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to Article 29 of the Regulation (EU)
No 305/2011 of the European
Parliament and of the Council of 9
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MEMBER OF EOTA



European Technical Assessment ETA-22/0542 of 2022/09/06

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:

HENSOTHERM® ST for single penetrations

Product family to which the above construction product belongs:

Fire stopping and fire sealing 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:

22 pages including 16 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:

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II SPECIFIC PART OF THE EUROPEAN TECHNICAL ASSESSMENT

1 Technical description of the product.

The HENSOTHERM® ST for single penetrations (HENSOTHERM® Service Transit for single penetrations) is an intumescent fire stop service transit for single penetrations, the product is used to form a penetration seal to reinstate the fire resistance performance of a separating element (wall or floor) temporarily or permanently where they have been provided with apertures, which are penetrated by various services such like cable or pipe penetration.

HENSOTHERM® ST for single penetrations is available in the following dimensions:

Available Product Variants	Length [mm]	Diameter [mm]
HENSOTHERM® ST 250-63	250	63
HENSOTHERM® ST 250-90	250	90
HENSOTHERM® ST 250-110	250	110
HENSOTHERM® ST 400-63	400	63
HENSOTHERM® ST 400-90	400	90
HENSOTHERM® ST 400-110	400	110

Table 1: HENSOTHERM® ST available product variants

HENSOTHERM® ST for single penetrations must not be cut to length or slit. A ceramic wool plug placed in the centre of the transit will prevent the passage of cold smoke and gases.

Penetrating services can be retrofitted without having to install a new penetration seal. After replacing or changing services passing through the HENSOTHERM® ST for single penetrations, the ceramic wool plug must always be adapted to the diameter of the penetrating services and re-fitted.

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

The construction product HENSOTHERM® ST for single penetrations is assessed on the basis of EAD 35054-00-1104, as a fire stopping product, penetration seal.

The construction product HENSOTHERM® ST for single penetrations is intended for use as a pre-assembled fire penetration seal solution consisting of a high-density crack-resistant plastic tube containing graphite based intumescent lining of HENSOTHERM® 7 KS Gewebe 1mm/2 mm E which expands upon heating to seal spaces or voids around cables and pipes led through it.

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

HENSOTHERM® ST for single penetrations can be used in the following constructions:

Flexible or rigid walls, thickness: $\geq 100 \leq 150$ mm.

Rigid walls, thickness: ≥ 150 mm.

Rigid floors, thickness: $\geq 150 \leq 200$ mm.

Rigid floors, thickness: ≥ 200 mm.

More information in the annexes A.1- D.4.1.

The fire sealing products are to be installed according to the manufacturer’s installation manual.

The provisions made in this European Technical Assessment are based on an assumed intended working life of the HENSOTHERM® ST for single penetrations 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 Euroclass E in accordance with EN 13501-1 and Commission Delegated Regulation 2016/364
Resistance to fire	The fire resistance is classified in accordance with EN 13501-2, more information in Annexes A.1 to D.4.1
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*	No dangerous substances
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
3.5 Protection against noise (BWR5)	
Airborne sound insulation	$R_w (C; C_{tr}) : 51 (-1; -3) \text{ dB}$
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.

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

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

Optionally the product was successfully tested under specific application conditions:

- Exposure to a constant temperature of 80 °C for 40 days.
- Exposure to solvents (tested with Butylacetat, Butanol, solvent naphtha and fuel)
- subsequent over-painting (tested with coatings on the basis of acryl dispersion, alkyd resin, polyurethan acryl and epoxide resin)
- Exposure to water immersion for 4 weeks
- Exposure to intimate contact to plastics (PVC,PE)

The characteristics “expansion ratio” and “expansion pressure” did not change essentially due to the exposure.

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.

HENSOTHERM® ST for single penetrations 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 2022-09-06 by



Thomas Bruun
Managing Director, ETA-Danmark

A.1. Construction details

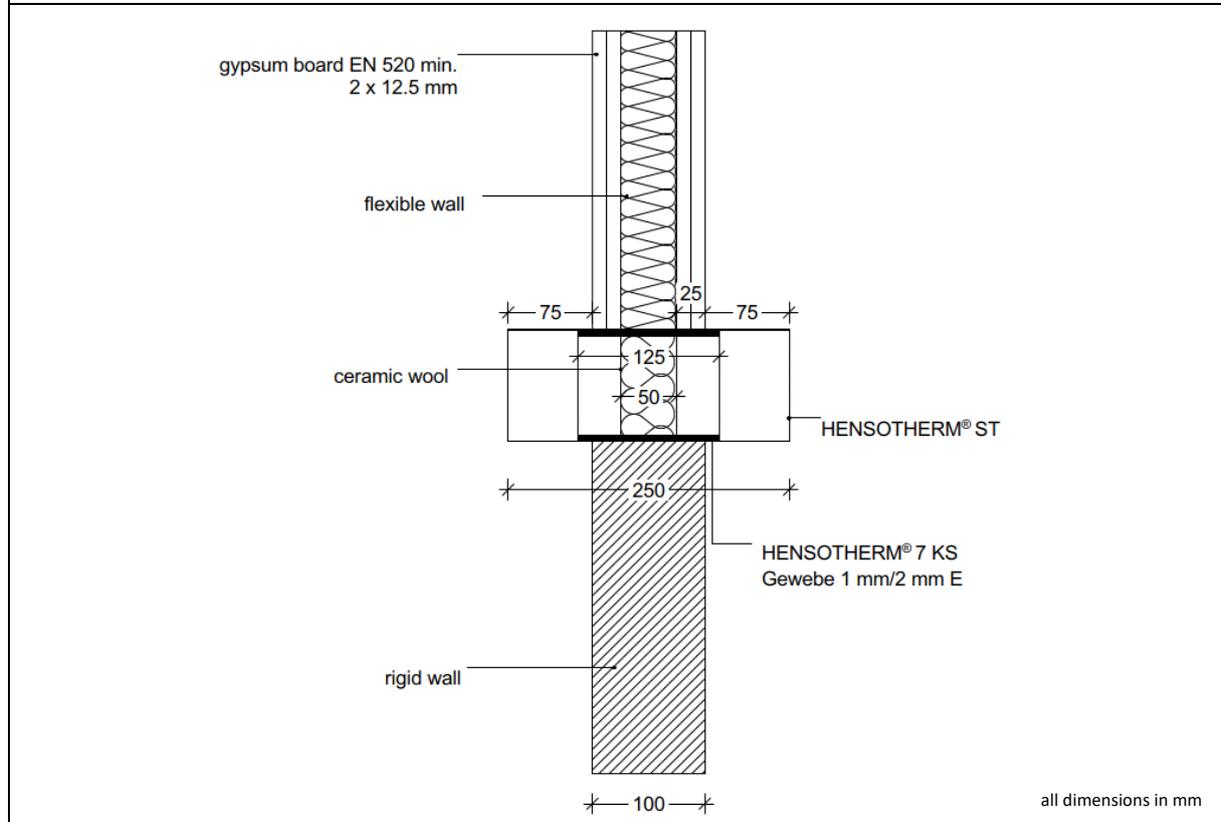
The supporting construction must be classified in accordance with EN 13501-2 for the required fire resistance period.

Flexible walls: The wall must have a minimum thickness of minimum 100 mm and maximum of 150 mm and consist of a wooden or steel stud structure lined on both faces with at least two layers of 12.5 mm thick boards. A minimum distance of 100 mm must be maintained between the seal and the studs, and the gap between the stud and the seal must be closed with at least 100 mm of insulation material of class A1 or A2 according to EN 13501-1.

Rigid walls: The wall must have a minimum thickness of 100 mm and maximum of 150 mm, and comprise concrete, aerated concrete or masonry, with a minimum density of 650 kg/m³.

Permitted distances: Other penetration seals: ≥ 200 mm, provided that one or both of the adjacent openings is larger than 400 mm x 400 mm, otherwise ≥ 100 mm. Other openings or installations: ≥ 200 mm, provided that one or both of the adjacent openings is larger than 200 mm x 200 mm, otherwise ≥ 100 mm.

Penetration Seal: HENSOTHERM® Service Transit type ST 250 (length 250 mm) friction fitted into a flexible or rigid wall and positioned centre of the wall. Allowed annular space width (a1) 0 mm, i.e. no annular gap, and maximum seal size defined by HENSOTHERM® Service Transit diameter. Blank seal, no penetrating services.



