Promat

Promat Handbook

Fire stopping

Passive Fire Protection Systems for Buildings

etex inspiring ways of living

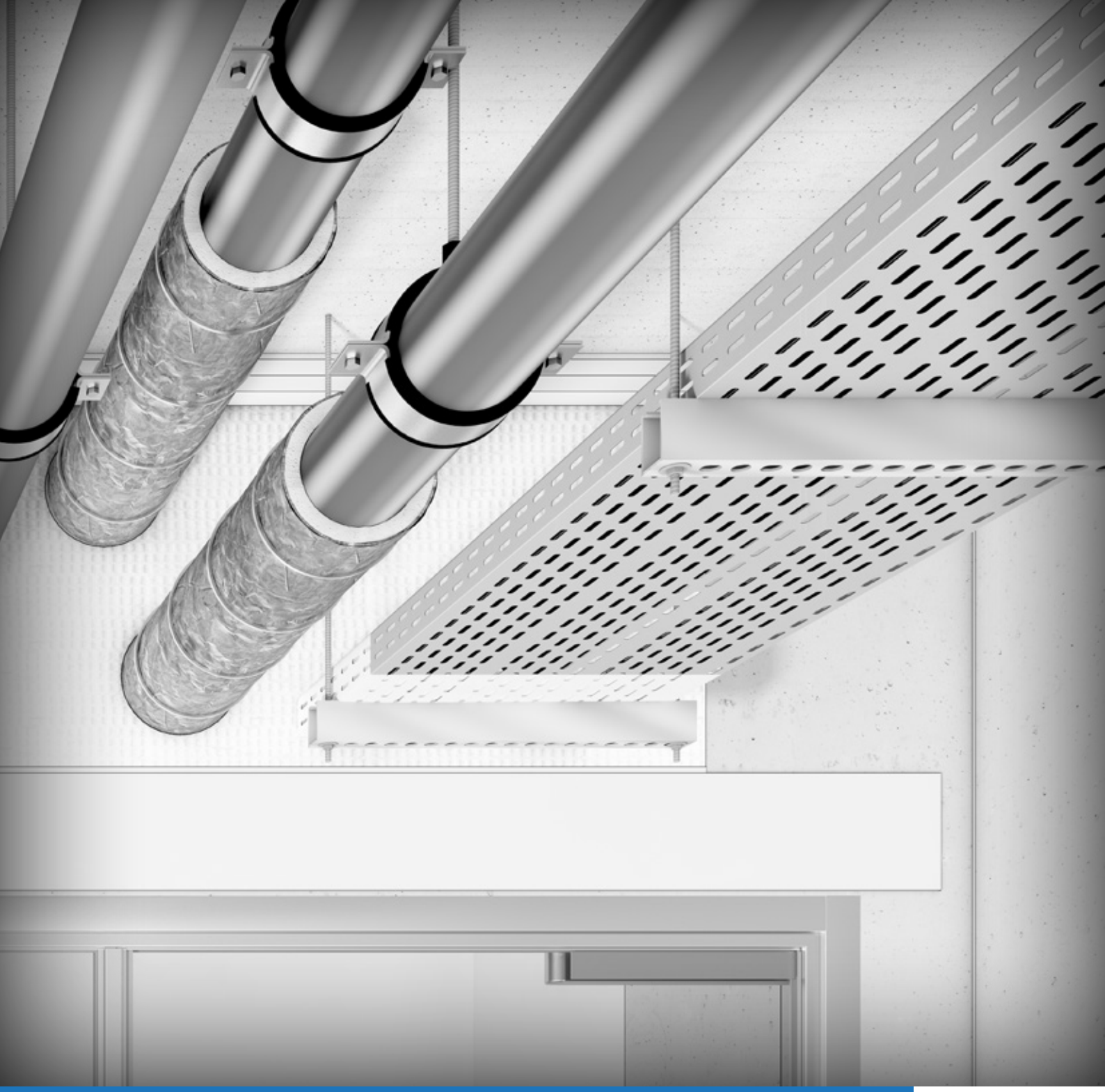
Fire Stopping Systems for Indoor Applications

Passive fire protection has long been European

The purpose of our introduction is to enable interested readers an understanding of the context of local building legislation with the tasks of local authorities and the European regulations (directives, ordinances, standards, etc.) that have developed rapidly in recent years. We want to make a very complex matter a little easier to understand, so the main focus of the information presented is on the simple comprehensibility of a topic, which occasionally creates a certain blurring. The purpose of these documents is to make the content comprehensible to everyone.

Promat - Never compromise on safety

The fundamental premise of modern fire protection is based on the principles of compartmentation. Every building is designed into several fireproof compartments, to prevent or slow the spread of fire and smoke from one compartment to another. Essential building services – water pipes and electrical cables, for example - penetrate compartment walls and ceilings. These have the potential to seriously risk the integrity of the fire compartment, unless special and proven fire stopping systems are employed. Promat fire stopping



systems restore the fire compartment to its original levels of fire performance.
Promat provides a number of integrated and effective fire stopping solutions, and these include the successful and easy to install PROMASTOP® and PROMASEAL® systems:

- fire stopping sealants
- intumescent fire stopping sealants
- fire stopping silicone
- water based coatings
- fire stopping collars for plastic and metal pipes
- fire stopping expanding wraps
- permanently elastic intumescent bricks and plugs
- fire stopping graphite-based pillows
- fire stopping mortars
- intumescent seals and sealing systems

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Information

1. Fire classification of construction products and building elements

1.1 Euro-classes of reaction to fire of construction products and building elements – Standard EN 13501 Part 1

Classes of reaction to fire of construction products and building materials according to EN 13501-1	Level of requirements for construction products (except flooring and pipe insulation)
A1	**"No contribution to the fire development"** In any stage of the fire including the fully developed fire it will not contribute to the fire development.
A2	**"Insignificant contribution to the fire development"** The same requirements as for Class B; however, in fully developed fire it will not contribute to the fire load and to the fire growth and/or the additional criteria for determining the value of gross calorific potential (PCS value, [MJ/kg or MJ/m²]) are determined.
B	**"Very limited contribution to the fire development"** Exposure to fire for 30 seconds with vertical flame spread max. 150 mm above ignition point, test termination 60 seconds after flame removal. Test for heat release determination: $FIGRA_{0,2MJ} \leq 120$ W/s ($FIGRA_{0,2MJ}$: fire growth rate index at THR threshold of 0,2 MJ) $THR_{600s} \leq 7,5$ MJ (THR_{600s}: total heat release within 600 s [MJ])
C	**"Limited contribution to the fire development"** Exposure to fire for 30 seconds with vertical flame spread max. 150 mm above ignition point, test termination 60 seconds after flame removal. Test for heat release determination: $FIGRA_{0,4MJ} \leq 250$ W/s ($FIGRA_{0,4MJ}$: fire growth rate index at THR threshold of 0,4 MJ $THR_{600s} \leq 15$ MJ
D	**"Acceptable contribution to fire"** Exposure to fire for 30 seconds with vertical flame spread max. 150 mm above ignition point, test termination 60 seconds after flame removal. Test for heat release determination $FIGRA_{0,4MJ} \leq 750$ W/s
E	**Acceptable reaction to fire** Exposure to fire for 15 seconds with vertical flame spread max. 150 mm above ignition point, test termination 20 seconds after flame removal.
F	The contribution is not determined or cannot be classified in one of the classes A1, A2, B, C, D, E. Highly flammable.

The above presentation of classification is for construction products, excluding floorings and linear pipe thermal insulation products.

The classification of floorings includes suffix fl (for example $A2_{fl}$). The classification of linear pipe thermal insulation products includes suffix L (for example D_L).

Additional classification of smoke production	Level of requirements
s1	Stringent criteria on released smoke quantity are met (slight smoke). SMOGRA ≤ 30 m^2/s^2 (smoke growth rate. The maximum of the quotient of smoke production rate from the specimen and the time of its occurence). TSP_{600s} ≤ 50 m^2 (total smoke production within 600 s [m^2]).
s2	Total smoke quantity and ratio of increased smoke development are limited (usual smoke). SMOGRA ≤ 180 m^2/s^2 and TSP_{600s} ≤ 200 m^2.
s3	Unlimited smoke development (thick smoke). Products for which no performance is declared or which do not comply with the s1 and s2 criteria.

Additional classification for flaming droplets and/or particles	Level of requirements
d0	No flaming droplets/particles occur within 600 seconds time period when tested according to EN 13823.
d1	No flaming droplets/particles which last longer than 10 seconds in a 600 seconds time period when tested according to EN 13823.
d2	No performance is declared or the product a) does not comply with the above given d0 and d1 criteria or b) ignites the paper in the ignitability test according to EN ISO 11925-2.

The form of classification:

Reaction to fire		Smoke production			Flaming droplets and/or particles
From **A1** to **F** (After test performed)	–	**s**	**1, 2** or **3** (After test performed)	,	**d**	**0, 1** or **2** (After test performed)

For example:
A1 or $A1_{fl}$ or $A1_L$
A2-s1, d0 or A2-s2, d1 or A2-s3, d2
$A2_{fl}$-s1 or $A2_{fl}$-s2 (floorings: in all classifications without droplets and max. s2)
B-s1, d0 or B-s1, d1 or B-s1, d2
B_L-s1, d1 (for linear pipe thermal insulation products)
C-s1, d0 or C-s1, d1 or C-s1, d2
D-s3, d0 or D-s3, d1 or D-s3, d2
E or E-d2
F

Due to the data completeness it is necessary to note also the second standard of the classification of reaction to fire of construction products (building materials), namely Standard EN 13501 Part 5 for classification using data from external fire exposure to roof tests. With four different test methods (from (t1) to (t4)) based on different assumptions (ignition source, without wind and with wind and with additional radiation) the spreading of fire throughout the interior and exterior of the roof, the external and internal damages and the possible fire penetration and flaming droplets or particles were identified.
The newest Part 6 of Standard EN 13501 deals with the classification using data from reaction to fire tests on electric cables. By using this standard the fire load of building installations is determined, which is certainly an important part of the construction fire protection.

1.2 Euro-classes of fire resistance of construction products and building elements – Standard EN 13501 Part 2, Part 3, Part 4

By using different methods of testing and classification in the Member States the classification of the fire resistance of construction products and building elements was arranged on a uniform and new way. It has been intensively worked already in the 1990s, not only in one but in several parts:

- Part 2: Classification using data from fire resistance tests, excluding ventilation services
- Part 3: Classification using data from fire resistance tests on products and elements used in building service installations: fire resisting ducts and fire dampers.
- Part 4: Classification using data from fire resistance tests on components of smoke control systems.

Compared to previous denomination the essential change made in the classification method is that the component is no longer named after the first letter, but its features are denominated with a letter which indicates an important characteristic of the fire protection. For the Member States with high level of fire protection it remains important that as a mathematical function (equation) so called standard temperature/time curve (model of fully developed fire or post flash-over fire) is maintained, which obliges other Member States to improve their products for fire safety. The constructions are also exposed to other thermal loads, such the slow heating curve (smouldering fire curve), the 'semi-natural' fire, the external fire exposure curve or constant temperature attack.

Characteristic features of building elements according to EN 13501 Part 2, 3 and 4 are the following:

Letter according to EN 13501-2, -3 or -4	Denomination / Characteristics
R	Load-bearing capacity (**r**ésitance) Limited deformation, limited deformation ratio.
E	Integrity (**e**tanchéité) Ignition of a cotton pad, cracks or openings, sustained flaming on the unexposed side
I (I_1, I_2)	Thermal insulation (**i**solation) Mean temperature rise on the unexposed side limited to 140 °C, maximum temperature rise limited to 180 °C. I_1 and I_2 are relevant for doors and shutters: in case of I_1 the measured points are closer to the border line of the visible part of the door leaf and the temperature criteria is lower than in case of I2 (details in the standard EN 13501-2). All the member countries may choose between these criteria as local requirement for fire doors and shutters and closures for conveyor systems.
W	Radiation (**r**adiation) Maximum value of radiation, measured as specified in the related test standard, does not exceed 15 kW/m^2.
M	Mechanical action (**m**echanical) Resistance to impact.
C	Self-closing (**c**losing) Self-closing in the event of fire. Tests of self-closing ability are made under ambient conditions according to EN 1191 for pedestrian doorsets and/or openable windows and EN 12604 for industrial, commercial and garage doors and gates. Number of test cycles to be performed: C0: 1 to 499, C1: ≥ 500, C2: ≥ 10 000, C3: ≥ 50 000, C4: ≥ 100 000, C5: ≥ 200 000
S (S_a, S_{200})	Smoke leakage resistance (**s**moke) Limited smoke leakage (components to reduce or eliminate the passage of gases or smoke from one side to the other). S_a: smoke leakage at ambient temperature only. S_{200} (previously S_m): smoke leakage at both ambient temperature and at 200 °C. This classification is relevant in EN 13501-2 for smoke control doors only. Other elements with limited smoke leakage: in EN 13501-3: • ventilation ducts tested according to EN 1366-1 (means 10 m^3/(m^2.h)) • fire resisting dampers tested according to EN 1366-2 (means 200 m^3/(m^2.h)). in EN 13501-4: • smoke control ducts tested according to EN 1366-8 or EN 1366-9 (means 5 m^3/(m^2.h)) • smoke control dampers tested according to EN 1366-10 (means 200 m^3/(m^2.h)).
G	Soot fire resistance resistance of chimneys and chimney related products to soot fire
K (K_1, K_2)	Fire protection ability Fire protection ability of a wall or ceiling covering to provide protection for the covered material against ignition, charring and other damage for a specified period of time. Classification time period for K_1 10 minutes, for K_2 10, 30 or 60 minutes.
P, PH	Continuity of power and/or signal supply (in prEN 13501-3 edition 2019) P is the ability to provide such continuity under the conditions of the standard temperature/time curve. PH is the ability of a small electrical cable to maintain a reliable form of power supply or signal from the source to the safety installation(s) when exposed to a constant flame temperature attack of a notional 842 °C.
D, DH	D: Stability duration under constant temperature (relevant for smoke barriers in EN 13501-4) The ability of a product to resist the passage of gasses or smoke under a constant temperature attack of 600 °C. DH: Stability duration under the standard time-temperature curve (relevant for smoke barriers in EN 13501-4) The ability of a product to resist the passage of gasses or smoke when subjected to the standard temperature/ time curve.
F	Functionality of powered smoke and heat ventilators (EN 13501-4) The ability of a powered smoke and heat ventilator to function as prescribed under the defined test conditions.
B	Functionality of natural smoke and heat ventilators (EN 13501-4) The ability of a natural smoke and heat ventilator to function as prescribed under the defined test conditions.

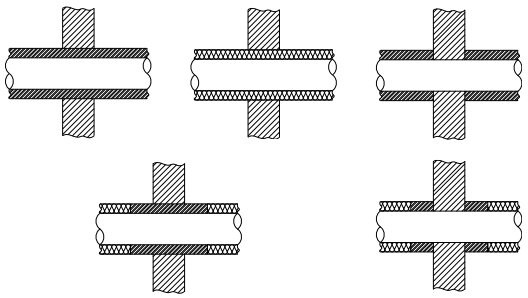
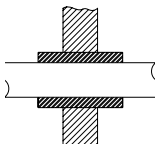
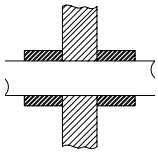
Supplement performances	Denomination / Characteristics / Requirements
IncSlow	response of the product to the slow heating curve has been evaluated
sn	performance against semi-natural fire
ef	performance against external fire exposure curve
r	performance against reduced temperature exposure (constant temperature of 500 °C)
i → o	Classification from inside to outside
o → i	Classification from outside to inside
o ↔ i	Classification from inside to outside and from outside to inside
a → b	Classification only from above (a) downwards (b)
b → a	Classification only from below (b) upwards (a)
a ↔ b	Classification for both tests (equally from below and from above)
U	Pipe end configuration »uncapped«
C	Pipe end configuration »capped«
v_e	Installation position »vertical«
h_o	Installation position »horizontal«
H	Linear joint seals: horizontal supporting construction
V	Linear joint seals: vertical supporting construction – vertical joints
T	Linear joint seals: vertical supporting construction – horizontal joints
X	Linear joint seals: no movement
M000	Linear joint seals: movement induced (in % of the joint width)
M	Type of splices in linear joint seals: manufactured
F	Type of splices in linear joint seals: on field created joint
B	Type of splices in linear joint seals: both in advance manufactured and on field created joint
W w1 to W w2	Linear joint seals: joint widths range (w1 and w2 in mm; w1 the lower width limit, w2 the higher width limit)

Format classifications in the classification range:

Characteristic		Time duration of exposure		Additional characteristics, parameter
R E I W		t t	–	M S C IncSlow sn ef r

Examples
Load-bearing wall: REI 90 / REI 90-M
Lightweight construction (wall): EI 90
Fire door: EI_2 90-C or EI_2 30-C
Fire door with additional protection against smoke: EI_2 30-C S_{200}
Fire resistant cable penetration seal: EI 90
Pipe penetration seal: EI 90 U/U or EI 90 C/U or EI 90 C/C
Fire damper: EI 90 (v_e h_o i ↔ o) S

Pipe insulation according to EN 1366-3:2009

	Local sustained	Local interrupted
Local sustained along the pipe length		
	Example **CS** (**C**ontinued **S**ustained)	Example **CI** (**C**ontinued **I**nterrupted)
Local (»sectional insulation«)		
	Example **LS** (**L**ocal **S**ustained)	Example **LI** (**L**ocal **I**nterrupted)

Key:

- building element
- pipe
- thermal/acoustic/other pipe insulation
- insulation acting as penetration seal or forming part of the penetration seal

The table above shows the possible arrangement of pipe insulation according to EN 1366-3. Our individual solutions are marked with codes CS, CI, LS or LI.

The arrangements of pipe insulation are according to EN 1366-3. For the respective details of our solutions designations CS, CI, LS or LI are listed.
The terms CS, CI, LS and LI mean the following:

- CS: type CS is an insulation on the whole length of the pipe, passing through the separating building component.
- CI: type CI is an insulation on the whole length of the pipe except the penetration area; the insulation is interrupted in the area of the separating building component.
- LS: type LS is a local insulation on a given length of the pipe, passing through the separating building component.
- LI: type LI is a a local insulation on a given length of the pipe; the insulation is interrupted in the area of the separating building component.

Configuration of pipe end according to EN 1366-3:2009

Test condition	Pipe end configuration		Type of pipes
	Oriented inside (in furnace)	Oriented outside (outside the furnace)	
U/U	uncapped	uncapped	plastic: rainwater, ventilated sewage (drainage channel)
U/C	uncapped	capped	plastic: unventilated sewage; gas; drinking water, water for heating; (supply channel); metal: non fire rated suspension/coupling systems; waste disposal shafts made from pipes
C/U	capped	uncapped	metal: fire rated suspension/coupling systems
C/C	capped	capped	---

Fields of application rules for pipe end configuration

		Tested			
		U/U	**C/U**	**U/C**	**C/C**
Covered	**U/U**	Y	N	N	N
	C/U	Y	Y	N	N
	U/C	Y	Y	Y	N
	C/C	Y	Y	Y	Y

Y= acceptable, N = not acceptable

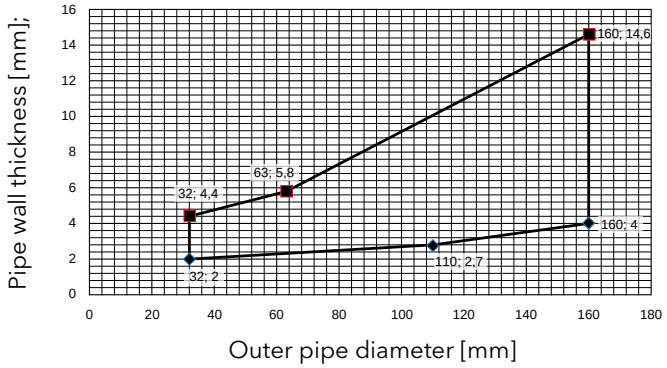
Pipes without insulation

The tested pipes shall be selected in order to demonstrate the corner points of the required range (see the figures below):

- the largest pipe diameter at the maximum pipe wall thickness
- the largest pipe diameter at the minimum pipe wall thickness
- the smallest pipe diameter at the minimum pipe wall thicknes

Results of tests may be interpolated for pipes with diameters and wall thicknesses between those tested.

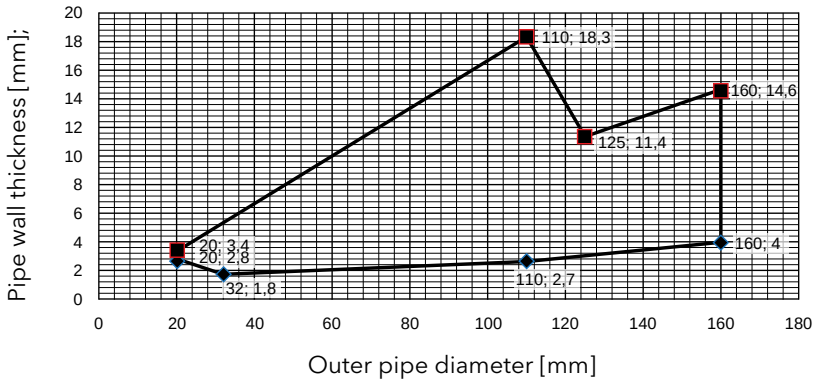
For example:
PROMASTOP®-W penetration seal for PE-HD, ABS and SAN+PVC pipes:



Our written presentation lists the corner points without figure:

- lower limits: Ø 32 mm, s 2,0 mm → Ø 110 mm, s 2,7 mm → Ø 160 mm, s 4,0 mm
- upper limits: Ø 32 mm, s 4,4 mm → Ø 63 mm, s 5,8 mm → Ø 160 mm, s 14,6 mm

PROMASTOP®-W penetration seal for PP-H and PP-R pipes:

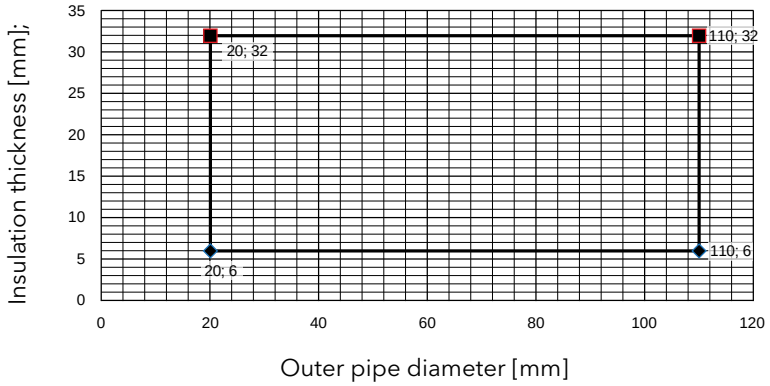


Our written presentation lists the corner points without figure:

- lower limits: Ø 20 mm, s 2,8 mm → Ø 32 mm, s 1,8 mm → Ø 110 mm, s 2,7 mm → Ø 160 mm, s 4,0 mm
- upper limits: Ø 20 mm, s 3,4 mm → Ø 110 mm, s 18,3 mm → Ø 125 mm, s 11,4 mm → Ø 160 mm, s 14 mm

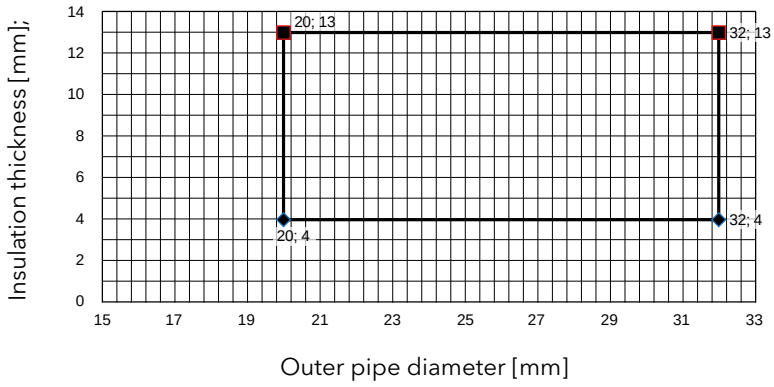
Pipes with insulation

The tested pipes and insulation types and thicknesses shall be selected in order to demonstrate the corner points of the required range (see the figures below):
For example:
PROMASTOP®-W penetration seal for PP-H and PP-R pipes with insulation B-s3, d0:



Our written presentation lists the corner points without figure: Ø 20 - 110 mm, d 6 - 32 mm

PROMASTOP®-W penetration seal for PP-H and PP-R pipes with insulation E:



Our written presentation lists the corner points without figure: Ø 20 - 32 mm, d 4 - 13 mm

Cable groups (CG)

The tested cable configurations are grouped into 6 cable groups in EN 1366-3:
CG 1: small sheathed cable types Ø ≤ 21 mm
CG 2: medium sheathed cable types 21 < Ø ≤ 50 mm
CG 3: large sheathed cable types 50 < Ø ≤ 80 mm
CG 4: cable bundles made of cables from CG 1 Ø ≤ 100 mm (telecommunication cable)
CG 5: non-sheathed cable types Ø ≤ 24 mm (wire)
CG 6: empty conduit or tube made of steel, copper or plastic with pipe end configuration U/C, Ø ≤ 16 mm

Conduit: metal or plastic casing designed to accommodate cables (normally circular or oval in section)
Non-sheathed cable (wire): normally a single core cable with only one layer of covering
Sheathed cable: single or multi-core cable with individual covering of the cores and an additional protective covering of the assembly.
Trunking: metal or plastic casing designed to accommodate cables (normally square or rectangular in section)
Waveguide: circular, elliptical or rectangular metal tube or pipe or a coaxial assembly of tubes/pipes through which electromagnetic waves are propagated in microwave and radio wave frequency communications

Fields of application of joints tested according to EN 1366-4+A1

The rules for tests of linear joint seals in the EN 1366-4+A1 Fire resistance tests for service installations - Part 4: Linear joint seals. According to the test method 3 different tests orientations can be tested:

- A: Linear joint in a horizontal test construction (floor to floor)
- B: Vertical linear joint in a vertical test construction (vertical joint wall to wall)
- C: Horizontal Linear joint in a vertical construction (horizontal joint wall to wall)

Every test orientation gives you the approval for different applications in practice (without testing). Also, the head of wall or top of the wall is covered depending on the tested orientation during the test.

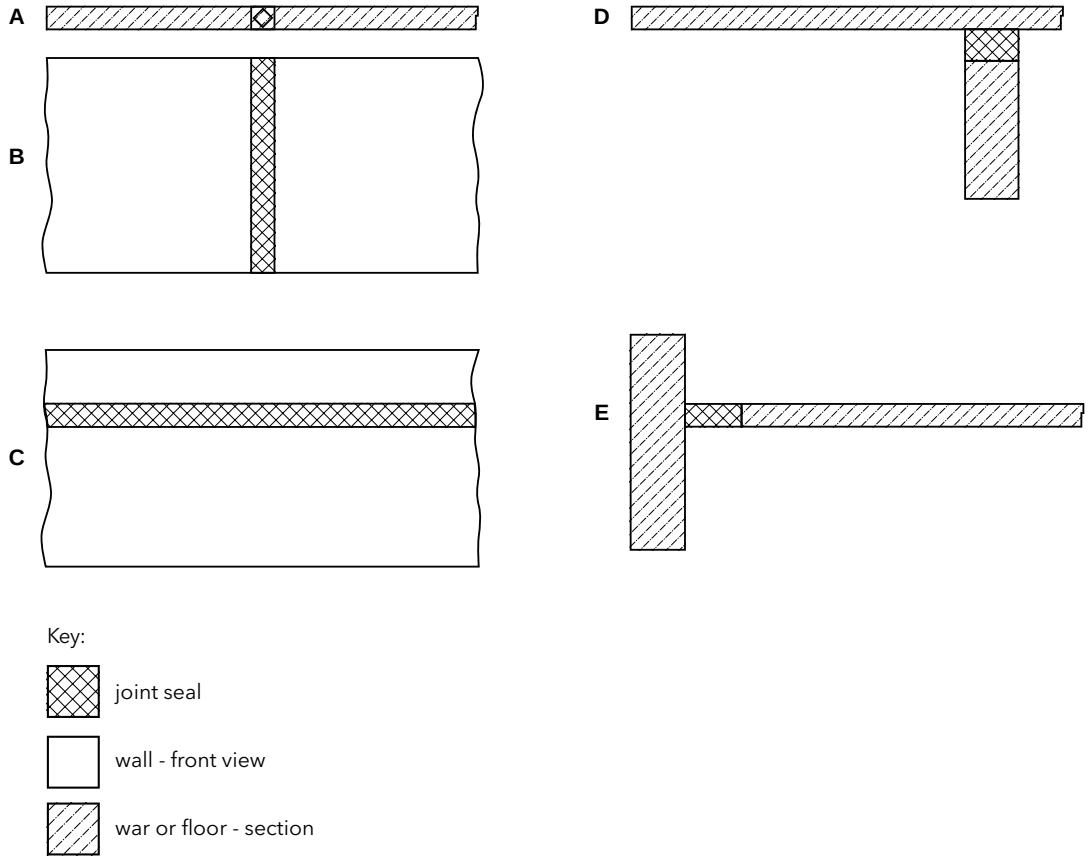
See below the table with the tested set-up (orientation) and the allowed applications.

Tested orientation	Application
A	A, D, E[a]
B	B
C	C, D[b]

A linear joint in a horizontal test construction
B vertical linear joint in a vertical test construction
C horizontal linear joint in a vertical test construction
D horizontal wall joint abutting a floor, ceiling or roof
E horizontal floor joint abutting a wall

[a] Orientation E will only be covered by test orientation A if shear movement was chosen and one face of the joint was fixed and the other face was moved.

[b] Orientation D will only be covered by test orientation C if shear movement was chosen and one face of the joint was fixed and the other face was moved.



According to the test standard, a 'head of wall' or 'top of wall' (application D) is always covered without any restrictions after the test of a 'floor to floor' construction (orientation A) according to EN 1366-4+A1 Fire resistance tests for service installations - Part 4: Linear joint seals.

2. Categories of use

Penetration seals and linear joint, gap seals can be used in different environmental conditions and are divided into the following categories of use (EAD 350454-00-1104: Products for penetration seals; EAD 350141-00-1106: Products for linear joint and gap seals):

Type X: Products for penetration and linear joint/gap seals intended for use in conditions exposed to weathering (rain, UV radiation, frost).
Type Y_1: Products for penetration and linear joint/gap seals intended for use at temperatures below 0 °C with (casual) exposure to UV radiation but no exposure to rain (roofed out-door application).
Type Y_2: Products for penetration and linear joint/gap seals intended for use at temperatures below 0 °C but no exposure to rain or UV radiation.
Type Z_1: Products for penetration and linear joint/gap seals intended for use at internal conditions with humidity equal to or higher than 85% RH, excluding temperatures below 0 °C (no exposure to frost or changing frost-thaw but permanent or alternating condensation).
Type Z_2: Products for penetration and linear joint/gap seals intended for use in internal conditions with humidity lower than 85% RH, excluding temperatures below 0 °C, without exposure to rain or UV radiation.

Products that meet requirements for type X, meet the requirements for all other types. Products that meet requirements for types Y_1 also meet the requirements for type Y_2, Z_1 and Z_2. Products that meet requirements for types Y_2 also meet the requirements for type Z_1 and Z_2. Products that meet the requirements for type Z_1, also meet the requirements for type Z_2.

3. Summary

Although the European requirements for fire protection in the EC Regulation on construction products together with the harmonized European Standards (EN) or European Assesment Documents (EAD) are very complex, they should be incorporated into national legislation. Many EU countries have done this successfully. Thus, on the field of construction fire safety it is increasingly possible to meet the long-term goal, namely the free movement of goods within the EC Member States (»CE«). By developing and issuing of progressive European Standards for products (EN), which will replace the individual national standards, the construction fire safety will be regulated on the European level and thereby the interstate differences in licences for construction products will disappear.

Promat Products
Technical Data Sheets

Promat Fire Stopping has been providing approved fire stopping products for application in all building areas all across the world for the past 50 years.
The following pages give an overview of the products, which are used for building Promat fire stopping constructions as well as product data, features, area of application and processing information.
The products include:

- fire stopping sealants
- intumescent fire stopping sealants
- fire stopping silicone
- water based coatings
- fire stopping collars for plastic and metal pipes
- fire stopping intumescent wraps
- permanently elastic intumescent bricks and plugs
- fire stopping graphite-based pillows
- fire stopping mortars
- intumescent seals and sealing systems

The development of new products and systems is made possible by carrying out research and subsequent fire tests in our own facilities.

For Promat, safety and quality are two aspects, which belong together. In addition to offical quality control effectuated by the means of independent testing of our materials' fire stopping properties, the quality of our products is also strictly monitored during the production process.
By continually developing the range of products on offer, Promat focuses not only on fire stopping properties but also on

- ecological,
- economical,
- design and application

aspects.

The required ETAs and Classification Reports for the listed products and their use in fire stopping constructions/systems are available and should be complied with.

PROMASTOP®-CC
Fire stopping coating

Technical data and properties	
	applied by brush
Colour	light grey
Consistency	liquid
Consumption	1,35 kg/m² for 0,7 mm dry film thickness
Density	1500 ± 200 kg/m³
Use category	Type X
Reaction to fire	Class B-s1, d0
VOC Content	0 g/l
Expansion temperature	approx. 190 °C

Product description
PROMASTOP®-CC is a water-based 'hybrid' fire stopping coating. It combines the positive qualities of intumescent and ablative coatings. In the field of fire stopping penetrations, PROMASTOP®-CC provides reliable protection against the spread of smoke, fire and heat due to its foaming effect and simultaneous formation of a hard and solid char.

Fields of application
PROMASTOP®-CC is a fire stopping coating for services in walls and floors. It is designed for use with single cables, cable bundles, combustible and non-combustible pipes, fire dampers, smoke control dampers and also insulated ventilation systems to prevent the spread of smoke, fire and heat. There is also an EN-test for PROMASTOP®-CC to prevent fire from spreading along cables and cable bundles.

System advantages / customer benefit
- Suitable for use in damp rooms (i.e. high humidity levels, splashing water, etc.)
- Excellent adhesive properties
- Minimal length coating for all cable groups
- Big dimensions of the penetration area
- Good acoustical properties
- Tested in sandwich panel walls and CLT constructions
- Use category: type X

Constructions have been tested, classified and approved according to the following standards / guidelines
- EN 1366-3 and EN 1366-4
- EN 13501-1 and EN 13501-2
- ETAG 026-2 (used as EAD)
- EN ISO 10140-2
- EN ISO 717-1
- IEC 60331-11 and IEC 60331-21
- EN 60332-3-10 and EN 60332-3-22
- EN 61034-1 and EN 61034-2

Packaging
- 12,5 kg plastic buckets
- 44 buckets/pallet
- 550 kg/pallet

Subject to change.

Storage requirements
- Store in cool and dry conditions: 3 °C - 35 °C
- Shelf life of original sealed buckets at least 6 months
- Once opened, containers should be finished swiftly

Safety instructions
- Please refer to the safety data sheet for additional advice

PROMASTOP®-I
Fire stopping coating

Technical data and properties		
	liquid	**paste**
Colour	white	white
Consistency	liquid	paste
Consumption	1,95 kg/m² for 1 mm dry film thickness	1,80 kg/m² for 1 mm dry film thickness
Density	1400 ± 200 kg/m³	1400 ± 200 kg/m³
Viscosity	20 - 40 Pa.s	190 - 220 Pa.s
Stability	approx. 1 mm	approx. 10 mm
Use category	Type Z_2	Type Z_2
Expansion temperature	approx. 300 °C	approx. 300 °C
Expansion ratio	approx. 1:22	approx. 1:22
Reaction to fire	Class C-s2, d0	Class C-s2, d0
VOC content	38 g/l	38 g/l

Product description
PROMASTOP®-I is a water-based intumescent coating. Due to its intumescent properties, PROMASTOP®-I protects against the spread of smoke, fire and heat. Good workability allows fast and clean installation of coated batts to fire stop openings.

Fields of application
PROMASTOP®-I is a fire stopping coating for services in walls and floors. It is designed for use with cables and combustible and non-combustible pipes to prevent the spread of smoke, heat and fire.

System advantages / customer benefit
- Intumescent fire stopping coating
- Minor surface cracks do not affect fire performance

Constructions have been tested, classified and approved according to the following standards / guidelines
- EN 1366-3
- EN 13501-1 and EN 13501-2
- ETAG 026-2 (used as EAD)
- EN ISO 10140-2
- EN ISO 717-1

Packaging
- 12,5 kg plastic buckets
- 44 buckets/pallet
- 550 kg/pallet

Subject to change.

Storage requirements
- Store in cool and dry conditions: 3 °C - 35 °C
- Shelf life of original sealed containers at least 6 months
- Once opened, buckets should be finished swiftly

Safety instructions
- Please refer to the safety data sheet for additional advice

PROMASTOP®-CA
Fire stopping coating

Technical data and properties	
Colour	white
Consistency	liquid
Density	1500 ± 200 kg/m³
Use category	Type X
Reaction to fire	Class B-s1, d0

Product description
PROMASTOP®-CA is a water-based, single component fire stopping coating, which provides protection against spread of fire.

Fields of application
PROMASTOP®-I is a fire stopping coating for services in walls and floors. It is designed for use with cables and combustible and non-combustible pipes to prevent the spread of smoke, heat and fire.

System advantages / customer benefit
- Suitable for use in damp rooms (i.e. high humidity levels, splashing water, etc.)
- Excellent adhesive properties
- For usage as paint and filler

Constructions have been tested, classified and approved according to the following standards / guidelines
- EN 1366-3
- EN 13501-1/2
- EAD-350454-00-1104

Packaging
- 12 kg plastic buckets
- 44 buckets/pallet
- 528 kg/pallet

Subject to change.

Storage requirements
- Store in cool and dry conditions: 3 °C–35 °C
- Shelf life of original sealed containers at least 12 months
- Once opened, containers should be finished swiftly

Safety instructions
- Please refer to the safety data sheet for additional advice

PROMASTOP®-M
Fire stopping mortar

Technical data and properties		
Colour	light grey	
Consistency	powder	
Density (powder)	330 - 430 g/l	
Ash content	86% ± 3%	
Wet density	1400 ± 200 kg/m³	
Dry density	1100 ± 200 kg/m³	
Reaction to fire	Class A1	
Use category	Type X	
Air pore content	13%	
Mortar group	M5 according to EN 998-2, IIa according to DIN 1053	
Bucket life	approx. 60 mins. (depending on the consistency)	
Hardness	**Time**	**Bending strength**
	3 days	2,95 N/mm²
	7 days	4,0 N/mm²
	28 days	5,8 N/mm²

Theoretical consumption data for 100 mm thickness and 1m² penetration	
10% cable capacity	100 kg
20% cable capacity	90 kg
30% cable capacity	80 kg
40% cable capacity	70 kg

Product description
PROMASTOP®-M is a cement based fire stopping mortar. PROMASTOP®-M in combination with additional protection performs up to EI 120 in walls and floors.

Fields of application
PROMASTOP®-M in combination with additional protection is a mortar system for walls and floors. It is designed for use with cables, cable bundles, combustible and non-combustible pipes to seal against the spread of smoke and fire.

System advantages / customer benefits
- Excellent thermal insulation
- Overhead installation for small penetrations possible
- Weatherproof (suitable for outdoor use, use category Type X)

Constructions have been tested, classified and approved according to the following standards / guidelines
- EN 1366-3
- EN 13501-1 and EN 13501-2
- ETAG 026-2 (used as EAD)

Packaging
- 20 kg paper bags
- 40 bags/pallet

Subject to change.

Storage requirements
- Store in cool and dry conditions: 3 °C - 35 °C
- Shelf life of original sealed containers at least 12 months
- Once opened, bags should be finished swiftly

Safety instructions
- Please refer to the safety data sheet for additional advice
- Please mind the H and P phrases

PROMASTOP®-Brandschutzmörtel MG III

Fire stopping mortar

Technical data and properties	
Colour	light grey
Consistency	powder
Dry density	approx. 1740 kg/m³
Hardness	**Compressive strength**
	24,40 N/mm² (if applied properly)
	Bending strength
	7,10 N/mm² (if applied properly)
Mixing ratio	4,76 kg/l water (15 liter fresh mortar/bag)
Working temperature	min. 5 °C
Compressive strength	M10
Water vapor permeability	15/35
Reaction to fire	Class A1

Product description

PROMASTOP®-Brandschutzmörtel MG III is a cement-bound dry mortar based on Portland cement.
PROMASTOP®-Brandschutzmörtel MG III can be prepared using commercially available mixing and plastering machines. The powder is mixed with tap water and prepared without any additional aggregates.

Fields of application

PROMASTOP®-Brandschutzmörtel MG III is used to securely grout fire dampers, smoke control dampers, ventilation ducts and non-combustible pipes in floors and walls and for grouting of fire doors in rigid walls.

System advantages / customer benefit

- Resistance to moisture after curing
- Strong substrate adhesion
- Good pumping and flow characteristics
- Resistant to moisture after curing, very high density of approx. 1740 kg/m³

Constructions have been tested, classified and approved according to the following standards / guidelines

- DIN 4102
- DIN 1053-1
- EN 998-2
- EN 1052-3

Packaging

- Paper bags with 30 kg each
- 36 bags/pallet

Subject to change.

Storage requirements

- Store in cool and dry conditions, temperature range: 3 °C – 35 °C
- Shelf life of original sealed bags at least 12 months
- Once opened, bags should be used quickly

Safety instructions

- Please refer to the safety data sheet for additional advice

PROMASTOP®-FC
Fire stopping collar

Technical data and properties			
Collar type	**Internal diameter [mm]**	**External diameter [mm]**	**Number of brackets**
PROMASTOP®-FC3/032	41	53	2
PROMASTOP®-FC3/040	48	64	3
PROMASTOP®-FC3/050	60	77	3
PROMASTOP®-FC3/056	66	83	3
PROMASTOP®-FC3/063	73	90	3
PROMASTOP®-FC3/075	85	107	4
PROMASTOP®-FC3/090	100	122	4
PROMASTOP®-FC3/110	120	142	4
PROMASTOP®-FC3/125	135	157	4
PROMASTOP®-FC3/160	170	202	5
PROMASTOP®-FC6/050	60	77	3
PROMASTOP®-FC6/056	66	83	3
PROMASTOP®-FC6/063	73	90	3
PROMASTOP®-FC6/075	85	107	3
PROMASTOP®-FC6/090	100	122	4
PROMASTOP®-FC6/110	120	142	4
PROMASTOP®-FC6/125	135	157	4
PROMASTOP®-FC6/140	150	177	4
PROMASTOP®-FC6/160	170	202	5
PROMASTOP®-FC6/200	210	242	5
PROMASTOP®-FC6/225	235	276	6
PROMASTOP®-FC6/250	260	312	6
PROMASTOP®-FC6/315	320	372	6
PROMASTOP®-FC15/315	330	377	5
PROMASTOP®-FC15/350	365	433	5
PROMASTOP®-FC15/400	415	483	5

Product description
PROMASTOP®-FC is a fire stopping collar for plastic pipes made from powder-coated stainless steel with a special intumescent inlay. PROMASTOP®-FC fire collars are tested according to European standards for open plastic pipe systems (U/U).

Fields of application
PROMASTOP®-FC fire stopping collars are tested for walls and floors in both surface-mounted and built-in conditions as well as in combination with the fire stopping coatings PROMASTOP®-I and PROMASTOP®-CC. They are suitable for all common plastic piping materials such as PVC, PP, PE, ABS, as well as for pressure pipes.

- PROMASTOP®-FC3: Installation depth of 30 mm for straight penetrations
- PROMASTOP®-FC6: Installation depth of 60 mm for couplings, sloped pipes and pipe diameter bigger than 160 mm
- PROMASTOP®-FC15: Installation depth of 150 mm for straight penetrations

System advantages / customer benefit
- Ready-to-install collar so assembly is quick and easy
- Possible to achieve zero gap between collars
- Use category: type Y_1
- Reaction to fire: Class E
- Three collar depths: 30 mm, 60 mm or 150 mm
- Tested in sandwich panel walls and CLT constructions

Constructions have been tested, classified and approved according to the following standards / guidelines
- EN 1366-3
- EN 13501-1 and 2
- ETAG 026-2 (used as EAD)

Packaging
- PROMASTOP® FC3/32 - PROMASTOP® FC3/160: 48 collars per box
- PROMASTOP® FC6/50 - PROMASTOP® FC6/160: 28 collars per box
- PROMASTOP® FC6/200 - PROMASTOP® FC6/315: 2 collars per box
- PROMASTOP® FC15/315 - PROMASTOP® FC15/400: 1 collar per box

Storage requirements
- Store in dry conditions

Safety instructions
- Please refer to the safety data sheet for additional advice

PROMASTOP®-FC MD
Fire stopping collar

Technical data and properties	
Colour	anthracite grey
Consistency	flexible collar with stainless steel foil
Expansion temperature	approx. 190 °C
Thickness	approx. 5,5 mm
Width	approx. 55 mm
Use category	Type X
Reaction to fire	Class E

Guide of collar sizes

Pipe outer diameter [mm]	Collar length [mm]	Number of collars from one package	Number of brackets required
40	225	14	2
50	255	12	2
64	300	10	3
75	335	9	3
90	380	8	3
110	445	7	3
125	490	6	4

Product description
PROMASTOP®-FC MD is a multi-diameter fire stopping collar for plastic pipes with a special intumescent seal and a stainless steel covering. The collar is tested according to EN 1366-3 for open end pipe configurations (U/U) up to ø 200 mm.

Fields of application
PROMASTOP®-FC MD fire stopping collar is tested for plastic pipe penetrations throught light partition and rigid walls and floors in surface-mounted condition, ensuring fire resistance from EI 30 to EI 120 (U/U) in all exposure classes (X). It is suitable for common plastic pipes such as PVC, PP, PE.

System advantage / customer benefit
- Flexible collar
- Quick and easy to install
- Cut-to-size solution
- Tested on standard plastic pipes: PP, PE, PVC and with pipe/cable bundles of air-conditioning systems
- Suitable for applications in hard-to-reach places thanks to its low thickness
- Single collar up to ø 125 mm
- Use category: type X

Constructions have been tested, classified and approved according to the following standards / guidelines
- EN 1366-3
- EN 13501-1 and EN 13501-2
- EAD 350454-00-1104

Packaging
- 3200 mm collar (= 7 collars ø 110 mm)
- 7 closing brackets A*
- 7 closing brackets B*
- 21 fixing brackets C*

Subject to change.
** Additional fixings/brackets available.*

Storage requirements
- Store in dry conditions

Safety instructions
- Please refer to the safety data sheet for additional advice

PROMASTOP®-W
Fire stopping wrap

Technical data and properties	
Colour	anthracite grey
Consistency	flexible wrap
Consumption	number of layers depends on pipe diameter and pipe ending (see the construction sheet)
Exapansion temperature	approx. 150 °C
Thickness	approx. 2,5 mm
Width	approx. 50 mm
Use category	Type X
Reaction to fire	Class E
VOC content	< 0,01 g/l

Product description
PROMASTOP®-W is an expanding fire stopping wrap. Flexibility is given by the possibility to make any wrap diameter on site. Furthermore, it is the most space-efficient solution for plastic pipe penetrations.

Fields of application
PROMASTOP®-W is tested for walls and floors for soft and mortarsystem penetrations and for all common plastic piping materials, such as PVC, PE, PP; sound reduction plastic drain pipes with multi layer technology, aluminium composite (MLC) and metal pipes with combustible insulation and with pipe/cable bundles of air-conditioning systems.

System advantages / customer benefit
- Flexible
- Quick and easy installation
- Resistant to atmospheric influences (light, heat, frost, UV radiation, humidity); use category: type X
- Universally usable
- Tested in sandwich panel walls and CLT constructions

Constructions have been tested, classified and approved according to the following standards / guidelines
- EN 1366-3
- EN 13501-1 and EN 13501-2
- ETAG 026-2 (used as EAD)

Packaging
- Wrap length: 18 m/box
- 100 boxes/pallet

Subject to change.

Storage requirements
- Store in cool and dry conditions

Safety instructions
- Please refer to the safety data sheet for additional advice

PROMASTOP®-IM CJ21
Fire stopping cable jacket

Technical data and properties	
Consistency	soft
Weight	~ 8,0 g ± 10%
Height	approx. 40 mm
Outer diameter	approx. 26 mm
Wall thickness	approx. 1,5 mm
Reaction to fire	Class E

Product description
PROMASTOP®-IM CJ21 is graphite based intumescent component for penetration of single cables, even in conduits.

Fields of application
PROMASTOP®-IM CJ21 is a fire stopping jacket for penetration seals in walls and floors. PROMASTOP®-IM CJ21 is suitable for single cables, wires and empty pipes of cable group 1 (up to 21 mm).

System advantages / customer benefit
- Quick and easy installation
- Easy retrofitting of cables
- Integrated smoke seal
- No annular gap seal required
- No coating of cables required

Constructions have been tested, classified and approved according to the following standards / guidelines
- EN 1366-3
- EN 13501-1 and EN 13501-2
- ETAG 026-2 (used as EAD)

Packaging
- 100 jackets/box

Subject to change.

Storage requirements
- Store in dry conditions

Safety instructions
- Please refer to the safety data sheet for additional advice

PROMASTOP®-IM Cbox 125
Fire stopping circular cable box

Product description
PROMASTOP®-IM Cbox 125 is an intumescent sealing system for cable penetrations. It is always possible to re-assign cables after installing the cable box.

Fields of application
PROMASTOP®-IM Cbox 125 is used for cable penetration in walls and floors. A smoke seal is already in the system integrated.

System advantages / customer benefit
- Easy to install
- Easy retrofitting of cables

Constructions have been tested, classified and approved according to the following standards / guidelines
- EN 1366-3
- EN 13501-1 and EN 13501-2

Packaging
- 1 pc./box

Subject to change.

Storage requirements
- Store in dry conditions

Safety instructions
- Please refer to the safety data sheet for additional advice

Technical data and properties	
Colour	dark grey/blue
Consistency	solid
Dimension (H x W x D)	160 x 160 x 300 mm
Outer diameter	124 mm
Inner diameter	106 mm
Core drill hole diameter	approx. 130 mm
Reaction to fire	Class E

PROMASTOP®-B
Fire stopping brick

Technical data and properties	
Colour	dark grey
Weight	approx. 340 g
Dimensions	200 mm x 120 mm x 60 mm (w x l x h)
Expansion ratio (loaded)	approx. 1:2
Expansion temperature	approx. 150 °C
Environmental compatibility	solvent-free, no odour, environmentally friendly
Use category	Type Y_1
Reaction to fire	Class E

Theoretical consumption (pieces/opening)				
	Cable Capacity in %			
Opening size [m²]	**0%**	**10%**	**30%**	**60%**
0,005	1	1	1	1
0,01	1	1	1	1
0,02	3	3	2	1
0,03	4	4	3	2
0,04	6	5	4	2
0,05	7	6	5	3
0,1	14	13	10	6
0,2	28	25	19	11
0,3	42	38	29	17
0,4	56	50	39	22
0,5	69	63	49	28

Product description
PROMASTOP®-B is a permanently elastic intumescent brick, which is used to prevent the spread of smoke, fire and heat.

Fields of application
PROMASTOP®-B is a fire stopping brick-shaped seal for walls and floors. It is designed to be used with single cables, cable bundles or combustible and non-combustible pipes to prevent the spread of smoke, fire and heat. In addition the fire stopping brick can be installed into rigid walls as a linear joint seal.

System advantages / customer benefit
- Permanently elastic and dust-proof
- Quick and easy, dust-free installation
- Easy retrofitting of cables and plastic pipes

Constructions have been tested, classified and approved according to the following standards / guidelines
- EN 1366-3 and EN 1366-4
- EN 13501-1 and EN 13501-2
- ETAG 026-2 (used as EAD)

Packaging
- 16 bricks/box
- 640 bricks/pallet

Subject to change.

Storage requirements
- Store in dry conditions

Safety instructions
- Please refer to the safety data sheet for additional advice

PROMASTOP®-FB
Fire stopping brick

Technical data and properties	
Colour	dark red/brown
Dimension	200 mm x 144 mm x 60 mm (w x l x h)
Use category	Type Z_1
Reaction to fire	Class E
VOC emission (28 days)	6 g/l

Product description
PROMASTOP®–FB is a permanently elastic intumescent block, which is used to prevent the spread of fire.

Fields of application
PROMASTOP®–FB is a fire stopping block-shaped seal for walls and floors. It is designed to be used with single cables, cable bundles or combustible and non-combustible pipes to prevent the spread of smoke, fire and heat.

System advantages / customer benefit
- Permanently elastic and dust-tight
- Quick and easy, dust-free installation
- Easy retrofitting of cables and pipes

Constructions have been tested, classified and approved according to the following standards / guidelines
- EN 1366–3
- EN 13501–1/2
- EAD 350454-00–1104

Packaging
- 18 blocks/box
- 540 blocks/pallet

Subject to change.

Storage requirements
- Store in dry conditions

Safety instructions
- Please refer to the safety data sheet for additional advice

PROMASTOP®-P
Fire stopping plug

Technical data and properties	
Colour	dark grey
Density	approx. 250 g/l
Dimensions **PROMASTOP®-P 65** **PROMASTOP®-P 80** **PROMASTOP®-P 110** **PROMASTOP®-P 125** **PROMASTOP®-P 140** **PROMASTOP®-P 170** **PROMASTOP®-P 210** **PROMASTOP®-P 260**	diameter in mm (bottom / top) 65 / 75 80 / 90 110 / 120 125 / 135 140 / 150 170 / 180 210 / 220 260 / 270
Height	60 mm
Expansion ratio (loaded)	approx. 1:2
Expansion temperature	approx. 150 °C
Environmental compatibility	solvent-free, no odour, environmentally friendly
Use category	Type Y_1
Reaction to fire	Class E

Product description
PROMASTOP®-P is a permanently elastic intumescent plug, which creates pressure on expansion and is used to prevent especially the spread of smoke, fire and heat.

Fields of application
PROMASTOP®-P fire stopping plug is a shaped seal for walls and floors. It is designed to be used with single cables, cable bundles or combustible and non-combustible pipes to prevent the spread of smoke, fire and heat.

System advantages / customer benefit
- Permanently elastic and dust-proof
- Quick and easy, dust-free installation
- Easy retrofitting of cables and pipes
- One-sided closure of openings and cutted edges with PROMASTOP®-AG

Constructions have been tested, classified and approved according to the following standards / guidelines
- EN 1366-3
- EN 13501-1 and EN 13501-2
- ETAG 026-2 (used as EAD)

Packaging
- PROMASTOP®-P 65 - 42 pcs./carton
- PROMASTOP®-P 80 - 30 pcs./carton
- PROMASTOP®-P 110 - 20 pcs./carton
- PROMASTOP®-P 125 - 14 pcs./carton
- PROMASTOP®-P 140 - 9 pcs./carton
- PROMASTOP®-P 170 - 8 pcs./carton
- PROMASTOP®-P 210 - 6 pcs./carton
- PROMASTOP®-P 260 - 2 pcs./carton
- 40 cartons/pallet

Subject to change.

Storage requirements
- Store in dry conditions

Safety instructions
- Please refer to the safety data sheet for additional advice

PROMASTOP®-FP
Fire stopping plug

Technical data and properties		
Colour	Dark red/brown	
Dimensions	diameter in mm (bottom / top)	plus heigth in mm
PROMASTOP®-P 65	67 / 74	85
PROMASTOP®-P 78	80 / 85	85
PROMASTOP®-P 104	109 / 115	85
PROMASTOP®-P 118	122 / 129	85
PROMASTOP®-P 128	134 / 140	85
PROMASTOP®-P 160	168 / 175	85
PROMASTOP®-P 194	204 / 212	85
PROMASTOP®-P 250	248 / 254	85
Use category	Type Z_1	
Reaction to fire	Class E	
VOC emission (28 days)	6 g/l	

Product description
PROMASTOP®–FP is a permanently elastic intumescent plug, which is used to prevent the spread of fire.

Fields of application
PROMASTOP®–FP is a fire stopping seal for walls and floors. It is designed to be used with single cables and cable bundles to prevent the spread of smoke, fire and heat.

System advantages / customer benefit
- Permanently elastic and dust-tight
- Quick and easy, dust-free installation
- Easy retrofitting of cables and pipes

Constructions have been tested, classified and approved according to the following standards / guidelines
- EN 1366–3
- EN 13501–1/2
- EAD 350454-00–1104

Packaging
- PROMASTOP®-FP 65 - 20 pcs./box
- PROMASTOP®-FP 78 - 20 pcs./box
- PROMASTOP®-FP 104 - 20 pcs./box
- PROMASTOP®-FP 118 - 20 pcs./box
- PROMASTOP®-FP 128 - 20 pcs./box
- PROMASTOP®-FP 160 - 20 pcs./box
- PROMASTOP®-FP 194 - 10 pcs./box
- PROMASTOP®-FP 250 - 10 pcs./box

Subject to change.

Storage requirements
- Store in dry conditions

Safety instructions
- Please refer to the safety data sheet for additional advice

PROMASTOP®-S & PROMASTOP®-L
Fire stopping pillow

Technical data and properties	
Colour	light grey
Consistency	compact
Density	230 – 430 g/l
Solid content	100%
Expansion ratio	minimum 1 : 2,5 (30 minutes / 600 °C)
Expansion temperature	approx. 150 °C
Volume	PROMASTOP®-S approx. 1 l PROMASTOP®-L approx. 2 l
Dimensions **PROMASTOP®-S** **PROMASTOP®-L**	 approx. 320 x 100 mm approx. 320 x 200 mm
Use category	Type X
Reaction to fire	Class E

Theoretical consumption (pieces/opening)					
Opening size [m²]		**Cable Capacity**			
Combination PROMASTOP®-S and PROMASTOP®-L		**10%**	**20%**	**30%**	**40%**
0,1 m²	**PROMASTOP®-S +**	3	2	2	2
	PROMASTOP®-L	12	11	10	9
0,2 m²	**PROMASTOP®-S +**	6	4	4	4
	PROMASTOP®-L	24	22	20	18
0,3 m²	**PROMASTOP®-S +**	9	6	6	6
	PROMASTOP®-L	36	33	30	27
0,4 m²	**PROMASTOP®-S +**	12	8	8	8
	PROMASTOP®-L	48	44	40	36
0,5 m²	**PROMASTOP®-S +**	15	10	10	10
	PROMASTOP®-L	60	55	50	45
0,6 m²	**PROMASTOP®-S +**	18	12	12	12
	PROMASTOP®-L	72	66	60	54
0,7 m²	**PROMASTOP®-S +**	21	14	14	14
	PROMASTOP®-L	84	77	70	63
0,8 m²	**PROMASTOP®-S +**	24	16	16	16
	PROMASTOP®-L	96	88	80	72
0,9 m²	**PROMASTOP®-S +**	27	18	18	18
	PROMASTOP®-L	108	99	90	81
1,0 m²	**PROMASTOP®-S +**	30	20	20	20
	PROMASTOP®-L	120	110	100	90

Product description
PROMASTOP®-S and PROMASTOP®-L is a fire stopping graphite based pillow, which enables quick and easy, dust-free installation. Pillows that have previously been installed can be reused provided they have not been subjected to fire.

Fields of application
PROMASTOP®-S and PROMASTOP®-L is a fire stopping pillow for walls and floors. It is designed for use with cables, cable trays and plastic pipes to prevent the spread of fire.

System advantages / customer benefit
- Temporary penetration during construction and easy retrofitting
- Permanent penetration at base of walls (smoke)
- Dust-proof, suitable for computer and server centres
- Low workload due to easy installation

Constructions have been tested, classified and approved according to the following standards / guidelines
- EN 1366-3
- EN 13501-1 and EN 13501-2
- ETAG 026-2 (used as EAD)

Packaging
- PROMASTOP®-S - 10 pillows per box
  - 1000 pcs./pallet
- PROMASTOP®-L - 5 pillows per box
  - 500 pcs./pallet

Subject to change.

Storage requirements
- Store in dry conditions

Safety instructions
- Please refer to the safety data sheet for additional advice
- Only when getting in contact with content - please mind H and P phrases

PROMASTOP®-IM Grille

Intumescent sealing system

Technical data and properties	
Colour	anthracite grey
Consistency	hard, intumescent
Dimension (H x W x D)	100 x 100 x 80 mm
Weight	approx. 300 g
Expansion temperature	approx. 190 °C
Open cross-sectional area	approx. 6900 mm² (approx. 69%)

Product description

PROMASTOP®-IM Grille is a fire intumescent sealing system for ventilation openings. The ventilation grill starts expanding at approx. 190 °C and seals the openings, which prevents spreading of smoke and fire.

Fields of application

PROMASTOP®-IM Grille is used as ventilation module in fire compartment walls.

System advantages / customer benefits

- Module system
- Slim design
- Resistant to atmospheric influences (light, heat, frost, UV radiation, humidity)

Constructions have been tested, classified and approved according to the following standards / guidelines

- EN 1364-1
- EN 13501-2
- ETAG 026-4

Packaging

- 8 pieces in box

Subject to change.

Storage

- Store in cool and dry conditions.

Safety instructions

- Keep out of reach of children.
- Avoid contact with food or beverages.

PROMASEAL®-A spray
Fire stopping coating

Technical data and properties	
Colour	white/grey
Consumption	1,90 kg/m² for 1 mm dry film thickness
Density	1350 kg/m³
Viscosity	approx. 60 Pa·s
Solid content	approx. 70%
Ash content	approx. 30%
Shore A	40
Tensile strength	0,35 MPa
Elongation before failure	approx. 250%
Use category	Type Y_1
Reaction to fire	Class E

Product description
PROMASEAL®-A spray is an acrylic based, single component, permanently elastic fire stopping coating. It forms a flexible seal once dry, is very suitable for accommodating movement and is also resistant to moisture. Joints even with movement can be sealed quickly and securely thanks to its outstanding application qualities.

Fields of application
PROMASEAL®-A spray is a fire stopping coating for joints in walls and floors. It is designed for use within joints where movement is possible, to seal against the spread of smoke and fire.

System advantages / customer benefit
- Quick and easy installation
- 30% movement capability
- Excellent adhesion qualities
- Moisture resistant once dry

Constructions have been tested, classified and approved according to the following standards / guidelines
- EN 1366-3 and EN 1366-4
- EN 13501-1 and EN 13501-2
- ETAG 026-3 (used as EAD)

Packaging
- 12 kg plastic bucket
- 33 buckets /pallet
- 396 kg/pallet

Subject to change.

Storage requirements
- Store in cool and dry conditions: 3 °C - 35 °C
- Shelf life of original sealed containers at least 12 months
- Once opened, buckets should be finished swiftly

Safety instructions
- Please refer to the safety data sheet for additional advice

PROMASEAL®-A
Fire stopping acrylic sealant

Technical data and properties	
Colour	white/grey
Consistency	paste
Density	wet: 1600 ± 200 kg/m³ dry: 1800 ± 200 kg/m³
Solid content	86 ± 5 wt%
Movement capabilities	elongation minimum 15% compression minimum 15%
Use category	Type Y_1
Reaction to fire	Class E

Theoretical consumption per 310 ml cartridge							
Joint width	**10 mm**	**15 mm**	**20 mm**	**25 mm**	**30 mm**	**40 mm**	**50 mm**
Joint depth							
10 mm	3,1 m	2,0 m	1,5 m	1,2 m	1,0 m	0,8 m	0,6 m
15 mm	2,0 m	1,3 m	1,0 m	0,8 m	0,7 m	0,5 m	0,4 m
20 mm	1,5 m	1,0 m	0,7 m	0,6 m	0,5 m	0,4 m	0,3 m

Product description
PROMASEAL®-A is an acrylic based, single component fire stopping sealant. Joints without movement can be sealed quickly and securely thanks to its outstanding application qualities. A common emulsion paint can be used to colour the joints.

Fields of application
PROMASEAL®-A is a fire stopping sealant for joints in walls and floors with a maximum movement of 7,5%.

PROMASEAL®-A can also be used as an annular gap seal between structural components and sustained insulation.

System advantages / customer benefit
- Can be painted
- Good adhesion to various substrates

Constructions have been tested, classified and approved according to the following standards / guidelines
- EN 1366-3 and EN 1366-4
- EN 13501-1 and EN 13501-2
- ETAG 026-2 and ETAG 026-3 (both used as EAD)

Packaging
- 310 ml cartridges
- 12 cartridges/box
- 1200 cartridges/pallet

Subject to change.

Storage requirements
- Store in cool and dry conditions: 3 °C - 35 °C
- Shelf life of original sealed containers at least 12 months
- Once opened, cartridges should be finished swiftly

Safety instructions
- Please refer to the safety data sheet for additional advice

PROMASEAL®-AG

Intumescent fire stopping acrylic sealant

Technical data and properties	
Colour	grey
Consistency	paste
Density	wet: 1500 ± 200 kg/m³ dry: 1600 ± 200 kg/m³
Expansion ratio	approx. 1:13 (550 °C)
Solid content	84 ± 5 wt%
Expansion temperature	approx. 150 °C
Expansion pressure	approx. 0,9 N/mm²
Use category	Type Y_1
Reaction to fire	Class E

Theoretical consumption per 310 ml cartridge							
Joint width	**10 mm**	**15 mm**	**20 mm**	**25 mm**	**30 mm**	**40 mm**	**50 mm**
Joint depth							
10 mm	3,1 m	2,0 m	1,5 m	1,2 m	1,0 m	0,8 m	0,6 m
15 mm	2,0 m	1,3 m	1,0 m	0,8 m	0,7 m	0,5 m	0,4 m
20 mm	1,5 m	1,0 m	0,7 m	0,6 m	0,5 m	0,4 m	0,3 m

Product description

PROMASEAL®-AG is an acrylic-based, intumescent, single component fire stopping sealant, which creates high pressure on expansion.

Fields of application

PROMASEAL®-AG is a fire stopping sealant for walls and floors. It is designed for use with cables, cable jackets, cable bundles and combustible and non-combustible pipes with combustible insulation to prevent the spread of smoke, fire and heat.

System advantages / customer benefit

- Expands with pressure
- Can be painted
- Good adhesion to various substrates

Constructions have been tested, classified and approved according to the following standards / guidelines

- EN 1366-3 and EN 1366-4
- EN 13501-1 and EN 13501-2
- ETAG 026-2

Packaging

- 310 ml cartridges
- 12 cartridges/box
- 1200 cartridges/pallet

Subject to change.

Storage requirements

- Store in cool and dry conditions: 3 °C - 35 °C
- Shelf life of original sealed cartridges at least 12 months
- Once opened, containers should be finished swiftly

Safety instructions

- Please refer to the safety data sheet for additional advice

PROMASEAL®-S
Fire stopping silicone

Technical data and properties	
Colour	white/grey
Consistency	paste
Density	1200 ± 200 kg/m³
Use category	Type X
Reaction to fire	Class B-s2, d0

Theoretical consumption per 310 ml cartridge							
Joint width	**10 mm**	**15 mm**	**20 mm**	**25 mm**	**30 mm**	**40 mm**	**50 mm**
Joint depth							
10 mm	3,1 m	2,0 m	1,5 m	1,2 m	1,0 m	0,8 m	0,6 m
15 mm	2,0 m	1,3 m	1,0 m	0,8 m	0,7 m	0,5 m	0,4 m
20 mm	1,5 m	1,0 m	0,7 m	0,6 m	0,5 m	0,4 m	0,3 m

Product description
PROMASEAL®-S is a silicone based, elastic, single component fire stopping sealant. PROMASEAL®-S is suitable for linear joints that can easily be used outdoors. PROMASEAL®-S swells with various solvents, lubricants, oils and fuels, but does not dissolve.

Fields of application
PROMASEAL®-S is a fire stopping sealant for linear joints in walls and floors with maximum movement of 27,5%.

System advantages / customer benefit
- Aging and weather resistant (outdoor use; use category: type X)
- Insensitive to chemicals

Constructions have been tested, classified and approved according to the following standards / guidelines
- EN 1366-4
- EN 13501-1 and EN 13501-2
- EAD 350141-00-1106

Packaging
- 310 ml cartridges
- 12 cartridges/box
- 1488 cartridges/pallet

Subject to change.

Storage requirements
- Store in cool and dry conditions: 3 °C - 35 °C
- Shelf life of original sealed cartridges at least 12 months
- Once opened, cartridges should be finished swiftly

Safety instructions
- Please refer to the safety data sheet for additional advice

PROMAFOAM®-C
Fire insulation foam

Technical data and properties	
Colour	grey
Bulk density ρ	22 to 28 kg/m³ (sprayed in joints)
Yield	30 to 35 litres (free sprayed)
Temperature resistance	-40 °C to +90 °C
Cartridge temperature	+5 °C up to max +30 °C
Thermal conductivity λ	0,04 W/m.K
Water absorption	approx. 0,3 Vol.%
Climatic influences	Resistant to decomposition, heat, water and to many chemicals (must be protected against UV)
Tack free time	After 8 to 10 minutes (30 mm strip) (depending on temperature and air humidity)
Cutting ability	After 35 to 60 minutes (30 mm strip) (depending on temperature and air humidity)
Building material class	Flame retardant, B1 according to DIN 4102 between solid mineral or metal building materials
Processing temperature	+5 °C up to +35 °C
Storage	Store in cool and dry place in upright position, protected from frost and heat
Shelf life	Approx. 12 months from date of packaging when stored in original closed cartridges

Product description
PROMAFOAM®-C is a one component polyurethane foam with CFC-free propellant, modified with the addition of fire retardants. It has excellent properties of adhesion to the wide range of building materials, good dimensional stability and allows fast processing due to its short outlet and curing time. After expansion, the foam is firm to the touch, but still retains some flexibility.

Fields of application
PROMAFOAM®-C is used for filling and sealing joints, gaps, interspaces and cavities and for filling of joints in window and door frames. Moreover the PROMAFOAM®-C is used for thermal insulation. PROMAFOAM®-C is intended for use inside the buildings and in open halls (do not expose it to external weather influences).

Processing
The substrates should be clean and able to bear load. Remove any loose parts, dust and grease. Adhesion surfaces should be moistened well prior to foam application. Shake the cartridge about 20 times prior to use.
The dosing of PROMAFOAM®-C is done by operating the trigger lever and the screw for adjusting on the gun. Screw the PROMAFOAM® pistol on the screw seat of the PROMAFOAM®-C cartridge. For dosing of PROMAFOAM®-C foam operate the trigger lever and the adjusting screw on the gun. When processing, always hold the cartridge with the valve facing down. The foam should be applied to the surface sparingly in stripes. In case of several layers moistening between the layers is necessary. To prevent the discolouration the foam should be covered or sealed.
The pistol may remain installed to the filled or partly filled cartridge of PROMAFOAM®-C foam for up to 4 weeks according to instructions of use. For further details please read the instructions for use of the PROMAFOAM® pistol which are enclosed in its packaging.
For requirements on structural fire protection, official certificates for the relevant building components, should be observed.

Packaging
- 768 cartridges/pallet
- 750 ml cartridge
- 12 cartridges/box

Subject to change.

Safety instructions
The cartridge is under pressure. Protect from sunlight and temperatures above 50 °C. Do not open by force and/or burn even after use. Do not spray on an open flame or other ignition source. Keep away from ignition sources. No smoking. Use only in a well-ventilated area. Keep out of the reach of children. Observe the information written on the product label and in the Safety Data Sheet.

Please note
Since the verification of required preconditions as well as the applied processing methods is beyond our control, our recommendations should be adapted to the local conditions. Prior to carrying out the work the user should perform the testing.

PROMAFOAM®-2C
Fire insulation foam

Technical data and properties	
Colour	red-brown
Density fully cured	≥ 215 kg/m³
Foaming factor	1,6 – 4,5 x depending on on-site conditions
VOC content (28 days)	≤ 5 g/l
Use category	Type Z_1
Reaction to fire	Class E

Product description
PROMAFOAM®–2C is a 2-component polyurethane foam with halogen-free fire retardants.

Fields of application
PROMAFOAM®–2C is a fire stopping foam for walls and floors. It is designed to be used with cables and conduits, combustible and non-combustible pipes and HVAC split pipes to prevent the spread of smoke, fire and heat. In addition it can be installed in combination with the fire stopping brick PROMASTOP®–FB.

System advantage / customer benefit
- Multi penetration applications
- Fast reaction and good adhesion
- Re-usage cut-off pieces

Constructions have been tested, classified and approved according to the following standards / guidelines
- EN 1366-3
- EN 13501-2
- EAD 350454-00-1104

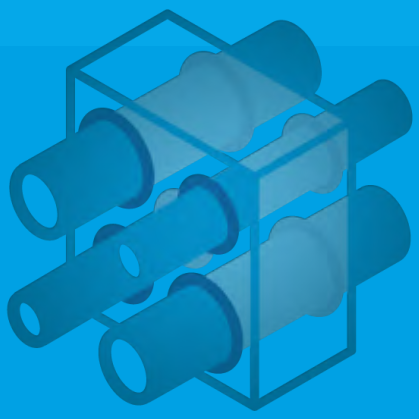
Packaging
- 380ml/can
- 6 cans/box
- 360 cans/pallet

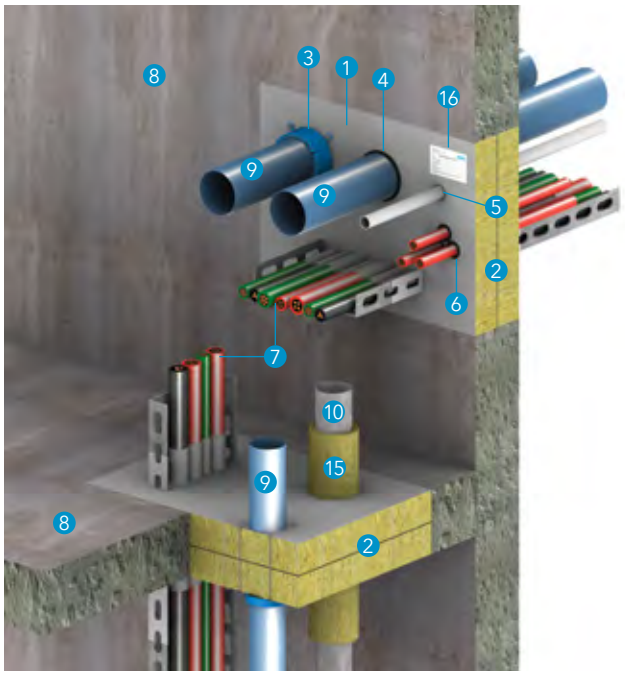
Subject to change.

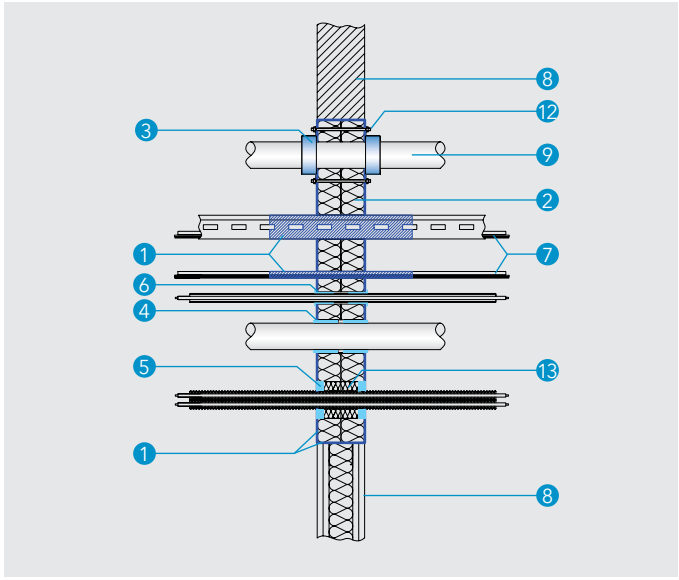
Storage requirements
- Store in cool and dry conditions: 5 °C – 30 °C
- Shelf life of original sealed containers at least 12 months
- Once opened, containers should be finished immediately

Safety instructions
- Please refer to the safety data sheet for additional advice

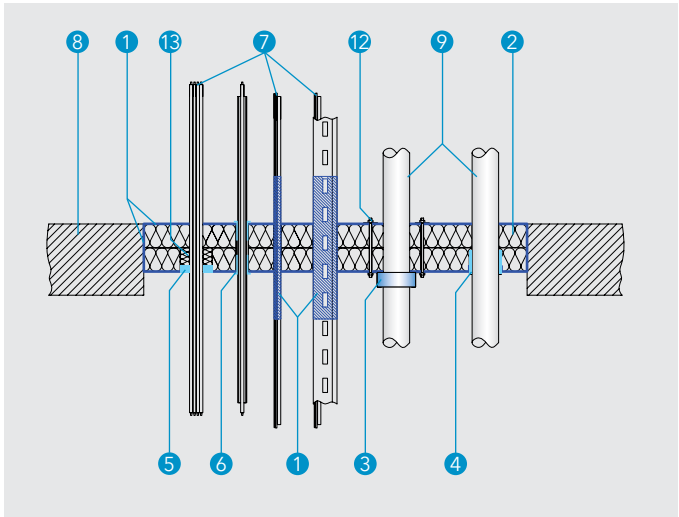
Penetration seal systems
Construction Data Sheets







Detail A - Mixed penetration seal in flexible and rigid wall



Detail B - Mixed penetration seal in rigid floor

Technical data

1. PROMASTOP®-CC
2. Mineral wool, according to the related detail
3. PROMASTOP®-FC or PROMASTOP®-FC MD (see on the related detail)
4. PROMASTOP®-W
5. PROMASEAL®-AG
6. PROMASTOP®-IM CJ21
7. Cables, cable bundles
8. Supporting construction
9. Plastic pipes
10. Non-combustible pipes
11. MLC pipes (multi-layered pipes including metal layer(s))
12. Fixing material, e.g. threaded rods (≥ M6) or spiral screws or spring toggle bolts M4 (see on the related detail)
13. Mineral wool backfilling, density ≥ 40 g/m³
14. Combustible insulation
15. Non-combustible local insulation
16. Identification label
17. Additional mineral wool protection

Certificates: ETA-16/0523, IBS CR 316100407-A-en,Rev1, IBS CR 13061206-A,Rev1-en, IBS KB 317020305-A,Rev1, IBS CR 316071301-A-en, ITB CR 01633.1/21/R164NZP, Pavus CR PK2-11-19-002-E-1, CR 2016-Efectis-R000326, ITB CR 01633.1/19/R140NZP + ITB CR 01633.2/19/R140NZP

Customer benefit

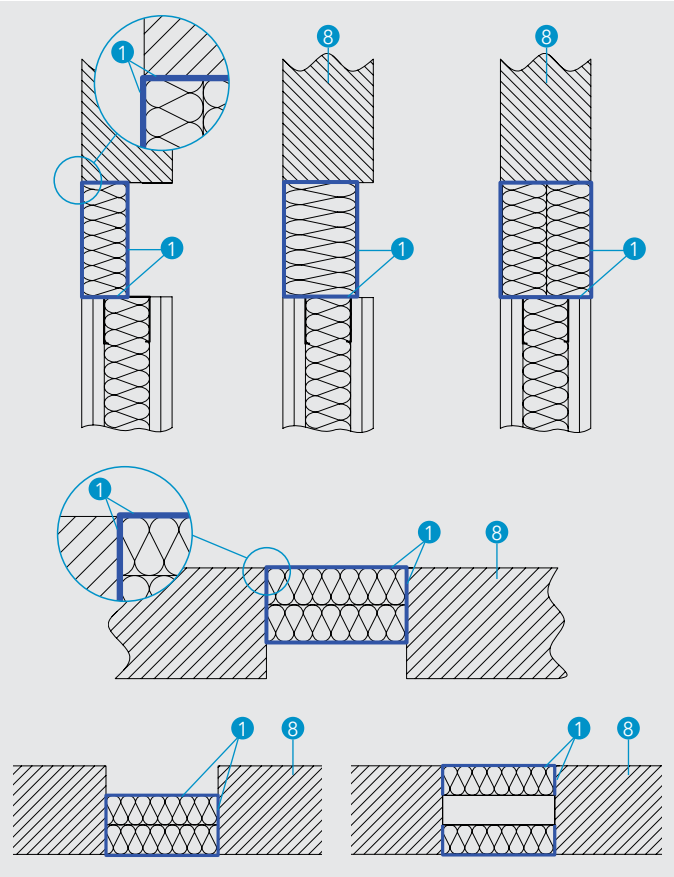
- Seal size up to 3,75 m² tested in wall and floor
- Moisture-resistant
- Wet film thickness 0,9 mm on the mineral wool boards (means dry film thickness of 0,7 mm)
- PROMASTOP®-CC penetration seals can be overpainted with coatings and paints based on emulsion, polyurethane, acrylic or their mixtures for decorative or environmental protection purposes. Overpainting with fire stopping coatings PROMASTOP®-I or PROMASTOP®-E allowed.

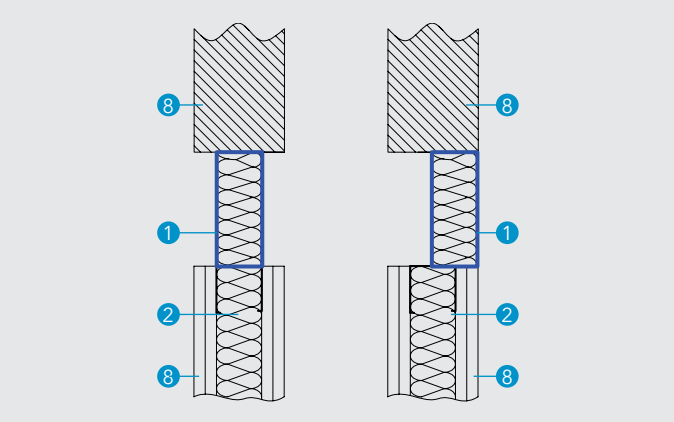
1. Installation

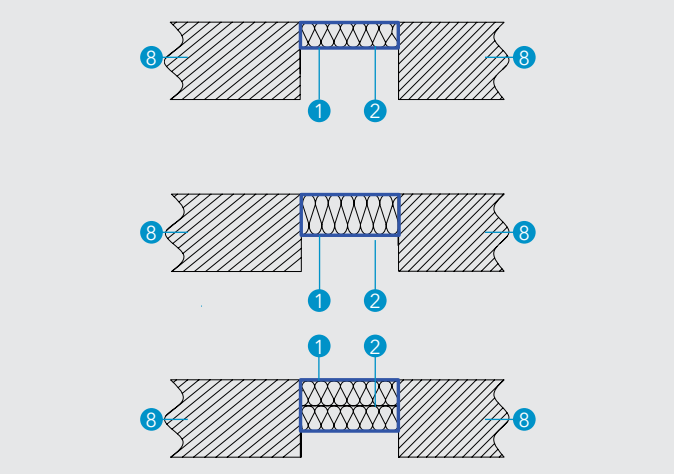
- A flexible wall requires aperture framing, see Detail D.
- Depending on the fire resistance, apply a corresponding number of boards made of non-combustible mineral wool (A1 acc. to EN 13501-1) with a melting point of ≥ 1000 °C and a density of ≥ 140 kg/m³ unless defined otherwise.
- The distance between the mineral wool boards ≥ 0 mm.
- The mineral wool boards must be coated with 0,7 mm (dry film thickness) PROMASTOP®-CC on the outer surfaces, all cutting edges and board joints. The inner surfaces of the mineral wool boards remain uncoated.
- The required coating thickness on cables can be taken from the cable classifications; however, basically the surface requires 1 mm; except for cable group 6 which takes 3 mm.
- The consumption of PROMASTOP®-CC on the mineral wool is 1,35 kg/m² for 0,7 mm dry film thickness.
- Fill remaining gaps and spaces with mineral wool and coated flush or filled with PROMASEAL®-AG.
- It is not necessary to coat over the adjacent wall and floor.
- Secure floor penetration seals against being stepped on.
- Label the penetration seal.

Details A and B

Mixed penetration seals can be applied in rigid walls and floors as well as in lightweight constructions.





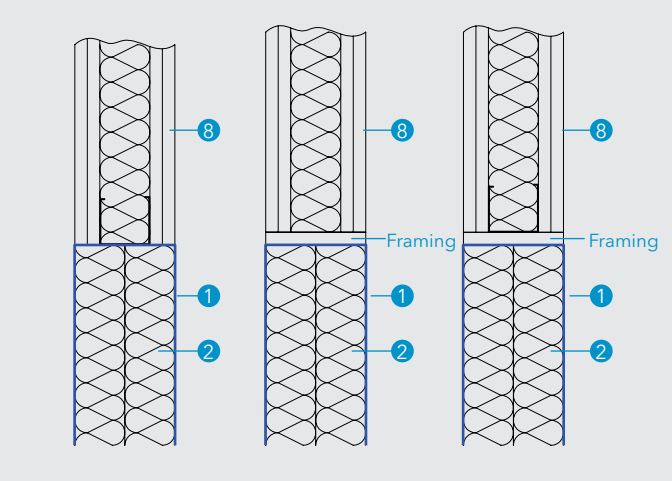


Detail C – Possible positions of the mineral wool boards

Detail C

There are many possibilities shown in Detail C how to arrange mineral wool board(s) of the PROMASTOP®-CC soft penetration seal in flexible or rigid walls ≥ 100 mm or in rigid floors ≥ 150 mm.

- Single board soft penetration seal composed of 50 mm or 80 mm mineral wool board arranged to one side of the wall or installed in the middle of the wall thickness. Both surfaces of the mineral wool must be covered with 0,7 mm PROMASTOP®-CC.
- Double board soft penetration seal composed of two layers of 50 mm mineral wool board arranged to one side of the wall or installed in the middle of the wall thickness.
- Single or double board soft penetration seal flush to the upper edge of the floor.
- Single or double board soft penetration seal flush to the lower edge of the floor.
- Double board soft penetration seal: both mineral wool boards flush to the upper and lower edge of the floor.



Detail D – Aperture framing of the flexible wall

Detail D

For flexible walls, there are the following options for aperture framing:

- Without additional aperture framing, but with the metal stud (left drawing).
- With the metal stud and minimum 1 layer of the flexible wall lining in the aperture (right drawing).
- Without the metal stud but with minimum 1 layer of the flexible wall lining in the aperture (middle drawing).

Table 1 – Fields of application and maximum seal size

Supporting construction	Thickness of mineral wool boards [mm]		
	1 × 50	1 × 80	2 × 50
Flexible wall ≥ 100 mm	3,0 m²		3,75 m²
Rigid wall ≥ 100 mm			
Rigid floor ≥ 150 mm	3,0 m²		
Sandwich panel wall ≥ 80 mm (ArcelorMittal Pflaum)	-		2,0 m²
Sandwich panel wall (Kingspan KS 1100 CS) thickness 100 and 175 mm	-		0,36 m²
Shaft wall ≥ 2 x 20 mm	-		0,60 m²
Suspended ceiling ≥ 2 x 20 mm	-		0,60 m²
Consumption of PROMASTOP®-CC	1,35 kg/m²		

Fire resistance class (blank seal)

	Thickness of mineral wool boards [mm]		
	1 × 50	1 × 80	2 × 50
Flexible wall ≥ 100 mm	EI 60 E 90	EI 120	EI 120
Rigid wall ≥ 100 mm			
Rigid floor ≥ 150 mm			

2. Fields of application

Table 1

Table 1 shows the maximum tested and certified penetration seal sizes and the fire resistance classes with the various installation situations. The maximum dimensions shall be observed and shall not be exceeded.

The components (supporting constructions) must be classified acc. to EN 13501-2 for the required fire resistance period.

Flexible wall

Classifications for flexible wall supporting construction are valid for penetration seals in flexible walls made of gypsum plasterboards type F or DF with steel or timber studs substructure, thickness equal to or greater than given in appropriate point (min. two layers of gypsum plasterboards type F or DF or calcium silicate boards which are CE marked based on an ETA for the application as lining of flexible walls, with overall board layer thickness equal to or greater than 25 mm), with fire resistance class (classified according to EN 13501-2) equal to or greater than given in appropriate point.

In case of supporting constructions with timber studs no part of the penetration seal is closer than 100 mm to a stud, the cavity is closed between the penetration seal and the stud and minimum 100 mm of insulation of class A1 or A2 according to EN 13501-1 is provided within the cavity between the penetration seal and the stud.

Classifications given for flexible wall supporting construction are also valid for penetration seals in wall made of concrete, reinforced concrete, aerated concrete, ceramic brick, cavity brick, checker brick, with density greater than or equal to 450 kg/m³ and thickness equal to or greater than given in appropriate point, with fire resistance class (classified according to EN 13501-2) equal to or greater than given in appropriate point.

Rigid wall

Classifications for rigid wall supporting construction are valid for penetration seals in wall made of concrete, reinforced concrete, aerated concrete, ceramic brick, cavity brick, checker brick, with density greater than or equal to 600 kg/m³ and thickness equal to or greater than given in appropriate point,

with fire resistance class (classified according to EN 13501-2) equal to or greater than given in appropriate point.

Rigid floor
Classifications for rigid floor supporting construction are valid for penetration seals floor made of concrete, aerated concrete or reinforced concrete, with density greater or equal to 600 kg/m^3 and thickness greater than or equal to given in appropriate point.

Classifications are valid for the penetration seals in round or rectangular openings, provided that the distance from the edge of the opening to the service edge remains as specified in appropriate point.

For penetration seals in soft-seal the thickness of the penetration seal mineral wool infill can be increased but may not be reduced. No extension to other insulations (specified by the product name and manufacturer) is permissible.

The minimum distances between the adjacent penetration seals is 100 mm.

Shaft wall
This is defined as a shaft wall lined on one side on metal studs, the total board thickness according to the fire resistance period must be ≥ 40 mm and consist of at least two layers.

Suspended ceiling
The total thickness of the boards must be ≥ 40 mm and consist of at least two layers.

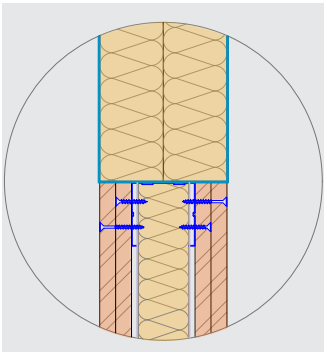
Sandwich panel wall
The tested ArcelorMittal Pflaum FO-010-10-80/1000 stone wool panel must be ≥ 80 mm thick, with a circumferential frame made of PROMATECT®-100 fire protective boards (thickness ≥ 10 mm) must be installed around the opening using dry wall screws (distance ≤ 200 mm). The PROMATECT®-100 fire protective boards must cover the edge of the opening over a width of ≥ 50 mm.

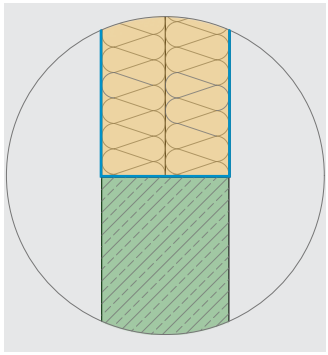
The thickness of the tested Kingspan KS 1100 CS sandwich panel partition (with IPN QuadCore® insulating core) was 100 and 175 mm. The two layers of mineral wool boards were installed flush with the supporting construction. No circumferential frame required.

Overview of the combinations of soft penetration seals with supporting constructions

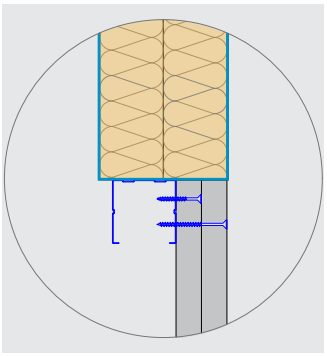
Depending on the wall or floor, there are different combination options for soft penetration seals and supporting constructions.

PROMASTOP®-CC in walls (1 x 50 mm, 1 x 80 mm or 2 x 50 mm mineral wool boards)

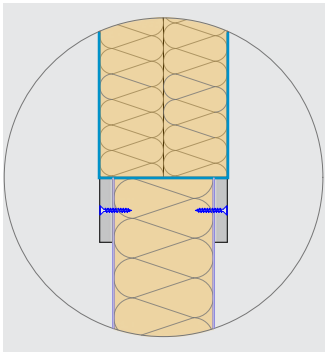


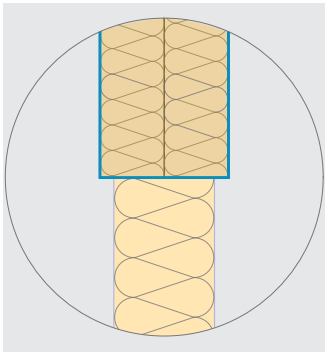


Flexible wall / rigid wall ≥ 100 mm
Maximum penetration seal sizes
- 1 × 50 mm mineral wool boards: 3,00 m²
- 1 × 80 mm mineral wool boards: 3,00 m²
- 2 × 50 mm mineral wool boards: 3,75 m²



Shaft wall ≥ 2 ×20 mm
Maximum penetration seal size
- 0,60 m² (EI 90)



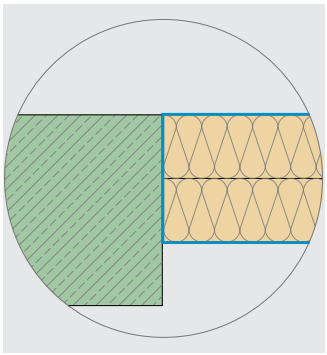


Sandwich panel wall type 1
thickness ≥ 80 mm
Maximum penetration seal sizes
- PFLAUM FO-010-10-80/1000 (ArcelorMittal Pflaum): 2,0 m² (EI 120)
- WP-F 100 (Brucha): 0,16 m² (EI 90)

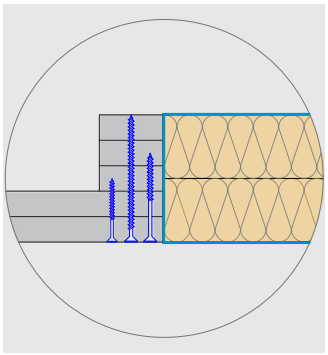
Sandwich panel wall type 2
thickness 100 mm
Maximum penetration seal sizes
- Kingspan KS 1100 CS panels: 0,36 m²

Sandwich panel wall type 3
thickness 175 mm
Maximum penetration seal sizes
- Kingspan KS 1100 CS panels: 0,36 m²

PROMASTOP®-CC in floors

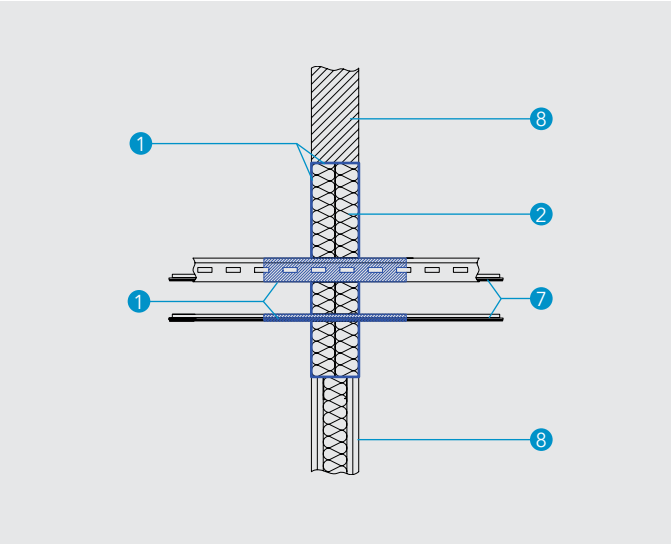


Rigid floor ≥ 150 mm
Maximum penetration seal sizes
- 1 × 50 mm mineral wool: 3,00 m²
- 1 × 80 mm mineral wool: 3,00 m²
- 2 × 50 mm mineral wool: 3,75 m²

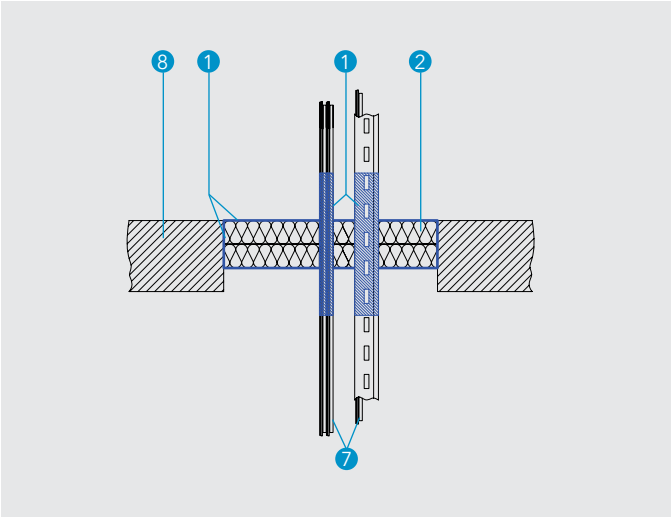


Suspended ceiling ≥ 2 × 20 mm
Maximum penetration seal size
- 0,6 m²

3. PROMASTOP®-CC cable penetration seal



Detail E – Cable penetration seal in flexible and rigid wall



Detail F – Cable penetration seal in rigid floor

Details E and F

Single cables, cable bundles, flexible conduits, conduit bundles, empty conduits, cable trays and cable ladders may penetrate the PROMASTOP®-CC penetration seal in wall and floor. No additional measures need to be taken up to a cable bundle diameter of 100 mm. Coating with PROMASTOP®-CC (acc. to Table 2) is sufficient.

Table 2

As shown in Table 2, a dry film with a thickness of 1 mm shall be applied to cables of the cable group 1-5, cable trays and cable ladders over a length of 100 mm. The coating length shall be measured from the surface of the penetration seal. Lines of cable group 6 shall be coated with a 3 mm thick layer (dry film thickness) over the same length.

Table 2 – Layer thickness and coating length

Object	Dry film thickness [mm]	Coating length [mm]
Cable group 1 - 5	1	100
Cable group 6	3	
Cable trays, cable ladders	1	

Supporting distance

The cables, cable bundles, cable ladders and cable trays must be suspended/supported ≤ 250 mm on both sides of walls or from the top of the floor.

Table 3

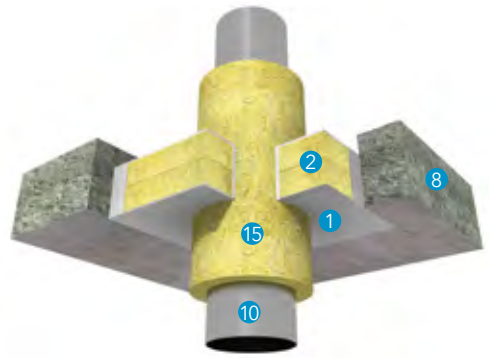
Table 3 shows the fire resistance classification of the cable groups depending on the penetration seal structure.
Later installation in a PROMASTOP®-CC soft penetration seal is generally possible if all application guidelines are followed.

Table 3 – Fire resistance class of the respective cable groups depending on the penetration seal structure

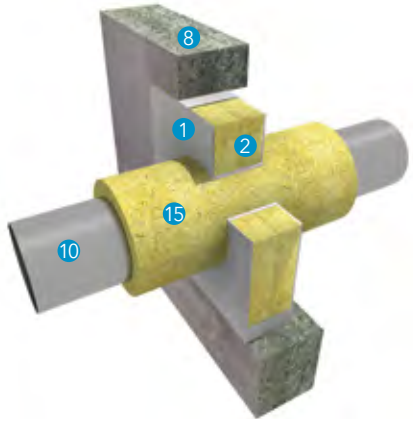
Electrical installations	Thickness and orientation of mineral wool boards					
	1 × 50 mm		1 × 80 mm		2 × 50 mm	
	Wall	Floor	Wall	Floor	Wall	Floor
CG 1: All sheathed cable types Ø ≤ 21 mm	EI 60	EI 90	EI 90	EI 90	EI 120	EI 120
CG 2: All sheathed cable types 21 < Ø ≤ 50 mm	EI 60	EI 60	EI 60	EI 90	EI 90	EI 90
CG 3: All sheathed cable types 50 < Ø ≤ 80 mm	EI 60	EI 60	EI 60	EI 90	EI 90	EI 90
CG 4: Cable bundles made of cables from CG 1 Ø ≤ 100 mm	EI 60	EI 90	EI 90	EI 90	EI 120	EI 120
CG 5: Non-sheathed cable types Ø ≤ 24 mm	EI 45	EI 60	EI 60	EI 60	EI 90	EI 90
CG 6: Empty conduit/pipe made of steel, copper or plastic with pipe end configuration U/C, Ø ≤ 16 mm	EI 45	EI 45	EI 60	EI 60	EI 90	EI 90

CG … Cable group acc. to EN 1366-3:2009

4. PROMASTOP®-CC penetration seal for non-combustible pipes with non-combustible insulation



Detail G – Metal pipe penetration seal in rigid floor



Detail H – Metal pipe penetration seal in rigid wall

Table 4 – Classifications of 2 x 50 mm PROMASTOP®-CC cable penetration seals in Kingspan KS 1100 CS sandwich panel walls

Object	Kingspan KS 1100 CS, 100 mm	Kingspan KS 1100 CS, 175 mm
Cable group 1 - 5, see the details in the text	EI 30	EI 60

Minimum working spaces of a1 to a5 according to Annex A (figure A.1) in EN 1366-3 are stated:

a_1: 35 mm; a_2: 24 mm; a_3: 65 mm; a_4: 65 mm; a_5: 125 mm

Detail G

Non-combustible pipes can be sealed with appropriate pipe insulation made of mineral wool (melting point ≥ 1000 °C, A2/A2$_L$ or higher rated acc. to EN 13501-1). The required lengths and thicknesses are shown in the diagrams. These depend on the pipe diameter, the pipe wall thickness and the pipe type (steel, copper or their substitutes).
The pipe insulation can be realised as a LS, LI, CS or CI configuration in compliance with EN 1366-3.

Detail H

The insulation (configuration LS) is placed in the centre of the supporting construction or the soft penetration seal and fixed with steel wire (minimum diameter 0,6 mm). The insulation length is shown in Diagrams 1 and 2. Results of copper pipes can be also apply to steel pipes but not vice versa.
To fill gaps between the pipe insulation and the mineral wool boards of the penetration seal (melting point ≥ 1000 °C, A1 acc. to EN 13501-1) PROMASTOP®-CC or PROMASEAL®-A can be used. Insulated metal pipes may pass at angles between 90° and 45° to the supporting construction.

Supporting distance

The pipes must be suspended/supported ≤ 250 mm on both sides of walls or from the top of the floor.

Table 4

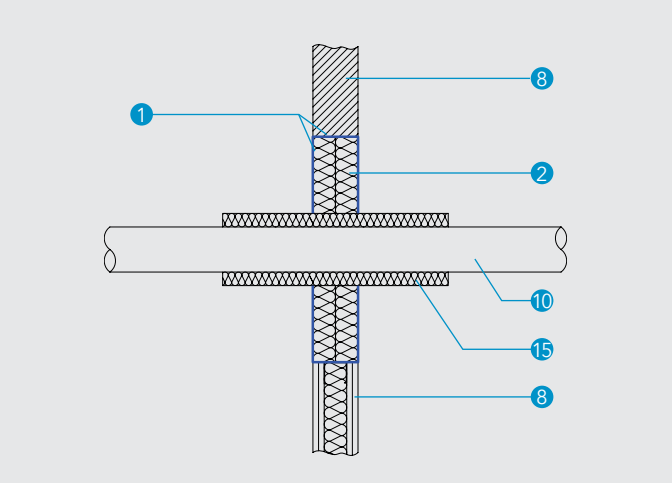
The tested configuration of large cable penetration seal in Kingspan sandwich panels cover all cable types currently and commonly used in building practice in Europe and cover cables to a maximum diameter of 80 mm, except tied bundles, waveguides according to 3.23 of EN 1366-3:2009 and non-sheathed cables (wires). Optical fibre cables are covered. Coating with PROMASTOP®-CC (acc. to Table 2) is sufficient. The penetration seal had an overall size of 600 x 600 x 100 mm (w x h x t).

Supporting distance

The cables, cable bundles, cable ladders and cable trays must be suspended/supported ≤ 300 mm on both sides of the walls.

The tests result is valid for those situations where the cable support does not pass through the seal. Around the perimeter of the aperture in the supporting construction PROMASTOP®-CC and PROMASEAL®-AG were applied. Gaps between the cables were sealed with PROMASEAL®-AG.

4.1. Steel pipes



Detail I – Metal pipe penetration seal in flexible and rigid wall in LS configuration

Details I and J

Metal pipes with non-combustible pipe insulation may penetrate flexible walls and rigid walls, among others.

Table 5 – Insulation information for steel pipes

Type	Specification
Mineral wool	Melting point ≥ 1000 °C, Class min. A2-s1, d0 or $A2_L$-s1, d0 acc. to EN 13501-1
Density	≥ 40 kg/m³ to ≤ 150 kg/m³
Insulation thick-ness	≥ 30 mm to ≤ 100 mm
Type of insulation	LS, CS, LI or CI
Insulation length	see Diagram 1

Table 6

Table 6 shows the the classification of steel pipes and substitutes.

