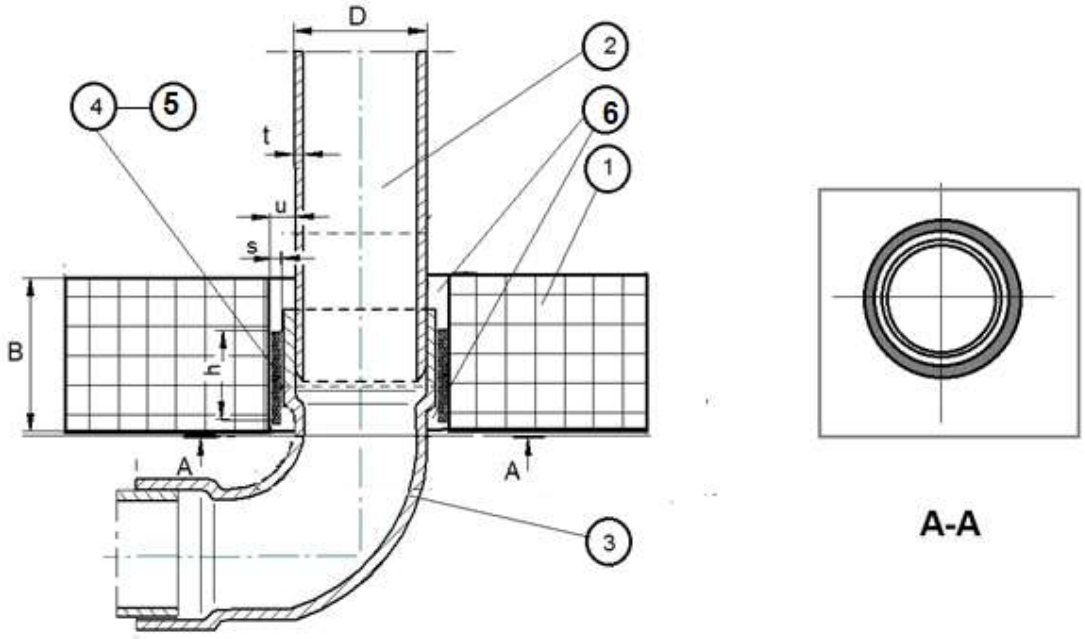
3 PIRO Multitube PM (inside) [h x s]; placed in the distance of l = 15 ± 5 mm from the bottom
of the floor

4 Gap between the cables and supporting construction, maximum width of u = 25 mm, filled with cement mortar

5 Electrically clamped band or self-adhesive tape

PIRO Multitube PM	**Annex D16** of European Technical Assessment ETA-17/1061
Construction details Non-insulated cable bundle penetration seals in rigid floor	

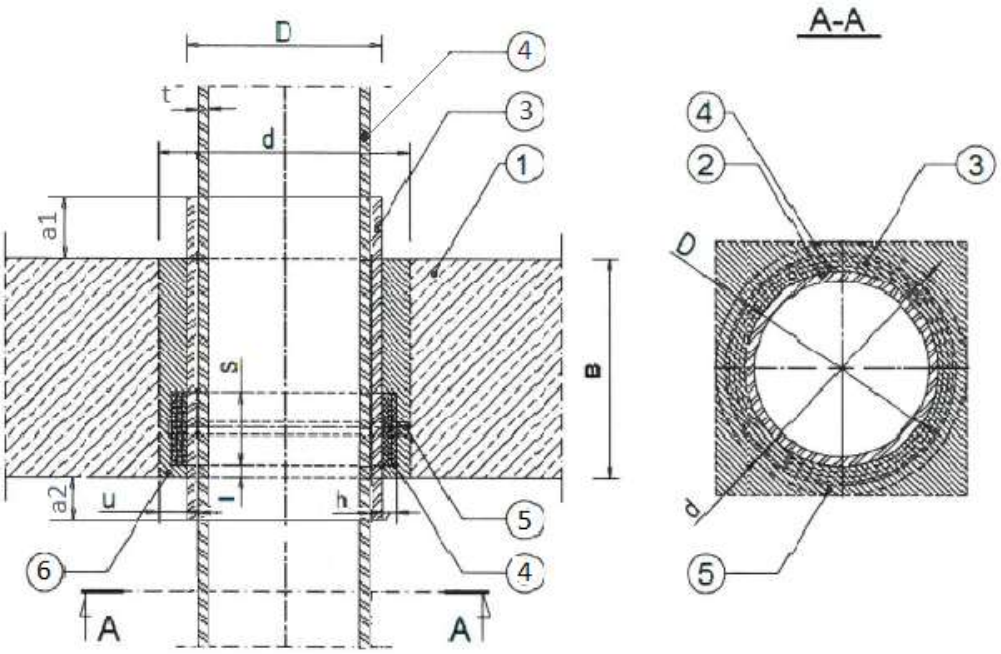
Fig. D17. Plastic pipes with pipe elbow 87,5° penetration seals in rigid floor, made with use of PIRO Multitube PM (without insulation).



1 Reinforced concrete floor with minimum thickness of B = 150 mm
2 Plastic pipe diameter of “D” and pipe wall thickness of “t”
3 Plastic pipe elbow 87,5°, diameter of D1 and pipe wall thickness of t1
4 PIRO Multitube PM [h x s] mm, placed inside the floor, in the distance of 15 ± 5 mm from the floor bottom
5 Electrically clamped band or self-adhesive tape
6 Space between the floor and the service filled with cement mortar, c.a. 25 mm

PIRO Multitube PM	**Annex D17** of European Technical Assessment ETA-17/1061
Construction details Non-insulated plastic pipes penetration seals in rigid floor	