A.1.1. Blank seal, friction fitted

Conduit	Classification		
	HENSOTHERM® ST 250 Diameter 63 mm	HENSOTHERM® ST 250 Diameter 90 mm	HENSOTHERM® ST 250 Diameter 110 mm
Empty, no penetrating services	EI 120	EI 120	EI 120

A.2. Construction details

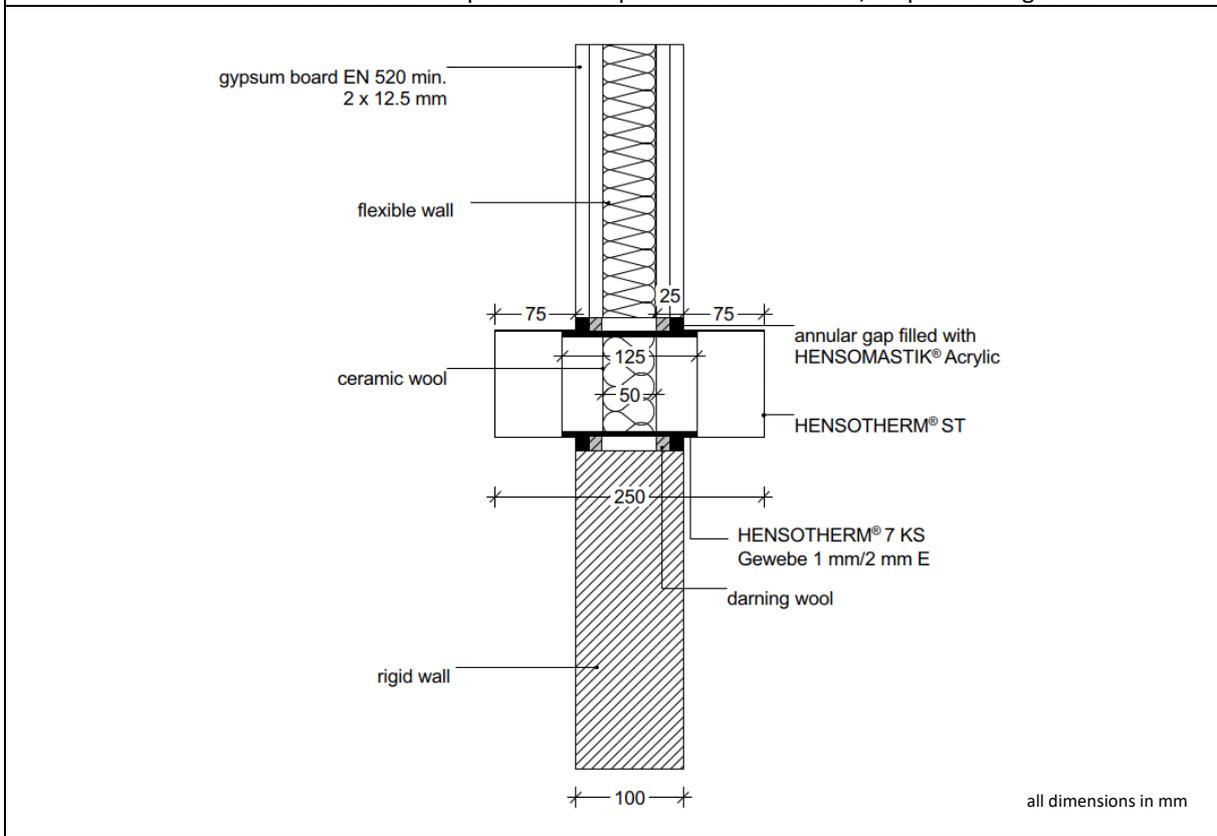
The supporting construction must be classified in accordance with EN 13501-2 for the required fire resistance period.

Flexible walls: The wall must have a minimum thickness of minimum 100 mm and maximum of 150 mm and consist of a wooden or steel stud structure lined on both faces with at least two layers of 12.5 mm thick boards. A minimum distance of 100 mm must be maintained between the seal and the studs, and the gap between the stud and the seal must be closed with at least 100 mm of insulation material of class A1 or A2 according to EN 13501-1.

Rigid walls: The wall must have a minimum thickness of 100 mm and maximum of 150 mm, and comprise concrete, aerated concrete or masonry, with a minimum density of 650 kg/m³.

Permitted distances: Other penetration seals: ≥ 200 mm, provided that one or both of the adjacent openings is larger than 400 mm x 400 mm, otherwise ≥ 100 mm. Other openings or installations: ≥ 200 mm, provided that one or both of the adjacent openings is larger than 200 mm x 200 mm, otherwise ≥ 100 mm.

Penetration Seal: HENSOTHERM® Service Transit type ST 250 (length 250 mm) fitted into a flexible or rigid wall and positioned centrally in the wall. The annular gap sealed on both sides of the wall with loose stone wool ≥ 40 kg/m³ backing 12.5 mm deep and HENSOMASTIK® Acrylic min. 12.5 mm deep and flush with the faces of the wall. Allowed annular space width (a1) 10-20 mm, and maximum seal size defined by HENSOTHERM® Service Transit diameter plus annular space width. Blank seal, no penetrating services.



A.2.1. Blank seal, annular gap filled with HENSOMASTIK® Acrylic

Conduit	Classification		
	HENSOTHERM® ST 250 Diameter 63 mm	HENSOTHERM® ST 250 Diameter 90 mm	HENSOTHERM® ST 250 Diameter 110 mm
Empty, no penetrating services	EI 90	EI 90	EI 90

A.3. Construction details

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

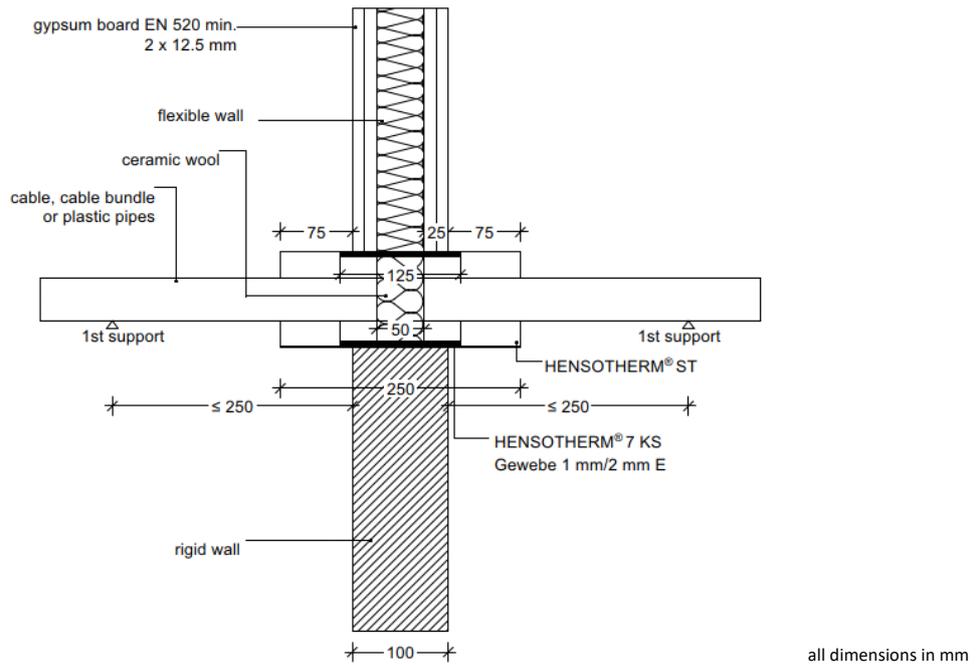
Flexible walls: The wall must have a minimum thickness of minimum 100 mm and maximum of 150 mm and consist of a wooden or steel stud structure lined on both faces with at least two layers of 12.5 mm thick boards. A minimum distance of 100 mm must be maintained between the seal and the studs, and the gap between the stud and the seal must be closed with at least 100 mm of insulation material of class A1 or A2 according to EN 13501-1.

Rigid walls: The wall must have a minimum thickness of 100 mm and maximum of 150 mm, and comprise concrete, aerated concrete or masonry, with a minimum density of 650 kg/m³.

Permitted distances: Other penetration seals: ≥ 200 mm, provided that one or both of the adjacent openings is larger than 400 mm x 400 mm, otherwise ≥ 100 mm. Other openings or installations: ≥ 200 mm, provided that one or both of the adjacent openings is larger than 200 mm x 200 mm, otherwise ≥ 100 mm. Services shall be supported at maximum 250 mm from both faces of the wall.

Penetration Seal: Single cables, cable bundles or electrical installation pipes (PVC) with or without cables led through a HENSOTHERM® Service Transit type ST 250 (length 250 mm) friction fitted into a flexible or rigid wall and positioned centrally in the wall. Allowed annular space width (a1) 0 mm, i.e. no annular gap, and maximum seal size defined by HENSOTHERM® Service Transit diameter.

The maximum permissible occupancy of the HENSOTHERM® Service Transit is 100 % of its inner cross-section. The ceramic wool plug must be removed, and its length adapted to the diameter of the penetrating services to allow a re-installation centrally in the HENSOTHERM® Service Transit, sealing any remaining free spaces around the penetrating services.



