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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 2024/06/24

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:

System Flammotect

Product family to which the
above construction product
belongs:

Ablative fire stopping product used in penetration seals

Manufacturer:

Flamro Brandschutz-Systeme GmbH
Am Sportplatz 2
DE-56291 Leiningen
Tel +49 4105 4090 0
Internet www.flamro.de

Manufacturing plant:

Plant LEI

This European Technical
Assessment contains:

185 pages including 179 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:

The previous ETA with the same number, issued on
2024-01-12

Translations of this European Technical Assessment in other languages shall fully correspond to the original issued document and should be identified as such.

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II SPECIFIC PART OF THE EUROPEAN TECHNICAL ASSESSMENT

1 Technical description of product

The construction product "System Flammotect" is an ablative coating material. It is delivered as a filler of white 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 the annexes.

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 "System Flammotect" 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	System Flammotect
Mineral fibreboards	Mineral fibre board in accordance with EN 13162 thickness ≥ 50 mm density 150 kg/m^3 Reaction to fire classification in accordance with EN 13501-1: Class A1

Product type	Trade name
Mineral fibre mats	Mineral fibre lamella mat in accordance with EN 14303 Reaction to fire class acc. to EN 13501-1: A2-s1, d0 or A1 Bulk density: $\geq 35 \text{ kg/m}^3$ Melting point: $\geq 1000 \text{ }^\circ\text{C}$
Mineral fibre pipe shells	pipe shell of concentrically wrapped rockwool – unbacked in accordance with EN 14303 density: $100 \text{ kg/m}^3 - 120 \text{ kg/m}^3$ Reaction to fire class acc. to EN 13501-1: A2-s1, d0 or A1 Bulk density: $\geq 80 \text{ kg/m}^3$ Melting point: $\geq 1000 \text{ }^\circ\text{C}$
FEF-Insulation	Insulation made of flexible elastomeric foam (FEF) in accordance with EN 14304 Reaction to fire class acc. to EN 13501-1: B-s3, d0
Mineral wool, loose stone wool	rockwool with grid strengthened and aluminium foil according to the general building supervisory board approval Z-23.14-1115 density: $40 \text{ kg/m}^3 - 50 \text{ kg/m}^3$ Reaction to fire class acc. to EN 13501-1: A1 Melting point: $\geq 1000 \text{ }^\circ\text{C}$

Table 1 – components of the verified penetration seals

Detailed information and data on the verified penetration seals are given in the annexes. 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 "System Flammotect" 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	Classified in accordance with EN 13501-2, see annexes 1 – 177 for details
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 performance assessed
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

See additional information in Chapter 3.7-3.8

*) In addition to the specific clauses relating to dangerous substances contained in this European technical Assessment, 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 Products Regulation, these requirements need also to be complied with, when and where they apply.

3.7 Methods of verification

The assessment of the performance of " System Flammotect" 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, as an ablative coating.

3.8 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 " System Flammotect" 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 "System Flammotect" 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 provided for 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 2024-06-24 by



Thomas Bruun
Managing Director, ETA-Danmark

Penetration sealing system made of mineral wool and ablative filler ($\geq 3,0$ mm dft)

Empty seal

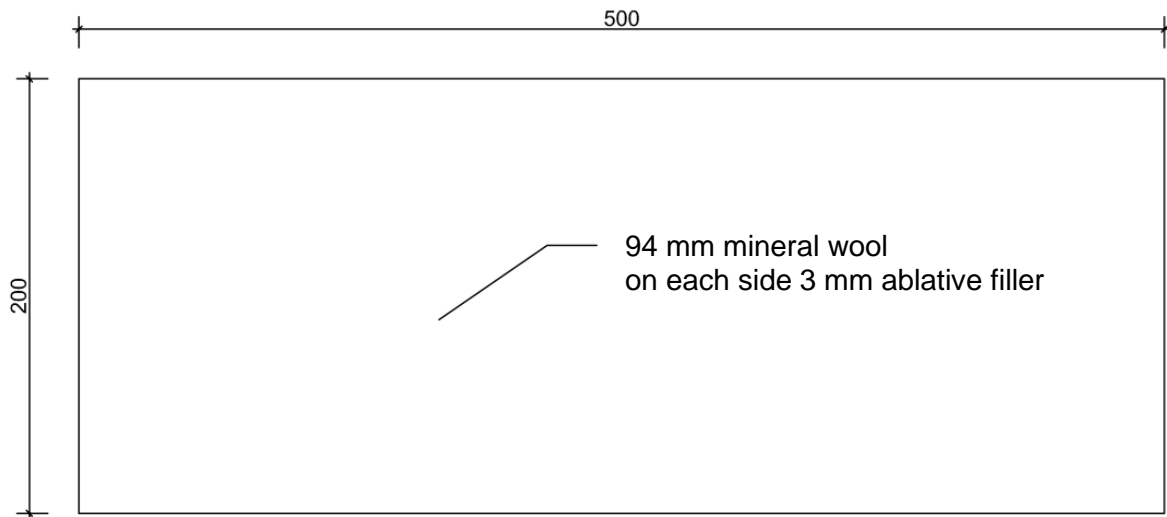
Mixed penetration seal "ES"

lightweight partition wall, thickness 100 mm

rectangular penetration seal w x h = 500 mm x 200 mm, no aperture framing, seal depth 100 mm

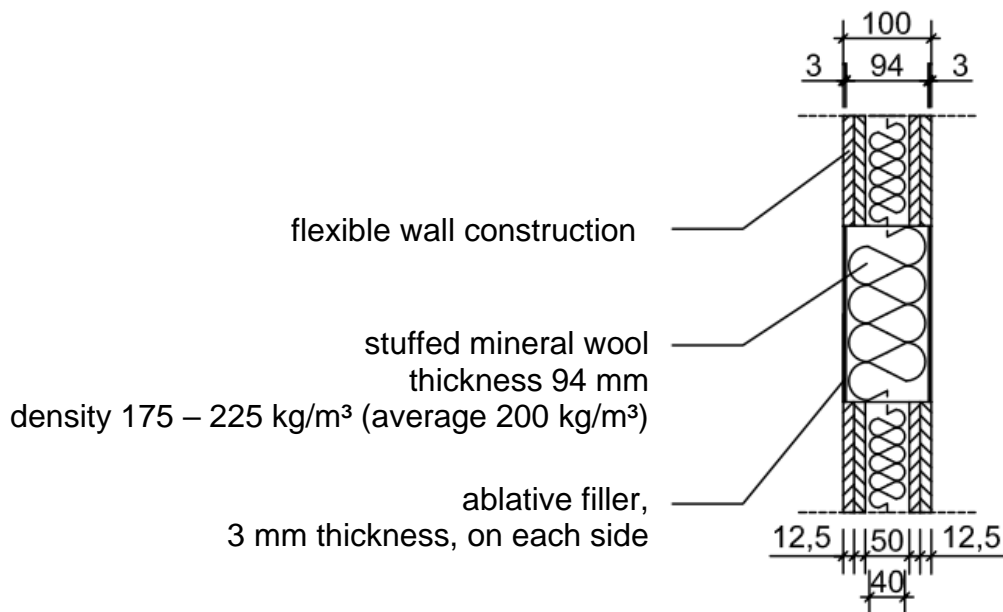
View penetration seal ES No. 1

blank penetration seal



Section view penetration seal ES No. 1

Blank penetration seal



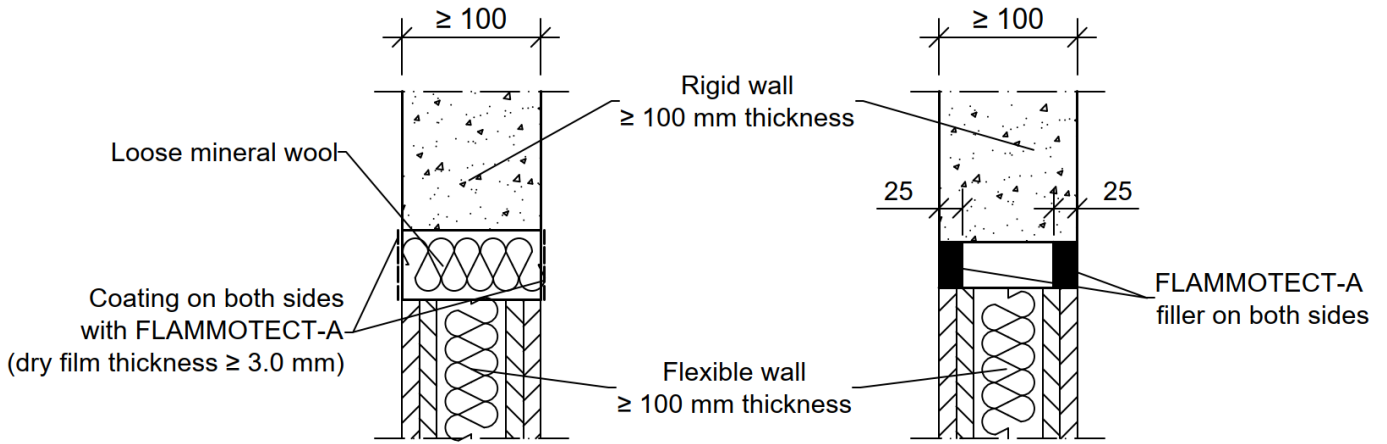
Dimensions in mm

System Flammotect	Annex 2
Penetration sealing system made of mineral wool and ablative filler in walls and floors	

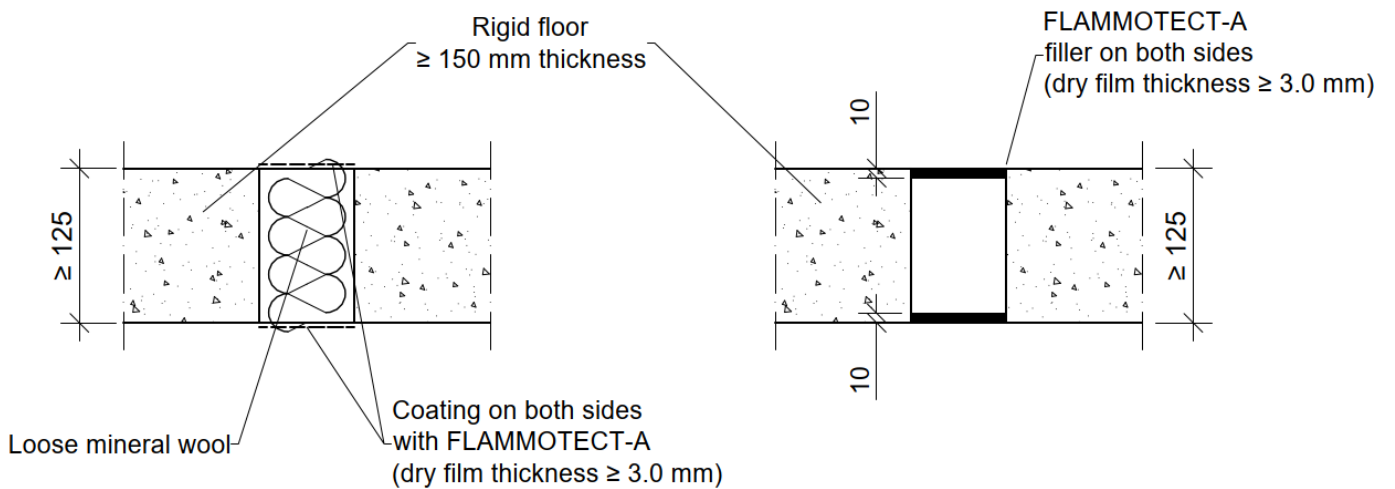
Penetration sealing system made of mineral wool and ablative filler ($\geq 3,0$ mm dft)

Design variants

Wall



Floor

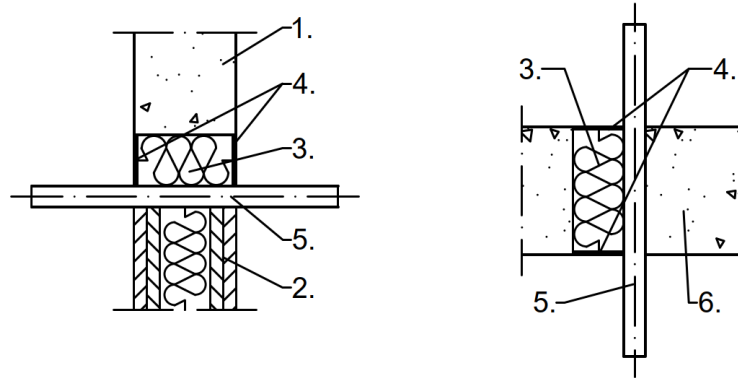


Dimensions in mm

System Flammotect	Annex 3
Penetration sealing system made of mineral wool and ablative filler in walls and floors	

Penetration sealing system made of mineral wool and ablative filler ($\geq 3,0$ mm dft)

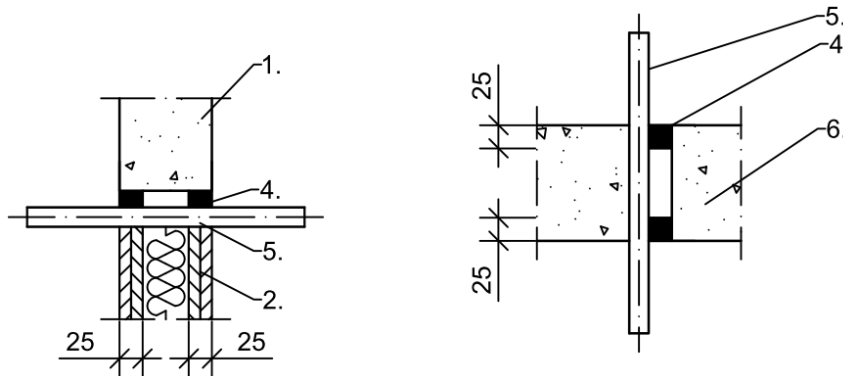
Cables $\varnothing \leq 21$ mm or cable bundles $\varnothing \leq 100$ mm with cables ≤ 21 mm without measures



Fire resistance classes			
Service	Measures	Wall Fire resistance class	Floor Fire resistance class
Cables, cable bundles			
Cables $\varnothing \leq 21$ mm	-	EI 90	EI 90
Cable bundles $\varnothing \leq 100$ mm with cables ≤ 21 mm	-	EI 90	EI 90

Cables

Single penetration without backfilling material, cables $\varnothing \leq 21$ mm, with ablative filler



Fire resistance classes			
Service	Measures	Wall Fire resistance class	Floor Fire resistance class
Cables			
Cables $\varnothing \leq 21$ mm	Ablative filler, dft ≥ 25 mm	EI 90	EI 90
	Ablative filler, dft ≥ 3 mm	-	EI 90

- 1. Rigid wall ≥ 100 mm thickness
- 2. Flexible wall ≥ 100 mm thickness
- 3. Loose mineral wool

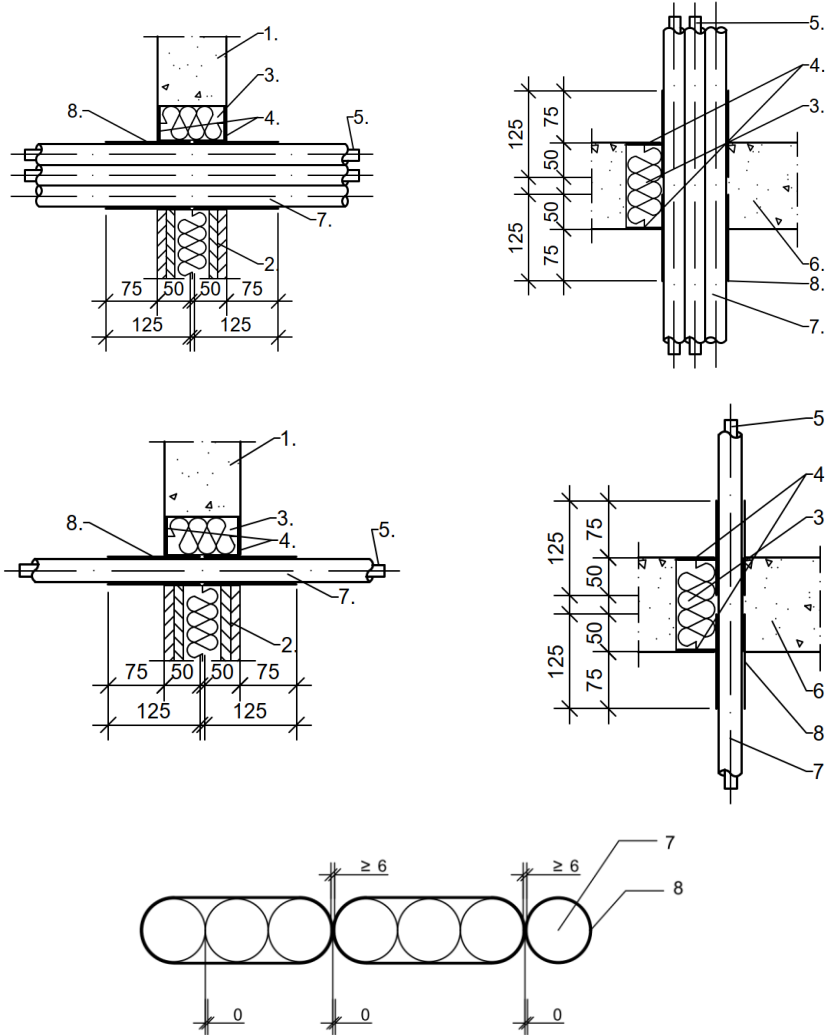
- 4. Ablative filler ≥ 3 mm resp. ≥ 25 mm
- 5. Cable
- 6. Rigid floor ≥ 150 mm thickness

Dimensions in mm

System Flammotect	Annex 4
Penetration sealing system made of mineral wool and ablative filler in walls and floors	

Penetration sealing system made of mineral wool and ablative filler ($\geq 3,0$ mm dft)

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



Fire resistance classes				
Service	Cable	Measures	Wall Fire resistance class	Floor Fire resistance class
Electrical installation conduits (EIC)				
EIC made of plastic $\varnothing \leq 32$	with/ without	Intumescent wrap 2 x 62,5 / 1 x 125 mm 1 layer	EI 120 U/U	EI 120 U/U
EIC made plastic bundle $\varnothing \leq 100$	with/ without	Intumescent wrap 2 x 62,5 / 1 x 125 mm 2 layers	EI 120 U/U	EI 120 U/U
Linear arrangement of plastic EIC ≤ 3 pcs.	with/ without	Intumescent wrap 2 x 62,5 / 1 x 125 mm 1 layer	EI 120 U/U	EI 120 U/U

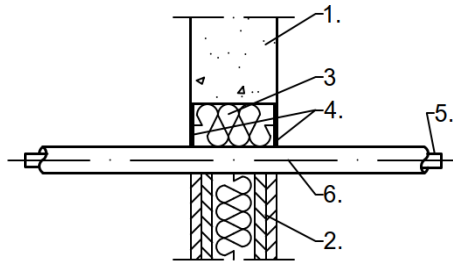
- 1. Rigid wall ≥ 100 mm thickness
- 2. Flexible wall ≥ 100 mm thickness
- 3. Loose mineral wool
- 4. Ablative filler ≥ 3 mm
- 5. Cable
- 6. Rigid floor ≥ 150 mm thickness
- 7. Electric installation conduits
- 8. Intumescent wrap

Dimensions in mm

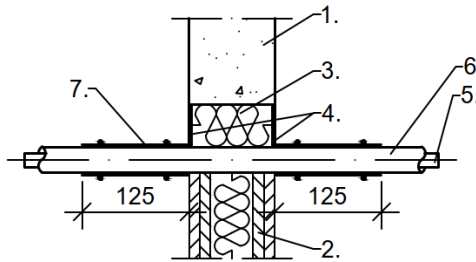
System Flammotect	Annex 5
Penetration sealing system made of mineral wool and ablative filler in walls and floors	

Penetration sealing system made of mineral wool and ablative filler ($\geq 3,0$ mm dft)

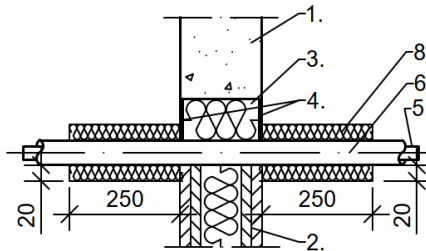
Metal conduits $\varnothing \leq 16$ mm - $\varnothing \leq 32$ mm, rigid, with or without cables ≤ 14 mm or $\varnothing 32$ mm - ≤ 50 mm with or without cables $\varnothing \leq 21$ mm - no measures



Metal conduits ≤ 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



Fire resistance classes					
Service	Cable	Measures	Wall Fire resistance class	Floor Fire resistance class	
Electrical installation conduits (EIC)					
EIC made of metal	$\varnothing \leq 16$	with/ without ≤ 14	-	EI 120 U/C	-
	$\varnothing > 16 - \leq 32$	with/ without ≤ 14	-	EI 30 / E 120 U/C	-
	$\varnothing > 32 - \leq 50$	with/ without ≤ 14	-	EI 30 / E 120 U/C	-
	$\varnothing \leq 16$	with/ without ≤ 14	Intumescent wrap (2 x 62,5 / 1 x 125 mm) 2 x 2 layers	EI 120 U/C	-
	$\varnothing > 16 - \leq 32$	with/ without ≤ 14	Intumescent wrap (2 x 62,5 / 1 x 125 mm) 2 x 2 layers	EI 120 U/C	-
	$\varnothing > 32 - \leq 50$	with/ without ≤ 14	Intumescent wrap (2 x 62,5 / 1 x 125 mm) 2 x 2 layers	EI 120 U/C	-
	$\varnothing \leq 32$	with/ without ≤ 14	Lamella mat	EI 120 U/C	EI 120 U/C
	$\varnothing > 32 - \leq 50$	with/ without ≤ 14	Lamella mat	EI 120 U/C	-

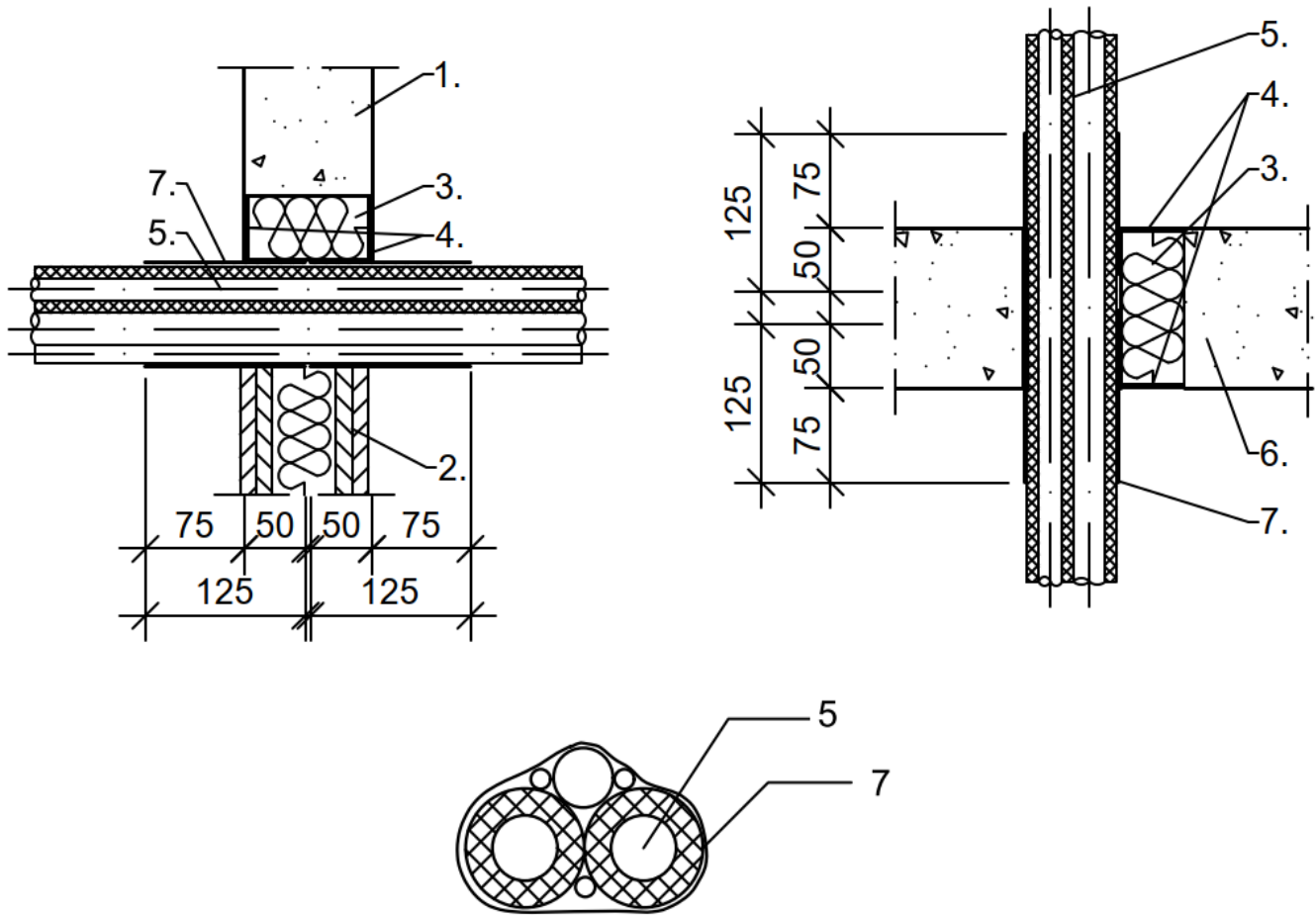
- | | |
|--|-----------------------------------|
| 1. Rigid wall ≥ 100 mm thickness | 5. Cable |
| 2. Flexible wall ≥ 100 mm thickness | 6. Electric installation conduits |
| 3. Loose mineral wool | 7. Intumescent wrap |
| 4. Ablative filler ≥ 3 mm | 8. Lamella mat |

Dimensions in mm

System Flammotect	Annex 6
Penetration sealing system made of mineral wool and ablative filler in walls and floors	

Penetration sealing system made of mineral wool and ablative filler ($\geq 3,0$ mm dft)

HVAC-split line combinations



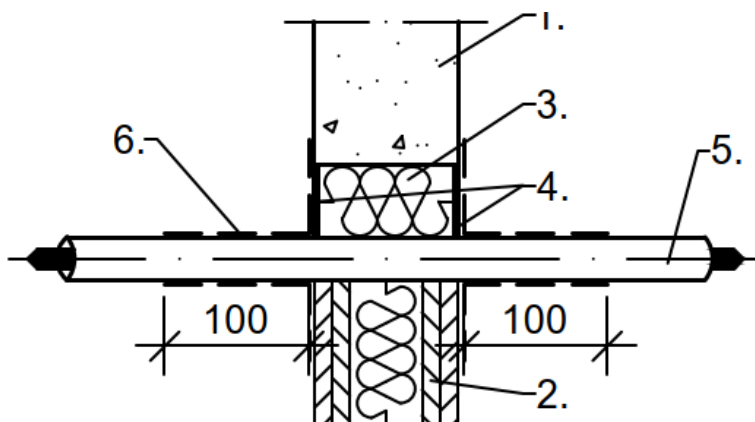
Fire resistance classes			
Service	Measures	Wall Fire resistance class	Floor Fire resistance class
HVAC split line combinations			
Copper pipe $\leq 2 \times \varnothing \leq 18$ + PE-Foam 9 mm + 1x PVC-U/PVC-C pipe $\varnothing \leq 25 \times 1,5$ mm + ≤ 3 x cables $\varnothing \leq 14$ mm	Intumescent wrap 2 x 62,5 / 1 x 125 mm 2 layers	EI 120	EI 120

- | | |
|--|--|
| 1. Rigid wall ≥ 100 mm thickness | 5. HVAC split line combination |
| 2. Flexible wall ≥ 100 mm thickness | 6. Rigid floor ≥ 150 mm thickness |
| 3. Loose mineral wool | 7. Intumescent wrap |
| 4. Ablative filler ≥ 3 mm | |

Dimensions in mm

System Flammotect	Annex 7
Penetration sealing system made of mineral wool and ablative filler in walls and floors	

Coaxial cables and waveguides



Fire resistance classes		
Service	Measures	Wall Fire resistance class
Coaxial cable/waveguides		
CommScope Heliax $\varnothing \leq 51,1$ mm	Ablative coating ≥ 100 mm x ≥ 1 mm DFT	EI 120 U/C
RFS Cellflex $\varnothing \leq 50,3$ mm	Ablative coating ≥ 100 mm x ≥ 1 mm DFT	EI 120 U/C
RFS Radiaflex $\varnothing \leq 48,2$ mm	Ablative coating ≥ 100 mm x ≥ 1 mm DFT	EI 120 U/C

- | | |
|--|---------------------------------|
| 1. Rigid wall ≥ 100 mm thickness | 4. Ablative filler ≥ 3 mm |
| 2. Flexible wall ≥ 100 mm thickness | 5. Coaxial cables or waveguides |
| 3. Loose mineral wool | 6. Ablative coating ≥ 1 mm |

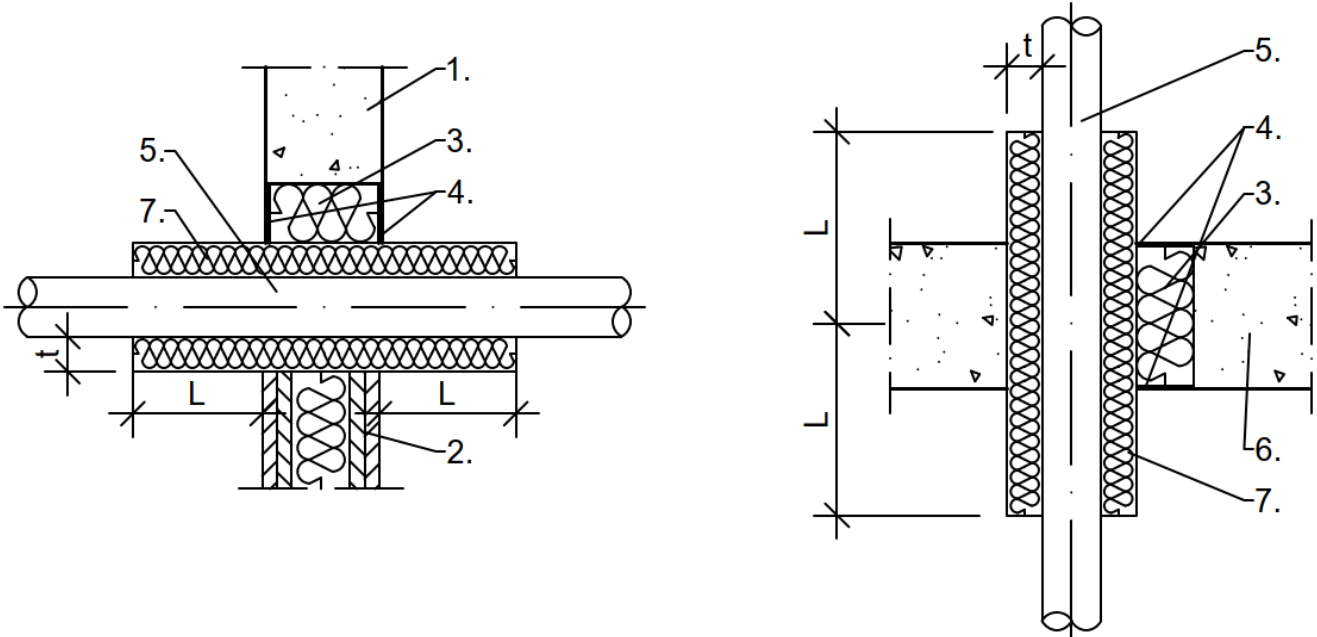
Dimensions in mm

System Flammotect	Annex 8
Penetration sealing system made of mineral wool and ablative filler in walls and floors	

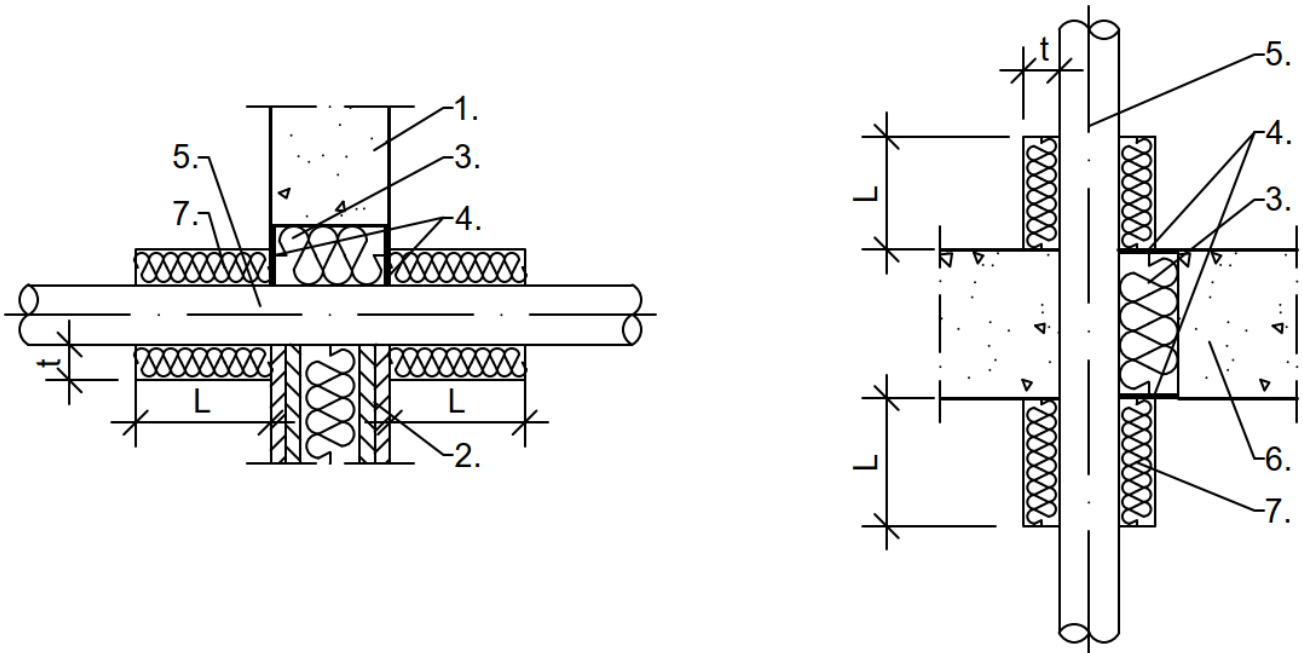
Penetration sealing system made of mineral wool and ablative filler ($\geq 3,0$ mm dft)

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

Variant LS



Variant LI



- 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

System Flammotect	Annex 9
Penetration sealing system made of mineral wool and ablative filler in walls and floors	

Penetration sealing system made of mineral wool and ablative filler ($\geq 3,0$ mm dft)**Non-combustible pipes of copper, steel, stainless steel or cast iron with non-combustible insulation made of mineral fibre**

Fire resistance classes - Wall				
Service	Outside \varnothing	Pipe wall thickness	Measures	Wall Fire resistance class
Non-combustible pipes with insulation made of mineral fibre				
Copper, steel, stainless steel, cast iron	≤ 22	0,6 - 14,2	Lamella mat Both sides $\geq 450 \times 20-100$ mm	EI 120 U/C
	$> 22 - \leq 60$		Lamella mat Both sides $\geq 200 \times 30-100$ mm	EI 120 U/C
	$> 60 - \leq 88,9$		Lamella mat Both sides $\geq 450 \times 30-100$ mm	EI 120 U/C
Steel, stainless steel, cast iron	≤ 42	1,8 - 14,2	Lamella mat Both sides $\geq 200 \times 30-100$ mm	EI 120 U/C
	$> 42 - \leq 114,3$	1,8/3,2 - 14,2	Lamella mat Both sides $\geq 450 \times 30-100$ mm	EI 120 U/C
	$> 114,3 - \leq 159$	3,2/4,0 - 14,2	Lamella mat Both sides $\geq 1200 \times 100$ mm	EI 120 U/C
	$> 114,3 - \leq 219,1$	3,2/4,5 - 14,2	Lamella mat Both sides $\geq 1200 \times 30-100$ mm	EI 90 U/C

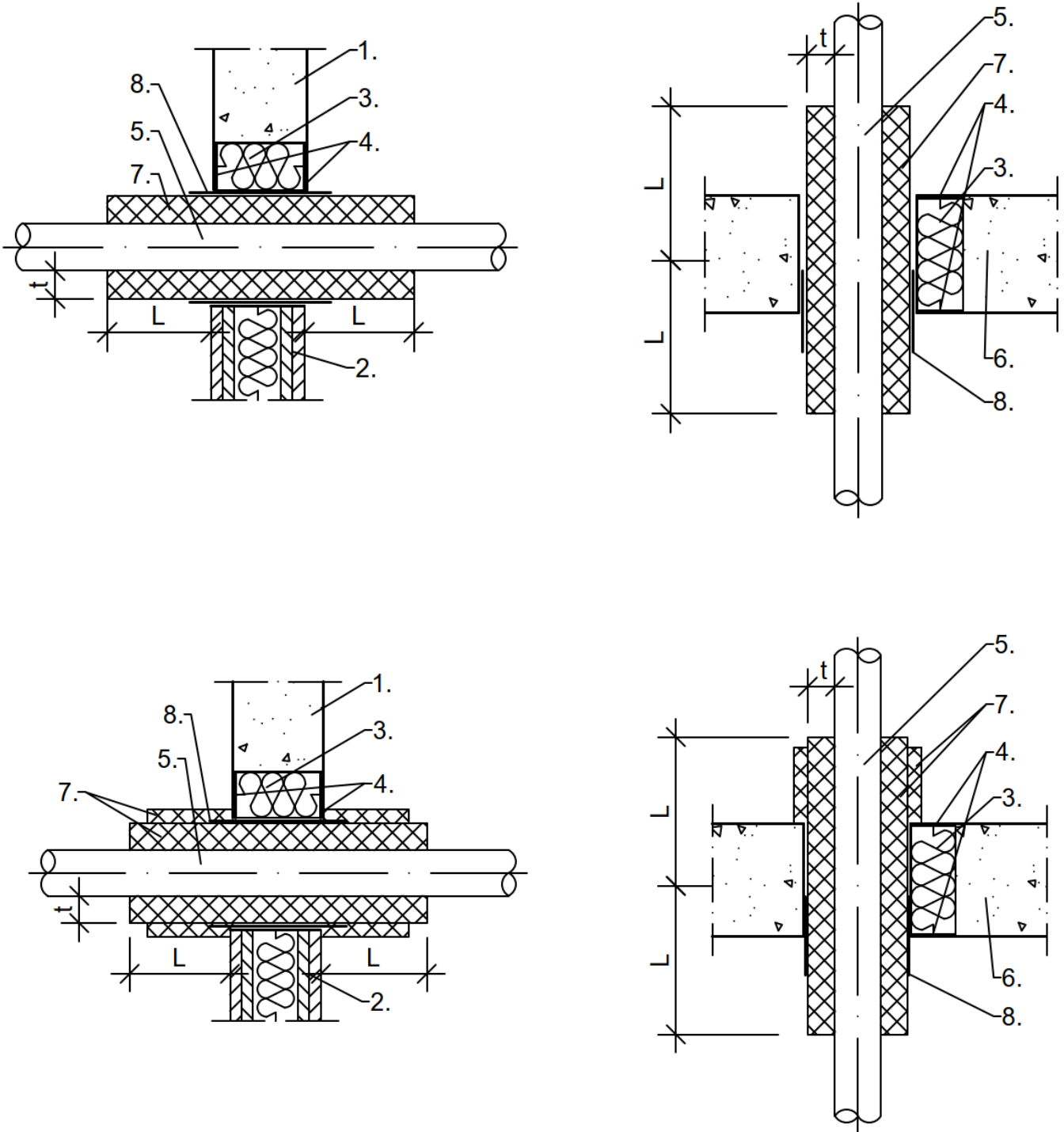
Fire resistance classes - Floor				
Service	Outside \varnothing	Pipe wall thickness	Measures	Floor Fire resistance class
Non-combustible pipes with insulation made of mineral fibre				
Copper, steel, stainless steel, cast iron	≤ 22	0,6 - 14,2	Lamella mat Both sides $\geq 425 \times 20-100$ mm	EI 120 U/C
			Lamella mat Both sides $\geq 175 \times 30-100$ mm	EI 120 U/C
	$> 22 - \leq 42$		Lamella mat Both sides $\geq 425 \times 30-100$ mm	EI 120 U/C
	$> 42 - \leq 88,9$		Lamella mat Both sides $\geq 675 \times 30-100$ mm	EI 90 U/C
Steel, stainless steel, cast iron	≤ 42	1,8 - 14,2	Lamella mat Both sides $\geq 125 \times 30-100$ mm	EI 120 U/C
	$> 42 - \leq 114,3$	1,8/3,2 - 14,2	Lamella mat Both sides $\geq 425 \times 30-100$ mm	EI 120 U/C
	$> 114,3 - \leq 159$	3,2/4,0 - 14,2	Lamella mat Both sides $\geq 1175 \times 30-100$ mm	EI 120 U/C
	$> 114,3 - \leq 219,1$	3,2/4,5 - 14,2	Lamella mat Both sides $\geq 1175 \times 30$ mm	EI 120 U/C
			Lamella mat Both sides $\geq 1175 \times 30-100$ mm	EI 90 U/C

Dimensions in mm

System Flamotect	Annex 10
Penetration sealing system made of mineral wool and ablative filler in walls and floors	

Penetration sealing system made of mineral wool and ablative filler ($\geq 3,0$ mm dft)

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



- 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. Insulation made of FEF
- 8. Intumescent wrap

Dimensions in mm

System Flammotect	Annex 11
Penetration sealing system made of mineral wool and ablative filler in walls and floors	

Penetration sealing system made of mineral wool and ablative filler ($\geq 3,0$ mm dft)**Non-combustible pipes of copper, steel, stainless steel or cast iron with insulation made of FEF**

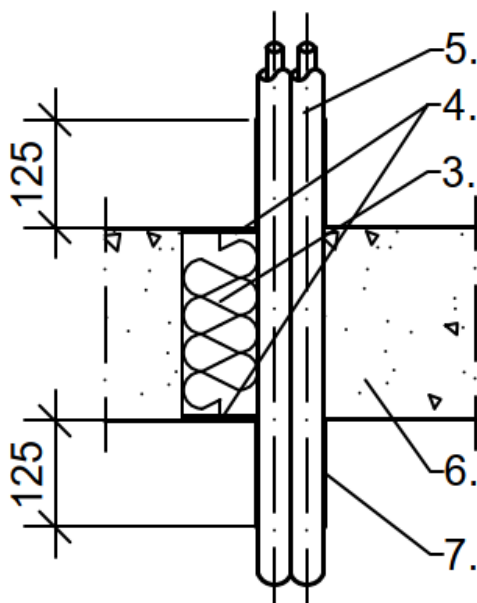
Fire resistance classes - Wall				
Service	Outside \varnothing	Pipe wall thickness	Measures	Wall Fire resistance class
Non-combustible pipes with insulation made of FEF acc. EN 14304				
Copper, steel, stainless steel, cast iron	≤ 15 mm Insulation thickness 10 mm	0,8 - 14,2	Intumescent wrap 2 x 62,5 / 1 x 125 mm; 1 layer	EI 120 U/C
	$> 15 - \leq 54$ mm Insulation thickness 19 - 38 mm		Intumescent wrap 2 x 62,5 / 1 x 125 mm; 2 layers	EI 120 U/C
	$> 54 - \leq 88,9$ mm Insulation thickness 25 mm		Intumescent wrap 2 x 62,5 / 1 x 125 mm; 2 layers	EI 120 U/C
	≤ 42 mm Insulation thickness 10 mm		Intumescent wrap 2 x 62,5 / 1 x 125 mm; 1 layer	EI 90 U/C
	$> 42 - \leq 88,9$ mm Insulation thickness 19 - 38 mm		Intumescent wrap 2 x 62,5 / 1 x 125 mm; 2 layers	EI 90 U/C
Steel, stainless steel, cast iron	≤ 15 mm Insulation thickness 10 - 38 mm		Intumescent wrap 2 x 62,5 / 1 x 125 mm; 2 layers	EI 120 U/C
	$> 15 - \leq 88,9$ mm Insulation thickness 19 - 38 mm		Intumescent wrap 2 x 62,5 / 1 x 125 mm; 2 layers	EI 120 U/C
	$> 88,9 - \leq 114,3$ mm Insulation thickness 19 - 38 mm		Intumescent wrap 2 x 62,5 / 1 x 125 mm; 2 layers + Protective insulation FEF 250x19	EI 120 U/C
	$> 114,3 - \leq 159$ mm Insulation thickness 25 - 38 mm		Intumescent wrap 2 x 62,5 / 1 x 125 mm; 2 layers + Protective insulation FEF 250x19	EI 120 U/C
	$> 159 - \leq 219,1$ mm Insulation thickness 25 - 38 mm		Intumescent wrap 2 x 62,5 / 1 x 125 mm; 2 layers + Protective insulation FEF 600x38	EI 120 U/C

Fire resistance classes - Floor				
Service	Outside \varnothing	Pipe wall thickness	Measures	Floor Fire resistance class
Non-combustible pipes with insulation made of FEF acc. EN 14304				
Copper, steel, stainless steel, cast iron	≤ 60 mm Insulation thickness 13 - 40 mm	0,6 - 14,2	Intumescent wrap 2 x 62,5 / 1 x 125 mm; 2 layers	EI 120 U/C
	$> 60 - \leq 88,9$ mm Insulation thickness 25 mm		Intumescent wrap 2 x 62,5 / 1 x 125 mm; 2 layers	EI 120 U/C
	≤ 42 mm Insulation thickness 10 mm		Intumescent wrap 2 x 62,5 / 1 x 125 mm; 1 layer	EI 90 U/C
	≤ 42 mm Insulation thickness 9 - 40 mm		Intumescent wrap 2 x 62,5 / 1 x 125 mm; 2 layers	EI 90 U/C
	$> 42 - \leq 60$ mm Insulation thickness 13 - 40 mm		Intumescent wrap 2 x 62,5 / 1 x 125 mm; 2 layers	EI 90 U/C
	$> 60 - \leq 88,9$ mm Insulation thickness 19 - 38 mm		Intumescent wrap 2 x 62,5 / 1 x 125 mm; 2 layers	EI 90 U/C
Steel, stainless steel, cast iron	≤ 159 mm Insulation thickness 25 - 38 mm	Intumescent wrap 2 x 62,5 / 1 x 125 mm; 2 layers + Protective insulation FEF 250x25	EI 90 U/C	
	$> 159 - \leq 219,1$ mm Insulation thickness 25 - 38 mm	Intumescent wrap 2 x 62,5 / 1 x 125 mm; 2 layers + Protective insulation FEF 250x38	EI 90 U/C	

Dimensions in mm

System Flamotect	Annex 12
Penetration sealing system made of mineral wool and ablative filler in walls and floors	

Solar pipes NanoSUN² (installation only in floors) with intumescent wrap



Fire resistance classes - Floor		
Service	Measures	Floor Fire resistance class
NanoSUN² - double solar pipes		
DN 16	Intumescent wrap 2 x 125 mm 2 layers	EI 90 U/U
DN 40	Intumescent wrap 2 x 125 mm 2 layers	EI 30 / E 90 U/U

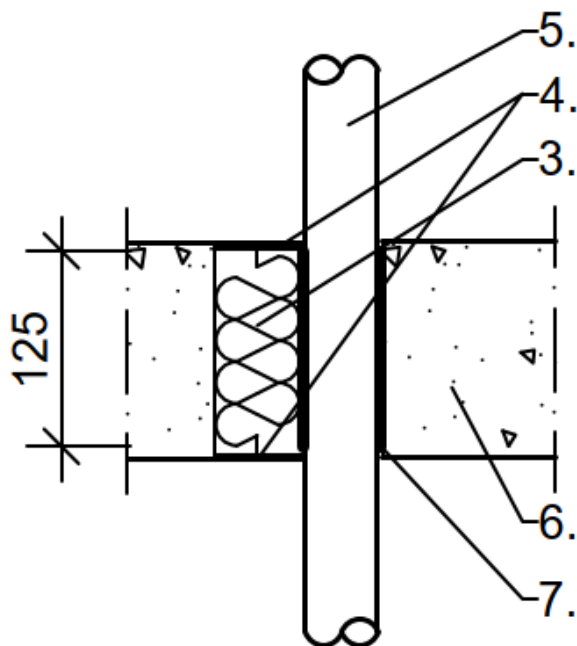
- 3. Loose mineral wool
- 4. Ablative filler ≥ 3 mm
- 5. Solar pipes

- 6. Rigid floor ≥ 150 mm thickness
- 7. Intumescent wrap

Dimensions in mm

System Flammotect	Annex 13
Penetration sealing system made of mineral wool and ablative filler in walls and floors	

Combustible pipes (installation only in floors) - with intumescent wrap



Fire resistance classes - Floor		
Service	Measures	Floor Fire resistance class
Combustible pipes		
PVC-U outer- $\varnothing \leq 32$ mm	Intumescent wrap 1 x 100 mm 1 layer	EI 90 U/U

- 3. Loose mineral wool
- 4. Ablative filler ≥ 3 mm
- 5. Combustible pipes

- 6. Rigid floor ≥ 150 mm thickness
- 7. Intumescent wrap

Dimensions in mm

System Flammotect	Annex 14
Penetration sealing system made of mineral wool and ablative filler in walls and floors	

Penetration sealing system made of mineral wool and ablative filler ($\geq 3,0$ mm dft)

Minimum Distances									
	Cables	Cable bundles	Coaxial cables	Steel conduits	Plastic conduits	HVAC lines	Non-combustible pipes with mineral fibre	Non-combustible pipes with FEF-insulation	Seal edge
Cables	0	0	100	75	100	100	0	0	0
Cable bundles	0	0	100	75	100	100	0	0	0
Coaxial cables	100	100	50	100	100	100	100	100	25
Steel conduits	75	75	100	0	100	100	100	100	25
Plastic conduits	75	75	100	100	100	100	100	100	25
HVAC lines	100	100	100	100	100	50	100	100	25
Non-combustible pipes with mineral fibre	0	0	100	100	100	100	0	100	25
Non-combustible pipes with FEF-insulation	0	0	100	100	100	100	100	0	25

Dimensions in mm

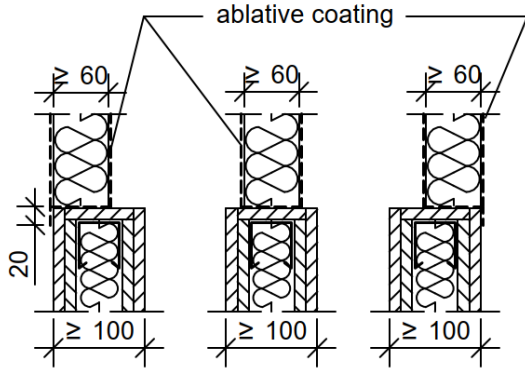
System Flamotect	Annex 15
Penetration sealing system made of mineral wool and ablative filler in walls and floors	

Mixed penetration seal made of mineral fibre board (1 x 60 mm) with ablative coating ($\geq 0,75$ mm dft)

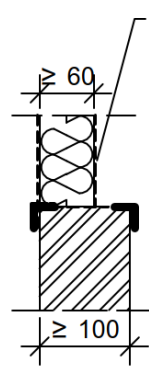
Design variants

Wall

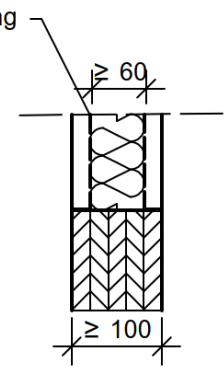
Light Partition Wall



Sandwich Wall

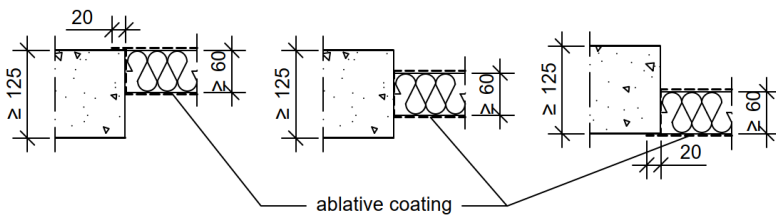


CLT Wall

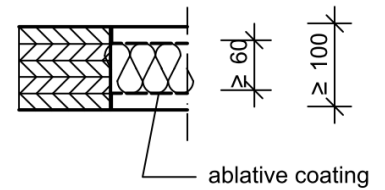


Floor

Solid Floor



CLT Floor



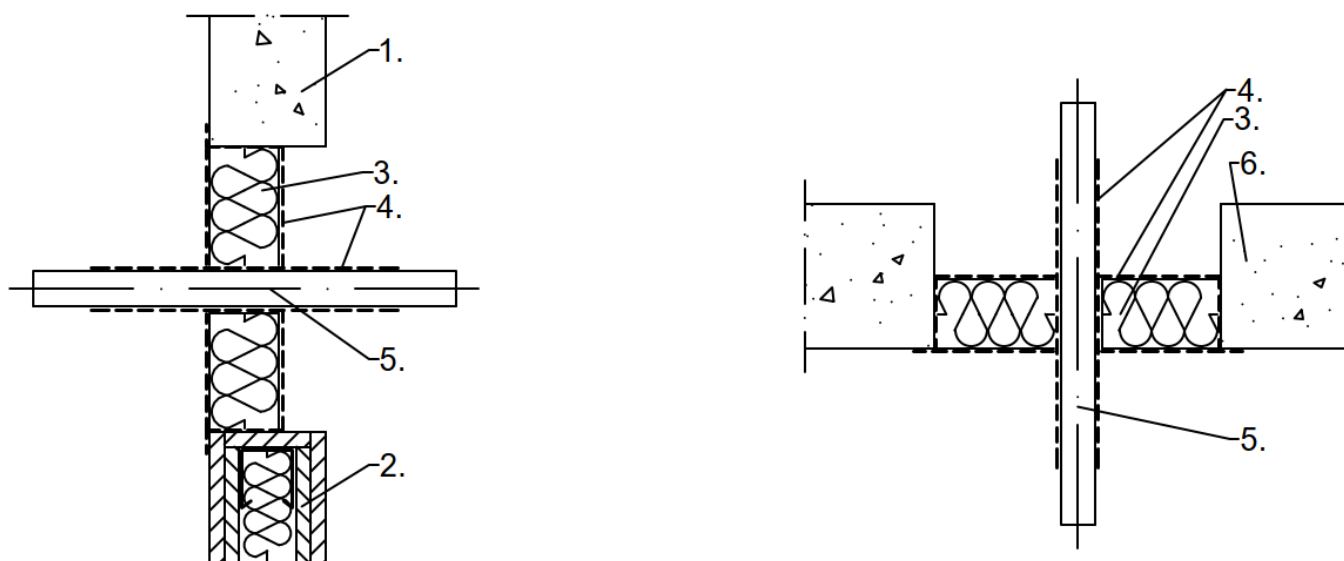
Fire resistance classes		
Max. Sealing size	Measure	Fire resistance class
2000 x 1224 mm	Light Partition Wall Solid Wall	EI 90
10,000 x 1000 mm	Solid Floor	EI 90
1000 x 1000 mm	Sandwich Wall PAROC AST-S (100 mm)	EI 60
800 x 600 mm	CLT Wall Stora Enso CLT 100 C5S NVI WW C24 SAN	EI 60
800 x 600 mm	CLT Floor Stora Enso CLT 100 L5S NVI WW C24 SAN	EI 60

Dimensions in mm

System Flammotect	Annex 16
Mixed penetration seal made of one mineral fibre board (1 x 60 mm) and ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (1 x 60 mm) with ablative coating ($\geq 0,75$ mm dft)

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



Fire resistance classes			
Service	Measures	Wall Fire resistance class	Floor Fire resistance class
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 ≥ 100 mm x $\geq 0,75$ mm dry film thickness	EI 60 / E 90	EI 60 / E 90
Cables $\varnothing > 50$ mm to $\varnothing \leq 80$ mm	Ablative coating ≥ 100 mm x $\geq 0,75$ mm dry film thickness	EI 60 / E 90	EI 60 / E 90
Cable bundles $\varnothing > 100$ mm	Ablative coating ≥ 100 mm x $\geq 0,75$ mm dry film thickness	EI 60 / E 90	EI 60 / E 90
	Ablative coating ≥ 150 mm x ≥ 1 mm dry film thickness	EI 90	EI 60 / E 90

1. Rigid wall ≥ 100 thickness
2. Flexible wall ≥ 100 mm thickness
3. Mineral fibre board

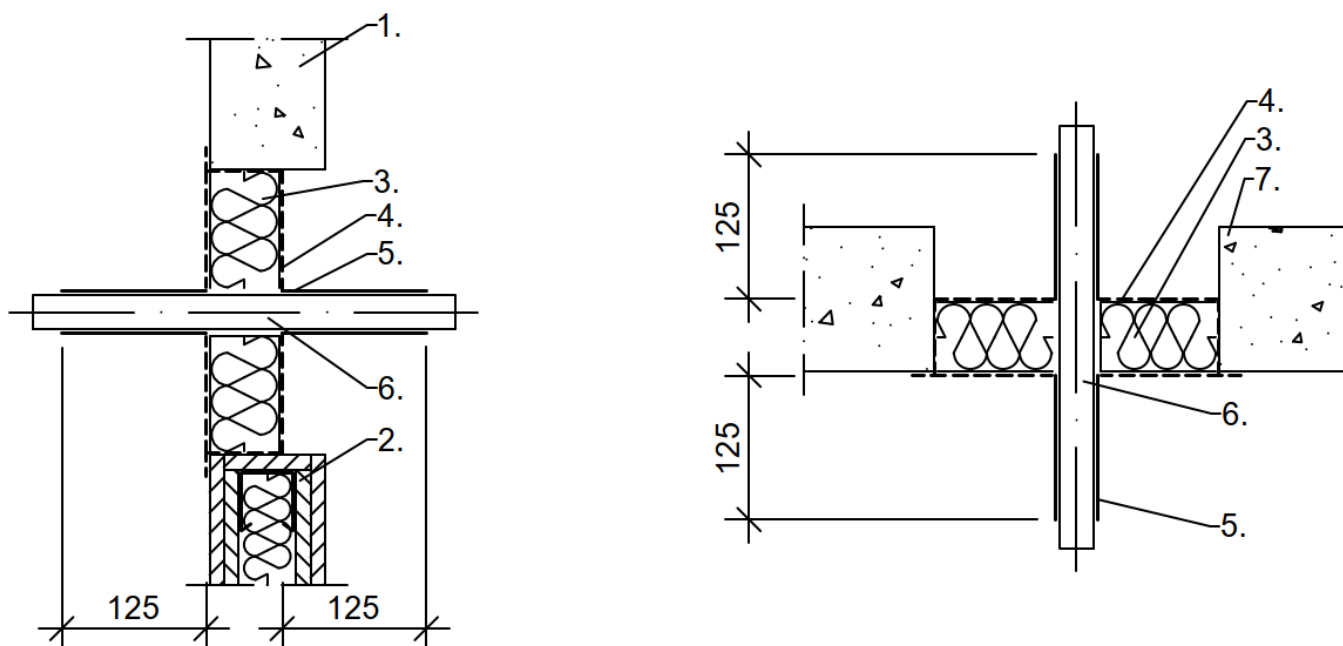
4. Ablative Coating
5. Cable
6. Rigid floor ≥ 125 mm thickness

Dimensions in mm

System Flammotect	Annex 17
Mixed penetration seal made of one mineral fibre board (1 x 60 mm) and ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (1 x 60 mm) with ablative coating (≥ 0,75 mm dft)

Cables Ø ≤ 21 mm up to ≤ Ø 80 mm or cable bundles Ø ≤ 100 mm with cables ≤ 21 mm - with intumescent wrap



Fire resistance classes			
Service	Measures	Wall Fire resistance class	Floor Fire resistance class
Cables, cable bundles and cable trays			
Cables Ø ≤ 21 mm without cable tray trough drill holes	Intumescent wrap 2 x 62,5 / 1 x 125 mm 2 x 1 layer + 45 mm overlapping	EI 90	EI 90
Cables Ø ≤ 21 mm	Intumescent wrap 2 x 62,5 / 1 x 125 mm 2 x 1 layer + 45 mm overlapping	EI 60 / E 90	EI 60 / E 90
Cables Ø > 21 mm to Ø ≤ 50 mm	Intumescent wrap 2 x 62,5 / 1 x 125 mm 2 x 1 layer + 45 mm overlapping	EI 60 / E 90	EI 60 / E 90
Cables Ø > 50 mm to Ø ≤ 80 mm	Intumescent wrap 2 x 62,5 / 1 x 125 mm 2 x 1 layer + 45 mm overlapping	EI 60 / E 90	EI 60 / E 90
Cable bundles Ø > 100 mm	Intumescent wrap 2 x 62,5 / 1 x 125 mm 2 x 1 layer + 45 mm overlapping	EI 60 / E 90	EI 60 / E 90

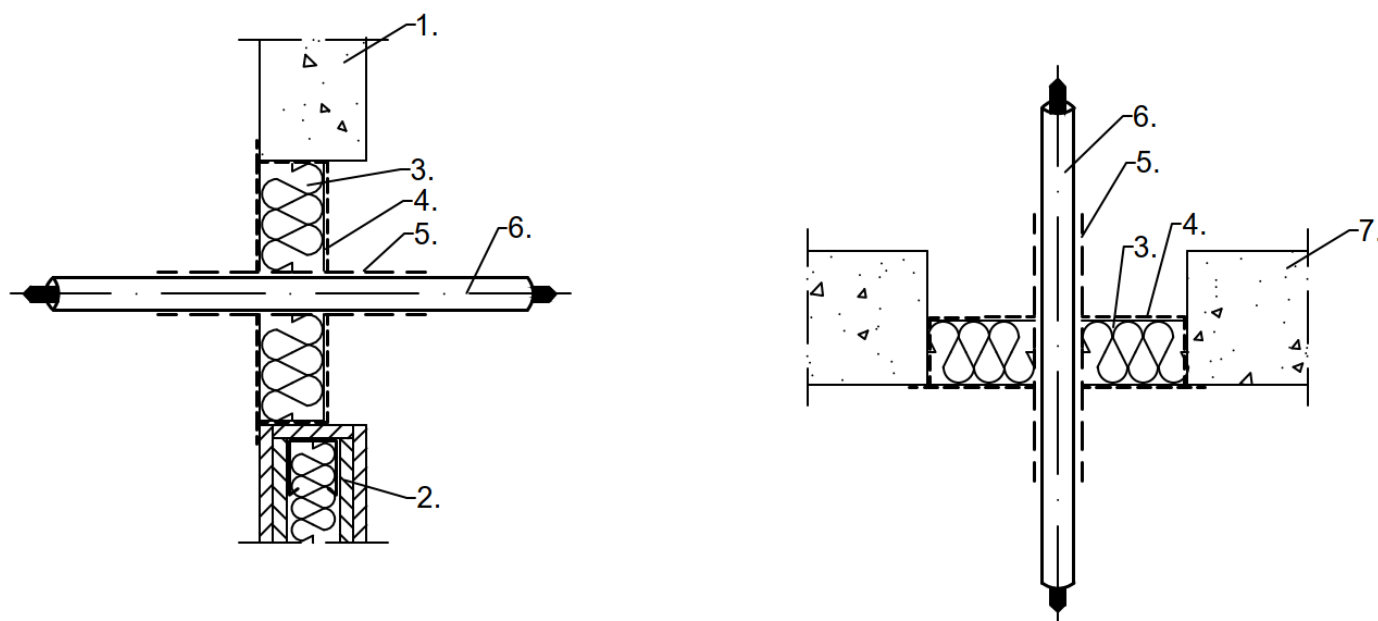
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| 1. Rigid wall ≥ 100 thickness | 5. Intumescent wrap |
| 2. Flexible wall ≥ 100 mm thickness | 6. Cable |
| 3. Mineral fibre board | 7. Rigid floor ≥ 125 mm thickness |
| 4. Ablative Coating | |

Dimensions in mm

System Flammotect	Annex 18
Mixed penetration seal made of one mineral fibre board (1 x 60 mm) and ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (1 x 60 mm) with ablative coating (≥ 0,75 mm dft)

Coaxial cables and waveguides with ablative coating



Fire resistance classes			
Service	Measures	Wall Fire resistance class	Floor Fire resistance class
Coaxial cable/waveguides			
CommScope Heliac $\varnothing \leq 51,1$ mm	Ablative coating ≥ 100 mm x ≥ 1 mm DFT	EI 45 U/C E 90 U/C	EI 45 U/C E 90 U/C
RFS Cellflex $\varnothing \leq 50,3$ mm	Ablative coating ≥ 100 mm x ≥ 1 mm DFT	EI 60 U/C E 90 U/C	EI 45 U/C E 90 U/C
RFS Radiaflex $\varnothing \leq 48,2$ mm	Ablative coating ≥ 100 mm x ≥ 1 mm DFT	EI 60 U/C E 90 U/C	EI 60 U/C E 90 U/C

- 1. Rigid wall ≥ 100 thickness
- 2. Flexible wall ≥ 100 mm thickness
- 3. Mineral fibre board

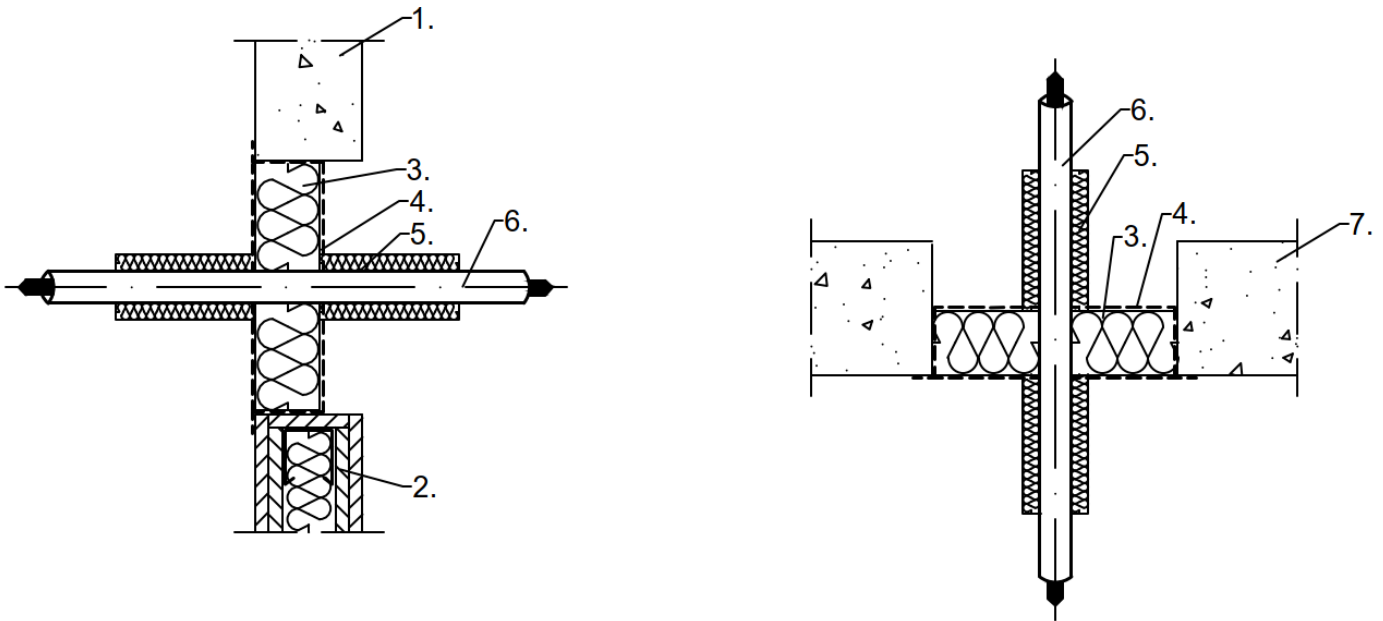
- 4. Ablative Coating
- 5. Ablative Coating
- 6. Coaxial cables / waveguides
- 7. Rigid floor ≥ 125 mm thickness

Dimensions in mm

System Flammotect	Annex 19
Mixed penetration seal made of one mineral fibre board (1 x 60 mm) and ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (1 x 60 mm) with ablative coating (≥ 0,75 mm dft)

Coaxial cables and waveguides with lamella mat



Fire resistance classes			
Service	Measures	Wall Fire resistance class	Floor Fire resistance class
Coaxial cable/waveguides			
CommScope Heliac Ø ≤ 51,1 mm	Lamella mat ≥ 250 mm x ≥ 30 mm	EI 60 U/C E 90 U/C	EI 60 U/C E 90 U/C
RFS Cellflex Ø ≤ 50,3 mm	Lamella mat ≥ 250 mm x ≥ 30 mm	EI 45 U/C E 90 U/C	EI 60 U/C E 90 U/C
RFS Cellflex Ø 28 mm	Lamella mat ≥ 250 mm x ≥ 30 mm	EI 60 U/C E 90 U/C	EI 60 U/C E 90 U/C
RFS Radiaflex Ø ≤ 48,2 mm	Lamella mat ≥ 250 mm x ≥ 30 mm	EI 60 U/C E 90 U/C	EI 90 U/C