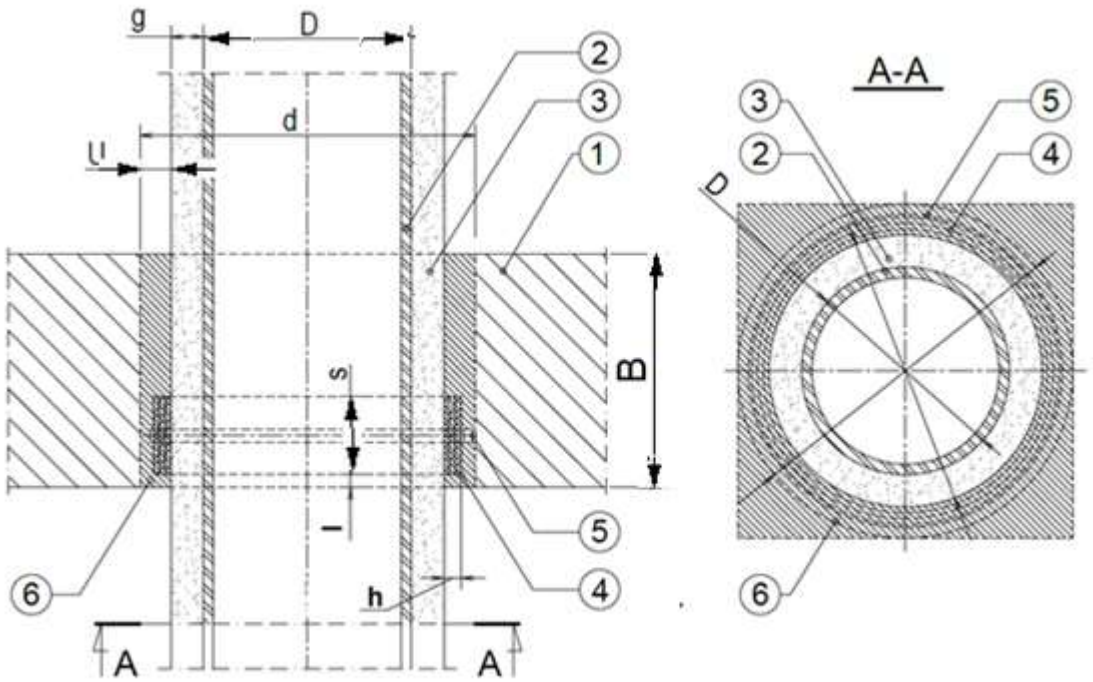
Fig. D18. Plastic pipes penetration seals in rigid floor, made with use of PIRO Multitube PM (with PE acoustic mat insulation).



1 Reinforced concrete floor with minimum thickness of B = 150 mm
2 Plastic pipe diameter of “D” and pipe wall thickness of “t”
3 Insulating acoustic mat made of PE and thickness of “g”, length of the mat on the top a1 = 30 mm and on the bottom a2 = 30 mm
4 PIRO Multitube PM [h x s] mm, placed inside the floor, in the distance of 15 ± 5 mm from the floor bottom
5 Electrically clamped band or self-adhesive tape
6 Space between the floor and the service filled with cement mortar, c.a. 25 mm

PIRO Multitube PM	**Annex D18** of European Technical Assessment ETA-17/1061
Construction details Insulated plastic pipes penetration seals in rigid floor	

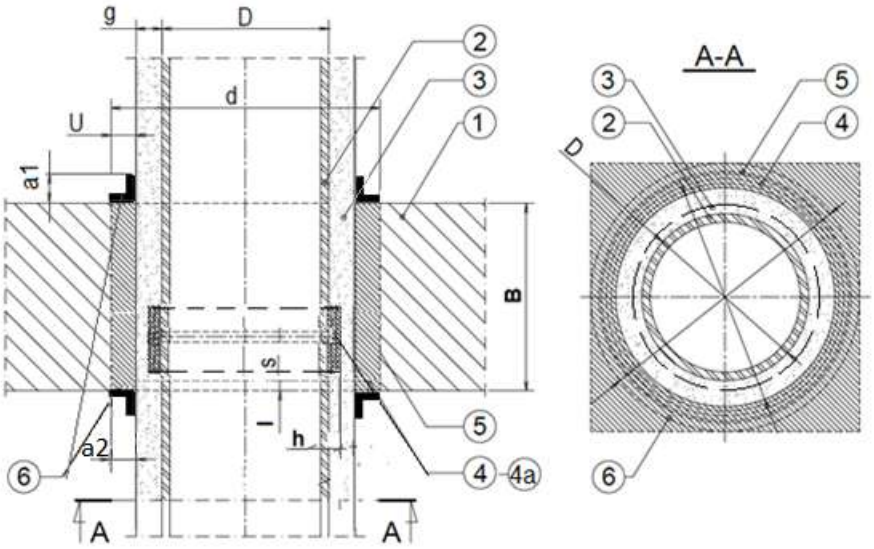
Fig. D19. Plastic pipes penetration seals in rigid floor, made with use of PIRO Multitube PM (with flexible elastomeric foam (FEF) insulation).



1 Reinforced concrete floor with minimum thickness of B = 150 mm
2 Plastic pipe diameter of “D” and pipe wall thickness of “t”
3 Insulation made of flexible elastomeric foam (FEF) thickness of “g” (continous insulation)
4 PIRO Multitube PM [h x s] mm, placed inside the floor, in the distance of 15 ± 5 mm from the floor bottom
5 Electrically clamped band or self-adhesive tape
6 Space between the floor and the service filled with cement mortar, c.a. 25 mm

PIRO Multitube PM	**Annex D19** of European Technical Assessment ETA-17/1061
Construction details Insulated plastic pipes penetration seals in rigid floor	

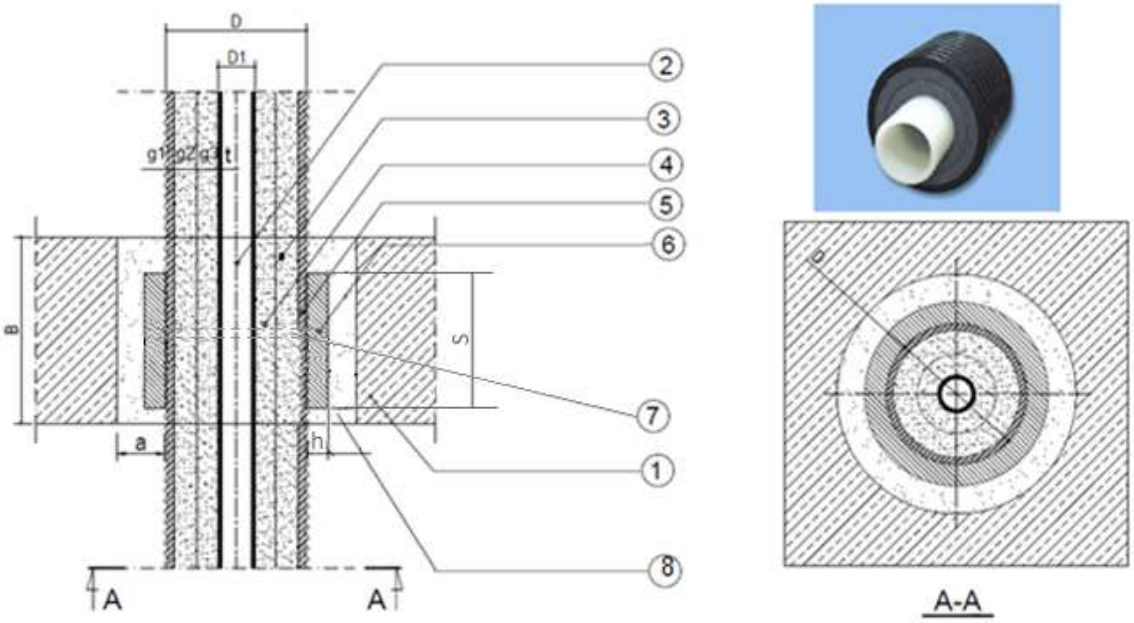
Fig. D20. Plastic pipes penetration seals in rigid floor, made with use of PIRO Multitube PM and PiroCoat A (with mineral wool insulation).



