PYRO-SAFE® Flammotect single layer

Installation instructions

Mixed penetration sealing system made of one mineral-fibre board (60 mm) and an ablative coating for electrical cables of any type, and for combustible and non-combustible pipes.
Fire resistance class maximum EI 90 compliant with EN 13501-2 in accordance with ETA-14/0418.

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PYRO-SAFE® Flammotect single layer

1. Preliminary remarks / Overview

1.1 Target group

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

1.2 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. Installation results may differ in appearance.
- Unless otherwise indicated, all lengths are in millimeters
- All information in this document corresponds to the current state of the art or the valid standard version at the time of preparation. Upon request, svt will gladly provide the relevant statutory and technical framework conditions or manufacturer‘s specifications for each individual case.
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1.3 Safety instructions

- The safety data sheets must be used for advice when processing the fire protection compounds.
- Personal protective equipment:

	Wear protective clothing and non-slip shoes.
	Use protective goggles, wrap-around glasses.
	In case of short-term or low-level exposure: P2 particle filter. In case of intensive or long-term exposure: use self-contained breathing apparatus. Only use respirators that comply with international/national standards.
	Use chemicals-resistant protective gloves. Recommended material: butyl rubber, nitrile rubber, fluoro rubber, PVC.

Safety instructions for the installation of floor penetration seals

	The area below the floor penetration seal must be cordoned off while work on the penetration seal is underway (warning tape, or sign: danger - falling objects; keep off this area; sealing work underway in the floor above!
	The company that is commissioned to install the floor penetration seals shall provide the client with written information (to be passed on to the owner or his authorised representative), pointing out that fire-resistant penetration seals in floors must be provided on site with adequate protection (e.g. barriers), or covered with grating to prevent them from being walked on after installation.

1.4 Scope

The PYRO-SAFE® Flammotect - single layer mixed penetration sealing system in wall and floor openings is assessed and evaluated in accordance with ETAG 026-2 regarding the features „Reaction to fire“, „fire resistance“, „release of dangerous substances“ and „durability and serviceability“.

Reaction to fire

The ablative „PYRO-SAFE® FLAMMOTECT-A“ component is classified as E in accordance with EN 13501-1; the intumescent

„PYRO-SAFE® DG-CR“ material is classified as B-s1,d0 in accordance with EN 13501-1; the mineral-fibre boards are classified as A1 and the mineral-fibre mats are classified as A2-s1,d0 in accordance with EN 13501-1.

Fire resistance

PYRO-SAFE® Flammotect - single layer complies with requirements of max class EI 90 (extension -U/U for plastic pipes; extension -C/U for metal pipes) in accordance with EN 13501-2.

The fire resistance class for plastic pipes EI 90 -U/U also covers all other possible endings in accordance with EN 13501-2. The fire resistance class EI 90 -C/U for metal pipes also covers the class for the same fire resistance time with extension -C/C.

When installed in walls/floors with a lower fire resistance time, the fire resistance time of the penetration seal is also reduced to the fire resistance class of the wall or floor.

Release of dangerous substances

The ablative “PYRO-SAFE® FLAMMOTECT-A“ component and the intumescent “PYRO-SAFE® DG-CR“ fabric do not contain any substances identified as dangerous in the list of the European Commission.

The mineral-fibre board; the mineral-fibre mat and the loose mineral-fibre wool do not contain any dangerous substances listed in Directive 67/548/EC or Regulation (EC) No. 1272/2008 or the Indicative List on Dangerous Substances.

Durability and serviceability

The ablative „PYRO-SAFE® FLAMMOTECT-A“ component and the intumescent „PYRO-SAFE® DG-CR“ fulfills the type X in accordance with EOTA TR 024.

PYRO-SAFE® Flammotect - single layer system can be subjected to the conditions of inside rooms with and without exposure to moisture or atmospheric conditions, without substantial changes to the fire protection characteristics being expected.

1.5 Structural elements

Plasterboard walls with steel frame

In studworks and double-sided lining with at least 2 layers of 12.5 mm thick cement or gypsum-based building slabs with a fire performance of Class A1 or A2 in accordance with EN 13501-1.

The wall structure shall be complemented by additional wall struts and bars to form the edge of the opening.

The walls must be classified with the required fire resistance rating in accordance with EN 13501-2.

Plasterboard walls with wood frame

In studworks and double-sided lining with at least 2 layers of 12.5 mm thick cement or gypsum-based building slabs with a fire performance of Class A1 or A2 in accordance with EN 13501-1.

The distance from the opening to the struts and bars shall be ≥ 100 mm and the hollow spaces between the linings of the wall, the struts and bars as well as the opening edge shall be stuffed down to a depth of ≥ 100 mm with mineral-wool, fire resistance Class A1 or A2 in accordance with EN 13501 -1.

The walls shall be classified with the required fire resistance rating in accordance with EN 13501-2.

Lining of opening edge for plasterboard

Alongside the opening edge, there shall be at least a 12.5 mm thick layer of concrete or gypsum based slabs with a fire reaction class A1 or A2 according to EN 13501-1.

Solid walls

made of masonry, concrete, reinforced concrete, aerated concrete, ceramic bricks, cellular bricks or honeycomb bricks with a density ≥ 450 kg/m³.

The walls shall be classified for the desired fire resistance time in accordance with EN 13501-2.

Solid floors

made of concrete, reinforced concrete, with a density ≥ 2.200 (±500) kg/m³.

The floors shall be classified for the required fire resistance time in accordance with EN 13501-2.

1.6 Fire resistance classes

Fire resistance classes					
	Measures	Wall		Floor	
		Fire resistance class	Source*	Fire resistance class	Source*
Cables, cable bundles and cable trays with coating „PYRO-SAFE® FLAMMOTECT-A“					
Cables Ø ≤ 21 mm without cable tray through drill holes	≥ 100 mm x ≥ 0.75 mm dry film thickness	-		EI 90	2
Cables Ø ≤ 21 mm	≥ 100 mm x ≥ 0.75 mm dry film thickness	EI 60 / E 90	1, 2	EI 60 / E 90	2
Cables Ø > 21 mm to ≤ 50 mm	≥ 150 mm x ≥ 1.00 mm dry film thickness	EI 60 / E 90	1, 2	EI 60 / E 90	2
Cables Ø > 50 mm to ≤ 80 mm	≥ 150 mm x ≥ 1.00 mm dry film thickness	EI 60 / E 90	1, 2	EI 60 / E 90	2
Cable bundles Ø ≤ 100 mm	≥ 100 mm x ≥ 0.75 mm dry film thickness	EI 60 / E 90	1, 2	EI 60 / E 90	2
Cable bundles Ø ≤ 100 mm	≥ 150 mm x ≥ 1.00 mm dry film thickness	EI 90	1, 2	EI 60	1
Cables, cable bundles and cable trays with fire protection wrap „PYRO-SAFE® DG-CR 1.5“ – Wrap width = 125 mm					
Cables Ø ≤ 21 mm without cable tray through drill holes	2 x 1-layer, ≥ 45 mm overlapping	EI 90	2	EI 90	2
Cables Ø ≤ 21 mm	2 x 1-layer, ≥ 45 mm overlapping	EI 60 / E 90	1, 2	EI 60 / E 90	2
Cables Ø > 21 mm to ≤ 50 mm	2 x 1-layer, ≥ 45 mm overlapping	EI 60 / E 90	1, 2	EI 60 / E 90	2
Cables Ø > 50 mm to ≤ 80 mm	2 x 1-layer, ≥ 45 mm overlapping	EI 60 / E 90	1, 2	EI 60 / E 90	2
Cable bundles Ø ≤ 100 mm	2 x 1-layer, ≥ 45 mm overlapping	EI 60 / E 90	1, 2	EI 60 / E 90	2
Electrical installation conduits with fire protection wrap „PYRO-SAFE® DG-CR 1.5“ – Wrap width = 125 mm					
made of plastic Ø ≤ 32 mm single or bundled up to Ø ≤ 100 mm, with or w/o cables (Ø ≤ 21 mm)	2 x 2-layer	EI 60 / E 90 U/U	2	EI 90 U/U	2
„speed pipe“ bundled or single pipes, with or w/o glass fibre or micro cables; with fire protection wrap „PYRO-SAFE® DG-CR 1.5“ – Wrap width = 125 mm					
max. 24 pcs. outside pipe-Ø ≤ 7 max. 7 pcs. outside pipe-Ø ≤ 10 max. 5 pcs. outside pipe-Ø ≤ 12	2 x 1-layer, 125 mm	EI 60 / E 90 U/U	1	EI 60 U/U	1
Combustible pipes made of PVC-U, PVC-C in accordance with EN ISO 15493, EN ISO 1452 and DIN 8061/8062 with intumescent wrap “PYRO-SAFE® DG-CR BS” – Wrap width = 100 mm					
Outside pipe-Ø ≤ 50,0 mm	1 x 1-layer	EI 90 U/U	2	EI 90 U/U	2
Outside pipe-Ø ≤ 70,0 mm	1 x 2-layer	EI 60 / E 90 U/U	2	EI 45 / E 90 U/U	2
Outside pipe-Ø ≤ 90,0 mm	1 x 3-layer	EI 60 / E 90 U/U	2	EI 45 / E 90 U/U	2
Outside pipe-Ø ≤ 110,0 mm	1 x 4-layer	EI 60 / E 90 U/U	2	EI 45 / E 90 U/U	2
Combustible pipes made of PE-100 with intumescent wrap “PYRO-SAFE® DG-CR BS” – Wrap width = 100 mm					
Outside pipe-Ø ≤ 50,0 mm	1 x 1-layer	EI 90 U/U	2	EI 90 U/U	2
Outside pipe-Ø ≤ 70,0 mm	1 x 2-layer	EI 60 / E 90 U/U	2	EI 60 / E 90 U/U	2
Outside pipe-Ø ≤ 90,0 mm	1 x 3-layer	EI 60 / E 90 U/U	2	EI 60 / E 90 U/U	2
Outside pipe-Ø ≤ 110,0 mm	1 x 4-layer	EI 60 / E 90 U/U	2	EI 60 / E 90 U/U	2
Combustible pipes made of PP-H with intumescent wrap “PYRO-SAFE® DG-CR BS” – Wrap width = 100 mm					
Outside pipe-Ø ≤ 50,0 mm	1 x 1-layer	EI 90 U/U	2	EI 90 U/U	2
Outside pipe-Ø ≤ 70,0 mm	1 x 2-layer	EI 60 / E 90 U/U	2	EI 90 U/U	2
Outside pipe-Ø ≤ 90,0 mm	1 x 3-layer	EI 60 / E 90 U/U	2	EI 90 U/U	2
Outside pipe-Ø ≤ 110,0 mm	1 x 4-layer	EI 60 / E 90 U/U	2	EI 90 U/U	2