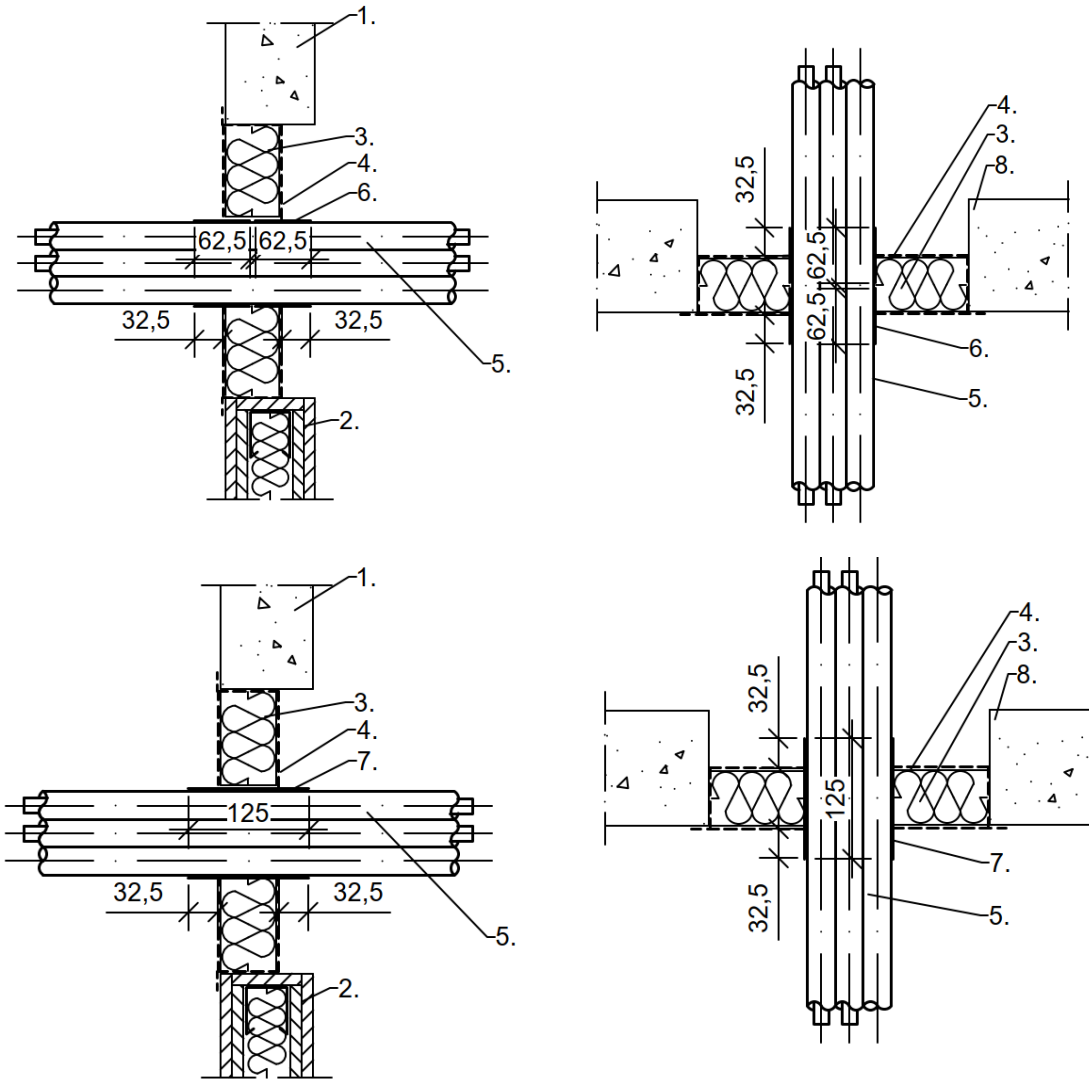
- 1. Rigid wall ≥ 100 thickness
- 2. Flexible wall ≥ 100 mm thickness
- 3. Mineral fibre board
- 4. Ablative Coating
- 5. Lamella mat
- 6. Coaxial cables / waveguides
- 7. Rigid floor ≥ 125 mm thickness

Dimensions in mm

System Flammotect	Annex 20
Mixed penetration seal made of one mineral fibre board (1 x 60 mm) and ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (1 x 60 mm) with ablative coating (≥ 0,75 mm dft)

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



Fire resistance classes				
Service	Cable	Measures	Wall Fire resistance class	Floor Fire resistance class
Electrical Installation conduits (EIC)				
EIC made of plastic $\varnothing \leq 32$	With/without	Intumescent wrap 2 x 62,5 / 1 x 125 mm 2 layers	EI 60 U/U E 90 U/U	EI 45 U/U E 90 U/U
EIC made of plastic bundle $\varnothing \leq 100$	With/without	Intumescent wrap 2 x 62,5 / 1 x 125 mm 2 layers	EI 60 U/U E 90 U/U	EI 45 U/U E 90 U/U

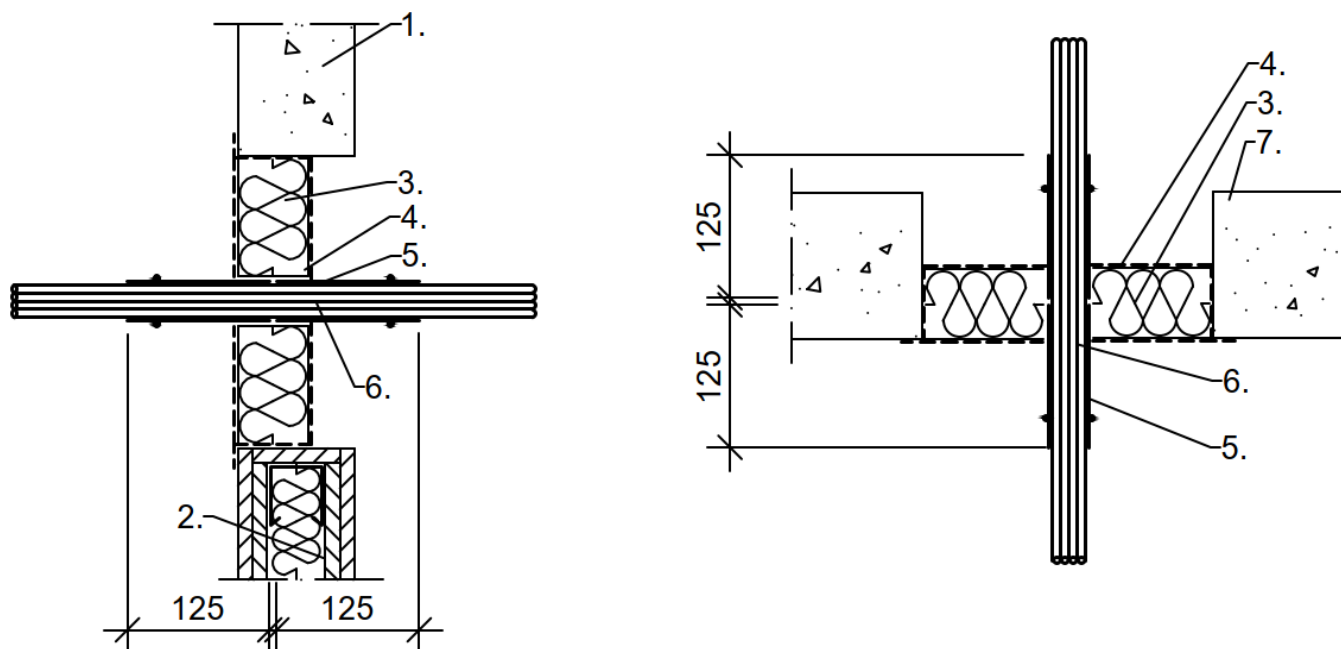
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| 1. Rigid wall ≥ 100 thickness | 5. Electrical installation conduit |
| 2. Flexible wall ≥ 100 mm thickness | 6. Intumescent wrap 2 x 62,5 mm |
| 3. Mineral fibre board | 7. Intumescent wrap 1 x 125 mm |
| 4. Ablative Coating | 8. Rigid floor ≥ 125 mm thickness |

Dimensions in mm

System Flammotect	Annex 21
Mixed penetration seal made of one mineral fibre board (1 x 60 mm) and ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (1 x 60 mm) with ablative coating (≥ 0,75 mm dft)

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



Fire resistance classes			
Service	Measures	Wall Fire resistance class	Floor Fire resistance class
Speed pipes, bundles or single pipes, with or without glass fibre or micro cables			
Bundle- $\varnothing \leq 40$ Single- $\varnothing \leq 14$	Intumescent wrap 2 x 62,5 / 1 x 125 mm 1 layer	EI 60 U/U E 90 U/U	EI 90 U/U
Bundle- $\varnothing \leq 40$ Single- $\varnothing \leq 7$	Intumescent wrap 2 x 62,5 / 1 x 125 mm 1 layer	EI 90 U/U	EI 90 U/U

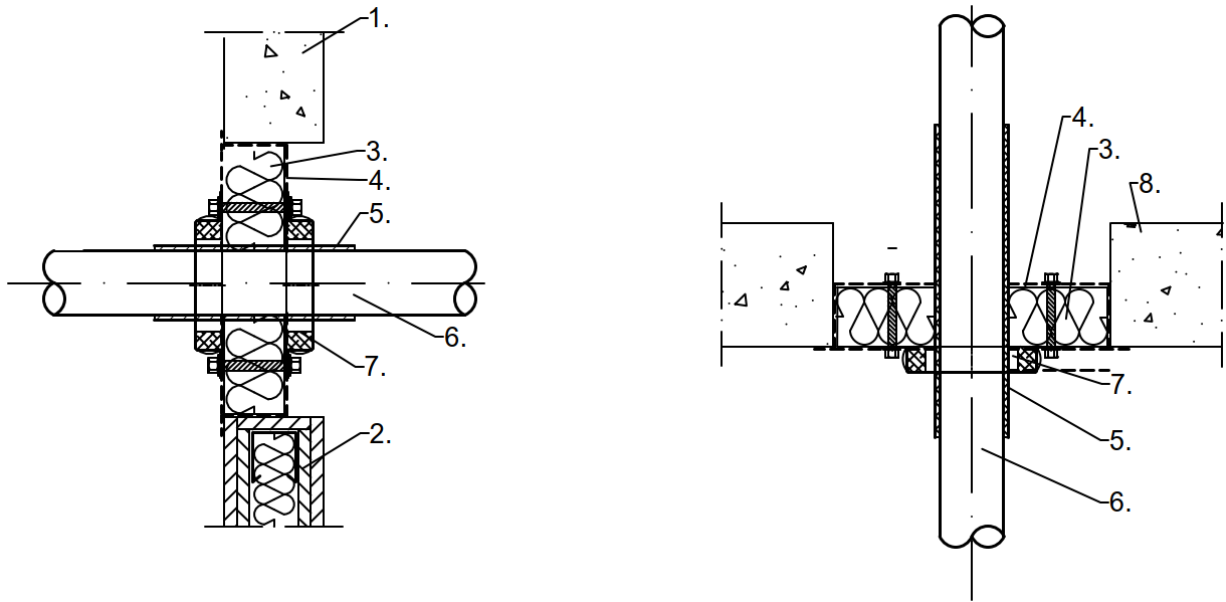
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| 1. Rigid wall ≥ 100 thickness | 5. Intumescent wrap |
| 2. Flexible wall ≥ 100 mm thickness | 6. Speed pipe |
| 3. Mineral fibre board | 7. Rigid floor ≥ 125 mm thickness |
| 4. Ablative Coating | |

Dimensions in mm

System Flammotect	Annex 22
Mixed penetration seal made of one mineral fibre board (1 x 60 mm) and ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (1 x 60 mm) with ablative coating (≥ 0,75 mm dft)

Combustible pipes - Regulated and non-regulated pipes with fire protection collar



Fire resistance classes - Wall			
Service	Pipe wall thickness	Measures	Wall Fire resistance class
PVC-U, PVC-C			
Ø 32 – 50 mm	1.5 – 5.6 mm	Fire protection collar Installed on both sides	EI 90 U/U
Ø 63 – 75 mm	1.6 – 6.6 mm		EI 90 U/U
Ø 90 – 110 mm	1.8 – 8.1 mm		EI 90 U/U
Ø 125 – 160 mm	3.2 – 11.8 mm		EI 90 U/U
PE-HD, ABS, SAN+PVC			
Ø 32 – 50 mm	1.8 – 4.6 mm	Fire protection collar Installed on both sides	EI 90 U/U
Ø 63 – 75 mm	2.2 – 6.6 mm		EI 60 U/U / E 90 U/U
	5.1 – 6.6 mm		EI 90 U/U
Ø 90 – 110 mm	2.7 – 10.0 mm		EI 60 U/U / E 90 U/U
	10.0 mm		EI 90 U/U
Ø 125 – 160 mm	4.0 – 14.6 mm		EI 90 U/U

- | | |
|-------------------------------------|-----------------------------------|
| 1. Rigid wall ≥ 100 thickness | 5. PE noise protection |
| 2. Flexible wall ≥ 100 mm thickness | 6. Combustible pipe |
| 3. Mineral fibre board | 7. Fire protection collar |
| 4. Ablative Coating | 8. Rigid floor ≥ 125 mm thickness |

Dimensions in mm

System Flammotect	Annex 23
Mixed penetration seal made of one mineral fibre board (1 x 60 mm) and ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (1 x 60 mm) with ablative coating ($\geq 0,75$ mm dft)**Combustible pipes - Regulated and non-regulated pipes with fire protection collar**

Fire resistance classes - Wall			
Service	Pipe wall thickness	Measures	Wall Fire resistance class
PP-H			
Ø 32 – 50 mm	1.8 – 4.6 mm	Fire protection collar Installed on both sides	EI 90 U/U
Ø 63 – 75 mm	2.2 – 6.6 mm		EI 90 U/U
Ø 90 – 110 mm	2.7 – 10.0 mm		EI 90 U/U
Ø 125 – 160 mm	4.0 – 14.6 mm		EI 60 U/U / E 90 U/U
	4.0 mm		EI 90 U/U
Rehau Raupiano light			
Ø 40 mm	1.8 mm	Fire protection collar Installed on both sides	EI 90 U/U
Ø 50 mm	1.8 mm		EI 90 U/U
Ø 75 mm	1.9 mm		EI 90 U/U
Ø 90 mm	2.2 mm		EI 60 U/U / E 90 U/U
Ø 110 mm	2.7 mm		EI 90 U/U
Conel DRAIN			
Ø 40 mm	1.8 mm	Fire protection collar Installed on both sides	EI 90 U/U
Ø 50 mm	1.8 mm		EI 90 U/U
Ø 75 mm	1.9 mm		EI 90 U/U
Ø 90 mm	2.2 mm		EI 60 U/U / E 90 U/U
Ø 110 mm	2.7 mm		EI 90 U/U
Ø 40 mm	1.8 mm		EI 90 U/U
Geberit Silent dB20			
Ø 56 mm	3.2 mm	Fire protection collar Installed on both sides	EI 90 U/U
Ø 63 mm	3.2 mm		EI 90 U/U
Ø 75 mm	3.6 mm		EI 90 U/U
Ø 90 mm	5.5 mm		EI 90 U/U
Ø 110 mm	6.0 mm		EI 90 U/U
Ø 135 mm	6.0 mm		EI 90 U/U
Ø 160 mm	7.0 mm		EI 90 U/U

Dimensions in mm

System Flammotect	Annex 24
Mixed penetration seal made of one mineral fibre board (1 x 60 mm) and ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (1 x 60 mm) with ablative coating ($\geq 0,75$ mm dft)**Combustible pipes - Regulated and non-regulated pipes with fire protection collar**

Fire resistance classes - Wall			
Service	Pipe wall thickness	Measures	Wall Fire resistance class
Geberit Silent PP			
Ø 32 mm	2.0 mm	Fire protection collar Installed on both sides	EI 90 U/U
Ø 40 mm	2.0 mm		EI 90 U/U
Ø 50 mm	2.0 mm		EI 90 U/U
Ø 75 mm	2.6 mm		EI 90 U/U
Ø 90 mm	3.1 mm		EI 90 U/U
Ø 110 mm	3.6 mm		EI 90 U/U
Ø 125 mm	4.2 mm		EI 90 U/U
Ø 160 mm	5.2 mm		EI 90 U/U
Geberit Silent Pro			
Ø 50 mm	3.0 mm	Fire protection collar Installed on both sides	EI 90 U/U
Ø 75 mm	3.8 mm		EI 90 U/U
Ø 90 mm	4.3 mm		EI 90 U/U
Ø 110 mm	4.5 mm		EI 90 U/U
Ø 125 mm	5.0 mm		EI 90 U/U
Ø 160 mm	6.0 mm		EI 90 U/U
POLO-KAL NG / POLO-KAL XS			
Ø 40 mm	1.8 mm	Fire protection collar Installed on both sides	EI 90 U/U
Ø 50 mm	2.0 mm		EI 90 U/U
Ø 75 mm	2.6 mm		EI 90 U/U
Ø 90 mm	3.0 mm		EI 90 U/U
Ø 110 mm	3.4 mm		EI 90 U/U
Ø 125 mm	3.9 mm		EI 90 U/U
Ø 160 mm	4.9 mm		EI 90 U/U
Rehau Raupiano Plus			
Ø 50 mm	1.8 mm	Fire protection collar Installed on both sides	EI 90 U/U
Ø 75 mm	2.0 mm		EI 60 U/U / E 90 U/U
Ø 90 mm	2.2 mm		EI 90 U/U
Ø 110 mm	2.7 mm		EI 90 U/U
Ø 125 mm	3.1 mm		EI 90 U/U
Ø 160 mm	3.9 mm		EI 90 U/U

Dimensions in mm

System Flammotect	Annex 25
Mixed penetration seal made of one mineral fibre board (1 x 60 mm) and ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (1 x 60 mm) with ablative coating ($\geq 0,75$ mm dft)**Combustible pipes - Regulated and non-regulated pipes with fire protection collar**

Fire resistance classes - Wall			
Service	Pipe wall thickness	Measures	Wall Fire resistance class
Wavin AS+			
Ø 50 mm	3.0 mm	Fire protection collar Installed on both sides	EI 90 U/U
Ø 75 mm	3.5 mm		EI 90 U/U
Ø 90 mm	4.6 mm		EI 90 U/U
Ø 110 mm	5.3 mm		EI 90 U/U
Ø 125 mm	5.3 mm		EI 90 U/U
Ø 160 mm	5.6 mm		EI 90 U/U

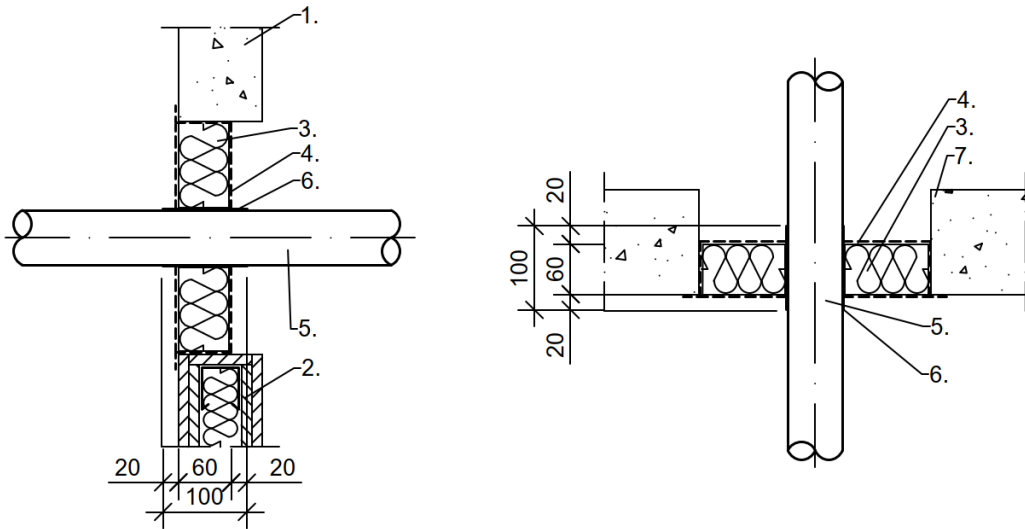
Fire resistance classes - Floor			
Service	Pipe wall thickness	Measures	Floor Fire resistance class
PVC-U, PVC-C			
Ø 32 – 50 mm	1.5 mm	Fire protection collar Installed on bottom side	EI 60 U/U / E 90 U/U
	1.5 – 5.6 mm		EI 45 U/U / E 90 U/U
Ø 63 – 75 mm	1.6 – 4.2 mm		EI 60 U/U / E 90 U/U
	1.6 – 6.6 mm		EI 45 U/U / E 90 U/U
Ø 90 – 110 mm	1.8 – 8.1 mm		EI 60 U/U / E 90 U/U
Ø 125 – 160 mm	3.2 mm		EI 60 U/U / E 90 U/U
	3.2 – 11.8 mm		EI 45 U/U / E 90 U/U
PE-HD, ABS, SAN+PVC			
Ø 32 – 50 mm	1.8 – 4.6 mm	Fire protection collar Installed on bottom side	EI 60 U/U
Ø 63 – 75 mm	2.2 – 6.6 mm		EI 30 U/U
	5.1 – 6.6 mm		EI 60 U/U
Ø 90 – 110 mm	2.7 – 10.0 mm		EI 30 U/U
	10.0 mm		EI 60 U/U
Ø 125 – 160 mm	4.0 – 14.6 mm		EI 60 U/U
PP-H			
Ø 32 – 50 mm	1.8 – 4.6 mm	Fire protection collar Installed on bottom side	EI 60 U/U
Ø 125 – 160 mm	4.0 – 14.6 mm		EI 60 U/U

Dimensions in mm

System Flammotect	Annex 26
Mixed penetration seal made of one mineral fibre board (1 x 60 mm) and ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (1 x 60 mm) with ablative coating (≥ 0,75 mm dft)

Combustible pipes - Regulated pipes with intumescent wrap



Fire resistance classes				
Service	Pipe wall thickness	Measures	Wall Fire resistance class	Floor Fire resistance class
Combustible pipes made of PVC-U, PVC-C in accordance with EN ISO 15493, EN ISO 1452				
Ø 32 – 50 mm	1.5 – 3.7 mm	Intumescent wrap 100 mm, 1 x 1 layer	EI 90 U/U	EI 90 U/U
Ø 50 – 70 mm	1.9 – 5.2 mm	Intumescent wrap 100 mm, 1 x 2 layers	EI 60 U/U / E 90 U/U	EI 45 U/U / E 90 U/U
Ø 70 – 90 mm	1.8 – 6.7 mm	Intumescent wrap 100 mm, 1 x 3 layers	EI 60 U/U / E 90 U/U	EI 60 U/U / E 90 U/U
Ø 90 – 110 mm	2.2 – 8.2 mm	Intumescent wrap 100 mm, 1 x 4 layers	EI 60 U/U / E 90 U/U	EI 45 U/U / E 90 U/U
Combustible pipes made of PP-H				
Ø 32 – 50 mm	1.8 – 4.6 mm	Intumescent wrap 100 mm, 1 x 1 layer	EI 90 U/U	EI 90 U/U
Ø 50 – 70 mm	2.0 – 5.2 mm	Intumescent wrap 100 mm, 1 x 2 layers	EI 60 U/U / E 90 U/U	EI 90 U/U
Ø 70 – 90 mm	2.2 – 8.2 mm	Intumescent wrap 100 mm, 1 x 3 layers	EI 60 U/U / E 90 U/U	EI 90 U/U
Ø 90 – 110 mm	2.6 – 6.3 mm	Intumescent wrap 100 mm, 1 x 4 layers	EI 60 U/U / E 90 U/U	EI 90 U/U
Combustible pipes made of PE 100				
Ø 32 – 50 mm	1.8 – 4.6 mm	Intumescent wrap 100 mm, 1 x 1 layer	EI 90 U/U	EI 90 U/U
Ø 50 – 70 mm	2.0 – 6.4 mm	Intumescent wrap 100 mm, 1 x 2 layers	EI 60 U/U / E 90 U/U	EI 60 U/U / E 90 U/U
Ø 70 – 90 mm	2.3 – 8.2 mm	Intumescent wrap 100 mm, 1 x 3 layers	EI 60 U/U / E 90 U/U	EI 60 U/U / E 90 U/U
Ø 90 – 110 mm	2.6 – 10.0 mm	Intumescent wrap 100 mm, 1 x 4 layers	EI 60 U/U / E 90 U/U	EI 60 U/U / E 90 U/U

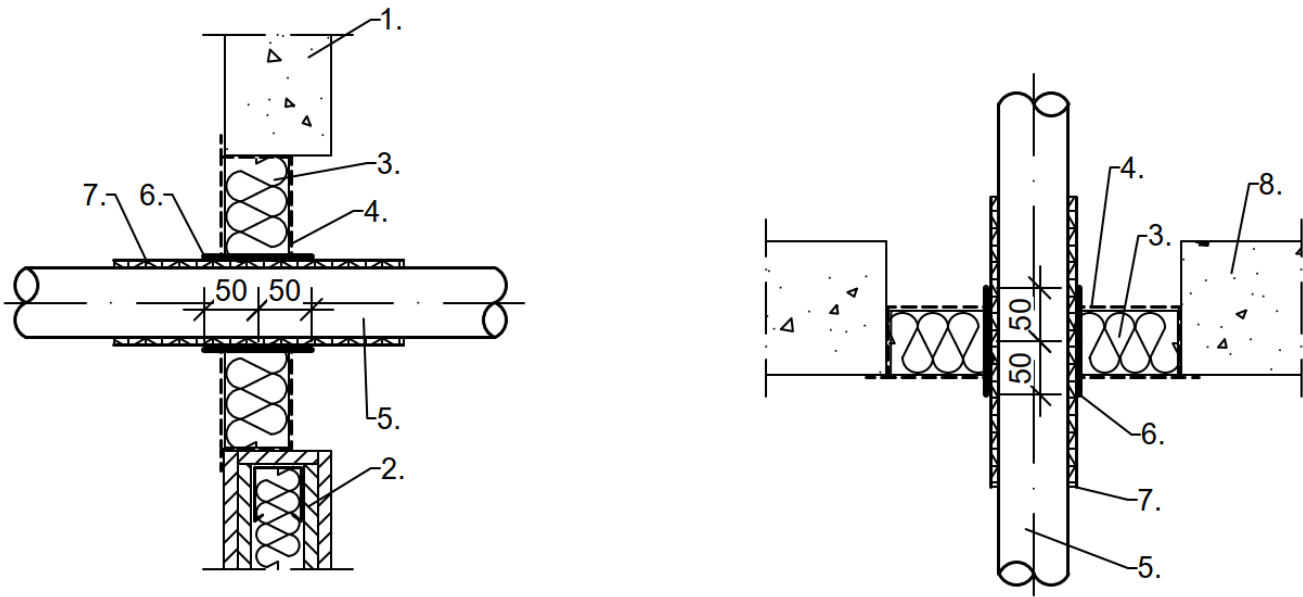
- 1. Rigid wall ≥ 100 thickness
- 2. Flexible wall ≥ 100 mm thickness
- 3. Mineral fibre board
- 4. Ablative Coating
- 5. Intumescent wrap
- 6. Combustible pipe
- 7. Rigid floor ≥ 125 mm thickness

Dimensions in mm

System Flammotect	Annex 27
Mixed penetration seal made of one mineral fibre board (1 x 60 mm) and ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (1 x 60 mm) with ablative coating (≥ 0,75 mm dft)

Combustible pipes - Regulated pipes with intumescent wrap



Fire resistance classes - Wall			
Service	Pipe wall thickness	Measures	Wall Fire resistance class
PVC-U, PVC-C			
Ø 40 – ≤ 50 mm	1.5 – 4.6 mm	Intumescent wrap 50 mm, 2 x 2 layers	EI 60 U/U / E 90 U/U
Ø > 50 – ≤ 90 mm	1.5/1.8 – 6.7 mm	Intumescent wrap 50 mm, 2 x 3 layers	EI 45 U/U / E 90 U/U
PP-H			
Ø 40 – ≤ 50 mm	1.8 – 4.6 mm	Intumescent wrap 50 mm, 2 x 2 layers	EI 60 U/U / E 90 U/U
Ø > 50 – ≤ 90 mm	1.8/2.2 – 4.6/8.2 mm	Intumescent wrap 50 mm, 2 x 3 layers	EI 60 U/U / E 90 U/U
PE-HD, ABS, SAN+PVC			
Ø 40 – 50 mm	1.8 – 4.8 mm	Intumescent wrap 50 mm, 2 x 2 layers	EI 60 U/U / E 90 U/U
Ø > 50 – ≤ 90 mm	1.8/2.2 – 4.8/8.2 mm	Intumescent wrap 50 mm, 2 x 3 layers	EI 45 U/U / E 90 U/U
Ø 90 mm	8.2 mm	Intumescent wrap 50 mm, 2 x 3 layers	EI 60 U/U / E 90 U/U

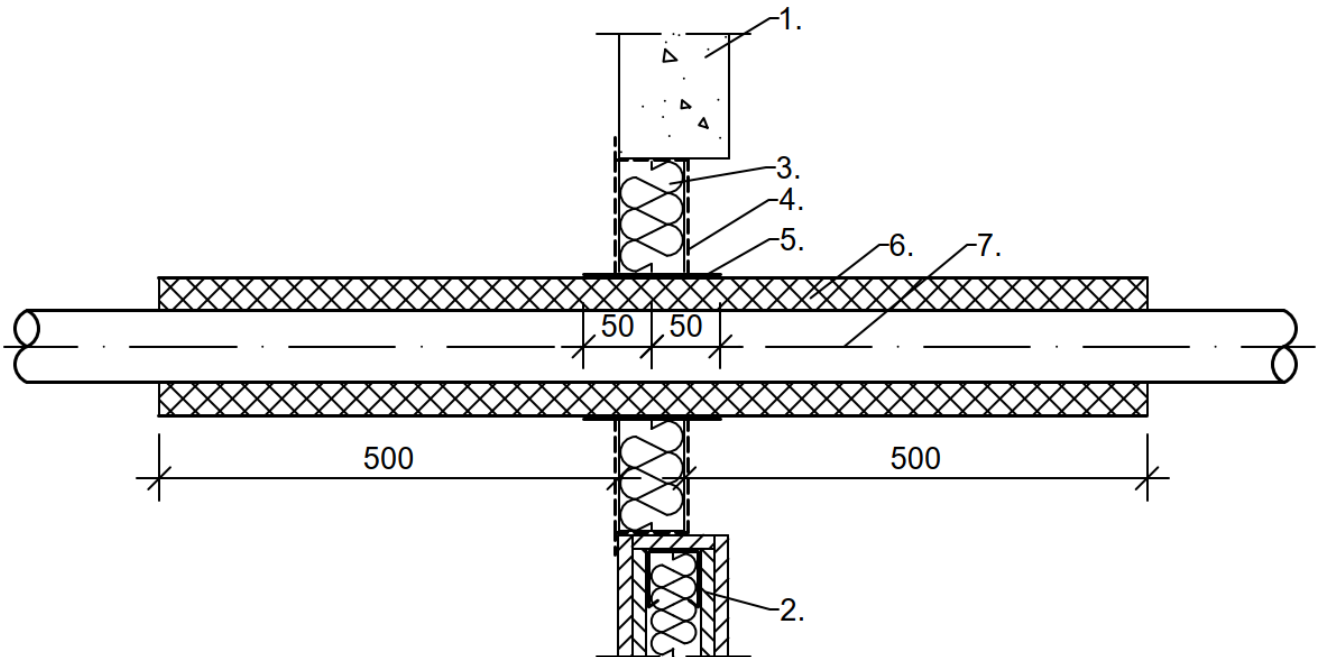
- 1. Rigid wall ≥ 100 thickness
- 2. Flexible wall ≥ 100 mm thickness
- 3. Mineral fibre board
- 4. Ablative Coating
- 5. Combustible pipe
- 6. Intumescent wrap
- 7. PE sound insulation
- 8. Rigid floor ≥ 125 mm thickness

Dimensions in mm

System Flammotect	Annex 28
Mixed penetration seal made of one mineral fibre board (1 x 60 mm) and ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (1 x 60 mm) with ablative coating (≥ 0,75 mm dft)

Combustible pipes - Regulated pipes with FEF-Insulation and intumescent wrap



Fire resistance classes - Wall				
Service	Pipe wall thickness	Insulation	Measures	Wall Fire resistance class
PP-H				
Ø 40 – 50 mm	1.8 – 4.6 mm	FEF acc. EN 14304 9 – 20.5 mm	Intumescent wrap 50 mm, 2 x 2 layers	EI 60 U/U / E 90 U/U
			Intumescent wrap 50 mm, 2 x 3 layers	EI 90 U/U
Ø 50 – 75 mm	1.9 – 8.2 mm	FEF acc. EN 14304 9 – 22 mm	Intumescent wrap 50 mm, 2 x 2 layers	EI 60 U/U / E 90 U/U
			Intumescent wrap 50 mm, 2 x 3 layers	EI 90 U/U

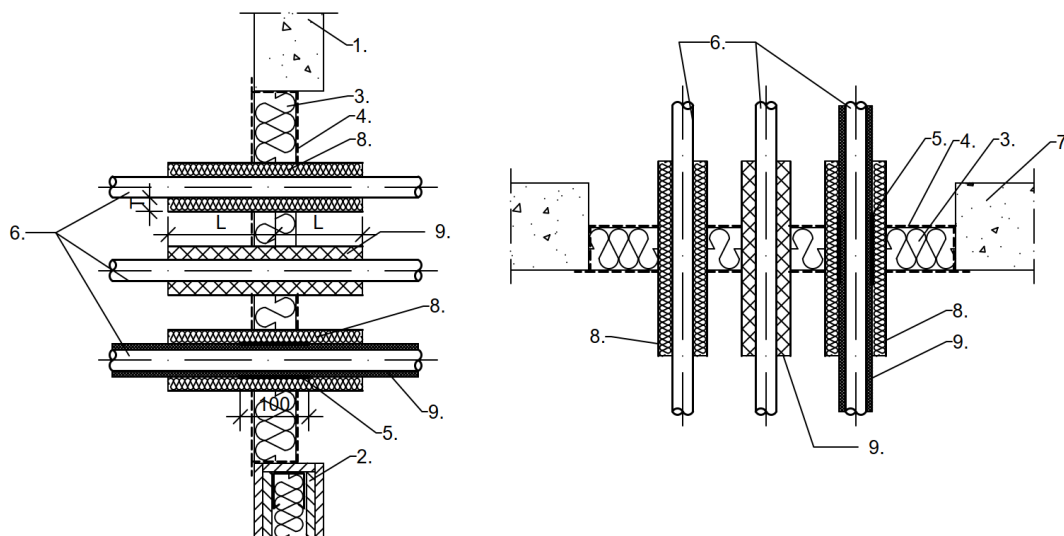
- 1. Rigid wall ≥ 100 thickness
- 2. Flexible wall ≥ 100 mm thickness
- 3. Mineral fibre board
- 4. Ablative Coating
- 5. Fire protection wrap
- 6. FEF-Insulation
- 7. Combustible pipe

Dimensions in mm

System Flammotect	Annex 29
Mixed penetration seal made of one mineral fibre board (1 x 60 mm) and ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (1 x 60 mm) with ablative coating (≥ 0,75 mm dft)

Multilayer composite pipes - HENCO pipes with protective insulation of lamella mat or FEF



Fire resistance classes			
Service	Measures	Wall Fire resistance class	Floor Fire resistance class
Multilayer composite pipes HENCO-pipes			
Outside pipe-Ø ≤ 12 mm wall thickness ≥ 1,6 mm	Lamella mat ≥ 250 mm x ≥ 20 mm	EI 30 U/C	EI 90 U/C
Outside pipe-Ø ≤ 32 mm wall thickness ≥ 3 mm	Lamella mat ≥ 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 ≥ 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 ≥ 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 ≥ 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 ≥ 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 100 mm, 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 100 mm, 1 x 1 layer, ≥ 25 mm overlapping + lamella mat ≥ 250 mm x ≥ 20 mm	EI 60 / E 90 U/U	EI 90 U/U
Outside pipe-Ø ≤ 63 mm wall thickness ≥ 4,5 mm	Intumescent wrap 100 mm, 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 with protective insulation of lamella mat or FEF			
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

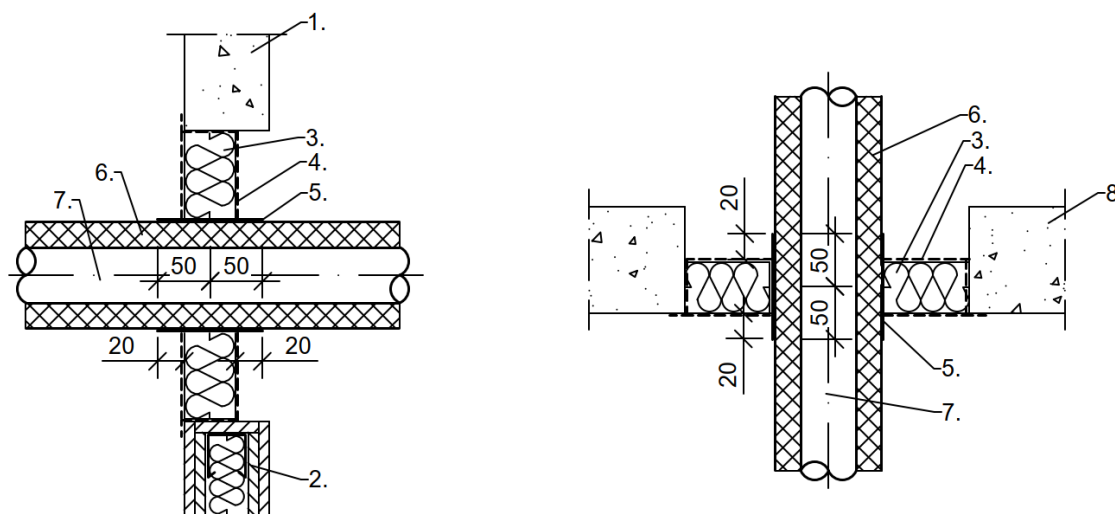
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|-------------------------------------|-----------------------------------|
| 1. Rigid wall ≥ 100 thickness | 6. Multilayer composite pipe |
| 2. Flexible wall ≥ 100 mm thickness | 7. Rigid floor ≥ 125 mm thickness |
| 3. Mineral fibre board | 8. Lamella mat |
| 4. Ablative Coating | 9. FEF insulation |
| 5. Intumescent wrap | |

Dimensions in mm

System Flammotect	Annex 30
Mixed penetration seal made of one mineral fibre board (1 x 60 mm) and ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (1 x 60 mm) with ablative coating (≥ 0,75 mm dft)

Multilayer composite pipes - Geberit Mepla with protective insulation of FEF and intumescent wrap



Fire resistance classes - Wall					
Service	Pipe wall thickness	Insulation type	Insulation thickness	Measures	Wall Fire resistance class
Geberit Mepla					
Ø 16 mm	2.25 mm	FEF acc. EN 14304 (B-s3,d0)	8 – 35 mm	Intumescent wrap 50 mm 2 x 1 layer	EI 60 U/C / E 90 U/C
Ø 20 mm	2.5 mm		35 mm		EI 60 U/C / E 90 U/C
			8 – 35 mm		EI 45 U/C / E 90 U/C
Ø 26 mm	3.0 mm		35 mm		EI 60 U/C / E 90 U/C
			8 – 35 mm		EI 45 U/C / E 90 U/C
Ø 32 mm	3.0 mm		35 mm	EI 60 U/C / E 90 U/C	
Ø 40 mm	3.5 mm		> 35 – 39 mm	Intumescent wrap 50 mm 2 x 2 layers	EI 60 U/C / E 90 U/C
			39 mm		EI 60 U/C / E 90 U/C
Ø 50 mm	4.5 mm		8 – 39 mm		EI 45 U/C / E 90 U/C
			39 mm		EI 60 U/C / E 90 U/C
Ø 63 mm	4.5 mm		9 – 39 mm		EI 45 U/C / E 90 U/C
			39 – 40.5 mm		EI 60 U/C / E 90 U/C
Ø 75 mm	4.7 mm		9 – 40.5 mm		EI 45 U/C / E 90 U/C
			39 – 40.5 mm		EI 60 U/C / E 90 U/C
		9.5 – 40.5 mm	EI 45 U/C / E 90 U/C		

- | | |
|-------------------------------------|-----------------------------------|
| 1. Rigid wall ≥ 100 thickness | 5. Fire protection wrap |
| 2. Flexible wall ≥ 100 mm thickness | 6. FEF insulation |
| 3. Mineral fibre board | 7. Multilayer composite pipe |
| 4. Ablative Coating | 8. Rigid floor ≥ 125 mm thickness |

Dimensions in mm

System Flammotect	Annex 31
Mixed penetration seal made of one mineral fibre board (1 x 60 mm) and ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (1 x 60 mm) with ablative coating ($\geq 0,75$ mm dft)**Multilayer composite pipes - Geberit Mepla with protective insulation of FEF and intumescent wrap**

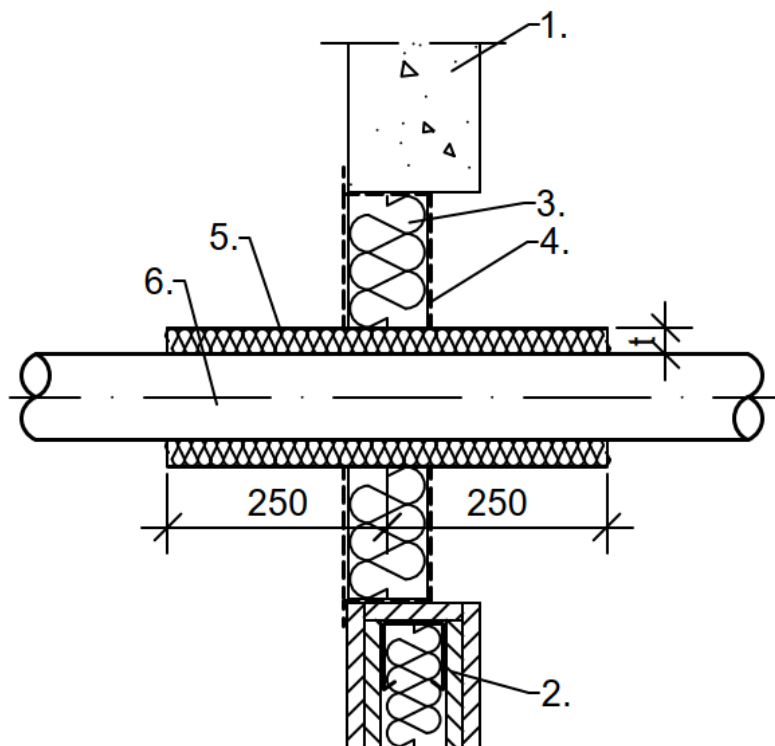
Fire resistance classes - Floor					
Service	Pipe wall thickness	Insulation type	Insulation thickness	Measures	Floor Fire resistance class
Geberit Mepla					
Ø 16 mm	2.25 mm	FEF acc. EN 14304 (B-s3, d0)	8 – 32 mm	Intumescent wrap 50 mm 2 x 1 layer	EI 60 U/C / E 90 U/C
Ø 20 mm	2.5 mm		8 – 32 mm		EI 60 U/C / E 90 U/C
Ø 26 mm	3.0 mm		8 – 32 mm		EI 60 U/C / E 90 U/C
Ø 32 mm	3.0 mm		8 – 35 mm		EI 60 U/C / E 90 U/C
Ø 40 mm	3.5 mm		9 – 39 mm	Intumescent wrap 50 mm 2 x 2 layers	EI 60 U/C / E 90 U/C
			35 – 39 mm		EI 90 U/C
Ø 50 mm	4.5 mm		9 – 39 mm		EI 45 U/C / E 90 U/C
			39 mm		EI 90 U/C
Ø 63 mm	4.5 mm		9 – 40.5 mm		EI 45 U/C / E 90 U/C
			39 mm		EI 90 U/C
			39 – 40.5 mm		EI 60 U/C / E 90 U/C
Ø 75 mm	4.7 mm		9.5 – 40.5 mm		EI 45 U/C / E 90 U/C
			40.5 mm	EI 60 U/C / E 90 U/C	

Dimensions in mm

System Flammotect	Annex 32
Mixed penetration seal made of one mineral fibre board (1 x 60 mm) and ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (1 x 60 mm) with ablative coating (≥ 0,75 mm dft)

Geberit Mepla Systempipe ML with insulation of mineral fibre pipe shell



Fire resistance classes - Wall			
Service	Pipe wall thickness	Measures	Wall Fire resistance class
Geberit Mepla Systempipe ML			
≤ 63 mm	2.25 – 4.5 mm	Pipe shell Both sides ≥ 250 x 20-30 mm	EI 60 U/C / E 90 U/C

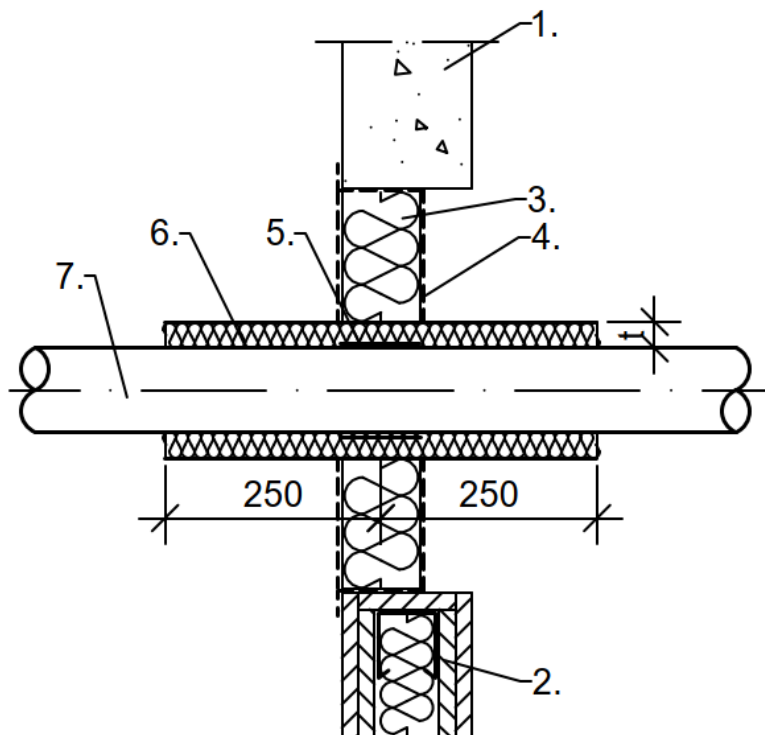
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|-------------------------------------|--------------------------------|
| 1. Rigid wall ≥ 100 thickness | 4. Ablative Coating |
| 2. Flexible wall ≥ 100 mm thickness | 5. Pipe shell |
| 3. Mineral fibre board | 6. Geberit Mepla Systempipe ML |

Dimensions in mm

System Flammotect	Annex 33
Mixed penetration seal made of one mineral fibre board (1 x 60 mm) and ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (1 x 60 mm) with ablative coating (≥ 0,75 mm dft)

Geberit Mepla Systempipe ML with insulation of mineral fibre lamella mat and intumescent wrap



Fire resistance classes - Wall				
Service	Pipe wall thickness	Insulation thickness	Measures	Wall Fire resistance class
Geberit Mepla Systempipe ML				
≤ 26 mm	2.25 – 4.5 mm	PEF 6 - 13 mm	Intumescent wrap 100 mm 1 x 1-layer + Lamella Mat Both sides ≥ 250 x 30 mm	EI 90 U/C

- 1. Rigid wall ≥ 100 thickness
- 2. Flexible wall ≥ 100 mm thickness
- 3. Mineral fibre board
- 4. Ablative Coating
- 5. Intumescent wrap
- 6. Lamella mat
- 7. Geberit Mepla Systempipe ML

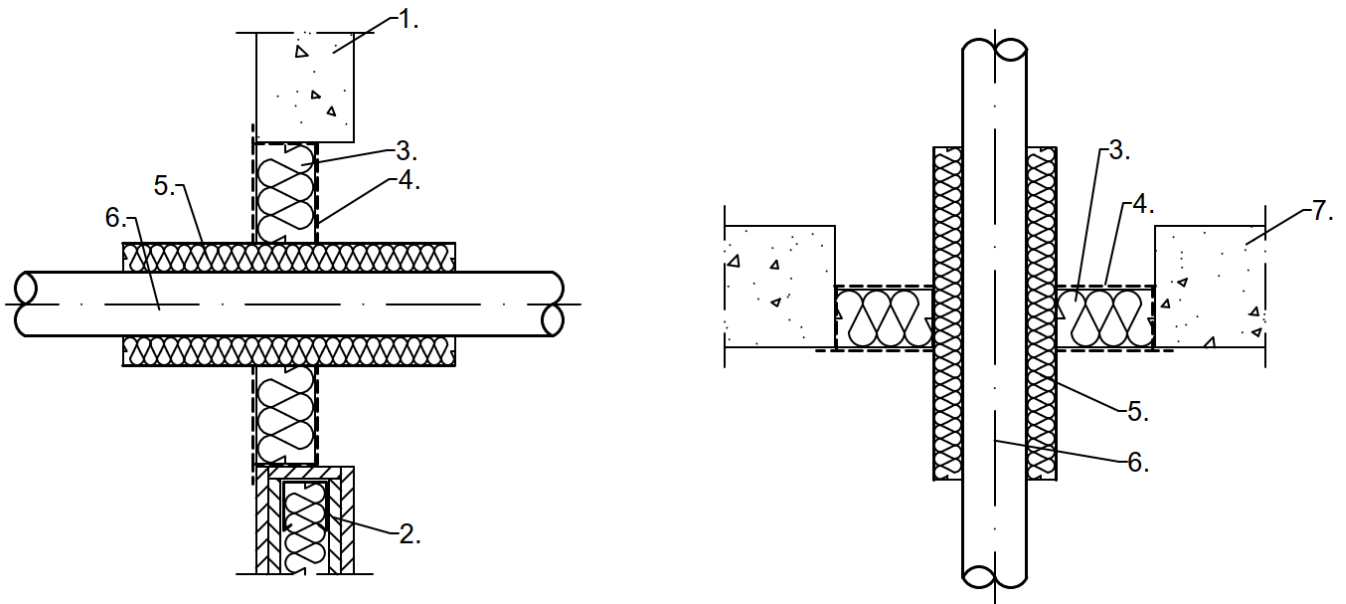
Dimensions in mm

System Flammotect	Annex 34
Mixed penetration seal made of one mineral fibre board (1 x 60 mm) and ablative coating in walls and floors	

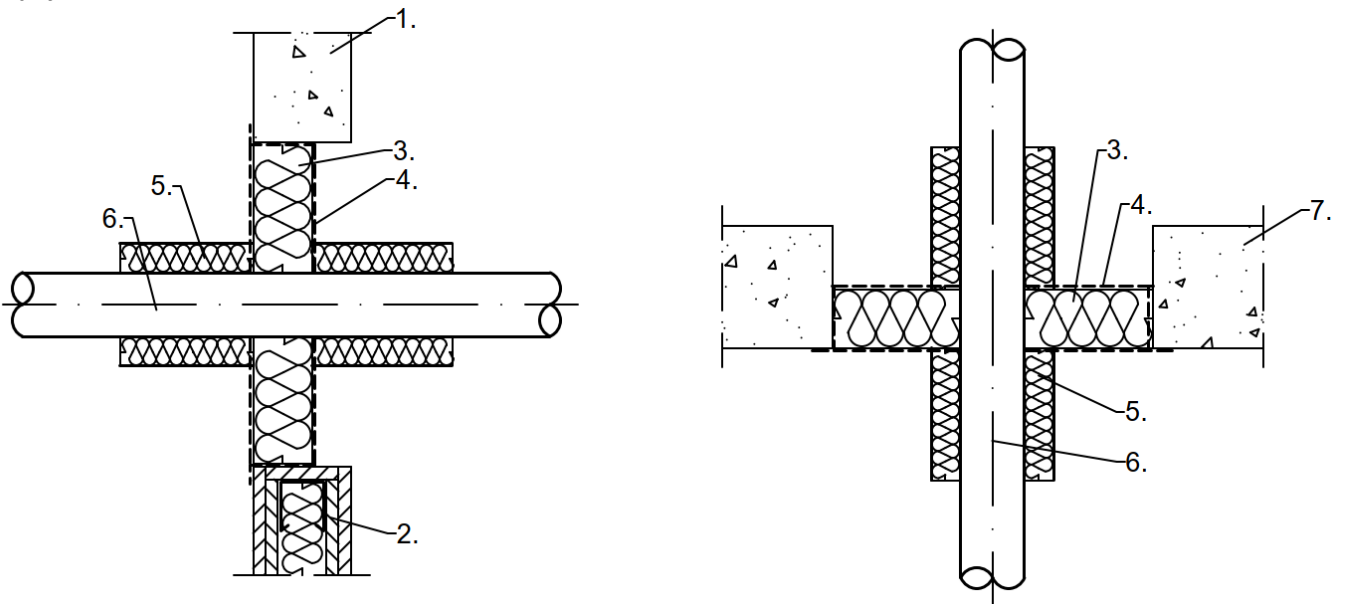
Mixed penetration seal made of mineral fibre board (1 x 60 mm) with ablative coating ($\geq 0,75$ mm dft)

Non-combustible pipes - single metal pipes with insulation made of mineral-fibre lamella mat

Variant LS



Variant LI



All angles between 90° and 45° are permissible

- | | |
|--|--|
| 1. Rigid wall ≥ 100 thickness | 5. Lamella mat |
| 2. Flexible wall ≥ 100 mm thickness | 6. Non-combustible pipe |
| 3. Mineral fibre board | 7. Rigid floor ≥ 125 mm thickness |
| 4. Ablative Coating | |

Dimensions in mm

System Flammotect	Annex 35
Mixed penetration seal made of one mineral fibre board (1 x 60 mm) and ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (1 x 60 mm) with ablative coating ($\geq 0,75$ mm dft)**Non-combustible pipes - Single metal pipes with insulation made of mineral-fibre lamella mat**

Fire resistance classes - Wall				
Service	Outside-Ø	Pipe wall thickness	Measures	Wall Fire resistance class
Non-combustible pipes with insulation made of mineral fibre				
Copper, steel, stainless steel, cast iron	≤ 60 mm	0.6 – 14.2 mm	Lamella mat Both sides $\geq 470 \times 30$ -100 mm	EI 60 U/C / E 90 U/C
	$> 60 - \leq 88.9$ mm	0.6/2.0 – 14.2 mm	Lamella mat Both sides $\geq 720 \times 30$ -100 mm	EI 60 U/C / E 90 U/C
Steel, stainless steel, cast iron	$> 60 - \leq 114.3$ mm	0.6/2.8 – 14.2 mm	Lamella mat Both sides $\geq 470 \times 30$ -100 mm	EI 60 U/C / E 90 U/C
	$> 114.3 - \leq 219.1$ mm	2.8/4.5 – 14.2 mm	Lamella mat Both sides $\geq 970 \times 30$ -100 mm	EI 60 U/C / E 90 U/C

Fire resistance classes - Floor				
Service	Outside-Ø	Pipe wall thickness	Measures	Floor Fire resistance class
Non-combustible pipes with insulation made of mineral fibre				
Copper, steel, stainless steel, cast iron	≤ 15 mm	0.8 – 14.2 mm	Lamella mat Both sides $\geq 220 \times 30$ -100 mm	EI 60 U/C / E 90 U/C
	$> 15 - \leq 42$ mm	0.8/1.0 – 14.2 mm	Lamella mat Both sides $\geq 470 \times 30$ -100 mm	EI 60 U/C / E 90 U/C
	≤ 42 mm	1.0 – 14.2 mm	Lamella mat Both sides $\geq 470 \times 30$ mm	EI 90 U/C
	$> 42 - \leq 88.9$ mm	1.0/2.0 – 14.2 mm	Lamella mat Both sides $\geq 970 \times 30$ -100 mm	EI 60 U/C / E 90 U/C
			Lamella mat Both sides $\geq 970 \times 30$ mm	EI 90 U/C
Steel, stainless steel, cast iron	≤ 63.5 mm	0.8/2.3 – 14.2 mm	Lamella mat Both sides $\geq 220 \times 30$ -100 mm	EI 90 U/C
	$> 63.5 - \leq 114.3$ mm	2.3/3.2 – 14.2 mm	Lamella mat Both sides $\geq 470 \times 30$ -100 mm	EI 90 U/C
	$> 114.3 - \leq 159$ mm	3.2/3.6 – 14.2 mm	Lamella mat Both sides $\geq 970 \times 30$ -100 mm	EI 90 U/C
	$> 159 - \leq 219.1$ mm	3.6/4.0 – 14.2 mm	Lamella mat Both sides $\geq 970 \times 30$ -100 mm	EI 60 U/C / E 90 U/C

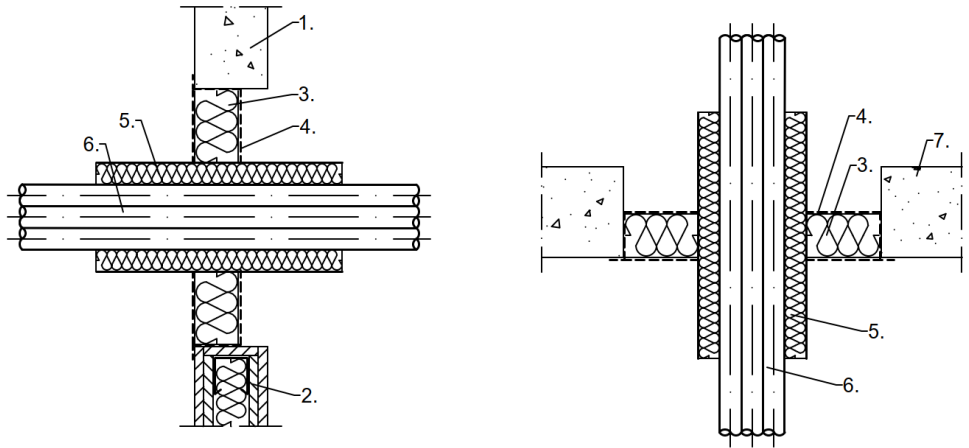
Dimensions in mm

System Flammotect	Annex 36
Mixed penetration seal made of one mineral fibre board (1 x 60 mm) and ablative coating in walls and floors	

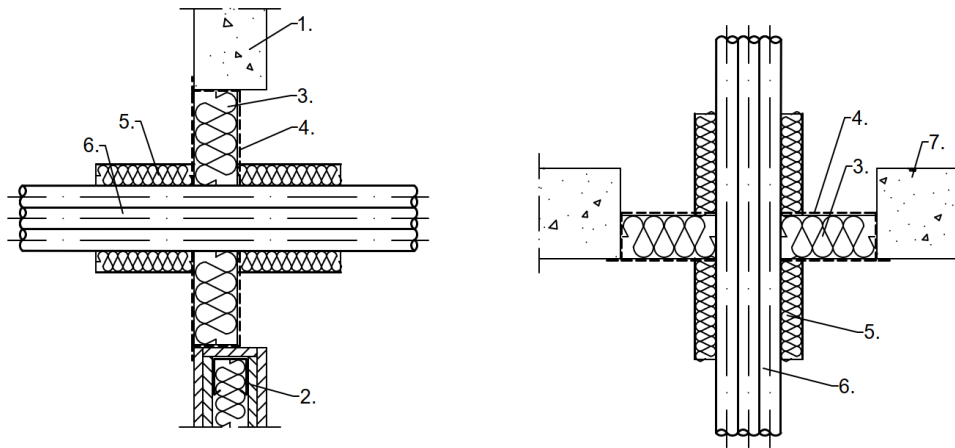
Mixed penetration seal made of mineral fibre board (1 x 60 mm) with ablative coating (≥ 0,75 mm dft)

Non-combustible pipes - Multiple metal pipes with section insulation made of mineral-fibre lamella mat

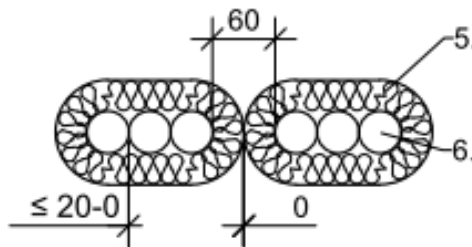
Variant LS



Variant LI



Detail, Distance to each other:



Fire resistance classes					
Service	Outside-Ø	Pipe wall thickness	Measures	Wall Fire resistance class	Floor Fire resistance class
Copper, steel, stainless steel, cast iron	Max. 3x Ø ≤ 22 mm	1.0 – 14.2 mm	Lamella mat Both sides ≥ 470 x 30 mm	EI 60 U/C / E 90 U/C	EI 45 U/C / E 90 U/C

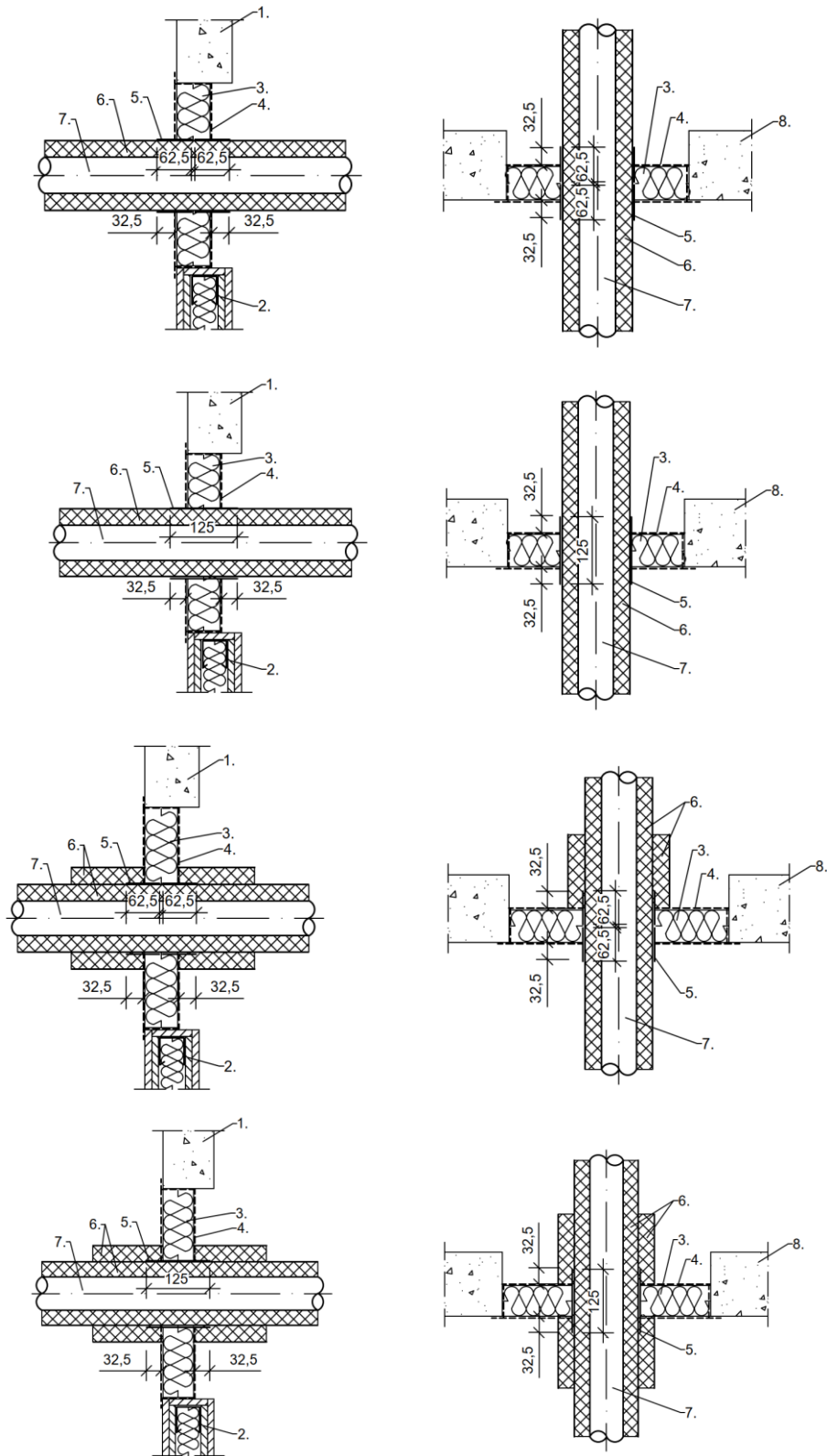
- 1. Rigid wall ≥ 100 thickness
- 2. Flexible wall ≥ 100 mm thickness
- 3. Mineral fibre board
- 4. Ablative Coating
- 5. Mineral fibre lamella mat
- 6. Multiple metal pipes
- 7. Rigid floor ≥ 125 mm thickness

Dimensions in mm

System Flammotect	Annex 37
Mixed penetration seal made of one mineral fibre board (1 x 60 mm) and ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (1 x 60 mm) with ablative coating ($\geq 0,75$ mm dft)

Non-combustible pipes - Metal pipes with insulation made of FEF and intumescent wrap



- | | |
|---|--|
| <ul style="list-style-type: none"> 1. Rigid wall ≥ 100 thickness 2. Flexible wall ≥ 100 mm thickness 3. Mineral fibre board 4. Ablative Coating | <ul style="list-style-type: none"> 5. Intumescent wrap 6. FEF-Insulation 7. Non-combustible pipe 8. Rigid floor ≥ 125 mm thickness |
|---|--|

Dimensions in mm

System Flammotect	Annex 38
Mixed penetration seal made of one mineral fibre board (1 x 60 mm) and ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (1 x 60 mm) with ablative coating ($\geq 0,75$ mm dft)**Non-combustible pipes - Metal pipes with insulation made of FEF and intumescent wrap**

Fire resistance classes - Wall						
Service	Outside-Ø	Pipe wall thickness	Insulation Type	Insulation Thickness	Measures	Wall Fire resistance class
Non-combustible pipes with insulation made of FEF acc. EN 14304						
Copper, steel, stainless steel, cast iron	≤ 15 mm	0.6 – 14.2 mm	FEF acc. EN 14304 (CS)	10 – 26 mm	Intumescent wrap 2 x 62,5/1 x 125 mm 1 x 2 layers	EI 90 U/C
				10 – 38 mm		EI 60 U/C / E 90 U/C
	$> 15 - \leq 42$ mm			16.5 – 26 mm		EI 90 U/C
				12 – 38 mm		EI 60 U/C / E 90 U/C
	$> 42 - \leq 60$ mm			10 – 38 mm		EI 30 U/C
				19 mm		EI 90 U/C
				19 – 38 mm		EI 60 U/C / E 90 U/C
	$> 60 - \leq 88.9$ mm			22.5 – 38 mm		EI 60 U/C / E 90 U/C
	Steel, stainless steel, cast iron			≤ 88.9 mm		0.6/2.6 – 14.2 mm
15.5 – 38 mm		EI 60 U/C				
$> 88.9 - \leq 114.3$ mm		2.6/3.2 – 14.2 mm	19 – 38 mm	EI 60 U/C		
$> 114.3 - \leq 159$ mm		3.2/3.6 – 14.2 mm	25 – 38 mm	Intumescent wrap 2 x 62,5/1 x 125 mm 1 x 2 layers + Protective Insulation FEF ≥ 250 x 19 mm	EI 60 U/C / E 90 U/C	
$> 159 - \leq 219.1$ mm		3.6/4.5 – 14.2 mm		Intumescent wrap 2 x 62,5/1 x 125 mm 1 x 2 layers + Protective Insulation FEF ≥ 250 x 38 mm	EI 60 U/C / E 90 U/C	

Dimensions in mm

System Flammotect	Annex 39
Mixed penetration seal made of one mineral fibre board (1 x 60 mm) and ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (1 x 60 mm) with ablative coating ($\geq 0,75$ mm dft)**Non-combustible pipes - Metal pipes with insulation made of FEF and intumescent wrap**

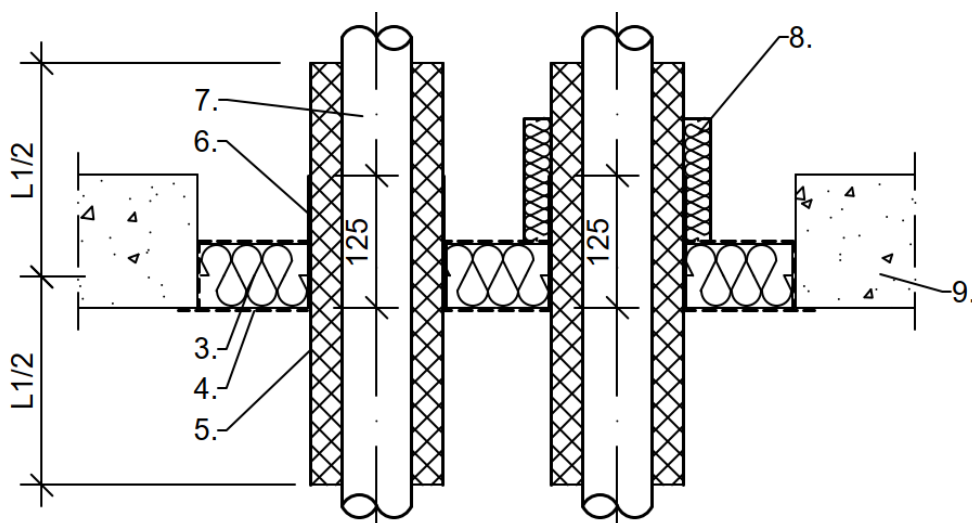
Fire resistance classes - Floor						
Service	Outside-Ø	Pipe wall thickness	Insulation Type	Insulation Thickness	Measures	Floor Fire resistance class
Non-combustible pipes with insulation made of FEF acc. EN 14304						
Copper, steel, stainless steel, cast iron	≤ 15 mm	0.6 – 14.2 mm	FEF acc. EN 14304 (CS)	38 mm	Intumescent wrap 2 x 62,5/1 x 125 mm 1 x 2 layers	EI 90 U/C
				10 – 38 mm		EI 60 U/C / E 90 U/C
	$> 15 - \leq 42$ mm			38 mm		EI 90 U/C
				12 – 38 mm		EI 60 U/C / E 90 U/C
				10 – 38 mm		EI 30 U/C
	$> 42 - \leq 88.9$ mm			38 mm		EI 90 U/C
				19 – 38 mm		EI 60 U/C / E 90 U/C
Steel, stainless steel, cast iron	≤ 88.9 mm	0.6– 14.2 mm	FEF acc. EN 14304 (CS)	18.5 – 38 mm	Intumescent wrap 2 x 62,5/1 x 125 mm 1 x 2 layers	EI 60 U/C
	$> 88.9 - \leq 114.3$ mm	0.6/3.2 – 14.2 mm		18.5 – 38 mm		EI 60 U/C
	$> 114.3 - \leq 159$ mm	3.2/3.6 – 14.2 mm		25 – 38 mm	Intumescent wrap 2 x 62,5/1 x 125 mm 1 x 2 layers + Protective Insulation FEF ≥ 250 x 19 mm	EI 60 U/C / E 90 U/C
	$> 159 - \leq 219.1$ mm	3.6/4.5 – 14.2 mm				Intumescent wrap 2 x 62,5/1 x 125 mm 1 x 2 layers + Protective Insulation FEF ≥ 250 x 38 mm

