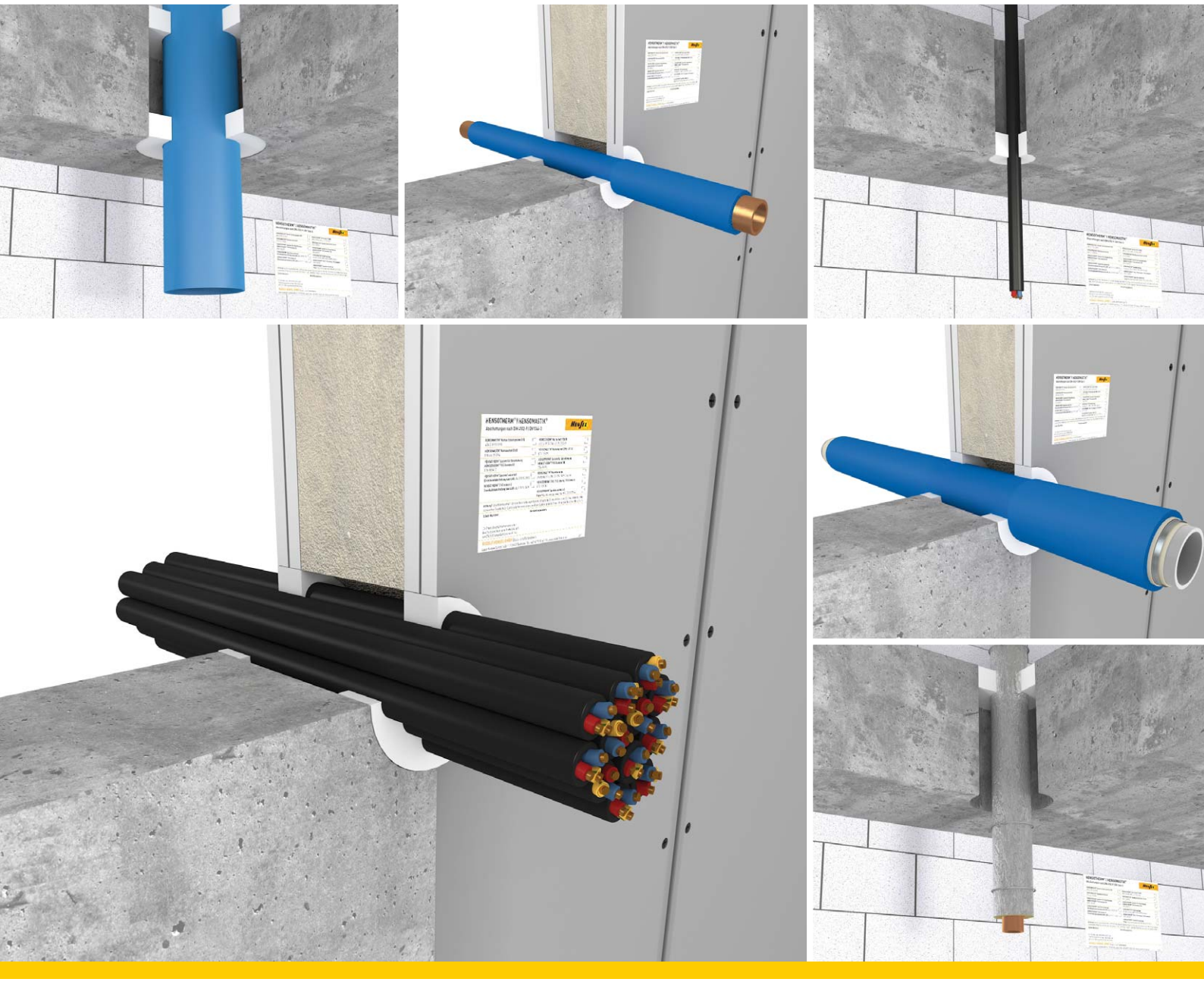
HENSEL

FIRE PROTECTION SYSTEMS



HENSOMASTIK® Acrylic
Fireresistant sealing compound for single penetrations

Technical Data Sheet and Installation Manual

Ready for use acrylic based liquid filler from cartridge used to form a firestop sealing in all types of construction elements such as flexible, masonry or concrete walls, as well as concrete or cross-laminated timber walls and floors.

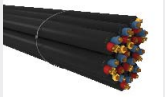
- Tested in accordance with EN 1366-3 up to fire resistance class EI 120 (see ETA 22/0654)
- One-sided seal constructions tested up to EI 120 in rigid walls and floors
- Simple to apply with a smooth surface finish, optional stone wool backing to define filling depth
- Low emissions – environmental and user friendly
- High sound insulation and durability (classes Y_1, Y_2, Z_1 and Z_2)

Member of DGNB
Deutsche Gesellschaft für Nachhaltiges Bauen
German Sustainable Building Council

TECHNICAL INFORMATION

Intended Use

HENSOMASTIK® Acrylic for single penetration seals is a flexible white acrylic sealant especially formulated to provide excellent fire resistance and acoustic performance. **HENSOMASTIK® Acrylic** is supplied in liquid form in cartridges or sleeves, and used to form a penetration seal around metallic pipes, plastic pipes and electrical cables to reinstate the fire resistance performance of wall and floor constructions, where they have been provided with apertures for the penetration of single or multiple services such as cable bundles. For use in linear joints and wooden construction elements, see the dedicated technical data sheets and installation manuals.

Permitted Services		Max. Ø [mm]
	Single cables	≤ 80.0
	Cable bundles	≤ 100.0
	Combustible pipes	≤ 110.0
	Non-combustible metal pipes with flexible elastomeric foam (FEF) insulation	≤139.7 [steel] ≤54.0 [copper]
	Non-combustible metal pipes with stone wool insulation	≤219.1 [steel] ≤89.0 [copper]
	Aluminium composite pipes with flexible elastomeric foam (FEF) or stone wool insulation	≤ 75.0
	Pipe-in-pipe system	≤35.0 / 25.0

Product Characteristics HENSOMASTIK® Acrylic	
European Technical Assessment (ETA):	22/0654
Tested in accordance with:	EN 1366-3
Reaction to fire (EN 13501-1):	Euroclass E
Colour:	White, RAL 9010
Curing time:	5 to 15 days
Skinning time:	15 to 60 minutes
Max movement capability:	≤ 7.5 %
Max deformation (ISO 8339):	14 %
Resilience (ISO 7389 B):	28 %
Durability classes:	Y_1 / Y_2 / Z_1 / Z_2
Shelf life (at 20 °C and dry storage):	12 months
Storage and transport temperature:	+5 °C to +30 °C Keep free from frost!
Application temperature range:	+5 °C to +40 °C
Airborne sound insulation (ISO 717-1):	$R_{w,max}$ = 66 dB

Product Properties and Advantages

- The seal may be formed with or without stone wool backing in the annular gap
- Simple to apply, surface can be smoothed out with a spatula
- Aluminium-composite and non-combustible metal pipes with all common FEF insulations
- No priming necessary, surfaces just need to be dusted off
- The seal will retain a degree of elasticity for joint movement (max. deformation 14 %)
- Non-toxic, low smoke, and halogen-free
- Can be over painted with most paints once fully cured
- 12 months storage time (under correct conditions)
- Also usable for fire penetration seals in linear joints

Construction Elements	
Flexible walls:	≥ 100 mm
Rigid walls:	≥ 100 mm
Rigid floors:	≥ 150 mm

Product	Article Number / EAN Code	Container / Packing Size
HENSOMASTIK® Acrylic	42501535 45903 (42501535 45910)	310 ml cartridge (20 cartridges per box)
	42501535 45927 (42501535 45934)	300 ml sleeve (20 sleeves per box)
	42501535 45941 (42501535 45958)	600 ml sleeve (20 sleeves per box)

TECHNICAL INFORMATION

Emission Data

HENSOMASTIK® Acrylic has certified low emissions, is environmental and user friendly, and compliant to most common regulations or protocols for building materials.

Regulation or Protocol	Assessment
French VOC regulation	A+
French CMR components	Compliant
ABG / AgBB guidelines DIBt	Compliant
Leed v4.1	Compliant
Emission class M1 for building materials	Compliant

Compound	Emission rate after 3 Days	Emission rate after 28 Days
TVOC	≤ 150 µg/m³	≤ 20 µg/m³
TSVOC	≤ 5 µg/m³	≤ 5 µg/m³
R value	0.11	0
Carcinogenic	< 1 µg/m³	< 1 µg/m³

Retrofitting

Penetrating services sealed with **HENSOMASTIK® Acrylic** may be retrofitted. Following a retrofit, the seal must be returned to its intended state. The specifications in the technical assessment document (ETA) and installation instructions must be observed.

Inspection and Maintenance

The fire protection properties of **HENSOMASTIK® Acrylic** seals are safeguarded over the service life only when the system is maintained in proper working condition, a regular inspection for possible damage and maintenance is recommended. All penetrations seals which are subsequently damaged or modified should be made good using **HENSOMASTIK® Acrylic** only. The developer / principal must be referred thereto by the applicator / commissioning company.

Disposal

The materials of **HENSOMASTIK® Acrylic** seal must be handled like waste paints and varnishes. The applicable national laws and regulations must be observed.

Labelling

In Germany and Switzerland, following the installation, by law each **HENSOMASTIK® Acrylic** seal must be marked in close proximity with a permanent label affixed to the wall / floor according to national laws and regulations. Such label is highly recommended also for other countries to inform succeeding applicator / commissioning companies on the materials used and where to look for further information.

Construction Details

The seal is formed by inserting **HENSOMASTIK® Acrylic** in the annular gap between the construction element around the services 25 mm deep from only one or both sides, depending on the use case and classification of the seal. It is recommended to moisten absorbent substrates such as concrete, aerated concrete or masonry before application to achieve better adhesion. The permitted annular gap width is 10 – 20 mm, and the maximum seal size depends on the diameter of the sealed penetrating service. Use a spatula to achieve a smooth surface finish. After complete curing, **HENSOMASTIK® Acrylic** can be painted over with most paints, e.g. emulsion paints, alkyd resins.

The seal may be formed with or without stone wool (class A1 or A2 according to EN 13501-1) backing in the annular gap in order to secure the correct filling depth.

TECHNICAL INFORMATION

Work Safety

Use **HENSOMASTIK® Acrylic** in accordance with all applicable local and national regulations. **Giscode: M-DF01**

Permitted Construction Elements

The specific elements of construction that **HENSOMASTIK® Acrylic** may be used to provide a fire penetration seal in, are:

Flexible walls: The wall must have a minimum thickness of 100 mm and consist of a wooden or steel stud structure lined on both faces with at least two layers of 12.5 mm thick boards. A minimum distance of 100 mm must be maintained between the seal and the studs, and the gap between the stud and the seal must be closed with at least 100 mm of insulation material of class A1 or A2 according to EN 13501-1.

Rigid walls: The wall must have a minimum thickness of 100 mm and comprise concrete, aerated concrete or masonry, with a minimum density of 650 kg/m³.

Rigid floors: The floor must have a minimum thickness of 150 mm and comprise aerated concrete or concrete with a minimum density of 650 kg/m³.

The supporting construction must be classified in accordance with EN 13501-2 for the required fire resistance period.

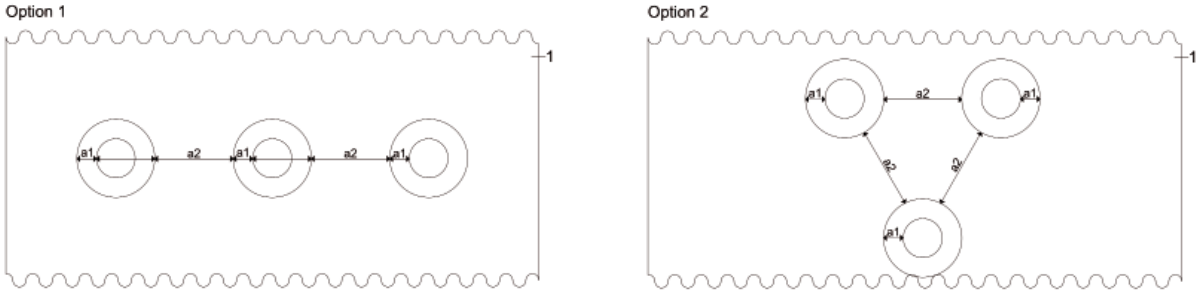
Maximum Seal Size

The permitted annular gap width is 10 - 20 mm, and the maximum seal size depends on the diameter of the sealed penetrating service and its insulation.

Permitted Distances and First Support

All services shall be supported at maximum 250 mm from both faces of the wall, or from the top of the floor.

Permitted distances of the seal to other openings or installations:



1: Supporting construction element, a1: Annular gap width, a2: Distance of the seal to other openings or installations

Other fire penetration seals:	≥ 20 cm, provided that one or both of the adjacent openings is larger than 40 x 40 cm, otherwise ≥ 10 cm.
Other apertures or installations:	≥ 20 cm, provided that one or both of the adjacent openings is larger than 20 x 20 cm, otherwise ≥ 10 cm.

Flexible Elastomeric Foam (FEF) Insulation

On the basis of equivalent or more favourable fire resistance properties, a variety of flexible elastomeric foam (FEF) or synthetic rubber insulations with a classification equal to or better than B-s3,d0 according to EN 13501-1 may be used, for example:

AF/ArmaFlex	Eurobatex	Kaiflex KKplus s3
AF/ArmaFlex Evo	Evo Eurobatex H	Kaiflex LS
ArmaFlex Class 0	Eurobatex Plus UF	Kaiflex ST
ArmaFlex LS	FLEXEN Heizungskautschuk plus	K-FLEX H
ArmaFlex Ultima	Kaiflex HTplus	K-FLEX SRC ECO
ArmaFlex XG	Kaiflex KKplus s1	K-FLEX ST
SH/ArmaFlex	Kaiflex KKplus s2	K-FLEX ST/SK

PRODUCT SELECTOR

FIRE PROTECTION SYSTEMS

buildingSMART German Chapter Member

Product Selector for fire protection penetration seals

We have digitised for your use the general type approvals (aBG) and European Technical Assessments (ETA) affecting our fire protection systems for penetration seals!

Your advantages in brief:

- ✓ The right product system in only 5 steps
- ✓ Access to all relevant product information and documents
- ✓ Planning, sizing, and implementation provisions at a glance
- ✓ Full text search and quick filter for tested lines
- ✓ MRP support
- ✓ Various print functions
- ✓ Fast and intuitive interface
- ✓ Compatible with all customary web browsers
- ✓ Optimised PC and tablet operability
- ✓ Freeware

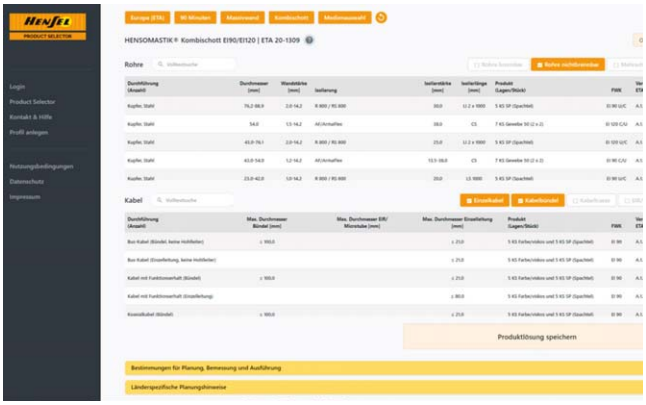
Additional advantages for registered users:

- ✓ Structured project management in a private area
- ✓ MRP support for major projects
- ✓ Project documentation simplified with personal notes and project partners' contact details
- ✓ Requests for quotations based on planning data
- ✓ Fast support for all conformity questions affecting project approval
- ✓ Creation of BIM objects

Try now without commitment at
www.rudolf-hensel.de/product-selector

Select the product system, and you can consult the innovative table of all tested conduits, featuring a full text search and quick filter for media types, to verify quickly and easily whether the planned fire protection penetration seal conforms with the technical requirements.

Important provisions for planning, sizing, and implementing the penetration seal can be consulted in an overview. The complete documentation, including approvals, ETAs, technical data sheets, and assembly instructions, can be retrieved via additional links. Various export options and print functions simplify collaboration with other project members.



Simple networking: Once registered as a user, you can also assign the product system and the penetrations you have selected to a specific project and construction phase and commit these to a file under "Save Product Solution". You can then manage these, add additional details, and print them out for your hard-copy files at your convenience in a private area.

Use now the Product Selector to configure your first penetration seal solution.

The Product Selector opens in a new browser window in encrypted mode. You can immediately start configuring your own, approved penetration seal solution without first having to register.

Just give it a go.

Let's go!