*Classification report no. 1 → 1913.2/13/Z00NP 2 → KB 00924.1/15/Z00NP/e

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Fire resistance classes

	Measures	Wall		Floor	
		Fire resistance class	Source*	Fire resistance class	Source*
Multi-layer composite pipes „Henco-Pipes“ with non-combustible insulation made of mineral-fibre „lamella mat“					
Outside pipe-Ø ≤ 12,0 mm, Wall thickness ≥ 1,6 mm	≥ 250 mm x ≥ 20 mm	**EI 30 U/C**	**2**	**EI 90 U/C**	**2**
Outside pipe-Ø ≤ 32,0 mm, Wall thickness ≥ 3,0 mm	≥ 250 mm x ≥ 20 mm	**EI 30 U/C**	**2**	**EI 90 U/C**	**2**
Outside pipe-Ø ≤ 63,0 mm, Wall thickness ≥ 4,5 mm	≥ 250 mm x ≥ 30 mm	**EI 30 U/C**	**2**	**EI 90 U/C**	**2**
Multi-layer composite pipes „Henco-Pipes“ with combustible insulation made of FEF „Armaflex Protect“					
Outside pipe-Ø ≤ 12,0 mm, Wall thickness ≥ 1,6 mm	≥ 240 mm x 13 mm	**EI 30 U/C**	**2**	**EI 90 U/C**	**2**
Outside pipe-Ø ≤ 32,0 mm, Wall thickness ≥ 3,0 mm	≥ 240 mm x 13 mm	**EI 90 U/C**	**2**	**EI 90 U/C**	**2**
Outside pipe-Ø ≤ 63,0 mm, Wall thickness ≥ 4,5 mm	≥ 240 mm x 26 (2 x 13) mm	**EI 30 U/C**	**2**	**EI 90 U/C**	**2**
Multi-layer composite pipes „Henco-Pipes“ with PE-foam insulation and intumescent wrap “PYRO-SAFE® DG-CR BS” – Wrap width = 100 mm					
Outside pipe-Ø ≤ 14,0 mm, 6 mm PE-Foam, Wall thickness ≥ 2,0 mm	1 x 1-layer, ≥ 25 mm Overlapping + Lamella mat ≥ 250 mm x ≥ 20 mm	**EI 30 U/C**	**2**	**EI 90 U/C**	**2**
Outside pipe-Ø ≤ 26,0 mm, 6 - 13 mm PE-Foam, Wall thickness ≥ 3,0 mm	1 x 1-layer, ≥ 25 mm Overlapping + Lamella mat ≥ 250 mm x ≥ 20 mm	**EI 30 U/C**	**2**	**EI 90 U/C**	**2**
Outside pipe-Ø ≤ 32,0 mm, 6 - 10 mm PE-Foam Wall thickness ≥ 3,0 mm	1 x 1-layer, ≥ 25 mm Overlapping + Lamella mat ≥ 250 mm x ≥ 20 mm	**EI 30 U/C**	**2**	**EI 90 U/C**	**2**
Multi-layer composite pipes „Uponor MLC pipe white S“					
Outside pipe-Ø ≤ 110,0 mm, Wall thickness = 10,0 mm	Lamella mat ≥ 250 mm x ≥ 30 mm	**-**		**EI 60 / E 90 U/C**	**2**
	Armaflex Protect ≥ 240 mm x 26 mm	**-**		**EI 60 U/C**	**2**
Non-combustible pipes made of copper, steel, stainless steel or cast iron with non-combustible insulation made of mineral-fibre „lamella mat“					
Outside pipe-Ø ≤ 15,0 mm, Wall thickness ≥ 0,8	≥ 250 mm x ≥ 20 mm	**EI 60 / E 90 C/U**	**1**	**EI 60 C/U**	**1**
Outside pipe-Ø ≤ 22,0 mm, Wall thickness ≥ 1,0	≥ 250 mm x ≥ 60 mm	**EI 60 / E 90 C/U**	**1**	**EI 60 C/U**	**1**
Outside pipe-Ø ≤ 22,0 mm, Wall thickness ≥ 1,0	≥ 500 mm x ≥ 20 mm	**EI 60 / E 90 C/U**	**1**	**EI 60 C/U**	**1**
Outside pipe-Ø ≤ 54,0 mm, Wall thickness ≥ 1,5	≥ 500 mm x ≥ 30 mm	**EI 60 / E 90 C/U**	**1**	**EI 60 C/U**	**1**
Outside pipe-Ø ≤ 88,9 mm, Wall thickness ≥ 2,0	≥ 800 mm x ≥ 40 mm	**EI 60 / E 90 C/U**	**1**	**EI 60 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 ≤ 88,9 mm, Wall thickness ≥ 2,0	≥ 800 mm x ≥ 40 mm	**EI 90 C/U**	**1**	**EI 60 C/U**	**1**
Outside pipe-Ø ≤ 114,3 mm, Wall thickness ≥ 3,6	≥ 500 mm x ≥ 40 mm	**EI 60 / E 90 C/U**	**1**	**EI 60 C/U**	**1**
Outside pipe-Ø ≤ 170,0 mm, Wall thickness ≥ 3,0	≥ 800 mm x ≥ 60 mm + ≥ 500 mm x ≥ 30 mm	**EI 60 C/U**	**1**	**EI 60 C/U**	
Outside pipe-Ø ≤ 219,1 mm, Wall thickness ≥ 5,0	≥ 800 mm x ≥ 60 mm + ≥ 500 mm x ≥ 30 mm	**EI 60 / E 90 C/U**	**1**	**EI 60 C/U**	**1**

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Fire resistance classes

	Measures	Wall		Floor	
		Fire resistance class	Source*	Fire resistance class	Source*
Non-combustible pipes made of copper, steel, stainless steel or cast iron with combustible insulation „NH/Armaflex“ and fire protection wrap „PYRO-SAFE® DG-CR 1.5“ – Wrap width = 125 mm					
Outside pipe-Ø ≤ 15,0 mm; Wall thickness ≥ 0,8 mm					
Insulation thickness 13 - 24 mm	2 x 2-layer	**EI 60 / E 90 C/U**	**2**	**-**	
Insulation thickness 25 mm	2 x 2-layer	**EI 90 C/U**	**2**	**-**	
Insulation thickness 13 - 19 mm	2 x 2-layer	**-**		**EI 90 C/U**	**2**
Insulation thickness 19 - 25 mm	1 x 2-layer	**-**		**EI 60 / E 90 C/U**	**2**
Outside pipe-Ø ≤ 28,0 mm; Wall thickness ≥ 1,0 mm					
Insulation thickness 19 - 24 mm	2 x 2-layer	**EI 60 / E 90 C/U**	**2**	**-**	
Insulation thickness 25 mm	2 x 2-layer	**EI 90 C/U**	**2**	**-**	
Insulation thickness 13 - 30 mm	2 x 1-layer, + Lamella mat ≥ 250 mm x ≥ 20 mm	**EI 90 C/U**	**2**	**-**	
Insulation thickness 19 - 25 mm	2 x 2-layer	**-**		**EI 90 C/U**	**2**
Insulation thickness 25 mm	1 x 2-layer	**-**		**EI 60 / E 90 C/U**	**2**
Outside pipe-Ø ≤ 42,0 mm; Wall thickness ≥ 1,2 mm					
Insulation thickness 25 - 43 mm	2 x 2-layer	**EI 60 / E 90 C/U**	**2**	**-**	
Insulation thickness 44 mm	2 x 2-layer	**EI 90 C/U**	**2**	**-**	
Insulation thickness 25 mm	2 x 2-layer	**-**		**EI 90 C/U**	**2**
Insulation thickness 25 - 44 mm	1 x 2-layer	**-**		**EI 60 / E 90 C/U**	**2**
Outside pipe-Ø ≤ 54,0 mm; Wall thickness ≥ 1,5 mm					
Insulation thickness 29 - 57 mm	2 x 1-layer, + Lamella mat ≥ 500 mm x ≥ 30 mm	**EI 90 C/U**	**2**	**-**	
Insulation thickness 28 - 57 mm	1 x 1-layer, + Lamella mat ≥ 500 mm x ≥ 30 mm	**-**		**EI 90 C/U**	**2**
Outside pipe-Ø ≤ 88,9 mm; Wall thickness ≥ 2,0 mm					
Insulation thickness 25 - 89 mm	2 x 2-layer, + Lamella mat ≥ 500 mm x ≥ 30 mm	**EI 90 C/U**	**2**	**-**	
Insulation thickness 25 - 88 mm	1 x 2-layer, + Lamella mat ≥ 500 mm x ≥ 40 mm	**-**		**EI 90 C/U**	**2**
Insulation thickness 89 mm	1 x 2-layer, + Lamella mat ≥ 500 mm x ≥ 30 mm	**-**		**EI 90 C/U**	**2**
Outside pipe-Ø ≤ 108,0 mm; Wall thickness ≥ 2,5 mm					
Insulation thickness 57 mm	2 x 2-layer, + Lamella mat ≥ 750 mm x ≥ 40 mm	**EI 90 C/U**	**2**	**-**	
Insulation thickness 57 mm	1 x 2-layer, + Lamella mat ≥ 1000 mm x ≥ 40 mm	**-**		**EI 90 C/U**	**2**
Insulation thickness 58 - 89 mm	1 x 2-layer, + Lamella mat ≥ 1000 mm x ≥ 40 mm	**-**		**EI 60 C/U**	**2**
Non-combustible pipes made of steel, stainless steel or cast iron with combustible insulation „NH/Armaflex“ and fire protection wrap „PYRO-SAFE® DG-CR 1.5“ – Wrap width = 125 mm					
Outside pipe-Ø ≤ 170,0 mm, Wall thickness ≥ 2,9 mm					
Insulation thickness 25 mm	2 x 2-layer, + Lamella mat ≥ 750 mm x ≥ 40 mm	**EI 60 / E 90 C/U**	**2**		
Insulation thickness 25 mm	1 x 2-layer, + Lamella mat ≥ 1000 mm x ≥ 40 mm			**EI 90 C/U**	**2**
Insulation thickness 26 - 85 mm	1 x 2-layer, + Lamella mat ≥ 1000 mm x ≥ 40 mm			**EI 60 C/U**	**2**

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Fire resistance classes					
	Measures	Wall		Floor	
		Fire resistance class	Source*	Fire resistance class	Source*
Non-combustible pipes made of copper, steel, stainless steel or cast iron with combustible insulation „Armaflex Protect“					
Outside pipe-Ø ≤ 88,9 mm, Wall thickness ≥ 0,8 mm	-	**EI 60 / E 90 C/U**	**1**	**EI 60 / E 90 C/U**	**1**
Non-combustible pipes made of steel, stainless steel or cast iron with combustible insulation„Armaflex Protect“					
Outside pipe-Ø ≤ 170,0 mm, Wall thickness ≥ 3,0 mm	-	**EI 90 C/U**	**1**	**EI 60 / E 90 C/U**	**1**
HVAC split line combinations with fire protection wrap “PYRO-SAFE® DG-CR 1.5“– Wrap width = 125 mm					
Pipe-Ø 6/10 mm or Ø 6-10, 9 mm PE-foam, 1 Pipe PVC-U Ø ≤ 25,0 mm, Wall thickness 1,8-3,5 mm, 2 cable Ø ≤ 14,0 mm	2 x 2-layer	**EI 60 / E 90**	**1**	**EI 45 / E 60**	**1**
Pipe-Ø 22/22 mm or Ø 6-22, 9 mm PE-foam, 1 Pipe PVC-U Ø ≤ 25,0 mm, Wall thickness 1,8 mm, 4 cable Ø ≤ 21,0 mm	1 x 2-layer + Lamella mat ≥ 250 mm x ≥ 30 mm	**EI 30**	**2**	**EI 90**	**2**
Double solar pipes „NanoSUN²“ with fire protection wrap „PYRO-SAFE® DG-CR 1.5“– Wrap width = 125 mm					
DN16	2 x 1-layer, ≥ 25 mm Overlapping	**EI 90 U/U**	**1**	**EI 60 U/U**	**1**
DN40	2 x 1-layer, ≥ 25 mm Overlapping	**EI 30 / E 90 U/U**	**1**	**EI 60 U/U**	**1**

