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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-25/1247 of 2026/06/16

I General Part

Technical Assessment Body issuing the European Technical Assessment:
ETA-Danmark A/S

Trade name of the construction product:	System ECP
Product family to which the above construction product belongs:	Fire Stopping and Fire Sealing Products, Penetration Seals
Manufacturer:	Flamro Brandschutz-Systeme GmbH Am Sportplatz 2 DE-56291 Leiningen Tel +49 06746 94100 Internet www.flamro.de
Manufacturing plant:	Plant E
This European Technical Assessment contains:	54 pages including 8 annexes which form an integral part of the document
This European Technical Assessment is issued in accordance with Article 95(4) of Regulation (EU) 2024/3110, on the basis of:	EAD 350454-00-1104 Firestopping and Fire Sealing Products, Penetration Seals
This version replaces:	The ETA with the same number issued on 2026-01-07

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II SPECIFIC PART OF THE EUROPEAN TECHNICAL ASSESSMENT

1 Technical description of the product

FLAMRO System ECP is a collar made from an active inlay covered with a glass fabric sheet which is fixed with metal lashes and shall be defined as a pipe closure device in horizontal and vertical orientations used in lightweight and solid constructions.

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

System ECP is intended to be used to form a cable- and/or pipe penetration seal (mixed penetration seal) to temporarily or permanently reinstate the fire resistance performance of flexible wall constructions, rigid wall constructions and rigid floor constructions where they have been provided with apertures which are penetrated by various cables, conduits / tubes, metal pipes, plastic pipes, multi-layer composite pipes.

It is assumed that

- Damages to the penetration seal are repaired accordingly,
- The installation of the penetration seal does not affect the stability of the adjacent building element – even in case of fire,
- The lintel or floor above the penetration seal is designed structurally and in terms of fire protection such that no additional mechanical load (other than its own weight) is imposed on the penetration seal,
- The aperture lining within a flexible wall is supported by the studs (transoms and mullions) in such a way that the mechanical load imposed to the aperture lining by the penetration seal does not affect the stability of the aperture lining and the flexible wall,
- The thermal movement in the pipe work will be accommodated in such way that it does not impose a load on the penetration seal,
- The installations are fixed to the adjacent building element in accordance with the relevant regulations in such a way that, in case of fire, no additional mechanical load is imposed to the penetration seal,
- The support of the installations is maintained for the required period of fire resistance and
- Pneumatic dispatch systems, compressed air systems, etc. are switched off by additional means in case of fire.

This European Technical Assessment does not address any risks associated with the emission of dangerous liquids or gases caused by failure of the pipe(s) in case of fire nor does it prove the prevention of the transmission of fire through heat transfer via the medium in the pipes.

This European Technical Assessment does not verify the prevention of destruction of adjacent building elements with fire separating function or of the pipes themselves due to distortion forces caused by extreme temperatures. These risks shall be accounted for by taking appropriate measures when designing or installing the pipe work.

The mounting or hanging of the cables/pipes or the layout of the pipe work shall be implemented in such a way that the cables/pipes and the fire-resistant building elements shall remain functional within a period of time which corresponds to the fire resistance period required.

The risk of downward spread of fire caused by burning material which drips through a pipe to floors below is not considered in this European Technical Assessment.

The assessment does not cover the avoidance of destruction of the penetration seal or of the adjacent building element(s) by forces caused by temperature changes in case of fire. This must be considered when designing the piping system.

The provisions made in this European Technical Assessment are based on an assumed intended working life of the sealant of 10 years, provided that the conditions laid down in the product data sheet for the packaging/transport/storage/installation/use/repair are met.

The indications given on the intended working life cannot be interpreted as a guarantee given by the producer or the Technical Assessment Body but are to be regarded only as a means for selecting the appropriate 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 intumescent material is classified as **Class E** according to EN 13501-1 and the EC Delegated regulation 96/603/EU.
Resistance to fire	**See Annex B**
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 (BWR4)	
Mechanical resistance and stability	**No performance assessed**
Resistance to impact/movement	**No performance assessed**
Adhesion	**No performance assessed**
Durability	Use category: **Type X**
3.5 Protection against noise (BWR5)	
Airborne sound insulation	**No performance assessed**
3.6 Energy economy and heat retention (BWR6)	
Thermal properties	**No performance assessed**
Water vapour permeability	**No performance assessed**

See additional information in section 3.8-3.9

*) 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.

3.8 Methods of verification

The assessment of System ECP for the declared intended use has been made in accordance with EAD 350454-00-1104 Firestopping and fire sealing products, Penetration Seals, assessed as a collar according to table 1.1 of the EAD.

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

The verification of durability is part of testing the essential characteristics. System ECP may be used in end-use applications according to the provisions for use category X (intended for use in conditions exposed to weathering) without expecting significant changes in the characteristics relevant for fire protection. Products that meet the requirements for type X also meet the requirements for all other types.

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 ECP for firestopping and fire sealing purposes are 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 Attestation 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 of the European Commission, the system of assessment and verification of constancy of performance (see Annex V to Regulation (EU) No 305/2011) is: **1.**

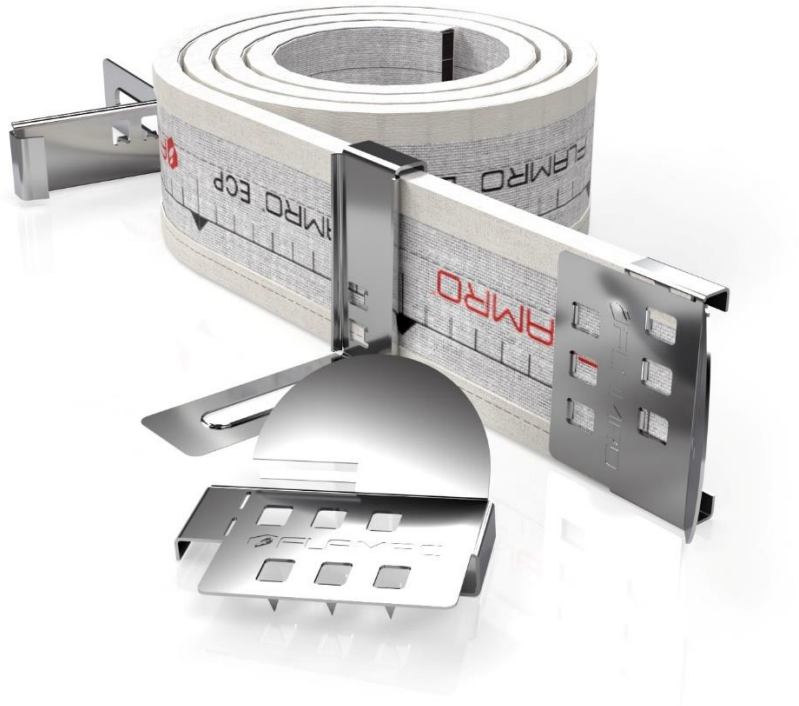
5 Technical details necessary for the implementation of the AVCP system, as provided for in the applicable EAD.

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 2026-06-16 by

Thomas Bruun
Managing Director, ETA-Danmark

System ECP



Design/Length groups:
Incl. couplings

Pipe diameter [mm]	32 - 63	> 63 - 110	> 110 - 160
Layers [pcs]	1		
Lashes / screws[pcs]	2	3	4
Lashes / screws (zero distance to building component[pcs]	4	4	4

System ECP, flexible / rigid wall

Flexible walls:
The wall must have a minimum thickness of ≥ 100 mm and be made from wooden or metal studs which are coated on both sides with at least 2 layer of gypsum plaster fire protection boards (minimum thickness 12,5 mm) with classification A2-s1,d0 or A1 according to EN 13501-1, in case that wooden stand walls are applied, a minimum distance of 100 mm must be kept from each of the wooden stands to the seal and the cavity between the stands and the seal must be filled with at least 100 mm insulation material compliant to class A1 or A2 (according to EN 13501-1).

This European Technical Assessment does not cover sandwich panel constructions and flexible walls where the lining does not cover studs on both sides. Penetration in such constructions shall be tested on a case-by-case basis.

Gap filler	Gypsum
Backfilling	-
Width	10 – 20 mm
Depth	≥ 100 mm

Gap filler	BIOFERM-A
Backfilling	-
Width	10 – 20 mm
Depth	20 mm on both sides

Gap filler	SIBRALIT DX
Backfilling	-
Width	10 – 20 mm
Depth	20 mm on both sides

Table 1, flexible wall constructions

Fasteners for flexible wall constructions:
- Würth Metal cavity anchor W-MH M6x78/66
- fischer Metal cavity fixing HM 6x65 S with metric screw
- HILTI cavity anchor HHD-S M6/24x65
- TOX Acrobat cavity plug M6/65
- Simpson StrongTie TMC metallic anchor M6x74/66
- Stabilit metal cavity plug HM 6 X 65 S
- BTI metal anchor with screw M6 x 63
- BTI cavity anchor HRA M6 11 x 63 mm

Rigid walls:
The wall must have a minimum thickness of ≥100 mm and consist of concrete, aerated concrete or masonry, with a minimum density of ≥ 450 kg/m³.
The rigid wall shall be classified in accordance with EN 13501-2 for the required fire resistance period.