Table 6 – Dimensions for steel pipes with non-combustible insulation

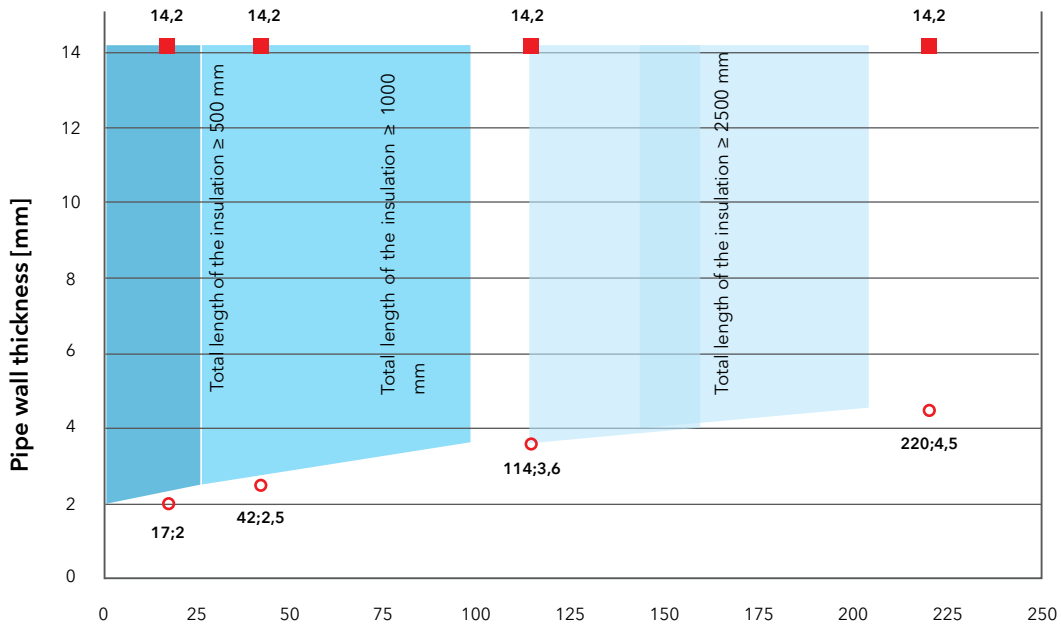
Dimensions for steel pipes with non-combustible insulation	PROMASTOP®-CC					
	1 × 50 mm mineral wool board		1 × 80 mm mineral wool board		2 × 50 mm mineral wool boards	
	Wall	Floor	Wall	Floor	Wall	Floor
Outer pipe diameter Ø [mm]	Ø ≤ 114	Ø ≤ 114	Ø ≤ 114	Ø ≤ 114	Ø ≤ 220	Ø ≤ 220
Pipe wall thickness s [mm]	s ≤ 14,2	s ≤ 14,2	s ≤ 14,2	s ≤ 14,2	s ≤ 14,2	s ≤ 14,2
Classification	EI 60-U/C		EI 90-U/C		EI 90-U/C	

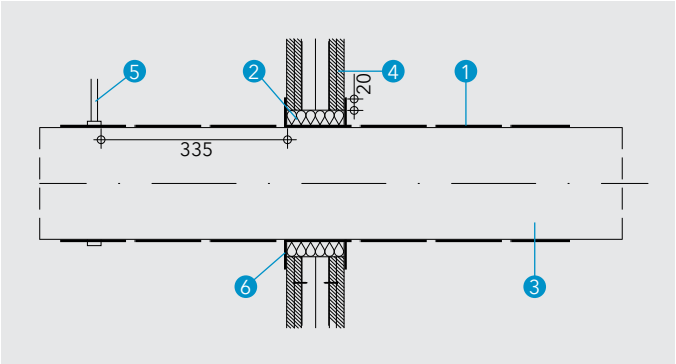
Diagram 1

The diagram shows the respective total length of the pipe insulation depending on the pipe wall thickness and the pipe diameter.

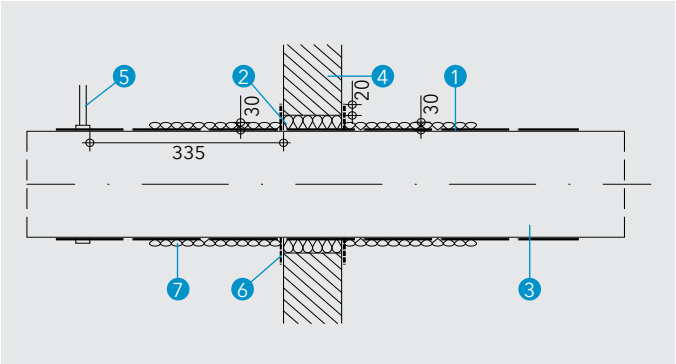
The results can also be applied to metal pipes with lower heat conductivity λ ≤ 58 W/mK and a melting point ≥ 1100 °C (e.g. stainless steel, cast iron and Ni alloys -NiCr, NiMo, NiCu- and Ni).

Diagram 1 – Information about the total length of non-combustible insulation for steel pipes in PROMASTOP®-CC penetration seal





Detail A – Penetration seal of metal pipes without insulation, sealed with use of PROMASTOP®-CC, soft-seal in wall



Detail B – Penetration seal of metal pipes with mineral wool insulation, sealed with use of PROMASTOP®-CC, soft-seal in wall

Technical data

1. PROMASTOP®-CC, dry layer thickness of 2,0 mm
2. Mineral wool, density ≥ 140 kg/m³
3. Steel or cast iron pipe, Ø ≤ 108,0 mm
4. Flexible or rigid wall, see the details
5. First place of support
6. PROMASTOP®-CC, dry layer thickness of 0,7 mm (seal cover)
7. Mineral wool pipe insulation (density ≥ 80 kg/m³, length acc. to Table 1, thickness ≥ 30 mm)

Certificates: ETA-16/0523, ITB CR 01633.1/21/R164NZP

Customer benefit

- Quick and easy installation in walls
- For non-insulated steel pipes as well

4.1.1. Installation

The ambient temperature during application should be above +5 °C. The coating should be well mixed before use.

4.1.2. Fields of application

The nominal diameter of the penetrating steel and cast iron pipes should not exceed 108,0 mm.

Rigid wall

The classifications on next page for rigid wall supporting construction are valid for penetration seals in wall made of concrete, reinforced concrete, aerated concrete, ceramic brick, cavity brick, checker brick, with density greater than or equal to 600 kg/m³ and thickness equal to or greater than given in appropriate point, with fire resistance class (classified according to EN 13501-2) equal to or greater than given in appropriate point. Required thickness ≥ 100 mm.

Flexible wall

The classifications on next page for flexible wall supporting construction are valid for penetration seals in flexible walls made of gypsum plasterboards type F or DF with steel or timber studs substructure, thickness equal to or greater than given in appropriate point (min. two layers of gypsum plasterboards type F or DF with overall board layer thickness equal to or greater than 25 mm), with fire resistance class (classified according to EN 13501-2) equal to or greater than given in appropriate point. Required thickness ≥ 100 mm.

In case of supporting constructions with timber studs no part of the penetration seal is closer than 100 mm to a stud, the cavity is closed between the penetration seal and the stud and minimum 100 mm of insulation of class A1 or A2 according to EN 13501-1 is provided within the cavity between the penetration seal and the stud.

Classifications given for "flexible wall supporting construction" are also valid for penetration seals in rigid wall supporting constructions with greater than or equal to 450 kg/m³ and thickness equal to or greater than given in appropriate point, with fire resistance class (classified according to EN 13501-2) equal to or greater than given in appropriate point.

Supporting distance
The metal pipes must be suspended/supported at a distance of ≤ 335 mm on both sides of the wall or from the top of the floor.

Metal pipes
The classification on this page given for metal (copper or steel) pipes covers pipe materials with a thermal conductivity lower than presented in appropriate point, subject to the material having a melting point at least equal to that of the presented material or greater than:

- 843 °C for the fire resistance class 30 min,
- 903 °C for the fire resistance class 45 min,
- 946 °C for the fire resistance class 60 min,
- 1006 °C for the fire resistance class 90 min,
- 1049 °C for the fire resistance class 120 min.

The classifications on this page given for metal (copper or steel) pipes are valid for pipe end configuration as follows:

- C/U, U/C and C/C in case of penetrations with "U/C" in classification code,
- C/C in case of penetrations with "C/C" in classification code.

Pipe insulation
The classifications on this page given for pipes with mineral wool insulation concerns local insulated pipes and does not cover non-insulated pipes. For this type of penetrations the thickness, length and density of insulation can be increased but may not be reduced.

Soft penetration seal
STEPROCK PLUS mineral wool insulation is classified as infill of the soft penetration seal, but the classification is valid for other mineral wool types provided that the thickness and density of the mineral wool infill is not reduced (it can be increased).

4.1.3. Steel pipe penetration seal

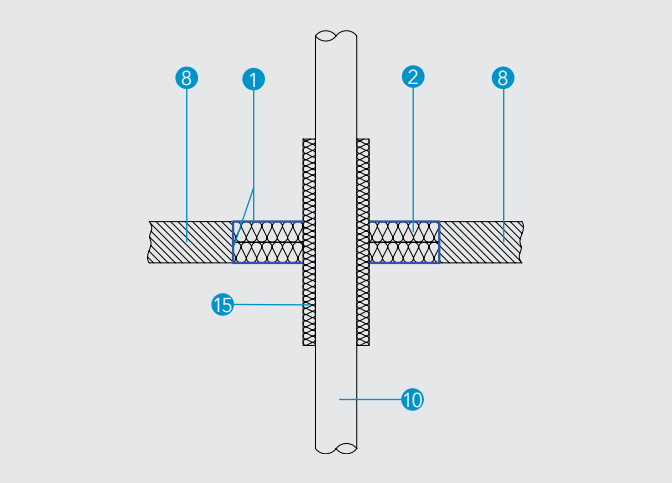
Detail A
Soft penetration seals of non-insulated metal pipes sealed with use of PROMASTOP®-CC in flexible or rigid walls. The coating covers the pipe with dry layer thickness of min. 2,0 mm. Length of the coating on both sides of the supporting construction is 400 mm. The pipe inside the partition should also be coated with PROMASTOP®-CC. The coating covers the mineral wool infill of the soft penetration seal and the supporting construction on the width of 20 mm on the perimeter of the opening with dry layer thickness of min. 0,7 mm. The space between the supporting construction and service is filled with STEPROCK PLUS mineral wool (or other mineral wool with min. density of 140 kg/m^3) with overall thickness of min. 100 mm. The maximum dimension of the soft penetration seal is 250 x 250 mm and the minimum distance between the service and the seal edge is 100 mm.

Detail B
Soft penetration seals of metal pipes with mineral wool insulation (thickness ≥ 30 mm, density ≥ 80 kg/m^3, length in Table 1 below) sealed with use of PROMASTOP®-CC in rigid walls. The pipe insulation should adhere to the soft penetration seal. The coating covers the pipe with dry layer thickness of min. 2,0 mm. Length of the coating on both sides of the supporting construction is 400 mm. The pipe inside the partition should also be coated with PROMASTOP®-CC. The coating covers the mineral wool infill of the soft penetration seal and the supporting construction on the width of 20 mm on the perimeter of the opening with dry layer thickness of min. 0,7 mm. The space between the supporting construction and service is filled with STEPROCK PLUS mineral wool (or other mineral wool with min. density of 140 kg/m^3) with overall thickness of min. 100 mm. The maximum dimension of the soft penetration seal is 540 x 400 mm (width x height) and the minimum distance between the service and the seal edge is 30 mm.

Table 1 – Overview of pipe materials, dimensions, insulations, installation situations and classifications

Requirement		Dimension range Ø: outer pipe diameter [mm] s: pipe wall thickness [mm]	Pipe insulation thickness x length [mm]	PROMASTOP®-CC thickness x length [mm]	Classification
Flexible or rigid wall	Rigid floor				
Steel pipes without insulation for pipe penetrations at 90°					
Flexible or rigid wall, construction thickness ≥ 100 mm		Ø ≤ 15,0 mm, s ≥ 2,3 mm	-	2,0 x 400	EI 120-C/C
Steel pipes with mineral wool insulation for pipe penetrations at 90°					
Rigid wall, construction thickness ≥ 100 mm		Ø ≤ 21,3 mm, s 2,3 - 3,5 mm	30 x 400	-	EI 120-C/C
		Ø ≤ 21,3 mm, s ≥ 3,6 mm	30 x 150	2,0 x 400	EI 90 / E 120-C/C
		Ø ≤ 21,3 mm, s ≥ 3,6 mm	30 x 400	-	EI 120-C/C
		21,3 < Ø ≤ 108,0 mm, s 3,6 - 14,2 mm	30 x 150	2,0 x 400	EI 90 / E 120-C/C

4.2. Copper pipes



Detail J – Metal pipe penetration seal in rigid floor in LS configuration

Table 7
For information on copper pipe insulation see Table 7.

Table 7 – Insulation information for copper pipes

Type	Specification
Mineral wool	Melting point ≥ 1000 °C, Class min. A2-s1, d0 or $A2_L$-s1, d0 acc. to EN 13501-1
Density	≥ 40 kg/m³ to ≤ 150 kg/m³
Insulation thickness	≥ 30 mm to ≤ 100 mm
Type of insulation	LS, CS, LI or CI
Insulation length	see Diagram 2

Table 8
Table 8 shows the classification of copper pipes and substitutes.

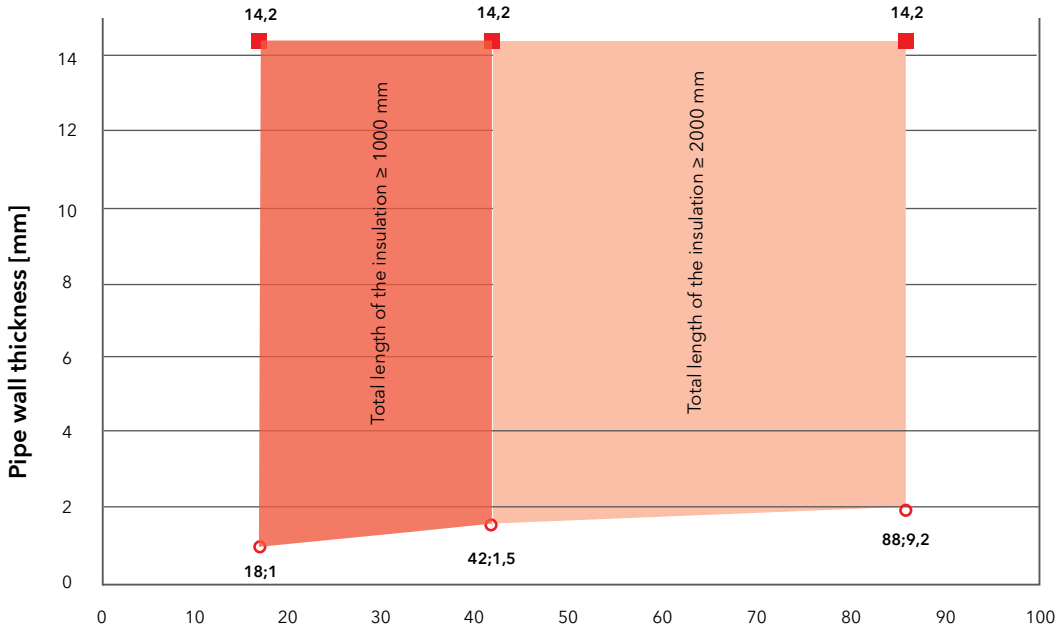
Table 8 – Dimensions for copper pipes with non-combustible insulation

Dimensions for copper pipes with non-combustible insulation	PROMASTOP®-CC					
	1 × 50 mm mineral wool board		1 × 80 mm mineral wool board		2 × 50 mm mineral wool boards	
	Wall	Floor	Wall	Floor	Wall	Floor
Outer pipe diameter Ø [mm]	Ø ≤ 88,9	Ø ≤ 88,9	Ø ≤ 88,9	Ø ≤ 88,9	Ø ≤ 88,9	Ø ≤ 88,9
Pipe wall thickness s [mm]	s ≤ 14,2	s ≤ 14,2	s ≤ 14,2	s ≤ 14,2	s ≤ 14,2	s ≤ 14,2
Classification	EI 60-U/C		EI 90-U/C		EI 90-U/C	

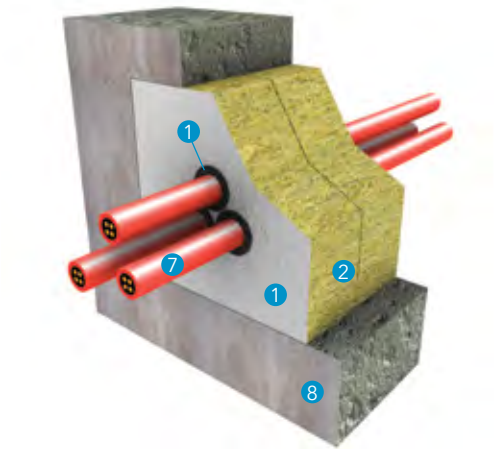
Diagram 2
The diagram shows the respective total length of the pipe insulation depending on the pipe wall thickness and the pipe diameter.

Results of copper pipes are valid for steel pipes, but not vice versa, and for pipes with λ ≤ 380 W/mK and melting point ≥ 1083 °C (e.g. steel, stainless steel, cast iron and Ni alloys -NiCr, NiMo, NiCu- and Ni).

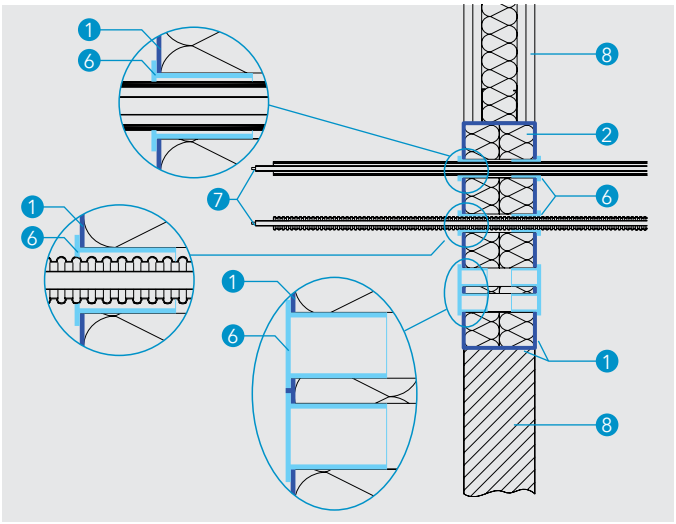
Diagram 2 – Information about the total length of non-combustible insulation for copper pipes in PROMASTOP®-CC penetration seal



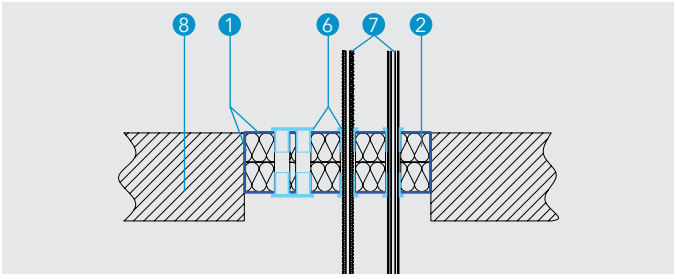
5. PROMASTOP®-CC cable penetration seal in combination with PROMASTOP®-IM CJ21



Detail K – Cable penetration seal in rigid wall



Detail L – Cable penetration seal in flexible and rigid wall



Detail M – Cable penetration seal in rigid floor

Details K, L and M

The cable jacket PROMASTOP®-IM CJ21 is a penetration seal option for cables, wires, flexible and rigid conduits up to ≤ 21 mm in diameter (with or without cables) . Since it closes flue gas-tight, later installation of cables is possible without any repair work. No annular gap filling or additional coating or gluing required.
An advantage of the system is the option of later installation.
In wall and floor applications of the soft penetration seal and the fire stopping jacket, the PROMASTOP®-IM CJ21 cable jackets shall be installed (screwed in) into the boards on both sides of the wall and on top and below the floor.

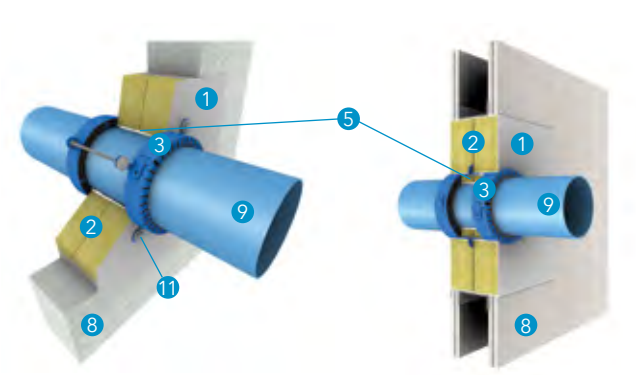
Table 9

Table 8 shows the classification results for electrical installations for PROMASTOP®-CC in combination with PROMASTOP®-IM CJ21.

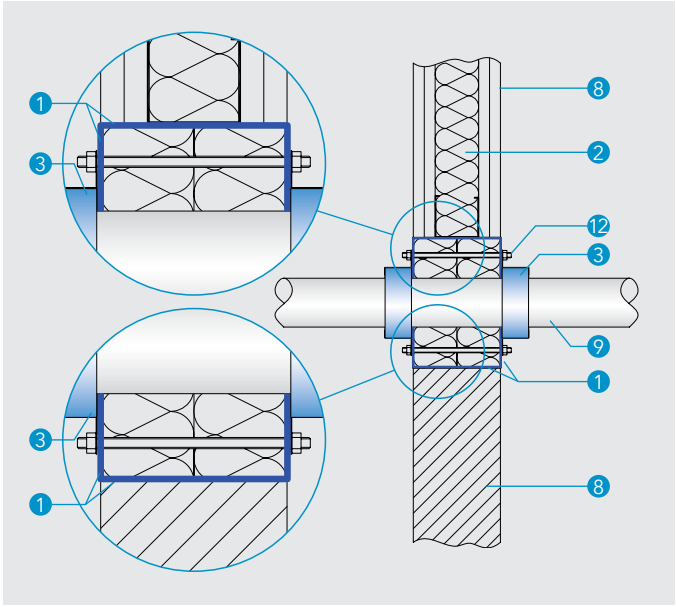
Table 9 – Fire resistance of the cable jacket depending on the penetration seal thickness and situation

Electrical installations	PROMASTOP®-CC					
	1 × 50 mm		1 × 80 mm		2 × 50 mm	
	Wall	Floor	Wall	Floor	Wall	Floor
Flexible conduits (with or without cables) or all sheathed cable types of CG1 (Ø ≤ 21 mm)	EI 60	EI 60	EI 90	EI 90	EI 90	EI 90
Attachment	one side	on top	both sides		both sides	

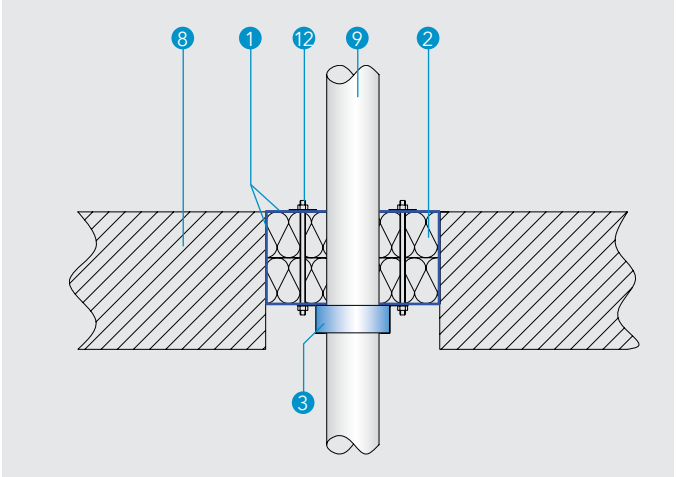
6. PROMASTOP®-CC plastic pipe penetration seal in combination with PROMASTOP®-FC



Detail N – Plastic pipe penetration seal in rigid wall



Detail O – Plastic pipe penetration seal in flexible and rigid wall



Detail P – Plastic pipe penetration seal in rigid floor

Details N, O and P

PROMASTOP®-FC3 and PROMASTOP®-FC6 are suitable for surface-mounted and built-in installations. In walls, the fire stopping collars are installed on both sides. The collars shall be installed in floor penetration seals below the floor. In surface-mounted installations, several collars may be installed without a lateral gap.
The fire stopping collars are suitable for all standard plastic pipes and special pipe materials (see the following tables).

The classifications for PVC-U pipes are applicable for pipes in acc. with EN 1452-1, DIN 8061, DIN 8062, EN 1329-1, EN 1453-1 and PVC-C pipes in acc. with EN 1566-1.
The classifications for PE pipes are applicable for pipes in acc. with EN 12201-2, EN 1519-1, EN 12666-1, DIN 8074, DIN 8075 and ABS-pipes in acc. with EN 1455-1 and SAN + PVC-pipes in acc. with EN 1565-1.
The classifications for PP-H and PP-R pipes are applicable for pipes in acc. e.g. to DIN 8077, DIN 8078 or equal products.
The classifications for all stated multilayer pipes are applicable on equal products.

Fixing

The fixing of the collar in soft penetration seals depends on the number of board layers and the thickness of the mineral wool boards.

Table 10

Table 10 provides a fixing overview for PROMASTOP®-FC in the soft penetration seal.

Table 10 – Fixing of PROMASTOP®-FC in the soft penetration seal

Mineral wool boards	Threaded rods M6/M8*	Spiral screws 65 mm**	Spring toggle bolts M4*	Built-in (recessed) installation***
2 × 50 mm	✓	✓	✓	✓
1 × 80 mm	✓	X	X	X
1 × 50 mm	✓	X	X	X

** The collars shall be fixed on every second fixing latch (e.g. 2 of 4 or 3 of 5) - no two adjacent latches may be left unfixed.*
*** The collars shall be fixed on every fixing latch.*
**** The fixing latches are inbetween the two mineral wool boards.*

Annular gap sealing

Backfill the annular gap with mineral wool (Class A1 acc. to EN 13501-1, melting point ≥ 1000 °C) and coat it on both sides with fire stopping sealant PROMASEAL®-A or with PROMASTOP®-CC.

If the penetration allows using PROMASTOP®-FC3, optionally PROMASTOP®-FC6 may also be used but not vice versa.

Couplings

The diameter of the tested coupling may be decreased but not increased. For this application the PROMASTOP®-FC6 collar with a height of 60 mm is needed.

Sloped pipes
The angle of the pipe may vary between the tested one and the right angle.

Sound decoupling
In flexible walls (incl. shaft walls), suspended ceilings, rigid and timber constructions every type of sound decoupling strip based on PE-foam of class E or higher rated acc. to EN 13501-1, with a maximum thickness of 5 mm may be used.

See the required distances between objects on page 67.

Table 11
For the pipe materials, dimensions, installation situations and classifications see Table 11.

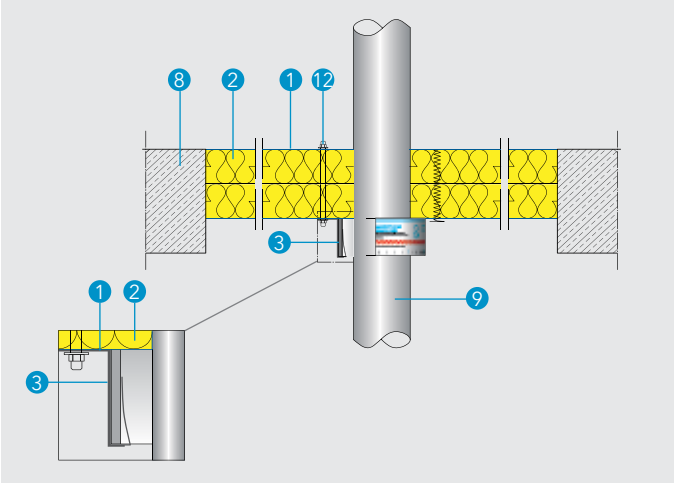
Table 11 – Overview of pipe materials, dimensions, installation situations and classifications

Soft penetration seal [mm]	Orientation F: floor W: wall	Dimension range Ø: outer pipe diameter [mm] s: pipe wall thickness [mm]	Classification
PE-HD, ABS, SAN + PVC pipes			
1 × 50	F/W	PROMASTOP®-FC3 lower limits: Ø 32 mm, s 1,8 mm → Ø 63 mm, s 1,8 mm → Ø 125 mm, s 3,1 mm upper limits: Ø 32 mm, s 5,8 mm → Ø 63 mm, s 5,8 mm → Ø 125 mm, s 7,4 mm	EI 60-U/U
1 × 80	F/W		EI 90-U/U
2 × 50	F/W	PROMASTOP®-FC6 lower limits: Ø 50 mm, s 1,8 mm → Ø 63 mm, s 1,8 mm → Ø 125 mm, s 3,1 mm → Ø 200 mm, s 4,9 mm upper limits: Ø 50 mm, s 5,8 mm → Ø 63 mm, s 5,8 mm → Ø 125 mm, s 7,4 mm → Ø 200 mm, s 11,4 mm	EI 120-U/U
2 × 50	Kingspan KS 1100 CS, 100 mm	PROMASTOP®-FC6/125 limits: Ø 125 mm, s 3,1 mm	EI 30-U/U
2 × 50	Kingspan KS 1100 CS, 175 mm		EI 60-U/U
PP-H and PP-R pipes			
1 × 50	F/W	PROMASTOP®-FC3 lower limits: Ø 32 mm, s 1,8 mm → Ø 63 mm, s 1,8 mm → Ø 125 mm, s 3,1 mm → Ø 160 mm, s 4,0 mm upper limits: Ø 32 mm, s 8,6 mm → Ø 63 mm, s 8,6 mm → Ø 125 mm, s 7,1 mm → Ø 160 mm, s 4,0 mm	EI 60-U/U
1 × 80	F/W		EI 90-U/U
2 × 50	F/W	PROMASTOP®-FC6 lower limits: Ø 50 mm, s 1,8 mm → Ø 63 mm, s 1,8 mm → Ø 125 mm, s 3,1 mm → Ø 200 mm, s 4,9 mm upper limits: Ø 50 mm, s 8,6 mm → Ø 63 mm, s 8,6 mm → Ø 125 mm, s 7,1 mm → Ø 200 mm, s 11,4 mm	EI 120-U/U
PVC-U and PVC-C pipes			
1 × 50	F/W	PROMASTOP®-FC3 lower limits: Ø 32 mm, s 1,8 mm → Ø 63 mm, s 1,8 mm → Ø 125 mm, s 3,1 mm upper limits: Ø 32 mm, s 5,8 mm → Ø 63 mm, s 5,8 mm → Ø 125 mm, s 7,1 mm	EI 60-U/U
1 × 80	F/W		EI 90-U/U
2 × 50	F/W	PROMASTOP®-FC6 (couplings tested up to Ø 125 mm) lower limits: Ø 50 mm, s 1,8 mm → Ø 63 mm, s 1,8 mm → Ø 125 mm, s 3,1 mm → Ø 250 mm, s 4,9 mm upper limits: Ø 50 mm, s 5,8 mm → Ø 63 mm, s 5,8 mm → Ø 125 mm, s 7,1 mm → Ø 250 mm, s 4,9 mm	EI 120-U/U
POLOPLAST POLO-KAL NG pipes			
1 × 50	F/W	PROMASTOP®-FC3 limits: Ø 32 mm, s 1,8 mm → Ø 40 mm, s 1,8 mm → Ø 50 mm, s 2,0 mm → Ø 75 mm, s 2,6 mm → Ø 110 mm, s 3,4 mm → Ø 125 mm, s 3,9 mm → Ø 160 mm, s 4,9 mm	EI 60-U/U
1 × 80	F/W		EI 90-U/U
2 × 50	F/W	PROMASTOP®-FC6 (couplings tested up to Ø 125 mm) limits: Ø 50 mm, s 2,0 mm → Ø 75 mm, s 2,6 mm → Ø 110 mm, s 3,4 mm → Ø 125 mm, s 3,9 mm → Ø 160 mm, s 4,9 mm → Ø 200 mm, s 6,8 mm → Ø 250 mm, s 8,6 mm	EI 120-U/U
POLOPLAST POLO-KAL XS pipes			
1 × 50	F/W	PROMASTOP®-FC3 limits: Ø 32 mm, s 1,8 mm → Ø 40 mm, s 1,8 mm → Ø 50 mm, s 2,0 mm → Ø 75 mm, s 2,6 mm → Ø 110 mm, s 3,4 mm	EI 60-U/U
1 × 80	F/W		EI 90-U/U
2 × 50	F/W	PROMASTOP®-FC6 (couplings tested up to Ø 110 mm) limits: Ø 50 mm, s 2,0 mm → Ø 75 mm, s 2,6 mm → Ø 110 mm, s 3,4 mm	EI 120-U/U

Soft penetration seal [mm]	Orientation F: floor W: wall	Dimension range Ø: outer pipe diameter [mm] s: pipe wall thickness [mm]	Classification
POLOPLAST POLO-KAL 3S pipes			
1 × 50	F/W	PROMASTOP®-FC3 limits: Ø 75 mm, s 3,8 mm → Ø 110 mm, s 4,8 mm → Ø 125 mm, s 5,3 mm → Ø 160 mm, s 7,5 mm PROMASTOP®-FC6 (couplings tested up to Ø 125 mm) limits: Ø 75 mm, s 3,8 mm → Ø 110 mm, s 4,8 mm → Ø 125 mm, s 5,3 mm → Ø 160 mm, s 7,5 mm	EI 60-U/U
1 × 80	F/W		EI 90-U/U
2 × 50	F/W		EI 120-U/U
POLOPLAST POLO ECO plus Premium 10 pipes			
2 × 50	F/W	PROMASTOP®-FC6 limits: Ø 110 mm, s 3,9 mm → Ø 125 mm, s 4,8 mm → Ø 160 mm, s 5,6 mm → Ø 200 mm, s 6,9 mm → Ø 250 mm, s 8,5 mm PROMASTOP®-FC15 limits: Ø 315 mm, s 10,8 mm → Ø 400 mm, s 13,6 mm	EI 120-U/U
Pipelife MASTER 3 pipes			
1 × 50	F/W	PROMASTOP®-FC3 limits: Ø 32 mm, s 1,8 mm → Ø 40 mm, s 1,8 mm → Ø 50 mm, s 1,8 mm → Ø 75 mm, s 2,1 mm → Ø 110 mm, s 3,0 mm → Ø 125 mm, s 3,5 mm PROMASTOP®-FC6 limits: Ø 50 mm, s 1,8 mm → Ø 75 mm, s 2,1 mm → Ø 110 mm, s 3,0 mm → Ø 125 mm, s 3,5 mm → Ø 160 mm, s 4,4 mm	EI 60-U/U
1 × 80	F/W		EI 90-U/U
2 × 50	F/W		EI 120-U/U
Geberit Silent-db20 pipes			
1 × 50	F/W	PROMASTOP®-FC3 limits: Ø 56 mm, s 3,2 mm → Ø 63 mm, s 3,2 mm → Ø 75 mm, s 3,6 mm → Ø 90 mm, s 5,5 mm → Ø 110 mm, s 6,0 mm PROMASTOP®-FC6 (couplings tested up to Ø 135 mm) limits: Ø 50 mm, s 3,2 mm → Ø 63 mm, s 3,2 mm → Ø 75 mm, s 3,6 mm → Ø 90 mm, s 5,5 mm → Ø 110 mm, s 6,0 mm → Ø 135 mm, s 6,0 mm → Ø 160 mm, s 7,0 mm	EI 60-U/U
1 × 80	F/W		EI 90-U/U
2 × 50	F/W		EI 120-U/U
Geberit Silent-PP pipes			
1 × 50	F/W	PROMASTOP®-FC3 limits: Ø 32 mm, s 2,0 mm → Ø 40 mm, s 2,0 mm → Ø 50 mm, s 2,0 mm → Ø 75 mm, s 2,6 mm → Ø 90 mm, s 3,1 mm → Ø 110 mm, s 3,6 mm → Ø 125 mm, s 4,2 mm PROMASTOP®-FC6 limits: Ø 32 mm, s 2,0 mm → Ø 40 mm, s 2,0 mm → Ø 50 mm, s 2,0 mm → Ø 75 mm, s 2,6 mm → Ø 90 mm, s 3,1 mm → Ø 110 mm, s 3,6 mm → Ø 125 mm, s 4,2 mm → Ø 160 mm, s 5,2 mm	EI 60-U/U
1 × 80	F/W		EI 90-U/U
2 × 50	F/W		EI 120-U/U
REHAU RAUPIANO PLUS pipes			
1 × 50	F/W	PROMASTOP®-FC6 (couplings tested up to Ø 125 mm) limits: Ø 40 mm, s 1,8 mm → Ø 50 mm, s 1,8 mm → Ø 125 mm, s 3,1 mm → Ø 160 mm, s 3,9 mm → Ø 200 mm, s 6,2 mm	EI 60-U/U
1 × 80	F/W		EI 90-U/U
2 × 50	F/W		EI 120-U/U
Nicoll dBlue plus pipes			
1 × 50	F/W	PROMASTOP®-FC3 limits: Ø 50 mm, s 1,8 mm → Ø 125 mm, s 3,9 mm	EI 60-U/U
1 × 80	F/W		EI 90-U/U
2 × 50	F/W		EI 120-U/U
Girpi Friaphon pipes			
1 × 50	F/W	PROMASTOP®-FC3 limits: Ø 52 mm, s 2,8 mm → Ø 78 mm, s 4,9 mm → Ø 110 mm, s 5,3 mm PROMASTOP®-FC6 limits: Ø 52 mm, s 2,8 mm → Ø 78 mm, s 4,9 mm → Ø 110 mm, s 5,3 mm → Ø 135 mm, s 5,6 mm → Ø 160 mm, s 6,3 mm	EI 60-U/U
1 × 80	F/W		EI 90-U/U
2 × 50	F/W		EI 120-U/U

Soft penetration seal [mm]	Orientation F: floor W: wall	Dimension range Ø: outer pipe diameter [mm] s: pipe wall thickness [mm]	Classification
Girpi HTA-E pipes			
1 × 50	F/W	PROMASTOP®-FC6 limits: Ø 40 mm, s 3,0 mm → Ø 50 mm, s 3,7 mm → Ø 63 mm, s 4,7 mm → Ø 75 mm, s 5,5 mm → Ø 90 mm, s 6,6 mm → Ø 110 mm, s 5,3 mm → Ø 125 mm, s 6,0 mm	EI 60-U/U
1 × 80	F/W		EI 90-U/U
2 × 50	F/W		EI 120-U/U
KE KELIT Phonex AS pipes			
1 × 50	F/W	PROMASTOP®-FC6 limits: Ø 58 mm, s 4,0 mm → Ø 78 mm, s 4,5 mm → Ø 110 mm, s 5,3 mm → Ø 135 mm, s 5,3 mm → Ø 160 mm, s 5,3 mm	EI 60-U/U
1 × 80	F/W		EI 90-U/U
2 × 50	F/W		EI 120-U/U
Wavin AS pipes			
1 × 50	F/W	PROMASTOP®-FC6 limits: Ø 58 mm, s 4,0 mm → Ø 78 mm, s 4,5 mm → Ø 110 mm, s 5,3 mm → Ø 135 mm, s 5,3 mm → Ø 160 mm, s 5,3 mm	EI 60-U/U
1 × 80	F/W		EI 90-U/U
2 × 50	F/W		EI 120-U/U
Wavin SiTech+ pipes			
1 × 50	F/W	PROMASTOP®-FC6 limits: Ø 50 mm, s 1,8 mm → Ø 125 mm, s 3,9 mm → Ø 160 mm, s 4,9 mm	EI 60-U/U
1 × 80	F/W		EI 90-U/U
2 × 50	F/W		EI 120-U/U
Marley Silent pipes			
1 × 50	F/W	PROMASTOP®-FC6 limits: Ø 75 mm, s 2,0 mm → Ø 110 mm, s 3,0 mm	EI 60-U/U
1 × 80	F/W		EI 90-U/U
2 × 50	F/W		EI 120-U/U

7. PROMASTOP®-CC plastic pipe penetration seal in combination with PROMASTOP®-FC MD



Detail Q – Plastic pipe penetration seal in rigid floor

Detail Q
PROMASTOP®-FC MD collar in 2 x 50 mm PROMASTOP®-CC coated batt seal (related render and technical data on p. 37). The collar shall be installed below the floor (thickness min. 150 mm).

Supporting distance
The pipes must be suspended/supported at a distance of ≤ 335 mm from the top of the floor.

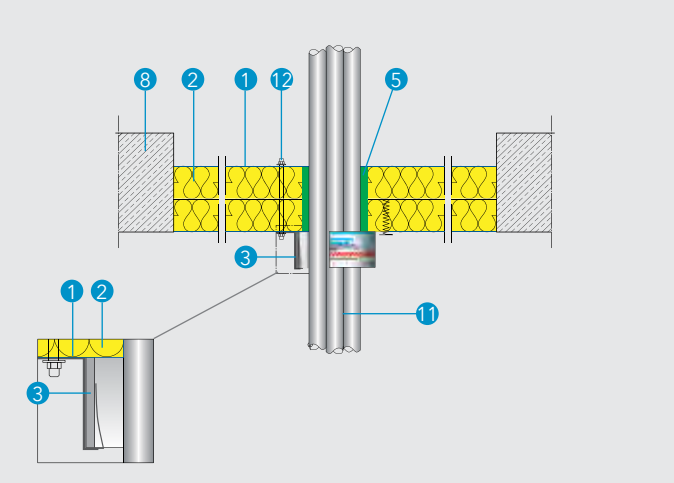
Filling of annular space
Stone wool backfilling and covering with PROMASTOP®-CC fire stopping coating.

Sound decoupling strips
Sound decoupling strips based on PE-foam (class E according to EN 13501-1 or higher rated) with a max. thickness of 4 mm may be used.

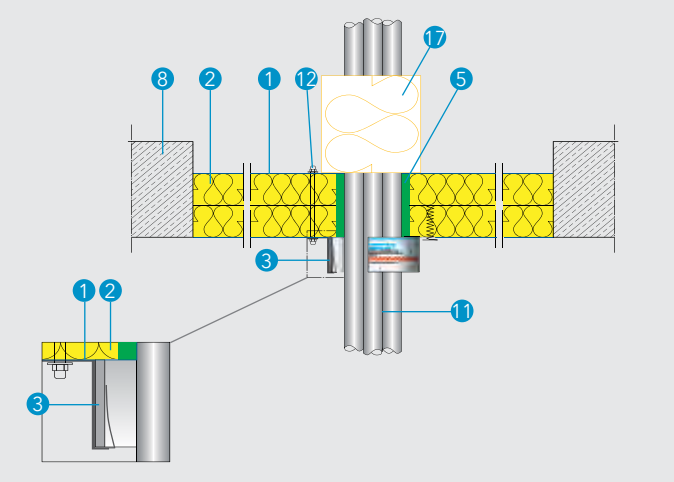
Table 12 – Overview of pipe materials, dimensions, installation situations and classifications

Soft penetration seal [mm]	Orientation F: floor W: wall	Dimension range Ø: outer pipe diameter [mm] s: pipe wall thickness [mm]	Classification
PE-HD, ABS, SAN + PVC pipes			
2 × 50	F	lower limits: Ø 40 mm, s 2,4 mm → Ø 110 mm, s 2,7 mm → Ø 125 mm, s 3,1 mm upper limits: Ø 40 mm, s 7,4 mm → Ø 125 mm, s 7,4 mm	collar fixed with: - threaded rods ≥ M6, nuts and washers: EI 120-U/U - collar fixed with spiral screws ≥ 8 x 100 mm: EI 90-U/U
PP-H and PP-R pipes			
2 × 50	F	lower limits: Ø 40 mm, s 1,8 mm → Ø 110 mm, s 2,7 mm → Ø 125 mm, s 3,1 mm upper limits: Ø 40 mm, s 7,1 mm → Ø 125 mm, s 7,1 mm	collar fixed with: - threaded rods ≥ M6, nuts and washers: EI 120-U/U - collar fixed with spiral screws ≥ 8 x 100 mm: EI 90-U/U
PVC-U and PVC-C pipes			
2 × 50	F	lower limits: Ø 40 mm, s 1,8 mm → Ø 110 mm, s 2,7 mm → Ø 125 mm, s 3,1 mm upper limits: Ø 40 mm, s 7,1 mm → Ø 125 mm, s 7,1 mm	collar fixed with: - threaded rods ≥ M6, nuts and washers: EI 120-U/U - collar fixed with spiral screws ≥ 8 x 100 mm: EI 90-U/U
Geberit Silent-db20 (PE-S2) pipes			
2 × 50	F	lower limits: Ø 56 mm, s 3,2 mm → Ø 110 mm, s 6,0 mm upper limits: Ø 56 mm, s 6,0 mm → Ø 110 mm, s 6,0 mm	collar fixed with threaded rods ≥ M6, nuts and washers: EI 90-U/U
Geberit Silent-PP (PP-C/PP-MD/PP-C) pipes			
2 × 50	F	lower limits: Ø 40 mm, s 1,8 mm → Ø 50 mm, s 2,0 mm → Ø 75 mm, s 2,6 mm → Ø 90 mm, s 3,1 mm → Ø 110 mm, s 3,6 mm → Ø 125 mm, s 3,9 mm upper limits: Ø 40 mm, s 3,9 mm → Ø 125 mm, s 3,9 mm	collar fixed with threaded rods ≥ M6, nuts and washers: EI 90-U/U
Geberit Silent-Pro (PP-MX) pipes			
2 × 50	F	limits: Ø 50 mm, s 2,7 mm collar fixed with threaded rods ≥ M6, nuts and washers	EI 90-U/U
REHAU Raupiano Plus (PP-MD) pipes			
2 × 50	F	lower limits: Ø 40 mm, s 1,8 mm → Ø 125 mm, s 3,1 mm upper limits: Ø 40 mm, s 3,1 mm → Ø 125 mm, s 3,1 mm	collar fixed with threaded rods ≥ M6, nuts and washers: EI 90-U/U
DykaSono Blue (PVC-U) pipes			
2 × 50	F	lower limits: Ø 50 mm, s 4,0 mm → Ø 125 mm, s 5,3 mm upper limits: Ø 50 mm, s 5,3 mm → Ø 125 mm, s 5,3 mm	collar fixed with threaded rods ≥ M6, nuts and washers: EI 90-U/U

8. PROMASTOP®-CC penetration seal in combination with PROMASTOP®-FC MD for MLC (multi-layered pipes including metal layer(s)) pipes (single or bundle)



Detail R – MLC pipe penetration seal in rigid floor



Detail S – MLC pipe penetration seal with additional stone wool protection in rigid floor

Supporting distance
The pipes must be suspended/supported at a distance of ≤ 335 mm from the top of the floor.

Filling of annular space
PROMASEAL®-AG over complete depth of the coated batt seal and inbetween the pipe gussets.

Sound decoupling strips
Sound decoupling strips based on PE-foam (class E according to EN 13501-1 or higher rated) with a max. thickness of 4 mm may be used.

Fixing material
Threaded rods ≥ M6 with nuts and washers or spiral screws made of steel, ≥ 8 x 45 mm.

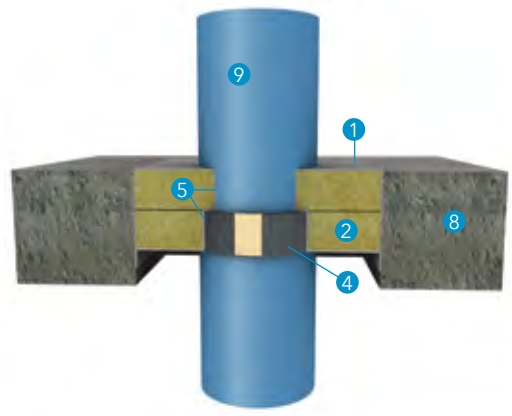
Detail R
PROMASTOP®-FC MD collar in 2 x 50 mm PROMASTOP®-CC coated batt seal for MLC pipes (with or without insulation or PE corrugated cover (related render and technical data on page 40). The collar shall be installed below the floor (thickness min. 150 mm).

Detail S
Additional protection
In some cases additional stone wool (class A1 acc. to EN 13051-1) protection is required around the pipe bundle on the unexposed side of the penetration seal (related render and technical data on page 40). Length, density and thickness of the additional protection in Table 13.

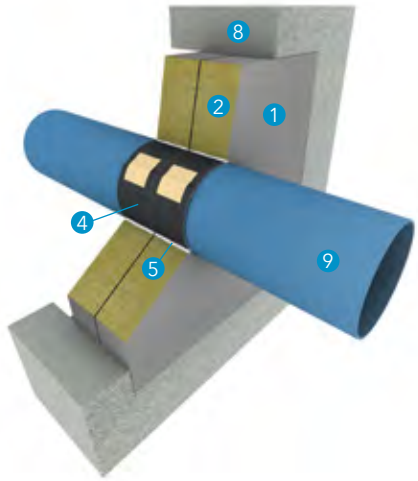
Table 13 – Overview of pipe materials, dimensions, installation situations and classifications

Requirement		Dimension range Ø: outer pipe diameter [mm]	Classification
Rigid or flexible wall	Rigid floor		
Henco Standard (PE-XC/AL/PE-Xc) pipe bundles for pipe penetrations at 90°			
	Construction thickness ≥ 150 mm	Max. bundle (the amount of pipes may be decreased): 1 x Ø 16 mm x 2,0 mm / 1 x Ø 18 mm x 2,0 mm / 1 x Ø 20 mm x 2,0 mm / 1 x Ø 26 mm x 3,0 mm / 1 x Ø 32 mm x 3,0 mm / 1 x Ø 40 mm x 3,5 mm / 1 x Ø 63 mm x 4,5 mm (insulation of the pipes: -) Additional protection required: stone wool (class A1 acc. to EN 13501-1, density ≥ 35 kg/m³), thickness 50 mm, 150 mm length on the unexposed side around the pipe bundle.	E 120-U/C EI 90-U/C
	Construction thickness ≥ 150 mm	Max. bundle (the amount of pipes may be decreased): 1 x Ø 14 mm x 2,0 mm / 1 x Ø 16 mm x 2,0 mm / 3 x Ø 18 mm x 2,0 mm / 1 x Ø 20 mm x 2,0 mm / 1 x Ø 26 mm x 3,0 mm / 1 x Ø 32 mm x 3,0 mm (insulation of the pipes: corrugated cover made of PE, case: CS) Additional protection required: stone wool (class A1 acc. to EN 13501-1, density ≥ 35 kg/m³), thickness 50 mm, 150 mm length on the unexposed side around the pipe bundle.	EI 120-U/C
	Construction thickness ≥ 150 mm	Max. bundle (the amount of pipes may be decreased): 1 x Ø 14 mm x 2,0 mm / 1 x Ø 16 mm x 2,0 mm / 1 x Ø 18 mm x 2,0 mm / 1 x Ø 20 mm x 2,0 mm / 1 x Ø 26 mm x 3,0 mm / 1 x Ø 32 mm x 3,0 mm (insulation of the pipes: PE foam (class E acc. to EN 13501-1, thickness: 6 mm, case: CS) Additional protection required: stone wool (class A1 acc. to EN 13501-1, density ≥ 30 kg/m³), thickness 50 mm, 150 mm length on the unexposed side around the pipe bundle.	EI 120-U/C
	Construction thickness ≥ 150 mm	Max. bundle (the amount of pipes may be decreased): 1 x Ø 18 mm x 2,0 mm / 1 x Ø 20 mm x 2,0 mm / 1 x Ø 26 mm x 3,0 mm / 1 x Ø 32 mm x 3,0 mm (insulation of the pipes: PE foam (class E acc. to EN 13501-1, thickness: 13 mm, case: CS) Additional protection required: stone wool (class A1 acc. to EN 13501-1, density ≥ 30 kg/m³), thickness 50 mm, 150 mm length on the unexposed side around the pipe bundle.	EI 120-U/C
	Construction thickness ≥ 150 mm	Max. bundle (the amount of pipes may be decreased): 1 x Ø 16 mm x 2,0 mm / 1 x Ø 18 mm x 2,0 mm / 1 x Ø 20 mm x 2,0 mm / 1 x Ø 26 mm x 3,0 mm / 1 x Ø 32 mm x 3,0 mm / 1 x Ø 40 mm x 3,5 mm / 1 x Ø 63 mm x 4,5 mm (insulation of the pipes: -) Additional protection not required.	E 120-U/C EI 30-U/C
	Construction thickness ≥ 150 mm	Max. bundle (the amount of pipes may be decreased): 1 x Ø 14 mm x 2,0 mm / 1 x Ø 16 mm x 2,0 mm / 3 x Ø 18 mm x 2,0 mm / 1 x Ø 20 mm x 2,0 mm / 1 x Ø 26 mm x 3,0 mm / 1 x Ø 32 mm x 3,0 mm (insulation of the pipes: corrugated cover made of PE, case: CS) Additional protection not required.	EI 120-U/C
	Construction thickness ≥ 150 mm	Max. bundle (the amount of pipes may be decreased): 1 x Ø 14 mm x 2,0 mm / 1 x Ø 16 mm x 2,0 mm / 1 x Ø 18 mm x 2,0 mm / 1 x Ø 20 mm x 2,0 mm / 1 x Ø 26 mm x 3,0 mm / 1 x Ø 32 mm x 3,0 mm (insulation of the pipes: PE foam (class E acc. to EN 13501-1, thickness: 6 mm, case: CS) Additional protection not required.	EI 120-U/C
	Construction thickness ≥ 150 mm	Max. bundle (the amount of pipes may be decreased): 1 x Ø 18 mm x 2,0 mm / 1 x Ø 20 mm x 2,0 mm / 1 x Ø 26 mm x 3,0 mm / 1 x Ø 32 mm x 3,0 mm (insulation of the pipes: PE foam (class E acc. to EN 13501-1, thickness: 13 mm, case: CS) Additional protection not required.	EI 120-U/C
	Construction thickness ≥ 150 mm	Max. bundle (the amount of pipes may be decreased): 3 x Ø 16 mm x 2,0 mm / 1 x Ø 18 mm x 2,0 mm / 1 x Ø 20 mm x 2,0 mm / 1 x Ø 26 mm x 3,0 mm / 1 x Ø 32 mm x 3,0 mm / 1 x Ø 40 mm x 3,5 mm / 1 x Ø 50 mm x 4,0 mm (insulation of the pipes: -) Additional protection not required.	E 120-U/C EI 45-U/C
	Construction thickness ≥ 150 mm	Max. bundle (the amount of pipes may be decreased): 3 x Ø 16 mm x 2,0 mm / 1 x Ø 18 mm x 2,0 mm / 1 x Ø 20 mm x 2,0 mm / 1 x Ø 26 mm x 3,0 mm / 1 x Ø 32 mm x 3,0 mm / 1 x Ø 40 mm x 3,5 mm / 1 x Ø 50 mm x 4,0 mm (insulation of the pipes: -) Additional protection required: stone wool (class A1 acc. to EN 13501-1, density ≥ 30 kg/m³), thickness 50 mm, 150 mm length on the unexposed side around the pipe bundle.	E 120-U/C EI 90-U/C

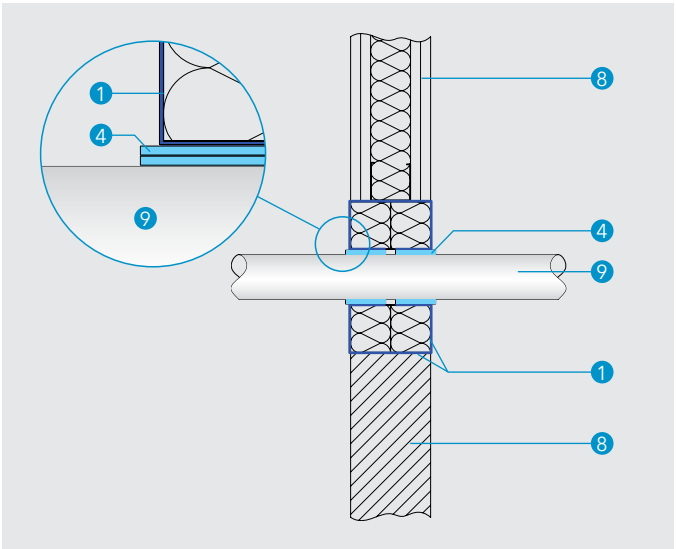
9. PROMASTOP®-CC plastic pipe penetration seal in combination with PROMASTOP®-W



Detail T – Plastic pipe penetration seal in rigid floor



Detail U – Plastic pipe penetration seal in rigid wall



Detail V – Plastic pipe penetration seal in flexible and rigid wall

Details T, U and V

PROMASTOP®-W fire stopping wrap is used as a pipe closure device in PROMASTOP®-CC soft penetration seal. The amount of layers of the PROMASTOP®-W depends on the installation, the pipe end configuration and the diameter of the pipe or insulation.

PROMASTOP®-W is exclusively suitable for built-in installation. There must be space around the installations to install a penetration seal. If necessary, the required space must be made available on-site.

PROMASTOP®-W shall be installed flush with the penetration seal surface, maximum ≤ 5 mm in front of the penetration seal. For fixing PROMASTOP®-W in the mineral wool penetration seals use PROMASTOP®-CC, PROMASEAL®-A or PROMASEAL®-AG between the cutting edge and the fire stopping wrap.

There will be no waste as the cut end can be used. The application of PROMASTOP®-W is on one side in floors flush with the bottom edge of the seal and on both sides in walls flush with the outer edges of the seal. The number of layers for PROMASTOP®-W must be observed at all times.

The pipes must be suspended/supported ≤ 250 mm on both sides of the wall or from the top of the floor.

Sloped pipes or couplings were not tested with PROMASTOP®-W.

The classifications for PVC-U pipes are applicable for pipes in acc. with EN 1452-1, DIN 8061, DIN 8062, EN 1329-1, EN 1453-1 and PVC-C pipes in acc. with EN 1566-1.
The classifications for PE pipes are applicable for pipes in acc. with EN 12201-2, EN 1519-1, EN 12666-1, DIN 8074, DIN 8075 and ABS-pipes in acc. with EN 1455-1 and SAN + PVC-pipes in acc. with EN 1565-1.
The classifications for PP-H and PP-R pipes are applicable for pipes in acc. e.g. to DIN 8077, DIN 8078 or equal products.
The classifications for all stated multilayer pipes are applicable on equal products.

Annular gap sealing

For soft penetration seals, the annular gap can be sealed as follows:

- With PROMASTOP®-CC or PROMASTOP®-I, if the width of the annular gap is ≤ 5 mm.
- With mineral wool (Class A1 acc. to EN 13501-1, melting point ≥ 1000 °C) covered on both sides with ≥ 10 mm PROMASEAL®-A fire stopping sealant if the width of the annular gap is ≤ 10 mm.
- With mineral wool (Class A1 acc. to EN 13501-1, melting point ≥ 1000 °C) covered on both sides with ≥ 10 mm PROMASEAL®-AG fire stopping sealant if the width of the annular gap is ≤ 20 mm.

See the required distances between objects on page 67.

9.1 Plastic pipes without insulation

Pype types

The listed pipe types are tested according the requirements of EN 1366-3 and EN 13882-3 and given by the rules of the direct and the extended fields of application:

- PE-HD pipes according to EN 12201-2, EN 1519-1, EN 12666-1, DIN 8074, DIN 8075
- ABS pipes according to EN 1455-1
- SAN + PVC pipes according to EN 1565-1
- PP-H and PP-R pipes according to ÖNORM B 5174-1, DIN 8077, DIN 8078
- KE KELIT KETRIX
- PE-X pipes according to EN ISO 15875 (for example: REHAU RAUTITAN flex, Viega Sanfix Fosta PE-X, Uponor Radi Pipe, Uponor Aqua Pipe)

Table 14 – Overview of pipe materials, dimensions, installation situations and classifications

Soft penetration seal [mm]	Orientation F: floor W: wall	Dimension range Ø: outer pipe diameter [mm] s: pipe wall thickness [mm]	Number of layers Ø: outer pipe diameter [mm] L: number of wrap layers	Classification
PE-HD, ABS, SAN + PVC pipes				
2 × 50	F/W	lower limits: Ø 32 mm, s 2,0 mm → Ø 110 mm, s 2,7 mm → Ø 160 mm, s 4,0 mm upper limits: Ø 32 mm, s 4,4 mm → Ø 63 mm, s 5,8 mm → Ø 160 mm, s 14,6 mm	Ø 32 - 63 mm → L 1 Ø 64 - 110 mm → L 2 Ø 111 -125 mm → L 3 Ø 126 - 160 mm → L 4	EI 120-U/C
PP-H and PP-R pipes				
2 × 50	W	lower limits: Ø 20 mm, s 2,8 mm → Ø 32 mm, s 1,8 mm → Ø 110 mm, s 2,7 mm → Ø 160 mm, s 4,0 mm upper limits: Ø 20 mm, s 3,4 mm → Ø 110 mm, s 18,3 mm → Ø 125 mm, s 11,4 mm → Ø 160 mm, s 14,6 mm	Ø 20 - 63 mm → L 1 Ø 64 - 110 mm → L 2 Ø 111 - 125 mm → L 3 Ø 126 - 160 mm → L 4	EI 60-U/C
2 × 50	W	lower limits: Ø 20 mm, s 2,8 mm → Ø 32 mm, s 1,8 mm → Ø 110 mm, s 2,7 mm → Ø 160 mm, s 4,0 mm upper limits: Ø 20 mm, s 3,4 mm → Ø 63 mm, s 10,5 mm → Ø 110 mm, s 10,0 mm → Ø 160 mm, s 14,6 mm		EI 90-U/C
2 × 50	W	lower limits: Ø 32 mm, s 1,8 mm → Ø 110 mm, s 2,7 mm → Ø 160 mm, s 4,0 mm upper limits: Ø 32 mm, s 5,4 mm → Ø 110 mm, s 10,0 mm → Ø 160 mm, s 14,6 mm		EI 120-U/C
2 × 50	F	lower limits: Ø 20 mm, s 2,8 mm → Ø 32 mm, s 1,8 mm → Ø 110 mm, s 2,7 mm → Ø 160 mm, s 4,0 mm upper limits: Ø 20 mm, s 2,8 mm → Ø 63 mm, s 8,6 mm → Ø 110 mm, s 10,0 mm → Ø 160 mm, s 14,6 mm		EI 120-U/C
PVC-U pipes				
2 × 50	F/W	lower limits: Ø 32 mm, s 1,8 mm → Ø 63 mm, s 1,8 mm → Ø 110 mm, s 2,0 mm → Ø 160 mm, s 4,0 mm upper limits: Ø 32 mm, s 3,0 mm → Ø 63 mm, s 4,6 mm → Ø 110 mm, s 8,1 mm → Ø 160 mm, s 11,8 mm	Ø 32 - 63 mm → L 1 Ø 75 - 110 mm → L 2 Ø 111 - 125 mm → L 3 Ø 140 -160 mm → L 4	EI 120-U/C
2 × 50	F	≤ Ø 32 mm, s 3,0 mm	Ø 32 mm (with or without sound decoupling strips) → L 1	EI 90-U/U
POLOPLAST POLO-KAL NG pipes				
2 × 50	W	limits: Ø 32 mm, s 1,8 mm → Ø 40 mm, s 1,8 mm → Ø 50 mm, s 2,0 mm → Ø 75 mm, s 2,6 mm → Ø 110 mm, s 3,4 mm → Ø 125 mm, s 3,9 mm → Ø 160 mm, s 4,9 mm	Ø 32 - 63 mm → L 3 Ø 75 - 90 mm → L 4 Ø 110 -125 mm → L 5 Ø 140 -160 mm → L 6	EI 90-U/U
2 × 50	F	limits: Ø 32 - 40 mm, s 1,8 mm → Ø 50 mm, s 2,0 mm → Ø 75 mm, s 2,6 mm → Ø 110 mm, s 3,4 mm → Ø 125 mm, s 3,9 mm		

Soft penetration seal [mm]	Orientation F: floor W: wall	Dimension range Ø: outer pipe diameter [mm] s: pipe wall thickness [mm]	Number of layers Ø: outer pipe diameter [mm] L: number of wrap layers	Classification
POLOPLAST POLO-KAL XS pipes				
2 × 50	F/W	limits: Ø 32 - 40 mm, s 1,8 mm → Ø 50 mm, s 2,0 mm → Ø 75 mm, s 2,6 mm → Ø 110 mm, s 3,4 mm → Ø 125 mm, s 3,9 mm → Ø 160 mm, s 4,9 mm	Ø 32 - 63 mm → L 3 Ø 75 - 90 mm → L 4 Ø 110 - 125 mm → L 5 Ø 140 - 160 mm → L 6	EI 90-U/U
POLOPLAST POLO-KAL 3S pipes				
2 × 50	W	limits: Ø 75 mm, s 3,8 mm → Ø 110 mm, s 4,8 mm → Ø 125 mm, s 5,3 mm → Ø 160 mm, s 7,5 mm	Ø 75 - 90 mm → L 4 Ø 110 - 125 mm → L 5 Ø 140 - 160 mm → L 6	EI 90-U/U
2 × 50	F	limits: Ø 75 mm, s 3,8 mm → Ø 110 mm, s 4,8 mm → Ø 125 mm, s 5,3 mm		
Geberit Silent-db20 pipes				
2 × 50	W	limits: Ø 56 - 63 mm, s 3,2 mm → Ø 75 mm, s 3,6 mm → Ø 90 mm, s 5,5 mm → Ø 110 - 135 mm, s 6,0 mm → Ø 160 mm, s 7,0 mm	Ø 56 - 63 mm → L 3 Ø 75 - 90 mm → L 4 Ø 110 - 125 mm → L 5 Ø 140 - 160 mm → L 6	EI 90-U/U
2 × 50	F	limits: Ø 56 - 63 mm, s 3,2 mm → Ø 75 mm, s 3,6 mm → Ø 90 mm, s 5,5 mm → Ø 110 mm, s 6,0 mm		
KE KELIT KETRIX pipes				
2 × 50	F/W	lower limits: Ø 20 mm, s 2,8 mm → Ø 32 mm, s 2,9 mm → Ø 63 mm, s 5,8 mm → Ø 110 mm, s 10,0 mm → Ø 160 mm, s 14,6 mm upper limits: Ø 20 mm, s 2,8 mm → Ø 32 mm, s 4,4 mm → Ø 63 mm, s 8,6 mm → Ø 125 mm, s 17,1 mm → Ø 160 mm, s 14,6 mm	Ø 20 - 63 mm → L 1 Ø 64 - 110 mm → L 2 Ø 111 - 125 mm → L 3 Ø 126 - 160 mm → L 4	EI 90-U/C
PE-X pipes				
2 × 50	F/W	limits: Ø 16 mm, s 2,2 mm → Ø 40 mm, s 5,5 mm → Ø 63 mm, s 8,6 mm	Ø 16 - 63 mm → L 1	EI 90-U/C

9.2 Plastic pipes with combustible insulation

Pype types

The listed pipe types are tested according the requirements of EN 1366-3 and EN 13882-3 and given by the rules of the direct and the extended fields of application:

- PP-H and PP-R pipes according to ÖNORM B 5174-1, DIN 8077, DIN 8078
- KE KELIT KETRIX
- PE-X pipes according to EN ISO 15875, DIN 16892, DIN 16893 (for example: REHAU RAUTITAN flex, REHAU RAUTHERM-FW, Viega Sanfix Fosta PE-X, Uponor Radi Pipe, Uponor Aqua Pipe)

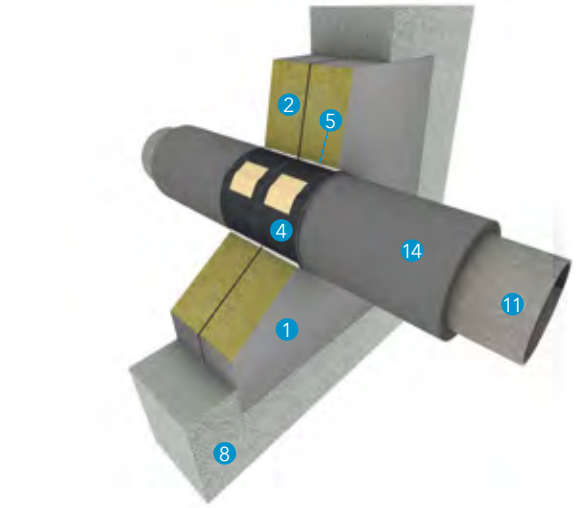
Combustible insulations

In flexible walls, rigid walls, shaft walls and soft penetration seals every type of combustible insulation of class E or B-s3, d0 (acc. to EN 13501-1, for example foam, e.g. PE or elastomeric foam, e.g. Neopren, respectively), with a maximum thickness of 32 mm may be used. The thresholds for pipe diameter and insulation thickness are shown in the tables below.

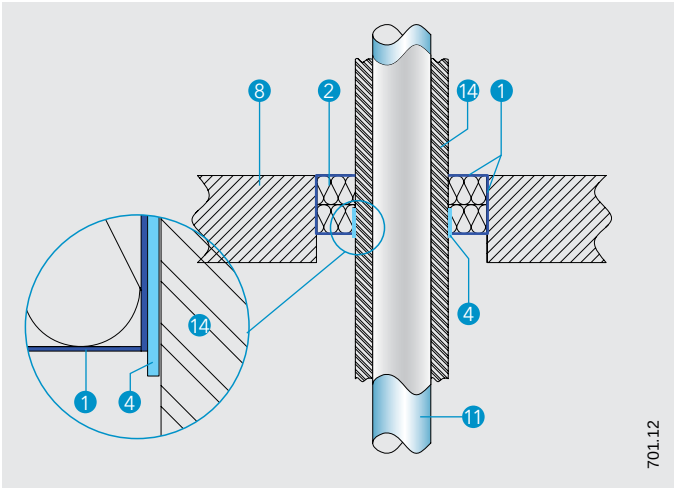
Table 15 – Overview of pipe materials, dimensions, installation situations and classifications

Soft penetration seal [mm]	Orientation F: floor W: wall	Dimension range Ø: outer pipe diameter [mm] d: insulation thickness [mm]	Number of layers Ø: outer diameter incl. insulation [mm] L: number of wrap layers	Classification
PP-H and PP-R pipes				
2 × 50	F/W	Ø 20 - 110 mm, d 6 - 32 mm	Ø 20 - 63 mm → L 1 Ø 64 - 110 mm → L 2 Ø 111 - 125 mm → L 3 Ø 126 - 160 mm → L 4 Ø 161 - 180 mm → L 6	EI 90-U/C with combustible insulation B-s3, d0
2 × 50	W	Ø 20 - 32 mm, d 4 - 13 mm	Ø 20 – 63 mm → L 1	EI 90-U/C with combustible insulation E
2 × 50	F	Ø 20 - 32 mm, d 4 - 13 mm		EI 120-U/C with combustible insulation E
KE KELIT KETRIX pipes				
2 × 50	W	Ø 20 - 160 mm, d 6 - 32 mm	Ø 20 - 63 mm → L 1 Ø 64 - 110 mm → L 2 Ø 111 - 125 mm → L 3 Ø 126 - 160 mm → L 4 Ø 161 - 180 mm → L 6 Ø 181 - 200 mm → L 7 Ø 201 -225 mm → L 8	EI 90-U/C with combustible insulation B-s3, d0
2 × 50	F	Ø 20 - 160 mm, d 6 - 32 mm		EI 120-U/C with combustible insulation B-s3, d0
PE-X pipes				
2 × 50	W	Ø 16 - 63 mm, d 6 - 32 mm	Ø 20 - 63 mm → L 1 Ø 64 - 110 mm → L 2 Ø 111 - 125 mm → L 3 Ø 126 - 160 mm → L 4	EI 120-U/C with combustible insulation B-s3, d0
2 × 50	F	Ø 16 - 63 mm, d 6 - 32 mm		EI 90-U/C with combustible insulation B-s3, d0
2 × 50	F/W	Ø 16 - 25 mm, d 4 - 13 mm	Ø 16 – 63 mm → L 1	EI 120-U/C with combustible insulation E

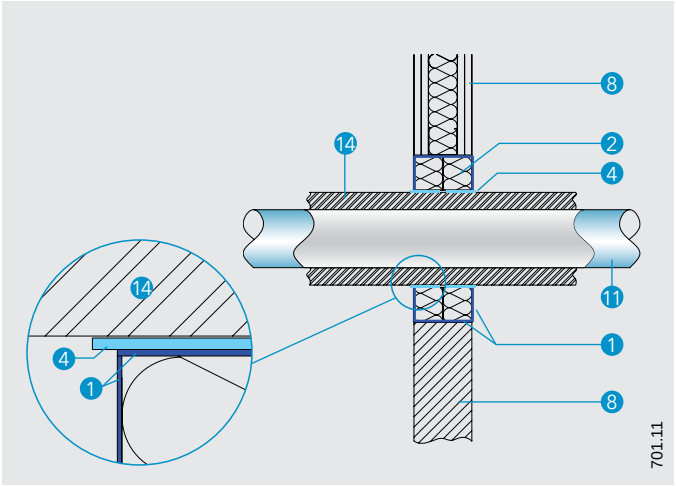
10. PROMASTOP®-CC penetration seal in combination with PROMASTOP®-W for stainless steel and MLC (multi-layered pipes including metal layer(s)) pipes with combustible insulation



Detail W – MLC pipe penetration seal in rigid wall



Detail X – MLC pipe penetration seal in rigid floor



Detail Y – MLC pipe penetration seal in flexible and rigid wall

Details W, X and Y

In wall and floor applications, fire stopping wraps shall be installed on both sides in the soft penetration seal. For Pipelife Radopress pipes which are used in floor applications, attachment to the underside is sufficient. The fire stopping wrap PROMASTOP®-W may protrude max. 5 mm from the soft penetration seal surface and must not be coated. PROMASTOP®-CC, PROMASEAL®-A or PROMASEAL®-AG can be used for fixing in the soft penetration seal.

MLC pipes with combustible insulation (thickness 6 mm to 32 mm, Class B-s3, d0 or higher rated acc. to EN 13501-1, e.g. rubber, Neopren or thickness 4 mm to 13 mm, Class E acc. to EN 13501-1, e.g. PE) can be sealed in combination with fire stopping wrap PROMASTOP®-W. The combustible insulation is centred in the soft penetration seal and must have a minimum total length of 500 mm. The configuration of this insulation is LS or CS for insulations of Class B-s3, d0, CS for insulations of Class E.

The pipes must be suspended/supported ≤ 250 mm on both sides of walls or from the top of the floor.

Pype types

The listed pipe types are tested according the requirements of EN 1366-3 and EN 13882-3 and given by the rules of the direct and the extended fields of application:

- Geberit Mepla, Geberit PushFit, Viega Sanfix Fosta, Viega Raxofix, Viega Raxinox, Uponor UNI pipe, Uponor MLC pipe, Roth Alu-Laserplus, Uponor MPC pipe red, Uponor MPC pipe white, REHAU RAUTITAN stabil, KE KELIT KELOX, KE KELIT KETRIX TRI01, KE KELIT HIT K06, Pipelife Radopress

Combustible insulations

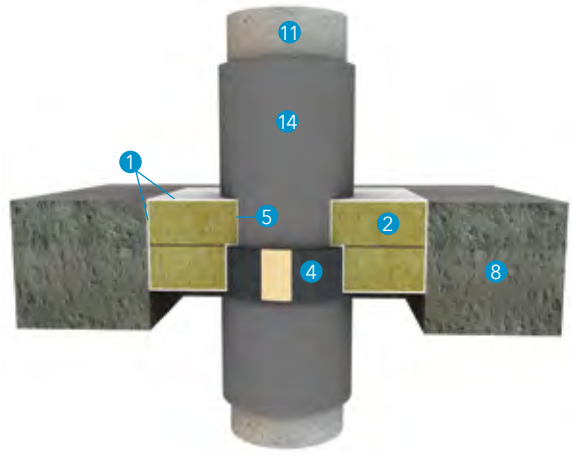
In flexible walls, rigid walls, shaft walls and in soft penetration seals every type of combustible insulation of class E or B-s3, d0 (acc. to EN 13501-1, for example foam, e.g. PE or elastomeric foam, e.g. Neopren, respectively), with a maximum thickness of 32 mm may be used. The thresholds for pipe diameter and insulation thickness are shown in the table below.

Table 16 – Overview of pipe materials, dimensions, installation situations and classifications

Soft penetration seal [mm]	Orientation F: floor W: wall	Dimension range Ø: outer pipe diameter [mm] s: pipe wall thickness [mm] d: insulation thickness [mm]	Number of wrap layers	Classification
Geberit Mepla pipes				
2 × 50	F/W	Ø 16 - 75 mm, d 6 - 32 mm	1	EI 90-U/C with combustible insulation B-s3, d0
2 × 50	W	Ø 16 - 75 mm, d 4 - 13 mm	1	EI 90-U/C with combustible insulation E
2 × 50	F	Ø 16 - 75 mm, d 4 - 13 mm	1	EI 120-U/C with combustible insulation E
Geberit PushFit pipes				
2 × 50	F/W	Ø 16 - 25 mm, d 6 - 32 mm	1	EI 120-U/C with combustible insulation B-s3, d0
Pipelife Radopress pipes				
2 × 50	F/W	Ø 16 - 63 mm, d 6 - 32 mm	1	EI 120-U/C with combustible insulation B-s3, d0
2 × 50	F/W	Ø 16 - 32 mm, d 4 - 9 mm	1	EI 120-U/C with combustible insulation E
REHAU RAUTITAN stabil pipes				
2 × 50	W	Ø 16 - 40 mm, s 2,6 - 6,0 mm, d 6 - 32 mm	1	EI 120-U/C with combustible insulation B-s3, d0
2 × 50	F	Ø 16 - 40 mm, d 6 - 32 mm	1	EI 90-U/C with combustible insulation B-s3, d0
2 × 50	F/W	Ø 16 - 25 mm, d 4 - 13 mm	1	EI 90-U/C with combustible insulation E
Viega Raxofix pipes				
2 × 50	W	Ø 16 - 63 mm, d 6 - 32 mm	1	EI 120-U/C with combustible insulation B-s3, d0
2 × 50	F	Ø 20 - 65 mm, s 2,8 - 4,0 mm, d 6 - 32 mm	1	EI 90-U/C with combustible insulation B-s3, d0
Viega Sanfix Fosta pipes				
2 × 50	W	Ø 16 - 63 mm, d 6 - 32 mm	1	EI 120-U/C with combustible insulation B-s3, d0
2 × 50	F	Ø 20 - 50 mm, d 6 - 32 mm	1	EI 90-U/C with combustible insulation B-s3, d0
2 × 50	F	Ø 16 - 20 mm, s 2,2 - 2,8 mm, d 6 mm	1	EI 90-U/C with combustible insulation B-s3, d0 (6 mm, LS configuration 500 mm)
2 × 50	F	Ø 16 - 20 mm, s 2,2 - 2,8 mm, d 32 mm	1	EI 60-U/C with combustible insulation B-s3, d0 (32 mm, LS configuration 500 mm)
Viega Raxinox pipes				
2 × 50	F	Ø 16 - 20 mm, s 2,2 - 2,8 mm, d 9 - 25 mm (CS configuration)	1	EI 120-U/C with combustible insulation E (9 - 25 mm), except next line
2 × 50	F	Ø 20 mm, s 2,8 mm, d 25 mm (CS configuration)	1	E 120 EI 90-U/C with combustible insulation E (25 mm)

Soft penetration seal [mm]	Orientation F: floor W: wall	Dimension range Ø: outer pipe diameter [mm] s: pipe wall thickness [mm] d: insulation thickness [mm]	Number of wrap layers	Classification
Viega Raxinox pipes with protective tube PE (Ø 20 - 28 mm, s 2,0 mm)				
2 × 50	F	Ø 16 mm, s 2,2 mm → Ø 20 mm, s 2,8 mm	1	EI 120-U/C with protective tube PE (Ø 20 - 28 mm, s 2,0 mm)
Uponor MLC pipes				
2 × 50	F/W	lower limits: Ø 14 - 40 mm, d 6 mm → Ø 75 mm, d 9 mm upper limits: Ø 14 - 75 mm, d 32 mm	1	EI 90-U/C with combustible insulation B-s3, d0
2 × 50	F/W	Ø 76 - 110 mm, d 6 - 32 mm with additional insulation A2 (LS configuration, 200 mm on both sides)	1	EI 90-U/C with combustible insulation B-s3, d0 plus additional insulation A2
2 × 50	W	lower limits: Ø 14 - 20 mm, s 2,0 - 42,5 mm, d 4 mm → Ø 25 mm, s 2,0 - 42,5 mm, d 9 mm upper limits: Ø 14 - 25 mm, s 2,0 - 42,5 mm, d 13 mm	1	EI 90-U/C with combustible insulation E
2 × 50	F	lower limits: Ø 16 - 20 mm, d 4 mm → Ø 25 mm, d 9 mm upper limits: Ø 16 - 25 mm, d 13 mm	1	EI 90-U/C with combustible insulation E
Uponor MLCP red pipes				
2 × 50	F	Ø 14 mm, s 1,6 mm, d 6 - 32 mm (CS configuration)	1	EI 90-U/C with combustible insulation B-s3, d0
Uponor MLCP white pipes				
2 × 50	F	Ø 40 mm, s 4,0 mm, d 6 - 32 mm (CS configuration)	1	EI 90-U/C with combustible insulation B-s3, d0
Uponor UNI pipes				
2 × 50	F/W	Ø 16 - 32 mm, d 6 - 32 mm	1	EI 90-U/C with combustible insulation B-s3, d0
2 × 50	W	Ø 16 - 25 mm, s 2,0 - 2,5 mm, d 4 - 10 mm	1	EI 90-U/C with combustible insulation E
2 × 50	F	Ø 16 - 25 mm, d 4 - 10 mm	1	EI 120-U/C with combustible insulation E
KE KELIT KELOX pipes				
2 × 50	F/W	lower limits: Ø 14 - 40 mm, d 6 mm → Ø 75 mm, d 9 mm upper limits: Ø 14 - 75 mm, d 32 mm	1	EI 90-U/C with combustible insulation B-s3, d0
2 × 50	W	Ø 14 - 32 mm, s 2,0 - 3,0 mm, d 4 - 13 mm	1	EI 90-U/C with combustible insulation E
2 × 50	F	Ø 14 - 32 mm, d 4 - 13 mm	1	EI 120-U/C with combustible insulation E
KE KELIT HIT K06 pipes				
2 × 50	W	lower limits: Ø 20 - 90 mm, d 6 mm upper limits: Ø 20 - 63 mm, d 32 mm	1	EI 90-U/C with combustible insulation B-s3, d0
		lower limit: Ø 90 mm, d 6 mm upper limits: Ø 63 - 90 mm, d 32 mm	2	
2 × 50	F	Ø 20 - 90 mm, d 6 - 32 mm	1	EI 90-U/C with combustible insulation B-s3, d0
KE KELIT KETRIX TRI01 pipes				
2 × 50	W	lower limits: Ø 20 - 90 mm, d 6 mm upper limits: Ø 20 - 63 mm, d 32 mm	1	EI 90-U/C with combustible insulation B-s3, d0
		lower limit: Ø 90 mm, d 6 mm upper limits: Ø 63 - 90 mm, d 32 mm	2	
2 × 50	F	Ø 20 - 90 mm, d 6 - 32 mm	1	EI 120-U/C with combustible insulation B-s3, d0

11. PROMASTOP®-CC penetration seal in combination with PROMASTOP®-W for non-combustible pipes with combustible insulation



Detail Z – Non-combustible pipes with combustible local insulation

Detail Z

E195 grade (1.0034) or better non-alloy steel (acc. to EN 10305; for example: Geberit Mapress, KE KELIT Steelfix) and copper pipes according to EN 1057 (and their substitutes) with combustible insulation (Class B-s3, d0 or higher rated acc. to EN 13501-1, e.g. rubber, elastomeric foam, e.g. Neopren, thickness 6 to 32 mm, LS or CS configuration) can be sealed in combination with fire stopping wrap PROMASTOP®-W. The thresholds for pipe diameter and insulation thickness are shown in Tables 17 and 18.

In wall applications, fire stopping wraps shall be applied on both sides in the soft penetration seal; in floor applications only on the underside. PROMASTOP®-W shall be installed flush with the penetration seal surface, maximum 5 mm in front of the penetration seal. For fixing PROMASTOP®-W in the mineral wool penetration seals use PROMASTOP®-CC, PROMASEAL®-A or PROMASEAL®-AG between the cutting edge and the fire stopping wrap. Annular gap width ≤ 10 mm, depth ≥ 10 mm. The end faces of PROMASTOP®-W must not be painted.

For backfilling gaps between the mineral wool boards and PROMASTOP®-W use mineral wool (melting point ≥ 1000 °C and Class A1 in accordance with EN 13501-1).

The pipes must be suspended/supported ≤ 250 mm on both sides of walls or from the top of the floor.

11.1 Carbon (non-alloy) steel pipes

Table 17

The results can also be applied to metal pipes with a lower heat conductivity than λ ≤ 58 W/mK and a melting point ≥ 1100 °C (e.g. stainless steel, cast iron, Ni alloys /NiCr, NiMo and NiCu alloys/ and Ni).

Table 17 – Classification of steel pipes

Steel pipes with combustible insulation and PROMASTOP®-W Ø: outer pipe diameter s: pipe wall thickness d: insulation thickness L: number of wrap layers	PROMASTOP®-CC 2 × 50 mm	
	Wall	Floor
Ø 15 - 220 mm, s 2,0 - 14,2 mm, d 6 - 32 mm (LS or CS configuration) L 1	EI 90-U/C	EI 90-U/C

11.2 Copper pipes

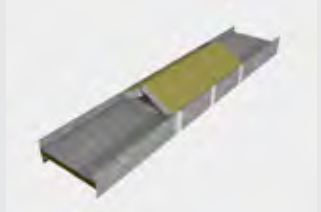
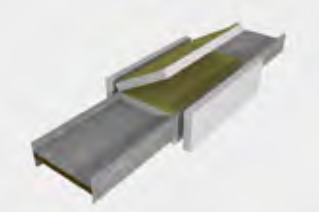
Table 18

Results of copper pipes are valid for steel pipes and their substitutes, but not vice versa, and for other metal pipes with λ ≤ 380 W/mK and a melting point of ≥ 1083 °C.

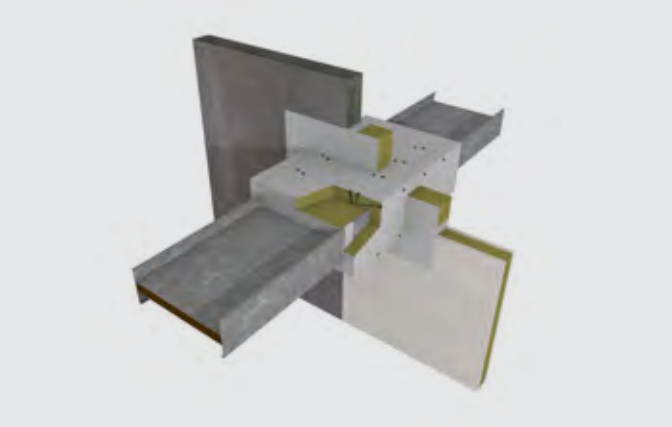
Table 18 – Classification of copper pipes

Copper pipes with combustible insulation and PROMASTOP®-W Ø: outer pipe diameter s: pipe wall thickness d: insulation thickness L: number of wrap layers	PROMASTOP®-CC 2 × 50 mm	
	Wall	Floor
Ø 15 - 88,9 mm, s 2,0 - 14,2 mm d 6 - 32 mm (LS or CS configuration) L 1	EI 90-U/C	EI 90-U/C

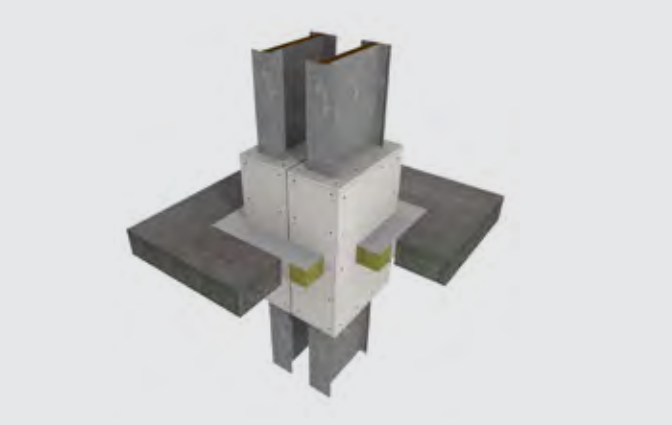
12. PROMASTOP®-CC penetration seal for Canalis® KTA busbar systems


Detail AA - Construction of the penetration seal



Detail AB – Soft penetration seal of the busbar system



Detail AC – Single lining of the busbar systems with zero distance with PROMATECT®-H in the soft penetration seal

PROMASTOP®-CC serves to seal Canalis® KTA busbar systems in horizontal and vertical orientation in lightweight and rigid constructions.

The components (supporting constructions) must be classified acc. to EN 13501-2 for the required fire resistance period. The classification exclusively applies to busbar systems of type Canalis® KTA 800 A to 4000 A.

Supporting distance
The busbar systems must be suspended/supported ≤ 750 mm on both sides of the walls or from the top of the floor.

Rigid floor
The floor must have a thickness of ≥ 150 mm and a density of ≥ 450 kg/m³.

Rigid wall
The wall must have a thickness of ≥ 100 mm and a density of ≥ 450 kg/m³.

Flexible wall
The wall must have a thickness of ≥ 100 mm and be made from timber or metal studs which are lined on both sides with a minimum of two layers of 12,5 mm thick fire protective boards (other board thicknesses shall be permissible, please note minimum thickness). A separate aperture lining is not necessary, the penetration seal can be installed directly on the metal studs in the flexible wall. For timber stud walls, a minimum distance of 100 mm must be kept from the penetration seal to each of the wooden studs and the cavity between stud and sealing must be filled with a least 100 mm of insulation material compliant to Class A1 or A2 (acc. to EN 13501-1).

Details AA and AB
The mineral wool boards (Class A1 acc. to EN 13501-1, melting point ≥ 1000 °C, density ≥ 140 kg/m³, thickness ≥ 2 x 50 mm) shall be coated with PROMASTOP®-CC on the cutting edges, the board joints and the outer surfaces. The required dry layer thickness of PROMASTOP®-CC is ≥ 0,7 mm. In addition, three stripes shall be painted around the busbars and stick the boards on it. The mineral wool boards shall then be fixed with ordinary metal nails (length ≥ 70 mm). Length of the penetration seal is ≥ 800 mm (100 mm penetration seal + min. 700 mm of additional board penetration seal). Application in wall and floor possible. The asymmetrical arrangement of the penetration seal is only applicable in walla. The PROMASTOP®-CC penetration seal can be installed one-sided of the main penetration seal, this means the length of the penetration seal on the busbar is min. 700 mm.

Detail AC
If the penetration seal is built from PROMATECT®-H fire protective boards, it can be guided centrally into the penetration seal. More details available. This penetration seal is classified for vertical use.

Table 19 – Details of the PROMASTOP®-CC penetration seal

Installation situation	PROMASTOP®-CC seal size	
Rigid floor	≤ 3,75 m²	
Rigid wall	≤ 3,75 m²	
Flexible wall	≤ 3,75 m²	
	Classification	
	Wall	**Floor**
Canalis® KTA 800 A to 4000 A with PROMASTOP®-CC	EI 120	EI 90
Canalis® KTA 800 A to 4000 A with PROMASTOP®-CC and PROMATECT®-H	-	EI 90

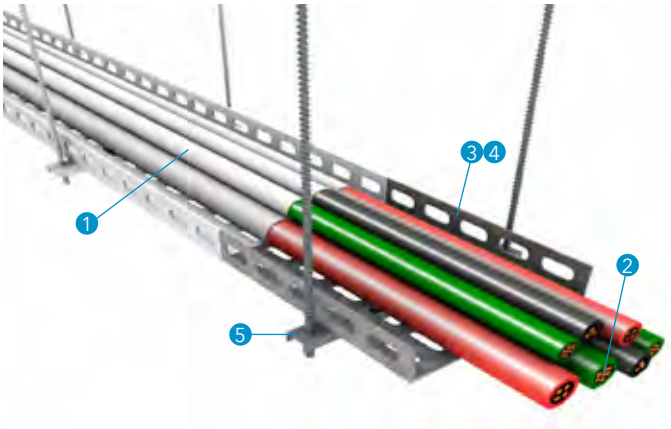
13. Information about the minimum distances in PROMASTOP®-CC penetration seals

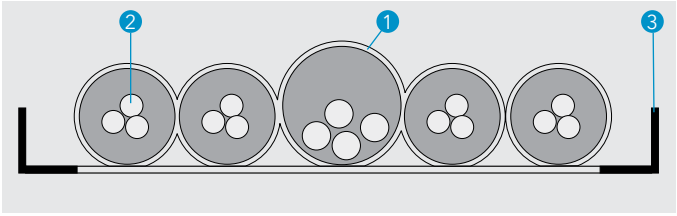
Table 20

Sufficient space needs to be provided for the construction of professional applications. For practical and physical reasons, we recommend observing a minimum distance of 100 mm between installed objects and support construction/component framing during planning. If this is impossible due to the situation on the construction site, the permitted minimum distances shall be taken from Table 20.

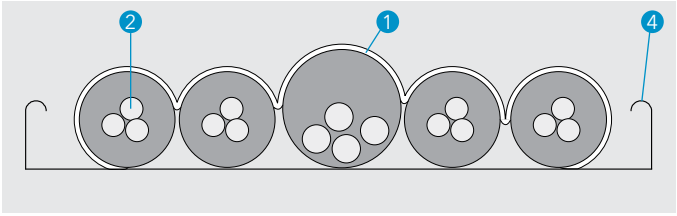
Table 20 – Minimum distances

Object	Minimum distance [mm]
Non-combustible insulation – non-combustible insulation	0
Non-combustible insulation – supporting construction/aperture opening	0
Coated steel pipe with mineral wool insulation – supporting construction/aperture opening	30
Non-combustible insulation – PROMASTOP®-IM CJ21	0
Non-combustible insulation – PROMATECT® duct	0
Non-combustible insulation – PROMASTOP®-FC	0
Non-combustible insulation – PROMASTOP®-W	0
Cables, cable trays, cable ladders – supporting construction/aperture opening	0
Cables, cable trays, cable ladders – cables, cable trays, cable ladders	0
Cables, cable trays, cable ladders – PROMASTOP®-FC	20
Cables, cable trays, cable ladders – PROMASTOP®-W	100
Cables, cable trays, cable ladders – PROMASTOP®-IM CJ21	0
Bus bar – Bus bar	0
Bus bar (covering) – Bus bar (covering)	0
Bus bar (covering) – Supporting construction/aperture opening	0
PROMASTOP®-FC – PROMASTOP®-FC	0
PROMASTOP®-FC – PROMASTOP®-IM CJ21	0
PROMASTOP®-FC – PROMASEAL®-A	0
PROMASTOP®-FC – PROMASEAL®-AG	0
PROMASTOP®-FC – PROMATECT® duct	0
PROMASTOP®-FC – supporting construction/aperture opening	0
PROMASTOP®-FC MD – PROMASTOP®-FC MD	70
PROMASTOP®-FC MD – supporting construction/aperture opening	50
PROMASTOP®-W – PROMASTOP®-W	0
PROMASTOP®-W – PROMASTOP®-IM CJ21	0
PROMASTOP®-W – PROMASTOP®-FC	0
PROMASTOP®-W – PROMATECT® duct	30
PROMASTOP®-W – PROMASEAL®-A	0
PROMASTOP®-W – PROMASEAL®-AG	0
PROMASTOP®-W – supporting construction/aperture opening	0
PROMASTOP®-IM CJ21 – PROMASTOP®-IM CJ21	0
PROMASTOP®-IM CJ21 – PROMASEAL®-A	0
PROMASTOP®-IM CJ21 – PROMASEAL®-AG	0
PROMASTOP®-IM CJ21 – supporting construction/aperture opening	0
Between all other objects	100

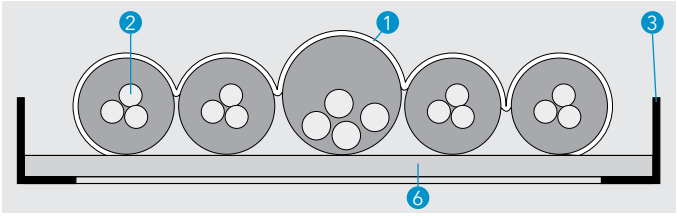




Detail A – required coating on perforated cable trays



Detail B – required coating on non-perforated cable trays



Detail C – required coating on perforated cable trays filled with PROMATECT®-H

Details A, B and C

PROMASTOP®-CC coating is applied repeatedly in individual layers until the required coating thickness is reached. It is always applied on the visible surface of cables or cable bundles (2). For cable bundles, it is necessary to apply the maximum amount of PROMASTOP®-CC coating in the cavities between the individual cables. For perforated cable trays (3) it is necessary to apply the coating from the underside as well (Detail A). For non-perforated cable trays (4, Detail B) or cable trays filled with PROMATECT®-H fire protective boards (6, Detail C), the coating is applied from the top only.

Technical data

1. PROMASTOP®-CC fire stopping coating, dry film thickness 1,0 mm
2. cables, cable bundles
3. cable tray (perforated)
4. cable tray (non perforated)
5. supporting construction of the cables
6. PROMATECT®-H
7. Identification label

Certificate: Electrotechnical Testing Institute Nr. 1160590

Related standards

EN 50266-2: Common test methods for cables under fire conditions. Test for vertical flame spread of vertically-mounted bunched wires or cables.

EN 60332-1: Tests on electric and optical fibre cables under fire conditions.

Important instructions

The required dry film thickness of the PROMASTOP®-CC coating is 1 mm (approx. 1,5 mm wet film thickness). This corresponds to a consumption of approx. 2.2 kg/m² of the painted surface without dilution. Before applying PROMASTOP®-CC, it must be thoroughly mixed. Drying and curing time depends on ambient temperature and relative humidity. The complete curing of the coating takes 48 hours in dry environment. The surface of the cured PROMASTOP®-CC coating is flexible and resistant to moisture and mold.

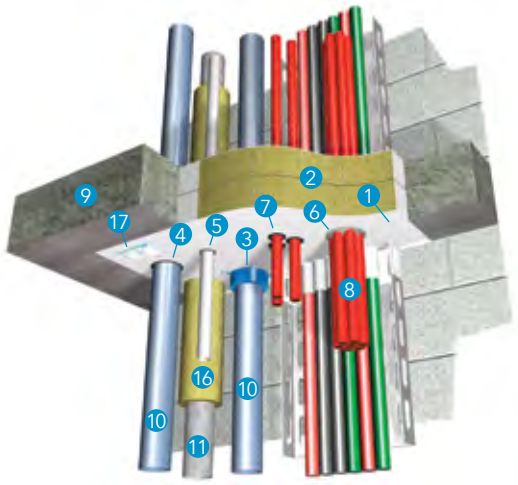
1. Application

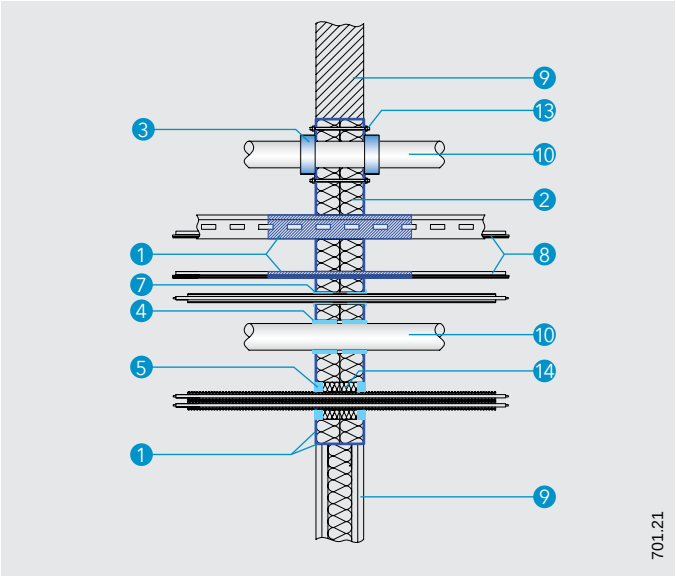
- cables and cable bundles (2) must be cleaned of dust, dirt or grease; the cables must be dry when applying the coating
- mix PROMASTOP®-CC thoroughly or dilute with max. 10% water (the required amount of coating must be recalculated)
- for easier control of the required coating thickness, it is suitable to provide the cables with a 1 mm thick wire and make the necessary number of layers until the wire is covered
- PROMASTOP®-CC can be applied by brush or high-pressure spraying machine
- wash tools or machines with water immediately after finishing
- after the coating has dried, carry out a visual inspection and check the thickness of the paint; repair defective areas

Application by brush: to achieve the required thickness of the PROMASTOP®-CC coating, it is necessary to apply a coating of min. two layers. A technological break of min. 30 minutes recommended (at 20 °C and 60% relative humidity).

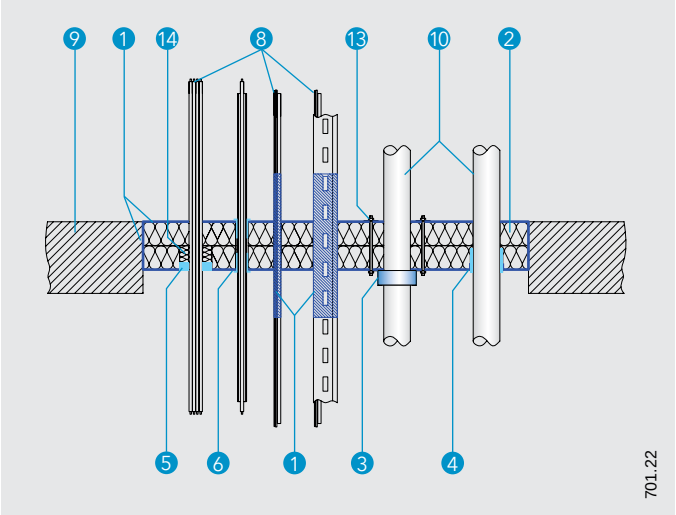
Application by high-pressure spraying machine: according to the manufacturer's instructions for the spraying equipment used, mix the PROMASTOP®-CC coating to the required density. Spraying is assumed in at least three layers. A technological break of approx. 30 minutes recommended between spraying the layers (at 20 °C and 60% relative humidity).

After drying (approx. 30 to 60 minutes at 20 °C and 60% relative humidity), carry out a visual inspection of the coating thickness and the quality of the coating; repair defective areas. After finishing the work, place the identification label (7) in a visible place.





Detail A – Mixed penetration seal in flexible and rigid wall



Detail B – Mixed penetration seal in rigid floor

Details A and B
Mixed penetration seals can be applied in rigid walls and floors as well as in lightweight constructions.