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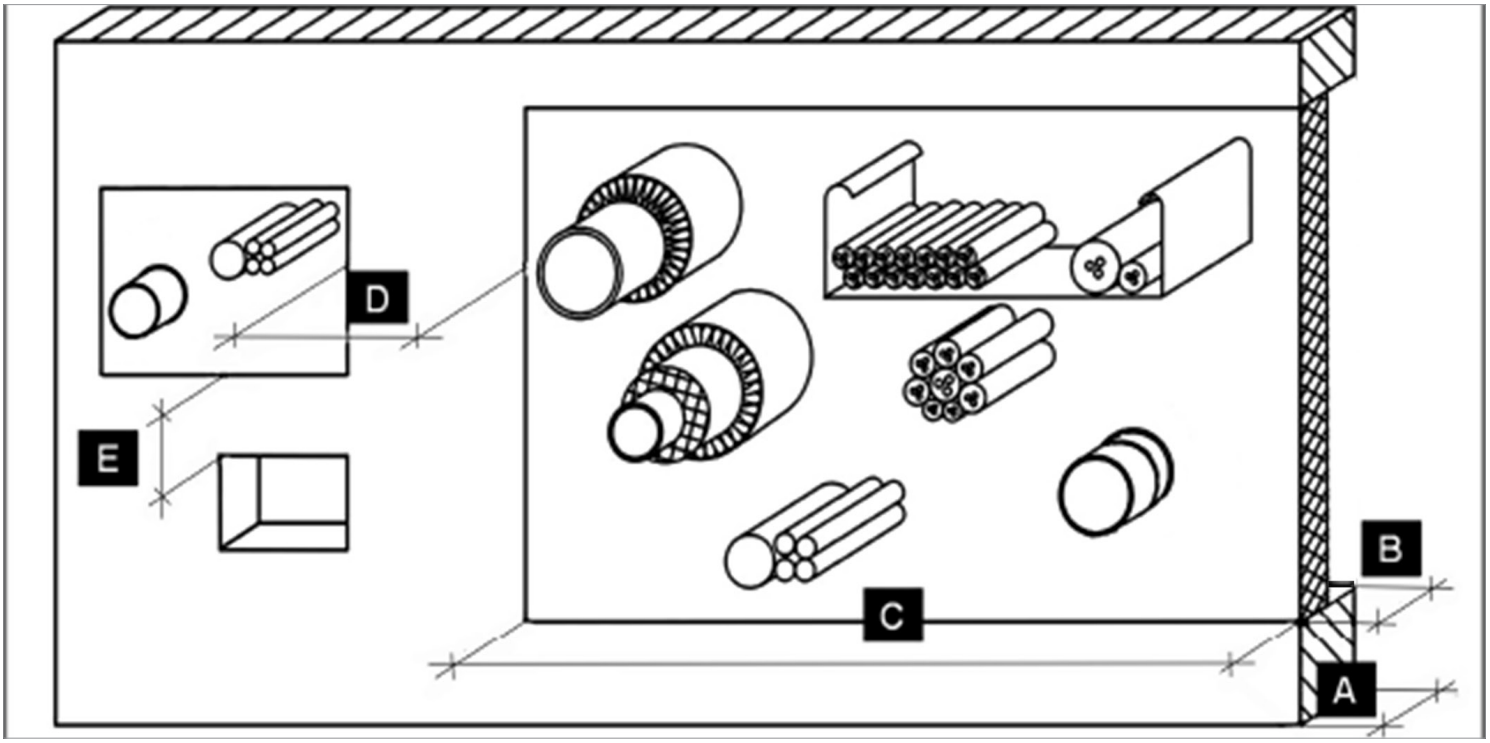
1.7 Field of application (Dimensions)

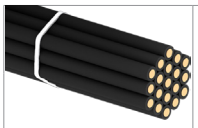
Dimensions			
Pos.	**Legend**	**Wall [mm]**	**Floor [mm]**
A	Thickness of structural element	≥ 100	≥ 125
B	Thickness of penetration seal	≥ 60	≥ 60
C	Maximum dimensions of the opening (width x height)	1.175 x 1.200	1.200 x 2.400 or 800 x ∞
D	Distance from other openings or installations	≥ 200	≥ 200
E	Reduced distance from neighbouring openings for penetration seals, if both openings are ≤ 400 mm x 400 mm	≥ 100	≥ 100



2. Allowed services

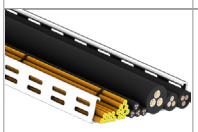
2.1 Allowed services – cables

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



Cable bundles

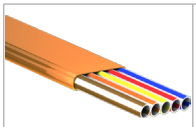
up to Ø ≤ 100 mm with cables up to Ø ≤ 21 mm.
No filling needed for tightly compressed and tied bundles.



Cable support constructions

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.

Electrical installation conduits, single made of plastic.
Outer Ø ≤ 32 mm, with/without cable assignment Ø ≤ 21 mm.



PE lines „speed pipes“ (for glass fibre cables and micro cables)
from Gabocom Systemtechnik GmbH, bundled or individual, with/without glass fibre cable.

Outside pipe-Ø [mm]	Max. qty. [pcs.]	Thickness of pipe wall [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 ≤ 100 mm for 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	
Standards: EN 1329-1, EN 1453-1, EN 1542-1, EN 15493, DIN 8061/8062, EN 1566-1		Standards: EN 1555-2, EN 12201-2+A1, DIN 8074/8075, EN 15874, DIN 8077/8078		Standards: EN 1555-2, EN 12201-2+A1, DIN 8074/8075	
Outside pipe-Ø [mm]	**Wall thickness [mm]**	**Outside pipe-Ø [mm]**	**Wall thickness [mm]**	**Outside pipe-Ø [mm]**	**Wall thickness [mm]**
≤ 50	1,8 - 3,7	≤ 50	1,8 - 4,6	≤ 50	1,8 - 4,6
≤ 70	1,9 /2.0- 5,2	≤ 70	2,0/2,1 - 5,2	≤ 70	2,0/2,1 - 6,4
≤ 90	2,0/2,1 - 6,7	≤ 90	2,3/2,4 - 5,8	≤ 90	2,3/2,4 - 8,2
≤ 110	2,2 - 8,2	≤ 110	2,6/2,7 - 6,3	≤ 110	2,6/2,7 - 10,0

Multi-layer composite 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.

Outside pipe-Ø [mm]	Wall thickness [mm]
≤ 12	1,6
≤ 14	2,0
≤ 32	3,0
≤ 63	4,5

Multi-layer composite pipes „Uponor MLC Pipe White S“
Pipes in a multilayered network of aluminium and PE-RT (PE-RT/Al/PE-RT) by Uponor with an outside-Ø ≤ 110.0 mm, wall thickness 10.0

2.3 Allowed services – non-combustible pipes

Non-combustible pipes Pipes made of copper, steel, stainless steel or cast iron	
Pipe material / insulation	**Outside-Ø [mm]**
Copper with non-combustible pipe insulation made of mineral-fibre e.g. „lamella mat“	≤ 88,9
Steel, stainless steel or cast iron with non-combustible pipe insulation made of mineral-fibre e.g. „lamella mat“	≤ 219,1
Copper with combustible pipe insulation „NH/Armaflex“	≤ 108,0
Steel, stainless steel, cast iron with combustible pipe insulation „NH/Armaflex“	≤ 170,0
Copper with combustible pipe insulation „Armaflex Protect“	≤ 88,9
Steel, stainless steel, cast iron with combustible pipe insulation „Armaflex Protect“	≤ 170,0

Pipe material	Outside pipe-Ø [mm]	Wall thickness [mm]
Copper, steel, stainless steel, cast iron	Ø ≤ 15,0	≥ 0,8
	Ø ≤ 22,0	≥ 1,0
	Ø ≤ 42,0	≥ 1,2
	Ø ≤ 54,0	≥ 1,5
	Ø ≤ 88,9	≥ 2,0
Steel, stainless steel, cast iron	Ø ≤ 114,3	≥ 3,6
	Ø ≤ 170,0	≥ 2,9
	Ø ≤ 219,1	≥ 5,0

2.4 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, resp. 4 sheath cables Ø ≤ 21 mm) without spacing.

Double solar pipes „NanoSUN²“

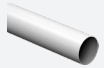
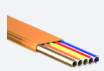
Pipes for solar thermal applications made of corrugated stainless steel with insulation, an accessory line integrated in the insulation and a PVC sheath by Aktarus Group Srl according to DN 16 to DN 40.

3. Distances

3.1 Distances – Wall

Distances – Wall

Protect your values.

		Cables	Cable bundles	Cable trays	Electrical installation conduits single or bundled	Combustible pipes	Multilayer pipes	Non-combustible pipes; insulation made of "Lamella mat"	Non-combustible pipes; insulation made of FEF	HVAC split line combinations	Double solar pipes „NanoSUN²“	PE lines "speed pipes"	Surface of structural element		
													Upper	Under	Side
	Cables	≥ 0*			≥ 0***	≥ 50	≥ 10***	≥ 70**	≥ 25	≥ 25	≥ 25	≥ 25	≥ 10	≥ 0	≥ 0
	Cable bundles	≥ 0*			≥ 0***	≥ 50	≥ 10***	≥ 70**	≥ 25	≥ 25	≥ 25	≥ 25	≥ 10	≥ 0	≥ 0
	Cable trays	≥ 0*			≥ 0***	≥ 50	≥ 10***	≥ 70**	≥ 25	≥ 25	≥ 25	≥ 25	≥ 10	≥ 0	≥ 0
	Electrical installation conduits single or bundled	≥ 0			≥ 0	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 25	≥ 25	≥ 25
	Combustible pipes	≥ 50			≥ 100	≥ 25	≥ 100	≥ 25	≥ 50	≥ 100	≥ 100	≥ 100	≥ 50	≥ 50	≥ 50
	Multilayer pipes	≥ 10			≥ 100	≥ 100	≥ 0	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 0	≥ 0	≥ 0
	Non-combustible pipes; insulation made of lamella mat	≥ 70**			≥ 100	≥ 25	≥ 100	≥ 0	≥ 100	≥ 100	≥ 100	≥ 100	≥ 0	≥ 0	≥ 0
	Non-combustible pipes; insulation made of FEF“	≥ 25			≥ 100	≥ 50	≥ 100	≥ 100	≥ 0	≥ 100	≥ 100	≥ 100	≥ 0	≥ 0	≥ 0
	HVAC split line combinations	≥ 25			≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 0	≥ 100	≥ 100	≥ 0	≥ 0	≥ 0
	Double solar pipes „NanoSUN²“	≥ 25			≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 0	≥ 100	≥ 0	≥ 0	≥ 0
	PE lines "speed pipes"	≥ 25			≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 50	≥ 100	≥ 100	≥ 0

* Distance above each other ≥ 50

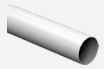
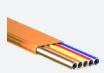
** Distance at cable / cable bundle / cable support systems with wrap ≥ 50

*** if cable ≤ 21 then distance ≥ 0

3.2 Distances – Floor

Distances – Floor

Protect your values.

		Cables	Cable bundles	Cable trays	Electrical installation conduits single or bundled	Combustible pipes	Multilayer pipes	Non-combustible pipes; insulation made of "Lamella mat"	Non-combustible pipes; insulation made of FEF	HVAC split line combinations	Double solar pipes „NanoSUN²“	PE lines "speed pipes"	Surface of structural element		
													front	at the back	side
	Cables	≥ 0*			≥ 0***	≥ 50	≥ 20	≥ 50	≥ 25**	≥ 50	≥ 10	≥ 20	≥ 5	≥ 0	≥ 0
	Cable bundles	≥ 0*			≥ 0***	≥ 50	≥ 20	≥ 50	≥ 25**	≥ 50	≥ 10	≥ 20	≥ 5	≥ 0	≥ 0
	Cable trays	≥ 0*			≥ 0***	≥ 50	≥ 20	≥ 50	≥ 25**	≥ 50	≥ 10	≥ 20	≥ 5	≥ 0	≥ 0
	Electrical installation conduits single or bundled	≥ 0			≥ 0	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 25	≥ 25	≥ 25
	Combustible pipes	≥ 50			≥ 100	≥ 25	≥ 100	≥ 25	≥ 50	≥ 100	≥ 100	≥ 100	≥ 50	≥ 50	≥ 50
	Multilayer pipes	≥ 20			≥ 100	≥ 100	≥ 0	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 0	≥ 0	≥ 0
	Non-combustible pipes; insulation made of lamella mat	≥ 50			≥ 100	≥ 25	≥ 100	≥ 0	≥ 100	≥ 100	≥ 100	≥ 100	≥ 0	≥ 0	≥ 0
	Non-combustible pipes; insulation made of FEF“	≥ 25**			≥ 100	≥ 50	≥ 100	≥ 100	≥ 0	≥ 100	≥ 100	≥ 100	≥ 0	≥ 0	≥ 0
	HVAC split line combinations	≥ 50			≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 0	≥ 100	≥ 100	≥ 0	≥ 0	≥ 0
	Double solar pipes „NanoSUN²“	≥ 10			≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 0	≥ 100	≥ 0	≥ 0	≥ 0
	PE lines "speed pipes"	≥ 20			≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 20	≥ 100	≥ 100	≥ 0

* Distance above each other ≥ 50

** Distance at cable / cable bundle / cable support systems with wrap ≥ 50

*** if cable ≤ 21 then distance ≥ 0

4. Used products

PYRO-SAFE® FLAMMOTECT-A Coating

in accordance with ETA-14/0418

12,5 kg Pail – Product no. 01155101
15,0 kg Pail – Product no. 01155105

PYRO-SAFE® FLAMMOTECT-A Solid emulsion

in accordance with ETA-14/0418

12,5 kg Pail – Product no. 01155106
15,0 kg Pail – Product no. 01155107

PYRO-SAFE® FLAMMOTECT-A Filler

in accordance with ETA-14/0418

12,5 kg Pail – Product no. 01155104
15,0 kg Pail – Product no. 01155109

PYRO-SAFE® FLAMMOTECT-A Filler

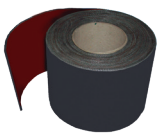
in accordance with ETA-14/0418

310 ml cartridge - Product no. 01155115

PYRO-SAFE® DG-CR 1.5 Fire protection wrap

in accordance with ETA-16/0268

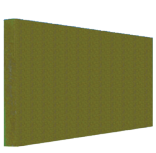
Roll à 10 m x 125 mm – Product no. 01261125



