*protect your values*

# PYRO-SAFE Flammotect *four-layer*

## Installation instructions

**Penetration sealing system made of a 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 and Classification Report No. 1858.1/12/Z00NP (concrete floor, t = 200 mm) and Classification Report No. 2163/11/Z00NP (aerated concrete wall, t = 250 mm)**





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## Contents







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# PYRO-SAFE Flammotect *four-layer*

## 1. Preliminary Remarks / Overview

## 1.1 Target group

- The installation instructions are aimed exclusively at individuals trained in fire protection.

## 1.1 Use of the manual

- Read through these installation instructions completely before starting work. Observe the following safety instructions in particular.
- The approval holder assumes no liability for damage caused by non-observance of these instructions.
- The pictures are only examples. The installation may differ visually.



## 1.1 Safety information

Read the safety data sheets when working with the penetration seal components.

**Personal protective equipment:**

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.

Hand protection
Use chemical-resistant gloves.
Recommended material: butyl rubber, nitrile rubber, fluorinated rubber, PVC.

Eye protection
Wear protective goggles, safety glasses

Body protection
Wear protective clothing and non-slip shoes

Safety information for installation of floor penetration seals:

- The area below the floor penetration seal must be cordoned during the intallation (warning tape, or sign: danger - falling objects; keep off this area; sealing work underway in the floor above!
- The installer shall inform the client in writing (to be forwarded to the building owners or their agents) that, after the installation, the penetration seal shall be secured against any loading with suitable measures, in particular the access shall be inhibited (e.g. with safety fence or grating).



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# PYRO-SAFE Flammotect *four-layer*

## 1.2 Field of application - Scope

The usefulness of the PYRO-SAFE Flammotect four-layer cable penetration seal was determined according to ETAG 026-2 regarding the features „fire performance“, „fire resistance“, „release of dangerous substances“ and „durability and fitness for use“ .

### 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.



## 1.2 Field of application - Structural elements

### Massive 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.

### Applicability of DIN 4102

The classifications according to DIN 4102-2 and according to DIN EN 13501-2, DIN EN 13501-3 and DIN EN 13501-5 are used alternatively for evidence of the required fire resistance rating of a component. (Building Regulations List A Part 1 - Appendix 0.1)

### Solid floors

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



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## 1.3 Fire resistance classes for wall and floor penetration seals

| Fire resistance classes | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Wall ≥ 240 mm | | | | | | |
| | Fire resistance classes | | | | | | |
| | EI 30 | EI 45 | EI 60 | EI 90 | EI 120 | EI 240 | E 240 |
| **Cables on cable ducts or without cable ducts, with "PYRO-SAFE DG-CR 1,5" intumescent wrap** | | | | | | | |
| Cable Ø ≤ 21 mm | ● | ● | ● | ● | ● | ● | ● |
| Cable bundle Ø ≤ 100 mm with cable Ø ≤ 21 mm | ● | ● | ● | ● | ● | ● | ● |
| Cable support structures | ● | ● | ● | ● | ● | ● | ● |
| Cable Ø > 21 mm to Ø ≤ 80 mm | ● | ● | ● | ● | ● | ● | ● |

| Fire resistance classes | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Floor ≥ 200 mm | | | | | | |
| | Fire resistance classes | | | | | | |
| | EI 30 | EI 45 | EI 60 | EI 90 | EI 120 | EI 240 | E 240 |
| **Cables on cable ducts or without cable ducts, with "PYRO-SAFE DG-CR 1,5" intumescent wrap** | | | | | | | |
| Cable Ø ≤ 21 mm | ● | ● | ● | ● | ● | ● | ● |
| Cable bundle Ø ≤ 100 mm with cable Ø ≤ 21 mm | ● | ● | ● | ● | ● | ● | ● |
| Cable support structures | ● | ● | ● | ● | ● | ● | ● |
| Cable Ø > 21 mm to Ø ≤ 80 mm | ● | ● | ● | ● | ● | ● | ● |





