

HENSOMASTIK® Mixed Penetration Seal EI 60

Technical Data Sheet and Installation Manual

HENSOMASTIK® Mixed Penetration Seal systems are used to form a fire penetration seal for combustible, multilayer and metal pipes with or without insulation, electric cables, conduits or support structures in flexible or rigid wall and rigid floor constructions where they are provided with openings for single, multiple or mixed supply lines.

- Fire resistance up to EI 90 in walls and floors (tested acc. to EN 1366-3, ETA Nr. 20/1310)
- Only 1 x ≥ 60 mm thick mineral fibre board coated on both sides with HENSOMASTIK® 5 KS Farbe or HENSOMASTIK® 5 KS viskos fire protection coating
- Application indoors and in protected outdoor areas without driving rain – Use category Y1

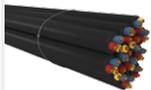
TECHNICAL INFORMATION

Intended Use

The **HENSOMASTIK® Mixed Penetration Seal EI60** (see ETA 20/1310) is a coated board soft fire penetration seal system, comprising 60 mm Rockwool Hardrock 040 mineral fibre boards coated on both faces with **HENSOMASTIK® 5 KS Farbe/viskos**. It is 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 medium and large apertures for the penetration of multiple and mixed services.

The **HENSOMASTIK® Mixed Penetration Seal EI60** is supplied as a kit of pre-coated boards with dimensions of 600 x 1000 x 60 mm. The boards are cut to size and inserted into the aperture in the supporting construction element around the penetrating services. There is also the option to use uncoated boards in the aperture and coat them during installation.

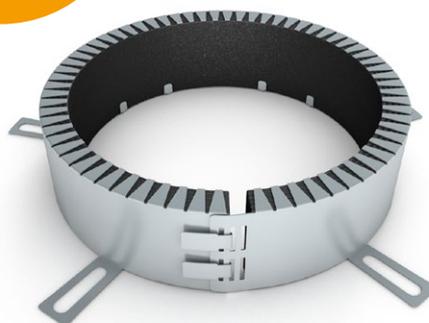
Board joints and edges are buttered and sealed, and the services sealed and coated with **HENSOMASTIK® 5 KS Farbe/viskos** and **HENSOMASTIK® 5 KS SP (Spachtel)**, supplied in liquid form in pails or cartridges. **HENSOTHERM® RM 30/RM 50** pipe collars (also see ETA 19/0730) and **HENSOTHERM® 7 KS Gewebe 50/100/125** endless pipe wraps (also see ETA 16/0369) are also incorporated into the penetration seal where it is penetrated by combustible plastic pipes or non-combustible metal pipes with flexible elastomeric foam insulation.

Permitted Services		Max. Ø [mm]
	Single cables	≤ 80
	Cable bundles	≤ 100/21
	Single polyolefin flexible electrical installation conduits with or without cables	≤ 32/21
	Cable trays, ladders and support structures	≤ 500
	Electrical installation conduits (EIC)	≤ 125 / 32 / 21
	Combustible pipes	≤ 125
	Combustible pipes with PE insulation	≤ 125
	Aluminium composite pipes with FEF insulation	≤ 63
	Metal pipes with stone wool insulation	≤ 88.9 [copper] ≤ 139.7 [steel]
	Metal pipes with FEF insulation	≤ 88.9 [copper] ≤ 114.3 [steel]
	Metal pipes with FEF insulation and pipe heating	≤ 15

Technical Assessment Document	
European Technical Assessment: In accordance with:	ETA No. 20/1310 EN 1366-3

Construction Elements	Min. Thickness
Flexible walls	≥ 100 mm
Rigid walls	≥ 100 mm
Rigid floors	≥ 150 mm

NEU!
Jetzt mit
HENSOTHERM®
RM 30 / RM 50



TECHNICAL INFORMATION

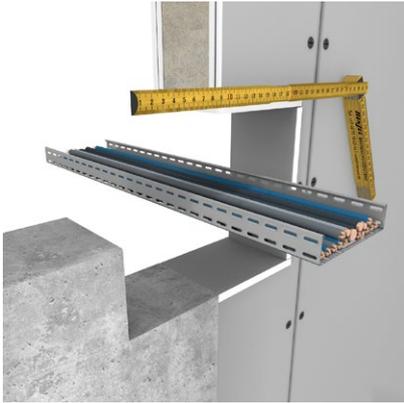
Single Products in this Product System

	Product Name	Container / Packing Size	Article Number / EAN Code
	HENSOMASTIK® 5 KS Farbe	6 kg pail	4250153504900 (4250153504900)
		12.5 kg pail	4250153504917 (4250153504917)
	HENSOMASTIK® 5 KS vikos	6 kg pail	4250153505136 (4250153505136)
		12.5 kg pail	4250153505129 (4250153505129)
	HENSOMASTIK® 5 KS SP	6 kg pail	4250153505228 (4250153505228)
		12.5 kg pail	4250153505235 (4250153505235)
	HENSOMASTIK® 5 KS SP	310 ml cartridge (20 cartridges per box)	4250153505242 (4250153505242)
	HENSOTHERM® 7 KS Gewebe 50	1 Rolle = L: 15 m	4250153511052 (4250153511052)
	HENSOTHERM® 7 KS Gewebe 100	1 Rolle = L: 15 m	4250153511090 (4250153511090)
	HENSOTHERM® 7 KS Gewebe 125	1 Rolle = L: 10 m	4250153511069 (4250153511069)
	HENSOTHERM® RM 30, DN 40 bis 125 mm	1 Stück	42501535xxxxx (42501535xxxxx)
	HENSOTHERM® RM 50, DN 140 mm	1 Stück	4250153512677 (4250153512677)
	Pre-coated mineral fibre board, 600 x 1.000 x 60 mm, coated on both faces with HENSOMASTIK® 5 KS Farbe (DFT ≥ 1 mm)	80 pcs. (packed on pallet)	4250153504887 (4250153504887)

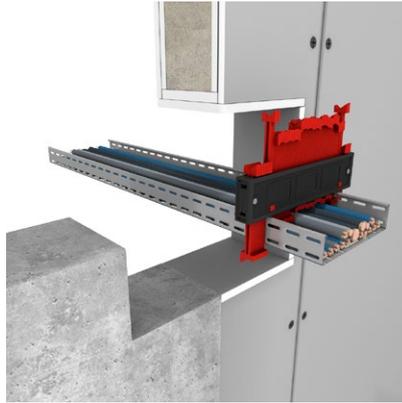
TECHNICAL INFORMATION

Product specifications	HENSOMASTIK® 5 KS Farbe	HENSOMASTIK® 5 KS viskos	HENSOMASTIK® 5 KS SP
Colour	White	White	White
Consistency	Liquid	Viscous	Viscous
Apparent density	1.28–1.42 g/cm ³	1.27–1.41 g/cm ³	1.28–1.45 g/cm ³
Usage category with respect to weathering effects	Typ X: Also designed for use outdoors	Typ X: Also designed for use outdoors	Typ X: Also designed for use outdoors
Fire properties as defined in DIN EN 13501-1	Class E	Class E	Class E
VOC content	< 1 g/l	< 1 g/l	< 1 g/l
Tested and classified according to	EN 1366-3 and EN 13501-2	EN 1366-3 and EN 13501-2	EN 1366-3 and EN 13501-2
Approved according to	EAD 350454-00-1104	EAD 350454-00-1104	EAD 350454-00-1104
Application	<ul style="list-style-type: none"> • Material, surface and ambient air temperatures > +5°C, relative humidity < 80 % • Before application stir up thoroughly with slow speed! • Application by brush, roller or airless spraying • Airless spraying: delivery capacity > 5.5l/min; hose length max. 15m; material pressure min. 200 bar • Remove filters from airless pump and spraying gun • Remove suction hose from airless pump • Nozzle size for airless spraying: 0.023" – 0.027" • Coverage rate: approx. 1.4mm wet = 1.0mm dry = approx. 1.8kg/m² • Thinning with max. 3% water 	<ul style="list-style-type: none"> • Material, surface and ambient air temperatures > +5°C, relative humidity < 80 % • Before application stir up thoroughly with slow speed! • Application by brush, roller or airless spraying • Airless spraying: delivery capacity > 5.5l/min; hose length max. 15m; material pressure min. 200 bar • Remove filters from airless pump and spraying gun • Remove suction hose from airless pump • Nozzle size for airless spraying: 0.025" – 0.031" • Coverage rate: approx. 1.4mm wet = 1.0mm dry = approx. 1.8kg/m² • Thinning with max. 3% water 	<ul style="list-style-type: none"> • Material, surface and ambient air temperatures > +8°C to max. +30°C • Recommended material temperature > +15°C • Application by trowel or out of the cartridge
	Check surface for appropriate adhesion! Free from dust, dirt, grease or other separating layers.		
	Clean working tools immediately after use with water!		
Work Safety	Use HENSOMASTIK® 5 KS Farbe, viskos and SP in accordance with all applicable local and national regulations.		
Giscode	M-DF01		
Environment, Health and Safety	As regulations are often revised please request for the actual safety data sheet before using the product.		
Storage and transport	Storage and transport at min. ≥ +5°C to max. +30°C.		
	Free from frost!		
	Opened containers must be sealed carefully after use!		
Best before	At least 12 months in unopened containers.		

TECHNICAL INFORMATION



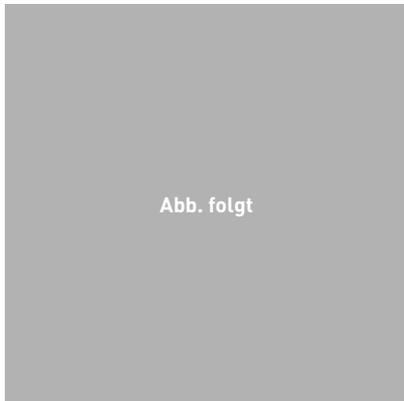
Measure length and width of the opening and penetrating services and transfer the sizes to the mineral fibre boards.



To transfer the shape of electrical cables and cable support structures the use of a contour gauge is recommended.



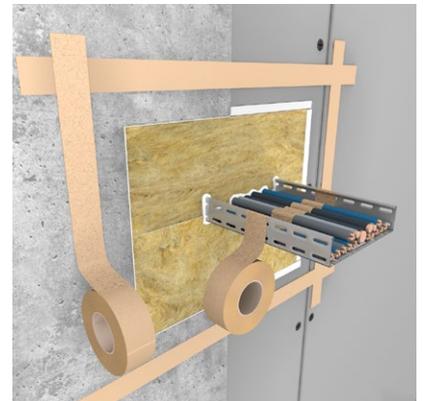
Cut the ready-to-use mineral fibre board coated on both sides in perfectly fitting pieces to be installed precisely in the opening.



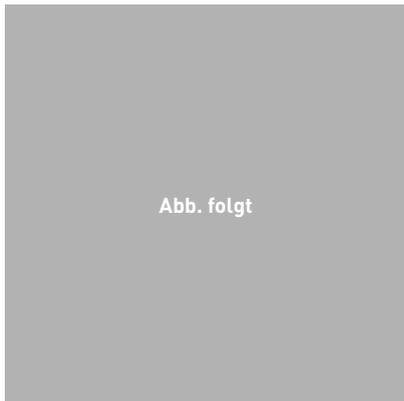
Apply thick layer of **HENSOMASTIK® 5 KS Farbe /viskos** to butter all cut edges and the outer edges of the mineral fibre board.



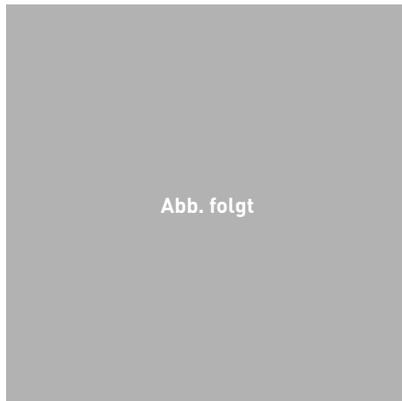
Fill all gaps > 10 mm with loose mineral fibre material, then with **HENSOMASTIK® 5 KS SP (Spachtel)** from both sides in full depth.



Apply duct tape for a min. 20 mm wide circumferential coating.



Apply a thick layer of **HENSOMASTIK® 5 KS Farbe /viskos** to seal the gap between mineral fibre boards and reveals.



Smooth out the excess material with a spatula or putty knife to form the circumferential coating (DFT min. 1 mm).



Remove tape. Colour may be designed using top coatings **HENSOTOP SB** or **HENSOTOP WB** in 50 - 100 µm dry film thickness.

Note: In floors, any gap between mineral fibre boards and reveal is closed and a circumferential coating is applied from the underside of the floor accordingly.

Caution! Installations of the **HENSOMASTIK® Mixed Penetration Seal EI 60** in floors must be additionally secured against stepping on!

PRODUCT SELECTOR



Product Selector for fire protection penetration seals



FIRE PROTECTION SYSTEMS



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.

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

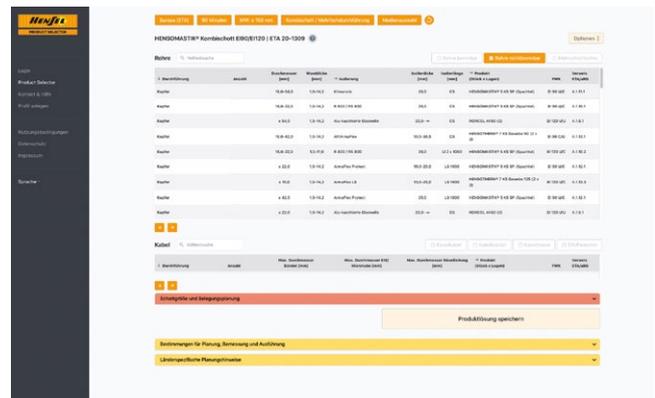
Your advantages in brief:

- ✓ 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

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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.



Let's go!

Just give it a go.

TECHNICAL INFORMATION

Maximum Seal Size, Permitted Minimum Spacing and Distance of the First Support | Installation in Walls

A.1. Maximum seal size, minimum spacing and distance of the first support

A.1.1. Maximum seal size

The maximum permissible seal size in walls is 1200x2000 mm (w x h) or 2000x1200 mm (w x h).

The maximum permissible seal area that can be occupied by penetrating services and sustained insulation is 60%.

A.1.2. Permitted Minimum Spacing

The following minimum spacings apply for all construction variants and applications in walls (see drawing for explanation).

Legend:

- 1: HENSOMASTIK® Mixed Penetration Seal EI 60
- 2: Penetrating services inside the seal area
- 3: Supporting construction element
- 4: Other fire penetration seals, openings or installations

Minimum spacing between penetrating services:

- a1: between cable/cable trays and metal pipes ≥ 30 mm
- a2: between cable/cable trays and plastic pipes ≥ 30 mm
- a3: between metal pipes and plastic pipes ≥ 25 mm
- a4: between plastic pipes ≥ 0 mm
- a5: between metal pipes ≥ 25 mm
- a6: between cable trays ≥ 30 mm

Minimum spacing between penetrating services and seal edges:

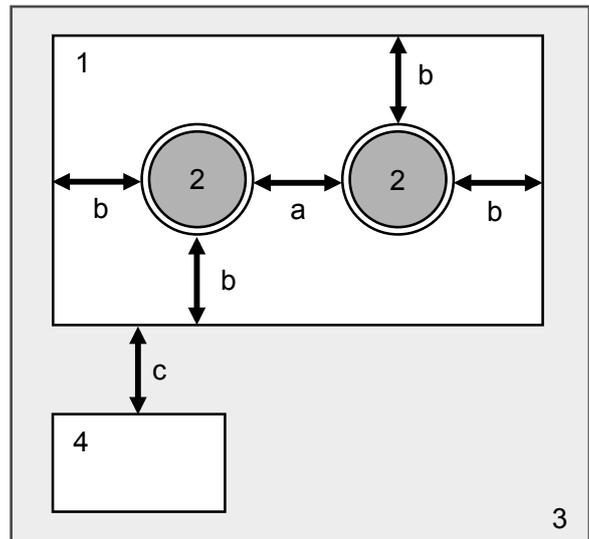
- b1: between cable/cable trays and the upper seal edge ≥ 25 mm
- b2: between cable/cable trays and the side seal edge ≥ 25 mm
- b3: between cable/cable trays and the lower seal edge ≥ 25 mm
- b4: between metal pipes and the side seal edge ≥ 25 mm
- b5: between plastic pipes and the side seal edge ≥ 0 mm

Minimum spacing between other openings or installations:

c1-1 Other fire penetration seals:	≥ 20 cm, if one or both of the adjacent openings is larger than 40 x 40 cm, otherwise ≥ 10 cm.
c1-2 Other openings or installations:	≥ 20 cm, if one or both of the adjacent openings is larger than 20 x 20 cm, otherwise ≥ 10 cm.

A.1.3. Distance of the first support:

Distance of the first support:	All services shall be supported at maximum 250 mm distance on both sides of the wall, measured from the seal surface.
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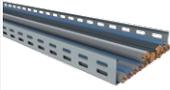
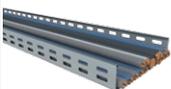
Pipe End Configuration

Proper pipe end configuration must be taken into account when choosing a suitable fire penetration seal solution for e.g. plastic rainwater or ventilated sewage pipes, or unventilated drinking or heating water pipes. The classifications stated in this manual include whether the ends of tested pipes were closed [Capped, marked C] inside and outside of the furnace or was open [Uncapped, marked U]. According to EN 1366-3, configuration U/U includes all other configurations, but not vice versa:



TECHNICAL INFORMATION

HENSOMASTIK® Kombischott EI60 | Permitted Minimum Spacing and Distance of the First Support | Max. Seal Size 1.200 x 2.000 mm (W x H) oder 2.000 x

Flexible and rigid walls ≥ 100 mm	Minimum spacing between penetrating services / reveals / distance of first support [mm]			Single cables, cable bundles, cable trays and support structures	Polyolefin flexible cable conduits with HENSOTHERM® 7 KS Gewebe 100	Combustible plastic pipes without insulation with HENSOTHERM® RM pipe collars
	ETA 20/1310 section					
A.3.	Single cables, cable bundles, cable trays and support structures		≥ 30	≥ 30	≥ 30	
A.4.	Polyolefin flexible cable conduits with HENSOTHERM® 7 KS Gewebe 100		≥ 30	≥ 0	≥ 0	
A.5. A.6.	Combustible plastic pipes without insulation with HENSOTHERM® RM pipe collars		≥ 30	≥ 0	≥ 0	
A.7.	Combustible plastic pipes without insulation with HENSOTHERM® 7 KS Gewebe 100		≥ 30	≥ 0	≥ 0	
A.8.	Aluminium-composite pipes with FEF-insulation with HENSOTHERM® 7 KS Gewebe 100		≥ 30	≥ 0	≥ 0	
A.9. A.10. A.11.	Metal pipes with non-combustible insulation		≥ 30	≥ 25	≥ 25	
A.12. A.13.	Metal pipes with FEF-insulation with HENSOTHERM® 7 KS Gewebe 125		≥ 30	≥ 25	≥ 25	
A.14. A.15.	Metal pipes with FEF-insulation with HENSOTHERM® 7 KS Gewebe 50		≥ 30	≥ 25	≥ 25	

1.200 mm (W x H) in Walls ≥ 100 mm

Combustible plastic pipes without insulation with HENSOTHERM® 7 KS Gewebe 100	Aluminium-composite pipes with FEF-insulation with HENSOTHERM® 7 KS Gewebe 100	Metal pipes with non-combustible insulation	Metal pipes with FEF-insulation with HENSOTHERM® 7 KS Gewebe 125	Metal pipes with FEF-insulation with HENSOTHERM® 7 KS Gewebe 50	Reveal / seal edges	First support
						
≥ 30	≥ 30	≥ 30	≥ 30	≥ 30	≥ 25	≤ 250
≥ 0	≥ 0	≥ 25	≥ 25	≥ 25	≥ 0	≤ 250
≥ 0	≥ 0	≥ 25	≥ 25	≥ 25	≥ 0	≤ 250
≥ 0	≥ 0	≥ 25	≥ 25	≥ 25	≥ 0	≤ 250
≥ 0	≥ 0	≥ 25	≥ 25	≥ 25	≥ 0	≤ 250
≥ 25	≥ 25	≥ 25	≥ 25	≥ 25	≥ 25	≤ 250
≥ 25	≥ 25	≥ 25	≥ 25	≥ 25	≥ 25	≤ 250
≥ 25	≥ 25	≥ 25	≥ 25	≥ 25	≥ 25	≤ 250

TECHNICAL INFORMATION

Overview of Applications and Construction Details

A. Flexible or Rigid Wall ≥ 100 mm

A.		Application	Page
2.		Blank seal (no penetrating services)	12
3.		Single cables, cable bundles, electrical installation conduits (PVC or steel) and cable support structures	13
4.		Polyolefin flexible cable conduits with or without cables	14
5.		Single cables, cable bundles or electrical installation pipes (EIP) led through a HENSOTHERM® Service Transit	15-17
6.		Combustible plastic pipes with PE-insulation with HENSOTHERM® RM pipe collars	18
7.		Combustible plastic pipes without insulation with HENSOTHERM® 7 KS Gewebe 100	19-21
8.		Aluminium-composite pipes with FEF-insulation with HENSOTHERM® 7 KS Gewebe 100	22-23

TECHNICAL INFORMATION

Overview of Applications and Construction Details

A. Flexible or Rigid Wall ≥ 100 mm

A.		Application	Page
9.		Metal pipes with non-combustible insulation (LI)	24
10.		Metal pipes with non-combustible insulation (LS)	25
11.		Metal pipes with non-combustible insulation (CS)	26
12.		Metal pipes with FEF-insulation with HENSOTHERM® 7 KS Gewebe 125	27-29
13.		Metal pipes with pipe heating and FEF-insulation with HENSOTHERM® 7 KS Gewebe 125	30
14.		Metal pipes with FEF-insulation (LS) with HENSOTHERM® 7 KS Gewebe 50	31-32
15.		Metal pipes with FEF-insulation (CS) with HENSOTHERM® 7 KS Gewebe 50	33-35

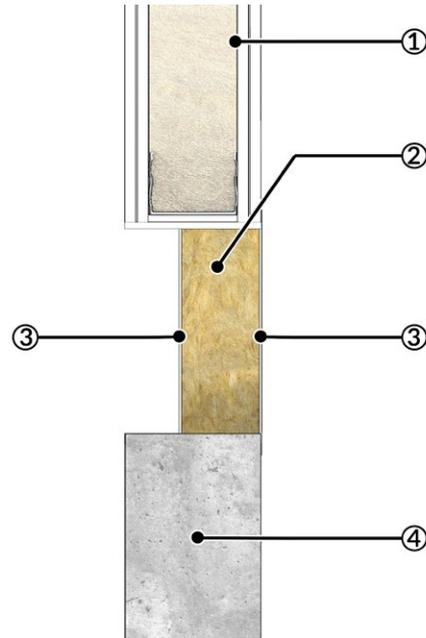
TECHNICAL INFORMATION

Flexible or Rigid Walls ≥ 100 mm

A.2. Blank seal, wall application

Construction details: Blank HENSOMASTIK® Mixed Penetration Seal EI60 comprising one ≥ 60 mm thick Rockwool Hardrock 040 mineral fibre board ≥ 150 kg/m³ installed flush with either side of the wall and fixed by friction.

The mineral fibre boards are cut to size and friction fitted into the supporting element. Board joints and edges are buttered and sealed and the external faces of the boards coated with HENSOMASTIK® 5 KS Farbe or HENSOMASTIK® 5 KS viskos in dry film thickness (DFT) ≥ 1 mm. All gaps and joints between boards and reveal are closed with HENSOMASTIK® 5 KS Farbe or HENSOMASTIK® 5 KS viskos and a min. 20 mm wide circumferential coating (DFT ≥ 1 mm) is applied from both sides of the wall.



1 = Flexible wall (drywall), 2 = Mineral fiber board $1 \times \geq 60$ mm, density ≥ 150 kg/m³, Rockwool Hardrock 040, 3 = Outer sides coated (DFT ≥ 1 mm) with HENSOMASTIK® 5 KS Farbe/viskos, circumferential coating ≥ 20 mm width, 4 = Rigid wall

A.2.1. Blank seal, wall application (EI 60)

Services	Classification
Blank seal, no penetrating services	EI 60

TECHNICAL INFORMATION

Flexible or Rigid Walls ≥ 100 mm

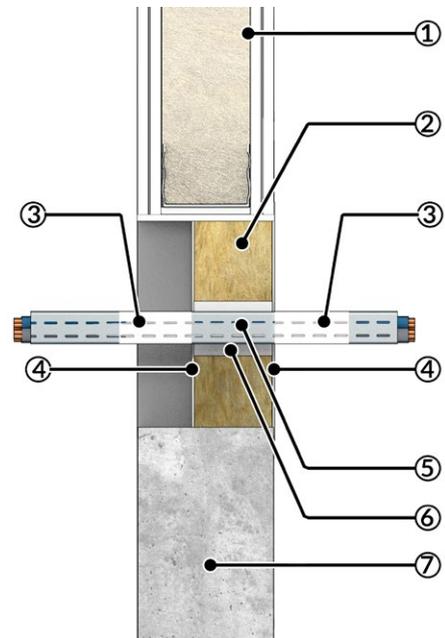
A.3. Single cables, cable bundles, cable trays and support structures

Construction details: Single cables, cable bundles, cable trays and support structures in a HENSOMASTIK® Mixed Penetration Seal EI60 comprising one ≥ 60 mm thick Rockwool Hardrock 040 mineral fibre board ≥ 150 kg/m³ installed flush with either side of the wall and fixed by friction.

The mineral fibre boards are cut to size and friction fitted into the supporting element. Board joints and edges are buttered and sealed and the external faces of the boards coated with HENSOMASTIK® 5 KS Farbe or HENSOMASTIK® 5 KS viskos in dry film thickness (DFT) ≥ 1 mm. All gaps and joints between boards and reveal are closed with HENSOMASTIK® 5 KS Farbe or HENSOMASTIK® 5 KS viskos and a min. 20 mm wide circumferential coating (DFT ≥ 1 mm) is applied from both sides of the wall.

The annular gap between boards and penetrating single cables, cable bundles, cable trays or support structures is stuffed with mineral wool (reaction to fire class A1 or A2 according to EN 13501-1) and joints ≤ 10 mm filled with HENSOMASTIK® 5 KS SP (Spachtel) from both sides in full depth.

A coating of HENSOMASTIK® 5 KS Farbe or HENSOMASTIK® 5 KS viskos is applied in dry film thickness (DFT) ≥ 1 mm extending 200 mm from both faces of the seal.



