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

MEMBER OF EOTA



European Technical Assessment ETA-20/1310 of 2023/08/21

I General Part

Technical Assessment Body issuing the ETA and designated according to Article 66 of the Regulation (EU) No 305/2011: ETA-Danmark A/S

Trade name of the construction product:

HENSOMASTIK® Mixed Penetration Seal EI60

Product family to which the above construction product belongs:

Fire stopping product – penetration seals.

Manufacturer:

Rudolf Hensel GmbH
Lauenburger Landstraße 11
DE-21039 Börnsen
Telephone: +49 40 72106210
www.rudolf-hensel.de

Manufacturing plant:

Rudolf Hensel GmbH
Lauenburger Landstraße 11
DE-21039 Börnsen

This European Technical Assessment contains:

61 pages including 2 annexes which form an integral part of the document

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

European Assessment Document (EAD) No. 350454-00-1104: Fire Stopping and fire sealing products – Penetration seals

This version replaces:

The ETA with the same number, issued on 2021-01-01

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

Communication of this European Technical Assessment, including transmission by electronic means, shall be in full (excepted the confidential Annex(es) referred to above). However, partial reproduction may be made, with the written consent of the issuing Technical Assessment Body. Any partial reproduction must be identified as such.

II SPECIFIC PART OF THE EUROPEAN TECHNICAL ASSESSMENT

1 Technical description of the product.

HENSOMASTIK® Mixed Penetration Seal EI60 is a coated board system comprising 60 mm Rockwool Hardrock 040 mineral fibre boards coated on both faces with HENSOMASTIK® 5 KS Farbe, used to form a penetration seal around metallic pipes, plastic pipes and electrical cables to reinstate the fire resistance performance of wall and floor constructions, where they have been provided with apertures for the penetration of services.

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 element around the services. There is also the option to use un-coated boards in the aperture and coat them afterwards.

Board joints and edges are then 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 (ETA 19/0730) and HENSOTHERM® 7 KS Gewebe 50/100/125 endless pipe wraps (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.

The applicant submitted a written declaration that HENSOMASTIK® Mixed Penetration Seal EI60 does not contain substances which have to be classified as dangerous according to Directive 67/548/EEC and Regulation (EC) No 1272/2008 and listed in the "Indicative list on dangerous substances" of the EGDS - taking into account the installation conditions of the construction product and the release scenarios resulting from there. An emission report has also been provided. In addition to the specific clauses relating to dangerous substances contained in this European technical Assessment, there may be other requirements applicable to the products falling within its scope (e.g. transposed European legislation and national laws, regulations and administrative provisions). In order to meet the provisions of the Construction Products Regulation, these requirements need also to be complied with, when and where they apply.

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

The construction product HENSOMASTIK® Mixed Penetration Seal EI60 is assessed on the basis of EAD 35054-00-1104, as a fire stopping product, penetration seal.

The intended use of system HENSOMASTIK® Mixed Penetration Seal EI60 is to reinstate the fire resistance performance of flexible wall constructions, rigid wall constructions and rigid floor constructions where they are penetrated by various metal pipe services with insulation, plastic pipes, composite pipes and electrical cables.

The specific elements of construction that the system HENSOMASTIK® Mixed Penetration Seal EI60 may be used to provide a penetration seal in, are as follows:

Flexible walls:

The wall must have a minimum thickness of 100 mm and comprise steel studs or timber studs* lined on both faces with minimum 2 layers of 12.5 mm thick boards.

Rigid walls:

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

Rigid floors:

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

* No part of the penetration seal may be closer than 100 mm to a stud, the cavity must be closed between the penetration seal and the stud, and minimum 100 mm of insulation of class A1 or A2 according to EN 13501-1 must be provided within the cavity between the penetration seal and the stud.

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

The system HENSOMASTIK® Mixed Penetration Seal EI60 may be used to provide a mixed penetration seal with insulated metal pipes, plastic pipes, and electrical cables, single or in a bundle (for details see Annexes A and B).

Apertures in the separating element shall be maximum 1200 x 2000 mm (w x h) or 2000 x 1200 mm (w x h) in walls, and 1125 x 8250 mm (w x l) in floors. Blank seals are permitted. For full details, see Annexes A and B.

Services shall be supported at maximum 250 mm away from both faces of the wall constructions and from the upper face of floor constructions.

Type X: Intended for use in conditions exposed to weathering.

More information in table 3: “Performance of the product and references to the methods used for its assessment”.

The provisions made in this European Technical Assessment are based on an assumed intended working life of the HENSOMASTIK® Mixed Penetration Seal EI60 of 10 years, provided the manufacturers conditions laid down in the manufacturers data sheet for the packaging, transport, storage, installation, use, maintenance and repair are met.

The indications given as to the working life of the construction product cannot be interpreted as a guarantee neither given by the product manufacturer or his representative nor by the Technical Assessment Body issuing an ETA based on the EAD No. 350454-00-1104 but are regarded only as means for expressing the expected economically reasonable working life of the product.

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

Characteristic	Assessment of characteristic									
3.2 Safety in case of fire (BWR2)										
Reaction to fire	The product is classified as Class E in accordance with EN 13501-1 and Commission Delegated Regulation 2016/364									
Resistance to fire	The product is classified according to EN 13501-2, information can be found in annex A & B.									
3.3 Hygiene, health and the environment (BWR3)										
Air permeability (material property)	No performance assessed									
Water Permeability (material property)	No performance assessed									
Content, emission and/or release of dangerous substances*	Release scenario: IA1									
	<table><tr><td>HENSOMASTIK® Mixed Penetration Seal EI60</td><td>After 3 days [µg/m³]</td><td>After 28 days [µg/m³]</td></tr><tr><td>SVOC</td><td>< 5</td><td>< 5</td></tr><tr><td>VOC</td><td>≤ 5</td><td>≤ 5</td></tr></table>	HENSOMASTIK® Mixed Penetration Seal EI60	After 3 days [µg/m³]	After 28 days [µg/m³]	SVOC	< 5	< 5	VOC	≤ 5	≤ 5
HENSOMASTIK® Mixed Penetration Seal EI60	After 3 days [µg/m³]	After 28 days [µg/m³]								
SVOC	< 5	< 5								
VOC	≤ 5	≤ 5								
3.4 Safety in use (BWR4)										
Mechanical resistance and stability	No performance assessed									
Resistance to impact/movement	No performance assessed									
Adhesion	No performance assessed									
Durability	Use condition: X Effects of over-painting with epoxy resin, polyurethane acrylic, alkyd resin, or plastic dispersion is assessed to have no direct influence on the surface hardness of the test specimen.									
3.5 Protection against noise (BWR5)										
Airborne sound insulation	No performance assessed									
3.6 Energy Economy and heat retention (BWR6)										
Thermal properties	No performance assessed									
Water vapour permeability	No performance assessed									

See additional information in section 3.9 – 3.10.

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

3.9 Methods of verification

The characteristic values of the joint sealing system are based on the EAD 350454-00-1104 as a combination of the products described.

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

The verification of durability is part of testing the essential characteristics. HENSOMASTIK® Mixed Penetration Seal EI60 may be used in end-use applications according to the provisions for use category X (intended for in conditions exposed to weathering) without expecting significant changes of the characteristics relevant for fire protection. Products that meet the requirements for type X also meet the requirement for all other types.

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

HENSOMASTIK® Mixed Penetration Seal EI60 is manufactured in accordance with the provisions of this European Technical Assessment using the manufacturing processes as identified in the inspection of the plant by the notified inspection body and laid down in the technical documentation.

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

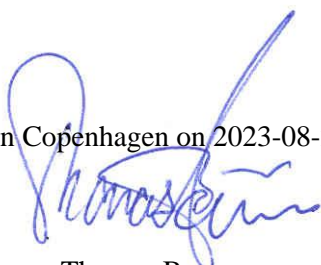
4.1 AVCP system

According to the decision 1999/454/EC of the European Commission, as amended, the system(s) of assessment and verification of constancy of performance is system 1 (see Annex V to Regulation (EU) No 305/2011).

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

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

Issued in Copenhagen on 2023-08-21 by



Thomas Bruun
Managing Director, ETA-Danmark

ANNEX A – Resistance to Fire Classification – HENSOMASTIK® Mixed Penetration Seal EI60

A.1 Flexible and rigid wall constructions with wall thickness of minimum 100 mm

A.1.1 Maximum seal size

Maximum permissible seal size 1200 x 2000 mm (w x h) or 2000 x 1200 mm (w x h).

A.1.2. Minimum spacing and distance of the first support

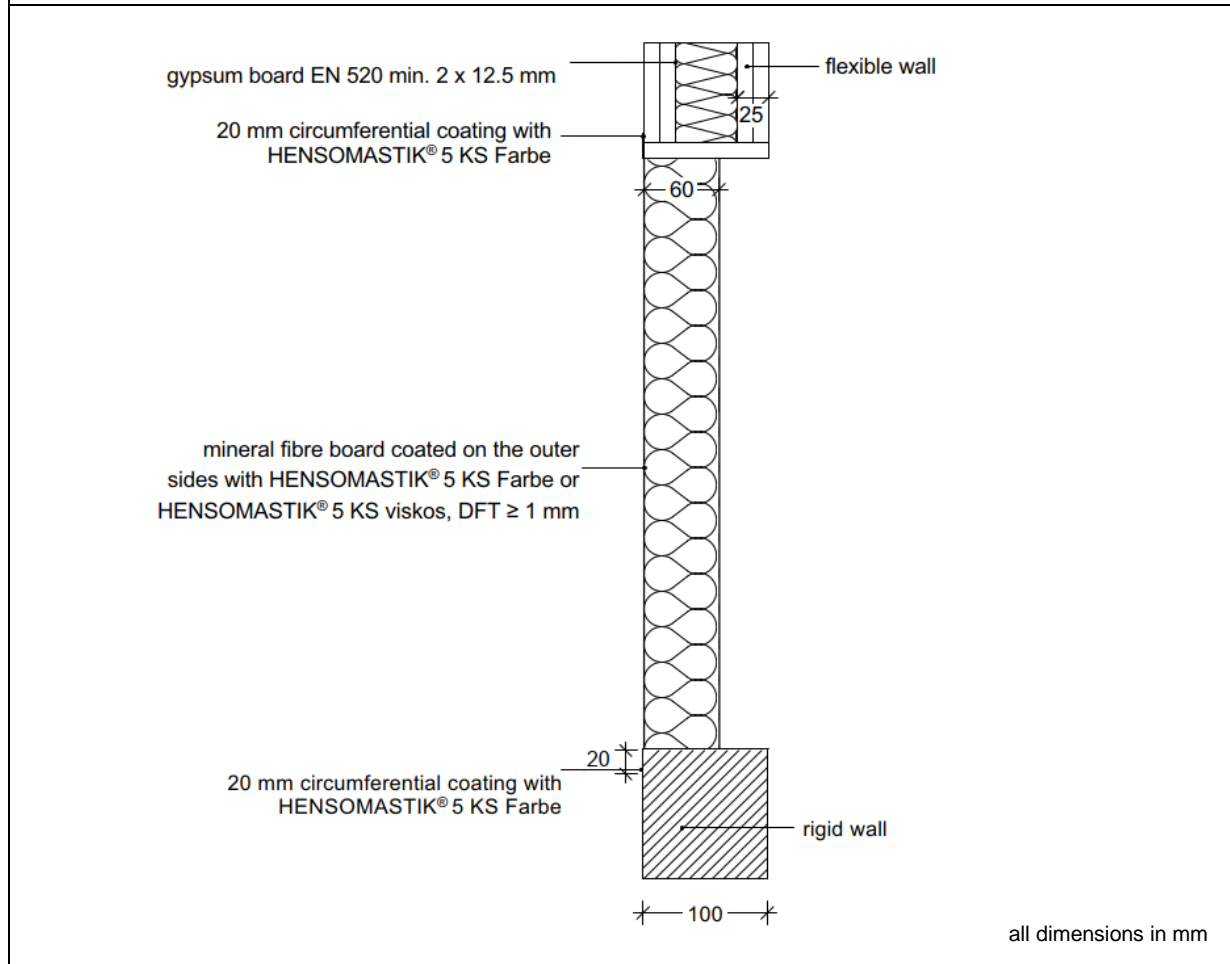
- a₁: between cable/cable trays and metal pipes ≥ 30 mm
- a₂: between cable/cable trays and plastic pipes ≥ 30 mm
- a₃: between metal pipes and plastic pipes ≥ 25 mm
- a₄: between plastic pipes ≥ 0 mm
- a₅: between metal pipes ≥ 25 mm
- a₆: between cable trays ≥ 30 mm
- b₁: between cable/cable trays 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

Distance of first support of penetrating services ≤ 250 mm on both sides of the wall.

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.

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

Services	Classification
Blank seal, no penetrating services	EI 60

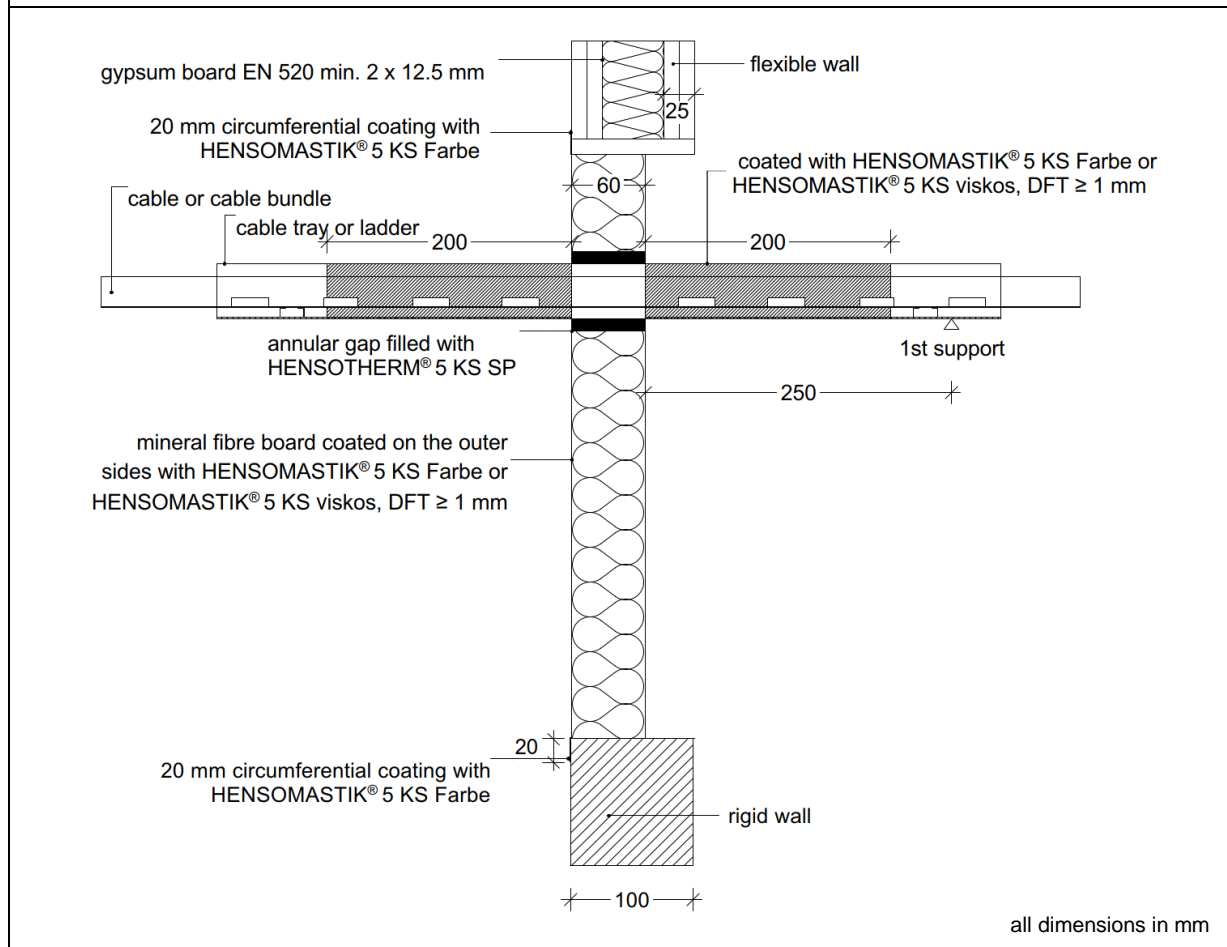
A.3. Single cables, cable bundles, cable trays and support structures

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.



