



 **PIROSYSTEM**

PASSIVE FIRE PROTECTION SYSTEMS FOR BUILDINGS

PRODUCT CATALOG

PIROSYSTEM Sp. z o.o.

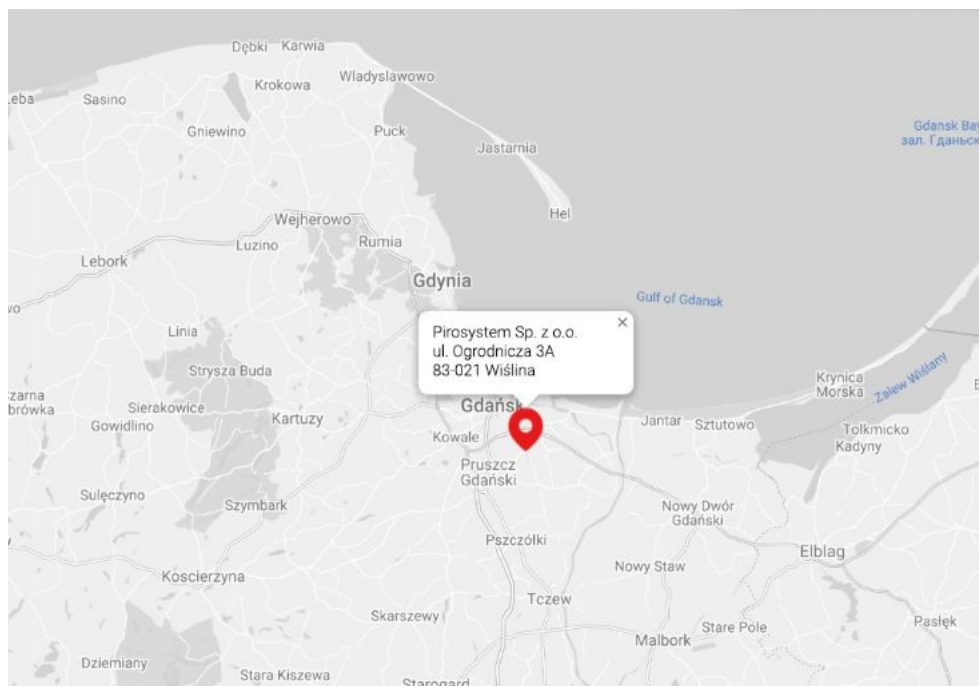
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**Office and warehouse building
of PIROSYSTEM Sp. z o.o. in Wiślina**



**Office and warehouse building
of PIROSYSTEM Sp. z o.o. in Wiślina**



Dear Sir or Madam,

Pirosystem Sp. z o.o. is a Polish manufacturer of fire protection systems for buildings. Many years of experience in research and excellent knowledge of the industry allow us to identify the best technical solutions and optimize the costs of protecting the entire facility.

We have extensive production experience and our highly specialized technical knowledge allows us to create the highest quality advanced COMPREHENSIVE FIRE PROTECTION OF BUILDINGS. First of all, we want to provide the customer with a complete set for fire protection products, which will enable comprehensive fire protection of the building by providing protection for all penetration seals, constructional nodes, expansion joints, main construction etc. required by law. That is why we have developed and implemented a complete system of innovative products, which includes, for instance: fireproofing paints, pastes, intumescent tapes, collars and wraps, etc. We optimize our solutions adequately to the needs of our customers by testing them in real conditions. Our proposal consists of optimally selected set of products in terms of their performance, safety, ease of installation and economics of use.

All products offered by Pirosystem Sp. z o.o. have European Technical Approvals as well as CE mark to ensure full compliance.

I invite you to cooperation,

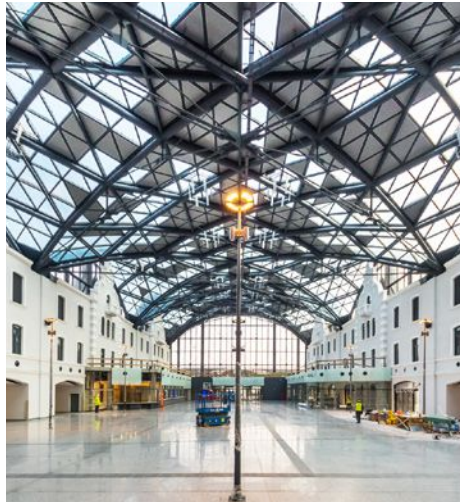
Marcin Gierej

Chairman of the Board

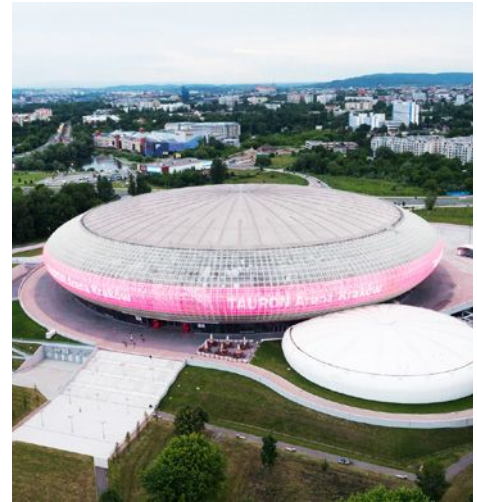
PIROSYSTEM Sp. z o.o.



Main Railway Station in Poznań



Łódź Fabryczna Railway Station



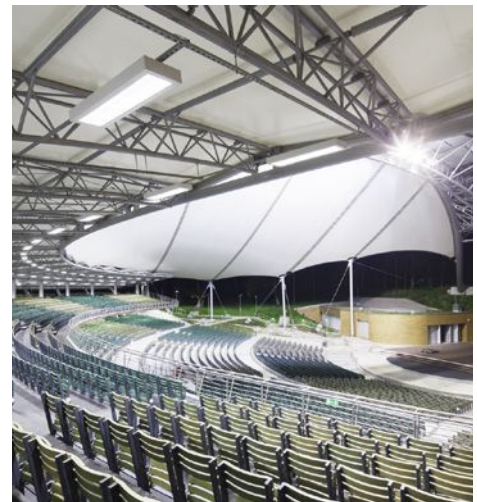
Tauron Arena in Krakow



Balice airport in Krakow



Port Lotniczy Gdańsk



The Forest Opera in Sopot



Sky Tower in Wrocław



Residential buildings

And also:

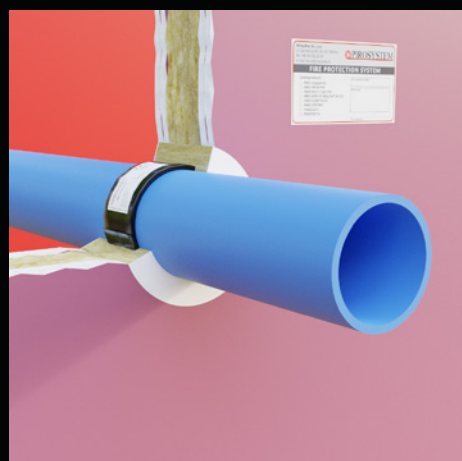
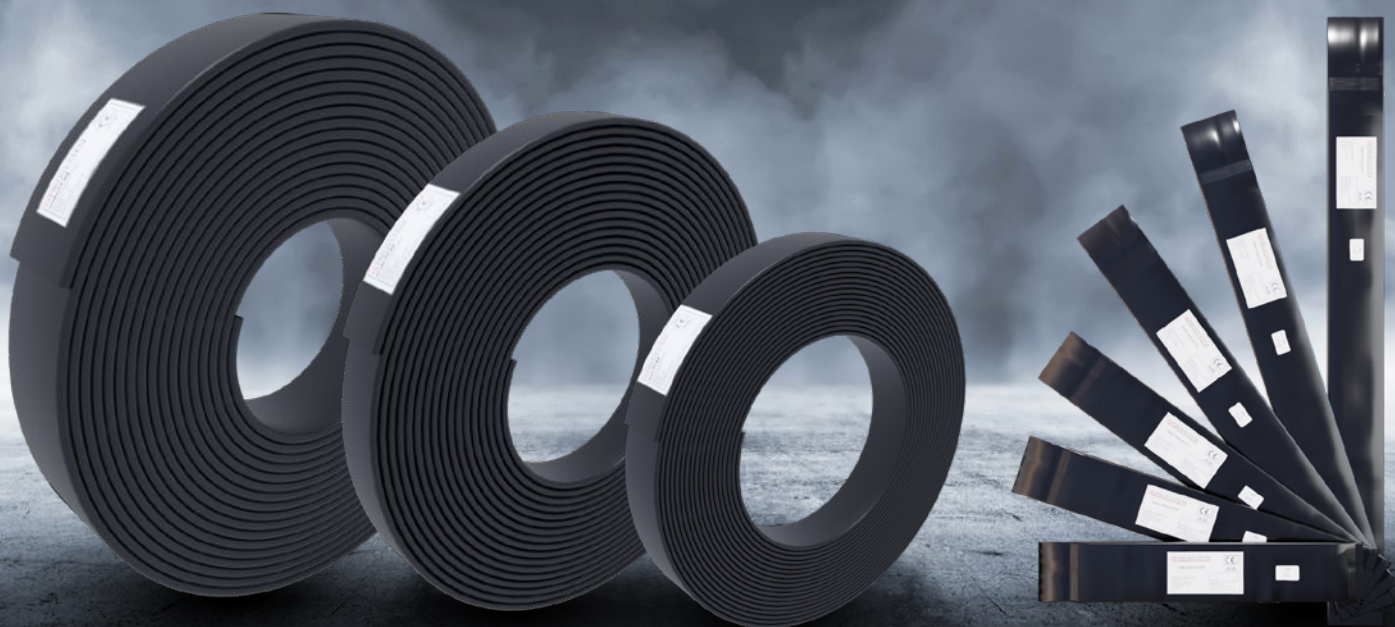
1. PGE ARENA in Gdańsk
2. Palace of Culture and Science in Warsaw
3. "Nowy Świat" Banking and Finance Center in Warsaw
4. Silesian Center for Heart Diseases in Zabrze
5. Hotel BUKOVINA in Bukowina Tatrzańska
6. Manufaktura in Łódź

and many more.

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INTUMESCENT TAPES AND WRAPS



PRODUCT DOCUMENTS

European Technical Approval :	ETA-17/1061
Certificate of Constancy of Performance:	1488-CPR-0727/W
Hygienic certificate:	BK/B/0178/01/2019
European Declaration of Performance:	PIRO/07-2018-09-10

PRODUCT TECHNICAL DATA

Fire resistance class:	up to EI 180 C/U, U/C, C/C
Reaction to fire:	B-s2, d0
Color:	dark graphite
Environment class:	Z2
Storage temperature range:	from +5°C to +30°C
Shelf life:	no limit, recommended period not longer than 24 months
Packaging:	5 m, 15 m, 30 m roll
Dimensions (thickness x width):	2,5 x 60 mm 4,0 x 60 mm 4,8 x 100 mm



TECHNICAL DESCRIPTION:

The Piro Multitube PM is a polymer tape with an admixture of graphite and other components that make the assembly smooth and flexible, and under the influence of high temperature, it increases its volume, closing the hole with the pipe or cable on which it is wrapped. The cross-section tape has a rectangular shape and is produced in several sizes: 60 x 2.5 mm, 60 x 4 mm, 100 x 4.8 mm. The tape is rolled into 5 m, 15 m and 30 m. In the case of Piro Multitube PM, its unique feature is the interchangeability of sections. The strip cross-sections are interchangeable, which means that one cross-section can be replaced by another cross-section, interchangeability of cross-sections is presented in the tables at the end of this chapter. The tape should be cut off and adjusted to the external circumference of the pipe, wrapped on the pipe and fixed with an electric band (so-called cable tie) or a self-adhesive universal adhesive tape.

INTENDED USE:

The Piro Multitube PM is designed for sealing and stopping fire in the penetrations of flammable and metal pipes without or with flammable or non-flammable insulation, and cables penetrating walls or floors. Fire resistance class from EI 30 to EI 180. The material list of pipes and insulation is given in Table 2. For further information see ETA-17/1061.

APPLICATION:

THE TYPES OF PARTITIONS WHICH CAN BE USED FOR PIRO MULTITUBE PM SHOWN IN TABLE 1 BELOW

TABLE 1

FLOOR	RIGID WALL	FLEXIBLE WALL
width from 150 mm	width from 100 mm	width from 100 mm
Reinforced concrete	Aerated concrete, concrete, brick, other ceramic products	Plasterboard
	 	

TABLE 2

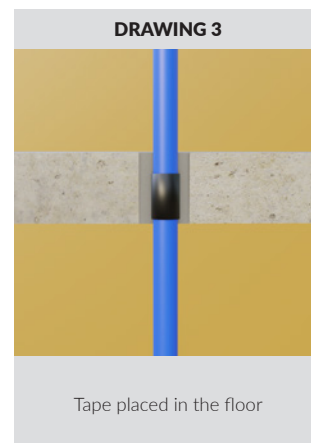
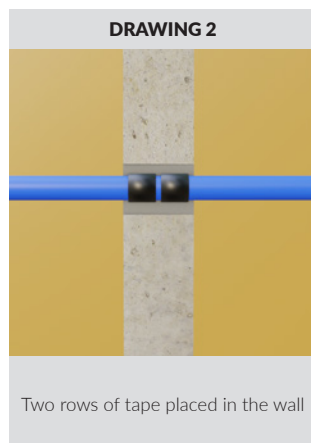
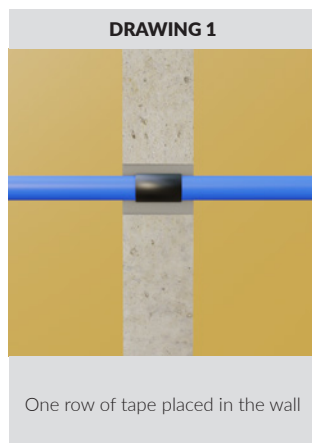
FLAMMABLE PIPES	TYPE OF INSULATION
PVC-U, PVC-C, SAN + PVC	PE
PE, PE-HD, PE-X, PE-RT, PE-RT/AL/PE-RT	PE or FEF
PP, PP-R, PP-R/AL/PP-R, PP-R STABI AL, PP-R/GF/PP-R, PP-R/PP-R+GF/PP-R	PE or FEF, mineral wool
ENERGY PIPES – SYNCOPEX	PE I PVC single or bundle
ABS	
LOW-NOISE PIPES - WAVIN WAFIX PP, WAVIN SI TECH+ I WAVIN AS	PE or FEF
METAL PIPES	
STEEL PIPES	PE or FEF
COPPER PIPES – CU	PE or FEF
CAST IRON PIPES	FEF
WIRES	UP TO 12 mm
2NYY-J 5 x 1,5 RE, E-YY-J 5 x 1,5 RE lub VV 5 x 1,5.	Single or bundles of cables up to a diameter of 100 mm
Cables in a PVC pipe	Single or bundles of cables

INSTALLATION DATA:

Piro Multitube PM does not require a supporting structure, therefore it can be mounted directly on the pipe at its destination. The clamp is wrapped directly on the pipe or on the outside of the pipe insulation depending on the type of pipe and type of insulation (for details see ETA-17/1061). For pipes penetrating floor, wrapping with a tape can be done both before pouring the floor or part of the floor with concrete mortar, and when pouring the floor or part of the floor with concrete mortar. For pipes penetrating a wall, wrapping with a tape can be done while building the wall or part of it. For pipes led in a shaft or in technical openings, wrapping with a tape should be done before walling them up. In the case of drilled holes, Piro Multitube PM should be wrapped and attached around the pipe outside the hole and inserted into the hole in the separating partition or placed on both sides of the partition. Fixing the tape on the pipe can be done using an electric band (so-called cable tie) or with a silver adhesive tape.

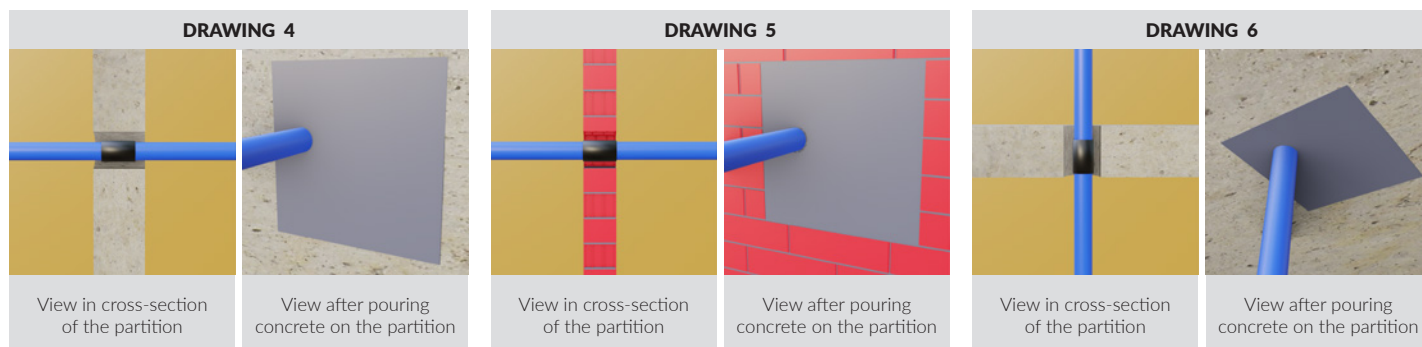
The mounting clearance (u = approx. 25 mm) for penetration seals using Piro Multitube PM is only required due to the space necessary for its installation when drilling holes in existing partitions.

Install the tapes in the walls along the axis of the wall or symmetrically on both sides. In floors, the tape should be installed 15 ± 5 mm from the bottom of the floor.



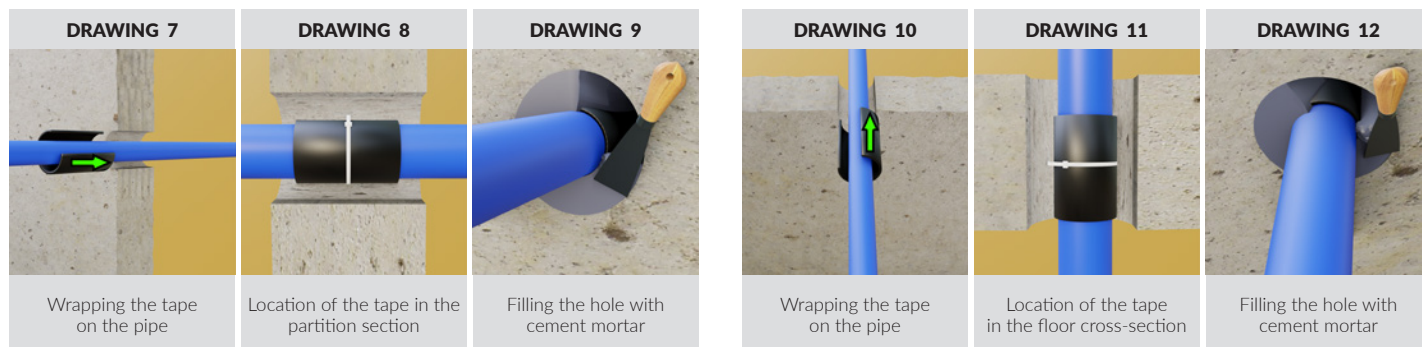
■ INSTALLATION HOLE

The installation hole is a temporarily prepared hole in the partition through which the installation is carried out (pipes or cables), after the installation is completed, the hole should be bricked up, filled with concrete (belongs to the group of downtime works). The tapes can be mounted directly on the pipes or on the pipe insulation as follows: in the installation opening before or during pouring concrete in the floor, part of the floor, wall or shaft or technical opening. Examples of application of the clamp assembly before bricking it with concrete are shown in Drawings 4, 5, 6.



■ DRILL HOLE

In the case of drilled holes, Piro Multitube PM should be wrapped and fixed around the pipe outside the hole and inserted into the hole in the partition. An example of installation is shown in drawings 7, 8, 9, 10, 11, 12.



Mounting clearance ($u = \text{c.a. } 25 \text{ mm}$) obtained after drilling in the supporting structure in order to seal with Piro Multitube PM is required due to the space needed for installation (inserting the tape into the hole).

■ ADDITIONAL PRODUCTS THAT CAN BE USED WITH PIRO MULTITUBE PM IN PENETRATION SEALS

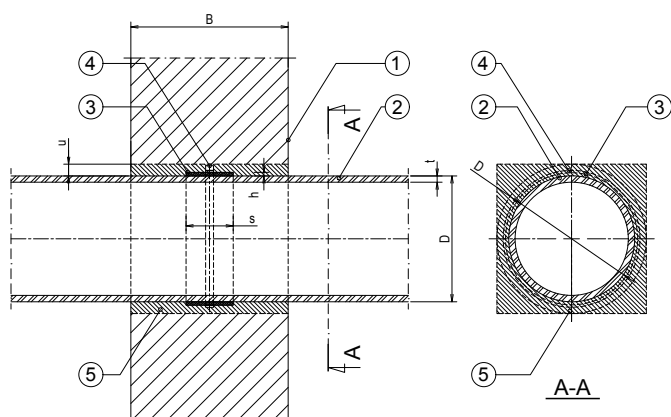
- **synthetic, flexible elastomeric foam (FEF)** according to EN 14304, with the reaction to fire class BL-s3, d0 according to EN 13501-1, and with a nominal density of $45 - 70 \text{ kg/m}^3$,
- **mineral wool** continuous insulation with a minimum thickness of 30 mm and a density of 80 kg/m^3 on combustible or metal pipes,
- **PE foam**, with reaction to fire class E according to EN 13501-1, and nominal density of 30 kg/m^3 ,
- **insulating foam Tubolit PE**, with reaction to fire class E according to EN 13501-1, and with a nominal density of 30 kg/m^3 ,
- **PE acoustic mat** (Weberfloor 4955 dB mat), with a reaction to fire class Bfl-s1 according to EN 13501-1, and with a nominal mass per unit area of 12 kg/30 m^2 .

CAUTION:

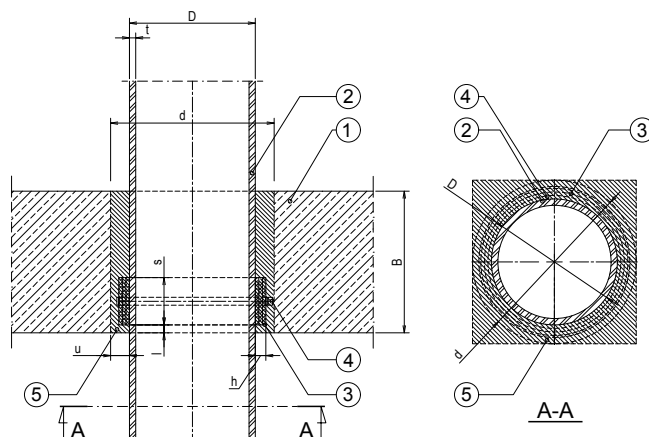
PE Weberfloor 4955 dB mat acoustic is recommended for floors, especially when it is required to reduce the acoustic effects of sewer pipes - according to the manufacturer's data, additional sound absorption of the mat up to 19 dB for one mat layer.

EXAMPLES OF TECHNICAL APPLICATION OF THE PRODUCT:

METHOD OF PROTECTING A PLASTIC PIPE WITHOUT INSULATION IN WALL AND FLOOR ACCORDING TO ETA-17/1061

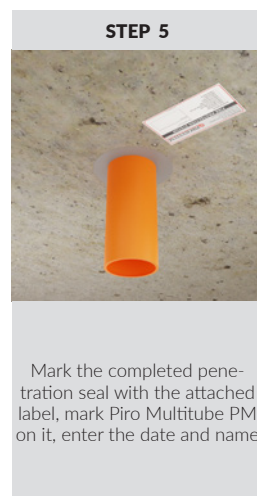
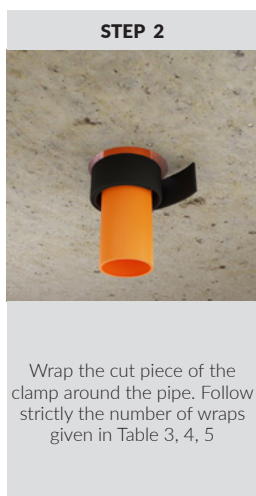


- 1 - rigid wall thickness $B = \min. 150 \text{ mm}$
- 2 - plastic pipe, diameter "D" and pipe wall thickness "t"
- 3 - Piro Multitube PM tape (inside) with dimensions $[h \times s]$, centrally located inside the wall
- 4 - clamp or adhesive tape
- 5 - the gap between the pipe and the partition with a maximum width of 25 mm, filled with cement mortar or mineral wool with a minimum density of 50 kg / m^3 and closed with gypsum mortar with a thickness of min. 5 mm

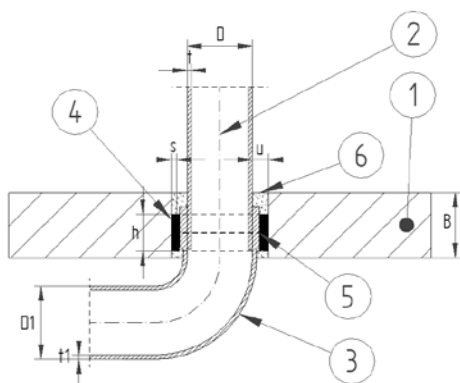


- 1 - reinforced concrete floor, thickness $B = \min. 150 \text{ mm}$
- 2 - plastic pipe, diameter "D" and pipe wall thickness "t"
- 3 - Piro Multitube PM tape (inside) $[h \times s] \text{ mm}$, placed in distance $l = 15 \pm 5 \text{ mm}$ from the underside of the floor
- 4 - clamp or adhesive tape
- 5 - the gap between the pipe and the partition, width $u = \max. 25 \text{ mm}$, filled with cement mortar

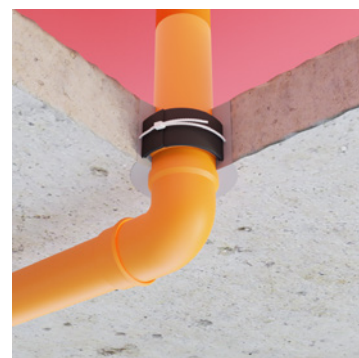
INSTALLATION OF THE PIRO MULTITUBE PM TAPE ON A PLASTIC PIPE WITHOUT INSULATION THROUGH THE WALL OR FLOOR



METHOD OF PROTECTING A PLASTIC PIPE WITH AN ELBOW PENETRATING THE FLOOR, MOUNTING THE TAPE ON THE SOCKET OF THE PIPE ACCORDING TO ETA-17/1061



- 1 - reinforced concrete floor with thickness $B = \min. 150 \text{ mm}$
- 2 - plastic pipe, diameter "D" and thickness pipe wall "t"
- 3 - plastic pipe bend 87.5° , diameter $D1$ and wall thickness $t1$
- 4 - Piro Multitube PM tape $[h \times s] \text{ mm}$, placed inside the floor, at a distance of $15 \pm 5 \text{ mm}$ from the underside of the floor
- 5 - clamp band or adhesive tape
- 6 - the space between the floor and the penetration seal, filled with mortar cement, approx. 25 mm



■ TABLE FOR SELECTING THE LENGTH AND NUMBER OF WRAPS FOR THE PIRO MULTITUBE PM TAPE FOR PVC PIPES WITHOUT INSULATION

TABLE 3									
PVC									
	Choose the type of Piro Multitube PM			FLOOR CLASS EI 120 (width from 150 mm density 1700 kg/m³)		WALL CLASS EI 120 (width from 150 mm density 600 kg/m³)		WALL CLASS EI 120 (width from 100 mm plasterboard)	
The outer diameter of the flammable pipe	Piro Multitube PM width selected from ETA	Piro Multitube PM thickness selected from ETA	Number of rows of the Piro Multitube PM	Number of Piro Multitube PM wraps in one row	Total length of Piro Multitube PM to be cut off	Number of Piro Multitube PM wraps in one row	Total length of Piro Multitube PM to be cut off	Number of Piro Multitube PM wraps in one row	Total length of Piro Multitube PM to be cut off
mm	mm	mm			mm		mm		mm
15	60	2,5	1	1	55	1	55	1	55
	60	4	1	1	60	1	60	1	60
	100	4,8	1	1	62	1	62	1	62
25	60	2,5	1	1	86	1	86	1	86
	60	4	1	1	91	1	91	1	91
	100	4,8	1	1	94	1	94	1	94
32	60	2,5	1	1	108	1	108	1	108
	60	4	1	1	113	1	113	1	113
	100	4,8	1	1	116	1	116	1	116
40	60	2,5	1	1	134	1	134	1	134
	60	4	1	1	138	1	138	1	138
	100	4,8	1	1	141	1	141	1	141
50	60	2,5	1	2	404	1	165	1	165
	60	4	1	1	170	1	170	1	170
	100	4,8	1	1	172	1	172	1	172
63	60	2,5	2	2	885	2	885	2	885
	60	4	1	2	471	2	471	2	471
	100	4,8	1	1	213	1	213	1	213
75	60	2,5	2	2	1036	2	1036	2	1036
	60	4	1	2	546	2	546	2	546
	100	4,8	1	1	251	1	251	1	251
83	60	2,5	2	2	1137	2	1137	2	1137
	60	4	1	2	597	2	597	2	597
	100	4,8	1	1	276	1	276	1	276
90	60	2,5	2	2	1225	2	1225	2	1225
	60	4	1	2	641	2	641	2	641
	100	4,8	1	1	298	1	298	1	298
110	60	2,5	2	2	1476	2	1476	2	1476
	60	4	1	2	766	2	766	2	766
	100	4,8	1	1	361	1	361	1	361
125	60	2,5	2	4	3454	3	2543		
	60	4	2	3	2656	2	1721		
	100	4,8	1	3	1358	2	875		
135	60	2,5	2	4	3705	3	2732		
	60	4	2	3	2845	2	1846		
	100	4,8	1	3	1453	2	938		
145	60	2,5	2	5	5024	4	3956		
	60	4	2	3	3033	3	3033		
	100	4,8	1	3	1547	3	1547		
150	60	2,5	2	5	5181	4	4082		
	60	4	2	3	3127	3	3127		
	100	4,8	1	3	1594	3	1594		
160	60	2,5	2	5	5495	5	5495		
	60	4	2	3	3316	3	3316		
	100	4,8	1	3	1688	3	1688		
185	60	2,5	2	6	7630	6	7630		
	60	4	2	4	5150	4	5150		
	100	4,8	1	4	2625	4	2625		
200	60	2,5	2	6	8195	6	8195		
	60	4	2	4	5526	4	5526		
	100	4,8	1	4	2813	4	2813		

The red color suggests the most optimal solution

TABLE FOR SELECTING THE LENGTH AND NUMBER OF WRAPS OF PIRO MULTITUBE PM FOR PE-HD, PE, PP, ABS, SAN + PVC WITHOUT INSULATION

TABLE 4									
PE-HD/PE/ABS/SAN+PVC									
	Choose the type of Piro Multitube PM			FLOOR CLASS EI 120 (width from 150 mm density 1700 kg/m³)		WALL CLASS EI 120 (width from 150 mm density 600 kg/m³)		WALL CLASS EI 120 (width from 100 mm plasterboard)	
The outer diameter of the flammable pipe	Piro Multitube PM width selected from ETA	Piro Multitube PM thickness selected from ETA	Number of rows of the Piro Multitube PM	Number of Piro Multitube PM wraps in one row	Total length of Piro Multitube PM to be cut off	Number of Piro Multitube PM wraps in one row	Total length of Piro Multitube PM to be cut off	Number of Piro Multitube PM wraps in one row	Total length of Piro Multitube PM to be cut off
mm	mm	mm			mm		mm		mm
15	60	2,5	1	1	50	1	50	1	50
	60	4	1	1	60	1	60	1	60
	100	4,8	1	1	62	1	62	1	62
25	60	2,5	1	1	86	1	86	1	86
	60	4	1	1	91	1	91	1	91
	100	4,8	1	1	94	1	94	1	94
32	60	2,5	1	1	108	1	108	1	108
	60	4	1	1	113	1	113	1	113
	100	4,8	1	1	116	1	116	1	116
40	60	2,5	1	1	134	1	134	1	134
	60	4	1	1	138	1	138	1	138
	100	4,8	1	1	141	1	141	1	141
50	60	2,5	1	4	785	1	173	1	173
	60	4	1	2	389	1	182	1	182
	100	4,8	1	1	172	1	172	1	172
63	60	2,5	2	2	885	2	885	2	885
	60	4	1	2	471	2	471	2	471
	100	4,8	1	1	213	1	213	1	213
75	60	2,5	2	2	1036	2	1036	2	1036
	60	4	1	2	546	2	546	2	546
	100	4,8	1	1	251	1	251	1	251
83	60	2,5	2	2	1137	2	1137	2	1137
	60	4	1	2	597	2	597	2	597
	100	4,8	1	1	276	1	276	1	276
90	60	2,5	2	2	1225	2	1225	2	1225
	60	4	1	2	641	2	641	2	641
	100	4,8	1	1	298	1	298	1	298
110	60	2,5	2	2	1476	2	1476	2	1476
	60	4	1	2	766	2	766	2	766
	100	4,8	1	1	361	1	361	1	361
125	60	2,5	2	4	3454	4	3454		
	60	4	2	3	2656	3	2656		
	100	4,8	1	3	1358	3	1358		
135	60	2,5	2	4	3705	5	4710		
	60	4	2	3	2845	3	2845		
	100	4,8	1	3	1453	3	1453		
145	60	2,5	2	5	5024	5	5024		
	60	4	2	3	3033	3	3033		
	100	4,8	1	3	1547	3	1547		
150	60	2,5	2	5	5181	5	5181		
	60	4	2	3	3127	3	3127		
	100	4,8	1	3	1594	3	1594		
160	60	2,5	2	5	5495	6	6688		
	60	4	2	3	3316	4	4522		
	100	4,8	1	3	1688	4	2311		
185	60	2,5	2	6	7630	6	7630		
	60	4	2	4	5150	4	5150		
	100	4,8	1	4	2625	4	2625		
200	60	2,5	2	6	8195				
	60	4	2	4	5526				
	100	4,8	1	4	2813				

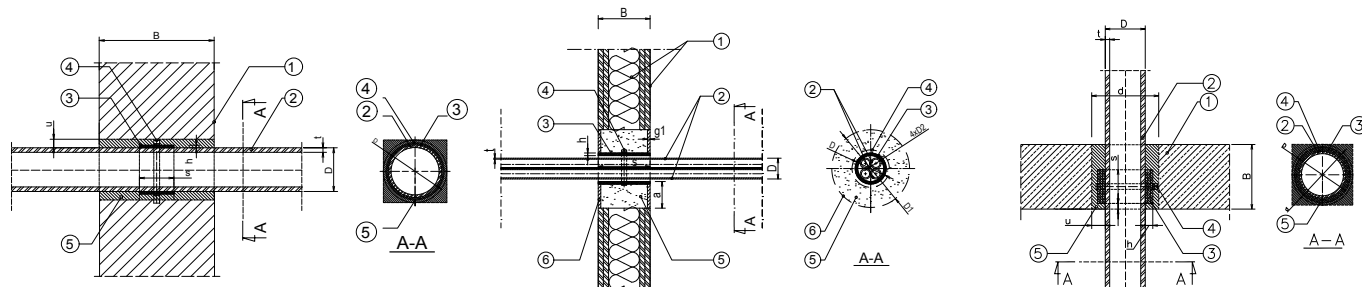
The red color suggests the most optimal solution