1 Reinforced concrete floor with minimum thickness of B = 150 mm
2 Plastic pipe diameter of “D” and pipe wall thickness of “t”
3 Mineral wool density of min. 50 kg/m^3 (continuous insulation)
4 PIRO Multitube PM [h x s] mm, placed inside the floor, in the distance of 15 ± 5 mm from the floor bottom
4a Electrically clamped band or self-adhesive tape
5 Space between the floor and the service filled with cement mortar, c.a. 25 mm
6 PiroCoat A on both sides of the floor; length a1= min. 50 mm,
thickness g1 = min. 0,6 mm, width a2 = min. 50 mm, thickness g2 = min. 0,6 mm

PIRO Multitube PM	**Annex D20** of European Technical Assessment ETA-17/1061
Construction details Insulated plastic pipes bundle penetration seals in rigid floor	

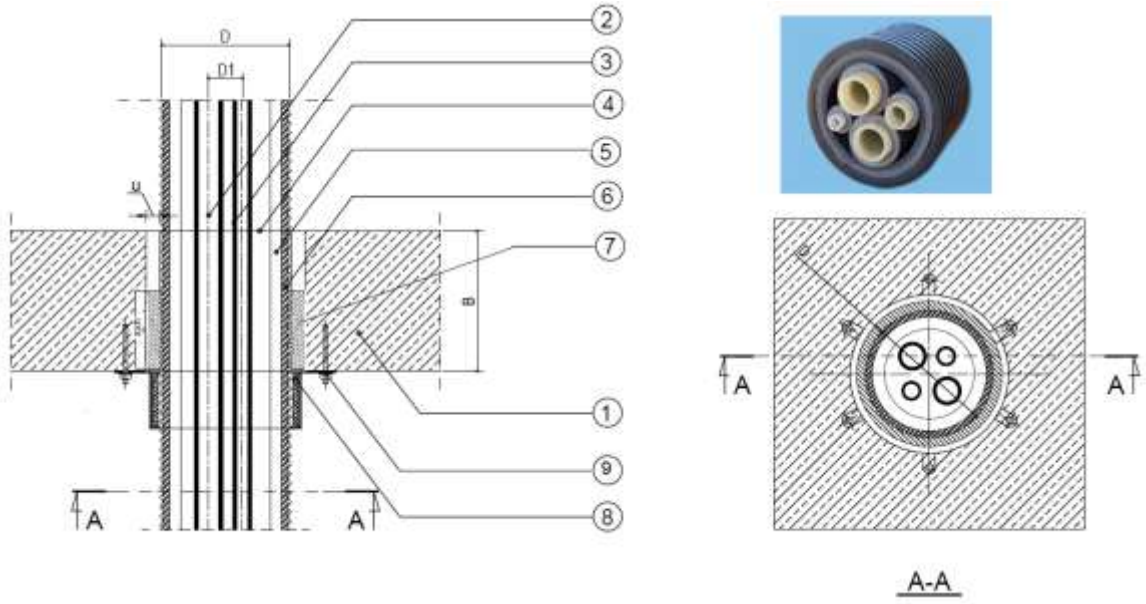
Fig. D21. Single heating pipe type Syncopex C.O. PN6/95 C, C.W. PN10/70C penetration seals in rigid floor, made with use of PIRO Multitube PM (with PE insulation).



1	Reinforced concrete floor with minimum thickness of B = 150 mm
2	PE-X pipe, diameter of D1 ≤ 41 mm and pipe wall thickness of 4,0 mm
3, 4	Two layers of PE insulation, overall thickness of 32 mm (2 x 16 mm), continuous insulation
5	Corrugated pipe made of PE-HD, D ≤ 110 mm, and pipe wall thickness of 0,5 mm
6	PIRO Multitube PM [h x s] mm, placed inside the floor, in the distance of 15 ± 5 mm from the floor bottom
7	Electrically clamped band or self-adhesive tape
8	Space between the floor and the service filled with cement mortar, c.a. 25 mm

PIRO Multitube PM	**Annex D21** of European Technical Assessment ETA-17/1061
Construction details Insulated single heating Syncopex pipes penetration seals in rigid floor	

Fig. D22. Quadruple heating pipe type Syncopex C.O. PN6/95 C, C.W. PN10/70C penetration seal in rigid floor, made with use of PIRO Multitube PM and Piro Collar PC (with PE insulation).



1 Reinforced concrete floor with minimum thickness of B = 150 mm

2 Quadruple heating pipe type Syncopex C.O. PN6/95 C, C.W. PN10/70C (corrugated pipe made of PE-HD, diameter of D ≤ 160 mm and pipe wall thickness of 0,5 mm), with max. 4 following PE-X pipes inside:
- with diameter of D1 ≤ 50 mm and pipe wall thickness of t = 3,0 mm
- with diameter of D1 ≤ 50 mm and pipe wall thickness of t = 5,0 mm
- with diameter of D1 ≤ 32 mm and pipe wall thickness of t = 2,5 mm
- with diameter of D1 ≤ 20 mm and pipe wall thickness of t = 2,1 mm

3, 4 Two layers of PE insulation, overall thickness of 32 mm (2 x 16 mm), continuous insulation

5 Area between the insulation of inside pipe and corrugated pipe

6 Corrugated pipe made of PE-HD, D ≤ 160 mm and pipe wall thickness of 0,5 mm

7 PIRO Multitube PM [h x s] mm, placed inside the floor, in the distance of 15 ± 5 mm from the floor bottom

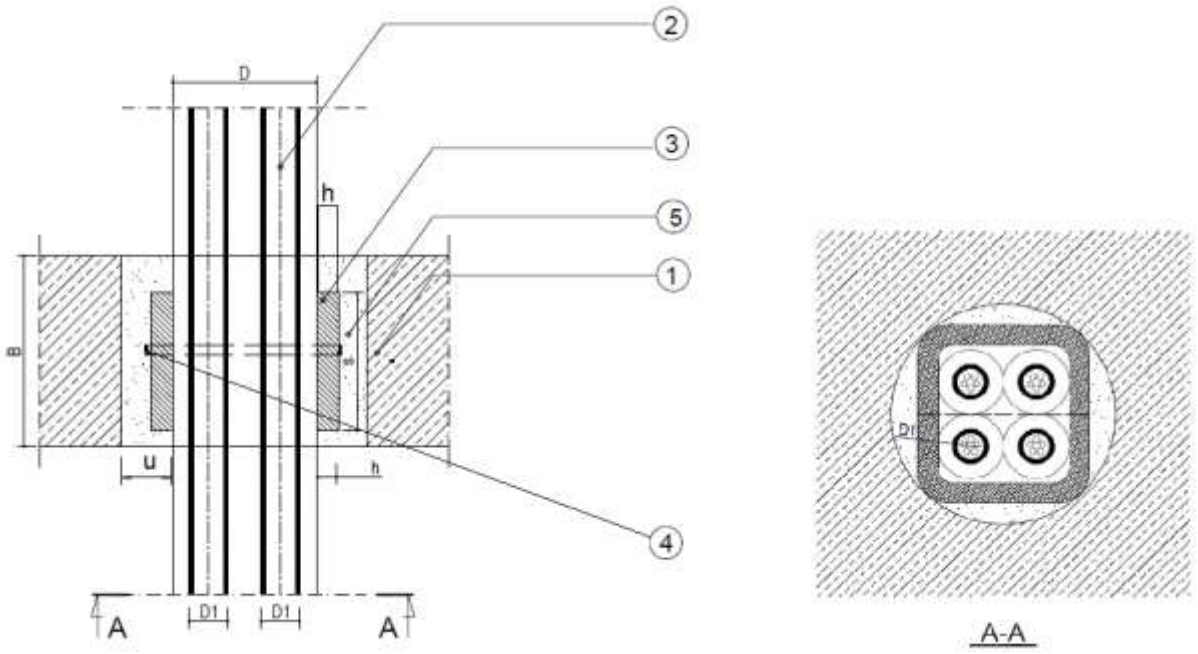
8 Piro Collar PC, with intumescent material dimensions of [s x h], placed on the bottom of the floor