CONSTRUCTION DETAILS AND CLASSIFICATION

A. Rigid or Flexible Wall ≥ 100 mm

A.	Application	Flexible Wall	Rigid Wall	Insulation	Sealed on one side	Sealed on both sides	Page
1.	Single cables or cable bundles	-	●	-	●	-	7
2.		●	●	-	-	●	8
3.		-	●	-	-	●	9
4.	Combustible plastic pipes	●	●	-	-	●	10
5.	Combustible pipe-in-pipe-system	●	●	-	-	●	11
6.	Combustible plastic pipes	-	●	-	-	●	12
7.	Combustible pipe-in-pipe-system	-	●	-	-	●	13
8.	Aluminium-composite pipes	-	●	-	-	●	14
9.		●	●	FEF	-	●	15
10.		-	●		-	●	16
11.		-	●	Stone wool	●	-	17
12.		●	●		-	●	18
13.		-	●		-	●	19
14.		●	●		-	●	20
15.	Non-combustible metal pipes	-	●	FEF	-	●	21
16.		-	●		-	●	22
17.		-	●	Stone wool	●	-	23
18.		-	●		●	-	24

B. Rigid Wall ≥ 150 mm

B.	Application	Insulation	Sealed on one side	Sealed on both sides	Page
1.	Single cables or cable bundles	-	-	●	25
2.	Combustible plastic pipes	-	-	●	26
4.	Non-combustible metal pipes	Stone wool	●	-	27

C. Rigid Floor ≥ 150 mm

C.	Application	Insulation	Sealed on top	Sealed on bottom	Sealed on both sides	Page
1.	Single cables or cable bundles	-	●	-	-	30
2.		-	-	●	-	31
3.		-	-	-	●	32
4.	Combustible plastic pipes	-	-	-	●	33
5.	Combustible pipe-in-pipe-system	-	-	-	●	34
6.	Aluminium-composite pipes	-	-	-	●	35
7.		FEF	-	-	●	36
8.		Stone wool	●	-	-	37
9.			-	●	-	38
10.	Non-combustible metal pipes	FEF	-	-	●	39
11.			-	-	●	40
12.		Stone wool	●	-	-	41
13.			-	●	-	42
14.			●	-	-	43
15.			-	●	-	44

TECHNICAL INFORMATION

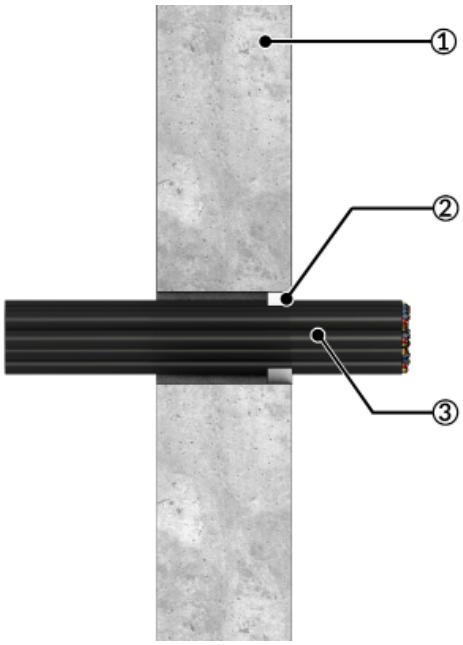
Rigid Wall ≥ 100 mm | Single cables or cable bundles, sealed on one side

A.1. Construction details

The supporting construction must be classified in accordance with EN 13501-2 for the required fire resistance period.

Rigid walls: The wall must have a minimum thickness of 100 mm and comprise concrete, aerated concrete or masonry, with a minimum density of 650 kg/m³.

Penetration Seal: Single cables or cable bundles sealed on either one side of the wall with HENSOMASTIK® Acrylic, min. 25 mm deep and positioned flush to the face of the wall. Annular space width (a1) 10 – 20 mm, and maximum seal size defined by penetrating service diameter and allowed max annular space. Services shall be supported at maximum 250 mm from both faces of the wall.



1 = Rigid wall, 2 = Annular gap (width 10 – 20 mm) filled ≥ 25 mm deep with HENSOMASTIK® Acrylic, optional backing with stone wool (class A1 or A2 according to EN 13501-1), 3 = Single cable or cable bundle

A.1.1. Single cables or cable bundles, sealed on one side

Services	Max. diameter cable bundle (mm)	Max. diameter single cable (mm)	Annular space (mm)	Classification
Aluminium cable type NAYY4x16RE, single	-	23	10 – 20	EI 90
Sheathed cables of all types, single	-	21	10 – 20	EI 60
A1, A2, A3 and B cables, single or in a bundle	50	21	10 – 20	EI 60

TECHNICAL INFORMATION

Rigid or Flexible Wall ≥ 100 mm | Single cables or cable bundles, sealed on both sides

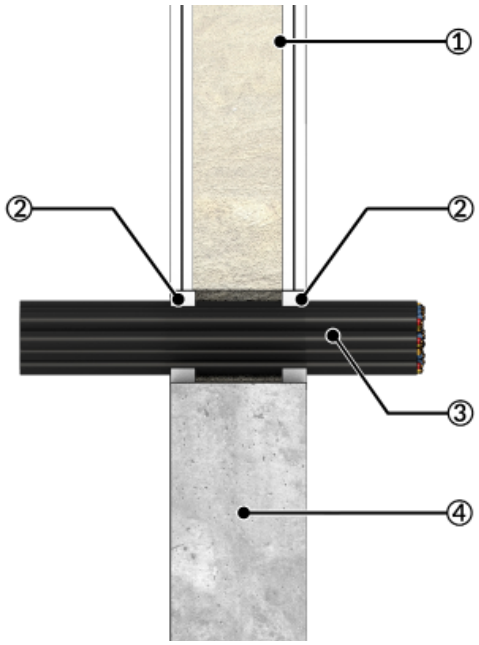
A.2. Construction details

The supporting construction must be classified in accordance with EN 13501-2 for the required fire resistance period.

Flexible walls: The wall must have a minimum thickness of 100 mm and consist of a wooden or steel stud structure lined on both faces with at least two layers of 12.5 mm thick boards. A minimum distance of 100 mm must be maintained between the seal and the studs, and the gap between the stud and the seal must be closed with at least 100 mm of insulation material of class A1 or A2 according to EN 13501-1.

Rigid walls: The wall must have a minimum thickness of 100 mm and comprise concrete, aerated concrete or masonry, with a minimum density of 650 kg/m³.

Penetration Seal: Single cables or cable bundles sealed on both sides of the wall with HENSOMASTIK® Acrylic, min. 25 mm deep and positioned flush to the faces of the walls. Annular space width (a1) 10 – 20 mm, and maximum seal size defined by penetrating service diameter and allowed max annular space. Services shall be supported at maximum 250 mm from both faces of the wall.



1 = Flexible wall (drywall), 2 = Annular gap (width 10 – 20 mm) filled ≥ 25 mm deep with HENSOMASTIK® Acrylic, optional backing with stone wool (class A1 or A2 according to EN 13501-1), 3 = Single cable or cable bundle, 4 = Rigid wall

A.2.1. Single cables or cable bundles, sealed on both sides

Services	Max. diameter cable bundle (mm)	Max. diameter single cable (mm)	Annular space (mm)	Classification
Aluminium cable type NAYY4x16RE, single	-	23	10 – 20	EI 120
Sheathed cables of all types, single	-	21	10 – 20	EI 120
A1, A2, A3 and B cables, single or in a bundle	50	21	10 – 20	EI 120

TECHNICAL INFORMATION

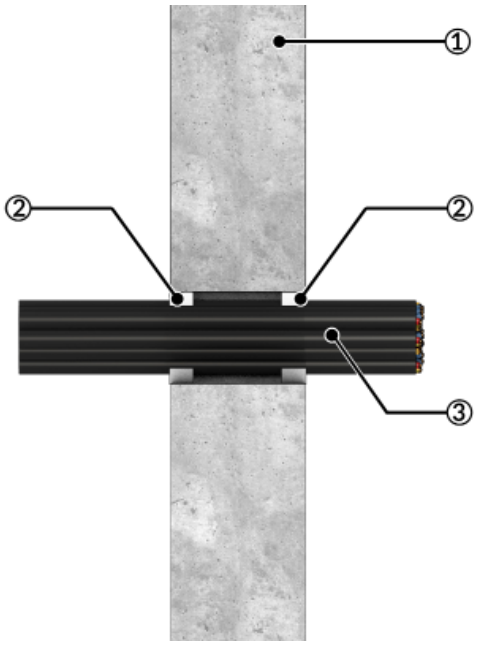
Rigid Wall ≥ 100 mm | Single cables or cable bundles, sealed on both sides

A.3. Construction details

The supporting construction must be classified in accordance with EN 13501-2 for the required fire resistance period.

Rigid walls: The wall must have a minimum thickness of 100 mm and comprise concrete, aerated concrete or masonry, with a minimum density of 650 kg/m³.

Penetration Seal: Single cables or cable bundles sealed on both sides of the wall with HENSOMASTIK® Acrylic, min. 25 mm deep and positioned flush to the faces of the walls. Annular space width (a1) 10 – 20 mm, and maximum seal size defined by penetrating service diameter and allowed max annular space. Services shall be supported at maximum 250 mm from both faces of the wall.



1 = Rigid wall, 2 = Annular gap (width 10 – 20 mm) filled ≥ 25 mm deep with HENSOMASTIK® Acrylic, optional backing with stone wool (class A1 or A2 according to EN 13501-1), 3 = Single cable or cable bundle

A.3.1. Single cables or cable bundles, sealed on both sides

Services	Max. diameter cable bundle (mm)	Max. diameter single cable (mm)	Annular space (mm)	Classification
Sheathed cables of all types, single or in a bundle	100	21	10 – 20	EI 60
Telecommunications F-cables, single or in a bundle	100	21	10 – 20	EI 60
Aluminium cable type NAYY4x16RE, single	-	23	10 – 20	EI 120
C2 cable, single	-	50	10 – 20	EI 60
D1 cable, single	-	80	10 – 20	EI 90
D2 cable, single	-	80	10 – 20	EI 90
E cable, single	-	80	10 – 20	EI 60

TECHNICAL INFORMATION

Rigid or Flexible Wall ≥ 100 mm |Combustible plastic pipes without insulation, sealed on both sidess

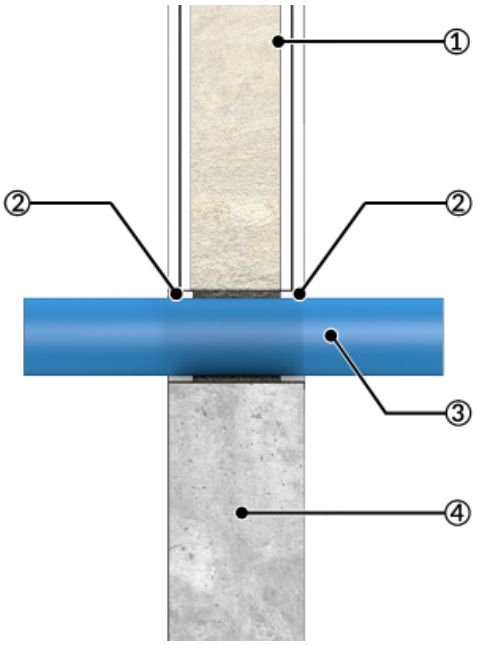
A.4. Construction details

The supporting construction must be classified in accordance with EN 13501-2 for the required fire resistance period.

Flexible walls: The wall must have a minimum thickness of 100 mm and consist of a wooden or steel stud structure lined on both faces with at least two layers of 12.5 mm thick boards. A minimum distance of 100 mm must be maintained between the seal and the studs, and the gap between the stud and the seal must be closed with at least 100 mm of insulation material of class A1 or A2 according to EN 13501-1.

Rigid walls: The wall must have a minimum thickness of 100 mm and comprise concrete, aerated concrete or masonry, with a minimum density of 650 kg/m³.

Penetration Seal: Combustible plastic pipes without insulation, sealed on both sides of the wall with HENSOMASTIK® Acrylic, min. 25 mm deep and positioned flush to the faces of the wall. Annular space width (a1) 10 – 20 mm, and maximum seal size defined by penetrating service diameter and allowed max annular space. Services shall be supported at maximum 250 mm from both faces of the wall.



1 = Flexible wall (drywall), 2 = Annular gap (width 10 – 20 mm) filled ≥ 25 mm deep with HENSOMASTIK® Acrylic, optional backing with stone wool (class A1 or A2 according to EN 13501-1), 3 = Combustible / plastic pipe, 4 = Rigid wall

A.4.1. Combustible plastic pipes without insulation, sealed on both sides

Services	Diameter (mm)	Wall thickness (mm)	Annular space (mm)	Classification
PE incl. PE 100, PE-HD, PE-X*, ABS, SAN+PVC	20-32	2.0	10 – 20	EI 60 U/C
PP-H	32	2.9	10 – 20	EI 90 U/C
PVC-U	32	1.9	10 – 20	EI 60 U/C

*** Examples of branded PE-X pipes in accordance with EN ISO 15875-2 (list not exhaustive):**

Manufacturer	Product Name / Pipe Series
FRANK GmbH, Germany	FRANK SurePEX
Jentro NV, Belgium	Jentro PEX pipe
REHAU Industries SE & Co. KG, Germany	REHAU RAUTITAN flex
Uponor GmbH, Germany	Uponor Aqua Pipe, Uponor Aqua Pipe Blue, Uponor Combi Pipe, Uponor Comfort Pipe PLUS Blue, Uponor Radi Pipe

TECHNICAL INFORMATION

Rigid or Flexible Wall ≥ 100 mm | Combustible pipe-in-pipe-system without insulation, sealed on both sides

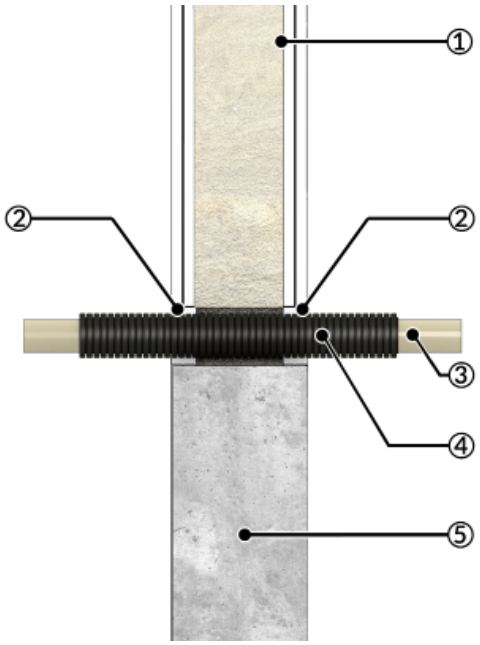
A.5. Construction details

The supporting construction must be classified in accordance with EN 13501-2 for the required fire resistance period.

Flexible walls: The wall must have a minimum thickness of 100 mm and consist of a wooden or steel stud structure lined on both faces with at least two layers of 12.5 mm thick boards. A minimum distance of 100 mm must be maintained between the seal and the studs, and the gap between the stud and the seal must be closed with at least 100 mm of insulation material of class A1 or A2 according to EN 13501-1.

Rigid walls: The wall must have a minimum thickness of 100 mm and comprise concrete, aerated concrete or masonry, with a minimum density of 650 kg/m³.

Penetration Seal: Combustible pipe-in-pipe-system without insulation, sealed on both sides of the wall with HENSOMASTIK® Acrylic, min. 25 mm deep and positioned flush to the faces of the wall. Annular space width (a1) 10 – 20 mm, and maximum seal size defined by penetrating service diameter and allowed max annular space. Services shall be supported at maximum 250 mm from both faces of the wall.



1 = Flexible wall (drywall), 2 = Annular gap (width 10 – 20 mm) filled ≥ 25 mm deep with HENSOMASTIK® Acrylic, optional backing with stone wool (class A1 or A2 according to EN 13501-1), 3 = Combustible inner pipe, 4 = Combustible outer pipe, 5 = Rigid wall

A.5.1. Combustible pipe-in-pipe-system without insulation, sealed on both sides

Services	Diameter outer pipe (mm)	Diameter inner pipe (mm)	Wall thickness inner pipe (mm)	Annular space (mm)	Classification
JRG Sanipex MT in PE pipe-in-pipe-system	35	25	3.5	10 – 20	EI 90 U/C

TECHNICAL INFORMATION

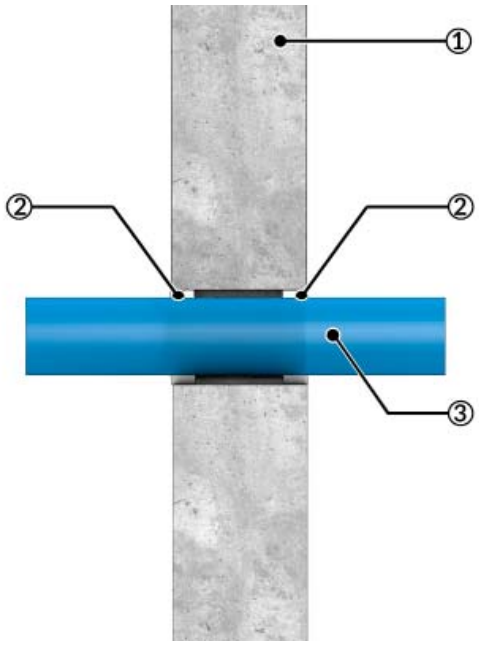
Rigid Wall ≥ 100 mm | Combustible plastic pipes without insulation, sealed on both sides

A.6. Construction details

The supporting construction must be classified in accordance with EN 13501-2 for the required fire resistance period.