Technical data

1. PROMASTOP®-I
2. Mineral wool, acc. to Table 1
3. PROMASTOP®-FC or PROMASTOP®-FC MD (see on the related detail)
4. PROMASTOP®-W
5. PROMASEAL®-AG
6. PROMASEAL®-A
7. PROMASTOP®-IM CJ21
8. Cables, cable bundles
9. Supporting construction
10. Plastic pipes
11. Non-combustible pipes
12. MLC pipes (multi-layered pipes including metal layer(s))
13. Fixing material, e.g. threaded rods (≥ M6) or spiral screws or spring toggle bolts M4
14. Mineral wool backfilling material, density ≥ 40 kg/m³
15. Combustible insulation
16. Non-combustible local insulation
17. Identification label

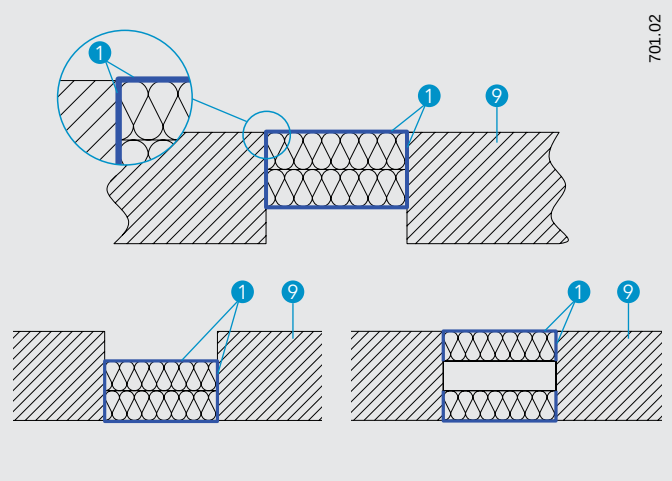
Certificates: ETA-14/0446, IBS KB 13061207-A,Rev1, IBS CR 13061206-A,Rev1-en, IBS CR 317020305-A,Rev1, IBS CR 316071301-A-en, Pavus CR PK2-11-19-002-E-1

Customer benefit

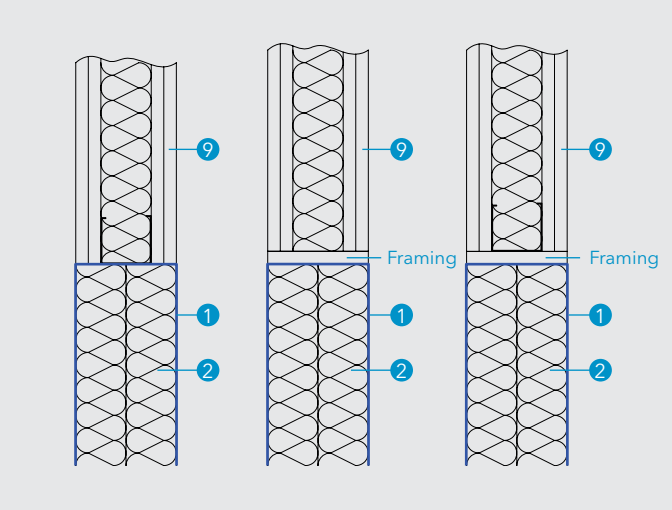
- Quick and easy to install in wall and floors
- Wet film thickness 1,3 mm on mineral wool boards (means dry film thickness of 1,0 mm)
- Workable with brush, roller, spatula or airless device
- PROMASTOP®-I soft penetration seals can be overpainted with many different coating systems and paints for decorative purposes or against environmental impact
- Overpainting with fire stop coatings PROMASTOP®-CC or PROMASTOP®-E allowed

1. Installation

- A flexible wall requires aperture framing, see description below (Detail D).
- Use boards made of non-combustible mineral wool (A1 acc. to EN 13501-1) with a melting point of ≥ 1000 °C and a density of ≥ 140 kg/m³.
- The distance between the mineral wool boards ≥ 0 mm; in cross laminated timber (CLT) constructions ≤ 10 mm.
- The mineral wool boards must be coated with PROMASTOP®-I on the outer surfaces, all cutting edges and board joints. The inner surfaces of the mineral wool boards remain uncoated.
- The required dry coating thickness can be taken from the cable classifications; however, basically the surface requires 1 mm; except for cable group 6 which takes 2 mm.
- The consumption of PROMASTOP®-I liquid is 1,95 kg/m², that of PROMASTOP®-I is 1,80 kg/m²; both for 1 mm dry film thickness.
- Fill remaining gaps and spaces with mineral wool and coat them with PROMASTOP®-I paste or fill them with PROMASEAL®-A.
- It is not necessary to coat the adjacent wall and floor area.
- Secure floor penetration seals against being stepped on.
- Label the penetration seal.



Detail C – Possible positions of the mineral wool boards



Detail D – Aperture framing of the flexible wall

Table 1
The table shows the maximum tested and certified penetration seal sizes shown as well as the various installation situations. The maximum dimensions shall be observed and shall not be exceeded.

Table 1 – Fields of application, maximum seal size and fire resistance class of the blank seal

Supporting construction	Mineral wool 2 x 50 mm	Fire resistance class
Flexible wall ≥ 100 mm	≤ 3,0 m²	EI 120
Rigid wall	≤ 3,0 m²	EI 120
Rigid floor	≤ 3,0 m²	EI 90

Detail C
There are three possibilities shown in Detail C how to install a mineral wool penetration seal in rigid floors ≥ 100 mm:
- Flush to the upper edge of the floor
- Flush to the lower edge of the floor
- Both mineral wool boards flush to the upper and lower edge of the floor

Detail D
The penetration seal may be installed in walls and floors according to Table 1.
For flexible walls, there are the following options for aperture framing:
- Without additional aperture framing, but with the metal stud (left drawing).
- With the metal stud and minimum 1 layer of the flexible wall lining in the aperture (right drawing).
- Without the metal stud but with minimum 1 layer of the flexible wall lining in the aperture (middle drawing).

2. Fields of application

The components (supporting constructions) must be classified acc. to EN 13501-2 for the required fire resistance period.

Flexible wall
The wall must have a thickness of ≥ 100 mm and be made from timber or metal studs which are lined on both sides with a minimum of 2 layers of 12,5 mm thick fire protective boards (other board thicknesses shall be permissible, please note minimum thickness). For timber stud walls, a minimum distance of 100 mm must be kept from the penetration seal to each of the timber studs and the cavity between stud and seal must be filled with at least 100 mm of insulation material compliant to Class A1 or A2 (acc. to EN 13501-1). Additional aperture framing with boards is not necessary; the metal studs of the wall could be used as aperture framing.
The classification results from flexible walls may also apply to rigid walls in case the thickness and density is higher than those of the tested construction.

Rigid wall
The rigid wall must have a thickness ≥ 100 mm and a density of ≥ 450 kg/m³. The results achieved using a rigid standard supporting construction are valid for separating construction products of concrete or masonry having a similar or higher thickness and density as the tested ones.

Rigid floor
The rigid floor must have a thickness of ≥ 150 mm and a density of ≥ 450 kg/m³.

Shaft wall
This is defined as a shaft wall lined on one side on metal studs, the total board thickness according to the fire resistance period must be ≥ 40 mm and consist of at least two layers.

Cross laminated timber (CLT) wall
The cross laminated timber wall must have a thickness of ≥ 140 mm without lining.

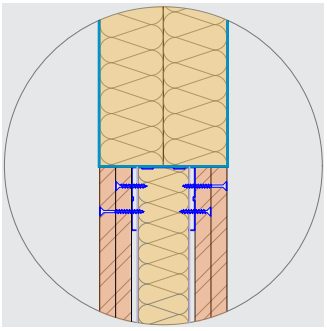
Cross laminated timber (CLT) floor
The cross laminated timber floor must have a thickness of ≥ 140 mm without lining.

Suspended ceiling
The total thickness of the boards must be ≥ 40 mm and consist of at least two layers.

Overview of the combinations of soft penetration seals with supporting constructions

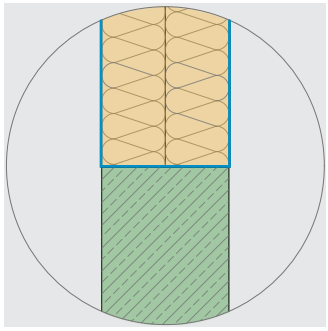
Depending on the wall or floor, there are different combination options for soft penetration seals and supporting constructions.

PROMASTOP®-I in walls (2 x 50 mm mineral wool boards)



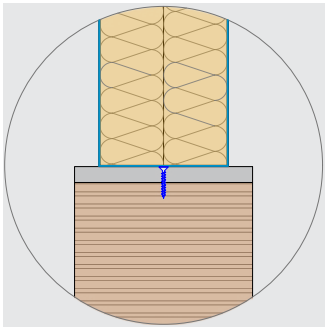
Flexible wall / rigid wall ≥ 100 mm

Maximum penetration seal size
- 3,0 m² (up to EI 120)



Cross laminated timber wall ≥140 mm

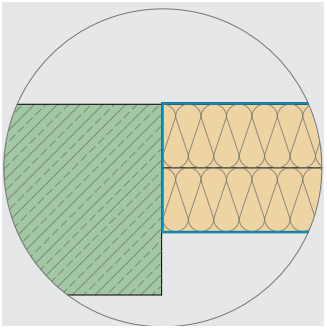
Maximum penetration seal size
- 2,0 m² (up to EI 90)



Shaft wall ≥ 2 ×20 mm

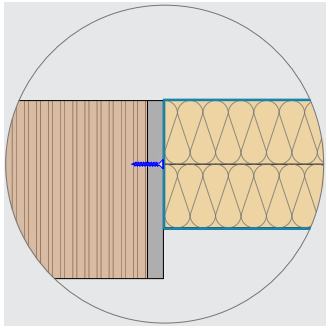
Maximum penetration seal size
- 0,6 m² (up to EI 90)

PROMASTOP®-I in floors (2 x 50 mm mineral wool boards)



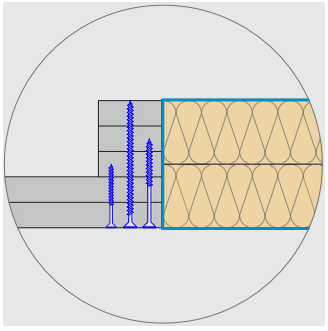
Rigid floor ≥ 150 mm

Maximum penetration seal size
- 3,0 m² (up to EI 90)



Cross laminated timber wall ≥ 140 mm

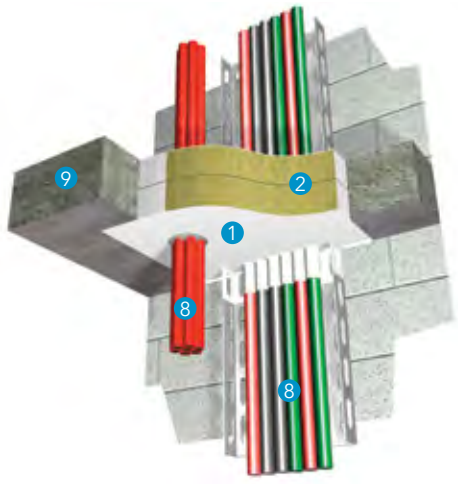
Maximum penetration seal size
- 2,0 m² (up to EI 90)



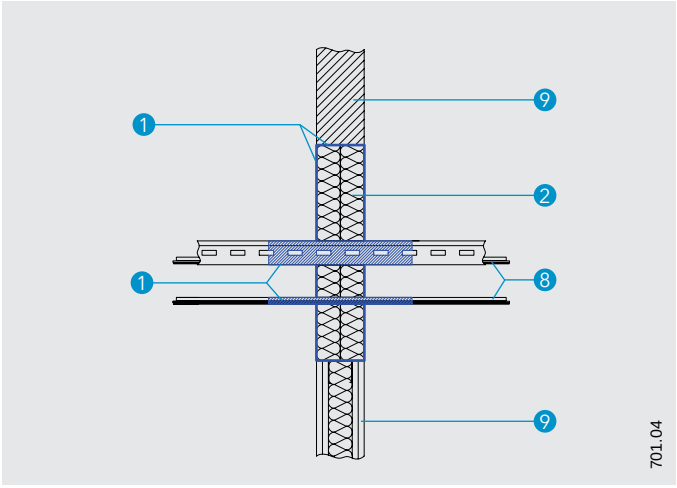
Suspended ceiling ≥ 2 × 20 mm

Maximum penetration seal size
- 0,6 m² (up to EI 90)

3. PROMASTOP®-I cable penetration seal



Detail E – Cable penetration seal in rigid floor



Detail F – Cable penetration seal in flexible and rigid wall

Details E and F

Single cables, cable bundles, flexible conduits, conduit bundles, empty conduits, cable trays and cable ladders may penetrate a PROMASTOP®-I penetration seal in wall and floor. No additional measures need to be taken up to a cable bundle diameter of max. 100 mm. Coating with PROMASTOP®-I is sufficient.

Table 2

As shown in Table 2, a dry film with a thickness of 1 mm shall be applied to cables of the cable group 1-5, cable trays and cable ladders over a length of 100 mm, measured from the surface of the penetration seal. Lines of cable group 6 shall be coated with a 2 mm thick layer over the same length.

Table 2 – Layer thickness and coating length

Object	Dry film thickness [mm]	Coating length [mm]
Cable groups 1 - 5	1	100
Cable group 6	2	
Cable tray, cable ladders	1	

Supporting distance

The cables, cable bundles, cable ladders and cable trays must be suspended/supported ≤ 250 mm on both sides of walls or from the top of the floor.

Table 3

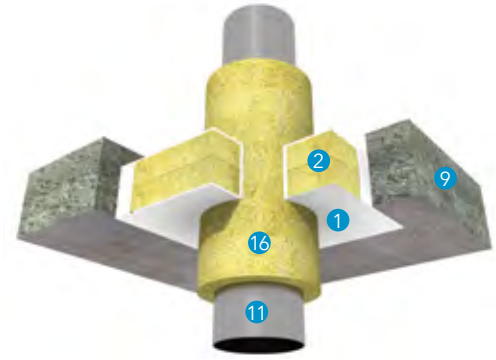
Table 3 shows the fire resistance classification of the cable groups depending on the supporting construction. Later installation in a PROMASTOP®-I soft penetration seal is possible if all application guidelines are followed.

Table 3 – Fire resistance class of the respective cable groups depending on the penetration seal structure

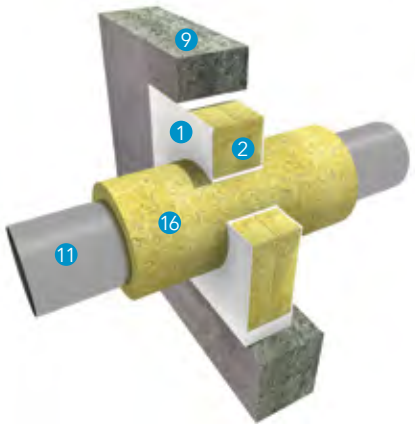
Electrical installation	Thickness and orientation of mineral wool boards	
	2 × 50 mm	
	Wall	Floor
CG 1: All sheathed cable types Ø ≤ 21 mm	EI 120	EI 90
CG 2: All sheathed cable types 21 < Ø ≤ 50 mm	EI 90	EI 90
CG 3: All sheathed cable types 50 < Ø ≤ 80 mm	EI 90	EI 90
CG 4: Cable bundles made of cables from CG Ø ≤ 100 mm	EI 120	EI 90
CG 5: Non-sheathed cable types Ø ≤ 24 mm	EI 90	EI 90
CG 6: Empty conduit/pipe made of steel, copper or plastic, pipe end configuration U/C, Ø ≤ 16 mm	EI 120	EI 90

CG … Cable group acc. to EN 1366-3:2009

4. PROMASTOP®-I penetration seal for non-combustible pipes with non-combustible insulation



Detail G – Metal pipe penetration seal in rigid floor



Detail H – Metal pipe penetration seal in flexible and rigid wall

Detail G

Non-combustible pipes can be sealed with appropriate pipe insulation made of mineral wool (melting point ≥ 1000 °C, A2/A2$_L$ or higher rated acc. to EN 13501-1). The required lengths and thicknesses are shown in the diagrams. These depend on the pipe diameter, the pipe wall thickness and the pipe type (steel, copper or their substitutes).

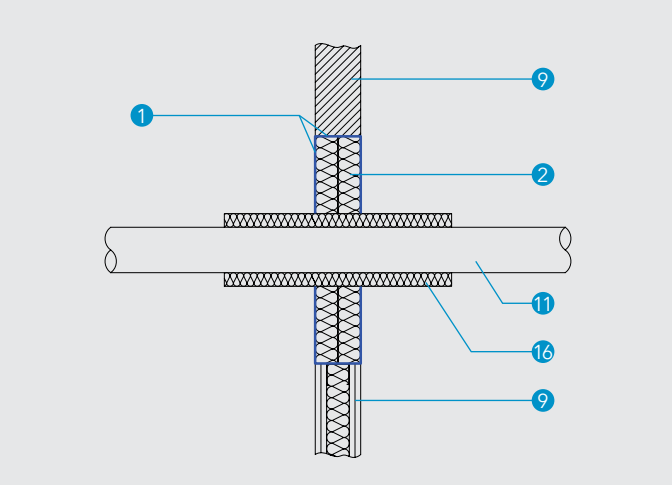
The pipe insulation can be realised as a LS, LI, CS or CI configuration in compliance with EN 1366-3.

Detail H

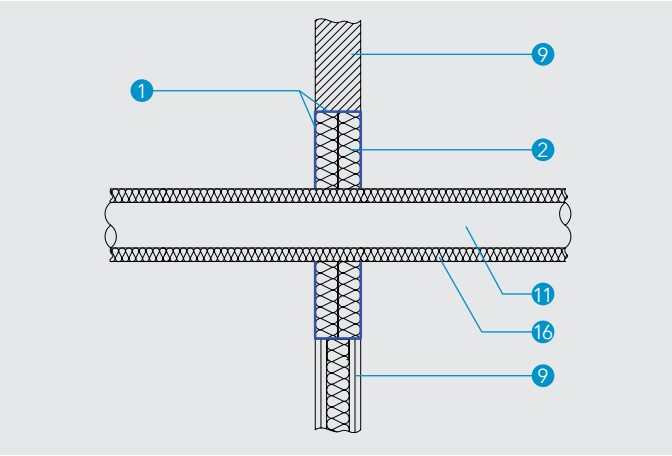
The insulation (configuration LS) is placed in the centre of the supporting construction or the soft penetration seal and fixed with steel wire (minimum thickness 0,6 mm). The insulation length is shown in Diagrams 1 and 2. Results of copper pipes can be also apply to steel pipes but not vice versa.
To fill gaps around pipe insulation, mineral wool with a melting point of ≥ 1000 °C, A1 acc. to EN 13501-1 can be coated with PROMASTOP®-I paste or PROMASEAL®-A.
Insulated metal pipes may pass at angles between 90° and 45° to the supporting construction.

Supporting distance

The pipes must be suspended/supported ≤ 250 mm on both sides of walls or from the top of the floor.



Detail I – Metal pipe penetration seal in flexible and rigid wall in LS configuration



Detail J – Metal pipe penetration seal in flexible and rigid wall in CS configuration

4.1 Steel pipes

Details I, J, K and L

Steel pipes with non-combustible insulation may penetrate the PROMASTOP®-I penetration seal in flexible and rigid walls and in rigid floors.

Table 4 – Insulation information for steel pipes

Type	Specification
Mineral wool	Melting point ≥ 1000 °C, Class min. A2-s1, d0 or $A2_L$-s1, d0
Density	≥ 40 kg/m³ to ≤ 150 kg/m³
Insulation thickness	≥ 30 mm to ≤ 100 mm
Type of insulation	LS, CS, LI or CI
Insulation length	see Diagram 1

Table 5

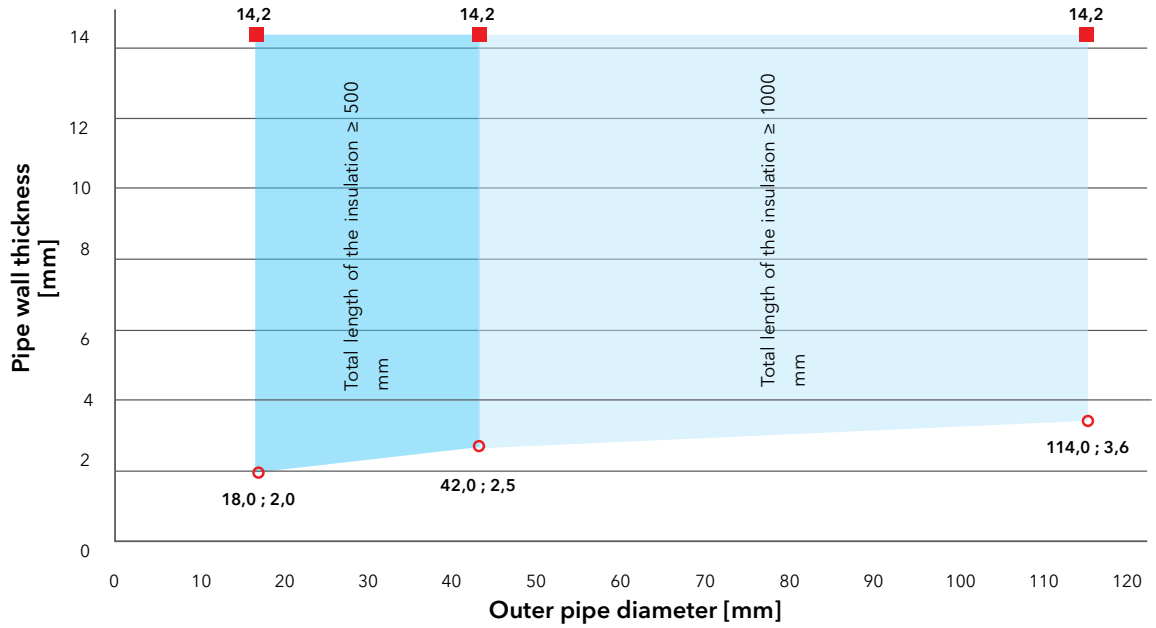
Table 5 shows the classification of steel pipes and substitutes.

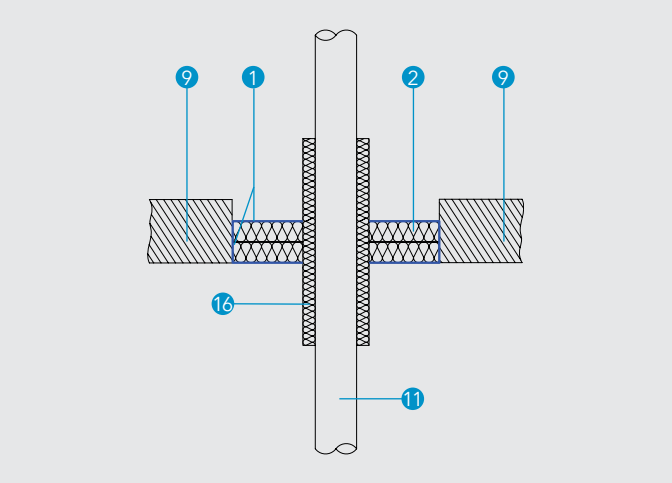
Table 5 – Dimensions for steel pipes with non-combustible insulation

Dimensions for steel pipes with non-combustible insulation	PROMASTOP®-I soft penetration seal with 2 × 50 mm mineral wool boards	
	Wall	Floor
Outer pipe diameter [mm]	17 ≤ 114	17 ≤ 114
Pipe wall thickness [mm]	2,0 ≤ 14,2	2,0 ≤ 14,2
Classification	EI 90-U/C	EI 120-U/C

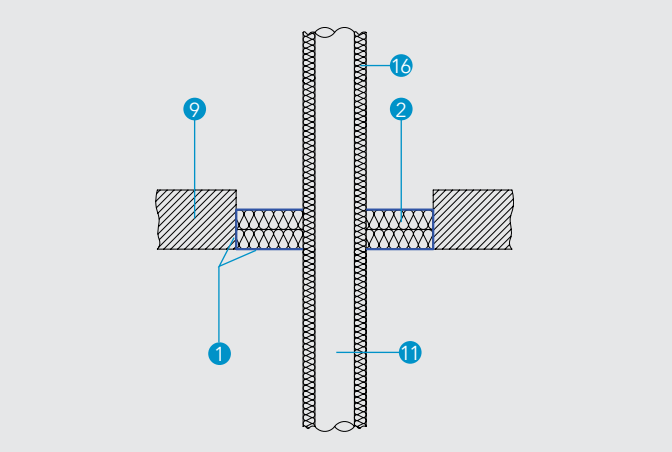
Diagram 1 - Information about the total length of non-combustible insulation for steel pipes in PROMASTOP®-I penetration seal

In the diagram shown, the respective total length of the pipe insulation depending on the pipe wall thickness and the pipe diameter. The results can also be applied to metal pipes with a lower thermal conductivity λ ≤ 58 W/mK and a melting point ≥ 1100 °C (e.g. stainless steel, cast iron and Ni alloys -NiCr, NiMo, NiCu- and Ni).





Detail K – Metal pipe penetration seal in rigid floor in LS configuration



Detail L – Metal pipe penetration seal in rigid floor in CS configuration

4.2 Copper pipes

Details I, J, K and L

Copper pipes with non-combustible insulation may penetrate the PROMASTOP®-I penetration seal in flexible and rigid walls and in rigid floors.

Table 6 – Insulation information for copper pipes

Type	Specification
Mineral wool	Melting point ≥ 1000 °C, Class min. A2-s1, d0 or $A2_L$-s1, d0
Density	≥ 40 kg/m³ to ≤ 150 kg/m³
Insulation thickness	≥ 30 mm to ≤ 100 mm
Type of insulation	LS, CS, LI or CI
Insulation length	see Diagram 2

Table 7

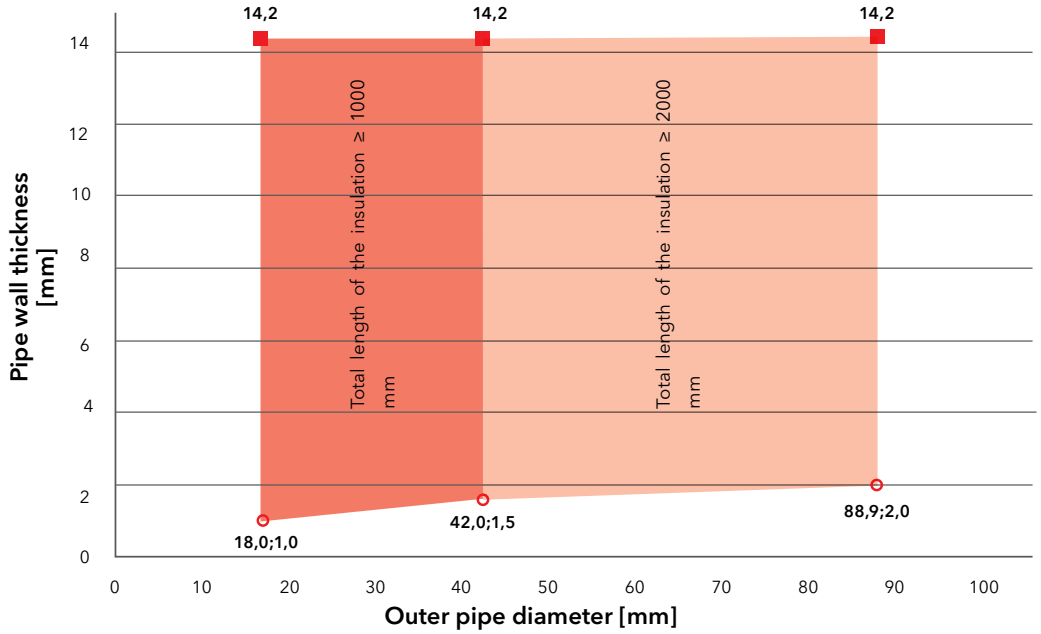
Table 7 shows the classification of copper pipes and substitutes.

Table 7 – Dimensions for copper pipes with non-combustible insulation

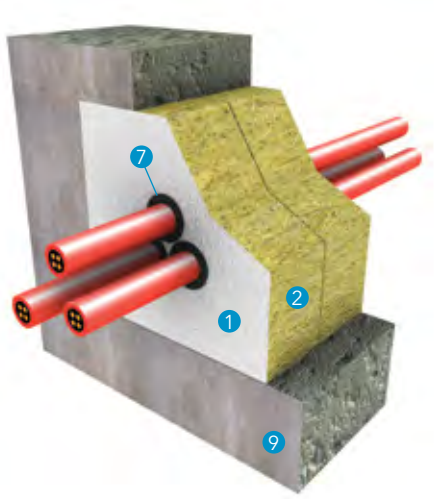
Dimensions for copper pipes with non-combustible insulation	PROMASTOP®-I soft penetration seal with 2 × 50 mm mineral wool boards	
	Wall	Floor
Outer pipe diameter [mm]	18 ≤ 88,9	18 ≤ 88,9
Pipe wall thickness [mm]	1,0 ≤ 14,2	1,0 ≤ 14,2
Classification	EI 90-U/C	EI 90-U/C

Diagram 2 – Information about the total length of non-combustible insulation for copper pipes in PROMASTOP®-I penetration seal

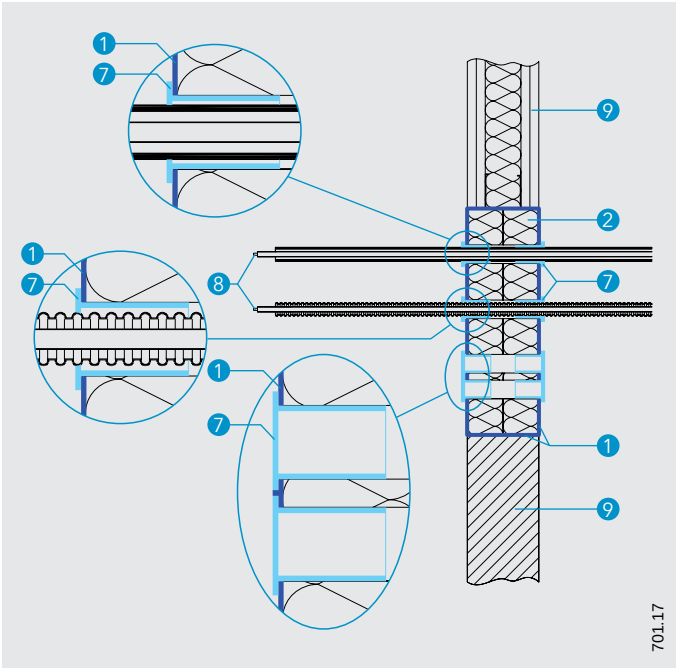
In the diagram shown, the respective total length of the pipe insulation depending on the pipe wall thickness and the pipe diameter. Results of copper pipes are valid for steel pipes, but not vice versa, and for pipes with λ ≤ 380 W/mK and melting point ≥ 1083 °C (e.g. steel, stainless steel, cast iron and Ni alloys -NiCr, NiMo, NiCu- and Ni).



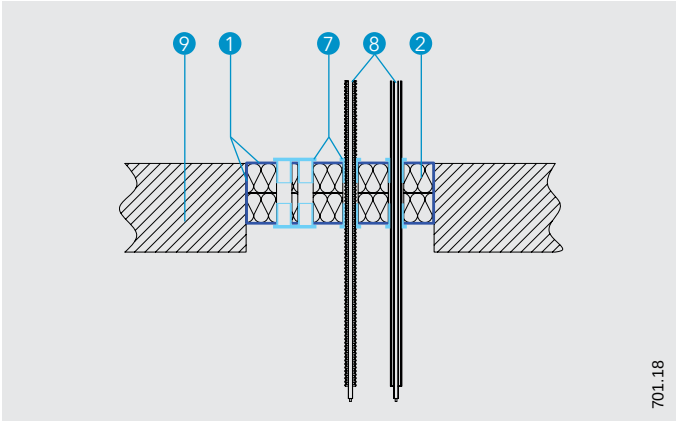
5. PROMASTOP®-I cable penetration seal in combination with PROMASTOP®- IM CJ21



Detail M – Cable penetration seal in rigid wall



Detail N – Cable penetration seal in flexible and rigid wall



Detail O – Cable penetration seal in rigid floor

Details M, N and O

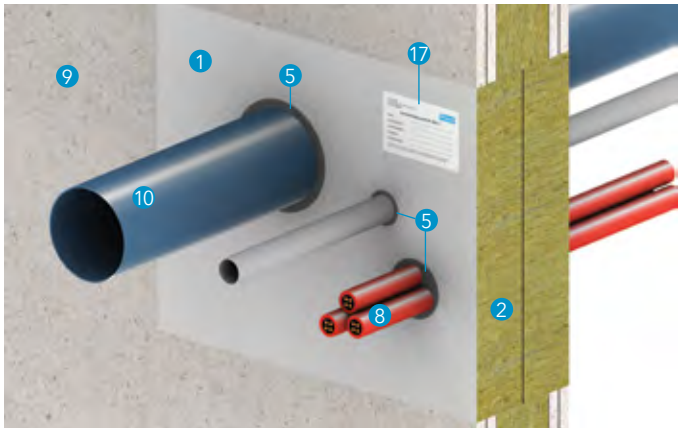
The cable jacket PROMASTOP®-IM CJ21 is a penetration seal option for cables, wires, flexible and rigid conduits with or without cables up to ≤ 21 mm in diameter. Since it is flue gas-tight, later penetration of new cable is possible without any repair work. No annular gap filling or additional coating or gluing required.
An advantage of the system is the option of later installation. In wall and floor applications of the soft penetration seal the fire stopping cable jacket, PROMASTOP®-IM CJ21 shall be installed (screwed) into the mineral wool boards on both sides of the wall and on top and below the floor.

Table 8 – Fire resistance class of the cable jacket depending on the penetration seal orientation

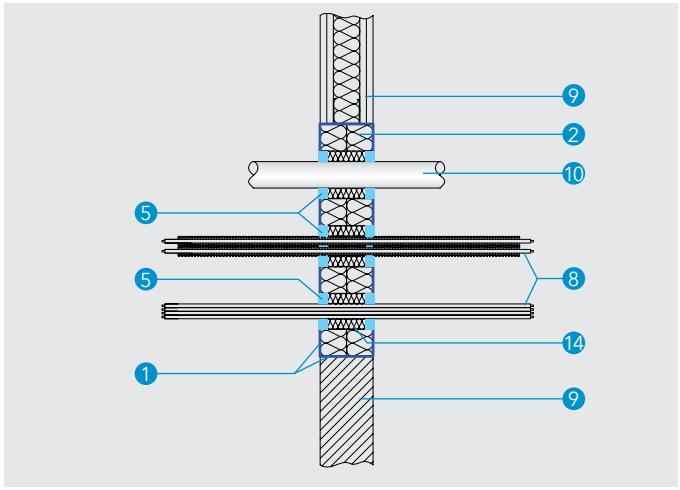
Electrical installation	PROMASTOP®-I soft penetration seal with 2 × 50 mm mineral wool boards	
	Wall	Floor
CG1: All sheathed cable types Ø ≤ 21 mm	EI 90	EI 90
Flexible and rigid conduits; with or without cable, U/U Ø ≤ 20 mm	EI 120	EI 90
Blank seal (without cable or conduit)	EI 120	EI 90
Installation	on both sides	

See the required distances between objects on page 93.

6. PROMASTOP®-I mixed penetration seal in combination with PROMASEAL®-AG



Detail P – Mixed penetration seal in flexible wall



Detail Q – Cable penetration seal in flexible and rigid wall

Details P and Q

The intumescent fire stopping sealant PROMASEAL®-AG can be used as a penetration seal for cable bundles Ø ≤ 160 mm, flexible conduits, conduit bundles and plastic pipes Ø ≤ 50 mm. A defined annular gap will be created around the installations in the soft penetration seal. This annular gap should be backfilled with mineral wool and covered with PROMASEAL®-AG (details in Table 9).

In wall applications, the filling with PROMASEAL®-AG shall be applied on both sides in the soft penetration seal, but only on the underside for floor application.

Table 9 – Annular gap information

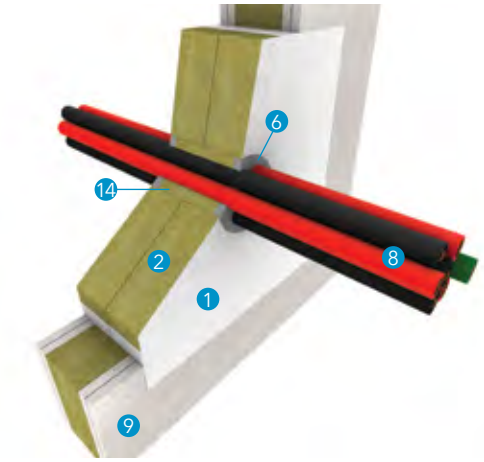
Type	Specification
Backfilling	Class A1 (mineral wool, ceramic wool,…), melting point ≥ 1000 °C
Density of backfilling	≥ 40 kg/m³
Annular gap width	≤ 20 mm
Annular gap depth	≥ 15 mm

Table 10 – Overview of pipe materials, dimensions, installation situations and classifications

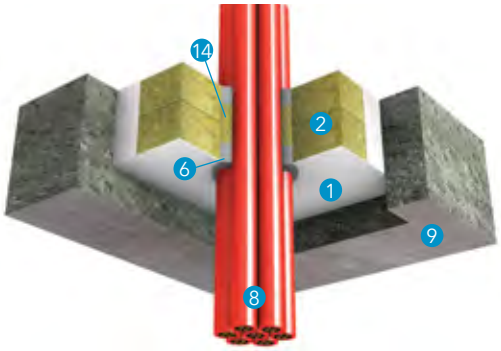
PROMASTOP®-I soft penetration seal with mineral wool boards	Orientation F: floor W: wall	Dimension range Ø: outer pipe diameter [mm] s: pipe wall thickness [mm]	Annular gap width × depth [mm]	Classification
PVC pipes				
2 × 50	F/W	Ø ≤ 50 mm, s 1,8 mm	20 × 15	EI 120-U/C
PP pipes				
2 × 50	F/W	Ø ≤ 50 mm, s 1,8 mm	20 × 15	EI 120-U/C
PE pipes				
2 × 50	F/W	Ø ≤ 50 mm, s 1,8 mm	20 × 15	EI 120-U/C
Cable bundles, single cables Ø ≤ 21 mm				
2 × 50	F/W	Ø ≤ 160 mm	20 × 15	EI 120
Single flexible conduit (U/C) or bundle of them, with or without cable				
2 × 50	W	single Ø ≤ 50 mm	20 × 15	EI 120-U/C
2 × 50	W	Ø ≤ 5 × 50 mm	20 × 15	EI 120-U/C

Required distance of cable bundles or flexible conduits from each other: 0 mm.

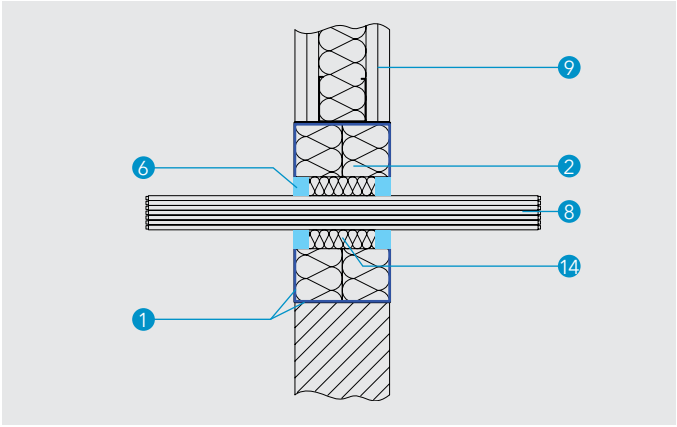
7. PROMASTOP®-I cable penetration seal in combination with PROMASEAL®-A



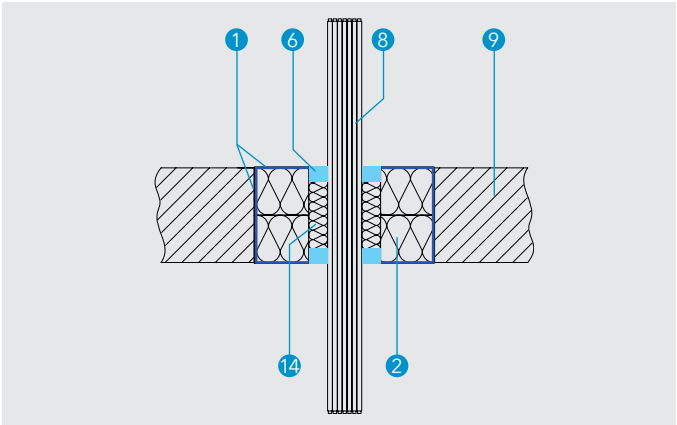
Detail R – Cable penetration in flexible wall



Detail S – Cable penetration seal in rigid floor



Detail T – Cable penetration seal in flexible or rigid wall



Detail U – Cable penetration seal in rigid floor

Details R, S, T and U

The fire stopping sealant PROMASEAL®-A can be used as a penetration seal for single cables and cable bundles. A defined annular gap will be created around the installations in the soft penetration seal.

Table 11

The annular gap is backfilled with mineral wool (Class A1 acc. to EN 13501-1, melting point ≥ 1000 °C), compression 50%. In wall and floor applications, seal the annular gap with PROMASEAL®-A on both sides in the soft penetration seal. Cable bundles can be sealed with zero distance.

Table 11 – Annular gap information

Type	Specification
Backfilling	Class A1 (mineral wool, ceramic wool,…), melting point ≥ 1000 °C
Density of backfilling	≥ 40 kg/m³
Annular gap width	≤ 20 mm
Annular gap depth	≥ 15 mm

Tables 12 and 13

The fields of application of PROMASTOP®-I in combination with PROMASEAL®-A can be determined from Tables 12 and 13.

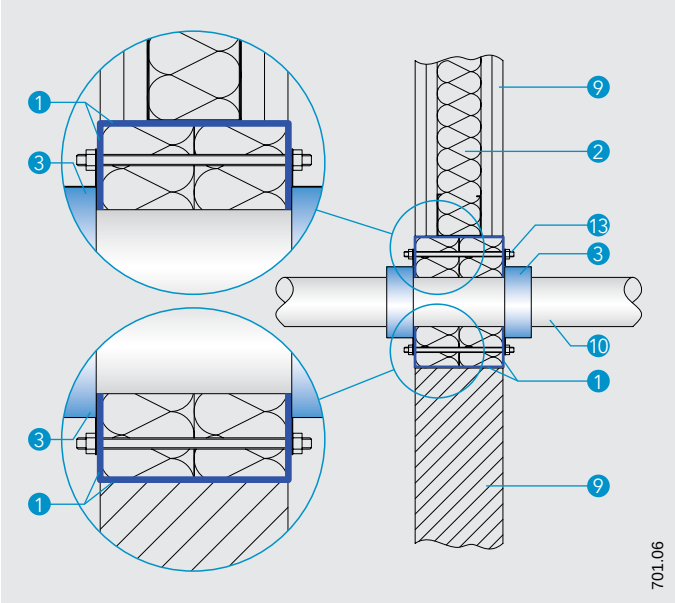
Table 12 – Flexible and rigid wall

Classification in soft penetration seal PROMASTOP®-I	Wall
Sheathed single cable ≤ 4 × 10 mm² (H07RN-F 4 G 10 SW or equivalent)	EI 120
Sheathed single cable ≤ 3 × 150 mm² (N2XSEY or equivalent)	E 120 EI 90
Cable bundle with 26 pieces of sheathed single cables ≤ 5 × 1,5 mm² (H07RN-F or equivalent)	EI 120
Cable bundle with 20 pieces of sheathed single cables ≤ 2 × 0,6 mm² (control, power, data, signal, telecommunication, optical fibre cables or equivalent)	E 120 EI 90

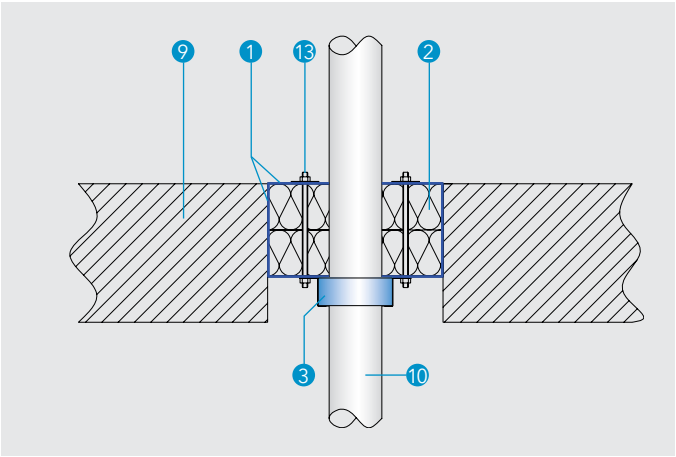
Table 13 – Rigid floor

Classification in soft penetration seal PROMASTOP®-I	Floor
Sheathed single cable ≤ 4 × 10 mm² (H07RN-F 4 G 10 SW or equivalent)	EI 120
Sheathed single cable ≤ 3 × 150 mm² (N2XSEY or equivalent)	EI 120
Cable bundle with 26 pieces of sheathed single cables ≤ 5 × 1,5 mm² (H07RN-F or equivalent)	EI 120
Cable bundle with 20 pieces of sheathed single cables ≤ 2 × 0,6 mm² (control, power, data, signal, telecommunication, optical fibre cables or equivalent)	EI 120

8. PROMASTOP®-I plastic pipe penetration seal in combination with PROMASTOP®-FC



Detail V – Plastic pipe penetration seal in flexible and rigid wall



Detail W – Plastic pipe penetration seal in rigid floor

Details V and W

PROMASTOP®-FC3 and PROMASTOP®-FC6 are suitable for surface-mounted and built-in installations. In wall applications, fire stopping collars shall be fixed on both sides of the soft penetration seal; in floor applications only on the bottom side.

The classifications for PVC-U pipes are applicable for pipes in acc. with EN 1452-1, DIN 8061, DIN 8062, EN 1329-1, EN 1453-1 and PVC-C pipes in acc. with EN 1566-1.
The classifications for PE pipes are applicable for pipes in acc. with EN 12201-2, EN 1519-1, EN 12666-1, DIN 8074, DIN 8075 and ABS-pipes in acc. with EN 1455-1 and SAN + PVC-pipes in acc. with EN 1565-1.
The classifications for PP-H and PP-R pipes are applicable for pipes in acc. e.g. to DIN 8077, DIN 8078 or equal products.
The classifications for all stated multilayer pipes are applicable on equal products.

Fixing

The fixing of the collar in penetration seals depends on the type of installation.

Table 14 – Fixing of PROMASTOP®-FC in the PROMASTOP®-I penetration seal

Mineral wool boards	Threaded rods M6/M8*	Spiral screws 65 mm**	Spring toggle bolts M4*	Built-in (recessed) installation***
2 × 50 mm	✓	✓	✓	✓

** The collars shall be fixed on every second fixing latch (e.g. 2 of 4 or 3 of 5) - no two adjacent latches may be left unfixed.*

*** The collars shall be fixed on every fixing latch.*

**** The fixing latches are inbetween the two mineral wool boards.*

Annular gap sealing

Backfill the annular gap with mineral wool (Class A1 acc. to EN 13501-1, melting point ≥ 1000 °C) and coat it on both sides with fire stopping sealant PROMASEAL®-A or with PROMASTOP®-I.
If the penetration seal allows using PROMASTOP®-FC3, optionally PROMASTOP®-FC6 may also be used but not vice versa.

Couplings

The diameter of the tested coupling may be decreased but not increased. For this application the PROMASTOP®-FC6 collar with a height of 60 mm is needed.

Sloped pipes

The angle of the pipe may vary between the tested one and the right angle.

Sound decoupling

In flexible walls (incl. shaft walls), suspended ceilings, rigid and timber constructions every type of sound decoupling strip based on PE-foam of class E or higher rated acc. to EN 13501-1, with a maximum thickness of 5 mm may be used.

See the required distances between objects on page 93.

Table 15
For the pipe materials, dimensions, installation situations and classifications see Table 15.

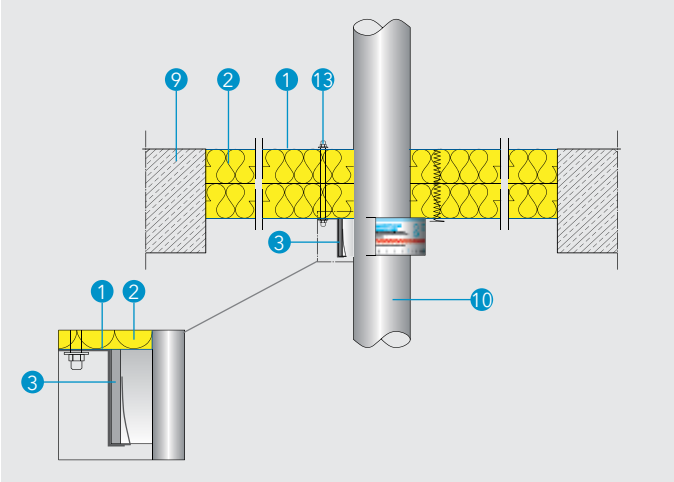
Table 15 – Overview of pipe materials, dimensions, installation situations and classifications

Soft penetration seal [mm]	Orientation F: floor W: wall	Dimension range Ø: outer pipe diameter [mm] s: pipe wall thickness [mm]	Classification
PE-HD, ABS, SAN + PVC pipes			
2 × 50	F/W	**PROMASTOP®-FC3** lower limits: Ø 32 mm, s 1,8 mm → Ø 63 mm, s 1,8 mm → Ø 125 mm, s 3,1 mm upper limits: Ø 32 mm, s 5,8 mm → Ø 63 mm, s 5,8 mm → Ø 125 mm, s 7,4 mm **PROMASTOP®-FC6** lower limits: Ø 50 mm, s 1,8 mm → Ø 63 mm, s 1,8 mm → Ø 125 mm, s 3,1 mm → Ø 200 mm, s 4,9 mm upper limits: Ø 50 mm, s 5,8 mm → Ø 63 mm, s 5,8 mm → Ø 125 mm, s 7,4 mm → Ø 200 mm, s 11,4 mm	EI 90-U/U
PP-H and PP-R pipes			
2 × 50	F/W	**PROMASTOP®-FC3** lower limits: Ø 32 mm, s 1,8 mm → Ø 63 mm, s 1,8 mm → Ø 125 mm, s 3,1 mm → Ø 160 mm, s 4,0 mm upper limits: Ø 32 mm, s 8,6 mm → Ø 63 mm, s 8,6 mm → Ø 125 mm, s 7,1 mm → Ø 160 mm, s 4,0 mm **PROMASTOP®-FC6** lower limits: Ø 50 mm, s 1,8 mm → Ø 63 mm, s 1,8 mm → Ø 125 mm, s 3,1 mm → Ø 200 mm, s 4,9 mm upper limits: Ø 50 mm, s 8,6 mm → Ø 63 mm, s 8,6 mm → Ø 125 mm, s 7,1 mm → Ø 200 mm, s 11,4 mm	EI 90-U/U
2 x 50 mm, collar built-in	F	**PROMASTOP®-FC3 and PROMASTOP®-FC6** limits: Ø 75 mm, s 2,6 mm → Ø 90 mm, s 3,0 mm	EI 90-U/U
PVC-U and PVC-C pipes			
2 × 50	F/W	**PROMASTOP®-FC3** lower limits: Ø 32 mm, s 1,8 mm → Ø 63 mm, s 1,8 mm → Ø 125 mm, s 3,1 mm upper limits: Ø 32 mm, s 5,8 mm → Ø 63 mm, s 5,8 mm → Ø 125 mm, s 7,1 mm **PROMASTOP®-FC6** lower limits: Ø 50 mm, s 1,8 mm → Ø 63 mm, s 1,8 mm → Ø 125 mm, s 3,1 mm → Ø 200 mm, s 4,9 mm upper limits: Ø 50 mm, s 5,8 mm → Ø 63 mm, s 5,8 mm → Ø 125 mm, s 7,1 mm → Ø 200 mm, s 4,9 mm couplings tested up to Ø 125 mm	EI 90-U/U
2 x 50 mm, collar built-in	F	**PROMASTOP®-FC3 and PROMASTOP®-FC6** limits: Ø 125 mm, s 3,2 mm → Ø 160 mm, s 3,6 mm	EI 90-U/U
POLOPLAST POLO-KAL NG pipes			
2 × 50	F/W	**PROMASTOP®-FC3** limits: Ø 32 mm, s 1,8 mm → Ø 40 mm, s 1,8 mm → Ø 50 mm, s 2,0 mm → Ø 75 mm, s 2,6 mm → Ø 110 mm, s 3,4 mm → Ø 125 mm, s 3,9 mm → Ø 160 mm, s 4,9 mm **PROMASTOP®-FC6** limits: Ø 50 mm, s 2,0 mm → Ø 75 mm, s 2,6 mm → Ø 110 mm, s 3,4 mm → Ø 125 mm, s 3,9 mm → Ø 160 mm, s 4,9 mm → Ø 200 mm, s 6,8 mm → Ø 250 mm, s 8,6 mm couplings tested up to Ø 125 mm	EI 90-U/U

Soft penetration seal [mm]	Orientation F: floor W: wall	Dimension range Ø: outer pipe diameter [mm] s: pipe wall thickness [mm]	Classification
POLOPLAST POLO-KAL XS pipes			
2 × 50	F/W	**PROMASTOP®-FC3** limits: Ø 32 mm, s 1,8 mm → Ø 40 mm, s 1,8 mm → Ø 50 mm, s 2,0 mm → Ø 75 mm, s 2,6 mm → Ø 110 mm, s 3,4 mm **PROMASTOP®-FC6** limits: Ø 50 mm, s 2,0 mm → Ø 75 mm, s 2,6 mm → Ø 110 mm, s 3,4 mm couplings tested up to Ø 110 mm	EI 90-U/U
POLOPLAST POLO-KAL 3S pipes			
2 × 50	F/W	**PROMASTOP®-FC3** limits: Ø 75 mm, s 3,8 mm → Ø 110 mm, s 4,8 mm → Ø 125 mm, s 5,3 mm → Ø 160 mm, s 7,5 mm **PROMASTOP®-FC6** limits: Ø 75 mm, s 3,8 mm → Ø 110 mm, s 4,8 mm → Ø 125 mm, s 5,3 mm → Ø 160 mm, s 7,5 mm couplings tested up to Ø 125 mm	EI 90-U/U
POLOPLAST POLO ECO plus Premium 10 pipes			
2 × 50	F/W	**PROMASTOP®-FC6** limits: Ø 110 mm, s 3,9 mm → Ø 125 mm, s 4,8 mm → Ø 160 mm, s 5,6 mm → Ø 200 mm, s 6,9 mm → Ø 250 mm, s 8,5 mm	EI 90-U/U
Pipelife MASTER 3 pipes			
2 × 50	F/W	**PROMASTOP®-FC3** limits: Ø 32 mm, s 1,8 mm → Ø 40 mm, s 1,8 mm → Ø 50 mm, s 1,8 mm → Ø 75 mm, s 2,1 mm → Ø 110 mm, s 3,0 mm → Ø 125 mm, s 3,5 mm **PROMASTOP®-FC6** limits: Ø 50 mm, s 1,8 mm → Ø 75 mm, s 2,1 mm → Ø 110 mm, s 3,0 mm → Ø 125 mm, s 3,5 mm → Ø 160 mm, s 4,4 mm	EI 90-U/U
Geberit Silent-db20 pipes			
2 × 50	F/W	**PROMASTOP®-FC3** limits: Ø 56 mm, s 3,2 mm → Ø 63 mm, s 3,2 mm → Ø 75 mm, s 3,6 mm → Ø 90 mm, s 5,5 mm → Ø 110 mm, s 6,0 mm **PROMASTOP®-FC6** limits: Ø 50 mm, s 3,2 mm → Ø 63 mm, s 3,2 mm → Ø 75 mm, s 3,6 mm → Ø 90 mm, s 5,5 mm → Ø 110 mm, s 6,0 mm → Ø 135 mm, s 6,0 mm → Ø 160 mm, s 7,0 mm couplings tested up to Ø 135 mm	EI 90-U/U
Geberit Silent-PP pipes			
2 × 50	F/W	**PROMASTOP®-FC3** limits: Ø 32 mm, s 2,0 mm → Ø 40 mm, s 2,0 mm → Ø 50 mm, s 2,0 mm → Ø 75 mm, s 2,6 mm → Ø 90 mm, s 3,1 mm → Ø 110 mm, s 3,6 mm → Ø 125 mm, s 4,2 mm **PROMASTOP®-FC6** limits: Ø 32 mm, s 2,0 mm → Ø 40 mm, s 2,0 mm → Ø 50 mm, s 2,0 mm → Ø 75 mm, s 2,6 mm → Ø 90 mm, s 3,1 mm → Ø 110 mm, s 3,6 mm → Ø 125 mm, s 4,2 mm → Ø 160 mm, s 5,2 mm	EI 90-U/U

Soft penetration seal [mm]	Orientation F: floor W: wall	Dimension range Ø: outer pipe diameter [mm] s: pipe wall thickness [mm]	Classification
REHAU RAUPIANO PLUS pipes			
2 × 50	F/W	**PROMASTOP®-FC6** limits: Ø 40 mm, s 1,8 mm → Ø 50 mm, s 1,8 mm → Ø 125 mm, s 3,1 mm → Ø 160 mm, s 3,9 mm → Ø 200 mm, s 6,2 mm couplings tested up to Ø 125 mm	EI 90-U/U
Nicoll dBlue plus pipes			
2 × 50	F/W	**PROMASTOP®-FC3** limits: Ø 50 mm, s 1,8 mm → Ø 125 mm, s 3,9 mm	EI 90-U/U
Girpi Friaphon pipes			
2 × 50	F/W	**PROMASTOP®-FC3** limits: Ø 52 mm, s 2,8 mm → Ø 78 mm, s 4,9 mm → Ø 110 mm, s 5,3 mm **PROMASTOP®-FC6** limits: Ø 52 mm, s 2,8 mm → Ø 78 mm, s 4,9 mm → Ø 110 mm, s 5,3 mm → Ø 135 mm, s 5,6 mm → Ø 160 mm, s 6,3 mm	EI 90-U/U
Girpi HTA-E pipes			
2 × 50	F/W	**PROMASTOP®-FC6** limits: Ø 40 mm, s 3,0 mm → Ø 50 mm, s 3,7 mm → Ø 63 mm, s 4,7 mm → Ø 75 mm, s 5,5 mm → Ø 90 mm, s 6,6 mm → Ø 110 mm, s 5,3 mm → Ø 125 mm, s 6,0 mm	EI 90-U/U
KE KELIT Phonex AS pipes			
2 × 50	F/W	**PROMASTOP®-FC6** limits: Ø 58 mm, s 4,0 mm → Ø 78 mm, s 4,5 mm → Ø 110 mm, s 5,3 mm → Ø 135 mm, s 5,3 mm → Ø 160 mm, s 5,3 mm	EI 90-U/U
Wavin AS pipes			
2 × 50	F/W	**PROMASTOP®-FC6** limits: Ø 58 mm, s 4,0 mm → Ø 78 mm, s 4,5 mm → Ø 110 mm, s 5,3 mm → Ø 135 mm, s 5,3 mm → Ø 160 mm, s 5,3 mm	EI 90-U/U
Wavin SiTech+ pipes			
2 × 50	F/W	**PROMASTOP®-FC6** limits: Ø 50 mm, s 1,8 mm → Ø 125 mm, s 3,9 mm → Ø 160 mm, s 4,9 mm	EI 90-U/U
Marley Silent pipes			
2 × 50	F/W	**PROMASTOP®-FC6** limits: Ø 75 mm, s 2,0 mm → Ø 110 mm, s 3,0 mm	EI 90-U/U

9. PROMASTOP®-I plastic pipe penetration seal in combination with PROMASTOP®-FC MD



Detail X – Plastic pipe penetration seal in rigid floor

Detail X
PROMASTOP®-FC MD collar in 2 x 50 mm PROMASTOP®-I coated batt seal. The collar shall be installed below the floor (thickness min. 150 mm).

Supporting distance
The pipes must be suspended/supported at a distance of ≤ 335 mm from the top of the floor.

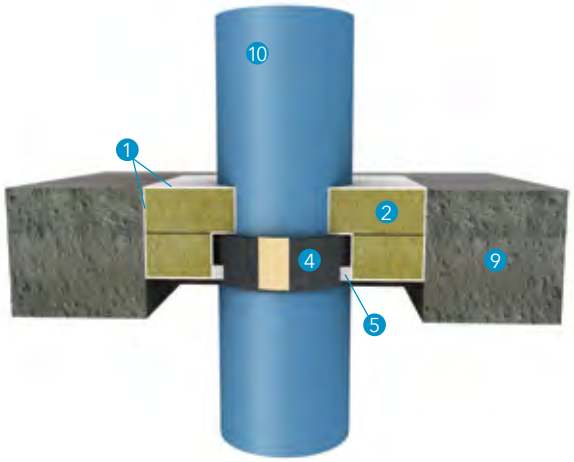
Filling of annular space
Stone wool backfilling and covering with PROMASTOP®-I fire stopping coating.

Sound decoupling strips
Sound decoupling strips based on PE-foam (class E according to EN 13501-1 or higher rated) with a max. thickness of 4 mm may be used.

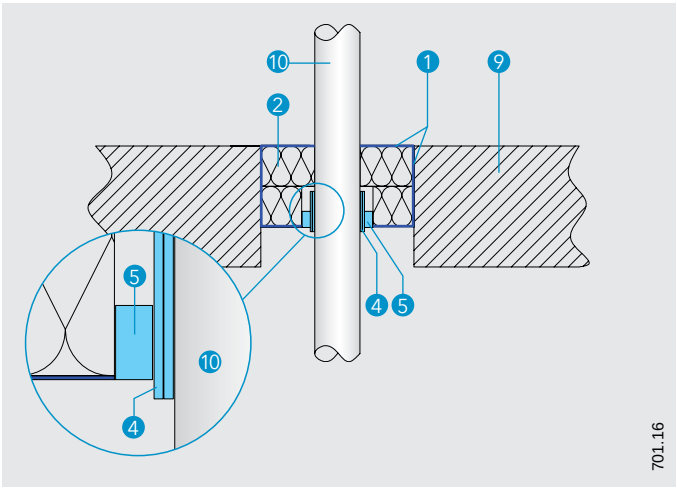
Table 16 – Overview of pipe materials, dimensions, installation situations and classifications

Soft penetration seal [mm]	Orientation F: floor W: wall	Dimension range Ø: outer pipe diameter [mm] s: pipe wall thickness [mm]	Classification
PE-HD, ABS, SAN + PVC pipes			
2 × 50	F	lower limits: Ø 40 mm, s 2,4 mm → Ø 110 mm, s 2,7 mm → Ø 125 mm, s 3,1 mm upper limits: Ø 40 mm, s 7,4 mm → Ø 125 mm, s 7,4 mm	collar fixed with spiral screws made of steel ≥ 8 x 100 mm or with threaded rods ≥ M6 with nuts and washers: EI 90-U/U
PP-H and PP-R pipes			
2 × 50	F	lower limits: Ø 40 mm, s 1,8 mm → Ø 110 mm, s 2,7 mm → Ø 125 mm, s 3,1 mm upper limits: Ø 40 mm, s 7,1 mm → Ø 125 mm, s 7,1 mm	collar fixed with spiral screws made of steel ≥ 8 x 100 mm or with threaded rods ≥ M6 with nuts and washers: EI 90-U/U
PVC-U and PVC-C pipes			
2 × 50	F	lower limits: Ø 40 mm, s 1,8 mm → Ø 110 mm, s 2,7 mm → Ø 125 mm, s 3,1 mm upper limits: Ø 40 mm, s 7,1 mm → Ø 125 mm, s 7,1 mm	collar fixed with spiral screws made of steel ≥ 8 x 100 mm or with threaded rods ≥ M6 with nuts and washers: EI 90-U/U

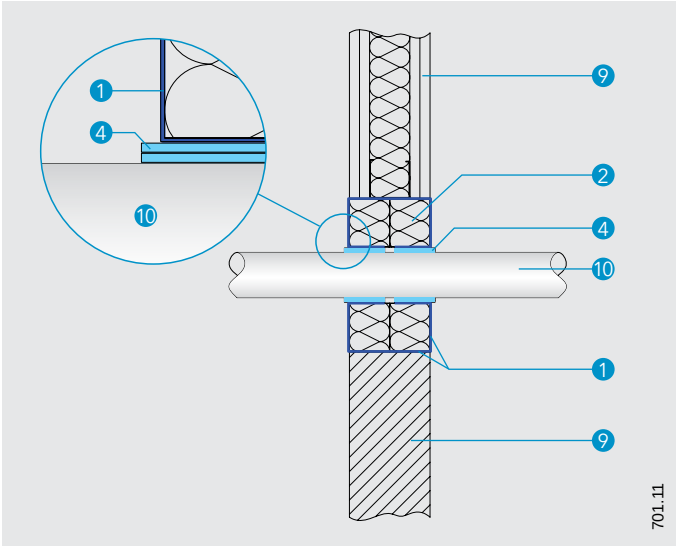
10. PROMASTOP®-I plastic pipe penetration seal in combination with PROMASTOP®-W



Detail Y – Plastic pipe penetration seal in rigid floor



Detail Z – Plastic pipe penetration seal in rigid floor



Detail AA – Plastic pipe penetration seal in flexible and rigid wall

Detail Y, Z and AA

PROMASTOP®-W fire stopping wrap is used as a pipe closure device in mineral wool penetration seal PROMASTOP®-I. The amount of layers of the PROMASTOP®-W depends on the installation, the pipe end configuration and the diameter of the pipe or insulation.
In wall applications, fire stopping wrap shall be installed on both sides of the soft seal; in floor applications only on the underside. PROMASTOP®-W shall be installed flush with the penetration seal or wall/floor surface, maximum ≤ 5 mm in front of the penetration seal. For fixing PROMASTOP®-W in the mineral wool penetration seal use PROMASTOP®-I, PROMASEAL®-A or PROMASEAL®-AG between the cutted edge and the fire stopping wrap.

The pipes must be suspended/supported ≤ 250 mm on both sides of walls or from the top of the floor.

Sloped pipes or couplings were not tested with PROMASTOP®-W.

The classifications for PVC-U pipes are applicable for pipes in acc. with EN 1452-1, DIN 8061, DIN 8062, EN 1329-1, EN 1453-1 and PVC-C pipes in acc. with EN 1566-1.
The classifications for PE pipes are applicable for pipes in acc. with EN 12201-2, EN 1519-1, EN 12666-1, DIN 8074, DIN 8075 and ABS-pipes in acc. with EN 1455-1 and SAN + PVC-pipes in acc. with EN 1565-1.
The classifications for PP-H and PP-R pipes are applicable for pipes in acc. e.g. to DIN 8077, DIN 8078 or equal products.
The classifications for all stated multilayer pipes are applicable on equal products.

Annular gap sealing

For soft penetration seals, the annular gap can be sealed as follows:

- With PROMASTOP®-CC or PROMASTOP®-I, if the width of the annular gap is ≤ 5 mm
- With mineral wool (Class A1 acc. to EN 13501-1, melting point ≥ 1000 °C) covered on both sides with ≥ 10 mm PROMASEAL®-A fire stopping sealant if the width of the annular gap is ≤ 10 mm
- With mineral wool (Class A1 acc. to EN 13501-1, melting point ≥ 1000 °C) covered on both sides with ≥ 10 mm PROMASEAL®-AG fire stopping sealant if the width of the annular gap is ≤ 20 mm

See the required distances between objects on page 93.

10.1 Plastic pipes without insulation

Pype types

The listed pipe types are tested according the requirements of EN 1366-3 and EN 13882-3 and given by the rules of the direct and the extended fields of application:

- PE-HD pipes according to EN 12201-2, EN 1519-1, EN 12666-1, DIN 8074, DIN 8075
- ABS pipes according to EN 1455-1
- SAN + PVC pipes according to EN 1565-1
- PP-H and PP-R pipes according to ÖNORM B 5174-1, DIN 8077, DIN 8078
- KE KELIT KETRIX
- PE-X pipes according to EN ISO 15875 (for example: REHAU RAUTITAN flex, Viega Sanfix Fosta PE-X, Uponor Radi Pipe, Uponor Aqua Pipe)

Table 17 – Overview of pipe materials, dimensions, installation situations and classifications

Soft penetration seal [mm]	Orientation F: floor W: wall	Dimension range Ø: outer pipe diameter [mm] s: pipe wall thickness [mm]	Number of layers Ø: outer pipe diameter [mm] L: number of wrap layers	Classification
PE-HD, ABS, SAN + PVC pipes				
2 × 50	F/W	lower limits: Ø 32 mm, s 2,0 mm → Ø 110 mm, s 2,7 mm → Ø 160 mm, s 4,0 mm upper limits: Ø 32 mm, s 4,4 mm → Ø 63 mm, s 5,8 mm → Ø 160 mm, s 14,6 mm	Ø 32 - 63 mm → L 1 Ø 64 - 110 mm → L 2 Ø 111 - 125 mm → L 3 Ø 126 - 160 mm → L 4	EI 120-U/C
2 × 50	F	limits: Ø 32 mm, s 3,0 mm	Ø 32 mm → L 1	EI 90-U/U
PP-H and PP-R pipes				
2 × 50	W	lower limits: Ø 20 mm, s 2,8 mm → Ø 32 mm, s 1,8 mm → Ø 110 mm, s 2,7 mm → Ø 160 mm, s 4,0 mm upper limits: Ø 20 mm, s 3,4 mm → Ø 110 mm, s 18,3 mm → Ø 125 mm, s 11,4 mm → Ø 160 mm, s 14,6 mm	Ø 20 - 63 mm → L 1 Ø 64 - 110 mm → L 2 Ø 111 - 125 mm → L 3 Ø 126 - 160 mm → L 4	EI 60-U/C
2 × 50	W	lower limits: Ø 20 mm, s 2,8 mm → Ø 32 mm, s 1,8 mm → Ø 110 mm, s 2,7 mm → Ø 160 mm, s 4,0 mm upper limits: Ø 20 mm, s 3,4 mm → Ø 63 mm, s 10,5 mm → Ø 110 mm, s 10,0 mm → Ø 160 mm, s 14,6 mm		EI 90-U/C
2 × 50	W	lower limits: Ø 32 mm, s 1,8 mm → Ø 110 mm, s 2,7 mm → Ø 160 mm, s 4,0 mm upper limits: Ø 32 mm, s 5,4 mm → Ø 110 mm, s 10,0 mm → Ø 160 mm, s 14,6 mm		EI 120-U/C
2 × 50	F	lower limits: Ø 20 mm, s 2,8 mm → Ø 32 mm, s 1,8 mm → Ø 110 mm, s 2,7 mm → Ø 160 mm, s 4,0 mm upper limits: Ø 20 mm, s 2,8 mm → Ø 63 mm, s 8,6 mm → Ø 110 mm, s 10,0 mm → Ø 160 mm, s 14,6 mm		EI 120-U/C
PVC-U pipes				
2 × 50	F/W	lower limits: Ø 32 mm, s 1,8 mm → Ø 63 mm, s 1,8 mm → Ø 110 mm, s 2,0 mm → Ø 160 mm, s 4,0 mm upper limits: Ø 32 mm, s 3,0 mm → Ø 63 mm, s 4,6 mm → Ø 110 mm, s 8,1 mm → Ø 160 mm, s 11,8 mm	Ø 32 - 63 mm → L 1 Ø 75 - 110 mm → L 2 Ø 111 - 125 mm → L 3 Ø 140 -160 mm → L 4	EI 120-U/C
POLOPLAST POLO-KAL NG pipes				
2 × 50	W	limits: Ø 32 mm, s 1,8 mm → Ø 40 mm, s 1,8 mm → Ø 50 mm, s 2,0 mm → Ø 75 mm, s 2,6 mm → Ø 110 mm, s 3,4 mm → Ø 125 mm, s 3,9 mm → Ø 160 mm, s 4,9 mm	Ø 32 - 63 mm → L 3 Ø 75 - 90 mm → L 4 Ø 110 -125 mm → L 5 Ø 140 -160 mm → L 6	EI 90-U/U
2 × 50	F	limits: Ø 32 - 40 mm, s 1,8 mm → Ø 50 mm, s 2,0 mm → Ø 75 mm, s 2,6 mm → Ø 110 mm, s 3,4 mm → Ø 125 mm, s 3,9 mm		

Soft penetration seal [mm]	Orientation F: floor W: wall	Dimension range Ø: outer pipe diameter [mm] s: pipe wall thickness [mm]	Number of layers Ø: outer pipe diameter [mm] L: number of wrap layers	Classification
POLOPLAST POLO-KAL XS pipes				
2 × 50	F/W	limits: Ø 32 - 40 mm, s 1,8 mm → Ø 50 mm, s 2,0 mm → Ø 75 mm, s 2,6 mm → Ø 110 mm, s 3,4 mm → Ø 125 mm, s 3,9 mm → Ø 160 mm, s 4,9 mm	Ø 32 - 63 mm → L 3 Ø 75 - 90 mm → L 4 Ø 110 -125 mm → L 5 Ø 140 -160 mm → L 6	EI 90-U/U
POLOPLAST POLO-KAL 3S pipes				
2 × 50	W	limits: Ø 75 mm, s 3,8 mm → Ø 110 mm, s 4,8 mm → Ø 125 mm, s 5,3 mm → Ø 160 mm, s 7,5 mm	Ø 75 - 90 mm → L 4 Ø 110 -125 mm → L 5 Ø 140 -160 mm → L 6	EI 90-U/U
2 × 50	F	limits: Ø 75 mm, s 3,8 mm → Ø 110 mm, s 4,8 mm → Ø 125 mm, s 5,3 mm		
Geberit Silent-db20 pipes				
2 × 50	W	limits: Ø 56 - 63 mm, s 3,2 mm → Ø 75 mm, s 3,6 mm → Ø 90 mm, s 5,5 mm → Ø 110 - 135 mm, s 6,0 mm → Ø 160 mm, s 7,0 mm	Ø 56 - 63 mm → L 3 Ø 75 - 90 mm → L 4 Ø 110 - 125 mm → L 5 Ø 140 - 160 mm → L 6	EI 90-U/U
2 × 50	F	limits: Ø 56 - 63 mm, s 3,2 mm → Ø 75 mm, s 3,6 mm → Ø 90 mm, s 5,5 mm → Ø 110 mm, s 6,0 mm		
KE KELIT KETRIX pipes				
2 × 50	F/W	lower limits: Ø 20 mm, s 2,8 mm → Ø 32 mm, s 2,9 mm → Ø 63 mm, s 5,8 mm → Ø 110 mm, s 10,0 mm → Ø 160 mm, s 14,6 mm upper limits: Ø 20 mm, s 2,8 mm → Ø 32 mm, s 4,4 mm → Ø 63 mm, s 8,6 mm → Ø 125 mm, s 17,1 mm → Ø 160 mm, s 14,6 mm	Ø 20 - 63 mm → L 1 Ø 64 - 110 mm → L 2 Ø 111 - 125 mm → L 3 Ø 126 - 160 mm → L 4	EI 90-U/C
PE-X pipes				
2 × 50	F/W	limits: Ø 16 mm, s 2,2 mm → Ø 40 mm, s 5,5 mm → Ø 63 mm, s 8,6 mm	Ø 16 - 63 mm → L 1	EI 90-U/C

10.2 Plastic pipes with combustible insulation

Pype types

The listed pipe types are tested according the requirements of EN 1366-3 and EN 13882-3 and given by the rules of the direct and the extended fields of application.

- PP-H and PP-R pipes according to ÖNORM B 5174-1, DIN 8077, DIN 8078
- KE KELIT KETRIX
- PE-X pipes according to EN ISO 15875, DIN 16892, DIN 16893 (for example: REHAU RAUTITAN flex, REHAU RAUTHERM-FW, Viega Sanfix Fosta PE-X, Uponor Radi Pipe, Uponor Aqua Pipe)

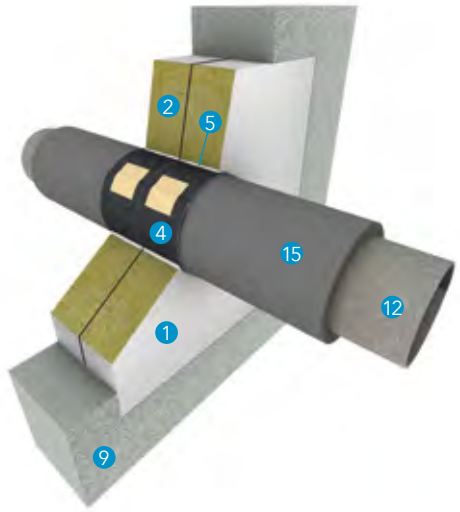
Combustible insulations

In flexible walls, rigid walls, shaft walls and soft penetration seals every type of combustible insulation of class E or B-s3, d0 (acc. to EN 13501-1, for example foam, e.g. PE or elastomeric foam, e.g. Neopren, respectively), with a maximum thickness of 32 mm may be used. The thresholds for pipe diameter and insulation thickness are shown in the tables below.

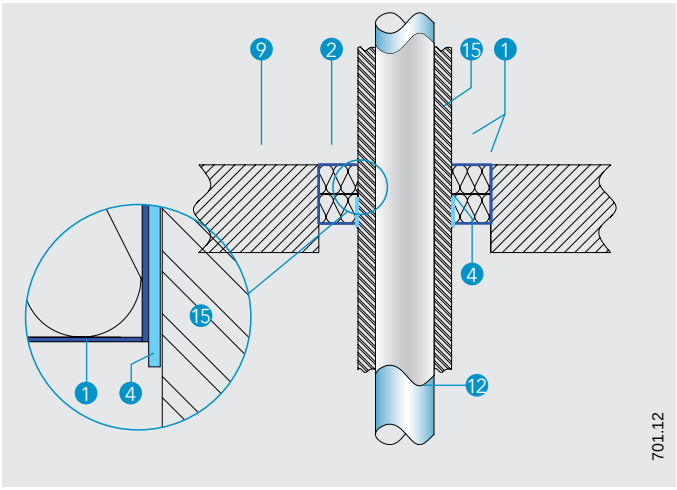
Table 18 – Overview of pipe materials, dimensions, installation situations and classifications

Soft penetration seal [mm]	Orientation F: floor W: wall	Dimension range Ø: outer pipe diameter [mm] d: insulation thickness [mm]	Number of layers Ø: outer diameter incl. insulation [mm] L: number of wrap layers	Classification
PP-H and PP-R pipes				
2 × 50	F/W	Ø 20 - 110 mm, d 6 - 32 mm	Ø 20 - 63 mm → L 1 Ø 64 - 110 mm → L 2 Ø 111 - 125 mm → L 3 Ø 126 - 160 mm → L 4 Ø 161 - 180 mm → L 6	EI 90-U/C with combustible insulation B-s3, d0
2 × 50	W	Ø 20 - 32 mm, d 4 - 13 mm	Ø 20 – 63 mm → L 1	EI 90-U/C with combustible insulation E
2 × 50	F	Ø 20 - 32 mm, d 4 - 13 mm		EI 120-U/C with combustible insulation E
KE KELIT KETRIX pipes				
2 × 50	W	Ø 20 - 160 mm, d 6 - 32 mm	Ø 20 - 63 mm → L 1 Ø 64 - 110 mm → L 2 Ø 111 - 125 mm → L 3 Ø 126 - 160 mm → L 4 Ø 161 - 180 mm → L 6 Ø 181 - 200 mm → L 7 Ø 201 -225 mm → L 8	EI 90-U/C with combustible insulation B-s3, d0
2 × 50	F	Ø 20 - 160 mm, d 6 - 32 mm		EI 120-U/C with combustible insulation B-s3, d0
PE-X pipes				
2 × 50	W	Ø 16 - 63 mm, d 6 - 32 mm	Ø 20 - 63 mm → L 1 Ø 64 - 110 mm → L 2 Ø 111 - 125 mm → L 3 Ø 126 - 160 mm → L 4	EI 120-U/C with combustible insulation B-s3, d0
2 × 50	F	Ø 16 - 63 mm, d 6 - 32 mm		EI 90-U/C with combustible insulation B-s3, d0
2 × 50	F/W	Ø 16 - 25 mm, d 4 - 13 mm	Ø 16 – 63 mm → L 1	EI 120-U/C with combustible insulation E

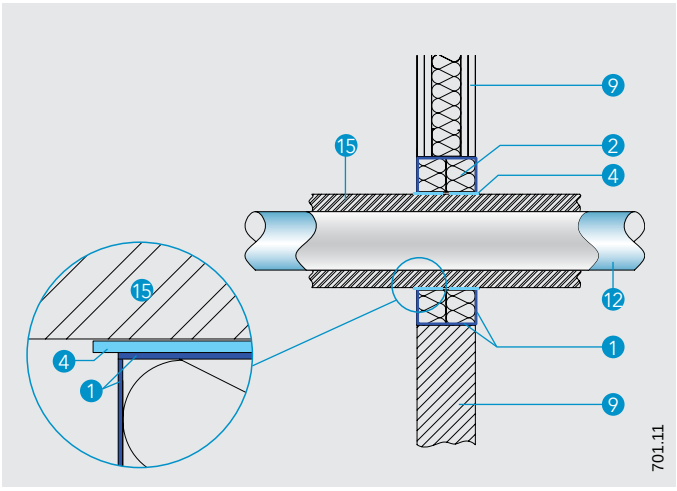
11. PROMASTOP®-I penetration seal in combination with PROMASTOP®-W for stainless steel and MLC (multi-layered pipes including metal layer(s)) pipes with combustible insulation



Detail AB – MLC pipe penetration seal in rigid wall



Detail AC – MLC pipe penetration seal in rigid floor



Detail AD – MLC pipe penetration seal in flexible and rigid wall

Details AB, AC and AD

In wall and floor applications, fire stopping wraps shall be installed on both sides in the soft penetration seal. For Pipelife Radopress pipes used in floor applications, attachment to the underside is sufficient. The fire stopping wrap PROMASTOP®-W may protrude max. 5 mm from the soft penetration seal surface and must not be coated. PROMASTOP®-I, PROMASEAL®-A or PROMASEAL®-AG can be used for fixing in the soft penetration seal.

MLC pipes with combustible insulation (thickness 6 mm to 32 mm, Class B-s3, d0 or higher rated acc. to EN 13501-1, e.g. rubber, Neopren or thickness 4 mm to 13 mm, Class E acc. to EN 13501-1, e.g. PE) can be sealed in combination with fire stopping wrap PROMASTOP®-W. The combustible insulation is centred in the soft penetration seal and must have a minimum total length of 500 mm. The configuration of this insulation is LS or CS for insulations of Class B-s3, d0, CS for insulations of Class E.

The pipes must be suspended/supported ≤ 250 mm on both sides of walls or from the top of the floor.

Pype types

The listed pipe types are tested according the requirements of EN 1366-3 and EN 13882-3 and given by the rules of the direct and the extended fields of application:

- Geberit Mepla, Geberit PushFit, Viega Sanfix Fosta, Viega Raxofix, Viega Raxinox, Uponor UNI pipe, Uponor MLC pipe, Roth Alu-Laserplus, Uponor MPC pipe red, Uponor MPC pipe white, REHAU RAUTITAN stabil, KE KELIT KELOX, KE KELIT KETRIX TRI01, KE KELIT HIT K06, Pipelife Radopress.

Combustible insulations

In flexible walls, rigid walls, shaft walls and soft penetration seals every type of combustible insulation of class E or B-s3, d0 (acc. to EN 13501-1), with a maximum thickness of 32 mm may be used. The thresholds for pipe diameter and insulation thickness are shown in the tables below.

Table 19 – Overview of pipe materials, dimensions, installation situations and classifications

Soft penetration seal [mm]	Orientation F: floor W: wall	Dimension range Ø: outer pipe diameter [mm] s: pipe wall thickness [mm] d: insulation thickness [mm]	Number of wrap layers	Classification
Geberit Mepla pipes				
2 × 50	F/W	Ø 16 - 75 mm, d 6 - 32 mm	1	EI 90-U/C with combustible insulation B-s3, d0
2 × 50	W	Ø 16 - 75 mm, d 4 - 13 mm	1	EI 90-U/C with combustible insulation E
2 × 50	F	Ø 16 - 75 mm, d 4 - 13 mm	1	EI 120-U/C with combustible insulation E
Geberit PushFit pipes				
2 × 50	F/W	Ø 16 - 25 mm, d 6 - 32 mm	1	EI 120-U/C with combustible insulation B-s3, d0
Pipelife Radopress pipes				
2 × 50	F/W	Ø 16 - 63 mm, d 6 - 32 mm	1	EI 120-U/C with combustible insulation B-s3, d0
2 × 50	F/W	Ø 16 - 32 mm, d 4 - 9 mm	1	EI 120-U/C with combustible insulation E
REHAU RAUTITAN stabil pipes				
2 × 50	W	Ø 16 - 40 mm, s 2,6 - 6,0 mm, d 6 - 32 mm	1	EI 120-U/C with combustible insulation B-s3, d0
2 × 50	F	Ø 16 - 40 mm, d 6 - 32 mm	1	EI 90-U/C with combustible insulation B-s3, d0
2 × 50	F/W	Ø 16 - 25 mm, d 4 - 13 mm	1	EI 90-U/C with combustible insulation E
Viega Raxofix pipes				
2 × 50	W	Ø 16 - 63 mm, d 6 - 32 mm	1	EI 120-U/C with combustible insulation B-s3, d0
2 × 50	F	Ø 20 - 65 mm, s 2,8 - 4,0 mm, d 6 - 32 mm	1	EI 90-U/C with combustible insulation B-s3, d0
Viega Sanfix Fosta pipes				
2 × 50	W	Ø 16 - 63 mm, d 6 - 32 mm	1	EI 120-U/C with combustible insulation B-s3, d0
2 × 50	F	Ø 20 - 50 mm, d 6 - 32 mm	1	EI 90-U/C with combustible insulation B-s3, d0
2 × 50	F	Ø 16 - 20 mm, s 2,2 - 2,8 mm, d 6 mm	1	EI 90-U/C with combustible insulation B-s3, d0 (6 mm, LS configuration 500 mm)
2 × 50	F	Ø 16 - 20 mm, s 2,2 - 2,8 mm, d 32 mm	1	EI 60-U/C with combustible insulation B-s3, d0 (32 mm, LS configuration 500 mm)
Viega Raxinox pipes				
2 × 50	F	Ø 16 - 20 mm, s 2,2 - 2,8 mm, d 9 - 25 mm (CS configuration)	1	EI 120-U/C with combustible insulation E (9 - 25 mm), except next line
2 × 50	F	Ø 20 mm, s 2,8 mm, d 25 mm (CS configuration)	1	E 120 EI 90-U/C with combustible insulation E (25 mm)
Viega Raxinox pipes with protective tube PE (Ø 20 - 28 mm, s 2,0 mm)				
2 × 50	F	Ø 16 mm, s 2,2 mm → Ø 20 mm, s 2,8 mm	1	EI 120-U/C with protective tube PE (Ø 20 - 28 mm, s 2,0 mm)

Soft penetration seal [mm]	Orientation F: floor W: wall	Dimension range Ø: outer pipe diameter [mm] s: pipe wall thickness [mm] d: insulation thickness [mm]	Number of wrap layers	Classification
Uponor MLC pipes				
2 × 50	F/W	lower limits: Ø 14 - 40 mm, d 6 mm → Ø 75 mm, d 9 mm upper limits: Ø 14 - 75 mm, d 32 mm	1	EI 90-U/C with combustible insulation B-s3, d0
2 × 50	F/W	Ø 76 - 110 mm, d 6 - 32 mm with additional insulation A2 (LS configuration, 200 mm on both sides)	1	EI 90-U/C with combustible insulation B-s3, d0 plus additional insulation A2
2 × 50	W	lower limits: Ø 14 - 20 mm, s 2,0 - 42,5 mm, d 4 mm → Ø 25 mm, s 2,0 - 42,5 mm, d 9 mm upper limits: Ø 14 - 25 mm, s 2,0 - 42,5 mm, d 13 mm	1	EI 90-U/C with combustible insulation E
2 × 50	F	lower limits: Ø 16 - 20 mm, d 4 mm → Ø 25 mm, d 9 mm upper limits: Ø 16 - 25 mm, d 13 mm	1	EI 90-U/C with combustible insulation E
2 × 50	F	Ø 14 mm, s 1,6 mm, d 6 - 32 mm (CS configuration)	1	EI 90-U/C with combustible insulation B-s3, d0
2 × 50	F	Ø 40 mm, s 4,0 mm, d 6 - 32 mm (CS configuration)	1	EI 90-U/C with combustible insulation B-s3, d0
Uponor UNI pipes				
2 × 50	F/W	Ø 16 - 32 mm, d 6 - 32 mm	1	EI 90-U/C with combustible insulation B-s3, d0
2 × 50	W	Ø 16 - 25 mm, s 2,0 - 2,5 mm, d 4 - 10 mm	1	EI 90-U/C with combustible insulation E
2 × 50	F	Ø 16 - 25 mm, d 4 - 10 mm	1	EI 120-U/C with combustible insulation E
KE KELIT KELOX pipes				
2 × 50	F/W	lower limits: Ø 14 - 40 mm, d 6 mm → Ø 75 mm, d 9 mm upper limits: Ø 14 - 75 mm, d 32 mm	1	EI 90-U/C with combustible insulation B-s3, d0
2 × 50	W	Ø 14 - 32 mm, s 2,0 - 3,0 mm, d 4 - 13 mm	1	EI 90-U/C with combustible insulation E
2 × 50	F	Ø 14 - 32 mm, d 4 - 13 mm	1	EI 120-U/C with combustible insulation E
KE KELIT HIT K06 pipes				
2 × 50	W	lower limits: Ø 20 - 90 mm, d 6 mm upper limits: Ø 20 - 63 mm, d 32 mm	1	EI 90-U/C with combustible insulation B-s3, d0
		lower limit: Ø 90 mm, d 6 mm upper limits: Ø 63 - 90 mm, d 32 mm	2	
2 × 50	F	Ø 20 - 90 mm, d 6 - 32 mm	1	EI 90-U/C with combustible insulation B-s3, d0
KE KELIT KETRIX TRI01 pipes				
2 × 50	W	lower limits: Ø 20 - 90 mm, d 6 mm upper limits: Ø 20 - 63 mm, d 32 mm	1	EI 90-U/C with combustible insulation B-s3, d0
		lower limit: Ø 90 mm, d 6 mm upper limits: Ø 63 - 90 mm, d 32 mm	2	
2 × 50	F	Ø 20 - 90 mm, d 6 - 32 mm	1	EI 120-U/C with combustible insulation B-s3, d0

12. PROMASTOP®-I penetration seal for MLC pipes (multi-layered pipes including metal layer(s)) with non-combustible insulation

Table 20 – Classification of MLC pipes Geberit Mepla

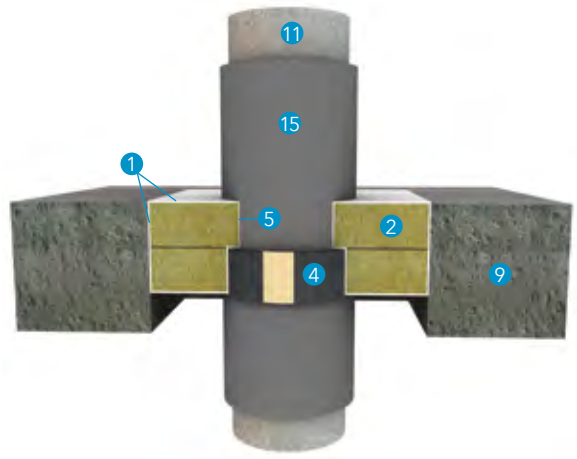
Soft penetration seal [mm]	Orientation W: wall	Dimension range Ø: outer pipe diameter [mm]	Classification
Geberit Mepla pipes			
2 × 50	W	Ø 17 - 75 mm	EI 90-U/C

Table 20

MLC pipes of type Geberit Mepla with non-combustible insulations as pipe shells (thickness ≥ 30 mm, density ≥ 100 kg/m³, Class $A2_L$ or higher rated acc. to EN 13501-1) can be sealed in the PROMASTOP®-I penetration seal.

The non-combustible insulation is centred in the soft penetration seal and must have a minimum length of 500 mm. The configuration of this insulation is LS for insulations of Class $A2_L$.

13. PROMASTOP®-I penetration seal in combination with PROMASTOP®-W for non-combustible pipes with combustible insulation



Detail AE – Non-combustible pipes with combustible local insulation

Detail AE

E195 grade (1.0034) or better non-alloy steel (according to EN 10305; for example: Geberit Mapress, KE KELIT Steelfix) and copper pipes according to EN 1057 (and their substitutes) with combustible insulation (Class B-s3, d0 or higher rated acc. to EN 13501-1, e.g. rubber, elastomeric foam, e.g. Neopren, thickness 6 to 32 mm, LS or CS configuration) can be sealed in combination with fire stopping wrap PROMASTOP®-W. The thresholds for pipe diameter and insulation thickness are shown in the tables.

In wall applications, fire stopping wraps shall be applied on both sides in the soft penetration seal; in floor applications only on the underside. PROMASTOP®-W shall be installed flush with the penetration seal surface, maximum 5 mm in front of the penetration seal. For fixing PROMASTOP®-W in the mineral wool penetration seals use PROMASTOP®-I, PROMASEAL®-A or PROMASEAL®-AG between the cutting edge and the fire stopping wrap. Annular gap width ≤ 10 mm, depth ≥ 10 mm. The end faces of PROMASTOP®-W must not be painted.

For backfilling gaps between the mineral wool boards and PROMASTOP®-W use mineral wool (melting point ≥ 1000 °C and Class A1 in accordance with EN 13501-1).

The pipes must be suspended/supported ≤ 250 mm on both sides of walls or from the top of the floor.

13.1. Carbon (non-alloy) steel pipes

Table 21

The results can also be applied to metal pipes with a lower heat conductivity λ ≤ 58 W/mK and a melting point ≥ 1100 °C (e.g. stainless steel, cast iron, Ni alloys /NiCr, NiMo and NiCu alloys/ and Ni).

Table 21 – Classification of steel pipes

Steel pipes with combustible insulation and PROMASTOP®-W Ø: outer pipe diameter s: pipe wall thickness d: insulation thickness L: number of layers	PROMASTOP®-I 2 × 50 mm	
	Wall	Floor
Ø 15 - 42 mm, d 9 - 32 mm Ø 50 mm, s 2,0 - 14,2 mm → Ø 220 mm, s 10,0 - 14,2 mm, d 6 - 32 mm (LS or CS configuration) L1	EI 90-U/C	EI 90-U/C

13.2. Copper pipes

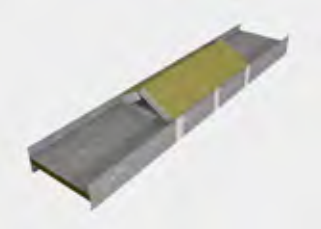
Table 22

Results of copper pipes are valid for steel pipes and their substitutes, but not vice versa, and for other metal pipes with λ ≤ 380 W/mK and a melting point of ≥ 1083 °C.

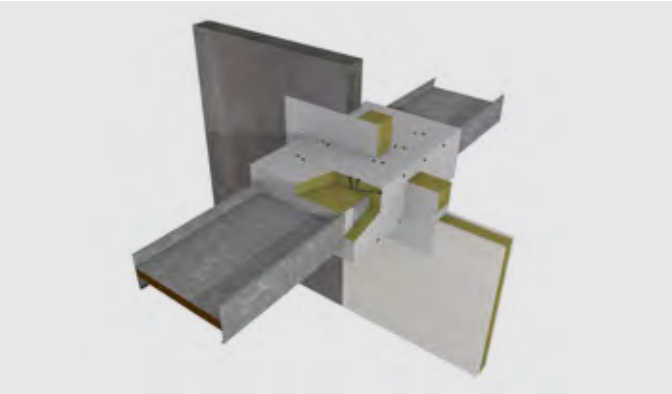
Table 22 – Classification of copper pipes

Copper pipes with combustible insulation and PROMASTOP®-W Ø: outer pipe diameter s: pipe wall thickness d: insulation thickness L: number of layers	PROMASTOP®-I 2 × 50 mm	
	Wall	Floor
Ø 15 - 42 mm, s 2,0 - 14,2 mm, d 6 - 32 mm Ø 88,9 mm, s 2,0 - 14,2 mm, d 6 - 32 mm L1	EI 90-U/C	EI 90-U/C

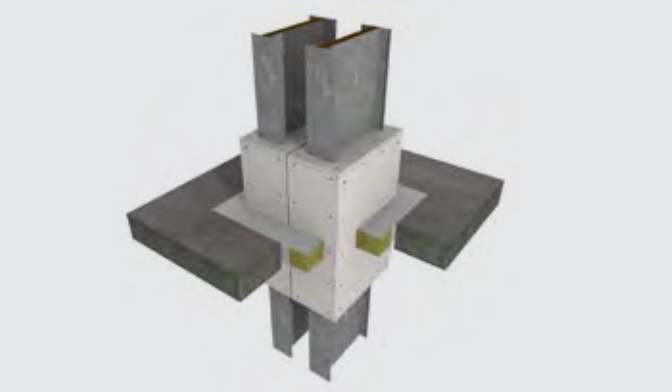
14. PROMASTOP®-I penetration seal for Canalis® KTA busbar systems

Detail AF - Construction of the penetration seal



Detail AG – Lining of a busbar system



Detail AH – Single lining of the busbar systems with zero distance with PROMATECT®-H in the soft penetration seal

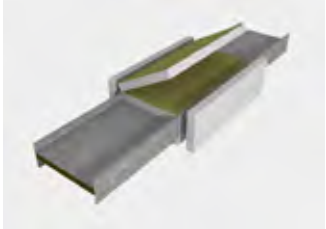
PROMASTOP®-I serves to seal Canalis® KTA busbar rails in horizontal and vertical orientation in lightweight and rigid constructions.

The components (supporting constructions) must be classified acc. to EN 13501-2 for the required fire resistance period. The classification exclusively applies to busbar systems of type Canalis® KTA 800 A to 4000 A.

Supporting distance
The busbar systems must be suspended/supported ≤ 750 mm on both sides of the walls or from the top of the floor.

Rigid floor
The floor must have a thickness of ≥ 150 mm and a density of ≥ 450 kg/m³.

Rigid wall
The wall must have a thickness of ≥ 100 mm and a density of ≥ 450 kg/m³.




Flexible wall
The wall must have a thickness of ≥ 100 mm and be made from timber or metal studs which are lined on both sides with a minimum of two layers of 12,5 mm thick fire protective boards (other board thicknesses shall be permissible, please note minimum thickness). A separate aperture lining is not necessary, the penetration seal can be installed directly on the metal studs in the flexible wall. For timber stud walls, a minimum distance of 100 mm must be kept from the penetration seal to each of the wooden studs and the cavity between stud and sealing must be filled with a least 100 mm of insulation material compliant to Class A1 or A2 (acc. to EN 13501-1).

Details AF and AG
The mineral wool boards (Class A1 acc. to EN 13501-1, melting point ≥ 1000 °C, density ≥ 140 kg/m³, thickness ≥ 2 x 50 mm) shall be coated with PROMASTOP®-I on the cutting edges, the board joints and the outer surfaces. The required dry layer thickness of PROMASTOP®-I is ≥ 1,0 mm. In addition, three stripes shall be painted around the busbars and stick the boards on it. The mineral wool boards shall then be fixed with ordinary metal nails (length ≥ 70 mm). Length of the penetration seal is ≥ 800 mm (100 mm penetration seal + min. 700 mm of additional board penetration seal). Application in wall and floor possible. The asymmetrical arrangement of the penetration seal is only applicable in walla. The PROMASTOP®-I penetration seal can be installed one-sided of the main penetration seal, this means the length of the penetration seal on the busbar is min. 700 mm.

Detail AH
If the penetration seal is built from PROMATECT®-H fire protective boards, it can be guided centrally into the penetration seal. This penetration seal is exclusively classified for vertical use.

Table 23 – Fire resistance depending on the penetration seal structure with PROMASTOP®-I

Installation situation	PROMASTOP®-I seal size	
Rigid floor	≤ 1,44 m²	
Rigid wall	≤ 1,44 m²	
Flexible wall	≤ 1,44 m²	
	Classification	
	Wall	Floor
Canalis® KTA 800 A to 4000 A with PROMASTOP®-I	EI 120	EI 90
Canalis® KTA 800 A to 4000 A with PROMASTOP®-I and PROMATECT®-H	–	EI 90

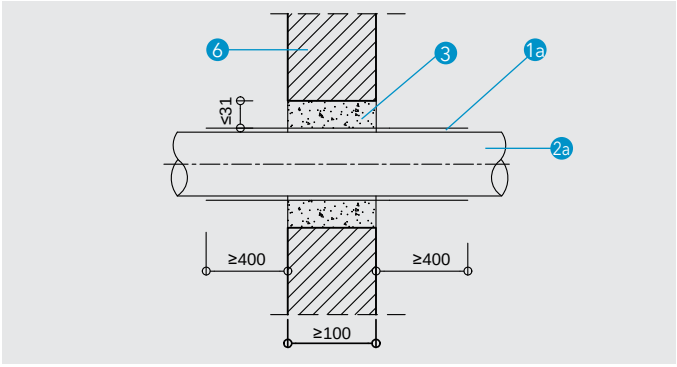
15. Information about the minimum distances in PROMASTOP®-I penetration seals

Table 24

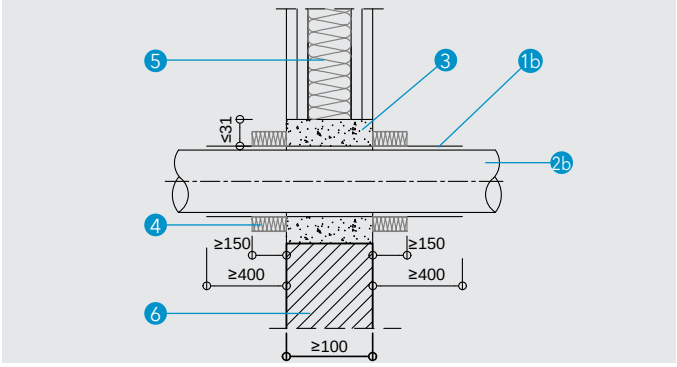
Sufficient space needs to be provided for the construction of professional applications. For practical and physical reasons, we recommend observing a minimum distance of 100 mm between installed objects and support construction/component framing during planning.
If this is impossible due to the situation on the construction site, the permitted minimum distances shall be taken from Table 24.

Table 24 – Minimum distances

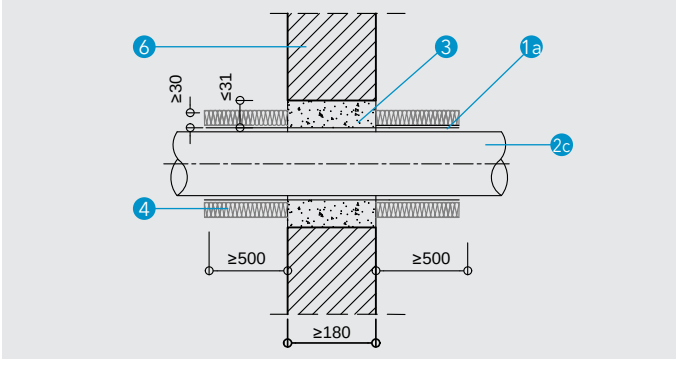
Object	Minimum distance [mm]
Non-combustible insulation – Non-combustible insulation	0
Non-combustible insulation – Supporting construction/aperture opening	0
Non-combustible insulation – PROMASTOP®-IM CJ21	0
Non-combustible insulation – PROMATECT® ducts	0
Non-combustible insulation – PROMASTOP®-FC	0
Non-combustible insulation – PROMASTOP®-W	0
Cables, cable trays, cable ladders – Supporting construction/aperture opening	0
Cables, cable trays, cable ladders – Cables, cable trays, cable ladders	0
Cables, cable trays, cable ladders – PROMASTOP®-FC	20
Cables, cable trays, cable ladders – PROMASTOP®-IM CJ21	0
Cables, cable trays, cable ladders – PROMASTOP®-W	0
Bus bar – Bus bar	0
Bus bar (covering) – Bus bar (covering)	0
Bus bar (covering) – Supporting construction/aperture opening	0
PROMASTOP®-FC – Combustible insulation	0
PROMASTOP®-FC – PROMASTOP®-FC	0
PROMASTOP®-FC – PROMASTOP®-IM CJ21	0
PROMASTOP®-FC – PROMASEAL®-A	0
PROMASTOP®-FC – PROMASEAL®-AG	0
PROMASTOP®-FC – PROMATECT® ducts	0
PROMASTOP®-FC – Supporting construction/aperture opening	0
PROMASTOP®-FC – Busbars and their claddings	20
PROMASTOP®-FC MD – PROMASTOP®-FC MD	95
PROMASTOP®-FC MD – Supporting construction/aperture opening	50
PROMASTOP®-W – Combustible insulation	0
PROMASTOP®-W – PROMASTOP®-W	0
PROMASTOP®-W – PROMASTOP®-IM CJ21	0
PROMASTOP®-W – PROMASTOP®-FC	0
PROMASTOP®-W – PROMATECT® ducts	20
PROMASTOP®-W – PROMASEAL®-A	0
PROMASTOP®-W – PROMASEAL®-AG	0
PROMASTOP®-W – Supporting construction/aperture opening	0
PROMASTOP®-IM CJ21 – PROMASTOP®-IM CJ21	0
PROMASTOP®-IM CJ21 – PROMASEAL®-A	0
PROMASTOP®-IM CJ21 – PROMASEAL®-AG	0
PROMASTOP®-IM CJ21 – Supporting construction/aperture opening	0
PROMASTOP®-IM CJ21 – Combustible insulation	0
Between all other objects	100



Detail A – Penetrations of steel and cast iron pipes, max. diameter 76,1 mm through walls



Detail B – Penetrations of steel and cast iron pipes, max. diameter 108 mm through walls



Detail C – Penetrations of steel and cast iron pipes, max. diameter 219 mm through walls

Technical data

1a PROMASEAL®-A spray, min. thickness 2 mm
1b PROMASEAL®-A spray fire stopping coating, min. thickness 2,5 mm
2a Steel or cast iron pipe, max diameter 76,1 mm
2b Steel or cast iron pipe, max diameter 108 mm
2c Steel or cast iron pipe, max diameter 219 mm
3 Cement mortar, or gypsum putty
4 Insulation of mineral wool, min. thickness 30 mm, min. density 80 kg/m^3
5 Flexible wall
6 Rigid floor

Certificates: ITB CR 01633/22/R181NZP

Description

The minimum thickness of the partitions which can be protected with the PROMASEAL®-A spray (1) coating is:

- Flexible wall min. thickness 100 mm
- Rigid wall min. thickness 100/180 mm (details below)

In the case of the penetrations of steel and cast iron pipes of the diameter not exceeding 219 mm, the opening of such penetrations is sealed with utilisation of a gypsum joint filler, cement mortar, the Promat joint filler, or the PROMASTOP®-M mortar (3), located throughout the wall thickness. The max. width of the gap between the pipes and partitions is 31 mm.

