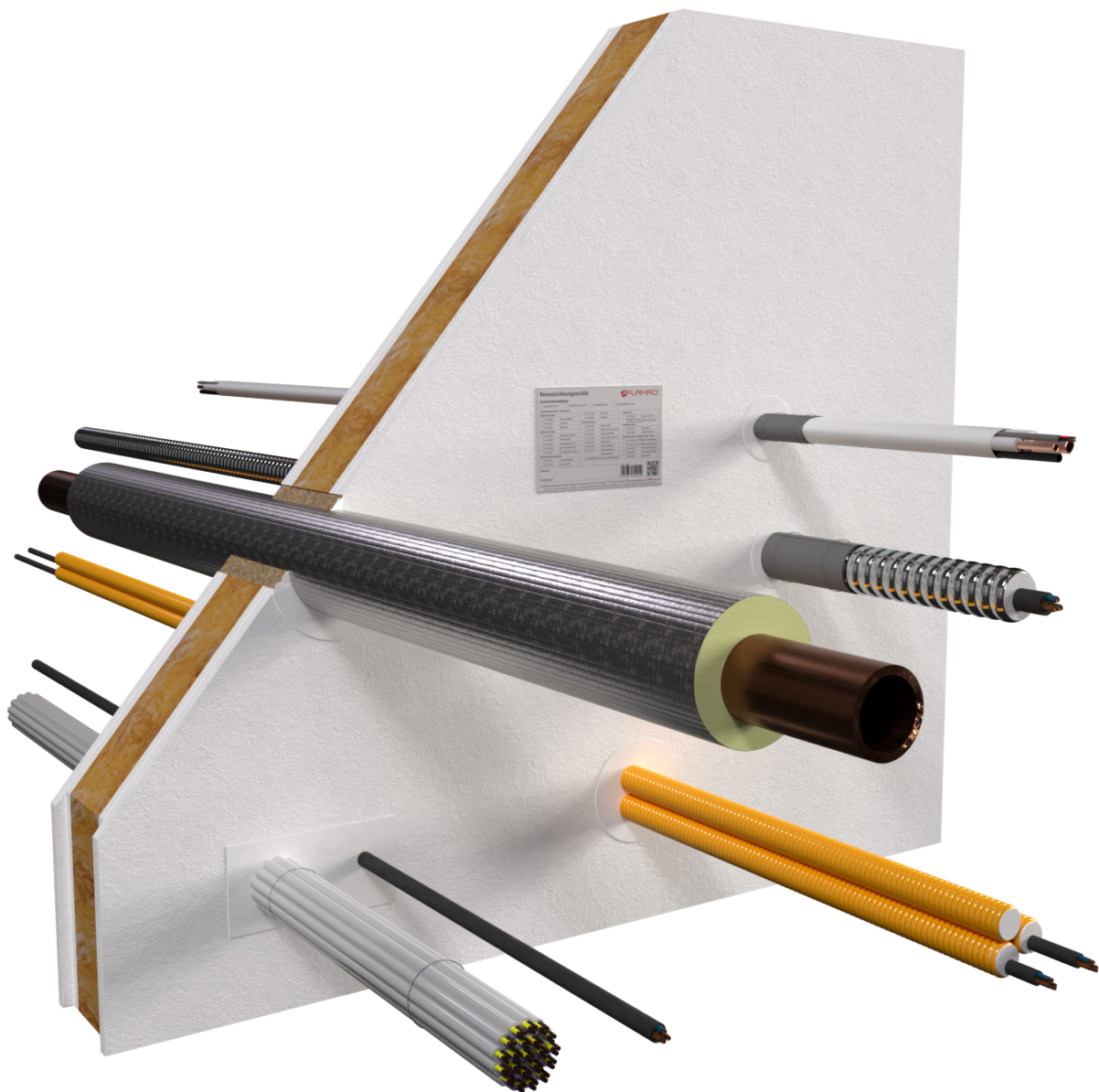


System Flammotect Easy Seal

Ablative fire protection seal

Easy-to-install sealing system made of mineral wool and ablative coating for electrical installations and pipes in accordance with ETA-22/0052.

Fire resistance class max. EI 120 in acc. with EN 13501-2.



System Flammotect Easy Seal

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System Flammotect Easy Seal

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.