Rigid walls: The wall must have a minimum thickness of 100 mm and comprise concrete, aerated concrete or masonry, with a minimum density of 650 kg/m³.

Penetration Seal: Combustible plastic pipes without insulation, sealed on both sides of the wall with HENSOMASTIK® Acrylic, min. 25 mm deep and positioned flush to the faces of the wall. Annular space width (a1) 10 – 20 mm, and maximum seal size defined by penetrating service diameter and allowed max annular space. Services shall be supported at maximum 250 mm from both faces of the wall.



1 = Rigid wall, 2 = Annular gap (width 10 – 20 mm) filled ≥ 25 mm deep with HENSOMASTIK® Acrylic, optional backing with stone wool (class A1 or A2 according to EN 13501-1), 3 = Combustible / plastic pipe

A.6.1. Combustible plastic pipes without insulation, sealed on both sides

Services	Diameter (mm)	Wall thickness (mm)	Annular space (mm)	Classification
PE incl. PE 100, PE-HD, PE-X*, ABS, SAN+PVC	20-32	2.0-3.0	10 – 20	EI 120 U/C
	50	3.0-4.6	10 – 20	EI 90 U/C
PP	32	2.9	10 – 20	EI 120 U/C
PVC-U	32	1.9	10 – 20	EI 120 U/C
	50	2.4-5.6	10 – 20	EI 90 U/C
	110	8.1	10 – 20	EI 90 U/C

* For examples of branded PE-X pipes in accordance with EN ISO 15875-2 see page 10.

TECHNICAL INFORMATION

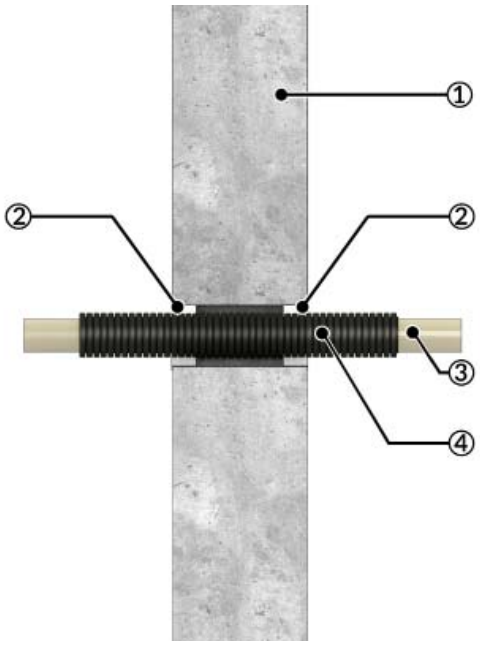
Rigid Wall ≥ 100 mm | Combustible pipe-in-pipe-system without insulation, sealed on both sides

A.7. Construction details

The supporting construction must be classified in accordance with EN 13501-2 for the required fire resistance period.

Rigid walls: The wall must have a minimum thickness of 100 mm and comprise concrete, aerated concrete or masonry, with a minimum density of 650 kg/m³.

Penetration Seal: Combustible pipe-in-pipe-system without insulation, sealed on both sides of the wall with HENSOMASTIK® Acrylic, min. 25 mm deep and positioned flush to the faces of the wall. Annular space width (a1) 10 – 20 mm, and maximum seal size defined by penetrating service diameter and allowed max annular space. Services shall be supported at maximum 250 mm from both faces of the wall.



1 = Rigid wall, 2 = Annular gap (width 10 – 20 mm) filled ≥ 25 mm deep with HENSOMASTIK® Acrylic, optional backing with stone wool (class A1 or A2 according to EN 13501-1), 3 = Combustible inner pipe, 4 = Combustible outer pipe

A.7.1. Combustible pipe-in-pipe-system without insulation, sealed on both sides

Services	Diameter outer pipe (mm)	Diameter inner pipe (mm)	Wall thickness inner pipe (mm)	Annular space (mm)	Classification
JRG Sanipex MT in PE pipe-in-pipe-system	18	12	1.8	10 – 20	EI 90 U/C
	35	25	3.5	10 – 20	EI 90 U/C

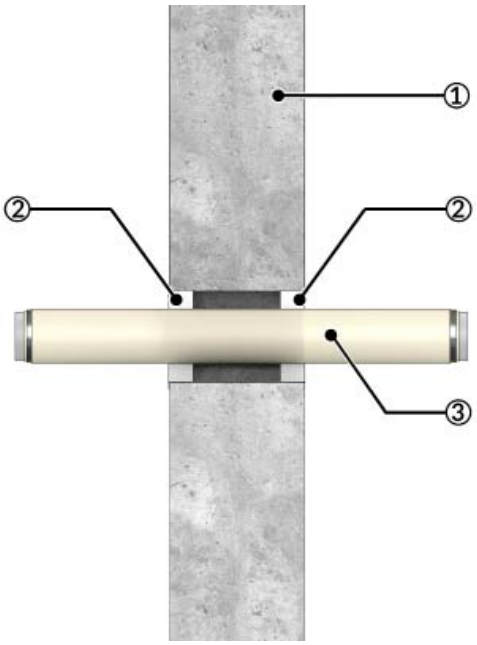
Rigid Wall ≥ 100 mm | Aluminium-composite pipes without insulation, sealed on both sides

A.8. Construction details

The supporting construction must be classified in accordance with EN 13501-2 for the required fire resistance period.

Rigid walls: The wall must have a minimum thickness of 100 mm and comprise concrete, aerated concrete or masonry, with a minimum density of 650 kg/m³.

Penetration Seal: Aluminium-composite pipes without insulation, sealed on both sides of the wall with HENSOMASTIK® Acrylic, min. 25 mm deep and positioned flush to the faces of the wall. Annular space width (a1) 10 – 20 mm, and maximum seal size defined by penetrating service diameter and allowed max annular space. Services shall be supported at maximum 250 mm from both faces of the wall.



1 = Rigid wall, 2 = Annular gap (width 10 – 20 mm) filled ≥ 25 mm deep with HENSOMASTIK® Acrylic, optional backing with stone wool (class A1 or A2 according to EN 13501-1), 3 = Aluminium-composite pipe

A.8.1. Aluminium-composite pipes without insulation, sealed on both sides

Services	Diameter (mm)	Wall thickness (mm)	Annular space (mm)	Classification
Uponor MLC	50	4.5	10 – 20	EI 60 U/C

TECHNICAL INFORMATION

Rigid or Flexible Wall ≥ 100 mm | Aluminium-composite pipes with FEF-insulation, sealed on both sides

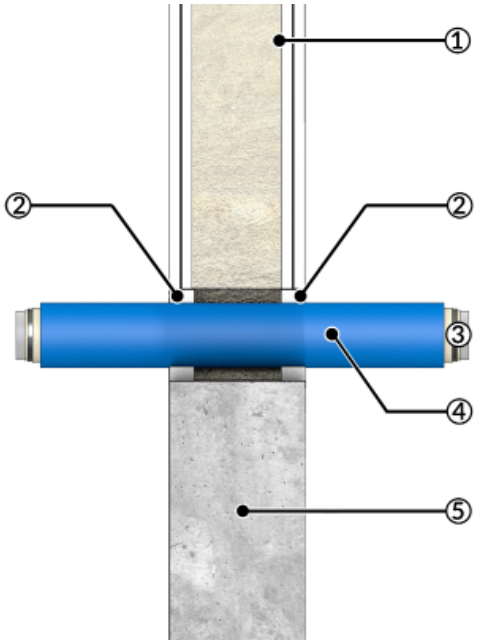
A.9. Construction details

The supporting construction must be classified in accordance with EN 13501-2 for the required fire resistance period.

Flexible walls: The wall must have a minimum thickness of 100 mm and consist of a wooden or steel stud structure lined on both faces with at least two layers of 12.5 mm thick boards. A minimum distance of 100 mm must be maintained between the seal and the studs, and the gap between the stud and the seal must be closed with at least 100 mm of insulation material of class A1 or A2 according to EN 13501-1.

Rigid walls: The wall must have a minimum thickness of 100 mm and comprise concrete, aerated concrete or masonry, with a minimum density of 650 kg/m³.

Penetration Seal: Combustible multilayer aluminium-composite pipes with continuous sustained (CS) flexible elastomeric foam (FEF) or synthetic rubber insulation with a building material class rated equal to or better than B,s3-d0 according to DIN EN 13501-1, sealed on both sides of the wall with HENSOMASTIK® Acrylic, min. 25 mm deep and positioned flush to the faces of the wall. Annular space width (a1) 10 – 20 mm, and maximum seal size defined by penetrating service diameter and allowed max annular space. Services shall be supported at maximum 250 mm from both faces of the wall.



1 = Flexible wall (drywall), 2 = Annular gap (width 10 – 20 mm) filled ≥ 25 mm deep with HENSOMASTIK® Acrylic, optional backing with stone wool (class A1 or A2 according to EN 13501-1), 3 = Aluminium-composite pipe, 4 = Insulation, 5 = Rigid wall

A.9.1. Aluminium-composite pipes with FEF-insulation, sealed on both sides

Services	Diameter (mm)	Wall thickness (mm)	FEF-Insulation	Insulation thickness (mm)	Insulation length (mm)	Annular space (mm)	Classification
Geberit Mepla	16	2.25	≤ B,s3-d0	8.0	CS	10 – 20	EI 120 U/C
	40	3.5	≤ B,s3-d0	9.0	CS	10 – 20	EI 120 U/C
	40	3.5	≤ B,s3-d0	9.0 – 19.5	CS	10 – 20	EI 90 U/C
	75	4.7	≤ B,s3-d0	9.5 – 22.0	CS	10 – 20	EI 60 U/C

TECHNICAL INFORMATION

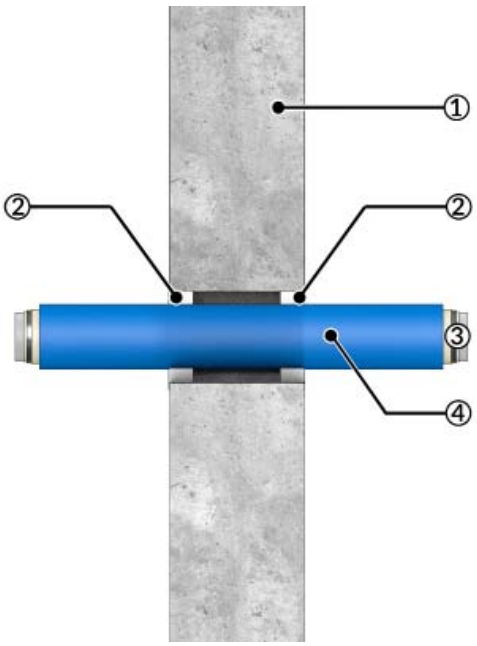
Rigid Wall ≥ 100 mm | Aluminium-composite pipes with FEF-insulation, sealed on both sides

A.10. Construction details

The supporting construction must be classified in accordance with EN 13501-2 for the required fire resistance period.

Rigid walls: The wall must have a minimum thickness of 100 mm and comprise concrete, aerated concrete or masonry, with a minimum density of 650 kg/m³.

Penetration Seal: Combustible multilayer aluminium-composite pipes with continuous sustained flexible elastomeric foam (FEF) or synthetic rubber insulation with a building material class rated equal to or better than B,s3-d0, according to DIN EN 13501-1, sealed on both sides of the wall with HENSOMASTIK® Acrylic, min. 25 mm deep and positioned flush to the faces of the wall. Annular space width (a1) 10 – 20 mm, and maximum seal size defined by penetrating service diameter and allowed max annular space. Services shall be supported at maximum 250 mm from both faces of the wall.



1 = Rigid wall, 2 = Annular gap (width 10 – 20 mm) filled ≥ 25 mm deep with HENSOMASTIK® Acrylic, optional backing with stone wool (class A1 or A2 according to EN 13501-1), 3 = Aluminium-composite pipe, 4 = Insulation

A.10.1. Aluminium-composite pipes with FEF-insulation, sealed on both sides

Services	Diameter (mm)	Wall thickness (mm)	FEF-Insulation	Insulation thickness (mm)	Insulation length (mm)	Annular space (mm)	Classification
Geberit Mepla	16	2.25	≤ B,s3-d0	8.0	CS	10 – 20	EI 120 U/C
	40	3.5	≤ B,s3-d0	9.0 – 19.5	CS	10 – 20	EI 120 U/C
	75	4.7	≤ B,s3-d0	9.5	CS	10 – 20	EI 120 U/C
	75	4.7	≤ B,s3-d0	9.5 – 22.0	CS	10 – 20	EI 90 U/C
JRG Sanipex MT	16	2.25	≤ B,s3-d0	8.0	CS	10 – 20	EI 90 U/C
	40	3.5	≤ B,s3-d0	9.0 – 19.5	CS	10 – 20	EI 90 U/C
	63	4.5	≤ B,s3-d0	9.0	CS	10 – 20	EI 90 U/C
	63	4.5	≤ B,s3-d0	9.0 – 21.5	CS	10 – 20	EI 60 U/C
Wavin Tigris K1	16	2.0	≤ B,s3-d0	8.0	CS	10 – 20	EI 90 U/C
	40	4.0	≤ B,s3-d0	9.0 – 19.5	CS	10 – 20	EI 90 U/C
	75	7.5	≤ B,s3-d0	9.0 – 22.0	CS	10 – 20	EI 90 U/C

TECHNICAL INFORMATION

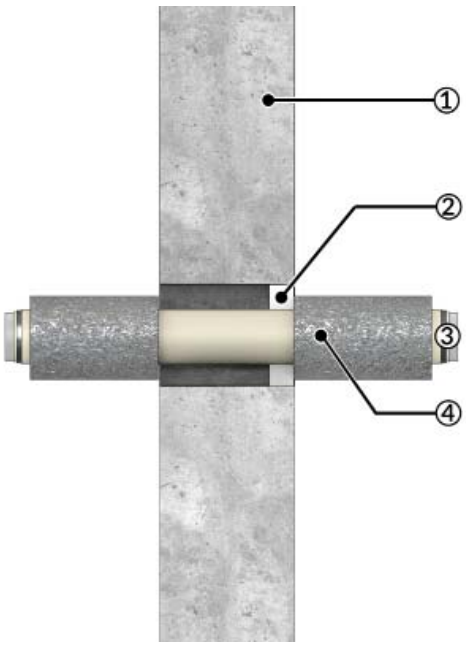
Rigid Wall ≥ 100 mm | Aluminium-composite pipes with stone wool insulation, sealed on one side

A.11. Construction details

The supporting construction must be classified in accordance with EN 13501-2 for the required fire resistance period.

Rigid walls: The wall must have a minimum thickness of 100 mm and comprise concrete, aerated concrete or masonry, with a minimum density of 650 kg/m³.

Penetration Seal: Combustible multilayer aluminium-composite pipes with min. 2 x 250 mm long local interrupted (LI) stone wool insulation 80 kg/m³ or higher, sealed on either one side of the wall with HENSOMASTIK® Acrylic, min. 25 mm deep and positioned flush to the face of the wall. Annular space width (a1) 10 – 20 mm, and maximum seal size defined by penetrating service diameter and allowed max annular space. The length of the local insulation may be increased but not reduced. Services shall be supported at maximum 250 mm from both faces of the wall.