PYRO-SAFE® DG-CR BS Fire protection wrap

in accordance with ETA-16/0268

Roll à 10 m x 100 mm – Product no. 01264100



Mineral fibreboard in accordance with DIN EN 13162

Criteria:
Density≥ 150 kg/m³
Reaction to fire class A1 according to EN 13501:1
Melting point ≥ 1000°C.
(TR10) tensile strength perpendicular to the board surface ≥ 10 kPa according to EN1607
Thickness ≥ 60 mm

Mineral fibreboard

coated with PYRO-SAFE® FLAMMOTECT-A on both sides
Dimensions 1000 x 600 x 60 mm
4 pcs. – Product no. 01182160

Mineral fibre wool A1

Reaction to fire class according to EN 13501-1: A1
Melting point ≥ 1000 °C

10 kg bag – Product no. 01183000

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
Roll 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

Label

1 piece - product no. 01229000

Recommended tools

Filler, brush, masking tape
Mineral-wool knife and saw
If required: plastic film, folding ladder
Lock wire pliers, steel wire (galvanized)

Section- and protection insulation

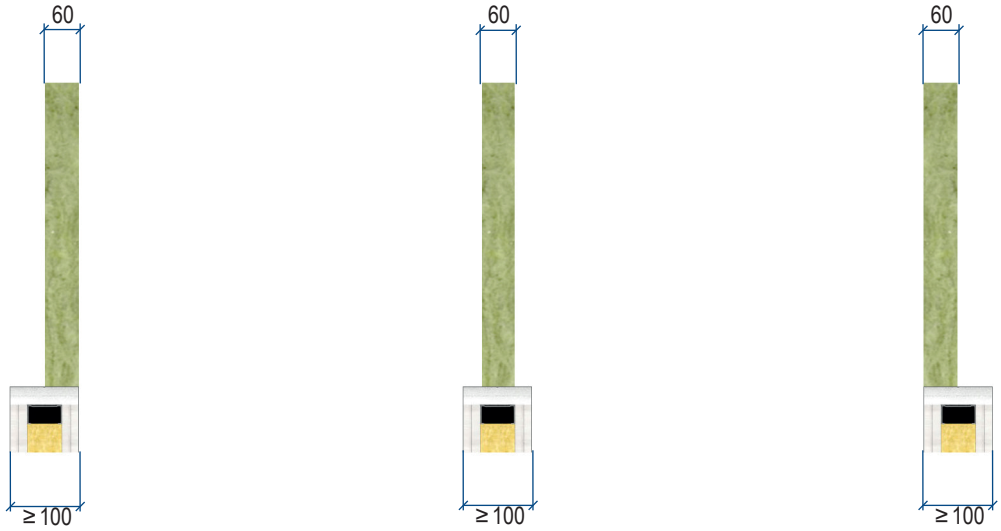
made of flexible elastomeric foam (FEF) in accordance with DIN EN 14304

Name	DIN/ abZ/abP
NH/Armaflex	DIN EN 14304
Armaflex Protect	DIN EN 14304

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.
- The interior surface of openings in light-weight partitions must be provided with an all-around protection.
- The penetration seal surface made of mineral-fibre boards and their edges, must be provided with an at least 0.75-mm thick (dry coat thickness) PYRO-SAFE® FLAMMOTECT-A coating; this coating must also be applied as a 20-mm all-around protection on the interior surface of the opening in the structural element/on the structural element plane.
- Annular gaps ≤ 5 mm around cables, cable bundles, cable trays as well as speed pipes, double solar pipes and HVAC split line combinations have to be coated with PYRO-SAFE® Flammotect-A inside the penetration / > 5 mm through filling with loose mineral-fibre wool and coating.
- Annular gaps ≤ 5 mm around combustible/non-combustible pipes have to be filled with loose mineral-fibre wool

Variants in plasterboards and solid walls



Plasterboard or solid wall

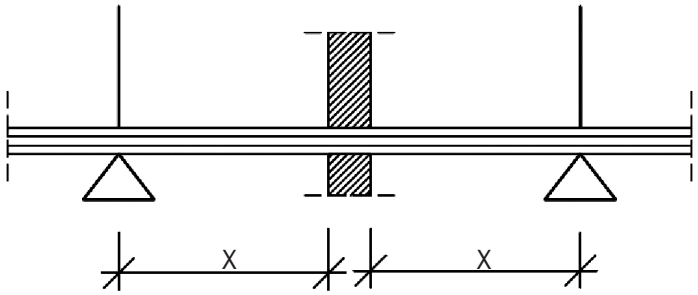
Dimension in mm

Variants in solid floors

Dimension in mm

5.1 Rules over the first cable/pipe support

- The first supports before the installation shall be made of non-combustible material (fire resistance class A1 or A2 in accordance with EN 13501-1); 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!

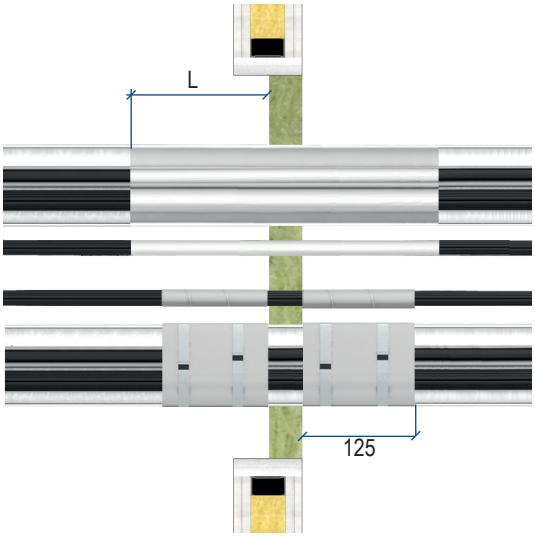
First cable/pipe support	
Cables, cable trays	≤ 200 mm (Wall)
Combustible pipes	≤ 400 mm (Wall)
Multi-layer composite pipes „Henco Pipes“	≤ 550 mm (Wall)
Non-combustible pipes - section insulation made of mineral-fibre mats or shells	≤ 850 mm
Non-combustible pipes made of copper - section insulation made of NH/Armaflex (without protection insulation)	≤ 800 mm (Wall)
Non-combustible pipes - section insulation made of NH/Armaflex (with protection insulation)	≤ 1000 mm (Wall)
Non-combustible pipes made of copper - section insulation made of Armaflex Protect	≤ 600 mm
Non-combustible pipes made of steel, stainless steel, cast iron - section insulation made of Armaflex Protect	≤ 1100 mm
Double solar pipes „NanoSUN²“	The manufacturers installation instructions are applied
„speed pipes“ for glass fibre cables and micro cables	The manufacturers installation instructions are applied
HVAC split line combinations	≤ 500 mm

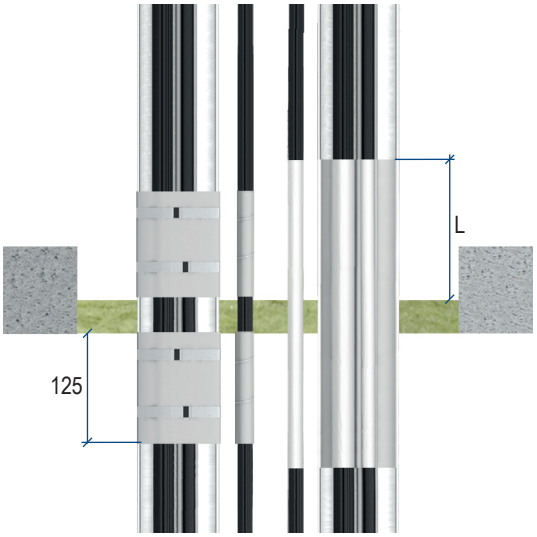
6. Fire protection measures

6.1 Cables / cable bundles / cable trays

- The feed-through of cables or cable bundles is allowed with or without 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 or hollow aluminium profiles, 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





Wall-/Floor-, seal thickness and implementation variants see page 16

Dimension in mm

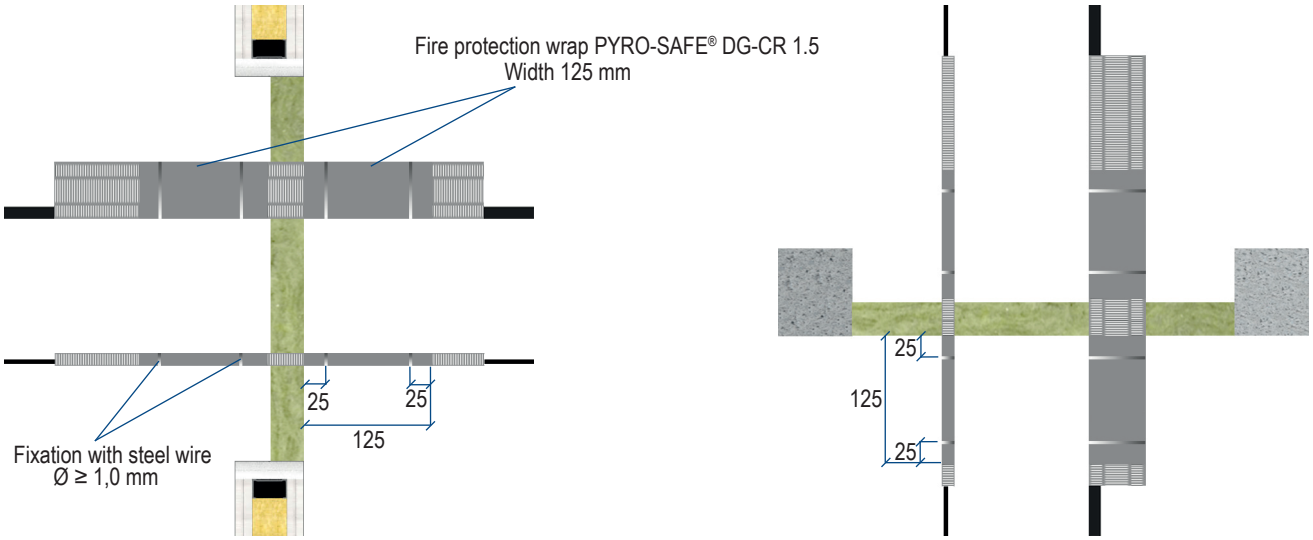
	Dimensions [mm]	Fire protection coating PYRO-SAFE® FLAMMOTECT-A			Fire resistance class	
		Dry film thickness [mm]	Inside seal [mm]	Outside seal L [mm]	Wall	Floor
Cables	Ø ≤ 21 (through drill holes))	0,75	60	100	-	EI 90
	Ø ≤ 21	0,75		100	EI 60 / E 90	EI 60 / E 90
	Ø > 21 to ≤ 50	1,00		150		
	Ø > 50 to ≤ 80	1,00		150		
Cable bundles	Ø ≤ 100	0,75		100		
	Ø ≤ 100	1,00		150	EI 90	-

	Dimensions [mm]	Fire protection wrap PYRO-SAFE® DG-CR 1.5						Fire resistance class	
		Wrap width[mm]	Qty. wraps [n]	Qty. layer [n]	Overlapping [mm]	Inside seal [mm]	Outside seal [mm]	Wall	Floor
Cables	Ø ≤ 21 (through drill holes)	125	2	1	≥ 45	0	125	EI 90	EI 90
	Ø ≤ 21							EI 60 / E 90	EI 60 / E 90
	Ø > 21 to ≤ 50								
	Ø > 50 to ≤ 80								
Cable bundles	Ø ≤ 100								

6.2 Electrical installation conduits

- The feed-through is allowed for single plastic conduits (max. Ø ≤ 32 mm) or bundled conduits (up to Ø ≤ 100 mm with single conduits Ø ≤ 32 mm) with or without cables Ø ≤ 21 mm.
- Conduits must be wrapped on both sides with the PYRO-SAFE® DG-CR 1.5 fire protection wrap (width 125 mm, thickness 1.5 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.

