Mounting instructions

Fire protection foam PYROSIT© NG

OBO BETTERMANN

Table of contents

1 About these instructions

1.1 Target group

The instructions are aimed at installers with fire protection training and proof of training on the use of products containing diisocyanates.

1.2 Relevance of these instructions

These instructions are based on the standards valid at the time of compilation (April 2025).

Before commencing work, read these instructions through once completely. We will not accept any warranty claims for damage caused through non-observance of these instructions.

Keep all the documents supplied with the system safe, so that the information is available should you need it.

Any images are intended merely as examples. Mounting results may look different.

In these instructions, cables and lines are referred to simply as cables.

1.3 Types of warning information

CAUTION

Type of risk!
Shows a risky situation. If the warning information is not observed, then medium or minor injuries may occur.

ATTENTION

Type of risk!
Shows a risky situation. If the warning information is not observed, then damage to the product or the surroundings may occur.

Note! *Indicates important information or assistance.*

1.4 Basic standards and regulations

– EN 1366-3

– EN 13501-1 / EN 13501-2

– EN 1363

– EU-BauPVO

1.5 Applicable documents

– European Technical Assessment ETA-11/0527

Note! *In addition to the European Technical Assessment ETA-11/0527, further national requirements for setting up insulation in building codes and building regulations may apply.*

– Declaration of Performance 05-DOP-003

– Declaration of Performance 05-DOP-004

– PYROSIT® NG safety data sheet

The declarations of performance can be viewed for the appropriate products at www.obo.global.

2 Intended use

PYROSIT® NG fire protection foam is a fire protection insulation system for building interiors, used to close openings in fire-resistant walls or ceilings through which cables, electrical installation pipes, combustible or non-combustible pipelines are run. In case of fire, this prevents the spread of fire and smoke in the area of the penetration.

The system is not designed for any purpose other 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.

3 Safety

3.1 General safety information

Observe the following general safety information:

– Training is required to handle products containing diisocyanates. Industrial and commercial users of PYROSIT® NG require evidence of a corresponding safety instruction.

Note! *You will find more information at www.safeusediisocyanates.eu. Training 048 is recommended to use OBO Bettermann products.*

– PYROSIT® NG fire protection foam 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.

– Ensure that the installation of the fire insulation does not compromise the stability of the adjacent element – even in the event of a fire. Consult the proof of application of the component.

– Observe and comply with all the appropriate regulations and technical regulations of other units, in particular those for electrical engineering.

– Fire insulation in ceilings must be safeguarded against loads, in particular including being walked on, by means of suitable measures (e.g. through protectors or covering them with a grating).

– The insulation system falls under use category Z_1. This means that the approved ambient conditions for the use of the product are interiors with any moisture and temperatures above 0 °C.

– Observe the safety data sheets of the products.

3.2 Personal protective equipment

List of personal protective equipment to be used:

Use hand protection

Wear eye protection

Wear protective clothing

4 Product description, PYROSIT® NG fire protection foam

4.1 Basic principles

Fire protection foam PYROSIT® NG is a fire protection insulation system that can be used as cable or combination insulation in lightweight partitions, solid walls and solid ceilings in interior areas with and without moisture. The approved installations include cables, electrical installation pipes as well as combustible and non-combustible pipelines.

Correct mounting ensures that the insulation system prevents the cold smoke gases, created during the initial stages of a fire, from spreading into adjacent areas. This prevents the spread of fires through the wall/ ceiling opening for a period of up to 120 minutes.

PYROSIT® NG is particularly suitable for difficult-to-reach or irregular openings and non-combustible pipes.

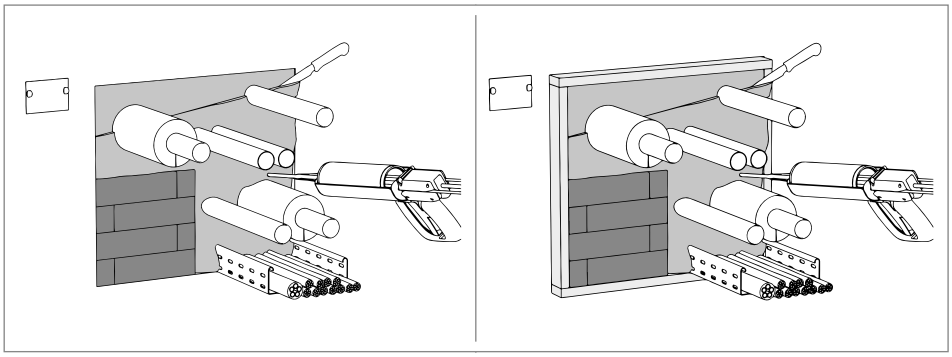

Fig. 1: PYROSIT® NG fire protection foam in a solid wall (left) and a lightweight partition (right)

4.2 System components

The system is made up of a 2-component fire protection foam, supplied in a 380 ml cartridge, which is applied to the insulation with a manual or battery-driven cartridge pistol. The evenly generated pressure from the cartridge pistol presses the two components into the mixer pipe screwed onto the cartridge and mixes them in the correct proportions there.

Figure no.	Designation	Item number
1	2-component fire protection foam PYROSIT® NG in a cartridge, including 2 mixer pipes	7203800
2	2-K cartridge pistol, hand-actuated, FBS-PH	7203806
3	2-component cartridge pistol, battery-operated, FBS-PA	7203813

Tab. 1: System components

4.3 Accessories

Figure no.	Designation	Item number
4	SHT adhesive tape, self-adhesive, transparent	7202521
5	PYROPLUG® Block foam block, intumescent	7202505
6	Mixer pipe set, FBS-M	7203803
7	Calcium silicate plate	
	Calcium silicate plate (500 x 150 x 20 mm), KSI-P1	7202283
	Calcium silicate plate (500 x 250 x 30 mm), KSI-P2	7202904
	Calcium silicate plate (1,000 x 250 x 30 mm), KSI-P3	7202912
8	Identification plate for insulation systems	7205425
9	Cable coil, self-adhesive, intumescent, FBA-WI	7202510
10	Mineral wool, aluminium-clad, MIW-MA	7202308
11	Metal strip clips	
	Metal strip clips, narrow (150 mm), MBS 015 A2	7203099
	Metal strip clips, narrow (300 mm), MBS 030 A2	7203103
	Metal strip clips, narrow (450 mm), MBS 045 A2	7203105
	Metal strip clips, narrow (610 mm), MBS 061 A2	7203107
	Metal strip clips, wide (750 mm), MBS 075 A2	7203109

Tab. 2: Accessories

4.4 Product data

Characteristic values	
Fire behaviour according to DIN EN 13501-1	Class E
Colour	Red-brown
Contents	380 ml (cartridge)
Transport/storage	5 °C–30 °C (dry, in original containers)
Processing temperature	15 °C–30 °C, recommended: 20 °C–25 °C
Additional characteristic values can be found in the Declaration of Performance 05-DOP-003 and in ETA-11/0527.	

Tab. 3: Product data

Note! *Specifications for foam volume, cuttability and maximum work interruption can be found in the chapter “6.6.1 Influence of the material temperature on processing” on page 24.*

5 Checking the installation requirements

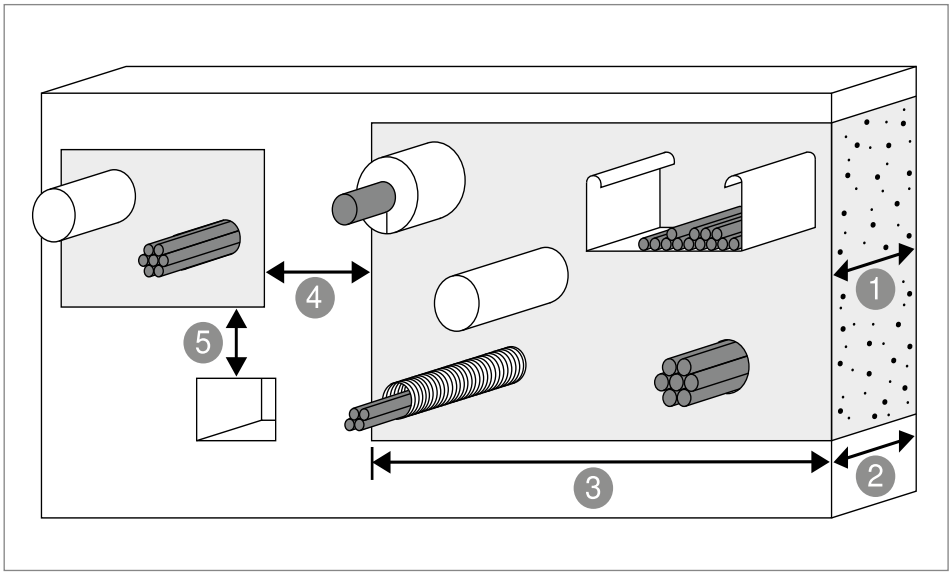

Fig. 2: Dimensions and distances

1 Insulation thickness

2 Component strength

3 Opening size

4 Distances to other insulation

5 Distances to other installed items

5.1 Checking component opening

Before creating the insulation, check whether the dimensions of the opening and, if applicable, distances to further openings are permissible.

Check the component type and thickness to determine which fire resistance class can be achieved and what installations are permissible.

Note! *The required specifications regarding dimensions and component thickness can be found in the chapters “9.2 Minimum component thicknesses and opening sizes” on page 29 and “9.4 Distances between openings” on page 30.*

If the thickness of the lightweight partition, solid wall or solid ceiling is insufficient to achieve the required component thickness, then tuning or a frame must also be created.

Note! *The required specifications for mounting the tuning/frame can be found in the chapters “6.1 Creating tunings and frames” on page 15 and “9.3 Dimensions for tunings and frames” on page 29.*

5.2 Checking the assignment

Before creating the insulation, check which installations (cables, cable support systems, pipes and combinations) may be passed through the insulation or whether an unused insulation (reserve insulation) is permitted.

Note! *The necessary specifications for assignment can be found in the chapter “9.5 Approved installations” on page 30.*

5.3 Checking distances

Installations must meet specific distances between one another and to the component side. After the assignment of the insulation has been determined and checked, check whether the distances are permissible.

Note! *The required specifications regarding minimum distances can be found in the chapter “9.7 Minimum distances to the component side and between installations” on page 37.*

5.4 Checking for necessary additional measures

After determining the distances, check whether any other measures are necessary on the intended installations.

The following measures can be performed independently of the installations performed:

– Route insulation on non-combustible pipes

– Cable coil

– Bulge of fire protection foam

Note! *Mounting information for necessary additional measures can be found in the chapter “10 Necessary additional measures” on page 41.*

6 Creating insulation

Note! *When mounting the insulation system, the approval ETA-11/0527 and the appropriate national regulations are of primary importance.*

Note! *Observe chapter “9.1 General information” on page 29.*

6.1 Creating tunings and frames

If the thickness of the solid ceiling, solid wall or lightweight partition is insufficient to achieve the required component thickness, then tuning and/or a frame must also be created around the insulation opening.

The tuning or frame must be made of non-combustible plates (GRP, silicate or calcium silicate plates, minimum thickness 12.5 mm) and be produced so that the PYROSIT® NG fire protection foam is in contact with the tuning or frame and the wall/ceiling over the entire length of the insulation.

6.1.1 Installation in solid walls and solid ceilings

Tuning

– The tuning width must be at least 50 mm.

– The tuning thickness must be at least 12.5 mm, but must not exceed 50 mm on each side of the wall.

– Tuning can be arranged on one or both sides of the component, as required. It must be fastened to the component with suitable steel screws at a distance of ≤ 250 mm – but with at least two screws per bar – in order to increase the component thickness to the minimum insulation thickness.