1 = Rigid wall, 2 = Annular gap (width 10 – 20 mm) filled ≥ 25 mm deep with HENSOMASTIK® Acrylic, optional backing with stone wool (class A1 or A2 according to EN 13501-1), 3 = Aluminium-composite pipe, 4 = Insulation

A.11.1. Aluminium-composite pipes with stone wool insulation, sealed on one side

Services	Diameter (mm)	Wall thickness (mm)	Insulation	Insulation thickness (mm)	Insulation length (mm)	Annular space (mm)	Classification
Geberit Mepla	16	2.25	Stone wool ≥ 80 kg/m³	20	2 x LI 250	10 – 20	EI 90 U/C
	75	4.7	Stone wool ≥ 80 kg/m³	30	2 x LI 250	10 – 20	EI 90 U/C
JRG Sanipex MT	16	2.25	Stone wool ≥ 80 kg/m³	20	2 x LI 250	10 – 20	EI 90 U/C
	40	3.5	Stone wool ≥ 80 kg/m³	20	2 x LI 250	10 – 20	EI 90 U/C
	63	4.5	Stone wool ≥ 80 kg/m³	30	2 x LI 250	10 – 20	EI 90 U/C
Wavin Tigris K1	16	2.0	Stone wool ≥ 80 kg/m³	20	2 x LI 250	10 – 20	EI 90 U/C
	40	4.0	Stone wool ≥ 80 kg/m³	20	2 x LI 250	10 – 20	EI 90 U/C
	75	7.5	Stone wool ≥ 80 kg/m³	30	2 x LI 250	10 – 20	EI 90 U/C

TECHNICAL INFORMATION

Rigid or Flexible Wall ≥ 100 mm | Aluminium-composite pipes with stone wool insulation, sealed on both sides

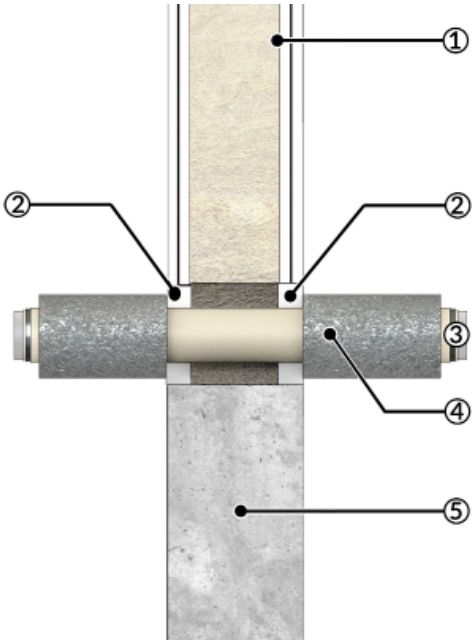
A.12. Construction details

The supporting construction must be classified in accordance with EN 13501-2 for the required fire resistance period.

Flexible walls: The wall must have a minimum thickness of 100 mm and consist of a wooden or steel stud structure lined on both faces with at least two layers of 12.5 mm thick boards. A minimum distance of 100 mm must be maintained between the seal and the studs, and the gap between the stud and the seal must be closed with at least 100 mm of insulation material of class A1 or A2 according to EN 13501-1.

Rigid walls: The wall must have a minimum thickness of 100 mm and comprise concrete, aerated concrete or masonry, with a minimum density of 650 kg/m³.

Penetration Seal: Combustible multilayer aluminium-composite pipes with min. 2 x 250 mm long local interrupted (LI) stone wool insulation 80 kg/m³ or higher, sealed on both sides of the wall with HENSOMASTIK® Acrylic, min. 25 mm deep and positioned flush to the faces of the wall. Annular space width (a1) 10 – 20 mm, and maximum seal size defined by penetrating service diameter and allowed max annular space. The length of the local insulation may be increased but not reduced. Services shall be supported at maximum 250 mm from both faces of the wall.



1 = Flexible wall (drywall), 2 = Annular gap (width 10 – 20 mm) filled ≥ 25 mm deep with HENSOMASTIK® Acrylic, optional backing with stone wool (class A1 or A2 according to EN 13501-1), 3 = Aluminium-composite pipe, 4 = Insulation, 5 = Rigid wall

A.12.1. Aluminium-composite pipes with stone wool insulation, sealed on both sides

Services	Diameter (mm)	Wall thickness (mm)	Insulation	Insulation thickness (mm)	Insulation length (mm)	Annular space (mm)	Classification
Geberit Mepla	16	2.25	Stone wool ≥ 80 kg/m³	20	2 x LI 250	10 – 20	EI 120 U/C
	40	3.5	Stone wool ≥ 80 kg/m³	20	2 x LI 250	10 – 20	EI 60 U/C
	75	4.7	Stone wool ≥ 80 kg/m³	30	2 x LI 250	10 – 20	EI 120 U/C

TECHNICAL INFORMATION

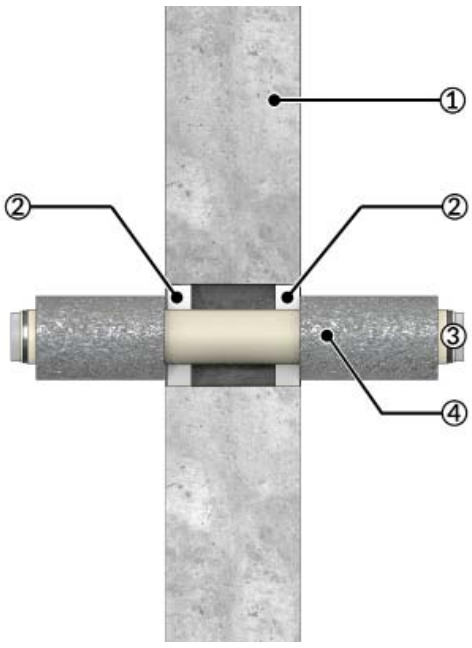
Rigid Wall ≥ 100 mm | Aluminium-composite pipes with stone wool insulation, sealed on both sides

A.13. Construction details

The supporting construction must be classified in accordance with EN 13501-2 for the required fire resistance period.

Rigid walls: The wall must have a minimum thickness of 100 mm and comprise concrete, aerated concrete or masonry, with a minimum density of 650 kg/m³.

Penetration Seal: Combustible multilayer aluminium-composite pipes with min. 2 x 250 mm long local interrupted (LI) stone wool insulation 80 kg/m³ or higher, sealed on both sides of the wall with HENSOMASTIK® Acrylic, min. 25 mm deep and positioned flush to the faces of the wall. Annular space width (a1) 10 – 20 mm, and maximum seal size defined by penetrating service diameter and allowed max annular space. The length of the local insulation may be increased but not reduced. Services shall be supported at maximum 250 mm from both faces of the wall.



1 = Rigid wall, 2 = Annular gap (width 10 – 20 mm) filled ≥ 25 mm deep with HENSOMASTIK® Acrylic, optional backing with stone wool (class A1 or A2 according to EN 13501-1), 3 = Aluminium-composite pipe, 4 = Insulation

A.13.1. Aluminium-composite pipes with stone wool insulation, sealed on both sides

Services	Diameter (mm)	Wall thickness (mm)	Insulation	Insulation thickness (mm)	Insulation length (mm)	Annular space (mm)	Classification
Geberit Mepla	16	2.25	Stone wool ≥ 80 kg/m³	20	2 x LI 250	10 – 20	EI 120 U/C
	40	3.5	Stone wool ≥ 80 kg/m³	20	2 x LI 250	10 – 20	EI 120 U/C
	75	4.7	Stone wool ≥ 80 kg/m³	30	2 x LI 250	10 – 20	EI 120 U/C

TECHNICAL INFORMATION

Rigid or Flexible Wall ≥ 100 mm | Aluminium-composite pipes with stone wool insulation, sealed on both sides

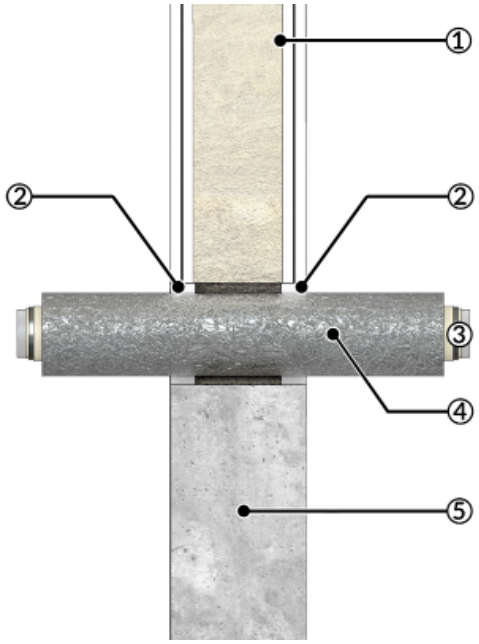
A.14. Construction details

The supporting construction must be classified in accordance with EN 13501-2 for the required fire resistance period.

Flexible walls: The wall must have a minimum thickness of 100 mm and consist of a wooden or steel stud structure lined on both faces with at least two layers of 12.5 mm thick boards. A minimum distance of 100 mm must be maintained between the seal and the studs, and the gap between the stud and the seal must be closed with at least 100 mm of insulation material of class A1 or A2 according to EN 13501-1.

Rigid walls: The wall must have a minimum thickness of 100 mm and comprise concrete, aerated concrete or masonry, with a minimum density of 650 kg/m³.

Penetration Seal: Combustible multilayer aluminium-composite pipes with min. 500 mm long local (LS) or continuous sustained (CS) stone wool 80 kg/m³ or higher insulation, sealed on both sides of the wall with HENSOMASTIK® Acrylic, min. 25 mm deep and positioned flush to the faces of the wall. Annular space width (a1) 10 – 20 mm, and maximum seal size defined by penetrating service diameter and allowed max annular space. The length of the local insulation may be increased but not reduced. Services shall be supported at maximum 250 mm from both faces of the wall.



1 = Flexible wall (drywall), 2 = Annular gap (width 10 – 20 mm) filled ≥ 25 mm deep with HENSOMASTIK® Acrylic, optional backing with stone wool (class A1 or A2 according to EN 13501-1), 3 = Aluminium-composite pipe, 4 = Insulation, 5 = Rigid wall

A.14.1. Aluminium-composite pipes with stone wool insulation, sealed on both sides

Services	Diameter (mm)	Wall thickness (mm)	Insulation	Insulation thickness (mm)	Insulation length (mm)	Annular space (mm)	Classification
Geberit Mepla	16	2.25	Stone wool ≥ 80 kg/m³	20	CS, LS 500	10 – 20	EI 120 U/C
	40	3.5	Stone wool ≥ 80 kg/m³	20	CS, LS 500	10 – 20	EI 120 U/C
	75	4.7	Stone wool ≥ 80 kg/m³	30	CS, LS 500	10 – 20	EI 120 U/C

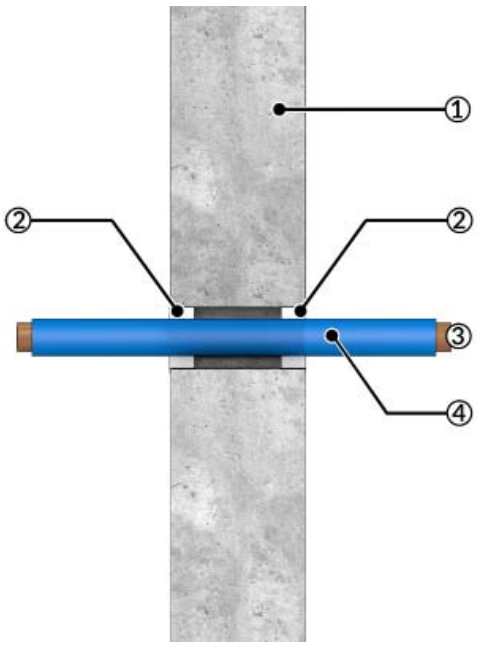
Rigid Wall ≥ 100 mm | Non-combustible metal pipes with FEF-insulation, sealed on both sides

A.15. Construction details

The supporting construction must be classified in accordance with EN 13501-2 for the required fire resistance period.

Rigid walls: The wall must have a minimum thickness of 100 mm and comprise concrete, aerated concrete or masonry, with a minimum density of 650 kg/m³.

Penetration Seal: Non-combustible metal pipes with continuous sustained (CS) flexible elastomeric foam (FEF) or synthetic rubber insulation with a building material class rated equal to or better than B,s3-d0 according to DIN EN 13501-1, sealed on both sides of the wall with HENSOMASTIK® Acrylic, min. 25 mm deep and positioned flush to the faces of the wall. Annular space width (a1) 10 – 20 mm, and maximum seal size defined by penetrating service diameter and allowed max annular space. Services shall be supported at maximum 250 mm from both faces of the wall.



1 = Rigid wall, 2 = Annular gap (width 10 – 20 mm) filled ≥ 25 mm deep with HENSOMASTIK® Acrylic, optional backing with stone wool (class A1 or A2 according to EN 13501-1), 3 = Non-combustible metal pipe, 4 = Insulation

A.15.1. Non-combustible metal pipes with FEF-insulation, sealed on both sides

Services	Diameter (mm)	Wall thickness (mm)	FEF-Insulation	Insulation thickness (mm)	Insulation length (mm)	Annular space (mm)	Classification
Copper, steel	≤ 15	1.0	≤ B,s3-d0	11.5	CS	10 – 20	EI 90 C/U
	≤ 42	1.2 – 14.2	≤ B,s3-d0	13.5	CS	10 – 20	EI 90 C/U
	≤ 42	1.2 – 14.2	≤ B,s3-d0	13.5 – 36.5	CS	10 – 20	EI 60 C/U
Steel	≤ 21.3	2.0	≤ B,s3-d0	12.0	CS	10 – 20	EI 120 C/U

TECHNICAL INFORMATION

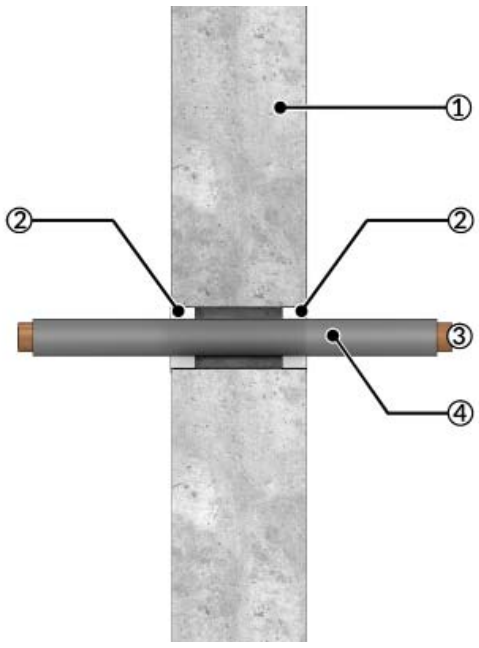
Rigid Wall ≥ 100 mm | Non-combustible metal pipes with FEF-insulation, sealed on both sides

A.16. Construction details

The supporting construction must be classified in accordance with EN 13501-2 for the required fire resistance period.

Rigid walls: The wall must have a minimum thickness of 100 mm and comprise concrete, aerated concrete or masonry, with a minimum density of 650 kg/m³.

Penetration Seal: Non-combustible metal pipes with min. 1000 mm long local (LS) or continuous sustained (CS) flexible elastomeric foam (FEF) or synthetic rubber insulation HT/ArmaFlex (building material class rated D,s3-d0 according to DIN EN 13501-1), sealed on both sides of the wall with HENSOMASTIK® Acrylic, min. 25 mm deep and positioned flush to the faces of the wall. The length of the local insulation may be increased but not reduced. Annular space width (a1) 10 – 20 mm, and maximum seal size defined by penetrating service diameter and allowed max annular space. Services shall be supported at maximum 250 mm from both faces of the wall.



1 = Rigid wall, 2 = Annular gap (width 10 – 20 mm) filled ≥ 25 mm deep with HENSOMASTIK® Acrylic, optional backing with stone wool (class A1 or A2 according to EN 13501-1), 3 = Non-combustible metal pipe, 4 = Insulation

A.16.1. Non-combustible metal pipes with FEF-insulation, sealed on both sides

Services	Diameter (mm)	Wall thickness (mm)	FEF-Insulation	Insulation thickness (mm)	Insulation length (mm)	Annular space (mm)	Classification
Copper, steel	≤15	1.0	HT/ArmaFlex	11.5	CS, LS 1000	10 – 20	EI 60 C/U

TECHNICAL INFORMATION

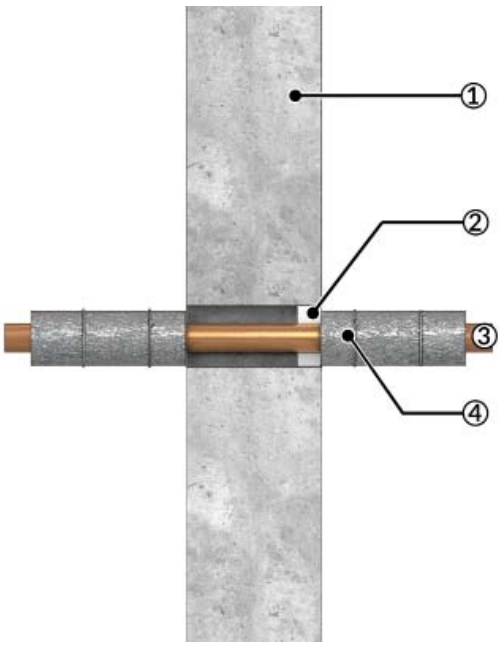
Rigid Wall ≥ 100 mm | Non-combustible metal pipes with stone wool insulation, sealed on one side

A.17. Construction details

The supporting construction must be classified in accordance with EN 13501-2 for the required fire resistance period.

Rigid walls: The wall must have a minimum thickness of 100 mm and comprise concrete, aerated concrete or masonry, with a minimum density of 650 kg/m³.

Penetration Seal: Non-combustible metal pipes with min. 2 x 500 mm long local interrupted (LI) stone wool insulation 80 kg/m³ or higher, sealed on either one side of the wall with HENSOMASTIK® Acrylic, min. 25 mm deep and positioned flush to the face of the wall. Annular space width (a1) 10 – 20 mm, and maximum seal size defined by penetrating service diameter and allowed max annular space. The classification applies to all penetration angles between 90 and 45 degrees. The length of the local insulation may be increased but not reduced. Services shall be supported at maximum 250 mm from both faces of the wall.