Detail A

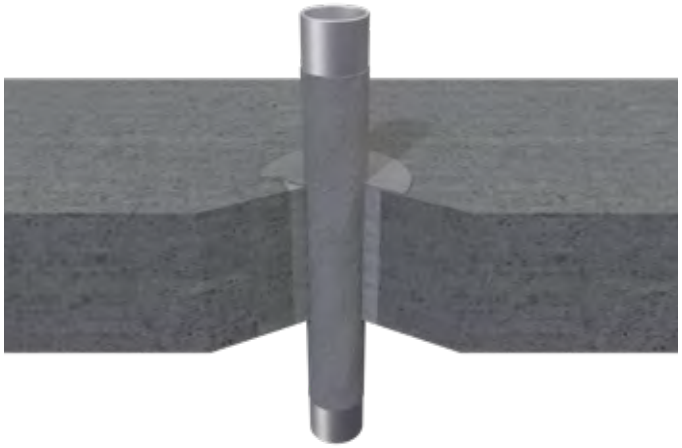
For the penetrations of steel or cast iron pipes through rigid walls, a min. 2 mm thick layer of the PROMASEAL®-A spray (1a) coating must be applied on min. 400 mm length of the pipe (2a) on both the partition sides. The pipe section located inside the wall must be covered with the PROMASEAL®-A spray (1a) fire stopping coating, as well. In this case there is no need to apply any mineral wool insulation on the pipe. Pipes of the diameter up to 76.1 mm can be protected in this particular way.

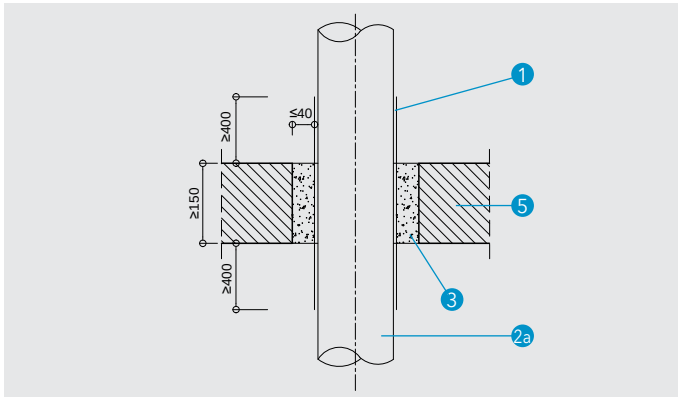
Detail B

For the penetrations of steel or cast iron pipes through flexible walls, a min. 2.5 mm thick layer of the PROMASEAL®- A spray (1b) coating must be applied on min. 400 mm length of the pipe (2b) on both the partition sides. Insulation of mineral wool must be put on such painted pipes (4), min. thickness 30 mm and min. density 80 kg/m^3 on the min. length of 150 mm, on both the sides. The insulation layer should touch the partition. In this way it is possible to protect pipes up to the maximum diameter of 108 mm.

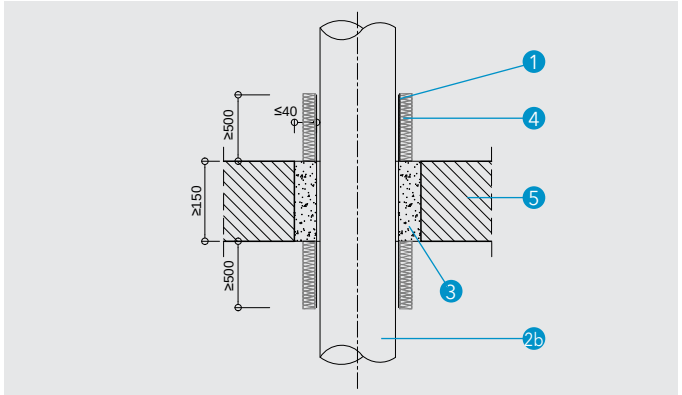
Detail C

The penetrations of steel or cast iron pipes through rigid walls must be protected by applying the PROMASEAL®-A spray (1a) coating onto the pipes (2c), min. 2 mm layer thickness, on the min. length of 500 mm on both the partition sides. The painted pipes should be covered with insulation of mineral wool (4), min. thickness 30 mm, and min. density 80 kg/m3 on the min. length of 500 mm, on both the sides. The insulation layer should touch the partitions. In this way it is possible to protect pipes up to the maximum diameter of 219 mm.

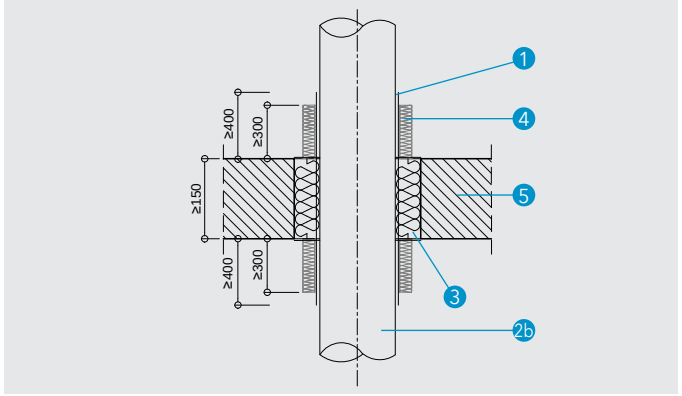




Detail A – Penetrations of steel and cast iron pipes, max. diameter 108 mm through floors



Detail B – Penetrations of steel and cast iron pipes, max. diameter 168,9 mm through floors



Detail C – Penetrations of steel and cast iron pipes, max. diameter 168,9 mm through floors ("soft" seal)

Technical data

1a PROMASEAL®-A spray, min. thickness 2 mm
2a Steel or cast iron pipe, max diameter 108 mm
2b Steel or cast iron pipe, max diameter 168,9 mm
2c Steel or cast iron pipe, max diameter 219 mm
3 Cement mortar, or gypsum putty
4 Insulation of mineral wool, min. thickness 30 mm, min. density 80 kg/m^3
5 Floor
6 Mineral wool min. density 65 kg/m^3

Certificates: ITB CR 01633/22/R181NZP

Description

The minimum thickness of the partitions which can be protected with the PROMASEAL®-A spray (1) coating is:

- Rigid floors min. thickness 150/200 mm (details below)

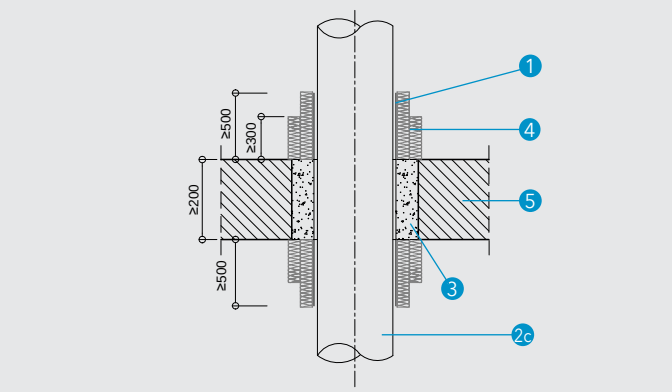
In the case of the penetrations of steel and cast iron pipes with diameter not exceeding 219 mm, the openings are sealed with utilisation of a gypsum joint filler, cement mortar, the Promat joint filler, the PROMASTOP®-M mortar (3), or mineral wool (7) placed throughout the floor thickness.

Detail A

For those penetrations of steel or cast iron pipes through floors, a min. 2 mm layer of the PROMASEAL®- A spray (1) coating must be applied on the min. 400 mm of the pipe length (2a) on both the partition sides. The pipe sections located within the partitions must be also covered with the PROMASEAL®-A spray (1) fire stopping coating. In this situation there is no need for applying insulation of mineral wool onto such pipes. The openings are protected with gypsum putty (3). Pipes up to the maximum diameter of 108 mm can be protected in this way.

Detail B and C

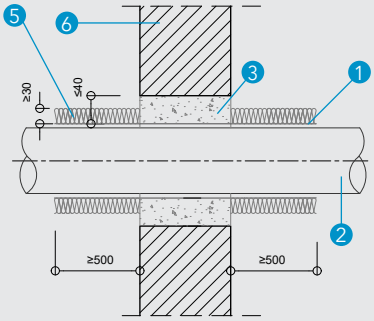
In the case of the penetrations of steel and cast iron pipes of max. diameter 168.9 mm through floors, a 2 mm thick layer of the PROMASEAL®-A spray (1) coating must be applied on the pipes (2b) on the length of 500 mm on both the partition sides. The pipes with such layers must be provided with insulation of mineral wool (4) of the min. thickness 30 mm and min. density 80 kg/m3 on the min. length of 500 mm, on both the sides. Such insulation layers should touch the partitions. The openings are protected with gypsum putty (3). When mineral wool of the min. density 65 kg/m3 (7), covered with a layer of the PROMASEAL-A spray (1) coating acting as a seal of the opening is applied, the pipes must be covered on both the sides of such partitions on the min. length of 400 mm, and min. 300 mm of the pipe length must be covered with insulation of mineral wool.



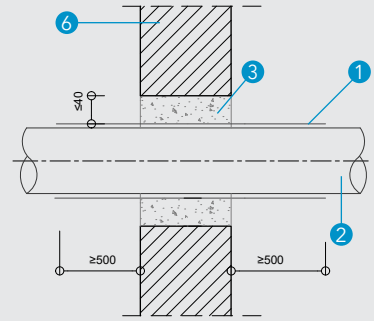
Detail D – Penetrations of steel and cast iron pipes, max. diameter 219 mm through floors

Detail D

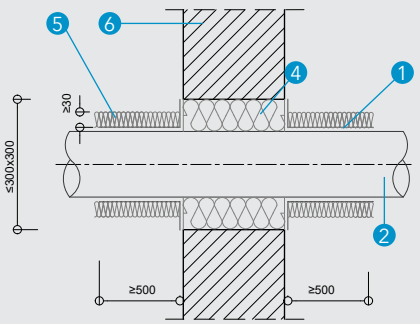
Those penetrations of steel or cast iron pipes through floors must be protected by applying a min. 2 mm layer of the PROMASEAL®-A spray (1) coating on such pipes (2c) on the length of min. 500 mm on both the partition sides. Insulation of min. 30 mm thick mineral wool (4) with the min. density 80 kg/m3 must be put on the pipes provided with such layers, the mineral wool must be provided in two layers on both the sides – the first mineral wool layer must cover the min. length of 500 mm of the pipes, the second – 300 mm. Those insulation layers should touch the partitions. The openings are sealed with gypsum putty (3). In this way it is possible to protect pipes up to the maximum diameter of 219 mm.



Detail A – Penetrations of steel or cast iron pipes diameter exceeding 42 mm through rigid walls



Detail B – Penetrations of steel or cast iron pipes diameter up to 42 mm through rigid walls



Detail C – Penetrations of steel or cast iron pipes up to 114 mm through rigid walls

Technical data

1. PROMASEAL®-A spray
2. Steel or cast iron pipe, diameter ≤ 114 mm
3. Cement mortar
4. Mineral wool 100 kg/m³
5. Insulation of mineral wool min. thickness 30 mm, min. density 80 kg/m³
6. Rigid wall

Certificates: ITB CR 01633/22/R181NZP

1. Installation

The nominal diameter of the sealed steel or cast iron pipes should not exceed 114 mm. The thickness of the partitions through which such services are running should not be smaller than:

- Rigid wall min. thickness 180 mm

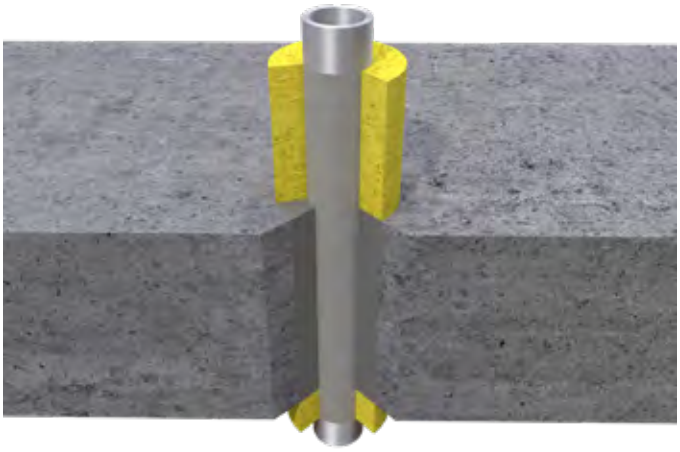
The PROMASEAL®-A spray is a solvent-free substance and is not included in any hazard class. After curing the PROMASEAL®-A spray is resistant to the influence of water and oil. It can be applied with utilisation of any existing methods of painting. The ambient temperature must not be lower than + 5 °C. The coating must be thoroughly mixed before application.

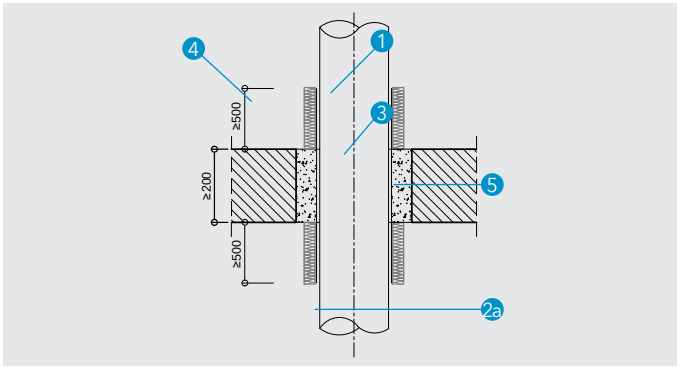
Detail A and B

A min. 2.5 mm thick layer of the PROMASEAL®-A spray (1) coating must be applied onto the pipe (2), on the length of 500 mm on both the partition sides. The pipe sections located within such partitions must be covered with the PROMASEAL®-A spray fire stopping coating, as well. Insulation of mineral wool (5), of the min. thickness 30 mm and min. density min. 80 kg/m3 must be applied on the painted pipes with the diameter exceeding 42 mm, on the length of 500 mm on both the sides. The insulation layer should touch the partitions. The diameter range of the steel or cast iron pipes (2) utilised for this solution is: 15 mm ÷ 114 mm. The penetrations of the steel pipes are protected with utilisation of cement mortar (3) located throughout the wall thickness. The maximum width of the gap between the pipes and partitions is 40 mm.

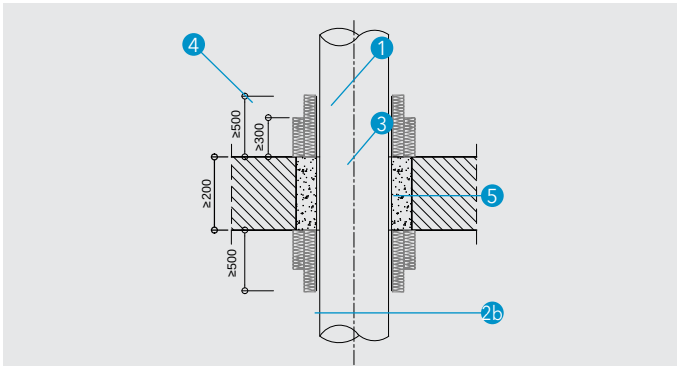
Detail C

A min. 2.5 mm thick layer of the PROMASEAL®-A spray (1) coating must be applied onto the pipes (2), on the length of 500 mm on both the partition sides. The pipe sections located within the partitions must be covered with the PROMASEAL®-A spray fire stopping coating, as well. Insulation of mineral wool (5), of the min. thickness 30 mm and min. density 80 kg/m3 must be applied on both the sides, on the length of 500 mm. The insulation layer should touch the partition. The diameter range of the steel or cast iron pipes (2) utilised for this solution is: 42 mm ÷ 114 mm. The max. dimensions of the penetrations are 300x300 mm. Such penetrations must be filled with mineral wool (4) of min. density 100 kg/m3 and min. thickness of 200 mm. The mineral wool must be covered with a 2.5 mm thick layer of the PROMASEAL®-A spray (1) coating on both the sides.





Detail A – Penetrations of pipes up to 108 mm diameter through floors



Detail B – Penetrations of pipes up to 168,9 mm diameter through floors

Technical data

1. PROMASEAL®-A spray, min. thickness 2 mm
2a. Steel or cast iron pipe, max. diameter 108 mm
2b. Steel or cast iron pipe, max. diameter 168,9 mm
3. Cement mortar
4. Insulation of mineral wool min. thickness 30 mm, min. density 80 kg/m^3
5. Floor

Certificates: ITB CR 01633/22/R181NZP

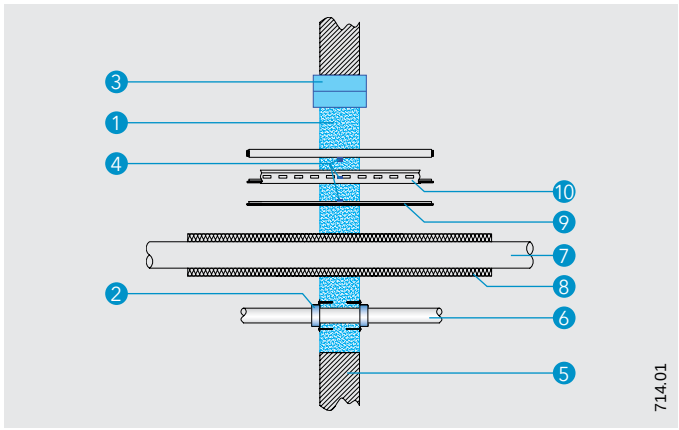
1. Installation

The min. thickness of the rigid floors for which penetrations can be protected with utilisation of the PROMASEAL®-A spray (1) coating within the fire resistance class EI240 is 200 mm.

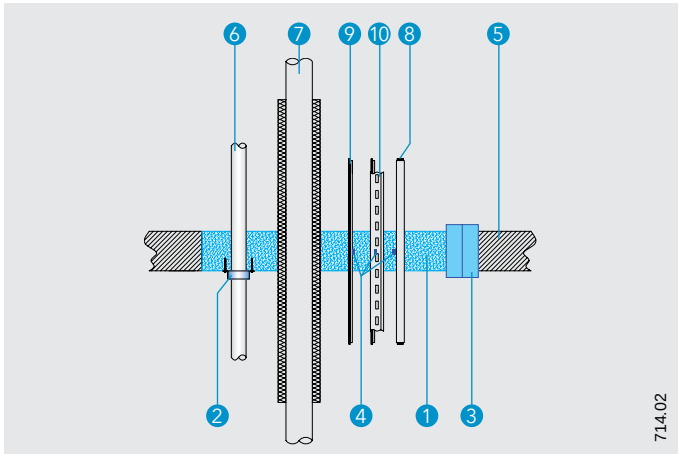
The openings of the penetrations of steel and cast iron pipes are sealed with cement mortar, or the PROMASTOP®-M (3) mortar located throughout the floor thickness.

Detail A and B

For the rigid floors, a min. 2 mm thick layer of the PROMASEAL®-A spray coating must be applied onto the penetrating pipes (2), the min. length of such layers is 500 mm on both the partition sides. The pipe sections located within the partitions must be covered with the PROMASEAL®-A spray fire stopping coating, as well. The pipes provided with such layers should be covered with insulation of mineral wool (5), of the min. thickness 30 mm and min. density 80 kg/m3, on the min. length of 500 mm, on both the sides. For the pipes with the diameters exceeding 108 mm, but not exceeding 168.9 mm, it is necessary to provide an additional insulation layer of mineral wool, of the min. length 300 mm (detail B). The insulation layers should touch the partitions. Such penetrations should be filled with cement mortar through the whole partition thickness.



Detail A – PROMASTOP®-M mixed penetration seal in rigid wall



Detail B – PROMASTOP®-M mixed penetration seal in rigid floor

Technical data

1. PROMASTOP®-M
2. PROMASTOP®-FC
3. PROMASTOP®-B
4. PROMASEAL®-AG
5. Supporting construction
6. Plastic pipes
7. Non-combustible pipes
8. Non-combustible insulation
9. Cable, cable bundle
10. Cable tray
11. Metal pins or screws as reinforcement
12. Identification label

Certificates: ETA-17/0862, IBS CR 316101904-A-en,Rev 1, IBS CR 13061206-A,Rev1-en

Customer benefit

- Penetration seal for cables, cable trays, cable bundles, flexible conduits, plastic pipes, steel and copper pipes in combination with PROMASTOP®-B, PROMASEAL®-AG and PROMASTOP®-FC
- Suitable for external use (use category X)
- Machine compatibility of the mortar
- Later installation easy in case PROMASTOP®-B is used in the penetration seal

1. Installation

- Clean the opening with water.
- For application in floors use additional iron rods or screws in the reveal (minimum depth 50 mm in the mortar and 50 mm in the reveal). The distance shall be not more than 300 mm.
- Insert PROMASEAL®-AG 5 mm deep and 20 mm wide next to the penetrating cables and cable bundles.
- Apply the lost formwork and the frame (e. g. PROMATECT® boards).
- Fill the remaining opening with PROMASTOP®-M and smoothen the surface.
- Label the penetration seal.

2. Fields of application

Details A and B

The fire stopping mortar PROMASTOP®-M can be used for penetration seals in rigid walls and floors as well as in flexible walls. A combination with PROMASTOP®-B, PROMASEAL®-AG and PROMASTOP®-FC is possible.

Rigid floor

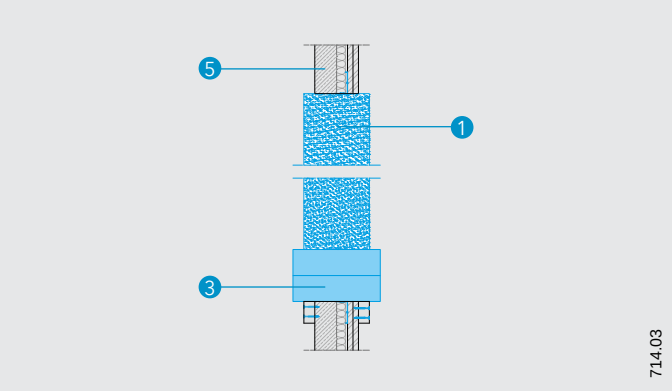
The floor must have a thickness of ≥ 150 mm and a density of ≥ 650 kg/m³.

Rigid wall

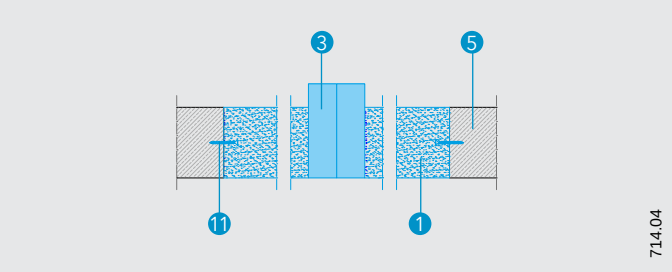
The wall must have a thickness of ≥ 100 mm and a density of ≥ 650 kg/m³.

Flexible wall

The wall must have a thickness of ≥ 100 mm and be made from timber or metal studs which are lined on both sides with a minimum of two layers of 12,5 mm thick fire protective boards (other board thicknesses shall be permissible, please note minimum thickness). For timber stud walls, a minimum distance of 100 mm must be kept from the penetration seal to each of the timber studs and the cavity between stud and sealing must be filled with a least 100 mm of insulation material compliant to Class A1 or A2 (acc. to EN 13501-1).



Detail C – PROMASTOP®-M blank seal in combination with PROMASTOP®-B in flexible or rigid wall



Detail D – PROMASTOP®-M blank seal in combination with PROMASTOP®-B in rigid floor

Table 1 – Installation situations, maximum seal size and classifications for PROMASTOP®-M and PROMASTOP®-B

Installation situations	PROMASTOP®-M	PROMASTOP®-B
Rigid floor ≥ 150 mm	≤ 3,0 m²	≤ 0,12 m²
Flexible wall ≥ 100 mm	≤ 3,0 m²	≤ 0,12 m²
Classification blank seal	EI 120	EI 120

Table 2 – Additional insulation information for cables

Type	Specification
Mineral wool	$A2_L$-s1, d0 or A2-s1, d0 or higher rated (acc. to EN 13501-1)
Density	≥ 35 kg/m³
Insulation thickness	≥ 20 mm
Type of pipe insulation	LI
Insulation length	≥ 150 mm

The aperture lining shall be made from steel studs with a thickness of minimum 0,6 mm and/or boards of the same specification as those used in the wall construction.
The classifications for the flexible wall may also be used for rigid walls provided that the thickness and density of the construction are higher than those of the one tested.
The components (supporting constructions) must be classified acc. to EN 13501-2 for the required fire resistance period.

3. PROMASTOP®-M blank penetration seal in combination with PROMASTOP®-B

Table 1
The dimensions defined in the table shall be observed for the construction of PROMASTOP®-M mortar penetration seals in combination with PROMASTOP®-B as single and mixed penetration seal.

Detail C
Application in flexible and rigid walls: the PROMASTOP®-B fire stopping bricks must be covered at least 150 mm with PROMASTOP®-M (blank seal thickness minimum 150 mm).

Detail D
For application in floors use additional iron rods or screws (11) in the reveal (minimum depth 50 mm in the mortar and 50 mm in the reveal). The distance shall be not more than 300 mm. The PROMASTOP®-B fire stopping bricks must be covered at least 150 mm with PROMASTOP®-M (blank seal thickness minimum 150 mm).

4. PROMASTOP®-M cable penetration seal in combination with PROMASEAL®-AG

PROMASEAL®-AG shall be applied around single cables and cable bundles, centred in the mortar penetration seal. Minimum thickness 3 mm, length ≥ 20 mm. Cable trays and cable ladders may penetrate the mortar penetration seal.

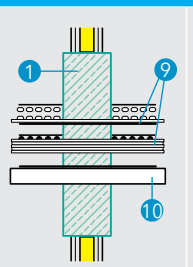
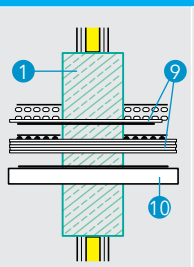
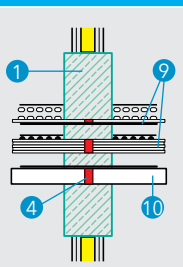
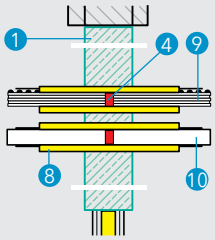
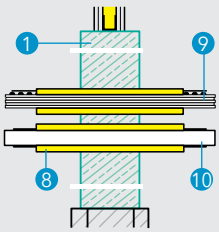
Additional protection with mineral wool
In some cases an additional aluminium faced mineral wool insulation shall be wrapped around the cables, cable bundles and cable trays and fixed with steel wire (minimum diameter 0,6 mm). The mineral wool shall be applied in length of 150 mm on both sides for penetration seals in walls, but only on the top for floor penetration seals.

Table 2
For information on additional cable insulation see Table 2.

Supporting distance
The cables, cable bundles, cable ladders and cable trays must be suspended/supported ≤ 275 mm on both sides of the wall and ≤ 320 mm from the top of the floor.

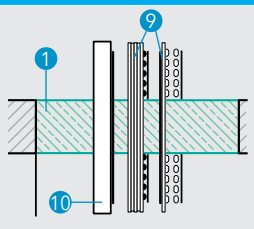
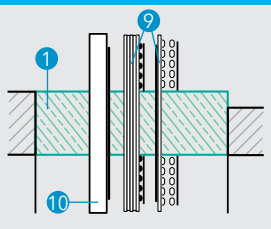
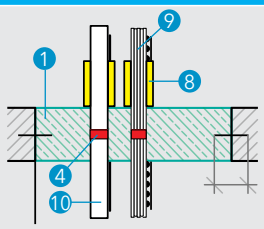
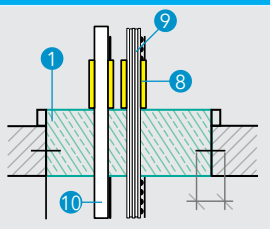
Tables 3 and 4
For the fire resistance depending on the penetration seal see Tables 3 and 4.

Table 3 – Classifications of PROMASTOP®-M cable penetration seals in wall

Electrical installations	PROMASTOP®-M cable penetration seal				
					
	without additional protection in wall	without additional protection in wall	with additional PROMASEAL®-AG in wall	with PROMASEAL®-AG and additional mineral wool in wall	with additional mineral wool in wall
	≥ 150 mm	≥ 200 mm	≥ 150 mm	≥ 150 mm	≥ 200 mm
CG 1: All sheathed cable types, Ø ≤ 21 mm	E 120 EI 90	EI 120	EI 120	EI 120	EI 120
CG 2: All sheathed cable types, 21 mm ≤ Ø ≤ 50 mm	E 120 EI 60	E 120 EI 90	E 120 EI 90	EI 120	EI 120
CG 3: All sheathed cable types, 50 mm ≤ Ø ≤ 80 mm	E 120 EI 60	E 120 EI 90	E 120 EI 90	EI 120	EI 120
CG 4: Cable bundles, Ø ≤ 100 mm made of cables from CG 1	E 120 EI 90	EI 120	E 120 EI 90	E 120 EI 90	EI 120
CG 5: Non-sheathed cable types, Ø ≤ 24 mm	E 120 EI 60	EI 120	E 120 EI 60	EI 120	EI 120
CG 6: Small conduits and tubes, made of steel, copper or plastic, Ø ≤ 16 mm	–	–	EI 120-U/C	EI 120-U/C	EI 120-U/C

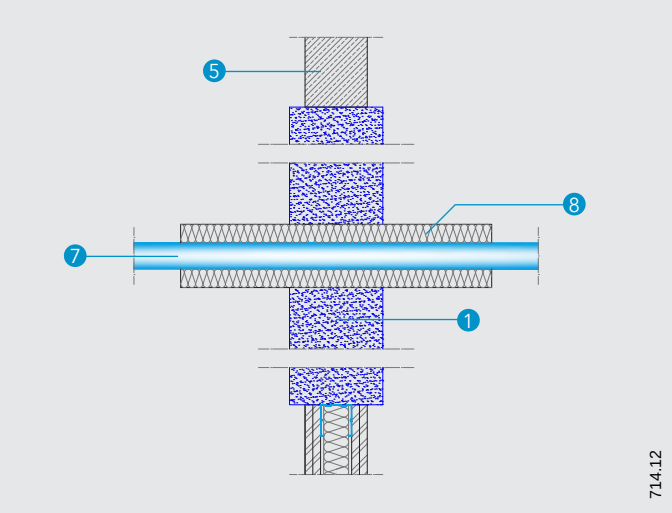
CG...Cable groups acc. to EN 1366-3:2009

Table 4 – Classifications of PROMASTOP®-M cable penetration seals in floor

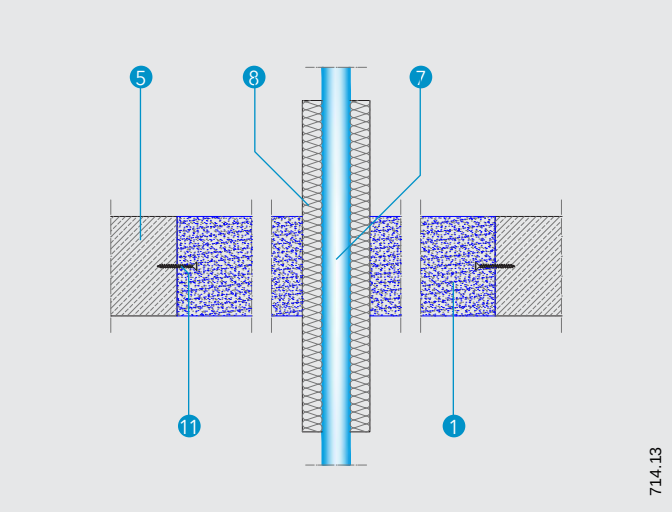
Electrical installations	PROMASTOP®-M cable penetration seal			
				
	without additional protection in floor	without additional protection in floor	with PROMASEAL®-AG and additional mineral wool in floor	with additional mineral wool in floor
	≥ 150 mm	≥ 200 mm	≥ 150 mm	≥ 200 mm
CG 1: All sheathed cable types, Ø ≤ 21 mm	E 120 EI 90	EI 120	E 120 EI 90	EI 120
CG 2: All sheathed cable types, 21 mm ≤ Ø ≤ 50 mm	E 120 EI 90	EI 120	E 120 EI 90	EI 120
CG 3: All sheathed cable types, 50 mm ≤ Ø ≤ 80 mm	E 120 EI 90	EI 120	EI 120	EI 120
CG 4: Cable bundles, Ø ≤ 100 mm made of cables from CG 1	E 120 EI 90	EI 120	E 120 EI 90	EI 120
CG 5: Non-sheathed cable types, Ø ≤ 24 mm	E 120 EI 90	EI 120	EI 120	EI 120
CG 6: Small conduits and tubes, made of steel, copper or plastic, Ø ≤ 16 mm	-	-	EI 120-U/C	EI 120-U/C

CG...Cable groups acc. to EN 1366-3:2009

5. PROMASTOP®-M penetration seal for non-combustible pipes with non-combustible insulation



Detail E – PROMASTOP®-M penetration seal for non-combustible pipes with non-combustible insulation in wall



Detail F – PROMASTOP®-M penetration seal for non-combustible pipes with non-combustible insulation in floor

Metal pipes with non-combustible insulation may penetrate the PROMASTOP®-M penetration seal. The pipe insulation made of mineral wool must have a melting point of ≥ 1000 °C and correspond to Class A2 or $A2_L$ or higher rated acc. to EN 13501-1.
The configuration of the pipe insulation is LS or CS acc. to EN 1366-3.
The insulation is placed in the centre of the PROMASTOP®-M penetration seal and fixed with steel wire (minimum diameter 0,6 mm). Insulated metal pipes can penetrate at angles between 90° and 45° to the supporting construction.

Test results with the pipe end configuration U/U also cover U/C, C/U and C/C. Test results with pipe end configuration U/C also cover C/U and C/C.

Supporting distance
The pipes must be suspended/supported at a distance of ≤ 400 mm on both sides of the wall or ≤ 320 mm from the top of the floor.

5.1 Steel pipes

Table 5 – Classification of steel pipes and their substitutes

With non-combustible insulation	Classification depending on installation orientation in the PROMASTOP®-M penetration seal	
	Wall	Floor
Pipe diameter Ø [mm]	17 - 220	17 - 220
Pipe wall thickness s [mm]	2,0 - 14,2	2,0 - 14,2
Classification	EI 120-U/C	EI 120-U/C

For the sealing of steel pipes and their substitutes, an insulating thickness of ≥ 30 mm and ≤ 100 mm, a total length of the pipe insulation of ≥ 500 mm (see Diagram 1 for details) and a density of the mineral wool of ≥ 40 kg/m³ to ≤ 150 kg/m³ shall be considered. Apply PROMASTOP®-M ≥ 150 mm thick in the penetration seal.

Table 5

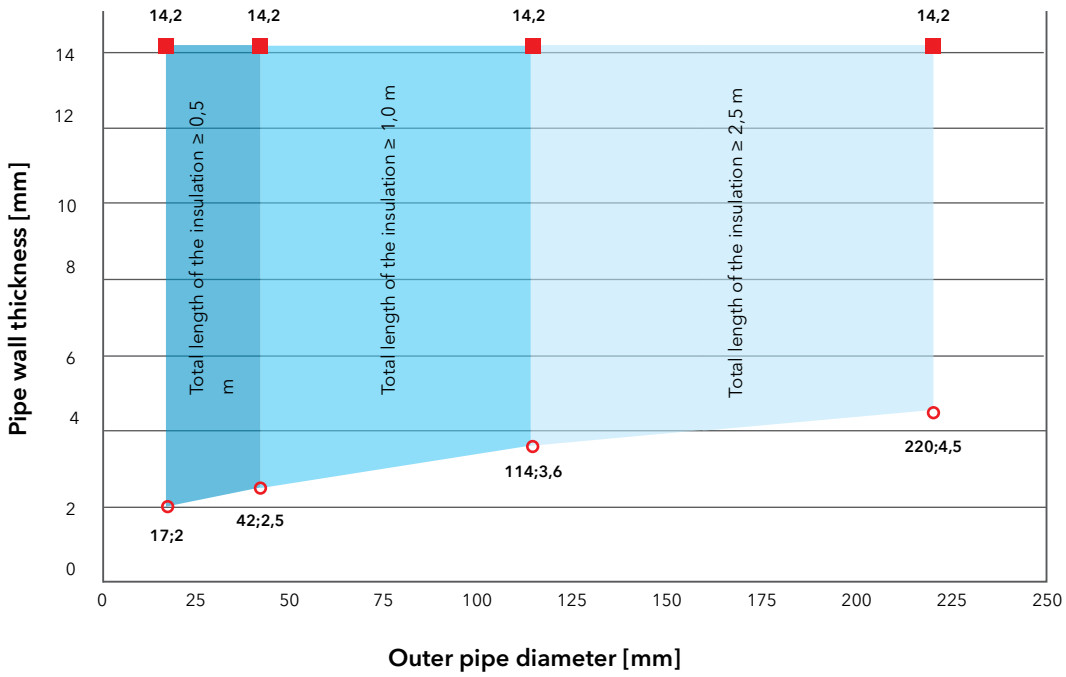
The results can also be applied to metal pipes with a lower heat conductivity λ ≤ 58 W/mK and a melting point ≥ 1100 °C (e.g. stainless steel, cast iron, Ni alloys -NiCr, NiMo, NiCu- and Ni).

Diagram 1

The diagram shows the total length of the local insulation depending on the steel pipe wall thickness and the outer pipe diameter.

The results can also be applied to metal pipes with lower heat conductivity λ ≤ 58 W/mK and a melting point ≥ 1100 °C (e.g. stainless steel, cast iron, Ni alloys -NiCr, NiMo, NiCu- and Ni).

Diagram 1 – Information about the total length of non-combustible insulation for steel pipes in PROMASTOP®-M penetration seal



5.2 Copper pipes

Table 6 – Classification of copper pipes and their substitutes

With non-combustible insulation	Classification depending on installation orientation in the PROMASTOP®-M penetration seal	
	Wall	Floor
Pipe diameter Ø [mm]	18 - 88,9	18 - 88,9
Pipe wall thickness s [mm]	1,0 - 14,2	1,0 - 14,2
Classification	E 120-U/C EI 90-U/C	EI 120-U/C

Diagram 2

The diagram shows the respective total length of the local insulation depending on the copper pipe wall thickness and the outer pipe diameter.

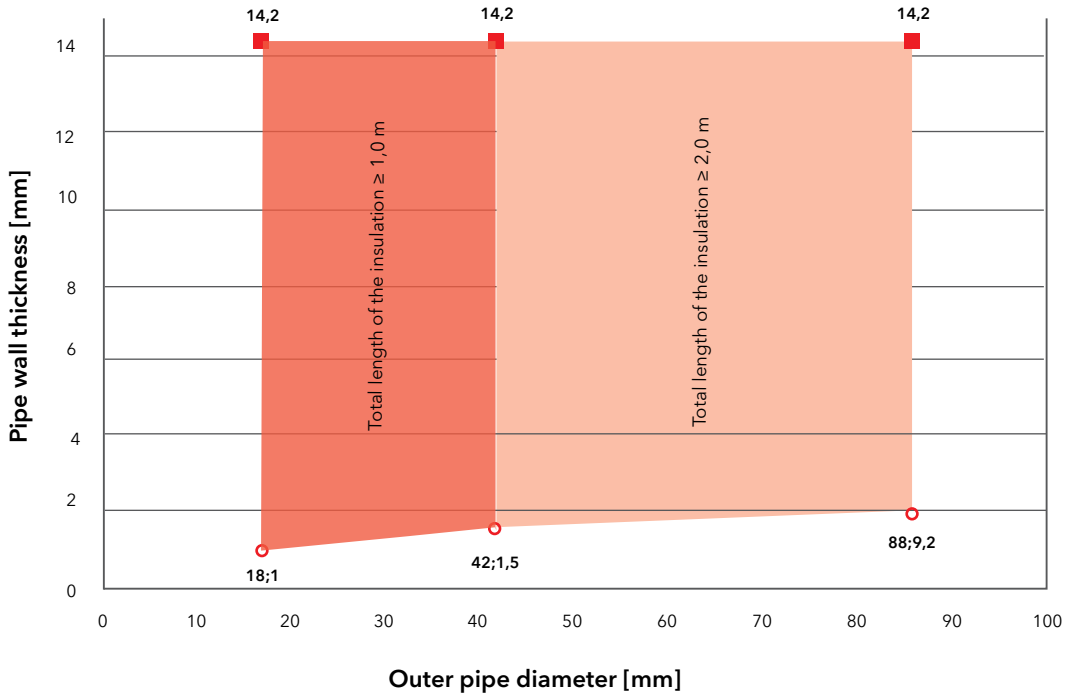
For the sealing of copper pipes and their substitutes, an insulating thickness of ≥ 30 mm and ≤ 100 mm, a total length of the pipe insulation of ≥ 1000 mm (see Diagram 2 for details) and a density of the mineral wool of ≥ 40 kg/m³ to ≤ 150 kg/m³ shall be considered. Apply PROMASTOP®-M ≥ 150 mm thick in the penetration seal.

Table 6

The results of copper pipes are valid for steel pipes, but not vice versa, and for pipes with a heat conductivity λ ≤ 380 W/mK and a melting point of ≥ 1083 °C (e. g. stainless steel, cast iron, Ni alloys -NiCr, NiMo, NiCu- and Ni).

Results of copper pipes are valid for steel pipes, but not vice versa, and for pipes with λ ≤ 380 W/mK and melting point ≥ 1083 °C (e.g. steel, stainless steel, cast iron, Ni alloys -NiCr, NiMo, NiCu- and Ni).

Diagram 2 – Information about the total length of non-combustible insulation for copper pipes in PROMASTOP®-M penetration seal



6. PROMASTOP®-M penetration seal for MLC pipes (multi-layered pipes including metal layer(s)) with non-combustible insulation

Table 7 – Length of pipe insulation acc. to type of MLC pipe

Length of pipe insulation	
Geberit Mepla Ø 16 - 40 mm	≥ 500 mm
Geberit Mepla Ø 50 - 75 mm	≥ 1000 mm
Geberit PushFit Ø 16 - 25 mm	≥ 500 mm

Table 8 – Classification of Geberit Mepla and Geberit PushFit pipes

Aluminium multilayer pipes with non-combustible insulation	Floor
Geberit Mepla Ø 16 - 75 mm	E 120-U/C EI 90-U/C
Geberit PushFit Ø 16 mm	EI 120-U/C
Geberit PushFit Ø 20 - 25 mm	E 120-U/C EI 90-U/C

Tables 7 and 8

MLC pipes of the types Geberit Mepla and Geberit PushFit may penetrate the PROMASTOP®-M mortar penetration seal. The pipe insulation made of mineral wool must have a melting point of ≥ 1000 °C and correspond to Class A2 or $A2_L$ or higher rated acc. to EN 13501-1.

The configuration of the pipe insulation is LS or CS acc. to EN 1366-3.

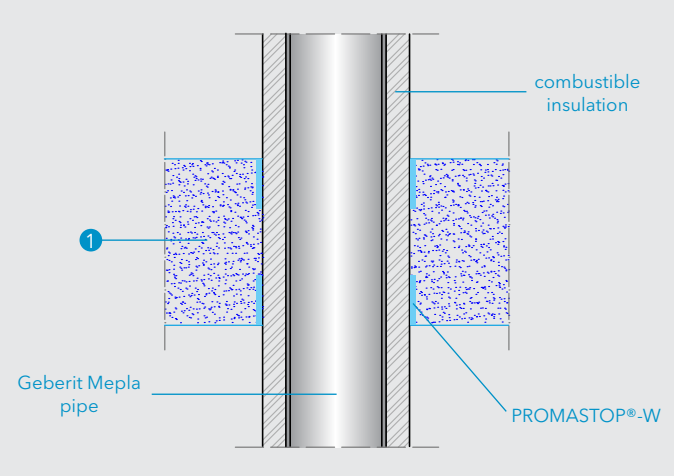
The insulation is placed in the centre of the PROMASTOP®-M penetration seal and fixed with steel wire or the like.

For the sealing an insulating thickness of ≥ 30 mm and ≤ 70 mm, a total length of the pipe insulation of ≥ 500 mm (see Table 7 for details) and a density of the mineral wool of ≥ 80 kg/m³ to ≤ 150 kg/m³ shall be considered. Apply PROMASTOP®-M ≥ 150 mm thick in the penetration seal.

7. PROMASTOP®-M penetration seal for MLC pipes (multi-layered pipes including metal layer(s)) with combustible insulation

Table 9 – Classification of Geberit Mepla pipe

Classification of Geberit Mepla pipe with a 32 mm thick and 500 mm long combustible insulation		
	Floor	PROMASTOP®-W
Geberit Mepla Ø 16 - 75 mm	EI 120-U/C	1-1 layer on top and bottom side



Detail G – PROMASTOP®-M floor penetration seal in combination with PROMASTOP®-W for Geberit Mepla pipes with combustible insulation

Table 9

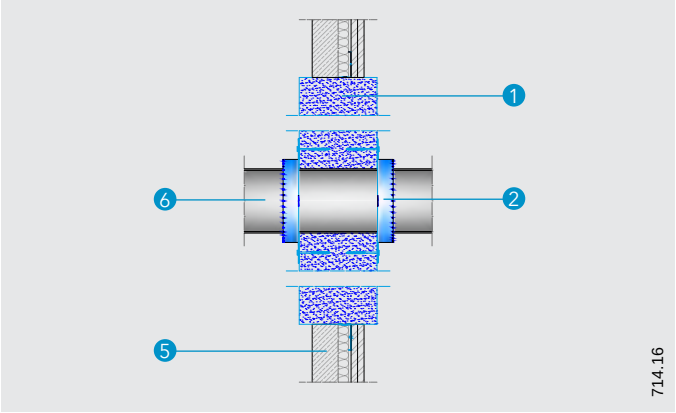
MLC pipes of the type Geberit Mepla may penetrate the PROMASTOP®-M mortar penetration seal combined with PROMASTOP®-W. The pipe insulation made of synthetic rubber must correspond to Class B-s3, d0 or higher rated acc. to EN 13501-1. Insulating thickness 32 mm.

The configuration of the pipe insulation is LS or CS acc. to EN 1366-3.

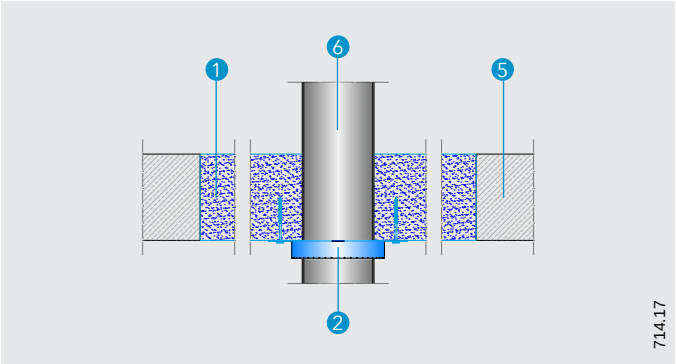
The insulation is placed in the centre of the PROMASTOP®-M penetration seal over a length of ≥ 500 mm.

Apply PROMASTOP®-M ≥ 150 mm thick in the penetration seal. Install one layer of PROMASTOP®-W on the top side and on the bottom side of the floor.

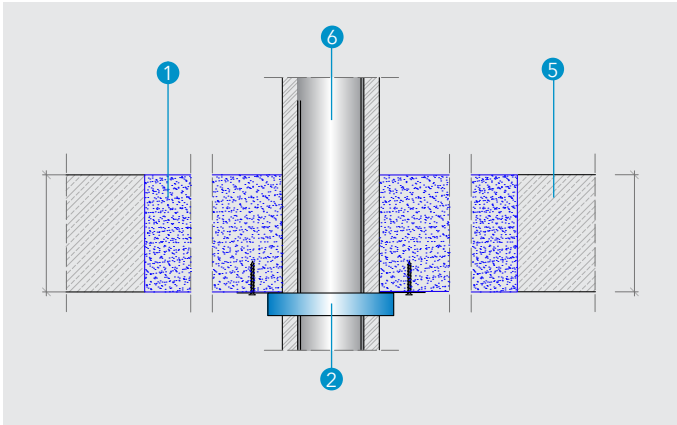
8. PROMASTOP®-M plastic pipe penetration seal in combination with PROMASTOP®-FC



Detail H – PROMASTOP®-M wall penetration seal in combination with PROMASTOP®-FC for plastic pipes



Detail I – PROMASTOP®-M floor penetration seal in combination with PROMASTOP®-FC for plastic pipes



Detail J – PROMASTOP®-M floor penetration seal in combination with PROMASTOP®-FC for plastic pipes with combustible insulation

Plastic pipes can penetrate the PROMASTOP®-M penetration seal; however, the fire stopping collar PROMASTOP®-FC is additionally required in this case. PROMASTOP®-FC3, PROMASTOP®-FC6 and PROMASTOP®-FC15 are classified in combination with PROMASTOP®-M.

The classifications for PVC-U pipes are applicable for pipes in acc. with EN 1452-1, DIN 8061, DIN 8062, EN 1329-1, EN 1453-1 and PVC-C pipes in acc. with EN 1566-1.
The classifications for PE pipes are applicable for pipes in acc. with EN 12201-2, EN 1519-1, EN 12666-1, DIN 8074, DIN 8075 and ABS-pipes in acc. with EN 1455-1 and SAN + PVC-pipes in acc. with EN 1565-1.
The classifications for PP-H and PP-R pipes are applicable for pipes in acc. e.g. to DIN 8077, DIN 8078 or equal products.
The classifications for all stated multilayer pipes are applicable on equal products.

Test results with the pipe end configuration U/U also cover U/C, C/U and C/C. Test results with pipe end configuration U/C also cover C/U and C/C.

Details H, I and J
In wall applications, fire stopping collars shall be installed on both sides of the penetration seal; in floor applications only on the bottom side. Apply PROMASTOP®-M in thickness ≥ 150 mm in the penetration seal.

Fixing
PROMASTOP®-FC can be installed in the mortar penetration seal either surface-mounted with the included fastening material or mortared in (built-in situation). The collars shall be fixed on every second fixing latch Attach the collar to at least 60% of the latches; no two adjacent latches may be left unfixed.

Annular gap filling

Couplings
The diameter of the tested coupling may be decreased but not increased.

Sloped pipes
The angle of the pipe may vary between the tested one and the right angle.

Sound decoupling strips
Every type of sound decoupling strip based on PE-foam of Class E or higher rated acc. to EN 13501-1, with a maximum thickness of 5 mm may be used.

Supporting distance
The pipes must be suspended/supported ≤ 250 mm on both sides of the wall or from the top of the floor.

Table 10 – PROMASTOP®-M plastic pipe penetration seal in combination with PROMASTOP®-FC - overview of pipe materials, dimensions, installation situations (collar surface-mounted or built-in), collar type (PROMASTOP®-FC3, PROMASTOP®-FC6 or PROMASTOP®-FC15) and classifications

Wall requirement	Floor requirement	Dimension range Ø: outer pipe diameter [mm] s: pipe wall thickness [mm] d: insulation thickness [mm]	Classification
PE-HD, ABS, SAN + PVC pipes for pipe penetrations at 90°			
Surface-mounted or built-in, construction thickness ≥ 150 mm	Surface-mounted or built-in, construction thickness ≥ 150 mm	PROMASTOP®-FC3 lower limits: Ø 32 mm, s 1,8 mm → Ø 63 mm, s 1,8 mm → Ø 125 mm, s 3,1 mm upper limits: Ø 32 mm, s 5,8 mm → Ø 63 mm, s 5,8 mm → Ø 125 mm, s 7,4 mm PROMASTOP®-FC6 lower limits: Ø 50 mm, s 1,8 mm → Ø 63 mm, s 1,8 mm → Ø 125 mm, s 3,1 mm → Ø 200 mm, s 4,9 mm upper limits: Ø 50 mm, s 5,8 mm → Ø 63 mm, s 5,8 mm → Ø 125 mm, s 7,4 mm → Ø 200 mm, s 11,4 mm	EI 120-U/U
Surface-mounted, construction thickness ≥ 150 mm		PROMASTOP®-FC6 lower limits: Ø 50 mm, s 1,8 mm → Ø 63 mm, s 1,8 mm → Ø 125 mm, s 3,1 mm → Ø 160 mm, s 4,0 mm upper limits: Ø 50 mm, s 5,8 mm → Ø 63 mm, s 5,8 mm → Ø 125 mm, s 4,8 mm → Ø 160 mm, s 6,2 mm	EI 240-U/U
Surface-mounted, construction thickness ≥ 100 mm		PROMASTOP®-FC3 lower limits: Ø 32 mm, s 1,8 mm → Ø 63 mm, s 1,8 mm → Ø 125 mm, s 3,1 mm → Ø 160 mm, s 4,0 mm upper limits: Ø 32 mm, s 5,8 mm → Ø 63 mm, s 5,8 mm → Ø 125 mm, s 11,4 mm → Ø 160 mm, s 14,6 mm PROMASTOP®-FC6 lower limits: Ø 50 mm, s 1,8 mm → Ø 63 mm, s 1,8 mm → Ø 125 mm, s 3,1 mm → Ø 160 mm, s 4,0 mm → Ø 200 mm, s 4,9 mm → Ø 250 mm, s 22,7 mm upper limits: Ø 50 mm, s 5,8 mm → Ø 63 mm, s 5,8 mm → Ø 125 mm, s 11,4 mm → Ø 160 mm, s 14,6 mm → Ø 250 mm, s 22,7 mm	EI 120-U/C
Surface-mounted, construction thickness ≥ 150 mm		PROMASTOP®-FC6 lower limits: Ø 50 mm, s 1,8 mm → Ø 63 mm, s 1,8 mm → Ø 125 mm, s 3,1 mm → Ø 160 mm, s 4,0 mm upper limits: Ø 50 mm, s 5,8 mm → Ø 63 mm, s 5,8 mm → Ø 125 mm, s 11,4 mm → Ø 160 mm, s 14,6 mm	EI 240-U/C
	Surface-mounted, construction thickness ≥ 150 mm	PROMASTOP®-FC3 lower limits: Ø 32 mm, s 1,8 mm → Ø 63 mm, s 1,8 mm → Ø 125 mm, s 3,1 mm upper limits: Ø 32 mm, s 5,8 mm → Ø 63 mm, s 5,8 mm → Ø 125 mm, s 11,4 mm PROMASTOP®-FC6 lower limits: Ø 50 mm, s 1,8 mm → Ø 63 mm, s 1,8 mm → Ø 125 mm, s 3,1 mm → Ø 160 mm, s 4,0 mm → Ø 200 mm, s 4,9 mm → Ø 250 mm, s 22,7 mm upper limits: Ø 50 mm, s 5,8 mm → Ø 63 mm, s 5,8 mm → Ø 125 mm, s 11,4 mm → Ø 160 mm, s 14,6 mm → Ø 250 mm, s 22,7 mm	EI 120-U/C

Wall requirement	Floor requirement	Dimension range Ø: outer pipe diameter [mm] s: pipe wall thickness [mm] d: insulation thickness [mm]	Classification
	Surface-mounted, construction thickness ≥ 150 mm	PROMASTOP®-FC6 lower limits: Ø 50 mm, s 1,8 mm → Ø 63 mm, s 1,8 mm → Ø 125 mm, s 3,1 mm → Ø 160 mm, s 4,0 mm → Ø 200 mm, s 4,9 mm → Ø 315 mm, s 15,0 mm upper limits: Ø 50 mm, s 5,8 mm → Ø 63 mm, s 5,8 mm → Ø 125 mm, s 11,4 mm → Ø 160 mm, s 14,6 mm → Ø 250 mm, s 22,7 mm → Ø 315 mm, s 15,0 mm	EI 90-U/C
PE-HD, ABS, SAN + PVC pipes for pipe penetrations at 90°			
Surface-mounted, construction thickness ≥ 100 mm		PROMASTOP®-FC6 s 2,0 - 10,4 mm limits: Ø 32 - 180 mm, d 6 - 32 mm	EI 120-U/U with combustible insulation B-s3, d0
Surface-mounted, construction thickness ≥ 100 mm		PROMASTOP®-FC6 s 2,0 - 10,4 mm lower limits: Ø 32 mm, d 6 mm → Ø 180 mm, d 6 mm → Ø 200 mm, d 6 mm upper limits: Ø 32 mm, d 32 mm → Ø 180 mm, d 32 mm → Ø 200 mm, d 19 mm	EI 90-U/U with combustible insulation B-s3, d0
	Surface-mounted, construction thickness ≥ 150 mm	PROMASTOP®-FC6 limits: Ø 32 - 110 mm, d 6 mm	EI 120-U/U with combustible insulation B-s3, d0
	Surface-mounted, construction thickness ≥ 150 mm	PROMASTOP®-FC6 with Promat SPC limits: Ø 32 - 180 mm, d 6 - 32 mm	EI 60-U/U with combustible insulation B-s3, d0
Surface-mounted, construction thickness ≥ 100 mm		PROMASTOP®-FC6 s 2,0 - 16,4 mm limits: Ø 32 - 180 mm, d 6 - 32 mm	EI 120-U/C with combustible insulation B-s3, d0
	Surface-mounted, construction thickness ≥ 150 mm	PROMASTOP®-FC6 with Promat SPC s 2,0 - 16,4 mm lower limits: Ø 32 mm, d 6 mm → Ø 180 mm, d 6 mm → Ø 200 mm, d 6 mm upper limits: Ø 32 mm, d 32 mm → Ø 180 mm, d 32 mm → Ø 200 mm, d 19 mm	EI 90-U/C with combustible insulation B-s3, d0
PE-HD, ABS, SAN + PVC pipes for pipe penetrations at 45°			
Surface-mounted, construction thickness ≥ 150 mm		PROMASTOP®-FC6 lower limits: Ø 32 mm, s 1,8 mm → Ø 63 mm, s 1,8 mm → Ø 125 mm, s 3,1 mm upper limits: Ø 32 mm, s 5,8 mm → Ø 63 mm, s 5,8 mm → Ø 125 mm, s 7,4 mm	EI 120-U/U
	Surface-mounted, construction thickness ≥ 150 mm	PROMASTOP®-FC6 lower limits: Ø 32 mm, s 1,8 mm → Ø 63 mm, s 1,8 mm → Ø 160 mm, s 4,0 mm upper limits: Ø 32 mm, s 5,8 mm → Ø 160 mm, s 6,2 mm	EI 120-U/U
PP-H and PP-R pipes for pipe penetrations at 90°			
Surface-mounted or built-in, construction thickness ≥ 150 mm	Surface-mounted or built-in, construction thickness ≥ 150 mm	PROMASTOP®-FC3 lower limits: Ø 32 mm, s 1,8 mm → Ø 63 mm, s 1,8 mm → Ø 125 mm, s 3,1 mm → Ø 160 mm, s 4,0 mm upper limits: Ø 32 mm, s 8,6 mm → Ø 63 mm, s 8,6 mm → Ø 125 mm, s 7,1 mm → Ø 160 mm, s 4,0 mm PROMASTOP®-FC6 lower limits: Ø 50 mm, s 1,8 mm → Ø 63 mm, s 1,8 mm → Ø 125 mm, s 3,1 mm → Ø 200 mm, s 4,9 mm upper limits: Ø 50 mm, s 8,6 mm → Ø 63 mm, s 8,6 mm → Ø 125 mm, s 7,1 mm → Ø 200 mm, s 11,4 mm	EI 120-U/U

Wall requirement	Floor requirement	Dimension range Ø: outer pipe diameter [mm] s: pipe wall thickness [mm] d: insulation thickness [mm]	Classification
Surface-mounted or built-in, construction thickness ≥ 150 mm	Surface-mounted or built-in, construction thickness ≥ 150 mm	PROMASTOP®-FC3 lower limits: Ø 32 mm, s 1,8 mm → Ø 63 mm, s 1,8 mm → Ø 125 mm, s 3,1 mm → Ø 160 mm, s 4,0 mm upper limits: Ø 32 mm, s 8,6 mm → Ø 63 mm, s 8,6 mm → Ø 125 mm, s 7,1 mm → Ø 160 mm, s 4,0 mm PROMASTOP®-FC6 lower limits: Ø 50 mm, s 1,8 mm → Ø 63 mm, s 1,8 mm → Ø 125 mm, s 3,1 mm → Ø 200 mm, s 4,9 mm upper limits: Ø 50 mm, s 8,6 mm → Ø 63 mm, s 8,6 mm → Ø 125 mm, s 7,1 mm → Ø 200 mm, s 11,4 mm	EI 120-U/U
Surface-mounted, construction thickness ≥ 150 mm		PROMASTOP®-FC6 lower limits: Ø 50 mm, s 1,8 mm → Ø 63 mm, s 1,8 mm → Ø 125 mm, s 3,1 mm → Ø 160 mm, s 4,0 mm upper limits: Ø 50 mm, s 5,8 mm → Ø 63 mm, s 5,8 mm → Ø 125 mm, s 4,8 mm → Ø 160 mm, s 6,2 mm	EI 240-U/U
		PP-H and PP-R pipes for pipe penetrations at 90°	
Surface-mounted, construction thickness ≥ 100 mm		PROMASTOP®-FC3 lower limits: Ø 32 mm, s 1,8 mm → Ø 40 mm, s 1,8 mm → Ø 63 mm, s 1,8 mm → Ø 125 mm, s 3,1 mm → Ø 160 mm, s 4,0 mm upper limits: Ø 32 mm, s 5,4 mm → Ø 40 mm, s 8,6 mm → Ø 63 mm, s 8,6 mm → Ø 125 mm, s 17,1 mm → Ø 160 mm, s 14,6 mm PROMASTOP®-FC6 lower limits: Ø 50 mm, s 1,8 mm → Ø 63 mm, s 1,8 mm → Ø 125 mm, s 3,1 mm → Ø 200 mm, s 4,9 mm → Ø 315 mm, s 15,0 mm upper limits: Ø 50 mm, s 8,6 mm → Ø 63 mm, s 8,6 mm → Ø 125 mm, s 17,1 mm → Ø 250 mm, s 22,7 mm → Ø 315 mm, s 15,0 mm	EI 120-U/C
Surface-mounted, construction thickness ≥ 150 mm		PROMASTOP®-FC6 lower limits: Ø 50 mm, s 1,8 mm → Ø 63 mm, s 1,8 mm → Ø 125 mm, s 3,1 mm → Ø 160 mm, s 4,0 mm upper limits: Ø 50 mm, s 5,8 mm → Ø 63 mm, s 5,8 mm → Ø 125 mm, s 11,4 mm → Ø 160 mm, s 14,6 mm	EI 240-U/C
	Surface-mounted, construction thickness ≥ 150 mm	PROMASTOP®-FC3 lower limits: Ø 32 mm, s 1,8 mm → Ø 40 mm, s 1,8 mm → Ø 63 mm, s 1,8 mm → Ø 125 mm, s 3,1 mm upper limits: Ø 32 mm, s 5,4 mm → Ø 40 mm, s 8,6 mm → Ø 63 mm, s 8,6 mm → Ø 125 mm, s 17,1 mm PROMASTOP®-FC6 lower limits: Ø 50 mm, s 1,8 mm → Ø 63 mm, s 1,8 mm → Ø 125 mm, s 3,1 mm → Ø 160 mm, s 4,0 mm → Ø 200 mm, s 4,9 mm → Ø 250 mm, s 6,2 mm → Ø 315 mm, s 15,0 mm upper limits: Ø 50 mm, s 8,6 mm → Ø 63 mm, s 8,6 mm → Ø 125 mm, s 17,1 mm → Ø 250 mm, s 22,7 mm → Ø 315 mm, s 15,0 mm	EI 120-U/C

Wall requirement	Floor requirement	Dimension range Ø: outer pipe diameter [mm] s: pipe wall thickness [mm] d: insulation thickness [mm]	Classification
Surface-mounted, construction thickness ≥ 100 mm		PROMASTOP®-FC6 s 2,0 - 9,2 mm limits: Ø 32 - 180 mm, d 6 - 32 mm	EI 120-U/U with combustible insulation B-s3, d0
	Surface-mounted, construction thickness ≥ 150 mm	PROMASTOP®-FC6 with Promat SPC limits: Ø 32 - 200 mm, d 6 - 19 mm	EI 120-U/U with combustible insulation B-s3, d0
	Surface-mounted, construction thickness ≥ 150 mm	PROMASTOP®-FC6 with Promat SPC lower limits: Ø 32 mm, d 6 mm → Ø 180 mm, d 6 mm → Ø 200 mm, d 6 mm upper limits: Ø 32 mm, d 32 mm → Ø 180 mm, d 32 mm → Ø 200 mm, d 19 mm	EI 60-U/U with combustible insulation B-s3, d0
Surface-mounted, construction thickness ≥ 100 mm		PROMASTOP®-FC6 s 1,8 - 21,9 mm limits: Ø 32 - 180 mm, d 6 - 32 mm	EI 120-U/C with combustible insulation B-s3, d0
Surface-mounted, construction thickness ≥ 100 mm		PROMASTOP®-FC6 s 1,8 - 21,9 mm lower limits: Ø 32 mm, d 6 mm → Ø 160 mm, d 6 mm → Ø 200 mm, d 6 mm upper limits: Ø 32 mm, d 32 mm → Ø 160 mm, d 32 mm → Ø 200 mm, d 19 mm	EI 60-U/C with combustible insulation B-s3, d0
	Surface-mounted, construction thickness ≥ 150 mm	PROMASTOP®-FC6 with Promat SPC s 1,8 - 21,9 mm limits: Ø 32 - 160 mm, d 6 - 32 mm	EI 90-U/C with combustible insulation B-s3, d0
	Surface-mounted, construction thickness ≥ 150 mm	PROMASTOP®-FC6 with Promat SPC s 1,8 - 21,9 mm lower limits: Ø 32 mm, d 6 mm → Ø 160 mm, d 6 mm → Ø 200 mm, d 6 mm upper limits: Ø 32 mm, d 32 mm → Ø 160 mm, d 32 mm → Ø 200 mm, d 19 mm	EI 60-U/C with combustible insulation B-s3, d0
PP-H and PP-R pipes for pipe penetrations at 45°			
Surface-mounted, construction thickness ≥ 150 mm		PROMASTOP®-FC6 lower limits: Ø 32 mm, s 1,8 mm → Ø 63 mm, s 1,8 mm → Ø 125 mm, s 3,1 mm upper limits: Ø 32 mm, s 5,4 mm → Ø 63 mm, s 5,4 mm → Ø 125 mm, s 7,1 mm	EI 120-U/U
	Surface-mounted, construction thickness ≥ 150 mm	PROMASTOP®-FC6 lower limits: Ø 32 mm, s 1,8 mm → Ø 63 mm, s 1,8 mm → Ø 160 mm, s 4,0 mm upper limits: Ø 32 mm, s 5,4 mm → Ø 63 mm, s 5,4 mm → Ø 160 mm, s 6,2 mm	EI 120-U/U
PVC-U and PVC-C pipes for pipe penetrations at 90°			
Surface-mounted or built-in, construction thickness ≥ 150 mm	Surface-mounted or built-in, construction thickness ≥ 150 mm	PROMASTOP®-FC3 lower limits: Ø 32 mm, s 1,8 mm → Ø 63 mm, s 1,8 mm → Ø 125 mm, s 3,1 mm upper limits: Ø 32 mm, s 5,8 mm → Ø 63 mm, s 5,8 mm → Ø 125 mm, s 7,1 mm PROMASTOP®-FC6 (couplings tested up to Ø 125 mm) lower limits: Ø 50 mm, s 1,8 mm → Ø 63 mm, s 1,8 mm → Ø 125 mm, s 3,1 mm → Ø 250 mm, s 4,9 mm upper limits: Ø 50 mm, s 5,8 mm → Ø 63 mm, s 5,8 mm → Ø 125 mm, s 7,1 mm → Ø 250 mm, s 4,9 mm	EI 120-U/U
Surface-mounted, construction thickness ≥ 150 mm		PROMASTOP®-FC6 lower limits: Ø 50 mm, s 1,8 mm → Ø 63 mm, s 1,8 mm → Ø 125 mm, s 3,1 mm → Ø 160 mm, s 4,0 mm → Ø 315 mm, s 7,7 mm upper limits: Ø 50 mm, s 5,8 mm → Ø 63 mm, s 5,8 mm → Ø 125 mm, s 4,8 mm → Ø 160 mm, s 6,2 mm → Ø 315 mm, s 7,7 mm	EI 180-U/U

Wall requirement	Floor requirement	Dimension range Ø: outer pipe diameter [mm] s: pipe wall thickness [mm] d: insulation thickness [mm]	Classification
Surface-mounted, construction thickness ≥ 150 mm		PROMASTOP®-FC6 lower limits: Ø 50 mm, s 1,8 mm → Ø 63 mm, s 1,8 mm → Ø 125 mm, s 3,1 mm → Ø 160 mm, s 4,0 mm upper limits: Ø 50 mm, s 5,8 mm → Ø 63 mm, s 5,8 mm → Ø 125 mm, s 4,8 mm → Ø 160 mm, s 6,2 mm	EI 240-U/U
Surface-mounted, construction thickness ≥ 100 mm		PROMASTOP®-FC3 lower limits: Ø 32 mm, s 1,8 mm → Ø 63 mm, s 1,8 mm → Ø 125 mm, s 3,1 mm → Ø 160 mm, s 4,0 mm upper limits: Ø 32 mm, s 5,4 mm → Ø 63 mm, s 5,4 mm → Ø 125 mm, s 11,4 mm → Ø 160 mm, s 14,6 mm PROMASTOP®-FC6 lower limits: Ø 50 mm, s 1,8 mm → Ø 63 mm, s 1,8 mm → Ø 125 mm, s 3,1 mm → Ø 160 mm, s 4,0 mm → Ø 200 mm, s 4,9 mm → Ø 250 mm, s 7,2 mm upper limits: Ø 50 mm, s 5,4 mm → Ø 63 mm, s 5,4 mm → Ø 125 mm, s 11,4 mm → Ø 160 mm, s 14,6 mm → Ø 250 mm, s 11,9 mm	EI 120-U/C
Surface-mounted, construction thickness ≥ 150 mm		PROMASTOP®-FC6 lower limits: Ø 50 mm, s 1,8 mm → Ø 63 mm, s 1,8 mm → Ø 125 mm, s 3,1 mm → Ø 160 mm, s 4,0 mm upper limits: Ø 50 mm, s 5,8 mm → Ø 63 mm, s 5,8 mm → Ø 125 mm, s 11,4 mm → Ø 160 mm, s 14,6 mm	EI 240-U/C
	Surface-mounted, construction thickness ≥ 150 mm	PROMASTOP®-FC3 lower limits: Ø 32 mm, s 1,8 mm → Ø 63 mm, s 1,8 mm → Ø 125 mm, s 3,1 mm upper limits: Ø 32 mm, s 5,8 mm → Ø 63 mm, s 5,8 mm → Ø 125 mm, s 11,4 mm PROMASTOP®-FC6 lower limits: Ø 50 mm, s 1,8 mm → Ø 63 mm, s 1,8 mm → Ø 125 mm, s 3,1 mm → Ø 250 mm, s 4,9 mm upper limits: Ø 50 mm, s 5,4 mm → Ø 63 mm, s 5,4 mm → Ø 125 mm, s 11,4 mm → Ø 250 mm, s 4,9 mm	EI 120-U/C
PVC-U and PVC-C pipes for pipe penetrations at 90°			
	Surface-mounted, construction thickness ≥ 150 mm	PROMASTOP®-FC6 lower limits: Ø 50 mm, s 1,8 mm → Ø 63 mm, s 1,8 mm → Ø 125 mm, s 3,1 mm → Ø 250 mm, s 4,9 mm → Ø 315 mm, s 7,7 mm upper limits: Ø 50 mm, s 5,4 mm → Ø 63 mm, s 5,4 mm → Ø 125 mm, s 11,4 mm → Ø 250 mm, s 11,9 mm → Ø 315 mm, s 18,7 mm	EI 90-U/C
Surface-mounted, construction thickness ≥ 100 mm		PROMASTOP®-FC6 s 2,0 - 6,2 mm limits: Ø 32 - 180 mm, d 6 - 32 mm	EI 120-U/U with combustible insulation B-s3, d0
Surface-mounted, construction thickness ≥ 100 mm		PROMASTOP®-FC6 s 2,0 - 6,2 mm lower limits: Ø 32 mm, d 6 mm → Ø 180 mm, d 6 mm → Ø 200 mm, d 6 mm upper limits: Ø 32 mm, d 32 mm → Ø 180 mm, d 32 mm → Ø 200 mm, d 19 mm	EI 60-U/U with combustible insulation B-s3, d0

Wall requirement	Floor requirement	Dimension range Ø: outer pipe diameter [mm] s: pipe wall thickness [mm] d: insulation thickness [mm]	Classification
	Surface-mounted, construction thickness ≥ 150 mm	PROMASTOP®-FC6 with Promat SPC limits: Ø 32 - 200 mm, d 6 - 19 mm	EI 120-U/U with combustible insulation B-s3, d0
Surface-mounted, construction thickness ≥ 100 mm		PROMASTOP®-FC6 s 1,8 - 8,6 mm limits: Ø 32 - 200 mm, d 6 - 19 mm	EI 120-U/C with combustible insulation B-s3, d0
Surface-mounted, construction thickness ≥ 100 mm		PROMASTOP®-FC6 with Promat SPC s 1,8 - 8,6 mm lower limits: Ø 32 mm, d 6 mm → Ø 180 mm, d 6 mm → Ø 200 mm, d 6 mm upper limits: Ø 32 mm, d 32 mm → Ø 180 mm, d 32 mm → Ø 200 mm, d 19 mm	EI 60-U/C with combustible insulation B-s3, d0
	Surface-mounted, construction thickness ≥ 150 mm	PROMASTOP®-FC6 with Promat SPC s 1,8 - 8,6 mm lower limits: Ø 32 mm, d 6 mm → Ø 180 mm, d 6 mm → Ø 200 mm, d 6 mm upper limits: Ø 32 mm, d 32 mm → Ø 180 mm, d 32 mm → Ø 200 mm, d 19 mm	EI 120-U/C with combustible insulation B-s3, d0
PVC-U and PVC-C pipes for pipe penetrations at 45°			
Surface-mounted, construction thickness ≥ 150 mm		PROMASTOP®-FC6 lower limits: Ø 32 mm, s 1,8 mm → Ø 63 mm, s 1,8 mm → Ø 125 mm, s 3,1 mm upper limits: Ø 32 mm, s 5,4 mm → Ø 63 mm, s 5,4 mm → Ø 125 mm, s 7,1 mm	EI 120-U/U
	Surface-mounted, construction thickness ≥ 150 mm	PROMASTOP®-FC6 (couplings tested up to Ø 160 mm) lower limits: Ø 32 mm, s 1,8 mm → Ø 63 mm, s 1,8 mm → Ø 160 mm, s 4,0 mm upper limits: Ø 32 mm, s 5,4 mm → Ø 63 mm, s 5,4 mm → Ø 160 mm, s 6,2 mm	EI 120-U/U
POLOPLAST POLO-KAL NG pipes for pipe penetrations at 90°			
Surface-mounted or built-in, construction thickness ≥ 150 mm	Surface-mounted or built-in, construction thickness ≥ 150 mm	PROMASTOP®-FC3 limits: Ø 32 mm, s 1,8 mm → Ø 40 mm, s 1,8 mm → Ø 50 mm, s 2,0 mm → Ø 75 mm, s 2,6 mm → Ø 110 mm, s 3,4 mm → Ø 125 mm, s 3,9 mm → Ø 160 mm, s 4,9 mm PROMASTOP®-FC6 (couplings tested up to Ø 125 mm) limits: Ø 50 mm, s 2,0 mm → Ø 75 mm, s 2,6 mm → Ø 110 mm, s 3,4 mm → Ø 125 mm, s 3,9 mm → Ø 160 mm, s 4,9 mm → Ø 200 mm, s 6,8 mm → Ø 250 mm, s 8,6 mm	EI 120-U/U
POLOPLAST POLO-KAL NG pipes for pipe penetrations at 90°			
Surface-mounted, construction thickness ≥ 100 mm		PROMASTOP®-FC6 limits: Ø 32 - 160 mm, d 6 - 32 mm	EI 90-U/U with combustible insulation B-s3, d0
	Surface-mounted, construction thickness ≥ 150 mm	PROMASTOP®-FC6 with Promat SPC limits: Ø 32 - 160 mm, d 6 - 32 mm	EI 90-U/U with combustible insulation B-s3, d0
POLOPLAST POLO-KAL NG pipes for pipe penetrations at 45°			
Surface-mounted, construction thickness ≥ 150 mm		PROMASTOP®-FC6 limits: Ø 32 mm, s 1,8 mm → Ø 40 mm, s 1,8 mm → Ø 50 mm, s 2,0 mm → Ø 75 mm, s 2,6 mm → Ø 110 mm, s 3,4 mm → Ø 125 mm, s 3,9 mm	EI 120-U/U
	Surface-mounted, construction thickness ≥ 150 mm	PROMASTOP®-FC6 (couplings tested up to Ø 160 mm) limits: Ø 32 mm, s 1,8 mm → Ø 40 mm, s 1,8 mm → Ø 50 mm, s 2,0 mm → Ø 75 mm, s 2,6 mm → Ø 110 mm, s 3,4 mm → Ø 125 mm, s 3,9 mm → Ø 160 mm, s 4,9 mm	EI 120-U/U
POLOPLAST POLO-KAL XS pipes for pipe penetrations at 90°			
Surface-mounted or built-in, construction thickness ≥ 150 mm	Surface-mounted or built-in, construction thickness ≥ 150 mm	PROMASTOP®-FC3 limits: Ø 32 mm, s 1,8 mm → Ø 40 mm, s 1,8 mm → Ø 50 mm, s 2,0 mm → Ø 75 mm, s 2,6 mm → Ø 110 mm, s 3,4 mm PROMASTOP®-FC6 (couplings tested up to Ø 110 mm) limits: Ø 50 mm, s 2,0 mm → Ø 75 mm, s 2,6 mm → Ø 110 mm, s 3,4 mm	EI 120-U/U

Wall requirement	Floor requirement	Dimension range Ø: outer pipe diameter [mm] s: pipe wall thickness [mm] d: insulation thickness [mm]	Classification
POLOPLAST POLO-KAL XS pipes for pipe penetrations at 45°			
Surface-mounted, construction thickness ≥ 150 mm		PROMASTOP®-FC6 limits: Ø 32 mm, s 1,8 mm → Ø 40 mm, s 1,8 mm → Ø 50 mm, s 2,0 mm → Ø 75 mm, s 2,6 mm → Ø 110 mm, s 3,4 mm	EI 120-U/U
	Surface-mounted, construction thickness ≥ 150 mm	PROMASTOP®-FC6 (couplings tested up to Ø 110 mm) limits: Ø 32 mm, s 1,8 mm → Ø 40 mm, s 1,8 mm → Ø 50 mm, s 2,0 mm → Ø 75 mm, s 2,6 mm → Ø 110 mm, s 3,4 mm	EI 120-U/U
POLOPLAST POLO-KAL 3S pipes for pipe penetrations at 90°			
Surface-mounted or built-in, construction thickness ≥ 150 mm	Surface-mounted or built-in, construction thickness ≥ 150 mm	PROMASTOP®-FC3 limits: Ø 75 mm, s 3,8 mm → Ø 110 mm, s 4,8 mm → Ø 125 mm, s 5,3 mm → Ø 160 mm, s 7,5 mm PROMASTOP®-FC6 (couplings tested up to Ø 125 mm) limits: Ø 75 mm, s 3,8 mm → Ø 110 mm, s 4,8 mm → Ø 125 mm, s 5,3 mm → Ø 160 mm, s 7,5 mm	EI 120-U/U
Surface-mounted, construction thickness ≥ 100 mm		PROMASTOP®-FC6 limits: Ø 75 - 160 mm, d 6 - 32 mm	EI 120-U/U with combustible insulation B-s3, d0
	Surface-mounted, construction thickness ≥ 150 mm	PROMASTOP®-FC6 with Promat SPC limits: Ø 75 - 160 mm, d 6 - 19 mm	EI 120-U/U with combustible insulation B-s3, d0
	Surface-mounted, construction thickness ≥ 150 mm	PROMASTOP®-FC6 with Promat SPC limits: Ø 75 - 160 mm, d 6 - 32 mm	EI 60-U/U with combustible insulation B-s3, d0
POLOPLAST POLO-KAL 3S pipes for pipe penetrations at 45°			
Surface-mounted, construction thickness ≥ 150 mm		PROMASTOP®-FC6 limits: Ø 75 mm, s 3,8 mm → Ø 110 mm, s 4,8 mm → Ø 125 mm, s 5,3 mm	EI 120-U/U
	Surface-mounted, construction thickness ≥ 150 mm	PROMASTOP®-FC6 (couplings tested up to Ø 160 mm) limits: Ø 75 mm, s 3,8 mm → Ø 110 mm, s 4,8 mm → Ø 125 mm, s 5,3 mm → Ø 160 mm, s 7,5 mm	EI 120-U/U
POLOPLAST POLO ECO plus Premium 10 pipes for pipe penetrations at 90°			
Surface-mounted, construction thickness ≥ 150 mm	Surface-mounted, construction thickness ≥ 150 mm	PROMASTOP®-FC6 limits: Ø 110 mm, s 3,9 mm → Ø 125 mm, s 4,8 mm → Ø 160 mm, s 5,6 mm → Ø 200 mm, s 6,9 mm → Ø 250 mm, s 8,5 mm PROMASTOP®-FC15 limits: Ø 315 mm, s 10,8 mm → Ø 400 mm, s 13,6 mm	EI 120-U/U
Pipelife MASTER 3 pipes for pipe penetrations at 90°			
Surface-mounted or built-in, construction thickness ≥ 150 mm	Surface-mounted or built-in, construction thickness ≥ 150 mm	PROMASTOP®-FC3 limits: Ø 32 mm, s 1,8 mm → Ø 40 mm, s 1,8 mm → Ø 50 mm, s 1,8 mm → Ø 75 mm, s 2,1 mm → Ø 110 mm, s 3,0 mm → Ø 125 mm, s 3,5 mm PROMASTOP®-FC6 (couplings tested up to Ø 125 mm) limits: Ø 50 mm, s 1,8 mm → Ø 75 mm, s 2,1 mm → Ø 110 mm, s 3,0 mm → Ø 125 mm, s 3,5 mm → Ø 160 mm, s 4,4 mm	EI 120-U/U
Geberit Silent-db20 pipes for pipe penetrations at 90°			
Surface-mounted or built-in, construction thickness ≥ 150 mm	Surface-mounted or built-in, construction thickness ≥ 150 mm	PROMASTOP®-FC3 limits: Ø 56 mm, s 3,2 mm → Ø 63 mm, s 3,2 mm → Ø 75 mm, s 3,6 mm → Ø 90 mm, s 5,5 mm → Ø 110 mm, s 6,0 mm PROMASTOP®-FC6 (couplings tested up to Ø 135 mm) limits: Ø 56 mm, s 3,2 mm → Ø 63 mm, s 3,2 mm → Ø 75 mm, s 3,6 mm → Ø 90 mm, s 5,5 mm → Ø 110 mm, s 6,0 mm → Ø 135 mm, s 6,0 mm → Ø 160 mm, s 7,0 mm	EI 120-U/U

Wall requirement	Floor requirement	Dimension range Ø: outer pipe diameter [mm] s: pipe wall thickness [mm] d: insulation thickness [mm]	Classification
Surface-mounted, construction thickness ≥ 100 mm		PROMASTOP®-FC6 limits: Ø 56 - 160 mm, d 6 - 32 mm	EI 120-U/U with combustible insulation B-s3, d0
	Surface-mounted, construction thickness ≥ 150 mm	PROMASTOP®-FC6 with Promat SPC limits: Ø 56 - 160 mm, d 6 - 32 mm	EI 120-U/U with combustible insulation B-s3, d0
Geberit Silent-PP pipes for pipe penetrations at 90°			
Surface-mounted or built-in, construction thickness ≥ 150 mm	Surface-mounted or built-in, construction thickness ≥ 150 mm	PROMASTOP®-FC3 limits: Ø 32 mm, s 2,0 mm → Ø 50 mm, s 2,0 mm → Ø 75 mm, s 2,6 mm → Ø 90 mm, s 3,1 mm → Ø 110 mm, s 3,6 mm → Ø 125 mm, s 4,2 mm PROMASTOP®-FC6 (couplings tested up to Ø 125 mm) limits: Ø 32 mm, s 2,0 mm → Ø 50 mm, s 2,0 mm → Ø 75 mm, s 2,6 mm → Ø 90 mm, s 3,1 mm → Ø 110 mm, s 3,6 mm → Ø 125 mm, s 4,2 mm → Ø 160 mm, s 5,2 mm	EI 120-U/U
Surface-mounted, construction thickness ≥ 100 mm		PROMASTOP®-FC6 limits: Ø 32 - 160 mm, d 6 - 32 mm	EI 120-U/U with combustible insulation B-s3, d0
	Surface-mounted, construction thickness ≥ 150 mm	PROMASTOP®-FC6 with Promat SPC limits: Ø 32 - 160 mm, d 6 mm	EI 120-U/U with combustible insulation B-s3, d0
	Surface-mounted, construction thickness ≥ 150 mm	PROMASTOP®-FC6 with Promat SPC limits: Ø 32 - 160 mm, d 6 - 32 mm	EI 60-U/U with combustible insulation B-s3, d0
REHAU RAUPIANO PLUS pipes for pipe penetrations at 90°			
Surface-mounted or built-in, construction thickness ≥ 150 mm	Surface-mounted or built-in, construction thickness ≥ 150 mm	PROMASTOP®-FC6 (couplings tested up to Ø 125 mm) limits: Ø 40 mm, s 1,8 mm → Ø 50 mm, s 1,8 mm → Ø 125 mm, s 3,1 mm → Ø 160 mm, s 3,9 mm → Ø 200 mm, s 6,2 mm	EI 120-U/U
Surface-mounted, construction thickness ≥ 100 mm		PROMASTOP®-FC6 limits: Ø 32 - 200 mm, d 6 - 19 mm	EI 120-U/U with combustible insulation B-s3, d0
Surface-mounted, construction thickness ≥ 100 mm		PROMASTOP®-FC6 lower limits: Ø 32 mm, d 6 mm → Ø 160 mm, d 6 mm → Ø 200 mm, d 6 mm upper limits: Ø 32 mm, d 32 mm → Ø 160 mm, d 32 mm → Ø 200 mm, d 19 mm	EI 90-U/U with combustible insulation B-s3, d0
	Surface-mounted, construction thickness ≥ 150 mm	PROMASTOP®-FC6 with Promat SPC limits: Ø 32 - 200 mm, d 6 - 19 mm	EI 120-U/U with combustible insulation B-s3, d0
	Surface-mounted, construction thickness ≥ 150 mm	PROMASTOP®-FC6 with Promat SPC lower limits: Ø 32 mm, d 6 mm → Ø 160 mm, d 6 mm → Ø 200 mm, d 6 mm upper limits: Ø 32 mm, d 32 mm → Ø 160 mm, d 32 mm → Ø 200 mm, d 19 mm	EI 60-U/U with combustible insulation B-s3, d0
REHAU RAUPIANO PLUS pipes for pipe penetrations at 45°			
	Surface-mounted, construction thickness ≥ 150 mm	PROMASTOP®-FC6 (couplings tested up to Ø 160 mm) limits: Ø 40 mm, s 1,8 mm → Ø 50 mm, s 1,8 mm → Ø 125 mm, s 3,1 mm → Ø 160 mm, s 3,9 mm	EI 120-U/U

Wall requirement	Floor requirement	Dimension range Ø: outer pipe diameter [mm] s: pipe wall thickness [mm] d: insulation thickness [mm]	Classification
Nicoll dBlue pipes for pipe penetrations at 90°			
Surface-mounted or built-in, construction thickness ≥ 150 mm	Surface-mounted or built-in, construction thickness ≥ 150 mm	PROMASTOP®-FC3 limits: Ø 50 mm, s 1,8 mm → Ø 125 mm, s 3,9 mm	EI 120-U/U
Girpi Friaphon pipes for pipe penetrations at 90°			
Surface-mounted or built-in, construction thickness ≥ 150 mm	Surface-mounted or built-in, construction thickness ≥ 150 mm	PROMASTOP®-FC3 limits: Ø 52 mm, s 2,8 mm → Ø 78 mm, s 4,9 mm → Ø 110 mm, s 5,3 mm PROMASTOP®-FC6 limits: Ø 52 mm, s 2,8 mm → Ø 78 mm, s 4,9 mm → Ø 110 mm, s 5,3 mm → Ø 135 mm, s 5,6 mm → Ø 160 mm, s 6,3 mm	EI 120-U/U
Friatec Friaphon pipes for pipe penetrations at 90°			
	Surface-mounted, construction thickness ≥ 150 mm	PROMASTOP®-FC6 limits: Ø 52 mm, s 2,8 mm → Ø 78 mm, s 4,9 mm → Ø 110 mm, s 5,3 mm → Ø 135 mm, s 5,6 mm → Ø 160 mm, s 6,3 mm d 4 mm (LS configuration, total centred insulation length 320 mm)	EI 120-U/U with combustible sound decoupling strip, Class E
Girpi HTA-E pipes for pipe penetrations at 90°			
Surface-mounted or built-in, construction thickness ≥ 150 mm	Surface-mounted or built-in, construction thickness ≥ 150 mm	PROMASTOP®-FC6 limits: Ø 40 mm, s 3,0 mm → Ø 50 mm, s 3,7 mm → Ø 63 mm, s 4,7 mm → Ø 75 mm, s 5,5 mm → Ø 90 mm, s 6,6 mm → Ø 110 mm, s 5,3 mm → Ø 125 mm, s 6,0 mm	EI 120-U/U
KE KELIT Phonex AS pipes for pipe penetrations at 90°			
Surface-mounted or built-in, construction thickness ≥ 150 mm	Surface-mounted or built-in, construction thickness ≥ 150 mm	PROMASTOP®-FC6 limits: Ø 58 mm, s 4,0 mm → Ø 78 mm, s 4,5 mm → Ø 110 mm, s 5,3 mm → Ø 135 mm, s 5,3 mm → Ø 160 mm, s 5,3 mm	EI 120-U/U
Wavin AS pipes for pipe penetrations at 90°			
Surface-mounted or built-in, construction thickness ≥ 150 mm	Surface-mounted or built-in, construction thickness ≥ 150 mm	PROMASTOP®-FC6 limits: Ø 58 mm, s 4,0 mm → Ø 78 mm, s 4,5 mm → Ø 110 mm, s 5,3 mm → Ø 135 mm, s 5,3 mm → Ø 160 mm, s 5,3 mm	EI 120-U/U
Wavin SiTech+ pipes for pipe penetrations at 90°			
Surface-mounted or built-in, construction thickness ≥ 150 mm	Surface-mounted or built-in, construction thickness ≥ 150 mm	PROMASTOP®-FC6 limits: Ø 50 mm, s 1,8 mm → Ø 125 mm, s 3,9 mm → Ø 160 mm, s 4,9 mm	EI 120-U/U
Marley Silent pipes for pipe penetrations at 90°			
Surface-mounted or built-in, construction thickness ≥ 150 mm	Surface-mounted or built-in, construction thickness ≥ 150 mm	PROMASTOP®-FC6 limits: Ø 75 mm, s 2,5 mm → Ø 110 mm, s 3,0 mm	EI 120-U/U

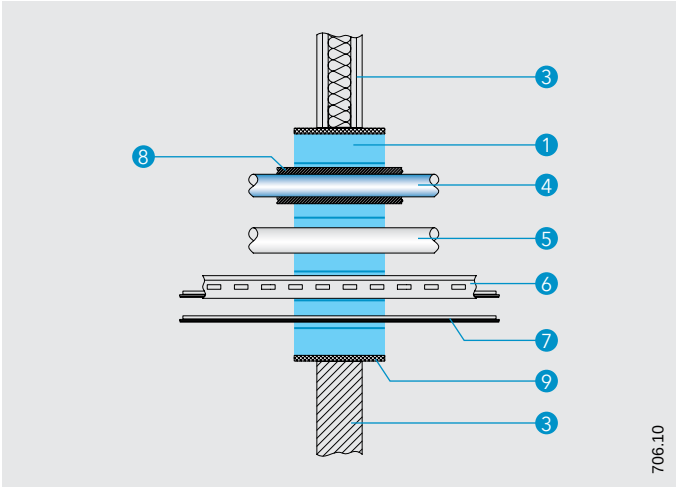
9. Information about the minimum distances in PROMASTOP®-M penetration seals

Table 11

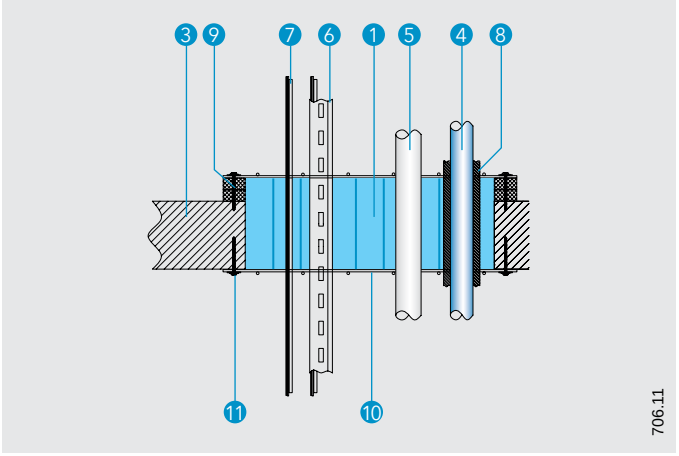
Sufficient space needs to be provided for the construction of professional applications. For practical and physical reasons, we recommend observing a minimum distance of 100 mm between installed objects and support construction/component framing during planning.
If this is impossible due to the situation on the construction site, the permitted minimum distances shall be taken from Table 11.

Table 11 – Minimum distances

Object	Minimum distance [mm]
Non-combustible insulation – Non-combustible insulation	0
Non-combustible insulation – Supporting construction/aperture framing	10
Cables, cable trays, cable ladders – Supporting construction/aperture framing	0
Cables, cables trays – Cables, cable trays, cable ladders	0
PROMASTOP®-FC – Cables, cable bundles, cable trays, cable ladders	0
PROMASTOP®-FC – PROMASTOP®-FC	0
PROMASTOP®-FC – Supporting construction/aperture framing	10
PROMASTOP®-FC – PROMASTOP®-B	10
PROMASTOP®-B – Supporting construction/aperture framing	0
Between all other objects not further defined	100



Detail A – PROMASTOP®-B mixed penetration seal with aperture framing in flexible and rigid wall



Detail B – PROMASTOP®-B mixed penetration seal with aperture framing in rigid floor

Technical data

1. PROMASTOP®-B
2. PROMASTOP®-FC
3. Supporting construction
4. Non-combustible pipes
5. Plastic pipes
6. Cable tray
7. Cables, cable bundles
8. Combustible insulation/non-combustible insulation
9. Aperture framing
10. Steel mesh
11. Suitable fastening material
12. Identification label

Certificates: ETA-15/0243, IBS CR 315011508-A-en, IBS CR 13061206-A,Rev1-en

Customer benefit

- Cold smoke-tight
- Quick, easy and dry installation
- Fibre-free penetration seal
- Simple, custom-fit shape

1. Installation

The depth of the penetration seal is always 200 mm, regardless of the thickness of the supporting construction. If the thickness of the supporting construction is smaller than 200 mm (except in PROMASTOP®-M mortar penetration seal, where 150 mm required), an aperture framing (plasterboard or calcium silicate board) is needed. The length (depth) of the aperture framing must be 200 mm and located in the middle of the supporting construction (see Detail A).
Alternative board strips (board types mentioned above) are installed around the opening (board strip width ≤ 50 mm) on the top side of the floor or on both sides of the flexible or rigid wall to reach the minimum thickness (see Details B, C and D).

Steps for penetration seal in walls

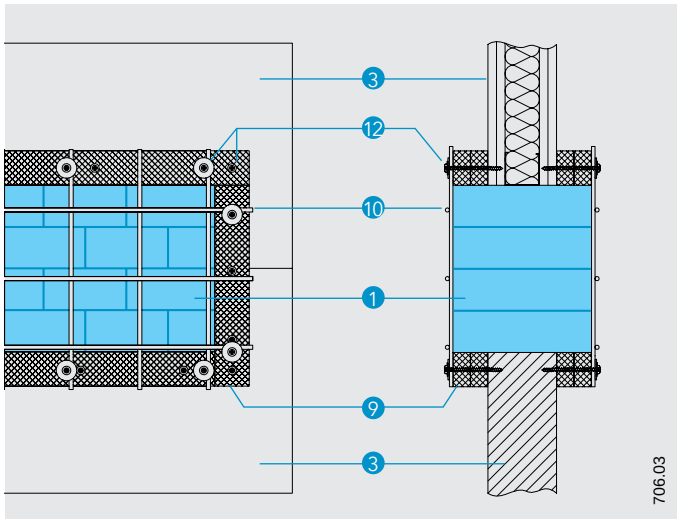
- An aperture framing of 200 mm is necessary.
- Insert the bricks following brick construction methods.
- Cut the bricks for the penetrating services to a size slightly larger than needed and insert by pressing them together.
- Seal the gaps between the cables and cable bundles with PROMASEAL®-AG on one side (not necessary for pipes).
- For the final row, cut the fire stopping bricks to a size slightly larger (approx. 5-7 mm) than needed, press them together and push them into the remaining opening.
- Label the penetration seal.

Steps for penetration seal in floors

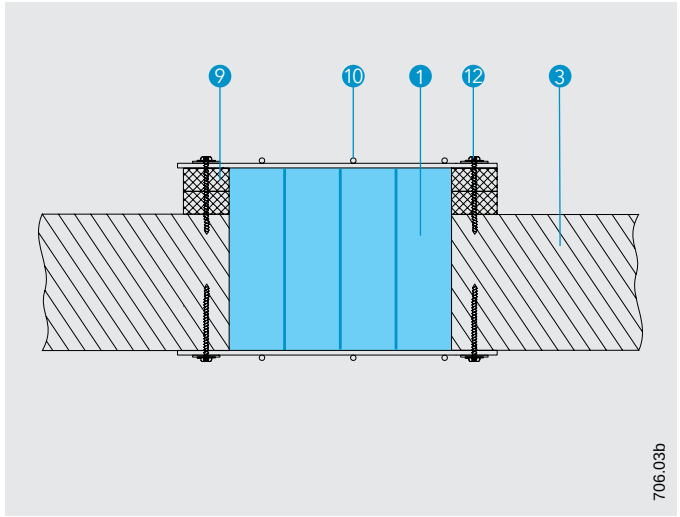
- Install steel mesh (mesh width ≤ 100 × 100 mm) as an installation support on the bottom side of the floor.
- Seal the gaps between the cables and cable bundles with PROMASEAL®-AG on one side.
- Cut the bricks for the penetrating services to a size slightly larger than needed and insert by pressing them together.
- Insert PROMASTOP®-B following brick construction methods.
- For the final row, cut the fire stopping bricks to a size slightly larger (approx. 5-7 mm) than needed, press them together and slide them into the remaining opening.
- Label the penetration seal.

Table 1 – Installation situations, maximum seal size and classifications for PROMASTOP®-B

Installation situation	PROMASTOP®-B penetration seal size	Classification blank seal
Flexible wall ≥ 100 mm	≤ 1,44 m²	EI 90
Rigid wall ≥ 100 mm		
Rigid floor ≥ 150 mm		EI 120



Detail C – PROMASTOP®-B blank seal in flexible and rigid wall



Detail D – PROMASTOP®-B blank seal in rigid floor

2. Fields of application

PROMASTOP®-B is used as mixed penetration seal. Fire resistance is classified according to EN 13501-2.

Table 1

Table 1 shows the maximum tested and certified penetration seal sizes, as well as the various installation situations. The maximum dimensions shall be observed and shall not be exceeded.
Combination with PROMASTOP®-M is possible, details of seal sizes, classifications and application in construction sheet 714.

Rigid wall
The wall must have a thickness of ≥ 100 mm and a density of ≥ 450 kg/m³.

Rigid floor
The floor must have a thickness of ≥ 150 mm and a density of ≥ 450 kg/m³.

Flexible wall
The wall must have a thickness of ≥ 100 mm and be made from timber or metal studs which are lined on both sides with a minimum of two layers of 12,5 mm thick fire protective boards (other board thicknesses shall be permissible, please note minimum thickness). For timber stud walls, a minimum distance of 100 mm must be kept from the penetration seal to each of the wooden studs and the cavity between stud and seal must be filled with at least 100 mm of insulation material of Class A1 or A2 (acc. to EN 13501-1).

The classifications for the flexible wall may also be used for rigid walls provided that the thickness and density of the construction are higher than those of the one tested.

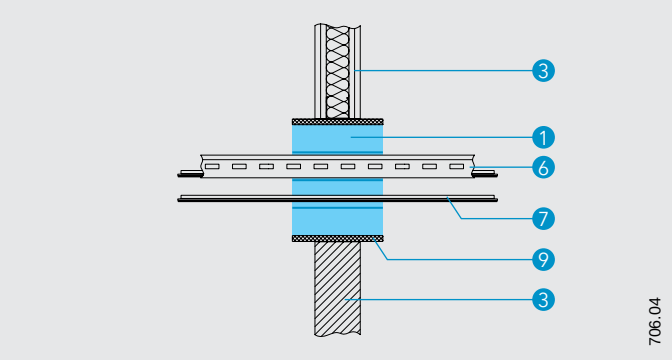
The components (supporting constructions) must be classified acc. to EN 13501-2 for the required fire resistance period.

Details C and D

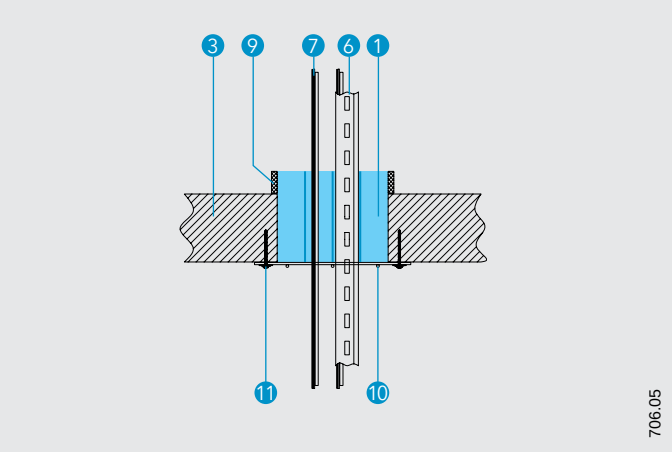
PROMASTOP®-B can be used as a blank penetration seal in flexible and rigid walls and in rigid floors.

Blank seal
For building blank seals use a steel mesh (10), mesh size ≤ 50 mm, thickness ≤ 5 mm, on both sides of the supporting construction (Detail C), for horizontal application use an additional connection between the steel meshes placed on top and bottom side with M8 threaded rods, nuts and washers (Detail D).

3. PROMASTOP®-B cable penetration seal



Detail E – PROMASTOP®-B penetration seal for cables, cable bundles and cable trays in flexible and rigid wall



Detail F – PROMASTOP®-B penetration seal for cables, cable bundles and cable trays in rigid floor

Table 3 – Consumption data for PROMASTOP®-B (pieces)

Cable capacity in %				
Opening size (m²)	0%	10%	30%	60%
≤ 0,01	1	1	1	1
0,02	3	3	2	1
0,03	4	4	3	2
0,04	6	5	4	2
0,05	7	6	5	3
0,1	14	13	10	6
0,2	28	25	19	11
0,3	42	38	29	17
0,4	56	50	39	22
0,5	69	63	49	28

Details E and F

Cable trays and cable ladders may penetrate the PROMASTOP®-B penetration seal.

Steel cable trays (perforated or non-perforated) and steel ladders with organic coatings shall be classified at least A2-s1, d0 according to EN 13501-1.

Fill the gaps between the cables and other gaps on the surface (one sided) with PROMASEAL®-AG, e.g. to prevent the passage of smoke and flue gas.

