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Authorised and notified according
to Article 29 of the Regulation (EU)
No 305/2011 of the European
Parliament and of the Council of 9
March 2011

MEMBER OF EOTA



European Technical Assessment ETA-22/0052 of 2022/03/27

I General Part

Technical Assessment Body issuing the ETA and designated according to Article 29 of the Regulation (EU) No 305/2011: ETA-Danmark A/S

Trade name of the
construction product:

"PYRO-SAFE FLAMMOTECT-A"

Product family to which the
above construction product
belongs:

Ablative fire stopping product used in penetration seals

Manufacturer:

svt Brandschutz Vertriebsgesellschaft mbH International
Glüsinger Straße 86
DE- 21217 Seevetal
Telephone: +49 4105 40900
www.svt.de

Manufacturing plant:

Manufacturing Plant I and Plant LEI

This European Technical
Assessment contains:

63 pages including 56 annexes which form an integral
part of the document

This European Technical
Assessment is issued in
accordance with Regulation
(EU) No 305/2011, on the
basis of:

EAD 350454-00-1104:
Fire stopping and fire sealing products - Penetration
seals

This version replaces:

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II SPECIFIC PART OF THE EUROPEAN TECHNICAL ASSESSMENT

1 Technical description of product

The construction product "PYRO-SAFE FLAMMOTECT-A" is an ablative coating material. It is delivered as a filler of white or grey colour and form on the surfaces to be protected layers which, when exposed to fire, consume energy or release matter through chemical or physical processes. In the process, they remain sufficiently stable and prevent the passage of heat, flame and/or smoke.

Detailed specifications for identification and performance criteria relevant for fire safety with regard to the construction products are given in Annex 1.

NOTE:

The characteristics listed can serve both for identifying the construction products as well as for performing the manufacturer's factory production control.

2 Specification of the intended use(s) in accordance with the applicable European Assessment Document (hereinafter EAD)

The construction products "PYRO-SAFE FLAMMOTECT-A" is intended for use as components with a fire protection effect in building elements, assembled systems or constructions that are subject to requirements related to fire protection. Their reactive effect prevents heat transmission and fire spreading in the event of fire.

Within the scope of this ETA, the fire resistance was demonstrated for mixed or cable penetration seals which consisted of the components listed in table 1. Mixed or cable penetration seals are used to seal off openings in fire resistant walls or floors, which are penetrated by cables and/or pipes, and serves to preserve the walls' or floors' fire resistance in the area of the penetrations.

Product type	Trade name
Ablative coating	PYRO-SAFE FLAMMOTECT-A
Mineral fibreboards	Hardrock 040
Mineral fibre mats	KLIMAROCK
Mineral fibre pipe shells	ProRox PS 960
Intumescent material, mat	PYRO-SAFE DG-CR
Mineral wool, loose stone wool	ProRox LF 970

Table 1 – components of the verified penetration seals

Detailed information and data on the verified penetration seals are given in Annexes 2 to 33. The performances given in Section 3 exclusively relate to this penetration seals (e.g. with respect to the design and arrangement of the components of the penetration seals and the type and position of the services).

The provisions made in this European Technical Assessment are based on an assumed working life of the "PYRO-SAFE FLAMMOTECT-A" of at least 10 years, provided that the installation systems products are subject to appropriate installation.

The indications given on the working life cannot be interpreted as a guarantee given by the manufacturer or the Assessment Body but are to be regarded only as a means for choosing the right products in relation to the expected economically reasonable working life of the works.

3 Performance of the product and references to the methods used for its assessment.

Characteristic	Assessment of characteristic
3.2 Safety in case of fire (BWR 2)	
Reaction to fire	The product classified as Euroclass E in accordance with EN 13501-1 and delegated regulation 2016/364.
Resistance to fire	
Sealing of cables and combustible pipes with mineral wool and ablative coating in walls and floors, see annexes 1 – 56 for details	Fire resistance class EI 30 -EI240 in accordance with EN 13501-2
3.3 Hygiene, health and the environment (BWR 3)	
Air permeability	No performance assessed
Water permeability	No performance assessed
Content, emission and/or release of dangerous substances*	No dangerous substances
3.4 Safety and accessibility in use (BWR 4)	
Mechanical resistance and stability	No performance assessed
Resistance to impact/movement	No performance assessed
Adhesion	No performance assessed
Durability	Use category X
3.5 Protection against noise (BWR 5)	
Airborne sound insulation	No performance assessed
3.6 Energy economy and heat retention (BWR 6)	
Thermal properties	No performance assessed
Water vapour permeability	No performance assessed

*) In addition to the specific clauses relating to dangerous substances contained in this European technical approval, there may be other requirements applicable to the products falling within its scope (e.g., transposed European legislation and national laws, regulations and administrative provisions). In order to meet the provisions of the Construction Product Directive, these requirements need also to be complied with, when and where they apply.

3.8 Methods of verification

The assessment of the performance of "PYRO-SAFE FLAMMOTECT-A" is in relation to the applicable BWR's has been made in accordance with the European Assessment Document (EAD) no. EAD 350454-00-1104: Fire stopping and fire sealing products - Penetration seals.

3.9 General aspects related to the fitness for use of the product.

The verification of durability is part of testing the essential characteristics. The ablative coating "PYRO-SAFE FLAMMOTECT-A" may be used in end-use applications according to the provisions for use category X (external use) without expecting significant changes of the characteristics relevant for

fire protection. Products that meet requirements for type X, meet the requirement for all other types.

If the ablative coating according to this ETA is to be exposed to specific stresses, further tests are necessary.

The European Technical Assessment is issued for the product based on agreed data/information, deposited with ETA-Danmark, which identifies the product that has been assessed and judged. Changes to the product or production process, which could result in this deposited data/information being incorrect, should be notified to ETA-Danmark before the changes are introduced. ETA-Danmark will decide if such changes affect the ETA and consequently the validity of the CE marking based on the ETA and if so whether further assessment or alterations to the ETA, shall be necessary.

The "PYRO-SAFE FLAMMOTECT-A" is manufactured in accordance with the provisions of this European Technical Assessment using the manufacturing processes as identified in the inspection of the plant by the notified inspection body and laid down in the technical documentation.

4 Assessment and verification of constancy of performance (hereinafter AVCP) system applied, with reference to its legal base.

4.1 AVCP system

According to the decision 1999/454/EC as amended by 2001/596/EC, the system(s) of assessment and verification of constancy of performance (see Annex III to Regulation (EU) No 305/2011) is **1**.

5 Technical details necessary for the implementation of the AVCP system, as foreseen in the applicable EAD.

Technical details necessary for the implementation of the AVCP system are laid down in the control plan deposited at ETA-Danmark prior to CE marking.

Issued in Copenhagen on 2022-03-37 by



Thomas Bruun
Managing Director, ETA-Danmark

Properties and Performance of components of the construction product "PYRO-SAFE FLAMMOTECT-A"

	Properties	Parameter	Test method
1	Density	1410 g/l \pm 70 g/l	EN ISO 2811-1
2	Nonvolatile components	66,0 % to 86,0%	EN ISO 3251
3	Weight loss due heating	38,0 % to 48,0 %	EN ISO 3451-1/EOTA TR 24 (2009) on 400°C for 30 Minutes
4	LOI	55,0 % \pm 3 %	ISO 4589 Sample thickness appr. 1,5 mm
5	Coating flexibility	\geq 5 mm	EN ISO 1519 Sample thickness appr. 1,5 mm
6	Fire behavior	Class E	EN ISO 11925-2

The properties listed can be used both for identifying the construction products as well as for the implementation of the factory production control by the manufacturer.

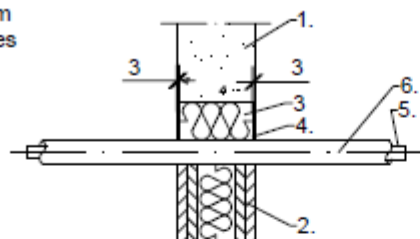
Implementation details for the factory production control are included in the protocol.

Description of additional tested components of the penetration seal

Description / Manufacturer	Description
"PYRO-SAFE DG-CR" svt Brandschutz Vertriebsgesellschaft mbH International 21217 Seevetal GERMANY	intumescent material in mat form in accordance with ETA-16/0268: Class of Fire behavior in accordance with DIN EN 13501-1: Class E
"Hardrock 040" ("Hardrock II") Deutsche Rockwool Mineralwoll GmbH 45966 Gladbeck GERMANY	mineral fibre board in accordance with DIN EN 13162 thickness \geq 50 mm density 150 kg/m ³ Class of Fire behavior in accordance with EN 13501-1: Class A1
"ProRox PS 960" (RS 880) Deutsche Rockwool Mineralwoll GmbH 45966 Gladbeck GERMANY	pipe shell of concentrically wrapped rockwool – unbacked in accordance with EN 14303 density: 100 kg/m ³ - 120 kg/m ³ Class of Fire behavior in accordance with EN 13501-1: Class A1 _L
"Klimarock" Deutsche Rockwool Mineralwoll GmbH 45966 Gladbeck GERMANY	rockwool with grid strengthened and aluminium foil according to DoP No. RWDOPBNL-0628-07-13-01 density: 40 kg/m ³ - 50 kg/m ³ Class of Fire behavior in accordance with EN 13501-1: Class A2 _L - s1,d0; thickness: 30 mm
"ProRox LF 970" Deutsche Rockwool Mineralwoll GmbH 45966 Gladbeck GERMANY	mineral wool , loose, in accordance with EN 14303 density: 100 kg/m ³ Class of Fire behavior in accordance with EN 13501-1: Class A1

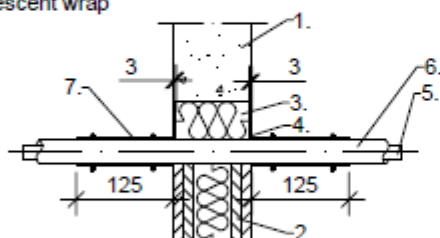
PYRO-SAFE FLAMMOTECT-A	Annex 1
Description of the construction products, properties and performances	

Metal conduits $\varnothing \leq 16$ mm - $\varnothing \leq 32$ mm, rigid, with or without cables ≤ 14 mm or $\varnothing 32$ mm - ≤ 50 mm with or without cables $\varnothing \leq 21$ mm
 - no measures

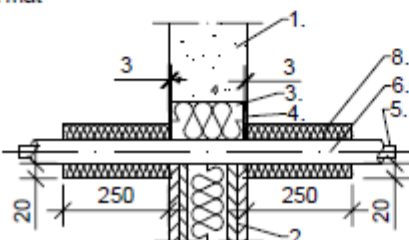


1. rigid wall ≥ 100 mm thickness
2. flexible wall ≥ 100 mm thickness
3. loose mineral wool
4. ablative filler ≥ 3 mm
5. cable
6. Electric installation conduits
7. intumescent wrap
8. Lamella mat Klimarock

Metal conduits $\varnothing \leq 16$ mm, rigid, with or without cables ≤ 14 mm or $\varnothing 32$ mm - ≤ 50 mm with or without cables $\varnothing \leq 21$ mm
 - with intumescent wrap



Metal conduits $\varnothing \leq 32$ mm, rigid, with or without cables ≤ 14 mm or $\varnothing 32$ mm - ≤ 50 mm with or without cables $\varnothing \leq 21$ mm
 - with lamella mat



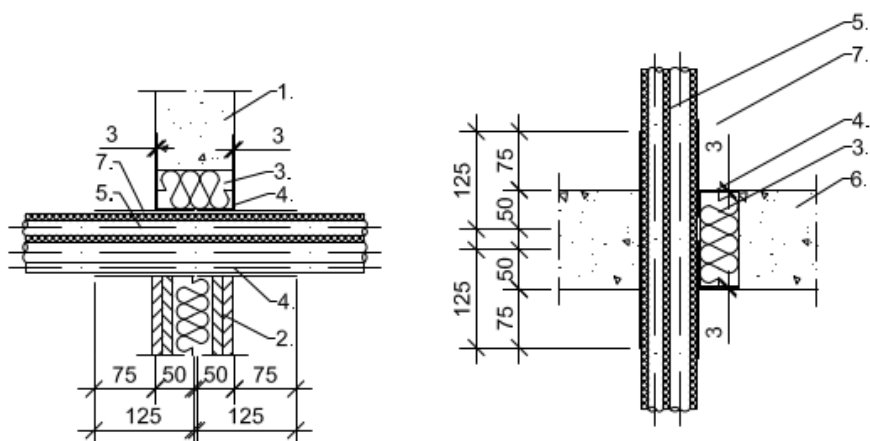
Service		Cable	Measure	Fire resistance class Wall
Electrical installation conduits (EIC)				
EIC made of metal	$\varnothing \leq 16$	with/ without ≤ 14	-	EI 120 C/U
	$\varnothing > 16 - \leq 32$	with/ without ≤ 14	-	EI 30 / E 120 C/U
	$\varnothing > 32 - \leq 50$	with/ without ≤ 21	-	EI 30 / E 120 C/U
	$\varnothing \leq 16$	with/ without ≤ 14	intumescent wrap 2 x 2 layers	EI 120
	$\varnothing > 16 - \leq 32$	with/ without ≤ 14	intumescent wrap 2 x 2 layers	EI 120
	$\varnothing > 32 - \leq 50$	with/ without ≤ 21	intumescent wrap 2 x 2 layers	EI 120
	$\varnothing \leq 32$	with/ without ≤ 14	Lamella mat Klimarock	EI 120
	$\varnothing > 32 - \leq 50$	with/ without ≤ 21	Lamella mat Klimarock	EI 120

1. rigid wall ≥ 100 mm thickness
2. flexible wall ≥ 100 mm thickness
3. loose mineral wool
4. ablative filler ≥ 3 mm
5. cable
6. Electric installation conduits
7. intumescent wrap
8. Lamella mat Klimarock

dimensions in mm

PYRO-SAFE FLAMMOTECT-A	Annex 3
Sealing of cables and combustible pipes with mineral wool and ablative coating in walls	

- HVAC- split line combinations



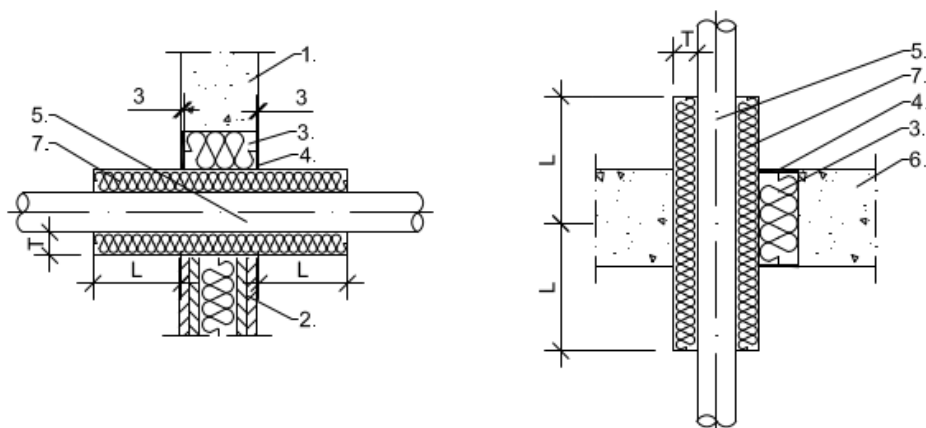
Service	Measure	Fire resistance class	
		Wall	Floor
HVAC split line combinations			
Double pipe (6-10/ 10-18 mm) or single copper pipe (6-18 mm) + PVC-U pipe ≤ Ø 25 mm + 2 accompanying cables ≤ 21 mm	intumescent wrap 2 x 1 layers	EI 90 U/U	-
Double pipe (6/10 mm) or single copper pipe (6-10 mm) pipe wall thickness 1 mm + pipe insulation of 9 mm thickness made of PEF	intumescent wrap 2 x 2 layer	-	EI 90 U/U
Double pipe (10/18 mm) or single copper pipe (10-18 mm) pipe wall thickness 1 mm + pipe insulation of 9 mm thickness made of PEF	intumescent wrap 2 x 2 layer	-	EI 30 / E 90 U/U

1. rigid wall ≥ 100 mm thickness
2. flexible wall ≥ 100 mm thickness
3. loose mineral wool
4. ablative filler ≥ 3 mm
5. HVAC split line combination
6. rigid floor ≥ 150 mm thickness
7. Intumescent wrap

dimensions in mm

PYRO-SAFE FLAMMOTECT-A	Annex 4
Sealing of cables and combustible pipes with mineral wool and ablative coating in walls and floors	

Non-combustible pipes of copper, steel, stainless steel or cast iron with non-combustible insulation made of mineral fibre lamella mat



Service	Measure [L X T]	Fire resistance class	
		Wall	Floor
Non-combustible pipes made of copper, steel, stainless steel or cast iron with non-combustible insulation made of mineral fibre lamella mat			
Pipe outer- $\varnothing \leq 15$ mm, wall thickness $\geq 0,8$ mm	≥ 250 mm x ≥ 20 mm	EI 60 / E90 C/U	EI 60 C/U
Pipe outer- $\varnothing \leq 22$ mm, wall thickness ≥ 1 mm	≥ 250 mm x ≥ 60 mm	EI 60 / E90 C/U	EI 60 C/U
Pipe outer- $\varnothing \leq 22$ mm, wall thickness ≥ 1 mm	≥ 500 mm x ≥ 20 mm	EI 60 / E90 C/U	EI 60 C/U
Pipe outer- $\varnothing \leq 54$ mm, wall thickness $\geq 1,5$ mm	≥ 500 mm x ≥ 30 mm	EI 60 / E90 C/U	EI 60 C/U
Pipe outer- $\varnothing \leq 88,9$ mm, wall thickness ≥ 2 mm	≥ 800 mm x ≥ 40 mm	EI 60 / E90 C/U	EI 60 C/U
Non-combustible pipes made of steel, stainless steel or cast iron with non-combustible insulation made of mineral fibre lamella mat			
Pipe outer- $\varnothing \leq 88,9$ mm, wall thickness ≥ 2 mm	≥ 800 mm x ≥ 40 mm	EI 90 C/U	EI 60 C/U
Pipe outer- $\varnothing \leq 114,3$ mm, wall thickness $\geq 03,6$ mm	≥ 500 mm x ≥ 40 mm	EI 60 / E 90 C/U	EI 60 C/U
Pipe outer- $\varnothing \leq 170$ mm, wall thickness ≥ 3 mm	≥ 800 mm x ≥ 60 mm + ≥ 500 mm x ≥ 30 mm*	EI 60 C/U	EI 60 C/U
Pipe outer- $\varnothing \leq 219,1$ mm, wall thickness ≥ 5 mm	≥ 800 mm x ≥ 60 mm + ≥ 500 mm x ≥ 30 mm*	EI 60 / E 90 C/U	EI 60 C/U

* additional protective insulation

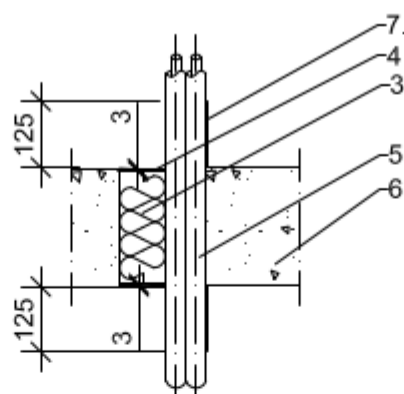
1. rigid wall ≥ 100 mm thickness
2. flexible wall ≥ 100 mm thickness
3. loose mineral wool
4. ablative filler ≥ 3 mm
5. non-combustible pipe
6. rigid floor ≥ 150 mm thickness
7. mineral fibre mat

dimensions in mm

PYRO-SAFE FLAMMOTECT-A	Annex 5
Sealing of cables and combustible pipes with mineral wool and ablative coating in walls and floors	

Solar pipes Nano SUN² (installation only in floors)

- with intumescent wrap



Service	Measure	Fire resistance class
		Floor
NanoSUN ² - double solar pipes		
DN 16	intumescent wrap 2 x 1 layer	EI 90 U/U
DN 40	intumescent wrap 2 x 1 layer	EI 30 / E 90 U/U

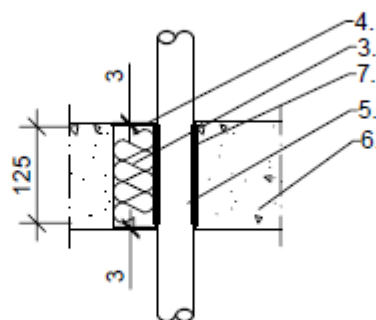
- 3. loose mineral wool
- 4. ablative filler ≥ 3 mm
- 5. solar pipes
- 6. rigid floor ≥ 150 mm thickness
- 7. Intumescent wrap

dimensions in mm

PYRO-SAFE FLAMMOTECT-A"	Annex 6
Sealing of cables and combustible pipes with mineral wool and ablative coating in floors	