1 = Rigid wall, 2 = Annular gap (width 10 – 20 mm) filled ≥ 25 mm deep with HENSOMASTIK® Acrylic, optional backing with stone wool (class A1 or A2 according to EN 13501-1), 3 = Non-combustible metal pipe, 4 = Insulation

A.17.1. Non-combustible metal pipes with stone wool insulation, sealed on one side

Services	Diameter (mm)	Wall thickness (mm)	Insulation	Insulation thickness (mm)	Insulation length (mm)	Annular space (mm)	Classification*
Copper, steel	≤15	1.0 – 11.0	Stone wool ≥ 80 kg/m³	20	2 x LI 500	10 – 20	EI 120 C/U
	≤54	1.5 – 14.2	Stone wool ≥ 80 kg/m³	20	2 x LI 500	10 – 20	EI 120 C/U
Steel	42.4	2.0 – 14.2	Stone wool ≥ 80 kg/m³	20	2 x LI 500	10 – 20	EI 90 C/U
	> 54 ≤ 219.1	4.0 – 14.2	Stone wool ≥ 80 kg/m³	30-80	2 x LI 500	10 – 20	EI 90 C/U

* Valid for all penetration angles between 90 and 45 degrees.

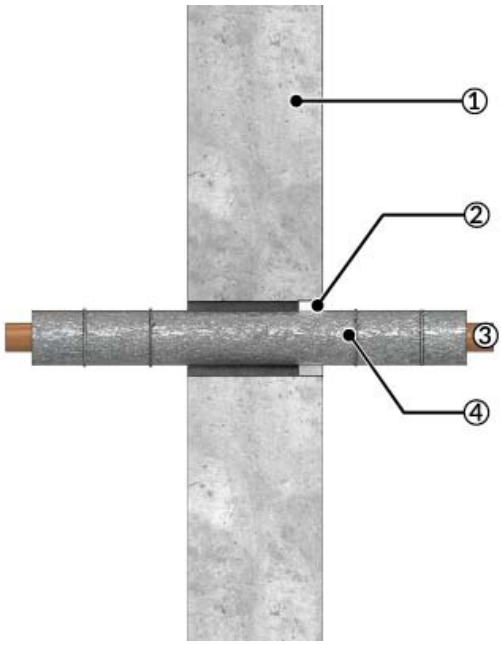
Rigid Wall ≥ 100 mm | Non-combustible metal pipes with stone wool insulation, sealed on one side

A.18. Construction details

The supporting construction must be classified in accordance with EN 13501-2 for the required fire resistance period.

Rigid walls: The wall must have a minimum thickness of 100 mm and comprise concrete, aerated concrete or masonry, with a minimum density of 650 kg/m³.

Penetration Seal: Non-combustible metal pipes with min. 1000 mm long local (LS) or continuous sustained (CS) stone wool 80 kg/m³ or higher insulation, sealed on either one side of the wall with HENSOMASTIK® Acrylic, min. 25 mm deep and positioned flush to the face of the wall. Annular space width (a1) 10 – 20 mm, and maximum seal size defined by penetrating service diameter and allowed max annular space.
The classification applies to all penetration angles between 90 and 45 degrees. The length of the local insulation may be increased but not reduced. Services shall be supported at maximum 250 mm from both faces of the wall.



1 = Rigid wall, 2 = Annular gap (width 10 – 20 mm) filled ≥ 25 mm deep with HENSOMASTIK® Acrylic, optional backing with stone wool (class A1 or A2 according to EN 13501-1),3 = Non-combustible metal pipe, 4 = Insulation

A.18.1. Non-combustible metal pipes with stone wool insulation, sealed on one side

Services	Diameter (mm)	Wall thickness (mm)	Insulation	Insulation thickness (mm)	Insulation length (mm)	Annular space (mm)	Classification
Copper, steel	≤ 15	1.0	Stone wool ≥ 80 kg/m³	20	CS, LS 1000	10 – 20	EI 90 C/U
	≤ 54	1.2 – 14.2	Stone wool ≥ 80 kg/m³	20	CS, LS 1000	10 – 20	EI 90 C/U
	> 54 ≤ 88.9	1.2 – 14.2	Stone wool ≥ 80 kg/m³	30	CS, LS 1000	10 – 20	EI 90 C/U

TECHNICAL INFORMATION

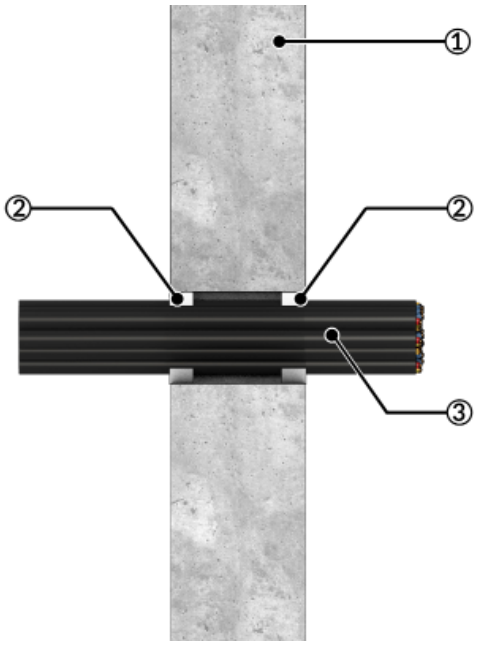
Rigid Wall ≥ 150 mm | Single cables or cable bundles, sealed on both sides

B.1. Construction details

The supporting construction must be classified in accordance with EN 13501-2 for the required fire resistance period.

Rigid walls: The wall must have a minimum thickness of 150 mm and comprise concrete, aerated concrete or masonry, with a minimum density of 650 kg/m³.

Penetration Seal: Single cables or cable bundles sealed on both sides of the wall with HENSOMASTIK® Acrylic, min. 25 mm deep and positioned flush to the faces of the walls. Annular space width (a1) 10 – 20 mm, and maximum seal size defined by penetrating service diameter and allowed max annular space. Services shall be supported at maximum 250 mm from both faces of the wall.



1 = Rigid wall, 2 = Annular gap (width 10 – 20 mm) filled ≥ 25 mm deep with HENSOMASTIK® Acrylic, optional backing with stone wool (class A1 or A2 according to EN 13501-1), 3 = Single cable or cable bundle

B.1.1 Single cables or cable bundles, sealed on both sides

Services	Max. diameter cable bundle (mm)	Max. diameter single cable (mm)	Annular space (mm)	Classification
Sheathed cables of all types, single or in a bundle	100	21	10 – 20	EI 60
Telecommunications F-cables, single or in a bundle	100	21	10 – 20	EI 60
Aluminium cable type NAYY4x16RE, single	-	23	10 – 20	EI 120
C1 cable, single	-	50	10 – 20	EI 60
C2 cable, single	-	50	10 – 20	EI 120
C3 cable, single	-	50	10 – 20	EI 60
D2 cable, single	-	80	10 – 20	EI 120
D3 cable, single	–	80	10 – 20	EI 60
E cable, single	–	80	10 – 20	EI 90

TECHNICAL INFORMATION

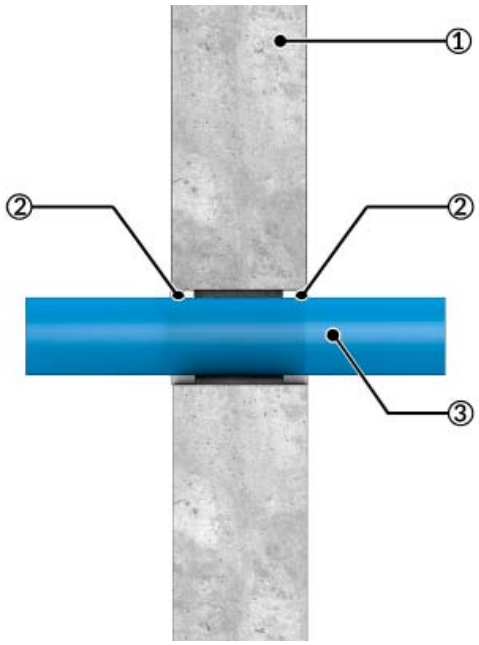
Rigid Wall ≥ 150 mm | Combustible plastic pipes without insulation, sealed on both sides

B.2. Construction details

The supporting construction must be classified in accordance with EN 13501-2 for the required fire resistance period.

Rigid walls: The wall must have a minimum thickness of 150 mm and comprise concrete, aerated concrete or masonry, with a minimum density of 650 kg/m³.

Penetration Seal: Combustible plastic pipes without insulation, sealed on both sides of the wall with HENSOMASTIK® Acrylic, min. 25 mm deep and positioned flush to the faces of the wall. Annular space width (a1) 10 – 20 mm, and maximum seal size defined by penetrating service diameter and allowed max annular space. Services shall be supported at maximum 250 mm from both faces of the wall.



1 = Rigid wall, 2 = Annular gap (width 10 – 20 mm) filled ≥ 25 mm deep with HENSOMASTIK® Acrylic, optional backing with stone wool (class A1 or A2 according to EN 13501-1), 3 = Combustible / plastic pipe

B.2.1. Combustible plastic pipes without insulation, sealed on both sides

Services	Diameter (mm)	Wall thickness (mm)	Annular space (mm)	Classification
PVC-U	110	3.2	10 – 20	EI 60 U/C

*** Examples of branded PE-X pipes in accordance with EN ISO 15875-2 (list not exhaustive):**

Manufacturer	Product Name / Pipe Series
FRANK GmbH, Germany	FRANK SurePEX
Jentro NV, Belgium	Jentro PEX pipe
REHAU Industries SE & Co. KG, Germany	REHAU RAUTITAN flex
Uponor GmbH, Germany	Uponor Aqua Pipe, Uponor Aqua Pipe Blue, Uponor Combi Pipe, Uponor Comfort Pipe PLUS Blue, Uponor Radi Pipe

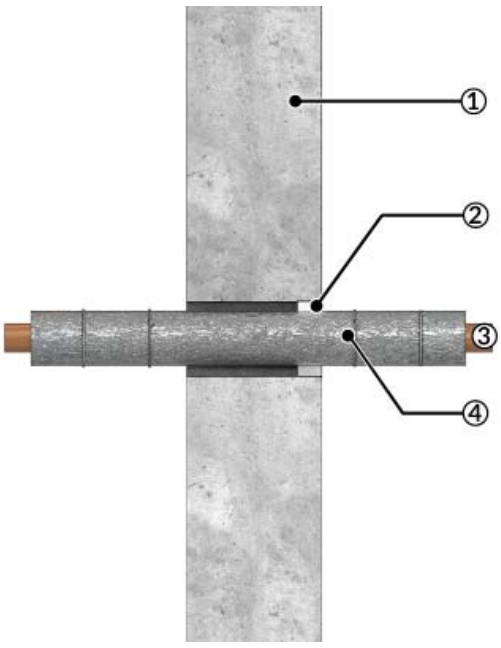
Rigid Wall ≥ 150 mm | Non-combustible metal pipes with stone wool insulation, sealed on one side

B.4. Construction details

The supporting construction must be classified in accordance with EN 13501-2 for the required fire resistance period.

Rigid walls: The wall must have a minimum thickness of 150 mm and comprise concrete, aerated concrete or masonry, with a minimum density of 650 kg/m³.

Penetration Seal: Non-combustible metal pipes with min. 1000 mm long local (LS) or continuous sustained (CS) stone wool 80 kg/m³ or higher insulation, sealed on either one side of the wall with HENSOMASTIK® Acrylic, min. 25 mm deep and positioned flush to the face of the wall. Annular space width (a1) 10 – 20 mm, and maximum seal size defined by penetrating service diameter and allowed max annular space.
The classification applies to all penetration angles between 90 and 45 degrees. The length of the local insulation may be increased but not reduced. Services shall be supported at maximum 250 mm from both faces of the wall.



1 = Rigid wall, 2 = Annular gap (width 10 – 20 mm) filled ≥ 25 mm deep with HENSOMASTIK® Acrylic, optional backing with stone wool (class A1 or A2 according to EN 13501-1), 3 = Non-combustible metal pipe, 4 = Insulation

B.4.1. Non-combustible metal pipes with stone wool insulation, sealed on one side

Services	Diameter (mm)	Wall thickness (mm)	Insulation	Insulation thickness (mm)	Insulation length (mm)	Annular space (mm)	Classification*
Steel	219.1	6.3	Stone wool ≥ 80 kg/m³	30	CS, LS 1000	10 – 20	EI 90 C/U

* Valid for all penetration angles between 90 and 45 degrees.

TECHNICAL INFORMATION

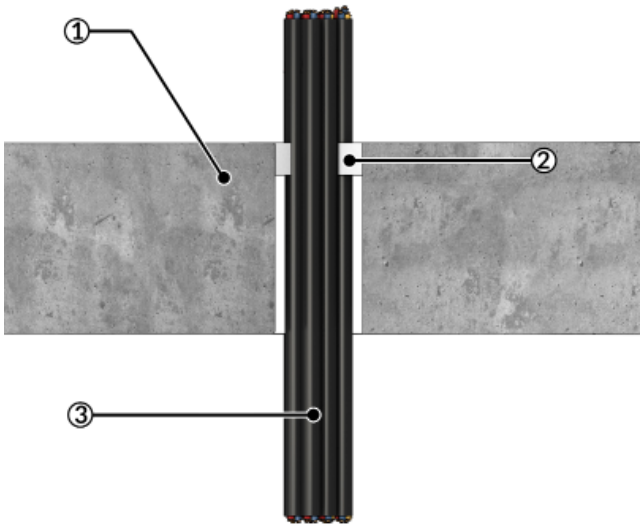
Rigid Floor ≥ 150 mm | Single cables or cable bundles, sealed on top

C.1. Construction details

The supporting construction must be classified in accordance with EN 13501-2 for the required fire resistance period.

Rigid floors: The floor must have a minimum thickness of 150 mm and ccomprise aerated concrete or concrete with a minimum density of 650 kg/m³.

Penetration Seal: Single cables or cable bundles sealed on the top of the floor with HENSOMASTIK® Acrylic, min. 25 mm deep and positioned flush to the top of the floor. Annular space width (a1) 10 – 20 mm, and maximum seal size defined by penetrating service diameter and allowed max annular space. Services shall be supported at maximum 250 mm from the top side of the floor.



1 = Rigid floor, 2 = Annular gap (width 10 – 20 mm) filled ≥ 25 mm deep with HENSOMASTIK® Acrylic, optional backing with stone wool (class A1 or A2 according to EN 13501-1), 3 = Single cable or cable bundle

C.1.1. Single cables or cable bundles, sealed on top

Services	Max. diameter cable bundle (mm)	Max. diameter single cable (mm)	Annular space (mm)	Classification
Aluminium cable type NAYY4x16RE, single	-	23	10 – 20	EI 120
Sheathed cables of all types, single	-	21	10 – 20	EI 90
A1, A2, A3 and B cables, single or in a bundle	50	21	10 – 20	EI 90

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TECHNICAL INFORMATION

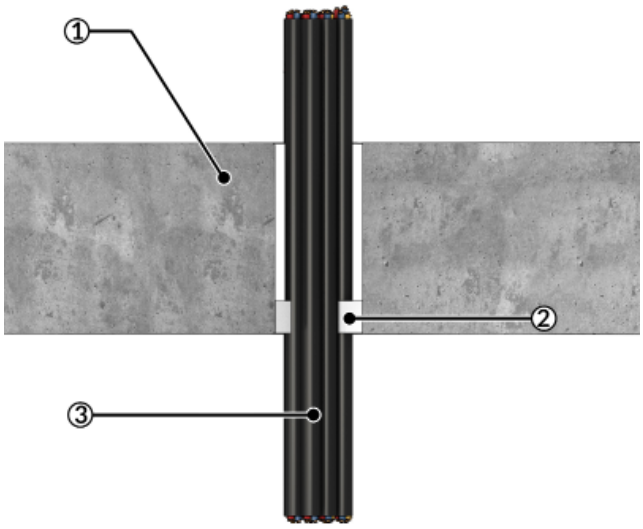
Rigid Floor ≥ 150 mm | Single cables or cable bundles, sealed on bottom

C.2. Construction details

The supporting construction must be classified in accordance with EN 13501-2 for the required fire resistance period.

Rigid floors: The floor must have a minimum thickness of 150 mm and ccomprise aerated concrete or concrete with a minimum density of 650 kg/m³.

Penetration Seal: Single cables or cable bundles sealed on the bottom of the floor with HENSOMASTIK® Acrylic, min. 25 mm deep and positioned flush to the bottom of the floor. Annular space width (a1) 10 – 20 mm, and maximum seal size defined by penetrating service diameter and allowed max annular space. Services shall be supported at maximum 250 mm from the top side of the floor.