■ TABLE FOR SELECTING THE LENGTH AND NUMBER OF WRAPS OF PIRO MULTITUBE PM FOR PP PIPES WITHOUT INSULATION

TABLE 5									
PP									
	Choose the type of Piro Multitube PM			FLOOR CLASS EI 120 (width from 150 mm density 1700 kg/m³)		WALL CLASS EI 120 (width from 150 mm density 600 kg/m³)		WALL CLASS EI 120 (width from 100 mm plasterboard)	
The outer diameter of the flammable pipe	Piro Multitube PM width selected from ETA	Piro Multitube PM thickness selected from ETA	Number of rows of the Piro Multitube PM	Number of Piro Multitube PM wraps in one row	Total length of Piro Multitube PM to be cut off	Number of Piro Multitube PM wraps in one row	Total length of Piro Multitube PM to be cut off	Number of Piro Multitube PM wraps in one row	Total length of Piro Multitube PM to be cut off
mm	mm	mm			mm		mm		mm
15	60	2,5	1	1	50	1	50	1	50
	60	4	1	1	60	1	60	1	60
	100	4,8	1	1	62	1	62	1	62
25	60	2,5	1	1	86	1	86	1	86
	60	4	1	1	91	1	91	1	91
	100	4,8	1	1	94	1	94	1	94
32	60	2,5	1	1	108	1	108	1	108
	60	4	1	1	113	1	113	1	113
	100	4,8	1	1	116	1	116	1	116
40	60	2,5	1	1	134	1	134	1	134
	60	4	1	1	138	1	138	1	138
	100	4,8	1	1	141	1	141	1	141
50	60	2,5	1	2	361	1	165	1	165
	60	4	1	1	170	1	170	1	170
	100	4,8	1	1	172	1	172	1	172
63	60	2,5	2	2	885	2	885	2	885
	60	4	1	2	471	2	471	2	471
	100	4,8	1	1	213	1	213	1	213
75	60	2,5	2	2	1036	2	1036	2	1036
	60	4	1	2	546	2	546	2	546
	100	4,8	1	1	251	1	251	1	251
83	60	2,5	2	2	1137	2	1137	2	1137
	60	4	1	2	597	2	597	2	597
	100	4,8	1	1	276	1	276	1	276
90	60	2,5	2	2	1225	2	1225	2	1225
	60	4	1	2	641	2	641	2	641
	100	4,8	1	1	298	1	298	1	298
110	60	2,5	2	2	1476	2	1476	2	1476
	60	4	1	2	766	2	766	2	766
	100	4,8	1	1	361	1	361	1	361
125	60	2,5	2	4	3454	3	2543		
	60	4	2	3	2656	2	1721		
	100	4,8	1	3	1358	2	875		
135	60	2,5	2	5	4710	3	2732		
	60	4	2	3	2845	2	1846		
	100	4,8	1	3	1453	2	938		
145	60	2,5	2	5	5024	4	3956		
	60	4	2	3	3033	3	3033		
	100	4,8	1	3	1547	3	1547		
150	60	2,5	2	5	5181	4	4082		
	60	4	2	3	3127	3	3127		
	100	4,8	1	3	1594	3	1594		
160	60	2,5	2	5	5495	5	5495		
	60	4	2	3	3316	3	3316		
	100	4,8	1	3	1688	3	1688		
185	60	2,5	2	6	7630	6	7630		
	60	4	2	4	5150	4	5150		
	100	4,8	1	4	2625	4	2625		
200	60	2,5	2	6	8195	6	8195		
	60	4	2	4	5526	4	5526		
	100	4,8	1	4	2813	4	2813		

The red color suggests the most optimal solution

METHOD OF PROTECTING THE P-EX PIPE AND A BUNDLE OF P-EX PIPES WITHOUT INSULATION THROUGH WALL AND FLOOR ACCORDING



- 1 - wall thickness $B \geq 150$ mm
- 2 - PE-X pipe, diameter "D" and pipe wall thickness "t"
- 3 - Piro Multitube PM [h x s] mm, placed inside the wall, inside its cross section
- 4 - clamp band or adhesive tape
- 5 - the space between the pipe and the wall, filled cement mortar with a thickness of $u \leq 25$ mm

- 1 - flexible or rigid wall with a thickness of $B = \text{min. } B100$ mm
- 2 - bundle of plastic pipes: 4 x PE-X pipe, with diameter max. 20 mm and pipe wall thickness 2 mm
- 3 - Piro Multitube PM with dimensions [h x s], centrally located in the center of the wall
- 4 - clamp band or adhesive tape
- 5 - the gap between the pipe and the partition, wide "A", filled with mineral wool with a density of min. 60 kg/m^3
- 6 - gypsum mortar with a thickness of $g1 = \text{min. } 5$ mm

- 1 - reinforced concrete floor, thickness $B \geq 150$ mm
- 2 - plastic pipe, diameter "D" and pipe wall thickness "t"
- 3 - Piro Multitube PM [h x s] mm, placed inside the floor, at a distance 15 ± 5 mm from the bottom of the floor
- 4 - clamp band or adhesive tape
- 5 - space between the pipe and the floor, filled with cement mortar with a thickness $u \leq 25$ mm

INSTALLATION OF THE PIRO MULTITUBE PM ON THE P-EX PIPE WITHOUT INSULATION THROUGH THE WALL OR FLOOR

STEP 1

From Table 6, read the length of the Piro Multitube PM for the given diameter of the pipe or bundle, measure it and cut it with a knife

STEP 2

Wrap the cut piece of cable tie around the pipe or bundle. Strictly stick to the number of wraps given in Table 6

STEP 3

Secure the tape with a clamp band or adhesive tape and slide it inside the partition. Location of the tape inside the opening - central position along the wall axis or 15 ± 5 mm from the bottom of the floor

STEP 4

Fill the space between pipe and partition with cement mortar. In case of a plasterboard wall, fill the space with mineral wool with a min. density of 60 kg/m^3 and fill with gypsum mortar with a thickness of min. 5 mm

STEP 5

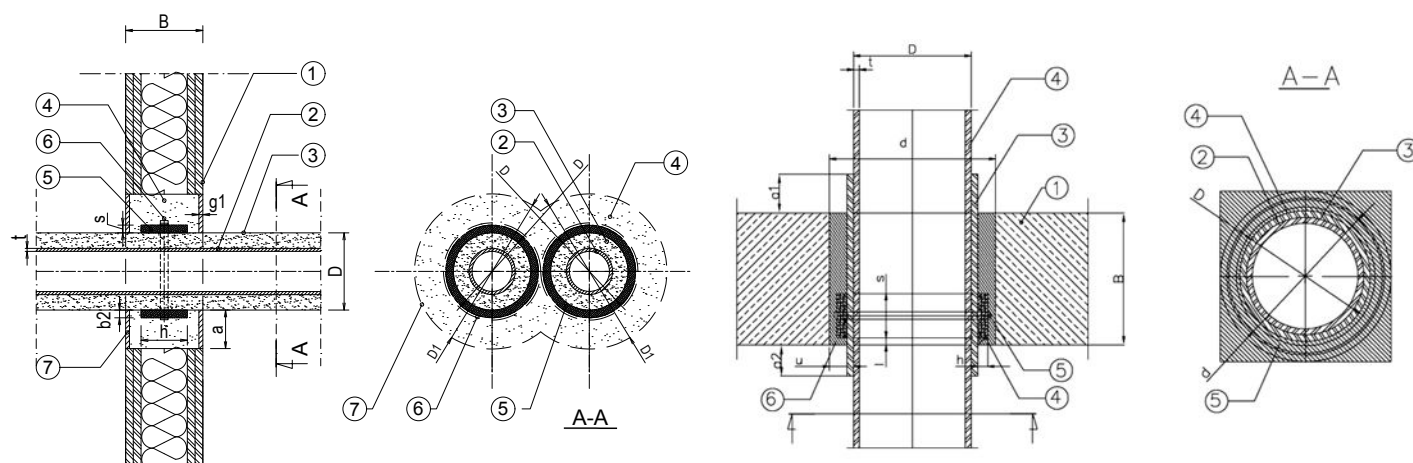
Mark the completed penetration seal with the attached label, mark Piro Multitube PM on it, enter the date and name

TABLE FOR SELECTING THE LENGTH AND NUMBER OF WRAPS FOR PIRO MULTITUBE PM FOR SINGLE PE-X PIPES OR BUNDLES

TABLE 6																	
PE-X																	
FLOOR CLASS EI 120 (width from 150 mm, density 1700 kg/m³)						WALL EI 120 (width from 150 mm and density 600 kg/m³)						WALL EI 120 (width from 100 mm plasterboard)					
The outer diameter of the PE-X pipe	Pipe wall thickness	The number of wraps of Piro Multitube PM depending on the dimensions of the tape			Length of the tape to be cut off	The outer diameter of the PE-X pipe	Pipe wall thickness	The number of wraps of Piro Multitube PM depending on the dimensions of the tape			Length of the tape to be cut off	The outer diameter of the PE-X pipe	Pipe wall thickness	The number of wraps of Piro Multitube PM depending on the dimensions of the tape			Length of the tape to be cut off
do (mm)	mm	2,5	4	4,8	mm	mm	mm	2,5	4	4,8	mm	mm	mm	2,5	4	4,8	mm
17	3,5	4			371	17	3	2			154	Pipe bundle max.4x20 mm	2	2			Depending on the diameter and the number of pipes
	3,5		2		182		3		1		66		2		2		
	3,5			1	68		3			1	68		2			1	
	4,5	6			650		5	3			254						
	4,5			2	197		5			1	68						
50	4,5	6			1272	50	5	3			565						
	4,5		4		879		5		2		389						
	4,5			2	404		5			1	172						

The red color suggests the most optimal solution

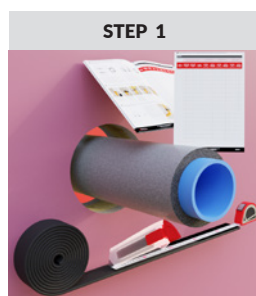
METHOD OF PROTECTING A PLASTIC PIPE IN INSULATION OF ACOUSTIC FOAM PE THROUGH A WALL AND FLOOR ACCORDING TO ETA-17/1061



- 1 - flexible or rigid wall with a thickness of $B = \text{min. } 100 \text{ mm}$
- 2 - plastic pipe, diameter "D" and pipe wall thickness "t"
- 3 - 3PE foam insulation, thickness "g"; nominal density of 30 kg/m^3 and reaction to fire class E according to EN 13501-1
- 4 - the gap between the pipe insulation and the partition with the maximum width $a = 30 \text{ mm}$, filled with mineral wool with a density of $\text{min. } 60 \text{ kg/m}^3$
- 5 - Piro Multitube PM (inside) with dimensions $[h \times s]$, centrally located inside the wall
- 6 - clamp band or adhesive tape
- 7 - gypsum mortar with a thickness of $g_1 = \text{min. } 5 \text{ mm}$

- 1 - reinforced concrete floor with thickness $B = \text{min. } 150 \text{ mm}$
- 2 - plastic pipe, diameter "D" and pipe wall thickness "t"
- 3 - insulation made of PE acoustic foam with a thickness of $= 6 \text{ mm}$
- 4 - Piro Multitube PM $[h \times s]$ mm, placed inside the floor, at a distance of $15 \pm 5 \text{ mm}$ from the underside of the floor
- 5 - clamp band or adhesive tape
- 6 - the space between the floor and the installation, filled with cement mortar approx. 25 mm

INSTALLATION OF THE PIRO MULTITUBE PM ON A PLASTIC PIPE IN PE FOAM INSULATION THROUGH A WALL OR FLOOR



From Table 7, read the length of the Piro Multitube PM for a given pipe diameter, measure it and cut it with a knife



Wrap the cut piece of cable tie around the pipe insulation. Follow strictly the number of turns given in Table 7



Secure the tape with a clamp band or adhesive tape and slide it inside the partition. Location of the tape inside the opening - central position along the wall axis or $15 \pm 5 \text{ mm}$ from the bottom of the floor



Fill the space between the pipe and the partition with cement mortar. In the case of a plasterboard wall, fill the space with mineral wool with a minimum density of 60 kg/m^3 and fill with gypsum mortar up to 5 mm thick



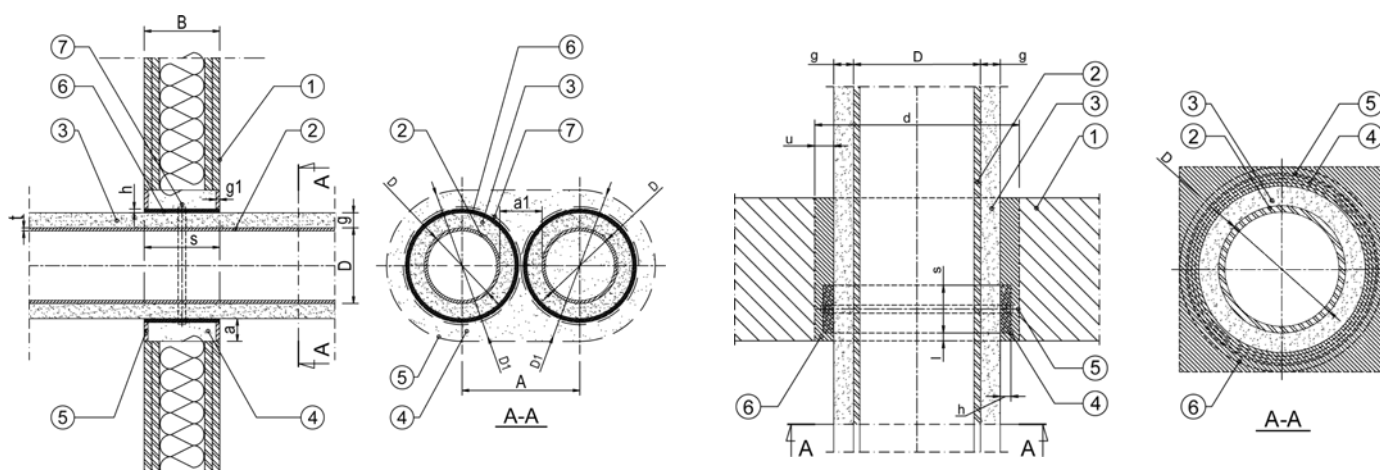
Mark the completed penetration seal with the attached label, mark Piro Multitube PM on it, enter the date and name

TABLE FOR SELECTING THE LENGTH AND NUMBER OF WRAPS FOR PIRO MULTITUBE PM FOR PLASTIC PIPES IN PE FOAM INSULATION
TABLE BELOW SHOWS SELECTION OF PIRO MULTITUBE PM TAPE FOR PP PIPES

TABLE 7								
PP PIPES								
	Choose the type of Piro Multitube PM		FLOOR CLASS EI 120 (width from 150 mm density 1700 kg/m³)			WALL CLASS EI 120 (width from 100 mm)		
			Insulation thickness 6 mm			Insulation thickness 9 mm		
The outer diameter of the flammable pipe	Piro Multitube PM width selected from ETA	Piro Multitube PM thickness selected from ETA	Number of rows of the Piro Multitube PM	Number of Piro Multitube PM wraps in one row	Total length of the Piro Multitube PM to be cut off	Number of rows of the Piro Multitube PM	Number of Piro Multitube PM wraps in one row	Total length of the Piro Multitube PM to be cut off
mm	mm	mm			mm			mm
15	60	2,5	1	4	496	1	2	254
	60	4	1	2	245	1	1	116
	100	4,8	1	1	100	1	1	119
25	60	2,5	1	4	622	1	2	317
	60	4	1	2	308	1	1	146
	100	4,8	1	1	131	1	1	150
32	60	2,5	1	4	710	1	2	361
	60	4	1	2	352	1	1	170
	100	4,8	1	1	153	1	1	172
40	60	2,5	1	4	810	1	2	411
	60	4	1	2	402	1	1	195
	100	4,8	1	1	178	1	1	197
50	60	2,5	1	4	936	2	2	948
	60	4	1	2	210	1	3	791
	100	4,8	1	1	225	1	2	517
63	60	2,5	1	4	1099	2	3	1714
	60	4	1	2	546	1	4	1269
	100	4,8	1	1	251	1	2	599
75	60	2,5	1	4	1250	2	3	1941
	60	4	1	2	622	1	4	1419
	100	4,8	1	1	288	1	2	674
83	60	2,5	1	4	1350	2	3	2091
	60	4	1	2	672	1	4	1520
	100	4,8	1	1	314	1	2	725
90	60	2,5	1	4	1438	2	3	2223
	60	4	1	2	716	1	4	1608
	100	4,8	1	1	336	1	2	769
110	60	2,5	1	4	1689	2	4	3529
	60	4	1	2	842	2	2	1758
	100	4,8	1	1	398	1	2	894
125	60	2,5	2	3	2769			
	60	4	1	3	1441			
	100	4,8	1	2	951			
135	60	2,5	2	3	2958			
	60	4	1	3	1535			
	100	4,8	1	2	1014			
145	60	2,5	2	4	4258			
	60	4	1	4	2223			
	100	4,8	1	2	1076			
150	60	2,5	2	4	4383			
	60	4	1	4	2286			
	100	4,8	1	2	1108			
160	60	2,5	2	4	4635			
	60	4	1	4	2412			
	100	4,8	1	2	1171			

The red color suggests the most optimal solution

METHOD OF PROTECTING A PLASTIC PIPE IN INSULATION WITH ELASTOMERIC FOAM FEF THROUGH A WALL AND FLOOR ACCORDING TO ETA-17/1061



- 1 - rigid wall thickness $B = \text{min. } 100 \text{ mm}$
- 2 - plastic pipe, diameter "D" and pipe wall thickness "t"
- 3 - continuous insulation made of flexible elastomeric foam (FEF), thickness "g", nominal density $45 - 70 \text{ kg/m}^3$ and reaction to fire class BL-s2, d0 according to EN 13501-1
- 4 - the gap between the pipe insulation and the partition with a maximum width $a = 30 \text{ mm}$, filled with mineral wool with a minimum density of 60 kg/m^3
- 5 - gypsum mortar with a thickness of $g_1 = \text{min. } 5 \text{ mm}$
- 6 - Piro Multitube PM (inside) with dimensions $[h \times s]$, centrally located inside the wall
- 7 - band clamp or adhesive tape

- 1 - reinforced concrete floor, thickness $B = \text{min. } 150 \text{ mm}$
- 2 - plastic pipe, diameter "D" and pipe wall thickness "t"
- 3 - insulation made of flexible elastomeric foam (FEF) with a thickness of "g" (continuous insulation)
- 4 - Piro Multitube PM $[h \times s] \text{ mm}$, placed inside the floor, at a distance of $15 \pm 5 \text{ mm}$ from the underside of the floor
- 5 - clamp band or adhesive tape
- 6 - the space between the floor and the installation, filled with cement mortar, approx. 25 mm

INSTALLATION OF PIRO MULTITUBE PM ON A PLASTIC PIPE IN INSULATION WITH ELASTOMERIC FEF FOAM THROUGH A WALL OR FLOOR



From Table 8, read the length of Piro Multitube PM for a given pipe diameter, measure it and cut it with a knife



Wrap the cut piece of cable tie around the pipe insulation. Follow strictly the number of turns given in Table 8



Secure the tape with a clamp band or adhesive tape and slide it inside the partition. Location of the trim inside the opening - central position along the wall axis or $15 \pm 5 \text{ mm}$ from the bottom



Fill the space between the pipe and the partition with cement mortar or mineral wool with a minimum density of 60 kg/m^3



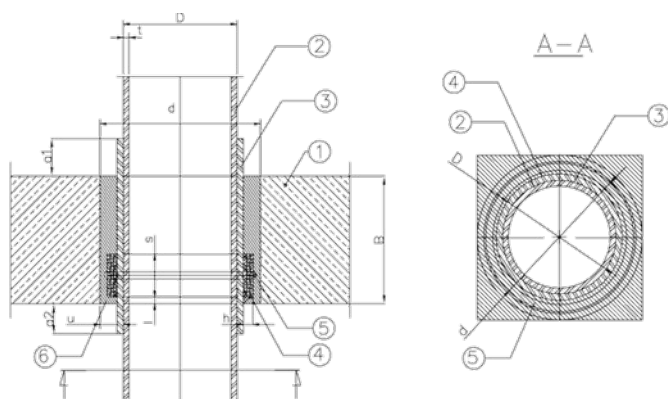
Mark the completed penetration seal with the attached label, mark Piro Multitube PM on it, enter the date and name

TABLE FOR SELECTING THE LENGTH AND NUMBER OF WRAPS FOR PIRO MULTITUBE PM FOR PLASTIC PIPES IN INSULATION WITH ELASTOMERIC FOAM FEF

TABLE 8								
	Select the dimension and number of rows of Piro Multitube PM		FLOOR CLASS EI 180 (width from 150 mm and density 1700kg/m³)			WALL CLASS EI 120 (width from 100 mm)		
			PE/HD/PE/ABS/SAN+PVC - insulation thickness 12 mm			PP - insulation thickness 32 mm		
The outer diameter of the flammable pipe	Piro Multitube PM dimensions selected from ETA		Number of rows of Piro Multitube PM	Number of Piro Multitube PM wraps in one row	Total length of the Piro Multitube PM to be cut off	Number of rows of Piro Multitube PM	Number of Piro Multitube PM wraps in one row	Total length of the Piro Multitube PM to be cut off
mm	mm	mm			mm			mm
15	60	2,5	1	4	647	1	4	1149
	60	4	1	2	320	1	2	571
	100	4,8	1	1	138	1	1	263
25	60	2,5	1	4	772	1	4	1275
	60	4	1	2	383	1	2	634
	100	4,8	1	1	169	1	1	295
32	60	2,5	1	4	860	1	4	1363
	60	4	1	2	427	1	2	678
	100	4,8	1	1	191	1	1	317
40	60	2,5	1	4	961	1	4	1463
	60	4	1	2	477	1	2	728
	100	4,8	1	1	216	1	1	342
50*	60	2,5	1	4	1086	2	3	2336
	60	4	1	2	540	2	2	1583
	100	4,8	1	1	248	1	2	806
63*	60	2,5	1	4	1250	2	3	2581
	60	4	1	2	622	2	2	1746
	100	4,8	1	1	288	1	2	888
75*	60	2,5	1	4	1400	2	4	3806
	60	4	1	2	697	2	2	1897
	100	4,8	1	1	326	1	2	963
83*	60	2,5	1	4	1501	2	4	4007
	60	4	1	2	747	2	3	3071
	100	4,8	1	1	351	1	3	1566
90*	60	2,5	1	4	1589	2	4	4182
	60	4	1	2	791	2	3	3203
	100	4,8	1	1	373	1	3	1632
110*	60	2,5	1	4	1840	2	5	5935
	60	4	1	2	917	2	3	3580
	100	4,8	1	1	436	1	3	1820

* The diameter of the tapes marked with (*) refers to PP pipes, possibility of increasing to EI 120 through Individual Technical Documentation

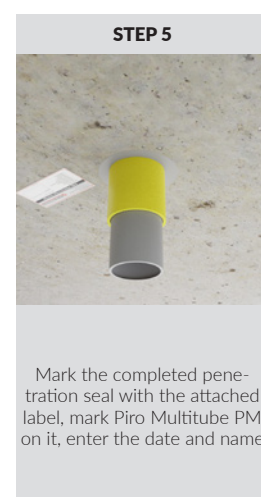
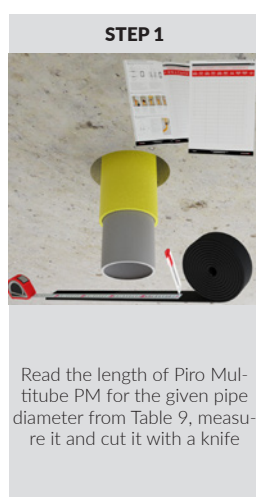
The red color suggests the most optimal solution



- 1 - reinforced concrete floor with thickness $B = \text{min. } 150 \text{ mm}$
- 2 - plastic pipe, diameter "D" and pipe wall thickness "t"
- 3 - insulation made of an acoustic mat made of PE, thickness g, length on top $a1 = 30 \text{ mm}$ and bottom $a2 = 30 \text{ mm}$
- 4 - Piro Multitube PM [h x s] mm, placed inside the floor, at a distance of $15 \pm 5 \text{ mm}$ from the underside of the floor
- 5 - band clamp or adhesive tape
- 6 - the space between the floor and the installation, filled cement mortar, approx. 25 mm

The correct way of installation of an acoustic mat on soundproof sewage pipes

■ INSTALLATION OF PIRO MULTITUBE PM ON THE SEWAGE PIPE IN LOW-NOISE FOAM INSULATION PE THROUGH THE FLOOR

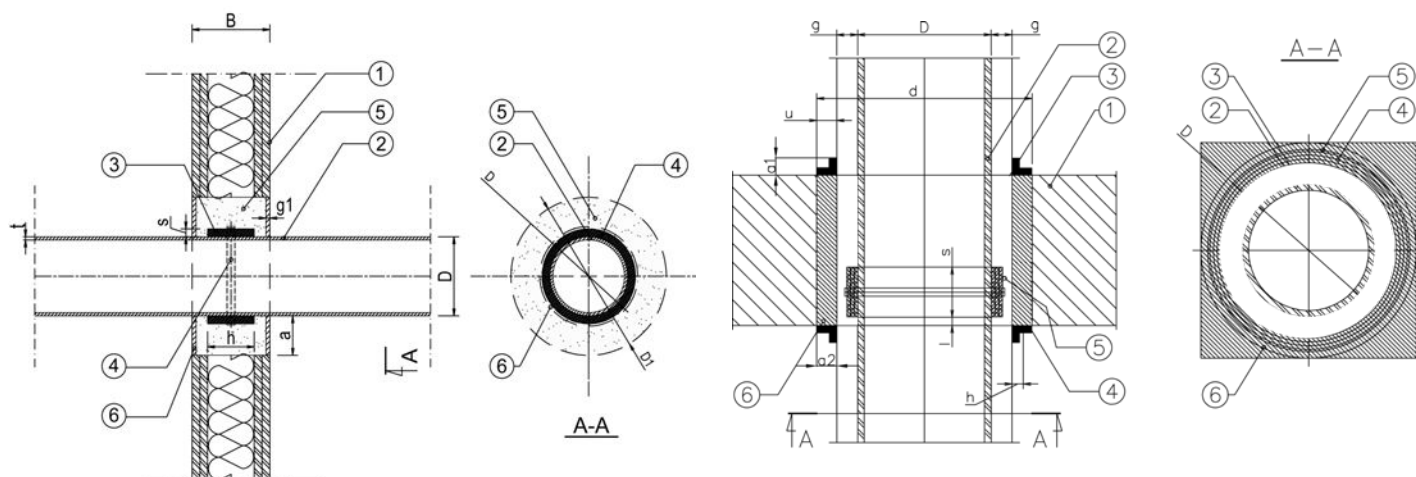


■ TABLE FOR SELECTING THE LENGTH AND NUMBER OF WRAPS FOR PIRO MULTITUBE PM FOR SINGLE LOW-NOISE WATER PIPES

TABLE 9											
	Select the size of Piro Multitube PM		FLOOR CLASS EI 120 (width from 150 mm, density 1700 kg/m ³)								
			Insulation thickness 6 mm								
			PVC			PE-HD/PE/ABS/SAN+PVC			PP		
The outer diameter of the flammable pipe	Piro Multitube PM width selected from ETA	Piro Multitube PM thickness selected from ETA	Number of rows of the Piro Multitube PM	Number of Piro Multitube PM wraps in one row	Total length of the Piro Multitube PM to be cut off	Number of rows of the Piro Multitube PM	Number of Piro Multitube PM wraps in one row	Total length of the Piro Multitube PM to be cut off	Number of rows of the Piro Multitube PM	Number of Piro Multitube PM wraps in one row	Total length of the Piro Multitube PM to be cut off
mm	mm	mm			mm			mm			mm
15	60	2,5	2	4	992	1	1	93	1	4	496
	60	4	1	4	590	1	1	97	1	2	245
	100	4,8	1	2	260	1	1	100	1	1	100
25	60	2,5	2	4	1243	1	1	124	1	4	622
	60	4	1	4	716	1	1	129	1	2	308
	100	4,8	1	2	323	1	1	131	1	1	131
32	60	2,5	2	4	1419	1	1	146	1	4	710
	60	4	1	4	804	1	1	151	1	2	352
	100	4,8	1	2	367	1	1	153	1	1	153
40	60	2,5	2	4	1620	1	1	171	1	4	810
	60	4	1	4	904	1	1	176	1	2	402
	100	4,8	1	2	417	1	1	178	1	1	178
50	60	2,5	2	4	1871	2	4	1871	1	4	936
	60	4	1	4	1030	1	4	1030	1	2	465
	100	4,8	1	2	480	1	2	480	1	1	210
63	60	2,5	2	4	2198	2	4	2198	1	4	1099
	60	4	1	4	1193	1	4	1193	1	2	546
	100	4,8	1	2	561	1	2	561	1	1	251
75	60	2,5	2	4	2499	2	4	2499	1	4	1250
	60	4	1	4	1344	1	4	1344	1	2	622
	100	4,8	1	2	637	1	2	637	1	1	288
83	60	2,5	2	4	2700	2	4	2700	1	4	1350
	60	4	1	4	1444	1	4	1444	1	2	672
	100	4,8	1	2	687	1	2	687	1	1	314
90	60	2,5	2	4	2876	2	4	2876	1	4	1438
	60	4	1	4	1532	1	4	1532	1	2	716
	100	4,8	1	2	731	1	2	731	1	1	336
110	60	2,5	2	4	3379	2	4	3379	1	4	1689
	60	4	1	4	1784	1	4	1784	1	2	842
	100	4,8	1	2	857	1	2	857	1	1	398
125	60	2,5	2	4	3755	2	4	3755	2	3	2769
	60	4	1	4	1972	1	4	1972	1	3	1441
	100	4,8	1	2	951	1	2	951	1	2	951
135	60	2,5	2	4	4007	2	4	4007	2	3	2958
	60	4	1	4	2098	1	4	2098	1	3	1535
	100	4,8	1	2	1014	1	2	1014	1	2	1014
145	60	2,5	2	4	4258	2	4	4258	2	4	4258
	60	4	1	4	2223	1	4	2223	1	4	2223
	100	4,8	1	2	1076	1	2	1076	1	2	1076
150	60	2,5	2	4	4383	2	4	4383	2	4	4383
	60	4	1	4	2286	1	4	2286	1	4	2286
	100	4,8	1	2	1108	1	2	1108	1	2	1108
160	60	2,5	2	4	4635	2	4	4635	2	4	4635
	60	4	1	4	2412	1	4	2412	1	4	2412
	100	4,8	1	2	1171	1	2	1171	1	2	1171

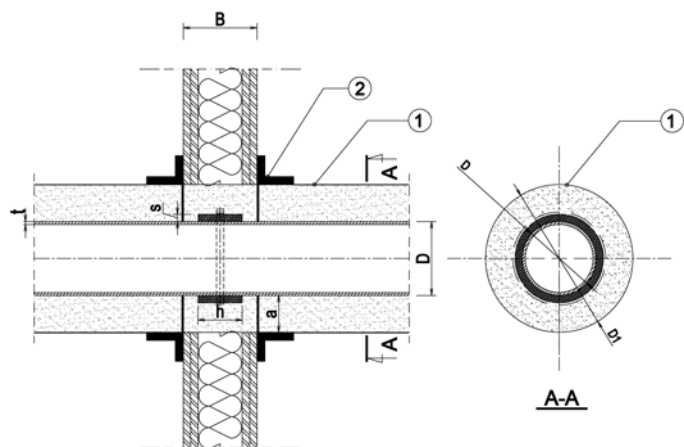
The red color suggests the most optimal solution

METHOD OF PROTECTING A PLASTIC PIPE IN INSULATION MADE OF MINERAL WOOL THROUGH A WALL AND FLOOR ACCORDING TO ETA-17/1061



- 1 - flexible or rigid wall, thickness $B = \text{min. } 100 \text{ mm}$
- 2 - plastic pipe, diameter " D " and pipe wall thickness " t "
- 3 - Piro Multitube PM (inside) with dimensions $[h \times s]$, centrally located inside the wall
- 4 - band clamp or adhesive tape
- 5 - the gap between the pipe and the partition with a maximum width of $a = 30 \text{ mm}$, filled with mineral wool with a density of $\text{min. } 60 \text{ kg/m}^3$
- 6 - gypsum mortar with a thickness of $g_1 = 5 \text{ mm}$

- 1 - reinforced concrete floor with a thickness of $B = \text{min. } 150 \text{ mm}$
- 2 - plastic pipe, diameter " D " and pipe wall thickness " t "
- 3 - mineral wool with a density of $\text{min. } 50 \text{ kg/m}^3$ (continuous insulation)
- 4 - PiroCoat A paste on both sides of the floor; length $a_1 = \text{min. } 50 \text{ mm}$, thickness $g_1 = \text{min. } 0.6 \text{ mm}$, width $a_2 = \text{min. } 50 \text{ mm}$, thickness $g_2 = \text{min. } 0.6 \text{ mm}$
- 5 - Piro Multitube PM $[h \times s] \text{ mm}$, placed inside the floor, at a distance of $15 \pm 5 \text{ mm}$ from the underside of the floor
- 6 - the space between the floor and the installation, filled cement mortar, approx. 25 mm



If necessary, it is possible to continue the mineral wool insulation along the entire length of the pipe:

- 1 - mineral wool with a density of $\text{min. } 50 \text{ kg/m}^3$ (continuous insulation)
- 2 - PiroCoat A on both sides of wall; length $a_1 = \text{min. } 50 \text{ mm}$, thickness $g_1 = \text{min. } 0.6 \text{ mm}$ width $a_2 = \text{min. } 50 \text{ mm}$, thickness $g_2 = \text{min. } 0.6 \text{ mm}$

INSTALLATION OF THE PIRO MULTITUBE PM ON A FLAMMABLE PIPE IN INSULATION OF MINERAL WOOL THROUGH A WALL OR FLOOR

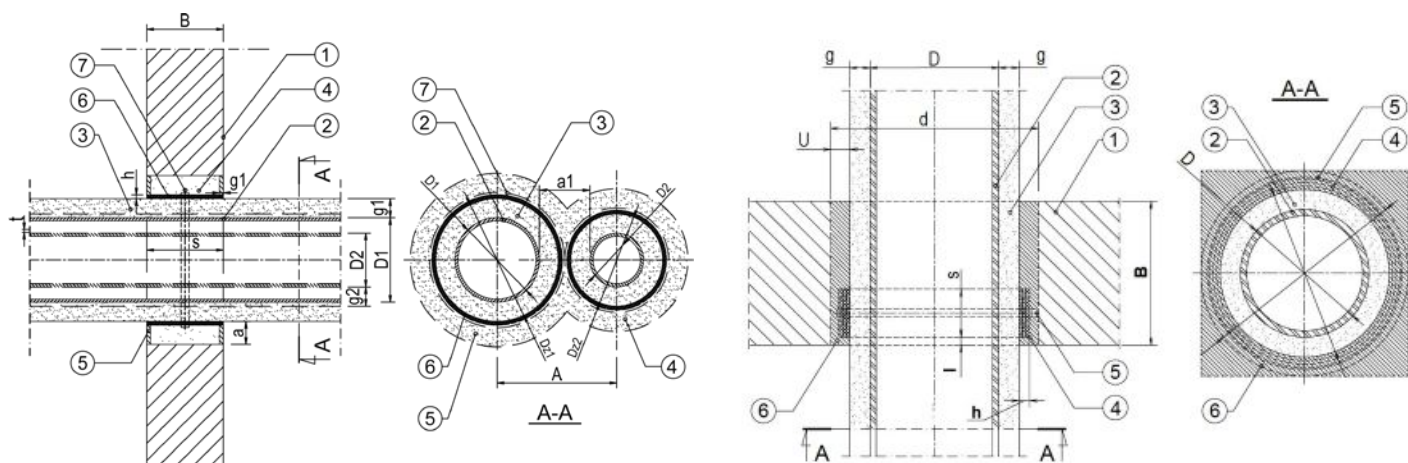
STEP 1	STEP 2	STEP 3	STEP 4	STEP 5	STEP 6
From Table 10, read the length of the Piro Multitube PM for a given pipe diameter, measure it and cut it with a knife	Remove the insulation from the pipe, wrap the cut piece of the tape around the pipe, under the mineral wool insulation. Follow strictly the number of turns given in Table 10	Secure the tape with a cable tie or adhesive tape and slide it inside the partition. Location of the trim inside the opening - central position along the wall axis or $15 \pm 5 \text{ mm}$ from the bottom	Put mineral wool insulation on the pipe so that it covers the clamp. Fill the space between the pipe and the partition with cement mortar or mineral wool with a minimum density of 60 kg/m^3	By using a putty knife, apply PiroCoat A on the partition and on the pipe insulation so that a ring with a width of $\text{min. } 50 \text{ mm}$ and a thickness of $\text{min. } 0.6 \text{ mm}$ is created	Mark the completed penetration seal with the attached label, mark on it Piro Multitube PM, and PiroCoat A. Enter the date and name

■ TABLE FOR SELECTING THE LENGTH AND NUMBER OF WRAPS OF PIRO MULTITUBE PM FOR PLASTIC PIPES IN MINERAL WOOL INSULATION

TABLE 10							
PP-R Stabi AL / PP-R/GF/PP-R PIPES							
	Select the dimension and number of rows of Piro Multitube PM			FLOOR CLASS EI 180 (width from 150 mm and density 1700 kg/m³)		WALL CLASS EI 180 (width from 150 mm and density 600 kg/m³)	
				Insulation thickness 25 mm			
The outer diameter of the flammable pipe	Piro Multitube PM width selected from ETA	Piro Multitube PM thickness selected from ETA	Number of rows of the Piro Multitube PM	Number of Piro Multitube PM wraps in one row	Total length of the Piro Multitube PM to be cut off	Number of Piro Multitube PM wraps in one row	Total length of the Piro Multitube PM to be cut off
mm	mm	mm			mm		mm
15	60	2,5	2	4	691	4	691
	60	4	1	4	440	4	440
	100	4,8	1	2	185	2	185
25	60	2,5	2	4	942	4	942
	60	4	1	4	565	4	565
	100	4,8	1	2	247	2	247
32	60	2,5	2	4	1118	4	1118
	60	4	1	4	653	4	653
	100	4,8	1	2	291	2	291
40	60	2,5	2	4	1319	4	1319
	60	4	1	4	754	4	754
	100	4,8	1	2	342	2	342
50	60	2,5	2	4	1570	4	1570
	60	4	1	4	879	4	879
	100	4,8	1	2	404	2	404
63	60	2,5	2	4	1897	4	1897
	60	4	1	4	1042	4	1042
	100	4,8	1	2	486	2	486
75	60	2,5	2	4	2193	4	2193
	60	4	1	4	1193	4	1193
	100	4,8	1	2	561	2	561
83	60	2,5	2	4	2399	4	2399
	60	4	1	4	1294	4	1294
	100	4,8	1	2	612	2	612
90	60	2,5	2	4	2575	4	2575
	60	4	1	4	1382	4	1382
	100	4,8	1	2	656	2	656
110	60	2,5	2	4	3077	4	3077
	60	4	1	4	1633	4	1633
	100	4,8	1	2	781	2	781

The red color suggests the most optimal solution

METHOD OF PROTECTING A METAL PIPE IN INSULATION WITH ELASTOMERIC FOAM FEF THROUGH A WALL AND FLOOR ACCORDING TO ETA-17/1061



- 1 - rigid wall thickness $B = \min. 150 \text{ mm}$
- 2 - plastic pipe, diameter "D" and pipe wall thickness "t"
- 3 - continuous insulation made of flexible elastomeric foam (FEF), thickness "G", nominal density $45 - 70 \text{ kg/m}^3$ and reaction to fire class BL-s2, d0 according to EN 13501-1
- 4 - the gap between the pipe insulation and the partition with a maximum width of $u = 25 \text{ mm}$, filled with mineral wool with a density of $\min. 60 \text{ kg/m}^3$ and closed with gypsum mortar with a thickness of $\min. 5 \text{ mm}$ or filled cement mortar
- 5 - gypsum mortar with a thickness of $g_1 = 5 \text{ mm}$
- 6 - Piro Multitube PM (inside) with dimensions $[h \times s]$, centrally located inside the wall
- 7 - band clamp or adhesive tape

- 1 - reinforced concrete floor with a thickness of $B = \min. 150 \text{ mm}$
- 2 - metal pipe, diameter "D" and pipe wall thickness "t"
- 3 - continuous insulation made of flexible elastomeric foam (FEF), thickness "G", nominal density $45 - 70 \text{ kg/m}^3$ and reaction to fire class BL-s2, d0 according to EN 13501-1
- 4 - Piro Multitube PM (inside) $[h \times s] \text{ mm}$; placed in distance $l = 15 \pm 5 \text{ mm}$ from the underside of the floor
- 5 - clamp band or adhesive tape
- 6 - the gap between the pipe insulation and the partition with the maximum width $u = 25 \text{ mm}$, filled with cement mortar

INSTALLATION OF PIRO MULTITUBE PM ON A METAL PIPE IN INSULATION WITH ELASTOMERIC FEF FOAM THROUGH A WALL OR FLOOR



STEP 1

Read from Table 11.1 for steel pipes, 11.2 for copper pipes or 11.3 for cast iron pipes, the length of Piro Multitube PM for the given pipe diameter, measure it and cut it with a knife



STEP 2

Wrap the cut piece around the pipe insulation. Follow the number of wraps given in Table 11.1 for steel pipes, 11.2 for copper pipes or 11.3 for cast iron pipes.



