

PYROMIX® system
Cable and combination insulation with
mortar

Installation instructions



PYROMIX® system, cable and combination insulation with mortar

Installation instructions

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1 About these instructions


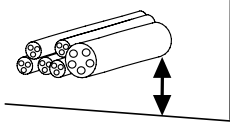
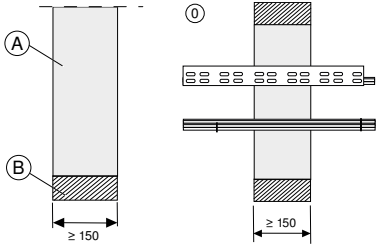
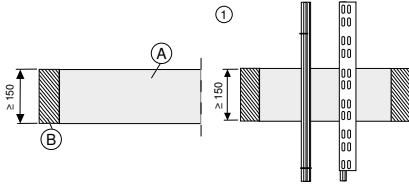
1.1 Target group

These instructions are aimed at installation engineers trained in fire protection.

1.2 Relevance of these instructions

- These instructions are based on the standards valid at the time of compilation (December 2018).
- All the documents supplied with the product must be stored in an easily accessible location, so as to be available when information is required.
- We will not accept any warranty claims for damage caused through non-observance of these instructions.
- Any images are intended merely as examples. Mounting results may look different.
- In these instructions, cables and lines are referred to simply as cables.
- To find out more about planning and mounting the product, we recommend a comprehensive training course.

1.3 Representation types in the document

Representation	Function
	Item numbers: List of components with reference to the text
	Schematic representation of installed items and their distances between each other and the component layer
	Side view, insulation in wall without and with installed items
	Side view, insulation in ceiling without and with installed items

1.4 Types of warning information



WARNING

Type of risk!

Shows a possibly risky situation. If the situation is not avoided, then death or serious injury may result.



CAUTION

Type of risk!

Shows a possibly risky situation. If the situation is not avoided, then light or minor injury and property damage may result.

Note!

Indicates important information or assistance

1.5 Correct use

PYROMIX® is an insulation system for building interiors. The main component of the system is a fire protection mortar. It closes openings in fire-resistant walls or ceilings, through which cables, cable support systems, electrical installation pipes or pipes are run. In the event of fire, the PYROMIX® insulation system prevents the spread of flame and smoke in the area of the opening. With the system, a fire resistance period of 30 to 240 minutes can be achieved, depending on the component opening, the installed items and the installation method. The insulation system can be created as cable or combination insulation. The fire protection mortar is suitable for interior rooms with and without a moisture load.

The insulation system is not designed for any other purpose than the one described here. If the system is installed and used for another purpose, any liability, warranty or damage claims shall be rendered null and void.

1.6 Applicable documents

- Declaration of performance 2018/05-CPR/015
- European Technical Assessment ETA-17/0472
- Safety data sheet, “PYROMIX®”

1.7 Basic standards and regulations

- EN 1366 Part 3
- EN 13501 Parts 1 and 2
- EU BauPVO (CPR)

1.8 Basic safety information

The following basic safety instructions and information on handling PYROMIX® must be observed:

- Mortar insulation made of PYROMIX® is not suitable for improving the stability of a wall or ceiling. Ensure that the wall or ceiling is sufficiently stable, despite the opening, without the application of fire insulation.
- The installation of the fire insulation may not compromise the stability of the adjacent elements – even in the event of a fire. Consult the proof of application of the component.
- If ceiling insulation is used, the producer of the ceiling insulation must inform the responsible customer or building owner in writing that the ceiling insulation must be protected against loads and being walked on. A safety fence or grated cover, for example, must be installed for this purpose.
- Insulation areas in ceilings must be secured against being walked on even during installation.

- If the insulation is installed in walls or ceilings with a low fire resistance period, the insulation's fire resistance period is reduced to the fire resistance class of the wall or ceiling.
- All the appropriate regulations and technical regulations of other units, in particular those for electrical engineering, must be complied with.
- Observe the safety data sheets of the products, which can be obtained online at www.obo-bettermann.com.

1.9 Personal protective equipment



Breathing protection

When the exposure limit values are exceeded, which is possible when stirring the mortar, use a particle-filtering half mask FFP 1 (white).



Hand protection

Wear waterproof, friction-proof and alkali-resistant nitrile gloves.



Eye protection

Wear protective glasses, frame goggles.



Physical protection

Wear protective clothing and non-slip shoes.

2 Product description, PYROMIX®

2.1 Basic principles

Fire insulation maintains the fire sections, thus limiting the spread of fire and smoke, and simplifying rescue and extinguishing work.

The PYROMIX® insulation system is designed for fire insulation in wall and ceiling openings and offers the following characteristics:

- Mortar insulation made of special mortar that is free of mineral fibres
- Mortar has fire behaviour of class A1 in accordance with EN 13501-1
- Production of combination or cable insulation for solid walls and solid ceilings
- Fire insulation of electrical cables, cable bundles, cable support systems and combustible and non-combustible pipes
- Prevention of the spread of fire and smoke gas over a period of 30 to 120 minutes (fire resistance class EI 30-120) for combination and cable insulation, depending on the design of the insulation
- Prevention of the spread of fire and smoke gas over a period of 240 minutes (fire resistance class EI 240) for cable insulation, depending on the design of the insulation
- Application in interior rooms with and without moisture. Fulfils the use category Z₂ in accordance with EOTA TR024
- Water-dilutable
- Filling of openings by hand or with pumps and presses
- Formwork unnecessary for small insulation areas
- Retro-installations possible
- Installation possible as reserve insulation without installed items

2.2 System components

The PYROMIX® insulation system consists of the following system components:

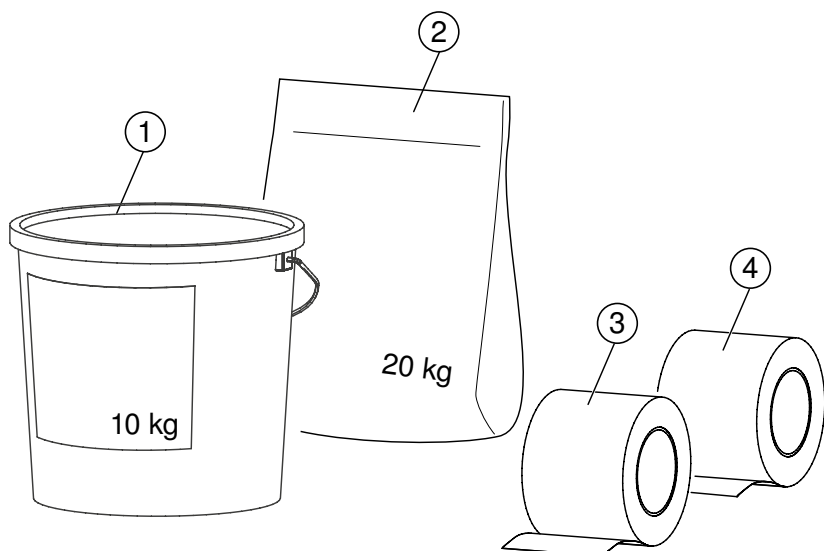


Figure 1: System components

Figure no.	Designation	Article number	Packing unit
①	PYROMIX® MSX E1 fire protection mortar in a pail,	7206058	10 kg
②	PYROMIX® MSX E1 fire protection mortar in a sack	7206104	20 kg
③	Fire protection coil FSB-WB 1.5	7203163	1
④	Fire protection coil FSB-WB BS	7203165	1

Tab. 1: System components

2.3 Accessories

The PYROMIX® insulation system is processed and installed with the following accessories:

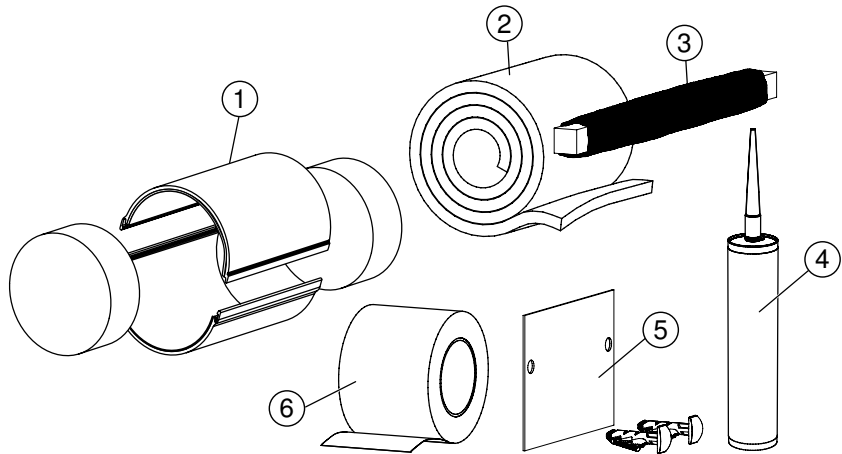


Figure 2: Accessories

Figure no.	Designation	Article number	Packaging unit
①	PYROCOMB® Intube pipe shell 150 mm PYROCOMB® Intube pipe shell 300 mm	7204300 7204304	1 unit
②	Path insulation for metal pipes MIW-MA	7202308	1 unit
③	Winding wire for path insulation MIW-TD	7202309	1 unit
④	Ablation coating ASX-K	7202310	1 unit
⑤	Identification plate KS-S (DE, SE, ES, EN, HR)	720542 5/6/7/9 7205438	1 unit
⑥	Aluminium adhesive tape for path insulation MIW-AT	7202305	1 unit

Tab. 2: Accessories

2.4 Recommended tools

For installation of the PYROMIX® insulating system, the following tools and aids are recommended:

- Mixing vessel – mortar bucket
- Mixer
- Masonry tools (round trowels)
- Protective film, if necessary
- Folding ladder
- Wire cutters
- 10 mm socket or torque spanner (ratchet)
- Galvanised winding wire

3 Installation requirements, PYROMIX®

To ensure proper functioning of the PYROMIX® insulation system, installed items and installation locations must fulfil technical and structural requirements.

3.1 Basic preconditions

- The thickness of the insulation in walls and ceilings must be at least 150 mm. The length and width of the insulation are aligned to the installation location and the installed items.
- The cables, cable bundles and electrical installation pipes must be fastened on the cable trays and ladders in support structures according to the technical rules.
- The cable support systems, cable trays and ladders and their supports and fastenings must be made of steel. They must be fastened in such a way on both sides of the fire insulation that, in the event of fire, no additional mechanical load can impact on the fire insulation for the length of the required fire resistance class. The technical regulations and specifications of the manufacturer of the cable support system and the fastening system must be complied with.
- The installed items must be arranged vertically to the component surface if there are no other specifications.
- To ensure functioning of the insulation, the total cross-section of the installed items must not be more than 60% of the wall/ceiling opening.
- If uninsulated metal pipes are installed, then a straight expansion of ≥ 10 mm/m must be expected in the event of fire.

3.2 Approved installation locations

The PYROMIX® insulation system can be installed in the following components:

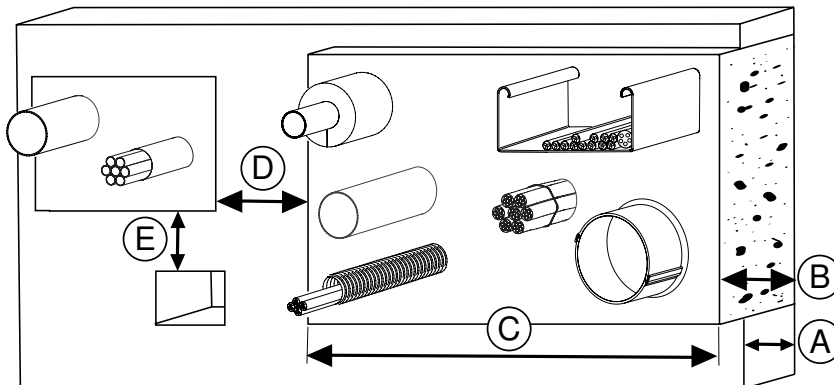
Components	Component thickness in mm	Classification of the component	Fire resistance of the component
Solid walls			
Masonry, concrete, reinforced concrete, porous concrete, ceramic tiles, hollow bricks or air bricks with a density $\geq 600 \text{ kg/m}^3$	≥ 150	EN 13501-2 DIN 4102-2	120 minutes
	≥ 240		240 minutes
Solid ceilings			
Concrete, reinforced concrete with a density $\geq 1,700 \text{ kg/m}^3$	≥ 150	EN 13501-2 DIN 4102-2	120 minutes
	≥ 240		240 minutes

Tab. 3: Overview of approved installation locations

The minimum component thicknesses for insulation must also be maintained when installing components with a lower fire resistance class. The insulation must then be labelled with the lower fire resistance class.

3.3 Approved insulation dimensions and distances to other component openings

When installing the PYROMIX® insulation system, the insulation must have the following dimensions and distances from other components or component openings:



Dimensions in mm		Walls	Ceilings
Dimensions			
Ⓐ	Component thickness for EI 120	≥ 150	≥ 150
	Component thickness for EI 240	≥ 240	≥ 240
Ⓑ	Insulation thickness for EI 120	≥ 150	≥ 150
	Insulation thickness for EI 240	≥ 240	≥ 240
Ⓒ	Maximum dimensions of the component opening (width x height) for EI 120	1,200 x 2,000	1,200 x 2,000
	Maximum dimensions of the component opening (width x height) for EI 240	600 x 600	600 x 600
Distance from other cable and pipe insulation in mm			
Ⓓ	One/both opening(s) > 400 x 400 mm	≥ 200	≥ 200
Ⓓ	Both openings ≤ 400 x 400 mm	≥ 100	≥ 100
Distance to other openings or installed items			
Ⓔ	One/both opening(s) > 200 x 200 mm	≥ 200	≥ 200
Ⓔ	Both openings ≤ 200 x 200 mm	≥ 100	≥ 100

Tab. 4: Permitted dimensions and insulation distances

4 Creating fire insulation

4.1 Creating cable or combination insulation

Only certain installed items may be guided through the insulation, depending on whether the fire resistance class EI 120 or EI 240 has to be achieved. In addition, different measures must be carried out on the installed items. The installed items are wrapped and/or insulated with fire protection coil. The details are described in chapter 6.6 Measures on installed items on page 39 for EI 120 and chapter 7.5 Measures on installed items on page 57 for EI 240. When creating fire insulation, the details must be observed.



WARNING



WARNING

Danger from falling objects!

During installation in the ceiling and the subsequent curing time (28 days), objects or mortar can fall and injure people or damage property. Secure the area below the ceiling insulation for 28 days against walking and storage.

Risk of falling!

Fire insulation in ceilings can give way if subjected to loads or walked upon. Breakthroughs or falls can lead to serious or even fatal injuries. Cover the insulation permanently with a grid or install a safety fence.

Note!

Installed items must be arranged vertically to the insulation surface, if there are no other specifications.

- 1) If necessary, prepare a framework, depending on the component and desired insulation thickness.

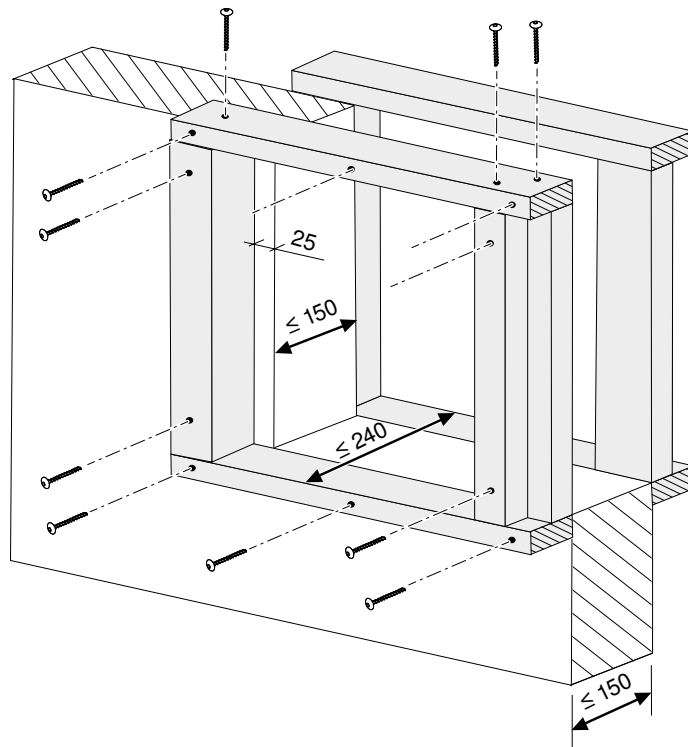


Figure 3: Framework for insulation thickness of 240 mm

- 2) If necessary, attach fire protection coil or protective insulation to installed items in the insulation (see chapter 6.6 Measures on installed items on page 39 for EI 120 and 7.5 Measures on installed items on page 57 EI 240).

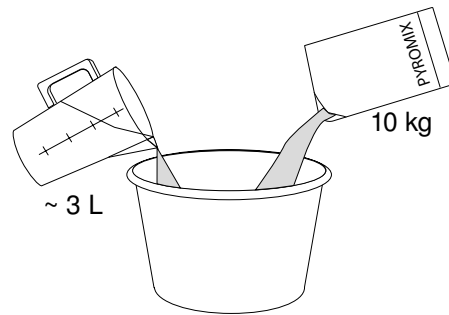


Figure 4: Mixing ratio of water to mortar

- 3) Pour fire protection mortar into water, paying attention to the mixing ratio according to the package (10 kg for approx. 3 litres of water, depending on the required viscosity).