1 = Rigid floor, 2 = Annular gap (width 10 – 20 mm) filled ≥ 25 mm deep with HENSOMASTIK® Acrylic, optional backing with stone wool (class A1 or A2 according to EN 13501-1), 3 = Single cable or cable bundle

C.2.1. Single cables or cable bundles, sealed on bottom

Services	Max. diameter cable bundle (mm)	Max. diameter single cable (mm)	Annular space (mm)	Classification
Aluminium cable type NAYY4x16RE, single	-	23	10 – 20	EI 120
Sheathed cables of all types, single	-	21	10 – 20	EI 60
A1, A2, A3 and B cables, single or in a bundle	50	21	10 – 20	EI 60

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TECHNICAL INFORMATION

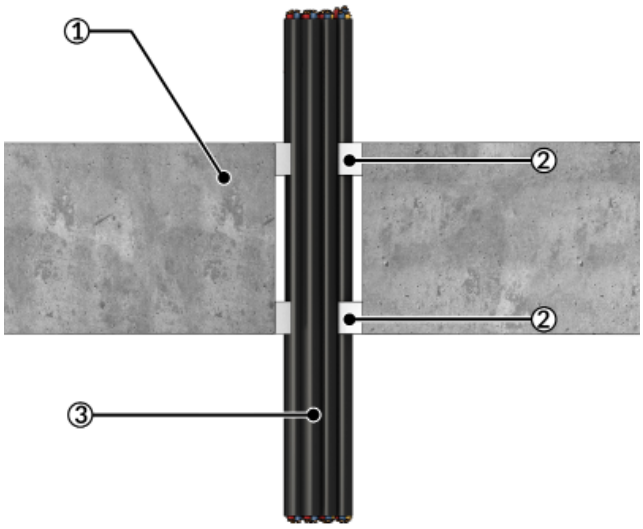
Rigid Floor ≥ 150 mm | Single cables or cable bundles, sealed on bottom

C.3. Construction details

The supporting construction must be classified in accordance with EN 13501-2 for the required fire resistance period.

Rigid floors: The floor must have a minimum thickness of 150 mm and ccomprise aerated concrete or concrete with a minimum density of 650 kg/m³.

Penetration Seal: Single cables or cable bundles sealed on both top and bottom side of the floor with HENSOMASTIK® Acrylic, min. 25 mm deep and positioned flush to the faces of the floor. Annular space width (a1) 10 – 20 mm, and maximum seal size defined by penetrating service diameter and allowed max annular space. Services shall be supported at maximum 250 mm from the top side of the floor.



1 = Rigid floor, 2 = Annular gap (width 10 – 20 mm) filled ≥ 25 mm deep with HENSOMASTIK® Acrylic, optional backing with stone wool (class A1 or A2 according to EN 13501-1), 3 = Single cable or cable bundle

C.3.1. Single cables or cable bundles, sealed on both sides

Services	Max. diameter cable bundle (mm)	Max. diameter single cable (mm)	Annular space (mm)	Classification
Sheathed cables of all types, single or in a bundle	100	21	10 – 20	EI 120
Telecommunications F-cables, single or in a bundle	100	21	10 – 20	EI 120
Aluminium cable type NAYY4x16RE, single	-	23	10 – 20	EI 120
C1 cable, single	-	50	10 – 20	EI 90
C2 or C3 cable, single	-	50	10 – 20	EI 120
D1, D2 or D3 cable, single	-	80	10 – 20	EI 120
E cable, single	-	80	10 – 20	EI 120

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TECHNICAL INFORMATION

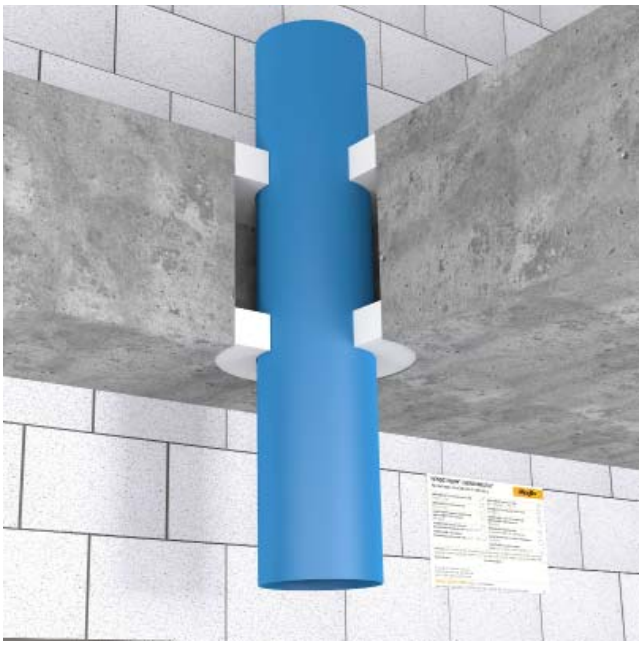
Rigid Floor ≥ 150 mm | Combustible plastic pipes without insulation, sealed on both sides

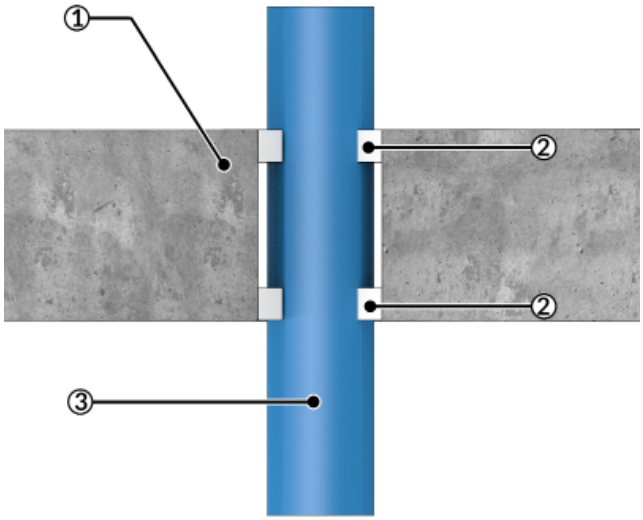
C.4. Construction details

The supporting construction must be classified in accordance with EN 13501-2 for the required fire resistance period.

Rigid floors: The floor must have a minimum thickness of 150 mm and ccomprise aerated concrete or concrete with a minimum density of 650 kg/m³.

Penetration Seal: Combustible plastic pipes without insulation, sealed on both top and bottom side of the floor with HENSOMASTIK® Acrylic, min. 25 mm deep and positioned flush to the faces of the floor. Annular space width (a1) 10 – 20 mm, maximum seal size defined by penetrating service diameter and allowed max annular space. Services shall be supported at maximum 250 mm from the top side of the floor.





1 = Rigid floor, 2 = Annular gap (width 10 – 20 mm) filled ≥ 25 mm deep with HENSOMASTIK® Acrylic, optional backing with stone wool (class A1 or A2 according to EN 13501-1), 3 = Combustible / plastic pipe

C.4.1. Combustible plastic pipes without insulation, sealed on both sides

Services	Diameter (mm)	Wall thickness (mm)	Annular space (mm)	Classification
PE incl. PE 100, PE-HD, PE-X*, ABS, SAN+PVC	20-32	2.0-3.0	10 – 20	EI 120 U/C
	50	3.0-4.6	10 – 20	EI 90 U/C
	50-110	3.0-6.6	10 – 20	EI 60 U/C
PP, PP-H	32	2.9	10 – 20	EI 120 U/C
	50	2.9-4.6	10 – 20	EI 60 U/C
	50	4.6	10 – 20	EI 90 U/C
	110	10.0	10 – 20	EI 60 U/C
PVC-U	32-50	1.9-2.4	10 – 20	EI 120 U/C
	50	2.4-5.6	10 – 20	EI 90 U/C
	50-110	3.2-8.1	10 – 20	EI 60 U/C

* For examples of branded PE-X pipes in accordance with EN ISO 15875-2 see page 26.

TECHNICAL INFORMATION

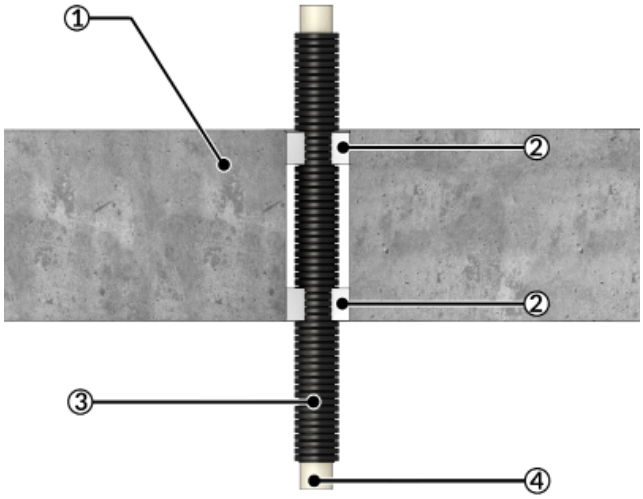
Rigid Floor ≥ 150 mm | Combustible pipe-in-pipe-system without insulation, sealed on both sides

C.5. Construction details

The supporting construction must be classified in accordance with EN 13501-2 for the required fire resistance period.

Rigid floors: The floor must have a minimum thickness of 150 mm and ccomprise aerated concrete or concrete with a minimum density of 650 kg/m³.

Penetration Seal: Combustible pipe-in-pipe-system without insulation, sealed on both top and bottom side of the floor with HENSOMASTIK® Acrylic, min. 25 mm deep and positioned flush to both faces of the floor. Annular space width (a1) 10 – 20 mm, and maximum seal size defined by penetrating service diameter and allowed max annular space. Services shall be supported at maximum 250 mm from the top side of the floor.



1 = Rigid wall, 2 = Annular gap (width 10 – 20 mm) filled ≥ 25 mm deep with HENSOMASTIK® Acrylic, optional backing with stone wool (class A1 or A2 according to EN 13501-1), 3 = Combustible outer pipe, 4 = Combustible inner pipe

C.5.1. Combustible pipe-in-pipe-system without insulation, sealed on both sidess

Services	Diameter outer pipe (mm)	Diameter inner pipe (mm)	Wall thickness inner pipe (mm)	Annular space (mm)	Classification
JRG Sanipex MT in PE pipe-in-pipe-system	18	12	1.8	10 – 20	EI 120 U/C
	35	25	3.5	10 – 20	EI 120 U/C

TECHNICAL INFORMATION

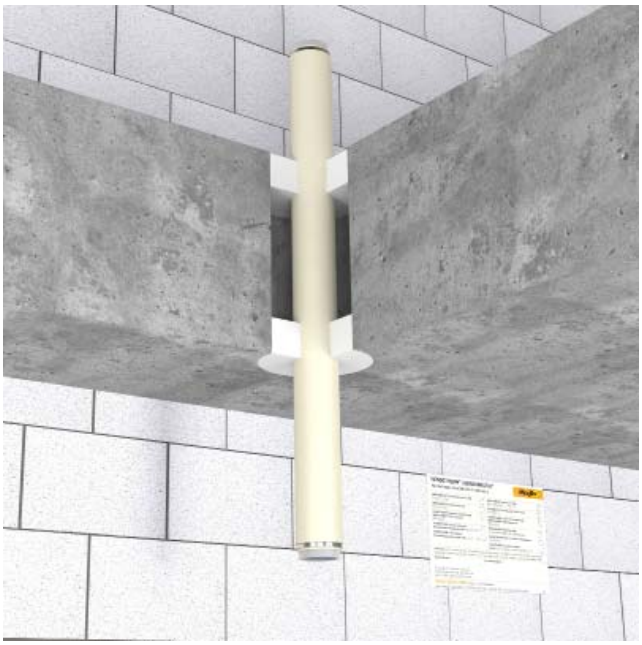
Rigid Floor ≥ 150 mm | Aluminium-composite pipes without insulation, sealed on both sides

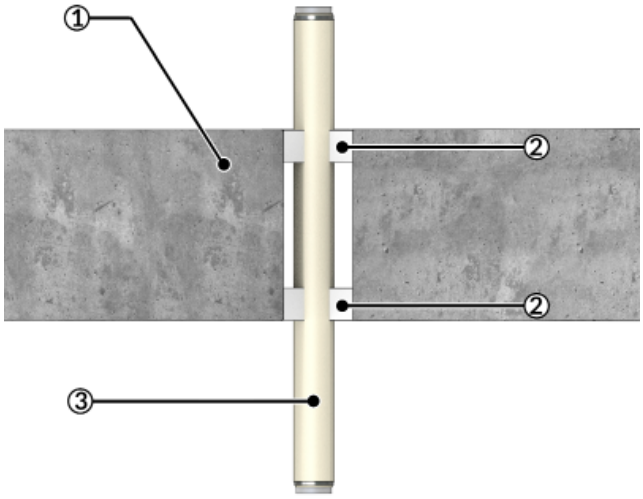
C.6. Construction details

The supporting construction must be classified in accordance with EN 13501-2 for the required fire resistance period.

Rigid floors: The floor must have a minimum thickness of 150 mm and ccomprise aerated concrete or concrete with a minimum density of 650 kg/m³.

Penetration Seal: Combustible multilayer aluminium-composite pipes without insulation, sealed on both top and bottom side of the floor with HENSOMASTIK® Acrylic, min. 25 mm deep and positioned flush to the faces of the floor. Annular space width (a1) 10 – 20 mm, maximum seal size defined by penetrating service diameter and allowed max annular space. Services shall be supported at maximum 250 mm from the top side of the floor.





1 = Rigid floor, 2 = Annular gap (width 10 – 20 mm) filled ≥ 25 mm deep with HENSOMASTIK® Acrylic, optional backing with stone wool (class A1 or A2 according to EN 13501-1), 3 = Aluminium-composite pipe

C.6.1. Aluminium-composite pipes without insulation, sealed on both sides

Services	Diameter (mm)	Wall thickness (mm)	Annular space (mm)	Classification
Uponor MLC	50	4.5	10 – 20	EI 90 U/C

TECHNICAL INFORMATION

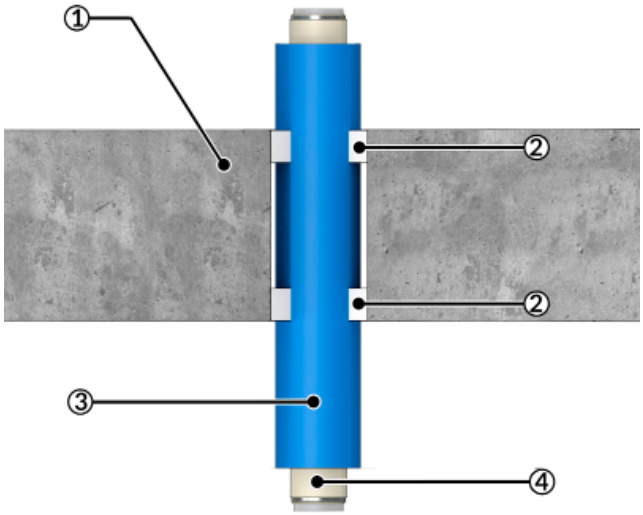
Rigid Floor ≥ 150 mm | Aluminium-composite pipes with FEF-insulation, sealed on both sides

C.7. Construction details

The supporting construction must be classified in accordance with EN 13501-2 for the required fire resistance period.

Rigid floors: The floor must have a minimum thickness of 150 mm and ccomprise aerated concrete or concrete with a minimum density of 650 kg/m³.

Penetration Seal: Combustible multilayer aluminium-composite pipes with continuous sustained flexible elastomeric foam (FEF) or synthetic rubber insulation with a building material class rated equal to or better than B,s3-d0, according to DIN EN 13501-1, sealed on both top and bottom side of the floor with HENSOMASTIK® Acrylic, min. 25 mm deep and positioned flush to both faces of the floor. Annular space width (a1) 10 – 20 mm, and maximum seal size defined by penetrating service diameter and allowed max annular space. Services shall be supported at maximum 250 mm from the top side of the floor.