A.3.1. Single electrical cables, cable bundles and electrical installation pipes (PVC)

Conduit	Classification		
	HENSOTHERM® ST 250 Diameter 63 mm	HENSOTHERM® ST 250 Diameter 90 mm	HENSOTHERM® ST 250 Diameter 110 mm
PVC pipes ≤ 32 mm without cables	EI 90	n. a.	n. a.
PVC pipes ≤ 32 mm with cables ≤ 21 mm	EI 60	n. a.	n. a.
PVC pipes ≤ 32 mm with cables A1, A2, A3 or B	n. a.	EI 90	EI 90
With cables A1, A2, A3 or B	EI 60	EI 90	EI 90

A.4. Construction details

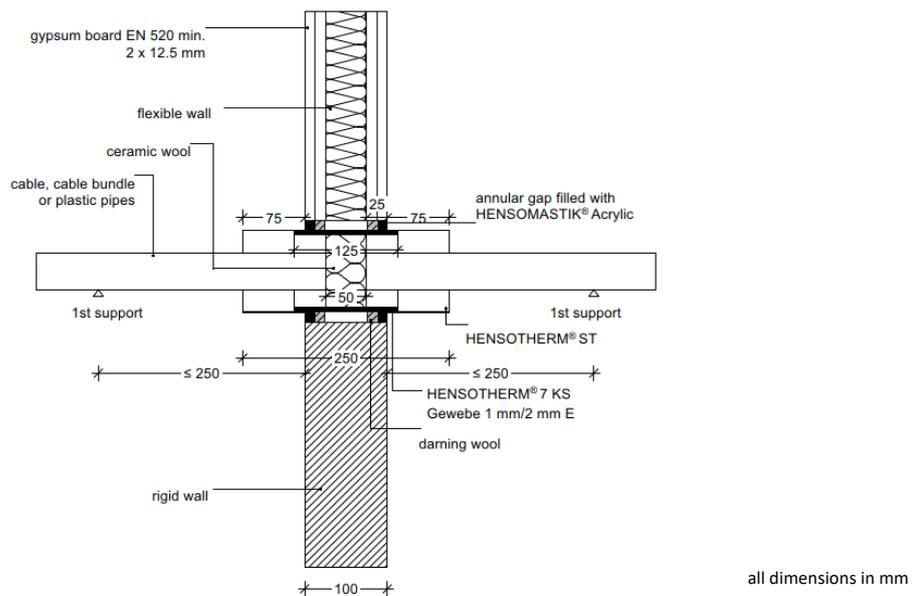
The supporting construction must be classified in accordance with EN 13501-2 for the required fire resistance period.

Flexible walls: The wall must have a minimum thickness of minimum 100 mm and maximum of 150 mm and consist of a wooden or steel stud structure lined on both faces with at least two layers of 12.5 mm thick boards. A minimum distance of 100 mm must be maintained between the seal and the studs, and the gap between the stud and the seal must be closed with at least 100 mm of insulation material of class A1 or A2 according to EN 13501-1.

Rigid walls: The wall must have a minimum thickness of 100 mm and maximum of 150 mm, and comprise concrete, aerated concrete or masonry, with a minimum density of 650 kg/m³.

Permitted distances: Other penetration seals: ≥ 200 mm, provided that one or both of the adjacent openings is larger than 400 mm x 400 mm, otherwise ≥ 100 mm. Other openings or installations: ≥ 200 mm, provided that one or both of the adjacent openings is larger than 200 mm x 200 mm, otherwise ≥ 100 mm. Services shall be supported at maximum 250 mm from both faces of the wall.

Penetration Seal: Single cables, cable bundles or electrical installation pipes (PVC) with or without cables led through a HENSOTHERM® Service Transit type ST 250 (length 250 mm) fitted into a flexible or rigid wall and positioned centrally in the wall. The annular gap sealed on both sides of the wall with loose stone wool ≥ 40 kg/m³ backing 12.5 mm deep and HENSOMASTIK® Acrylic min. 12.5 mm deep and positioned flush to the faces of the wall. Allowed annular space width (a1) 10-20 mm and maximum seal size defined by HENSOTHERM® Service Transit diameter plus annular space width. The ceramic wool plug is adapted to fit the diameter of the penetrating services and re-installed centrally in the HENSOTHERM® Service Transit, sealing any remaining free spaces around the penetrating services. The maximum permissible occupancy of the HENSOTHERM® Service Transit is 100 % of its inner cross-section.



A.4.1. Single electrical cables, cable bundles and electrical installation pipes (PVC), annular gap filled with HENSOMASTIK® Acrylic

Conduit	Classification		
	HENSOTHERM® ST 250 Diameter 63 mm	HENSOTHERM® ST 250 Diameter 90 mm	HENSOTHERM® ST 250 Diameter 110 mm
PVC pipes ≤ 32 mm without cables	EI 90	n. a.	n. a.
PVC pipes ≤ 32 mm with cables ≤ 21 mm	EI 90	n. a.	n. a.
PVC pipes ≤ 32 mm with cables A1, A2, A3 or B	n. a.	EI 90	EI 90
With cables A1, A2, A3 or B	EI 90	EI 90	EI 90

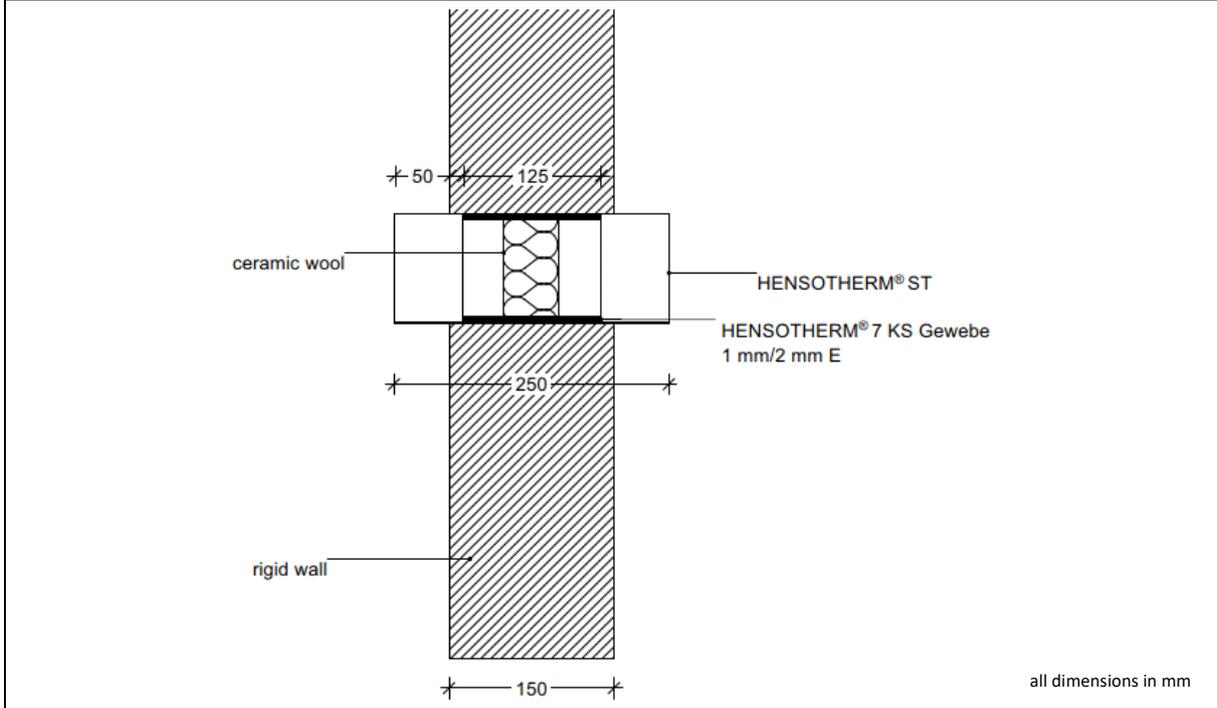
B.1. Construction details

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

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

Permitted distances: Other penetration seals: ≥ 200 mm, provided that one or both of the adjacent openings is larger than 400 mm x 400 mm, otherwise ≥ 100 mm. Other openings or installations: ≥ 200 mm, provided that one or both of the adjacent openings is larger than 200 mm x 200 mm, otherwise ≥ 100 mm.

Penetration Seal: HENSOTHERM® Service Transit type ST 250 (length 250 mm) friction fitted into a rigid wall and positioned centre of the wall. Allowed annular space width (a1) 0 mm, i.e. no annular gap, and maximum seal size defined by HENSOTHERM® Service Transit diameter. Blank seal, no penetrating services.