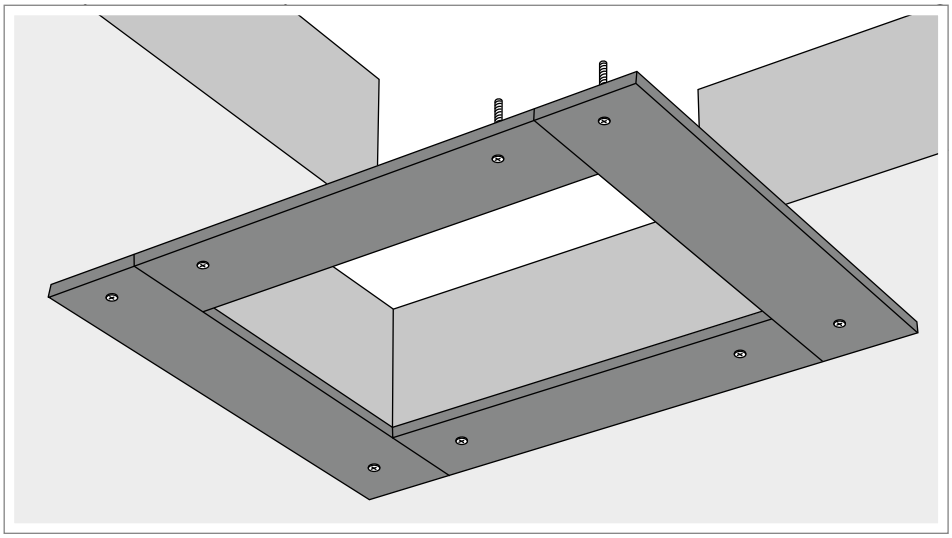

Fig. 3: Tuning for solid ceiling

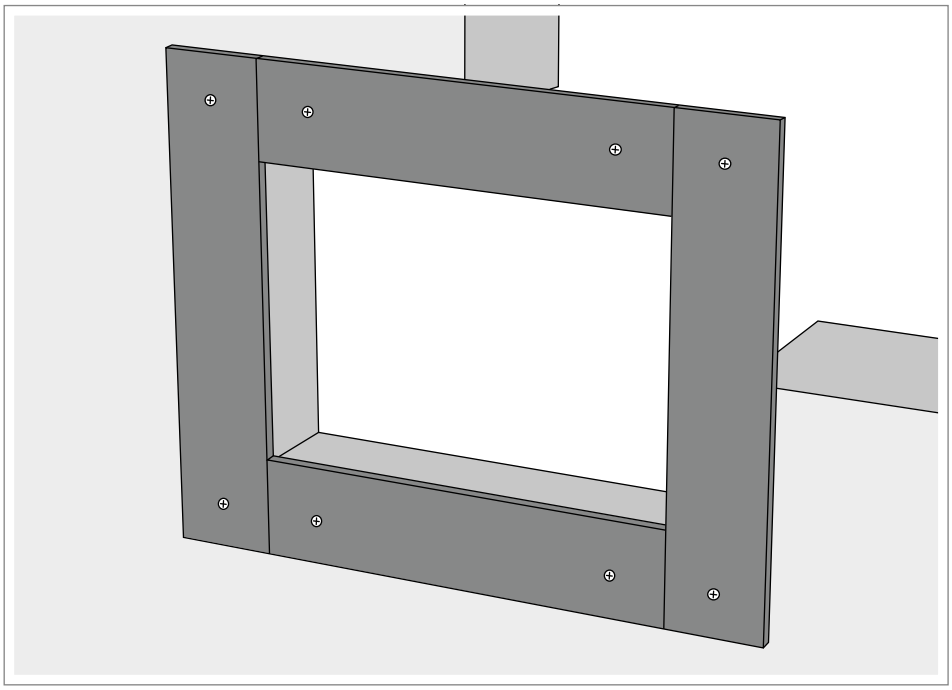

Fig. 4: Tuning for solid wall or lightweight partition wall

Frame

– The thickness of the frame parts must be at least 25 mm (1x 25 mm or 2x 12.5 mm plate thickness). The width of the frame parts must correspond to the minimum insulation thickness.

– In solid ceilings, the frame parts must be fastened in the component side using steel screws at a distance of ≤ 250 mm – but with at least two screws per bar. The frame may optionally be arranged symmetrical to the component axis or flush on the upper side/underside of the ceiling.

– In solid walls, there is no need for fastening with screws when installing the frame parts.

– Install the frame symmetrical to the wall axis. Clamp the individual frame sections together in the middle of the opening.

– Fill the gaps between the component and frame all around with fire protection foam, filler or mineral mortar on both sides of the insulation.

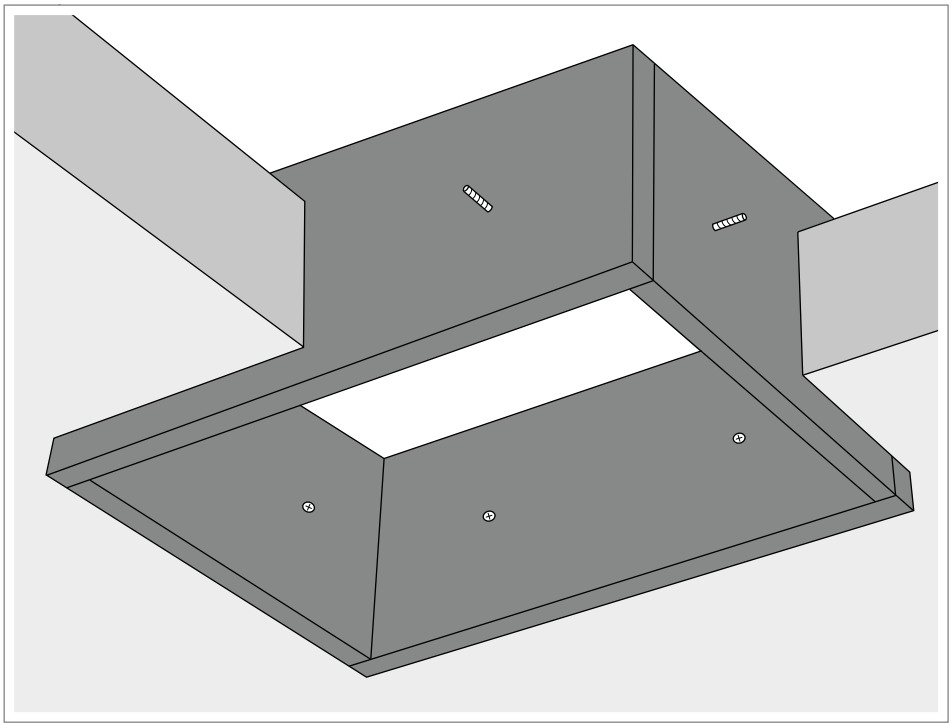

Fig. 5: Frame for solid ceiling

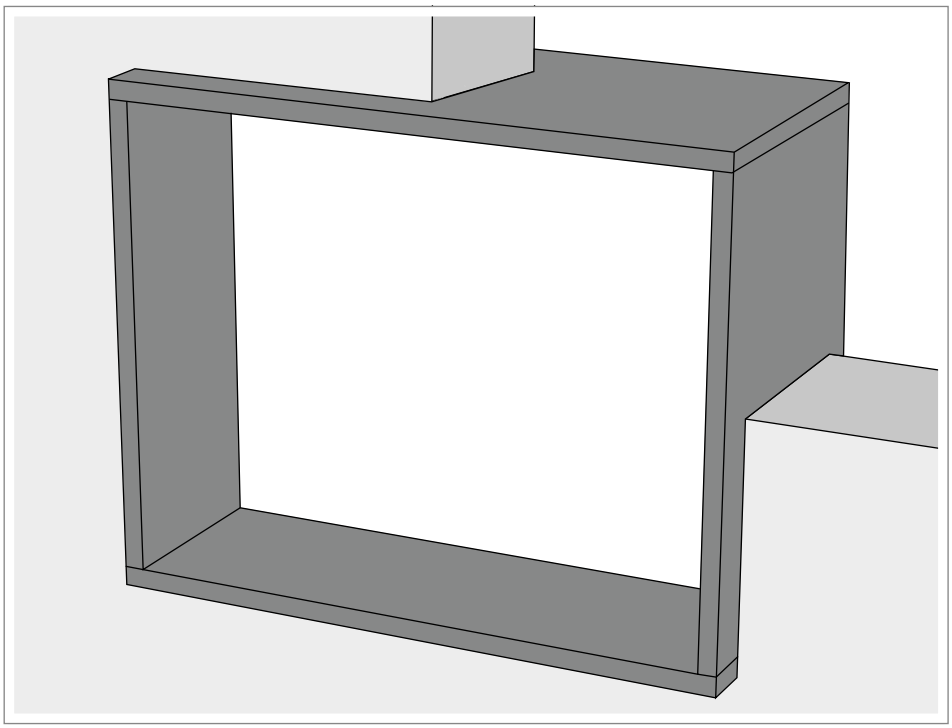

Fig. 6: Frame for solid wall

6.1.2 Installation in lightweight partitions

In the following cases, fill the hollow space within the wall around the opening with mineral wool (non-combustible, melting point > 1,000 °C, raw density at least 40 kg/m³) at a depth of at least 100 mm:

– If lightweight partitions already meet the required component thickness without adding a frame

– When installing tuning

– For installation in lightweight partitions with wood stand construction. Maintain a distance of at least 100 mm between the insulation and wood stands. The cross-section of the wood stand constructions must be at least 50 mm x 75 mm.

Reinforce openings exceeding a size of 320 mm x 320 mm with additional steel profiles at the upper and lower sides. Fasten the wall panelling accordingly at these steel profiles.

Tuning

– The tuning width must be at least 50 mm.

– The tuning thickness must be at least 12.5 mm, but must not exceed 50 mm on each side of the wall.

– Tuning can be arranged on one or both sides of the component, as required. They must be fastened to the component with suitable sheetrock or chipboard screws at a distance of ≤ 250 mm – but with at least two screws per bar – in order to increase the component thickness to the minimum insulation thickness.

Frame

– The thickness of the frame parts must be at least 25 mm (1x 25 mm or 2x 12.5 mm plate thickness). The width of the frame parts must correspond to the minimum insulation thickness.

– The frame must be installed symmetrical to the wall axis. The individual frame sections are clamped together in the middle of the opening.

– There is no need for fastening with screws when installing the frame parts.

– Gaps between lightweight partition and frame must be sealed tight all around with PYROSIT® NG or filler.

