

PYROCOMB® Tubes system
Cable insulation with pipe sleeve
Mounting instructions



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Table of contents

1	About these instructions	.4
1.1	Target group	4
1.2	Relevance of these instructions.	4
1.3	Types of warning information	4
1.4	Correct use	4
1.5	Applicable documents	5
1.6	Basic standards and regulations	5
1.7	General safety information	5
2	Product description, PYROCOMB® Tubes	.6
2.1	Basic principles	6
2.2	System components	6
2.2.1	Pipe sleeve	7
2.2.2	Joint closure	8
2.3	Accessories	8
3	Installation conditions PYROCOMB® Tubes	.9
3.1	General information	9
3.2	Approved installations	10
3.3	Approved installation locations	11
3.3.1	Lightweight partition wall	11
3.3.2	Solid wall	11
3.3.3	Solid ceiling	11
3.4	Component openings	11
4	Creating fire insulation	12
4.1	Preparations for mounting	12
4.2	Mounting a pipe sleeve	12
4.2.1	Wall mounting	13
4.2.2	Ceiling mounting	14
4.3	Attaching the identification plate	15
5	National requirements	15
6	Maintenance	15
7	Disposal	15
8	Appendix – Declaration of conformity (sample)	17

1 About these instructions

1.1 Target group

These instructions are aimed at installation engineers trained in fire protection and charged with the installation of the PYROCOMB® Tubes system.

1.2 Relevance of these instructions

- These instructions are based on the standards valid at the time of compilation (April 2017).
- 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 Types of warning information



Type of risk!

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

Note!

Indicates important information or assistance

1.4 Correct use

PYROCOMB® Tubes is an insulation system for individual or bundled bendable electrical installation pipes made of PVC or polyolefins for building interiors. It closes openings in fire-resistant walls or ceilings, through which combustible electrical installation pipes are run. The PYROCOMB® Tubes insulation system prevents the spread of fire and smoke in the area of the penetration.

The 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 conformity
- European Technical Approval ETA-12/0207
- Safety data sheet "PYROCOMB® Tubes"
- Declaration of performance 2013/05 - CPR/003 in the appropriate national language

1.6 Basic standards and regulations

- EN 13501-2:2010-02
- EN 13501-1:2007
- EN 1366-3: 2009-07
- ETAG 026-2
- EOT A TR 024

1.7 General safety information

Observe the following general safety information on handling the system:

- The European Technical Approval ETA-12/0207 of the Austrian Institute of Construction Engineering has priority when creating the fire insulation within the European Union (EU).
- Comply with all the technical specifications, such as the permitted insulation size, wall/ceiling types, fire resistance classes, installations and their first support, working areas, etc.
- The fastening of the cables to the adjacent component on both sides must take place according to the appropriate regulations, meaning that an additional mechanical load of the insulation cannot occur if there is a fire.
- The electrical installation pipes must be supported and the pipelines created in such a way that the pipelines and fire-resistant components must continue to function for at least a period equal to the desired fire resistance period, if there is a fire.
- 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.
- Comply with all the appropriate regulations and technical regulations of other units, in particular those for electrical engineering.
- Observe the safety data sheets of the products, which can be obtained online at www.obo-bettermann.com.

2 Product description, PYROCOMB® Tubes

2.1 Basic principles

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

- Cable insulation with pipe sleeve for combustible filled or unfilled electrical installation pipes
- Maximum fire resistance class EI 120 – U/C
- Installation in lightweight partitions, solid walls and solid ceilings

If there is a fire, the fire protection material in the pipe sleeve foams up after a few minutes under high pressure, closing the soft plastic pipe around the non-combustible cable sections. This safely prevents the spread of fire and smoke should a fire occur.

2.2 System components

The PYROCOMB® Tubes insulation system primarily consists of the pipe sleeve, type TCX, and a joint closure.

