protect your values

PYRO-SAFE Novasit BM

Installation instructions

Mixed penetration sealing system made of special mortar for electrical cables and lines of all types, electrical installation pipes, combustible/non-combustible pipes and further services.
Fire resistance class maximum EI 120 compliant with EN 13501-2 in accordance with ETA-16/0132.

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1. Preliminary remarks / Overview

1.1 Target group

• The installation instructions are intended solely for personnel trained in fire protection.

1.1 Use of the instructions

• Read through these installation instructions entirety before beginning work. Pay particular attention to the following safety instructions.
• The authorisation holder assumes no liability for damage caused by failure to comply with these instructions.
• Figures appear as examples only. Your installation results may differ in appearance.

1.1 Safety instructions

Refer to the safety data sheets when processing the fire protection compound PYRO-SAFE NOVASIT BM

Personal protective equipment:

Breathing protection – Dust mask
If the exposure limit values are exceeded (e.g. can happen when mixing), use particle-filtering half mask FFP 1 (white).

Hand protection – Protective gloves
Wear waterproof, abrasion- and alkali-resistant nitrile gloves.

Eye protection – Wear safety goggles.

Body protection – Wear protective clothing.

Safety instructions for the installation of floor penetration seals:

• The area underneath the floor penetration seal must be cordoned off against entry (warning cordoning tape and sign) during the mortaring and during the curing time (28 days): Warning against possible falling objects, do not enter area, mortaring work in floor component openings!

• The contractor for the manufacture of floor penetration seals must inform the client in writing (for sending to the constructors or duly appointed representative) that, after the manufacture of the fire penetration seals in floors, they must be secured on site against loading by suitable measures (e.g. by a safety fence or by covering by means of a grating), in particular against being entered.

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1.2 Scope

The PYRO-SAFE Novasit BM mixed penetration sealing system with mortar in wall and floor openings with PYRO-SAFE NOVASIT BM belong to the “mortar” product type in accordance with ETAG 026-2 and is assessed and evaluated accordingly. The fire protection mortar PYRO-SAFE NOVASIT BM is classified as a product for use in penetration seals in accordance with ETA-16/0132.

Reaction to fire

PYRO-SAFE NOVASIT BM is classified as A1 in accordance with EN 13501-1.

Fire resistance

PYRO-SAFE Novasit BM complies with requirements of class EI 120 for cables, EI 120-U/U resp. EI 120-U/C for plastic pipes and EI 120-C/U for metal pipes in accordance with EN 13501-2.
The pipe end configuration -U/U covers also all other possible endings (C/U, U/C und C/C) in accordance with EN 13501-2.
The pipe end configuration -U/C also covers the configuration -C/C in accordance with EN 13501-2. The -U/C configuration is also valid for -C/U and -C/C in accordance with EN 13501-2.
When installed in walls or floors with a lower fire resistance duration, the fire resistance duration of the penetration seal is also reduced to that of the fire resistance class of the wall or floor.

Release of dangerous substances

None

Durability and serviceability

The fire protection mortar „PYRO-SAFE NOVASIT BM“ fulfils the type Z 2 in accordance with EOTA TR 024.
PYRO-SAFE Novasit BM can be subjected to the conditions of inside rooms with and without exposure to moisture, without substantial changes to the fire protection characteristics being expected.

1.2 Structural elements

Solid walls

made of masonry, concrete, reinforced concrete, porous concrete, ceramic bricks, hollow bricks or air bricks with a density ≥ 600 kg/m³. The walls must be correspondingly rated for the required fire resistance class in accordance with EN 13501-2.

Solid floors

made of concrete, reinforced concrete with a density of ≥ 1700 kg/m³. The walls must be correspondingly rated for the required fire resistance class in accordance with EN 13501-2.

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1.3 Fire resistance classes for wall and floor partition

Fire resistance classes

	Measures	Wall		Floor	
		Fire resistance class	Source*	Fire resistance class	Source*
Cables, cable bundles and cable trays without protective measures					
Cables Ø ≤ 32 mm	-	**EI 120**	1, 2, 5	**EI 120**	3, 5
Single-core-non-sheathed cables (Wires, Ø ≤ 24 mm)	-	**EI 120**	1	**EI 120**	1
Cable bundles Ø ≤ 60 mm	-	**EI 120**	1	**EI 120**	1
Cable bundles Ø ≤ 100 mm	-	**EI 90 / E 120**	2	**EI 60 / E 120**	3
Cables, cable bundles and cable trays with 240 mm seal thickness					
Cables Ø ≤ 50 mm	240 mm seal thickness	**EI 120**	1	**EI 90 / E 120**	1
Cables Ø ≤ 80 mm	240 mm seal thickness	**EI 90 / E 120**	1	**EI 90 / E 120**	1
Cable bundles Ø ≤ 100 mm	240 mm seal thickness	**EI 120**	1	**EI 120**	1
Cables, cable bundles and cable trays with fire protection wrap „PYRO-SAFE DG-CR 1.5“					
Cables Ø ≤ 50 mm	2x 2-layer, 125 mm	**EI 120**	5	**EI 120**	5
Cables Ø ≤ 80 mm	2x 2-layer, 125 mm	**EI 90 / E 120**	5	**EI 120**	5
	2x 2-layer, 150 mm	**EI 120**	5	**EI 120**	5
Cable bundles Ø ≤ 100 mm	2x 1-layer, 125 mm	**EI 120**	1, 2, 5	**EI 120**	1, 3, 5
Electrical installation conduit (conduit) with fire protection wrap „PYRO-SAFE DG-CR 1.5“ – Wrap width 125 mm					
Conduits Ø ≤ 32 mm	2x 1-layer	**EI 120 U/U**	5	**EI 120 U/U**	5
Conduits Ø ≤ 63 mm	2x 2-layer	**EI 120 U/U**	5	**EI 120 U/U**	5
Conduits Ø ≤ 100 mm	2x 3-layer + lamella mat ≥ 500 mm x ≥ 30 mm	-		**EI 120 U/U**	5
Conduit-bundles Ø ≤ 100 mm (single conduits Ø ≤ 32 mm)	2x 2-layer	**EI 120 U/U**	5	**EI 120 U/U**	5
Electrical installation conduit (conduit) with non-combustible insulation made of mineral-fibre „lamella mat“					
Conduits Ø ≤ 63 mm	Lamella mat ≥ 500 mm x ≥ 30 mm	**EI 120 U/U**	5	**EI 120 U/U**	5
“speed pipe“ single or bundled, with or w/o glass fibre or micro cable; with fire protection wrap “PYRO-SAFE DG-CR 1.5“ – Wrap width 125 mm					
max. 24 pcs.; outside pipe-Ø ≤ 7 mm max. 7 pcs.; outside pipe-Ø ≤ 10 mm max. 5 pcs.; outside pipe-Ø ≤ 12 mm	Wall 2x, Floor 1x 1-layer	**EI 120 U/U**	1	**EI 120 U/U**	1
Non-combustible pipes made of copper with non-combustible insulation made of mineral-fibre „lamella mat”					
Outside pipe-Ø ≤ 15,0 mm	≥ 250 mm x ≥ 20 mm	**EI 120 C/U**	1	**EI 120 C/U**	1
Outside pipe-Ø ≤ 28,0 mm	≥ 500 mm x ≥ 20 mm	**EI 120 C/U**	1	**EI 120 C/U**	1
Outside pipe-Ø ≤ 42,0 mm	≥ 500 mm x ≥ 30 mm	**EI 120 C/U**	1	**EI 120 C/U**	1
Outside pipe-Ø ≤ 54,0 mm	≥ 500 mm x ≥ 40 mm	**EI 120 C/U**	1	**EI 120 C/U**	1
Outside pipe-Ø ≤ 88,9 mm	≥ 750 mm x ≥ 60 mm	**EI 120 C/U**	1	**EI 120 C/U**	1
Non-combustible pipes made of steel, stainless steel or cast iron with non-combustible insulation made of mineral-fibre „lamella mat”					
Outside pipe-Ø ≤ 15,0 mm	≥ 250 mm x ≥ 20 mm	**EI 120 C/U**	1	**EI 120 C/U**	1
Outside pipe-Ø ≤ 28,0 mm	≥ 500 mm x ≥ 20 mm	**EI 120 C/U**	1	**EI 120 C/U**	1
Outside pipe-Ø ≤ 42,0 mm	≥ 500 mm x ≥ 30 mm	**EI 120 C/U**	1	**EI 120 C/U**	1
Outside pipe-Ø ≤ 114,3 mm	≥ 500 mm x ≥ 40 mm	**EI 120 C/U**	1	**EI 120 C/U**	1
Outside pipe-Ø ≤ 168,3 mm	≥ 1000 mm x ≥ 40 mm	**EI 120 C/U**	1	**EI 120 C/U**	1
Outside pipe-Ø ≤ 323,9 mm	≥ 1000 mm x ≥ 40 mm + lamella mat ≥ 500 mm x ≥ 30 mm	**EI 120 C/U**	1	**EI 120 C/U**	1

*Classification report No.: 1 → 1883.1./14/Z00NP, 2 → KB 3.2/11-104-1, 3 → KB 3.2/11-103-1, 4 → 01883.2/14/Z00NP, 5 → 02761.3/16/Z00NP

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1.3 Fire resistance classes for wall and floor partition

Fire resistance classes

	Measures	Wall		Floor	
		Fire resistance class	Source*	Fire resistance class	Source*
Non-combustible pipes made of copper with non-combustible insulation „Conlit 150U“					
Outside pipe-Ø ≤ 15,0 mm	≥ 250 mm x ≥ 22,5 mm	EI 120 C/U	1	EI 120 C/U	1
Outside pipe-Ø ≤ 28,0 mm	≥ 500 mm x ≥ 26 mm	EI 120 C/U	1	-	1
Outside pipe-Ø ≤ 42,0 mm	≥ 500 mm x ≥ 19 mm	-	1	EI 120 C/U	1
Outside pipe-Ø ≤ 54,0 mm	≥ 500 mm x ≥ 38 mm	EI 120 C/U	1	EI 120 C/U	1
Outside pipe-Ø ≤ 108,0 mm	≥ 1000 mm x ≥ 36 mm	EI 120 C/U	1	EI 120 C/U	1
Non-combustible pipes made of steel, stainless steel or cast iron with non-combustible insulation „Conlit 150U“					
Outside pipe-Ø ≤ 15,0 mm	≥ 250 mm x ≥ 22,5 mm	EI 120 C/U	1	EI 120 C/U	1
Outside pipe-Ø ≤ 28,0 mm	≥ 500 mm x ≥ 26 mm	EI 120 C/U	1	EI 120 C/U	1
Outside pipe-Ø ≤ 42,0 mm	≥ 500 mm x ≥ 19 mm	-	-	EI 120 C/U	1
Outside pipe-Ø ≤ 54,0 mm	≥ 500 mm x ≥ 38 mm	EI 120 C/U	1	EI 120 C/U	1
Outside pipe-Ø ≤ 114,3 mm	≥ 750 mm x ≥ 33 mm	EI 120 C/U	1	EI 120 C/U	1
Outside pipe-Ø ≤ 168,3 mm	≥ 1000 mm x ≥ 40 mm	EI 120 C/U	1	EI 120 C/U	1
Outside pipe-Ø ≤ 219,1 mm	≥ 1000 mm x ≥ 40 mm + lamella mat ≥ 500 mm x ≥ 40 mm	EI 120 C/U	1	EI 120 C/U	1
Outside pipe-Ø ≤ 323,9 mm	≥ 1000 mm x ≥ 40 mm + lamella mat ≥ 500 mm x ≥ 40 mm	EI 120 C/U	1	EI 90 / E 120 C/U	1
Non-combustible pipes made of copper with combustible insulation „Armaflex Protect“					
Outside pipe-Ø ≤ 28,0 mm	≥ 250 mm x 25 mm	EI 120 C/U	1	EI 120 C/U	1
	≥ 500 mm x 26 mm - 51 mm	EI 120 C/U	1	EI 120 C/U	1
Outside pipe-Ø ≤ 88,9 mm	≥ 500 mm x 25 mm	EI 120 C/U	1	EI 120 C/U	1
	≥ 1000 mm x 26 mm - 51 mm	EI 120 C/U	1	EI 120 C/U	1
Outside pipe-Ø ≤ 108,0 mm	≥ 1000 mm x 26 mm - 52 mm + lamella mat ≥ 500 mm x ≥ 40 mm	EI 120 C/U	1	EI 120 C/U	1
Non-combustible pipes made of steel, stainless steel or cast iron with combustible insulation „Armaflex Protect“					
Outside pipe-Ø ≤ 28,0 mm	≥ 250 mm x 25 mm	EI 120 C/U	1	EI 120 C/U	1
	≥ 500 mm x 26 mm - 51 mm	EI 120 C/U	1	EI 120 C/U	1
Outside pipe-Ø ≤ 88,9 mm	≥ 500 mm x 25 mm	EI 120 C/U	1	EI 120 C/U	1
	≥ 1000 mm x 26 mm - 51 mm	EI 120 C/U	1	EI 120 C/U	1
Outside pipe-Ø ≤ 170,0 mm	≥ 1000 mm x 52 mm	EI 120 C/U	1	-	-
	≥ 1000 mm x 26 mm - 52 mm + lamella mat ≥ 500 mm x ≥ 40 mm	EI 120 C/U	1	EI 120 C/U	1
Non-combustible pipes made of copper with combustible insulation „NH/Armaflex“ with fire protection wrap „PYRO-SAFE DG-CR 1.5“ – Wrap width 125 mm					
Outside pipe-Ø ≤ 54,0 mm / 76,0 mm (Decke)	2x 2-layer	EI 120 C/U	5	EI 120 C/U	5
Outside pipe-Ø ≤ 88,9 mm	2x 2-layer + lamella mat ≥ 500 mm x ≥ 40 mm	EI 120 C/U	5	EI 120 C/U	5
Outside pipe-Ø ≤ 108,0 mm	2x 2-layer + lamella mat ≥ 750 mm x ≥ 40 mm	EI 120 C/U	5	EI 120 C/U	5
Non-combustible pipes made of steel, stainless steel or cast iron with combustible insulation „NH/Armaflex“ with fire protection wrap „PYRO-SAFE DG-CR 1.5“ – Wrap width 125 mm					
Outside pipe-Ø ≤ 168,3 mm	2x 2-layer + lamella mat ≥ 500 mm x ≥ 40 mm	EI 120 C/U	5	EI 120 C/U	5