Subject to errors, misprints and changes. All information contained in this brochure reflects the state of the art or, if applicable, the requirements of the pertinent standard at the time of printing (24.09).





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



1.2.1 Safety instructions

Consult the respective safety information for the individual 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. 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 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 being stepped on, by suitable measures (e.g. by fencing or by covering with grating).

System Flammotect Easy Seal

1.3 Building elements

Plasterboard walls

In stud design and double-sided cladding with at least 2 layers of 12.5 mm cement or gypsum-bound building boards with a reaction to fire of class A1 or A2 in accordance with EN 13501-1.

Instead of steel studs also timber studs may be used. The clearance between timber stud and seal must be at least 100 mm. The insulation between the studs must at least conform to reaction to fire class A1 or A2 in accordance with EN 13501-1.

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

Solid walls

Made of masonry, concrete, reinforced concrete, aerated concrete, ceramic bricks, cavity bricks or perforated bricks with a density of $\geq 600 \text{ kg/m}^3$.

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

Solid floors

Made of concrete or reinforced concrete with a density of $\geq 2200 (\pm 500) \text{ kg/m}^3$.






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

System Flammotect Easy Seal

2. Allowed services

For specific fire resistance classes and pipe end configurations depending on measurements and fire protection measures see the respective chapters on design variants starting on page 12.

2.1 Cables / electrical installation conduits / wave guides


Services		Maximum diameter [mm]
	Cables	≤ 21
	Cable bundles	≤ 100, cable Ø ≤ 21
	single	≤ 32 with or without cables, cable Ø ≤ 21
	bundled	≤ 100, conduit Ø ≤ 32 with or without cables, cable Ø ≤ 21
	single	≥ 14 – ≤ 50 with or without cables, cable Ø ≤ 21
	CommScope HELIAX®	≤ 51.1
	RFS CELLFLEX®	≤ 50.3
	RFS RADIAFLEX®	≤ 48.2

2.2 Non-combustible pipes

Pipe material	Diameter [mm]
Copper, steel, stainless steel, cast iron	≤ 88.9
Steel, stainless steel, cast iron	≤ 219.1

System Flammotect Easy Seal

2.3 Other services

Services		Configuration
	HVAC split line combinations	Copper pipe $\leq 2 \times \varnothing 18$ mm, + 9 mm PE foam, + 1 pipe PVC-U/PVC-C $\varnothing \leq 25.0 \times 1.5$ mm, + $\leq 3 \times$ cables $\varnothing \leq 14.0$ mm

3. Thicknesses, sizes and spacing

Dimensions for single installation		
	Wall [mm]	Floor [mm]
Thickness of building element	≥ 100	≥ 150
Thickness of penetration seal	≥ 100	≥ 150
Maximum size of aperture (width \times height)	$\leq 500 \times 200$	$\leq 350 \times 150$
Maximum size of aperture (round)	$\varnothing \leq 350$	$\varnothing \leq 160$
1. Distance to other sealing systems Easy Seal	≥ 50	≥ 100
2. Distance to other apertures or installations	≥ 100	≥ 100

The total allowable cross section of the installations (outer dimensions) is $\leq 60\%$ of the construction aperture.

3.1 Initial supports

Penetrating services must be supported at the distances specified in the table below. In wall constructions support is necessary on both sides. In floor constructions support is necessary on the upper side of the floor. Essential parts of the supports must be non-combustible.

Initial supports	Wall	Floor
Non-combustible pipes with mineral fibre insulation	≤ 500	
Non-combustible pipes with FEF insulation		
Cables, cable bundles	≤ 250	
Coaxial cables and wave guides		
Electrical installation conduits		
HVAC split line combinations		

System Flammotect Easy Seal

4. Spacing requirements for services

Spacing requirements in walls and floors										
										Aperture edge
		Single cables	Cable bundles	Coaxial cables and wave guides	Electrical installation conduits made of plastic, single/bundled	Electrical installation conduits made of metal	Non-combustible pipes with FEF insulation	Non-combustible pipes with lamella mat insulation	HVAC split line combinations	Upper Lower Side
	Single cables	≥ 0	≥ 100	≥ 100	≥ 100	≥ 75	≥ 0	≥ 0	≥ 100	≥ 0
	Cable bundles	≥ 0	≥ 100	≥ 100	≥ 100	≥ 75	≥ 0	≥ 0	≥ 100	≥ 0
	Coaxial cables and wave guides	≥ 100	≥ 50	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 25
	Electrical installation conduits made of plastic, single/bundled	≥ 75	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 25
	Electrical installation conduits made of metal	≥ 75	≥ 100	≥ 100	≥ 100	≥ 0	≥ 100	≥ 100	≥ 100	≥ 25
	Non-combustible pipes with FEF insulation	≥ 0	≥ 100	≥ 100	≥ 100	≥ 100	≥ 0	≥ 100	≥ 100	≥ 25
	Non-combustible pipes with lamella mat insulation	≥ 0	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 0	≥ 100	≥ 25
	HVAC split line combinations	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 50	≥ 25

