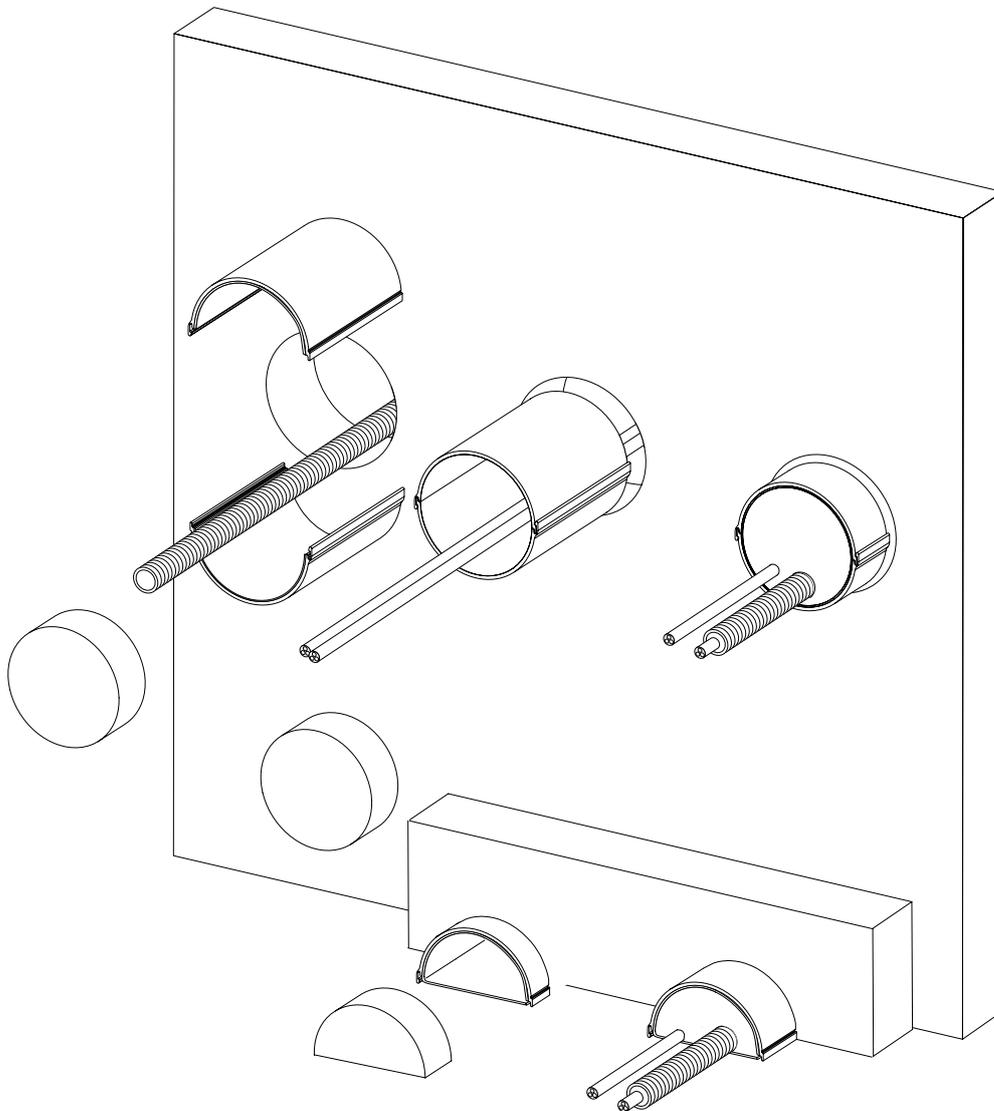


PYROCOMB® Intube system
Cable insulation with pipe shell and half shell

Mounting instructions



Pipe shell and half shell PYROCOMB® Intube

Mounting 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 Using these instructions

- These instructions are based on the standards valid at the time of compilation (July 2018).
- Before commencing work, read these instructions through once completely.
- Keep all the documents supplied with the system safe, so that the information is available should you need it.
- 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 system, we recommend a comprehensive training course.

1.3 Types of safety information



Type of risk!

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

Type of risk!

Shows a possibly hazardous situation. If the situation is not avoided, then damage to the product or the surroundings may occur.

Note! *Indicates important information or assistance!*

1.4 Correct use

PYROCOMB® Intube is an insulation system comprising pipe and half shell for building interiors. It closes openings in fire-resistant walls or ceilings, through which cable or electrical installation pipes are run. The PYROCOMB® Intube insulation system prevents the spread of fire and smoke in the area of the penetration.

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.

1.5 Applicable documents

- Declaration of performance 2013/05-CPR/007
- European technical approval ETA-13/0904
- Safety data sheet "Material to form an insulating layer FSB"

1.6 Basic standards and regulations

- EN 1366 Part 3
- EN 13501 Parts 1 and 2
- EN 1363
- EU BauPVO (CPR)

2 Basic safety information

The following general safety information on handling the system must be observed:

- Insulation with the PYROCOMB® Intube pipe and half shell is not suitable for improving the stability of a wall or ceiling. Structural measures must be taken to ensure that the wall/ceiling is sufficiently stable, despite the opening, without the application of an insulation system.
- When handling the materials for joint closure and fire protection insulation (e.g. OBO ASX ablation coating and MSX fire protection mortar), comply with the applicable instructions and safety data sheets.
- Always wear suitable protective glasses and protective gloves when handling the OBO MSX fire protection mortar.

3 Product description

3.1 Basic principles

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

PYROCOMB® Intube is an insulation system for lightweight partition walls, solid walls and solid ceilings in rooms without moisture. It is used for the penetration of cables and, in case of fire, prevents the spread of smoke and fire for up to 120 minutes.

The PYROCOMB® Intube insulation system consists of one pipe shell and one half shell with soft foam plug.

The PYROCOMB® Intube pipe shell consists of two plastic half shells with an internal coating, which are combined using a tongue and groove system (click locking), thus forming a pipe sleeve. The openings are closed to cold smoke using two inserted soft foam plugs, and sealed using the OBO ASX insulation layer forming agent.

The PYROCOMB® Intube half shell consists of a plastic half shell with a surrounding coating and a self-adhesive strap for positioning on the floor. The half shell requires only a one-sided closure with a soft foam plug and is sealed with OBO ASX ablation coating.

The PYROCOMB® Intube pipe and half shell can thus be used both as empty insulation and for the penetration of cables and electrical installation pipes. Installation around previously routed electrical installation is also possible.

Pipe and half shells can be installed in two ways.

PYROCOMB® Intube pipe shell:

- **Single penetration:** Individually in a core drill hole of approx. Ø 125 mm. The residual opening around the pipe shell must be closed off using non-combustible materials.
- **Multiple penetration:** For solid walls/ceilings, also in the case of large component openings, which must be closed off using the fire protection mortar OBO PYROMIX®. Here, multiple pipe shells can be installed at the same time.

PYROCOMB® Intube half shell:

- **Single penetration:** Individually in the PYROPLATE® Fibre soft insulation or PYROMIX® mortar insulation.
- **Multiple penetration:** Multiple times in the PYROPLATE® Fibre soft insulation or PYROMIX® mortar insulation.

See also „4.3 Materials approved for joint closure“ on page 11.

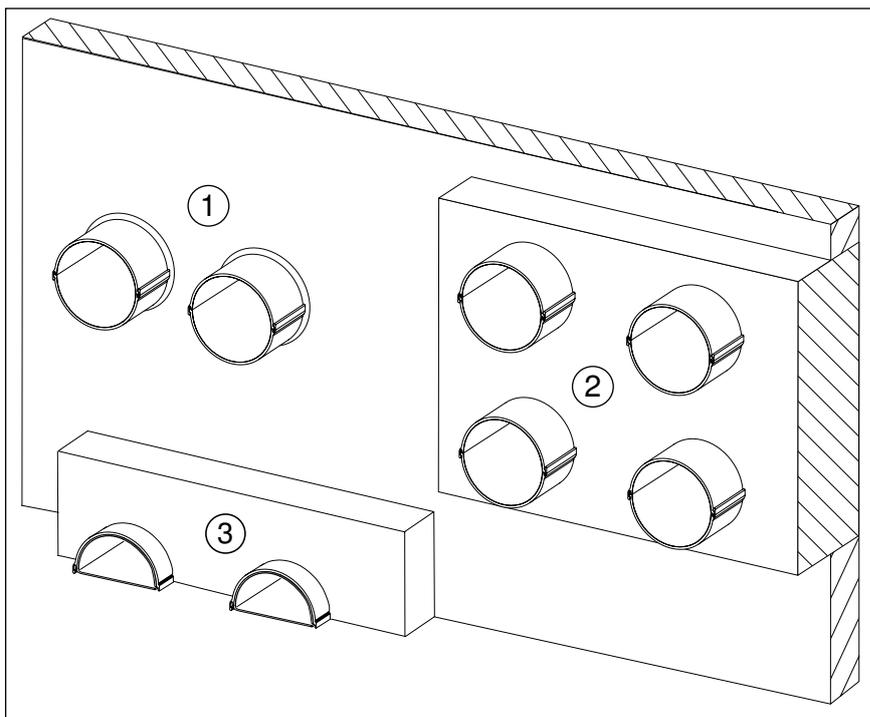


Figure 1: Installation types: Pipe shell single penetration ① and multiple penetration ② , half shell multiple penetration ③