Table 2 – Classifications in flexible and rigid wall and in rigid floor

Installation	Classification depending on orientation	
	Wall	Floor
CG 1, CG 2 and CG 3: All sheathed cable types, Ø ≤ 80 mm: ≤ 4 × 185 mm² (H07RN-F or equivalent)	E 120 EI 90	E 120 EI 90
CG 4: Cable bundle, Ø ≤ 100 mm	E 120 EI 90	E 120 EI 90
CG 5: Non-sheathed cable types, Ø ≤ 26,3 mm ≤ 1 × 185 mm² (H07V-K, H07Z-K, H07G-K or equivalent)	E 120 EI 90	E 120 EI 90

CG... Cable group acc. to EN 1366-3:2009

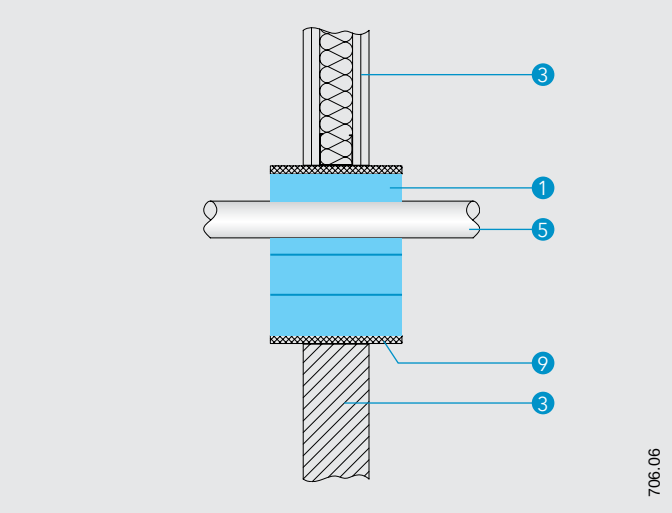
Supporting distance

Cables, cable bundles, cable ladders and cable trays must be suspended/supported ≤ 250 mm on both sides of walls or from the top of the floor.

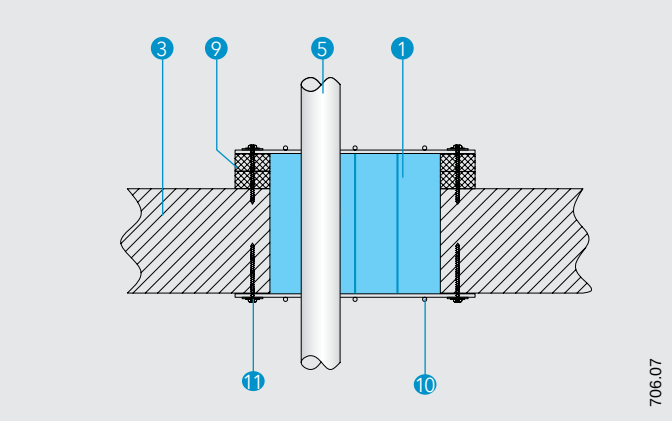
Table 3

Adapt the number of the fire stopping bricks PROMASTOP®-B according to the space required by the cable constructions.

4. PROMASTOP®-B plastic pipe penetration seal



Detail G – PROMASTOP®-B plastic pipe penetration seal in flexible and rigid wall



Detail H – PROMASTOP®-B plastic pipe penetration seal in rigid floor

Details G and H

PVC pipes according to EN 1452-2, DIN 8061 or DIN 8062 may penetrate the PROMASTOP®-B penetration seal.

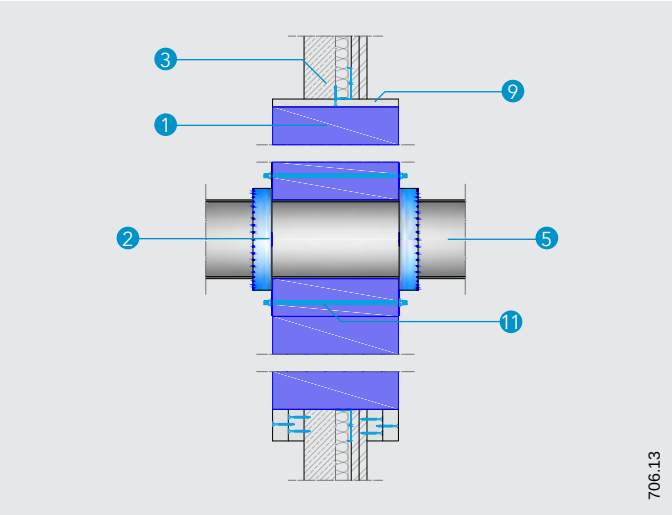
Supporting distance

The pipes must be suspended/supported ≤ 250 mm on both sides of walls or from the top of the floor.

Table 4 – Overview of pipe materials, dimensions, installation situations and classifications

Dimension range Ø: outer pipe diameter [mm] s: pipe wall thickness [mm]	Orientation F: floor W: wall	Classification
PVC pipes		
Ø ≤ 50 mm, s 1,9 mm	F / W	EI 120-U/U
Ø 50 mm, s 1,9 mm → Ø 140 mm, s 10,3 mm	F / W	EI 60-U/U

5. PROMASTOP®-B plastic pipe penetration seal in combination with PROMASTOP®-FC



Detail I – PROMASTOP®-B plastic pipe penetration seal in combination with PROMASTOP®-FC

Detail I

Plastic pipes may penetrate the PROMASTOP®-B penetration seals in combination with surface mounted PROMASTOP®-FC. Classified in flexible and rigid walls, thickness ≥ 100 mm; thickness for the penetration area is 200 mm (larger size of PROMASTOP®-B). Size of the penetration seal up to 1,44 m². If the construction allows using PROMASTOP®-FC3, optionally PROMASTOP®-FC6 may also be used but not vice versa. The collar is fixed in PROMASTOP®-B penetration seals by means of M6/M8 threaded rods on both sides of the wall. Attach the collar to at least 75% of the fixing latches; no two adjacent latches may be left unfixed.

Annular gap sealing

Fill the annular gap with PROMASEAL®-A or PROMASEAL®-AG fire stopping sealant on both sides.

Couplings

The diameter of the tested coupling may be decreased but not increased.

Supporting distance

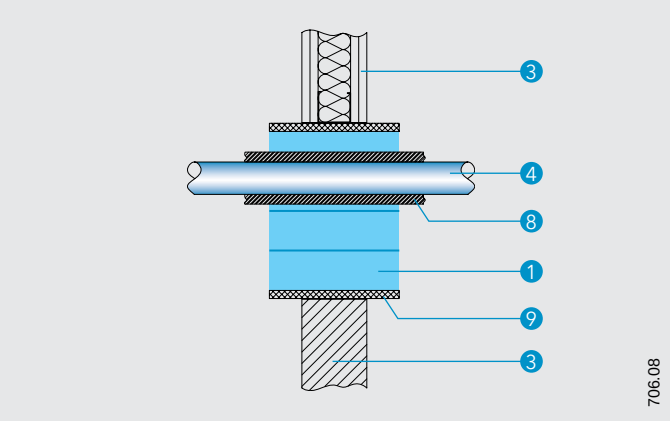
The pipes must be suspended/supported ≤ 250 mm on both sides of the wall.

Table 5 – Overview of pipe materials, dimensions, collar type (PROMASTOP®-FC3 or PROMASTOP®-FC6) and classifications

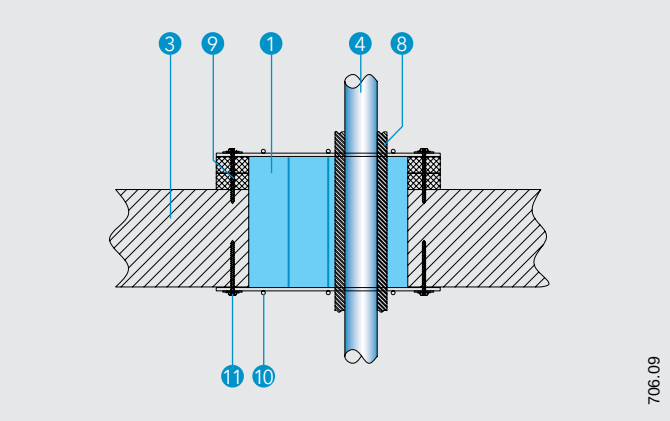
Type of collar	Dimension range Ø: outer pipe diameter [mm] s: pipe wall thickness [mm]	Classification
PE-HD, ABS, SAN + PVC pipes for pipe penetrations at 90°		
PROMASTOP®-FC3	lower limits: Ø 32 mm, s 1,8 mm → Ø 63 mm, s 1,8 mm → Ø 125 mm, s 3,1 mm upper limits: Ø 32 mm, s 5,8 mm → Ø 63 mm, s 5,8 mm → Ø 125 mm, s 7,4 mm	EI 120-U/U
PROMASTOP®-FC6	lower limits: Ø 50 mm, s 1,8 mm → Ø 63 mm, s 1,8 mm → Ø 125 mm, s 3,1 mm → Ø 200 mm, s 4,9 mm upper limits: Ø 50 mm, s 5,8 mm → Ø 63 mm, s 5,8 mm → Ø 125 mm, s 7,4 mm → Ø 200 mm, s 11,4 mm	
PP-H and PP-R pipes for pipe penetrations at 90°		
PROMASTOP®-FC3	lower limits: Ø 32 mm, s 1,8 mm → Ø 63 mm, s 1,8 mm → Ø 125 mm, s 3,1 mm → Ø 160 mm, s 4,0 mm upper limits: Ø 32 mm, s 8,6 mm → Ø 63 mm, s 8,6 mm → Ø 125 mm, s 7,1 mm → Ø 160 mm, s 4,0 mm	EI 120-U/U
PROMASTOP®-FC6	lower limits: Ø 50 mm, s 1,8 mm → Ø 63 mm, s 1,8 mm → Ø 125 mm, s 3,1 mm → Ø 200 mm, s 4,9 mm upper limits: Ø 50 mm, s 8,6 mm → Ø 63 mm, s 8,6 mm → Ø 125 mm, s 7,1 mm → Ø 200 mm, s 11,4 mm	
PVC-U and PVC-C pipes for pipe penetrations at 90°		
PROMASTOP®-FC3	lower limits: Ø 32 mm, s 1,8 mm → Ø 63 mm, s 1,8 mm → Ø 125 mm, s 3,1 mm upper limits: Ø 32 mm, s 5,8 mm → Ø 63 mm, s 5,8 mm → Ø 125 mm, s 7,1 mm	EI 120-U/U
PROMASTOP®-FC6 (couplings tested up to Ø 125 mm)	lower limits: Ø 50 mm, s 1,8 mm → Ø 63 mm, s 1,8 mm → Ø 125 mm, s 3,1 mm → Ø 200 mm, s 4,9 mm upper limits: Ø 50 mm, s 5,8 mm → Ø 63 mm, s 5,8 mm → Ø 125 mm, s 7,1 mm → Ø 200 mm, s 4,9 mm	
POLOPLAST POLO-KAL NG pipes for pipe penetrations at 90°		
PROMASTOP®-FC3	limits: Ø 32 mm, s 1,8 mm → Ø 40 mm, s 1,8 mm → Ø 50 mm, s 2,0 mm → Ø 75 mm, s 2,6 mm → Ø 110 mm, s 3,4 mm → Ø 125 mm, s 3,9 mm → Ø 160 mm, s 4,9 mm	EI 120-U/U
PROMASTOP®-FC6 (couplings tested up to Ø 125 mm)	limits: Ø 50 mm, s 2,0 mm → Ø 75 mm, s 2,6 mm → Ø 110 mm, s 3,4 mm → Ø 125 mm, s 3,9 mm → Ø 160 mm, s 4,9 mm → Ø 200 mm, s 6,8 mm → Ø 250 mm, s 8,6 mm	
POLOPLAST POLO-KAL XS pipes for pipe penetrations at 90°		
PROMASTOP®-FC3	limits: Ø 32 mm, s 1,8 mm → Ø 40 mm, s 1,8 mm → Ø 50 mm, s 2,0 mm → Ø 75 mm, s 2,6 mm → Ø 110 mm, s 3,4 mm	EI 120-U/U
PROMASTOP®-FC6 (couplings tested up to Ø 110 mm)	limits: Ø 50 mm, s 2,0 mm → Ø 75 mm, s 2,6 mm → Ø 110 mm, s 3,4 mm	
POLOPLAST POLO-KAL 3S pipes for pipe penetrations at 90°		
PROMASTOP®-FC3	limits: Ø 75 mm, s 3,8 mm → Ø 110 mm, s 4,8 mm → Ø 125 mm, s 5,3 mm → Ø 160 mm, s 7,5 mm	EI 120-U/U
PROMASTOP®-FC6 (couplings tested up to Ø 125 mm)	limits: Ø 75 mm, s 3,8 mm → Ø 110 mm, s 4,8 mm → Ø 125 mm, s 5,3 mm → Ø 160 mm, s 7,5 mm	
Pipelife MASTER 3 pipes for pipe penetrations at 90°		
PROMASTOP®-FC3	limits: Ø 32 mm, s 1,8 mm → Ø 40 mm, s 1,8 mm → Ø 50 mm, s 1,8 mm → Ø 75 mm, s 2,1 mm → Ø 110 mm, s 3,0 mm → Ø 125 mm, s 3,5 mm	EI 120-U/U
PROMASTOP®-FC6	limits: Ø 50 mm, s 1,8 mm → Ø 75 mm, s 2,1 mm → Ø 110 mm, s 3,0 mm → Ø 125 mm, s 3,5 mm → Ø 160 mm, s 4,4 mm	

Type of collar	Dimension range Ø: outer pipe diameter [mm] s: pipe wall thickness [mm]	Classification
Geberit Silent-db20 pipes for pipe penetrations at 90°		
PROMASTOP®-FC3	limits: Ø 50 mm, s 3,2 mm → Ø 63 mm, s 3,2 mm → Ø 75 mm, s 3,6 mm → Ø 90 mm, s 5,5 mm → Ø 110 mm, s 6,0 mm	EI 120-U/U
PROMASTOP®-FC6 (couplings tested up to Ø 135 mm)	limits: Ø 56 mm, s 3,2 mm → Ø 63 mm, s 3,2 mm → Ø 75 mm, s 3,6 mm → Ø 90 mm, s 5,5 mm → Ø 110 mm, s 6,0 mm → Ø 135 mm, s 6,0 mm → Ø 160 mm, s 7,0 mm	
Geberit Silent-PP pipes for pipe penetrations at 90°		
PROMASTOP®-FC3	limits: Ø 32 mm, s 2,0 mm → Ø 40 mm, s 2,0 mm → Ø 50 mm, s 2,0 mm → Ø 75 mm, s 2,6 mm → Ø 90 mm, s 3,1 mm → Ø 110 mm, s 3,6 mm → Ø 125 mm, s 4,2 mm	EI 120-U/U
PROMASTOP®-FC6	limits: Ø 32 mm, s 2,0 mm → Ø 40 mm, s 2,0 mm → Ø 50 mm, s 2,0 mm → Ø 75 mm, s 2,6 mm → Ø 90 mm, s 3,1 mm → Ø 110 mm, s 3,6 mm → Ø 125 mm, s 4,2 mm → Ø 160 mm, s 5,2 mm	
REHAU RAUPIANO PLUS pipes for pipe penetrations at 90°		
PROMASTOP®-FC6 (couplings tested up to Ø 125 mm)	limits: Ø 40 mm, s 1,8 mm → Ø 50 mm, s 1,8 mm → Ø 125 mm, s 3,1 mm → Ø 160 mm, s 3,9 mm → Ø 200 mm, s 6,2 mm	EI 120-U/U
Nicoll dBlue pipes for pipe penetrations at 90°		
PROMASTOP®-FC3	limits: Ø 50 mm, s 1,8 mm → Ø 125 mm, s 3,9 mm	EI 120-U/U
Girpi Friaphon pipes for pipe penetrations at 90°		
PROMASTOP®-FC3	limits: Ø 52 mm, s 2,8 mm → Ø 78 mm, s 4,9 mm → Ø 110 mm, s 5,3 mm	EI 120-U/U
PROMASTOP®-FC6	limits: Ø 52 mm, s 2,8 mm → Ø 78 mm, s 4,9 mm → Ø 110 mm, s 5,3 mm → Ø 135 mm, s 5,6 mm → Ø 160 mm, s 6,3 mm	
Girpi HTA-E pipes for pipe penetrations at 90°		
PROMASTOP®-FC6	limits: Ø 40 mm, s 3,0 mm → Ø 50 mm, s 3,7 mm → Ø 63 mm, s 4,7 mm → Ø 75 mm, s 5,5 mm → Ø 90 mm, s 6,6 mm → Ø 110 mm, s 5,3 mm → Ø 125 mm, s 6,0 mm	EI 120-U/U
KE KELIT Phonex AS pipes for pipe penetrations at 90°		
PROMASTOP®-FC6	limits: Ø 58 mm, s 4,0 mm → Ø 78 mm, s 4,5 mm → Ø 110 mm, s 5,3 mm → Ø 135 mm, s 5,3 mm → Ø 160 mm, s 5,3 mm	EI 120-U/U
Wavin AS pipes for pipe penetrations at 90°		
PROMASTOP®-FC6	limits: Ø 58 mm, s 4,0 mm → Ø 78 mm, s 4,5 mm → Ø 110 mm, s 5,3 mm → Ø 135 mm, s 5,3 mm → Ø 160 mm, s 5,3 mm	EI 120-U/U
Wavin SiTech+ pipes for pipe penetrations at 90°		
PROMASTOP®-FC6	limits: Ø 50 mm, s 1,8 mm → Ø 125 mm, s 3,9 mm → Ø 160 mm, s 4,9 mm	EI 120-U/U
Marley Silent pipes for pipe penetrations at 90°		
PROMASTOP®-FC6	limits: Ø 75 mm, s 2,5 mm → Ø 110 mm, s 3,0 mm	EI 120-U/U

6. PROMASTOP®-B penetration seal for non-combustible pipes with combustible insulation



Detail J – PROMASTOP®-B penetration seal for non-combustible pipes with combustible insulation in flexible and rigid wall



Detail K – PROMASTOP®-B penetration seal for non-combustible pipes with combustible insulation in rigid floor

Details J and K

Steel and copper pipes (and their substitutes) with combustible insulation (thickness ≤ 32 mm, Class B-s3, d0 or higher rated acc. to EN 13501-1, e.g. made of synthetic rubber) can be sealed with PROMASTOP®-B fire stopping bricks.

Supporting distance

The pipes must be suspended/supported ≤ 250 mm on both sides of walls or from the top of the floor.

Table 6 – Insulation information for non-combustible pipes

Insulation	Specification
Combustible insulation	Class B-s3, d0 or higher rated acc. to EN 13501-1
Insulation thickness	≤ 32 mm
Types of pipe insulation acc. to EN 1366-3	CS, CI

Table 7

The results of steel pipes can also be applied to metal pipes with lower heat conductivity λ ≤ 58 W/mK and melting point ≥ 1083 °C (e.g. stainless steel, cast iron, Ni alloys (NiCr, NiMo, NiCu)).

Results of copper pipes are valid for steel pipes, but not vice versa, and for pipes with λ ≤ 380 W/mK and a melting point of ≥ 1083 °C.

Table 7 – Classification depending on installation orientation

Dimension range Ø: outer pipe diameter [mm] s: pipe wall thickness [mm]	Orientation F: floor W: wall	Classification
Steel pipes		
Ø ≤ 220 mm, s ≤ 18 mm	F / W	EI 120-U/C
Copper pipes		
Ø ≤ 88,9 mm, s ≤ 14,2 mm	F / W	E 120-U/C EI 90-U/C

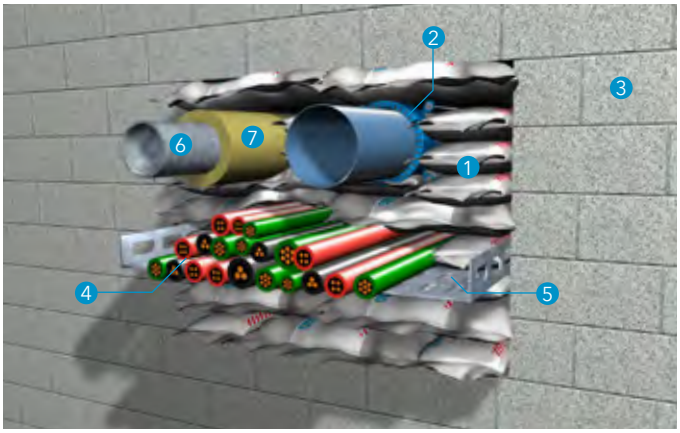
7. Information about the minimum distances in PROMASTOP®-B penetration seals

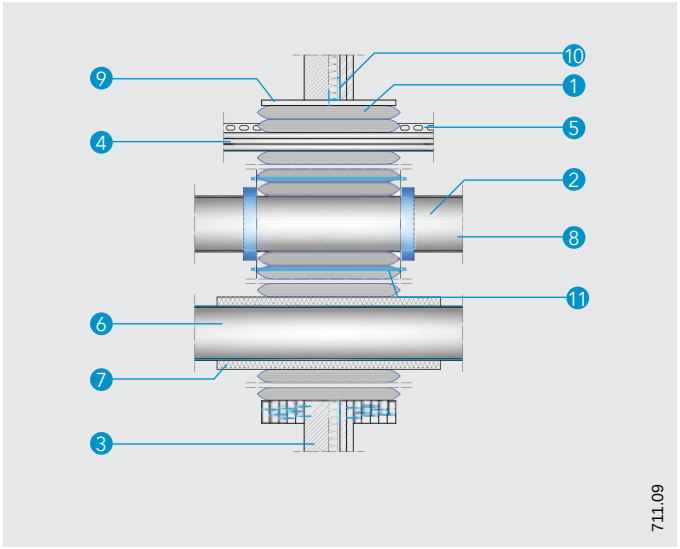
Table 8

Sufficient space needs to be provided for the construction of professional applications. For practical and physical reasons, we recommend observing a minimum distance of 100 mm between installed objects and support construction/component framing during planning. If this is impossible due to the situation on the construction site, the permitted minimum distances shall be taken from Table 8.

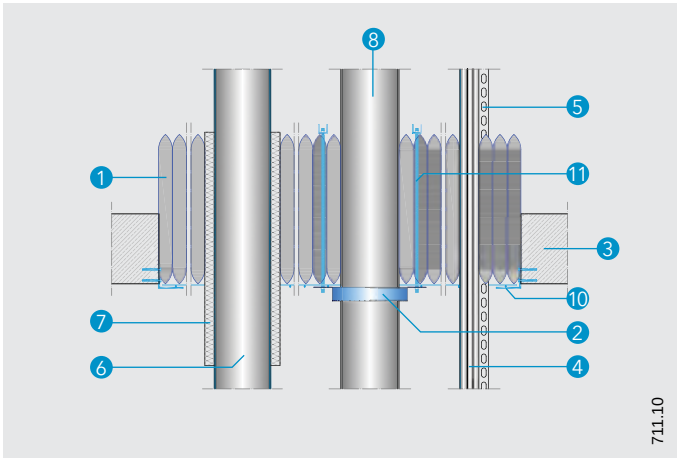
Table 8 – Minimum distances

Object	Minimum distance [mm]
Cables, cable bundles – Supporting construction/component framing	10
Cable, cable bundles – Cable tray	10
Cable tray – Supporting construction/component framing	10
Cables, cable bundles – Cables, cable bundles	0
Cable tray – Cable tray	20
Combustible insulation – Supporting construction/component framing	80
PROMASTOP®-FC - PROMASTOP®-FC	0
Between all other objects not further defined	100





Detail A – PROMASTOP®-S/-L mixed penetration seal in flexible and rigid wall



Detail B – PROMASTOP®-S/-L mixed penetration seal in rigid floor

Technical data

1. PROMASTOP®-S/-L
2. PROMASTOP®-FC
3. Supporting construction
4. Cables and cable bundles
5. Cable tray
6. Non-combustible pipes
7. Non-combustible insulation
8. Plastic pipes
9. Aperture framing
10. Suitable fastening material
11. Threaded rod ≥ M6
12. Identification label

Certificates: ETA-16/0311, IBS KB 317091403-A, IBS CR 13061206-A,Rev1-en

Customer benefit

- Quick, easy and dry installation in walls and floors
- Later installation possible at any time
- Dust-tightness
- Can be reused after a penetration seal has been removed or reconfigured (changed to a final penetration seal system, e.g. soft penetration seal)

1. Installation

- Create aperture framing of 300 mm in walls. If the PROMASTOP®-S/-L fire stopping pillows are not entirely supported by the opening, additionally create a 300 mm wide aperture framing composed of non-combustible material (see Detail A). Additional framing is not necessary in floors.
- Insert the fire stopping pillows into the opening without any gaps between the pillows; position the fire stopping pillows close to each other.
- Label the penetration seal.

2. Fields of application

Details A, B, C and D

PROMASTOP®-S/-L are used for penetration seals in flexible and rigid walls and in rigid floors. A combination with PROMASTOP®-FC is possible.

Metal grid

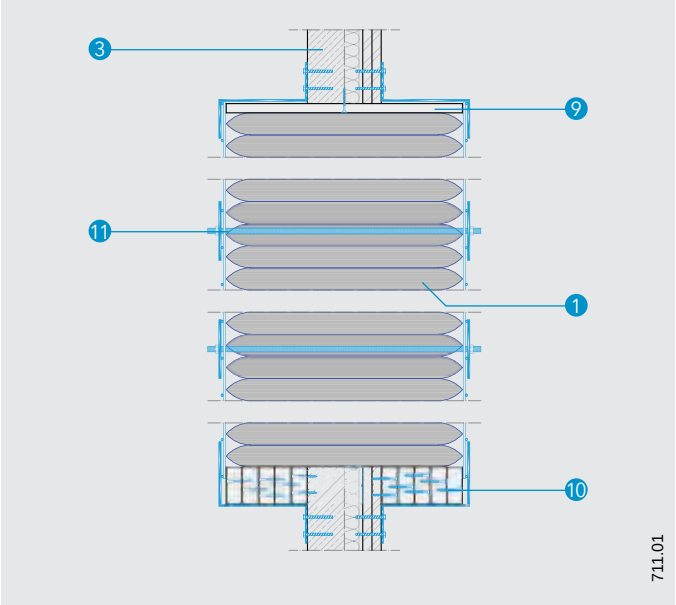
If installed as a blank seal in floor, install metal grid (wire size ≥ 4 mm, open square ≤ 50 mm) on the top and bottom surfaces of the floor, fixed with four threaded steel rods (≥ M6) through the pillow penetration seal; in wall applications fix the described metal grid on both sides.

Rigid floor

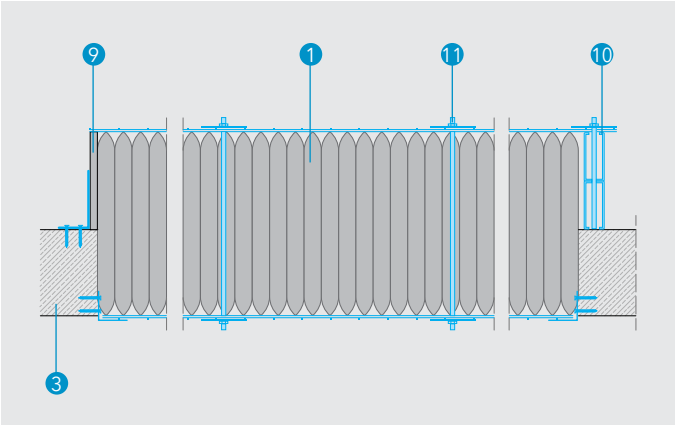
The floor must have a thickness of ≥ 150 mm and a density of ≥ 450 kg/m³.

Rigid wall

The wall must have a thickness of ≥ 100 mm and a density of ≥ 450 kg/m³.



Detail C – PROMASTOP®-S/-L blank penetration seal in flexible and rigid wall



Detail D – PROMASTOP®-S/-L blank penetration seal in rigid floor

Flexible wall

The wall must have a thickness of ≥ 100 mm and be made from timber or metal studs which are lined on both sides with a minimum of two layers of 12,5 mm thick fire protective boards (other board thicknesses shall be permissible, please note minimum thickness). For timber stud walls, a minimum distance of 100 mm must be kept from the penetration seal to each of the timber studs and the cavity between stud and sealing must be filled with a least 100 mm of insulation material of Class A1 or A2 (acc. to EN 13501-1). Additional aperture framing is necessary (see Detail C).
The classifications for the flexible wall may also be used for rigid walls provided that the thickness and density of the construction are higher than those of the one tested.

The components (supporting constructions) must be classified acc. to EN 13501-2 for the required fire resistance period.

For blank penetration seals made of PROMASTOP®-S/L, an additional framing on the top of the floor must be used that the pillows are fully covered when installed (see Detail D). The framing can be a fire protective board fixed with steel angle on the top surface of the floor (see Detail D left side). For openings in floor constructions where installations are penetrating the pillow seal, the additional framing is not necessary (see Details F and H). For PROMASTOP®-S/L penetration seals in floors, include a steel mesh (wire size ≥ 4 mm, open square ≥ 50 mm) on the bottom side of the floor.

Table 1

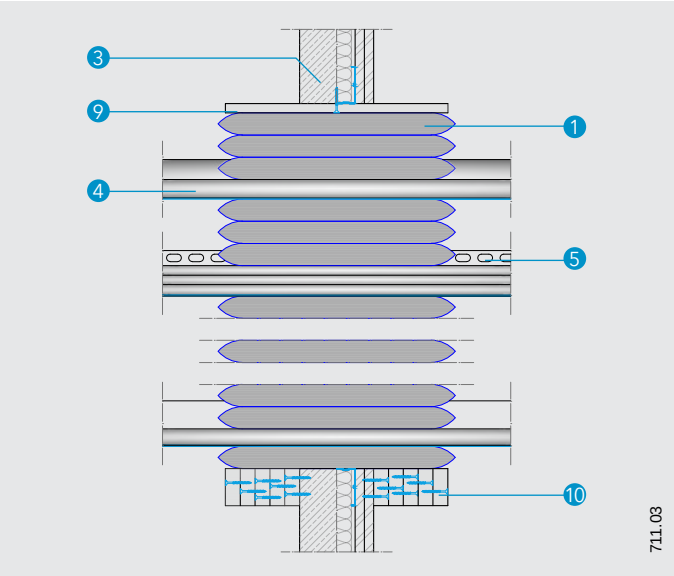
Table 1 shows the maximum tested and certified penetration seal sizes, as well as the various installation situations. The maximum dimensions shall be observed and shall not be exceeded.

Table 1 – Installation situations, maximum seal size and classifications for PROMASTOP®-S/-L

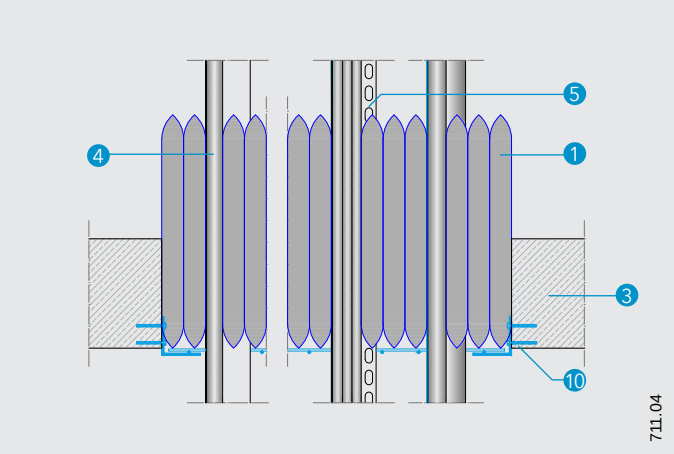
Installation situation	PROMASTOP®-S/-L penetration seal size	Classification blank seal
Flexible wall ≥ 100 mm*	≤ 1,44 m²	EI 90
Rigid wall ≥ 100 mm*		EI 90
Rigid floor ≥ 150 mm		EI 120

**110 mm when used as penetration seal for plastic pipes*

3. PROMASTOP®-S/-L cable penetration seal



Detail E – PROMASTOP®-S/-L penetration seal for cables, cable bundles and cable trays in walls



Detail F – PROMASTOP®-S/-L penetration seal for cables, cable bundles and cable trays in floors

Details E and F

Cable trays and cable ladders may penetrate the PROMASTOP®-S/-L penetration seal. 300 mm wide aperture framing composed of non-combustible material (9) is necessary in walls. Additional aperture framing in floors is not necessary.

Supporting distance

The cables, cable bundles, cable ladders and cable trays must be suspended/supported at a distance of ≤ 250 mm on both sides of the wall or ≤ 300 mm from the top of the floor.

All sheathed cable

All sheathed cable types currently and commonly used in building practice in Europe (e.g. control, power, data, optical fibre cables, signal, telecommunication, with or without cable supports).

All non-sheathed cable

All non-sheathed cables (wires) currently and commonly used in building practice in Europe (with or without cable supports).

Tied cable bundle

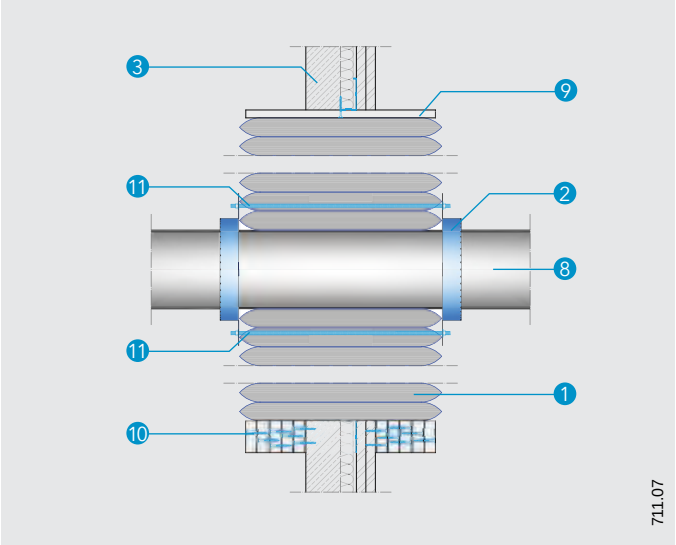
Tied cable bundle (maximum diameter 100 mm), maximum diameter of single cable 21 mm (with or without cable supports).

Table 2 – Classifications of the PROMASTOP®-S/-L cable penetration seals

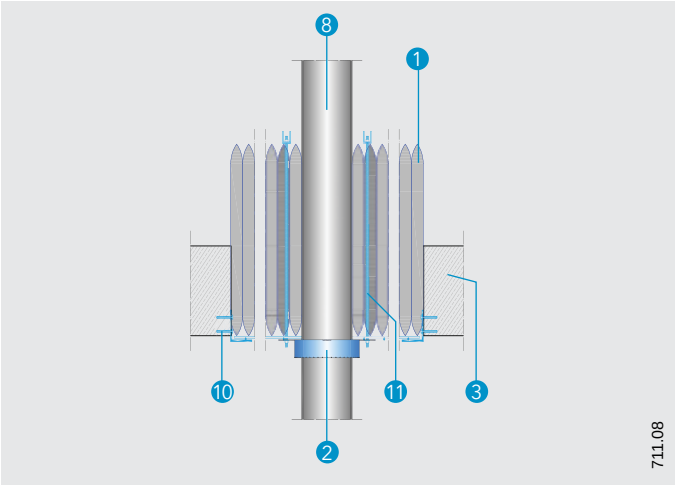
Installation	Classification depending on the installation orientation	
	Wall	Floor
CG 1: All sheathed cable types, Ø ≤ 21 mm	E 120 EI 90	E 120 EI 60
CG 2: All sheathed cable types, Ø ≤ 50 mm	E 120 EI 90	E 120 EI 60
CG 3: All sheathed cable types, Ø ≤ 80 mm	E 120 EI 90	E 120 EI 60
CG 4: Tied cable bundle, Ø ≤ 100 mm	E 120 EI 90	EI 120
CG 5: Non-sheathed cable types, Ø ≤ 24 mm	E 120 EI 90	E 120 EI 90
CG 6: Conduits made of steel, copper or plastic, Ø ≤ 16 mm	E 120-U/C EI 90-U/C	EI 120-U/C

CG...Cable groups acc. to EN 1366-3:2009

4. PROMASTOP®-S/-L plastic pipe penetration seal in combination with PROMASTOP®-FC



Detail G – PROMASTOP®-S/-L plastic pipe penetration seal in combination with PROMASTOP®-FC in wall



Detail H – PROMASTOP®-S/-L plastic pipe penetration seal in combination with PROMASTOP®-FC in rigid floor

Details G and H

Plastic pipes may penetrate the PROMASTOP®-S/-L penetration seal; however, the fire stopping collar PROMASTOP®-FC is additionally required in this case.
In wall applications, fire stopping collars shall be installed on both sides of the penetration seal; in floor applications only on the underside. Fix the PROMASTOP®-FC fire stopping collars through the PROMASTOP®-S/-L penetration seal with M6 threaded rods. In floor applications metal channels (length ≥ 100 mm, width ≥ 20 mm, thickness ≥ 2 mm) shall be used on the top of the floor as anchors for the threaded rods. Fix the PROMASTOP®-FC to every latch in the pillow seal.

Supporting distance

The pipes must be suspended/supported at a distance of ≤ 250 mm on both sides of the wall or ≤ 300 mm from the top of the floor.

The test results and the classification of the PE-HD pipes acc. to EN 12201-2, EN 1519-1, EN 12666-1, DIN 8074 and DIN 8075 with surface-mounted fire stopping collar PROMASTOP®-FC are valid for ABS pipes acc. to EN 1455-1 and SAN + PVC pipes acc. to EN 1565-1.
The test results and the classification of the PP-H / PP-R pipes are also valid for pipes acc. to ÖNORM B 5174-1, DIN 8077, DIN 8078 and EN ISO 15494.
The test results and the classification of the PVC-U pipes are also valid for pipes acc. to EN 1452-1, EN 1329-1, EN 1453-1, DIN 8061, DIN 8062, EN 1329-1, EN 1453-1 and PVC-C pipes acc. to EN 1566-1.

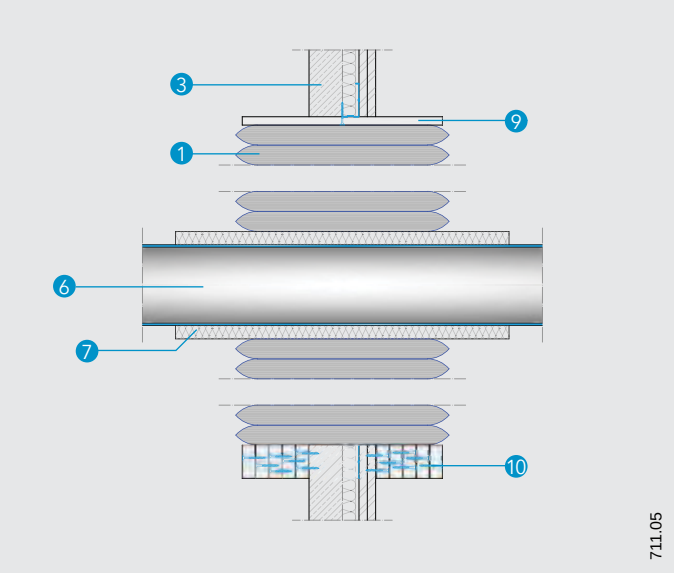
Table 3

For the pipe materials, dimensions, installation situations and classifications see Table 3.

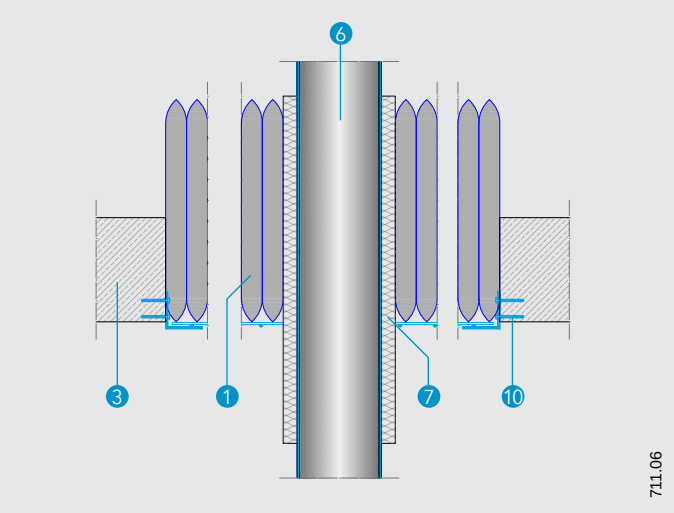
Table 3 – Overview of pipe materials, dimensions, installation situations, collar type and classifications

Requirement		Dimension range Ø: outer pipe diameter [mm] s: pipe wall thickness [mm]	Classification
Flexible or rigid wall	Rigid floor		
PE-HD, ABS, SAN + PVC pipes for pipe penetrations at 90°			
Surface-mounted, construction thickness ≥ 110 mm	Surface-mounted, construction thickness ≥ 150 mm	PROMASTOP®-FC3 or PROMASTOP®-FC6 limits: Ø 32 mm, s 1,8 mm → Ø 63 mm, s 1,8 mm → Ø 125 mm, s 3,1 mm	EI 120-U/U
PP-H and PP-R pipes for pipe penetrations at 90°			
Surface-mounted, construction thickness ≥ 110 mm	Surface-mounted, construction thickness ≥ 150 mm	PROMASTOP®-FC3 or PROMASTOP®-FC6 limits: Ø 32 mm, s 1,8 mm → Ø 63 mm, s 1,8 mm → Ø 125 mm, s 3,1 mm	EI 120-U/U
PVC-U and PVC-C pipes for pipe penetrations at 90°			
Surface-mounted, construction thickness ≥ 110 mm	Surface-mounted, construction thickness ≥ 150 mm	PROMASTOP®-FC3 or PROMASTOP®-FC6 limits: Ø 32 mm, s 1,8 mm → Ø 63 mm, s 1,8 mm → Ø 125 mm, s 3,1 mm	EI 120-U/U

5. PROMASTOP®-S/-L penetration seal for non-combustible pipes with non-combustible insulation



Detail I – PROMASTOP®-S/-L penetration seal for non-combustible pipes with non-combustible insulation in walls



Detail J – PROMASTOP®-S/-Lpenetration seal for non-combustible pipes with non-combustible insulation in floors

Table 4 – Classifications of metal pipes

Dimension range Ø: outer pipe diameter [mm] s: pipe wall thickness [mm]	Orientation F: floor W: wall	Classification
Steel pipes		
Ø 17 mm, s 2,0 - 14,2 mm → Ø 114 mm, s 3,6 - 14,2 mm	F / W	EI 120-U/C
Copper pipes		
Ø 18 mm, s 1,0 - 14,2 mm → Ø 88,9 mm, s 2,0 - 14,2 mm	F / W	EI 120-U/C

Details I and J

Metal pipes with non-combustible insulation may penetrate the PROMASTOP®-S/-L penetration seal. The insulation made of mineral wool must have a melting point of ≥ 1000 °C and correspond to Class A2 or $A2_L$ or higher rated acc. to EN 13501-1.
The configuration of the insulation is LS, CS, LI or CI acc. to EN 1366-3.
The sustained insulation (configuration LS or CS) is placed in the centre of the PROMASTOP®-S/-L penetration seal and fixed with steel wire (minimum thickness 0,6 mm) or similar. In the other configurations, the total insulation length must correspond to the tested one as a minimum.
Insulated metal pipes may penetrate at angles between 90° and 45° to the supporting construction.

Supporting distance

The pipes must be suspended/supported at a distance of ≤ 250 mm on both sides of the wall or ≤ 300 mm from the top of the floor.

Steel pipes

In penetration seals for steel pipes and their substitutes, an insulating thickness of ≥ 20 mm, a total length of the local insulation of ≥ 500 mm and a density of the mineral wool of ≥ 40 kg/m³ to ≤ 150 kg/m³ shall be considered.

The results of steel pipes can also be applied to metal pipes with lower heat conductivity λ ≤ 58 W/mK and a melting point ≥ 1100 °C (e.g. stainless steel, cast iron, Ni alloys -NiCr, NiMo, NiCu- and Ni).

Copper pipes

For the sealing of copper pipes and their substitutes, an insulating thickness of ≥ 20 mm, a total length of the local insulation of ≥ 1000 mm and a density of the mineral wool of ≥ 40 kg/m³ to ≤ 150 kg/m³ shall be considered.

The results of copper pipes are valid for steel pipes, but not vice versa, and for pipes with λ ≤ 380 W/mK and a melting point of ≥ 1083 °C.

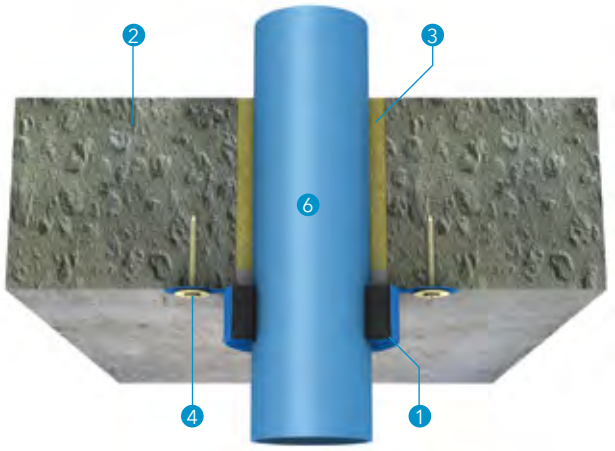
6. Information about the minimum distances in PROMASTOP®-S/-L penetration seals

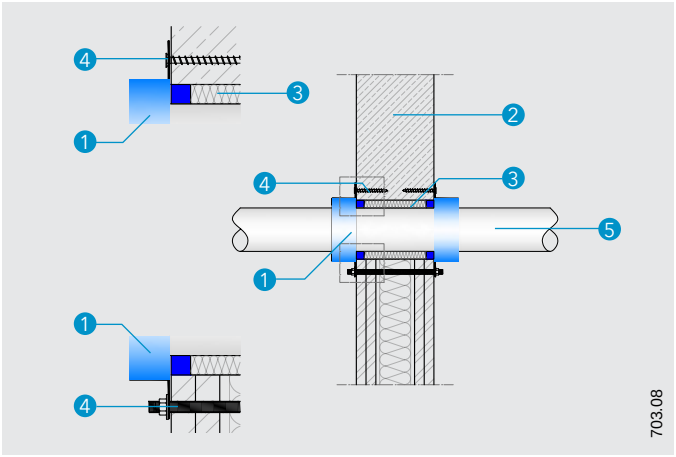
Table 5

Sufficient space needs to be provided for the construction of professional applications. For practical and physical reasons, we recommend observing a minimum distance of 100 mm between installed objects and support construction/component framing during planning.
If this is impossible due to the situation on the construction site, the permitted minimum distances shall be taken from Table 5.

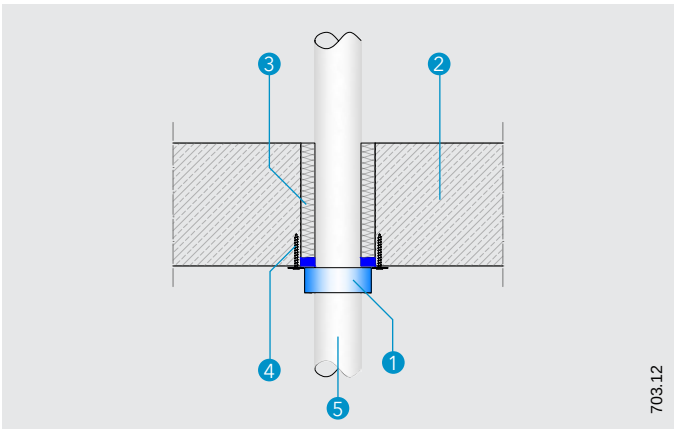
Table 5 – Minimum distances

Object	Minimum distance [mm]
Non-combustible insulation – Cables, cable trays, cable ladders	49
Cables, cable trays, cable ladders – Cables, cable trays, cable ladders	20
Cables, cable trays, cable ladders – Supporting construction/component framing	50
PROMASTOP®-FC – PROMASTOP®-FC	74
Between all other objects not further defined	100





Detail A – Surface-mounted PROMASTOP®-FC fire stopping collar in rigid or flexible wall



Detail B – Surface-mounted PROMASTOP®-FC fire stopping collar in rigid floor

Technical data

1. PROMASTOP®-FC
2. Supporting construction
3. Annular gap sealing between the installation and the opening edge in surface-mounted situation or between the collar and the opening edge in built-in situation; details at the related penetration seal
4. Suitable fastening material
5. Plastic pipe
6. Combustible insulation
7. Identification label
8. First place of support
9. PROMASEAL®-A, depth of 10 mm

Certificates: ETA-14/0089, CR 13061206-A,Rev1-en, CR 2018-Efectis-R002291, ITB CR 01633.1/21/R164NZP

Customer benefit

- Quick, easy and dry installation in walls and floors
- Zero distance between the collars possible
- Use category X
- Collar available in three heights (30 mm, 60 mm and 150 mm)
- Wide range of tested pipes, even with sound decoupling strips
- Wide range of uncapped-uncapped (U/U) classifications

1. Installation

- Attach a sound decoupling strip (with adhesive tape) if necessary.
- In floor applications, installation is generally on the underside of the floor. On a wall (other than a shaft wall), installation must be on both sides.
- There are more options for annular gap filling between the service and the opening edge:
  1. With gypsum-based filler e.g. Promat®-Spachtelmasse
  2. With mineral wool of Class A1 (acc. to EN 13501-1), density ≥ 40 kg/m³ and fire stopping sealant PROMASEAL®-A on both sides, depth ≥ 5 mm
  3. With PROMASTOP®-M fire stopping mortar
- Install the fire stopping collar around the pipe, engage the locking device and bend the tab back 180°.
- For surface installation, screw-fasten the fire stopping collar to the rigid wall or floor with the included or other suitable fastening material.
- Label the penetration seal.

2. Fields of application

Details A and B

PROMASTOP®-FC is a pipe closure device with reactive filling in collar form which can be used to seal the pipe penetrations in rigid constructions, in lightweight constructions including shaft walls and suspended ceilings as well as in cross laminated timber (CLT) constructions.
Test results for standard rigid supporting constructions are valid for separating construction products made of concrete or masonry having the same or a higher thickness and density. The classification of the results in flexible walls may also be applied to rigid walls in case the thickness and/or density are higher than those of the tested construction.

The components (supporting constructions) must be classified acc. to EN 13501-2 for the required fire resistance period.

Supporting distance

The pipes must be suspended/supported ≤ 250 mm on both sides of the walls or from the top of the floor.

Rigid floor

The floor must have a thickness of ≥ 150 mm and a density of ≥ 650 kg/m³.

Rigid wall

The rigid wall must have a thickness of ≥ 100 mm and a density of ≥ 450 kg/m³. When the fire stopping collar is embedded in mortar, the wall must be often ≥ 150 mm; check the related classification.

Flexible wall

The wall must have a thickness of ≥ 100 mm and be made from wooden or metal studs which are lined on both sides with a minimum of two layers of 12,5 mm thick fire protective boards (other board thicknesses shall be permissible, please note minimum thickness). For timber stud walls, a minimum distance of 100 mm must be kept from the penetration seal to each of the wooden studs and the cavity between stud and sealing must be filled with a least 100 mm of insulation material compliant to Class A1 or A2 (acc. to EN 13501-1).

Suspended ceiling

The overall thickness of the boards must have ≥ 40 mm and consist of minimum 2 layers.

Shaft wall

Overall details: single side layered wall based on metal studs, overall thickness of the boards according to the relevant fire resistance time must be ≥ 30 to ≥ 50 mm and consist of minimum 2 layers.

See the details of the shaft walls for conduit penetration seals at the related section.

Shaft wall solution 1: The collar has been mounted on one side. Fire exposure from the collar side.

Shaft wall solution 2: Two collars are installed from one side with shaft wall clip (the collars are both supported by the outer side of the wall; installation is however done through the opening from one side). Fire exposure on both sides.

Shaft wall solution 3: The collar is installed in built-in situation. PROMASTOP®-FC6 required. Fire exposure on both sides.

Cross laminated timber wall and floor

The cross laminated timber wall or floor must have a thickness of ≥ 140 mm without lining.

Sandwich panel wall type 1

The tested ArcelorMittal Pflaum FO-010-10-80/1000 mineral wool panel must be ≥ 80 mm thick, with a circumferential frame made of PROMATECT®-100 fire protective boards (thickness ≥ 10 mm) must be installed around the opening using dry wall screws (fixing distance ≤ 200 mm). The PROMATECT®-100 fire protective boards must cover at least 50 mm around the opening. An additional aperture framing is not necessary.

Sandwich panel wall type 2

The tested Kingspan KS 1100 CS sandwich panel partition had a thickness of 100 mm. Around the perimeter of the aperture in the supporting construction PROMASTOP®-CC liquid was applied. All plastic pipes were provided with a pipe closure device on both sides of the wall being a PROMASTOP®-FC6.

Sandwich panel wall type 3

The tested Kingspan KS 1100 CS sandwich panel partition had a thickness of 175 mm. All the other details as at sandwich panel wall type 2.

Sound decoupling strips

In rigid and cross laminated timber (CLT) constructions, every type of sound decoupling strip based on PE-foam of class E or higher rated acc. to EN 13501-1, with a maximum thickness of 5 mm may be used.

Combustible insulation

In rigid constructions every type of combustible insulation of class B-s3, d0 or higher rated acc. to EN 13501-1, with a maximum thickness of 32 mm may be used. The thresholds for pipe diameter and insulation thickness are shown in the related classification table, see Table 5.

Couplings

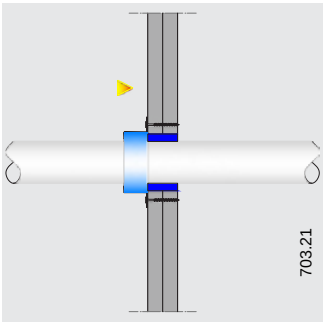
The diameter of the tested coupling may be decreased but not increased.

Sloped pipes

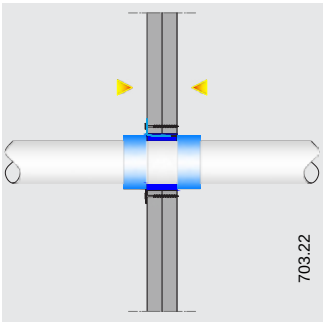
The angle of the pipe may vary between the tested one and the right angle.

For walls, the PROMASTOP®-FC collar shall be used usually on both sides; for floor application on the bottom side of the floor.

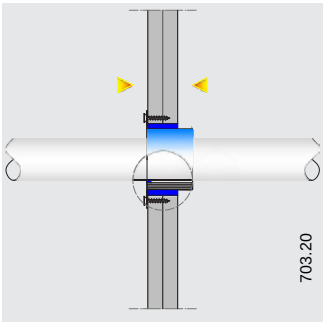
Overview of shaft wall solutions



Shaft wall solution 1

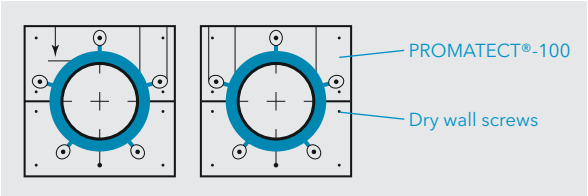


Shaft wall solution 2



Shaft wall solution 3

PROMASTOP®-FC on sandwich panel wall type 1



3. PROMASTOP®-FC conduit, mixed and postal pipe penetration seal in rigid floors and flexible walls

Table 1 – Classification of PROMASTOP®-FC for conduits

Requirement	Dimension range Ø: conduit diameter [mm] s: conduit wall thickness [mm]	Classification
Flexible wall, collar surface-mounted on both sides, construction thickness ≥ 100 mm	PROMASTOP®-FC3/50 core hole Ø 50 mm flexible conduit PVC-U Ø 50 mm, s 1,6 mm without cables	EI 90-U/U
	PROMASTOP®-FC3/50 core hole Ø 50 mm flexible conduit PVC-U or PE-HD, both Ø 50 mm, s 1,6 mm with 5 cables from cable group 1 (CG 1)	EI 90-U/U
Rigid floor, collar surface-mounted on the bottom side, construction thickness ≥ 150 mm	PROMASTOP®-FC3/50 core hole Ø 50 mm with conduit Evilon Ø 50 mm, s 1,6 mm with 5 cables from cable group 1 (CG 1)	EI 90-U/U
	PROMASTOP®-FC3/50 core hole Ø 50 mm with flexible conduit PVC-U or PE-HD, both Ø 50 mm, s 1,6 mm with 5 cables from cable group 1 (CG 1)	EI 90-U/U

Table 2 – Classification of PROMASTOP®-FC for mixed plastic pipe and conduit penetration seals

Requirement	Dimension range Ø: diameter [mm] s: pipe or conduit wall thickness [mm]	Classification
Shaft wall type 1 and type 2, collar surface-mounted on room side	PROMASTOP®-FC6/110 opening with PP-H pipe Ø 63 mm, s 1,8 mm and PP-H pipe Ø 16 mm, s 1,8 mm and Geberit Mepla pipe Ø 75 mm, s 4,7 mm with neopren insulation (Euroclass B, s3-d0, thickness 6 mm, LS configuration, total insulation length 500 mm) and flexible conduit Ø 32 mm, s 1,0 mm without cables and flexible conduit Ø 32 mm, s 1,0 mm with 3 cables from CG 4	EI 120-U/U for PP-H pipe Ø 63 mm EI 120-U/C for all other pipes and conduits

Rigid floor
The floor must have a thickness of ≥ 150 mm and a density of ≥ 650 kg/m³.

Flexible wall
The wall must have a thickness of ≥ 100 mm (backfilling from 50 mm mineral wool acc. to Euroclass A1, density 40 kg/m³) and be made from wooden or metal studs which are lined on both sides with a minimum of two layers of 12,5 mm thick fire protective boards (other board thicknesses shall be permissible, please note minimum thickness).

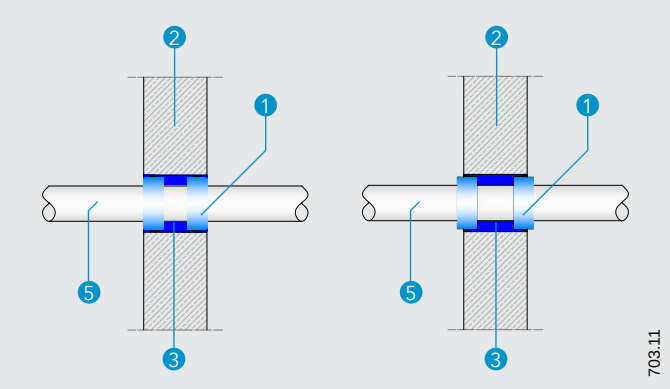
Shaft wall type 1
Thickness 50 mm, sheathed from one side with 25 mm thick fleece reinforced gypsum boards according to EN 15283-1. Annular gap and gussets are filled with PROMASEAL®-AG. PROMASTOP®-FC6/110 installed on room side.

Shaft wall type 2
Thickness 50 mm, double sheathed from one side with 25 mm thick gypsum boards according to EN 520. Annular gap and gussets are filled with PROMASEAL®-AG. PROMASTOP®-FC6/110 installed on room side.

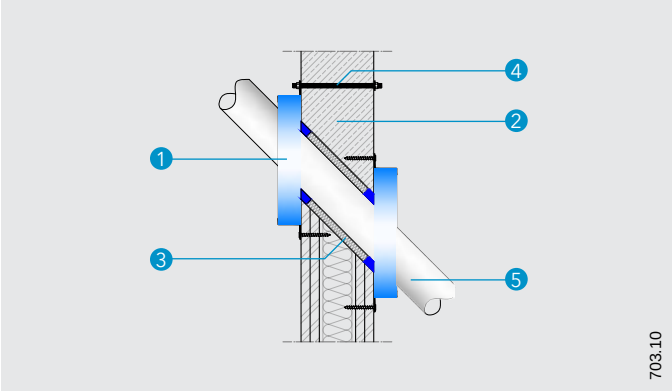
Table 3 – Classification of PROMASTOP®-FC for postal pipes with control cables

Requirement	Dimension range Ø: pipe diameter [mm] s: pipe wall thickness [mm]	Classification
Flexible wall, collar surface-mounted on both sides, construction thickness ≥ 100 mm	PROMASTOP®-FC3/110 core hole Ø 110 mm pipe PVC Ø 110 mm, s 3,0 mm with 2 control cables next to the pipe (in the collar)	EI 45-U/U
Rigid floor, collar surface-mounted on the bottom side, construction thickness ≥ 150 mm	PROMASTOP®-FC3/110 core hole Ø 110 mm pipe PVC Ø 110 mm, s 3,0 mm with 2 control cables next to the pipe (in the collar)	EI 90-U/U

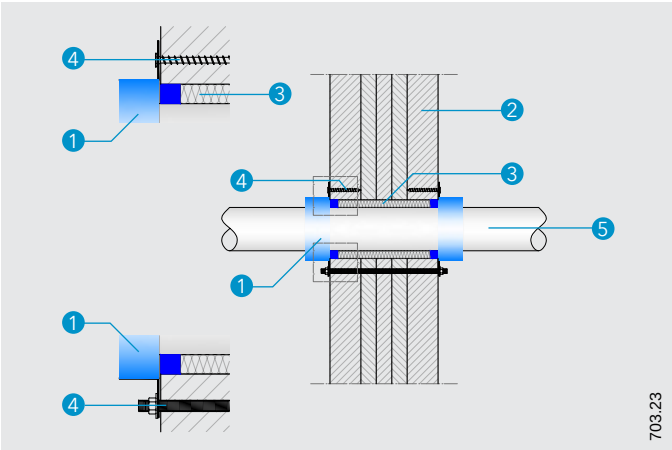
4.PROMASTOP®-FC pipe penetration seal in rigid supporting constructions and in cross laminated timber (CLT) constructions



Detail C – Built-in PROMASTOP®-FC fire stopping collar in rigid wall



Detail D – Surface-mounted PROMASTOP®-FC fire stopping collar for sloped pipes in rigid or flexible wall



Detail E – Surface-mounted PROMASTOP®-FC fire stopping collar in cross laminated timber (CLT) constructions

Details C and D

The collar is fixed in rigid walls with the included or with equivalent suitable fastening material. Mortaring in the collar is also possible; the collar housing must be at least minimum 10 mm out of the surface. For the fixing of PROMASTOP®-FC in cross laminated timber (CLT) constructions, timber screws e.g. SPAX, length ≥ 100 mm, can be used; for EI 90: Ø 6 x 100 mm threaded rods including washers.
In rigid walls and floors, attach the collar at least to every second fixing latch; no two adjacent latches may be left unfixed.
In cross laminated timber constructions, attach the collar to every latch.

Annular gap filling

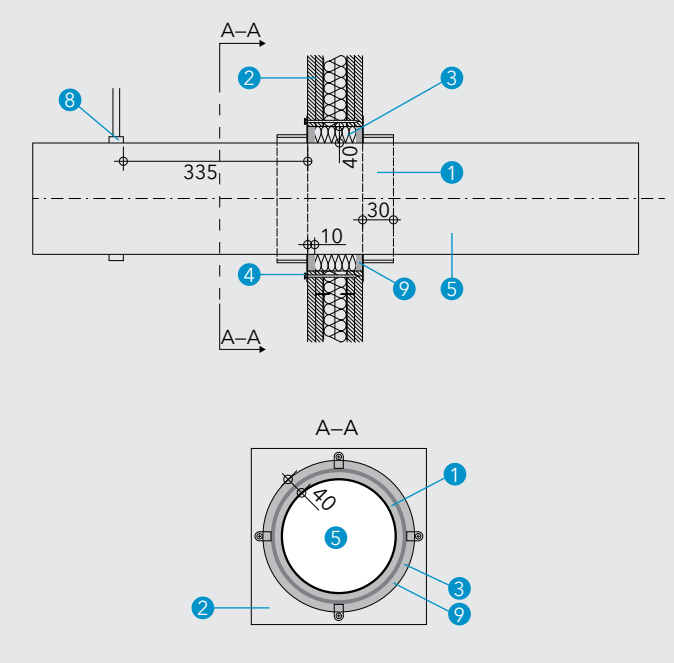
In rigid constructions, the annular gap can be backfilled as follows:

- With mineral wool (Class A1 acc. to EN 13501-1, melting point ≥ 1000 °C, density ≥ 40 kg/m³) covered on both sides with PROMASEAL®-A fire stopping sealant ≥ 5 mm
- With PROMASTOP®-M fire stopping mortar
- With gypsum-based filler e.g. Promat®-Spachtelmasse

Detail E

Annular gap filling

Backfill in cross laminated timber (CLT) constructions with mineral wool (Class A1 acc. to EN 13501-1, melting point ≥ 1000 °C, density ≥ 40 kg/m³) covered on both sides with PROMASEAL®-A fire stopping sealant ≥ 5 mm; annular gap width: 5 - 30 mm.



Detail F – Penetration seal of plastic pipes without insulation, sealed with use of PROMASTOP®-FC3 single collar (one collar per side), soft-seal in wall

4.1. PROMASTOP®-FC pipe penetration seal in flexible or rigid walls combined with PROMASEAL®-A soft penetration seal

4.1.1. Fields of application

Rigid wall

The classifications for rigid wall supporting construction are valid for penetration seals in wall made of concrete, reinforced concrete, aerated concrete, ceramic brick, cavity brick, checker brick, with density greater than or equal to 600 kg/m³ and thickness equal to or greater than given in appropriate point, with fire resistance class (classified according to EN 13501-2) equal to or greater than given in appropriate point. Required thickness in Table 4.

Flexible wall

The classifications for flexible wall supporting construction are valid for penetration seals in flexible walls made of gypsum plasterboards type F or DF with steel or timber studs substructure, thickness equal to or greater than given in appropriate point (min. two layers of gypsum plasterboards type F or DF with overall board layer thickness equal to or greater than 25 mm), with fire resistance class (classified according to EN 13501-2) equal to or greater than given in appropriate point. Required thickness in Table 4.

In case of supporting constructions with timber studs no part of the penetration seal is closer than 100 mm to a stud, the cavity is closed between the penetration seal and the stud and minimum 100 mm of insulation of class A1 or A2 according to EN 13501-1 is provided within the cavity between the penetration seal and the stud.

Classifications given for "flexible wall supporting construction" are also valid for penetration seals in rigid wall supporting constructions with greater than or equal to 450 kg/m³ and thickness equal to or greater than given in appropriate point, with fire resistance class (classified according to EN 13501-2) equal to or greater than given in appropriate point.

Detail F

Penetration seals of POLOPLAST POLO-KAL 3S pipes without insulation sealed with use of PROMASTOP®-FC3 or PROMASTOP®-FC6 single collar (one collar per side, in soft penetration seal) in flexible or rigid wall supporting construction. The collars are fixed by means of min. 4 pcs. of steel system anchors and steel screws dimensions of min. ø 6 x 100 mm. The space between the supporting construction and services, width of 10 – 40 mm is filled with STEPROCK PLUS mineral wool (or other mineral wool with density ≥ 140 kg/m³), thickness of min. 80 mm, covered on both sides with PROMASEAL®-A fire stopping sealant on the depth of min. 10 mm. For soft penetration seals the thickness and density of the penetration seal mineral wool infill can be increased but may not be reduced. Classification is also valid for other mineral wool insulations provided that the thickness and density of insulation is not reduced (it can be increased).

Table 4 – PROMASTOP®-FC penetration seal for plastic pipes without insulation in rigid and CLT constructions

Overview of pipe materials, dimensions, installation situations (collar surface-mounted or built-in), collar type (PROMASTOP®-FC3, PROMASTOP®-FC6 or PROMASTOP®-FC15) and classifications

Requirement			Dimension range Ø: outer pipe diameter [mm] s: pipe wall thickness [mm]	Classification
Rigid wall	Rigid floor	Cross laminated timber wall or floor		
PE-HD, ABS, SAN + PVC pipes for pipe penetrations at 90°				
		Surface-mounted, construction thickness ≥ 140 mm	PROMASTOP®-FC3 lower limits: Ø 32 mm, s 1,8 mm → Ø 63 mm, s 1,8 mm → Ø 125 mm, s 3,1 mm upper limits: Ø 32 mm, s 5,8 mm → Ø 63 mm, s 5,8 mm → Ø 125 mm, s 7,4 mm	EI 90-U/U
Surface-mounted, construction thickness ≥ 100 mm	Surface-mounted, construction thickness ≥ 150 mm		PROMASTOP®-FC6 lower limits: Ø 50 mm, s 1,8 mm → Ø 63 mm, s 1,8 mm → Ø 125 mm, s 3,1 mm → Ø 200 mm, s 4,9 mm upper limits: Ø 50 mm, s 5,8 mm → Ø 63 mm, s 5,8 mm → Ø 125 mm, s 7,4 mm → Ø 200 mm, s 11,4 mm	EI 120-U/U
Surface-mounted, construction thickness ≥ 150 mm			PROMASTOP®-FC6 lower limits: Ø 50 mm, s 1,8 mm → Ø 63 mm, s 1,8 mm → Ø 125 mm, s 3,1 mm → Ø 160 mm, s 4,0 mm upper limits: Ø 50 mm, s 5,8 mm → Ø 63 mm, s 5,8 mm → Ø 125 mm, s 4,8 mm → Ø 160 mm, s 6,2 mm	EI 240-U/U
Surface-mounted, construction thickness ≥ 100 mm			PROMASTOP®-FC3 lower limits: Ø 32 mm, s 1,8 mm → Ø 63 mm, s 1,8 mm → Ø 125 mm, s 3,1 mm → Ø 160 mm, s 4,0 mm upper limits: Ø 32 mm, s 5,8 mm → Ø 63 mm, s 5,8 mm → Ø 125 mm, s 11,4 mm → Ø 160 mm, s 14,6 mm PROMASTOP®-FC6 lower limits: Ø 50 mm, s 1,8 mm → Ø 63 mm, s 1,8 mm → Ø 125 mm, s 3,1 mm → Ø 160 mm, s 4,0 mm → Ø 200 mm, s 4,9 mm → Ø 250 mm, s 22,7 mm upper limits: Ø 50 mm, s 5,8 mm → Ø 63 mm, s 5,8 mm → Ø 125 mm, s 11,4 mm → Ø 160 mm, s 14,6 mm → Ø 250 mm, s 22,7 mm	EI 120-U/C
Surface-mounted, construction thickness ≥ 150 mm			PROMASTOP®-FC6 lower limits: Ø 50 mm, s 1,8 mm → Ø 63 mm, s 1,8 mm → Ø 125 mm, s 3,1 mm → Ø 160 mm, s 4,0 mm upper limits: Ø 50 mm, s 5,8 mm → Ø 63 mm, s 5,8 mm → Ø 125 mm, s 11,4 mm → Ø 160 mm, s 14,6 mm	EI 240-U/C
Built-in, construction thickness ≥ 150 mm	Surface-mounted or built-in, construction thickness ≥ 150 mm		PROMASTOP®-FC3 lower limits: Ø 32 mm, s 1,8 mm → Ø 63 mm, s 1,8 mm → Ø 125 mm, s 3,1 mm upper limits: Ø 32 mm, s 5,8 mm → Ø 63 mm, s 5,8 mm → Ø 125 mm, s 11,4 mm PROMASTOP®-FC6 lower limits: Ø 50 mm, s 1,8 mm → Ø 63 mm, s 1,8 mm → Ø 125 mm, s 3,1 mm → Ø 160 mm, s 4,0 mm → Ø 200 mm, s 4,9 mm → Ø 250 mm, s 22,7 mm upper limits: Ø 50 mm, s 5,8 mm → Ø 63 mm, s 5,8 mm → Ø 125 mm, s 11,4 mm → Ø 160 mm, s 14,6 mm → Ø 250 mm, s 22,7 mm	EI 120-U/C
Built-in, construction thickness ≥ 150 mm	Surface-mounted, construction thickness ≥ 150 mm		PROMASTOP®-FC3 lower limits: Ø 32 mm, s 1,8 mm → Ø 63 mm, s 1,8 mm → Ø 125 mm, s 3,1 mm upper limits: Ø 32 mm, s 5,8 mm → Ø 63 mm, s 5,8 mm → Ø 125 mm, s 11,4 mm PROMASTOP®-FC6 lower limits: Ø 50 mm, s 1,8 mm → Ø 63 mm, s 1,8 mm → Ø 125 mm, s 3,1 mm → Ø 160 mm, s 4,0 mm → Ø 200 mm, s 4,9 mm → Ø 315 mm, s 15,0 mm upper limits: Ø 50 mm, s 5,8 mm → Ø 63 mm, s 5,8 mm → Ø 125 mm, s 11,4 mm → Ø 160 mm, s 14,6 mm → Ø 250 mm, s 22,7 mm → Ø 315 mm, s 15,0 mm	EI 90-U/C

Requirement			Dimension range Ø: outer pipe diameter [mm] s: pipe wall thickness [mm]	Classification
Rigid wall	Rigid floor	Cross laminated timber wall or floor		
PE-HD, ABS, SAN + PVC pipes for pipe penetrations at 45°				
Surface-mounted, construction thickness ≥ 100 mm			PROMASTOP®-FC6 lower limits: Ø 32 mm, s 1,8 mm → Ø 63 mm, s 1,8 mm → Ø 125 mm, s 3,1 mm upper limits: Ø 32 mm, s 5,8 mm → Ø 63 mm, s 5,8 mm → Ø 125 mm, s 7,4 mm	EI 120-U/U
	Surface-mounted, construction thickness ≥ 150 mm		PROMASTOP®-FC6 lower limits: Ø 32 mm, s 1,8 mm → Ø 63 mm, s 1,8 mm → Ø 160 mm, s 4,0 mm upper limits: Ø 32 mm, s 5,8 mm → Ø 160 mm, s 6,2 mm	
PP-H and PP-R pipes for pipe penetrations at 90°				
		Surface-mounted, construction thickness ≥ 140 mm	PROMASTOP®-FC3 lower limits: Ø 32 mm, s 1,8 mm → Ø 63 mm, s 1,8 mm → Ø 125 mm, s 3,1 mm → Ø 160 mm, s 4,0 mm upper limits: Ø 32 mm, s 8,6 mm → Ø 63 mm, s 8,6 mm → Ø 125 mm, s 7,1 mm → Ø 160 mm, s 4,0 mm	EI 90-U/U
Surface-mounted, construction thickness ≥ 100 mm	Surface-mounted, construction thickness ≥ 150 mm		PROMASTOP®-FC6 lower limits: Ø 50 mm, s 1,8 mm → Ø 63 mm, s 1,8 mm → Ø 125 mm, s 3,1 mm → Ø 200 mm, s 4,9 mm upper limits: Ø 50 mm, s 8,6 mm → Ø 63 mm, s 8,6 mm → Ø 125 mm, s 7,1 mm → Ø 200 mm, s 11,4 mm	EI 120-U/U
Surface-mounted, construction thickness ≥ 150 mm			PROMASTOP®-FC6 lower limits: Ø 50 mm, s 1,8 mm → Ø 63 mm, s 1,8 mm → Ø 125 mm, s 3,1 mm → Ø 160 mm, s 4,0 mm upper limits: Ø 50 mm, s 5,8 mm → Ø 63 mm, s 5,8 mm → Ø 125 mm, s 4,8 mm → Ø 160 mm, s 6,2 mm	EI 240-U/U
Surface-mounted, construction thickness ≥ 100 mm			PROMASTOP®-FC3 lower limits: Ø 32 mm, s 1,8 mm → Ø 40 mm, s 1,8 mm → Ø 63 mm, s 1,8 mm → Ø 125 mm, s 3,1 mm → Ø 160 mm, s 4,0 mm upper limits: Ø 32 mm, s 5,4 mm → Ø 40 mm, s 8,6 mm → Ø 63 mm, s 8,6 mm → Ø 125 mm, s 7,1 mm → Ø 160 mm, s 14,6 mm PROMASTOP®-FC6 lower limits: Ø 50 mm, s 1,8 mm → Ø 63 mm, s 1,8 mm → Ø 125 mm, s 3,1 mm → Ø 160 mm, s 4,0 mm → Ø 200 mm, s 4,9 mm → Ø 315 mm, s 15,0 mm upper limits: Ø 50 mm, s 8,6 mm → Ø 63 mm, s 8,6 mm → Ø 125 mm, s 17,1 mm → Ø 250 mm, s 22,7 mm → Ø 315 mm, s 15,0 mm	EI 120-U/C
Surface-mounted, construction thickness ≥ 150 mm			PROMASTOP®-FC6 lower limits: Ø 50 mm, s 1,8 mm → Ø 63 mm, s 1,8 mm → Ø 125 mm, s 3,1 mm → Ø 160 mm, s 4,0 mm upper limits: Ø 50 mm, s 5,8 mm → Ø 63 mm, s 5,8 mm → Ø 125 mm, s 11,4 mm → Ø 160 mm, s 14,6 mm	EI 240-U/C
Built-in, construction thickness ≥ 150 mm			PROMASTOP®-FC3 lower limits: Ø 32 mm, s 1,8 mm → Ø 40 mm, s 1,8 mm → Ø 63 mm, s 1,8 mm → Ø 125 mm, s 3,1 mm upper limits: Ø 32 mm, s 5,4 mm → Ø 40 mm, s 8,6 mm → Ø 63 mm, s 8,6 mm → Ø 125 mm, s 17,1 mm PROMASTOP®-FC6 lower limits: Ø 50 mm, s 1,8 mm → Ø 63 mm, s 1,8 mm → Ø 125 mm, s 3,1 mm → Ø 160 mm, s 4,0 mm → Ø 200 mm, s 4,9 mm → Ø 250 mm, s 6,2 mm upper limits: Ø 50 mm, s 8,6 mm → Ø 63 mm, s 8,6 mm → Ø 125 mm, s 17,1 mm → Ø 250 mm, s 22,7 mm	EI 120-U/C

Requirement			Dimension range Ø: outer pipe diameter [mm] s: pipe wall thickness [mm]	Classification
Rigid wall	Rigid floor	Cross laminated timber wall or floor		
PP-H and PP-R pipes for pipe penetrations at 90°				
	Surface-mounted, construction thickness ≥ 150 mm		PROMASTOP®-FC3 lower limits: Ø 32 mm, s 1,8 mm → Ø 40 mm, s 1,8 mm → Ø 63 mm, s 1,8 mm → Ø 125 mm, s 3,1 mm upper limits: Ø 32 mm, s 5,4 mm → Ø 40 mm, s 8,6 mm → Ø 63 mm, s 8,6 mm → Ø 125 mm, s 17,1 mm PROMASTOP®-FC6 lower limits: Ø 50 mm, s 1,8 mm → Ø 63 mm, s 1,8 mm → Ø 125 mm, s 3,1 mm → Ø 160 mm, s 4,0 mm → Ø 200 mm, s 4,9 mm → Ø 250 mm, s 6,2 mm → Ø 315 mm, s 15,0 mm upper limits: Ø 50 mm, s 8,6 mm → Ø 63 mm, s 8,6 mm → Ø 125 mm, s 17,1 mm → Ø 250 mm, s 22,7 mm → Ø 315 mm, s 15,0 mm	EI 120-U/C
	Built-in, construction thickness ≥ 150 mm		PROMASTOP®-FC3 lower limits: Ø 50 mm, s 1,8 mm → Ø 63 mm, s 1,8 mm → Ø 125 mm, s 3,1 mm → Ø 160 mm, s 4,0 mm upper limits: Ø 50 mm, s 8,6 mm → Ø 63 mm, s 8,6 mm → Ø 125 mm, s 17,1 mm → Ø 160 mm, s 4,0 mm PROMASTOP®-FC6 lower limits: Ø 50 mm, s 1,8 mm → Ø 63 mm, s 1,8 mm → Ø 125 mm, s 3,1 mm → Ø 160 mm, s 4,0 mm → Ø 200 mm, s 4,9 mm → Ø 250 mm, s 6,2 mm upper limits: Ø 50 mm, s 8,6 mm → Ø 63 mm, s 8,6 mm → Ø 125 mm, s 17,1 mm → Ø 250 mm, s 22,7 mm	EI 120-U/C
PP-H and PP-R pipes for pipe penetrations at 45°				
Surface-mounted, construction thickness ≥ 100 mm			PROMASTOP®-FC6 lower limits: Ø 32 mm, s 1,8 mm → Ø 63 mm, s 1,8 mm → Ø 125 mm, s 3,1 mm upper limits: Ø 32 mm, s 5,4 mm → Ø 63 mm, s 5,4 mm → Ø 125 mm, s 7,1 mm	EI 120-U/U
	Surface-mounted, construction thickness ≥ 150 mm		PROMASTOP®-FC6 lower limits: Ø 32 mm, s 1,8 mm → Ø 63 mm, s 1,8 mm → Ø 160 mm, s 4,0 mm upper limits: Ø 32 mm, s 5,4 mm → Ø 63 mm, s 5,4 mm → Ø 160 mm, s 6,2 mm	
PVC-U and PVC-C pipes for pipe penetrations at 90°				
		Surface-mounted, construction thickness ≥ 140 mm	PROMASTOP®-FC3 lower limits: Ø 32 mm, s 1,8 mm → Ø 63 mm, s 1,8 mm → Ø 125 mm, s 3,1 mm upper limits: Ø 32 mm, s 5,8 mm → Ø 63 mm, s 5,8 mm → Ø 125 mm, s 7,1 mm	EI 90-U/U
Surface-mounted, construction thickness ≥ 100 mm	Surface-mounted, construction thickness ≥ 150 mm		PROMASTOP®-FC6 (couplings tested up to Ø 125 mm) lower limits: Ø 50 mm, s 1,8 mm → Ø 63 mm, s 1,8 mm → Ø 125 mm, s 3,1 mm → Ø 250 mm, s 4,9 mm upper limits: Ø 50 mm, s 5,8 mm → Ø 63 mm, s 5,8 mm → Ø 125 mm, s 7,1 mm → Ø 250 mm, s 4,9 mm	EI 120-U/U
Surface-mounted, construction thickness ≥ 150 mm			PROMASTOP®-FC6 lower limits: Ø 50 mm, s 1,8 mm → Ø 63 mm, s 1,8 mm → Ø 125 mm, s 3,1 mm → Ø 160 mm, s 4,0 mm → Ø 315 mm, s 7,7 mm upper limits: Ø 50 mm, s 5,8 mm → Ø 63 mm, s 5,8 mm → Ø 125 mm, s 4,8 mm → Ø 160 mm, s 6,2 mm → Ø 315 mm, s 7,7 mm	EI 180-U/U
Surface-mounted, construction thickness ≥ 150 mm			PROMASTOP®-FC6 lower limits: Ø 50 mm, s 1,8 mm → Ø 63 mm, s 1,8 mm → Ø 125 mm, s 3,1 mm → Ø 160 mm, s 4,0 mm upper limits: Ø 50 mm, s 5,8 mm → Ø 63 mm, s 5,8 mm → Ø 125 mm, s 4,8 mm → Ø 160 mm, s 6,2 mm	EI 240-U/U

Requirement			Dimension range Ø: outer pipe diameter [mm] s: pipe wall thickness [mm]	Classification
Rigid wall	Rigid floor	Cross laminated timber wall or floor		
			PVC-U and PVC-C pipes for pipe penetrations at 90°	
Surface-mounted, construction thickness ≥ 100 mm			PROMASTOP®-FC3 lower limits: Ø 32 mm, s 1,8 mm → Ø 63 mm, s 1,8 mm → Ø 125 mm, s 3,1 mm → Ø 160 mm, s 4,0 mm upper limits: Ø 32 mm, s 5,4 mm → Ø 40 mm, s 5,4 mm → Ø 63 mm, s 5,4 mm → Ø 125 mm, s 11,4 mm → Ø 160 mm, s 14,6 mm PROMASTOP®-FC6 lower limits: Ø 50 mm, s 1,8 mm → Ø 63 mm, s 1,8 mm → Ø 125 mm, s 3,1 mm → Ø 160 mm, s 4,0 mm → Ø 200 mm, s 4,9 mm → Ø 250 mm, s 7,2 mm upper limits: Ø 50 mm, s 5,4 mm → Ø 63 mm, s 5,4 mm → Ø 125 mm, s 11,4 mm → Ø 160 mm, s 14,6 mm → Ø 250 mm, s 11,9 mm	EI 120-U/C
	Surface-mounted, construction thickness ≥ 150 mm		PROMASTOP®-FC3 lower limits: Ø 32 mm, s 1,8 mm → Ø 63 mm, s 1,8 mm → Ø 125 mm, s 3,1 mm upper limits: Ø 32 mm, s 5,8 mm → Ø 63 mm, s 5,8 mm → Ø 125 mm, s 11,4 mm PROMASTOP®-FC6 lower limits: Ø 50 mm, s 1,8 mm → Ø 63 mm, s 1,8 mm → Ø 125 mm, s 3,1 mm → Ø 250 mm, s 4,9 mm upper limits: Ø 50 mm, s 5,4 mm → Ø 63 mm, s 5,4 mm → Ø 125 mm, s 11,4 mm → Ø 250 mm, s 4,9 mm	EI 120-U/C
	Surface-mounted, construction thickness ≥ 150 mm		PROMASTOP®-FC3 lower limits: Ø 32 mm, s 1,8 mm → Ø 63 mm, s 1,8 mm → Ø 125 mm, s 3,1 mm upper limits: Ø 32 mm, s 5,8 mm → Ø 63 mm, s 5,8 mm → Ø 125 mm, s 11,4 mm PROMASTOP®-FC6 lower limits: Ø 50 mm, s 1,8 mm → Ø 63 mm, s 1,8 mm → Ø 125 mm, s 3,1 mm → Ø 250 mm, s 4,9 mm → Ø 315 mm, s 7,7 mm upper limits: Ø 50 mm, s 5,4 mm → Ø 63 mm, s 5,4 mm → Ø 125 mm, s 11,4 mm → Ø 250 mm, s 11,9 mm → Ø 315 mm, s 18,7 mm	EI 90-U/C
Surface-mounted, construction thickness ≥ 150 mm			PROMASTOP®-FC6 lower limits: Ø 50 mm, s 1,8 mm → Ø 63 mm, s 1,8 mm → Ø 125 mm, s 3,1 mm → Ø 160 mm, s 4,0 mm upper limits: Ø 50 mm, s 5,8 mm → Ø 63 mm, s 5,8 mm → Ø 125 mm, s 11,4 mm → Ø 160 mm, s 14,6 mm	EI 240-U/C
Built-in, construction thickness ≥ 150 mm			PROMASTOP®-FC3 lower limits: Ø 32 mm, s 1,8 mm → Ø 63 mm, s 1,8 mm → Ø 125 mm, s 3,1 mm upper limits: Ø 32 mm, s 5,8 mm → Ø 63 mm, s 5,8 mm → Ø 125 mm, s 11,4 mm PROMASTOP®-FC6 lower limits: Ø 32 mm, s 1,8 mm → Ø 63 mm, s 1,8 mm → Ø 125 mm, s 3,1 mm → Ø 160 mm, s 4,0 mm upper limits: Ø 32 mm, s 5,8 mm → Ø 63 mm, s 5,8 mm → Ø 125 mm, s 11,4 mm → Ø 160 mm, s 14,6 mm	EI 120-U/C
	Built-in, construction thickness ≥ 150 mm		PROMASTOP®-FC3 lower limits: Ø 32 mm, s 1,8 mm → Ø 63 mm, s 1,8 mm → Ø 125 mm, s 3,1 mm upper limits: Ø 32 mm, s 5,8 mm → Ø 63 mm, s 5,8 mm → Ø 125 mm, s 11,4 mm PROMASTOP®-FC6 lower limits: Ø 50 mm, s 1,8 mm → Ø 63 mm, s 1,8 mm → Ø 125 mm, s 3,1 mm → Ø 160 mm, s 4,0 mm → Ø 250 mm, s 4,9 mm upper limits: Ø 50 mm, s 5,8 mm → Ø 63 mm, s 5,8 mm → Ø 125 mm, s 11,4 mm → Ø 160 mm, s 14,6 mm → Ø 250 mm, s 4,9 mm	EI 120-U/C

Requirement			Dimension range Ø: outer pipe diameter [mm] s: pipe wall thickness [mm]	Classification
Rigid wall	Rigid floor	Cross laminated timber wall or floor		
PVC-U and PVC-C pipes for pipe penetrations at 90°				
	Built-in, construction thickness ≥ 150 mm		PROMASTOP®-FC3 lower limits: Ø 32 mm, s 1,8 mm → Ø 63 mm, s 1,8 mm → Ø 125 mm, s 3,1 mm upper limits: Ø 32 mm, s 5,8 mm → Ø 63 mm, s 5,8 mm → Ø 125 mm, s 11,4 mm PROMASTOP®-FC6 lower limits: Ø 50 mm, s 1,8 mm → Ø 63 mm, s 1,8 mm → Ø 125 mm, s 3,1 mm → Ø 160 mm, s 4,0 mm → Ø 250 mm, s 4,9 mm → Ø 315 mm, s 18,7 mm upper limits: Ø 50 mm, s 5,8 mm → Ø 63 mm, s 5,8 mm → Ø 125 mm, s 11,4 mm → Ø 160 mm, s 14,6 mm → Ø 315 mm, s 18,7 mm	EI 90-U/C
PVC-U and PVC-C pipes for pipe penetrations at 45°				
Surface-mounted, construction thickness ≥ 100 mm			PROMASTOP®-FC6 lower limits: Ø 32 mm, s 1,8 mm → Ø 63 mm, s 1,8 mm → Ø 125 mm, s 3,1 mm upper limits: Ø 32 mm, s 5,4 mm → Ø 63 mm, s 5,4 mm → Ø 125 mm, s 7,1 mm	EI 120-U/U
	Surface-mounted, construction thickness ≥ 150 mm		PROMASTOP®-FC6 (couplings tested up to Ø 160 mm) lower limits: Ø 32 mm, s 1,8 mm → Ø 63 mm, s 1,8 mm → Ø 160 mm, s 4,0 mm upper limits: Ø 32 mm, s 5,4 mm → Ø 63 mm, s 5,4 mm → Ø 160 mm, s 6,2 mm	
POLOPLAST POLO-KAL NG pipes for pipe penetrations at 90°				
Surface-mounted, construction thickness ≥ 100 mm	Surface-mounted, construction thickness ≥ 150 mm		PROMASTOP®-FC3 limits: Ø 32 mm, s 1,8 mm → Ø 40 mm, s 1,8 mm → Ø 50 mm, s 2,0 mm → Ø 75 mm, s 2,6 mm → Ø 110 mm, s 3,4 mm → Ø 125 mm, s 3,9 mm → Ø 160 mm, s 4,9 mm PROMASTOP®-FC6 (couplings tested up to Ø 125 mm) limits: Ø 50 mm, s 2,0 mm → Ø 75 mm, s 2,6 mm → Ø 110 mm, s 3,4 mm → Ø 125 mm, s 3,9 mm → Ø 160 mm, s 4,9 mm → Ø 200 mm, s 6,8 mm → Ø 250 mm, s 8,6 mm	EI 120-U/U
Built-in, construction thickness ≥ 150 mm	Built-in, construction thickness ≥ 150 mm			EI 120-U/U
		Surface-mounted, construction thickness ≥ 140 mm		EI 90-U/U
POLOPLAST POLO-KAL NG pipes for pipe penetrations at 45°				
Surface-mounted, construction thickness ≥ 100 mm			PROMASTOP®-FC6 limits: Ø 32 mm, s 1,8 mm → Ø 40 mm, s 1,8 mm → Ø 50 mm, s 2,0 mm → Ø 75 mm, s 2,6 mm → Ø 110 mm, s 3,4 mm → Ø 125 mm, s 3,9 mm	EI 120-U/U
	Surface-mounted, construction thickness ≥ 150 mm		PROMASTOP®-FC6 (couplings tested up to Ø 160 mm) limits: Ø 32 mm, s 1,8 mm → Ø 40 mm, s 1,8 mm → Ø 50 mm, s 2,0 mm → Ø 75 mm, s 2,6 mm → Ø 110 mm, s 3,4 mm → Ø 125 mm, s 3,9 mm → Ø 160 mm, s 4,9 mm	

Requirement			Dimension range Ø: outer pipe diameter [mm] s: pipe wall thickness [mm]	Classification
Rigid wall	Rigid floor	Cross laminated timber wall or floor		
POLOPLAST POLO-KAL XS pipes for pipe penetrations at 90°				
Surface-mounted, construction thickness ≥ 100 mm	Surface-mounted, construction thickness ≥ 150 mm		PROMASTOP®-FC3 limits: Ø 32 mm, s 1,8 mm → Ø 40 mm, s 1,8 mm → Ø 50 mm, s 2,0 mm → Ø 75 mm, s 2,6 mm → Ø 110 mm, s 3,4 mm PROMASTOP®-FC6 (couplings tested up to Ø 110 mm) limits: Ø 50 mm, s 2,0 mm → Ø 75 mm, s 2,6 mm → Ø 110 mm, s 3,4 mm	EI 120-U/U
Built-in, construction thickness ≥ 150 mm	Built-in, construction thickness ≥ 150 mm			EI 120-U/U
		Surface-mounted, construction thickness ≥ 140 mm		EI 90-U/U
POLOPLAST POLO-KAL XS pipes for pipe penetrations at 45°				
Surface-mounted, construction thickness ≥ 100 mm			PROMASTOP®-FC6 limits: Ø 32 mm, s 1,8 mm → Ø 40 mm, s 1,8 mm → Ø 50 mm, s 2,0 mm → Ø 75 mm, s 2,6 mm → Ø 110 mm, s 3,4 mm	EI 120-U/U
	Surface-mounted, construction thickness ≥ 150 mm		PROMASTOP®-FC6 (couplings tested up to Ø 110 mm) limits: Ø 32 mm, s 1,8 mm → Ø 40 mm, s 1,8 mm → Ø 50 mm, s 2,0 mm → Ø 75 mm, s 2,6 mm → Ø 110 mm, s 3,4 mm	
POLOPLAST POLO-KAL 3S pipes for pipe penetrations at 90°				
Surface-mounted, construction thickness ≥ 100 mm	Surface-mounted, construction thickness ≥ 150 mm		PROMASTOP®-FC3 limits: Ø 75 mm, s 3,8 mm → Ø 110 mm, s 4,8 mm → Ø 125 mm, s 5,3 mm → Ø 160 mm, s 7,5 mm PROMASTOP®-FC6 (couplings tested up to Ø 125 mm) limits: Ø 75 mm, s 3,8 mm → Ø 110 mm, s 4,8 mm → Ø 125 mm, s 5,3 mm → Ø 160 mm, s 7,5 mm	EI 120-U/U
Built-in, construction thickness ≥ 150 mm	Built-in, construction thickness ≥ 150 mm			EI 120-U/U
		Surface-mounted, construction thickness ≥ 140 mm		EI 90-U/U
POLOPLAST POLO-KAL 3S pipes for pipe penetrations at 45°				
Surface-mounted, construction thickness ≥ 100 mm			PROMASTOP®-FC6 limits: Ø 75 mm, s 3,8 mm → Ø 110 mm, s 4,8 mm → Ø 125 mm, s 5,3 mm	EI 120-U/U
	Surface-mounted, construction thickness ≥ 150 mm		PROMASTOP®-FC6 (couplings tested up to Ø 160 mm) limits: Ø 75 mm, s 3,8 mm → Ø 110 mm, s 4,8 mm → Ø 125 mm, s 5,3 mm → Ø 160 mm, s 7,5 mm	
POLOPLAST POLO-KAL 3S Pro pipes for pipe penetrations at 90° (≥ 10 mm thick PROMASEAL®-A penetration seal, see Detail F)				
Surface-mounted, construction thickness ≥ 100 mm			PROMASTOP®-FC3 or PROMASTOP®-FC6 Ø ≤ 125 mm, s 3,9 mm	EI 120-U/U

Requirement			Dimension range Ø: outer pipe diameter [mm] s: pipe wall thickness [mm]	Classification
Rigid wall	Rigid floor	Cross laminated timber wall or floor		
POLOPLAST POLO ECO Premium 10 pipes for pipe penetrations at 90°				
Surface-mounted, construction thickness ≥ 150 mm	Surface-mounted, construction thickness ≥ 150 mm		PROMASTOP®-FC6 limits: Ø 110 mm, s 3,9 mm → Ø 125 mm, s 4,8 mm → Ø 160 mm, s 5,6 mm → Ø 200 mm, s 6,9 mm → Ø 250 mm, s 8,5 mm PROMASTOP®-FC15 limits: Ø 315 mm, s 10,8 mm → Ø 400 mm, s 13,6 mm	EI 120-U/U
Pipelife MASTER 3 pipes for pipe penetrations at 90°				
Surface-mounted, construction thickness ≥ 100 mm	Surface-mounted, construction thickness ≥ 150 mm		PROMASTOP®-FC3 limits: Ø 32 mm, s 1,8 mm → Ø 40 mm, s 1,8 mm → Ø 50 mm, s 1,8 mm → Ø 75 mm, s 2,1 mm → Ø 110 mm, s 3,0 mm → Ø 125 mm, s 3,5 mm PROMASTOP®-FC6 (couplings tested up to Ø 125 mm) limits: Ø 50 mm, s 1,8 mm → Ø 75 mm, s 2,1 mm → Ø 110 mm, s 3,0 mm → Ø 125 mm, s 3,5 mm → Ø 160 mm, s 4,4 mm	EI 120-U/U
Built-in, construction thickness ≥ 150 mm	Built-in, construction thickness ≥ 150 mm			EI 120-U/U
		Surface-mounted, construction thickness ≥ 140 mm		EI 90-U/U
Geberit Silent-db20 pipes for pipe penetrations at 90°				
Surface-mounted, construction thickness ≥ 100 mm	Surface-mounted, construction thickness ≥ 150 mm		PROMASTOP®-FC3 limits: Ø 56 mm, s 3,2 mm → Ø 63 mm, s 3,2 mm → Ø 75 mm, s 3,6 mm → Ø 90 mm, s 5,5 mm → Ø 110 mm, s 6,0 mm PROMASTOP®-FC6 (couplings tested up to Ø 135 mm) limits: Ø 56 mm, s 3,2 mm → Ø 63 mm, s 3,2 mm → Ø 75 mm, s 3,6 mm → Ø 90 mm, s 5,5 mm → Ø 110 mm, s 6,0 mm → Ø 135 mm, s 6,0 mm → Ø 160 mm, s 7,0 mm	EI 120-U/U
Built-in, construction thickness ≥ 150 mm	Built-in, construction thickness ≥ 150 mm			EI 120-U/U
		Surface-mounted, construction thickness ≥ 140 mm		EI 90-U/U
Geberit Silent-PP pipes for pipe penetrations at 90°				
Surface-mounted, construction thickness ≥ 100 mm	Surface-mounted, construction thickness ≥ 150 mm		PROMASTOP®-FC3 limits: Ø 32 mm, s 2,0 mm → Ø 40 mm, s 2,0 mm → Ø 50 mm, s 2,0 mm → Ø 75 mm, s 2,6 mm → Ø 90 mm, s 3,1 mm → Ø 110 mm, s 3,6 mm → Ø 125 mm, s 4,2 mm PROMASTOP®-FC6 (couplings tested up to Ø 125 mm) limits: Ø 32 mm, s 2,0 mm → Ø 40 mm, s 2,0 mm → Ø 50 mm, s 2,0 mm → Ø 75 mm, s 2,6 mm → Ø 90 mm, s 3,1 mm → Ø 110 mm, s 3,6 mm → Ø 125 mm, s 4,2 mm → Ø 160 mm, s 5,2 mm	EI 120-U/U
Built-in, construction thickness ≥ 150 mm	Built-in, construction thickness ≥ 150 mm			EI 120-U/U
		Surface-mounted, construction thickness ≥ 140 mm		EI 90-U/U

Requirement			Dimension range Ø: outer pipe diameter [mm] s: pipe wall thickness [mm]	Classification
Rigid wall	Rigid floor	Cross laminated timber wall or floor		
REHAU RAUPIANO PLUS pipes for pipe penetrations at 90°				
Surface-mounted, construction thickness ≥ 100 mm	Surface-mounted, construction thickness ≥ 150 mm		PROMASTOP®-FC6 (couplings tested up to Ø 125 mm) limits: Ø 40 mm, s 1,8 mm → Ø 50 mm, s 1,8 mm → Ø 125 mm, s 3,1 mm → Ø 160 mm, s 3,9 mm → Ø 200 mm, s 6,2 mm	EI 120-U/U
Built-in, construction thickness ≥ 150 mm	Built-in, construction thickness ≥ 150 mm			EI 120-U/U
		Surface-mounted, construction thickness ≥ 140 mm		EI 90-U/U
REHAU RAUPIANO PLUS pipes for pipe penetrations at 45°				
	Surface-mounted, construction thickness ≥ 150 mm		PROMASTOP®-FC6 (couplings tested up to Ø 160 mm) limits: Ø 40 mm, s 1,8 mm → Ø 50 mm, s 1,8 mm → Ø 125 mm, s 3,1 mm → Ø 160 mm, s 3,9 mm	EI 120-U/U
Nicoll dBlue pipes for pipe penetrations at 90°				
Surface-mounted, construction thickness ≥ 100 mm	Surface-mounted, construction thickness ≥ 150 mm		PROMASTOP®-FC3 limits: Ø 50 mm, s 1,8 mm → Ø 125 mm, s 3,9 mm	EI 120-U/U
Built-in, construction thickness ≥ 150 mm	Built-in, construction thickness ≥ 150 mm			EI 120-U/U
		Surface-mounted, construction thickness ≥ 140 mm		EI 90-U/U
Girpi Friaphon pipes for pipe penetrations at 90°				
Surface-mounted, construction thickness ≥ 100 mm	Surface-mounted, construction thickness ≥ 150 mm		PROMASTOP®-FC3 limits: Ø 52 mm, s 2,8 mm → Ø 78 mm, s 4,9 mm → Ø 110 mm, s 5,3 mm PROMASTOP®-FC6 limits: Ø 52 mm, s 2,8 mm → Ø 78 mm, s 4,9 mm → Ø 110 mm, s 5,3 mm → Ø 135 mm, s 5,6 mm → Ø 160 mm, s 6,3 mm	EI 120-U/U
Built-in, construction thickness ≥ 150 mm	Built-in, construction thickness ≥ 150 mm			EI 120-U/U
		Surface-mounted, construction thickness ≥ 140 mm		EI 90-U/U

Requirement			Dimension range Ø: outer pipe diameter [mm] s: pipe wall thickness [mm]	Classification
Rigid wall	Rigid floor	Cross laminated timber wall or floor		
Girpi HTA-E pipes for pipe penetrations at 90°				
Surface-mounted, construction thickness ≥ 100 mm	Surface-mounted, construction thickness ≥ 150 mm		PROMASTOP®-FC6 limits: Ø 40 mm, s 3,0 mm → Ø 50 mm, s 3,7 mm → Ø 63 mm, s 4,7 mm → Ø 75 mm, s 5,5 mm → Ø 90 mm, s 6,6 mm → Ø 110 mm, s 5,3 mm → Ø 125 mm, s 6,0 mm	EI 120-U/U
Built-in, construction thickness ≥ 150 mm	Built-in, construction thickness ≥ 150 mm			EI 120-U/U
		Surface-mounted, construction thickness ≥ 140 mm		EI 90-U/U
KE KELIT Phonex AS pipes for pipe penetrations at 90°				
Surface-mounted, construction thickness ≥ 100 mm	Surface-mounted, construction thickness ≥ 150 mm		PROMASTOP®-FC6 limits: Ø 58 mm, s 4,0 mm → Ø 78 mm, s 4,5 mm → Ø 110 mm, s 5,3 mm → Ø 135 mm, s 5,3 mm → Ø 160 mm, s 5,3 mm	EI 120-U/U
Built-in, construction thickness ≥ 150 mm	Built-in, construction thickness ≥ 150 mm			EI 120-U/U
		Surface-mounted, construction thickness ≥ 140 mm		EI 90-U/U
Wavin AS pipes for pipe penetrations at 90°				
Surface-mounted, construction thickness ≥ 100 mm	Surface-mounted, construction thickness ≥ 150 mm		PROMASTOP®-FC6 limits: Ø 58 mm, s 4,0 mm → Ø 78 mm, s 4,5 mm → Ø 110 mm, s 5,3 mm → Ø 135 mm, s 5,3 mm → Ø 160 mm, s 5,3 mm	EI 120-U/U
Built-in, construction thickness ≥ 150 mm	Built-in, construction thickness ≥ 150 mm			EI 120-U/U
		Surface-mounted, construction thickness ≥ 140 mm		EI 90-U/U

Requirement			Dimension range Ø: outer pipe diameter [mm] s: pipe wall thickness [mm]	Classification
Rigid wall	Rigid floor	Cross laminated timber wall or floor		
Wavin SiTech+ pipes for pipe penetrations at 90°				
Surface-mounted, construction thickness ≥ 100 mm	Surface-mounted, construction thickness ≥ 150 mm		PROMASTOP®-FC6 limits: Ø 50 mm, s 1,8 mm → Ø 125 mm, s 3,9 mm → Ø 160 mm, s 4,9 mm	EI 120-U/U
Built-in, construction thickness ≥ 150 mm	Built-in, construction thickness ≥ 150 mm			EI 120-U/U
		Surface-mounted, construction thickness ≥ 140 mm		EI 90-U/U
Marley Silent pipes for pipe penetrations at 90°				
Surface-mounted, construction thickness ≥ 100 mm	Surface-mounted, construction thickness ≥ 150 mm		PROMASTOP®-FC6 limits: Ø 75 mm, s 2,0 mm → Ø 110 mm, s 3,0 mm	EI 120-U/U
Built-in, construction thickness ≥ 150 mm	Built-in, construction thickness ≥ 150 mm			EI 120-U/U
		Surface-mounted, construction thickness ≥ 140 mm		EI 90-U/U

Table 5 – PROMASTOP®-FC penetration seal for plastic pipes with combustible insulation in rigid constructions

Overview of pipe materials, dimensions, installation situations (collar surface-mounted or built-in), collar type (PROMASTOP®-FC3 or PROMASTOP®-FC6) and classifications

Requirement		Dimension range Ø: outer pipe diameter [mm] s: pipe wall thickness [mm] d: insulation thickness [mm]	Classification
Rigid wall	Rigid floor		
PE-HD, ABS, SAN + PVC sewage pipes for pipe penetrations at 90°			
Surface-mounted, construction thickness ≥ 100 mm		PROMASTOP®-FC6 s 2,0 - 10,4 mm limits: Ø 32 - 180 mm, d 6 - 32 mm	EI 120-U/U with combustible insulation B-s3, d0
Surface-mounted, construction thickness ≥ 100 mm		PROMASTOP®-FC6 s 2,0 - 10,4 mm lower limits: Ø 32 mm, d 6 mm → Ø 110 mm, d 6 mm → Ø 180 mm, d 6 mm → Ø 200 mm, d 6 mm upper limits: Ø 32 mm, d 32 mm → Ø 180 mm, d 32 mm → Ø 200 mm, d 19 mm	EI 90-U/U with combustible insulation B-s3, d0
	Surface-mounted, construction thickness ≥ 150 mm	PROMASTOP®-FC6 limits: Ø 32 mm, d 6 mm → Ø 110 mm, d 6 mm	EI 120-U/U with combustible insulation B-s3, d0
	Surface-mounted, construction thickness ≥ 150 mm	PROMASTOP®-FC6 with Promat SPC limits: Ø 32 - 180 mm, d 6 - 32 mm	EI 60-U/U with combustible insulation B-s3, d0
PE-HD, ABS, SAN + PVC supply pipes for pipe penetrations at 90°			
Surface-mounted, construction thickness ≥ 100 mm		PROMASTOP®-FC6 s 2,0 - 16,4 mm limits: Ø 32 - 180 mm, d 6 - 32 mm	EI 120-U/C with combustible insulation B-s3, d0
	Surface-mounted, construction thickness ≥ 150 mm	PROMASTOP®-FC6 s 2,0 - 16,4 mm lower limits: Ø 32 mm, d 6 mm → Ø 110 mm, d 6 mm → Ø 180 mm, d 6 mm → Ø 200 mm, d 6 mm upper limits: Ø 32 mm, d 32 mm → Ø 180 mm, d 32 mm → Ø 200 mm, d 19 mm	EI 90-U/C with combustible insulation B-s3, d0
PP-H and PP-R sewage pipes for pipe penetrations at 90°			
Surface-mounted, construction thickness ≥ 100 mm		PROMASTOP®-FC6 s 2,0 - 9,2 mm limits: Ø 32 - 180 mm, d 6 - 32 mm	EI 120-U/U with combustible insulation B-s3, d0
	Surface-mounted, construction thickness ≥ 150 mm	PROMASTOP®-FC6 with Promat SPC limits: Ø 32 - 200 mm, d 6 - 19 mm	EI 120-U/U with combustible insulation B-s3, d0
	Surface-mounted, construction thickness ≥ 150 mm	PROMASTOP®-FC6 with Promat SPC lower limits: Ø 32 mm, d 6 mm → Ø 110 mm, d 6 mm → Ø 180 mm, d 6 mm → Ø 200 mm, d 6 mm upper limits: Ø 32 mm, d 32 mm → Ø 180 mm, d 32 mm → Ø 200 mm, d 19 mm	EI 60-U/U with combustible insulation B-s3, d0

Requirement		Dimension range Ø: outer pipe diameter [mm] s: pipe wall thickness [mm] d: insulation thickness [mm]	Classification
Rigid wall	Rigid floor		
PP-H and PP-R supply pipes for pipe penetrations at 90°			
Surface-mounted, construction thickness ≥ 100 mm		PROMASTOP®-FC6 s 1,8 - 21,9 mm limits: Ø 32 - 180 mm, d 6 - 32 mm	EI 120-U/C with combustible insulation B-s3, d0
Surface-mounted, construction thickness ≥ 100 mm		PROMASTOP®-FC6 s 1,8 - 21,9 mm lower limits: Ø 32 mm, d 6 mm → Ø 110 mm, d 6 mm → Ø 160 mm, d 6 mm → Ø 200 mm, d 6 mm upper limits: Ø 32 mm, d 32 mm → Ø 160 mm, d 32 mm → Ø 200 mm, d 19 mm	EI 60-U/C with combustible insulation B-s3, d0
	Surface-mounted, construction thickness ≥ 150 mm	PROMASTOP®-FC6 with Promat SPC s 1,8 - 21,9 mm limits: Ø 32 - 160 mm, d 6 - 32 mm	EI 90-U/C with combustible insulation B-s3, d0
	Surface-mounted, construction thickness ≥ 150 mm	PROMASTOP®-FC6 with Promat SPC lower limits: Ø 32 mm, d 6 mm → Ø 110 mm, d 6 mm → Ø 160 mm, d 6 mm → Ø 200 mm, d 6 mm upper limits: Ø 32 mm, d 32 mm → Ø 160 mm, d 32 mm → Ø 200 mm, d 19 mm	EI 60-U/C with combustible insulation B-s3, d0
PVC-U and PVC-C sewage pipes for pipe penetrations at 90°			
Surface-mounted, construction thickness ≥ 100 mm		PROMASTOP®-FC6 s 2,0 - 6,2 mm limits: Ø 32 - 180 mm, d 6 - 32 mm	EI 120-U/U with combustible insulation B-s3, d0
Surface-mounted, construction thickness ≥ 100 mm		PROMASTOP®-FC6 s 2,0 - 6,2 mm lower limits: Ø 32 mm, d 6 mm → Ø 110 mm, d 6 mm → Ø 180 mm, d 6 mm → Ø 200 mm, d 6 mm upper limits: Ø 32 mm, d 32 mm → Ø 180 mm, d 32 mm → Ø 200 mm, d 19 mm	EI 60-U/U with combustible insulation B-s3, d0
	Surface-mounted, construction thickness ≥ 150 mm	PROMASTOP®-FC6 with Promat SPC limits: Ø 32 - 200 mm, d 6 - 19 mm	EI 120-U/U with combustible insulation B-s3, d0
PVC-U and PVC-C supply pipes for pipe penetrations at 90°			
Surface-mounted, construction thickness ≥ 100 mm		PROMASTOP®-FC6 s 1,8 - 8,6 mm limits: Ø 32 - 200 mm, d 6 - 19 mm	EI 120-U/C with combustible insulation B-s3, d0
Surface-mounted, construction thickness ≥ 100 mm		PROMASTOP®-FC6 with Promat SPC s 1,8 - 8,6 mm lower limits: Ø 32 mm, d 6 mm → Ø 110 mm, d 6 mm → Ø 180 mm, d 6 mm → Ø 200 mm, d 6 mm upper limits: Ø 32 mm, d 32 mm → Ø 180 mm, d 32 mm → Ø 200 mm, d 19 mm	EI 60-U/C with combustible insulation B-s3, d0
	Surface-mounted, construction thickness ≥ 150 mm	PROMASTOP®-FC6 with Promat SPC s 1,8 - 8,6 mm lower limits: Ø 32 mm, d 6 mm → Ø 110 mm, d 6 mm → Ø 180 mm, d 6 mm → Ø 200 mm, d 6 mm upper limits: Ø 32 mm, d 32 mm → Ø 180 mm, d 32 mm → Ø 200 mm, d 19 mm	EI 120-U/C with combustible insulation B-s3, d0
POLOPLAST POLO-KAL NG sewage pipes for pipe penetrations at 90°			
Surface-mounted, construction thickness ≥ 100 mm		PROMASTOP®-FC6 limits: Ø 32 - 160 mm, d 6 - 32 mm	EI 90-U/U with combustible insulation B-s3, d0
	Surface-mounted, construction thickness ≥ 150 mm	PROMASTOP®-FC6 with Promat SPC limits: Ø 32 - 160 mm, d 6 - 32 mm	EI 90-U/U with combustible insulation B-s3, d0

Requirement		Dimension range Ø: outer pipe diameter [mm] s: pipe wall thickness [mm] d: insulation thickness [mm]	Classification
Rigid wall	Rigid floor		
POLOPLAST POLO-KAL 3S sewage pipes for pipe penetrations at 90°			
Surface-mounted, construction thickness ≥ 100 mm		PROMASTOP®-FC6 limits: Ø 75 - 160 mm, d 6 - 32 mm	EI 120-U/U with combustible insulation B-s3, d0
	Surface-mounted, construction thickness ≥ 150 mm	PROMASTOP®-FC6 with Promat SPC limits: Ø 75 - 160 mm, d 6 - 19 mm	EI 120-U/U with combustible insulation B-s3, d0
	Surface-mounted, construction thickness ≥ 150 mm	PROMASTOP®-FC6 with Promat SPC limits: Ø 75 - 160 mm, d 6 - 32 mm	EI 60-U/U with combustible insulation B-s3, d0
REHAU RAUPIANO PLUS sewage pipes for pipe penetrations at 90°			
Surface-mounted, construction thickness ≥ 100 mm		PROMASTOP®-FC6 limits: Ø 32 - 200 mm, d 6 - 19 mm	EI 120-U/U with combustible insulation B-s3, d0
Surface-mounted, construction thickness ≥ 100 mm		PROMASTOP®-FC6 lower limits: Ø 32 mm, d 6 mm → Ø 110 mm, d 6 mm → Ø 160 mm, d 6 mm → Ø 200 mm, d 6 mm upper limits: Ø 32 mm, d 32 mm → Ø 160 mm, d 32 mm → Ø 200 mm, d 19 mm	EI 90-U/U with combustible insulation B-s3, d0
	Surface-mounted, construction thickness ≥ 150 mm	PROMASTOP®-FC6 with Promat SPC limits: Ø 32 - 200 mm, d 6 - 19 mm	EI 120-U/U with combustible insulation B-s3, d0
	Surface-mounted, construction thickness ≥ 150 mm	PROMASTOP®-FC6 with Promat SPC lower limits: Ø 32 mm, d 6 mm → Ø 110 mm, d 6 mm → Ø 160 mm, d 6 mm → Ø 200 mm, d 6 mm upper limits: Ø 32 mm, d 32 mm → Ø 160 mm, d 32 mm → Ø 200 mm, d 19 mm	EI 60-U/U with combustible insulation B-s3, d0
Geberit Silent-PP sewage pipes for pipe penetrations at 90°			
Surface-mounted, construction thickness ≥ 100 mm		PROMASTOP®-FC6 limits: Ø 32 - 160 mm, d 6 - 32 mm	EI 120-U/U with combustible insulation B-s3, d0
	Surface-mounted, construction thickness ≥ 150 mm	PROMASTOP®-FC6 with Promat SPC limits: Ø 32 - 160 mm, d 6 mm	EI 120-U/U with combustible insulation B-s3, d0
	Surface-mounted, construction thickness ≥ 150 mm	PROMASTOP®-FC6 with Promat SPC limits: Ø 32 - 160 mm, d 6 - 32 mm	EI 60-U/U with combustible insulation B-s3, d0
Geberit Silent-db20 sewage pipes for pipe penetrations at 90°			
Surface-mounted, construction thickness ≥ 100 mm		PROMASTOP®-FC6 limits: Ø 56 - 160 mm, d 6 - 32 mm	EI 120-U/U with combustible insulation B-s3, d0
	Surface-mounted, construction thickness ≥ 150 mm	PROMASTOP®-FC6 with Promat SPC limits: Ø 56 - 160 mm, d 6 - 32 mm	EI 120-U/U with combustible insulation B-s3, d0

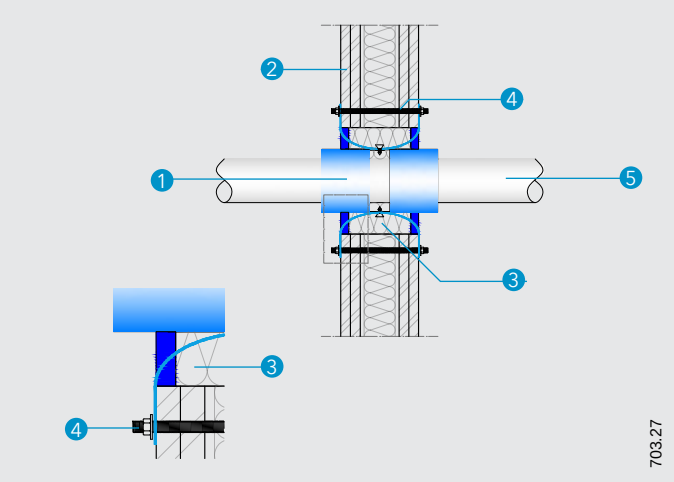
5. PROMASTOP®-FC pipe penetration seal in lightweight constructions (flexible walls, shaft walls, sandwich panel walls and suspended ceilings)

Table 6 – PROMASTOP®-FC penetration seal in flexible wall, shaft wall, sandwich panel wall and suspended ceiling

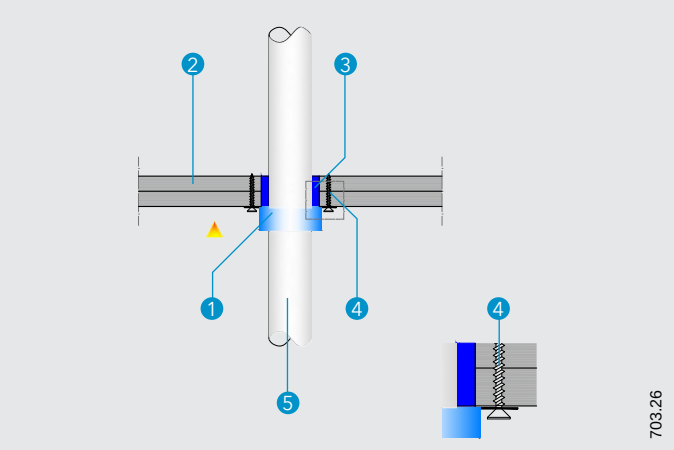
Supporting construction	Specification
Flexible wall*	Collar surface-mounted: threaded rods M6 or M8 Collar built-in: perforated metal band + enclosed fixing material
Suspended ceiling**	Enclosed fixing material
Shaft wall* (overview of shaft wall solutions on page 134)	**Shaft wall solution 1:** Enclosed fixing material **Shaft wall solution 2:** Enclosed fixing material + Promat shaft wall clip **Shaft wall solution 3:** Enclosed fixing material
Sandwich panel wall type 1 and type 2**	Enclosed fixing material

**The collar shall be fixed on every second fixing latch (e.g. 2 of 4 or 3 of 5) - no two adjacent latches may be left unfixed.*

*** The collar shall be fixed on very fixing latch.*



Detail G – Built-in PROMASTOP®-FC fire stopping collar in flexible wall



Detail H – Surface-mounted PROMASTOP®-FC fire stopping collar on suspended ceiling

The classification results in flexible walls may also be applied to rigid walls in case the thickness and density are higher than those of the tested construction.

