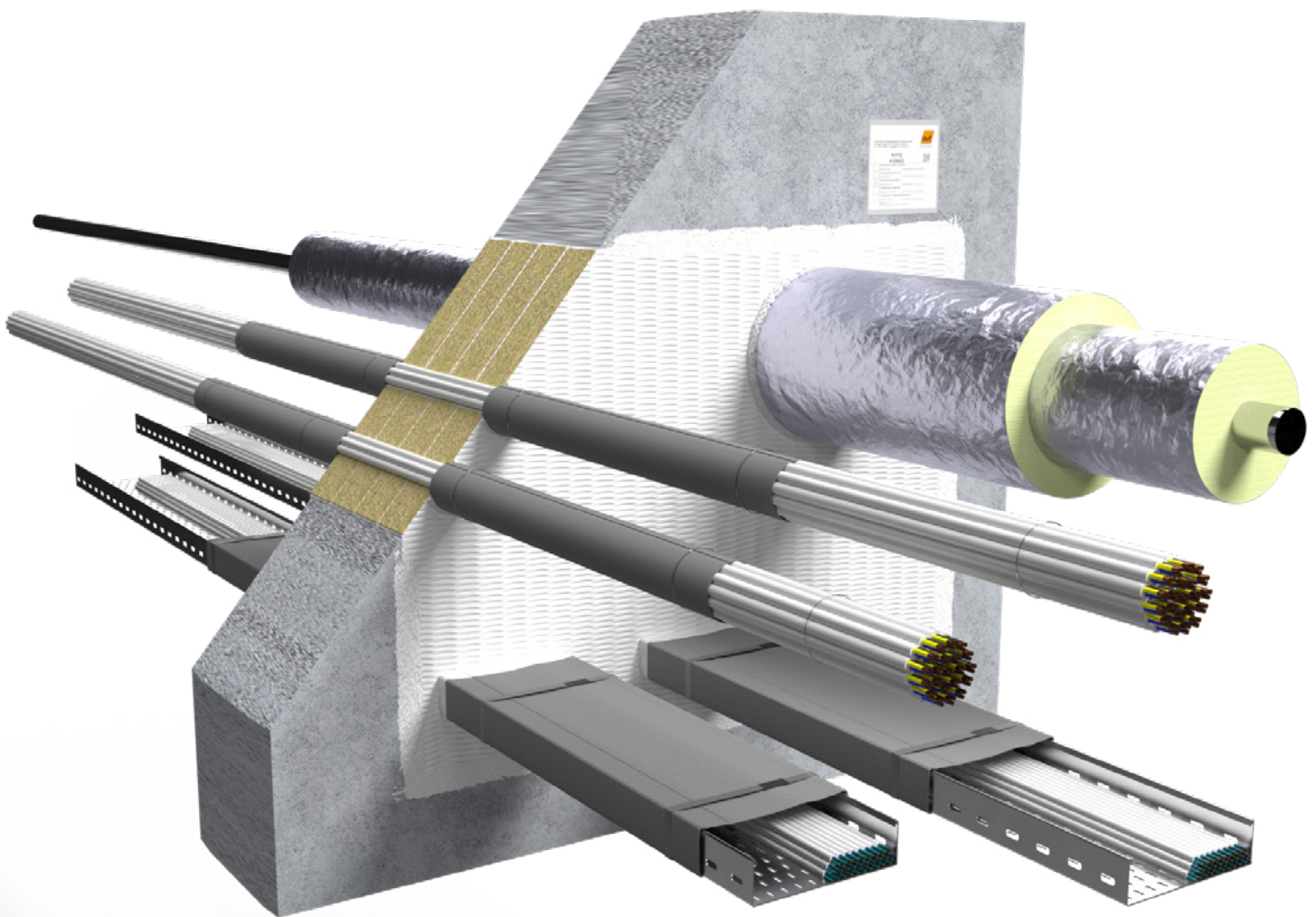




PYRO-SAFE® Flammotect four-layer

Ablative mineral fibre board seal

Penetration sealing system made of mineral fibre boards (MFP) and ablative coating for electric cables and wires of all kinds as per ETA-22/0052. Fire resistance class EI 240 in accordance with EN 13501-2.