STEP 3

Secure the tape with a clamp band and slide it into the partition. Location of the tape inside the hole - central position along the wall axis or 10-15 mm from the bottom of the floor



STEP 4

Fill the space between the pipe and the partition with cement mortar



STEP 5

Mark the completed penetration seal with the attached label, mark Piro Multitube PM on it, enter the date and name

■ TABLE FOR SELECTING THE LENGTH AND NUMBER OF WRAPS OF PIRO MULTITUBE PM FOR STEEL PIPES IN INSULATION WITH ELASTOMERIC FEF FOAM

TABLE 11.1

STEEL PIPES

Nominal pipe diameter, maximum wall thickness 14.2	Select the type of Piro Multitube PM			FLOOR CLASS EI120 (width 150 mm density 1700kg/m³)		WALL CLASS EI120 (width from 150 mm density 600kg/m³)		WALL CLASS EI120 (width from 100 mm)	
				Insulation thickness 9 mm		Insulation thickness 10 mm		Insulation thickness 32 mm	
	Piro Multitube PM width selected from ETA	Piro Multitube PM thickness selected from ETA	Number of rows of Piro Multitube PM	Number of Piro Multitube PM wraps on a pipe	Length of the tape to be cut off	Number of Piro Multitube PM wraps on a pipe	Length of the tape to be cut off	Number of Piro Multitube PM wraps on a pipe	Length of the tape to be cut off
mm	mm	mm			mm		mm		mm
17,2	60	2,5	1	1	118	1	125	4	1177
				Insulation thickness 25 mm		Insulation thickness 25 mm			
	60	4	1	2	497	2	497	2	585
	100	4,8	1	1	226	1	226	1	270
25	60	2,5	1	3	801	3	801	4	1275
	60	4	1	2	546	2	546	3	989
	100	4,8	1	1	251	1	251	2	649
26,9	60	2,5	1	3	819	3	819	4	1299
	60	4	1	2	558	2	558	3	1007
	100	4,8	1	1	257	1	257	2	661
31,8	60	2,5	1	3	865	3	865	6	2135
	60	4	1	2	589	2	589	4	1454
	100	4,8	1	1	272	1	272	2	692
38	60	2,5	1	3	923	3	923	6	2251
	60	4	1	2	628	2	628	4	1532
	100	4,8	1	1	292	1	292	2	731
42,4	60	2,5	1	3	965	3	965	6	2334
	60	4	1	2	656	2	656	4	1588
	100	4,8	1	1	305	1	305	2	759
48,3	60	2,5	1	3	1020	3	1020	6	2445
	60	4	1	2	693	2	693	4	1662
	100	4,8	1	1	324	1	324	2	796
54	60	2,5	1	3	1074	3	1074	6	2553
	60	4	1	2	728	2	728	4	1733
	100	4,8	1	1	342	1	342	2	831
57,2	60	2,5	1	3	1104	3	1104	6	2613
	60	4	1	2	749	2	749	4	1773
	100	4,8	1	1	352	1	352	2	852
60,3	60	2,5	1	3	1133	3	1133	7	3172
	60	4	1	2	768	2	768	4	1812
	100	4,8	1	1	362	1	362	2	871
76,1	60	2,5	2	3	2564	3	2564		
	60	4	1	4	1835	4	1835		
	100	4,8	1	2	882	2	882		
88,9	60	2,5	2	4	3803	4	3803		
	60	4	2	3	2918	3	2918		
	100	4,8	1	3	1489	3	1489		
101,6	60	2,5	2	4	4122	4	4122		
	60	4	2	3	3158	3	3158		
	100	4,8	1	3	1609	3	1609		
108,7	60	2,5	2	4	4301	4	4301		
	60	4	2	3	3291	3	3291		
	100	4,8	1	3	1676	3	1676		
133,9	60	2,5	2	5	6245	5	6245		
	60	4	2	3	3766	3	3766		
	100	4,8	1	3	1913	3	1913		
159,11	60	2,5	2	5	7037	5	7037		
	60	4	2	3	4241	3	4241		
	100	4,8	1	3	2151	3	2151		
168	60	2,5	2	5	7316	5	7316		
	60	4	2	3	4409	3	4409		
	100	4,8	1	3	2234	3	2234		
219	60	2,5	2	6	10795	6	10795		
	60	4	2	4	7260	4	7260		
	100	4,8	1	4	3680	4	3680		

The red color suggests the most optimal solution

■ TABLE FOR SELECTING THE LENGTH AND NUMBER OF WRAPS FOR PIRO MULTITUBE PM FOR COPPER PIPES IN INSULATION WITH ELASTOMERIC FEF FOAM

TABLE 11.2							
COPPER PIPES							
	Select the type of Piro Multitube PM			FLOOR CLASS EI120 (width 150 mm density 1700kg/m ³)		WALL CLASS EI120 (width from 150 mm density 600kg/m ³)	
				Insulation thickness 32 mm		Insulation thickness 25 mm	
Nominal pipe diameter, maximum wall thickness 14.2	Piro Multitube PM width selected from ETA	Piro Multitube PM thickness selected from ETA	Number of rows of Piro Multitube PM	Number of Piro Multitube PM wraps on a pipe	Length of the tape to be cut off	Number of Piro Multitube PM wraps on a pipe	Length of the tape to be cut off
mm	mm	mm			mm		mm
8	60	2,5	1	3	772	3	641
	60	4	1	2	528	2	440
	100	4,8	1	1	241	1	197
10	60	2,5	1	3	791	3	659
	60	4	1	2	540	2	452
	100	4,8	1	1	248	1	204
12	60	2,5	1	3	810	3	678
	60	4	1	2	553	2	465
	100	4,8	1	1	254	1	210
14	60	2,5	1	3	829	3	697
	60	4	1	2	565	2	477
	100	4,8	1	1	260	1	216
15	60	2,5	1	3	838	3	707
	60	4	1	2	571	2	484
	100	4,8	1	1	263	1	219
18	60	2,5	1	3	867	3	735
	60	4	1	2	590	2	502
	100	4,8	1	1	273	1	229
22	60	2,5	1	3	904	3	772
	60	4	1	2	615	2	528
	100	4,8	1	1	285	1	241
28	60	2,5	1	3	961	3	829
	60	4	1	2	653	2	565
	100	4,8	1	1	304	1	260
35	60	2,5	1	3	1027	3	895
	60	4	1	2	697	2	609
	100	4,8	1	1	326	1	282
42	60	2,5	1	3	1093	3	961
	60	4	1	2	741	2	653
	100	4,8	1	1	348	1	304
54	60	2,5	1	3	1206	3	1074
	60	4	1	2	816	2	728
	100	4,8	1	1	386	1	342
63	60	2,5	2	3	2581	3	2317
	60	4	2	2	1746	2	1570
	100	4,8	1	2	888	2	385
76,1	60	2,5	2	4	3833	4	3482
	60	4	2	3	2941	3	2677
	100	4,8	1	3	1501	3	1369
88,9	60	2,5	2	4	4155	4	3803
	60	4	2	3	3182	3	2918
	100	4,8	1	3	1621	3	1489
108	60	2,5	2	5	5872	5	5432
	60	4	2	3	3542	3	3278
	100	4,8	1	3	1801	3	1669

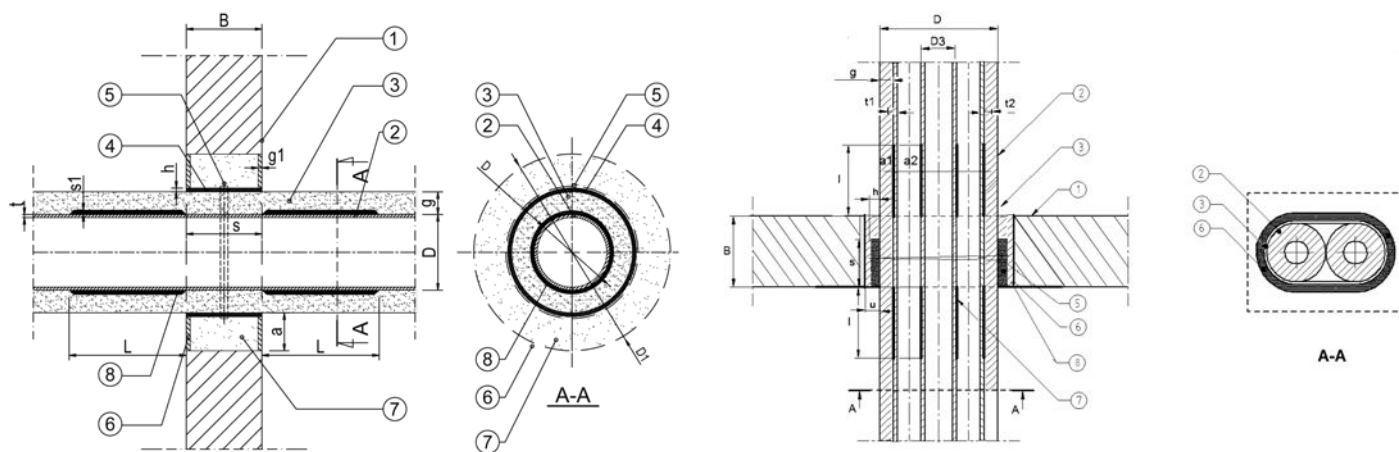
The red color suggests the most optimal solution

TABLE FOR SELECTING THE LENGTH AND NUMBER OF WRAPS OF PIRO MULTITUBE PM FOR CAST IRON PIPES IN INSULATION WITH ELASTOMERIC FEF FOAM

TABLE 11.3									
CAST IRON PIPES									
	Select the type of Piro Multitube PM			FLOOR CLASS EI 120 (width from 150 mm, density 1700 kg/m³)		WALL EI 120			
						(width from 150 mm, density 600 kg/m³)		(width from 100mm)	
				Insulation thickness 25 mm		Insulation thickness 13 mm		Insulation thickness 32 mm	
Nominal pipe diameter, maximum wall thickness 14.2	Piro Multitube PM width selected from ETA	Piro Multitube PM thickness selected from ETA	Number of rows of Piro Multitube PM	Number of Piro Multitube PM wraps on a pipe	Length of the tape to be cut off	Number of Piro Multitube PM wraps on a pipe	Length of the tape to be cut off	Nominal pipe diameter, maximum wall thickness 14.2	Piro Multitube PM width selected from ETA
mm	mm	mm			mm		mm		mm
50	60	2,5	2	2	1350	2	1049	3	2336
	60	4	2	2	1407	1	528	2	1583
	100	4,8	1	1	329	1	254	2	806
60	60	2,5	2	3	2261	2	1174	3	2525
	60	4	2	2	1532	1	590	2	1708
	100	4,8	1	2	781	1	285	2	869
65	60	2,5	2	3	2355	2	1237		
	60	4	2	2	1595	1	622		
	100	4,8	1	2	813	1	301		
70	60	2,5	2	3	2449	2	1300		
	60	4	2	2	1658	1	653		
	100	4,8	1	2	844	1	317		
75	60	2,5	2	3	2543	2	1363		
	60	4	2	2	1721	1	685		
	100	4,8	1	2	875	1	332		
80	60	2,5	2	3	2638	2	1426		
	60	4	2	2	1784	1	716		
	100	4,8	1	2	907	1	348		
100	60	2,5	2	4	4082	2	1677		
	60	4	2	3	3127	1	842		
	100	4,8	1	3	1594	1	411		
125	60	2,5	2	4	4710	2	1991		
	60	4	2	3	3598	1	999		
	100	4,8	1	3	1829	1	489		
150	60	2,5	2	4	5338	2	2305		
	60	4	2	3	4069	1	1156		
	100	4,8	1	3	2065	1	568		
200	60	2,5	2	5	8321	2	2933		
	60	4	2	3	5011	1	1470		
	100	4,8	1	3	2536	1	725		
250	60	2,5	2	6	11963	2	3561		
	60	4	2	4	8038	1	1784		
	100	4,8	1	4	4069	1	882		

The red color suggests the most optimal solution

METHOD OF PROTECTING METAL PIPES IN INSULATION OF PE FOAM THROUGH A WALL AND FLOOR ACCORDING TO ETA-17/1061



- 1 - rigid wall thickness $B = \text{min. } 100 \text{ mm}$
- 2 - metal pipe, diameter "D" and pipe wall thickness "t"
- 3 - PE foam insulation, thickness "g"; nominal density of 30 kg/m^3 and reaction to fire class E according to EN 13501-1
- 4 - Piro Multitube PM (inside) with dimensions [h x s], centrally located inside the wall
- 5 - clamp band or adhesive tape
- 6 - gypsum mortar with a thickness of $g_1 = \text{min. } 5 \text{ mm}$
- 7 - the gap between the pipe insulation and the partition with the maximum width $a = 30 \text{ mm}$, filled with mineral wool with a density of $\text{min. } 60 \text{ kg/m}^3$
- 8 - PiroCoat I with dimensions: length $L = \text{min. } 500 \text{ mm}$, thickness $s_1 = \text{min. } 1.2 \text{ mm}$

- 1 - reinforced concrete floor with a thickness of $B = \text{min. } 150 \text{ mm}$
- 2 - metal pipes with a diameter D_1, D_2 and a pipe wall thickness t_1, t_2
- 3 - Tubolit PE insulation on metal pipes, thickness "g" (continuous insulation) thickness $a_1 = \text{min. } 1.2 \text{ mm}$
- 5 - clamp band or adhesive tape
- 6 - Piro Multitube PM [h x s] mm, placed inside the floor, at a distance of $15 \pm 5 \text{ mm}$ from the underside of the floor
- 7 - PiroCoat I paste on metal pipes with PE insulation, length $L = \text{min. } 300 \text{ mm}$ and thickness $g_1 = \text{min. } 1.2 \text{ mm}$
- 8 - space between a floor and installation, filled cement mortar, approx. 25 mm .

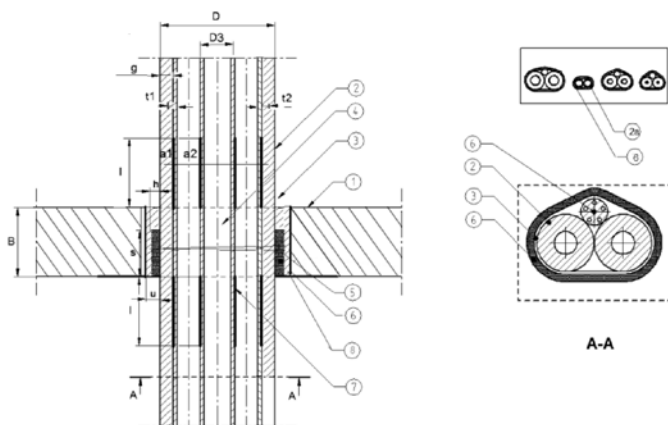
INSTALLATION OF PIRO MULTITUBE PM ON METAL PIPES IN PE FOAM INSULATION THROUGH A WALL OR FLOOR

STEP 1	STEP 2	STEP 3	STEP 4	STEP 5	STEP 6
					
From Table 12, read the length of Piro Multitube PM for a given pipe diameter, measure it and cut it with a knife	Wrap the cut tape around the pipe insulation. Follow strictly the number of wraps given in Table 12	Remove 300 mm of the insulation from the pipe on both sides of the partition	By using a brush, apply PiroCoat I on a pipe so that a ring with a width of min. 300 mm and a thickness of min. 1.2 mm is created	Reattach previously removed insulation to the pipe on both sides of the partition	Fill the space between the pipe and the partition with cement mortar or mineral wool with a minimum density of 60 kg/m^3 . Mark the penetration seal with the attached label, mark Piro Multitube PM and PiroCoat I on it, enter the date and name

TABLE FOR SELECTING THE LENGTH AND NUMBER OF WRAPS FOR PIRO MULTITUBE PM BANDS FOR SINGLE METAL PIPES IN PE FOAM INSULATION

TABLE 12							
PIPES: STEEL / COPPER / CAST IRON							
		FLOOR EI 120 (width from 150 mm, density 1700 kg/m^3)			WALL EI 120 (width from 100 mm, density 600 kg/m^3)		
		Insulation thickness 0.1-32 mm			Insulation thickness 0.1-32 mm		
Nominal pipe diameter, maximum wall thickness 14.2	Piro Multitube PM size selected from ETA	Number of rows of Piro Multitube PM	Number of Piro Multitube PM wraps	Length of the tape to be cut off	Number of rows of Piro Multitube PM	Number of Piro Multitube PM wraps	Length of the tape to be cut off
mm	mm			mm			mm
DN ≤ 35	60 x 2,5	1	4	Depending on the diameter and thickness of the insulation	1	4	Depending on the diameter and thickness of the insulation
	60 x 4	1	2		1	2	
	100 x 4,8	1	1		1	1	

METHOD OF PROTECTING METAL PIPES AND CABLES OR TWO PLASTIC PIPES IN PE FOAM INSULATION THROUGH THE FLOOR ACCORDING TO ETA-17/1061



- 1 - reinforced concrete floor with a thickness of $B = \text{min. } 150 \text{ mm}$
- 2 - metal pipes with a diameter $D1, D2$ and a pipe wall thickness $t1, t2$
- 2a - plastic pipes with a diameter of $D4, D5$ and a pipe wall thickness of $t3, t4$
- 3 - Tubolit PE insulation on metal pipes, thickness "g" (continuous insulation)
- 4 - small cable, diameter $D3$, covered with PiroCoating on length $L = \text{min. } 300 \text{ mm}$, thickness $a1 = \text{min. } 1.2 \text{ mm}$
- 5 - band clamp or adhesive tape
- 6 - Piro Multitube PM [h x s] mm band, placed inside the floor, at a distance of $15 \pm 5 \text{ mm}$ from the underside of the floor
- 7 - PiroCoat I on metal pipes with PE insulation, length $L = \text{min. } 300 \text{ mm}$ and thickness $g1 = \text{min. } 1.2 \text{ mm}$
- 8 - the space between the floor and the installation, filled cement mortar, approx. 25 mm.

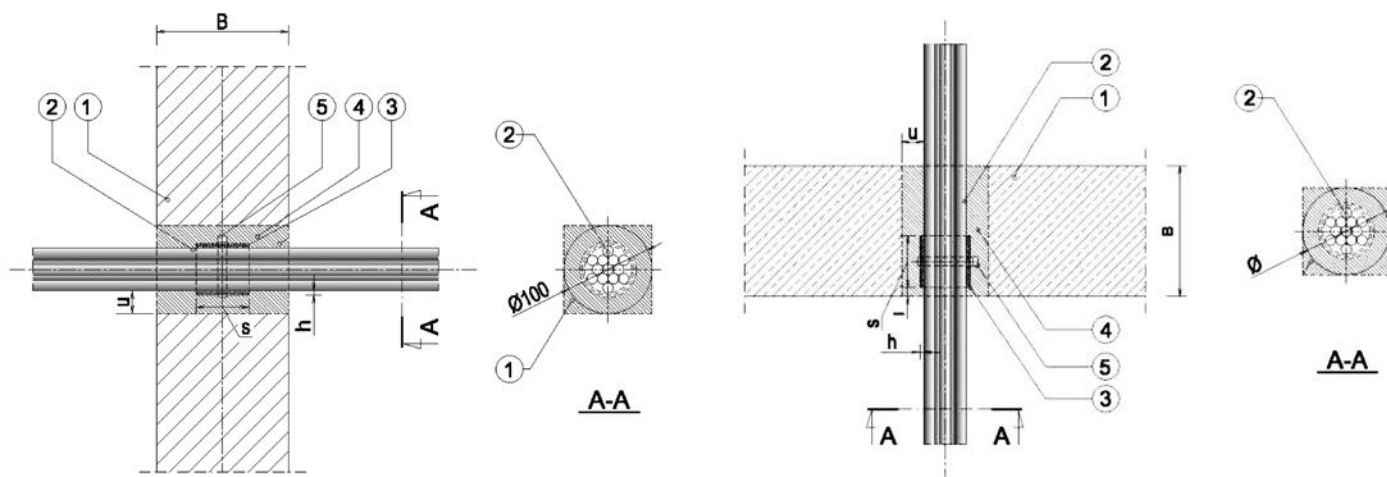
INSTALLATION OF PIRO MULTITUBE PM ON PIPE BUNDLE OF TWO METAL PIPES IN PE FOAM INSULATION WITH A CABLE, PASSING THROUGH THE FLOOR

STEP 1	STEP 2	STEP 3	STEP 4	STEP 5	STEP 6
Read from Table 13 the number of wraps of Piro Multitube PM for a given pipe diameter, measure the appropriate length of the tape and cut it with a knife	Wrap the cut tape around the bundle of pipes with a cable. Follow strictly the number of wraps given in Table 13	Secure the tape with a clamp band and slide it into the partition. Location of the tape inside the hole $-15 \pm 5 \text{ mm}$ from the bottom of the floor	Remove 300 mm of insulation from the pipes on both sides. By using a brush, apply PiroCoat I to the pipe for a length of min. 300 mm and a thickness of min. 1.2 mm	Reattach previously removed insulation to the pipe on both sides of the partition. By using a brush, apply the PiroCoating to the length of min. 300 mm. Fill the space between the bundle and the partition with cement mortar	Mark the penetration seal with the attached label, mark Piro Multitube PM, PiroCoat I, PiroCoating on it. Enter the date and name

TABLE FOR SELECTING THE NUMBER OF WRAPS FOR THE PIRO MULTITUBE PM FOR METAL PIPE IN INSULATION WITH PE FOAM WITH A CABLE THROUGH A FLOOR

TABLE 13					
COPPER PIPES					
	Select the type of Piro Multitube PM		FLOOR EI 120 (width from 150 mm and density 1700 kg/m ³)		
			Insulation thickness 9 mm		
Nominal pipe diameter, maximum wall thickness 14.2	Piro Multitube PM width selected from ETA	Piro Multitube PM thickness selected from ETA	Number of rows of Piro Multitube PM	Number of Piro Multitube PM wraps	Length of the tape to be cut off
mm	mm	mm			mm
DN ≤ 22.2 + kabel ≤ 14 mm	60	2,5	1	2	Depending on the diameter
	60	4	1	1	
	100	4,8	1	1	

METHOD OF PROTECTING A CABLE BUNDLE PENETRATING WALL AND FLOOR ACCORDING TO ETA-17/1061



- 1 - rigid wall thickness $B = \min. 150 \text{ mm}$
- 2 - cable bundle, diameter $\leq 100 \text{ mm}$, consisting of cables with diameter no greater than 14 mm
- 3 - Piro Multitube PM (inside) $[h \times s]$, located centrally in the middle of the wall
- 4 - the gap between the cable bundle and the partition with the maximum width $u = 25 \text{ mm}$, filled with cement mortar
- 5 - clamp band or adhesive tape

- 1 - reinforced concrete floor with a thickness of $B = \min. 150 \text{ mm}$
- 2 - cable bundle, diameter $\leq 100 \text{ mm}$, consisting of cables with diameter no greater than 14 mm
- 3 - Piro Multitube PM (inside) $[h \times s]$; placed at a distance $l = 15 \pm 5 \text{ mm}$ from the underside of the floor
- 4 - the gap between the cable bundle and the partition, with the maximum width $u = 25 \text{ mm}$, filled with cement mortar
- 5 - clamp band or adhesive tape

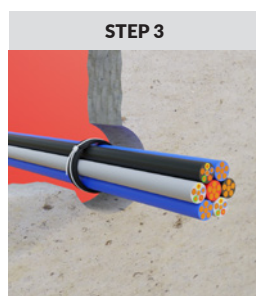
INSTALLATION OF PIRO MULTITUBE PM ON A CABLE BUNDLE THROUGH A WALL OR FLOOR



Read the number of Piro Multitube PM wraps from Table 14, measure the appropriate length of the tape and cut it with a knife



Wrap the cut piece of tape around the cable bundle. Follow strictly the number of wraps given in Table 14



Secure the Piro Multitube PM with a clamp band and slide it into the partition



Fill the space between the cable bundle and the partition with cement mortar



Mark the penetration seal with the attached label, mark Piro Multitube PM on it, enter the date and name

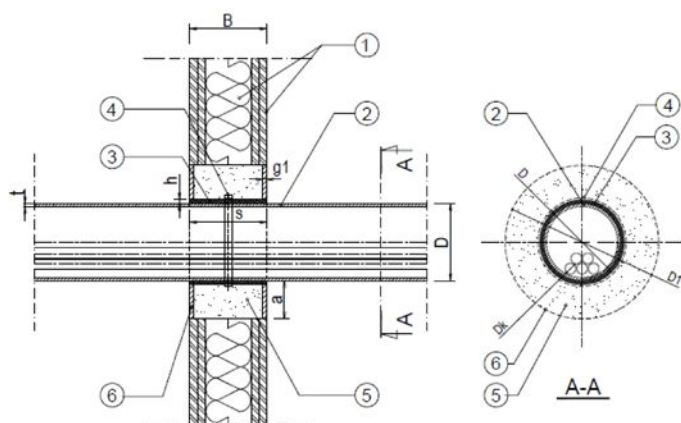
TABLE FOR SELECTING THE LENGTH AND NUMBER OF WRAPS OF PIRO MULTITUBE PM FOR A CABLE BUNDLE

TABLE 14

CABLE BUNDLE

WALL EI 120 (width from 150 mm and density 600 kg/m ³)			
Outer diameter of the cable bundle max.	Type Piro Multitube PM	Number of wraps of Piro Multitube PM	Length of the tape to be cut off
≤ 100	60 x 2,5	4	The length depends on the diameter of the cable bundle
	60 x 4	3	
	100 x 4,8	2	
	Or in two rows		
	60 x 2,5	2	
	60 x 4	2	

METHOD OF PROTECTING A CABLE BUNDLE IN A PLASTIC PIPE THROUGH A WALL AND FLOOR ACCORDING TO ETA-17/1061



- 1 - flexible or rigid wall with a thickness of $B = \text{min. } 100 \text{ mm}$
- 2 - plastic pipe, diameter "D" and pipe wall thickness "t", with a cable bundle inside, diameter 60 mm, consisting of a maximum of 5 cables with a diameter not greater than 13 mm
- 3 - Piro Multitube PM with dimensions [h x s] placed centrally inside the wall
- 4 - clamp band or adhesive tape
- 5 - the gap between the pipe and the partition, width "a", filled with mineral wool with a density of min. 60 kg/m^3
- 6 - gypsum mortar with a thickness of $g1 = \text{min. } 5 \text{ mm}$

INSTALLATION OF PIRO MULTITUBE PM ON A CABLE BUNDLE IN A PLASTIC PIPE THROUGH A WALL OR FLOOR

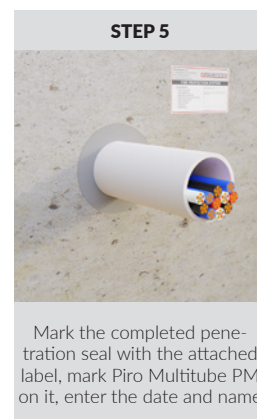
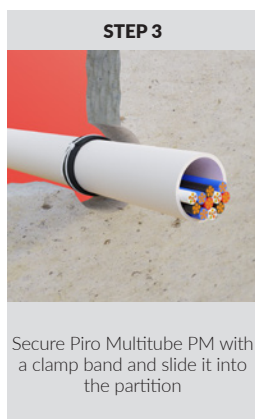


TABLE FOR SELECTING THE LENGTH AND NUMBER OF WRAPS OF PIRO MULTITUBE PM FOR A CABLE BUNDLE IN A PLASTIC TUBE

TABLE 15			
CABLE BUNDLE			
WALL EI 120 (width from 100 mm)			
The outer diameter of PVC pipe	Type of Piro Multitube PM	Number of wraps of Piro Multitube PM	Length of the tape to be cut off
≤110	60 x 2,5	7	The length depends on the diameter of the PVC pipe
	60 x 4	4	
	100 x 4,8	2	
	Or in two rows		
	60 x 2,5	4	
	60 x 4	2	

PIRO MULTITUBE PM EQUIVALENT WIDTH EXCHANGE TAPE SWITCH FROM 120 MM TAPE TO 100 MM WIDTH TAPE

TABLE 16

width of intumescent insert [mm]	thickness of intumescent insert [mm]	width of intumescent insert [mm]	thickness of intumescent insert [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

PIRO MULTITUBE PM EQUIVALENT WIDTH EXCHANGE TAPE SWITCH FROM 120 MM TAPE TO 60 MM WIDTH TAPE

TABLE 17

width of intumescent insert [mm]	thickness of intumescent insert [mm]	width of intumescent insert [mm]	thickness of intumescent insert [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

PIRO MULTITUBE PM EQUIVALENT WIDTH EXCHANGE TAPE SWITCH FROM 100 MM TAPE TO 60 MM WIDTH TAPE

TABLE 18

width of intumescent insert [mm]	thickness of intumescent insert [mm]	width of intumescent insert [mm]	thickness of intumescent insert [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

PRODUCT DOCUMENTS

European Technical Approval :	ETA-17/1064
Certificate of Constancy of Performance:	1488-CPR-0725/W
Hygienic certificate:	BK/B/0178/01/2019
European Declaration of Performance:	PIRO/07-2018-09-10

PRODUCT TECHNICAL DATA

Fire resistance class:	up to EI 120 C/U, U/C
Reaction to fire:	B-s2, d0
Color:	black
Environment class:	Z1, Z2
Storage temperature range:	from +5°C to +30°C
Shelf life:	no limit, recommended period not longer than 24 months
Packaging:	1 piece
Wraps types:	PW-55 PW-82 PW-90 PW-110 PW-125 PW-160



TECHNICAL DESCRIPTION:

Piro Wrap PW is a polymer wrap with an admixture of graphite and other components that make the assembly smooth and flexible, and under high temperature, it increases its volume, closing the hole with the pipe or cable on which it is wrapped. The wrap has a rectangular shape and is produced in several dimensions of the insert thickness and 60 mm or 100 mm width. Piro Wrap PW is delivered as ready-made products. It consists of one or more layers of intumescent inserts for the wraps, placed in a closed pouch made of PVC foil or similar material. At one end of the bag there is an adhesive tape with a tab used to fix the wrap to the pipe. Piro Wrap PW should be wrapped around the pipe, and if necessary, it can be cut to the required length. The wrap should be placed in the hole inside the partition.

INTENDED USE:

Piro Wrap PW is designed to stop fire and perform fireproof sealing of penetration seal in walls or floors through which single plastic pipes (PVC, PP, PE-HD, PE, ABS, SAN + PVC) with a diameter of up to 160 mm pass. The thickness of the insert depends on the type of pipe material and its diameter. The thickness of the partition through which the installations are carried out should not be less than: - 100 mm - for flammable pipes DN ≤ 110 mm - walls made of concrete, cellular concrete, solid brick, perforated or checkered mesh, - 150 mm - floors made of concrete or reinforced concrete.

APPLICATION:

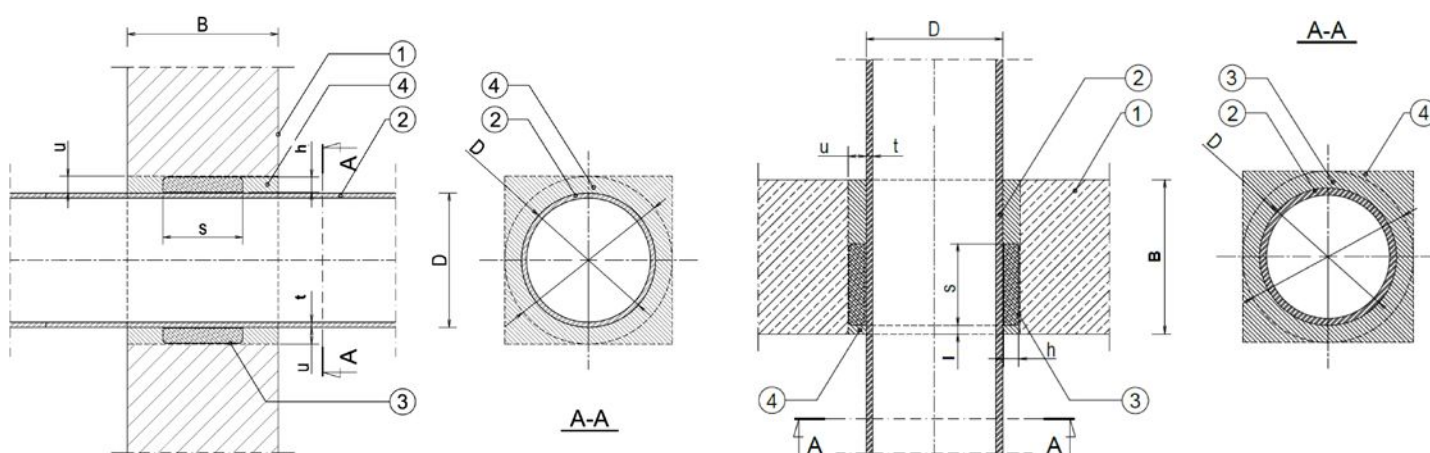
THE TYPES OF PARTITION WHERE PIRO WRAP PW CAN BE USED SHOWN IN TABLE 19 BELOW

TABLE 19	
FLOOR	RIGID WALL
width from 150 mm	width from 100 mm
Reinforced concrete	Aerated concrete, concrete, brick, other ceramic products
	

Piro Wrap PW is a type of Piro Multitube PM, just like Piro Multitube PM (ETA-15/06511) it is mounted inside the partition. The position of the wrap in the partition is shown in Figure 1.2. Piro Wrap PW is a ready-to-use product, intumescent insert matched to the diameter of a pipe is inside a foil bag, which is wrapped around the pipe. In order to mount the wrap before pouring the floor or building the wall, it should be fixed on the pipe in the same way as the Piro Multitube PM, by using a clamp band or adhesive tape, which will fix the band to the pipe and prevent it from moving. Piro Wrap PW does not require a supporting structure, therefore it can be mounted directly on the pipe. For pipes led in a shaft or in technical openings, the wraps should be installed before they are walled up. In the case of drilled holes, the Piro Wrap PW should be wrapped around the pipe outside the hole and inserted into the hole in the separating partition. The wrap is attached to the pipe by means of an integrated self-adhesive element. Mounting clearance ($u = \text{c.a. } 25 \text{ mm}$) obtained after drilling in the supporting structure in order to seal with the Piro Wrap PW is required due to the space needed for mounting (inserting the wrap into the hole).