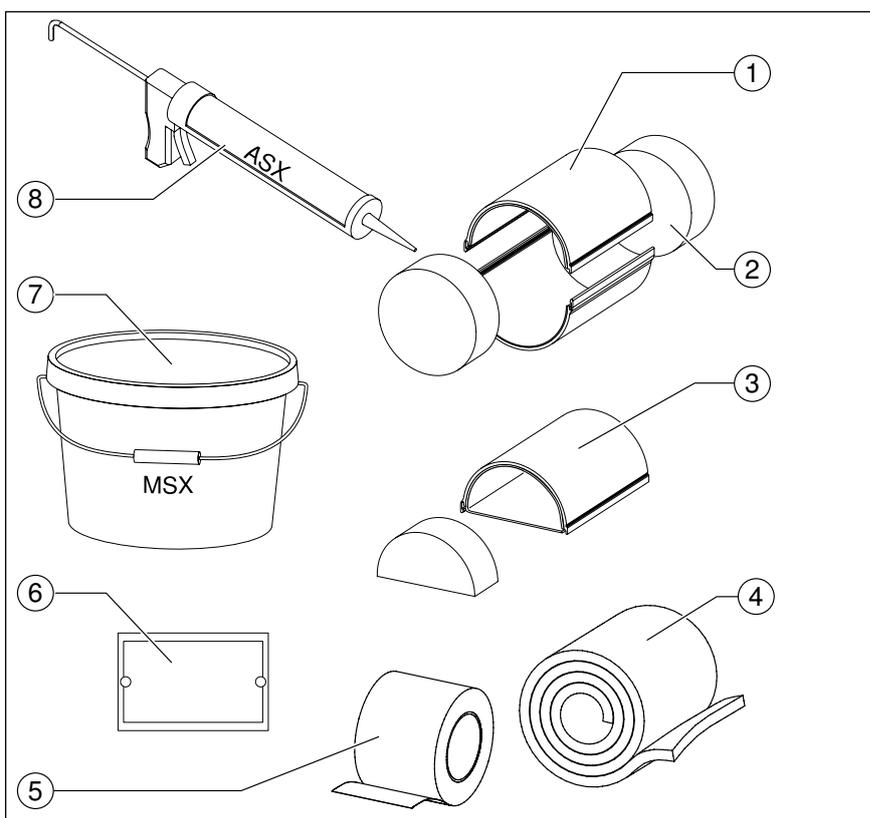


Figure 2: System components

Legend:

- ① PYROCOMB® Intube pipe shell (consisting of 2 half shells)
- ② 2 soft foam plugs
- ③ PYROCOMB® Intube half shell with a soft foam plug
- ④ Path insulation MIW-MA

- ⑤ Fire protection bandage FSB-WB 1.5
- ⑥ Identification plate
- ⑦ PYROMIX® MSX fire protection mortar (also available in a sack)
- ⑧ Ablation coating ASX (also available in a bucket)

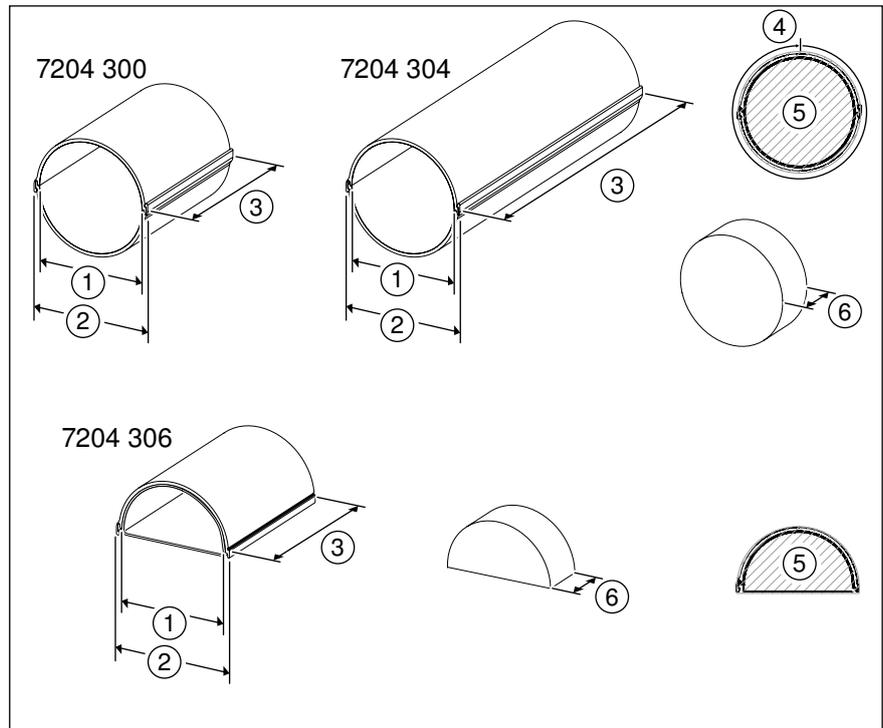


Figure 3: Dimensions

Dimension	7204 300	7204 304	7204 306
① Inner diameter	approx. 110 mm	approx. 110 mm	approx. 110 mm
② External diameter	approx. 120 mm	approx. 120 mm	approx. 120 mm
③ Length	150 mm	300 mm	200 mm
④ Circumference	approx. 380 mm		-
⑤ Covered area	approx. 95 cm ²		approx. 47 cm ²
⑥ Thickness	approx. 40 mm		approx. 40 mm

Table 1: Dimensions for Figure 3

3.2 Product behaviour in case of fire

The smoke gases which occur at the beginning of a fire are held back from the insulation seal by the soft foam plug and ASX ablation coating at the insulation penetration. At temperatures of above approx. 150 °C, the internal coating of PYROCOMB® Intube foams up, thus completely closing off the wall/ceiling penetration to fire and smoke.

Even when the temperature rises, neither the insulation forming material of PYROCOMB® Intube nor the ASX ablation coating allow hazardous substances to be released into the surrounding area. For this, an emission evaluation according to DIBt principles was carried out.

3.3 Technical data

PYROCOMB® Intube pipe and half shell			
Type/item number	CTS- 150/7204300	CTS- 300/7204304	CTS- HP200/7204306
Dimensions	See figure 3 on page 8		
Material Pipe/half shells Coating	PVC-U Insulation forming material FSB-WS		
Soft foam plug			
Dimensions	See figure 3 on page 8		
Material	Melamine resin foam		
Ablation coating ASX			
Type/item number In cartridge (300 ml) In a bucket (5 kg)	ASX-K/7202310 ASX-E/7202312		
Technical data: See ASX ablation coating material approval			
Fire protection mortar PYROMIX MSX			
Type/item number In a paper sack (20 kg) In a bucket (10 kg)	MSX-S1/7206104 MSX-E1/7206058		
Technical data: See instructions of PYROMIX® MSX			

Table 2: Technical data

4 Installation conditions

4.1 Basic mounting information

- The PYROCOMB® Intube pipe or half shell may only be mounted vertically to the wall or ceiling. Cables and pipes run through must also be arranged vertically to the wall or ceiling.
- If installed in walls, the PYROCOMB® Intube pipe or half shell must be installed in the centre of the wall and the length of the excesses are equal for the impact to be the same on both sides in case of fire.
- The PYROCOMB® Intube pipe or half shell may not be shortened, as otherwise there is no guarantee that the system can maintain the required fire resistance period.
- The distance between the PYROCOMB® Intube pipe or half shell and other openings or installations must be at least 60 mm.
- In lightweight partition walls and solid walls with a thickness of less than 150 mm, the PYROCOMB® Intube pipe or half shell may only be mounted as a single penetration (in its own component opening).
- With a multiple penetration, the area covered by the pipe shells may be a maximum of 60% of the area of the wall/ceiling opening. See also the sections 4.7.1 and 4.7.2 on page 18.
- If the PYROCOMB® Intube half shell is installed in PYROMIX® mortar insulation, the insulation must be at least 150 mm thick.
- If the PYROCOMB® Intube half shell is installed in PYROPLATE® Fibre soft insulation, the insulation must be at least 100 mm thick.

4.2 Wall/ceiling types approved for installation

The wall must be classified according to the desired fire resistance period, in accordance with EN 13501-2.

Solid wall (pipe and half shell)

Solid walls must consist of masonry, concrete, reinforced concrete or porous concrete with a density of $\geq 450 \text{ kg/m}^3$ and be at least 150 mm thick.

Solid ceiling (pipe shell)

Solid ceilings must consist of masonry, concrete, reinforced concrete or porous concrete with a density of $\geq 650 \text{ kg/m}^3$ and be at least 125 mm thick.

Lightweight partition wall with steel subconstruction (pipe and half shell)

Partitions must be constructed using the stand-off method, with panelling on both sides of at least two layers of 12.5 mm-thick cement or plaster-board plates, with a fire behaviour of class A1 or A2 according to EN 13501-1.

Lightweight partition wall with wooden subconstruction (pipe and half shell)

Partitions must be constructed using the stand-off method, with panelling on both sides of at least two layers of 12.5 mm-thick cement or plaster-board plates, with a fire behaviour of class A1 or A2 according to EN 13501-1.

The distance between the opening and the stands and bolts must be \geq 100 mm and the cavities between the panelling of the wall, the stands and bolts as well as the opening soffits must be tightly plugged to a depth of \geq 100 mm with mineral wool of fire behaviour class A1 or A2 in accordance with EN 13501-1.

4.3 Materials approved for joint closure**For single penetration**

With the PYROCOMB® Intube pipe shell, the joints around a single penetration (max. joint width 25 mm) must be closed with a dimensionally stable, non-combustible material such as concrete, cement mortar, fire protection mortar (e.g. OBO type PYROMIX® MSX) or gypsum filler.

With the PYROCOMB® Intube half shell, joints may only be closed around the single penetration with PYROMIX® MSX fire protection mortar.

For multiple penetration or larger openings

In the case of multiple penetrations or larger openings in the wall or ceiling, the cavity around the pipe shells must be closed off with PYROMIX® MSX fire protection mortar.

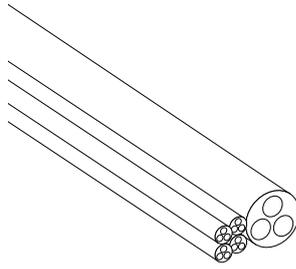
For sealing

The soft foam plugs for sealing the pipe shell, as well as all the detectable openings and gaps in the insulation, must be sealed with ASX ablation coating.

Always comply with the applicable mounting instructions for all the materials used.