All specifications in mm. All specifications refer to distances between the respective insulations and additional measures if applicable.

System Flammotect Easy Seal

5. Included products



**FLAMMOTECT-A
Coating**

5 kg pail – Art. no. 01155132
12.5 kg pail – Art. no. 01155131



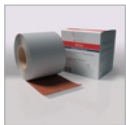
**FLAMMOTECT-A
Solid emulsion**

5 kg pail – Art. no. 01155121
12.5 kg pail – Art. no. 01155136



**FLAMMOTECT-A
Filler**

5 kg pail – Art. no. 01155135
12,5 kg pail – Art. no. 01155134
310 ml cartridge – Art. no. 01155115
600 ml flow pack – Art. no. 01155153



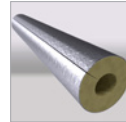
**NBR-plus
Fire protection wrap**

Roll, 5 m × 125 mm
(separable into 2 × 62.5 mm)
– Art. no. 0760150133
Roll, 10 m × 125 mm
(separable into 2 × 62.5 mm)
– Art. no. 01261941



Mineral wool A1

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



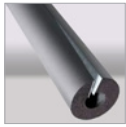
**Lamella mats and pipe shells made of
mineral fibre**

Classification: A2-S1, d0 or A1 in acc. with
EN 13501-1
Minimum bulk density: 35 kg/m³
Melting point ≥ 1000 °C

for example:

Name	Nominal bulk density [kg/m ³]	DIN/ abZ/abP
Rockwool lamella mat Klimarock Roll, 3.05 m ² – Art. no. 01187100	40-50	DE0628031801 of 14.03.2018
Rockwool ProRox PS 960 (formerly Rockwool Lapimus pipe shell 880)	95-150	PROPS960NL-03
Rockwool 800	90-115	DE0721011801 of 15.01.2018
Rockwool ProRox WM 950 (formerly WM 80/RTD-2)	85	PROWM950D-03 of 04.05.2017
Rockwool ProRox WM WM 960 (formerly WM 100/ RBM)	100	PROWM960D-03 of 04.05.2017
Rockwool Conlit 150 U	150	P-NDS04-417
Isover shells Protect 1000 S, Isover shells Protect 1000 S Alu	70-90	DE0002-Pi-pe_Sections 001 of 10.06.2013
Isover mineral fibre mat MD2 and MD2/A	80	DE0002-Pro- tect_EN14303 002 of 09.02.2015
Isover mineral fibre mat MDD and MDD/A	115	
PAROC Hvac Section AluCoat T	85-120	40361
PAROC Pro Section 100	100	40080
PAROC Hvac Lamella Mat AluCoat Fix	50	40236

System Flammotect Easy Seal



Section and protective insulations

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

for example:

Bezeichnung	DIN/abZ/abP
ArmaFlex Protect	(0543-CPR-2016-001 of 01.04.2015)
AF/ArmaFlex	0543-CPR-2016-001 of 01.04.2015
AF/ArmaFlex Evo	0543-CPR-2020-101
SH/ArmaFlex	0543-CPR-2013-013 of 01.01.2015
NH/ArmaFlex	0552-CPR-2013-015 of 08.08.2018
NH/ArmaFlex Smart	0543-CPR-2020-102
ArmaFlex LS	0551-CPR-2016-066
ArmaFlex Ultima	0543-CPR-2016-017
FEF Kaiflex KKplus s1	DoP KKplus s1 01032018001 of 01.03.2018
FEF Kaiflex HTplus	DoP HTplus s1 01032018001 of 01.03.2018
K-Flex R90	P-2300/871/16-MPA BS of 04.10.2016
flexen Heizungskautschuk	LE_5258006015_00_M_flexen_Heizungskautschuk of 30.06.2013
flexen Kältekautschuk	LE_0869806006_00_M_flexen_Kältekautschuk of 30.06.2013
EUROBATEX	01/20190610
EUROBATEX HF	03/20171201