PYRO-SAFE® Flammotect four-layer

Contents

	Topic	Page
1.	Preliminary remarks / overview	3
1.1	Target group	3
1.2	Use of the instructions	3
1.2.1	Safety instructions	3
1.3	Field of application	4
1.4	Components	5
1.5	Fire resistance classes for wall and floor penetration seals	5
1.6	Thicknesses and spacing	6
2.	Allowed services	7
2.1	Cables / cable bundles / cable support structures	7
2.2	Non-combustible pipes	7
3.	Spacing distances for services	8
4.	Included products	9
4.1	Declarations of Performance	9
5.	Regulations and variants	10
5.1	Initial brackets (supports)	10
6.	Fire protection measures	11
6.1	Cables / cable bundles / cable support structures	11
6.2	Non-combustible pipes	12
7.	Installation steps	13



PYRO-SAFE® Flammotect four-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

Before starting work, read through these installation instructions completely once. Pay particular attention to the following safety instructions

The authorisation holder assumes no liability for damage caused by failure to comply with these instructions.

Pictorial representations serve as examples only. Installation results may differ in appearance.

Unless stated otherwise, all lengths are specified in mm.

All information in this document represents the state of the art at the time of writing or the current version of the standard.

Upon request, svt will be pleased to provide the relevant legal and technical framework and manufacturer specifications for each individual case.

© Copyright svt Group, Gluesinger Strasse 86 Seevetal Germany

PYRO-SAFE® is a registered trademark of the svt Group

1.2.1 Safety instructions

The safety data sheets must be consulted when processing the penetration seal components.

Personal protective equipment:



Wear protective clothing and non-slip shoes.



Use safety goggles, safety glasses.



P2 particle filter in case of short-term or low level exposure.
For intensive or prolonged exposure use a breathing apparatus with independent air supply.
Use breathing protection in compliance with international/national standards.



Use chemically resistant gloves.
Recommended materials: Butyl rubber, nitrile rubber, fluorinated rubber, PVC.

Safety instructions for the installation of floor penetration seals



The area below the floor penetration seal must be cordoned off against entry during penetration seal work (barrier tape and warning sign: warning of possible falling objects, do not enter the area, penetration seal work in floor component openings).



The contractor for the production of floor penetration seals must inform the client in writing (for forwarding to the client or appointed representative) that after the production of the fire penetration seals in floors, these must be secured on site against loads, in particular against walking, by suitable measures (e.g. by fencing or by covering with grating).



PYRO-SAFE® Flammotect four-layer

1.3 Field of application

The suitability of use of the PYRO-SAFE® Flammotect four-layer cable penetration seal was determined according to 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“ components comply with reaction to fire class E of EN 13501-1; the intumescent „PYRO-SAFE DG-CR“ material complies with reaction to fire class B-s1,d0 of EN 13501-1; the mineral-fibre boards and the mineral-fibre mats comply with reaction to fire class A1 and A2-s1,d0, respectively, of EN 13501-1.

Fire resistance

The highest requirements that the PYRO-SAFE® Flammotect four-layer system complies with are those of class EI 240 in accordance with EN 13501-2.

If 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“ fabric comply with use category X in accordance with EOTA TR 024.

The fire safety characteristics of the PYRO-SAFE® Flammotect four-layer system is not affected in any significant way if exposed to indoor (moisture conditions) or outdoor atmospheric agents.



PYRO-SAFE® Flammotect four-layer

1.4 Components

Solid walls

Made of stone, concrete, reinforced concrete or aerated concrete with a density $\geq 600 \text{ kg/m}^3$.

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

Solid floors

Made of concrete.

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

1.5 Fire resistance classes for wall and floor penetration seals

Service	Measure	Wall		Floor	
		Fire resistance class	Source*	Fire resistance class	Source*
Cables, cable bundles and cable support structures with intumescent wrap „PYRO-SAFE® DG-CR 1.5“ – width: 500 mm					
Cables Ø ≤ 80 mm	2 × 2 layers	EI 240	1	EI 240	2
Cable bundles Ø ≤ 100 mm	2 × 2 layers	EI 240	1	EI 240	2