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1.3 Fire resistance classes for wall and floor partition

Fire resistance classes

	Measures	Wall		Floor	
		Fire resistance class	Source*	Fire resistance class	Source*
Multilayer pipes „HENCO pipes“ with non-combustible insulation made of mineral-fibre „lamella mat”					
Outside pipe-Ø ≤ 12,0 mm, wall thickness 1,6 mm	Lamella mat ≥ 250 mm x ≥ 20 mm	**EI 120 U/C**	5	**EI 120 U/C**	5
Outside pipe-Ø ≤ 32,0 mm, wall thickness 3,0 mm		**EI 120 U/C**	5	**EI 120 U/C**	5
Outside pipe-Ø ≤ 63,0 mm, wall thickness 4,5 mm	Lamella mat ≥ 250 mm x ≥ 30 mm	**EI 120 U/C**	5	**EI 120 U/C**	5
Multilayer pipes „HENCO pipes“ with PE-foam (PEF) insulation and intumescent wrap “PYRO-SAFE DG-CR BS” – Wrap width 100 mm					
Outside pipe-Ø ≤ 14,0 mm, wall thickn. 2,0 mm, PEF 6 mm	2x 1-layer + lamella mat ≥ 250 mm x ≥ 20 mm	**EI 120 U/C**	5	**EI 120 U/C**	5
Outside pipe-Ø ≤ 26,0 mm, wall thickn. 3,0 mm, PEF 6 - 13 mm		**EI 120 U/C**	5	**EI 120 U/C**	5
Outside pipe-Ø ≤ 32,0 mm, wall thickn. 2,0 mm, PEF 6 - 10 mm		**EI 120 U/C**	5	**EI 120 U/C**	5
Combustible pipes with/without 5 mm PE-foam acoustic insulation made of PVC-U, PVC-C , PP-H or PE-100 with intumescent wrap “PYRO-SAFE DG-CR BS“ – Wrap width 100 mm					
Outside pipe-Ø ≤ 50,0 mm	Wall 2x, Floor 1x 1-layer	**EI 120 U/U**	1	**EI 120 U/U**	1
Outside pipe-Ø ≤ 80,0 mm	Wall 2x, Floor 1x 2-layer	**EI 120 U/U**	1	**EI 120 U/U**	1
Outside pipe-Ø ≤ 110,0 mm	Wall 2x, Floor 1x 3-layer	**EI 120 U/U**	1	**EI 120 U/U**	1
Outside pipe-Ø ≤ 135,0 mm	Wall 2x, Floor 1x 4-layer	**EI 120 U/C**	1	**EI 120 U/C**	1
Outside pipe-Ø ≤ 160,0 mm	Wall 2x, Floor 1x 5-layer	**EI 120 U/C**	1	**EI 120 U/C**	1
HVAC split line combinations with fire protection wrap “PYRO-SAFE DG-CR 1.5“ – Wrap width 125 mm**					
Pipe 1/Pipe 2 outside-Ø 6 mm - 10 mm/ 10 mm - 18 mm + PE-100 outside-Ø ≤ 25 mm, t 1.9 - 3.5 mm	2x 2-layer	**EI 120**	1	**EI 120**	1
Double solar pipes „NanoSUN²“ with fire protection wrap „PYRO-SAFE DG-CR 1.5“ – Wrap width 125 mm					
DN16 and DN 25	Wall 2x, Floor 1x 1-layer	**EI 120 C/U**	2	**EI 120 C/U**	3
Hydraulic hoses „HANSA FLEX“ (also with wire braid reinforcement) with fire protection wrap „PYRO-SAFE DG-CR 1.5“ – Wrap width 125 mm					
up to Ø da ≈ 55.9 mm x t 8.0 to 9.0 mm (e.g. hydraulic hoses for elevators) with additional cables	2x 1-layer + lamella mat ≥ 250 mm x ≥ 20 mm	**EI 120**	2	**EI 120**	3

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**combined lines for split HVAC-units with twin or single copper pipe and pipe insulation 9 mm thick, made from PE foam, in accordance with EN 14313; optionally with additional cable/pipe without spacing.

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1.3 Fire resistance classes for wall and floor partition

Fire resistance classes				
PYRO-SAFE CT Cable Tube – Retrofitting posibilities in walls				
Length CT [mm]		150	200	300
Services	Measures			
Cable up to Ø 21 mm	-	**EI 90 / E 120**	**EI 120**	**EI 120**
Cable > Ø 21 mm to Ø 50 mm	-	**EI 45 / E 90**	**EI 45 / E 90**	**EI 90 / E 120**
Cable > Ø 50 mm to Ø 80 mm	-	**-**	**-**	**EI 90 / E 120**
Cable bundles up to Ø 107 mm with cable up to Ø 21 mm	-	**EI 90 / E 120**	**EI 120**	**EI 120**
Conduits up to 3 pcs. made of plastic, flexible Ø 32 mm with or w/o cable up to Ø 14 mm	-	**EI 90 / E 90**	**EI 120**	**EI 120**
Conduits made of plastic, flexible Ø 16 mm - 32 mm single or bundled up to Ø 107 mm, with w/o cable up to Ø ≤ 21 mm	-	**-**	**EI 120**	**EI 120**
max. 2 plastic pipes, outside pipe-Ø 20 mm x s 1.5 mm to Ø 32 mm x s 2.4 mm and max. 2 plastic pipes with outside pipe-Ø 20 mm x s 1.5 mm and up to 3 additional cable up to Ø ≤ 14 mm (sheathed cable with max. 5 wires ≤ 1.5 mm²)	-	**-**	**-**	**EI 120**
Combined lines for split HVAC-units Pipe 1/pipe 2 outside-Ø 6 mm - 10 mm/ 10 mm - 18 mm + 9 mm insulation made of PE-foam; Plastic pipe PVC-U, outside-Ø up to 25 mm, s 1.5 mm + max. 3 additional cable up to Ø 14 mm without spacing	-	**EI 90 / E 90**	**EI 90 / E 90**	**EI 90 / E 90**

Fire resistance classes				
PYRO-SAFE CT Cable Tube – Retrofitting posibilities in floors				
Length CT [mm]		150	200	300
Services	Measures			
Cable up to Ø 21 mm	-	**EI 120**	**EI 120**	**EI 120**
Cable > Ø 21 mm to Ø 50 mm	-	**EI 90 / E 90**	**EI 90 / E 90**	**EI 90 / E 120**
Cable > Ø 50 mm to Ø 80 mm	-	**-**	**-**	**EI 60 / E 120**
Cable bundles up to Ø 107 mm with cable up to Ø 21 mm	-	**EI 60 / E 90**	**EI 60 / E 90**	**EI 120**
Cable bundles up to Ø 107 mm with cable up to Ø 21 mm	1-layer PYRO-SAFE DG-CR 1.5, 125 mm wide above or below	**EI 120**	**EI 120**	**EI 120**
Conduits up to 3 pcs. made of plastic, flexible Ø 32 mm with or w/o cable up to Ø 14 mm	-	**EI 90 / E 90**	**EI 90 / E 90**	**EI 120**
Conduits made of plastic, flexible Ø 16 mm - 32 mm single or bundled up to Ø 107 mm, with w/o cable up to Ø ≤ 21 mm	-	**-**	**-**	**EI 120**
Combined lines for split HVAC-units Pipe 1/pipe 2 outside-Ø 6 mm - 10 mm/ 10 mm - 18 mm + 9 mm insulation made of PE-foam; Plastic pipe PVC-U, outside-Ø up to 25 mm, s 1.5 mm + max. 3 additional cable up to Ø 14 mm without spacing	-	**EI 90 / E 90**	**EI 90 / E 90**	**EI 90 / E 90**
Combined lines for split HVAC-units Pipe 1/pipe 2 outside-Ø 10 mm - 22 mm/ 18 mm - 22 mm + 9 mm insulation made of PE-foam; Plastic pipe PVC-U, outside-Ø up to 25 mm, s 1.5 mm + max. 3 additional cable up to Ø 14 mm without spacing	lamella mat (Klimarock) ≥ 250 mm x ≥ 300 mm above	**EI 120**	**EI 120**	**EI 120**
"speed pipe" bundled or single pipes, with or w/o glass fibre cables max. 24 pcs. outside pipe-Ø to 7 mm max. 7 pcs. outside pipe-Ø to 10 mm max. 5 pcs. outside pipe-Ø to 12 mm	-	**EI 120**	**EI 120**	**EI 120**

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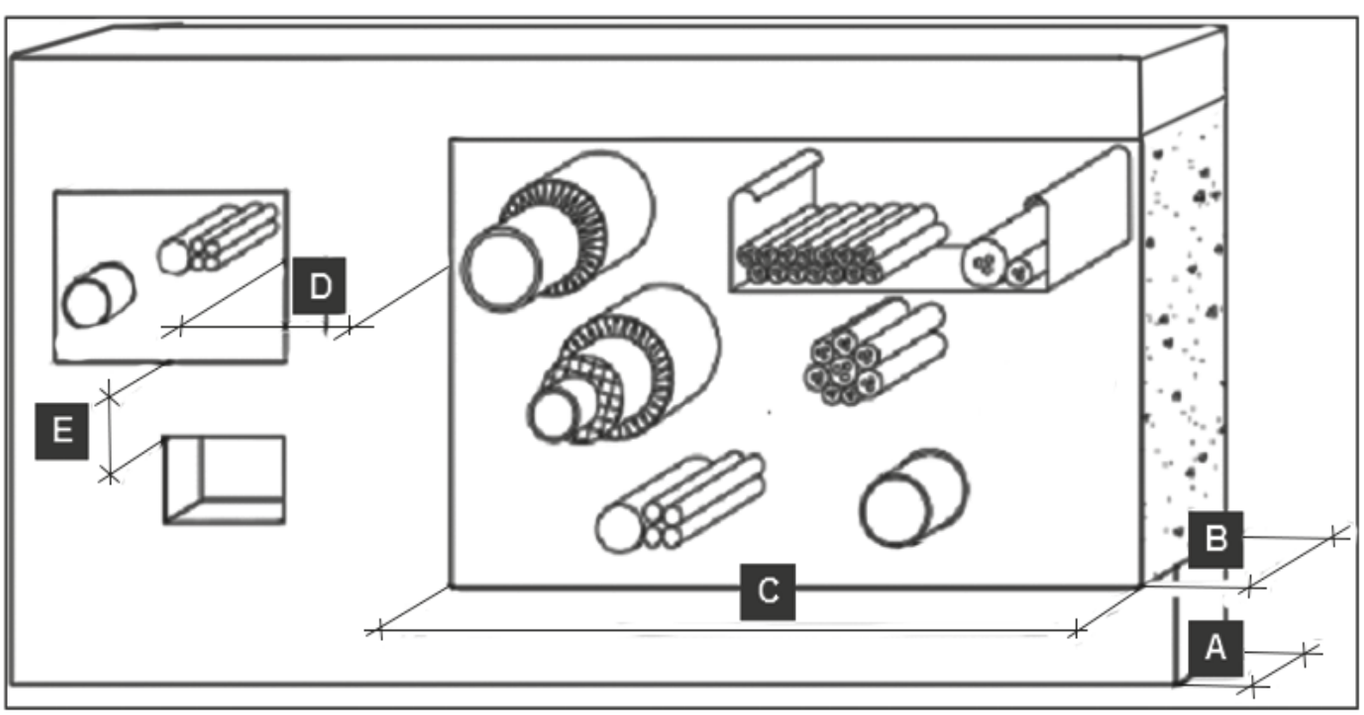
1.4 Field of application (Dimensions)

Dimensions

Pos.	Legend	Wall [mm]	Floor [mm]
A	Thickness of structural element	≥ 150	≥ 150
B	Thickness of penetration seal	≥ 150	≥ 150
C	Maximum dimensions of the opening (width x height)	1200 x 2000	1200 x 2000
D	Distance to other cable- oder pipe penetration seals one or both openings > 400 mm x 400 mm	≥ 200	≥ 200
	both openings ≤ 400 mm x 400 mm	≥ 100	≥ 100
E	Distance to other openings or installations one or both openings > 200 mm x 200 mm	≥ 200	≥ 200
	both openings ≤ 200 mm x 200 mm	≥ 100	≥ 100



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2. Allowed services

2.1 Cables / cable bundles / cable supports / Electrical installation conduits (conduits) / PE lines „speed pipes“

Electrical cables and lines of all types
(including optical fibre cables)
overall cross-section of individual cable
up to Ø ≤ 80 mm

Cable bundles
up to Ø ≤ 100 mm with cable up to Ø ≤ 21 mm.
No filling needed for tightly compressed and tied bundles.

Cable supports
Cable ducts and trays made of steel, with organic coating if applicable, as long as the fire reaction class complies at least with class A2 according to EN 13501-1.

Single electrical installation conduits
made of plastic, outside-Ø ≤ 100 mm, with or w/o cables (Ø ≤ 50 mm).

Bundled electrical installation conduits
made of plastic, outside-Ø ≤ 100 mm,
single conduits outside-Ø ≤ 32 mm, with or w/o cables (Ø ≤ 21 mm).

PE lines“speed pipes”
(for glass fibre cables and micro-cables)
Single cables or bundles with or w/o glass fibre cable by Gabocom Systemtechnik GmbH.

Outside pipe-Ø [mm]	Max. qty. [pcs.]	Pipe wall thickness [mm]
≤ 7	24	≤ 1,5
≤ 10	7	≤ 2,0
≤ 12	5	≤ 2,0

2.2 Combustible pipes

Combustible pipes
with fire protection wrap **PYRO-SAFE DG-CR BS** up to an outside-Ø ≤ 160 mm; optionally with w/o acoustic insulation tube made of 5 mm PE-foam.

Ventilated sewer pipes and closed piping systems. Circulation of non-combustible liquids and gases allowed (except ventilation lines).