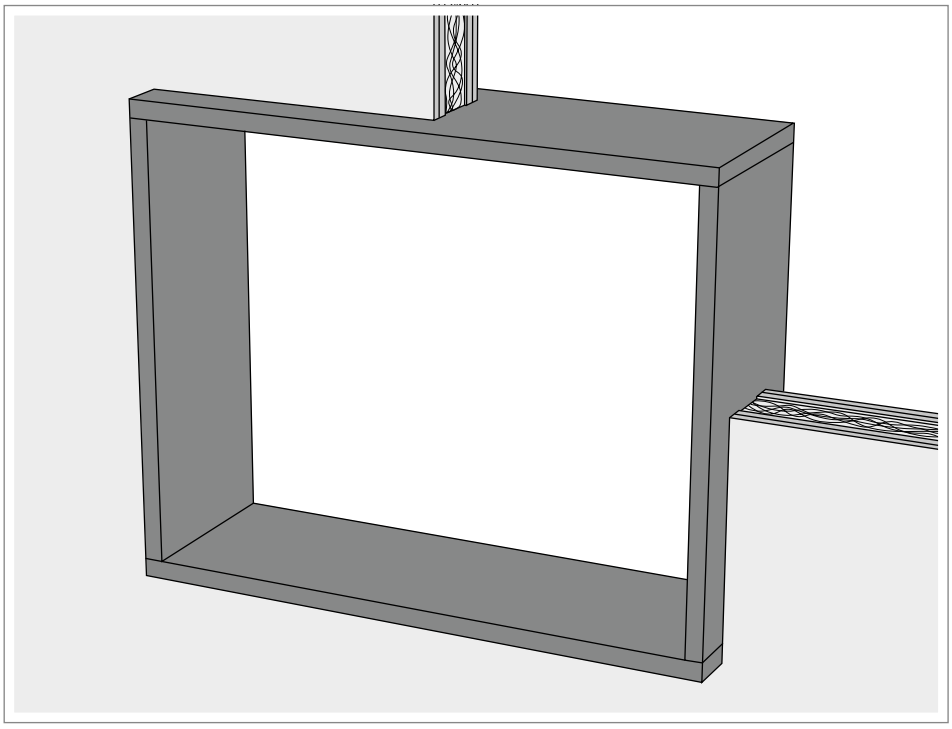

Fig. 7: Frame for lightweight partition

6.2 Preparing the opening

1. Cover the floor with foil on both sides of the insulation opening, if necessary.

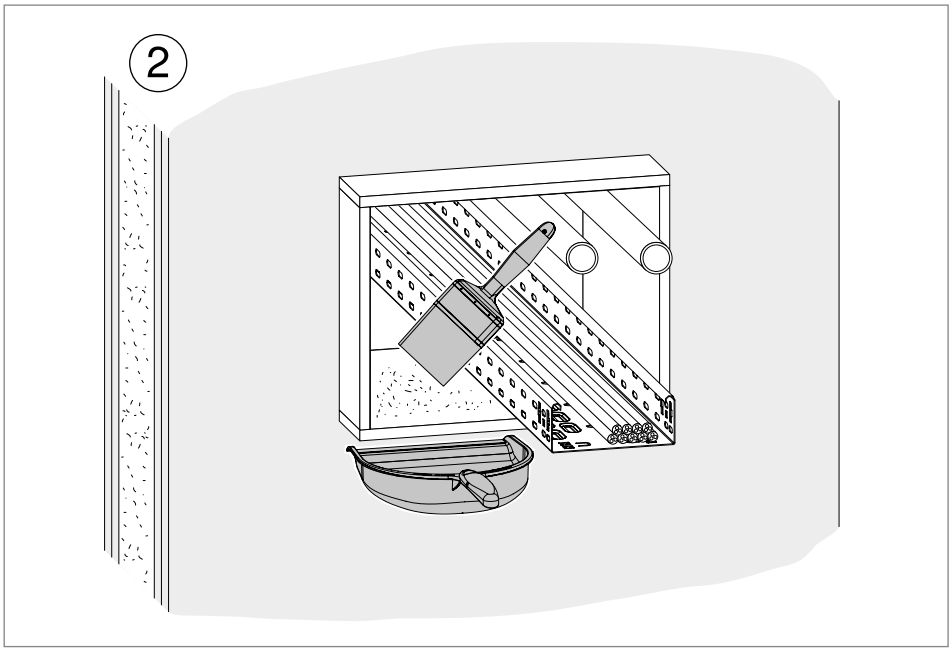

Fig. 8: Cleaning the component side or insulation opening (e.g. a lightweight partition)

2. Clean the component side/insulation opening, e.g. with a brush or hand cleaner.

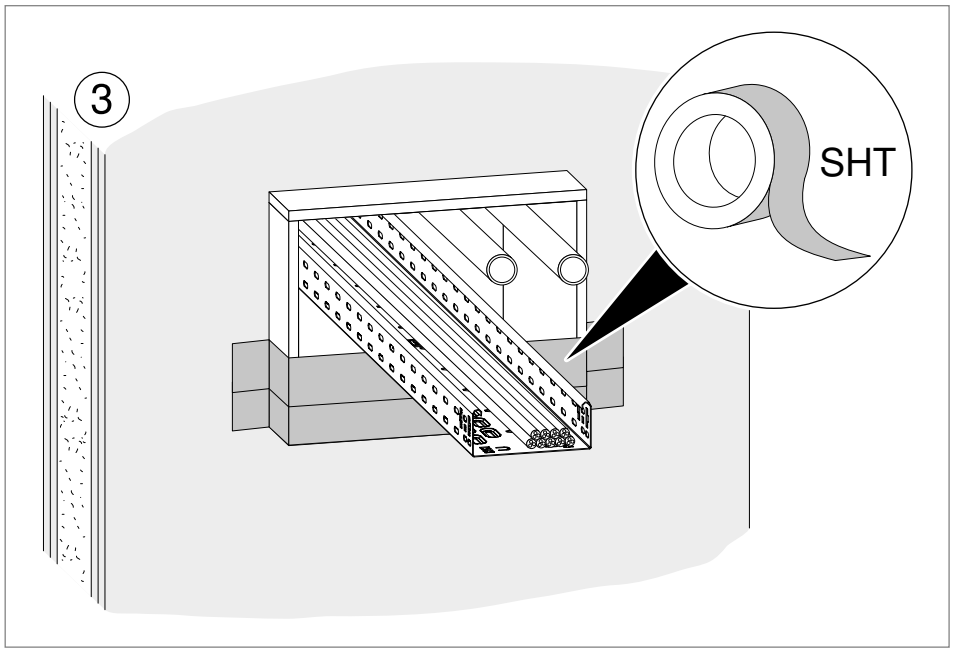

Fig. 9: Installing the lining (e.g. a lightweight partition)

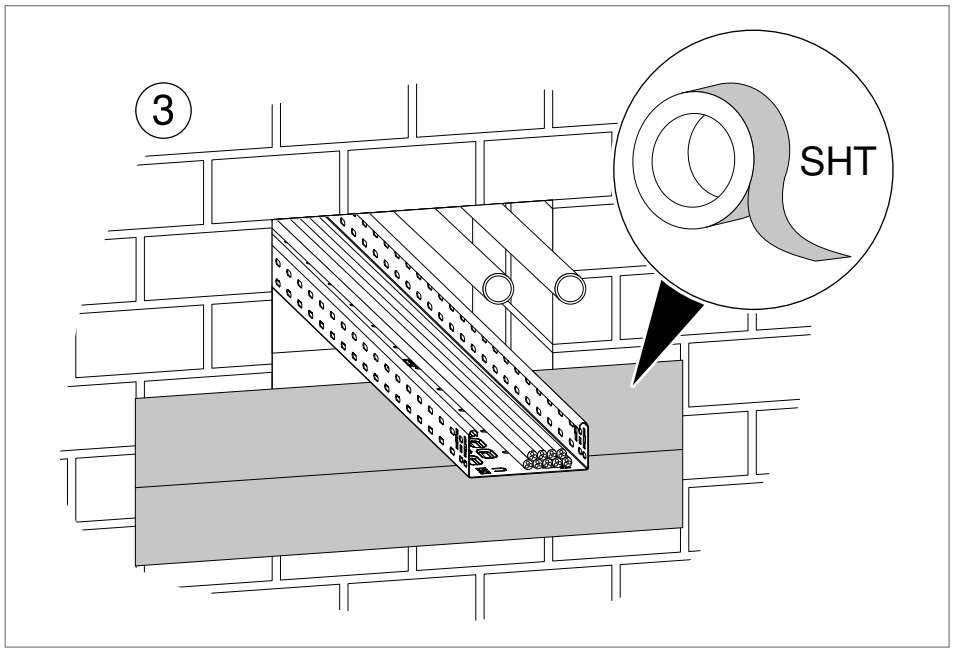

Fig. 10: Installing the lining (e.g. a solid wall)

3. If necessary, apply a lining on both sides, e.g. with SHT adhesive tape, in order to prevent the fire protection foam from oozing out.

6.3 Installing route insulation

If installations require route insulation, create this with mineral wool mats/ lining or AF/Armaflex in the corresponding insulation thickness. Secure route insulation against gaping using steel wire or metal strip clips.

Note! *The necessary specifications for pipe wall thicknesses, insulation materials and thicknesses can be found in the chapter “10.1 Route insulation on non-combustible pipes” on page 41.*

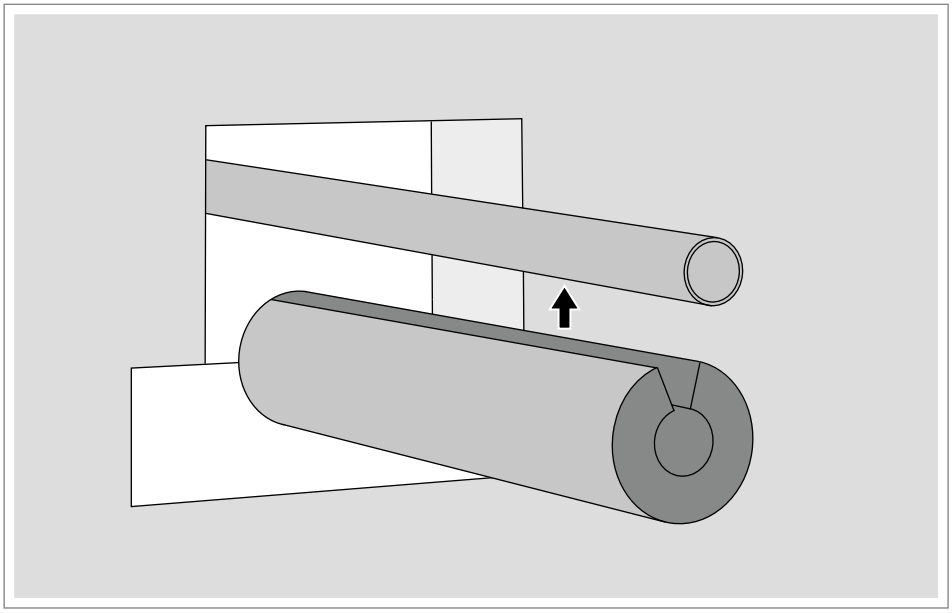

Fig. 11: Installing route insulation

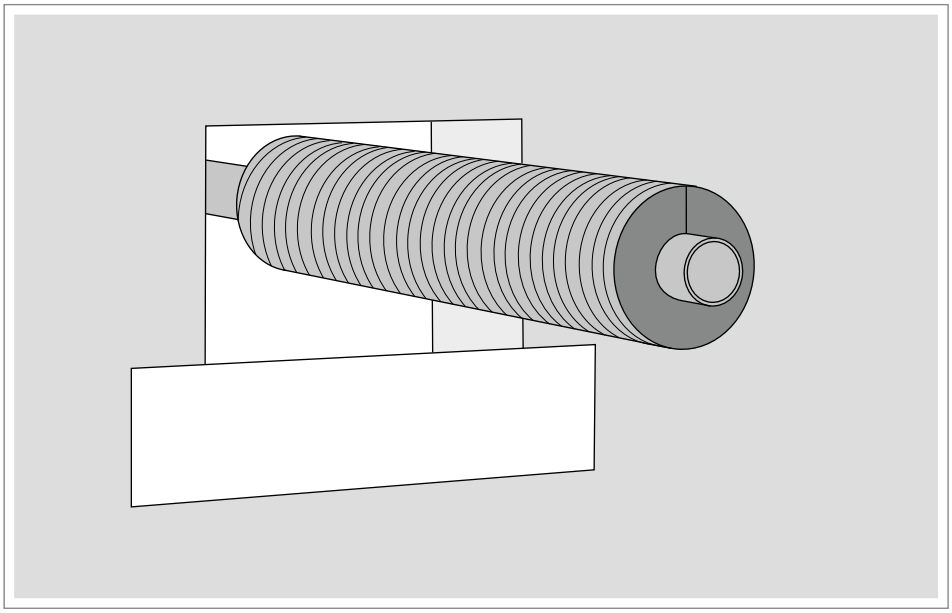

Fig. 12: Route insulation installed and secured

6.4 Establishing supports

Support installed items to avoid overloading the insulation in the event of a fire.