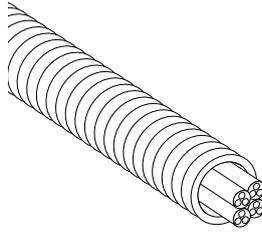
4.4 Approved installations

In intube pipes



Cables of all types, including fibre optic cables, but not hollow waveguides

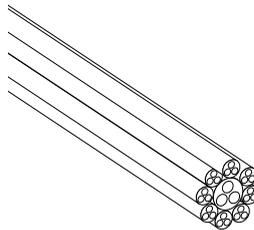
Maximum size of the total cable cross-section of the individual cables, according to the desired fire resistance period (see „4.8 Fire resistance classes“ on page 18).



Electrical installation pipes (EIP)

Maximum quantity of 3 individual pipes up to a maximum external pipe diameter of ≤ 32 mm, with or without cable assignment, diameter of individual cables ≤ 14 mm.

As bundles up to an external diameter ≤ 107 mm, flexible and made of plastic according to EN 61386-22 up to an external diameter ≤ 32 mm, with or without cable assignment, diameter of individual cables ≤ 21 mm.

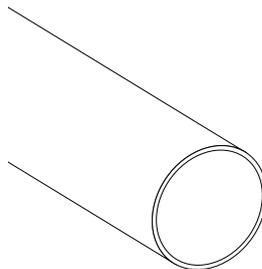


Cable bundle

Up to external diameter ≤ 107 with individual cables of external diameter ≤ 14 mm.

Up to external diameter ≤ 107 with individual cables of external diameter ≤ 21 mm.

No spandrel filling is required for tightly packed, tied cable bundles.



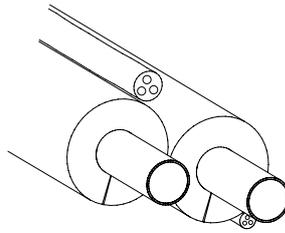
Combustible pipes

Made of PVC-U according to EN 1452 and DIN 8061/8062 with external diameter ≥ 20 mm x s 1.5 mm

up to external diameter ≤ 32 mm x s 2.4 mm.

In addition, the following applies to PVC-U pipes:

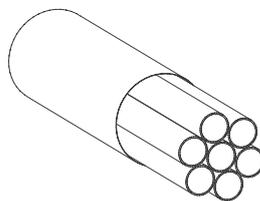
- They may only be installed in walls, not in ceilings!
- They may only be installed in the pipe shell of length 300 mm (CTS-300)!
- A maximum of 2 PVC-U pipes may be installed in each pipe shell!



HVAC split line combination

Pipe 1/pipe 2: external pipe diameter of 6-10 mm/10-18 mm + 9 mm insulation made of PE foam; plastic pipe PVC-U, external pipe diameter ≤ 25 mm, t 1.5 mm + maximum of 3 cables up to a maximum external pipe diameter of ≤ 14 mm in direct use next to each other.

Pipe 1/pipe 2: external pipe diameter of 6-22 mm/6-22 mm + 9 mm insulation made of PE foam; plastic pipe PVC-U, external pipe diameter ≤ 25 mm, t 1.8 mm + maximum of 3 cables up to a maximum external pipe diameter of ≤ 14 mm in direct use next to each other.



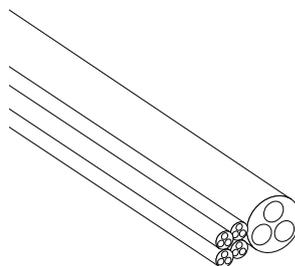
„speed pipe“, bundled or individual pipes, without fibre-optic cables

Maximum quantity of 24 with an external diameter ≤ 7 mm.

Maximum quantity of 7 with an external diameter ≤ 10 mm.

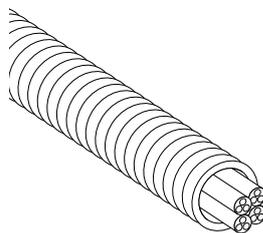
Maximum quantity of 5 with an external diameter ≤ 12 mm.

In half shells



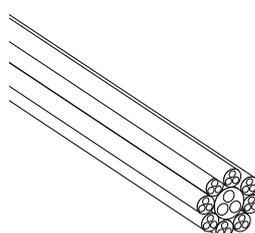
Cables of all kinds, including fibre-optic cables, except hollow conductors

Maximum size of the total cable cross-section of the individual cables, according to the desired fire resistance period (see „4.8 Fire resistance classes“ on page 18)



Electrical installation pipes (EIP)

Flexible and made of plastic according to EN 61386-22 up to an external diameter ≤ 32 mm, with or without cable assignment, diameter of individual cables ≤ 21 mm



Cables

Up to external diameter ≤ 107 with individual cables of external diameter ≤ 14 mm.

4.5 Distances for single penetration of pipe shell

A core drill hole of \varnothing 150 mm is required for a single PYROCOMB® Intube pipe shell installation in a wall/ceiling. Refer to the following figure and table for distances and component thickness.

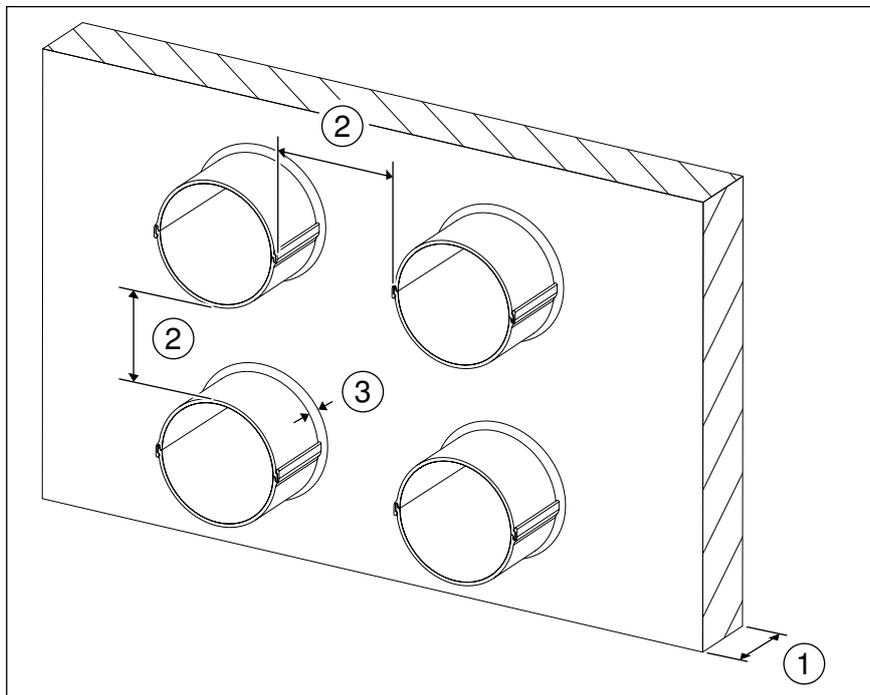


Figure 4: Spacings on installing the pipe shell in core drill holes

No.	Designation	Wall [mm]	Ceiling [mm]
①	Wall/ceiling thickness	≥ 100 *	≥ 125 *
②	PYROCOMB® Intube pipe shell spacing	≥ 60	
③	Ring gap size	$\geq 5 - \leq 25$	

Table 3: Distances for installation in core drill hole (Figure 4)

* The minimum thickness of the wall or ceiling is dependent on the desired fire resistance period.

4.6 Distances for single penetration of half shell

The PYROCOMB® Intube half shell can be installed in a semi-circular or rectangular hole. Irrespective of the wall thickness, the residual opening around the half shell can be closed off with PYROMIX® MSX (A) fire protection mortar or PYROPLATE® Fibre (B) mineral fibre plate. With both installation types, no special dimensional additions need be observed for the surrounding insulation or spacings.

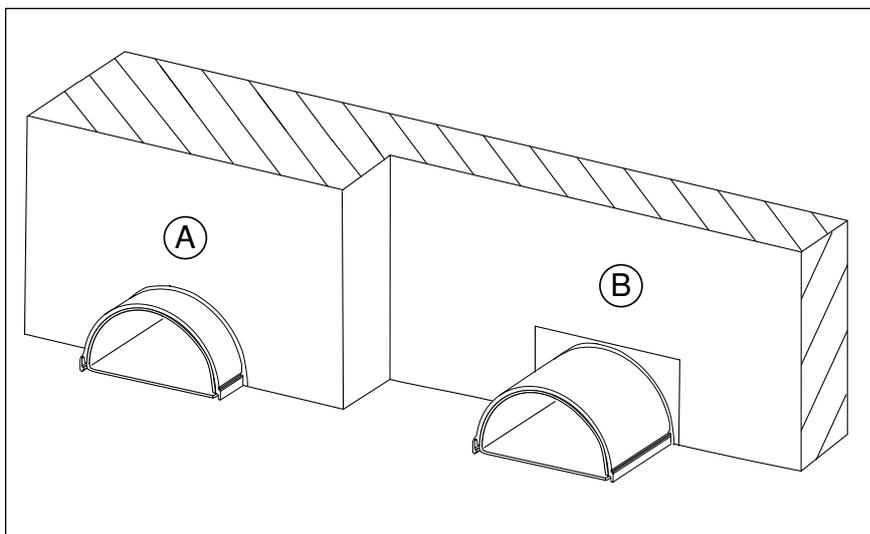


Figure 5: Single penetration of half shell

4.7 Distances for multiple penetration

The PYROCOMB® Intube pipe shell can be run multiple times through solid walls and ceilings. Specific spacings must be maintained. Multiple penetration through lightweight partitions is not permitted. The pipe shells must be installed in PYROMIX® MSX mortar insulation. The thickness of the insulation must be at least 150 mm. If the wall or ceiling thicknesses are less than 150 mm, then the insulation thickness must be adapted appropriately.

The PYROCOMB® Intube half shell can be run multiple times through solid walls and lightweight partitions. Specific spacings must be maintained. In a wall thickness of less than 150 mm, the half shells can be installed in insulation with PYROPLATE® Fibre. With a wall thickness of 150 mm or more, the half shells must be run through insulation with PYROMIX® MSX fire protection mortar.