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	-	

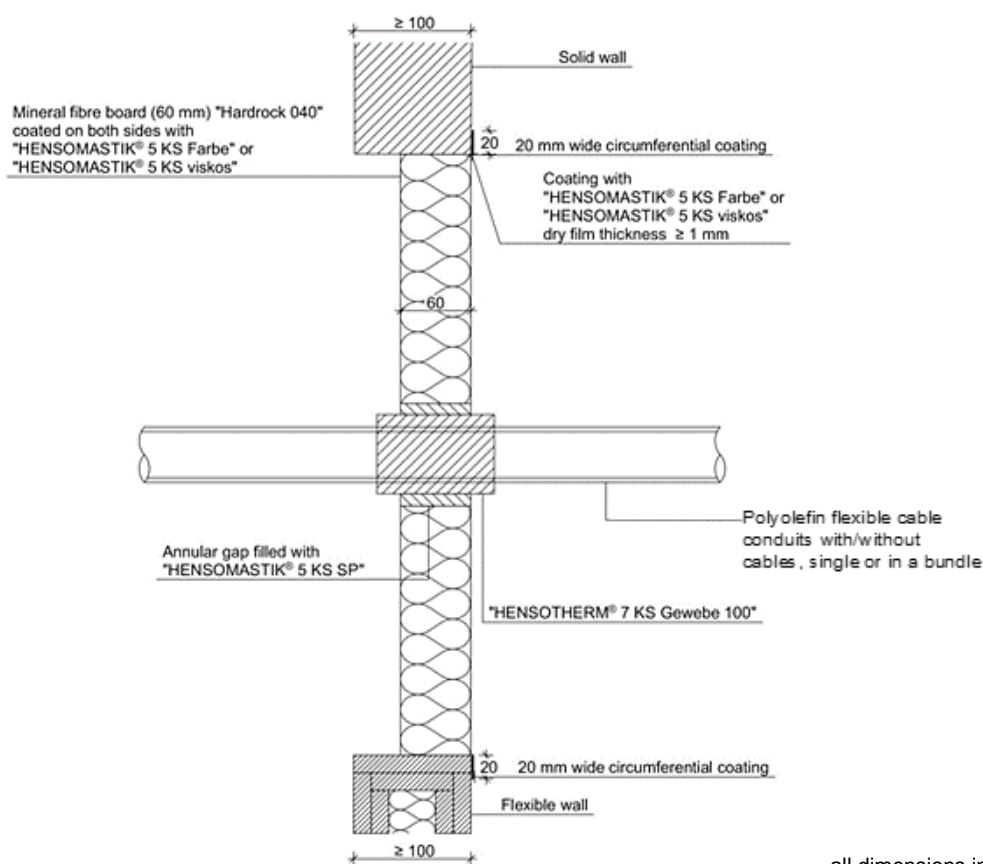
A.4. Polyolefin flexible cable conduits with or without cables with HENSOTHERM® 7 KS Gewebe 100

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.



all dimensions in mm

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	

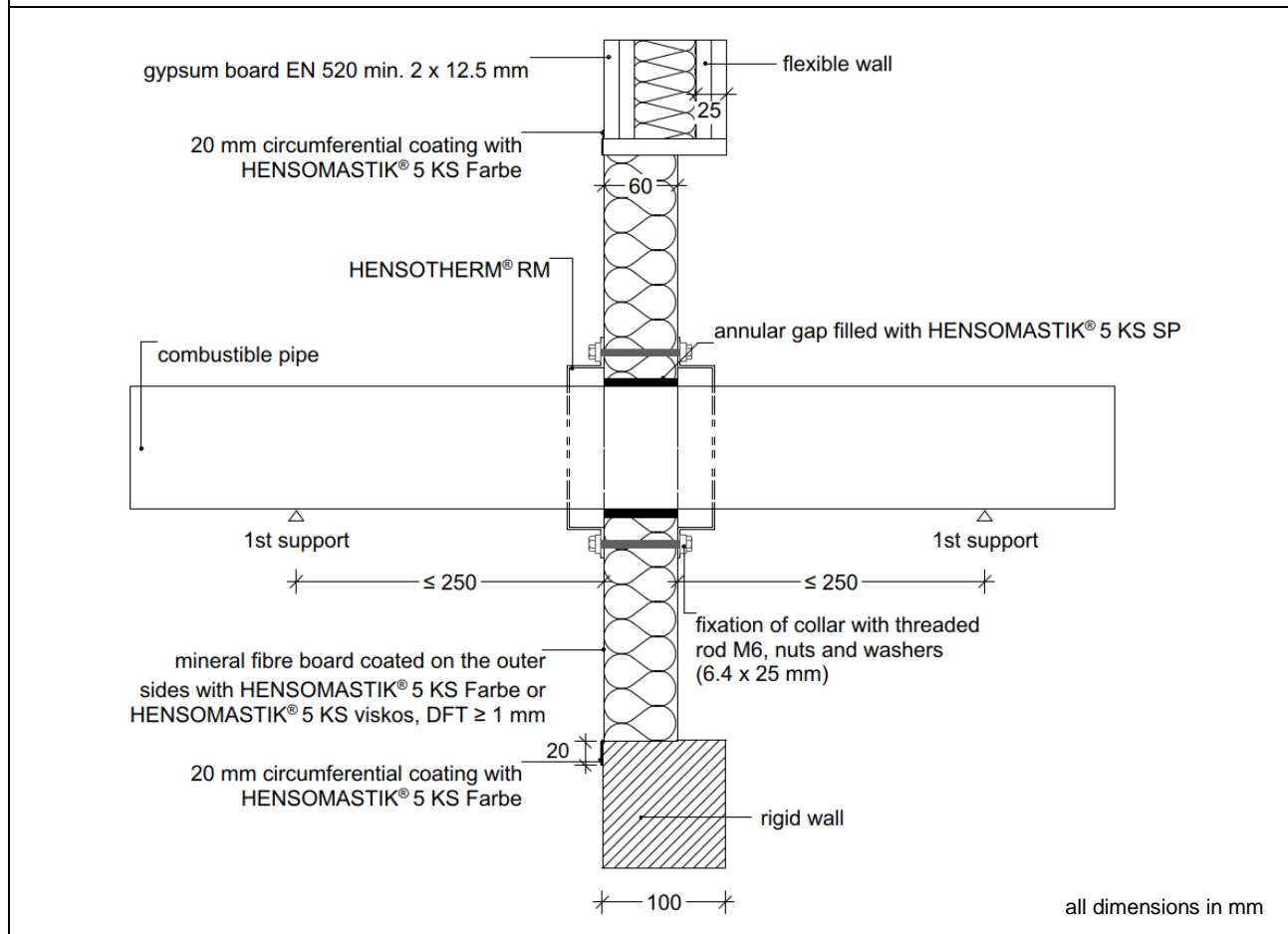
A.5. Combustible plastic pipes without insulation with HENSOTHERM® RM pipe collars

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.

**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	

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.

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.

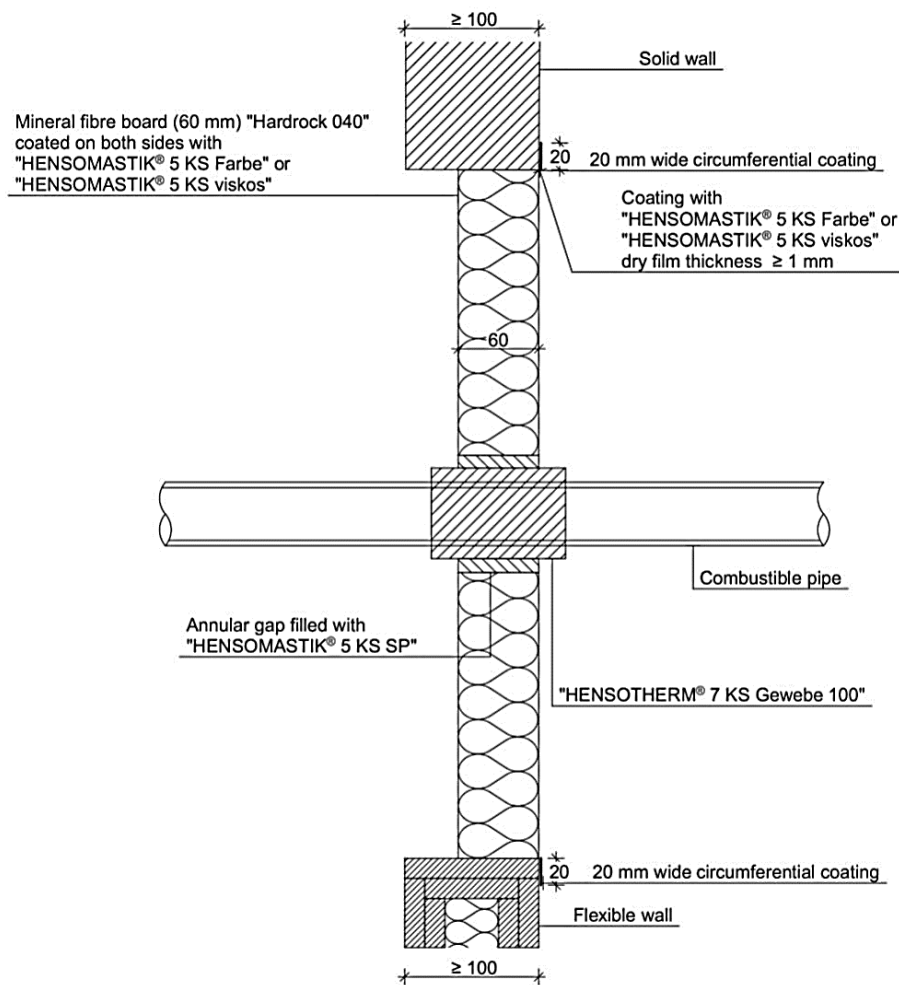
Services	Diameter [mm]	Wall thickness [mm]	Insulation	Insulation length [mm]	HENSOTHERM® RM pipe collar [height-size, mm]	Classification
Geberit Silent-PP	32	2.0	PE-foam sound decoupling ≤ 5 mm	LS 120	HENSOTHERM® RM 30-56	EI 60 U/U
	40	2.0		LS 120	HENSOTHERM® RM 30-56	
	50	2.0		LS 120	HENSOTHERM® RM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

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.



all dimensions in mm

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	

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 ≤ 90	3.5	4	
	> 90 ≤ 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

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 ≤ 90	1.8 – 6.7	4	
	> 90 ≤ 110	2.2 – 8.1	6	
	110	8.1	6	

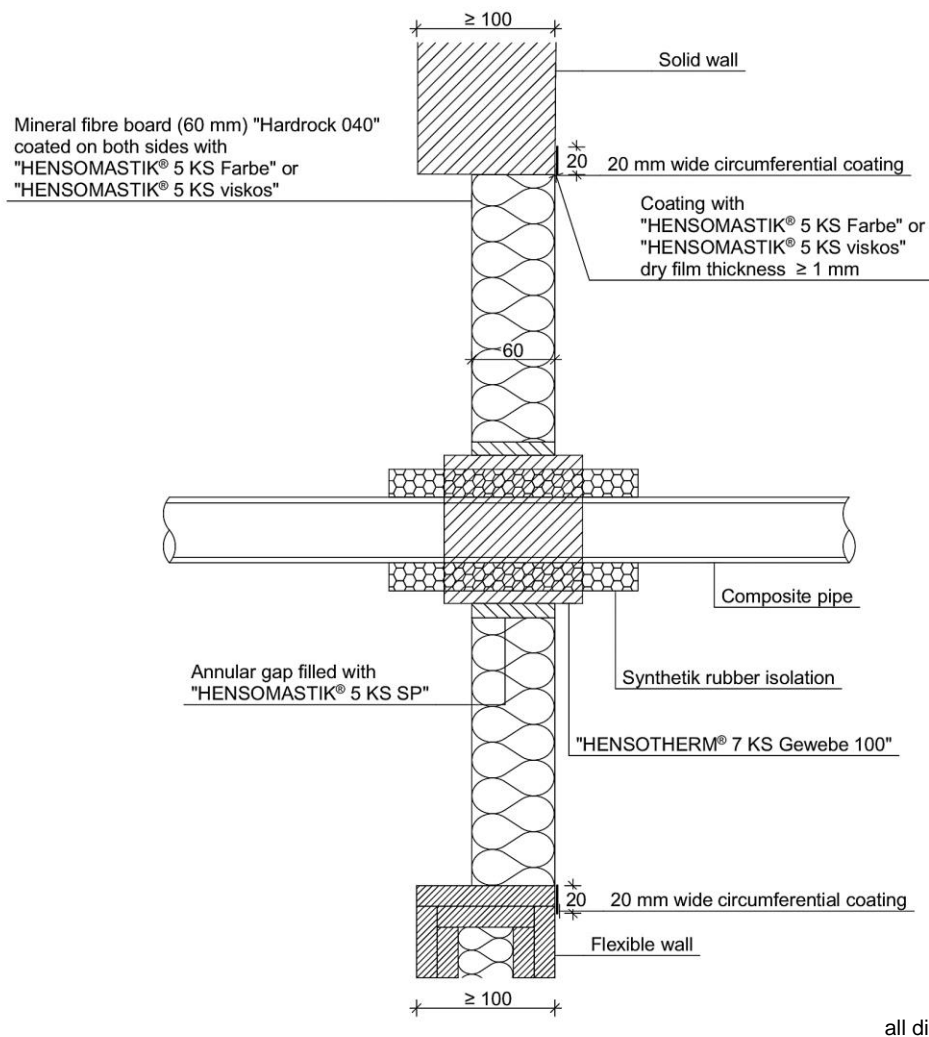
Test results on single layer pipes made of PVC-U in accordance with EN 1329-1, EN 1453-1 or EN ISO 1452-2 are valid for single layer pipes made of PVC-U in accordance with EN 1329-1, EN 1453-1, EN ISO 15493 and EN ISO 1452-2 and for pipes made of PVC-C in accordance with EN 1566-1, EN ISO 15493 and EN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