– Establish the supports for the installed items before and after the insulation for wall installation and above the insulation for ceiling installation.

– Fasten the support to the ceiling or wall using fire protection-approved fastening materials.

Note! *The necessary specifications for supports can be found in the chapter “9.8 First support of installations” on page 39.*

6.5 Processing the PYROPLUG® Block foam block

Areas of the insulation that are not occupied by installations can be sealed with PYROPLUG® Block foam blocks.

– Install the PYROPLUG® Block foam block so that the minimum insulation thickness is maintained.

– Install PYROPLUG® Block foam blocks in tightly packed layers in the bandage (i.e. layered offset of the vertical joints).

6.6 Preparing the PYROSIT® NG cartridge for use

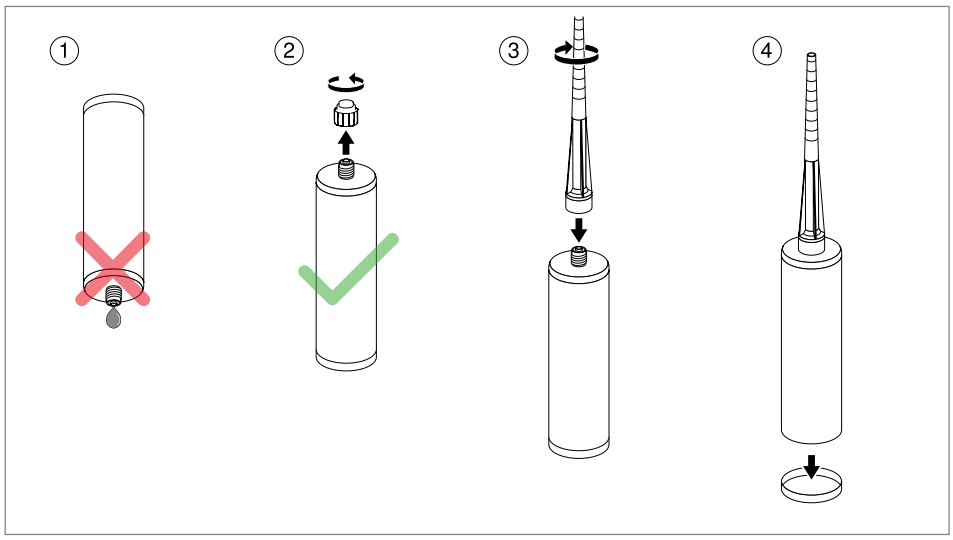

Fig. 13: Preparing the cartridge

1. When opening the cartridge, do not hold it downwards but upright.
2. Unscrew the closure cap.
3. Screw on the mixing pipe.
4. If applicable, remove the lower protective cap.

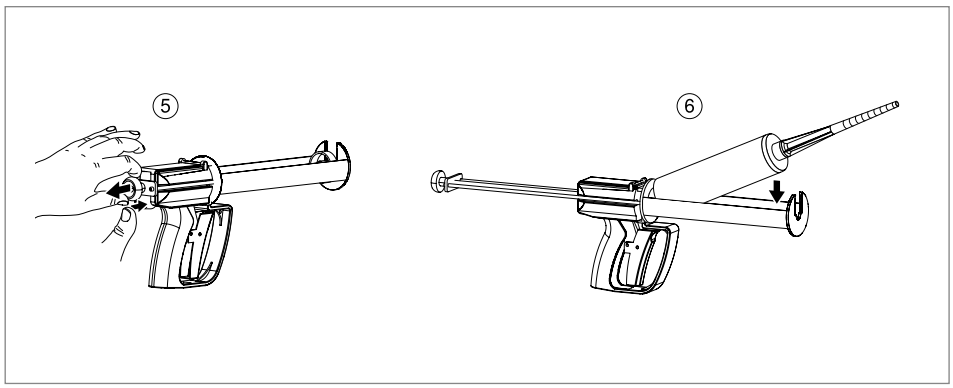

Fig. 14: Inserting the cartridge

5. Unlock the retaining lock of the cartridge pistol and pull the pressing piston back completely.
6. Insert the cartridge in the cartridge pistol as shown.

ATTENTION

Device failure!
Pressing out a cartridge with blocked mixer using force can result in destruction of the cartridge or the pressing device.
Replace blocked mixers.

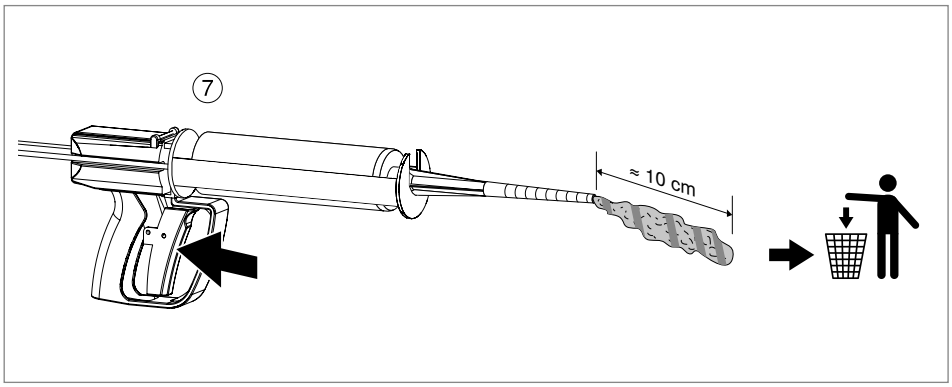

Fig. 15: Pressing out a cartridge

7. Press out fire protection compound until a homogenous mass exits the mixing pipe. Do not use the first 10 cm of the mass, but dispose of it.

6.6.1 Influence of the material temperature on processing

Material temperature	15 °C	20 °C	30 °C
Theor. foam volume [l/cartridge]	1.9	2.0	2.5
Start of foaming [s]	Approx. 35	Approx. 20	Approx. 12
Cuttability after [s]	Approx. 110	Approx. 90	Approx. 70
Work interruption [s]	Approx. 70	Approx. 50	Approx. 40

Tab. 4: Influence of the material temperature on processing

6.7 Closing insulation

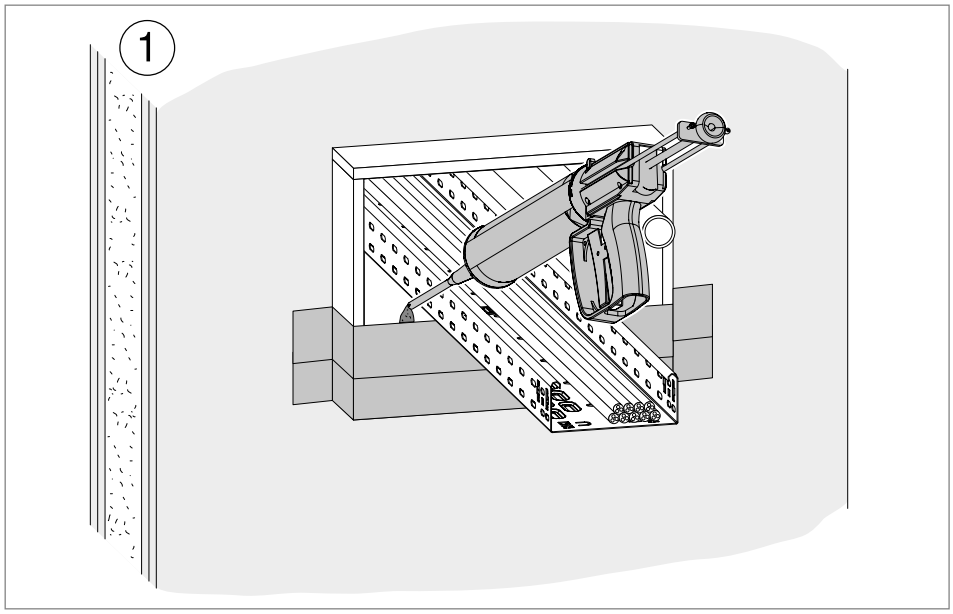

Fig. 16: Applying fire protection foam (e.g. a lightweight partition)

1. Apply the fire protection foam from the back to the front and from the bottom to the top. In so doing, always run the mixer tube tip above the foam, in order to prevent clogging of the tip.

Note! *After work interruptions of longer than approx. 50 seconds, the foam hardens in the mixer, which must then be replaced. Before exchanging mixers, remove any load from the pressing device and carefully exchange the mixer.*

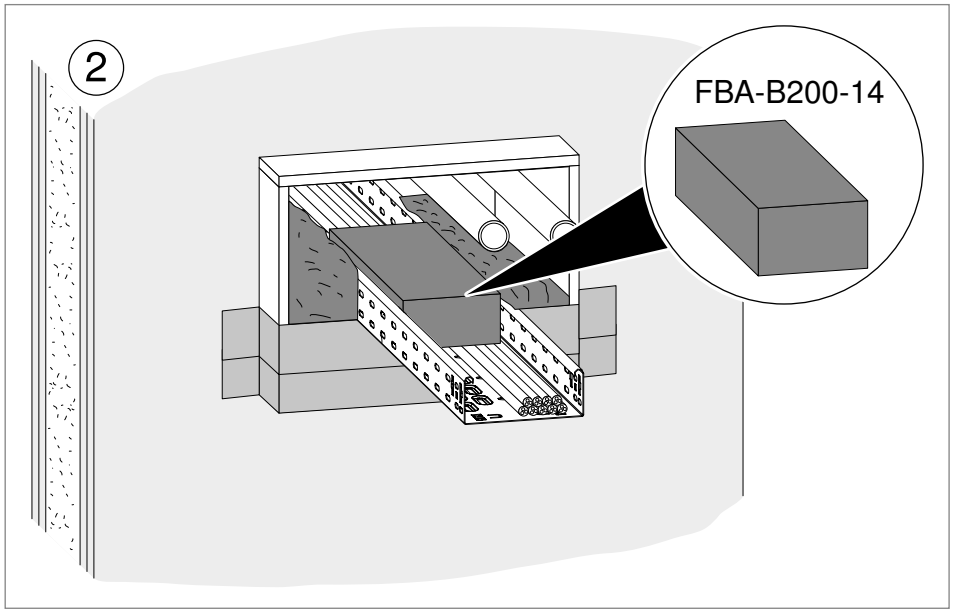

Fig. 17: Inserting foam blocks (e.g. a lightweight partition)

2. With larger openings, insert PYROPLUG® Block foam blocks in unused sections for greater stability. Surround foam blocks and, if applicable, gaps with PYROSIT® NG fire protection foam.