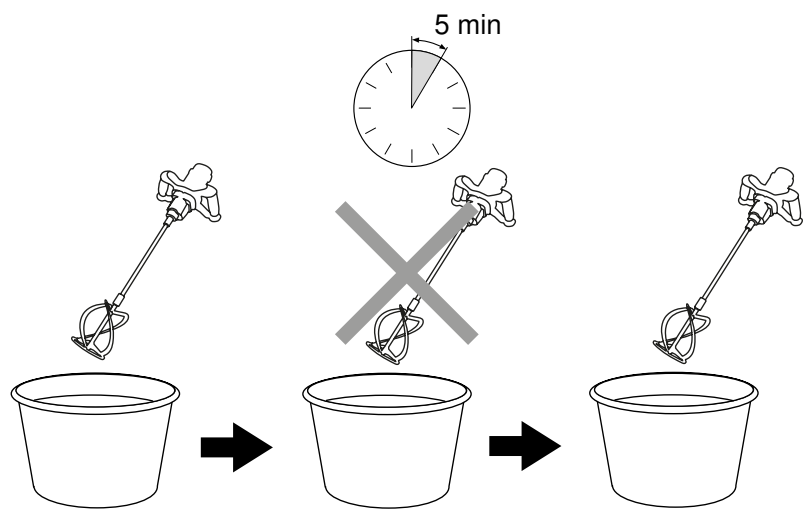


Figure 5: Stir mortar

- 4) Mix thoroughly with the mixer.
- 5) Let swell for approx. 5 minutes.
- 6) Mix again with the mixer.

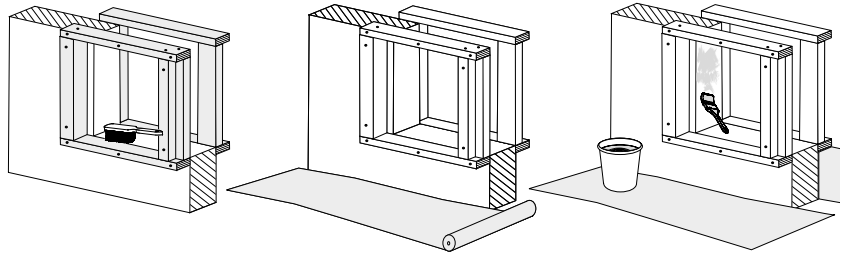


Figure 6: Prepare insulation opening

- 7) Clean the sides of the opening.
- 8) Cover the floor with foil on both sides of the insulation, if necessary.
- 9) Moisten absorbent surfaces on the sides of the opening with water.

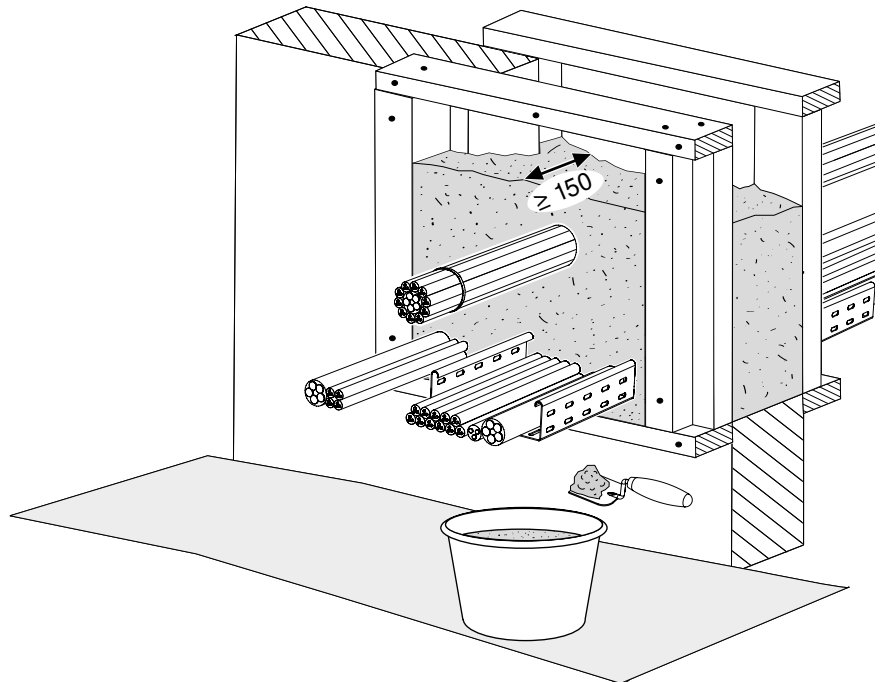


Figure 7: Apply mortar

- 10) Apply fire protection mortar to the opening at least 150 mm thick, ensuring that it is firmly connected to the component.
- 11) Fill gaps and spaces below pipes completely with mortar.
- 12) Let fire protection mortar set for 1 hour.

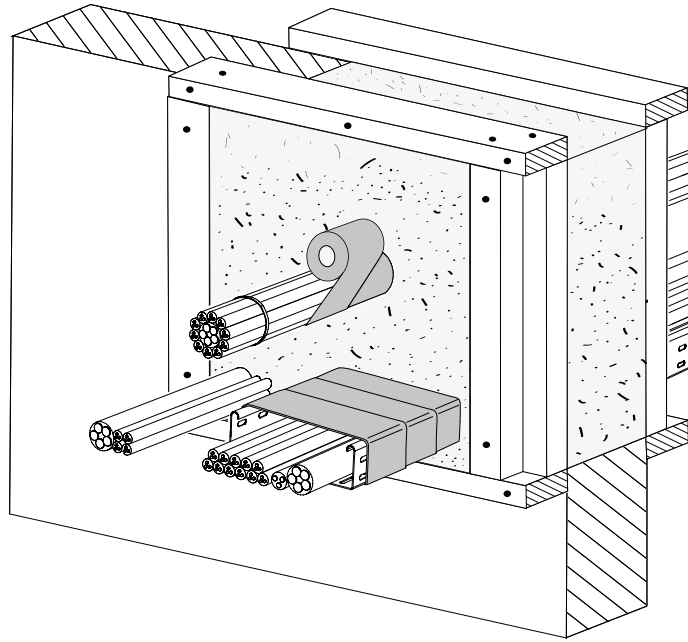


Figure 8: Apply fire protection coil

13) Only when the mortar is set, attach fire protection coil or protective insulation, if necessary, to installed items in front of the insulation (see chapter 6.6 Measures on installed items on page 39 and 7.5 Measures on installed items on page 57).

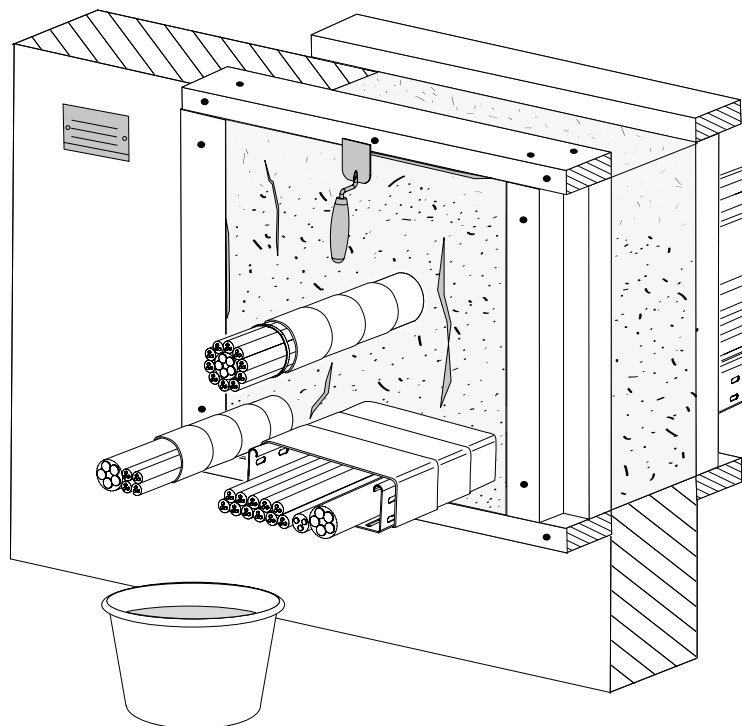


Figure 9: Rework insulation

14) Rework shrinkage cracks.
15) Smooth surface.

- 16) Fill out and attach the identification plate next to, not on, the insulation.
- 17) Remove formwork when the mortar has reached its basic strength.
- 18) Remove dried mortar residue from installed items, walls and floors.

Note!

The mortar is completely hardened only after 28 days.

4.2 Creating empty insulation in ceilings

If empty insulation areas > 500 x 500 mm are made in ceilings, a force-fit steel reinforcement made of iron rods must be installed. The exact execution of the reinforcement depends on the size and must be calculated by a structural engineer.

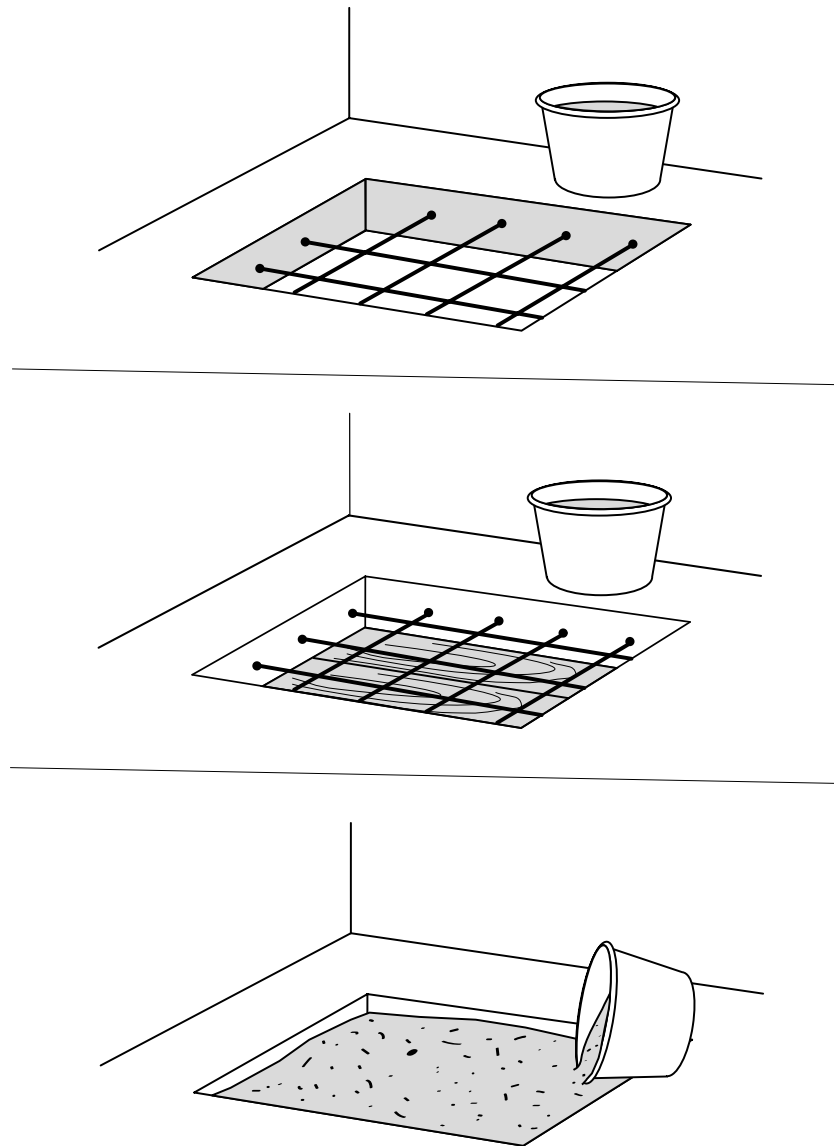


Figure 10: Creating empty insulation in ceilings

- 1) Drill holes corresponding to the iron rod diameter in the sides of the ceiling opening.
- 2) Push iron rods into the holes and apply adhesive.
- 3) Line the ceiling opening with boards from below.
- 4) Fill the ceiling opening with fire protection mortar.
- 5) Let fire protection mortar cure for 28 days.
- 6) Remove lining boards after the curing time.

4.3 For subsequent installations, building in PYROCOMB® Intube pipe shell

For subsequent installations, it is recommended to build in PYROCOMB® Intube pipe shell in the insulation. The following points must be observed:

- Details on installation of the pipe shells must be looked up in the installation instructions for the PYROCOMB® Intube system.
- Pipe shells of different lengths (150 or 300 mm) can be installed, depending on the installed items.
- Cables, cable bundles and electrical installation pipes (EIR) can touch each other and the inside of the pipe lining wall.

4.4 Filling insulation at a later date

If insulation is filled at a later date, the contents of these mounting instructions must be taken into account.

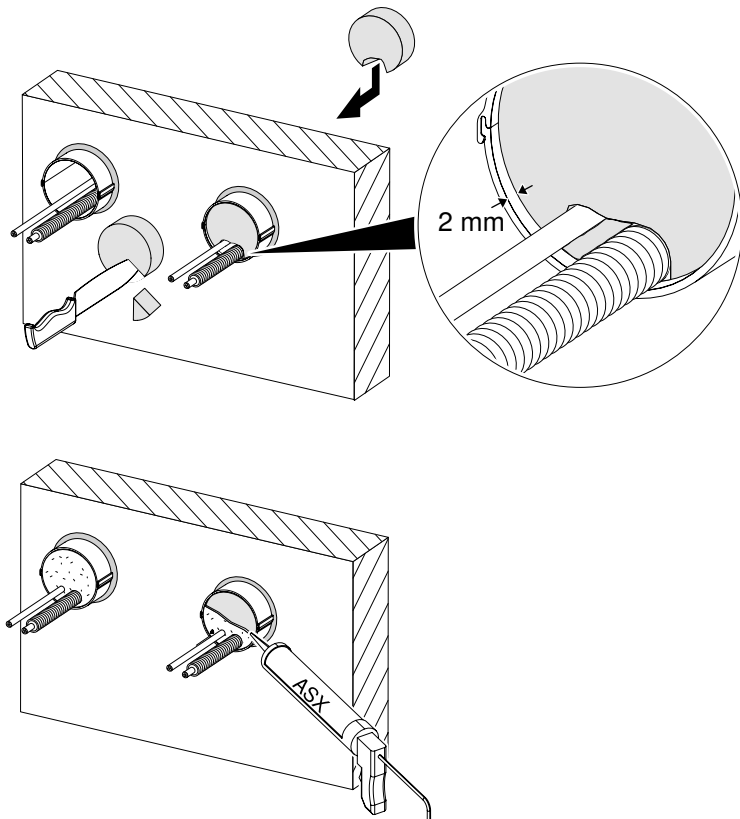


Figure 11: Filling insulation at a later date

- 1) Remove plugs on both sides of the PYROCOMB® Intube pipe shell.
- 2) Position installed items.
- 3) Cut out plugs corresponding to the installed items and fit them.
- 4) Insert plugs into the pipe shell on both sides.
- 5) If there are ring gaps around the cables, seal them with spreadable ASX ablation coating.
- 6) Stuff holes for electrical installation pipes or cables with mineral wool.
- 7) Apply ASX ablation coating to plugs or mineral wool; the thickness of dry coating must be ≥ 1 mm.

5 National requirements

Note! *When mounting the system outside Germany or Austria, comply with other country-specific requirements that exist in addition to the national construction law.*

Germany/Austria

- The insulation system must be permanently labelled with a sign next to the insulation.
- The technically correct creation of combination insulation must be learned on a training course. Proof of training can be obtained through successfully participating in a training course at OBO Bettermann.
- After work has been completed, the customer must be given a written declaration of conformity (see on page 11 Appendix – declaration of conformity (sample) on page 61).

6 Insulation for fire resistance class up to EI 120

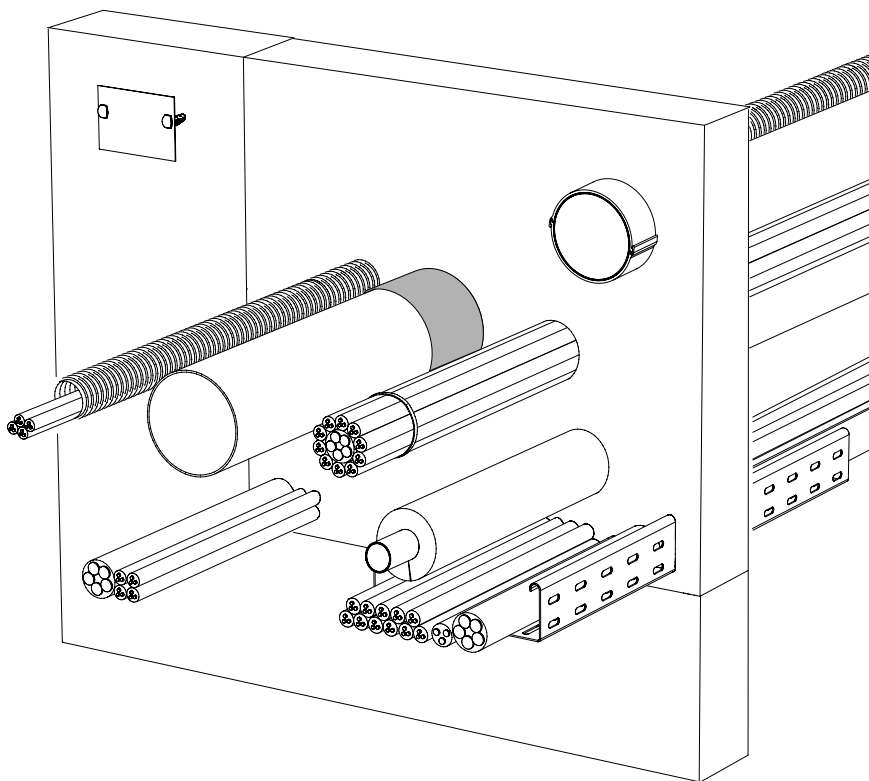


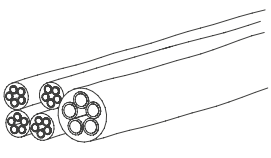
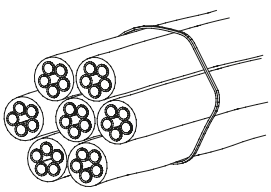
Figure 12: Installed items in insulation design E 120

6.1 Approved installed items

The total cross-section of the installed items must not be more than 60% of the wall/ceiling opening.