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.



all dimensions in mm

A.8.1.1. Geberit Mepla 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
Geberit Mepla	16	2.25	NH/ArmaFlex	9.0	CS / LS 500	1	EI 90 U/C

A.8.1.2. 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	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 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	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 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	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 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	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 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	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)

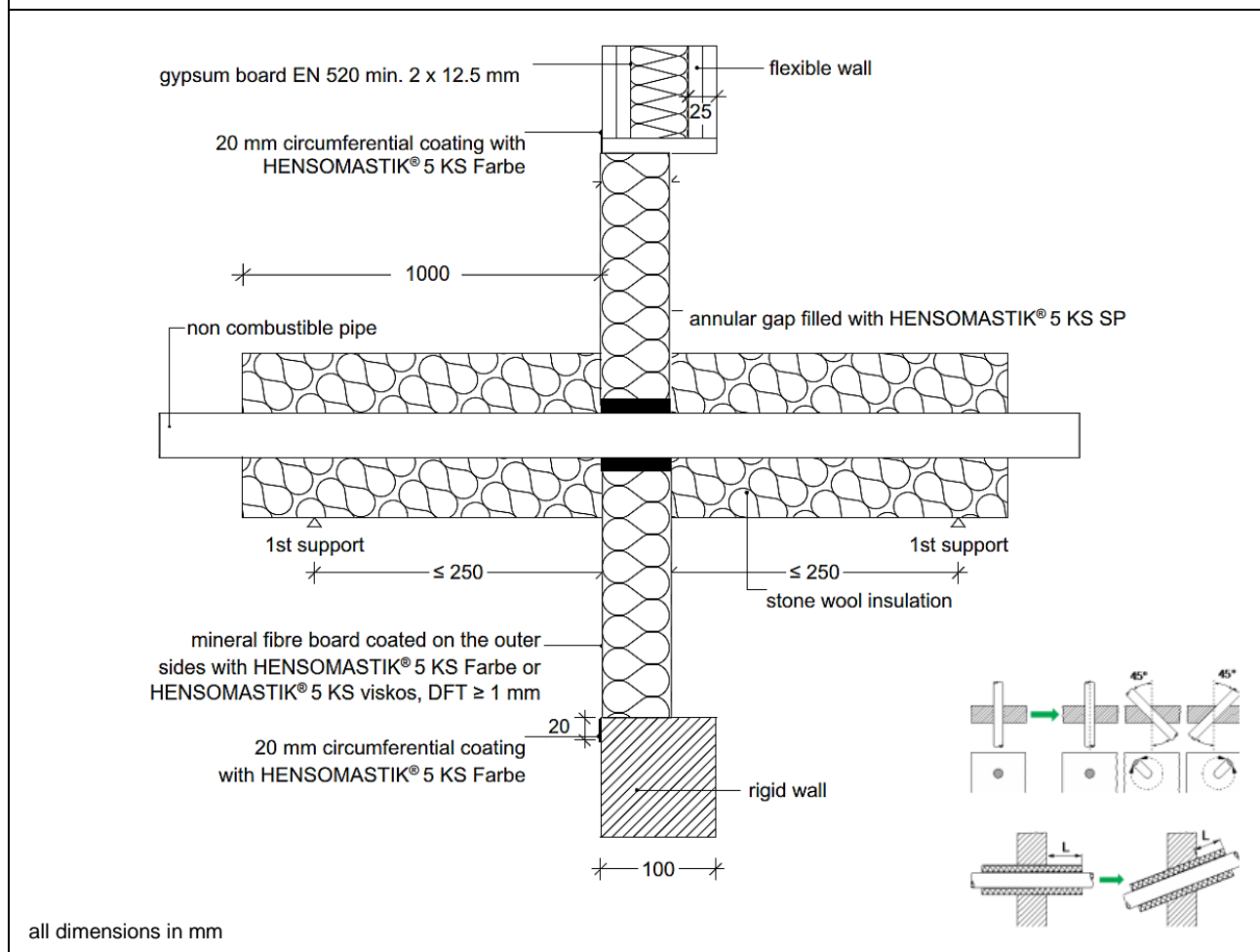
Services	Diameter [mm]	Wall thickn. [mm]	Insulation	Insulation thickness [mm]	Insulation length [mm]	Layers of HENSOTHERM® 7 KS Gewebe 100 (1 mm)	Classification
Rehau RAUTITAN stabil	16	2.6	NH/ArmaFlex	9.0	CS / LS 500	1	EI 60 U/C
	40	6.0		9.0		1	
	40	6.0		9.0 – 19.0		1	

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/m³ or higher 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. 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).



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

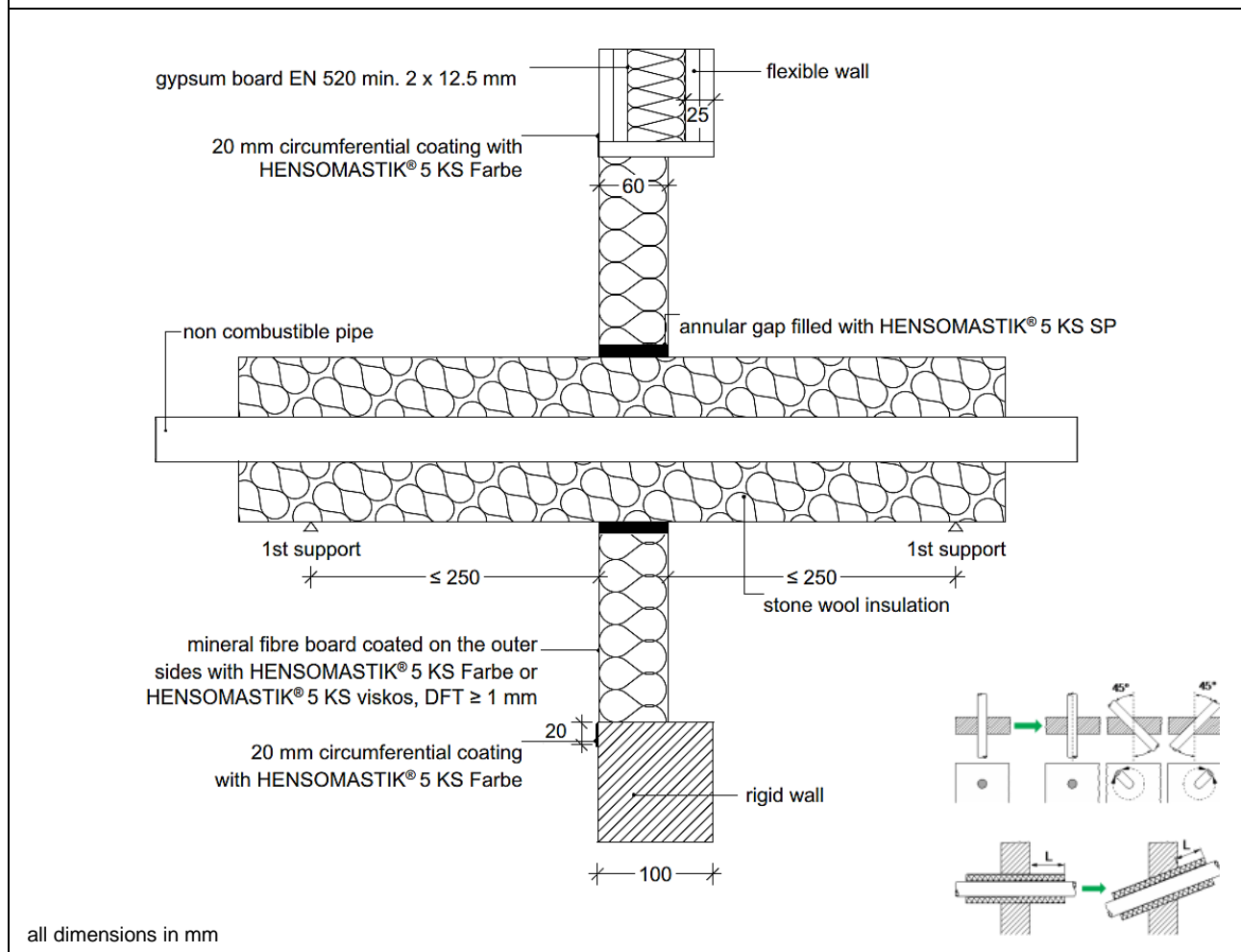
Services	Diameter [mm]	Wall thickness [mm]	Insulation	Insulation thickness min. [mm]	Insulation length min. [mm]	Classification
Copper	≤ 22	1.0 – 11.0	RS800	20	LI 1000	EI 60 U/C
	> 22 ≤ 42	1.5 – 14.2		20		
	> 42 ≤ 88.9	2.0 – 14.2		30		
Steel or cast iron	≤ 22	1.0 – 11.0	RS800	20	LI 1000	EI 60 U/C
	>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

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/m³ or higher 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 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).



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

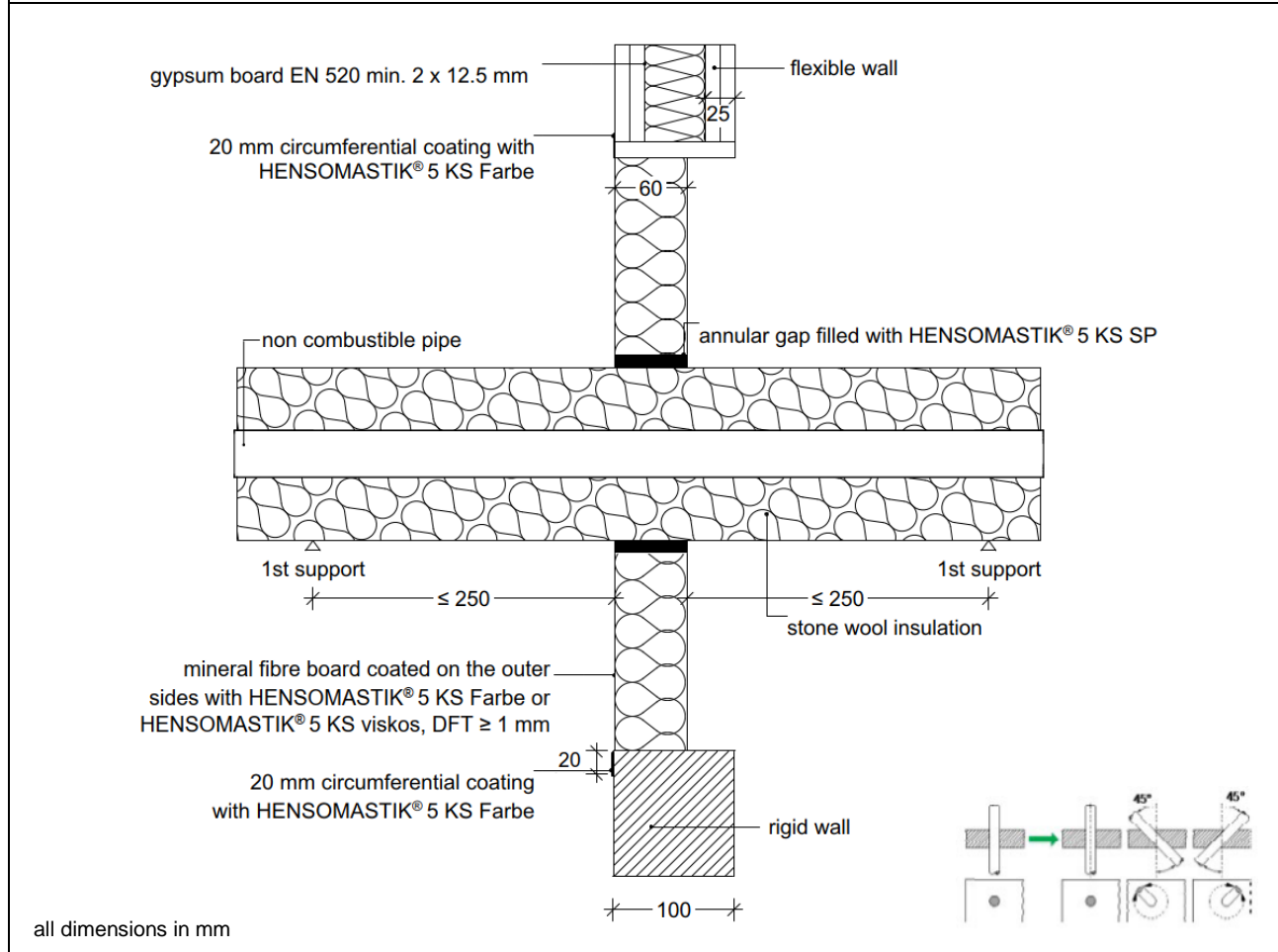
Services	Diameter [mm]	Wall thickness [mm]	Insulation	Insulation thickness min. [mm]	Insulation length min. [mm]	Classification
Copper	≤ 15	1.0 – 7.5	RS800	20	CS / LS 1000	EI 90 C/U
	> 15 ≤ 54	1.5 – 14.2		20		
Steel or cast iron	≤ 15	1.0 – 7.5	RS800	20	CS / LS 1000	EI 90 C/U
	> 15 ≤ 54	1.5 – 14.2		20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

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/m³ or higher 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 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).

**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 ≤ 54	1.5 – 14.2		20		
Steel or cast iron	≤ 15	1.0 – 7.5	Klimarock	20	CS	EI 60 U/C
	> 15 ≤ 54	1.5 – 14.2		20		
	> 54 ≤ 89	3.2 – 14.2		20		

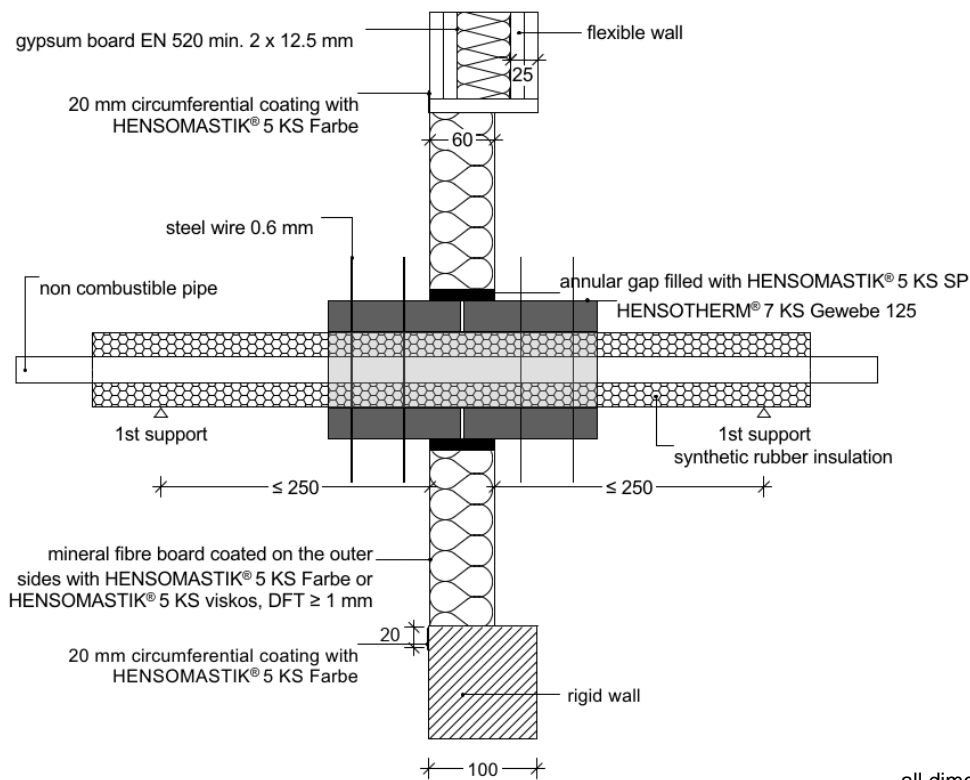
A.12. Metal pipes with FEF-insulation with HENSOTHERM® 7 KS Gewebe 125

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.



all dimensions in mm

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.