B.1.1. Blank seal, friction fitted

Conduit	Classification		
	HENSOTHERM® ST 250 Diameter 63 mm	HENSOTHERM® ST 250 Diameter 90 mm	HENSOTHERM® ST 250 Diameter 110 mm
Empty, no penetrating services	EI 180	EI 180	EI 180

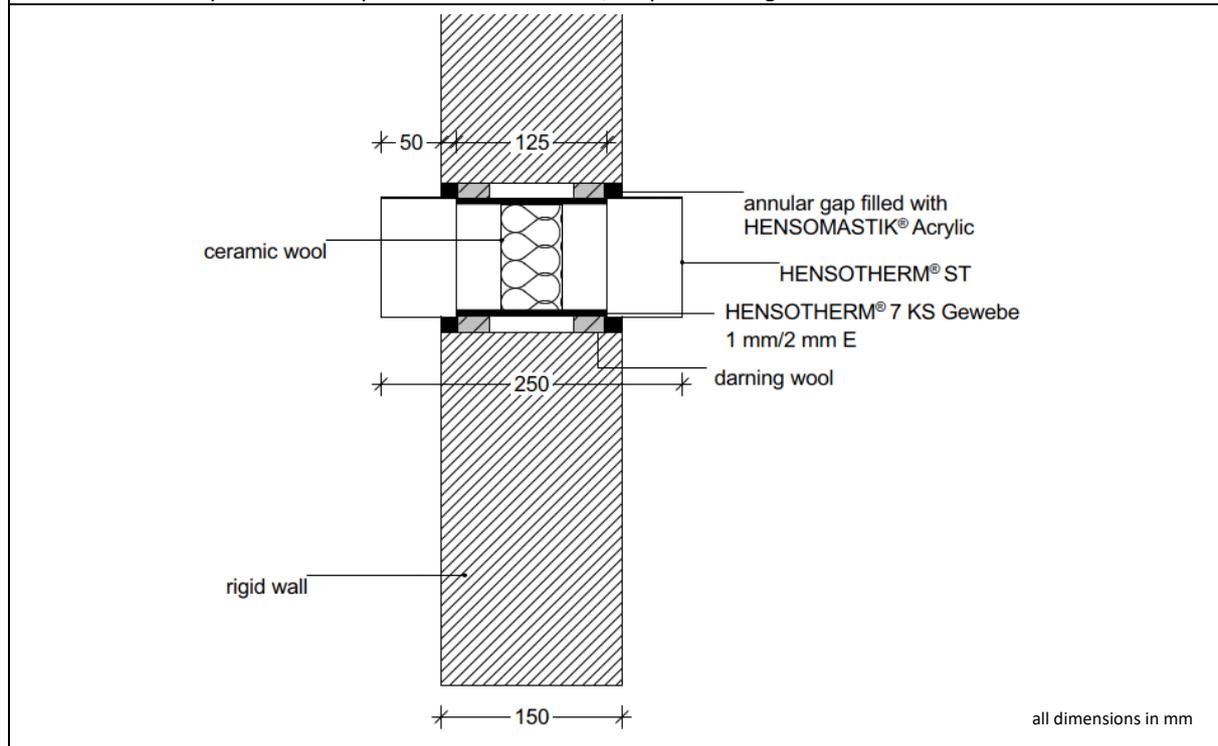
B.2. Construction details

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

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

Permitted distances: Other penetration seals: ≥ 200 mm, provided that one or both of the adjacent openings is larger than 400 mm x 400 mm, otherwise ≥ 100 mm. Other openings or installations: ≥ 200 mm, provided that one or both of the adjacent openings is larger than 200 mm x 200 mm, otherwise ≥ 100 mm.

Penetration Seal: HENSOTHERM® Service Transit type ST 250 (length 250 mm) fitted into a rigid wall and positioned centrally in the wall. The annular gap sealed on both sides of the wall with loose stone wool ≥ 40 kg/m³ backing 25 mm deep and HENSOMASTIK® Acrylic min. 15 mm deep and flush with the faces of the wall. Allowed annular space width (a1) 10-20 mm, and maximum seal size defined by HENSOTHERM® Service Transit diameter plus annular space width. Blank seal, no penetrating services.



B.2.1. Blank seal, annular gap filled with HENSOMASTIK® Acrylic

Conduit	Classification		
	HENSOTHERM® ST 250 Diameter 63 mm	HENSOTHERM® ST 250 Diameter 90 mm	HENSOTHERM® ST 250 Diameter 110 mm
Empty, no penetrating services	EI 180	EI 180	EI 180

B.3. Construction details

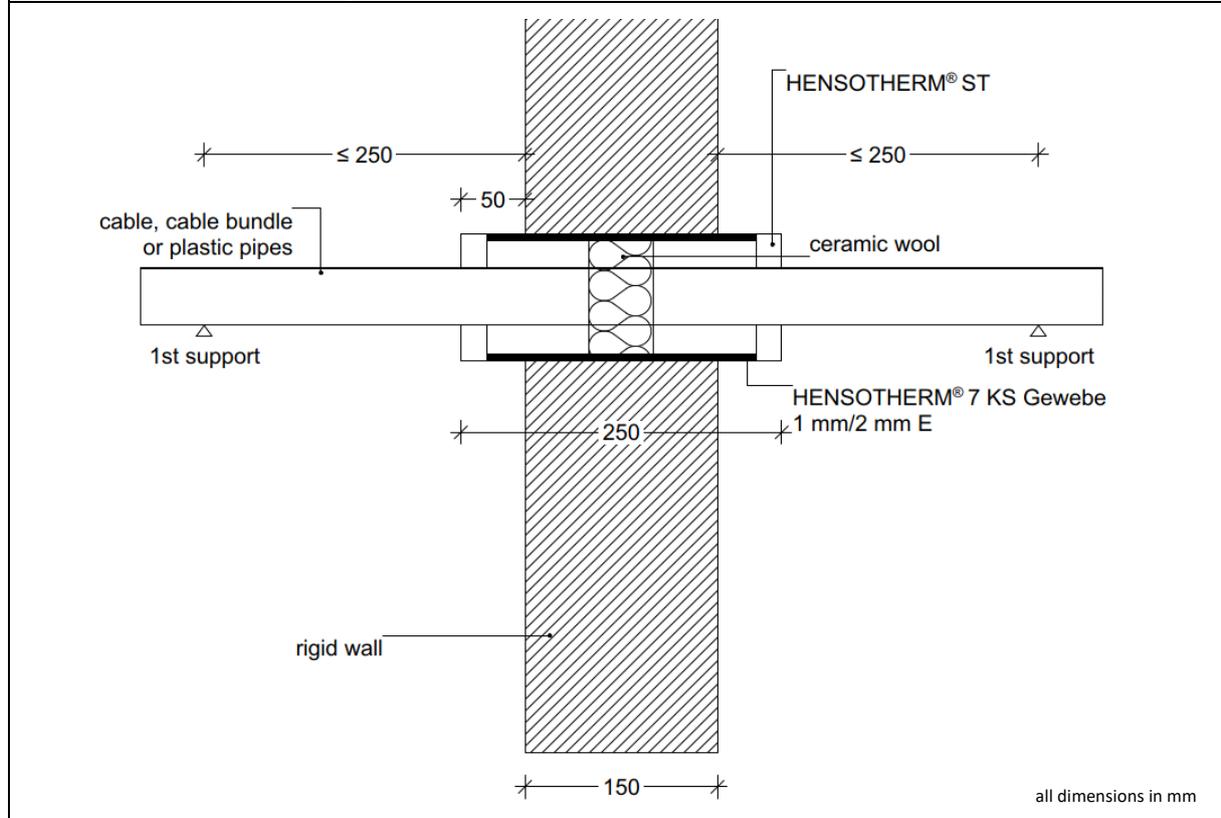
The supporting construction must be classified in accordance with EN 13501-2 for the required fire resistance period.

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

Permitted distances: Other penetration seals: ≥ 200 mm, provided that one or both of the adjacent openings is larger than 400 mm x 400 mm, otherwise ≥ 100 mm. Other openings or installations: ≥ 200 mm, provided that one or both of the adjacent openings is larger than 200 mm x 200 mm, otherwise ≥ 100 mm. Services shall be supported at maximum 250 mm from both faces of the wall.

Penetration Seal: Single cables, cable bundles or electrical installation pipes (PVC) with or without cables led through a HENSOTHERM® Service Transit type ST 250 (length 250 mm) friction fitted into a rigid wall and positioned centrally in the wall. Allowed annular space width (a1) 0 mm, i.e. no annular gap, and maximum seal size defined by HENSOTHERM® Service Transit diameter.

The maximum permissible occupancy of the HENSOTHERM® Service Transit is 100 % of its inner cross-section. The ceramic wool plug must be removed, and its length adapted to the diameter of the penetrating services to allow a re-installation centrally in the HENSOTHERM® Service Transit, sealing any remaining free spaces around the penetrating services.