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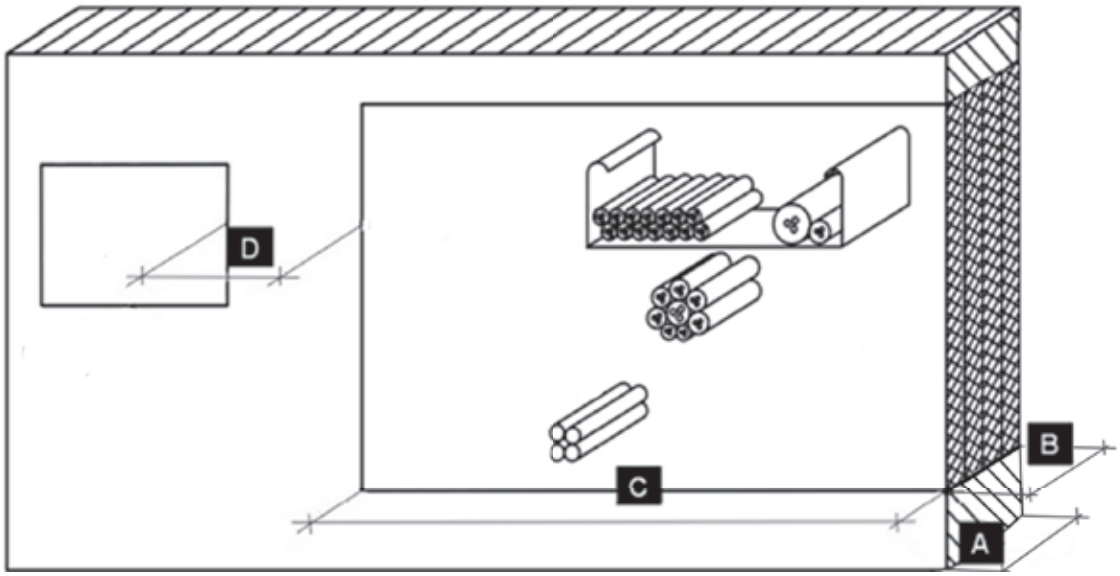
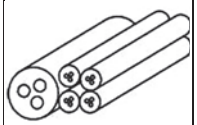
## 1.4 Field of application - Dimensions

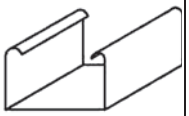
| Dimensions | | | |
|---|---|---|---|
| **Item** | **Designation** | **Wall [mm]** | **Ceiling [mm]** |
| A | Component thickness | ≥ 240 | ≥ 200 |
| B | Partition thickness | 240 | 240 |
| C | Maximum dimensions of the opening (width x height) | 600 x 600 | 600 x ∞ |
| D | Distance to other openings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



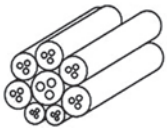

## 2. Allowed Services



**Electrical cables and ducts of any kind (incl. fibre optic cables )**
Maximum size of the overall cross section of the single cables Ø ≤ 80 mm



**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.



**Cable bundle**
Up to Ø ≤ 100 mm with single cable Ø ≤ 21 mm. Cable filler not required for tightly packed and tied cable bundles





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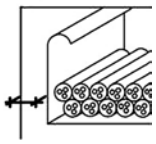
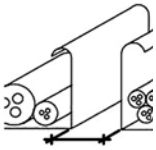
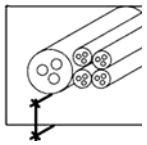
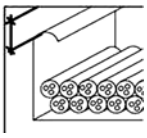
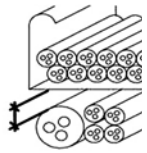
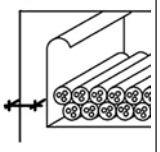
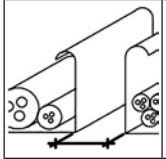
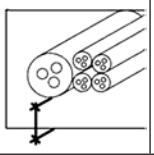
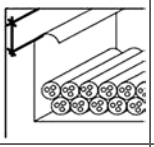
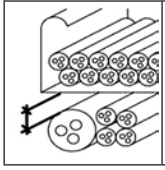
## 3 Spacing for massive walls and floors - cables