Combustible pipes (installation only in floors)

- with intumescent wrap



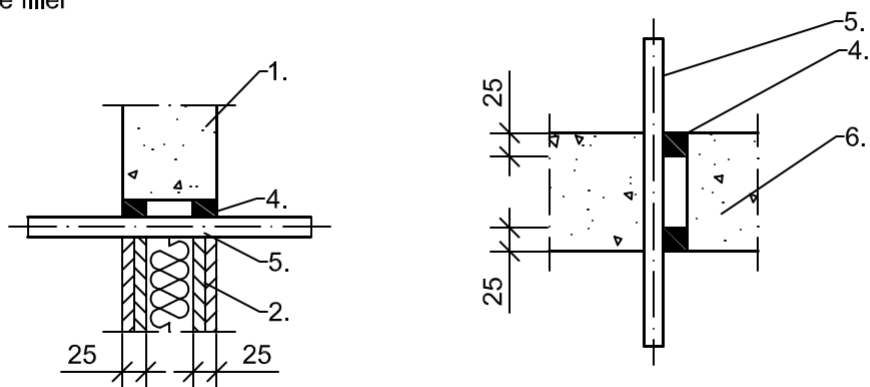
Service	Measure	Fire resistance
		class Floor
Combustible pipes		
PVC-U outer-Ø ≤ 32 mm	intumescent wrap 1 x 1 layer	EI 90 U/U

3. loose mineral wool
4. ablative filler ≥ 3 mm
5. combustible pipe
6. rigid floor ≥ 150 mm thickness
7. intumescent wrap

dimensions in mm

PYRO-SAFE FLAMMOTECT-A	Annex 7
Sealing of cables and combustible pipes with mineral wool and ablative coating in floors	

- Cables $\varnothing \leq 21$ mm in round openings without mineral wool
- ablative filler



Service	Measure	Fire resistance class	
		Wall	Floor
Cables, cable bundles			
Cables Ø ≤ 21 mm	ablative filler	EI 90	EI 90

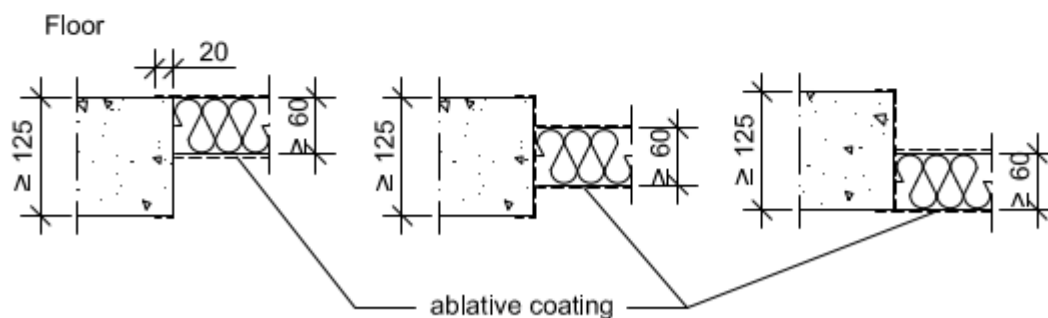
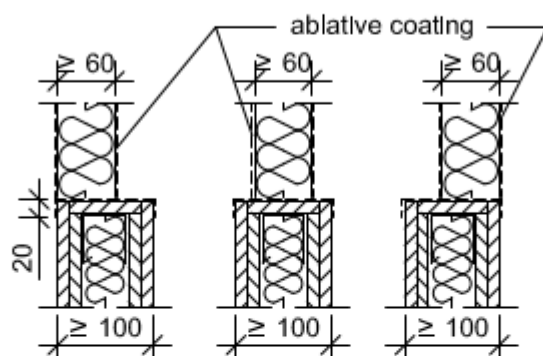
1. rigid wall ≥ 100 mm thickness
2. flexible wall ≥ 100 mm thickness
4. ablative filler ≥ 25 mm
5. cable
6. rigid floor ≥ 150 mm thickness

dimensions in mm

PYRO-SAFE FLAMMOTECT-A	Annex 8
Sealing of cables and combustible pipes with ablative filler in round openings in walls and floors	

Design variants

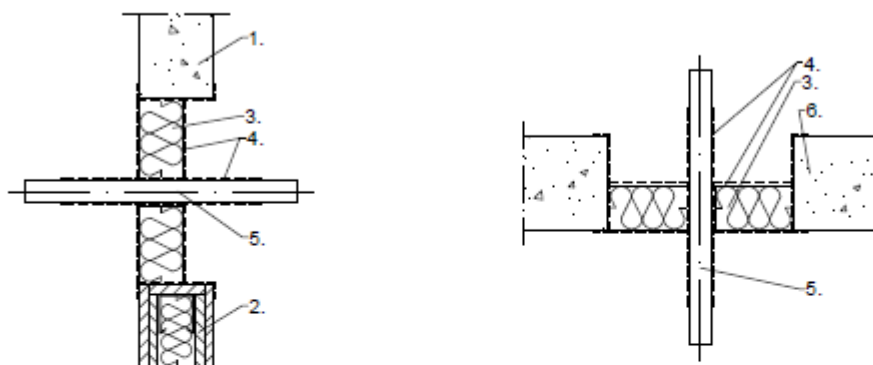
Wall



dimensions in mm

PYRO-SAFE FLAMMOTECT-A	Annex 9
Mixed penetration seal of one mineral fibre board (60 mm) and ablative coating in walls and floors - Design variants -	

Cables $\varnothing \leq 21$ mm up to $\leq \varnothing 80$ mm or cable bundles $\varnothing \leq 100$ mm with cables ≤ 21 mm
- with ablative coating



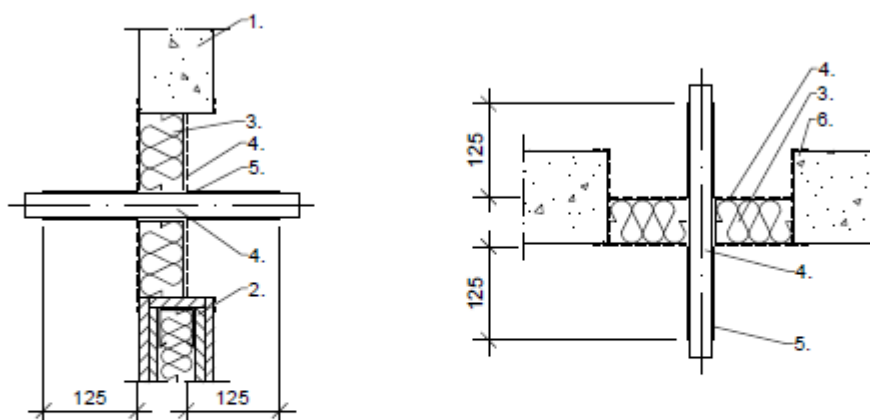
Service	Measure	Fire resistance class	
		Wall	Floor
Cables, cable bundles and cable trays			
Cables $\varnothing \leq 21$ mm without cable tray trough drill holes	ablative coating ≥ 100 mm x $\geq 0,75$ mm dry film thickness	-	EI 90
Cables $\varnothing \leq 21$ mm	ablative coating ≥ 100 mm x $\geq 0,75$ mm dry film thickness	EI 60 / E 90	EI 60 / E 90
Cables $\varnothing > 21$ mm to $\varnothing \leq 50$ mm	ablative coating ≥ 150 mm x ≥ 1 mm dry film thickness	EI 60 / E 90	EI 60 / E 90
Cables $\varnothing > 50$ mm to $\varnothing \leq 80$ mm	ablative coating ≥ 150 mm x ≥ 1 mm dry film thickness	EI 60 / E 90	EI 60 / E 90
Cable bundles $\varnothing \leq 100$ mm	ablative coating ≥ 100 mm x $\geq 0,75$ mm dry film thickness	EI 60 / E 90	EI 60 / E 90
Cable bundles $\varnothing \leq 100$ mm	ablative coating ≥ 150 mm x ≥ 1 mm dry film thickness	EI 90	EI 60

1. rigid wall ≥ 100 mm thickness
2. flexible wall 100 mm thickness
3. mineral fibre board
4. ablative coating
5. cable
6. rigid floor ≥ 125 mm thickness

dimensions in mm

PYRO-SAFE FLAMMOTECT-A	Annex 10
Mixed penetration seal of one mineral fibre board (60 mm) and ablative coating in walls and floors	

Cables $\varnothing \leq 21$ mm up to $\leq \varnothing 80$ mm or cable bundles $\varnothing \leq 100$ mm with cables ≤ 21 mm
- with intumescent wrap



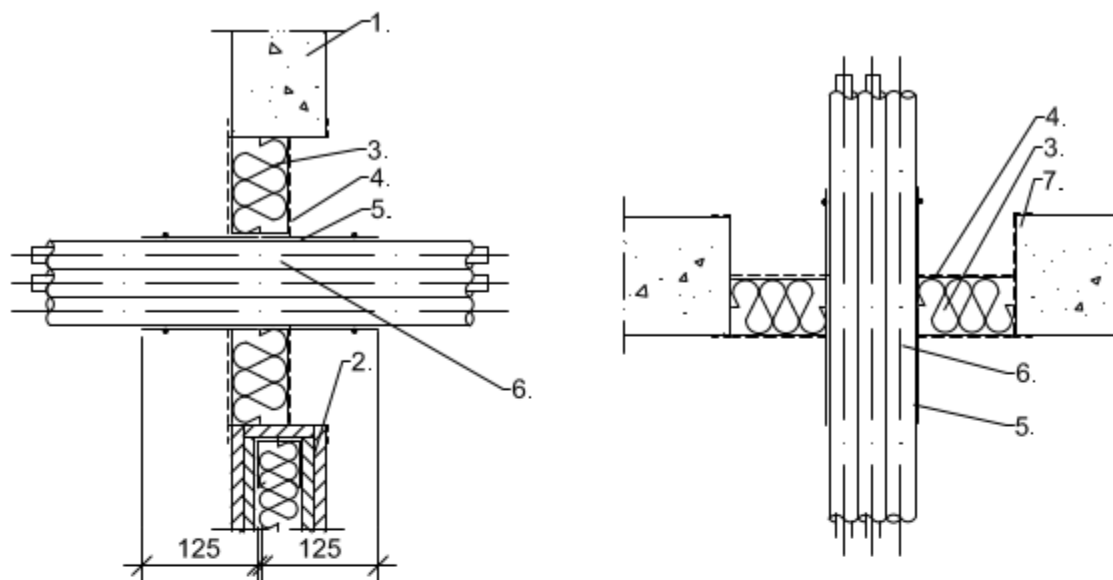
Service	Measure	Fire resistance class	
		Wall	Floor
Cables, cable bundles and cable trays			
Cables $\varnothing \leq 21$ mm without cable tray trough drill holes	intuescent wrap 2 x 1 layer, ≥ 45 mm overlapping	EI 90	EI 90
Cables $\varnothing \leq 21$ mm	intuescent wrap 2 x 1 layer, ≥ 45 mm overlapping	EI 60 / E 90	EI 60 / E 90
Cables $\varnothing > 21$ mm to $\varnothing \leq 50$ mm	intuescent wrap 2 x 1 layer, ≥ 45 mm overlapping	EI 60 / E 90	EI 60 / E 90
Cables $\varnothing > 50$ mm to $\varnothing \leq 80$ mm	intuescent wrap 2 x 1 layer, ≥ 45 mm overlapping	EI 60 / E 90	EI 60 / E 90
Cable bundles $\varnothing \leq 100$ mm	intuescent wrap 2 x 1 layer, ≥ 45 mm overlapping	EI 60 / E 90	EI 60 / E 90

1. rigid wall ≥ 100 mm thickness
2. flexible wall 100 mm thickness
3. mineral fibre board
4. ablative coating
5. intumescent wrap
6. cable
7. rigid floor ≥ 125 mm thickness

dimensions in mm

PYRO-SAFE FLAMMOTECT-A	Annex 11
Mixed penetration seal of one mineral fibre board (60 mm) and ablative coating in walls and floors	

Plastic conduits $\varnothing \leq 32$ mm or bundles $\varnothing \leq 100$ mm of conduits $\varnothing \leq 32$ mm with or without cables ≤ 21 mm
 - with intumescent wrap



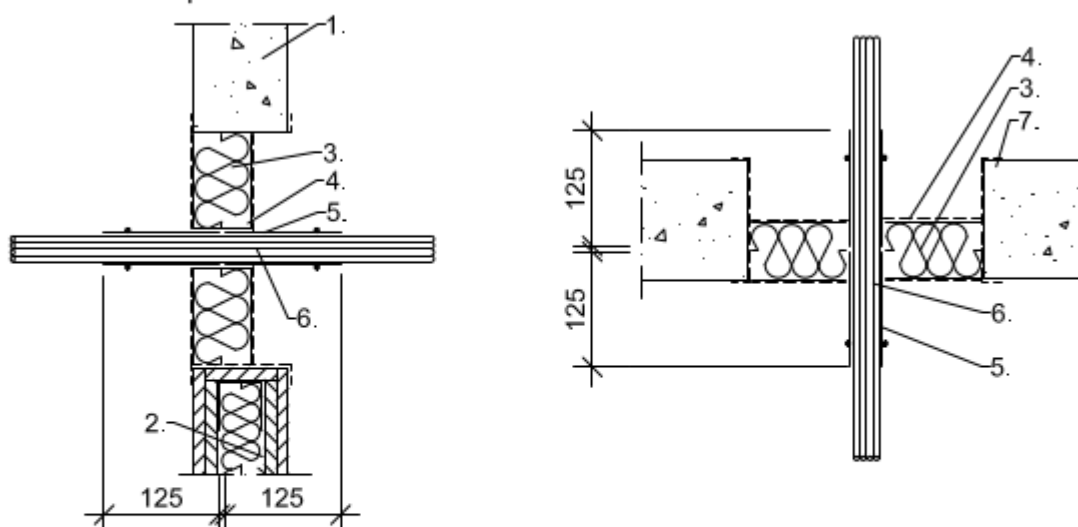
Service	cable	Measure	Fire resistance class	
			Wall	Floor
Electrical installation conduit (EIP)				
EIP made of plastics Ø ≤ 32 mm single or bundled up to Ø ≤ 100 mm	with/ without Ø ≤ 21 mm	intumescent wrap 2 x 2 layer,	EI 60 / E 90 U/U	EI 90 U/U

1. rigid wall ≥ 100 mm thickness
2. flexible wall 100 mm thickness
3. mineral fibre board
4. ablative coating
5. intumescent wrap
6. Electrical installation conduit
7. rigid floor ≥ 125 mm thickness

dimensions in mm

PYRO-SAFE FLAMMOTECT-A	Annex 12
Mixed penetration seal of one mineral fibre board (60 mm) and ablative coating in walls and floors	

speed-pipe , bundled or single pipes, with or without glass fibre or micro cables
- with intumescent wrap



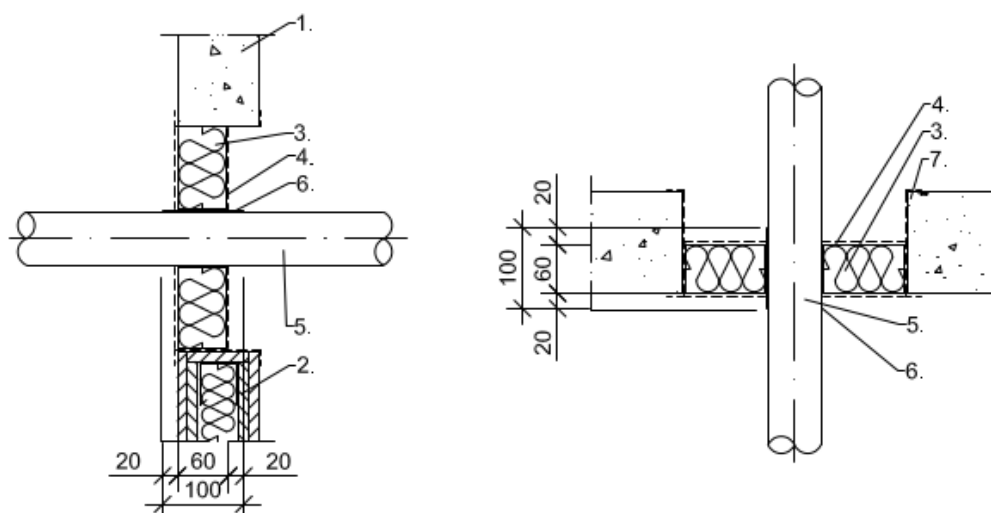
Service	Measure	Fire ressistance class	
		Wall	Floor
Speed pipes, bundles or single pipes, with or w/o glass fibre or micro cables			
max. 24 pcs. outside pipe- $\varnothing \leq 7$ mm	intumescent wrap 2 x 1 layer	EI 60 / E 90 U/U	EI 60 U/U
max. 7 pcs. outside pipe- $\varnothing \leq 10$ mm	intumescent wrap 2 x 1 layer	EI 60 / E 90 U/U	EI 60 U/U
max. 5 pcs. outside pipe- $\varnothing \leq 12$ mm	intumescent wrap 2 x 1 layer	EI 60 / E 90 U/U	EI 60 U/U

1. rigid wall ≥ 100 mm thickness
2. flexible wall 100 mm thickness
3. mineral fibre board
4. ablative coating
5. Intumescent wrap
6. Speed pipe
7. rigid floor ≥ 125 mm thickness

dimensions in mm

PYRO-SAFE FLAMMOTECT-A	Annex 13
Mixed penetration seal of one mineral fibre board (60 mm) and ablative coating in walls and floors	

Combustible pipes $\varnothing \leq 50 \text{ mm}$ - $\varnothing \leq 110 \text{ mm}$
 - with intumescent wrap coated on both sides



Service	Measure	Fire resistance class	
		Wall	Floor
Combustible pipes made of PVC-U, PVC-C in accordance with EN ISO 15493, EN ISO 1452			
Outside pipe- $\varnothing \leq 50$ mm	intumescent wrap 1 x 1 layer	EI 90 U/U	EI 90 U/U
Outside pipe- $\varnothing \leq 70$ mm	intumescent wrap 1 x 2 layer	EI 60 / E 90 U/U	EI 45 / E 90 U/U
Outside pipe- $\varnothing \leq 90$ mm	intumescent wrap 1 x 3 layer	EI 60 / E 90 U/U	EI 45 / E 90 U/U
Outside pipe- $\varnothing \leq 110$ mm	intumescent wrap 1 x 4 layer	EI 60 / E 90 U/U	EI 45 / E 90 U/U
Combustible pipes made of PE 100			
Outside pipe- $\varnothing \leq 50$ mm	intumescent wrap 1 x 1 layer	EI 90 U/U	EI 90 U/U
Outside pipe- $\varnothing \leq 70$ mm	intumescent wrap 1 x 2 layer	EI 60 / E 90 U/U	EI 60 / E 90 U/U
Outside pipe- $\varnothing \leq 90$ mm	intumescent wrap 1 x 3 layer	EI 60 / E 90 U/U	EI 60 / E 90 U/U
Outside pipe- $\varnothing \leq 110$ mm	intumescent wrap 1 x 4 layer	EI 60 / E 90 U/U	EI 60 / E 90 U/U
Combustible pipes made of PP-H			
Outside pipe- $\varnothing \leq 50$ mm	intumescent wrap 1 x 1 layer	EI 90 U/U	EI 90 U/U
Outside pipe- $\varnothing \leq 70$ mm	intumescent wrap 1 x 2 layer	EI 60 / E 90 U/U	EI 90 U/U
Outside pipe- $\varnothing \leq 90$ mm	intumescent wrap 1 x 3 layer	EI 60 / E 90 U/U	EI 90 U/U
Outside pipe- $\varnothing \leq 110$ mm	intumescent wrap 1 x 4 layer	EI 60 / E 90 U/U	EI 90 U/U