1 = Flexible wall (drywall), 2 = Mineral fiber board 1 x ≥ 60 mm, density ≥ 150 kg/m³, Rockwool Hardrock 040, 3 = Coating (200 mm, DFT ≥ 1 mm) with HENSOMASTIK® 5 KS Farbe or HENSOMASTIK® 5 KS viskos, 4 = Outer sides coated (DFT ≥ 1 mm) with HENSOMASTIK® 5 KS Farbe/viskos, circumferential coating ≥ 20 mm width, 5 = Single cables, cable bundles, cable trays or support structures, 6 = Annular gap filled with mineral wool (A1 or A2), annular gap ≤ 10 mm completely filled with HENSOMASTIK® 5 KS SP (Spachtel), 7 = Rigid wall

A.3.1. Single cables, cable bundles, cable trays and support structures (EI 60)

Services	Max. diameter bundle [mm]	Max. diameter single cable conduit [mm]	Max. diameter single cable [mm]	Classification
Sheathed cables of all types, single or in a bundle	100	-	80	EI 60
Telecommunication cables, single or in a bundle	100	-	21	
Sheathed cables of all types, single	-	-	80	
Cable support, tray or ladder	-	500	-	

TECHNICAL INFORMATION

Flexible or Rigid Walls ≥ 100 mm

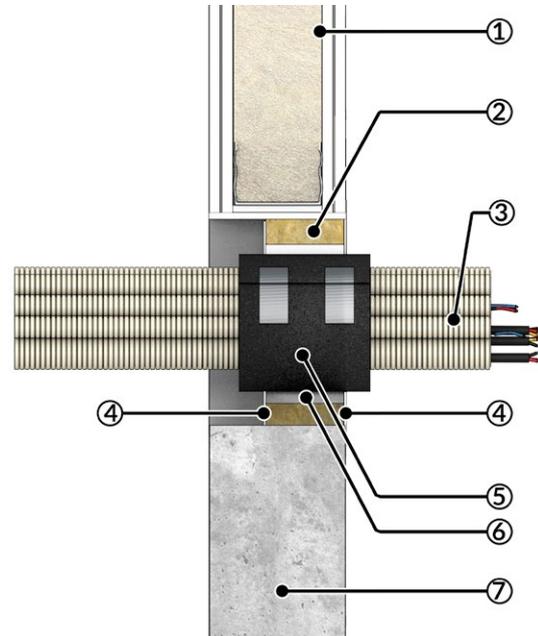
A.4. Polyolefin flexible cable conduits with or without cables with HENSOTHERM® 7 KS Gewebe 100

Construction details: Polyolefin flexible cable conduits, single or in a bundle, with or without cables in a HENSOMASTIK® Mixed Penetration Seal EI60 comprising one ≥ 60 mm thick Rockwool Hardrock 040 mineral fibre board ≥ 150 kg/m³ installed flush with either side of the wall and fixed by friction.

The mineral fibre boards are cut to size and friction fitted into the supporting element. Board joints and edges are buttered and sealed and the external faces of the boards coated with HENSOMASTIK® 5 KS Farbe or HENSOMASTIK® 5 KS viskos in dry film thickness (DFT) ≥ 1 mm. All gaps and joints between boards and reveal are closed with HENSOMASTIK® 5 KS Farbe or HENSOMASTIK® 5 KS viskos and a min. 20 mm wide circumferential coating (DFT ≥ 1 mm) is applied from both sides of the wall.

Around the single cable conduit or tight bundle, a wrapping of one length of HENSOTHERM® 7 KS Gewebe 100 endless pipe collar (thickness 1 mm), positioned at centre of the seal and protruding 20 mm on both sides, with number of layers of according to table, and fixed with adhesive tape, is applied.

The max. 10 mm wide annular gap between boards and HENSOTHERM® 7 KS Gewebe 100 is filled with HENSOMASTIK® 5 KS SP (Spachtel) from both sides in full depth.



1 = Flexible wall (drywall), 2 = Mineral fiber board 1 x ≥ 60 mm, density ≥ 150 kg/m³, Rockwool Hardrock 040, 3 = Polyolefin flexible cable conduits with or without cables, single or in a bundle, 4 = Outer sides coated (DFT ≥ 1 mm) with HENSOMASTIK® 5 KS Farbe/viskos, circumferential coating ≥ 20 mm width, 5 = HENSOTHERM® 7 KS Gewebe 100, fixed with adhesive tape or metal straps or wires ≥ 0.6 mm, 6 = Annular gap filled with HENSOMASTIK® 5 KS SP (Spachtel), 7 = Rigid wall

A.4.1. Polyolefin flexible cable conduits with or without cables with HENSOTHERM® 7 KS Gewebe 100 (EI 60)

Services	Max. diameter bundle [mm]	Max. diameter single cable conduit [mm]	Max. diameter single cable [mm]	Layers of HENSOTHERM® 7 KS Gewebe 100 (1 mm)	Classification
Polyolefin flexible cable conduits without cables, single or in a bundle	125	32	-	6	EI 60 C/C
Polyolefin flexible cable conduits with cables type NHXH-J 3 x 1.5 mm ² and NHXH-J 5 x 1.5 mm ² , single or in a bundle	125	32	21	6	

TECHNICAL INFORMATION

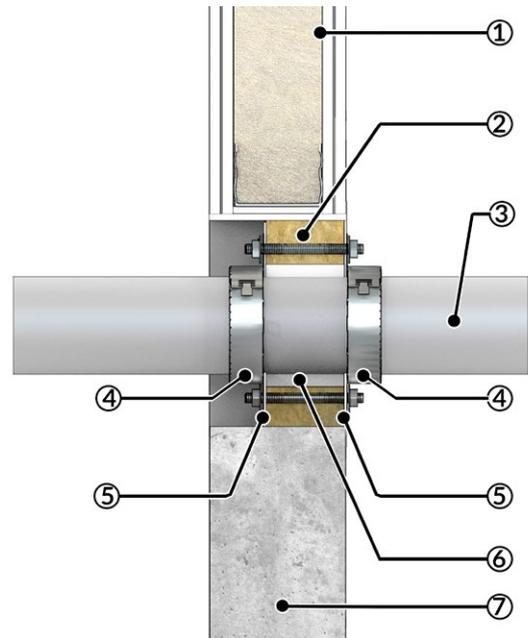
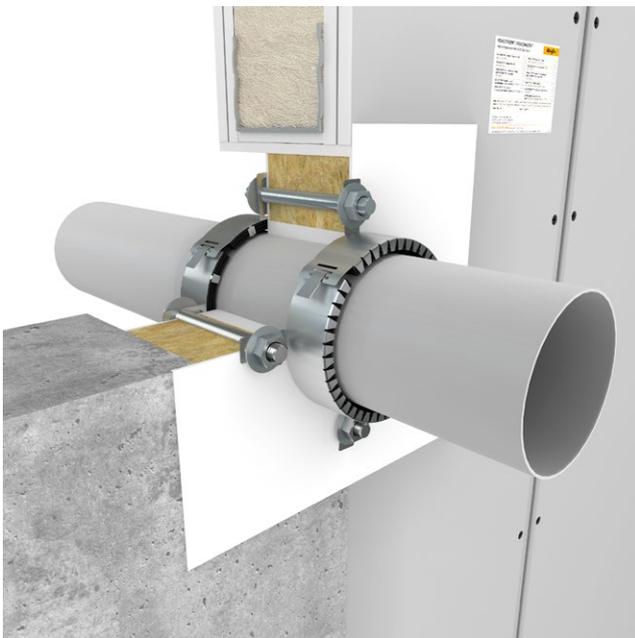
Flexible or Rigid Walls ≥ 100 mm

A.5. Combustible plastic pipes without insulation with HENSOTHERM® RM pipe collars

Construction details: Combustible pipes without insulation in a HENSOMASTIK® Mixed Penetration Seal EI60 comprising one ≥ 60 mm thick Rockwool Hardrock 040 mineral fibre board ≥ 150 kg/m³ installed flush with either side of the wall and fixed by friction. The mineral fibre boards are cut to size and friction fitted into the supporting element. Board joints and edges are buttered and sealed and the external faces of the boards coated with HENSOMASTIK® 5 KS Farbe or HENSOMASTIK® 5 KS viskos in dry film thickness (DFT) ≥ 1 mm. All gaps and joints between boards and reveal are closed with HENSOMASTIK® 5 KS Farbe or HENSOMASTIK® 5 KS viskos and a min. 20 mm wide circumferential coating (DFT ≥ 1 mm) is applied from both sides of the wall.

The max. 10 mm wide annular gap between boards and pipes is filled with HENSOMASTIK® 5 KS SP (Spachtel) from both sides in full depth.

Around the pipe, HENSOTHERM® RM pipe collars are applied in the appropriate collar type and size (see table) from both sides of the seal, aligned flush to the board's surface and closed with the locking lugs. The two opposing HENSOTHERM® RM pipe collars are secured in place with M6 threaded rods, nuts and washers 6.4 x 25 mm at all fastening lugs.



1 = Flexible wall (drywall), 2 = Mineral fiber board $1 \times \geq 60$ mm, density ≥ 150 kg/m³, Rockwool Hardrock 040, 3 = Combustible plastic pipe, 4 = HENSOTHERM® RM pipe collars fixed with threaded rods M6, nuts and washers (6.4 x 25 mm), 5 = Outer sides coated (DFT ≥ 1 mm) with HENSOMASTIK® 5 KS Farbe/viskos, circumferential coating ≥ 20 mm width, 6 = Annular gap filled with HENSOMASTIK® 5 KS SP (Spachtel), 7 = Rigid wall

A.5.1. Geberit Silent-PP with HENSOTHERM® RM pipe collars (EI 60)

Services	Diameter [mm]	Wall thickness [mm]	HENSOTHERM® RM pipe collar [height-size, mm]	Classification
Geberit Silent-PP	32	2.0	HENSOTHERM® RM 30-40	EI 60 U/U
	40	2.0	HENSOTHERM® RM 30-40	
	50	2.0	HENSOTHERM® RM 30-56	
	75	2.6	HENSOTHERM® RM 30-75	
	90	3.1	HENSOTHERM® RM 30-90	
	110	3.6	HENSOTHERM® RM 30-110	
	125	4.2	HENSOTHERM® RM 30-125	

TECHNICAL INFORMATION

Flexible or Rigid Walls ≥ 100 mm

A.5.2. PE pipes with HENSOTHERM® RM pipe collars (EI 60)

Services	Diameter [mm]	Wall thickness [mm]	HENSOTHERM® RM pipe collar [height-size, mm]	Classification
PE incl. PE 100, PE-HD, PE-X, ABS, SAN+PVC	$\geq 32 \leq 40$	3.0 – 4.6	HENSOTHERM® RM 30-40	EI 60 U/U
	$> 40 \leq 50$	3.0 – 4.6	HENSOTHERM® RM 30-56	
	$> 50 \leq 56$	3.4 – 6.6	HENSOTHERM® RM 30-56	
	$> 56 \leq 63$	3.4 – 6.6	HENSOTHERM® RM 30-63	
	$> 63 \leq 75$	3.4 – 6.6	HENSOTHERM® RM 30-75	
	$> 75 \leq 90$	3.4 – 6.6	HENSOTHERM® RM 30-90	
	$> 90 \leq 110$	3.4 – 6.6	HENSOTHERM® RM 30-110	
	$> 110 \leq 125$	3.1 – 7.4	HENSOTHERM® RM 30-125	

Test results on single layer pipes made of PE in accordance with EN 1519-1, EN 12201-1, EN ISO 15494 or EN 12666-1 are valid for all single layer PE pipes in accordance with EN 1519-1, EN 12666-1, EN 12201-2 and EN ISO 15494, PE-X pipes in accordance with EN ISO 15875-2, ABS pipes in accordance with EN 1455-1 and EN ISO 15493 as well as SAN+PVC pipes in accordance with ISO 19220.

The following list contains suitable branded PE-X pipes in accordance with EN ISO 15875-2 under this rule but may not be 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

A.5.3. POLO-KAL NG with HENSOTHERM® RM pipe collars (EI 60)

Services	Diameter [mm]	Wall thickness [mm]	HENSOTHERM® RM pipe collar [height-size, mm]	Classification
POLO-KAL NG	32	1.8	HENSOTHERM® RM 30-40	EI 60 U/U
	40	1.8	HENSOTHERM® RM 30-40	
	50	2.0	HENSOTHERM® RM 30-56	
	75	2.6	HENSOTHERM® RM 30-75	
	90	3.0	HENSOTHERM® RM 30-90	
	110	3.4	HENSOTHERM® RM 30-110	
	125	3.9	HENSOTHERM® RM 30-125	

A.5.4. PP pipes with HENSOTHERM® RM pipe collars (EI 60)

Services	Diameter [mm]	Wall thickness [mm]	HENSOTHERM® RM pipe collar [height-size, mm]	Classification
PP	$> 110 \leq 125$	3.1	HENSOTHERM® RM 30-125	EI 60 U/U

Test results on single layer pipes made of PP in accordance with EN 1451-1 are valid for single layer PP pipes in accordance with EN 1451-1, EN ISO 15874 and EN ISO 15494.

TECHNICAL INFORMATION

Flexible or Rigid Walls ≥ 100 mm

A.5.5. PVC-U pipes with HENSOTHERM® RM pipe collars (EI 60)

Services	Diameter [mm]	Wall thickness [mm]	HENSOTHERM® RM pipe collar [height-size, mm]	Classification
PVC-U	$\geq 32 \leq 40$	1.8 – 3.7	HENSOTHERM® RM 30-40	EI 60 U/U
	$> 40 \leq 50$	1.8 – 3.7	HENSOTHERM® RM 30-56	
	$> 50 \leq 56$	2.2 – 5.3	HENSOTHERM® RM 30-56	
	$> 56 \leq 63$	2.2 – 5.3	HENSOTHERM® RM 30-63	
	$> 63 \leq 75$	2.2 – 5.3	HENSOTHERM® RM 30-75	
	$> 75 \leq 90$	2.2 – 5.3	HENSOTHERM® RM 30-90	
	$> 90 \leq 110$	2.2 – 5.3	HENSOTHERM® RM 30-110	
	$> 110 \leq 125$	2.5 – 6.0	HENSOTHERM® RM 30-125	

Test results on single layer pipes made of PVC-U in accordance with EN 1329-1, EN 1453-1 or EN ISO 1452-2 are valid for single layer pipes made of PVC-U in accordance with EN 1329-1, EN 1453-1, EN ISO 15493 and EN ISO 1452-2 and for pipes made of PVC-C in accordance with EN 1566-1, EN ISO 15493 and EN ISO 15877-2.

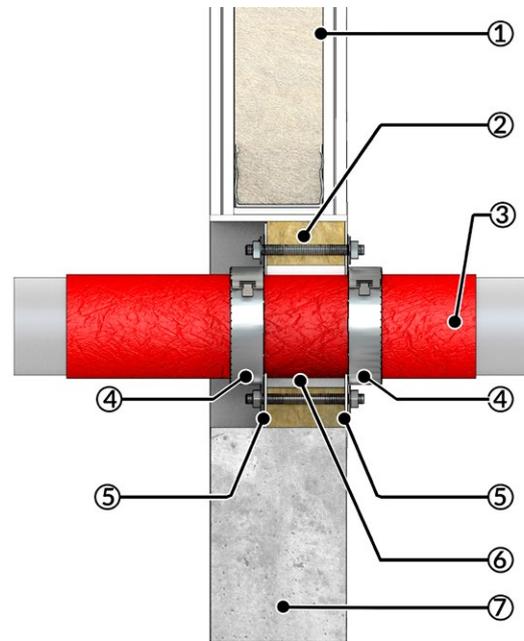
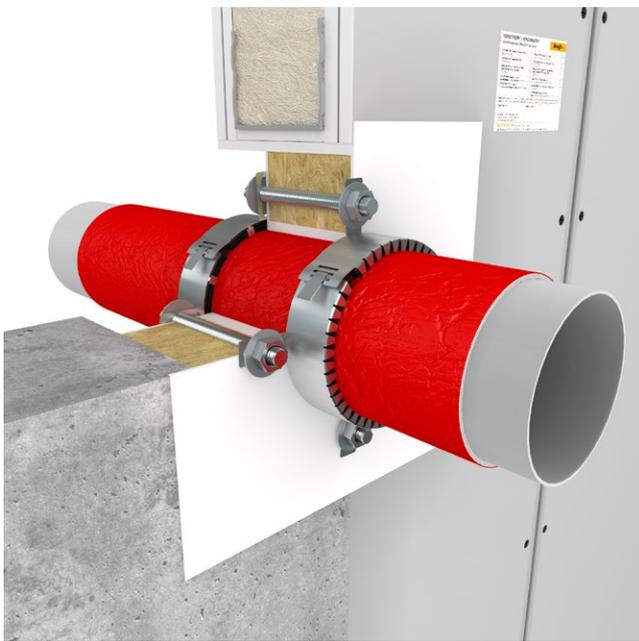
TECHNICAL INFORMATION

Flexible or Rigid Walls ≥ 100 mm

A.6. Combustible plastic pipes with PE-insulation with HENSOTHERM® RM pipe collars

Construction details: Combustible pipes with local sustained (LS) PE-foam sound decoupling insulation (manufacturer independent, strip wrapped around the pipe or pre-fabricated sleeve) with thickness ≤ 5 mm in a HENSOMASTIK® Mixed Penetration Seal EI60 comprising one ≥ 60 mm thick Rockwool Hardrock 040 mineral fibre board ≥ 150 kg/m³ installed flush with either side of the wall and fixed by friction. The mineral fibre boards are cut to size and friction fitted into the supporting element. Board joints and edges are buttered and sealed and the external faces of the boards coated with HENSOMASTIK® 5 KS Farbe or HENSOMASTIK® 5 KS viskos in dry film thickness (DFT) ≥ 1 mm. All gaps and joints between boards and reveal are closed with HENSOMASTIK® 5 KS Farbe or HENSOMASTIK® 5 KS viskos and a min. 20 mm wide circumferential coating (DFT ≥ 1 mm) is applied from both sides of the wall.

The PE-foam insulation (see table for length) is positioned at centre of the seal, protruding on both sides and ending directly after the pipe collars. The max. 10 mm wide annular gap between boards and insulation is filled with HENSOMASTIK® 5 KS SP (Spachtel) from both sides in full depth. Around the insulation, HENSOTHERM® RM pipe collars are applied in the appropriate collar type and size (see table) from both sides of the seal, aligned flush to the board's surface and closed with the locking lugs. The two opposing HENSOTHERM® RM pipe collars are secured in place with M6 threaded rods, nuts and washers 6.4 x 25 mm at all fastening lugs.



1 = Flexible wall (drywall), 2 = Mineral fiber board 1 x ≥ 60 mm, density ≥ 150 kg/m³, Rockwool Hardrock 040, 3 = Combustible plastic pipe with PE-foam sound decoupling, 4 = HENSOTHERM® RM pipe collars fixed with threaded rods M6, nuts and washers (6.4 x 25 mm), 5 = Outer sides coated (DFT ≥ 1 mm), with HENSOMASTIK® 5 KS Farbe/viskos, circumferential coating ≥ 20 mm width, 6 = Annular gap filled with HENSOMASTIK® 5 KS SP (Spachtel), 7 = Rigid wall

A.6.1. Geberit Silent-PP with PE-insulation and HENSOTHERM® RM pipe collars (EI 60)

Services	Diameter [mm]	Wall thickness [mm]	Insulation	Insulation length [mm]	HENSOTHERM® RM pipe collar [height-size, mm]	Classification
Geberit Silent-PP	32	2.0	PE-foam sound decoupling ≤ 5 mm	LS 120	HENSOTHERM® RM 30-56	EI 60 U/U
	40	2.0		LS 120	HENSOTHERM® RM 30-56	
	50	2.0		LS 120	HENSOTHERM® RM 30-75	
	75	2.6		LS 120	HENSOTHERM® RM 30-90	
	90	3.1		LS 120	HENSOTHERM® RM 30-110	
	110	3.6		LS 120	HENSOTHERM® RM 30-125	
	125	4.2		LS 160	HENSOTHERM® RM 50-140	

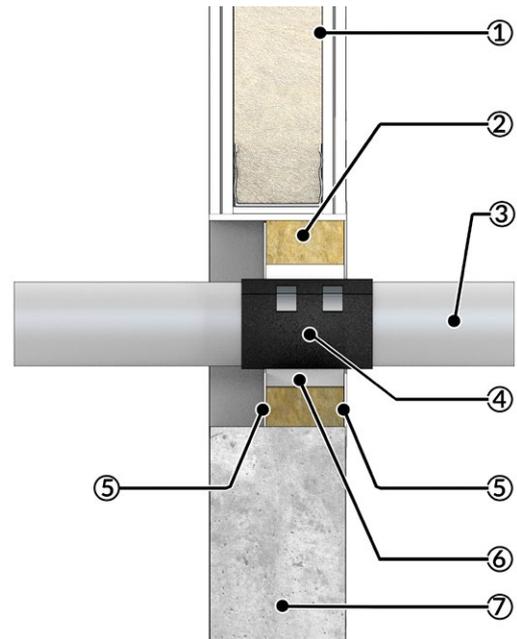
TECHNICAL INFORMATION

Flexible or Rigid Walls ≥ 100 mm

A.7. Combustible plastic pipes without insulation with HENSOTHERM® 7 KS Gewebe 100

Construction details: Combustible pipes without insulation in a HENSOMASTIK® Mixed Penetration Seal EI60 comprising one ≥ 60 mm thick Rockwool Hardrock 040 mineral fibre board ≥ 150 kg/m³ installed flush with either side of the wall and fixed by friction. The mineral fibre boards are cut to size and friction fitted into the supporting element. Board joints and edges are buttered and sealed and the external faces of the boards coated with HENSOMASTIK® 5 KS Farbe or HENSOMASTIK® 5 KS viskos in dry film thickness (DFT) ≥ 1 mm. All gaps and joints between boards and reveal are closed with HENSOMASTIK® 5 KS Farbe or HENSOMASTIK® 5 KS viskos and a min. 20 mm wide circumferential coating (DFT ≥ 1 mm) is applied from both sides of the wall.

Around the pipe, a wrapping of one length of HENSOTHERM® 7 KS Gewebe 100 endless pipe collar (thickness 1 mm), positioned at centre of the seal and protruding 20 mm on both sides, with number of layers of according to table, and fixed with adhesive tape, is applied. The max. 10 mm wide annular gap between boards and HENSOTHERM® 7 KS Gewebe 100 is filled with HENSOMASTIK® 5 KS SP (Spachtel) from both sides in full depth.



1 = Flexible wall (drywall), 2 = Mineral fiber board $1 \times \geq 60$ mm, density ≥ 150 kg/m³, Rockwool Hardrock 040, 3 = Combustible plastic pipe, 4 = HENSOTHERM® 7 KS Gewebe 100, fixed with adhesive tape or metal straps or wires ≥ 0.6 mm, 5 = Outer sides coated (DFT ≥ 1 mm) with HENSOMASTIK® 5 KS Farbe/viskos, circumferential coating ≥ 20 mm width, 6 = Annular gap filled with HENSOMASTIK® 5 KS SP (Spachtel), 7 = Rigid wall

A.7.1. Geberit Silent-dB20 with HENSOTHERM® 7 KS Gewebe 100 (EI 60)

Services	Diameter [mm]	Wall thickness [mm]	Layers of HENSOTHERM® 7 KS Gewebe 100 (1 mm)	Classification
Geberit Silent-dB20	56	3.2	3	EI 60 U/U
	63	3.2	4	
	75	3.6	4	
	90	5.5	4	
	110	6.0	6	

TECHNICAL INFORMATION

Flexible or Rigid Walls ≥ 100 mm

A.7.2.1. Geberit Silent-PP with HENSOTHERM® 7 KS Gewebe 100 (EI 90)

Services	Diameter [mm]	Wall thickness [mm]	Layers of HENSOTHERM® 7 KS Gewebe 100 (1 mm)	Classification
Geberit Silent-PP	32	2.0	3	EI 90 U/U
	40	2.0	3	
	50	2.0	3	
	75	2.6	4	
	90	3.1	4	

A.7.2.2. Geberit Silent-PP with HENSOTHERM® 7 KS Gewebe 100 (EI 60)

Services	Diameter [mm]	Wall thickness [mm]	Layers of HENSOTHERM® 7 KS Gewebe 100 (1 mm)	Classification
Geberit Silent-PP	32	2.0	3	EI 60 U/U
	40	2.0	3	
	50	2.0	3	
	75	2.6	4	
	90	3.1	4	
	110	3.6	6	

A.7.3. PE pipes with HENSOTHERM® 7 KS Gewebe 100 (EI 90)

Services	Diameter [mm]	Wall thickness [mm]	Layers of HENSOTHERM® 7 KS Gewebe 100 (1 mm)	Classification
PE incl. PE 100, PE-HD, PE-X, ABS, SAN+PVC	≤ 56	3.0	3	EI 90 U/U
	$> 56 \leq 90$	3.5	4	
	$> 90 \leq 110$	4.3	6	

Test results on single layer pipes made of PE in accordance with EN 1519-1, EN 12201-1, EN ISO 15494 or EN 12666-1 are valid for all single layer PE pipes in accordance with EN 1519-1, EN 12666-1, EN 12201-2 and EN ISO 15494, PE-X pipes in accordance with EN ISO 15875-2, ABS pipes in accordance with EN 1455-1 and EN ISO 15493 as well as SAN+PVC pipes in accordance with ISO 19220.

The following list contains suitable branded PE-X pipes in accordance with EN ISO 15875-2 under this rule but may not be 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

Flexible or Rigid Walls ≥ 100 mm

A.7.4.1. POLO-KAL NG with HENSOTHERM® 7 KS Gewebe 100 (EI 90)

Services	Diameter [mm]	Wall thickness [mm]	Layers of HENSOTHERM® 7 KS Gewebe 100 (1 mm)	Classification
POLO-KAL NG	32	1.8	3	EI 90 U/U
	40	1.8	3	
	50	2.0	3	
	75	2.6	4	
	90	3.0	4	

A.7.4.2. POLO-KAL NG with HENSOTHERM® 7 KS Gewebe 100 (EI 60)

Services	Diameter [mm]	Wall thickness [mm]	Layers of HENSOTHERM® 7 KS Gewebe 100 (1 mm)	Classification
POLO-KAL NG	32	1.8	3	EI 60 U/U
	40	1.8	3	
	50	2.0	3	
	75	2.6	4	
	90	3.0	4	
	110	3.4	6	

A.7.5.1. PVC-U pipes with HENSOTHERM® 7 KS Gewebe 100 (EI 90)

Services	Diameter [mm]	Wall thickness [mm]	Layers of HENSOTHERM® 7 KS Gewebe 100 (1 mm)	Classification
PVC-U	≤ 50	1.8	3	EI 90 U/U
	110	8.1	6	

Test results on single layer pipes made of PVC-U in accordance with EN 1329-1, EN 1453-1 or EN ISO 1452-2 are valid for single layer pipes made of PVC-U in accordance with EN 1329-1, EN 1453-1, EN ISO 15493 and EN ISO 1452-2 and for pipes made of PVC-C in accordance with EN 1566-1, EN ISO 15493 and EN ISO 15877-2.

A.7.5.2. PVC-U pipes with HENSOTHERM® 7 KS Gewebe 100 (EI 60)

Services	Diameter [mm]	Wall thickness [mm]	Layers of HENSOTHERM® 7 KS Gewebe 100 (1 mm)	Classification
PVC-U	≤ 50	1.8 – 5.6	3	EI 60 U/U
	≤ 50	1.8	3	
	$> 50 \leq 90$	1.8 – 6.7	4	
	$> 90 \leq 110$	2.2 – 8.1	6	
	110	8.1	6	

Test results on single layer pipes made of PVC-U in accordance with EN 1329-1, EN 1453-1 or EN ISO 1452-2 are valid for single layer pipes made of PVC-U in accordance with EN 1329-1, EN 1453-1, EN ISO 15493 and EN ISO 1452-2 and for pipes made of PVC-C in accordance with EN 1566-1, EN ISO 15493 and EN ISO 15877-2.