9 Collar fixing – min. 6-steel fixing dowels M8 x 25

note: Space between the floor and the service filled with cement mortar, c.a. 25 mm

PIRO Multitube PM	**Annex D22** of European Technical Assessment ETA-17/1061
Construction details Insulated quadruple heating Syncopex pipes penetration seals in rigid floor	

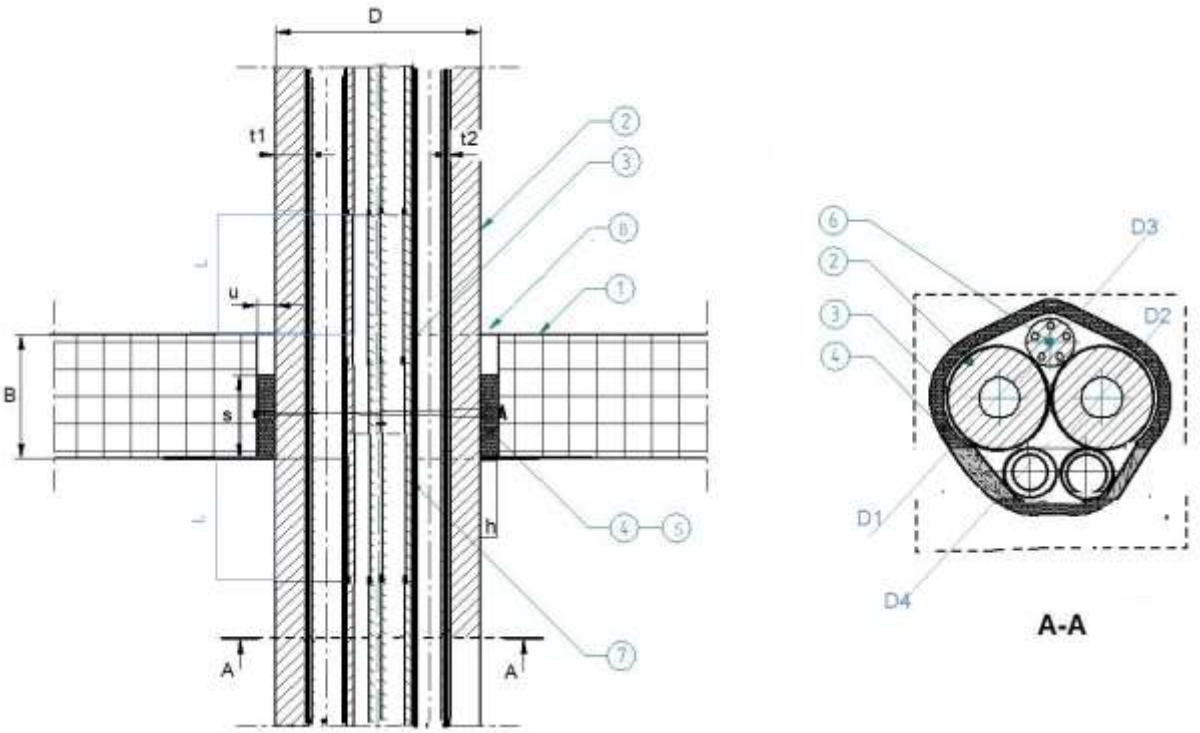
Fig. D23. Small cables in PVC-U cable tubes penetration seals in rigid floor, made with use of PIRO Multitube PM (without insulation).



1 Reinforced concrete floor with minimum thickness of B = 150 mm
2 Small cables in PVC-U cable tubes ø 28 x 1,0 (max. 4 tubes)
3 PIRO Multitube PM [h x s] mm, placed inside the floor, in the distance of 15 ± 5 mm from the floor bottom
4 Electrically clamped band or self-adhesive tape
5 Space between the floor and the service filled with cement mortar, c.a. 25 mm

PIRO Multitube PM	**Annex D23** of European Technical Assessment ETA-17/1061
Construction details Non-insulated small cable penetration seals in rigid floor	

Fig. D24. Plastic pipes bundle with small cable outside penetration seals in rigid floor, made with use of PIRO Multitube PM and PiroCoating (without insulation).



1 Reinforced concrete floor with minimum thickness of B = 150 mm
2 Two plastic pipes made of PE-RT/AL/PE-RT diameter of D1/D2 ≤ 50 mm and pipe wall thickness t1, t2 = 5,5 mm
3 Two plastic pipes made of PP-R/PP-R+GF/PP-R diameter of D4 ≤ 20 mm and pipe wall thickness of t3 = 4,0 mm
4 PIRO Multitube PM [h x s] mm, placed inside the floor, in the distance of 15 ± 5 mm from the floor bottom
5 Electrically clamped band or self-adhesive tape
6 Small cable covered with PiroCoating at the length of L = min. 300 mm and thickness g1 = min. 1,2 mm
7 PiroCoating on the length L = min. 300 mm and thickness g1 = min. 1,2 mm
8 Space between the floor and the service filled with cement mortar, c.a. 25 mm.

PIRO Multitube PM	**Annex D24** of European Technical Assessment ETA-17/1061
Construction details Non-insulated plastic pipes and small cable bundle penetration seals in rigid floor	

Fig. D25. Bundle of metal pipes (with Tubolit PE insulation) and small cable or double plastic pipe bundle penetration seals in rigid floor, made with use of PIRO Multitube PM.