B.3.1. Single electrical cables, cable bundles and electrical installation pipes (PVC), friction fitted

Conduit	Classification		
	HENSOTHERM® ST 250 Diameter 63 mm	HENSOTHERM® ST 250 Diameter 90 mm	HENSOTHERM® ST 250 Diameter 110 mm
PVC pipes ≤ 32 mm without cables	EI 180	n. a.	n. a.
PVC pipes ≤ 32 mm with cables ≤ 21 mm	EI 180	n. a.	n. a.
PVC pipes ≤ 32 mm with cables A1, A2, A3 or B	n. a.	EI 180	EI 180
With cables A1, A2, A3 or B	EI 180	EI 180	EI 180

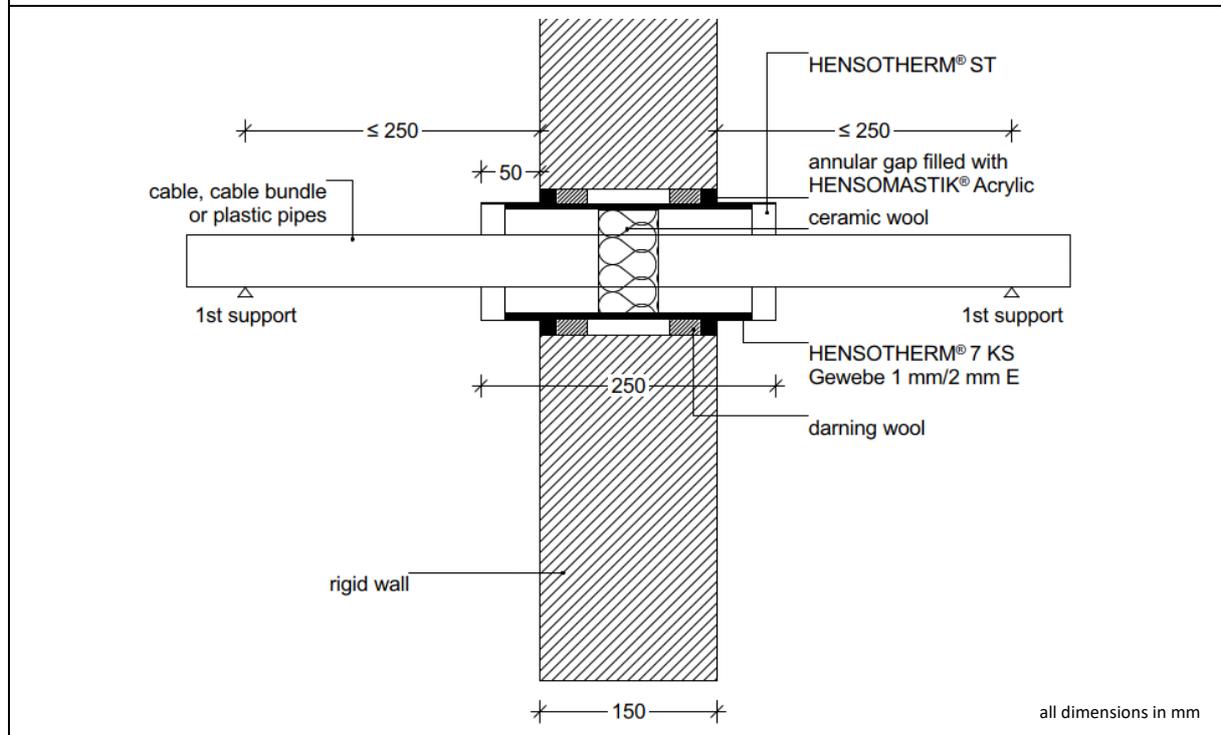
B.4. Construction details

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

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

Permitted distances: Other penetration seals: ≥ 200 mm, provided that one or both of the adjacent openings is larger than 400 mm x 400 mm, otherwise ≥ 100 mm. Other openings or installations: ≥ 200 mm, provided that one or both of the adjacent openings is larger than 200 mm x 200 mm, otherwise ≥ 100 mm. Services shall be supported at maximum 250 mm from both faces of the wall.

Penetration Seal: Single cables, cable bundles or electrical installation pipes (PVC) with or without cables led through a HENSOTHERM® Service Transit type ST 250 (length 250 mm) fitted into rigid wall and positioned centrally in the wall. The annular gap sealed on both sides of the wall with loose stone wool ≥ 40 kg/m³ backing 25 mm deep and HENSOMASTIK® Acrylic min. 15 mm deep and positioned flush to the faces of the wall. Allowed annular space width (a1) 10-20 mm and maximum seal size defined by HENSOTHERM® Service Transit diameter plus annular space width. The ceramic wool plug is adapted to fit the diameter of the penetrating services and re-installed centrally in the HENSOTHERM® Service Transit, sealing any remaining free spaces around the penetrating services. The maximum permissible occupancy of the HENSOTHERM® Service Transit is 100 % of its inner cross-section.



B.4.1. Single electrical cables, cable bundles and electrical installation pipes (PVC), annular gap filled with HENSOMASTIK® Acrylic

Conduit	Classification		
	HENSOTHERM® ST 250 Diameter 63 mm	HENSOTHERM® ST 250 Diameter 90 mm	HENSOTHERM® ST 250 Diameter 110 mm
PVC pipes ≤ 32 mm without cables	EI 180	n. a.	n. a.
PVC pipes ≤ 32 mm with cables ≤ 21 mm	EI 120	n. a.	n. a.
PVC pipes ≤ 32 mm with cables A1, A2, A3 or B	n. a.	EI 120	EI 120
With cables A1, A2, A3 or B	EI 180	EI 180	EI 180

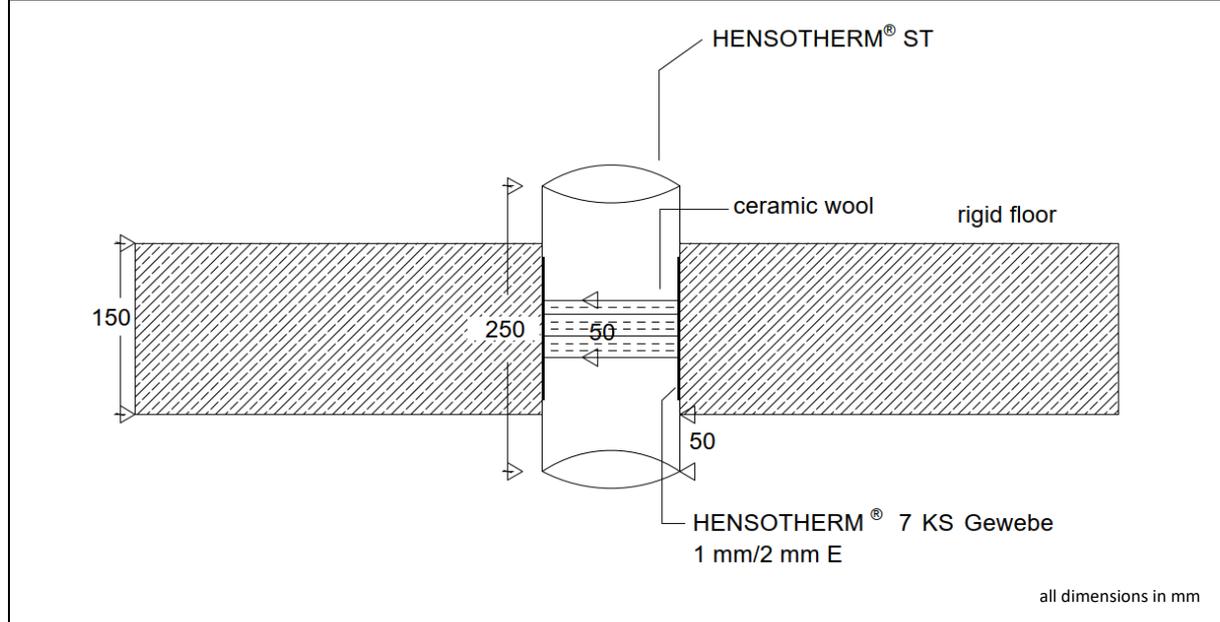
C.1. Construction details

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

Rigid floors: The floor must have a minimum thickness of 150 mm and maximum of 200 mm and comprise aerated concrete or concrete with a minimum density of 650 kg/m³.

Permitted distances: Other penetration seals: ≥ 200 mm, provided that one or both of the adjacent openings is larger than 400 mm x 400 mm, otherwise ≥ 100 mm. Other openings or installations: ≥ 200 mm, provided that one or both of the adjacent openings is larger than 200 mm x 200 mm, otherwise ≥ 100 mm.

Penetration Seal: HENSOTHERM® Service Transit type ST 250 (length 250 mm) friction fitted into a rigid floor and positioned centrally in the floor. Allowed annular space width (a1) 0 mm, i.e. no annular gap, and maximum seal size defined by HENSOTHERM® Service Transit diameter. Blank seal, no penetrating services.