PVC-U, PVC-C		PP-H		PE 100	
Norms: EN 1329-1, EN 1453-1, EN 1542-1, EN 15493, DIN 8061/8062, EN 1566-1		Norms: EN 1555-2, EN 12201-2+A1, DIN 8074/8075, EN 15874, DIN 8077/8078		Norms: EN 1555-2, EN 12201-2+A1 als auch DIN 8074/8075	
Outside pipe-Ø [mm]	Pipe wall thickness [mm]	Outside pipe-Ø [mm]	Pipe wall thickness [mm]	Outside pipe-Ø [mm]	Pipe wall thickness [mm]
≤ 50	1,8 - 3,7	≤ 50	1,8 - 4,6	≤ 50	1,8 - 4,8
≤ 110	2,2 - 8,2	≤ 110	2,7 - 10,0	≤ 110	2,7 - 10,0
≤ 160	3,2 - 11,9	≤ 160	3,9 - 9,1	≤ 160	3,9 - 9,1

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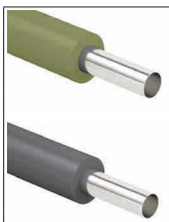
2.3 Multilayer pipes „HENCO-Pipes“

Multilayer pipes „HENCO pipes“

Pipes in a multilayered network and crosslinked PE (PE-Xc/Al/PE-Xc) by HENCO with an outside-Ø ≤ 63,0 mm

2.4 Non-combustible pipes



Non-combustible pipes
Pipes made of steel, stainless steel, cast iron or copper

Pipe materials / insulation	Outside-Ø [mm]
Copper with non-combustible pipe insulation made of mineral-fibre, e.g.”Klimarock” or “Conlit U”	≤ 108,0
Steel, stainless steel, cast iron with non-combustible insulation made of mineral-fibre, e.g. “Klimarock” or “Conlit U”	≤ 323,9
Copper with combustible insulation made of FEF „Armaflex Protect“	≤ 108,0
Steel, stainless steel, cast iron with combustible insulation made of FEF „Armaflex Protect“	≤ 170,0
Copper with combustible insulation made of FEF „NH/Armaflex“	≤ 108,0
Steel, stainless steel, cast iron with combustible insulation made of FEF „NH/Armaflex“	≤ 168,3

• The penetration seal may also be used for pipes made from other metals, whose heat transfer rate is lower than that of steel or copper, with a melting point ≥ 1049°C.

Non-combustible pipes		Pipe wall thickness [mm]
Material	Outside-Ø [mm]	min. / max.
Copper, steel, stainless steel, cast iron	Ø ≤ 15,0	≥ 0,8
	Ø > 15,0 - ≤ 108,0	≥ 1,0 - ≥ 2,5 / ≤ 14,2
Steel, stainless steel, cast iron	Ø > 108,0 - ≤ 323,9	≥ 2,6 - ≥ 7,5 / ≤ 14,2

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2.5 Further allowed services

HVAC split line combinations
E.g. “Tubolit DuoSplit” or “Tubolit Split” by Armacell or any other manufacturer with same characteristics. Double or single copper pipe and 9 mm thick insulation made of PE foam according to EN 14313 with an accessory line (1.5 mm thick plastic pipe (U/U) made of PVC-U, outside Ø 25 mm, according to EN 1453-1 or EN 1452-1 and to DIN 8061/DIN 8062 and up to 2 sheath cables with max. 5 wires with a surface ≤ 1.5 mm², Ø ≤ 14 mm) without spacing.

Double solar pipes „NanoSUN²“
Pipes for solar thermal applications made of corrugated stainless steel with insulation, an accessory line integrated in the insulation and a PVC sheath by Aktarus Group Srl. Ø ≤ DN 25.

Hydraulic hoses „HANSA FLEX“ with wire braid reinforcement

of the type “HD 200-2 SN” according to DIN EN 853 for mineral oils, Ø ≤ 55.9 mm.

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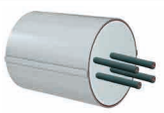
2.6 PYRO-SAFE CT Cable Tube (for retrofitting)

“PYRO-SAFE CT“ cable tube with intumescent inlining in accordance with ETA-13/0821 and ETA-16/0016

In dependence on the component and the installations carried out, the construction lengths 150 mm, 200 mm and 300 mm can be used.

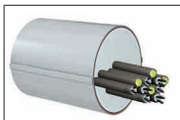


Electrical cables and lines of all types (including optical fibre cables) with „PYRO-SAFE CT“

Overall cross-section of individual cable up to Ø ≤ 80 mm if the „PYRO-SAFE CT“ cable tube is used.

Cable bundles with „PYRO-SAFE CT“

Cable bundles up to Ø ≤ 107 mm with cables Ø ≤ 21 mm if the „PYRO-SAFE CT“ cable tube is used.



Electrical installation conduits with “PYRO-SAFE CT”

Made of plastic (flexible) outside-Ø 16 mm to 32 mm single or bundled up to Ø 107, with w/o cables -Ø ≤ 21 mm.
Single conduits -Ø 63 mm (floor only)

Combustible pipes with additional cables with “PYRO-SAFE CT”

max. 4 PVC plastic pipes, 2 pipes with outside-Ø 20 mm to 32 mm and 2 pipes with outside-Ø up to 20 mm as well as max. 3 additional cable up to Ø 14 mm are allowed.

HVAC split line combinations with „PYRO-SAFE CT“

Double or single copper pipe (Pipe 1/pipe 2 outside-Ø 6 mm - 10 mm/ 10 mm - 18 mm) and 9 mm thick insulation made of PE foam according to EN 14313 with an accessory line (1.5 mm thick plastic pipe (U/U) made of PVC-U, outside Ø 25 mm, according to EN 1453-1 or EN 1452-1 and to DIN 8061/DIN 8062 and up to 3 sheath cables with max. 5 wires with a surface ≤ 1.5 mm², Ø ≤ 14 mm) without spacing.

PE lines “speed pipes” (for glass fibre cables and micro-cables) with „PYRO-SAFE CT“

Single cables or bundles with or w/o glass fibre cable by Gabocom Systemtechnik GmbH.

Outside pipe-Ø [mm]	Max. qty. [pcs.]	Pipe wall thickness [mm]
≤ 7	24	≤ 1,5
≤ 10	7	≤ 2,0
≤ 12	5	≤ 2,0

The entire permitted cross-section of the installations (outside dimensions) is ≤ 60 % of the bare masonry opening!

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Spacing requirements – walls

	Cables	Cable bundles	Cable trays	Electrical installation conduits single or bundled	Combustible pipes	Multilayer pipes	Non-combustible pipes; Insulation made of mineral-fibre mats	Non-combustible pipes; Insulation made of FEF	HVAC split line combinations	Double solar pipes „NanoSUN²“	PE lines „speed pipes“	Hydraulic hoses „HANSA FLEX“	PYRO-SAFE CT Cable Tube	Seal edge		
														Upper	Under	Side
Cables	≥ 10 (≥ 50 one above the other)			Cable ≤ 21: ≥ 0 Cable > 21: ≥ 100	≥ 50	Cable ≤ 21: ≥ 0 Cable > 21: ≥ 100	≥ 35	≥ 35	≥ 40	≥ 100	≥ 25	≥ 45	≥ 65	≥ 30	≥ 0	≥ 0
Cable bundles				≥ 100		≥ 100										
Cable trays																
Electrical installation conduits single or bundled	Cable ≤ 21: ≥ 0 Cable > 21: ≥ 100	≥ 100		≥ 0	≥ 100	≥ 100	≥ 80	≥ 80	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 0		
Combustible pipes	≥ 50			≥ 100	≥ 0	≥ 100	≥ 0	≥ 0	≥ 50	≥ 100	≥ 100	≥ 100	≥ 100	≥ 0		
Multilayer pipes	Cable ≤ 21: ≥ 0 Cable > 21: ≥ 100	≥ 100		≥ 100	≥ 100	≥ 0	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 0		
Non-combustible pipes; Insulation made of mineral-fibre mats	≥ 50			≥ 80	≥ 0	≥ 100	≥ 0	≥ 0	≥ 50	≥ 100	≥ 20	≥ 100	≥ 100	≥ 0		
Non-combustible pipes; Insulation made of FEF																
HVAC split line combinations	≥ 40			≥ 100	≥ 50	≥ 100	≥ 50	≥ 50	≥ 25	≥ 85	≥ 100	≥ 100	≥ 100	≥ 0		
Double solar pipes „NanoSUN²“	≥ 100			≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 85	≥ 100	≥ 100	≥ 85	≥ 100	≥ 0		
PE lines „speed pipes“	≥ 25			≥ 100	≥ 100	≥ 100	≥ 20	≥ 20	≥ 100	≥ 100	≥ 25	≥ 100	≥ 100	≥ 0		
Hydraulic hoses „HANSA FLEX“	≥ 45			≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 85	≥ 100	≥ 100	≥ 100	≥ 80		
PYRO-SAFE CT Cable Tube	≥ 65			≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 3	≥ 15		

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Spacing requirements – floors

	Cables	Cable bundles	Cable trays	Electrical installation conduits single or bundled	Combustible pipes	Multilayer pipes	Non-combustible pipes; Insulation made of mineral-fibre mats	Non-combustible pipes; Insulation made of FEF	HVAC split line combinations	Double solar pipes „NanoSUN²“	PE lines „speed pipes“	Hydraulic hoses „HANSA FLEX“	PYRO-SAFE CT Cable Tube	Seal edge		
														Front	Back	Side
Cables	Seal thickness ≥ 150: ≥ 10, (≥ 50 one above the other) Seal thickness ≥ 240: ≥ 0, (≥ 45 one above the other)			Cable ≤ 21: ≥ 0 Cable > 21: ≥ 100	≥ 50	Cable ≤ 21: ≥ 0 Cable > 21: ≥ 100	≥ 25	≥ 25	≥ 100	≥ 100	≥ 40	≥ 85	≥ 65	≥ 30	≥ 0	Seal thickness ≥ 150: ≥ 10 Seal thickness ≥ 240: ≥ 25
Cable bundles				≥ 100		≥ 100										
Cable trays																
Electrical installation conduits single or bundled	Cable ≤ 21: ≥ 0 Cable > 21: ≥ 100	≥ 100		≥ 0	≥ 100	≥ 100	≥ 60	≥ 60	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 0		
Combustible pipes	≥ 50			≥ 100	≥ 25	≥ 100	≥ 0	≥ 0	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 0		
Multilayer pipes	Cable ≤ 21: ≥ 0 Cable > 21: ≥ 100	≥ 100		≥ 100	≥ 100	≥ 0	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 0		
Non-combustible pipes; Insulation made of mineral-fibre mats	≥ 25			≥ 100	≥ 0	≥ 100	≥ 0	≥ 0	≥ 60	≥ 100	≥ 100	≥ 100	≥ 100	≥ 0		
Non-combustible pipes; Insulation made of FEF																
HVAC split line combinations	≥ 100			≥ 100	≥ 100	≥ 100	≥ 60	≥ 60	≥ 50	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100		
Double solar pipes „NanoSUN²“	≥ 100			≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 80	≥ 100	≥ 30		
PE lines „speed pipes“	≥ 40			≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 25	≥ 100	≥ 100	≥ 30		
Hydraulic hoses „HANSA FLEX“	≥ 85			≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 80	≥ 100	≥ 100	≥ 100	≥ 35		
PYRO-SAFE CT Cable Tube	≥ 65			≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 10	≥ 15		

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4. Used products

PYRO-SAFE NOVASIT BM
Fire protection mortar

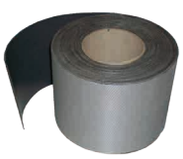
in accordance with ETA-16/0132

20 kg bag – ***product No. 01161000***
10 kg pail – ***product No. 01161010***

PYRO-SAFE FLAMMOTECT-A
Filler

in accordance with ETA-14/0418
Fire protection coating to seal conduits.

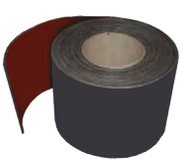
12,5 kg pail – ***product No. 01155104***
310 ml cartridge – ***product No. 01155115***



PYRO-SAFE DG-CR 1.5
Fire protection wrap

in accordance with ETA-16/0268
Intumescent material for wrapping plastic conduits, non-combustible pipes with FEF-insulation, hydraulic hoses and double solar pipes.

Roll à 10 m – ***product No. 01261125***



PYRO-SAFE DG-CR BS
Fire protection wrap

in accordance with ETA-16/0268
Fire protection wrap for combustible pipes, consisting of glas filament fabric with intumescent coating on both sides.