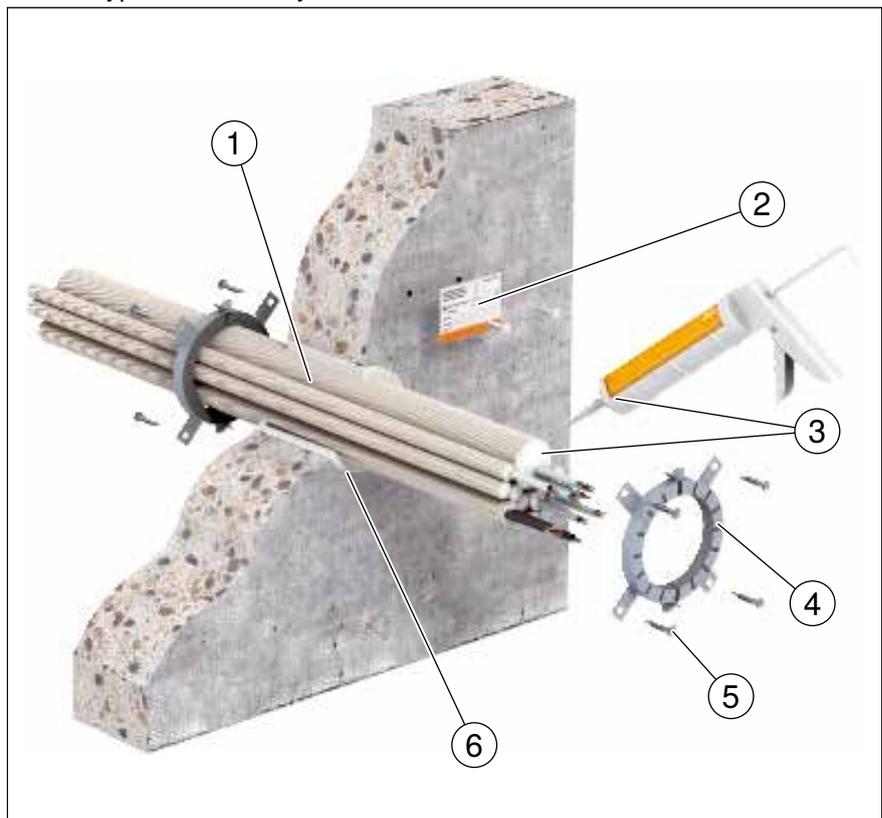


Figure 1: System components

- ① Bundles of plastic electrical installation pipes, rigid or flexible, filled or unfilled (combustible)
- ② Identification plate
- ③ Joint closure insulation layer creator DSX
- ④ Pipe sleeve, type TCX
- ⑤ Fastening screws
- ⑥ Smoke gas-proof joint closure, e.g. insulation layer creator DSX, concrete, cement, plaster or rockwool

2.2.1 Pipe sleeve

The pipe sleeve consists of a housing and an inlay of a material which creates an insulating layer according to ETA-10/117, which, depending on the size of the sleeve, consists of multiple layers. The housing is made of sheet steel and is thus sufficiently protected against corrosion.

- The large pipe sleeve ② consists of two semi-circles and is closed into a circle using the four connection straps.
- The small pipe sleeve ① consists of a strip not yet bent into a circle and is closed into a circle using the two connection straps.

