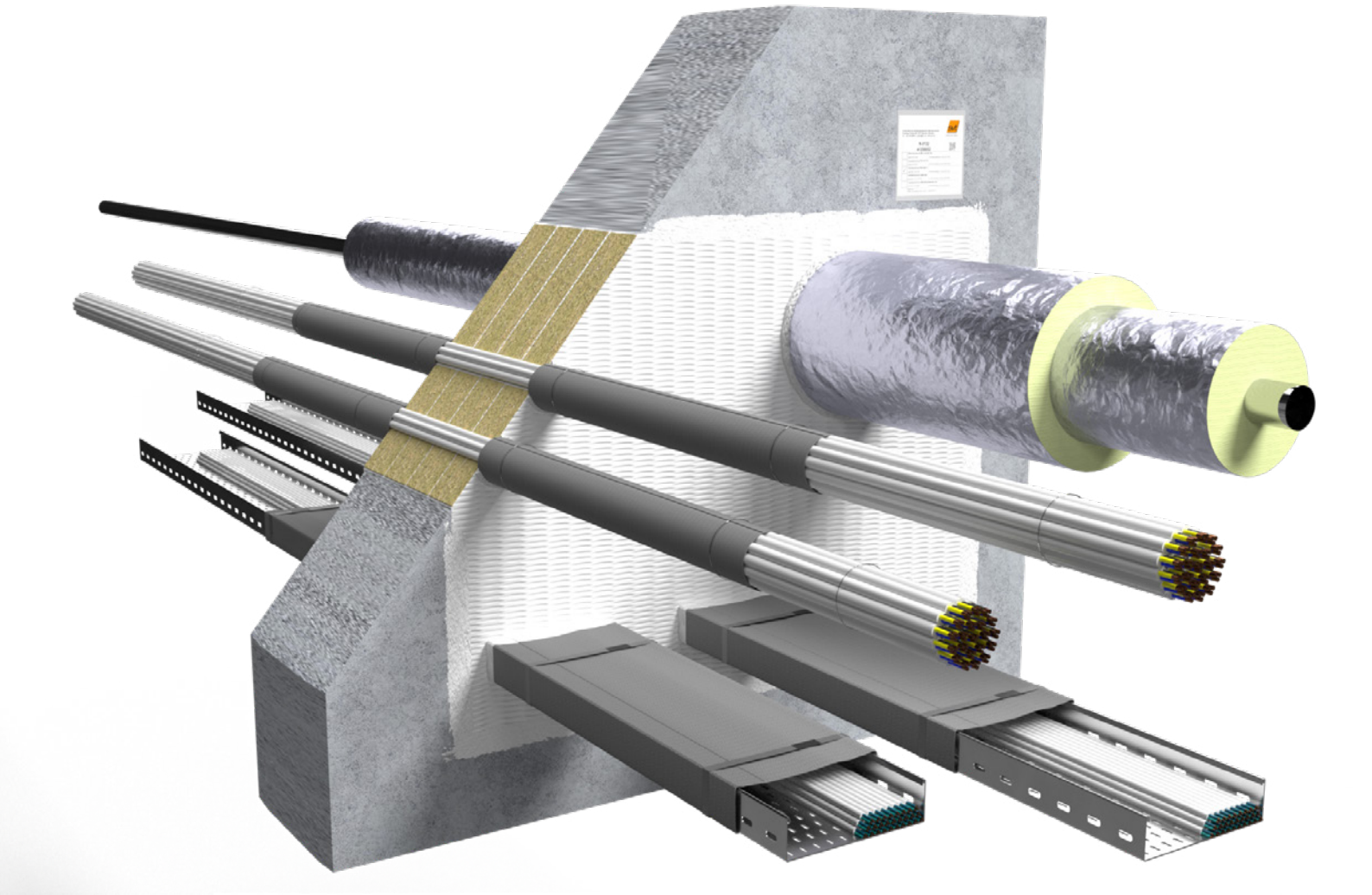
Protect your values.