EXAMPLES OF PRODUCT TECHNICAL APPLICATION:

METHOD OF PROTECTING A PLASTIC PIPE WITHOUT INSULATION THROUGH THE WALL AND FLOOR ACCORDING TO ETA-17/1064



- 1 - rigid wall with a thickness of $B \geq 100$ or 150 mm (see Annex B)
- 2 - plastic pipe, diameter "D" and pipe wall thickness "T" (see Annexes B and D)
- 3 - Piro Wrap PW with dimensions $[h \times s]$, placed in the center of the wall
- 4 - space between the pipe and the wall structure, width $u = \text{max. } 30 \text{ mm}$, filled with cement mortar or mineral wool with density min. 50 kg/m^3

- 1 - rigid floor with thickness $B \geq 150 \text{ mm}$
- 2 - plastic pipe, diameter "D" and pipe wall thickness "T" (see Annexes B and D)
- 3 - Piro Wrap PW with dimensions $[h \times s] \text{ mm}$; placed at the distance $l = 10 \text{ mm}$ from the underside of the floor
- 4 - space between the pipe and the floor structure, width $u = \text{max. } 25 \text{ mm}$, filled with cement mortar

■ INSTALLATION OF PIRO WRAP PC ON A FLAMMABLE PIPE THROUGH A RIGID WALL OR FLOOR

STEP 1  Read the pipe diameter from Table 20 and select the appropriate size of Piro Wrap PW	STEP 2  Wrap around the pipe and secure the wrap with the integrated adhesive	STEP 3  Slide the secured wrap into the partition. Location of the wrap inside the hole - central position along the wall axis or 15 ± 5 mm from the bottom of the floor	STEP 4  Fill the space between the pipe and the partition with cement mortar	STEP 5  Mark the completed penetration seal with the attached label, mark Piro Wrap PW on it, enter the date and name
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■ INSTALLATION OF PIRO WRAP PC ON A FLAMMABLE PIPE THROUGH FLOOR

STEP 1  Read the pipe diameter from Table 20 and select the appropriate size of the Piro Wrap PW	STEP 2  Wrap around the pipe and secure the wrap with the integrated adhesive	STEP 3  Slide the secured wrap into the partition. Location of the wrap inside the opening - central position along the wall axis	STEP 4  Fill the space between the pipe and the partition with mineral wool with a minimum density of 60 kg/m^3 and fill with gypsum mortar with a thickness of up to 5 mm	STEP 5  Mark the completed penetration seal with the attached label, mark Piro Wrap PW on it, enter the date and name
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■ PIRO WRAP PC SELECTION CHART FOR THE MOST COMMON PLASTIC PIPES

TABLE 20							
		RIGID WALL EI 120 (width 150 mm)			FLOOR EI 120 (width 150 mm)		
		Flammable pipe wall thickness selected from ETA			Flammable pipe wall thickness selected from ETA		
Pipe diameter	Type of Wrap	PVC	PE-HD, PE, ABS, SAN+ PVC	PP	PVC	PE-HD, PE, ABS, SAN+ PVC	PP
mm	CW	mm	mm	mm	mm	mm	mm
15	CW-25*	1,8-2,4	1,8-3,5	1,8-2,6	1,6	2,7	1,8
25	CW-25*	1,8-2,4	1,8-3,5	1,8-2,6	1,6	2,7	1,8
32	CW-32*	1,8-2,4	1,8-3,5	1,8-2,6	1,6	2,7	1,8
40	CW-40*	1,8-2,4	1,8-3,5	1,8-2,6	1,6	2,7	1,8
48	CW-55	1,8-2,4	1,8-3,5	1,8-2,6	1,9-2,2	2,9-3,3	2-2,2
50	CW-55	1,8-2,4	1,8-3,5	1,8-2,6	1,9-2,4	3-3,5	2-2,3
63	CW-63	2,1-2,8	2,8-4,4	2-3,2	2,2-3,3	3,3-4,3	2,2-2,9
75	CW-82	2,4-3,2	3,7-5	2,2-3,8	2,5-4,2	3,6-5	2,4-3,5
82	CW-82	2,6-3,4	4,3-5,5	2,3-4,1	2,7-4,7	3,8-5,4	2,5-3,9
90	CW-90	2,8-3,7	4,9-6	2,4-4,5	3-5,3	4-6	2,6-4,3
110	CW-110	3,4-4,4	6,7-7,3	2,8-5,5	3,5-6,9	4,5-7,2	3-5,3
125	CW-125**	4,1-4,9	7,7-8,3	4-5,6	4,3-7,9	4,9-8,1	4,1-6
135	CW-135**	4,7-5,2	8,5-8,9	6	4,6-8,3	5,1-8,7	4,9-6,5
160	CW-160**	6,2	10,5		6,2-10,5	10-10,5	6,7-7,5

CAUTION:

- Wraps marked with (*) are manufactured on an individual order and are not available in current sales, they can be replaced by shortening the PW-55 Bands
- The wall thickness may vary depending on the material and purpose of the pipe. In accordance with the standards for PVC, PP, PEHD pipes (PN-EN 1451-1_2001P, PN-EN 1555-2_2012P, PN-EN-1401-1_2009P) standard point 6.2.5 Wall thickness - the wall thickness may vary compared to the nominal and max. the tolerance is variable and depends on the pipe diameter and can vary from 0.3 to 1 mm.

ODUCT DOCUMENTS

European Technical Approval :	ETA-17/1061
Certificate of Constancy of Performance:	1488-CPR-0727/W
European Declaration of Performance:	PIRO/07-2018-09-10

PRODUCT TECHNICAL DATA

Fire resistance class :	up to EI 120 C/U,U/C, C/C
Reaction to fire :	B-s2, d0
Color:	gray, black
Environment class:	Z1, Z2
Storage temperature range:	from +5°C to +35°C
Shelf life:	no limit, recommended period not longer than 24 months
Packaging:	1 piece
EPIPE sizes:	Ø 50 Ø 110



TECHNICAL DESCRIPTION:

Piro MULTITUBE Epipe is simple and effective solution for making fireproof sealing of electric cable penetrations through walls or floors. Piro MULTITUBE Epipe is a plastic tube with a permanently fixed, on the outside, an intumescent insert in the form of a polymer tape with an admixture of graphite and other ingredients, causing it to increase its volume under the action of high temperature, closing the hole together with the tube on which it is rolled and cables inside the duct. The principle of operation of the fire ducts is exactly the same as in the case of protection for flammable pipes with the use of fire protection tape. They can also be used to protect small diameter non-flammable pipe bundles in FEF insulation.

INTENDED USE:

Piro MULTITUBE Epipe is designed to stop fire and perform fireproof sealing of penetration seal through walls or floors through which single cables or cable bundles pass. The advantage of this solution is the possibility of adding an additional cable or cables even after the complete installation of Piro MULTITUBE Epipe in the wall or floor. Piro MULTITUBE Epipe is available in two diameters: Ø 50 and Ø 110, which makes it possible to select the perfect solution depending on the needs. For further information see ETA-17/1061.

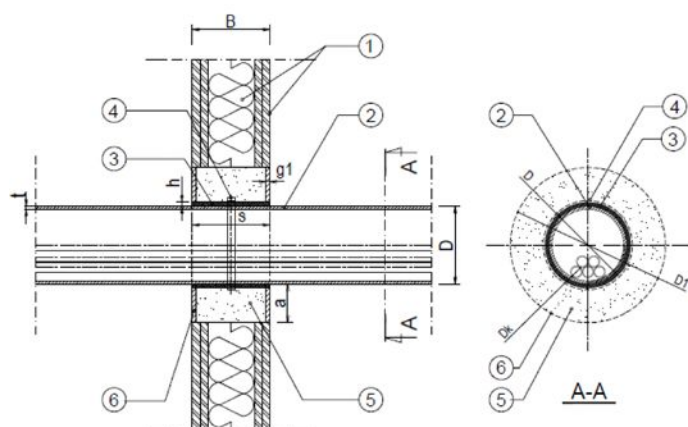
APPLICATION:

THE TYPES OF PARTITION WHERE PIRO WRAP PW CAN BE USED SHOWN IN TABLE 21 BELOW

TABLE 21		
FLOOR	RIGID WALL	FLEXIBLE WALL
width from 150 mm	width from 100 mm	width from 100 mm
Reinforced concrete	Aerated concrete, concrete, brick, other ceramic products	Plasterboard
		

EXAMPLES OF PRODUCT TECHNICAL APPLICATION:

METHOD OF PROTECTING A PLASTIC PIPE WITHOUT INSULATION WITH PLASTIC PIPES AND CABLE BUNDLES INSIDE THROUGH THE WALL ACCORDING TO ETA-17/1061



- 1 - flexible or rigid wall with a thickness of $B = \text{min. } 100 \text{ mm}$
- 2 - plastic pipe, diameter "D" and pipe wall thickness "t"; with a bundle of cables inside, with a diameter of 60 mm, consisting of a maximum of 5 cables with a diameter not greater than 13 mm
- 3 - Multitube with dimensions [h x s] placed centrally inside the wall
- 4 - clamp band or adhesive tape
- 5 - the gap between the pipe and the partition, width "a", filled mineral wool with a density of min. 60 kg/m^3
- 6 - gypsum mortar with a thickness of $g1 = \text{min. } 5 \text{ mm}$

INSTALLATION OF EPIPE FIRE DUCTS IN WALLS AND FLOORS

STEP 1	STEP 2	STEP 3	STEP 4	STEP 5
				
Place EPIPE in the hole so that its black part is centrally located inside the partition	Fill the empty space between the partition and the culvert with cement mortar	Cut off the parts of the EPIPE duct on both sides of the partition by means of saw	Run the cables inside the duct (the duct may be no greater than 60 percent of its cross section filled with cables)	Plug the remaining free space of the duct with the provided plugs

NEW PRODUCT!

Piro Collar PC L

PIROSYSTEM
Piro Collar PC L 110

DO ZASTOSOWAŃ W ŚCIANACH I STROPACH WYKONANYCH Z:

- BETONU I ŻELBETU
- BŁOCKÓW KOMÓRKOWYCH I SILIKATOWYCH
- CEGIEŁ I PUSTAKÓW CERAMICZNYCH
- PŁYT GIPSOWO KARTONOWYCH

Aprobata Techniczna: ETA-17/1063
Certyfikat Stałości Właściwości Użytkowych: 1488-CPB-0725/W
Deklaracja Właściwości Użytkowych: PIRO/08-2018-09-10

PRZEZNACZENIE I ZASTOSOWANIE:
ZGODNIE Z KARTĄ TECHNICZNĄ PRODUKTU (DANE O WYROBIE)

Zestaw Piro Collar PC L 110

5 907784 647405

EI 120

PIRO COLLAR PC L

OSŁONA SEGMENTOWA

WKLAD PĘCZNIACY

KOMPLET MOCOWAŃ

KOMPLET ZAPNEK

ZESTAW KOŁNIERZY OGNIOSCHRONNYCH DO ZABEZPIECZANIA PRZEJŚĆ RUR ORAZ KABLI PRZEZ ŚCIANY I STROPY PRZECIWPÓŻAROWE



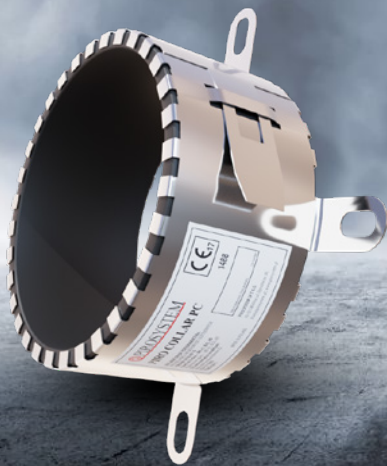
PIROSYSTEM Sp. z o.o. ul. Ogrodnicza 3A 83-021 Wiskita | biuro@pirosystem.pl | www.pirosystem.pl
WYPRODUKOWANO W POLSCE

MAJĄCODOPIKOWNO NA BOCIE

WYKORZYSTANIE ZP. z o.o. ul. Ogrodnicza 3A 83-021 Wiskita | biuro@pirosystem.pl | www.pirosystem.pl

FIREPROOF COLLARS

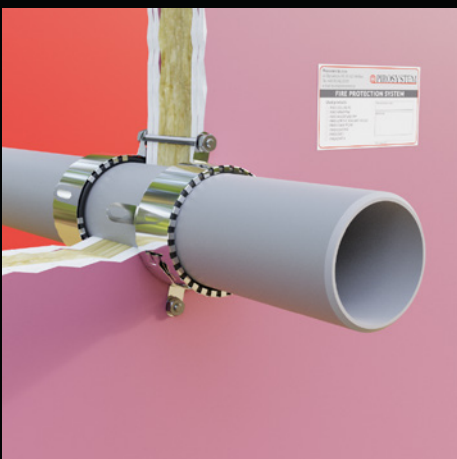
PIRO COLLAR PC
WITH A SMOOTH COVER
SMOOTH



PIRO COLLAR PC L
WITH A SEGMENT COVER
SEGMENT



PIRO COLLAR PC
WITH A SLIM COVER
SLIM



PRODUCT DOCUMENTS

European Technical Approval :	ETA-17/1063
Certificate of Constancy of Performance:	1488-CPR-0725/W
European Declaration of Performance:	PIRO/08-2018-09-10

PRODUCT TECHNICAL DATA

Fire resistance class :	up to EI 180 C/U, U/C
Reaction to fire :	B-s2, d0
Color:	silver
Environment class:	Z1, Z2
Storage temperature range:	from +5°C to +30°C
Shelf life:	no limit, recommended period not longer than 24 months
Packaging:	1 piece



SMOOTH



TECHNICAL DESCRIPTION:

Piro Collar PC is a metal cylindrical flexible clamp mounted on a pipe. It consists of an outer cover made of a single or multi-segment stainless steel sheet and one or more inserts made of intumescent material, which in fire conditions increases its volume and closes the opening. The steel cover is equipped with a clamp, used to fasten the collar and stabilize it on the pipe, and with mounting brackets with holes through which steel expansion bolts are led, fixing the collar to the partition. The collar is delivered in the form of a ready-made product or in the form of an assembly kit for self-cutting and assembly during work on the site. Collars can be 30, 60, 180 mm high. The height of the collar depends on the diameter of the pipe or its intended use. In the range of internal collar diameters up to a diameter of 160 mm, there is full interchangeability of collars. The 60 mm high collar can be changed to a 30 mm high collar regardless of the seal type and material of the pipe or cable installation.

INTENDED USE:

Piro Collar PC is a product intended for fireproof sealing of penetration seals and mixed penetration seals in walls and floors of flammable pipes without insulation or with FEF or PE foam insulation, metal pipes insulated with FEF or PE foam, electric cables. The possible fire resistance class of ranges from EI 30 to EI 180. With the use of Piro Collar PC, it is possible to seal single pipes or pipe bundles, pipes in groups of e.g. 4 pieces, cable bundles, pipe bends that are mounted just below the floor. Other necessary information can be found in the ETA. Due to its good fireproof properties, Piro Collar PC is used for sealing pipes with particularly large diameters and where large thicknesses of flammable insulation on steel pipes are required. The product is intended for professional use.

In individual cases, it is possible to produce collars with inside diameter up to 950 mm, more about this can be found on page 56.

APPLICATION:

Piro Collar PC is designed to restore the fire resistance of flexible and rigid walls as well as rigid floors where cables, flammable or metal pipes are passing through.

THE STRUCTURAL ELEMENTS IN WHICH PENETRATION SEALS CAN BE MADE USING PIRO COLLAR PC ARE SHOWN IN THE TABLE 22 BELOW

FLOOR	RIGID WALL	FLEXIBLE WALL
Floors made of concrete or reinforced concrete, with a thickness of not less than 150 mm and a density of not less than 1700 kg/m ³	Walls made of concrete, reinforced concrete, cellular concrete, solid brick, hollow or checkered brick, with a thickness of not less than 100 or 125 mm and a density of not less than 600 kg/m ³	Walls not less than 125 mm thick, with a frame construction made of steel or wooden sections
width from 150 mm	width from 100 mm or 125 mm	width from 125 mm
Żelbet	Aerated concrete, concrete, brick, other ceramic products	Plasterboard
		

INSTALLATION DATA:

The collar is delivered as ready for assembly or in the form of an assembly kit. The internal diameter of the collar should be matched to the external diameter of the protected installation element (pipe, insulation, cable). In case of walls, it is required to install two collars on both sides of partition, in case of floors, one collar should be installed on the lower side of the floor. For proper installation and use, adjusting the cover or the intumescent insert to the pipe diameter, always follow the instructions in the CC-IM1 / CC-IM2 manual, which is attached to the product. Piro Collar PC should be fixed to the wall or floor with the use of symmetrically placed expansion bolts (M6x60 mm or M8x80 mm). The minimum number of expansion bolts is given in TABLE 23 and 24.

60 MM COLLARS

PIPE DIAMETER OR PIPE DIAMETER WITH INSULATION	MINIMUM NUMBER OF EXPANSION BOLTS	TYPE OF EXPANSION BOLT
mm	pieces	-
25, 32, 40, 48	2	M6x60
55, 68, 82, 90	3	M6x60
110, 125	4	M8x80
135	5	M8x80
160	6	M8x80
200	7	M8x80
250	8	M8x80
315	10	M8x80
350	11	M8x80
400	13	M8x80

30 MM COLLARS

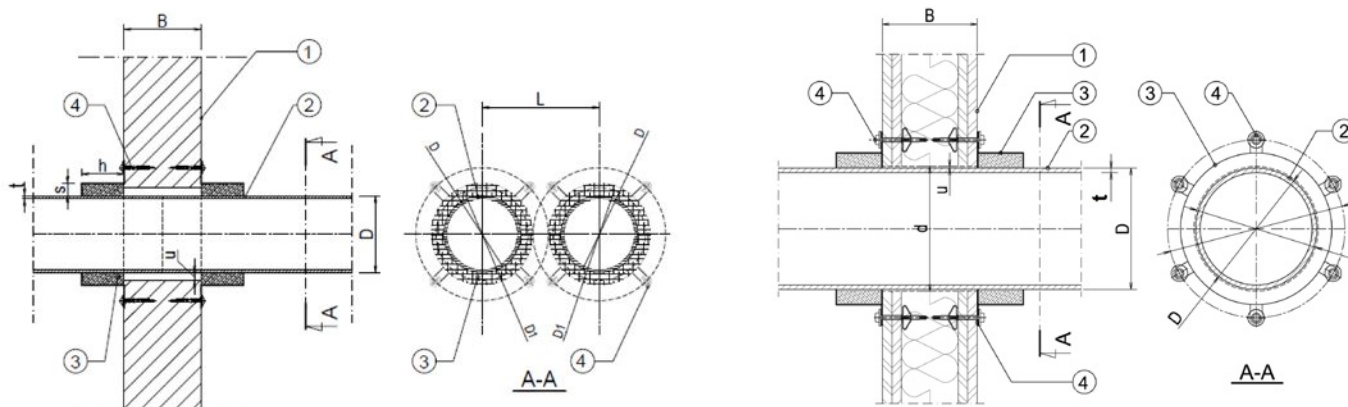
PIPE DIAMETER OR PIPE DIAMETER WITH INSULATION	MINIMUM NUMBER OF EXPANSION BOLTS	TYPE OF EXPANSION BOLT
mm	pieces	-
25, 32, 40, 48	2	M6x60
55	3	M6x60
68, 82	3	M8x80
110, 125, 135	4	M8x80
160	6	M8x80

ADDITIONAL PRODUCTS THAT CAN BE USED WITH PIRO COLLAR PC IN PIPE PENETRATION SEALS:

- **synthetic, flexible elastomeric foam (FEF)** wg EN 14304, reaction to fire class BL-s3,d0, EN 13501-1 and density 45 ÷ 70 kg/m³,
- **insulating foam Tubolit PE**, with reaction to fire class E according to EN 13501-1, and nominal density 30 kg/m³,
- **acoustic mat PE (Weberfloor 4955 db mat)**, with reaction to fire class Bfl-s1 according to EN 13501-1, and with a nominal mass per unit area of 12 kg/30 m². The PE acoustic mat is recommended in floors, especially when it is required to reduce the acoustic effects of sewage pipes - additional sound absorption of the mat up to 19 dB with one wrapping.

EXAMPLES OF PRODUCT TECHNICAL APPLICATION:

METHOD OF PROTECTING A PLASTIC PIPE WITHOUT INSULATION THROUGH THE WALL ACCORDING TO ETA-17/1063



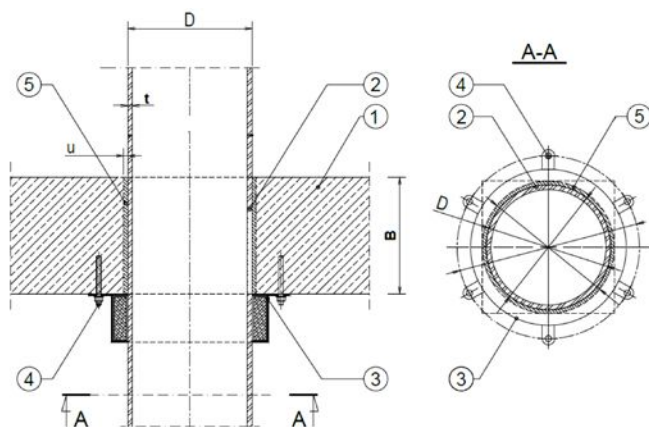
- 1 - rigid wall thickness $B = \min. 100 \text{ mm}$
- 2 - plastic pipe, diameter "D" and wall thickness "t" space between pipe insulation and wall structure width $u = \max. 15 \text{ mm}$, filled with gypsum plaster to a depth of min. 10 mm
- 3 - Piro Collar PC mounted on both sides of the wall
- 4 - collar mounting - steel mounting expansion bolt M6x60 or M8x80 (see TABLE 23)

- 1 - flexible wall with a thickness of $B = \min. 125 \text{ mm}$
- 2 - plastic pipe, diameter "D" and th. walls "t"; the space between the pipe insulation and the wall structure with a width of $u = \max. 15 \text{ mm}$
- 3 - Piro Collar PC mounted on both sides of the wall
- 4 - collar mounting - steel mounting expansion bolt M6x60 or M8x80 (see TABLE 23)

INSTALLATION OF PIRO COLLAR PC ON A PLASTIC PIPE THROUGH A RIGID AND FLEXIBLE WALL

STEP 1	STEP 2	STEP 3	STEP 4	STEP 5
Fill the space between the pipe wall and the partition tightly. Use cement mortar	Place the collar on the pipe. In case of collars with a diameter of PC-125 and larger Piro Collar PC L, first wrap the pipe four times with an intumescent insert and then put the steel cover on top	Pull the locking pin of the clamp through the fixing slot on the other end of the collar and fold it 180° backwards so that the collar is firmly closed on the pipe	Attach the collar to the wall with steel expansion bolts. Do not use expansion bolts containing plastic parts	Mark the completed penetration seal with the label attached to the set. Mark Piro Collar PC on it, enter the date and the name
Fill the space between the pipe wall and the partition tightly. Use mineral wool with a density of min. 60kg/m ³	Place the collar on the pipe. In case of collars with a diameter of PC-125 and larger Piro Collar PC L, first wrap the pipe four times with an intumescent insert and then put the steel cover on top	Pull the locking pin of the clamp through the fixing slot on the other end of the collar and fold it 180° backwards so that the collar is firmly closed on the pipe	Attach the collar to the wall with expansion bolts to plasterboard or by means of rod and nuts. Do not use expansion bolts containing plastic parts	Mark the completed penetration seal with the label attached to the set. Mark Piro Collar PC on it, enter the date and the name

METHOD OF PROTECTING PLASTIC PIPE WITHOUT INSULATION THROUGH FLOOR ACCORDING TO ETA-17/1063



- 1 - rigid floor with a thickness of B = min. 150 mm
- 2 - plastic pipe, diameter "D" and wall thickness "t"
- 3 - Piro Collar PC, mounted on the underside of the floor
- 4 - collar mounting - steel mounting expansion bolt M6x60 or M8x80 (see TABLE 23)
- 5 - the space between the pipe and the wall structure, filled with mortar cement, with a thickness of u = max. 10 mm

INSTALLATION OF PIRO COLLAR PC ON PLASTIC PIPE THROUGH THE FLOOR

STEP 1	STEP 2	STEP 3	STEP 4	STEP 5
Fill the space between the pipe wall and the partition tightly. Use cement mortar	Place the collar on the pipe. In case of collars with a diameter of PC-125 and larger L, first wrap the pipe four times with an intumescent insert and then put the steel cover on top	Pull the locking pin of the clamp through the fixing slot on the other end of the collar and fold it 180 ° backwards so that the collar is firmly closed on the pipe	Attach the collar to the floor with steel expansion bolts. Do not use expansion bolts containing plastic parts	Mark the completed penetration seal with the label attached to the set. Mark Piro Collar PC on it, enter the date and the name

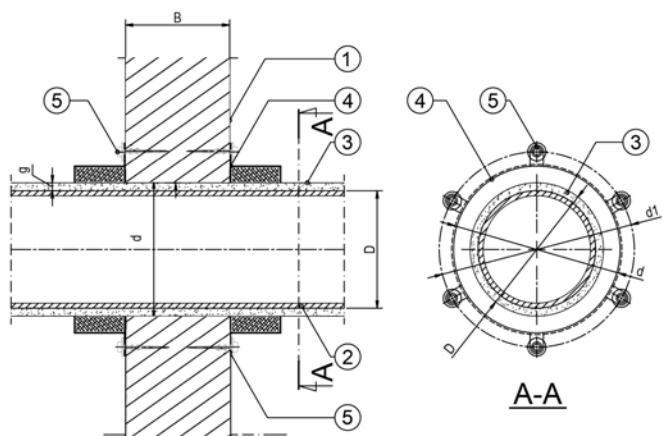
PIRO COLLAR PC SELECTION CHART FOR THE MOST COMMON PLASTIC PIPES

TABLE 25		FLEXIBLE WALL EI 120 (width 100 mm)			RIGID WALL EI 120 (width 150 mm)			FLOOR EI 120 (width 100 mm)		
		Flammable pipe wall thickness selected from ETA			Flammable pipe wall thickness selected from ETA			Flammable pipe wall thickness selected from ETA		
Pipe diameter	Selected collar	PVC	PE-HD, PE, ABS, SAN+ PVC	PP	PVC	PE-HD, PE, ABS, SAN+ PVC	PP	PVC	PE-HD, PE, ABS, SAN+ PVC	PP
mm	CC	mm	mm	mm	mm	mm	mm	mm	mm	mm
25	CC-25	1,8	1,8	1,8	1,8	2,4	1,8	1,6	2,7	6,7
32	CC-32	1,8	1,8	1,8	1,8	2,4	1,8	1,6	2,7	6,7
40	CC-40	1,8	1,8	1,8	1,8	2,4	1,8	1,6	2,7	6,7
48	CC-48	1,8	1,8	1,9	1,8	6,6	1,8	3,4	7	6,9
55	CC-55	2,1	1,8	2,0	2,7	6,6	2,4	3,4	7	7,2
68	CC-68	2,4	1,9	2,1	3,3	6,6	3	3,4	7	7,3
82	CC-82	2,7	1,9	2,3	3,6	6,6	3,4	3,4	7	7,4
90	CC-90	2,9	2,0	2,4	3,7	6,6	3,6	3,4	7	7,5
110	CC-110	3,3	2,0	2,6	4,6	6,6	4,4	3,4	7	7,6
125	CC-125	3,6	2,1	2,8	5,2	8,3	4,8	6	10	8
135	CC-135	3,9	2,1	2,9	5,6	8,3	5	6,5	10	8,1
160	CC-160	4,4	2,2	3,2	6,4	9,5	6,2	6,5	10	6,8
200	CC-200				3,9	11,9	7,7	6,5	11,9	13,5
250	CC-250							9,2		15,5
315	CC-315							10,4		18,2
350	CC-350							11,4		20
400	CC-400							12,3		

CAUTION:

Plastic pipe wall thickness may vary depending on the material and purpose of the pipe. In accordance with the standards for PVC, PP, PEHD pipes (PN-EN 1451-1_2001P, PN-EN 1555-2_2012P, PN-EN-1401-1_2009P) standard point 6.2.5 Wall thickness - the wall thickness may vary in relation to the nominal , and the maximum tolerance is variable and depends on the diameter of the pipe and can be from 0.3 to 1mm.

■ **METHOD OF PROTECTING A METAL OR PLASTIC PIPE IN FEF INSULATION THROUGH A RIGID WALL ACCORDING TO ETA-17/1063**



- 1 - rigid wall thickness $B = \text{min. } 100 \text{ mm}$
- 2 - plastic pipe, diameter "D" and wall thickness "t"
- 3 - the space between the pipe insulation and the wall structure in width $u = \text{max. } 15 \text{ mm}$, filled with gypsum plaster to the depth min. 10 mm
- 4 - Piro Collar PC mounted on both sides of the wall
- 5 - collar mounting - steel mounting expansion bolt M6x60 or M8x80 (see TABLE 23)

■ **INSTALLATION OF PIRO COLLAR PC ON METAL AND PLASTIC PIPE IN FLEXIBLE FOAM INSULATION FEF (RUBBER) PENETRATING A RIGID WALL**



Fill the space between the pipe insulation and the partition tightly. Use cement mortar



Place the collar on the pipe insulation. In case of collars with a diameter of PC-125 and larger L, first wrap the pipe four times with an intumescent insert and then put the steel cover on top



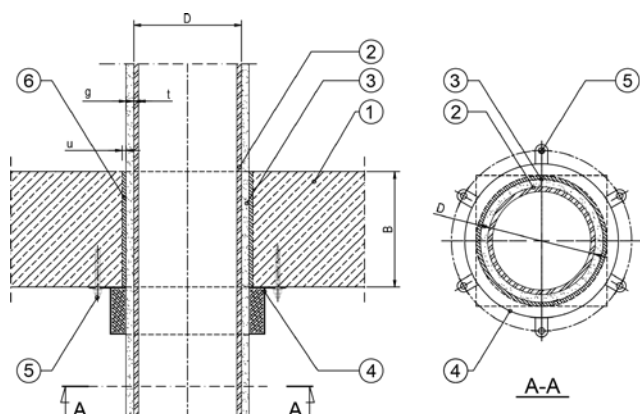
Pull the locking pin of the clamp through the fixing slot on the other end of the collar and fold it 180° backwards so that the collar is firmly closed on the pipe



Attach the collar to the wall with steel expansion bolts. Do not use expansion bolts containing plastic parts



Mark the completed penetration seal with the label attached to the set. Mark Piro Collar PC on it, enter the date and the name



- 1 - rigid floor with a thickness of min. 150 mm
- 2 - plastic or metal pipe, diameter "D" and wall thickness "t"
- 3 - continuous insulation made of flexible elastomeric foam (FEF), thickness "g", nominal density $45 \div 70 \text{ kg/m}^3$ and reaction to fire class BL-s2,d0 according to EN 13501-1
- 4 - Piro Collar PC, mounted on the underside of the floor
- 5 - collar mounting – expansion bolts M6x60 or M8x80 (see TABLE 23)
- 6 - space between pipe and wall structure, filled with mortar cement, with a thickness of $u = \text{max. } 10 \text{ mm}$

■ INSTALLATION OF PIRO COLLAR PC ON METAL AND PLASTIC PIPES IN INSULATION OF ELASTOMERIC FEF (RUBBER) FOAM PENETRATING THE FLOOR



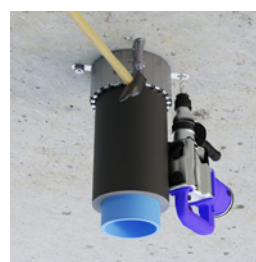
Fill the space between the pipe insulation and the partition tightly. Use cement mortar



Place the collar on the pipe insulation. In case of collars with a diameter of PC-125 and larger L, first wrap the pipe four times with an intumescent insert and then put the steel cover on top



Pull the locking pin of the clamp through the fixing slot on the other end of the collar and fold it 180° backwards so that the collar is firmly closed on the pipe

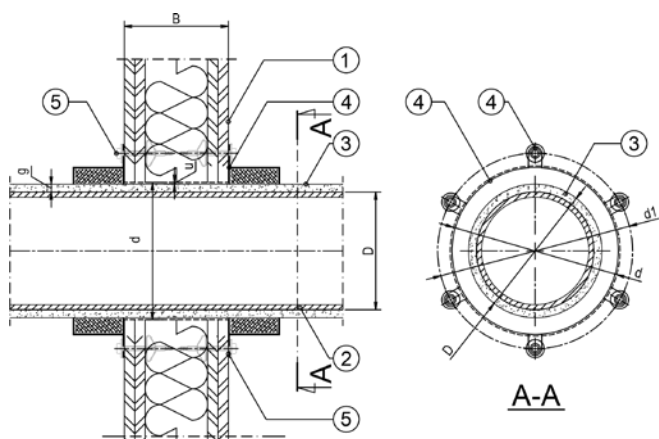


Attach the collar to the floor with steel expansion bolts. Do not use expansion bolts containing plastic parts



Mark the completed penetration seal with the label attached to the set. Mark Piro Collar PC on it, enter the date and the name

METHOD OF PROTECTING METAL AND PLASTIC PIPE IN FEF INSULATION IN A RIGID WALL ACCORDING TO ETA-17/1063



- 1 - flexible or rigid wall with a thickness of $B = \min. 125 \text{ mm}$
- 2 - metal or plastic pipe, diameter "D" and pipe wall thickness "t"; the space between the pipe insulation and the wall structure $u = \max. 15 \text{ mm}$
- 3 - continuous insulation made of flexible elastomeric foam (FEF), Thickness "G", nominal density $45 \div 70 \text{ kg/m}^3$ and reaction to fire class BL-s2, d0 according to EN 13501-1
- 4 - Piro Collar PC on the outside of the wall, mounted on both sides of walls
- 5 - collar mounting - expansion bolts M6x60 or M8x80 (see TABLE 23)

INSTALLATION OF PIRO COLLAR PC ON METAL AND PLASTIC PIPES IN INSULATION WITH ELASTOMERIC FEF FOAM PENETRATING A FLEXIBLE WALL

STEP 1	STEP 2	STEP 3	STEP 4	STEP 5
Fill the space between the pipe wall and the partition tightly. Use mineral wool with a density of $\min. 60 \text{ kg/m}^3$	Place the collar on the pipe insulation. In case of collars with a diameter of PC-125 and larger L, first wrap the pipe four times with an intumescent insert and then put the steel cover on top	Pull the locking pin of the clamp through the fixing slot on the other end of the collar and fold it 180° backwards so that the collar is firmly closed on the pipe	Attach the collar to the wall with expansion bolts to plasterboard or by means of rod and nuts. Do not use expansion bolts containing plastic parts	Mark the completed penetration seal with the label attached to the set. Mark Piro Collar PC on it, enter the date and the name

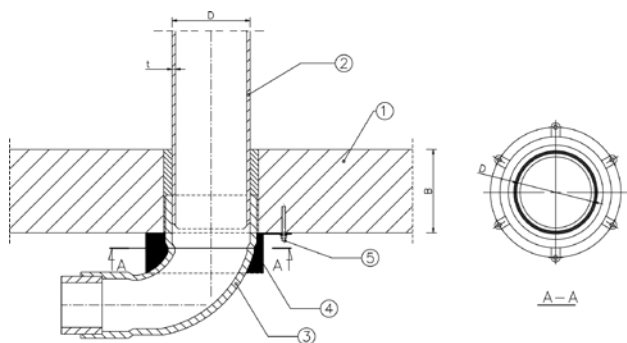
THE TABLE SHOWING POSSIBLE WALL AND FLOOR FEF INSULATION THICKNESSES DEPENDING ON PIPE MATERIAL

TABLE 26		
METAL AND PLASTIC PIPES		
	WALL EI 120 (wall thickness from 125 mm)	FLOOR EI 120 (floor thickness from 150 mm)
Pipe material	FEF insulation thicknesses [mm]	
COPPER	10, 35, 40	10, 25, 40, 50
STEEL	20, 25, 32	10, 19, 25, 32, 50
PVC	13, 25, 27	13 ÷ 20, 25

PIRO COLLAR PC SELECTION CHART FOR THE MOST COMMON PLASTIC AND METAL PIPES IN FEF INSULATION
THE TABLE SHOWS THE SELECTION OF PIRO COLLAR PC FOR INSULATION FEF = 13 MM (EI 120)