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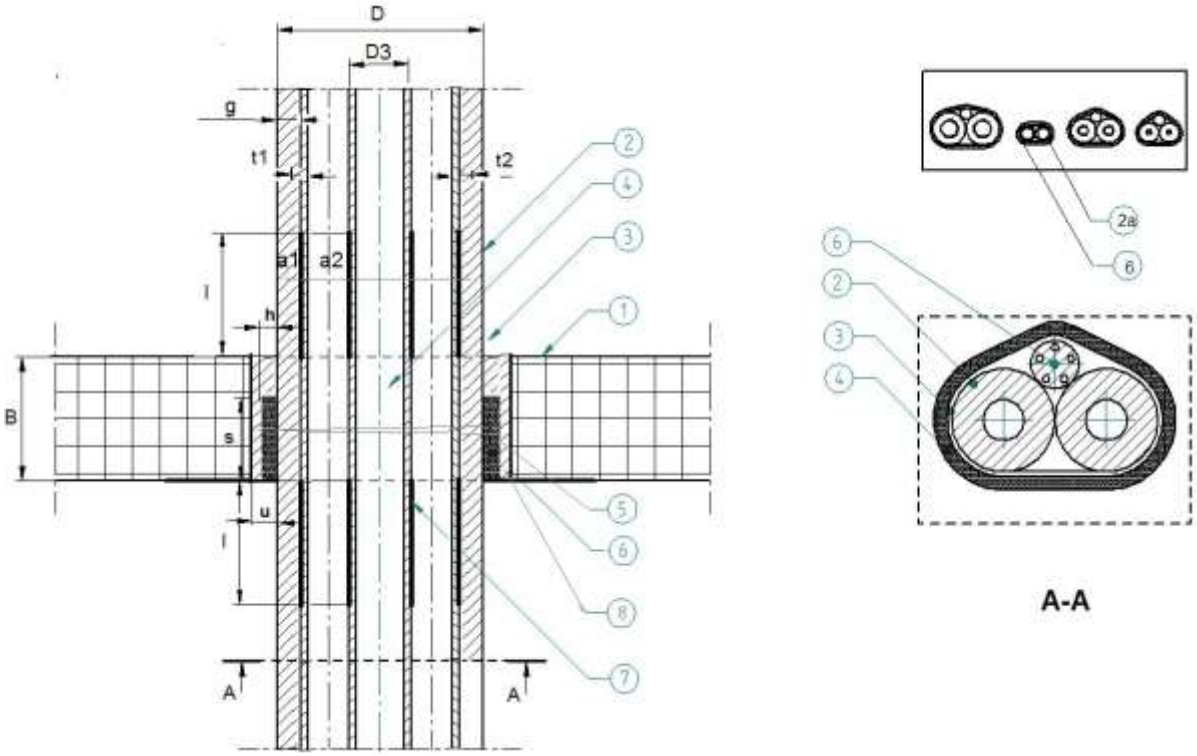
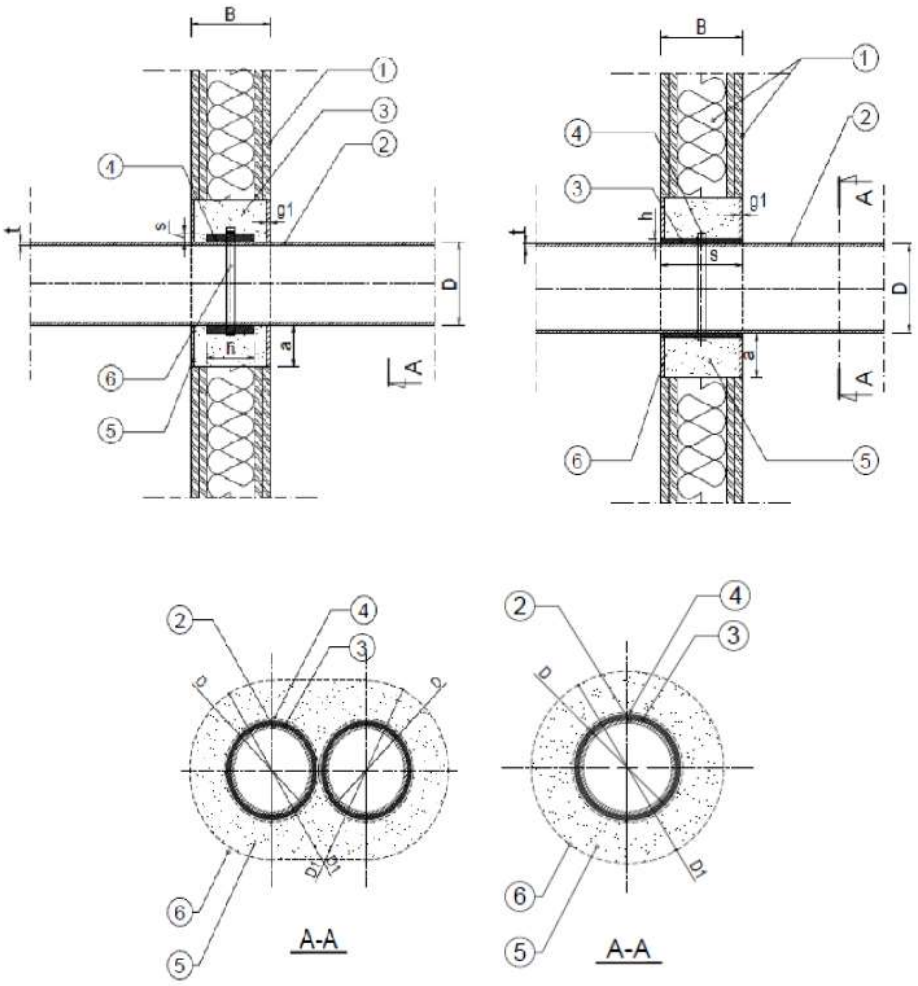


1 Reinforced concrete floor with minimum thickness of B = 150 mm
2 Metal pipes diameter of D1, D2 and pipe wall thickness of t1, t2
2a Plastic pipes diameter of D4, D5 and pipe wall thickness of t3, t4
3 Tubolit insulation made of PE on the metal pipes, thickness of “g” (continuous insulation)
4 Small cable, diameter of D3 covered with PiroCoating at the length of L = min. 300 mm, thickness of a1 = min. 1,2 mm
5 Electrically clamped band or self-adhesive tape
6 PIRO Multitube PM [h x s] mm, placed inside the floor, in the distance of 15 ± 5 mm from the floor bottom
7 PiroCoat I on the metal pipes with PE insulation, length of the L = min. 300 mm and thickness of g1 = min. 1,2 mm
8 Space between the floor and the service filled with cement mortar, c.a. 25 mm.