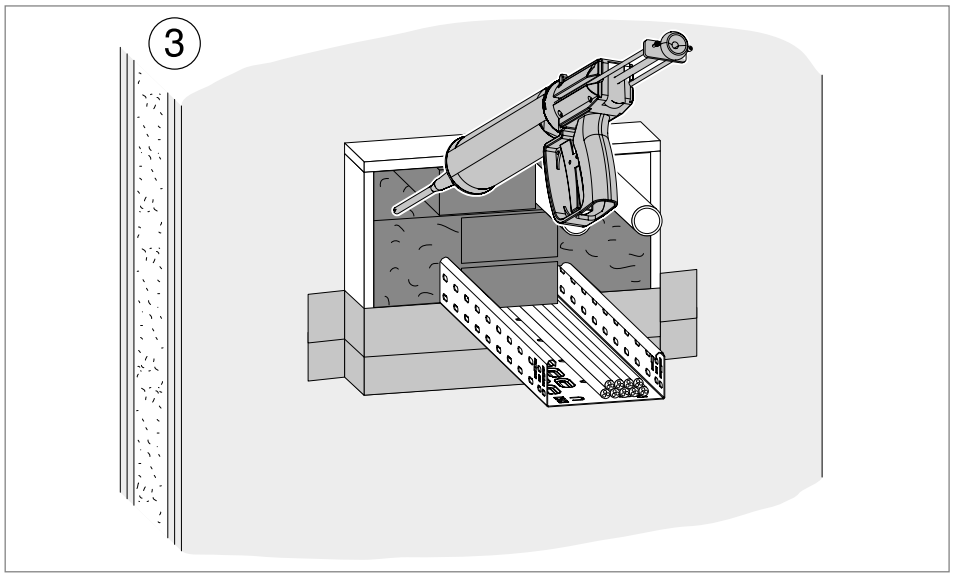

Fig. 18: Sealing the insulation opening (e.g. a lightweight partition)

3. Completely fill the insulation opening with fire protection foam and leave it for a few minutes to harden.

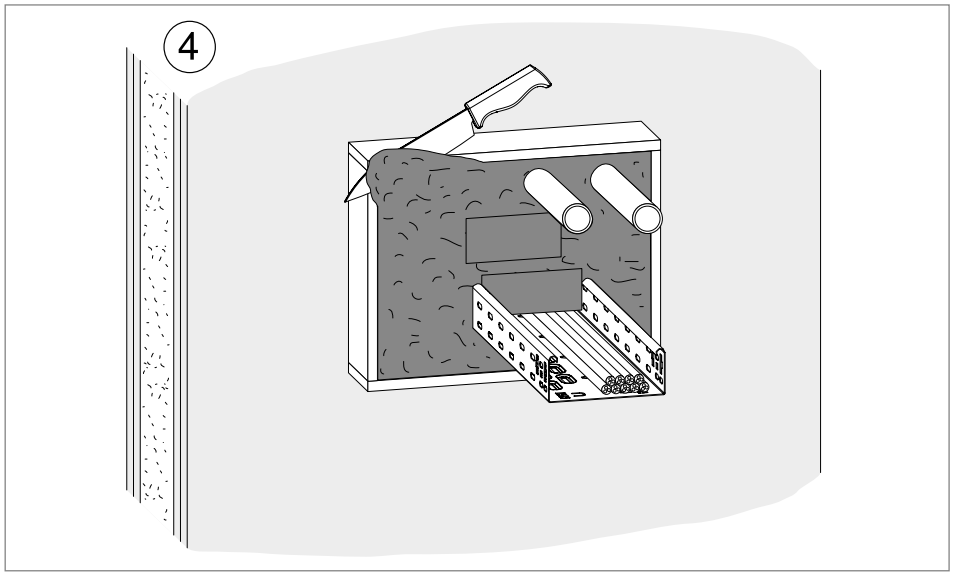

Fig. 19: Removing excess (e.g. a lightweight partition)

4. Remove any excess with a knife.

5. Apply any necessary additional measures, see chapters “10.2 Installing the intumescent coil FBA-WI” on page 43 and “10.3 Applying a bulge of PYROSIT® NG fire protection foam” on page 46.

6. If necessary, secure the insulation to prevent access or removal of the material.

6.8 Attaching the identification plate

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

6.9 Installing cables and pipes at a later time

– Installations can be run through the existing fire insulation at a later time. For this, create sufficiently large openings in the insulation using a cutting/drilling tool taking the necessary protective measures and safety regulations into account.

– Individual cables can simply be pushed through the insulation.

– Refill cavities or gaps around the installations performed at a later time or due to removed cables or pipes with PYROSIT® NG fire protection foam or PYROPLUG® Block foam blocks.

– The installations added at a later time must meet the requirements of the approval and of these mounting instructions.

6.10 Tips and notes

– The insulation system can be installed by one person.

– For optimum cutting of the OBO fire protection products, we recommend using a knife with a serrated blade.

– The insulation system can be coated, papered over or painted over with standard emulsion paint at a later time.

7 Maintaining PYROSIT® NG

PYROSIT® NG fire protection foam is maintenance-free. Nonetheless, we recommend carrying out a visual inspection of the insulation at regular intervals, as part of the inspection of the electrical systems:

1. Check whether all component parts of the insulation are tightly sealed with the PYROSIT® NG fire protection foam.

2. Reseal any gaps with PYROSIT® NG fire protection foam.

8 Disposing of PYROSIT® NG

Observe national laws and regulations for disposal.

During installation

– Dispose of non-empty cartridges as hazardous waste.

– Only dispose of completely emptied cartridges with household waste.

– Dispose of fully cured fire protection foam with household waste.

During building demolition

– Dispose of installed PYROSIT® NG fire protection foam as mixed construction waste.

After a fire

CAUTION

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

If the PYROSIT® NG system has been subjected to a fire, remove and dispose of the complete insulation. During disposal, obtain advice from a local fire damage repair company.

9 Approved installations and installation locations

9.1 General information

– Cable ducts and covers of cable support systems must not be fed through the insulation, but must end before it. Cable trays and ladders may be run through the fire insulation or end before it.

– The total cross-sectional area of the installations, relative to the insulation area, must not be more than 60%.

– The cable support structures (cable trays and ladders) may be made of steel, aluminium or plastic. The essential parts of pipe support structures, supports, suspensions or fastenings must be non-combustible.

– Cable support structures (cable trays and ladders), pipe support structures and their supports, suspensions and fastenings must be fastened on both sides of the fire insulation so that, in case of fire, no additional mechanical load can impact on the fire insulation for the length of the required fire resistance class. In this context, the technical regulations and specifications of the manufacturer of the cable support and pipe fastening systems must be complied with.

– Cables and pipes must be fastened on the cable trays and ladders or in support structures according to the technical rules.

9.2 Minimum component thicknesses and opening sizes

Component	Minimum component thicknesses	Minimum insulation thickness	Maximum opening sizes
Lightweight partition	94 mm	Cable: 100 mm Combination: 144 mm	Cable: 270 x 270 mm or Ø 300 mm Combination: 450 x 500 mm
Solid wall	100 mm		
Solid ceiling	150 mm		Cable: 270 x 270 mm or Ø 300 mm Combination: 450 x 450 mm

Tab. 5: Minimum component thicknesses and opening sizes

9.3 Dimensions for tunings and frames

Component	Tuning	Frame
	GRP boards acc. to EN 520 (Class A2-s1, d0 acc. to EN 13501-1) Silicate, calcium silicate plates (Class A1 acc. to EN 13501-1)	
Lightweight partition	Thickness ≥ 12.5 mm Width ≥ 50 mm	Thickness ≥ 25 mm Depth ≥ insulation thickness
Solid wall		
Solid ceiling		

Tab. 6: Tunings and frames

9.4 Distances between openings

Distance between opening and:	Size of the adjacent openings (width x height in mm)		Distance between the openings (in mm)
Insulation acc. to ETA-11/0527	See Tab. 5 on page 29		≥ 100
Other cable, combined or pipe insulation	One or both openings	> 400 x 400	≥ 200
	Both openings	≤ 400 x 400	≥ 100
Other openings or installed items	One or both openings	> 200 x 200	≥ 200
	Both openings	≤ 200 x 200	≥ 100

Tab. 7: Distances between openings

9.5 Approved installations

9.5.1 Cables, cable bundles, cable support structures

– Jacketed cables (e.g. electrical cables, telecommunication cables, data cables, fibre glass cables) up to an outer diameter of ≤ 80 mm

– Firmly tied cable bundles up to an overall diameter of ≤ 100 mm, outer diameter of the individual cables ≤ 21 mm

– Cables with an outer diameter ≤ 24 mm

– Routing of cables and cable bundles on steel cable sections (perforated or unperforated) or steel cable ladders, optionally coated

Note! *Hollow conductors or coaxial cables with hollow internal conductor/air insulation are not permissible.*

9.5.2 Electrical installation pipes

Note! *Bundles of electrical installation pipes must be wrapped with steel wire (Ø min. 1 mm) on both sides of the insulation at a maximum distance of 200 mm.*

– Individual electrical installation pipes made of steel with an outer diameter ≤ 16 mm (with or without cable assignment)

– Individual electrical installation pipes made of plastic with an outer diameter ≤ 63 mm (with or without cable assignment)

– Bundles with a maximum of three electrical installation pipes made of plastic with a total outer diameter of ≤ 80 mm, outer diameter of the individual electrical installation pipe ≤ 40 mm, with or without cable assignment

– Bundles with a maximum of three electrical installation pipes made of plastic with a total outer diameter of ≤ 100 mm, outer diameter of the individual electrical installation pipe ≤ 63 mm, with or without cable assignment

– Individual “speed pipe®”, with or without fibre glass cables, with the following dimensions:

Pipe type*	External diameter (mm)	Wall thickness (mm)
speed pipe®	7	0.75
		1.5
	10	1.0
		2.0
	12	1.1
		2.0
* From “gabo Systemtechnik GmbH”, 94559 Niederwinkling, Germany		

Tab. 8: Dimensions of speed pipe®

– Bundle of “speed pipe®” with or without fibre glass cables, with overall outer diameter ≤ 80 mm

9.5.3 Non-combustible pipes

Note! *Non-combustible pipes must be run through the insulation opening at a right angle.*

Note! *The specifications for pipe wall thicknesses, insulation materials and thicknesses can be found in the chapter “10.1 Route insulation on non-combustible pipes” on page 41.*

– Non-combustible pipes made of copper with an outer diameter ≤ 88.9 mm

– Non-combustible pipes made of steel, stainless steel or cast iron with an outer diameter ≤ 168.3 mm

– Pre-insulated metal pipes “WICU® Eco”, “WICU® Flex”, “WICU® Frio” or “WICU® Clim” with the following dimensions:

Pipe type*	External diameter (mm)	Wall thick-ness (mm)	Insulation type	Thickness of the insulation (mm)
WICU® Eco	12	1.0	PUR	11.0
	15			11.5
	18			12.0
	22			12.5
	28	1.5		17.5
	35			18.0
	42			24.0
	54	2.0		27.5

Pipe type*	External diameter (mm)	Wall thickness (mm)	Insulation type	Thickness of the insulation (mm)
WICU® Flex	12	1.0	PE	6.0
	15			
	18			
	22			
WICU® Frio	6			8.0
	10			10.0
	12			
	14			
	15			
	16			
	18			
	22			
WICU® Clim	6.35	0.762		6.0
	9.52	0.813		8.0
	12.70			10.0
	15.87	0.889		
	19.05			
	22.22			
* From “KME Germany GmbH & Co. KG”, 49074 Osnabrück, Germany or “Wieland-Werke AG”, 89079 Ulm, Germany				

Tab. 9: Dimensions of the pre-insulated pipes of the brand WICU®

Note! *Pre-insulated pipes of the brand WICU® must be equipped with an intumescent coil. Specifications for installing the coil can be found in the chapter “10.2 Installing the intumescent coil FBA-WI” on page 43.*

– Pre-insulated metal pipes “Tubolit® Split” and “Tubolit® DuoSplit” with the following dimensions:

Pipe type*	External diameter (mm)	Wall thickness (mm)	Insulation type	Thickness of the insulation (mm)
Tubolit® Split or DuoSplit	6.35	0.8	PE	9.0
	9.52			
	12.70			
	15.88	1.0		
	19.05			
	22.22			
* From “Armacell GmbH”, 48153 Münster, Germany				

Tab. 10: Dimensions of the pre-insulated pipes of the brand Tubolit®

9.5.4 Combustible pipes

– Combustible pipes made of PVC-U or PE-HD with the following dimensions:

Material	Pipe diameter		Pipe wall thickness	
	from	to	from	to
PVC-U	-	50 mm	1.8 mm	5.6 mm
PE-HD			2.9 mm	4.6 mm

Tab. 11: Plastic pipe wall thicknesses

– Plastic spiral hoses “SC-SH-16/E30”, “SC-SH-18/E30” and “SC-SH-20/E30” (from “Armacell GmbH”, 48153 Münster, Germany) with outer diameter ≤ 28 mm and wall thickness ≤ 4 mm