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



Wall-/Floor-, seal thickness and implementation variants see page 16

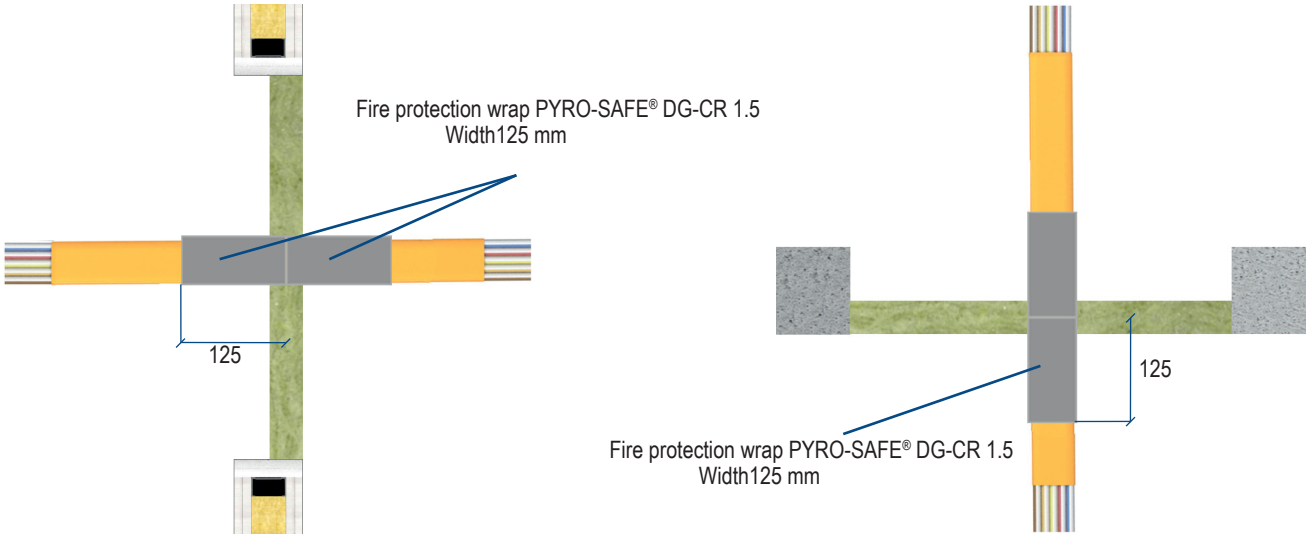
Dimension in mm

	Dimensions [mm]	Fire protection wrap PYRO-SAFE® DG-CR 1.5						Fire resistance class	
		Wrap width[mm]	Qty. wraps [n]	Qty. layer [n]	Overlapping [mm]	Inside seal [mm]	Outside seal [mm]	Wall	Floor
Conduit made of plastic single	Ø ≤ 32 (with or w/o cables Ø ≤ 21)	125	2	2	0	30	95	EI 60 / E 90 U/U	EI 90 U/U
Conduit made of plastic bundled	Ø ≤ 100 (single conduits Ø ≤ 32, with w/o cables Ø ≤ 21 mm)								

6.3 PE lines „speed pipe“ (for glass fibre cables and micro cables)

- The PE lines “speed pipe” shall be arranged vertical to the component´s surface. Pipe end configuration (U/U).
- The PE lines “speed pipe” must be wrapped on both sides with the PYRO-SAFE® DG-CR 1.5 fire protection wrap (width 125 mm, thickness 1.5 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.

Measures for sealing in walls and floors



Wall-/Floor-, seal thickness and implementation variants see page 16

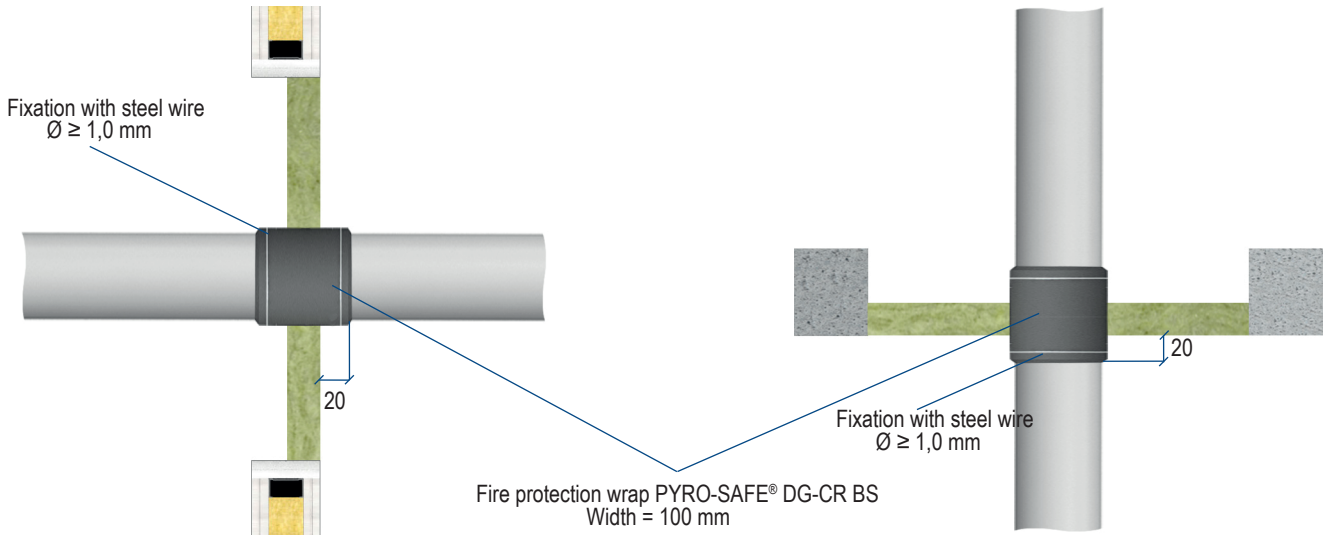
Dimension in mm

set-up speed pipes	Wall thickness s [mm]	Fire protection wrap PYRO-SAFE® DG-CR 1.5						Fire resistance class	
		Wrap width [mm]	Qty. wraps [n]	Qty. layer [n]	Overlapping [mm]	Inside seal [mm]	Outside seal [mm]	Wall	Floor
Ø 7,0 mm x 24 pcs	≥ 1,5	125	2	1	0	30	95	EI 60 / E 90 U/U	EI 60 U/U
Ø 10,0 mm x 7 pcs	≥ 2,0								
Ø 12,0 mm x 5 pcs	≥ 2,0								

6.4 Combustible pipes

- Combustible pipes shall be arranged vertical to the component´s surface.
- Combustible pipes have to be wrapped with the intumescent wrap „PYRO-SAFE® DG-CR BS“ (Width = 100 mm).
- 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.

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



Wall-/Floor-, seal thickness and implementation variants see page 16

Dimension in mm

Combustible pipes made of PVC-U, PVC-C

Dimensions [mm]	Intumescent wrap PYRO-SAFE® DG-CR BS						Fire resistance class	
	Wrap width [mm]	Qty. wraps [n]	Qty. layer [n]	Overlapping [mm]	Inside seal [mm]	Outside seal [mm]	Wall	Floor
≤ Ø 50	100	1	1	0	60	40 (20 per side)	EI 90 U/U	EI 90 U/U
≤ Ø 70			2				EI 60 / E 90 U/U	EI 45 / E 90 U/U
≤ Ø 90			3					
≤ Ø 110			4					

Combustible pipes made of PE-100

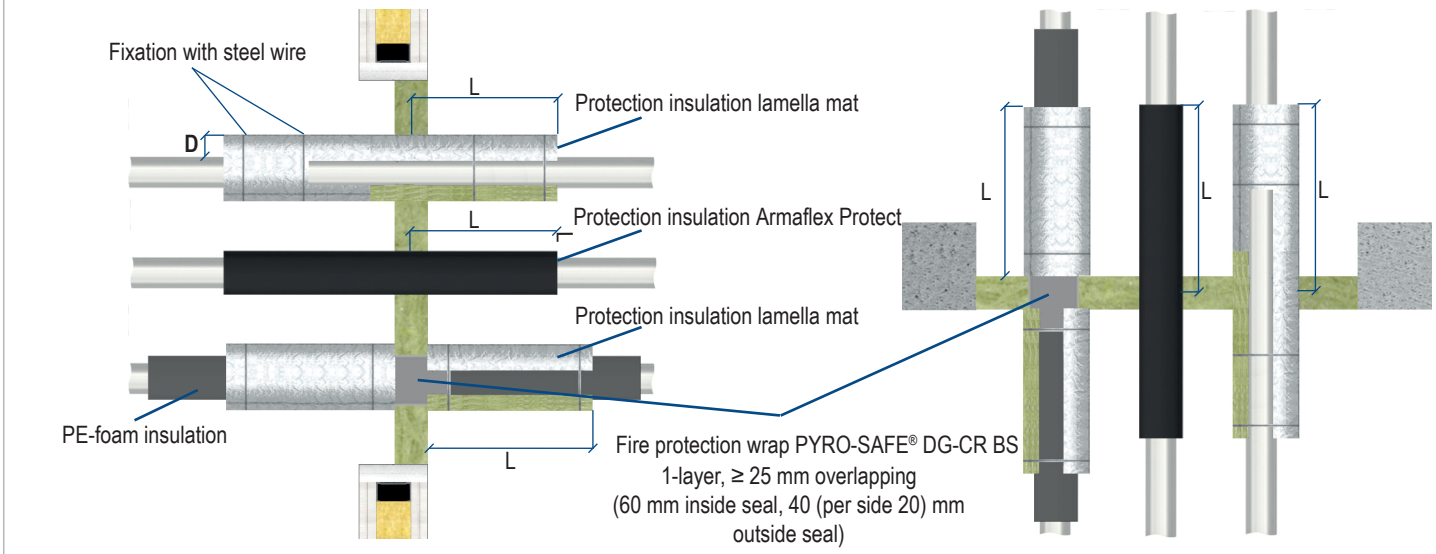
Dimensions [mm]	Intumescent wrap PYRO-SAFE® DG-CR BS						Fire resistance class	
	Wrap width [mm]	Qty. wraps [n]	Qty. layer [n]	Overlapping [mm]	Inside seal [mm]	Outside seal [mm]	Wall	Floor
≤ Ø 50	100	1	1	0	60	40 (20 per side)	EI 90 U/U	EI 90 U/U
≤ Ø 70			2				EI 60 / E 90 U/U	EI 60 / E 90 U/U
≤ Ø 90			3					
≤ Ø 110			4					

Combustible pipes made of PP-H

Dimensions [mm]	Intumescent wrap PYRO-SAFE® DG-CR BS						Fire resistance class	
	Wrap width [mm]	Qty. wraps [n]	Qty. layer [n]	Overlapping [mm]	Inside seal [mm]	Outside seal [mm]	Wall	Floor
≤ Ø 50	100	1	1	0	60	40 (20 per side)	EI 90 U/U	EI 90 U/U
≤ Ø 70			2				EI 60 / E 90 U/U	
≤ Ø 90			3					
≤ Ø 110			4					

6.5 Multi-layer composite pipes „HENCO Pipes“ and „Uponor MLC Pipes white S“

Measures for sealing in walls and floors



Wall-/Floor-, seal thickness and implementation variants see page 16

Dimension in mm

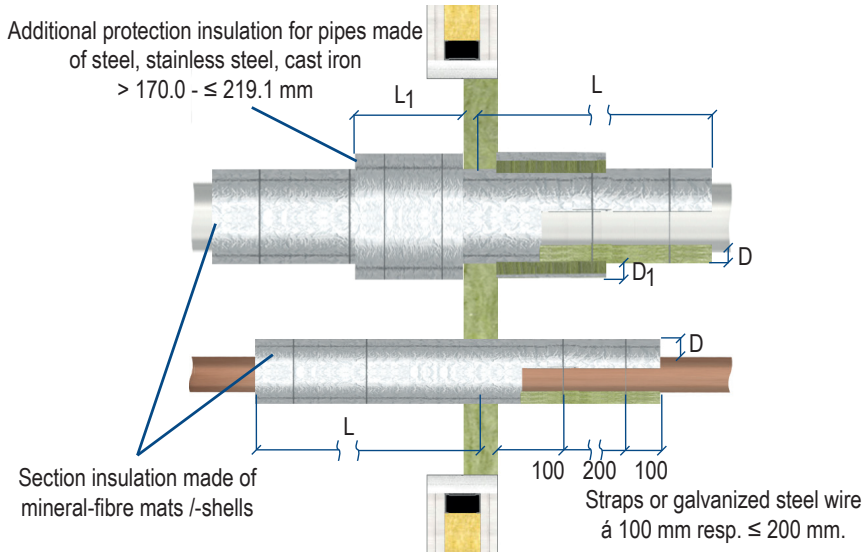
Outside-Ø [mm]	Installation in	Protection insulation		Fire resistance class	
		Length L [mm]	Thickness D [mm]	Wall	Floor
Multi-layer composite pipes „HENCO STANDARD“		**„Lamella mat“**			
≤ 12 mm	Wall	≥ 250	≥ 20	EI 30 U/C	EI 90 U/C
	Floor				
≤ 32 mm	Wall				
	Floor				
≤ 63 mm	Wall		≥ 30		
	Floor				
Multi-layer composite pipes „HENCO STANDARD“		**„Armaflex Protect“**			
≤ 12 mm	Wall	≥ 240	≥ 13	EI 30 U/C	EI 90 U/C
	Floor				
≤ 32 mm	Wall			EI 90 U/C	
	Floor				
≤ 63 mm	Wall		≥ 26	EI 30 U/C	
	Floor				