PIRO Multitube PM	**Annex D25** of European Technical Assessment ETA-17/1061
Construction details Insulated metal pipes and small cable bundle or plastic pipes bundle penetration seals in rigid floor	

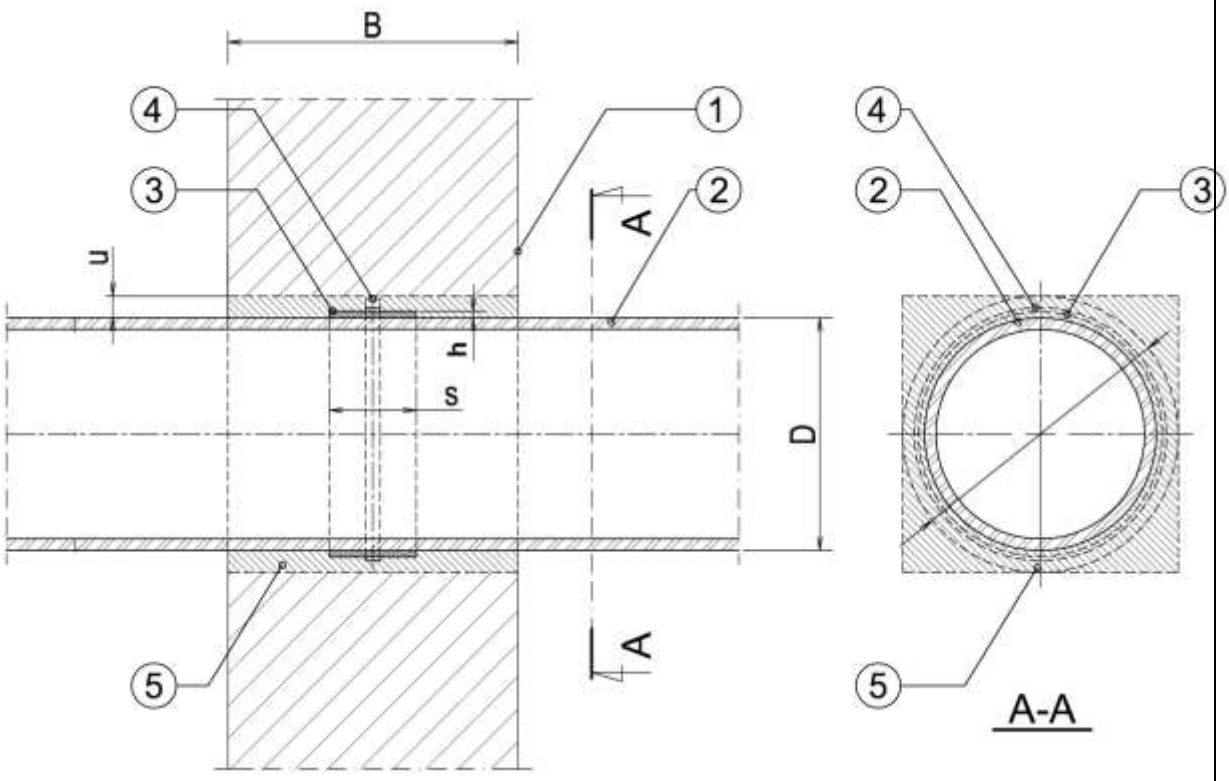
Fig. D26. Plastic pipe Wavin Wafix PP, Wavin Si Tech+ or Wavin AS+ (without insulation) penetration seal in flexible or rigid wall, made with use of PIRO Multitube PM.



1 Flexible or rigid wall supporting construction thickness of B = min. 100 mm
2 Plastic pipe Wavin Wafix PP, Wavin Si Tech+ or Wavin AS+, diameter of “D” and pipe wall thickness of “t”
3 PIRO Multitube PM, placed centrally inside the wall
4 Electrically clamped band or self-adhesive tape
5 Gap between the pipe insulation and supporting construction, maximum width of a = 30 mm, filled with mineral wool density of min. 60 kg/m^3
6 Gypsum mortar thickness of g1 = 5 mm

PIRO Multitube PM	**Annex D26** of European Technical Assessment ETA-17/1061
Construction details Wavin non-insulated plastic pipes penetration seals in flexible or rigid wall	

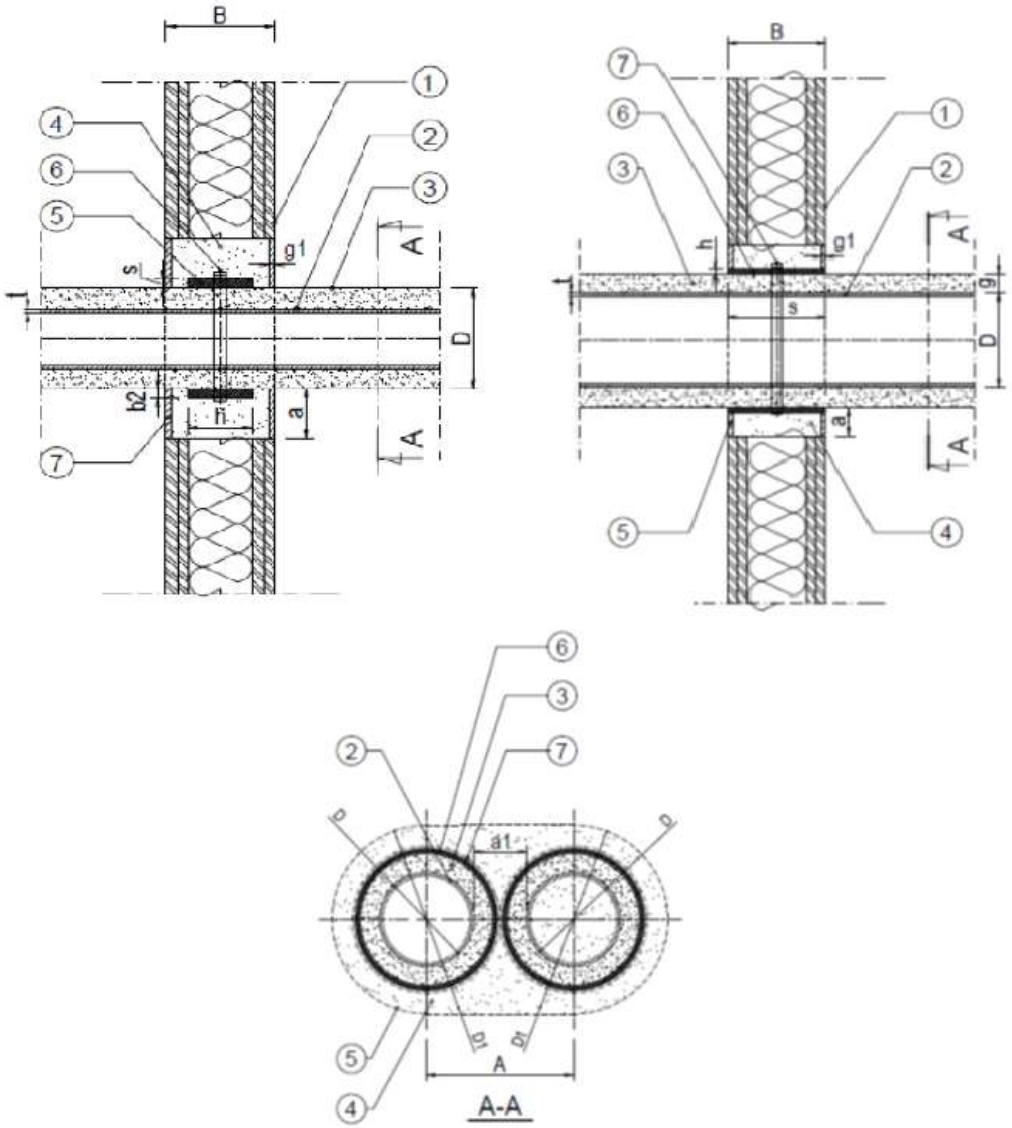
Fig. D27. Plastic pipe Wavin Wafix PP, Wavin Si Tech+ or Wavin AS+ (without insulation) penetration seal in rigid wall, made with use of PIRO Multitube PM.