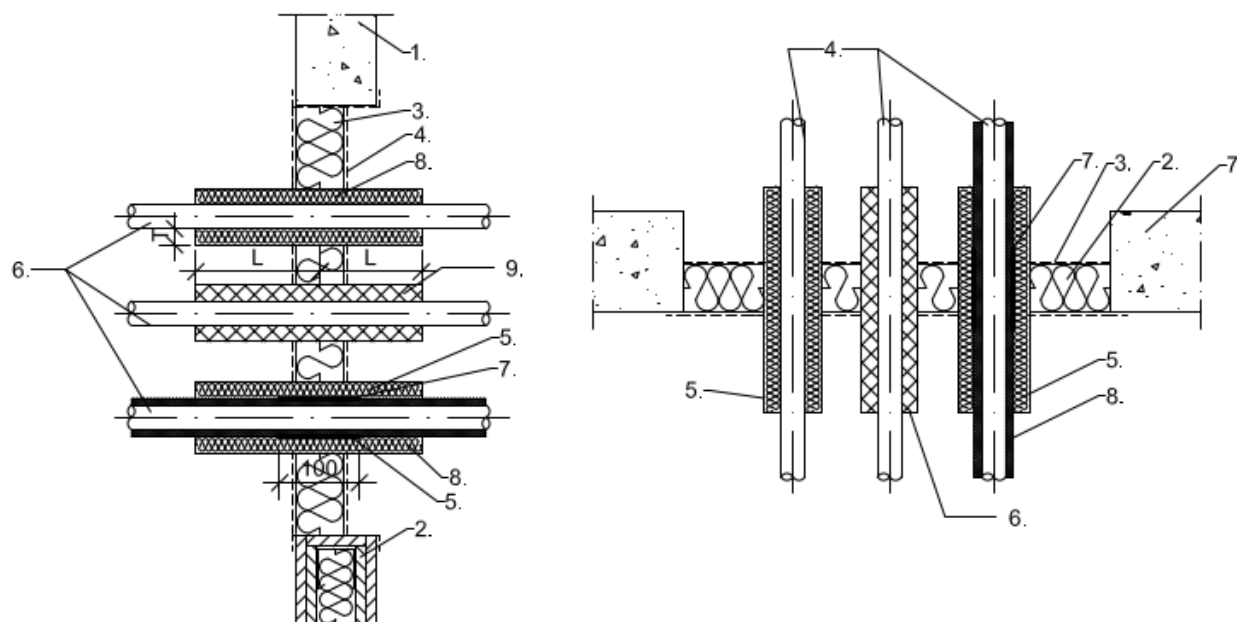
1. rigid wall $\geq 100 \text{ mm}$ thickness
2. flexible wall 100 mm thickness
3. mineral fibre board
4. ablative coating
5. intumescent wrap
6. Combustible pipe
7. rigid floor $\geq 125 \text{ mm}$ thickness

dimensions in mm

PYRO-SAFE FLAMMOTECT-A	Annex 14
Mixed penetration seal of one mineral fibre board (60 mm) and ablative coating in walls and floors	

Multi-layer composite pipes,

- protective insulation of lamella mat or FEF



Service	Measure	Fire resistance class	
		Wall	Floor
Multilayer composite pipes HENCO-pipes			
Outside pipe-Ø ≤ 12 mm, wall thickness ≥1,6 mm	lamella mat [L X T] ≥ 250 mm x ≥ 20 mm	EI 30 U/C	EI 90 U/C
Outside pipe-Ø ≤ 32 mm, wall thickness ≥ 3 mm	lamella mat [L X T] ≥ 250 mm x ≥ 20 mm	EI 30 U/C	EI 90 U/C
Outside pipe-Ø ≤ 63 mm, wall thickness ≥ 4,5 mm	lamella mat [L X T] ≥ 250 mm x ≥ 30 mm	EI 30 U/C	EI 90 U/C
Outside pipe-Ø ≤ 12 mm, wall thickness ≥ 1,6 mm	FEF Armaflex Protect [L X T] ≥ 240 mm x ≥ 13 mm	EI 30 U/C	EI 90 U/C
Outside pipe-Ø ≤ 32 mm, wall thickness ≥ 3 mm	FEF Armaflex Protect [L X T] ≥ 240 mm x ≥ 13 mm	EI 90 U/C	EI 90 U/C
Outside pipe-Ø ≤ 63 mm, wall thickness ≥ 4,5 mm	FEF Armaflex Protect [L X T] ≥ 240 mm x ≥ 26 (2 x 13) mm	EI 30 U/C	EI 90 U/C
Multilayer composite pipes HENCO-pipes, pre-insulated with PE-foam			
Outside pipe-Ø ≤ 12 mm, wall thickness ≥1,6 mm	intumescent wrap 1 x 1 layer, ≥ 25 mm overlapping + lamella mat ≥250 mm x ≥ 20 mm	EI 90 U/U	EI 90 U/U
Outside pipe-Ø ≤ 32 mm, wall thickness ≥ 3 mm	intumescent wrap 1 x 1 layer, ≥ 25 mm overlapping + lamella mat ≥250 mm x ≥ 20 mm	EI 60 / E 90 U/U	dimensions in mm EI 90 U/U
Outside pipe-Ø ≤ 63 mm, wall thickness ≥ 4,5 mm	intumescent wrap 1 x 1 layer, ≥ 25 mm overlapping + lamella mat ≥250 mm x ≥ 20 mm	EI 60 / E 90 U/U	EI 90 U/U
Uponor MLC pipe white S Outside pipe-Ø 110 mm, wall thickness=10 mm	lamella mat ≥ 250 mm x ≥ 20 mm	-	EI 60 / E 90 U/C
	Armaflex Protect ≥ 240 mm x ≥ 26 mm	-	EI 60 U/C

1. rigid wall ≥ 100 mm thickness
2. flexible wall 100 mm thickness
3. mineral fibre board
4. ablative coating

5. intumescent wrap
6. Multilayer composite pipe
7. rigid floor ≥ 125 mm thickness
8. lamella mat
9. FEF Insulation

dimensions in mm

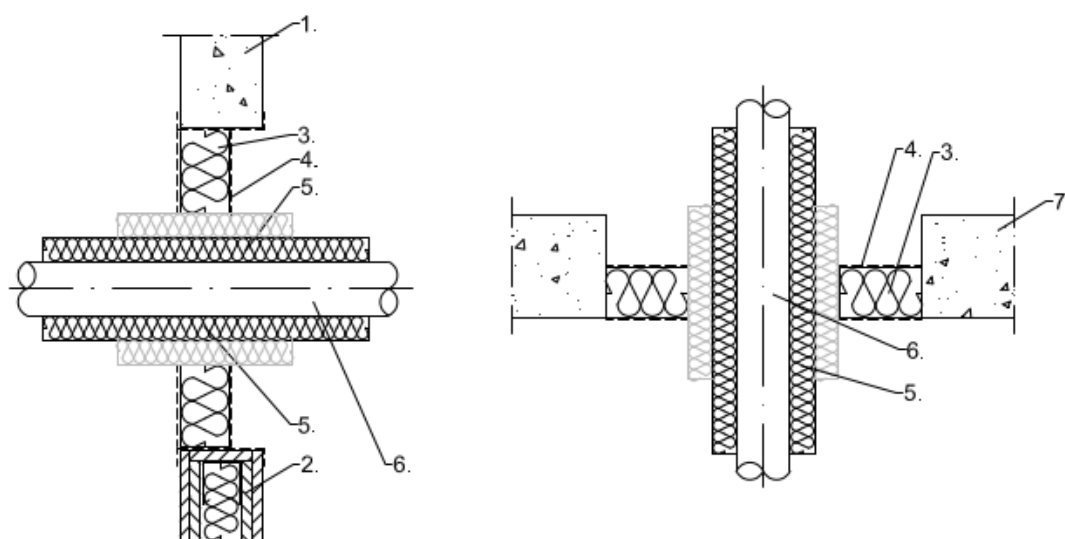
PYRO-SAFE FLAMMOTECT-A"

Mixed penetration seal of one mineral fibre board (60 mm) and ablative coating in walls and floors

Annex 15

Non-combustible pipes

- section insulation made of mineral-fibre lamella mat
- with protective insulation of lamella mat depending on pipe outer-Ø



Service	Measure [L X T]	Fire resistance class	
		Wall	Floor
Non-combustible pipes made of copper, steel, stainless steel or cast iron with non-combustible insulation made of mineral fibre lamella mat			
Pipe outer-Ø ≤ 15 mm, wall thickness ≥ 0,8 mm	≥ 250 mm x ≥ 20 mm	EI 60 / E90 C/U	EI 60 C/U
Pipe outer-Ø ≤ 22 mm, wall thickness ≥ 1 mm	≥ 250 mm x ≥ 60 mm	EI 60 / E90 C/U	EI 60 C/U
Pipe outer-Ø ≤ 22 mm, wall thickness ≥ 1 mm	≥ 500 mm x ≥ 20 mm	EI 60 / E90 C/U	EI 60 C/U
Pipe outer-Ø ≤ 54 mm, wall thickness ≥ 1,5 mm	≥ 500 mm x ≥ 30 mm	EI 60 / E90 C/U	EI 60 C/U
Pipe outer-Ø ≤ 88,9 mm, wall thickness ≥ 2 mm	≥ 800 mm x ≥ 40 mm	EI 60 / E90 C/U	EI 60 C/U
Non-combustible pipes made of steel, stainless steel or cast iron with non-combustible insulation made of mineral fibre lamella mat			
Pipe outer-Ø ≤ 88,9 mm, wall thickness ≥ 2 mm	≥ 800 mm x ≥ 40 mm	EI 90 C/U	EI 60 C/U
Pipe outer-Ø ≤ 114,3 mm, wall thickness ≥ 03,6mm	≥ 500 mm x ≥ 40 mm	EI 60 / E 90 C/U	EI 60 C/U
Pipe outer-Ø ≤ 170 mm, wall thickness ≥ 3 mm	≥ 800 mm x ≥ 60 mm + ≥ 500 mm x ≥ 30 mm*	EI 60 C/U	EI 60 C/U
Pipe outer-Ø ≤ 219,1 mm, wall thickness ≥ 5 mm	≥ 800 mm x ≥ 60 mm + ≥ 500 mm x ≥ 30 mm*	EI 60 / E 90 C/U	EI 60 C/U

1. rigid wall ≥ 100 mm thickness
2. flexible wall 100 mm thickness
3. mineral fibre board
4. ablative coating
5. lamella mat
6. Combustible pipe
7. rigid floor ≥ 125 mm thickness

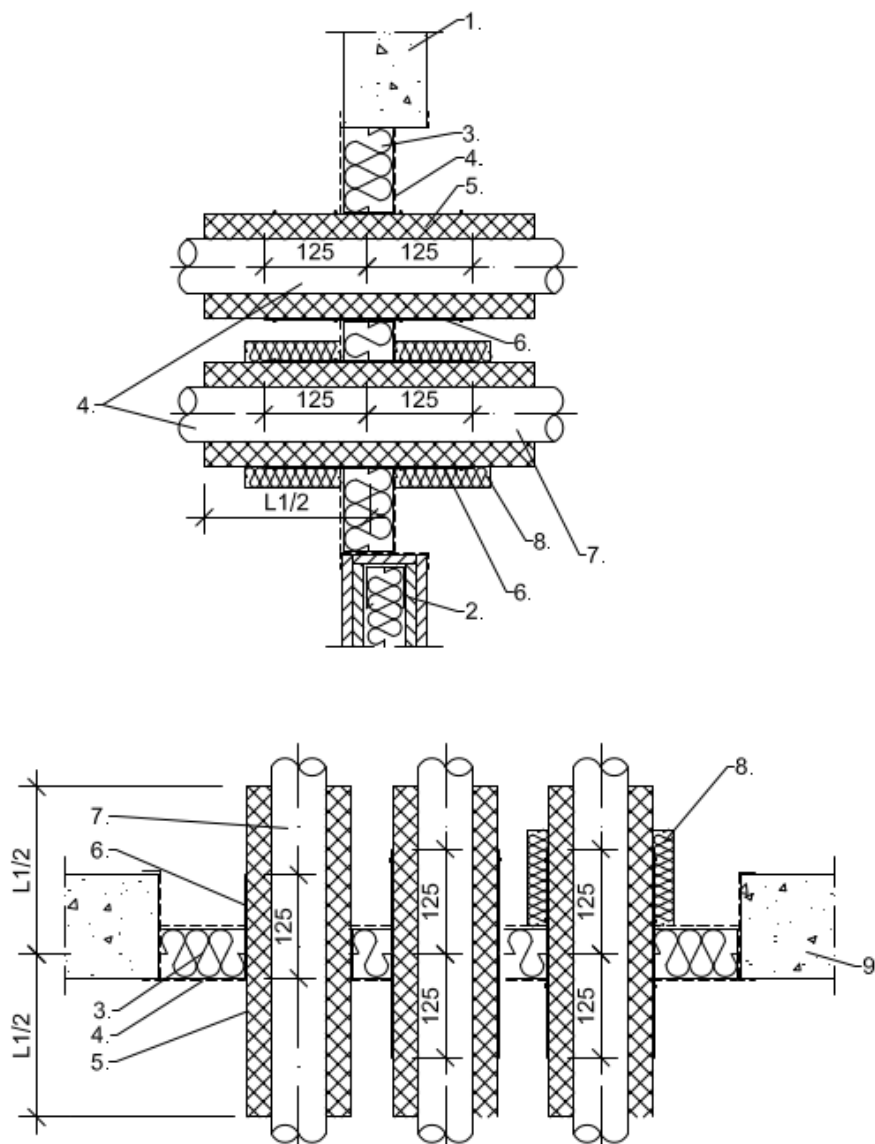
dimensions in mm

PYRO-SAFE FLAMMOTECT-A	Annex 16
Mixed penetration seal of one mineral fibre board (60 mm) and ablative coating in walls and floors	

Non-combustible pipes

7

- section insulation made of mineral-fibre lamella mat
- with protective insulation of lamella mat depending on pipe outer-Ø



1. rigid wall ≥ 100 mm thickness
2. flexible wall 100 mm thickness
3. mineral fibre board
4. ablative coating
5. FEF-insulation
6. intumescent wrap
7. Non-combustible pipe
8. rigid floor ≥ 125 mm thickness

dimensions in mm

PYRO-SAFE FLAMMOTECT-A	
Mixed penetration seal of one mineral fibre board (60 mm) and ablative coating in walls and floors	Annex 17

Service	Measure insulation L1/2 x T	Measure intumescent wrap	Fire resistance class	
			Wall	Floor
Non-combustible pipes made of copper, steel, stainless steel or cast iron with combustible insulation NH/Armaflex and Intumescent wrap				
Pipe outer-Ø ≤ 15 mm, wall thickness ≥ 0,8 mm	≥ 500 mm x13 - 24 mm	2 x 2 layer	EI 60 / E90 C/U	-
	≥ 500 mm x 25 mm	2 x 2 layer	EI 90 C/U	-
	≥ 500 mm x 13 - 19 mm	2 x 2 layer	-	EI 90 C/U
	≥ 500 mm x 19 -25 mm	1 x 2 layer	-	EI 60 / E 90 C/U
Pipe outer-Ø ≤ 28 mm, wall thickness ≥ 1mm	≥ 750 mm x 13 - 24 mm	2 x 2 layer	EI 60 / E 90 C/U	-
	≥ 750 mm x 25 mm	2 x 2 layer	EI 90 C/U	-
	≥ 750 mm x 13 - 19 mm	2 x 1 layer + lamella mat ≥ 250 x ≥ 20 mm	EI 90 C/U	-
	≥ 750 mm x 19 -25 mm	2 x 2 layer	-	EI 90 C/U
	≥ 750 mm x 25 mm	1 x 2 layer	-	EI 60 / E 90 C/U
Pipe outer-Ø ≤ 54 mm, wall thickness ≥ 1,5 mm	≥ 1000 mm x 29 - 57 mm	2 x 1 layer + lamella mat ≥ 500 x ≥ 30 mm	EI 90 C/U	-
	≥ 1000 mm x 28 -57 mm	1 x 1 layer + lamella mat ≥ 500 x ≥ 30 mm	-	EI 90 C/U
Pipe outer-Ø ≤ 88,9 mm, wall thickness ≥ 2,0 mm	≥ 1000 mm x 25 -89 mm	2 x2 layer + lamella mat ≥ 500 x ≥ 30 mm	EI 90 C/U	-
	≥ 1000 mm x 25 -88 mm	1 x 2 layer + lamella mat ≥ 500 x ≥ 40 mm	-	EI 90 C/U
	≥ 1000 mm x 89 mm	1 x 2 layer + lamella mat ≥ 500 x ≥ 30 mm	-	EI 90 C/U
Pipe outer-Ø ≤ 108 mm, wall thickness ≥ 2,5 mm	≥ 1000 mm x 57 mm	2 x 2 layer + lamella mat ≥ 750 x ≥ 40 mm	EI 90 C/U	-
	≥ 1000 mm x 57 mm	1 x 2 layer + lamella mat ≥ 1000 x ≥ 40 mm	-	EI 90 C/U
	≥ 1000 mm x 58 - 89 mm	1 x 2 layer + lamella mat ≥ 1000 x ≥ 40 mm	-	EI 60 C/U
Non-combustible pipes made of steel, stainless steel or cast iron with combustible insulation NH/Armaflex and intumescent wrap				
Pipe outer-Ø ≤ 108 mm, wall thickness ≥ 2,5 mm	≥ 1000 mm x 25 mm	2 x 2 layer + lamella mat ≥ 750 x ≥ 40 mm	EI 60 / E 90 C/U	-
	≥ 1000 mm x 25 mm	1 x 2 layer + lamella mat ≥ 1000 x ≥ 40 mm	-	EI 90 C/U
	≥ 1000 mm x 25 mm	1 x 2 layer + lamella mat ≥ 1000 x ≥ 40 mm	-	EI 60 C/U

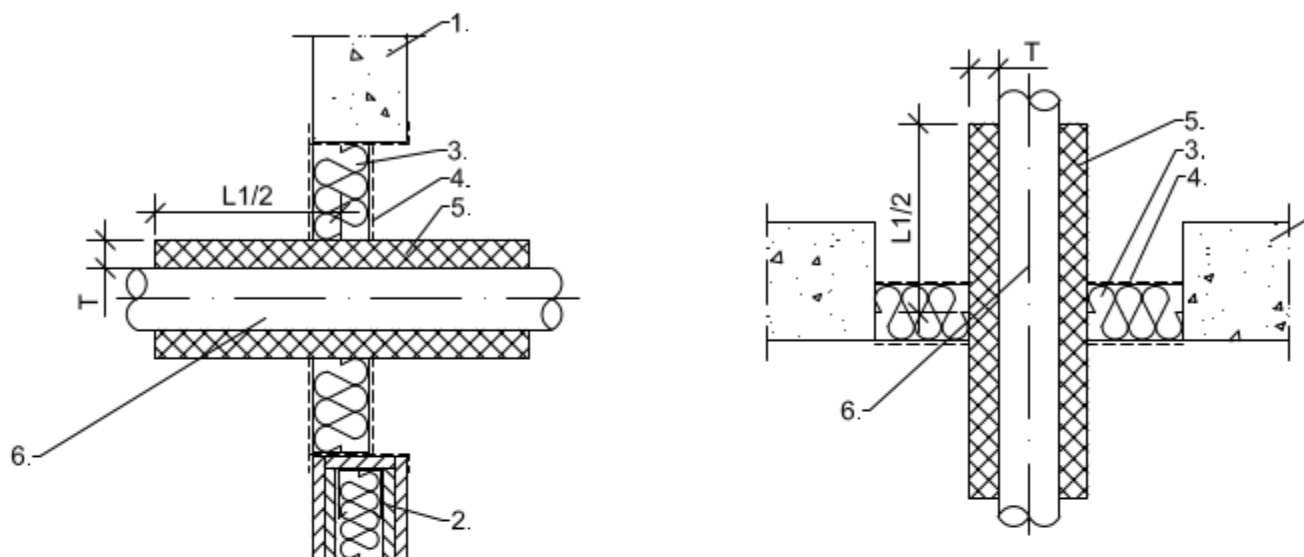
PYRO-SAFE FLAMMOTECT-A

Mixed penetration seal of one mineral fibre board (60 mm) and ablative coating in walls and floors

Annex 18

Non-combustible pipes

- section insulation made of FEF "Armaflex Protect"



Service	Measure insulation L1/2 X T	Fire resistance class	
		Wall	Floor
Non-combustible pipes made of copper, steel, stainless steel or cast iron with combustible Insulation Armaflex Protect			
Pipe outer-Ø ≤ 88,9 mm, wall thickness ≥ 0,8 mm	≥ 500 mm x 25 - 51 mm	EI 60 / E90 C/U	EI 60 / E 90 C/U
Non-combustible pipes made of steel, stainless steel or cast Iron with combustible insulation Armaflex Protect			
Pipe outer-Ø ≤ 170 mm, wall thickness ≥ 3 mm	≥ 1000 mm x 26 - 52 mm	EI 90 C/U	EI 60 / E 90 C/U