Dimensions in mm

System Flammotect	Annex 40
Mixed penetration seal made of one mineral fibre board (1 x 60 mm) and ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (1 x 60 mm) with ablative coating (≥ 0,75 mm dft)

Non-combustible pipes - Metal pipes with insulation made of FEF and intumescent wrap



Fire resistance classes - Floor						
Service	Outside-Ø	Pipe wall thickness	Insulation Type	Insulation Thickness	Measures	Floor Fire resistance class
Non-combustible pipes with insulation made of FEF acc. EN 14304						
Copper, steel, stainless steel, cast iron	≤ 42 mm	1.2 – 14.2 mm	FEF acc. EN 14304 (CS)	25 - 44 mm	Intumescent wrap 2 x 62,5/1 x 125 mm 1 x 2 layers	EI 60 C/U
	≤ 54 mm	1.5 – 14.2 mm		28 – 57 mm	Intumescent wrap 2 x 62,5/1 x 125 mm 1 x 2 layers + Lamella Mat ≥ 500 mm x 30 mm	EI 90 C/U
	≤ 88.9 mm	2.0 – 14.2 mm		25 – 89 mm	Intumescent wrap 2 x 62,5/1 x 125 mm 1 x 2 layers + Lamella Mat ≥ 500 mm x 40 mm	EI 60 C/U
	≤ 108 mm	2.5 – 14.2 mm		57 mm	Intumescent wrap 2 x 62,5/1 x 125 mm 1 x 2 layers	EI 90 C/U
Steel, stainless steel, cast iron	≤ 170 mm	2.9– 14.2 mm		57 – 89 mm	+ Lamella Mat ≥ 1000 mm x 40 mm	EI 60 C/U
				57 mm	Intumescent wrap 2 x 62,5/1 x 125 mm 1 x 2 layers	EI 90 C/U
			57 – 89 mm	+ Lamella Mat ≥ 1000 mm x 40 mm	EI 60 C/U	

- 3. Mineral fibre board
- 4. Ablative Coating
- 5. Intumescent wrap
- 6. Lamella mat

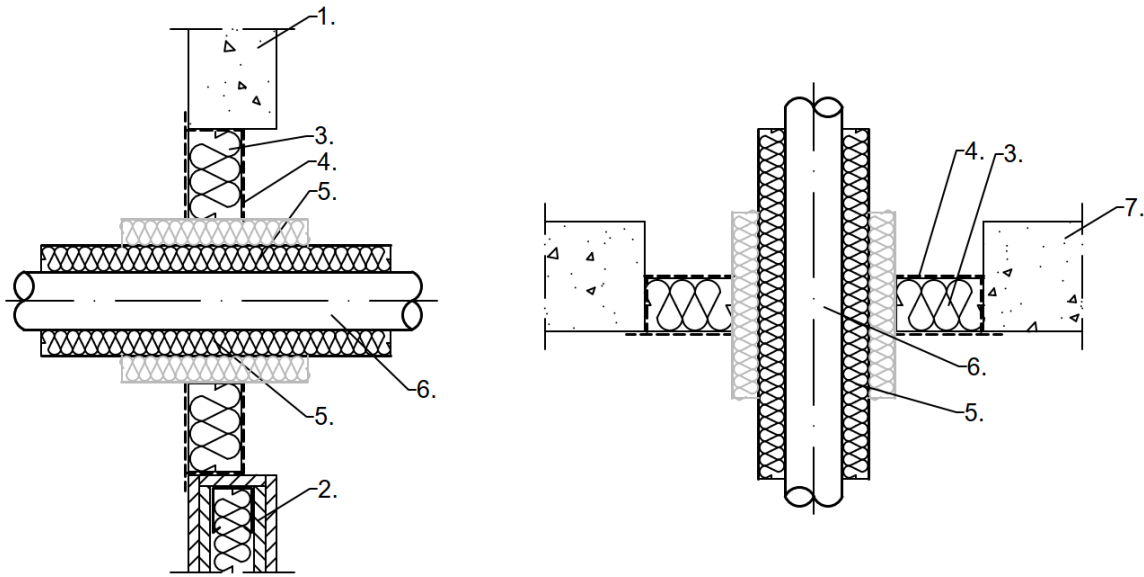
- 7. Multilayer composite pipe
- 8. FEF insulation
- 9. Rigid floor ≥ 125 mm thickness

Dimensions in mm

System Flammotect	Annex 41
Mixed penetration seal made of one mineral fibre board (1 x 60 mm) and ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (1 x 60 mm) with ablative coating (≥ 0,75 mm dft)

Non-combustible pipes with insulation made of mineral-fibre lamella mat and with protective insulation of lamella mat depending on pipe outer-Ø



Fire resistance classes			
Service	Measures	Wall Fire resistance class	Floor Fire resistance class
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 ≥ 3,6mm	≥ 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

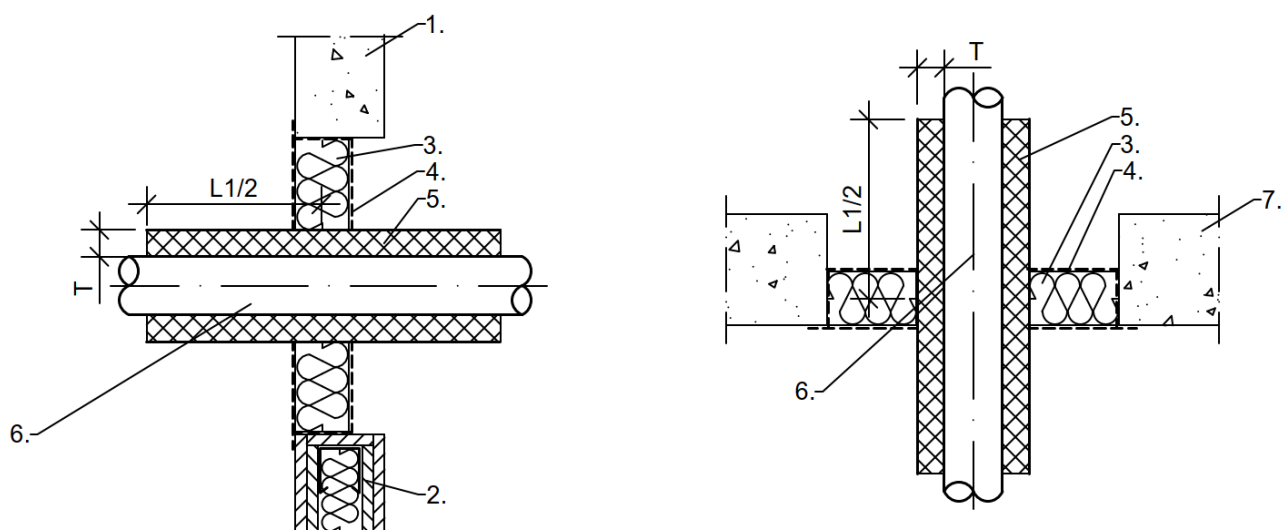
- 1. Rigid wall ≥ 100 thickness
- 2. Flexible wall ≥ 100 mm thickness
- 3. Mineral fibre board
- 4. Ablative Coating
- 5. Lamella mat
- 6. Non-combustible pipe
- 7. Rigid floor ≥ 125 mm thickness

Dimensions in mm

System Flammotect	Annex 42
Mixed penetration seal made of one mineral fibre board (1 x 60 mm) and ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (1 x 60 mm) with ablative coating (≥ 0,75 mm dft)

Non-combustible pipes section insulation made of FEF "Armaflex Protect"



Fire resistance classes			
Service	Measures Insulation L1/2 X T	Wall Fire resistance class	Floor Fire resistance class
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 thickness
2. Flexible wall ≥ 100 mm thickness
3. Mineral fibre board
4. Ablative Coating

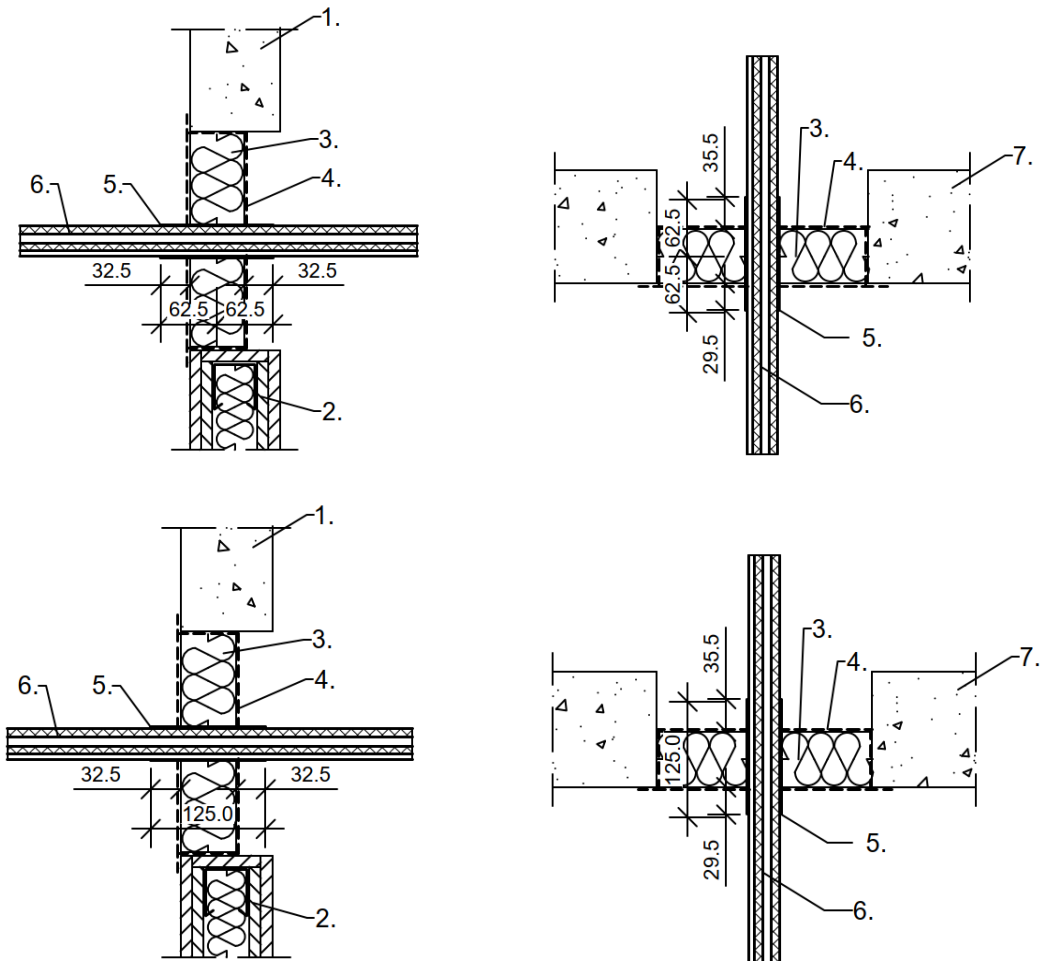
5. Armaflex Protect
6. Non-combustible pipe
7. Rigid floor ≥ 125 mm thickness

Dimensions in mm

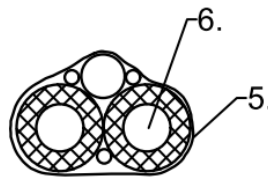
System Flammotect	Annex 43
Mixed penetration seal made of one mineral fibre board (1 x 60 mm) and ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (1 x 60 mm) with ablative coating (≥ 0,75 mm dft)

HVAC split line combination with intumescent wrap and additional protective insulation of mineral-fibre mat depending on copper-pipe Ø



Detail view:



Fire resistance classes			
Service	Measures	Wall Fire resistance class	Floor Fire resistance class
HVAC split line combinations			
Copper pipe ≤ 2x Ø ≤ 18 + PE-Foam 9 mm + 1x PVC-U/PVC-C pipe Ø ≤ 25x 1,5 mm + ≤ 3x cables Ø ≤ 14 mm	Intumescent wrap 2 x 62,5 / 1 x 125 mm 1 x 2 layers	EI 60	EI 60

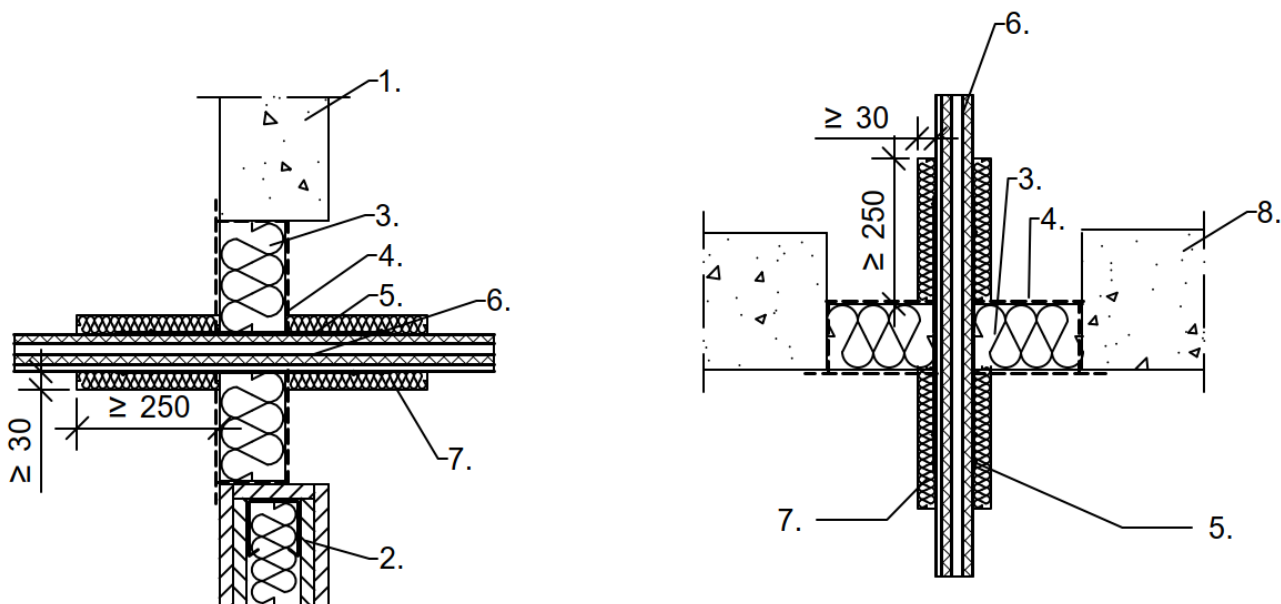
- 1. Rigid wall ≥ 100 thickness
- 2. Flexible wall ≥ 100 mm thickness
- 3. Mineral fibre board
- 4. Ablative Coating
- 5. Intumescent wrap
- 6. HVAC split line combination
- 7. Rigid floor ≥ 125 mm thickness

Dimensions in mm

System Flammotect	Annex 44
Mixed penetration seal made of one mineral fibre board (1 x 60 mm) and ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (1 x 60 mm) with ablative coating ($\geq 0,75$ mm dft)

HVAC split line combination with intumescent wrap and additional protective insulation of mineral-fibre mat depending on copper-pipe \varnothing



Fire resistance classes			
Service	Measures	Wall Fire resistance class	Floor Fire resistance class
HVAC split line combinations			
Pipe- \varnothing 22/22 mm or \varnothing 6 - 22 mm with 9 mm PE-foam + PVC-U pipe $\leq \varnothing$ 25 mm + 2 accompanying cables \leq 21 mm	Intumescent wrap 2 x 62,5 / 1 x 125 mm 1 x 2 layers + lamella mat ≥ 250 x ≥ 30 mm	EI 30	EI 90

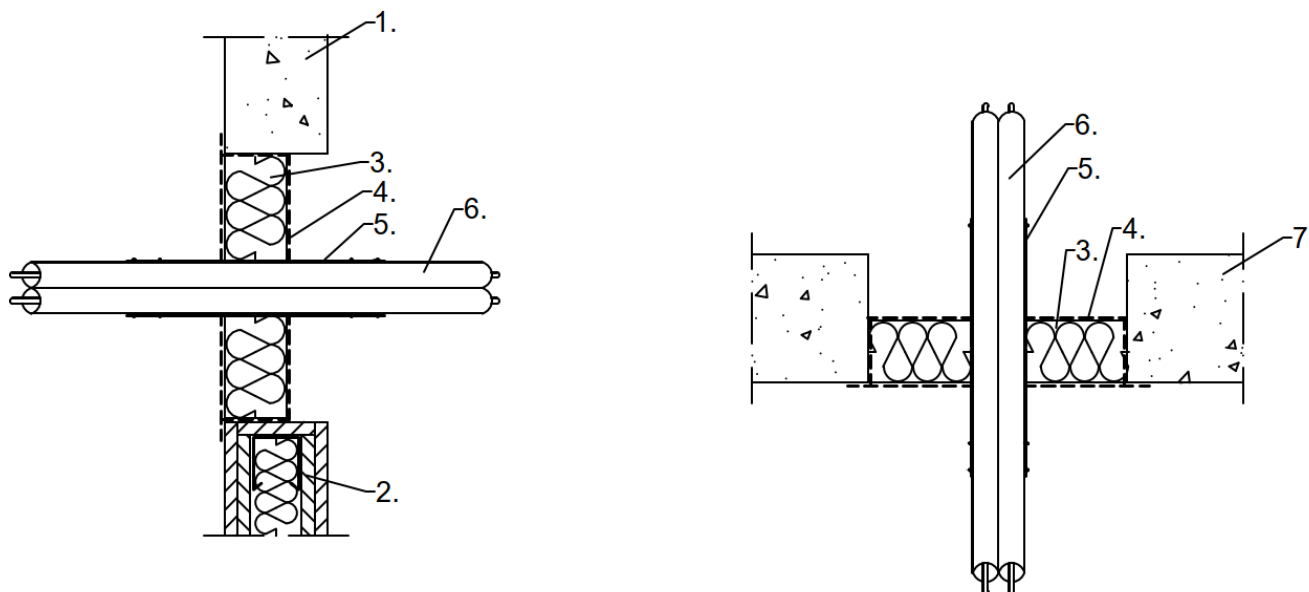
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|--|--|
| 1. Rigid wall ≥ 100 thickness | 5. Intumescent wrap |
| 2. Flexible wall ≥ 100 mm thickness | 6. HVAC split line combination |
| 3. Mineral fibre board | 7. Mineral fibre mat |
| 4. Ablative Coating | 8. Rigid floor ≥ 125 mm thickness |

Dimensions in mm

System Flammotect	Annex 45
Mixed penetration seal made of one mineral fibre board (1 x 60 mm) and ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (1 x 60 mm) with ablative coating (≥ 0,75 mm dft)

Solar pipes NanoSUN² with intumescent wrap



Fire resistance classes			
Service	Measures	Wall Fire resistance class	Floor Fire resistance class
NanoSUN² - double solar pipes			
DN 16	Intumescent wrap 2 x 62,5 / 1 x 125 mm 2 x 1 layer + 25 mm overlapping	EI 90 U/U	EI 60 U/U
DN 40	Intumescent wrap 2 x 62,5 / 1 x 125 mm 2 x 1 layer + 25 mm overlapping	EI 30 / E 90 U/U	EI 60 U/U

- | | |
|-------------------------------------|-----------------------------------|
| 1. Rigid wall ≥ 100 thickness | 5. Intumescent wrap |
| 2. Flexible wall ≥ 100 mm thickness | 6. Solar pipes |
| 3. Mineral fibre board | 7. Rigid floor ≥ 125 mm thickness |
| 4. Ablative Coating | |

Dimensions in mm

System Flammotect	Annex 46
Mixed penetration seal made of one mineral fibre board (1 x 60 mm) and ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (1 x 60 mm) with ablative coating ($\geq 0,75$ mm dft)

Minimum Distances in wall and floor														
	Cables	Cable bundles	Cable trays	Wave guides / coaxial cables	speedpipes	EIC, single/bundled made of plastic	Combustible pipes	Non-combustible pipes with FEF insulation	Non-combustible pipes with mineral wool insulation	Multilayer pipes	HVAC split line combinations	Seal Edge		
												Upper	Lower	Side
Cables	≥ 0	≥ 0	≥ 0	≥ 40	≥ 25	≥ 0	≥ 50	≥ 25	≥ 70	≥ 10	≥ 25	$(\geq 100)^*$		
Cable bundles	≥ 0	≥ 0	≥ 0	≥ 40	≥ 25	≥ 0	≥ 50	≥ 25	≥ 70	≥ 10	≥ 25	$(\geq 100)^*$		
Cable trays	≥ 0	≥ 0	≥ 0 (horizontally) ≥ 50 (vertically)	≥ 40	≥ 25	≥ 0	≥ 50	≥ 25	≥ 70	≥ 10	≥ 25	$(\geq 100)^*$		
Wave guides / coaxial cables	≥ 40	≥ 40	≥ 40	≥ 25	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	$(\geq 100)^*$		
speed pipes	≥ 25	≥ 25	≥ 25	≥ 100	≥ 0	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	$(\geq 100)^*$		
EIC, single/bundled made of plastic	≥ 0	≥ 0	≥ 0	≥ 100	≥ 100	≥ 0	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	$(\geq 100)^*$		
Combustible pipes	≥ 50	≥ 50	≥ 50	≥ 100	≥ 100	≥ 100	≥ 50	≥ 100	≥ 100	≥ 100	≥ 100	$(\geq 100)^*$		
Non-combustible pipes with FEF insulation	≥ 25	≥ 25	≥ 25	≥ 100	≥ 100	≥ 100	≥ 100	≥ 50	≥ 100	≥ 100	≥ 100	$(\geq 100)^*$		
Non-combustible pipes with mineral wool insulation	≥ 70	≥ 70	≥ 70	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 25	≥ 100	≥ 100	$(\geq 100)^*$		
Multilayer pipes	≥ 10	≥ 10	≥ 10	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 50	≥ 100	$(\geq 100)^*$		
HVAC split line combinations	≥ 25	≥ 25	≥ 25	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 50	$(\geq 100)^*$		

* valid only for CLT and sandwich wall as well as CLT Floor

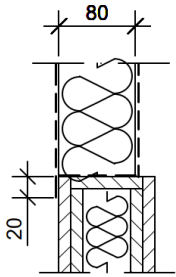
Dimensions in mm

System Flamotect	Annex 47
Mixed penetration seal made of one mineral fibre board (1 x 60 mm) and ablative coating in walls and floors	

Mixed penetration seal made of one mineral fibre board (80 mm) with ablative coating ($\geq 1,0$ mm dft)

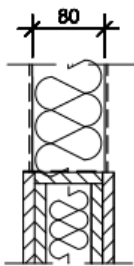
Design variants

Wall



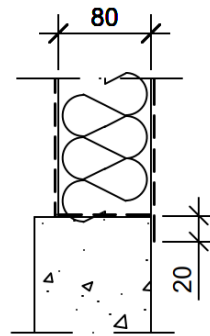
Flexible wall
 ≥ 100 mm thickness

Soffit planking minimum one layer,
 $\geq 1 \times 12,5$ mm thickness

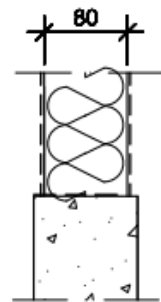


Flexible wall
 ≥ 100 mm thickness

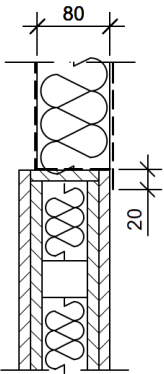
Soffit planking minimum one layer,
 $\geq 1 \times 12,5$ mm thickness



Rigid wall
 ≥ 100 mm thickness

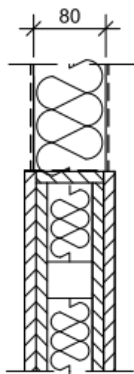


Rigid wall
 ≥ 100 mm thickness



Wooden framework
 ≥ 100 mm thickness

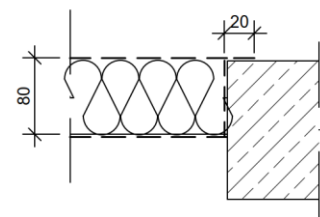
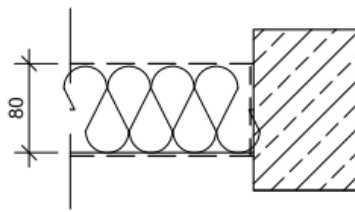
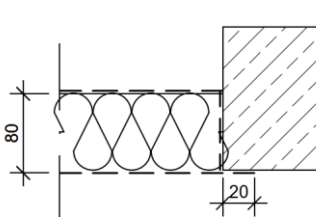
Soffit planking minimum one layer,
 $\geq 1 \times 12,5$ mm thickness



Wooden framework
 ≥ 100 mm thickness

Soffit planking minimum one layer,
 $\geq 1 \times 12,5$ mm thickness

Floor



Rigid Floor ≥ 150 mm thickness

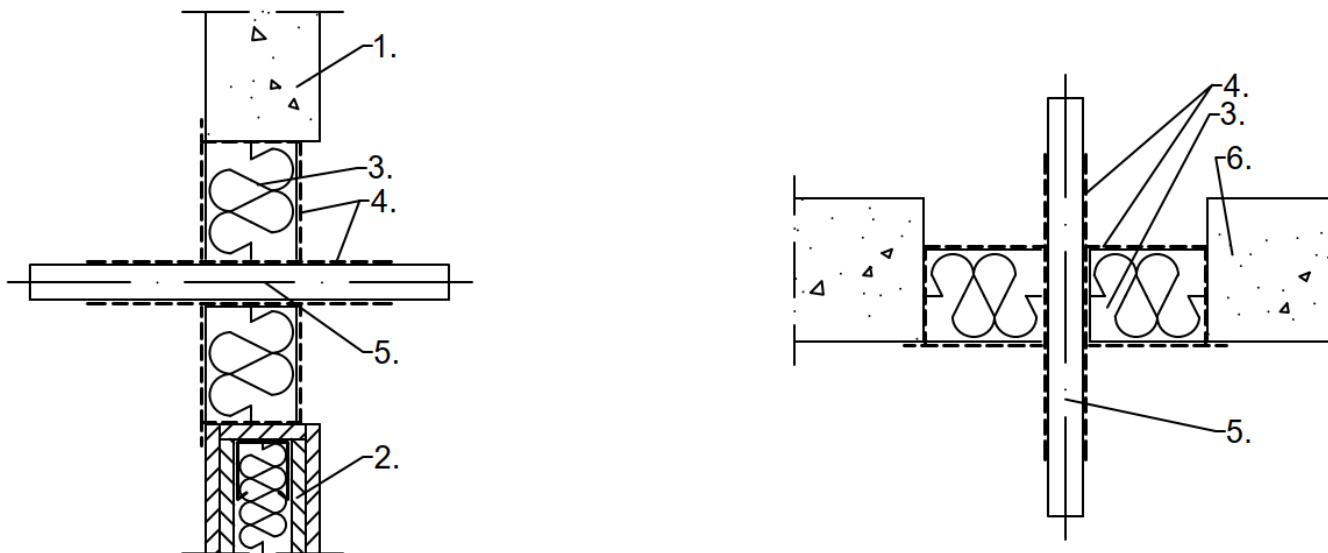
Fire resistance classes		
Max. Sealing size	Measure	Fire resistance class
2000 x 600 mm	Light Partition Wall Solid Wall	EI 120
2000 x 600 mm / 10,000 x 490 mm	Solid Floor	EI 120

Dimensions in mm

System Flammotect	Annex 48
Mixed penetration seal made of one mineral fibre board (80 mm) with ablative coating in walls and floors	

Mixed penetration seal made of one mineral fibre board (80 mm) with ablative coating ($\geq 1,0$ mm dft)

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



Fire resistance classes			
Service	Measures	Wall Fire resistance class	Floor Fire resistance class
Cables, cable bundles and cable trays			
Cables $\varnothing \leq 21$ mm	Ablative coating ≥ 200 mm x ≥ 1 mm dft	EI 90 / E 120	EI 90 / E 120
Cables $\varnothing > 21$ mm - ≤ 50 mm		EI 90 / E 120	EI 90 / E 120
Cables $\varnothing > 50$ mm - ≤ 80 mm		EI 90 / E 120	EI 90 / E 120
Cable bundles $\varnothing 100$ mm with cables $\varnothing \leq 21$ mm		EI 90 / E 120	EI 90 / E 120
Conduits made of steel $\varnothing \leq 16$ mm		EI 90 U/C / E 120 U/C	-
Conduits made of plastic $\varnothing \leq 16$ mm		EI 120 U/U	EI 120 U/U

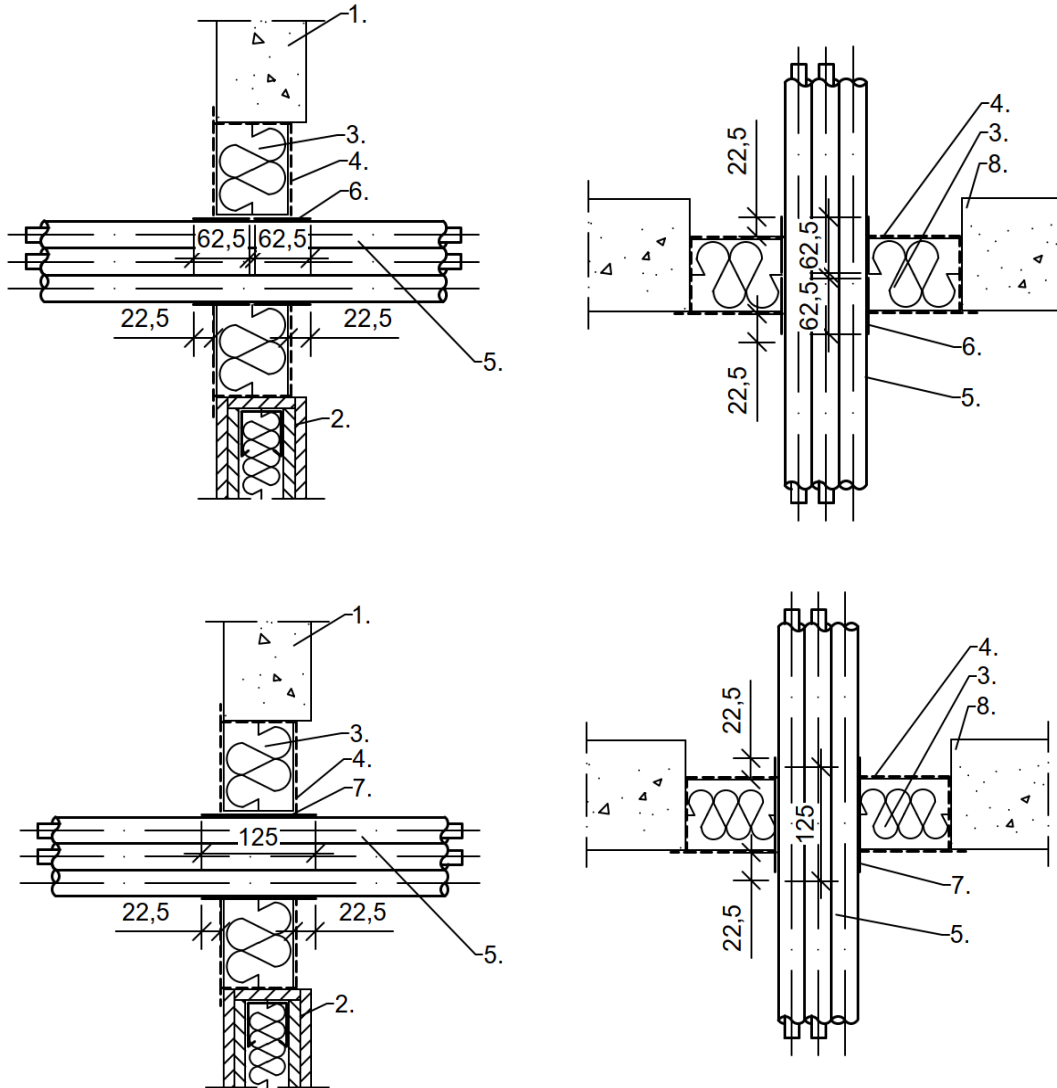
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| 1. Rigid wall ≥ 100 thickness | 4. Ablative Coating |
| 2. Flexible wall ≥ 100 mm thickness | 5. Cable |
| 3. Mineral fibre board | 6. Rigid floor ≥ 150 mm thickness |

Dimensions in mm

System Flammotect	Annex 49
Mixed penetration seal made of one mineral fibre board (80 mm) with ablative coating in walls and floors	

Mixed penetration seal made of one mineral fibre board (80 mm) with ablative coating ($\geq 1,0$ mm dft)

Plastic conduits bundled up to \varnothing 100 mm made of single conduits up to outer \varnothing 25 mm with or without cables ≤ 21 mm with intumescent wrap



Fire resistance classes				
Service	Cable	Measures	Wall Fire resistance class	Floor Fire resistance class
Electrical Installation conduits (EIC)				
EIC made plastic $\varnothing \leq 63$	With/without	Intumescent wrap 2 x 62,5 / 1 x 125 mm 1 x 2 layers	EI 120 U/U	EI 90 U/U E 120 U/U
EIC made plastic bundle $\varnothing \leq 100$	With/without	Intumescent wrap 2 x 62,5 / 1 x 125 mm 1 x 2 layers	EI 90 U/U E 120 U/U	EI 90 U/U E 120 U/U

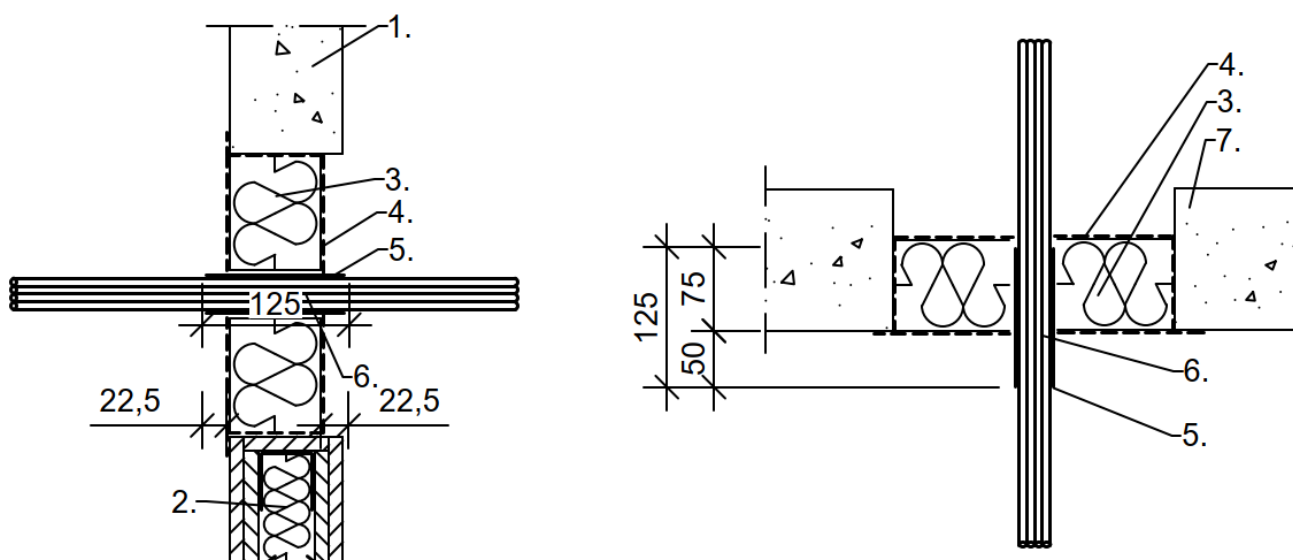
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| 1. Rigid wall ≥ 100 thickness | 5. Electrical installation conduit |
| 2. Flexible wall ≥ 100 mm thickness | 6. Intumescent wrap 2 x 62,5 mm |
| 3. Mineral fibre board | 7. Intumescent wrap 1 x 125 mm |
| 4. Ablative coating | 8. Rigid floor ≥ 150 mm thickness |

Dimensions in mm

System Flammotect	Annex 50
Mixed penetration seal made of one mineral fibre board (80 mm) with ablative coating in walls and floors	

Mixed penetration seal made of one mineral fibre board (80 mm) with ablative coating ($\geq 1,0$ mm dft)

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



Fire resistance classes				
Service	Measures	Wall Fire resistance class	Floor Fire resistance class	
Speedpipe				
Speedpipe	Bundle- $\varnothing \leq 50$ Single- $\varnothing \leq 14$	Intumescent wrap 2 x 62,5 / 1 x 125 mm 1 x 1 layer	EI 120 U/U	EI 120 U/U

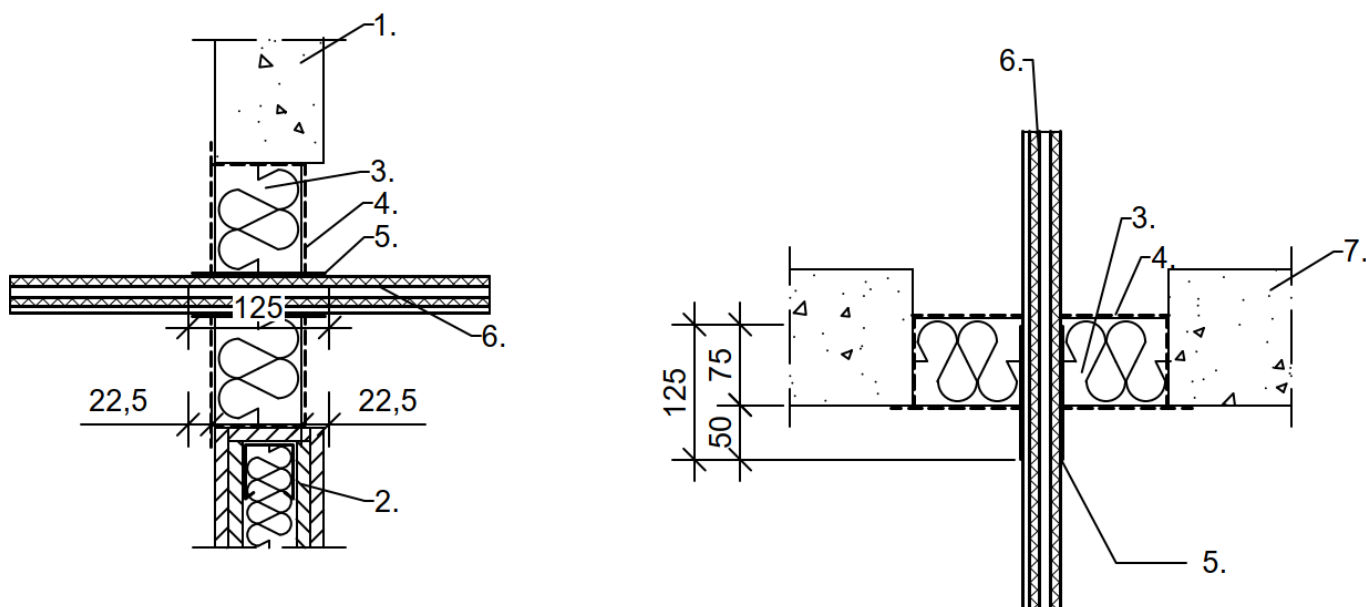
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| 1. Rigid wall ≥ 100 thickness | 5. Intumescent wrap |
| 2. Flexible wall ≥ 100 mm thickness | 6. Speed pipe |
| 3. Mineral fibre board | 7. Rigid floor ≥ 150 mm thickness |
| 4. Ablative coating | |

Dimensions in mm

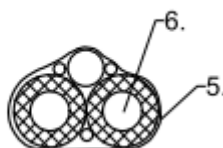
System Flammotect	Annex 51
Mixed penetration seal made of one mineral fibre board (80 mm) with ablative coating in walls and floors	

Mixed penetration seal made of one mineral fibre board (80 mm) with ablative coating ($\geq 1,0$ mm dft)

HVAC split line combination with intumescent wrap



Detail, view:



Fire resistance classes			
Service	Measures	Wall Fire resistance class	Floor Fire resistance class
HVAC-split line combinations			
Copper pipe $\leq 2x \varnothing \leq 18$ + PE-Foam 9 mm + 1x PVC-U/PVC-C pipe $\varnothing \leq 25x 1,5$ mm + $\leq 3x$ cables $\varnothing \leq 14$ mm	Intumescent wrap 2 x 62,5 / 1 x 125 mm 1 x 2 layers	EI 90 / E 120	EI 90 / E 120

- | | |
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| 1. Rigid wall ≥ 100 thickness | 5. Intumescent wrap |
| 2. Flexible wall ≥ 100 mm thickness | 6. HVAC split line combination |
| 3. Mineral fibre board | 7. Rigid floor ≥ 150 mm thickness |
| 4. Ablative coating | |

Dimensions in mm

System Flammotect	Annex 52
Mixed penetration seal made of one mineral fibre board (80 mm) with ablative coating in walls and floors	

Mixed penetration seal made of one mineral fibre board (80 mm) with ablative coating ($\geq 1,0$ mm dft)

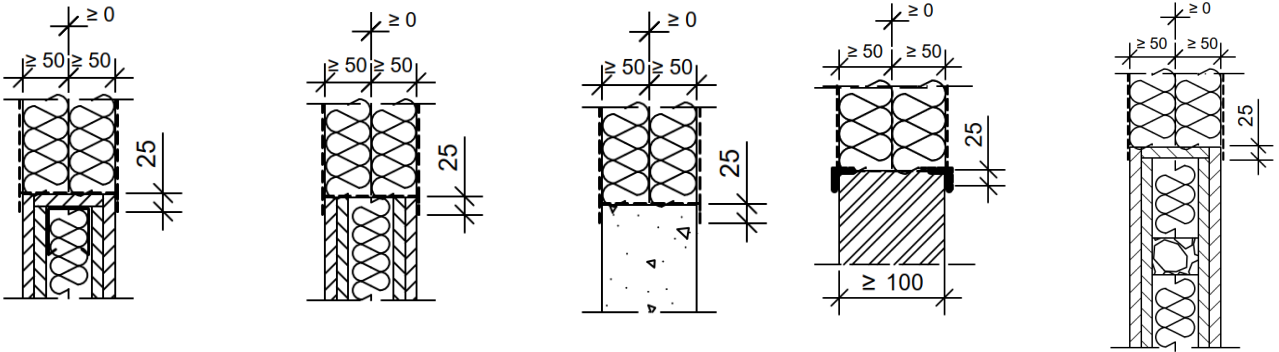
Minimum Distances in wall and floor									
	Cables	Cable bundles	Cable trays	speedpipes	EIC, single/bundled made of plastic	HVAC split line combinations	Seal Edge		
							Upper	Lower	Side
Cables	≥ 0	≥ 0	≥ 0	≥ 100	≥ 100	≥ 100	≥ 0		
Cable bundles	≥ 0	≥ 0	≥ 0	≥ 100	≥ 100	≥ 100	≥ 0		
Cable trays	≥ 0	≥ 0	≥ 0 (horizontally) ≥ 100 (vertically)	≥ 100	≥ 100	≥ 100	≥ 0		
speedpipes	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 20		
EIC, single/bundled made of plastic	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 25		
HVAC split line combinations	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 25		

Dimensions in mm

System Flammotect	Annex 53
Mixed penetration seal made of one mineral fibre board (80 mm) with ablative coating in walls and floors	

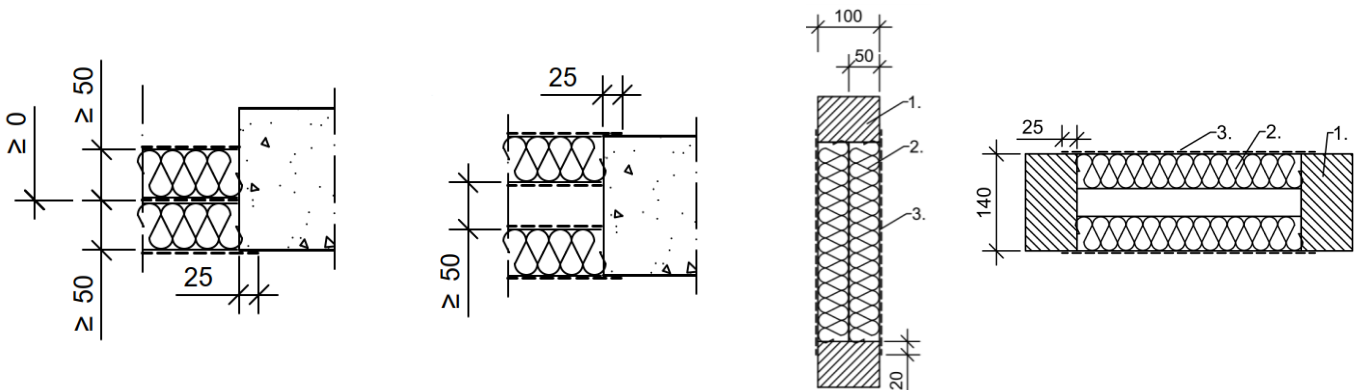
Mixed penetration seal made of mineral fibre board (2 x 50 mm) with ablative coating (≥ 1,0 mm dft)

Design variants



- Flexible wall ≥ 100 mm thickness
Soffit planking minimum one layer,
≥ 1 x 12,5 mm thickness
- Flexible wall ≥ 100 mm thickness
Without soffit planking
Maximum dimensions of the seal
600 mm x 800 mm or
800 mm x 600 mm
- Rigid wall
≥ 100 mm thickness
- Sandwich wall
Maximum dimensions
of the seal
800 x 600 mm
- Wooden framework
≥ 100 mm thickness
Optional without soffit planking
Maximum dimensions of the seal
600 mm x 800 mm or
800 mm x 600 mm

In elements with a thickness > 100 mm the two layers of mineral wool boards can be installed flushed to the surface of the separating element, centered within the separating element or in all positions in between.



- Rigid Floor
≥ 150 mm thickness
Maximum dimensions of the seal
1200 x 1100 mm
- Rigid Floor
≥ 150 mm thickness
- 1. cross laminated timber wall / floor
2. Ablative coating
3. Mineral wool
CLT Wood Wall / Floor: Minimum distances between media lines and seal edge in CLT wood construction >= 100 mm

Light partition / solid wall and solid floor: Circumferential edge coating ≥ 20 mm thick may optionally be omitted

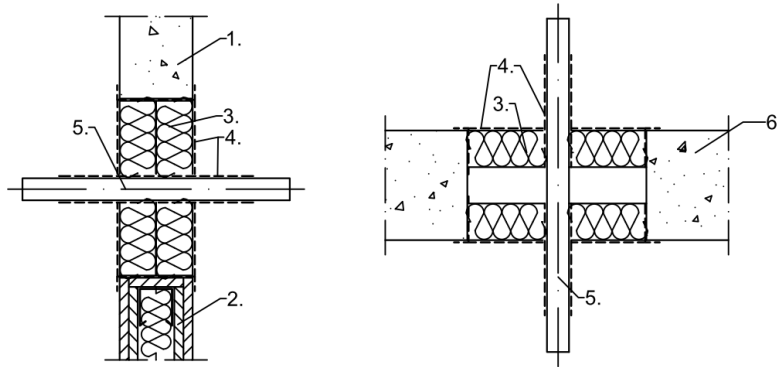
Fire resistance classes		
Max. Sealing size	Measure	Fire resistance class
2200 x 1100 mm / 1100 x 2200 mm	Light Partition Wall Solid Wall	EI 120
800 x 600 mm / 600 x 800 mm	Light Partition Wall without reveal cladding	EI 90
2600 x 1000 mm / ∞ x 800 mm	Solid Floor	EI 120
1000 x 600 mm / 600 x 1000 mm	CLT Wall STORA ENSO CLT 100 C3S NVI WW C24 SAN Thickn. 100 mm; 3 layers: 30/40/30	EI 90
1000 x 600 mm / 10.000 x 400 mm	CLT Floor STORA ENSO CLT 140 L5S NVI WW C24 SAN Thickn. 140 mm; 5 layers: 40/20/20/20/40	EI 90
800 x 600 mm	Sandwich Wall Paroc AST-F (120 mm)	EI 120

Dimensions in mm

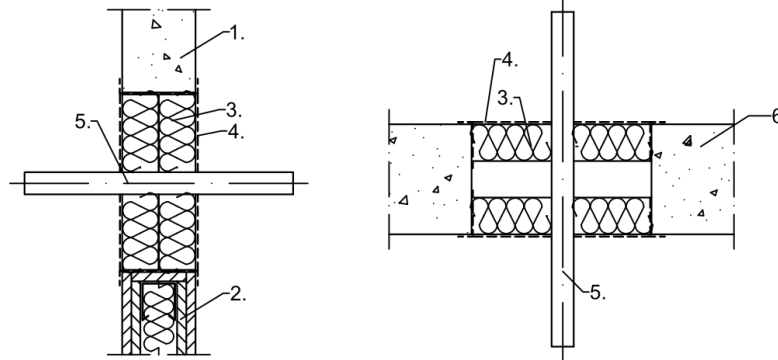
System Flammotect	Annex 54
Mixed penetration seal made of mineral fibre board (2 x 50 mm) with ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (2 x 50 mm) with ablative coating (≥ 1,0 mm dft)

Cables Ø ≤ 21 mm up to ≤ Ø 80 mm or cable bundles Ø ≤ 100 mm with cables Ø ≤ 21 mm and conduits made of plastic or steel Ø ≤ 16 mm - with ablative coating



Post installation: Single Cables (sheathed cables) Ø ≤ 21 mm – ablative coating may be omitted



Fire resistance classes			
Service	Measures	Wall Fire resistance class	Floor Fire resistance class
Cables, cable bundles and cable trays			
Cables Ø ≤ 21 mm	-	EI 120	EI 120
	Ablative coating ≥ 100 mm x ≥ 1 mm DFT	EI 120	EI 120
Cables Ø ≤ 50 mm	Ablative coating ≥ 100 mm x ≥ 1 mm DFT	EI 90 / E 120	EI 90
	Ablative coating ≥ 150 mm x ≥ 1 mm DFT	-	EI 120
Cables Ø ≤ 80 mm	Ablative coating ≥ 100 mm x ≥ 1 mm DFT	EI 90 / E 120	EI 90
	Ablative coating ≥ 150 mm x ≥ 1 mm DFT	-	EI 120
Cable bundles Ø 100 mm with cables Ø ≤ 21 mm	Ablative coating ≥ 100 mm x ≥ 1 mm DFT	EI 120	EI 120
Conduits made of steel Ø ≤ 16 mm	Ablative coating ≥ 100 mm x ≥ 1 mm DFT	EI 120 U/C	EI 120 U/C
Conduits made of plastic Ø ≤ 16 mm	Ablative coating ≥ 100 mm x ≥ 1 mm DFT	EI 120 U/U	EI 120 U/U

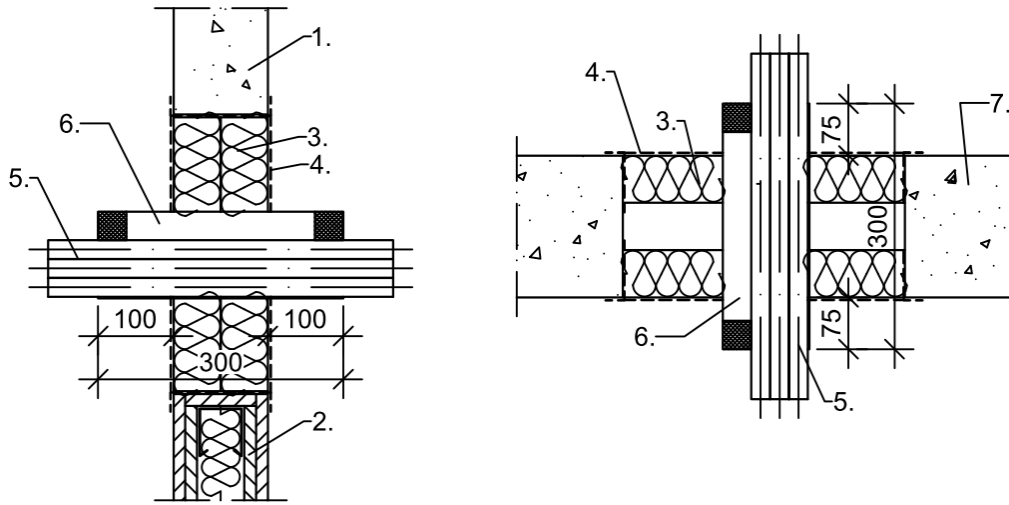
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|-------------------------------------|--|
| 1. Rigid wall ≥ 100 thickness | 4. Ablative Coating |
| 2. Flexible wall ≥ 100 mm thickness | 5. Cable, cable bundles, conduits, sheathed cables |
| 3. Mineral fibre board | 6. Rigid floor ≥ 150 mm thickness |

Dimensions in mm

System Flammotect	Annex 55
Mixed penetration seal made of mineral fibre board (2 x 50 mm) with ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (2 x 50 mm) with ablative coating (≥ 1,0 mm dft)

**Cables Ø ≤ 21 mm or cable bundles Ø ≤ 100 mm with cables Ø ≤ 21 mm
with Cable Tube CT (length 300 mm, Ø ≤ 116,4 mm)**



Fire resistance classes			
Service	Measures	Wall Fire resistance class	Floor Fire resistance class
Cables, cable bundles			
Cables Ø ≤ 21 mm	-	EI 90	EI 120
Cable bundles Ø 100 mm with cables Ø ≤ 21 mm	-	EI 90	EI 120

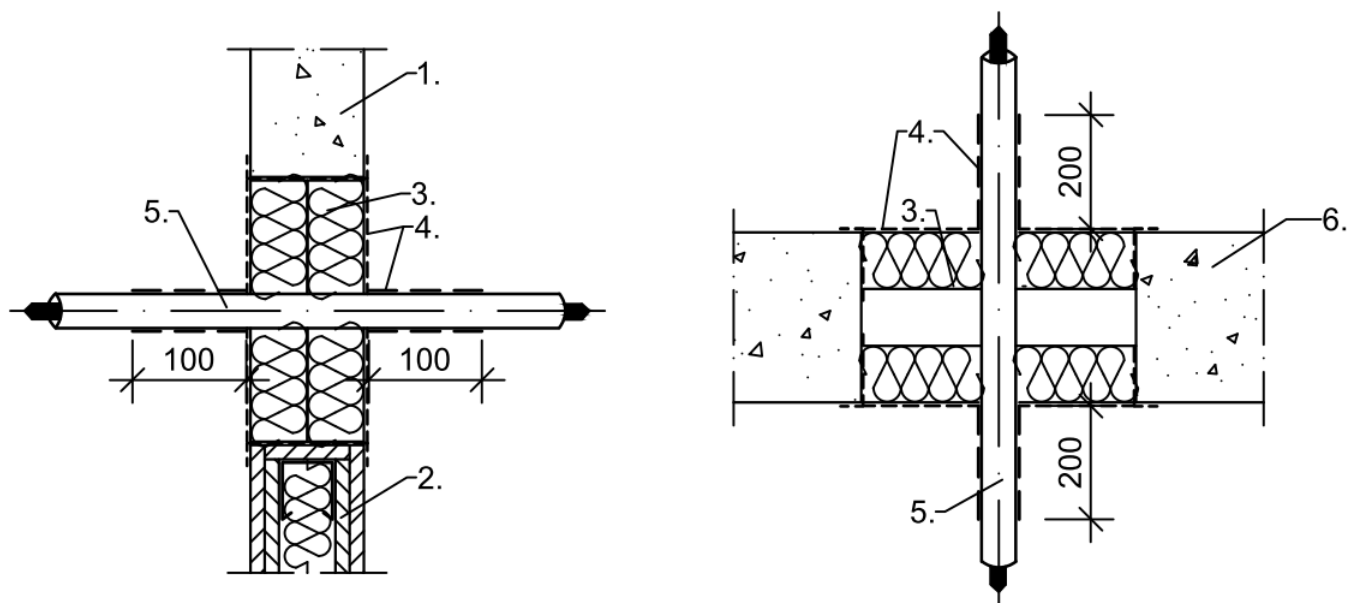
- 1. Rigid wall ≥ 100 thickness
- 2. Flexible wall ≥ 100 mm thickness
- 3. Mineral fibre board
- 4. Ablative Coating
- 5. Cable, cable bundles
- 6. Cable Tube CT
- 7. Rigid floor ≥ 150 mm thickness

Dimensions in mm

System Flammotect	Annex 56
Mixed penetration seal made of mineral fibre board (2 x 50 mm) with ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (2 x 50 mm) with ablative coating (≥ 1,0 mm dft)

Coaxial cables and waveguides with ablative coating



Fire resistance classes			
Service	Measures	Wall Fire resistance class	Floor Fire resistance class
Coaxial cable/waveguides			
CommScope Heliax Ø ≤ 51,1 mm	Ablative coating ≥ 100 mm x ≥ 1 mm DFT	EI 120 U/C	-
	Ablative coating ≥ 200 mm x ≥ 1 mm DFT	-	EI 120 U/C
RFS Cellflex Ø ≤ 50,3 mm	Ablative coating ≥ 100 mm x ≥ 1 mm DFT	EI 120 U/C	-
	Ablative coating ≥ 200 mm x ≥ 1 mm DFT	-	EI 120 U/C
RFS Radiaflex Ø ≤ 48,2 mm	Ablative coating ≥ 100 mm x ≥ 1 mm DFT	EI 120 U/C	-
RFS Radiaflex Ø ≤ 28,5 mm	Ablative coating ≥ 200 mm x ≥ 1 mm DFT	-	EI 120 U/C

1. Rigid wall ≥ 100 thickness
2. Flexible wall ≥ 100 mm thickness
3. Mineral fibre board

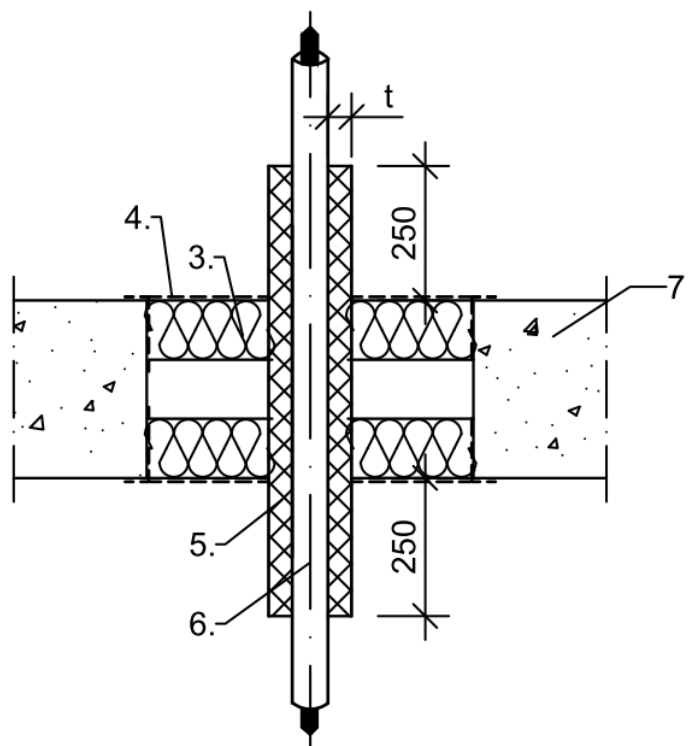
4. Ablative Coating
5. Coaxial cable / Waveguide
6. Rigid floor ≥ 150 mm thickness

Dimensions in mm

System Flammotect	Annex 57
Mixed penetration seal made of mineral fibre board (2 x 50 mm) with ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (2 x 50 mm) with ablative coating ($\geq 1,0$ mm dft)

Coaxial cables and waveguides with mineral fibre lamella mat



Fire resistance classes			
Service	Measures	Wall Fire resistance class	Floor Fire resistance class
Coaxial cable/waveguides			
CommScope Heliac $\varnothing \leq 51,1$ mm	Lamella mat both sides (LS) ≥ 250 mm 20 - 30 mm	-	EI 120 U/C
RFS Cellflex $\varnothing \leq 50,3$ mm	Lamella mat both sides (LS) ≥ 250 mm 20 - 30 mm	-	EI 120 U/C
RFS Radiaflex $\varnothing \leq 28,5$ mm	Lamella mat both sides (LS) ≥ 250 mm 20 - 30 mm	-	EI 120 U/C

- | | |
|--|--|
| 1. Rigid wall ≥ 100 thickness | 5. Mineral fibre lamella mat |
| 2. Flexible wall ≥ 100 mm thickness | 6. Coaxial cable / Waveguide |
| 3. Mineral fibre board | 7. Rigid floor ≥ 150 mm thickness |
| 4. Ablative Coating | |

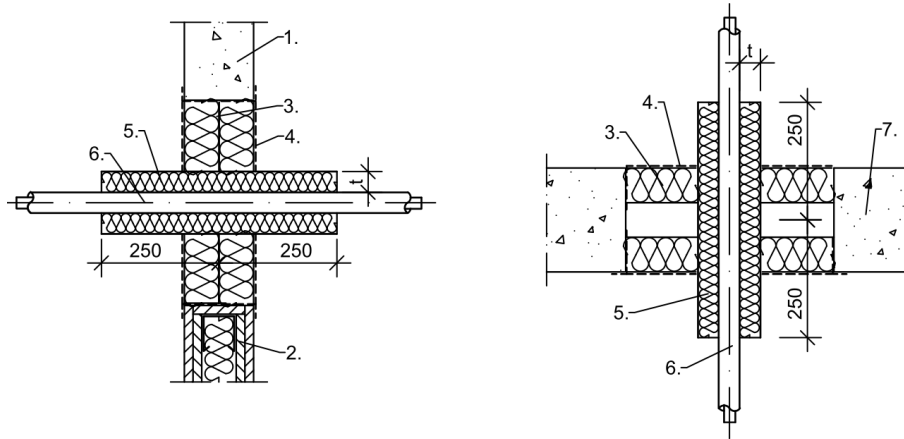
Dimensions in mm

System Flammotect	Annex 58
Mixed penetration seal made of mineral fibre board (2 x 50 mm) with ablative coating in walls and floors	

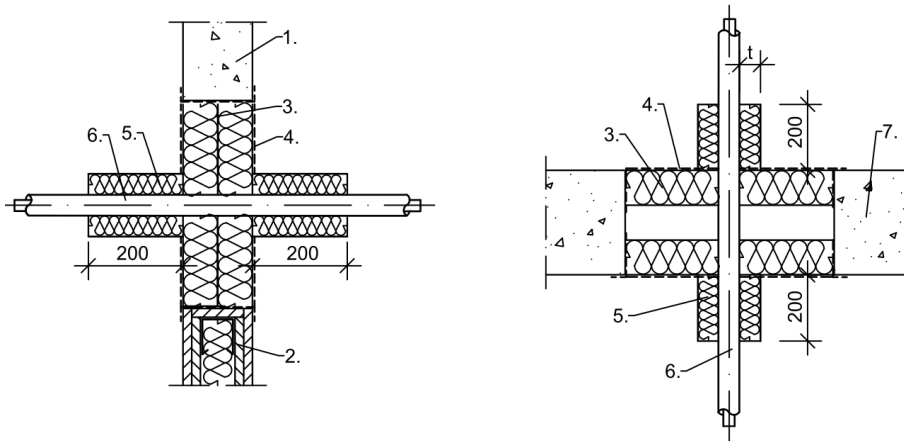
Mixed penetration seal made of mineral fibre board (2 x 50 mm) with ablative coating (≥ 1,0 mm dft)

Metal conduits with or without cables ≤ 21 mm, with mineral fibre lamella mat LI or LS

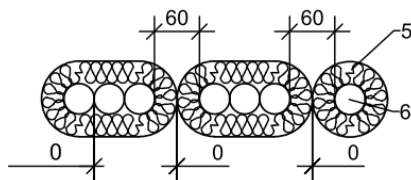
Variant LS



Variant LI



Detail, distances to each other:



Fire resistance classes					
Service	Cable	Measures	Wall Fire resistance class	Floor Fire resistance class	
Electrical Installation conduits (EIC)					
EIC made of steel	∅ ≤ 32	With/without	Lamella mat Both sides ≥ 250 x 30 mm (LS) / ≥ 200 x 30 mm (LI)	EI 120 U/C	EI 120 U/C
	≤ 3x ∅ ≤ 32	With/without		EI 90 / E 120 U/C	EI 120 U/C

- 1. Rigid wall ≥ 100 thickness
- 2. Flexible wall ≥ 100 mm thickness
- 3. Mineral fibre board
- 4. Ablative Coating
- 5. Mineral fibre lamella mat
- 6. Metal conduit
- 7. Rigid floor ≥ 150 mm thickness

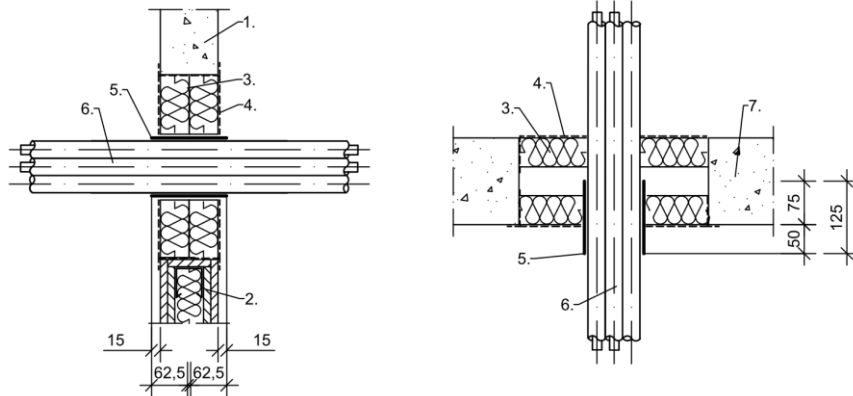
Dimensions in mm

System Flammotect	Annex 59
Mixed penetration seal made of mineral fibre board (2 x 50 mm) with ablative coating in walls and floors	

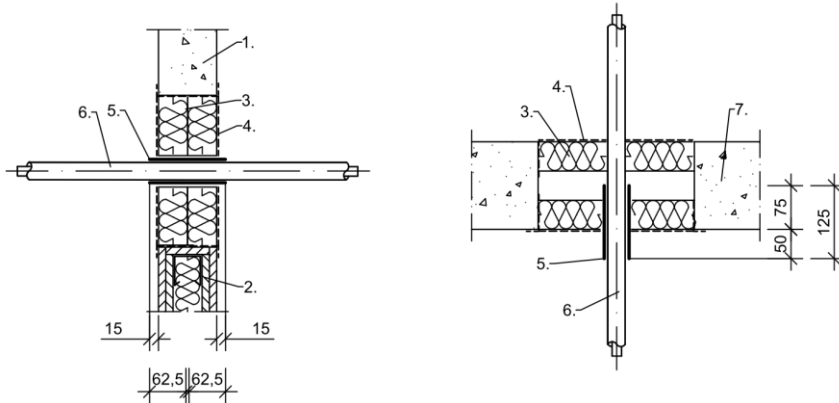
Mixed penetration seal made of mineral fibre board (2 x 50 mm) with ablative coating (≥ 1,0 mm dft)

Plastic conduits with intumescent wrap

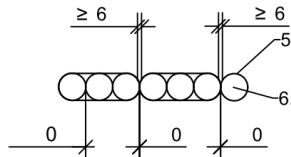
- Flexible plastic conduits bundled up to Ø 100 mm made of single conduits up to outer Ø 32 mm with or without cables ≤ 21 mm



- Inflexible plastic conduits Ø ≥ 63 mm, with or without cables ≤ 21 mm



- Detail, distances to each other



Fire resistance classes					
Service	Cable	Measures	Wall Fire resistance class	Floor Fire resistance class	
Electrical Installation conduits (EIC)					
EIC made of plastic	Ø ≤ 32	With/without	Intumescent wrap 2 x 62,5 / 1 x 125 mm, 1 x 1 layer	EI 120 U/U	EI 120 U/U
	Ø ≤ 63	With/without	Intumescent wrap 2x 62,5 / 1x 125 mm, 1 x 2 layers	EI 120 U/U	EI 90 U/U E 120 U/U
EIC made of plastic bundle	Ø ≤ 100	With/without	Intumescent wrap 2x 62,5 / 1x 125 mm, 1 x 2 layers	EI 120 U/U	EI 120 U/U
Linear arrangement of plastic EIC	≤ 3 pcs.	With/without	Intumescent wrap 2x 62,5 / 1x 125 mm, 1 x 1 layer	EI 120 U/U	EI 120 U/U