PYRO-SAFE® Flammotect four-layer

Ablative soft seal

Penetration sealing system made of mineral fibre boards (MFP) and ablative coating for electric cables and wires of all kinds. Fire resistance class EI 240 in accordance with EN 13501-2 according to ETA-14/0418



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PYRO-SAFE® Flammotect four-layer

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1. Preliminary remarks / overview

1.1 Target group

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

1.2 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.

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 min eral 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 ≥ 600 kg/m³.

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

Solid floors

Made of concrete.

The walls shall 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 x 2 layers	EI 240	1	EI 240	2
Cable bundles Ø ≤ 100 mm	2 x 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 x 2 layers	EI 240	1	EI 240	2
Cable bundles Ø ≤ 100 mm	2 x 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 prtoection wrap PYRO-SAFE® DG-CR 0.7 or PYRO-SAFE® DG-CR 1.5					

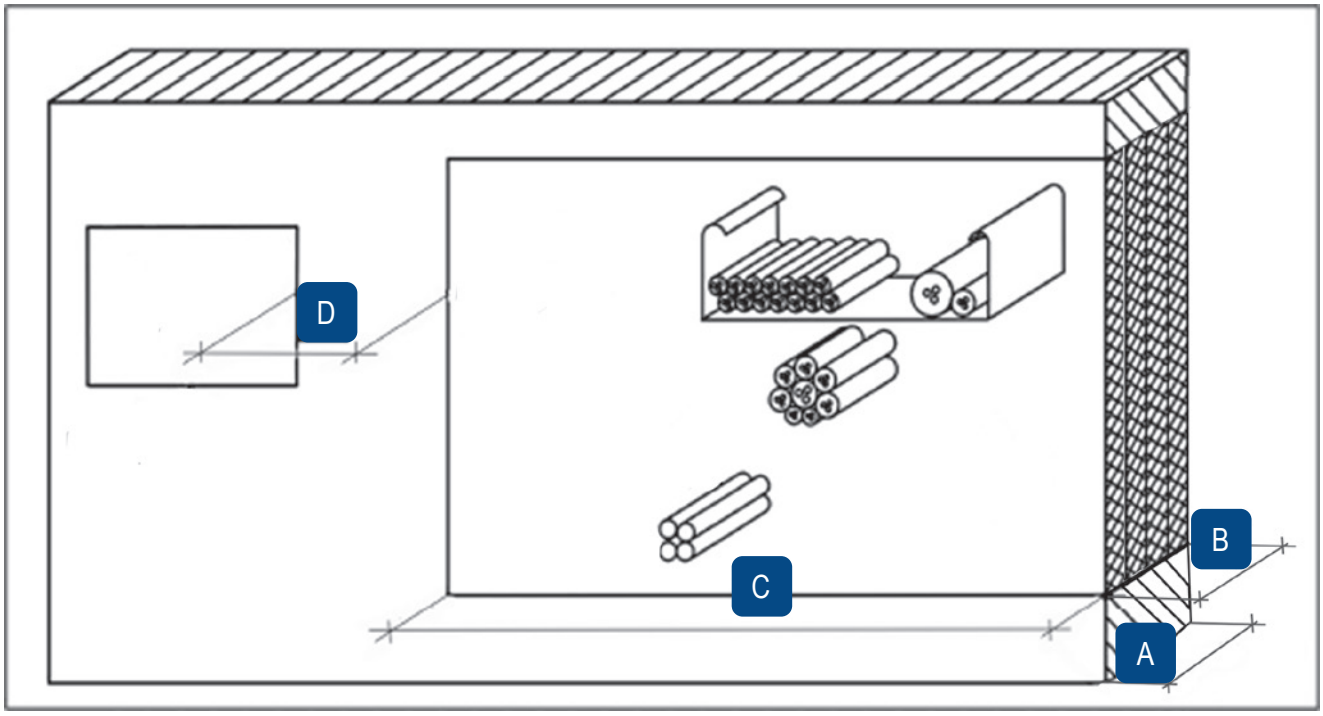
Pipe material	Outer Ø [mm] x pipe wall thickness [mm]	Measure			Wall	
		ProRox PS 960 length x thickness [mm]	Lamella mat Klimarock length x thickness [mm]	PYRO-SAFE® DG-CR 0.7 / 1.5 length [mm]	Fire resistance class	Source*
Steel, stainless steel, cast iron	42,4 x 2,3–14,2	750 x 50	500 x 30	500	EI 240 C/U	3
	88,9 x 2,9–14,2	1000 x 60	500 x 50			
	168,3 x 4,0–14,2	1250 x 70	750 x 50			
	219,1 x 4,5–14,2	1500 x 80	1000 x 50	1000		
	323,9 x 5,6–14,2	1750 x 90	1250 x 50			