| Cable / cable bundle / cable support structure with PYRO-SAFE DG-CR 1,5 wrap in walls | | [mm] |
|---|---|---|
|  | Distance to the side edge | ≥ 20 |
|  | Distance between support structures | ≥ 10 |
|  | Distance to the lower edge | ≥ 0 |
|  | Distance to the upper edge | ≥ 20 |
|  | Distance to each other | ≥ 80 |

| Cable / cable bundle / cable support structure with PYRO-SAFE DG-CR 1,5 wrap in floors | | [mm] |
|---|---|---|
|  | Distance to the side edge | ≥ 20 |
|  | Distance between support structures | ≥ 10 |
|  | Distance to the lower edge | ≥ 0 |
|  | Distance to the upper edge | ≥ 20 |
|  | Distance to each other | ≥ 40 |





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## 4. Used products

**PYRO-SAFE FLAMMOTECT- A Coating**

Reaction to fire class in accordance with EN 13501-1: class E
12.5-kg pail - product No. 01155101

**PYRO-SAFE FLAMMOTECT- A Solid emulsion**

Reaction to fire class in accordance with EN 13501-1: class E
12.5-kg pail - product No. 01155106

**PYRO-SAFE FLAMMOTECT- A Filler**

Reaction to fire class in accordance with EN 13501-1: class E
12.5-kg pail - product No. 01155104

**PYRO-SAFE FLAMMOTECT- A Filler**

Reaction to fire class in accordance with EN 13501-1: class E
310- cartridge - product No. 01155115

**PYRO-SAFE DG-CR 1,5**

Cable and pipe wrap in accordance with ETA-13/0100
Reaction to fire class in accordance with EN 13501-1: B-s1,d0
Intumescent construction material for wrapping cable and pipe wraps of various widths

**Mineral-fibre board in accordance with DIN 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 EN1607
Thickness: 60 mm

**Mineral-fibre board**

pre-coated with
PYRO-SAFE FLAMMOTECT - A on one side
Dimensions: 1,000 x 600 x 60 mm
Product No. 01181160

**Mineral wool**

in acc. with abZ approval Z-23.15-1468
Reaction to fire class in accordance with EN 13501-1: class A1
Melting point > 1,000 °C
10-kg bag - product No. 01183000

**Label**

1 piece - Part No.

**Recommended tools**

- Spatulas, brushes, masking tape
- cutter and saw
- Possibly foil, folding ladder
- Pliers, galvanized steel wire





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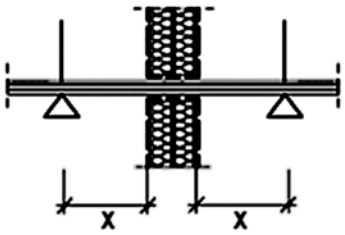
## 5. Regulations and variants for implementation

- The cable penetration seal may be used to seal openings without installations (so-called reserve partition).
- Penetration seal 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.