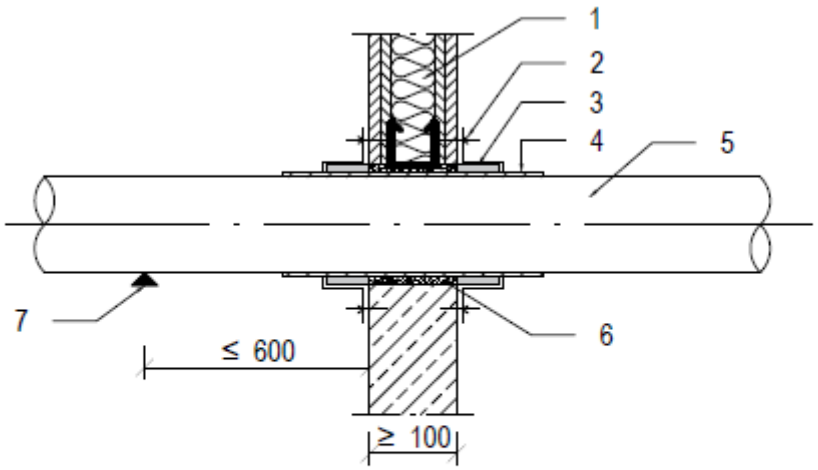
Gap filler	Mortar
Backfilling	-
Width	10 – 20 mm
Depth	≥ 100 mm

Gap filler	BIOFERM-A
Backfilling	-
Width	10 – 20 mm
Depth	20 mm on both sides

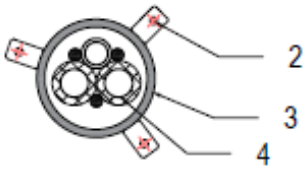
Gap filler	SIBRALIT DX
Backfilling	-
Width	10 – 20 mm
Depth	20 mm on both sides

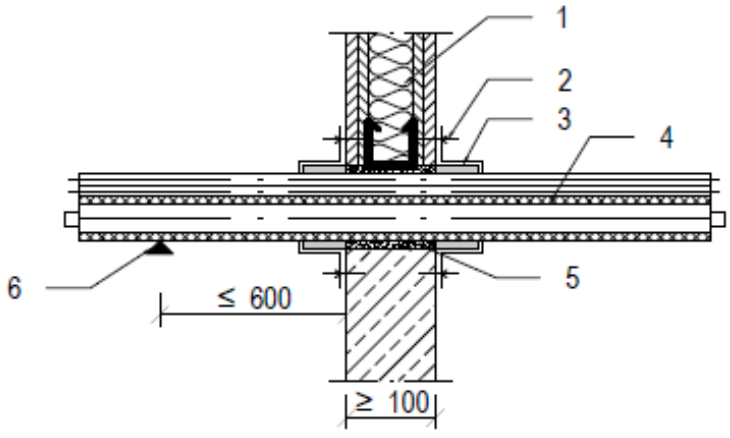
Table 2, rigid wall constructions

Fasteners for rigid wall constructions:
- HECO MULTI-MONTI-plus MMS-plus-P 6.0 x 50
- HILTI HUS3-P 6x60
- Würth concrete screw with pan head W-BS/S 6 x 50
- fischer concrete screw UltraCut FBS II 6 x 60/5 P Pan head
- Sikla Screwbolt TSM LP VZ 30 6 x 60
- TOGE TSM High Performance 6 x 50 P VZ30
- EJOT® Concrete screw JC2-FR 6 6x60



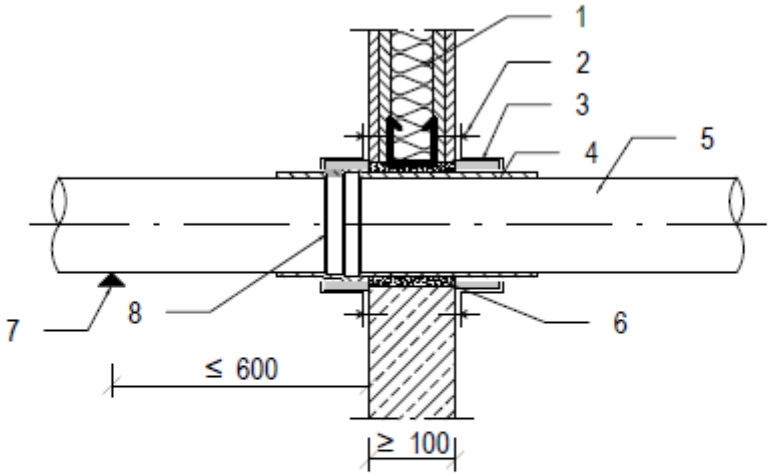
1. flexible wall / rigid wall
2. mounting
3. fire protection collar
4. insulation acc. to table
5. pipe acc. to table
6. annular gap filling acc. to table
7. first support



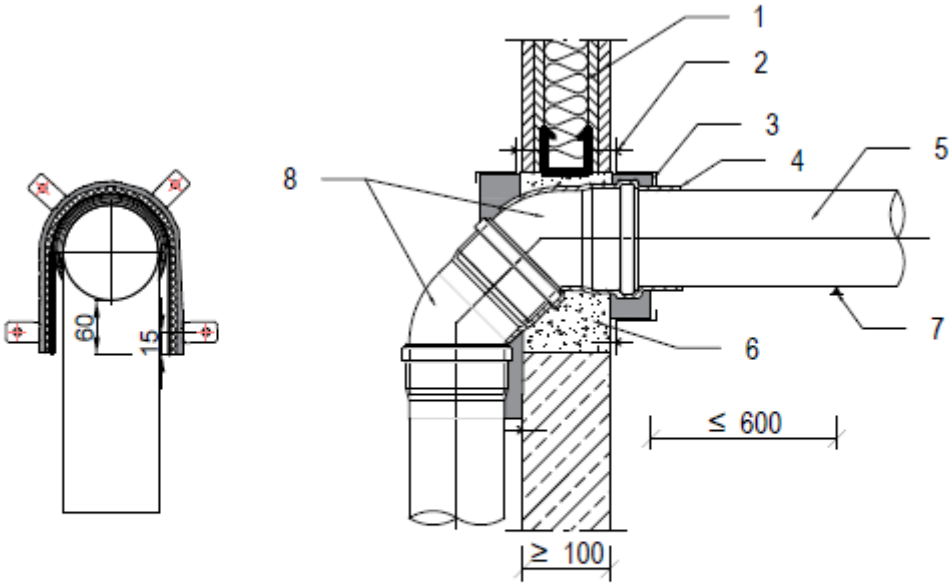


1. flexible wall / rigid wall
2. mounting
3. fire protection collar
4. clima split service bundle
5. annular gap filling acc. to table
6. first support

System ECP, flexible / rigid wall



1. flexible wall / rigid wall
2. mounting
3. fire protection collar
4. insulation acc. to table
5. pipe acc. to table
6. annular gap filling acc. to table
7. first support
8. coupling



1. flexible wall / rigid wall
2. mounting
3. fire protection collar
4. insulation acc. to table
5. pipe acc. to table
6. annular gap filling acc. to table
7. first support
8. 2 x 45°

System ECP	Annex B
Reaction to fire, flexible wall / rigid wall	

System ECP, application wall

Geberit Silent dB 20					
Ø [mm]	**s [mm]**	**Insulation [mm]**	**Installation**	**1 Support [mm]**	**Classification**
56	3,2	PEF, ≤ 5 x ≥ 300	straight	≤ 600	EI 120 - U/U
75	3,6				
90	5,5				
110	6				
135	5,5				
56	3,2	PEF, ≤ 5 x ≥ 300	straight, coupling	≤ 600	EI 120 - U/U
75	3,6				
90	5,5				EI 45 - U/U
56	3,2	PEF, ≤ 5 x ≥ 300	2 x 45°, zero distance to wall	≤ 600	EI 120 - U/U
75	3,6				
90	5,5				
110	6				

Geberit Silent PP					
Ø [mm]	**s [mm]**	**Insulation [mm]**	**Installation**	**1 Support [mm]**	**Classification**
32-50	2	PEF, ≤ 5 x ≥ 300	straight	≤ 600	EI 120 - U/U
75	3,8				
90	4,3				
110	4,5				
125	5				
160	6				
110	3,6	PEF, ≤ 5 x ≥ 300	straight, coupling	≤ 600	EI 120 - U/U
32-50	2	PEF, ≤ 5 x ≥ 300	2 x 45°, zero distance to wall	≤ 600	EI 120 - U/U
75	2,6				
90	3,1				
110	3,6				

Geberit Silent Pro					
Ø [mm]	**s [mm]**	**Insulation [mm]**	**Installation**	**1 Support [mm]**	**Classification**
50	3	PEF, ≤ 5 x ≥ 300	straight	≤ 600	EI 120 - U/U
75	3,8				
90	4,3				
110	4,5				
125	5				
50	3	PEF, ≤ 5 x ≥ 300	straight, coupling	≤ 600	EI 120 - U/U
75	3,8				
90	4,3				
110	4,5				
50	3	PEF, ≤ 5 x ≥ 300	2 x 45°, zero distance to wall	≤ 600	EI 120 - U/U
75	3,8				
90	4,3				

Ostendorf HT Safe					
Ø [mm]	**s [mm]**	**Insulation [mm]**	**Installation**	**1 Support [mm]**	**Classification**
32-50	1,8	PEF, ≤ 5 x ≥ 300	straight	≤ 600	EI 120 - U/U
75	1,9				
90	2,2				
110	2,7				

Ostendorf Skolan Safe					
Ø [mm]	**s [mm]**	**Insulation [mm]**	**Installation**	**1 Support [mm]**	**Classification**
58	4	PEF, ≤ 5 x ≥ 300	straight	≤ 600	EI 120 - U/U
78	4,5				
90	4,5				
110	5,3				EI 90 - U/U E 120 - U/U
135	5,3				
58	4	PEF, ≤ 5 x ≥ 300	straight, coupling	≤ 600	EI 120 - U/U
78	4,5				
90	4,5				
110	5,3				
58	4	PEF, ≤ 5 x ≥ 300	2 x 45°, zero distance to wall	≤ 600	EI 120 - U/U
78	4,5				
90	4,5				
110	5,3				

Pipelife Master 3+					
Ø [mm]	**s [mm]**	**Insulation [mm]**	**Installation**	**1 Support [mm]**	**Classification**
32-40	1,8	PEF, ≤ 5 x ≥ 300	straight	≤ 600	EI 120 - U/U
50	2				
75	2,1				
90	2,5				
110	3				
125	3,9				
32-40	1,8	PEF, ≤ 5 x ≥ 300	straight, coupling	≤ 600	EI 120 - U/U
50	2				
75	2,1				
90	2,5				
32-40	1,8	PEF, ≤ 5 x ≥ 300	2 x 45°, zero distance to wall	≤ 600	EI 120 - U/U
50	2				
75	2,1				
90	2,5				

POLO-KAL 3S					
Ø [mm]	**s [mm]**	**Insulation [mm]**	**Installation**	**1 Support [mm]**	**Classification**
75	3,8	PEF, ≤ 5 x ≥ 300	straight	≤ 600	EI 120 - U/U
90	4,5				
110	4,5				
125	4,8				
160	5,3				EI 90 / E 120 - U/C
50	2,2	PEF, ≤ 5 x ≥ 300	straight, coupling	≤ 600	EI 120 - U/U
75	3,8				
90	4,5				
50	2,2	PEF, ≤ 5 x ≥ 300	2 x 45°, zero distance to wall	≤ 600	EI 120 - U/U
75	3,8				
90	4,5				