TECHNICAL INFORMATION

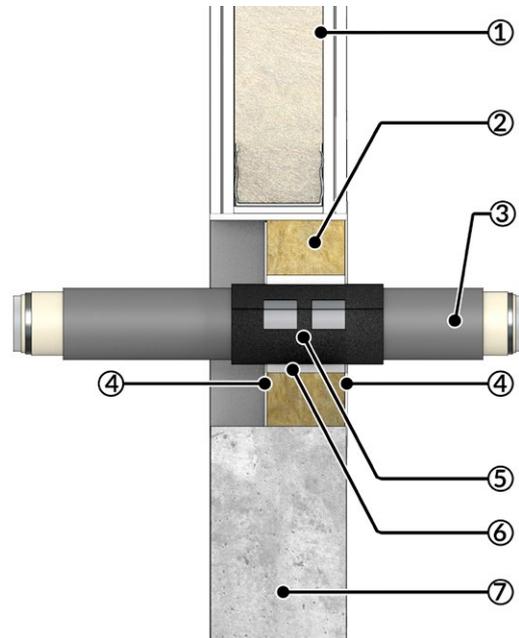
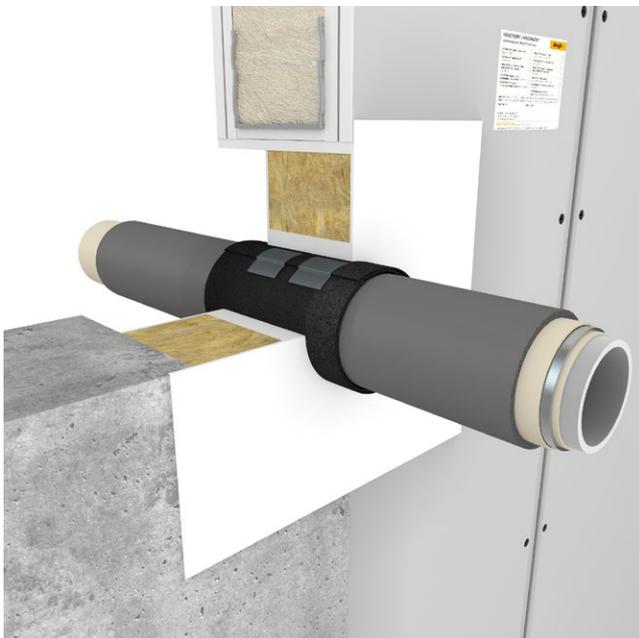
Flexible or Rigid Walls ≥ 100 mm

A.8. Aluminium-composite pipes with FEF-insulation with HENSOTHERM® 7 KS Gewebe 100

Construction details: Aluminium-composite pipes with min. 500 mm long local sustained (LS) or continuous sustained (CS) flexible elastomeric foam (FEF) or synthetic rubber NH/ArmaFlex insulation, with a with a building material class rated D-s2,d0 according to DIN EN 13501-1, in a HENSOMASTIK® Mixed Penetration Seal EI60 comprising one ≥ 60 mm thick Rockwool Hardrock 040 mineral fibre board ≥ 150 kg/m³ installed flush with either side of the wall and fixed by friction.

The mineral fibre boards are cut to size and friction fitted into the supporting element. Board joints and edges are buttered and sealed and the external faces of the boards coated with HENSOMASTIK® 5 KS Farbe or HENSOMASTIK® 5 KS viskos in dry film thickness (DFT) ≥ 1 mm. All gaps and joints between boards and reveal are closed with HENSOMASTIK® 5 KS Farbe or HENSOMASTIK® 5 KS viskos and a min. 20 mm wide circumferential coating (DFT ≥ 1 mm) is applied from both sides of the wall.

The local insulation is positioned at centre of the seal, protruding min. 220 mm on both sides. The length of the local insulation may be increased but not reduced, classification is also applicable to continuous sustained insulation (CS). Around the insulation, a wrapping of one length of HENSOTHERM® 7 KS Gewebe 100 endless pipe collar (thickness 1 mm), positioned at centre of the seal and protruding 20 mm on both sides, with number of layers of according to table, and fixed with adhesive tape, is applied. The max. 10 mm wide annular gap between boards and HENSOTHERM® 7 KS Gewebe 100 is filled with HENSOMASTIK® 5 KS SP (Spachtel) from both sides in full depth.



1 = Flexible wall (drywall), 2 = Mineral fiber board 1 x ≥ 60 mm, density ≥ 150 kg/m³, Rockwool Hardrock 040, 3 = Aluminium-composite pipe with FEF-insulation, 4 = Outer sides coated (DFT ≥ 1 mm) with HENSOMASTIK® 5 KS Farbe/viskos, circumferential coating ≥ 20 mm width, 5 = HENSOTHERM® 7 KS Gewebe 100, fixed with adhesive tape or metal straps or wires ≥ 0.6 mm, 6 = Annular gap filled with HENSOMASTIK® 5 KS SP (Spachtel), 7 = Rigid wall

A.8.1.1. Geberit Mepla with NH/ArmaFlex insulation and HENSOTHERM® 7 KS Gewebe 100 (EI 90)

Services	Diameter [mm]	Wall thickn. [mm]	Insulation	Insulation thickness [mm]	Insulation length [mm]	Layers of HENSOTHERM® 7 KS Gewebe 100 (1 mm)	Classification
Geberit Mepla	16	2.25	NH/ArmaFlex	9.0	CS / LS 500	1	EI 90 U/C

TECHNICAL INFORMATION

Flexible or Rigid Walls ≥ 100 mm

A.8.1.2. Geberit Mepla with NH/ArmaFlex insulation and HENSOTHERM® 7 KS Gewebe 100 (EI 60)

Services	Diameter [mm]	Wall thckn. [mm]	Insulation	Insulation thickness [mm]	Insulation length [mm]	Layers of HENSOTHERM® 7 KS Gewebe 100 (1 mm)	Classification
Geberit Mepla	16	2.25	NH/ArmaFlex	9.0	CS / LS 500	1	EI 60 U/C
	40	3.5		9.0 – 19.0		1	
	63	4.5		13.0 – 19.0		2	

A.8.2.1. Uponor MLC with NH/ArmaFlex insulation and HENSOTHERM® 7 KS Gewebe 100 (EI 90)

Services	Diameter [mm]	Wall thckn. [mm]	Insulation	Insulation thickness [mm]	Insulation length [mm]	Layers of HENSOTHERM® 7 KS Gewebe 100 (1 mm)	Classification
Uponor MLC	14	2.0	NH/ArmaFlex	9.0	CS / LS 500	1	EI 90 U/C
	40	4.0		19.0		1	

A.8.2.2. Uponor MLC with NH/ArmaFlex insulation and HENSOTHERM® 7 KS Gewebe 100 (EI 60)

Services	Diameter [mm]	Wall thckn. [mm]	Insulation	Insulation thickness [mm]	Insulation length [mm]	Layers of HENSOTHERM® KS Gewebe 100 (1 mm)	Classification
Uponor MLC	14	2.0	NH/ArmaFlex	9.0	CS / LS 500	1	EI 60 U/C
	40	4.0		9.0 – 19.0		1	
	40	4.0		19.0		1	
	63	6.0		13.0 – 19.0		2	

A.8.3.1. Viega Raxofix with NH/ArmaFlex insulation and HENSOTHERM® 7 KS Gewebe 100 (EI 90)

Services	Diameter [mm]	Wall thckn. [mm]	Insulation	Insulation thickness [mm]	Insulation length [mm]	Layers of HENSOTHERM® KS Gewebe 100 (1 mm)	Classification
Viega Raxofix	16	2.2	NH/ArmaFlex	9.0	CS / LS 500	1	EI 90 U/C
	40	3.5		9.0 – 19.0		1	

A.8.3.2. Viega Raxofix with NH/ArmaFlex insulation and HENSOTHERM® 7 KS Gewebe 100 (EI 60)

Services	Diameter [mm]	Wall thckn. [mm]	Insulation	Insulation thickness [mm]	Insulation length [mm]	Layers of HENSOTHERM® KS Gewebe 100 (1 mm)	Classification
Viega Raxofix	16	2.2	NH/ArmaFlex	9.0	CS / LS 500	1	EI 60 U/C
	40	3.5		9.0 – 19.0		1	
	63	4.5		13.0 – 19.0		2	

A.8.4. Rehau RAUTITAN with NH/ArmaFlex insulation and HENSOTHERM® 7 KS Gewebe 100 (EI 60)

Services	Diameter [mm]	Wall thckn. [mm]	Insulation	Insulation thickness [mm]	Insulation length [mm]	Layers of HENSOTHERM® KS Gewebe 100 (1 mm)	Classification
Rehau RAUTITAN stabil	16	2.6	NH/ArmaFlex	9.0	CS / LS 500	1	EI 60 U/C
	40	6.0		9.0		1	
	40	6.0		9.0 – 19.0		1	

TECHNICAL INFORMATION

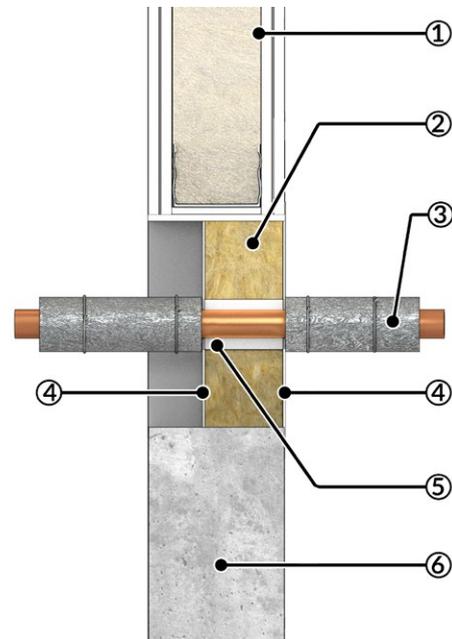
Flexible or Rigid Walls ≥ 100 mm

A.9. Metal pipes with non-combustible insulation (LI)

Construction details: Non-combustible metal pipes with min. 1000 mm long local interrupted (LI) Rockwool RS800 stone wool insulation 80 kg/m^3 or higher in a HENSOMASTIK® Mixed Penetration Seal EI60 comprising one ≥ 60 mm thick Rockwool Hardrock 040 mineral fibre board $\geq 150 \text{ kg/m}^3$ installed flush with either side of the wall and fixed by friction.

The mineral fibre boards are cut to size and friction fitted into the supporting element. Board joints and edges are buttered and sealed and the external faces of the boards coated with HENSOMASTIK® 5 KS Farbe or HENSOMASTIK® 5 KS viskos in dry film thickness (DFT) ≥ 1 mm. All gaps and joints between boards and reveal are closed with HENSOMASTIK® 5 KS Farbe or HENSOMASTIK® 5 KS viskos and a min. 20 mm wide circumferential coating (DFT ≥ 1 mm) is applied from both sides of the wall.

The max. 10 mm wide annular gap between boards and pipes is filled with HENSOMASTIK® 5 KS SP (Spachtel) from both sides in full depth. On both sides of the seal, the min. 1000 mm long insulation is installed, positioned at joint with the seal, and secured in place with metal straps or wires ≥ 0.6 mm. The length and thickness (see table) of the insulation may be increased but not reduced, classification is also applicable to continuous interrupted insulation (CI). The minimum insulation thickness tested in configuration LI may be applied for configuration CI with no limitation for the maximum insulation thickness. All penetration angles between 90° and 45° are covered in all directions. The stated min. insulation length shall be the shortest length (L) in an oblique situation on both sides of the seal in practice (see pictogram).



1 = Flexible wall (drywall), 2 = Mineral fiber board $1 \times \geq 60$ mm, density $\geq 150 \text{ kg/m}^3$, Rockwool Hardrock 040, 3 = Non-combustible metal pipe with stone wool insulation 80 kg/m^3 or higher, 4 = Outer sides coated (DFT ≥ 1 mm) with HENSOMASTIK® 5 KS Farbe/viskos, circumferential coating ≥ 20 mm width, 5 = Annular gap filled with HENSOMASTIK® 5 KS SP (Spachtel), 6 = Rigid wall

A.9.1. Metal pipes with Rockwool RS800 insulation, LI 1000 mm (EI 60)

Services	Diameter [mm]	Wall thickness [mm]	Insulation	Insulation thickness min. [mm]	Insulation length min. [mm]	Classification
Copper	≤ 22	1.0 – 11.0	RS800	20	LI 1000	EI 60 U/C
	$> 22 \leq 42$	1.5 – 14.2		20		
	$> 42 \leq 88.9$	2.0 – 14.2		30		
Steel or cast iron	≤ 22	1.0 – 11.0	RS800	20	LI 1000	EI 60 U/C
	$> 22 \leq 48.3$	2.6 – 14.2		20		
	$49 \leq 139.7$	4.0 – 14.2		30		

TECHNICAL INFORMATION

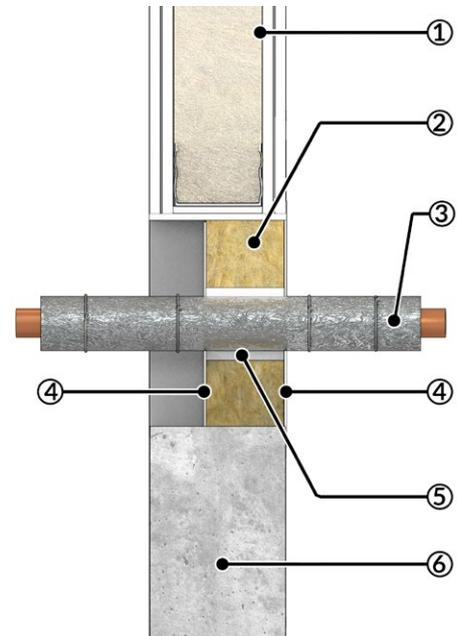
Flexible or Rigid Walls ≥ 100 mm

A.10. Metal pipes with non-combustible insulation (LS)

Construction details: Non-combustible metal pipes with min. 1000 mm long local sustained (LS) or continuous sustained (CS) Rockwool RS800 stone wool insulation 80 kg/m^3 or higher in a HENSOMASTIK® Mixed Penetration Seal EI60 comprising one ≥ 60 mm thick Rockwool Hardrock 040 mineral fibre board $\geq 150 \text{ kg/m}^3$ installed flush with either side of the wall and fixed by friction.

The mineral fibre boards are cut to size and friction fitted into the supporting element. Board joints and edges are buttered and sealed and the external faces of the boards coated with HENSOMASTIK® 5 KS Farbe or HENSOMASTIK® 5 KS viskos in dry film thickness (DFT) ≥ 1 mm. All gaps and joints between boards and reveal are closed with HENSOMASTIK® 5 KS Farbe or HENSOMASTIK® 5 KS viskos and a min. 20 mm wide circumferential coating (DFT ≥ 1 mm) is applied from both sides of the wall.

The max. 10 mm wide annular gap between boards and insulation is filled with HENSOMASTIK® 5 KS SP (Spachtel) from both sides in full depth. The local insulation is positioned at centre of the seal, protruding min. 470 mm on both sides, and secured in place with metal straps or wires ≥ 0.6 mm. The length (see table) of the insulation may be increased but not reduced, classification is also applicable to continuous sustained insulation (CS). The minimum insulation thickness tested in configuration LS may be applied for configuration CS with no limitation for the maximum insulation thickness. All penetration angles between 90° and 45° are covered in all directions. The stated min. insulation length shall be the shortest length (L) in an oblique situation on both sides of the seal in practice (see pictogram).



1 = Flexible wall (drywall), 2 = Mineral fiber board $1 \times \geq 60$ mm, density $\geq 150 \text{ kg/m}^3$, Rockwool Hardrock 040, 3 = Non-combustible metal pipe with stone wool insulation 80 kg/m^3 or higher, 4 = Outer sides coated (DFT ≥ 1 mm) with HENSOMASTIK® 5 KS Farbe/viskos, circumferential coating ≥ 20 mm width, 5 = Annular gap filled with HENSOMASTIK® 5 KS SP (Spachtel), 6 = Rigid wall

A.10.1. Metal pipes with Rockwool RS800 insulation, LS 1000 mm (EI 90)

Services	Diameter [mm]	Wall thickness [mm]	Insulation	Insulation thickness min. [mm]	Insulation length min. [mm]	Classification
Copper	≤ 15	1.0 – 7.5	RS800	20	CS / LS 1000	EI 90 C/U
	$> 15 \leq 54$	1.5 – 14.2		20		
Steel or cast iron	≤ 15	1.0 – 7.5	RS800	20	CS / LS 1000	EI 90 C/U
	$> 15 \leq 54$	1.5 – 14.2		20		
	$> 54 \leq 139.7$	4.0 – 14.2		30		

TECHNICAL INFORMATION

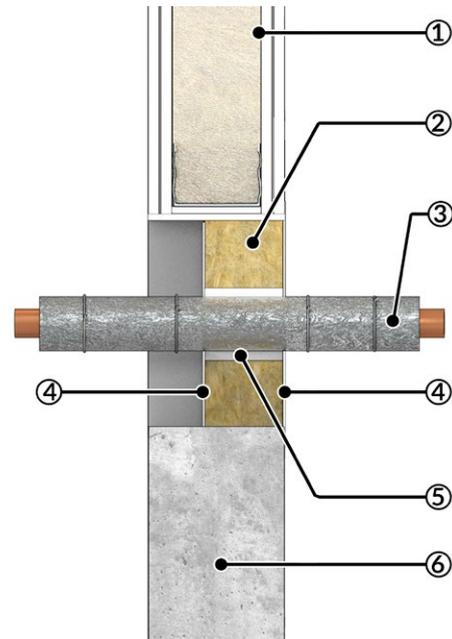
Flexible or Rigid Walls ≥ 100 mm

A.11. Metal pipes with non-combustible insulation (CS)

Construction details: Non-combustible metal pipes with continuous sustained (CS) Rockwool Klimarock stone wool insulation 40 kg/m^3 or higher in a HENSOMASTIK® Mixed Penetration Seal EI60 comprising one ≥ 60 mm thick Rockwool Hardrock 040 mineral fibre board $\geq 150 \text{ kg/m}^3$ installed flush with either side of the wall and fixed by friction.

The mineral fibre boards are cut to size and friction fitted into the supporting element. Board joints and edges are buttered and sealed and the external faces of the boards coated with HENSOMASTIK® 5 KS Farbe or HENSOMASTIK® 5 KS viskos in dry film thickness (DFT) ≥ 1 mm. All gaps and joints between boards and reveal are closed with HENSOMASTIK® 5 KS Farbe or HENSOMASTIK® 5 KS viskos and a min. 20 mm wide circumferential coating (DFT ≥ 1 mm) is applied from both sides of the wall.

The max. 10 mm wide annular gap between boards and insulation is filled with HENSOMASTIK® 5 KS SP (Spachtel) from both sides in full depth. The insulation is secured in place with metal straps or wires ≥ 0.6 mm. The thickness (see table) of the insulation may be increased but not reduced. All penetration angles between 90° and 45° are covered in all directions (see pictogram).



1 = Flexible wall (drywall), 2 = Mineral fiber board $1 \times \geq 60$ mm, density $\geq 150 \text{ kg/m}^3$, Rockwool Hardrock 040, 3 = Non-combustible metal pipe with stone wool insulation 40 kg/m^3 or higher, 4 = Outer sides coated (DFT ≥ 1 mm) with HENSOMASTIK® 5 KS Farbe/viskos, circumferential coating, ≥ 20 mm width, 5 = Annular gap filled with HENSOMASTIK® 5 KS SP (Spachtel), 6 = Rigid wall

A.11.1. Metal pipes with Klimarock insulation, CS (EI 60)

Services	Diameter [mm]	Wall thickness [mm]	Insulation	Insulation thickness min. [mm]	Insulation length [mm]	Classification
Copper	≤ 15	1.0 – 7.5	Klimarock	20	CS	EI 60 U/C
	$> 15 \leq 54$	1.5 – 14.2		20		
Steel or cast iron	≤ 15	1.0 – 7.5	Klimarock	20	CS	EI 60 U/C
	$> 15 \leq 54$	1.5 – 14.2		20		
	$> 54 \leq 89$	3.2 – 14.2		20		

TECHNICAL INFORMATION

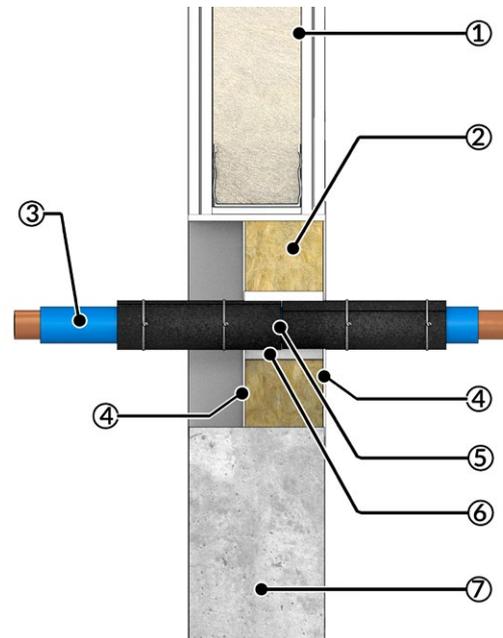
Flexible or Rigid Walls ≥ 100 mm

A.12. Metal pipes with FEF-insulation with HENSOTHERM® 7 KS Gewebe 125

Construction details: Non-combustible metal pipes with min. 1000 mm long local sustained (LS) or continuous sustained (CS) flexible elastomeric foam (FEF) or synthetic rubber insulation in a HENSOMASTIK® Mixed Penetration Seal EI60 comprising one ≥ 60 mm thick Rockwool Hardrock 040 mineral fibre board ≥ 150 kg/m³ installed flush with either side of the wall and fixed by friction.

The mineral fibre boards are cut to size and friction fitted into the supporting element. Board joints and edges are buttered and sealed and the external faces of the boards coated with HENSOMASTIK® 5 KS Farbe or HENSOMASTIK® 5 KS viskos in dry film thickness (DFT) ≥ 1 mm. All gaps and joints between boards and reveal are closed with HENSOMASTIK® 5 KS Farbe or HENSOMASTIK® 5 KS viskos and a min. 20 mm wide circumferential coating (DFT ≥ 1 mm) is applied from both sides of the wall.

The local insulation is positioned at centre of the seal, protruding min. 470 mm on both sides. The length of the insulation may be increased but not reduced, classification is also applicable to continuous sustained insulation (CS). The minimum insulation thickness tested in configuration LS may be applied for configuration CS with no limitation for the maximum insulation thickness. Around the insulation, a wrapping of two lengths of HENSOTHERM® 7 KS Gewebe 125 endless pipe collar (thickness 1 mm), positioned at joint at centre of the seal and protruding 95 mm on both sides, is applied. Each length with number of layers according to table and fixed with adhesive tape. The HENSOTHERM® 7 KS Gewebe 125 is secured in place with metal straps or wires ≥ 0.6 mm, two equally spaced windings on each side. The max. 10 mm wide annular gap between boards and HENSOTHERM® 7 KS Gewebe 125 is filled with HENSOMASTIK® 5 KS SP (Spachtel) from both sides in full depth.



1 = Flexible wall (drywall), 2 = Mineral fiber board $1 \times \geq 60$ mm, density ≥ 150 kg/m³, Rockwool Hardrock 040, 3 = Non-combustible metal pipe with FEF-insulation, 4 = Outer sides coated (DFT ≥ 1 mm) with HENSOMASTIK® 5 KS Farbe/viskos, circumferential coating ≥ 20 mm width, 5 = HENSOTHERM® 7 KS Gewebe 125 (2 x 125 mm wraps at joint at center), secured in place with metal straps or wires ≥ 0.6 mm, 6 = Annular gap filled with HENSOMASTIK® 5 KS SP (Spachtel), 7 = Rigid wall

A.12.1.1. Metal pipes with AF/ArmaFlex insulation and HENSOTHERM® 7 KS Gewebe 125 (EI 90)

Services	Diameter [mm]	Wall thickness [mm]	Insulation	Insulation thickness [mm]	Insulation length [mm]	Layers of HENSOTHERM® 7 KS Gewebe 125 (1 mm)	Classification
Copper	≤ 10	1.0 – 5.0	AF/ArmaFlex*	11.0	CS / LS 1000	1	EI 90 C/U
	$> 10 \leq 22$	1.0 – 11.0		18.0		1	
	$> 22 \leq 54$	1.5 – 14.2		21.0		1	
Steel or cast iron	≤ 10	1.0 – 5.0	AF/ArmaFlex*	11.0	CS / LS 1000	1	EI 90 C/U
	$> 10 \leq 54$	1.5 – 14.2		21.0		1	
	$> 54 \leq 60.3$	2.9 – 14.2		29.0		1	

*Classification also applies for AF/ArmaFlex Evo, AF/ArmaFlex N and AF/ArmaFlex Class 0 insulation.

TECHNICAL INFORMATION

Flexible or Rigid Walls ≥ 100 mm

A.12.1.2. Metal pipes with AF/ArmaFlex insulation and HENSOTHERM® 7 KS Gewebe 125 (EI 60)

Services	Diameter [mm]	Wall thickness [mm]	Insulation	Insulation thickness [mm]	Insulation length [mm]	Layers of HENSOTHERM® 7 KS Gewebe 125 (1 mm)	Classification
Copper	≤ 10	1.0 – 5.0	AF/ArmaFlex*	11.0	CS / LS 1000	1	EI 60 C/U
	$> 10 \leq 22$	1.0 – 11.0		18.0		1	
	$> 22 \leq 54$	1.5 – 14.2		21.0		1	
Steel or cast iron	≤ 10	1.0 – 5.0	AF/ArmaFlex*	11.0	CS / LS 1000	1	EI 60 C/U
	$> 10 \leq 22$	1.0 – 11.0		18.0		1	
	$> 10 \leq 54$	1.5 – 14.2		21.0		1	
	$> 54 \leq 60.3$	2.9 – 14.2		29.0		1	
	$> 60.3 \leq 88.9$	3.2 – 14.2		30.5		1	

*Classification also applies for AF/ArmaFlex Evo, AF/ArmaFlex N and AF/ArmaFlex Class 0 insulation.

A.12.1.3. Metal pipes with AF/ArmaFlex insulation and HENSOTHERM® 7 KS Gewebe 125 (EI 30)

Services	Diameter [mm]	Wall thickness [mm]	Insulation	Insulation thickness [mm]	Insulation length [mm]	Layers of HENSOTHERM® 7 KS Gewebe 125 (1 mm)	Classification
Copper	≤ 10	1.0 – 5.0	AF/ArmaFlex*	11.0	CS / LS 1000	1	EI 30 C/U
	$> 10 \leq 22$	1.0 – 11.0		18.0		1	
	$> 22 \leq 54$	1.5 – 14.2		21.0		1	
Steel or cast iron	≤ 10	1.0 – 5.0	AF/ArmaFlex*	11.0	CS / LS 1000	1	EI 30 C/U
	$> 10 \leq 22$	1.0 – 11.0		18.0		1	
	$> 10 \leq 54$	1.5 – 14.2		21.0		1	
	$> 54 \leq 60.3$	2.9 – 14.2		29.0		1	
	$> 60.3 \leq 88.9$	3.2 – 14.2		30.5		1	
	$> 88.9 \leq 114.3$	2.0 – 14.2		18.5 – 31.5		1	

*Classification also applies for AF/ArmaFlex Evo, AF/ArmaFlex N and AF/ArmaFlex Class 0 insulation.