Refer to the following figure and table for distances and component thicknesses.

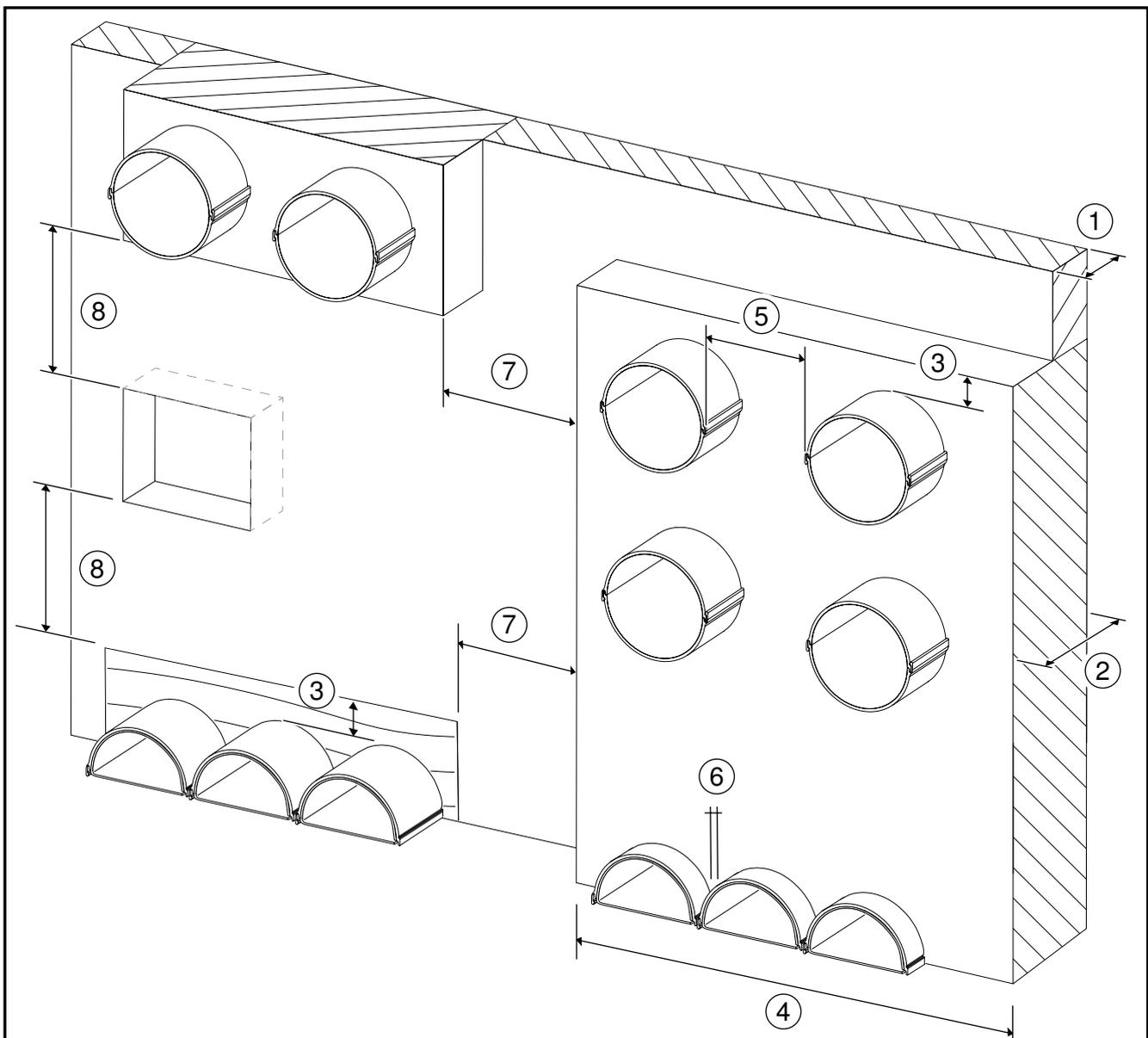


Figure 6: Distances for installation in component opening

No.	Designation	Wall [mm]	Ceiling [mm]
①	Component thickness	≥ 100	≥ 150
②	Insulation thickness (PYROMIX MSX)	≥ 150	
③	Distance to the appropriate opening soffit	≥ 15	
④	Maximum dimension of the component opening with pipe shell	Width: ≤ 1,200 Height: ≤ 2,000	Width: ≤ 640 Length: ∞
	Maximum dimension of the component opening with half shell	Width: ≤ 2,000 Height: 80–150	-
⑤	Distance to the neighbouring pipe shells	≥ 3	≥ 10
⑥	Distance to the neighbouring half sleeves	≥ 0	-
⑦	Distance to other component openings One or both openings > 400 x 400 mm	≥ 200	
	Both openings ≤ 400 x 400 mm	≥ 100	
⑧	Distance to other openings or installations	≥ 200	

Table 4: Distances for installation in component opening (Figure 6)

4.7.1 Solid wall – maximum number of pipe sleeves

The maximum number of pipe shells is dependent on the size of the component opening.

Height ≥ mm \ Width ≥ mm	Width ≥ mm								
	150	270	400	510	630	750	870	1,000	≥ 1,110 ≤ 1,200
150	1	2	3	4	5	6	7	8	9
270	2	4	6	8	10	12	14	16	18
400	3	6	9	12	15	18	21	24	27
510	4	8	12	16	20	24	28	32	26
630	5	10	15	20	25	30	35	40	45
750	6	12	18	24	30	36	42	48	54
870	7	14	21	28	35	42	49	56	63
1,000	8	16	24	32	40	48	56	64	72
1,110	9	18	27	36	45	54	63	72	81
1,230	10	20	30	40	50	60	70	80	90
1,350	11	22	33	44	55	66	77	88	99
1,470	12	24	36	48	60	72	84	96	108
,1590	13	26	39	52	65	78	91	104	117
1,710	14	28	42	56	70	84	98	112	126
,1830	15	30	45	60	75	90	105	120	135
,1950	16	32	48	64	80	96	112	128	144

Table 5: Maximum number of pipe shells for multiple installation in a solid wall, taking the necessary minimum distances into account

4.7.2 Solid ceiling – maximum number of pipe sleeves

The maximum number of pipe shells is dependent on the size of the component opening in the solid ceiling.

Height ≥ mm \ Width ≥ mm	150	280	400	≥ 530 ≤ 640
150	1	2	3	4
270	2	4	6	8
400	3	6	9	12
510	4	8	12	16
630	5	10	15	20
750	6	12	18	24
870	7	14	21	28
1,000	8	16	24	32
,1110	9	18	27	36
,1230	10	20	30	40
,1350	11	22	33	44
,1470	12	24	36	48
,1590	13	26	39	52
,1710	14	28	42	56
,1830	15	30	45	60
1,950	16	32	48	64

Table 6: Maximum number of pipe shells for multiple installation in a solid ceiling, taking the necessary minimum distances into account

4.8 Fire resistance classes

The PYROCOMB® Intube pipe and half shell is designed for a maximum fire resistance period of 120 minutes. However, the actual fire resistance period is dependent upon the wall or ceiling in which the insulation is installed and the kind of chosen installation.

The following tables show the maximum possible cable diameter of the approved installations, according to the maximum fire resistance class.

Example "EI 120/E 90":

Integrity (E) and heat insulation (I) of the installation for 45 minutes/Integrity (E) of the insulation for 90 minutes.

Maximum of fire resistance classes with pipe shell

	CTS-150		CTS-300	
	Wall thickness ≥ 100	Ceiling thickness ≥ 150	Wall thickness ≥ 100	Ceiling thickness ≥ 150
Cable Ø ≤ 21 mm	EI 90	EI 120*	EI 120	EI 120*
Cable Ø > 21 mm - Ø ≤ 50 mm	EI 45	EI 90	EI 90	EI 90
Cable Ø > 50 mm - Ø ≤ 80 mm	-	-	EI 90 (≥ 150)	EI 60
Cable Ø ≤ 21 mm	EI 90	EI 120*	EI 120	EI 120*
Cable Ø > 21 mm - Ø ≤ 50 mm	EI 45	EI 90	EI 90	EI 90
Cable Ø > 50 mm - Ø ≤ 80 mm	-	-	EI 90 (≥ 150)	EI 60
Cable bundles Ø ≤ 107 mm with cables Ø ≤ 14 mm	-	EI 120*	-	-
Cable bundles Ø ≤ 107 mm with cables Ø ≤ 21 mm	EI 90	EI 120* ²	EI 120	EI 120
Max 3 x EIP Ø ≤ 32 mm with or without cables Ø ≤ 14 mm	EI 90	EI 90	EI 90	EI 90
Bundle of EIP Ø ≤ 107 mm with EIP Ø ≥ 16 mm - Ø ≤ 32 mm, with or without cable Ø ≤ 21 mm	-	-	EI 120	EI 120*
PVC-U pipe with external diameter of 20 mm x s 1.5 mm up to Ø 32 mm x s 2,4 mm, up to a number of 2	-	-	EI 120	-
HVAC split line combination Pipe 1/pipe 2: external pipe diameter of 6-10 mm/10-18 mm + 9 mm insulation made of PE foam; plastic pipe PVC-U, external pipe diameter ≤ 25 mm, t 1.5 mm + maximum of 3 cables up to a maximum external pipe diameter of ≤ 14 mm in direct use next to each other.	EI 90	EI 90	EI 90	EI 90
HVAC split line combination Pipe 1/pipe 2: external pipe diameter of 6-22 mm/6-22 mm + 9 mm insulation made of PE foam; plastic pipe PVC-U, external pipe diameter ≤ 25 mm, t 1.8 mm + maximum of 3 cables up to a maximum external pipe diameter of ≤ 14 mm in direct use next to each other.	-	EI 120* ³	-	EI 120* ³
„speed pipe“, bundled or single pipes without fibre-optic cables A maximum number of 24 with an external diameter ≤ 7 mm. A maximum number of 7 with an external diameter ≤ 10 mm. A maximum number of 5 with an external diameter ≤ 12 mm.	-	EI 120*	-	EI 120*

* with a ceiling thickness of 200 mm either the pipe shell CTS-300 can be used or 2 pipe shells CTS-150

² Measure with fire protection bandage: Chapter „5.7 Carrying out measures on installations in ceilings“ on page 30

³ Measure with sectional insulation: Chapter „5.7 Carrying out measures on installations in ceilings“ on page 30

Maximum of fire resistance classes with half shelf CTS-HP200

	Wall \geq 100 mm
Cable $\varnothing \leq 21$ mm	EI 120
Cable $\varnothing > 21$ mm - $\varnothing \leq 50$ mm	EI 90
Cable bundle, full assignment with cables $\varnothing \leq 21$ mm	EI 120
EIP bundle, full assignment with EIP $\varnothing \geq 16$ mm - $\varnothing \leq 32$ mm with or without cables $\varnothing \leq 21$ mm	EI 120

5 Mounting the PYROCOMB® Intube pipe shell and half shell

Note! Before installing the PYROCOMB® Intube pipe and half shell, ensure that all the general conditions, such as the type and thickness of the wall or ceiling or the type of penetrated cables etc., are complied with. See also chapter 4 „Installation conditions“.