Sound decoupling strips

In lightweight constructions every type of sound decoupling strip based on PE-foam of class E or higher rated acc. to EN 13501-1, with a maximum thickness of 5 mm may be used.

Combustible insulation

In lightweight constructions every type of combustible insulation of class B-s3, d0 or higher rated acc. to EN 13501-1, with a maximum thickness of 32 mm may be used. The thresholds for pipe diameter and insulation thickness are shown in Table 9.

Couplings

The diameter of the tested coupling may be decreased but not increased.

Sloped pipes

The angle of the pipe may vary between the tested one and the right angle.

Detail G

In flexible walls, the PROMASTOP®-FC collar shall be used on both sides, shaft walls of solutions 1 and 3 are exluded.

Table 6

The fixing shall be considered depending on the supporting construction acc. to Table 6.

Annular gap filling

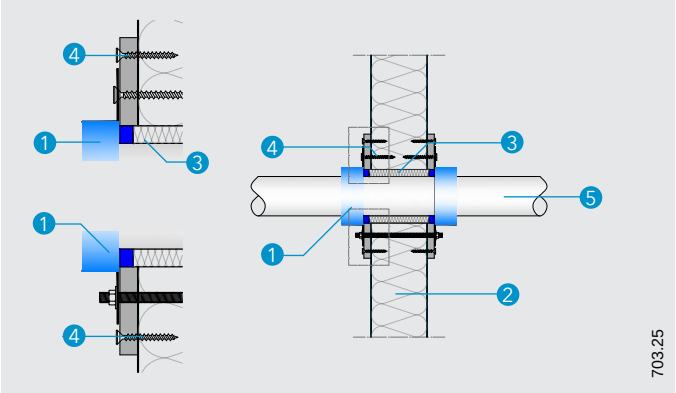
In lightweight constructions, the annular gap needs to be filled differently depending on the construction.

Table 7 – Annular gap filling for flexible wall, shaft wall, sandwich panel wall and suspended ceiling

Object	Specification
Flexible wall	Backfilling with mineral wool (Class A1 acc. to EN 13501-1, melting point ≥ 1000 °C, density ≥ 40 kg/m³) covered on both sides with PROMASEAL®-A fire stopping sealant ≥ 5 mm
	Filling with gypsum-based filler, e.g. Promat®-Spachtelmasse
Shaft wall and suspended ceiling	Filling with PROMASEAL®-A fire stopping sealant in whole depth (annular gap width: 5–20 mm)
	Filling with gypsum-based filler, e.g. Promat®-Spachtelmasse (annular gap width: 5–20 mm)
Sandwich panel wall type 1	Backfilling with mineral wool (Class A1 acc. to EN 13501-1, melting point ≥ 1000 °C, density ≥ 40 kg/m³) covered on both sides with PROMASEAL®-A fire stopping sealant ≥ 5 mm (annular gap width: 5–30 mm)

Detail H

In floor applications, install the collar on the bottom side of the floor.



Detail I – Surface-mounted PROMASTOP®-FC fire stopping collar on sandwich panel wall type 1

Detail I

In sandwich panel wall installations, install the collar on both sides.
The tested ArcelorMittal Pflaum FO-010-10-80/1000 mineral wool panel was ≥ 80 mm thick, with a circumferential frame made of PROMATECT®-100 fire protective boards (thickness ≥ 10 mm) must be installed around the opening using dry wall screws (fixing distance ≤ 200 mm). The PROMATECT®-100 fire protective boards must cover at least 50 mm around the opening. An additional aperture framing is not necessary.

Table 8

For the pipe materials, dimensions, installation situations and classifications see Table 8.

Table 8 – PROMASTOP®-FC penetration seal for plastic pipes without insulation in lightweight constructions - overview of pipe materials, dimensions, installation situations (collar surface-mounted or built-in), collar type (PROMASTOP®-FC3 or PROMASTOP®-FC6) and classification

Requirement				Dimension range Ø: outer pipe diameter [mm] s: pipe wall thickness [mm]	Classification
Flexible wall	Shaft wall	Suspended ceiling	Sandwich panel wall type 1,2 or 3		
PE-HD, ABS, SAN + PVC pipes for pipe penetrations at 90°					
	Solution 1, Solution 2: Surface-mounted, construction thickness ≥ 2 × 20 mm	Surface-mounted, construction thickness ≥ 2 × 20 mm	Surface-mounted, construction thickness ≥ 80 mm, wall type 1	PROMASTOP®-FC3 lower limits: Ø 32 mm, s 1,8 mm → Ø 63 mm, s 1,8 mm → Ø 125 mm, s 3,1 mm upper limits: Ø 32 mm, s 5,8 mm → Ø 63 mm, s 5,8 mm → Ø 125 mm, s 7,4 mm	EI 90-U/U
Surface-mounted, construction thickness ≥ 100 mm				PROMASTOP®-FC6 lower limits: Ø 50 mm, s 1,8 mm → Ø 63 mm, s 1,8 mm → Ø 125 mm, s 3,1 mm → Ø 200 mm, s 4,9 mm upper limits: Ø 50 mm, s 5,8 mm → Ø 63 mm, s 5,8 mm → Ø 125 mm, s 7,4 mm → Ø 200 mm, s 11,4 mm	EI 120-U/U
	Solution 3: Built-in, construction thickness ≥ 2 × 15 mm, ≥ 2 × 20 mm, ≥ 2 × 25 mm			PROMASTOP®-FC6 (couplings tested up to Ø 125 mm) lower limits: Ø 32 mm, s 1,8 mm → Ø 63 mm, s 1,8 mm → Ø 125 mm, s 3,1 mm upper limits: Ø 32 mm, s 5,8 mm → Ø 63 mm, s 5,8 mm → Ø 125 mm, s 7,4 mm	EI 60-U/U (for 2 × 15 mm) EI 90-U/U (for 2 × 20 mm) EI 120-U/U (for 2 × 25 mm)
				PROMASTOP®-FC6 lower limits: Ø 50 mm, s 1,8 mm → Ø 63 mm, s 1,8 mm → Ø 125 mm, s 3,1 mm upper limits: Ø 50 mm, s 5,8 mm → Ø 63 mm, s 5,8 mm → Ø 125 mm, s 11,4 mm	EI 60-U/C (for 2 × 15 mm) EI 90-U/C (for 2 × 20 mm) EI 120-U/C (for 2 × 25 mm)
			Construction thickness ≥ 100 mm, wall type 2	PROMASTOP®-FC6 lower limits: Ø 125 mm, s 3,1 mm → Ø 160 mm, s 4,0 mm upper limits: Ø 125 mm, s 14,6 mm → Ø 160 mm, s 14,6 mm	EI 30-U/U
			Construction thickness ≥ 175 mm, wall type 3	PROMASTOP®-FC6 lower limits: Ø 125 mm, s 3,1 mm → Ø 160 mm, s 4,0 mm upper limits: Ø 125 mm, s 14,6 mm → Ø 160 mm, s 14,6 mm	EI 60-U/U
PE-HD, ABS, SAN + PVC pipes for pipe penetrations at 45°					
Surface-mounted, construction thickness ≥ 100 mm				PROMASTOP®-FC6 lower limits: Ø 32 mm, s 1,8 mm → Ø 63 mm, s 1,8 mm → Ø 125 mm, s 3,1 mm upper limits: Ø 32 mm, s 5,8 mm → Ø 63 mm, s 5,8 mm → Ø 125 mm, s 7,4 mm	EI 120-U/U

Requirement				Dimension range Ø: outer pipe diameter [mm] s: pipe wall thickness [mm]	Classification
Flexible wall	Shaft wall	Suspended ceiling	Sandwich panel wall		
PP-H and PP-R pipes for pipe penetrations at 90°					
	Solution 1, Solution 2: Surface-mounted, construction thickness ≥ 2 × 20 mm	Surface-mounted, construction thickness ≥ 2 × 20 mm	Surface-mounted, construction thickness ≥ 80 mm, wall type 1	PROMASTOP®-FC3 lower limits: Ø 32 mm, s 1,8 mm → Ø 63 mm, s 1,8 mm → Ø 125 mm, s 3,1 mm → Ø 160 mm, s 4,0 mm upper limits: Ø 32 mm, s 8,6 mm → Ø 63 mm, s 8,6 mm → Ø 125 mm, s 7,1 mm → Ø 160 mm, s 4,0 mm	EI 90-U/U
Surface-mounted, construction thickness ≥ 100 mm				PROMASTOP®-FC6 lower limits: Ø 50 mm, s 1,8 mm → Ø 63 mm, s 1,8 mm → Ø 125 mm, s 3,1 mm → Ø 200 mm, s 4,9 mm upper limits: Ø 50 mm, s 8,6 mm → Ø 63 mm, s 8,6 mm → Ø 125 mm, s 7,1 mm → Ø 200 mm, s 11,4 mm	EI 120-U/U
	Solution 3: Built-in, construction thickness ≥ 2 × 15 mm, ≥ 2 × 20 mm, ≥ 2 × 25 mm			PROMASTOP®-FC6 lower limits: Ø 32 mm, s 1,8 mm → Ø 63 mm, s 1,8 mm → Ø 125 mm, s 3,1 mm upper limits: Ø 32 mm, s 5,8 mm → Ø 63 mm, s 5,8 mm → Ø 125 mm, s 7,4 mm	EI 60-U/U (for 2 × 15 mm) EI 90-U/U (for 2 × 20 mm) EI 120-U/U (for 2 × 25 mm)
				PROMASTOP®-FC6 lower limits: Ø 50 mm, s 1,8 mm → Ø 63 mm, s 1,8 mm → Ø 125 mm, s 3,1 mm upper limits: Ø 50 mm, s 5,8 mm → Ø 63 mm, s 5,8 mm → Ø 125 mm, s 11,4 mm	EI 60-U/C (for 2 × 15 mm) EI 90-U/C (for 2 × 20 mm) EI 120-U/C (for 2 × 25 mm)
			Construction thickness ≥ 100 mm, wall type 2	PROMASTOP®-FC6 lower limits: Ø 125 mm, s 3,1 mm → Ø 160 mm, s 4,0 mm upper limits: Ø 125 mm, s 14,6 mm → Ø 160 mm, s 14,6 mm	EI 30-U/U
			Construction thickness ≥ 175 mm, wall type 3	PROMASTOP®-FC6 lower limits: Ø 125 mm, s 3,1 mm → Ø 160 mm, s 4,0 mm upper limits: Ø 125 mm, s 14,6 mm → Ø 160 mm, s 14,6 mm	EI 45-U/U
PP-H and PP-R pipes for pipe penetrations at 45°					
Surface-mounted, construction thickness ≥ 100 mm				PROMASTOP®-FC6 lower limits: Ø 32 mm, s 1,8 mm → Ø 63 mm, s 1,8 mm → Ø 125 mm, s 3,1 mm upper limits: Ø 32 mm, s 5,4 mm → Ø 63 mm, s 5,4 mm → Ø 125 mm, s 7,1 mm	EI 120-U/U
PVC-U and PVC-C pipes for pipe penetrations at 90°					
	Solution 1, Solution 2: Surface-mounted, construction thickness ≥ 2 × 20 mm	Surface-mounted, construction thickness ≥ 2 × 20 mm	Surface-mounted, construction thickness ≥ 80 mm, wall type 1	PROMASTOP®-FC3 lower limits: Ø 32 mm, s 1,8 mm → Ø 63 mm, s 1,8 mm → Ø 125 mm, s 3,1 mm upper limits: Ø 32 mm, s 5,8 mm → Ø 63 mm, s 5,8 mm → Ø 125 mm, s 7,1 mm	EI 90-U/U
Surface-mounted, construction thickness ≥ 100 mm				PROMASTOP®-FC6 (couplings tested up to Ø 125 mm) lower limits: Ø 50 mm, s 1,8 mm → Ø 63 mm, s 1,8 mm → Ø 125 mm, s 3,1 mm → Ø 250 mm, s 4,9 mm upper limits: Ø 50 mm, s 5,8 mm → Ø 63 mm, s 5,8 mm → Ø 125 mm, s 7,1 mm → Ø 250 mm, s 4,9 mm	EI 120-U/U
	Solution 3: Built-in, construction thickness ≥ 2 × 15 mm, ≥ 2 × 20 mm, ≥ 2 × 25 mm			PROMASTOP®-FC6 lower limits: Ø 32 mm, s 1,8 mm → Ø 63 mm, s 1,8 mm → Ø 125 mm, s 3,1 mm upper limits: Ø 32 mm, s 5,8 mm → Ø 63 mm, s 5,8 mm → Ø 125 mm, s 7,4 mm	EI 60-U/U (for 2 × 15 mm) EI 90-U/U (for 2 × 20 mm) EI 120-U/U (for 2 × 25 mm)
				PROMASTOP®-FC6 lower limits: Ø 50 mm, s 1,8 mm → Ø 63 mm, s 1,8 mm → Ø 125 mm, s 3,1 mm upper limits: Ø 50 mm, s 5,8 mm → Ø 63 mm, s 5,8 mm → Ø 125 mm, s 11,4 mm	EI 60-U/C (for 2 × 15 mm) EI 90-U/C (for 2 × 20 mm) EI 120-U/C (for 2 × 25 mm)

Requirement				Dimension range Ø: outer pipe diameter [mm] s: pipe wall thickness [mm]	Classification
Flexible wall	Shaft wall	Suspended ceiling	Sandwich panel wall		
PVC-U and PVC-C pipes for pipe penetrations at 45°					
Surface-mounted, construction thickness ≥ 100 mm				PROMASTOP®-FC6 lower limits: Ø 32 mm, s 1,8 mm → Ø 63 mm, s 1,8 mm → Ø 125 mm, s 3,1 mm upper limits: Ø 32 mm, s 5,4 mm → Ø 63 mm, s 5,4 mm → Ø 125 mm, s 7,1 mm	EI 120-U/U
POLOPLAST POLO-KAL NG pipes for pipe penetrations at 90°					
	Solution 1, Solution 2: Surface-mounted, construction thickness ≥ 2 × 20 mm	Surface-mounted, construction thickness ≥ 2 × 20 mm	Surface-mounted, construction thickness ≥ 80 mm, wall type 1	PROMASTOP®-FC3 limits: Ø 32 mm, s 1,8 mm → Ø 40 mm, s 1,8 mm → Ø 50 mm, s 2,0 mm → Ø 75 mm, s 2,6 mm → Ø 110 mm, s 3,4 mm → Ø 125 mm, s 3,9 mm → Ø 160 mm, s 4,9 mm	EI 90-U/U
Surface-mounted, construction thickness ≥ 100 mm				PROMASTOP®-FC6 (couplings tested up to Ø 125 mm) limits: Ø 50 mm, s 2,0 mm → Ø 75 mm, s 2,6 mm → Ø 110 mm, s 3,4 mm → Ø 125 mm, s 3,9 mm → Ø 160 mm, s 4,9 mm → Ø 200 mm, s 6,8 mm → Ø 250 mm, s 8,6 mm	EI 120-U/U
Built-in, construction thickness ≥ 100 mm				PROMASTOP®-FC6 limits: Ø 50 mm, s 2,0 mm → Ø 75 mm, s 2,6 mm → Ø 110 mm, s 3,4 mm → Ø 125 mm, s 3,9 mm	EI 120-U/U
	Solution 3: Built-in, construction thickness ≥ 2 × 15 mm, ≥ 2 × 20 mm, ≥ 2 × 25 mm			PROMASTOP®-FC6 (couplings tested up to Ø 125 mm) limits: Ø 50 mm, s 2,0 mm → Ø 75 mm, s 2,6 mm → Ø 110 mm, s 3,4 mm → Ø 125 mm, s 3,9 mm	EI 60-U/U (for 2 × 15 mm) EI 90-U/U (for 2 × 20 mm) EI 120-U/U (for 2 × 25 mm)
POLOPLAST POLO-KAL NG pipes for pipe penetrations at 45°					
Surface-mounted, construction thickness ≥ 100 mm				PROMASTOP®-FC6 limits: Ø 32 mm, s 1,8 mm → Ø 40 mm, s 1,8 mm → Ø 50 mm, s 2,0 mm → Ø 75 mm, s 2,6 mm → Ø 110 mm, s 3,4 mm → Ø 125 mm, s 3,9 mm	EI 120-U/U
POLOPLAST POLO-KAL XS pipes for pipe penetrations at 90°					
	Solution 1, Solution 2: Surface-mounted, construction thickness ≥ 2 × 20 mm	Surface-mounted, construction thickness ≥ 2 × 20 mm	Surface-mounted, construction thickness ≥ 80 mm, wall type 1	PROMASTOP®-FC3 limits: Ø 32 mm, s 1,8 mm → Ø 40 mm, s 1,8 mm → Ø 50 mm, s 2,0 mm → Ø 75 mm, s 2,6 mm → Ø 110 mm, s 3,4 mm	EI 90-U/U
Surface-mounted, construction thickness ≥ 100 mm				PROMASTOP®-FC6 (couplings tested up to Ø 110 mm) limits: Ø 50 mm, s 2,0 mm → Ø 75 mm, s 2,6 mm → Ø 110 mm, s 3,4 mm	EI 120-U/U
Built-in, construction thickness ≥ 100 mm				PROMASTOP®-FC6 limits: Ø 50 mm, s 2,0 mm → Ø 75 mm, s 2,6 mm → Ø 110 mm, s 3,4 mm	EI 120-U/U
	Solution 3: Built-in, construction thickness ≥ 2 × 15 mm, ≥ 2 × 20 mm, ≥ 2 × 25 mm			PROMASTOP®-FC6 (couplings tested up to Ø 110 mm) limits: Ø 50 mm, s 2,0 mm → Ø 75 mm, s 2,6 mm → Ø 110 mm, s 3,4 mm	EI 60-U/U (for 2 × 15 mm) EI 90-U/U (for 2 × 20 mm) EI 120-U/U (for 2 × 25 mm)

Requirement				Dimension range Ø: outer pipe diameter [mm] s: pipe wall thickness [mm]	Classification
Flexible wall/ rigid wall	Shaft wall	Suspended ceiling	Sandwich panel wall		
POLOPLAST POLO-KAL XS pipes for pipe penetrations at 45°					
Surface-mounted, construction thickness ≥ 100 mm				PROMASTOP®-FC6 limits: Ø 32 mm, s 1,8 mm → Ø 40 mm, s 1,8 mm → Ø 50 mm, s 2,0 mm → Ø 75 mm, s 2,6 mm → Ø 110 mm, s 3,4 mm	EI 120-U/U
POLOPLAST POLO-KAL 3S pipes for pipe penetrations at 90°					
	Solution 1, Solution 2: Surface-mounted, construction thickness ≥ 2 × 20 mm	Surface-mounted, construction thickness ≥ 2 × 20 mm	Surface-mounted, construction thickness ≥ 80 mm, wall type 1	PROMASTOP®-FC3 limits: Ø 75 mm, s 3,8 mm → Ø 110 mm, s 4,8 mm → Ø 125 mm, s 5,3 mm → Ø 160 mm, s 7,5 mm	EI 90-U/U
Surface-mounted, construction thickness ≥ 100 mm				PROMASTOP®-FC6 (couplings tested up to Ø 125 mm) limits: Ø 75 mm, s 3,8 mm → Ø 110 mm, s 4,8 mm → Ø 125 mm, s 5,3 mm → Ø 160 mm, s 7,5 mm	EI 120-U/U
Built-in, construction thickness ≥ 100 mm				PROMASTOP®-FC6 limits: Ø 75 mm, s 3,8 mm → Ø 110 mm, s 4,8 mm → Ø 125 mm, s 5,3 mm	EI 120-U/U
	Solution 3: Built-in, construction thickness ≥ 2 × 15 mm, ≥ 2 × 20 mm, ≥ 2 × 25 mm			PROMASTOP®-FC6 (couplings tested up to Ø 125 mm) limits: Ø 75 mm, s 3,8 mm → Ø 110 mm, s 4,8 mm → Ø 125 mm, s 5,3 mm	EI 60-U/U (for 2 × 15 mm) EI 90-U/U (for 2 × 20 mm) EI 120-U/U (for 2 × 25 mm)
POLOPLAST POLO-KAL 3S pipes for pipe penetrations at 45°					
Surface-mounted, construction thickness ≥ 100 mm				PROMASTOP®-FC6 limits: Ø 75 mm, s 3,8 mm → Ø 110 mm, s 4,8 mm → Ø 125 mm, s 5,3 mm	EI 120-U/U
POLOPLAST POLO-KAL 3S Pro pipes for pipe penetrations at 90° (≥ 10 mm thick PROMASEAL®-A penetration seal, see Detail F)					
Surface-mounted, construction thickness ≥ 100 mm				PROMASTOP®-FC3 or PROMASTOP®-FC6 Ø ≤ 125 mm, s 3,9 mm	EI 120-U/U
Pipelife MASTER 3 pipes for pipe penetrations at 90°					
	Solution 1, Solution 2: Surface-mounted, construction thickness ≥ 2 × 20 mm	Surface-mounted, construction thickness ≥ 2 × 20 mm	Surface-mounted, construction thickness ≥ 80 mm, wall type 1	PROMASTOP®-FC3 limits: Ø 32 mm, s 1,8 mm → Ø 40 mm, s 1,8 mm → Ø 50 mm, s 1,8 mm → Ø 75 mm, s 2,1 mm → Ø 110 mm, s 3,0 mm → Ø 125 mm, s 3,5 mm	EI 90-U/U
Surface-mounted, construction thickness ≥ 100 mm				PROMASTOP®-FC6 limits: Ø 50 mm, s 1,8 mm → Ø 75 mm, s 2,1 mm → Ø 110 mm, s 3,0 mm → Ø 125 mm, s 3,5 mm → Ø 160 mm, s 4,4 mm	EI 120-U/U

Requirement				Dimension range Ø: outer pipe diameter [mm] s: pipe wall thickness [mm]	Classification
Flexible wall	**Shaft wall**	**Suspended ceiling**	**Sandwich panel wall**		
Geberit Silent-db20 pipes for pipe penetrations at 90°					
	Solution 1, Solution 2: Surface-mounted, construction thickness ≥ 2 × 20 mm	Surface-mounted, construction thickness ≥ 2 × 20 mm	Surface-mounted, construction thickness ≥ 80 mm, wall type 1	PROMASTOP®-FC3 limits: Ø 56 mm, s 3,2 mm → Ø 63 mm, s 3,2 mm → Ø 75 mm, s 3,6 mm → Ø 90 mm, s 5,5 mm → Ø 110 mm, s 6,0 mm PROMASTOP®-FC6 (couplings tested up to Ø 135 mm) limits: Ø 56 mm, s 3,2 mm → Ø 63 mm, s 3,2 mm → Ø 75 mm, s 3,6 mm → Ø 90 mm, s 5,5 mm → Ø 110 mm, s 6,0 mm → Ø 135 mm, s 6,0 mm → Ø 160 mm, s 7,0 mm	EI 90-U/U
Surface-mounted, construction thickness ≥ 100 mm					EI 120-U/U
	Solution 3: Built-in, construction thickness ≥ 2 × 15 mm, ≥ 2 × 20 mm, ≥ 2 × 25 mm			PROMASTOP®-FC6 limits: Ø 56 mm, s 3,2 mm → Ø 63 mm, s 3,2 mm → Ø 75 mm, s 3,6 mm → Ø 90 mm, s 5,5 mm → Ø 110 mm, s 6,0 mm	EI 60-U/U (for 2 × 15 mm) EI 90-U/U (for 2 × 20 mm) EI 120-U/U (for 2 × 25 mm)
Geberit Silent-PP pipes for pipe penetrations at 90°					
	Solution 1, Solution 2: Surface-mounted, construction thickness ≥ 2 × 20 mm	Surface-mounted, construction thickness ≥ 2 × 20 mm	Surface-mounted, construction thickness ≥ 80 mm, wall type 1	PROMASTOP®-FC3 limits: Ø 32 mm, s 2,0 mm → Ø 40 mm, s 2,0 mm → Ø 50 mm, s 2,0 mm → Ø 75 mm, s 2,6 mm → Ø 90 mm, s 3,1 mm → Ø 110 mm, s 3,6 mm → Ø 125 mm, s 4,2 mm PROMASTOP®-FC6 limits: Ø 32 mm, s 2,0 mm → Ø 40 mm, s 2,0 mm → Ø 50 mm, s 2,0 mm → Ø 75 mm, s 2,6 mm → Ø 90 mm, s 3,1 mm → Ø 110 mm, s 3,6 mm → Ø 125 mm, s 4,2 mm → Ø 160 mm, s 5,2 mm	EI 90-U/U
Surface-mounted, construction thickness ≥ 100 mm					EI 120-U/U
	Solution 3: Built-in, construction thickness ≥ 2 × 15 mm, ≥ 2 × 20 mm, ≥ 2 × 25 mm			PROMASTOP®-FC6 (couplings tested up to Ø 125 mm) limits: Ø 32 mm, s 2,0 mm → Ø 40 mm, s 2,0 mm → Ø 50 mm, s 2,0 mm → Ø 75 mm, s 2,6 mm → Ø 90 mm, s 3,1 mm → Ø 110 mm, s 3,6 mm → Ø 125 mm, s 4,2 mm	EI 60-U/U (for 2 × 15 mm) EI 90-U/U (for 2 × 20 mm) EI 120-U/U (for 2 × 25 mm)
REHAU RAUPIANO PLUS pipes for pipe penetrations at 90°					
	Solution 1, Solution 2: Surface-mounted, construction thickness ≥ 2 × 20 mm	Surface-mounted, construction thickness ≥ 2 × 20 mm	Surface-mounted, construction thickness ≥ 80 mm, wall type 1	PROMASTOP®-FC6 (couplings tested up to Ø 125 mm) limits: Ø 40 mm, s 1,8 mm → Ø 50 mm, s 1,8 mm → Ø 125 mm, s 3,1 mm → Ø 160 mm, s 3,9 mm → Ø 200 mm, s 6,2 mm	EI 90-U/U
Surface-mounted, construction thickness ≥ 100 mm					EI 120-U/U
Built-in, construction thickness ≥ 100 mm				PROMASTOP®-FC6 limits: Ø 40 mm, s 1,8 mm → Ø 50 mm, s 1,8 mm → Ø 125 mm, s 3,1 mm	EI 120-U/U

Requirement				Dimension range Ø: outer pipe diameter [mm] s: pipe wall thickness [mm]	Classification
Flexible wall	Shaft wall	Suspended ceiling	Sandwich panel wall		
Nicoll dBlue pipes for pipe penetrations at 90°					
	Solution 1, Solution 2: Surface-mounted, construction thickness ≥ 2 × 20 mm	Surface-mounted, construction thickness ≥ 2 × 20 mm	Surface-mounted, construction thickness ≥ 80 mm, wall type 1	PROMASTOP®-FC3 limits: Ø 50 mm, s 1,8 mm → Ø 125 mm, s 3,9 mm	EI 90-U/U
Surface-mounted, construction thickness ≥ 100 mm					EI 120-U/U
Girpi Friaphon pipes for pipe penetrations at 90°					
	Solution 1, Solution 2: Surface-mounted, construction thickness ≥ 2 × 20 mm	Surface-mounted, construction thickness ≥ 2 × 20 mm	Surface-mounted, construction thickness ≥ 80 mm, wall type 1	PROMASTOP®-FC3 limits: Ø 52 mm, s 2,8 mm → Ø 78 mm, s 4,9 mm → Ø 110 mm, s 5,3 mm PROMASTOP®-FC6 limits: Ø 52 mm, s 2,8 mm → Ø 78 mm, s 4,9 mm → Ø 110 mm, s 5,3 mm → Ø 135 mm, s 5,6 mm → Ø 160 mm, s 6,3 mm	EI 90-U/U
Surface-mounted, construction thickness ≥ 100 mm					EI 120-U/U
Girpi HTA-E pipes for pipe penetrations at 90°					
	Solution 1, Solution 2: Surface-mounted, construction thickness ≥ 2 × 20 mm	Surface-mounted, construction thickness ≥ 2 × 20 mm	Surface-mounted, construction thickness ≥ 80 mm, wall type 1	PROMASTOP®-FC6 limits: Ø 40 mm, s 3,0 mm → Ø 50 mm, s 3,7 mm → Ø 63 mm, s 4,7 mm → Ø 75 mm, s 5,5 mm → Ø 90 mm, s 6,6 mm → Ø 110 mm, s 5,3 mm → Ø 125 mm, s 6,0 mm	EI 90-U/U
Surface-mounted, construction thickness ≥ 100 mm					EI 120-U/U
KE KELIT Phonex AS pipes for pipe penetrations at 90°					
	Solution 1, Solution 2: Surface-mounted, construction thickness ≥ 2 × 20 mm	Surface-mounted, construction thickness ≥ 2 × 20 mm	Surface-mounted, construction thickness ≥ 80 mm, wall type 1	PROMASTOP®-FC6 limits: Ø 58 mm, s 4,0 mm → Ø 78 mm, s 4,5 mm → Ø 110 mm, s 5,3 mm → Ø 135 mm, s 5,3 mm → Ø 160 mm, s 5,3 mm	EI 90-U/U
Surface-mounted, construction thickness ≥ 100 mm					EI 120-U/U
Wavin AS pipes for pipe penetrations at 90°					
	Solution 1, Solution 2: Surface-mounted, construction thickness ≥ 2 × 20 mm	Surface-mounted, construction thickness ≥ 2 × 20 mm	Surface-mounted, construction thickness ≥ 80 mm, wall type 1	PROMASTOP®-FC6 limits: Ø 58 mm, s 4,0 mm → Ø 78 mm, s 4,5 mm → Ø 110 mm, s 5,3 mm → Ø 135 mm, s 5,3 mm → Ø 160 mm, s 5,3 mm	EI 90-U/U
Surface-mounted, construction thickness ≥ 100 mm					EI 120-U/U

Requirement				Dimension range Ø: outer pipe diameter [mm] s: pipe wall thickness [mm]	Classification
Flexible wall	Shaft wall	Suspended ceiling	Sandwich panel wall		
Wavin SiTech+ pipes for pipe penetrations at 90°					
	Solution 1, Solution 2: Surface-mounted, construction thickness ≥ 2 × 20 mm	Surface-mounted, construction thickness ≥ 2 × 20 mm	Surface-mounted, construction thickness ≥ 80 mm, wall type 1	PROMASTOP®-FC6 limits: Ø 50 mm, s 1,8 mm → Ø 125 mm, s 3,9 mm → Ø 160 mm, s 4,9 mm	EI 90-U/U
Surface-mounted, construction thickness ≥ 100 mm					EI 120-U/U
Marley Silent pipes for pipe penetrations at 90°					
	Solution 1, Solution 2: Surface-mounted, construction thickness ≥ 2 × 20 mm	Surface-mounted, construction thickness ≥ 2 × 20 mm	Surface-mounted, construction thickness ≥ 80 mm, wall type 1	PROMASTOP®-FC6 limits: Ø 75 mm, s 2,5 mm → Ø 110 mm, s 3,0 mm	EI 90-U/U
Surface-mounted, construction thickness ≥ 100 mm					EI 120-U/U

Table 9 – PROMASTOP®-FC penetration seal for plastic pipes with combustible insulation in lightweight constructions

Overview of pipe materials, dimensions, installation situations (collar surface-mounted or built-in), collar type (PROMASTOP®-FC3 or PROMASTOP®-FC6) and classifications

Requirement				Dimension range Ø: outer pipe diameter [mm] s: pipe wall thickness [mm] d: insulation thickness [mm]	Classification
Flexible wall	Shaft wall	Suspended ceiling	Sandwich panel wall		
PE-HD, ABS, SAN + PVC sewage pipes for pipe penetrations at 90°					
Surface-mounted, construction thickness ≥ 100 mm				PROMASTOP®-FC6 s 2,0 - 10,4 mm limits: Ø 32 - 180 mm, d 6 - 32 mm	EI 120-U/U with combustible insulation B-s3, d0
Surface-mounted, construction thickness ≥ 100 mm				PROMASTOP®-FC6 s 2,0 - 10,4 mm lower limits: Ø 32 mm, d 6 mm → Ø 110 mm, d 6 mm → Ø 180 mm, d 6 mm → Ø 200 mm, d 6 mm upper limits: Ø 32 mm, d 32 mm → Ø 180 mm, d 32 mm → Ø 200 mm, d 19 mm	EI 90-U/U with combustible insulation B-s3, d0
PE-HD, ABS, SAN + PVC supply pipes for pipe penetrations at 90°					
Surface-mounted, construction thickness ≥ 100 mm				PROMASTOP®-FC6 s 2,0 - 16,4 mm limits: Ø 32 - 180 mm, d 6 - 32 mm	EI 120-U/C with combustible insulation B-s3, d0
PP-H and PP-R sewage pipes for pipe penetrations at 90°					
Surface-mounted, construction thickness ≥ 100 mm				PROMASTOP®-FC6 s 2,0 - 9,2 mm limits: Ø 32 - 180 mm, d 6 - 32 mm	EI 120-U/U with combustible insulation B-s3, d0
PP-H and PP-R supply pipes for pipe penetrations at 90°					
Surface-mounted, construction thickness ≥ 100 mm				PROMASTOP®-FC6 s 1,8 - 21,9 mm limits: Ø 32 - 180 mm, d 6 - 32 mm	EI 120-U/C with combustible insulation B-s3, d0
Surface-mounted, construction thickness ≥ 100 mm				PROMASTOP®-FC6 s 1,8 - 21,9 mm lower limits: Ø 32 mm, d 6 mm → Ø 110 mm, d 6 mm → Ø 160 mm, d 6 mm → Ø 200 mm, d 6 mm upper limits: Ø 32 mm, d 32 mm → Ø 160 mm, d 32 mm → Ø 200 mm, d 19 mm	EI 60-U/C with combustible insulation B-s3, d0
PVC-U and PVC-C sewage pipes for pipe penetrations at 90°					
Surface-mounted, construction thickness ≥ 100 mm				PROMASTOP®-FC6 s 2,0 - 6,2 mm limits: Ø 32 - 180 mm, d 6 - 32 mm	EI 120-U/U with combustible insulation B-s3, d0
Surface-mounted, construction thickness ≥ 100 mm				PROMASTOP®-FC6 s 2,0 - 6,2 mm lower limits: Ø 32 mm, d 6 mm → Ø 110 mm, d 6 mm → Ø 180 mm, d 6 mm → Ø 200 mm, d 6 mm upper limits: Ø 32 mm, d 32 mm → Ø 180 mm, d 32 mm → Ø 200 mm, d 19 mm	EI 60-U/U with combustible insulation B-s3, d0

Requirement				Dimension range Ø: outer pipe diameter [mm] s: pipe wall thickness [mm] d: insulation thickness [mm]	Classification
Flexible wall	Shaft wall	Suspended ceiling	Sandwich panel wall		
PVC-U and PVC-C supply pipes for pipe penetrations at 90°					
Surface-mounted, construction thickness ≥ 100 mm				PROMASTOP®-FC6 s 1,8 - 8,6 mm limits: Ø 32 - 200 mm, d 6 - 19 mm	EI 120-U/C with combustible insulation B-s3, d0
Surface-mounted, construction thickness ≥ 100 mm				PROMASTOP®-FC6 with Promat SPC s 1,8 - 8,6 mm lower limits: Ø 32 mm, d 6 mm → Ø 110 mm, d 6 mm → Ø 180 mm, d 6 mm → Ø 200 mm, d 6 mm upper limits: Ø 32 mm, d 32 mm → Ø 180 mm, d 32 mm → Ø 200 mm, d 19 mm	EI 60-U/C with combustible insulation B-s3, d0
POLOPLAST POLO-KAL NG sewage pipes for pipe penetrations at 90°					
Surface-mounted, construction thickness ≥ 100 mm				PROMASTOP®-FC6 limits: Ø 32 - 160 mm, d 6 - 32 mm	EI 90-U/U with combustible insulation B-s3, d0
POLOPLAST POLO-KAL 3S sewage pipes for pipe penetrations at 90°					
Surface-mounted, construction thickness ≥ 100 mm				PROMASTOP®-FC6 limits: Ø 75 - 160 mm, d 6 - 32 mm	EI 120-U/U with combustible insulation B-s3, d0
REHAU RAUPIANO PLUS sewage pipes for pipe penetrations at 90°					
Surface-mounted, construction thickness ≥ 100 mm				PROMASTOP®-FC6 limits: Ø 32 - 200 mm, d 6 - 19 mm	EI 120-U/U with combustible insulation B-s3, d0
Surface-mounted, construction thickness ≥ 100 mm				PROMASTOP®-FC6 lower limits: Ø 32 mm, d 6 mm → Ø 110 mm, d 6 mm → Ø 160 mm, d 6 mm → Ø 200 mm, d 6 mm upper limits: Ø 32 mm, d 32 mm → Ø 160 mm, d 32 mm → Ø 200 mm, d 19 mm	EI 90-U/U with combustible insulation B-s3, d0
Geberit Silent-PP sewage pipes for pipe penetrations at 90°					
Surface-mounted, construction thickness ≥ 100 mm				PROMASTOP®-FC6 limits: Ø 32 - 160 mm, d 6 - 32 mm	EI 120-U/U with combustible insulation B-s3, d0
Geberit Silent-db20 sewage pipes for pipe penetrations at 90°					
Surface-mounted, construction thickness ≥ 100 mm				PROMASTOP®-FC6 limits: Ø 56 - 160 mm, d 6 - 32 mm	EI 120-U/U with combustible insulation B-s3, d0

6. PROMASTOP®-FC penetration seal for pellet tubes in rigid wall, flexible wall and rigid floor

Table 10 – Classification of PROMASTOP®-FC for pellet tubes

Requirement	Dimension range Ø: outer tube diameter [mm] s: tube wall thickness [mm]	Classification
Rigid wall, collar surface-mounted on both sides, construction thickness ≥ 150 mm	PROMASTOP®-FC3 Spiral tube for pellet delivery, Ø ≤ 60 mm	EI 120-U/U
Rigid floor, collar surface-mounted on the bottom side, construction thickness ≥ 150 mm	PROMASTOP®-FC3 Spiral tube for pellet delivery, Ø ≤ 90 mm s 8,2 mm for PE tube s 3,0 mm for PVC tube	EI 90-U/U
Flexible wall, collar surface-mounted on both sides, construction thickness ≥ 100 mm	PROMASTOP®-FC3 Spiral tube for pellet delivery, Ø ≤ 90 mm s 8,2 mm for PE tube s 3,0 mm for PVC tube	EI 90-U/U

Table 10

PROMASTOP®-FC penetration seal can be used for PE or PVC pellet tubes in rigid walls and floors (thickness ≥ 150 mm, density ≥ 650 kg/m³) and in flexible walls (thickness ≥ 100 mm). The components (supporting constructions) must be classified acc. to EN 13501-2 for the required fire resistance period.

The classification applies to pellet tubes with the mentioned diameter, both with and without pellet delivery and with zero distance to PROMASTOP®-FC.

For walls, the PROMASTOP®-FC collar shall be used on both sides; for floor application on the bottom side of the floor.

Supporting distance

The tubes must be suspended/supported ≤ 250 mm on both sides of the walls or from the top of the floor.

Annular gap filling

In rigid constructions, the annular gap can be backfilled as follows:

- With mineral wool of Class A1 (acc. to EN 13501-1), melting point ≥ 1000 °C, density 40 kg/m³, covered on both sides with PROMASEAL®-A fire stopping sealant or PROMASEAL®-S fire stopping silicone, depth ≥ 10 mm.
- With PROMASTOP®-M fire stopping mortar.

In flexible walls, the annular gap can be backfilled with min. 50 mm mineral wool of Class A1 (acc. to EN 13501-1), density 40 kg/m³.

7. PROMASTOP®-FC penetration seal for concentric (fluegas exhausting) plastic pipes in rigid wall and shaft wall

Table 11 – Classification of PROMASTOP®-FC3 for concentric plastic pipes

Requirement	Pipe type and collar type Ø: opening diameter [mm]	Classification
2 x 15 mm PROMATECT®-100 shaft wall or aerated concrete wall	PROMASTOP®-FC3/75 Rolux Ø80 RGA + PPØ80 VLT Ø 90 mm	EI 90-U/U
2 x 15 mm PROMATECT®-100 shaft wall	PROMASTOP®-FC3/110 UbiFit concentric PPtl/KS Ø60/100 Ø 110 mm	E 60-U/U
aerated concrete wall		E 90-U/U
2 x 15 mm PROMATECT®-100 shaft wall	PROMASTOP®-FC3/125 Concentric PPtl/KS 80/125 with clamping band Ø 135 mm	E 60-U/U
aerated concrete wall		EI 90-U/U
2 x 15 mm PROMATECT®-100 shaft wall	PROMASTOP®-FC3/110 PPtl Ø100 RGA + PP Ø100 VLT Ø 110 mm	E 90-U/U EI 60-U/U
aerated concrete wall		EI 90-U/U

Tables 11 and 12

PROMASTOP®-FC penetration seal can be used for the following concentric plastic pipes: Rolux Ø80 RGA + PPØ80 VLT, UbiFit concentric PPtl/KS Ø60/100, Concentric PPtl/KS 80/125 with clamping band, PPtl Ø100 RGA + PP Ø100 VLT.

The PROMASTOP®-FC3 or the PROMASTOP®-FC6 collars were directly surface-mounted on the exposed side.

Rigid wall

The seal system was tested in aerated concrete wall with a thickness of ≥ 70 mm and a density of ≥ 650 kg/m³ ± 200 kg/m³. Test results obtained with rigid standard supporting constructions may be applied to concrete or masonry separating elements of a thickness and density equal to or greater than that of the supporting construction used in the test, standard aerated concrete wall, thickness 70 mm.

Shaft wall

2 x 15 mm PROMATECT®-100 with the profiles on the unexposed side.

Supporting distances

The maximum distance from the surface of the separating element (wall) to the nearest support position for services:

- PROMASTOP®-FC6 on aerated concrete: 155 mm
- PROMASTOP®-FC3 on aerated concrete: 290 mm
- PROMASTOP®-FC6 on shaft wall: 175 mm
- PROMASTOP®-FC3 on shaft wall: 310 mm

Table 12 – Classification of PROMASTOP®-FC6 for concentric plastic pipes

Requirement	Pipe type and collar type Ø: opening diameter [mm]	Classification
2 x 15 mm PROMATECT®-100 shaft wall	PROMASTOP®-FC6/75 Rolux Ø80 RGA + PPØ80 VLT Ø 90 mm	E 90-U/U EI 60-U/U
aerated concrete wall		EI 90-U/U
2 x 15 mm PROMATECT®-100 shaft wall	PROMASTOP®-FC6/110 UbiFit concentric PPtl/KS Ø60/100 Ø 110 mm	E 90-U/U EI 60-U/U
aerated concrete wall		EI 90-U/U
2 x 15 mm PROMATECT®-100 shaft wall	PROMASTOP®-FC6/125 Concentric PPtl/KS 80/125 with clamping band Ø 135 mm	E 90-U/U EI 60-U/U
aerated concrete wall		EI 90-U/U
2 x 15 mm PROMATECT®-100 shaft wall	PROMASTOP®-FC6/110 PPtl Ø100 RGA + PP Ø100 VLT Ø 110 mm	E 90-U/U EI 60-U/U
aerated concrete wall		EI 90-U/U

Annular gap filling
Annular gap could be 0 mm. The gap around pipe must be sealed with PROMASEAL®-A (see the opening diameters and the pipe diameters in Tables 11 and 12).

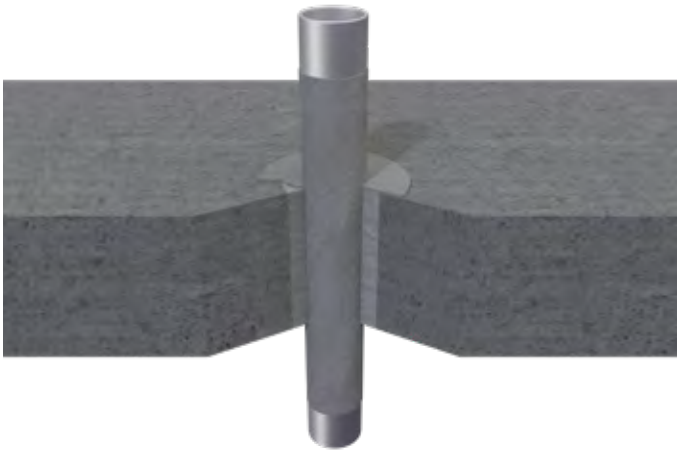
Minimum distance between the pipes
Minimum working space for pipe / pipe separation: 40 mm.

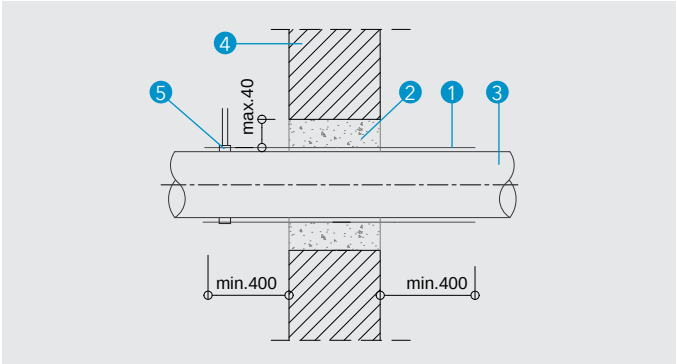
8.Information about the minimum distances from PROMASTOP®-FC

Table 13
Sufficient space needs to be provided for the construction of professional applications. For practical and physical reasons, we recommend observing a minimum distance of 100 mm between installed objects and supporting construction/component framing during planning. If this is impossible due to the situation on the construction site, the permitted minimum distances shall be taken from Table 13.

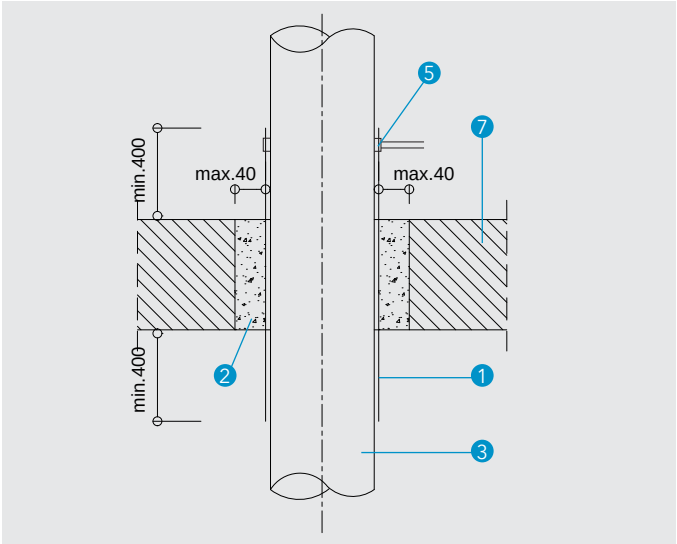
Table 13 – Minimum distances

Object	Minimum distance [mm]
PROMASTOP®-FC – PROMASTOP®-FC in rigid and flexible walls, in rigid floors, in CLT constructions	0
PROMASTOP®-FC – PROMASTOP®-FC in sandwich panel walls	70
PROMASTOP®-FC – PROMASTOP®-W in rigid and flexible walls, in rigid floors	0
PROMASTOP®-FC – Combustible insulation	0
PROMASTOP®-FC – Non-combustible insulation in rigid and flexible walls, in rigid floors	0
PROMASTOP®-FC – Cables, cable trays, cable ladders in rigid and flexible walls, in rigid floors	0
PROMASTOP®-FC – PROMASTOP®-B in rigid and flexible walls, in rigid floors	20
PROMASTOP®-FC – PROMATECT® ducts	0
PROMASTOP®-FC – PROMASEAL®-A	0
PROMASTOP®-FC – PROMASEAL®-AG	0
Between all other objects not further defined	100





Detail A – Mortar penetration seal of non-insulated metal pipes in rigid wall



Detail B – Mortar penetration seal of non-insulated metal pipes in rigid floor

Technical data

1. PROMASEAL®-A spray, dry layer thickness of 2,5 mm in walls, 2,0 mm in floors
2. Cement mortar, e.g. PROMASTOP®-M
3. Steel or cast iron pipe Ø ≤ 219,1 mm
4. Flexible or rigid wall
5. First place of support
6. Mineral wool pipe insulation (thickness ≥ 30 mm, density ≥ 80 kg/m³, length acc. to Table 1)
7. Rigid floor
8. Mineral wool (density ≥ 140 kg/m³)

Certificates: ETA-16/0310, ITB CR 01633.1/21/R164NZP

Customer benefit

- Quick and easy installation in walls and floors
- Mortar penetration seal and soft penetration seal is classified
- For non-insulated steel pipes as well
- PROMASEAL®-A spray is solvent-free and is not classified in any hazard class
- The dried PROMASEAL®-A spray is water and oil resistant

1. Installation

The ambient temperature during application should be above +5 °C. The coating should be well mixed before use.

There are more options for annular gap filling between the service and the opening edge:

- Cement mortar, e.g. PROMASTOP®-M as mortar penetration seal (width of the gap 10 - 40 mm, the gap should be filled in the whole thickness of the wall or floor);
- STEPROCK PLUS mineral wool, thickness ≥ 150 mm, called soft penetration seal, version 1;
- STEPROCK PLUS mineral wool, thickness ≥ 200 mm, called soft penetration seal, version 2.

More details and classifications in the drawings and in Table 1.

2. Fields of application

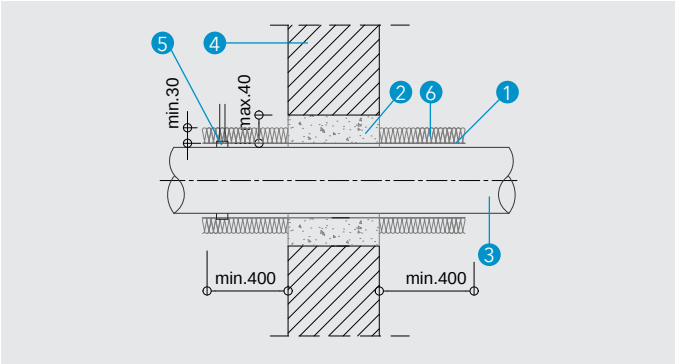
The nominal diameter of the penetrating steel and cast iron pipes should not exceed 219,1 mm.

Rigid wall

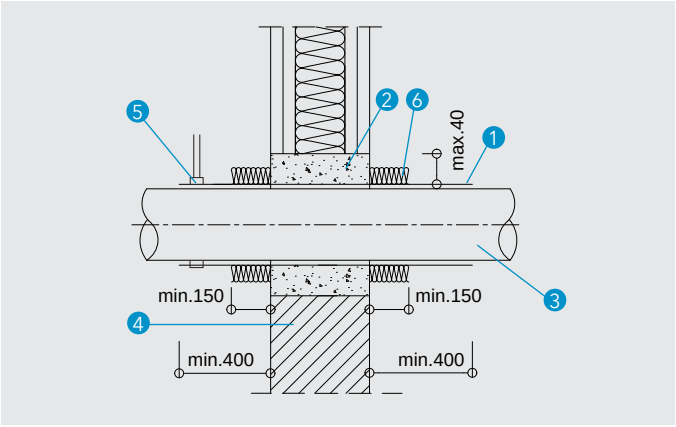
The classifications for rigid wall supporting construction are valid for penetration seals in wall made of concrete, reinforced concrete, aerated concrete, ceramic brick, cavity brick, checker brick, with density greater than or equal to 600 kg/m³ and thickness equal to or greater than given in appropriate point, with fire resistance class (classified according to EN 13501-2) equal to or greater than given in appropriate point. Required thickness in Table 1.

Flexible wall

The classifications for flexible wall supporting construction are valid for penetration seals in flexible walls made of gypsum plasterboards type F or DF with steel or timber studs sub-structure, thickness equal to or greater than given in appropriate point (min. two layers of gypsum plasterboards type F or DF with overall board layer thickness equal to or greater than 25 mm), with fire resistance class (classified according to EN 13501-2) equal to or greater than given in appropriate point. Required thickness in Table 1.



Detail C – Mortar penetration seal of metal pipes with mineral wool insulation in rigid wall, sealed with use of PROMASEAL®-A spray; the length of the coating on the pipe equal to the length of the insulation



Detail D – Mortar penetration seal of metal pipes with mineral wool insulation in flexible or rigid wall, sealed with use of PROMASEAL®-A spray; the length of the pipe insulation is less than the length of the coating on the pipe

In case of supporting constructions with timber studs no part of the penetration seal is closer than 100 mm to a stud, the cavity is closed between the penetration seal and the stud and minimum 100 mm of insulation of class A1 or A2 according to EN 13501-1 is provided within the cavity between the penetration seal and the stud.

Classifications given for "flexible wall supporting construction" are also valid for penetration seals in rigid wall supporting constructions with greater than or equal to 450 kg/m^3 and thickness equal to or greater than given in appropriate point, with fire resistance class (classified according to EN 13501-2) equal to or greater than given in appropriate point.

Rigid floor
The classifications for rigid floor supporting construction are valid for penetration seals in floor made of concrete, aerated concrete or reinforced concrete, with density greater or equal to 600 kg/m^3 and thickness greater than or equal to given in appropriate point. Required floor thickness in Table 1.

Supporting distance
The metal pipes must be suspended/supported at a distance of ≤ 335 mm on both sides of the wall or from the top of the floor.

Metal pipes
The classification given for metal (copper or steel) pipes covers pipe materials with a thermal conductivity lower than presented in appropriate point, subject to the material having a melting point at least equal to that of the presented material or greater than:

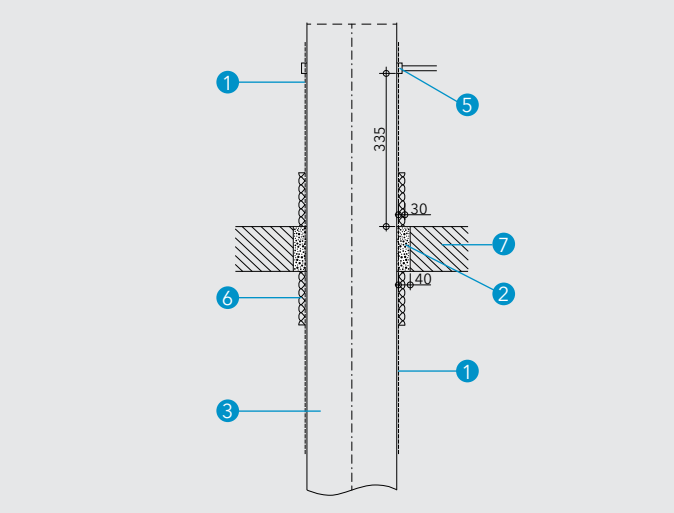
- 843 °C for the fire resistance class 30 min,
- 903 °C for the fire resistance class 45 min,
- 946 °C for the fire resistance class 60 min,
- 1006 °C for the fire resistance class 90 min,
- 1049 °C for the fire resistance class 120 min.

The classifications given for metal (copper or steel) pipes are valid for pipe end configuration as follows:

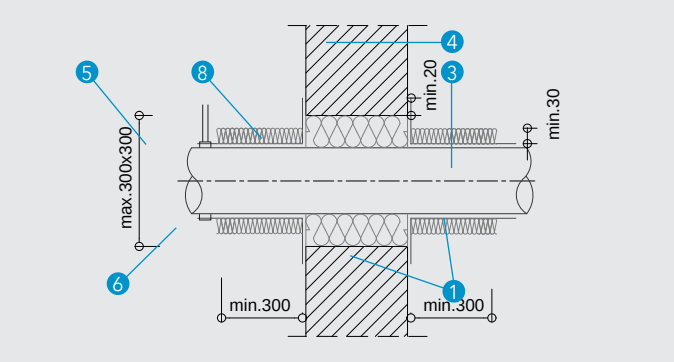
- C/U, U/C and C/C in case of penetrations with "U/C" in classification code,
- C/C in case of penetrations with "C/C" in classification code.

Pipe insulation
The classifications given for pipes with mineral wool insulation concerns local insulated pipes and does not cover non-insulated pipes. For this type of penetrations the thickness, length and density of insulation can be increased but may not be reduced.

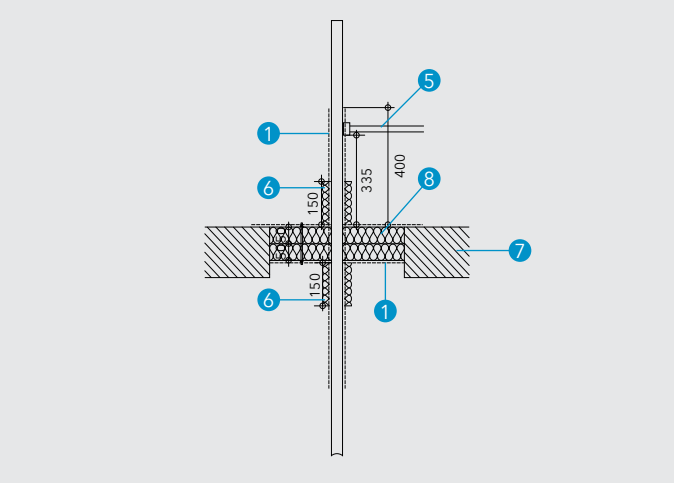
Soft penetration seal
STEPROCK PLUS mineral wool insulation is classified as infill of the soft penetration seal, but the classification is valid for other mineral wool types provided that the thickness and density of the mineral wool infill is not reduced (it can be increased).



Detail E – Mortar penetration seal of metal pipes with mineral wool insulation in rigid floor, sealed with use of PROMASEAL®-A spray



Detail F – Soft penetration seal of metal pipes with mineral wool insulation in rigid wall, sealed with use of PROMASEAL®-A spray



Detail G – Soft penetration seal of metal pipes with mineral wool insulation in rigid floor, sealed with use of PROMASTOP®-A spray

3. Steel pipe penetration seal

Details A and B

Mortar penetration seals of non-insulated metal pipes sealed with use of PROMASEAL®-A spray in flexible or rigid walls and in rigid floors. The spray covers the pipe with dry layer thickness of min. 2,5 mm in walls and 2,0 mm in floors. Length of the coating on both sides of the supporting construction in Table 1. The pipe inside the partition should also be coated with PROMASEAL®-A spray. The space between the supporting construction and service, width of 10 – 40 mm is filled with cement mortar in the whole thickness of the partition.

Details C, D and E

Mortar penetration seals of metal pipes with mineral wool insulation (thickness ≥ 30 mm, density ≥ 80 kg/m³, length in Table 1) sealed with use of PROMASEAL®-A spray in flexible or rigid walls. The insulation should adhere to the mortar penetration seal. The spray covers the pipe with dry layer thickness of min. 2,5 mm in walls and min. 2,0 mm in floors. The pipe inside the partition should also be coated with PROMASEAL®-A spray. Length of the coating on both sides of the supporting construction and the length and thickness of the mineral wool insulation is presented in Table 1. The space between the supporting construction and service, width of 10 – 40 mm is filled with cement mortar.

Detail F

Soft penetration seals of metal pipes with mineral wool insulation (thickness ≥ 30 mm, density ≥ 80 kg/m³, length in Table 1) sealed with use of PROMASEAL®-A spray in rigid walls. The pipe insulation should adhere to the soft penetration seal. The spray covers the pipe on the given length on both sides of the supporting construction and the mineral wool infill of the soft penetration seal and the supporting construction on the width of 20 mm on the perimeter of the opening with dry layer thickness of ≥ 2,5 mm (length of the coating on the pipe in Table 1). The pipe inside the partition should also be coated with PROMASEAL®-A spray. The space between the supporting construction and service is filled with STEPROCK PLUS mineral wool (or other mineral wool with density ≥ 140 kg/m³) with overall thickness of ≥ 150 mm (soft penetration seal, version 1) and ≥ 200 mm (soft penetration seal, version 2). The maximum dimension of both versions is 300 x 300 mm and the minimum distance between the service and the seal edge is 100 mm.

Detail G

Soft penetration seals of metal pipes with mineral wool insulation (thickness ≥ 30 mm, density ≥ 80 kg/m³, length in Table 1) sealed with use of PROMASEAL®-A spray in rigid floors. The pipe insulation should adhere to the soft penetration seal. The spray covers the pipe on 400 mm length on both sides of the supporting construction and the mineral wool infill of the soft penetration seal and the supporting construction on the width of 20 mm on the perimeter of the opening with dry layer thickness of ≥ 2,0 mm. The space between the supporting construction and service is filled with STEPROCK PLUS mineral wool (or other mineral wool with density ≥ 140 kg/m³) with overall thickness of ≥ 100 mm. Non-insulated PP-R plastic pipes can be additionally used in the soft seal. Details on page 175.

The maximum dimension is 500 x 500 mm and the minimum distance between the service and the seal edge is 40 mm.

Table 1 – Overview of pipe materials, dimensions, insulations, installation situations and classifications

Requirement		Dimension range Ø: outer pipe diameter [mm] s: pipe wall thickness [mm]	Insulation thickness x length [mm]	PROMASEAL®-A spray thickness x length [mm]	Classification
Flexible or rigid wall	Rigid floor				
Steel pipes without insulation for pipe penetrations at 90°					
Flexible wall, construction thickness ≥ 100 mm		Ø ≤ 26,9 mm, s ≥ 2,3 mm	-	2,5 x 400	EI 90 / E 120-C/C
Rigid wall, construction thickness 100 ≤ t < 180 mm		Ø ≤ 15,0 mm, s ≥ 1,2 mm	-	2,5 x 400	EI 120-U/C
		15,0 < Ø ≤ 21,3 mm, s 1,2 - 2,2 mm		2,5 x 400	EI 60 / E 120-U/C
		15,0 < Ø ≤ 21,3 mm, s ≥ 2,3 mm		2,5 x 400	EI 120-U/C
		21,3 < Ø ≤ 26,9 mm, s 1,2 - 2,2 mm		2,5 x 400	EI 60 / E 120-U/C
		21,3 < Ø ≤ 26,9 mm, s ≥ 2,3 mm		2,5 x 400	EI 60 / E 120-U/C
		21,3 < Ø ≤ 26,9 mm, s ≥ 2,3 mm		2,5 x 400	EI 90 / E 120-C/C
		26,9 < Ø ≤ 76,1 mm, s 1,2 - 14,2 mm		2,5 x 400	EI 60 / E 120-U/C
Rigid wall, construction thickness ≥ 180 mm		Ø ≤ 15,0 mm, s ≥ 1,2 mm	-	2,5 x 400	EI 120-U/C
		Ø ≤ 15,0 mm, s ≥ 1,2 mm		2,5 x 400	EI 240-C/C
		15,0 < Ø ≤ 21,3 mm, s 1,2 - 2,2 mm		2,5 x 400	EI 60 / E 120-U/C
		15,0 < Ø ≤ 21,3 mm, s ≥ 2,3 mm		2,5 x 400	EI 120-U/C
		15,0 < Ø ≤ 21,3 mm, s ≥ 2,3 mm		2,5 x 500	EI 240-C/C
		21,3 < Ø ≤ 26,9 mm, s 1,2 - 2,2 mm		2,5 x 400	EI 60 / E 120-U/C
		21,3 < Ø ≤ 26,9 mm, s ≥ 2,3 mm		2,5 x 400	EI 60 / E 120-U/C
		21,3 < Ø ≤ 26,9 mm, s ≥ 2,3 mm		2,5 x 400	EI 90 / E 120-C/C
		21,3 < Ø ≤ 26,9 mm, s ≥ 2,3 mm		2,5 x 400	EI 240-C/C
		26,9 < Ø ≤ 42,0 mm, s 1,2 - 2,2 mm		2,5 x 400	EI 60 / E 120-U/C
		26,9 < Ø ≤ 42,0 mm, s 2,3 - 14,2 mm		2,5 x 400	EI 60 / E 120-U/C
		26,9 < Ø ≤ 42,0 mm, s 2,3 - 14,2 mm		2,5 x 400	EI 240-C/C
		42,0 < Ø ≤ 76,1 mm, s 1,2 - 3,5 mm		2,5 x 400	EI 60 / E 120-U/C
		42,0 < Ø ≤ 76,1 mm, s 3,6 - 14,2 mm		2,5 x 400	EI 60 / E 120-U/C
		42,0 < Ø ≤ 76,1 mm, s 3,6 - 14,2 mm		2,5 x 400	EI 60 / E 240-C/C
		42,0 < Ø ≤ 76,1 mm, s 3,6 - 14,2 mm		2,5 x 500	EI 90 / E 240-C/C
		76,1 < Ø ≤ 114,0 mm, s 3,6 - 14,2 mm		2,5 x 400	EI 60 / E 240-C/C
		76,1 < Ø ≤ 114,0 mm, s 3,6 - 14,2 mm		2,5 x 500	EI 90 / E 240-C/C
	Rigid floor, construction thickness ≥ 150 mm	Ø ≤ 76,1 mm, s 1,2 - 14,2 mm	-	2,0 x 400	EI 120-U/C
		76,1 < Ø ≤ 108,0 mm, s 2,0 - 14,2 mm		2,0 x 400	EI 120-U/C
		108,0 < Ø ≤ 168,9 mm, s 3,6 - 14,2 mm		2,0 x 400	EI 60 / E 120-U/C
		168,9 < Ø ≤ 219,1 mm, s 4,0 - 14,2 mm		2,0 x 400	EI 60 / E 120-U/C

Requirement		Dimension range Ø: outer pipe diameter [mm] s: pipe wall thickness [mm]	Insulation thickness x length [mm]	PROMASEAL®-A spray thickness x length [mm]	Classification
Flexible or rigid wall	Rigid floor				
Steel pipes with mineral wool insulation for pipe penetrations at 90° in mortar penetration seal					
Flexible wall, construction thickness ≥ 100 mm		Ø ≤ 15,0 mm, s ≥ 1,2 mm	30 x 150	2,5 x 400	EI 120-C/C
		15,0 < Ø ≤ 108,0 mm, s 2,0 - 14,2 mm	30 x 150	2,5 x 400	EI 120-C/C
		108,0 < Ø ≤ 159,0 mm, s 4,0 - 14,2 mm	30 x 150	2,5 x 400	EI 90 / E 120-C/C
Rigid wall, construction thickness 100 ≤ t < 180 mm		Ø ≤ 15,0 mm, s ≥ 1,2 mm	30 x 150	2,5 x 400	EI 120-C/C
		15,0 < Ø ≤ 108,0 mm, s 2,0 - 14,2 mm	30 x 150	2,5 x 400	EI 120-C/C
		108,0 < Ø ≤ 159,0 mm, s 4,0 - 14,2 mm	30 x 150	2,5 x 400	EI 90 / E 120-C/C
Rigid wall, construction thickness ≥ 180 mm		Ø ≤ 15,0 mm, s 1,2 - 2,2 mm	30 x 150	2,5 x 400	EI 120-C/C
		Ø ≤ 15,0 mm, s ≥ 2,3 mm	30 x 150	2,5 x 400	EI 120-C/C
		Ø ≤ 15,0 mm, s ≥ 2,3 mm	30 x 300	2,5 x 500	EI 240-C/C
		15,0 < Ø ≤ 42,0 mm, s 2,0 - 2,2 mm	30 x 150	2,5 x 400	EI 120-C/C
		15,0 < Ø ≤ 42,0 mm, s 2,3 - 14,2 mm	30 x 150	2,5 x 400	EI 120-C/C
		15,0 < Ø ≤ 42,0 mm, s 2,3 - 14,2 mm	30 x 300	2,5 x 500	EI 240-C/C
		42,0 < Ø ≤ 108,0 mm, s 2,0 - 3,5 mm	30 x 150	2,5 x 400	EI 120-C/C
		42,0 < Ø ≤ 108,0 mm, s 3,6 - 14,2 mm	30 x 150	2,5 x 400	EI 120-C/C
		42,0 < Ø ≤ 108,0 mm, s 3,6 - 14,2 mm	30 x 300	2,5 x 500	EI 180 / E 240-C/C
		42,0 < Ø ≤ 108,0 mm, s 3,6 - 14,2 mm	30 x 500	2,5 x 500	EI 240-C/C
		108,0 < Ø ≤ 114,0 mm, s 3,6 - 3,9 mm	30 x 300	2,5 x 500	EI 180 / E 240-C/C
		108,0 < Ø ≤ 114,0 mm, s 3,6 - 3,9 mm	30 x 500	2,5 x 500	EI 240-C/C
		108,0 < Ø ≤ 114,0 mm, s 4,0 - 14,2 mm	30 x 150	2,5 x 400	EI 90 / E 120-C/C
		108,0 < Ø ≤ 114,0 mm, s 4,0 - 14,2 mm	30 x 300	2,5 x 500	EI 180 / E 240-C/C
		108,0 < Ø ≤ 114,0 mm, s 4,0 - 14,2 mm	30 x 500	2,5 x 500	EI 240-C/C
		114,0 < Ø ≤ 159,0 mm, s 4,0 - 14,2 mm	30 x 150	2,5 x 400	EI 90 / E 120-C/C
	Rigid floor, construction thickness ≥ 150 mm	Ø ≤ 76,1 mm, s 1,2 - 14,2 mm	30 x 150	2,0 x 400	EI 120-U/C
		76,1 < Ø ≤ 108,0 mm, s 2,0 - 14,2 mm	30 x 150	2,0 x 400	EI 120-U/C
		108,0 < Ø ≤ 168,9 mm, s 3,6 - 14,2 mm	30 x 150	2,0 x 400	EI 60 / E 120-U/C
		168,9 < Ø ≤ 219,1 mm, s 4,0 - 14,2 mm	30 x 150	2,0 x 400	EI 60 / E 120-U/C

Requirement		Dimension range Ø: outer pipe diameter [mm] s: pipe wall thickness [mm]	Pipe insulation thickness x length [mm]	PROMASEAL®-A spray thickness x length [mm]	Classification
Flexible or rigid wall	Rigid floor				
Horizontal steel pipes with mineral wool insulation for pipe penetrations at 90° in soft penetration seal, version 1					
Rigid wall, construction thickness ≥ 180 mm		Ø ≤ 42,0 mm, s 2,3 - 14,2 mm	30 x 300	2,5 x 500	EI 240-C/C
		42,0 < Ø ≤ 114,0 mm, s 3,6 - 14,2 mm	30 x 300	2,5 x 500	EI 90 / E 240-C/C
Vertical steel pipes with mineral wool insulation for pipe penetrations at 90° in soft penetration seal					
	Rigid floor, construction thickness ≥ 150 mm	Ø ≤ 15,0 mm, s ≥ 1,2 mm	30 x 150	2,0 x 400	EI 60-U/C
		15,0 < Ø ≤ 108,0 mm, s 2,0 - 14,2 mm	30 x 150	2,0 x 400	EI 60-U/C
Horizontal steel pipes with mineral wool insulation for pipe penetrations at 90° in soft penetration seal, version 2					
Rigid wall, construction thickness ≥ 180 mm		Ø ≤ 42,0 mm, s 2,3 - 14,2 mm	30 x 500	2,5 x 500	EI 240-C/C
		42,0 < Ø ≤ 114,0 mm, s 3,6 - 14,2 mm	30 x 500	2,5 x 500	EI 240-C/C

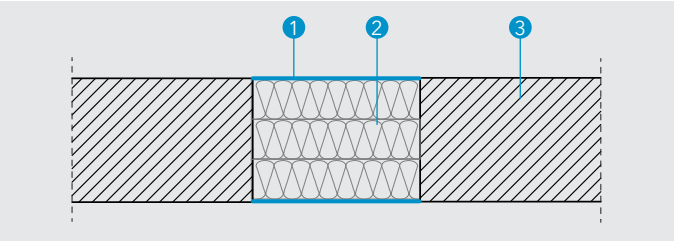
4. Information about the minimum distances in PROMASEAL®-A spray penetration seals

Table 2

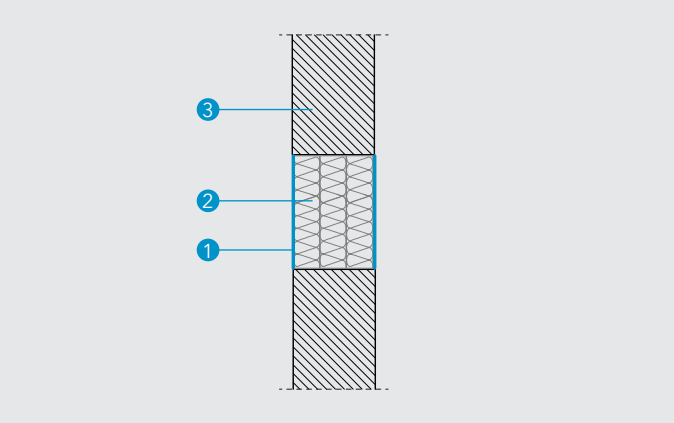
Sufficient space needs to be provided for the construction of professional applications. For practical and physical reasons, we recommend observing a minimum distance of 100 mm between installed objects and support construction/component framing during planning.
If this is impossible due to the situation on the construction site, the permitted minimum distances shall be taken from Table 2.

Table 2 – Minimum distances

Object	Minimum distance [mm]
Pipes with mineral wool insulation in soft penetration seal in floors – All adjacent services	40
Between all other objects not further defined	100



Detail A - Blank seal made with use of mineral wool and PROMASEAL®-A spray in rigid wall



Detail B - Blank seal made with use of mineral wool and PROMASEAL®-A spray in rigid floor

Technical data

1. PROMASEAL-A SPRAY
2. Mineral wool
3. Suporting construction

Certificates: : ITB CR 01633/22/R181NZP, CR 01633.1/21/R164NZP

Detail A - Blank penetration seal in wall (soft-seal)

Maximum dimensions of the blank penetration seal (soft-seal) in rigid wall are 600 x 600 mm. The penetration seal is made of three mineral wool boards type STEPROCK PLUS (density of 110 kg/m^3) with overall thickness of min. 150 mm (min. 3 x 50 mm), see Detail A. The mineral wool infill of the opening is covered by means of PROMASEAL-A spray with dry layer thickness of min. 2,5 mm.

Detail B - Blank penetration seal in floor (soft-seal)

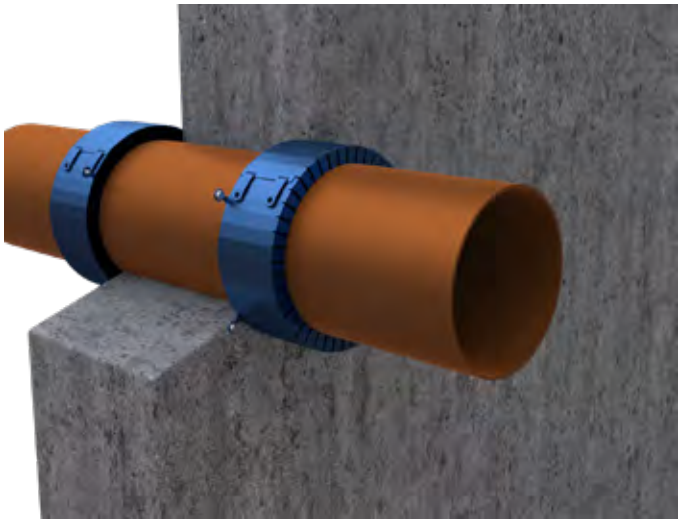
Maximum dimensions of the blank penetration seal (soft-seal) in rigid floor are 600 x 600 mm. The penetration seal is made of three mineral wool boards type STEPROCK HD (density of 140 kg/m^3) with overall thickness of min. 150 mm (min. 3 x 50 mm) placed flush with floor top side (Detail B). The mineral wool infill of the opening is covered by means of PROMASEAL-A spray with dry layer thickness of min. 2,0 mm.

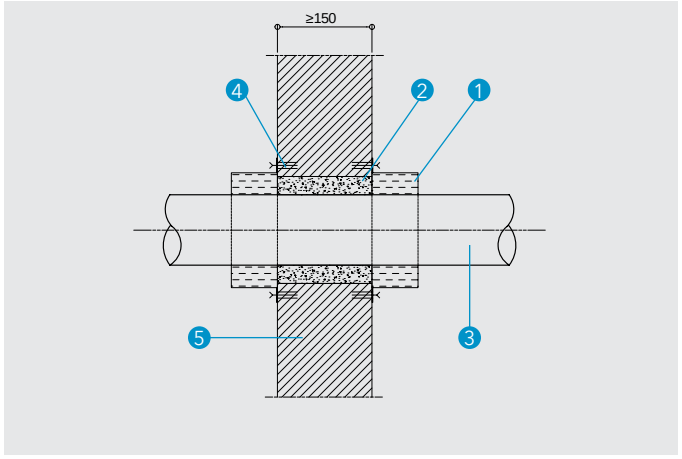
Table 1

Table 1 shows the fire resistance class of the blank penetration seals.

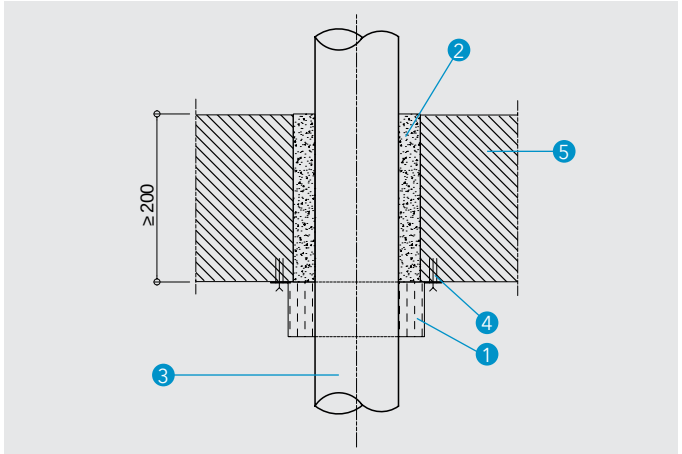
Table 1 – Fire resistance class (blank seal)

	Thickness of mineral wool boards [mm]
	≥ 3 × 50
Rigid wall ≥ 180 mm	EI 240
Rigid floor ≥ 200 mm	





Detail A – Collars fixed in walls



Detail B – Collars fixed in floors

Technical data

1. PROMASTOP®-FC fire collar
2. PROMASEAL®-A, thickness 10 mm
3. Plastic pipe
4. Steel fastening material, e.g. screws or anchors
5. Rigid walls or floors

Certificates: ITB CR 01633/22/R181NZP

1. Fields of application

With utilisation of the PROMASTOP®-FC6 collars (1), it is possible to provide fire protection for plastic pipes of the diameters ranging from 32 mm to 160 mm, meeting the requirements of the fire resistance class EI240.

2. General guidelines

The PROMASTOP®-FC are collars of powder-coated stainless steel, adjusted to pipes of various diameters. They consist of steel encasements, fixing hooks, and special intumescent inserts which expand under the influence of high temperatures.

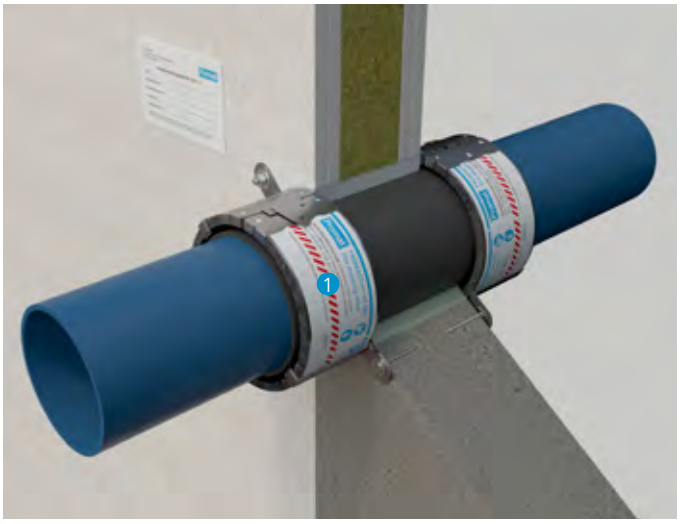
Detail A

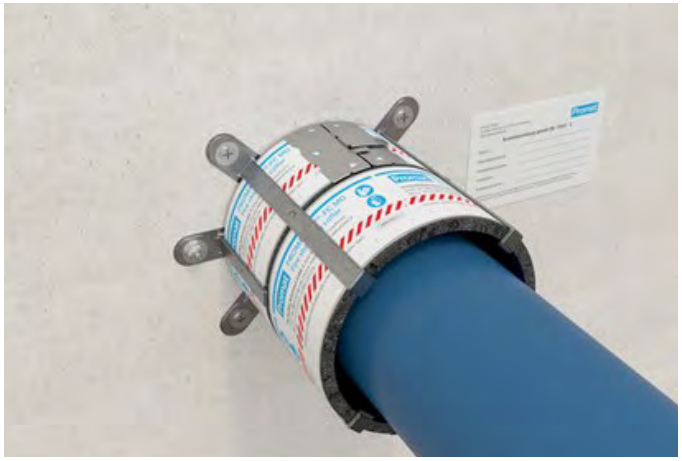
In order to protect those penetrations of pipes running through walls it is necessary to install the collars on both the wall sides. The collars are fixed to rigid walls with utilisation of the provided steel screws (4). The gaps around the penetrating pipes must be filled with cement mortar (6) located throughout the whole thickness of a wall.
Protection of the PE-HD, PVC and PP pipes, diameter range 50÷160 mm in rigid walls, min. thickness 150 mm, can be provided with utilisation of the PROMASTOP®-FC6 collars (1).

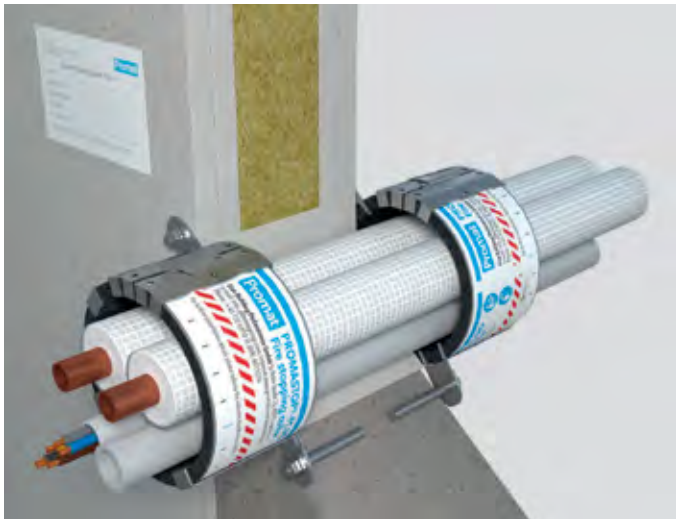
Detail B

In order to protect those penetrations of pipes running through floors it is necessary to install the collars on the bottom sides of such floors. The collars are fixed to rigid partitions with utilisation of the provided steel screws (4). The gap around the pipes must be filled with cement mortar (6) located throughout the whole thickness of a wall.
It is possible to provide the following protection solutions with utilisation of the PROMASTOP®-FC collars for the rigid floors of min. thickness 200 mm:

- PVC-U pipes, diameter range 32÷110 mm. The FC3 collars are appropriate for the 32 mm diameter pipes, the FC6 are appropriate for the pipes of greater diameters.
- PP-R pipes, diameter range 20÷110 mm in flammable insulation reaction to fire class B, thickness 6÷25 mm. The FC3 collars are appropriate for the 20 mm diameter pipes, the FC6 are appropriate for the pipes of greater diameters.







Technical data

1. PROMASTOP®-FC MD
2. Closing brackets A and B
3. Fixing bracket C for one or the first collar
4. Fixing bracket D for the second collar on top of the first collar
5. Plastic pipe or MLC pipes (details on the drawings)
6. Optional sound decoupling strips based on PE-foam (max. 4 mm)
7. Steel fastening material, e.g. screws or anchors
8. Fastening material, min. M6 steel threaded rod
9. Backfilling, details on the drawings
10. Supporting construction
11. Identification label
12. First place of support
13. PROMASEAL®-A, thickness 10 mm
14. PROMASEAL®-A spray, thickness 2,0 mm
15. Annular gap sealing, details on the drawings
16. Additional mineral wool protection

Certificates: ETA-19/0215, Pavus CR PK2-11-19-002-E-1, ITB CR 01633.1/21/R164NZP

Customer benefit

- Quick and easy installation in walls and floors
- One layer for all the tested pipe types
- Wide range of tested pipes, even with sound decoupling strips
- Use category X

1. Installation

- Attach a sound decoupling strip (with adhesive tape) if necessary.
- In floor applications, installation is generally on the underside of the floor. On a wall, installation must be on both sides.
- There are four options for annular gap filling (details at the related type of the penetration seal):
  1. With gypsum-based filler e.g. Promat®-Spachtelmasse
  2. With PROMASTOP®-M fire stopping mortar
  3. With mineral wool backfilling (Class A1 acc. to EN 13501-1), covered with PROMASEAL®-A fire stopping acrilic sealant.
  4. With mineral wool backfilling (Class A1 acc. to EN 13501-1), covered with PROMASEAL®-AG intumescent fire stopping sealant.
- Fix the fire stopping collar around the pipe.
- Fasten the fire stopping collar to the rigid wall or floor with the included or other suitable fastening material.
- Label the penetration seal.

2. Fields of application

PROMASTOP®-FC MD is a pipe closure device for rigid and lightweight constructions and can be used for wall and floor penetration seals.
Test results for standard rigid supporting constructions are valid for separating construction products made of concrete or masonry having the same or a higher thickness and density. The classification of the results in flexible walls may also be applied to rigid walls in case the thickness and/or density are higher than those of the tested construction.
The components (supporting constructions) must be classified acc. to EN 13501-2 for the required fire resistance period.

Supporting distance
The pipes must be suspended/supported ≤ 335 mm on both sides of the walls and ≤ 525 mm from the top of the floor.

Rigid floor
The floor must have a thickness of ≥ 150 mm and a density of ≥ 650 kg/m³.

Rigid wall
The wall must have a thickness of ≥ 100 mm and a density of ≥ 450 kg/m³.

Flexible wall
The wall must have a thickness of ≥ 100 mm and be made from timber or metal studs which are lined on both sides with a minimum of two layers of min. 12,5 mm thick fire protective boards (other board thicknesses permitted, please note minimum thickness). For timber stud walls, a minimum distance of 100 mm must be kept from the penetration seal to each of the timber studs and the cavity between stud and sealing must be filled with a least 100 mm of insulation material compliant to Class A1 or A2 (acc. to EN 13501-1).

Annular gap sealing in wall penetration seals
The annular gap between all pipe types Ø ≤ 160 mm except MLC pipes and the supporting wall construction with width ≤ 31 mm, shall be filled with gypsum-based filler e.g. Promat®-Spachtelmasse filler for up to EI 120. For PP, PE and PVC pipes Ø ≤ 125 mm up to EI 90 the alternative backfilling in the annular gap (width ≤ 10 mm) could be mineral wool (Class A1 acc. to EN 13501-1) covered with ≥ 10 mm thick PROMASEAL®-A fire stopping acrilic sealant sealant on both sides of the seal.

For MLC (multi-layered pipes including metal layer(s)) pipes no backfilling required (tested pipe type: Henco Standard). The annular gap (width 5 - 20 mm) shall be filled with ≥ 25 mm thick PROMASEAL®-AG fire stopping acrilic on both sides of the seal.

Annular gap sealing in floor penetration seals
For pipes and pipe bundles: with PROMASTOP®-M fire stopping mortar or mortar with min. class M5 acc. to EN 998-2. Width of the annular gap ≤ 47 mm for the single pipes and ≤ 40 mm for the pipe bundles.

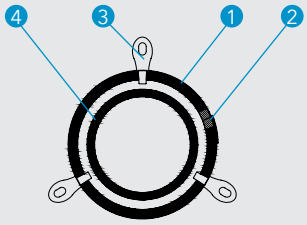
For pipes with couplings: with PROMASTOP®-M fire stopping mortar or mortar with min. class M5 acc. to EN 998-2. Width of the annular gap ≤ 31 mm.

For corner application: for pipes Ø ≤ 110 mm with PROMASTOP®-M fire stopping mortar or mortar with min. class M5 acc. to EN 998-2. Width of the annular gap ≤ 30 mm. For pipes Ø ≤ 40 mm the alternative backfilling in the annular gap (width ≤ 10 mm) could be mineral wool (Class A1 acc. to EN 13501-1) covered with ≥ 10 mm PROMASEAL®-AG intumescent fire stopping acrilic sealant on the bottom side of the seal.

Pipe couplings
The diameter of the tested coupling (Ø 125 mm) may be decreased but not increased. Pipe material PE-HD, PP-H, PP-R and PVC. The number of fixing brackets C must be increased by one acc. to the standard application.

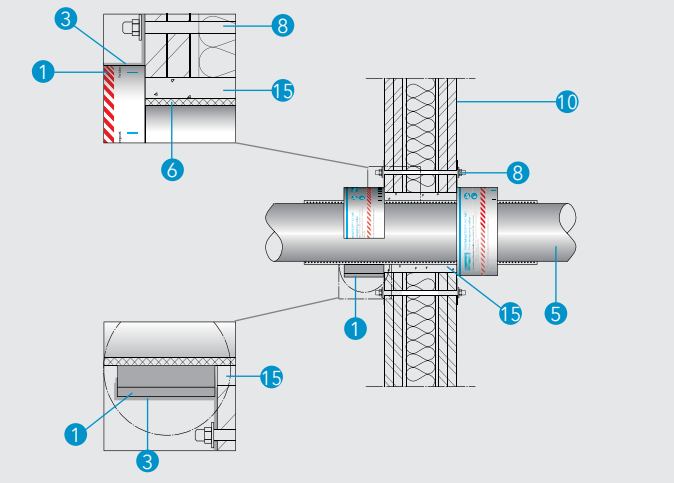
Sloped pipes
Not allowed.

Sound decoupling strips
Sound decoupling strips based on PE-foam with a maximum thickness of 4 mm may be used. This sound decoupling strips may penetrate the wall or floor as well as the PROMASTOP®-FC MD fire stopping collar. The classification of reaction to fire shall be Class E or higher rated according to EN 13501-1.