The following installed items are permitted with the PYROMIX® installation system in solid walls and ceilings:

6.1.1 Cables and cable support systems

Cables	
	<ul style="list-style-type: none"> – Electrical cables of all kinds, including fibre-optic cables – Total conductor diameter of the separate cables ≤ 80 mm
Cable bundles	
	<ul style="list-style-type: none"> – Total bundle diameter ≤ 100 mm made up of separate cables with outside diameter ≤ 21 mm – No surrounding filling is necessary if cable bundles consist of tightly packed, firmly tied, sewn or welded parallel-running cables.

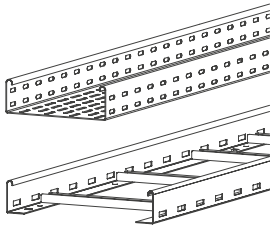
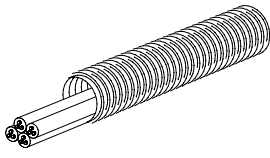
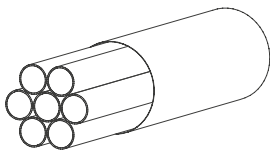
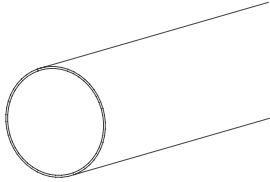
Cable support systems			
	<ul style="list-style-type: none"> – Cable trays and cable ladders made of steel With organic coatings if the fire behaviour corresponds to at least A2 according to EN 13501-1 		
Electrical installation pipes			
	<ul style="list-style-type: none"> – Separate, made of plastic or steel (rigid) – Outside diameter ≤ 16 mm 		
"Speed pipe" PE lines (for fibre-optic cables and micro-cables)			
	<ul style="list-style-type: none"> – From Gabocom Systemtechnik GmbH – Bundled or single – With or without fibre-optic cables 		
	External pipe diameter in mm	Maximum quantity	Pipe wall thickness in mm
	≤ 7	24	≤ 1.5
	≤ 10	7	≤ 2.0
	≤ 12	5	≤ 2.0

Figure 13: Approved cables

6.1.2 Combustible pipes

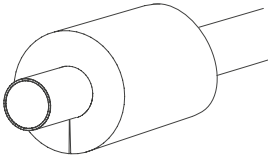
Pipes must be arranged vertically to the insulation surface.

Combustible pipes			
	<ul style="list-style-type: none"> – Vented wastewater pipes and closed pipe systems. – Non-combustible liquids and non-combustible gases may be run in the pipes (with the exception of ventilation lines). 		
Pipe materials/dimensions in mm	External pipe diameter	Pipe wall thickness	
		Minimum	Maximum
Pipes made from PVC-U according to EN 1329-1, EN 1453-1, EN 1542-1, EN 15493 and DIN 8061/8062 or PVC-C according to EN 1566-1	≤ 50	1.8	3.7
	> 50–≤ 110	2.2	8.2
	> 110–≤ 160	3.2	11.9
PP-H in accordance with EN 1555-2, EN 12201-2+A1, DIN 8074/8075, EN 15874, DIN 8077/8078	≤ 50	1.8	4.6
	> 50–≤ 110	2.7	10
	> 110–≤ 160	3.9	9.1
PE 100, in accordance with EN 1555-2, EN 12201-2+A1 as well as DIN 8074/8075	≤ 50	1.8	4.8
	> 50–≤ 110	2.7	10
	> 110–≤ 160	3.9	9.1

Tab. 5: Permitted combustible pipes

6.1.3 Non-combustible pipes

Non-combustible pipes with a path insulation made of mineral fibres may be run through the insulation at a slanting angle of 45° to 90°.

Non-combustible pipes		
	Pipe materials	External diameter in mm
	– Steel, stainless steel, case with non-combustible pipe insulation made of "Klimarock" mineral fibres	≤ 323.9
	– Copper with non-combustible pipe insulation made of mineral fibres, such as "Klimarock" / "Conlit U"	≤ 108.0
	– Steel, stainless, cast with "Armaflex Protect" combustible insulation	≤ 170.0
	– Copper with "Armaflex Protect" combustible insulation	≤ 108.0

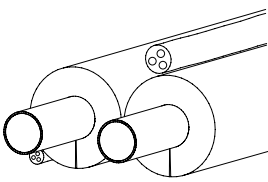
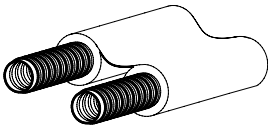
Tab. 6: Permitted non-combustible pipes

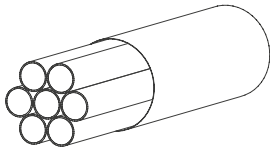
Permitted pipe-wall thicknesses of non-combustible pipes		
Material	External diameter in mm	Wall thickness in mm
Copper, steel, stainless, cast	≤ 15	≥ 0.8
	≤ 15–≤ 108	≥ 1.0–≥ 2.5/≤14.2
Steel, stainless, cast	> 108–≤ 323.9	≥ 2.6–≥ 7.5/≤14.2

Tab. 7: Pipe-wall thicknesses of non-combustible pipes

Pipes of other metals may be installed, whose heat transmission is lower than steel or copper and whose melting point is ≥ 1,049 °C.

6.1.4 Other approved installed items

Other installed items	
	<p>Klimasplit cable combinations</p> <ul style="list-style-type: none"> – E.g. "Tubolit DuoSplit" or "Tubolit Split" from Armacell or types with the same parameters – Double or single copper pipe and pipe insulation of 9 mm-thick PE foam according to EN 14313 with optional accompanying cables at zero distance (one plastic pipe (U/U) made of PVC-U, external diameter 25 mm and pipe wall thickness 1.5 mm, according to EN1453-1 or EN1452-1 and DIN 8061/DIN 8062 and up to 2 jacketed cables with max. 5 wires, each of ≤ 1.5 mm², Ø ≤ 14 mm) at zero distance
	<p>Double solar pipes "NanoSUN"</p> <ul style="list-style-type: none"> – Pipes made of rippled stainless steel with insulation, an accompanying cable integrated in the insulation and a PVC protective jacket of make Aktarus Group Srl for solar thermal applications, DN 16 to DN 40

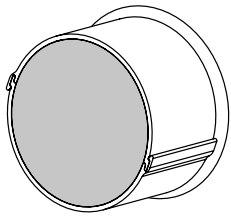
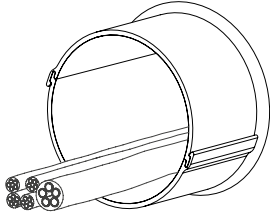
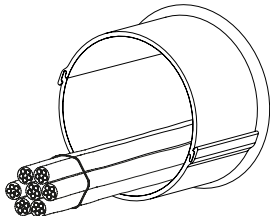
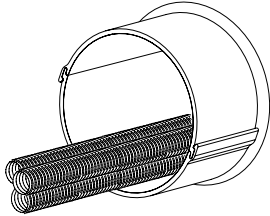
	<p>Hydraulic hoses with "HANSA-FLEX" wire mesh inserts</p> <ul style="list-style-type: none"> – Of type "HD 200-2 SN" corresponding to DIN EN 853 for mineral oils, with outside diameter ≤ 55.9 mm
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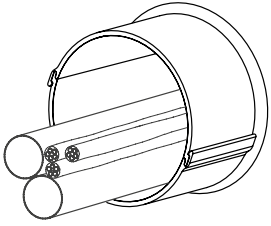
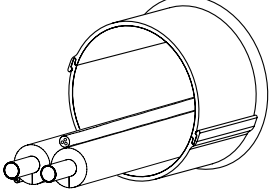
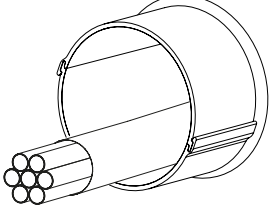
Tab. 8: Other approved pipes

6.1.5 PYROCOMB® Intube pipe shell for subsequent installations

The PYROCOMB® Intube pipe shell can be installed for subsequent installations. The lengths 150 and 300 mm can be used, depending on the component and installed items. The installation instructions for the PYROCOMB® Intube pipe shell must be observed.

The following installed items can be guided through the pipe shell:

<p>Empty pipe shell</p>	
	<ul style="list-style-type: none"> – The opening of the empty pipe shell must be closed on both sides with foam plugs and coated with ASX ablation coating.
<p>Electrical cables lines of all kinds, including fibre-optic cables</p>	
	<ul style="list-style-type: none"> – Outside diameter of the separate cables ≤ 80 mm
<p>Cable bundles</p>	
	<ul style="list-style-type: none"> – Up to a diameter ≤ 107 mm, made of separate cables with diameter ≤ 21 mm
<p>Electrical installation pipes</p>	
	<ul style="list-style-type: none"> – Made of plastic (flexible) – Outside diameter 16 mm to 32 mm single or bundled up to diameter 107 mm – With and without cable assignment – Single cable diameter ≤ 21 mm – Single electrical installation pipe diameter 63 mm (only ceiling)

Combustible pipes with accompanying cables														
	<p>– A maximum of 4 plastic pipes made of PVC, of these 2 pipes with an outside diameter of 20 to 32 mm and 2 pipes with an outside diameter up to 20 mm as well as a maximum of 3 accompanying cables with diameter up to 14 mm</p>													
Klimasplit cable combinations														
	<p>– Double or single copper pipe (pipe 1/pipe 2 outside diameter 6–10 mm/ 10–18 mm) and pipe insulation of 9 mm-thick PE foam according to EN 14313 with optional accompanying cables (one plastic pipe (U/U) made of PVC-U, outside diameter 25 mm and pipe wall thickness 1.5 mm according to EN1453-1 or EN1452-1 and DIN 8061/DIN 8062 and up to 3 jacketed cables with max. 5 wires, each of $\leq 1.5 \text{ mm}^2$, diameter $\leq 14 \text{ mm}$) at zero distance</p>													
"Speed pipe" PE lines and micro-cables														
	<p>– From Gabocom Systemtechnik GmbH – Bundled or single – With or without fibre-optic cables</p> <table border="1" data-bbox="914 1066 1436 1229"> <thead> <tr> <th>External pipe diameter in mm</th> <th>Maximum quantity</th> <th>Pipe wall thickness in mm</th> </tr> </thead> <tbody> <tr> <td>≤ 7</td> <td>24</td> <td>≤ 1.5</td> </tr> <tr> <td>≤ 10</td> <td>7</td> <td>≤ 2.0</td> </tr> <tr> <td>≤ 12</td> <td>5</td> <td>≤ 2.0</td> </tr> </tbody> </table>		External pipe diameter in mm	Maximum quantity	Pipe wall thickness in mm	≤ 7	24	≤ 1.5	≤ 10	7	≤ 2.0	≤ 12	5	≤ 2.0
External pipe diameter in mm	Maximum quantity	Pipe wall thickness in mm												
≤ 7	24	≤ 1.5												
≤ 10	7	≤ 2.0												
≤ 12	5	≤ 2.0												

Tab. 9: Permitted assignments of pipe shells

Note!

The pipe shell must be closed with the supplied soft foam plugs after installation is performed. The soft foam plug as well as all detectable openings and leaks must be sealed with ASX ablation coating.

6.2 Fire resistance classes

Various fire resistance classes can be achieved with the insulation made of PYROMIX®. The possible fire resistance classes are aligned according to the component and type of installed item. Additional measures with fire protection coil and insulation must be performed on some installed items. Installation may only be performed in solid walls and solid ceilings with a thickness ≥ 150 mm.

Note! *The necessary additional measures on the installed items are depicted in chapter 6.6 Measures on installed items on page 39.*

6.2.1 Fire resistance classes with various installed items

Fire resistance classes in walls and ceilings		
Installed items	Wall	Ceiling
Cables, cable bundles and cable support systems without additional measures		
Cables, $\varnothing \leq 21$ mm	EI 120	EI 120
Conductors (wires, $\varnothing \leq 24$ mm)	EI 120	EI 120
Cable bundles, $\varnothing \leq 60$ mm	EI 120	EI 120
Cable bundles, $\varnothing \leq 100$ mm	EI 90/E 120*	EI 60/E 120*
Cables, cable bundles and cable support systems with 240 mm insulation thickness		
Cables, $\varnothing > 21$ mm to ≤ 50 mm	EI 120	EI 90/E 120*
Cables, $\varnothing > 50$ mm to ≤ 80 mm	EI 90/E 120*	EI 90/E 120*
Cable bundles, $\varnothing \leq 100$ mm	EI 120	EI 120
Cables, cable bundles and cable support systems with fire protection coil FSB-WB 1.5		
Cables, $\varnothing > 21$ mm to ≤ 50 mm	EI 90/E 120	EI 120
Cables, $\varnothing > 21$ mm to ≤ 50 mm	EI 120	EI 120
Cables, $\varnothing > 50$ mm to ≤ 80 mm	EI 60/E 120*	EI 90/E 120*
Cables, $\varnothing > 50$ mm to ≤ 80 mm	EI 120	EI 120
Cable bundles, $\varnothing \leq 100$ mm	EI 120	EI 120
Electrical installation pipes with fire protection coil fire protection coil FSB-WB 1.5 coil width 125 mm		
Electrical installation pipes made of steel, rigid, up to $\varnothing \leq 16$ mm	EI 120 C/U	EI 120 C/U
Electrical installation pipes made of plastic, rigid, up to $\varnothing \leq 16$ mm	EI 120 U/C	EI 120 U/C
"Speed pipe" bundled or separate, with or without fibre-optic cables, with fire protection coil FSB-WB 1.5 – coil width 125 mm		
Max. 24 units, external pipe $\varnothing \leq 7$ Max. 7 units, external pipe $\varnothing \leq 10$ Max. 5 units, external pipe $\varnothing \leq 12$	EI 120 U/U	EI 120 U/U
Non-combustible pipes made of copper with path insulation MIW-WA		
External pipe $\varnothing \leq 15.0$ mm	EI 120 C/U	EI 120 C/U
2x external pipe $\varnothing \leq 22.0$ mm	-	EI 30/ E 90* C/U

Fire resistance classes in walls and ceilings		
Installed items	Wall	Ceiling
3x external pipe $\varnothing \leq 15.0$ mm	EI 120 C/U	EI 60/ E 90* C/U
External pipe $\varnothing > 15.0$ to ≤ 28.0 mm	EI 120 C/U	EI 120 C/U
External pipe $\varnothing > 28.0$ to ≤ 42.0 mm	EI 120 C/U	EI 120 C/U
External pipe $\varnothing > 42.0$ to ≤ 54.0 mm	EI 120 C/U	EI 120 C/U
External pipe $\varnothing > 54.0$ to ≤ 88.9 mm	EI 120 C/U	EI 120 C/U
Non-combustible pipelines made of steel, stainless steel or cast iron with path insulation MIW-MA		
External pipe $\varnothing \leq 15.0$ mm	EI 120 C/U	EI 120 C/U
External pipe $\varnothing > 15.0$ to ≤ 28.0 mm	EI 120 C/U	EI 120 C/U
External pipe $\varnothing > 28.0$ to ≤ 42.0 mm	EI 120 C/U	EI 120 C/U
External pipe $\varnothing > 42.0$ to ≤ 114.3 mm	EI 120 C/U	EI 120 C/U
External pipe $\varnothing > 114.3$ to ≤ 168.3 mm	EI 120 C/U	EI 120 C/U
External pipe $\varnothing > 168.3$ to ≤ 323.9 mm	EI 120 C/U	EI 120 C/U
Non-combustible pipelines made of copper with non-combustible insulation "Conlit 150U"		
External pipe $\varnothing \leq 15.0$ mm	EI 120 C/U	EI 120 C/U
2x external pipe $\varnothing \leq 22.0$ mm	-	EI 30/ E 120* C/U
External pipe $\varnothing > 15.0$ to ≤ 28.0 mm	EI 120 C/U	-
External pipe $\varnothing > 15.0$ to ≤ 42.0 mm	-	EI 120 C/U
External pipe $\varnothing > 28.0$ to ≤ 54.0 mm	EI 120 C/U	EI 120 C/U
External pipe $\varnothing > 54.0$ to ≤ 108.0 mm	EI 120 C/U	EI 120 C/U
Non-combustible pipelines made of steel, stainless steel or cast iron with non-combustible insulation "Conlit 150U"		
External pipe $\varnothing \leq 15.0$ mm	EI 120 C/U	EI 120 C/U
External pipe $\varnothing > 15.0$ to ≤ 28.0 mm	EI 120 C/U	EI 120 C/U
External pipe $\varnothing > 15.0$ to ≤ 42.0 mm	-	EI 120 C/U
External pipe $\varnothing > 28.0$ to ≤ 54.0 mm	EI 120 C/U	EI 120 C/U
External pipe $\varnothing > 54.0$ to ≤ 114.3 mm	EI 120 C/U	EI 120 C/U
External pipe $\varnothing > 114.3$ to ≤ 168.3 mm	EI 120 C/U	EI 120 C/U
External pipe $\varnothing > 168.3$ to ≤ 219.1 mm	EI 120 C/U	EI 120 C/U
External pipe $\varnothing > 219.1$ to ≤ 323.9 mm	EI 120 C/U	EI 90/ E 120* C/U
Non-combustible pipelines made of copper with combustible insulation "Armaflex Protect"		
External pipe $\varnothing \leq 28.0$ mm	EI 120 C/U	EI 120 C/U
External pipe $\varnothing \leq 28.0$ mm	EI 120 C/U	EI 120 C/U
External pipe $\varnothing > 28.0$ mm to ≤ 88.9 mm	EI 120 C/U	EI 120 C/U
External pipe $\varnothing > 28.0$ mm to ≤ 88.9 mm	EI 120 C/U	EI 120 C/U
External pipe $\varnothing \leq 88.9$ mm to ≤ 108.0 mm	EI 120 C/U	EI 120 C/U