## 5.1 Rules over the first cable supports

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

| First support for wall installations | | X [mm] |
|---|---|---|
|  | Cables, cable bundles, cable support structures | ≤ 100 |





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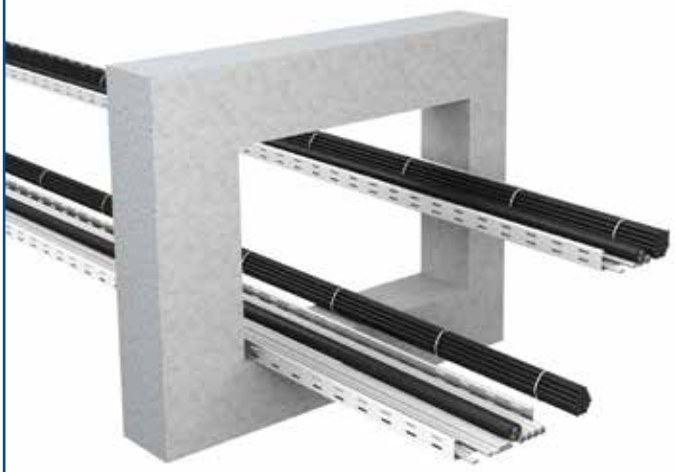
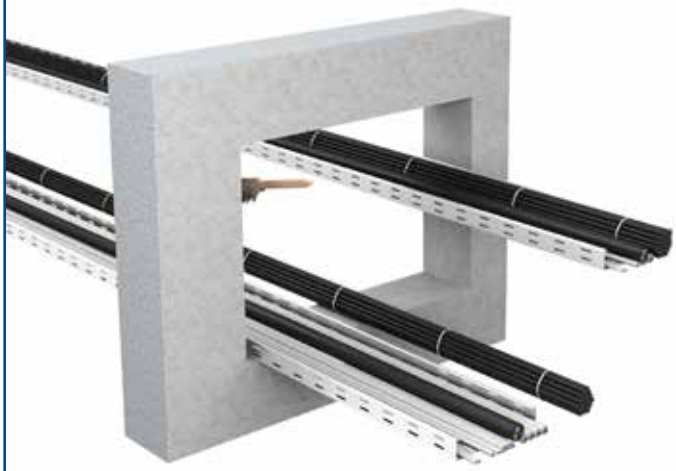
# PYRO-SAFE Flammotect *four-layer*