1 Rigid wall supporting construction thickness of B = min. 150 mm
2 Plastic pipe Wavin Wafix PP, Wavin Si Tech+ or Wavin AS+, diameter of “D” and pipe wall thickness of “t”
3 PIRO Multitube PM, placed centrally inside the wall
4 Electrically clamped band or self-adhesive tape
5 Gap between the pipe insulation and supporting construction, maximum width of a = 30 mm, filled with mineral wool density of min. 60 kg/m^3

PIRO Multitube PM	**Annex D27** of European Technical Assessment ETA-17/1061
Construction details Wavin non-insulated plastic pipes penetration seals in rigid wall	

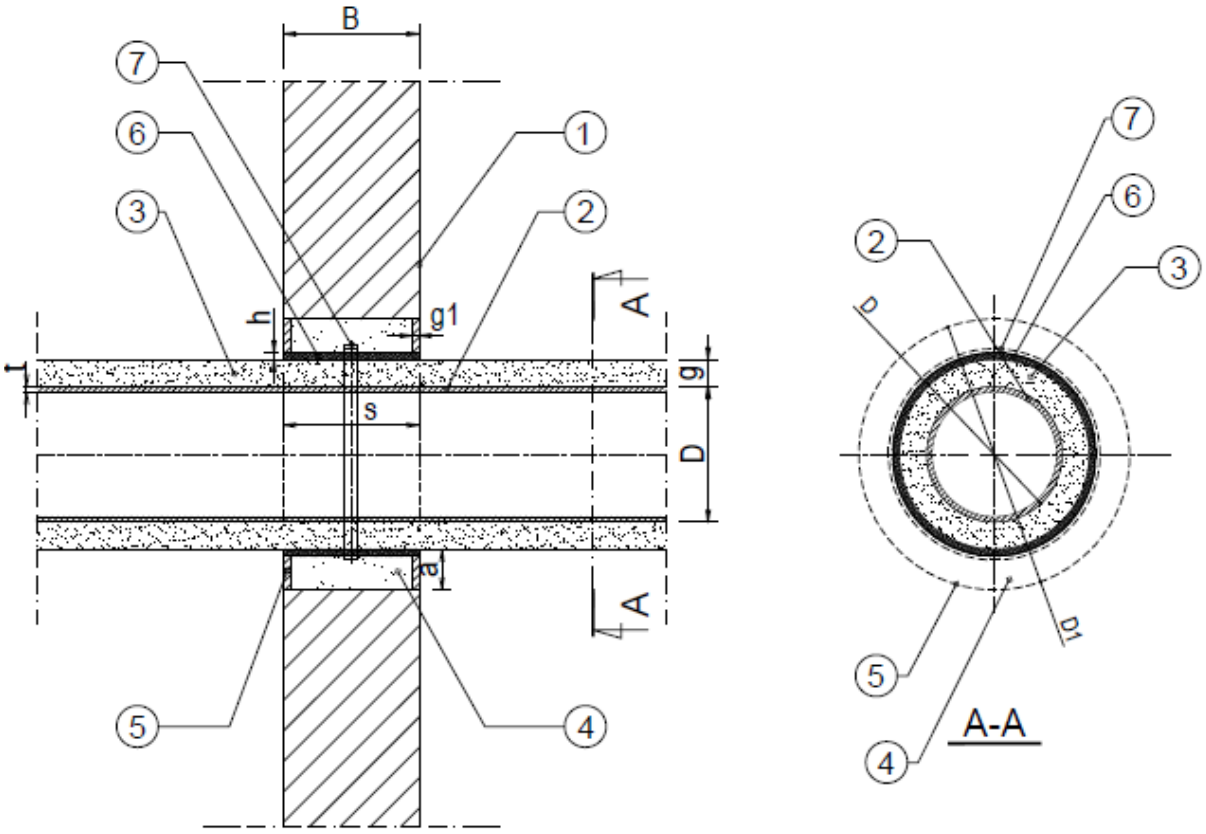
Fig. D28. Plastic pipe Wavin Wafix PP, Wavin Si Tech+ or Wavin AS+ (with PE foam insulation) penetration seal in rigid wall, made with use of PIRO Multitube PM.



1 Rigid wall supporting construction thickness of B = min. 100 mm
2 Plastic pipe Wavin Wafix PP, Wavin Si Tech+ or Wavin AS+, diameter of "D" and pipe wall thickness of "t"
3 PE foam insulation, thickness of "g"; nominal density of 30 kg/m^3 and reaction to fire class E in accordance with EN 13501-1
4 Gap between the pipe insulation and supporting construction, maximum width of a = 30 mm, filled with mineral wool density of min. 60 kg/m^3
5 Gypsum mortar thickness of g1 = 5 mm
6 PIRO Multitube PM, placed centrally inside the wall
7 Electrically clamped band or self-adhesive tape

PIRO Multitube PM	**Annex D28** of European Technical Assessment ETA-17/1061
Construction details Wavin insulated plastic pipes penetration seals in rigid wall	