Recommended tools

- filler, brush, masking tape,
- if required: plastic film, folding ladder,
- lock wire pliers, steel wire (galvanised)



Label

1 piece – Art. no. 14003

5.1 Declarations of Performance

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

<https://flamro.com/eu/downloads/>

System Flammotect Easy Seal

6. Design

6.1 Fire resistance classes

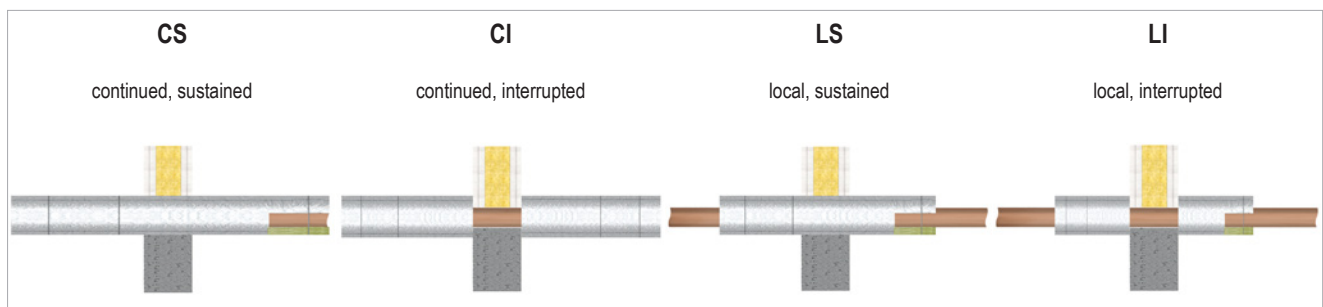
System Flammotect Easy Seal meets the requirements of max. class EI 120 in acc. with EN 13501-2.

The fire resistance class of the sealing system is reduced to the fire resistance class of the installed service with the lowest fire resistance rating. The fire resistance class of the sealing system is reduced to the maximum fire resistance class of the surrounding building element.

6.2 Pipe end configurations

Non-combustible pipes				
tested	included configurations			
	U/U	U/C	C/U	C/C
U/U	✓	✓	✓	✓
U/C	–	✓	✓	✓
C/U	–	–	✓	✓
C/C	–	–	–	✓

6.3 Pipe insulation configurations



Results for LS insulation are also applicable to CS insulation.

Results for LI insulation are also applicable to CI insulation.

System Flammotect Easy Seal

6.4 Design variants

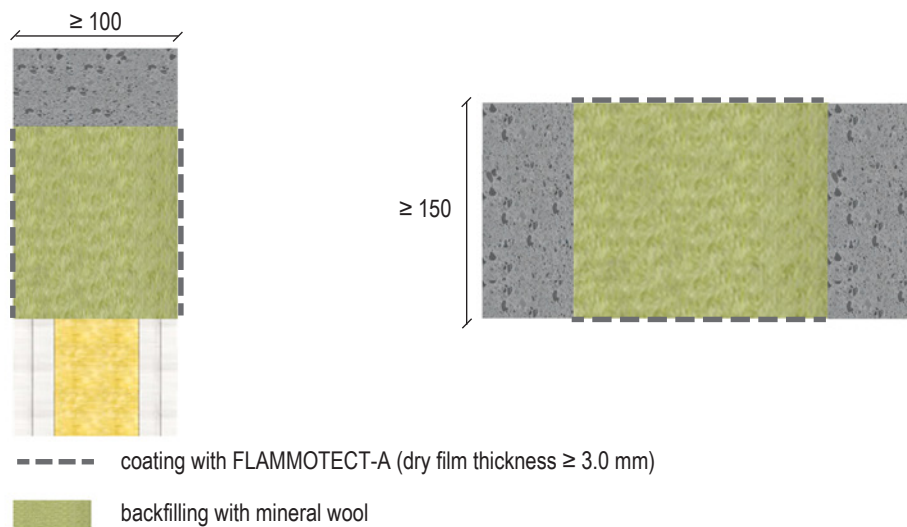
The sealing system may be used to seal openings without installations (reserve penetration for subsequent configurations).