* Classification report no:: 1 → 2163/11/Z00NP, 2 → 1858.1/12/Z00NP, 3 → 03476/20/Z00NZP

PYRO-SAFE® Flammotect four-layer

1.6 Field of application (component and penetration seal thicknesses, penetration seal distances)

Dimensions arranged individually			
Item	**Name**	**Wall [mm]**	**Floor [mm]**
A	Component thickness	≥ 240	≥ 200
B	Partition thickness	≥ 240	≥ 240
C	Maximum dimensions of the opening (width x height)	600 x 600	600 x ∞
D	Distance to other openings or installations	≥ 200	≥ 200



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

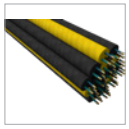
PYRO-SAFE® Flammotect four-layer

2. Allowed services

2.1 Cables / cable bundles / cable support structures / electrical installation conduits/ PE pipes

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

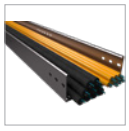
Maximum size of the overall cross section of the individual cables Ø ≤ 80 mm



Cable bundles

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

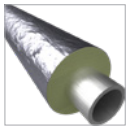
Cable filler not required for tightly packed and tied cable bundles.



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/m^3)

PYRO-SAFE® Flammotect four-layer

3. Distance regulations

PYRO-SAFE® Flammotect four-layer – distance regulations: wall

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

PYRO-SAFE® Flammotect four-layer – distance regulations: floor

		 Single cable	 Cable bundle	 Cable support structure	 Non-combustible pipes	Seal edge: Front	Seal edge: Back	Seal edge: Side
	Single cable	≥ 10 (side by side) ≥ 40 (on top of each other)			≥ 100	≥ 20	≥ 0	≥ 20
	Cable bundle	≥ 10 (side by side) ≥ 40 (on top of each other)			≥ 100	≥ 20	≥ 0	≥ 20
	Cable support structure	≥ 10 (side by side) ≥ 40 (on top of each other)			≥ 100	≥ 20	≥ 0	≥ 20
	Non-combustible pipes	≥ 100			≥ 100	≥ 40	≥ 40	≥ 40

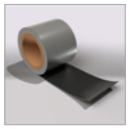
PYRO-SAFE® Flammotect four-layer

4. Products used

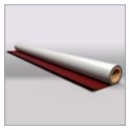
PYRO-SAFE® FLAMMOTECT-A Coating
according to ETA-14/0418
12.5 kg pail – Art. no. 01155101
15.0 kg pail – Art no. 01155105

PYRO-SAFE® FLAMMOTECT-A Solid emulsion
according to ETA-14/0418
12.5 kg pail – Art. no. 01155106
15.0 kg pail – Art. no. 01155107

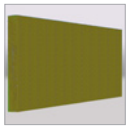
PYRO-SAFE® FLAMMOTECT-A Filler
according to ETA-14/0418
12.5 kg pail – Art. no. 01155104
15.0 kg pail – Art. no. 01155109



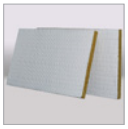
PYRO-SAFE® DG-CR 1.5 Fire protection wrap
according to ETA-16/0268
Roll of 10 m x 125 mm – Art. no. 01261125



PYRO-SAFE® DG-CR 0.7 Brandschutzwickel
gemäß ETA-16/0268
Rolle à 20 m x 1100 mm – Art.-Nr. 01260201

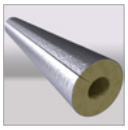


Mineral fibre board according to EN 13162
characteristics:
density ≥ 150 kg / m³
reaction to fire class A1 according to EN 13501:1
melting point ≥ 1,000°C.
(TR10) tensile strength perpendicular to the panel ≥ 10kPa according to EN 1607
thickness: 60 mm