* Classification report no: 1 → 2163/11/Z00NP, 2 → 1858.1/12/Z00NP

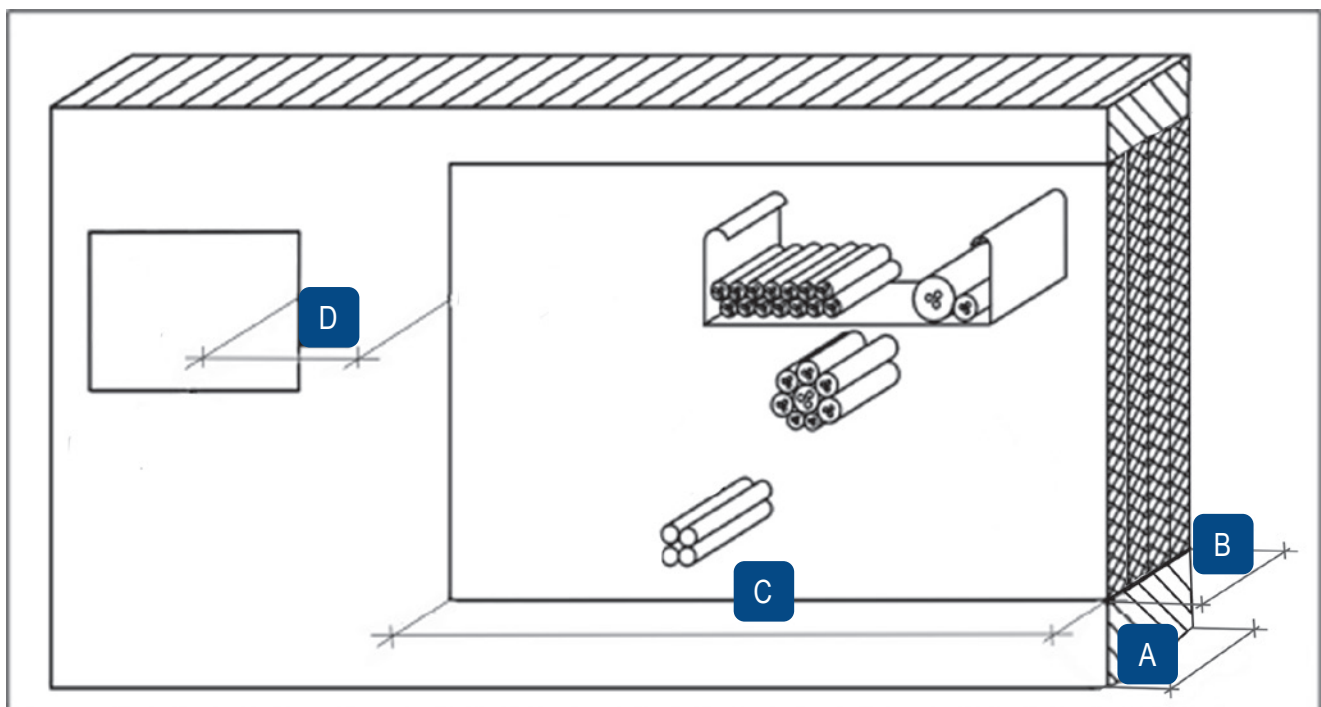
Service		Measure	Wall		Floor	
			Fire resistance class	Source*	Fire resistance class	Source*
Cables, cable bundles and cable support structures with intumescent wrap PYRO-SAFE® DG-CR 1.5 – width: 500 mm						
Cables Ø ≤ 80 mm		2 × 2 layers	EI 240	1	EI 240	2
Cable bundles Ø ≤ 100 mm		2 × 2 layers	EI 240	1	EI 240	2
Non-combustible pipes with insulation made from pipe sections, e.g. ProRox PS 960, Klimarock lamella mat and fire prttection wrap PYRO-SAFE® DG-CR 0.7 or PYRO-SAFE® DG-CR 1.5						
Pipe material	Outer Ø [mm] × pipe wall thickness [mm]	Measure			Wall	
		ProRox PS 960 length × thickness [mm]	Lamella mat Klimarock length × thickness [mm]	PYRO-SAFE® DG-CR 0.7 / 1.5 length [mm]	Fire resistance class	Source*
Steel, stainless steel, cast iron	42,4 × 2,3–14,2	750 × 50	500 × 30	500	EI 240 C/U	3
	88,9 × 2,9–14,2	1000 × 60	500 × 50			
	168,3 × 4,0–14,2	1250 × 70	750 × 50			
	219,1 × 4,5–14,2	1500 × 80	1000 × 50	1000		
	323,9 × 5,6–14,2	1750 × 90	1250 × 50			

* Classification report no.: 1 → 2163/11/Z00NP, 2 → 1858.1/12/Z00NP, 3 → 03476/20/Z00NP

PYRO-SAFE® Flammotect four-layer

1.6 Thicknesses and spacing

Dimensions			
Item	Name	Wall [mm]	Floor [mm]
A	Component thickness	≥ 240	≥ 200
B	Partition thickness	≥ 240	≥ 240
C	Maximum dimensions of the opening (width × height)	cables: 600 × 600 pipes: 400 × 400	600 × 1000
D	Distance to other openings or installations	≥ 200	≥ 200



The total permissible cross-section of the installations (external dimensions) is ≤ 60% of the construction opening.