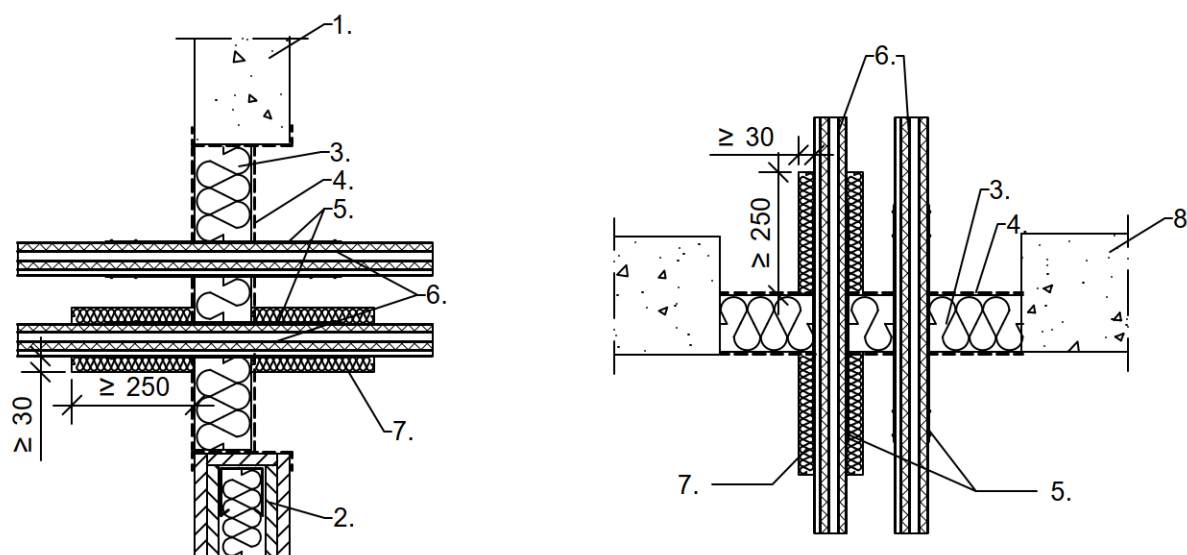
1. rigid wall ≥ 100 mm thickness
2. flexible wall 100 mm thickness
3. mineral fibre board
4. ablative coating
5. Armaflex Protect
6. Non-combustible pipe
7. rigid floor ≥ 125 mm thickness

dimensions in mm

PYRO-SAFE FLAMMOTECT-A	Annex 19
Mixed penetration seal of one mineral fibre board (60 mm) and ablative coating in walls and floors	

H/VAC split line combination

- with intumescent wrap
- additional protective insulation of mineral-fibre mat depending on copper-pipe Ø



Service	Measure	Fire resistance class	
		Wall	Floor
HVAC split line combinations			
PipeØ 6/10 with 9 mm PE-foam + PVC-U pipe ≤ Ø 25 mm + 2 accompanying cables ≤ 14 mm	intumescent wrap 2 x 2 layers	EI 60 / E 90	EI 45 / E 60
Pipe-Ø 22/22 mm or Ø 6 - 22 mm with 9 mm PE-foam + PVC-U pipe ≤ Ø 25 mm + 2 accompanying cables ≤ 21 mm	intumescent wrap 1x 2 layer + lamella mat	EI 30	EI 90

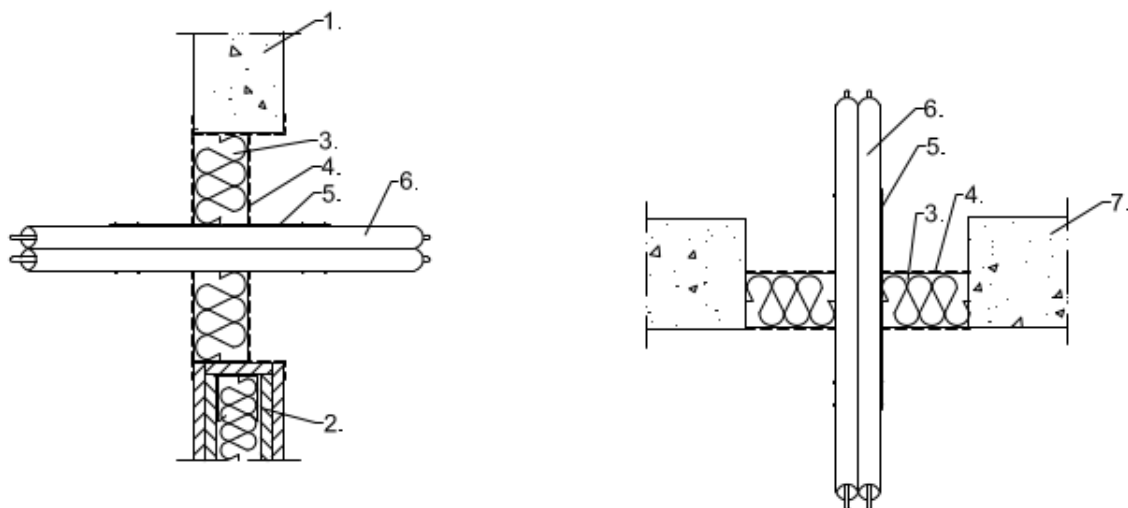
1. rigid wall ≥ 100 mm thickness
2. flexible wall 100 mm thickness
3. mineral fibre board
4. ablative coating
5. intumescent wrap
6. HVAC units
7. protective insulation lamella mat
8. rigid floor ≥ 125 mm thickness

dimensions in mm

PYRO-SAFE FLAMMOTECT-A	Annex 20
Mixed penetration seal of one mineral fibre board (60 mm) and ablative coating in walls and floors	

Solar pipes Nano SUN²

- with intumescent wrap

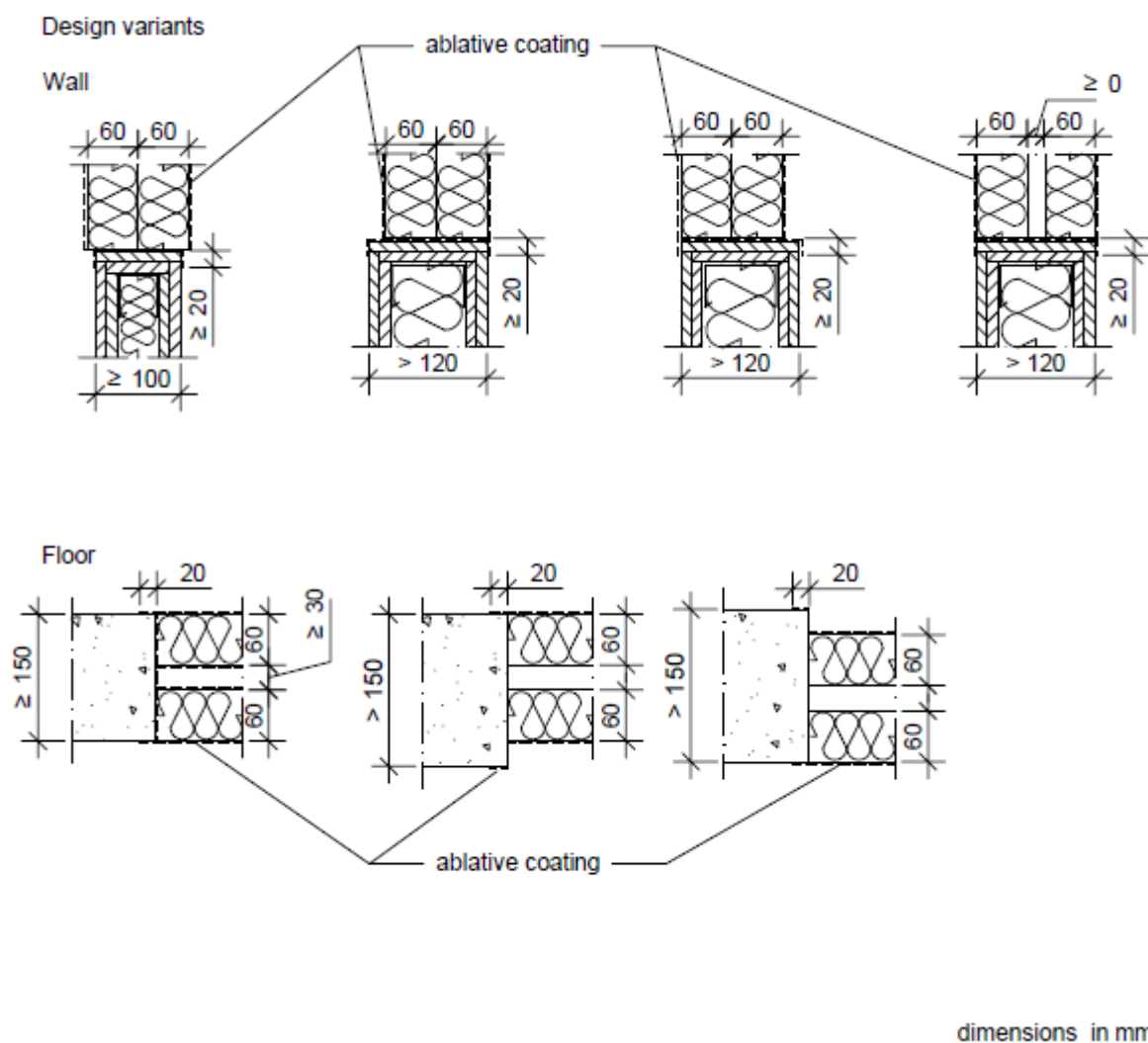


Service	Measure	Fire resistance class	
		Wall	Floor
NanoSUN ² - double solar pipes			
DN 16	intumescent wrap 2 x 1 layer + 25 mm overlapping	EI 90 U/U	EI 60 U/U
DN 40	intumescent wrap 2 x 1 layer + 25 mm overlapping	EI 30 / E 90 U/U	EI 60 U/U

1. rigid wall ≥ 100 mm thickness
2. flexible wall 100 mm thickness
3. mineral fibre board
4. ablative coating
5. intumescent wrap
6. Solar pipes
7. rigid floor ≥ 125 mm thickness

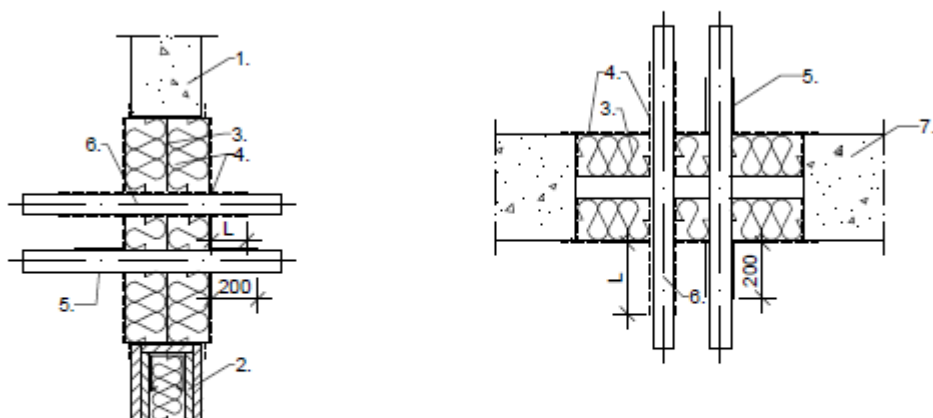
dimensions in mm

PYRO-SAFE FLAMMOTECT-A	Annex 21
Mixed penetration seal of one mineral fibre board (60 mm) and ablative coating in walls and floors	



PYRO-SAFE FLAMMOTECT-A	Annex 22
Mixed penetration seal of two mineral fibre boards (2 x 60 mm) and ablative coating in walls and floors - Design variants -	

- Cables $\varnothing \leq 21$ mm up to $\leq \varnothing 80$ mm or cable bundles $\varnothing \leq 100$ mm with cables ≤ 21 mm
- with ablative coating
 - with intumescent wrap



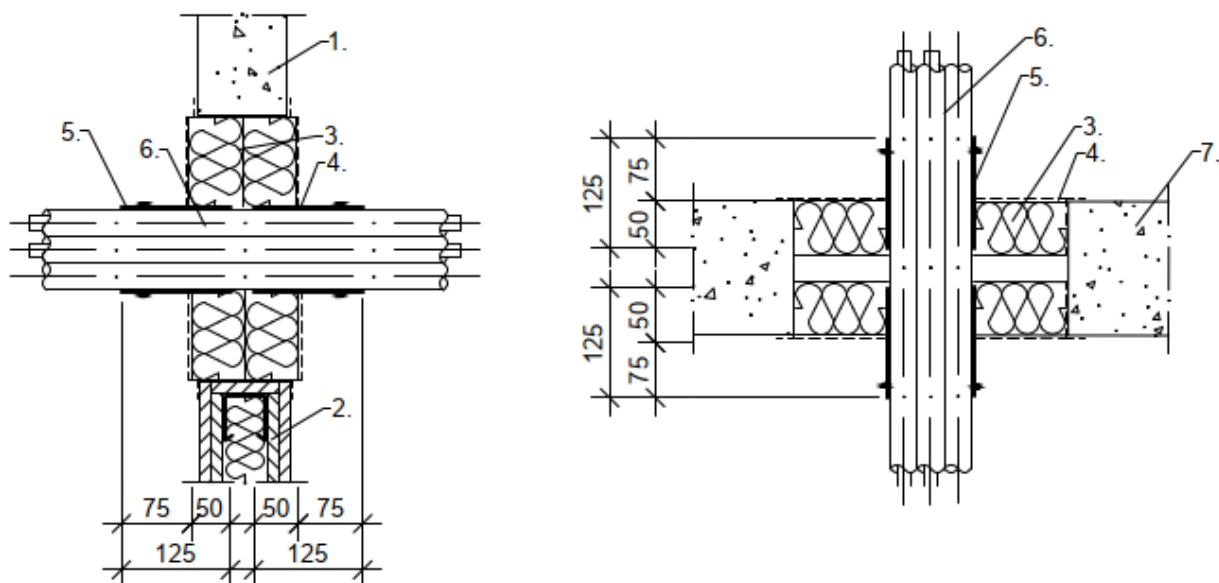
Service	Measure	Fire resistance class	
		Wall	Floor
Cables, cable bundles and cable trays			
Cables $\varnothing \leq 21$ mm without cable tray trough drill holes	ablative coating $L \geq 200$ mm \times ≥ 1 mm dry film thickness	EI 120	-
Cables $\varnothing \leq 21$ mm without cable tray trough drill holes	intumescent wrap 2 x 2 layer, 45 - 60 mm overlapping	EI 120	EI 120
Cables $\varnothing \leq 21$ mm	ablative coating $L \geq 100$ mm \times ≥ 1 mm dry film thickness	EI 120	-
Cables $\varnothing \leq 21$ mm	ablative coating $L \geq 250$ mm \times ≥ 1 mm dry film thickness	-	EI 120
Cables $\varnothing \leq 50$ mm	ablative coating $L \geq 200$ mm \times ≥ 2 mm dry film thickness	EI 120	-
Cables $\varnothing \leq 50$ mm	ablative coating $L \geq 250$ mm \times ≥ 2 mm dry film thickness	-	EI 120
Cables $\varnothing \leq 80$ mm	ablative coating $L \geq 250$ mm \times ≥ 2 mm dry film thickness	EI 120	EI 120
Cables $\varnothing \leq 80$ mm	intumescent wrap 2 x 2 layer, 45 - 60 mm overlapping	EI 120	EI 120
Cable bundles $\varnothing \leq 100$ mm	ablative coating $L \geq 100$ mm \times \geq mm dry film thickness	EI 120	-
Cable bundles $\varnothing \leq 100$ mm	ablative coating $L \geq 250$ mm \times ≥ 1 mm dry film thickness	-	EI 120
Cable bundles $\varnothing \leq 100$ mm	intumescent wrap 2 x 2 layer, 45 - 60 mm overlapping	EI 120	EI 120

1. rigid wall ≥ 100 mm thickness
2. flexible wall 100 mm thickness
3. mineral fibre board
4. ablative coating
5. intumescent wrap
6. cable
7. rigid floor ≥ 150 mm thickness

dimensions in mm

PYRO-SAFE FLAMMOTECT-A	Annex 23
Mixed penetration seal of two mineral fibre boards (2 x 60 mm) and ablative coating in walls and floors	

Electrical installation conduits $\varnothing \leq 32$ mm or bundles $\varnothing \leq 100$ mm of conduits $\varnothing \leq 32$ mm
 with or without cables ≤ 21 mm
 - with intumescent wrap



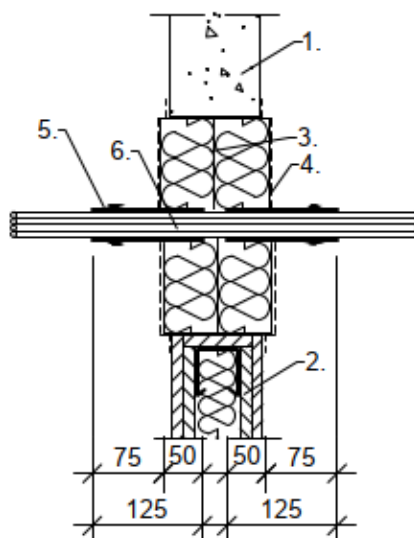
Service	cable	Measure	Fire resistance class	
			Wall	Floor
Electrical installation conduit (EIP)				
EIP made of plastics Ø ≤ 32 mm	with/ without Ø ≤ 21 mm	intumescent wrap 2 x 2 layer	EI 90 U/U	EI 90 U/U
EIP made of plastics Ø ≤ 32 mm	with/ without Ø ≤ 21 mm	intumescent wrap 2 x 3 layer	EI 120 U/U	-
EIP made of plastics, bundled Ø ≤ 100 mm	with/ without Ø ≤ 21 mm	intumescent wrap 2 x 2 layer	EI 90 U/U	EI 90 U/U
EIP made of plastics Ø ≤ 32 mm	with/ without Ø ≤ 21 mm	intumescent wrap 2 x 3 layer	EI 120 U/U	-

1. rigid wall ≥ 100 mm thickness
2. flexible wall 100 mm thickness
3. mineral fibre board
4. ablative coating
5. intumescent wrap
6. Electrical installation conduit
7. rigid floor ≥ 150 mm thickness

dimensions in mm

PYRO-SAFE FLAMMOTECT-A	Annex 24
Mixed penetration seal of two mineral fibre boards (2 x 60 mm) and ablative coating in walls and floors	

Speed-pipe , bundled or single pipes, with or without glass fibre or micro cables with intumescent wrap



Service	Measure	Fire ressistance class
		Wall
Speed pipes, bundles or single pipes, with or w/o glass fibre or micro cables		
max. 24 pcs. outside pipe- $\varnothing \leq 7$ mm	intumescent wrap 2 x 2 layer	EI120
max. 7 pcs. outside pipe- $\varnothing \leq 10$ mm	intumescent wrap 2 x 2 layer	EI120
max. 5 pcs. outside pipe- $\varnothing \leq 12$ mm	intumescent wrap 2 x 2 layer	EI120

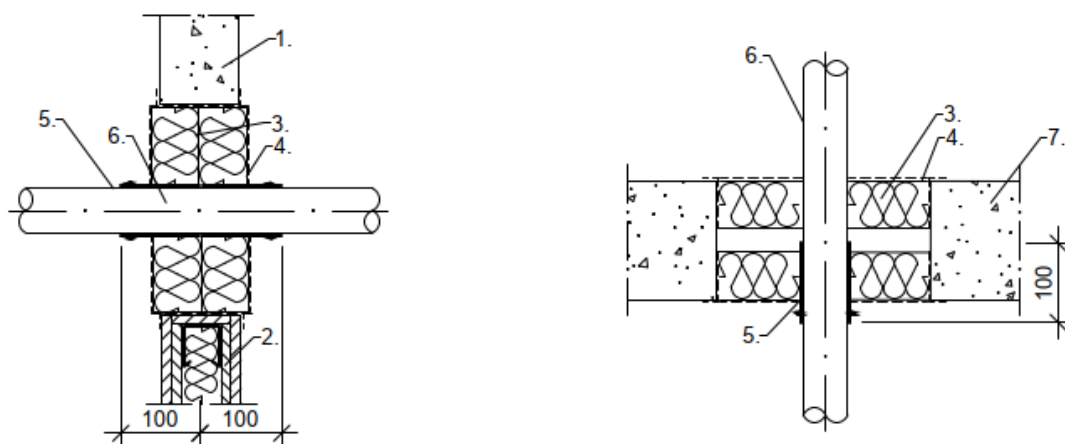
1. rigid wall ≥ 100 mm thickness
2. flexible wall ≥ 100 mm thickness
3. mineral fibre board
4. ablative coating
5. intumescent wrap
6. speed pipe

dimensions in mm

PYRO-SAFE FLAMMOTECT-A	Annex 25
Mixed penetration seal of two mineral fibre boards (2 x 60 mm) and ablative coating in walls and floors	