## 6.1 Installation procedure in walls

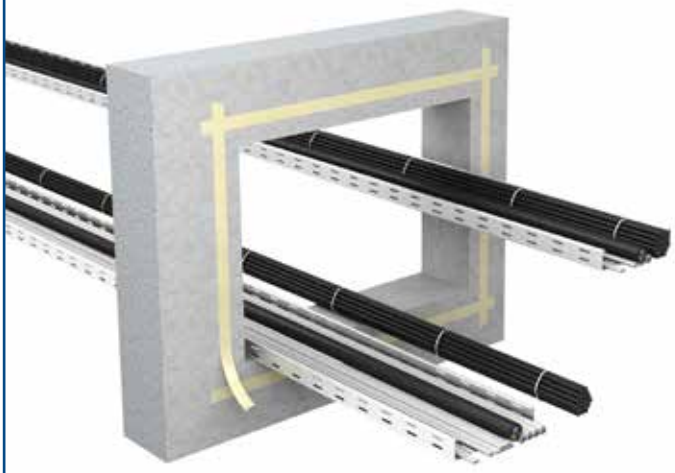
**1.Opening with penetrations**



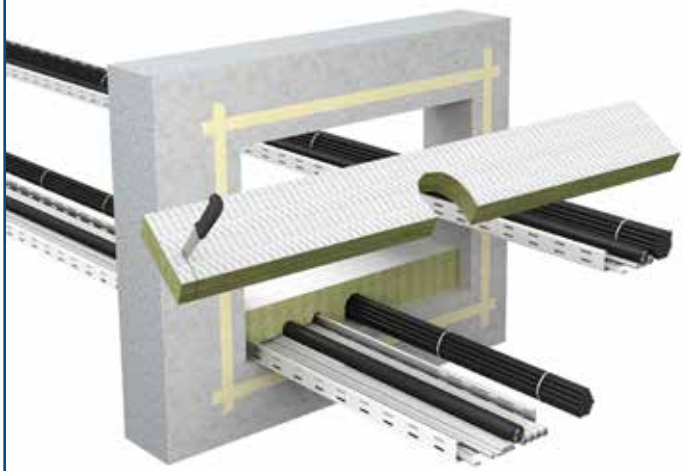
**2. Clean the inside edge**



**3. Place the masking tape around the opening at a distance of 20 mm to the edge.**



**4. Cut mineral fibre boards to the needed side (provide openings for cables and cable ducts).**







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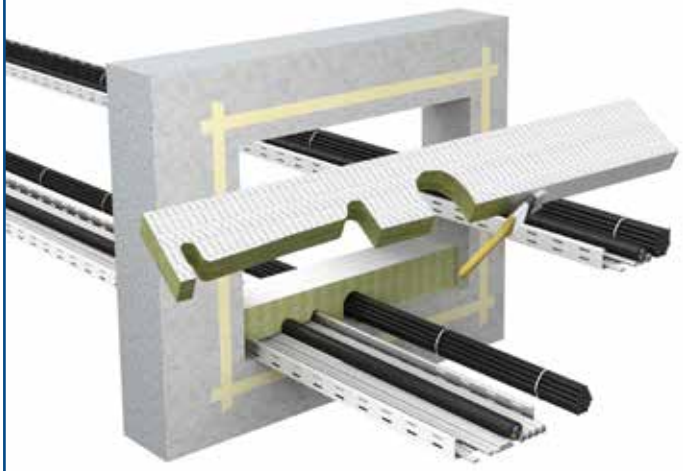
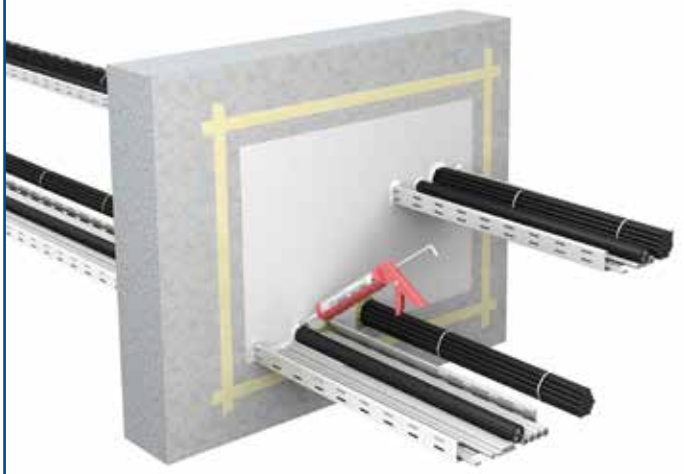
# PYRO-SAFE Flammotect *four-layer*

## 6.1 Installation procedure in walls - requirements for cables

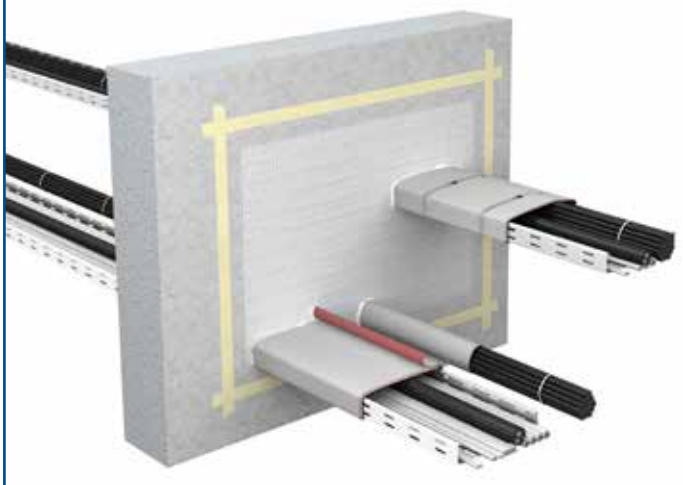
5. Apply PYRO-SAFE FLAMMOTECT-A to the cut faces of the mineral fibre board and insert flush and tightly the board into the opening.