Mineral fibre boards
pre-coated with
PYRO-SAFE® FLAMMOTECT-A
dimensions 1,000 x 600 x 60 mm
Box of 4 items – Art. no. 01181160

Mineral wool A1
Reaction to fire class according to EN 13501-1: A1
Melting point ≥ 1000 °C
10 kg bag – Art. no. 01183000



ProRox PS 960 pipe section

according to EN 14303 made from mineral wool with A1 classification according to EN 13501-1,
Nominal density: 100 kg/m³
Melting point: > 1000 °C
DoP: PROPS960NL-03
Corresponding to Rockwool 880

Lamella mat Klimarock
according to DIN EN 14303 und
LE DE0628071802 of 13/07/2018
Fire behaviour class in accordance with EN 13501-1: Class A1
Dimensions 610 x 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

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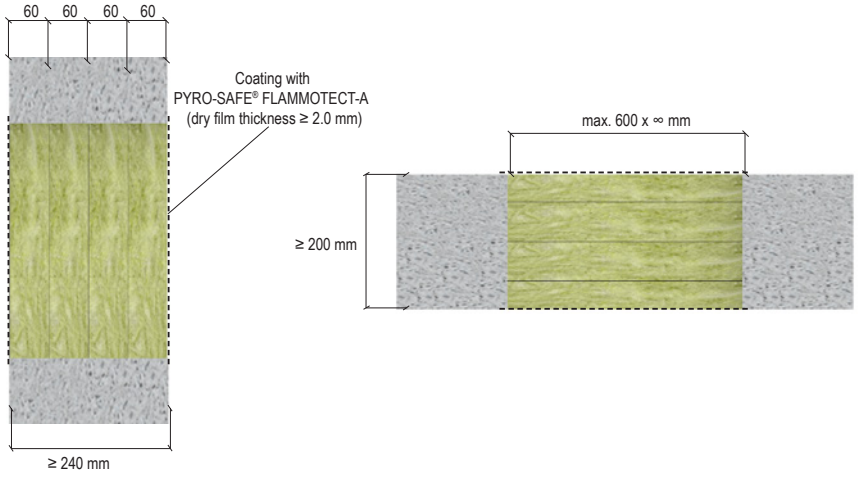
5. Regulations and variants / initial brackets

- The cable penetration seal may be used to seal openings without installations (so-called reserve partition).
- Penetration seals in floors shall be protected with suitable barriers or covered with grating by the installer, in order to prevent them from being load or walked on.
- The penetration seal mineral fibre surface shall be coated with a layer of PYRO-SAFE® FLAMMOTECT-A with a dry film thickness of at least 2 mm.
- The fire protection measures are shown on the following pages and apply also for post-installations.

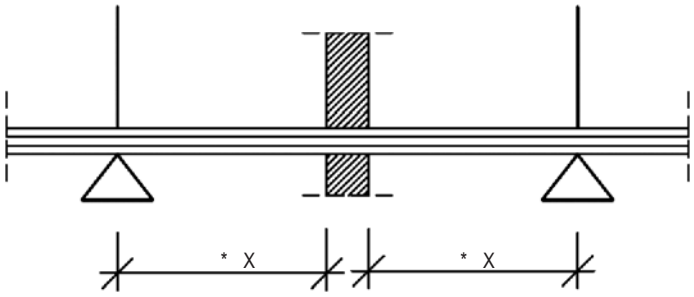
Design variants in walls and floors



Dimensions in mm

5.1 Initial brackets (supports)

Essential parts of the brackets/supports for the installations in front of the wall penetration sealing system must be non-combustible (fire resistance class A1 or A2 according to EN 13501-1) and must be configured with a spacing as per the overview on both sides.



Initial bracket (support) of the installations in front of the wall penetration sealing system made of steel or equivalent.