Combustible pipes $\varnothing \leq 50$ mm - $\varnothing \leq 160$ mm

- with intumescent wrap coated on both sides



Service	Measure	Fire resistance class	
		Wall	Floor
Combustible pipes made of PVC-U			
Outside pipe-Ø ≤ 50 mm	intumescent wrap 2 x 1 layer	EI 120 U/U	EI 120 U/U
Outside pipe-Ø ≤ 80 mm	intumescent wrap 2 x 2 layer	EI 120 U/U	EI 120 U/U
Outside pipe-Ø ≤ 110 mm	intumescent wrap 2 x 3 layer	EI 120 U/U	EI 120 U/U
Outside pipe-Ø ≤ 160 mm	intumescent wrap 2 x 4 layer	EI 120 U/C	EI 90 U/C
Combustible pipes made of PE 100			
Outside pipe-Ø ≤ 50 mm	intumescent wrap 2 x 1 layer	EI 120 U/U	EI 120 U/U
Outside pipe-Ø ≤ 80 mm	intumescent wrap 2 x 2 layer	EI 120 U/U	EI 120 U/U
Outside pipe-Ø ≤ 110 mm	intumescent wrap 2 x 3 layer	EI 120 U/U	EI 120 U/U
Outside pipe-Ø ≤ 160 mm	intumescent wrap 2 x 4 layer	EI 120 U/C	EI 90 U/C
Combustible pipes made of PP-H			
Outside pipe-Ø ≤ 50 mm	intumescent wrap 2 x 1 layer	EI 120 U/U	EI 90 U/U
Outside pipe-Ø ≤ 80 mm	intumescent wrap 2 x 2 layer	EI 120 U/U	EI 90 U/U
Outside pipe-Ø ≤ 110 mm	intumescent wrap 2 x 3 layer	EI 120 U/U	EI 90 U/U
Outside pipe-Ø ≤ 160 mm	intumescent wrap 2 x 4 layer	EI 120 U/C	EI 90 U/C

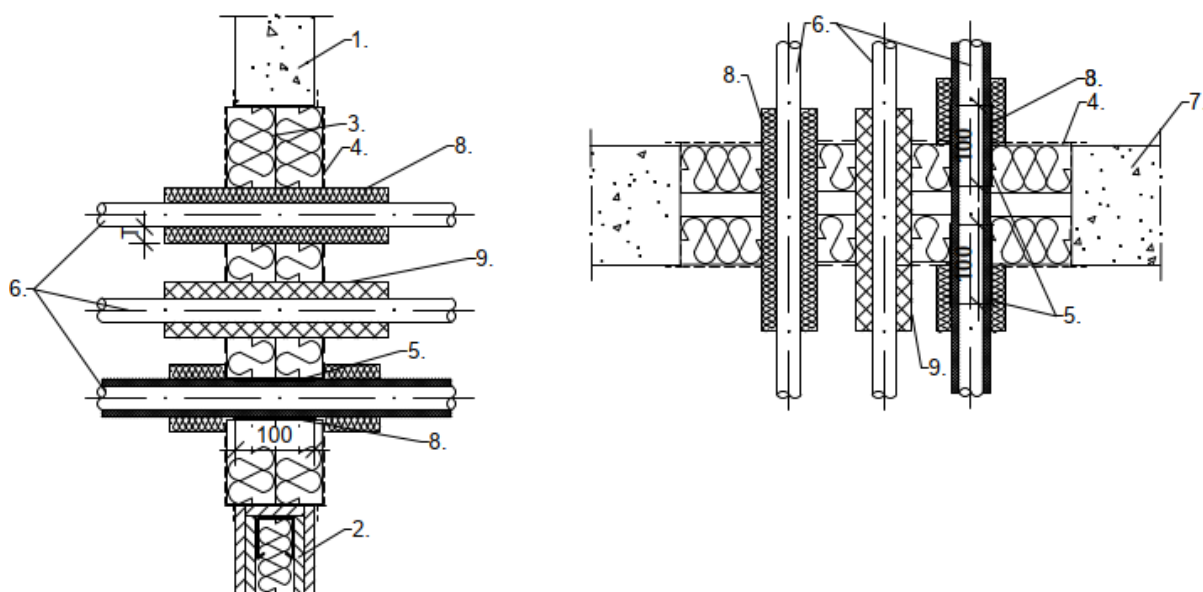
1. rigid wall ≥ 100 mm thickness
2. flexible wall ≥ 100 mm thickness
3. mineral fibre board
4. ablative coating
5. intumescent wrap
6. combustible pipes

dimensions in mm

PYRO-SAFE FLAMMOTECT-A	Annex 26
Mixed penetration seal of two mineral fibre boards (2 x 60 mm) and ablative coating in walls and floors	

Multi-layer composite pipes,

- with non-combustible insulation
- with FEF-insulation Armaflex Protect
- pre-insulated with PEF, intumescent wrap coated from both sides and protective insulation lamella mat



Service	Measure	Fire resistance class	
		Wall	Floor
Multilayer composite pipes HENCO-pipes			
Outside pipe-Ø ≤ 32 mm, wall thickness ≥ 3 mm	lamella mat [L X T] ≥ 250 mm x ≥ 20 mm	EI 120 U/C	-
Outside pipe-Ø ≤ 32 mm, wall thickness ≥ 3 mm	lamella mat [L X T] ≥ 500 mm x ≥ 20 mm	-	EI 120 U/C
Outside pipe-Ø ≤ 63 mm, wall thickness ≥ 4,5 mm	lamella mat [L X T] ≥ 250 mm x ≥ 30 mm	EI 120 U/C	-
Outside pipe-Ø ≤ 63 mm, wall thickness ≥ 4,5 mm	lamella mat [L X T] ≥ 500 mm x ≥ 30 mm	-	EI 120 U/C
Outside pipe-Ø ≤ 12 mm, wall thickness ≥ 1,6 mm	FEF Armaflex Protect [L X T] ≥ 240 mm x ≥ 13 mm	EI 120 U/C	EI 120 U/C
Outside pipe-Ø ≤ 63 mm, wall thickness ≥ 4,5 mm	FEF Armaflex Protect [L X T] ≥ 240 mm x ≥ 26 (2 x 13) mm	EI 120 U/C	EI 120 U/C
Multilayer composite pipes HENCO-pipes, pre-insulated with PE-foam			
Outside pipe-Ø ≤ 14 mm, insulation thickness 6 mm	intumescent wrap both sides coated 2 x 1 layer, ≥ 25 mm overlapping + lamella mat ≥250 mm x ≥ 20 mm	EI 120 U/U	EI 120 U/U
Outside pipe-Ø ≤ 26 mm, insulation thickness 13 mm	intumescent wrap both sides coated 2 x 1 layer, ≥ 25 mm overlapping + lamella mat ≥250 mm x ≥ 20 mm	EI 120 U/U	EI 120 U/U
Outside pipe-Ø ≤ 32 mm, insulation thickness 6 - 10 mm	intumescent wrap both sides coated 2 x 1 layer, ≥ 25 mm overlapping + lamella mat ≥250 mm x ≥ 20 mm	EI 120 U/U	EI 120 U/U

1. rigid wall ≥ 100 mm thickness
2. flexible wall 100 mm thickness
3. mineral fibre board
4. ablative coating
5. intumescent wrap
6. Multilayer composite pipe
7. rigid floor ≥ 150 mm thickness
8. lamella mat
9. FEF insulation

dimensions in mm

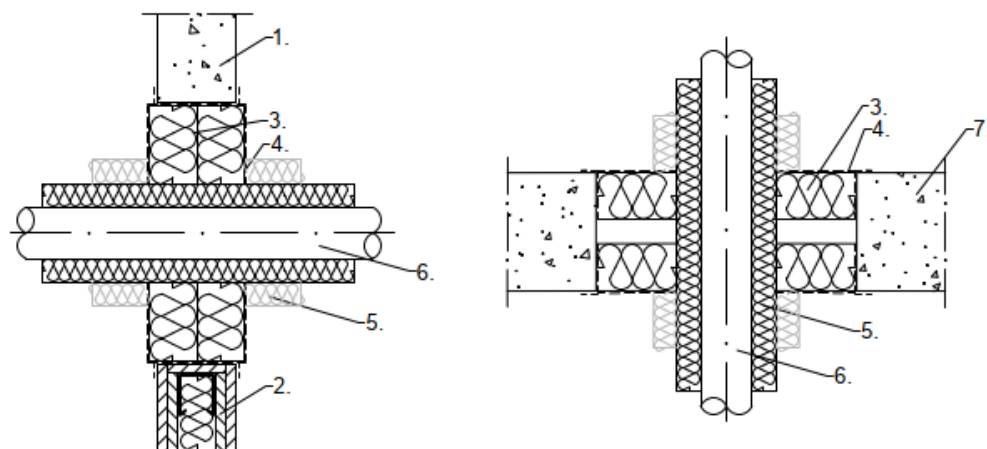
PYRO-SAFE FLAMMOTECT-A

Mixed penetration seal of two mineral fibre boards (2 x 60 mm) and ablative coating in walls and floors

Annex 27

Non-combustible pipes

- section insulation made of mineral-fibre lamella mat
- with protective insulation of lamella mat depending on pipe outer-Ø



Service	Measure [L X T]	Fire resistance class	
		Wall	Floor
Non-combustible pipes made of copper, steel, stainless steel or cast iron with non-combustible insulation made of mineral fibre lamella mat			
Pipe outer-Ø ≤ 15 mm,	≥ 250 mm x ≥ 20 mm	EI 120C/U	-
Pipe outer-Ø ≤ 28 mm,	≥ 500 mm x ≥ 20 mm	EI 120 C/U	EI 120C/U
Pipe outer-Ø ≤ 42 mm,	≥ 500 mm x ≥ 30 mm	EI 120 C/U	EI 60 C/U
Pipe outer-Ø ≤ 54 mm,	≥ 750 mm x ≥ 40 mm + lamella mat	EI 120 C/U	EI 120 C/U
	≥ 500 mm x ≥ 30 mm + lamella mat	-	EI 120 C/U
	≥ 750 mm x ≥ 30 mm + lamella mat	-	EI 120 C/U
Pipe outer-Ø ≤ 88,9 mm,	≥ 500 mm x ≥ 30 mm + lamella mat	EI 120 C/U	EI 120 C/U
	≥ 750 mm x ≥ 40 mm + lamella mat	EI 120 C/U	EI 120 C/U
	≥ 1000 mm x ≥ 30 mm + lamella mat	EI 120 C/U	EI 120 C/U
Pipe outer-Ø ≤ 108 mm,	≥ 500 mm x ≥ 30 mm + lamella mat	EI 120 C/U	EI 120 C/U
	≥ 1000 mm x ≥ 30 mm + lamella mat	EI 120 C/U	EI 120 C/U
Non-combustible pipes made of steel, stainless steel or cast iron with non-combustible insulation made of mineral fibre lamella mat			
Pipe outer-Ø ≤ 114,3 mm,	≥ 1000 mm x ≥ 30 mm + lamella mat	EI 120 C/U	EI 120 C/U
Pipe outer-Ø ≤ 170 mm,	≥ 500 mm x ≥ 30 mm + lamella mat	EI 120 C/U	EI 120 C/U
	≥ 1000 mm x ≥ 40 mm + lamella mat	EI 120 C/U	EI 120 C/U
	≥ 500 mm x ≥ 60 mm + lamella mat	EI 120 C/U	-
Pipe outer-Ø ≤ 323,9 mm,	≥ 1000 mm x ≥ 60 mm + lamella mat	-	EI 120 C/U
	≥ 1250 mm x ≥ 30 mm + lamella mat	-	EI 120 C/U

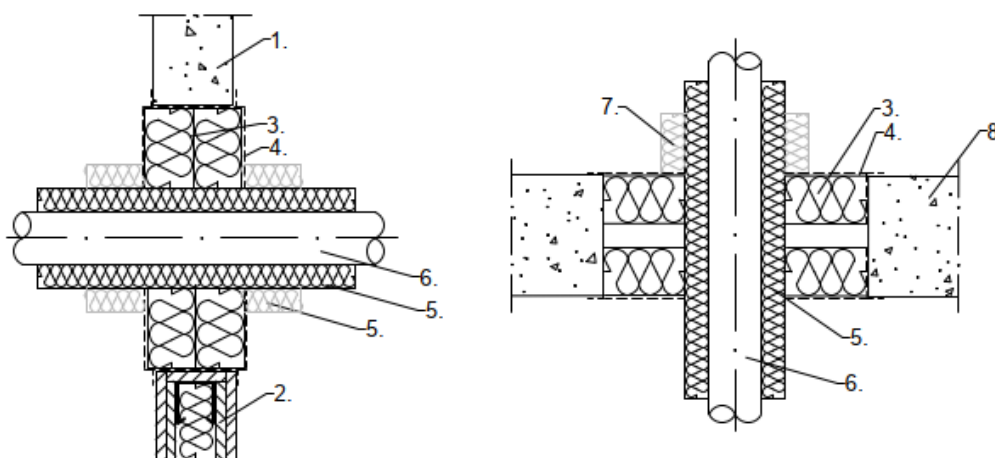
1. rigid wall ≥ 100 mm thickness
2. flexible wall 100 mm thickness
3. mineral fibre board
4. ablative coating
5. lamella mat
6. Non-combustible pipe
7. rigid floor ≥ 150 mm thickness

dimensions in mm

PYRO-SAFE FLAMMOTECT-A	Annex 28
Mixed penetration seal of two mineral fibre boards (2 x 60 mm) and ablative coating in walls and floors	

Non-combustible pipes

- section insulation made of mineral-fibre pipe sleeves
- with protective insulation of lamella mat depending on pipe outer-Ø



Service	Measure [L X T]	Fire resistance class	
		Wall	Floor
Non-combustible pipes made of copper, steel, stainless steel or cast iron with non-combustible insulation made of mineral fibre pipe sleeves			
Pipe outer-Ø ≤ 22 mm	≥ 1000 mm x ≥ 30 mm	EI 90C / E 120 C/U	-
	≥ 1000 mm x ≥ 40 mm + lamella mat	-	EI 120 C/U
	≥ 500 mm x ≥ 30 mm		
Pipe outer-Ø ≤ 54 mm,	≥ 1000 mm x ≥ 40 mm	EI 90 / E 120 C/U	-
	≥ 1000 mm x ≥ 40 mm + lamella mat	-	EI 120 C/U
	≥ 500 mm x ≥ 30 mm		
Pipe outer-Ø ≤ 88,9 mm,	≥ 1000 mm x ≥ 40 mm	EI 60 / E 120 C/U	-
	≥ 1000 mm x ≥ 30 mm + lamella mat	-	EI 120 C/U
	≥ 500 mm x ≥ 30 mm		
Non-combustible pipes made of steel, stainless steel or cast iron with non-combustible insulation made of mineral fibre lamella mat			
Pipe outer-Ø ≤ 170 mm,	≥ 1000 mm x ≥ 40 mm	EI 60 / E 120 C/U	-
	≥ 1000 mm x ≥ 40 mm + lamella mat	-	EI 120 C/U
	≥ 500 mm x ≥ 30 mm		

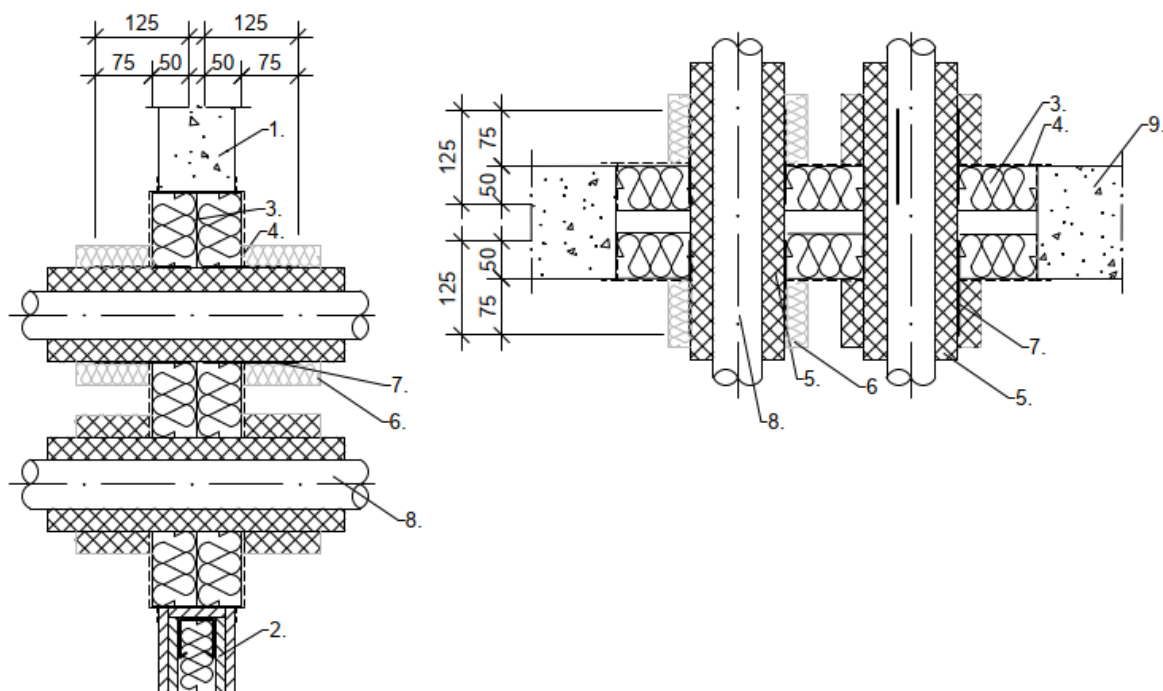
1. rigid wall ≥ 100 mm thickness
2. flexible wall 100 mm thickness
3. mineral fibre board
4. ablative coating
5. pipe sleeve
6. lamella mat
7. Non-combustible pipe
8. rigid floor ≥ 150 mm thickness

dimensions in mm

PYRO-SAFE FLAMMOTECT-A	Annex 29
Mixed penetration seal of two mineral fibre boards (2 x 60 mm) and ablative coating in walls and floors	

Non-combustible pipes

- section insulation made of FEF-insulation
- with intumescent wrap
- with protective insulation of lamella mat depending on pipe outer-Ø



1. rigid wall ≥ 100 mm thickness
2. flexible wall 100 mm thickness
3. mineral fibre board
4. ablative coating
5. FEF-insulation
6. lamella mat
7. intumescent wrap
8. Non-combustible pipe
9. rigid floor ≥ 150 mm thickness

dimensions in mm

PYRO-SAFE FLAMMOTECT-A	Annex 30
Mixed penetration seal of two mineral fibre boards (2 x 60 mm) and ablative coating in walls and floors	

Service	Measure insulation L 1/2 x T	Measure intumescent wrap	Fire resistance class	
			Wall	Floor
Non-combustible pipes made of copper, steel, stainless steel or cast iron with combustible insulation NH/Armaflex and intumescent wrap				
Pipe outer-Ø ≤ 10 mm	≥ 500 mm x 9 - 19 mm + lamella mat ≥ 250 mm x ≥ 20 mm	2 x 1 layer	EI 120 C/U	EI 120 C/U
Pipe outer-Ø ≤ 15 mm	≥ 750 mm x 9 - 25 mm + lamella mat ≥ 250 mm x ≥ 20 mm	2 x 1 layer	EI 90 / E 120 C/U	EI 120 C/U
	≥ 750 mm x 9 - 19 mm + Armaflex Protect ≥ 250 mm x ≥ 13 mm	-	EI 120 C/U	EI 120 C/U
	Continious insulation x 9 - 50 mm + lamella mat ≥ 250 mm x ≥ 20 mm	2 x 1 layer	EI 120 C/U	-
Pipe outer-Ø ≤ 28 mm	≥ 750 mm x 9 - 25 mm + lamella mat ≥ 250 mm x ≥ 20 mm	2 x 1 layer	EI 90 / E 120 C/U	-
	Continious insulation x 10 - 50 mm + lamella mat ≥ 250 mm x ≥ 20 mm	2 x 1 layer	EI 120	EI 90 C/U
	Continious insulation x 89 mm + lamella mat ≥ 500 mm x ≥ 40 mm	2 x 1 layer	EI 120	-
Pipe outer-Ø ≤ 42 mm	≥ 750 mm x 10 - 50 mm + lamella mat ≥ 250 mm x ≥ 20 mm	2 x 1 layer	EI 120	EI 120
	≥ 750 mm x 10 - 50 mm + Armaflex layer ≥ 250 mm x 2 x 13 mm	2 x 1 layer	EI 120	EI 120
	Continious insulation x 89 mm + lamella mat ≥ 500 mm x ≥ 40 mm	2 x 1 layer	EI 120	-
Pipe outer-Ø ≤ 54 mm	≥ 1000 mm x 25 mm + lamella mat ≥ 250 mm x ≥ 20 mm	2 x 1 layer	EI 90 / E 120 C/U	EI 120
	Continious insulation x 25 mm + lamella mat ≥ 250 mm x ≥ 20 mm	2 x 1 layer	EI 120	-
	≥ 1000 mm x 29 - 57 mm + lamella mat ≥ 500 mm x ≥ 30 mm	2 x 1 layer	EI 90	-
	Continious insulation x 25 mm + lamella mat ≥ 500 mm x ≥ 40 mm	2 x 1 layer	EI 120	-
Pipe outer-Ø ≤ 88,9 mm	≥ 1000 mm x 25 - 89 mm + lamella mat ≥ 500 mm x ≥ 30 mm	2 x 1 layer	EI 90	-
	Continious insulation x 89 mm + lamella mat ≥ 500 mm x ≥ 40 mm	2 x 1 layer	EI 120	-
	≥ 1000 mm x 25 mm + lamella mat ≥ 250 mm x ≥ 40 mm	2 x 1 layer	-	EI 90 C/U
	≥ 1000 mm x 89 mm + lamella mat ≥ 250 mm x ≥ 40 mm	2 x 1 layer	-	EI 90 C/U
Pipe outer-Ø ≤ 108 mm	≥ 1000 mm x 57 mm + lamella mat ≥ 750 mm x ≥ 40 mm	2 x 2 layer	EI 90 C/U	-
	≥ 1000 mm x 57 mm + lamella mat ≥ 1000 mm x ≥ 40 mm	1 x 2 layer	-	EI 90 C/U