There must be suitable measures in the buildings to secure sealing systems in floors from being stepped on or subjected to loads.

The surface of the sealing system must be provided with a coating of FLAMMOTECT-A (dry film thickness ≥ 3.0 mm).

The fire protection measures described on the following pages also apply to retrofitting.

Design variants for walls and floors



All specifications in mm

System Flammotect Easy Seal

- 7. Fire protection measures
- 7.1 Cables / cable bundles

Design for wall and floor penetration seals

For building element and seal thicknesses see page 6. For design variants see page 10. All specifications in mm

Service	Diameter [mm]	Fire resistance class	
		Wall	Floor
Cables	≤ 21	EI 90	EI 90
Cable bundles with cables $\varnothing \leq 21$ mm	≤ 100	EI 90	EI 90

Single cable penetrations through round apertures with a diameter of ≤ 30 mm do not require backfilling with mineral wool.

Design for wall and floor penetration seals without backfilling

For building element and seal thicknesses see page 6. For design variants see page 10. All specifications in mm

Service	Diameter [mm]	FLAMMOTECT-A filler	Fire resistance class	
		Dry film thickness [mm]	Wall	Floor
Cables	≤ 21	≥ 25	EI 90	EI 90
		≥ 3	-	EI 90

System Flammotect Easy Seal

7.2 Electrical installation conduits

7.2.1 Conduits made of plastic

Design for wall and floor penetration seals

For building element and seal thicknesses see page 6. For design variants see page 10. All specifications in mm

Service	Diameter [mm]	Fire protection wrap NBR-plus		Fire resistance class	
		Number of wraps [n]	Number of layers [n]	Wall	Floor
Conduits made of plastic – single	$\varnothing \leq 32$ with/without cables ($\varnothing \leq 21$)	1 × 125 mm	1	EI 120 U/U	EI 120 U/U
Conduits made of plastic – bundled	$\varnothing \leq 32$ bundled up to $\varnothing \leq 100$ with/without cables ($\varnothing \leq 21$)	or 2 × 62.5 mm	2	EI 120 U/U	EI 120 U/U

System Flammotect Easy Seal

7.2.2 Conduits made of metal

Design for wall and floor penetration seals

mineral fibre lamella mat
(min. A2,s1,d0;
melting point ≥ 1000 °C,
bulk density ≥ 35 kg/m³)

For building element and seal thicknesses see page 6. For design variants see page 10. All specifications in mm

Electrical installation conduits		Measure	Fire resistance class	
Outer diameter [mm]	Service		Wall	Floor
≤ 16	with/without cables ≤ 14	–	EI 120 U/C	–
≤ 50		–	EI 30 / E 120 UC	–
≤ 32		lamella mat, insulation length 250 mm, insulation thickness 20 mm	EI 120 U/C	EI 120 U/C
≤ 50		EI 120 U/C	–	

System Flammotect Easy Seal

7.3 Coaxial cables and wave guides

Design for wall penetration seals

100

coating with FLAMMOTECT-A

For building element and seal thicknesses see page 6. For design variants see page 10. All specifications in mm

Wall			
Service	Fire protection coating FLAMMOTECT-A		Fire resistance class
	Dry film thickness [mm]	Length of coating in front of seal [mm]	Wall
CommScope Heliax $\varnothing \leq 51.1$ mm	≥ 1.0	≥ 100	EI 120 U/C
RFS Cellflex $\varnothing \leq 50.3$ mm			EI 120 U/C
RFS Radiaflex $\varnothing \leq 48.2$ mm			EI 120 U/C