C.1.1. Blank seal, friction fitted

Conduit	Classification		
	HENSOTHERM® ST 250 Diameter 63 mm	HENSOTHERM® ST 250 Diameter 90 mm	HENSOTHERM® ST 250 Diameter 110 mm
Empty, no penetrating services	EI 120	EI 120	EI 120

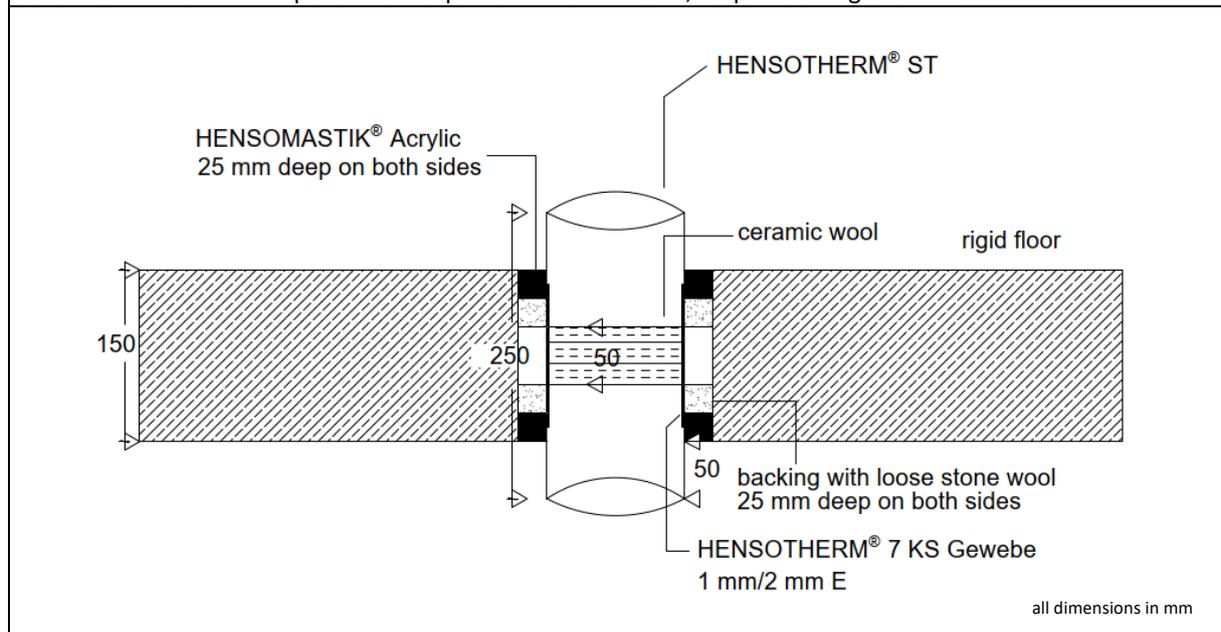
C.2. Construction details

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

Rigid floors: The floor must have a minimum thickness of 150 mm and maximum of 200 mm and comprise aerated concrete or concrete with a minimum density of 650 kg/m³.

Permitted distances: Other penetration seals: ≥ 200 mm, provided that one or both of the adjacent openings is larger than 400 mm x 400 mm, otherwise ≥ 100 mm. Other openings or installations: ≥ 200 mm, provided that one or both of the adjacent openings is larger than 200 mm x 200 mm, otherwise ≥ 100 mm.

Penetration Seal: HENSOTHERM® Service Transit type ST 250 (length 250 mm) fitted into a rigid floor and positioned centrally in the floor. The annular gap sealed on both sides of the floor with loose stone wool ≥ 40 kg/m³ backing 25 mm deep and HENSOMASTIK® Acrylic min. 25 mm deep flush with the faces of the floor. Allowed annular space width (a1) 10-20 mm, and maximum seal size defined by HENSOTHERM® Service Transit diameter plus annular space width. Blank seal, no penetrating services.



C.2.1. Blank seal, annular gap filled with HENSOMASTIK® Acrylic

Conduit	Classification		
	HENSOTHERM® ST 250 Diameter 63 mm	HENSOTHERM® ST 250 Diameter 90 mm	HENSOTHERM® ST 250 Diameter 110 mm
Empty, no penetrating services	EI 120	EI 120	EI 120

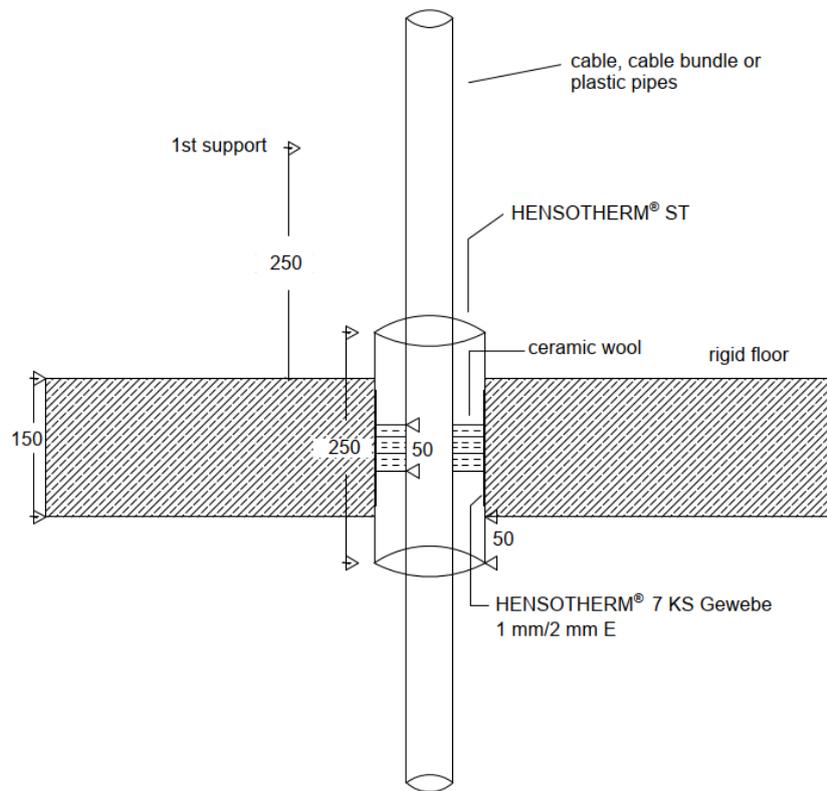
C.3. Construction details

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

Rigid floors: The floor must have a minimum thickness of 150 mm and maximum of 200 mm and comprise aerated concrete or concrete with a minimum density of 650 kg/m³.

Permitted distances: Other penetration seals: ≥ 200 mm, provided that one or both of the adjacent openings is larger than 400 mm x 400 mm, otherwise ≥ 100 mm. Other openings or installations: ≥ 200 mm, provided that one or both of the adjacent openings is larger than 200 mm x 200 mm, otherwise ≥ 100 mm. Services shall be supported at maximum 250 mm from the top side of the floor.

Penetration Seal: Single cables, cable bundles or electrical installation pipes (PVC) with or without cables led through a HENSOTHERM® Service Transit type ST 250 (length 250 mm) friction fitted into a rigid floor and positioned centrally in the floor. Allowed annular space width (a1) 0 mm, i.e. no annular gap, and maximum seal size defined by HENSOTHERM® Service Transit diameter. The ceramic wool plug is adapted to fit the diameter of the penetrating services and re-installed centrally in the HENSOTHERM® Service Transit, sealing any remaining free spaces around the penetrating services. The maximum permissible occupancy of the HENSOTHERM® Service Transit is 100 % of its inner cross-section.



all dimensions in mm

C.3.1. Single electrical cables, cable bundles and electrical installation pipes (PVC), friction fitted

Conduit	Classification		
	HENSOTHERM® ST 250 Diameter 63 mm	HENSOTHERM® ST 250 Diameter 90 mm	HENSOTHERM® ST 250 Diameter 110 mm
PVC pipes ≤ 32 mm without cables	EI 120	n. a.	n. a.
PVC pipes ≤ 32 mm with cables ≤ 21 mm	EI 120	n. a.	n. a.
PVC pipes ≤ 32 mm with cables A1, A2, A3 or B	n. a.	EI 120	EI 120
With cables A1, A2, A3 or B	EI 120	EI 120	EI 120

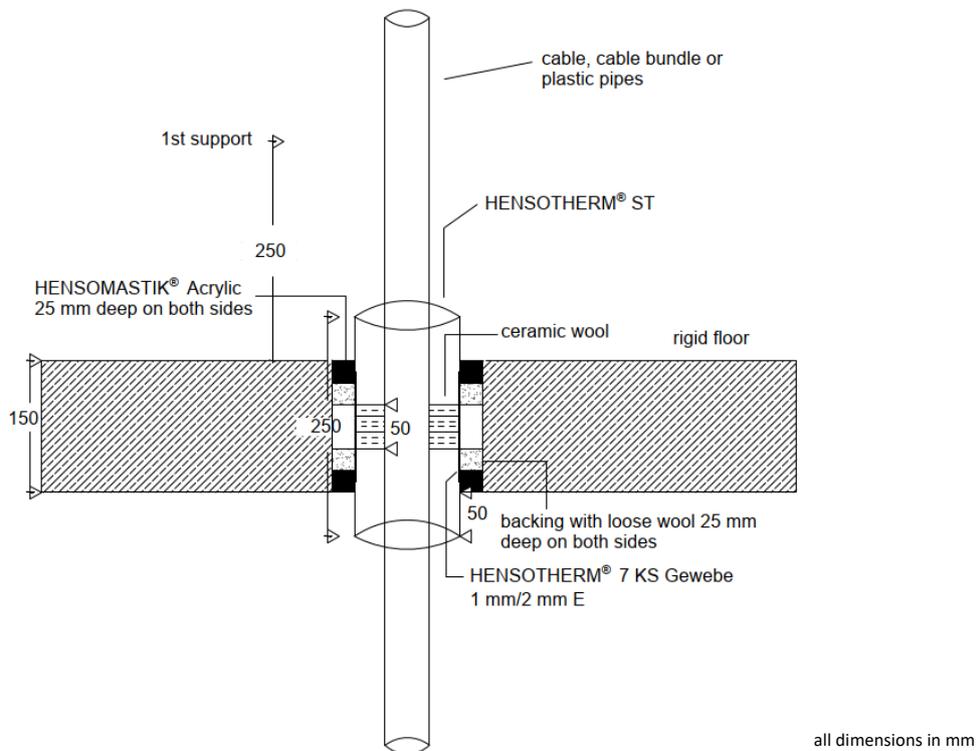
C.4. Construction details

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

Rigid floors: The floor must have a minimum thickness of 150 mm and maximum of 200 mm and comprise aerated concrete or concrete with a minimum density of 650 kg/m³.