Roll à 10 m – ***product No. 01264100***

PYRO-SAFE CT Cable Tube

in accordance with ETA-13/0821 and ETA-16/0016
Lengths 150 mm, 200 mm, 300 mm
Outside-Ø 116,4 mm
Inside-Ø 107 mm

CT 150 – ***product No. 01281150***
CT 200 – ***product No. 01281200***
CT 300 – ***product No. 01281300***

Lamella mat („KLIMAROCK“)

in accordance with DIN EN 14303 and DoP DE0628011501 dated 06.08.2015
Reaction to fire class according to EN 13501-1: Class A2-s1 d0
Dimensions ≥ 610 x 50 cm
Thickness 30 mm
Rolle à 3,05 m² – ***product No. 01187100***

It is allowed to apply any lamella mats/ mineral fibre mats/ mineral fibre pipe shells if they match the following requirements:
EN 14303
density ≥ 40 kg/g³
Reaction to fire class according to EN 13501-1: Class A2-s1 d0 or better A1 in accordance with EN 13501-1
Thickness = minimum 30 mm

Name	Nominal density kg/m³	In accordance with abZ/abP/ Declaration of performance
Rockwool lamella mat „KLIMAROCK“ ***product No. 01187100***	40-50	DE0628011501 of 06.08.2015
Rockwool Conlit U	150	P-NDS04-417

Label

1 piece – ***product No. 01229000***

Recommended tools

- Mixing container – mortar cask
- Mixing paddle
- Cover sheeting
- Masonry tools (round dippers)
- Wire binding pliers, size 10 key or ratchet
- steel wire

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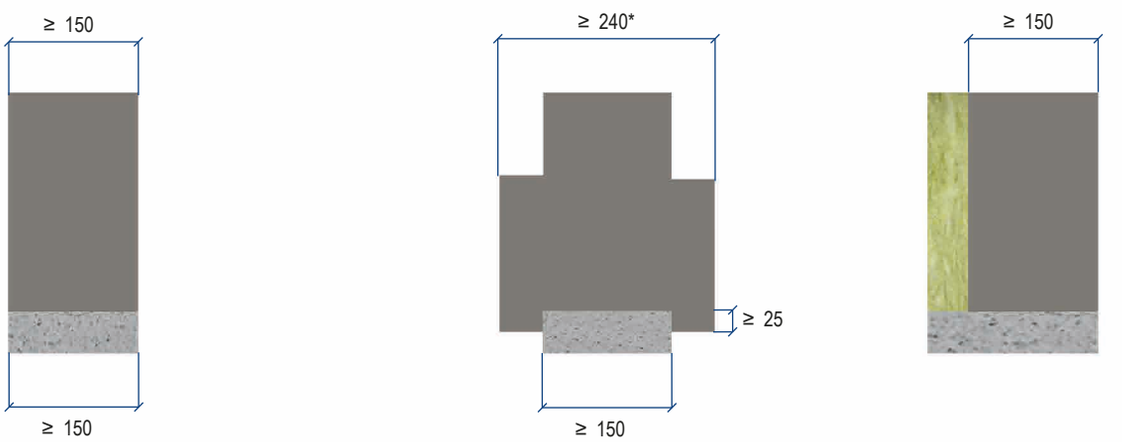
5. Regulations and variants

- The combination penetration seal may be used for closing openings without installations (so-called reserve penetration seal).
- Penetration seal in floors shall be protected on site by client with suitable barriers or covered with grating, in order to prevent them from being load or walked on.
- During installation in walls, one side can be boxed in if necessary and, for floor penetration seals, the underside can boxed in.
- **For installation in floors, sealing surfaces larger than 500 mm x 500 mm without penetration of cables and cable trays must be carried out with a professional friction-locked steel reinforcement.**

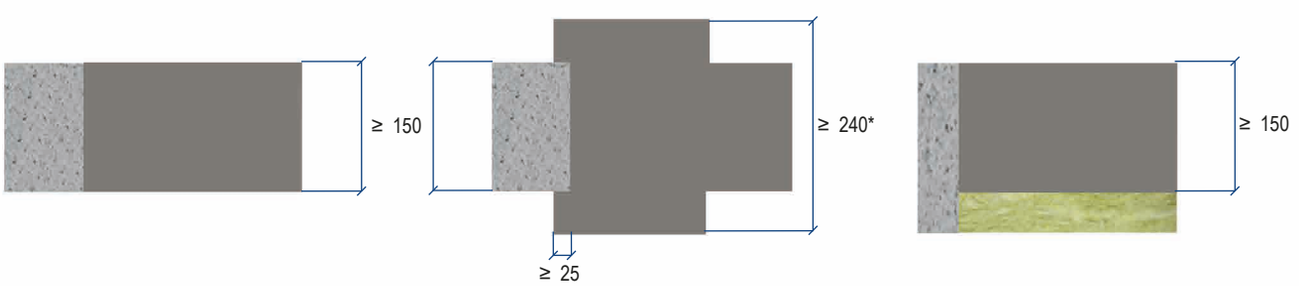
Variants in solid walls



PYRO-SAFE NOVASIT BM fire protection mortar
Lost formwork e.g. made of mineral fibre mat (non-flammable, melting point > 1000 °C)

Dimension specifications in mm

Variants in floors



PYRO-SAFE NOVASIT BM fire protection mortar
Lost formwork e.g. made of mineral fibre mat (non-flammable, melting point > 1000 °C)

Dimension specifications in mm

* Bulkhead thickness 240 mm see page 19.

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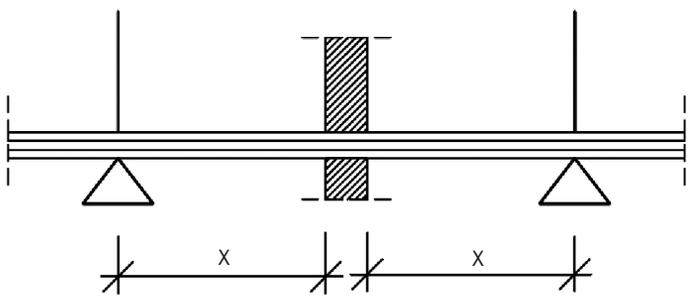
5.1 Rules over the first cable/pipe support

• The core of the first supports before the installation shall be made of non-combustible material (fire resistance class A1 or A2 according to EN 13501-1) and the supports shall be placed at a distance according to the table below.



First holder (support) of the installations in front of the wall partition made of steel or equivalent.

First cable/pipe support		
Cables, cable bundles, cable trays	Wall	≤ 500 mm
	Floor	≤ 400 mm
Electrical installation conduits		≤ 500 mm
Combustible pipes		≤ 500 mm
Multilayer pipes „HENCO pipes“		≤ 400 mm
Non-combustible pipes - section insulation made of mineral fibre mats or shells		L* + 50 mm
Non-combustible pipes - section insulation made of FEF		
Double solar pipes „NanoSUN²“		≤ 500 mm
PE lines „speed pipes“ for glass fibre cables and micro-cables		**
HVAC split line combinations		≤ 500 mm
Hydraulic hoses “HANSA-FLEX” with wire braid reinforcement		≤ 500 mm
PYRO-SAFE CT installations in the cable tube		≤ 300 mm

* L = Length of the protective insulation
** The manufacturer‘s installation instructions are applied.

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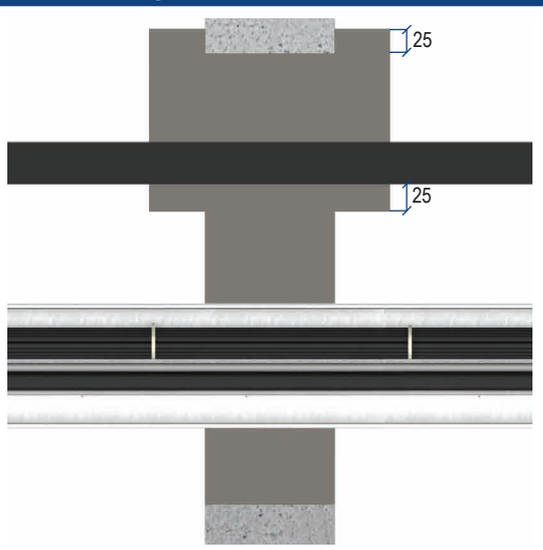
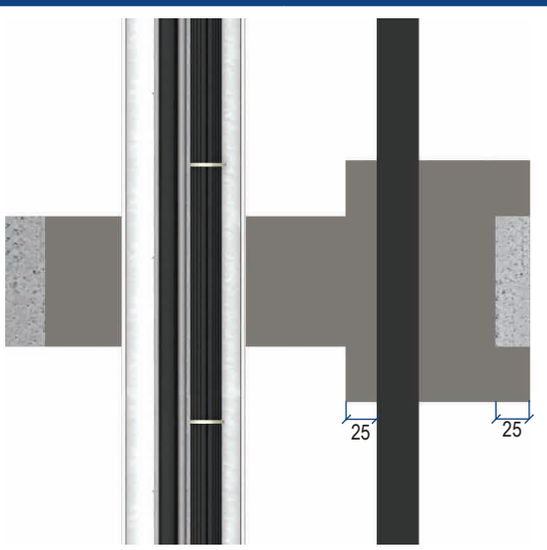
6. Fire protection measures

6.1 Cables / cable bundles / cable trays

- The feed-through of cables or cable bundles is permitted without and with cable trays.
- Cable bundles can be installed unopened through the penetration sealing. If they consist of parallel-running cables that are densely packed and permanently bound, stitched or welded together they don´t have to be filled inside with filler material.
- The support structures of the cable trays shall be formed so that, in case of fire, no additional mechanical loading of the penetration sealing can occur.
- For cable support structures made of sheet steel, the spars must be drilled and filled with the ablative coating PYRO-SAFE FLAMMOTECT-A in the penetration area (on-site agreement of the measures required).

Measures for sealing in walls and floors without further measures





PYRO-SAFE NOVASIT BM fire protection mortar
Wall-/Floor-, seal thickness and implementation variants see page 17

Dimension specifications in mm

	Dimensions [mm]	Seal thickness [mm]	Fire resistance class	
			Wall	Floor
Cables	Ø ≤ 32	150	EI 120	EI 120
	Ø ≤ 50	240	EI 120	EI 90 / E 120
	Ø ≤ 80		EI 90 / E 120	EI 90
Single-core-non-sheathed cables	Ø wires ≤ 24	150	EI 120	EI 120
Cable bundles	Ø ≤ 60		EI 120	EI 120
	Ø ≤ 100		EI 90 / E 120	EI 60 / E 120
		240	EI 120	EI 120

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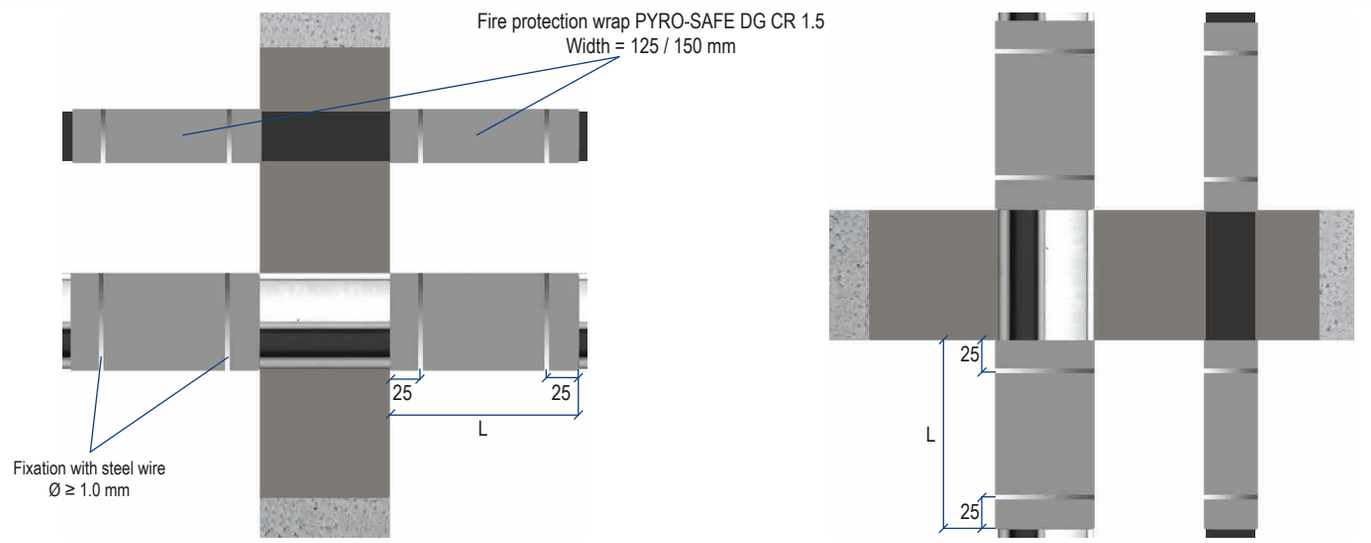
6.1 Cables / cable bundles / cable trays

- The PYRO-SAFE DG-CR 1.5 fire protection wrap is coated and covered with a protective film on one side. Before installation the protective film shall be removed, the coated side have to be inside. Fixation of the wrap with steel wires.

Measures for sealing in walls and floors fire protection wrap „PYRO-SAFE DG-CR 1.5“



PYRO-SAFE NOVASIT BM fire protection mortar
Wall-/Floor-, seal thickness and implementation variants see page 17

Dimension specifications in mm

	Dimensions [mm]	Fire protection wrap PYRO-SAFE DG-CR 1.5						Fire resistance class	
		Wrap width L [mm]	Qty. wraps [n]	Qty. layers [n]	Overlapping [mm]	Inside seal [mm]	Outside seal [mm]	Wall	Floor
Cables	Ø ≤ 32	-	-	-	-	-	-	EI 120	EI 120
	Ø ≤ 50	125	2	2	45 - 60	0	125	EI 120	EI 120
	Ø ≤ 80							EI 90 / E 120	EI 120
		150					150	EI 120	EI 120
Cable bundles	Ø ≤ 100	125		1			125	EI 120	EI 120

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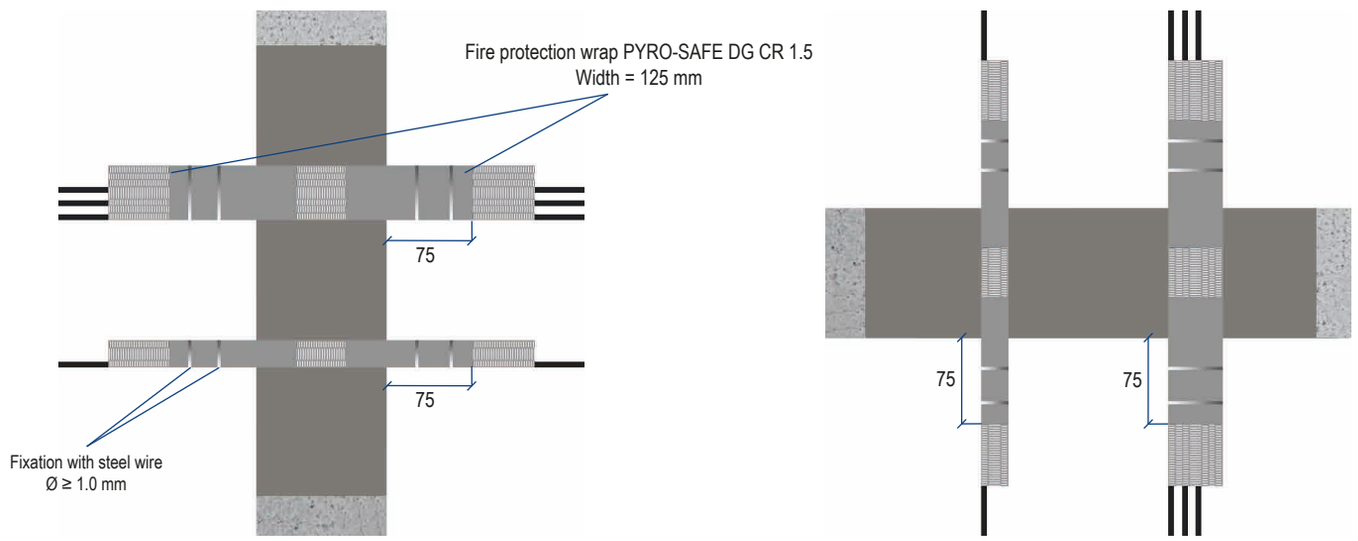
PYRO-SAFE Novasit BM

6.2 Electrical installation conduits (EIC) single or bundled – application with fire protection wrap PYRO-SAFE DG-CR 1.5

• The PYRO-SAFE DG-CR 1.5 fire protection wrap is coated and covered with a protective film on one side. Before installation the protective film shall be removed, the coated side have to be inside. Fixation of the wrap with steel wires.