A.12.2. Metal pipes with ArmaFlex LS insulation and HENSOTHERM® 7 KS Gewebe 125 (EI 60)

Services	Diameter [mm]	Wall thickness [mm]	Insulation	Insulation thickness [mm]	Insulation length [mm]	Layers of HENSOTHERM® 7 KS Gewebe 125 (1 mm)	Classification
Copper	≤ 15	1.0 – 7.5	ArmaFlex LS	13.0	CS / LS 1000	1	EI 60 U/C
	$> 15 \leq 54$	1.5 – 14.2		25.0		1	
Steel or cast iron	≤ 15	1.0 – 7.5	ArmaFlex LS	13.0	CS / LS 1000	1	EI 60 U/C
	$> 15 \leq 54$	1.5 – 14.2		25.0		1	
	$> 54 \leq 89$	3.2 – 14.2		25.0		1	

TECHNICAL INFORMATION

Flexible or Rigid Walls ≥ 100 mm

A.12.3. Metal pipes with ArmaFlex Ultima insulation and HENSOTHERM® 7 KS Gewebe 125 (EI 60)

Services	Diameter [mm]	Wall thickness [mm]	Insulation	Insulation thickness [mm]	Insulation length [mm]	Layers of HENSOTHERM® 7 KS Gewebe 125 (1 mm)	Classification
Copper	≤ 15	1.0 – 7.5	ArmaFlex Ultima	13.0	CS / LS 1000	1	EI 60 U/C
	$> 15 \leq 54$	1.5 – 14.2		25.0			
Steel or cast iron	≤ 15	1.0 – 7.5	ArmaFlex Ultima	13.0	CS / LS 1000	1	EI 60 U/C
	$> 15 \leq 54$	1.5 – 14.2		25.0			
	$> 54 \leq 89$	3.2 – 14.2		25.0			

A.12.4. Metal pipes with Eurobatex insulation and HENSOTHERM® 7 KS Gewebe 125 (EI 30)

Services	Diameter [mm]	Wall thickness [mm]	Insulation	Insulation thickness [mm]	Insulation length [mm]	Layers of HENSOTHERM® 7 KS Gewebe 125 (1 mm)	Classification
Copper	≤ 15	1.0 – 7.5	Eurobatex	13.0	CS / LS 1000	1	EI 30 C/U
	$> 15 \leq 42$	1.2 – 14.2		32.0			
	$> 42 \leq 88.9$	1.2 – 14.2		32.0			
Steel or cast iron	≤ 15	1.0 – 7.5	Eurobatex	13.0	CS / LS 1000	1	EI 30 C/U
	$> 15 \leq 42$	1.2 – 14.2		19.0 – 32.0			
	$> 15 \leq 42$	1.2 – 14.2		32.0			
	$> 42 \leq 88.9$	1.2 – 14.2		32.0			
	$> 88.9 \leq 114.3$	2.0 – 14.2		19.0 – 32.0			
	$> 88.9 \leq 114.3$	2.0 – 14.2		32.0			
	$> 88.9 \leq 114.3$	2.0 – 14.2		32.0			

A.12.5. Metal pipes with Kaiflex ST insulation and HENSOTHERM® 7 KS Gewebe 125 (EI 60)

Services	Diameter [mm]	Wall thickness [mm]	Insulation	Insulation thickness [mm]	Insulation length [mm]	Layers of HENSOTHERM® 7 KS Gewebe 125 (1 mm)	Classification
Copper	≤ 22	1.0 – 11.0	Kaiflex ST	9.0	CS / LS 1000	1	EI 60 C/U
	$> 22 \leq 54$	1.5 – 14.2		19.0			
Steel or cast iron	≤ 22	1.0 – 11.0	Kaiflex ST	9.0	CS / LS 1000	1	EI 60 C/U
	$> 22 \leq 54$	1.5 – 14.2		19.0			
	$> 54 \leq 60.3$	2.9 – 14.2		5.0			

A.12.6. Metal pipes with Kaiflex KKplus insulation and HENSOTHERM® 7 KS Gewebe 125 (EI 60)

Services	Diameter [mm]	Wall thickness [mm]	Insulation	Insulation thickness [mm]	Insulation length [mm]	Layers of HENSOTHERM® 7 KS Gewebe 125 (1 mm)	Classification
Copper	≤ 15	1.0 – 7.5	Kaiflex KKplus	11.0	CS / LS 1000	1	EI 60 U/C
	$> 15 \leq 54$	1.5 – 14.2		21.0			
Steel or cast iron	≤ 15	1.0 – 7.5	Kaiflex KKplus	11.0	CS / LS 1000	1	EI 60 U/C
	$> 15 \leq 54$	1.5 – 14.2		21.0			
	$> 54 \leq 89$	3.2 – 14.2		28.5			

TECHNICAL INFORMATION

Flexible or Rigid Walls ≥ 100 mm

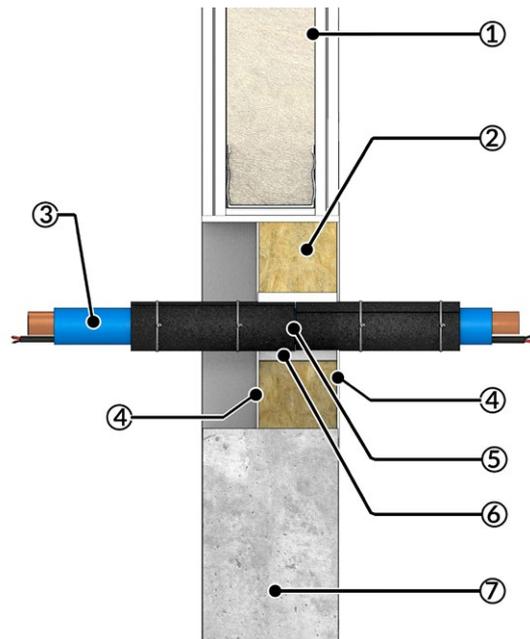
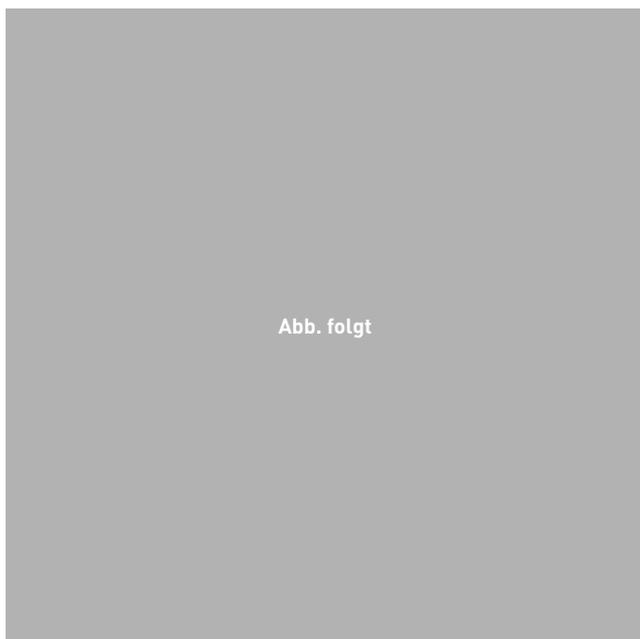
A.13. Metal pipes with pipe heating and FEF-insulation with HENSOTHERM® 7 KS Gewebe 125

Construction details: Non-combustible metal pipes with electric heating cable Danfoss ECpipeheat and min. 1000 mm long local sustained (LS) or continuous sustained (CS) flexible elastomeric foam (FEF) or synthetic rubber insulation in a HENSOMASTIK® Mixed Penetration Seal EI60 comprising one ≥ 60 mm thick Rockwool Hardrock 040 mineral fibre board ≥ 150 kg/m³ installed flush with either side of the wall and fixed by friction.

The mineral fibre boards are cut to size and friction fitted into the supporting element. Board joints and edges are buttered and sealed and the external faces of the boards coated with HENSOMASTIK® 5 KS Farbe or HENSOMASTIK® 5 KS viskos in dry film thickness (DFT) ≥ 1 mm. All gaps and joints between boards and reveal are closed with HENSOMASTIK® 5 KS Farbe or HENSOMASTIK® 5 KS viskos and a min. 20 mm wide circumferential coating (DFT ≥ 1 mm) is applied from both sides of the wall.

The local insulation is positioned around pipe and electric heating cable, at centre of the seal, protruding min. 470 mm on both sides. The length of the insulation may be increased but not reduced, classification is also applicable to continuous sustained insulation (CS). The minimum insulation thickness tested in configuration LS may be applied for configuration CS with no limitation for the maximum insulation thickness.

Around the insulation, a wrapping of two lengths of HENSOTHERM® 7 KS Gewebe 125 endless pipe collar (thickness 1 mm), positioned at joint at centre of the seal and protruding 95 mm on both sides, is applied. Each length with number of layers according to table and fixed with adhesive tape. The HENSOTHERM® 7 KS Gewebe 125 is secured in place with metal straps or wires ≥ 0.6 mm, two equally spaced windings on each side. The max. 10 mm wide annular gap between boards and HENSOTHERM® 7 KS Gewebe 125 is filled with HENSOMASTIK® 5 KS SP (Spachtel) from both sides in full depth.



1 = Flexible wall (drywall), 2 = Mineral fiber board $1 \times \geq 60$ mm, density ≥ 150 kg/m³, Rockwool Hardrock 040, 3 = Non-combustible metal pipe with pipe heating cable and FEF-insulation, 4 = Outer sides coated (DFT ≥ 1 mm) with HENSOMASTIK® 5 KS Farbe/viskos, circumferential coating ≥ 20 mm width, 5 = HENSOTHERM® 7 KS Gewebe 125 (2 x 125 mm wraps at joint at centre), secured in place with metal straps or wires ≥ 0.6 mm, 6 = Annular gap filled with HENSOMASTIK® 5 KS SP (Spachtel), 7 = Rigid wall

A.13.1. Metal pipes with pipe heating and NH/ArmaFlex with HENSOTHERM® 7 KS Gewebe 125 (EI 60)

Services	Diameter [mm]	Wall thickness [mm]	Insulation	Insulation thickness [mm]	Insulation length [mm]	Layers of HENSOTHERM® 7 KS Gewebe 125 (1 mm)	Classification
Copper	≤ 15	1.0 – 7.5	NH/ArmaFlex	19.0	CS / LS 1000	1	EI 60 C/U
Steel or cast iron	≤ 15	1.0 – 7.5	NH/ArmaFlex	19.0	CS / LS 1000	1	EI 60 C/U

TECHNICAL INFORMATION

Flexible or Rigid Walls ≥ 100 mm

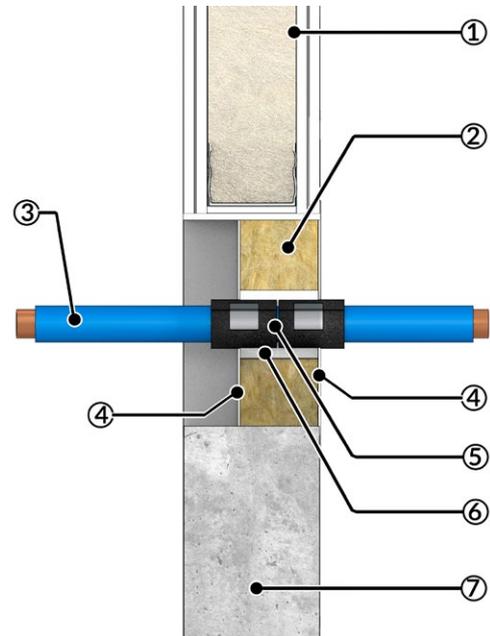
A.14. Metal pipes with FEF-insulation (LS) with HENSOTHERM® 7 KS Gewebe 50

Construction details: Non-combustible metal pipes with min. 1000 mm long local sustained (LS) or continuous sustained (CS) flexible elastomeric foam (FEF) or synthetic rubber insulation in a HENSOMASTIK® Mixed Penetration Seal EI60 comprising one ≥ 60 mm thick Rockwool Hardrock 040 mineral fibre board ≥ 150 kg/m³ installed flush with either side of the wall and fixed by friction.

The mineral fibre boards are cut to size and friction fitted into the supporting element. Board joints and edges are buttered and sealed and the external faces of the boards coated with HENSOMASTIK® 5 KS Farbe or HENSOMASTIK® 5 KS viskos in dry film thickness (DFT) ≥ 1 mm. All gaps and joints between boards and reveal are closed with HENSOMASTIK® 5 KS Farbe or HENSOMASTIK® 5 KS viskos and a min. 20 mm wide circumferential coating (DFT ≥ 1 mm) is applied from both sides of the wall.

The local insulation is positioned at centre of the seal, protruding min. 470 mm on both sides. The length of the insulation may be increased but not reduced, classification is also applicable to continuous sustained insulation (CS). The minimum insulation thickness tested in configuration LS may be applied for configuration CS with no limitation for the maximum insulation thickness.

Around the insulation, a wrapping of two lengths of HENSOTHERM® 7 KS Gewebe 50 endless pipe collar (thickness 2 mm), positioned at joint at centre of the seal and protruding 20 mm on both sides, is applied. Each length with number of layers according to table and fixed with adhesive tape. The max. 10 mm wide annular gap between boards and HENSOTHERM® 7 KS Gewebe 50 is filled with HENSOMASTIK® 5 KS SP (Spachtel) from both sides in full depth.



1 = Flexible wall (drywall), 2 = Mineral fiber board $1 \times \geq 60$ mm, density ≥ 150 kg/m³, Rockwool Hardrock 040, 3 = Non-combustible metal pipe with FEF-insulation, 4 = Outer sides coated (DFT ≥ 1 mm) with HENSOMASTIK® 5 KS Farbe/viskos, circumferential coating ≥ 20 mm width, 5 = HENSOTHERM® 7 KS Gewebe 50 (2 x 50 mm wraps at joint at centre), fixed with adhesive tape or metal straps or wires ≥ 0.6 mm, 6 = Annular gap filled with HENSOMASTIK® 5 KS SP (Spachtel), 7 = Rigid wall

TECHNICAL INFORMATION

Flexible or Rigid Walls ≥ 100 mm

A.14.1.1. Metal pipes with ArmaFlex Protect insulation and HENSOTHERM® 7 KS Gewebe 50 (EI 90)

Services	Diameter [mm]	Wall thickness [mm]	Insulation	Insulation thickness [mm]	Insulation length [mm]	Layers of HENSOTHERM® 7 KS Gewebe 50 (2 mm)	Classification
Copper	≤ 15	1.0 – 7.5	ArmaFlex Protect	19.0 – 25.0	CS / LS 1000	1	EI 90 C/U
	$> 15 \leq 42$	1.2 – 14.2		25.0		1	
	$> 42 \leq 54$	1.5 – 14.2		25.0		1	
Steel or cast iron	≤ 15	1.0 – 7.5	ArmaFlex Protect	19.0 – 25.0	CS / LS 1000	1	EI 90 C/U
	$> 15 \leq 42$	1.2 – 14.2		25.0		1	
	$> 42 \leq 54$	1.5 – 14.2		25.0		1	

A.14.1.2. Metal pipes with ArmaFlex Protect insulation and HENSOTHERM® 7 KS Gewebe 50 (EI 60)

Services	Diameter [mm]	Wall thickness [mm]	Insulation	Insulation thickness [mm]	Insulation length [mm]	Layers of HENSOTHERM® 7 KS Gewebe 50 (2 mm)	Classification
Copper	≤ 15	1.0 – 7.5	ArmaFlex Protect	19.0 – 25.0	CS / LS 1000	1	EI 60 C/U
	$> 15 \leq 42$	1.2 – 14.2		25.0		1	
	$> 42 \leq 54$	1.5 – 14.2		25.0		1	
	$> 54 \leq 89$	2.0 – 14.2		25.0		1	
Steel or cast iron	≤ 15	1.0 – 7.5	ArmaFlex Protect	19.0 – 25.0	CS / LS 1000	1	EI 60 C/U
	$> 15 \leq 42$	1.2 – 14.2		25.0		1	
	$> 42 \leq 54$	1.5 – 14.2		25.0		1	
	$> 54 \leq 89$	2.0 – 14.2		25.0		1	

TECHNICAL INFORMATION

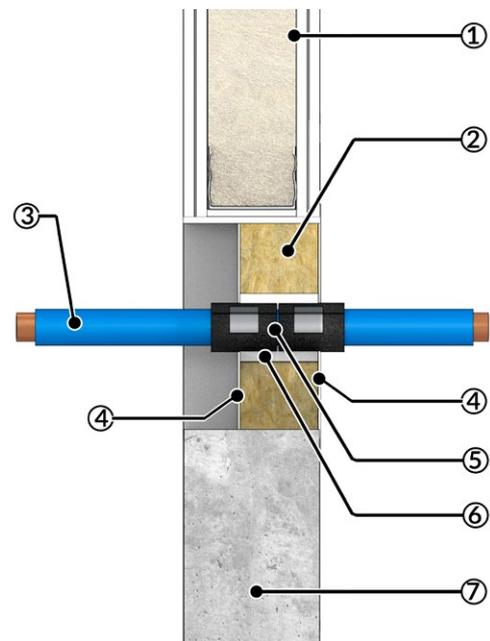
Flexible or Rigid Walls ≥ 100 mm

A.15. Metal pipes with FEF-insulation (CS) with HENSOTHERM® 7 KS Gewebe 50

Construction details: Non-combustible metal pipes with continuous sustained (CS) flexible elastomeric foam (FEF) or synthetic rubber insulation in a HENSOMASTIK® Mixed Penetration Seal EI60 comprising one ≥ 60 mm thick Rockwool Hardrock 040 mineral fibre board ≥ 150 kg/m³ installed flush with either side of the wall and fixed by friction.

The mineral fibre boards are cut to size and friction fitted into the supporting element. Board joints and edges are buttered and sealed and the external faces of the boards coated with HENSOMASTIK® 5 KS Farbe or HENSOMASTIK® 5 KS viskos in dry film thickness (DFT) ≥ 1 mm. All gaps and joints between boards and reveal are closed with HENSOMASTIK® 5 KS Farbe or HENSOMASTIK® 5 KS viskos and a min. 20 mm wide circumferential coating (DFT ≥ 1 mm) is applied from both sides of the wall.

Around the insulation, a wrapping of two lengths of HENSOTHERM® 7 KS Gewebe 50 endless pipe collar (thickness 2 mm), positioned at joint at centre of the seal and protruding 20 mm on both sides, is applied. Each length with number of layers according to table and fixed with adhesive tape. The max. 10 mm wide annular gap between boards and HENSOTHERM® 7 KS Gewebe 50 is filled with HENSOMASTIK® 5 KS SP (Spachtel) from both sides in full depth.



1 = Flexible wall (drywall), 2 = Mineral fiber board $1 \times \geq 60$ mm, density ≥ 150 kg/m³, Rockwool Hardrock 040, 3 = Non-combustible metal pipe with FEF-insulation, 4 = Outer sides coated (DFT ≥ 1 mm) with HENSOMASTIK® 5 KS Farbe/viskos, circumferential coating ≥ 20 mm width, 5 = HENSOTHERM® 7 KS Gewebe 50 (2 x 50 mm wraps at joint at centre), fixed with adhesive tape or metal straps or wires ≥ 0.6 mm, 6 = Annular gap filled with HENSOMASTIK® 5 KS SP (Spachtel), 7 = Rigid wall

A.15.1.1. Metal pipes with ArmaFlex Ultima insulation and HENSOTHERM® 7 KS Gewebe 50 (EI 90)

Services	Diameter [mm]	Wall thickness [mm]	Insulation	Insulation thickness [mm]	Insulation length [mm]	Layers of HENSOTHERM® 7 KS Gewebe 50 (2 mm)	Classification
Copper	≤ 15	1.0 – 7.5	ArmaFlex Ultima	9.0	CS	1	EI 90 C/U
Steel or cast iron	≤ 15	1.0 – 7.5	ArmaFlex Ultima	9.0	CS	1	EI 90 C/U

TECHNICAL INFORMATION

Flexible or Rigid Walls ≥ 100 mm

A.15.1.2. Metal pipes with ArmaFlex Ultima insulation and HENSOTHERM® 7 KS Gewebe 50 (EI 60)

Services	Diameter [mm]	Wall thickness [mm]	Insulation	Insulation thickness [mm]	Insulation length [mm]	Layers of HENSOTHERM® 7 KS Gewebe 50 (2 mm)	Classification
Copper	≤ 15	1.0 – 7.5	ArmaFlex Ultima	9.0	CS	1	EI 60 C/U
	$> 15 \leq 42$	1.2 – 14.2		13.0 – 25.0		2	
	$> 42 \leq 89$	2.0 – 14.2		19.0 – 25.0		2	
Steel or cast iron	≤ 15	1.0 – 7.5	ArmaFlex Ultima	9.0	CS	1	EI 60 C/U
	$> 15 \leq 42$	1.2 – 14.2		13.0 – 25.0		2	
	$> 42 \leq 89$	2.0 – 14.2		19.0 – 25.0		2	

A.15.2.1. Metal pipes with Eurobatex HF insulation and HENSOTHERM® 7 KS Gewebe 50 (EI 90)

Services	Diameter [mm]	Wall thickness [mm]	Insulation	Insulation thickness [mm]	Insulation length [mm]	Layers of HENSOTHERM® 7 KS Gewebe 50 (2 mm)	Classification
Copper	≤ 15	1.0 – 7.5	Eurobatex HF	9.0	CS	1	EI 90 C/U
Steel or cast iron	≤ 15	1.0 – 7.5	Eurobatex HF	9.0	CS	1	EI 90 C/U

A.15.2.2. Metal pipes with Eurobatex HF insulation and HENSOTHERM® 7 KS Gewebe 50 (EI 60)

Services	Diameter [mm]	Wall thickness [mm]	Insulation	Insulation thickness [mm]	Insulation length [mm]	Layers of HENSOTHERM® 7 KS Gewebe 50 (2 mm)	Classification
Copper	≤ 15	1.0 – 7.5	Eurobatex HF	9.0	CS	1	EI 60 C/U
	$> 15 \leq 42$	1.2 – 14.2		13.0 – 25.0		2	
Steel or cast iron	≤ 15	1.0 – 7.5	Eurobatex HF	9.0	CS	1	EI 60 C/U
	$> 15 \leq 42$	1.2 – 14.2		13.0 – 25.0		2	
	114	4.5 – 14.2		19.0 – 32.0		2	

A.15.2.3. Metal pipes with Eurobatex HF insulation and HENSOTHERM® 7 KS Gewebe 50 (EI 30)

Services	Diameter [mm]	Wall thickness [mm]	Insulation	Insulation thickness [mm]	Insulation length [mm]	Layers of HENSOTHERM® 7 KS Gewebe 50 (2 mm)	Classification
Copper	≤ 15	1.0 – 7.5	Eurobatex HF	9.0	CS	1	EI 30 C/U
	$> 15 \leq 42$	1.2 – 14.2		13.0 – 25.0		2	
	$> 42 \leq 54$	1.5 – 14.2		13.0 – 25.0		2	
	$> 54 \leq 89$	2.0 – 14.2		25.0		2	
Steel or cast iron	≤ 15	1.0 – 7.5	Eurobatex HF	9.0	CS	1	EI 30 C/U
	$> 15 \leq 42$	1.2 – 14.2		13.0 – 25.0		2	
	$> 42 \leq 54$	1.5 – 14.2		13.0 – 25.0		2	
	$> 54 \leq 89$	2.0 – 14.2		25.0		2	
	$> 89 \leq 114$	4.5 – 14.2		25.0 – 32.0		2	
	114	4.5 – 14.2		19.0 – 32.0		2	

TECHNICAL INFORMATION

Flexible or Rigid Walls ≥ 100 mm

A.15.3.1. Metal pipes with NH/ArmaFlex insulation and HENSOTHERM® 7 KS Gewebe 50 (EI 90)

Services	Diameter [mm]	Wall thickness [mm]	Insulation	Insulation thickness [mm]	Insulation length [mm]	Layers of HENSOTHERM® 7 KS Gewebe 50 (2 mm)	Classification
Copper, steel or cast iron	≤ 15	1.0 – 7.5	NH/ArmaFlex	9.0	CS	1	EI 90 C/U
	$> 15 \leq 42$	1.2 – 14.2		13.0		2	
	54	1.5 – 14.2		25.0		2	
Steel or cast iron	≤ 15	1.0 – 7.5	NH/ArmaFlex	9.0	CS	1	EI 90 C/U
	$> 15 \leq 42$	1.2 – 14.2		13.0		2	
	54	1.5 – 14.2		25.0		2	

A.15.3.2. Metal pipes with NH/ArmaFlex insulation and HENSOTHERM® 7 KS Gewebe 50 (EI 60)

Services	Diameter [mm]	Wall thickness [mm]	Insulation	Insulation thickness [mm]	Insulation length [mm]	Layers of HENSOTHERM® 7 KS Gewebe 50 (2 mm)	Classification
Copper, steel or cast iron	≤ 15	1.0 – 7.5	NH/ArmaFlex	9.0	CS	1	EI 60 C/U
	$> 15 \leq 42$	1.2 – 14.2		13.0 – 25.0		2	
	$> 15 \leq 42$	1.2 – 14.2		13.0		2	
	54	1.5 – 14.2		25.0		2	
Steel or cast iron	≤ 15	1.0 – 7.5	NH/ArmaFlex	9.0	CS	1	EI 60 C/U
	$> 15 \leq 42$	1.2 – 14.2		13.0 – 25.0		2	
	$> 15 \leq 42$	1.2 – 14.2		13.0		2	
	54	1.5 – 14.2		25.0		2	

A.15.3.3. Metal pipes with NH/ArmaFlex insulation and HENSOTHERM® 7 KS Gewebe 50 (EI 30)

Services	Diameter [mm]	Wall thickness [mm]	Insulation	Insulation thickness [mm]	Insulation length [mm]	Layers of HENSOTHERM® 7 KS Gewebe 50 (2 mm)	Classification
Copper, steel or cast iron	≤ 15	1.0 – 7.5	NH/ArmaFlex	9.0	CS	1	EI 30 C/U
	$> 15 \leq 42$	1.2 – 14.2		13.0 – 25.0		2	
	$> 15 \leq 42$	1.2 – 14.2		13.0		2	
	$> 42 \leq 54$	1.5 – 14.2		13.0 – 25.0		2	
	54	1.5 – 14.2		25.0		2	
	$> 54 \leq 89$	2.0 – 14.2		19.0 – 25.0		2	
Steel or cast iron	≤ 15	1.0 – 7.5	NH/ArmaFlex	9.0	CS	1	EI 30 C/U
	$> 15 \leq 42$	1.2 – 14.2		13.0 – 25.0		2	
	$> 15 \leq 42$	1.2 – 14.2		13.0		2	
	$> 42 \leq 54$	1.5 – 14.2		13.0 – 25.0		2	
	54	1.5 – 14.2		25.0		2	
	$> 54 \leq 89$	2.0 – 14.2		19.0 – 25.0		2	
	$> 89 \leq 114.3$	4.5 – 14.2		19.0 – 25.0		2	

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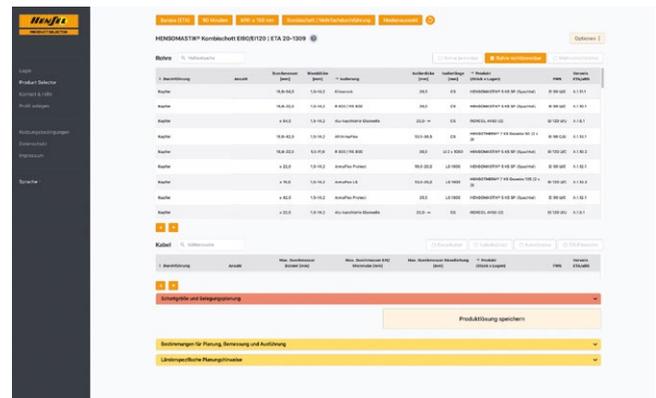
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TECHNICAL INFORMATION

Maximum Seal Size, Permitted Minimum Spacing and Distance of the First Support | Installation in Floors

B.1. Maximum seal size, minimum spacing and distance of the first support

B.1.1. Maximum seal size

Maximum permissible seal size 1200 x 2000 mm (w x l) or 1125 x 8250 mm (w x l).