Fire resistance classes in walls and ceilings		
Installed items	Wall	Ceiling
Non-combustible pipelines made of steel, stainless steel or cast iron with combustible insulation "Armaflex Protect"		
External pipe $\varnothing \leq 28.0$ mm	EI 120 C/U	
External pipe $\varnothing \leq 28.0$ mm	EI 120 C/U	EI 120 C/U
External pipe $\varnothing > 28.0$ to ≤ 88.9 mm	EI 120 C/U	EI 120 C/U
External pipe $\varnothing > 28.0$ to ≤ 88.9 mm	EI 120 C/U	EI 120 C/U
External pipe $\varnothing > 108.0$ to ≤ 170.0 mm	EI 120 C/U	EI 120 C/U
External pipe $\varnothing > 88.9$ to ≤ 170.0 mm	EI 120 C/U	-
Combustible pipes, with/without 5 mm PE noise insulation tube, made of PVC-U, PVC-C, PP-H or PE 100 with fire protection coil FSB-WB BS – coil width 100 mm		
External pipe $\varnothing \leq 50.0$ mm	EI 120 U/U	EI 120 U/U
External pipe $\varnothing > 50.0$ to ≤ 80.0 mm	EI 120 U/U	EI 120 U/U
External pipe $\varnothing > 80.0$ to ≤ 110.0 mm	EI 120 U/U	EI 120 U/U
External pipe $\varnothing > 110.0$ to ≤ 135.0 mm	EI 120 U/C	EI 120 U/C
External pipe $\varnothing > 135.0$ to ≤ 160.0 mm	EI 120 U/C	EI 120 U/C
**Klimasplit cable combinations with fire protection coil FSB-WB 1.5 – coil width 125 mm		
Pipe 1/pipe 2 outside \varnothing 6 mm/10 mm + PE-100 outside $\varnothing \leq 25$ mm, t^{***} 1.9–3.5 mm	EI 120	EI 120
Pipe 1/pipe 2 outside \varnothing 6–10 mm/10–18 mm + PE-100 outside $\varnothing \leq 25$ mm, t^{***} 1.8 mm	EI 120	EI 120
Pipe 1/pipe 2 outside \varnothing 6–10 mm/10–18 mm + PE-100 outside $\varnothing \leq 25$ mm, t^{***} 1.9–3.5 mm"	EI 90/E 120*	EI 120
"NanoSUN" double solar pipe with fire protection coil FSB-WB – coil width 125 mm		
DN16 and DN 25	EI 120 C/U	EI 120 C/U
DN40	EI 30/ E 120* U/U	EI 45/ E 90* U/U
DN40	EI 120 U/U	EI 30/ E 120* U/U
HANSA-FLEX hydraulic hoses with fire protection coil FSB-WB 1.5		
Up to \varnothing da $\approx 55.9 \times t$ 8.0 up to 9.0 mm (such as lines for lifts) with additional line	EI 120	EI 120
<p>*Attention: In this fire resistance class, only the room sealing (E = Étanchéité) is guaranteed for the classified time, but not heat insulation (I = insulation).</p> <p>** Klimasplit cable combinations with double or single copper pipe and pipe insulation of 9 mm thickness made of PE foam according to EN 14313 and optionally with additional accompanying cables at zero distance.</p> <p>***t = thickness, wall thickness of the plastic line.</p>		

Tab. 10: Fire resistance classes with various installed items in walls and ceilings

6.2.2 Fire resistance classes for retro-installations

Fire resistance classes for retro-installations with PYROCOMB® Intube pipe shell in walls		
Installed items	150	300
Cables up to Ø 21 mm	EI 90/ E 120*	EI 120
Cables > Ø 21 mm up to Ø 50 mm	EI 45/ E 90*	EI 90/ E 120*
Cables > Ø 50 mm up to Ø 80 mm	-	EI 90/ E 120*
Cable bundles up to Ø 107 mm comprising single cables up to Ø 21 mm	EI 90/ E 120*	EI 120
Max. 3 electrical installation pipes made of plastic, flexible, Ø 32 mm with/without cable up to Ø 14 mm	EI 90/ E 90*	EI 120
Electrical installation pipes made of plastic, flexible, Ø 16–32 mm separate or bundled up to Ø 107 mm, with/without cable up to Ø ≤ 21 mm	-	EI 120
Max. 2 plastic pipes with outside Ø 20 mm x s 1.5 mm up to Ø 32 mm x s 2.4 mm and max. 2 plastic pipes with outside Ø 20 mm x s 1.5 mm and with up to 3 accompanying cables up to Ø ≤ 14 mm (jacketed cables with max. 5 wires ≤ 1.5 mm ²)	-	EI 120
Klimasplit line combination: pipe 1/pipe 2 outside Ø 6–10 mm/10–18 mm + 9 mm insulation of PE foam; plastic pipe PVC-U, outside Ø up to 25 mm, s 1.5 mm + max. 3 accompanying cables up to Ø 14 mm at zero distance	EI 90/ E 90*	EI 90/ E 90*

*Attention: In this fire resistance class, only the room sealing (E = Étanchéité) is guaranteed for the classified time, but not heat insulation (I = insulation).

Tab. 11: Retro-installations in walls with PYROCOMB® Intube pipe shell

Fire resistance classes for retro-installations in ceilings with PYROCOMB® Intube pipe shell		
Installed items	150	300
Cables up to Ø 21 mm	EI 120	EI 120
Cables > Ø 21 mm up to Ø 50 mm	EI 90/ E 90*	EI 90/ E 90*
Cables > Ø 50 mm up to Ø 80 mm	-	EI 60/ E 120*
Cable bundles up to Ø 107 mm comprising single cables up to Ø 21 mm	EI 60/ E 90*	EI 120
Cable bundles up to Ø 107 mm comprising single cables up to Ø 21 mm with additional measures, see chapter 6.6.1 Measures on cables, cable bundles, cable support systems in walls and ceilings on page 39	EI 120	EI 120
Max. 3 electrical installation pipes made of plastic, flexible, Ø 32 mm with/without cable up to Ø 14 mm	EI 90/ E 90*	EI 120
Electrical installation pipes made of plastic, flexible, Ø 16–32 mm separate or bundled up to Ø 107 mm, with/without cable up to Ø ≤ 21 mm	-	EI 120

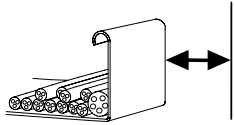
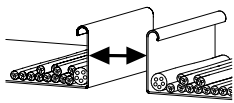
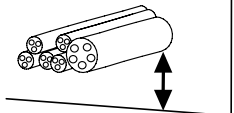
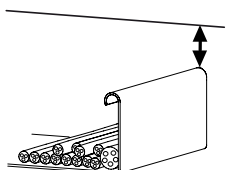
Fire resistance classes for retro-installations in ceilings with PYROCOMB® Intube pipe shell		
Installed items	150	300
Klimasplit line combination pipe 1/pipe 2 outside Ø 6–10 mm/ 10–18 mm + 9 mm insulation of PE foam; plastic pipe PVC-U, outside Ø up to 25 mm, s 1.5 mm + max. 3 accompanying cables up to Ø 14 mm at zero distance	EI 90/ E 90*	EI 90/ E 90*
Klimasplit line combination: pipe 1/pipe 2 outside Ø 10–22 mm/18–22 mm + 9 mm insulation of PE foam; plastic pipe PVC-U, outside Ø up to 25 mm, s 1.5 mm + max. 3 accompanying cables up to Ø 14 mm at zero distance, with additional measures, see chapter 6.6.6 Measures on other pipes on page 49	EI 120	EI 120
PE lines "speed pipe" bundled or separately, with or without fibre-optic cable Max. 24 units, external pipe Ø up to 7 mm Max. 7 units, external pipe Ø up to 10 mm Max. 5 units, external pipe Ø up to 12 mm	EI 120	EI 120
*Attention: In this fire resistance class, only the room sealing (E = Étanchéité) is guaranteed for the classified time, but not heat insulation (I = insulation).		

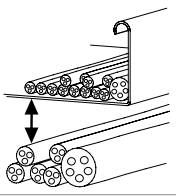
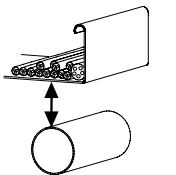
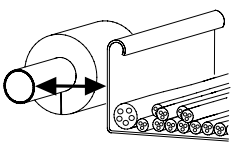
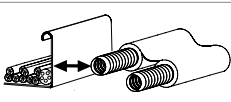
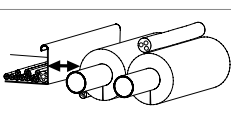
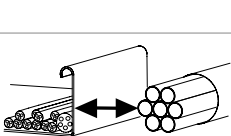
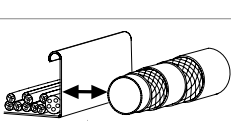
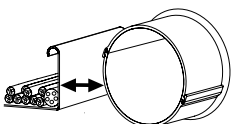
Tab. 12: Retro-installations in ceilings with PYROCOMB® Intube pipe shell

6.3 Minimum distances between installed items

To guarantee the functionality of the PYROMIX® insulation system, minimum distances between installed items in solid walls and ceilings must be taken into account.


Cables, cable bundles or cable support systems

Cables, cable bundles or cable support systems	mm	
	Side distance to component side with wall penetration	≥ 0
	With ceiling penetration	≥ 10
	With ceiling penetration (insulation thickness 240 mm)	≥ 25
	Distance from each other	≥ 10
	With ceiling penetration (insulation thickness 240 mm)	≥ 0
	Lower/rear distance to the component side	≥ 0
	Top/front distance to the component side	≥ 30

Cables, cable bundles or cable support systems		mm
	Distance from each other	≥ 50
	With ceiling penetration (insulation thickness 240 mm)	≥ 45
	Distance to combustibile pipes	≥ 50
	Distance to non-combustibile pipes with wall penetration	≥ 50
	With ceiling penetration	≥ 25
	Distance to "NanoSUN" double solar pipes with wall penetration	≥ 40
	With ceiling penetrations	≥ 100
	Distance to Klimasplit cable combinations with wall penetration	≥ 40
	With ceiling penetration	≥ 100
	Distance to "speed pipe" PE lines with wall penetration	≥ 25
	With ceiling penetration	≥ 40
	Distance to "HANSA-FLEX" hydraulic hoses with wall penetration	≥ 45
	With ceiling penetration	≥ 85
	Distance to PYROCOMB Intube pipe shell	≥ 65

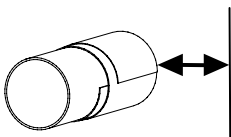
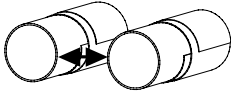

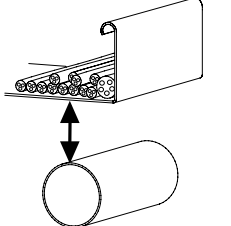
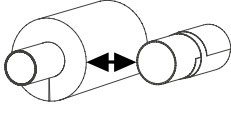
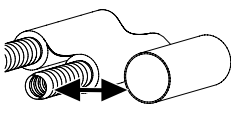
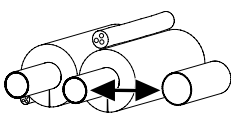

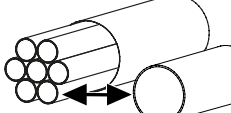
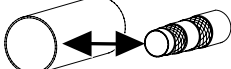
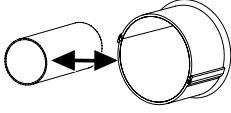
Tab. 13: Distances to cables, cable bundles, cable support systems

Control cables made of steel or plastic

Control cables made of steel or plastic		mm
	Distance from each other	≥ 0
	Distance of rows from each other – recommendation	≥ 30

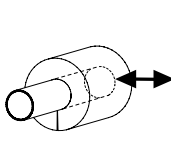
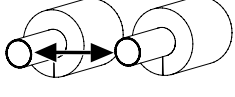
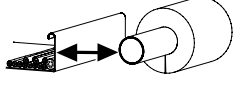
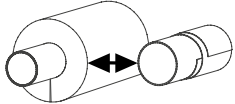
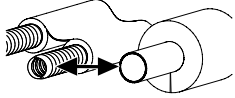
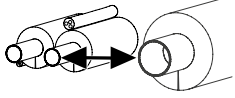
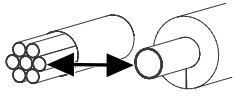
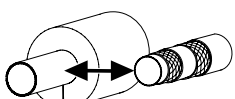
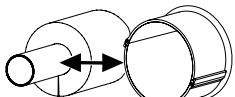
Tab. 14: Distances to control cables

Combustible pipes

Combustible pipes	mm
	Distance to component side ≥ 0
	Distance to each other (measured between the fire protection coils FSB-WB BS) with wall penetration ≥ 0
	With ceiling penetration ≥ 25
	Distance to cables/cable bundles/cable support systems ≥ 50
	Distance to non-combustible pipes (measured from the pipe insulation of the metal pipes) ≥ 0
	Distance to "NanoSUN" double solar pipes ≥ 100
	Distance to Klimasplit cable combinations with wall penetration ≥ 50
	With ceiling penetration ≥ 100
	Distance to "speed pipe" PE lines ≥ 100
	Distance to "HANSA-FLEX" hydraulic hoses ≥ 100
	Distance to PYROCOMB® Intube pipe shell ≥ 100

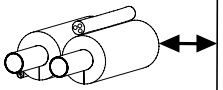
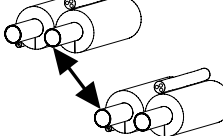


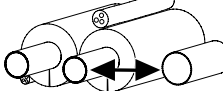
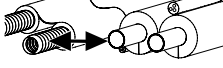



Tab. 15: Distances to combustible pipes

Non-combustible pipes

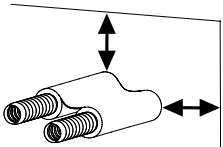
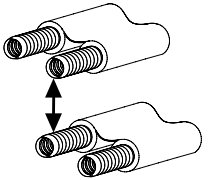
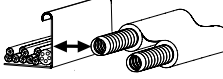
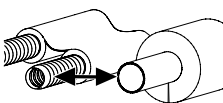
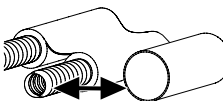
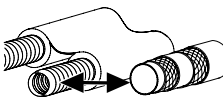
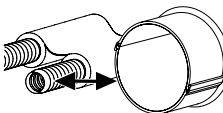
Non-combustible pipes	mm
	Distance to component side ≥ 0
	Distances to each other (pipe insulations must not contact each other) ≥ 0
	Distance to cables/cable bundles/cable support systems with wall penetration ≥ 50 With ceiling penetration ≥ 25
	Distance to combustible pipes (measured from the pipe insulation of the metal pipes) ≥ 0
	Distance to "NanoSUN" double solar pipes ≥ 100
	Distance to Klimasplit cable combinations with wall penetration ≥ 50 With ceiling penetration ≥ 60
	Distance to "speed pipe" PE lines with wall penetration ≥ 20 With ceiling penetration ≥ 100
	Distance to "HANSA-FLEX" hydraulic hoses ≥ 100
	Distance to PYROCOMB® Intube pipe shell ≥ 100

Tab. 16: Distances of non-combustible pipes

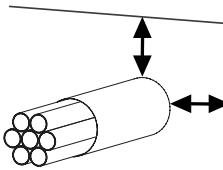
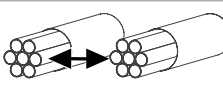
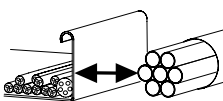
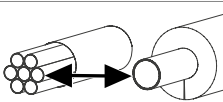
Other installed items