5.1 Dismantling and assembling

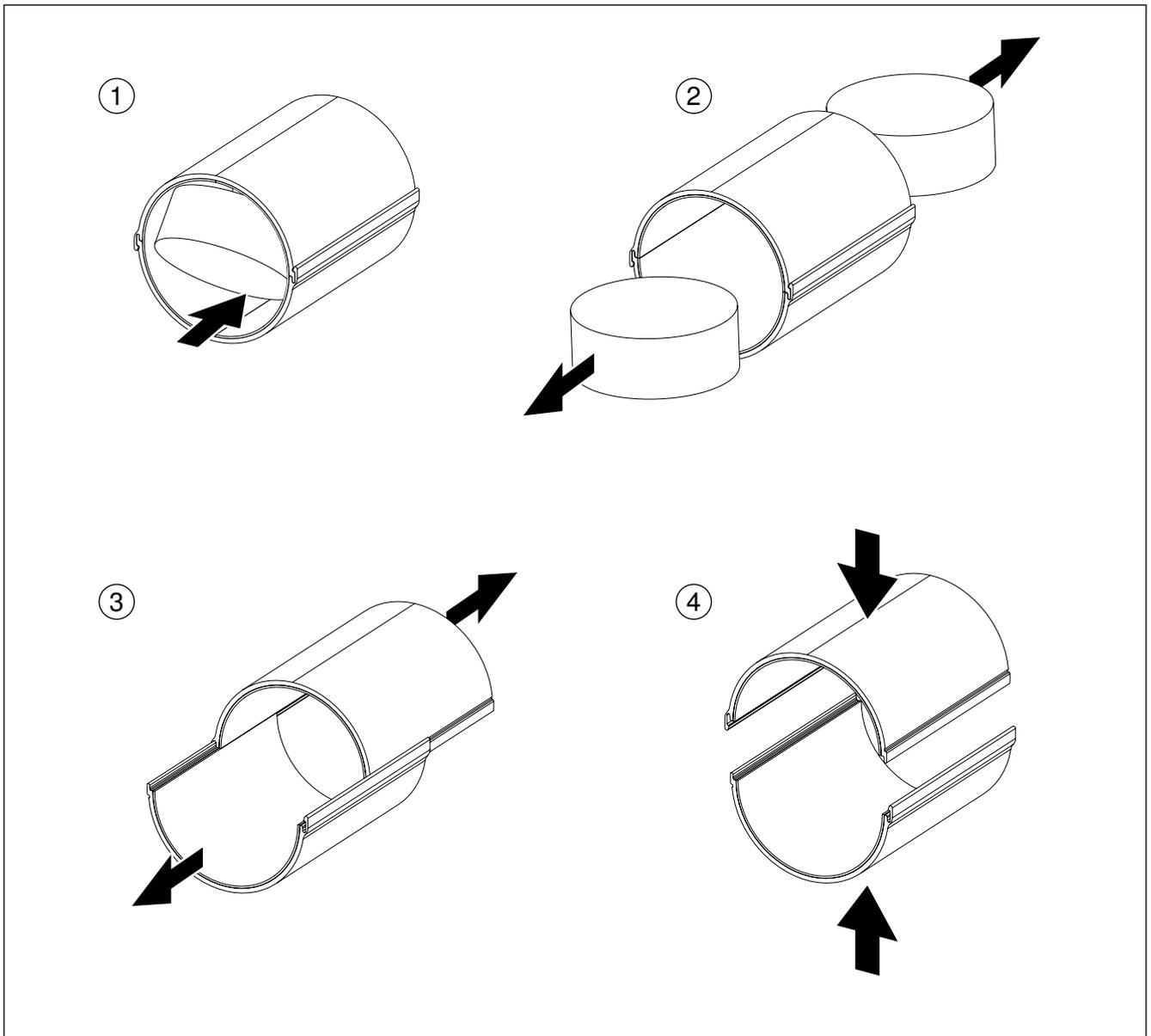


Figure 7: Dismantling and assembling PYROCOMB® Intube pipe shell

- ① Push the plug in and tilt it.
- ② Remove both plugs.
- ③ To disconnect, push the half shells against each other.
- ④ To connect, attach the half shells to one another using the locking contour and push them until the engage.

5.2 Securing the pipe shells with tightening straps

In certain mounting situations, the two half shells of the PYROCOMB® Intube pipe shell must be secured with steel tightening straps (e.g. OBO MBS 045, item no. 7203 104). The securing measure counteracts the pressure from the foaming up of the fire coating and holds the two half shells together.

5.2.1 Securing the pipe shell in the middle

Under certain situations, the two half shells of the PYROCOMB® Intube pipe shell must be secured in the centre:

- Installation in a dry-constructed wall (not required for solid wall or ceiling) and
- inner spacing of the wall planks (X) greater than 50 mm.

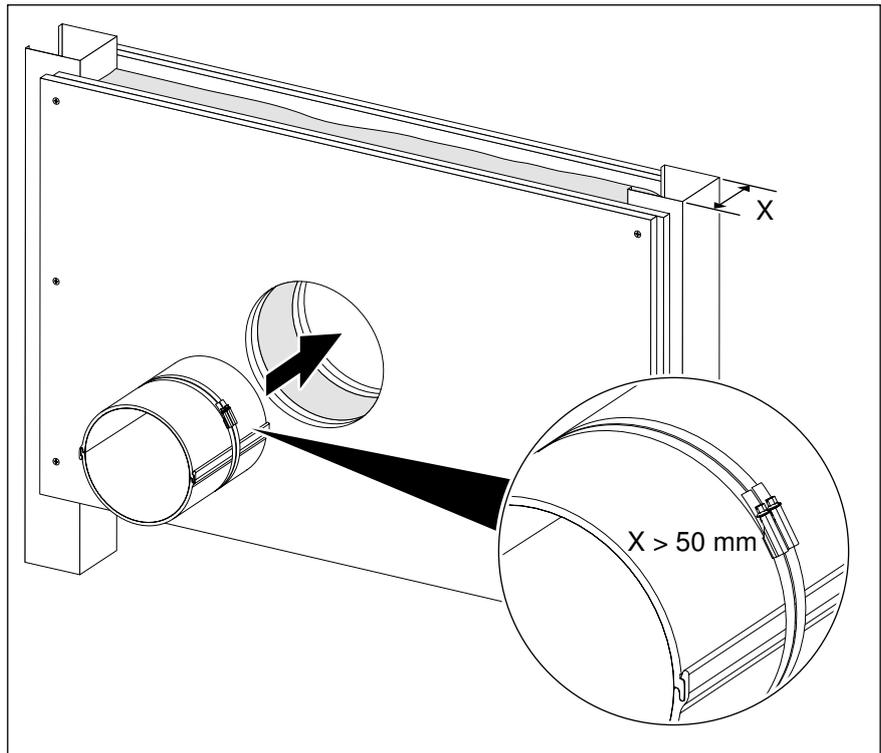


Figure 8: Secure internally with a tightening strap

5.2.2 Securing the outside of the pipe shell

Under certain situations, the two half shells of the PYROCOMB® Intube pipe shell must be secured on the outside:

- Installation in a dry-constructed wall (not required for solid wall or ceiling) and
- Overhang of the pipe shell to the wall (X) greater than 50 mm and
- Penetration of electrical installation pipes (EIR)

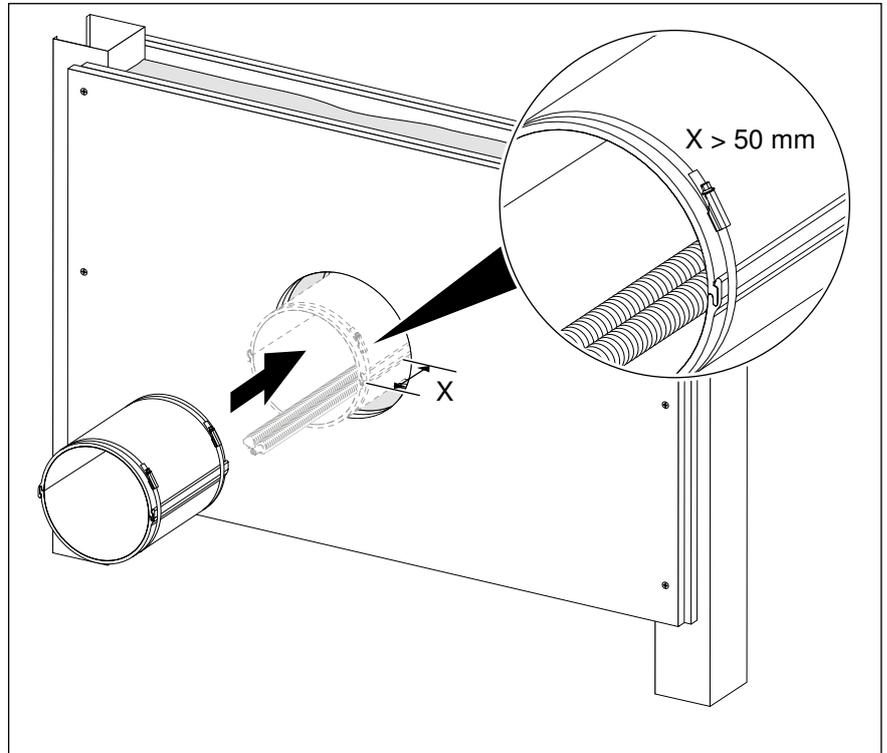


Figure 9: Secure externally with a tightening strap

5.3 Mounting empty insulation for later assignment

Empty insulation can be created using the PYROCOMB® Intube pipe or half shell, which can be filled with cables at a later time.