Initial brackets

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

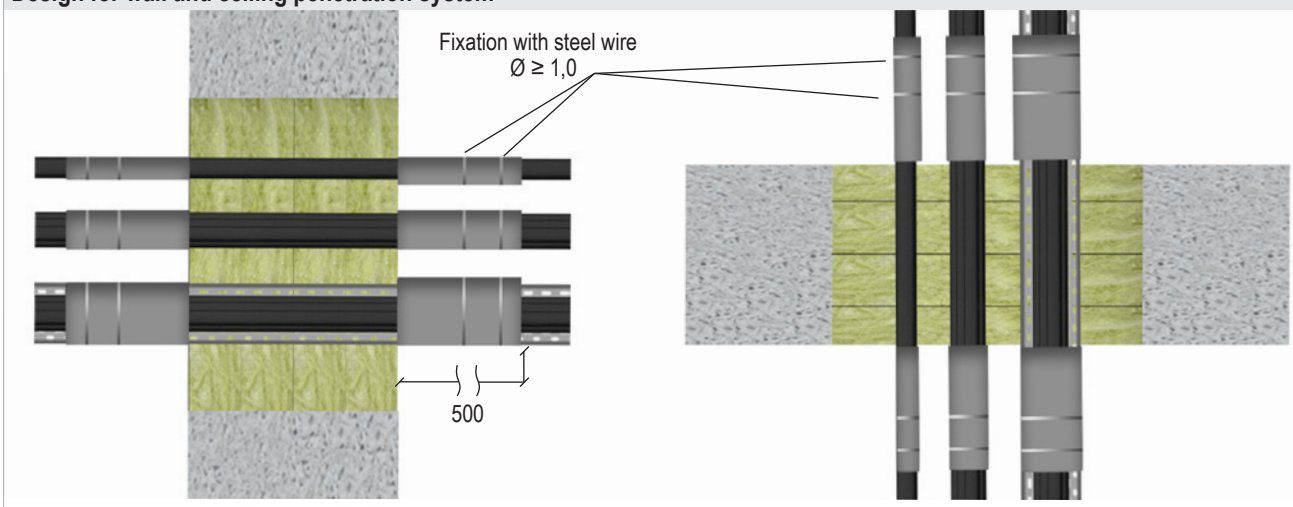
PYRO-SAFE® Flammotect four-layer

6. Fire protection measures

6.1 Cables / cable bundles / cable support structures

- The passage of cables or cable bundles is permitted without and with cable trays.
- Cable bundles may be routed unopened through the penetration sealing system and do not have to be filled internally (gusset) with construction materials if they consist of tightly packed cables which are tightly tied, sewn or welded together and run in parallel.
- The support structures of the cable trays must be designed in such a way that in the event of fire no additional mechanical stress can occur on the penetration sealing system.
- 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. This must be removed before the wrap is fixed in position with the coated side pointing inwards and with steel wires (Ø ≥ 1,0 mm).

Design for wall and ceiling penetration system



Component, seal thickness and variants page 10

Material	Dimensions	Fire protection wrap PYRO-SAFE® DG-CR 1.5						Fire resistance class	
		Wrap width [mm]	Qty. wraps [n]	Qty. wraps [n]	Overlap	Inside seal	Outside seal	Wall	Floor
Cable	Ø ≤ 80	500	2	2	2	-	500	EI 240	EI 240
Cable bundle	Ø ≤ 100 with cable Ø ≤ 21 mm								