POLO-KAL NG / POLO-KAL XS *					
Ø [mm]	**s [mm]**	**Insulation [mm]**	**Installation**	**1 Support [mm]**	**Classification**
32-40	1,8	PEF, ≤ 5 x ≥ 300	straight	≤ 600	EI 120 - U/U
50	2				
75	2,6				
90	3				
110	3,4				
125	3,9				
32-40	1,8	PEF, ≤ 5 x ≥ 300	straight, coupling	≤ 600	EI 120 - U/U
50	2				
75	2,6				
90	3				
110	3,4				
32-40	1,8	PEF, ≤ 5 x ≥ 300	2 x 45°, zero distance to wall	≤ 600	EI 120 - U/U
50	2				
75	2,6				
90	3				
110	3,4				

** only straight Installation*

REHAU Raupiano light					
Ø [mm]	**s [mm]**	**Insulation [mm]**	**Installation**	**1 Support [mm]**	**Classification**
32-50	1,8	PEF, ≤ 5 x ≥ 300	straight	≤ 600	EI 120 - U/U
75	1,9				
90	2,2				
110	2,7				
125	3,1				
32-50	1,8	PEF, ≤ 5 x ≥ 300	straight, coupling	≤ 600	EI 120 - U/U
75	1,9				
90	2,2				
110	2,7				
32-50	1,8	PEF, ≤ 5 x ≥ 300	2 x 45°, zero distance to wall	≤ 600	EI 120 - U/U
75	1,9				
90	2,2				

Conel Drain					
Ø [mm]	**s [mm]**	**Insulation [mm]**	**Installation**	**1 Support [mm]**	**Classification**
32-50	1,8	PEF, ≤ 5 x ≥ 300	straight	≤ 600	EI 120 - U/U
75	1,9				
90	2,2				
110	2,7				
125	3,1				
32-50	1,8	PEF, ≤ 5 x ≥ 300	straight, coupling	≤ 600	EI 120 - U/U
75	1,9				
90	2,2				
110	2,7				
32-50	1,8	PEF, ≤ 5 x ≥ 300	2 x 45°, zero distance to wall	≤ 600	EI 120 - U/U
75	1,9				
90	2,2				

REHAU Raupiano plus					
Ø [mm]	**s [mm]**	**Insulation [mm]**	**Installation**	**1 Support [mm]**	**Classification**
32-50	1,8	PEF, ≤ 5 x ≥ 300	straight	≤ 600	EI 120 - U/U
75	1,9				
90	2,2				
110	2,7				
125	3,1				
32-50	1,8	PEF, ≤ 5 x ≥ 300	straight, coupling	≤ 600	EI 120 - U/U
75	1,9				
90	2,2				
110	2,7				
32-50	1,8	PEF, ≤ 5 x ≥ 300	2 x 45°, zero distance to wall	≤ 600	EI 120 - U/U
75	1,9				
90	2,2				
110	2,7				

Silenta Premium					
Ø [mm]	**s [mm]**	**Insulation [mm]**	**Installation**	**1 Support [mm]**	**Classification**
78	4,6	PEF, ≤ 5 x ≥ 300	straight	≤ 600	EI 120 - U/U
90	4,7				
110	5,3				
135	5,3				
58	4,1	PEF, ≤ 5 x ≥ 300	straight, coupling	≤ 600	EI 120 - U/U
78	4,6				
90	4,7				EI 45 - U/U
58	4,1	PEF, ≤ 5 x ≥ 300	2 x 45°, zero distance to wall	≤ 600	EI 120 - U/U
78	4,6				
90	4,7				
110	5,3				

Upondor Decibel					
Ø [mm]	**s [mm]**	**Insulation [mm]**	**Installation**	**1 Support [mm]**	**Classification**
50	2	PEF, ≤ 5 x ≥ 300	straight	≤ 600	EI 120 - U/U
75	2,6				
110	3,8				
50	2	PEF, ≤ 5 x ≥ 300	straight, coupling	≤ 600	EI 120 - U/U
75	2,6				
50	2	PEF, ≤ 5 x ≥ 300	2 x 45°, zero distance to wall	≤ 600	EI 120 - U/U
75	2,6				
110	3,8				

Valsir Blackfire					
Ø [mm]	**s [mm]**	**Insulation [mm]**	**Installation**	**1 Support [mm]**	**Classification**
32-50	1,8	PEF, ≤ 5 x ≥ 300	straight	≤ 600	EI 120 - U/U
75	2,3				
110	3,4				
125	3,9				
32-50	1,8	PEF, ≤ 5 x ≥ 300	straight, coupling	≤ 600	EI 120 - U/U
75	2,3				
90	2,8				EI 30 - U/U E 45 - U/U
110	3,4				
75	2,3	PEF, ≤ 5 x ≥ 300	2 x 45°, zero distance to wall	≤ 600	EI 120 - U/U

Valsir Triplus					
Ø [mm]	**s [mm]**	**Insulation [mm]**	**Installation**	**1 Support [mm]**	**Classification**
32-50	1,8	PEF, ≤ 5 x ≥ 300	straight	≤ 600	EI 120 - U/U
75	2,6				
90	3,1				
110	3,4				
125	3,9				
32-50	1,8	PEF, ≤ 5 x ≥ 300	straight, coupling	≤ 600	EI 120 - U/U
75	2,6				
90	3,1				
110	3,4				
32-50	1,8	PEF, ≤ 5 x ≥ 300	2 x 45°, zero distance to wall	≤ 600	EI 120 - U/U
75	2,6				
90	3,1				
110	3,4				EI 90 - U/U

Wavin AS+					
Ø [mm]	**s [mm]**	**Insulation [mm]**	**Installation**	**1 Support [mm]**	**Classification**
50	3	PEF, ≤ 5 x ≥ 300	straight	≤ 600	EI 120 - U/U
75	3,5				
90	4,6				
110	5,3				
125	5,3				
50	3	PEF, ≤ 5 x ≥ 300	straight, coupling	≤ 600	EI 120 - U/U
75	3,5				
90	4,6				
110	5,3				EI 60 - U/U
50	3	PEF, ≤ 5 x ≥ 300	2 x 45°, zero distance to wall	≤ 600	EI 120 - U/U
75	3,5				
90	4,6				
110	5,3				

Wavin SiTech+					
Ø [mm]	**s [mm]**	**Insulation [mm]**	**Installation**	**1 Support [mm]**	**Classification**
32-40	2	PEF, ≤ 5 x ≥ 300	straight	≤ 600	EI 120 - U/U
50	2,1				
75	2,6				
90	3,1				
110	3,6				
125	4				
32-40	2	PEF, ≤ 5 x ≥ 300	straight, coupling	≤ 600	EI 120 - U/U
50	2,1				
75	2,6				
90	3,1				
110	3,6				
40	2	PEF, ≤ 5 x ≥ 300	2 x 45°, zero distance to wall	≤ 600	EI 120 - U/U
50	2,1				
75	2,6				
90	3,1				
110	3,6				

PE - HD, ABS, SAN + PVC					
Ø [mm]	**s [mm]**	**Insulation [mm]**	**Installation**	**1 Support [mm]**	**Classification**
32-125	1,5 - 11,4	PEF, ≤ 5 x ≥ 300	straight	≤ 600	EI 120 - U/U
32-160	1,5-14,6				EI 90 - U/C
32-160	1,5-9,2				EI 90 - U/U

PVC-U, PVC-C					
Ø [mm]	**s [mm]**	**Insulation [mm]**	**Installation**	**1 Support [mm]**	**Classification**
32-125	1,9 - 9,2	PEF, ≤ 5 x ≥ 300	straight	≤ 600	EI 120 - U/U
32-160	1,9-11,8				EI 120 - U/C
32-160	1,9-9,2				EI 90 - U/U

PP					
Ø [mm]	**s [mm]**	**Insulation [mm]**	**Installation**	**1 Support [mm]**	**Classification**
32-125	1,8 - 3,1	PEF, ≤ 5 x ≥ 300	straight	≤ 600	EI 120 - U/U
	1,8 - 7,1				EI 90 - U/U
32-160	1,8-9,1				EI 120 - U/C
32-125	1,8-11,4				EI 30 - U/U

HVAC split line combination				
Pipe [mm]	**Ø x s [mm]**	**Insulation [mm]**	**1 Support [mm]**	**Classification**
Copper	≤ 2 x Ø ≤ 18	PEF, (CS) 9,0	≤ 600	EI 120 - U/C
λ ≤ 380 W/mK	t= 1 - 14,2	-		
PE - HD; ABS; SAN + PVC	≤ 1 x ≤ Ø 25/t3,5	-	-	EI 120 - U/U
Cable	≤ 3 x Ø 14	-	-	EI 120

EIC - Bundle		
Pipe [mm]	**Ø [mm]**	**Classification**
EIC - Bundle	≤ 7 x ≤ 32	EI 120 - U/U

System ECP, rigid floor

The floor must have a minimum thickness of ≥150 mm and consist of aerated concrete or concrete with a minimum density of ≥650 kg/m³.
The rigid floor shall be classified in accordance with EN 13501-2 for the required fire resistance period.