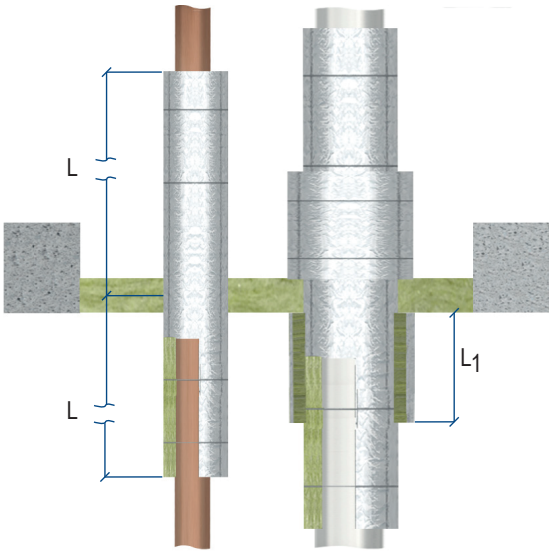
Multi-layer composite pipes „HENCO STANDARD“ with PE-foam insulation							Protection insulation		Fire resistance class	
Outside-Ø [mm]	Wrap width [mm]	Qty. wraps [n]	Qty. layer [n]	Overlapping [mm]	Inside seal [mm]	Outside seal [mm]	Length L [mm]	Thickness D [mm]	Wall	Floor
Multi-layer composite pipes „HENCO STANDARD“ with PE-foam insulation							**„Lamella mat“**			
≤ 14 mm	100	1	1	≥ 25	60	40 (20 per side)	≥ 250	≥ 20	EI 30 U/C	EI 90 U/C
≤ 26 mm										
≤ 32 mm										
Multi-layer composite pipes „Uponor MLC pipe white S“							**„Lamella mat“**			
≤ 110 mm	-						≥ 250	≥ 30	-	EI 60 / E90 U/C
							„Armaflex Protect“			
							≥ 240	≥ 26	-	EI 60 U/C

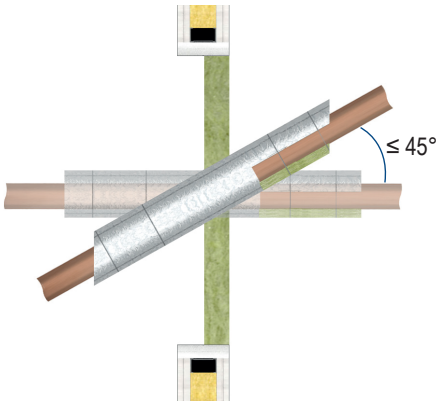
6.6 Non-combustible pipes – section insulation made of mineral-fibre lamella mat

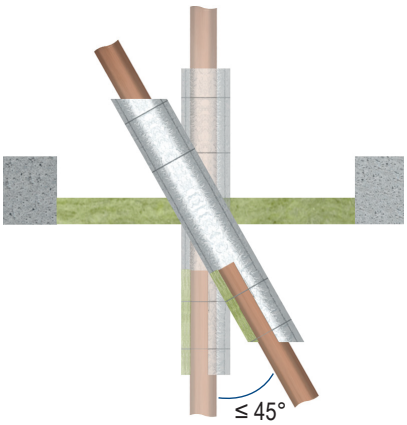
- Insulation made of mineral-fibre mats, for example, must be applied on non-combustible pipes. Depending on the pipe´s wall thickness and outside diameter, an additional protection insulation made of mineral-fibre mats can be necessary.
- The Insulation must be fixed on the pipe with straps or wire.
- 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









Wall-/Floor-, seal thickness and implementation variants see page 16

Dimension in mm

Measures

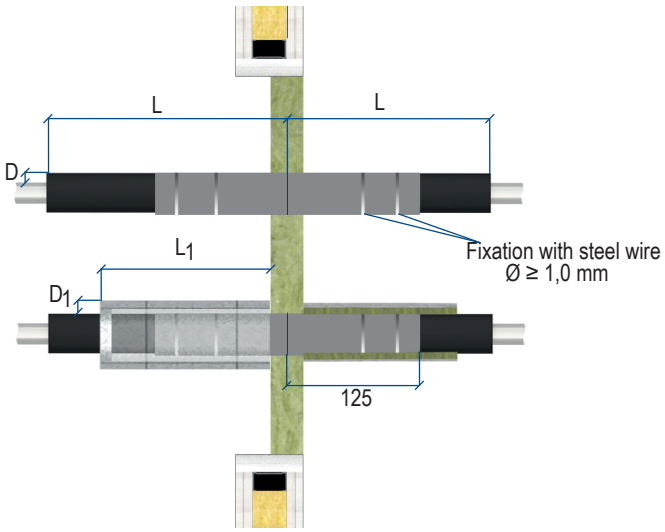
Pipe material	Outside pipe-Ø [mm]	Pipe wall thickness [mm]	Insulation length L [mm]	Insulation thickness D [mm]	Fire resistance class	
					Wall	Floor
Copper, steel, stainless steel, cast iron	Ø ≤ 15,0	≥ 0,8	≥ 250	≥ 20	EI 60 / E 90 C/U	EI 60 C/U
	Ø ≤ 22,0	≥ 1,0	≥ 250	≥ 60		
			≥ 500	≥ 20		
	Ø ≤ 54,0	≥ 1,5	≥ 500	≥ 30		
	Ø ≤ 88,9	≥ 2,0	≥ 800	≥ 40		
Steel, stainless steel, cast iron	Ø ≤ 88,9	≥ 2,0	≥ 800	≥ 40	EI 90 C/U	
	Ø ≤ 114,3	≥ 3,6	≥ 500	≥ 40	EI 60 / E 90 C/U	
	Ø ≤ 170,0	≥ 3,0	≥ 800*	≥ 60	EI 60 C/U	
	Ø ≤ 219,1	≥ 5,0	≥ 800*	≥ 60	EI 60 / E 90 C/U	

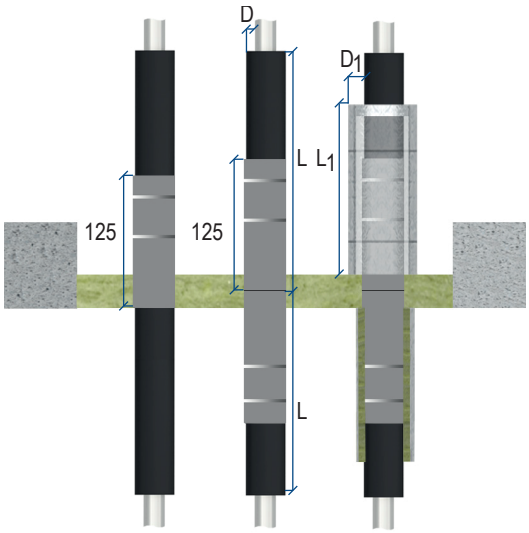
* Additional protective insulation made of mineral fibre mat (L1 ≥ 500 mm x D1 ≥ 30 mm)

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

- Non-combustible pipes with section insulation made of FEF „NH/Armaflex“ have to be wrapped with the PYRO-SAFE® DG-CR 1.5 fire protection wrap (Width 125 mm, thickness 1.5 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.
- 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 wall thickness 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 made of FEF „NH/Armaflex“





Wall-/Floor-, seal thickness and implementation variants see page 16

Dimension in mm

6.7.1 Non-combustible pipes – Section insulation made of FEF „NH/Armaflex“ – Walls

Measures for non-combustible pipes made of copper, steel, stainless steel, cast iron with combustible insulation „NH/Armaflex“ in walls										
Type of insulation	Insulation thickness D [mm]	Fire protection wrap PYRO-SAFE® DG-CR 1.5						Protection insulation (L1 x D1)	Fire resistance class	
		Wrap width [mm]	Qty. wraps [n]	Qty. layer [n]	Overlapping [mm]	Inside seal [mm]	Outside seal [mm]		Wall	Floor
Outside pipe-Ø ≤ 15,0 mm										
NH/Armaflex	13 - 24	125	2	2	0	30	95	-	EI 60 / E 90 C/U	-
	25								EI 90 C/U	-
Outside pipe-Ø ≤ 28,0 mm										
NH/Armaflex	13 - 30	125	2	1	0	30	95	Lamella mat ≥ 250 mm x ≥ 20 mm	EI 60 / E 90 C/U	-
	19 - 24			2				-	EI 90 C/U	-
	25									
Outside pipe-Ø ≤ 42,0 mm										
NH/Armaflex	25 - 43	125	2	2	0	30	95	-	EI 60 / E 90 C/U	-
	44								EI 90 C/U	-
Outside pipe-Ø ≤ 54,0 mm										
NH/Armaflex	29 - 57	125	2	2	0	30	95	Lamella mat ≥ 500 mm x ≥ 30 mm	EI 90 C/U	-
Outside pipe-Ø ≤ 88,9 mm										
NH/Armaflex	25 - 89	125	2	2	0	30	95	Lamella mat ≥ 500 mm x ≥ 30 mm	EI 90 C/U	-
Outside pipe-Ø ≤ 108,0 mm										
NH/Armaflex	57	125	2	2	0	30	95	Lamella mat ≥ 750 mm x ≥ 40 mm	EI 90 C/U	-

Measures for non-combustible pipes made of steel, stainless steel, cast iron with combustible insulation „NH/Armaflex“ in walls										
Type of insulation	Insulation thickness D [mm]	Fire protection wrap PYRO-SAFE® DG-CR 1.5						Protection insulation (L1 x D1)	Fire resistance class	
		Wrap width [mm]	Qty. wraps [n]	Qty. layer [n]	Overlapping [mm]	Inside seal [mm]	Outside seal [mm]		Wall	Floor
Outside pipe-Ø ≤ 170,0 mm										
NH/Armaflex	25	125	2	2	0	30	95	Lamella mat ≥ 750 mm x ≥ 40 mm	EI 60 / E 90 C/U	-

Insulation made of NH/Armaflex

Test case LS wall:

≥ 500 / ≥ 500 – Outside pipe-Ø ≤ 28.0 mm

≥ 750 / ≥ 750 – Outside pipe-Ø ≤ 42.0 mm

≥ 1000 / ≥ 1000 – Outside pipe-Ø > 42.0 mm

Insulation length L in mm per side

6.7.2 Non-combustible pipes – Section insulation made of FEF „NH/Armaflex“ – Floors

Measures for non-combustible pipes made of copper, steel, stainless steel, cast iron with combustible insulation „NH/Armaflex“ in floors