Measures for sealing in walls and floors with fire protection wrap „PYRO-SAFE DG-CR 1.5“



PYRO-SAFE NOVASIT BM fire protection mortar
Wall-/Floor-, seal thickness and implementation variants see page 17

Dimension specifications in mm

	Dimensions [mm]	Fire protection wrap PYRO-SAFE DG-CR 1.5						Fire resistance class	
		Wrap width [mm]	Qty. wraps [n]	Qty. layers [n]	Overlapping [mm]	Inside seal [mm]	Outside seal [mm]	Wall	Floor
EIC made of plastic, single	EIC-Ø ≤ 32 cable-Ø ≤ 21	125	2	1	0	50	75	EI 120 U/U	EI 120 U/U
	EIC-Ø ≤ 63 cable-Ø ≤ 21			2				EI 120 U/U	
EIC made of plastic, single*	EIC-Ø ≤ 100 cable-Ø ≤ 50			3				-	
EIC made of plastic, bundled	bundle-Ø ≤ 100 EIC-Ø ≤ 32 cable-Ø ≤ 21			2				EI 120 U/U	

* With additional protective insulation made of mineral-fibre mats (L_1 ≥ 500 mm x D_1 ≥ 30 mm)

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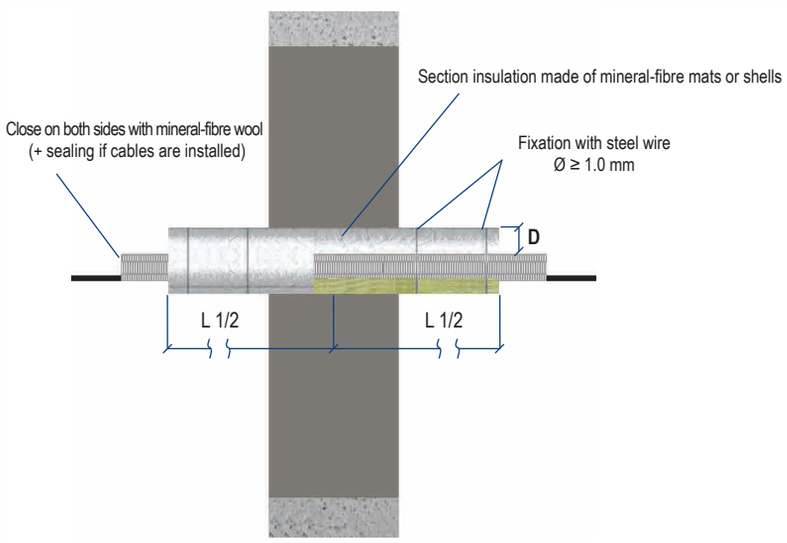
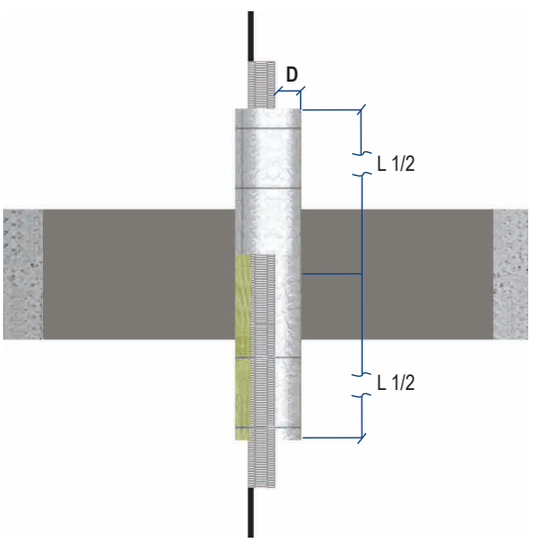
6.2 Electrical installation conduits (EIC) single – application with mineral-fibre mats

• Electrical installation conduits (EIC) with or w/o cables (cable-Ø ≤ 22,0 mm) can be installed.

• A section insulation made of mineral-fibre mats or -shells is necessary. The section insulation shall be fixed with steel wires.

Measures for sealing in walls and floors





PYRO-SAFE NOVASIT BM fire protection mortar
Wall-/Floor-, seal thickness and implementation variants see page 17

Dimension specifications in mm

EIC-material	EIC outside-Ø [mm]	Section insulation		Fire resistance class	
		Thickness [mm]	Length L 1/2 [mm]	Wall	Floor
PE-HD	≤ 63	≥ 30	≥ 500	EI 120 U/C	EI 120 U/C

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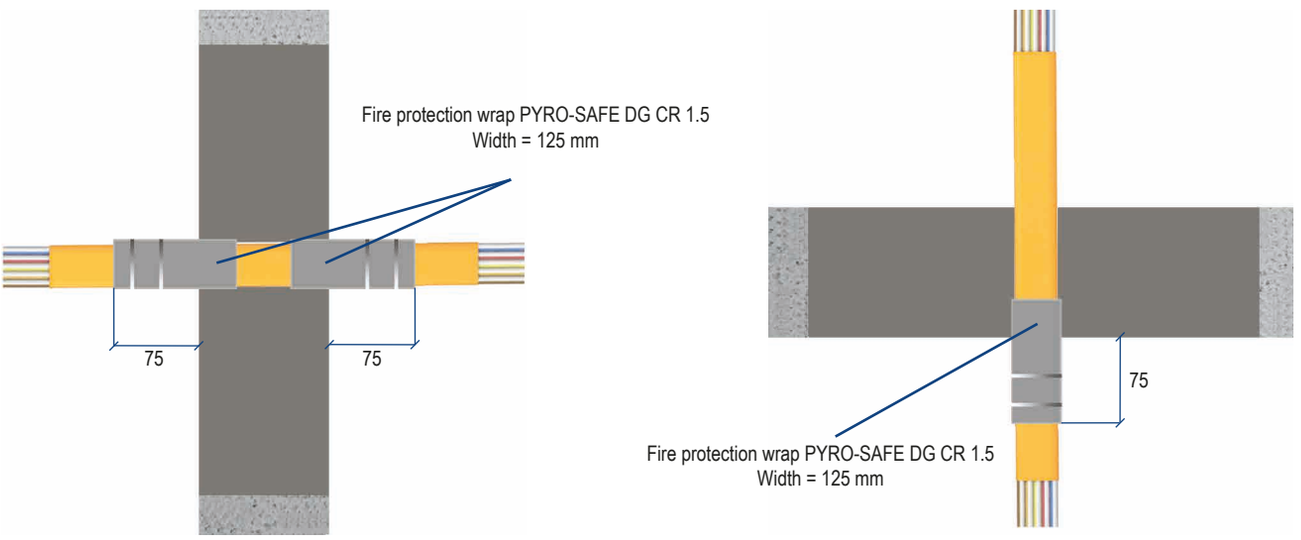
6.3 PE lines “speed pipes” (for glass fibre cables and micro cables)

- The “speed pipe” PE lines must be arranged vertical to the component´s surface. Pipe end configuration (U/U).
- The “speed pipe” PE lines must be wrapped on both sides with the PYRO-SAFE DG-CR 1.5 fire protection wrap (width 125 mm).
- The PYRO-SAFE DG-CR 1.5 fire protection wrap is coated and covered with a protective film on one side. Before installation the protective film shall be removed, the coated side have to be inside. Fixation of the wrap with steel wires.
- The wrap must be arranged in such a way that it is 75 mm in the partition.

Measures for sealing in walls and floors



PYRO-SAFE NOVASIT BM fire protection mortar
Wall-/Floor-, seal thickness and implementation variants see page 17

Dimension specifications in mm

Set-up „speed pipes“	Wall thickness [mm]	Fire protection wrap PYRO-SAFE DG-CR 1.5						Fire resistance class	
		Wrap width [mm]	Qty. wraps [n]	Qty. layers [n]	Overlapping [mm]	Inside seal [mm]	Outside seal [mm]	Wall	Floor
Ø 7,0 mm x 24 pcs.	≥ 1,5	125	2	1	0	50	75	EI 120 U/U	-
Ø 10,0 mm x 7 pcs.	≥ 2,0								
Ø 12,00 mm x 5 pcs.	≥ 2,0								
Ø 7,0 mm x 24 pcs.	≥ 1,5		1	2				-	EI 120 U/U
Ø 10,0 mm x 7 pcs.	≥ 2,0								
Ø 12,00 mm x 5 pcs.	≥ 2,0								

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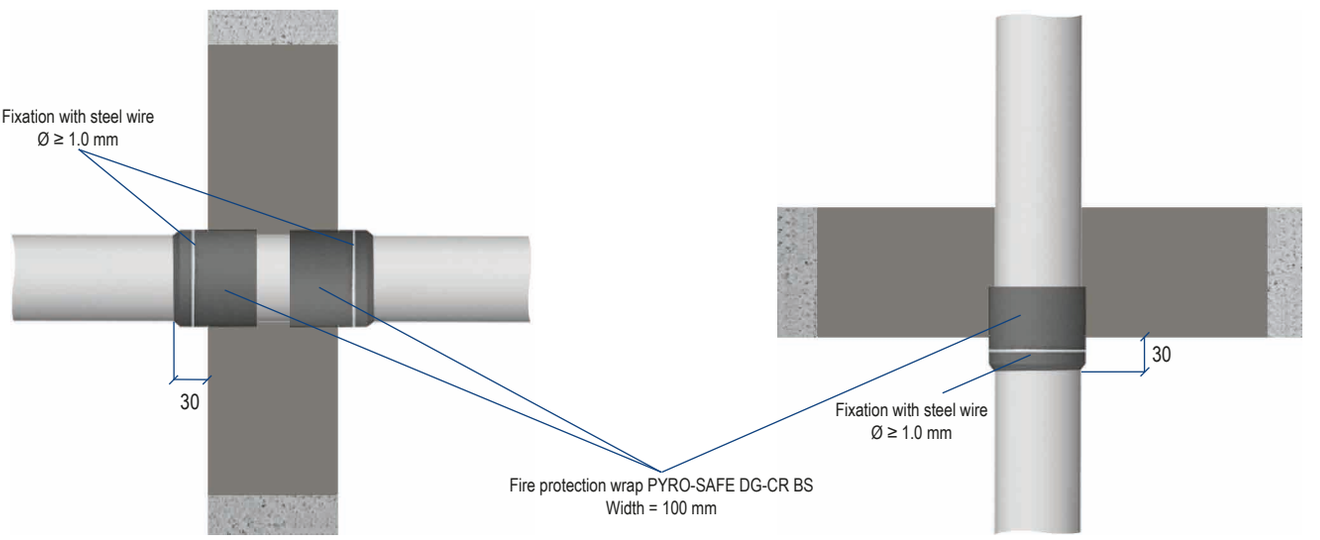
6.4 Combustible pipes

- For wall sealing, install the fire protection wrap PYRO-SAFE DG-CR BS (width = 100 mm) on both sides; for floor penetration sealing install only one PYRO-SAFE DG-CR BS fire protection wrap (width = 100 mm) bottom of the floor.
- Pipes shall be installed vertical to the barrier´s surface.
- The penetration sealing may be used on pneumatic conveyors, compressed air lines and so on if the pipeline system is switched off in the event of a fire.
- Optional with w/o an acoustic insulation made of 5 mm PE-foam.

Measures for sealing in walls and floors with fire protection wrap „PYRO-SAFE DG-CR BS“



PYRO-SAFE NOVASIT BM fire protection mortar
Wall-/Floor-, seal thickness and implementation variants see page 17

Dimension specifications in mm

Dimensions [mm]	Fire protection wrap PYRO-SAFE DG-CR BS						Fire resistance class	
	Wrap width [mm]	Qty. wraps [n]	Qty. layers [n]	Overlapping [mm]	Inside seal [mm]	Outside seal [mm]	Wall	Floor
≤ Ø 50	100	2	1	0	70	30	EI 120 U/U	-
> Ø 50 - 80			2					
> Ø 80 - 110			3					
> Ø 110 - 135			4				EI 120 U/C	
> Ø 135 - 160			5					
≤ Ø 50	100	1	1	0	70	30	-	EI 120 U/U
> Ø 50 - 80			2					
> Ø 80 - 110			3					
> Ø 110 - 135			4					EI 120 U/C
> Ø 135 - 160			5					