PYRO-SAFE® Flammotect four-layer

The maximum dimensions of the tested penetration seal in floors are 600 × 1000 mm (W × L).

The minimum ratio of circumference to area of the tested penetration seal is 5,33 m⁻¹ (C_{tested}).

The maximum permissible width is 600 mm.

The maximum length must be calculated as follows:

$$\text{Length} = \frac{\text{Width}}{((C_{\text{tested}}/2) \times \text{Width}) - 1}$$

If the width is less than 0,375 m, there is no need to limit the length.

2. Allowed services

2.1 Cables / cable bundles / cable support structures



Electrical cables and lines of all types (including fibre optic cables)

Maximum size of the overall cross section of the individual cables Ø ≤ 80 mm



Cable bundles

Up to Ø ≤ 100 mm with single cable Ø ≤ 21 mm.

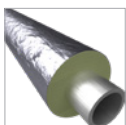
Cable filler not required for tightly packed and tied cable bundles.



Cable support structures

Cable ducts and ladders 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.

2.2 Non-combustible pipes





Made of steel, stainless steel or cast iron with insulation made from ProRox PS 960 pipe sections (density 100 kg/m³)









PYRO-SAFE® Flammotect four-layer

3. Spacing distances for services

Spacing distances in walls

						Seal edge		
		Single cables	Cable bundles	Cable support structures	Non-combustible pipes	Upper	Lower	Side
	Single cables	≥ 10 (side by side) ≥ 80 (on top of each other)			≥ 100	≥ 20	≥ 0	≥ 20
	Cable bundles	≥ 10 (side by side) ≥ 80 (on top of each other)			≥ 100	≥ 20	≥ 0	≥ 20
	Cable support structures	≥ 10 (side by side) ≥ 80 (on top of each other)			≥ 100	≥ 20	≥ 0	≥ 20
	Non-combustible pipes	≥ 100			≥ 100	≥ 40	≥ 40	≥ 40

Spaing distances in floors

					Seal edge		
		Single cables	Cable bundles	Cable support structures	Front	Back	Side
	Single cables	≥ 10 (side by side) ≥ 40 (on top of each other)			≥ 20	≥ 0	≥ 20
	Cable bundles	≥ 10 (side by side) ≥ 40 (on top of each other)			≥ 20	≥ 0	≥ 20
	Cable support structures	≥ 10 (side by side) ≥ 40 (on top of each other)			≥ 20	≥ 0	≥ 20

PYRO-SAFE® Flammotect four-layer

4. Included products



PYRO-SAFE® FLAMMOTECT-A Coating

12.5 kg pail – Art. no. 01155101
15.0 kg pail – Art. no. 01155105



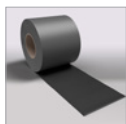
PYRO-SAFE® FLAMMOTECT-A Solid emulsion

12.5 kg pail – Art. no. 01155106
15.0 kg pail – Art. no. 01155107



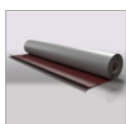
PYRO-SAFE® FLAMMOTECT-A Filler

12.5 kg pail – Art. no. 01155104
15.0 kg pail – Art. no. 01155109



PYRO-SAFE® DG-CR 1.5 Fire protection wrap

Roll of 10 m × 125 mm – Art. no. 01261125



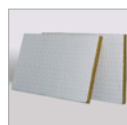
PYRO-SAFE® DG-CR 0.7 Brandschutzwickel

Rolle à 20 m × 1100 mm – Art.-Nr. 01260201



Mineral fibre board in accordance with EN 13162

characteristics:
density $\geq 150 \text{ kg/m}^3$
reaction to fire class A1 in accordance with EN 13501-1
melting point $\geq 1,000^\circ\text{C}$.
(TR10) tensile strength perpendicular to the panel $\geq 10\text{kPa}$ in acc. with EN 1607
thickness: 60 mm