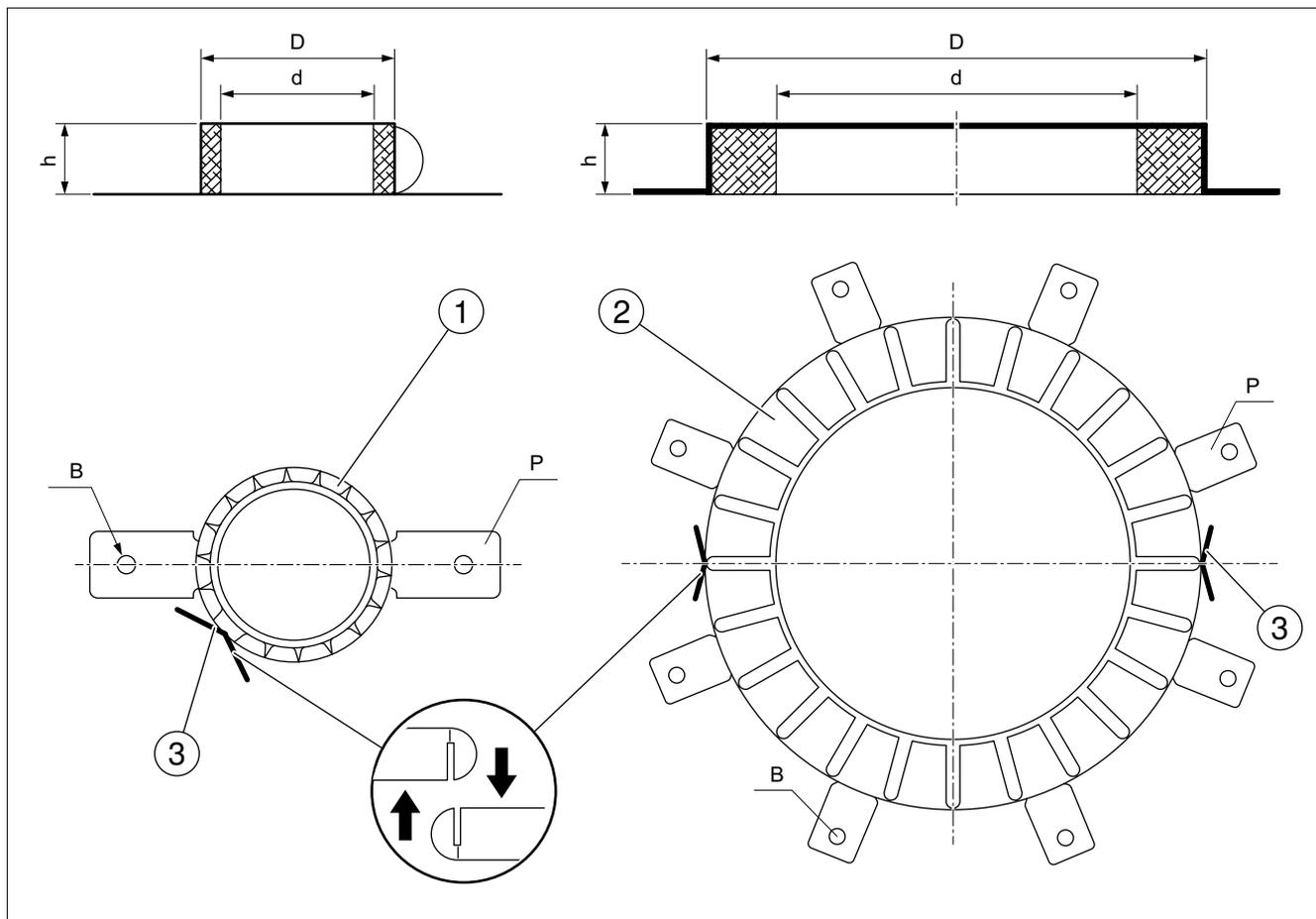


Figure 2: Pipe sleeve

- ① Pipe sleeve dA 32 – dA 50
- ② Pipe sleeve dA 63 – dA 125
- ③ Connection straps

Permitted pipe sleeves

Type	dA ¹⁾ [mm]	d ²⁾ [mm]	D ³⁾ [mm]	h ⁴⁾ [mm]	P ⁵⁾ [unit]	B ⁶⁾ [mm]	M ⁷⁾
TCX-2	32	36	50	26.0	2	6.0	M6
TCX-40	40	44	58	26.0	2	6.0	M6
TCX-50	50	54	68	26.0	2	6.0	M6
TCX-63	63	67	94	26.0	4	6.0	M6
TCX-75	75	79	106	26.0	4	6.0	M6
TCX-90	90	94	132	26.6	4	9.0	M8
TCX-110	110	114	155	26.6	4	9.0	M8
TCX-125	125	129	172	40.0	4	9.0	M8

¹⁾ External pipe diameter
²⁾ Internal pipe sleeve diameter
³⁾ External pipe sleeve diameter
⁴⁾ Pipe sleeve height
⁵⁾ Fastening straps
⁶⁾ Drill hole
⁷⁾ Fastening screw

Table 1: Pipe sleeves

2.2.2 Joint closure

The joint closure must be made of dimensionally stable, non-combustible (class A1 or A2-s1, dO to EN 13501 - 1) substances, such as concrete, cement mortar or gypsum mortar.

The ends of filled or unfilled electrical installation pipes must be closed off. They can be closed off with the insulation layer creating material "Insulation layer creator DSX" to a depth of at least 10 mm or with screw plugs.

If rockwool is used for joint closure, then this must be installed to a level half as deep as the pipe diameter, but at least 30 mm deep.

2.3 Accessories

Depending on the national requirements, the insulation must be given a filled-out identification plate.



Figure 3: Identification plate for insulation systems

3 Installation conditions PYROCOMB® Tubes

3.1 General information

The cable insulation may be used on straight electrical installation pipes arranged vertically to the wall or ceiling surface.

The electrical installation pipes may be made of:

- PVC according to EN 61386-1 and EN 61386-22
- Polyolefin according to EN 61386-1 and EN 61386-22

The electrical installation pipes can be run individually or in a bundle through the pipe sleeve.