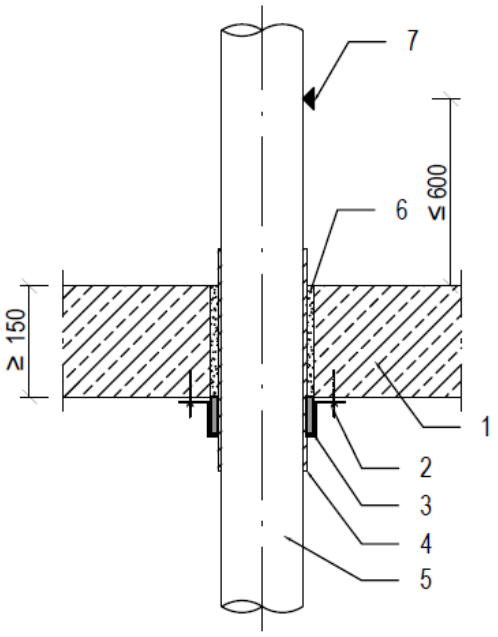
Gapfiller	Mortar
Backfilling	-
Width	10 – 20 mm
Depth	≥ 150 mm

Gapfiller	BIOFERM-A
Backfilling	-
Width	10 – 20 mm
Depth	20 mm on both sides

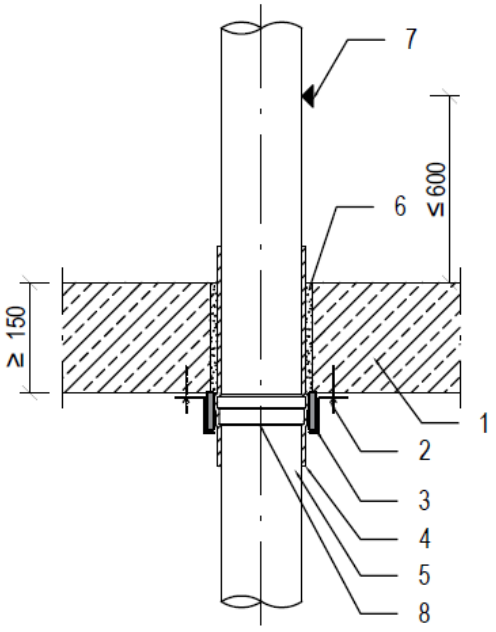
Table 3, floor constructions

Fasteners for rigid floor constructions:
- HECO MULTI-MONTI-plus MMS-plus-P 6.0 x 50
- HILTI HUS3-P 6x60
- Würth concrete screw with pan head W-BS/S 6 x 50
- fischer concrete screw UltraCut FBS II 6 x 60/5 P Pan head
- Sikla Screwbolt TSM LP VZ 30 6 x 60
- TOGE TSM High Performance 6 x 50 P VZ30
- EJOT® Concrete screw JC2-FR 6 6x60

System ECP, rigid floor

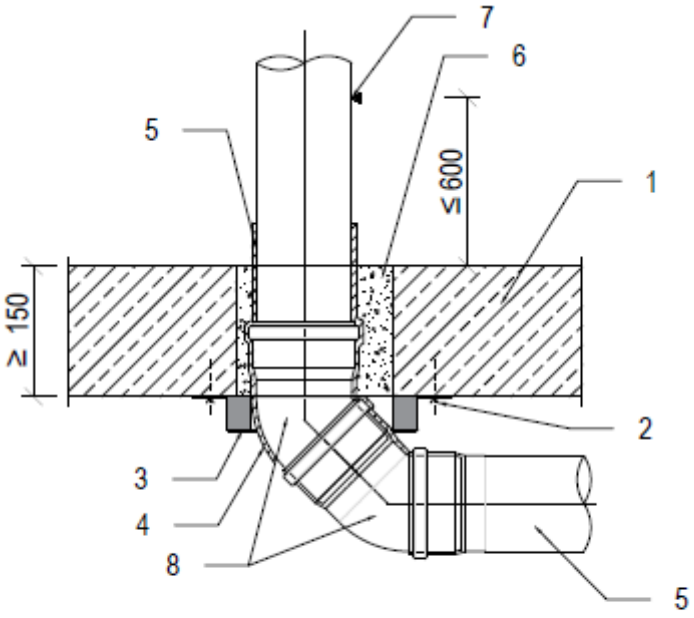


1. aerated concrete floor
2. mounting
3. fire protection collar
4. insulation acc. to table
5. pipe acc. to table
6. annular gap filling acc. to table
7. first support

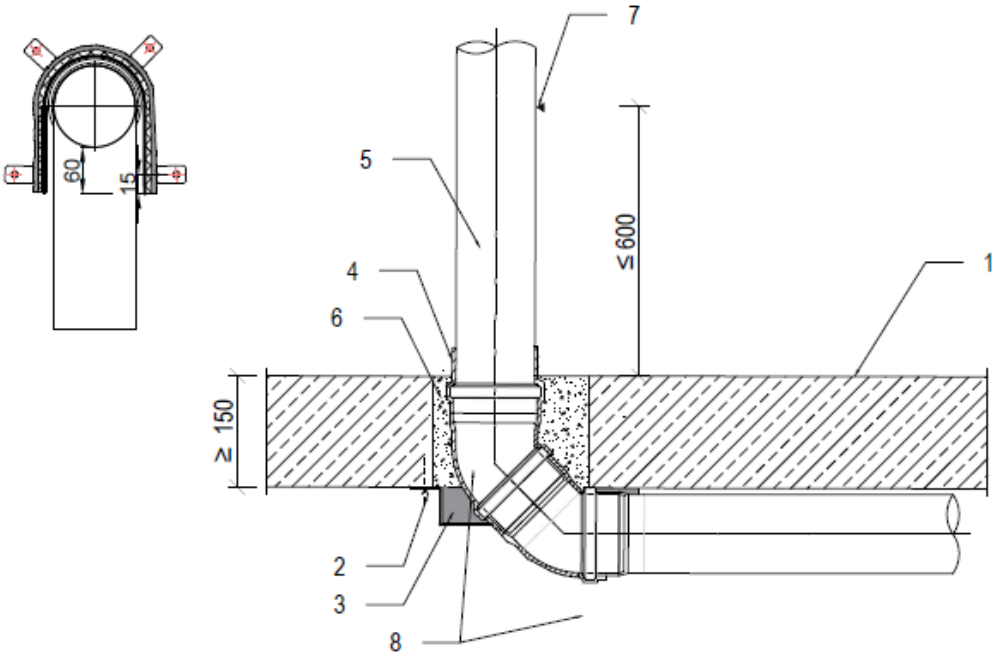


1. aerated concrete floor
2. mounting
3. fire protection collar
4. insulation acc. to table
5. pipe acc. to table
6. annular gap filling acc. to table
7. first support
8. coupling

System ECP	Annex C
Reaction to fire, rigid floor	



1. aerated concrete floor
2. mounting
3. fire protection collar
4. insulation acc. to table
5. pipe acc. to table
6. annular gap filling acc. to table
7. first support
8. 2 x 45°



1. aerated concrete floor
2. mounting
3. fire protection collar
4. insulation acc. to table
5. pipe acc. to table
6. annular gap filling acc. to table
7. first support
8. 2 x 45°, zero distance to floor

System ECP	Annex C
Reaction to fire, rigid floor	

System ECP application floor

Geberit Silent PP					
Ø [mm]	**s [mm]**	**Insulation [mm]**	**Installation**	**1 Support [mm]**	**Classification**
32-50	2	PEF, ≤ 5 x ≥ 300	straight	≤ 600	EI 120 - U/U
75	2,6				
90	3,1				
110	3,6				
125	4,2				
32-50	2	PEF, ≤ 5 x ≥ 300	straight, coupling	≤ 600	EI 120 - U/U
75	2,6				
90	3,1				
110	3,6				
32-50	2	PEF, ≤ 5 x ≥ 300	2 x 45 °	≤ 600	EI 120 - U/U
75	2,6				
90	3,1				
110	3,6				
32-50	2	PEF, ≤ 5 x ≥ 300	2 x 45 °, zero distance to floor	≤ 600	EI 120 - U/U
75	2,6				
90	3,1				
110	3,6				

Geberit Silent dB 20					
Ø [mm]	**s [mm]**	**Insulation [mm]**	**Installation**	**1 Support [mm]**	**Classification**
56	3,2	PEF, ≤ 5 x ≥ 300	straight	≤ 600	EI 120 - U/U
75	3,6				
90	5,5				
110	6				
135	6				
160	7				

Geberit Silent Pro					
Ø [mm]	**s [mm]**	**Insulation [mm]**	**Installation**	**1 Support [mm]**	**Classification**
50	3	PEF, ≤ 5 x ≥ 300	straight	≤ 600	EI 120 - U/U
75	3,8				
90	4,3				
110	4,5				
125	5				
160	6				
50	3	PEF, ≤ 5 x ≥ 300	straight, coupling	≤ 600	EI 120 - U/U
75	3,8				
90	4,3				
110	4,5				
125	5				
75	3,8	PEF, ≤ 5 x ≥ 300	2 x 45 °	≤ 600	EI 120 - U/U
50	3	PEF, ≤ 5 x ≥ 300	2 x 45 °, zero distance to floor	≤ 600	EI 120 - U/U
75	3,8				
90	4,3				

Ostendorf HT Safe					
Ø [mm]	**s [mm]**	**Insulation [mm]**	**Installation**	**1 Support [mm]**	**Classification**
32-50	1,8	PEF, ≤ 5 x ≥ 300	straight	≤ 600	EI 120 - U/U
75	1,8				
90	2,2				
110	3,7				
125	3,1				
32-50	1,8	PEF, ≤ 5 x ≥ 300	straight, coupling	≤ 600	EI 120 - U/U
75	1,9				
90	2,2				
110	2,7				
125	3,1				
32-50	1,8	PEF, ≤ 5 x ≥ 300	2 x 45 °	≤ 600	EI 120 - U/U
75	1,9				
90	2,2				
110	2,7				
32-50	1,8	PEF, ≤ 5 x ≥ 300	2 x 45°, zero distance to floor	≤ 600	EI 120 - U/U
75	1,9				
90	2,2				

Ostendorf Skolan Safe					
Ø [mm]	**s [mm]**	**Insulation [mm]**	**Installation**	**1 Support [mm]**	**Classification**
58	4	PEF, ≤ 5 x ≥ 300	straight	≤ 600	EI 120 - U/U
78	4,5				
90	4,5				
110	5,3				
135	5,3				
160	5,3				
78	4,5	PEF, ≤ 5 x ≥ 300	straight, coupling	≤ 600	EI 120 - U/U
90	4,5				
110	5,3				
135	5,3				
110	5,3	PEF, ≤ 5 x ≥ 300	2 x 45°	≤ 600	EI 120 - U/U

Pipelife Master 3+					
Ø [mm]	**s [mm]**	**Insulation [mm]**	**Installation**	**1 Support [mm]**	**Classification**
32-40	1,8	PEF, ≤ 5 x ≥ 300	straight	≤ 600	EI 120 - U/U
50	2				
75	2,1				
90	2,5				
110	3				
125	3,9				
160	4,9				
32-40	1,8	PEF, ≤ 5 x ≥ 300	straight, coupling	≤ 600	EI 120 - U/U
50	2				
75	2,1				
90	2,5				
110	3				
32-40	1,8	PEF, ≤ 5 x ≥ 300	2 x 45°	≤ 600	EI 120 - U/U
50	2				
75	2,1				
90	2,5				
90	2,5	PEF, ≤ 5 x ≥ 300	2 x 45°, zero distance to floor	≤ 600	EI 120 - U/U