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 ≤ 22	1.0 – 11.0		18.0		1	
	> 22 ≤ 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 ≤ 22	1.0 – 11.0		18.0		1	
	> 10 ≤ 54	1.5 – 14.2		21.0		1	
	> 54 ≤ 60.3	2.9 – 14.2		29.0		1	
	> 60.3 ≤ 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 ≤ 22	1.0 – 11.0		18.0		1	
	> 22 ≤ 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 ≤ 22	1.0 – 11.0		18.0		1	
	> 10 ≤ 54	1.5 – 14.2		21.0		1	
	> 54 ≤ 60.3	2.9 – 14.2		29.0		1	
	> 60.3 ≤ 88.9	3.2 – 14.2		30.5		1	
	> 88.9 ≤ 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 ≤ 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 ≤ 54	1.5 – 14.2		25.0		1	
	> 54 ≤ 89	3.2 – 14.2		25.0		1	

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 ≤ 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 ≤ 54	1.5 – 14.2		25.0		1	
	> 54 ≤ 89	3.2 – 14.2		25.0		1	

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 ≤ 42	1.2 – 14.2		19.0 – 32.0		1	
	> 15 ≤ 42	1.2 – 14.2		32.0		1	
	> 42 ≤ 88.9	1.2 – 14.2		19.0 – 32.0		1	
	> 42 ≤ 88.9	1.2 – 14.2		32.0		1	
Steel or cast iron	≤ 15	1.0 – 7.5	Eurobatex	13.0	CS / LS 1000	1	EI 30 C/U
	> 15 ≤ 42	1.2 – 14.2		19.0 – 32.0		1	
	> 15 ≤ 42	1.2 – 14.2		32.0		1	
	> 42 ≤ 88.9	1.2 – 14.2		19.0 – 32.0		1	
	> 42 ≤ 88.9	1.2 – 14.2		32.0		1	
	> 88.9 ≤ 114.3	2.0 – 14.2		19.0 – 32.0		1	
	> 88.9 ≤ 114.3	2.0 – 14.2		32.0		1	

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 ≤ 54	1.5 – 14.2		19.0		1	
Steel or cast iron	≤ 22	1.0 – 11.0	Kaiflex ST	9.0	CS / LS 1000	1	EI 60 C/U
	> 22 ≤ 54	1.5 – 14.2		19.0		1	
	> 54 ≤ 60.3	2.9 – 14.2		5.0		1	

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 ≤ 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 ≤ 54	1.5 – 14.2		21.0		1	
	> 54 ≤ 89	3.2 – 14.2		28.5		1	

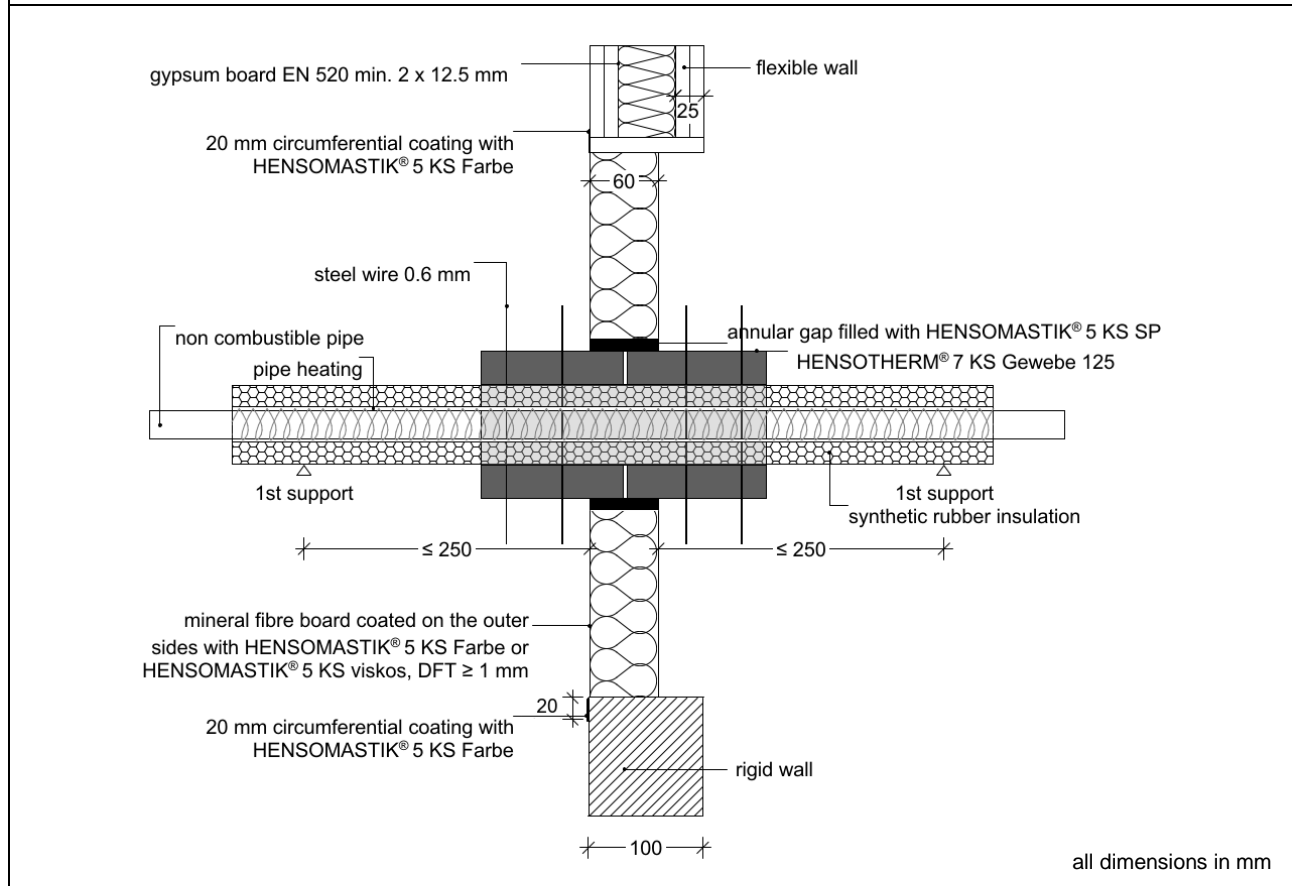
A.13. Metal pipes with pipe heating and FEF-insulation with HENSOTHERM® 7 KS Gewebe 125

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.

**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

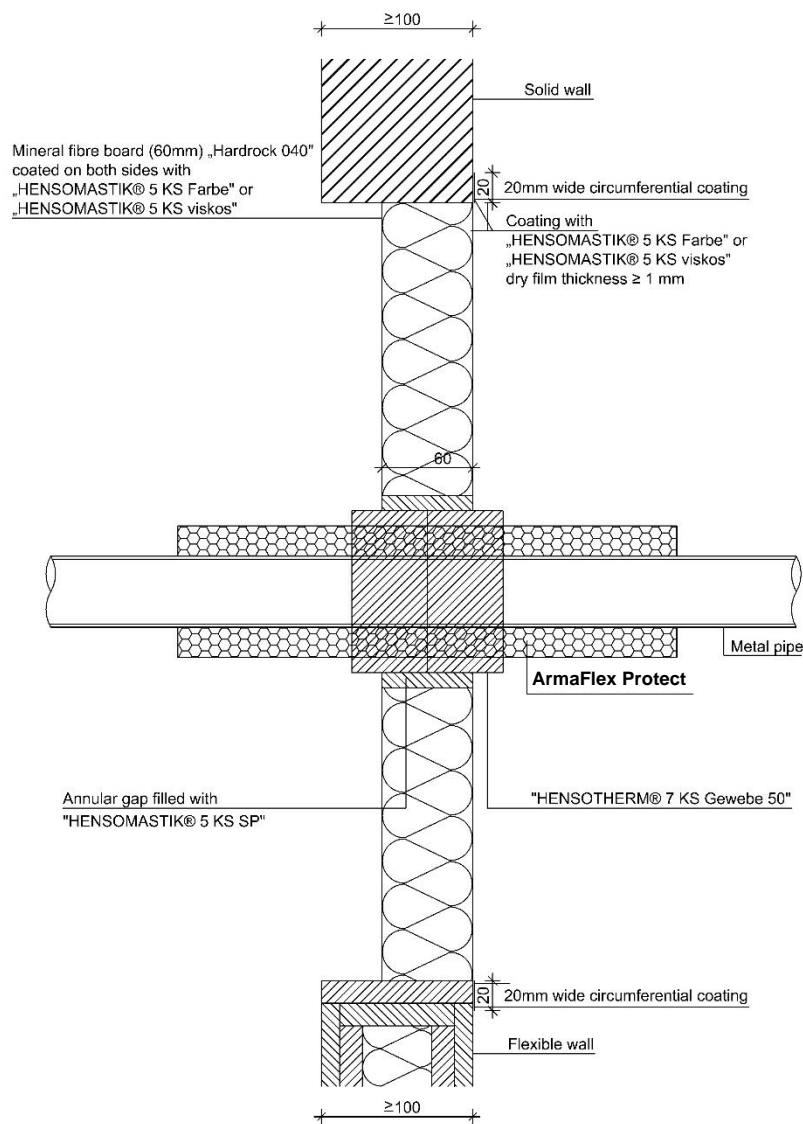
A.14. Metal pipes with FEF-insulation (LS) with HENSOTHERM® 7 KS Gewebe 50

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.



all dimensions in 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 ≤ 42	1.2 – 14.2		25.0		1	
	> 42 ≤ 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 ≤ 42	1.2 – 14.2		25.0		1	
	> 42 ≤ 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)

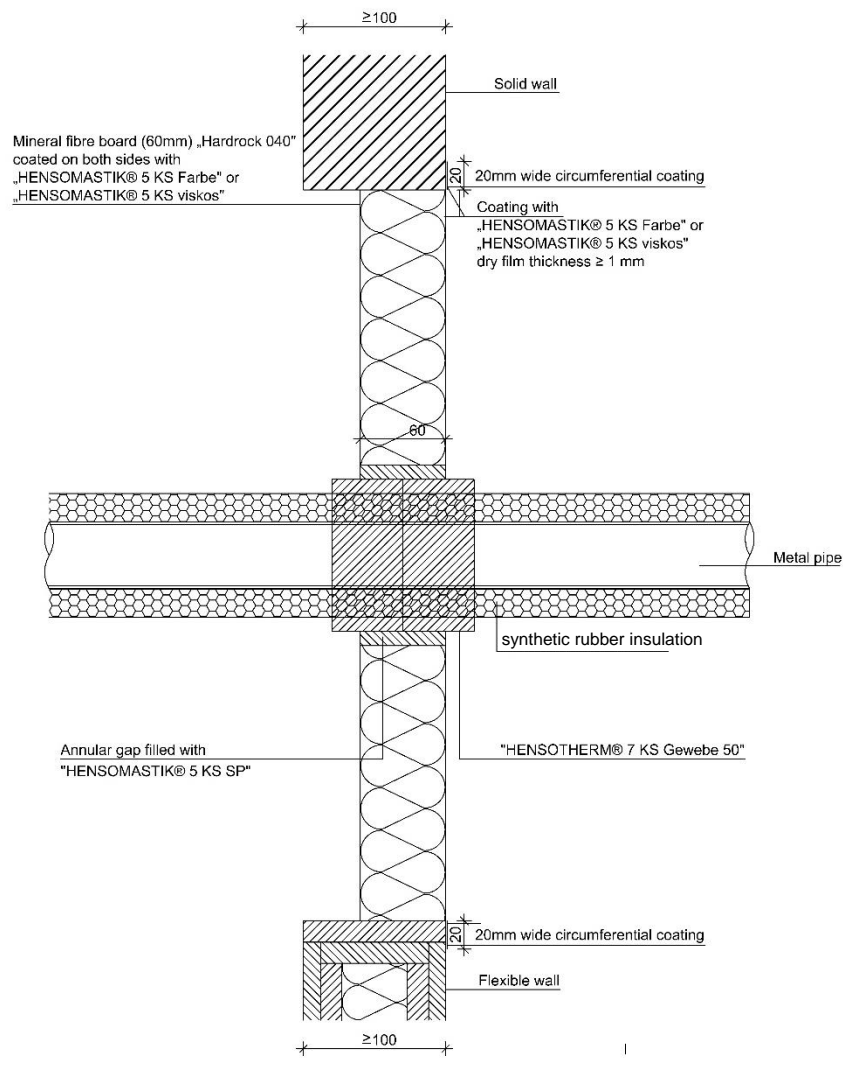
Services	Diameter [mm]	Wall thickness [mm]	Insulation	Insulation thickness [mm]	Insulation length [mm]	Layers of HENSOTHERM® 7 KS Gewebe 50 (2 mm)	Classification
Copper	≤ 15	1.0 – 7.5	ArmaFlex Protect	19.0 – 25.0	CS / LS 1000	1	EI 60 C/U
	> 15 ≤ 42	1.2 – 14.2		25.0		1	
	> 42 ≤ 54	1.5 – 14.2		25.0		1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

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.



all dimensions in mm

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

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 ≤ 42	1.2 – 14.2		13.0 – 25.0		2	
	> 42 ≤ 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 ≤ 42	1.2 – 14.2		13.0 – 25.0		2	
	> 42 ≤ 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 ≤ 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 ≤ 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 ≤ 42	1.2 – 14.2		13.0 – 25.0		2	
	> 42 ≤ 54	1.5 – 14.2		13.0 – 25.0		2	
	> 54 ≤ 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 ≤ 42	1.2 – 14.2		13.0 – 25.0		2	
	> 42 ≤ 54	1.5 – 14.2		13.0 – 25.0		2	
	> 54 ≤ 89	2.0 – 14.2		25.0		2	
	> 89 ≤ 114	4.5 – 14.2		25.0 – 32.0		2	
	114	4.5 – 14.2		19.0 – 32.0		2	

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 ≤ 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 ≤ 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 ≤ 42	1.2 – 14.2		13.0 – 25.0		2	
	> 15 ≤ 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 ≤ 42	1.2 – 14.2		13.0 – 25.0		2	
	> 15 ≤ 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 ≤ 42	1.2 – 14.2		13.0 – 25.0		2	
	> 15 ≤ 42	1.2 – 14.2		13.0		2	
	> 42 ≤ 54	1.5 – 14.2		13.0 – 25.0		2	
	54	1.5 – 14.2		25.0		2	
	> 54 ≤ 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 ≤ 42	1.2 – 14.2		13.0 – 25.0		2	
	> 15 ≤ 42	1.2 – 14.2		13.0		2	
	> 42 ≤ 54	1.5 – 14.2		13.0 – 25.0		2	
	54	1.5 – 14.2		25.0		2	
	> 54 ≤ 89	2.0 – 14.2		19.0 – 25.0		2	
	> 89 ≤ 114.3	4.5 – 14.2		19.0 – 25.0		2	

B.1. Rigid floor constructions with floor thickness of minimum 150 mm

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.