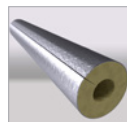
Mineral fibre boards

pre-coated with PYRO-SAFE® FLAMMOTECT-A
dimensions 1000 × 600 × 60 mm
Box of 4 items – Art. no. 01181160



Mineral wool A1

Reaction to fire class in acc. with EN 13501-1: A1
Melting point $\geq 1000^\circ\text{C}$
10 kg bag – Art. no. 01183000



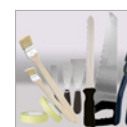
ProRox PS 960 pipe section

according to EN 14303 made from mineral wool with A1 classification in accordance with EN 13501-1,
Nominal density: 100 kg/m^3
Melting point: $> 1000^\circ\text{C}$
DoP: PROPS960NL-03
Corresponding to Rockwool 880



Lamella mat Klimarock

in acc. with DIN EN 14303 und DoP DE0628071802 of 13/07/2018
Fire behaviour class in accordance with EN 13501-1: Class A1
Dimensions 610 × 50 cm
Thickness 30 mm
Roll of 3.05 m² – Art. no. 01187100



Recommended tools

spatula, brush, crepe tape
mat knife and saw
possibly foil, folding ladder, wire tying pliers, galvanised steel wire

4.1 Declarations of Performance

The Declarations of Performance for featured svt products are available for download on our website:

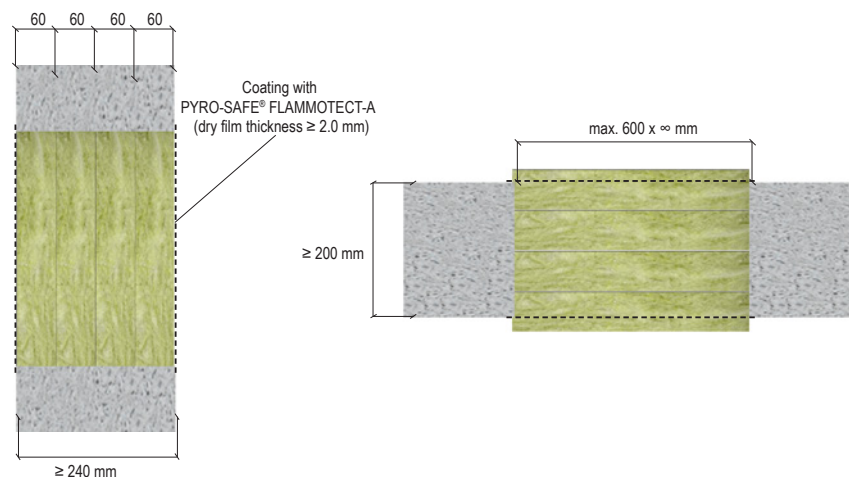
<https://svt-global.com/downloads>

PYRO-SAFE® Flammotect four-layer

5. Regulations and variants

- The cable penetration seal may be used to seal openings without installations.
- Penetration seals in floors must be protected with suitable barriers or covered with grating in order to prevent them from being subjected to loads or stepped on.
- The surface of the mineral fibre boards must be coated with a layer of PYRO-SAFE® FLAMMOTECT-A. The dry film thickness must be at least 2 mm.
- The fire protection measures are shown on the following pages and apply also for subsequent installations.

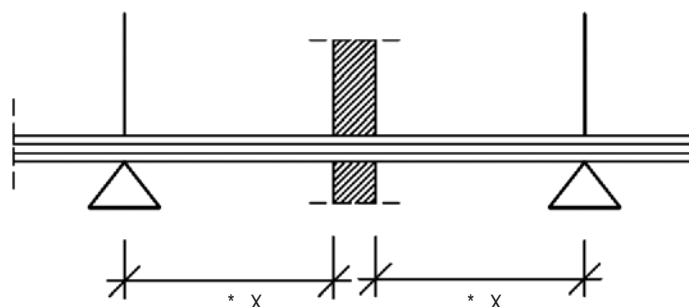
Design variants in walls and floors



Dimensions in mm

5.1 Initial brackets (supports)

The brackets/supports of the installations in front of the wall seal must be largely non-combustible (building material class DIN 4102-A) and installed at distances on both sides according to the overview.



Initial brackets (supports) of the installations in front of the wall penetration sealing system must be made of steel or equivalent material.