POLO-KAL 3S					
Ø [mm]	**s [mm]**	**Insulation [mm]**	**Installation**	**1 Support [mm]**	**Classification**
75	3,8	PEF, ≤ 5 x ≥ 300	straight	≤ 600	EI 120 - U/U
90	4,5				
110	4,8				
125	5,3				
75	3,8	PEF, ≤ 5 x ≥ 300	straight, coupling	≤ 600	EI 120 - U/U
90	4,5				
110	4,8				
75	3,8	PEF, ≤ 5 x ≥ 300	2 x 45°	≤ 600	EI 120 - U/U
50	2,2	PEF, ≤ 5 x ≥ 300	2 x 45°, zero distance to floor	≤ 600	EI 120 - U/U
75	3,8				
90	4,5				
110	4,8				

POLO-KAL NG / POLO-KAL XS *					
Ø [mm]	**s [mm]**	**Insulation [mm]**	**Installation**	**1 Support [mm]**	**Classification**
32-40	1,8	PEF, ≤ 5 x ≥ 300	straight	≤ 600	EI 120 - U/U
50	2				
75	2,6				
90	3				
110	3,4				
125	3,9				
32-40	1,8	PEF, ≤ 5 x ≥ 300	straight, coupling	≤ 600	EI 120 - U/U
50	2				
75	2,6				
90	3				
110	3,4				
32-40	1,8	PEF, ≤ 5 x ≥ 300	2 x 45°, zero distance to floor	≤ 600	EI 120 - U/U
50	2				
75	2,6				
90	3				
110	3,4				

** only straight Installation*

REHAU Raupiano light					
Ø [mm]	**s [mm]**	**Insulation [mm]**	**Installation**	**1 Support [mm]**	**Classification**
32-50	1,8	PEF, ≤ 5 x ≥ 300	straight	≤ 600	EI 120 - U/U
75	1,9				
90	2,2				
110	2,7				
125	3,1				
32-50	1,8	PEF, ≤ 5 x ≥ 300	straight, coupling	≤ 600	EI 120 - U/U
75	1,9				
90	2,2				
110	2,7				
32-50	1,8	PEF, ≤ 5 x ≥ 300	2 x 45°	≤ 600	EI 120 - U/U
75	1,9				
90	2,2				
110	2,7				
32-50	1,8	PEF, ≤ 5 x ≥ 300	2 x 45°, zero distance to floor	≤ 600	EI 120 - U/U
75	1,9				
90	2,2				
110	2,7				

Conel Drain					
Ø [mm]	**s [mm]**	**Insulation [mm]**	**Installation**	**1 Support [mm]**	**Classification**
32-50	1,8	PEF, ≤ 5 x ≥ 300	straight	≤ 600	EI 120 - U/U
75	1,9				
90	2,2				
110	2,7				
32-50	1,8	PEF, ≤ 5 x ≥ 300	straight, coupling	≤ 600	EI 120 - U/U
75	1,9				
90	2,2				
110	2,7				
32-50	1,8	PEF, ≤ 5 x ≥ 300	2 x 45°	≤ 600	EI 120 - U/U
75	1,9				
90	2,2				
110	2,7				
32-50	1,8	PEF, ≤ 5 x ≥ 300	2 x 45°, zero distance to floor	≤ 600	EI 120 - U/U
75	1,9				
90	2,2				
110	2,7				

REHAU Raupiano plus					
Ø [mm]	**s [mm]**	**Insulation [mm]**	**Installation**	**1 Support [mm]**	**Classification**
32-50	1,8	PEF, ≤ 5 x ≥ 300	straight	≤ 600	EI 120 - U/U
75	1,9				
90	2,2				
110	2,7				
125	3,1				
32-50	1,8	PEF, ≤ 5 x ≥ 300	straight, coupling	≤ 600	EI 120 - U/U
75	1,9				
90	2,2				
110	2,7				
32-50	1,8	PEF, ≤ 5 x ≥ 300	2 x 45°	≤ 600	EI 120 - U/U
32-50	1,8	PEF, ≤ 5 x ≥ 300	2 x 45°, zero distance to floor	≤ 600	EI 120 - U/U
75	1,9				
90	2,2				

Silenta Premium					
Ø [mm]	**s [mm]**	**Insulation [mm]**	**Installation**	**1 Support [mm]**	**Classification**
58	4,1	PEF, ≤ 5 x ≥ 300	straight	≤ 600	EI 120 - U/U
78	4,6				
90	4,7				
110	5,3				
135	5,3				
58	4,1	PEF, ≤ 5 x ≥ 300	straight, coupling	≤ 600	EI 120 - U/U
78	4,6				
90	4,7				
110	5,3				
78	4,6	PEF, ≤ 5 x ≥ 300	2 x 45°	≤ 600	EI 120 - U/U
90	4,7				
78	4,6	PEF, ≤ 5 x ≥ 300	2 x 45°, zero distance to floor	≤ 600	EI 120 - U/U

Uponor Decibel					
Ø [mm]	**s [mm]**	**Insulation [mm]**	**Installation**	**1 Support [mm]**	**Classification**
50	2	PEF, ≤ 5 x ≥ 300	straight	≤ 600	EI 120 - U/U
75	2,6				
110	3,8				
75	2,6	PEF, ≤ 5 x ≥ 300	straight, coupling	≤ 600	EI 120 - U/U
75	2,6	PEF, ≤ 5 x ≥ 300	2 x 45°	≤ 600	EI 120 - U/U
110	3,8				
50	2	PEF, ≤ 5 x ≥ 300	2 x 45°, zero distance to floor	≤ 600	EI 120 - U/U
75	2,6				
110	3,8				

Valsir Blackfire					
Ø [mm]	**s [mm]**	**Insulation [mm]**	**Installation**	**1 Support [mm]**	**Classification**
32-50	1,8	PEF, ≤ 5 x ≥ 300	straight	≤ 600	EI 120 - U/U
75	2,3				
90	2,8				
110	3,4				
125	3,9				
32-50	1,8	PEF, ≤ 5 x ≥ 300	straight, coupling	≤ 600	EI 120 - U/U
75	2,3				
90	2,8				
110	3,4				
125	3,9				
110	3,4	PEF, ≤ 5 x ≥ 300	2 x 45°, zero distance to floor	≤ 600	EI 120 - U/U

Valsir Triplus					
Ø [mm]	**s [mm]**	**Insulation [mm]**	**Installation**	**1 Support [mm]**	**Classification**
32-50	1,8	PEF, ≤ 5 x ≥ 300	straight	≤ 600	EI 120 - U/U
75	2,6				
90	3,1				
110	3,4				
125	3,9				
75	2,6	PEF, ≤ 5 x ≥ 300	straight, coupling	≤ 600	EI 120 - U/U
90	3,1				
110	3,4				
125	3,9				
90	3,1	PEF, ≤ 5 x ≥ 300	2 x 45°	≤ 600	EI 120 - U/U
110	3,4				

Wavin AS+					
Ø [mm]	**s [mm]**	**Insulation [mm]**	**Installation**	**1 Support [mm]**	**Classification**
50	3	PEF, ≤ 5 x ≥ 300	straight	≤ 600	EI 120 - U/U
75	3,5				
90	4,6				
110	5,3				
125	5,3				
160	5,6				
50	3	PEF, ≤ 5 x ≥ 300	straight, coupling	≤ 600	EI 120 - U/U
75	3,5				
90	4,6				
110	5,3				
125	5,3				
90	4,6	PEF, ≤ 5 x ≥ 300	2 x 45°, zero distance to floor	≤ 600	EI 120 - U/U

Wavin SiTech+					
Ø [mm]	**s [mm]**	**Insulation [mm]**	**Installation**	**1 Support [mm]**	**Classification**
32-40	2	PEF, ≤ 5 x ≥ 300	straight	≤ 600	EI 120 - U/U
50	2,1				
75	2,6				
90	3,1				
110	3,6				
125	4				
32-40	2	PEF, ≤ 5 x ≥ 300	straight, coupling	≤ 600	EI 120 - U/U
50	2,1				
75	2,6				
90	3,1				
110	3,6				
125	4				
32-40	2	PEF, ≤ 5 x ≥ 300	2 x 45°	≤ 600	EI 120 - U/U
50	2,1				
90	3,1				
50	2,1	PEF, ≤ 5 x ≥ 300	2 x 45°, zero distance to floor	≤ 600	EI 120 - U/U
75	2,6				
90	3,1				

PE - HD, ABS, SAN + PVC					
Ø [mm]	**s [mm]**	**Insulation [mm]**	**Installation**	**1 Support [mm]**	**Classification**
32-125	1,8 -7,1	PEF, ≤ 5 x ≥ 300	straight	≤ 600	EI 120 - U/U
32-125	1,8 - 11,0				EI 30 - U/U
32-160	1,8-4,0				EI 120 - U/U
32-160	1,8-14,6				EI 120 - U/C

PVC-U, PVC-C					
Ø [mm]	**s [mm]**	**Insulation [mm]**	**Installation**	**1 Support [mm]**	**Classification**
32-125	1,9 - 9,2	PEF, ≤ 5 x ≥ 300	straight	≤ 600	EI 120 - U/U
32-160	1,9-11,8				EI 120 - U/C

PP					
Ø [mm]	**s [mm]**	**Insulation [mm]**	**Installation**	**1 Support [mm]**	**Classification**
32-125	1,6 - 11,0	PEF, ≤ 5 x ≥ 300	straight	≤ 600	EI 30 - U/U
32-125	1,6-7,1				EI 120 - U/U
32-160	1,6-14,6				EI 120 - U/C

System Flammotect 1 x 60 mm

Consisting of Mineral Fibre Boards (ρ ≥ 150 kg/m³, θ ≥ 1000 °C, thickness = 60 mm) pre-coated on both sides with FLAMMOTECTA paint with a dry film thickness of approxi-mately 0.5 mm

Gapfiller	FLAMMOTECT-A, 1,0 mm
Backfilling	loose wool, Mineral Fibre Board
Width	10 – 20 mm
Depth	60 mm