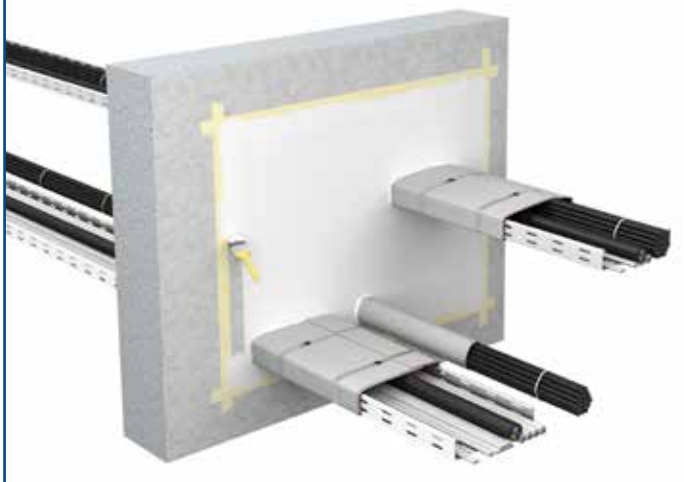
6. Fill remaining gaps with mineral fibre wool or seal with PYRO-SAFE FLAMMOTECT-A.



7. *Wrap cables, cable bundles and cable support structures with PYRO-SAFE DG-CR 1,5 For details, see* next page.



8. Apply a final PYRO-SAFE FLAMMOTECT-A coating







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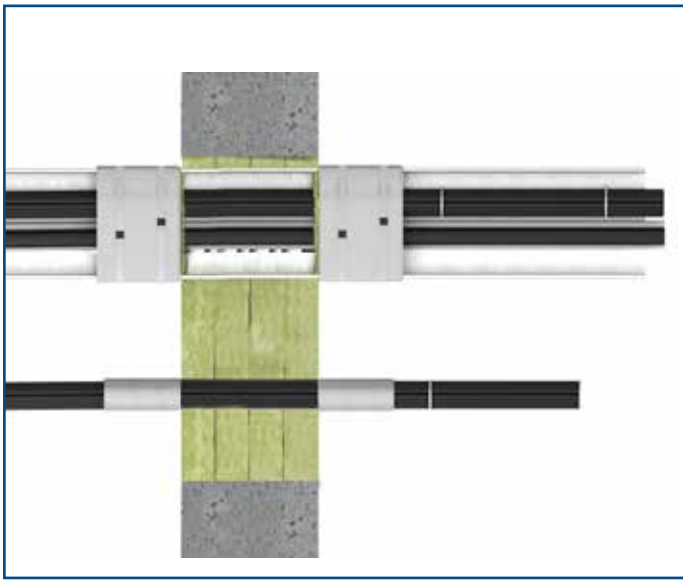
# PYRO-SAFE Flammotect *four-layer*

## 6.1 Installation procedure in walls

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

## 6.1 Fire protection measures in walls



**Measures for wall penetration seals (per side)**

| | Type | Dry film thickness / wrap width [mm] | Length inside / before seal surface [mm] | | Layers | Overlap [mm] | Steel-wire fasteners (amount) |
|---|---|---|---|---|---|---|---|
| | | | inside | before | | | |
| Cable Ø ≤ 21 mm | PYRO-SAFE DG-CR 1,5 wrap | 500 | - | 500 | 2 | 2 installed at 150 mm and 300 mm from penetration seal surface | |
| Cable bundle Ø ≤ 100 mm with cable Ø ≤ 21 mm | | | | | | | |
| Cable support structures | | | | | | | |
| Cable Ø > 21 mm to Ø ≤ 80 mm | | | | | | | |