TABLE 27												
METAL AND PLASTIC PIPES												
	WALL EI 120 (wall thickness from 125 mm)			FLOOR EI 120 (floor thickness from 150 mm)		FLOOR EI 180 (floor thickness from 150 mm)						
	FEF 13 mm insulation											
Pipe material	Pipe diameter	Outer diameter	Selected collar PC	Outer diameter	Selected collar PC	Material rury	Pipe diameter	Insulation thickness	Outer diameter	Selected collar PC		
	mm	mm	CC	mm	CC		mm	mm	mm	CC		
COPPER	8	34	CC - 40	34	CC - 40	PE-RT	15	12	39	CC - 40		
	10	36	CC - 40	36	CC - 40		25	12	49	CC - 48		
	12	38	CC - 40	38	CC - 40		32	12	56	CC - 55		
	14	40	CC - 40	40	CC - 40		40	12	64	CC - 68		
	15	41	CC - 40	41	CC - 48		50	12	74	CC - 82		
	18	44	CC - 48	44	CC - 48	PP-STABI AL./ PP-R/ GF/PP-R	15	32	79	CC - 82		
	22	48	CC - 55	48	CC - 55		25	32	89	CC - 90		
	28	54	CC - 55	54	CC - 55		32	32	96	CC - 110		
	35	61	CC - 68	61	CC - 68		40	32	104	CC - 110		
	42	68	CC - 68	68	CC - 68		50	32	114	CC - 125		
	54	80	CC - 82	80	CC - 82		63	32	127	CC - 135		
	63	89	CC - 90	89	CC - 90		75	32	139	CC - 160		
	76,1	102,1	CC - 110	102,1	CC - 110		83	32	147	CC - 160		
	88,9	114,9	CC - 125	114,9	CC - 125		90	32	154	CC - 160		
	108	134	CC - 135	134	CC - 135			32	174	CC - 200		
	STEEL	17,2	43,2	CC - 48	43,2		CC - 48					
		25	51	CC - 55	51		CC - 55					
26,9		52,9	CC - 55	52,9	CC - 55							
31,8		57,8	CC - 68	57,8	CC - 68							
38		64	CC - 68	64	CC - 68							
42,4		68,4	CC - 68	68,4	CC - 68							
48,3		74,3	CC - 82	74,3	CC - 82							
54		80	CC - 82	80	CC - 82							
57,2		83,2	CC - 90	83,2	CC - 90							
60,3		86,3	CC - 90	86,3	CC - 90							
76,1		102,1	CC - 110	102,1	CC - 110							
88,9		114,9	CC - 125	114,9	CC - 125							
101,6		127,6	CC - 135	127,6	CC - 135							
108,7		134,7	CC - 135	134,7	CC - 135							
PVC	133,9	159,9	CC - 160	159,9	CC - 160							
	159,11	185,11	CC - 200	185,11	CC - 200							
	15	41	CC - 40	41	CC - 40							
	25	51	CC - 55	51	CC - 55							
	32	58	CC - 68	58	CC - 68							
	40	66	CC - 68	66	CC - 68							
	50	76	CC - 82	76	CC - 82							
	63	89	CC - 90	89	CC - 90							
	75	101	CC - 110	101	CC - 110							
	83	109	CC - 110	109	CC - 110							
	90	116	CC - 125	116	CC - 125							
	110	136	CC - 135	136	CC - 135							
	125	151	CC - 160	151	CC - 160							
	135	161	CC - 160	161	CC - 160							
	PP	145	171	CC - 200	171	CC - 200						
150		176	CC - 200	176	CC - 200							
160		186	CC - 200	186	CC - 200							
185		211	CC - 250	211	CC - 250							
200		226	CC - 250	226	CC - 250							
15		41	CC - 40									
25		51	CC - 55									
32	58	CC - 68										
40	66	CC - 68										
50	76	CC - 82										
63	89	CC - 90										
75	101	CC - 110										

METHOD OF PROTECTING A PLASTIC PIPE WITH 87.5° ELBOW PENETRATING THE FLOOR ACCORDING TO ETA-17/1063



- 1 - reinforced concrete floor, thickness $B = \min. 150 \text{ mm}$
- 2 - plastic pipe, diameter "D" and wall thickness "t"
- 3 - pipe bend 87.5° , diameter "D1" and wall thickness "t1"
- 4 - Piro Collar PC located at the bottom of the floor
- 5 - collar mounting – expansion bolts

TABLE 28

FLOOR CLASS EI 180

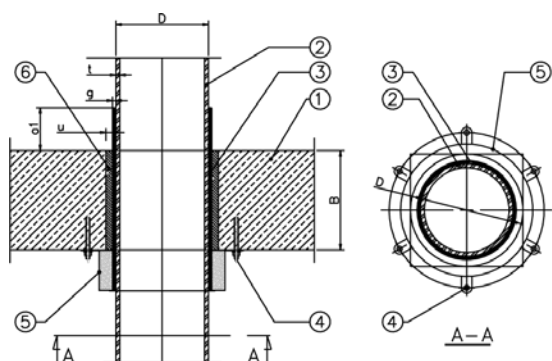
(width min. 150 mm density 1700 kg/m^3)

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Intumescent material width [mm]	Intumescent material thickness [mm]
PP	$D \leq 110$ 1)	3,2	60	6,5
PVC	$D \leq 110$ 1)	2,2	60	6,5
PVC	$D \leq 110$ 2)	4,2	60	6,5

1) Pipe elbow diameter is 130mm for 110mm diameter pipes, it should be proportionally reduced for smaller pipes; the wall thickness of the elbow is 3.2 mm

2) Pipe elbow diameter is 136mm for 110mm diameter pipes, it should be proportionally reduced for smaller pipes; the wall thickness of the elbow is 4.2 mm

METHOD OF PROTECTING A PLASTIC PIPE WITH PE ACOUSTIC INSULATION PENETRATING THE FLOOR ACCORDING TO ETA-17/1063



- 1 - rigid floor with a thickness of $B = \min. 150 \text{ mm}$
- 2 - plastic pipe, diameter "D" and wall thickness "t"
- 3 - insulation made of an acoustic mat made of PE with a thickness of "g"
- 4 - collar mounting - expansion bolts M6x60 or M8x80 (see TABLE 23)
- 5 - Piro Collar PC mounted on the underside of the floor
- 6 - space between the pipe and the wall structure, filled with mortar cement, thickness of $u = \max. 10 \text{ mm}$

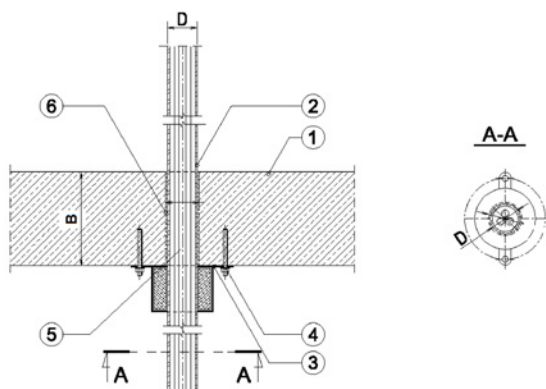
TABLE 29

FLOOR CLASS EI 180

(width min. 150 mm density 1700 kg/m^3)

Pipe material	Pipe diameter [mm]	PE mat insulation thickness [mm]	Pipe wall thickness [mm]	Intumescent material width [mm]	Intumescent material thickness [mm]
PE-HD, PE, ABS, SAN+PVC	$D \leq 110$	3	$4,5 \div 7,8$	60	6,5
PVC	$D \leq 110$	3	$3,2 \div 6,4$	60	6,5
PP-R	$D \leq 32$	3	5	60	4
PP-R STABI AL	$D \leq 42$	3	8,5	60	4
PP-R/PP-R+GF/PP-R	$D \leq 42$	3	8,5	60	4

METHOD OF PROTECTING A PLASTIC PIPE WITH A1 TYPE CABLES INSIDE PENETRATING THE FLOOR ACCORDING TO ETA-17/1063



- 1 - rigid floor with a thickness of $B = \text{min. } 150 \text{ mm}$
- 2 - plastic pipe, diameter "D" and wall thickness "t"
- 3 - Piro Collar PC mounted on the underside of the floor
- 4 - collar mounting - expansion bolts M6x60 or M8x80 (see TABLE 23)
- 5 - A1 type cables according to EN 1366-3, max. 10 cables
- 6 - the space between the pipe and the wall structure, filled with cement mortar, and thickness $u = \text{max. } 10 \text{ mm}$

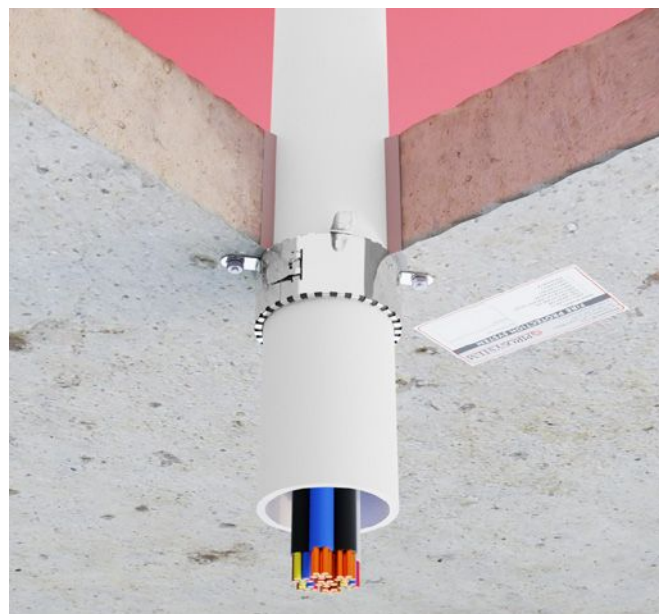
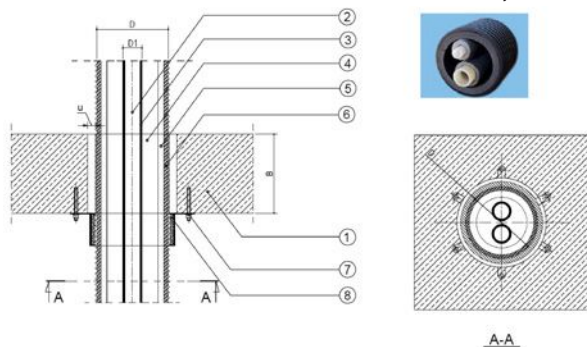


TABLE 30

FLOOR CLASS EI 120 (width min. 150 mm density 1700 kg/m ³)					
Pipe material	Pipe diameter [mm]	Max. number of A1 type cables inside the pipe	Pipe wall thickness [mm]	Intumescent material width [mm]	Intumescent material thickness [mm]
PVC pipes with A1 type cables	$D \leq 40$	3	1,6	60	2,5
	$D \leq 110$	10	3,4	60	2,5 ÷ 9,5
	$D \leq 160$	10	6,2	60	2,5 ÷ 17

METHOD OF PROTECTING A DOUBLE HEATING PIPE SYNCOPEX C.O. PN6 / 95 C, C.W. PN10 / 70C WITH PE INSULATION (COMPACT PIPES) PENETRATING THE FLOOR ACCORDING TO ETA-17/1063



- 1 - reinforced concrete floor, thickness $B = \text{min. } 150 \text{ mm}$
 - 2 - Syncopex C.O. double heating pipe PN6 / 95 C, C.W. PN10 / 70C (corrugated PE-HD pipe, diameter $D \leq 110$ and pipe wall thickness 0.5 mm), with inside max. with two PE-X pipes:
 - with diameter $D1 \leq 21 \text{ mm}$ and the pipe walls $t = 2.5 \text{ mm}$
 - diam. $D1 \leq 17 \text{ mm}$ and the pipe wall $t = 2.5 \text{ mm}$
 - 3 - 4 - two PE insulation layers with a total thickness of 32 mm (2 x 16 mm), continuous insulation
 - 5 - space between the insulation of the inner pipe and the corrugated pipe
 - 6 - corrugated pipe made of PE-HD, diameter $D \leq 110$ and pipe wall thickness 0.5 mm
 - 7 - collar mounting - expansion bolts
 - 8 - Piro Collar PC, placed on the underside of the floor
- The space between the floor and the pipe, filled with cement mortar, thick. $u = \text{max. } 25 \text{ mm}$



TABLE 31

FLOOR CLASS EI 180 (width min. 150 mm density 1700 kg/m ³)	
a) Double heating pipe Syncopex C.O. PN6 / 95 C, C.W. PN10 / 70C - PE-X pipes with dimensions: 21 x 2.5 mm and 17 x 2.5 mm (max.diameter x pipe wall thickness)	
b) PE insulation 32 mm thick, laid in a corrugated PE-HD pipe with a max. 160 mm diameter and 0.5 mm pipe wall thickness	
c) Dimensions of intumescent material: 16.0 x 60 mm (thickness x width)	

METHOD OF PROTECTING THE SYNCOPEX CO.HEATING PIPE PN6 / 95 C, C.W. PN10 / 70C WITH PE INSULATION PENETRATING THE FLOOR ACCORDING TO ETA-17/1063

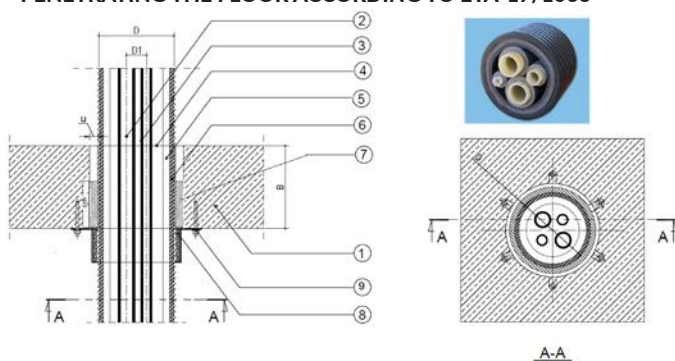
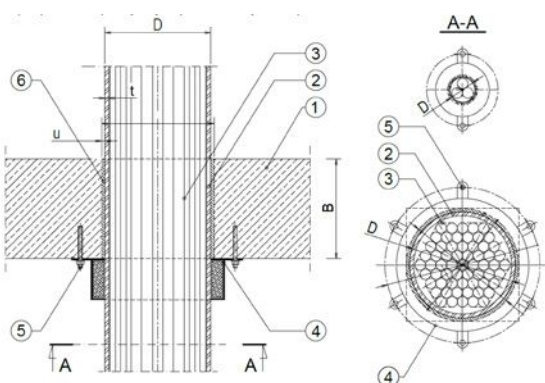


TABLE 32

FLOOR CLASS EI 180 (width min. 150 mm density 1700 kg/m³)

- a) Quadruple heating pipe Syncopex C.O. PN6 / 95 C, C.W. PN10 / 70C - PE-X pipes with dimensions: 50 x 3.0 mm, 32 x 2.5 mm, 20 x 2.1 mm and 50 x 5.0 mm (max.diameter x constant thickness of pipe wall)
- b) 32 mm thick PE insulation placed in a corrugated PE-HD pipe with a max. 160 mm diameter and 0.5 mm pipe wall thickness
- c) Piro Multitube PM (in accordance with ETA-17/1061) with dimensions of 9.6 x 100 mm (thickness x width)
- d) Dimensions of the intumescent material: 16.0 x 60 mm (thickness x width)

METHOD OF PROTECTING A PLASTIC PIPE WITH PP PIPES INSIDE PENETRATING THE FLOOR ACCORDING TO ETA-17/1063



- 1 - rigid floor with a thickness of B = min. 150 mm
- 2 - plastic pipe, diameter "D" and wall thickness "t"
- 3 - PP pipes inside the pipe
- 4 - Piro Collar PC, mounted on the underside of the floor
- 5 - collar mounting - expansion bolts M6x60 or M8x80 (see TABLE 23)
- 6 - the space between the pipe and the wall structure, filled with cement mortar, thick. u = max. 10 mm

TABLE 33

FLOOR CLASS EI 120 (width min. 150 mm density 1700 kg/m³)

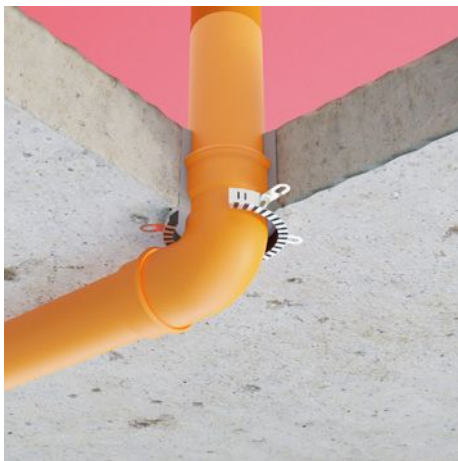
Pipe material	Pipe diameter [mm]	Max. number of pipes inside the pipe x max. diameter of PP pipes x max. wall thickness of PP pipe [mm]	Intumescent material width [mm]	Intumescent material thickness [mm]
PVC pipes with cables A1	D≤40	3 x 16 x 0,8	60	2,5
	D≤110	70 x 16 x 0,8	60	2,5÷11



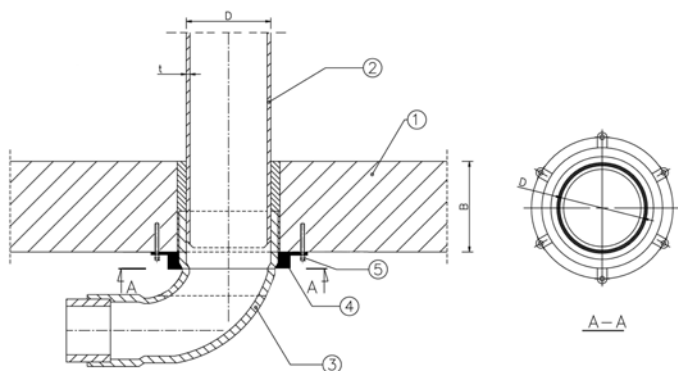
SLIM

TECHNICAL DESCRIPTION:

Piro Collar PC SLIM is a metal cylindrical flexible clamp mounted on a pipe with a height of 30 mm. It consists of an outer cover made of a single or multi-section stainless steel sheet and one or more inserts made of intumescent material, which in fire conditions increases its volume and closes the opening. The steel casing is equipped with a clamp used to fasten the collar and stabilize it on the pipe, and with mounting brackets with holes through which steel expansion bolts are led, fixing the collar to the partition. The collar is delivered as a finished product.



METHOD OF PROTECTING A PLASTIC PIPE WITH 87.5 ° ELBOW PENETRATING THE FLOOR ACCORDING TO ETA-17/1063 BY USING PIRO COLLAR PC SLIM



- 1 - reinforced concrete floor, thickness B = min. 150 mm
- 2 - plastic pipe, diameter "D" and wall thickness "t"
- 3 - pipe bend 87.5°, diameter "D1" and wall thickness "t1"
- 4 - Piro Collar PC SLIM placed at the bottom of the floor
- 5 - collar mounting - expansion bolts

INTENDED USE:

Piro Collar PC SLIM is a product intended for fireproof sealing of penetration seals and mixed penetration seals in walls and ceilings of flammable pipes without insulation or with FEF or PE foam insulation, metal pipes insulated with FEF or PE foam, electric cables. The possible fire resistance class ranges from EI 30 to EI 180. With the use of Piro Collar PC SLIM, it is possible to seal single pipes or pipe bundles, pipes in groups of e.g. 4 pieces, cable bundles, pipe bends that are mounted just below the floor. Other information can be found in ETA. Fireproof properties make Piro Collar PC SLIM a good tool for sealing pipes with particularly large diameters and where large thicknesses of flammable insulation on steel pipes are required. **The product is intended for professional use.**



SEGMENT

TECHNICAL DESCRIPTION:

Piro Collar PC L is delivered in the form of sets that enable each trained and licensed by PiroSystem person to make collars on their own in accordance with the attached manufacturer's instructions.

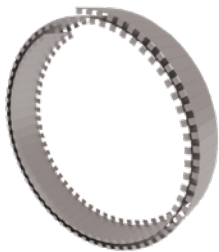
With the Piro Collar PC L sets, you can easily and quickly build the required dimensions of the Piro Collar PC, at the place of its installation on the pipe (e.g. on the construction site). It is enough to break off the appropriate number of segments of the segment cover indicated in Table 33, attach the connecting elements at its ends, and install the fastening elements on the appropriate cover segments (the number of fasteners depends on the size of the collar). The intumescent insert should be placed in such a complex cover and it's ready. In case of collar 125 and larger, the intumescent insert is first wrapped on the pipe and then prepared segmented cover is placed on it. A detailed assembly diagram is in the box, in the instructions attached to the sets.

Collars are delivered without expansion bolts. The finished assembled collar is placed around the pipe, closed, and then attached to the partition with the help of fasteners, the number of which is given in the table. When constructing and assembling collars, the steps described in PC-IM1 / PC-IM2 installation manual attached to the collar must be strictly followed.

CAUTION:

Expansion bolts are a separate product and are supplied with the set on request.

SEGMENT STEEL COVER



2 m for PC L 110
2 m for PC L 200

INTUMESCENT INSERT



2m 60 x 6,5 mm for PC L 110
7m 60 x 4 mm for PC L 200

FASTENING ELEMENTS



27 pcs for PC L 110
18 pcs for PC L 200

CONNECTING ELEMENTS



10 pcs for PC L 110
3 pcs for PC L 200

Two sets are available: Piro Collar PC L 110 for the construction of Piro Collar PC L 110 and smaller sizes and Piro Collar PC L 200 for the construction of Piro Collar PC 200 and smaller sizes with a height of 60 mm. The set also allow to build open-ended U-shaped collars for use on pipe elbows and closed collars for protecting several pipes next to one another. Properly constructed Piro Collar PC L collars meet the requirements of ETA and are an ideal solution when there are many pipes of different diameters to protect.

INTENDED USE:

Piro Collar PC L collars are intended for fireproof sealing of penetration seals through walls or floors, through which pipes with a diameter of ≤ 160 mm made of:

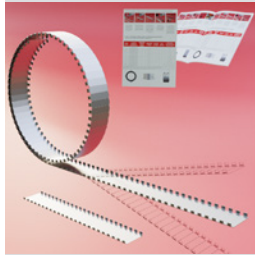
- plastic materials (PVC, PP, PE-HD, PE, ABS, SAN+PVC),
- copper, steel and cast iron in flammable insulation or pipes made of:
- PVC with cables with PVC insulation running inside the PVC pipe, - PVC with PP pipes running inside the PVC pipes, insulated with an elastomeric foam cover (FEF - eg Kaflex, Armaflex).

The thickness of the partition through which the installations are carried out should not be less than:

- 100 mm - rigid walls, made of aerated concrete, fire bricks, perforated or checkered walls,
- 125 mm - flexible walls, walls made of cellular concrete, solid brick, perforated or checkered,
- 150 mm - walls made of cellular concrete, fire bricks, perforated or checkered walls,
- 150 mm - floors - made of concrete or reinforced concrete.

CONSTRUCTION OF PIRO COLLAR PC L ROUND SHAPE:

STEP 1



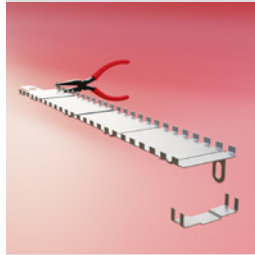
From Table 34 (column 3) below, read the correct length of the segment cover for the given collar diameter and break it off

STEP 2



Place the fastening elements on the appropriate sections of the steel cover from below and bend the ends with pliers. Segment numbers are given in Table 34 "Mounting data for Round O-shaped collars" (Column 7)

STEP 3



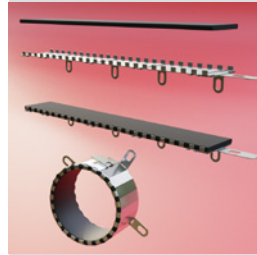
Put on one end of the cover the connecting element securing the buckle and the connecting element with the mounting slot on the last segment of the cover. Install these components on top of the cover, opposite to the fastening elements, and bend the ends

STEP 4



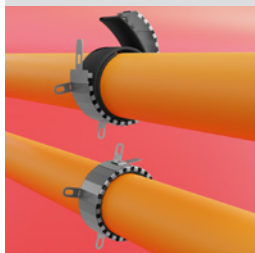
Read the appropriate length of the intumescent insert for a given diameter from the table below (column 4) and cut it off with a knife

STEP 5



Place the intumescent insert in the previously prepared steel cover of the collar with connecting elements and give the whole collar a round shape. Stick the label and write the size of the collar

STEP 5



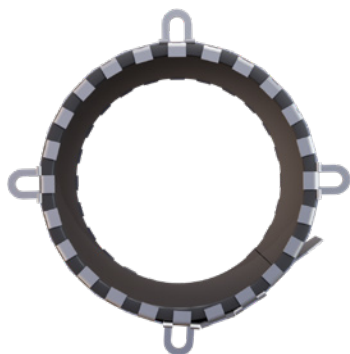
In case of the PC L - 200 mounting set for the construction of Piro Collar PC L in the range from 125 to 200, the intumescent insert should first be wrapped four times on the pipe and then the prepared segmented collar cover should be placed on it

PIRO COLLAR PC L MOUNTING DATA FOR ROUND O-SHAPED COLLARS:

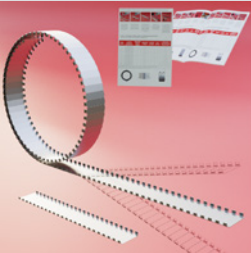
TABLE 34

Column 1	Column 2	Column 3	Column 4	Column 5	Column 6	Column 7
Piro Collar Diameter	Type of Piro Collar PC L set needed to build the collar	Number of segments required to make the collar	The length of the intumescent insert to be cut off	Number of wraps around the pipe with an intumescent insert	Number of fastening elements	Sequential numbers of the cover segments on which the mounting elements should be placed
25 mm	Piro Collar PC 110	8	95 mm	1	2	2, 6
32 mm	Piro Collar PC 110	9	122 mm	1	2	2, 6
40 mm	Piro Collar PC 110	11	159 mm	1	2	2, 7
48 mm	Piro Collar PC 110	12	175 mm	1	2	2, 8
55 mm	Piro Collar PC 110	13	190 mm	1	3	3, 7, 11
68 mm	Piro Collar PC 110	16	237 mm	1	3	3, 9, 14
82 mm	Piro Collar PC 110	19	275 mm	1	3	4, 10, 16
90 mm	Piro Collar PC 110	20	301 mm	1	3	5, 10, 16
110 mm	Piro Collar PC 110	24	369 mm	1	4	2, 8, 14, 20
125 mm	Piro Collar PC 200	31	1768 mm	4	4	2, 10, 18, 26
135 mm	Piro Collar PC 200	33	1909 mm	4	5	2, 9, 16, 23, 30
160 mm	Piro Collar PC 200	38	2239 mm	4	6	2, 8, 15, 21, 27, 34
180 mm	Piro Collar PC 200	41	2517 mm	4	7	4, 10, 16, 22, 28, 34, 40
200 mm	Piro Collar PC 200	45	2730 mm	4	7	4, 10, 17, 24, 31, 37, 43

For insulated pipes, always use a collar with a diameter greater than or equal to the outer diameter of the pipe insulation. When mounting on a pipe joint, a collar with a diameter equal to or greater than the outer diameter of the joint should be used. For non-flammable pipes, the minimum thickness of FEF insulation is 10mm and the maximum 50mm.



CONSTRUCTION OF PIRO COLLAR PC L U-SHAPED:

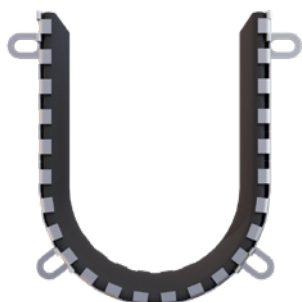
STEP 1	STEP 2	STEP 3	STEP 4	STEP 5
				
From Table 35 (column 3) below, read the correct length of the segment cover for the given collar diameter and break it off	Place the fastening elements on the appropriate sections of the steel cover from below and bend the ends with pliers. Segment numbers are given in Table 35 "Mounting data for U-shaped collars" (Column 7)	Read the appropriate length of the intumescent insert for a given diameter from the table below (column 4) and cut it off with a knife	Place the intumescent insert in the previously prepared steel cover of the cover with mounting elements installed and give it a U shape	Collars prepared this way are ideal for installation on pipe bends or pipes at an angle

PIRO COLLAR PC L MOUNTING DATA FOR U-SHAPED COLLARS:

TABLE 35

Column 1	Column 2	Column 3	Column 4	Column 5	Column 6	Column 7
Piro Collar Diameter	Type of Piro Collar PC L set needed to build the collar	Number of segments required to make the collar	The length of the intumescent insert to be cut off	Number of wraps around the pipe with an intumescent insert	Number of fastening elements	Sequential numbers of the cover segments on which the mounting elements should be placed
25 mm	Piro Collar PC L 110	8	131 mm	1	3	1, 4, 8
32 mm	Piro Collar PC L 110	9	153 mm	1	3	1, 5, 9
40 mm	Piro Collar PC L 110	11	179 mm	1	3	1, 6, 11
48 mm	Piro Collar PC L 110	12	204 mm	1	3	1, 6, 12
55 mm	Piro Collar PC L 110	13	226 mm	1	3	1, 7, 13
68 mm	Piro Collar PC L 110	16	266 mm	1	3	1, 8, 16
82 mm	Piro Collar PC L 110	19	310 mm	1	3	1, 10, 19
90 mm	Piro Collar PC L 110	20	335 mm	1	3	1, 10, 20
110 mm	Piro Collar PC L 110	24	397 mm	1	4	1, 9, 16, 24
125 mm	Piro Collar PC L 200	28	442 + 429 + 412 + 397 mm*	4	4	1, 10, 18, 28
135 mm	Piro Collar PC L 200	30	485 + 470 + 457 + 442 mm*	4	5	1, 9, 16, 23, 30
160 mm	Piro Collar PC L 200	34	559 + 545 + 534 + 519 mm*	4	6	1, 8, 15, 21, 27, 34

For collars with diameters greater than or equal to 125mm, use 3 layers of the intumescent insert. Their lengths are listed in the table according to the scheme: layer length 1 + layer length 2 + layer length 3 * For collars in the range from 135 to 160 mm, the values of the length of the intumescent insert are given in the following format: length of the first layer + length of the second layer + length of the third layer + the length of the fourth layer



COLLARS FOR SEVERAL PIPES RUNNING TOGETHER:

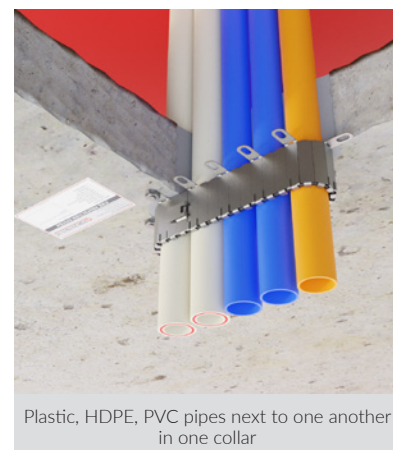
With one Piro Collar PC L closed collar, it is possible to protect several pipes running together. In this case, the collar fastening elements should always be on the longer, flat side of the collar. Always install one fastener at the top of the oval portion of the collar. On the flat sides of the collar there should always be at least 2 fastening elements for each pipe placed opposite to one another. Collars constructed in this way enable:

- protection with one collar of 2 plastic pipes running together next to each other with diameters up to 50mm
- protection with one collar of a bundle of 3 plastic pipes running together with diameters up to 75mm
- protection of a set up to 5 plastic, HDPE, PVC pipes running together next to one another with diameters: PVC up to 40mm, PEHD up to 40mm, plastic up to 50mm

CAUTION:

PC L 200 collars can only replace Piro Collar PC 200 with a smooth cover 60 mm.

In practice, PC L 200 collars can only be used for some pipes with a diameter of 200 mm and all pipes from a diameter of 160 mm, according to the data provided in the tables for Piro Collar PC collars with a smooth cover.



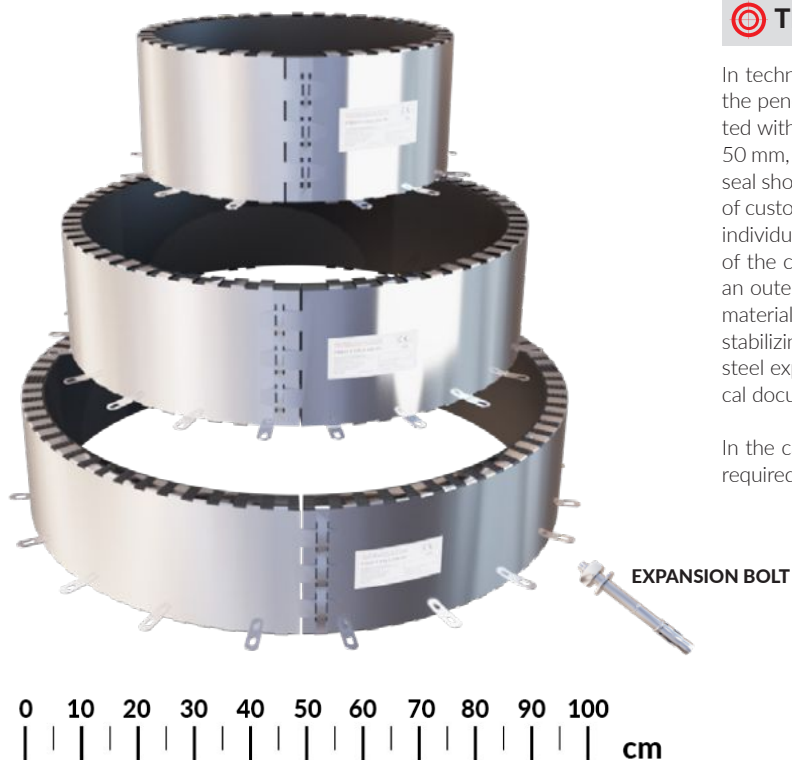
PIRO COLLAR U-SHAPE:

Piro Collar PC L is also intended for the assembly of U-shaped open collars, which protect elbows of flammable pipes. In this case, clamps do not required. It is important that the fastening elements are always installed on the first and last segment of the steel cover. The arrangement of the remaining clamps should be made in accordance with Table 34 (column 7).

When selecting the appropriate collar, remember that its diameter should always be greater than or equal to the outer diameter of the pipe bend. The collar can also replace Piro Collar PC in the range discussed above.

■ INSTALLATION OF PIRO COLLAR PC L U-SHAPE ON PVC PIPE ELBOW





 TECHNICAL DESCRIPTION:

In technical solutions, e.g. heating and cooling installations, a frequent case is the penetration of steel pipes with a diameter of greater than 273 mm, insulated with combustible foam insulation with a thickness greater than or equal to 50 mm, penetrating walls or floors. In such cases, an analysis of the penetration seal should be performed. One of the technical solutions we propose is the use of custom made Piro Collar PC of individual increased size. The collars are made individually - adapted to the outer diameters of pipes. The possible diameters of the collars can be from 400 mm to 950 mm. Piro Collar PC max consist of an outer cover made of stainless steel sheet and inserts made of intumescent material. The steel cover is equipped with clamps for fastening the collar and stabilizing it on the pipe, and with mounting brackets with holes through which steel expansion fasteners are led. It is possible to perform an individual technical documentation.

In the case of orders of max collar, a prepayment of 50% of the collar price is required.

 EXPANSION BOLT

EXPANSION BOLTS



 TECHNICAL DESCRIPTION:

Expansion bolts are made entirely of steel. Designed for fixing Piro Collar PC for massive partitions (concrete, reinforced concrete), they are not suitable for flexible partitions e.g. plasterboards. Expansion bolts are installed in a pre-drilled hole in the partition. After inserting the expansion bolt into the hole and a light hit from the front, the expansion bolt wedges in the hole, which allows the nut to be screwed on and the collar fixed. The number of expansion bolts needed to fix the collar is given in Table 34 (the number of expansion bolts corresponds to the number of fasteners). The expansion bolts are delivered on an individual order - they are not part of a set with the collar. The expansion bolts are packed in collective packages of 10 pieces in one package.



FIRE-PROTECTIVE PASTES AND MASSES

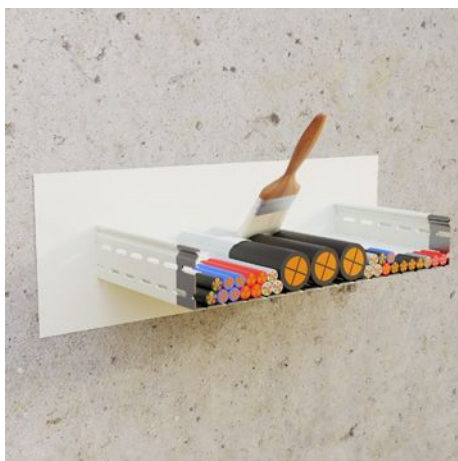


PRODUCT DOCUMENTS

European Technical Approval :	ETA-17/1062
Certificate of Constancy of Performance:	1488-CPR-0726/W
Hygienic certificate:	BK/B/0264/01/2019
European Declaration of Performance:	PIRO/06-2018-09-10

PRODUCT TECHNICAL DATA

Fire resistance class:	up to EI 120
Reaction to fire:	Bfl-s1; B-s2,d0
Color:	creamy white
Density:	1,36 ± 5% g/cm ³
Environment class:	Z1, Z2
Storage temperature range:	from +5°C to +30°C
Shelf life:	10 months in original closed packaging
Theoretical amount of mass needed (kg/m ²) to obtain a coating thickness of 1 mm:	1,81 kg/m ²
Oxygen index:	≥45
Packaging:	3 kg, 10 kg bucket



TECHNICAL DESCRIPTION:

PiroCoating is a one-component intumescent paint, which is a water dispersion of synthetic resin and pigments. The paint is produced in the form of a thick cream-white mass. It is suitable for brush application or, after its slight dilution with water, it can be applied hydrodynamically as a paint coating. After drying, PiroCoating has very good adhesion to the substrates made of plastic used in the production of cables. The coating is flexible, which means that the paint-protected cables can be bent without peeling off the coating. The paint is packed in various containers up to 10 kg. Before applying, the surfaces of the cables should be clean from dust and degreased.