The electrical installation pipes must protrude at least 200 mm out of the wall and ceiling.

The maximum external diameter of an individual electrical installation pipe may be DN 63 (maximum 50.5 mm internal diameter), and the wall thickness between 0.3 mm and 0.8 mm.

The maximum diameter of a single cable may be 21 mm.

The pipe sleeve may be completely filled with electrical installation pipes or bundles.

The internal diameter of the pipe sleeve may be a maximum of 30 mm greater than the diameter of the electrical installation pipe or the bundle.

Electrical installation pipes must be supported.

The maximum spacing is:

- 450 mm on both sides of wall constructions
- 420 mm from the top side of ceiling constructions

Pipe sleeves next to one another must maintain a minimum spacing of 100 mm in solid or lightweight walls.

In solid ceilings, the pipe sleeves can be installed without a minimum spacing.

3.2 Approved installations

PVC

Type	Pipe diameter [mm]	Pipe wall thickness [mm]	Fire resistance class
DN 16	10.9	0.3 – 0.5	EI 120-U/C
DN 20	14.2	0.3 – 0.5	
DN 25	18.6	0.3 – 0.6	
DN 32	24.3	0.3 – 0.6	
DN 40	31.3	0.3 – 0.6	
DN 50	40.0	0.3 – 0.5	
DN 63	50.5	0.3 – 0.5	

Table 2: Approved PVC pipes

Polyolefin

Type	Pipe diameter [mm]	Pipe wall thickness [mm]	Fire resistance class
DN 16	10.4	0.3 – 0.8	EI 120-U/C
DN 20	13.6	0.3 – 0.8	
DN 25	17.9	0.4 – 0.8	
DN 32	23.4	0.4 – 0.8	
DN 40	30.0	0.5 – 0.8	
DN 50	38.8	0.5 – 0.8	
DN 63	48.8	0.7 – 0.8	

Table 3: Approved polyolefin pipes

3.3 Approved installation locations

3.3.1 Lightweight partition wall

- Partition constructed using the stand-off method, with steel substructure and panelling on both sides of at least 2 layers of 12.5 mm-thick cement or plasterboard plates, with a fire behaviour of class A1 or A2 according to EN 13501-1.
- Stand-off partition with wooden sub-construction and panelling on both sides with at least 2 layers of 12.5 mm-thick cement or gypsum plates with a fire behaviour of class A1 or A2 according to EN 13501 - 1. The distance between the wooden stands and the insulation must be ≥ 100 mm and the space between the panelling of the wall and the stand or the insulation must be tightly filled at least 100 mm deep with mineral wool of fire behaviour A1 or A2 according to EN 13501 - 1.
- Thickness of the partition ≥ 100 mm
- Partitions must be classified according to the desired fire resistance period, in accordance with EN 13501-2 (maximum EI 120).

3.3.2 Solid wall

- Masonry, concrete, reinforced concrete, porous concrete
- Thickness of the solid wall ≥ 650 kg/m³
- Thickness of the solid wall ≥ 100 mm
- Walls must be classified according to the desired fire resistance period, in accordance with EN 13501-2

3.3.3 Solid ceiling

- Made of concrete, reinforced concrete, porous concrete
- Thickness of the solid ceiling $\geq 2,400$ kg/m³ for concrete
- Thickness of the solid ceiling ≥ 550 kg/m³ for porous concrete
- Thickness of the solid ceiling ≥ 150 mm
- Ceilings must be classified according to the desired fire resistance period, in accordance with EN 13501-2

Note! *The ETA-12/0207 does not cover installation in special walls, e.g. in walls made of sandwich elements.*

3.4 Component openings

The opening size is limited to a size which allows fastening of the sleeve to the component.

4 Creating fire insulation



Skin reactions possible!

Constant, lengthy handling of the product can lead to allergic skin reactions in rare cases.

Wear protective gloves.

Avoid contact with the eyes and skin.

Wash your hands before breaks and after completing work.

When creating the fire insulation, the approval ETA-12/0207 and the appropriate national regulations are of primary importance.

4.1 Preparations for mounting

Before creating fire insulation, the following points must be ensured:

- The type and thickness of the wall or ceiling are suitable for the insulation.
- The type and dimensions of the pipes are suitable for the insulation.
- The smallest suitable pipe sleeve has been selected for the appropriate external pipe diameter.