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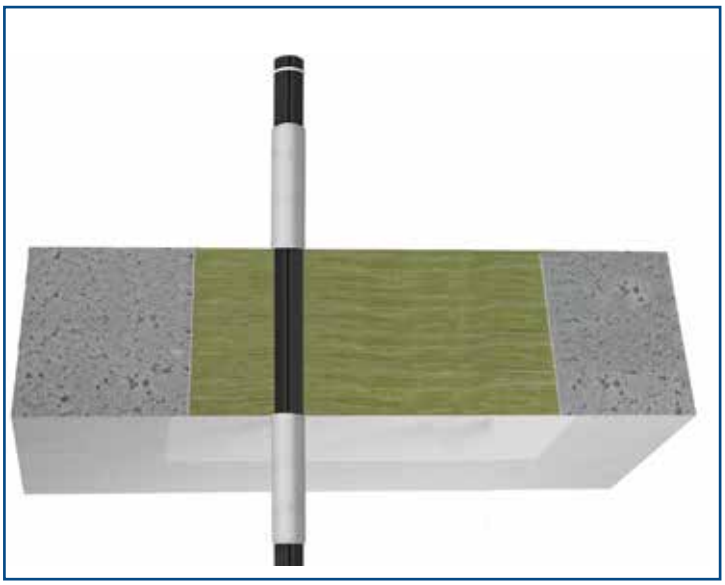
# PYRO-SAFE Flammotect *four-layer*

## 6.2 Fire protection measures in floors



| Measures for floor penetration seals (per side) | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Type | Dry film thickness / wrap width [mm] | Length inside / before surface [mm] | | Layers | Overlap [mm] | Steel-wire fasteners (number) |
| | | | Inside | before | | | |
| Cable Ø ≤ 21 mm | PYRO-SAFE DG-CR 1,5 wrap | 500 | - | 500 | 2 | 2 installedat 150 mm and 300 mm from penetration seal surface | |
| Cable bundle Ø ≤ 100 mm with cable Ø ≤ 21 mm | | | | | | | |
| Cable support structures | | | | | | | |
| Cable Ø > 21 mm to Ø ≤ 80 mm | | | | | | | |





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# Declaration of Performance
N° 01155-PYRO-SAFE-FLAMMOTECT-A
**PYRO-SAFE FLAMMOTECT-A**



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

*Intended use:*
**Ablative fire stopping product used in penetration seals**

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

*System for assessing and verifying constancy of performance*
**System 1**

*European Assessment Document*
**ETAG 026-2:2011-10-14**

*European Technical Assessment*
**ETA-14/0418 of 04.12.2014**

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

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

*Declared performance*

| Essential characteristics | Performance | Harmonised technical specification |
|---|---|---|
| Reaction to fire | **Class E** | EN 13501-1 |
| Fire resistance | **Class EI 30** of a penetration seal (with mineral wool; see Annexes 1 and 17-22 of ETA-14/0418 for details) | EN 13501-2 |
| | **Class EI 60** of a penetration seal (with mineral fibre board single-layer; see Annexes 1 and 2-6 of ETA-14/0418 for details) | |
| | **Class EI 60** of a penetration seal (with mineral wool; see Annexes 1 and 23-27 of ETA-14/0418 for details) | |
| | **Class EI 90** of a penetration seal (with mineral wool; see Annexes 1 and 28-32 of ETA-14/0418 for details) | |
| | **Class EI 90** of a penetration seal (without mineral wool; see Annexes 1 and 33 of ETA-14/0418 for details) | |
| | **Class EI 120** of a penetration seal (with mineral fibre boards double-layer; see Annexes 1 and 7-11 of ETA-14/0418 for details) | |
| | **Class EI 240** of a penetration seal (with mineral fibre boards quadruple-layer; see Annexes 1 and 12-16 of ETA-14/0418 for details) | |
| Emission of dangerous substances | no dangerous substances | ETAG 026-2 |
| Durability and serviceability | Use category type X | EOTA TR 024 |

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

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

i.V. Andree Schober
Head of chemical department