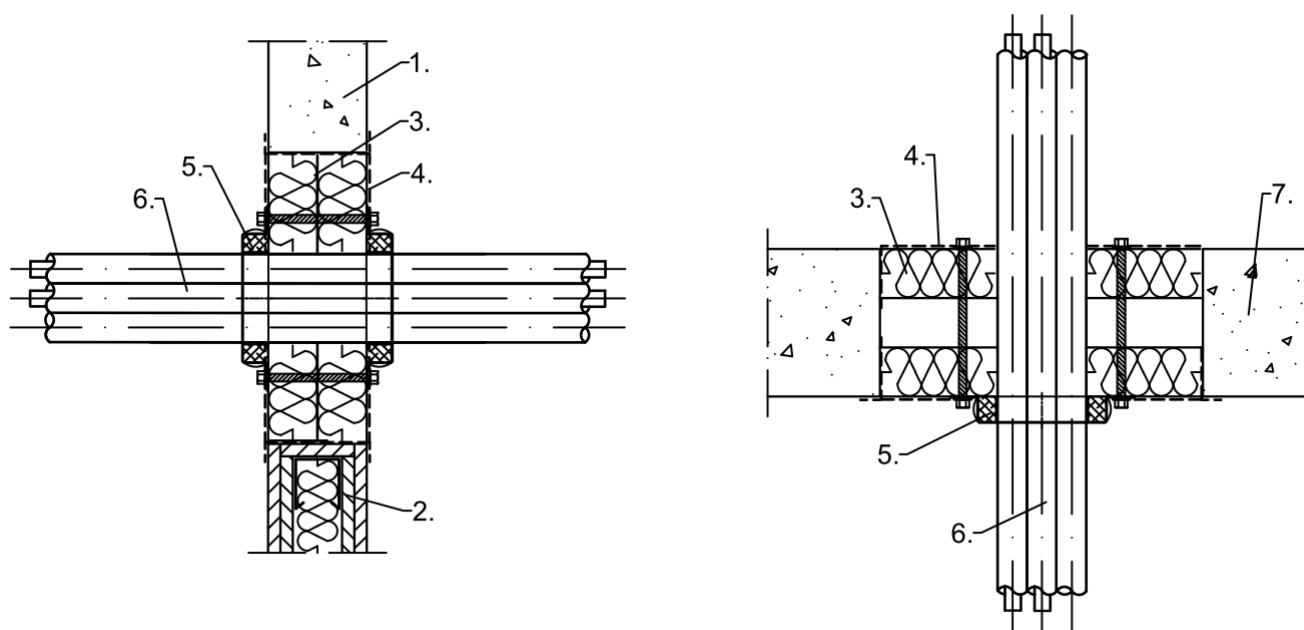
- | | |
|-------------------------------------|-----------------------------------|
| 1. Rigid wall ≥ 100 thickness | 5. Intumescent wrap |
| 2. Flexible wall ≥ 100 mm thickness | 6. Plastic conduit |
| 3. Mineral fibre board | 7. Rigid floor ≥ 150 mm thickness |
| 4. Ablative Coating | |

Dimensions in mm

System Flammotect	Annex 60
Mixed penetration seal made of mineral fibre board (2 x 50 mm) with ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (2 x 50 mm) with ablative coating (≥ 1,0 mm dft)

Plastic conduits bundled up to Ø 125 mm made of single conduits up to outer Ø 63 mm with or without cables ≤ 21 mm with fire protection collar



Fire resistance classes				
Service		Measures	Wall Fire resistance class	Floor Fire resistance class
Electrical Installation conduits (EIC)				
EIC made of plastic	Ø ≤ 32	Fire protection collar Wall: Installed on both sides Floor: Installed on bottom side	EI 120 U/U	EI 120 U/U
	Ø ≤ 63	Fire protection collar Wall: Installed on both sides Floor: Installed on bottom side	EI 90 U/C	EI 90 U/C
EIC made of plastic bundle	Ø ≤ 125 with single EIC Ø ≤ 63	Fire protection collar Wall: Installed on both sides Floor: Installed on bottom side	EI 90 U/C	EI 90 U/C

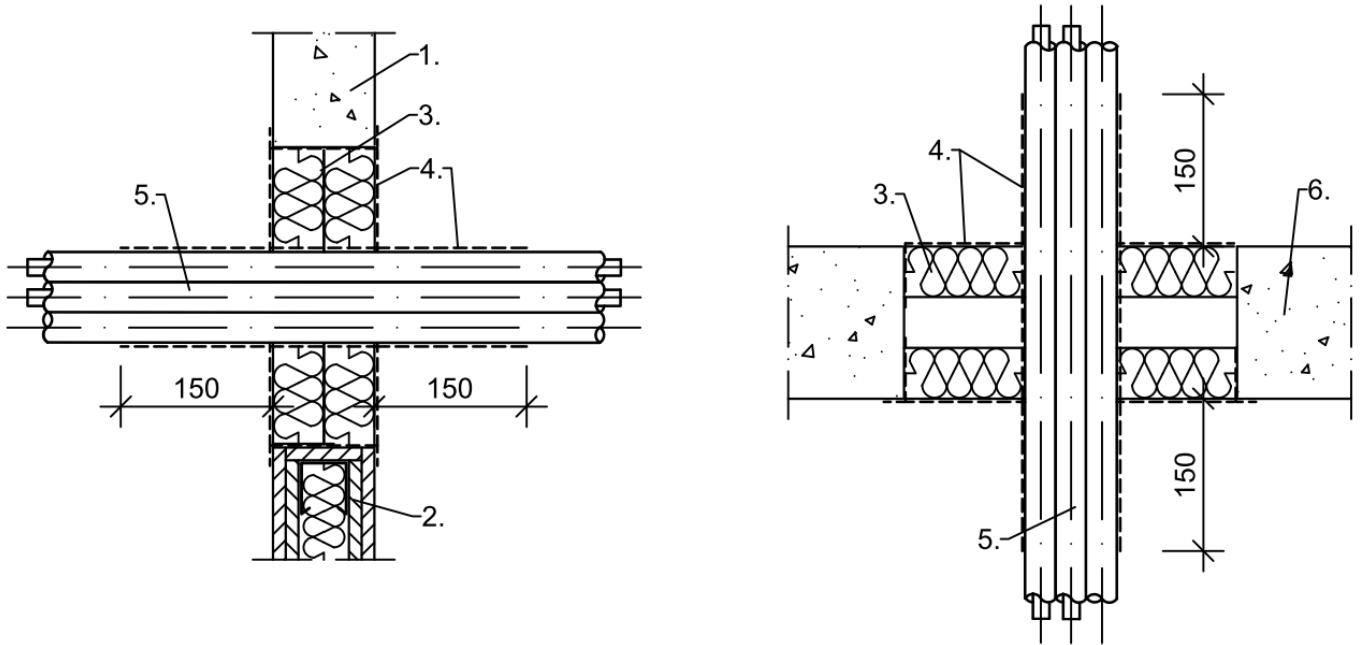
- | | |
|-------------------------------------|-----------------------------------|
| 1. Rigid wall ≥ 100 thickness | 5. Fire protection collar |
| 2. Flexible wall ≥ 100 mm thickness | 6. Plastic conduit |
| 3. Mineral fibre board | 7. Rigid floor ≥ 150 mm thickness |
| 4. Ablative Coating | |

Dimensions in mm

System Flammotect	Annex 61
Mixed penetration seal made of mineral fibre board (2 x 50 mm) with ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (2 x 50 mm) with ablative coating (≥ 1,0 mm dft)

Plastic conduits Ø ≤ 32 mm with fire protection coating



Fire resistance classes				
Service	Measures		Wall Fire resistance class	Floor Fire resistance class
Electrical installation conduits (EIC)				
EIC made of plastic	Ø ≤ 32	Ablative coating ≥ 150 mm x ≥ 1 mm dft	EI 90 U/C	EI 90 U/C

- 1. Rigid wall ≥ 100 thickness
- 2. Flexible wall ≥ 100 mm thickness
- 3. Mineral fibre board

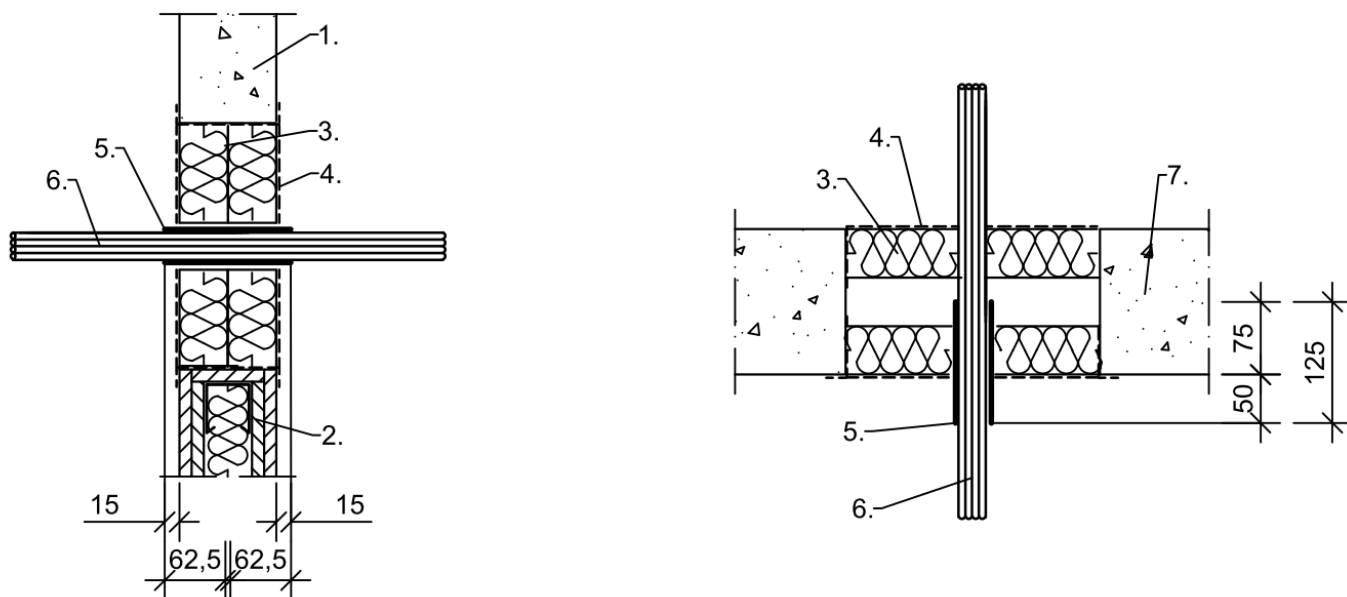
- 4. Ablative Coating
- 5. Plastic conduit
- 6. Rigid floor ≥ 150 mm thickness

Dimensions in mm

System Flammotect	Annex 62
Mixed penetration seal made of mineral fibre board (2 x 50 mm) with ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (2 x 50 mm) with ablative coating (≥ 1,0 mm dft)

Speed pipes bundled up to $\varnothing \leq 50$ mm made of PE pipes up to outer $\varnothing \leq 14$ mm with fire protection wrap



Fire resistance classes				
Service	Measures	Wall Fire resistance class	Floor Fire resistance class	
Speed pipes				
Speed pipes	Bundle- $\varnothing \leq 50$ Single- $\varnothing \leq 14$	Intumescent wrap 2 x 62,5 / 1 x 125 mm 1 x 1 layer	EI 120 U/U	EI 120 U/U

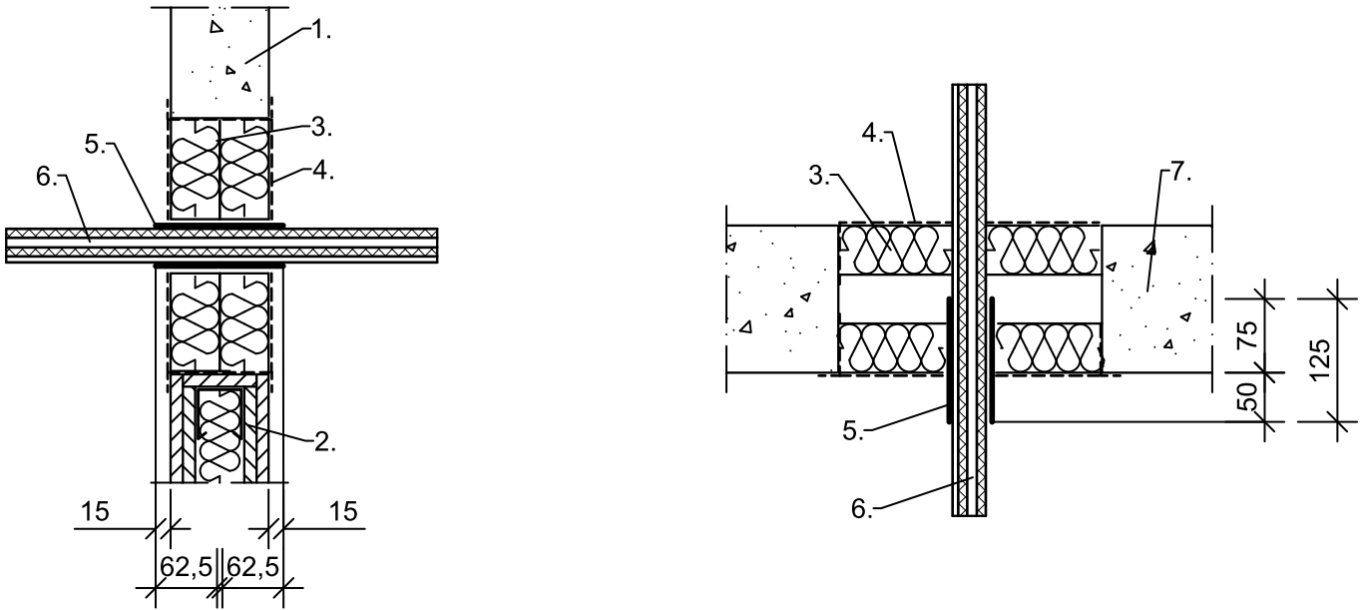
- 1. Rigid wall ≥ 100 thickness
- 2. Flexible wall ≥ 100 mm thickness
- 3. Mineral fibre board
- 4. Ablative Coating
- 5. Fire protection wrap
- 6. Speed pipe
- 7. Rigid floor ≥ 150 mm thickness

Dimensions in mm

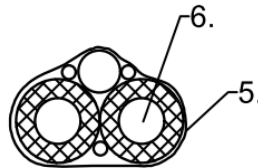
System Flammotect	Annex 63
Mixed penetration seal made of mineral fibre board (2 x 50 mm) with ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (2 x 50 mm) with ablative coating ($\geq 1,0$ mm dft)

HVAC split line combinations with fire protection wrap



Detail, view:



Fire resistance classes			
Service	Measures	Wall Fire resistance class	Floor Fire resistance class
HVAC-split line combinations			
Copper pipe $\leq 2x \text{ } \varnothing \leq 18$ + PE-Foam 9 mm + 1x PVC-U/PVC-C pipe $\varnothing \leq 25x 1,5$ mm + $\leq 3x$ cables $\varnothing \leq 14$ mm	Intumescent wrap 2 x 62,5 / 1 x 125 mm 1 x 2 layers	EI 120	EI 120

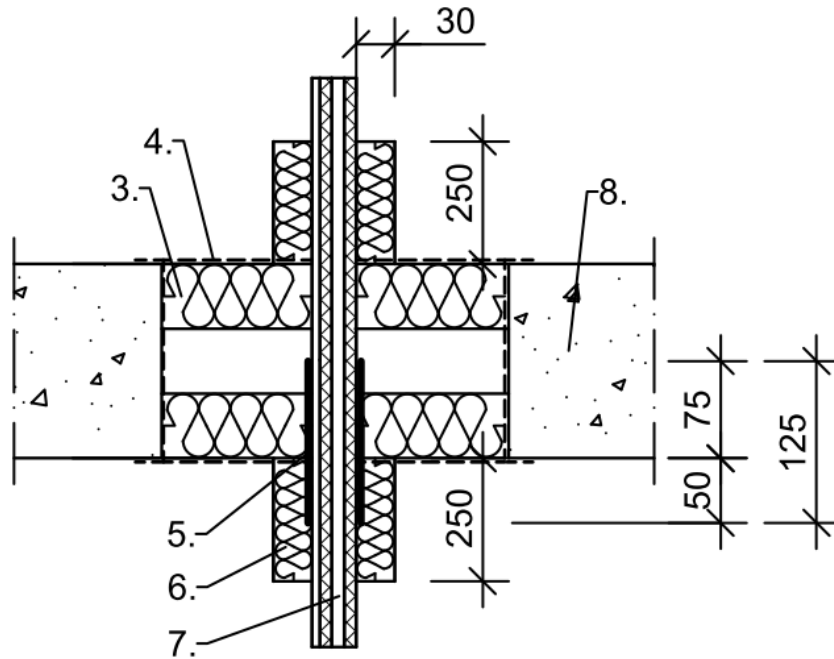
- | | |
|--|--|
| 1. Rigid wall ≥ 100 thickness | 5. Fire protection wrap |
| 2. Flexible wall ≥ 100 mm thickness | 6. HVAC split line combination |
| 3. Mineral fibre board | 7. Rigid floor ≥ 150 mm thickness |
| 4. Ablative Coating | |

Dimensions in mm

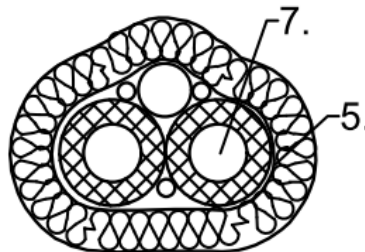
System Flammotect	Annex 64
Mixed penetration seal made of mineral fibre board (2 x 50 mm) with ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (2 x 50 mm) with ablative coating (≥ 1,0 mm dft)

HVAC split line combinations with mineral fibre lamella mat



Detail view:



Fire resistance classes			
Service	Measures	Wall Fire resistance class	Floor Fire resistance class
HVAC-split line combinations			
Copper pipe ≤ 2x Ø ≤ 22 + PE-Foam 9 mm + 1x PVC-U pipe Ø ≤ 25 mm + ≤ 2x cables Ø ≤ 21 mm	Intumescent wrap 2 x 62,5 / 1 x 125 mm 1 x 2 layers + lamella mat ≥ 250 x ≥ 30 mm	-	EI 90

- | | |
|-------------------------------------|-----------------------------------|
| 1. Rigid wall ≥ 100 thickness | 5. Fire protection wrap |
| 2. Flexible wall ≥ 100 mm thickness | 6. Mineral fibre lamella mat |
| 3. Mineral fibre board | 7. HVAC split line combination |
| 4. Ablative Coating | 8. Rigid floor ≥ 150 mm thickness |

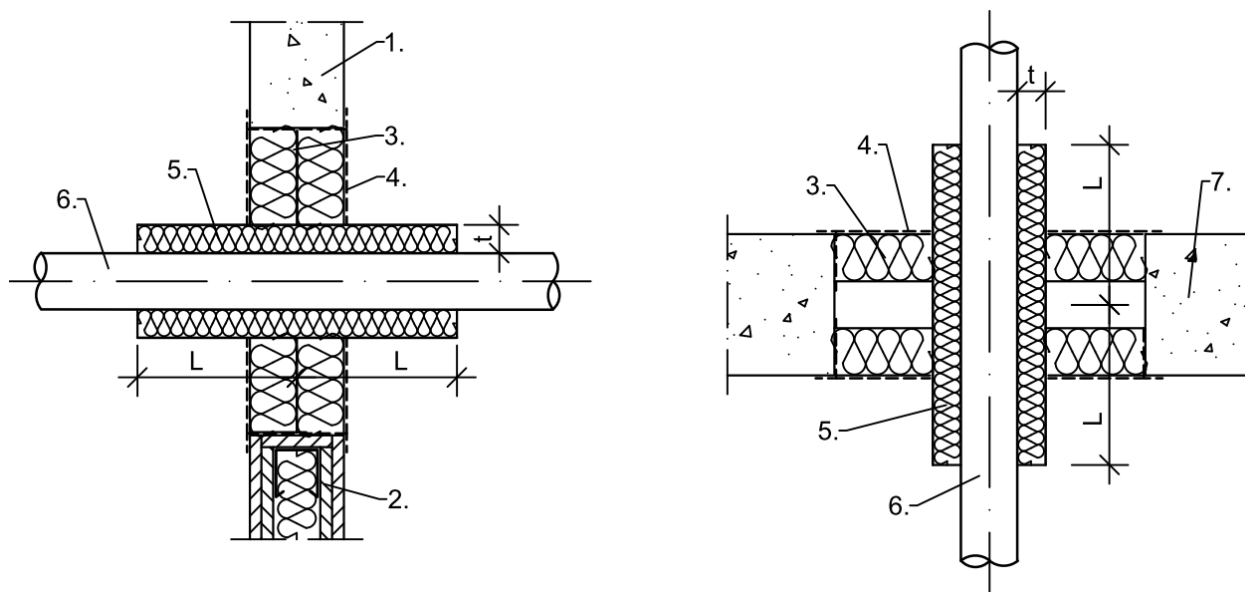
Dimensions in mm

System Flammotect	Annex 65
Mixed penetration seal made of mineral fibre board (2 x 50 mm) with ablative coating in walls and floors	

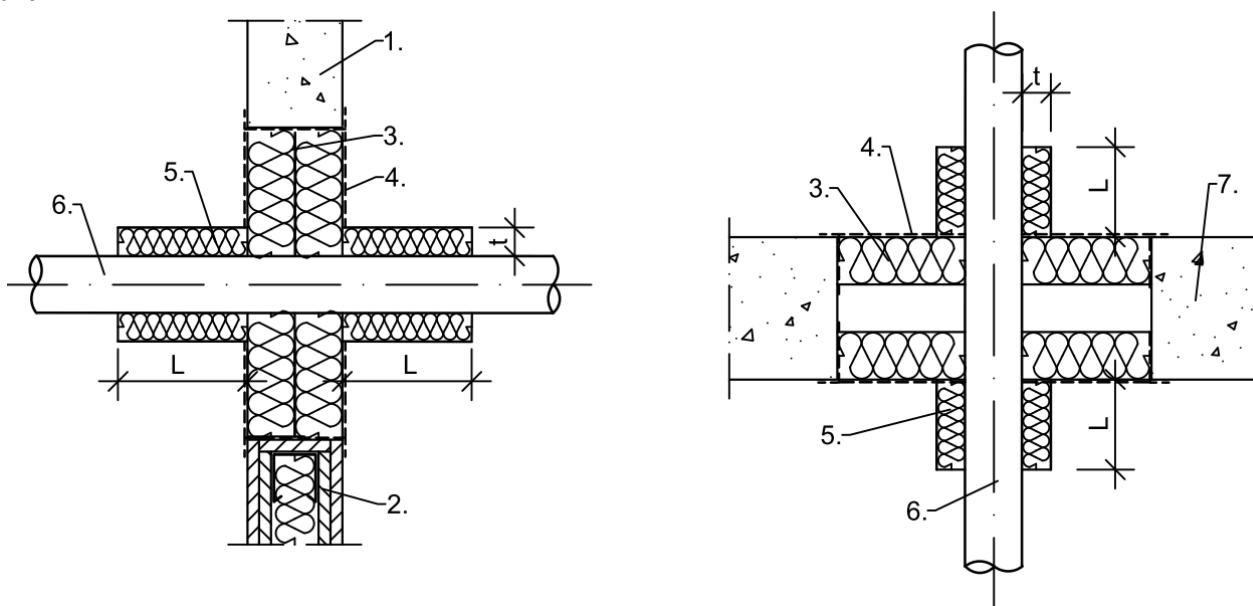
Mixed penetration seal made of mineral fibre board (2 x 50 mm) with ablative coating ($\geq 1,0$ mm dft)

Non-combustible pipes with insulation made of mineral fibre

Variant LS



Variant LI



All angles between 90° and 45° are permissible

- | | |
|--|--|
| 1. Rigid wall ≥ 100 thickness | 5. Mineral fibre lamella mat |
| 2. Flexible wall ≥ 100 mm thickness | 6. Non-combustible pipe |
| 3. Mineral fibre board | 7. Rigid floor ≥ 150 mm thickness |
| 4. Ablative Coating | |

Dimensions in mm

System Flammotect	Annex 66
Mixed penetration seal made of mineral fibre board (2 x 50 mm) with ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (2 x 50 mm) with ablative coating ($\geq 1,0$ mm dft)**Non-combustible pipes with insulation made of mineral fibre**

Fire resistance classes - Wall				
Service	Outside-Ø	Pipe wall thickness	Measures	Wall Fire resistance class
Non-combustible pipes with insulation made of mineral fibre				
Copper, steel, stainless steel, cast iron	≤ 22	0,6 - 14,2	Lamella mat Both sides $\geq 450 \times 20-100$ mm	EI 120 U/C
	$> 22 - \leq 60$		Lamella mat Both sides $\geq 200 \times 30-100$ mm	EI 120 U/C
	$> 60 - \leq 88,9$		Lamella mat Both sides $\geq 450 \times 30-100$ mm	EI 120 U/C
Steel, stainless steel, cast iron	≤ 42	1,8 - 14,2	Lamella mat Both sides $\geq 200 \times 30-100$ mm	EI 120 U/C
	$> 42 - \leq 114,3$	1,8/3,2 - 14,2	Lamella mat Both sides $\geq 450 \times 30-100$ mm	EI 120 U/C
	$> 114,3 - \leq 159$	3,2/4,0 - 14,2	Lamella mat Both sides $\geq 1200 \times 100$ mm	EI 120 U/C
	$> 114,3 - \leq 219,1$	3,2/4,5 - 14,2	Lamella mat Both sides $\geq 1200 \times 30-100$ mm	EI 90 U/C

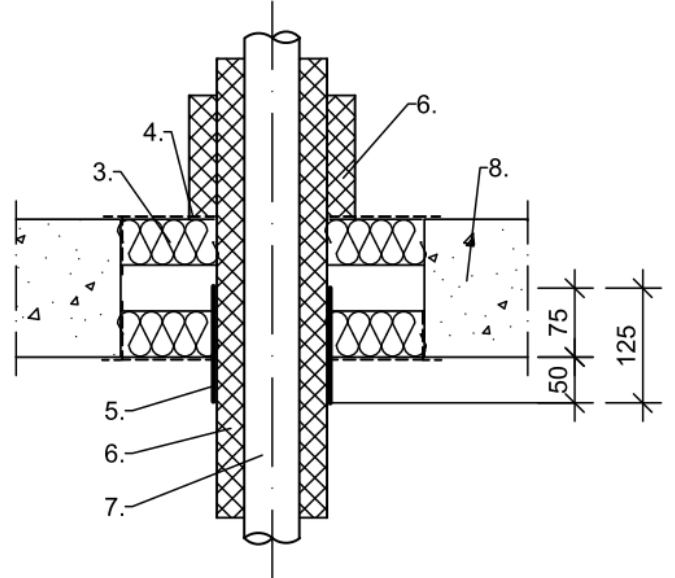
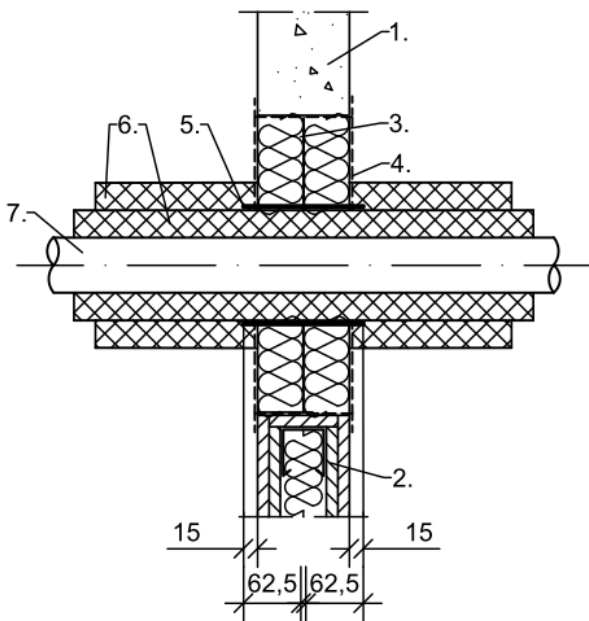
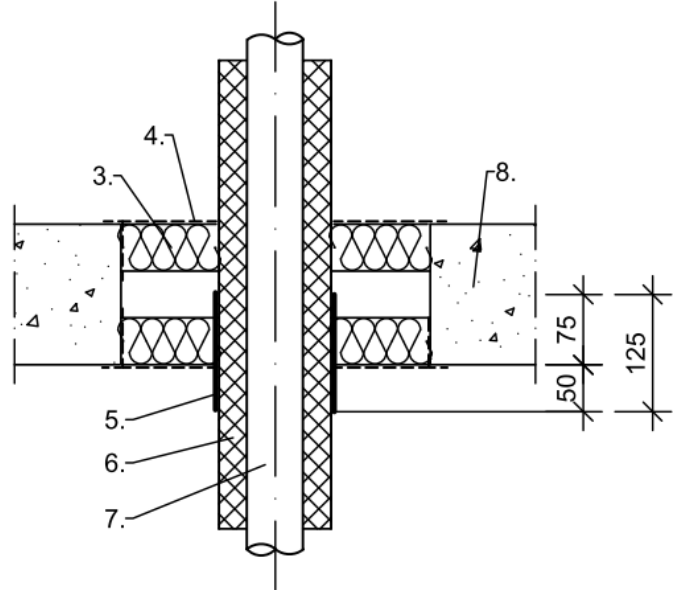
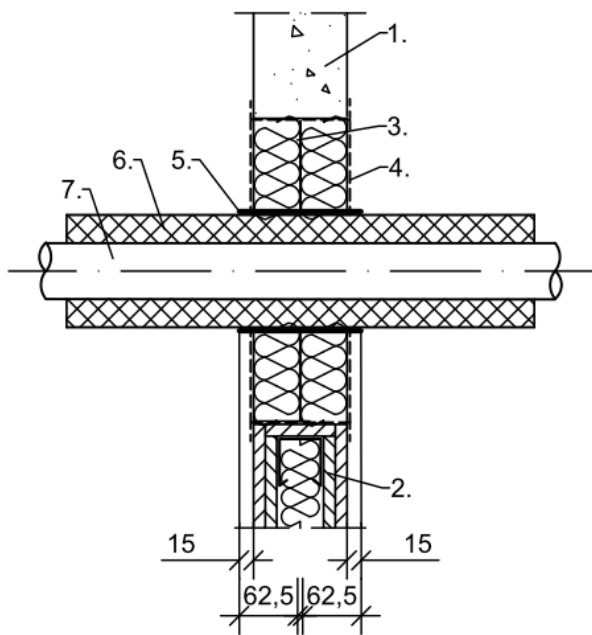
Fire resistance classes - Floor				
Service	Outside-Ø	Pipe wall thickness	Measures	Floor Fire resistance class
Non-combustible pipes with insulation made of mineral fibre				
Copper, steel, stainless steel, cast iron	≤ 22	0,6 - 14,2	Lamella mat Both sides $\geq 425 \times 20-100$ mm	EI 120 U/C
			Lamella mat Both sides $\geq 175 \times 30-100$ mm	EI 120 U/C
	$> 22 - \leq 42$		Lamella mat Both sides $\geq 425 \times 30-100$ mm	EI 120 U/C
	$> 42 - \leq 88,9$		Lamella mat Both sides $\geq 675 \times 30-100$ mm	EI 90 U/C
Steel, stainless steel, cast iron	≤ 42	1,8 - 14,2	Lamella mat Both sides $\geq 125 \times 30-100$ mm	EI 120 U/C
	$> 42 - \leq 114,3$	1,8/3,2 - 14,2	Lamella mat Both sides $\geq 425 \times 30-100$ mm	EI 120 U/C
	$> 114,3 - \leq 159$	3,2/4,0 - 14,2	Lamella mat Both sides $\geq 1175 \times 30-100$ mm	EI 120 U/C
	$> 114,3 - \leq 219,1$	3,2/4,5 - 14,2	Lamella mat Both sides $\geq 1175 \times 30$ mm	EI 120 U/C
			Lamella mat Both sides $\geq 1175 \times 30-100$ mm	EI 90 U/C

Dimensions in mm

System Flamotect	Annex 67
Mixed penetration seal made of mineral fibre board (2 x 50 mm) with ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (2 x 50 mm) with ablative coating ($\geq 1,0$ mm dft)

Non-combustible pipes with insulation made of FEF



- 1. Rigid wall ≥ 100 thickness
- 2. Flexible wall ≥ 100 mm thickness
- 3. Mineral fibre board
- 4. Ablative Coating

- 5. Fire protection wrap
- 6. Insulation made of FEF
- 7. Non-combustible pipe
- 8. Rigid floor ≥ 150 mm thickness

Dimensions in mm

System Flammotect	Annex 68
Mixed penetration seal made of mineral fibre board (2 x 50 mm) with ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (2 x 50 mm) with ablative coating ($\geq 1,0$ mm dft)**Non-combustible pipes with insulation made of FEF**

Fire resistance classes - Wall					
Service	Outside- \emptyset	Pipe wall thickness	Insulation thickness	Measures	Wall Fire resistance class
Non-combustible pipes with insulation made of FEF acc. EN 14304					
Copper, steel, stainless steel, cast iron	≤ 15 mm	0,8 - 14,2	10 mm	Intumescent wrap 2 x 62,5 / 1 x 125 mm 1 x 1 layer	EI 120 U/C
	$> 15 - \leq 54$ mm		19 - 38 mm	Intumescent wrap 2 x 62,5 / 1 x 125 mm 1 x 2 layers	EI 120 U/C
	$> 54 - \leq 88,9$ mm		25 mm	Intumescent wrap 2 x 62,5 / 1 x 125 mm 1 x 2 layers	EI 120 U/C
	≤ 42 mm		10 mm	Intumescent wrap 2 x 62,5 / 1 x 125 mm 1 x 1 layer	EI 90 U/C
	$> 42 - \leq 88,9$ mm		19 - 38 mm	Intumescent wrap 2 x 62,5 / 1 x 125 mm 1 x 2 layers	EI 90 U/C
Steel, stainless steel, cast iron	≤ 15 mm		10 - 38 mm	Intumescent wrap 2 x 62,5 / 1 x 125 mm 1 x 2 layers	EI 120 U/C
	$> 15 - \leq 88,9$ mm		19 - 38 mm	Intumescent wrap 2x 62,5 / 1x 125 mm 1 x 2 layers	EI 120 U/C
	$> 88,9 - \leq 114,3$ mm		19 - 38 mm	Intumescent wrap 2 x 62,5 / 1 x 125 mm 1 x 2 layers + Protective insulation FEF 250x19	EI 120 U/C
	$> 114,3 - \leq 159$ mm		25 - 38 mm	Intumescent wrap 2 x 62,5 / 1 x 125 mm 1 x 2 layers + Protective insulation FEF 250x19	EI 120 U/C
	$> 159 - \leq 219,1$ mm		25 - 38 mm	Intumescent wrap 2 x 62,5 / 1 x 125 mm 1 x 2 layers + Protective insulation FEF 600x38	EI 120 U/C

Dimensions in mm

System Flammotect	Annex 69
Mixed penetration seal made of mineral fibre board (2 x 50 mm) with ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (2x 50 mm) with ablative coating ($\geq 1,0$ mm dft)**Non-combustible pipes with insulation made of FEF**

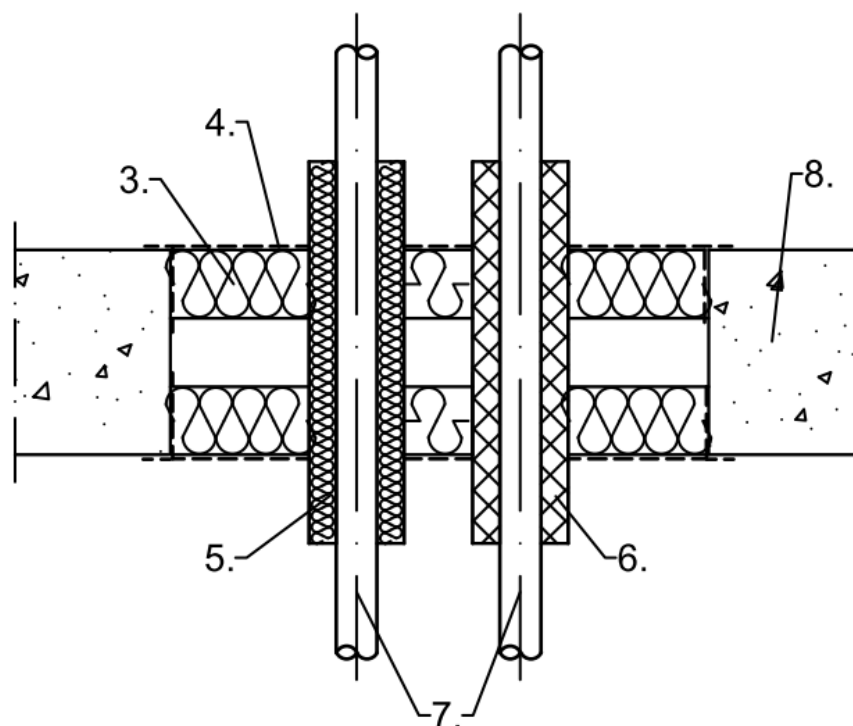
Fire resistance classes - Floor					
Service	Outside-Ø	Pipe wall thickness	Insulation Thickness	Measures	Floor Fire resistance class
Non-combustible pipes with insulation made of FEF acc. EN 14304					
Copper, steel, stainless steel, cast iron	≤ 60 mm	0,6 - 14,2	13 - 40 mm	Intumescent wrap 2 x 62,5 / 1 x 125 mm 1 x 2 layers	EI 120 U/C
	$> 60 - \leq 88,9$ mm		25 mm	Intumescent wrap 2 x 62,5 / 1 x 125 mm 1 x 2 layers	EI 120 U/C
	≤ 42 mm		10 mm	Intumescent wrap 2 x 62,5 / 1 x 125 mm 1 x 1 layer	EI 90 U/C
	≤ 42 mm		9 - 40 mm	Intumescent wrap 2 x 62,5 / 1 x 125 mm 1 x 2 layers	EI 90 U/C
	$> 42 - \leq 60$ mm		13 - 40 mm	Intumescent wrap 2 x 62,5 / 1 x 125 mm 1 x 2 layers	EI 90 U/C
	$> 60 - \leq 88,9$ mm		19 - 38 mm	Intumescent wrap 2 x 62,5 / 1 x 125 mm 2 layers	EI 90 U/C
Steel, stainless steel, cast iron	≤ 159 mm		25 - 38 mm	Intumescent wrap 2 x 62,5 / 1 x 125 mm 1 x 2 layers + Protective insulation FEF 250x25	EI 90 U/C
	$> 159 - \leq 219,1$ mm		25 - 38 mm	Intumescent wrap 2 x 62,5 / 1 x 125 mm 1 x 2 layers + Protective insulation FEF 250x38	EI 90 U/C

Dimensions in mm

System Flammotect	Annex 70
Mixed penetration seal made of mineral fibre board (2 x 50 mm) with ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (2 x 50 mm) with ablative coating (≥ 1,0 mm dft)

Multi-layer composite pipes insulated with lamella mat or FEF



Fire resistance classes				
Service	Pipe wall thickness	Measures	Wall Fire resistance class	Floor Fire resistance class
Multi-layer composite pipes HENCO pipes				
Ø ≤ 12 mm	≥ 1.6 mm	Lamella mat [L x T] ≥ 250 mm x ≥ 20 mm	-	EI 90 U/C
Ø ≤ 32 mm	≥ 3.0 mm	Lamella mat [L x T] ≥ 250 mm x ≥ 20 mm	-	EI 90 U/C
Ø ≤ 63 mm	≥ 4.5 mm	Lamella mat [L x T] ≥ 250 mm x ≥ 30 mm	-	EI 90 U/C
Ø ≤ 12 mm	≥ 1.6 mm	FEF acc. EN 14304 [L x T] ≥ 240 mm x ≥ 13 mm	-	EI 90 U/C
Ø ≤ 32 mm	≥ 3.0 mm	FEF acc. EN 14304 [L x T] ≥ 240 mm x ≥ 13 mm	-	EI 90 U/C
Ø ≤ 63 mm	≥ 4.5 mm	FEF acc. EN 14304 [L x T] ≥ 240 mm x ≥ 26 (2x 13) mm	-	EI 90 U/C

- 3. Mineral fibre board
- 4. Ablative Coating
- 5. Mineral fibre lamella mat

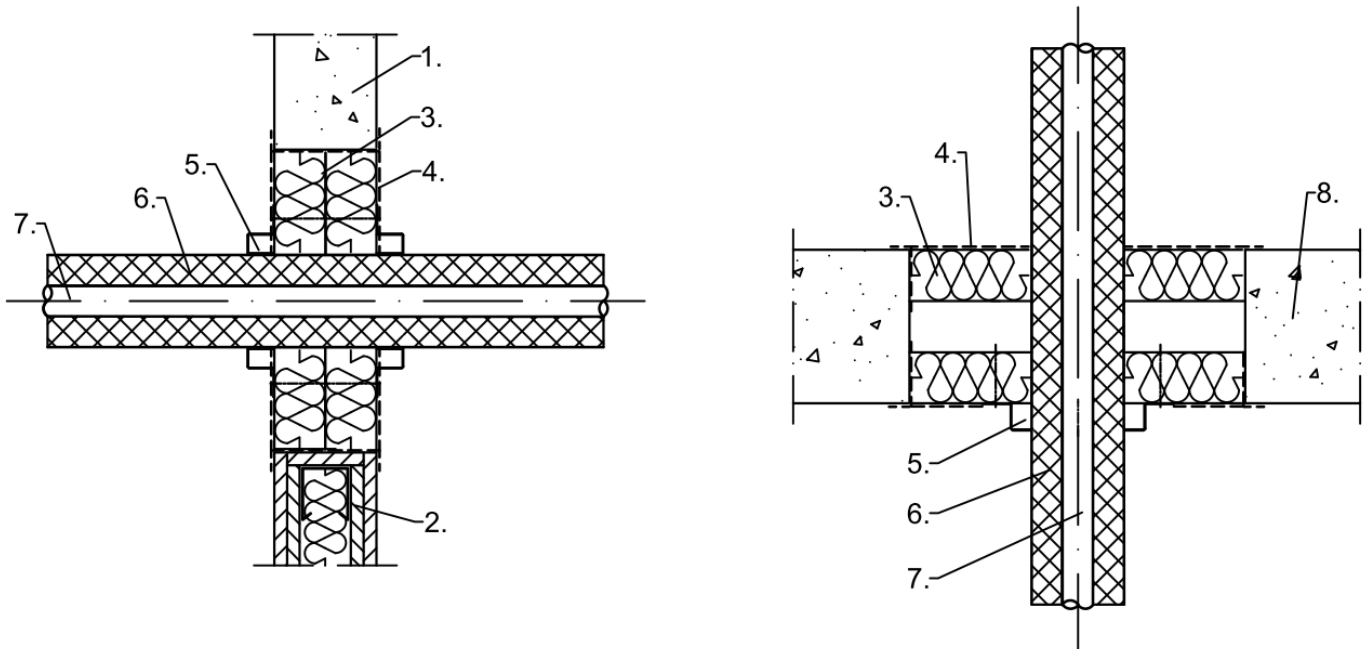
- 6. Insulation made of FEF
- 7. Multi-layer pipe
- 8. Rigid floor ≥ 150 mm thickness

Dimensions in mm

System Flammotect	Annex 71
Mixed penetration seal made of mineral fibre board (2 x 50 mm) with ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (2 x 50 mm) with ablative coating (≥ 1,0 mm dft)

Multi-layer composite pipes insulated with FEF and Endless Collar



The fire protection endless collar may be attached with coarse thread screws

Permitted screws:

Würth	ASSY D	8x70 mm
Heco	HECO-TOPIX-plus	8x80 mm
SPAX	T-STAR plus	8x80 mm

Pipe outer diameter	Fastening hooks / insulation thickness		
	2	3	4
16 mm	≤ 17 mm	17.5 – 38 mm	-
20 mm	≤ 15 mm	15.5 – 38 mm	-
26 mm	≤ 12 mm	12.5 – 38 mm	-
32 mm	≤ 9 mm	9.5 – 38 mm	-
40 mm	-	8 – 35 mm	35.5 – 38 mm
50 mm	-	8 – 30 mm	30.5 – 38 mm
63 mm	-	8 – 23.5 mm	24 – 38 mm
75 mm	-	8 – 17.5 mm	18 – 38 mm

- | | |
|-------------------------------------|-----------------------------------|
| 1. Rigid wall ≥ 100 thickness | 5. Endless Collar |
| 2. Flexible wall ≥ 100 mm thickness | 6. Insulation made of FEF |
| 3. Mineral fibre board | 7. Multi-layer pipe |
| 4. Ablative Coating | 8. Rigid floor ≥ 150 mm thickness |

Dimensions in mm

System Flammotect	Annex 72
Mixed penetration seal made of mineral fibre board (2 x 50 mm) with ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (2 x 50 mm) with ablative coating ($\geq 1,0$ mm dft)**Multi-layer composite pipes insulated with FEF and Endless Collar**

Fire resistance classes - Wall					
Service	Pipe wall thickness	Insulation type	Insulation thickness	Measures	Wall Fire resistance class
Multi-layer composite pipes Fränkische Alpex L, Fränkische Alpex F50					
Ø 16 mm	2 mm	FEF acc. EN 14304 (B-s3, d0)	8 – 30 mm	Endless Collar 2-layers Installed on both sides	EI 120 U/C
Ø 20 mm			9 – 11.5 mm		EI 120 U/C

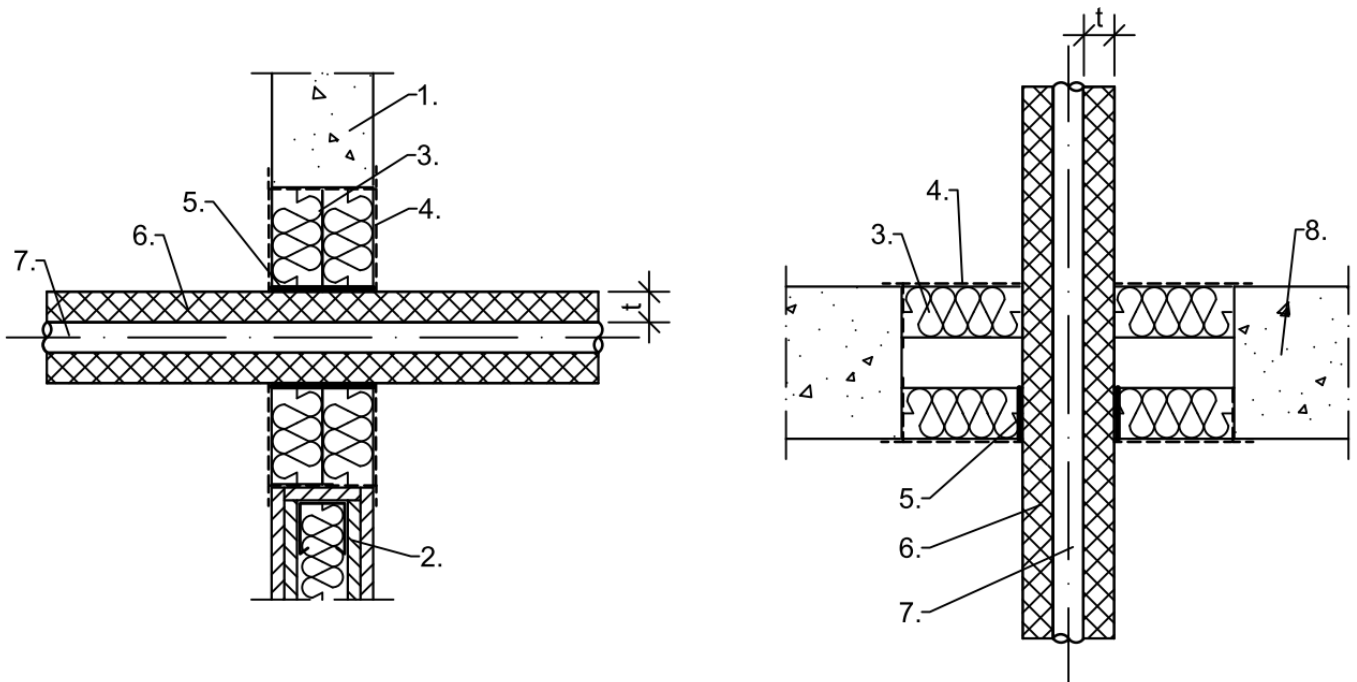
Fire resistance classes - Floor					
Service	Pipe wall thickness	Insulation type	Insulation thickness	Measures	Floor Fire resistance class
Multi-layer composite pipes Fränkische Alpex L, Fränkische Alpex F50					
Ø 16 mm	2 mm	FEF acc. EN 14304 (B-s3, d0)	9 – 38 mm	Endless Collar 2-layers Installed on bottom side	EI 90 U/C
Ø 20 mm					EI 90 U/C
Ø 26 mm	3 mm		10 – 38 mm		EI 90 U/C
Ø 32 mm					EI 90 U/C
Ø 40 mm	3.5 mm		20 – 38 mm		EI 90 U/C
Ø 50 mm	4 mm				EI 90 U/C
Ø 63 mm	4.5 mm		EI 90 U/C		
Ø 75 mm	5 mm		EI 90 U/C		

Dimensions in mm

System Flamotect	Annex 73
Mixed penetration seal made of mineral fibre board (2 x 50 mm) with ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (2 x 50 mm) with ablative coating ($\geq 1,0$ mm dft)

Multi-layer composite pipes insulated with FEF and intumescent wrap



- | | |
|---|--|
| <ul style="list-style-type: none"> 1. Rigid wall ≥ 100 thickness 2. Flexible wall ≥ 100 mm thickness 3. Mineral fibre board 4. Ablative Coating | <ul style="list-style-type: none"> 5. Intumescent wrap 6. Insulation made of FEF 7. Multi-layer pipe 8. Rigid floor ≥ 150 mm thickness |
|---|--|

Dimensions in mm

System Flammotect	Annex 74
Mixed penetration seal made of mineral fibre board (2 x 50 mm) with ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (2 x 50 mm) with ablative coating ($\geq 1,0$ mm dft)**Multi-layer composite pipes insulated with FEF and intumescent wrap**

Fire resistance classes - Wall					
Service	Pipe wall thickness	Insulation type	Insulation thickness	Measures	Wall Fire resistance class
Multi-layer composite pipes Geberit Mepla					
Ø 16 mm	2.25 mm	FEF acc. EN 14304 (B-s3, d0)	8.0 – 32 mm	Intumescent wrap 50 mm 2 x 1-layer	EI 120 U/C
Ø 20 mm	2.5 mm				EI 120 U/C
Ø 26 mm	3 mm		8.5 – 35 mm		EI 120 U/C
Ø 32 mm	3 mm		EI 120 U/C		
Ø 40 mm	3.5 mm		9.0 – 35 mm	Intumescent wrap 50 mm 2 x 2-layer	EI 120 U/C
Ø 50 mm	4 mm				EI 120 U/C
Ø 63 mm	4.5 mm		9.0 – 39 mm		EI 120 U/C
Ø 75 mm	4.7 mm		9.5 mm		EI 90 U/C
		>9.5 – 40.5 mm	EI 120 U/C		
Multi-layer composite pipes Rehau Rautitan stabil					
Ø 16 mm	2.6 mm	FEF acc. EN 14304 (B-s3, d0)	8.0 – 32 mm	Intumescent wrap 50 mm 2 x 1-layer	EI 120 U/C
Ø 20 mm	2.9 mm				EI 120 U/C
Ø 25 mm	3.7 mm		8.5 – 35 mm		EI 120 U/C
Ø 32 mm	4.7 mm		9.0 – 35 mm	EI 120 U/C	
Ø 40 mm	6.0 mm			Intumescent wrap 50 mm 2 x 2-layer	EI 120 U/C
Multi-layer composite pipes Kekelit Kelox					
Ø 16 mm	2 mm	FEF acc. EN 14304 (B-s3, d0)	8.0 – 32 mm	Intumescent wrap 50 mm 2 x 1-layer	EI 120 U/C
Ø 18 mm	2 mm				EI 120 U/C
Ø 20 mm	2.25 mm				EI 120 U/C
Ø 25 mm	2.5 mm		8.5 – 35 mm		EI 120 U/C
Ø 32 mm	3 mm		9.0 – 35 mm	EI 120 U/C	
Ø 40 mm	4 mm			EI 120 U/C	
Ø 50 mm	4.5 mm		9.0 – 39 mm	Intumescent wrap 50 mm 2 x 2-layer	EI 120 U/C
Ø 63 mm	6 mm			EI 120 U/C	
Ø 75 mm	7.5 mm			9.5 – 40.5 mm	EI 120 U/C
Multi-layer composite pipes HENCO pipes					
Ø 20 mm	2-3 mm	FEF acc. EN 14304 (B-s3, d0)	8.0 – 32 mm	Intumescent wrap 50 mm 2 x 1-layer	EI 120 U/C
Ø 32 mm	3 mm				EI 120 U/C

Dimensions in mm

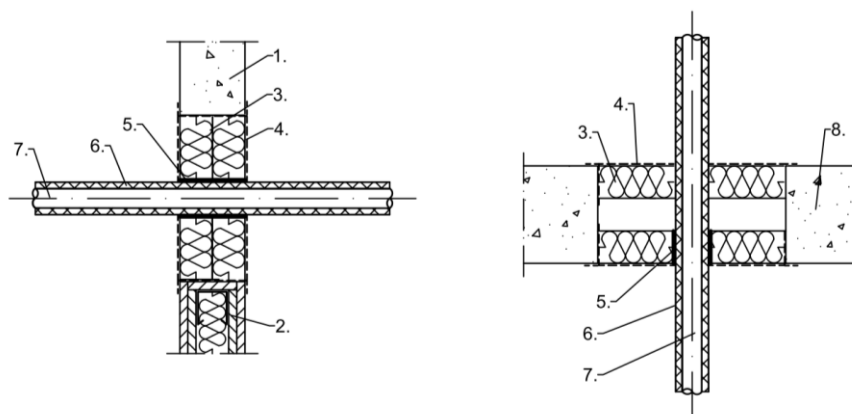
System Flamotect	Annex 75
Mixed penetration seal made of mineral fibre board (2 x 50 mm) with ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (2 x 50 mm) with ablative coating ($\geq 1,0$ mm dft)**Multi-layer composite pipes insulated with FEF and intumescent wrap**

Fire resistance classes - Floor					
Service	Pipe wall thickness	Insulation type	Insulation thickness	Measures	Floor Fire resistance class
Multi-layer composite pipes Geberit Mepla					
Ø 16 mm	2.25 mm	FEF acc. EN 14304 (B-s3, d0)	8.0 – 32 mm	Intumescent wrap 50 mm 1 x 1-layer	EI 120 U/C
Ø 20 mm	2.5 mm				EI 120 U/C
Ø 26 mm	3 mm		8.5 – 35 mm		EI 120 U/C
Ø 32 mm	3 mm		9.0 – 35 mm		EI 120 U/C
Ø 40 mm	3.5 mm			EI 120 U/C	
Ø 50 mm	4 mm			Intumescent wrap 50 mm 1 x 2-layers	EI 120 U/C
Ø 63 mm	4.5 mm				EI 120 U/C
Ø 75 mm	4.7 mm		9.5 mm	EI 90 U/C	
Multi-layer composite pipes Rehau Rautitan stabil					
Ø 16 mm	2.6 mm	FEF acc. EN 14304 (B-s3, d0)	8.0 – 32 mm	Intumescent wrap 50 mm 1 x 1-layer	EI 120 U/C
Ø 20 mm	2.9 mm				EI 120 U/C
Ø 25 mm	3.7 mm		8.5 – 35 mm		EI 120 U/C
Ø 32 mm	4.7 mm		9.0 – 35 mm	EI 120 U/C	
Ø 40 mm	6.0 mm			Intumescent wrap 50 mm 1 x 2-layers	EI 120 U/C
Multi-layer composite pipes Kekelit Kelox					
Ø 16 mm	2 mm	FEF acc. EN 14304 (B-s3, d0)	8.0 – 32 mm	Intumescent wrap 50 mm 1 x 1-layer	EI 120 U/C
Ø 18 mm	2 mm				EI 120 U/C
Ø 20 mm	2.25 mm		8.5 – 35 mm		EI 120 U/C
Ø 25 mm	2.5 mm				EI 120 U/C
Ø 32 mm	3 mm			EI 120 U/C	
Ø 40 mm	4 mm		9.0 – 35 mm	Intumescent wrap 50 mm 1 x 2-layers	EI 120 U/C
Ø 50 mm	4.5 mm				EI 120 U/C
Ø 63 mm	6 mm		9.0 – 39 mm		EI 120 U/C
Ø 75 mm	7.5 mm		9.5 – 40.5 mm		EI 120 U/C

Dimensions in mm

System Flamotect	Annex 76
Mixed penetration seal made of mineral fibre board (2 x 50 mm) with ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (2 x 50 mm) with ablative coating ($\geq 1,0$ mm dft)**Multi-layer composite pipes insulated with PE-Foam and intumescent wrap**

Fire resistance classes - Wall					
Service	Pipe wall thickness	Insulation type	Insulation thickness	Measures	Wall Fire resistance class
Multi-layer composite pipes HENCO pipes					
Ø 20 mm	2.0 – 3.0 mm	PEF	6 – 13 mm	Intumescent wrap 50 mm 2 x 1-layer	EI 120 U/C
Ø 32 mm	3 mm				EI 120 U/C
Multi-layer composite pipes Kekelit Kelox					
Ø 18 mm	2 mm	PEF	4 – 13 mm	Intumescent wrap 50 mm 2 x 1-layer	EI 120 U/C
Ø 20 mm	2.25 mm				EI 120 U/C
Ø 25 mm	2.5 mm				EI 120 U/C
Ø 32 mm	3 mm				EI 120 U/C
Multi-layer composite pipes Geberit Mepla					
Ø 16 mm	2.25 mm	PEF	6 – 13 mm	Intumescent wrap 50 mm 2 x 1-layer	EI 120 U/C
Ø 20 mm	2.5 mm				EI 120 U/C
Ø 26 mm	3 mm				EI 120 U/C
Ø 32 mm	3 mm				EI 120 U/C
Multi-layer composite pipes Rehau Rautitan stabil					
Ø 16 mm	2.6 mm	PEF	4 – 26 mm	Intumescent wrap 50 mm 2 x 1-layer	EI 120 U/C
Ø 20 mm	2.9 mm				EI 120 U/C
Ø 25 mm	3.7 mm				EI 120 U/C
Ø 32 mm	4.7 mm				EI 120 U/C

1. Rigid wall ≥ 100 thickness
2. Flexible wall ≥ 100 mm thickness
3. Mineral fibre board
4. Ablative Coating

5. Intumescent wrap
6. PE-Foam
7. Multilayer pipe
8. Rigid floor ≥ 150 mm thickness

Dimensions in mm

System Flammotect	Annex 77
Mixed penetration seal made of mineral fibre board (2 x 50 mm) with ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (2 x 50 mm) with ablative coating ($\geq 1,0$ mm dft)**Multi-layer composite pipes insulated with PE-Foam and intumescent wrap**

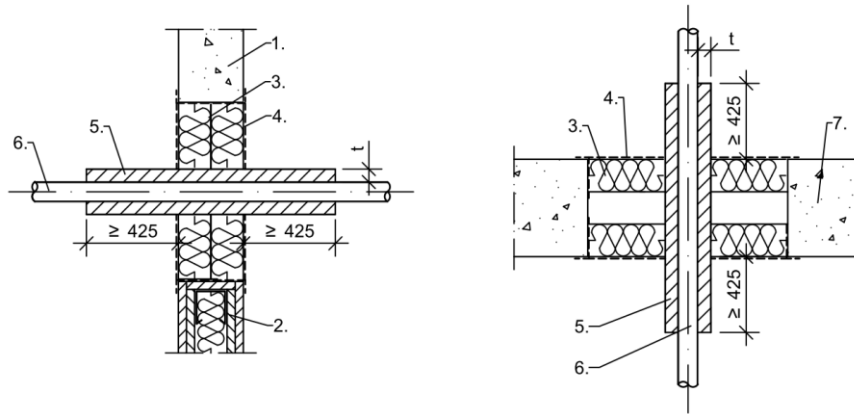
Fire resistance classes - Floor					
Service	Pipe wall thickness	Insulation type	Insulation thickness	Measures	Floor Fire resistance class
Multi-layer composite pipes HENCO pipes					
Ø 20 mm	2.0 – 3.0 mm	PEF	6 – 13 mm	Intumescent wrap 50 mm 1 x 1-layer	EI 120 U/C
Ø 32 mm	3 mm		13 mm		EI 120 U/C
Multi-layer composite pipes Kekelit Kelox					
Ø 18 mm	2 mm	PEF	4 – 13 mm	R Intumescent wrap 50 mm 1 x 1-layer	EI 120 U/C
Ø 20 mm	2.25 mm				EI 120 U/C
Ø 25 mm	2.5 mm				EI 120 U/C
Ø 32 mm	3 mm				EI 120 U/C
Multi-layer composite pipes Geberit Mepla					
Ø 16 mm	2.25 mm	PEF	6 – 13 mm	Intumescent wrap 50 mm 1 x 1-layer	EI 120 U/C
Ø 20 mm	2.5 mm				EI 120 U/C
Ø 26 mm	3 mm				EI 120 U/C
Ø 32 mm	3 mm				EI 120 U/C
Multi-layer composite pipes Rehau Rautitan stabil					
Ø 16 mm	2.6 mm	PEF	4 – 26 mm	Intumescent wrap 50 mm 1 x 1-layer	EI 120 U/C
Ø 20 mm	2.9 mm		26 mm		EI 120 U/C
Ø 25 mm	3.7 mm				EI 120 U/C
Ø 32 mm	4.7 mm		EI 120 U/C		

Dimensions in mm

System Flammotect	Annex 78
Mixed penetration seal made of mineral fibre board (2 x 50 mm) with ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (2 x 50 mm) with ablative coating (≥ 1,0 mm dft)

Multi-layer composite pipes insulated with mineral fibre shells



Fire resistance classes - Wall					
Service	Pipe wall thickness	Insulation type	Insulation thickness	Measures	Wall Fire resistance class
Multi-layer composite pipes Geberit Mepla					
Ø 16 mm	2.25 mm	Mineral fibre pipe shells acc. EN 14303*	20 – 30 mm	-	EI 120 U/C
Ø 20 mm	2.5 mm		20 – 40 mm		EI 120 U/C
Ø 26 mm	3 mm		20 – 50 mm		EI 120 U/C
Ø 32 mm	3 mm		20 – 60 mm		EI 120 U/C
Ø 40 mm	3.5 mm		20 – 80 mm		EI 120 U/C
Ø 50 mm	4 mm				EI 120 U/C
Ø 63 mm	4.5 mm				EI 120 U/C
Ø 75 mm	4.7 mm				EI 120 U/C

Fire resistance classes - Floor					
Service	Pipe wall thickness	Insulation type	Insulation thickness	Measures	Floor Fire resistance class
Multi-layer composite pipes Geberit Mepla					
Ø 16 mm	2.25 mm	Mineral fibre pipe shells acc. EN 14303*	20 – 30 mm	-	EI 120 U/C
Ø 20 mm	2.5 mm		20 – 40 mm		EI 120 U/C
Ø 26 mm	3 mm		20 – 50 mm		EI 120 U/C
Ø 32 mm	3 mm		20 – 60 mm		EI 120 U/C
Ø 40 mm	3.5 mm		20 – 80 mm		EI 120 U/C
Ø 50 mm	4 mm				EI 120 U/C
Ø 63 mm	4.5 mm				EI 120 U/C
Ø 75 mm	4.7 mm				EI 120 U/C

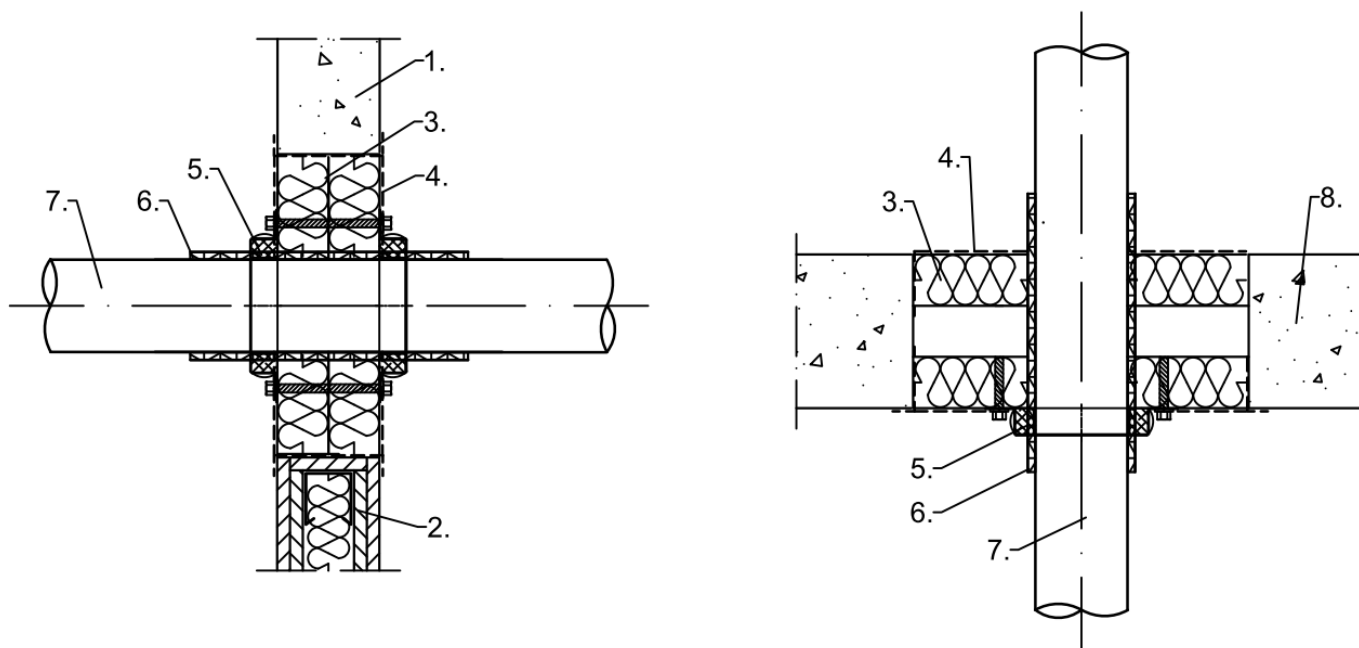
- 1. Rigid wall ≥ 100 thickness
- 2. Flexible wall ≥ 100 mm thickness
- 3. Mineral fibre board
- 4. Ablative Coating
- 5. Pipe shell
- 6. Multi-layer pipe
- 7. Rigid floor ≥ 150 mm thickness

Dimensions in mm

System Flammotect	Annex 79
Mixed penetration seal made of mineral fibre board (2 x 50 mm) with ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (2 x 50 mm) with ablative coating (≥ 1,0 mm dft)

Combustible pipes with and without PE sound insulation and fire protection collar



The fire protection endless collar may be attached with coarse thread screws

Permitted screws:		
Würth	ASSY D	8x70 mm
Heco	HECO-TOPIX-plus	8x80 mm
SPAX	T-STAR plus	8x80 mm

- 1. Rigid wall ≥ 100 thickness
- 2. Flexible wall ≥ 100 mm thickness
- 3. Mineral fibre board
- 4. Ablative Coating
- 5. Fire protection collar
- 6. PE sound insulation
- 7. Multi-layer pipe
- 8. Rigid floor ≥ 150 mm thickness

Dimensions in mm

System Flammotect	Annex 80
Mixed penetration seal made of mineral fibre board (2 x 50 mm) with ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (2 x 50 mm) with ablative coating ($\geq 1,0$ mm dft)**Combustible pipes with and without PE sound insulation and fire protection collar**

Fire resistance classes - Wall			
Service	Pipe wall thickness	Measures	Wall Fire resistance class
PVC-U, PVC-C			
Ø 32 – 50 mm	1.8 – 5.6 mm	Fire protection collar Installed on both sides	EI 90 U/U
Ø 63 – 75 mm	1.8 – 8.4 mm		EI 90 U/U
Ø 90 mm	1.8 – 10.0 mm		EI 90 U/U
Ø 110 mm	1.8 – 12.3 mm		EI 90 U/U
Ø 125 mm	2.5 – 9.3 mm		EI 120 U/U
Ø 140 – 160 mm	4.0 – 14.6 mm		EI 90 U/U
PE-HD, ABS, SAN+PVC			
Ø 32 – 50 mm	1.8 – 4.6 mm	Fire protection collar Installed on both sides	EI 90 U/U
	4.6 mm		EI 120 U/U
Ø 63 – 75 mm	2.2 – 6.9 mm		EI 90 U/U
Ø 75 mm	3.8 – 4.5 mm		EI 120 U/U
Ø 90 - 110 mm	2.7 – 4.3 mm		EI 120 U/U
Ø 90 mm	2.4 – 8.2 mm		EI 90 U/U
Ø 110 mm	2.7 – 10.0 mm		EI 90 U/U
Ø 125 mm	3.1 – 4.2 mm		EI 120 U/U
Ø 140 – 160 mm	4.0 – 14.6 mm		EI 90 U/U
	4.0 mm		EI 120 U/U
PP			
Ø 32 – 50 mm	1.8 mm	Fire protection collar Installed on both sides	EI 90 U/U
Ø 63 – 75 mm	2.2 – 5.2 mm		EI 90 U/U
Ø 90 mm	2.4 – 7.3 mm		EI 90 U/U
Ø 110 mm	2.7 – 10.0 mm		EI 90 U/U
	10.0 mm		EI 120 U/U
Ø 125 mm	3.1 mm		EI 90 U/U
Ø 140 – 160 mm	4.0 – 14.6 mm		EI 90 U/U

Dimensions in mm

System Flammotect	Annex 81
Mixed penetration seal made of mineral fibre board (2 x 50 mm) with ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (2 x 50 mm) with ablative coating ($\geq 1,0$ mm dft)**Combustible pipes with and without PE sound insulation and fire protection collar**

Fire resistance classes - Wall			
Service	Pipe wall thickness	Measures	Wall Fire resistance class
Rehau Raupiano light			
Ø 40 mm	1.8 mm	Fire protection collar Installed on both sides	EI 120 U/U
Ø 50 mm	1.8 mm		EI 120 U/U
Ø 75 mm	1.9 mm		EI 120 U/U
Ø 90 mm	2.2 mm		EI 120 U/U
Ø 110 mm	2.7 mm		EI 120 U/U
Ø 125 mm	3.1 mm		EI 120 U/U
Ø 160 mm	3.9 mm		EI 120 U/U
Conel DRAIN			
Ø 40 mm	1.8 mm	Fire protection collar Installed on both sides	EI 120 U/U
Ø 50 mm	1.8 mm		EI 120 U/U
Ø 75 mm	1.9 mm		EI 120 U/U
Ø 90 mm	2.2 mm		EI 120 U/U
Ø 110 mm	2.7 mm		EI 120 U/U
Rehau RAUSILENTO			
Ø 40 mm	1.8 mm	Fire protection collar Installed on both sides	EI 120 U/U
Ø 50 mm	1.8 mm		EI 120 U/U
Ø 75 mm	1.9 mm		EI 120 U/U
Ø 90 mm	2.2 mm		EI 120 U/U
Ø 110 mm	2.7 mm		EI 120 U/U
Ø 125 mm	3.1 mm		EI 120 U/U
Ø 160 mm	3.9 mm		EI 120 U/U