System Flammotect Easy Seal

7.4 Non-combustible pipes

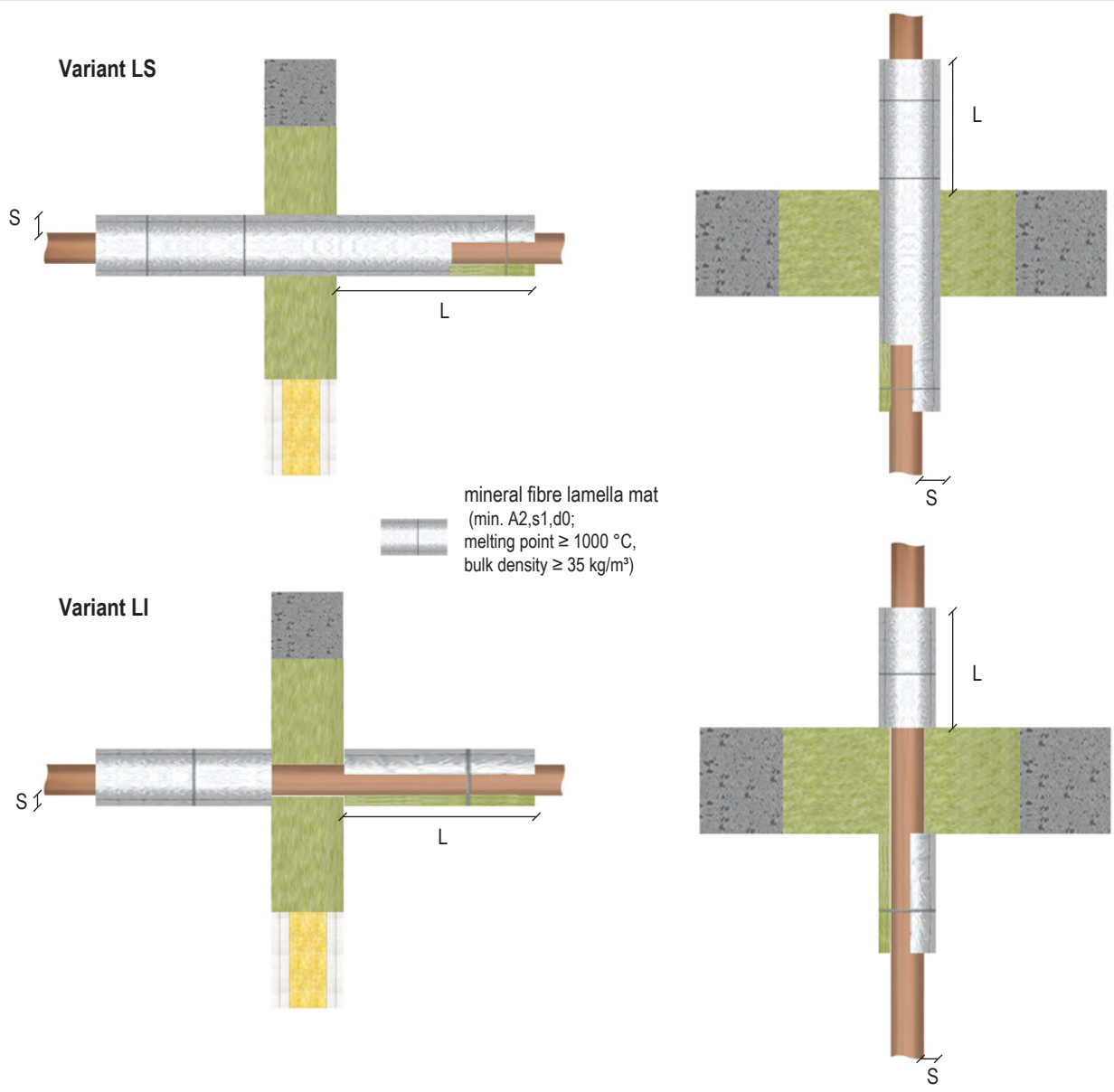
7.4.1 Section insulation made of mineral fibre mats or shells

A section insulation (for example made of mineral fibre mats) must be applied to non-combustible pipes. Depending on pipe wall thickness and the outer diameter of the pipe, an additional protective insulation made of mineral fibre mats may be necessary.

The insulation must be secured with tension strips or wire.

In floor installations suitable fastening measures must be applied to prevent the mat from slipping.

Design for wall and floor penetration seals



For building element and seal thicknesses see page 6. For design variants see page 10.