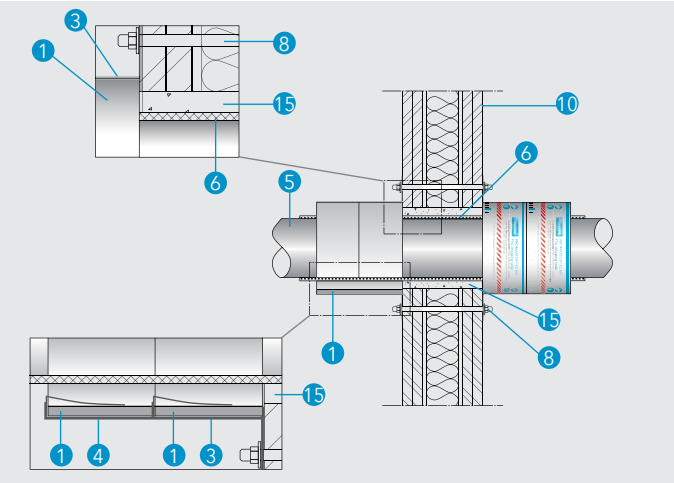


Detail A – Collar view

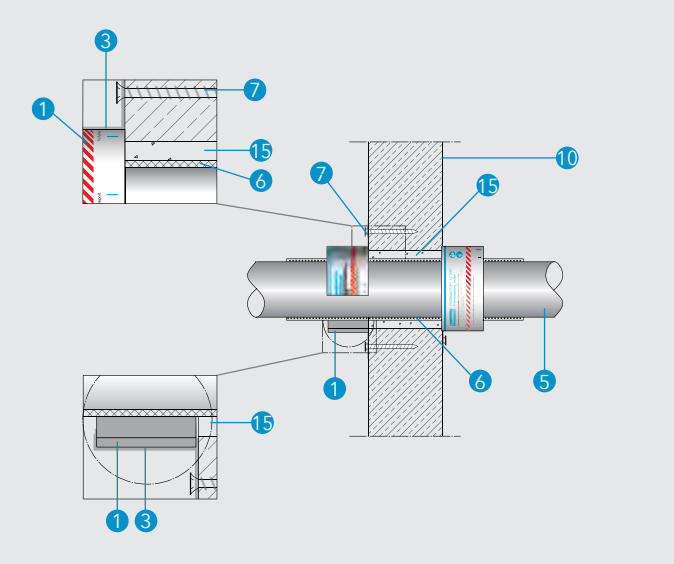
Detail A
The drawing shows the view of the collar mounted on the pipe when passing through the partition. For example, 7 collars for pipes with an outer diameter of 110 mm can be obtained from one package. The cutted collar is closed with closing brackets A and B (7 sets per package; see the installation guideline for details). The collar is mounted to the partition by means of steel fixing brackets C with the use of appropriate fastening material. One package contains 21 fixing brackets C.



Detail B – PROMASTOP®-FC MD penetration seal in flexible wall for pipes without insulation (Ø ≤ 125 mm)



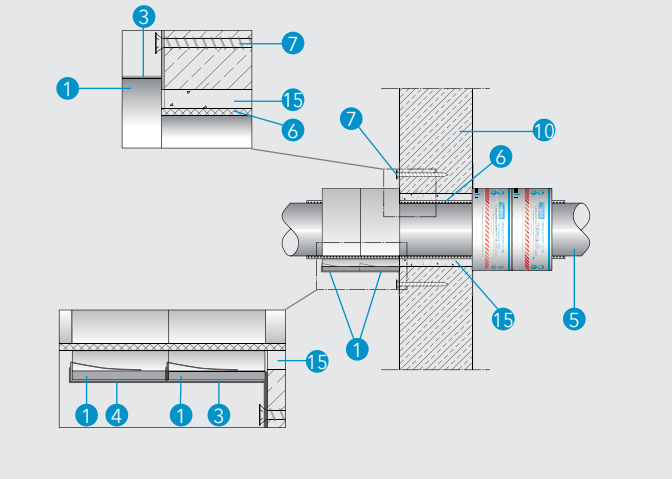
Detail C – PROMASTOP®-FC MD penetration seal in flexible wall for pipes without insulation (Ø > 125 mm)



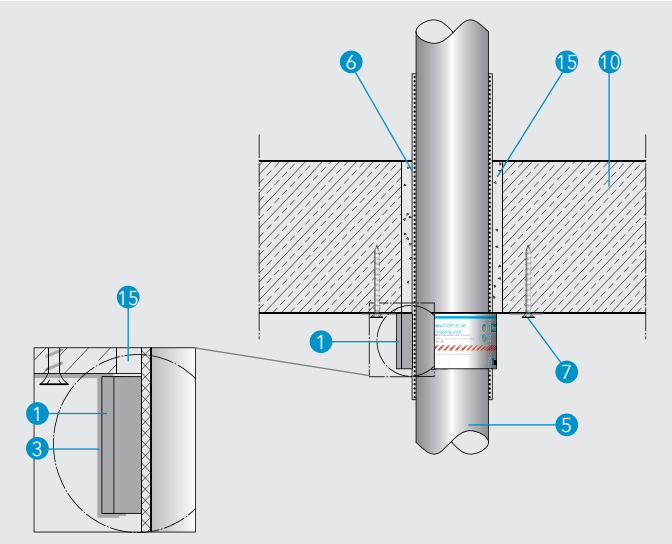
Detail D – PROMASTOP®-FC MD penetration seal in rigid wall for pipes without insulation (Ø ≤ 125 mm)

Details B, C, D and E

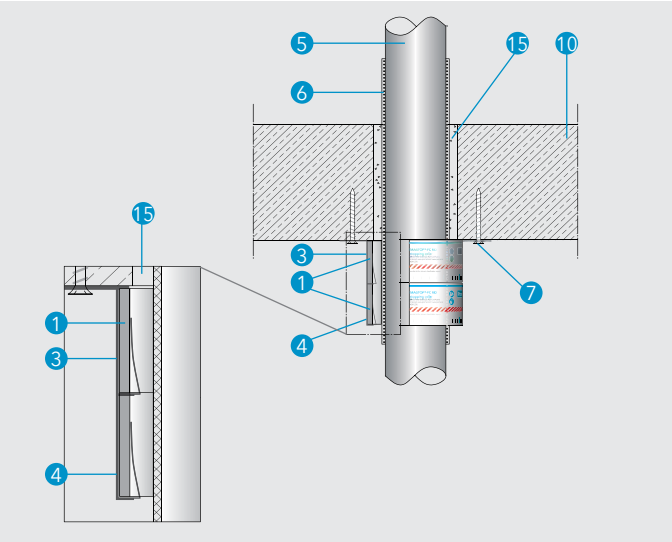
In order to apply the pipe penetration seal in walls, the collar should be mounted on both sides of the partition. The collar is attached to a rigid wall with screws or steel anchors (7), in case of flexible wall, it is installed with min. M6 threaded rods (8) with nuts and washers. For pipes Ø > 125 mm two layers of PROMASTOP®-FC MD fire stopping collars shall be installed on both sides (Details C and E).



Detail E – PROMASTOP®-FC MD penetration seal in rigid wall for pipes without insulation (Ø > 125 mm)



Detail F – PROMASTOP®-FC MD penetration seal in rigid floor for pipes without insulation (Ø ≤ 125 mm)



Detail G – PROMASTOP®-FC MD penetration seal in rigid floor for pipes without insulation (Ø > 125 mm)

Details F and G

For floor penetrations, the collar should only be used from the bottom of the floor. Installation is the same as in the case of passing through the wall. The pipes may be fitted with max. 4 mm thick combustible sound decoupling strips (6), reaction to fire Class E or higher rated acc. to EN 13501-1. For pipes Ø > 125 mm two layers of PROMASTOP®-FC MD fire stopping collars shall be installed on the bottom side (Detail G).

The length of the collar and the number of fixing brackets

The tables below specify the required length of the collar and the number of fixing bracket C and D per one ready penetration seal as well as the capacity (number of seals per package), depending on the outer diameter of the pipe or the pipe bundle. The number of brackets may be increased. For corner application, no closing bracket A and B may be used, but 2 layers of PROMASTOP®-FC MD shall be used at any time.

Table 1 – Collar and brackets consumption table for perpendicular pipes or bundles made of MLC pipes (Henco type Standard; max. bundle diameter 110 mm)

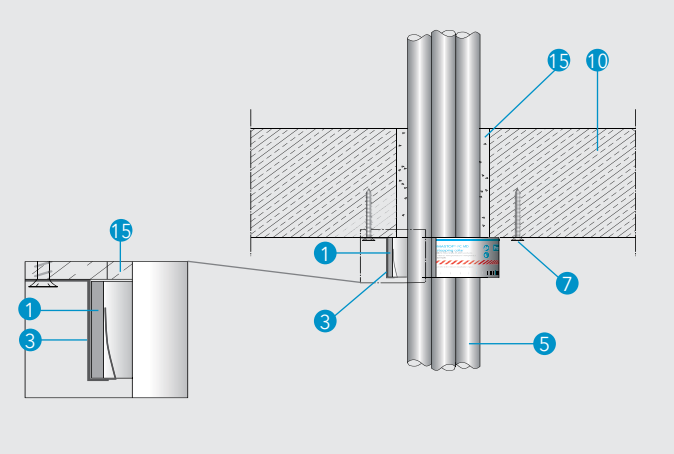
Outer pipe diameter [mm]	Collar length [mm]	Capacity floor / wall	Number of fixing bracket C	Number of fixing bracket D
40	225	14 / 7	2	-
50	255	12 / 6	2	-
64	300	10 / 5	3	-
75	335	9 / 4	3	-
90	380	8 / 4	3	-
110	445	7 / 3	3	-
125	490	6 / 3	4	-
160	600	5 / 2	2 (first collar)	4 (second collar)
200	720	4 / 2	2 (first collar)	4 (second collar)

Table 2 – Brackets consumption table for perpendicular pipes with couplings

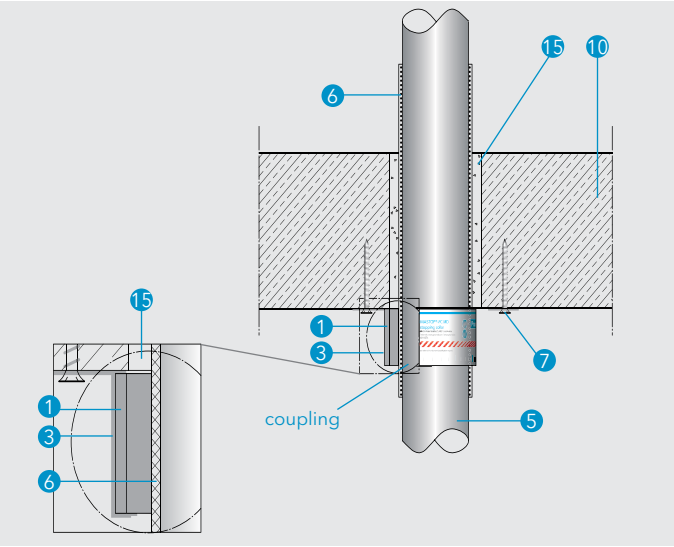
Outer pipe diameter [mm]	Number of fixing bracket C	Number of fixing bracket D
≤ 50	3	-
≤ 110	4	-
125	5	-

Table 3 – Brackets consumption table for pipes in corners of walls and columns (always 2 collar layers)

Outer pipe diameter [mm]	Number of fixing bracket C	Number of fixing bracket D
≤ 40	1 (first collar)	2 (second collar)
≤ 110	2 (first collar)	3 (second collar)



Detail H – PROMASTOP®-FC MD penetration seal in rigid floor for plastic pipe bundles



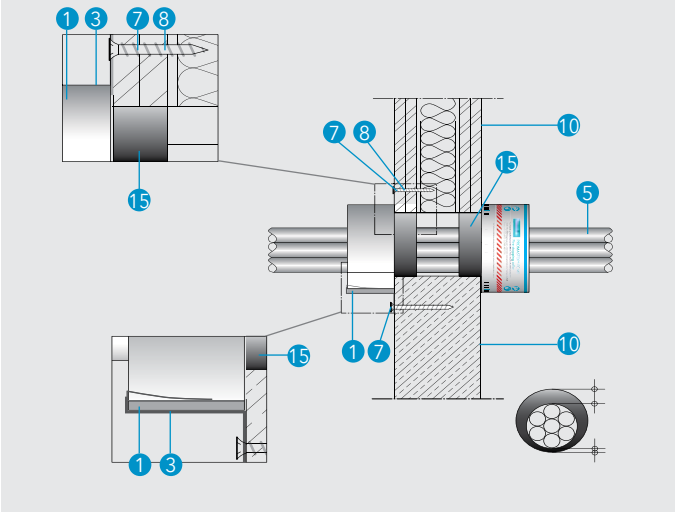
Detail I – PROMASTOP®-FC MD penetration seal in rigid floor for plastic pipes with couplings

Detail H

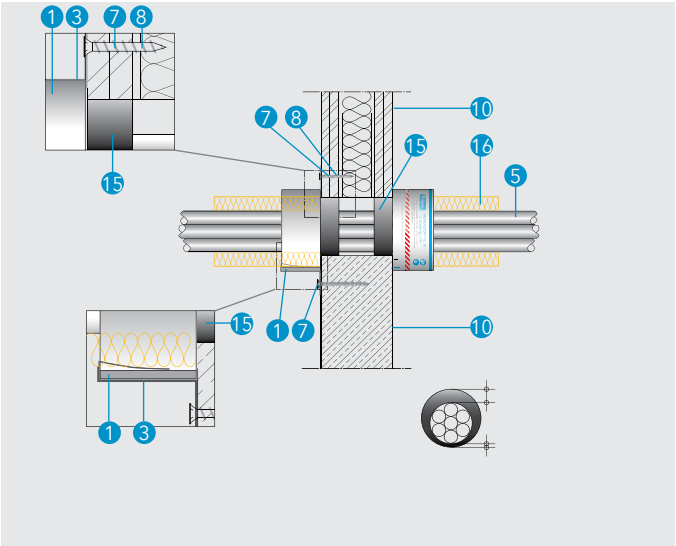
Pipe bundles were classified in floor penetration seals for the following pipe types: PE, PP-H, PVC-U and bundles made of a mixture of PE, PP-H and PVC-U pipes. One layer of PROMASTOP®-FC MD fire stopping collar shall be installed on the bottom side of the floor. The pipes may be fitted with max. 4 mm thick combustible sound decoupling strip (6), reaction to fire Class E or higher rated acc. to EN 13501-1. Details in Table 4.

Detail I

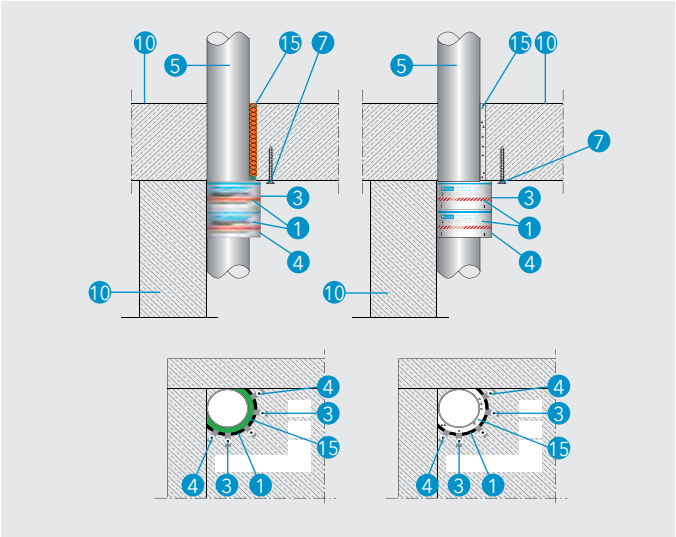
Pipe couplings were classified in floor penetration seals for the following pipe types: PE, PP and PVC. Diameter of the pipe up to 125 mm for all types. One layer of PROMASTOP®-FC MD fire stopping collar shall be installed on the bottom side of the floor. The pipes may be fitted with max. 4 mm thick combustible sound decoupling strip (6), reaction to fire Class E or higher rated acc. to EN 13501-1. Details in Table 4.



Detail J – PROMASTOP®-FC MD penetration seal in rigid or flexible wall for single MLC pipe or MLC pipe bundles



Detail K – PROMASTOP®-FC MD penetration seal with additional protection in rigid or flexible wall for single MLC pipe or MLC pipe bundles



Detail L – PROMASTOP®-FC MD penetration seal in rigid floor for plastic pipes, corner application

Details J and K

Henco Standard (PE-Xc/Al/PE-Xc) pipes and pipe bundles were classified in wall penetration seals. One piece of PROMASTOP®-FC MD fire stopping collar shall be installed on both sides of the wall. The pipes may be with or without insulation, the seal could be with or without additional protection. In same cases additional protection is required (Detail K): the protection is composed of stone wool (class A1 acc. to EN 13501-1, density ≥ 35 kg/m³), thickness 50 mm, 150 mm length on both sides of the wall around the pipe bundle, in the collar. The additonal protection is fixed using steel wire (min. diameter 0,6 mm). Details in Table 6. The amount of pipes may be decreased.

The application of the penetration seal is without backfilling possible. PROMASEAL®-AG shall be used in the gussets of the pipes in the wall at any time. Covering depth ≥ 25 mm PROMASEAL®-AG on both sides of the wall. Annular space width between the pipe bundle and the wall: 5 - 20 mm.

Detail L

PE-HD, PP-H, PP-R, PP-C and PVC pipes mounted on the bottom side of a rigid floor construction, thickness 150 mm, in the corners of two walls (corner application) were classified with PROMASTOP®-FC MD fire stopping collar. Pipe orientation 90° to the floor. 2 layers of PROMASTOP®-FC MD shall be used at any time. For pipe diameter Ø ≤ 40 mm, 1 fixing bracket C for the first collar and 2 fixing brackets D for the second collar shall be used. For pipe diameter Ø > 40 mm and ≤ 110 mm, 2 fixing brackets C for the first collar and 3 fixing brackets D for the second collar shall be used. The number of brackets may be increased. No closing brackets A and B are required. Distance of the PROMASTOP®-FC MD collar around the pipe about 10 mm. The PROMASTOP®-FC MD collar does not completely cover the circumference (about three quarters circumferential) of the pipe.

Filling of annular space: for pipes Ø ≤ 110 mm with PROMASTOP®-M fire stopping mortar or mortar with min. class M5 acc. to EN 998-2. Width of the annular gap ≤ 30 mm. For pipes Ø ≤ 40 mm the alternative backfilling in the annular gap (width ≤ 10 mm) could be mineral wool (Class A1 acc. to EN 13501-1) covered with ≥ 10 mm PROMASEAL®-AG intumescent fire stopping acrilic sealant on the bottom side of the seal.

3.1. PROMASTOP®-FC MD penetration seal for single plastic pipe or plastic pipe bundles

Fields of application

Details under 2. Fields of application.

Pype types

The listed pipe types are tested according the requirements of EN 1366-3 and EN 13882-3 and given by the rules of the direct and the extended fields of application.

- The classifications for PE pipes are applicable for pipes according to EN 12201-2, EN 1519-1, EN 12666-1, DIN 8074, DIN 8075 and for ABS pipes according to EN 1455-1 and for SAN + PVC pipes according to EN 1565-1
- The classifications for PP-H and PP-R pipes are applicable for pipes according to ÖNORM B 5174-1, DIN 8077, DIN 8078, EN 1451-1 and EN ISO 15494.
- The classifications for PVC-U pipes are applicable for pipes according to EN 1452-1, EN 1329-1, EN 1453-1, DIN 8061, DIN 8062, EN 1329-1, EN 1453-1 and to PVC-C pipes according to EN 1566-1.
- PE-S2 pipes (Geberit Silent-db20), PP-C/PP-MD/PP-C pipes (Geberit Silent-PP), PP-MX pipes (Geberit Silent-Pro), PP-MD pipes (REHAU RAUPIANO PLUS), POLOPLAST POLO-KAL NG pipes, POLOPLAST POLO-KAL 3S pipes, POLOPLAST POLO-KAL XS pipes

Table 4 – Overview of pipe materials, dimensions, installation situations and classifications (see other classifications for smaller pipe diameters, etc. in Table 5; the tested annular gap sealing method is shown there)

Requirement		Dimension range Ø: outer pipe diameter [mm] s: pipe wall thickness [mm]	Classification
Rigid or flexible wall	Rigid floor		
PE-HD, ABS, SAN + PVC single pipe for pipe penetrations at 90°			
Construction thickness ≥ 100 mm		lower limits: Ø 40 mm, s 2,4 mm → Ø 110 mm, s 2,7 mm → Ø 125 mm, s 3,1 mm with double collars only: Ø 125 mm, s 3,1 mm → Ø 160 mm, s 4,0 mm upper limits: Ø 40 mm, s 11,4 mm → Ø 125 mm, s 11,4 mm with double collars only: Ø 125 mm, s 6,2 mm → Ø 160 mm, s 6,2 mm (with or without sound decoupling strips)	EI 90-U/C
	Construction thickness ≥ 150 mm	PE pipes couplings: lower limits: Ø 40 mm, s 2,4 mm → Ø 110 mm, s 2,7 mm → Ø 125 mm, s 3,1 mm upper limits: Ø 40 mm, s 7,4 mm → Ø 125 mm, s 7,4 mm (with or without sound decoupling strips)	E 120, EI 90-U/U
Construction thickness ≥ 100 mm		lower limits: Ø 40 mm, s 2,4 mm → Ø 110 mm, s 2,7 mm → Ø 125 mm, s 3,1 mm with double collars only: Ø 125 mm, s 3,1 mm → Ø 160 mm, s 4,0 mm upper limits: Ø 40 mm, s 10,0 mm → Ø 110 mm, s 10,0 mm → Ø 110 mm, s 7,4 mm → Ø 125 mm, s 7,4 mm with double collars only: Ø 125 mm, s 6,2 mm → Ø 160 mm, s 6,2 mm (with or without sound decoupling strips)	EI 120-U/C
	Construction thickness ≥ 150 mm	lower limits: Ø 40 mm, s 2,4 mm → Ø 110 mm, s 2,7 mm → Ø 125 mm, s 3,1 mm with double collars only: Ø 125 mm, s 3,1 mm → Ø 160 mm, s 4,0 mm → Ø 200 mm, s 4,9 mm upper limits: Ø 40 mm, s 15,1 mm → Ø 110 mm, s 15,1 mm → Ø 110 mm, s 11,4 mm → Ø 125 mm, s 11,4 mm with double collars only: Ø 125 mm, s 9,5 mm → Ø 160 mm, s 9,5 mm → Ø 160 mm, s 4,9 mm → Ø 200 mm, s 4,9 mm (with or without sound decoupling strips)	EI 120-U/C
Construction thickness ≥ 100 mm		lower limits: Ø 40 mm, s 2,4 mm → Ø 110 mm, s 2,7 mm → Ø 125 mm, s 3,1 mm with double collars only: Ø 125 mm, s 3,1 mm → Ø 160 mm, s 4,0 mm upper limits: Ø 40 mm, s 7,4 mm → Ø 125 mm, s 7,4 mm with double collars only: Ø 125 mm, s 6,2 mm → Ø 160 mm, s 6,2 mm (with or without sound decoupling strips)	EI 120-U/U
	Construction thickness ≥ 150 mm	lower limits: Ø 40 mm, s 2,4 mm → Ø 110 mm, s 2,7 mm → Ø 125 mm, s 3,1 mm with double collars only: Ø 125 mm, s 3,1 mm → Ø 160 mm, s 4,0 mm → Ø 200 mm, s 4,9 mm upper limits: Ø 40 mm, s 7,4 mm → Ø 125 mm, s 7,4 mm with double collars only: Ø 125 mm, s 6,2 mm → Ø 160 mm, s 6,2 mm → Ø 160 mm, s 4,9 mm → Ø 200 mm, s 4,9 mm (with or without sound decoupling strips)	EI 120-U/U
PE single pipe for pipe penetrations at 90° in the corners of two walls (corner application)			
	Construction thickness ≥ 150 mm	with double collars only: lower limits: Ø 40 mm, s 2,4 mm → Ø 110 mm, s 3,4 mm upper limits: Ø 40 mm, s 6,6 mm → Ø 110 mm, s 6,6 mm (with or without sound decoupling strips)	EI 120-U/U

Requirement		Dimension range Ø: outer pipe diameter [mm] s: pipe wall thickness [mm]	Classification
Rigid or flexible wall	Rigid floor		
PE pipe bundles for pipe penetrations at 90°			
	Construction thickness ≥ 150 mm	Max. bundle (the amount of pipes may be decreased): 1 x Ø 32 mm x 2,0 mm / 1 x Ø 50 mm x 3,0 mm / 1 x Ø 75 mm x 2,3 mm (with or without sound decoupling strips)	EI 120-U/U
PP-H and PP-R single pipe for pipe penetrations at 90°			
	Construction thickness ≥ 150 mm	lower limits: Ø 40 mm, s 1,8 mm → Ø 110 mm, s 2,7 mm → Ø 125 mm, s 3,1 mm with double collars only: Ø 125 mm, s 3,1 mm → Ø 160 mm, s 4,0 mm → Ø 200 mm, s 7,7 mm upper limits: Ø 40 mm, s 17,1 mm → Ø 125 mm, s 17,1 mm with double collars only: Ø 125 mm, s 9,5 mm → Ø 160 mm, s 9,5 mm → Ø 160 mm, s 7,7 mm → Ø 200 mm, s 7,7 mm (with or without sound decoupling strips)	EI 60-U/C
	Construction thickness ≥ 150 mm	lower limits: Ø 40 mm, s 1,8 mm → Ø 110 mm, s 2,7 mm → Ø 125 mm, s 3,1 mm with double collars only: Ø 125 mm, s 3,1 mm → Ø 160 mm, s 4,0 mm → Ø 200 mm, s 7,7 mm upper limits: Ø 40 mm, s 7,1 mm → Ø 125 mm, s 7,1 mm with double collars only: Ø 125 mm, s 7,7 mm → Ø 200 mm, s 7,7 mm (with or without sound decoupling strips)	EI 60-U/U
	Construction thickness ≥ 150 mm	lower limits: Ø 40 mm, s 1,8 mm → Ø 110 mm, s 2,7 mm → Ø 125 mm, s 3,1 mm with double collars only: Ø 125 mm, s 3,1 mm → Ø 160 mm, s 4,0 mm upper limits: Ø 40 mm, s 17,1 mm → Ø 125 mm, s 17,1 mm with double collars only: Ø 125 mm, s 9,5 mm → Ø 160 mm, s 9,5 mm (with or without sound decoupling strips)	EI 90-U/C
	Construction thickness ≥ 150 mm	lower limits: Ø 40 mm, s 1,8 mm → Ø 110 mm, s 2,7 mm → Ø 125 mm, s 3,1 mm upper limits: Ø 40 mm, s 7,1 mm → Ø 125 mm, s 7,1 mm (with or without sound decoupling strips)	EI 90-U/U
	Construction thickness ≥ 150 mm	PP pipes couplings: lower limits: Ø 40 mm, s 1,8 mm → Ø 110 mm, s 2,7 mm → Ø 125 mm, s 3,1 mm upper limits: Ø 40 mm, s 7,1 mm → Ø 125 mm, s 7,1 mm (with or without sound decoupling strips)	E 120 EI 90-U/U
Construction thickness ≥ 100 mm		lower limits: Ø 40 mm, s 1,8 mm → Ø 110 mm, s 2,7 mm → Ø 125 mm, s 3,1 mm with double collars only: Ø 125 mm, s 3,1 mm → Ø 160 mm, s 4,0 mm upper limits: Ø 40 mm, s 11,4 mm → Ø 125 mm, s 11,4 mm with double collars only: Ø 125 mm, s 6,1 mm → Ø 160 mm, s 6,1 mm (with or without sound decoupling strips)	EI 120-U/C
	Construction thickness ≥ 150 mm	lower limits: Ø 40 mm, s 1,8 mm → Ø 110 mm, s 2,7 mm → Ø 125 mm, s 3,1 mm with double collars only: Ø 125 mm, s 3,1 mm → Ø 160 mm, s 4,0 mm upper limits: Ø 40 mm, s 15,1 mm → Ø 110 mm, s 15,1 mm → Ø 110 mm, s 7,1 mm → Ø 125 mm, s 7,1 mm with double collars only: Ø 125 mm, s 6,1 mm → Ø 160 mm, s 6,1 mm (with or without sound decoupling strips)	EI 120-U/C
Construction thickness ≥ 100 mm		lower limits: Ø 40 mm, s 1,8 mm → Ø 110 mm, s 2,7 mm → Ø 125 mm, s 3,1 mm with double collars only: Ø 125 mm, s 3,1 mm → Ø 160 mm, s 4,0 mm upper limits: Ø 40 mm, s 7,1 mm → Ø 125 mm, s 7,1 mm with double collars only: Ø 125 mm, s 6,1 mm → Ø 160 mm, s 6,1 mm (with or without sound decoupling strips)	EI 120-U/U
	Construction thickness ≥ 150 mm	lower limits: Ø 40 mm, s 1,8 mm → Ø 110 mm, s 2,7 mm → Ø 125 mm, s 3,1 mm with double collars only: Ø 125 mm, s 3,1 mm → Ø 160 mm, s 4,0 mm upper limits: Ø 40 mm, s 7,1 mm → Ø 125 mm, s 7,1 mm with double collars only: Ø 125 mm, s 6,1 mm → Ø 160 mm, s 6,1 mm (with or without sound decoupling strips)	EI 120-U/U
PP single pipe for pipe penetrations at 90° in the corners of two walls (corner application)			
	Construction thickness ≥ 150 mm	with double collars only: lower limits: Ø 40 mm, s 1,8 mm → Ø 110 mm, s 2,7 mm upper limits: Ø 40 mm, s 3,4 mm → Ø 110 mm, s 3,4 mm (with or without sound decoupling strips)	EI 120-U/U

Requirement		Dimension range Ø: outer pipe diameter [mm] s: pipe wall thickness [mm]	Classification
Rigid or flexible wall	Rigid floor		
PP-H pipe bundles for pipe penetrations at 90°			
	Construction thickness ≥ 150 mm	Max. bundle (the amount of pipes may be decreased): 1 x Ø 32 mm x 2,9 mm / 1 x Ø 50 mm x 2,9 mm / 1 x Ø 75 mm x 4,3 mm (with or without sound decoupling strips)	EI 120-U/U
PVC-U and PVC-C single pipe (e.g. DYKA Sono blue) for pipe penetrations at 90°			
	Construction thickness ≥ 150 mm	lower limits: Ø 40 mm, s 1,8 mm → Ø 110 mm, s 2,7 mm → Ø 125 mm, s 3,1 mm upper limits: Ø 40 mm, s 7,4 mm → Ø 125 mm, s 7,4 mm (with or without sound decoupling strips)	EI 90-U/U
	Construction thickness ≥ 150 mm	PVC pipes couplings: lower limits: Ø 40 mm, s 1,8 mm → Ø 110 mm, s 2,7 mm → Ø 125 mm, s 3,1 mm upper limits: Ø 40 mm, s 7,4 mm → Ø 125 mm, s 7,4 mm (with or without sound decoupling strips)	E 120 EI 90-U/U
Construction thickness ≥ 100 mm		lower limits: Ø 40 mm, s 1,8 mm → Ø 110 mm, s 2,7 mm → Ø 125 mm, s 3,1 mm with double collars only: Ø 125 mm, s 3,1 mm → Ø 160 mm, s 4,0 mm upper limits: Ø 40 mm, s 7,4 mm → Ø 125 mm, s 7,4 mm with double collars only: Ø 125 mm, s 6,2 mm → Ø 160 mm, s 6,2 mm (with or without sound decoupling strips)	EI 120-U/U
	Construction thickness ≥ 150 mm	lower limits: Ø 40 mm, s 1,8 mm → Ø 110 mm, s 2,7 mm → Ø 125 mm, s 3,1 mm with double collars only: Ø 125 mm, s 3,1 mm → Ø 160 mm, s 4,0 mm upper limits: Ø 40 mm, s 7,4 mm → Ø 125 mm, s 7,4 mm with double collars only: Ø 125 mm, s 6,1 mm → Ø 160 mm, s 6,1 mm (with or without sound decoupling strips)	EI 120-U/U
PVC single pipe for pipe penetrations at 90° in the corners of two walls (corner application)			
	Construction thickness ≥ 150 mm	with double collars only: lower limits: Ø 40 mm, s 1,9 mm → Ø 110 mm, s 5,3 mm upper limits: Ø 40 mm, s 8,1 mm → Ø 110 mm, s 8,1 mm (with or without sound decoupling strips)	EI 90-U/U
PVC-U pipe bundles for pipe penetrations at 90°			
	Construction thickness ≥ 150 mm	Max. bundle (the amount of pipes may be decreased): 1 x Ø 32 mm x 3,6 mm / 1 x Ø 50 mm x 1,8 mm / 1 x Ø 75 mm x 1,8 mm (with or without sound decoupling strips)	EI 90-U/U
PE, PVC-U and PP-H pipe bundles for pipe penetrations at 90°			
	Construction thickness ≥ 150 mm	Max. bundle (the amount of pipes may be decreased): PVC-U 1 x Ø 32 mm x 3,6 mm / PP-H 1 x Ø 50 mm x 2,0 mm / PE 1 x Ø 75 mm x 2,3 mm (with or without sound decoupling strips)	EI 90-U/U
PE-S2 (Geberit Silent-db20) single pipe for pipe penetrations at 90°			
Construction thickness ≥ 100 mm	Construction thickness ≥ 150 mm	lower limits: Ø 56 mm, s 3,2 mm → Ø 110 mm, s 6,0 mm upper limits: Ø 56 mm, s 6,0 mm → Ø 110 mm, s 6,0 mm (with or without sound decoupling strips)	EI 120-U/U
PP-C/PP-MD/PP-C (Geberit Silent-PP) single pipe for pipe penetrations at 90°			
Construction thickness ≥ 100 mm	Construction thickness ≥ 150 mm	lower limits: Ø 40 mm, s 1,8 mm → Ø 50 mm, s 2,0 mm → Ø 75 mm, s 2,6 mm → Ø 90 mm, s 3,1 mm → Ø 110 mm, s 3,6 mm → Ø 125 mm, s 3,9 mm upper limits: Ø 40 mm, s 3,9 mm → Ø 125 mm, s 3,9 mm (with or without sound decoupling strips)	EI 120-U/U
PP-MD (REHAU Raupiano Plus) single pipe for pipe penetrations at 90°			
Construction thickness ≥ 100 mm	Construction thickness ≥ 150 mm	lower limits: Ø 40 mm, s 1,8 mm → Ø 125 mm, s 3,1 mm upper limits: Ø 40 mm, s 3,1 mm → Ø 125 mm, s 3,1 mm (with or without sound decoupling strips)	EI 120-U/U

Requirement		Dimension range Ø: outer pipe diameter [mm] s: pipe wall thickness [mm]	Classification
Rigid or flexible wall	Rigid floor		
PP-MX (Geberit Silent-Pro) single pipe for pipe penetrations at 90°			
Construction thickness ≥ 100 mm		lower limits: Ø 50 mm, s 2,7 mm → Ø 75 mm, s 3,5 mm → Ø 90 mm, s 4,0 mm → Ø 110 mm, s 4,2 mm → Ø 125 mm, s 4,7 mm upper limits: Ø 50 mm, s 4,7 mm → Ø 125 mm, s 4,7 mm (with or without sound decoupling strips)	EI 90-U/U
Construction thickness ≥ 100 mm		Ø 50 mm, s 2,7 mm (with or without sound decoupling strips)	EI 120-U/U
	Construction thickness ≥ 150 mm	lower limits: Ø 50 mm, s 2,7 mm → Ø 75 mm, s 3,5 mm → Ø 90 mm, s 4,0 mm → Ø 110 mm, s 4,2 mm → Ø 125 mm, s 4,7 mm upper limits: Ø 50 mm, s 4,7 mm → Ø 125 mm, s 4,7 mm (with or without sound decoupling strips)	EI 120-U/U
POLOPLAST POLO-KAL NG single pipe for pipe penetrations at 90°			
	Construction thickness ≥ 150 mm	lower limits: Ø 40 mm, s 1,8 mm → Ø 50 mm, s 2,0 mm → Ø 75 mm, s 2,6 mm → Ø 90 mm, s 3,0 mm → Ø 110 mm, s 3,4 mm → Ø 125 mm, s 3,9 mm upper limits: Ø 40 mm, s 3,9 mm → Ø 125 mm, s 3,9 mm (with or without sound decoupling strips)	EI 120-U/U
POLOPLAST POLO-KAL 3S single pipe for pipe penetrations at 90°			
	Construction thickness ≥ 150 mm	lower limits: Ø 75 mm, s 3,8 mm → Ø 90 mm, s 4,5 mm → Ø 110 mm, s 4,8 mm → Ø 125 mm, s 5,3 mm upper limits: Ø 75 mm, s 5,3 mm → Ø 125 mm, s 5,3 mm (with or without sound decoupling strips)	EI 120-U/U
POLOPLAST POLO-KAL XS single pipe for pipe penetrations at 90°			
	Construction thickness ≥ 150 mm	lower limits: Ø 40 mm, s 1,8 mm → Ø 50 mm, s 2,0 mm → Ø 75 mm, s 2,6 mm → Ø 90 mm, s 3,0 mm → Ø 110 mm, s 3,4 mm → Ø 125 mm, s 3,9 mm upper limits: Ø 40 mm, s 3,9 mm → Ø 125 mm, s 3,9 mm (with or without sound decoupling strips)	EI 120-U/U

3.2. PROMASTOP®-FC MD penetration seal for single plastic pipe

3.2.1. Fields of application

Rigid wall
The classifications for rigid wall supporting construction are valid for penetration seals in wall made of concrete, reinforced concrete, aerated concrete, ceramic brick, cavity brick, checker brick, with density greater than or equal to 600 kg/m³ and thickness equal to or greater than given in appropriate point, with fire resistance class (classified according to EN 13501-2) equal to or greater than given in appropriate point. Required thickness in Table 5.

Flexible wall
The classifications for flexible wall supporting construction are valid for penetration seals in flexible walls made of gypsum plasterboards type F or DF with steel or timber studs substructure, thickness equal to or greater than given in appropriate point (min. two layers of gypsum plasterboards type F or DF with overall board layer thickness equal to or greater than 25 mm), with fire resistance class (classified according to EN 13501-2) equal to or greater than given in appropriate point. Required thickness in Table 5.

In case of supporting constructions with timber studs no part of the penetration seal is closer than 100 mm to a stud, the cavity is closed between the penetration seal and the stud and minimum 100 mm of insulation of class A1 or A2 according to EN 13501-1 is provided within the cavity between the penetration seal and the stud.

Classifications given for "flexible wall supporting construction" are also valid for penetration seals in rigid wall supporting constructions with greater than or equal to 450 kg/m³ and thickness equal to or greater than given in appropriate point, with fire resistance class (classified according to EN 13501-2) equal to or greater than given in appropriate point.

Rigid floor
The classifications for rigid floor supporting construction are valid for penetration seals in floor made of concrete, aerated concrete or reinforced concrete, with density greater or equal to 600 kg/m³ and thickness greater than or equal to given in appropriate point. Required floor thickness in Table 5.

Supporting distance
The metal and plastic pipes must be suspended/supported at a distance of ≤ 335 mm on both sides of the wall or from the top of the floor.

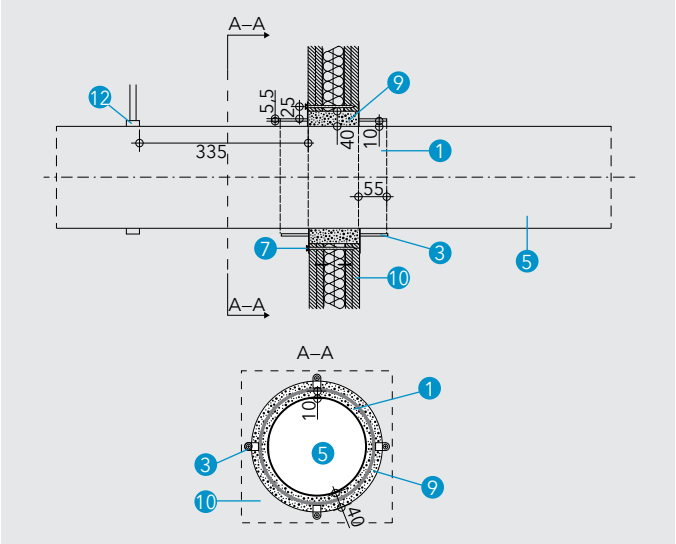
Metal pipes
The classification given for metal (copper or steel) pipes covers pipe materials with a thermal conductivity lower than presented in appropriate point, subject to the material having a melting point at least equal to that of the presented material or greater than:
- 843 °C for the fire resistance class 30 min,
- 903 °C for the fire resistance class 45 min,
- 946 °C for the fire resistance class 60 min,
- 1006 °C for the fire resistance class 90 min,
- 1049 °C for the fire resistance class 120 min.

The classifications given for metal (copper or steel) pipes are valid for pipe end configuration as follows:
- C/U, U/C and C/C in case of penetrations with "U/C" in classification code,
- C/C in case of penetrations with "C/C" in classification code.

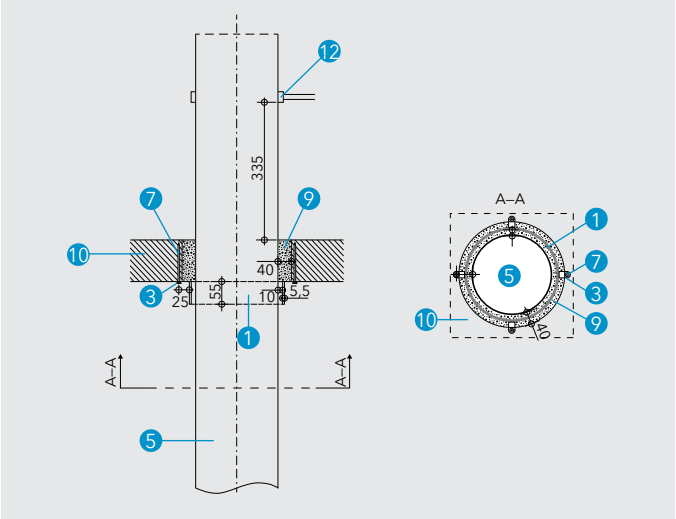
Pipe insulation for metal and plastic pipes
The classifications given for pipes with AF/ArmaFlex (FEF, reaction to fire B-s3, d0 acc. to EN 13501-1), with Armaflex ACE Plus (FEF, reaction to fire B-s3, d0), with MIRELON® PRO (PE, reaction to fire E), with Tubolit S (PE, reaction to fire E for steel pipes or B_L-s1, d0 for copper pipes in bundle) or with Thermaflex ThermaEco FRZ (PE, reaction to fire E) insulation concerns continuously insulated pipes (CS configuration) and does not cover local insulated nor non-insulated pipes. For this type of penetrations the thickness and density of the continuous insulation cannot be increased or reduced and the reaction to fire class (acc. to EN 13501-1) of the insulation shall remain the same as given. Classification is also valid for other flexible elastomeric foams (FEF) and for other PE foams made in accordance with appropriate product standard (EN 14304+A1 for FEF and EN 14313+A1 for PE) provided that the thickness and density of a continuous insulation is not increased or reduced and the reaction to fire class is same as given.

Plastic pipes
Classification given for PE-100 pipes is valid for pipes made from PE-100 according to EN 12201-2.
Classification given for PP pipes is valid for pipes made from PP according to EN 1852-1.
Classification given for PP-H pipes is valid for pipes made from PP-H in accordance with EN 1451.
Classification given for PP-R pipes is valid for pipes made from PP-R in accordance with EN 15874-1.
Classification given for PP-MD pipes is valid for pipes made from PP-MD in accordance with EN 14758-1.
Classification given for PVC-U pipes covers pipe material: PVC-U according to EN 1453-1, EN 1452-1, EN 15493, DIN 8061:2009 and DIN 8062:2009 and PVC-C according to EN 1566-1.

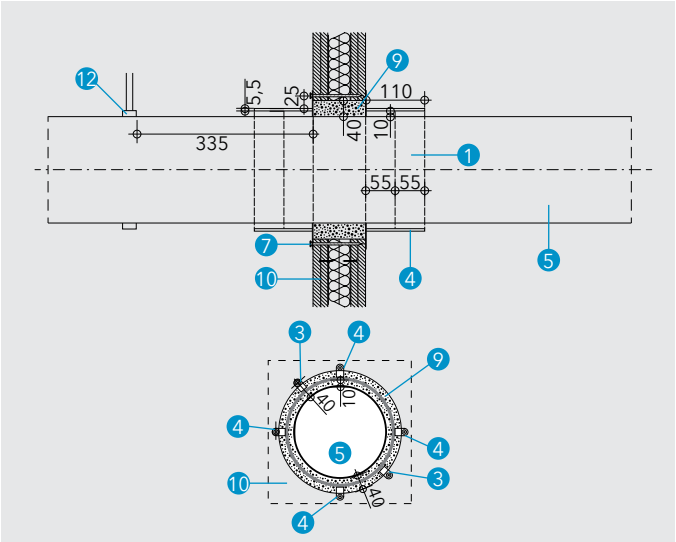
The classifications given for plastic pipes are valid for pipe end configuration as follows:
- U/U, U/C, C/U and C/C C in case of penetrations with "U/U" in classification code
- U/C and C/C in case of penetrations with "U/C" in classification code,
- C/C in case of penetrations with "C/C" in classification code.



Detail M – Penetration seal of plastic pipes without insulation, sealed with use of PROMASTOP®-FC MD single collar (one collar per side) in wall



Detail N – Penetration seal of plastic pipes without insulation, sealed with use of PROMASTOP®-FC MD collar in floor



Detail O – Penetration seal of plastic pipes without insulation, sealed with use of PROMASTOP®-FC MD double collar (two collars per side) in wall

Classifications

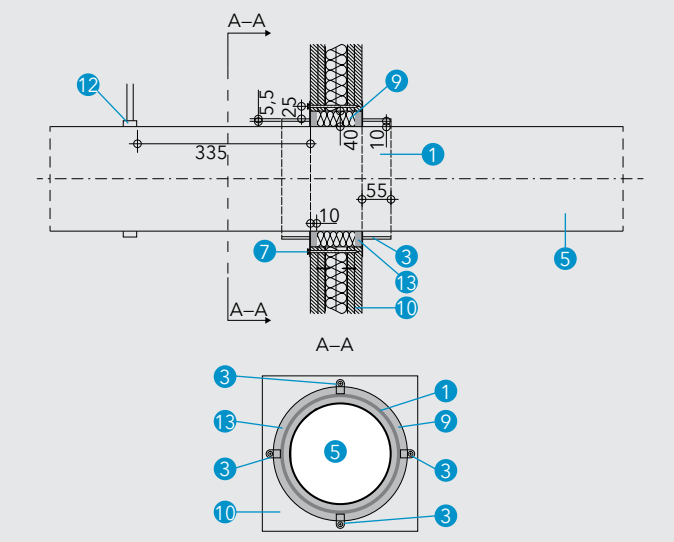
The type, diameter and wall thickness of the pipes and the classifications are presented in Table 5.

Details M and N

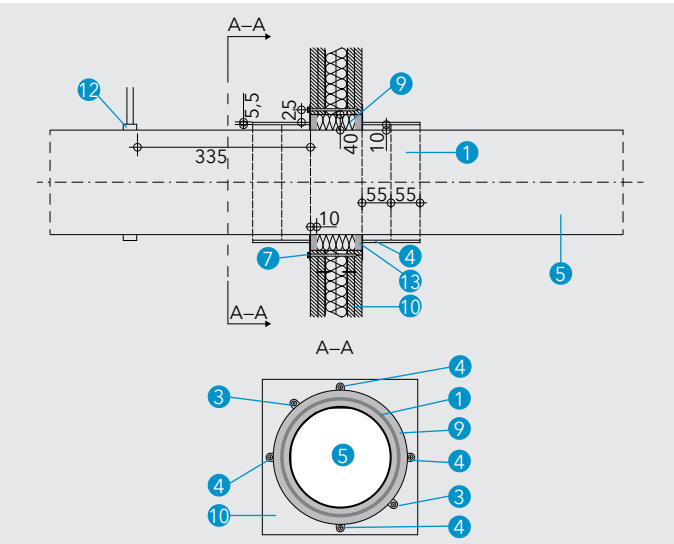
Mortar penetration seal of non-insulated plastic pipes sealed with use of PROMASTOP®-FC MD single collar (one collar on both sides of the wall or one collar on the bottom of the floor) in flexible or rigid wall and in rigid floor supporting construction. The collars are placed on the pipe outside the wall or the floor. The collars are fixed with fixing bracket C and steel screws dimensions of min. ø 6 x 100 mm. Required numbers of fixing brackets C: min. 2 pieces for service perimeter ≤ 200 mm, min. 3 pieces for service perimeter 201 - 300 mm, min. 4 pieces for service perimeter > 300 mm. The gap between the supporting construction and services, width of 10 – 40 mm is filled with gypsum or cement mortar.

Detail O

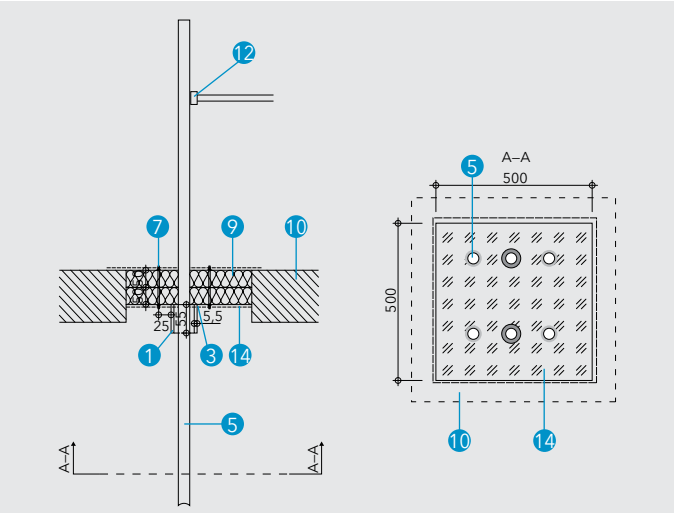
Mortar penetration seal of non-insulated plastic pipes sealed with use of PROMASTOP®-FC MD double collar (two collars on both sides of the wall) in flexible or rigid wall supporting construction. The collars are placed on the pipe outside the wall. The collars are fixed with min. 2 pcs of fixing bracket C, min. 4 pcs of fixing bracket D and steel screws dimensions of min. ø 6 x 100 mm. The gap between the supporting construction and services, width of 10 – 40 mm is filled with gypsum or cement mortar.



Detail P – Penetration seal of plastic pipes without nsulation, sealed with use of PROMASTOP®-FC MD single collar (one collar per side), soft-seal in wall



Detail Q – Penetration seal of plastic pipes without insulation, sealed with use of PROMASTOP®-FC MD double collar (two collars per side), soft-seal in wall



Detail R – Penetration seal of plastic pipes without insulation, sealed with use of PROMASTOP®-FC MD collar in floor, soft seal

Detail P

Soft penetration seal of non-insulated plastic pipes sealed with use of PROMASTOP®-FC MD single collar (one collar on both sides of the wall) in flexible or rigid wall supporting construction. The collars are placed on the pipe outside the wall. The collars are fixed with fixing bracket C and steel screws dimensions of min. ø 6 x 100 mm. Required numbers of fixing brackets C: min. 2 pieces for service perimeter ≤ 200 mm, min. 3 pieces for service perimeter 201 - 300 mm, min. 4 pieces for service perimeter > 300 mm. The space between the supporting construction and the pipe, width of 10 - 40 mm is filled with STEPROCK PLUS mineral wool with overall thickness of min. 80 mm (density of min. 140 kg/m³), covered on both sides with ≥ 10 mm PROMASEAL®-A. The thickness and density of the mineral wool infill can be increased but may not be reduced. Classification is also valid for other mineral wool insulations provided that the thickness and density of the insulation is not reduced (it can be increased).

Detail Q

Soft penetration seal of non-insulated plastic pipes sealed with use of PROMASTOP®-FC MD double collar (two collars on both sides of the wall) in flexible or rigid wall supporting construction. The collars are placed on the pipe outside the wall. The collars are fixed with min. 2 pcs of fixing bracket C, min. 4 pcs of fixing bracket D and steel screws dimensions of min. ø 6 x 100 mm. The space between the supporting construction and the pipe, width of 10 - 40 mm is filled with STEPROCK PLUS mineral wool with overall thickness of min. 80 mm (density of min. 140 kg/m³), covered on both sides with ≥ 10 mm PROMASEAL®-A.

Detail R

Soft penetration seal of non-insulated plastic pipes sealed with use of PROMASTOP®-FC MD single collar (one collar on the bottom of the floor) in rigid floor supporting construction. The collars are placed on the pipe outside the floor. The collars are fixed with fixing bracket C and steel screws dimensions of min. ø 6 x 100 mm. Required numbers of fixing brackets C: min. 2 pieces for service perimeter ≤ 200 mm, min. 3 pieces for service perimeter 201 - 300 mm, min. 4 pieces for service perimeter > 300 mm. The space between the supporting construction and the pipe is filled with STEPROCK PLUS mineral wool with overall thickness of min. 100 mm (density of min. 140 kg/m³). The thickness and density of the mineral wool infill can be increased but may not be reduced. Classification is also valid for other mineral wool insulations provided that the thickness and density of the insulation is not reduced (it can be increased). The mineral wool boards are placed flush with the top of the floor. The mineral wool boards and supporting construction on the width of 20 mm on the perimeter of the opening are covered with PROMASEAL®-A spray, dry layer thickness of 2,0 mm.

Steel pipes with mineral wool insulation sealed with use of PROMASEAL®-A spray can be additionally used in the soft seal. Details on page 129.

The maximum dimension of the soft seal is 500 x 500 mm and the minimum distance between the service and the seal edge is 40 mm.

The total amount of cross sections of the services (including insulation) cannot exceed 60% of the penetration area.

Table 5 – Overview of pipe materials, dimensions, installation situations and classifications

Requirement			Dimension range Ø: outer pipe diameter [mm] s: pipe wall thickness [mm]	Number of PROMASTOP®-FC MD collars per side	Classification
Rigid wall	Flexible wall	Rigid floor			
PE-100 pipes for pipe penetrations at 90° (mortar penetration seal)					
Construction thickness ≥ 100 mm	Construction thickness ≥ 100 mm		Ø ≤ 32,0 mm, s 2,0 mm	1	EI 120-U/C
PE-100 pipes for pipe penetrations at 90° (mortar penetration seal)					
Construction thickness ≥ 100 mm	Construction thickness ≥ 100 mm		125,0 < Ø ≤ 160,0 mm, s 6,2 mm	2	EI 120-U/C
			125,0 < Ø ≤ 160,0 mm, s 6,3 - 18,2 mm	2	EI 90 / E 120-U/C
			160,0 < Ø ≤ 200,0 mm, s 7,7 - 18,1 mm	2	EI 90-U/C
			160,0 < Ø ≤ 200,0 mm, s 18,2 mm	2	EI 90 / E 120-U/C
PP pipes for pipe penetrations at 90° (mortar penetration seal)					
Construction thickness ≥ 100 mm	Construction thickness ≥ 100 mm		Ø ≤ 32,0 mm, s 1,8 mm	1	EI 120-U/C
PP pipes for pipe penetrations at 90° (mortar penetration seal)					
Construction thickness ≥ 100 mm	Construction thickness ≥ 100 mm		125,0 < Ø ≤ 160,0 mm, s 6,2 - 7,3 mm	2	EI 120-U/C
			125,0 < Ø ≤ 160,0 mm, s 7,4 - 7,7 mm	2	EI 90 / E 120-U/C
			160,0 < Ø ≤ 200,0 mm, s 7,7 mm	2	EI 90 / E 120-U/C
PP-R pipes for pipe penetrations at 90° (mortar penetration seal)					
Construction thickness ≥ 100 mm	Construction thickness ≥ 100 mm		Ø ≤ 20,0 mm, s 1,9 - 12,5 mm	1	EI 120-U/C
			20,0 < Ø ≤ 50,0 mm, s 4,5 - 12,5 mm	1	EI 120-U/C
			50,0 < Ø ≤ 75,0 mm, s 6,8 - 12,5 mm	1	EI 120-U/C
		Construction thickness ≥ 150 mm	Ø ≤ 20,0 mm, s ≥ 1,9 mm	1	EI 120-U/C
			20,0 < Ø ≤ 50,0 mm, s 4,5 - 18,3 mm	1	EI 120-U/C
			50,0 < Ø ≤ 75,0 mm, s 6,8 - 18,3 mm	1	EI 120-U/C
			75,0 < Ø ≤ 100,0 mm, s 9,0 - 18,3 mm	1	EI 120-U/C
			100,0 < Ø ≤ 110,0 mm, s 10,0 - 18,3 mm	1	EI 120-U/C
PP-R pipes for pipe penetrations at 90° (≥ 2,0 mm PROMASEAL®-A spray penetration seal, mineral wool ≥ 100 mm)					
		Construction thickness ≥ 150 mm	Ø ≤ 20,0 mm, s ≥ 1,9 mm	1	EI 60-U/C
			20,0 < Ø ≤ 50,0 mm, s 4,6 - 18,3 mm	1	EI 60-U/C
			50,0 < Ø ≤ 75,0 mm, s 6,8 - 18,3 mm	1	EI 60-U/C
			75,0 < Ø ≤ 100,0 mm, s 9,1 - 18,3 mm	1	EI 60-U/C
			100,0 < Ø ≤ 110,0 mm, s 10,0 - 18,3 mm	1	EI 60-U/C
PP-H pipes for pipe penetrations at 90° (mortar penetration seal)					
Construction thickness ≥ 100 mm	Construction thickness ≥ 100 mm		125,0 < Ø ≤ 160,0 mm, s 14,6 - 18,2 mm	2	EI 60 / E 120-U/C
			160,0 < Ø ≤ 200,0 mm, s 18,2 mm	2	EI 60 / E 120-U/C
PVC-U pipes for pipe penetrations at 90° (mortar penetration seal)					
Construction thickness ≥ 100 mm	Construction thickness ≥ 100 mm		Ø ≤ 32,0 mm, s 1,8 mm	1	EI 120-U/C
		Construction thickness ≥ 150 mm	Ø ≤ 110,0 mm, s 2,7 mm (couplings tested)	1	EI 120-U/C
PVC-U pipes for pipe penetrations at 90° (mortar penetration seal)					
Construction thickness ≥ 100 mm	Construction thickness ≥ 100 mm		125,0 < Ø ≤ 160,0 mm, s 3,2 - 11,9 mm	2	EI 120-U/C
			160,0 < Ø ≤ 200,0 mm, s 3,9 - 11,9 mm	2	EI 120-U/C
POLOPLAST POLO-KAL 3S Pro pipes for pipe penetrations at 90° (≥ 10 mm PROMASEAL®-A penetration seal, mineral wool ≥ 80 mm)					
Construction thickness ≥ 100 mm	Construction thickness ≥ 100 mm		Ø ≤ 125,0 mm, s 3,9 mm	1	EI 60-U/U
			Ø ≤ 125,0 mm, s 3,9 mm	2	EI 90-U/U
			Ø ≤ 125,0 mm, s 3,9 - 4,9 mm	2	EI 60-U/U
			125,0 < Ø ≤ 160,0 mm, s 4,9 mm	2	EI 60-U/U

4. PROMASTOP®-FC MD penetration seal for single MLC pipe or MLC pipe bundles

Fields of application
Details under 2. Fields of application.

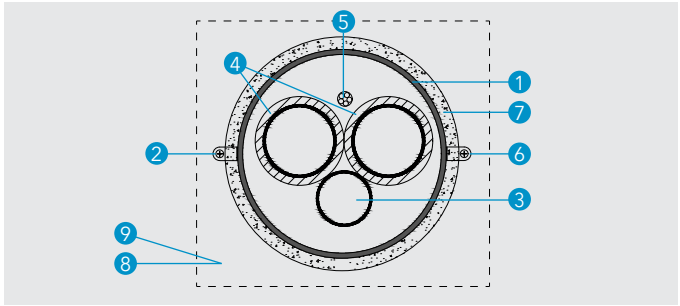
Pype types
PE-Xc/Al/PE-Xc - plastic aluminum compound pipes type Henco Standard were tested.

Table 6 – Overview of pipe materials, dimensions, installation situations and classifications

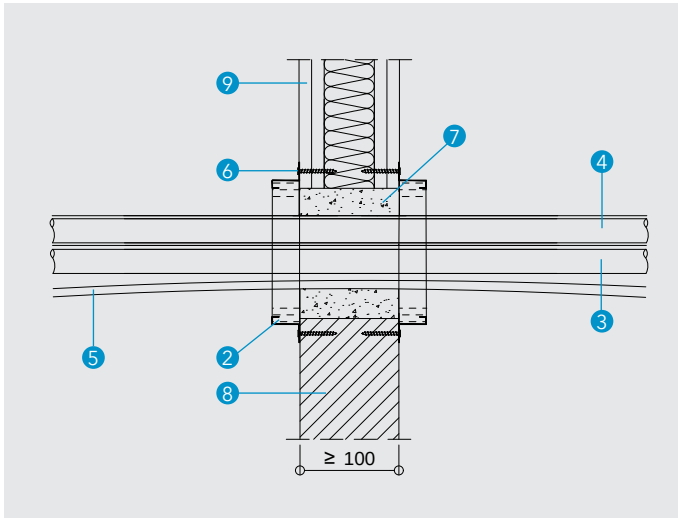
Requirement		Dimension range Ø: outer pipe diameter [mm]	Classification
Rigid or flexible wall	Rigid floor		
Henco Standard (PE-XC/AL/PE-Xc) pipe bundles for pipe penetrations at 90°			
Construction thickness ≥ 100 mm		Max. bundle (the amount of pipes may be decreased): 1 x Ø 16 mm x 2,0 mm / 1 x Ø 18 mm x 2,0 mm / 1 x Ø 20 mm x 2,0 mm / 1 x Ø 32 mm x 3,0 mm / 1 x Ø 40 mm x 3,5 mm / 1 x Ø 50 mm x 4,0 mm (insulation of the pipes: -) Additional protection required: stone wool (class A1 acc. EN 13501-1, density ≥ 35 kg/m³), thickness 50 mm, 150 mm length on each side of the wall around the pipe bundle, in the collar.	EI 120-U/C
Construction thickness ≥ 100 mm		Max. bundle (the amount of pipes may be decreased): 1 x Ø 14 mm x 2,0 mm / 2 x Ø 16 mm x 2,0 mm / 1 x Ø 18 mm x 2,0 mm / 1 x Ø 20 mm x 2,0 mm / 1 x Ø 26 mm x 3,0 mm / 1 x Ø 32 mm x 3,0 mm (insulation of the pipes: corrugated cover made of PE, CS configuration) Additional protection required: stone wool (class A1 acc. EN 13501-1, density ≥ 35 kg/m³), thickness 50 mm, 150 mm length on each side of the wall around the pipe bundle, in the collar.	EI 120-U/C
Construction thickness ≥ 100 mm		Max. bundle (the amount of pipes may be decreased): 1 x Ø 14 mm x 2,0 mm / 1 x Ø 16 mm x 2,0 mm / 1 x Ø 18 mm x 2,0 mm / 1 x Ø 20 mm x 2,0 mm / 1 x Ø 26 mm x 3,0 mm / 1 x Ø 32 mm x 3,0 mm (insulation of the pipes: PE foam (class E acc. to EN 13501-1, thickness: 6 mm, CS configuration) Additional protection required: stone wool (class A1 acc. EN 13501-1, density ≥ 35 kg/m³), thickness 20 mm, 150 mm length on each side of the wall around the pipe bundle, in the collar.	EI 120-U/C
Construction thickness ≥ 100 mm		Max. bundle (the amount of pipes may be decreased): 1 x Ø 16 mm x 2,0 mm / 1 x Ø 20 mm x 2,0 mm / 1 x Ø 32 mm x 3,0 mm (insulation of the pipes: PE foam (class E acc. to EN 13501-1, thickness: 6 - 13 mm, CS configuration) Additional protection required: stone wool (class A1 acc. EN 13501-1, density ≥ 35 kg/m³), thickness 20 mm, 150 mm length on each side of the wall around the pipe bundle, in the collar.	EI 120-U/C
Construction thickness ≥ 100 mm		Max. bundle (the amount of pipes may be decreased): 1 x Ø 16 mm x 2,0 mm / 1 x Ø 18 mm x 2,0 mm / 1 x Ø 20 mm x 2,0 mm / 1 x Ø 32 mm x 3,0 mm / 1 x Ø 40 mm x 3,5 mm / 1 x Ø 50 mm x 4,0 mm (insulation of the pipes: -) Additional protection not required.	E 120-U/C EI 90-U/C
Construction thickness ≥ 100 mm		Max. bundle (the amount of pipes may be decreased): 1 x Ø 14 mm x 2,0 mm / 2 x Ø 16 mm x 2,0 mm / 1 x Ø 18 mm x 2,0 mm / 1 x Ø 20 mm x 2,0 mm / 1 x Ø 26 mm x 3,0 mm / 1 x Ø 32 mm x 3,0 mm (insulation of the pipes: corrugated cover made of PE, CS configuration) Additional protection not required.	EI 120-U/C
Construction thickness ≥ 100 mm		Max. bundle (the amount of pipes may be decreased): 1 x Ø 14 mm x 2,0 mm / 1 x Ø 16 mm x 2,0 mm / 1 x Ø 18 mm x 2,0 mm / 1 x Ø 20 mm x 2,0 mm / 1 x Ø 26 mm x 3,0 mm / 1 x Ø 32 mm x 3,0 mm (insulation of the pipes: PE foam (class E acc. to EN 13501-1, thickness: 6 mm, CS configuration) Additional protection not required.	EI 120-U/C
Construction thickness ≥ 100 mm		Max. bundle (the amount of pipes may be decreased): 1 x Ø 16 mm x 2,0 mm / 1 x Ø 20 mm x 2,0 mm / 1 x Ø 32 mm x 3,0 mm (insulation of the pipes: PE foam (class E acc. to EN 13501-1, thickness: 6 - 13 mm, CS configuration) Additional protection not required.	EI 120-U/C

5. PROMASTOP®-FC MD penetration seal for air-conditioning systems

Mixed bundle
Copper pipes with Tubolit S (PE) insulation with additional cable(s) and PVC-U pipe(s). See the details in the classification table.



Detail S – Collar view



Detail T – Mortar penetration seal of mixed bundles, sealed with use of single PROMASTOP®-FC MD in flexible or rigid wall

Technical data

1. PROMASTOP®-FC MD
2. Fixing bracket C
3. Plastic pipe
4. Copper pipes with combustible insulation
5. Cable 5 x 1,5 mm²
6. Steel fastening material, e.g. screws or anchors
7. Annular gap filling, e.g. cement mortar or gypsum putty
8. Rigid wall
9. Flexible wall
10. Rigid floor

Certificates: ETA-19/0215, ITB CR 01633.1/21/R164NZP

5.1. Fields of application

The minimum thickness of the supporting construction:
- Flexible or rigid wall min. 100 mm
- Rigid floor min. 150 mm

Fields of application
Details under 3.2.1. Fields of application.

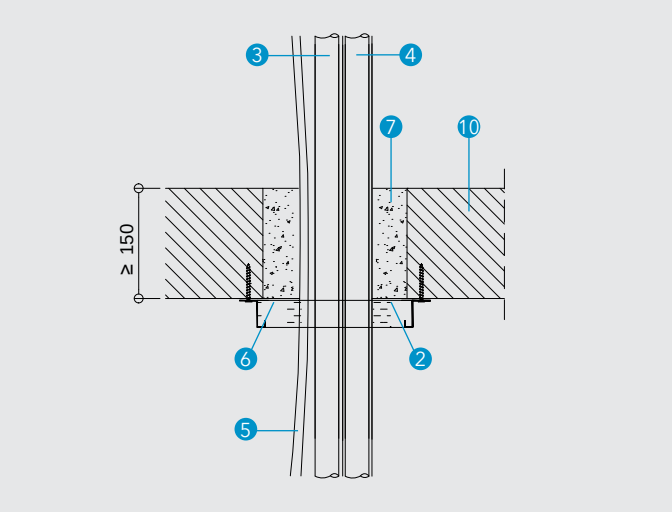
Supporting distance
The plastic pipes must be suspended/supported at a distance of ≤ 335 mm on both sides of the wall or from the top of the floor.

Mixed bundles
Mixed bundle in flexible or rigid wall (collars on both sides):
- copper pipes (max. 2 pipes, Ø ≤ 22,2 mm, pipe wall thickness ≥ 0,8 mm) with Tubolit S (PE) insulation (or other insulation with the same reaction to fire class, thickness 9,0 mm), more details in Table 7,
- PVC-U pipe Ø ≤ 42 mm, pipe wall thickness of 2,9 mm,
- cable 5 x 1,5 mm².

Mixed bundle A in rigid floor (wrap on the bottom side only):
- copper pipes (max. 2 pipes, Ø ≤ 22,2 mm, pipe wall thickness ≥ 0,8 mm) with Tubolit S (PE) insulation (or other insulation with the same reaction to fire class, thickness 9,0 mm), more details in Table 7,
- PVC-U pipe Ø ≤ 32 mm, pipe wall thickness of 1,9 mm,
- cable 5 x 1,5 mm².

Mixed bundle B in rigid floor (wrap on the bottom side only):
- copper pipes (max. 4 pipes, Ø ≤ 22,2 mm, pipe wall thickness ≥ 1,0 mm) with Tubolit S (PE) insulation (or other with the same reaction to fire class, thickness 9,0 mm), more details in Table 7,
- PVC-U pipes (max. 2 pipes), Ø ≤ 32 mm, pipe wall thickness of 1,9 mm,
- cables (max. 2 pieces) 5 x 1,5 mm².

The above mentioned conduits are the maximum bunch which can be inserted in a single penetration seal. The number of elements in a penetration can be smaller or with smaller diameter.



Detail U – Mortar penetration seal of mixed bundles, sealed with use of single PROMASTOP®-FC MD in rigid floor

Details S and T

Mortar penetration seal of mixed bundles sealed with use of PROMASTOP®-FC MD single collar (one collar on both sides of the wall) in flexible or rigid wall supporting construction. The collars are placed on the bundle outside the wall. The collars are fixed with fixing bracket C and steel screws dimensions of min. ø 6 x 100 mm. Required numbers of fixing brackets C: min. 2 pieces for service perimeter ≤ 200 mm, min. 3 pieces for service perimeter 201 - 300 mm, min. 4 pieces for service perimeter > 300 mm. The gap between the supporting construction and services, width of 10 – 40 mm is filled with gypsum or cement mortar.

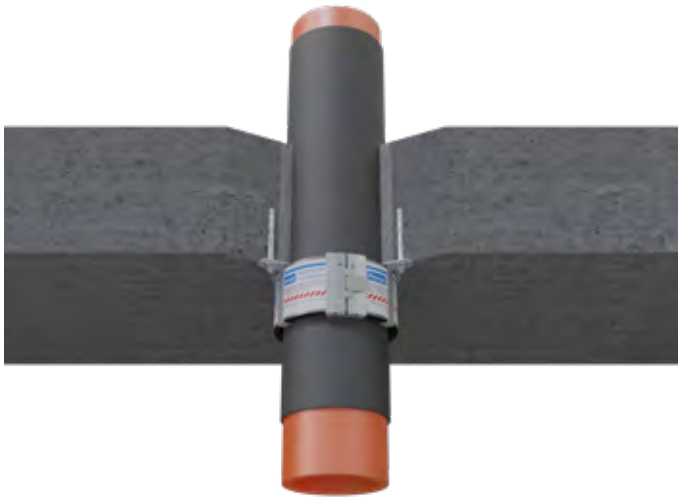
Detail U

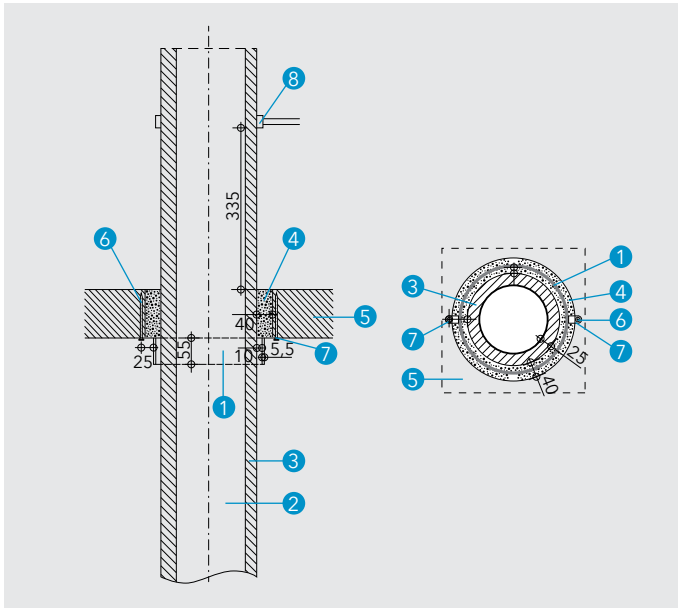
Mortar penetration seal of mixed bundles sealed with use of PROMASTOP®-FC MD single collar (one collar on the bottom of the floor) in rigid floor supporting construction. The collars are placed on the bundle outside the floor. The collars are fixed with min. 2 pieces of fixing bracket C and steel screws dimensions of min. ø 6 x 100 mm. The gap between the supporting construction and services, width of 10 – 40 mm is filled with cement mortar.

Table 7 – Overview of pipe materials, dimensions, installation situations and classifications

Requirement			Dimension range Ø: single or double pipe diameter [mm] s: pipe wall thickness [mm] d: insulation thickness [mm]	Position of PROMASTOP®-FC MD	Classification
Rigid wall	Flexible wall	Rigid floor			
Mixed bundle: single or double copper pipe with Tubolit S (PE) insulation with additional cable 5 x 1,5 mm² and PVC-U pipe diameter of ≤ 42 mm and pipe wall thickness of 2,9 mm					
Construction thickness ≥ 100 mm	Construction thickness ≥ 100 mm		Ø ≤ 12,7 mm, s ≥ 0,8 mm, d 9 mm	on both sides of the wall	EI 120-U/C
			12,7 < Ø ≤ 22,2 mm, s ≥ 1,0 mm, d 9 mm	on both sides of the wall	EI 120-U/C
Mixed bundle: single or double copper pipe with Tubolit S (PE) insulation with additional cable 5 x 1,5 mm² and PVC-U pipe diameter of ≤ 32 mm and pipe wall thickness of 1,9 mm					
		Construction thickness ≥ 150 mm	Ø ≤ 12,7 mm, s ≥ 0,8 mm, d 9 mm	on the bottom side of the floor	EI 120-U/C
			12,7 < Ø ≤ 22,2 mm, s ≥ 1,0 mm, d 9 mm	on the bottom side of the floor	EI 120-U/C
Mixed bundle: single, double, triple or quadruple copper pipe with Tubolit S (PE) insulation with additional single or double cable 5 x 1,5 mm² and single or double PVC-U pipe diameter of ≤ 32 mm and pipe wall thickness of 1,9 mm					
		Construction thickness ≥ 150 mm	Ø ≤ 22,2 mm, s ≥ 1,0 mm, d 9 mm	on the bottom side of the floor	EI 90-U/C

6. PROMASTOP®-FC MD penetration seal for plastic pipes with combustible insulation





Detail V – Penetration seal of plastic pipes with FEF insulation (AF/ArmaFlex), sealed with use of PROMASTOP®-FC MD collar in floor

Technical data

1. PROMASTOP®-FC MD
2. Plastic pipe
3. Combustible insulation
4. Cement mortar, e.g. PROMASTOP®-M
5. Rigid floor
6. Steel fastening material, e.g. screws or anchors
7. Fixing bracket C
8. First place of support

Certificates: ETA-19/0215, ITB CR 01633.1/21/R164NZP

Customer benefit

- cut-to-size collar for insulated plastic pipes

6.1. Fields of application

Fields of application

Details under 3.2.1. Fields of application.

The minimum thickness of the supporting construction:

- Rigid floor min. 150 mm

Pipe insulation for plastic pipes

The classifications given for pipes with AF/ArmaFlex (FEF, reaction to fire B-s3, d0 acc. to EN 13501-1) or with Tubolit S (PE, reaction to fire E) insulation concerns continuously insulated pipes (CS configuration) and does not cover local insulated nor non-insulated pipes. For this type of penetrations the thickness and density of the continuous insulation cannot be increased or reduced and the reaction to fire class (acc. to EN 13501-1) of the insulation shall remain the same as given. Classification is also valid for other flexible elastomeric foams (FEF) and for other PE foams made in accordance with appropriate product standard (EN 14304+A1 for FEF and EN 14313+A1 for PE) provided that the thickness and density of a continuous insulation is not increased or reduced and the reaction to fire class is same as given.

Detail V

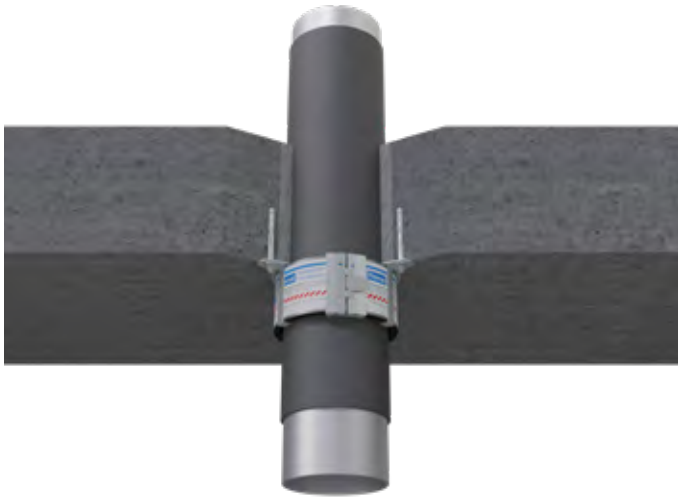
Mortar penetration seal of plastic pipes with continuous AF/ArmaFlex (FEF) or Tubolit S (PE) insulation sealed with use of PROMASTOP®-FC MD single collar (one collar on the bottom of the floor) in rigid floor supporting construction. The collars are placed on the bottom of the floor on the FEF or on the PE insulation. The collars are fixed with fixing bracket C and steel screws dimensions of min. ø 6 x 100 mm. Required numbers of fixing brackets C: min. 2 pieces for service perimeter ≤ 200 mm, min. 3 pieces for service perimeter 201 - 300 mm, min. 4 pieces for service perimeter > 300 mm. The gap between the supporting construction and services, width of 10 – 40 mm is filled with cement mortar.

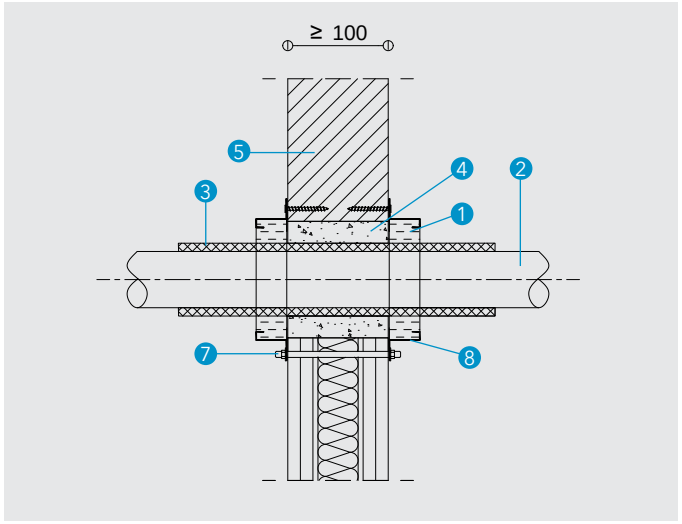
The type, the diameter and the wall thickness of the pipe, the thickness of the FEF or PE insulation and the classifications are presented in Table 8.

Table 8 – Overview of pipe materials, dimensions, insulations, installation situations and classifications

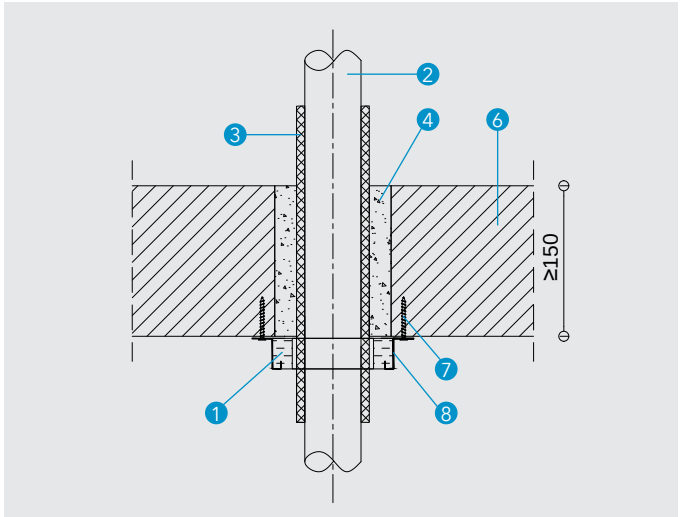
Requirement			Dimension range Ø: outer pipe diameter [mm] s: pipe wall thickness [mm] d: insulation thickness [mm]	Classification
Rigid wall	Flexible wall	Rigid floor		
PP-R pipes with AF/ArmaFlex (FEF) insulation (CS configuration) for pipe penetrations at 90°				
		Construction thickness ≥ 150 mm	Ø ≤ 20,0 mm, s 1,9 mm, d 9 - 25 mm	EI 120-U/C
			Ø ≤ 20,0 mm, s ≥ 2,0 mm, d 9 mm	EI 120-U/C
			Ø ≤ 20,0 mm, s ≥ 2,0 mm, d 10 - 25 mm	EI 90-U/C
			20,0 < Ø ≤ 50,0 mm, s 4,6 - 18,3 mm, d 9 mm	EI 120-U/C
			20,0 < Ø ≤ 50,0 mm, s 4,6 - 18,3 mm, d 10 - 25 mm	EI 90-U/C
			50,0 < Ø ≤ 75,0 mm, s 6,8 - 18,3 mm, d 9 mm	EI 120-U/C
			50,0 < Ø ≤ 75,0 mm, s 6,8 - 18,3 mm, d 10 - 25 mm	EI 90-U/C
			75,0 < Ø ≤ 100,0 mm, s 9,1 - 18,3 mm, d 9 mm	EI 120-U/C
			75,0 < Ø ≤ 100,0 mm, s 9,1 - 18,3 mm, d 10 - 25 mm	EI 90-U/C
			100,0 < Ø ≤ 110,0 mm, s 10,0 - 18,3 mm, d 9 mm	EI 120-U/C
			100,0 < Ø ≤ 110,0 mm, s 10,0 - 18,3 mm, d 10 - 25 mm	EI 90-U/C
PP-R pipes with Tubolit S (PE) insulation (CS configuration) for pipe penetrations at 90°				
		Construction thickness ≥ 150 mm	Ø ≤ 20,0 mm, s 1,9 - 10,0 mm, d 13 - 30 mm	EI 120-U/C
			20,0 < Ø ≤ 50,0 mm, s 4,6 - 10,0 mm, d 13 - 30 mm	EI 120-U/C
			50,0 < Ø ≤ 75,0 mm, s 6,8 - 10,0 mm, d 13 - 30 mm	EI 120-U/C
			75,0 < Ø ≤ 100,0 mm, s 9,1 - 10,0 mm, d 13 - 30 mm	EI 120-U/C
			100,0 < Ø ≤ 110,0 mm, s 10,0 mm, d 13 - 30 mm	EI 120-U/C
			100,0 < Ø ≤ 110,0 mm, s 10,1 - 18,3 mm, d 13 mm	EI 60 / E 120-U/C

7. PROMASTOP®-FC MD penetration seal for metal pipes with combustible insulation





Detail W – Mortar penetration seal of metal pipes with combustible insulation, sealed with use of PROMASTOP®-FC MD in flexible or rigid wall



Detail X – Mortar penetration seal of metal pipes with combustible insulation, sealed with use of PROMASTOP®-FC MD in rigid floor

Technical data

1. PROMASTOP®-FC MD
2. Steel or copper pipe
3. Combustible insulation
4. Cement mortar, e.g. PROMASTOP®-M or gypsum putty
5. Rigid or flexible wall
6. Rigid floor
7. Steel fastening material, e.g. screws or anchors
8. Fixing bracket C

Certificates: ETA-19/0215, ITB CR 01633.1/21/R164NZP

Customer benefit

- cut-to-size collar for steel or copper pipes with various combustible insulations

7.1. Fields of application

Fields of application

Details under 3.2.1. Fields of application.

The minimum thickness of the supporting construction:

- Flexible or rigid wall min. 100 mm
- Rigid floor min. 150 mm

Supporting distance

The metal pipes must be suspended/supported at a distance of ≤ 335 mm on both sides of the wall or from the top of the floor.

Details W and X

Penetration seals of metal pipes with continuous AF/ArmaFlex (FEF), Armaflex ACE Plus (FEF), Thermaflex ThermaEco FRZ (PE) or Tubolit S (PE) insulation sealed with use of PROMASTOP®-FC MD single collar (one collar on both sides of the wall or one collar on the bottom of the floor) in flexible or rigid wall and in rigid floor supporting construction. The collars are placed on the insulation outside the wall or the floor (clearance max. 10 mm). The parameters of the pipe, the thickness of the FEF or PE insulation and the classifications are presented in Table 9. The collars are fixed with fixing bracket C and steel screws dimensions of min. ø 6 x 100 mm. Required numbers of fixing brackets C: min. 2 pieces for service perimeter ≤ 200 mm, min. 3 pieces for service perimeter 201 - 300 mm, min. 4 pieces for service perimeter > 300 mm. The gap between the supporting construction and services, width of 10 – 40 mm is filled with cement mortar. In case of Armaflex ACE Plus or Thermaflex ThermaEco FRZ insulation in wall penetration seals gypsum or cement mortar is classified.

Table 9 – Overview of pipe materials, dimensions, installation situations and classifications

Requirement			Dimension range Ø: outer pipe diameter [mm] s: pipe wall thickness [mm] d: insulation thickness [mm]	Classification
Rigid wall	Flexible wall	Rigid floor		
Copper pipes with AF/ArmaFlex (FEF) insulation (CS configuration) for pipe penetrations at 90°				
Construction thickness ≥ 100 mm			Ø ≤ 42,0 mm, s ≥ 1,0 mm, d 50 mm	EI 120-U/C
		Construction thickness ≥ 150 mm	Ø ≤ 22,0 mm, s ≥ 1,0 mm, d 6 - 50 mm	EI 120-U/C
			22,0 < Ø ≤ 42,0 mm, s 1,0 - 14,2 mm, d 6 mm	EI 120-U/C
			22,0 < Ø ≤ 42,0 mm, s 1,0 - 14,2 mm, d 7 - 50 mm	EI 90-U/C
Copper pipes with Armaflex ACE Plus (FEF) insulation (CS configuration) for pipe penetrations at 90°				
Construction thickness ≥ 100 mm	Construction thickness ≥ 100 mm		Ø ≤ 22,0 mm, s ≥ 1,0 mm, d 6 - 50 mm	EI 120-U/C
			22,0 < Ø ≤ 42,0 mm, s 1,0 - 14,2 mm, d 6 mm	EI 120-U/C
			22,0 < Ø ≤ 42,0 mm, s 1,0 - 14,2 mm, d 7 - 50 mm	EI 60-U/C
			42,0 < Ø ≤ 88,9 mm, s 1,0 - 14,2 mm, d 9 - 50 mm	EI 60-U/C
Steel pipes with AF/ArmaFlex (FEF) insulation (CS configuration) for pipe penetrations at 90°				
		Construction thickness ≥ 150 mm	Ø ≤ 15,0 mm, s ≥ 1,2 mm, d 9 - 50 mm	EI 120-U/C
			15,0 < Ø ≤ 21,3 mm, s 2,0 - 2,2 mm, d 9 mm	EI 90-U/C
			15,0 < Ø ≤ 21,3 mm, s ≥ 2,3 mm, d 6 - 75 mm	EI 120-U/C
			21,3 < Ø ≤ 108,0 mm, s 2,0 - 3,5 mm, d 9 mm	EI 90-U/C
			21,3 < Ø ≤ 108,0 mm, s 3,6 - 14,2 mm, d 9 mm	EI 120-U/C
			21,3 < Ø ≤ 108,0 mm, s 3,6 - 14,2 mm, d 10 - 75 mm	EI 90 / E 120-U/C
Steel pipes with Armaflex ACE Plus (FEF) insulation (CS configuration) for pipe penetrations at 90°				
Construction thickness ≥ 100 mm	Construction thickness ≥ 100 mm		Ø ≤ 21,7 mm, s ≥ 2,3 mm, d 6 - 75 mm	EI 120-U/C
			Ø ≤ 21,7 mm, s ≥ 2,3 mm, d 76 - 100 mm	EI 90-U/C
			21,7 < Ø ≤ 76,1 mm, s 2,9 - 3,9 mm, d 9 - 75 mm	EI 120-U/C
			21,7 < Ø ≤ 76,1 mm, s 4,0 - 14,2 mm, d 9 - 75 mm	EI 120-U/C
			21,7 < Ø ≤ 76,1 mm, s 4,0 - 14,2 mm, d 76 - 100 mm	EI 90-U/C
			76,1 < Ø ≤ 108,0 mm, s 3,6 - 3,9 mm, d 9 mm	EI 90 / E 120-U/C
			76,1 < Ø ≤ 108,0 mm, s 3,6 - 3,9 mm, d 10 - 75 mm	EI 60-U/C
			76,1 < Ø ≤ 108,0 mm, s 4,0 - 14,2 mm, d 9 mm	EI 90 / E 120-U/C
			76,1 < Ø ≤ 108,0 mm, s 4,0 - 14,2 mm, d 10 - 100 mm	EI 90-U/C
			108,0 < Ø ≤ 114,9 mm, s 4,0 - 14,2 mm, d 9 mm	EI 90 / E 120-U/C
			108,0 < Ø ≤ 114,9 mm, s 4,0 - 14,2 mm, d 10 - 100 mm	EI 90-U/C

Requirement			Dimension range Ø: outer pipe diameter [mm] s: pipe wall thickness [mm] d: insulation thickness [mm]	Classification
Rigid wall	Flexible wall	Rigid floor		
Steel pipes with Tubolit S (PE) insulation (CS configuration) for pipe penetrations at 90°				
		Construction thickness ≥ 150 mm	Ø ≤ 15,0 mm, s 1,2 - 2,2 mm, d 13 - 30 mm	EI 120-U/C
			Ø ≤ 15,0 mm, s ≥ 2,3 mm, d 9 - 30 mm	EI 120-U/C
			15,0 < Ø ≤ 21,3 mm, s 2,0 - 2,2 mm, d 13 - 30 mm	EI 120-U/C
			15,0 < Ø ≤ 21,3 mm, s ≥ 2,3 mm, d 9 - 30 mm	EI 120-U/C
			21,3 < Ø ≤ 76,1 mm, s 2,0 - 2,8 mm, d 13 - 30 mm	EI 120-U/C
			21,3 < Ø ≤ 76,1 mm, s 2,9 - 14,2 mm, d 9 - 30 mm	EI 120-U/C
			76,1 < Ø ≤ 108,0 mm, s 2,0 - 14,2 mm, d 13 - 30 mm	EI 120-U/C
Steel pipes with Thermaflex ThermaEco FRZ (PE) insulation (CS configuration) for pipe penetrations at 90°				
Construction thickness ≥ 100 mm	Construction thickness ≥ 100 mm		Ø ≤ 21,7 mm, s 2,3 - 2,4 mm, d 9 - 22 mm	EI 120-U/C
			Ø ≤ 21,7 mm, s ≥ 2,5 mm, d 9 - 22 mm	EI 120-U/C
			Ø ≤ 21,7 mm, s ≥ 2,5 mm, d 23 - 25 mm	EI 90 / E 120-U/C
			21,7 < Ø ≤ 76,1 mm, s 2,9 - 3,5 mm, d 9 mm	EI 120-U/C
			21,7 < Ø ≤ 76,1 mm, s 2,9 - 3,5 mm, d 10 - 25 mm	EI 90 / E 120-U/C
			21,7 < Ø ≤ 76,1 mm, s 3,6 - 3,9 mm, d 9 - 18 mm	EI 120-U/C
			21,7 < Ø ≤ 76,1 mm, s 3,6 - 3,9 mm, d 19 - 25 mm	EI 90 / E 120-U/C
			21,7 < Ø ≤ 76,1 mm, s 4,0 - 14,2 mm, d 9 - 17 mm	EI 90 / E 120-U/C
			21,7 < Ø ≤ 76,1 mm, s 4,0 - 14,2 mm, d 18 - 25 mm	EI 120-U/C
			76,1 < Ø ≤ 108,0 mm, s 3,6 - 3,9 mm, d 18 mm	EI 120-U/C
			76,1 < Ø ≤ 108,0 mm, s 4,0 - 14,2 mm, d 9 - 17 mm	EI 60 / E 120-U/C
			76,1 < Ø ≤ 108,0 mm, s 4,0 - 14,2 mm, d 18 - 25 mm	EI 120-U/C
			108,0 < Ø ≤ 114,9 mm, s 4,0 - 14,2 mm, d 9 - 24 mm	EI 60 / E 120-U/C
			108,0 < Ø ≤ 114,9 mm, s 4,0 - 14,2 mm, d 25 mm	EI 120-U/C

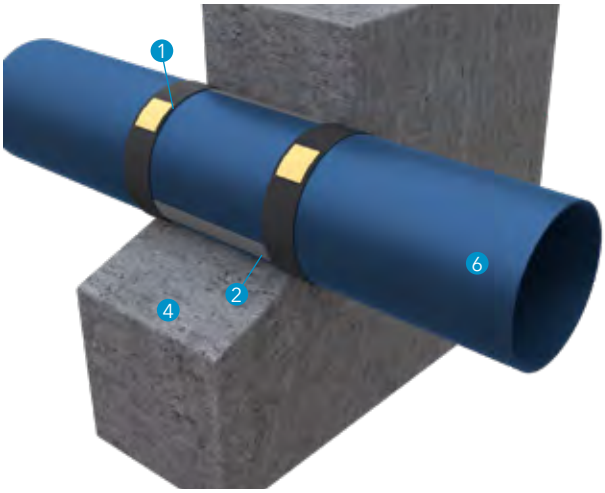
8. Information about the minimum distances from PROMASTOP®-FC MD

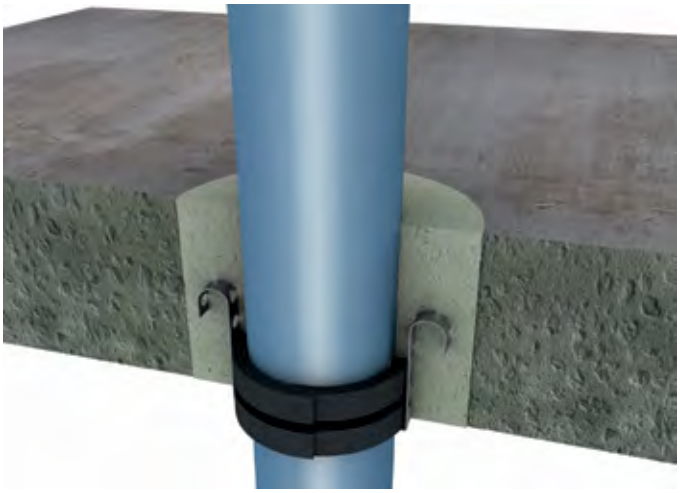
Table 10

Sufficient space needs to be provided for the construction of professional applications. For practical and physical reasons, we recommend observing a minimum distance of 100 mm between installed objects and supporting construction/component framing during planning. If this is impossible due to the situation on the construction site, the permitted minimum distances shall be taken from Table 10.

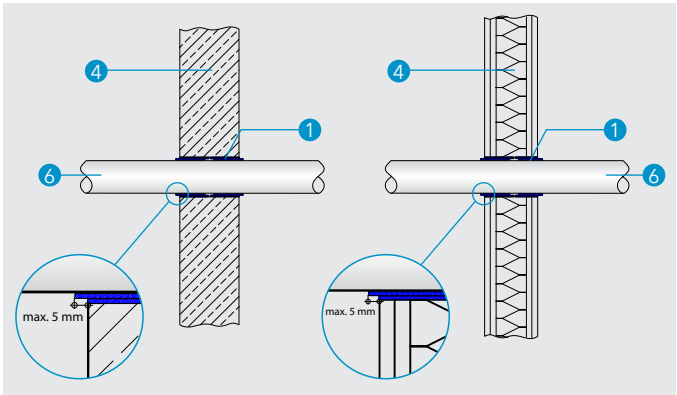
Table 10 – Minimum distances

Object	Minimum distance [mm]
PROMASTOP®-FC MD – PROMASTOP®-FC MD in rigid and flexible walls	60
PROMASTOP®-FC MD – PROMASTOP®-FC MD in rigid floors	88
PROMASTOP®-FC MD – PROMASTOP®-FC MD in PROMASTOP®-CC coated batt seals in rigid floors	70
PROMASTOP®-FC MD – PROMASTOP®-FC MD in PROMASTOP®-I coated batt seals in rigid floors	95
PROMASTOP®-FC MD – Lateral supporting construction/lateral aperture framing in PROMASTOP®-CC and PROMASTOP®-I coated batt seals in rigid floors	50
Between adjacent services in case of plastic pipes without insulation in floor (soft penetration seal)	40
Between all other objects not further defined	100





Detail A – PROMASTOP®-W penetration seal in rigid wall or floor for pipes without insulation



Detail B – PROMASTOP®-W pipe penetration seal in rigid or flexible wall for pipes without insulation

Technical data

1. PROMASTOP®-W
2. PROMASTOP®-M
3. PROMASEAL®-AG or PROMASEAL®-A
4. Supporting construction
5. Mineral wool backfilling, density ≥ 40 kg/m³
6. Pipe
7. PROMASTOP®-CC
8. Mineral wool local insulation, density ≥ 100 kg/m³
9. Combustible pipe insulation
10. PROMATECT®-L500, thickness 25 mm
11. PROMATECT®-L500, thickness 50 mm
12. Gypsum and mineral wool backfilling, density ≥ 140 kg/m³

Certificates: ETA-14/0456, IBS KB 317020305-A,Rev1, ITB CR 01633.1/21/R164NZP, ITB CR 01633.1/19/R140NZP + ITB CR 01633.2/19/R140NZP

Customer benefit

- Quick, easy and dry installation in walls and floors
- No fixing with screws or threaded rods necessary
- Saves space
- Universally usable for many pipe types, pipe wall thicknesses and pipe diameters

1. Installation in walls

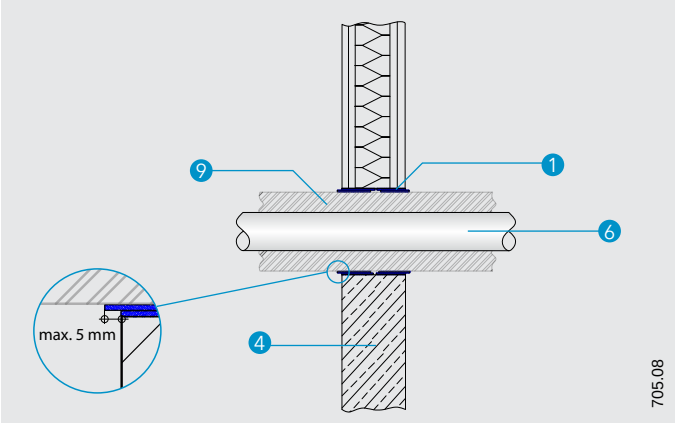
- The outer pipe diameter and the pipe wall thickness need to be determined.
- Determine the number of wrap layers according to the package leaflet or see Table 1 alternatively.
- Cut the fire stopping wrap to size.
- Wrap the fire stopping wrap around the pipe – preferably with the intumescent side facing the pipe and the fabric side facing outward. Fix the wrap with adhesive tape and insert it flush or with an overlap of max. 5 mm to the outer edge of the wall.
- Apply the fire stopping wrap on both sides.
- Label the penetration seal.

2. Fields of application

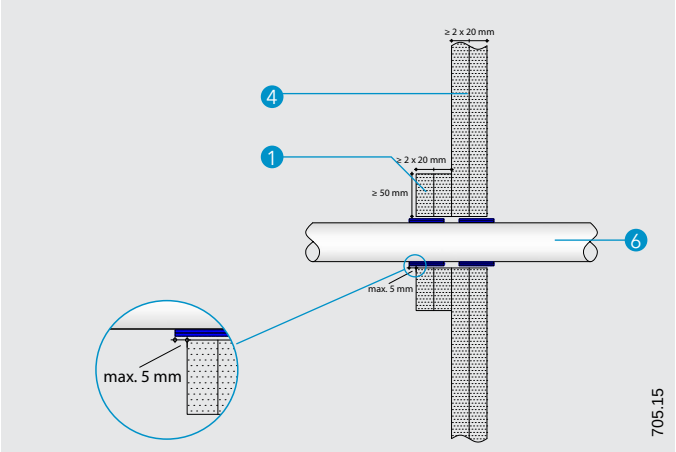
PROMASTOP®-W is a pipe closure device for rigid, lightweight and timber constructions and can be used for wall and floor penetration seals.
Test results for standard rigid supporting constructions are valid for separating construction products made of concrete or masonry having the same or a higher thickness and density. The classification of the results in flexible walls may also be applied to rigid walls in case the thickness and/or density are higher than those of the tested construction.
The components (supporting constructions) must be classified acc. to EN 13501-2 for the required fire resistance period.

Rigid floor
The floor must have a thickness of ≥ 150 mm and a density of ≥ 650 kg/m³.

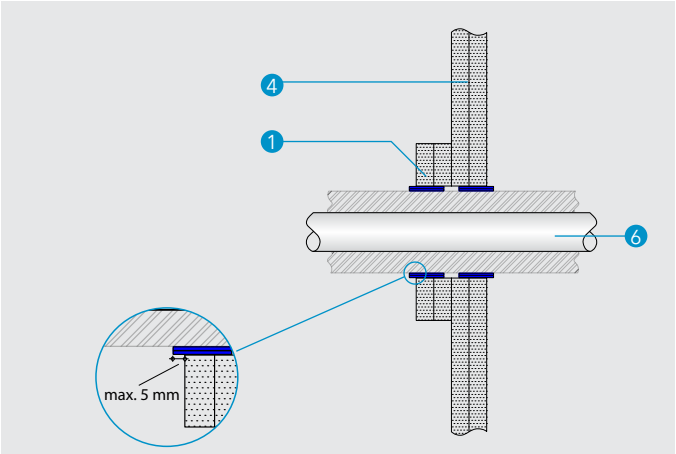
Rigid wall
The wall must have a thickness of ≥ 100 mm and a density of ≥ 450 kg/m³.



Detail C – PROMASTOP®-W penetration seal in flexible or rigid wall for pipes with combustible insulation



Detail D – PROMASTOP®-W penetration seal in shaft wall for pipes without insulation



Detail E – PROMASTOP®-W penetration seal in shaft wall for pipes with combustible insulation

Flexible wall
The wall must have a thickness of ≥ 100 mm and be made from timber or metal studs which are lined on both sides with a minimum of two layers of min. 12,5 mm thick fire protective boards (other board thicknesses permitted, please note minimum thickness). For timber stud walls, a minimum distance of 100 mm must be kept from the penetration seal to each of the timber studs and the cavity between stud and sealing must be filled with a least 100 mm of insulation material compliant to Class A1 or A2 (acc. to EN 13501-1).

Suspended ceiling
The total thickness of the construction must be ≥ 40 mm and consist of at least two layers.

Shaft wall
This is defined as a shaft wall lined on one side on metal studs, the total board thickness according to the fire resistance must be ≥ 40 mm and consist of at least two layers.

Cross laminated timber (CLT) walls and floors
The cross laminated timber (CLT) wall or floor must have a thickness of ≥ 140 mm without lining.

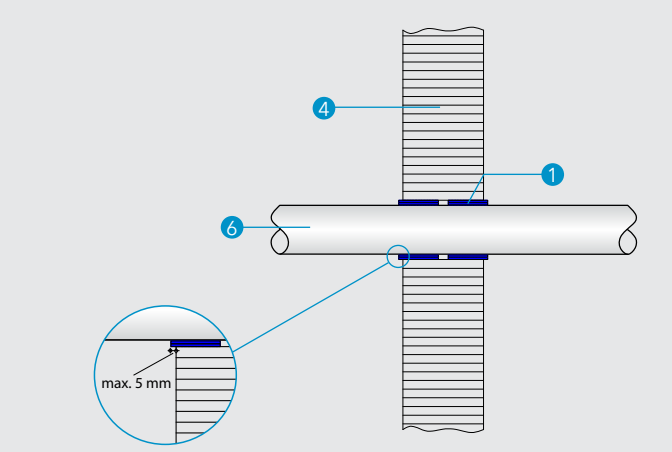
Sandwich panel wall (in combination with the soft penetration seal)
The tested ArcelorMittal Pflaum FO-010-10-80/1000 stone wool panel type must be ≥ 80 mm thick, with a circumferential frame made of PROMATECT®-100 fire protective boards (thickness ≥ 10 mm) must be installed on both sides of the opening using dry wall screws (distance ≤ 200 mm). The width of the PROMATECT®-100 board must cover at least 50 mm around the opening. An additional aperture framing is not necessary.