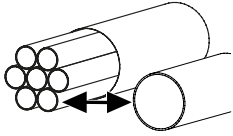
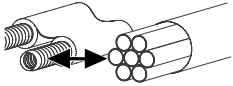
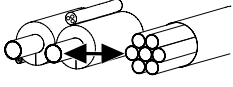
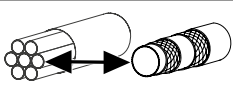
Klimasplit cable combinations	mm
	Distance to component sides with wall penetration ≥ 0 With ceiling penetration ≥ 100
	Distance next to or from each other with wall penetration ≥ 100 With ceiling penetration ≥ 50
	Distance to cables/cable bundles/cable support systems ≥ 40
	Distance to non-combustible pipes ≥ 50
	Distance to combustible pipes ≥ 50
	Distance to "NanoSUN" double solar pipes with wall penetration ≥ 85 With ceiling penetration ≥ 100
	Distance to "speed pipe" PE lines ≥ 100
	Distance to hydraulic hoses ≥ 100
	Distance to PYROCOMB® Intube pipe shell ≥ 100

Tab. 17: Klimasplit cable combination distances

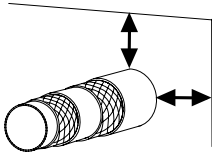
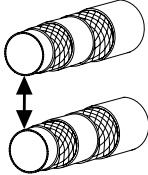
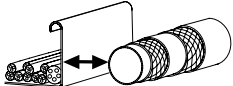
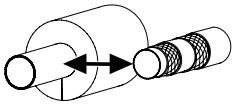
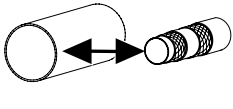
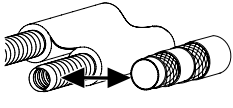
"NanoSUN" double solar pipe		mm
	Distance to component side with wall penetration	≥ 0
	With ceiling penetration	≥ 30
	Spacing	≥ 100
	Distance to cables/cable bundles/cable support systems with wall penetration	≥ 40
	With ceiling penetration	≥ 30
	Distance to non-combustible pipes	≥ 100
	Distance to combustible pipes	≥ 100
	Distance to hydraulic oil hoses with wall penetration	≥ 85
	With ceiling penetration	≥ 80
	Distance to PYROCOMB® Intube pipe shell	≥ 100

Tab. 18: Distances to "NanoSUN" double solar pipes

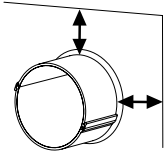
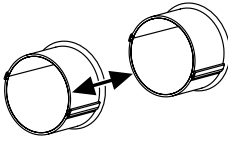
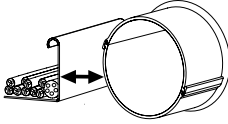
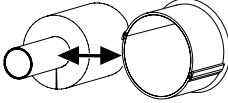
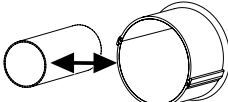
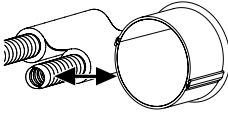
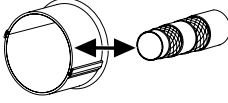
"Speed pipe" PE lines		mm
	Distance to component side	≥ 0
	Spacing	≥ 25
	Distance to cables/cable bundles/cable support systems	≥ 25
	Distance to non-combustible pipes with wall penetration	≥ 20
	With ceiling penetration	≥ 100

"Speed pipe" PE lines		mm
	Distance to combustible pipes	≥ 100
	Distance to "NanoSUN" double solar pipes	≥ 100
	Distance to Klimaspalt cable combinations	≥ 100
	Distance to hydraulic hoses	≥ 100

Tab. 19: Distances to "speed pipe" PE lines

"HANSA-FLEX" hydraulic hoses		mm
	Distance to the component side with wall penetration	≥ 80
	With ceiling penetration	≥ 35
	Spacing	≥ 100
	Distance to cables/cable bundles/cable support systems with wall penetration	≥ 45
	With ceiling penetration	≥ 85
	Distance to non-combustible pipes	≥ 100
	Distance to combustible pipes	≥ 100
	Distance to double solar pipes with wall penetration	≥ 85
	With ceiling penetration	≥ 80
	Distance to additional lines	≥ 100

Tab. 20: Distances to "HANSA-FLEX" hydraulic hoses

PYROCOMB® Intube pipe shell		mm
	Distance to the component side	≥ 15
	Distance from each other with wall penetration	≥ 3
	With ceiling penetration	≥ 10
	Distance to cables/cable bundles/cable support systems	≥ 100
	Distance to non-combustible pipes	≥ 100
	Distance to combustible pipes	≥ 100
	Distance to double solar pipes	≥ 100
	Distance to hydraulic hoses	≥ 100
	Distance to lines for which no distance is specified above	≥ 100

Tab. 21: Distances to PYROCOMB® Intube pipe shell

6.4 First support in walls

Installed items must be supported in order to avoid overloading the insulation in the event of fire.

The supports of the installation must be non-combustible (material class DIN 4102-A).

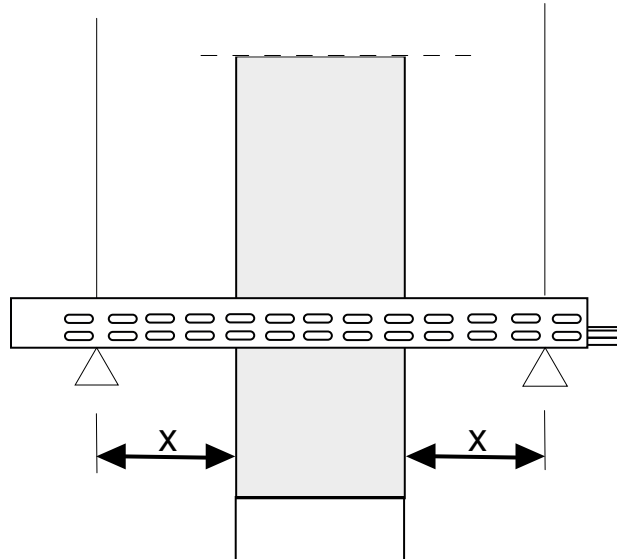


Figure 14: Maximum distance for supports

First support of:	Maximum distance x in mm from the insulation surface
Cables, cable bundles, cable support systems	In walls ≤ 500
	In ceilings ≤ 400
Combustible pipes	≤ 500
Non-combustible pipes – path insulation MIW-MA or mineral-fibre shells	Length of the protective insulation + 50 mm
Non-combustible pipes – path insulation made of "Armaflex Protect"	
"NanoSUN" – double solar pipes	≤ 500
Klimasplit cable combinations	≤ 500
"Speed pipes" for fibre-optic cables and micro-cables	*
"HANSA-FLEX" hydraulic hoses	≤ 500
PYROCOMB® Intube pipe shell	≤ 300
* Distance according to manufacturer's specifications	

Tab. 22: Distances for supports

6.5 Arrangement of the insulation

To ensure the functioning of the PYROMIX® insulation system, the insulation must be carried out with fire protection mortar as follows:

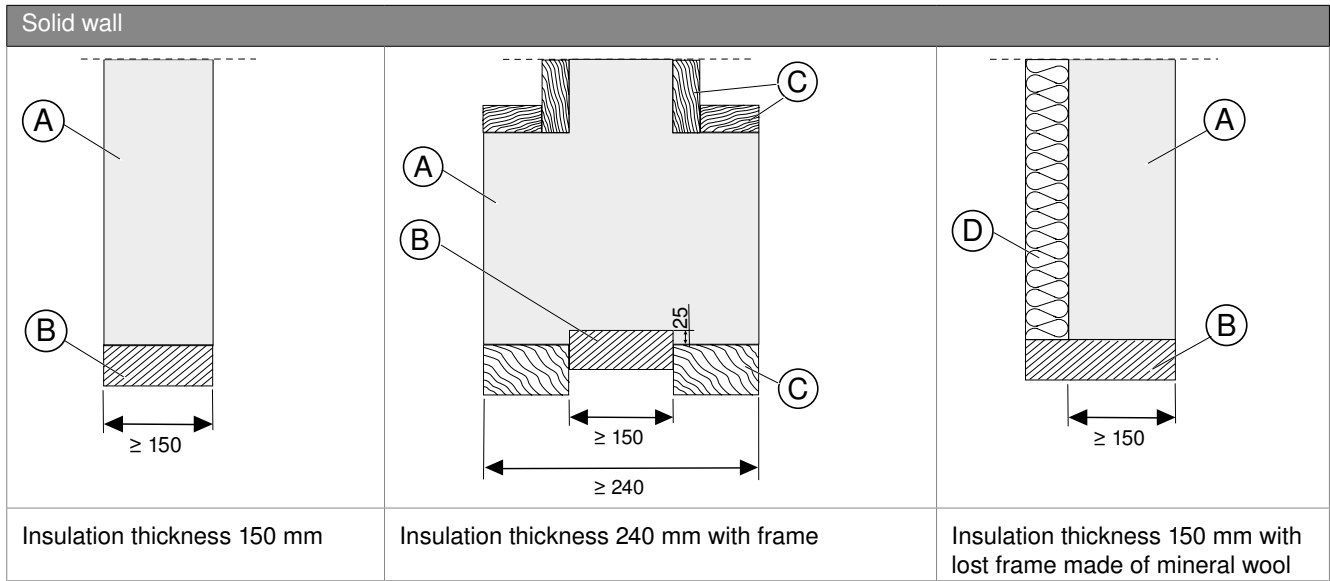


Figure 23: Solid wall insulation arrangement

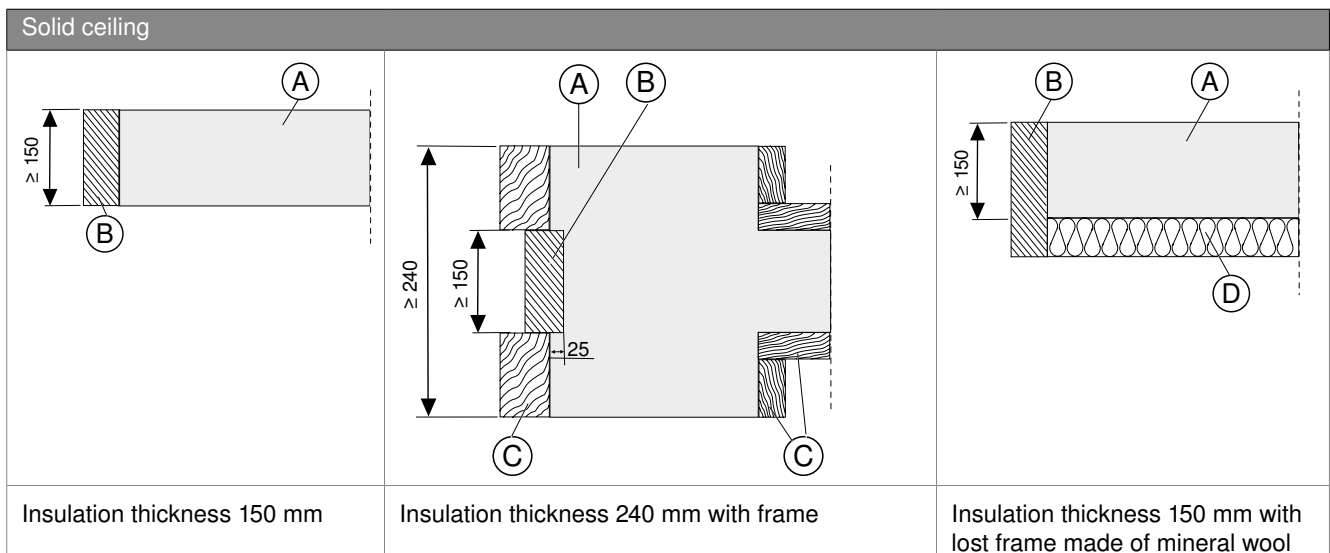


Figure 24: Solid ceiling insulation arrangement

- (A) Insulation
- (B) Solid wall/solid ceiling
- (C) Frame
- (D) Mineral wool as lost frame

For cables, cable bundles and cable support constructions with certain diameters, an insulation thickness of 240 mm is required to achieve the fire resistance class EI 120. The insulation thickness can be achieved with a frame. The insulation must be reinforced only in the area that the installed items go through. See chapter 6.6.1 Measures on cables, cable bundles, cable support systems in walls and ceilings on page 39.

Mineral wool can be used as a lost frame to compensate for wall thicknesses ≥ 150 mm.

6.6 Measures on installed items

To ensure the functioning of the PYROMIX® insulation system, the installed items in the insulation must be wrapped with fire protection coil and/or insulated with protective insulation, depending on the type of installed item and fire protection class needed.

6.6.1 Measures on cables, cable bundles, cable support systems in walls and ceilings

Note! *For cable support systems made of sheet metal, the beams in the area of the insulation must be drilled and coated with ablation coating to prevent heat transfer through the beams. These measures must be coordinated with the responsible trade at the construction site to avoid functional limitations of the cable support systems.*

Without additional measures, insulation thickness ≥ 150 mm

Insulation thickness ≥ 150 mm			
	Dimensions	Fire resistance class	
		Wall	Ceiling
Cables	$\varnothing \leq 21$	EI 120	EI 120
Wires	\varnothing wires ≤ 24	EI 120	EI 120
Cable bundles	$\varnothing \leq 60$	EI 120	EI 120
	$\varnothing \leq 100$	EI 90 / E* 120	EI 60 / E* 120

*Attention: Only the room sealing (E = Étanchéité) is guaranteed for 120 minutes, but not heat insulation (I = insulation).

Tab. 25: Without measures on cables with insulation thickness ≥ 150 mm

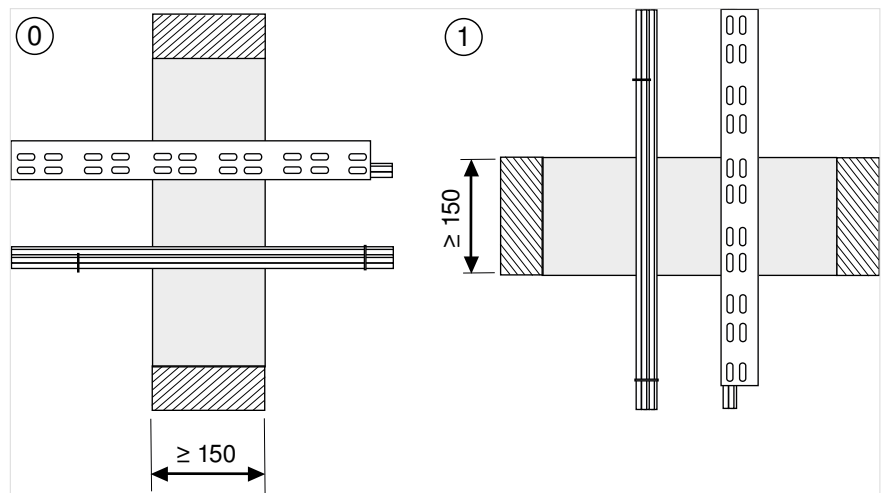


Figure 15: 150 mm insulation with cables in wall ① and ceiling ②

Without additional measures, insulation thickness ≥ 240 mm

Separate cables up to $\varnothing 80$ mm and/or cable bundles up to $\varnothing 100$ mm can be placed through a 240 mm-thick insulation without additional fire protection measures.

Insulation thickness ≥ 240 mm			
	Dimensions	Fire resistance class	
		Wall	Ceiling
Cables	$\varnothing > 21$ to ≤ 50	EI 120	EI 90/E 120*
	$\varnothing > 50$ to ≤ 80	EI 90/E 120*	EI 90
Cable bundles	$\varnothing \leq 100$	EI 120	EI 120

*Attention: Only the room sealing (E = Étanchéité) is guaranteed for 120 minutes, but not heat insulation (I = insulation).

Tab. 26: Without measures on cables with insulation thickness ≥ 240 mm

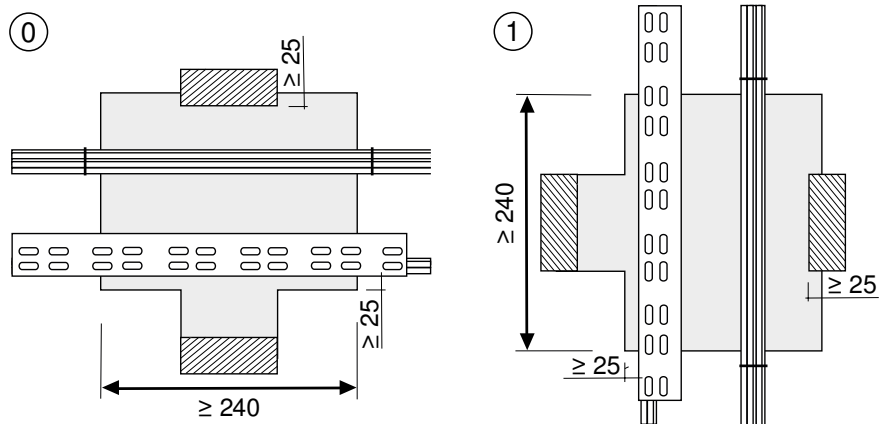


Figure 16: 240 mm insulation with cables in wall ① and ceiling ②

Measure fire protection coil FSB-WB 1.5

Cable, cable bundle and cable support constructions must be wrapped with fire protection coil FSB-WB 1.5 from a certain cross-section onwards. The fire protection coil must be wrapped around the installed item with the coated side inward and fixed in place with winding wire MIW-TD $\varnothing \geq 1.0$ mm. The wire must be attached ≥ 25 mm from the outside edge of the fire protection coil.