B.1.2. Minimum spacing and distance of the first support

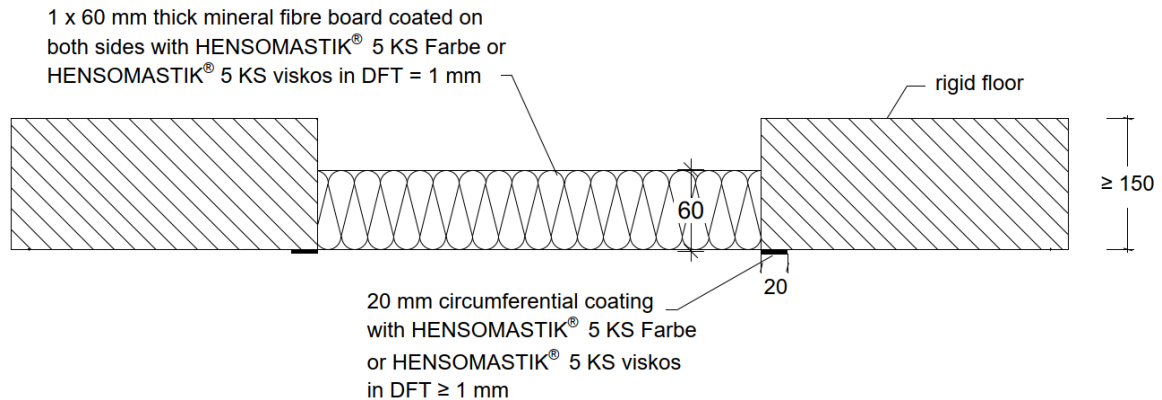
- a₁₋₁: between cable/cable trays and metal pipes ≥ 20 mm
- a₁₋₂: between cable/cable trays and plastic pipes ≥ 25 mm
- a₁₋₃: between metal pipes and plastic pipes ≥ 25 mm
- a₁₋₄: between plastic pipes ≥ 15 mm
- a₁₋₅: between metal pipes ≥ 25 mm
- a₁₋₆: between cable trays ≥ 20 mm
- a₁₋₇: between plastic pipes with sound-insulation mass layer ≥ 100 mm
- b₁₋₁: between cable/cable trays and the upper seal edge ≥ 25 mm
- b₁₋₂: between cable/cable trays and the side seal edge ≥ 25 mm
- b₁₋₃: between cable/cable trays and the lower seal edge ≥ 25 mm
- b₁₋₄: between metal pipes and the side seal edge ≥ 25 mm
- b₁₋₅: between plastic pipes and the side seal edge ≥ 25 mm

Distance of first support of penetrating services ≤ 250 mm on top side of the floor.

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.



all dimensions in mm

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

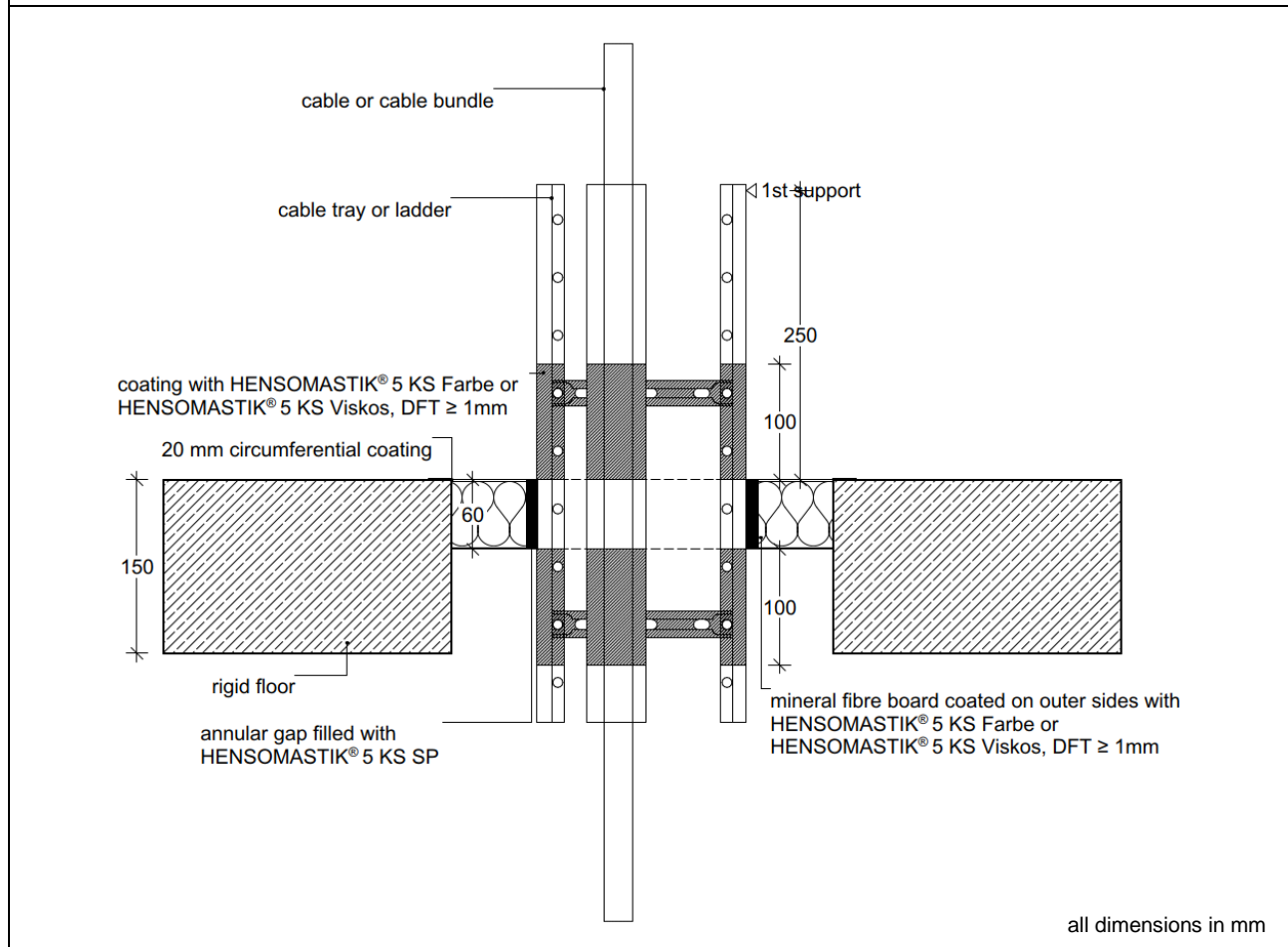
Services	Classification
Blank seal, no penetrating services	EI 60

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.



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

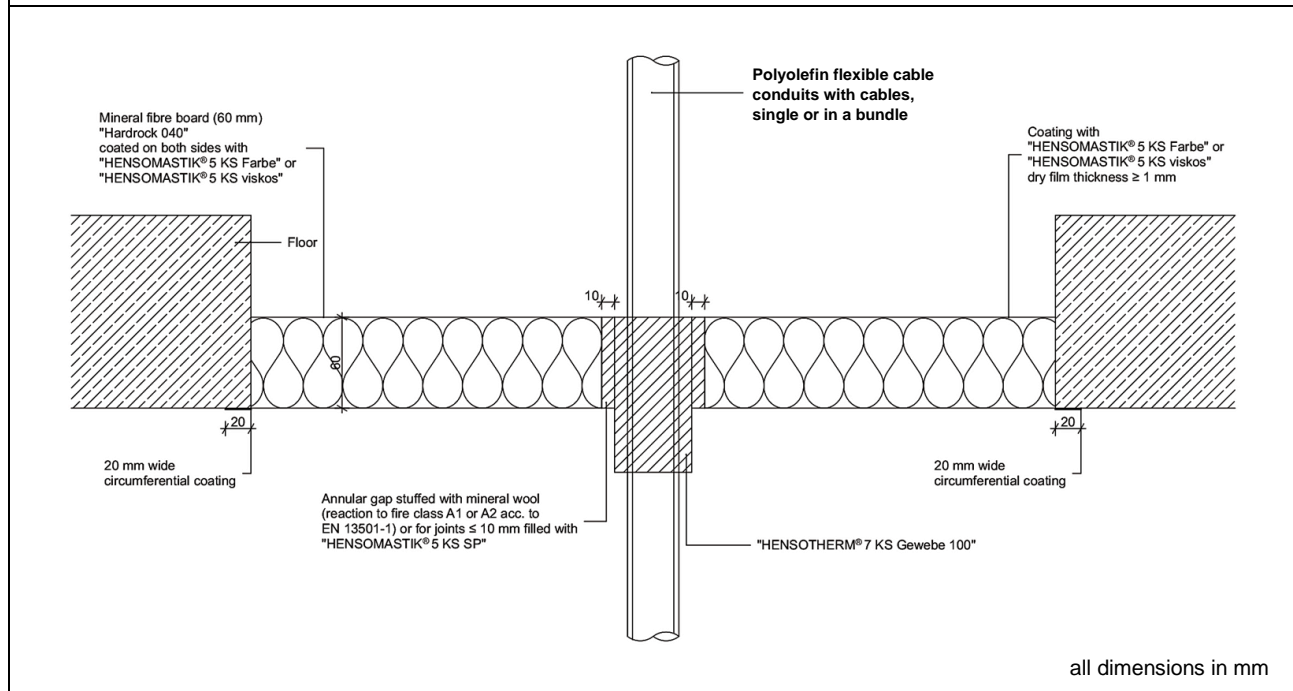
Services	Max. diameter bundle [mm]	Max. diameter single cable conduit [mm]	Max. diameter single cable [mm]	Classification
Sheathed cables of all types, single or in a bundle	100	-	21	EI 60
Telecommunication cables, single or in a bundle	100	-	21	
Sheathed cables of all types, single	-	-	21	
Cable support,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

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.



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

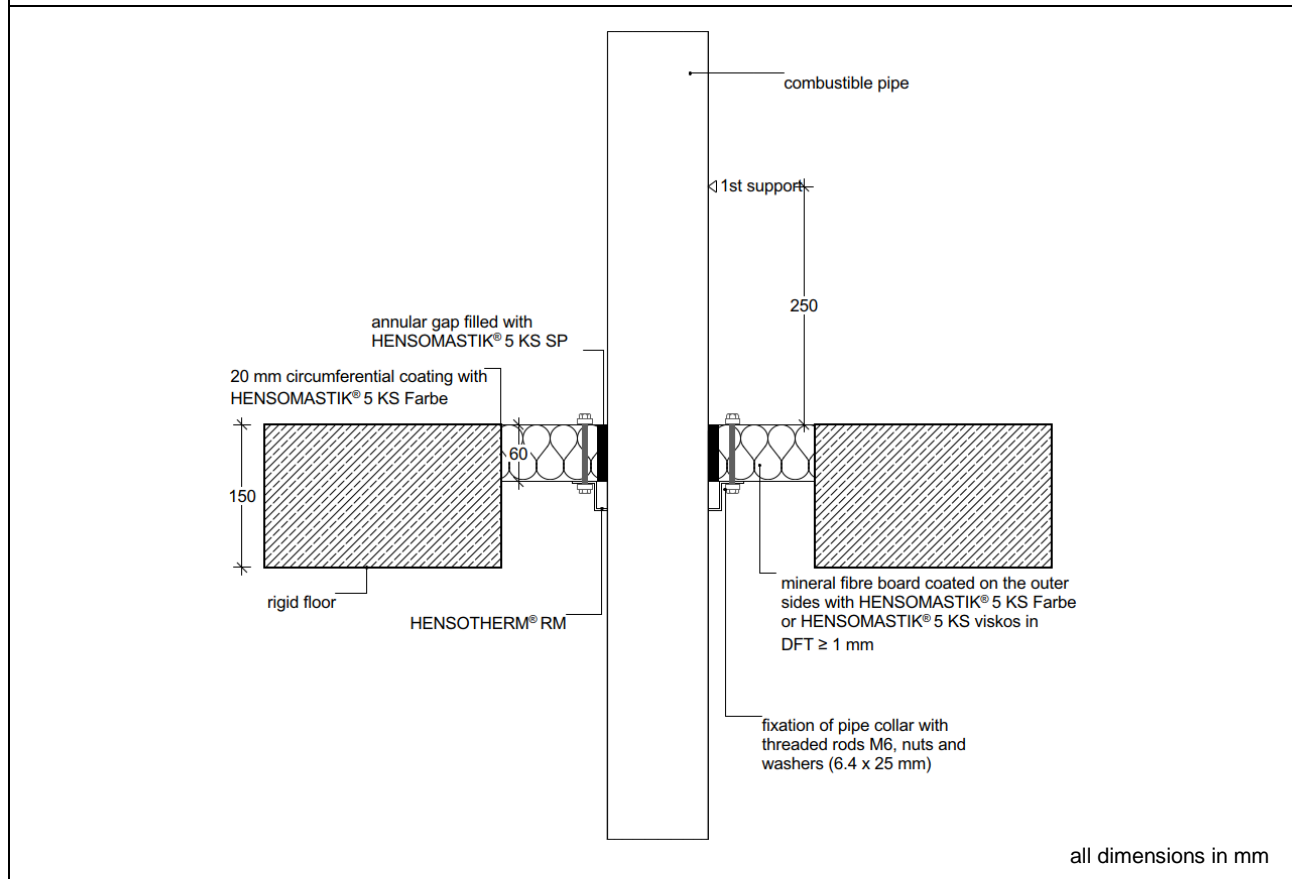
Services	Max. diameter bundle [mm]	Max. diameter single cable conduit [mm]	Max. diameter single cable [mm]	Layers of HENSOTHERM® 7 KS Gewebe 100 (1 mm)	Classifi- cation
Polyolefin flexible cable conduits with cables type NHXH-J 3 x 1.5 mm ² and NHXH-J 5 x 1.5 mm ² , single or in a bundle	125	32	21	6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

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.