Dimensions in mm

System Flammotect	Annex 82
Mixed penetration seal made of mineral fibre board (2 x 50 mm) with ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (2 x 50 mm) with ablative coating ($\geq 1,0$ mm dft)**Combustible pipes with and without PE sound insulation and fire protection collar**

Fire resistance classes - Wall			
Service	Pipe wall thickness	Measures	Wall Fire resistance class
Geberit Silent dB20			
Ø 56 mm	3.2 mm	Fire protection collar Installed on both sides	EI 120 U/U
Ø 63 mm	3.2 mm		EI 120 U/U
Ø 75 mm	3.6 mm		EI 120 U/U
Ø 90 mm	5.5 mm		EI 120 U/U
Ø 110 mm	6.0 mm		EI 120 U/U
Ø 135 mm	6.0 mm		EI 90 U/U
Ø 160 mm	7.0 mm		EI 90 U/U
Geberit Silent Pro			
Ø 50 mm	3.0 mm	Fire protection collar Installed on both sides	EI 120 U/U
Ø 75 mm	3.8 mm		EI 120 U/U
Ø 90 mm	4.3 mm		EI 120 U/U
Ø 110 mm	4.5 mm		EI 120 U/U
Ø 125 mm	5.0 mm		EI 120 U/U
Ø 160 mm	6.0 mm		EI 120 U/U
POLO-KAL NG / POLO-KAL XS			
Ø 40 mm	1.8 mm	Fire protection collar Installed on both sides	EI 120 U/U
Ø 50 mm	2.0 mm		EI 120 U/U
Ø 75 mm	2.6 mm		EI 120 U/U
Ø 90 mm	3.0 mm		EI 120 U/U
Ø 110 mm	3.4 mm		EI 120 U/U
POLO-KAL 3S			
Ø 90 mm	4.5 mm	Fire protection collar Installed on both sides	EI 120 U/U
Ø 110 mm	4.8 mm		EI 120 U/U

Dimensions in mm

System Flammotect	Annex 83
Mixed penetration seal made of mineral fibre board (2 x 50 mm) with ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (2 x 50 mm) with ablative coating ($\geq 1,0$ mm dft)**Combustible pipes with and without PE sound insulation and fire protection collar**

Fire resistance classes - Wall			
Service	Pipe wall thickness	Measures	Wall Fire resistance class
Rehau Raupiano Plus			
Ø 50 mm	1.8 mm	Fire protection collar Installed on both sides	EI 120 U/U
Ø 75 mm	2.0 mm		EI 120 U/U
Ø 90 mm	2.2 mm		EI 120 U/U
Ø 110 mm	2.7 mm		EI 120 U/U
Ø 125 mm	3.1 mm		EI 120 U/U
Ø 160 mm	3.9 mm		EI 120 U/U
Wavin AS			
Ø 58 mm	4.0 mm	Fire protection collar Installed on both sides	EI 90 U/U
Ø 78 mm	4.5 mm		EI 90 U/U
Ø 90 mm	4.5 mm		EI 90 U/U
Ø 110 mm	5.3 mm		EI 90 U/U
Ø 135 mm	5.3 mm		EI 90 U/U
Ø 160 mm	5.3 mm		EI 90 U/U
GF Silenta Premium			
Ø 58 mm	4.1 mm	Fire protection collar Installed on both sides	EI 120 U/U
Ø 78 mm	4.6 mm		EI 120 U/U
Ø 90 mm	4.7 mm		EI 120 U/U
Ø 110 mm	5.3 mm		EI 120 U/U
Ø 135 mm	5.3 mm		EI 120 U/U
Ø 160 mm	5.3 mm		EI 120 U/U

Dimensions in mm

System Flammotect	Annex 84
Mixed penetration seal made of mineral fibre board (2 x 50 mm) with ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (2 x 50 mm) with ablative coating ($\geq 1,0$ mm dft)**Combustible pipes with and without PE sound insulation and fire protection collar**

Fire resistance classes - Wall			
Service	Pipe wall thickness	Measures	Wall Fire resistance class
Hakan Silenta Premium			
Ø 58 mm	4.1 mm	Fire protection collar Installed on both sides	EI 120 U/U
Ø 78 mm	4.6 mm		EI 120 U/U
Ø 90 mm	4.7 mm		EI 120 U/U
Ø 110 mm	5.3 mm		EI 120 U/U
Ø 135 mm	5.3 mm		EI 120 U/U
Ø 160 mm	5.3 mm		EI 120 U/U
Wavin SITECH+			
Ø 32 mm	2.0 mm	Fire protection collar Installed on both sides	EI 120 U/U
Ø 40 mm	2.0 mm		EI 120 U/U
Ø 50 mm	2.1 mm		EI 120 U/U
Ø 75 mm	2.6 mm		EI 120 U/U
Ø 90 mm	3.1 mm		EI 120 U/U
Ø 110 mm	3.4 mm		EI 120 U/U
Ø 125 mm	4.0 mm		EI 120 U/U
Ø 160 mm	5.0 mm		EI 120 U/U
Valsir Triplus			
Ø 32 mm	1.8 mm	Fire protection collar Installed on both sides	EI 120 U/U
Ø 40 mm	1.8 mm		EI 120 U/U
Ø 50 mm	1.8 mm		EI 120 U/U
Ø 75 mm	2.5 mm		EI 120 U/U
Ø 90 mm	3.1 mm		EI 120 U/U
Ø 110 mm	3.4 mm		EI 120 U/U
Ø 125 mm	3.9 mm		EI 120 U/U
Ø 160 mm	4.9 mm		EI 120 U/U

Dimensions in mm

System Flammotect	Annex 85
Mixed penetration seal made of mineral fibre board (2 x 50 mm) with ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (2 x 50 mm) with ablative coating ($\geq 1,0$ mm dft)**Combustible pipes with and without PE sound insulation and fire protection collar**

Fire resistance classes - Wall			
Service	Pipe wall thickness	Measures	Wall Fire resistance class
Pipelife Master 3 PLUS			
Ø 32 mm	1.8 mm	Fire protection collar Installed on both sides	EI 120 U/U
Ø 40 mm	1.8 mm		EI 120 U/U
Ø 50 mm	2.0 mm		EI 120 U/U
Ø 75 mm	2.1 mm		EI 120 U/U
Ø 90 mm	2.5 mm		EI 120 U/U
Ø 110 mm	3.0 mm		EI 120 U/U
Ø 125 mm	3.5 mm		EI 120 U/U
Ø 160 mm	4.4 mm		EI 120 U/U
Kekelit PHON EX AS			
Ø 58 mm	4.0 mm	Fire protection collar Installed on both sides	EI 90 U/U
Ø 78 mm	4.5 mm		EI 90 U/U
Ø 90 mm	4.5 mm		EI 90 U/U
Ø 110 mm	5.3 mm		EI 90 U/U
Ø 135 mm	5.3 mm		EI 90 U/U
Ø 160 mm	5.3 mm		EI 90 U/U
Geberit Silent PP			
Ø 32 mm	2.0 mm	Fire protection collar Installed on both sides	EI 120 U/U
Ø 40 mm	2.0 mm		EI 120 U/U
Ø 50 mm	2.0 mm		EI 120 U/U
Ø 75 mm	2.6 mm		EI 120 U/U
Ø 90 mm	3.1 mm		EI 120 U/U
Ø 110 mm	3.6 mm		EI 120 U/U
Ø 125 mm	4.2 mm		EI 120 U/U
Ø 160 mm	5.2 mm		EI 120 U/U

Dimensions in mm

System Flammotect	Annex 86
Mixed penetration seal made of mineral fibre board (2 x 50 mm) with ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (2 x 50 mm) with ablative coating ($\geq 1,0$ mm dft)**Combustible pipes with and without PE sound insulation and fire protection collar**

Fire resistance classes - Floor			
Service	Pipe wall thickness	Measures	Floor Fire resistance class
PVC-U, PVC-C			
Ø 32 – 50 mm	1.8 – 5.6 mm	Fire protection collar Installed on bottom side	EI 90 U/U
Ø 63 – 75 mm	1.8 – 8.4 mm		EI 90 U/U
Ø 90 mm	1.8 – 10.0 mm		EI 90 U/U
Ø 110 mm	1.8 – 12.3 mm		EI 90 U/U
	1.8 mm		EI 120 U/U
Ø 125 mm	2.5 mm		EI 120 U/U
Ø 140 – 160 mm	3.2 – 11.9 mm		EI 90 U/U
	3.2 mm		EI 120 U/U
PE-HD, ABS, SAN+PVC			
Ø 32 – 50 mm	1.8 – 4.6 mm	Fire protection collar Installed on bottom side	EI 90 U/U
Ø 63 – 75 mm	2.2 – 6.9 mm		EI 90 U/U
Ø 90 mm	2.4 – 8.2 mm		EI 90 U/U
Ø 110 mm	2.7 – 10.0 mm		EI 90 U/U
Ø 125 mm	3.1 mm		EI 90 U/U
Ø 140 – 160 mm	4.0 – 14.6 mm		EI 90 U/U
PP			
Ø 32 – 50 mm	1.8 – 4.6 mm	Fire protection collar Installed on bottom side	EI 90 U/U
	1.8 mm		EI 120 U/U
Ø 63 – 75 mm	2.2 – 6.9 mm		EI 90 U/U
	2.2 mm		EI 120 U/U
Ø 90 mm	2.4 – 8.2 mm		EI 90 U/U
	2.4 mm		EI 120 U/U
Ø 110 mm	2.7 – 10.0 mm		EI 90 U/U
	2.7 mm		EI 120 U/U
Ø 125 mm	3.1 – 11.4 mm		EI 90 U/U
	3.1 mm		EI 120 U/U
Ø 140 – 160 mm	4.0 – 14.6 mm		EI 90 U/U

Dimensions in mm

System Flammotect	Annex 87
Mixed penetration seal made of mineral fibre board (2 x 50 mm) with ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (2 x 50 mm) with ablative coating ($\geq 1,0$ mm dft)**Combustible pipes with and without PE sound insulation and fire protection collar**

Fire resistance classes - Floor			
Service	Pipe wall thickness	Measures	Floor Fire resistance class
Rehau Raupiano light			
Ø 50 mm	1.8 mm	Fire protection collar Installed on bottom side	EI 90 U/U
Ø 75 mm	1.9 mm		EI 90 U/U
Ø 90 mm	2.2 mm		EI 90 U/U
Ø 110 mm	2.7 mm		EI 90 U/U
Conel DRAIN			
Ø 50 mm	1.8 mm	Fire protection collar Installed on bottom side	EI 90 U/U
Ø 75 mm	1.9 mm		EI 90 U/U
Ø 90 mm	2.2 mm		EI 90 U/U
Ø 110 mm	2.7 mm		EI 90 U/U
Rehau RAUSILENTO			
Ø 50 mm	1.8 mm	Fire protection collar Installed on bottom side	EI 90 U/U
Ø 75 mm	1.9 mm		EI 90 U/U
Ø 90 mm	2.2 mm		EI 90 U/U
Ø 110 mm	2.7 mm		EI 90 U/U
Geberit Silent PP			
Ø 32 mm	2.0 mm	Fire protection collar Installed on bottom side	EI 90 U/U
Ø 40 mm	2.0 mm		EI 90 U/U
Ø 50 mm	2.0 mm		EI 90 U/U
Ø 75 mm	2.6 mm		EI 90 U/U
Ø 90 mm	3.1 mm		EI 90 U/U
Ø 110 mm	3.6 mm		EI 90 U/U
Geberit Silent Pro			
Ø 50 mm	3.0 mm	Fire protection collar Installed on bottom side	EI 90 U/U
Ø 75 mm	3.8 mm		EI 90 U/U
Ø 90 mm	4.3 mm		EI 90 U/U
Ø 110 mm	4.5 mm		EI 90 U/U

Dimensions in mm

System Flammotect	Annex 88
Mixed penetration seal made of mineral fibre board (2 x 50 mm) with ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (2 x 50 mm) with ablative coating ($\geq 1,0$ mm dft)**Combustible pipes with and without PE sound insulation and fire protection collar**

Fire resistance classes - Floor			
Service	Pipe wall thickness	Measures	Floor Fire resistance class
POLO-KAL NG / POLO-KAL XS			
Ø 40 mm	1.8 mm	Fire protection collar Installed on bottom side	EI 90 U/U
Ø 50 mm	2.0 mm		EI 90 U/U
Ø 75 mm	2.6 mm		EI 90 U/U
Ø 90 mm	3.0 mm		EI 90 U/U
Ø 110 mm	3.4 mm		EI 90 U/U
Ø 125 mm	3.9 mm		EI 90 U/U
Ø 160 mm	4.9 mm		EI 90 U/U
GF Silenta Premium			
Ø 58 mm	4.1 mm	Fire protection collar Installed on bottom side	EI 90 U/U
Ø 78 mm	4.6 mm		EI 90 U/U
Ø 90 mm	4.7 mm		EI 90 U/U
Ø 110 mm	5.3 mm		EI 90 U/U
Hakan Silenta Premium			
Ø 58 mm	4.1 mm	Fire protection collar Installed on bottom side	EI 90 U/U
Ø 78 mm	4.6 mm		EI 90 U/U
Ø 90 mm	4.7 mm		EI 90 U/U
Ø 110 mm	5.3 mm		EI 90 U/U
Wavin SITECH+			
Ø 32 mm	2.0 mm	Fire protection collar Installed on bottom side	EI 90 U/U
Ø 40 mm	2.0 mm		EI 90 U/U
Ø 50 mm	2.1 mm		EI 90 U/U
Ø 75 mm	2.6 mm		EI 90 U/U
Ø 90 mm	3.1 mm		EI 90 U/U
Ø 110 mm	3.4 mm		EI 90 U/U
Ø 125 mm	4.0 mm		EI 90 U/U
Ø 160 mm	5.0 mm		EI 90 U/U

Dimensions in mm

System Flammotect	Annex 89
Mixed penetration seal made of mineral fibre board (2 x 50 mm) with ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (2 x 50 mm) with ablative coating (≥ 1,0 mm dft)

Combustible pipes with and without PE sound insulation and fire protection collar

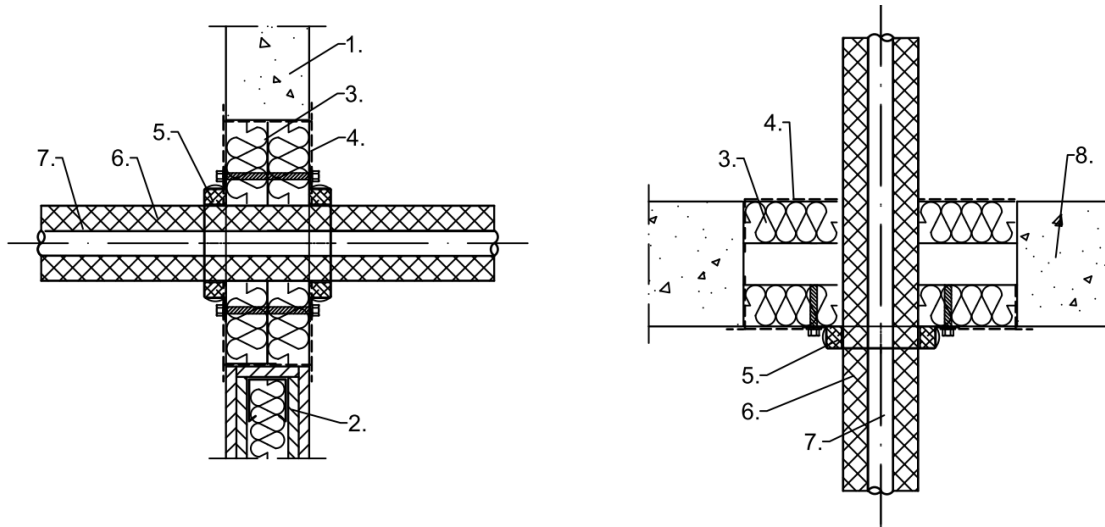
Fire resistance classes - Floor			
Service	Pipe wall thickness	Measures	Floor Fire resistance class
Valsir Triplus			
Ø 32 mm	1.8 mm	Fire protection collar Installed on bottom side	EI 90 U/U
Ø 40 mm	1.8 mm		EI 90 U/U
Ø 50 mm	1.8 mm		EI 90 U/U
Ø 75 mm	2.5 mm		EI 90 U/U
Ø 90 mm	3.1 mm		EI 90 U/U
Ø 110 mm	3.4 mm		EI 90 U/U
Ø 125 mm	3.9 mm		EI 90 U/U
Ø 160 mm	4.9 mm		EI 90 U/U

Dimensions in mm

System Flammotect	Annex 90
Mixed penetration seal made of mineral fibre board (2 x 50 mm) with ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (2 x 50 mm) with ablative coating (≥ 1,0 mm dft)

Combustible pipes with FEF insulation and fire protection collar



The fire protection endless collar may be attached with coarse thread screws

Permitted screws:

Würth	ASSY D	8x70 mm
Heco	HECO-TOPIX-plus	8x80 mm
SPAX	T-STAR plus	8x80 mm

Fire resistance classes - Wall

Service	Pipe wall thickness	Insulation	Pipe wall thickness	Measures	Wall Fire resistance class
PP					
Ø 32 – 50 mm	1.8 – 4.6 mm	FEF acc. EN 14304	6 – 32 mm	Fire protection collar Installed on both sides	EI 120 U/U
Ø 63 – 75 mm	2.2 – 6.8 mm				EI 120 U/U
Ø 90 – 110 mm	2.7 – 10.0 mm				EI 120 U/U

Fire resistance classes - Floor

Service	Pipe wall thickness	Insulation	Pipe wall thickness	Measures	Floor Fire resistance class
PP					
Ø 32 – 50 mm	1.8 mm	FEF acc. EN 14304	6 – 32 mm	Fire protection collar Installed on bottom side	EI 90 U/U
			6 mm		EI 120 U/U
Ø 63 – 75 mm	2.2 mm		6 – 32 mm		EI 90 U/U
			6 mm		EI 120 U/U
Ø 90 – 110 mm	2.7 mm		6 – 32 mm		EI 120 U/U

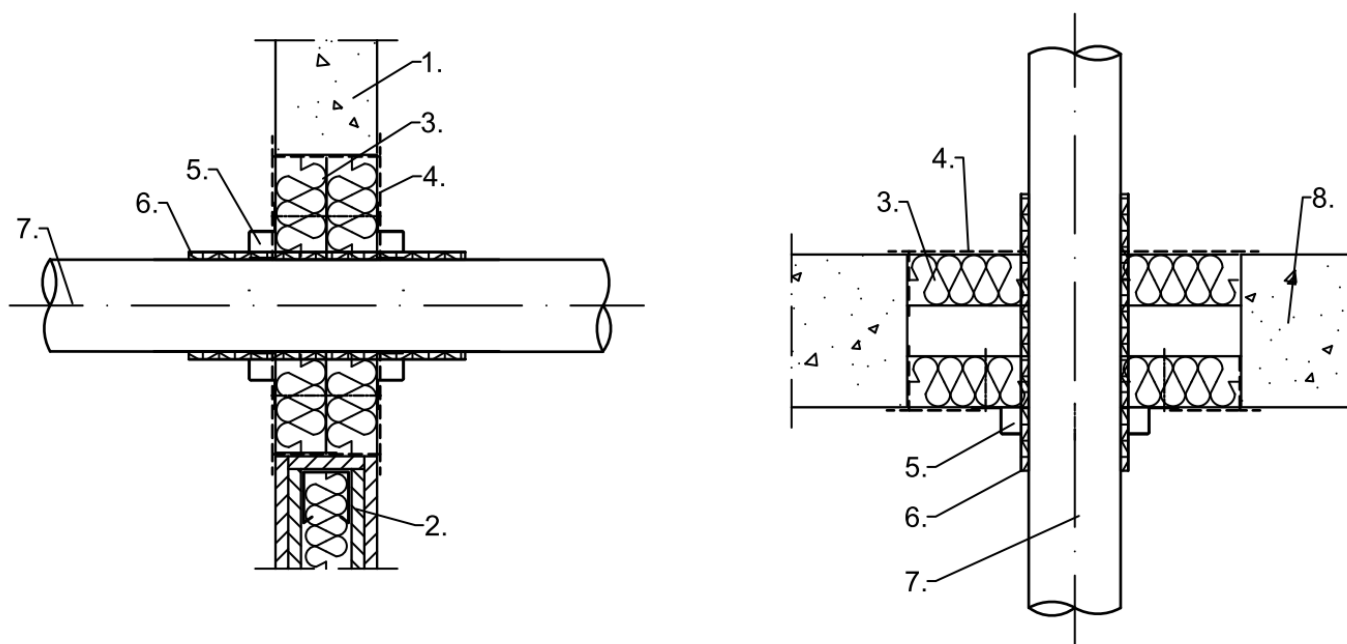
- | | |
|-------------------------------------|-----------------------------------|
| 1. Rigid wall ≥ 100 thickness | 5. Fire protection collar |
| 2. Flexible wall ≥ 100 mm thickness | 6. FEF insulation |
| 3. Mineral fibre board | 7. Combustible pipe |
| 4. Ablative Coating | 8. Rigid floor ≥ 150 mm thickness |

Dimensions in mm

System Flammotect	Annex 91
Mixed penetration seal made of mineral fibre board (2 x 50 mm) with ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (2 x 50 mm) with ablative coating (≥ 1,0 mm dft)

Combustible pipes with and without PE sound insulation and fire protection endless collar



The fire protection endless collar may be attached with coarse thread screws

Permitted screws:

Würth	ASSY D	8x70 mm
Heco	HECO-TOPIX-plus	8x80 mm
SPAX	T-STAR plus	8x80 mm

- | | |
|-------------------------------------|-----------------------------------|
| 1. Rigid wall ≥ 100 thickness | 5. Fire protection endless collar |
| 2. Flexible wall ≥ 100 mm thickness | 6. PE sound insulation |
| 3. Mineral fibre board | 7. Combustible pipes |
| 4. Ablative Coating | 8. Rigid floor ≥ 150 mm thickness |

Dimensions in mm

System Flammotect	Annex 92
Mixed penetration seal made of mineral fibre board (2 x 50 mm) with ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (2 x 50 mm) with ablative coating ($\geq 1,0$ mm dft)**Combustible pipes with and without PE sound insulation and fire protection endless collar**

Fire resistance classes - Wall			
Service	Pipe wall thickness	Measures	Wall Fire resistance class
PVC-U, PVC-C			
Ø 40 – 50 mm	2.0 – 5.6 mm	Endless Collar Installed on both sides	EI 90 U/U
Ø 63 – 75 mm	1.9 – 7.0 mm		EI 90 U/U
Ø 90 – 110 mm	1.8 – 9.0 mm		EI 90 U/U
Ø 125 mm	2.3 – 9.8 mm		EI 90 U/U
Ø 140 – 160 mm	3.2 – 11.9 mm		EI 90 U/U
PE-HD, ABS, SAN+PVC			
Ø 40 – 50 mm	1.8 – 4.6 mm	Endless Collar Installed on both sides	EI 120 U/U
Ø 63 – 75 mm	2.2 – 3.8 mm		EI 90 U/U
Ø 90 mm	2.4 – 3.3 mm		EI 90 U/U
Ø 110 mm	2.7 mm		EI 90 U/U
PP			
Ø 90 – 110 mm	2.7 mm	Endless Collar Installed on both sides	EI 120 U/U
POLO-KAL NG / POLO-KAL XS			
Ø 90 mm	3.0 mm	Endless Collar Installed on both sides	EI 90 U/U
Ø 110 mm	3.4 mm		EI 90 U/U
Rehau Raupiano plus			
Ø 75 mm	1.9 mm	Endless Collar Installed on both sides	EI 90 U/U
Ø 90 mm	2.2 mm		EI 90 U/U
Geberit Silent PP			
Ø 90 mm	3.1 mm	Endless Collar Installed on both sides	EI 90 U/U
Ø 110 mm	3.6 mm		EI 90 U/U
Wavin SiTech+			
Ø 32 mm	2.0 mm	Endless Collar Installed on both sides	EI 90 U/U
Ø 50 mm	2.1 mm		EI 90 U/U
Ø 75 mm	2.6 mm		EI 90 U/U
Ø 90 mm	3.1 mm		EI 90 U/U
Ø 110 mm	3.6 mm		EI 90 U/U

Dimensions in mm

Mixed penetration seal made of mineral fibre board (2 x 50 mm) with ablative coating ($\geq 1,0$ mm dft)

System Flammotect	Annex 93
Mixed penetration seal made of mineral fibre board (2 x 50 mm) with ablative coating in walls and floors	

Combustible pipes with and without PE sound insulation and fire protection endless collar

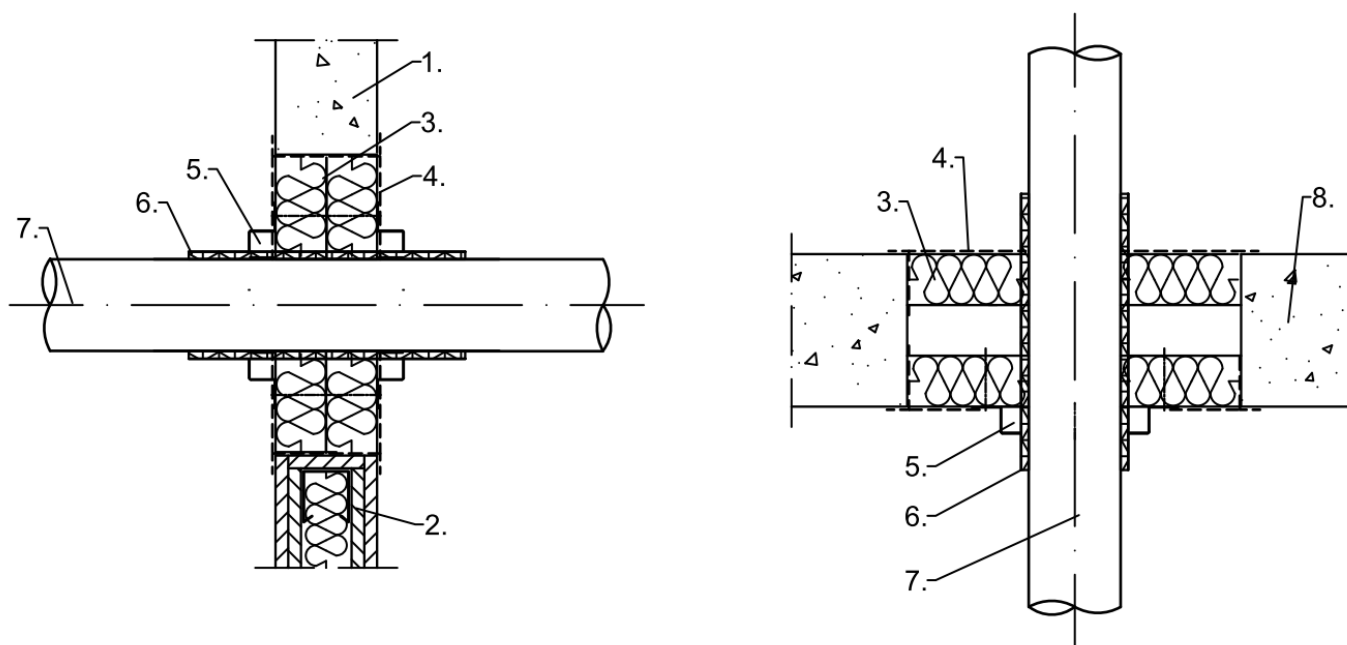
Fire resistance classes - Floor			
Service	Pipe wall thickness	Measures	Floor Fire resistance class
PVC-U, PVC-C			
Ø 40 – 50 mm	1.8 – 5.6 mm	Endless Collar Installed on bottom side	EI 120 U/U
Ø 63 – 75 mm	2.1 – 5.1 mm		EI 120 U/U
Ø 90 – 110 mm	2.6 – 4.3 mm		EI 120 U/U
Ø 125 mm	2.8 – 4.0 mm		EI 120 U/U
Ø 140 mm	3.0 – 3.6 mm		EI 120 U/U
Ø 160 mm	3.2 mm		EI 120 U/U
PE-HD, ABS, SAN+PVC			
Ø 40 – 50 mm	4.6 mm	Endless Collar Installed on bottom side	EI 90 U/U
Ø 63 – 75 mm	3.8 mm		EI 90 U/U
Ø 90 mm	2.7 – 3.4 mm		EI 90 U/U
Ø 110 mm	2.7 mm		EI 90 U/U
PP			
Ø 40 - 50 mm	1.8 – 4.6 mm	Endless Collar Installed on bottom side	EI 120 U/U
Ø 63 – 75 mm	2.2 – 6.8 mm		EI 90 U/U
Ø 63 mm	3.8 – 6.8 mm		EI 120 U/U
Ø 75 mm	5.2 – 6.8 mm		EI 120 U/U
Ø 90 – 110 mm	2.7 – 10.0 mm		EI 90 U/U
Ø 90 mm	7.3 – 10.0 mm		EI 120 U/U
Ø 110 mm	10.0 mm		EI 120 U/U
Rehau Raupiano plus			
Ø 75 mm	1.9 mm	Endless Collar Installed on bottom side	EI 120 U/U
Ø 90 mm	2.2 mm		EI 120 U/U
Geberit Silent PP			
Ø 32 mm	2.0 mm	Endless Collar Installed on bottom side	EI 90 U/U
Ø 50 mm	2.0 mm		EI 90 U/U
Wavin SiTech+			
Ø 32 mm	2.0 mm	Endless Collar Installed on bottom side	EI 90 U/U
Ø 50 mm	2.1 mm		EI 90 U/U

Dimensions in mm

System Flammotect	Annex 94
Mixed penetration seal made of mineral fibre board (2 x 50 mm) with ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (2 x 50 mm) with ablative coating (≥ 1,0 mm dft)

Nonregulated combustible pipes with and without PE sound insulation and fire protection endless collar



The fire protection endless collar may be attached with coarse thread screws

Permitted screws:

Rockwool	Conlit Screw	65 mm
Bohl	Fireprotect Screw	60 mm

- | | |
|-------------------------------------|-----------------------------------|
| 1. Rigid wall ≥ 100 thickness | 5. Fire protection endless collar |
| 2. Flexible wall ≥ 100 mm thickness | 6. PE sound insulation |
| 3. Mineral fibre board | 7. Non-combustible pipe |
| 4. Ablative Coating | 8. Rigid floor ≥ 150 mm thickness |

Dimensions in mm

System Flammotect	Annex 95
Mixed penetration seal made of mineral fibre board (2 x 50 mm) with ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (2 x 50 mm) with ablative coating ($\geq 1,0$ mm dft)**Nonregulated combustible pipes with and without PE sound insulation and fire protection endless collar**

Fire resistance classes - Wall			
Service	Pipe wall thickness	Measures	Wall Fire resistance class
POLO-KAL NG / POLO-KAL XS			
Ø 90 mm	3.0 mm	Endless Collar Installed on both sides	EI 120 U/U
Ø 110 mm	3.4 mm		EI 120 U/U
Ø 125 mm	3.9 mm		EI 120 U/U
Ø 160 mm	4.9 mm		EI 120 U/U
Rehau Raupiano plus			
Ø 90 mm	2.2 mm	Endless Collar Installed on both sides	EI 120 U/U
Ø 110 mm	2.7 mm		EI 120 U/U
Ø 125 mm	3.1 mm		EI 120 U/U
Ø 160 mm	3.9 mm		EI 120 U/U
Geberit Silent PP			
Ø 32 mm	2.0 mm	Endless Collar Installed on both sides	EI 120 U/U
Ø 50 mm	2.0 mm		EI 120 U/U
Ø 75 mm	2.6 mm		EI 120 U/U
Ø 90 mm	3.1 mm		EI 120 U/U
Ø 110 mm	3.6 mm		EI 120 U/U
Wavin SiTech+			
Ø 32 mm	2.0 mm	Endless Collar Installed on both sides	EI 120 U/U
Ø 50 mm	2.1 mm		EI 120 U/U

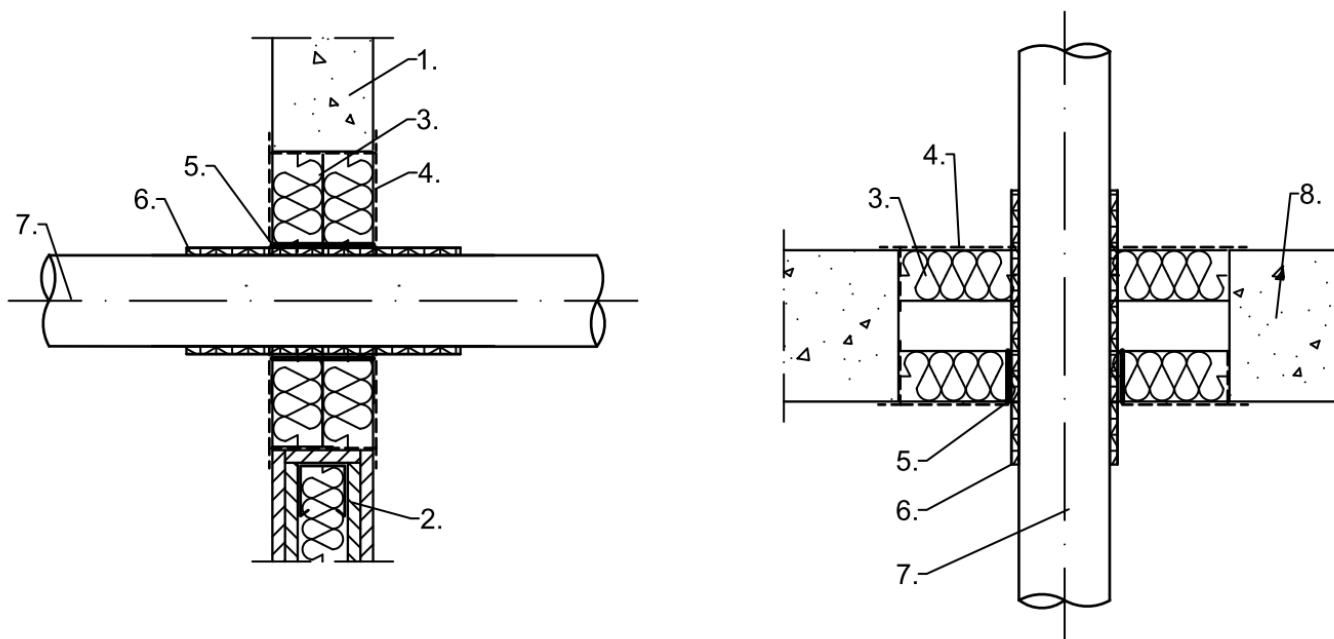
Fire resistance classes - Floor			
Service	Pipe wall thickness	Measures	Floor Fire resistance class
Geberit Silent PP			
Ø 32 mm	2.0 mm	Endless Collar Installed on bottom side	EI 90 U/U
Ø 50 mm	2.0 mm		EI 90 U/U
Wavin SiTech+			
Ø 32 mm	2.0 mm	Endless Collar Installed on bottom side	EI 90 U/U
Ø 50 mm	2.1 mm		EI 90 U/U

Dimensions in mm

System Flammotect	Annex 96
Mixed penetration seal made of mineral fibre board (2 x 50 mm) with ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (2 x 50 mm) with ablative coating ($\geq 1,0$ mm dft)

Combustible pipes with and without PE sound insulation and fire protection wrap



- | | |
|--|--|
| 1. Rigid wall ≥ 100 thickness | 5. Fire protection wrap |
| 2. Flexible wall ≥ 100 mm thickness | 6. PE sound insulation |
| 3. Mineral fibre board | 7. Combustible pipe |
| 4. Ablative Coating | 8. Rigid floor ≥ 150 mm thickness |

Dimensions in mm

System Flammotect	Annex 97
Mixed penetration seal made of mineral fibre board (2 x 50 mm) with ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (2 x 50 mm) with ablative coating ($\geq 1,0$ mm dft)**Combustible pipes with and without PE sound insulation and fire protection wrap**

Fire resistance classes - Wall			
Service	Pipe wall thickness	Measures	Wall Fire resistance class
PVC-U, PVC-C			
Ø 32 – 50 mm	1.8 – 5.6 mm	Intumescent Wrap 50 mm 1 x 2 layers	EI 120 U/U
Ø 63 – 110 mm	1.8 – 12.3 mm	Intumescent Wrap 50 mm 1 x 4 layers	EI 120 U/U
PE-HD, ABS, SAN+PVC			
Ø 32 – 50 mm	1.8 – 4.6 mm	Intumescent Wrap 50 mm 1 x 2 layers	EI 120 U/U
Ø 63 – 110 mm	1.8 – 10.0 mm	Intumescent Wrap 50 mm 1 x 4 layers	EI 120 U/U
PP			
Ø 32 – 50 mm	1.8 – 4.6 mm	Intumescent Wrap 50 mm 1 x 2 layers	EI 120 U/U
Ø 63 – 110 mm	1.8 – 10.0 mm	Intumescent Wrap 50 mm 1 x 4 layers	EI 120 U/U
Geberit Silent PP			
Ø ≤ 50 mm		Intumescent Wrap 50 mm 1 x 2 layers	EI 120 U/U
Ø ≤ 110 mm		Intumescent Wrap 50 mm 1 x 4 layers	EI 120 U/U
Geberit Silent Pro			
Ø ≤ 75 mm		Intumescent Wrap 50 mm 1 x 2 layers	EI 120 U/U
Ø ≤ 110 mm		Intumescent Wrap 50 mm 1 x 4 layers	EI 120 U/U
Kekelit Phon EX AS			
Ø ≤ 56 mm		Intumescent Wrap 50 mm 1 x 2 layers	EI 120 U/U
Ø ≤ 110 mm		Intumescent Wrap 50 mm 1 x 4 layers	EI 120 U/U
Pipelife Master 3			
Ø ≤ 50 mm		Intumescent Wrap 50 mm 1 x 2 layers	EI 120 U/U
Ø ≤ 110 mm		Intumescent Wrap 50 mm 1 x 4 layers	EI 120 U/U

Dimensions in mm

System Flammotect	Annex 98
Mixed penetration seal made of mineral fibre board (2 x 50 mm) with ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (2 x 50 mm) with ablative coating ($\geq 1,0$ mm dft)**Combustible pipes with and without PE sound insulation and fire protection wrap**

Fire resistance classes - Wall			
Service	Pipe wall thickness	Measures	Wall Fire resistance class
POLO-KAL NG / POLO KAL XS			
$\varnothing \leq 50$ mm		Intumescent Wrap 50 mm 1 x 2 layers	EI 120 U/U
$\varnothing \leq 110$ mm		Intumescent Wrap 50 mm 1 x 4 layers	EI 120 U/U
Rehau Raupiano light			
$\varnothing \leq 50$ mm		Intumescent Wrap 50 mm 1 x 2 layers	EI 120 U/U
$\varnothing \leq 110$ mm		Intumescent Wrap 50 mm 1 x 4 layers	EI 120 U/U
Rehau RAUSILENTO			
$\varnothing \leq 50$ mm		Intumescent Wrap 50 mm 1 x 2 layers	EI 120 U/U
$\varnothing \leq 110$ mm		Intumescent Wrap 50 mm 1 x 4 layers	EI 120 U/U
Conel DRAIN			
$\varnothing \leq 50$ mm		Intumescent Wrap 50 mm 1 x 2 layers	EI 120 U/U
$\varnothing \leq 110$ mm		Intumescent Wrap 50 mm 1 x 4 layers	EI 120 U/U
Geberit Silent dB20			
$\varnothing \leq 56$ mm		Intumescent Wrap 50 mm 1 x 2 layers	EI 120 U/U
$\varnothing \leq 110$ mm		Intumescent Wrap 50 mm 1 x 4 layers	EI 120 U/U
Wavin SiTech+			
$\varnothing \leq 50$ mm		Intumescent Wrap 50 mm 1 x 2 layers	EI 120 U/U
$\varnothing \leq 110$ mm		Intumescent Wrap 50 mm 1 x 4 layers	EI 120 U/U
Rehau Raupiano plus			
$\varnothing \leq 50$ mm		Intumescent Wrap 50 mm 1 x 2 layers	EI 120 U/U
$\varnothing \leq 110$ mm		Intumescent Wrap 50 mm 1 x 4 layers	EI 120 U/U
Silenta Premium			
$\varnothing \leq 58$ mm		Intumescent Wrap 50 mm 1 x 2 layers	EI 120 U/U
$\varnothing \leq 110$ mm		Intumescent Wrap 50 mm 1 x 4 layers	EI 120 U/U

Dimensions in mm

System Flammotect	Annex 99
Mixed penetration seal made of mineral fibre board (2 x 50 mm) with ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (2 x 50 mm) with ablative coating ($\geq 1,0$ mm dft)**Combustible pipes with and without PE sound insulation and fire protection wrap**

Fire resistance classes - Floor			
Service	Pipe wall thickness	Measures	Floor Fire resistance class
PVC-U, PVC-C			
Ø 32 – 50 mm	1.8 – 5.6 mm	Intumescent Wrap 50 mm 1 x 2 layers	EI 120 U/U
Ø 63 – 110 mm	1.8 – 12.3 mm	Intumescent Wrap 50 mm 1 x 4 layers	EI 120 U/U
PE-HD, ABS, SAN+PVC			
Ø 32 – 50 mm	1.8 – 4.6 mm	Intumescent Wrap 50 mm 1 x 2 layers	EI 120 U/U
Ø 63 – 110 mm	1.8 – 10.0 mm	Intumescent Wrap 50 mm 1 x 4 layers	EI 120 U/U
PP			
Ø 32 – 50 mm	1.8 – 4.6 mm	Intumescent Wrap 50 mm 1 x 2 layers	EI 120 U/U
Ø 63 – 110 mm	1.8 – 10.0 mm	Intumescent Wrap 50 mm 1 x 4 layers	EI 120 U/U
Geberit Silent PP			
Ø ≤ 50 mm		Intumescent Wrap 50 mm 1 x 2 layers	EI 120 U/U
Ø ≤ 110 mm		Intumescent Wrap 50 mm 1 x 4 layers	EI 120 U/U
Geberit Silent Pro			
Ø ≤ 75 mm		Intumescent Wrap 50 mm 1 x 2 layers	EI 120 U/U
Ø ≤ 110 mm		Intumescent Wrap 50 mm 1 x 4 layers	EI 120 U/U
Kekelit Phon EX AS			
Ø ≤ 56 mm		Intumescent Wrap 50 mm 1 x 2 layers	EI 120 U/U
Ø ≤ 110 mm		Intumescent Wrap 50 mm 1 x 4 layers	EI 120 U/U
Pipelife Master 3			
Ø ≤ 50 mm		Intumescent Wrap 50 mm 1 x 2 layers	EI 90 U/U
Ø ≤ 110 mm		Intumescent Wrap 50 mm 1 x 4 layers	EI 120 U/U

Dimensions in mm

System Flammotect	Annex 100
Mixed penetration seal made of mineral fibre board (2 x 50 mm) with ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (2 x 50 mm) with ablative coating ($\geq 1,0$ mm dft)**Combustible pipes with and without PE sound insulation and fire protection wrap**

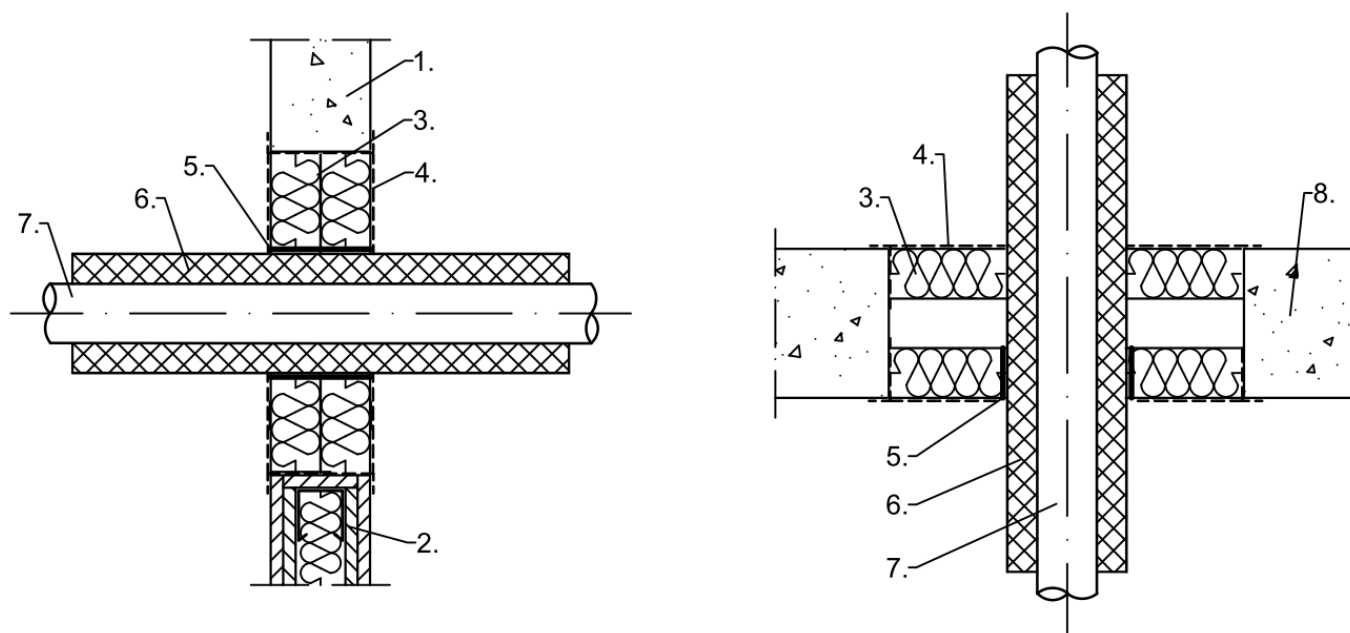
Fire resistance classes - Floor			
Service	Pipe wall thickness	Measures	Floor Fire resistance class
POLO-KAL NG / POLO KAL XS			
$\varnothing \leq 50$ mm		Intumescent Wrap 50 mm 1 x 2 layers	EI 120 U/U
$\varnothing \leq 110$ mm		Intumescent Wrap 50 mm 1 x 4 layers	EI 120 U/U
Rehau Raupiano light			
$\varnothing \leq 50$ mm		Intumescent Wrap 50 mm 1 x 2 layers	EI 120 U/U
$\varnothing \leq 110$ mm		Intumescent Wrap 50 mm 1 x 4 layers	EI 120 U/U
Rehau RAUSILENTO			
$\varnothing \leq 50$ mm		Intumescent Wrap 50 mm 1 x 2 layers	EI 120 U/U
$\varnothing \leq 110$ mm		Intumescent Wrap 50 mm 1 x 4 layers	EI 120 U/U
Conel DRAIN			
$\varnothing \leq 50$ mm		Intumescent Wrap 50 mm 1 x 2 layers	EI 120 U/U
$\varnothing \leq 110$ mm		Intumescent Wrap 50 mm 1 x 4 layers	EI 120 U/U
Geberit Silent dB20			
$\varnothing \leq 56$ mm		Intumescent Wrap 50 mm 1 x 2 layers	EI 120 U/U
$\varnothing \leq 110$ mm		Intumescent Wrap 50 mm 1 x 4 layers	EI 120 U/U
Wavin SiTech+			
$\varnothing \leq 50$ mm		Intumescent Wrap 50 mm 1 x 2 layers	EI 120 U/U
$\varnothing \leq 110$ mm		Intumescent Wrap 50 mm 1 x 4 layers	EI 120 U/U
Rehau Raupiano plus			
$\varnothing \leq 110$ mm		Intumescent Wrap 50 mm 1 x 4 layers	EI 120 U/U
Silenta Premium			
$\varnothing \leq 58$ mm		Intumescent Wrap 50 mm 1 x 2 layers	EI 90 U/U
$\varnothing \leq 110$ mm		Intumescent Wrap 50 mm 1 x 4 layers	EI 120 U/U

Dimensions in mm

System Flammotect	Annex 101
Mixed penetration seal made of mineral fibre board (2 x 50 mm) with ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (2 x 50 mm) with ablative coating (≥ 1,0 mm dft)

Combustible pipes with FEF insulation and fire protection wrap



Fire resistance classes - Wall					
Service	Pipe wall thickness	Insulation	Insulation thickness	Measures	Wall Fire resistance class
PP-H					
Ø 40 – 50 mm	1.8 – 4.6 mm	FEF acc. EN 14304 (B-s3, d0)	9 – 20.5 mm	Intumescent Wrap 50 mm 1 x 3 layers	EI 90 U/U
Ø 50 – 75 mm	1.9 – 8.2 mm	FEF acc. EN 14304 (B-s3, d0)	9 – 22 mm	Intumescent Wrap 50 mm 1 x 3 layers	EI 90 U/U

- | | |
|-------------------------------------|-----------------------------------|
| 1. Rigid wall ≥ 100 thickness | 5. Fire protection wrap |
| 2. Flexible wall ≥ 100 mm thickness | 6. FEF insulation |
| 3. Mineral fibre board | 7. Combustible pipe |
| 4. Ablative Coating | 8. Rigid floor ≥ 150 mm thickness |

Dimensions in mm

System Flammotect	Annex 102
Mixed penetration seal made of mineral fibre board (2 x 50 mm) with ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (2 x 50 mm) with ablative coating ($\geq 1,0$ mm dft)**Combustible pipes with FEF insulation and fire protection wrap**

Fire resistance classes - Floor					
Service	Pipe wall thickness	Insulation	Insulation Thickness	Measures	Floor Fire resistance class
Geberit Silent dB20					
Ø 56 mm	3.2 mm	FEF acc. EN 14304 (B-s3, d0)	17 mm	Intumescent wrap 50 mm 1 x 2 layers	EI 120 U/U
Ø 63 mm	3.2 mm		18 mm		Intumescent wrap 50 mm 1 x 4 layers
Ø 75 mm	3.6 mm		18 mm	EI 90 U/U	
Ø 90 mm	5.5 mm		18 mm	EI 90 U/U	
Ø 110 mm	6.0 mm		18 mm	EI 90 U/U	
Ø 135 mm	6.0 mm		18.5 mm	Intumescent wrap 50 mm 1 x 5 layers	EI 120 U/U
Ø 160 mm	7.0 mm		19 mm	Intumescent wrap 50 mm 1 x 6 layers	EI 120 U/U
Geberit Silent PP					
Ø 32 mm	2.0 mm	FEF acc. EN 14304 (B-s3, d0)	17 mm	Intumescent wrap 50 mm 1 x 2 layers	EI 120 U/U
Ø 40 mm	2.0 mm		17 mm		EI 120 U/U
Ø 50 mm	2.0 mm		17 mm		EI 120 U/U
Ø 75 mm	2.6 mm		18 mm	Intumescent wrap 50 mm 1 x 4 layers	EI 120 U/U
Ø 90 mm	3.1 mm		18 mm		EI 120 U/U
Ø 110 mm	3.6 mm		18 mm		EI 120 U/U
Ø 125 mm	4.2 mm		18.5 mm		Intumescent wrap 50 mm 1 x 5 layers
Geberit Silent Pro					
Ø 50 mm	3.0 mm	FEF acc. EN 14304 (B-s3, d0)	17 mm	Intumescent wrap 50 mm 1 x 2 layers	EI 120 U/U
Ø 75 mm	3.8 mm		18 mm	Intumescent wrap 50 mm 1 x 4 layers	EI 120 U/U
Ø 90 mm	4.3 mm		18 mm		EI 120 U/U
Ø 110 mm	4.5 mm		18 mm		EI 120 U/U
Pipelife Master 3 PLUS					
Ø 32 mm	1.8 mm	FEF acc. EN 14304 (B-s3, d0)	17 mm	Intumescent wrap 50 mm 1 x 2 layers	EI 120 U/U
Ø 40 mm	1.8 mm		17 mm		EI 120 U/U
Ø 50 mm	2.0 mm		17 mm		EI 120 U/U
Ø 75 mm	2.1 mm		18 mm	Intumescent wrap 50 mm 1 x 4 layers	EI 120 U/U
Ø 90 mm	2.5 mm		18 mm		EI 120 U/U
Ø 110 mm	3.0 mm		18 mm		EI 120 U/U

Mixed penetration seal made of mineral fibre board (2 x 50 mm) with ablative coating ($\geq 1,0$ mm dft)

System Flammotect	Annex 103
Mixed penetration seal made of mineral fibre board (2 x 50 mm) with ablative coating in walls and floors	

Combustible pipes with FEF insulation and fire protection wrap

Fire resistance classes - Floor					
Service	Pipe wall thickness	Insulation	Insulation Thickness	Measures	Floor Fire resistance class
POLO-KAL NG / POLO-KAL XS					
Ø 40 mm	1.8 mm	FEF acc. EN 14304 (B-s3, d0)	17 mm	Intumescent wrap 50 mm 1 x 2 layers	EI 120 U/U
Ø 50 mm	2.0 mm		17 mm		EI 120 U/U
Ø 75 mm	2.6 mm		18 mm	Intumescent wrap 50 mm 1 x 4 layers	EI 120 U/U
Ø 90 mm	3.0 mm		18 mm		EI 120 U/U
Ø 110 mm	3.4 mm		18 mm		EI 120 U/U
Rehau Raupiano Plus					
Ø 50 mm	1.8 mm	FEF acc. EN 14304 (B-s3, d0)	17 mm	Intumescent wrap 50 mm 1 x 2 layers	EI 120 U/U
Rehau Raupiano light					
Ø 50 mm	1.8 mm	FEF acc. EN 14304 (B-s3, d0)	17 mm	Intumescent wrap 50 mm 1 x 2 layers	EI 120 U/U
Ø 75 mm	1.9 mm		18 mm		EI 120 U/U
Ø 90 mm	2.2 mm		18 mm	Intumescent wrap 50 mm 1 x 4 layers	EI 120 U/U
Ø 110 mm	2.7 mm		18 mm		EI 120 U/U
Ø 125 mm	3.1 mm		18.5 mm		EI 120 U/U
Ø 160 mm	3.9 mm		19 mm	Intumescent wrap 50 mm 1 x 6 layers	EI 90 U/U
Rehau RAUSILENTO					
Ø 50 mm	1.8 mm	FEF acc. EN 14304 (B-s3, d0)	17 mm	Intumescent wrap 50 mm 1 x 2 layers	EI 120 U/U
Ø 75 mm	1.9 mm		18 mm		EI 120 U/U
Ø 90 mm	2.2 mm		18 mm	Intumescent wrap 50 mm 1 x 4 layers	EI 120 U/U
Ø 110 mm	2.7 mm		18 mm		EI 120 U/U
Ø 125 mm	3.1 mm		18.5 mm		EI 120 U/U
Ø 160 mm	3.9 mm		19 mm	Intumescent wrap 50 mm 1 x 6 layers	EI 90 U/U
Conel Drain					
Ø 50 mm	1.8 mm	FEF acc. EN 14304 (B-s3, d0)	17 mm	Intumescent wrap 50 mm 1x 2 layers	EI 120 U/U
Ø 75 mm	1.9 mm		18 mm		EI 120 U/U
Ø 90 mm	2.2 mm		18 mm	Intumescent wrap 50 mm 1 x 4 layers	EI 120 U/U
Ø 110 mm	2.7 mm		18 mm		EI 120 U/U
Ø 125 mm	3.1 mm		18.5 mm		EI 120 U/U
Ø 160 mm	3.9 mm		19 mm	Intumescent wrap 50 mm 1 x 6 layers	EI 90 U/U
System Flammotect					Annex 105
Mixed penetration seal made of mineral fibre board (2 x 50 mm) with ablative coating in walls and floors					
System Flammotect					Annex 104
Mixed penetration seal made of mineral fibre board (2 x 50 mm) with ablative coating in walls and floors					

Mixed penetration seal made of mineral fibre board (2 x 50 mm) with ablative coating ($\geq 1,0$ mm dft)**Combustible pipes with FEF insulation and fire protection wrap**

Fire resistance classes - Floor					
Service	Pipe wall thickness	Insulation	Insulation Thickness	Measures	Floor Fire resistance class
Wavin SiTECH					
Ø 50 mm	1.8 mm	FEF acc. EN 14304 (B-s3, d0)	17 mm	Intumescent wrap 50 mm 1 x 2 layers	EI 120 U/U
Ø 75 mm	2.3/2.6 mm		18 mm	Intumescent wrap 50 mm 1 x 4 layers	EI 120 U/U
Ø 90 mm	2.8/3.1 mm		18 mm		EI 120 U/U
Ø 110 mm	3.4 mm		18 mm		EI 120 U/U
Wavin SiTECH+					
Ø 32 mm	2.0 mm	FEF acc. EN 14304 (B-s3, d0)	17 mm	Intumescent wrap 50 mm 1 x 2 layers	EI 120 U/U
Ø 40 mm	2.0 mm		17 mm		EI 120 U/U
Ø 50 mm	2.1 mm		17 mm		EI 120 U/U
Ø 75 mm	2.6 mm		18 mm	Intumescent wrap 50 mm 1 x 4 layers	EI 120 U/U
Ø 90 mm	3.1 mm		18 mm		EI 120 U/U
Ø 110 mm	3.4 mm		18 mm		EI 120 U/U
Wavin AS+					
Ø 50 mm	3.0 mm	FEF acc. EN 14304 (B-s3, d0)	17 mm	Intumescent wrap 50 mm 1 x 2 layers	EI 120 U/U
Ø 75 mm	3.5 mm		18 mm	Intumescent wrap 50 mm 1 x 4 layers	EI 120 U/U
Ø 90 mm	4.6 mm		18 mm		EI 120 U/U
Ø 110 mm	5.3 mm		18 mm		EI 120 U/U
Hakan Silenta Premium					
Ø 58 mm	4.1 mm	FEF acc. EN 14304 (B-s3, d0)	17 mm	Intumescent wrap 50 mm 1 x 2 layers	EI 120 U/U
Ø 78 mm	4.6 mm		18 mm	Intumescent wrap 50 mm 1 x 4 layers	EI 120 U/U
Ø 90 mm	4.7 mm		18 mm		EI 120 U/U
Ø 110 mm	5.3 mm		18 mm		EI 120 U/U
Ø 135 mm	5.3 mm		18.5 mm	Intumescent wrap 50 mm 1 x 5 layers	EI 120 U/U
Ostendorf Skolan dB					
Ø 58 mm	4.0 mm	FEF acc. EN 14304 (B-s3, d0)	17 mm	Intumescent wrap 50 mm 1 x 2 layers	EI 120 U/U
Ø 135 mm	5.3 mm		18.5 mm	Intumescent wrap 50 mm 1 x 5 layers	EI 120 U/U

System Flammotect	Annex 106
Mixed penetration seal made of mineral fibre board (2 x 50 mm) with ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (2 x 50 mm) with ablative coating (≥ 1,0 mm dft)

Minimum Distances in wall and floor																			
	Cables	Cable bundles	Cable trays	Wave guides / coaxial cables	speedpipes	EIC, single/bundle made of plastic		EIC made of steel	Combustible pipes			Non-combustible pipes with FEF insulation	Non-combustible pipes with mineral wool insulation	Multilayer pipes	HVAC split line combinations	Cable Tube	Seal Edge		
						With Wrap	With Collar		With Collar	With Endless Collar	With Wrap						Upper	Lower	Side
Cables	≥ 0	≥ 0	≥ 0	≥ 100	≥ 25	≥ 75	≥ 100	≥ 75	≥ 20	≥ 100	≥ 100	≥ 50	≥ 50	≥ 100	≥ 100	≥ 100	≥ 0		
Cable bundles	≥ 0	≥ 0	≥ 0	≥ 100	≥ 25	≥ 75	≥ 100	≥ 75	≥ 20	≥ 100	≥ 100	≥ 50	≥ 50	≥ 100	≥ 100	≥ 100	≥ 0		
Cable trays	≥ 0	≥ 0	≥ 0 / ≥ 100 (next/ above)	≥ 100	≥ 25	≥ 75	≥ 100	≥ 75	≥ 20	≥ 100	≥ 100	≥ 50	≥ 50	≥ 100	≥ 100	≥ 100	≥ 0		
Wave guides / coaxial cables	≥ 100	≥ 100	≥ 100	≥ 50	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 25		
speed pipes	≥ 25	≥ 25	≥ 25	≥ 100	≥ 0	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 25		
EIC, single/bundle made of plastic	With Wrap	≥ 75	≥ 75	≥ 75	≥ 100	≥ 100	≥ 0	≥ 100	≥ 100	≥ 100	≥ 75	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 25		
	With Collar	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 0	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 25		
EIC made of steel	≥ 75	≥ 75	≥ 75	≥ 100	≥ 100	≥ 100	≥ 100	≥ 0	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 75	≥ 0		
Combustible pipes	With Collar	≥ 20	≥ 20	≥ 20	≥ 100	≥ 100	≥ 100	≥ 100	≥ 50	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 25		
	With Endless Collar	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 75	≥ 100	≥ 100	≥ 50	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 25		
	With Wrap	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 25		
Non-combustible pipes with FEF insulation	≥ 0	≥ 0	≥ 0	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 0	≥ 0	≥ 100	≥ 100	≥ 100	≥ 25		
Non-combustible pipes with mineral wool insulation	≥ 0	≥ 0	≥ 0	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 0	≥ 0	≥ 100	≥ 100	≥ 100	≥ 25		
Multilayer pipes	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 0	≥ 0	≥ 100	≥ 100	≥ 100	≥ 25		
HVAC split line combinations	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 0	≥ 0	≥ 100	≥ 50	≥ 100	≥ 25		
Cable Tube	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 75	≥ 50	≥ 50	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 10		

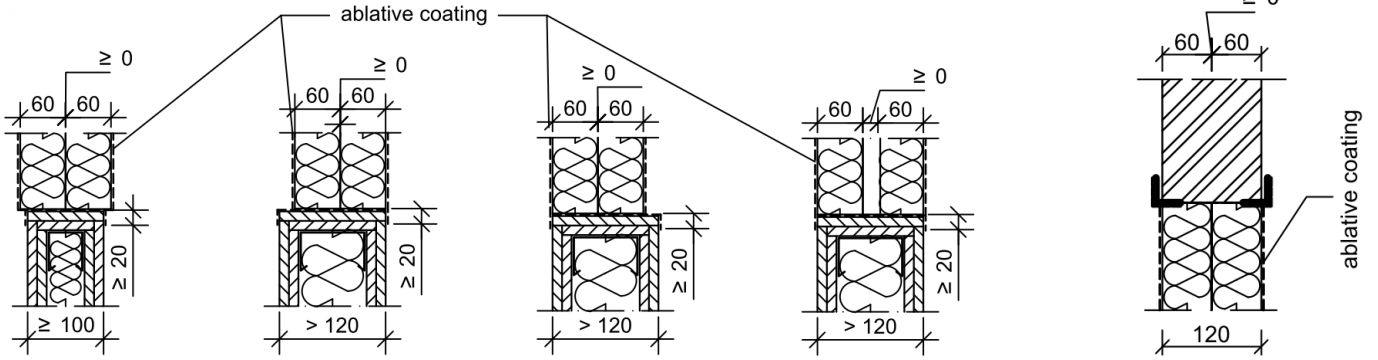
Mixed penetration seal made of mineral fibre board (2 x 60 mm) with ablative coating ($\geq 1,0$ mm dft)

Design variants

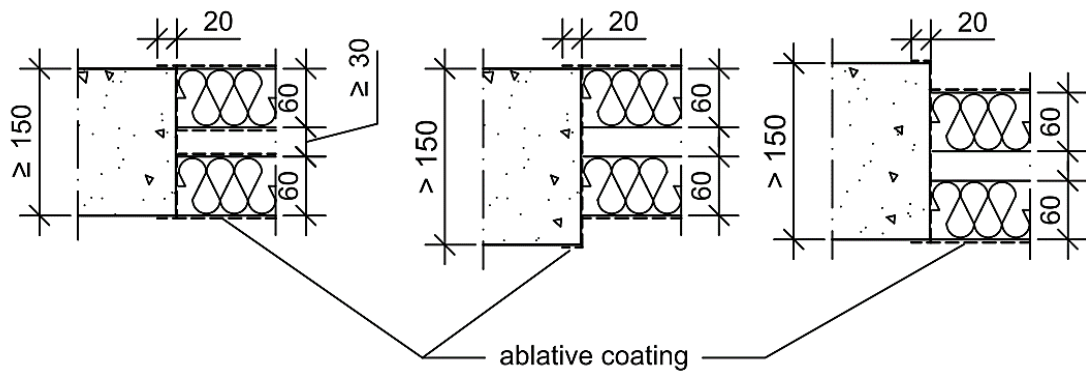
Wall

**Light Partition Wall
Solid Wall**

Sandwich Wall



Floor



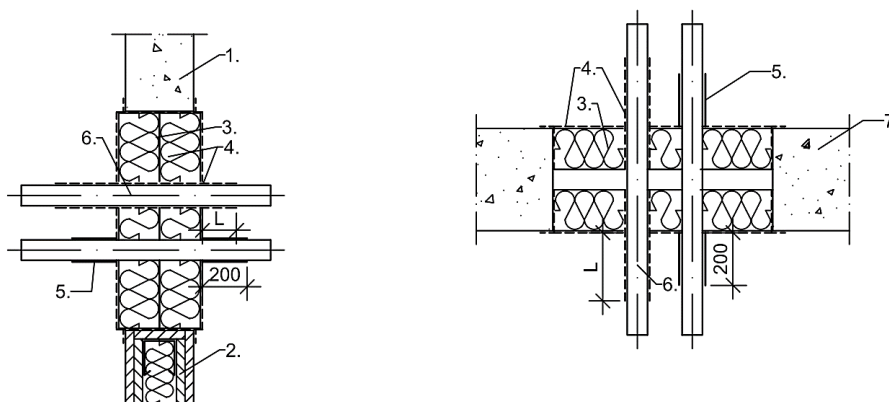
Fire resistance classes		
Max. Sealing size	Measure	Fire resistance class
1400 x 2000 mm / 2000 x 1400 mm	Light Partition Wall Solid Wall	EI 120
1400 x 2000 mm / 2000 x 1400 mm	Solid Floor	EI 120
1000 x 1000 mm	Sandwich Wall PAROC AST-F (120 mm)	EI 120

Dimensions in mm

System Flammotect	Annex 107
Mixed penetration seal made of mineral fibre board (2 x 50 mm) with ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (2 x 60 mm) with ablative coating (≥ 1,0 mm dft)

Cables Ø ≤ 21 mm up to ≤ Ø 80 mm or cable bundles Ø ≤ 100 mm with cables ≤ 21 mm with ablative coating or with intumescent wrap



Fire resistance classes			
Service	Measures	Wall Fire resistance class	Floor Fire resistance class
Cables, cable bundles			
Cables Ø ≤ 21 mm	-	EI 120	EI 120
	Ablative coating ≥ 100 mm x ≥ 1 mm DFT	EI 120	EI 120
Cables Ø ≤ 50 mm	Ablative coating ≥ 100 mm x ≥ 1 mm DFT	EI 90 / E 120	EI 90
	Ablative coating ≥ 150 mm x ≥ 1 mm DFT	-	EI 120
	Ablative coating ≥ 200 mm x ≥ 2 mm DFT	EI 120	EI 120
Cables Ø ≤ 80 mm	Ablative coating ≥ 100 mm x ≥ 1 mm DFT	EI 90 / E 120	EI 90
	Ablative coating ≥ 150 mm x ≥ 1 mm DFT	-	EI 120
	Ablative coating ≥ 200 mm x ≥ 2 mm DFT	EI 120	EI 120
Cable bundles Ø 100 mm with cables Ø ≤ 21 mm	Ablative coating ≥ 100 mm x ≥ 1 mm DFT	EI 120	EI 120
Conduits made of steel Ø ≤ 16 mm	Ablative coating ≥ 100 mm x ≥ 1 mm DFT	EI 120 U/C	EI 120 U/C
Conduits made of plastic Ø ≤ 16 mm	Ablative coating ≥ 100 mm x ≥ 1 mm DFT	EI 120 U/U	EI 120 U/U

Fire resistance classes			
Service	Measures	Wall Fire resistance class	Floor Fire resistance class
Cables, cable bundles			
Cables Ø ≤ 21 mm	Intumescent wrap 125 mm / 4 x 2 layer Longitudinal overlap 25 mm Cross overlap 45 mm	EI 120	EI 120
Cables Ø ≤ 50 mm		EI 120	EI 120
Cables Ø ≤ 80 mm		EI 120	EI 120
Cable bundles Ø 100 mm with cables Ø ≤ 21 mm		EI 120	EI 120