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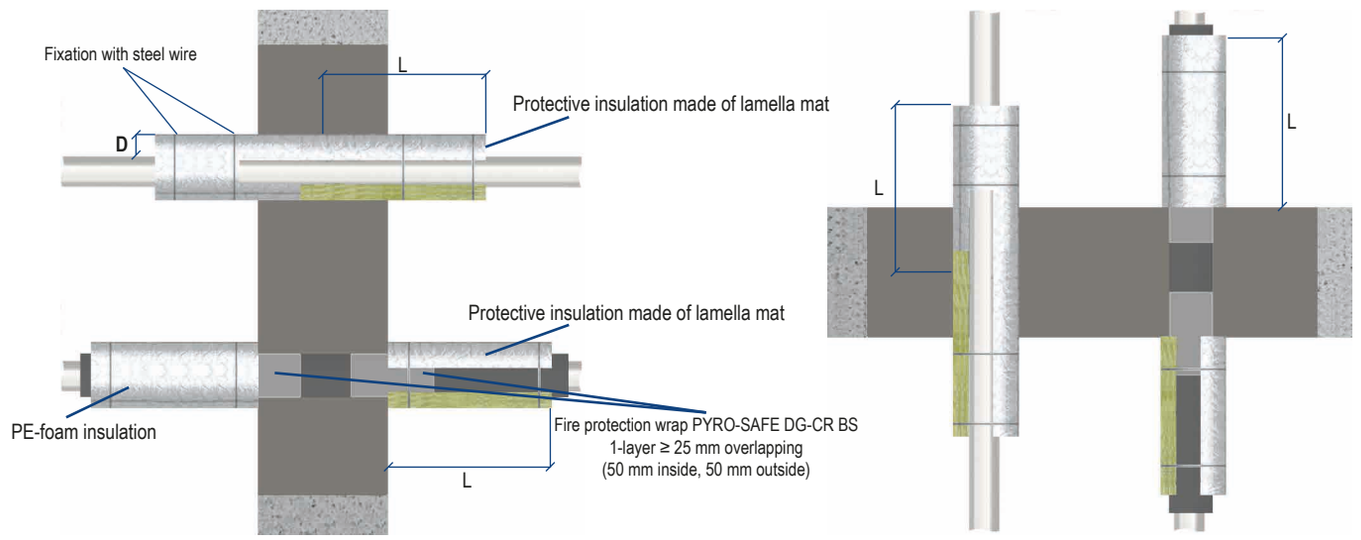
6.5 Multilayer pipes „HENCO pipes“

Measures for sealing in walls and floors



PYRO-SAFE NOVASIT BM fire protection mortar
Wall-/Floor-, seal thickness and implementation variants see page 17

Dimension specifications in mm

Outside-Ø [mm]	Thickness PEF-insulation [mm]	Wall thickness [mm]	Fire protection wrap		Protective insulation		Fire resistance class	
			Width [mm]	Qty. layers [n]	Length L [mm]	Thickn. D [mm]	Wall	Floor
Multilayer pipes „HENCO STANDARD“			-		**„Lamella mat“**		EI 120 U/C	EI 120 U/C
≤ 12 mm	-	1,6			≥ 250	≥ 20		
≤ 32 mm		3,0						
≤ 63 mm		4,5				≥ 30		
Multilayer pipes „HENCO STANDARD“ with PE-foam insulation			**PYRO-SAFE DG-CR BS**		**„Lamella mat“**			
≤ 14 mm	6	2,0	100 (50 inside the seal/ 50 outside the seal)	1 (25 mm overlapping)	≥ 250	≥ 20		
≤ 26 mm	6 - 13	3,0						
≤ 32 mm	6 - 10	2,0						

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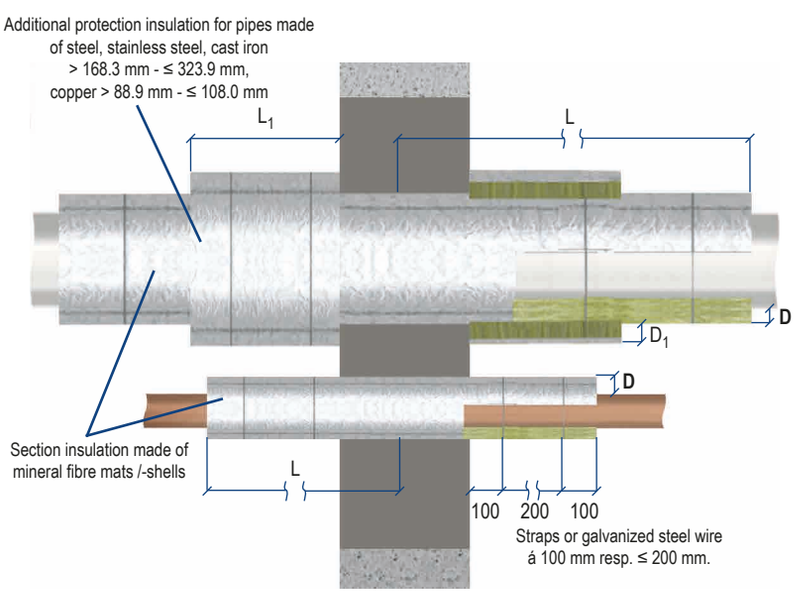
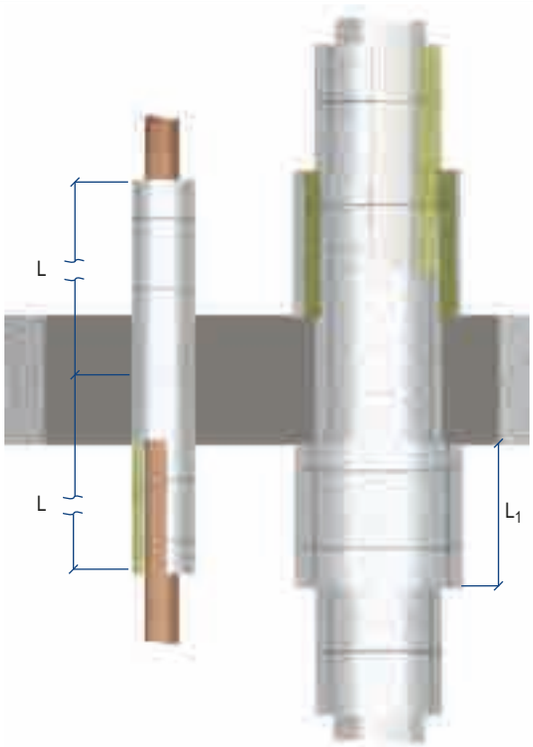
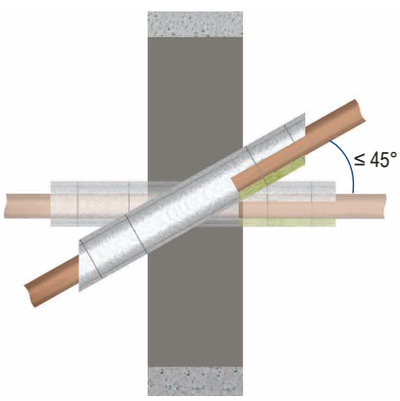
6.6 Non-combustible pipes – section insulation made of lamella mat „KLIMAROCK“ or mineral fibre shell „Conlit 150U“

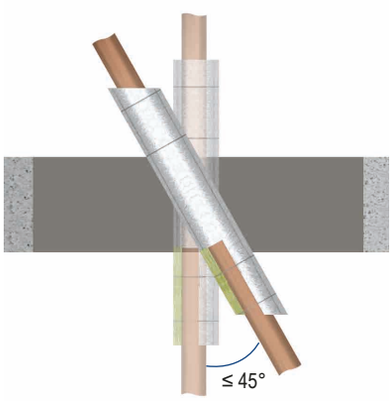
- Insulation made of mineral fibre mats, for example, must be applied on non-combustible pipes. Depending on the pipe´s wallthickness and outside diameter, an additional protection insulation made of mineral fibre mats can be necessary.
- The Insulation must be fixed on the pipe with straps or wire.
- In floor installations, the insulation “lamella mat” shall be secured from slipping with additional wire mesh hooks.
- Non-combustible pipes with insulation made of mineral fibre mats can be installed in an angle of 45°- 90° in relation to the components surface.

Measures for sealing in walls and floors









PYRO-SAFE NOVASIT BM fire protection mortar
Wall-/Floor-, seal thickness and implementation variants see page 17

Dimension specifications in mm

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6.6 Non-combustible pipes – section insulation made of lamella mat „KLIMAROCK“ or mineral fibre shell „Conlit 150U“

Measures for penetration seals with lamella mat „Klimarock“

Pipe material	Outside pipe-Ø [mm]	Insulation length L [mm]	Insulation thickness D [mm]	Fire resistance class	
				Wall	Floor
Copper	Ø ≤ 15,0	≥ 250	≥ 20	EI 120 C/U	EI 120 C/U
	Ø > 15,0 - ≤ 28,0	≥ 500	≥ 20		EI 120 C/U
	Ø > 28,0 - ≤ 42,0		≥ 30		
	Ø > 42,0 - ≤ 54,0		≥ 40		
	Ø > 54,0 - ≤ 88,9	≥ 750	≥ 60		
	Ø > 88,9 - ≤ 108,0*	≥ 1000	≥ 30		
Steel, stainless steel, cast iron	Ø ≤ 15,0	≥ 250	≥ 20		
	Ø > 15,0 - ≤ 28,0	≥ 500			
	Ø > 28,0 - ≤ 42,0		≥ 30		
	Ø > 42,0 - ≤ 114,3		≥ 40		
	Ø > 114,3 - ≤ 168,3	≥ 1000			
	Ø > 168,3 - ≤ 323,9*				

* Additional protective insulation made of mineral fibre mat (L_1 ≥ 500 mm x D_1 ≥ 30 mm)

Measures for penetration seals with mineral fibre shells „Conlit 150U“

Pipe material	Outside pipe-Ø [mm]	Insulation length L [mm]	Insulation thickness D [mm]	Fire resistance class	
				Wall	Floor
Copper	Ø ≤ 15,0	≥ 250	≥ 22,5	EI 120 C/U	EI 120 C/U
	Ø > 15,0 - ≤ 28,0		≥ 26		-
	Ø > 15,0 - ≤ 42,0		≥ 19	-	EI 120 C/U
	Ø > 28,0 - ≤ 54,0		≥ 38	EI 120 C/U	
	Ø > 54,0 - ≤ 108,0	≥ 1000	≥ 38		
Steel, stainless steel, cast iron	Ø ≤ 15,0	≥ 250	≥ 22,5		
	Ø > 15,0 - ≤ 28,0	≥ 500	≥ 26		
	Ø > 15,0 - ≤ 42,0		≥ 19	-	
	Ø > 28,0 - ≤ 54,0		≥ 38	EI 120 C/U	
	Ø > 54,0 - ≤ 114,3	≥ 750	≥ 33		
	Ø > 114,3 - ≤ 168,3	≥ 1000	≥ 40		
	Ø > 168,3 - ≤ 323,9*				EI 90 / E 120 C/U

* Additional protective insulation made of mineral fibre mat (L_1 ≥ 500 mm x D_1 ≥ 40 mm)

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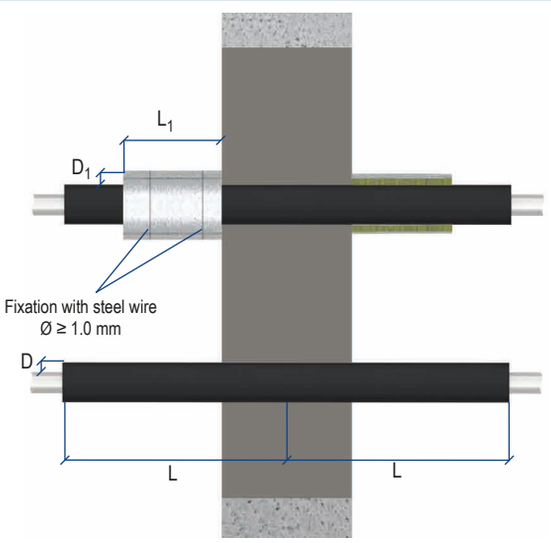
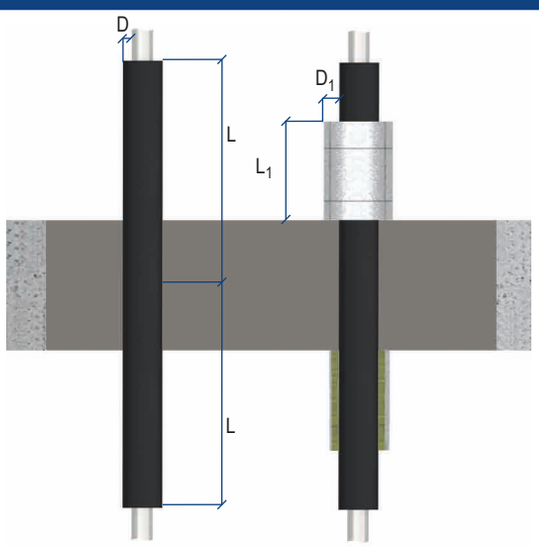
6.7 Non-combustible pipes – section insulation made of FEF „Armaflex Protect“

- Non-combustible pipes with insulation made of FEF „Armaflex Protect“ possibly have to set up with an additional protection insulation made of mineral fibre mats, depending on the pipe´s wallthickness and outside diameter.
- The protection insulation must be fixed on the pipe with straps or wires.
- In floor installations, the protection insulation shall be secured from slipping with additional wire mesh hooks.