4.2 Mounting a pipe sleeve

In the case of pipe penetrations through ceilings, a pipe sleeve must be attached to the underside of the ceiling and, in the case of pipe penetrations through walls, a pipe sleeve must be attached on each side of the wall.

The pipe sleeves must be fastened to lightweight partitions with continuous M6 or M8 threaded rods.

With solid walls or ceilings of a high density, fastening can be performed with suitable anchors and M6 or M8 steel screws.

The amount of fastening materials must correspond to the amount of fastening straps.

Note! *When fastening the sleeves with anchors, the edge spacings must be observed, in accordance with the appropriate anchor specification.*

The pipe sleeves must be flat against the wall and ceiling.

Before the pipe sleeves are mounted, the residual opening between the wall or ceilings and the passed-through pipe must be completely filled with dimensionally stable, non-combustible substances, such as concrete, cement or gypsum mortar to the component thickness.

The ends of open electrical installation pipes must be closed off.

4.2.1 Wall mounting

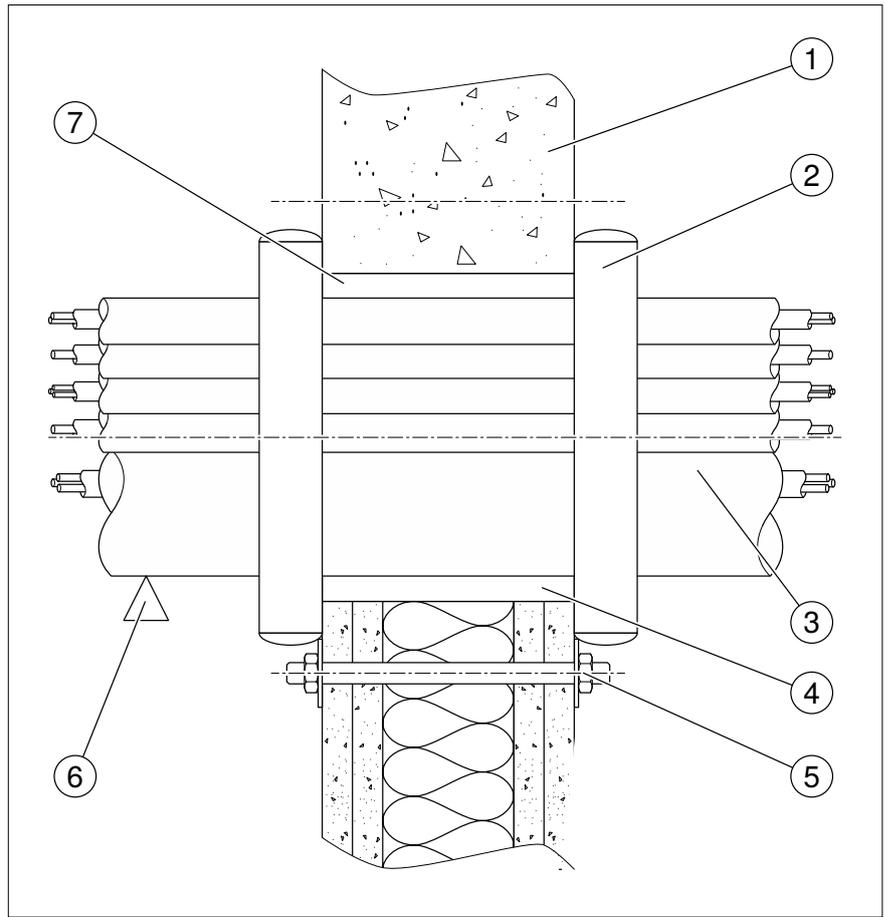


Figure 4: Wall mounting

- ① Solid wall
- ② Pipe sleeve
- ③ Bundle of electrical installation pipes (combustible) filled or not filled with cables
- ④ Joint closure
- ⑤ Fastening with threaded rod
- ⑥ Distance to the first support max. 450 mm from the wall on both sides
- ⑦ Joint closure

- Seal the joint between the wall and the pipe along the entire wall thickness so that it is fireproof and smoke gas-tight.
- Close off the ends of open electrical installation pipes, e.g. with the insulation layer creating material "DSX insulation layer creator".
- Remove any plaster/mortar or dust in the area of the pipe to which the pipe sleeves are to be attached.
- Place the pipe sleeve around the pipe on each side of the wall.
- Close the pipe sleeves with the connection shackles.
- Fasten the fastening straps of the pipe sleeves.
 - Connect both pipe sleeves through the wall with threaded rods and nuts.
 - Connect both pipe sleeves individually to the solid wall with anchors and bolts.