Type of insulation	Insulation thickness D [mm]	Fire protection wrap PYRO-SAFE® DG-CR 1.5						Protection insulation (L1 x D1)	Fire resistance class	
		Wrap width [mm]	Qty. wraps [n]	Qty. layer [n]	Overlapping [mm]	Inside seal [mm]	Outside seal [mm]		Wall	Floor
Outside pipe-Ø ≤ 15,0 mm										
NH/Armaflex	13 - 19	125	2	2	0	30	95	-	-	EI 90 C/U
	19 - 25		1			60	65 (above)		-	EI 60 / E 90 C/U
Outside pipe-Ø ≤ 28,0 mm										
NH/Armaflex	19 - 25	125	2	2	0	30	95	-	-	EI 90 C/U
	25		1			60	65 (above)	-	-	EI 60 / E 90 C/U
Outside pipe-Ø ≤ 42,0 mm										
NH/Armaflex	25	125	2	2	0	30	95	-	-	EI 90 C/U
	25 - 44		1			60	65 (above)		-	EI 60 / E 90 C/U
Outside pipe-Ø ≤ 54,0 mm										
NH/Armaflex	28 - 57	125	1	1	0	60	65 (above)	-	-	EI 90 C/U
Outside pipe-Ø ≤ 88,9 mm										
NH/Armaflex	25 - 88	125	1	2	0	60	65 (above)	Lamella mat ≥ 500 mm x ≥ 40 mm	-	EI 90 C/U
	89							Lamella mat ≥ 500 mm x ≥ 30 mm		
Outside pipe-Ø ≤ 108,0 mm										
NH/Armaflex	57	125	1	2	0	60	65 (above)	Lamella mat ≥ 1000 mm x ≥ 40 mm	EI 90 C/U	
	58 - 89								EI 60 C/U	

Measures for non-combustible pipes made of steel, stainless steel, cast iron with combustible insulation „NH/Armaflex“ in floors

Type of insulation	Insulation thickness D [mm]	Fire protection wrap PYRO-SAFE® DG-CR 1.5						Protection insulation (L1 x D1)	Fire resistance class	
		Wrap width [mm]	Qty. wraps [n]	Qty. layer [n]	Overlapping [mm]	Inside seal [mm]	Outside seal [mm]		Wall	Floor
Outside pipe-Ø ≤ 170,0 mm										
NH/Armaflex	25	125	1	2	0	60	65 (above)	Lamella mat ≥ 1000 mm x ≥ 40 mm	-	EI 60 / E 90 C/U
	26 - 85								-	EI 90 C/U

Insulation made of NH/Armaflex

Test case LS floor:

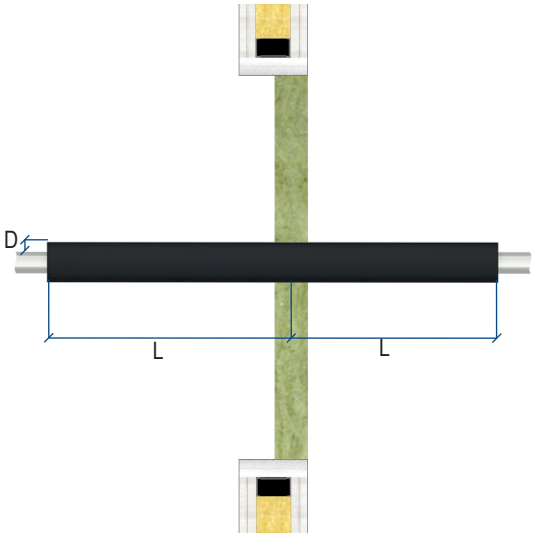
≥ 350 / ≥ 1000 – Outside pipe-Ø ≤ 88.9 mm

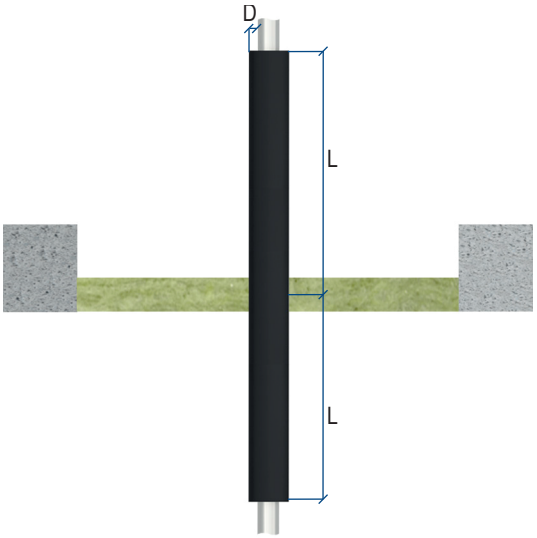
≥ 1000 / ≥ 1000 – Outside pipe-Ø > 88.9 mm

Insulation length L in mm under/above partition.

6.8 Non-combustible pipes – Section insulation made of FEF „Armaflex Protect“

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





Wall-/Floor-, seal thickness and implementation variants see page 16

Dimension in mm

Pipe material	Type of insulation	Insulation thickness D [mm]	Fire resistance class Wall & Floor	
			Wall	Floor
Copper, steel, stainless steel, cast iron	**Outside pipe-Ø ≤ 15,0 mm**		EI 60 / E 90 C/U	
	Armaflex Protect	19		
		20		
		25 - 51		
	Outside pipe-Ø ≤ 22,0 mm			
	Armaflex Protect	20		
		25 - 51		
	Outside pipe-Ø ≤ 54,0 mm			
	Armaflex Protect	25 - 51		
	Outside pipe-Ø ≤ 88,9 mm			
	Armaflex Protect	25 - 51		
steel, stainless steel, cast iron	**Outside pipe-Ø ≤ 170,0 mm**		EI 90 C/U (Wall) EI 60 / E 90 C/U (Floor)	
	Armaflex Protect	26 - 52		

Insulation made of Armaflex Protect

Test case LS wall and floor:

≥ 500 / ≥ 500 – Outside pipe-Ø ≤ 88.9 mm

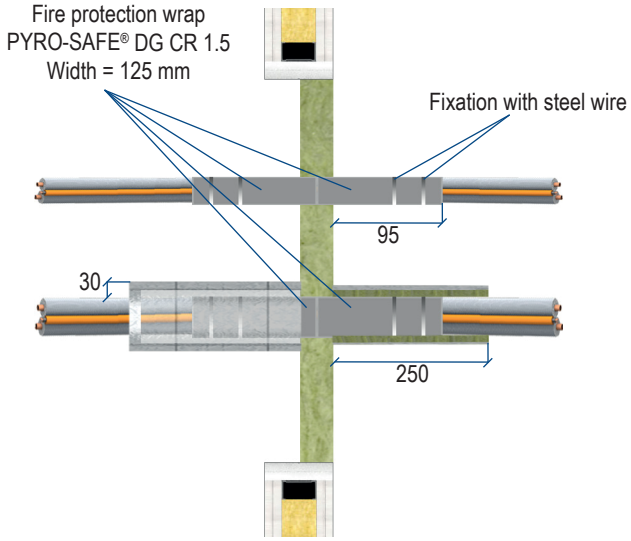
≥ 1000 / ≥ 1000 – Outside pipe-Ø > 88.9 mm

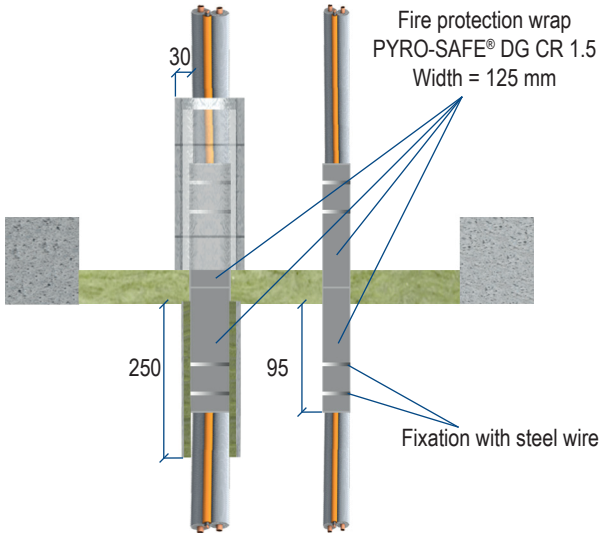
Insulation length L in mm per side. In floors, insulation length under/above the partition.

6.9 Further allowed services – HVAC split line combinations

- HVAC split line combinations „Tubolit Duo Split“ (Copper pipes with PE-Insulation, one pipe made of PE and up to 4 additional cables) shall be arranged vertical to the component´s surface.
- HVAC split line combinations have to be wrapped with the PYRO-SAFE® DG-CR 1.5 fire protection wrap (Width 125 mm, thickness 1.5 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.
- Possibly an additional protection insulation in necessary. The protection insulation must be installed in a way that it ends at the components surface and shall be fixed on the pipe with straps or wires.

Measures for sealing in walls and floors





Wall-/Floor-, seal thickness and implementation variants see page 16

Dimension in mm

HVAC split line combination						Fire protection wrap PYRO-SAFE® DG-CR 1.5						Fire resistance class	
Pipe-Material	Out-side-Ø [mm]	+ Qty. add. cables [n]	Insulation [Typ]	Insulation thickness D [mm]	PE-Pipe Ø [mm]	Wrap width [mm]	Qty. wraps [n]	Qty. layer [n]	Overlapping [mm]	Inside seal [mm]	Outside seal [mm]	Wall	Floor
Copper	6/10	2 (Ø ≤ 14 mm)	PEF**	≤ 9,0	≤ 25 Wall thick-ness 1,8 - 3,5	125	2	2	≥ 25	30	95	EI 60 / E 90	EI 45 / E 60
	22/22*	4 (Ø ≤ 21 mm)			≤ 25 Wall thick-ness 1,8		2	1	0	30	95	EI 30	EI 90

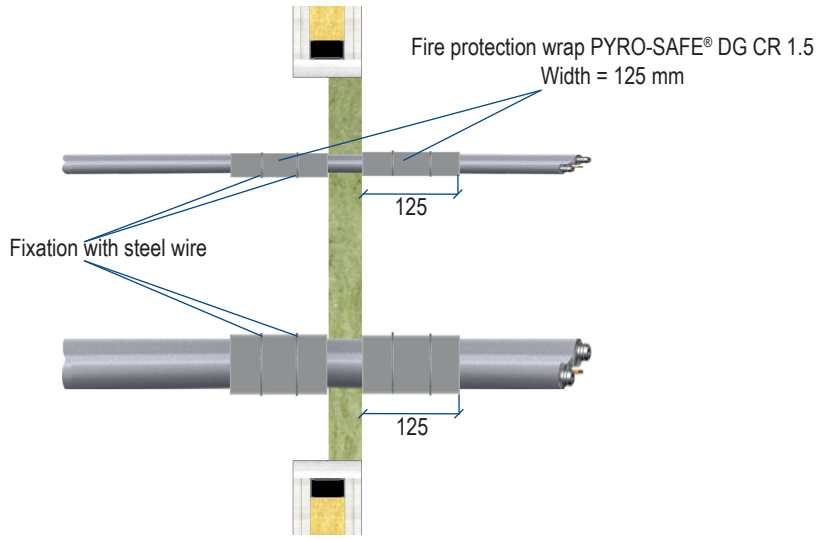
*Additional protection insulation made of mineral-fibre mat (L1 ≥ 250 mm x D1 ≥ 30 mm)
**PEF = Polyethylen foam

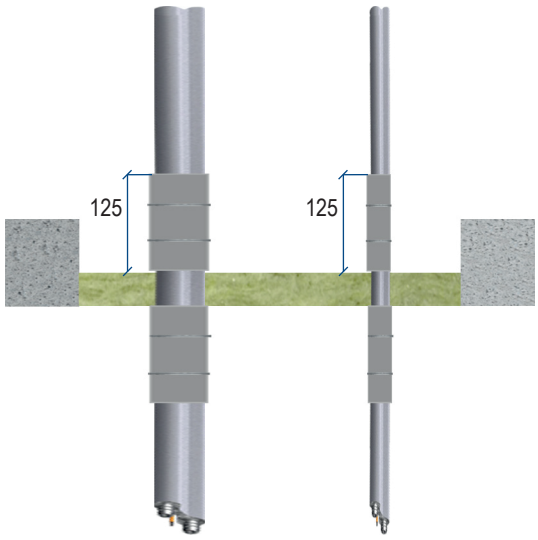
PYRO-SAFE® Flammotect single layer

6.10 Further allowed services – Double solar pipes „NanoSUN²“

- The double solar pipes “NanoSUN²” shall be arranged vertical to the component´s surface. Pipe end configuration (U/U).
- Double solar pipes have to be wrapped with the PYRO-SAFE® DG-CR 1.5 fire protection wrap (Width 125 mm, thickness 1.5 mm) on both sides.
- 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