9.6 Fire resistance classification acc. to ETA-11/0527

9.6.1 Combination insulation

Installed item		Insulation thickness		
			144 mm	200 mm
Cables/cable support structures	Cables up to Ø 80 mm	Wall	EI 60	EI 90
		Ceiling		
	Cable bundle up to Ø 100 mm Individual cable up to Ø 21 mm	Wall	EI 60	EI 90
		Ceiling		
	Wires up to Ø 24 mm	Wall	EI 45	EI 60
		Ceiling	EI 30	
Electrical installation pipes	Electrical installation pipes made of steel up to Ø 16 mm with/without cables	Wall	EI 60-U/C	EI 90-U/U
		Ceiling		
	Electrical installation pipes made of plastic up to Ø 16 mm with/without cables	Wall	EI 90-U/C	EI 120-U/U
		Ceiling	EI 60-U/C	
	Electrical installation pipes made of plastic up to Ø 40 mm with/without cables	Wall	EI 90-U/C	EI 120-U/C
		Ceiling	EI 60-U/C	EI 120-U/U
	Electrical installation pipe bundle made of plastic up to Ø 80 mm Individual electrical installation pipe up to Ø 40 mm	Wall	EI 90-U/C	EI 120-U/C
		Ceiling	EI 60-U/C	EI 120-U/U
	Electrical installation pipes made of plastic up to Ø 63 mm with/without cables	Wall	EI 120-U/C	EI 120-U/C
		Ceiling	EI 60-U/C	EI 90-U/C
	Electrical installation pipe bundle made of plastic up to Ø 100 mm Individual electrical installation pipe up to Ø 63 mm	Wall	EI 120-U/C	EI 120-U/C
		Ceiling	EI 60-U/C	EI 90-U/C
	speed-pipe® up to Ø 12 mm with/without fibre optic cables	Wall	EI 120-U/C	EI 120-U/C
		Ceiling	EI 60-U/C	EI 90-U/C
	Bundle of speed pipe® up to Ø 80 mm Individual pipe up to Ø 12 mm with/without fibre optic cables	Wall	EI 120-U/C	EI 120-U/C
		Ceiling	EI 60-U/C	EI 90-U/C
Uninsulated metal pipes	Copper pipes up to Ø 28 mm [1]	Wall	EI 60-C/U	EI 90-C/U
		Ceiling		
	Steel pipes up to Ø 35 mm [1]	Wall	EI 90-C/U	EI 90-C/U
		Ceiling	EI 60-C/U	

Installed item		Insulation thickness		
			144 mm	200 mm
Pre-insulated metal pipes	WICU® Frio pipes up to Ø 22 mm [2]	Wall	EI 90-C/U	EI 90-C/U
		Ceiling	EI 60-C/U	
	WICU® Clim pipes up to Ø 22.22 mm [2]	Wall	EI 90-C/U	EI 90-C/U
		Ceiling	EI 60-C/U	
	WICU® Flex pipes up to Ø 22 mm [2]	Wall	EI 90-C/U	EI 90-C/U
		Ceiling	EI 60-C/U	
	WICU® Eco pipes up to Ø 35 mm [2]	Wall	EI 60-C/U	EI 60-C/U
		Ceiling		EI 90-C/U
	Tubolit® Split/DuoSplit pipes up to Ø 12.7 mm	Wall	EI 60-C/U	EI 120-C/U
		Ceiling		
	Tubolit® Split/DuoSplit pipes up to Ø 22.22 mm	Wall	EI 60-C/U	EI 90-C/U
		Ceiling		
Insulated metal pipes	Metal pipes insulated with mineral wool up to Ø 54 mm [1]	Wall	EI 90-C/U	EI 90-C/U
		Ceiling	EI 60-C/U	
	Metal pipes insulated with mineral wool up to Ø 88.9 mm [1]	Wall	EI 90-C/U	EI 90-C/U
		Ceiling	EI 60-C/U	EI 120-C/U
	Steel pipes insulated with mineral wool up to Ø 168.3 mm [1]	Wall	EI 120-C/U	EI 120-C/U
		Ceiling	EI 60-C/U	EI 90-C/U
	Metal pipes insulated with AF/Armaflex (thickness 9 mm) up to Ø 54 mm [1]	Wall	EI 90-C/U	EI 90-C/U
		Ceiling	EI 60-C/U	
	Metal pipes insulated with AF/Armaflex (thickness > 9 mm) up to Ø 88.9 mm [1]	Wall	EI 90-C/U	EI 120-C/U
		Ceiling	EI 60-C/U	
Plastic pipes/hoses	Plastic pipes up to Ø 50 mm	Wall	EI 120-U/C	EI 120-U/U
		Ceiling	EI 60-U/C	
	SC-SH-16/E30, SC-SH-18/E30 and SC-SH-20/E30 up to Ø 28 mm	Wall	EI 60-U/U	EI 60-U/U
		Ceiling		EI 90-U/U
[1] See chapter “10.1 Route insulation on non-combustible pipes” on page 41				
[2] See chapter “10.2 Installing the intumescent coil FBA-WI” on page 43				

Tab. 12: Combination insulation acc. to ETA-11/0527

9.6.2 Cable insulation

Installed item		Insulation thickness				
			100 mm	144 mm	200 mm	250 mm
Cables/cable support structures	Cables up to Ø 21 mm	Wall	EI 60	EI 120	EI 120	EI 120
		Ceiling		EI 90		
	Cables up to Ø 50 mm	Wall	EI 45	EI 60	EI 90 EI 120 [2]	EI 120
		Ceiling	EI 60 [3]			
	Cables up to Ø 80 mm	Wall	-	EI 60	EI 90 EI 120 [2]	EI 90
		Ceiling				
	Cable bundle up to Ø 100 mm Individual cable up to Ø 21 mm	Wall	-	EI 60	EI 90	EI 90
		Ceiling			EI 90 EI 120 [2]	EI 120
	Wires up to Ø 24 mm	Wall	-	EI 45	EI 90	EI 90
		Ceiling		EI 30	EI 60	EI 60
Electrical installation pipes	Electrical installation pipes made of steel up to Ø 16 mm with/without cables	Wall	-	EI 60-U/C	EI 120-U/U	EI 120-U/U
		Ceiling			EI 90-U/U	
	Electrical installation pipes made of plastic up to Ø 16 mm with/without cables	Wall	-	EI 120-U/C	EI 120-U/U	EI 120-U/U
		Ceiling				
	Electrical installation pipes made of plastic up to Ø 40 mm with/without cables	Wall	-	EI 120-U/C	EI 120-U/C	EI 120-U/C
		Ceiling			EI 120-U/U	EI 120-U/U
	Electrical installation pipe bundle made of plastic up to Ø 80 mm Individual electrical installation pipe up to Ø 40 mm with/without cables	Wall	-	EI 120-U/C	EI 120-U/C	EI 120-U/C
		Ceiling			EI 120-U/U	EI 120-U/U
	Electrical installation pipes made of plastic up to Ø 63 mm with/without cables	Wall	-	EI 120-U/C	EI 120-U/C	EI 120-U/C
		Ceiling		EI 90-U/C	EI 90-U/C	EI 90-U/C
	Electrical installation pipe bundle made of plastic up to Ø 100 mm Individual electrical installation pipe up to Ø 63 mm with/without cables	Wall	-	EI 120-U/C	EI 120-U/C	EI 120-U/C
		Ceiling		EI 90-U/C	EI 90-U/C	EI 90-U/C
	speed-pipe® up to Ø 12 mm with/without fibre optic cables	Wall	-	EI 120-U/C	EI 120-U/C	EI 120-U/C
		Ceiling		EI 90-U/C	EI 90-U/C	EI 90-U/C
	Bundle of speed pipe® up to Ø 80 mm Individual pipe up to Ø 12 mm with/without fibre optic cables	Wall	-	EI 120-U/C	EI 120-U/C	EI 120-U/C
		Ceiling		EI 90-U/C	EI 90-U/C	EI 90-U/C

[2] See chapter “10.2 Installing the intumescent coil FBA-WI” on page 43

[3] See chapter “10.3 Applying a bulge of PYROSIT® NG fire protection foam” on page 46

Tab. 13: Cable insulation acc. to ETA-11/0527

9.7 Minimum distances to the component side and between installations

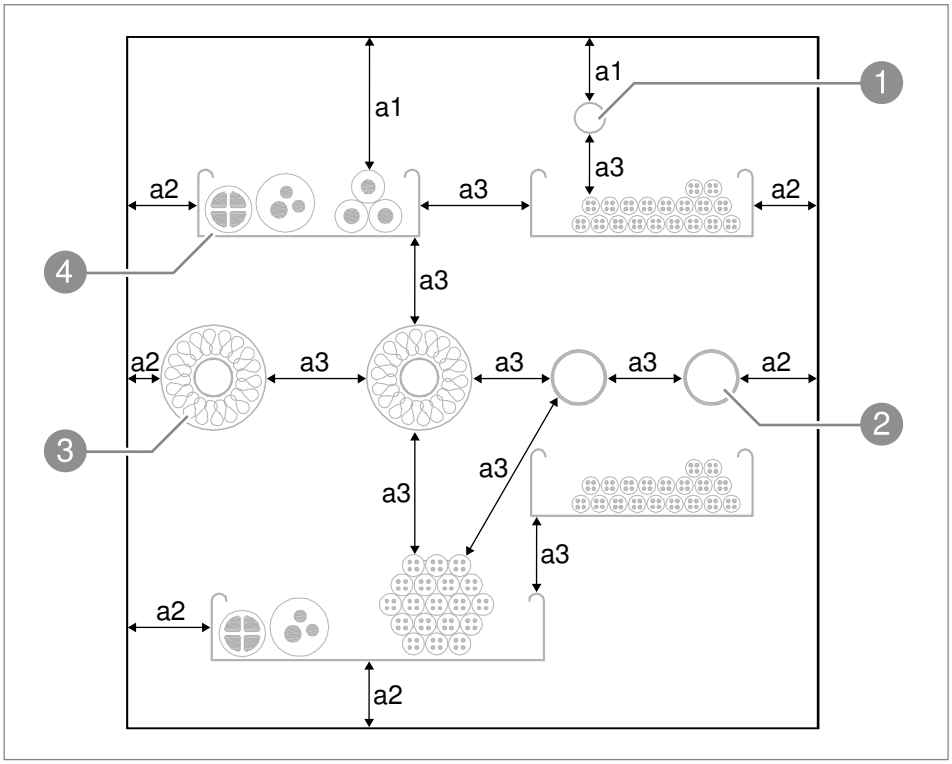

Fig. 20: Minimum distances to the component side and between installations

1 Uninsulated, non-combustible pipes

2 Combustible pipes

3 Insulated, non-combustible pipes

4 Cables/cable support structure/electrical installation pipes

a1: Distance from the installation to the upper component side of the insulation

a2: Distance from the installation to the lower or side component side of the insulation

a3: Distance between installations

Installations	a1	a2	a3	
Cable Cable support structures Electrical installation pipes	50 mm	0 mm	Cable	0 mm
			Electrical installation pipes	0 mm
			Cable support structures (next to each other)	0 mm
			Cable support structures (on top of one another)	50 mm
			Uninsulated metal pipes	60 mm
			Other installations	50 mm
speed pipe®	0 mm	0 mm	Cable	0 mm
			Electrical installation pipes	0 mm
			Cable support structures (next to each other)	0 mm
			Cable support structures (on top of one another)	50 mm
			Uninsulated metal pipes	60 mm
			Other installations	50 mm
Metal pipes, insulated with mineral wool	0 mm	0 mm	Metal pipes, insulated with mineral wool	0 mm
			Uninsulated metal pipes	60 mm
			Other installations	50 mm
Metal pipes, insulated with AF/Armaflex	35 mm	35 mm	Metal pipes, insulated with AF/Armaflex (d = 9 mm)	50 mm
			Metal pipes, insulated with AF/Armaflex (d ≥ 9 mm)	35 mm
			Uninsulated metal pipes	60 mm
			Other installations	50 mm
Uninsulated metal pipes	35 mm	35 mm	All installations	60 mm
Pre-insulated metal pipes	0 mm	0 mm	Pre-insulated metal pipes	0 mm
			Uninsulated metal pipes	60 mm
			Other installations	50 mm
Combustible pipes	50 mm	50 mm	Combustible pipes	50 mm
			Uninsulated metal pipes	60 mm
			Other installations	50 mm

Tab. 14: Minimum distances to the component side and between installations

9.8 First support of installations

– The essential parts of the support must not be combustible.