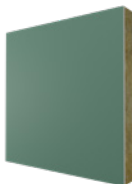
INTENDED USE:

PiroCoating is used for fire sealing and fireproof protection of penetrations through walls and floors of cables, cable bundles, cable trays or their combinations. It can be applied to mineral wool used as an insulating cover, wool boards in mixed penetrations. It has good adhesion to various surfaces, including ceramic, gypsum, mineral wool and metals. PiroCoating is characterized by very good insulating properties, protects the surfaces during direct heating with an open flame and blocks its spread under fire conditions. Penetration seals protected by PiroCoating are classified in class EI.

APPLICATION:

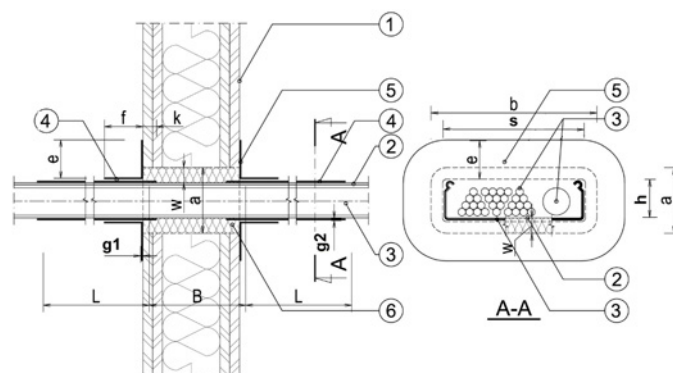
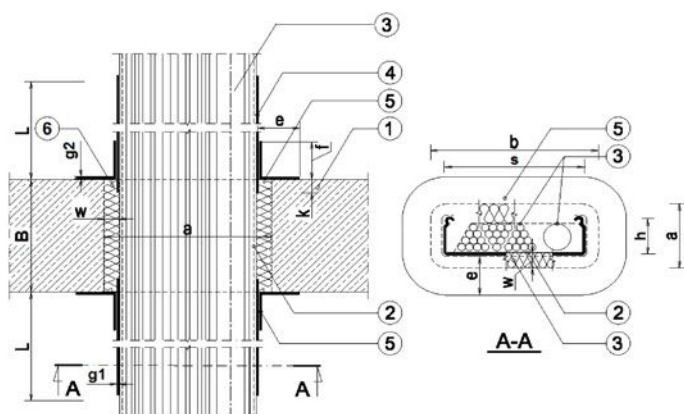
THE TYPES OF PARTITIONS WHICH CAN BE USED FOR PIROCOATING SHOWN IN TABLE 36 BELOW

TABLE 35

FLOOR	RIGID WALL	FLEXIBLE WALL
width from 150 mm	width from 100 mm	width from 125 mm
Reinforced concrete	Aerated concrete, concrete, brick, other ceramic products	Plasterboard
		

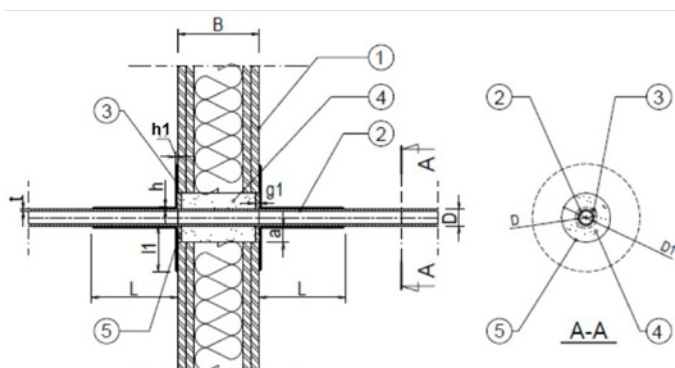
EXAMPLES OF PRODUCT TECHNICAL APPLICATION:

METHOD OF PROTECTING A CABLE TRAY WITH CABLES INSIDE, CABLE BUNDLES AND SINGLE CABLES PENETRATING WALL AND FLOOR ACCORDING TO ETA-17/1062



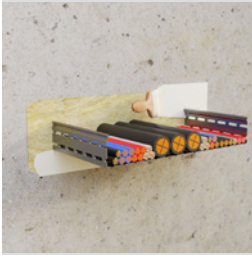
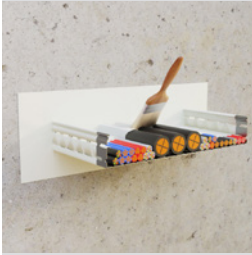
- 1 - floor with a minimum thickness of 150 mm
- 2 - cable tray
- 3 - cables with a diameter of max. 21 mm
- 4 - PiroCoating; on both sides of the floor, length $L = \text{min. } 300 \text{ mm}$, depth $k = \text{min. } 30 \text{ mm}$, thickness $g2 = \text{min. } 1.2 \text{ mm}$
- 5 - PiroCoating, on both sides of the floor, with dimensions: $f = \text{min. } 50 \text{ mm}$, $e = \text{min. } 50 \text{ mm}$, $g1 = \text{min. } 0.6 \text{ mm}$
- 6 - mineral wool, density 50 kg/m^3 , thickness $w = \text{max. } 40 \text{ mm}$

- 1 - flexible or rigid wall with a thickness of min. 125 mm
- 2 - cable tray
- 3 - cables with a diameter of max. 21 mm
- 4 - PiroCoating; on both sides of the partition, length $L = \text{min. } 300 \text{ mm}$, depth $k = \text{min. } 30 \text{ mm}$, thickness $g2 = \text{min. } 1.2 \text{ mm}$
- 5 - PiroCoating, on both sides of the partition, dimensions: $f = \text{min. } 50 \text{ mm}$, $e = \text{min. } 50 \text{ mm}$, $g1 = \text{min. } 0.6 \text{ mm}$
- 6 - mineral wool, with a density of min. 50 kg/m^3 , thickness $w = \text{max. } 40 \text{ mm}$



- 1 - flexible or rigid wall with a thickness of min. 100 mm
- 2 - single cable with a diameter of max. 13 mm
- 3 - PiroCoating with dimensions: length $L = \text{min. } 300 \text{ mm}$, thickness $h = \text{min. } 1.2 \text{ mm}$, length $l1 = \text{min. } 50 \text{ mm}$, thickness $h1 = \text{min. } 0.6 \text{ mm}$
- 4 - space between the pipe and the partition structure, max. $a = 30 \text{ mm}$, filled with mineral wool with a density of min. 50 kg/m^3
- 5 - gypsum mortar with a thickness of min. $g1 = 5 \text{ mm}$

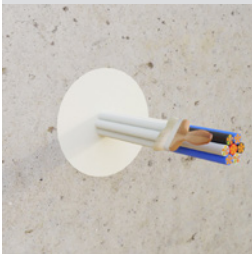
APPLICATION OF PIROCOATING ON THE CABLE TRAY PENETRATING A WALL OR FLOOR

STEP 1  Fill the hole in the wall on both sides with mineral wool boards with a minimum density of 50 kg/m³ and a maximum thickness of 40 mm	STEP 2  By using a brush, apply a 0.6 mm thick PiroCoating layer on the wool over a length of min. 50 mm from the cable route	STEP 3  Apply PiroCoating with a brush on the cables and cable tray 1.2 mm thick layer over the length of min. 300 mm from the partition	STEP 4  Mark the completed penetration seal with the label. Mark PiroCoating on it, enter the date and the name
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PIROCOATING APPLICATION FOR A SINGLE CABLE PENETRATING WALL OR FLOOR

STEP 1  Fill the space between the cable and the partition tightly. Use mineral wool with a density of min. 50 kg/m³ or cement mortar	STEP 2  By using a brush, apply PiroCoating on the partition in such a way that a ring with a width of min. 50 mm and a thickness of min. 0.6 mm is created	STEP 3  Apply the PiroCoating on a cable so that a ring with a width of min. 300 mm and a thickness of min. 1.2 mm is created	STEP 4  Mark the completed penetration seal with the label. Mark PiroCoating on it, enter the date and the name
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PIROCOATING APPLICATION FOR A CABLE BUNDLE PENETRATING WALL OR FLOOR

STEP 1  Fill the space between the cable and the partition tightly. Use mineral wool with a density of min. 60 kg/m³ or cement mortar	STEP 2  By using a brush, apply PiroCoating on the partition in such a way that a ring with a width of min. 50 mm and a thickness of min. 0.6 mm is created	STEP 3  Apply the PiroCoating on a cable bundle so that a ring with a width of min. 300 mm and a thickness of min. 1.2 mm is created	STEP 4  Mark the completed penetration seal with the label. Mark PiroCoating on it, enter the date and the name
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Pirocoating selection table

TABLE 37					
Material	Type	Bundle or cable dimension max [mm]	Protection made using products	Class EI or E	
				Floor	Wall
Kable	Single	52	PiroCoating 1,2 mm PiroCoat A 1,2 mm	EI120	EI120
	Cable bundles	100		EI120	EI120
	Cables in a cable tray	150x500		EI120	EI120
Kable	Single	52	PiroCoating 1,2 mm PiroCoat A 1,2 mm	EI120	EI120
	Cable bundles	100		EI120	EI120
	Cables in a cable tray	130x360		EI120	EI120



PRODUCT DOCUMENTS

European Technical Approval :	ETA-17/1062
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Hygienic certificate:	BK/B/0264/01/2019
European Declaration of Performance:	PIRO/06-2018-09-10

PRODUCT TECHNICAL DATA

Fire resistance class:	up to EI 120
Reaction to fire:	Bfl-s1; B-s2,d0
Color:	creamy white
Density:	1,36 ± 5% g/cm ³
Environment class:	Z1, Z2
Storage temperature range:	from +5°C to +30°C
Shelf life:	10 months in original closed packaging
Theoretical amount of mass needed (kg/m ²) to obtain a coating thickness of 1 mm:	1,93 kg/m ²
Oxygen index:	≥45
Packaging:	3 kg, 10 kg bucket 310 ml cartridge



TECHNICAL DESCRIPTION:

PiroCoat A is a one-component ablation paste, which is a water dispersion of synthetic resin and pigments. The paste is produced in the form of a thick, cream-white mass of high density. It is suitable for application with a putty knife or, after its slight dilution with water, it can be applied hydrodynamically as a paint coating. PiroCoat A is completely non-flammable. It can be packed in various containers, from 330 ml cartridges to 10 kg buckets. In order to change the color, PiroCoat A can be topcoated with decorative water-based paints. Before applying, the surfaces should be clean from dust and degreased and slightly moisten with water.

INTENDED USE:

PiroCoat A ablation paste is intended for sealing penetration seals of certain types of flammable and metal pipes and cables, it is intended for fire protection, mineral wool used as an insulating cover, wool boards in mixed penetration seals, filling gaps and expansion joints in fire walls and floors, fire protection of plasterboards or filling between them. It has good adhesion to various surfaces, including ceramic, gypsum, mineral wool and metals. PiroCoat A is characterized by very good endothermic properties and strongly cools the surfaces when heated with the flame and blocks its spread under fire conditions. Penetration seals made by PiroCoat A are classified in EI class.

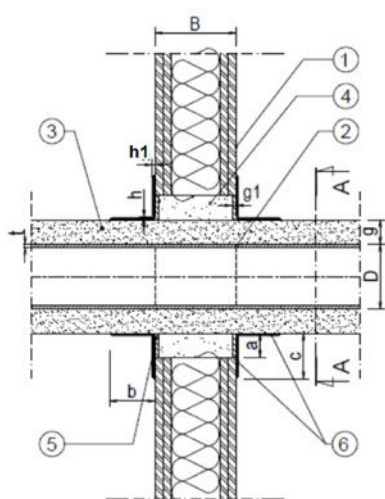
APPLICATION:

THE TYPES OF PARTITIONS WHICH CAN BE USED FOR PIROCOAT A SHOWN IN TABLE 38 BELOW

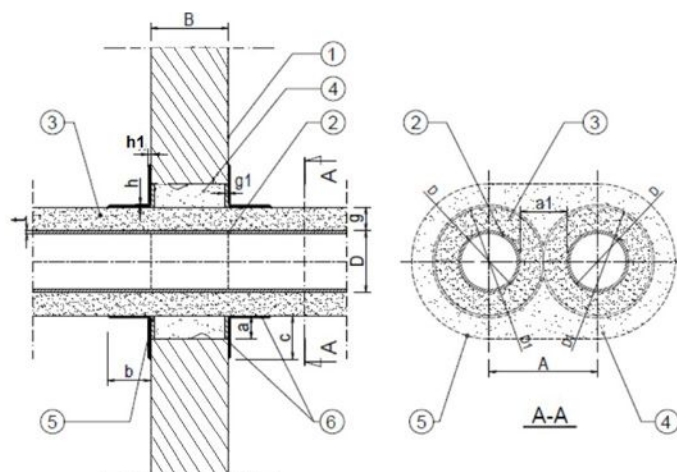
TABLE 38		
FLOOR	RIGID WALL	FLEXIBLE WALL
width from 150 mm	width from 100 mm	width from 125 mm
Reinforced concrete	Aerated concrete, concrete, brick, other ceramic products	Plasterboard
	 	

EXAMPLES OF PRODUCT TECHNICAL APPLICATION:

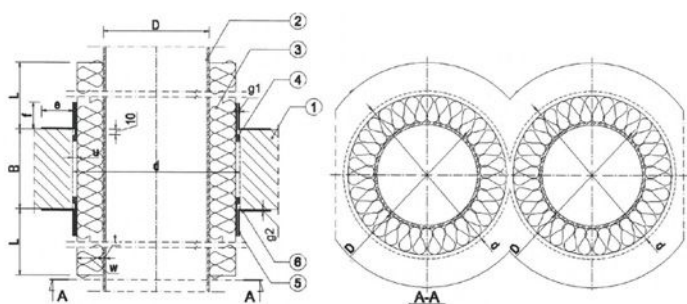
METHOD OF PROTECTING A METAL PIPE IN THE INSULATION OF MINERAL WOOL PENETRATING A WALL AND FLOOR ACCORDING TO ETA-17/1062



- 1 - flexible or rigid wall with a thickness of min. 100 mm
- 2 - metal pipe, diameter "D" and pipe wall thickness "t"
- 3 - mineral wool with a density of min. 80 kg/m³ and thickness g = 30 mm (continuous insulation)
- 4 - space between the pipe and the partition structure, max. a = 30 mm, filled with mineral wool with a density of min. 50 kg/m³
- 5 - gypsum mortar with a thickness of min. g1 = 5 mm
- 6 - PiroCoat A, dimensions: b = min. 50 mm and h = min. 0.6 mm (on the pipe insulation); c = min. 50 mm and h1 = min. 0.6 mm (ring on wall around the penetration seal)



- 1 - rigid wall with a thickness of min. 100 mm
- 2 - metal pipe, diameter "D" and pipe wall thickness "t"
- 3 - mineral wool with a density of min. 80 kg/m³ and thickness g = 30 mm (continuous insulation)
- 4 - space between the pipe and the partition structure, max. a = 30 mm, filled with mineral wool with a density of min. 50 kg/m³
- 5 - gypsum mortar with a thickness of min. g1 = 5 mm
- 6 - PiroCoat A, dimensions: b = min. 50 mm and h = min. 0.6 mm (on the pipe insulation); c = min. 50 mm and h1 = min. 0.6 mm (ring on wall around the penetration seal)



- 1 - rigid floor (made of concrete or reinforced concrete) with a thickness of min. B = 150 mm
- 2 - metal pipe, diameter "D" and pipe wall thickness "t"
- 3 - mineral wool, density 50 kg/m³, thickness 30 mm (continuous insulation)
- 4 - the space between the ceiling and the pipe is filled with cement mortar, max. 25 mm
- 5 - PiroCoat A on both sides of partition, with a length f = 50 mm and thickness g1 = 0.6 mm
- 6 - PiroCoat A on both sides of partition, with a width e = 50 mm and thickness g2 = 0.6 mm

PIROCOAT A APPLICATION ON PIPES INSULATED WITH MINERAL WOOL PENETRATING WALL AND FLOOR

STEP 1



STEP 2



By using a putty knife, apply the PiroCoat A on the partition in such a way that a ring with a width of min. 50 mm and a thickness of min. 0.6 mm is created

STEP 3



Apply PiroCoat A on mineral wool on a pipe so that a ring with a width of min. 50 mm and a thickness of min. 0.6 mm is created

STEP 4



The protection should be done on both sides of the partition, both in wall and floor

STEP 5



Mark the completed penetration seal with the label. Mark PiroCoat A on it, enter the date and the name



Fill the space between the pipe insulation and the partition tightly. Use mineral wool with a density of min. 60 kg/m³





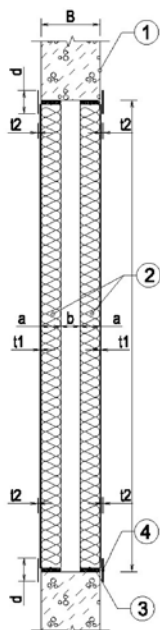




SEAL SELECTION TABLE DEPENDING ON PIPE MATERIAL AND DIMENSIONS

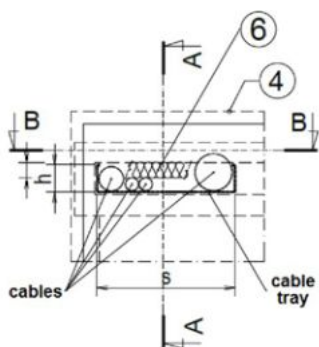
TABLE 39							
Pipe material	Type of insulation on the pipe	Pipe diameter DN		Protection	EI class		Type of partition
		from	to		Floor	Wall	
Steel	Mineral wool (continuous)	0	35	PiroCoat A		EI 120	Flexible wall min. 100 mm
		0	114,3			EI 120	Rigid wall min. 100 mm
		0	50		EI 180		Rigid floor minimum 150 mm
	Mineral wool (local)	0	42			EI 120	Rigid wall minimum 150 mm
		42	108			EI 60 / E 120	
		0	17,2		EI 120		Rigid floor minimum 150 mm
		17,2	108		EI 60 / E 120		
		0	273		EI 120	EI 120	Flexible or rigid wall min. 125mm / Rigid floor
Spiro steel	Mineral wool (local)	0	80			EI 120	Flexible or rigid wall min. 125mm
		80	160			EI 30 / E 120	
		0	80			EI 120	Rigid wall min. 150 mm
		80	160			EI 60 / E 120	
		0	160		EI 120		Rigid floor minimum 150 mm
		0	35			EI 120	Flexible wall min. 100 mm
Copper	Mineral wool (continuous)	0	35			EI 120	Rigid wall min. 100 mm
		0	50		EI 180		Rigid floor minimum 150 mm
		0	10		EI 120	EI 120	Flexible or rigid wall min. 125mm / Rigid floor
	Mineral wool (local)	10	108		EI 60 / E 120	EI 60 / E 120	
		0	42			EI 120	Rigid wall min. 150 mm
		42	108			EI 60 / E 120	
		0	35			EI 120	Flexible wall min. 100 mm
Cast iron	Mineral wool (continuous)	0	114,3			EI 120	Rigid wall min. 100 mm
		0	273			EI 120	Flexible or rigid wall min. 125mm / Rigid floor
		0	42			EI 120	Rigid wall min. 150 mm
	Mineral wool (local)	42	108			EI 60 / E 120	
		0	60		EI 120		Rigid floor minimum 150 mm
			274				

CONSTRUCTION DETAILS OF MIXED PENETRATION SEAL ACCORDING TO ETA-17/1062

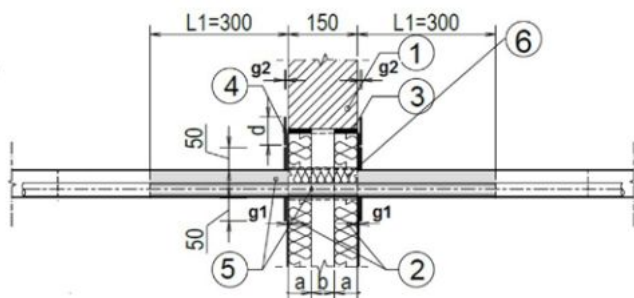


- 1 - rigid wall with a minimum density of 600 kg/m³ and thickness of $B \geq 150$ mm or rigid floor with a minimum density of 1700 kg/m³ and thickness of $B \geq 150$ mm
- 2 - two mineral wool boards with a minimum density of 150 kg/m³, thickness of $a \geq 50$ mm, covered with PiroCoat A with thickness of $t1 \geq 1,2$ mm; $b \geq 50$ mm (space between the boards)
- 3 - PiroCoat A; length ≥ 50 mm, thickness $\leq 5,0$ mm
- 4 - PiroCoat A on both sides of the wall or floor (placed on the perimeter of the mixed penetration seal); length $d \geq 60$ mm, thickness $t2 \geq 0,6$ mm

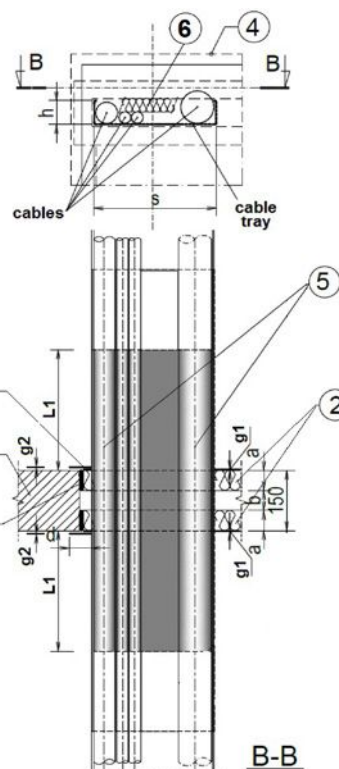
METHOD OF PROTECTING MIXED PENETRATION SEAL: SINGLE CABLES, CABLE BUNDLES AND CABLE TRAYS PENETRATING WALL OR FLOOR ACCORDING TO ETA-17/1062



A-A



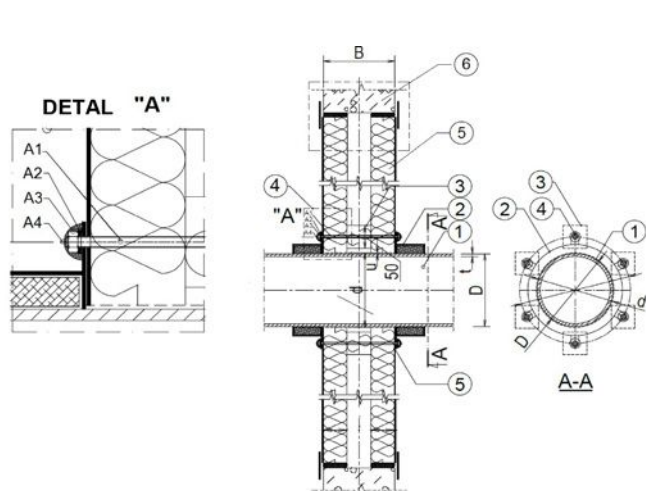
- 1 - rigid wall with a minimum density of ≥ 600 kg/m³ and minimum thickness of 150 mm
- 2 - two mineral wool boards with a minimum density of 150 kg/m³, thickness of $a \geq 50$ mm, covered with PiroCoat A, thickness of $g1 \geq 1,2$ mm; $b \geq 50$ mm (space between the boards)
- 3 - PiroCoat A; length ≥ 50 mm, thickness $\leq 5,0$ mm
- 4 - PiroCoat A on both sides of the wall (placed on the perimeter of the mixed penetration seal); length $d \geq 60$ mm, thickness $g2 \geq 0,6$ mm
- 5 - PiroCoating on both sides of the penetration seal, on cables and cable trays (with dimensions of $h \times s$); coating length of $L1 \geq 300$ mm and thickness $\geq 1,2$ mm
- 6 - empty space in the cable tray filled with mineral wool with a minimum density of 40 kg/m³



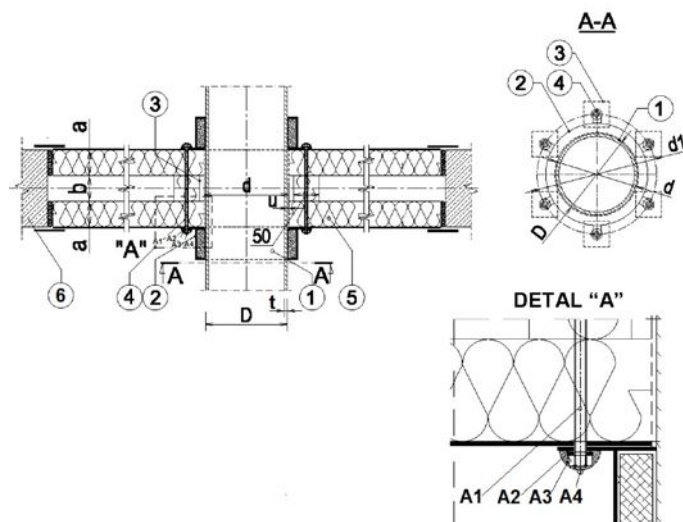
B-B

- 1 - rigid floor with a minimum density of 1700 kg/m³ and minimum thickness of 150 mm
- 2 - two mineral wool boards with a minimum density of 150 kg/m³, thickness of $a \geq 50$ mm, covered with PiroCoat A, thickness of $g1 \geq 1,2$ mm; $b \geq 50$ mm (space between the boards)
- 3 - PiroCoat A; length ≥ 50 mm, thickness $\leq 5,0$ mm
- 4 - PiroCoat A on both sides of the floor (placed on the perimeter of the mixed penetration seal); length $d \geq 60$ mm, thickness $g2 \geq 0,6$ mm
- 5 - PiroCoating on both sides of the penetration seal, on cables and cable trays (with dimensions of $h \times s$); coating length of $L1 \geq 300$ mm and thickness $\geq 1,2$ mm
- 6 - empty space in the cable tray filled with mineral wool with a minimum density of 40 kg/m³

METHOD OF PROTECTING MIXED PENETRATION SEAL: PLASTIC PIPES PENETRATING WALL AND FLOOR ACCORDING TO ETA-17/1062

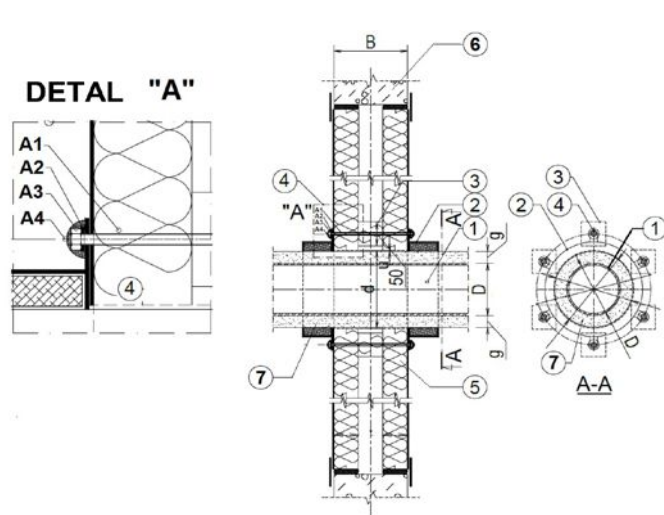


- 1 - plastic pipe; distance of $u \leq 10$ mm
- 2 - Piro Collar PC, fixed on both sides of the wall, outside of the penetration seal, number of fixing points
- 3 - mineral wool with a minimum density of 150 kg/m^3 ; minimum dimensions of $50 \times 50 \times 50$ mm
- 4 - steel threaded rod M6 (A1), pad, 2 pcs. (A2), steel nut (A3), PiroCoat A (A4)
- 5 - construction of mixed penetration seal
- 6 - rigid wall with a minimum density of 600 kg/m^3 and thickness of $B \geq 150$ mm

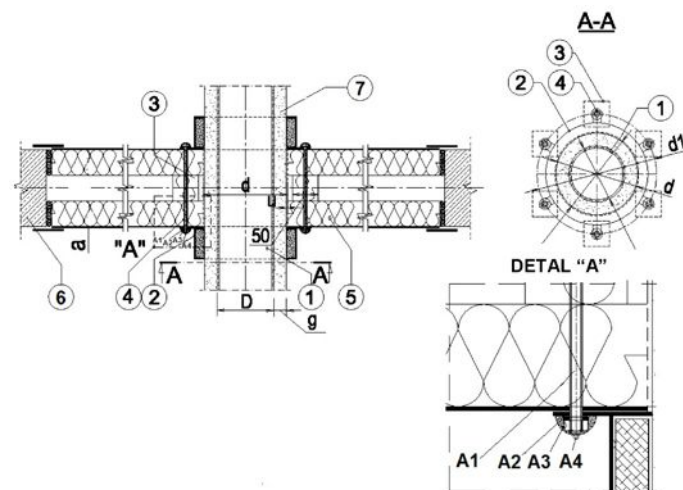


- 1 - plastic pipe in accordance with table C4; distance of $u \leq 10$ mm
- 2 - Piro Collar PC, fixed on the bottom of the floor, outside of the penetration seal, number of fixing points
- 3 - mineral wool with a minimum density of 150 kg/m^3 ; minimum dimensions of $50 \times 50 \times 50$ mm
- 4 - steel threaded rod M6 (A1), pad, 2 pcs. (A2), steel nut (A3), PiroCoat A (A4)
- 5 - construction of mixed penetration seal
- 6 - rigid floor with a minimum density of 1700 kg/m^3 and thickness of $B \geq 150$ mm

METHOD OF PROTECTING MIXED PENETRATION SEAL: PLASTIC PIPES (WITH FLEXIBLE ELASTOMER FOAM INSULATION FEF) THROUGH WALL AND FLOOR ACCORDING TO ETA-17/1062

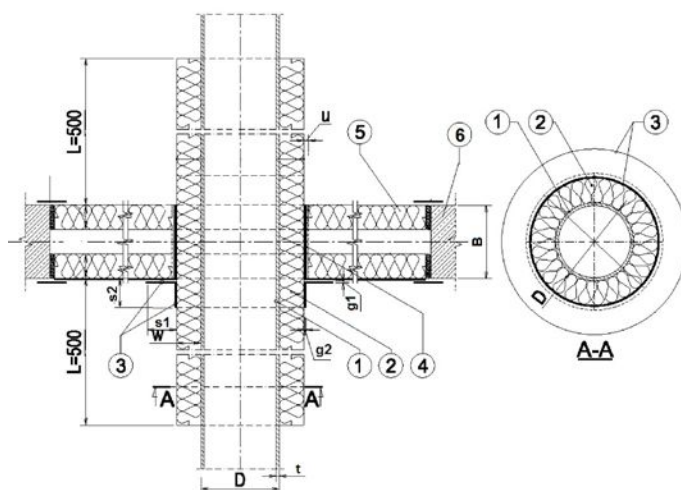
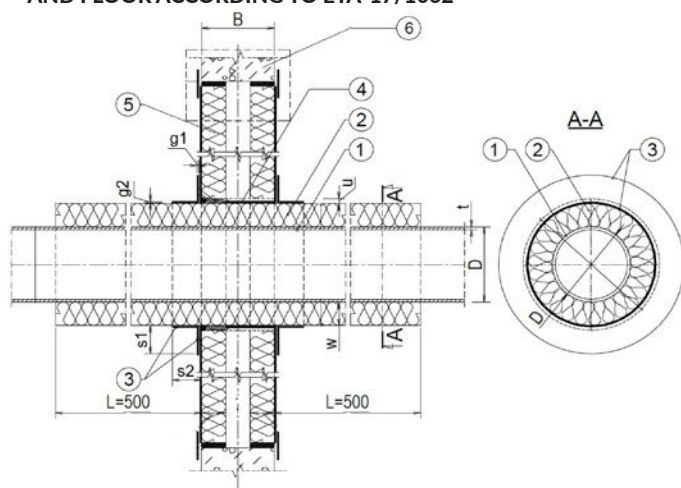


- 1 - metal pipe; distance of $u \leq 15$ mm
- 2 - Piro Collar PC, fixed on both sides of the wall, outside of the penetration seal, number of fixing points
- 3 - mineral wool with a minimum density of 150 kg/m^3 ; minimum dimensions of $50 \times 50 \times 50$ mm
- 4 - steel threaded rod M6 (A1), pad, 2 pcs. (A2), steel nut (A3), PiroCoat A (A4)
- 5 - construction of mixed penetration seal
- 6 - rigid wall with a minimum density of 600 kg/m^3 and thickness of $B \geq 150$ mm
- 7 - flexible elastomeric foam (FEF) insulation, thickness



- 1 - metal pipe; distance of $u \leq 15$ mm
- 2 - Piro Collar PC, fixed on both sides of the wall, outside of the penetration seal, number of fixing points
- 3 - mineral wool with a minimum density of 150 kg/m^3 ; minimum dimensions of $50 \times 50 \times 50$ mm
- 4 - steel threaded rod M6 (A1), pad, 2 pcs. (A2), steel nut (A3), PiroCoat A (A4)
- 5 - construction of mixed penetration seal
- 6 - rigid floor with a minimum density of 1700 kg/m^3 and thickness of $B \geq 150$ mm
- 7 - flexible elastomeric foam (FEF) insulation, thickness

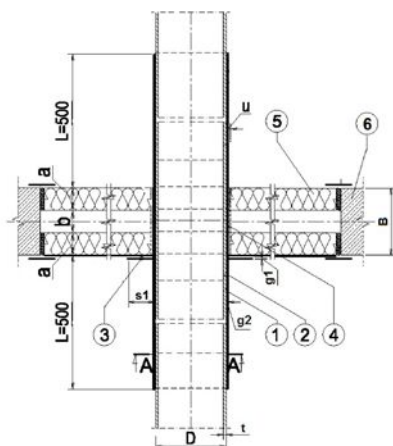
METHOD OF PROTECTING MIXED PENETRATION SEAL: PIPE OF METAL PIPE (WITH MINERAL WOOL INSULATION) PENETRATING WALL AND FLOOR ACCORDING TO ETA-17/1062



- 1 - metal pipe diameter of "D", pipe wall thickness "t"
- 2 - mineral wool with a minimum density of 40 kg/m³; length of L ≥ 500 mm, thickness of w ≥ 50 mm
- 3 - PiroCoat A; length of s1 ≥ 60 mm, thickness of g1 ≥ 0,6 mm, length of s2 ≥ 60 mm, thickness of g2 ≥ 0,6 mm
- 4 - space between the pipe insulation and mixed penetration seal filled with PiroCoat A thickness of u ≤ 5 mm
- 5 - construction of mixed penetration seal
- 6 - rigid wall with a minimum density of 600 kg/m³ and thickness of B ≥ 150 mm

- 1 - metal pipe diameter of D, pipe wall thickness t
- 2 - mineral wool with a minimum density of 50 kg/m³; length of L ≥ 500 mm, thickness of w ≥ 50 mm
- 3 - PiroCoat A; length of s1 ≥ 60 mm, thickness of g1 ≥ 0,6 mm, length of s2 ≥ 60 mm, thickness of g2 ≥ 0,6 mm
- 4 - space between the pipe insulation and mixed penetration seal filled with PiroCoat A thickness of u ≤ 5 mm
- 5 - construction of mixed penetration seal
- 6 - rigid floor with a minimum density of 1700 kg/m³ and thickness of B ≥ 150 mm

METHOD OF PROTECTING MIXED PENETRATION SEAL: METAL PIPE PENETRATING FLOOR ACCORDING TO ETA-17/1062



- 1 - steel pipe with diameter of D ≤ 273 mm and pipe wall thickness of t from 6,0 to 14,2 mm
- 2 - PiroCoat I, length of L ≥ 500 mm, thickness of g2 ≥ 1,2 mm
- 3 - PiroCoat I, length of s1 ≥ 50 mm, thickness of g1 ≥ 0,6 mm
- 4 - space between the pipe and mixed penetration seal filled with PiroCoat I; thickness of u ≤ 5 mm
- 5 - construction of mixed penetration seal
- 6 - rigid floor with a minimum density of 1700 kg/m³ and thickness of B ≥ 150 mm

PIROCOAT A APPLICATION ON MIXED PENETRATION SEALS OF PIPES AND CABLES PENETRATING A WALL OR FLOOR

STEP 1



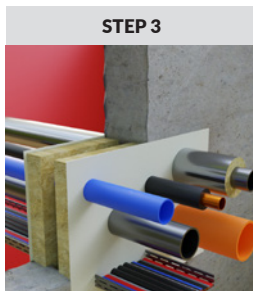
Fill the hole in the wall with mineral wool boards with a minimum density of 150 kg/m³ and a minimum thickness of 50 mm

STEP 2



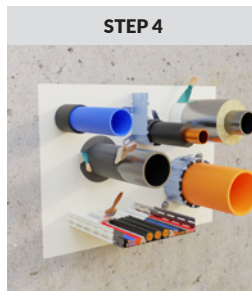
By using a putty knife, apply a 1.2 mm thick layer of PiroCoat A paste on the wool

STEP 3



Protection of wool and wall by PiroCoat A should be done on both sides

STEP 4



Protect pipes and cables in accordance with the instructions in the information leaflet or product catalog

STEP 5



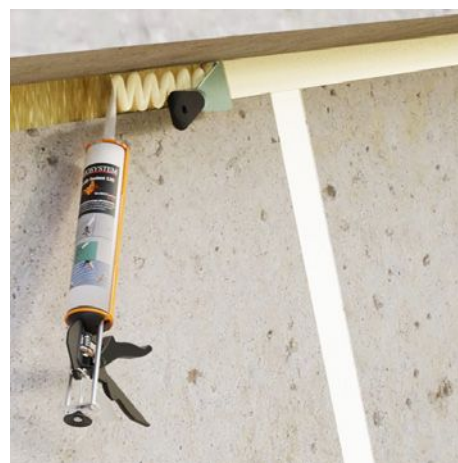
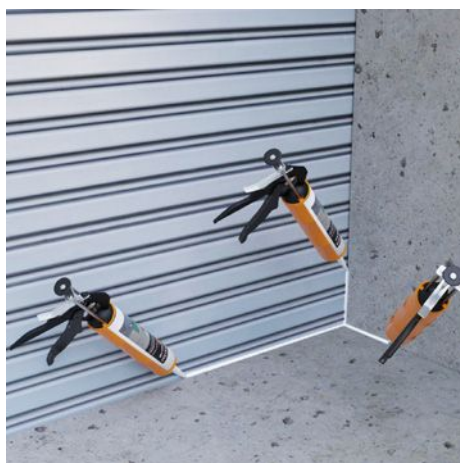
Mark the completed penetration seal with the label. Mark all Pirosystem materials used on it, enter the date and the name

PRODUCT DOCUMENTS

European Technical Approval :	ETA-17/1059
Certificate of Constancy of Performance:	1488-CPR-0669/W
Hygienic certificate:	BK/B/0264/01/2019
European Declaration of Performance:	PIRO/04-2017-12-31

PRODUCT TECHNICAL DATA

Fire resistance class:	up to EI 120
Reaction to fire:	Bfl-s1; B-s2,d0
Color:	white
Density:	1,60 ± 5% g/cm ³
Environment class:	Z1, Z2
Storage temperature range:	from +5°C to +30°C
Shelf life:	10 months in original closed packaging
Theoretical amount of mass needed (kg/m ²) to obtain a coating thickness of 1 mm:	1,93 kg/m ²
Oxygen index:	≥45
Packaging:	3 kg, 10 kg bucket 310 ml cartridge



TECHNICAL DESCRIPTION:

Fire-resistant acrylic mass Piro Acrylic Sealant AC120 is a liquid, thick mass of white color, based on a water-dilutable acrylic resin with special additives. The mass pressed into expansion joints or gaps under fire conditions expands its volume, filling the spaces between construction elements tightly.