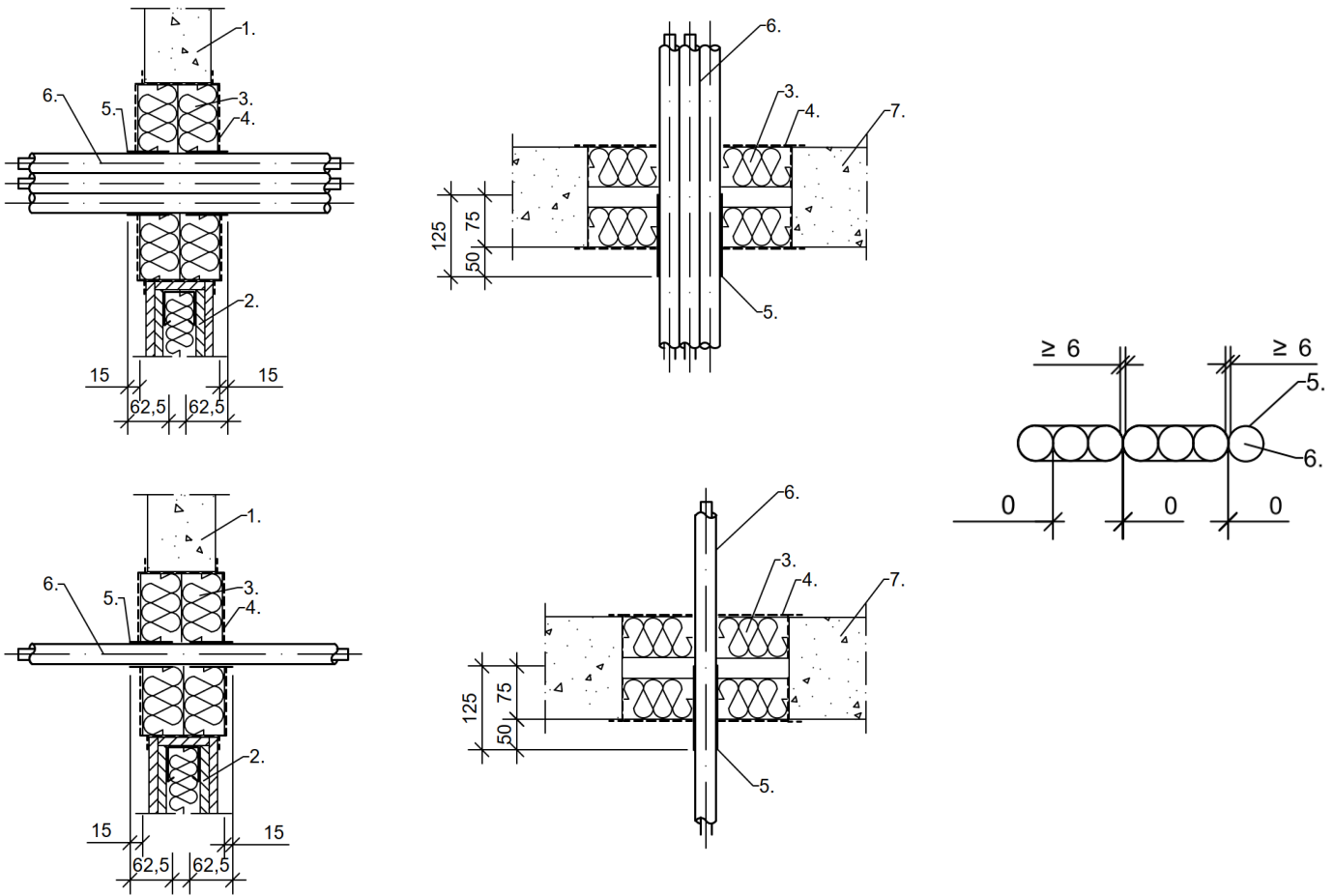
- | | |
|-------------------------------------|-----------------------------------|
| 1. Rigid wall ≥ 100 thickness | 5. Intumescent wrap |
| 2. Flexible wall ≥ 100 mm thickness | 6. Cable |
| 3. Mineral fibre board | 7. Rigid floor ≥ 150 mm thickness |
| 4. Ablative Coating | |

Dimensions in mm

System Flammotect	Annex 108
Mixed penetration seal made of mineral fibre board (2 x 60 mm) with ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (2 x 60 mm) with ablative coating (≥ 1,0 mm dft)

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



Fire resistance classes				
Service	Cable	Measures	Wall Fire resistance class	Floor Fire resistance class
Electrical installation conduit (EIP)				
EIC made of plastic	$\varnothing \leq 32$	With/without	Intumescent wrap 2 x 62,5 / 1 x 125 mm 1 layer	EI 120 U/U
	$\varnothing \leq 63$	With/without	Intumescent wrap 2 x 62,5 / 1 x 125 mm 2 layers	EI 120 U/U E 120 U/U
EIC made of plastic bundle	$\varnothing \leq 100$	With/without	Intumescent wrap 2 x 62,5 / 1 x 125 mm 2 layers	EI 120 U/U
Linear arrangement of plastic EIC	≤ 3 pcs.	With/without	Intumescent wrap 2 x 62,5 / 1 x 125 mm 1 layer	EI 120 U/U

- 1. Rigid wall ≥ 100 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

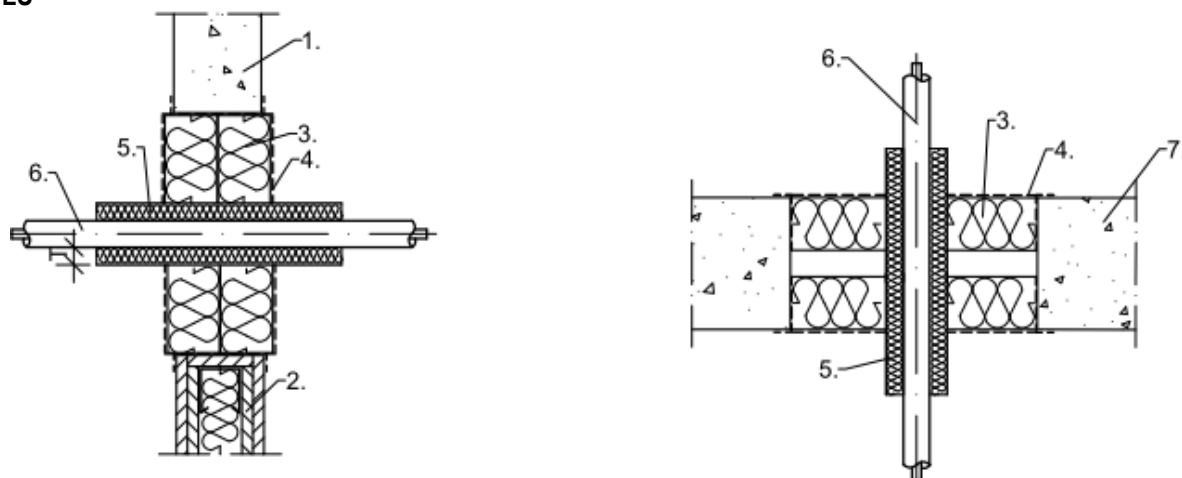
Dimensions in mm

System Flammotect	Annex 109
Mixed penetration seal made of mineral fibre board (2 x 60 mm) with ablative coating in walls and floors	

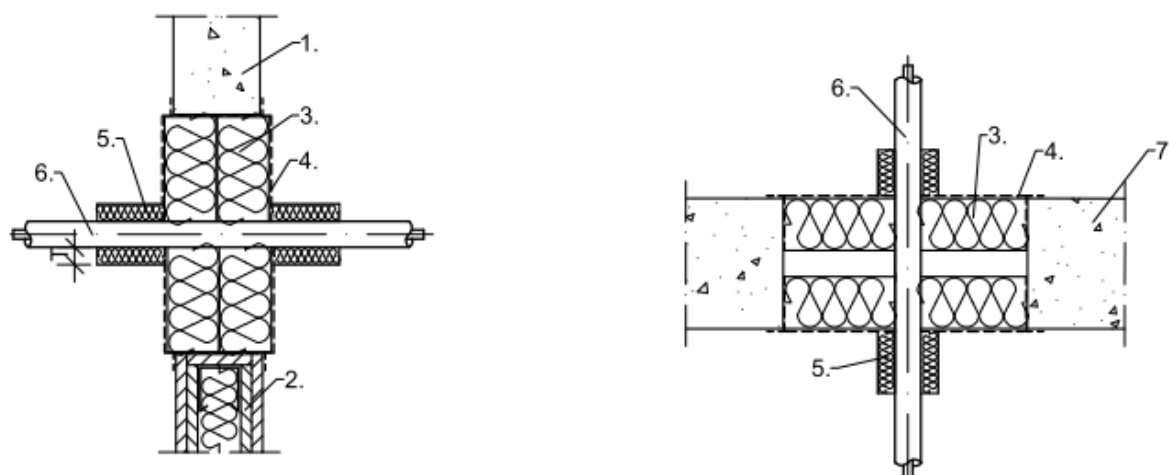
Mixed penetration seal made of mineral fibre board (2 x 60 mm) with ablative coating (≥ 1,0 mm dft)

Metal conduits $\varnothing \leq 32$ mm with or without cables ≤ 21 mm with mineral fibre lamella mat

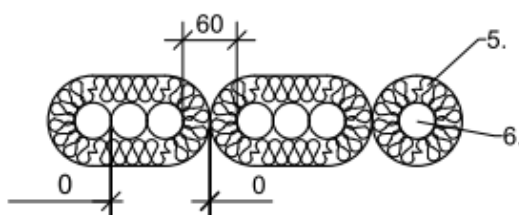
Variant LS



Variant LI



Detail: Distances to each other:



Fire resistance classes					
Service	Cable	Measures	Wall Fire resistance class	Floor Fire resistance class	
Metal conduits					
EIC made of steel	$\varnothing \leq 32$	with/without	Lamella mat Both sides $\geq 250 \times 30$ mm (LS) / $\geq 200 \times 30$ mm (LI)	EI 120 U/C	EI 120 U/C
	$\leq 3 \times \varnothing \leq 32$	with/without		EI 90 / E 120 U/C	EI 120 U/C

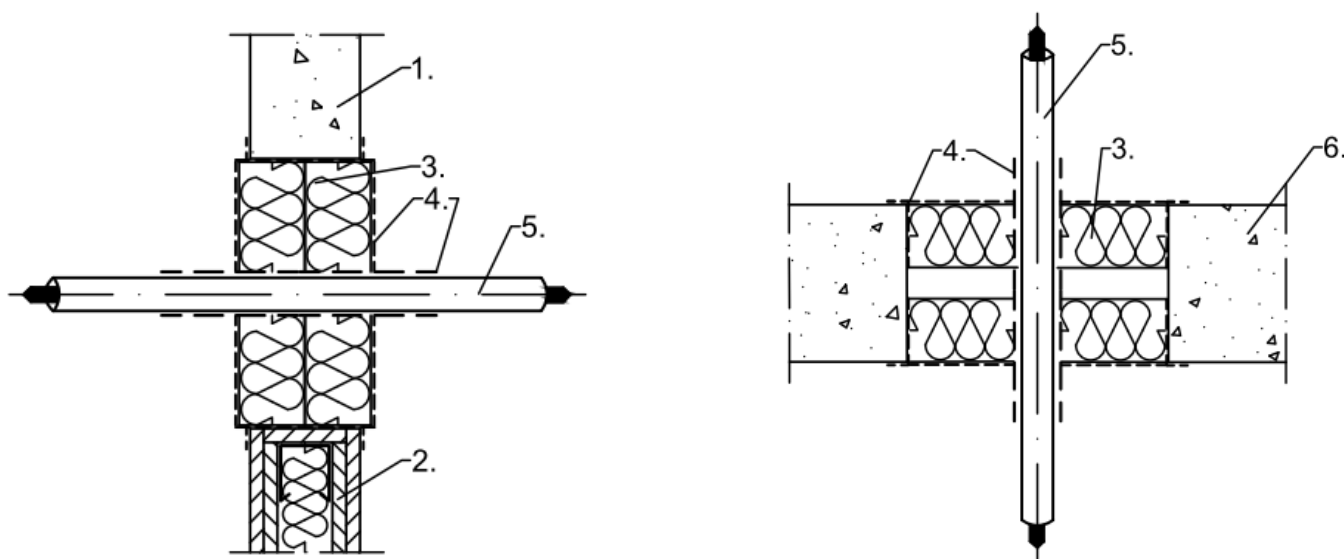
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| 1. Rigid wall ≥ 100 thickness | 5. Mineral fibre lamella mat |
| 2. Flexible wall ≥ 100 mm thickness | 6. Electrical installation conduit |
| 3. Mineral fibre board | 7. Rigid floor ≥ 150 mm thickness |
| 4. Ablative Coating | |

Dimensions in mm

System Flammotect	Annex 110
Mixed penetration seal made of mineral fibre board (2 x 60 mm) with ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (2 x 60 mm) with ablative coating (≥ 1,0 mm dft)

Coaxial cables and waveguides with ablative coating



Fire resistance classes			
Service	Measures	Wall Fire resistance class	Floor Fire resistance class
Coaxial cables / waveguides			
CommScope Heliac Ø ≤ 51,1 mm	Ablative coating ≥ 100 mm x ≥ 1 mm DFT	EI 120 U/C	-
	Ablative coating ≥ 200 mm x ≥ 1 mm DFT	-	EI 120 U/C
RFS Cellflex Ø ≤ 50,3 mm	Ablative coating ≥ 100 mm x ≥ 1 mm DFT	EI 120 U/C	-
	Ablative coating ≥ 200 mm x ≥ 1 mm DFT	-	EI 120 U/C
RFS Radiaflex Ø ≤ 48,2 mm	Ablative coating ≥ 100 mm x ≥ 1 mm DFT	EI 120 U/C	-
RFS Radiaflex Ø ≤ 28,5 mm	Ablative coating ≥ 200 mm x ≥ 1 mm DFT	-	EI 120 U/C

- 1. Rigid wall ≥ 100 thickness
- 2. Flexible wall ≥ 100 mm thickness
- 3. Mineral fibre board

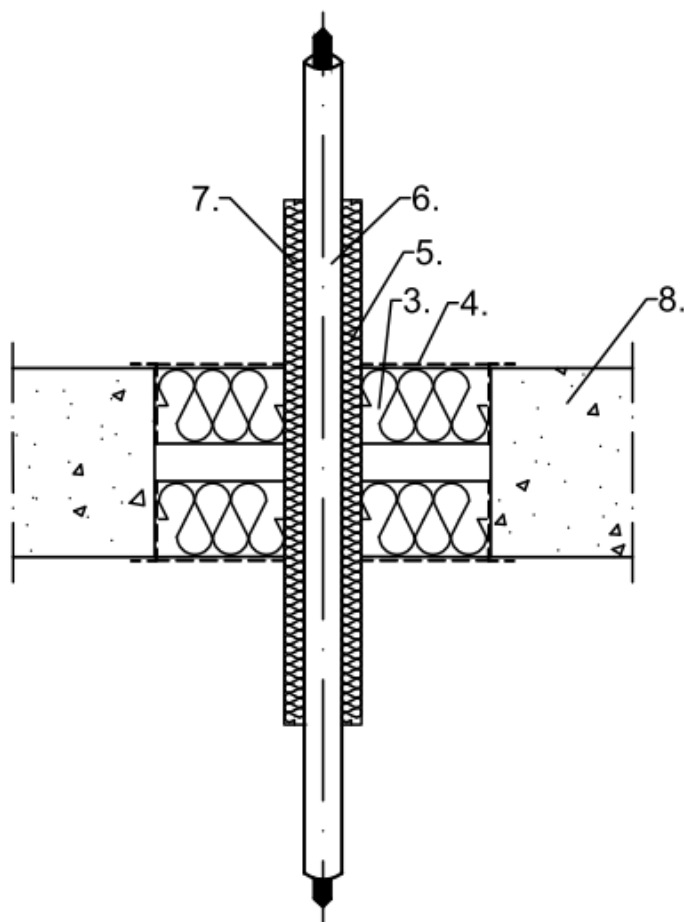
- 4. Ablative coating
- 5. Electrical installation conduit
- 6. Rigid floor ≥ 150 mm thickness

Dimensions in mm

System Flammotect	Annex 111
Mixed penetration seal made of mineral fibre board (2 x 60 mm) with ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (2 x 60 mm) with ablative coating (≥ 1,0 mm dft)

Coaxial cables and waveguides with mineral fibre lamella mat



Fire resistance classes			
Service	Measures	Wall Fire resistance class	Floor Fire resistance class
Coaxial cables / waveguides			
CommScope Heliac Ø ≤ 51,1 mm	Lamella mat both sides (LS) ≥ 250 mm 20 - 30 mm	-	EI 120 U/C
RFS Cellflex Ø ≤ 50,3 mm	Lamella mat both sides (LS) ≥ 250 mm 20 - 30 mm	-	EI 120 U/C
RFS Radiaflex Ø ≤ 28,5 mm	Lamella mat both sides (LS) ≥ 250 mm 20 - 30 mm	-	EI 120 U/C

- 3. Mineral fibre board
- 4. Ablative Coating

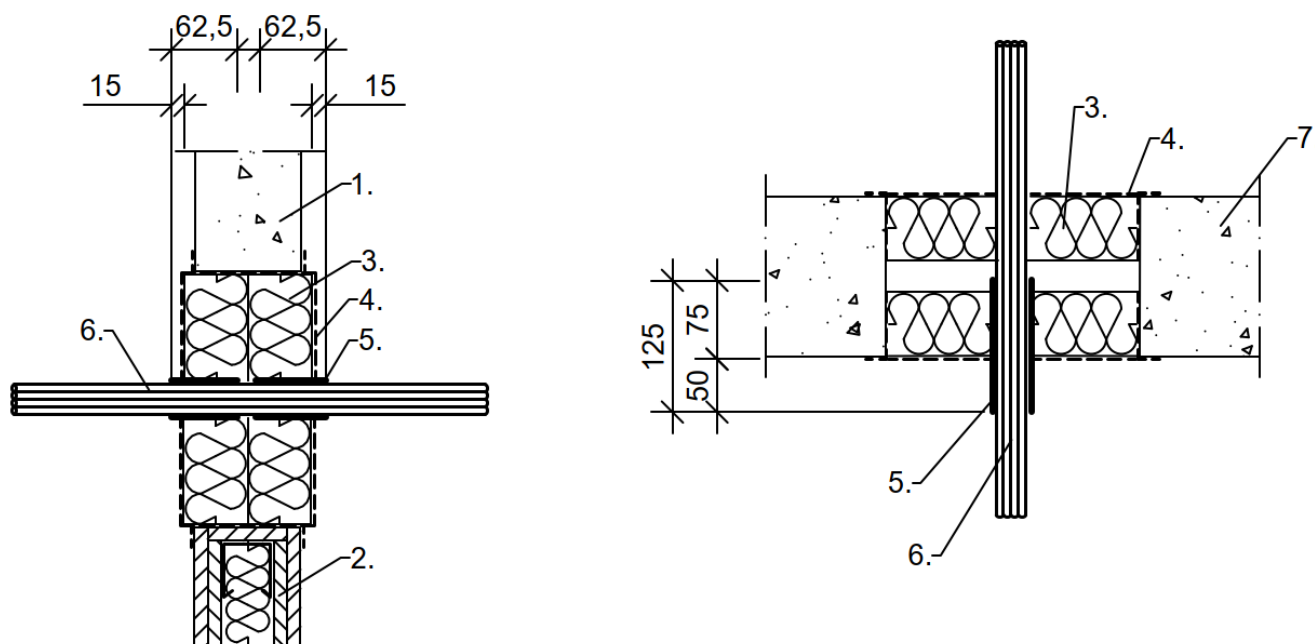
- 5. Lamella mat
- 6. Electrical installation conduit
- 7. Rigid floor ≥ 150 mm thickness

Dimensions in mm

System Flammotect	Annex 112
Mixed penetration seal made of mineral fibre board (2 x 60 mm) with ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (2 x 60 mm) with ablative coating (≥ 1,0 mm dft)

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



Fire resistance classes			
Service	Measures	Wall Fire resistance class	Floor Fire resistance class
Speed pipes, bundles or single pipes, with or without glass fibre or micro cables			
Speedpipes Bundle- $\varnothing \leq 50$ Single- $\varnothing \leq 14$	Intumescent wrap 2 x 62,5 / 1 x 125 mm 1 layer	EI 120 U/U	EI 120 U/U

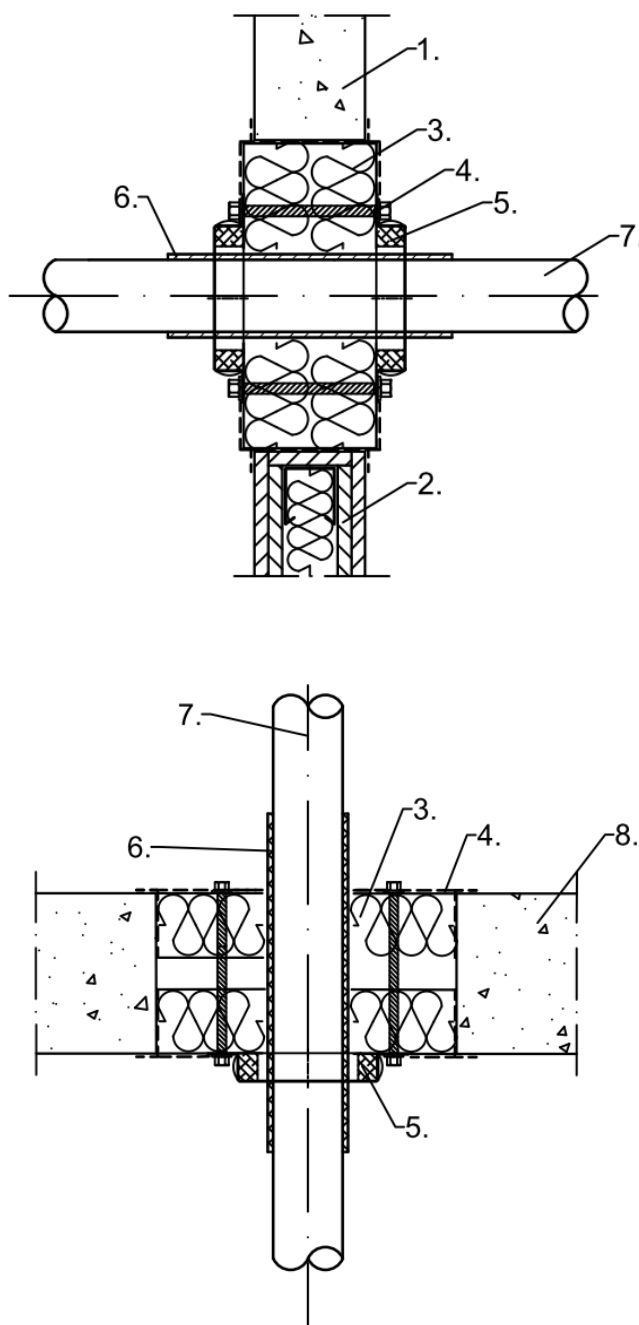
- | | |
|--|--|
| 1. Rigid wall ≥ 100 thickness | 5. Intumescent wrap |
| 2. Flexible wall ≥ 100 mm thickness | 6. Speed pipe |
| 3. Mineral fibre board | 7. Rigid floor ≥ 150 mm thickness |
| 4. Ablative Coating | |

Dimensions in mm

System Flammotect	Annex 113
Mixed penetration seal made of mineral fibre board (2 x 60 mm) with ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (2 x 60 mm) with ablative coating (≥ 1,0 mm dft)

Combustible pipes $\varnothing \leq 32 \text{ mm}$ - $\varnothing \leq 160 \text{ mm}$ with and without PE sound insulation and fire protection collar



The fire protection endless collar may be attached with coarse thread screws

Permitted screws:

Würth	ASSY D	8x70 mm
Heco	HECO-TOPIX-plus	8x80 mm
SPAX	T-STAR plus	8x80 mm

- | | |
|--|--|
| 1. Rigid wall ≥ 100 thickness | 5. Fire protection collar |
| 2. Flexible wall ≥ 100 mm thickness | 6. PE sound insulation |
| 3. Mineral fibre board | 7. Combustible pipe |
| 4. Ablative Coating | 8. Rigid floor ≥ 150 mm thickness |

Dimensions in mm

System Flammotect

Mixed penetration seal made of mineral fibre board (2 x 60 mm) with ablative coating in walls and floors

Annex 114

Mixed penetration seal made of mineral fibre board (2 x 60 mm) with ablative coating ($\geq 1,0$ mm dft)**Combustible pipes $\varnothing \leq 32$ mm - $\varnothing \leq 160$ mm with and without PE sound insulation and fire protection collar**

Fire resistance classes - Wall			
Service	Pipe wall thickness	Measures	Wall Fire resistance class
PVC-U, PVC-C			
$\varnothing 32 - 50$ mm	1.8 – 5.6 mm	Fire protection collar Installed on both sides	EI 90 U/U
$\varnothing 63 - 75$ mm	1.8 – 8.4 mm		EI 90 U/U
$\varnothing 90$ mm	1.8 – 10.0 mm		EI 90 U/U
$\varnothing 110$ mm	1.8 – 12.3 mm		EI 90 U/U
$\varnothing 125$ mm	2.5 – 9.3 mm		EI 120 U/U
$\varnothing 140 - 160$ mm	4.0 – 14.6 mm		EI 90 U/U
PE-HD, ABS, SAN+PVC			
$\varnothing 32 - 50$ mm	1.8 – 4.6 mm	Fire protection collar Installed on both sides	EI 90 U/U
	4.6 mm		EI 120 U/U
$\varnothing 63 - 75$ mm	2.2 – 6.9 mm		EI 90 U/U
$\varnothing 75$ mm	3.8 – 4.5 mm		EI 120 U/U
$\varnothing 90 - 110$ mm	2.7 – 4.3 mm		EI 120 U/U
$\varnothing 90$ mm	2.4 – 8.2 mm		EI 90 U/U
$\varnothing 110$ mm	2.7 – 10.0 mm		EI 90 U/U
$\varnothing 125$ mm	3.1 – 4.2 mm		EI 120 U/U
$\varnothing 140 - 160$ mm	4.0 – 14.6 mm		EI 90 U/U
	4.0 mm		EI 120 U/U
PP			
$\varnothing 32 - 50$ mm	1.8 mm	Fire protection collar Installed on both sides	EI 90 U/U
$\varnothing 63 - 75$ mm	2.2 – 5.2 mm		EI 90 U/U
$\varnothing 90$ mm	2.4 – 7.3 mm		EI 90 U/U
$\varnothing 110$ mm	2.7 – 10.0 mm		EI 90 U/U
	10.0 mm		EI 120 U/U
$\varnothing 125$ mm	3.1 mm		EI 90 U/U
$\varnothing 140 - 160$ mm	4.0 – 14.6 mm		EI 90 U/U
Rehau Raupiano light			
$\varnothing 40$ mm	1.8 mm	Fire protection collar Installed on both sides	EI 120 U/U
$\varnothing 50$ mm	1.8 mm		EI 120 U/U
$\varnothing 75$ mm	1.9 mm		EI 120 U/U
$\varnothing 90$ mm	2.2 mm		EI 120 U/U
$\varnothing 110$ mm	2.7 mm		EI 120 U/U
$\varnothing 125$ mm	3.1 mm		EI 120 U/U
$\varnothing 160$ mm	3.9 mm		EI 120 U/U
Conel DRAIN			
$\varnothing 40$ mm	1.8 mm	Fire protection collar Installed on both sides	EI 120 U/U
$\varnothing 50$ mm	1.8 mm		EI 120 U/U
$\varnothing 75$ mm	1.9 mm		EI 120 U/U
$\varnothing 90$ mm	2.2 mm		EI 120 U/U
$\varnothing 110$ mm	2.7 mm		EI 120 U/U

Dimensions in mm

System Flammotect	Annex 115
Mixed penetration seal made of mineral fibre board (2 x 60 mm) with ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (2 x 60 mm) with ablative coating ($\geq 1,0$ mm dft)**Combustible pipes $\varnothing \leq 32$ mm - $\varnothing \leq 160$ mm with and without PE sound insulation and fire protection collar**

Fire resistance classes - Wall			
Service	Pipe wall thickness	Measures	Wall Fire resistance class
Rehau RAUSILENTO			
$\varnothing 40$ mm	1.8 mm	Fire protection collar Installed on both sides	EI 120 U/U
$\varnothing 50$ mm	1.8 mm		EI 120 U/U
$\varnothing 75$ mm	1.9 mm		EI 120 U/U
$\varnothing 90$ mm	2.2 mm		EI 120 U/U
$\varnothing 110$ mm	2.7 mm		EI 120 U/U
$\varnothing 125$ mm	3.1 mm		EI 120 U/U
$\varnothing 160$ mm	3.9 mm		EI 120 U/U
Geberit Silent dB20			
$\varnothing 56$ mm	3.2 mm	Fire protection collar Installed on both sides	EI 120 U/U
$\varnothing 63$ mm	3.2 mm		EI 120 U/U
$\varnothing 75$ mm	3.6 mm		EI 120 U/U
$\varnothing 90$ mm	5.5 mm		EI 120 U/U
$\varnothing 110$ mm	6.0 mm		EI 120 U/U
$\varnothing 135$ mm	6.0 mm		EI 90 U/U
$\varnothing 160$ mm	7.0 mm		EI 90 U/U
Geberit Silent PP			
$\varnothing 32$ mm	2.0 mm	Fire protection collar Installed on both sides	EI 120 U/U
$\varnothing 40$ mm	2.0 mm		EI 120 U/U
$\varnothing 50$ mm	2.0 mm		EI 120 U/U
$\varnothing 75$ mm	2.6 mm		EI 120 U/U
$\varnothing 90$ mm	3.1 mm		EI 120 U/U
$\varnothing 110$ mm	3.6 mm		EI 120 U/U
$\varnothing 125$ mm	4.2 mm		EI 120 U/U
$\varnothing 160$ mm	5.2 mm		EI 120 U/U
Geberit Silent Pro			
$\varnothing 50$ mm	3.0 mm	Fire protection collar Installed on both sides	EI 120 U/U
$\varnothing 75$ mm	3.8 mm		EI 120 U/U
$\varnothing 90$ mm	4.3 mm		EI 120 U/U
$\varnothing 110$ mm	4.5 mm		EI 120 U/U
$\varnothing 125$ mm	5.0 mm		EI 120 U/U
$\varnothing 160$ mm	6.0 mm		EI 120 U/U
POLO-KAL NG / POLO-KAL XS			
$\varnothing 40$ mm	1.8 mm	Fire protection collar Installed on both sides	EI 120 U/U
$\varnothing 50$ mm	2.0 mm		EI 120 U/U
$\varnothing 75$ mm	2.6 mm		EI 120 U/U
$\varnothing 90$ mm	3.0 mm		EI 120 U/U
$\varnothing 110$ mm	3.4 mm		EI 120 U/U

Dimensions in mm

System Flammotect	Annex 116
Mixed penetration seal made of mineral fibre board (2 x 60 mm) with ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (2 x 60 mm) with ablative coating ($\geq 1,0$ mm dft)**Combustible pipes $\varnothing \leq 32$ mm - $\varnothing \leq 160$ mm with and without PE sound insulation and fire protection collar**

Fire resistance classes - Wall			
Service	Pipe wall thickness	Measures	Wall Fire resistance class
POLO-KAL 3S			
$\varnothing 90$ mm	4.5 mm	Fire protection collar Installed on both sides	EI 120 U/U
$\varnothing 110$ mm	4.8 mm		EI 120 U/U
Rehau Raupiano Plus			
$\varnothing 50$ mm	1.8 mm	Fire protection collar Installed on both sides	EI 120 U/U
$\varnothing 75$ mm	2.0 mm		EI 120 U/U
$\varnothing 90$ mm	2.2 mm		EI 120 U/U
$\varnothing 110$ mm	2.7 mm		EI 120 U/U
$\varnothing 125$ mm	3.1 mm		EI 120 U/U
$\varnothing 160$ mm	3.9 mm		EI 120 U/U
Wavin AS			
$\varnothing 58$ mm	4.0 mm	Fire protection collar Installed on both sides	EI 90 U/U
$\varnothing 78$ mm	4.5 mm		EI 90 U/U
$\varnothing 90$ mm	4.5 mm		EI 90 U/U
$\varnothing 110$ mm	5.3 mm		EI 90 U/U
$\varnothing 135$ mm	5.3 mm		EI 90 U/U
$\varnothing 160$ mm	5.3 mm		EI 90 U/U
Wavin AS+			
$\varnothing 50$ mm	3.0 mm	Fire protection collar Installed on both sides	EI 90 U/U
$\varnothing 75$ mm	3.5 mm		EI 90 U/U
$\varnothing 90$ mm	4.6 mm		EI 90 U/U
$\varnothing 110$ mm	5.3 mm		EI 90 U/U
$\varnothing 125$ mm	5.3 mm		EI 90 U/U
$\varnothing 160$ mm	5.6 mm		EI 90 U/U
GF Silenta Premium			
$\varnothing 58$ mm	4.1 mm	Fire protection collar Installed on both sides	EI 120 U/U
$\varnothing 78$ mm	4.6 mm		EI 120 U/U
$\varnothing 90$ mm	4.7 mm		EI 120 U/U
$\varnothing 110$ mm	5.3 mm		EI 120 U/U
$\varnothing 135$ mm	5.3 mm		EI 120 U/U
$\varnothing 160$ mm	5.3 mm		EI 120 U/U
Hakan Silenta Premium			
$\varnothing 58$ mm	4.1 mm	Fire protection collar Installed on both sides	EI 120 U/U
$\varnothing 78$ mm	4.6 mm		EI 120 U/U
$\varnothing 90$ mm	4.7 mm		EI 120 U/U
$\varnothing 110$ mm	5.3 mm		EI 120 U/U
$\varnothing 135$ mm	5.3 mm		EI 120 U/U
$\varnothing 160$ mm	5.3 mm		EI 120 U/U

Dimensions in mm

System Flammotect	Annex 117
Mixed penetration seal made of mineral fibre board (2 x 60 mm) with ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (2 x 60 mm) with ablative coating ($\geq 1,0$ mm dft)**Combustible pipes $\varnothing \leq 32$ mm - $\varnothing \leq 160$ mm with and without PE sound insulation and fire protection collar**

Fire resistance classes - Wall			
Service	Pipe wall thickness	Measures	Wall Fire resistance class
Wavin SiTECH+			
$\varnothing 32$ mm	2.0 mm	Fire protection collar Installed on both sides	EI 120 U/U
$\varnothing 40$ mm	2.0 mm		EI 120 U/U
$\varnothing 50$ mm	2.1 mm		EI 120 U/U
$\varnothing 75$ mm	2.6 mm		EI 120 U/U
$\varnothing 90$ mm	3.1 mm		EI 120 U/U
$\varnothing 110$ mm	3.4 mm		EI 120 U/U
$\varnothing 125$ mm	4.0 mm		EI 120 U/U
$\varnothing 160$ mm	5.0 mm		EI 120 U/U
Valsir Triplus			
$\varnothing 32$ mm	1.8 mm	Fire protection collar Installed on both sides	EI 120 U/U
$\varnothing 40$ mm	1.8 mm		EI 120 U/U
$\varnothing 50$ mm	1.8 mm		EI 120 U/U
$\varnothing 75$ mm	2.5 mm		EI 120 U/U
$\varnothing 90$ mm	3.1 mm		EI 120 U/U
$\varnothing 110$ mm	3.4 mm		EI 120 U/U
$\varnothing 125$ mm	3.9 mm		EI 120 U/U
$\varnothing 160$ mm	4.9 mm		EI 120 U/U
Pipelife Master 3 PLUS			
$\varnothing 32$ mm	1.8 mm	Fire protection collar Installed on both sides	EI 120 U/U
$\varnothing 40$ mm	1.8 mm		EI 120 U/U
$\varnothing 50$ mm	2.0 mm		EI 120 U/U
$\varnothing 75$ mm	2.1 mm		EI 120 U/U
$\varnothing 90$ mm	2.5 mm		EI 120 U/U
$\varnothing 110$ mm	3.0 mm		EI 120 U/U
$\varnothing 125$ mm	3.5 mm		EI 120 U/U
$\varnothing 160$ mm	4.4 mm		EI 120 U/U
Kekelit PHON EX AS			
$\varnothing 58$ mm	4.0 mm	Fire protection collar Installed on both sides	EI 90 U/U
$\varnothing 78$ mm	4.5 mm		EI 90 U/U
$\varnothing 90$ mm	4.5 mm		EI 90 U/U
$\varnothing 110$ mm	5.3 mm		EI 90 U/U
$\varnothing 135$ mm	5.3 mm		EI 90 U/U
$\varnothing 160$ mm	5.3 mm		EI 90 U/U

Dimensions in mm

System Flammotect	Annex 118
Mixed penetration seal made of mineral fibre board (2 x 60 mm) with ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (2 x 60 mm) with ablative coating ($\geq 1,0$ mm dft)**Combustible pipes $\varnothing \leq 32$ mm - $\varnothing \leq 160$ mm with and without PE sound insulation and fire protection collar**

Fire resistance classes - Floor				
Service	Pipe wall thickness	Measures	Floor Fire resistance class	
PVC-U, PVC-C				
$\varnothing 32 - 50$ mm	1.8 – 5.6 mm	Fire protection collar Installed on bottom side	EI 90 U/U	
$\varnothing 63 - 75$ mm	1.8 – 8.4 mm		EI 90 U/U	
$\varnothing 90$ mm	1.8 – 10.0 mm		EI 90 U/U	
$\varnothing 110$ mm	1.8 – 12.3 mm		EI 90 U/U	
	1.8 mm		EI 120 U/U	
$\varnothing 125$ mm	2.5 mm		EI 120 U/U	
$\varnothing 140 - 160$ mm	3.2 – 11.9 mm		EI 90 U/U	
	3.2 mm		EI 120 U/U	
PE-HD, ABS, SAN+PVC				
$\varnothing 32 - 50$ mm	1.8 – 4.6 mm	Fire protection collar Installed on bottom side	EI 90 U/U	
$\varnothing 63 - 75$ mm	2.2 – 6.9 mm		EI 90 U/U	
$\varnothing 90$ mm	2.4 – 8.2 mm		EI 90 U/U	
$\varnothing 110$ mm	2.7 – 10.0 mm		EI 90 U/U	
$\varnothing 125$ mm	3.1 mm		EI 90 U/U	
$\varnothing 140 - 160$ mm	4.0 – 14.6 mm		EI 90 U/U	
PP				
$\varnothing 32 - 50$ mm	1.8 – 4.6 mm	Fire protection collar Installed on bottom side	EI 90 U/U	
	1.8 mm		EI 120 U/U	
$\varnothing 63 - 75$ mm	2.2 – 6.9 mm		EI 90 U/U	
	2.2 mm		EI 120 U/U	
$\varnothing 90$ mm	2.4 – 8.2 mm		EI 90 U/U	
	2.4 mm		EI 120 U/U	
$\varnothing 110$ mm	2.7 – 10.0 mm		EI 90 U/U	
	2.7 mm		EI 120 U/U	
$\varnothing 125$ mm	3.1 – 11.4 mm		EI 90 U/U	
	3.1 mm		EI 120 U/U	
$\varnothing 140 - 160$ mm	4.0 – 14.6 mm		EI 90 U/U	
Rehau Raupiano light				
$\varnothing 50$ mm	1.8 mm		Fire protection collar Installed on bottom side	EI 90 U/U
$\varnothing 75$ mm	1.9 mm			EI 90 U/U
$\varnothing 90$ mm	2.2 mm	EI 90 U/U		
$\varnothing 110$ mm	2.7 mm	EI 90 U/U		

Dimensions in mm

System Flammotect	Annex 119
Mixed penetration seal made of mineral fibre board (2 x 60 mm) with ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (2 x 60 mm) with ablative coating ($\geq 1,0$ mm dft)**Combustible pipes $\varnothing \leq 32$ mm - $\varnothing \leq 160$ mm with and without PE sound insulation and fire protection collar**

Fire resistance classes - Floor			
Service	Pipe wall thickness	Measures	Floor Fire resistance class
Conel DRAIN			
$\varnothing 50$ mm	1.8 mm	Fire protection collar Installed on bottom side	EI 90 U/U
$\varnothing 75$ mm	1.9 mm		EI 90 U/U
$\varnothing 90$ mm	2.2 mm		EI 90 U/U
$\varnothing 110$ mm	2.7 mm		EI 90 U/U
Rehau RAUSILENTO			
$\varnothing 50$ mm	1.8 mm	Fire protection collar Installed on bottom side	EI 90 U/U
$\varnothing 75$ mm	1.9 mm		EI 90 U/U
$\varnothing 90$ mm	2.2 mm		EI 90 U/U
$\varnothing 110$ mm	2.7 mm		EI 90 U/U
Geberit Silent PP			
$\varnothing 32$ mm	2.0 mm	Fire protection collar Installed on bottom side	EI 90 U/U
$\varnothing 40$ mm	2.0 mm		EI 90 U/U
$\varnothing 50$ mm	2.0 mm		EI 90 U/U
$\varnothing 75$ mm	2.6 mm		EI 90 U/U
$\varnothing 90$ mm	3.1 mm		EI 90 U/U
$\varnothing 110$ mm	3.6 mm		EI 90 U/U
Geberit Silent Pro			
$\varnothing 50$ mm	3.0 mm	Fire protection collar Installed on bottom side	EI 90 U/U
$\varnothing 75$ mm	3.8 mm		EI 90 U/U
$\varnothing 90$ mm	4.3 mm		EI 90 U/U
$\varnothing 110$ mm	4.5 mm		EI 90 U/U
POLO-KAL NG / POLO-KAL XS			
$\varnothing 40$ mm	1.8 mm	Fire protection collar Installed on bottom side	EI 90 U/U
$\varnothing 50$ mm	2.0 mm		EI 90 U/U
$\varnothing 75$ mm	2.6 mm		EI 90 U/U
$\varnothing 90$ mm	3.0 mm		EI 90 U/U
$\varnothing 110$ mm	3.4 mm		EI 90 U/U
$\varnothing 125$ mm	3.9 mm		EI 90 U/U
$\varnothing 160$ mm	4.9 mm		EI 90 U/U
GF Silenta Premium			
$\varnothing 58$ mm	4.1 mm	Fire protection collar Installed on bottom side	EI 90 U/U
$\varnothing 78$ mm	4.6 mm		EI 90 U/U
$\varnothing 90$ mm	4.7 mm		EI 90 U/U
$\varnothing 110$ mm	5.3 mm		EI 90 U/U

Dimensions in mm

System Flammotect	Annex 120
Mixed penetration seal made of mineral fibre board (2 x 60 mm) with ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (2 x 60 mm) with ablative coating ($\geq 1,0$ mm dft)**Combustible pipes $\varnothing \leq 32$ mm - $\varnothing \leq 160$ mm with and without PE sound insulation and fire protection collar**

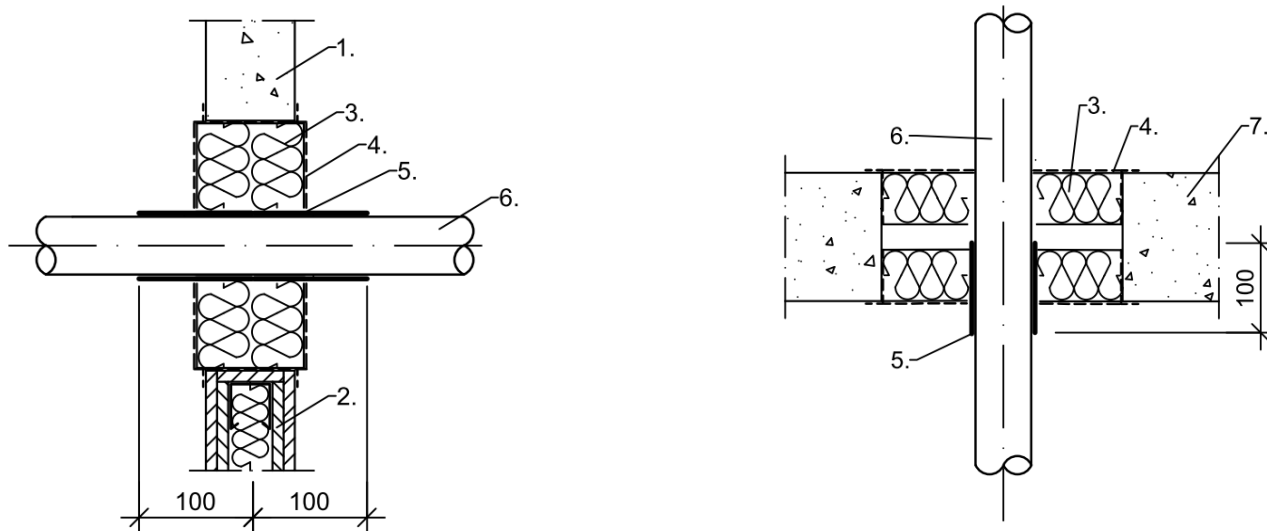
Fire resistance classes - Floor			
Service	Pipe wall thickness	Measures	Floor Fire resistance class
Hakan Silenta Premium			
$\varnothing 58$ mm	4.1 mm	Fire protection collar Installed on bottom side	EI 90 U/U
$\varnothing 78$ mm	4.6 mm		EI 90 U/U
$\varnothing 90$ mm	4.7 mm		EI 90 U/U
$\varnothing 110$ mm	5.3 mm		EI 90 U/U
Wavin SITECH+			
$\varnothing 32$ mm	2.0 mm	Fire protection collar Installed on bottom side	EI 90 U/U
$\varnothing 40$ mm	2.0 mm		EI 90 U/U
$\varnothing 50$ mm	2.1 mm		EI 90 U/U
$\varnothing 75$ mm	2.6 mm		EI 90 U/U
$\varnothing 90$ mm	3.1 mm		EI 90 U/U
$\varnothing 110$ mm	3.4 mm		EI 90 U/U
$\varnothing 125$ mm	4.0 mm		EI 90 U/U
$\varnothing 160$ mm	5.0 mm		EI 90 U/U
Valsir Triplus			
$\varnothing 32$ mm	1.8 mm	Fire protection collar Installed on bottom side	EI 90 U/U
$\varnothing 40$ mm	1.8 mm		EI 90 U/U
$\varnothing 50$ mm	1.8 mm		EI 90 U/U
$\varnothing 75$ mm	2.5 mm		EI 90 U/U
$\varnothing 90$ mm	3.1 mm		EI 90 U/U
$\varnothing 110$ mm	3.4 mm		EI 90 U/U
$\varnothing 125$ mm	3.9 mm		EI 90 U/U
$\varnothing 160$ mm	4.9 mm		EI 90 U/U

Dimensions in mm

System Flammotect	Annex 121
Mixed penetration seal made of mineral fibre board (2 x 60 mm) with ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (2 x 60 mm) with ablative coating (≥ 1,0 mm dft)

Combustible pipes $\varnothing \leq 50 \text{ mm}$ - $\varnothing \leq 160 \text{ mm}$ with fire protection wrap



Fire resistance classes				
Service	Pipe wall thickness	Measures	Wall Fire resistance class	Floor Fire resistance class
PVC-U, PVC-C				
$\varnothing 50 \text{ mm}$	1.8 – 3.7 mm	Intumescent wrap 100 mm 2 x 1 layer wall, 1 x 1 layer floor	EI 120 U/U	EI 120 U/U
$\varnothing 80 \text{ mm}$	1.9 – 6.0 mm	Intumescent wrap 100 mm 2 x 1 layer wall, 1 x 2 layers floor	EI 120 U/U	EI 120 U/U
$\varnothing 110 \text{ mm}$	2.1 – 8.2 mm	Intumescent wrap 100 mm 2 x 1 layer wall, 1 x 3 layers floor	EI 120 U/U	EI 120 U/U
$\varnothing 160 \text{ mm}$	2.4 – 11.9 mm	Intumescent wrap 100 mm 2 x 1 layer wall, 1 x 4 layers floor	EI 120 U/C	EI 90 U/C
PE 100				
$\varnothing 50 \text{ mm}$	1.8 – 4.8 mm	Intumescent wrap 100 mm 2 x 1 layer wall, 1 x 1 layer floor	EI 120 U/U	EI 120 U/U
$\varnothing 80 \text{ mm}$	2.0 – 7.3 mm	Intumescent wrap 100 mm 2 x 1 layer wall, 1 x 2 layers floor	EI 120 U/U	EI 120 U/U
$\varnothing 110 \text{ mm}$	2.4 – 10.0 mm	Intumescent wrap 100 mm 2 x 1 layer wall, 1 x 3 layers floor	EI 120 U/U	EI 120 U/U
$\varnothing 160 \text{ mm}$	3.0 – 9.5 mm	Intumescent wrap 100 mm 2 x 1 layer wall, 1 x 4 layers floor	EI 120 U/C	EI 90 U/C
PP-H				
$\varnothing 50 \text{ mm}$	1.8 – 4.6 mm	Intumescent wrap 100 mm 2 x 1 layer wall, 1 x 1 layer floor	EI 120 U/U	EI 90 U/U
$\varnothing 80 \text{ mm}$	2.0 – 7.3 mm	Intumescent wrap 100 mm 2 x 1 layer wall, 1 x 2 layers floor	EI 120 U/U	EI 90 U/U
$\varnothing 110 \text{ mm}$	2.4 – 10.0 mm	Intumescent wrap 100 mm 2 x 1 layer wall, 1 x 3 layers floor	EI 120 U/U	EI 90 U/U
$\varnothing 160 \text{ mm}$	3.0 – 9.1 mm	Intumescent wrap 100 mm 2 x 1 layer wall, 1 x 4 layers floor	EI 120 U/C	EI 90 U/C

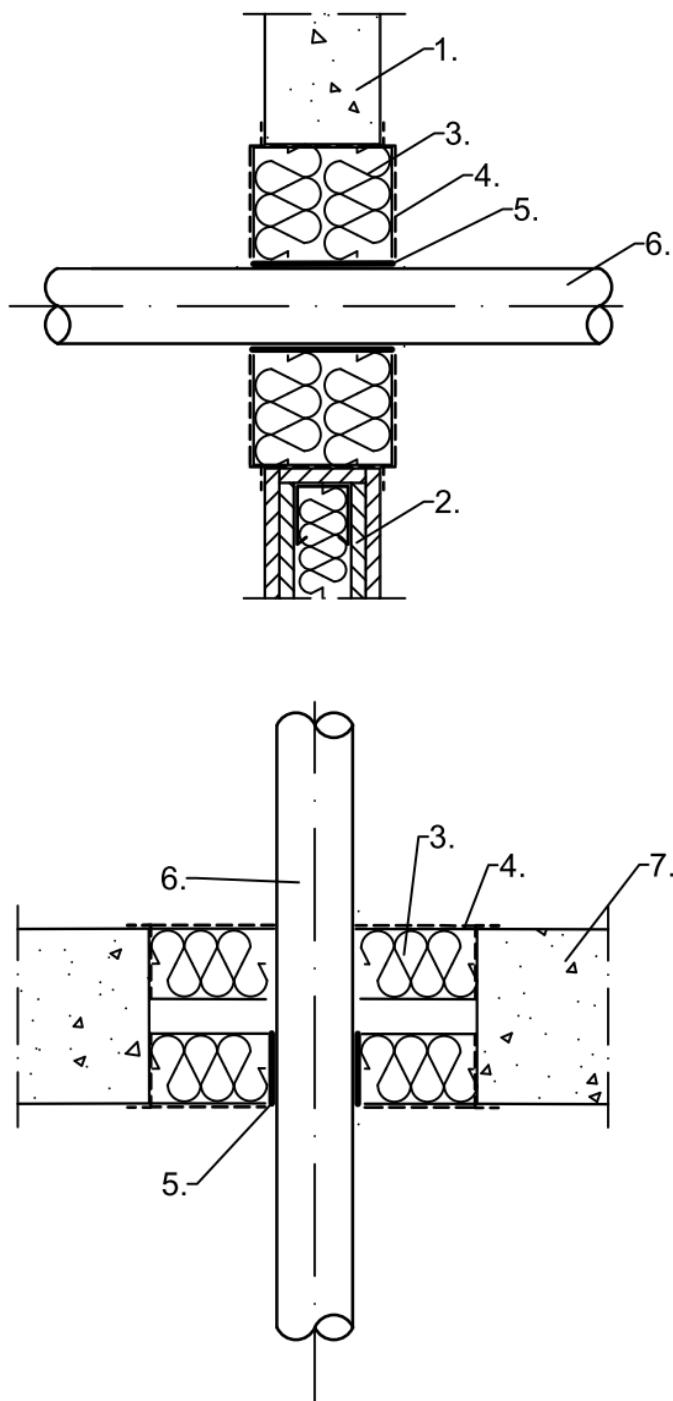
- | | |
|--|--|
| 1. Rigid wall ≥ 100 thickness | 5. Fire protection wrap |
| 2. Flexible wall ≥ 100 mm thickness | 6. Combustible pipe |
| 3. Mineral fibre board | 7. Rigid floor ≥ 150 mm thickness |
| 4. Ablative Coating | |

Dimensions in mm

System Flammotect	Annex 122
Mixed penetration seal made of mineral fibre board (2 x 60 mm) with ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (2 x 60 mm) with ablative coating ($\geq 1,0$ mm dft)

Combustible pipes $\varnothing \leq 50$ mm - $\varnothing \leq 160$ mm with and without PE sound insulation and fire protection wrap



- | | |
|--|--|
| 1. Rigid wall ≥ 100 thickness | 5. Fire protection wrap |
| 2. Flexible wall ≥ 100 mm thickness | 6. Combustible pipe |
| 3. Mineral fibre board | 7. Rigid floor ≥ 150 mm thickness |
| 4. Ablative Coating | |

Dimensions in mm

System Flammotect	Annex 123
Mixed penetration seal made of mineral fibre board (2 x 60 mm) with ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (2 x 60 mm) with ablative coating ($\geq 1,0$ mm dft)**Combustible pipes $\varnothing \leq 50$ mm - $\varnothing \leq 160$ mm with and without PE sound insulation and fire protection wrap**

Fire resistance classes - Wall			
Service	Pipe wall thickness	Measures	Wall Fire resistance class
PVC-U, PVC-C			
$\varnothing 32 - 50$ mm	1.8 – 5.6 mm	Intumescent Wrap 2 x 50 mm 2 layers	EI 120 U/U
$\varnothing 63 - 110$ mm	1.8 – 12.3 mm	Intumescent Wrap 2 x 50 mm 4 layers	EI 120 U/U
PE-HD, ABS, SAN+PVC			
$\varnothing 32 - 50$ mm	1.8 – 4.6 mm	Intumescent Wrap 2 x 50 mm 2 layers	EI 120 U/U
$\varnothing 63 - 110$ mm	1.8 – 10.0 mm	Intumescent Wrap 2 x 50 mm 4 layers	EI 120 U/U
PP			
$\varnothing 32 - 50$ mm	1.8 – 4.6 mm	Intumescent Wrap 2 x 50 mm 2 layers	EI 120 U/U
$\varnothing 63 - 110$ mm	1.8 – 10.0 mm	Intumescent Wrap 2 x 50 mm 4 layers	EI 120 U/U
Geberit Silent PP			
$\varnothing \leq 50$ mm		Intumescent Wrap 2 x 50 mm 2 layers	EI 120 U/U
$\varnothing \leq 110$ mm		Intumescent Wrap 2 x 50 mm 4 layers	EI 120 U/U
Geberit Silent Pro			
$\varnothing \leq 75$ mm		Intumescent Wrap 2 x 50 mm 2 layers	EI 120 U/U
$\varnothing \leq 110$ mm		Intumescent Wrap 2 x 50 mm 4 layers	EI 120 U/U
Kekelit Phon EX AS			
$\varnothing \leq 56$ mm		Intumescent Wrap 2 x 50 mm 2 layers	EI 120 U/U
$\varnothing \leq 110$ mm		Intumescent Wrap 2 x 50 mm 4 layers	EI 120 U/U
Pipelife Master 3			
$\varnothing \leq 50$ mm		Intumescent Wrap 2 x 50 mm 2 layers	EI 120 U/U
$\varnothing \leq 110$ mm		Intumescent Wrap 2 x 50 mm 4 layers	EI 120 U/U

Dimensions in mm

System Flammotect	Annex 124
Mixed penetration seal made of mineral fibre board (2 x 60 mm) with ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (2 x 60 mm) with ablative coating ($\geq 1,0$ mm dft)**Combustible pipes $\varnothing \leq 50$ mm - $\varnothing \leq 160$ mm with and without PE sound insulation and fire protection wrap**

Fire resistance classes - Wall			
Service	Pipe wall thickness	Measures	Wall Fire resistance class
POLO-KAL NG / POLO KAL XS			
$\varnothing \leq 50$ mm		Intumescent Wrap 2 x 50 mm 2 layers	EI 120 U/U
$\varnothing \leq 110$ mm		Intumescent Wrap 2 x 50 mm 4 layers	EI 120 U/U
Rehau Raupiano light			
$\varnothing \leq 50$ mm		Intumescent Wrap 2 x 50 mm 2 layers	EI 120 U/U
$\varnothing \leq 110$ mm		Intumescent Wrap 2 x 50 mm 4 layers	EI 120 U/U
Rehau RAUSILENTO			
$\varnothing \leq 50$ mm		Intumescent Wrap 2 x 50 mm 2 layers	EI 120 U/U
$\varnothing \leq 110$ mm		Intumescent Wrap 2 x 50 mm 4 layers	EI 120 U/U
Conel DRAIN			
$\varnothing \leq 50$ mm		Intumescent Wrap 2 x 50 mm 2 layers	EI 120 U/U
$\varnothing \leq 110$ mm		Intumescent Wrap 2 x 50 mm 4 layers	EI 120 U/U
Geberit Silent dB20			
$\varnothing \leq 56$ mm		Intumescent Wrap 2 x 50 mm 2 layers	EI 120 U/U
$\varnothing \leq 110$ mm		Intumescent Wrap 2 x 50 mm 4 layers	EI 120 U/U
Wavin SiTech+			
$\varnothing \leq 50$ mm		Intumescent Wrap 2 x 50 mm 2 layers	EI 120 U/U
$\varnothing \leq 110$ mm		Intumescent Wrap 2 x 50 mm 4 layers	EI 120 U/U
Rehau Raupiano plus			
$\varnothing \leq 50$ mm		Intumescent Wrap 2 x 50 mm 2 layers	EI 120 U/U
$\varnothing \leq 110$ mm		Intumescent Wrap 2 x 50 mm 4 layers	EI 120 U/U
Silenta Premium			
$\varnothing \leq 58$ mm		Intumescent Wrap 2 x 50 mm 2 layers	EI 120 U/U
$\varnothing \leq 110$ mm		Intumescent Wrap 2 x 50 mm 4 layers	EI 120 U/U

System Flammotect	Annex 125
Mixed penetration seal made of mineral fibre board (2 x 60 mm) with ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (2 x 60 mm) with ablative coating ($\geq 1,0$ mm dft)**Combustible pipes $\varnothing \leq 50$ mm - $\varnothing \leq 160$ mm with and without PE sound insulation and fire protection wrap**

Fire resistance classes - Floor			
Service	Pipe wall thickness	Measures	Floor Fire resistance class
PVC-U, PVC-C			
$\varnothing 32 - 50$ mm	1.8 – 5.6 mm	Intumescent Wrap 1 x 50 mm 2 layers	EI 120 U/U
$\varnothing 63 - 110$ mm	1.8 – 12.3 mm	Intumescent Wrap 1 x 50 mm 4 layers	EI 120 U/U
PE-HD, ABS, SAN+PVC			
$\varnothing 32 - 50$ mm	1.8 – 4.6 mm	Intumescent Wrap 1 x 50 mm 2 layers	EI 120 U/U
$\varnothing 63 - 110$ mm	1.8 – 10.0 mm	Intumescent Wrap 1 x 50 mm 4 layers	EI 120 U/U
PP			
$\varnothing 32 - 50$ mm	1.8 – 4.6 mm	Intumescent Wrap 1 x 50 mm 2 layers	EI 120 U/U
$\varnothing 63 - 110$ mm	1.8 – 10.0 mm	Intumescent Wrap 1 x 50 mm 4 layers	EI 120 U/U
Geberit Silent PP			
$\varnothing \leq 50$ mm		Intumescent Wrap 1 x 50 mm 2 layers	EI 120 U/U
$\varnothing \leq 110$ mm		Intumescent Wrap 1 x 50 mm 4 layers	EI 120 U/U
Geberit Silent Pro			
$\varnothing \leq 75$ mm		Intumescent Wrap 1 x 50 mm 2 layers	EI 120 U/U
$\varnothing \leq 110$ mm		Intumescent Wrap 1 x 50 mm 4 layers	EI 120 U/U
Kekelit Phon EX AS			
$\varnothing \leq 56$ mm		Intumescent Wrap 1 x 50 mm 2 layers	EI 120 U/U
$\varnothing \leq 110$ mm		Intumescent Wrap 1 x 50 mm 4 layers	EI 120 U/U
Pipelife Master 3			
$\varnothing \leq 50$ mm		Intumescent Wrap 1 x 50 mm 2 layers	EI 90 U/U
$\varnothing \leq 110$ mm		Intumescent Wrap 1 x 50 mm 4 layers	EI 120 U/U
POLO-KAL NG / POLO KAL XS			
$\varnothing \leq 50$ mm		Intumescent Wrap 1 x 50 mm 2 layers	EI 120 U/U
$\varnothing \leq 110$ mm		Intumescent Wrap 1 x 50 mm 4 layers	EI 120 U/U

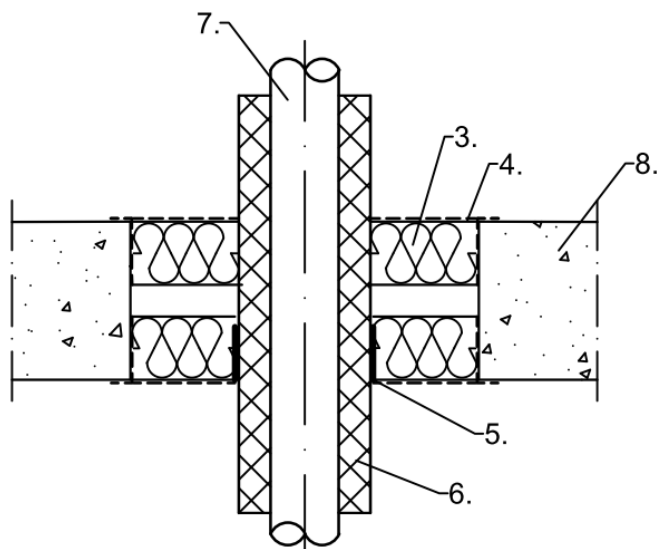
System Flammotect	Annex 126
Mixed penetration seal made of mineral fibre board (2 x 60 mm) with ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (2 x 60 mm) with ablative coating ($\geq 1,0$ mm dft)**Combustible pipes $\varnothing \leq 50$ mm - $\varnothing \leq 160$ mm with and without PE sound insulation and fire protection wrap**

Fire resistance classes - Floor			
Service	Pipe wall thickness	Measures	Floor Fire resistance class
Rehau Raupiano light			
$\varnothing \leq 50$ mm		Intumescent Wrap 1 x 50 mm 2 layers	EI 120 U/U
$\varnothing \leq 110$ mm		Intumescent Wrap 1 x 50 mm 4 layers	EI 120 U/U
Rehau RAUSILENTO			
$\varnothing \leq 50$ mm		Intumescent Wrap 1 x 50 mm 2 layers	EI 120 U/U
$\varnothing \leq 110$ mm		Intumescent Wrap 1 x 50 mm 4 layers	EI 120 U/U
Conel DRAIN			
$\varnothing \leq 50$ mm		Intumescent Wrap 1 x 50 mm 2 layers	EI 120 U/U
$\varnothing \leq 110$ mm		Intumescent Wrap 1 x 50 mm 4 layers	EI 120 U/U
Geberit Silent dB20			
$\varnothing \leq 56$ mm		Intumescent Wrap 1 x 50 mm 2 layers	EI 120 U/U
$\varnothing \leq 110$ mm		Intumescent Wrap 1 x 50 mm 4 layers	EI 120 U/U
Wavin SiTech+			
$\varnothing \leq 50$ mm		Intumescent Wrap 1 x 50 mm 2 layers	EI 120 U/U
$\varnothing \leq 110$ mm		Intumescent Wrap 1 x 50 mm 4 layers	EI 120 U/U
Rehau Raupiano plus			
$\varnothing \leq 110$ mm		Intumescent Wrap 1 x 50 mm 4 layers	EI 120 U/U
Silenta Premium			
$\varnothing \leq 58$ mm		Intumescent Wrap 1 x 50 mm 2 layers	EI 90 U/U
$\varnothing \leq 110$ mm		Intumescent Wrap 1 x 50 mm 4 layers	EI 120 U/U

Dimensions in mm

System Flammotect	Annex 127
Mixed penetration seal made of mineral fibre board (2 x 60 mm) with ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (2 x 60 mm) with ablative coating ($\geq 1,0$ mm dft)**Combustible pipes $\varnothing \leq 32$ mm - $\varnothing \leq 160$ mm with FEF insulation and fire protection wrap**

Fire resistance classes - Floor					
Service	Pipe wall thickness	Insulation Type	Insulation Thickness	Measures	Floor Fire resistance class
Geberit Silent dB20					
$\varnothing 56$ mm	3.2 mm	FEF acc. EN 14304 (B-s3, d0)	17 mm	Intumescent wrap 1 x 50 mm 2 layers	EI 120 U/U
$\varnothing 63$ mm	3.2 mm		18 mm		Intumescent wrap 1 x 50 mm 4 layers
$\varnothing 75$ mm	3.6 mm		18 mm	EI 90 U/U	
$\varnothing 90$ mm	5.5 mm		18 mm	EI 90 U/U	
$\varnothing 110$ mm	6.0 mm		18 mm	EI 90 U/U	
$\varnothing 135$ mm	6.0 mm		18.5 mm	Intumescent wrap 1 x 50 mm 5 layers	
$\varnothing 160$ mm	7.0 mm		19 mm	Intumescent wrap 1 x 50 mm 6 layers	EI 120 U/U
Geberit Silent PP					
$\varnothing 32$ mm	2.0 mm	FEF acc. EN 14304 (B-s3, d0)	17 mm	Intumescent wrap 1 x 50 mm 2 layers	EI 120 U/U
$\varnothing 40$ mm	2.0 mm		17 mm		EI 120 U/U
$\varnothing 50$ mm	2.0 mm		17 mm		EI 120 U/U
$\varnothing 75$ mm	2.6 mm		18 mm	Intumescent wrap 1 x 50 mm 4 layers	EI 120 U/U
$\varnothing 90$ mm	3.1 mm		18 mm		EI 120 U/U
$\varnothing 110$ mm	3.6 mm		18 mm		EI 120 U/U
$\varnothing 125$ mm	4.2 mm		18.5 mm		Intumescent wrap 1 x 50 mm 5 layers

3. Mineral fibre board
4. Ablative Coating

5. Fire protection wrap
6. Combustible pipe
7. Rigid floor ≥ 150 mm thickness

Dimensions in mm

System Flammotect	Annex 128
Mixed penetration seal made of mineral fibre board (2 x 60 mm) with ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (2 x 60 mm) with ablative coating ($\geq 1,0$ mm dft)**Combustible pipes $\varnothing \leq 32$ mm - $\varnothing \leq 160$ mm with FEF insulation and fire protection wrap**

Fire resistance classes - Floor					
Service	Pipe wall thickness	Insulation Type	Insulation Thickness	Measures	Floor Fire resistance class
Geberit Silent Pro					
$\varnothing 50$ mm	3.0 mm	FEF acc. EN 14304 (B-s3, d0)	17 mm	Intumescent wrap 1 x 50 mm 2 layers	EI 120 U/U
$\varnothing 75$ mm	3.8 mm		18 mm		Intumescent wrap 1 x 50 mm 4 layers
$\varnothing 90$ mm	4.3 mm		18 mm	EI 120 U/U	
$\varnothing 110$ mm	4.5 mm		18 mm	EI 120 U/U	
Pipelife Master 3 PLUS					
$\varnothing 32$ mm	1.8 mm	FEF acc. EN 14304 (B-s3, d0)	17 mm	Intumescent wrap 1 x 50 mm 2 layers	EI 120 U/U
$\varnothing 40$ mm	1.8 mm		17 mm		EI 120 U/U
$\varnothing 50$ mm	2.0 mm		17 mm		EI 120 U/U
$\varnothing 75$ mm	2.1 mm		18 mm	Intumescent wrap 1 x 50 mm 4 layers	EI 120 U/U
$\varnothing 90$ mm	2.5 mm		18 mm		EI 120 U/U
$\varnothing 110$ mm	3.0 mm		18 mm		EI 120 U/U
POLO-KAL NG / POLO-KAL XS					
$\varnothing 40$ mm	1.8 mm	FEF acc. EN 14304 (B-s3, d0)	17 mm	Intumescent wrap 1 x 50 mm 2 layers	EI 120 U/U
$\varnothing 50$ mm	2.0 mm		17 mm		EI 120 U/U
$\varnothing 75$ mm	2.6 mm		18 mm	Intumescent wrap 1 x 50 mm 4 layers	EI 120 U/U
$\varnothing 90$ mm	3.0 mm		18 mm		EI 120 U/U
$\varnothing 110$ mm	3.4 mm		18 mm		EI 120 U/U
Rehau Raupiano Plus					
$\varnothing 50$ mm	1.8 mm	FEF acc. EN 14304 (B-s3, d0)	17 mm	Intumescent wrap 1 x 50 mm 2 layers	EI 120 U/U
Rehau Raupiano light					
$\varnothing 50$ mm	1.8 mm	FEF acc. EN 14304 (B-s3, d0)	17 mm	Intumescent wrap 1 x 50 mm 2 layers	EI 120 U/U
$\varnothing 75$ mm	1.9 mm		18 mm		Intumescent wrap 1 x 50 mm 4 layers
$\varnothing 90$ mm	2.2 mm		18 mm	EI 120 U/U	
$\varnothing 110$ mm	2.7 mm		18 mm	EI 120 U/U	
$\varnothing 125$ mm	3.1 mm		18.5 mm	EI 120 U/U	
$\varnothing 160$ mm	3.9 mm		19 mm	Intumescent wrap 1 x 50 mm 6 layers	EI 90 U/U

Dimensions in mm

System Flammotect	Annex 129
Mixed penetration seal made of mineral fibre board (2 x 60 mm) with ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (2 x 60 mm) with ablative coating ($\geq 1,0$ mm dft)**Combustible pipes $\varnothing \leq 32$ mm - $\varnothing \leq 160$ mm with FEF insulation and fire protection wrap**