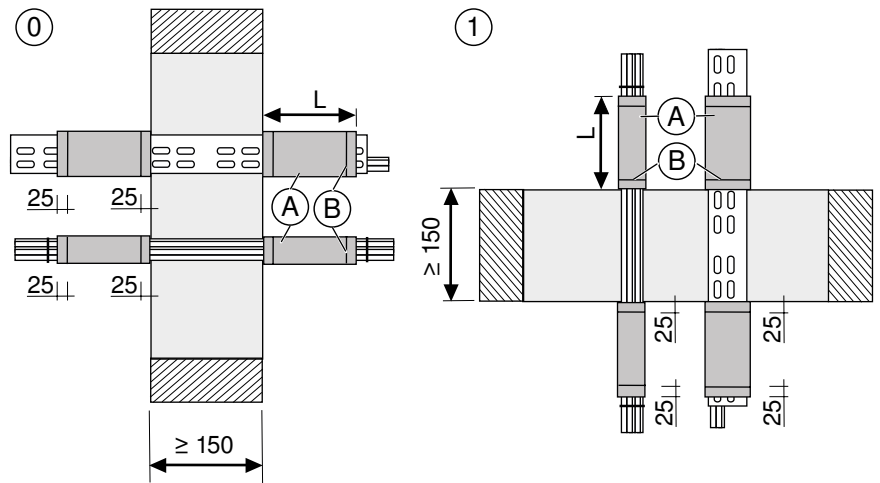


Figure 17: Cable in wall ① and ceiling ② with fire protection coil

- Ⓐ Fire protection coil FSB-WB 1.5
- Ⓑ Winding wire MIW-TD

Fire protection coil FSB-WB 1.5 on cables, cable bundles, cable support systems									
Dimensions in mm								Fire resistance class	
Installed item	Dimensions	Coil width	Number of coils	Number of layers	Overlap	In the insulation	In front of the insulation (L)	Wall	Ceiling
Cables	$\varnothing \leq 21$	-	-	-	-	-	-	EI 120	EI 120
	$\varnothing > 21$ to ≤ 50	125	2	1	45-60	0	125	EI 90/ E 120*	EI 120
	$\varnothing > 21$ to ≤ 50	200	2	2	45-60	0	200	EI 120	EI 120
	$\varnothing > 50$ to ≤ 80	125	2	1	45-60	0	125	EI 60/ E 120*	EI 90/ E 120*
	$\varnothing > 50$ to ≤ 80	200	2	2	45-60	0	200	EI 120	EI 120
Cable bundles	$\varnothing \leq 100$	125	2	1	45-60	0	125	EI 120	EI 120

*Attention: Only the room sealing (E = Étanchéité) is guaranteed for 120 minutes, but not heat insulation (I = insulation).

Tab. 27: Measures on cables, cable bundles, cable support systems

Measure on cable bundles in PYROCOMB® pipe shell with cover installation

If certain cable bundles are guided through a PYROCOMB® Intube pipe shell installed in a ceiling, the lines above and below the ceiling must be wrapped with fire protection coil FSB-WB 1.5.

Fire protection coil FSB-WB 1.5 on cable bundles in PYROCOMB® Intube pipe shell in ceilings					
Installed item	Dimensions	Coil width	Number of coils	Fire resistance class in ceiling	
Cable bundles comprising single cables up to $\varnothing 21$ mm	$\varnothing \leq 107$ mm	125 mm	1	EI 120 with pipe shell 150	EI 120 with pipe shell 300

Tab. 28: Measure on cable bundles in pipe shell with ceiling installation

6.6.2 Measures on electrical installation pipes

Fire protection coil FSB-WB 1.5

Electrical installation pipes must be wrapped with fire protection coil FSB-WB 1.5. The fire protection coil must be wrapped around the installed item with the coated side inward and fixed in place with winding wire MIW-TD $\varnothing \geq 1.0$ mm. The wire must be attached 25 mm from the outside edge of the fire protection coil.

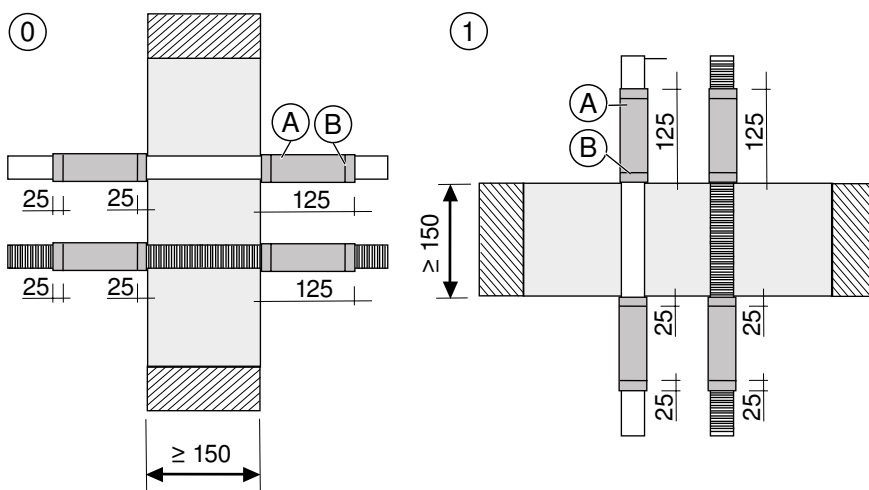


Figure 18: Electrical installation pipes in wall ① and ceiling ② with fire protection coil

- ① Fire protection coil FSB-WB 1.5
- ② Winding wire MIW-TD

Fire protection coil FSB-WB 1.5 on electrical installation pipes								Fire resistance class	
Dimensions in mm								Wall	Ceiling
Installed item	Dimensions	Coil width	Number of coils	Number of layers	Overlap	In the insulation	In front of the insulation		
Steel electrical installation pipes (rigid)	Up to $\varnothing \leq 16$	125	2	1	0	0	125	EI 120 C/U	EI 120 C/U
Plastic electrical installation pipes (rigid)	Up to $\varnothing \leq 16$	125	2	1	0	0	125	EI 120 C/U	EI 120 C/U

Tab. 29: Measures on electrical installation pipes

6.6.3 Measures on "speed pipe" PE lines

"Speed pipe" PE lines must be wrapped with fire protection coil FSB-WB 1.5. The fire protection coil must be wrapped around the installed item with the coated side inward. It must reach 75 mm into the insulation on both sides of the wall or ceiling.

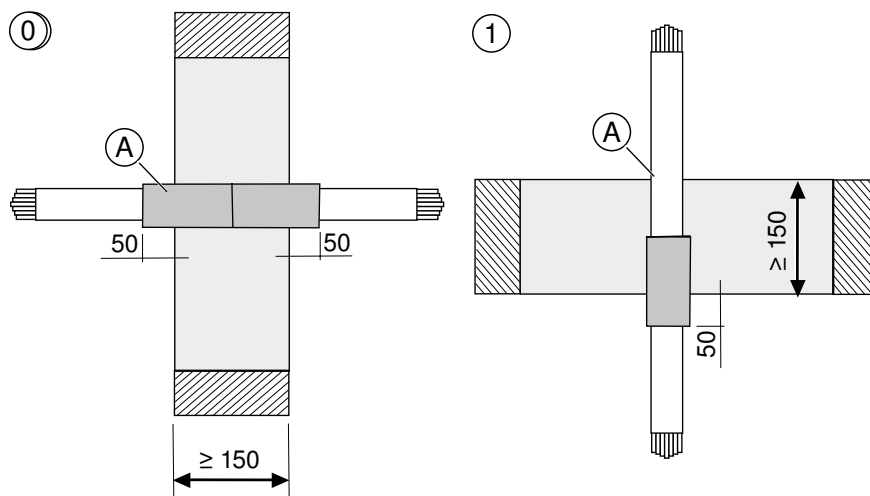


Figure 19: "Speed pipe" PE lines in wall ① and ceiling ② with fire protection coil

Ⓐ Fire protection coil FSB-WB 1.5

Fire protection coil FSB-WB 1.5 on "speed pipe" PE lines										
Dimensions in mm									Fire resistance class	
	Pipe wall thickness	Arrangement of "speed pipes"	Coil width	Number of coils	Number of layers	Overlap	In the insulation	In front of the insulation	Wall	Ceiling
Wall	≥ 1.5	Ø 7.0 mm x 24 pieces	125	2	1	0	75	50	EI 120	EI 120
	≥ 2.0	Ø 10.0 mm x 7 pieces							EI 120	EI 120
	≥ 2.0	Ø 12.00 mm x 5 pieces							EI 120	EI 120
Dimensions in mm									Fire resistance class	
	Pipe wall thickness	Arrangement of "speed pipes"	Coil width	Number of coils	Number of layers	Overlap	In the insulation	In front of the insulation	Wall	Ceiling
Ceiling	≥ 1.5	Ø 7.0 mm x 24 pieces	125	1	2	0	75	50	EI 120	EI 120
	≥ 2.0	Ø 10.0 mm x 7 pieces							U/U	U/U
	≥ 2.0	Ø 12.00 mm x 5 pieces							EI 120	EI 120

Tab. 30: Measures on "speed pipe" PE lines

6.6.4 Measures on combustible pipes

Combustible pipes must be wrapped with the fire protection coil FSB-WB BS, coated on both sides, and fixed in place with winding wire MIW-TD $\varnothing \geq 1.0$ mm. The fire protection coil must reach 70 mm into the insulation on both sides of the wall. For ceiling installation, the fire protection coil must be attached only on the lower side of the insulation and reach 70 mm into the insulation.

Note! *The insulation may only be used on pneumatic conveyor systems, compressed air lines or the like if the pipeline system is automatically switched off in the event of fire.*

Note! *Optionally, a noise insulation tube ≤ 5 mm can be installed on combustible pipes. The noise insulation tube must likewise be wrapped with the fire protection coil.*

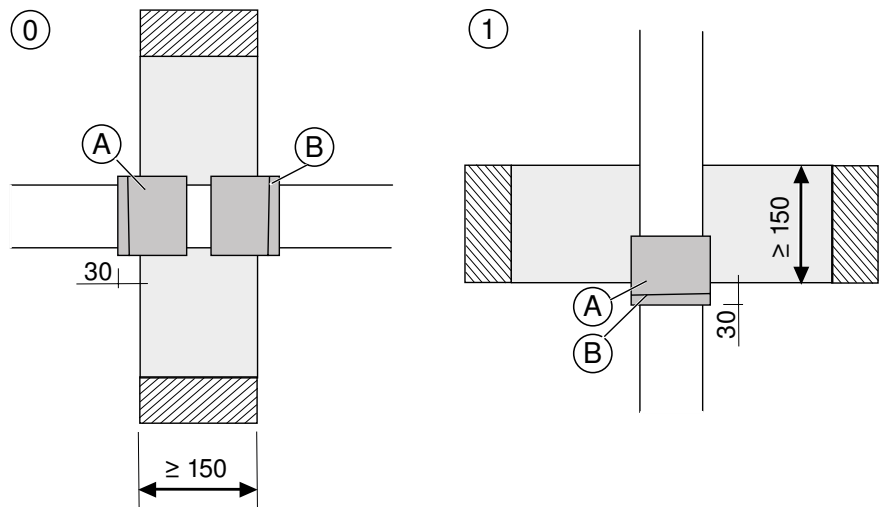


Figure 20: Combustible pipes in wall ① and ceiling ② with fire protection coil

- ① Fire protection coil FSB-WB BS
- ② Winding wire MIW-TD

Fire protection coil FSB-WB BS, 100 mm wide, on combustible pipes								Fire resistance class	
Dimensions in mm									
Installation location	Dimensions	Coil width	Number of coils	Number of layers	Overlap	In the insulation	In front of the insulation	Wall	Ceiling
Wall	$\leq \varnothing 50$	100	2	1	0	70	30	EI 120	EI 120
	$> \varnothing 50-80$			2				EI 120	EI 120
	$> \varnothing 80-110$			3				EI 120	EI 120
	$> \varnothing 110-135$			4				EI 120	EI 120
	$> \varnothing 135-160$			5				EI 120	EI 120
Ceiling	$\leq \varnothing 50$	125	2	1	0	70	30	EI 120	EI 120
	$> \varnothing 50-80$			2				EI 120	EI 120
	$> \varnothing 80-110$			3				EI 120	EI 120
	$> \varnothing 110-135$			4				EI 120	EI 120
	$> \varnothing 135-160$			5				EI 120	EI 120

Tab. 31: Measures on combustible pipes

6.6.5 Measures on non-combustible pipes

Non-combustible pipes must be insulated with a path insulation. Depending on the pipe wall thickness and pipe outside diameter, protective insulation might also be necessary. The path insulation must be fixed to the pipe with tightening straps or winding wire MIW-TD so the insulation cannot slip off even in ceiling installation.

Note! *Combustible pipes with a path insulation may be arrayed at an angle of 45°–90° to the component surface.*

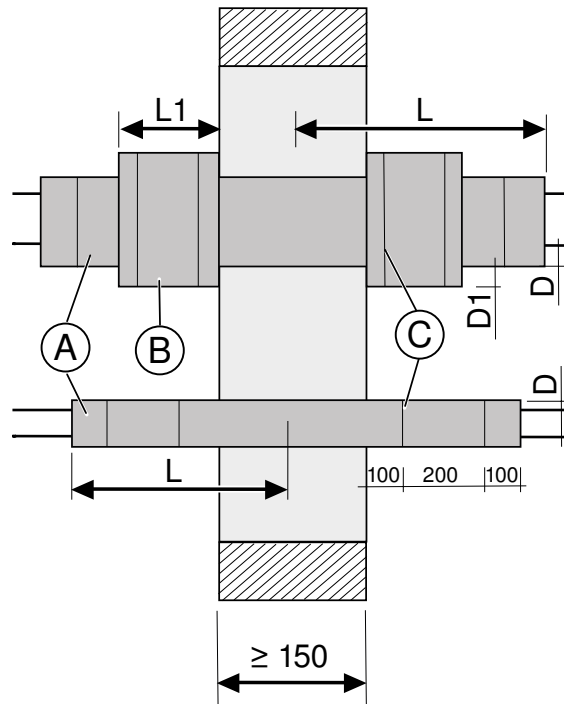


Figure 21: Non-combustible pipes in walls with path and protection insulation

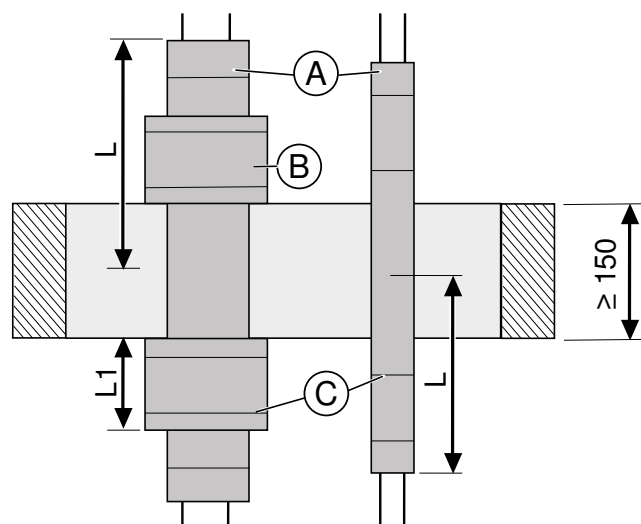


Figure 22: Non-combustible pipes in ceilings with path and protection insulation

- (A) Path insulation for metal pipes MIW-MA or made of mineral fibre shells
- (B) Protective insulation made of path insulation for metal pipes MIW-MA
- (C) Fixing with winding wire MIW-TD

Path insulation MIW-MA on non-combustible pipes					
Dimensions in mm				Fire resistance class	
Installed item	External pipe diameter	Insulation length L	Insulation thickness D	Wall	Ceiling
Copper	$\varnothing \leq 15.0$	≥ 250	≥ 20	EI 120	EI 120
	$2x \varnothing \leq 22.0$			-	EI 30/ E 90*
	$3x \varnothing \leq 15.0$	≥ 500	≥ 30	EI 120	EI 60/ E 90*
	$\varnothing > 15.0 - \leq 28.0$			EI 120	EI 120
	$\varnothing > 28.0 - \leq 42.0$			EI 120	EI 120
	$\varnothing > 42.0 - \leq 54.0$			EI 120	EI 120
	$\varnothing > 54.0 - \leq 88.9$	≥ 750	≥ 60	EI 120	EI 120
$\varnothing > 88.9 - \leq 108.0^{**}$	≥ 1000	≥ 30	EI 120	EI 120	
Steel, stainless, cast	$\varnothing \leq 15.0$	≥ 250	≥ 20	EI 120	EI 120
	$\varnothing > 15.0 - \leq 28.0$	≥ 500	≥ 30	EI 120	EI 120
	$\varnothing > 28.0 - \leq 42.0$			EI 120	EI 120
	$\varnothing > 42.0 - \leq 114.3$			EI 120	EI 120
	$\varnothing > 114.3 - \leq 168.3$	$\geq 1,000$	≥ 40	EI 120	EI 120
	$\varnothing > 168.3 - \leq 323.9^{**}$			EI 120	EI 120

*Attention: In this fire resistance class, only the room sealing (E = Étanchéité) is guaranteed, but not heat insulation (I = insulation).
 ** Additional protective insulation made of path insulation MIW-MA (L1 \geq 500 mm x D1 \geq 30 mm)

Tab. 32: Measures with path insulation MIW-MA on non-combustible pipes

Path insulation made of mineral fibre shells "Conlit 150U" on non-combustible pipes					
Dimensions in mm				Fire resistance class	
Installed item	External pipe diameter	Insulation length	Insulation thickness	Wall	Ceiling
Copper	$\varnothing \leq 15.0$	≥ 250	≥ 22.5	EI 120	EI 120
	$2x \varnothing \leq 22.0$	≥ 500	≥ 19	-	EI 30/ E 120*
	$\varnothing > 15.0 - \leq 28.0$			EI 120	EI 120
	$\varnothing > 15.0 - \leq 42.0$			-	EI 120
	$\varnothing > 28.0 - \leq 54.0$	$\geq 1,000$	≥ 38	EI 120	EI 120
	$\varnothing > 54.0 - \leq 108.0$			EI 120	EI 120

Path insulation made of mineral fibre shells "Conlit 150U" on non-combustible pipes					
Steel, stainless, cast	$\varnothing \leq 15.0$	≥ 250	≥ 22.5	EI 120	EI 120
	$\varnothing > 15.0 - \leq 28.0$	≥ 500	≥ 26	EI 120	EI 120
	$\varnothing > 15.0 - \leq 42.0$		≥ 19	-	EI 120
	$\varnothing > 28.0 - \leq 54.0$		≥ 38	EI 120	EI 120
	$\varnothing > 54.0 - \leq 114.3$	≥ 750	≥ 33	EI 120	EI 120
	$\varnothing > 114.3 - \leq 168.3$	$\geq 1,000$	≥ 40	EI 120	EI 120
	$\varnothing > 168.3 - \leq 219.1^{**}$			EI 120	EI 120
	$\varnothing > 219.1 - \leq 323.9^{**}$			EI 120	EI 90/ E 120*

*Attention: In this fire resistance class, only the room sealing (E = Étanchéité) is guaranteed, but not heat insulation (I = insulation).