INTENDED USE:

Piro Acrylic Sealant AC120 is intended for fireproof seals:

- expansion joints in building partitions constituting fire partitions with a possible displacement of ± 7.5%
- spaces between frames and window and door frames (wooden, steel, PVC) - the mass does not replace the mechanical fastening of windows and doors to the building partition,
- around steel or copper pipes,
- previously protected with one of PiroSystem products: tape, collar, foam or seals

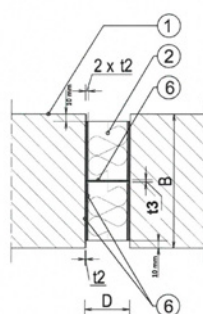
APPLICATION:

THE TYPES OF PARTITIONS WHICH CAN BE USED FOR PIRO ACRYLIC SEALANT AC 120 SHOWN IN TABLE 41 BELOW

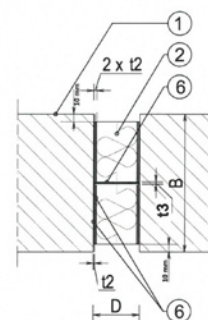
TABLE 41		
FLOOR	RIGID WALL	FLEXIBLE WALL
width from 150 mm	width from 100 mm	width from 125 mm
Reinforced concrete	Aerated concrete, concrete, brick, other ceramic products	Plasterboard
	 	

EXAMPLES OF PRODUCT TECHNICAL APPLICATION:

METHOD OF PROTECTING EXPANSION JOINTS IN WALL AND FLOOR ACCORDING TO ETA-17/1059



- 1 - rigid wall with a thickness of $B \geq 150$ mm, density ≥ 600 kg/m³ and $D = 5 \div 60$ mm
- 2 - mineral wool with a density of not less than 120 kg/m³
- 6 - Piro Acrylic Sealant AC120, with a thickness of $t_2 \geq 2.5$ mm, $t_3 \geq 3$ mm



- 1 - rigid floor with a thickness of $B \geq 150$ mm, density ≥ 600 kg/m³ and $D = 5 \div 60$ mm
- 2 - mineral wool with a density of not less than 120 kg/m³
- 6 - Piro Acrylic Sealant AC120, with a thickness of $t_2 \geq 2.5$ mm, $t_3 \geq 3$ mm

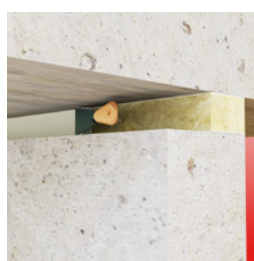
PIRO ACRYLIC SEALANT AC120 APPLICATION ON EXPANSION JOINTS IN WALL AND CEILING



Apply Piro Acrylic Sealant AC120 by using a putty knife on both sides (the layer thickness is given in the technical drawings above) on the mineral wool board with a minimum density of 80 kg/m³ (the board thickness should be half of the expansion joint depth)



Place prepared mineral wool boards inside the expansion joint at one of its edges



By using a putty knife apply Piro Acrylic Sealant AC120 on mineral wool boards (layer thickness is given in the technical drawings above)

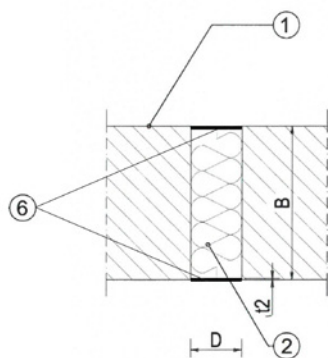


Fill the remaining expansion joint with mineral wool boards with a density of 80 kg/m³ with Piro Acrylic Sealant AC120 applied previously, the same way as in step 1



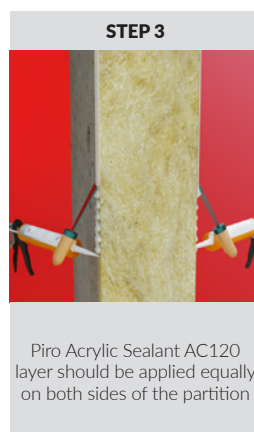
Properly protected expansion joint

METHOD OF PROTECTING EXPANSION JOINT IN A WALL ACCORDING TO ETA-17/1059

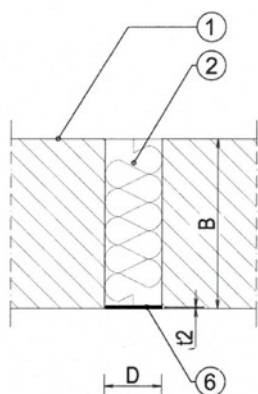


- 1 - rigid wall, thickness $B \geq 150$ mm, density ≥ 600 kg/m³ and $D = 5 \div 60$ mm
- 2 - mineral wool with a density of not less than 120 kg /m³
- 6 - Piro Acrylic Sealant AC120, applied on both sides of expansion joint, thickness $t_2 \geq 0.4$ mm

PIRO ACRYLIC SEALANT AC120 APPLICATION ON EXPANSION JOINTS IN WALL

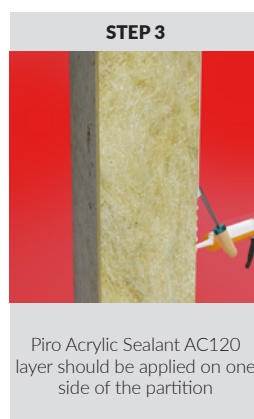


METHOD OF PROTECTING EXPANSION JOINT IN A WALL ACCORDING TO ETA-15/0853

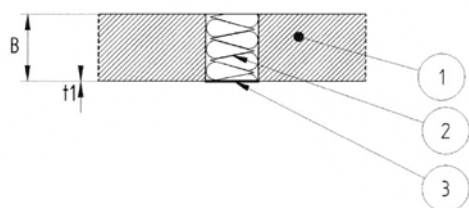


- 1 - rigid wall with a thickness of $B \geq 150$ mm, density ≥ 600 kg/m³ and $D = 6.5 \div 100$ mm
- 2 - mineral wool with a density of not less than 80 kg/m³
- 6 - Piro Acrylic Sealant AC120 placed on one side of the expansion joint, thickness $t_2 \geq 1.6$ mm

PIRO ACRYLIC SEALANT AC120 APPLICATION ON EXPANSION JOINTS IN WALL

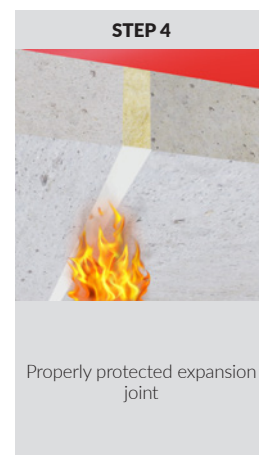
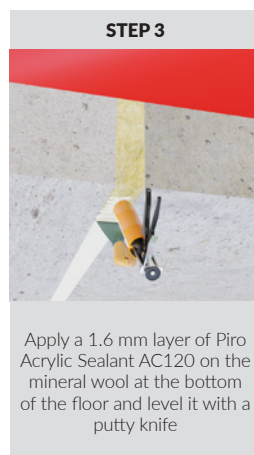
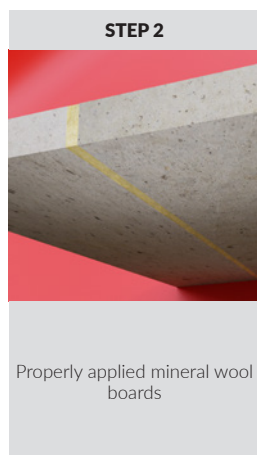
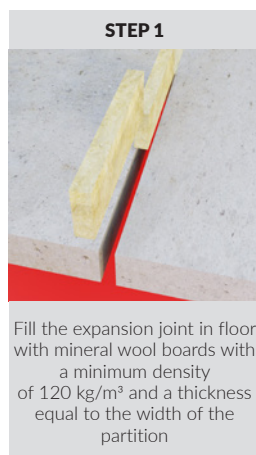


METHOD OF PROTECTING EXPANSION JOINT IN WALL OF FLOOR TOGETHER WITH FLOOR ACCORDING TO ETA-17/1059

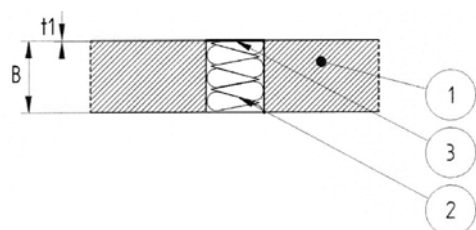


- 1 - rigid floor with thickness of $B \geq 150$ mm and density ≥ 1700 kg/m³
- 2 - mineral wool with a density of not less than 80 kg/m³
- 3 - Piro Acrylic Sealant AC120 with a thickness of $t1 \geq 1.6$ mm placed at the bottom of expansion joint

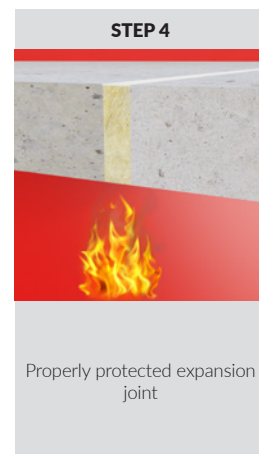
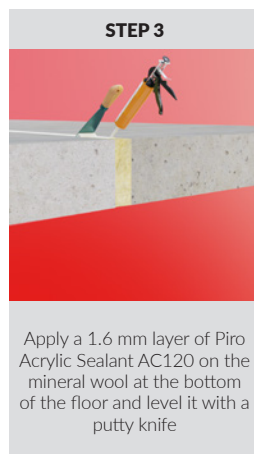
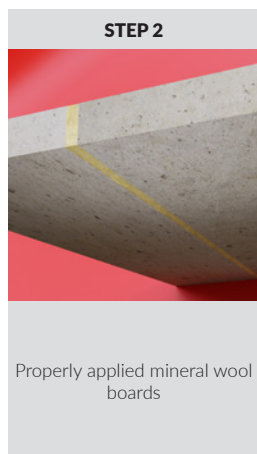
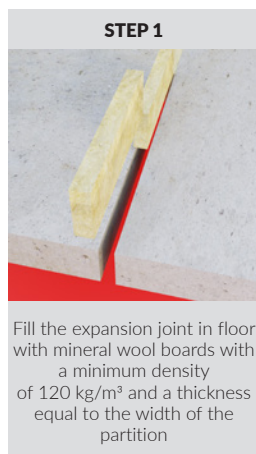
PIRO ACRYLIC SEALANT AC120 APPLICATION ON EXPANSION JOINTS IN FLOOR



PIRO ACRYLIC SEALANT AC120 APPLICATION ON EXPANSION JOINTS IN FLOOR



- 1 - rigid floor with thickness of $B \geq 150$ mm and density ≥ 1700 kg/m³
- 2 - mineral wool with a density of not less than 80 kg/m³
- 3 - Piro Acrylic Sealant AC120 with a thickness of $t1 \geq 1.6$ mm placed at the top of expansion joint



METHOD OF PROTECTING WALL AND FLOOR GAPS

STEP 1	STEP 2	STEP 3	STEP 4	STEP 5
				
Prepare the gap by brushing off loose parts and dust with a brush	In case of narrow gaps not filled with wool, insert Piro Acrylic Sealant AC120 as deep as possible into the gap	In case of deep gaps fill them partially with mineral wool	Apply Piro Acrylic Sealant AC120 so that a layer is formed. Use a putty knife to level it	Properly protected wall gap

TYPES OF EXPANSION JOINTS

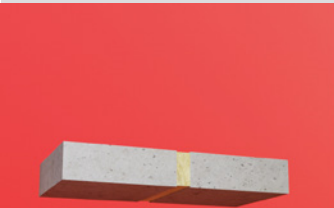
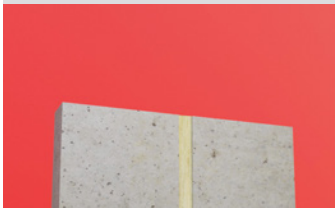
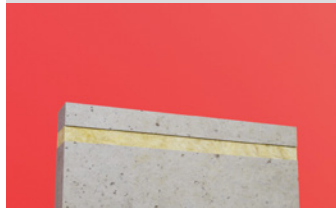
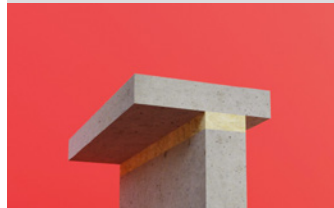
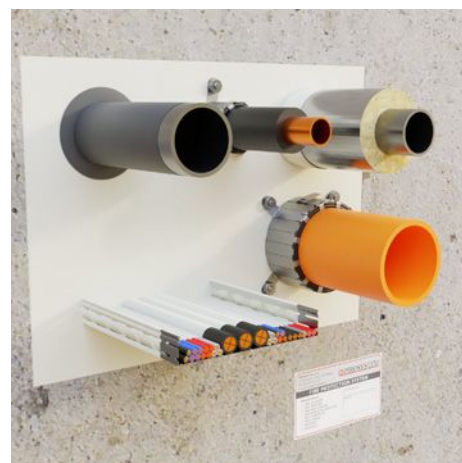
TYPE A	TYPE B	TYPE C	TYPE D
			
EXPANSION JOINT IN FLOOR	VERTICAL EXPANSION JOINT IN WALL	HORIZONTAL EXPANSION JOINT IN WALL	EXPANSION JOINT BETWEEN FLOOR AND WALL

TABLE FOR SELECTING THE SEALING OF EXPANSION JOINTS IN WALLS OF FLOORS AND BETWEEN WALLS AND FLOORS

TABLE 40						
Type of expansion joint	Protection	Expansion joint width	PiroCoat A	EI classification		ETA-17/1059
		mm	mm	floor - floor floor - wall	wall - wall	
TYPE B, C	Mineral wool one side	60	2,5/3		EI 120-V-T-X-B-W60	1
TYPE B, C	Mineral wool j one side	100	1,6		EI 120-V-T-X-B-W100	3
TYPE B, C	Mineral wool both sides	60	0,4		EI 120-V-T-X-B-W60	2
TYPE A, D	Mineral wool one side	60	0,6/1,2	EI 120-H-T-X-B-W60		4
TYPE A, D	Mineral wool one side top	100	1,6	EI 120-H-T-X-B-W100		5
TYPE A, D	Mineral wool one side bottom	100	1,6	EI 120-H-T-X-B-W100		6

PRODUCT TECHNICAL DATA	
Surface color:	creamy white
Mineral wool density:	150 kg/m ³
Storage temperature range:	from +5°C to +30°C
Shelf life:	24 months in original closed packaging
PiroCoat A thickness:	1,6 mm
Board dimensions: (height x width x thickness)	1000 mm x 600 mm x 51,6 mm
Packaging:	2 boards



TECHNICAL DESCRIPTION:

PiroCoat A painted mineral wool board is a mineral wool board with a density of 150 kg/m³ and a thickness of 50 mm, covered with a 1.6 mm layer of PiroCoat A, i.e. ablative paste, which is a water dispersion of synthetic resin and pigments. PiroCoat A layer is completely non-flammable.

INTENDED USE:

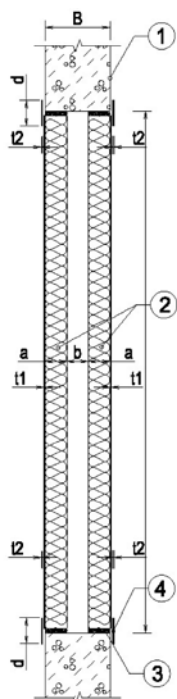
PiroCoat A painted mineral wool board is used in the construction of mixed penetration seals of certain types of flammable, non-flammable pipes as well as cables penetrating flexible and rigid walls and floors. It is also used to fill expansion joints in walls and floors. In addition, it can be a fireproof protection for plasterboards or a filling between them in order to increase the fire resistance of a partition made of these boards. PiroCoat A coating on the mineral wool board is characterized by very good endothermic properties, it strongly cools the surfaces when heated with the flame and blocks its spread under fire conditions. The main advantage of PiroCoat A painted mineral wool board is filling mixed penetration seals and expansion joints and the speed and simplicity of installation. The product is designed in accordance with ETA-17/1062 and ETA-15/0853.

APPLICATION OF PIROCOAT A PAINTED MINERAL WOOL BOARD WHEN FILLING EXPANSION JOINTS

STEP 1	STEP 2	STEP 3	STEP 4	STEP 5	STEP 6
					
Cut off the strip with a knife of PiroCoat A painted mineral wool board with a width equal to the width of the expansion joint.	Place the previously cut strip in the expansion joint so that the top layer coated with PiroCoat A is together with the partition surface	If the partition is thicker than 100 mm, then the space between the applied PiroCoat A painted mineral wool board strips should be filled with any mineral wool	If the protection must be made on both sides, place the cut PiroCoat A painted mineral wool board strip in the expansion joint on the opposite side of the partition	Joints between the PiroCoat A painted mineral wool board and the partition seal with PiroCoat A (in the cartridge)	Properly protected expansion joint on one and both sides. In this way, you can protect horizontal and vertical expansion joints both in walls and floor. Technical details concerning expansion joint protection can be found on page 68

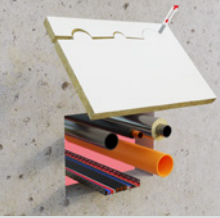
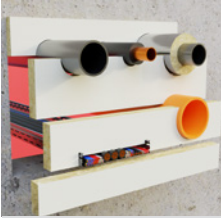
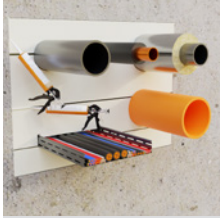
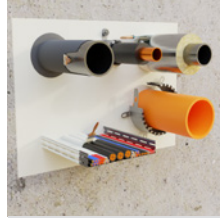
METHOD OF MAKING PARTITION IN MIXED PENETRATION:

CONSTRUCTION DETAILS OF MIXED PENETRATION ACCORDING TO ETA-17/1062



- 1 - rigid wall with adensity of min. 600 kg/m³ and thickness B ≥ 150 mm or a rigid floor with a minimum density of 1700 kg/m³ and thickness B ≥ 150 mm
- 2 - two mineral wool boards with a density of min. 150 kg/m³, thickness a ≥ 50 mm, painted with PiroCoat A with a thickness of t₁ ≥ 1.2 mm; b ≥ 50 mm (space between the boards)
- 3 - PiroCoat A, ≥ 50 mm long and ≤ 5.0 mm thick
- 4 - PiroCoat A on both sides of the wall or ceiling (located on the perimeter of the penetration), length d ≥ 60 mm and thickness t₂ ≥ 0.6 mm

PIROCOAT A PAINTED MINERAL WOOL BOARD APPLICATION AND IN MIXED PENETRATIONS

STEP 1	STEP 2	STEP 3	STEP 4	STEP 5	STEP 6
					
Cut the right shape with a knife to match PiroCoat A painted mineral wool board with pipes, cable trays or cable bundles	The fragments of PiroCoat A painted mineral wool board place in the partition so that the top painted layer of PiroCoat A is together with the partition	Use PiroCoat A in the cartridge to protect the gaps between the arranged fragments of PiroCoat A painted mineral wool board and the places where the board and partition meet	Protection of the mixed penetrations both in the wall and in the floor with PiroCoat A painted mineral wool board should be made on both sides	Protect pipes and cables in accordance with the instructions in the information leaflet or product catalog	Mark the completed penetration seal with the label. Mark PiroCoat A on it, enter the date and the name

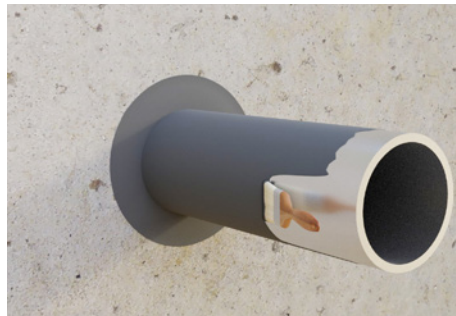
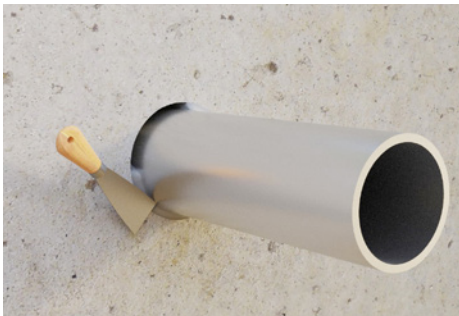


PRODUCT DOCUMENTS

European Technical Approval:	ETA-17/1062
Certificate of Constancy of Performance:	1488-CPR-0726/W
Hygienic certificate:	BK/B/0264/01/2019
European Declaration of Performance:	PIRO/06-2010-09-10

PRODUCT TECHNICAL DATA

Fire resistance class:	up to EI 120
Reaction to fire:	Bfl-s1; B-s2,d0
Color:	graphite gray
Density:	1,42 ± 5% g/cm ³
Environment class:	Z1, Z2
Storage temperature range:	from +5°C to +30°C
Shelf life:	10 months in original closed packaging
Theoretical amount of mass needed (kg/m ²) to obtain a coating thickness of 1 mm:	1,89 kg/m ²
Packaging:	3 kg, 10 kg bucket 310 ml cartridge



TECHNICAL DESCRIPTION:

PiroCoat I is a one-component, dense, water-based dispersion of synthetic resin and graphite-colored pigments. The paste reacts - it increases its volume under the influence of temperature above 150 °C. It is suitable for application with a putty knife or brush with stiff bristles. It can be diluted by adding up to 3% water. The PiroCoat I coating is rough after drying. Use mechanical instruments for thickness measurement, e.g. callipers. The dried coating of PiroCoat I can conduct electricity. PiroCoat I can be packed in various containers, from 310 ml cartridges to 10 kg buckets. In order to change the color, PiroCoat I can be topcoated with decorative water-based paints. Before applying, the surfaces should be clean from dust and degreased.

INTENDED USE:

PiroCoat I is designed for fire insulation and sealing and fireproof protection of penetrations through walls and floors of steel, copper and cast iron pipes without insulation or insulated with PE foam (in combination with Piro Multitube PM). It can also be used to protect penetrations through walls and floors, small diameter flammable pipes, stabilized with glass or aluminum. The coating made of this mass, under the influence of high temperature, intumesces under fire conditions, creating a foamed, fire-protective thermal insulation layer on the protected surface. Penetration seals made by PiroCoat I are classified in EI class.

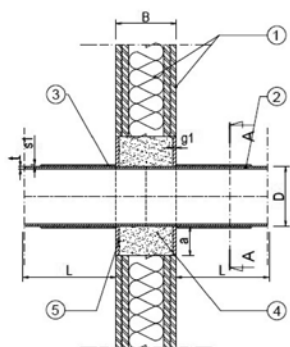
APPLICATION:

THE TYPES OF PARTITIONS WHICH CAN BE USED FOR PIROCOAT I SHOWN IN TABLE 42 BELOW

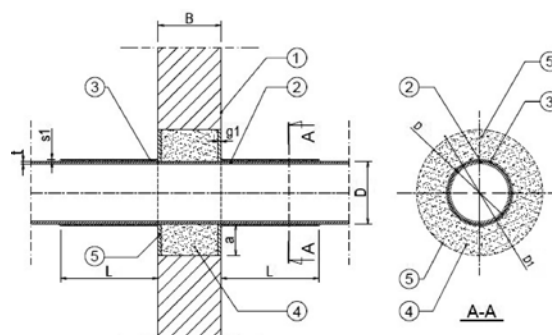
TABLE 42		
FLOOR	RIGID WALL	FLEXIBLE WALL
width from 150 mm	width from 100 mm	width from 100 mm
Reinforced concrete	Aerated concrete, concrete, brick, other ceramic products	Plasterboard
	 	

EXAMPLES OF PRODUCT TECHNICAL APPLICATION:

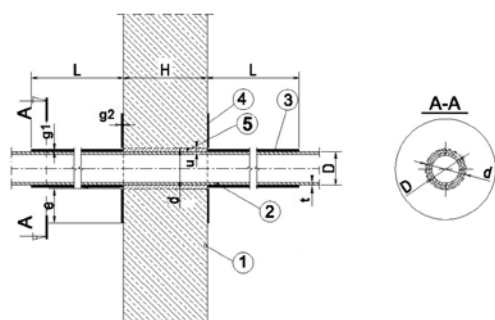
METHOD OF PROTECTING A METAL PIPE PENETRATING A WALL AND FLOOR ACCORDING TO ETA-17/1062



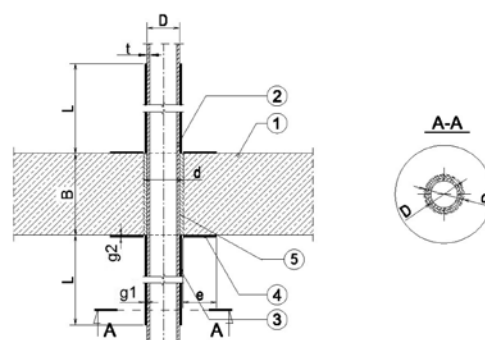
- 1 - flexible wall with a thickness of min. 100 mm
- 2 - metal pipe, diameter "D" and pipe wall thickness "t"
- 3 - PiroCoat I, dimensions: length L = min. 500 mm, thickness s1 = min. 1.2 mm, paste additionally used for length g1 = min. 5 mm, inside the partition
- 4 - the space between the pipe and the partition structure, max. a = 30 mm, filled with mineral wool with a density of min. 50 kg/m³
- 5 - gypsum mortar with a thickness of min. g1 = 5 mm



- 1 - rigid wall with a thickness of min. 100 mm
- 2 - metal pipe, diameter "D" and pipe wall thickness "t"
- 3 - PiroCoat I, dimensions: length L = min. 500 mm, thickness s1 = min. 1.2 mm, paste additionally used for length g1 = min. 5 mm, inside the partition
- 4 - the space between the pipe and the partition structure, max. a = 30 mm, filled with mineral wool with a density of min. 50 kg/m³
- 5 - gypsum mortar with a thickness of min. g1 = 5 mm



- 1 - rigid wall with a thickness of min. 150 mm
- 2 - metal or plastic pipe; diameter "D" and pipe wall thickness "t"
- 3 - PiroCoat I (pipe cover), length L = min. 500 mm and thickness g1 = min. 1.2 mm
- 4 - PiroCoat I (ring on the wall around the penetration seal), length e = min. 50 mm and thickness g2 = min. 0.6 mm
- 5 - the space between the pipe and the partition structure filled with mineral wool with density of min. 50 kg/m³ or with cement mortar, width max. u = 30 mm



- 1 - floor with a thickness of min. 150 mm
- 2 - metal pipe, diameter "D" and pipe wall thickness "t"
- 3 - PiroCoat I (pipe cover), thickness g1 = min. 1.2 mm and min. 500 mm
- 4 - PiroCoat I (ring on the floor around the penetration seal), thickness g2 = min. 0.6 mm; length e = min. 60 mm
- 5 - the space between the pipe and the partition structure filled with cement mortar thickness u = max. 15 mm

PIROCOAT I APPLICATION ON METAL PIPES WITHOUT INSULATION PENETRATING A WALL OR FLOOR

STEP 1



Fill the space between the pipe and the partition tightly. Use mineral wool with a density of min. 60 kg/m³ or cement mortar

STEP 2



By using a brush, apply PiroCoat I on the partition in such a way that a ring with a width of min. 50 mm and a minimum thickness of 0.6 mm is created

STEP 3



Apply PiroCoat I on the pipe so that a ring with a width of min. 500 mm and a thickness of min. 1.2 mm is created

STEP 4



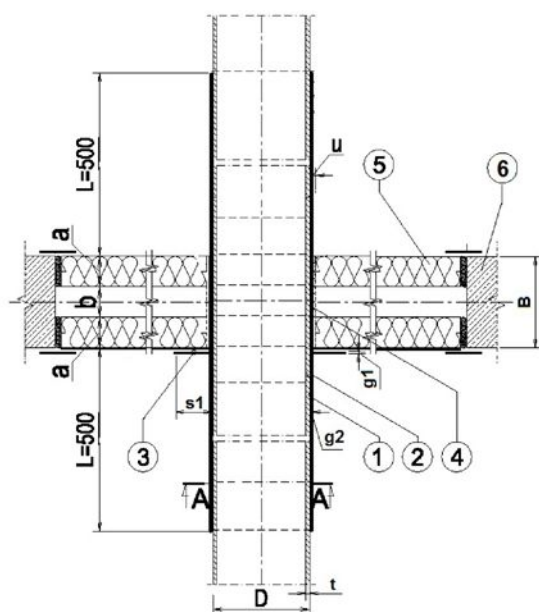
The protection should be made on both sides of the partition, both in the wall and in the floor

STEP 5



Mark the completed penetration with the attached label, mark PiroCoat I on it, enter the date and name

METHOD OF PROTECTING A METAL PIPE PENETRATING FLOOR ACCORDING TO ETA-17/1062



- 1 - metal pipe with a diameter $D \leq 273$ mm and a pipe wall thickness t from 6.0 to 14.2 mm
- 2 - PiroCoat I, length $L \geq 500$ mm, thickness $g2 \geq 1.2$ mm
- 3 - PiroCoat I, length $s1 \geq 50$ mm, thickness $g1 \geq 0.6$ mm
- 4 - the space between the pipe insulation and the PiroCoat I seal; thickness $u \leq 5$ mm
- 5 - construction details of a mixed penetration seal
- 6 - rigid floor with a density of min. 1700 kg/m^3 and thickness $B \geq 150$ mm

PIROCOAT I APPLICATION ON METAL PIPES WITHOUT INSULATION PENETRATING THE FLOOR

STEP 1

Fill the hole in the wall with mineral wool boards on both sides with a minimum density of 150 kg/m^3 and a minimum thickness of 50 mm

STEP 2

Using a putty knife, apply a 1.2 mm thick layer of PiroCoat A to the mineral wool

STEP 3

By using a brush, apply PiroCoat I on the partition in such a way that a ring with a minimum width of 50 mm and a minimum thickness of 0.6 mm is created. Apply PiroCoat I on the pipe for a length of min. 500 mm and a thickness of min. 1.2 mm

STEP 4

The protection of mineral wool filling the partition and pipes should be made on both sides of the partition, both in the wall and in the floor

STEP 5

Mark the completed penetration with the attached label, mark PiroCoat I, PiroCoat A on it, enter the date and name

SCOPE OF APPLICATION OF PIROCOAT I DEPENDING ON THE PIPE MATERIAL AND DIAMETER AND THE TYPE OF PARTITION

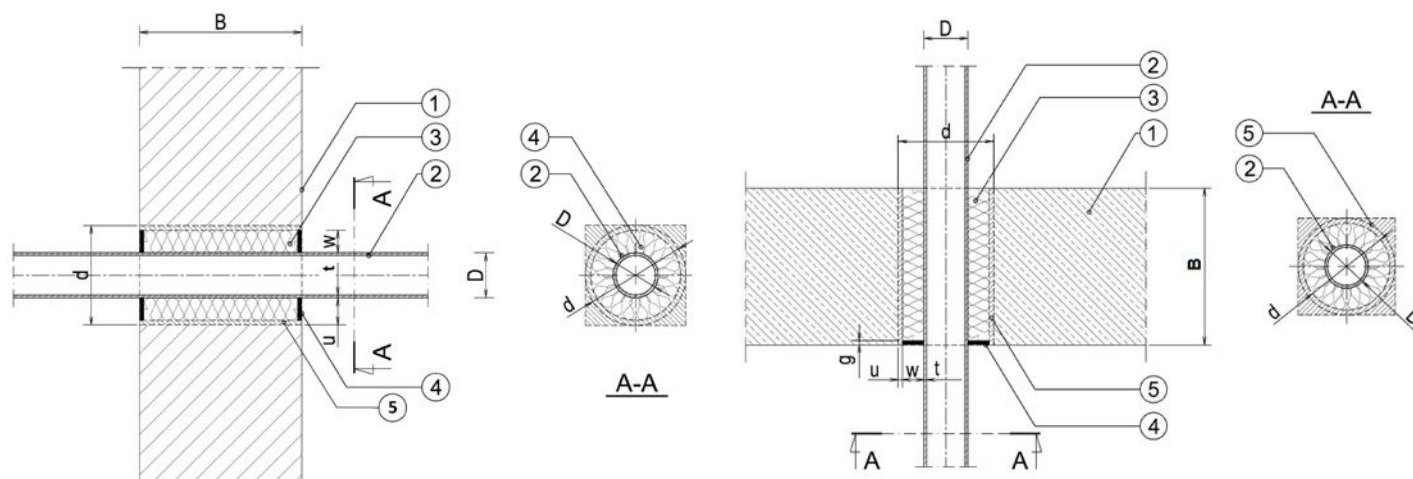
TABLE 43

Pipe penetration through plasterboard with a width of min. 100 mm						Pipe penetration through a rigid wall or floor					
Pipe material	Type of insulation	Pipe diameter DN		Protection	Resistance class	Pipe material	Type of insulation	Pipe diameter DN		Protection	Resistance class
		min.	max.					min.	max.		
Copper	Without insulation	0	10	PiroCoat I	EI 120	Copper	Without insulation	0	35/108 ¹⁾	PiroCoat I	EI 120
Steel		0	63,9			Steel		0	273		
Cast iron		0	63,9			Cast iron		0	273		
						PE-X		0	17 ²⁾		

1) Copper for a rigid wall DN max. = 35mm, and for ceiling DN max. = 108 mm

2) PE-X for a rigid wall DN max. = 17 mm

METHOD OF PROTECTING FLAMMABLE PIPES WITH A SMALL DIAMETER PENETRATING A WALL OR FLOOR ACCORDING TO ETA-17/1062



- 1 - a rigid wall with a minimum thickness of 150 mm
 2 - plastic pipe with diameter "D" and pipe wall thickness "t"
 3 - mineral wool with a density of 50 kg/m³ and a thickness of w = min. 15 mm
 4 - PiroCoat I, thickness min. 4 mm
 5 - the space between the mineral wool and the partition structure filled with cement mortar, max. 17.5 mm

- 1 - floor with a minimum thickness of 150 mm
 2 - plastic pipe with diameter "D" and pipe wall thickness "t"
 3 - mineral wool with a density of 50 kg/m³ and a thickness of w = min. 15 mm
 4 - PiroCoat I, thickness min. 5 mm
 5 - the space between the mineral wool and the partition structure filled with cement mortar, max. 17.5 mm

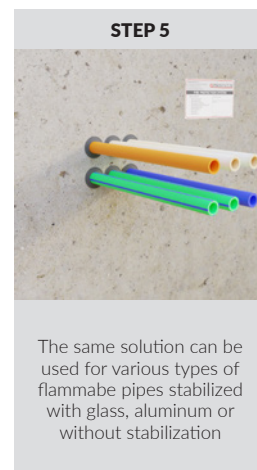
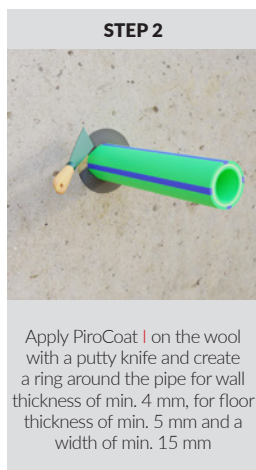


TABLE FOR SELECTING THE THICKNESS OF PIROCOAT I

TABLE 44								
	Complementary material mineral wool 50 kg/m³	RIGID WALL EI 120			FLOOR EI 120			Theoretical use of PiroCoat I for a thickness of 4 mm
		Maximum wall thicknesses of a flammabe pipe selected from ETA			Maximum wall thicknesses of a flammabe pipe selected from ETA			
Nominal diameter of the pipe	PiroCoat I thickness	PVC	PE-HD, PE, ABS, SAN+ PVC	PP	PVC	PE-HD, PE, ABS, SAN+ PVC	PP	
mm	mm	mm	mm	mm	mm	mm	mm	kg
15	4	1,9	2,4	1,8	2	3	1,9	0,18
25	4	1,9	2,4	1,8	2	3	1,9	0,20
32	4	1,9	2,4	1,8	2	3	1,9	0,22
40	4	1,9	2,4	1,8	2	3	1,9	0,25

PRODUCT DOCUMENTS

National Technical Assessment:	ITB-KOT-2018/0650 ITB-02706.6/19/Z00NZP
Fire Resistance Classification:	02706.6/19/Z00NZP
National Declaration of Performance:	PIRO/05-2018-09-10

PRODUCT TECHNICAL DATA

Fire resistance class:	up to EI 240
Reaction to fire:	B-s1,d0
Color:	yellow
Environment class:	Z1, Z2
Storage temperature range:	from +10°C to +30°C
Shelf life:	2 months in original closed packaging
Theoretical usage out of a 750 ml spray:	38 dm ³ hardened foam
Packaging:	750 ml spray (straw or gun)



TECHNICAL DESCRIPTION:

Piro Foam PF 240 is a one-component, semi-rigid polyurethane spray foam. It is supplied in a liquid state in a 750 ml spray in a version with a flexible application by straw or with a tip adapted to a dispensing gun. The foam hardens by absorbing moisture from air.