5.3.1 Mounting the pipe shell as empty insulation

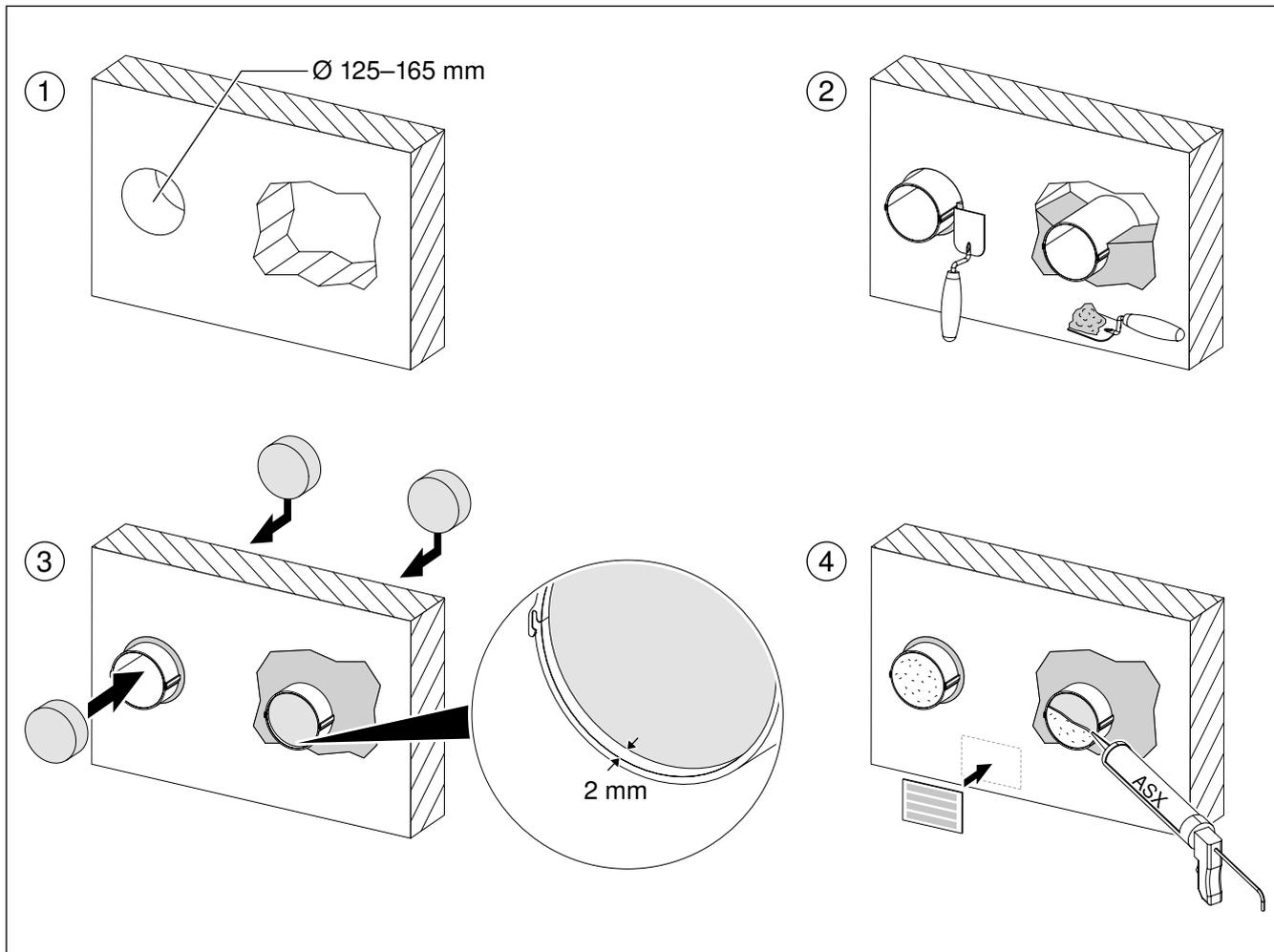


Figure 10: Creating empty insulation with a pipe shell

- ① Create a core drill hole or use an existing wall/ceiling opening.
- ② Insert the PYROCOMB® Intube pipe shell and
 - Close off the core drill hole (ring gap ≤ 25 mm) with gypsum filler or
 - a larger wall/ceiling opening with the PYROMIX® MSX fire protection mortar.See also „4.3 Materials approved for joint closure“ on page 11.
- ③ On both sides, insert the soft foam plug in such a way that there is a space of approx. 2 mm for later sealing.
- ④ Tightly seal the empty insulation with the ASX ablation coating. Complete and attach the identification plate.

5.3.2 Mounting the half shell as empty insulation

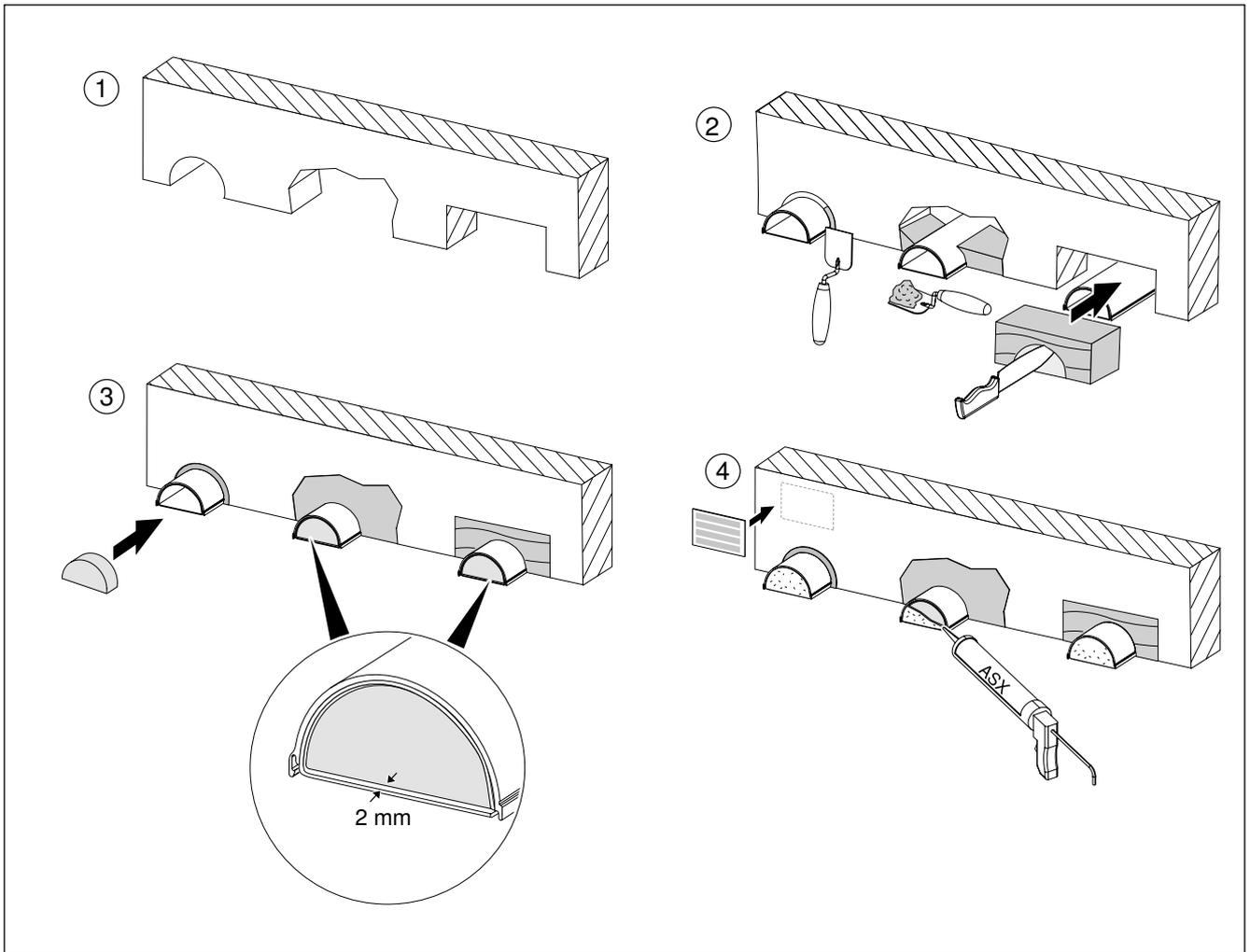


Figure 11: Creating empty insulation with a half shell

- ① Create a hole in the wall or use the existing wall opening.
- ② Fix the PYROCOMB® Intube half shell with the self-adhesive strap to the floor.
- ③ Close off the wall opening with PYROMIX® MSX fire protection mortar or PYROPLATE® Fibre mineral fibre plate.
See also „4.3 Materials approved for joint closure“ on page 11.
- ④ On one side, insert the soft foam plug in such a way that there is a space of approx. 2 mm for later sealing.
- ⑤ Tightly seal the empty insulation with the ASX ablation coating.
Complete and attach the identification plate.

When the insulation is filled with cables or pipes later on, it must be re-sealed. See also chapter „5.4 Mounting insulation with cable assignment“ on page 26.

5.4 Mounting insulation with cable assignment

Cables can be routed during the mounting of the pipe or half shell or the insulation can be mounted around an existing electrical installation.