1 = Rigid floor, 2 = Annular gap (width 10 – 20 mm) filled ≥ 25 mm deep with HENSOMASTIK® Acrylic, optional backing with stone wool (class A1 or A2 according to EN 13501-1), 3 = Insulation, 4 = Aluminium-composite pipe

C.7.1. Aluminium-composite pipes with FEF-insulation, sealed on both sides

Services	Diameter (mm)	Wall thickness (mm)	FEF-Insulation	Insulation thickness (mm)	Insulation length (mm)	Annular space (mm)	Classification
Geberit Mepla	16	2.25	≤ B,s3-d0	8.0	CS	10 – 20	EI 120 U/C
	40	3.5	≤ B,s3-d0	8.0 – 19.5	CS	10 – 20	EI 120 U/C
	75	4.7	≤ B,s3-d0	9.5 – 22.0	CS	10 – 20	EI 90 U/C
JRG Sanipex MT	16	2.25	≤ B,s3-d0	8.0	CS	10 – 20	EI 120 U/C
	40	3.5	≤ B,s3-d0	9.0 – 19.5	CS	10 – 20	EI 120 U/C
	63	4.5	≤ B,s3-d0	9.0	CS	10 – 20	EI 120 U/C
	63	4.5	≤ B,s3-d0	9.0 – 21.5	CS	10 – 20	EI 60 U/C
Wavin Tigris	16	2.0	≤ B,s3-d0	8.0	CS	10 – 20	EI 120 U/C
	40	4.0	≤ B,s3-d0	9.0 – 19.5	CS	10 – 20	EI 120 U/C
	75	7.5	≤ B,s3-d0	9.0 – 22.0	CS	10 – 20	EI 90 U/C

TECHNICAL INFORMATION

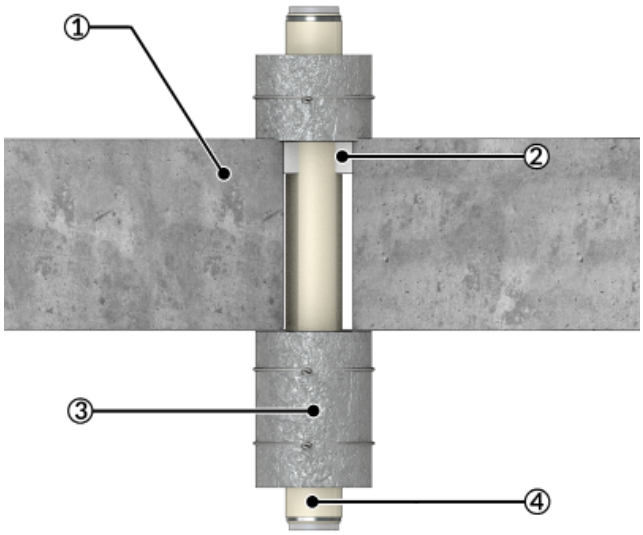
Rigid Floor ≥ 150 mm | Aluminium-composite pipes with stone wool insulation, sealed on top

C.8. Construction details

The supporting construction must be classified in accordance with EN 13501-2 for the required fire resistance period.

Rigid floors: The floor must have a minimum thickness of 150 mm and ccomprise aerated concrete or concrete with a minimum density of 650 kg/m³.

Penetration Seal: Combustible multilayer aluminium-composite pipes with min. 2 x 250 mm long local interrupted (LI) stone wool insulation 80 kg/m³ or higher, sealed on the top of the floor with HENSOMASTIK® Acrylic, min. 25 mm deep and positioned flush to the top face of the floor. Annular space width (a1) 10 – 20 mm, and maximum seal size defined by penetrating service diameter and allowed max annular space. The length of the local insulation may be increased but not reduced. Services shall be supported at maximum 250 mm from the top side of the floor.



1 = Rigid floor, 2 = Annular gap (width 10 – 20 mm) filled ≥ 25 mm deep with HENSOMASTIK® Acrylic, optional backing with stone wool (class A1 or A2 according to EN 13501-1), 3 = Insulation, 4 = Aluminium-composite pipe

C.8.1. Aluminium-composite pipes with stone wool insulation, sealed on top

Services	Diameter (mm)	Wall thickness (mm)	Insulation	Insulation thickness (mm)	Insulation length (mm)	Annular space (mm)	Classification
Geberit Mepla	16	2.25	Stone wool ≥ 80 kg/m³	20	2 x LI 250	10 – 20	EI 120 U/C
	40	3.5	Stone wool ≥ 80 kg/m³	20	2 x LI 250	10 – 20	EI 120 U/C
	75	4.7	Stone wool ≥ 80 kg/m³	30	2 x LI 250	10 – 20	EI 90 U/C
JRG Sanipex MT	16	2.25	Stone wool ≥ 80 kg/m³	20	2 x LI 250	10 – 20	EI 120 U/C
	40	3.5	Stone wool ≥ 80 kg/m³	20	2 x LI 250	10 – 20	EI 90 U/C
	63	4.5	Stone wool ≥ 80 kg/m³	20	2 x LI 250	10 – 20	EI 120 U/C
Wavin Tigris	16	2.0	Stone wool ≥ 80 kg/m³	20	2 x LI 250	10 – 20	EI 120 U/C
	40	4.0	Stone wool ≥ 80 kg/m³	20	2 x LI 250	10 – 20	EI 120 U/C
	75	7.5	Stone wool ≥ 80 kg/m³	30	2 x LI 250	10 – 20	EI 120 U/C

TECHNICAL INFORMATION

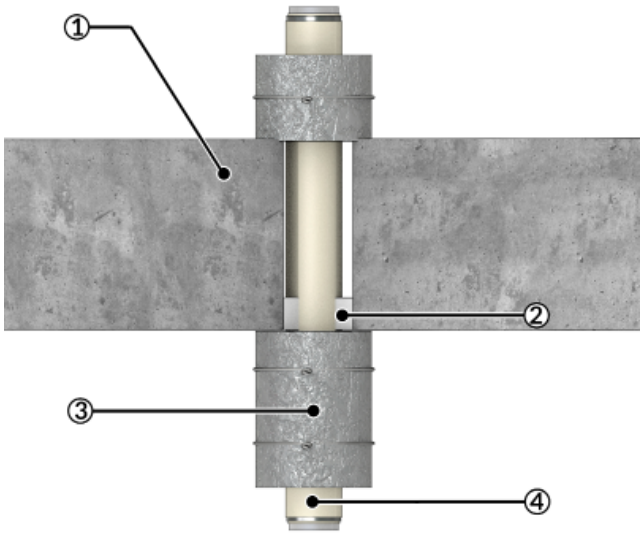
Rigid Floor ≥ 150 mm | Aluminium-composite pipes with stone wool insulation, sealed on bottom

C.9. Construction details

The supporting construction must be classified in accordance with EN 13501-2 for the required fire resistance period.

Rigid floors: The floor must have a minimum thickness of 150 mm and ccomprise aerated concrete or concrete with a minimum density of 650 kg/m³.

Penetration Seal: Combustible multilayer aluminium-composite pipes with min. 2 x 500 mm long local interrupted (LI) stone wool insulation 80 kg/m³ or higher, sealed on the bottom of the floor with HENSOMASTIK® Acrylic, min. 25 mm deep and positioned flush to the bottom face of the floor. Annular space width (a1) 10 – 20 mm, and maximum seal size defined by penetrating service diameter and allowed max annular space. The length of the local insulation may be increased but not reduced. Services shall be supported at maximum 250 mm from the top side of the floor.



1 = Rigid floor, 2 = Annular gap (width 10 – 20 mm) filled ≥ 25 mm deep with HENSOMASTIK® Acrylic, optional backing with stone wool (class A1 or A2 according to EN 13501-1), 3 = Insulation, 4 = Aluminium-composite pipe

C.9.1. Aluminium-composite pipes with stone wool insulation, sealed on bottom

Services	Diameter (mm)	Wall thickness (mm)	Insulation	Insulation thickness (mm)	Insulation length (mm)	Annular space (mm)	Classification
Geberit Mepla	16	2.25	Stone wool ≥ 80 kg/m³	20	2 x LI 250	10 – 20	EI 120 U/C
	40	3.5	Stone wool ≥ 80 kg/m³	20	2 x LI 250	10 – 20	EI 120 U/C
	75	4.7	Stone wool ≥ 80 kg/m³	30	2 x LI 250	10 – 20	EI 90 U/C
JRG Sanipex MT	16	2.25	Stone wool ≥ 80 kg/m³	20	2 x LI 250	10 – 20	EI 120 U/C
	40	3.5	Stone wool ≥ 80 kg/m³	20	2 x LI 250	10 – 20	EI 90 U/C
	63	4.5	Stone wool ≥ 80 kg/m³	20	2 x LI 250	10 – 20	EI 60 U/C
Wavin Tigris	16	2.0	Stone wool ≥ 80 kg/m³	20	2 x LI 250	10 – 20	EI 90 U/C
	40	4.0	Stone wool ≥ 80 kg/m³	20	2 x LI 250	10 – 20	EI 120 U/C
	75	7.5	Stone wool ≥ 80 kg/m³	30	2 x LI 250	10 – 20	EI 120 U/C

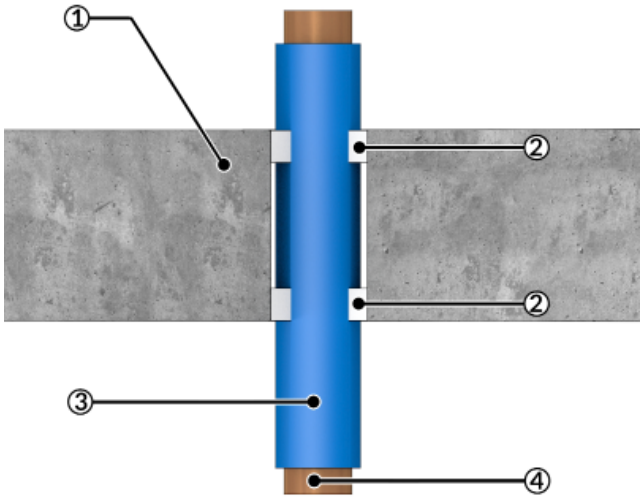
Rigid Floor ≥ 150 mm | Non-combustible metal pipes with FEF-insulation, sealed on both sides

C.10. Construction details

The supporting construction must be classified in accordance with EN 13501-2 for the required fire resistance period.

Rigid floors: The floor must have a minimum thickness of 150 mm and ccomprise aerated concrete or concrete with a minimum density of 650 kg/m³.

Penetration Seal: Non-combustible metal pipes with continuous sustained (CS) flexible elastomeric foam (FEF) or synthetic rubber insulation with a building material class rated equal to or better than B,s3-d0 according to DIN EN 13501-1, sealed both on both top and bottom side of the floor with HENSOMASTIK® Acrylic, min. 25 mm deep and positioned flush to both faces of the floor. Annular space width (a1) 10 – 20 mm, and maximum seal size defined by penetrating service diameter and allowed max annular space. Services shall be supported at maximum 250 mm from the top side of the floor.



1 = Rigid floor, 2 = Annular gap (width 10 – 20 mm) filled ≥ 25 mm deep with HENSOMASTIK® Acrylic, optional backing with stone wool (class A1 or A2 according to EN 13501-1), 3 = Insulation, 4 = Non-combustible metal pipe

C.10.1. Non-combustible metal pipes with FEF-insulation, sealed on both sides

Services	Diameter (mm)	Wall thickness (mm)	FEF-Insulation	Insulation thickness (mm)	Insulation length (mm)	Annular space (mm)	Classification
Copper, steel	≤ 15	1.0 – 11.0	≤ B,s3-d0	11.5	CS	10 – 20	EI 120 C/U
	≤ 42	1.2 – 14.2	≤ B,s3-d0	13.5 – 36.5	CS	10 – 20	EI 90 C/U
	42	1.2 – 14.2	≤ B,s3-d0	13.5	CS	10 – 20	EI 120 C/U
	> 42 ≤ 54	1.5 – 14.2	≤ B,s3-d0	13.5 – 38.0	CS	10 – 20	EI 90 C/U

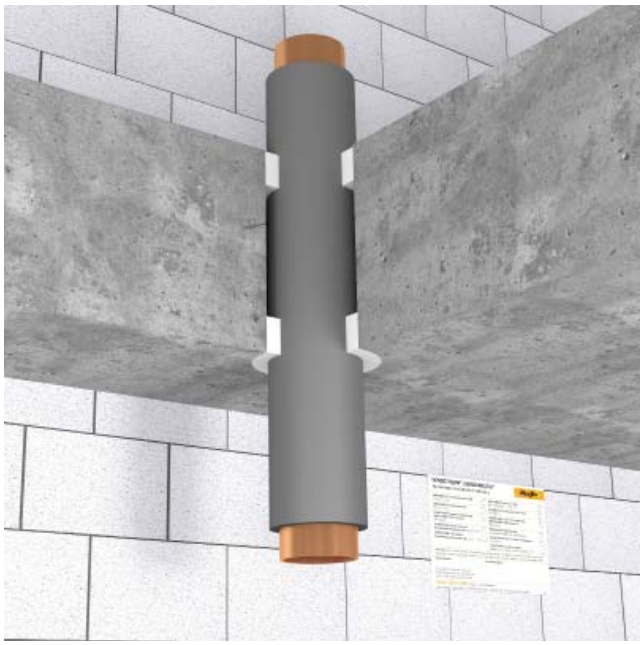
Rigid Floor ≥ 150 mm | Non-combustible metal pipes with FEF-insulation, sealed on both sides

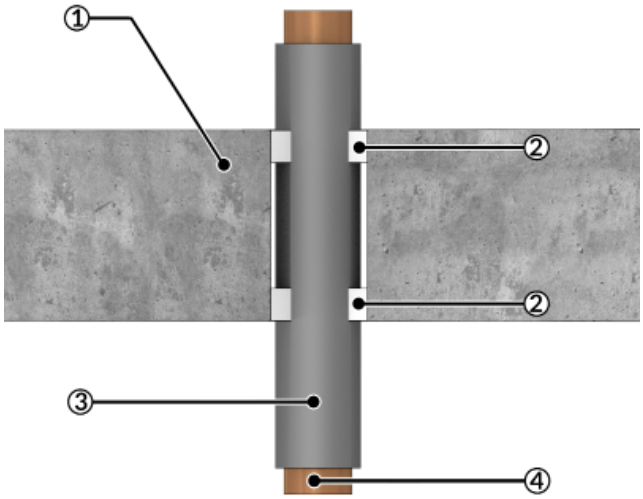
C.11. Construction details

The supporting construction must be classified in accordance with EN 13501-2 for the required fire resistance period.

Rigid floors: The floor must have a minimum thickness of 150 mm and ccomprise aerated concrete or concrete with a minimum density of 650 kg/m³.

Penetration Seal: Non-combustible metal pipes with min. 1000 mm long local (LS) or continuous sustained (CS) flexible elastomeric foam (FEF) or synthetic rubber insulation HT/ArmaFlex (building material class rated D,s3-d0 according to DIN EN 13501-1), sealed both on both top and bottom side of the floor with HENSOMASTIK® Acrylic, min. 25 mm deep and positioned flush to both faces of the floor. Annular space width (a1) 10 – 20 mm, and maximum seal size defined by penetrating service diameter and allowed max annular space. Services shall be supported at maximum 250 mm from the top side of the floor.





1 = Rigid floor, 2 = Annular gap (width 10 – 20 mm) filled ≥ 25 mm deep with HENSOMASTIK® Acrylic, optional backing with stone wool (class A1 or A2 according to EN 13501-1), 3 = Insulation, 4 = Non-combustible metal pipe

C.11.1. Non-combustible metal pipes with FEF-insulation, sealed on both sides

Services	Diameter (mm)	Wall thickness (mm)	FEF-Insulation	Insulation thickness (mm)	Insulation length (mm)	Annular space (mm)	Classification
Copper, steel	≤ 15	1.0 – 11.0	HT/ArmaFlex	13	CS, LS 1000	10 – 20	EI 90 C/U

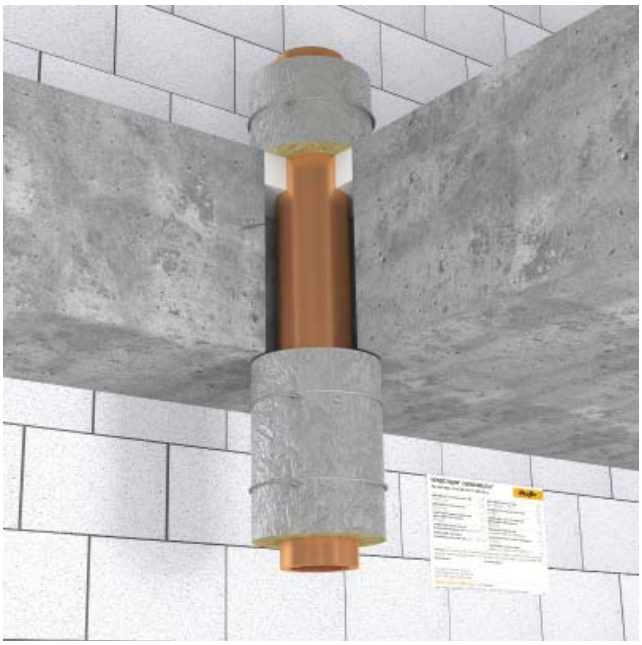
Rigid Floor ≥ 150 mm | Non-combustible metal pipes with stone wool insulation, sealed on top

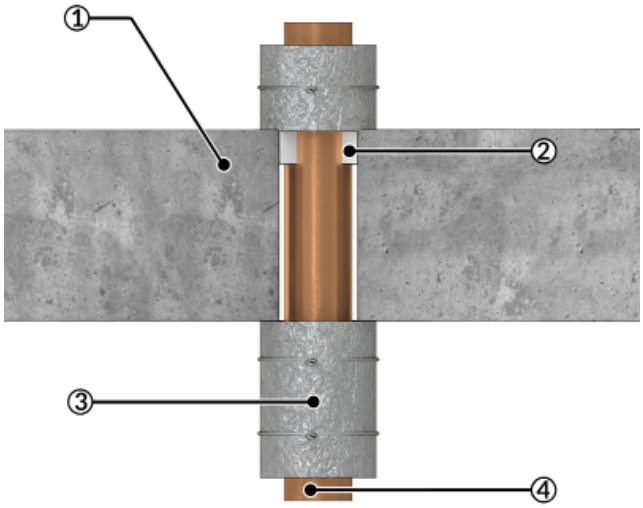
C.12. Construction details

The supporting construction must be classified in accordance with EN 13501-2 for the required fire resistance period.