System Flammotect Easy Seal

Wall					
Pipe material	Pipe outer Ø [mm]	Pipe wall thickness [mm]	Lamella mat		Fire resistance class
			Insulation length L [mm]	Insulation thickness S [mm]	
Copper, steel, stainless steel, cast iron	≤ 22.0	0.6–14.2	≥ 450 on both sides	20–100	EI 120 U/C
	> 22.0 – ≤ 60.0		≥ 200 on both sides	30–100	EI 120 U/C
	> 60.0 – ≤ 88.9		≥ 450 on both sides	30–100	EI 120 U/C
Steel, stainless steel, cast iron	≤ 42.0	1.8–14.2	≥ 200 on both sides	30–100	EI 120 U/C
	> 42.0 – ≤ 114.3	1.8/3.2–14.2	≥ 450 on both sides	30–100	EI 120 U/C
	> 114.3 – 159.0	3.2/4.0–14.2	≥ 1200 on both sides	100	EI 120 U/C
	> 159.0 – ≤ 219.1	3.2/4.5–14.2	≥ 1200 on both sides	30–100	EI 120 U/C

Floor					
Pipe material	Pipe outer Ø [mm]	Pipe wall thickness [mm]	Lamella mat		Fire resistance class
			Insulation length L [mm]	Insulation thickness S [mm]	
Copper, steel, stainless steel, cast iron	≤ 22.0	0.6–14.2	≥ 425 on both sides	20–100	EI 120 U/C
	> 22.0 – ≤ 42.0		≥ 175 on both sides	30–100	EI 120 U/C
			≥ 425 on both sides	30–100	EI 120 U/C
			> 42.0 – ≤ 88.9	≥ 675 on both sides	30–100
Steel, stainless steel, cast iron	≤ 42.0	1.8–14.2	≥ 125 on both sides	30–100	EI 120 U/C
	> 42.0 – ≤ 114.3	1.8/3.2–14.2	≥ 425 on both sides	30–100	EI 120 U/C
	> 114.3 – 159.0	3.2/4.0–14.2	≥ 1175 on both sides	30–100	EI 120 U/C
	> 114.3 – 219.1	3.2/4.5–14.2	≥ 1175 on both sides	30	EI 120 U/C
			≥ 1175 on both sides	30–100	EI 90 U/C

System Flammotect Easy Seal

7.4.2 Section insulation made of FEF

Design for wall and floor penetration seals

For building element and seal thicknesses see page 6. For design variants see page 10. All specifications in mm

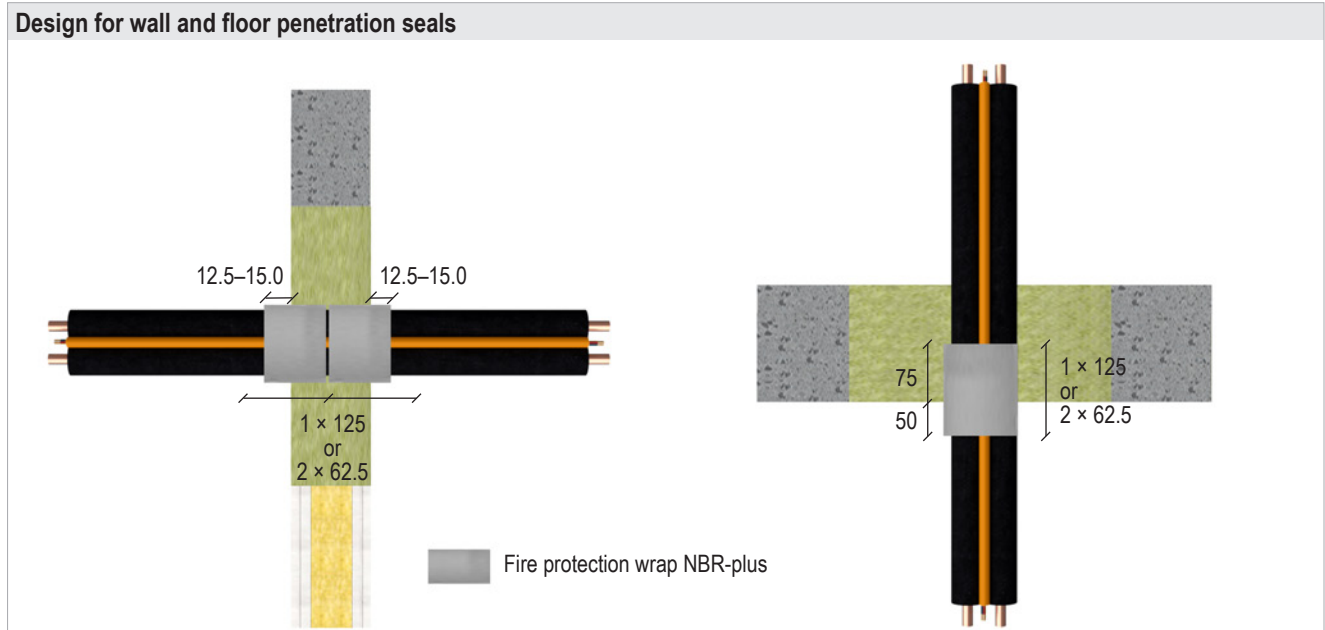
Wall								
Pipe outer Ø [mm]	Pipe wall thickness [mm]	FEF section insulation		FEF protective insulation		Fire protection wrap NBR-plus		Fire resistance class
		Length L [mm]	Thickness S [mm]	Length L ₁ [mm]	Thickness S ₁ [mm]	Number of wraps [n]	Number of layers [n]	
Copper, steel, stainless steel, cast iron								
≤ 15.0	0.8–14.2	CS	10	–	–	1 × 125 mm or 2 × 62.5 mm	1	EI 120 U/C
> 15.0 – ≤ 54.0			19–38	–	–		1	EI 120 U/C
≤ 42.0			10	–	–		1	EI 90 U/C
> 42.0 – ≤ 88.9			19–38	–	–		2	EI 90 U/C
> 54.0 – ≤ 88.9			25	–	–		2	EI 120 U/C
Steel, stainless steel, cast iron								
≤ 15.0	0.8–14.2	CS	10–38	–	–	1 × 125 mm or 2 × 62.5 mm	2	EI 120 U/C
> 15.0 – ≤ 88.9			19–38	–	–		2	EI 120 U/C
> 88.9 – ≤ 114.3			19–38	250	19		2	EI 120 U/C
> 114.3 – ≤ 159.0			25–38	250	19		2	EI 120 U/C
> 159.0 – ≤ 219.1			25–38	600	38		2	EI 120 U/C