For floor constructions, according to H.8.8 of EN 1366-3, classifications apply to any penetration seal length as long as the width is reduced to an extent so that the perimeter length to seal area ratio is not smaller than that tested. For floor constructions with length ≥ 2000 mm ≤ 8250 mm, the maximum permissible seal width is 1125 mm.

The maximum permissible seal area that can be occupied by penetrating services and sustained insulation is 60%.

B.1.2. Permitted Minimum Spacing

The following minimum spacings apply for all construction variants and applications in floors (see drawing for explanation).

Legend:

- 1: HENSOMASTIK® Mixed Penetration Seal EI 60
- 2: Penetrating services inside the seal area
- 3: Supporting construction element
- 4: Other fire penetration seals, openings or installations

Minimum spacing between penetrating services:

- a1-1: between cable/cable trays and metal pipes ≥ 20 mm
- a1-2: between cable/cable trays and plastic pipes ≥ 25 mm
- a1-3: between metal pipes and plastic pipes ≥ 25 mm
- a1-4: between plastic pipes ≥ 15 mm
- a1-5: between metal pipes ≥ 25 mm
- a1-6: between cable trays ≥ 20 mm
- a1-7: between plastic pipes with sound-insulation mass layer ≥ 100 mm

Minimum spacing between penetrating services and seal edges:

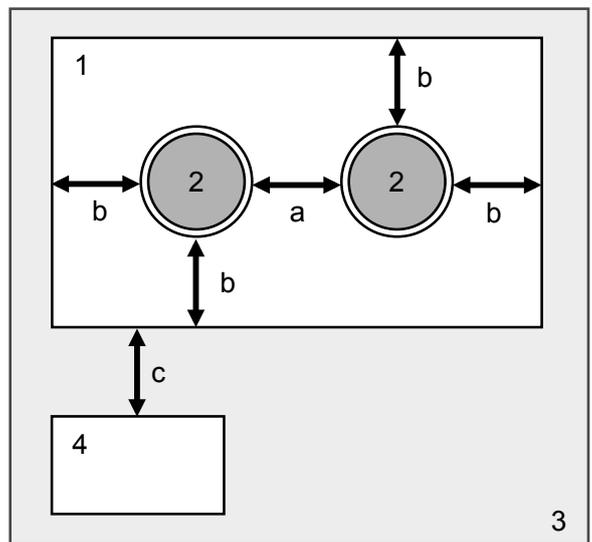
- b1: between cable/cable trays and the upper seal edge ≥ 25 mm
- b2: between cable/cable trays and the side seal edge ≥ 25 mm
- b3: between cable/cable trays and the lower seal edge ≥ 25 mm
- b4: between metal pipes and the side seal edge ≥ 25 mm
- b5: between plastic pipes and the side seal edge ≥ 25 mm

Minimum spacing between other openings or installations:

c1-1 Other fire penetration seals:	≥ 20 cm, if one or both of the adjacent openings is larger than 40 x 40 cm, otherwise ≥ 10 cm.
c1-2 Other openings or installations:	≥ 20 cm, if one or both of the adjacent openings is larger than 20 x 20 cm, otherwise ≥ 10 cm.

B.1.3. Distance of the first support:

Distance of the first support:	All services shall be supported at maximum 250 mm distance from the top side of the floor.
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Pipe End Configuration

Proper pipe end configuration must be taken into account when choosing a suitable fire penetration seal solution for e.g. plastic rainwater or ventilated sewage pipes, or unventilated drinking or heating water pipes. The classifications stated in this manual include whether the ends of tested pipes were closed (Capped, marked C) inside and outside of the furnace or was open (Uncapped, marked U). According to EN 1366-3, configuration U/U includes all other configurations, but not vice versa:



TECHNICAL INFORMATION

HENSOMASTIK® Kombischott EI60 | Permitted Minimum Spacing and Distance of the First Support | Max. Seal Size 1.200 x 2.000 mm (W x H) oder 1.125 x 1.125 mm (W x H)

Rigid floors ≥ 150 mm		Minimum spacing between penetrating services / reveals / distance of first support [mm]			
ETA 20/1310 section		Single cables, cable bundles, cable trays and support structures	Polyolefin flexible cable conduits with HENSOTHERM® 7 KS Gewebe 100	Combustible plastic pipes without insulation with HENSOTHERM® RM pipe collars	
B.3.	Single cables, cable bundles, cable trays and support structures		≥ 20	≥ 25	≥ 25
B.4.	Polyolefin flexible cable conduits with HENSOTHERM® 7 KS Gewebe 100		≥ 25	≥ 15	≥ 15
B.5. B.6. B.8.	Combustible plastic pipes without insulation with HENSOTHERM® RM pipe collars		≥ 25	≥ 15	≥ 15
B.7.	Combustible plastic pipes with sound-insulation mass layer with HENSOTHERM® RM		≥ 100	≥ 100	≥ 100
B.9.	Combustible plastic pipes without insulation with HENSOTHERM® 7 KS Gewebe 100		≥ 25	≥ 15	≥ 15
B.10.	Aluminium-composite pipes with FEF-insulation with HENSOTHERM® 7 KS Gewebe 100		≥ 25	≥ 15	≥ 15
B.11 B.12 B.13	Metal pipes with non-combustible insulation		≥ 20	≥ 25	≥ 25
B.14 B.15	Metal pipes with FEF-insulation with HENSOTHERM® 7 KS Gewebe 125		≥ 20	≥ 25	≥ 25
B.16 B.17	Metal pipes with FEF-insulation with HENSOTHERM® 7 KS Gewebe 50		≥ 20	≥ 25	≥ 25

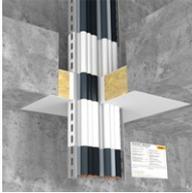
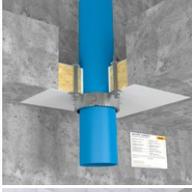
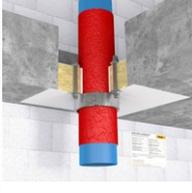
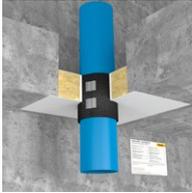
8.250 mm (W x H) in Floors ≥ 150 mm

Combustible plastic pipes with sound-insulation mass layer with HENSOTHERM® RM	Combustible plastic pipes without insulation with HENSOTHERM® 7 KS Gewebe 100	Aluminium-composite pipes with FEF-insulation with HENSOTHERM® 7 KS Gewebe 100	Metal pipes with non-combustible insulation	Metal pipes with FEF-insulation with HENSOTHERM® 7 KS Gewebe 125	Metal pipes with FEF-insulation with HENSOTHERM® 7 KS Gewebe 50	Reveal / seal edges	First support
≥ 100	≥ 25	≥ 25	≥ 20	≥ 20	≥ 20	≥ 25	≤ 220
≥ 100	≥ 15	≥ 15	≥ 25	≥ 25	≥ 25	≥ 25	≤ 250
≥ 100	≥ 15	≥ 15	≥ 25	≥ 25	≥ 25	≥ 25	≤ 250
≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 25	≥ 250
≥ 100	≥ 15	≥ 15	≥ 25	≥ 25	≥ 25	≥ 25	≤ 250
≥ 100	≥ 15	≥ 15	≥ 25	≥ 25	≥ 25	≥ 25	≤ 250
≥ 100	≥ 25	≥ 25	≥ 25	≥ 25	≥ 25	≥ 25	≤ 250
≥ 100	≥ 25	≥ 25	≥ 25	≥ 25	≥ 25	≥ 25	≤ 250
≥ 100	≥ 25	≥ 25	≥ 25	≥ 25	≥ 25	≥ 25	≤ 250

TECHNICAL INFORMATION

Overview of Applications and Construction Details

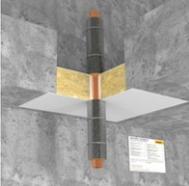
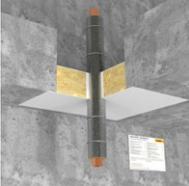
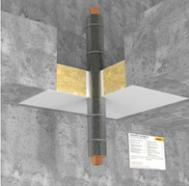
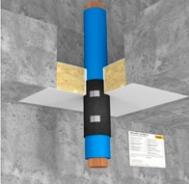
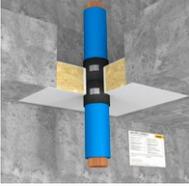
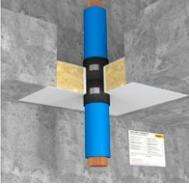
B. Rigid Floor ≥ 150 mm

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TECHNICAL INFORMATION

Overview of Applications and Construction Details

B. Rigid Floor ≥ 150 mm

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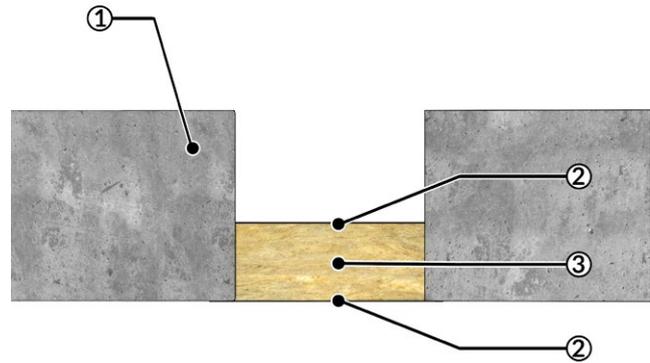
TECHNICAL INFORMATION

Rigid floor constructions with floor thickness ≥ 150 mm

B.2. Blank seal, floor application

Construction details: Blank HENSOMASTIK® Mixed Penetration Seal EI60 comprising one ≥ 60 mm thick Rockwool Hardrock 040 mineral fibre board ≥ 150 kg/m³ fixed in the floor by friction.

The mineral fibre boards are cut to size and friction fitted into the supporting element. Board joints and edges are buttered and sealed and the external faces of the boards coated with HENSOMASTIK® 5 KS Farbe or HENSOMASTIK® 5 KS viskos in dry film thickness (DFT) ≥ 1 mm. All gaps and joints between boards and reveal are closed with HENSOMASTIK® 5 KS Farbe or HENSOMASTIK® 5 KS viskos and a min. 20 mm wide circumferential coating (DFT ≥ 1 mm) is applied from both sides of the floor.



1 = Rigid floor, 2 = Outer sides coated (DFT ≥ 1 mm) with HENSOMASTIK® 5 KS Farbe/viskos, circumferential coating ≥ 20 mm width, 3 = Mineral fiber board $1 \times \geq 60$ mm, density ≥ 150 kg/m³, Rockwool Hardrock 040

B.2.1. Blank seal, floor application (EI 60)

Services	Classification
Blank seal, no penetrating services	EI 60

TECHNICAL INFORMATION

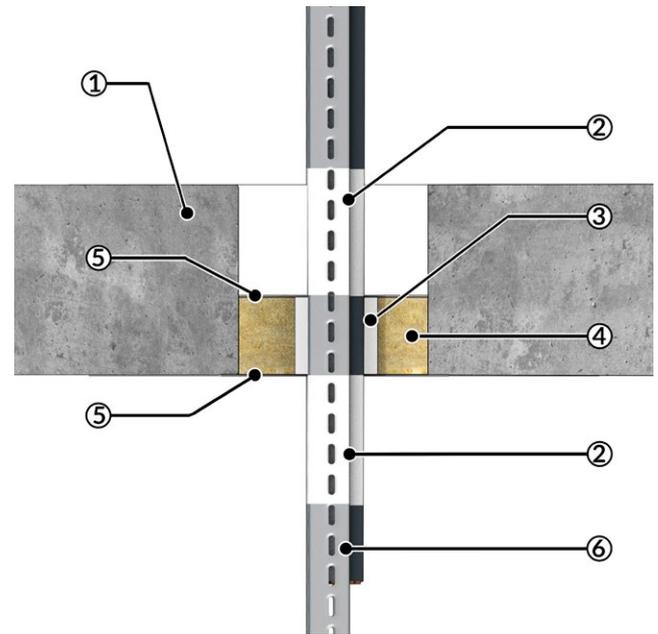
Rigid floor constructions with floor thickness ≥ 150 mm

B.3. Single cables, cable bundles, cable trays and support structures

Construction details: Single cables, cable bundles, cable trays and support structures in a HENSOMASTIK® Mixed Penetration Seal EI60 comprising one ≥ 60 mm thick Rockwool Hardrock 040 mineral fibre board ≥ 150 kg/m³ fixed in the floor by friction.

The mineral fibre boards are cut to size and friction fitted into the supporting element. Board joints and edges are buttered and sealed and the external faces of the boards coated with HENSOMASTIK® 5 KS Farbe or HENSOMASTIK® 5 KS viskos in dry film thickness (DFT) ≥ 1 mm. All gaps and joints between boards and reveal are closed with HENSOMASTIK® 5 KS Farbe or HENSOMASTIK® 5 KS viskos and a min. 20 mm wide circumferential coating (DFT ≥ 1 mm) is applied from both sides of the floor.

The annular gap between boards and penetrating single cables, cable bundles, cable trays or support structures is stuffed with mineral wool (reaction to fire class A1 or A2 according to EN 13501-1) and joints ≤ 10 mm filled with HENSOMASTIK® 5 KS SP (Spachtel) from both sides in full depth. A coating of HENSOMASTIK® 5 KS Farbe or HENSOMASTIK® 5 KS viskos is applied in dry film thickness (DFT) ≥ 1 mm extending 100 mm from both faces of the seal.



1 = Rigid floor, 2 = Coating (100 mm, DFT ≥ 1 mm) with HENSOMASTIK® 5 KS Farbe or HENSOMASTIK® 5 KS viskos, 3 = Annular gap filled with mineral wool (A1 or A2), annular gap ≤ 10 mm completely filled with HENSOMASTIK® 5 KS SP (Spachtel), 4 = Mineral fiber board 1 x ≥ 60 mm, density ≥ 150 kg/m³, Rockwool Hardrock 040, 5 = Outer sides coated (DFT ≥ 1 mm) with HENSOMASTIK® 5 KS Farbe/viskos, circumferential coating ≥ 20 mm width, 6 = Single cables, cable bundles, cable trays or support structures

B.3.1. Single cables, cable bundles, cable trays and support structures (EI 60)

Services	Max. diameter bundle [mm]	Max. diameter single cable conduit [mm]	Max. diameter single cable [mm]	Classification
Sheathed cables of all types, single or in a bundle	100	-	21	EI 60
Telecommunication cables, single or in a bundle	100	-	21	
Sheathed cables of all types, single	-	-	21	
Cable support, tray or ladder	-	500	-	

TECHNICAL INFORMATION

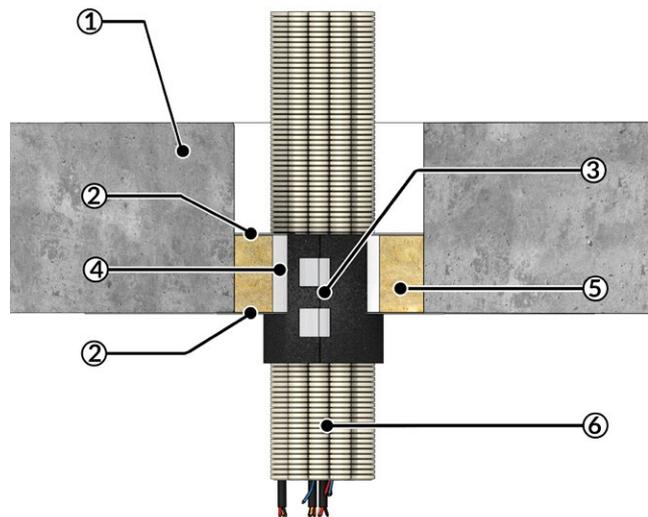
Rigid floor constructions with floor thickness ≥ 150 mm

B.4. Polyolefin flexible cable conduits with or without cables with HENSOTHERM® 7 KS Gewebe 100

Construction details: Polyolefin flexible cable conduits, single or in a bundle, with cables in a HENSOMASTIK® Mixed Penetration Seal EI60 comprising one ≥ 60 mm thick Rockwool Hardrock 040 mineral fibre board ≥ 150 kg/m³ fixed in the floor by friction.

The mineral fibre boards are cut to size and friction fitted into the supporting element. Board joints and edges are buttered and sealed and the external faces of the boards coated with HENSOMASTIK® 5 KS Farbe or HENSOMASTIK® 5 KS viskos in dry film thickness (DFT) ≥ 1 mm. All gaps and joints between boards and reveal are closed with HENSOMASTIK® 5 KS Farbe or HENSOMASTIK® 5 KS viskos and a min. 20 mm wide circumferential coating (DFT ≥ 1 mm) is applied from both sides of the floor.

Around the single cable conduit or tight bundle, a wrapping of one length of HENSOTHERM® 7 KS Gewebe 100 endless pipe collar (thickness 1 mm), positioned flush with the topside of the seal and protruding 40 mm on the underside, with number of layers of according to table, and fixed with adhesive tape or metal straps or wires ≥ 0.6 mm, is applied. The max. 10 mm wide annular gap between boards and HENSOTHERM® 7 KS Gewebe 100 is filled with HENSOMASTIK® 5 KS SP (Spachtel) from both sides in full depth.



1 = Rigid floor, 2 = Outer sides coated (DFT ≥ 1 mm) with HENSOMASTIK® 5 KS Farbe/viskos, circumferential coating ≥ 20 mm width, 3 = HENSOTHERM® 7 KS Gewebe 100, positioned flush with the topside of the seal and fixed with adhesive tape or metal straps or wires ≥ 0.6 mm, 4 = Annular gap filled with HENSOMASTIK® 5 KS SP (Spachtel), 5 = Mineral fiber board 1 x ≥ 60 mm, density ≥ 150 kg/m³, Rockwool Hardrock 040, 6 = Polyolefin flexible cable conduits with or without cables, single or in a bundle

B.4.1. Polyolefin flexible cable conduits with or without cables with HENSOTHERM® 7 KS Gewebe 100 (EI 60)

Services	Max. diameter bundle [mm]	Max. diameter single cable conduit [mm]	Max. diameter single cable [mm]	Layers of HENSOTHERM® 7 KS Gewebe 100 (1 mm)	Classification
Polyolefin flexible cable conduits with cables type NHXH-J 3 x 1.5 mm ² and NHXH-J 5 x 1.5 mm ² , single or in a bundle	125	32	21	6	EI 60 C/C

TECHNICAL INFORMATION

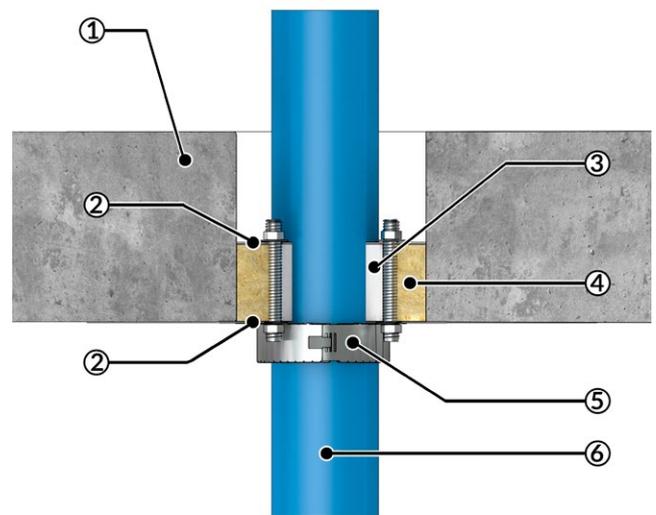
Rigid floor constructions with floor thickness ≥ 150 mm

B.5. Combustible plastic pipes without insulation with HENSOTHERM® RM pipe collars

Construction details: Combustible pipes without insulation in a HENSOMASTIK® Mixed Penetration Seal EI60 comprising one ≥ 60 mm thick Rockwool Hardrock 040 mineral fibre board ≥ 150 kg/m fixed in the floor by friction.

The mineral fibre boards are cut to size and friction fitted into the supporting element. Board joints and edges are buttered and sealed and the external faces of the boards coated with HENSOMASTIK® 5 KS Farbe or HENSOMASTIK® 5 KS viskos in dry film thickness (DFT) ≥ 1 mm. All gaps and joints between boards and reveal are closed with HENSOMASTIK® 5 KS Farbe or HENSOMASTIK® 5 KS viskos and a min. 20 mm wide circumferential coating (DFT ≥ 1 mm) is applied from both sides of the floor.

The max. 10 mm wide annular gap between boards and pipes is filled with HENSOMASTIK® 5 KS SP (Spachtel) from both sides in full depth. Around the pipe, a HENSOTHERM® RM pipe collar is applied in the appropriate collar type and size (see table) from the underside of the seal, aligned flush to the board's surface and closed with the locking lugs. The HENSOTHERM® RM pipe collar is secured in place with M6 threaded rods, nuts and washers 6.4 x 25 mm at all fastening lugs.



1 = Rigid floor, 2 = Outer sides coated (DFT ≥ 1 mm) with HENSOMASTIK® 5 KS Farbe/viskos, circumferential coating ≥ 20 mm width, 3 = Annular gap filled with HENSOMASTIK® 5 KS SP (Spachtel), 4 = Mineral fiber board $1 \times \geq 60$ mm, density ≥ 150 kg/m³, Rockwool Hardrock 040, 5 = HENSOTHERM® RM pipe collar, secured with M6 threaded rods, nuts and washers 6.4 x 25 mm, 6 = Combustible plastic pipe

B.5.1.1. Geberit Silent-PP with HENSOTHERM® RM pipe collars (EI 90)

Services	Diameter [mm]	Wall thickness [mm]	HENSOTHERM® RM pipe collar [height-size, mm]	Classification
Geberit Silent-PP	110	3.6	HENSOTHERM® RM 30-110	EI 90 U/U

B.5.1.2. Geberit Silent-PP with HENSOTHERM® RM pipe collars (EI 60)

Services	Diameter [mm]	Wall thickness [mm]	HENSOTHERM® RM pipe collar [height-size, mm]	Classification
Geberit Silent-PP	50	2.0	HENSOTHERM® RM 30-56	EI 60 U/U
	75	2.6	HENSOTHERM® RM 30-75	
	90	3.1	HENSOTHERM® RM 30-90	
	110	3.6	HENSOTHERM® RM 30-110	
	125	4.2	HENSOTHERM® RM 30-125	

TECHNICAL INFORMATION

Rigid floor constructions with floor thickness ≥ 150 mm

B.5.2.1. PE pipes with HENSOTHERM® RM pipe collars (EI 90)

Services	Diameter [mm]	Wall thickness [mm]	HENSOTHERM® RM pipe collar [height-size, mm]	Classification
PE incl. PE 100, PE-HD, PE-X, ABS, SAN+PVC	$\geq 32 \leq 40$	3.0 – 4.6	HENSOTHERM® RM 30-40	EI 90 U/U
	$> 40 \leq 50$	3.0 – 4.6	HENSOTHERM® RM 30-56	
	$> 50 \leq 56$	3.4 – 6.6	HENSOTHERM® RM 30-56	
	$> 56 \leq 63$	3.4 – 6.6	HENSOTHERM® RM 30-63	
	$> 63 \leq 75$	3.4 – 6.6	HENSOTHERM® RM 30-75	
	$> 75 \leq 90$	3.4 – 6.6	HENSOTHERM® RM 30-90	
	$> 90 \leq 110$	3.4 – 6.6	HENSOTHERM® RM 30-110	

B.5.2.2. PE pipes with HENSOTHERM® RM pipe collars (EI 60)

Services	Diameter [mm]	Wall thickness [mm]	HENSOTHERM® RM pipe collar [height-size, mm]	Classification
PE incl. PE 100, PE-HD, PE-X, ABS, SAN+PVC	$\geq 32 \leq 40$	3.0 – 4.6	HENSOTHERM® RM 30-40	EI 60 U/U
	$> 40 \leq 50$	3.0 – 4.6	HENSOTHERM® RM 30-56	
	$> 50 \leq 56$	3.4 – 6.6	HENSOTHERM® RM 30-56	
	$> 56 \leq 63$	3.4 – 6.6	HENSOTHERM® RM 30-63	
	$> 63 \leq 75$	3.4 – 6.6	HENSOTHERM® RM 30-75	
	$> 75 \leq 90$	3.4 – 6.6	HENSOTHERM® RM 30-90	
	$> 90 \leq 110$	3.4 – 6.6	HENSOTHERM® RM 30-110	
	$> 110 \leq 125$	4.0	HENSOTHERM® RM 30-125	

Test results on single layer pipes made of PE in accordance with EN 1519-1, EN 12201-1, EN ISO 15494 or EN 12666-1 are valid for all single layer PE pipes in accordance with EN 1519-1, EN 12666-1, EN 12201-2 and EN ISO 15494, PE-X pipes in accordance with EN ISO 15875-2, ABS pipes in accordance with EN 1455-1 and EN ISO 15493 as well as SAN+PVC pipes in accordance with ISO 19220.

The following list contains suitable branded PE-X pipes in accordance with EN ISO 15875-2 under this rule but may not be 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

B.5.3.1. POLO-KAL NG with HENSOTHERM® RM pipe collars (EI 90)

Services	Diameter [mm]	Wall thickness [mm]	HENSOTHERM® RM pipe collar [height-size, mm]	Classification
POLO-KAL NG	125	3.9	HENSOTHERM® RM 30-125	EI 90 U/U

TECHNICAL INFORMATION

Rigid floor constructions with floor thickness ≥ 150 mm

B.5.3.2. POLO-KAL NG with HENSOTHERM® RM pipe collars (EI 60)

Services	Diameter [mm]	Wall thickness [mm]	HENSOTHERM® RM pipe collar [height-size, mm]	Classification
POLO-KAL NG	32	1.8	HENSOTHERM® RM 30-40	EI 60 U/U
	40	1.8	HENSOTHERM® RM 30-40	
	50	2.0	HENSOTHERM® RM 30-56	
	75	2.6	HENSOTHERM® RM 30-75	
	90	3.0	HENSOTHERM® RM 30-90	
	110	3.4	HENSOTHERM® RM 30-110	
	125	3.9	HENSOTHERM® RM 30-125	

B.5.4. PP pipes with HENSOTHERM® RM pipe collars (EI 60)

Services	Diameter [mm]	Wall thickness [mm]	HENSOTHERM® RM pipe collar [height-size, mm]	Classification
PP	$> 110 \leq 125$	3.1	HENSOTHERM® RM 30-125	EI 60 U/U

Test results on single layer pipes made of PP in accordance with EN 1451-1 are valid for single layer PP pipes in accordance with EN 1451-1, EN ISO 15874 and EN ISO 15494.