4.2.2 Ceiling mounting

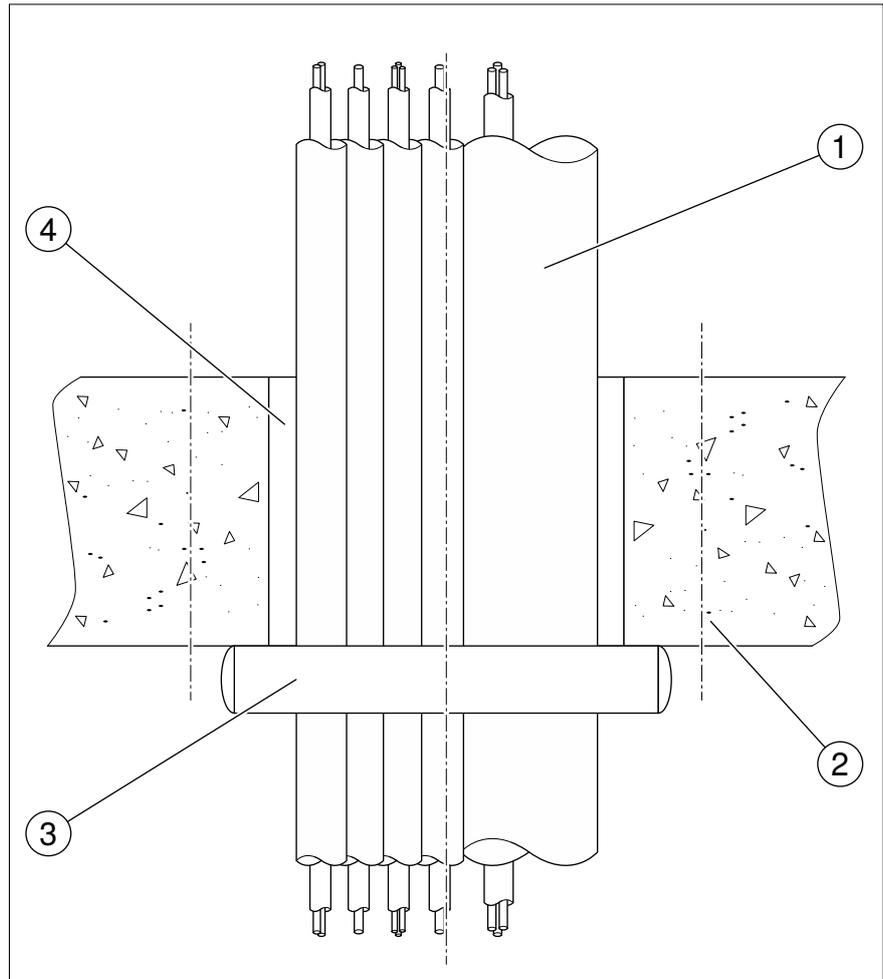


Figure 5: Ceiling mounting

- ① Bundle of electrical installation pipes (combustible) filled or not filled with cables
- ② Solid ceiling
- ③ Pipe sleeve
- ④ Joint closure

- Seal the joint between the ceiling and the pipe so that it is fireproof and smoke gas-tight.
- Remove any plaster/mortar or dust in the area of the pipe to which the pipe sleeve is to be applied.
- Close off the ends of open electrical installation pipes, e.g. with the insulation layer creating material "DSX insulation layer creator".
- Place the pipe sleeve around the pipe on the underside of the ceiling.
- Close the pipe sleeve with the connection shackles.
- Fasten all the fastening straps of the pipe sleeve to the underside of the ceiling.
- Use anchors and bolts.

4.3 Attaching the identification plate

- Fill out the identification plate for insulation systems clearly with a permanent marker and attach it permanently on one side next to the insulation.

5 National requirements

Note! *Outside Germany or Austria, please note that other country-specific requirements may exist, in addition to the national construction law.*

Germany/Austria

- The insulation system must be permanently labelled with a sign next to the insulation.
- After work has been completed, the client must be presented with a written declaration of conformity.