**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	

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

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 ≤ 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	≥ 32 ≤ 40	1.8 – 3.7	HENSOTHERM® RM 30-40	EI 90 U/U
	> 40 ≤ 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	≥ 32 ≤ 40	1.8 – 3.7	HENSOTHERM® RM 30-40	EI 60 U/U
	> 40 ≤ 50	1.8 – 3.7	HENSOTHERM® RM 30-56	
	> 50 ≤ 56	2.2 – 5.3	HENSOTHERM® RM 30-56	
	> 56 ≤ 63	2.2 – 5.3	HENSOTHERM® RM 30-63	
	> 63 ≤ 75	2.2 – 5.3	HENSOTHERM® RM 30-75	
	> 75 ≤ 90	2.2 – 5.3	HENSOTHERM® RM 30-90	
	> 90 ≤ 110	2.2 – 5.3	HENSOTHERM® RM 30-110	
	> 110 ≤ 125	2.5 – 6.0	HENSOTHERM® RM 30-125	

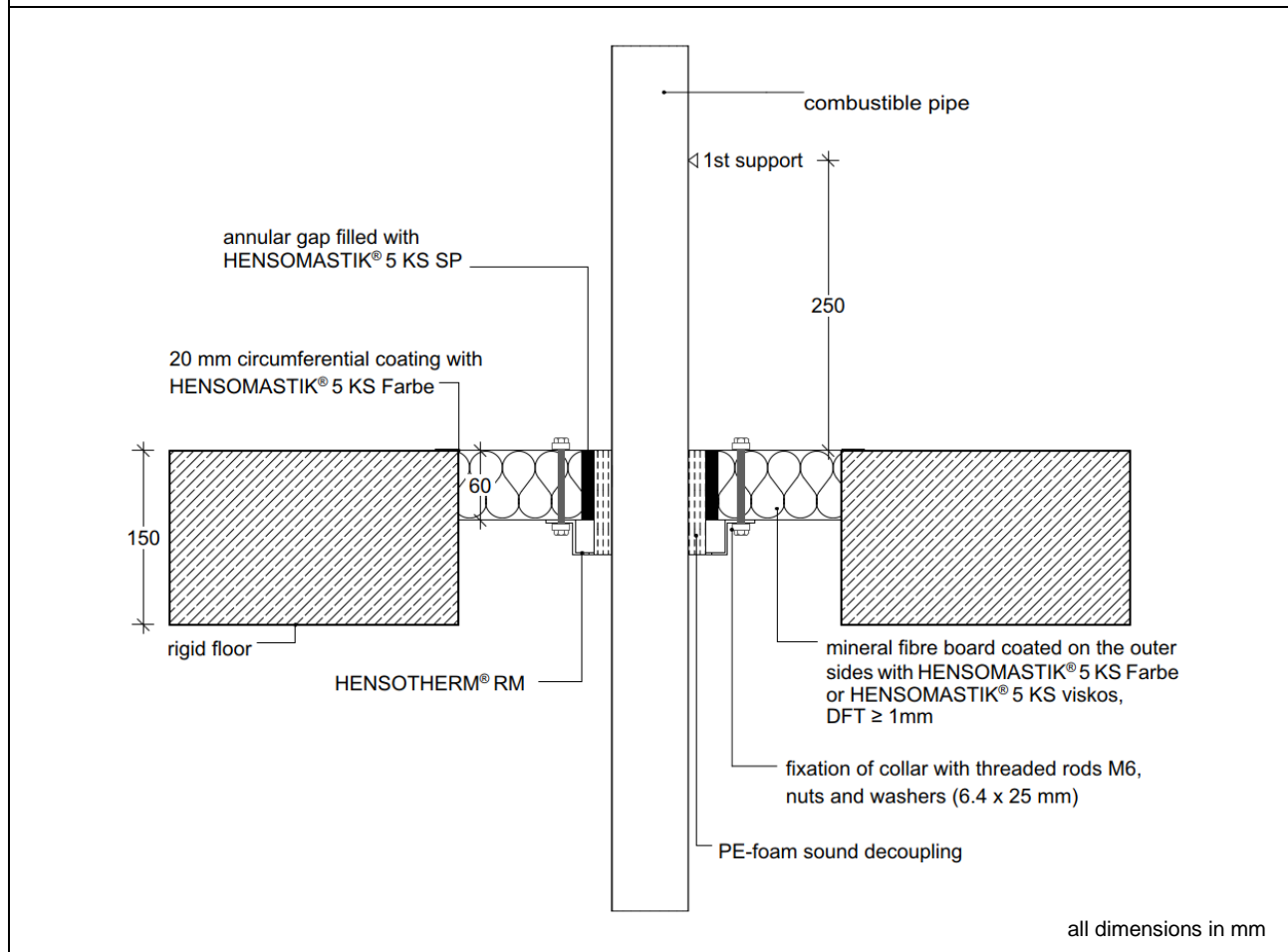
Test results on single layer pipes made of PVC-U in accordance with EN 1329-1, EN 1453-1 or EN ISO 1452-2 are valid for single layer pipes made of PVC-U in accordance with EN 1329-1, EN 1453-1, EN ISO 15493 and EN ISO 1452-2 and for pipes made of PVC-C in accordance with EN 1566-1, EN ISO 15493 and EN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

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.

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

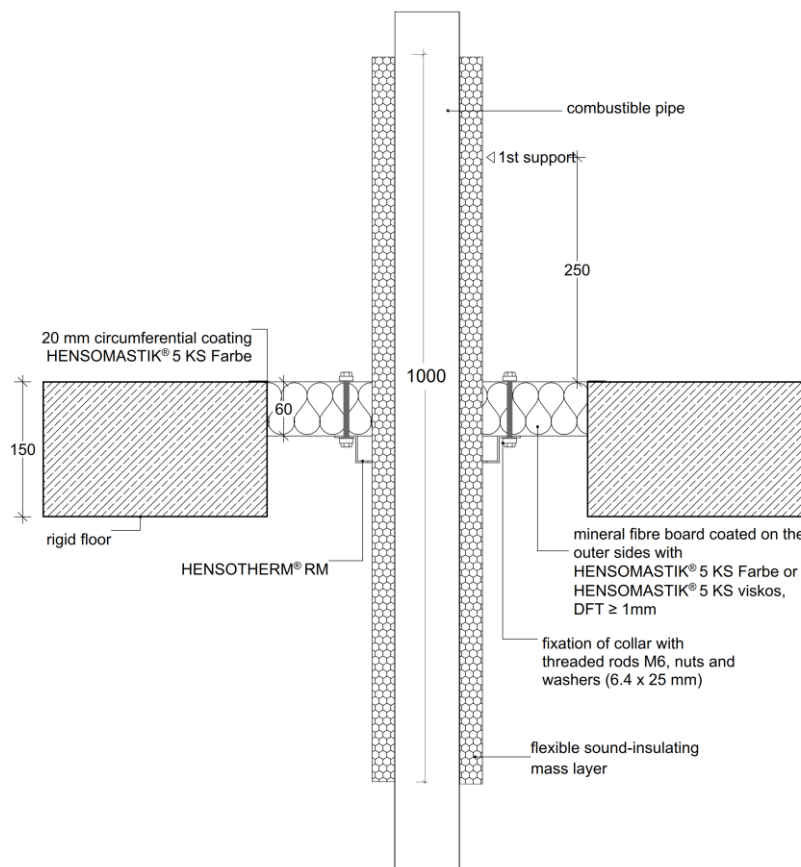
Services	Diameter [mm]	Wall thickness [mm]	Insulation	Insulation length [mm]	HENSOTHERM® RM pipe collar [height-size, mm]	Classification
Geberit Silent-PP	32	2.0	PE-foam sound decoupling ≤ 5 mm	LS 90	HENSOTHERM® RM 30-56	EI 90 U/U
	40	2.0		LS 90	HENSOTHERM® RM 30-56	
	50	2.0		LS 90	HENSOTHERM® RM 30-75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

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.



all dimensions in mm

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)

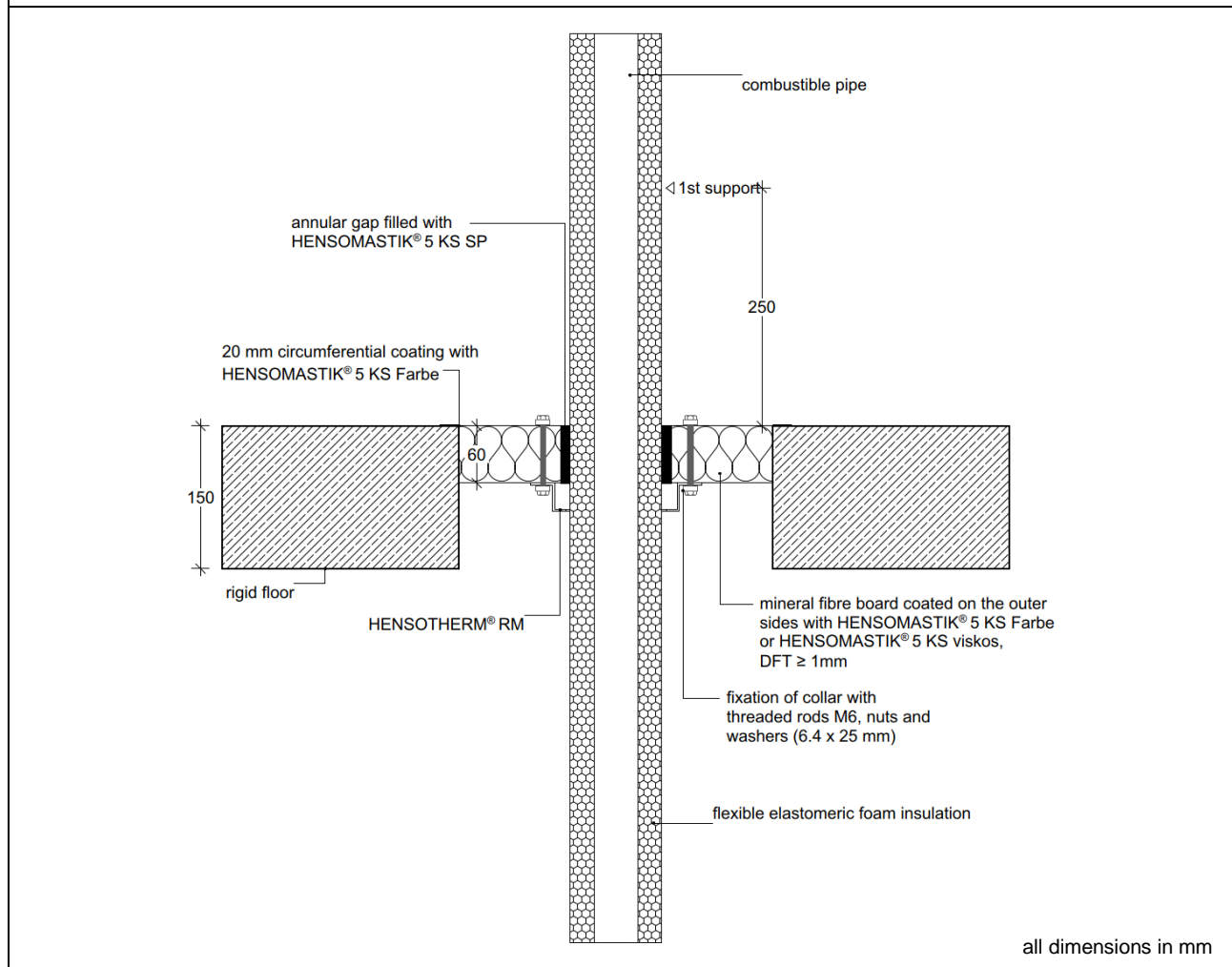
Services	Diameter [mm]	Wall thickness [mm]	Insulation	Insulation thickness [mm]	Insulation length [mm]	HENSOTHERM® RM pipe collar [height-size, mm]	Classification
Geberit Silent-PP	110	3.6	Geberit Isol Flex	17.0	CS / LS 1000	HENSOTHERM® RM 50-140	EI 90 U/U

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 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.

**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:

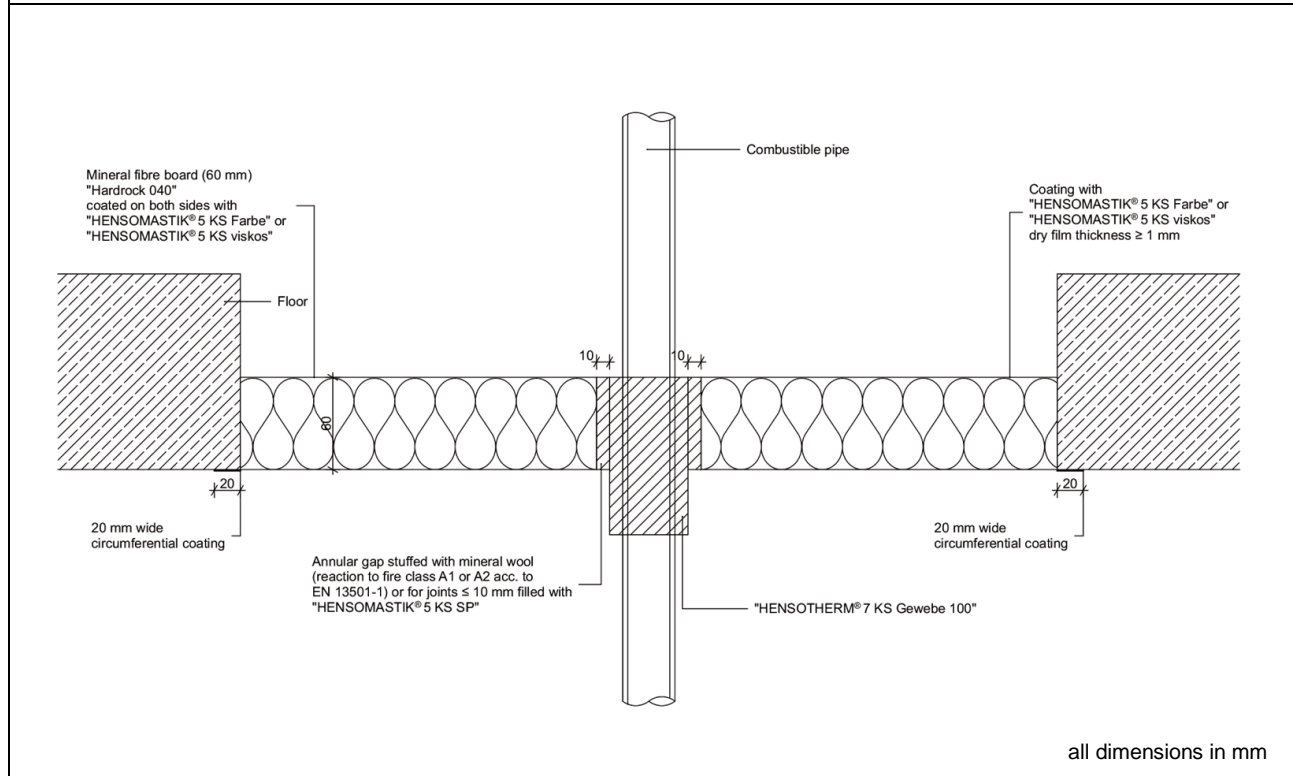
Manufacturer	Product Name / Pipe Series
FRANK GmbH, Germany	FRANK SurePEX
Jentro NV, Belgium	Jentro PEX pipe
REHAU Industries SE & Co. KG Germany	REHAU RAUTITAN flex
Uponor GmbH, Germany	Uponor Aqua Pipe
	Uponor Aqua Pipe Blue
	Uponor Combi Pipe
	Uponor Comfort Pipe PLUS Blue
	Uponor Radi Pipe

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 reveal is filled with HENSOMASTIK® 5 KS SP (Spachtel) from both sides in full depth.