B.5.5.1. PVC-U pipes with HENSOTHERM® RM pipe collars (EI 90)

Services	Diameter [mm]	Wall thickness [mm]	HENSOTHERM® RM pipe collar [height-size, mm]	Classification
PVC-U	$\geq 32 \leq 40$	1.8 – 3.7	HENSOTHERM® RM 30-40	EI 90 U/U
	$> 40 \leq 50$	1.8 – 3.7	HENSOTHERM® RM 30-56	

B.5.5.2. PVC-U pipes with HENSOTHERM® RM pipe collars (EI 60)

Services	Diameter [mm]	Wall thickness [mm]	HENSOTHERM® RM pipe collar [height-size, mm]	Classification
PVC-U	$\geq 32 \leq 40$	1.8 – 3.7	HENSOTHERM® RM 30-40	EI 60 U/U
	$> 40 \leq 50$	1.8 – 3.7	HENSOTHERM® RM 30-56	
	$> 50 \leq 56$	2.2 – 5.3	HENSOTHERM® RM 30-56	
	$> 56 \leq 63$	2.2 – 5.3	HENSOTHERM® RM 30-63	
	$> 63 \leq 75$	2.2 – 5.3	HENSOTHERM® RM 30-75	
	$> 75 \leq 90$	2.2 – 5.3	HENSOTHERM® RM 30-90	
	$> 90 \leq 110$	2.2 – 5.3	HENSOTHERM® RM 30-110	
	$> 110 \leq 125$	2.5 – 6.0	HENSOTHERM® RM 30-125	

Test results on single layer pipes made of PVC-U in accordance with EN 1329-1, EN 1453-1 or EN ISO 1452-2 are valid for single layer pipes made of PVC-U in accordance with EN 1329-1, EN 1453-1, EN ISO 15493 and EN ISO 1452-2 and for pipes made of PVC-C in accordance with EN 1566-1, EN ISO 15493 and EN ISO 15877-2.

TECHNICAL INFORMATION

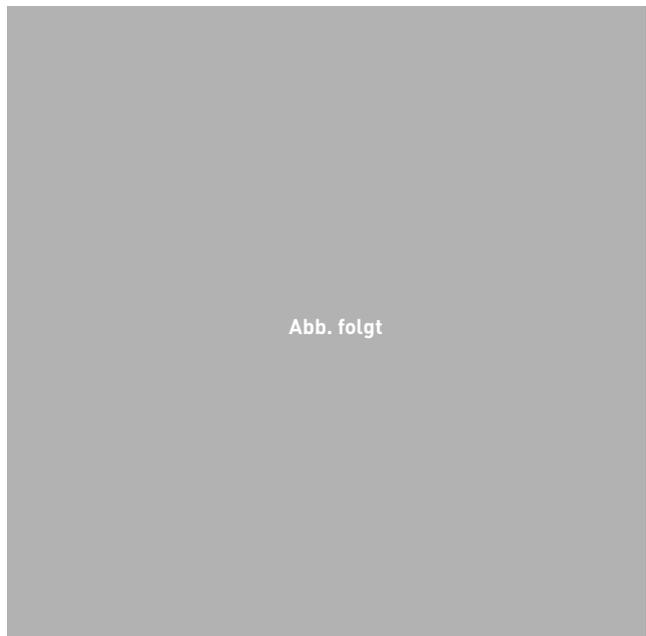
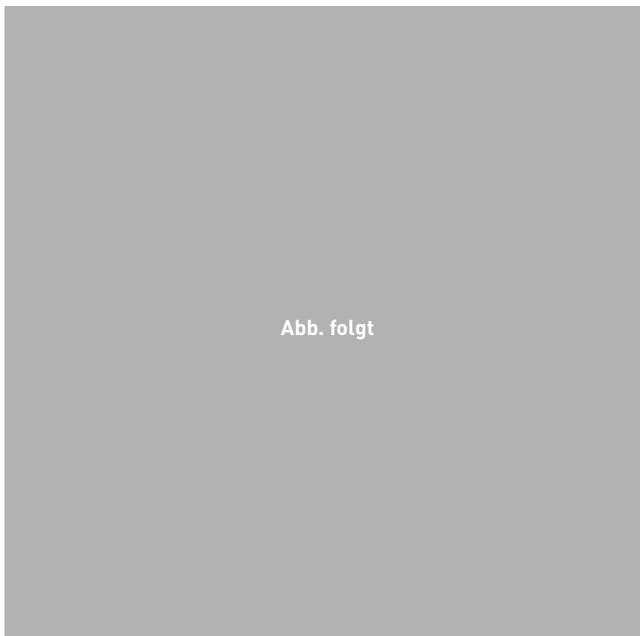
Rigid floor constructions with floor thickness ≥ 150 mm

B.6. Combustible plastic pipes with PE-insulation with HENSOTHERM® RM pipe collars

Construction details: Combustible pipes with local sustained (LS) PE-foam sound decoupling insulation (manufacturer independent, strip wrapped around the pipe or pre-fabricated sleeve) with thickness ≤ 5 mm in a HENSOMASTIK® Mixed Penetration Seal EI60 comprising one ≥ 60 mm thick Rockwool Hardrock 040 mineral fibre board ≥ 150 kg/m³ fixed in the floor by friction.

The mineral fibre boards are cut to size and friction fitted into the supporting element. Board joints and edges are buttered and sealed and the external faces of the boards coated with HENSOMASTIK® 5 KS Farbe or HENSOMASTIK® 5 KS viskos in dry film thickness (DFT) ≥ 1 mm. All gaps and joints between boards and reveal are closed with HENSOMASTIK® 5 KS Farbe or HENSOMASTIK® 5 KS viskos and a min. 20 mm wide circumferential coating (DFT ≥ 1 mm) is applied from both sides of the floor.

The PE-foam insulation (see table for length) is positioned flush with the topside of the seal, protruding on the underside and ending directly after the pipe collar. The max. 10 mm wide annular gap between boards and insulation is filled with HENSOMASTIK® 5 KS SP (Spachtel) from both sides in full depth. Around the insulation, a HENSOTHERM® RM pipe collar is applied in the appropriate collar type and size (see table) from the underside of the seal, aligned flush to the board's surface and closed with the locking lugs. The HENSOTHERM® RM pipe collar is secured in place with M6 threaded rods, nuts and washers 6.4 x 25 mm at all fastening lugs.



1 = Rigid floor, 2 = Outer sides coated (DFT ≥ 1 mm) with HENSOMASTIK® 5 KS Farbe/viskos, circumferential coating ≥ 20 mm width, 3 = Annular gap filled with HENSOMASTIK® 5 KS SP (Spachtel), 4 = Mineral fiber board 1 x ≥ 60 mm, density ≥ 150 kg/m³, Rockwool Hardrock 040, 5 = HENSOTHERM® RM pipe collar, secured with M6 threaded rods, nuts and washers 6.4 x 25 mm, 6 = Combustible plastic pipe with, PE-foam sound decoupling

B.6.1. Geberit Silent-PP with PE-insulation and HENSOTHERM® RM pipe collars (EI 90)

Services	Diameter [mm]	Wall thickness [mm]	Insulation	Insulation length [mm]	HENSOTHERM® RM pipe collar [height-size, mm]	Classification
Geberit Silent-PP	32	2.0	PE-foam sound decoupling ≤ 5 mm	LS 90	HENSOTHERM® RM 30-56	EI 90 U/U
	40	2.0		LS 90	HENSOTHERM® RM 30-56	
	50	2.0		LS 90	HENSOTHERM® RM 30-75	
	75	2.6		LS 90	HENSOTHERM® RM 30-90	
	90	3.1		LS 90	HENSOTHERM® RM 30-110	
	110	3.6		LS 90	HENSOTHERM® RM 30-125	
	125	4.2		LS 110	HENSOTHERM® RM 50-140	

TECHNICAL INFORMATION

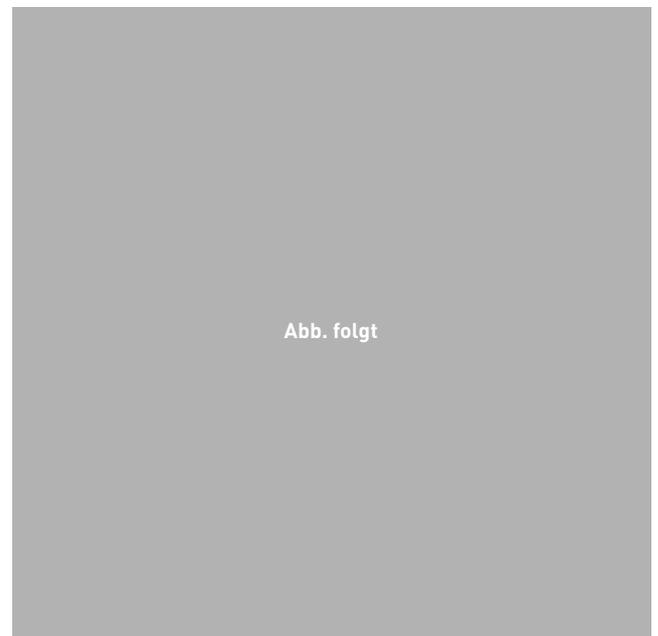
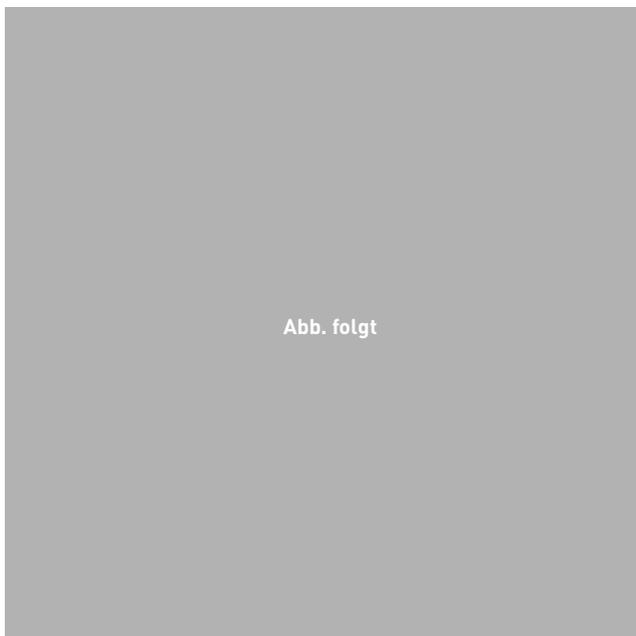
Rigid floor constructions with floor thickness ≥ 150 mm

B.7. Combustible plastic pipes with sound-insulation mass layer with HENSOTHERM® RM

Construction details: Combustible pipes with local sustained (LS) flexible sound-insulating mass layer in a HENSOMASTIK® Mixed Penetration Seal EI60 comprising one ≥ 60 mm thick Rockwool Hardrock 040 mineral fibre board ≥ 150 kg/m³ fixed in the floor by friction.

The mineral fibre boards are cut to size and friction fitted into the supporting element. Board joints and edges are buttered and sealed and the external faces of the boards coated with HENSOMASTIK® 5 KS Farbe or HENSOMASTIK® 5 KS viskos in dry film thickness (DFT) ≥ 1 mm. All gaps and joints between boards and reveal are closed with HENSOMASTIK® 5 KS Farbe or HENSOMASTIK® 5 KS viskos and a min. 20 mm wide circumferential coating (DFT ≥ 1 mm) is applied from both sides of the floor.

The local insulation is positioned at centre of the seal, protruding min. 470 mm on both sides. The length of the local insulation may be increased but not reduced, classification is also applicable to continuous sustained insulation (CS). The max. 10 mm wide annular gap between boards and insulation is filled with HENSOMASTIK® 5 KS SP (Spachtel) from both sides in full depth. Around the insulation, a HENSOTHERM® RM pipe collar is applied in the appropriate collar type and size (see table) from the underside of the seal, aligned flush to the board's surface and closed with the locking lugs. The HENSOTHERM® RM pipe collar is secured in place with M6 threaded rods, nuts and washers 6.4 x 25 mm at all fastening lugs.



1 = Rigid floor, 2 = Outer sides coated (DFT ≥ 1 mm) with HENSOMASTIK® 5 KS Farbe/viskos, circumferential coating ≥ 20 mm width, 3 = Annular gap filled with HENSOMASTIK® 5 KS SP (Spachtel), 4 = Mineral fiber board 1 x ≥ 60 mm, density ≥ 150 kg/m³, Rockwool Hardrock 040, 5 = HENSOTHERM® RM pipe collar, secured with M6 threaded rods, nuts and washers 6.4 x 25 mm, 6 = Combustible plastic pipe with sound-insulation mass layer

B.7.1. Geberit Silent-PP with Sonimass insulation and HENSOTHERM® RM pipe collars (EI 90)

Services	Diameter [mm]	Wall thickness [mm]	Insulation	Insulation thickness [mm]	Insulation length [mm]	HENSOTHERM® RM pipe collar [height-size, mm]	Classification
Geberit Silent-PP	110	3.6	Sonimass	12.0	CS / LS 1000	HENSOTHERM® RM 50-140	EI 90 U/U

B.7.2. Geberit Silent-PP with Geberit Isol Flex insulation and HENSOTHERM® RM pipe collars (EI 90)

Services	Diameter [mm]	Wall thickness [mm]	Insulation	Insulation thickness [mm]	Insulation length [mm]	HENSOTHERM® RM pipe collar [height-size, mm]	Classification
Geberit Silent-PP	110	3.6	Geberit Isol Flex	17.0	CS / LS 1000	HENSOTHERM® RM 50-140	EI 90 U/U

TECHNICAL INFORMATION

Rigid floor constructions with floor thickness ≥ 150 mm

B.8. Combustible plastic pipes with FEF-insulation (CS) with HENSOTHERM® RM pipe collars

Construction details: Combustible pipes with continuous sustained (CS) flexible elastomeric foam (FEF) or synthetic rubber Eurobatex insulation, with a building material class rated B-s2,d0 according to DIN EN 13501-1, in a HENSOMASTIK® Mixed Penetration Seal EI60 comprising one ≥ 60 mm thick Rockwool Hardrock 040 mineral fibre board ≥ 150 kg/m³ fixed in the floor by friction.

The mineral fibre boards are cut to size and friction fitted into the supporting element. Board joints and edges are buttered and sealed and the external faces of the boards coated with HENSOMASTIK® 5 KS Farbe or HENSOMASTIK® 5 KS viskos in dry film thickness (DFT) ≥ 1 mm. All gaps and joints between boards and reveal are closed with HENSOMASTIK® 5 KS Farbe or HENSOMASTIK® 5 KS viskos and a min. 20 mm wide circumferential coating (DFT ≥ 1 mm) is applied from both sides of the floor.

The max. 10 mm wide annular gap between boards and insulation is filled with HENSOMASTIK® 5 KS SP (Spachtel) from both sides in full depth. Around the insulation, a HENSOTHERM® RM pipe collar is applied in the appropriate collar type and size (see table) from the underside of the seal, aligned flush to the board's surface and closed with the locking lugs. The HENSOTHERM® RM pipe collar is secured in place with M6 threaded rods, nuts and washers 6.4 x 25 mm at all fastening lugs.

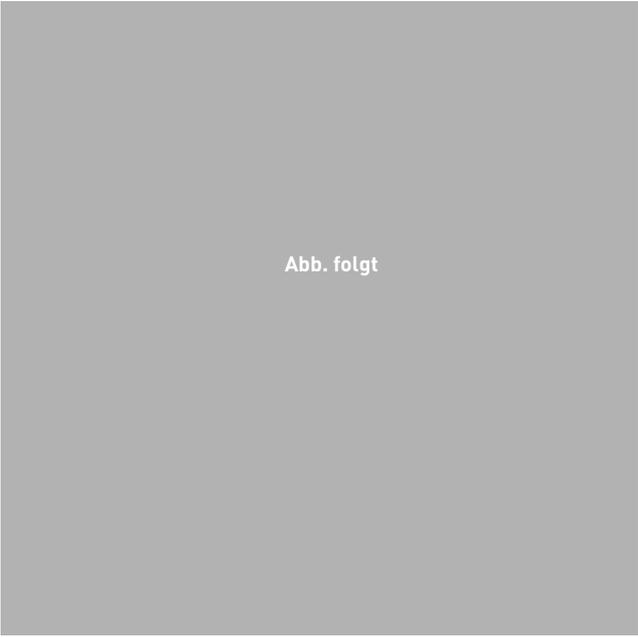


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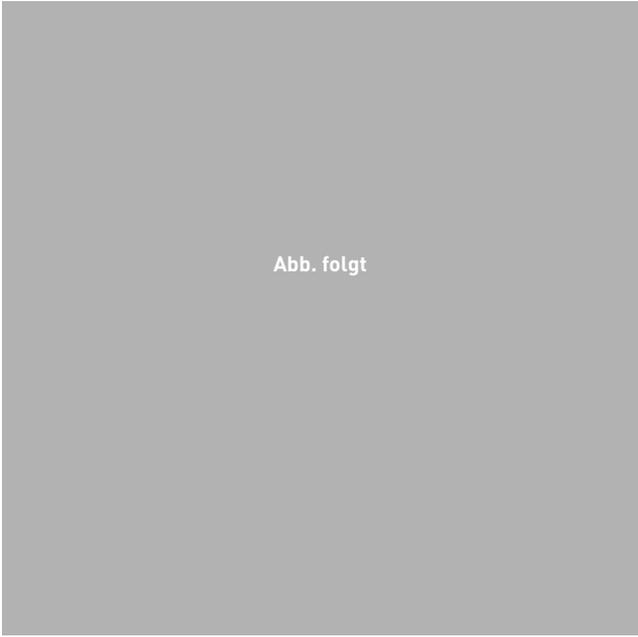


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1 = Rigid floor, 2 = Outer sides coated (DFT ≥ 1 mm) with HENSOMASTIK® 5 KS Farbe/viskos, circumferential coating ≥ 20 mm width, 3 = Annular gap filled with HENSOMASTIK® 5 KS SP (Spachtel), 4 = Mineral fiber board 1 x ≥ 60 mm, density ≥ 150 kg/m³, Rockwool Hardrock 040, 5 = HENSOTHERM® RM pipe collar, secured with M6 threaded rods, nuts and washers 6.4 x 25 mm, 6 = Combustible plastic pipe with FEF-insulation (CS)

TECHNICAL INFORMATION

Rigid floor constructions with floor thickness ≥ 150 mm

B.8.1. PE pipes with Eurobatex insulation and HENSOTHERM® RM pipe collars (EI 60)

Services	Diameter [mm]	Wall thickness [mm]	Insulation	Insulation thickness [mm]	Insulation length [mm]	HENSOTHERM® RM pipe collar [height-size, mm]	Classification
PE incl. PE 100, PE-HD, PE-X, ABS, SAN+PVC	125	4.9	Eurobatex	25.0	CS	HENSOTHERM® RM 50-180	EI 60 U/U

Test results on single layer pipes made of PE in accordance with EN 1519-1, EN 12201-1, EN ISO 15494 or EN 12666-1 are valid for all single layer PE pipes in accordance with EN 1519-1, EN 12666-1, EN 12201-2 and EN ISO 15494, PE-X pipes in accordance with EN ISO 15875-2, ABS pipes in accordance with EN 1455-1 and EN ISO 15493 as well as SAN+PVC pipes in accordance with ISO 19220.

The following list contains suitable branded PE-X pipes in accordance with EN ISO 15875-2 under this rule but may not be 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

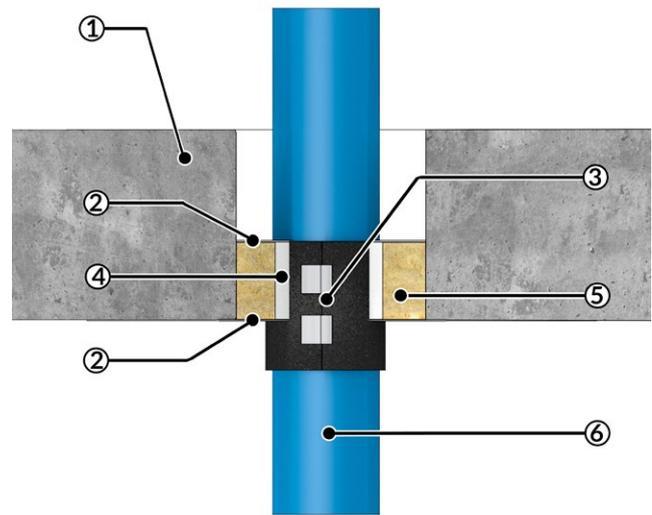
Rigid floor constructions with floor thickness ≥ 150 mm

B.9. Combustible plastic pipes without insulation with HENSOTHERM® 7 KS Gewebe 100

Construction details: Combustible pipes without insulation in a HENSOMASTIK® Mixed Penetration Seal EI60 comprising one ≥ 60 mm thick Rockwool Hardrock 040 mineral fibre board ≥ 150 kg/m³ fixed in the floor by friction.

The mineral fibre boards are cut to size and friction fitted into the supporting element. Board joints and edges are buttered and sealed and the external faces of the boards coated with HENSOMASTIK® 5 KS Farbe or HENSOMASTIK® 5 KS viskos in dry film thickness (DFT) ≥ 1 mm. All gaps and joints between boards and reveal are closed with HENSOMASTIK® 5 KS Farbe or HENSOMASTIK® 5 KS viskos and a min. 20 mm wide circumferential coating (DFT ≥ 1 mm) is applied from both sides of the floor.

Around the pipe, a wrapping of one length of HENSOTHERM® 7 KS Gewebe 100 endless pipe collar (thickness 1 mm), positioned flush with the topside of the seal and protruding 40 mm on the underside, with number of layers of according to table, and fixed with adhesive tape or metal straps or wires ≥ 0.6 mm, is applied. The max. 10 mm wide annular gap between boards and HENSOTHERM® 7 KS Gewebe 100 is filled with HENSOMASTIK® 5 KS SP (Spachtel) from both sides in full depth.



1 = Rigid floor, 2 = Outer sides coated (DFT ≥ 1 mm) with HENSOMASTIK® 5 KS Farbe/viskos, circumferential coating ≥ 20 mm width, 3 = HENSOTHERM® 7 KS Gewebe 100, positioned flush with the topside of the seal and fixed with adhesive tape or metal straps or wires ≥ 0.6 mm, 4 = Annular gap filled with HENSOMASTIK® 5 KS SP (Spachtel), 5 = Mineral fiber board 1 x ≥ 60 mm, density ≥ 150 kg/m³, Rockwool Hardrock 040, 6 = Combustible plastic pipe

B.9.1. Geberit Silent-dB20 with HENSOTHERM® 7 KS Gewebe 100 (EI 60)

Services	Diameter [mm]	Wall thickness [mm]	Layers of HENSOTHERM® 7 KS Gewebe 100 [1 mm]	Classification
Geberit Silent-dB20	56	3.2	3	EI 60 U/U
	63	3.2	4	
	75	3.6	4	
	90	5.5	4	
	110	6.0	6	

B.9.2.1. Geberit Silent-PP with HENSOTHERM® 7 KS Gewebe 100 (EI 90)

Services	Diameter [mm]	Wall thickness [mm]	Layers of HENSOTHERM® 7 KS Gewebe 100 [1 mm]	Classification
Geberit Silent-PP	32	2.0	3	EI 90 U/U
	40	2.0	3	
	50	2.0	3	

TECHNICAL INFORMATION

Rigid floor constructions with floor thickness ≥ 150 mm

B.9.2.2. Geberit Silent-PP with HENSOTHERM® 7 KS Gewebe 100 (EI 30)

Services	Diameter [mm]	Wall thickness [mm]	Layers of HENSOTHERM® 7 KS Gewebe 100 (1 mm)	Classification
Geberit Silent-PP	32	2.0	3	EI 30 U/U
	40	2.0	3	
	50	2.0	3	
	75	2.6	6	
	90	3.1	6	
	110	3.6	6	

B.9.3. PE pipes with HENSOTHERM® 7 KS Gewebe 100 (EI 60)

Services	Diameter [mm]	Wall thickness [mm]	Layers of HENSOTHERM® 7 KS Gewebe 100 (1 mm)	Classification
PE incl. PE 100, PE-HD, PE-X, ABS, SAN+PVC	≤ 56	3.0	3	EI 60 U/U
	$> 56 \leq 90$	3.5	4	
	$> 90 \leq 110$	4.3	6	

Test results on single layer pipes made of PE in accordance with EN 1519-1, EN 12201-1, EN ISO 15494 or EN 12666-1 are valid for all single layer PE pipes in accordance with EN 1519-1, EN 12666-1, EN 12201-2 and EN ISO 15494, PE-X pipes in accordance with EN ISO 15875-2, ABS pipes in accordance with EN 1455-1 and EN ISO 15493 as well as SAN+PVC pipes in accordance with ISO 19220.

The following list contains suitable branded PE-X pipes in accordance with EN ISO 15875-2 under this rule but may not be 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

B.9.4. POLO-KAL NG with HENSOTHERM® 7 KS Gewebe 100 (EI 60)

Services	Diameter [mm]	Wall thickness [mm]	Layers of HENSOTHERM® 7 KS Gewebe 100 (1 mm)	Classification
POLO-KAL NG	32	1.8	3	EI 60 U/U
	40	1.8	3	
	50	2.0	3	
	75	2.6	4	
	90	3.0	4	
	110	3.4	6	

B.9.5. PVC-U pipes with HENSOTHERM® 7 KS Gewebe 100 (EI 60)

Services	Diameter [mm]	Wall thickness [mm]	Layers of HENSOTHERM® 7 KS Gewebe 100 (1 mm)	Classification
PVC-U	≤ 50	1.8 – 5.6	3	EI 60 U/U
	$> 50 \leq 90$	1.8 – 6.7	4	
	$> 90 \leq 110$	2.2 – 8.1	6	

Test results on single layer pipes made of PVC-U in accordance with EN 1329-1, EN 1453-1 or EN ISO 1452-2 are valid for single layer pipes made of PVC-U in accordance with EN 1329-1, EN 1453-1, EN ISO 15493 and EN ISO 1452-2 and for pipes made of PVC-C in accordance with EN 1566-1, EN ISO 15493 and EN ISO 15877-2.

TECHNICAL INFORMATION

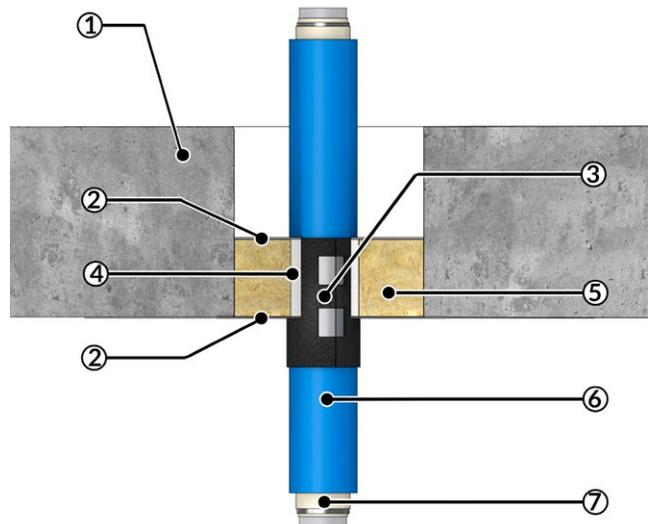
Rigid floor constructions with floor thickness ≥ 150 mm

B.10. Aluminium-composite pipes with FEF-insulation with HENSOTHERM® 7 KS Gewebe 100

Construction details: Aluminium-composite pipes with min. 500 mm long local sustained (LS) or continuous sustained (CS) flexible elastomeric foam (FEF) or synthetic rubber NH/ArmaFlex insulation, with a with a building material class rated D-s2,d0 according to DIN EN 13501-1, in a HENSOMASTIK® Mixed Penetration Seal EI60 comprising one ≥ 60 mm thick Rockwool Hardrock 040 mineral fibre board ≥ 150 kg/m³ fixed in the floor by friction.

The mineral fibre boards are cut to size and friction fitted into the supporting element. Board joints and edges are buttered and sealed and the external faces of the boards coated with HENSOMASTIK® 5 KS Farbe or HENSOMASTIK® 5 KS viskos in dry film thickness (DFT) ≥ 1 mm. All gaps and joints between boards and reveal are closed with HENSOMASTIK® 5 KS Farbe or HENSOMASTIK® 5 KS viskos and a min. 20 mm wide circumferential coating (DFT ≥ 1 mm) is applied from both sides of the floor.