INTENDED USE:

Piro Foam PF 240 is designed for fireproof sealing:

- gaps, expansion joints in building partitions constituting fire partitions with a possible displacement of up to $\pm 7.5\%$,
- space between steel structure and partition,
- spaces between frames and window and door frames (wooden, steel, PVC) - the foam does not replace the mechanical fastening of windows and doors to the building partition,
- ideal for filling large, irregular and difficult-to-fill gaps, increasing their volume, fills them completely.

ADDITIONAL INFORMATION:

Works with the use of foam are carried out at a temperature of + 5 ° C to + 30 ° C. The product should not be exposed to direct effects of external weather conditions. The foam is not resistant to UV radiation, it should be protected against its effects by covering it with a suitable material intended for use on building facades, e.g. cement mortar, gypsum mortar, fire-resistant acrylic mass, PiroCoat A ablation paste or topcoat paint. The time required for the foam to fully cure and volatile flammable components to evaporate in order to achieve full fire resistance is 14 days.

■ **PIRO FOAM PF 240 APPLICATION WHILE MOUNTING DOORS**

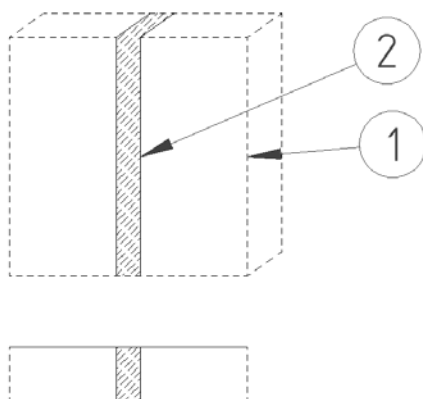
STEP 1	STEP 2	STEP 3
		
Fill the space between frame and wall with Piro Foam PF 240	Use a knife to cut off any excess Piro Foam PF 240	Properly protected gap between door frame and partition

■ **PIRO FOAM PF 240 APPLICATION WHILE MOUNTING WINDOWS**

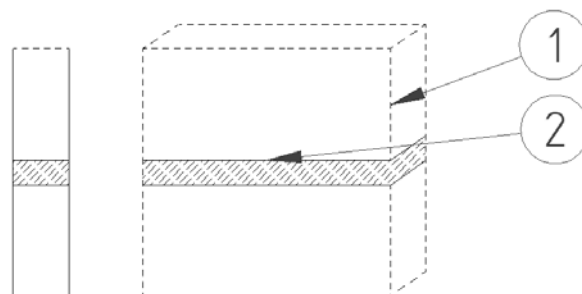
STEP 1	STEP 2	STEP 3
		
Fill the space between window frame and wall with Piro Foam PF 240	Use a knife to cut off any excess Piro Foam PF 240	Properly protected gap between window frame and partition

EXAMPLES OF PRODUCT TECHNICAL APPLICATION:

METHOD OF PROTECTING EXPANSION JOINTS IN WALL AND FLOOR ACCORDING TO ITB-KOT-2018/0650

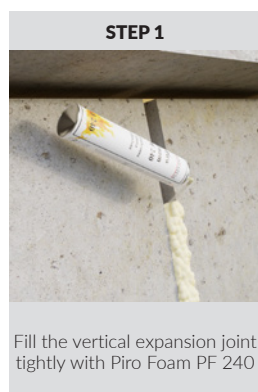


1 - rigid wall
2 - Piro Foam PF 240



1 - rigid wall
2 - Piro Foam PF 240

PIRO FOAM PF 240 APPLICATION ON EXPANSION JOINTS IN WALL

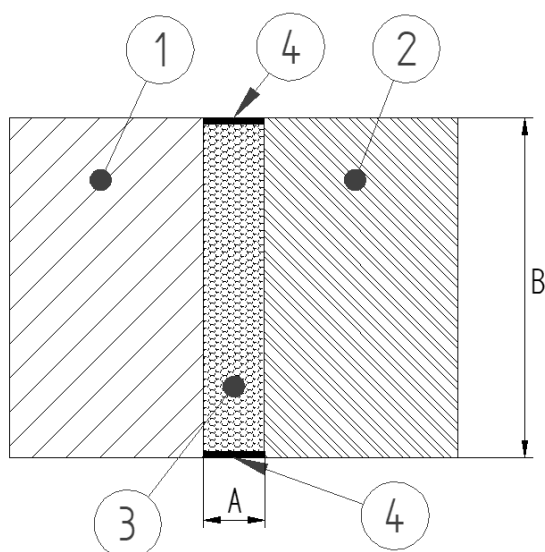


SELECTION TABLE FOR HORIZONTAL AND VERTICAL EXPANSION JOINTS IN WALLS

TABLE 45				
VERTICAL EXPANSION JOINTS				
wall width		150 mm	200 mm	240 mm
GUN				
Expansion joint width [mm]	5 do 10	EI 180	EI 240	EI 240
	11 do 20	EI 90	EI 120	EI 180
	21 do 30	EI 60	EI 90	EI 90
STRAW				
Expansion joint width [mm]	5 do 10	EI 180	EI 180	EI 240
	11 do 20	EI 90	EI 120	EI 240
	21 do 30	EI 60	EI 90	EI 90

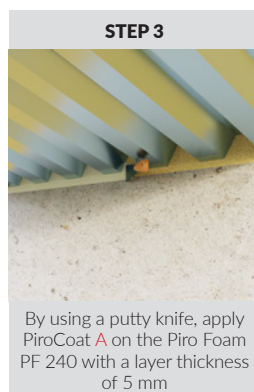
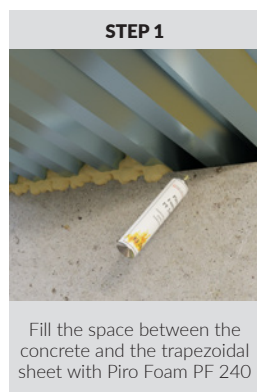
TABLE 46				
HORIZONTAL EXPANSION JOINTS				
wall width		150 mm	200 mm	240 mm
GUN				
Expansion joint width [mm]	5 do 10	EI 180	EI 180	EI 180
	11 do 20	EI 90	EI 90	EI 120
	21 do 30	EI 30	EI 60	EI 120
STRAW				
Expansion joint width [mm]	5 do 10	EI 120	EI 180	EI 240
	11 do 20	EI 60	EI 60	EI 90
	21 do 30	EI 60	EI 60	EI 90

METHOD OF PROTECTING THE JOINT OF CONCRETE AND TRAPEZOIDAL SHEET ACCORDING TO ITB-KOT-2018/0650

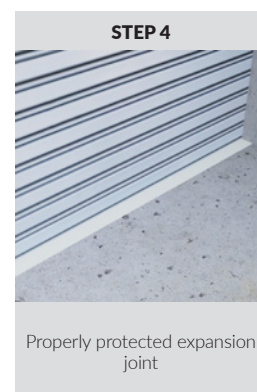
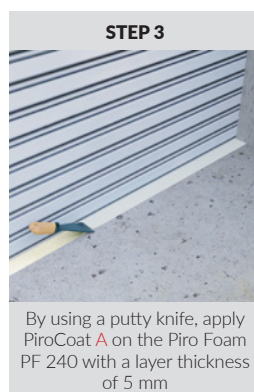
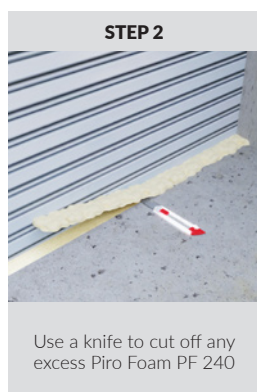
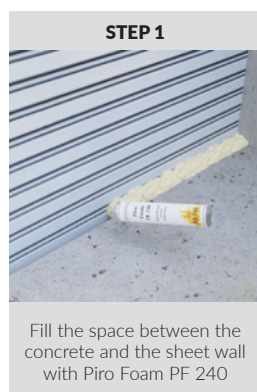


- 1 - surface made of concrete
- 2 - surface made of steel
- 3 - PiroFoam 240 filling the expansion joint with dimensions B = max. 150 mm and A = max. 90 mm
- 4 - PiroCoat A applied on the length = max. 90 mm with a thickness of g = 5 mm

PIRO FOAM PF 240 APPLICATION ON THE JOINT OF CONCRETE AND TRAPEZOIDAL SHEET



PIRO FOAM PF 240 APPLICATION ON THE JOINT OF CONCRETE AND A SHEET WALL



SELECTION TABLE FOR PROTECTION OF THE EXPANSION JOINT BETWEEN REINFORCED CONCRETE AND STEEL CONSTRUCTION

TABLE 47

Protection	Expansion joint width max. [mm]	PiroCoat A thickness [mm]	Resistance class
Piro Foam 240 + PiroCoat A	90	5	EI 120

FIRE-PROTECTIVE PAINTS



PRODUCT DOCUMENTS

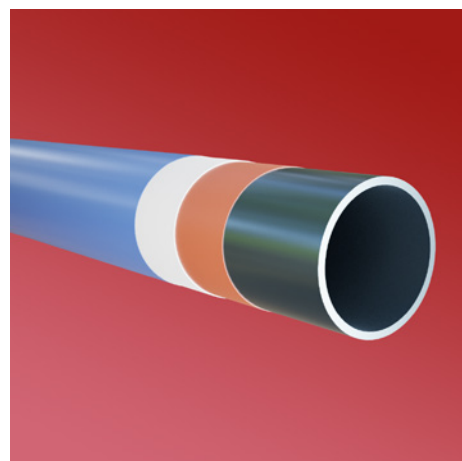
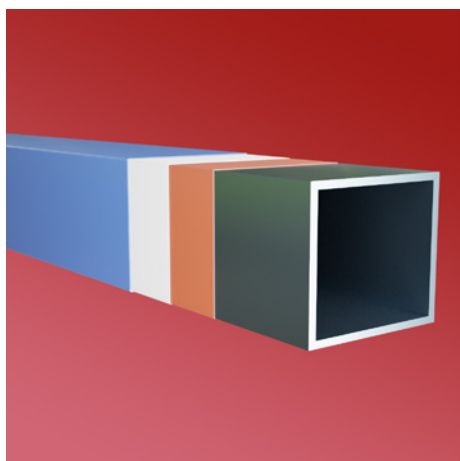
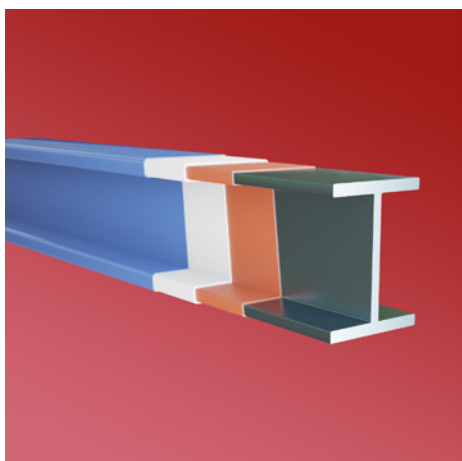
European Technical Approval:	ETA-20/0957
Certificate of Constancy of Performance:	FIRES-1396-CPR-0199
Declaration of performance:	PIRO-03-2021-01-20
Hygienic certificate:	B-BK-60211-0096/21

PRODUCT TECHNICAL DATA

Fire resistance class:	from R15 to R60
Color:	creamy
Density:	1,42 ± 5%
Solids content %:	81 ± 3
Drying time:	30 ± 10 minutes
VOC (g/dm ³):	23,45 ± 1,8
Storage temperature range:	from +5°C to +35°C
Packaging:	20l bucket



Packaging: 20l bucket



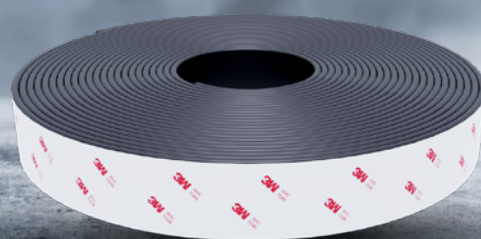
TECHNICAL DESCRIPTION:

Flame Stal is a fire resistant intumescent paint. One-component, thixotropic mixture based on organic solvents. Under the influence of high temperatures, Flame Stal foams, creating a durable thermal insulation, delaying the temperature rise of the steel substrate. R-15 to R-60 against thermal effects of standard fires according to PN-EN 1363-1: 2012 The set of Flame Stal® Fire Proof Solvent paints has the Technical Approval No. AT-15-9175 / 2015 and the ITB-2260 / W certificate of conformity. Fire-protected elements can be used inside and outside buildings in the conditions of the influence of environmental factors Z1, Z2, X, Y and various environmental corrosivity categories from C1 to C5 -I / M.

INTENDED USE:

The paint is applied on surfaces previously protected against corrosion with a primer paint or on galvanized surfaces prepared for this purpose. The Flame Stal fire protection system creates a flexible and mechanically durable protection, resistant to moisture, condensation water and weather conditions, including industrial atmosphere. As an intumescent layer in sets with appropriate primer and topcoat paints it is used for fireproof protection of steel structures with open and closed working profiles outside or inside buildings, including galvanized surfaces. Before using the system, consult the Technical Advisor of the paint manufacturer or distributor. Fire protection may be performed only by licensed companies that have received or have a valid Flame Stal® Fire Proof Solvent System Contractor's License.

GLUES AND GASKETS





FIREPROOF GLUEMSFG-100

FIRE PROTECTIVE GLUE

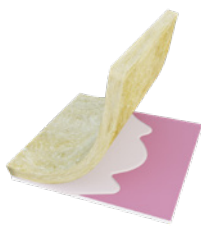
PRODUCT TECHNICAL DATA	
Fire resistance class:	to EI 120
Reaction to fire:	A2-s1,d0
Color:	creamy-white
Density:	1,56 ± 5% g/cm ³
Environment class:	Z1, Z2
Storage temperature range:	from +5°C to +35°C
Shelf life:	10 months
Theoretical usage out of 380 ml:	1,93 kg/m ²
Oxygen index :	≥45
Packaging:	10 kg bucket



Gluing chipboard
with furniture veneer



Gluing mineral wool
with concrete



Gluing mineral wool
with plasterboard



Gluing carpet
with concrete



Gluing polystyrene
with concrete

TECHNICAL DESCRIPTION:

MSFG-100 fireproof glue is ideal for permanent gluing of mineral wool, polystyrene, phenolic foam boards, PE, floor coverings, metals, including aluminum, stainless steel, wood or processed wood boards and derivatives. It can be applied to smooth or porous surfaces. MSFG-100 adhesive is a non-flammable one-component water-based polymer dispersion (polyvinyl acetate) with additives. The glue does not contain organic solvents. The glue has excellent adhesion and good performance properties, cures in a short time after application, creating a flexible, very durable joint.

INTENDED USE:

- Multi-layer insulation of external buildings
- Making insulation consisting of several layers
- Gluing carpets, decor elements and facades that require fire resistance

PRODUCT TECHNICAL DATA	
Fire resistance class:	do EI 60
Reaction to fire:	B-s2,d0
Color:	dark graphite or on request
Density:	1,41 ± 10%
Storage temperature range:	from +5°C to +35°C
Maximum application temperature:	without glue - 160°C with glue - 65°C
Intumescent pressure (N/mm2):	0,45 to 0,65 (depending on the type)
Intumescent factor (times):	from 15 to 30 (depending on the need)
Shelf life:	no limit, the recommended time is no longer than 24 months
Packaging:	10 - 100m roll



TECHNICAL DESCRIPTION:

The intumescent gasket PUD is made of a mixture of polymers and fillers that intumesce under fire conditions. By increasing its volume many times, it prevents the spread of fire through the fire door in which it is installed

INTENDED USE:

The PUD intumescent gasket is designed to make fireproof door seals. It is used for sealing rebates in leaves and frames, both wooden, aluminum and steel single and double fire doors. It can also be used on uneven surfaces, as well as under decorative strips. The gasket is completely resistant to water, does not peel or delaminate, and is very difficult to break after assembly. The gasket is pressed in the matrix, which gives it very precise and unchanging geometric dimensions and high surface quality. In order to facilitate installation, the gasket can be equipped with a self-adhesive tape. Selling in tapes of various lengths allows to minimize waste. The intumescent height and pressure of the PUD door gasket were tested at the Building Research Institute in accordance with the EOTA TR024: 2006 am: 2009 bubble method.

APPLICATION:

The PUD gasket is installed around the door, in a previously milled place. 3M double-sided adhesive tape ensures a stable connection with the glued element. The tape should be fitted into the slot of the prepared cutter and then stick it around the protected door.

CAUTION:

Install gaskets with glue on well-cleaned and degreased surfaces - in the case of painted surfaces, paints may react with the adhesive, e.g. non-chemically hardened paints or polyvinyl paints. It is therefore necessary to check the quality by sticking a sample of the gasket to the painted surface and observe the reactions for two days. Use professional metal rollers for sticking. It is recommended to wear gloves.

GASKET DIMENSION TABLE

TABLE 48		
NAME	DIMENSION (MM)	CATALOG NUMBER
PUD	10 x 1,8	340018015102
PUD	14 x 1,8	340018015142
PUD	15 x 1,8	340018015152
PUD	20 x 1,8	340016015202
PUD	22,2 x 1,8	340017015222
PUD	24 x 1,8	340018015242
PUD	30 x 1,8	340018015302
PUD	35 x 1,8	340018015352
PUD	40 x 1,8	340018015402
PUD	45 x 1,8	340018015442
PUD	48 x 1,8	340016015482
PUD	49 x 1,8	340018015492
PUD	58 x 1,8	340018015582
PUD	60 x 1,8	340018015602

§1. GENERAL PROVISIONS

1. These General Terms and Conditions of Sale ("GTCs") shall apply to all commercial relations in which PIROSYSTEM Sp. z o.o. acts as the Seller ("Seller"), and apply to sales contracts concluded by the Seller with other entities ("Buyer", "Contractor").
2. The Contractor is required to read these terms and conditions whenever he places an order or concludes a contract, as they constitute an integral part of the sales contracts concluded with the Seller.
3. Conclusion of the contract by the Buyer without reservations means that the Buyer has read these GTS and agrees to their inclusion in the content of the contract, and moreover, that they have been agreed with the Buyer and apply wherever the parties have not expressly agreed otherwise in writing, the Buyer is burdened with the burden of proving that there was a different written agreement between the Parties.
4. These GTS are widely available in information materials, so the parties agree that they were delivered to the Buyer no later than at the conclusion of the contract. If the Buyer remains in regular business contacts with the Seller, the GCS valid as of the date of conclusion of the given contract shall always apply.

§2. CONCLUSION AND BINDING OF CONTRACTS

1. Each order placement is tantamount to concluding a sales contract and consent to apply these GTS to it, if the Seller confirms the order in a manner adopted by the parties in accordance with the regulations contained below.
2. The order should be submitted in writing / electronic form and specify the exact name, address and tax identification number of the Buyer, assortment, quantity of the ordered goods, place of delivery, date of receipt from the Seller and be stamped with a company stamp or on letterhead or on a letterhead of orders and signed by a person authorized to place orders on behalf of the Buyer.
3. The Seller may accept (confirm) the order in whole or in part. In the order confirmation, the Seller specifies the quantity and type of goods being sold, their price, and the date and method of payment for the goods. The delivery date and the payment date are considered reserved in favor of the Seller.
4. The Buyer is obliged to collect the goods on the date agreed by the Parties.
5. Offers, advertisements and price lists are non-binding, unless otherwise stated in a given offer or price list.
6. The Buyer is not entitled to withdraw from the placed Order after the Seller confirms the order acceptance in whole or in part.
7. Any amounts paid by the Buyer on account of the order constitute an advance payment, however, it has the effect that if the Buyer withdraws from the order for any reason, the Seller has the right to keep the advance payment and cover the costs incurred by the Seller in connection with the acceptance of the payment. and order fulfillment. If any part of the advance paid by the Buyer remains in such a situation, the remaining amount of the advance payment may be returned to the Buyer upon his written request.
8. Value added tax (VAT) is added to the price included in the price list, offer or order confirmation, in the amount consistent with applicable regulations.
9. In the event of increasing the prices of products by the Seller's sub-suppliers, the Buyer hereby agrees to the appropriate increase of the price specified in the contract, price list, offer or order confirmation.
10. In the event that the price is not specified in Polish zlotys, and between the date of conclusion of the contract and the date of performance of the contract, there will be a change in the currency exchange rate, the Seller has the right to change the price according to the change in the foreign currency rate determined according to the average exchange rates of foreign currencies announced by the National Bank of Poland.

§3. PAYMENTS

1. The date of payment (date of payment) is the date on which the funds are credited to the Seller's account.
2. In the event of the Buyer's delay in payment for any invoice or payment for the goods, the Seller shall, at his choice, have the following rights:
 - a. may demand payment of interest on the terms specified in the Act on payment deadlines in commercial transactions or other currently applicable regulations;
 - b. has the right to set off any payment made by the Buyer for any invoice, first of all against the interest for the delay, and then against the receivables which are most recently due. This provision waives the debtor's right to credit the payment towards the amounts he chooses towards the Seller (under Art. 451 §1 of the Civil Code), to which the Buyer hereby agrees;
 - c. has the right to claim, apart from the principal amount and interest for delay, also the amount of EUR 40.00 resulting from the Act of March 8, 2013 on payment deadlines in commercial transactions, reimbursement of court and enforcement costs, legal representation and recovery of costs related to debt recovery receivables, including costs of insurance of receivables;

- d. may request the Buyer to return the goods for which the Buyer has not paid and the goods have already been delivered to the Buyer. Compensation may also occur if the goods have been used up or damaged, especially when the value of the goods collected from the Buyer's warehouse is lower than the amount of the payment that the Buyer should pay for the goods received;
 - e. may refuse to release another batch of goods;
 - f. has the right to demand immediate payment of all obligations of the Buyer towards the Seller and demand payment of all existing obligations at one time, regardless of the payment terms specified in the invoice or otherwise agreed, to which the Buyer hereby agrees;
 - g. has the right to cancel any discounts and rebates granted for future orders
- 3. The parties hereby exclude the possibility for the Buyer to make any deductions from the payment due to the Seller. This does not preclude the Seller from unilaterally deducting its own receivables from the Buyer's receivables.
 - 4. The parties hereby exclude the possibility of assigning any claims of the Buyer towards the Seller, unless the Seller agrees to it in writing.
 - 5. The Seller shall be entitled to the ownership of the goods purchased by the Buyer, until full payment for the goods and the goods related to the goods, such as costs of transport, insurance, packaging (reservation of ownership of the sold goods). Until the price for the purchase of goods from the Seller is settled and the remaining costs under the contract are covered, the Buyer may not perform any activities that would result in the sale or encumbrance of the purchased goods, for which the retention of title remains in force.
 - 6. Payment to the hands of the Seller's representative may be made only on the basis of a written power of attorney granted by the Seller to accept the payment by this representative.
 - 7. An account for a cash payment requires a separate arrangement. In the event of such an arrangement, the account is calculated from the net price after deducting the rebate and other discounts and the costs of transport, insurance and packaging incurred by the Seller. A prerequisite for granting the account is that there are no arrears in the payment of previous receivables in the Buyer's settlement.
 - 8. The submission of a bill of exchange or check by the Buyer shall not constitute payment, unless the parties have agreed otherwise in writing.
 - 9. In the event of payment difficulties with the Buyer, in particular in the event of a delay in payment, the Seller is entitled to refrain from performing the contract and make its further performance dependent on the payment of the price before delivery, or request the establishment of additional security that guarantees the satisfaction of existing obligations. the Buyer's payment to the Seller. In addition, any existing obligations with respect to which the Seller has granted the Buyer consent to delay their payment become due. The Buyer agrees to the above.
 - 10. In the event of overdue payments, failure to pay interest for late payments, or exceeding the credit limits by the Buyer, the execution of subsequent orders is suspended until appropriate payments are made.
 - 11. The Buyer waives unconditionally and irrevocably the right of retention resulting from previous or other current contractual relationships on the basis of which the goods have already been delivered to the Buyer by the Seller.
 - 12. Filing a complaint does not entitle the Buyer to withhold payment for the goods or for part of them.

§ 4. CONDITIONS OF DELIVERY

- 1. The place of the Seller's performance is the place where the goods are unloaded. This does not apply to those cases where the goods are not transported by means of transport provided by the Seller - then the place of performance is the place where the goods are released. These rules also apply to the moment of performance.
- 2. If it is agreed that the transport is performed by the Seller, the Seller is obliged to deliver the goods to the agreed place without unloading it and provided that the access road is suitable for heavy transport.
- 3. As soon as the item is released by the Seller, the benefits and burdens related to the item and the risk of its accidental loss or damage shall be transferred to the Buyer.
- 4. The agreed delivery dates are binding for the Seller only if the Seller confirms the delivery date in writing.
- 5. The Buyer is obliged to immediately and professionally unload the goods, not later than within 2 hours of the goods reaching the destination. The buyer bears the costs of unloading. In the event that the Buyer has not unloaded within the specified time of 2 hours, the Buyer also bears the costs of downtime of the vehicle with the driver.
- 6. The Buyer has the right to indicate another, additional place for unloading the vehicle with the goods. If the delivery of the goods to an additional unloading site results in an extension of the transport route or a significant increase in transport costs, then the resulting additional transport costs shall be borne by the Buyer.
- 7. In any case, the Buyer is obliged to pay the costs related to waiting for the unloading of the goods and any other costs and is liable to the Seller for damages resulting from such delay.

8. Freight details are not binding. Prices are based on freight and shipping costs in effect on the date of the offer. Subsequent changes shall be charged to the Buyer's benefit or expense, respectively.
9. The Buyer also bears the costs of packaging the goods for transport, charges for packaging and pallets used to transport the purchased goods, as well as costs caused by the need to secure the transport or protect materials.
10. Costs and losses resulting from unjustified refusal to accept the goods, including additional costs and transport risks, shall be borne by the Buyer.
11. The return of the goods is possible only in the event of confirmation of the conditions of acceptance of the goods by the Seller.
12. If the place or date of delivery is changed by the Buyer after confirming the order, the Buyer covers all costs resulting therefrom.
13. The Buyer is obliged to carefully check the completeness of the shipment immediately upon receipt and to determine any shortages or damage to the goods caused during transport.
14. The Seller hereby authorizes the Buyer, and the Buyer undertakes to complete all formalities related to the complaint procedure related to the transport of goods. The buyer is obliged to request the carrier to make a note of the damage on the bill of lading or to demand that a damage report be drawn up upon receipt, under pain of losing any claims for damages.
15. Extraordinary, external, unforeseeable and impossible to prevent on the date of the contract, including in particular acts of war, fire, epidemics, strikes, blockades, boycotts, lockouts or any other similar circumstances that are beyond the control of the Party (force majeure), release the Seller from the obligation to comply with the agreed terms for the performance of the sales contract for the period of their duration.
16. Force majeure is also understood as disputes between employers and employees, including between the Seller's employees and the Seller, strikes, disturbances in the supplier's plant operation not attributable to the Seller, communication disruptions, or acts of state authority impeding the performance of the concluded Agreement.

§ 5 PACKAGING

1. The Seller will make every effort to ensure that the goods to be delivered to the Buyer are properly packed.
2. The Seller shall not be liable for damages resulting from the properties of the material usually used to package the goods of a given type.
3. In the event that the goods should be delivered on pallets, the Seller will use single and reusable non-returnable pallets.

§ 6 WARRANTY AND WARRANTY AND COMPLAINT PROCEDURE

1. The Buyer declares that he is not a consumer within the meaning of Art. 22 (1) of the Civil Code.
2. Under these GTS, the provisions of the Civil Code on the warranty for defects in the goods do not apply to the concluded contract, however, the Seller may, at its option, accept the Buyer's complaint, if it considers it justified and if the following conditions are met:
 - a. The complaint will be reported immediately and in writing;
 - b. If the complaint concerns the quantity of goods resulting from improper packaging, the complaint should be reported on the day following unloading at the latest, and if it concerns damage incurred in transport - it should be reported on the day of unloading, and it is necessary to make a note about the improper condition of the goods at the time of unloading. unloading on the consignment note and confirmation by the carrier's representative;
 - c. If the complaint concerns the quality of the goods, it must be submitted within one week from the date the defect was discovered;
 - d. If the complaint is considered justified, the goods may be replaced with a new one, free from defects, or a discount may be applied. The settlement of the complaint in the above-described manner excludes the possibility of demanding further compensation.
 - e. Until the complaint is finally considered, the Buyer is obliged to store the goods subject to the complaint with due diligence so that it does not become damaged or lacks, as well as the properties of the goods are not lost.
 - f. The Seller is not responsible for improper storage of the goods, damage caused in the unloading due to the fault of the Buyer or a third party.
 - g. The condition for considering the complaint is also the possession by the Buyer of photographic documentation showing the type and size of the defect giving the basis for the complaint and providing this documentation to the Seller.

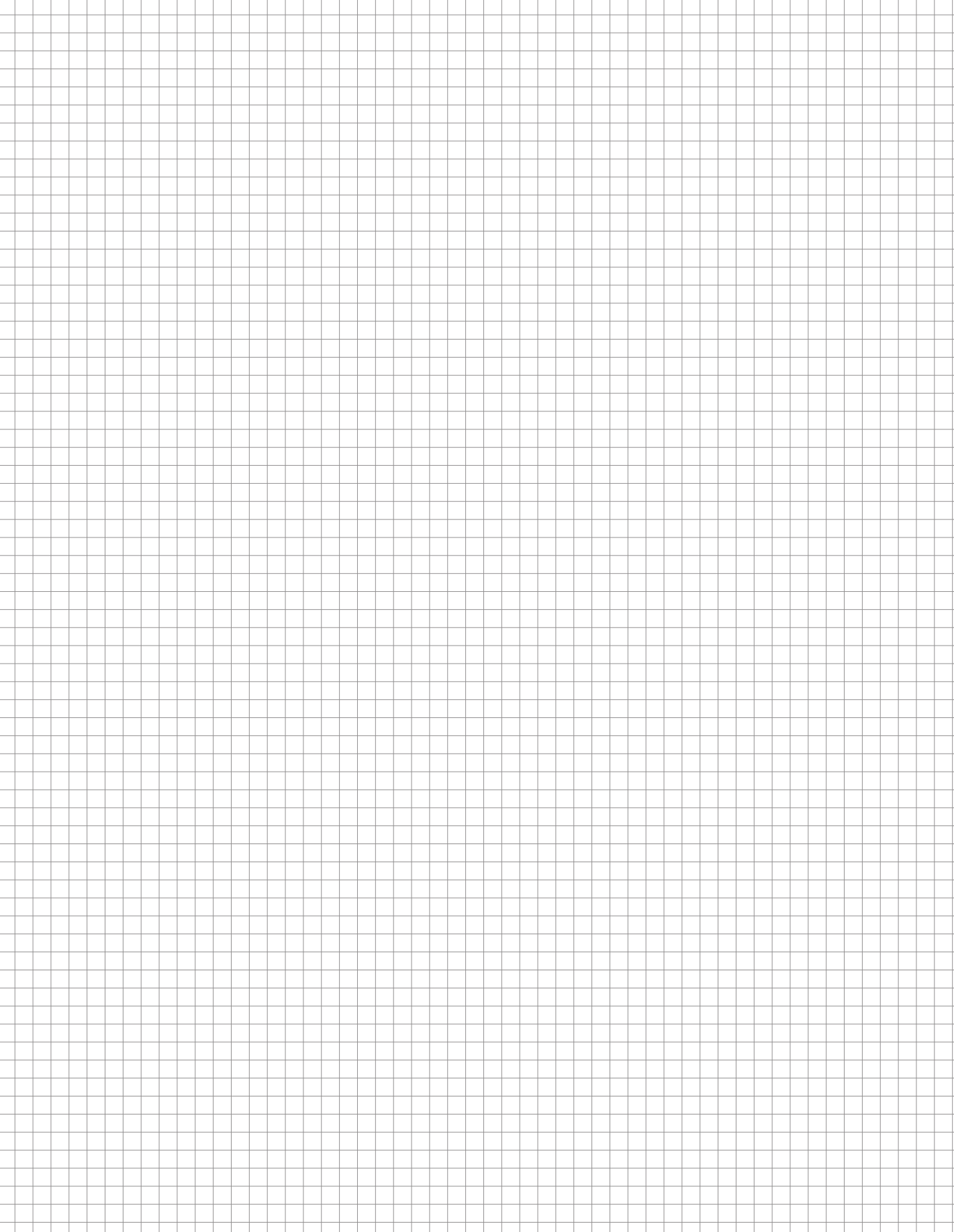
§ 7 FINAL PROVISIONS

1. All deliveries made by the Seller to the Buyer to the address shown in the order or in any other correspondence addressed by the Buyer to the Seller, will be effective and in the event of failure to collect the parcel, the date of effective delivery will be the date on which the parcel was not delivered or the date of expiry of the second notice. .
2. In matters not covered by these GTS, the provisions of the Civil Code shall apply.
3. The Seller and the Buyer will strive for an amicable settlement of any disputes arising in connection with the performance of contracts covered by these terms. In the event of disagreement within one month from the date of reporting the dispute to the other party, the court competent for the seat of the Seller shall be competent to resolve the dispute.

§ 8 PROVISIONS CONCERNING THE CATALOG

The catalog and the information contained therein do not constitute a commercial offer by law. The catalog contains information necessary for the user to select and perform the task or technical documentation. The catalog has been compiled in good faith according to our current knowledge and experience. Before approving the design documentation, check the technical requirements against the reference documents (ETAs) - which are the parent documents. The information contained in the catalog may be changed without prior notice. Each subsequent edition of the directory replaces the contents of the previous one. Therefore, when using the information provided, please make sure that the catalog or data sheet of the product that the user has is still valid. Current documents are available at www.pirosystem.pl

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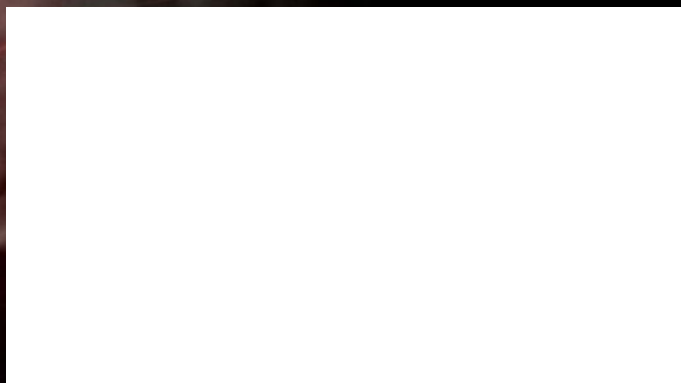




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