6 Maintenance

The PYROCOMB® Tubes insulation system 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:

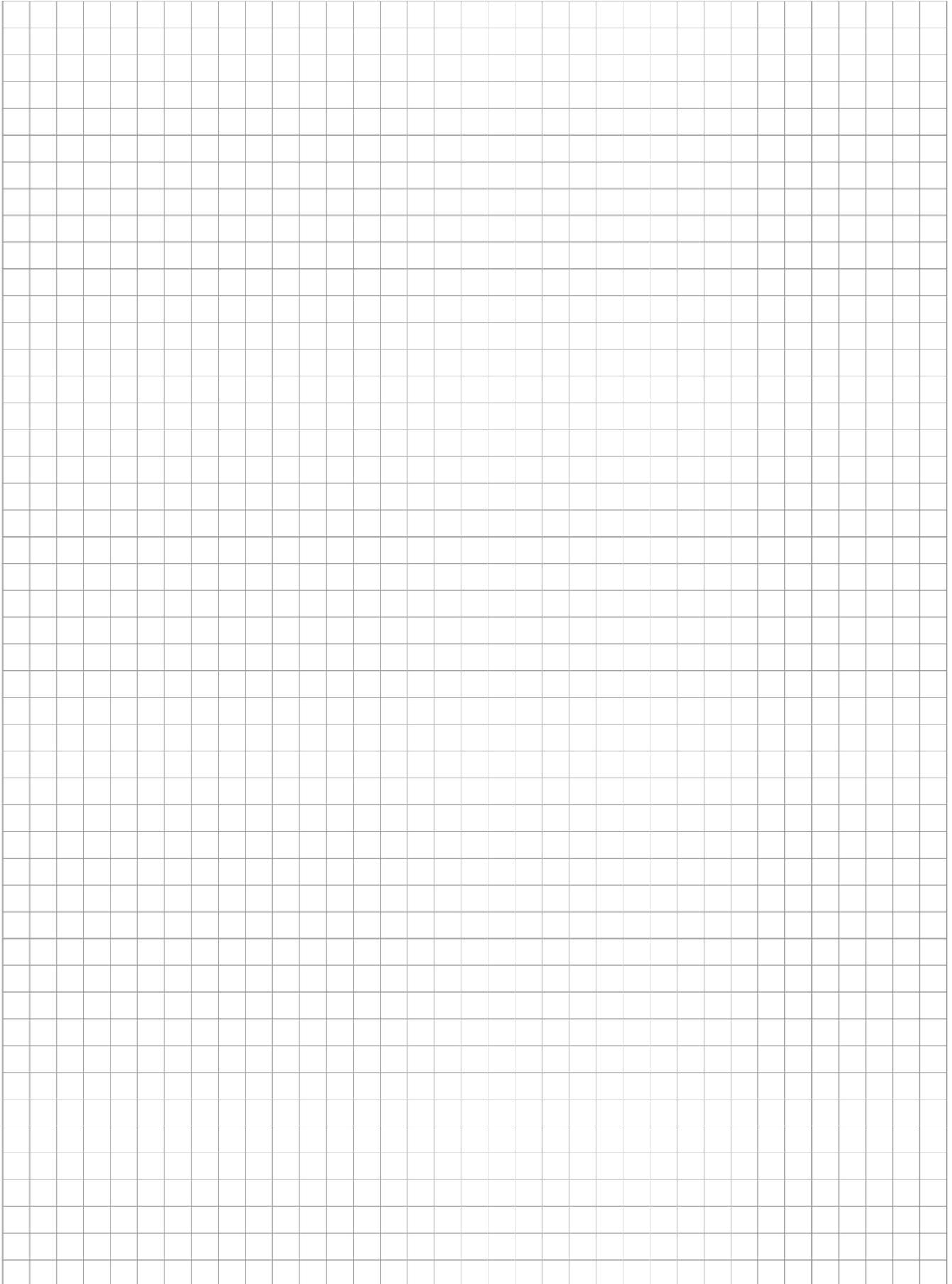
- Check that all the component parts of the insulation are tightly sealed.
- Reseal any joints or gaps with spreadable ASX ablation coating.

7 Disposal

National laws and regulations must be observed for disposal.

- Material: As household waste
- Packaging: As household waste

Own notes



8 Appendix – Declaration of conformity (sample)

Insulation system according to 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 PYROCOMB® Tubes, fire resistance classes to EI 120 according to EN 1366-3 and EN 13501, European Approval Number of Deutsches Institut für Bautechnik DIBt ETA-15/0701 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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