The local insulation is positioned at centre of the seal, protruding min. 220 mm on both sides. The length of the local insulation may be increased but not reduced, classification is also applicable to continuous sustained insulation (CS). Around the insulation, a wrapping of one length of HENSOTHERM® 7 KS Gewebe 100 endless pipe collar (thickness 1 mm), positioned flush with the topside of the seal and protruding 40 mm on the underside, with number of layers of according to table, and fixed with adhesive tape or metal straps or wires ≥ 0.6 mm, is applied. The max. 10 mm wide annular gap between boards and HENSOTHERM® 7 KS Gewebe 100 is filled with HENSOMASTIK® 5 KS SP (Spachtel) from both sides in full depth.



1 = Rigid floor, 2 = Outer sides coated (DFT ≥ 1 mm) with HENSOMASTIK® 5 KS Farbe/viskos, circumferential coating ≥ 20 mm width, 3 = HENSOTHERM® 7 KS Gewebe 100, positioned flush with the topside of the seal and fixed with adhesive tape or metal straps or wires ≥ 0.6 mm, 4 = Annular gap filled with HENSOMASTIK® 5 KS SP (Spachtel), 5 = Mineral fiber board 1 x ≥ 60 mm, density ≥ 150 kg/m³, Rockwool Hardrock 040, 6 = FEF-insulation, 7 = Aluminium-composite pipe

TECHNICAL INFORMATION

Rigid floor constructions with floor thickness ≥ 150 mm

B.10.1. Geberit Mepla with NH/ArmaFlex insulation and HENSOTHERM® 7 KS Gewebe 100 (EI 60)

Services	Diameter [mm]	Wall thickn. [mm]	Insulation	Insulation thickness [mm]	Insulation length [mm]	Layers of HENSOTHERM® 7 KS Gewebe 100 (1 mm)	Classification
Geberit Mepla	16	2.25	NH/ArmaFlex	9.0 – 19.0	CS / LS 500	1	EI 60 U/C
	40	3.5		9.0 – 19.0		1	
	63	4.5		13.0 – 19.0		2	

B.10.2. Uponor MLC with NH/ArmaFlex insulation and HENSOTHERM® 7 KS Gewebe 100 (EI 60)

Services	Diameter [mm]	Wall thickn. [mm]	Insulation	Insulation thickness [mm]	Insulation length [mm]	Layers of HENSOTHERM® 7 KS Gewebe 100 (1 mm)	Classification
Uponor MLC	14	2.0	NH/ArmaFlex	9.0 – 19.0	CS / LS 500	1	EI 60 U/C
	40	4.0		9.0 – 19.0		1	
	63	6.0		13.0 – 19.0		2	

B.10.3. Viega Raxofix with NH/ArmaFlex insulation and HENSOTHERM® 7 KS Gewebe 100 (EI 60)

Services	Diameter [mm]	Wall thickn. [mm]	Insulation	Insulation thickness [mm]	Insulation length [mm]	Layers of HENSOTHERM® 7 KS Gewebe 100 (1 mm)	Classification
Viega Raxofix	16	2.2	NH/ArmaFlex	9.0 – 19.0	CS / LS 500	1	EI 60 U/C
	40	3.5		9.0 – 19.0		1	
	63	4.5		13.0 – 19.0		2	

B.10.4. Rehau RAUTITAN with NH/ArmaFlex insulation and HENSOTHERM® 7 KS Gewebe 100 (EI 60)

Services	Diameter [mm]	Wall thickn. [mm]	Insulation	Insulation thickness [mm]	Insulation length [mm]	Layers of HENSOTHERM® 7 KS Gewebe 100 (1 mm)	Classification
Rehau RAUTITAN stabil	16	2.6	NH/ArmaFlex	9.0 – 19.0	CS / LS 500	1	EI 60 U/C
	40	6.0		9.0 – 19.0		1	

TECHNICAL INFORMATION

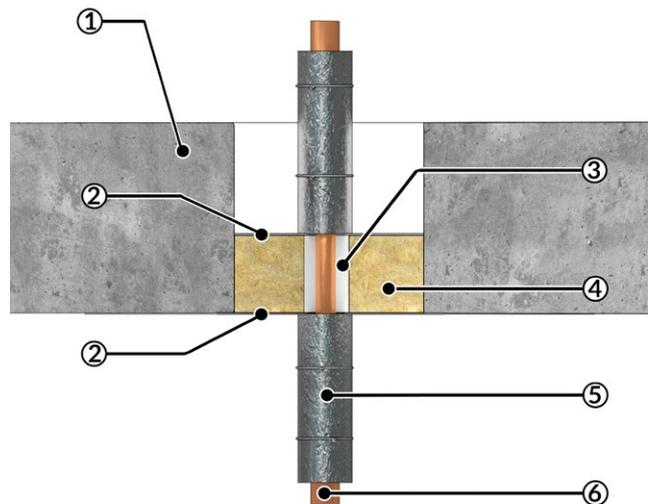
Rigid floor constructions with floor thickness ≥ 150 mm

B.11. Metal pipes with non-combustible insulation (LI)

Construction details: Non-combustible metal pipes with min. 1000 mm long local interrupted (LI) Rockwool RS800 stone wool insulation 80 kg/m^3 or higher in a HENSOMASTIK® Mixed Penetration Seal EI60 comprising one ≥ 60 mm thick Rockwool Hardrock 040 mineral fibre board $\geq 150 \text{ kg/m}^3$ fixed in the floor by friction.

The mineral fibre boards are cut to size and friction fitted into the supporting element. Board joints and edges are buttered and sealed and the external faces of the boards coated with HENSOMASTIK® 5 KS Farbe or HENSOMASTIK® 5 KS viskos in dry film thickness (DFT) ≥ 1 mm. All gaps and joints between boards and reveal are closed with HENSOMASTIK® 5 KS Farbe or HENSOMASTIK® 5 KS viskos and a min. 20 mm wide circumferential coating (DFT ≥ 1 mm) is applied from both sides of the floor.

The max. 10 mm wide annular gap between boards and pipes is filled with HENSOMASTIK® 5 KS SP (Spachtel) from both sides in full depth. On both sides of the seal, the min. 1000 mm long insulation is installed, positioned at joint with the seal, and secured in place with metal straps or wires ≥ 0.6 mm. The length and thickness (see table) of the insulation may be increased but not reduced, classification is also applicable to continuous interrupted insulation (CI). The minimum insulation thickness tested in configuration LI may be applied for configuration CI with no limitation for the maximum insulation thickness. All penetration angles between 90° and 45° are covered in all directions. The stated min. insulation length shall be the shortest length (L) in an oblique situation on both sides of the seal in practice (see pictogram).



1 = Rigid floor, 2 = Outer sides coated (DFT ≥ 1 mm) with HENSOMASTIK® 5 KS Farbe/viskos, circumferential coating ≥ 20 mm width, 3 = Annular gap filled with HENSOMASTIK® 5 KS SP (Spachtel), 4 = Mineral fiber board $1 \times \geq 60$ mm, density $\geq 150 \text{ kg/m}^3$, Rockwool Hardrock 040, 5 = Stone wool insulation 80 kg/m^3 or higher, 6 = Non-combustible metal pipe

B.11.1. Metal pipes with Rockwool RS800 insulation, LI 1000 mm (EI 60)

Services	Diameter [mm]	Wall thickness [mm]	Insulation	Insulation thickness min. [mm]	Insulation length min. [mm]	Classification
Copper	≤ 22	1.0 – 11.0	RS800	20	LI 1000	EI 60 U/C
	$> 22 \leq 42$	1.5 – 14.2		20		
	$> 42 \leq 88.9$	2.0 – 14.2		30		
Steel or cast iron	≤ 22	1.0 – 11.0	RS800	20	LI 1000	EI 60 U/C
	$> 22 \leq 48.3$	2.6 – 14.2		20		
	$49 \leq 139.7$	4.0 – 14.2		30		

TECHNICAL INFORMATION

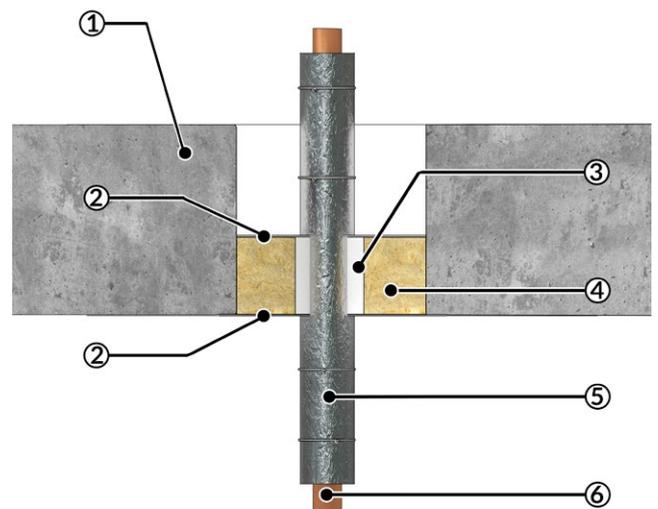
Rigid floor constructions with floor thickness ≥ 150 mm

B.12. Metal pipes with non-combustible insulation (LS)

Construction details: Non-combustible metal pipes with min. 1000 mm long local sustained (LS) or continuous sustained (CS) Rockwool RS800 stone wool insulation 80 kg/m³ or higher in a HENSOMASTIK® Mixed Penetration Seal EI60 comprising one ≥ 60 mm thick Rockwool Hardrock 040 mineral fibre board ≥ 150 kg/m³ fixed in the floor by friction.

The mineral fibre boards are cut to size and friction fitted into the supporting element. Board joints and edges are buttered and sealed and the external faces of the boards coated with HENSOMASTIK® 5 KS Farbe or HENSOMASTIK® 5 KS viskos in dry film thickness (DFT) ≥ 1 mm. All gaps and joints between boards and reveal are closed with HENSOMASTIK® 5 KS Farbe or HENSOMASTIK® 5 KS viskos and a min. 20 mm wide circumferential coating (DFT ≥ 1 mm) is applied from both sides of the floor.

The max. 10 mm wide annular gap between boards and insulation is filled with HENSOMASTIK® 5 KS SP (Spachtel) from both sides in full depth. The local insulation is positioned at centre of the seal, protruding min. 470 mm on both sides, and secured in place with metal straps or wires ≥ 0.6 mm. The length (see table) of the insulation may be increased but not reduced, classification is also applicable to continuous sustained insulation (CS). The minimum insulation thickness tested in configuration LS may be applied for configuration CS with no limitation for the maximum insulation thickness. All penetration angles between 90° and 45° are covered in all directions. The stated min. insulation length shall be the shortest length (L) in an oblique situation on both sides of the seal in practice (see pictogram).



1 = Rigid floor, 2 = Outer sides coated (DFT ≥ 1 mm) with HENSOMASTIK® 5 KS Farbe/viskos, circumferential coating ≥ 20 mm width, 3 = Annular gap filled with HENSOMASTIK® 5 KS SP (Spachtel), 4 = Mineral fiber board $1 \times \geq 60$ mm, density ≥ 150 kg/m³, Rockwool Hardrock 040, 5 = Stone wool insulation 80 kg/m³ or higher, 6 = Non-combustible metal pipe

B.12.1.1. Metal pipes with Rockwool RS800 insulation, LS 1000 mm (EI 90)

Services	Diameter [mm]	Wall thickness [mm]	Insulation	Insulation thickness min. [mm]	Insulation length min. [mm]	Classification
Copper	54	1.5 – 14.2	RS800	20	CS / LS 1000	EI 90 C/U
Steel or cast iron	54	1.5 – 14.2	RS800	20	CS / LS 1000	EI 90 C/U

B.12.1.2. Metal pipes with Rockwool RS800 insulation, LS 1000 mm (EI 60)

Services	Diameter [mm]	Wall thickness [mm]	Insulation	Insulation thickness min. [mm]	Insulation length min. [mm]	Classification
Copper	< 54	1.5 – 14.2	RS800	20	CS / LS 1000	EI 60 C/U
	54	1.5 – 14.2		20		
Steel or cast iron	≤ 15	1.0 – 7.5	RS800	20	CS / LS 1000	EI 60 C/U
	> 15 < 54	1.5 – 14.2		20		
	54	1.5 – 14.2		20		
	> 54 ≤ 139.7	4.0 – 14.2		30		

TECHNICAL INFORMATION

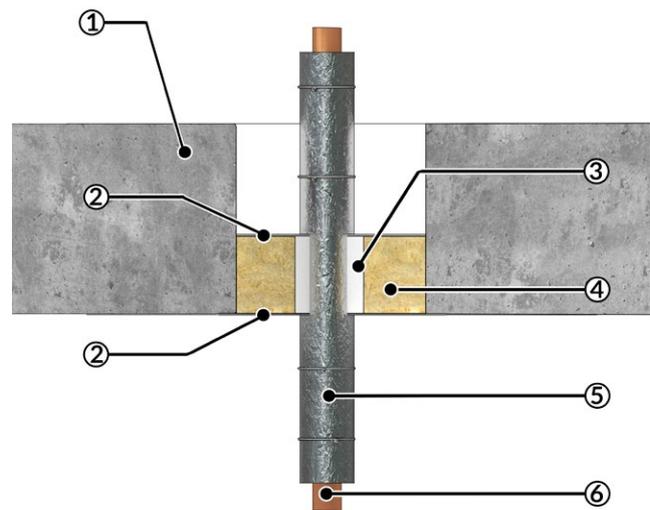
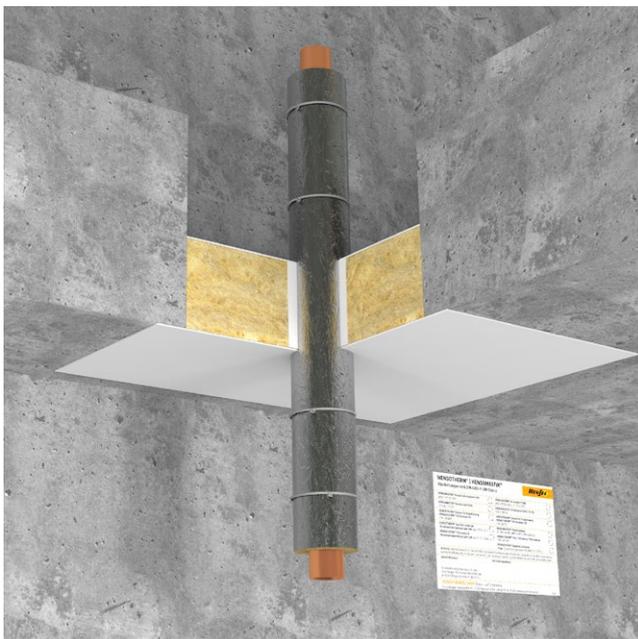
Rigid floor constructions with floor thickness ≥ 150 mm

B.13. Metal pipes with non-combustible insulation (CS)

Construction details: Non-combustible metal pipes with continuous sustained (CS) Rockwool Klimarock stone wool insulation 40 kg/m^3 or higher in a HENSOMASTIK® Mixed Penetration Seal EI60 comprising one ≥ 60 mm thick Rockwool Hardrock 040 mineral fibre board $\geq 150 \text{ kg/m}^3$ fixed in the floor by friction.

The mineral fibre boards are cut to size and friction fitted into the supporting element. Board joints and edges are buttered and sealed and the external faces of the boards coated with HENSOMASTIK® 5 KS Farbe or HENSOMASTIK® 5 KS viskos in dry film thickness (DFT) ≥ 1 mm. All gaps and joints between boards and reveal are closed with HENSOMASTIK® 5 KS Farbe or HENSOMASTIK® 5 KS viskos and a min. 20 mm wide circumferential coating (DFT ≥ 1 mm) is applied from both sides of the floor.

The max. 10 mm wide annular gap between boards and insulation is filled with HENSOMASTIK® 5 KS SP (Spachtel) from both sides in full depth. The insulation is secured in place with metal straps or wires ≥ 0.6 mm. The thickness (see table) of the insulation may be increased but not reduced. All penetration angles between 90° and 45° are covered in all directions (see pictogram).



1 = Rigid floor, 2 = Outer sides coated (DFT ≥ 1 mm) with HENSOMASTIK® 5 KS Farbe/viskos, circumferential coating ≥ 20 mm width, 3 = Annular gap filled with HENSOMASTIK® 5 KS SP (Spachtel), 4 = Mineral fiber board $1 \times \geq 60$ mm, density $\geq 150 \text{ kg/m}^3$, Rockwool Hardrock 040, 5 = Stone wool insulation 40 kg/m^3 or higher, 6 = Non-combustible metal pipe

B.13.1. Metal pipes with Klimarock insulation, CS (EI 60)

Services	Diameter [mm]	Wall thickness [mm]	Insulation	Insulation thickness min. [mm]	Insulation length min. [mm]	Classification
Copper	≤ 15	1.0 – 7.5	Klimarock	20	CS	EI 60 U/C
	$> 15 \leq 54$	1.5 – 14.2		20		
Steel or cast iron	≤ 15	1.0 – 7.5	Klimarock	20	CS	EI 60 U/C
	$> 15 \leq 54$	1.5 – 14.2		20		
	$> 54 \leq 89$	3.2 – 14.2		20		

TECHNICAL INFORMATION

Rigid floor constructions with floor thickness ≥ 150 mm

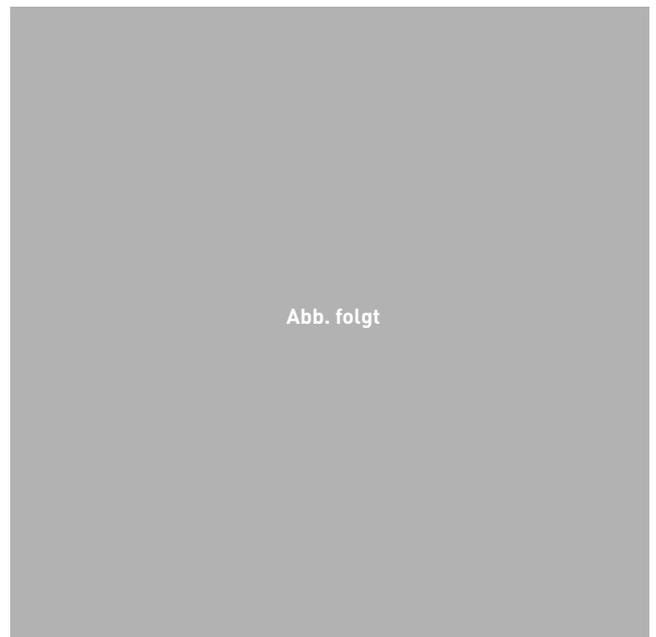
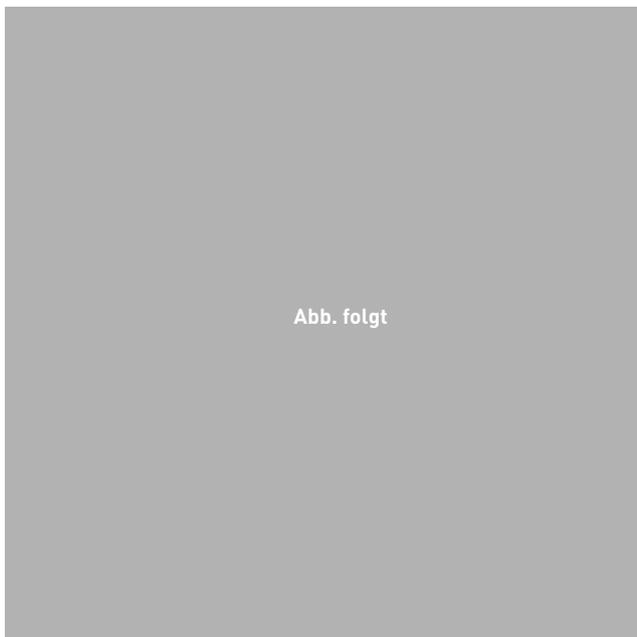
B.14. Metal pipes with FEF-insulation with HENSOTHERM® 7 KS Gewebe 125

Construction details: Non-combustible metal pipes with min. 1000 mm long local sustained (LS) or continuous sustained (CS) flexible elastomeric foam (FEF) or synthetic rubber insulation in a HENSOMASTIK® Mixed Penetration Seal EI60 comprising one ≥ 60 mm thick Rockwool Hardrock 040 mineral fibre board ≥ 150 kg/m³ fixed in the floor by friction.

The mineral fibre boards are cut to size and friction fitted into the supporting element. Board joints and edges are buttered and sealed and the external faces of the boards coated with HENSOMASTIK® 5 KS Farbe or HENSOMASTIK® 5 KS viskos in dry film thickness (DFT) ≥ 1 mm. All gaps and joints between boards and reveal are closed with HENSOMASTIK® 5 KS Farbe or HENSOMASTIK® 5 KS viskos and a min. 20 mm wide circumferential coating (DFT ≥ 1 mm) is applied from both sides of the floor.

The local insulation is positioned at centre of the seal, protruding min. 470 mm on both sides. The length of the insulation may be increased but not reduced, classification is also applicable to continuous sustained insulation (CS). The minimum insulation thickness tested in configuration LS may be applied for configuration CS with no limitation for the maximum insulation thickness. Around the insulation, a wrapping of one length of HENSOTHERM® 7 KS Gewebe 125 endless pipe collar (thickness 1 mm), positioned with one end at centre of the seal and protruding 95 mm on the underside, is applied with number of layers according to table and fixed with adhesive tape and two windings of metal straps or wires ≥ 0.6 mm.

The max. 10 mm wide annular gap between boards, insulation and HENSOTHERM® 7 KS Gewebe 125 is filled with HENSOMASTIK® 5 KS SP (Spachtel) from both sides in full depth.



1 = Rigid floor, 2 = Outer sides coated (DFT ≥ 1 mm) with HENSOMASTIK® 5 KS Farbe/viskos, circumferential coating ≥ 20 mm width, 3 = Annular gap filled with HENSOMASTIK® 5 KS SP (Spachtel), 4 = Mineral fiber board $1 \times \geq 60$ mm, density ≥ 150 kg/m³, Rockwool Hardrock 040, 5 = HENSOTHERM® 7 KS Gewebe 125, positioned with one end at centre of the seal and protruding 95 mm on the underside, fixed with adhesive tape and two windings of metal straps or wires ≥ 0.6 mm, 6 = FEF-insulation, 7 = Non-combustible metal pipe

TECHNICAL INFORMATION

Rigid floor constructions with floor thickness ≥ 150 mm

B.14.1.1. Metal pipes with AF/ArmaFlex insulation and HENSOTHERM® 7 KS Gewebe 125 (EI 60)

Services	Diameter [mm]	Wall thickness [mm]	Insulation	Insulation thickness [mm]	Insulation length [mm]	Layers of HENSOTHERM® 7 KS Gewebe 125 (1 mm)	Classification
Copper	≤ 10	1.0 – 5.0	AF/ArmaFlex*	11.0	CS / LS 1000	1	EI 60 C/U
	$> 10 \leq 22$	1.0 – 11.0		18.0		1	
	$> 22 \leq 54$	1.5 – 14.2		21.0		1	
Steel or cast iron	≤ 10	1.0 – 5.0	AF/ArmaFlex*	11.0	CS / LS 1000	1	EI 60 C/U
	$> 10 \leq 22$	1.0 – 11.0		18.0		1	
	$> 23 \leq 54$	1.5 – 14.2		21.0		1	
	$> 54 \leq 60.3$	2.9 – 14.2		29.0		1	

*Classification also applies for AF/ArmaFlex Evo, AF/ArmaFlex N and AF/ArmaFlex Class 0 insulation.

B.14.1.2. Metal pipes with AF/ArmaFlex insulation and HENSOTHERM® 7 KS Gewebe 125 (EI 30)

Services	Diameter [mm]	Wall thickness [mm]	Insulation	Insulation thickness [mm]	Insulation length [mm]	Layers of HENSOTHERM® 7 KS Gewebe 125 (1 mm)	Classification
Copper	≤ 10	1.0 – 5.0	AF/ArmaFlex*	11.0	CS / LS 1000	1	EI 30 C/U
	$> 10 \leq 22$	1.0 – 11.0		18.0		1	
	$> 22 \leq 54$	1.5 – 14.2		21.0		1	
Steel or cast iron	≤ 10	1.0 – 5.0	AF/ArmaFlex*	11.0	CS / LS 1000	1	EI 30 C/U
	$> 10 \leq 22$	1.0 – 11.0		18.0		1	
	$> 23 \leq 54$	1.5 – 14.2		21.0		1	
	$> 54 \leq 60.3$	2.9 – 14.2		29.0		1	
	$> 60.3 \leq 88.9$	3.2 – 14.2		30.5		1	

*Classification also applies for AF/ArmaFlex Evo, AF/ArmaFlex N and AF/ArmaFlex Class 0 insulation.