Initial brackets		
Cables, cable bundles, cable support structures	Wall and floor	≤ 100 mm
Non-combustible pipes	Floor	≤ 950 mm

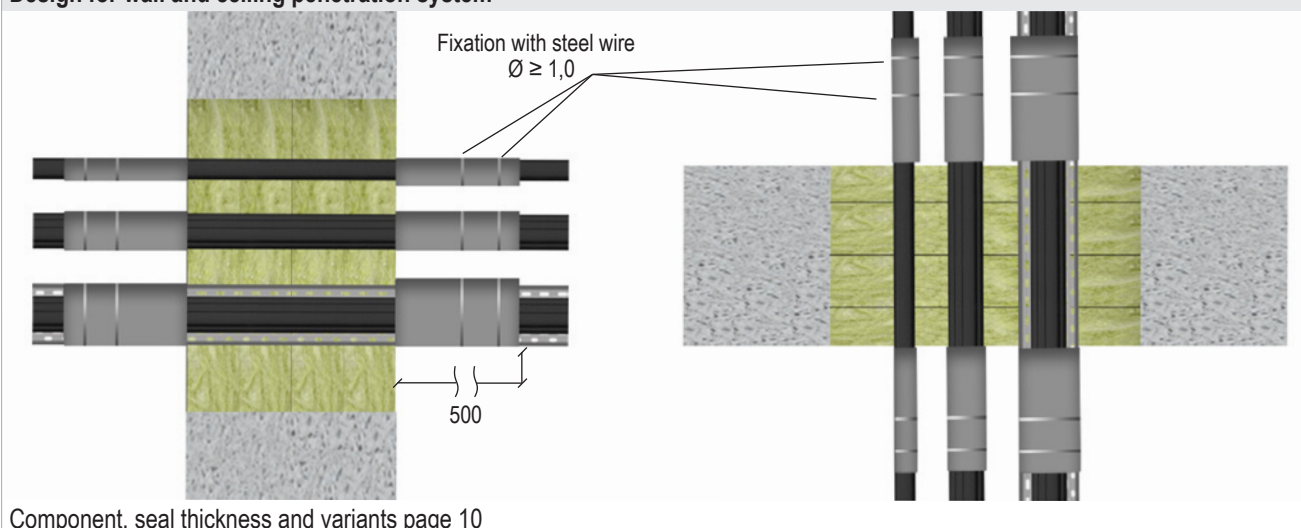
PYRO-SAFE® Flammotect four-layer

6. Fire protection measures

6.1 Cables / cable bundles / cable support structures

- Cables and cable bundles may be installed with or without cable trays.
- Cable bundles may be installed unopened in the seal. It is not necessary to fill the interstices if the bundles consist of parallel-running cables that are tightly packed, tied, stitched or welded together.
- The supporting structures for cable trays must be designed in such a way that the penetration seal will not be subjected to additional mechanical stress in case of fire.
- Cables must be wrapped on both sides with the fire protection wrap PYRO-SAFE® DG-CR 1.5.
- The fire protection wrap PYRO-SAFE® DG-CR 1.5 is coated on one side and equipped with a protective film. The film must be removed before applying the wrap. The wrap is applied with the coated side facing inwards and fastened with steel wires.

Design for wall and ceiling penetration system



Material	Dimensions	Fire protection wrap PYRO-SAFE® DG-CR 1.5						Fire resistance class	
		Wrap width [mm]	Number of wraps [n]	Number of layers [n]	Overlap [mm]	Inside seal	Outside seal	Wall	Floor
Cable	$\varnothing \leq 80$	500	2	2	50	-	500	EI 240	EI 240
Cable bundle	$\varnothing \leq 100$ with cable $\varnothing \leq 21$ mm								