Table 4, System Flammotect 1 x 60 mm

Fastening:
- Würth ASSY 6x60/52

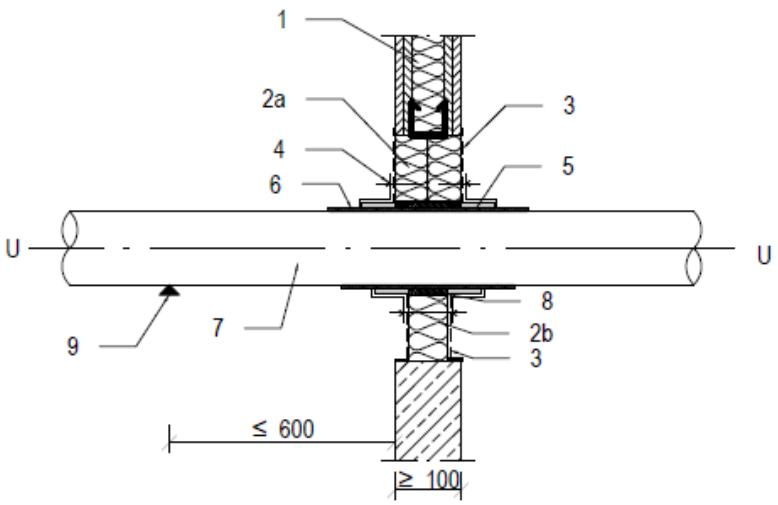
System Flammotect 2 x 50 mm

Consisting of Mineral Fibre Boards (ρ ≥ 150 kg/m³, θ ≥ 1000 °C, thickness = 50 mm) pre-coated on one side with FLAMMOTECT-A paint with a dry film thickness of approximately 0.5 mm

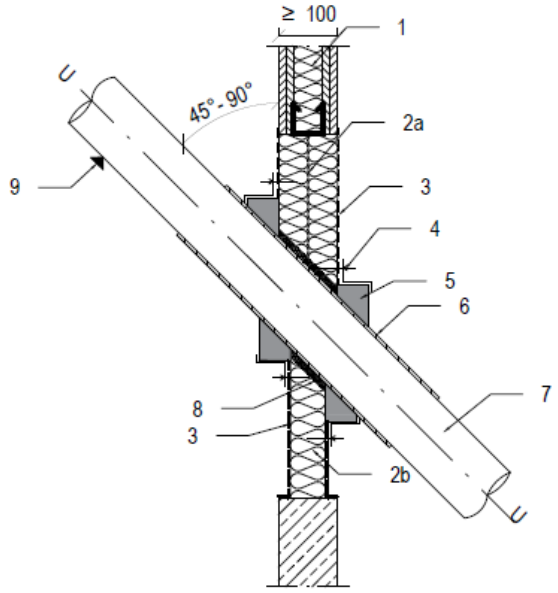
Gapfiller	FLAMMOTECT-A, 1,0 mm
Backfilling	loose wool, Mineral Fibre Board
Width	10 – 20 mm
Depth	2 x 50 mm

Table 4, System Flammotect 2 x 50 mm

Fastening:
- Würth ASSY D 8x70/60
- Heco-Topix-plus 8x80
- Spax T-Star plus 8x80

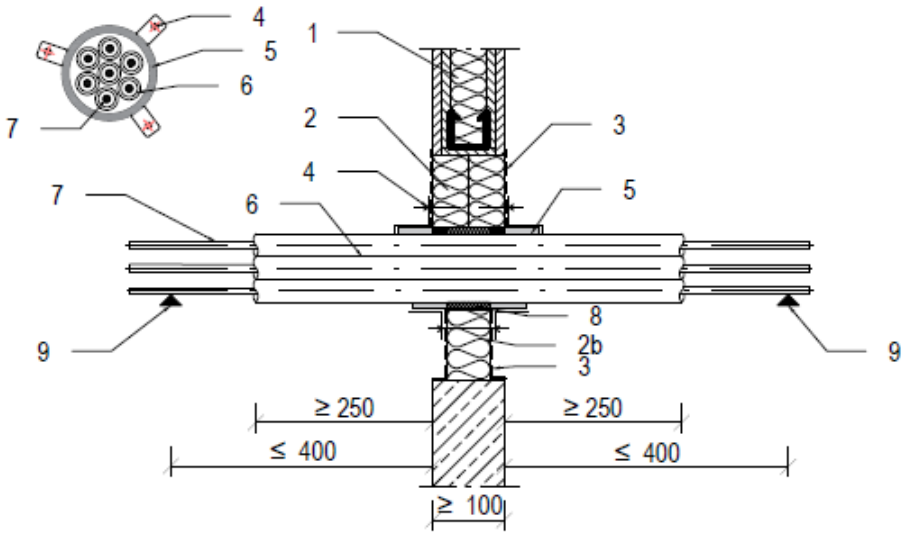


1. flexible wall / rigid wall
2a. 2 x 50 mm mineral fibre board
2b. 1 x 60 mm mineral fibre board
3. coating
4. mounting
5. fire protection collar
6. Insulation acc. to table
7. pipe acc. to table
8. annular gap filling acc. to table
9. first support



1. flexible wall / rigid wall
2a. 2 x 50 mm mineral fibre board
2b. 1 x 60 mm mineral fibre board
3. coating
4. mounting
5. fire protection collar
6. Insulation acc. to table
7. pipe acc. to table
8. annular gap filling acc. to table
9. first support

System ECP	Annex D
Mineral fibre board seal 1 x 60 mm and 2 x 50 mm	



1. flexible wall / ridgid wall
2a. 2 x 50 mm mineral fibre board
2b. 1 x 60 mm mineral fibre board
3. coating
4. mounting
5. fire protection collar
6. flexible conduit bundle
7. cables
8. annular gap filling acc. to table
9. first support (cables

Application wall 1 x 60 mm

aquatherm blue MF RP					
Ø [mm]	**s [mm]**	**Insulation [mm]**	**Installation**	**1 Support [mm]**	**Classification**
50	4,6	PEF, ≤ 5 x ≥ 300	straight	≤ 580	EI 60 - U/C
50	4,6	FEF, (LS) 350 x ≤ 32	straight	≤ 580	EI 60 - U/C

Geberit Systempipe ML					
Ø [mm]	**s [mm]**	**Insulation [mm]**	**Installation**	**1 Support [mm]**	**Classification**
16	2	PEF, (LS) 350 x ≤20	straight	≤ 580	EI 60 - U/C
20	2				
25	2,5				
32	2,8				
40	3				EI 45 / E 60 - U/C
50	3,8				
63	4				
16	2	FEF, (LS) 350 x 10-32			EI 60 - U/C
20	2				
25	2,5				
32	2,8				
40	3				
50	3,8				
63	4				
16	2	-	straight, bundles	≤ 580	EI 45 - U/C E 60 - U/C
20	2				

Ø Bundle ≤ 75 mm

Metal pipes					
Ø [mm]	**s [mm]**	**Insulation [mm]**	**Installation**	**1 Support [mm]**	**Classification**
≤ 76,1	≥ 2,9	Isover ML3, (LS) 450 x 30	straight	≤ 510	EI 60 - C/U
≤ 76,1	≥ 2,9	Isover ML3, (LS) 450 x 50			EI 45 E 60 C/U
≤ 139,7	≥ 4,0				

REHAU Raupiano plus					
Ø [mm]	**s [mm]**	**Insulation [mm]**	**Installation**	**1 Support [mm]**	**Classification**
110	2,7	PEF, ≤ 5 x ≥ 300	straight	≤ 580	EI 60 - U/U

aquatherm green MF RP					
Ø [mm]	**s [mm]**	**Insulation [mm]**	**Installation**	**1 Support [mm]**	**Classification**
50	4,6	PEF, ≤ 5 x ≥ 300	straight	≤ 580	EI 60 - U/C
50	4,6	FEF, (LS) 350 x ≤ 32	straight	≤ 580	EI 60 - U/C

PVC-U and PVC-C					
Ø [mm]	**s [mm]**	**Insulation [mm]**	**Installation**	**1 Support [mm]**	**Classification**
32-110	3,2	PEF, ≤ 5 x ≥ 300	straight	≤ 580	EI 60 - U/U
32-110	3,2	PEF, ≤ 5 x ≥ 300	45° - 90°	≤ 580	EI 60 - U/U

PE- HD, ABS and SAN + PVC					
Ø [mm]	**s [mm]**	**Insulation [mm]**	**Installation**	**1 Support [mm]**	**Classification**
32-110	2,7	PEF, ≤ 5 x ≥ 300	straight	≤ 580	EI 45 / E 60 - U/U
32-110	2,7	PEF, ≤ 5 x ≥ 300	45° - 90°	≤ 580	EI 60 - U/U

PP					
Ø [mm]	**s [mm]**	**Insulation [mm]**	**Installation**	**1 Support [mm]**	**Classification**
32-125	2,7-3,1	PEF, ≤ 5 x ≥ 300	straight	≤ 580	EI 60 - U/U
32-110	2,7	PEF, ≤ 5 x ≥ 300	45° - 90°	≤ 580	EI 60 - U/U

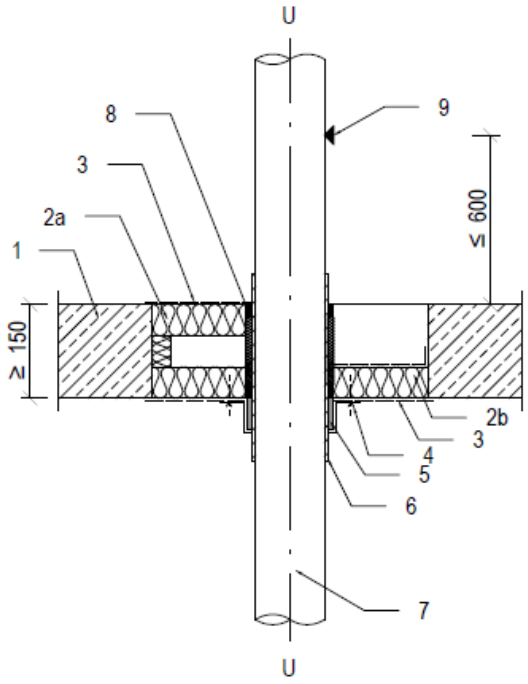
HVAC split line combination				
Pipe [mm]	**Ø x s [mm]**	**Insulation [mm]**	**1 Support [mm]**	**Classification**
Copper λ ≤ 380 W/mK	≤ 2 x Ø ≤ 22 mm	PEF, (CS) 9,0	≤ 600	EI 45 - C/U EI 60 - U/U
PE - HD; ABS; SAN + PVC	≤ 1 x ≤ Ø 25/s1,5	-	-	
Cable	≤ 3 x Ø ≤ 14	-	-	EI 60

EIC - Bundle		
Pipe [mm]	**Ø [mm]**	**Classification**
EIC - Bundle flexible / elastic	Ø ≤ 172mm	EI 60 - U/U
EIC - flexible / elastic	Ø ≤ 63mm	