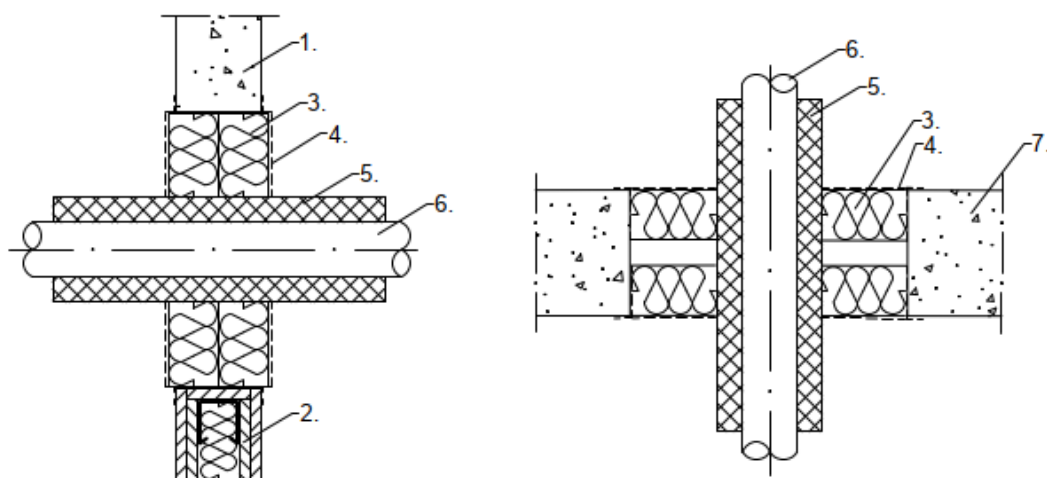
PYRO-SAFE FLAMMOTECT-A	Annex 31
Mixed penetration seal of two mineral fibre boards (2 x 60 mm) and ablative coating in walls and floors	

Service	Measure insulation L1/2 x T	Measure intumescent wrap	Fire resistance class	
			Wall	Floor
Non-combustible pipes made of steel, stainless steel or cast iron with combustible insulation NH/Armaflex and intumescent wrap				
Pipe outer-Ø ≤ 170 mm	≥ 1000 mm x 50 - 89 mm + lamella mat ≥ 750 mm x ≥ 60 mm	2 x 1 layer	EI 120 C/U	EI 90 C/U
Non-combustible pipes made of copper, steel, stainless steel or cast iron with combustible insulationKaiflex ST and intumescent wrap				
Pipe outer-Ø ≤ 8 mm	≥ 2000 mm x 9 - 18 mm	2 x 1 layer	EI 120 C/U	EI 120 C/U
Pipe outer-Ø ≤ 22 mm	≥ 2000 mm x 32 mm	2 x 2 layer	EI 120 C/U	-
Pipe outer-Ø ≤ 88,9 mm	≥ 2000 mm x 9 - 32 mm + lamella mat ≥ 500 mm x ≥ 30 mm	2 x 2 layer	-	EI 120 C/U
	≥ 2000 mm x 32 mm + lamella mat ≥ 500 mm x ≥ 30 mm	2 x 2 layer	EI 120 C/U	-
Non-combustible pipes made of steel, stainless steel or cast iron with combustible insulationKaiflex ST and intumescent wrap				
Pipe outer-Ø ≤ 170 mm	≥ 2000 mm x 10 - 32 mm + lamella mat ≥ 500 mm x ≥ 30 mm	2 x 2 layer	EI 90 / E 120 C/U	EI 90 / E 120 C/U

PYRO-SAFE FLAMMOTECT-A	Annex 32
Mixed penetration seal of two mineral fibre boards (2 x 60 mm) and ablative coating in walls and floors	

Non-combustible pipes

- section insulation made of FEF-insulation



Service	Measure insulation L1/2 x T	Fire resistance class	
		Wall	Floor
Non-combustible pipes made of copper, steel, stainless steel or cast iron with combustible insulation Armaflex Protect			
Pipe outer-Ø ≤ 8 mm	≥ 1000 mm x 16 mm	-	EI 120 C/U
Pipe outer-Ø ≤ 10 mm	≥ 1000 mm x 16 mm	EI 120 C/U	-
Pipe outer-Ø ≤ 15 mm	≥ 1000 mm x 19 mm	EI 90 / E 120 C/U	EI 120 C/U
Pipe outer-Ø ≤ 22 mm	≥ 1000 mm x 20 mm	EI120	EI 120 C/U
Pipe outer-Ø ≤ 28 mm	≥ 1000 mm x 25 mm	EI 60/ E 120 C/U	EI 120 C/U
Pipe outer-Ø ≤ 35 mm	≥ 1000 mm x 25 mm	EI 90 / E 120 C/U	EI 90 / E 120 C/U
Pipe outer-Ø ≤ 54 mm	≥ 1000 mm x 25 mm	EI 90 / E 120 C/U	EI 90 / E 120 C/U
Pipe outer-Ø ≤ 88,9 mm	≥ 1000 mm x 25 mm	EI 60 / E 120 C/U	EI 60 / E 120 C/U
Non-combustible pipes made of steel, stainless steel or cast iron with combustible insulation Armaflex Protect			
Pipe outer-Ø ≤ 170 mm	≥ 1000 mm x 26 mm (2 x 13 mm)	EI 90 / E 120 C/U	EI 90 / E 120 C/U

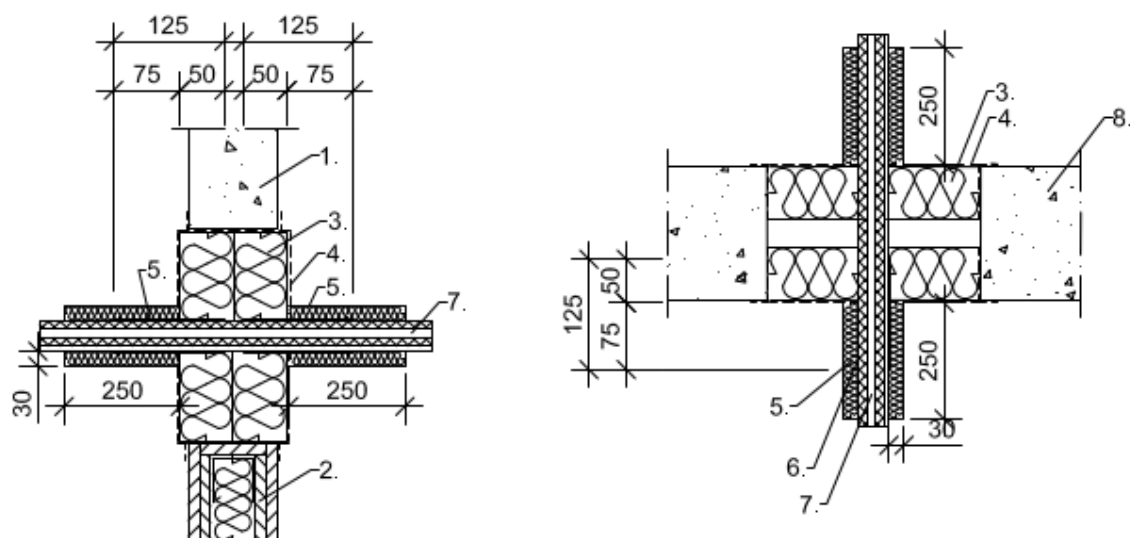
1. rigid wall ≥ 100 mm thickness
2. flexible wall 100 mm thickness
3. mineral fibre board
4. ablative coating
5. FEF-insulation
6. lamella mat
7. intumescent wrap
8. Non-combustible pipe
9. rigid floor ≥ 150 mm thickness

dimensions in mm

PYRO-SAFE FLAMMOTECT-A	Annex 33
Mixed penetration seal of two mineral fibre boards (2 x 60 mm) and ablative coating in walls and floors	

HVAC split line combination

- with intumescent wrap
- additional protective insulation of mineral-fibre mat

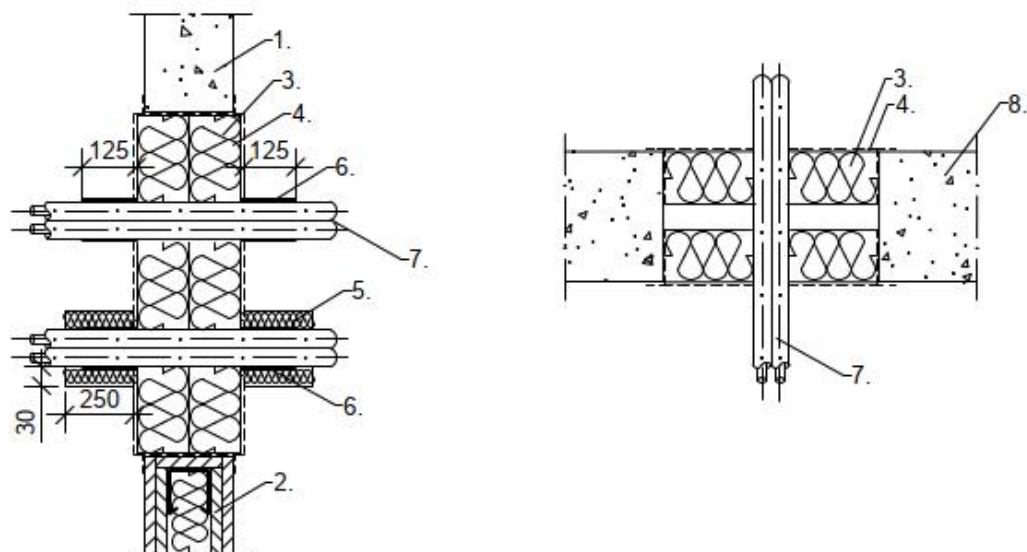


Service	Measure	Fire resistance class	
		Wall	Floor
HVAC split line combinations			
Double pipe (6-10/ 6-18 mm) or single copper pipe (6-22 mm) + PVC-U pipe ≤ Ø 25 mm + 5 accompanying cables ≤ 21 mm	intumescent wrap 2 x 1 layers + lamella mat ≥ 250 mm x ≥ 30 mm	EI 120 U/U	-
Double pipe (6-22/ 8-22 mm) or single copper pipe (6-22 mm) + PVC-U pipe ≤ Ø 25 mm + 4 accompanying cables ≤ 21 mm	intumescent wrap 2 x 1 layers + lamella mat ≥ 250 mm x ≥ 30 mm	-	EI 90 U/U

1. rigid wall ≥ 100 mm thickness
2. flexible wall 100 mm thickness
3. mineral fibre board
4. ablative coating
5. lamella mat
6. intumescent wrap
7. Non-combustible pipe
8. rigid floor ≥ 150 mm thickness

dimensions in mm

PYRO-SAFE FLAMMOTECT-A	Annex 34
Mixed penetration seal of two mineral fibre boards (2 x 60 mm) and ablative coating in walls and floors	



Service	Measure	Fire resistance class	
		Wall	Floor
NanoSUN ² - double solar pipes			
DN 25	intumescent wrap 2 x 1 layerg	EI 120 C/U	-
	-	-	EI 120 C/U
DN 40	intumescent wrap 2 x 1 layer + 25 mm overlapping	EI 60 / E 120 U/U	-
	intumescent wrap 2 x 1 layer + 25 mm overlapping + lamella mat ≥ 250 mm x ≥ 30 m	EI 120 U/U	-
	-	-	EI 120 U/U

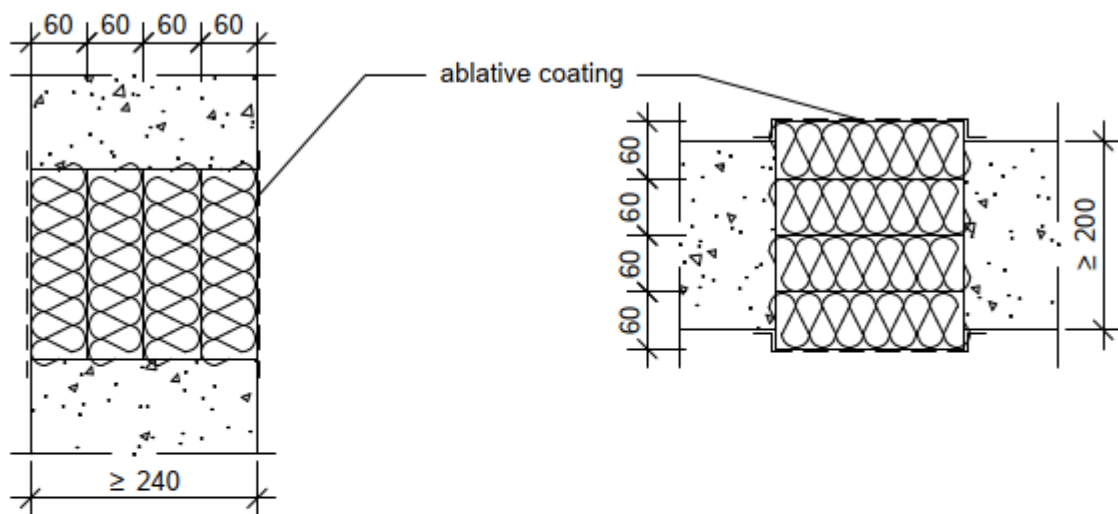
1. rigid wall ≥ 100 mm thickness
2. flexible wall 100 mm thickness
3. mineral fibre board
4. ablative coating
5. lamella mat
6. intumescent wrap
7. Solar pipe
8. rigid floor ≥ 150 mm thickness

dimensions in mm

PYRO-SAFE FLAMMOTECT-A	Annex 35
Mixed penetration seal of two mineral fibre boards (2 x 60 mm) and ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre boards (4 x 60 mm) with ablative coating

Wall

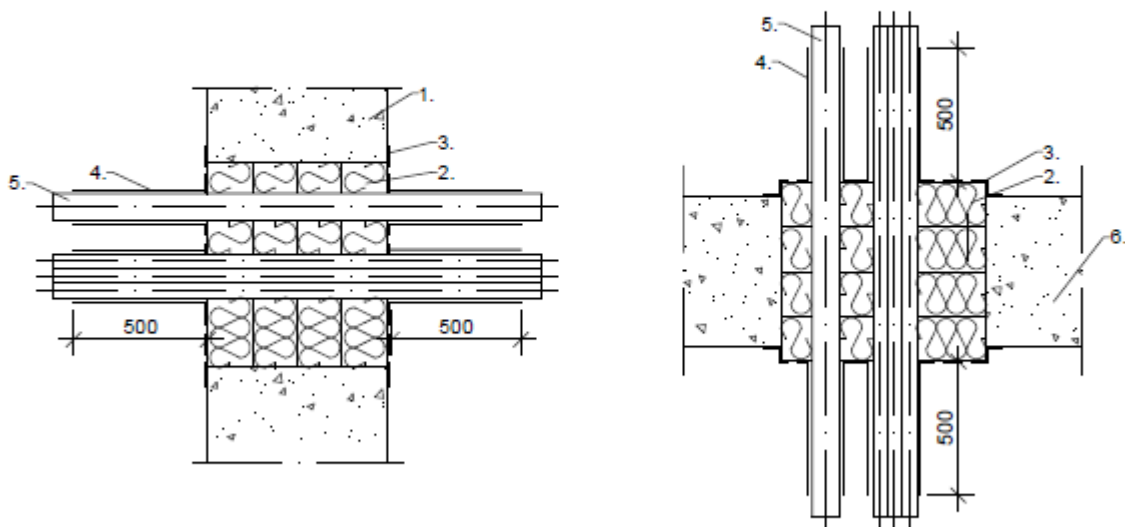


dimensions in mm

PYRO-SAFE FLAMMOTECT-A	Annex 36
Mixed penetration seal of four mineral fibre boards (4 x 60 mm) and ablative coating in walls and floors	

Cables $\varnothing \leq \varnothing 80$ mm or cable bundles $\varnothing \leq 100$ mm with cables ≤ 21 mm

- with ablative coating
- with intumescent wrap



Service	Measure	Fire resistance class	
		Wall	Floor
Cables, cable bundles and cable trays			
Cables $\varnothing \leq 80$ mm	intumescent wrap 2 x 2 layer	EI 240	EI 240
Cable bundles $\varnothing \leq 100$ mm	intumescent wrap 2 x 2 layer	EI 240	EI 240

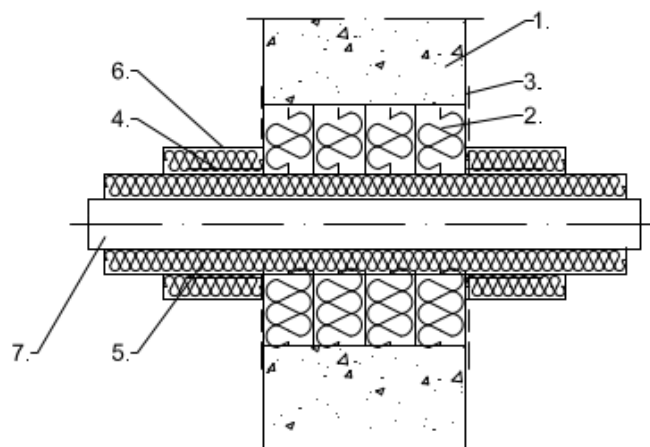
1. rigid wall ≥ 240 mm thickness
2. mineral fibre board
3. ablative coating
4. intumescent wrap
5. cable
6. rigid floor ≥ 200 mm thickness

dimensions in mm

PYRO-SAFE FLAMMOTECT-A	Annex 37
Mixed penetration seal of four mineral fibre boards (4 x 60 mm) and ablative coating in walls and floors	

Non-combustible pipes

- with mineral fibre pipe sleeves
- with protective insulation of lamella mat
- with intumescent wrap



Service	Measure pipe sleeve ProRox 960	Measure lamella mat Klimarock	Measure Intumescent wrap	Fire resistance class Wall
Non-combustible pipes made of steel, stainless steel or cast iron with non-combustible insulation made of mineral fibre lamella mat				
Pipe outer-Ø ≤ 42,4 mm,	≥ 750 mm x ≥ 50 mm	≥ 500 mm x ≥ 30 mm	500	EI 240 C/U
Pipe outer-Ø ≤ 88,9 mm,	≥ 1000 mm x ≥ 60 mm	≥ 500 mm x ≥ 50 mm	500	EI 240 C/U
Pipe outer-Ø ≤ 168,3 mm,	≥ 1250 mm x ≥ 70 mm	≥ 750 mm x ≥ 30 mm	500	EI 240 C/U
Pipe outer-Ø ≤ 219,1 mm	≥ 1500 mm x ≥ 80 mm	≥ 1000 mm x ≥ 30 mm	1000	EI 240 C/U
Pipe outer-Ø ≤ 323,9 mm	≥ 1750 mm x ≥ 90 mm	≥ 1250 mm x ≥ 30 mm	1000	EI 240 C/U