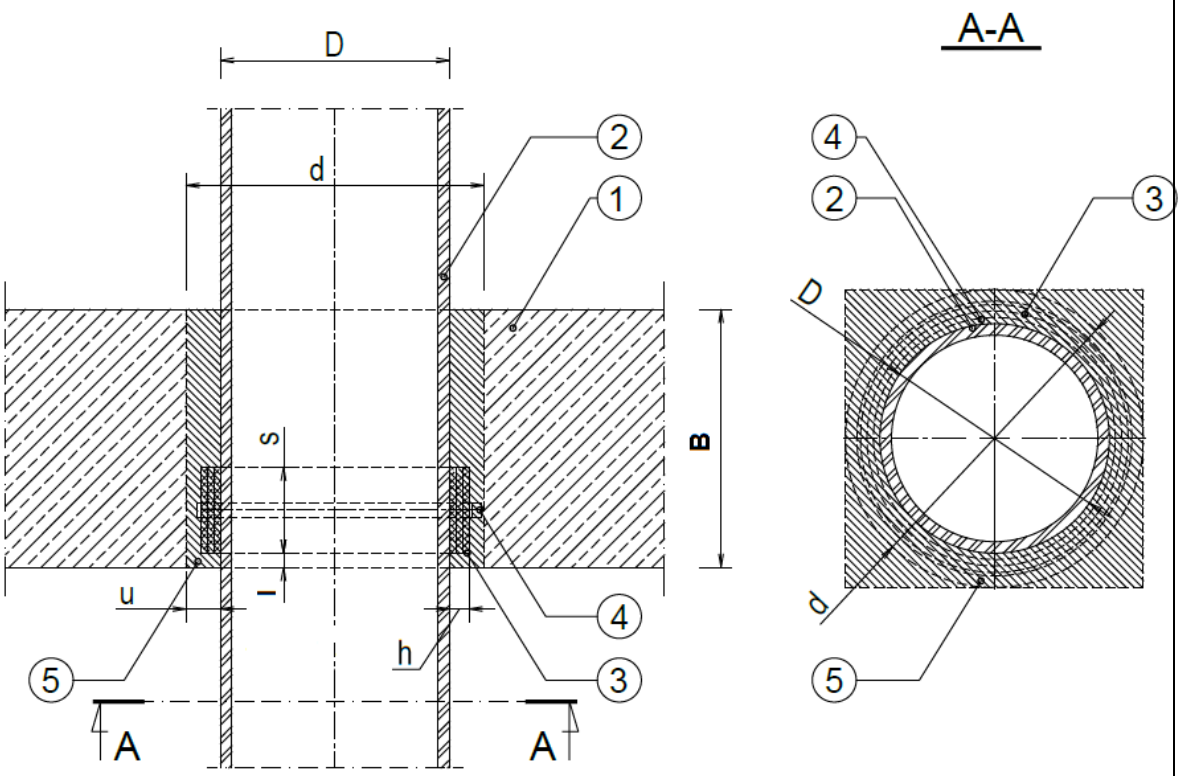
Fig. D29. Plastic pipe Wavin Wafix PP, Wavin Si Tech+ or Wavin AS+ (with flexible elastomeric foam (FEF) insulation) penetration seal in rigid wall, made with use of PIRO Multitube PM.



1 Rigid wall supporting construction thickness of B = min. 100 mm
2 Plastic pipe Wavin Wafix PP, Wavin Si Tech+ or Wavin AS+, diameter of "D" and pipe wall thickness of "t"
3 Flexible elastomeric foam (FEF) continuous insulation, thickness of "g", nominal density of 45 – 70 kg/m^3 and reaction to fire class B_L-s2, d0 in accordance with EN 13501-1
4 Gap between the pipe insulation and supporting construction, maximum width of a = 30 mm, filled with mineral wool density of min. 60 kg/m^3
5 Gypsum mortar thickness of g1 = 5 mm
6 PIRO Multitube PM, placed centrally inside the wall
7 Electrically clamped band or self-adhesive tape

PIRO Multitube PM	**Annex D29** of European Technical Assessment ETA-17/1061
Construction details Wavin insulated plastic pipes penetration seals in rigid wall	

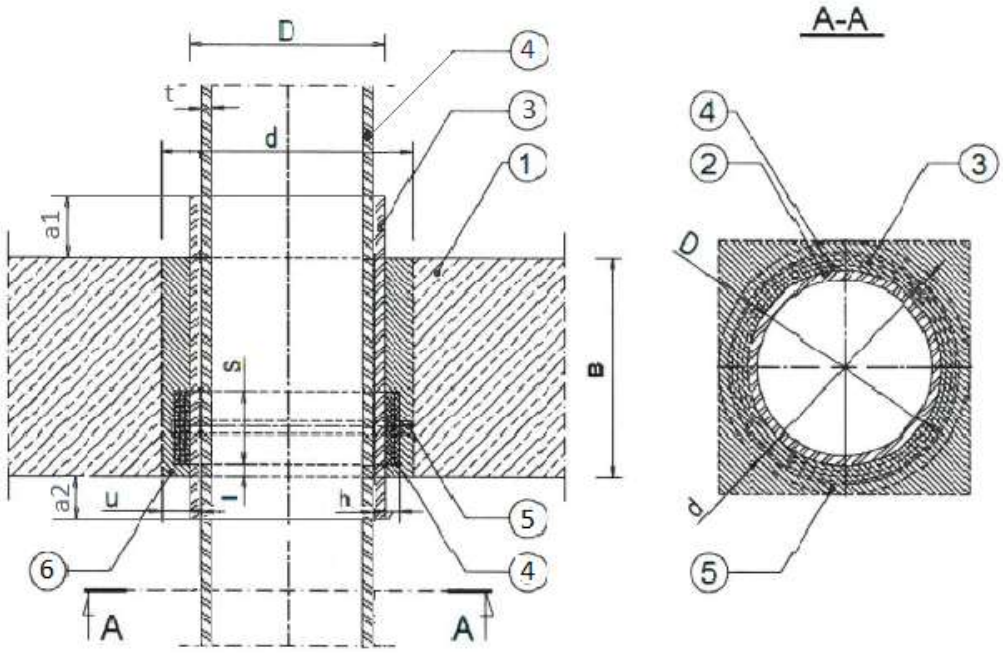
Fig. D30. Plastic pipe Wavin Wafix PP, Wavin Si Tech+ or Wavin AS+ (without insulation) penetration seal in rigid floor, made with use of PIRO Multitube PM.



1 Rigid floor supporting construction thickness of B = min. 150 mm
2 Plastic pipe Wavin Wafix PP, Wavin Si Tech+ or Wavin AS+, diameter of “D” and pipe wall thickness of “t”
3 PIRO Multitube PM, placed in the distance of l = 15 ± 5 mm from the bottom of the floor
4 Electrically clamped band or self-adhesive tape
5 Gap between the pipe insulation and supporting construction, maximum width of u = 25 mm, filled with cement mortar

PIRO Multitube PM	**Annex D30** of European Technical Assessment ETA-17/1061
Construction details Wavin non-insulated plastic pipes penetration seals in rigid floor	

Fig. D31. Plastic pipe Wavin Wafix PP, Wavin Si Tech+ or Wavin AS+ (with PE acoustic mat insulation) penetration seal in rigid floor, made with use of PIRO Multitube PM.



1 Rigid floor supporting construction thickness of B = min. 150 mm
2 Plastic pipe Wavin Wafix PP, Wavin Si Tech+ or Wavin AS+, diameter of “D” and pipe wall thickness of “t”
3 Insulating acoustic mat made of PE with thickness of “g”, length of the mat: on the top a1 = 30 mm and on the bottom a2 = 30 mm
4 PIRO Multitube PM, placed in the distance of l = 15 ± 5 mm from the bottom of the floor
5 Electrically clamped band or self-adhesive tape
6 Space between the floor and the service filled with cement mortar, c.a. 25 mm

PIRO Multitube PM	**Annex D31** of European Technical Assessment ETA-17/1061
Construction details Wavin insulated plastic pipes penetration seals in rigid floor	