– Mount the first support of cables, cable support structures and electrical installation pipes at a max. distance of 200 mm before the insulation.

– Mount the first support of pipes (combustible and non-combustible) at a max. distance of 750 mm (for wall installation) or 1,200 mm (for ceiling installation) before the insulation.

– The following fastenings can serve as support, for example:

  – Metal screw-in spacer clips

  – Pendulum suspensions with mounting rails and threaded rods

  – Wall bracket and mounting rail constructions

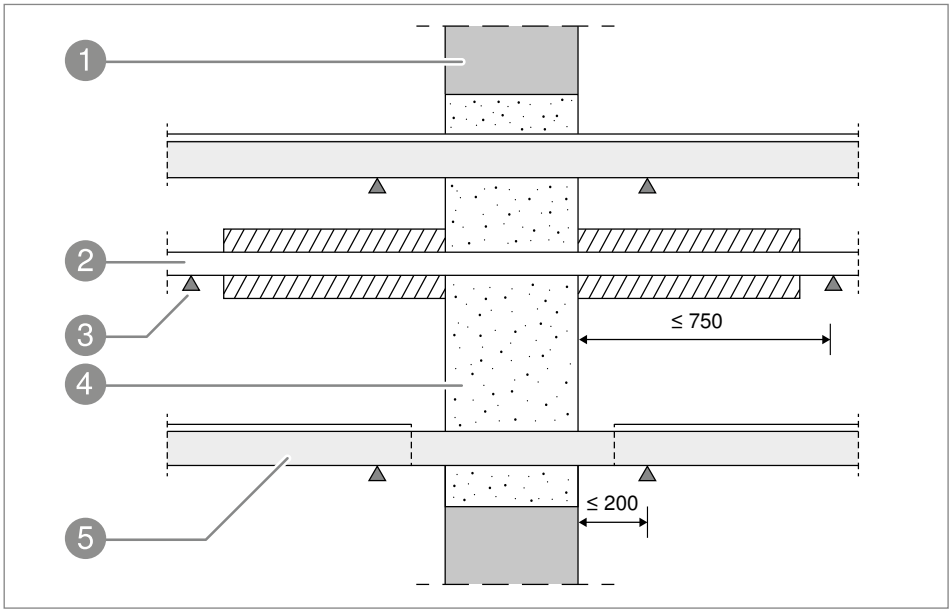

Fig. 21: Support of installations in walls

1 Wall

2 Pipes

3 First support of the installations

4 PYROSIT® NG fire protection foam

5 Cables/cable support structures/electrical installation pipes

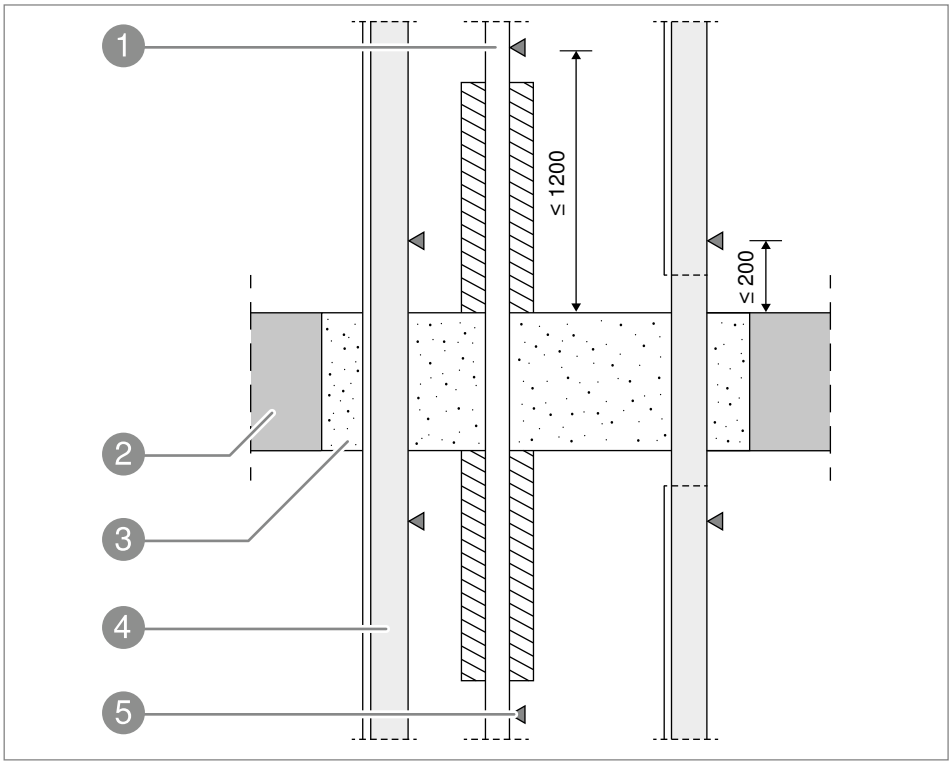

Fig. 22: Support of installations in ceilings

1 Pipes

2 Ceiling

3 PYROSIT® NG fire protection foam

4 Cables/cable support structures/electrical installation pipes

5 First support of the installations

10 Necessary additional measures

10.1 Route insulation on non-combustible pipes

– Route insulation can optionally be made of mineral wool lining, mineral wool mats or AF/Armaflex.

– Route insulation of mineral wool can additionally be jacketed with sheet steel (0.4–1.0 mm thickness) or plastic (0.35–1.0 mm thickness).

– Continuous route insulation of AF/Armaflex must be installed before mounting the insulation material. Mineral wool insulation interrupted in the insulation area can also be installed after mounting the insulation material.

– Metal pipes with a diameter > 28 mm (made of copper) or > 35 mm (made of steel, stainless steel or cast iron) must be equipped with path insulation.

– If metal pipes > 28 mm (made of copper) or > 35 mm (made of steel, stainless steel or cast iron) are not insulated or are equipped with insulation that is not permissible, this insulation must be installed or replaced in the insulation area.

– Route insulation must comply with the following specifications and figures:

<table>
<tr><th rowspan="3">Insulation type</th><th colspan="8">Non-combustible pipes made of copper*</th></tr>
<tr><th colspan="2">Pipe diameter</th><th colspan="2">Pipe wall thickness</th><th colspan="2">Thickness of the insulation</th><th rowspan="2">Length of the insulation L</th><th rowspan="2">Continuous</th><th rowspan="2">Inter-rupted</th></tr>
<tr><th>from</th><th>to</th><th>from</th><th>to</th><th>from</th><th>to</th></tr>
<tr><td>Without insulation (optionally)</td><td>-</td><td>≤ 28</td><td>1.0</td><td>14.2</td><td colspan="2">-</td><td>-</td><td>-</td><td>-</td></tr>
<tr><td rowspan="3">Mineral wool</td><td>> 28</td><td>≤ 35</td><td>1.0</td><td rowspan="3">14.2</td><td colspan="2" rowspan="3">≥ 30</td><td>Insulation thickness ≥ 144: on both sides ≥ 428
Insulation thickness ≥ 200: on both sides ≥ 650</td><td rowspan="2">✓</td><td rowspan="2">✓</td></tr>
<tr><td>> 35</td><td>≤ 54</td><td rowspan="2">2.0</td></tr>
<tr><td>> 54</td><td>≤ 88.9</td><td>Insulation thickness ≥ 144: on both sides ≥ 528
Insulation thickness ≥ 200: on both sides ≥ 800</td></tr>
<tr><td rowspan="4">Flexible elastomer foam</td><td>-</td><td>≤ 35</td><td>1.0</td><td rowspan="4">14.2</td><td rowspan="3">≥ 9</td><td>35</td><td rowspan="4">On both sides ≥ 650</td><td rowspan="4">✓</td><td rowspan="4">–</td></tr>
<tr><td>> 35</td><td>≤ 42</td><td>1.5</td><td>36.5</td></tr>
<tr><td>> 42</td><td>≤ 54</td><td rowspan="2">2.0</td><td>38</td></tr>
<tr><td>> 54</td><td>≤ 88.9</td><td colspan="2">41.5</td></tr>
</table>

Tab. 15: Insulation materials and thicknesses for copper pipes (in mm)

* The values for copper pipes can also be applied to pipes made of steel, stainless steel or cast iron.

Insulation type	Non-combustible pipes made of steel, stainless steel or cast iron							
	Pipe diameter		Pipe wall thickness		Thickness of the insulation	Length of the insulation L	Continuous	Inter-rupted
	from	to	from	to				
Without insulation (optionally)	-	≤ 35	2.6	3.6	-	-	-	-
Mineral wool	> 35	≤ 168.3	3.6	14.2	≥ 50	On both sides ≥ 596 mm	✓	✓

Tab. 16: Insulation materials and thicknesses for pipes made of steel, stainless steel and cast iron (in mm)

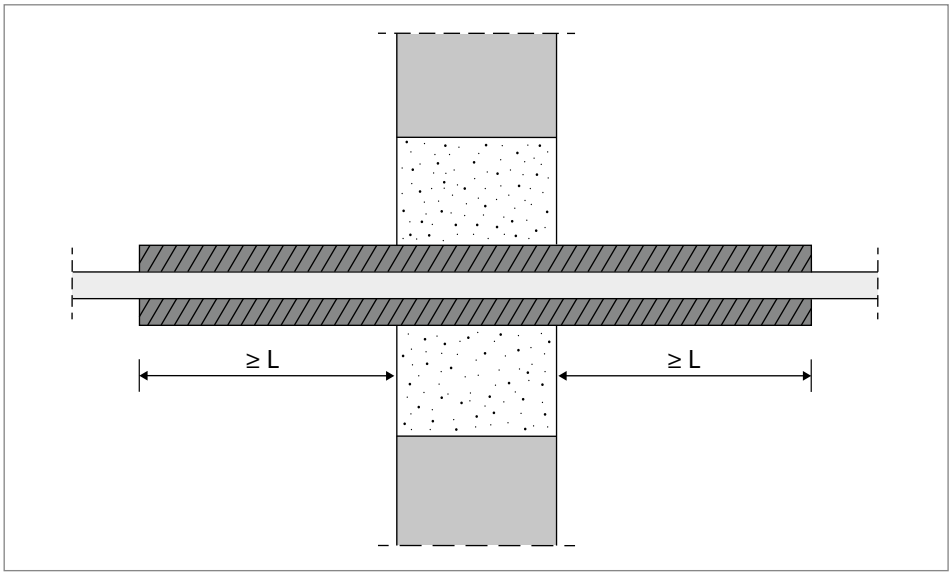

Fig. 23: Metal pipe with continuous insulation

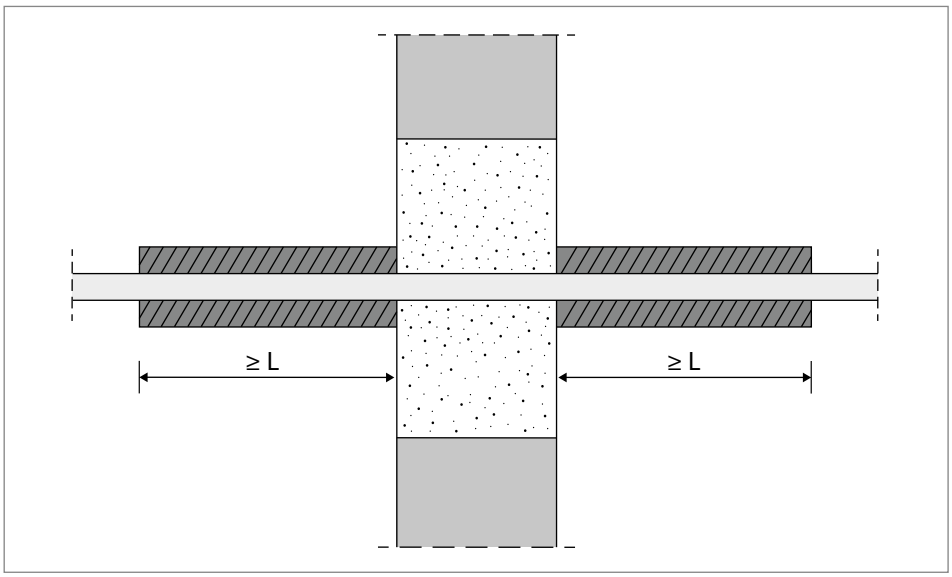

Fig. 24: Metal pipe with interrupted insulation

10.2 Installing the intumescent coil FBA-WI

When installing insulation according to ETA-11/0527, for some installations, it is necessary to install intumescent coil FBA-WI to achieve the required fire resistance class.