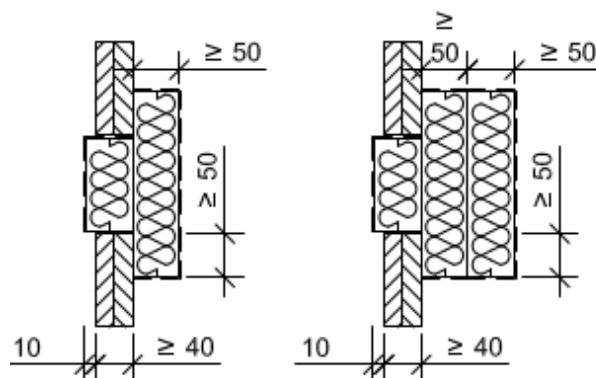
1. rigid wall ≥ 240 mm thickness
2. mineral fibre board
3. ablative coating
4. intumescent wrap
5. pipe sleeve
6. lamella mat
7. non-combustible pipe

dimensions in mm

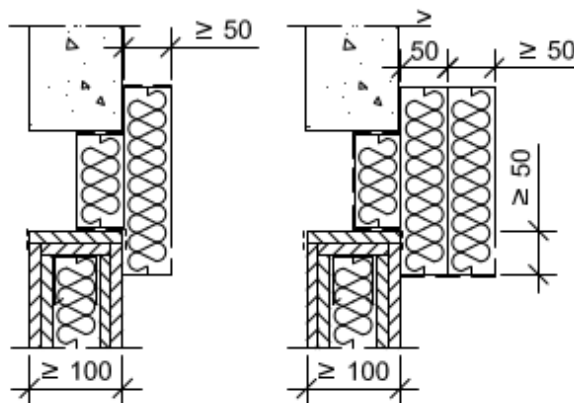
PYRO-SAFE FLAMMOTECT-A	Annex 38
Mixed penetration seal of four mineral fibre boards (4 x 60 mm) and ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre boards with ablative coating for one-sided installation in shaft wall, walls and floors

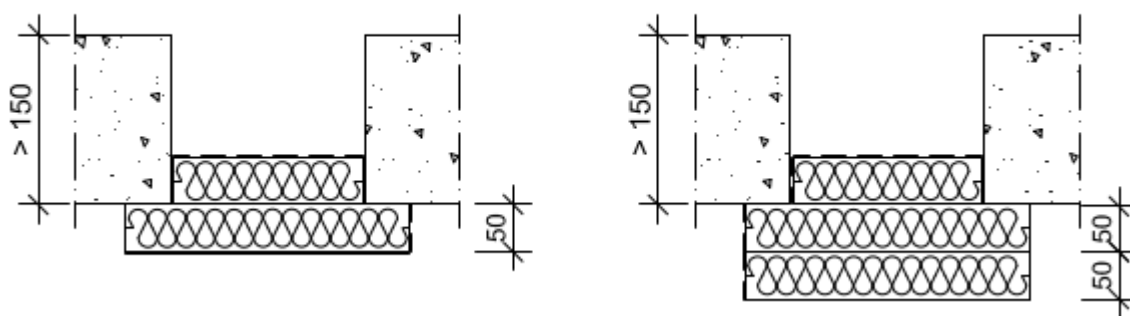
Variants in shaft walls



Variants in walls



Variants in floors



PYRO-SAFE FLAMMOTECT-A

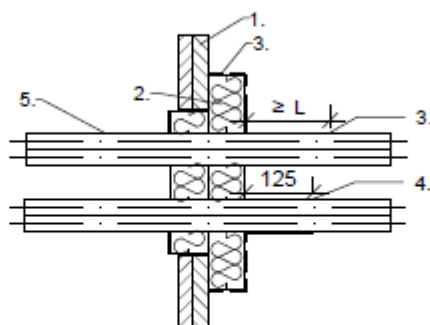
Mixed penetration seal of two or three mineral fibre boards (2 x 50 mm or 3 x 50 mm) for installation in walls in floors with access from one side only
- Design variants -

Annex 39

Installation in shaft walls, 2-layer

Cables, cable bundles and cable trays

- with ablative coating
- with intumescent wrap



Service	Measure	Fire resistance class Wall
Cables, cable bundles and cable trays		
Cables $\varnothing \leq 21$ mm	ablative coating $L \geq 150$ mm x ≥ 1 mm dry film thickness	EI 90/ E 120
Cables $\varnothing \leq 21$ mm	intumescent wrap 1 x 1 layer 40 - 60 mm overlap	EI 120
Cable bundles $\varnothing \leq 100$ mm	ablative coating $L \geq 150$ mm x ≥ 1 mm dry film thickness	EI 120
Cable bundles $\varnothing \leq 100$ mm	intumescent wrap 1 x 1 layer 40 - 60 mm overlap	EI 90 / E 120

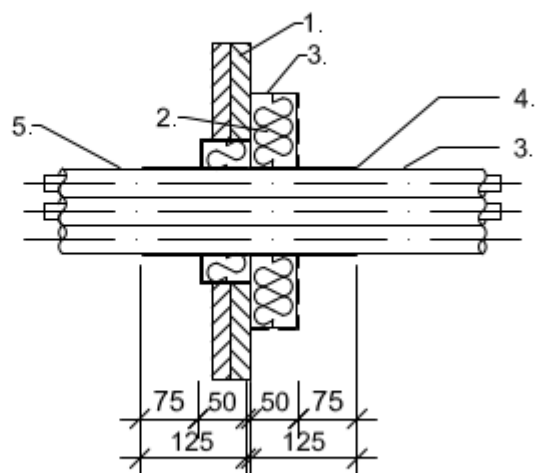
1. shaft wall ≥ 40 mm thickness
2. mineral fibre board
3. ablative coating
4. intumescent wrap
5. cable

dimensions in mm

PYRO-SAFE FLAMMOTECT-A	Annex 40
Mixed penetration seal of two or three mineral fibre boards (2 x 50 mm or 3 x 50 mm) for installation in walls with access from one side only	

Installation in shaft walls, 2-layer

Electrical installation conduits (EIP), single or bundled
- with intumescent wrap



Service	Measure	Fire resistance class Wall
Electrical installation conduit (EIP)		
EIC single $\varnothing \leq 21$ mm	intumescent wrap 2 x 2 layer	EI 90/ E 120
EIC bundled $\varnothing \leq 100$ mm	intumescent wrap 2 x 2 layer	EI 120

1. shaft wall ≥ 40 mm thickness
2. mineral fibre board
3. ablative coating
4. intumescent wrap
5. electrical installation conduit

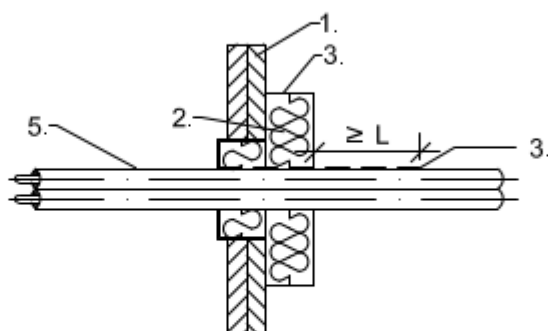
dimensions in mm

PYRO-SAFE FLAMMOTECT-A	Annex 41
Mixed penetration seal of two or three mineral fibre boards (2 x 50 mm or 3 x 50 mm) for installation in walls with access from one side only	

Installation in shaft walls, 2-layer

Special-duo-coax bundle

- with ablative coating



Service	Measure	Fire resistance class Wall
Special-duo-coax bundle with ablative coating		
Bundle $\varnothing \leq 21$ mm / cable $\varnothing \leq 14$ mm	ablative coating $L \geq 150$ mm x ≥ 1 mm dry film thickness	EI 120 U/U

1. shaft wall ≥ 40 mm thickness
2. mineral fibre board
3. ablative coating
4. Intumescent wrap
5. special-duo-coax-bundle

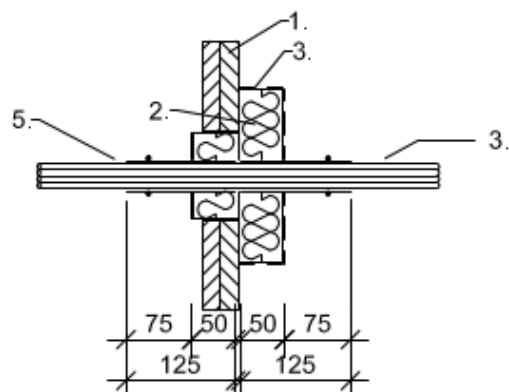
dimensions in mm

PYRO-SAFE FLAMMOTECT-A	Annex 42
Mixed penetration seal of two or three mineral fibre boards (2 x 50 mm or 3 x 50 mm) for installation in walls with access from one side only	

Installation in shaft walls, 2-layer

Speed pipes, bundled or single, with/ without glas fibre cable

- with intumescent wrap



Service	Measure	Fire ressistance class
		Wall
Speed pipes, bundles or single pipes, with or w/o glass fibre or micro cables		
max. 24 pcs. outside pipe- $\varnothing \leq 7$ mm	intumescent wrap 2 x 2 layer	EI 120 U/U
max. 7 pcs. outside pipe- $\varnothing \leq 10$ mm	intumescent wrap 2 x 2 layer	EI 120 U/U
max. 5 pcs. outside pipe- $\varnothing \leq 12$ mm	intumescent wrap 2 x 2 layer	EI 120 U/U

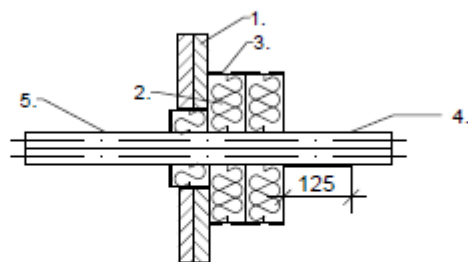
1. shaft wall ≥ 40 mm thickness
2. mineral fibre board
3. ablative coating
4. intumescent wrap
5. speed pipe

dimensions in mm

PYRO-SAFE FLAMMOTECT-A	Annex 43
Mixed penetration seal of two or three mineral fibre boards (2 x 50 mm or 3 x 50 mm) for installation in walls with access from one side only	

Installation in shaft walls, 3-layer

Cables, cable bundles and cable trays
- with intumescent wrap



Service	Measure	Fire resistance class
		Wall
Cables, cable bundles and cable trays		
Cables $\varnothing \leq 21$ mm	intumescent wrap 1 x 1 layer 40 - 60 mm overlap	EI 120
Cables $\varnothing \leq 50$ mm	intumescent wrap 1 x 1 layer 40 - 60 mm overlap	EI 90 / E 120
Cables $\varnothing \leq 80$ mm	intumescent wrap 1 x 1 layer 40 - 60 mm overlap	EI 90 / E 120
Cable bundles $\varnothing \leq 100$ mm	intumescent wrap 1 x 1 layer 40 - 60 mm overlap	EI 120

1. shaft wall ≥ 40 mm thickness
2. mineral fibre board
3. ablative coating
4. intumescent wrap
5. cable

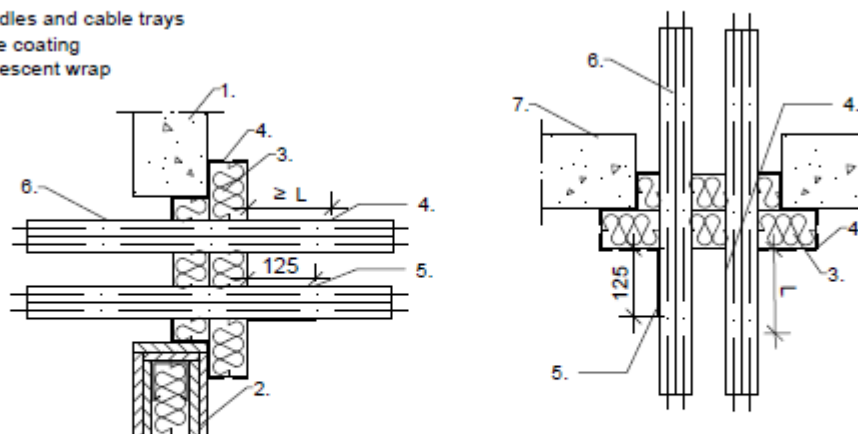
dimensions in mm

PYRO-SAFE FLAMMOTECT-A	Annex 44
Mixed penetration seal of two or three mineral fibre boards (2 x 50 mm or 3 x 50 mm) for installation in walls with access from one side only	

Installation in walls and floors, 2-layer

Cables, cable bundles and cable trays

- with ablative coating
- with intumescent wrap



Service	Measure	Fire resistance class	
		Wall	Floor
Cables, cable bundles and cable trays			
Cables Ø ≤ 21 mm	ablative coating L ≥ 150 mm x ≥ 1 mm dry film thickness	EI 120	EI 120
Cables Ø ≤ 21 mm	intumescent wrap 1 x 1 layer 40 - 60 mm overlap	EI 120	EI 120
Cables Ø ≤ 50 mm	ablative coating L ≥ 150 mm x ≥ 1 mm dry film thickness	-	EI 120
Cables Ø ≤ 80 mm	ablative coating L ≥ 150 mm x ≥ 1 mm dry film thickness	-	EI 120
Cable bundles Ø ≤ 100 mm	ablative coating L ≥ 150 mm x ≥ 1 mm dry film thickness	EI 120	EI 120
Cable bundles Ø ≤ 100 mm	intumescent wrap 1 x 1 layer 40 - 60 mm overlap	EI 90 / E 120	EI 120

1. rigid wall ≥ 100 mm thickness
2. flexible wall ≥ 100 mm thickness
3. mineral fibre board
4. ablative coating
5. intumescent wrap
6. cable
7. floor ≥ 150 mm

dimensions in mm

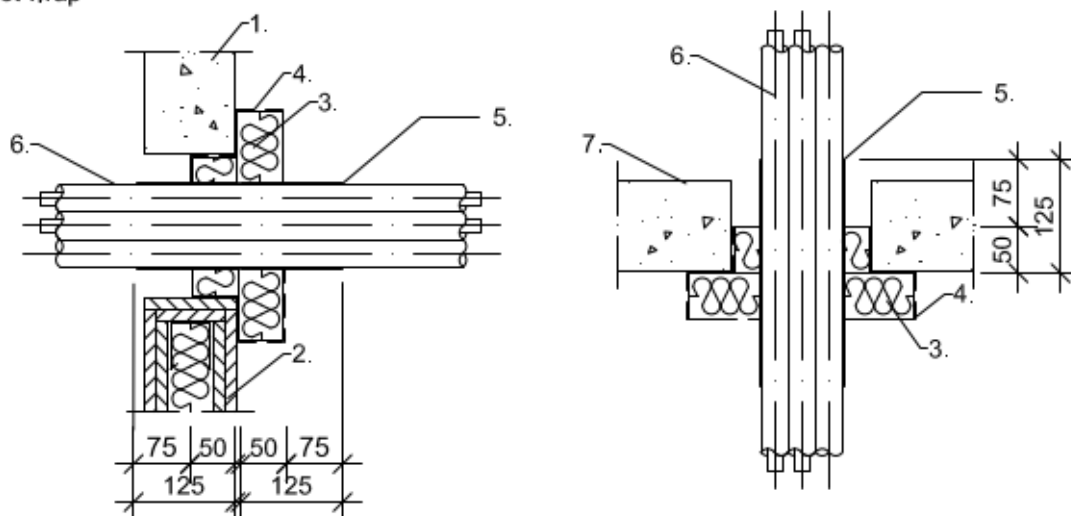
PYRO-SAFE FLAMMOTECT-A

Mixed penetration seal of two or three mineral fibre boards (2 x 50 mm or 3 x 50 mm) for installation in walls and floors with access from one side only

Annex 45

Installation in walls and floors, 2-layer

Electrical installation conduits (EIP), single or bundled
- with intumescent wrap



Service	Measure	Fire resistance class	
		Wall	Floor
Electrical installation conduit (EIP)			
EIC single $\varnothing \leq 21$ mm	intumescent wrap 2 x 2 layer	EI 120 U/U	EI 120 U/U
EIC bundled $\varnothing \leq 100$ mm	intumescent wrap 2 x 2 layer	EI 120 U/U	EI 120 U/U

1. rigid wall ≥ 100 mm thickness
2. flexible wall ≥ 100 mm thickness
3. mineral fibre board
4. ablative coating
5. intumescent wrap
6. Electrical installation conduit
7. floor ≥ 150 mm

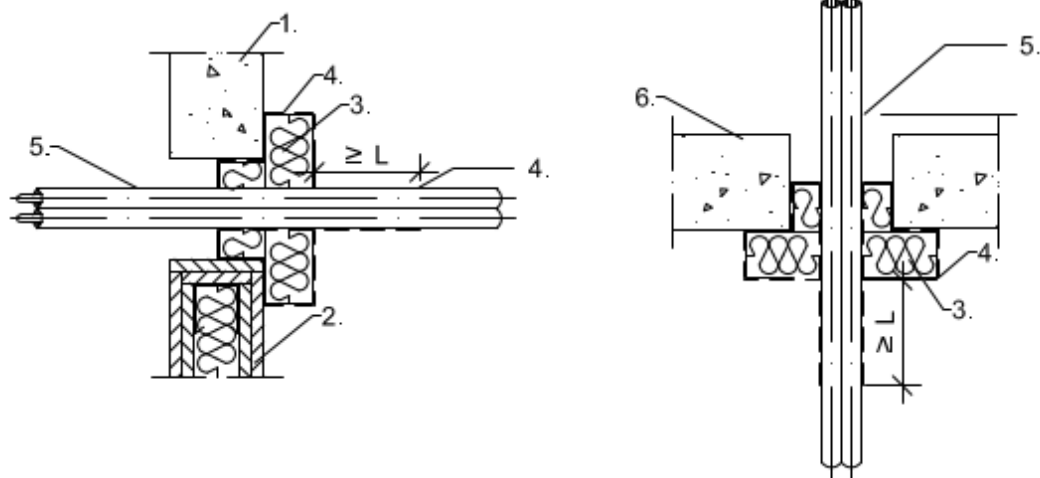
dimensions in mm

PYRO-SAFE FLAMMOTECT-A	Annex 46
Mixed penetration seal of two or three mineral fibre boards (2 x 50 mm or 3 x 50 mm) for installation in walls and floors with access from one side only	

Installation in walls and floors, 2-layer

Special-duo-coax bundle

- with ablative coating



Service	Measure	Fire ressistance class	
		Wall	Floor
Special-duo-coax bundle with ablative coating			
Bundle Ø ≤ 90 mm / cable Ø ≤ 14 mm	ablative coating L ≥ 150 mm x ≥ 1 mm dry film thickness	EI 120 U/U	EI 120 U/U

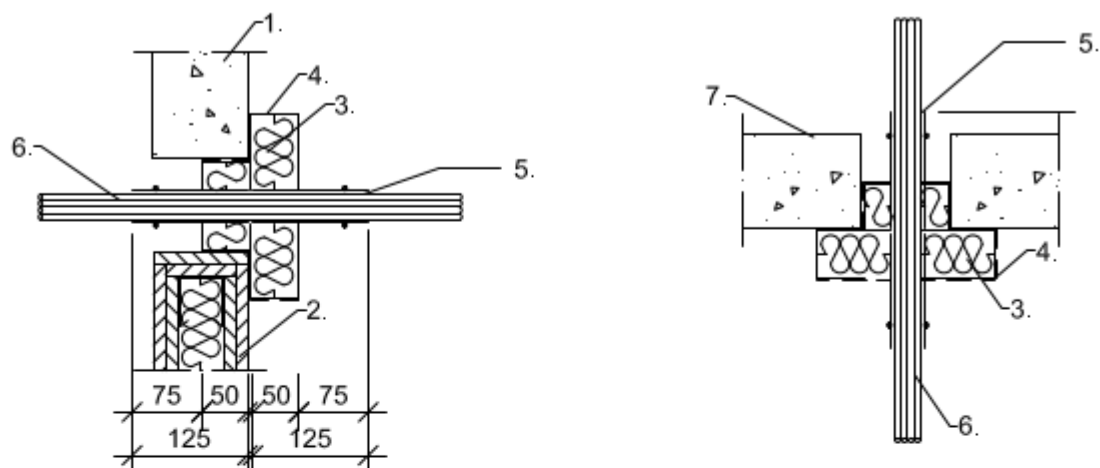
1. rigid wall ≥ 100 mm thickness
2. flexible wall ≥ 100 mm thickness
3. mineral fibre board
4. ablative coating
5. special-duo-coax cable
6. floor ≥ 150 mm

dimensions in mm

PYRO-SAFE FLAMMOTECT-A	Annex 47
Mixed penetration seal of two or three mineral fibre boards (2 x 50 mm or 3 x 50 mm) for installation in walls and floors with access from one side only	

Installation in walls and floors, 2-layer

Speed pipes, bundled or single, with/ without glas fibre cable
 - with intumescent wrap