Permitted distances: Other penetration seals: ≥ 200 mm, provided that one or both of the adjacent openings is larger than 400 mm x 400 mm, otherwise ≥ 100 mm. Other openings or installations: ≥ 200 mm, provided that one or both of the adjacent openings is larger than 200 mm x 200 mm, otherwise ≥ 100 mm. Services shall be supported at maximum 250 mm from the top side of the floor.

Penetration Seal: Single cables, cable bundles or electrical installation pipes (PVC) with or without cables led through a HENSOTHERM® Service Transit type ST 250 (length 250 mm) fitted into a rigid floor and positioned centrally in the floor. The annular gap sealed on both sides of the floor with loose stone wool ≥ 40 kg/m³ backing 25 mm deep and HENSOMASTIK® Acrylic min. 25 mm deep flush with the faces of the floor. Allowed annular space width (a1) 10-20 mm, and maximum seal size defined by HENSOTHERM® Service Transit diameter plus annular space width. The ceramic wool plug is adapted to fit the diameter of the penetrating services and re-installed centrally in the HENSOTHERM® Service Transit, sealing any remaining free spaces around the penetrating services. The maximum permissible occupancy of the HENSOTHERM® Service Transit is 100 % of its inner cross-section.



C.4.1. Single electrical cables, cable bundles and electrical installation pipes (PVC), annular gap filled with HENSOMASTIK® Acrylic

Conduit	Classification		
	HENSOTHERM® ST 250 Diameter 63 mm	HENSOTHERM® ST 250 Diameter 90 mm	HENSOTHERM® ST 250 Diameter 110 mm
PVC pipes ≤ 32 mm without cables	EI 120	n. a.	n. a.
PVC pipes ≤ 32 mm with cables ≤ 21 mm	EI 120	n. a.	n. a.
PVC pipes ≤ 32 mm with cables A1, A2, A3 or B	n. a.	EI 120	EI 120
With cables A1, A2, A3 or B	EI 120	EI 120	EI 120

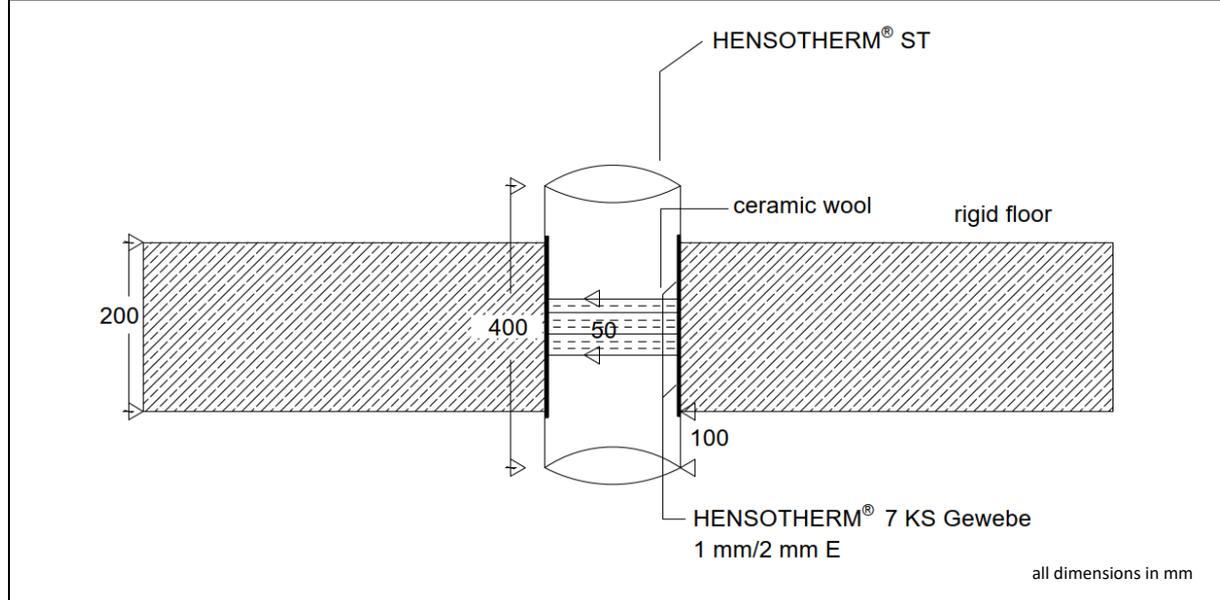
D.1. Construction details

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

Rigid floors: The floor must have a minimum thickness of 200 mm and comprise aerated concrete or concrete with a minimum density of 650 kg/m³.

Permitted distances: Other penetration seals: ≥ 200 mm, provided that one or both of the adjacent openings is larger than 400 mm x 400 mm, otherwise ≥ 100 mm. Other openings or installations: ≥ 200 mm, provided that one or both of the adjacent openings is larger than 200 mm x 200 mm, otherwise ≥ 100 mm.

Penetration Seal: HENSOTHERM® Service Transit type ST 400 (length 400 mm) friction fitted into a rigid floor and positioned centrally in the floor. Allowed annular space width (a1) 0 mm, i.e. no annular gap, and maximum seal size defined by HENSOTHERM® Service Transit diameter. Blank seal, no penetrating services.



D.1.1. Blank seal, friction fitted

Conduit	Classification		
	HENSOTHERM® ST 400 Diameter 63 mm	HENSOTHERM® ST 400 Diameter 90 mm	HENSOTHERM® ST 400 Diameter 110 mm
Empty, no penetrating services	EI 120	EI 120	EI 120

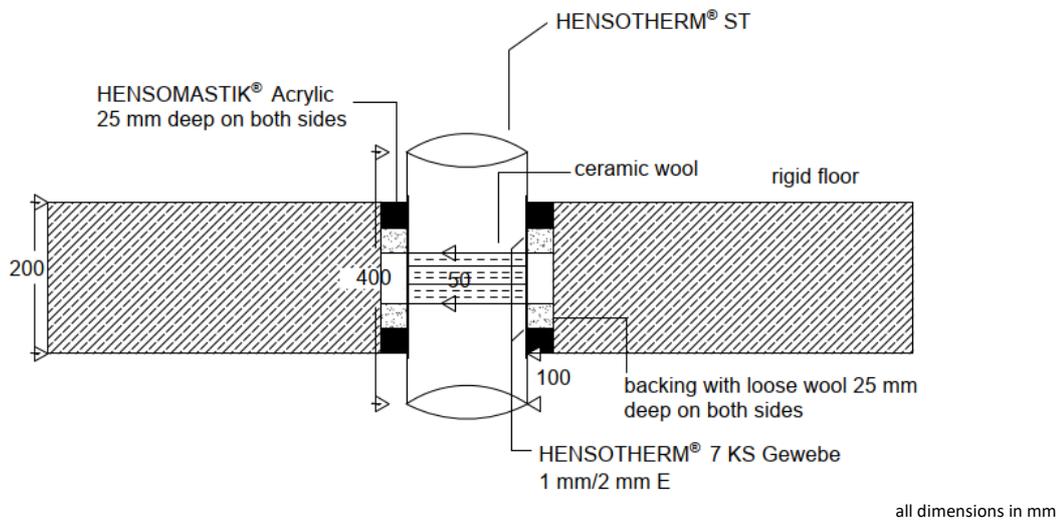
D.2. Construction details

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

Rigid floors: The floor must have a minimum thickness of 200 mm and comprise aerated concrete or concrete with a minimum density of 650 kg/m³.

Permitted distances: Other penetration seals: ≥ 200 mm, provided that one or both of the adjacent openings is larger than 400 mm x 400 mm, otherwise ≥ 100 mm. Other openings or installations: ≥ 200 mm, provided that one or both of the adjacent openings is larger than 200 mm x 200 mm, otherwise ≥ 100 mm.

Penetration Seal: HENSOTHERM® Service Transit type ST 400 (length 400 mm) fitted into a rigid floor and positioned centrally in the floor. The annular gap sealed on both sides of the floor with loose stone wool ≥ 40 kg/m³ backing 25 mm deep and HENSOMASTIK® Acrylic, min. 25 mm deep and positioned flush to the bottom and top face of the floor. Annular space (a1) 10-20 mm and maximum seal size defined by HENSOTHERM® Service Transit diameter plus annular space width. Blank seal, no penetrating services.