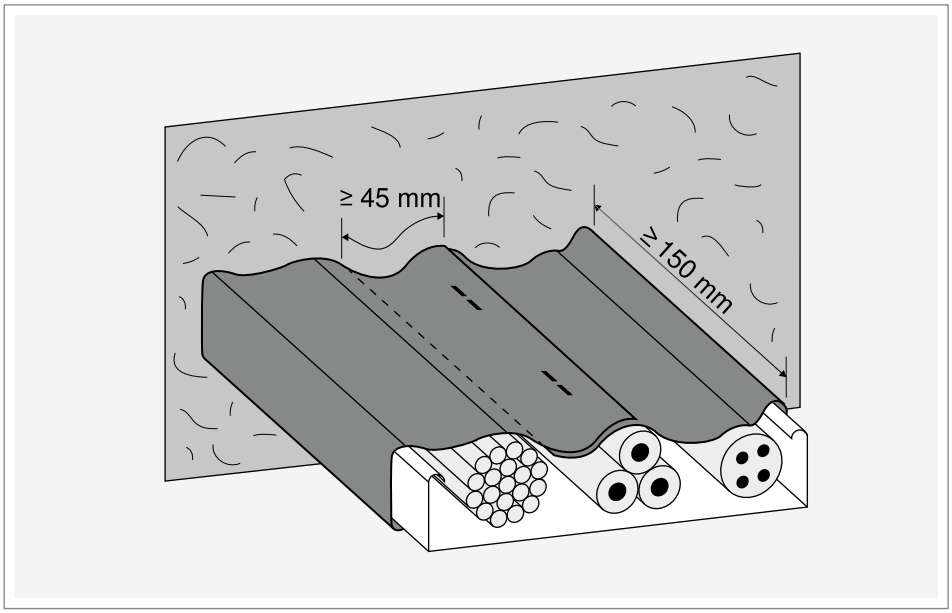

Fig. 25: Installing the intumescent coil FBA-WI

1. Wind intumescent coil FBA-WI around the installation routed through the insulation at a length of at least 150 mm. The glass fibre must be on the outside.

2. Overlap the ends of the coil at least 45 mm and connect them with two steel clamps or steel wire.

10.2.1 Intumescent coil in cable insulation

To achieve fire resistance class EI 120 in cable insulation, install intumescent coil in the following cases:

Cable insulation			
Insulation thickness	**Installations**	**Penetration location**	**Attachment**
200–250 mm	Cable with outer diameter 21 mm to 80 mm	Wall/ceiling	On both sides of the insulation
	Cable bundles up to Ø 100 mm, filled with individual cables to Ø 21 mm	Ceiling	

Tab. 17: Installing the intumescent coil in cable insulation

10.2.2 Intumescent coil in combination insulation

The following table indicates the method for installing the intumescent coil on the pre-insulated metal pipes, types WICU® Flex, Frio, Clim and Eco, in combination insulation:

Combination insulation		
Penetration location	**WICU® pipe type**	**Attachment**
Wall	Flex	On both sides of the insulation
	Frio	
	Clim	
	Eco	
Ceiling	Flex	On the upper side of the insulation
	Frio	
	Clim	
	Eco	On both sides of the insulation

Tab. 18: Installing the intumescent coil in combination insulation

Two pre-insulated metal pipes, types WICU® Flex, Frio or Clim, may be equipped with a joint intumescent coil FBA-WI at a distance of 0 mm.

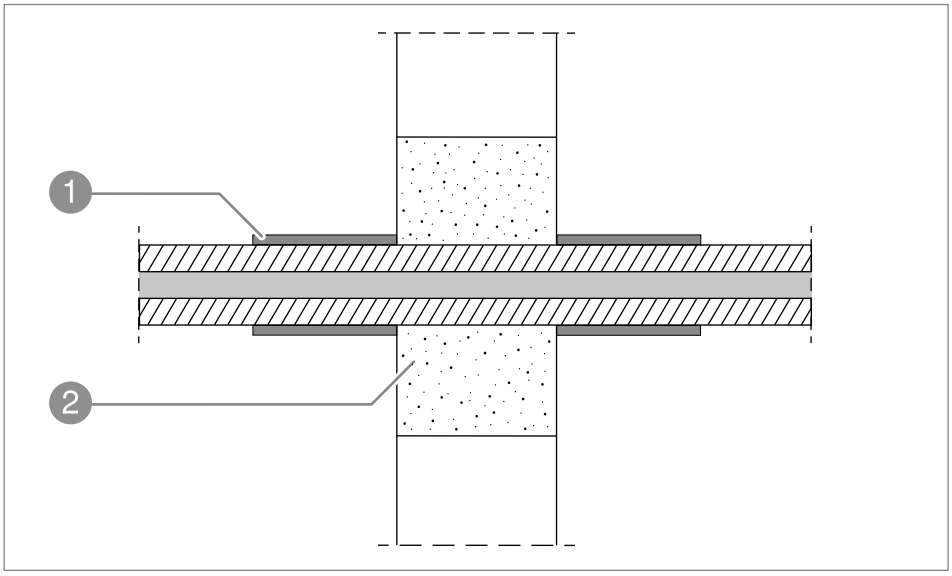

Fig. 26: Coil with wall penetration

1 1 Cable coil FBA-WI

2 1 PYROSIT® NG fire protection foam

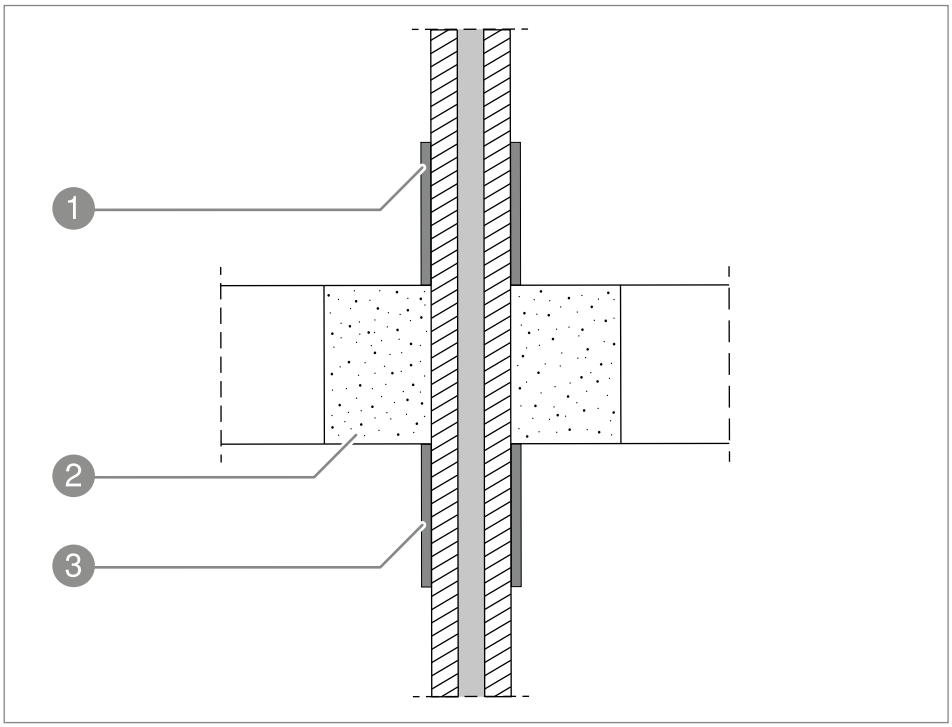

Fig. 27: Coil with ceiling penetration

1 1 Cable coil FBA-WI

2 1 PYROSIT® NG fire protection foam

3 1 Cable coil FBA-WI (with metal pipe WICU® Eco)

10.3 Applying a bulge of PYROSIT® NG fire protection foam

To achieve fire resistance class EI 60, a bulge of PYROSIT® NG fire protection foam must be applied around the installations when pushing cables with a diameter of Ø 21–50 mm through cable insulation with an insulation thickness of 100–144 mm.

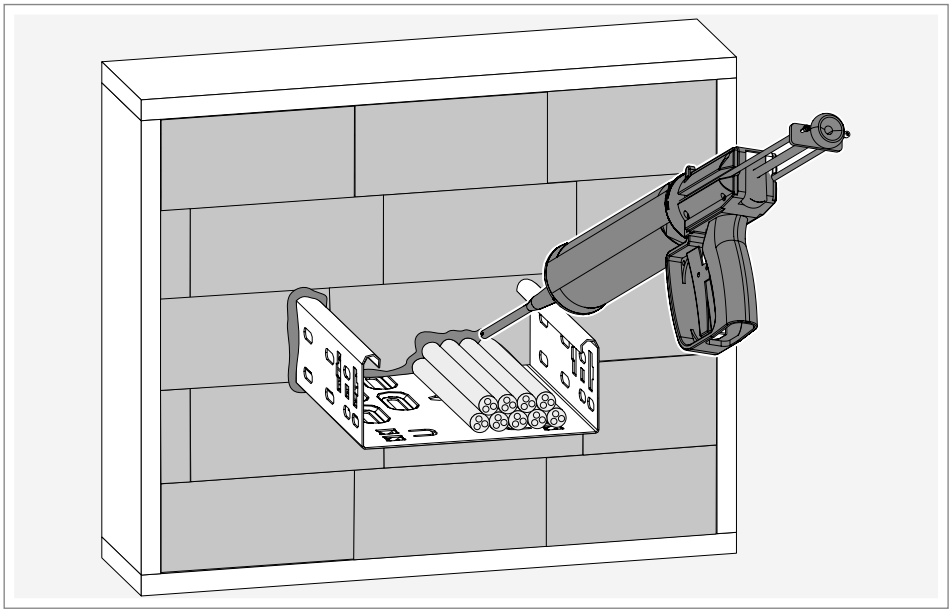

Fig. 28: Applying a bulge of fire protection foam

Apply the bulge around the installations on both sides of the insulation with dimensions of at least 30 mm length and 20 mm thickness.

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 “PYROSIT® NG fire protection foam”, fire resistance classes up to EI 120 according to EN 1366-3, European approval number of the OIB: ETA-11/0527 for installation in walls and ceilings up to a fire resistance class of 120 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 (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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