**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	

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 ≤ 90	3.5	4	
	> 90 ≤ 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 ≤ 90	1.8 – 6.7	4	
	> 90 ≤ 110	2.2 – 8.1	6	

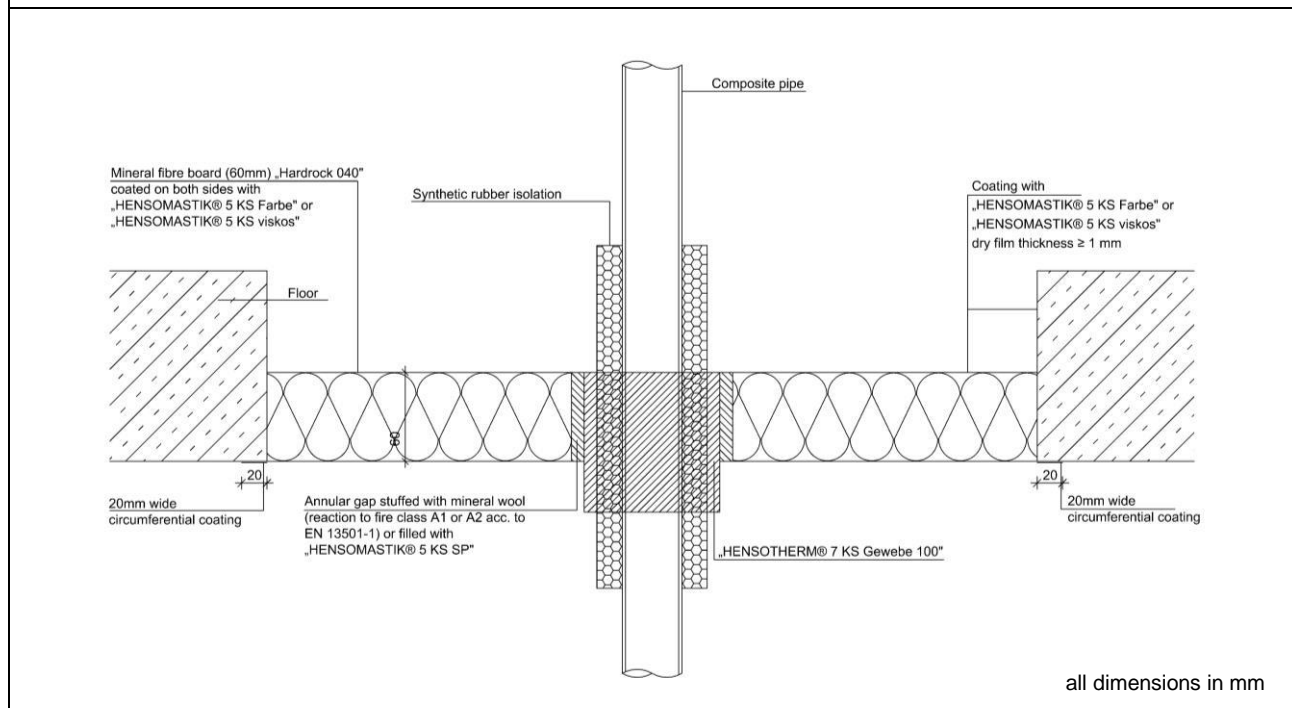
Test results on single layer pipes made of PVC-U in accordance with EN 1329-1, EN 1453-1 or EN ISO 1452-2 are valid for single layer pipes made of PVC-U in accordance with EN 1329-1, EN 1453-1, EN ISO 15493 and EN ISO 1452-2 and for pipes made of PVC-C in accordance with EN 1566-1, EN ISO 15493 and EN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

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 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.

**B.10.1. 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 – 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 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 – 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	

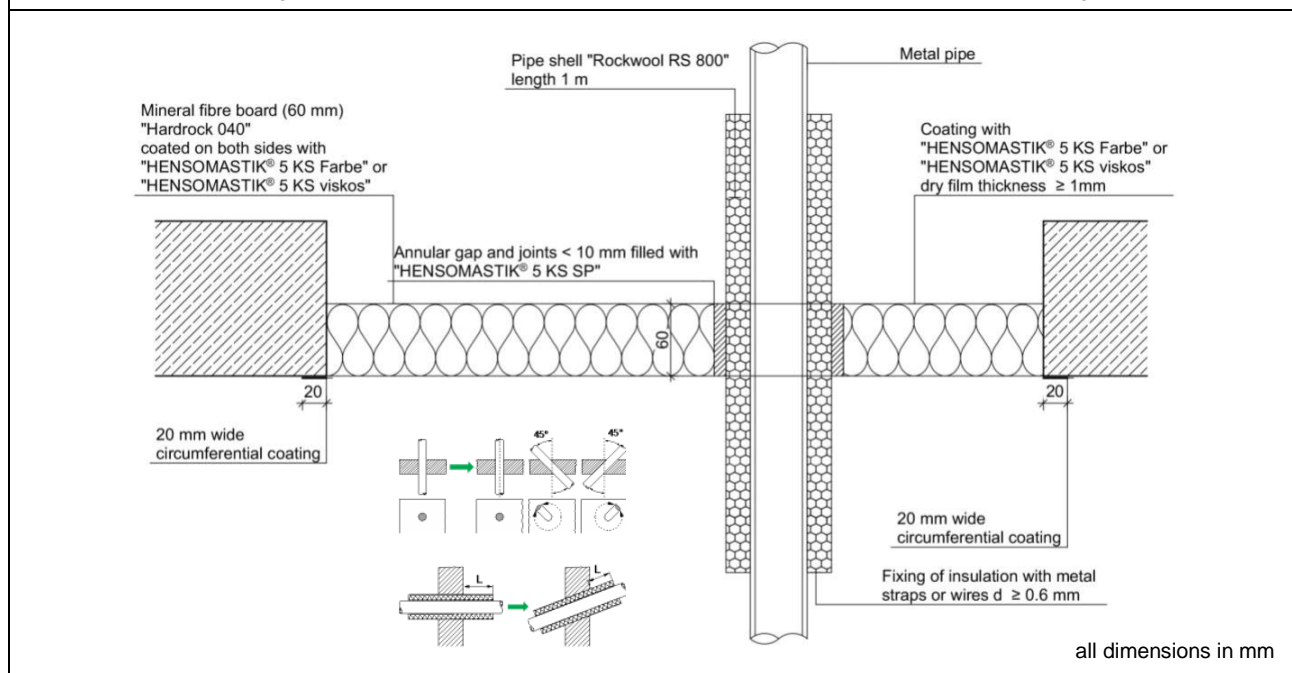
Services	Diameter [mm]	Wall thickness [mm]	Insulation	Insulation thickness min. [mm]	Insulation length min. [mm]	Classification
Copper	≤ 22	1.0 – 11.0	RS800	20	LI 1000	EI 60 U/C
	> 22 ≤ 42	1.5 – 14.2		20		
	> 42 ≤ 88.9	2.0 – 14.2		30		
Steel or cast iron	≤ 22	1.0 – 11.0	RS800	20	LI 1000	EI 60 U/C
	>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

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).

**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)

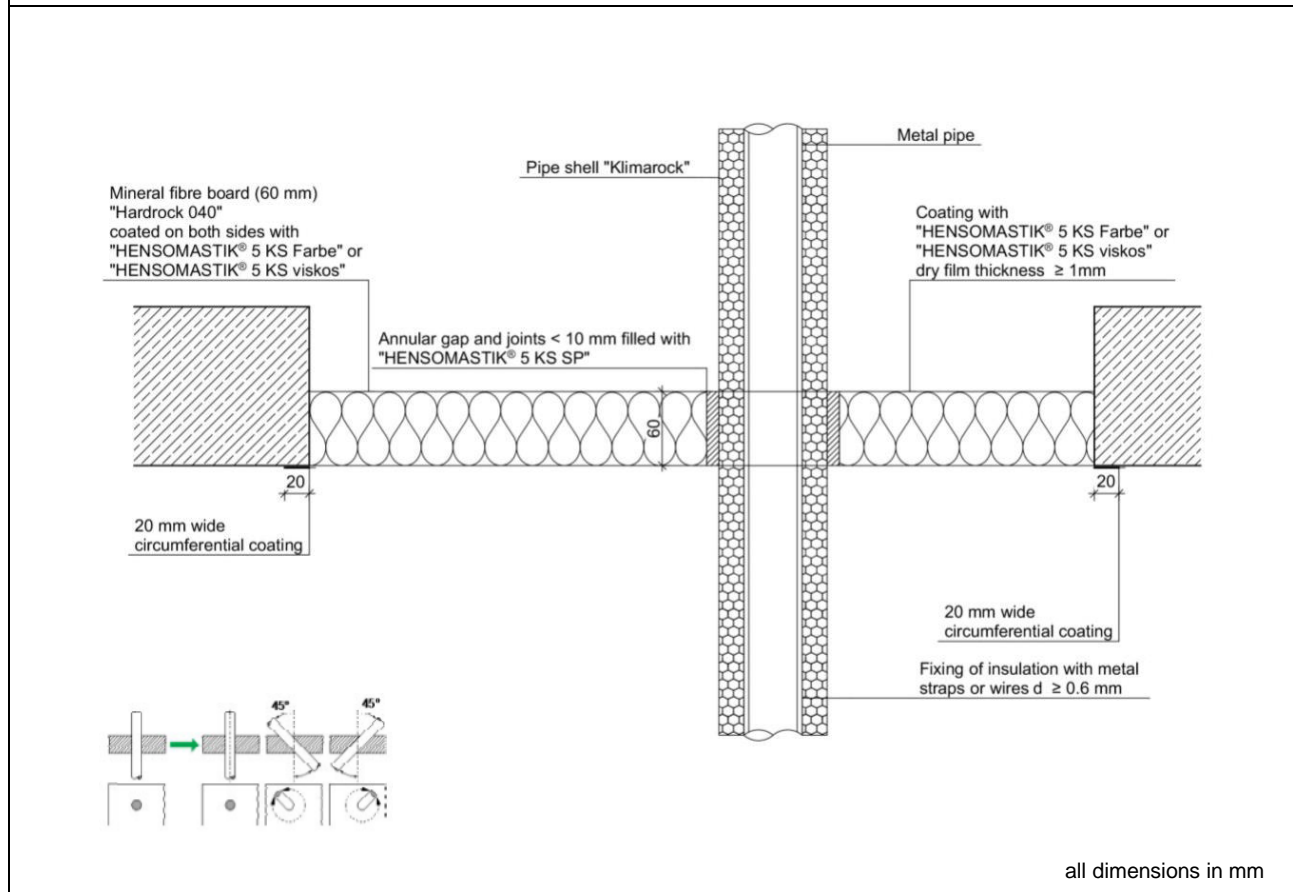
Services	Diameter [mm]	Wall thickness [mm]	Insulation	Insulation thickness min. [mm]	Insulation length min. [mm]	Classification
Copper	< 54	1.5 – 14.2	RS800	20	CS / LS 1000	EI 60 C/U
	54	1.5 – 14.2		20		
Steel or cast iron	≤ 15	1.0 – 7.5	RS800	20	CS / LS 1000	EI 60 C/U
	> 15 < 54	1.5 – 14.2		20		
	54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

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/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 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).

**B.13.1. 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 ≤ 54	1.5 – 14.2		20		
Steel or cast iron	≤ 15	1.0 – 7.5	Klimarock	20	CS	EI 60 U/C
	> 15 ≤ 54	1.5 – 14.2		20		
	> 54 ≤ 89	3.2 – 14.2		20		

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

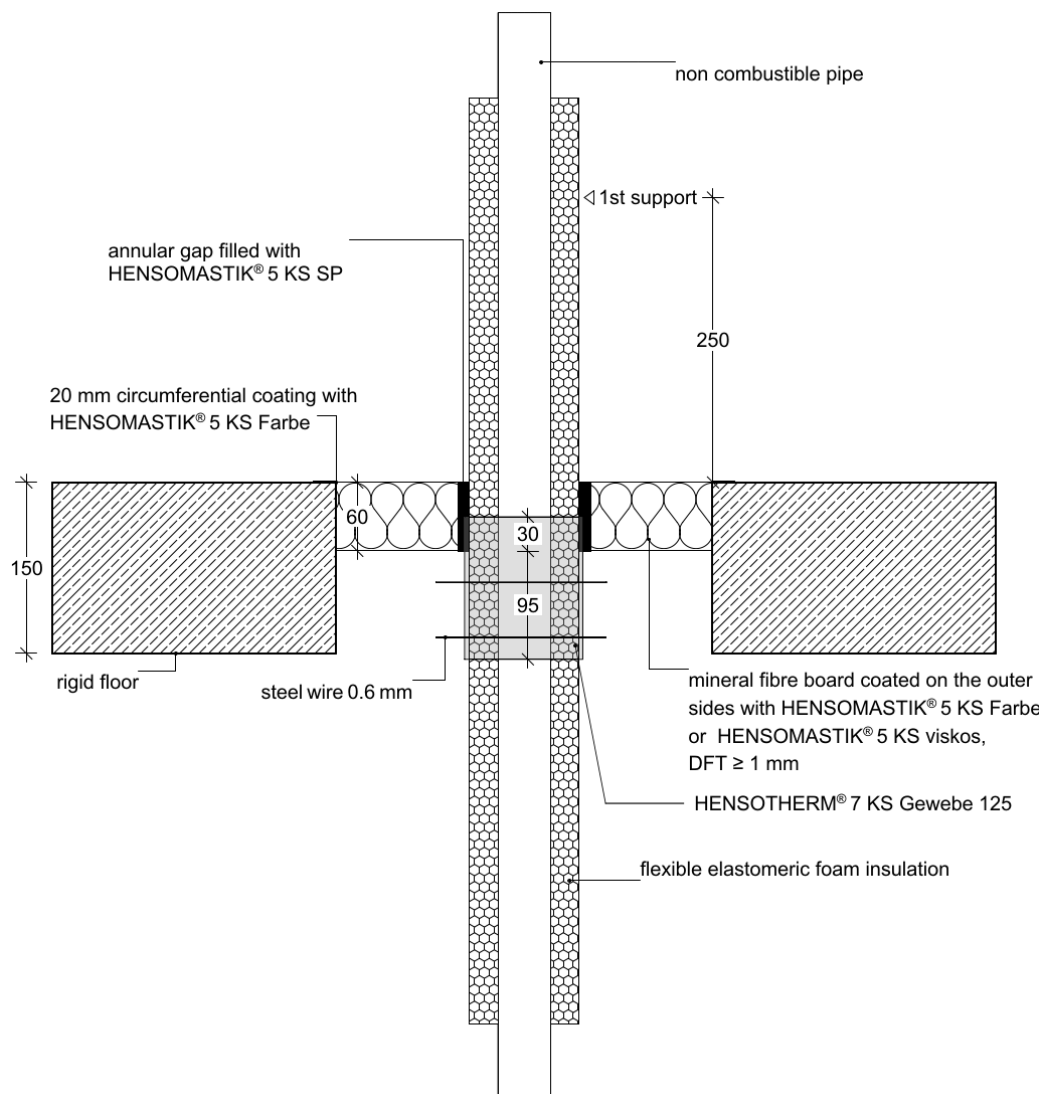
Construction details: Non-combustible metal pipes with min. 1000 mm long local sustained (LS) or continuous sustained (CS) flexible elastomeric foam (FEF) or synthetic rubber insulation in a HENSOMASTIK® Mixed Penetration Seal EI60 comprising one ≥ 60 mm thick Rockwool Hardrock 040 mineral fibre board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



all dimensions in 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 ≤ 22	1.0 – 11.0		18.0		1	
	> 22 ≤ 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 ≤ 22	1.0 – 11.0		18.0		1	
	> 23 ≤ 54	1.5 – 14.2		21.0		1	
	> 54 ≤ 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 ≤ 22	1.0 – 11.0		18.0		1	
	> 22 ≤ 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 ≤ 22	1.0 – 11.0		18.0		1	
	> 23 ≤ 54	1.5 – 14.2		21.0		1	
	> 54 ≤ 60.3	2.9 – 14.2		29.0		1	
	> 60.3 ≤ 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 ≤ 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 ≤ 54	1.5 – 14.2		25.0		1	
	> 54 ≤ 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 ≤ 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 ≤ 54	1.5 – 14.2		25.0		1	
	> 54 ≤ 89	3.2 – 14.2		25.0		1	