Fire resistance classes - Floor					
Service	Pipe wall thickness	Insulation Type	Insulation Thickness	Measures	Floor Fire resistance class
Rehau RAUSILENTO					
$\varnothing 50$ mm	1.8 mm	FEF acc. EN 14304 (B-s3, d0)	17 mm	Intumescent wrap 1 x 50 mm 2 layers	EI 120 U/U
$\varnothing 75$ mm	1.9 mm		18 mm		Intumescent wrap 1 x 50 mm 4 layers
$\varnothing 90$ mm	2.2 mm		18 mm	EI 120 U/U	
$\varnothing 110$ mm	2.7 mm		18 mm	EI 120 U/U	
$\varnothing 125$ mm	3.1 mm		18.5 mm	EI 120 U/U	
$\varnothing 160$ mm	3.9 mm		19 mm	Intumescent wrap 1x 50 mm 6 layers	EI 90 U/U
Conel Drain					
$\varnothing 50$ mm	1.8 mm	FEF acc. EN 14304 (B-s3, d0)	17 mm	Intumescent wrap 1 x 50 mm 2 layers	EI 120 U/U
$\varnothing 75$ mm	1.9 mm		18 mm		Intumescent wrap 1 x 50 mm 4 layers
$\varnothing 90$ mm	2.2 mm		18 mm	EI 120 U/U	
$\varnothing 110$ mm	2.7 mm		18 mm	EI 120 U/U	
$\varnothing 125$ mm	3.1 mm		18.5 mm	EI 120 U/U	
$\varnothing 160$ mm	3.9 mm		19 mm	Intumescent wrap 1 x 50 mm 6 layers	EI 90 U/U
Wavin SiTECH					
$\varnothing 50$ mm	1.8 mm	FEF acc. EN 14304 (B-s3, d0)	17 mm	Intumescent wrap 1 x 50 mm 2 layers	EI 120 U/U
$\varnothing 75$ mm	2.3/2.6 mm		18 mm		Intumescent wrap 1 x 50 mm 4 layers
$\varnothing 90$ mm	2.8/3.1 mm		18 mm	EI 120 U/U	
$\varnothing 110$ mm	3.4 mm		18 mm	EI 120 U/U	
Wavin SiTECH+					
$\varnothing 32$ mm	2.0 mm	FEF acc. EN 14304 (B-s3, d0)	17 mm	Intumescent wrap 1 x 50 mm 2 layers	EI 120 U/U
$\varnothing 40$ mm	2.0 mm		17 mm		EI 120 U/U
$\varnothing 50$ mm	2.1 mm		17 mm		EI 120 U/U
$\varnothing 75$ mm	2.6 mm		18 mm	Intumescent wrap 1 x 50 mm 4 layers	EI 120 U/U
$\varnothing 90$ mm	3.1 mm		18 mm		EI 120 U/U
$\varnothing 110$ mm	3.4 mm		18 mm		EI 120 U/U

Dimensions in mm

System Flamotect	Annex 130
Mixed penetration seal made of mineral fibre board (2 x 60 mm) with ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (2 x 60 mm) with ablative coating ($\geq 1,0$ mm dft)**Combustible pipes $\varnothing \leq 32$ mm - $\varnothing \leq 160$ mm with FEF insulation and fire protection wrap**

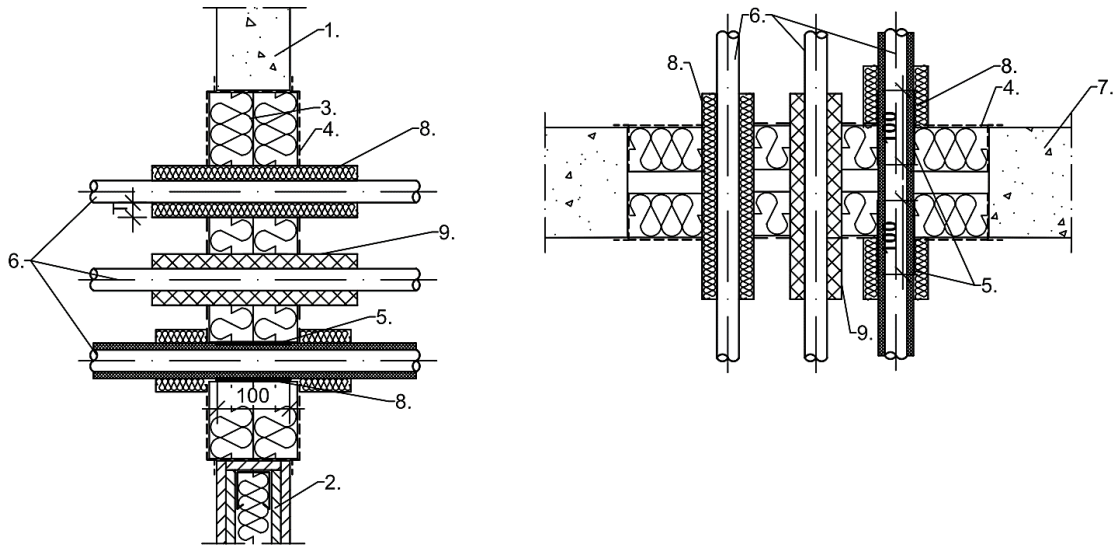
Fire resistance classes - Floor					
Service	Pipe wall thickness	Insulation Type	Insulation Thickness	Measures	Floor Fire resistance class
Wavin AS+					
$\varnothing 50$ mm	3.0 mm	FEF acc. EN 14304 (B-s3, d0)	17 mm	Intumescent wrap 1 x 50 mm 2 layers	EI 120 U/U
$\varnothing 75$ mm	3.5 mm		18 mm	Intumescent wrap 1 x 50 mm 4 layers	EI 120 U/U
$\varnothing 90$ mm	4.6 mm		18 mm		EI 120 U/U
$\varnothing 110$ mm	5.3 mm		18 mm		EI 120 U/U
Hakan Silenta Premium					
$\varnothing 58$ mm	4.1 mm	FEF acc. EN 14304 (B-s3, d0)	17 mm	Intumescent wrap 1 x 50 mm 2 layers	EI 120 U/U
$\varnothing 78$ mm	4.6 mm		18 mm	Intumescent wrap 1 x 50 mm 4 layers	EI 120 U/U
$\varnothing 90$ mm	4.7 mm		18 mm		EI 120 U/U
$\varnothing 110$ mm	5.3 mm		18 mm		EI 120 U/U
$\varnothing 135$ mm	5.3 mm		18.5 mm	Intumescent wrap 1 x 50 mm 5 layers	EI 120 U/U
Ostendorf Skolan dB					
$\varnothing 58$ mm	4.0 mm	FEF acc. EN 14304 (B-s3, d0)	17 mm	Intumescent wrap 1 x 50 mm 2 layers	EI 120 U/U
$\varnothing 135$ mm	5.3 mm		18.5 mm	Intumescent wrap 1 x 50 mm 5 layers	EI 120 U/U

Dimensions in mm

System Flammotect	Annex 131
Mixed penetration seal made of mineral fibre board (2 x 60 mm) with ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (2 x 60 mm) with ablative coating (≥ 1,0 mm dft)

Multi-layer composite pipes, with non-combustible insulation; with FEF-insulation Armaflex Protect; pre-insulated with PEF, intumescent wrap coated and protective insulation lamella mat



Fire resistance classes			
Service	Measures	Wall Fire resistance class	Floor Fire resistance class
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/U	-
Outside pipe-Ø ≤ 32 mm wall thickness ≥ 3 mm	Lamella mat [L X T] ≥ 500 mm x ≥ 20 mm	-	EI 120 U/U
Outside pipe-Ø ≤ 63 mm wall thickness ≥ 4,5 mm	Lamella mat [L X T] ≥ 250 mm x ≥ 30 mm	EI 120 U/U	-
Outside pipe-Ø ≤ 63 mm wall thickness ≥ 4,5 mm	Lamella mat [L X T] ≥ 500 mm x ≥ 30 mm	-	EI 120 U/U
Outside pipe-Ø ≤ 12 mm wall thickness ≥ 1,6 mm	FEF Armaflex Protect [L X T] ≥ 240 mm x ≥ 13 mm	EI 120 U/U	EI 120 U/U
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/U	EI 120 U/U
Multilayer composite pipes HENCO-pipes, pre-insulated with PE-foam			
Outside pipe-Ø ≤ 14 mm insulation thickness 6 mm	Intumescent wrap 100 mm 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 100 mm 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 100 mm 2 x 1 layer, ≥ 25 mm overlapping + lamella mat ≥250 mm x ≥ 20 mm	EI 120 U/U	EI 120 U/U

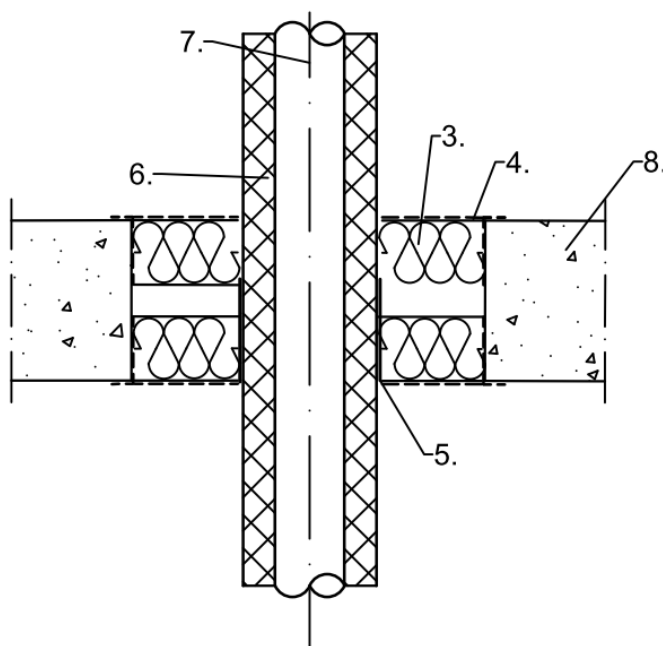
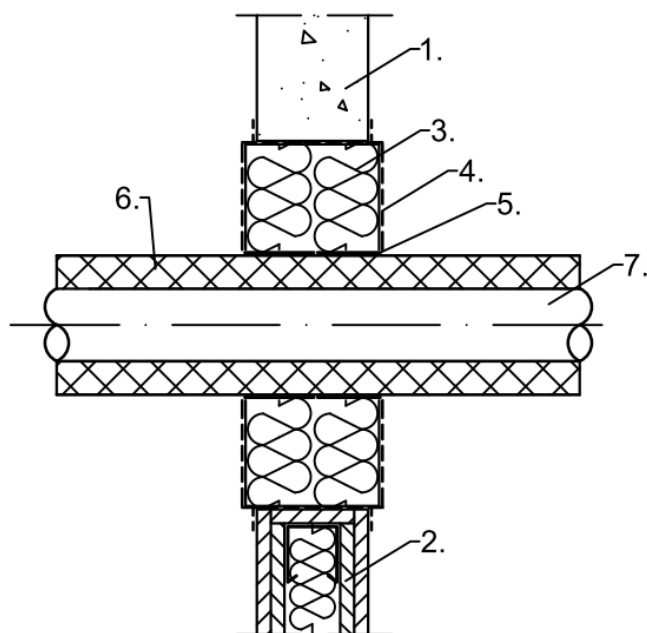
- | | |
|-------------------------------------|-----------------------------------|
| 1. Rigid wall ≥ 100 thickness | 6. Multilayer composite pipe |
| 2. Flexible wall ≥ 100 mm thickness | 7. Rigid floor ≥ 150 mm thickness |
| 3. Mineral fibre board | 8. Lamella mat |
| 4. Ablative Coating | 9. FEF insulation |
| 5. Intumescent wrap | |

Dimensions in mm

System Flammotect	Annex 132
Mixed penetration seal made of mineral fibre board (2 x 60 mm) with ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (2 x 60 mm) with ablative coating ($\geq 1,0$ mm dft)

Multi-layer composite pipes with FEF-insulation and fire protection wrap



- | | |
|--|--|
| 1. Rigid wall ≥ 100 thickness | 5. Intumescent wrap |
| 2. Flexible wall ≥ 100 mm thickness | 6. FEF insulation |
| 3. Mineral fibre board | 7. Multilayer composite pipe |
| 4. Ablative Coating | 8. Rigid floor ≥ 150 mm thickness |

Dimensions in mm

System Flammotect	Annex 133
Mixed penetration seal made of mineral fibre board (2 x 60 mm) with ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (2 x 60 mm) with ablative coating ($\geq 1,0$ mm dft)**Multi-layer composite pipes with FEF-insulation and fire protection wrap**

Fire resistance classes - Wall						
Service	Pipe wall thickness	Insulation Type	Insulation Thickness	Measures	Wall Fire resistance class	
Multi-layer composite pipes Geberit Mepla						
Ø 16 mm	2.25 mm	FEF acc. EN 14304 (B-s3, d0)	8.0 – 32 mm	Intumescent wrap 50 mm 2 x 1-layer	EI 120 U/C	
Ø 20 mm	2.5 mm					EI 120 U/C
Ø 26 mm	3 mm		8.5 – 35 mm			EI 120 U/C
Ø 32 mm	3 mm		9.0 – 35 mm			EI 120 U/C
Ø 40 mm	3.5 mm			Intumescent wrap 50 mm 2 x 2-layer	EI 120 U/C	
Ø 50 mm	4 mm				EI 120 U/C	
Ø 63 mm	4.5 mm		9.0 – 39 mm		EI 120 U/C	
Ø 75 mm	4.7 mm		9.5 mm		EI 90 U/C	
			>9.5 – 40.5 mm		EI 120 U/C	
Multi-layer composite pipes Rehau Rautitan stabil						
Ø 16 mm	2.6 mm	FEF acc. EN 14304 (B-s3, d0)	8.0 – 32 mm	Intumescent wrap 50 mm 2 x 1-layer	EI 120 U/C	
Ø 20 mm	2.9 mm					EI 120 U/C
Ø 25 mm	3.7 mm		8.5 – 35 mm		EI 120 U/C	
Ø 32 mm	4.7 mm			EI 120 U/C		
Ø 40 mm	6.0 mm		9.0 – 35 mm	Intumescent wrap 50 mm 2 x 2-layer	EI 120 U/C	
Multi-layer composite pipes Kekelit Kelox						
Ø 16 mm	2 mm	FEF acc. EN 14304 (B-s3, d0)	8.0 – 32 mm	Intumescent wrap 50 mm 2 x 1-layer	EI 120 U/C	
Ø 18 mm	2 mm					EI 120 U/C
Ø 20 mm	2.25 mm					EI 120 U/C
Ø 25 mm	2.5 mm				8.5 – 35 mm	EI 120 U/C
Ø 32 mm	3 mm			EI 120 U/C		
Ø 40 mm	4 mm		9.0 – 35 mm	Intumescent wrap 50 mm 2 x 2-layer	EI 120 U/C	
Ø 50 mm	4.5 mm				EI 120 U/C	
Ø 63 mm	6 mm		9.0 – 39 mm		EI 120 U/C	
Ø 75 mm	7.5 mm		9.5 – 40.5 mm		EI 120 U/C	
Multi-layer composite pipes HENCO pipes						
Ø 20 mm	2-3 mm	FEF acc. EN 14304 (B-s3, d0)	8.0 – 32 mm	Intumescent wrap 50 mm 2 x 1-layer	EI 120 U/C	
Ø 32 mm	3 mm				EI 120 U/C	

Dimensions in mm

System Flammotect	Annex 134
Mixed penetration seal made of mineral fibre board (2 x 60 mm) with ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (2 x 60 mm) with ablative coating ($\geq 1,0$ mm dft)**Multi-layer composite pipes with FEF-insulation and fire protection wrap**

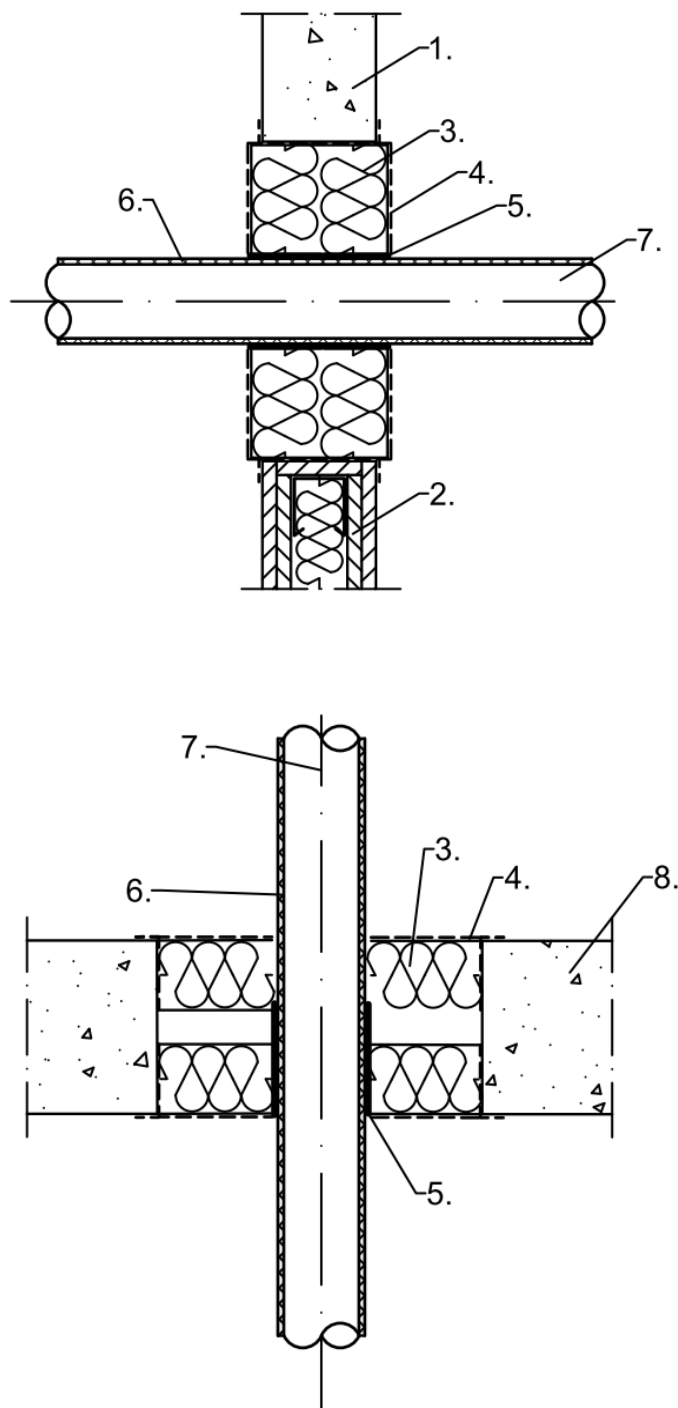
Fire resistance classes - Floor					
Service	Pipe wall thickness	Insulation Type	Insulation Thickness	Measures	Floor Fire resistance class
Multi-layer composite pipes Geberit Mepla					
Ø 16 mm	2.25 mm	FEF acc. EN 14304 (B-s3, d0)	8.0 – 32 mm	Intumescent wrap 50 mm 1 x 1-layer	EI 120 U/C
Ø 20 mm	2.5 mm				EI 120 U/C
Ø 26 mm	3 mm		EI 120 U/C		
Ø 32 mm	3 mm		9.0 – 35 mm	Intumescent wrap 50 mm 1 x 2-layers	EI 120 U/C
Ø 40 mm	3.5 mm				EI 120 U/C
Ø 50 mm	4 mm		9.0 – 39 mm	Intumescent wrap 50 mm 1 x 2-layers	EI 120 U/C
Ø 63 mm	4.5 mm				EI 90 U/C
Ø 75 mm	4.7 mm				EI 120 U/C
Multi-layer composite pipes Rehau Rautitan stabil					
Ø 16 mm	2.6 mm	FEF acc. EN 14304 (B-s3, d0)	8.0 – 32 mm	Intumescent wrap 50 mm 1 x 1-layer	EI 120 U/C
Ø 20 mm	2.9 mm				EI 120 U/C
Ø 25 mm	3.7 mm		8.5 – 35 mm		Intumescent wrap 50 mm 1 x 2-layers
Ø 32 mm	4.7 mm			EI 120 U/C	
Ø 40 mm	6.0 mm		9.0 – 35 mm	EI 120 U/C	
Multi-layer composite pipes Kekelit Kelox					
Ø 16 mm	2 mm	FEF acc. EN 14304 (B-s3, d0)	8.0 – 32 mm	Intumescent wrap 50 mm 1 x 1-layer	EI 120 U/C
Ø 18 mm	2 mm				EI 120 U/C
Ø 20 mm	2.25 mm		8.5 – 35 mm		Intumescent wrap 50 mm 1 x 2-layers
Ø 25 mm	2.5 mm			EI 120 U/C	
Ø 32 mm	3 mm		9.0 – 35 mm	Intumescent wrap 50 mm 1 x 2-layers	EI 120 U/C
Ø 40 mm	4 mm				EI 120 U/C
Ø 50 mm	4.5 mm		9.0 – 39 mm	Intumescent wrap 50 mm 1 x 2-layers	EI 120 U/C
Ø 63 mm	6 mm				EI 120 U/C
Ø 75 mm	7.5 mm				EI 120 U/C

Dimensions in mm

System Flammotect	Annex 135
Mixed penetration seal made of mineral fibre board (2 x 60 mm) with ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (2 x 60 mm) with ablative coating (≥ 1,0 mm dft)

Multi-layer composite pipes with FEF-insulation and fire protection wrap



- | | |
|-------------------------------------|-----------------------------------|
| 1. Rigid wall ≥ 100 thickness | 5. Intumescent wrap |
| 2. Flexible wall ≥ 100 mm thickness | 6. PEF Insulation |
| 3. Mineral fibre board | 7. Multilayer composite pipe |
| 4. Ablative Coating | 8. Rigid floor ≥ 150 mm thickness |

Dimensions in mm

System Flammotect	Annex 136
Mixed penetration seal made of mineral fibre board (2 x 60 mm) with ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (2 x 60 mm) with ablative coating ($\geq 1,0$ mm dft)**Multi-layer composite pipes with PEF-insulation and fire protection wrap**

Fire resistance classes - Wall					
Service	Pipe wall thickness	Insulation Type	Insulation Thickness	Measures	Wall Fire resistance class
Multi-layer composite pipes HENCO pipes					
Ø 20 mm	2.0 – 3.0 mm	PEF	6 – 13 mm	Intumescent wrap 50 mm 2 x 1-layer	EI 120 U/C
Ø 32 mm	3 mm				EI 120 U/C
Multi-layer composite pipes Kekelit Kelox					
Ø 18 mm	2 mm	PEF	4 – 13 mm	Intumescent wrap 50 mm 2 x 1-layer	EI 120 U/C
Ø 20 mm	2.25 mm				EI 120 U/C
Ø 25 mm	2.5 mm				EI 120 U/C
Ø 32 mm	3 mm				EI 120 U/C
Multi-layer composite pipes Geberit Mepla					
Ø 16 mm	2.25 mm	PEF	6 – 13 mm	Intumescent wrap 50 mm 2 x 1-layer	EI 120 U/C
Ø 20 mm	2.5 mm				EI 120 U/C
Ø 26 mm	3 mm				EI 120 U/C
Ø 32 mm	3 mm				EI 120 U/C
Multi-layer composite pipes Rehau Rautitan stabil					
Ø 16 mm	2.6 mm	PEF	4 – 26 mm	Intumescent wrap 50 mm 2 x 1-layer	EI 120 U/C
Ø 20 mm	2.9 mm				EI 120 U/C
Ø 25 mm	3.7 mm				EI 120 U/C
Ø 32 mm	4.7 mm				EI 120 U/C

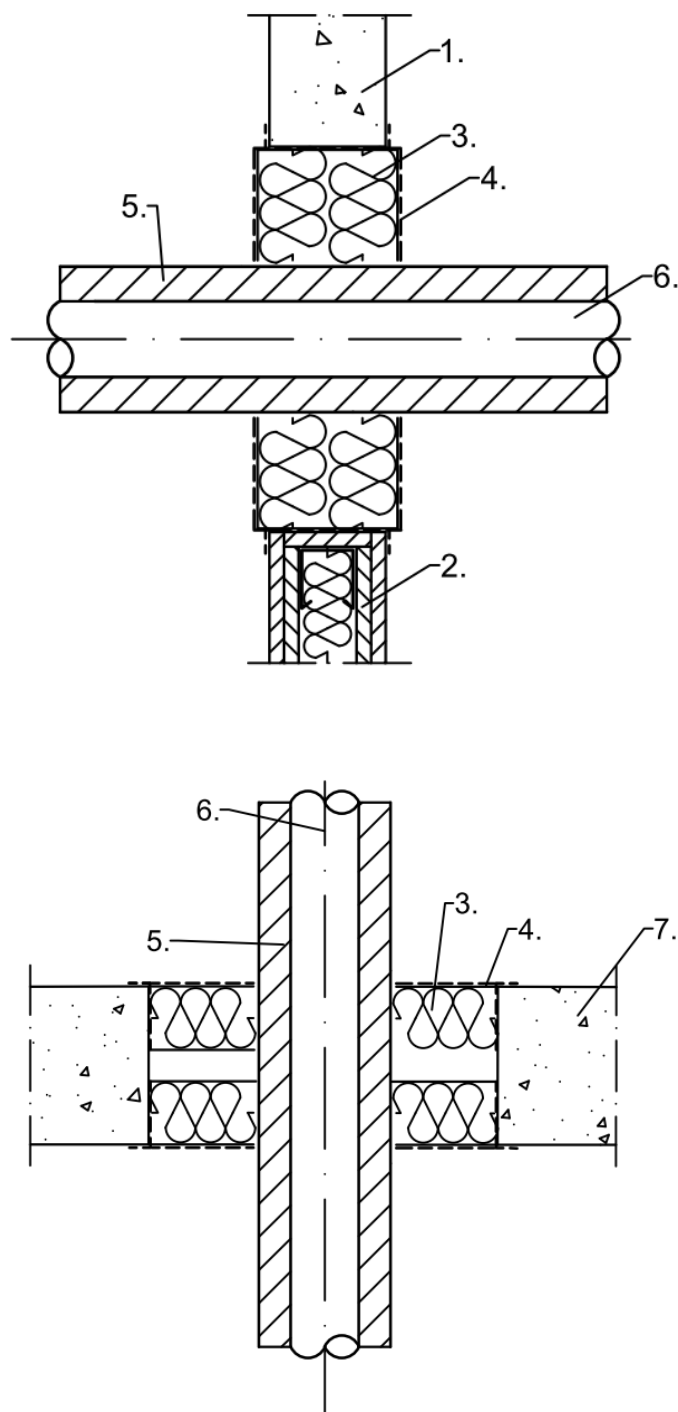
Fire resistance classes - Floor					
Service	Pipe wall thickness	Insulation Type	Insulation Thickness	Measures	Floor Fire resistance class
Multi-layer composite pipes HENCO pipes					
Ø 20 mm	2.0 – 3.0 mm	PEF	6 – 13 mm	Intumescent wrap 50 mm 1x 1-layer	EI 120 U/C
Ø 32 mm	3 mm		13 mm		EI 120 U/C
Multi-layer composite pipes Kekelit Kelox					
Ø 18 mm	2 mm	PEF	4 – 13 mm	Intumescent wrap 50 mm 1 x 1-layer	EI 120 U/C
Ø 20 mm	2.25 mm				EI 120 U/C
Ø 25 mm	2.5 mm				EI 120 U/C
Ø 32 mm	3 mm				EI 120 U/C
Multi-layer composite pipes Geberit Mepla					
Ø 16 mm	2.25 mm	PEF	6 – 13 mm	Intumescent wrap 50 mm 1 x 1-layer	EI 120 U/C
Ø 20 mm	2.5 mm				EI 120 U/C
Ø 26 mm	3 mm				EI 120 U/C
Ø 32 mm	3 mm				EI 120 U/C
Multi-layer composite pipes Rehau Rautitan stabil					
Ø 16 mm	2.6 mm	PEF	4 – 26 mm	Intumescent wrap 50 mm 1 x 1-layer	EI 120 U/C
Ø 20 mm	2.9 mm		26 mm		EI 120 U/C
Ø 25 mm	3.7 mm				EI 120 U/C
Ø 32 mm	4.7 mm		EI 120 U/C		

Dimensions in mm

System Flammotect	Annex 137
Mixed penetration seal made of mineral fibre board (2 x 60 mm) with ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (2 x 60 mm) with ablative coating (≥ 1,0 mm dft)

Multi-layer composite pipes insulated with mineral fibre pipe shells



- | | |
|-------------------------------------|-----------------------------------|
| 1. Rigid wall ≥ 100 thickness | 5. Mineral fibre pipe shell |
| 2. Flexible wall ≥ 100 mm thickness | 6. Multilayer composite pipe |
| 3. Mineral fibre board | 7. Rigid floor ≥ 150 mm thickness |
| 4. Ablative Coating | |

Dimensions in mm

System Flammotect	Annex 138
Mixed penetration seal made of mineral fibre board (2 x 60 mm) with ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (2 x 60 mm) with ablative coating ($\geq 1,0$ mm dft)**Multi-layer composite pipes insulated with mineral fibre pipe shells**

Fire resistance classes - Wall					
Service	Pipe wall thickness	Insulation Type	Insulation Thickness	Measures	Wall Fire resistance class
Multi-layer composite pipes Geberit Mepla					
Ø 16 mm	2.25 mm	Mineral fibre pipe shells acc. EN 14303*	20 – 30 mm	-	EI 120 U/C
Ø 20 mm	2.5 mm		20 – 30 mm		EI 120 U/C
Ø 26 mm	3 mm		20 – 40 mm	-	EI 120 U/C
Ø 32 mm	3 mm		20 – 40 mm		EI 120 U/C
Ø 40 mm	3.5 mm		20 – 50 mm	-	EI 120 U/C
Ø 50 mm	4 mm		20 – 50 mm		EI 120 U/C
Ø 63 mm	4.5 mm		20 – 60 mm	-	EI 120 U/C
Ø 75 mm	4.7 mm		20 – 80 mm		EI 120 U/C

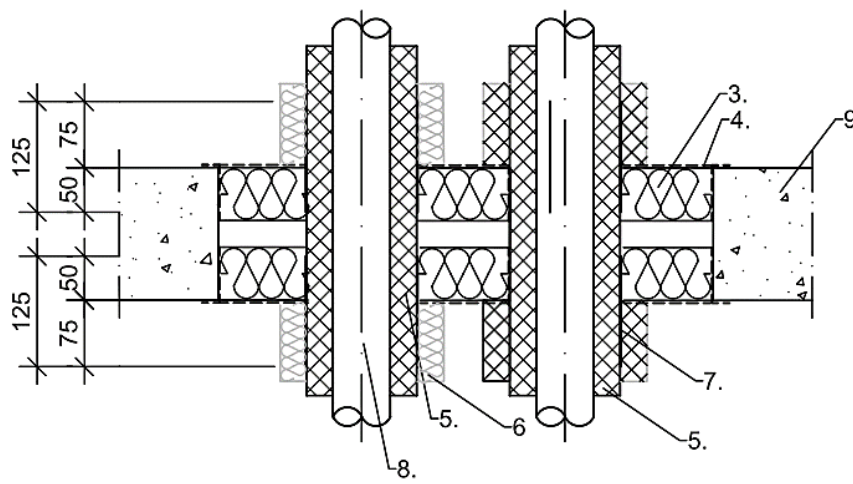
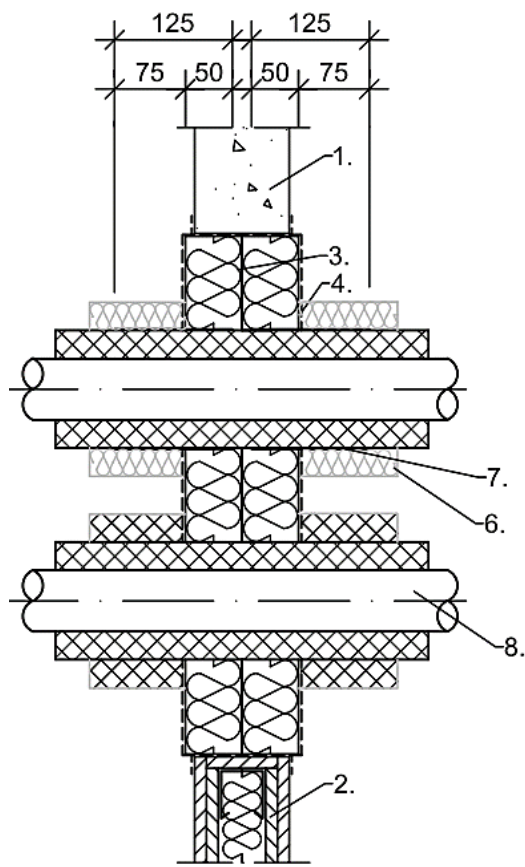
Fire resistance classes - Floor					
Service	Pipe wall thickness	Insulation Type	Insulation Thickness	Measures	Floor Fire resistance class
Multi-layer composite pipes Geberit Mepla					
Ø 16 mm	2.25 mm	Mineral fibre pipe shells acc. EN 14303*	20 – 30 mm	-	EI 120 U/C
Ø 20 mm	2.5 mm		20 – 30 mm		EI 120 U/C
Ø 26 mm	3 mm		20 – 40 mm	-	EI 120 U/C
Ø 32 mm	3 mm		20 – 40 mm		EI 120 U/C
Ø 40 mm	3.5 mm		20 – 50 mm	-	EI 120 U/C
Ø 50 mm	4 mm		20 – 50 mm		EI 120 U/C
Ø 63 mm	4.5 mm		20 – 60 mm	-	EI 120 U/C
Ø 75 mm	4.7 mm		20 – 80 mm		EI 120 U/C

Dimensions in mm

System Flammotect	Annex 139
Mixed penetration seal made of mineral fibre board (2 x 60 mm) with ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (2 x 60 mm) with ablative coating ($\geq 1,0$ mm dft)

Non-combustible pipes with insulation made of FEF, with intumescent wrap and with protective insulation of lamella mat depending on pipe outer- \varnothing



- | | |
|--|--|
| 1. Rigid wall ≥ 100 thickness | 6. Lamella mat |
| 2. Flexible wall ≥ 100 mm thickness | 7. Intumescent wrap |
| 3. Mineral fibre board | 8. Non-combustible pipe |
| 4. Ablative Coating | 9. Rigid floor ≥ 150 mm thickness |
| 5. FEF insulation | |

Dimensions in mm

System Flammotect	Annex 140
Mixed penetration seal made of mineral fibre board (2 x 60 mm) with ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (2 x 60 mm) with ablative coating ($\geq 1,0$ mm dft)**Non-combustible pipes with insulation made of FEF**

Fire resistance classes - Wall					
Service	Outside-Ø	Pipe wall thickness	Insulation thickness	Measures	Wall Fire resistance class
Non-combustible pipes with insulation made of FEF acc. EN 14304					
Copper, steel, stainless steel, cast iron	≤ 15 mm	0,8 - 14,2	10 mm	Intumescent wrap 2 x 62,5 / 1 x 125 mm 1 x 1 layer	EI 120 U/C
	≤ 15 mm		9 – 50 mm	Intumescent wrap 2 x 62,5 / 1 x 125 mm 2 x 1 layer + lamella mat ≥ 250 mm x ≥ 20 mm	EI 120 U/C
	≤ 42 mm		10 mm	Intumescent wrap 2 x 62,5 / 1 x 125 mm 1 x 1 layer	EI 90 U/C
	≤ 42 mm		10 – 50 mm	Intumescent wrap 2 x 62,5 / 1 x 125 mm 2 x 1 layer + lamella mat ≥ 250 mm x ≥ 20 mm	EI 120 U/C
	≤ 42 mm		10 – 50 mm	Intumescent wrap 2 x 62,5 / 1 x 125 mm 2 x 1 layer + Protective insulation FEF ≥ 250 mm x ≥ 2 x 13 mm	EI 120 U/C
	≤ 42 mm		89 mm	Intumescent wrap 2 x 62,5 / 1 x 125 mm 2 x 1 layer + lamella mat ≥ 500 mm x ≥ 40 mm	EI 120 U/C
	$> 15 - \leq 54$ mm		19 - 38 mm	Intumescent wrap 2 x 62,5 / 1 x 125 mm 1 x 2 layers	EI 120 U/C
	≤ 54 mm		29 – 57 mm	Intumescent wrap 2 x 62,5 / 1 x 125 mm 2 x 1 layer + lamella mat ≥ 500 mm x ≥ 40 mm	EI 90 U/C
	$> 54 - \leq 88,9$ mm		25 mm	Intumescent wrap 2 x 62,5 / 1 x 125 mm 1 x 2 layers	EI 120 U/C
	$\leq 88,9$ mm		89 mm	Intumescent wrap 2 x 62,5 / 1 x 125 mm 2 x 1 layer + lamella mat ≥ 500 mm x ≥ 40 mm	EI 120 U/C
	$> 42 - \leq 88,9$ mm		19 - 38 mm	Intumescent wrap 2 x 62,5 / 1 x 125 mm 1 x 2 layers	EI 90 U/C
	$\leq 88,9$ mm		29 – 89 mm	Intumescent wrap 2 x 62,5 / 1 x 125 mm 2 x 1 layer + lamella mat ≥ 500 mm x ≥ 30 mm	EI 90 U/C
	≤ 108 mm		57 mm	Intumescent wrap 2 x 62,5 / 1 x 125 mm 2 x 2 layer + lamella mat ≥ 750 mm x ≥ 40 mm	EI 90 U/C

Dimensions in mm

System Flammotect	Annex 141
Mixed penetration seal made of mineral fibre board (2 x 60 mm) with ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (2 x 60 mm) with ablative coating ($\geq 1,0$ mm dft)**Non-combustible pipes with insulation made of FEF**

Fire resistance classes - Wall					
Service	Outside-Ø	Pipe wall thickness	Insulation thickness	Measures	Wall Fire resistance class
Non-combustible pipes with insulation made of FEF acc. EN 14304					
Steel, stainless steel, cast iron	≤ 15 mm	0,8 - 14,2	10 - 38 mm	Intumescent wrap 2 x 62,5 / 1 x 125 mm 1 x 2 layers	EI 120 U/C
	$> 15 - \leq 88,9$ mm		19 - 38 mm	Intumescent wrap 2x 62,5 / 1x 125 mm 1 x 2 layers	EI 120 U/C
	$> 88,9 - \leq 114,3$ mm		19 - 38 mm	Intumescent wrap 2 x 62,5 / 1 x 125 mm 1 x 2 layers + Protective insulation FEF 250x19	EI 120 U/C
	$> 114,3 - \leq 159$ mm		25 - 38 mm	Intumescent wrap 2 x 62,5 / 1 x 125 mm 1 x 2 layers + Protective insulation FEF 250x19	EI 120 U/C
	≤ 170 mm		50 – 89 mm	Intumescent wrap 2 x 62,5 / 1 x 125 mm 2 x 1 layer + lamella mat ≥ 500 mm x ≥ 60 mm	EI 120 U/C
	$> 159 - \leq 219,1$ mm		25 - 38 mm	Intumescent wrap 2 x 62,5 / 1 x 125 mm 1 x 2 layers + Protective insulation FEF 600x38	EI 120 U/C

Fire resistance classes - Floor					
Service	Outside-Ø	Pipe wall thickness	Insulation Thickness	Measures	Floor Fire resistance class
Non-combustible pipes with insulation made of FEF acc. EN 14304					
Copper, steel, stainless steel, cast iron	≤ 60 mm	0,6 - 14,2	13 - 40 mm	Intumescent wrap 2 x 62,5 / 1 x 125 mm 1 x 2 layers	EI 120 U/C
	$> 60 - \leq 88,9$ mm		25 mm	Intumescent wrap 2 x 62,5 / 1 x 125 mm 1 x 2 layers	EI 120 U/C
	$\leq 88,9$ mm		9 – 32 mm	Intumescent wrap 2 x 62,5 / 1 x 125 mm 2 x 2 layer + lamella mat ≥ 500 mm x ≥ 30 mm	EI 120 U/C
	≤ 10 mm		9 – 19 mm	Intumescent wrap 2 x 62,5 / 1 x 125 mm 2 x 1 layer + lamella mat ≥ 250 mm x ≥ 20 mm	EI 120 U/C
	≤ 15 mm		9 – 25 mm	Intumescent wrap 2 x 62,5 / 1 x 125 mm 2 x 1 layer + lamella mat ≥ 250 mm x ≥ 20 mm	EI 120 U/C
	≤ 15 mm		9 – 19 mm	Intumescent wrap 2 x 62,5 / 1 x 125 mm 2 x 1 layer + Protective insulation FEF ≥ 250 mm x ≥ 2 x 13 mm	EI 120 U/C

Dimensions in mm

System Flammotect	Annex 142
Mixed penetration seal made of mineral fibre board (2 x 60 mm) with ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (2 x 60 mm) with ablative coating ($\geq 1,0$ mm dft)**Non-combustible pipes with insulation made of FEF**

Fire resistance classes - Floor					
Service	Outside-Ø	Pipe wall thickness	Insulation Thickness	Measures	Floor Fire resistance class
Non-combustible pipes with insulation made of FEF acc. EN 14304					
Copper, steel, stainless steel, cast iron	≤ 15 mm	0,6 - 14,2	9 – 25 mm	Intumescent wrap 2 x 62,5 / 1 x 125 mm 2 x 1 layer + lamella mat ≥ 250 mm x ≥ 20 mm	EI 120 U/C
	≤ 15 mm		9 – 19 mm	Intumescent wrap 2 x 62,5 / 1 x 125 mm 2 x 1 layer + Protective insulation FEF ≥ 250 mm x ≥ 2 x 13 mm	EI 120 U/C
	≤ 42 mm		10 – 19 mm	Intumescent wrap 2 x 62,5 / 1 x 125 mm 2 x 1 layer + lamella mat ≥ 250 mm x ≥ 20 mm	EI 120 U/C
	≤ 42 mm		10 – 19 mm	Intumescent wrap 2 x 62,5 / 1 x 125 mm 2 x 1 layer + Protective insulation FEF ≥ 250 mm x ≥ 2 x 13 mm	EI 120 U/C
	≤ 42 mm		10 mm	Intumescent wrap 2 x 62,5 / 1 x 125 mm 1 x 1 layer	EI 90 U/C
	≤ 42 mm		9 - 40 mm	Intumescent wrap 2 x 62,5 / 1 x 125 mm 1 x 2 layers	EI 90 U/C
	$> 42 - \leq 60$ mm		13 - 40 mm	Intumescent wrap 2 x 62,5 / 1 x 125 mm 1 x 2 layers	EI 90 U/C
	$> 60 - \leq 88,9$ mm		19 - 38 mm	Intumescent wrap 2 x 62,5 / 1 x 125 mm 2 layers	EI 90 U/C
	$\leq 88,9$ mm		89 mm	Intumescent wrap 2 x 62,5 / 1 x 125 mm 2 x 1 layer + lamella mat ≥ 250 mm x ≥ 40 mm	EI 90 U/C
	≤ 108 mm		57 mm	Intumescent wrap 2 x 62,5 / 1 x 125 mm 2 x 1 layer + lamella mat ≥ 1000 mm x ≥ 40 mm	EI 90 U/C
Steel, stainless steel, cast iron	≤ 159 mm	25 - 38 mm	Intumescent wrap 2 x 62,5 / 1 x 125 mm 1 x 2 layers + Protective insulation FEF 250x25	EI 90 U/C	
	≤ 170 mm	10 - 32 mm	Intumescent wrap 2 x 62,5 / 1 x 125 mm 2 x 2 layer + lamella mat ≥ 500 mm x ≥ 30 mm	EI 90 U/C	
	≤ 170 mm	50 – 89 mm	Intumescent wrap 2 x 62,5 / 1 x 125 mm 2 x 1 layer + lamella mat ≥ 500 mm x ≥ 60 mm	EI 90 U/C	
	$> 159 - \leq 219,1$ mm	25 - 38 mm	Intumescent wrap 2 x 62,5 / 1 x 125 mm 1 x 2 layers + Protective insulation FEF 250x38	EI 90 U/C	

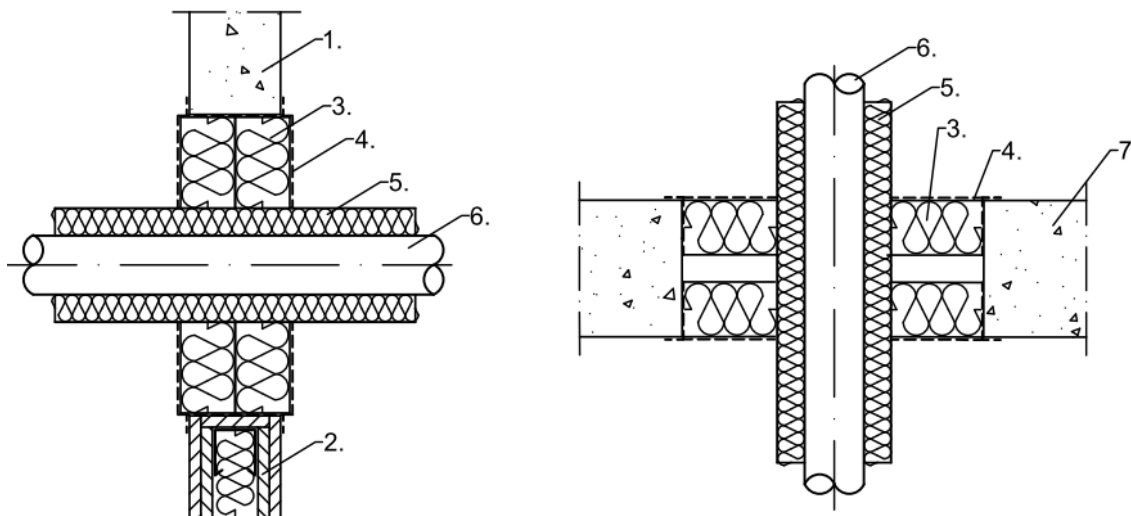
Dimensions in mm

System Flammotect	Annex 143
Mixed penetration seal made of mineral fibre board (2 x 60 mm) with ablative coating in walls and floors	

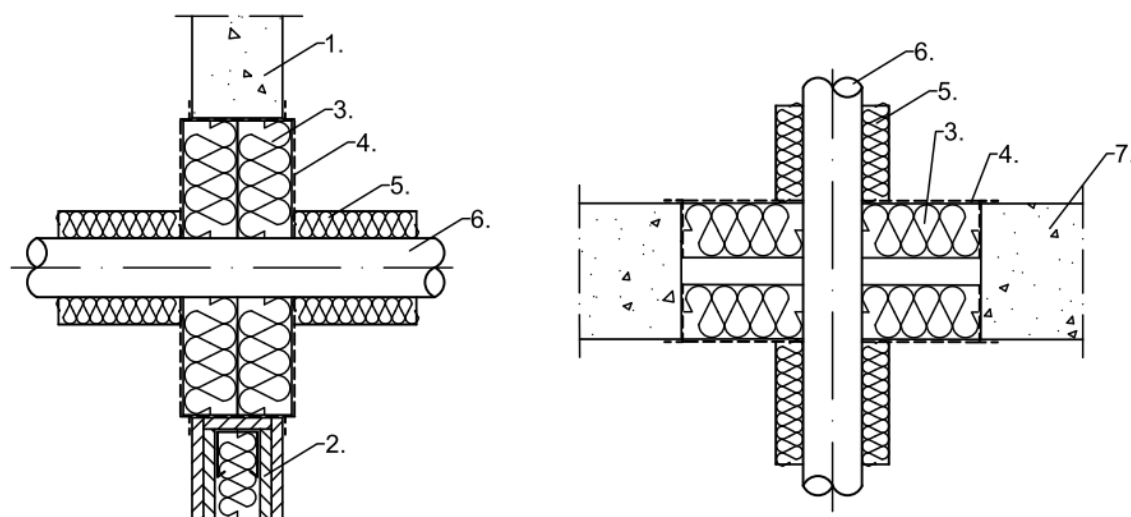
Mixed penetration seal made of mineral fibre board (2 x 60 mm) with ablative coating ($\geq 1,0$ mm dft)

Non-combustible pipes with insulation made of mineral fibre

Variant LS



Variant LI



- | | |
|--|--|
| 1. Rigid wall ≥ 100 thickness | 5. Mineral fibre lamella mat |
| 2. Flexible wall ≥ 100 mm thickness | 6. Non-combustible pipe |
| 3. Mineral fibre board | 7. Rigid floor ≥ 150 mm thickness |
| 4. Ablative Coating | |

Dimensions in mm

System Flammotect	Annex 144
Mixed penetration seal made of mineral fibre board (2 x 60 mm) with ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (2 x 60 mm) with ablative coating ($\geq 1,0$ mm dft)**Non-combustible pipes with insulation made of mineral fibre**

Fire resistance classes - Wall				
Service	Outside-Ø	Pipe wall thickness	Measures	Wall Fire resistance class
Non-combustible pipes with insulation made of mineral fibre				
Copper, steel, stainless steel, cast iron	≤ 15	0,8 - 14,2	Lamella mat Both sides $\geq 250 \times 20$ mm	EI 120 C/U
	≤ 22	0,6 - 14,2	Lamella mat Both sides $\geq 450 \times 20-100$ mm	EI 120 U/C
	$> 22 - \leq 60$		Lamella mat Both sides $\geq 200 \times 30-100$ mm	EI 120 U/C
	$> 60 - \leq 88,9$		Lamella mat Both sides $\geq 450 \times 30-100$ mm	EI 120 U/C
	≤ 108	2,1/2,5 - 14,2	Lamella mat Both sides $\geq 1000 \times 30$ mm + Lamella mat $\geq 500 \times 30$ mm	EI 120 C/U
Steel, stainless steel, cast iron	≤ 42	1,8 - 14,2	Lamella mat Both sides $\geq 200 \times 30-100$ mm	EI 120 U/C
	$> 42 - \leq 114,3$	1,8/3,2 - 14,2	Lamella mat Both sides $\geq 450 \times 30-100$ mm	EI 120 U/C
	$> 114,3 - \leq 159$	3,2/4,0 - 14,2	Lamella mat Both sides $\geq 1200 \times 100$ mm	EI 120 U/C
	$> 114,3 - \leq 170$	2,6/2,9 - 14,2	Lamella mat Both sides $\geq 1000 \times 40$ mm + Lamella mat $\geq 500 \times 60$ mm	EI 120 C/U
			Lamella mat Both sides $\geq 1000 \times 60$ mm + Lamella mat $\geq 500 \times 30$ mm	EI 120 C/U
$> 114,3 - \leq 219,1$	3,2/4,5 - 14,2	Lamella mat Both sides $\geq 1200 \times 30-100$ mm	EI 90 U/C	

Dimensions in mm

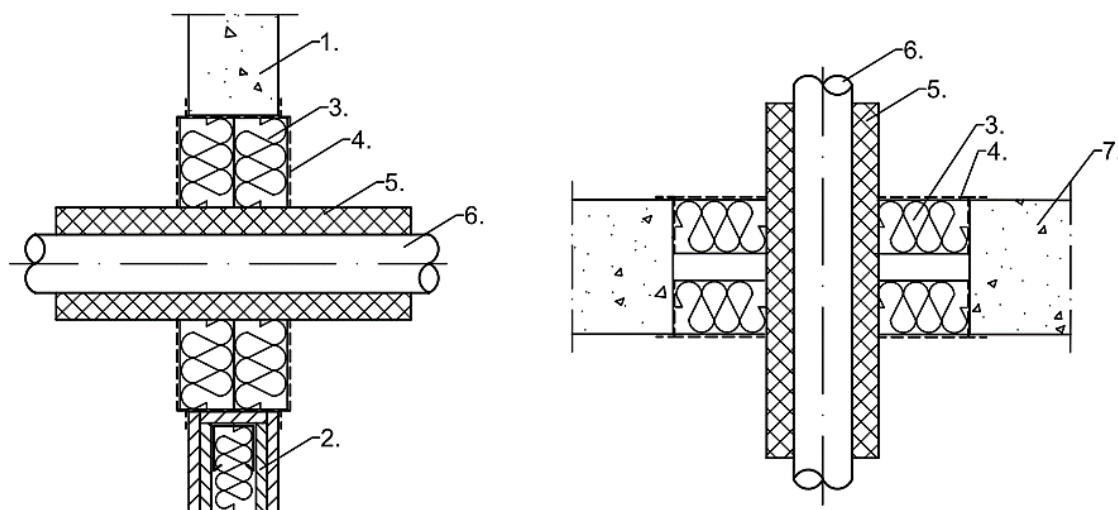
System Flammotect	Annex 145
Mixed penetration seal made of mineral fibre board (2 x 60 mm) with ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (2 x 60 mm) with ablative coating ($\geq 1,0$ mm dft)**Non-combustible pipes with insulation made of mineral fibre**

Fire resistance classes - Floor				
Service	Outside-Ø	Pipe wall thickness	Measures	Floor Fire resistance class
Non-combustible pipes with insulation made of mineral fibre				
Copper, steel, stainless steel, cast iron	≤ 22	0,6 - 14,2	Lamella mat Both sides $\geq 425 \times 20-100$ mm	EI 120 U/C
			Lamella mat Both sides $\geq 175 \times 30-100$ mm	EI 120 U/C
			Lamella mat Both sides $\geq 425 \times 30-100$ mm	EI 120 U/C
	$> 22 - \leq 42$		Lamella mat Both sides $\geq 425 \times 30-100$ mm	EI 120 U/C
	$> 42 - \leq 54$	1,3/1,5 - 14,2	Lamella mat Both sides $\geq 750 \times 30$ mm + Lamella mat $\geq 500 \times 30$ mm	EI 120 C/U
	$> 42 - \leq 88,9$	0,6 - 14,2	Lamella mat Both sides $\geq 675 \times 30-100$ mm	EI 90 U/C
	$> 54 - \leq 108$	1,6/2,5 - 14,2	Lamella mat Both sides $\geq 1000 \times 30$ mm + Lamella mat $\geq 500 \times 30$ mm	EI 120 C/U
Steel, stainless steel, cast iron	≤ 42	1,8 - 14,2	Lamella mat Both sides $\geq 125 \times 30-100$ mm	EI 120 U/C
	$> 42 - \leq 114,3$	1,8/3,2 - 14,2	Lamella mat Both sides $\geq 425 \times 30-100$ mm	EI 120 U/C
	$> 114,3 - \leq 159$	3,2/4,0 - 14,2	Lamella mat Both sides $\geq 1175 \times 30-100$ mm	EI 120 U/C
	$> 159 - \leq 170$	2,9 - 14,2	Lamella mat Both sides $\geq 1000 \times 40$ mm + Lamella mat $\geq 500 \times 60$ mm	EI 120 C/U
	$> 114,3 - \leq 219,1$	3,2/4,5 - 14,2	Lamella mat Both sides $\geq 1175 \times 30$ mm	EI 120 U/C
			Lamella mat Both sides $\geq 1175 \times 30-100$ mm	EI 90 U/C
	$> 170 - \leq 323,9$	2,9/7,5 - 14,2	Lamella mat Both sides $\geq 1250 \times 60$ mm + Lamella mat $\geq 1000 \times 60$ mm	EI 120 C/U

Dimensions in mm

System Flammotect	Annex 146
Mixed penetration seal made of mineral fibre board (2 x 60 mm) with ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (2 x 60 mm) with ablative coating ($\geq 1,0$ mm dft)**Non-combustible pipes with insulation made of ArmaFlex Protect**

Fire resistance classes			
Service	Measures Insulation [L X T]	Wall Fire resistance class	Floor Fire resistance class
Non-combustible pipes made of copper, steel, stainless steel or cast iron with combustible insulation Armaflex Protect			
Pipe outer- $\varnothing \leq 8$ mm	≥ 1000 mm x 16 mm	-	EI 120 C/U
Pipe outer- $\varnothing \leq 10$ mm	≥ 1000 mm x 16 mm	EI 120 C/U	-
Pipe outer- $\varnothing \leq 15$ mm	≥ 1000 mm x 19 mm	EI 90 / E 120 C/U	EI 120 C/U
Pipe outer- $\varnothing \leq 22$ mm	≥ 1000 mm x 20 mm	EI120	EI 120 C/U
Pipe outer- $\varnothing \leq 28$ mm	≥ 1000 mm x 25 mm	EI 60/ E 120 C/U	EI 120 C/U
Pipe outer- $\varnothing \leq 35$ mm	≥ 1000 mm x 25 mm	EI 90 / E 120 C/U	EI 90 / E 120 C/U
Pipe outer- $\varnothing \leq 54$ mm	≥ 1000 mm x 25 mm	EI 90 / E 120 C/U	EI 90 / E 120 C/U
Pipe outer- $\varnothing \leq 88,9$ 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- $\varnothing \leq 170$ 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 thickness
2. Flexible wall ≥ 100 mm thickness
3. Mineral fibre board
4. Ablative Coating

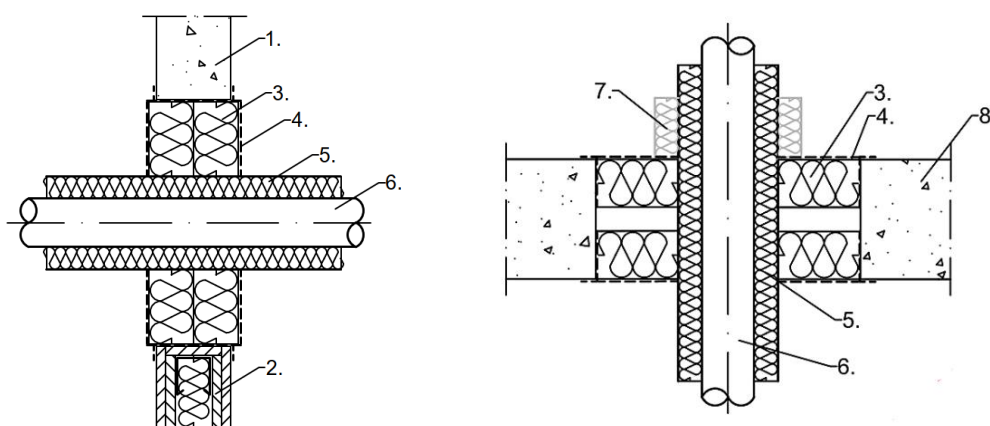
5. FEF-insulation
6. Non-combustible pipe
7. Rigid floor ≥ 150 mm thickness

Dimensions in mm

System Flammotect	Annex 147
Mixed penetration seal made of mineral fibre board (2 x 60 mm) with ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (2 x 60 mm) with ablative coating (≥ 1,0 mm dft)

Non-combustible pipes with insulation made of mineral fibre pipe shells



Fire resistance classes - Wall				
Service	Outside-Ø	Pipe wall thickness	Measures	Wall Fire resistance class
Non-combustible pipes with insulation made of mineral fibre pipe shells				
Copper, steel, stainless steel, cast iron	≤ 15	0.8 – 14.2	Mineral fibre pipe shell CS x 20-30 mm	EI 120 C/U
	≤ 28	1.0 – 14.2		EI 120 C/U
	≤ 42	1.2 – 14.2		EI 120 C/U
	≤ 54	1.5 – 14.2		EI 120 C/U
	≤ 88.9	2.0 – 14.2		
	≤ 108	2.5 – 14.2	Mineral fibre pipe shell CS x 30-40 mm	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				
Steel, stainless steel, cast iron	≤ 170		Mineral fibre pipe shell CS x 40 mm	EI 60 / E 120 C/U

Fire resistance classes - Floor				
Service	Outside-Ø	Pipe wall thickness	Measures	Floor Fire resistance class
Non-combustible pipes with insulation made of mineral fibre pipe shells				
Copper, steel, stainless steel, cast iron	≤ 15	0.8 – 14.2	Mineral fibre pipe shell CS x 20-40 mm	EI 120 C/U
	≤ 28	1.0 – 14.2		EI 120 C/U
	≤ 42	1.2 – 14.2		EI 120 C/U
	≤ 54	1.5 – 14.2		EI 120 C/U
	≤ 88.9	2.0 – 14.2		
	≤ 108	2.5 – 14.2	Mineral fibre pipe shell CS x 30-40 mm	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				
Steel, stainless steel, cast iron	≤ 170		Mineral fibre pipe shell CS x 40 mm + lamella mat > 500 mm x ≥ 30 mm	EI 120 C/U

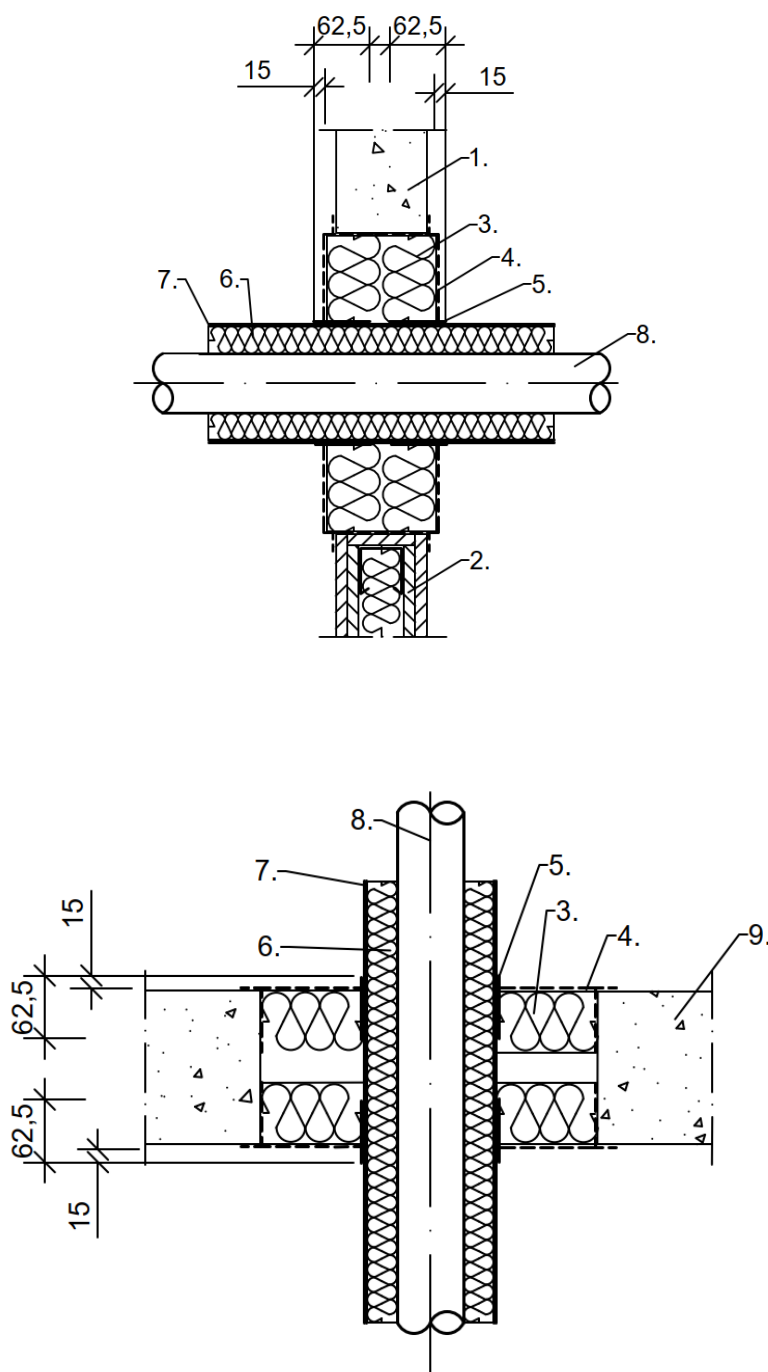
- | | |
|-------------------------------------|-----------------------------------|
| 1. Rigid wall ≥ 100 thickness | 5. Mineral fibre pipe shells |
| 2. Flexible wall ≥ 100 mm thickness | 6. Non-combustible pipe |
| 3. Mineral fibre board | 7. Lamella mat |
| 4. Ablative Coating | 8. Rigid floor ≥ 150 mm thickness |

Dimensions in mm

System Flammotect	Annex 148
Mixed penetration seal made of mineral fibre board (2 x 60 mm) with ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (2 x 60 mm) with ablative coating ($\geq 1,0$ mm dft)

Non-combustible pipes with insulation made of PIR



- | | |
|---|---|
| <ul style="list-style-type: none"> 1. Rigid wall ≥ 100 thickness 2. Flexible wall ≥ 100 mm thickness 3. Mineral fibre board 4. Ablative Coating | <ul style="list-style-type: none"> 5. Intumescent wrap 6. PIR Insulation 7. PVC protective shell 8. Non-combustible pipe 9. Rigid floor ≥ 150 mm thickness |
|---|---|

Dimensions in mm

System Flammotect	Annex 149
Mixed penetration seal made of mineral fibre board (2 x 60 mm) with ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (2 x 60 mm) with ablative coating ($\geq 1,0$ mm dft)**Non-combustible pipes with insulation made of PIR**

Fire resistance classes - Wall					
Service	Outside-Ø	Pipe wall thickness	Insulation	Measures	Wall Fire resistance class
Non-combustible pipes with insulation made of PIR (swisspor AG, acc. DoP No. LE-013.1.0-HT-15.2, density 32 kg/m³)					
Copper, steel, stainless steel, cast iron	≤ 28	1.0 – 14.2	PIR-ALU-PVC CS x 20 mm	Intumescent wrap 2 x 62,5 mm 2 layers	EI 90 C/U
			PIR-ALU-PVC CS x 50 mm	Intumescent wrap 2 x 62,5 mm 3 layers	EI 120 C/U
	≤ 42	1.2 – 14.2	PIR-ALU-PVC CS x 20 mm	Intumescent wrap 2 x 62,5 mm 2 layers	EI 90 C/U
			PIR-ALU-PVC CS x 60 mm	Intumescent wrap 2 x 62,5 mm 3 layers	EI 120 C/U
	≤ 54	1.5 – 14.2	PIR-ALU CS x 20 mm	Intumescent wrap 2 x 62,5 mm 2 layers	EI 90 C/U
			PIR-ALU CS x 80 mm	Intumescent wrap 2x 62,5 mm 4 layers	EI 120 C/U
			PIR-ALU-PVC CS x 20 mm	Intumescent wrap 2 x 62,5 mm 2 layers	EI 90 C/U
			PIR-ALU-PVC CS x 80 mm	Intumescent wrap 2 x 62,5 mm 4 layers	EI 60 C/U
	≤ 88.9	2.0 – 14.2	PIR-ALU-PVC CS x 40 mm	Intumescent wrap 2 x 62,5 mm 2 layers	EI 90 C/U
			PIR-ALU-PVC CS x 100 mm	Intumescent wrap 2 x 62,5 mm 4 layers	EI 120 C/U
Steel, stainless steel, cast iron	≤ 88.9	2.9 – 14.2	PIR-ALU-PVC CS x 20 mm	Intumescent wrap 2 x 62,5 mm 2 layers	EI 90 C/U
			PIR-ALU-PVC CS x 100 mm	Intumescent wrap 2x 62,5 mm 4 layers	EI 120 C/U
	≤ 133.0	3.6 – 14.2	PIR-ALU-PVC CS x 30 mm	Intumescent wrap 2 x 62,5 mm 2 layers	EI 60 C/U
			PIR-ALU-PVC CS x 40 mm	Intumescent wrap 2 x 62,5 mm 2 layers	EI 60 C/U
			PIR-ALU-PVC CS x 100 mm	Intumescent wrap 2 x 62,5 mm 4 layers	EI 90 C/U
	≤ 219.1	4.5 – 14.2	PIR-ALU-PVC CS x 40 mm	Intumescent wrap 2 x 62,5 mm 2 layers	EI 90 C/U
			PIR-ALU-PVC CS x 60 mm	Intumescent wrap 2 x 62,5 mm 4 layers	EI 120 C/U
			PIR-ALU-PVC CS x 100 mm	Intumescent wrap 2 x 62,5 mm 4 layers	EI 120 C/U

Dimensions in mm

System Flammotect	Annex 150
Mixed penetration seal made of mineral fibre board (2 x 60 mm) with ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (2 x 60 mm) with ablative coating ($\geq 1,0$ mm dft)**Non-combustible pipes with insulation made of PIR**