Service	Measure	Fire ressistance class
		Wall
Speed pipes, bundles or single pipes, with or w/o glass fibre or micro cables		
max. 24 pcs. outside pipe- $\varnothing \leq 7$ mm	intumescent wrap 2 x 2 layer	EI 120 U/U
max. 7 pcs. outside pipe- $\varnothing \leq 10$ mm	intumescent wrap 2 x 2 layer	EI 120 U/U
max. 5 pcs. outside pipe- $\varnothing \leq 12$ mm	intumescent wrap 2 x 2 layer	EI 120 U/U

1. rigid wall ≥ 100 mm thickness
2. flexible wall 100 mm thickness
3. mineral fibre board
4. ablative coating
5. intumescent wrap
6. speed pipes
7. floor ≥ 150 mm thickness

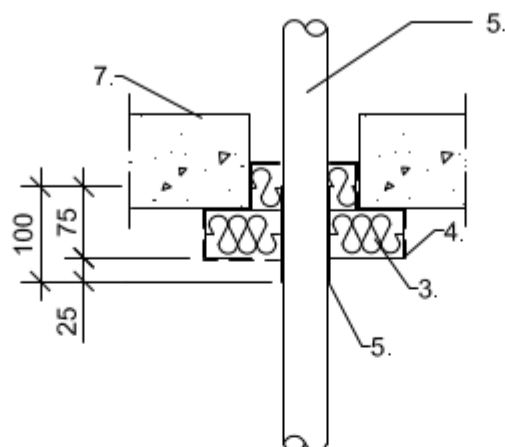
dimensions in mm

PYRO-SAFE FLAMMOTECT-A	Annex 48
Mixed penetration seal of two or three mineral fibre boards (2 x 50 mm or 3 x 50 mm) for installation in walls in floor with access from one side only	

Installation in floors, 2-layer

Combustible pipes

- with intumescent wrap coated from both sides



Service	Measure	Fire resistance
		class Floor
Combustible pipe		
Outside pipe- $\varnothing \leq 50$ mm,	intumescent wrap 1 x 2 layer	EI 90 U/C
Outside pipe- $\varnothing \leq 70$ mm,	intumescent wrap 1 x 2 layer	EI 120 U/C
Outside pipe- $\varnothing \leq 110$ mm,	Intumescent wrap 1 x 3 layer	EI 120 U/C
Outside pipe- $\varnothing \leq 110$ mm,	intumescent wrap 1 x 4 layer	EI 120 U/C

- 3. mineral fibre board
- 4. ablative coating
- 5. intumescent wrap
- 6. combustible pipes
- 7. floor ≥ 150 mm thickness

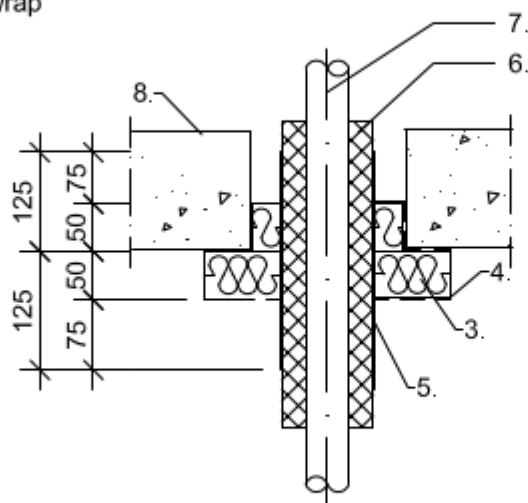
dimensions in mm

PYRO-SAFE FLAMMOTECT-A	Annex 49
Mixed penetration seal of two or three mineral fibre boards (2 x 50 mm or 3 x 50 mm) for installation in floors with access from one side only	

Installation in floors, 2-layer

Non-combustible pipes made of copper, steel stainless steel or cast iron

- with combustible insulation of NH/Armaflex
- with intumescent wrap



Service	Measure	Fire resistance
		class Floor
Combustible pipe		
Outside pipe-Ø ≤ 15 mm,	≥ 400 / 750 mm (bottom top) x 25 mm + intumescent wrap 1 x 2 layer	EI 90 C/U / E 120
Outside pipe-Ø ≤ 15 mm,	≥ 400 / 750 mm (bottom top) x 13 - 24 mm + intumescent wrap 2 x 1 layer	EI 120 C/U
Outside pipe-Ø ≤ 28 mm,	≥ 400 / 750 mm (bottom top) x 19 - 25 mm + intumescent wrap 2 x1 layer	EI 120 C/U
Outside pipe-Ø ≤ 42 mm,	≥ 400 / 750 mm (bottom top) 19 x 24 mm + intumescent wrap 2 x 1 layer	EI 90 / E 120 C/U
Outside pipe-Ø ≤ 42 mm,	≥ 400 / 750 mm (bottom top) 25 mm + intumescent wrap 2 x 1 layer	EI 120 C/U

- 3. mineral fibre board
- 4. ablative coating
- 5. intumescent wrap
- 6. NH/Armacell
- 7. non-combustible pipe
- 8. floor ≥ 150 mm thickness

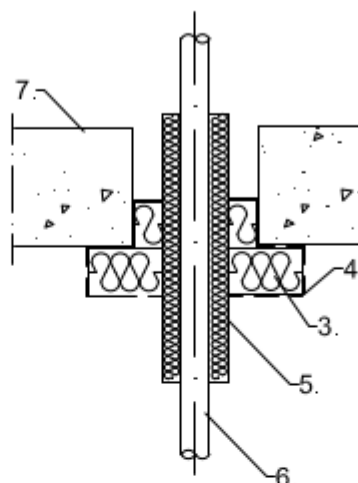
dimensions in mm

PYRO-SAFE FLAMMOTECT-A	Annex 50
Mixed penetration seal of two or three mineral fibre boards (2 x 50 mm or 3 x 50 mm) for installation in floors with access from one side only	

Installation in floors, 2-layer

Multilayer composite pipes HENCO pipes

- with lamella mat



Service	Measure	Fire ressistance class
		Floor
Multilayer composite pipes HENCO-pipes		
Outside pipe- $\varnothing \leq 12$ mm, wall thickness $\geq 1,6$ mm	lamella mat [L X T] ≥ 500 mm x ≥ 20 mm	EI 120 U/C
Outside pipe- $\varnothing \leq 63$ mm, wall thickness $\geq 4,5$ mm	lamella mat [L X T] ≥ 500 mm x ≥ 30 mm	EI 120 U/C

- 3. mineral fibre board
- 4. ablative coating
- 5. lamella mat
- 6. multilayer composite pipe
- 7. floor ≥ 150 mm thickness

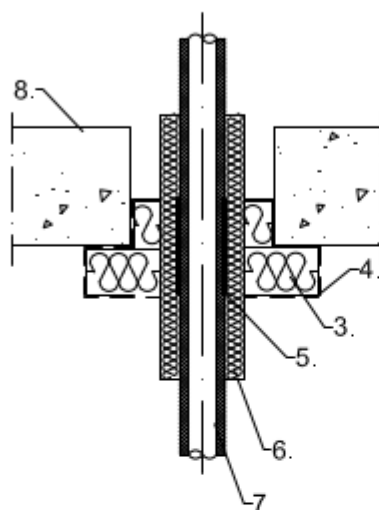
dimensions in mm

PYRO-SAFE FLAMMOTECT-A	Annex 51
Mixed penetration seal of two or three mineral fibre boards (2 x 50 mm or 3 x 50 mm) for installation in floors with access from one side only	

Installation in floors, 2-layer

Multilayer composite pipes HENCO pipes, pre-insulated with PEF

- with intumescent wrap coated on both sides
- with lamella mat



Service	Measure	Fire ressistance class
		Floor
Multilayer composite pipes HENCO-pipes, pre-insulated		
Outside pipe-Ø ≤ 32 mm,	lamella mat [L X T] ≥ 500 mm x ≥ 20 mm intumescent wrap 2 x 1 layer	EI 120 U/C

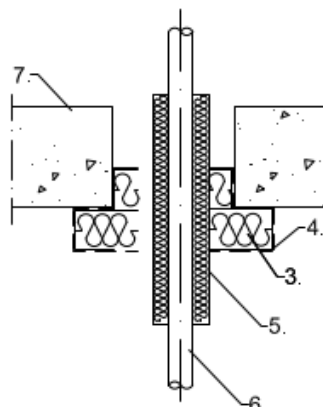
3. mineral fibre board
4. ablative coating
5. intumescent wrap
6. lamella mat
7. multilayer composite pipe
8. floor ≥ 150 mm thickness

dimensions in mm

PYRO-SAFE FLAMMOTECT-A	Annex 52
Mixed penetration seal of two or three mineral fibre boards (2 x 50 mm or 3 x 50 mm) for installation in floors with access from one side only	

Installation in floors, 2-layer

Non-combustible pipes made of copper, steel, stainless steel or cast iron
 - with lamella mat



Service	Measure	Fire ressistance class Floor
Non-combustible pipes made of copper, steel, stainless steel or cast iron		
Outside pipe-Ø ≤ 28 mm,	lamella mat (top/bottom) ≥ 500 mm x ≥ 500 mm x ≥ 30 mm	EI 120 U/C
Outside pipe-Ø ≤ 42 mm,	lamella mat (top/bottom) ≥ 500 mm x ≥ 500 mm x ≥ 40 mm	EI 120 U/C
Outside pipe-Ø ≤ 54 mm,	lamella mat (top/bottom) ∞ / ≥ 950 mm x ≥ 40 mm	EI 120 U/C
Outside pipe-Ø ≤ 54 mm,	lamella mat (top/bottom) ≥ 500 m / 1000 mm x ≥ 30 mm + lamella mat ≥ 950 mm x ≥ 30 mm + lamella mat ≥ 500 mm x ≥ 30 mm	EI 120 U/C
Outside pipe-Ø ≤ 88,9 mm,	lamella mat (top/bottom) ∞ / ≥ 950 mm x ≥ 50 mm	EI 120 U/C
Outside pipe-Ø ≤ 88,9 mm,	lamella mat (top/bottom) ≥ 500 / 1000 mm x ≥ 50 mm + lamella mat ≥ 500 mm x ≥ 50 mm	EI 120 U/C
Non-combustible pipes made of steel, stainless steel or cast iron		
Outside pipe-Ø ≤ 63,5 mm,	lamella mat (top/bottom) ∞ / ≥ 950 mm x ≥ 300 mm	EI 120 U/C
Outside pipe-Ø ≤ 63,5 mm,	lamella mat (top/bottom) ≥ 500 / 1000 mm x ≥ 30 mm + lamella mat ≥ 500 mm x ≥ 30 m	EI 120 U/C
Outside pipe-Ø ≤ 114,3 mm,	lamella mat (top/bottom) ∞ / ≥ 950 mm x ≥ 50 mm	EI 120 U/C
Outside pipe-Ø ≤ 114,3 mm,	lamella mat (top/bottom) ≥ 500 / 1000 mm x ≥ 50 mm + lamella mat ≥ 950 mm x ≥ 30 m	EI 120 U/C

- 3. mineral fibre board
- 4. ablative coating
- 5. lamella mat
- 6. non-combustible pipe
- 7. floor ≥ 150 mm thickness

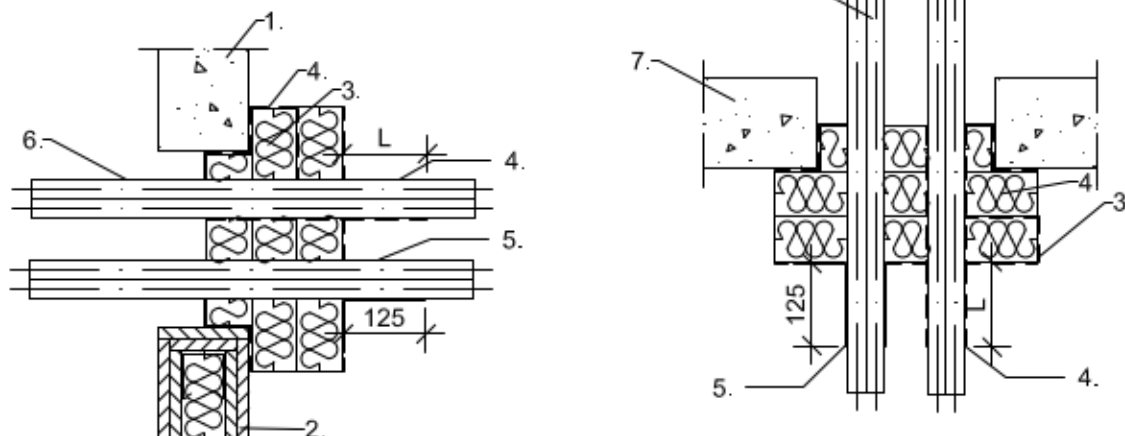
dimensions in mm

PYRO-SAFE FLAMMOTECT-A	Annex 53
Mixed penetration seal of two or three mineral fibre boards (2 x 50 mm or 3 x 50 mm) for installation in floors with access from one side only	

Installation in walls and floors, 3-layer

Cables, cable bundles and cable trays

- with ablative coating
- with intumescent wrap



Service	Measure	Fire resistance class	
		Wall	Floor
Cables, cable bundles and cable trays			
Cables Ø ≤ 21 mm	ablative coating L ≥ 150 mm x ≥ 1 mm dry film thickness	EI 120	EI 120
Cables Ø ≤ 21 mm	intumescent wrap 1 x 1 layer +45 mm overlapping	EI 120	EI 120
Cables Ø ≤ 50 mm	ablative coating L ≥ 150 mm x ≥ 1 mm dry film thickness	EI 90/ E 120	EI 90
Cables Ø ≤ 50 mm	intumescent wrap 1 x 1 layer +45 mm overlapping	EI 90/ E 120	EI 90
Cables Ø ≤ 80 mm	ablative coating L ≥ 150 mm x ≥ 1 mm dry film thickness	EI 90/ E 120	EI 90
Cables Ø ≤ 80 mm	Intumescent wrap 1 x 1 layer +45 mm overlapping	EI 90/ E 120	EI 90
Cable bundles Ø > 100 mm	ablative coating L ≥ 150 mm x ≥ 1 mm dry film thickness	EI 120	EI 120
Cable bundles Ø > 100 mm	intumescent wrap 1 x 1 layer +45 mm overlapping	EI 120	EI 120

1. rigid wall ≥ 100 mm thickness
2. flexible wall 100 mm thickness
3. mineral fibre board
4. ablative coating
5. intumescent wrap
6. cable

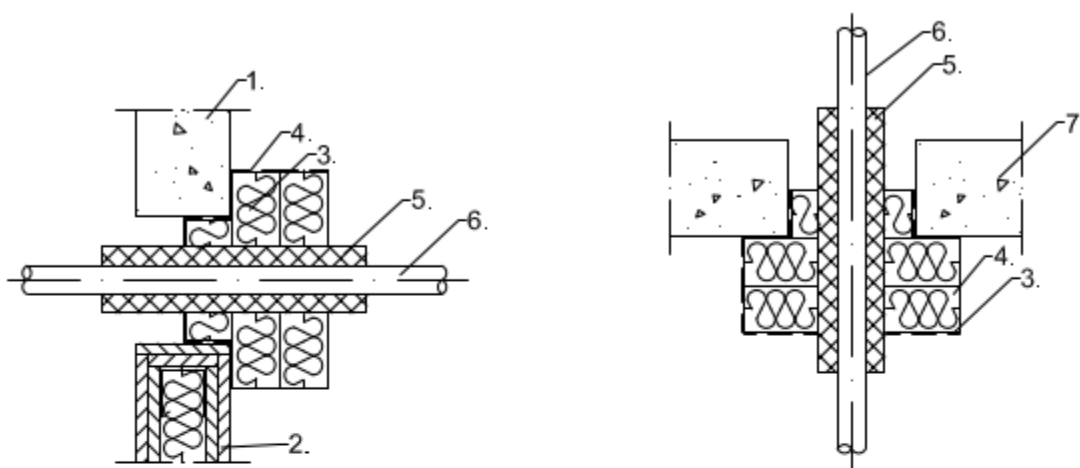
dimensions in mm

PYRO-SAFE FLAMMOTECT-A	Annex 54
Mixed penetration seal of two or three mineral fibre boards (2 x 50 mm or 3 x 50 mm) for installation in walls and floors with access from one side only	

Installation in walls and floors, 3-layer

Multilayer composite pipes "HENCO pipes"

- with combustible insulation "Armaflex Protect"



Service	Measure	Fire resistance class	
		Wall	Floor
Multilayer composite pipes HENCO-pipes			
Outside pipe-Ø ≤ 12 mm, wall thickness ≥1,6 mm	ArmaflexProtect [L X T] ≥ 480 mm x ≥ 19 mm	EI 120 U/C	EI 90 U/C
Outside pipe-Ø ≤ 63 mm, wall thickness ≥ 4,5 mm	ArmaflexProtect [L X T] ≥ 480 mm x ≥ 25 mm	EI 120 U/C	EI 90 U/C

1. rigid wall ≥ 100 mm thickness
2. flexible wall ≥ 100 mm thickness
3. mineral fibre board
4. ablative coating
5. ArmaflexProtect
6. Multilayer composite pipe
7. floor ≥ 150 mm thickness

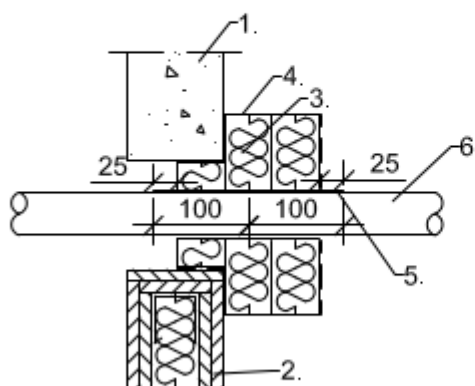
dimensions in mm

PYRO-SAFE FLAMMOTECT-A	Annex 55
Mixed penetration seal of two or three mineral fibre boards (2 x 50 mm or 3 x 50 mm) for installation in walls and floors with access from one side only	

Installation in walls, 3-layer

Combustible pipes

- with intumescent wrap coated from both sides



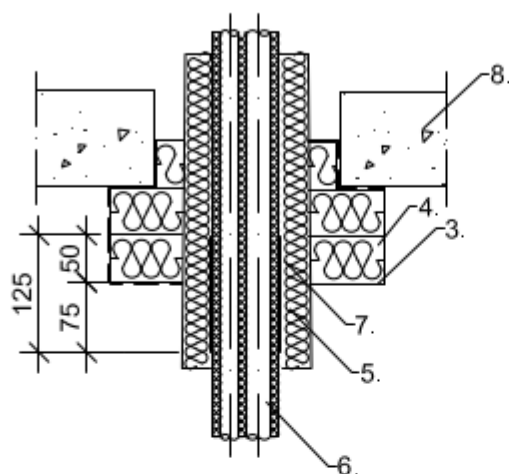
Service	Measure	Fire resistance class	
		Wall	Floor
Combustible pipe			
Outside pipe-Ø ≤ 50 mm,	intumescent wrap 1 x 2 layer	EI 120 U/U	EI 90 U/C
Outside pipe-Ø ≤ 80 mm,	intumescent wrap 2 x 2 layer	EI 120 U/U	EI 120 U/C
Outside pipe-Ø ≤ 110 mm,	intumescent wrap 2 x 3 layer	EI 120 U/U	

1. rigid wall ≥ 100 mm thickness
2. flexible wall 100 mm thickness
3. mineral fibre board
4. ablative coating
5. intumescent wrap
6. Combustible pipe

dimensions in mm

PYRO-SAFE FLAMMOTECT-A	Annex 56
Mixed penetration seal of two or three mineral fibre boards (2 x 50 mm or 3 x 50 mm) for installation in walls with access from one side only	

Installation in floors, 3-layer
 HVAC-split lines
 - with intumescent wrap



Service	Measure	Fire resistance
		class Floor
HVAC split line combinations		
Double pipe (6-22/ 8-22 mm) or single copper pipe (6-22 mm); PEF-insulation 9 mm thickness + PVC-U pipe ≤ Ø 25 mm + 4 accompanying cables ≤ 21 mm	intumescent wrap 2 x 1 layer + lamella mat ≥ 250/ 500 mm (top/bottom) x ≥ 30 mm	EI 90 U/U

- 3. mineral fibre board
- 4. ablative coating
- 5. lamella mat
- 6. non-combustible pipe
- 7. floor ≥ 150 mm thickness

dimensions in mm

PYRO-SAFE FLAMMOTECT-A	Annex 56
Mixed penetration seal of two or three mineral fibre boards (2 x 50 mm or 3 x 50 mm) for installation in floors with access from one side only	