5.4.1 Mounting the pipe shell around cables

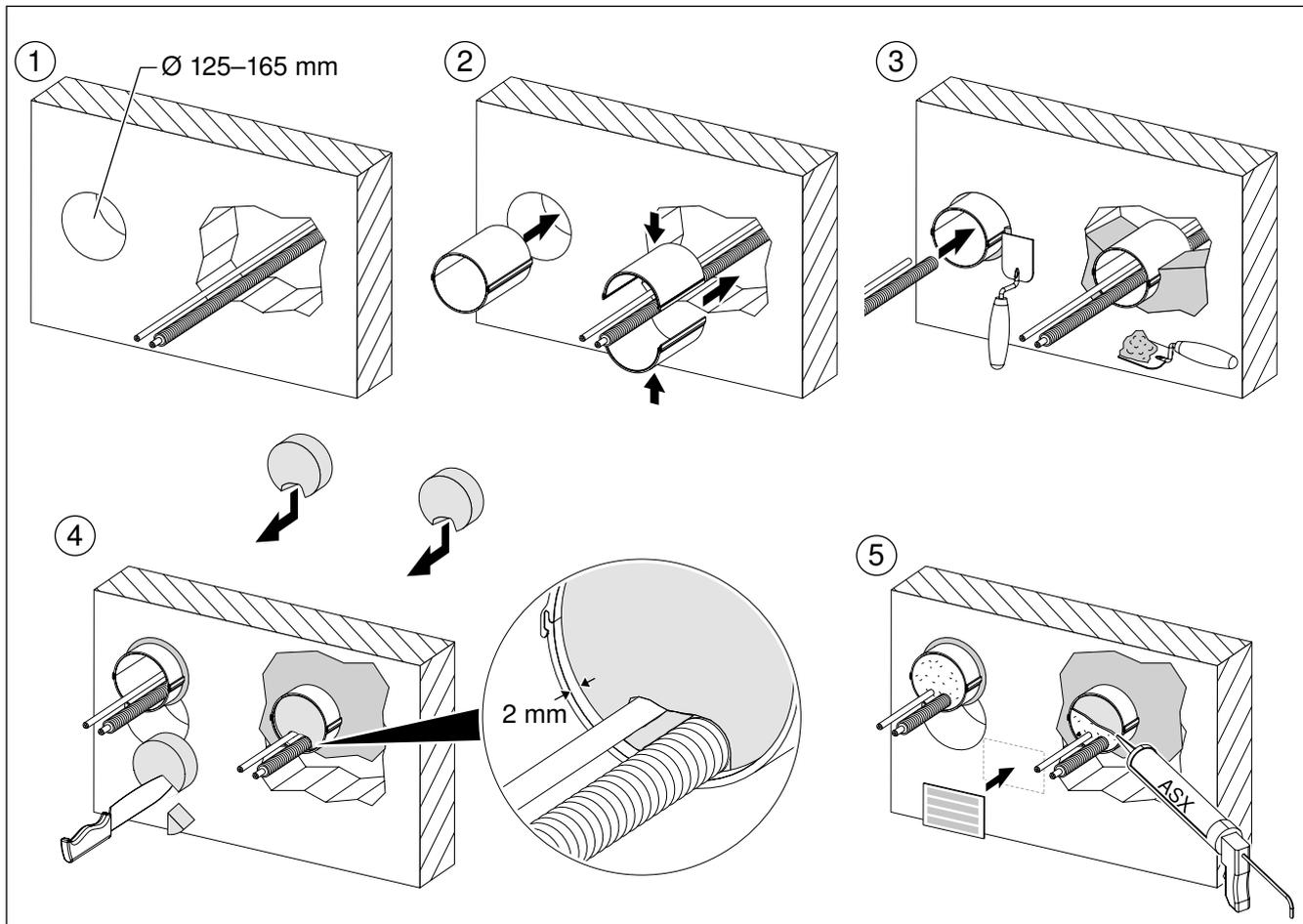


Figure 12: Mounting the pipe shell around cables

- ① Create a core drill hole or use an existing wall/ceiling opening. The opening can be empty or previously filled with cables.
- ② Insert or disassemble the PYROCOMB® Intube pipe shell and insert the previously routed cables.
- ③ – Close of the core drill hole (ring gap ≤ 25 mm) with gypsum filler.
– Close a larger wall/ceiling opening with the PYROMIX® MSX fire protection mortar.
See also „4.3 Materials approved for joint closure“ on page 11.
- ④ Cut the soft foam plugs to fit the cabling and, on both sides, insert them in such a way that there is a space of approx. 2 mm for later sealing. Close off larger gaps between cables using tightly fitting pieces of the soft foam plugs.
- ⑤ Tightly seal the insulation with the ASX ablation coating. If using electrical installation pipes (EIR), also seal empty pipes and spaces between cables with ASX.
Complete and attach the identification plate.

5.4.2 Mounting the half shell around cables

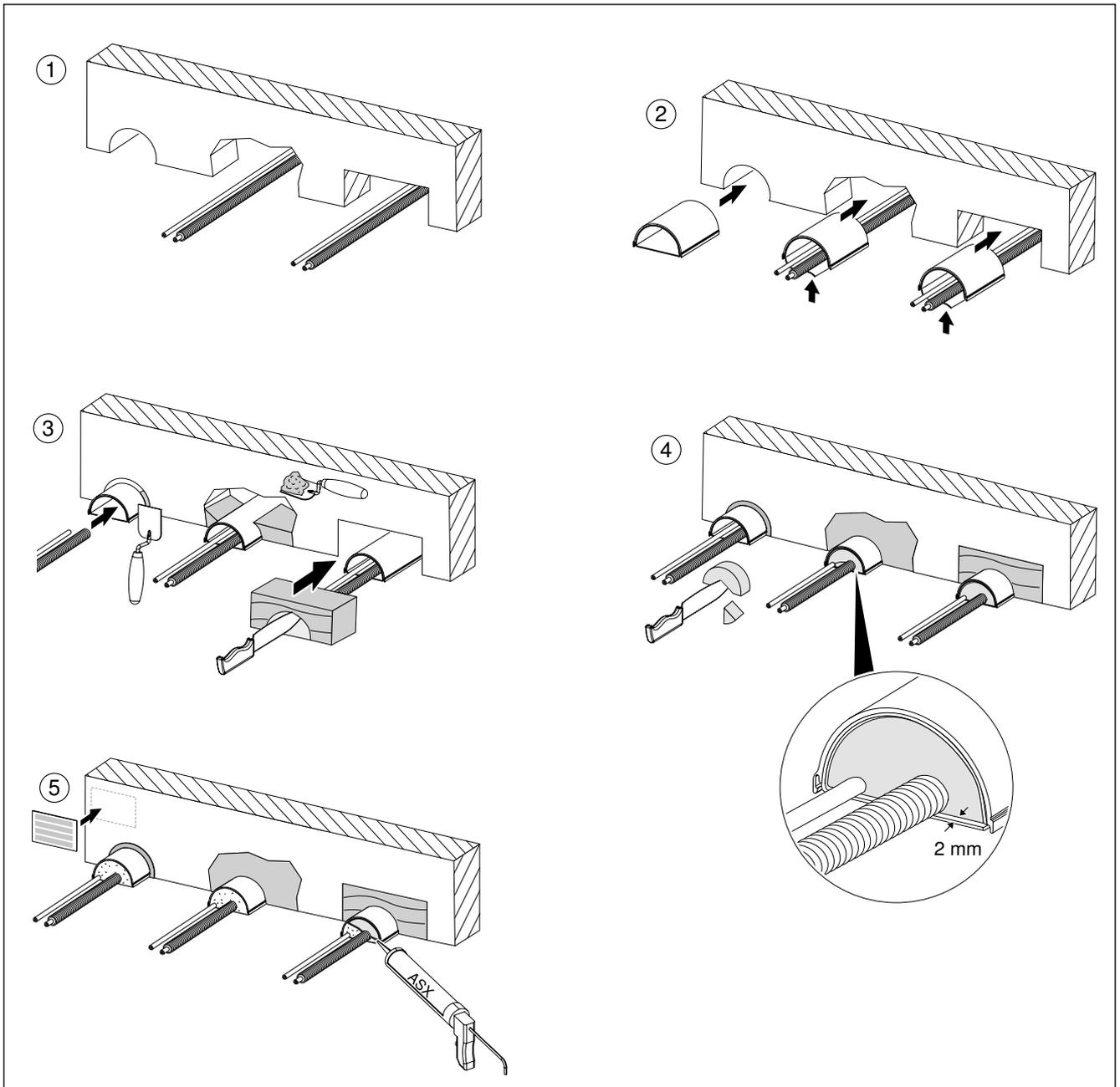


Figure 13: Mounting the half shell around cables

- ① Create a hole in the wall or use the existing wall opening. The opening can be empty or previously filled with cables.
 - ② Position the PYROCOMB® Intube half shell with the self-adhesive strap. If the opening is already filled with cables, pull the self-adhesive strap under previously routed cables.
 - ③
 - Close off smaller gaps and ring gaps ≤ 25 mm or residual openings with PYROMIX® MSX fire protection mortar.
 - Close off a larger wall/ceiling opening with wall/ceiling thicknesses ≤ 100 mm with the PYROPLATE® Fibre mineral fibre plate.
 - Close off a larger wall/ceiling opening with wall/ceiling thicknesses > 100 with PYROMIX® MSX fire protection mortar, whereby the insulation must be at least 150 mm thick.
- See also „4.3 Materials approved for joint closure“ on page 11.

- ④ Cut the soft foam plugs to fit the cabling and insert them in such a way that there is a space of approx. 2 mm for later sealing. Close off larger gaps between cables using tightly fitting pieces of the soft foam plugs.
- ⑤ Tightly seal the insulation with the ASX ablation coating. If using electrical installation pipes (EIR), also seal empty pipes and spaces between cables with ASX.
Complete and attach the identification plate.