Rigid floors: The floor must have a minimum thickness of 150 mm and ccomprise aerated concrete or concrete with a minimum density of 650 kg/m³.

Penetration Seal: Non-combustible metal pipes with min. 500 mm long local interrupted (LI) stone wool insulation 80 kg/m³ or higher, sealed on the top side of the floor with HENSOMASTIK® Acrylic, min. 25 mm deep and positioned flush to the top face of the floor. Annular space width (a1) 10 – 20 mm, and maximum seal size defined by penetrating service diameter and allowed max annular space. The classification applies to all penetration angles between 90 and 45 degrees. The length of the local insulation may be increased but not reduced. Services shall be supported at maximum 250 mm from the top side of the floor.





1 = Rigid floor, 2 = Annular gap (width 10 – 20 mm) filled ≥ 25 mm deep with HENSOMASTIK® Acrylic, optional backing with stone wool (class A1 or A2 according to EN 13501-1), 3 = Insulation, 4 = Non-combustible metal pipe

C.12.1. Non-combustible metal pipes with stone wool insulation, sealed on top

Services	Diameter (mm)	Wall thickness (mm)	Insulation	Insulation thickness (mm)	Insulation length (mm)	Annular space (mm)	Classification*
Copper, steel	≤ 54	1.0 – 14.2	Stone wool ≥ 80 kg/m³	20	2 x LI 500	10 – 20	EI 120 C/U
Steel	> 54 ≤ 139.7	2.0 – 14.2	Stone wool ≥ 80 kg/m³	30 – 80	2 x LI 500	10 – 20	EI 120 C/U
	> 139.7 ≤ 219.1	4.0 – 14.2	Stone wool ≥ 80 kg/m³	30	2 x LI 500	10 – 20	EI 120 C/U
	> 139.7 ≤ 219.1	4.0 – 14.2	Stone wool ≥ 80 kg/m³	30 – 80	2 x LI 500	10 – 20	EI 90 C/U

* Valid for all penetration angles between 90 and 45 degrees.

TECHNICAL INFORMATION

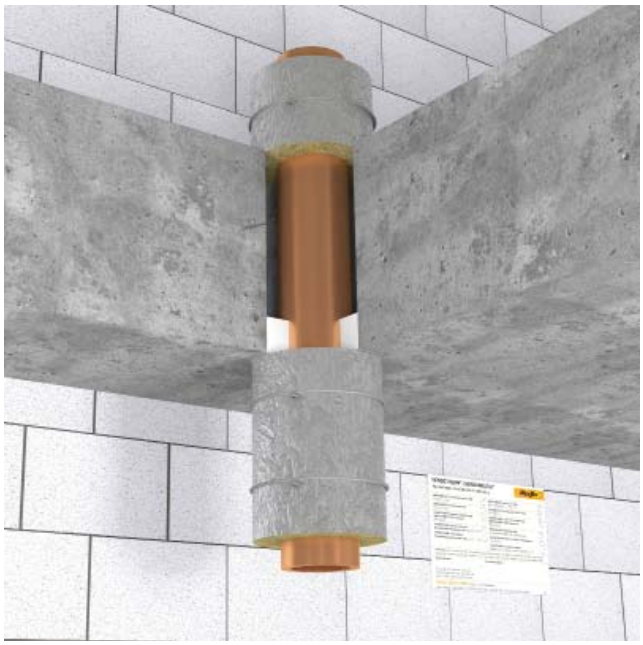
Rigid Floor ≥ 150 mm | Non-combustible metal pipes with stone wool insulation, sealed on bottom

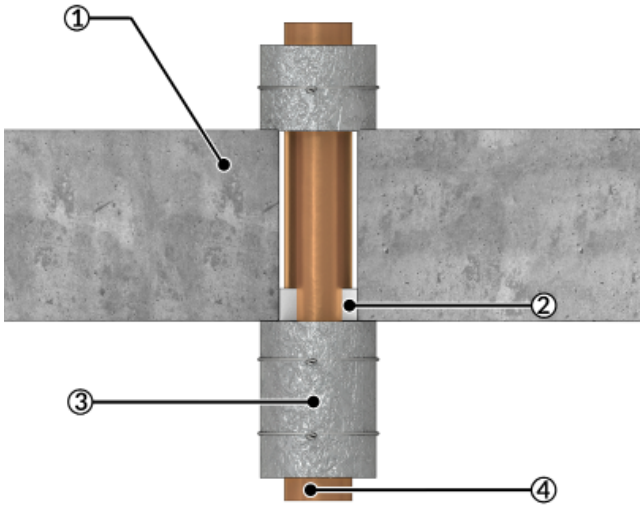
C.13. Construction details

The supporting construction must be classified in accordance with EN 13501-2 for the required fire resistance period.

Rigid floors: The floor must have a minimum thickness of 150 mm and ccomprise aerated concrete or concrete with a minimum density of 650 kg/m³.

Penetration Seal: Non-combustible metal pipes with min. 500 mm long local interrupted (LI) stone wool insulation 80 kg/m³ or higher, sealed on the bottom side of the floor with HENSOMASTIK® Acrylic, min. 25 mm deep and positioned flush to the bottom face of the floor. Annular space width (a1) 10 – 20 mm, and maximum seal size defined by penetrating service diameter and allowed max annular space. The classification applies to all penetration angles between 90 and 45 degrees. The length of the local insulation may be increased but not reduced. Services shall be supported at maximum 250 mm from the top side of the floor.





1 = Rigid floor, 2 = Annular gap (width 10 – 20 mm) filled ≥ 25 mm deep with HENSOMASTIK® Acrylic, optional backing with stone wool (class A1 or A2 according to EN 13501-1), 3 = Insulation, 4 = Non-combustible metal pipe

C.13.1. Non-combustible metal pipes with stone wool insulation, sealed on bottom

Services	Diameter (mm)	Wall thickness (mm)	Insulation	Insulation thickness (mm)	Insulation length (mm)	Annular space (mm)	Classification*
Copper, steel	≤ 15	1.0 – 14.2	Stone wool ≥ 80 kg/m³	20	2 x LI 500	10 – 20	EI 120 C/U
	≤ 54	1.5 – 14.2	Stone wool ≥ 80 kg/m³	20	2 x LI 500	10 – 20	EI 90 C/U
Steel	≤ 42.4	1.0 – 14.2	Stone wool ≥ 80 kg/m³	20	2 x LI 500	10 – 20	EI 120 C/U
	> 42.4 ≤ 139.7	2.0 – 14.2	Stone wool ≥ 80 kg/m³	30 – 80	2 x LI 500	10 – 20	EI 120 C/U
	> 139.7 ≤ 219.1	4.0 – 14.2	Stone wool ≥ 80 kg/m³	30 – 80	2 x LI 500	10 – 20	EI 60 C/U
	> 139.7 ≤ 219.1	4.0 – 14.2	Stone wool ≥ 80 kg/m³	80	2 x LI 500	10 – 20	EI 90 C/U

* Valid for all penetration angles between 90 and 45 degrees.

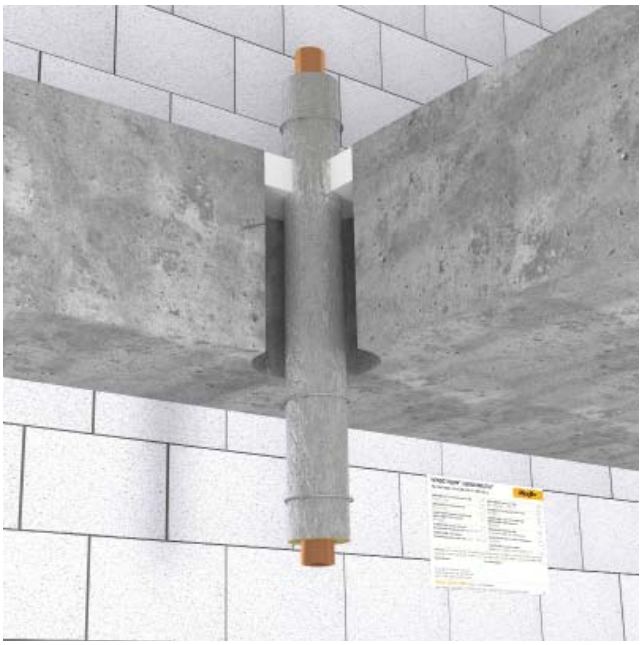
Rigid Floor ≥ 150 mm | Non-combustible metal pipes with stone wool insulation, sealed on top

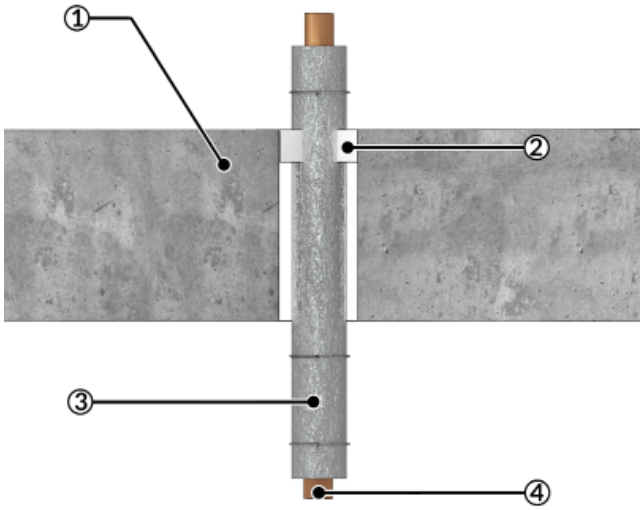
C.14. Construction details

The supporting construction must be classified in accordance with EN 13501-2 for the required fire resistance period.

Rigid floors: The floor must have a minimum thickness of 150 mm and ccomprise aerated concrete or concrete with a minimum density of 650 kg/m³.

Penetration Seal: Non-combustible metal pipes with min. 1000 mm long local sustained (LS) or continuous sustained (CS) stone wool insulation 80 kg/m³ or higher, sealed on the top side of the floor with HENSOMASTIK® Acrylic, min. 25 mm deep and positioned flush to the top face of the floor. Annular space width (a1) 10-20 mm, and maximum seal size defined by penetrating service diameter and allowed max annular space. The classification applies to all penetration angles between 90 and 45 degrees. The length of the local insulation may be increased but not reduced. Services shall be supported at maximum 250 mm from the top side of the floor.





1 = Rigid floor, 2 = Annular gap (width 10 – 20 mm) filled ≥ 25 mm deep with HENSOMASTIK® Acrylic, optional backing with stone wool (class A1 or A2 according to EN 13501-1), 3 = Insulation, 4 = Non-combustible metal pipe

C.14.1. Non-combustible metal pipes with stone wool insulation, sealed on top

Services	Diameter (mm)	Wall thickness (mm)	Insulation	Insulation thickness (mm)	Insulation length (mm)	Annular space (mm)	Classification*
Copper, steel	≤ 54	1.0 – 14.2	Stone wool ≥ 80 kg/m³	20	CS, LS 1000	10 – 20	EI 60 C/U
	54	1.5 – 14.2	Stone wool ≥ 80 kg/m³	20	CS, LS 1000	10 – 20	EI 90 C/U
	> 54 ≤ 88.9	1.5 – 14.2	Stone wool ≥ 80 kg/m³	30	CS, LS 1000	10 – 20	EI 60 C/U
Steel	> 42.4 ≤ 219.1	2.0 – 14.2	Stone wool ≥ 80 kg/m³	20 – 30	CS, LS 1000	10 – 20	EI 60 C/U
	219.1	2.0 – 14.2	Stone wool ≥ 80 kg/m³	30	CS, LS 1000	10 – 20	EI 90 C/U

* Valid for all penetration angles between 90 and 45 degrees.

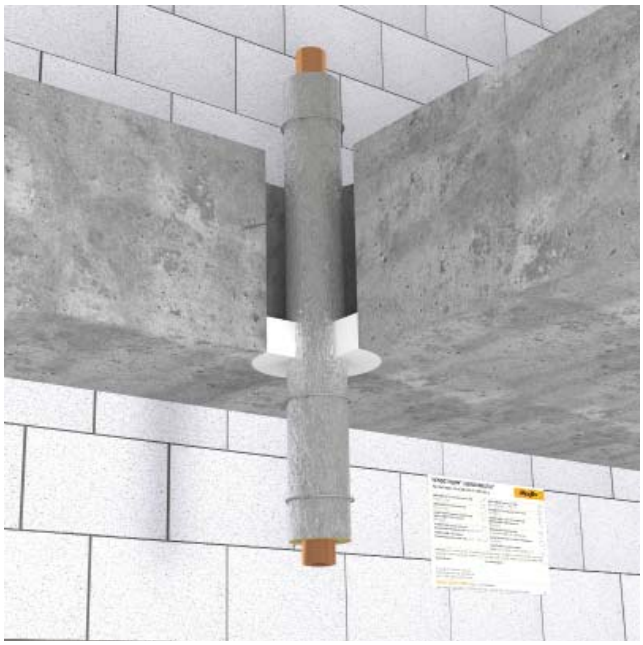
Rigid Floor ≥ 150 mm | Non-combustible metal pipes with stone wool insulation, sealed on bottom

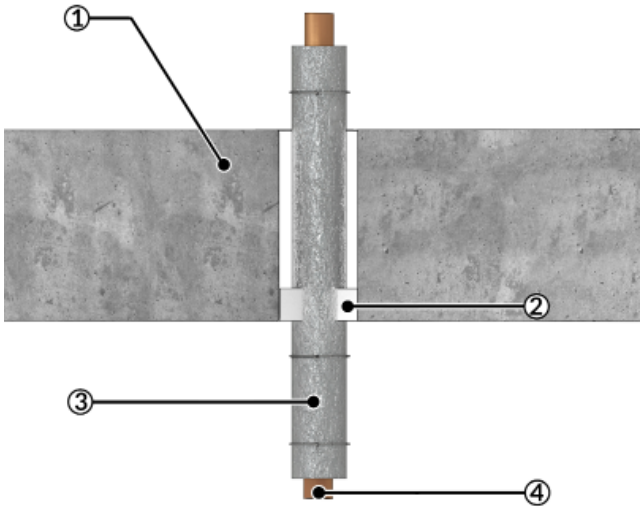
C.15. Construction details

The supporting construction must be classified in accordance with EN 13501-2 for the required fire resistance period.

Rigid floors: The floor must have a minimum thickness of 150 mm and ccomprise aerated concrete or concrete with a minimum density of 650 kg/m³.

Penetration Seal: Non-combustible metal pipes with min. 1000 mm long local sustained (LS) or continuous sustained (CS) stone wool insulation 80 kg/m³ or higher, sealed on the bottom side of the floor with HENSOMASTIK® Acrylic, min. 25 mm deep and positioned flush to the bottom face of the floor. Annular space width (a1) 10-20 mm, and maximum seal size defined by penetrating service diameter and allowed max annular space. The classification applies to all penetration angles between 90 and 45 degrees. The length of the local insulation may be increased but not reduced. Services shall be supported at maximum 250 mm from the top side of the floor.





1 = Rigid floor, 2 = Annular gap (width 10 – 20 mm) filled ≥ 25 mm deep with HENSOMASTIK® Acrylic, optional backing with stone wool (class A1 or A2 according to EN 13501-1), 3 = Insulation, 4 = Non-combustible metal pipe

C.15.1. Non-combustible metal pipes with stone wool insulation, sealed on bottom

Services	Diameter (mm)	Wall thickness (mm)	Insulation	Insulation thickness (mm)	Insulation length (mm)	Annular space (mm)	Classification*
Copper, steel	≤ 15	1.0 – 14.2	Stone wool ≥ 80 kg/m³	20	CS, LS 1000	10 – 20	EI 90 C/U
	> 15 ≤ 54	1.0 – 14.2	Stone wool ≥ 80 kg/m³	20	CS, LS 1000	10 – 20	EI 90 C/U
Steel	> 54 ≤ 88.9	1.5 – 14.2	Stone wool ≥ 80 kg/m³	30	CS, LS 1000	10 – 20	EI 90 C/U
	> 42.2 ≤ 219.1	2.0 – 14.2	Stone wool ≥ 80 kg/m³	20 – 30	CS, LS 1000	10 – 20	EI 90 C/U

* Valid for all penetration angles between 90 and 45 degrees.

Our technical advisers will be pleased to assist you with your enquiries.
Further details can be downloaded from: **www.rudolf-hensel.de**

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