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 ≤ 22	1.0 – 11.0		9.0		1	
	> 22 ≤ 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 ≤ 22	1.0 – 11.0		9.0		1	
	> 22 ≤ 54	1.5 – 14.2		19.0		1	
	> 54 ≤ 60.3	2.9 – 14.2		25.0		1	
	> 60.3 ≤ 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)

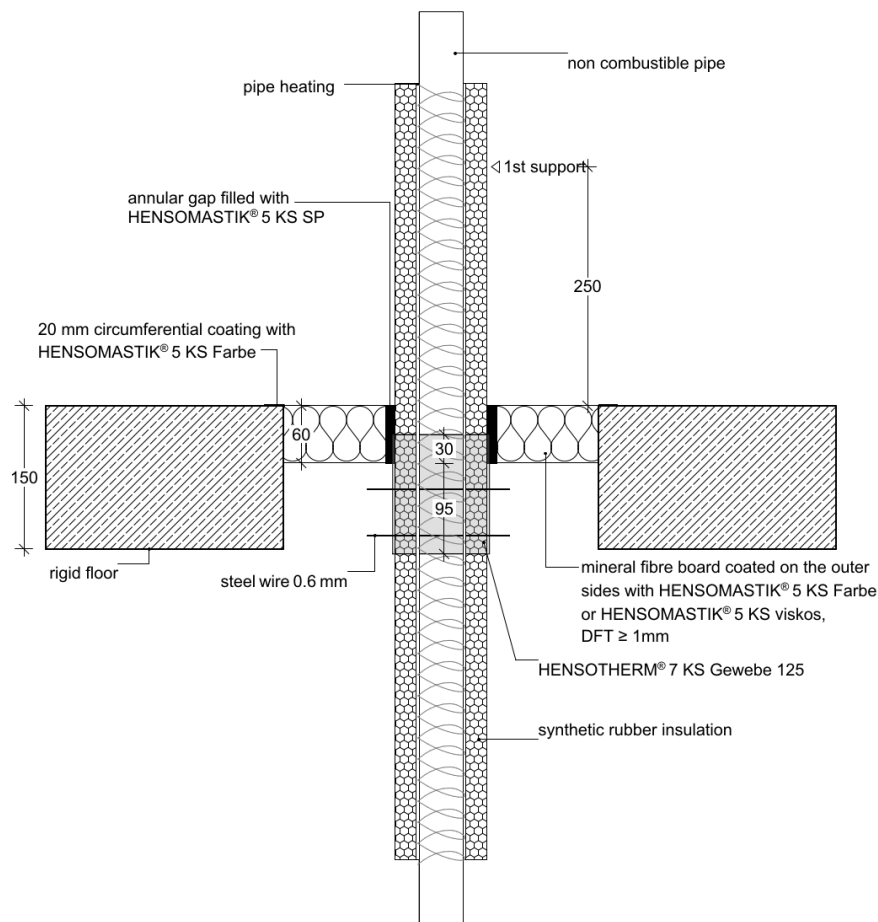
Services	Diameter [mm]	Wall thickness [mm]	Insulation	Insulation thickness [mm]	Insulation length [mm]	Layers of HENSOTHERM® 7 KS Gewebe 125 (1 mm)	Classification
Copper	≤ 15	1.0 – 7.5	Kaiflex KKplus	11.0	CS / LS 1000	1	EI 60 U/C
	> 15 ≤ 54	1.5 – 14.2		21.0		1	
Steel or cast iron	≤ 15	1.0 – 7.5	Kaiflex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

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.



all dimensions in mm

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

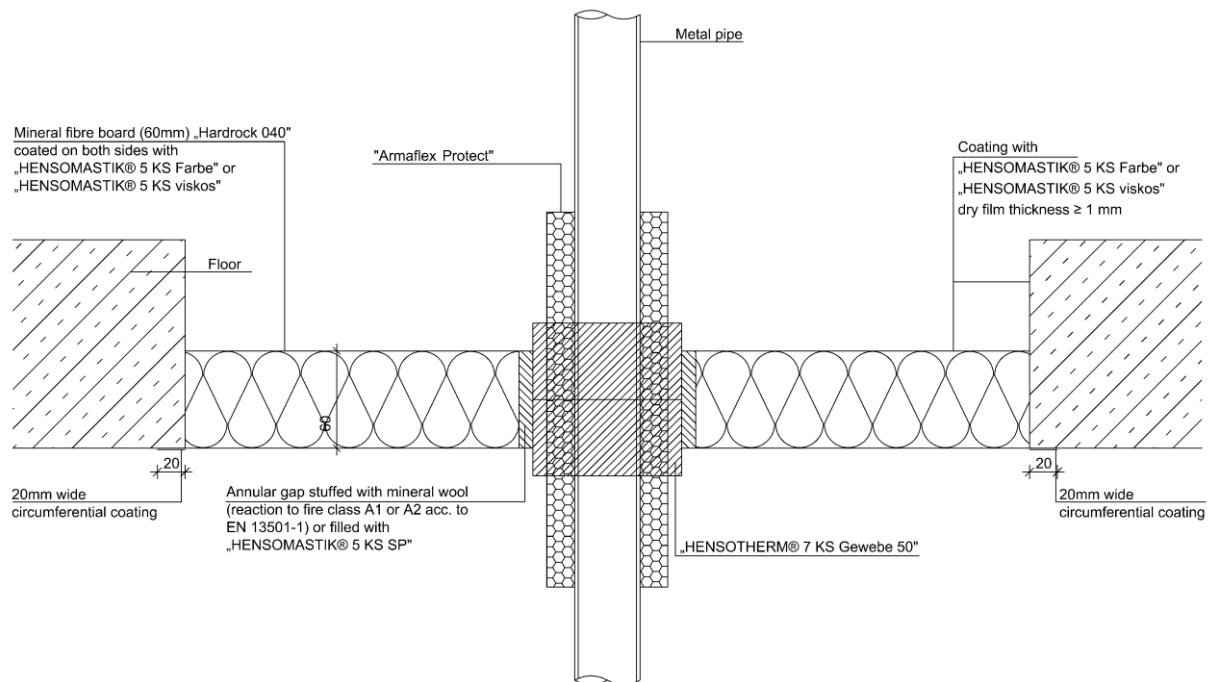
B.16. Metal pipes with FEF-insulation (LS) with HENSOTHERM® 7 KS Gewebe 50

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.



all dimensions in mm

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	

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

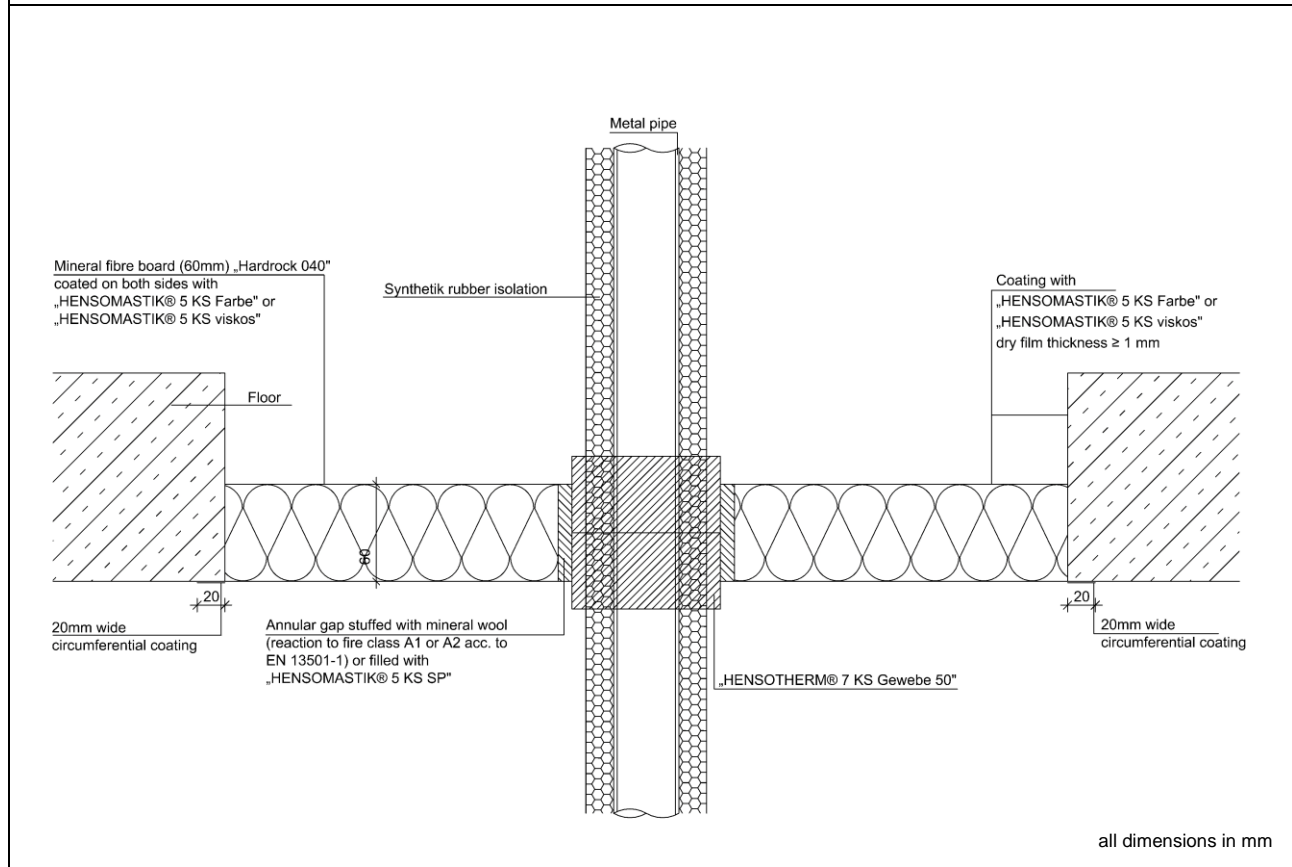
Services	Diameter [mm]	Wall thickness [mm]	Insulation	Insulation thickness [mm]	Insulation length [mm]	Layers of HENSOTHERM® 7 KS Gewebe 50 (2 mm)	Classification
Copper	≤ 15	1.0 – 7.5	ArmaFlex Protect	19.0 – 25.0	CS / LS 1000	1	EI 60 C/U
	> 15 ≤ 42	1.2 – 14.2		25.0		1	
	> 42 ≤ 54	1.5 – 14.2		25.0		1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

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.

**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	

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 ≤ 42	1.2 – 14.2		13.0 – 25.0		2	
	> 15 ≤ 42	1.2 – 14.2		25.0		2	
	> 42 ≤ 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 ≤ 42	1.2 – 14.2		13.0 – 25.0		2	
	> 15 ≤ 42	1.2 – 14.2		25.0		2	
	> 42 ≤ 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 ≤ 42	1.2 – 14.2		13.0 – 25.0		2	
	> 15 ≤ 42	1.2 – 14.2		25.0		2	
	> 42 ≤ 89	2.0 – 14.2		19.0 – 25.0		2	
	> 42 ≤ 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 ≤ 42	1.2 – 14.2		13.0 – 25.0		2	
	> 15 ≤ 42	1.2 – 14.2		25.0		2	
	> 42 ≤ 89	2.0 – 14.2		19.0 – 25.0		2	
	> 42 ≤ 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 ≤ 42	1.2 – 14.2		13.0 – 25.0		2	
	> 42 ≤ 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 ≤ 42	1.2 – 14.2		13.0 – 25.0		2	
	> 42 ≤ 54	1.5 – 14.2		25.0		2	
	114.3	4.5 – 14.2		32.0		2	

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 ≤ 42	1.2 – 14.2		13.0 – 25.0		2	
	> 42 ≤ 54	1.5 – 14.2		13.0 – 25.0		2	
	> 42 ≤ 54	1.5 – 14.2		25.0		2	
	> 54 ≤ 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 ≤ 42	1.2 – 14.2		13.0 – 25.0		2	
	> 42 ≤ 54	1.5 – 14.2		13.0 – 25.0		2	
	> 42 ≤ 54	1.5 – 14.2		25.0		2	
	> 54 ≤ 89	2.0 – 14.2		19.0 – 25.0		2	
	> 89 ≤ 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 ≤ 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 ≤ 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 ≤ 42	1.2 – 14.2		13.0 – 25.0		2	
	> 15 ≤ 42	1.2 – 14.2		25.0		2	
	> 42 ≤ 54	1.5 – 14.2		13.0 – 25.0		2	
	> 54 ≤ 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 ≤ 42	1.2 – 14.2		13.0 – 25.0		2	
	> 15 ≤ 42	1.2 – 14.2		25.0		2	
	> 42 ≤ 54	1.5 – 14.2		13.0 – 25.0		2	
	> 54 ≤ 89	2.0 – 14.2		19.0 – 25.0		2	
	> 89 ≤ 114.3	4.5 – 14.2		19.0		2	

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 ≤ 42	1.2 – 14.2		13.0 – 25.0		2	
	> 15 ≤ 42	1.2 – 14.2		25.0		2	
	> 42 ≤ 54	1.5 – 14.2		13.0 – 25.0		2	
	> 54 ≤ 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 ≤ 42	1.2 – 14.2		13.0 – 25.0		2	
	> 15 ≤ 42	1.2 – 14.2		25.0		2	
	> 42 ≤ 54	1.5 – 14.2		13.0 – 25.0		2	
	> 54 ≤ 89	2.0 – 14.2		19.0 – 25.0		2	
	> 89 ≤ 114.3	4.5 – 14.2		19.0		2	
	> 89 ≤ 114.3	4.5 – 14.2		19.0 – 25.0		2	