** Additional protective insulation made of path insulation MIW-MA (L1 \geq 500 mm x D1 \geq 40 mm)

Tab. 33: Measures with path insulation "Conlit 150U" on non-combustible pipes

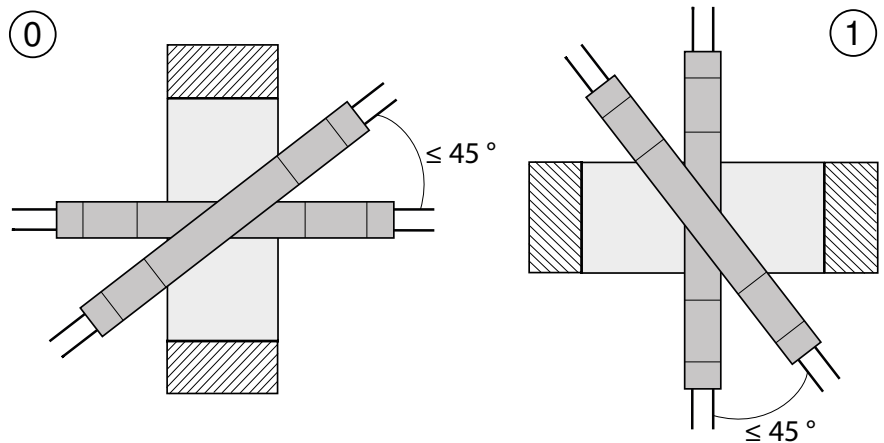


Figure 23: Sloping arrangement up to 45° for non-combustible pipes

Path insulation made of "Armaflex Protect"

Non-combustible pipes with path insulation made of "Armaflex Protect" must also receive protective insulation, depending on the pipe wall thickness and pipe outside diameter. The protective insulation can be made with the path insulation MIW-MA. It must be fixed to the pipe with tightening straps or winding wire MIW-TD so the insulation cannot slip off even in ceiling installation.

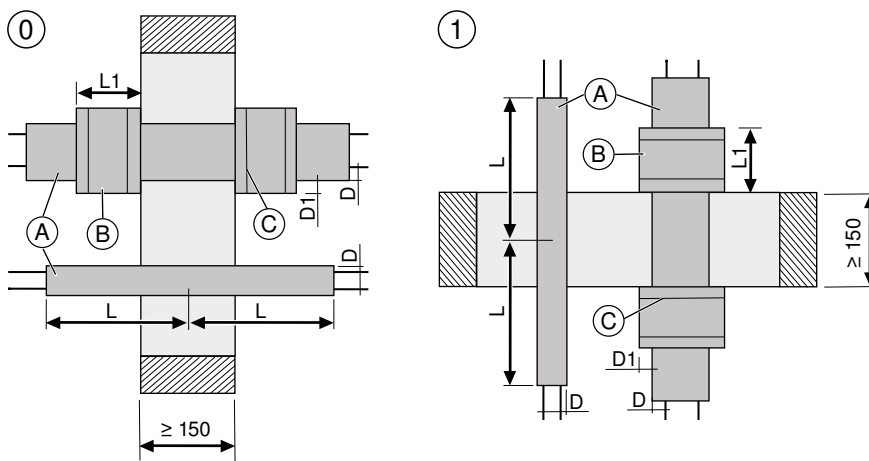


Figure 24: Non-combustible pipes in wall ① and ceiling ② with path insulation "Armaflex Protect"

- ① Path insulation "Armaflex Protect"
- ② Protective insulation made of MIW-MA (path insulation)
- ③ Fixing with winding wire MIW-TD ≥ 1.0 mm

Path insulation "Armaflex Protect" on non-combustible pipes					
Dimensions in mm				Fire resistance class	
Installed item	External pipe diameter	Insulation length	Insulation thickness	Wall	Ceiling
Copper	$\varnothing \leq 28.0$	≥ 250	25	EI 120	EI 120
	$\varnothing \leq 28.0$	≥ 500	26–51	EI 120	EI 120
	$\varnothing > 28.0 - \leq 88.9$		25	EI 120	EI 120
	$\varnothing > 28.0 - \leq 88.9$	$\geq 1,000$	26–51	EI 120	EI 120
	$\varnothing > 88.9 - \leq 108.0^{**}$		26–52	EI 120	EI 120
Steel, stainless, cast	$\varnothing \leq 28.0$	≥ 250	25	EI 120	EI 120
	$\varnothing \leq 28.0$	≥ 500	26–51	EI 120	EI 120
	$\varnothing > 28.0 - \leq 88.9$		25	EI 120	EI 120
	$\varnothing > 28.0 - \leq 88.9$	$\geq 1,000$	26–51	EI 120	EI 120
	$\varnothing > 88.9 - \leq 170.0$		52	EI 120	EI 120
	$\varnothing > 88.9 - \leq 170.0^{**}$		26–52	EI 120	EI 120
	$\varnothing > 108.0 - \leq 170.0$		52	EI 120	-

**** Additional protective insulation made of path insulation MIW-MA (L1 ≥ 500 mm x D1 ≥ 40 mm)**

Tab. 34: Measures with path insulation "Armaflex Protect" on non-combustible pipes

6.6.6 Measures on other pipes

Klimasplit line combination

Klimasplit line combinations must be wound on both sides of the insulation with fire protection coil FSB-WB 1.5. The fire protection coil must be wrapped around the installed item with the coated side inward and fixed in place with winding wire. It must reach 50 mm into the insulation on both sides of the wall or ceiling.

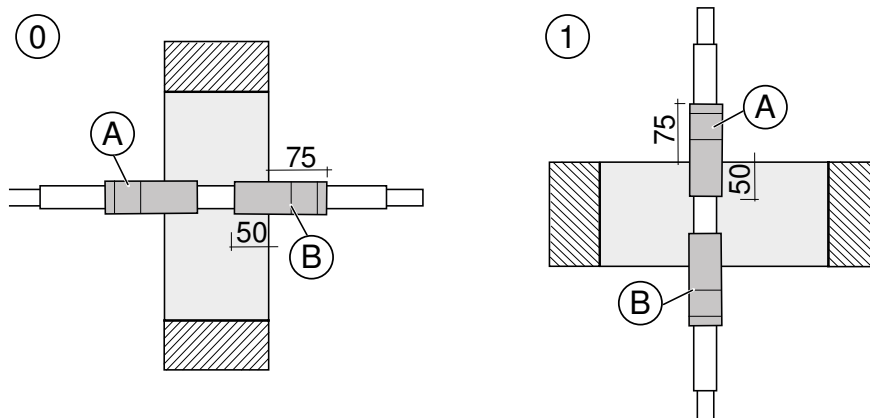


Figure 25: Klimasplit line combination in wall ① and ceiling ② with fire protection coil

- ① Fire protection coil FSB-WB 1.5
- ② Fixing with winding wire MIW-TD

Fire protection coil FSB-WB1.5 on Klimasplit line combination							
Copper pipe, wall thickness ≥ 8 mm, with PE insulation $d \leq 9.0$ mm, a plastic pipe PE-100 $\varnothing \leq 25$ mm and 2 accompanying cables $\varnothing \leq 14$ mm							
External pipe diameter	Coil width	Number of coils	Number of layers	Over-lap	In the insulation	In front of the insulation	Wall/ceiling
6.0–18.0	125	2	2	≥ 40	0	125	EI 120

Tab. 35: Measures on Klimasplit line combination

Measures on Klimasplit line combination in PYROCOMB® pipe shell during ceiling installation

If certain Klimasplit line combinations are guided through a PYROCOMB® Intube pipe shell installed in a ceiling, the lines above the ceiling must be wrapped with path insulation MIW-MA.

Path insulation MIW-MA on Klimasplit line combination in PYROCOMB® Intube pipe shell in ceilings				
Dimensions in mm	Insulation length	Insulation thickness	Fire resistance class in ceiling	
Klimasplit line combination: pipe 1/ pipe 2 outside Ø 10–22 mm/18–22 mm + 9 mm insulation of PE foam; plastic pipe PVC-U, outside Ø up to 25 mm, s 1.5 mm + max. 3 accompanying cables up to Ø 14 mm at zero distance	≥ 250	≥ 30	EI 120 with pipe shell 150	EI 120 with pipe shell 300

Tab. 36: Measure on Klimasplit line combination in pipe shell during ceiling installation

Double solar pipes “NanoSUN”

“NanoSUN” double solar pipes must be wound on both sides of the insulation with fire protection coil FSB-WB 1.5. For ceiling penetration, the fire protection coil is necessary only above the ceiling. For pipe nominal widths > DN 25–≤ DN 40, an additional protective insulation made of path insulation MIW-MA is necessary for each side, both in walls and in ceilings. With ceiling penetration of these pipes, the fire protection coil is also necessary below the ceiling. The fire protection coil must be fixed with winding wire MIW-TD.

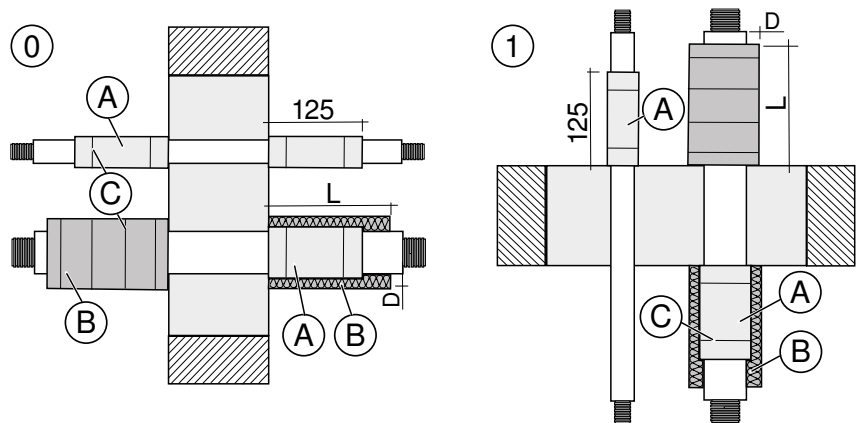


Figure 26: “NanoSUN” double solar pipes in wall ① and ceiling ② with path insulation and fire protection coil

- ① Fire protection coil FSB-WB 1.5
- ② Path insulation for metal pipes MIW-MA
- ③ Fixing with winding wire MIW-TD

Fire protection coil FSB-WB 1.5 and protective insulation on "NanoSUN" double solar pipes										
Dimensions in mm								Fire resist- ance class	Protective insulation of MIW-MA	
Instal- lation loca- tion	External pipe diameter	Coil width	Number of coils	Num- ber of layers	Overlap	In the insula- tion	In front of the insula- tion		Length L	Thick- ness D
Wall	DN 16–DN 25	125	2	1	≥ 40	0	125	EI 120	-	-
Ceil- ing	DN 16–DN 25	125	1 (above)	1	≥ 40	0	125	EI 120	-	-
Wall	> DN 25–≤ DN 40	125	2	1	≥ 50	0	125	EI 120	≥ 250	≥ 30
Ceil- ing	> DN 25–≤ DN 40	125	2	1	≥ 50	0	125	EI 30 E 120*	≥ 250	≥ 30
Wall	> DN 25–≤ DN 40	125	2	1	≥ 50	0	125	EI 30 E 120	-	-
Ceil- ing	> DN 25–≤ DN 40	125	2	1	≥ 50	0	125	EI 45 E 90*	-	-

*Attention: In this fire resistance class, only the room sealing (E = Étanchéité) is guaranteed, but not heat insulation (I = insulation).

Tab. 37: Measures on "NanoSUN" double solar pipes

Hydraulic hoses with "HANSA-FLEX" wire mesh inserts

Hydraulic hoses with "HANSA-FLEX" wire mesh inserts must be insulated with path insulation MIW-MA in the insulation area and also wrapped with the fire protection coil FSB-WB 1.5. The fire protection coil must be wrapped around the installed item with the coated side inward and fixed in place with winding wire.

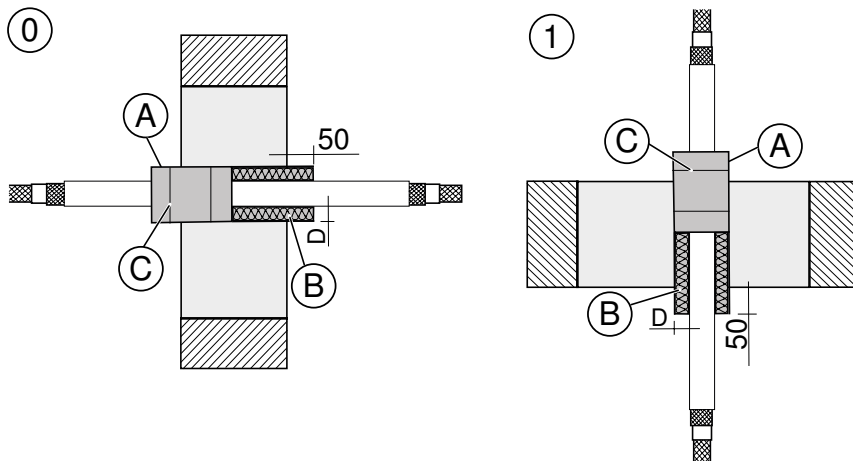


Figure 27: HANSA-FLEX hydraulic hoses in wall ① and ceiling ② with path insulation and fire protection coil

- ① Fire protection coil FSB-WB 1.5
- ② Path insulation MIW-MA
- ③ Fixing with winding wire MIW-TD

Fire protection coil FSB-WB 1.5 and protective insulation on "HANSA-FLEX" hydraulic hoses											
Dimensions in mm								Fire resistance class		Protective insulation of MIW-MA	
Installation location	External pipe diameter	Coil width	Number of coils	Number of layers	Overlap	In the insulation	In front of the insulation	Wall	Ceiling	Length	Thickness
Wall/ceiling	≤ 55.9	125	2	1	0	75	50	EI 120	EI 120	≥ 250	≥ 20

Tab. 38: Measures on "HANSA-FLEX" hydraulic hoses

7 Insulation for fire resistance class EI 240

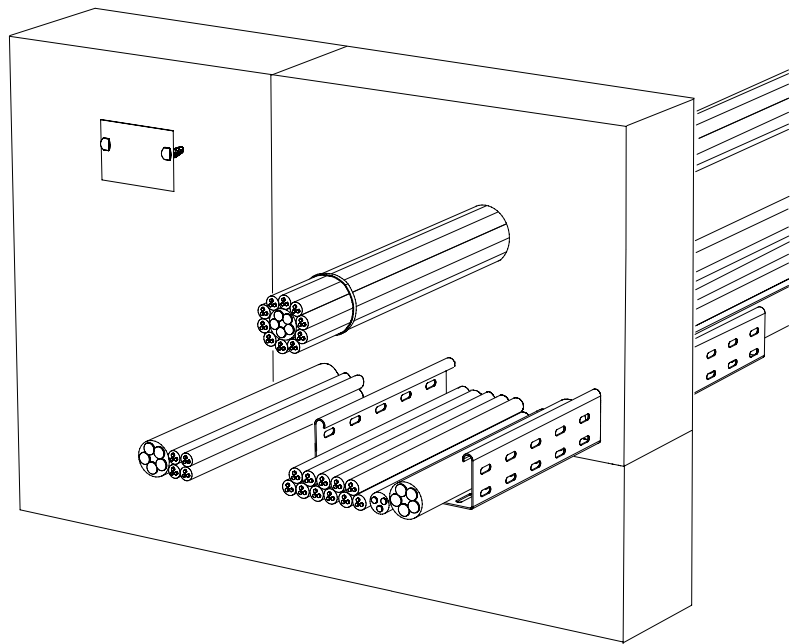


Figure 28: Installed items in insulation design E 240

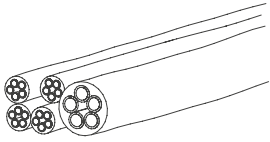
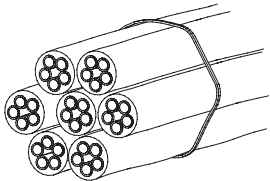
7.1 Approved installed items

Fire resistance class EI 240 can be reached in walls and ceilings with the below-named installed items.