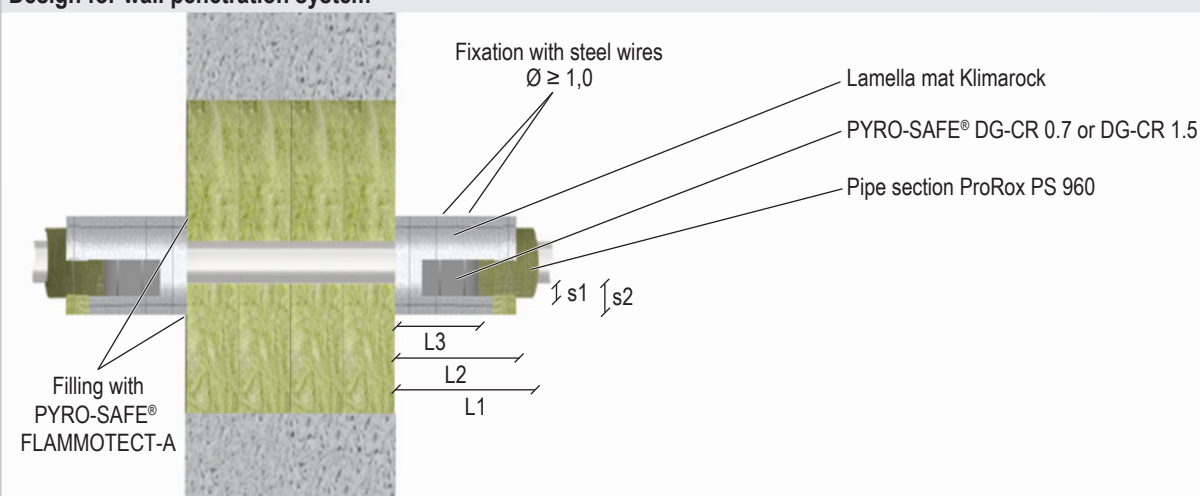
Dimensions in mm

PYRO-SAFE® Flammotect four-layer

6.2 Non-combustible pipes

- Pipes must be additionally wrapped on both sides with PYRO-SAFE® DG-CR 0.7 or DG-CR 1.5.
- The fire protection wraps PYRO-SAFE® DG-CR 0.7 und DG-CR 1.5 are coated on one side and equipped with a protective film. The film must be removed before applying the wrap. The wrap is applied with the coated side facing inwards and fastened with steel wires ($\varnothing \geq 1,0$ mm).

Design for wall penetration system



Component, seal thickness and variants page 10

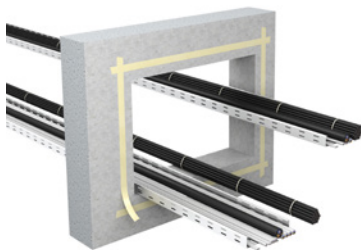
Pipe material	Outer Ø [mm]	Pipe wall thickness [mm]	ProRox PS 960		Lamella mat Klimarock		PYRO-SAFE® DG-CR 0.7 / 1.5 length L3 [mm]
			Insulation length L1	Insulation thickness s1	Insulation length L2	Insulation thickness s2	
Steel, stainless steel, cast iron	≤ 42.4	2.3–14.2	750	50	500	30	500
	≤ 88.9	2.9–14.2	1000	60	500	50	
	≤ 168.3	4.0–14.2	1250	70	750		
	≤ 219.1	4.5–14.2	1500	80	1000		
	≤ 323.9	5.6–14.2	1750	90	1250		

Dimensions in mm

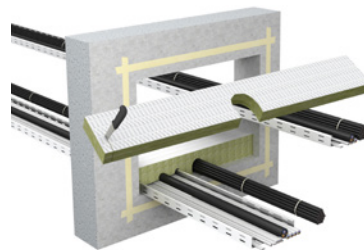
PYRO-SAFE® Flammotect four-layer

7. Installation steps

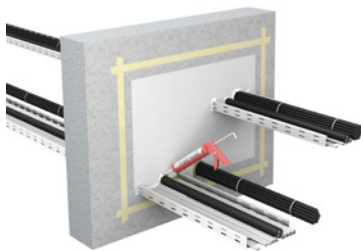
1. Place the crepe tape around the opening at a distance of 20 mm to the edge.



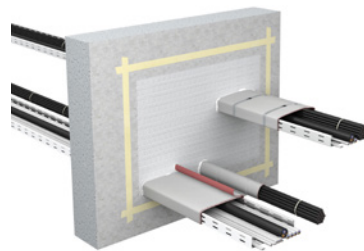
2. Cut mineral fibre boards to size and produce cut-outs for the installations. Coat the edges of the boards with PYRO-SAFE® FLAMMOTECT-A and insert the boards into the component.



3. Seal remaining openings tightly with mineral wool or with PYRO-SAFE® FLAMMOTECT-A.



4. Wrap cables, cable bundles and cable support structures with PYRO-SAFE® DG-CR 1.5.



5. Apply final coating with PYRO-SAFE® FLAMMOTECT-A



6. Label the penetration seal. Fill out the label neatly and attach it firmly next to/above (not on!) the penetration seal.