Dimensions in mm

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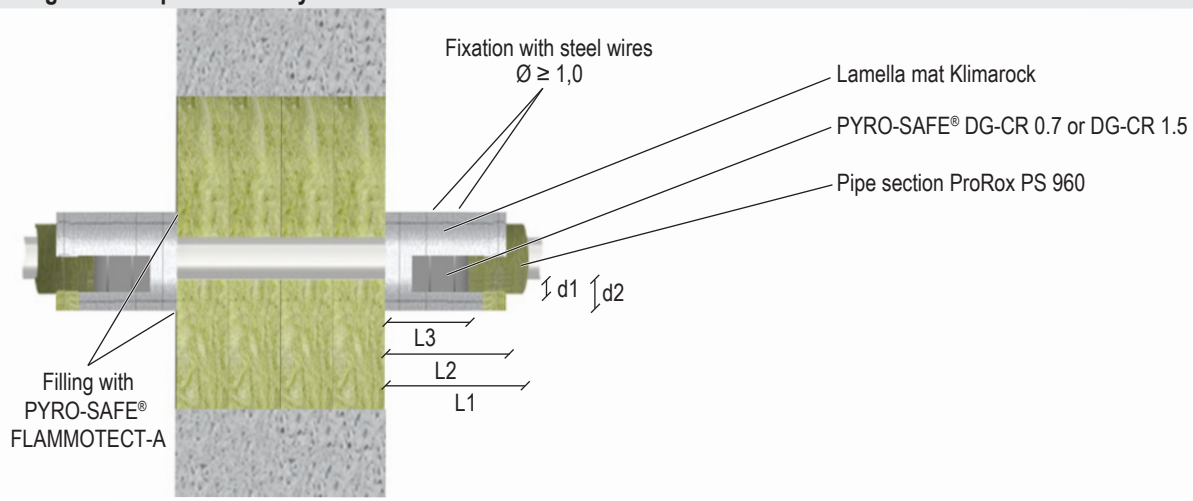
6.2 Nichtbrennbare Rohre

- 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 covered with a protective film. The film needs to be removed before application. The wrap must be applied with the coated side on the inside and fixed with steel wires Ø ≥ 1,0 mm .

Design for wall penetration system



Component, seal thickness and variants pageSeite 10

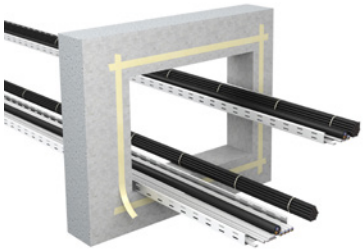
Pipe material	Outer Ø [mm]	Pipe wall thickness [mm]	ProRox PS 960		Lamella mat Klimarock		PYRO-SAFE® DG-CR 0.7 / 1.5 length L3 [mm]
			Isolation length L1	Isolation thickness d1	Isolation length L2	Isolation thickness d2	
Steel, stainless steel, cast iron	≤ 42,4	2,3–14,2	750	50	500	30	500
	≤ 88,9	2,9–14,2	1000	60	500	50	
	≤ 168,3	4,0–14,2	1250	70	750		
	≤ 219,1	4,5–14,2	1500	80	1000		1000
	≤ 323,9	5,6–14,2	1750	90	1250		

Dimensions in mm

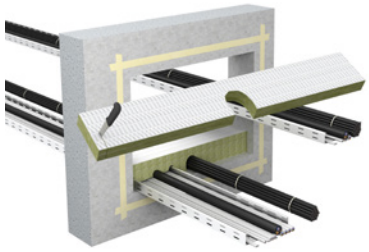
PYRO-SAFE® Flammotect four-layer

7. Installation steps

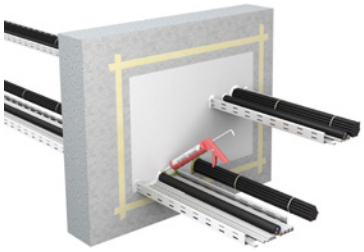
1. Place the crepe tape around the opening at a distance of 20 mm to the edge.



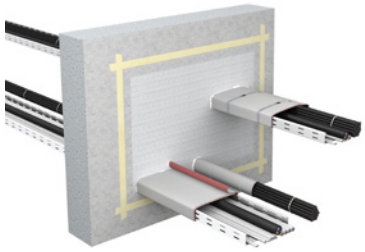
2. Cut mineral fibre boards to size and produce cut-outs for the installations. Coat the edges of the boards with PYRO-SAFE® FLAMMOTECT-A and insert the boards into the component.



3. Seal remaining openings tightly with mineral wool and/or close 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 sealing system if necessary or required. Legibly complete the label and permanently affix it next to or above the penetration seal (not on it!).

Declaration of Performance

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

Protect your values.

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:

i.V. Christian Meyer-Korte
Product Management Construction

i.A. Daniel Bernhardi
Technical Documentation Construction