Measures for sealing in walls and floors with section insulation „Armaflex Protect“





PYRO-SAFE NOVASIT BM fire protection mortar
Wall-/Floor-, seal thickness and implementation variants see page 17

Dimension specifications in mm

Measures for penetration seals with FEF-insulation „Armaflex Protect“

Pipe material	Outside pipe-Ø [mm]	Insulation length L [mm]	Insulation thickness D [mm]	Fire resistance class	
				Wall	Floor
Copper	Ø ≤ 28,0	≥ 250	25	EI 120 C/U	EI 120 C/U
	Ø ≤ 28,0	≥ 500	26 - 51		
	Ø > 28,0 - ≤ 88,9		25		
	Ø >28,0 - ≤ 88,9	≥ 1000	26 - 51		
	Ø >88,9 - ≤ 108,0*		26 - 52		
Steel, stainless steel, cast iron	Ø ≤ 28,0	≥ 250	25		
	Ø ≤ 28,0	≥ 500	26 - 51		
	Ø >28,0 - ≤ 88,9		25		
	Ø >28,0 - ≤ 88,9	≥ 1000	26 - 51		
	Ø >88,9 - ≤ 170,0		52		-
	Ø >88,9 - ≤ 170,0*		26 - 52		EI 120 C/U

*Additional protective insulation made of mineral fibre mat (L_1 ≥ 500 mm x D_1 ≥ 40 mm)

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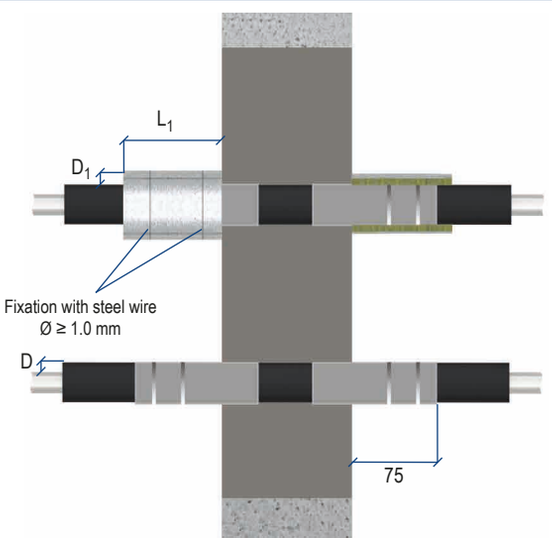
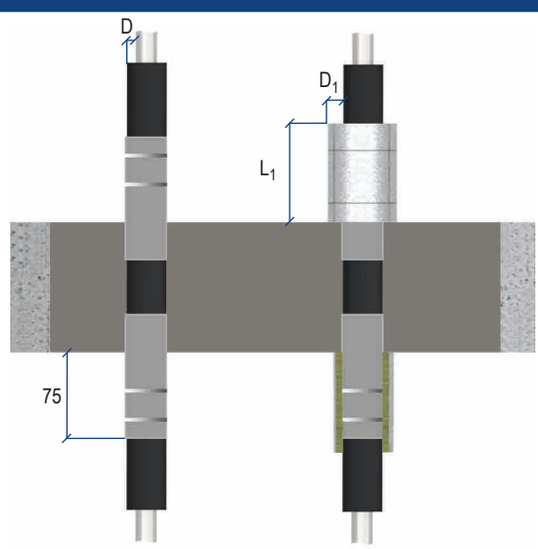
6.7 Non-combustible pipes – section insulation made of FEF „NH/Armaflex“

- Non-combustible pipes with insulation made of FEF „NH/Armaflex“ possibly have to set up with an additional protection insulation made of mineral fibre mats, depending on the pipe´s wallthickness and outside diameter.
- The protection insulation must be fixed on the pipe with straps or wires.
- In floor installations, the protection insulation shall be secured from slipping with additional wire mesh hooks.

Measures for sealing in walls and floors with section insulation „NH/Armaflex“





PYRO-SAFE NOVASIT BM fire protection mortar
Wall-/Floor-, seal thickness and implementation variants see page 17

Dimension specifications in mm

Measures for penetration seals with FEF-insulation „NH/Armaflex“

Pipe-		Insulation thickness D [mm]	Fire protection wrap PYRO-SAFE DG-CR 1.5						Fire resistance class	
material	outside-Ø [mm]		Wrap width [mm]	Qty. wraps [n]	Qty. layers [n]	Overlapping [mm]	Inside seal [mm]	Outside seal [mm]	Wall	Floor
Copper	Ø ≤ 28,0	9 - 25							EI 120 C/U	EI 120 C/U
	Ø ≤ 42,0	10 - 44								
	Ø ≤ 54,0	13 - 50								
	Ø ≤ 76,0	13	125	2	2	0	50	75	-	
		14 - 50								EI 90 C/U
	Ø ≤ 88,9*	19 - 50							EI 120 C/U	EI 120 C/U
	Ø ≤ 108,0**	25 - 50								
Steel, stainless steel, cast iron	Ø ≤ 168,3*	19 - 50								

* Additional protective insulation made of mineral fibre mat (L_1 ≥ 500 mm x D_1 ≥ 40 mm)
** Additional protective insulation made of mineral fibre mat (L_1 ≥ 750 mm x D_1 ≥ 40 mm)

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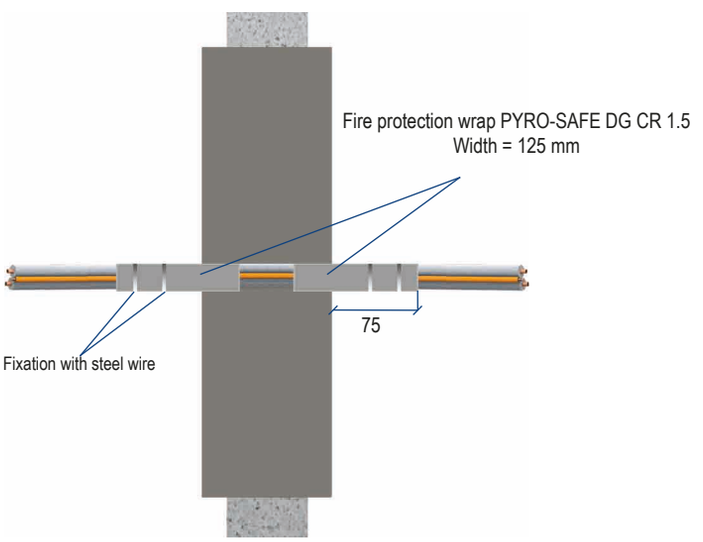
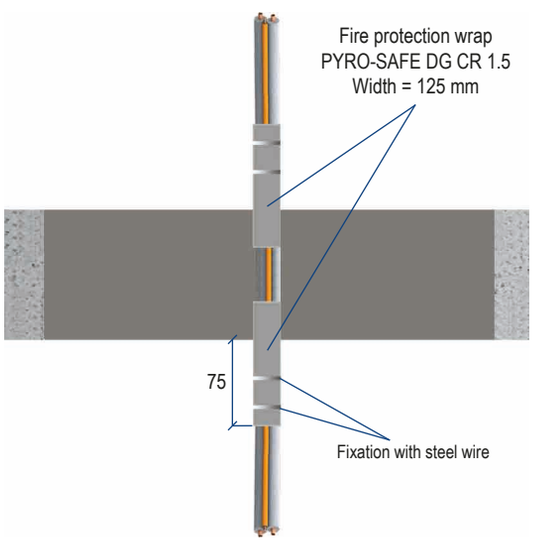
6.8 Further allowed services – HVAC split line combinations

- HVAC split line combinations “Tubolit Duo Split” (copper pipes with PE insulation, one PE-100 plastic pipe and two accompanying cables). must be arranged vertically to the component surface.
- HVAC split line combinations must be wrapped on both side with the fire protection wrap PYRO-SAFE DG-CR 1.5 (width 125 mm).
- The PYRO-SAFE DG-CR 1.5 fire protection wrap is coated and covered with a protective film on one side. Before installation the protective film shall be removed, the coated side have to be inside. Fixation of the wrap with steel wires.
- The fire protection wrap (125 mm) must be arranged so that 50 mm is in the partition. The wrap must be fixed with two steel wires.

Measures for sealing in walls and floors





PYRO-SAFE NOVASIT BM fire protection mortar
Wall-/Floor-, seal thickness and implementation variants see page 17

Dimension specifications in mm

Pipe-material	Pipe-outside-Ø [mm]	Qty. add. cables Ø ≤ 14 mm [n]	Pipe-insulation [Type, mm]	PE-pipe Ø [mm]	Fire protection wrap PYRO-SAFE DG-CR 1.5						Fire resistance class	
					Wrap width [mm]	Qty. wraps [n]	Qty. layers [n]	Overlap-ping [mm]	Inside seal [mm]	Outside seal [mm]	Wall	Floor
Copper	2 x ≤ 10/18	2	PEF ≤ 9,0	≤ 25	125	2	2	0	50	75	EI 120	EI 120

Fire resistance class wall/floor see page 7

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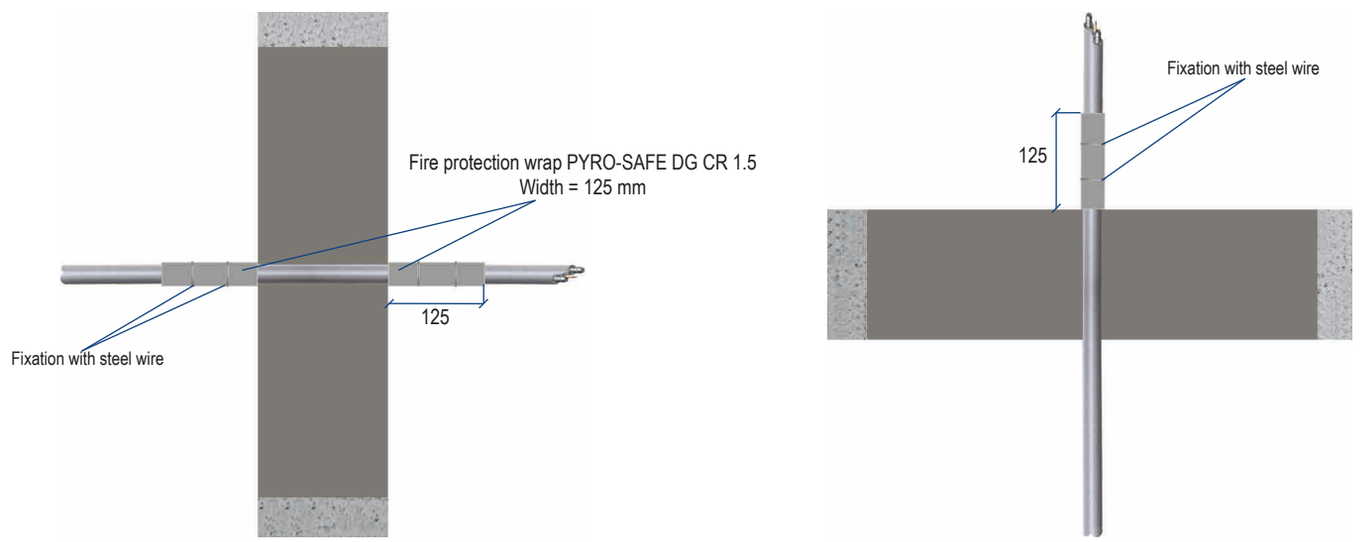
6.8 Further allowed services – double solar pipes „NanoSUN²“

- The double solar pipes must be arranged vertical to the component´s surface. Pipe end configuration (U/U).
- The double solar pipes must be wrapped with the fire protection wrap PYRO-SAFE DG-CR 1.5 (width 125 mm) on both sides. If built in floors, only one wrap is necessary above the floor.
- The PYRO-SAFE DG-CR 1.5 fire protection wrap is coated and covered with a protective film on one side. Before installation the protective film shall be removed, the coated side have to be inside. Fixation of the wrap with steel wires.

Measures for sealing in walls and floors



PYRO-SAFE NOVASIT BM fire protection mortar
Wall-/Floor-, seal thickness and implementation variants see page 17

Dimension specifications in mm

Outside pipe-Ø [mm]	Fire protection wrap PYRO-SAFE DG-CR 1.5						Fire resistance class	
	Wrap width [mm]	Qty. wraps [n]	Qty. layers [n]	Overlapping [mm]	Inside seal [mm]	Outside seal [mm]	Wall	Floor
DN 16 - DN 25	125	2	1	≥ 40	0	125	EI 120 C/U	EI 120 C/U
		1 (above)					EI 120 C/U	EI 120 C/U

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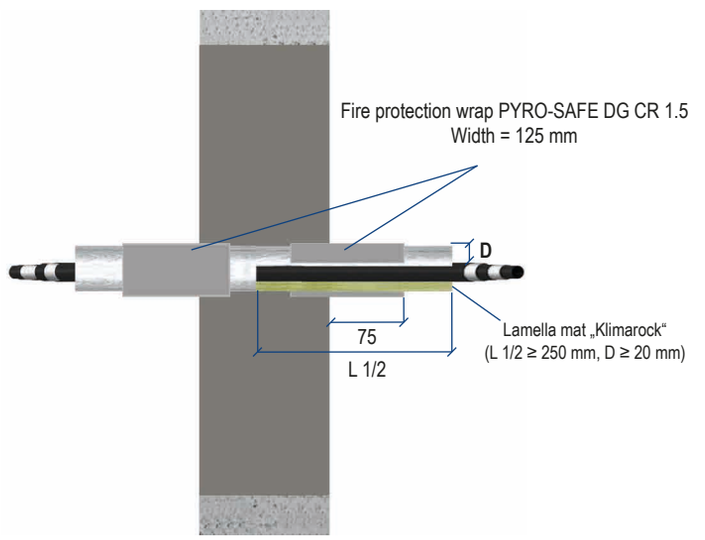
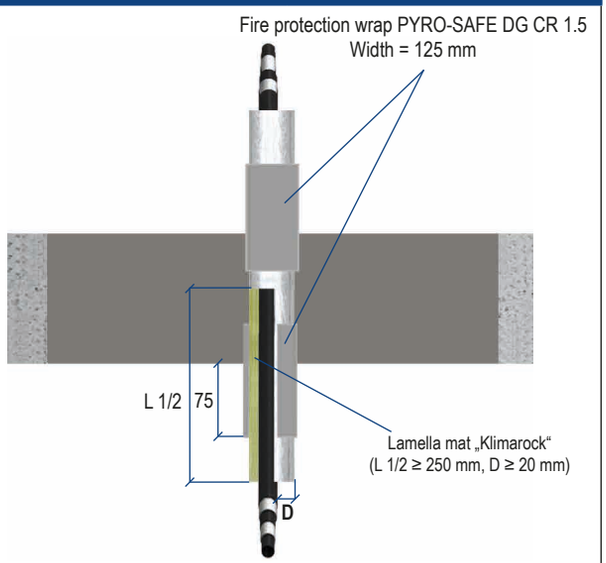
6.8 Further allowed services – “HANSA FLEX” hydraulic hoses with wire mesh insert

- The pipes must arranged vertically to the wall/floor surface.
- The pipes must be wrapped in one layer centrally to the wall/floor axis in the partition area with the lamella mat „Klimarock“ (L 1/2 ≥ 250 mm, D ≥ 20 mm). The lamella mat then must be wrapped per side with one layer without overlapping with the PYRO-SAFE DG-CR 1.5 fire protection wrap (width 125 mm).
- The wrap must be arranged so that 50 mm per partition side are outside of the wall/floor.
- The PYRO-SAFE DG-CR 1.5 fire protection wrap is coated and covered with a protective film on one side. Before installation the protective film shall be removed, the coated side have to be inside. Fixation of the wrap with steel wires.