The total cross-section of the installed items must not be more than 60% of the wall/ceiling opening.

The following installed items are permitted with the PYROMIX® installation system in solid walls and ceilings:

7.1.1 Cables and cable support systems

Cables	
	<ul style="list-style-type: none"> – Electrical cables of all kinds, including fibre-optic cables – Total conductor diameter of the separate cables ≤ 80 mm
Cable bundles	
	<ul style="list-style-type: none"> – Total bundle diameter ≤ 100 mm made up of separate cables with outside diameter ≤ 21 mm – No surrounding filling is necessary if cable bundles consist of tightly packed, firmly tied, sewn or welded parallel-running cables.

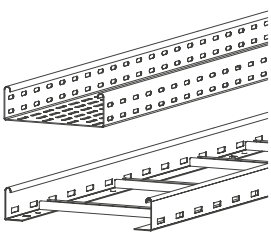
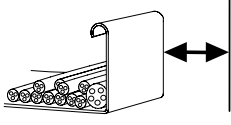
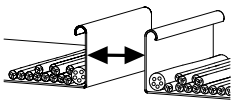
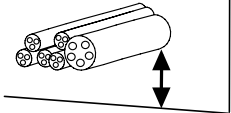
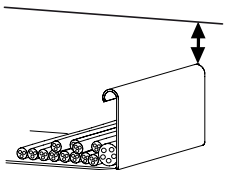
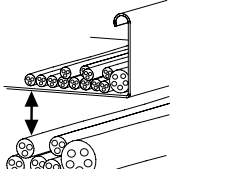
Cable support systems	
	<p>– Cable trays and cable ladders made of steel with organic coatings if the fire behaviour corresponds to at least A2 according to EN 13501-1</p>

Figure 29: Approved cables

7.2 Minimum distances between installed items

To guarantee the functionality of the PYROMIX® insulation system, minimum distances between installed items in solid walls and ceilings must be taken into account.

Cables, cable bundles or cable support systems

Cables, cable bundles, cable support systems		mm
	Side distance to component layer	≥ 20
	Distance from each other	≥ 10
	Lower/rear distance to the component side	≥ 20
	Top/front distance to the component side	≥ 30
	Distance from each other	≥ 40

Tab. 39: Distances to cables, cable bundles, cable support systems

7.3 First support in walls

Installed items must be supported in order to avoid overloading the insulation in the event of fire.

The supports of the installation must be non-combustible (material class DIN 4102-A).

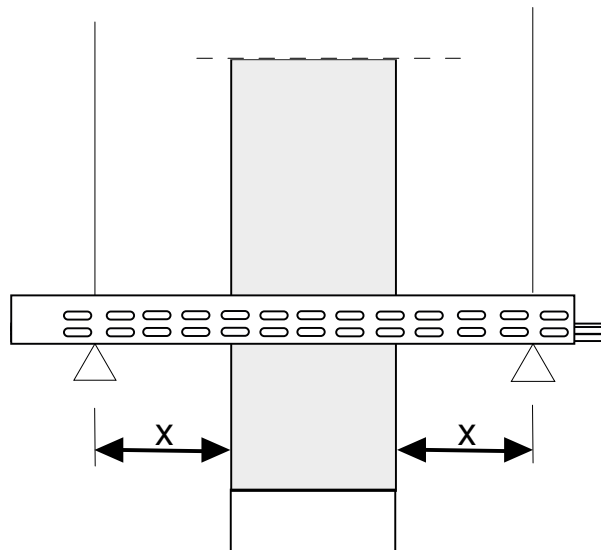


Figure 30: Maximum distance for supports

First support of:	Maximum distance x in mm from the insulation surface
Cables, cable bundles, cable support systems	In walls ≤ 500
	In ceilings ≤ 400

Tab. 40: Distances for supports

7.4 Arrangement of the insulation

To ensure the functioning of the PYROMIX® insulation system, the insulation must be carried out with fire protection mortar as follows:

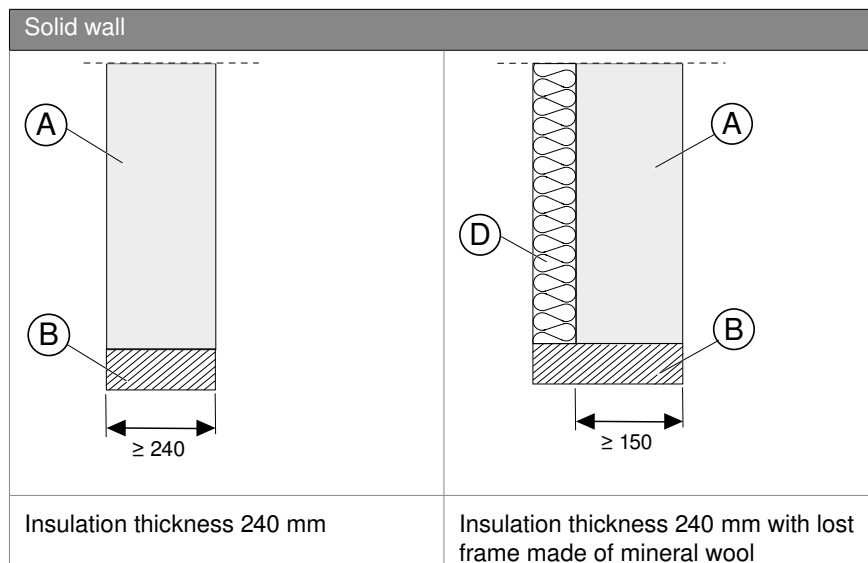


Figure 31: Solid wall insulation arrangement

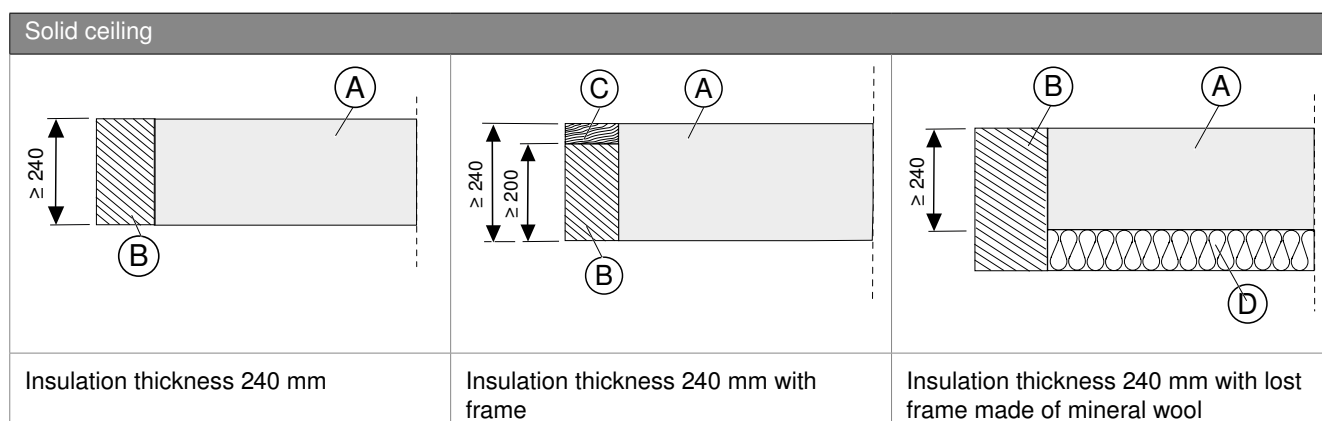


Figure 41: Solid ceiling insulation arrangement

- Ⓐ Insulation
- Ⓑ Solid wall/solid ceiling
- Ⓒ Frame
- Ⓓ Mineral wool as lost frame

Mineral wool can be used as a lost frame to compensate for wall thicknesses ≥ 240 mm.

7.5 Measures on installed items

To ensure the functionality of the PYROMIX® insulation system, the installed items must be wound with fire protection coil FSB-WB 1.5. The fire protection coil must be wrapped around the installed item with the coated side inward and fixed in place with winding wire MIW-TD $\varnothing \geq 1.0$ mm. The wire must be attached 25 mm from the outside edge of the fire protection coil.

Note! For cable support systems made of sheet metal, the beams in the area of the insulation must be drilled and coated with ablation coating to prevent heat transfer through the beams. These measures must be coordinated with the responsible trade at the construction site to avoid functional limitations of the cable support systems.

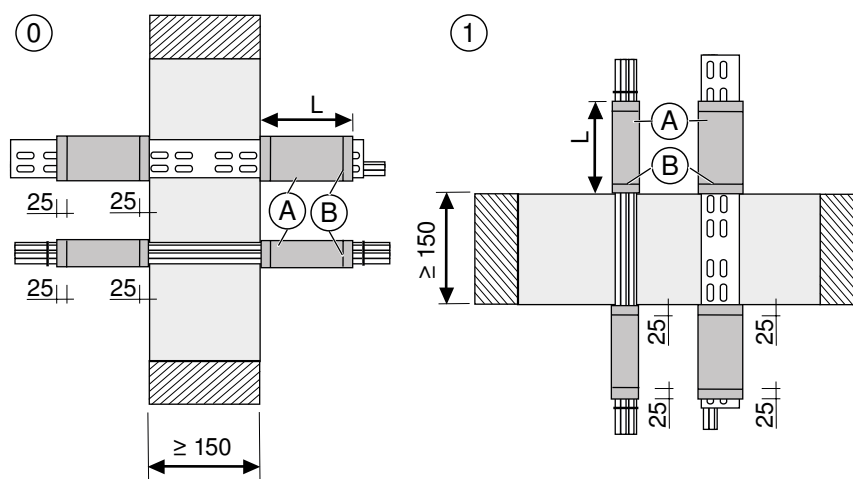


Figure 32: Cable in wall ① and ceiling ② with fire protection coil

- Ⓐ Fire protection coil FSB-WB 1.5
- Ⓑ Fixing with winding wire MIW-TD

Fire protection coil FSB-WB 1.5 on cables, cable bundles, cable support systems								Fire resistance class	
Dimensions in mm								Wall	Ceiling
Installed item	Dimensions	Coil width	Number of coils	Number of layers	Overlap	In the insulation	In front of the insulation (L)		
Cables	$\varnothing \leq 80$	500	2	2	45–60	0	500	EI 240	EI 240
Cable bundles	$\varnothing \leq 100$	500	2	2	0	0	500	EI 240	EI 240

Tab. 42: Measures on cables, cable bundles, cable support systems

8 Maintenance

The insulation made of PYROMIX® requires no maintenance. Nonetheless, we recommend carrying out a visual inspection of the insulation at regular intervals, as part of the inspection of the electrical systems.

- Check that all the component parts of the insulation are tightly sealed.
- Reseal any joints or gaps with spreadable ASX ablation coating.

9 Disposal

National laws and regulations must be observed for disposal.

Disposal during mounting

- Residual material and packaging of the PYROMIX® system components must be disposed of as mixed construction waste.

Disposal during building demolition

- Installed PYROMIX® materials must be disposed of as mixed construction waste.

Disposal after a fire



Caution: Irritant effect!

If there is a fire, burning cable insulation can create corrosive gases, which have an irritant and corrosive effect. When disposing of duct sections which have been subjected to a fire, wear breathing protection and protective clothing.

If the components of the PYROMIX® system or other parts of the fire insulation have been subjected to fire damage, the complete insulation must be removed and disposed of. We recommend obtaining the advice of the local fire damage restorer during disposal.

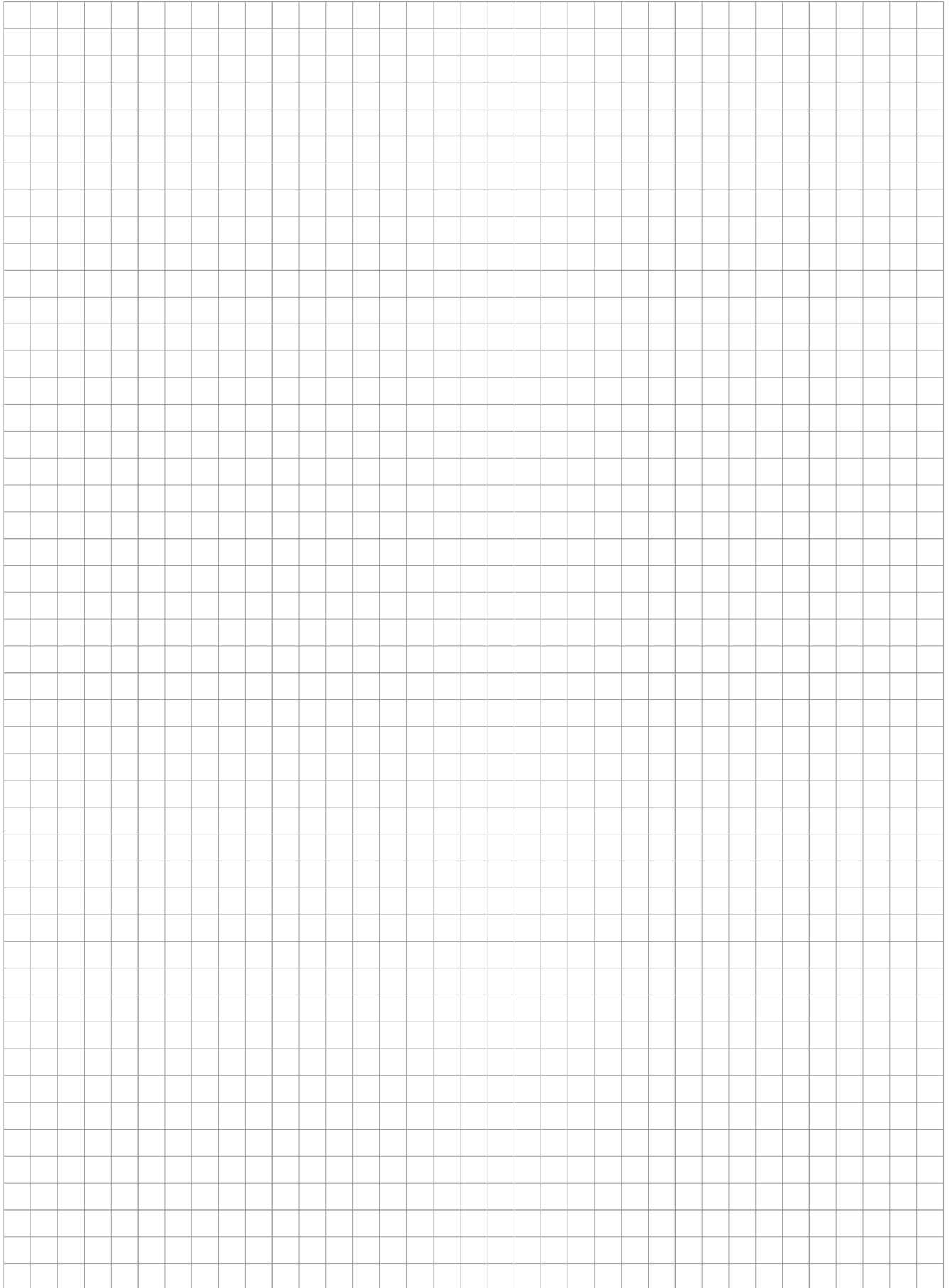
10 Appendix

10.1 Technical data

Key features	Performance	Harmonised technical specification
Fire behaviour	A1	EN 13501-1
Compression resistance	M2.5	EN 998-2:2010
Dry bulk density	900 kg/m ³	
Initial shearing strength (bond shearing strength)	0.15 N/mm ² (table value)	
Water absorption	NPD	
Chloride content	≤ 0.10 M.-%	
Water vapour permeability	5/20 (table value)	
Thermal conductivity $\Lambda_{10,\text{dry}}$	≤ 0.25 W/(mK) for P = 50% ≤ 0.27 W/(mK) for P = 90% (table values n. EN 1745)	
Release of hazardous substances	No hazardous substances	
Durability and serviceability	Use category type Z2	EOTA TR 024
Fire resistance	Dependent on the design and type of component as well as the lines passing through, see ETA-16/0132	EN 13501-2

Tab. 43: Declared performance of PYROMIX® fire protection mortar

Own notes



11 Appendix – declaration of conformity (sample)

Insulation system according to DIN EN 1366 Part 3

Name and address of the company which erected the cable insulation

Building site or building with address

Required fire resistance class

Date of erection

This is confirmation that

- The cable/combination insulation made of "PYROMIX®", fire resistance classes up to EI 120 (EI 240) according to EN 1366-3, European approval number of ETA-17/0472 for installation in walls and ceilings up to a fire resistance class of 120 minutes (240 minutes) was correctly made and installed as well as labelled according to all the individual requirements and in compliance with all the requirements of the named proof of usability and
- The building products used to produce the object of the approval were labelled according to the requirements of the proof of usability.

Place, date

Stamp and signature

This confirmation must be given to the builder for forwarding, if necessary, to the responsible construction supervisory board.



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