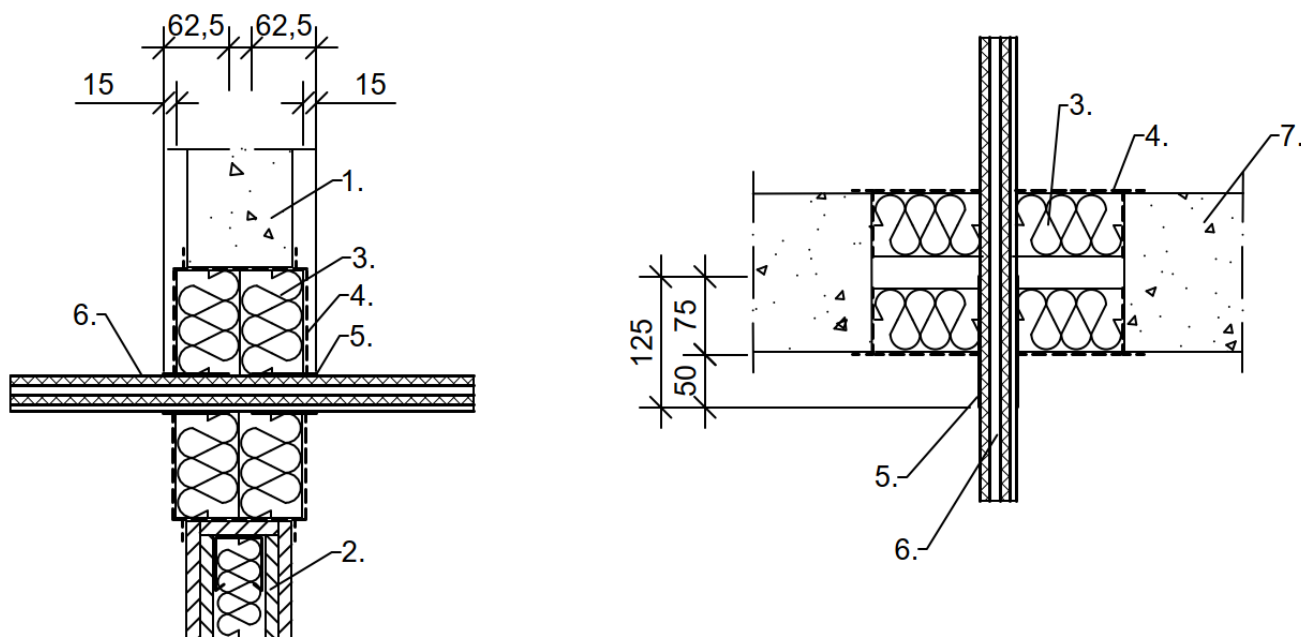
Fire resistance classes - Floor						
Service	Outside-Ø	Pipe wall thickness	Insulation	Measures	Floor Fire resistance class	
Non-combustible pipes with insulation made of PIR (swisspor AG, acc. DoP No. LE-013.1.0-HT-15.2, density 32 kg/m³)						
Copper, steel, stainless steel, cast iron	≤ 28	1.0 – 14.2	PIR-ALU-PVC CS x 30 mm	Intumescent wrap 2 x 62,5 mm 2 layers	EI 120 C/U	
			PIR-ALU-PVC CS x 50 mm	Intumescent wrap 2 x 62,5 mm 3 layers	EI 120 C/U	
	≤ 42	1.2 – 14.2	PIR-ALU-PVC CS x 30 mm	Intumescent wrap 2 x 62,5 mm 2 layers	EI 120 C/U	
			PIR-ALU-PVC CS x 60 mm	Intumescent wrap 2 x 62,5 mm 3 layers	EI 120 C/U	
	≤ 54	1.5 – 14.2	PIR-ALU-PVC CS x 30 mm	Intumescent wrap 2 x 62,5 mm 2 layers	EI 120 C/U	
			PIR-ALU-PVC CS x 80 mm	Intumescent wrap 2 x 62,5 mm 4 layers	EI 120 C/U	
	≤ 88.9	2.0 – 14.2	PIR-ALU-PVC CS x 40 mm	Intumescent wrap 2 x 62,5 mm 2 layers	EI 120 C/U	
			PIR-ALU-PVC CS x 50 mm	Intumescent wrap 2 x 62,5 mm 3 layers	EI 120 C/U	
			PIR-ALU-PVC CS x 100 mm	Intumescent wrap 2 x 62,5 mm 4 layers	EI 90 C/U	
	Steel, stainless steel, cast iron	≤ 88.9	2.9 – 14.2	PIR-ALU-PVC CS x 30 mm	Intumescent wrap 2 x 62,5 mm 2 layers	EI 90 C/U
				PIR-ALU-PVC CS x 100 mm	Intumescent wrap 2 x 62,5 mm 4 layers	EI 120 C/U
		≤ 133.0	3.6 – 14.2	PIR-ALU-PVC CS x 40 mm	Intumescent wrap 2 x 62,5 mm 2 layers	EI 90 C/U
PIR-ALU-PVC CS x 100 mm				Intumescent wrap 2 x 62,5 mm 4 layers	EI 120 C/U	
≤ 219.1		4.5 – 14.2	PIR-ALU-PVC CS x 40 mm	Intumescent wrap 2 x 62,5 mm 2 layers	EI 90 C/U	
			PIR-ALU-PVC CS x 60 mm	Intumescent wrap 2 x 62,5 mm 3 layers	EI 120 C/U	
			PIR-ALU-PVC CS x 100 mm	Intumescent wrap 2 x 62,5 mm 4 layers	EI 120 C/U	

Dimensions in mm

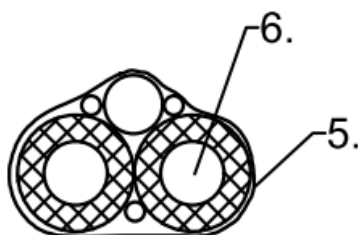
System Flammotect	Annex 151
Mixed penetration seal made of mineral fibre board (2 x 60 mm) with ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (2 x 60 mm) with ablative coating (≥ 1,0 mm dft)

HVAC split line combination with intumescent wrap



Detail view:



Fire resistance classes			
Service	Measures	Wall Fire resistance class	Floor Fire resistance class
HVAC split line combinations			
Copper pipe ≤ 2x Ø ≤ 18 + PE-Foam 9 mm + 1x PVC-U/PVC-C pipe Ø ≤ 25x 1,5 mm + ≤ 3x cables Ø ≤ 14 mm	Intumescent wrap 2 x 62,5 / 1 x 125 mm 2 layers	EI 120	EI 120

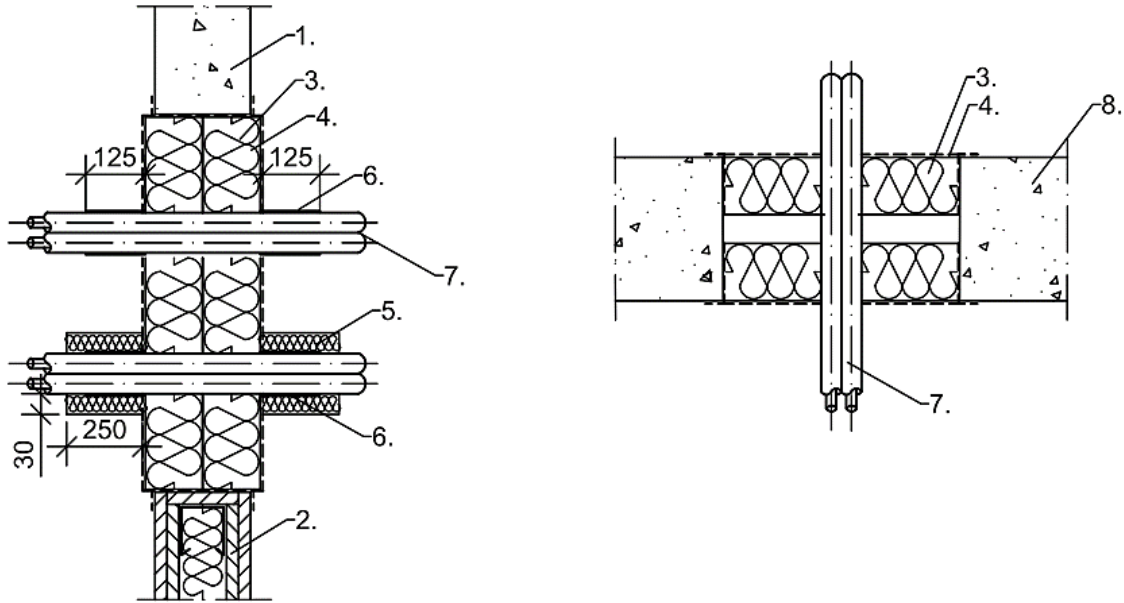
- | | |
|-------------------------------------|-----------------------------------|
| 1. Rigid wall ≥ 100 thickness | 5. Intumescent wrap |
| 2. Flexible wall ≥ 100 mm thickness | 6. HVCA split line combinations |
| 3. Mineral fibre board | 7. Rigid floor ≥ 150 mm thickness |
| 4. Ablative Coating | |

Dimensions in mm

System Flammotect	Annex 152
Mixed penetration seal made of mineral fibre board (2 x 60 mm) with ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (2 x 60 mm) with ablative coating (≥ 1,0 mm dft)

Double solar pipes NanoSUN with intumescent wrap (wall)



Fire resistance classes			
Service	Measures	Wall Fire resistance class	Floor Fire resistance class
NanoSUN² - double solar pipes			
DN 25	Intumescent wrap 2 x 62,5 / 1 x 125 mm 2 x 1 layer	EI 120 C/U	-
	-	-	EI 120 C/U
DN 40	Intumescent wrap 2 x 62,5 / 1 x 125 mm 2 x 1 layer + 25 mm overlapping	EI 60 / E 120 U/U	-
	Intumescent wrap 2 x 62,5 / 1 x 125 mm 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 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

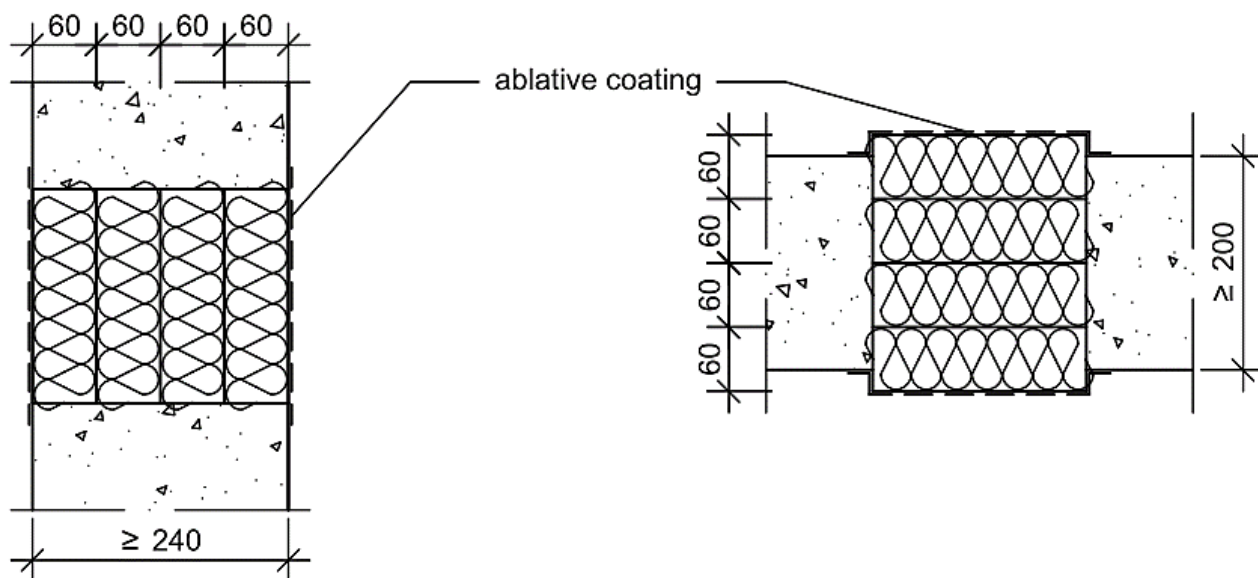
System Flammotect	Annex 153
Mixed penetration seal made of mineral fibre board (2 x 60 mm) with ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (2 x 60 mm) with ablative coating (≥ 1,0 mm dft)

Minimum Distances in wall and floor																			
	Cables	Cable bundles	Cable trays	Wave guides / coaxial cables	speedpipes	EIC, single/bundle made of plastic		EIC made of steel	Combustible pipes			Non-combustible pipes with FEF insulation	Non-combustible pipes with mineral wool insulation	Multilayer pipes	HVAC split line combinations	Cable Tube	Seal Edge		
						With Wrap	With Collar		With Collar	With Endless Collar	With Wrap						Upper	Lower	Side
Cables	≥ 0	≥ 0	≥ 0	≥ 100	≥ 25	≥ 75	≥ 100	≥ 75	≥ 20	≥ 100	≥ 100	≥ 50	≥ 50	≥ 100	≥ 100	≥ 100	≥ 0		
Cable bundles	≥ 0	≥ 0	≥ 0	≥ 100	≥ 25	≥ 75	≥ 100	≥ 75	≥ 20	≥ 100	≥ 100	≥ 50	≥ 50	≥ 100	≥ 100	≥ 100	≥ 0		
Cable trays	≥ 0	≥ 0	≥ 0 / ≥ 100 (next/ above)	≥ 100	≥ 25	≥ 75	≥ 100	≥ 75	≥ 20	≥ 100	≥ 100	≥ 50	≥ 50	≥ 100	≥ 100	≥ 100	≥ 0		
Wave guides / coaxial cables	≥ 100	≥ 100	≥ 100	≥ 50	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 25		
speed pipes	≥ 25	≥ 25	≥ 25	≥ 100	≥ 0	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 25		
EIC, single/bundle made of plastic	With Wrap	≥ 75	≥ 75	≥ 75	≥ 100	≥ 100	≥ 0	≥ 100	≥ 100	≥ 100	≥ 75	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 25		
	With Collar	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 0	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 25		
EIC made of steel	≥ 75	≥ 75	≥ 75	≥ 100	≥ 100	≥ 100	≥ 100	≥ 0	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 75	≥ 0		
Combustible pipes	With Collar	≥ 20	≥ 20	≥ 20	≥ 100	≥ 100	≥ 100	≥ 100	≥ 50	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 25		
	With Endless Collar	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 75	≥ 100	≥ 100	≥ 50	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 25		
	With Wrap	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 25		
Non-combustible pipes with FEF insulation	≥ 0	≥ 0	≥ 0	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 0	≥ 0	≥ 100	≥ 100	≥ 100	≥ 25		
Non-combustible pipes with mineral wool insulation	≥ 0	≥ 0	≥ 0	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 0	≥ 0	≥ 100	≥ 100	≥ 100	≥ 25		
Multilayer pipes	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 0	≥ 0	≥ 100	≥ 100	≥ 100	≥ 25		
HVAC split line combinations	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 0	≥ 0	≥ 100	≥ 50	≥ 100	≥ 25		
Cable Tube	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 75	≥ 50	≥ 50	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 10		

Mixed penetration seal made of mineral fibre board (4 x 60 mm) with ablative coating (≥ 2,0 mm dft)

Wall



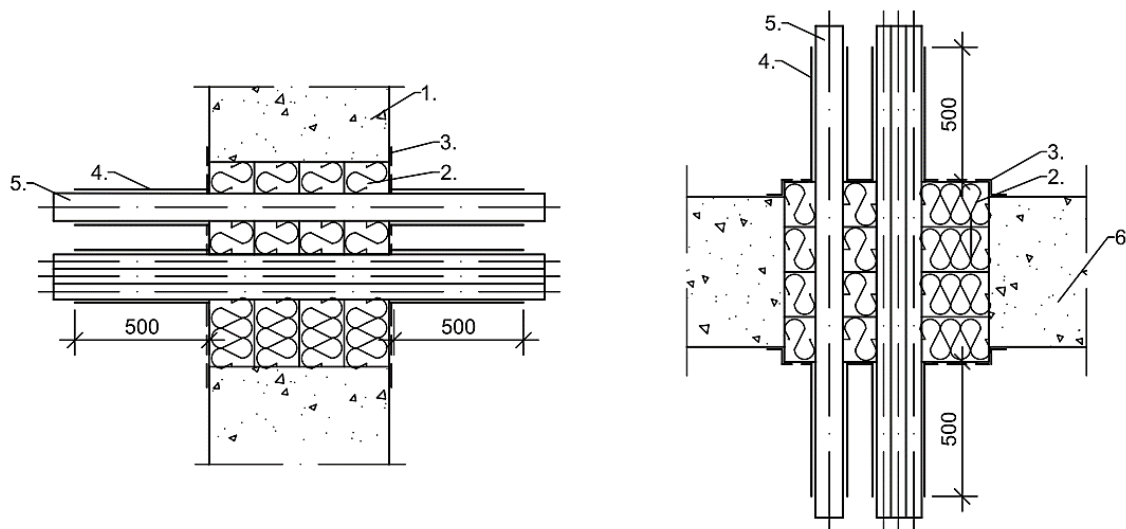
Fire resistance classes		
Max. Sealing size	Measure	Fire resistance class
600 x 600 mm	Solid Wall	EI 240
600 x 1000 mm	Solid Floor	EI 240

Dimensions in mm

System Flammotect	Annex 155
Mixed penetration seal made of mineral fibre board (4 x 60 mm) with ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (4 x 60 mm) with ablative coating (≥ 2,0 mm dft)

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



Fire resistance classes			
Service	Measures	Wall Fire resistance class	Floor Fire resistance class
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 thickness
- 2. Mineral fibre board
- 3. Ablative Coating

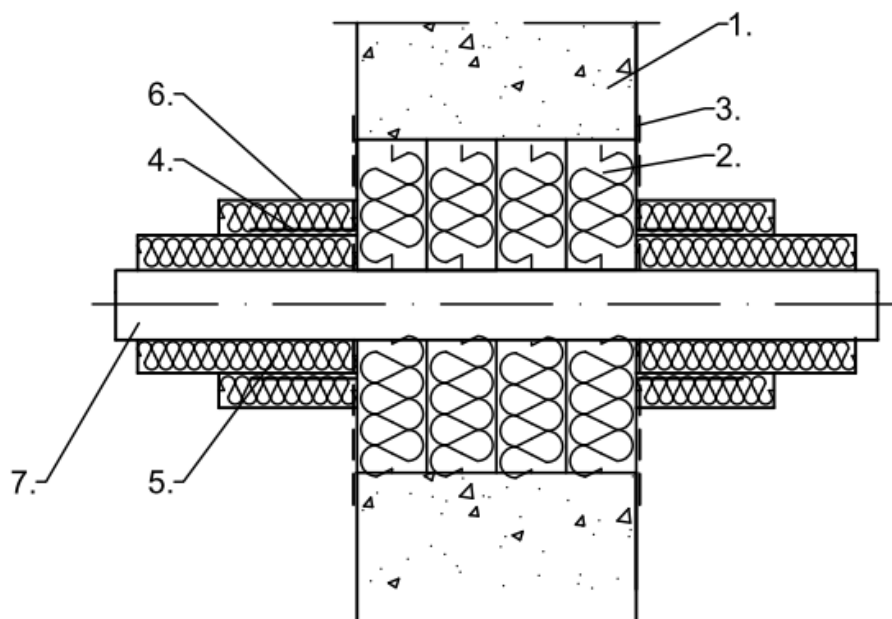
- 4. Intumescent wrap
- 5. Cable
- 6. Rigid floor ≥ 200 mm thickness

Dimensions in mm

System Flammotect	Annex 156
Mixed penetration seal made of mineral fibre board (4 x 60 mm) with ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (4 x 60 mm) with ablative coating (≥ 2,0 mm dft)

Non-combustible pipes with mineral fibre pipe shells with protective insulation of lamella mat with intumescent wrap



Fire resistance classes - Wall				
Service	Measure pipe shell ProRox 960	Measure lamella mat Klimarock	Measure Intumescent wrap	Wall Fire resistance class
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 thickness | 5. Pipe shell |
| 2. Mineral fibre board | 6. Lamella mat |
| 3. Ablative Coating | 7. Non-combustible pipe |
| 4. Intumescent wrap | |

Dimensions in mm

System Flammotect	Annex 157
Mixed penetration seal made of mineral fibre board (4 x 60 mm) with ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre board (4 x 60 mm) with ablative coating ($\geq 2,0$ mm dft)

Minimum Distances in wall							
	Cables	Cable bundles	Cable trays	Non-combustible pipes	Seal Edge		
					Upper	Lower	Side
Cables	$\geq 10 / \geq 80$ (next/above)	$\geq 10 / \geq 80$ (next/above)	$\geq 10 / \geq 80$ (next/above)	≥ 100	≥ 20	≥ 0	≥ 20
Cable bundles	$\geq 10 / \geq 80$ (next/above)	$\geq 10 / \geq 80$ (next/above)	$\geq 10 / \geq 80$ (next/above)	≥ 100	≥ 20	≥ 0	≥ 20
Cable trays	$\geq 10 / \geq 80$ (next/above)	$\geq 10 / \geq 80$ (next/above)	$\geq 10 / \geq 80$ (next/above)	≥ 100	≥ 20	≥ 0	≥ 20
Non-combustible pipes	≥ 100	≥ 100	≥ 100	≥ 100	≥ 40	≥ 40	≥ 40

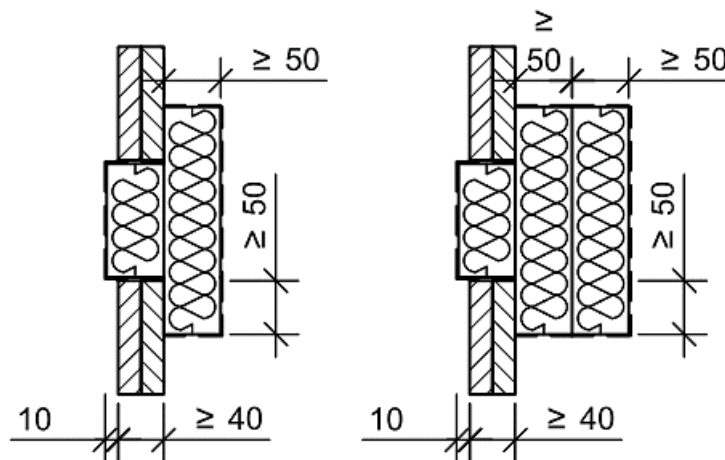
Minimum Distances in floor							
	Cables	Cable bundles	Cable trays	Seal Edge			
				Upper	Lower	Side	
Cables	$\geq 10 / \geq 40$ (next/above)	$\geq 10 / \geq 40$ (next/above)	$\geq 10 / \geq 40$ (next/above)	≥ 20	≥ 0	≥ 20	
Cable bundles	$\geq 10 / \geq 40$ (next/above)	$\geq 10 / \geq 40$ (next/above)	$\geq 10 / \geq 40$ (next/above)	≥ 20	≥ 0	≥ 20	
Cable trays	$\geq 10 / \geq 40$ (next/above)	$\geq 10 / \geq 40$ (next/above)	$\geq 10 / \geq 40$ (next/above)	≥ 20	≥ 0	≥ 20	

Dimensions in mm

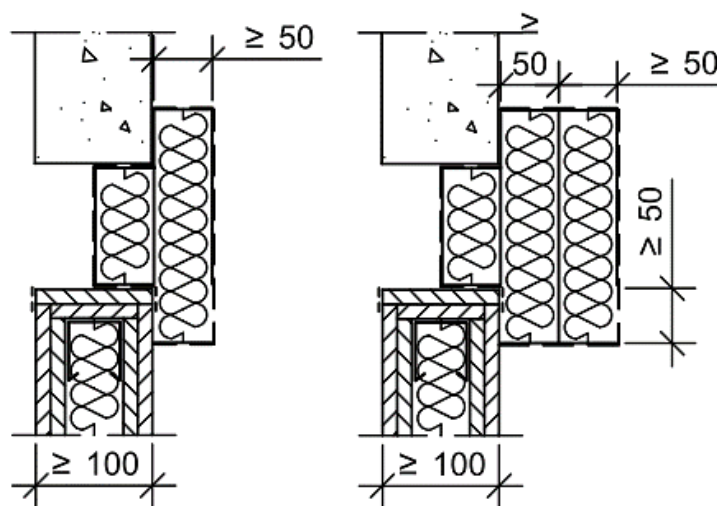
System Flammotect	Annex 158
Mixed penetration seal made of mineral fibre board (4 x 60 mm) with ablative coating in walls and floors	

Mixed penetration seal made of mineral fibre boards with ablative coating ($\geq 0,75$ mm dft) for one-sided installation in shaft wall, walls and floors

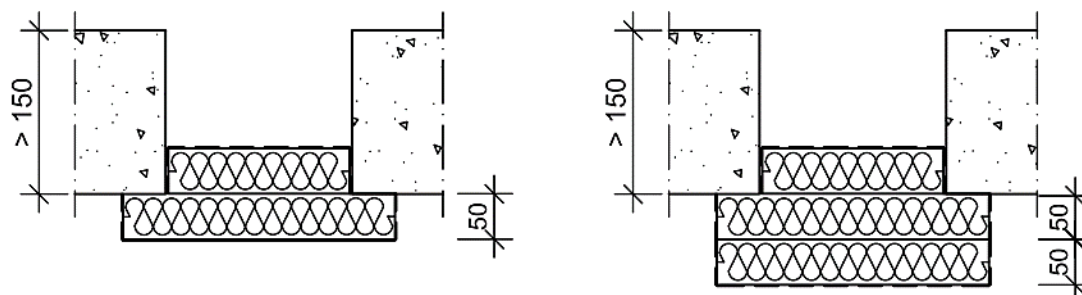
Variants in shaft walls



Variants in walls



Variants in floors



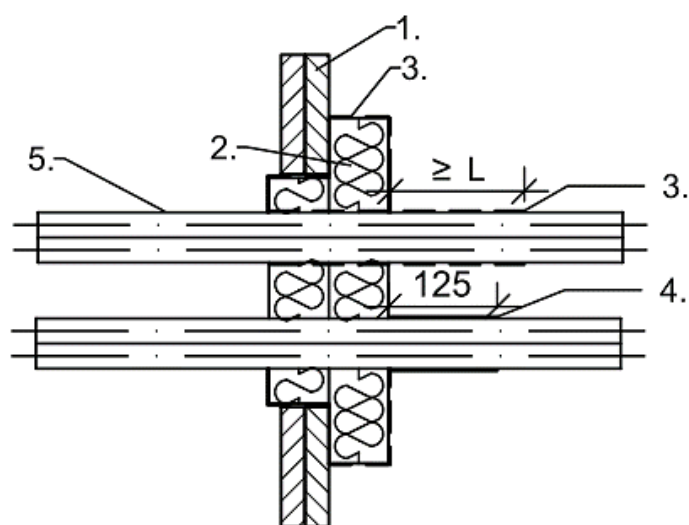
Dimensions in mm

<p>System Flammotect</p>	<p>Annex 159</p>
<p>Mixed penetration seal made of mineral fibre boards with ablative coating for one-sided installation in shaft wall, walls and floors</p>	

Mixed penetration seal made of mineral fibre boards with ablative coating ($\geq 0,75$ mm dft) for one-sided installation in shaft wall, walls and floors

Installation in shaft walls, 2-layer

Cables, cable bundles and cable trays with ablative coating or with intumescent wrap



Fire resistance classes - Wall		
Service	Measures	Wall Fire resistance class
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 2 x 62,5 / 1 x 125 mm 40 - 60 mm overlap	EI 120
Cable bundles $\varnothing > 100$ mm	Ablative coating $L \geq 150$ mm x ≥ 1 mm dry film thickness	EI 120
Cable bundles $\varnothing > 100$ mm	Intumescent wrap 2 x 62,5 / 1 x 125 mm 40 - 60 mm overlap	EI 90/ E 120

- 1. Shaft wall ≥ 40 thickness
- 2. Mineral fibre board
- 3. Ablative Coating

- 4. Intumescent wrap
- 5. Cable

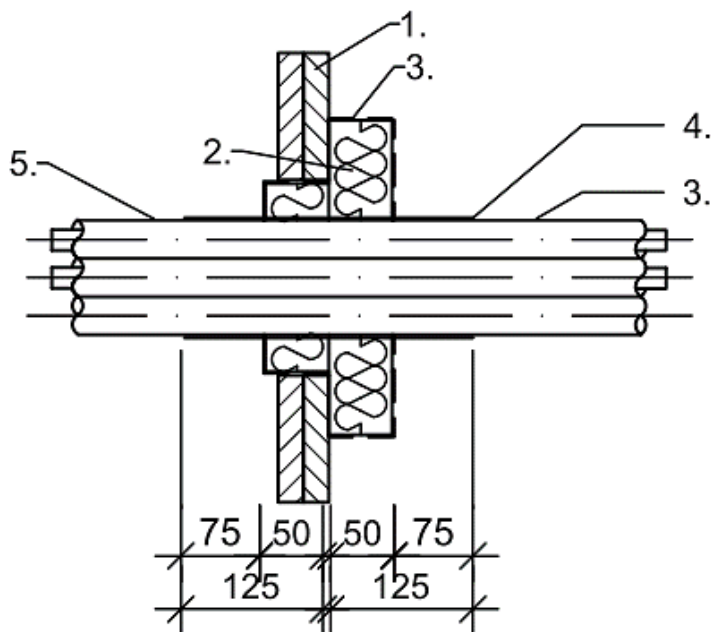
Dimensions in mm

System Flammotect	Annex 160
Mixed penetration seal made of mineral fibre boards with ablative coating for one-sided installation in shaft wall, walls and floors	

Mixed penetration seal made of mineral fibre boards with ablative coating ($\geq 0,75$ mm dft) for one-sided installation in shaft wall, walls and floors

Installation in shaft walls, 2-layer

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



Fire resistance classes - Wall		
Service	Measures	Wall Fire resistance class
Electrical installation conduit (EIP)		
EIC single $\varnothing \leq 21$ mm	Intumescent wrap 2 x 62,5 / 1 x 125 mm	EI 90/ E 120
EIC bundled $\varnothing \leq 100$ mm	Intumescent wrap 2 x 62,5 / 1 x 125 mm	EI 120

- 1. Shaft wall ≥ 40 thickness
- 2. Mineral fibre board
- 3. Ablative Coating

- 4. Intumescent wrap
- 5. Electrical installation conduit

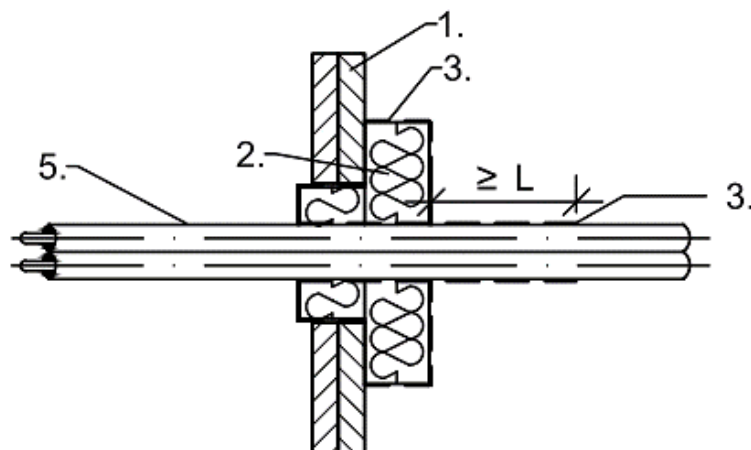
Dimensions in mm

System Flammotect	Annex 161
Mixed penetration seal made of mineral fibre boards with ablative coating for one-sided installation in shaft wall, walls and floors	

Mixed penetration seal made of mineral fibre boards with ablative coating ($\geq 0,75$ mm dft) for one-sided installation in shaft wall, walls and floors

Installation in shaft walls, 2-layer

Special-duo-coax bundle with ablative coating



Fire resistance classes - Wall		
Service	Measures	Wall Fire resistance class
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 thickness
- 2. Mineral fibre board
- 3. Ablative Coating

- 4. Intumescent wrap
- 5. Special-duo-coax-bundle

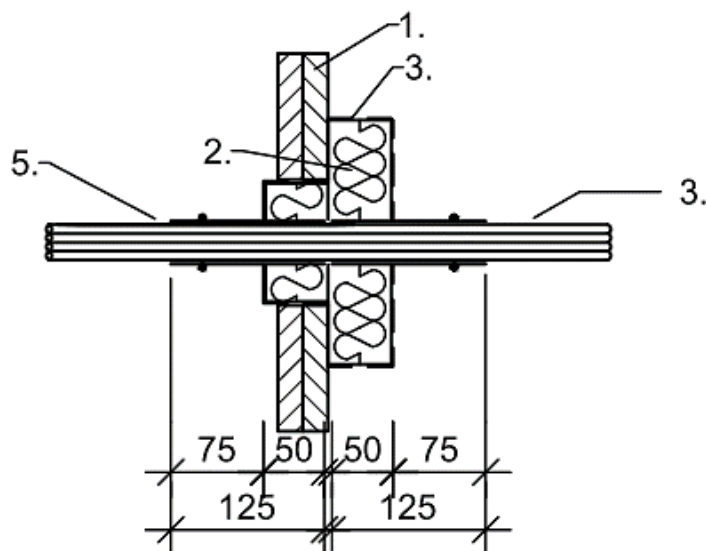
Dimensions in mm

System Flammotect	Annex 162
Mixed penetration seal made of mineral fibre boards with ablative coating for one-sided installation in shaft wall, walls and floors	

Mixed penetration seal made of mineral fibre boards with ablative coating ($\geq 0,75$ mm dft) for one-sided installation in shaft wall, walls and floors

Installation in shaft walls, 2-layer

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



Fire resistance classes - Wall		
Service	Measures	Wall Fire resistance class
Speed pipes, bundles or single pipes, with or without glass fibre or micro cables		
max. 24 pcs. outside pipe- $\varnothing \leq 7$ mm	Intumescent wrap 2 x 62,5 / 1 x 125 mm	EI 120 U/U
max. 7 pcs. outside pipe- $\varnothing \leq 10$ mm	Intumescent wrap 2 x 62,5 / 1 x 125 mm	EI 120 U/U
max. 5 pcs. outside pipe- $\varnothing \leq 12$ mm	Intumescent wrap 2 x 62,5 / 1 x 125 mm	EI 120 U/U

- 1. Shaft wall ≥ 40 thickness
- 2. Mineral fibre board
- 3. Ablative Coating

- 4. Intumescent wrap
- 5. Speed pipe

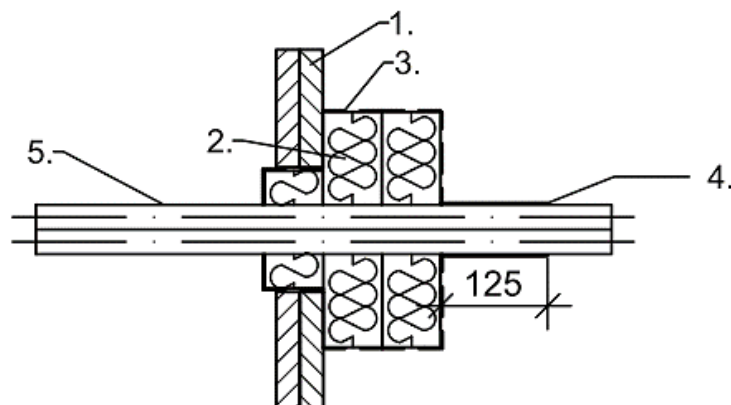
Dimensions in mm

System Flammotect	Annex 163
Mixed penetration seal made of mineral fibre boards with ablative coating for one-sided installation in shaft wall, walls and floors	

Mixed penetration seal made of mineral fibre boards with ablative coating ($\geq 0,75$ mm dft) for one-sided installation in shaft wall, walls and floors

Installation in shaft walls, 3-layer

Cables, cable bundles and cable trays with intumescent wrap



Fire resistance classes - Wall		
Service	Measures	Wall Fire resistance class
Cables, cable bundles and cable trays		
Cables $\varnothing \leq 21$ mm	Intumescent wrap 2 x 62,5 / 1 x 125 mm 40 - 60 mm overlap	EI 120
Cables $\varnothing \leq 50$ mm	Intumescent wrap 2 x 62,5 / 1 x 125 mm 40 - 60 mm overlap	EI 90 / E 120
Cables $\varnothing \leq 80$ mm	Intumescent wrap 2 x 62,5 / 1 x 125 mm 40 - 60 mm overlap	EI 90 / E 120
Cable bundles $\varnothing > 100$ mm	Intumescent wrap 2 x 62,5 / 1 x 125 mm 40 - 60 mm overlap	EI 120

- 1. Shaft wall ≥ 40 thickness
- 2. Mineral fibre board
- 3. Ablative Coating

- 4. Intumescent wrap
- 5. Cable

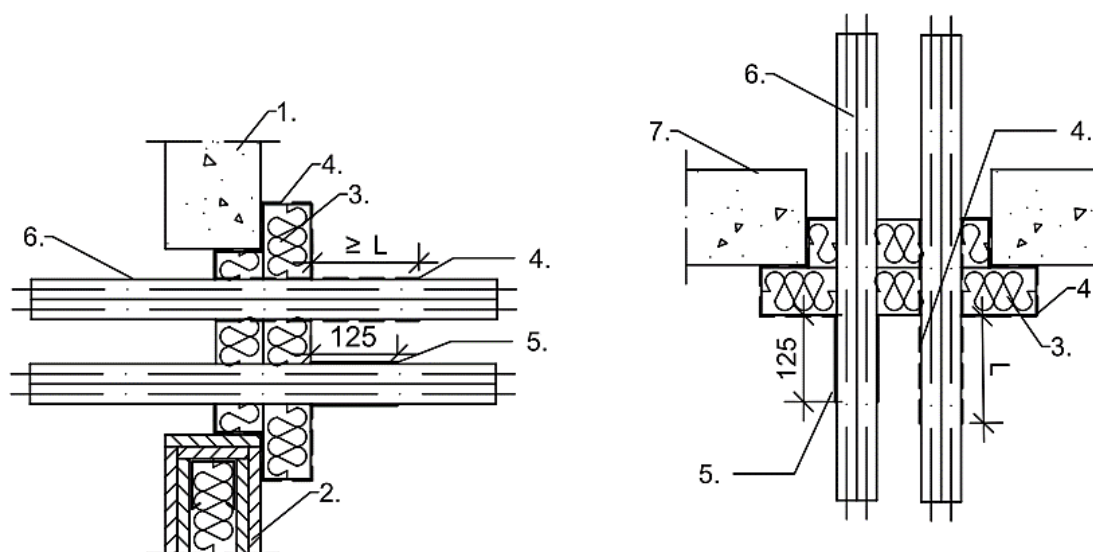
Dimensions in mm

System Flammotect	Annex 164
Mixed penetration seal made of mineral fibre boards with ablative coating for one-sided installation in shaft wall, walls and floors	

Mixed penetration seal made of mineral fibre boards with ablative coating ($\geq 0,75$ mm dft) for one-sided installation in shaft wall, walls and floors

Installation in walls and floors, 2-layer

Cables, cable bundles and cable trays with ablative coating with intumescent wrap



Fire resistance classes			
Service	Measures	Wall Fire resistance class	Floor Fire resistance class
Cables, cable bundles and cable trays			
Cables $\varnothing \leq 21$ mm	Ablative coating $L \geq 150$ mm x ≥ 1 mm dry film thickness	EI 120	EI 120
Cables $\varnothing \leq 21$ mm	Intumescent wrap 2 x 62,5 / 1 x 125 mm 40 - 60 mm overlap	EI 120	EI 120
Cables $\varnothing \leq 50$ mm	Ablative coating $L \geq 150$ mm x ≥ 1 mm dry film thickness	-	EI 120
Cables $\varnothing \leq 80$ mm	Ablative coating $L \geq 150$ mm x ≥ 1 mm dry film thickness	-	EI 120
Cable bundles $\varnothing > 100$ mm	Ablative coating $L \geq 150$ mm x ≥ 1 mm dry film thickness	EI 120	EI 120
Cable bundles $\varnothing > 100$ mm	Intumescent wrap 2 x 62,5 / 1 x 125 mm 40 - 60 mm overlap	EI 90 / E 120	EI 120

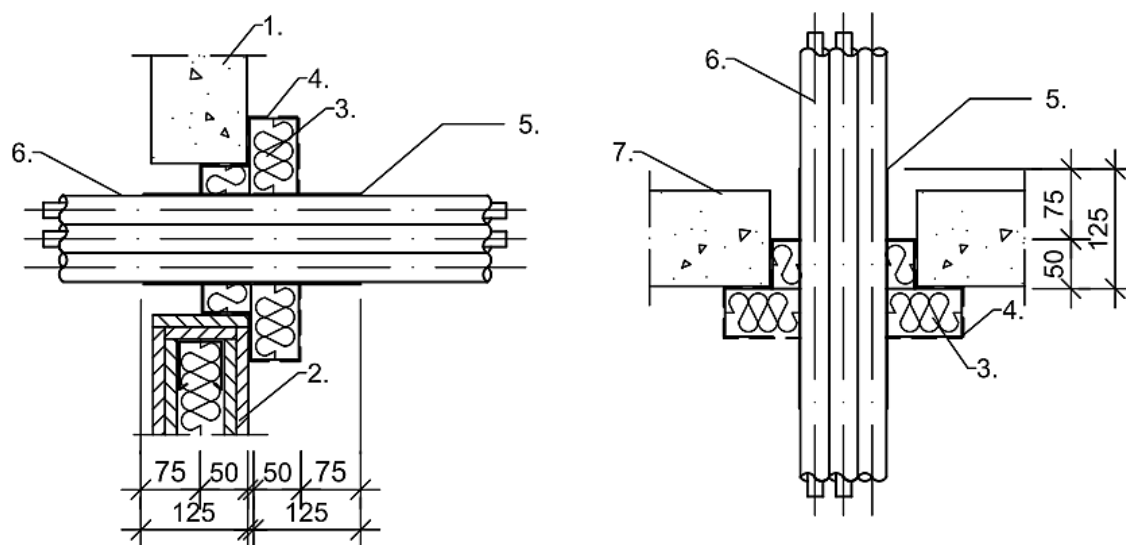
- | | |
|--|----------------------------------|
| 1. Rigid wall ≥ 100 mm thickness | 5. Intumescent wrap |
| 2. Flexible wall ≥ 100 mm thickness | 6. Cable |
| 3. Mineral fibre board | 7. Floor ≥ 150 mm thickness |
| 4. Ablative Coating | |

Dimensions in mm

Mixed penetration seal made of mineral fibre boards with ablative coating ($\geq 0,75$ mm dft) for one-sided installation in shaft wall, walls and floors

Installation in walls and floors, 2-layer

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



Fire resistance classes			
Service	Measures	Wall Fire resistance class	Floor Fire resistance class
Electrical installation conduit (EIP)			
EIC single $\varnothing \leq 21$ mm	Intumescent wrap 2 x 62,5 / 1 x 125 mm	EI 120 U/U	EI 120 U/U
EIC bundled $\varnothing \leq 100$ mm	Intumescent wrap 2 x 62,5 / 1 x 125 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

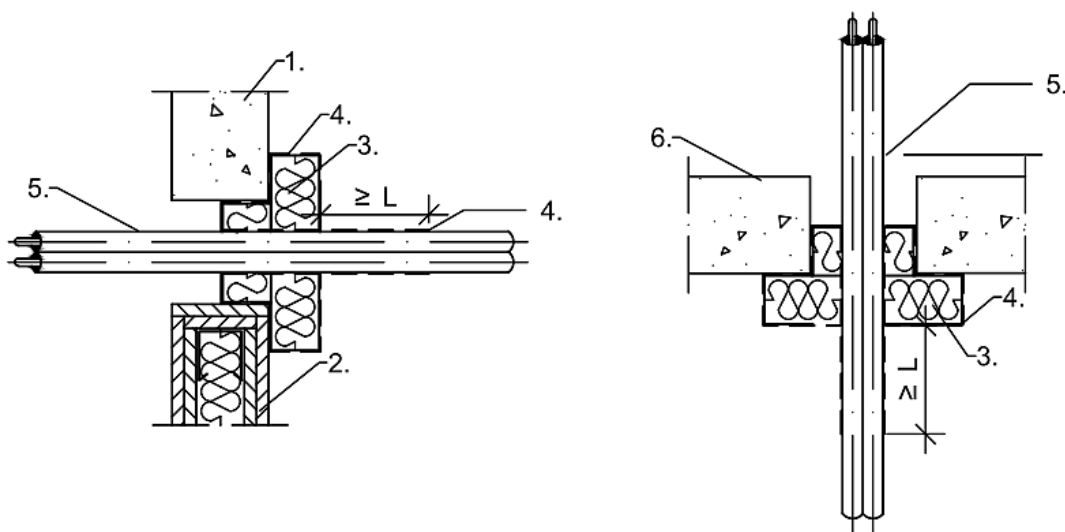
5. Intumescent wrap
6. Electrical installation conduit
7. Floor ≥ 150 mm thickness

Dimensions in mm

System Flammotect	Annex 166
Mixed penetration seal made of mineral fibre boards with ablative coating for one-sided installation in shaft wall, walls and floors	

Mixed penetration seal made of mineral fibre boards with ablative coating ($\geq 0,75$ mm dft) for one-sided installation in shaft wall, walls and floors

**Installation in walls and floors, 2-layer
Special-duo-coax bundle with ablative coating**



Fire resistance classes			
Service	Measures	Wall Fire resistance class	Floor Fire resistance class
Special-duo-coax bundle with ablative coating			
Bundle $\varnothing \leq 90$ mm / cable $\varnothing \leq 14$ mm	ablative coating $L \geq 150$ 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 thickness

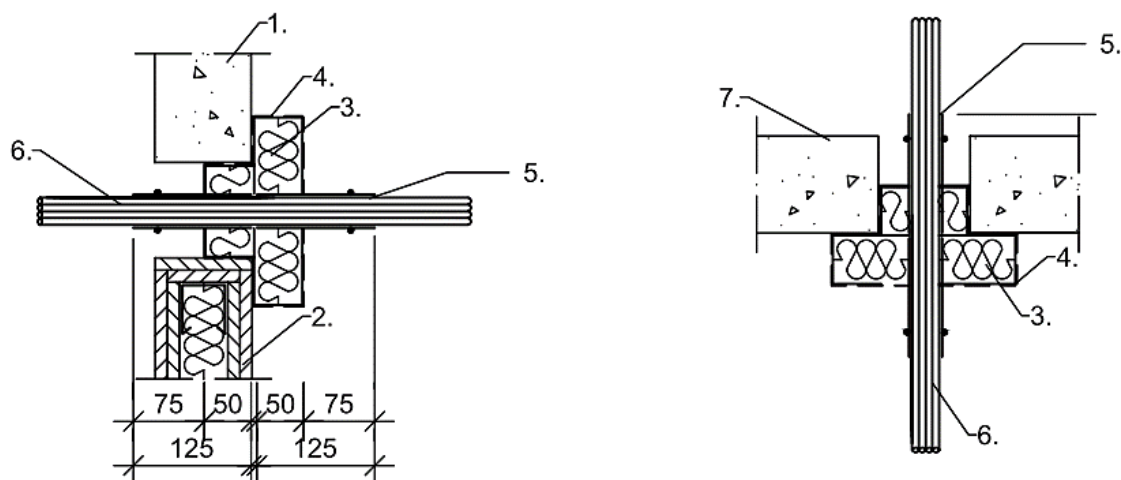
Dimensions in mm

System Flammotect	Annex 167
Mixed penetration seal made of mineral fibre boards with ablative coating for one-sided installation in shaft wall, walls and floors	

Mixed penetration seal made of mineral fibre boards with ablative coating ($\geq 0,75$ mm dft) for one-sided installation in shaft wall, walls and floors

Installation in shaft walls, 2-layer

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



Fire resistance classes - Wall		
Service	Measures	Wall Fire resistance class
Speed pipes, bundles or single pipes, with or without glass fibre or micro cables		
max. 24 pcs. outside pipe- $\varnothing \leq 7$ mm	Intumescent wrap 2 x 62,5 / 1 x 125 mm	EI 120 U/U
max. 7 pcs. outside pipe- $\varnothing \leq 10$ mm	Intumescent wrap 2 x 62,5 / 1 x 125 mm	EI 120 U/U
max. 5 pcs. outside pipe- $\varnothing \leq 12$ mm	Intumescent wrap 2 x 62,5 / 1 x 125 mm	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

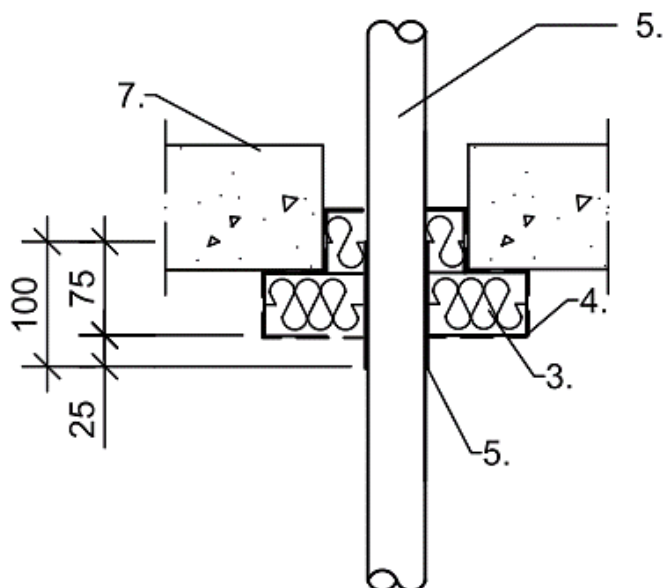
Dimensions in mm

System Flammotect	Annex 168
Mixed penetration seal made of mineral fibre boards with ablative coating for one-sided installation in shaft wall, walls and floors	

Mixed penetration seal made of mineral fibre boards with ablative coating ($\geq 0,75$ mm dft) for one-sided installation in shaft wall, walls and floors

Installation in floors, 2-layer

Combustible pipes with intumescent wrap



Fire resistance classes - Floor		
Service	Measures	Floor Fire resistance class
Combustible pipe		
Outside pipe- $\varnothing \leq 50$ mm	Intumescent wrap 100 mm 1 x 2 layer	EI 90 U/C
Outside pipe- $\varnothing \leq 70$ mm	Intumescent wrap 100 mm 1 x 2 layer	EI 120 U/C
Outside pipe- $\varnothing \leq 110$ mm	Intumescent wrap 100 mm 1 x 3 layer	EI 120 U/C
Outside pipe- $\varnothing \leq 110$ mm	Intumescent wrap 100 mm 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

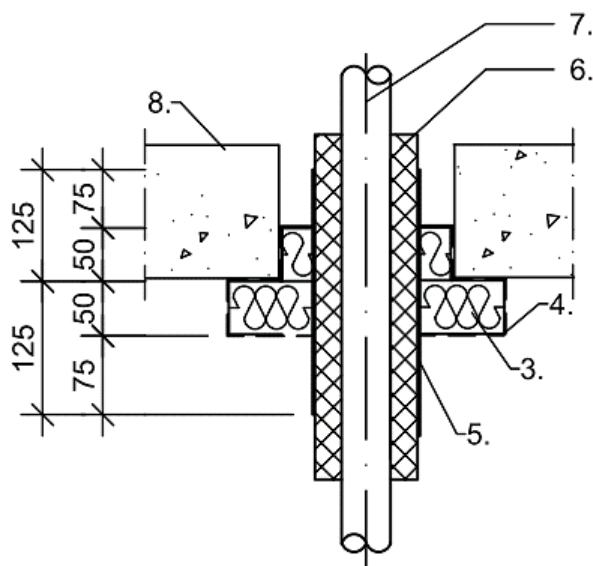
Dimensions in mm

System Flammotect	Annex 169
Mixed penetration seal made of mineral fibre boards with ablative coating for one-sided installation in shaft wall, walls and floors	

Mixed penetration seal made of mineral fibre boards with ablative coating ($\geq 0,75$ mm dft) for one-sided installation in shaft wall, walls and floors

Installation in floors, 2-layer

Non-combustible pipes made of copper, steel stainless steel or cast iron with combustible insulation made of FEF with intumescent wrap



Fire resistance classes - Floor		
Service	Measures	Floor Fire resistance class
Combustible pipe		
Outside pipe- $\varnothing \leq 15$ mm	$\geq 400 / 750$ mm (bottom top) x 25 mm + intumescent wrap 2 x 62,5 / 1 x 125 mm 1 x 2 layers	EI 90 C/U / E 120
Outside pipe- $\varnothing \leq 15$ mm	$\geq 400 / 750$ mm (bottom top) x 13 - 24 mm + intumescent wrap 2 x 62,5 / 1 x 125 mm 1 x 2 layers	EI 120 C/U
Outside pipe- $\varnothing \leq 28$ mm	$\geq 400 / 750$ mm (bottom top) x 19 - 25 mm + intumescent wrap 2 x 62,5 / 1 x 125 mm 1 x 2 layers	EI 120 C/U
Outside pipe- $\varnothing \leq 42$ mm	$\geq 400 / 750$ mm (bottom top) 19 x 24 mm + intumescent wrap 2 x 62,5 / 1 x 125 mm 1 x 2 layers	EI 90 / E 120 C/U
Outside pipe- $\varnothing \leq 42$ mm	$\geq 400 / 750$ mm (bottom top) 25 mm + intumescent wrap 2 x 62,5 / 1 x 125 mm 1 x 2 layers	EI 120 C/U

- 3. Mineral fibre board
- 4. Ablative Coating
- 5. Intumescent wrap

- 6. FEF
- 7. Non-combustible pipe
- 8. Floor ≥ 150 mm thickness

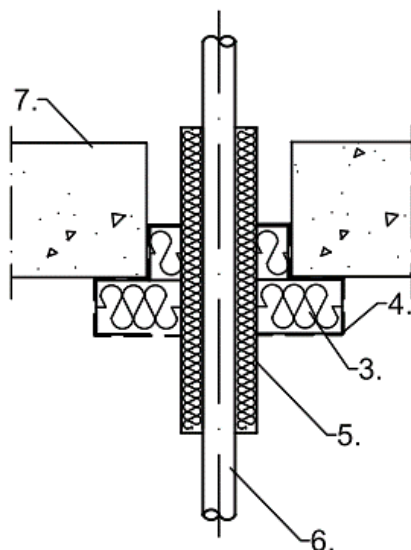
Dimensions in mm

System Flammotect	Annex 170
Mixed penetration seal made of mineral fibre boards with ablative coating for one-sided installation in shaft wall, walls and floors	

Mixed penetration seal made of mineral fibre boards with ablative coating ($\geq 0,75$ mm dft) for one-sided installation in shaft wall, walls and floors

Installation in floors, 2-layer

Multilayer composite pipes HENCO pipes with lamella mat



Fire resistance classes - Floor		
Service	Measures	Floor Fire resistance class
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

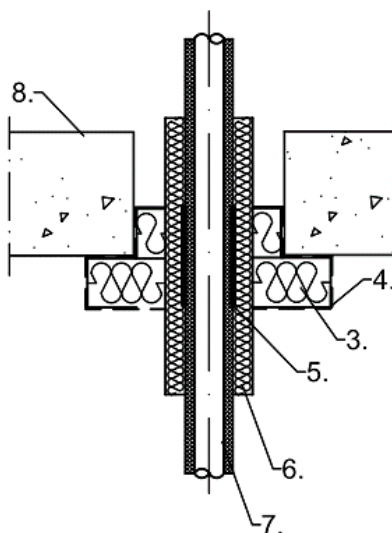
Dimensions in mm

System Flammotect	Annex 171
Mixed penetration seal made of mineral fibre boards with ablative coating for one-sided installation in shaft wall, walls and floors	

Mixed penetration seal made of mineral fibre boards with ablative coating (≥ 0,75 mm dft) for one-sided installation in shaft wall, walls and floors

Installation in floors, 2-layer

Multilayer composite pipes HENCO pipes, pre-insulated with PEF with intumescent wrap and coated on both sides with lamella mat



Fire resistance classes - Floor		
Service	Measures	Floor Fire resistance class
Multilayer composite pipes HENCO-pipes, pre-insulated		
Outside pipe-Ø ≤ 32 mm	Lamella mat [L X T] ≥ 500 mm x ≥ 20 mm intumescent wrap 100 mm 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

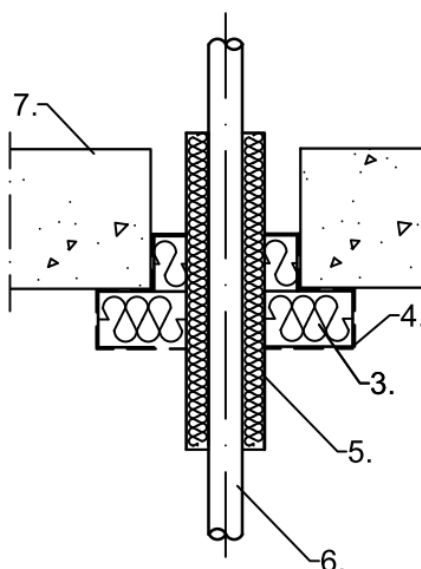
Dimensions in mm

System Flammotect	Annex 172
Mixed penetration seal made of mineral fibre boards with ablative coating for one-sided installation in shaft wall, walls and floors	

Mixed penetration seal made of mineral fibre boards with ablative coating (≥ 0,75 mm dft) for one-sided installation in shaft wall, walls and floors

Installation in floors, 2-layer

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



Fire resistance classes - Floor		
Service	Measures	Floor Fire resistance class
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

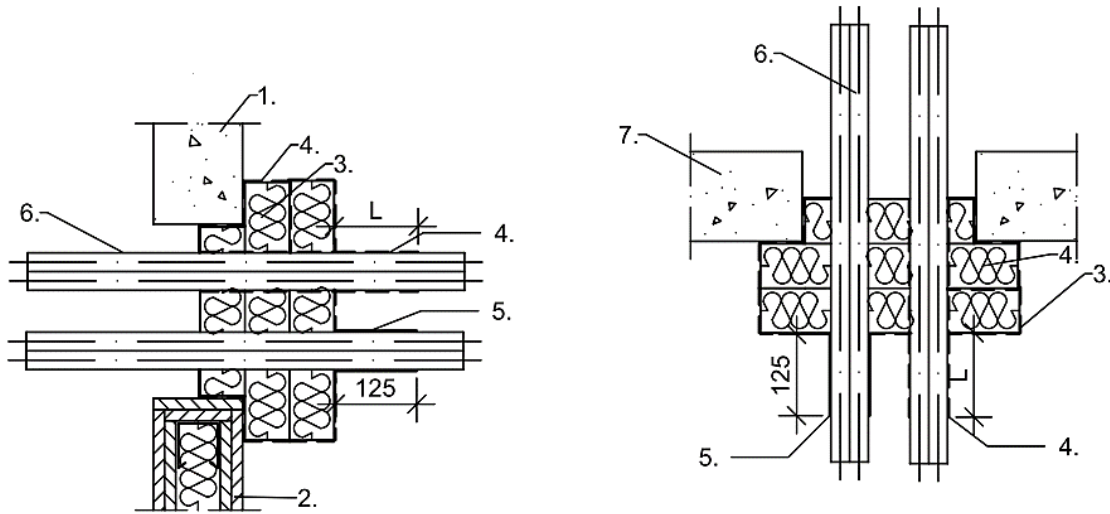
Dimensions in mm

System Flammotect	Annex 173
Mixed penetration seal made of mineral fibre boards with ablative coating for one-sided installation in shaft wall, walls and floors	

Mixed penetration seal made of mineral fibre boards with ablative coating ($\geq 0,75$ mm dft) for one-sided installation in shaft wall, walls and floors

Installation in walls and floors, 3-layer

Cables, cable bundles and cable trays with ablative coating or with intumescent wrap



Fire resistance classes			
Service	Measures	Wall Fire resistance class	Floor Fire resistance class
Cables, cable bundles and cable trays			
Cables $\varnothing \leq 21$ mm	Ablative coating $L \geq 150$ mm $x \geq 1$ mm dry film thickness	EI 120	EI 120
Cables $\varnothing \leq 21$ mm	Intumescent wrap 2 x 62,5 / 1 x 125 mm + 45 mm overlapping	EI 120	EI 120
Cables $\varnothing \leq 50$ mm	Ablative coating $L \geq 150$ mm $x \geq 1$ mm dry film thickness	EI 90/ E 120	EI 90
Cables $\varnothing \leq 50$ mm	Intumescent wrap 2 x 62,5 / 1 x 125 mm + 45 mm overlapping	EI 90/ E 120	EI 90
Cables $\varnothing \leq 80$ mm	Ablative coating $L \geq 150$ mm $x \geq 1$ mm dry film thickness	EI 90/ E 120	EI 90
Cables $\varnothing \leq 80$ mm	Intumescent wrap 2 x 62,5 / 1 x 125 mm + 45 mm overlapping	EI 90/ E 120	EI 90
Cable bundles $\varnothing > 100$ mm	Ablative coating $L \geq 150$ mm $x \geq 1$ mm dry film thickness	EI 120	EI 120
Cable bundles $\varnothing > 100$ mm	Intumescent wrap 2 x 62,5 / 1 x 125 mm + 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

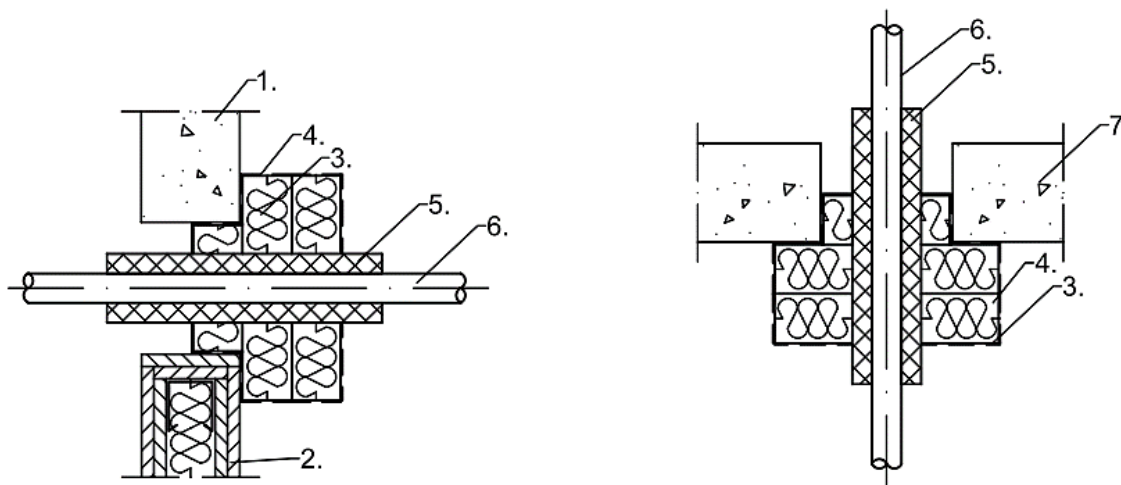
Dimensions in mm

System Flammotect	Annex 174
Mixed penetration seal made of mineral fibre boards with ablative coating for one-sided installation in shaft wall, walls and floors	

Mixed penetration seal made of mineral fibre boards with ablative coating ($\geq 0,75$ mm dft) for one-sided installation in shaft wall, walls and floors

Installation in walls and floors, 3-layer

Multilayer composite pipes "HENCO pipes" with combustible insulation "Armaflex Protect"



Fire resistance classes			
Service	Measures	Wall Fire resistance class	Floor Fire resistance class
Multilayer composite pipes HENCO-pipes			
Outside pipe- $\varnothing \leq 12$ mm wall thickness $\geq 1,6$ mm	Armaflex Protect [L X T] ≥ 480 mm x ≥ 19 mm	EI 120 U/C	EI 90 U/C
Outside pipe- $\varnothing \leq 63$ mm wall thickness $\geq 4,5$ mm	Armaflex Protect [L X T] ≥ 480 mm x ≥ 25 mm	EI 120 U/C	EI 90 U/C

- | | |
|--|----------------------------------|
| 1. Rigid wall ≥ 100 mm thickness | 5. Armaflex Protect |
| 2. Flexible wall ≥ 100 mm thickness | 6. Multilayer composite pipe |
| 3. Mineral fibre board | 7. Floor ≥ 150 mm thickness |
| 4. Ablative Coating | |

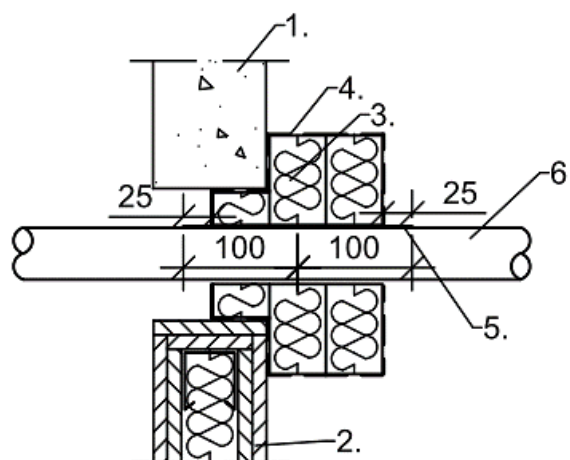
Dimensions in mm

System Flammotect	Annex 175
Mixed penetration seal made of mineral fibre boards with ablative coating for one-sided installation in shaft wall, walls and floors	

Mixed penetration seal made of mineral fibre boards with ablative coating ($\geq 0,75$ mm dft) for one-sided installation in shaft wall, walls and floors

Installation in walls, 3-layer

Combustible pipes with intumescent wrap



Fire resistance classes			
Service	Measures	Wall Fire resistance class	Floor Fire resistance class
Combustible pipe			
Outside pipe- $\varnothing \leq 50$ mm	Intumescent wrap 100 mm 1 x 2 layer	EI 120 U/U	EI 90 U/C
Outside pipe- $\varnothing \leq 80$ mm	Intumescent wrap 100 mm 2 x 2 layer	EI 120 U/U	EI 120 U/C
Outside pipe- $\varnothing \leq 110$ mm	Intumescent wrap 100 mm 2 x 3 layer	EI 120 U/U	-

1. Rigid wall ≥ 100 mm thickness
2. Flexible wall ≥ 100 mm thickness
3. Mineral fibre board

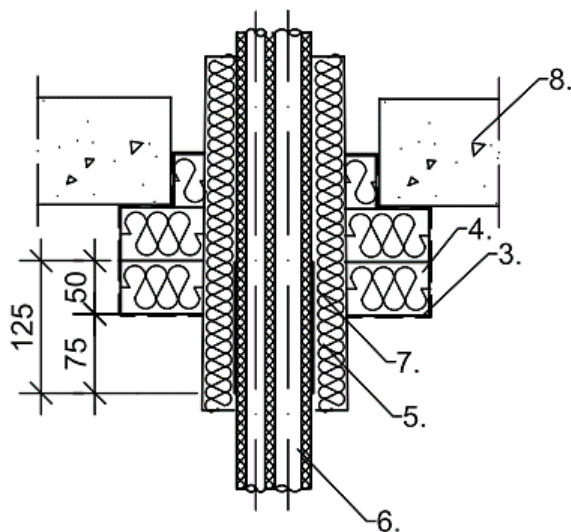
4. Ablative Coating
5. Intumescent wrap
6. Combustible pipe

Dimensions in mm

System Flammotect	Annex 176
Mixed penetration seal made of mineral fibre boards with ablative coating for one-sided installation in shaft wall, walls and floors	

Mixed penetration seal made of mineral fibre boards with ablative coating ($\geq 0,75$ mm dft) for one-sided installation in shaft wall, walls and floors

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



Fire resistance classes - Floor		
Service	Measures	Floor Fire resistance class
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 $\leq \varnothing 25$ mm + 4 accompanying cables ≤ 21 mm	Intumescent wrap 2 x 62,5 / 1 x 125 mm + lamella mat $\geq 250/ 500$ 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. Lamella mat
- 8. Floor ≥ 150 mm thickness

Dimensions in mm

System Flammotect	Annex 177
Mixed penetration seal made of mineral fibre boards with ablative coating for one-sided installation in shaft wall, walls and floors	

Description of possible additional components of the penetration seal

Description of possible additional components of the penetration seal		
Description	Performance	Sample Product
Intumescent wrap 2 x 62,5 mm / 1 x 125 mm	Class of Fire behavior in accordance with DIN EN 13501-1: Class B-s1,d0	NBR-plus in accordance to ETA-21/0461
		DG-CR Pro in accordance to ETA-20/0612
Intumescent wrap 100 mm	Class of Fire behavior in accordance with DIN EN 13501-1: Class E	DG-CR BS / DG-CR BS in accordance to ETA-16/0268
Intumescent wrap 50 mm	Class of Fire behavior in accordance with DIN EN 13501-1: Class E	KSL-W in accordance to ETA-18/0885
		ROKU FPW in accordance to ETA-18/0096
Fire protection collar	Class of Fire behavior in accordance with DIN EN 13501-1: Class E	ROKU AWM II in accordance to ETA-17/0753
		VARIANT N II A in accordance to ETA-13/0922
Fire protection Endless collar	Class of Fire behavior in accordance with DIN EN 13501-1: Class E	ROKU EC Endless collar in accordance to ETA-22/0054
		VARIANT N EC in accordance to ETA-15/0802
Loose mineral wool in accordance with EN 14303	Reaction to fire class acc. to EN 13501-1: A1 Melting point: ≥ 1000 °C	Knauf Insulation LW; Rockwool "ProRox LF 970"
Mineral fibre board in accordance with DIN EN 13162	Reaction to fire class acc. to EN 13501-1: A1 Nominal Density: ≥ 150 kg/m ³ Melting point: ≥ 1000 °C	Rockwool "Hardrock 040" Paroc Pyrotech Slab 160 Rockwool "RP-GF 70"
Mineral fibre lamella mat in accordance with EN 14303	Reaction to fire class acc. to EN 13501-1: A2-s1, d0 or A1 Bulk density: ≥ 35 kg/m ³ Melting point: ≥ 1000 °C	Rockwool lamella mat "KLIMAROCK"; PAROC Hvac Lamella Mat AluCoat
Pipe shell of concentrically wrapped rockwool in accordance with EN 14303	Reaction to fire class acc. to EN 13501-1: A2-s1, d0 or A1 Bulk density: ≥ 80 kg/m ³ Melting point: ≥ 1000 °C	Isover U Protect Pipe Section Alu 2 ; Rockwool ProRox PS 960 Rockwool 800 Rockwool ProRox WM 950 Rockwool ProRox WM 960 Rockwool Conlit 150 U ISODAEM STEINWOLL-ROHRSCHALE Alu

System Flammotect	Annex 178
Description of possible additional components of the penetration seal	

Description of possible additional components of the penetration seal

Description of possible additional components of the penetration seal		
Description	Performance	Sample Product
Insulation made of flexible elastomeric foam (FEF) in accordance with EN 14304	Reaction to fire class acc. to EN 13501-1: B-s3, d0	Armalok 50 Armalok 100 ArmaFlex SE ArmaFlex XG AF/ArmaFlex AF/ArmaFlex Evo SH/ArmaFlex NH/ArmaFlex HT/ArmaFlex ArmaFlex Ultima Kaiflex HT s2 Kaiflex KK Kaiflex KKplus s2 Kaiflex KKplus s3 FLEXEN Heizungskautschuk s2 FLEXEN Kältekautschuk Plus s2 isopren Plus isopren Polar Plus K-FLEX ST K-FLEX ST PLUS K-FLEX ECO K-FLEX H Eurobatex SC Eurobatex High Technology Eurobatex H Eurobatex H Super
Insulation made of PUR/PIR in accordance with EN 14308	Reaction to fire class acc. to EN 13501-1: D-s2, d0	Regisol REGOPIR HF Regisol REGOPIR HF ALU Glatt
Black closed-cell flexible elastomeric foam (FEF) in accordance EN 14304	Reaction to fire class acc. to EN 13501-1: Tubes: B _L -s2,d0 Sheets: B-s3,d0 Sheets 60 mm: E Tapes: B-s2,d0	Eurobatex
Black closed-cell flexible elastomeric foam (FEF) coupled with mineral fibre material with a black coloured exterior finishing in accordance EN 14304	Reaction to fire class acc. to EN 13501-1: Tubes: B _L -s1,d0 Sheets: B-s2,d0	Eurobatex Glastec