B.14.2. Metal pipes with ArmaFlex LS insulation and HENSOTHERM® 7 KS Gewebe 125 (EI 60)

Services	Diameter [mm]	Wall thickness [mm]	Insulation	Insulation thickness [mm]	Insulation length [mm]	Layers of HENSOTHERM® 7 KS Gewebe 125 (1 mm)	Classification
Copper	≤ 15	1.0 – 7.5	ArmaFlex LS	13.0	CS / LS 1000	1	EI 60 U/C
	$> 15 \leq 54$	1.5 – 14.2		25.0		1	
Steel or cast iron	≤ 15	1.0 – 7.5	ArmaFlex LS	13.0	CS / LS 1000	1	EI 60 U/C
	$> 15 \leq 54$	1.5 – 14.2		25.0		1	
	$> 54 \leq 89$	3.2 – 14.2		25.0		1	

B.14.3. Metal pipes with ArmaFlex Ultima insulation and HENSOTHERM® 7 KS Gewebe 125 (EI 60)

Services	Diameter [mm]	Wall thickness [mm]	Insulation	Insulation thickness [mm]	Insulation length [mm]	Layers of HENSOTHERM® 7 KS Gewebe 125 (1 mm)	Classification
Copper	≤ 15	1.0 – 7.5	ArmaFlex Ultima	13.0	CS / LS 1000	1	EI 60 U/C
	$> 15 \leq 54$	1.5 – 14.2		25.0		1	
Steel or cast iron	≤ 15	1.0 – 7.5	ArmaFlex Ultima	13.0	CS / LS 1000	1	EI 60 U/C
	$> 15 \leq 54$	1.5 – 14.2		25.0		1	
	$> 54 \leq 89$	3.2 – 14.2		25.0		1	

TECHNICAL INFORMATION

Rigid floor constructions with floor thickness ≥ 150 mm

B.14.4. Metal pipes with Kaiflex ST insulation and HENSOTHERM® 7 KS Gewebe 125 (EI 60)

Services	Diameter [mm]	Wall thickness [mm]	Insulation	Insulation thickness [mm]	Insulation length [mm]	Layers of HENSOTHERM® 7 KS Gewebe 125 (1 mm)	Classification
Copper	≤ 10	1.0 – 5.0	Kaiflex ST	9.0	CS / LS 1000	1	EI 60 C/U
	$> 10 \leq 22$	1.0 – 11.0		9.0		1	
	$> 22 \leq 54$	1.5 – 14.2		19.0		1	
Steel or cast iron	≤ 10	1.0 – 5.0	Kaiflex ST	9.0	CS / LS 1000	1	EI 60 C/U
	$> 10 \leq 22$	1.0 – 11.0		9.0		1	
	$> 22 \leq 54$	1.5 – 14.2		19.0		1	
	$> 54 \leq 60.3$	2.9 – 14.2		25.0		1	
	$> 60.3 \leq 88.9$	3.2 – 14.2		30.5		1	

B.14.5. Metal pipes with Kaiflex KKplus insulation and HENSOTHERM® 7 KS Gewebe 125 (EI 60)

Services	Diameter [mm]	Wall thickness [mm]	Insulation	Insulation thickness [mm]	Insulation length [mm]	Layers of HENSOTHERM® 7 KS Gewebe 125 (1 mm)	Classification
Copper	≤ 15	1.0 – 7.5	Kaiflex KKplus	11.0	CS / LS 1000	1	EI 60 U/C
	$> 15 \leq 54$	1.5 – 14.2		21.0		1	
Steel or cast iron	≤ 15	1.0 – 7.5	Kaiflex KKplus	11.0	CS / LS 1000	1	EI 60 U/C
	$> 15 \leq 54$	1.5 – 14.2		21.0		1	
	$> 54 \leq 89$	3.2 – 14.2		28.5		1	

TECHNICAL INFORMATION

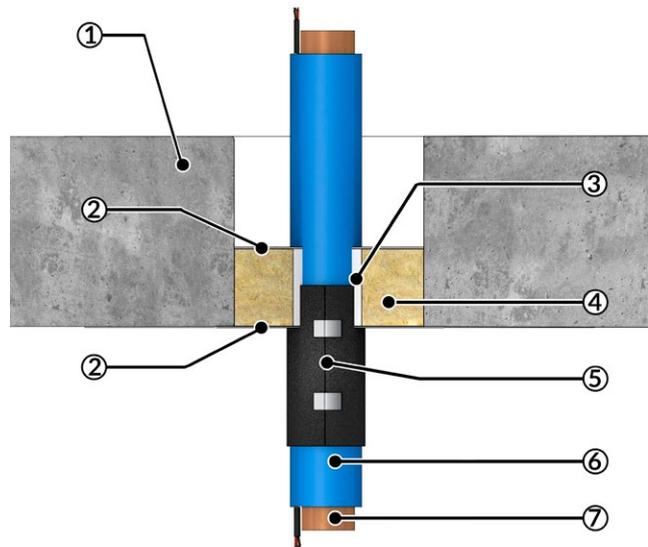
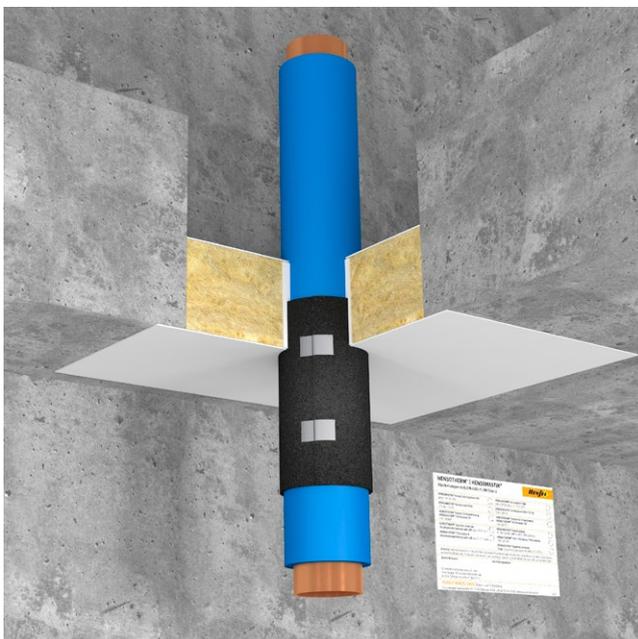
Rigid floor constructions with floor thickness ≥ 150 mm

B.15. Metal pipes with pipe heating and FEF-insulation with HENSOTHERM® 7 KS Gewebe 125

Construction details: Non-combustible metal pipes with an electric heating cable type Danfoss ECpipeheat and minimum 1000 mm long local sustained (LS) or continuous sustained (CS) flexible elastomeric foam (FEF) or synthetic rubber insulation in a HENSOMASTIK® Mixed Penetration Seal EI60 comprising one ≥ 60 mm thick Rockwool Hardrock 040 mineral fibre board ≥ 150 kg/m³ fixed in the floor by friction.

The mineral fibre boards are cut to size and friction fitted into the supporting element. Board joints and edges are buttered and sealed and the external faces of the boards coated with HENSOMASTIK® 5 KS Farbe or HENSOMASTIK® 5 KS viskos in dry film thickness (DFT) ≥ 1 mm. All gaps and joints between boards and reveal are closed with HENSOMASTIK® 5 KS Farbe or HENSOMASTIK® 5 KS viskos and a min. 20 mm wide circumferential coating (DFT ≥ 1 mm) is applied from both sides of the floor.

The local insulation is positioned around pipe and electric heating cable, at centre of the seal, protruding min. 470 mm on both sides. The length of the insulation may be increased but not reduced, classification is also applicable to continuous sustained insulation (CS). The minimum insulation thickness tested in configuration LS may be applied for configuration CS with no limitation for the maximum insulation thickness. Around the insulation, a wrapping of one length of HENSOTHERM® 7 KS Gewebe 125 endless pipe collar (thickness 1 mm), positioned with one end at centre of the seal and protruding 95 mm on the underside, is applied with number of layers according to table and fixed with adhesive tape and two windings of metal straps or wires ≥ 0.6 mm. The max. 10 mm wide annular gap between boards and HENSOTHERM® 7 KS Gewebe 125 is filled with HENSOMASTIK® 5 KS SP (Spachtel) from both sides in full depth.



1 = Rigid floor, 2 = Outer sides coated (DFT ≥ 1 mm) with HENSOMASTIK® 5 KS Farbe/viskos, circumferential coating ≥ 20 mm width, 3 = Annular gap filled with HENSOMASTIK® 5 KS SP (Spachtel), 4 = Mineral fiber board 1 x ≥ 60 mm, density ≥ 150 kg/m³, Rockwool Hardrock 040, 5 = HENSOTHERM® 7 KS Gewebe 125, positioned with one end at centre of the seal and protruding 95 mm on the underside, fixed with adhesive tape and two windings of metal straps or wires ≥ 0.6 mm, 6 = FEF-insulation, 7 = Non-combustible metal pipe with pipe heating

B.15.1. Metal pipes with pipe heating and NH/ArmaFlex insulation with HENSOTHERM® 7 KS Gewebe 125 (EI 60)

Services	Diameter [mm]	Wall thickness [mm]	Insulation	Insulation thickness [mm]	Insulation length [mm]	Layers of HENSOTHERM® 7 KS Gewebe 125 (1 mm)	Classification
Copper	≤ 15	1.0 – 7.5	NH/ArmaFlex	19.0	CS / LS 1000	1	EI 90 C/U
Steel or cast iron	≤ 15	1.0 – 7.5	NH/ArmaFlex	19.0	CS / LS 1000	1	EI 90 C/U

TECHNICAL INFORMATION

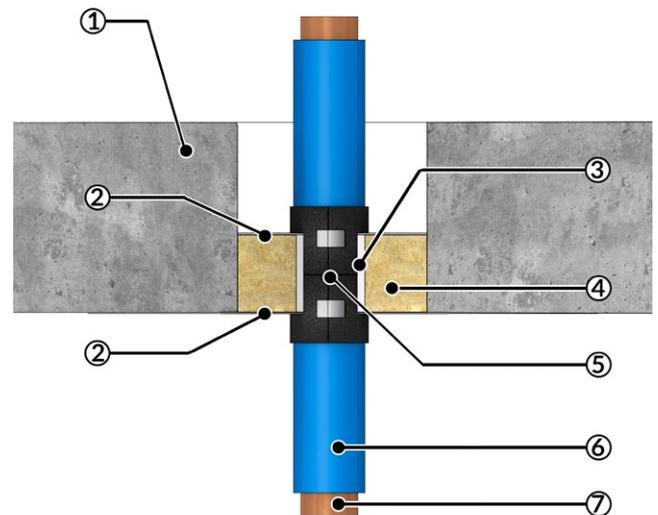
Rigid floor constructions with floor thickness ≥ 150 mm

B.16. Metal pipes with FEF-insulation (LS) with HENSOTHERM® 7 KS Gewebe 50

Construction details: Non-combustible metal pipes with min. 1000 mm long local sustained (LS) or continuous sustained (CS) flexible elastomeric foam (FEF) or synthetic rubber insulation in a HENSOMASTIK® Mixed Penetration Seal EI60 comprising one ≥ 60 mm thick Rockwool Hardrock 040 mineral fibre board ≥ 150 kg/m³ fixed in the floor by friction.

The mineral fibre boards are cut to size and friction fitted into the supporting element. Board joints and edges are buttered and sealed and the external faces of the boards coated with HENSOMASTIK® 5 KS Farbe or HENSOMASTIK® 5 KS viskos in dry film thickness (DFT) ≥ 1 mm. All gaps and joints between boards and reveal are closed with HENSOMASTIK® 5 KS Farbe or HENSOMASTIK® 5 KS viskos and a min. 20 mm wide circumferential coating (DFT ≥ 1 mm) is applied from both sides of the floor.

The local insulation is positioned at centre of the seal, protruding min. 470 mm on both sides. The length of the insulation may be increased but not reduced, classification is also applicable to continuous sustained insulation (CS). The minimum insulation thickness tested in configuration LS may be applied for configuration CS with no limitation for the maximum insulation thickness. Around the insulation, a wrapping of two lengths of HENSOTHERM® 7 KS Gewebe 50 endless pipe collar (thickness 2 mm), positioned at joint at centre of the seal and protruding 20 mm on both sides, is applied. Each length with number of layers according to table and fixed with adhesive tape. The max. 10 mm wide annular gap between boards and HENSOTHERM® 7 KS Gewebe 50 is filled with HENSOMASTIK® 5 KS SP (Spachtel) from both sides in full depth.



1 = Rigid floor, 2 = Outer sides coated (DFT ≥ 1 mm) with HENSOMASTIK® 5 KS Farbe/viskos, circumferential coating ≥ 20 mm width, 3 = Annular gap filled with HENSOMASTIK® 5 KS SP (Spachtel), 4 = Mineral fiber board $1 \times \geq 60$ mm, density ≥ 150 kg/m³, Rockwool Hardrock 040, 5 = Two lengths of HENSOTHERM® 7 KS Gewebe 50 positioned at joint at centre of the seal, protruding 20 mm on both sides, and fixed with adhesive tape or metal straps or wires ≥ 0.6 mm, 6 = FEF-insulation, 7 = Non-combustible metal pipe

B.16.1.1. Metal pipes with ArmaFlex Protect insulation and HENSOTHERM® 7 KS Gewebe 50 (EI 90)

Services	Diameter [mm]	Wall thickness [mm]	Insulation	Insulation thickness [mm]	Insulation length [mm]	Layers of HENSOTHERM® 7 KS Gewebe 50 (2 mm)	Classification
Copper	≤ 15	1.0 – 7.5	ArmaFlex Protect	19.0 – 25.0	CS / LS 1000	1	EI 90 C/U
	$> 15 \leq 42$	1.2 – 14.2		25.0		1	
	$> 42 \leq 54$	1.5 – 14.2		25.0		1	
Steel or cast iron	≤ 15	1.0 – 7.5	ArmaFlex Protect	19.0 – 25.0	CS / LS 1000	1	EI 90 C/U
	$> 15 \leq 42$	1.2 – 14.2		25.0		1	
	$> 42 \leq 54$	1.5 – 14.2		25.0		1	

TECHNICAL INFORMATION

Rigid floor constructions with floor thickness ≥ 150 mm

B.16.1.2. Metal pipes with ArmaFlex Protect insulation and HENSOTHERM® 7 KS Gewebe 50 (EI 60)

Services	Diameter [mm]	Wall thickness [mm]	Insulation	Insulation thickness [mm]	Insulation length [mm]	Layers of HENSOTHERM® 7 KS Gewebe 50 (2 mm)	Classification
Copper	≤ 15	1.0 - 7.5	ArmaFlex Protect	19.0 - 25.0	CS / LS 1000	1	EI 60 C/U
	$> 15 \leq 42$	1.2 - 14.2		25.0		1	
	$> 42 \leq 54$	1.5 - 14.2		25.0		1	
	$> 54 \leq 89$	2.0 - 14.2		25.0		1	
Steel or cast iron	≤ 15	1.0 - 7.5	ArmaFlex Protect	19.0 - 25.0	CS / LS 1000	1	EI 60 C/U
	$> 15 \leq 42$	1.2 - 14.2		25.0		1	
	$> 42 \leq 54$	1.5 - 14.2		25.0		1	
	$> 54 \leq 89$	2.0 - 14.2		25.0		1	

TECHNICAL INFORMATION

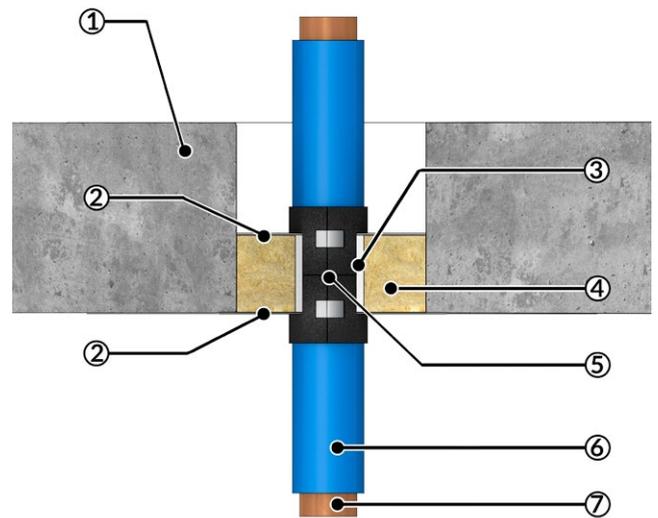
Rigid floor constructions with floor thickness ≥ 150 mm

B.17. Metal pipes with FEF-insulation (CS) with HENSOTHERM® 7 KS Gewebe 50

Construction details: Non-combustible metal pipes with continuous sustained (CS) flexible elastomeric foam (FEF) or synthetic rubber insulation in a HENSOMASTIK® Mixed Penetration Seal EI60 comprising one ≥ 60 mm thick Rockwool Hardrock 040 mineral fibre board ≥ 150 kg/m³ fixed in the floor by friction.

The mineral fibre boards are cut to size and friction fitted into the supporting element. Board joints and edges are buttered and sealed and the external faces of the boards coated with HENSOMASTIK® 5 KS Farbe or HENSOMASTIK® 5 KS viskos in dry film thickness (DFT) ≥ 1 mm. All gaps and joints between boards and reveal are closed with HENSOMASTIK® 5 KS Farbe or HENSOMASTIK® 5 KS viskos and a min. 20 mm wide circumferential coating (DFT ≥ 1 mm) is applied from both sides of the floor.

Around the insulation, a wrapping of two lengths of HENSOTHERM® 7 KS Gewebe 50 endless pipe collar (thickness 2 mm), positioned at joint at centre of the seal and protruding 20 mm on both sides, is applied. Each length with number of layers according to table and fixed with adhesive tape. The max. 10 mm wide annular gap between boards and HENSOTHERM® 7 KS Gewebe 50 is filled with HENSOMASTIK® 5 KS SP (Spachtel) from both sides in full depth.



1 = Rigid floor, 2 = Outer sides coated (DFT ≥ 1 mm) with HENSOMASTIK® 5 KS Farbe/viskos, circumferential coating ≥ 20 mm width, 3 = Annular gap filled with HENSOMASTIK® 5 KS SP (Spachtel), 4 = Mineral fiber board 1 x ≥ 60 mm, density ≥ 150 kg/m³, Rockwool Hardrock 040, 5 = Two lengths of HENSOTHERM® 7 KS Gewebe 50 positioned at joint at centre of the seal, protruding 20 mm on both sides, and fixed with adhesive tape or metal straps or wires ≥ 0.6 mm, 6 = FEF-insulation, 7 = Non-combustible metal pipe

B.17.1.1. Metal pipes with ArmaFlex Ultima insulation and HENSOTHERM® 7 KS Gewebe 50 (EI 90)

Services	Diameter [mm]	Wall thickness [mm]	Insulation	Insulation thickness [mm]	Insulation length [mm]	Layers of HENSOTHERM® 7 KS Gewebe 50 (2 mm)	Classification
Copper	≤ 15	1.0 – 7.5	ArmaFlex Ultima	9.0	CS	1	EI 90 C/U
	$> 15 \leq 42$	1.2 – 14.2		25.0		2	
Steel or cast iron	≤ 15	1.0 – 7.5	ArmaFlex Ultima	9.0	CS	1	EI 90 C/U
	$> 15 \leq 42$	1.2 – 14.2		25.0		2	

TECHNICAL INFORMATION

Rigid floor constructions with floor thickness ≥ 150 mm

B.17.1.2. Metal pipes with ArmaFlex Ultima insulation and HENSOTHERM® 7 KS Gewebe 50 (EI 60)

Services	Diameter [mm]	Wall thickness [mm]	Insulation	Insulation thickness [mm]	Insulation length [mm]	Layers of HENSOTHERM® 7 KS Gewebe 50 (2 mm)	Classification
Copper	≤ 15	1.0 – 7.5	ArmaFlex Ultima	9.0	CS	1	EI 60 C/U
	$> 15 \leq 42$	1.2 – 14.2		13.0 – 25.0		2	
	$> 15 \leq 42$	1.2 – 14.2		25.0		2	
	$> 42 \leq 89$	2.0 – 14.2		25.0		2	
Steel or cast iron	≤ 15	1.0 – 7.5	ArmaFlex Ultima	9.0	CS	1	EI 60 C/U
	$> 15 \leq 42$	1.2 – 14.2		13.0 – 25.0		2	
	$> 15 \leq 42$	1.2 – 14.2		25.0		2	
	$> 42 \leq 89$	2.0 – 14.2		25.0		2	

B.17.1.3. Metal pipes with ArmaFlex Ultima insulation and HENSOTHERM® 7 KS Gewebe 50 (EI 30)

Services	Diameter [mm]	Wall thickness [mm]	Insulation	Insulation thickness [mm]	Insulation length [mm]	Layers of HENSOTHERM® 7 KS Gewebe 50 (2 mm)	Classification
Copper	≤ 15	1.0 – 7.5	ArmaFlex Ultima	9.0	CS	1	EI 30 C/U
	$> 15 \leq 42$	1.2 – 14.2		13.0 – 25.0		2	
	$> 15 \leq 42$	1.2 – 14.2		25.0		2	
	$> 42 \leq 89$	2.0 – 14.2		19.0 – 25.0		2	
	$> 42 \leq 89$	2.0 – 14.2		25.0		2	
Steel or cast iron	≤ 15	1.0 – 7.5	ArmaFlex Ultima	9.0	CS	1	EI 30 C/U
	$> 15 \leq 42$	1.2 – 14.2		13.0 – 25.0		2	
	$> 15 \leq 42$	1.2 – 14.2		25.0		2	
	$> 42 \leq 89$	2.0 – 14.2		19.0 – 25.0		2	
	$> 42 \leq 89$	2.0 – 14.2		25.0		2	

B.17.2.1. Metal pipes with Eurobatex HF insulation and HENSOTHERM® 7 KS Gewebe 50 (EI 90)

Services	Diameter [mm]	Wall thickness [mm]	Insulation	Insulation thickness [mm]	Insulation length [mm]	Layers of HENSOTHERM® 7 KS Gewebe 50 (2 mm)	Classification
Copper	≤ 15	1.0 – 7.5	Eurobatex HF	9.0	CS	1	EI 90 C/U
Steel or cast iron	≤ 15	1.0 – 7.5	Eurobatex HF	9.0	CS	1	EI 90 C/U

B.17.2.2. Metal pipes with Eurobatex HF insulation and HENSOTHERM® 7 KS Gewebe 50 (EI 60)

Services	Diameter [mm]	Wall thickness [mm]	Insulation	Insulation thickness [mm]	Insulation length [mm]	Layers of HENSOTHERM® 7 KS Gewebe 50 (2 mm)	Classification
Copper	≤ 15	1.0 – 7.5	Eurobatex HF	9.0	CS	1	EI 60 C/U
	$> 15 \leq 42$	1.2 – 14.2		13.0 – 25.0		2	
	$> 42 \leq 54$	1.5 – 14.2		25.0		2	
Steel or cast iron	≤ 15	1.0 – 7.5	Eurobatex HF	9.0	CS	1	EI 60 C/U
	$> 15 \leq 42$	1.2 – 14.2		13.0 – 25.0		2	
	$> 42 \leq 54$	1.5 – 14.2		25.0		2	
	114.3	4.5 – 14.2		32.0		2	

TECHNICAL INFORMATION

Rigid floor constructions with floor thickness ≥ 150 mm

B.17.2.3. Metal pipes with Eurobatex HF insulation and HENSOTHERM® 7 KS Gewebe 50 (EI 30)

Services	Diameter [mm]	Wall thickness [mm]	Insulation	Insulation thickness [mm]	Insulation length [mm]	Layers of HENSOTHERM® 7 KS Gewebe 50 (2 mm)	Classification
Copper	≤ 15	1.0 – 7.5	Eurobatex HF	9.0	CS	1	EI 30 C/U
	$> 15 \leq 42$	1.2 – 14.2		13.0 – 25.0		2	
	$> 42 \leq 54$	1.5 – 14.2		13.0 – 25.0		2	
	$> 42 \leq 54$	1.5 – 14.2		25.0		2	
	$> 54 \leq 89$	2.0 – 14.2		19.0 – 25.0		2	
Steel or cast iron	≤ 15	1.0 – 7.5	Eurobatex HF	9.0	CS	1	EI 30 C/U
	$> 15 \leq 42$	1.2 – 14.2		13.0 – 25.0		2	
	$> 42 \leq 54$	1.5 – 14.2		13.0 – 25.0		2	
	$> 42 \leq 54$	1.5 – 14.2		25.0		2	
	$> 54 \leq 89$	2.0 – 14.2		19.0 – 25.0		2	
	$> 89 \leq 114.3$	4.5 – 14.2		19.0 – 32.0		2	
	114.3	4.5 – 14.2		32.0		2	

B.17.3.1. Metal pipes with NH/ArmaFlex insulation and HENSOTHERM® 7 KS Gewebe 50 (EI 90)

Services	Diameter [mm]	Wall thickness [mm]	Insulation	Insulation thickness [mm]	Insulation length [mm]	Layers of HENSOTHERM® 7 KS Gewebe 50 (2 mm)	Classification
Copper	≤ 15	1.0 – 7.5	NH/ArmaFlex	9.0	CS	1	EI 90 C/U
	$> 15 \leq 42$	1.2 – 14.2		25.0		2	
Steel or cast iron	≤ 15	1.0 – 7.5	NH/ArmaFlex	9.0	CS	1	EI 90 C/U
	$> 15 \leq 42$	1.2 – 14.2		25.0		2	

B.17.3.2. Metal pipes with NH/ArmaFlex insulation and HENSOTHERM® 7 KS Gewebe 50 (EI 60)

Services	Diameter [mm]	Wall thickness [mm]	Insulation	Insulation thickness [mm]	Insulation length [mm]	Layers of HENSOTHERM® 7 KS Gewebe 50 (2 mm)	Classification
Copper	≤ 15	1.0 – 7.5	NH/ArmaFlex	9.0	CS	1	EI 60 C/U
	$> 15 \leq 42$	1.2 – 14.2		13.0 – 25.0		2	
	$> 15 \leq 42$	1.2 – 14.2		25.0		2	
	$> 42 \leq 54$	1.5 – 14.2		13.0 – 25.0		2	
	$> 54 \leq 89$	2.0 – 14.2		19.0 – 25.0		2	
Steel or cast iron	≤ 15	1.0 – 7.5	NH/ArmaFlex	9.0	CS	1	EI 60 C/U
	$> 15 \leq 42$	1.2 – 14.2		13.0 – 25.0		2	
	$> 15 \leq 42$	1.2 – 14.2		25.0		2	
	$> 42 \leq 54$	1.5 – 14.2		13.0 – 25.0		2	
	$> 54 \leq 89$	2.0 – 14.2		19.0 – 25.0		2	
	$> 89 \leq 114.3$	4.5 – 14.2		19.0		2	

TECHNICAL INFORMATION

Rigid floor constructions with floor thickness ≥ 150 mm

B.17.3.3. Metal pipes with NH/ArmaFlex insulation and HENSOTHERM® 7 KS Gewebe 50 (EI 30)

Services	Diameter [mm]	Wall thickness [mm]	Insulation	Insulation thickness [mm]	Insulation length [mm]	Layers of HENSOTHERM® 7 KS Gewebe 50 (2 mm)	Classification
Copper	≤ 15	1.0 – 7.5	NH/ArmaFlex	9.0	CS	1	EI 30 C/U
	$> 15 \leq 42$	1.2 – 14.2		13.0 – 25.0		2	
	$> 15 \leq 42$	1.2 – 14.2		25.0		2	
	$> 42 \leq 54$	1.5 – 14.2		13.0 – 25.0		2	
	$> 54 \leq 89$	2.0 – 14.2		19.0 – 25.0		2	
Steel or cast iron	≤ 15	1.0 – 7.5	NH/ArmaFlex	9.0	CS	1	EI 30 C/U
	$> 15 \leq 42$	1.2 – 14.2		13.0 – 25.0		2	
	$> 15 \leq 42$	1.2 – 14.2		25.0		2	
	$> 42 \leq 54$	1.5 – 14.2		13.0 – 25.0		2	
	$> 54 \leq 89$	2.0 – 14.2		19.0 – 25.0		2	
	$> 89 \leq 114.3$	4.5 – 14.2		19.0		2	
	$> 89 \leq 114.3$	4.5 – 14.2		19.0 – 25.0		2	

TECHNICAL INFORMATION

Work Safety

Use system **HENSOMASTIK® Mixed Penetration Seal EI 60** products in accordance with all applicable local and national regulations. Wear protective clothing and avoid contact with eyes and skin. See material Safety Data Sheet (SDS) for further information.



Giscode: M-DF01

Retrofits

If the sealing system is designed for retrofits, note the following:
Following a retrofit, the system must be returned to its intended state.
The specifications in the ETA / assembly instructions must be observed.

Use and inspection

The sealing system's fire protection properties are safeguarded over the service life only when the system is maintained in proper working condition.
The developer / principal must be referred thereto by the applicator / commissioned company.

Disposal

The materials must be handled like waste paints and varnishes.
The applicable national laws and regulations must be observed.

Labelling (D/CH)

Following their installation, the sealing systems must be marked with the provided permanent labels affixed to the wall / floor.

The information provided herein reflects the current state of our technical testing and experience with the use of this product. However, the buyer / user is hereby not relieved of their duty, at their own responsibility, to properly examine our materials for their suitability for the intended use based on the respective site conditions. Legal claims for damages arising from the use of this product for purposes other than, or in a manner that differs from, the description contained herein without our prior written approval are precluded and may not be asserted against us. In light of the circumstance that we have no influence over site conditions and various factors that could influence the performance and use of our product, a guarantee of results or liability, regardless of legal grounds, cannot be derived from this information or from verbal consultation provided by one of our employees unless we may be accused of intent or gross negligence. Our General Terms and Conditions apply for all other purposes (www.rudolf-hensel.de/gtc). The most recent version of our technical data sheet is valid and may be requested from the Rudolf Hensel GmbH or downloaded at www.rudolf-hensel.de.

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NOTES

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for fire penetration seals



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