D.2.1. Blank seal, annular gap filled with HENSOMASTIK® Acrylic

Conduit	Classification		
	HENSOTHERM® ST 400 Diameter 63 mm	HENSOTHERM® ST 400 Diameter 90 mm	HENSOTHERM® ST 400 Diameter 110 mm
Empty, no penetrating services	EI 120	EI 120	EI 120

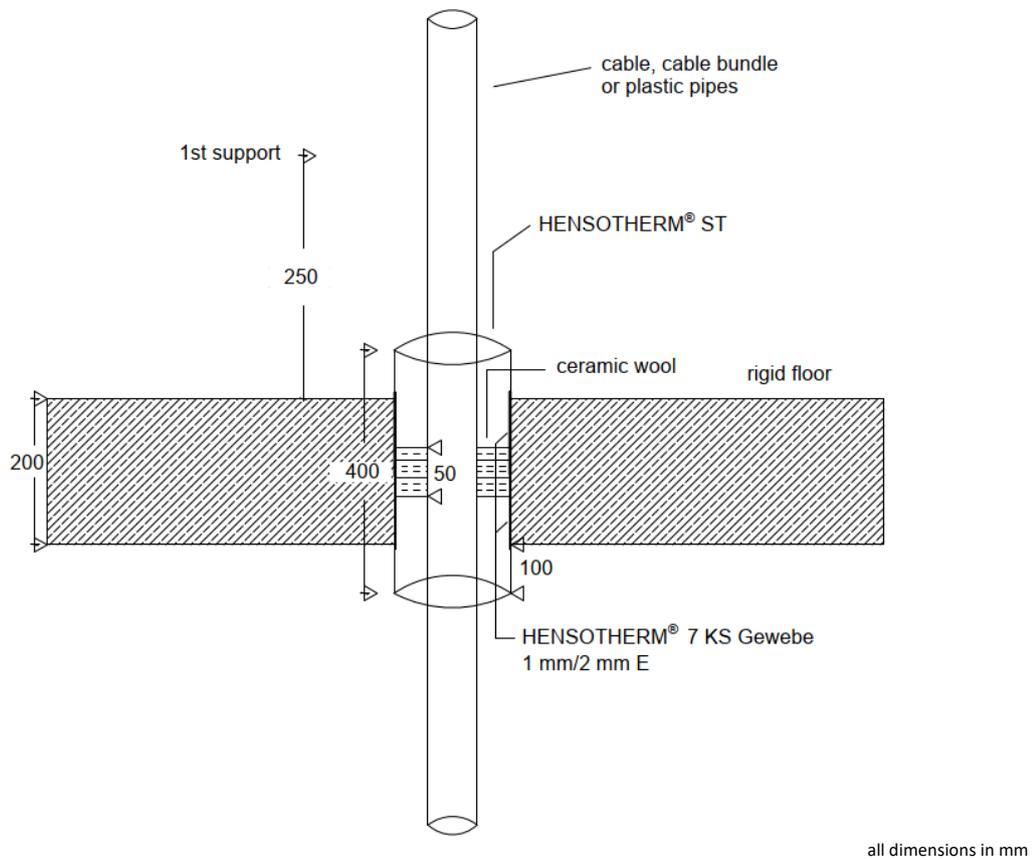
D.3. Construction details

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

Rigid floors: The floor must have a minimum thickness of 200 mm and comprise aerated concrete or concrete with a minimum density of 650 kg/m³.

Permitted distances: Other penetration seals: ≥ 200 mm, provided that one or both of the adjacent openings is larger than 400 mm x 400 mm, otherwise ≥ 100 mm. Other openings or installations: ≥ 200 mm, provided that one or both of the adjacent openings is larger than 200 mm x 200 mm, otherwise ≥ 100 mm.

Penetration Seal: Single cables, cable bundles or electrical installation pipes (PVC) with or without cables led through a HENSOTHERM® Service Transit type ST 400 (length 400 mm) friction fitted into a rigid floor and positioned centrally in the floor. Allowed annular space width (a1) 0 mm, i.e. no annular gap, and maximum seal size defined by HENSOTHERM® Service Transit diameter. The ceramic wool plug is adapted to fit the diameter of the penetrating services and re-installed centrally in the HENSOTHERM® Service Transit, sealing any remaining free spaces around the penetrating services. The maximum permissible occupancy of the HENSOTHERM® Service Transit is 100 % of its inner cross-section.



D.3.1. Single electrical cables, cable bundles and electrical installation pipes (PVC), friction fitted

Conduit	Classification		
	HENSOTHERM® ST 250 Diameter 63 mm	HENSOTHERM® ST 250 Diameter 90 mm	HENSOTHERM® ST 250 Diameter 110 mm
PVC pipes ≤ 32 mm without cables	EI 120	n. a.	n. a.
PVC pipes ≤ 32 mm with cables ≤ 21 mm	EI 120	n. a.	n. a.
PVC pipes ≤ 32 mm with cables A1, A2, A3 or B	n. a.	EI 120	EI 120
With cables A1, A2, A3 or B	EI 120	EI 120	EI 120

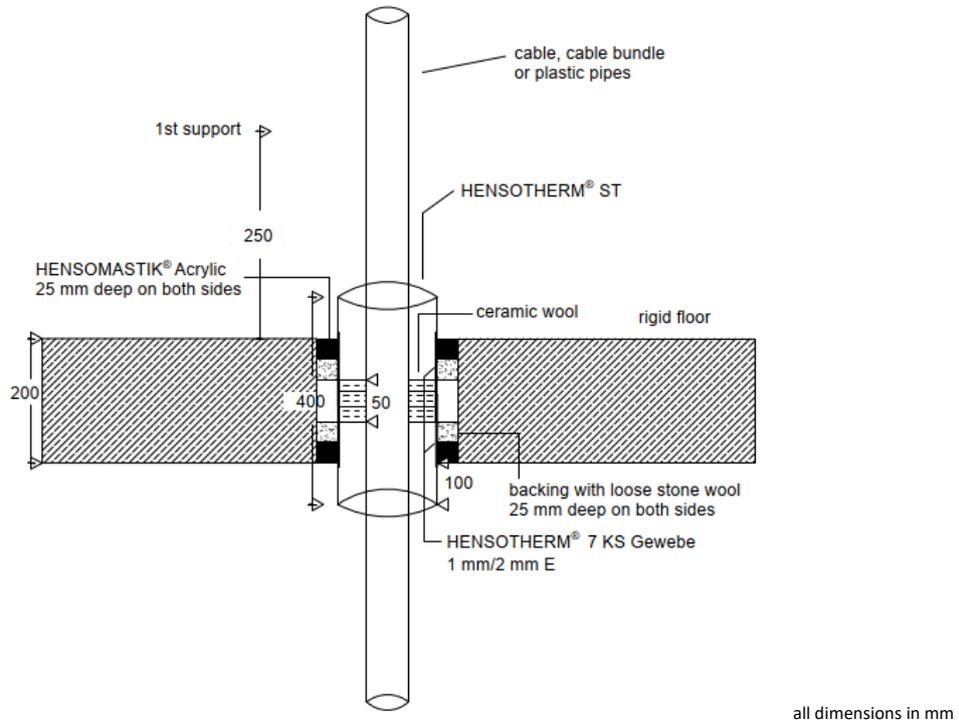
D.4. Construction details

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

Rigid floors: The floor must have a minimum thickness of 200 mm and comprise aerated concrete or concrete with a minimum density of 650 kg/m³.

Permitted distances: Other penetration seals: ≥ 200 mm, provided that one or both of the adjacent openings is larger than 400 mm x 400 mm, otherwise ≥ 100 mm. Other openings or installations: ≥ 200 mm, provided that one or both of the adjacent openings is larger than 200 mm x 200 mm, otherwise ≥ 100 mm.

Penetration Seal: Single cables, cable bundles or electrical installation pipes (PVC) with or without cables led through a HENSOTHERM® Service Transit type ST 400 (length 400 mm) fitted into a rigid floor and positioned centrally in the floor. The annular gap sealed on both sides of the floor with loose stone wool ≥ 40 kg/m³ backing 25 mm deep and HENSOMASTIK® Acrylic, min. 25 mm deep and positioned flush to the bottom and top face of the floor. Annular space (a1) 10-20 mm and maximum seal size defined by HENSOTHERM® Service Transit diameter plus annular space width. The ceramic wool plug is adapted to fit the diameter of the penetrating services and re-installed centrally in the HENSOTHERM® Service Transit, sealing any remaining free spaces around the penetrating services. The maximum permissible occupancy of the HENSOTHERM® Service Transit is 100 % of its inner cross-section.



D.4.1. Single electrical cables, cable bundles and electrical installation pipes (PVC), annular gap filled with HENSOMASTIK® Acrylic

Conduit	Classification		
	HENSOTHERM® ST 250 Diameter 63 mm	HENSOTHERM® ST 250 Diameter 90 mm	HENSOTHERM® ST 250 Diameter 110 mm
PVC pipes ≤ 32 mm without cables	EI 120	n. a.	n. a.
PVC pipes ≤ 32 mm with cables ≤ 21 mm	EI 120	n. a.	n. a.
PVC pipes ≤ 32 mm with cables A1, A2, A3 or B	n. a.	EI 120	EI 120
With cables A1, A2, A3 or B	EI 120	EI 120	EI 120