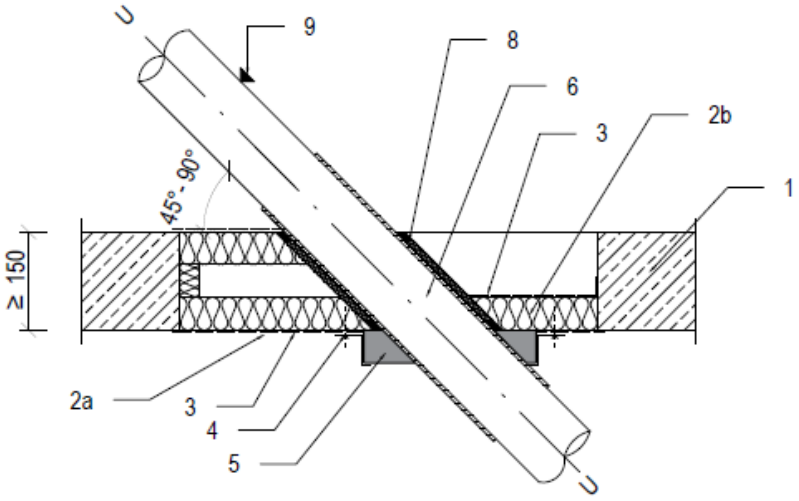
with and without cables

Python pipe - Bundle			
Pipe [mm]	**Ø [mm]**	**Insulation [mm]**	**Classification**
Bundle + Insulation	Ø ≤ 108mm	CS 19 mm	EI 60 - U/U
	≤ 13 x Ø 9,5/1,4 ≤ 2 x Ø 12,7/1,6		

Application floor

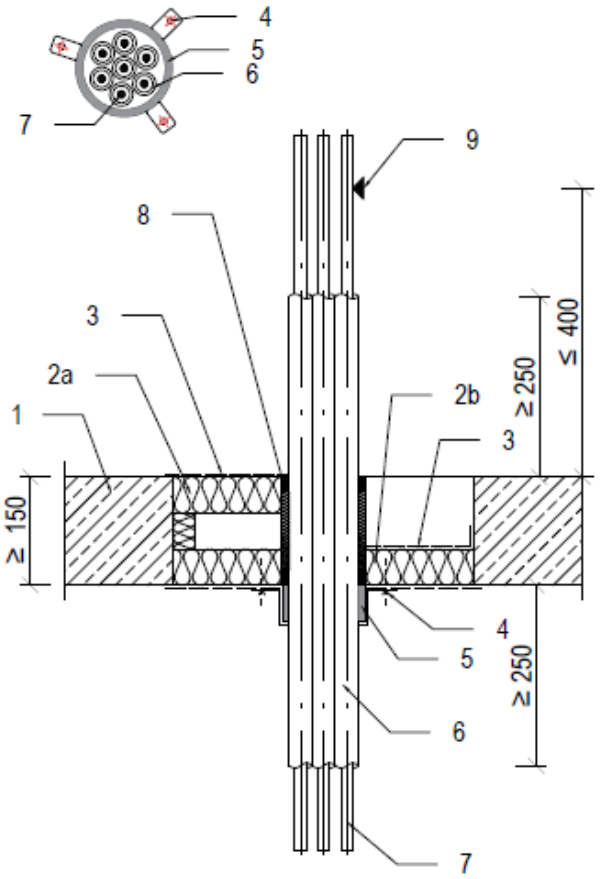


1. aerated concrete floor
2a. 2 x 50 mm mineral fibre board
2b. 1 x 60 mm mineral fibre board
3. coating
4. mounting
5. fire protection collar
6. insulation acc. to table
7. pipe acc. to table
8. annular gap filling acc. to table
9. first support



1. aerated concrete floor
2a. 2 x 50 mm mineral fibre board
2b. 1 x 60 mm mineral fibre board
3. coating
4. mounting
5. fire protection collar
6. insulation acc. to table
7. pipe acc. to table
8. annular gap filling acc. to table
9. first support

System ECP	Annex F
Mineral fibre board seal 1 x 60 mm and 2 x 50 mm	



1. aerated concrete floor
2a. 2 x 50 mm mineral fibre board
2b. 1 x 60 mm mineral fibre board
3. coating
4. mounting
5. fire protection collar
6. flexible conduit bundle
7. Cables
8. annular gap filling acc. to table
9. first support (cables)

Application floor 1 x 60 mm

aquatherm green MF RP					
Ø [mm]	**s [mm]**	**Insulation [mm]**	**Installation**	**1 Support [mm]**	**Classification**
50	4,6	PEF, ≤ 5 x ≥ 300	straight	≤ 510	EI 60 - U/C
50	4,6	FEF, (LS) 350 x ≤32			

aquatherm blue MF RP					
Ø [mm]	**s [mm]**	**Insulation [mm]**	**Installation**	**1 Support [mm]**	**Classification**
50	4,6	PEF, ≤ 5 x ≥ 300	straight	≤ 510	EI 60 - U/C
50	4,6	FEF, (LS) 350 x ≤32			

Geberit Systempipe ML					
Ø [mm]	**s [mm]**	**Insulation [mm]**	**Installation**	**1 Support [mm]**	**Classification**
16	2	PEF, (LS) 350 x ≤ 20	straight	≤ 510	EI 60 - U/C
20	2				
25	2,5				
32	2,8				
40	3				
50	3,8				
63	4				
16	2	FEF, (LS) 350 x 10	straight	≤ 510	EI 60 - U/C
20	2				
25	2,5				
32	2,8				
40	3				
50	3,8				
63	4				
16	2	FEF, (LS) 350 x 32	straight	≤ 510	EI 45 - U/C E 60 - U/C
20	2				
25	2,5				
32	2,8				
40	3				
50	3,8				
63	4				
16	2	-	straight, bundles		EI 30 / E 60 - U/C
20	2				

Ø Bundle ≤ 75 mm

POLO-KAL 3S					
Ø [mm]	**s [mm]**	**Insulation [mm]**	**Installation**	**1 Support [mm]**	**Classification**
110	4,8	PEF, ≤ 5 x ≥ 300	straight	≤ 510	EI 60 - U/U

Ostendorf HT Safe					
Ø [mm]	**s [mm]**	**Insulation [mm]**	**Installation**	**1 Support [mm]**	**Classification**
125	3,1	PEF, ≤ 5 x ≥ 300	straight	≤ 510	EI 60 - U/U

Metal pipes					
Ø [mm]	**s [mm]**	**Insulation [mm]**	**Installation**	**1 Support [mm]**	**Classification**
≤ 76,1	≥ 2,9	Isover ML3, (LS) 450 x 30	straight	≤ 510	EI 30 - C/U E 60 - U/C
≤ 76,1	≥ 2,9	Isover ML3, (LS) 450 x 50			EI 60 - C/U
≤ 139,7	≥ 4,0				

PVC-U and PVC-C					
Ø [mm]	**s [mm]**	**Insulation [mm]**	**Installation**	**1 Support [mm]**	**Classification**
32-110	3,2	PEF, ≤ 5 x ≥ 300	straight	≤ 510	EI 45 - U/U E 60 - U/U
32-110	3,2	PEF, ≤ 5 x ≥ 300	45° - 90°	≤ 510	EI 45 - U/U

PE- HD, ABS and SAN + PVC					
Ø [mm]	**s [mm]**	**Insulation [mm]**	**Installation**	**1 Support [mm]**	**Classification**
32-110	2,7	PEF, ≤ 5 x ≥ 300	straight	≤ 510	EI 60 - U/U
32-110	2,7	PEF, ≤ 5 x ≥ 300	45° - 90°	≤ 510	EI 45 - U/U E 60 - U/U

PP					
Ø [mm]	**s [mm]**	**Insulation [mm]**	**Installation**	**1 Support [mm]**	**Classification**
32-110	2,7	PEF, ≤ 5 x ≥ 300	straight	≤ 510	EI 60 - U/U
32-125	2,7-7,1				EI 45 - U/U E 60 - U/U
32-110	2,7	PEF, ≤ 5 x ≥ 300	45° - 90°	≤ 510	EI 45 - U/U

HVAC split line combination				
Pipe [mm]	**Ø x s [mm]**	**Insulation [mm]**	**1 Support [mm]**	**Classification**
Copper	≤ 2 x Ø 22 mm	PEF, (CS) 9,0	≤ 600	EI 45 - C/U EI 60 - C/U
λ ≤ 380 W/mK	t=9 mm			
PE - HD; ABS; SAN + PVC	≤ 1 x ≤ Ø 25/s1,5 mm	-		EI 45 - U/U EI 60 - U/U
Cable	≤ 3 x Ø ≤ 14 mm	-		EI 45 / E 60

EIC - Bundle		
Pipe [mm]	**Ø [mm]**	**Classification**
EIC - Bundle flexible / elastic	Ø ≤ 115 mm	EI 60 - U/U
EIC - flexible / elastic	Ø ≤ 32mm	

with and without cables

Python pipe - Bundle			
Pipe [mm]	**Ø [mm]**	**Insulation [mm]**	**Classification**
Bundle + Insulation	Ø ≤ 108mm	(CS) 19	EI 60 - U/U
	≤ 13 x Ø 9,5/1,4 ≤ 2 x Ø 12,7/1,6		

Application wall 2 x 50 mm

aquatherm green MF RP					
Ø [mm]	**s [mm]**	**Insulation [mm]**	**Installation**	**1 Support [mm]**	**Classification**
50	4,6	PEF, ≤ 5 x ≥ 300	straight	≤ 600	EI 120 - U/C
50	4,6	FEF, (LS) 350 x 32			

aquatherm blue MF RP					
Ø [mm]	**s [mm]**	**Insulation [mm]**	**Installation**	**1 Support [mm]**	**Classification**
50	4,6	PEF, ≤ 5 x ≥ 300	straight	≤ 600	EI 90 - U/C
50	4,6	FEF, (LS) 350 x 32			

Ostendorf Skolan Safe					
Ø [mm]	**s [mm]**	**Insulation [mm]**	**Installation**	**1 Support [mm]**	**Classification**
135	5,3	PEF, ≤ 5 x ≥ 300	straight	≤ 600	EI 120 - U/U

POLO-KAL 3S					
Ø [mm]	**s [mm]**	**Insulation [mm]**	**Installation**	**1 Support [mm]**	**Classification**
110	4,8	PEF, ≤ 5 x ≥ 300	straight	≤ 600	EI 120 - U/U