System Flammotect Easy Seal

Floor								
Pipe outer Ø [mm]	Pipe wall thickness [mm]	FEF section insulation		FEF protective insulation		Fire protection wrap NBR-plus		Fire resistance class
		Length L [mm]	Thickness S [mm]	Length L ₁ [mm]	Thickness S ₁ [mm]	Number of wraps [n]	Number of layers [n]	
Copper, steel, stainless steel, cast iron								
≤ 42.0	0.6–14.2	CS	9–40	–	–	1 × 125 mm or 2 × 62.5 mm	2	EI 90 U/C
			10	–	–		1	EI 90 U/C
> 42.0 – ≤ 60.0			13–40	–	–		2	EI 90 U/C
≤ 60.0			13–40	–	–		2	EI 120 U/C
> 60.0 – ≤ 88.9			19–38	–	–		2	EI 90 U/C
			25	–	–		2	EI 120 U/C
Steel, stainless steel, cast iron								
≤ 159.0	0.6–14.2	CS	25–38	250	25	1 × 125 mm or 2 × 62.5 mm	2	EI 90 U/C
> 159.0 – ≤ 219.1				250	38		2	EI 90 U/C

System Flammotect Easy Seal

7.5 HVAC split line combinations



For building element and seal thicknesses see page 6. For design variants see page 10.

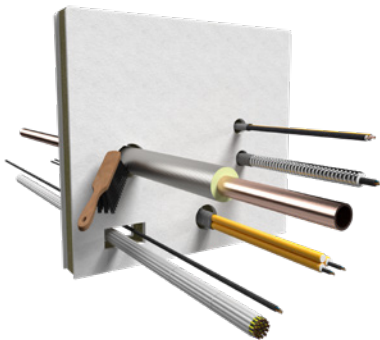
All specifications in mm

Configuration	Fire protection wrap NBR-plus		Fire resistance class	
	Number of wraps [n]	Number of layers [n]	Wall	Floor
Copper pipe $\leq 2 \times \text{Ø } 18 \text{ mm}$, + 9 mm PE foam, + 1 pipe PVC-U/PVC-C $\text{Ø} \leq 25.0 \times 1.5 \text{ mm}$, + $\leq 3 \times$ cables $\text{Ø} \leq 14.0 \text{ mm}$	1 x 125 mm or 2 x 62.5 mm	2	EI 120	EI 120

System Flammotect Easy Seal

8. Installation steps

1. Clean the aperture edge and the installations.
If necessary, wrap the services with NBR-plus.



2. Fill the openings with tightly mineral wool and seal them with FLAMMOTECT-A.



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