Measures for sealing in walls and floors





PYRO-SAFE NOVASIT BM fire protection mortar
Wall-/Floor-, seal thickness and implementation variants see page 17

Dimension specifications in mm

Outside pipe-Ø [mm]	Protective insulation made of lamella mat „Klimarock“		Fire protection wrap PYRO-SAFE DG-CR 1.5						Fire resistance class	
	Length L 1/2 [mm]	Thickness D [mm]	Wrap width [mm]	Qty. wraps [n]	Qty. layers [n]	Overlapping [mm]	Inside seal [mm]	Outside seal [mm]	Wall	Floor
≤ 55,9	≥ 250 mm	≥ 20 mm	125	2	1	0	50	75	EI 120	EI 120

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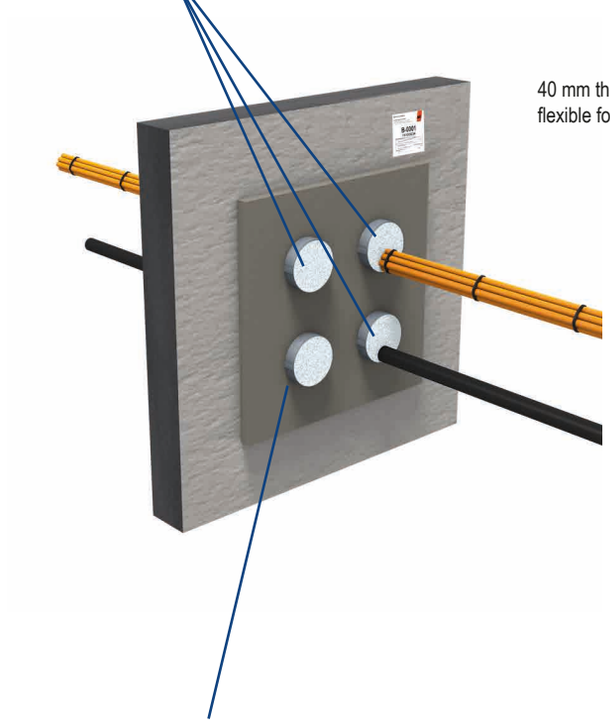
PYRO-SAFE Novasit BM

7. Retrofitting with „PYRO-SAFE CT“ Cable Tube

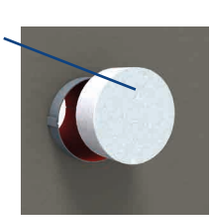
- Depending of the implemented media and wall thickness, the cable tube can be used in lengths of 150 mm, 200 mm and 300 mm can be used.
- Cables, cable bundles and conduits for electrical installation may abut one another and lie inside on the cable tube.
- The cable tube may be used for closing the openings without installations (empty seal).
- Further information and installation requirement are in the PYRO-SAFE CT Cable Tube manual.
- For retrofitting, the existing foam plugs must be removed.
- The remaining openings between the PYRO-SAFE CT Cable Tube and the installations or between the installations must be fully sealed with the 40 mm thick flexible foam plugs. After it must be sealed with the ablative paint PYRO-SAFE FLAMMOTECT-A building material.
- For fire resistance classes see page 8.
- Two cable tubes á 150 mm can be put together to a cable tube with a length of 300 mm to built in floors with a thickness of ≥ 200 mm. (Connection with tape).

Retrofitting with „PYRO-SAFE CT“ Cable Tube



Plugs sealed with
PYRO-SAFE FLAMMOTECT-A

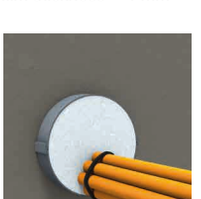
1. Remove plugs on both sides



2. Carry out subsequent assignment in accordance with approval

3. Adapt and install the plugs according to the lines fed through

3. Seal plugs with PYRO-SAFE FLAMMOTECT-A
dry film thickness ≥ 1 mm



For subsequent assignment with conduit (conduits for electrical installations) without cable occupation, the opening of the conduit must be plugged with mineral wool and then with
PYRO-SAFE FLAMMOTECT-A building material.

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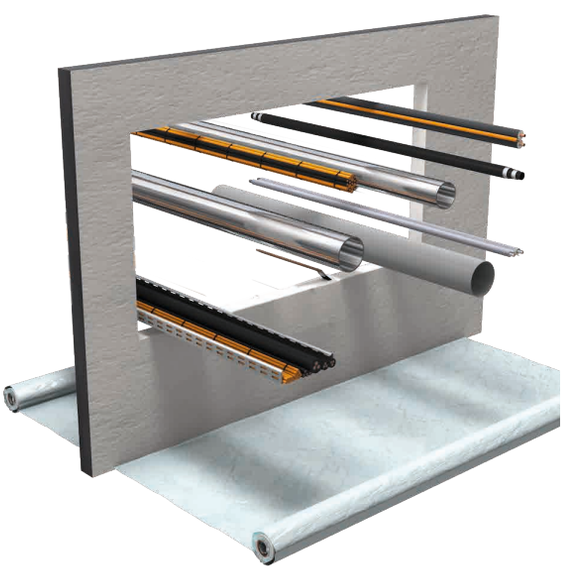
PYRO-SAFE Novasit BM

8. General installation steps

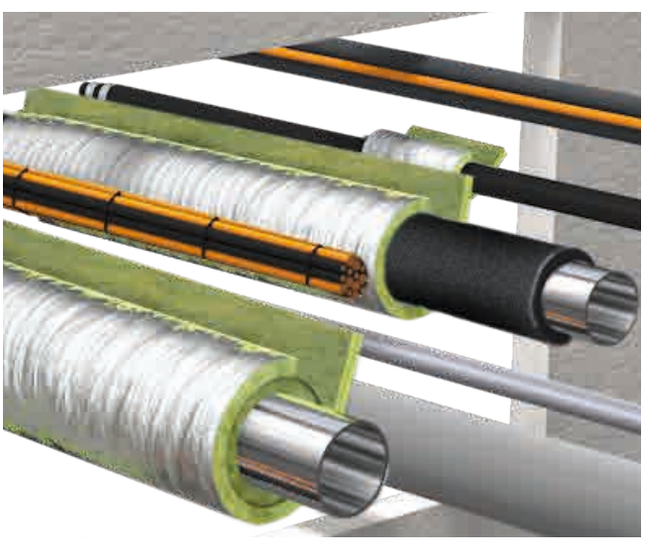
1. Mix a PYRO-SAFE NOVASIT BM 20 kg bag of fireproofing compound with approx. 6 litres of water. Pour water into a mixing container, add mortar. Follow the safety instructions on p. 3.

2. Stir to mix in thoroughly. After approx. 4-5 minutes soaking period, mix up again thoroughly.

3. If necessary, cover the floor on both sides with film, clean the recess, wet absorbing surfaces of the recess with water.



4. For additional assignment with non-combustible pipes, apply section/protective insulation, for hydraulic hoses, “HANSA-FLEX” protective insulation in accordance with overview.



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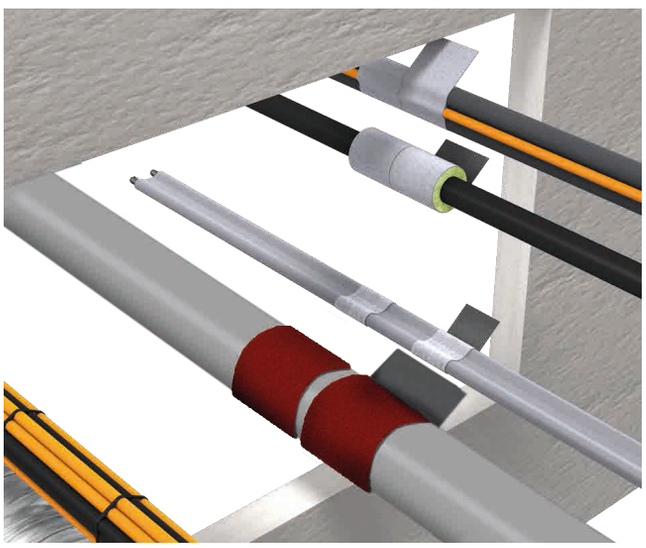
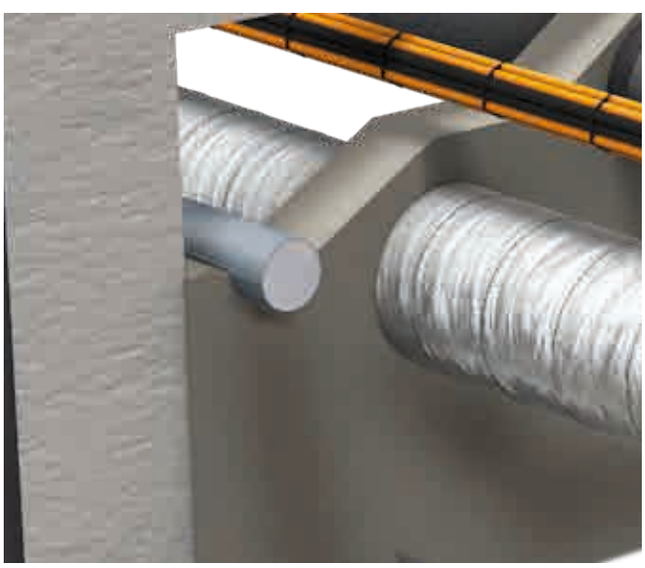
8. General installation steps

5. For additional assignment with “NanoSUN²”, Klimasplit cables, hydraulic hoses “HANSA-FLEX” fireproof bandage PYRO-SAFE DG-CR 1.5, wrap combustible pipes with the PYRO-SAFE DG-CR BS fire protection wrap in accordance with overview.

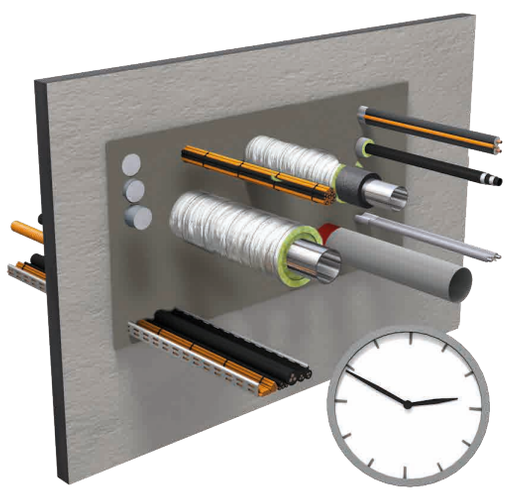


6. Apply the partition compound so that there is a solid, tight connection to the component (partition thickness min. 15 cm!). Completely fill intermediate spaces and bandage cavities.

7. For additional assignment with the “PYRO-SAFE CT” cable tube, insert in the fire protection compound and completely seal remaining openings while observing the distances. Then seal the plugs of the cable tubes with PYRO-SAFE FLAMMOTECT-A.



8. After appropriate hardening, smooth the surfaces with the trowel and fully rework any shrinkage cracks. The same applies to the areas after removing the formwork.



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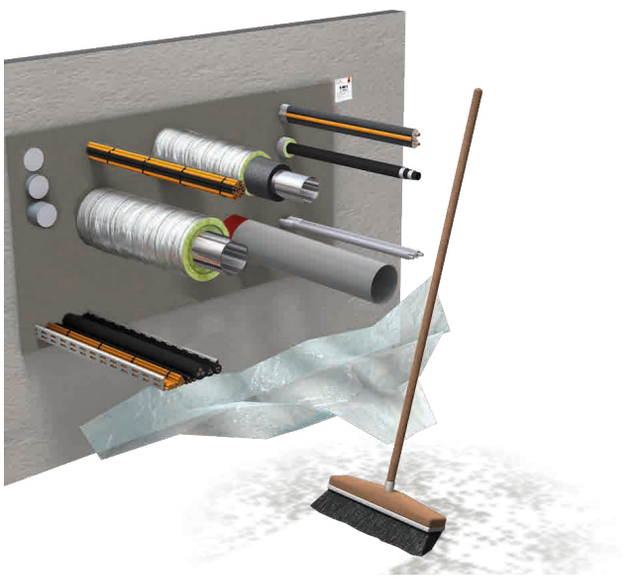
PYRO-SAFE Novasit BM

8. General installation steps

9. If required or mandatory, fill the identification label and apply on the side or below (not on!) the installation.

10. After the mortar residues dry, remove them from cables, walls and floors, clean surfaces including the removal of the cover films and dispose of properly.



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Declaration of Performance
Nr. 01161000-NOVASIT-BM
PYRO-SAFE NOVASIT BM

Date: 30.01.2017
Rev. 03

Unique identification code of the product type
PYRO-SAFE NOVASIT BM

Intended use:
Product for use in penetration seals

Producer
svt Brandschutz Vertriebsgesellschaft mbH International
Gluesinger Strasse 86
D - 21217 Seevetal

System for assessing and verifying constancy of performance
System 1

European Assessment Document
ETAG 026-2:2008-01-01

Harmonised technical Specification/ European Technical Assessment	*EC cerificate of conformity*
EN 998-2: 2010	0764-CPD-0190
ETA-16/0132 dated 16.01.2017	**0761-CPR-0582**

Technical Assessment Body
Deutsches Institut für Bautechnik (DIBt), Berlin

The notified body
Materialprüfanstalt für das Bauwesen Braunschweig, code number 0761

Declared performance

Essential characteristics	Performance	Harmonised technical specification
Reaction to fire	class A1	EN 13501-1
Pressure resistance	M 2,5	EN 998-2:2010
Gross density (dry mortar)	900 kg/m³	
Starting shear strength (Adhesive shear strength)	0,15 N/mm² (table value)	
Water absorption	NPD	
Chloride content	≤ 0,10 M.-%	
Water vapor permeability μ	5/20 (table value)	
Thermal conductivity $\Lambda_{10,dry}$	≤ 0,25 W/(mK) for P=50% ≤ 0,27 W/(mK) for P=90% (table values acc. EN 1745)	
Emission of dangerous substances	no dangerous substances	ETAG 026-2
Durability and serviceability	Use category type Z_2	EOTA TR 024
Fire resistance	Depending on the type of installation, the type of building element and the penetrating services – see ETA-16/0132	EN 13501-2

The performance of the product identified above is in conformity with the set of declared performances. This declaration of performance is issued, in accordance with Regulation (EU) No. 305/2011, under the sole responsibility of the manufacturer identified above
DoP online available at www.svt.de.
Signed for and on behalf of the manufacturer by:

i.V. Christian Meyer-Korte
Head of Product Management

i.V. Andree Schober
Head of chemical department