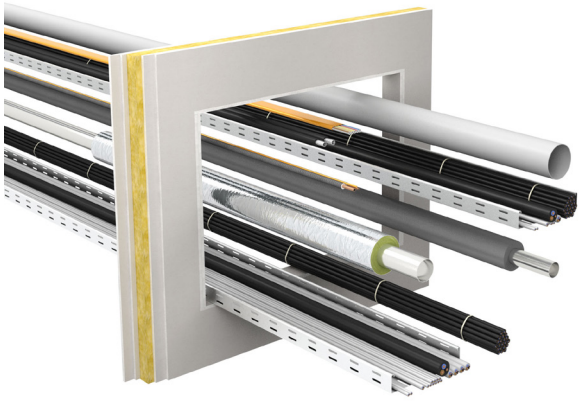
Wall-/Floor-, seal thickness and implementation variants see page 16

Dimension in mm

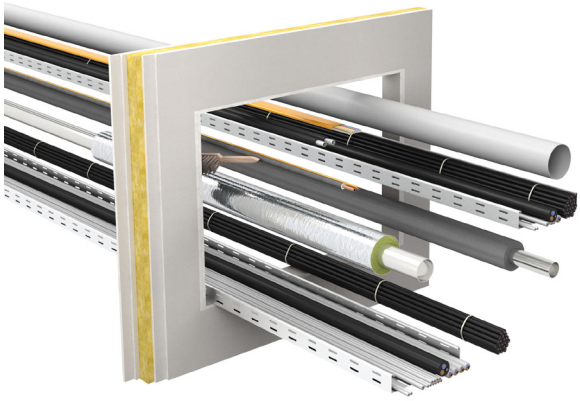
Outside pipe-Ø [mm]	Fire protection wrap PYRO-SAFE® DG-CR 1.5						Fire resistance class	
	Wrap width [mm]	Qty. wraps [n]	Qty. layer [n]	Overlapping [mm]	Inside seal [mm]	Outside seal [mm]	Wall	Floor
DN 16	125	2	1	≥ 25	0	125	EI 90 U/U	EI 60 U/U
DN 40	125	2	1	≥ 25	0	125	EI 30 / E 90 U/U	EI 60 U/U

7. Installation steps

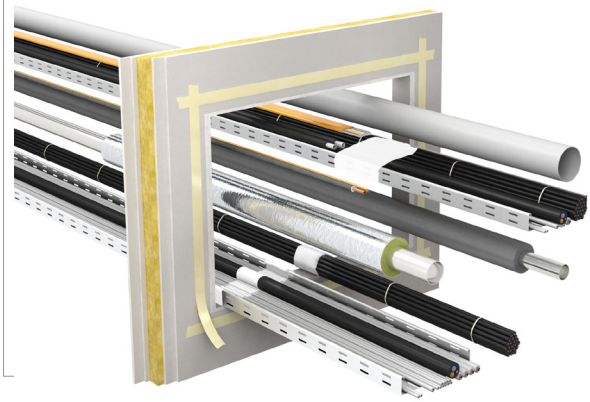
1. Opening with installations passed through it



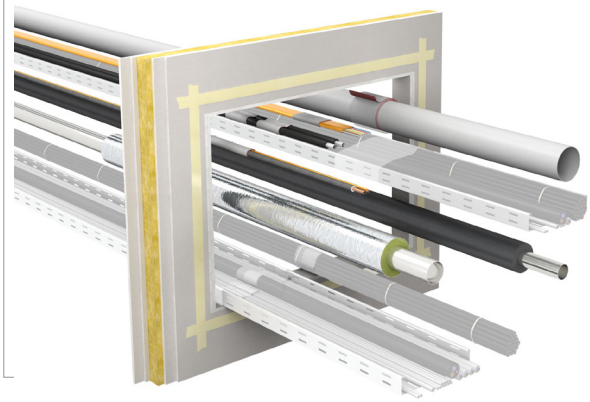
2. Clean the inside edges (edge planking is not supplied by the manufacturer)



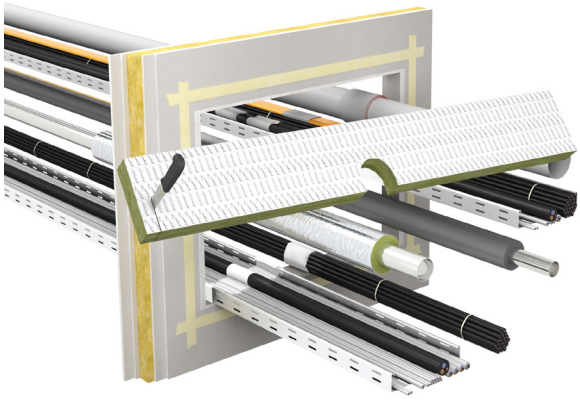
3. Place the masking tape around the opening at a distance of 20 mm to the edge. Coat the cables with PYRO-SAFE® FLAMMOTECT-A in correspondence to the opening. (Details page 16)



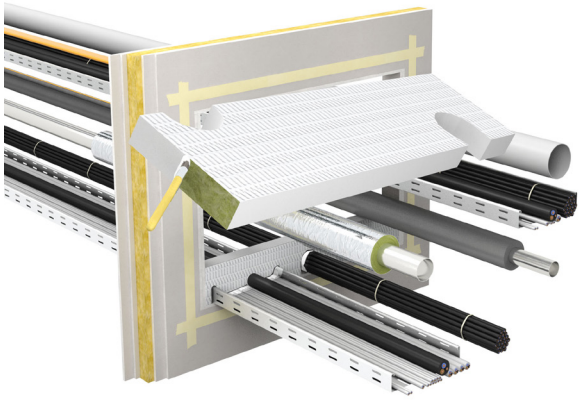
4. Wrap combustible pipes with PYRO-SAFE® DG-CR BS. Wrap PE-lines, multi-layer composite pipes, non-combustible pipes with FEF-insulation and HVAC split line combination with PYRO-SAFE® DG-CR 1.5.



5. Cut mineral-fibre boards to size (provide openings for cables, cable trays and pipes).

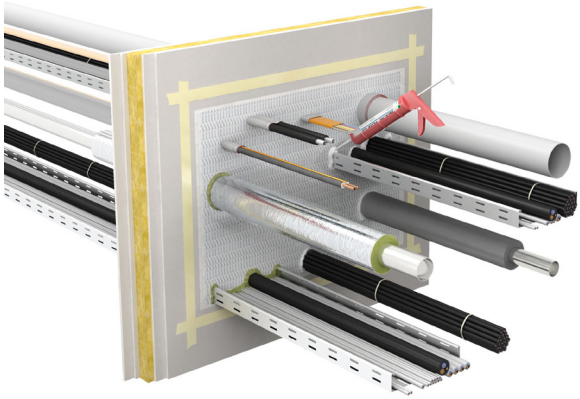


6. Apply PYRO-SAFE® FLAMMOTECT-A to the cut faces of the mineral-fibre board and insert flush and tightly the board into the opening.

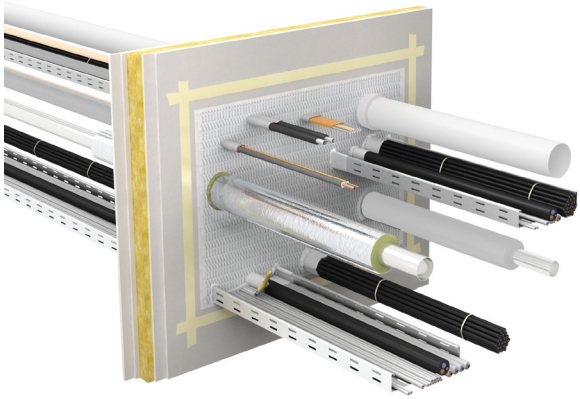


PYRO-SAFE® Flammotect single layer

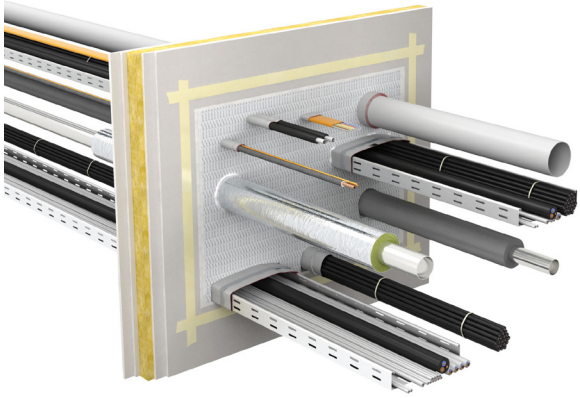
7. Fill remaining gaps with mineral-fibre wool or seal with PYRO-SAFE® FLAMMOTECT-A filler. (Details page 16)



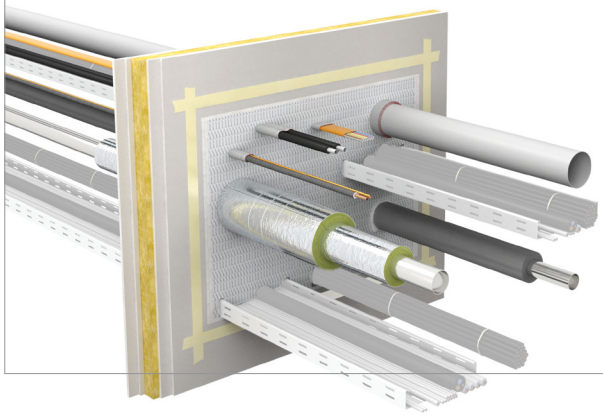
8. Coat the cables with PYRO-SAFE® FLAMMOTECT-A. (L ≥ 100 / 150 mm, dry film thickness 0.75 / 1.0 mm). (Details page 16)



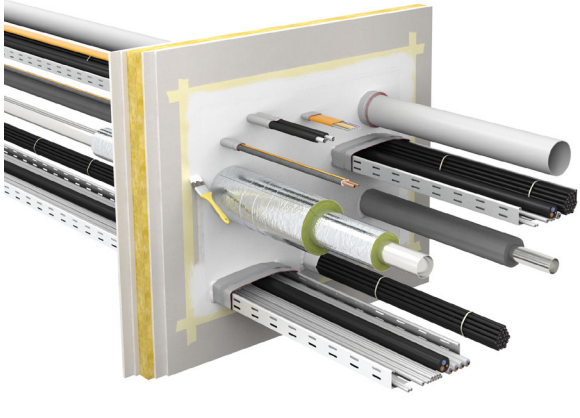
8a. Alternative to step 8. Wrap cables, cable bundles, cable trays with PYRO-SAFE® DG-CR 1.5. (Details page 18)



9. Wrap conduits and double solar pipes with PYRO-SAFE® DG-CR 1.5. Non-combustible pipes, multi-layer pipes and HVAC split line combinations possibly need a protection insulation.



10. Apply final coating with PYRO-SAFE® FLAMMOTECT-A (dry film thickness 0.75 mm).



11. If required or mandatory, fill the identification label and apply it next to / above (not on!) the penetration seal for permanent marking.

Declaration of Performance

No. 01155-PYRO-SAFE-FLAMMOTECT-A
PYRO-SAFE® FLAMMOTECT-A

Unique identification code of the product type
PYRO-SAFE® FLAMMOTECT-A

Intended use
A) Ablative fire stopping product used in penetration seals
B) Fire stopping product used for linear joint and gap sealing

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

System for assessing and verifying constancy of performance
A) + B) System 1

European Assessment Document
A) ETAG 026-2:2011
B) EAD 350141-00-1106

European Technical Assessment
A) ETA-14/0418 dated 04.12.2014
B) ETA-18/0237 dated 16.05.2018

Cerificate of constancy of performance
A) 0761-CPR-0426
B) 0761-CPR-0726

Technical Assessment Body
A) Deutsches Institut für Bautechnik (DIBt), Berlin
B) ETA-Danmark A/S

The notified body
A) + B) Civil Engineering Materials Testing Institute (MPA BS) in Braunschweig, code number 0761

Declared performance

	Essential characteristics	Performance	Harmonised technical specifications
A) + B)	Reaction to fire	Class E	EN 13501-1
A)	Fire resistance	Class EI 30 - Class EI 240 For details check ETA-14/0418	EN 13501-2
B)		Maximum Class EI 120-H-X-B-W-00 up to 200 Class EI 120-V-X-B-W-00 up to 200 for details check ETA-18/0237	
A)	Emission of dangerous substances	No dangerous substances	ETAG 018-2
A) + B)	Durability and serviceability	Use category type X	ETAG 026-2

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:

p.p. Christian Meyer-Korte
Head of Product Management / Private Label

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