Metal pipes					
Ø [mm]	**s [mm]**	**Insulation [mm]**	**Installation**	**1 Support [mm]**	**Classification**
≤ 76,1	≥ 2,9	Isover ML3, (LS) 450 x 30	straight	≤ 510	EI 90 - C/U E 120 - C/U
≤ 76,1	≥ 2,9	Isover ML3, (LS) 450 x 50			EI 60 - C/U E 120 - C/U
≤ 139,7	≥ 4,0				

Geberit Systempipe ML					
Ø [mm]	**s [mm]**	**Insulation [mm]**	**Installation**	**1 Support [mm]**	**Classification**
16	2	-	straight	≤ 510	EI 120 - U/C EI 90 - U/C E 120 - U/C
20	2				
25	2,5				
32	2,8				
16	2	PEF, (LS) 350 x ≤20	straight	≤ 510	EI 120 - U/C EI 90 - U/C E 120 - U/C
20	2				
25	2,5				
32	2,8				
40	3				EI 60 - U/C E 120 - U/C
50	3,8				
63	4				
16	2	FEF, (LS) 350 x 10-32	straight	≤ 510	EI 120 - U/C
20	2				
25	2,5	FEF, (LS) 350 x 10			EI 120 - U/C
25	2,5	FEF, (LS) 350 x 32			EI 90 - U/C
32	2,8	FEF, (LS) 350 x 10			EI 120 - U/C
32	2,8	FEF, (LS) 350 x 32			EI 90 - U/C
40	3	FEF, (LS) 350 x 10			EI 60 - U/C
40	3	FEF, (LS) 350 x 32			EI 90 - U/C
50	3,8	FEF, (LS) 350 x 10			EI 60 - U/C
50	3,8	FEF, (LS) 350 x 32			EI 90 - U/C
63	4	FEF, (LS) 350 x 10			EI 60 - U/C
63	4	FEF, (LS) 350 x 32			EI 90 - U/C
16	2	-	straight, bundles	≤ 510	EI 60 - U/C E 120 - U/C
20	2	-			

Ø Bundle ≤ 75 mm

PVC-U and PVC-C					
Ø [mm]	**s [mm]**	**Insulation [mm]**	**Installation**	**1 Support [mm]**	**Classification**
32-110	3,2	PEF, ≤ 5 x ≥ 300	straight	≤ 600	EI 90 - U/U E 120 - U/U
32-110	3,2	PEF, ≤ 5 x ≥ 300	45° - 90°	≤ 600	EI 120 - U/U

PE-HD, ABS and SAN + PVC					
Ø [mm]	**s [mm]**	**Insulation [mm]**	**Installation**	**1 Support [mm]**	**Classification**
32-110	2,7	PEF, ≤ 5 x ≥ 300	straight	≤ 600	EI 120 - U/U
32-110	2,7	PEF, ≤ 5 x ≥ 300	45° - 90°	≤ 600	EI 60 - U/U

PP					
Ø [mm]	**s [mm]**	**Insulation [mm]**	**Installation**	**1 Support [mm]**	**Classification**
32-110	2,7	PEF, ≤ 5 x ≥ 300	straight	≤ 600	EI 120 - U/U
32-125	3,1				EI 90 - U/U
32-110	2,7	PEF, ≤ 5 x ≥ 300	45° - 90°	≤ 600	EI 120 - U/U

HVAC split line combination				
Pipe [mm]	**Ø x s [mm]**	**Insulation [mm]**	**1 Support [mm]**	**Classification**
Copper	≤ 2 x Ø 22	PEF, (CS) 9,0	≤ 600	EI 120 - C/U
λ ≤ 380 W/mK	t=9 mm			
PE - HD; ABS; SAN + PVC	≤ 1 x ≤ Ø 25/s1,5	-		EI 120 - U/U
Cable	≤ 3 x Ø 14	-		EI 120

EIC - Bundle		
Pipe [mm]	**Ø [mm]**	**Classification**
EIC - Bundle flexible/elastic	Ø ≤ 172 mm	EI 120 - U/U
EIC - flexible / elastic	Ø ≤ 63 mm	

with and without cables

Python pipe			
Pipe [mm]	**Ø [mm]**	**Insulation [mm]**	**Classification**
Bundle + Insulation	Ø 37,5mm	(CS) 19	EI 120 - U/U
	13 x Ø 9,5/1,4 2 x Ø 12,7/1,6		
	Ø 130mm		
	23 x Ø 9,5/1,4 3 x Ø 12,7/1,6		
	Ø 148mm		EI 60 - U/U E 120 - U/U
	34 x Ø 9,5/1,4 2 x Ø 12,7/1,6		

Application floor 2 x 50 mm

aquatherm green MF RP					
Ø [mm]	**s [mm]**	**Insulation [mm]**	**Installation**	**1 Support [mm]**	**Classification**
50	4,6	PEF, ≤ 5 x ≥ 300	straight	≤ 600	EI 60 - U/C
50	4,6	FEF, (LS) 350 x 32			EI 90 - U/C

aquatherm blue MF RP					
Ø [mm]	**s [mm]**	**Insulation [mm]**	**Installation**	**1 Support [mm]**	**Classification**
50	4,6	PEF, ≤ 5 x ≥ 300	straight	≤ 600	EI 90 - U/C
50	4,6	FEF, (LS) 350 x 32			

POLO-KAL 3S					
Ø [mm]	**s [mm]**	**Insulation [mm]**	**Installation**	**1 Support [mm]**	**Classification**
50	2,2	PEF, ≤ 5 x ≥ 300	straight	≤ 600	EI 120 - U/U
75	3,8				
90	4,5				
110	4,8				

Ostendorf HT Safe					
Ø [mm]	**s [mm]**	**Insulation [mm]**	**Installation**	**1 Support [mm]**	**Classification**
125	3,1	PEF, ≤ 5 x ≥ 300	straight	≤ 600	EI 90 - U/U

Metal pipes					
Ø [mm]	**s [mm]**	**Insulation [mm]**	**Installation**	**1 Support [mm]**	**Classification**
≤ 76,1	≥ 2,9	Isover ML3, (LS) 450 x 30	straight	≤ 510	EI 90 - C/U
≤ 76,1	≥ 2,9	Isover ML3, (LS) 450 x 50			EI 120 - C/U
≤ 139,7	≥ 4,0				

Geberit Systempipe ML					
Ø [mm]	**s [mm]**	**Insulation [mm]**	**Installation**	**1 Support [mm]**	**Classification**
16	2	PEF, (LS) 350 x ≤20	straight	≤ 600	EI 120 - U/C
20	2				
25	2,5				EI 90 / E 120 - U/C
32	2,8				
40	3	PEF, (LS) 350 x 20			EI 60 / E 120 - U/C
50	3,8				
63	4				
16	2	FEF, (LS) 350 x 10-32	straight	≤ 600	EI 90 - U/C
20	2				
25	2				
32	2,8				
40	3	FEF, (LS) 350 x 10			EI 120 - U/C
40	3	FEF, (LS) 350 x 32			EI 90 - U/C
50	3,8	FEF, (LS) 350 x 10			EI 120 - U/C
50	3,8	FEF, (LS) 350 x 32			EI 90 - U/C
63	4	FEF, (LS) 350 x 10			EI 120 - U/C
63	4	FEF, (LS) 350 x 32			EI 90 - U/C
16	2	-	straight, bundles	≤ 600	EI 90 / E 120 - U/C
20	2	-			

Ø Bundle ≤ 75 mm

PVC-U and PVC-C					
Ø [mm]	**s [mm]**	**Insulation [mm]**	**Installation**	**1 Support [mm]**	**Classification**
32-110	3,2	PEF, ≤ 5 x ≥ 300	straight	≤ 600	EI 90 - U/U
32-110	3,2	PEF, ≤ 5 x ≥ 300	45° - 90°	≤ 600	EI 60 - U/U

PE-HD, ABS and SAN + PVC					
Ø [mm]	**s [mm]**	**Insulation [mm]**	**Installation**	**1 Support [mm]**	**Classification**
32-110	2,7	PEF, ≤ 5 x ≥ 300	straight	≤ 600	EI 90 - U/U
32-110	2,7	PEF, ≤ 5 x ≥ 300	45° - 90°	≤ 600	EI 60 - U/U

PP					
Ø [mm]	**s [mm]**	**Insulation [mm]**	**Installation**	**1 Support [mm]**	**Classification**
32-110	2,7	PEF, ≤ 5 x ≥ 300	straight	≤ 600	EI 120 - U/U
32-125	2,7-7,1	PEF, ≤ 5 x ≥ 300			EI 60 - U/U
32-110	2,7	PEF, ≤ 5 x ≥ 300	45° - 90°	≤ 600	EI 60 - U/U

HVAC split line combination				
Pipe [mm]	**Ø x s [mm]**	**Insulation [mm]**	**1 Support [mm]**	**Classification**
Copper	≤ 2 x Ø 18	PEF, (CS) 9,0	≤ 600	EI 120 - C/U
λ ≤ 380 W/mK	t=9			
PE - HD; ABS; SAN + PVC	≤ 1 x ≤ Ø 25/s1,5	-	-	
Cable	≤ 3 x Ø 14	-	-	

EIC - Bundle		
Pipe [mm]	**Ø [mm]**	**Classification**
EIC - Bundle flexible / elastic	Ø ≤ 172	EI 120 - U/U
EIC - flexible / elastic	Ø ≤ 63	

with and without cables

Python pipe - Bundle			
Pipe [mm]	**Ø [mm]**	**Insulation [mm]**	**Classification**
Bundle + Insulation	Ø 148 mm	(CS) 19	EI 90 - U/U
	34 x Ø 9,5/1,4 2 x Ø 12,7/1,6		

Description of possible additional components of the penetration seal

Description of possible additional components of the penetration seal		
Description	**Performance**	**Sample - Product**
Mortar	Classification in accordance with EN13501-1, Class A1	NOVASIT BM in acc. to ETA-22/0051 GFM in acc. to EN 998-2
Intumeszent filler / acrylic	Classification in accordance with EN13501-1, Class E	SIBRALIT DX in acc. to ETA-22/0151 BIOFERM - A in acc. to EN 15651-1
Ablative coating	Classification in accordance with EN13501-1, Class E	FLAMMOTECT- A in acc. to ETA-22/0052
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/m³ Melting point: ≥ 1000 °C	Rockwool “Hardrock 040” Paroc Pyrotech Slab 160 Rockwool "RP-GF 70"
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