5.5 Supporting cables for wall installation



Risk of untightness on account of mechanical load!

If, in case of fire, the cables and pipes create a weight load on the insulation, then the fire and smoke-inhibiting function may be impaired. The following instructions must be observed!

In the case of wall installation, the routed cables and pipes must be supported against the wall at a maximum distance of 300 mm using suitable holders (e.g. wall brackets or threaded rod suspension), so that, if there is a fire, no mechanical load can impact on the insulation. Support must be provided on both sides of the wall and its principle parts may not be combustible.

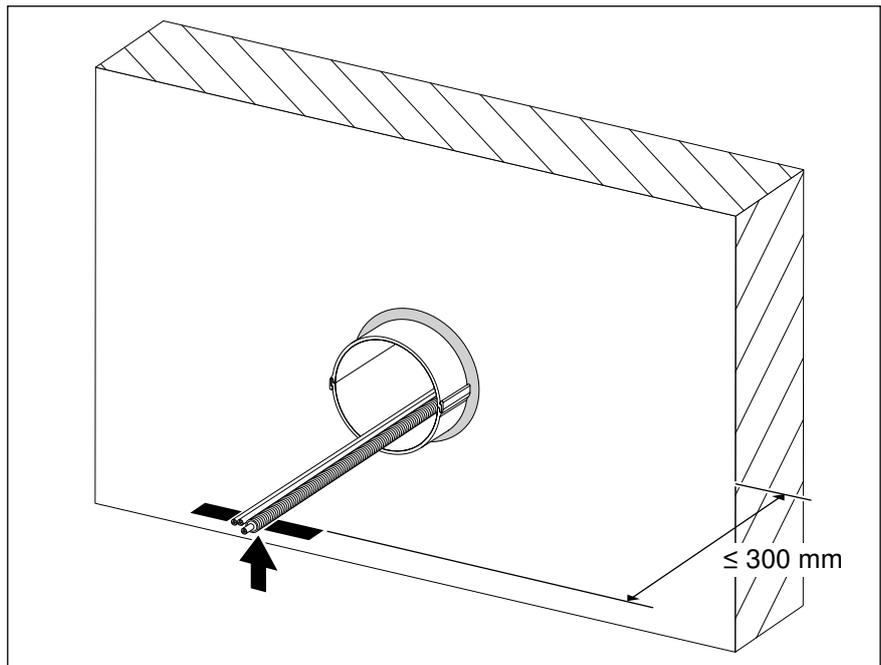


Figure 14: Supporting cables for wall installation

5.6 Installing as ceiling penetration

Observe the following information when installing the PYROCOMB® Intube pipe shell as insulation for a ceiling penetration:

- The underside of the pipe shell ① must end flush to the underside of the ceiling.
- To fix it, create a shell ② on the underside of the ceiling and fill the cavity with fire protection mortar, e.g. with PYROMIX® MSX.
- Secure the ceiling penetration with suitable measures (e.g. reinforcement or grid), as it will still not be able to carry loads even if the joint material has hardened.
- Carry out the routing of cables and pipes, the insertion of the soft foam plug and the sealing with ASX ablation coating in the same way as when mounting with wall penetrations. See also „5.3 Mounting empty insulation for later assignment“ on page 24 and „5.4 Mounting insulation with cable assignment“ on page 26.
- If necessary, look up chapter „5.7 Carrying out measures on installations in ceilings“ on page 30 for extra measures with fire protection bandage or sectional insulation

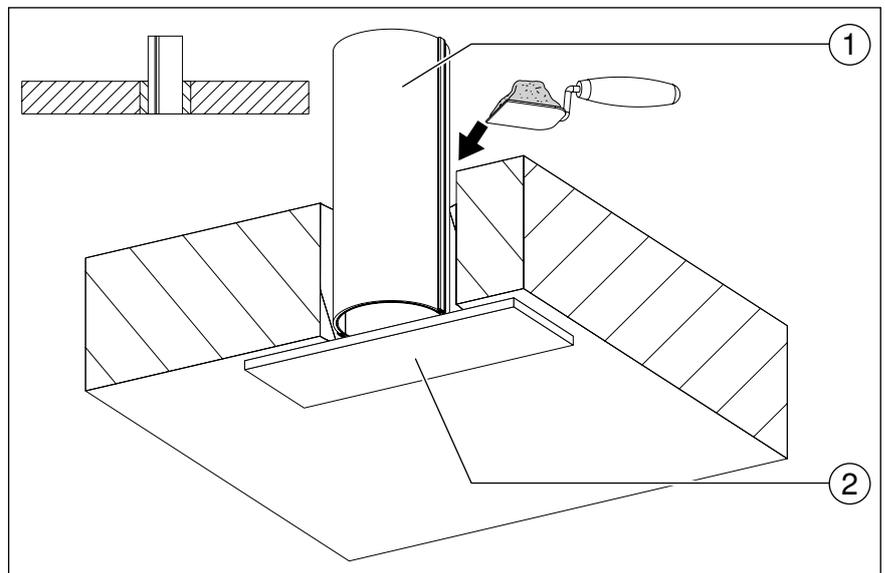


Figure 15: Install PYROCOMB® Intube flush to the underside of the ceiling

5.7 Carrying out measures on installations in ceilings

To ensure the functionality of the insulation system, some installations in the insulation must be wound with a fire protection bandage or insulated with sectional insulation .

Fire protection bandage FSB-WB 1.5:

Cable bundle Ø ≤ 107 mm with cables Ø ≤ 21 mm

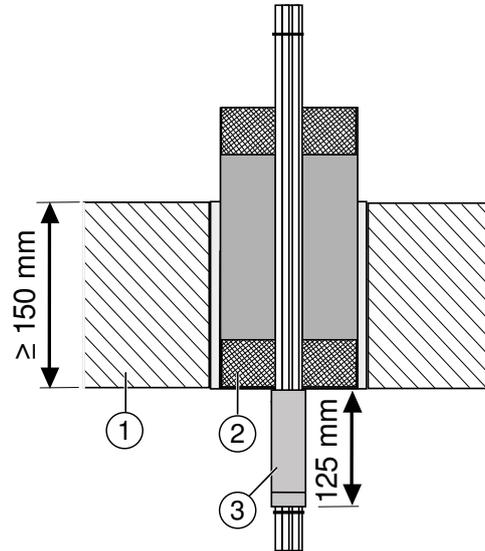


Figure 16: Fire protection bandage on cable bundles in ceilings

Sectional insulation MIW-MA:

HVAC split line combination

Pipe 1/pipe 2: external pipe diameter of 6-22 mm/6-22 mm + 9 mm insulation made of PE foam; plastic pipe PVC-U, external pipe diameter ≤ 25 mm, t 1.8 mm + maximum of 3 cables up to a maximum external pipe diameter of ≤ 14 mm in direct use next to each other.

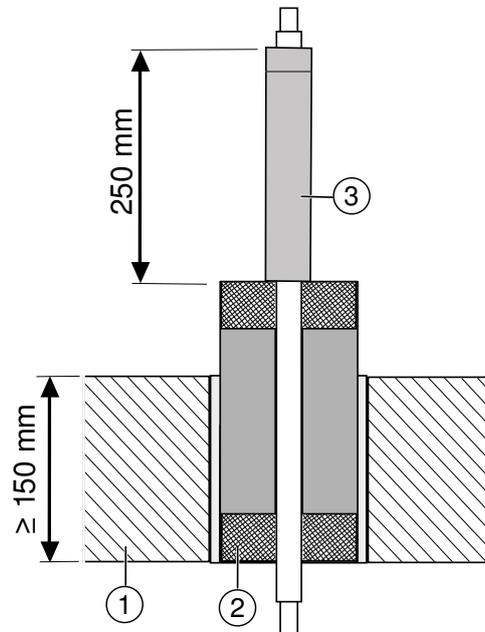


Figure 17: Sectional insulation MIW-MA on HVAC split line combination in ceilings

- ① Ceiling
- ② Pipe shell with soft foam plug

③ Fig. 16: Fire protection bandage FSB-WB 1.5 above and under ceiling

Fig. 17: Sectional insulation MIW-MA above ceiling

5.8 Completing and attaching the identification plate

German construction law demands that, after mounting fire protection insulation, the installation engineer attaches an identification plate next to the insulation and hands over a declaration of conformity to the client for documentation purposes. It hereby guarantees that the requirements of the European technical approval have been fulfilled and that the insulation was erected correctly.

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

The identification plate (see also Figure 2) should contain the following data:

- Erection engineer
- Date of erection
- Insulation type
- Fire resistance class
- Approval number

You can find a sample declaration of conformity in the appendix.

6 Maintenance

Insulation with the PYROCOMB® Intube pipe and half shell 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 with the ASX ablation coating.
- Reseal any gaps with ASX ablation coating.

7 Disposal

Disposal during mounting

National laws and regulations must be observed for disposal.

- Residual material of the pipe and half shell (also with coating): As household waste
- Residual material of the ASX ablation coating: As hardened paint and varnish waste (EAK 08 01 12)
- Residual material of the PYROMIX® MSX fire protection mortar: As mixed construction site waste
- Packaging: As household waste

Disposal during building demolition

As mixed construction site waste

Disposal after a fire

If insulation with the PYROCOMB® Intube pipe or half shell was subjected to fire damage, then the complete insulation must be removed and disposed of. We recommend obtaining the advice of the local fire damage restorer during disposal.

Danger from corrosive effect of fire residues!

If there is a fire in the interior of the pipe or half shell, the burned cable insulation will create corrosive gases, which have an irritant and corrosive effect.

Before opening and disposing of insulation components that have been subjected to a fire, wear breathing protection and protective clothing.



8 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 insulation "System PYROCOMB® Intube", fire resistance classes to EI 120 according to EN 1366-3 and EN 13501, European Approval Number of Deutsches Institut für Bautechnik DIBt ETA-13/0904 for installation in

(component with fire resistance class, e.g. "Walls of fire resistance class EI 90")

was correctly created 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 (e.g. insulation compounds, mineral fibre plates, frames, etc.) 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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