Annular gap sealing and arrangement
For floor applicatioans, installation is generally only on the underside of the floor (unless otherwise described in the tables) with the exception of pipes with combustible insulation (Class B-s3, d0 or E acc. to EN 13501-1), where PROMASTOP®-W is to be installed to the top and bottom of the floor. For walls, application must be done on both sides (in some cases one single wrap placed centrally or on one side in the penetration seal, see the related details).

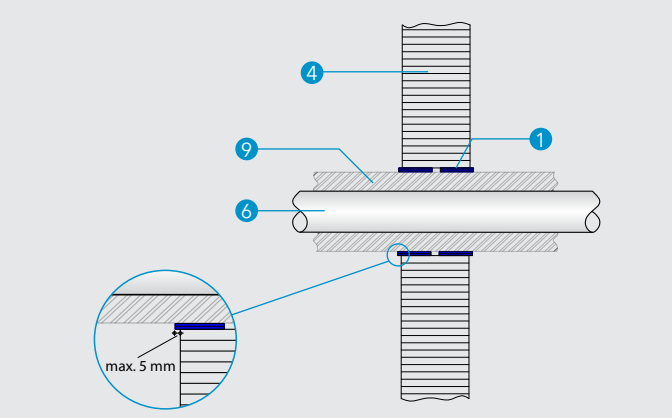
In rigid and lightweight constructions:
- Backfilling with mineral wool (Class A1 acc. to EN 13501-1, melting point ≥ 1000 °C, density ≥ 40 kg/m³), PROMASEAL®-A or PROMASEAL®-AG ≥ 10 mm thick fire stopping sealant on both sides (Details B and C). Width of the annular gap < 10 mm and < 20 mm, respectively.
- Filling with gypsum filler or Promat®-Spachtelmasse. Width of the annular gap < 20 mm.

In rigid constructions only:
- With PROMASTOP®-M or PROMASTOP®-MG III fire stopping mortar (Detail A). Width of the annular gap < 20 mm.

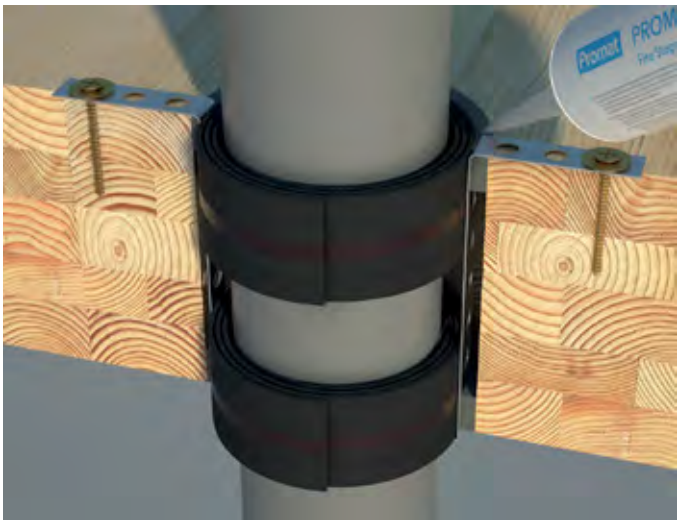
Fill the annular gap of shaft walls with PROMASEAL®-A fire stopping sealant or a joint filler, with the annular gap being between 10 mm and 20 mm wide (Details D and E).



Detail F – PROMASTOP®-W penetration seal in CLT wall for pipes without insulation



Detail G – PROMASTOP®-W penetration seal in CLT wall for pipes with combustible insulation



Detail H – PROMASTOP®-W penetration seal in CLT floor for pipes without insulation

In CLT constructions, fill the annular gap on both sides of the wall (Details F and G), or on top and below the floor (Detail H), with < 20 mm wide mineral wool and with < 20 mm wide and ≥ 10 mm deep PROMASEAL®-AG.

Covering of the wrap with intumescent coating, fire stopping sealant or mortar is not permitted.

Sloped pipes or couplings were not tested with PROMASTOP®-W.

Supporting distance
The pipes must be suspended/supported ≤ 250 mm on both sides of the wall or from the top of the floor.

Details A, B and C
In floor applications, PROMASTOP®-W is applied to the underside of the floor; the exception are pipes with combustible insulation (Class B-s3, d0 or E acc. to EN 13501-1), where the fire stopping wrap shall be installed on top and below the floor. On a wall, installation must be on both sides (in some cases one single wrap placed centrally or on one side in the penetration seal, see the related details).

Detail D
Shaft wall lined on one side on metal studs. The total board thickness according to the fire resistance, must be ≥ 40 mm and consist of at least two layers. Around the opening area the wall thickness is doubled with 2 x 20 mm board of the shaft wall within 50 mm of the penetration. Classification for fire on both sides of the shaft.

Tables 1 to 4
For pipe materials, dimensions, installation situations and classifications see Tables 1 to 4.

3. PROMASTOP®-W penetration seal for plastic pipes without insulation

Pype types

The listed pipe types are tested according the requirements of EN 1366-3 and EN 13882-3 and given by the rules of the direct and the extended fields of application.

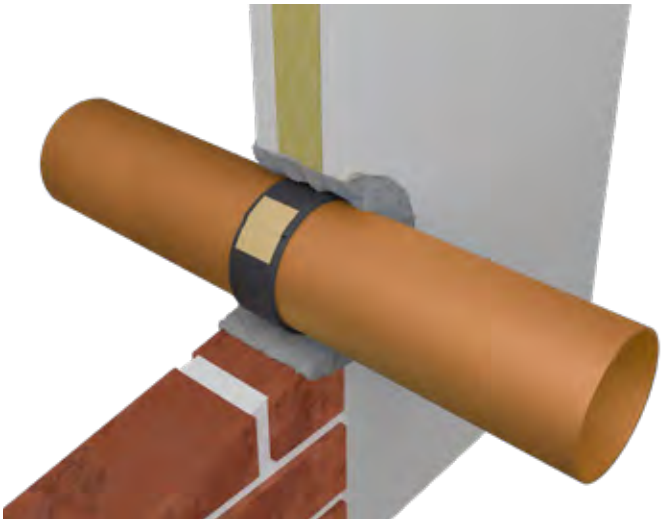
- PE-HD pipes according to EN 12201-2, EN 1519-1, EN 12666-1, DIN 8074, DIN 8075
- ABS pipes according to EN 1455-1
- SAN + PVC pipes according to EN 1565-1
- PP-H and PP-R pipes according to ÖNORM B 5174-1, DIN 8077, DIN 8078
- KE KELIT KETRIX
- PE-X pipes according to EN ISO 15875 (for example: REHAU RAUTITAN flex, Viega Sanfix Fosta PE-X, Uponor Radi Pipe, Uponor Aqua Pipe)
- PVC-U pipes according to EN 1452-2, EN 1453-1, EN 1329-1, DIN 8061, DIN 8062

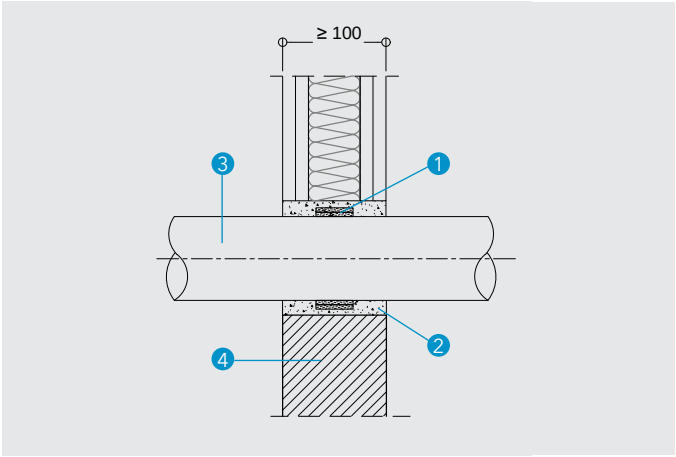
Table 1 – Overview of pipe materials, dimensions, installation situations and classifications

Requirement						Dimension range Ø: outer pipe diameter [mm] s: pipe wall thickness [mm]	Number of layers Ø: outer pipe diameter [mm] L: wrap layers	Classification
Rigid wall	Rigid floor	Flexible wall	CLT wall	CLT floor	Shaft wall			
PE-HD, ABS, SAN + PVC pipes for pipe penetrations at 90°								
	Construction thickness ≥ 150 mm					Ø 32 mm, s 3,1 - 7,4 mm → Ø 125 mm, s 3,1 - 7,4 mm	Ø 32 –124 mm → L 3 Ø 125 mm → L 5	EI 120-U/C
Construction thickness ≥ 100 mm		Construction thickness ≥ 100 mm	Construction thickness ≥ 140 mm		Construction thickness ≥ 2 × 20 mm	Ø 32 mm, s 2,0 mm → Ø 160 mm, s 14,6 mm	Ø 32 –63 mm → L 1 Ø 64 – 110 mm → L 2 Ø 110 – 125 mm → L 3 Ø 140 –160 mm → L 4	EI 90-U/C
Construction thickness ≥ 150 mm						Ø 32 mm, s 1,8 mm → Ø 160 mm, s 14,6 mm	Ø 32 –63 mm → L 3 Ø 75 – 90 mm → L 4 Ø 110 – 125 mm → L 5 Ø 140 – 160 mm → L 6	EI 120-U/U
Construction thickness ≥ 100 mm		Construction thickness ≥ 100 mm				≤ Ø 32 mm, s 3,0 mm (with or without sound decoupling strips)	Ø 32 mm → L 2	EI 120-U/U
	Construction thickness ≥ 150 mm					≤ Ø 32 mm, s 3,0 mm > Ø 32 mm, s 3,0 mm → Ø 110 mm, s 2,7 - 6,6 mm Ø 125 mm, s 3,1 - 4,8 mm (all diameters with or without sound decoupling strips)	Ø 32 mm → L 2 Ø 33 –110 mm → L 4 Ø 125 mm → L 5 (for all diameters on bottom side only)	EI 120-U/U
PP-H and PP-R pipes for pipe penetrations at 90°								
	Construction thickness ≥ 150 mm					≤ Ø 125 mm, s 3,1 - 7,4 mm	Ø 32 –125 mm → L 5	EI 120-U/C
Construction thickness ≥ 100 mm		Construction thickness ≥ 100 mm	Construction thickness ≥ 140 mm		Construction thickness ≥ 2 × 20 mm	Ø 20 mm, s 2,8 mm → Ø 32 mm, s 1,8 mm → Ø 160 mm, s 14,6 mm	Ø 20 – 63 mm → L 1 Ø 64 - 110 mm → L 2 Ø 111 – 125 mm → L 3 Ø 140 – 160 mm → L 4	EI 90-U/C
Construction thickness ≥ 150 mm						Ø 32 mm, s 1,8 - 5,4 mm → Ø 160 mm, s 9,1 mm	Ø 32 – 63 mm → L 3 Ø 75 – 90 mm → L 4 Ø 110 – 125 mm → L 5 Ø 126 – 160 mm → L 6	EI 120-U/U
Construction thickness ≥ 100 mm		Construction thickness ≥ 100 mm				Ø 32 mm, s 2,9 mm (all diameters with or without sound decoupling strips)	Ø 32 mm → L 2	EI 120-U/U

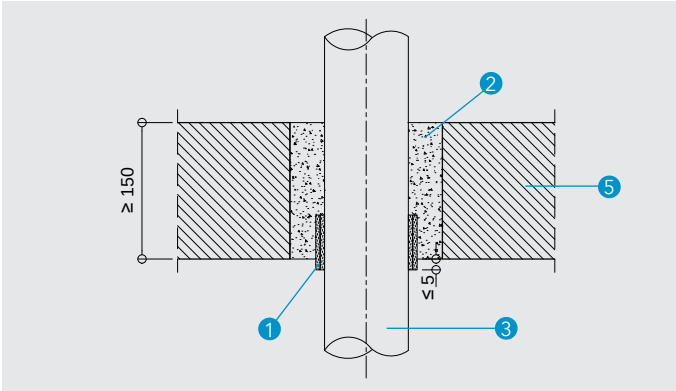
Requirement						Dimension range Ø: outer pipe diameter [mm] s: pipe wall thickness [mm]	Number of layers Ø: outer pipe diameter [mm] L: wrap layers	Classification
Rigid wall	Rigid floor	Flexible wall	CLT wall	CLT floor	Shaft wall			
	Construction thickness ≥ 150 mm					≤ Ø 32 mm, s 2,9 mm > Ø 32 mm, s 2,9 mm → Ø 110 mm, s 2,7 - 6,3 mm Ø 125 mm, s 3,1 - 4,8 mm (all diameters with or without sound decoupling strips)	Ø 32 mm → L 2 Ø 33 – 110 mm → L 4 Ø 125 mm → L 5 (for all diameters on bottom side only)	EI 120-U/U except Ø 32 mm E 120 EI 90-U/U for Ø 32 mm
KE KELIT KETRIX pipes for pipe penetrations at 90°								
Construction thickness ≥ 100 mm		Construction thickness ≥ 100 mm	Construction thickness ≥ 140 mm		Construction thickness ≥ 2 × 20 mm	lower limits: Ø 20 mm, s 2,8 mm → Ø 32 mm, s 2,9 mm → Ø 63 mm, s 5,8 mm → Ø 110 mm, s 10,0 mm → Ø 160 mm, s 14,6 mm upper limits: Ø 20 mm, s 2,8 mm → Ø 32 mm, s 4,4 mm → Ø 63 mm, s 8,6 mm → Ø 125 mm, s 17,1 mm → Ø 160 mm, s 14,6 mm	Ø 20 – 63 mm → L 1 Ø 64 – 110 mm → L 2 Ø 111 – 125 mm → L 3 Ø 126 – 160 mm → L 4	EI 90-U/C
PE-X pipes for pipe penetrations at 90°								
Construction thickness ≥ 100 mm		Construction thickness ≥ 100 mm	Construction thickness ≥ 140 mm		Construction thickness ≥ 2 × 20 mm	lower and upper limits: Ø 16 mm, s 2,2 mm → Ø 40 mm, s 5,5 mm → Ø 63 mm, s 8,6 mm	Ø 16 – 63 mm → L 1	EI 90-U/C
POLOPLAST POLO-KAL NG pipes for pipe penetrations at 90°								
Construction thickness ≥ 100 mm		Construction thickness ≥ 100 mm				Ø 32 mm, s 1,8 mm → Ø 160 mm, s 4,9 mm (all diameters with or without sound decoupling strips)	Ø 32 – 160 mm → L 6	E 90 EI 60-U/U
POLOPLAST POLO-KAL NG pipes for pipe penetrations at 90°								
	Construction thickness ≥ 150 mm					Ø 32 - 40 mm, s 1,8 mm → Ø 50 mm, s 2,0 mm → Ø 75 mm, s 2,6 mm → Ø 110 mm, s 3,4 mm → Ø 125 mm, s 3,9 mm → Ø 160 mm, s 4,9 mm (all diameters with or without sound decoupling strips)	Ø 32 – 40 mm → L 2 Ø 50 mm → L 3 Ø 75 – 110 mm → L 4 Ø 125 mm → L 5 Ø 160 mm → L 6 (for all diameters on bottom side only)	EI 120-U/U
				Construction thickness ≥ 140 mm		Ø 32 - 40 mm, s 1,8 mm → Ø 50 mm, s 2,0 mm → Ø 75 mm, s 2,6 mm → Ø 125 mm, s 3,9 mm (all diameters with or without sound decoupling strips)	Ø 32 mm → L 2 Ø 40 – 50 mm → L 3 Ø 75 – 125 mm → L 5 (for all diameters on both sides of the floor)	EI 120-U/U

Requirement						Dimension range Ø: outer pipe diameter [mm] s: pipe wall thickness [mm]	Number of layers Ø: outer pipe diameter [mm] L: wrap layers	Classification
Rigid wall	Rigid floor	Flexible wall	CLT wall	CLT floor	Shaft wall			
POLOPLAST POLO-KAL XS pipes for pipe penetrations at 90°								
	Construction thickness ≥ 150 mm					Ø 32 - 40 mm, s 1,8 mm → Ø 50 mm, s 2,0 mm → Ø 75 mm, s 2,6 mm → Ø 110 mm, s 3,4 mm → Ø 125 mm, s 3,9 mm → Ø 160 mm, s 4,9 mm (all diameters with or without sound decoupling strips)	Ø 32 – 40 mm → L 2 Ø 50 mm → L 3 Ø 75 – 110 mm → L 4 Ø 125 mm → L 5 Ø 160 mm → L 6 (for all diameters on bottom side only)	EI 120-U/U
				Construction thickness ≥ 140 mm		Ø 32 - 40 mm, s 1,8 mm → Ø 50 mm, s 2,0 mm → Ø 75 mm, s 2,6 mm → Ø 125 mm, s 3,9 mm (all diameters with or without sound decoupling strips)	Ø 32 mm → L 2 Ø 40 – 50 mm → L 3 Ø 75 – 125 mm → L 5 (for all diameters on both sides of the floor)	EI 120-U/U
POLOPLAST POLO-KAL 3S pipes for pipe penetrations at 90°								
	Construction thickness ≥ 150 mm					Ø 75 mm, s 3,8 mm → Ø 90 mm, s 4,5 mm → Ø 125 mm, s 5,3 mm → Ø 160 mm, s 7,5 mm (all diameters with or without sound decoupling strips)	Ø 75mm → L 4 Ø 90 – 125 mm → L 5 Ø 160 mm → L 6 (for all diameters on bottom side only)	EI 120-U/U
				Construction thickness ≥ 140 mm		Ø 75 mm, s 3,8 mm → Ø 90 mm, s 4,5 mm → Ø 125 mm, s 5,3 mm (all diameters with or without sound decoupling strips)	Ø 75 mm → L 4 Ø 90 – 125 mm → L 5 (for all diameters on both sides of the floor)	EI 120-U/U
Geberit Silent-db20 pipes for pipe penetrations at 90°								
Construction thickness ≥ 100 mm		Construction thickness ≥ 100 mm				Ø 56 mm, s 3,2 mm → Ø 160 mm, s 7,0 mm (all diameters with or without sound decoupling strips)	Ø 56 – 160 mm → L 6	EI 90-U/U
	Construction thickness ≥ 150 mm					Ø 56 - 63 mm, s 3,2 mm → Ø 75 mm, s 3,6 mm → Ø 110 mm, s 6,0 mm → Ø 135 mm, s 6,0 mm → Ø 160 mm, s 6,4 mm (all diameters with or without sound decoupling strips)	Ø 56 – 63 mm → L 3 Ø 75 – 110 mm → L 4 Ø 135 – 160 mm → L 5 (for all diameters on bottom side only)	EI 120-U/U
				Construction thickness ≥ 140 mm		Ø 56 - 63 mm, s 3,2 mm → Ø 75 mm, s 3,6 mm → Ø 90 mm, s 5,5 mm → Ø 110 mm, s 6,0 mm (all diameters with or without sound decoupling strips)	Ø 56 – 63 mm → L 3 Ø 75 – 90 mm → L 4 Ø 110 mm → L 5 (for all diameters on both sides of the floor)	EI 120-U/U

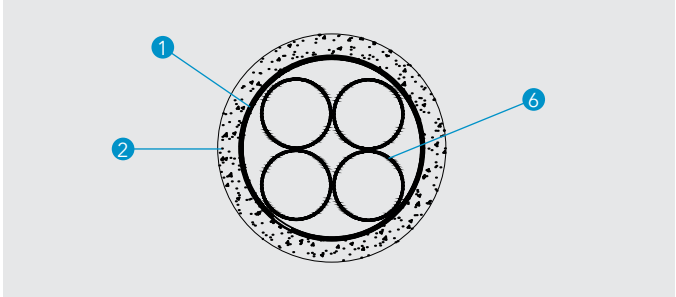




Detail A – Penetrations of the PP-R and PVC-U pipes through walls



Detail B – Penetrations of the PP-R pipes through floors



Detail C – View of pipe bundles in floors and walls

Technical data

1. PROMASTOP®-W
2. Cement mortar, or gypsum putty
3. PP-R, or PVC pipe
4. Rigid or flexible wall
5. Rigid floor
6. Bundle of PP-R pipes

Certificates: ETA-14/0456, ITB CR 01633/22/R181NZP

Detail A

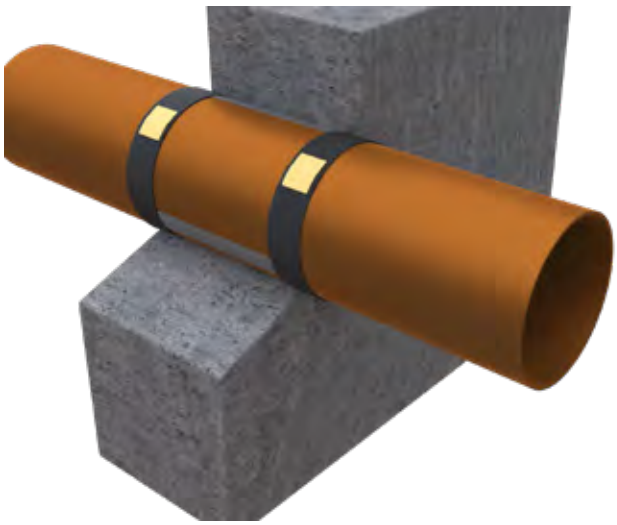
In order to protect the penetrations of the PP-R and PVC-U pipes through walls the PROMASTOP®-W wrap (1) must be applied within the partitions. The wrap, trimmed to the appropriate length, must be wrapped around the pipes with its intumescent side directed towards the pipes, and fixed with a mounting tape, to prevent the wrap against unwrapping. The gap between the wrap and the partitions must be filled with cement mortar, or a filling compound (2) throughout the thickness of the wall. This solution can be applied for the PP-R pipes of the diameter ranging from 16 to 110 mm, and the PVC-U pipes of the diameter from 32 to 110 mm. 2 wraps of the PROMASTOP®-W wrap must be provided for protection of the PP-R pipes, and 3 wraps – for the PVC-U pipes.
Bundles consisting of 4 PP-R pipes can be protected with the PROMASTOP®-W wrap located in the axis of a partition by providing 4 wraps (detail C). The max. diameter of a single pipe of the four in a bundle can range from 16 to 75 mm.

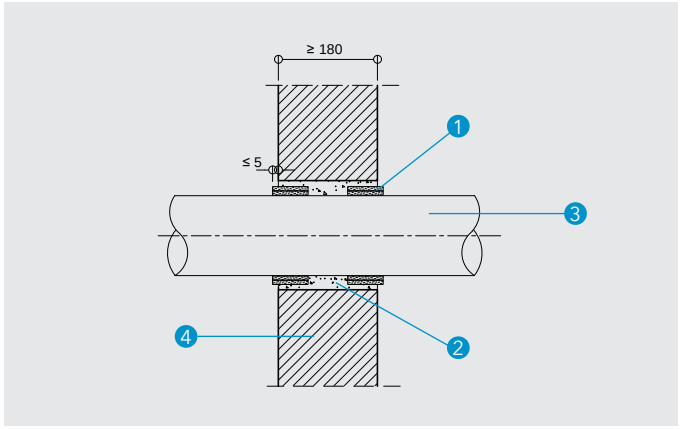
Detail B

For the penetrations through floors the PROMASTOP®-W wrap (1) should be installed from the bottom of the floor only. Such wrap should be flush with the bottom edge of a floor, or extend by max. 5 mm beyond the surface of this partition. A gap between the wrap and the partition must be filled with cement mortar, or filling compound (2) throughout the floor thickness. This solution can be applied for the PP-R pipes with diameter ranging from 20 to 110 mm. The pipes must be provide with two layers of wrap. Bundles consisting of 4 PP-R pipes can be protected with the PROMASTOP®-W wrap from the bottom of the floor by providing 4 loops (detail C). The max. diameter of a single pipe of the four in a bundle can range from 16 to 75 mm. Efficiency of one packaging of the PROMASTOP®-W wrap for the PP-R pipes is presented in the table below.

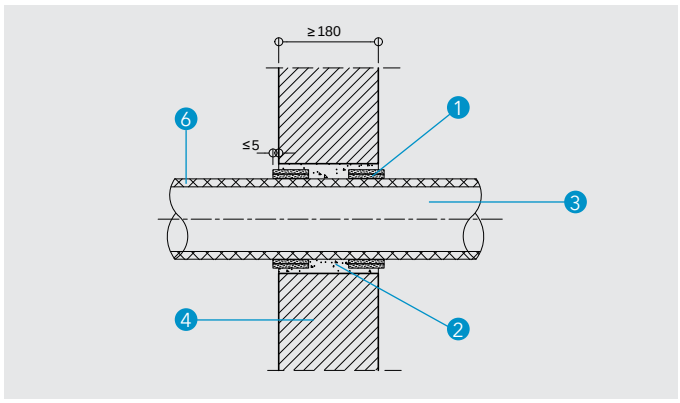
Table 1 - The number of loops and efficiency of the PROMASTOP®-W for the PP-R pipes.

Diameter [mm]	Application in floor (F) or wall (W)	Number of wraps	Consumption
16	W	2	179
20	F/W	2	104
32	F/W	2	72
40	F/W	2	60
50	F/W	2	49
55	F/W	2	45
63	F/W	2	40
75	F/W	2	34
82	F/W	2	32
90	F/W	2	29
110	F/W	2	24





Detail A – Penetrations of plastic pipes through walls



Detail B – Penetrations of plastic pipes in flammable insulation through walls

Technical data

1. PROMASTOP®-W
2. Cement mortar, or gypsum putty
3. Plastic pipe
4. Rigid or floor
5. Bundle of PP-R pipes
6. Flammable insulation

Certificates: ETA-14/0456, ITB CR 01633/22/R181NZP

1. Installation in walls

The minimum thickness of the partitions in which penetrations can be protected with the PROMASTOP®-W wrap (1) is:

- Rigid walls min. thickness 180 mm
- Rigid floors min. thickness 200 mm

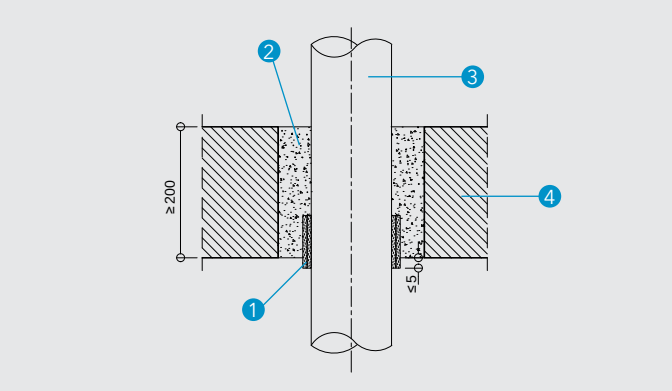
The gap between the wrap and the partitions must be filled with cement mortar (2).

Detail A and B

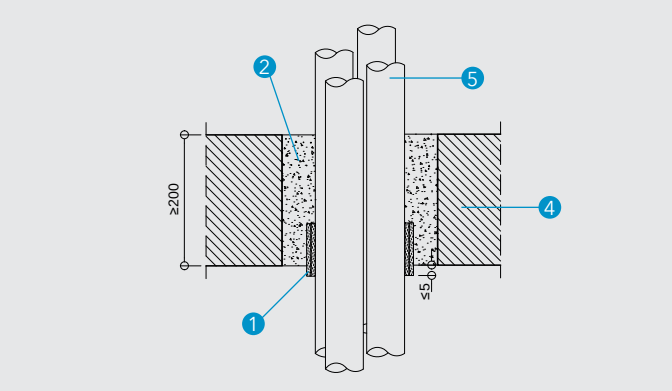
In order to protect the penetrations of

- PP-R or PE-100 pipes, diameter from 20 to 110 mm,
- PP-R pipes, diameter from 20 to 110 mm, in flammable insulation, reaction to fire class B, thickness 6-25 mm
- PVC-U pipes, diameter from 32 to 110 mm,

through walls it is necessary to install the PROMASTOP®-W wrap (1) on both the sides of a partition. The wrap, trimmed to its appropriate length, must be wrapped around the pipe with its intumescent side directed towards the pipe, and then fixed with a mounting tape, to prevent the wrap against unwrapping. Pipes without insulation must be wrapped three times. The PP-R pipes with the diameter of 20 mm in flammable insulation must be wrapped 3 times, and flammable pipes of a greater diameter must be wrapped 5 times.



Detail C – Penetrations of plastic pipes through floors



Detail D – Penetrations of PP-R pipe bundles through floors

Detail C and D

For the penetrations running through the floors of min. thickness 200 mm it is necessary to apply the PROMASTOP®-W wrap (1) from the bottom side of the floor only. The wrap should be installed flush with the bottom edge of such floor, or extend by max. 5 mm beyond the partition surface. This solution can be applied for:

- PP-R pipes, diameter from 20 to 110 mm.
- bundles of 4 PP-R pipes, max. diameter of a single pipe 75 mm,
- PVC-U pipes, diameter from 32 to 110 mm.

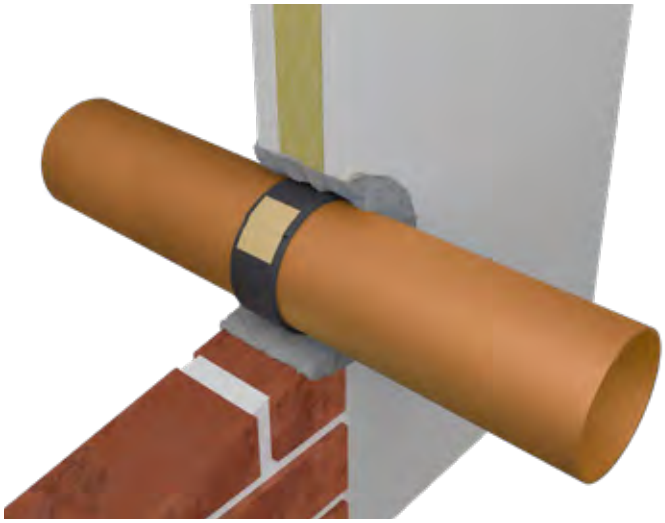
The number of wraps and consumption of the PROMASTOP®-W wrap (1) from one package for protection of the PP-R and PVC-U pipes is presented in the tables below. For the bundles of the PP-R pipes in floors it is necessary to apply 4 wraps.

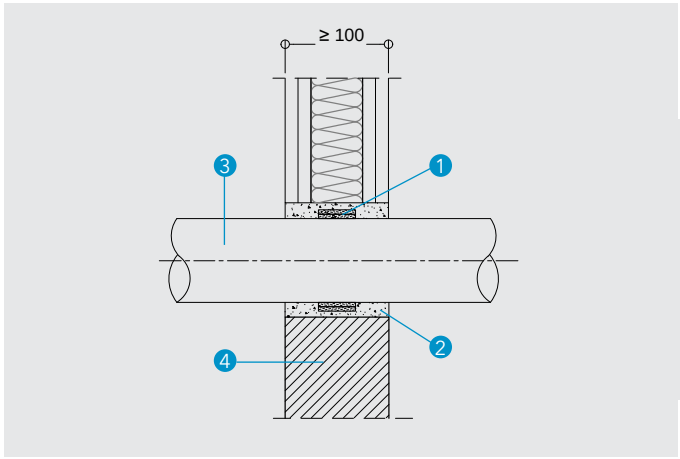
Table 1 - The number of wraps and consumption of the PROMASTOP®-W for the PP-R and PE-100 pipes

Diameter [mm]	Application in floor (F) or wall (W)	Number of wraps	Consumption floor/ wall
20	F/W	3	94/47
32	F/W	3	59/29
40	F/W	3	47/23
50	F/W	3	36/18
55	F/W	3	34/17
63	F/W	3	30/15
75	F/W	3	25/12
82	F/W	3	22/11
90	F/W	3	20/10
110	F/W	3	17/8

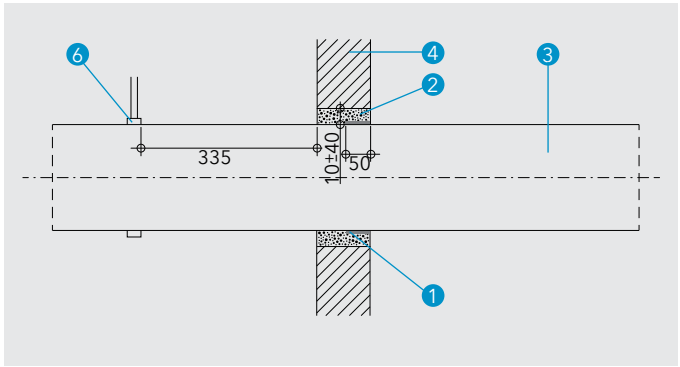
Table 2 - The number of wraps and consumption of the PROMASTOP®-W for the PVC-U pipes

Diameter [mm]	Application in floor (F) or wall (W)	Number of wraps	Consumption floor/ wall
32	F/W	3/3	59/29
40	F/W	4/3	35/23
50	F/W	4/3	28/18
55	F/W	4/3	25/17
63	F/W	4/3	23/15
75	F/W	4/3	18/12
82	F/W	4/3	17/11
90	F/W	4/3	15/10
110	F/W	4/3	13/8





Detail I – Mortar penetration seal of plastic pipes without insulation, sealed with use of PROMASTOP®-W single wrap placed centrally in wall



Detail J – Mortar penetration seal of plastic pipes without insulation, sealed with use of PROMASTOP®-W single wrap placed on one side in wall

Technical data

1. PROMASTOP®-W
2. Cement mortar, e.g. PROMASTOP®-M
3. Plastic pipe
4. Rigid or flexible wall
5. Rigid floor
6. First place of support
7. Mineral wool, denstiy ≥ 140 kg/m³
8. PROMASTOP®-CC, dry layer thickness of 0,7 mm or PROMASEAL®-A spray, dry layer thickness of 2,5 mm

Certificates: ETA-14/0456, ITB CR 01633.1/21/R164NZP

Customer benefit

- Single wrap placed centrally in the penetration seal in flexible and rigid walls for insulated metal and plastic pipes and for plastic pipes without insulation
- Single wrap placed on one sde of the wall for plastic pipes without insulation
- Double wrap in mortar penetration seal, in PROMASEAL®-A spray and in PROMASTOP®-CC soft penetration seal

2. Fields of application

Rigid wall

The classifications for rigid wall supporting construction are valid for penetration seals in wall made of concrete, reinforced concrete, aerated concrete, ceramic brick, cavity brick, checker brick, with density greater than or equal to 600 kg/m³ and thickness equal to or greater than given in appropriate point, with fire resistance class (according to EN 13501-2) equal to or greater than given in appropriate point. Required thickness in Table 3.

Flexible wall

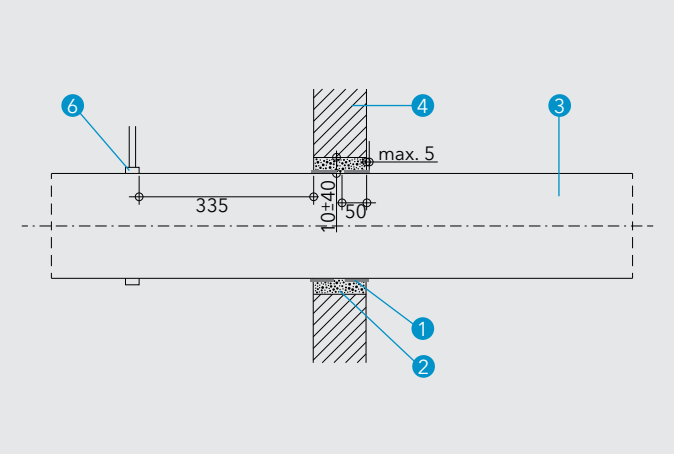
The classifications for flexible wall supporting construction are valid for penetration seals in flexible walls made of gypsum plasterboards type F or DF with steel or timber studs sub-structure, thickness equal to or greater than given in appropriate point (min. two layers of gypsum plasterboards type F or DF with overall board layer thickness equal to or greater than 25 mm), with fire resistance class (classified according to EN 13501-2) equal to or greater than given in appropriate point. Required thickness in Table 3.

In case of supporting constructions with timber studs no part of the penetration seal is closer than 100 mm to a stud, the cavity is closed between the penetration seal and the stud and minimum 100 mm of insulation of class A1 or A2 according to EN 13501-1 is provided within the cavity between the penetration seal and the stud.

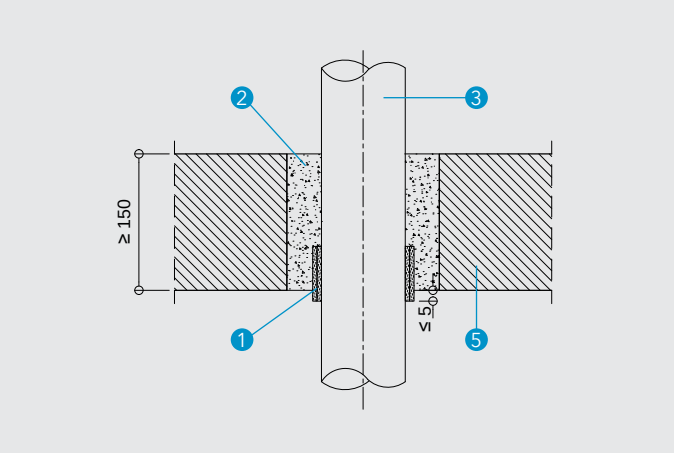
Classifications given for "flexible wall supporting construction" are also valid for penetration seals in rigid wall supporting constructions with greater than or equal to 450 kg/m³ and thickness equal to or greater than given in appropriate point, with fire resistance class (classified according to EN 13501-2) equal to or greater than given in appropriate point.

Rigid floor

The classifications for rigid floor supporting construction are valid for penetration seals in floor made of concrete, aerated concrete or reinforced concrete, with density greater or equal to 600 kg/m³ and thickness greater than or equal to given in appropriate point. Required floor thickness in Table 3.



Detail K – Mortar penetration seal of plastic pipes without insulation, sealed with use of PROMASTOP®-W double wrap in wall (on both sides)



Detail L – Mortar penetration seal of plastic pipes without insulation, sealed with use of PROMASTOP®-W in floor

Supporting distance
The metal and plastic pipes must be suspended/supported at a distance of ≤ 335 mm on both sides of the wall or from the top of the floor.

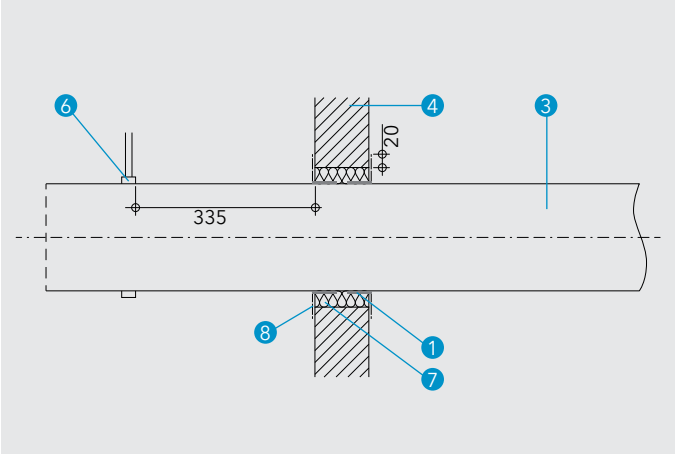
Metal pipes
The classification given for metal (copper or steel) pipes covers pipe materials with a thermal conductivity lower than presented in appropriate point, subject to the material having a melting point at least equal to that of the presented material or greater than:
- 843 °C for the fire resistance class 30 min,
- 903 °C for the fire resistance class 45 min,
- 946 °C for the fire resistance class 60 min,
- 1006 °C for the fire resistance class 90 min,
- 1049 °C for the fire resistance class 120 min.

The classifications given for metal (copper or steel) pipes are valid for pipe end configuration as follows:
- C/U, U/C and C/C in case of penetrations with "U/C" in classification code,
- C/C in case of penetrations with "C/C" in classification code.

Pipe insulation for metal and plastic pipes
The classifications given for pipes with AF/ArmaFlex (FEF, reaction to fire B-s3, d0 acc. to EN 13501-1), with Armaflex ACE Plus (FEF, reaction to fire B-s3, d0), with MIRELON® PRO (PE, reaction to fire E), with Tubolit S (PE, reaction to fire E for steel pipes or B_L-s1, d0 for copper pipes in bundle) or with Thermaflex ThermaEco FRZ (PE, reaction to fire E) insulation concerns continuously insulated pipes (CS configuration) and does not cover local insulated nor non-insulated pipes. For this type of penetrations the thickness and density of the continuous insulation cannot be increased or reduced and the reaction to fire class (acc. to EN 13501-1) of the insulation shall remain the same as given. Classification is also valid for other flexible elastomeric foams (FEF) and for other PE foams made in accordance with appropriate product standard (EN 14304+A1 for FEF and EN 14313+A1 for PE) provided that the thickness and density of a continuous insulation is not increased or reduced and the reaction to fire class is same as given.

Plastic pipes
Classification given for PE-100 pipes is valid for pipes made from PE-100 according to EN 12201-2.
Classification given for PP pipes is valid for pipes made from PP according to EN 1852-1.
Classification given for PP-H pipes is valid for pipes made from PP-H in accordance with EN 1451.
Classification given for PP-R pipes is valid for pipes made from PP-R in accordance with EN 15874-1.
Classification given for PP-MD pipes is valid for pipes made from PP-MD in accordance with EN 14758-1.
Classification given for PVC-U pipes covers pipe material: PVC-U according to EN 1453-1, EN 1452-1, EN 15493, DIN 8061:2009 and DIN 8062:2009 and PVC-C according to EN 1566-1.

The classifications given for plastic pipes are valid for pipe end configuration as follows:
- U/U, U/C, C/U and C/C C in case of penetrations with "U/U" in classification code
- U/C and C/C in case of penetrations with "U/C" in classification code,
- C/C in case of penetrations with "C/C" in classification code.



Detail M – Soft penetration seal of plastic pipes without insulation, sealed with use of PROMASTOP®-W double wrap in wall (on both sides)

The yield of one box of PROMASTOP®-W for the penetration seal of plastic pipes is presented in the table below.

Table 2 - Required layers and yield of PROMASTOP®-W wrap (the table shows 2 layers only, find the required number of layers for different situations in Table 3)

Diameter [mm]	Application in floor (F) or wall (W)	Layers of wrap placed centrally in the wall or on the bottom side of the floor	Yield
32	F/W	2	72
40	F/W	2	60
50	F/W	2	49
55	F/W	2	45
63	F/W	2	40
75	F/W	2	34
82	F/W	2	32
90	F/W	2	29
110	F/W	2	24

Soft penetration seals

The thickness and density of the penetration seal the mineral wool infill can be increased but may not be reduced. Classification is also valid for other mineral wool insulations provided that the thickness and density of insulation is not reduced (it can be increased). The total amount of cross sections of the services (including insulation) cannot exceed 60% of the penetration area.

Detail I

The cut-to-length PROMASTOP®-W single wrap placed centrally in the penetration seal in flexible or rigid wall supporting construction, wrapped on the pipe with the expanding part facing the pipe and fixed with adhesive tape so that the wrap does not unwrap. Find the required number of layers of PROMASTOP®-W wrap in Table 3. The gap between the supporting construction and the services, width of 10 – 40 mm is filled with cement mortar.

Detail J

The cut-to-length PROMASTOP®-W single wrap placed on one side of the wall in rigid wall supporting construction and it protrudes 2 - 5 mm beyond the surface of the wall. Find the required number of layers of PROMASTOP®-W wrap in Table 3. The gap between the supporting construction and the services, width of 10 – 40 mm is filled with cement mortar.

Detail K

The cut-to-length PROMASTOP®-W wraps are placed on both sides of the wall in rigid wall supporting construction and it protrudes 2 - 5 mm beyond the surface of the wall. Find the required number of layers of PROMASTOP®-W wrap in Table 3. The gap between the supporting construction and the services, width of 10 – 40 mm is filled with cement mortar.

Detail L

The cut-to-length PROMASTOP®-W single wrap in rigid floor supporting construction is placed on the bottom of the floor and it protrudes 2 - 5 mm beyond the surface of the floor. Find the required number of layers of PROMASTOP®-W wrap in Table 3. The gap between the supporting construction and the services, width of 10 – 40 mm is filled with cement mortar.

Detail M

The cut-to-length PROMASTOP®-W wraps are placed on both sides of the wall in rigid wall supporting construction and it protrudes 2 - 5 mm beyond the surface of the wall. Find the required number of layers of PROMASTOP®-W wrap in Table 3. The mineral wool infill of the soft penetration seal and the supporting construction on the width of 20 mm on the perimeter of the opening is covered with PROMASTOP®-CC coating (dry layer thickness ≥ 0,7 mm) or with PROMASEAL®-A spray coating (dry layer thickness ≥ 2,5 mm). The space between the supporting construction and service is filled with STEPROCK PLUS mineral wool (density of min. 140 kg/m^3) with overall thickness ≥ 100 mm for PROMASTOP®-CC and ≥ 150 mm for PROMASEAL®-A spray. The maximum dimension of the PROMASTOP®-CC soft penetration seal is 350 x 350 mm and the minimum distance between the service and the seal edge is 35 mm. The maximum dimension of the PROMASEAL®-A spray soft penetration seal is 300 x 300 mm and the minimum distance between the service and the seal edge is 100 mm.

Table 3 – Overview of pipe materials, dimensions, installation situations and classifications

Requirement			Dimension range Ø: outer pipe diameter [mm] s: pipe wall thickness [mm]	Number of PROMASTOP®-W wrap layers	Classification
Rigid wall	Flexible wall	Rigid floor			
PVC-U pipes for pipe penetrations at 90° (mortar penetration seal, single wrap placed on one side only)					
Construction thickness ≥ 100 mm			Ø ≤ 32,0 mm, s 1,8 mm	L 3	EI 240-C/C
PVC-U pipes for pipe penetrations at 90° (mortar penetration seal, single wrap placed centrally in the wall)					
	Construction thickness ≥ 100 mm		Ø ≤ 32,0 mm, s 1,8 - 2,7 mm	L 2	EI 120-U/U
			Ø ≤ 32,0 mm, s 2,8 - 3,2 mm	L 2	EI 60-U/U EI 120-U/C
			32,0 < Ø ≤ 50,0 mm, s 2,0 - 2,6 mm	L 2	EI 60-U/U
			32,0 < Ø ≤ 50,0 mm, s 2,7 mm	L 2	EI 90-U/U
			32,0 < Ø ≤ 50,0 mm, s 2,8 - 3,1 mm	L 2	EI 60-U/U
			32,0 < Ø ≤ 50,0 mm, s 3,2 mm	L 2	EI 60-U/U EI 120-U/C
			50,0 < Ø ≤ 75,0 mm, s 2,2 - 2,6 mm	L 2	EI 60-U/U
			50,0 < Ø ≤ 75,0 mm, s 2,7 mm	L 2	EI 90-U/U
			50,0 < Ø ≤ 75,0 mm, s 2,8 - 3,1 mm	L 2	EI 60-U/U
			50,0 < Ø ≤ 75,0 mm, s 3,2 mm	L 2	EI 60-U/U EI 120-U/C
			75,0 < Ø ≤ 100,0 mm, s 2,5 - 2,6 mm	L 2	EI 60-U/U
			75,0 < Ø ≤ 100,0 mm, s 2,7 mm	L 2	EI 90-U/U
			75,0 < Ø ≤ 100,0 mm, s 2,8 - 3,1 mm	L 2	EI 60-U/U
			75,0 < Ø ≤ 100,0 mm, s 3,2 mm	L 2	EI 60-U/U EI 120-U/C
			100,0 < Ø ≤ 110,0 mm, s 2,7 mm	L 2	EI 90-U/U
			100,0 < Ø ≤ 110,0 mm, s 2,8 - 3,1 mm	L 2	EI 60-U/U
			100,0 < Ø ≤ 110,0 mm, s 3,2 mm	L 2	EI 60-U/U EI 120-U/C
			Ø ≤ 32,0 mm, s 1,8 - 2,7 mm	L 2	EI 120-U/U
			Ø ≤ 32,0 mm, s 2,8 - 3,2 mm	L 2	EI 90-U/U EI 120-U/C
			Ø ≤ 32,0 mm, s 3,3 - 4,0 mm	L 2	EI 90-U/U
			32,0 < Ø ≤ 50,0 mm, s 2,0 - 2,6 mm	L 2	EI 60-U/U
			32,0 < Ø ≤ 50,0 mm, s 2,7 mm	L 2	EI 90-U/U
			32,0 < Ø ≤ 50,0 mm, s 2,8 - 3,1 mm	L 2	EI 60-U/U
			32,0 < Ø ≤ 50,0 mm, s 3,2 mm	L 2	EI 60-U/U EI 120-U/C
			50,0 < Ø ≤ 75,0 mm, s 2,2 - 2,6 mm	L 2	EI 60-U/U
			50,0 < Ø ≤ 75,0 mm, s 2,7 mm	L 2	EI 90-U/U
			50,0 < Ø ≤ 75,0 mm, s 2,8 - 3,1 mm	L 2	EI 60-U/U
			50,0 < Ø ≤ 75,0 mm, s 3,2 mm	L 2	EI 60-U/U EI 120-U/C
			75,0 < Ø ≤ 100,0 mm, s 2,5 - 2,6 mm	L 2	EI 60-U/U
			75,0 < Ø ≤ 100,0 mm, s 2,7 mm	L 2	EI 90-U/U
			75,0 < Ø ≤ 100,0 mm, s 2,8 - 3,1 mm	L 2	EI 60-U/U
			75,0 < Ø ≤ 100,0 mm, s 3,2 mm	L 2	EI 60-U/U EI 120-U/C
			100,0 < Ø ≤ 110,0 mm, s 2,7 mm	L 2	EI 90-U/U
			100,0 < Ø ≤ 110,0 mm, s 2,8 - 3,1 mm	L 2	EI 60-U/U
			100,0 < Ø ≤ 110,0 mm, s 3,2 mm	L 2	EI 60-U/U EI 120-U/C

Requirement			Dimension range Ø: outer pipe diameter [mm] s: pipe wall thickness [mm]	Number of PROMASTOP®-W wrap layers	Classification
Rigid wall	Flexible wall	Rigid floor			
PVC-U pipes for pipe penetrations at 90° (mortar penetration seal, single wrap placed centrally in the wall)					
Construction thickness ≥ 180 mm			Ø ≤ 32,0 mm, s 1,8 mm	L 2	EI 120-U/U
			Ø ≤ 32,0 mm, s 1,8 mm	L 4	EI 240-C/C
			Ø ≤ 32,0 mm, s 1,9 - 2,7 mm	L 2	EI 120-U/U
			Ø ≤ 32,0 mm, s 2,8 - 3,2 mm	L 2	EI 90-U/U EI 120-U/C
			Ø ≤ 32,0 mm, s 3,3 - 4,0 mm	L 2	EI 90-U/U
			32,0 < Ø ≤ 50,0 mm, s 2,0 - 2,6 mm	L 2	EI 60-U/U
			32,0 < Ø ≤ 50,0 mm, s 2,7 mm	L 2	EI 90-U/U
			32,0 < Ø ≤ 50,0 mm, s 2,7 mm	L 4	EI 180-C/C
			32,0 < Ø ≤ 50,0 mm, s 2,8 - 3,1 mm	L 2	EI 60-U/U
			32,0 < Ø ≤ 50,0 mm, s 3,2 mm	L 2	EI 60-U/U EI 120-U/C
			50,0 < Ø ≤ 75,0 mm, s 2,2 - 2,6 mm	L 2	EI 60-U/U
			50,0 < Ø ≤ 75,0 mm, s 2,7 mm	L 2	EI 90-U/U
			50,0 < Ø ≤ 75,0 mm, s 2,7 mm	L 4	EI 180-C/C
			50,0 < Ø ≤ 75,0 mm, s 2,8 - 3,1 mm	L 2	EI 60-U/U
			50,0 < Ø ≤ 75,0 mm, s 3,2 mm	L 2	EI 60-U/U EI 120-U/C
			75,0 < Ø ≤ 100,0 mm, s 2,5 - 2,6 mm	L 2	EI 60-U/U
			75,0 < Ø ≤ 100,0 mm, s 2,7 mm	L 2	EI 90-U/U
			75,0 < Ø ≤ 100,0 mm, s 2,7 mm	L 4	EI 180-C/C
			75,0 < Ø ≤ 100,0 mm, s 2,8 - 3,1 mm	L 2	EI 60-U/U
			75,0 < Ø ≤ 100,0 mm, s 3,2 mm	L 2	EI 60-U/U EI 120-U/C
			100,0 < Ø ≤ 110,0 mm, s 2,7 mm	L 2	EI 90-U/U
			100,0 < Ø ≤ 110,0 mm, s 2,7 mm	L 4	EI 180-C/C
			100,0 < Ø ≤ 110,0 mm, s 2,8 - 3,1 mm	L 2	EI 60-U/U
			100,0 < Ø ≤ 110,0 mm, s 3,2 mm	L 2	EI 60-U/U EI 120-U/C
PVC-U pipes for pipe penetrations at 90° (mortar penetration seal, wrap placed on both sides of the wall)					
Construction thickness ≥ 180 mm			Ø ≤ 32,0 mm, s 1,8 - 2,7 mm	L 2	EI 240-C/C
			32,0 < Ø ≤ 110,0 mm, s 2,7 mm	L 2	EI 240-C/C
PVC-U pipes for pipe penetrations at 90° (≥ 150 mm thick PROMASEAL®-A spray penetration seal, wrap placed on both sides of the wall)					
Construction thickness ≥ 180 mm			Ø ≤ 32,0 mm, s 1,8 - 2,7 mm	L 2	EI 240-C/C
			32,0 < Ø ≤ 110,0 mm, s 2,7 mm	L 2	EI 240-C/C

Requirement			Dimension range Ø: outer pipe diameter [mm] s: pipe wall thickness [mm]	Number of PROMASTOP®-W wrap layers	Classification
Rigid wall	Flexible wall	Rigid floor			
PP-R pipes for pipe penetrations at 90° (mortar penetration seal, single wrap placed centrally in the wall)					
Construction thickness ≥ 100 mm	Construction thickness ≥ 100 mm		Ø ≤ 20,0 mm, s ≥ 1,9 mm	L 2	EI 120-U/C
			20,0 < Ø ≤ 50,0 mm, s 4,5 - 12,5 mm	L 2	EI 120-U/C
			50,0 < Ø ≤ 75,0 mm, s 6,8 - 12,5 mm	L 2	EI 120-U/C
PP-R pipes for pipe penetrations at 90° (mortar penetration seal, single wrap placed on the bottom side of the floor)					
		Construction thickness ≥ 150 mm	Ø ≤ 20,0 mm, s ≥ 1,9 mm	L 2	EI 120-U/C
			20,0 < Ø ≤ 50,0 mm, s 4,5 - 18,3 mm	L 2	EI 120-U/C
			50,0 < Ø ≤ 75,0 mm, s 6,8 - 18,3 mm	L 2	EI 120-U/C
			75,0 < Ø ≤ 90,0 mm, s 8,1 - 18,3 mm	L 2	EI 120-U/C
			90,0 < Ø ≤ 110,0 mm, s 9,0 - 18,3 mm	L 2	EI 120-U/C
PP-R pipes for pipe penetrations at 90° (≥ 100 mm thick PROMASTOP®-CC penetration seal, wrap placed on both sides of the wall)					
Construction thickness ≥ 100 mm			Ø ≤ 20,0 mm, s 1,9 - 3,3 mm	L 2	EI 60 / E 120-U/C
			Ø ≤ 20,0 mm, s 3,4 mm	L 2	EI 90 / E 120-U/C
			Ø ≤ 20,0 mm, s 3,5 - 15,0 mm	L 2	EI 90-U/C
			20,0 < Ø ≤ 40,0 mm, s 3,7 - 15,0 mm	L 2	EI 90-U/C
			40,0 < Ø ≤ 75,0 mm, s 6,8 - 15,0 mm	L 2	EI 90-U/C
			75,0 < Ø ≤ 90,0 mm, s 8,2 - 15,0 mm	L 2	EI 90-U/C
PP-MD pipes for pipe penetrations at 90° (mortar penetration seal, single wrap placed centrally in the wall)					
Construction thickness ≥ 100 mm			Ø ≤ 32,0 mm, s 1,8 mm	L 2	EI 120-U/U

3. PROMASTOP®-W penetration seal for plastic pipes with combustible insulation

Pype types

The listed pipe types are tested according the requirements of EN 1366-3 and EN 13882-3 and given by the rules of the direct and the extended fields of application:

- PE-HD pipes in accordance with EN 1519-1 and EN 12666-1
- PP-H and PP-R pipes according to ÖNORM B 5174-1, DIN 8077, DIN 8078
- KE KELIT KETRIX
- PE-X pipes according to EN ISO 15875, DIN 16892, DIN 16893 (for example: REHAU RAUTITAN flex, REHAU RAU-THERM-FW, Viega Sanfix Fosta PE-X, Uponor Radi Pipe, Uponor Aqua Pipe)

Combustible insulations

In flexible walls, rigid walls and floors, CLT walls and shaft walls every type of combustible insulation of Class E or B-s3, d0 (acc. to EN 13501-1), with a maximum thickness of 32 mm may be used. The thresholds for pipe diameter and insulation thickness are shown in Table 4.

Plastic pipes with MIRELON® PRO (PE) insulation in wall (double wrap, soft-seal)

Penetration seals of PP-R pipes with continuous MIRELON® PRO (PE) insulation sealed with use of PROMASTOP®-W wrap in rigid wall supporting construction. The wraps are placed on both sides of the wall and it protrudes 2 - 5 mm beyond the surface of the wall. Find the required number of layers of PROMASTOP®-W wrap in Table 4. The mineral wool infill of the soft penetration seal and the supporting construction on the width of 20 mm on the perimeter of the opening as well as the PE insulation on the length of 150 mm is covered with PROMASTOP®-CC coating (dry layer thickness of min. 0,7 mm). The space between the supporting construction and service is filled with STEPROCK PLUS mineral wool with overall thickness of min. 100 mm. The maximum dimension of the soft penetration seal is 600 x 600 mm and the minimum distance between the service and the seal edge is 30 mm.

Table 4 – Overview of pipe materials, dimensions, installation situations and classifications

Requirement					Dimension range Ø: outer pipe diameter [mm] s: pipe wall thickness [mm] d: insulation thickness [mm]	Number of layers Ø: outer diameter incl. insulation [mm] L: wrap layers	Classification
Rigid wall	Rigid floor	Flexible wall	CLT wall	Shaft wall			
PP-H and PP-R pipes for pipe penetrations at 90°							
Construction thickness ≥ 100 mm		Construction thickness ≥ 100 mm	Construction thickness ≥ 140 mm	Construction thickness ≥ 2 × 20 mm	Ø 20 - 110 mm, d 6 - 32 mm	Ø 20 – 63 mm → L 1 Ø 64 – 110 mm → L 2 Ø 111 – 125 mm → L 3 Ø 126 – 160 mm → L 4 Ø 161 – 180 mm → L 6	EI 90-U/C with combustible insulation B-s3, d0
Construction thickness ≥ 100 mm		Construction thickness ≥ 100 mm	Construction thickness ≥ 140 mm	Construction thickness ≥ 2 × 20 mm	Ø 20 - 32 mm, d 4 - 13 mm	Ø 20 – 63 mm → L 1	EI 90-U/C with combustible insulation E
	Construction thickness ≥ 150 mm				Ø 25 mm, s 3,5 mm → Ø 63 mm, s 10,5 mm for all diameters: d 9 - 13 mm, CS configuration	→ L 1, except pipe diameter 63 mm → L 2 (for all diameters on bottom side only)	EI 120-U/C with combustible insulation E
KE KELIT KETRIX pipes for pipe penetrations at 90°							
Construction thickness ≥ 100 mm		Construction thickness ≥ 100 mm	Construction thickness ≥ 140 mm	Construction thickness ≥ 2 × 20 mm	Ø 20 - 160 mm, d 6 - 32 mm	Ø 20 – 63 mm → L 1 Ø 64 – 110 mm → L 2 Ø 111–125 mm → L 3 Ø 126 – 160 mm → L 4 Ø 161 – 180 mm → L 6 Ø 181 – 200 mm → L 7 Ø 201 – 225 mm → L 8	EI 90-U/C with combustible insulation B-s3, d0
PE-X pipes for pipe penetrations at 90°							
Construction thickness ≥ 100 mm		Construction thickness ≥ 100 mm	Construction thickness ≥ 140 mm	Construction thickness ≥ 2 × 20 mm	Ø 16 - 63 mm, d 6 - 32 mm	Ø 16 – 63 mm → L 1 Ø 64 – 110 mm → L 2 Ø 111–125 mm → L 3 Ø 126 – 160 mm → L 4	EI 90-U/C with combustible insulation B-s3, d0
	Construction thickness ≥ 150 mm				Ø 16 mm, s 2,2 mm → Ø 40 mm, s 5,5 mm for all diameters: d 32 mm, CS configuration	→ L 2 (for all diameters on both sides of the floor)	EI 120-U/C with combustible insulation B-s3, d0
Construction thickness ≥ 100 mm		Construction thickness ≥ 100 mm	Construction thickness ≥ 140 mm	Construction thickness ≥ 2 × 20 mm	Ø 16 - 25 mm, d 4 - 13 mm	Ø 16 – 63 mm → L 1	EI 90-U/C with combustible insulation E

Requirement			Dimension range Ø: outer pipe diameter [mm] s: pipe wall thickness [mm] d: insulation thickness [mm]	Number of PROMASTOP®-W wrap layers	Classification
Rigid wall	Flexible wall	Rigid floor			
PP-R pipes with MIRELON® PRO (PE) insulation (CS configuration) for pipe penetrations at 90° (≥ 100 mm thick PROMASTOP®-CC penetration seal, wrap placed on both sides of the wall)					
Construction thickness ≥ 100 mm			Ø ≤ 20,0 mm, s 1,9 mm, d 9 -20 mm	L 2	EI 90-U/C
			Ø ≤ 20,0 mm, s 1,9 - 5,8 mm, d 9 -19 mm	L 2	EI 60 / E 90-U/C
			Ø ≤ 20,0 mm, s 1,9 - 5,8 mm, d 20 mm	L 2	EI 90-U/C
			Ø ≤ 20,0 mm, s 5,9 - 9,5 mm, d 9 -20 mm	L 2	EI 60 / E 90-U/C
			20,0 < Ø ≤ 40,0 mm, s 3,7 - 5,8 mm, d 20 mm	L 2	EI 90-U/C
			20,0 < Ø ≤ 40,0 mm, s 5,9 - 9,4 mm, d 20 mm	L 2	EI 60 / E 90-U/C
			20,0 < Ø ≤ 40,0 mm, s 9,5 mm, d 9 - 20 mm	L 2	EI 60 / E 90-U/C
			40,0 < Ø ≤ 63,0 mm, s 5,8 mm, d 9 mm	L 2	EI 90-U/C
			40,0 < Ø ≤ 63,0 mm, s 5,9 - 9,4 mm, d 20 mm	L 2	EI 60 / E 90-U/C
			40,0 < Ø ≤ 63,0 mm, s 9,5 mm, d 9 -20 mm	L 2	EI 60 / E 90-U/C

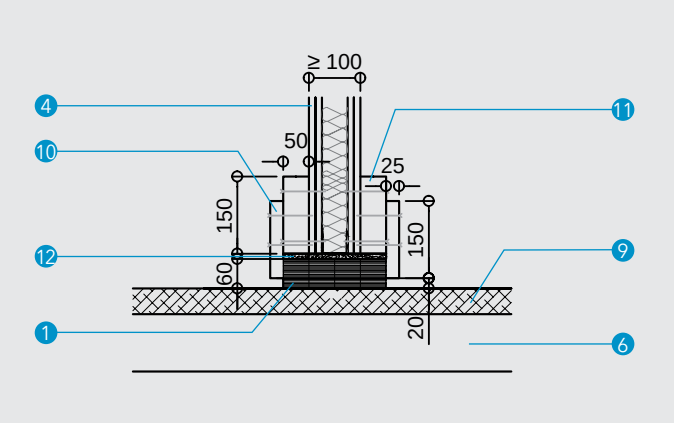
Large PE-HD pipes with flexible elastomeric foam (FEF) insulation
PE-HD pipes in accordance with EN 1519-1 and EN 12666-1 with flexible elastomeric foam insulation (K-flex insulation /factory made FEF/, made in accordance with EN 14304:2009+A1:2013, with apparent density of 45 - 70 kg/m^3 and reaction to fire class B_L-s2, d0 in accordance with EN 13501-1).

Supporting construction
The listed classification (see Table 3) is valid for penetration seals in flexible walls made of gypsum plasterboards type F or DF with steel or timber studs substructure, thickness equal to or greater than given in appropriate point (min. two layers of gypsum plasterboards type F or DF with overall board layer thickness equal to or greater than 25 mm), with fire resistance class (classified according to EN 13501-2) equal to or greater than given in appropriate point. In case of supporting constructions with timber studs no part of the penetration seal is closer than 100 mm to a stud, the cavity is closed between the penetration seal and the stud and minimum 100 mm of insulation of class A1 or A2 according to EN 13501-1 is provided within the cavity between the penetration seal and the stud. The classification is valid in walls made of concrete, reinforced concrete, aerated concrete, ceramic brick, cavity brick, checker brick, with density greater than or equal to 600 kg/m^3 and thickness equal to or greater than given in appropriate point, with fire resistance class (classified according to EN 13501-2) equal to or greater than given in appropriate point.

Supporting distance
The pipes must be suspended/supported ≤ 300 mm on both sides of the wall.

Minimum distance between the penetration seals
The minimum distance between the adjacent penetration seals is 100 mm.

Seal sizes, annular gap
Size of the gap between the service (wrap or insulation) filled with mineral wool density of 140 kg/m^3 and gypsum mortar (12) cannot be greater than 30 mm (width of the ring around the service).



Detail N – Penetration seal of large plastic pipes with combustible insulation, sealed with use of PROMASTOP®-W wraps in wall

Detail N
Penetration seal type 1:
The penetration seal is made with use of PROMASTOP®-W (1) and PROMATECT®-L500 boards (10, 11). The wraps are placed centrally in the penetration seals, wrapped on the insulation in 4 rows, each with 24 layers dimensions of 50 x 2,5 mm (width x thickness of each layer). The space between the supporting construction and wrap is filled with mineral wool density of 140 kg/m^3 and gypsum mortar (used along the edges of the opening). The supporting construction is thickened using two layers of PROMATECT®-L500 boards (10, 11) mounted on both sides, in the place where wraps are mounted. The first layer of the boards, thickness of 50 mm (11) is fixed above the wraps, by means of steel screws dimensions of 5,0 x 80 mm, arranged in 200 mm distance. Second layer of the boards (closing plate), thickness of 25 mm (10) is fixed by means of steel screws dimensions of 5,0 x 80 mm in such a way that it partially cover the wraps, leaving a 20 mm wide clearance.

Penetration seal type 2:
Practically the same as type 1 but the closing plate, thickness of 25 mm (10) is fixed by means of steel screws dimensions of 5,0 x 80 mm in such a way that it fully cover the wraps. The classification is the same as for type 1 (see Table 5).

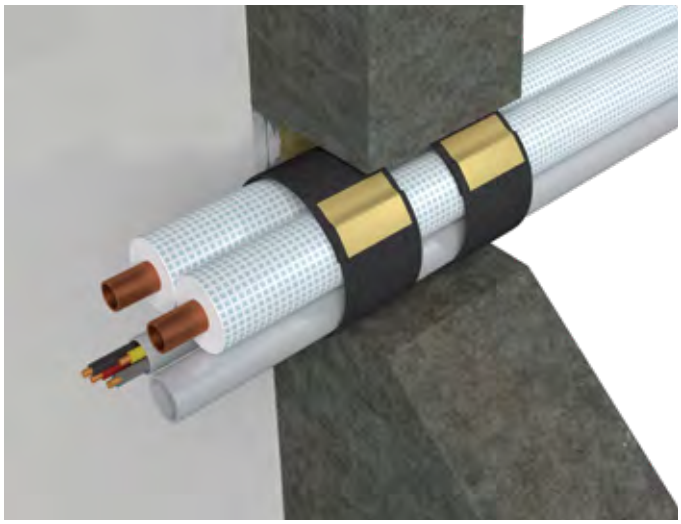
Table 5 – Overview of pipe materials, dimensions, installation situations and classifications

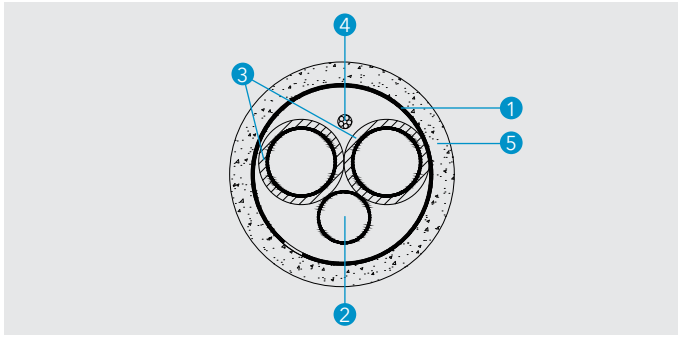
Requirement		Dimension range Ø: outer pipe diameter [mm] s: pipe wall thickness [mm] d: insulation thickness [mm]	Intumescent material rows x layers x (width x thickness of each layers) [mm]	Classification
Rigid wall	Flexible wall			
PE-HD, PE, ABS, SAN+PVC pipes				
Construction thickness ≥ 100 mm	Construction thickness ≥ 100 mm	Ø ≤ 710 mm, s 42,1 mm, d 50 mm, CS configuration	4 x 24 x (50 x 2,5)	EI 120-C/C with combustible insulation B_L-s2, d0

4. PROMASTOP®-W penetration seal for air-conditioning systems

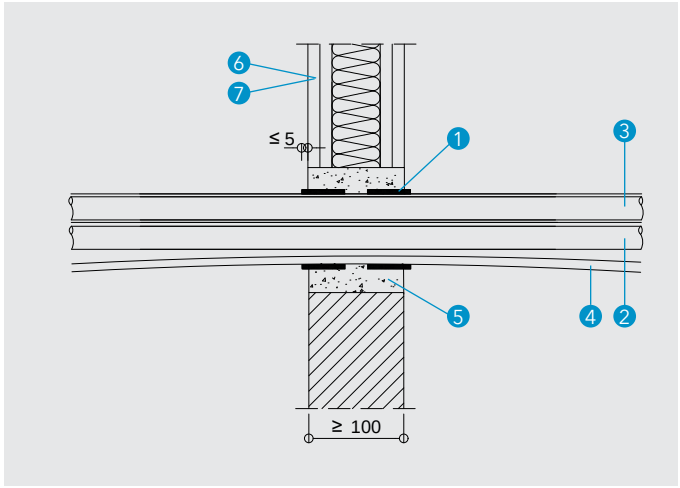
Mixed bundle

Copper pipes with Tubolit S (PE) insulation with additional cable(s) and PVC-U pipe(s). See the details in the classification table.





Detail O – Wrap view



Detail P – Penetration seal of mixed bundle, sealed with use of PROMASTOP®-W double wrap in flexible or rigid wall

Technical data

1. PROMASTOP®-W
2. Plastic pipe
3. Copper pipes with combustible insulation
4. Cable(s) 5 x 1,5 mm²
5. Cement mortar, e.g. PROMASTOP®-M
6. Rigid wall
7. Flexible wall
8. Rigid floor

Certificates: ETA-14/0456, ITB CR 01633.1/21/R164NZP

Customer benefit

- Wrap placed around the mixed bundle of insulated copper pipe(s), PVC-U pipe(s) and cable(s)

Fields of application

Details under 3.1. Fields of application.

Mixed bundle in flexible or rigid wall (wraps on both sides):

- copper pipes (max. 2 pipes, Ø ≤ 22,2 mm, pipe wall thickness ≥ 0,8 mm) with Tubolit S (PE) insulation (or other insulation with the same reaction to fire class, thickness 9,0 mm), more details in Table 6,
- PVC-U pipe Ø ≤ 42 mm, pipe wall thickness of 2,9 mm,
- cable 5 x 1,5 mm².

Mixed bundle A in rigid floor (wrap on the bottom side only):

- copper pipes (max. 2 pipes, Ø ≤ 22,2 mm, pipe wall thickness ≥ 0,8 mm) with Tubolit S (PE) insulation (or other insulation with the same reaction to fire class, thickness 9,0 mm), more details in Table 6,
- PVC-U pipe Ø ≤ 32 mm, pipe wall thickness of 1,9 mm,
- cable 5 x 1,5 mm².

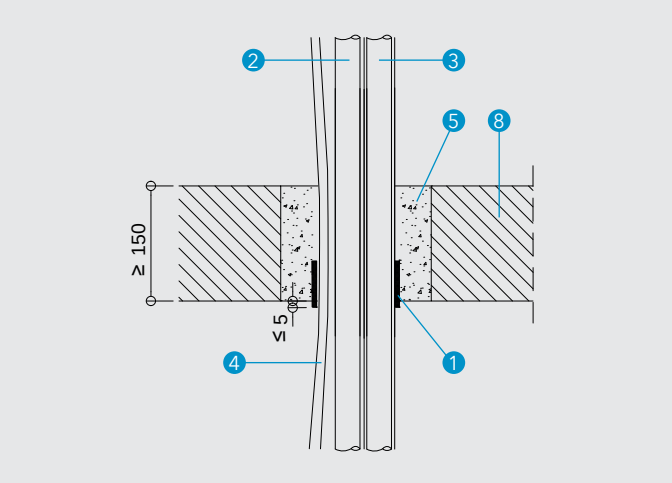
Mixed bundle B in rigid floor (wrap on the bottom side only):

- copper pipes (max. 4 pipes, Ø ≤ 22,2 mm, pipe wall thickness ≥ 1,0 mm) with Tubolit S (PE) insulation (or other with the same reaction to fire class, thickness 9,0 mm), more details in Table 6,
- PVC-U pipes (max. 2 pipes), Ø ≤ 32 mm, pipe wall thickness of 1,9 mm,
- cables (max. 2 pieces) 5 x 1,5 mm².

The above mentioned conduits are the maximum bunch which can be inserted in a single penetration seal. The number of elements in a penetration can be smaller or with smaller diameter.

Details O and P

PROMASTOP®-W wraps are placed on both sides of the wall in flexible or rigid wall supporting construction and it protrudes 2 - 5 mm beyond the surface of the wall. The wrap should fit tightly around the pipe. Find the required number of layers of PROMASTOP®-W wrap are presented in Table 6. The gap between the supporting construction and services, width of 10 – 40 mm is filled with gypsum or cement mortar.



Detail Q – Penetration seal of mixed bundle, sealed with use of PROMASTOP®-W wrap in rigid floor

Detail Q

PROMASTOP®-W single wrap is placed on the bottom side of the floor in rigid floor supporting construction and it protrudes 2 - 5 mm beyond the surface of the floor. The wrap should fit tightly around the pipe. Find the required number of layers of PROMASTOP®-W wrap in Table 6. The gap between the supporting construction and services, width of 10 – 40 mm is filled with cement mortar.

Table 6 – Overview of pipe materials, dimensions, installation situations and classifications

Requirement			Dimension range Ø: copper pipe(s), diameter [mm] s: copper pipe(s) wall thickness [mm] d: insulation thickness [mm]	Number of PROMASTOP®-W wrap layers	Classification
Rigid wall	Flexible wall	Rigid floor			
Mixed bundle: single or double copper pipe with Tubolit S (PE) insulation with additional cable 5 x 1,5 mm² and PVC-U pipe diameter of ≤ 42 mm and pipe wall thickness of 2,9 mm					
Construction thickness ≥ 100 mm	Construction thickness ≥ 100 mm		Ø ≤ 12,7 mm, s ≥ 0,8 mm, d 9 mm	L 2 (on both sides of the wall)	EI 120-U/C
			12,7 < Ø ≤ 22,2 mm, s ≥ 1,0 mm, d 9 mm	L 2 (on both sides of the wall)	EI 120-U/C
Mixed bundle: single or double copper pipe with Tubolit S (PE) insulation with additional cable 5 x 1,5 mm² and PVC-U pipe diameter of ≤ 32 mm and pipe wall thickness of 1,9 mm					
		Construction thickness ≥ 150 mm	Ø ≤ 12,7 mm, s ≥ 0,8 mm, d 9 mm	L 2 (on the bottom side of the floor)	EI 120-U/C
			12,7 < Ø ≤ 22,2 mm, s ≥ 1,0 mm, d 9 mm	L 2 (on the bottom side of the floor)	EI 120-U/C
Mixed bundle: single, double, triple or quadruple copper pipe with Tubolit S (PE) insulation with additional single or double cable 5 x 1,5 mm² and single or double PVC-U pipe diameter of ≤ 32 mm and pipe wall thickness of 1,9 mm					
		Construction thickness ≥ 150 mm	Ø ≤ 22,2 mm, s ≥ 1,0 mm, d 9 mm	L 2 (on the bottom side of the floor)	EI 90-U/C

5. PROMASTOP®-W penetration seal for stainless steel and MLC (multi-layered pipes including metal layer(s)) pipes with combustible insulation

Fields of application
Details under 2. Fields of application.

Pype types
The listed pipe types are tested according the requirements of EN 1366-3 and EN 13882-3 and given by the rules of the direct and the extended fields of application.

- Geberit Mepla, Geberit PushFit, Viega Sanfix Fosta, Viega Raxofix, Viega Raxinox, Uponor UNI pipe, Uponor MLC pipe, Roth Alu-Laserplus, Uponor MPC pipe red, Uponor MPC pipe white, KE KELIT KELOX, KE KELIT KETRIX TRI01, KE KELIT HIT K06, REHAU RAUTITAN stabil, Pipelife Radopress

Combustible insulations
In flexible walls, rigid walls, CLT walls and shaft walls every type of combustible insulation of Class E or B-s3, d0 (acc. to EN 13501-1), with maximum thickness of 32 mm may be used. The thresholds for pipe diameter and insulation thickness are shown in the tables below.

Table 7 – Overview of pipe materials, dimensions, installation situations and classifications

Requirement						Dimension range Ø: outer pipe diameter [mm] s: pipe wall thickness [mm] d: insulation thickness [mm]	Number of wrap layers	Classification
Rigid wall	Rigid floor	Flexible wall	CLT wall	CLT floor	Shaft wall			
Geberit Mepla pipes for pipe penetrations at 90°								
Construction thickness ≥ 100 mm		Construction thickness ≥ 100 mm	Construction thickness ≥ 140 mm		Construction thickness ≥ 2 × 20 mm	Ø 16 - 75 mm, d 6 - 32 mm	L 1	EI 90-U/C with combustible insulation B-s3, d0
	Construction thickness ≥ 150 mm					Ø 16 - 75 mm, d 6 - 32 mm	L 1	EI 120-U/C with combustible insulation B-s3, d0
Construction thickness ≥ 100 mm	Construction thickness ≥ 150 mm	Construction thickness ≥ 100 mm	Construction thickness ≥ 140 mm	Construction thickness ≥ 140 mm	Construction thickness ≥ 2 × 20 mm	Ø 16 - 75 mm, d 4 - 13 mm	L 1	EI 90-U/C with combustible insulation E
Construction thickness ≥ 100 mm		Construction thickness ≥ 100 mm				Ø 16 mm, s 2,25 mm, d 13 mm, CS configuration	L 1	EI 120-U/C without insulation or with combustible insulation E
Geberit PushFit pipes for pipe penetrations at 90°								
Construction thickness ≥ 100 mm		Construction thickness ≥ 100 mm	Construction thickness ≥ 140 mm		Construction thickness ≥ 2 × 20 mm	Ø 16 - 25 mm, d 6 - 32 mm	L 1	EI 90-U/C with combustible insulation B-s3, d0
Construction thickness ≥ 100 mm		Construction thickness ≥ 100 mm				Ø 16 mm, s 2,0 mm → Ø 25 mm, s 2,5 mm	L 1	EI 120-U/C without insulation

Requirement						Dimension range Ø: outer pipe diameter [mm] s: pipe wall thickness [mm] d: insulation thickness [mm]	Number of wrap layers	Classification
Rigid wall	Rigid floor	Flexible wall	CLT wall	CLT floor	Shaft wall			
Geberit PushFit pipes for pipe penetrations at 90°								
Construction thickness ≥ 100 mm		Construction thickness ≥ 100 mm	Construction thickness ≥ 140 mm		Construction thickness ≥ 2 × 20 mm	Ø 16 - 25 mm, d 6 - 32 mm	L 1	EI 90-U/C with combustible insulation B-s3, d0
Construction thickness ≥ 100 mm		Construction thickness ≥ 100 mm				Ø 16 mm, s 2,0 mm → Ø 25 mm, s 2,5 mm	L 1	EI 120-U/C without insulation
Pipelife Radopress pipes for pipe penetrations at 90°								
Construction thickness ≥ 100 mm		Construction thickness ≥ 100 mm	Construction thickness ≥ 140 mm		Construction thickness ≥ 2 × 20 mm	Ø 16 - 63 mm, d 6 - 32 mm	L 1	EI 90-U/C with combustible insulation B-s3, d0
Construction thickness ≥ 100 mm		Construction thickness ≥ 100 mm	Construction thickness ≥ 140 mm		Construction thickness ≥ 2 × 20 mm	Ø 16 - 32 mm, d 4 - 9 mm	L 1	EI 90-U/C with combustible insulation E
	Construction thickness ≥ 150 mm					Ø 63 mm, s 4,5 mm d 32 mm, LS configuration, length 400 mm	L 1	E 120 EI 60-U/C with combustible insulation B-s3, d0
	Construction thickness ≥ 150 mm					Ø 63 mm, s 4,5 mm d 32 mm, LS configuration, length 400 mm	L 1 (on both sides of the floor)	EI 120-U/C with combustible insulation B-s3, d0
REHAU RAUTITAN stabil pipes for pipe penetrations at 90°								
Construction thickness ≥ 100 mm		Construction thickness ≥ 100 mm	Construction thickness ≥ 140 mm		Construction thickness ≥ 2 × 20 mm	Ø 16,2 - 40 mm, d 6 - 32 mm	L 1	EI 90-U/C with combustible insulation B-s3, d0
Construction thickness ≥ 100 mm		Construction thickness ≥ 100 mm	Construction thickness ≥ 140 mm		Construction thickness ≥ 2 × 20 mm	Ø 16,2 - 25 mm, d 4 - 13 mm	L 1	EI 90-U/C with combustible insulation E
	Construction thickness ≥ 150 mm					Ø 25 mm, s 3,7 mm d 13 mm, CS configuration	L 1 (on both sides of the floor)	EI 120-U/C with combustible insulation E
Viega Raxofix pipes for pipe penetrations at 90°								
Construction thickness ≥ 100 mm		Construction thickness ≥ 100 mm	Construction thickness ≥ 140 mm		Construction thickness ≥ 2 × 20 mm	Ø 16 - 63 mm, d 6 - 32 mm	L 1	EI 90-U/C with combustible insulation B-s3, d0

Requirement						Dimension range Ø: outer pipe diameter [mm] s: pipe wall thickness [mm] d: insulation thickness [mm]	Number of wrap layers	Classification
Rigid wall	Rigid floor	Flexible wall	CLT wall	CLT floor	Shaft wall			
Viega Sanfix Fosta pipes for pipe penetrations at 90°								
Construction thickness ≥ 100 mm		Construction thickness ≥ 100 mm	Construction thickness ≥ 140 mm		Construction thickness ≥ 2 × 20 mm	Ø 16 - 63 mm, d 6 - 32 mm	L 1	EI 90-U/C with combustible insulation B-s3, d0
	Construction thickness ≥ 150 mm					Ø 16 mm, s 2,2 mm → Ø 63 mm, s 4,5 mm d 6 - 32 mm, LS configuration, length 500 mm	L 1	EI 120-U/C with combustible insulation B-s3, d0
	Construction thickness ≥ 150 mm					Ø 20 mm, s 2,8 mm d 6 mm, CS configuration	L 1 (on both sides of the floor)	EI 120-U/C with combustible insulation E
Viega Raxinox pipes for pipe penetrations at 90°								
	Construction thickness ≥ 150 mm					Ø 16 mm, s 2,2 mm → Ø 20 mm, s 2,8 mm d 4 - 13 mm, CS configuration	L 1	EI 120-U/C with combustible insulation E
Uponor MLC pipes for pipe penetrations at 90°								
Construction thickness ≥ 100 mm		Construction thickness ≥ 100 mm	Construction thickness ≥ 140 mm		Construction thickness ≥ 2 × 20 mm	Ø 14 - 40 mm, d 6 - 32 mm Ø 75 mm, d 9 - 32 mm	L 1	EI 90-U/C with combustible insulation B-s3, d0
Construction thickness ≥ 100 mm		Construction thickness ≥ 100 mm	Construction thickness ≥ 140 mm		Construction thickness ≥ 2 × 20 mm	Ø 75 - 110 mm, d 6 - 32 mm additional insulation A2 (LS configuration, 200 mm on both sides)	L 1	EI 90-U/C with combustible insulation B-s3, d0
Construction thickness ≥ 100 mm		Construction thickness ≥ 100 mm	Construction thickness ≥ 140 mm		Construction thickness ≥ 2 × 20 mm	Ø 16 - 20 mm, d 4 - 13 mm Ø 25 mm, d 9 - 13 mm	L 1	EI 90-U/C with combustible insulation E
Uponor UNI pipes for pipe penetrations at 90°								
Construction thickness ≥ 100 mm		Construction thickness ≥ 100 mm	Construction thickness ≥ 140 mm		Construction thickness ≥ 2 × 20 mm	Ø 16 - 32 mm, d 6 - 32 mm	L 1	EI 90-U/C with combustible insulation B-s3, d0
Construction thickness ≥ 100 mm		Construction thickness ≥ 100 mm	Construction thickness ≥ 140 mm		Construction thickness ≥ 2 × 20 mm	Ø 16 - 25 mm, d 4 - 10 mm	L 1	EI 90-U/C with combustible insulation E
Uponor Aqua Pipe natural pipes for pipe penetrations at 90°								
	Construction thickness ≥ 150 mm					Ø 16 mm, s 2,2 mm, d 32 mm, LS configuration, length 400 mm	L 2	EI 120-U/C with combustible insulation B-s3, d0

Requirement						Dimension range Ø: outer pipe diameter [mm] s: pipe wall thickness [mm] d: insulation thickness [mm]	Number of wrap layers	Classification
Rigid wall	Rigid floor	Flexible wall	CLT wall	CLT floor	Shaft wall			
KE KELIT KELOX pipes for pipe penetrations at 90°								
Construction thickness ≥ 100 mm		Construction thickness ≥ 100 mm	Construction thickness ≥ 140 mm		Construction thickness ≥ 2 × 20 mm	Ø 14 - 40 mm, d 6 - 32 mm Ø 75 mm, d 9 - 32 mm	L 1	EI 90-U/C with combustible insulation B-s3, d0
Construction thickness ≥ 100 mm		Construction thickness ≥ 100 mm	Construction thickness ≥ 140 mm		Construction thickness ≥ 2 × 20 mm	Ø 14 - 32 mm, d 4 - 13 mm	L 1	EI 90-U/C with combustible insulation E
KE KELIT HIT K06 pipes for pipe penetrations at 90°								
Construction thickness ≥ 100 mm		Construction thickness ≥ 100 mm	Construction thickness ≥ 140 mm		Construction thickness ≥ 2 × 20 mm	Ø 20 - 63 mm, d 6 - 32 mm Ø 90 mm, d 6 mm	L 1	EI 90-U/C with combustible insulation B-s3, d0
Construction thickness ≥ 100 mm		Construction thickness ≥ 100 mm	Construction thickness ≥ 140 mm		Construction thickness ≥ 2 × 20 mm	Ø 63 - 90 mm, d 6 - 32 mm	L 2	EI 90-U/C with combustible insulation B-s3, d0
KE KELIT KETRIX TRI01 pipes for pipe penetrations at 90°								
Construction thickness ≥ 100 mm		Construction thickness ≥ 100 mm	Construction thickness ≥ 140 mm		Construction thickness ≥ 2 × 20 mm	Ø 20 - 63 mm, d 6 - 32 mm Ø 90 mm, d 6 mm	L 1	EI 90-U/C with combustible insulation B-s3, d0
Construction thickness ≥ 100 mm		Construction thickness ≥ 100 mm	Construction thickness ≥ 140 mm		Construction thickness ≥ 2 × 20 mm	Ø 63 - 90 mm, d 6 - 32 mm	L 2	EI 90-U/C with combustible insulation B-s3, d0
Roth Alu-Laserplus pipes for pipe penetrations at 90°								
Construction thickness ≥ 100 mm		Construction thickness ≥ 100 mm				Ø 14 mm, s 2,0 mm → Ø 63 mm, s 4,5 mm d 6 – 32 mm, LS configuration, length 500 mm, except Ø 63 mm, d 32 mm	L 1	EI 120-U/C with combustible insulation B-s3, d0
Construction thickness ≥ 100 mm		Construction thickness ≥ 100 mm				Ø 63 mm, d 32 mm, LS configuration, length 500 mm	L 1	E 120 EI 90-U/C with combustible insulation B-s3, d0
	Construction thickness ≥ 150 mm					Ø 14 mm, s 2,0 mm → Ø 63 mm, s 4,5 mm d 6 – 32 mm, LS configuration, length 500 mm,	L 1	EI 120-U/C with combustible insulation B-s3, d0

6. PROMASTOP®-W penetration seal for non-combustible pipes with combustible insulation

Fields of application

Details under 2. Fields of application.

Pype types

The listed pipe types are tested according the requirements of EN 1366-3 and EN 13882-3 and given by the rules of the direct and the extended fields of application:

- EN 1.0034 (E195) or better non-alloy steel (for example: Geberit Mapress, KE KELIT Steelfix)
- Copper pipes according to EN 1057

Combustible insulations

In flexible walls, rigid walls, shaft walls and soft penetration seals every type of combustible insulation of class B-s3, d0 (acc. to EN 13501-1), with a maximum thickness of 32 mm may be used. The thresholds for pipe diameter and insulation thickness are shown in the tables below.

Table 8 – Overview of pipe materials, dimensions, installation situations and classifications

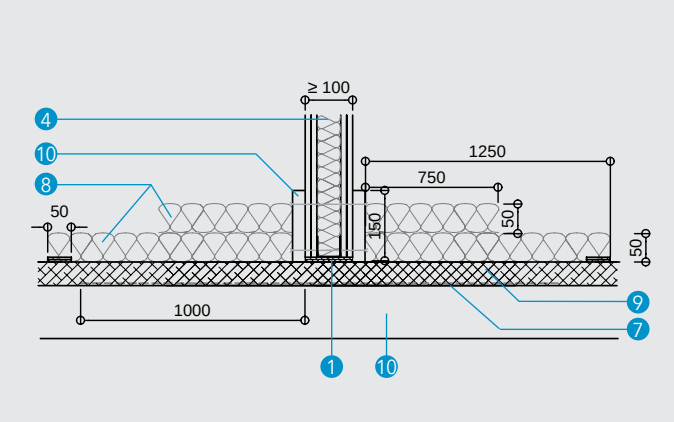
Requirement						Dimension range Ø: outer pipe diameter [mm] s: pipe wall thickness [mm] d: insulation thickness [mm]	Number of wrap layers	Classification
Rigid wall	Rigid floor	CLT wall	CLT floor	Flexible wall	Shaft wall			
Carbon (non-alloy) steel pipes for pipe penetrations at 90°								
Construction thickness ≥ 100 mm		Construction thickness ≥ 140 mm		Construction thickness ≥ 100 mm		Ø 15 - 42 mm, d 9 - 32 mm Ø 108 mm, d 32 mm	L 1	EI 90-U/C with combustible insulation B-s3, d0
	Construction thickness ≥ 150 mm		Construction thickness ≥ 140 mm			Ø 18 mm, s 1,0 - 14,2 mm, d 6 - 32 mm → Ø 42 mm, s 1,5 - 14,2 mm, d 6 - 32 mm	L 1 (on both sides of the floor)	EI 120-U/C with combustible insulation B-s3, d0 (d 6 – 32 mm, CS configuration)
Carbon (non-alloy) steel or copper pipes for pipe penetrations at 90°								
					Construction thickness ≥ 2 × 20 mm	Ø 15 - 42 mm, d 9 - 32 mm	L 1	EI 90-U/C with combustible insulation B-s3, d0
Copper pipes for pipe penetrations at 90°								
Construction thickness ≥ 100 mm		Construction thickness ≥ 140 mm		Construction thickness ≥ 100 mm		Ø 15 - 42 mm, d 9 - 32 mm Ø 88,9 mm, d 32 mm	L 1	EI 90-U/C with combustible insulation B-s3, d0
	Construction thickness ≥ 150 mm					Ø 18 mm, s 1,0 - 14,2 mm, d 6 mm	L 1	EI 120-U/C with combustible insulation B-s3, d0 (d 6 mm, LS configuration, length 800 mm)
	Construction thickness ≥ 150 mm					Ø 18 mm, s 1,2 - 14,2 mm, d 6 - 32 mm → Ø 42 mm, s 1,5 - 14,2 mm, d 6 - 32 mm	L 1 (on both sides of the floor)	EI 120-U/C with combustible insulation B-s3, d0 (d 6 – 32 mm, CS configuration)
			Construction thickness ≥ 140 mm			Ø 18 mm, s 1,2 - 14,2 mm, d 6 - 32 mm → Ø 42 mm, s 1,5 - 14,2 mm, d 6 - 32 mm	L 1 (on both sides of the floor)	EI 120-U/C with combustible insulation B-s3, d0 (d 6 - 32 mm) except Ø 42 mm, d 32 mm
			Construction thickness ≥ 140 mm			Ø 42 mm, s 1,5 - 14,2 mm, d 32 mm	L 1 (on both sides of the floor)	E 120 EI 90-U/C with combustible insulation B-s3, d0 (d 32 mm)

Large steel pipes with flexible elastomeric foam (FEF) insulation

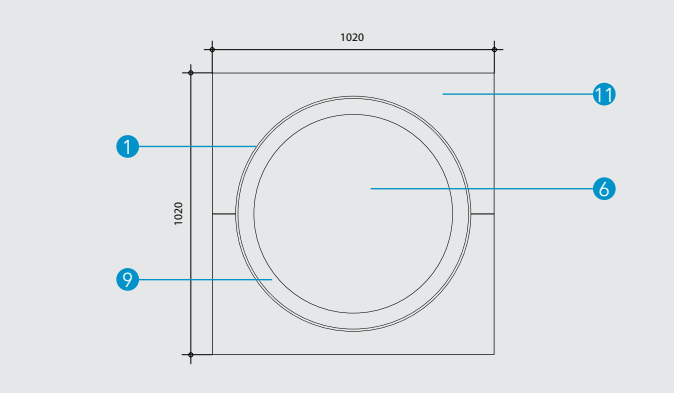
Steel pipes with flexible elastomeric foam insulation (K-flex insulation, made acc. to EN 14304:2009+A1:2013, with apparent density of 45 - 70 kg/m^3 and reaction to fire class B_L-s2, d0 in accordance with EN 13501-1).

Supporting construction

The listed classification (see Table 6) is valid for penetration seals in flexible walls made of gypsum plasterboards type F or DF with steel or timber studs substructure, thickness equal to or greater than given in appropriate point (min. two layers of gypsum plasterboards type F or DF with overall board layer thickness equal to or greater than 25 mm), with fire resistance class (classified according to EN 13501-2) equal to or greater than given in appropriate point. In case of supporting constructions with timber studs no part of the penetration seal is closer than 100 mm to a stud, the cavity is closed between the penetration seal and the stud and minimum 100 mm of insulation of class A1 or A2 according to EN 13501-1 is provided within the cavity between the penetration seal and the stud. The classification is valid in walls made of concrete, reinforced concrete, aerated concrete, ceramic brick, cavity brick, checker brick, with density greater than or equal to 600 kg/m^3 and thickness equal to or greater than given in appropriate point, with fire resistance class (classified according to EN 13501-2) equal to or greater than given in appropriate point.



Detail R – Penetration seal of large steel pipes with combustible insulation, sealed with use of PROMASTOP®-W wraps in wall - seal type 3



Detail S – Seal view

Supporting distance

The pipes must be suspended/supported ≤ 300 mm on both sides of the wall.

Minimum distance between the penetration seals

The minimum distance between the adjacent penetration seals is 100 mm.

Seal sizes, annular gap

Size of the gap between the service (wrap or insulation) filled with mineral wool density of 140 kg/m^3 and gypsum mortar (12) cannot be greater than 30 mm (width of the ring around the service).

Details R, S and T

Penetration seal type 1:

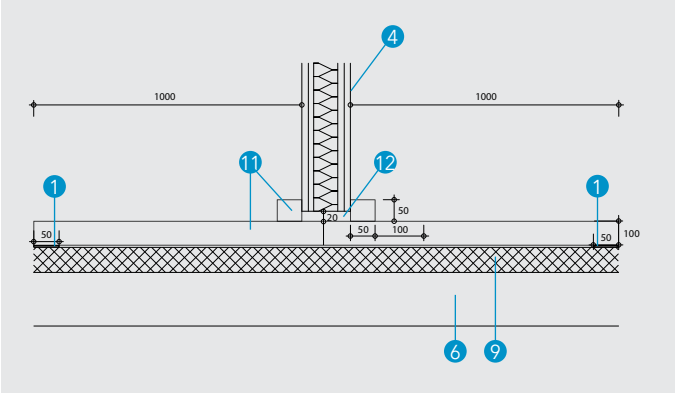
The penetration seal is made with use of PROMASTOP®-W wrap (1) and PROMATECT®-L500 boards. The wraps are placed on the ends of the casing made of PROMATECT®-L500 boards, wrapped on the insulation in 1 row with 2 layers dimensions of 50 x 2,5 mm (width x thickness of each layer). The casing is made of PROMATECT®-L500 boards thickness of 50 mm (11), mounted inside the supporting construction and outside on the length of 1000 mm on each side. The casing is closed on each side by means of PROMATECT®-L500 boards thickness of 50 mm, with opening fitted to the installation sizes. The plates of the casing are connected by means of steel staples dimensions of 80/12,2/2,03 mm, arranged in 150 mm distance. Two strips of PROMATECT®-L500 boards dimensions of 50 x 50 mm are additionally fixed to the supporting construction and the casing, by means of steel staples dimensions of 80/12,2/2,03 mm, arranged in 150 mm distance. The space between the boards of casing and supporting construction is filled with gypsum mortar. See the classification in Table 9.

Penetration seal type 2:

Practically the same as penetration seal type 1 but the the casing is closed on each side by means of minimum two PROMATECT®-L500 boards (instead of one), each thickness of min. 50 mm (overall minimum thickness of 100 mm), with opening fitted to the installation sizes. See the classification in Table 9.

Penetration seal type 3:

The penetration seal is made with use of PROMASTOP®-W (1) and PROMATECT®-L500 boards, PROMASTOP®-CC coating and additional insulation made of mineral wool density of 100 kg/m^3. Pipe is covered with PROMASTOP®-CC (under the FEF insulation) on both sides on the length of 1000 mm from the wall surface with dry layer thickness of 2 mm. The wraps are placed on the ends of the first layer of mineral wool insulation and in the center of the penetration. The wraps are placed on the FEF insulation, on each side 1 row with 2 layers dimensions of 50 x 2,5 mm (width x thickness of each layer) and in the penetration seal center 2 rows with 2 layers



Detail T – Penetration seal of large steel pipes with combustible insulation, sealed with use of PROMASTOP®-W wraps in wall - seal type 1

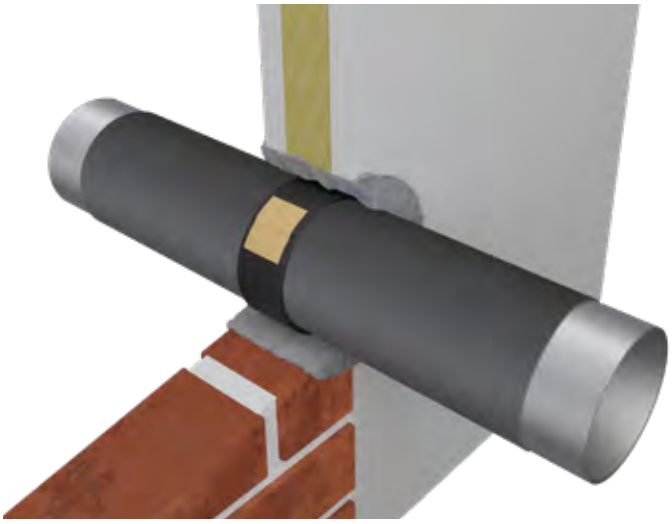
dimensions of 50 x 2,5 mm (width x thickness of each layer). The wraps and FEF insulation are additionally covered with two layers of mineral wool insulation – first layer thickness of 50 mm and length of 1000 mm (from the wall surface), second layer thickness of 50 mm and length of 500 mm (from the wall surface). The supporting construction is thickened by means of PROMATECT-L500 boards thickness of 25 mm, fixed on both sides of the wall by means of steel screws dimensions of 5,0 x 80 mm, arranged in 200 mm distance. See the classifications in Table 9.

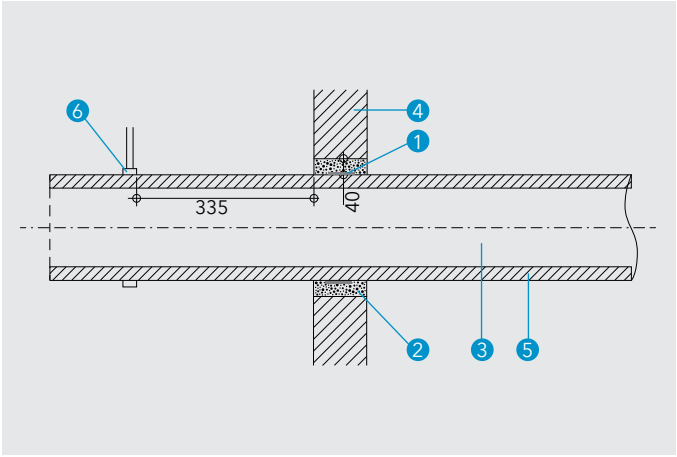
Classification given in Table 9 covers steel and pipe materials with a thermal conductivity lower than steel, subject to the material having a melting point at least equal to the copper or greater than:

- 739 °C for the fire resistance class 15 min,
- 782 °C for the fire resistance class 20 min,
- 843 °C for the fire resistance class 30 min,
- 903 °C for the fire resistance class 45 min,
- 946 °C for the fire resistance class 60 min,
- 1006 °C for the fire resistance class 90 min,
- 1049 °C for the fire resistance class 120 min.

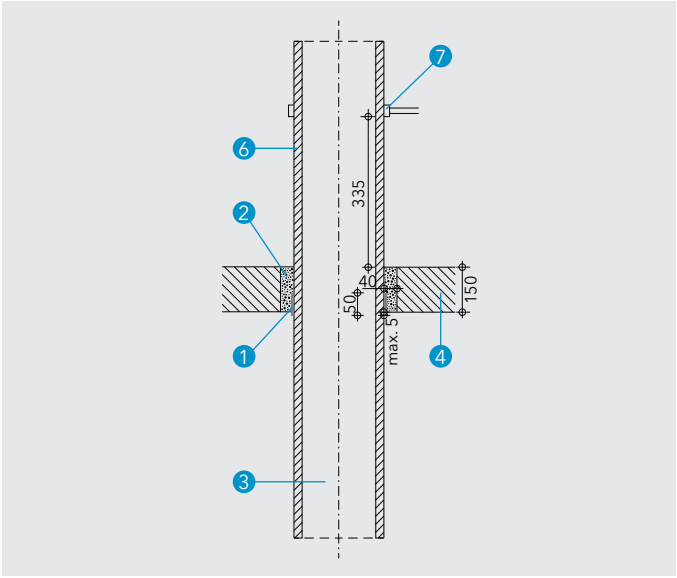
Table 9 – Overview of pipe materials, dimensions, installation situations and classifications

Requirement		Dimension range Ø: outer pipe diameter [mm] s: pipe wall thickness [mm] d: insulation thickness [mm]	Intumescent material rows x layers x (width x thickness of each layers) [mm]	Classification
Rigid wall	Flexible wall			
Penetration seal type 1				
Construction thickness ≥ 100 mm	Construction thickness ≥ 100 mm	Ø ≤ 610 mm, s 7,1 - 14,2 mm, d 50 mm, CS configuration	1 x 2 x (50 x 2,5) wraps are placed on the ends of the casing	E 120 / EI 90-C/C with combustible insulation B_L-s2, d0
Penetration seal type 2				
Construction thickness ≥ 100 mm	Construction thickness ≥ 100 mm	Ø ≤ 610 mm, s 7,1 - 14,2 mm, d 50 mm, CS configuration	1 x 2 x (50 x 2,5) wraps are placed on the ends of the casing	EI 120-C/C with combustible insulation B_L-s2, d0
Penetration seal type 3				
Construction thickness ≥ 100 mm	Construction thickness ≥ 100 mm	Ø ≤ 610 mm, s 7,1 - 14,2 mm, d 50 mm, CS configuration + additional mineral wool 50 x 1000 mm and 50 x 500 mm	1 x 2 x (50 x 2,5) wraps are placed on the ends of the mineral wool insulation 2 x 2 x (50 x 2,5) wraps are placed on the center of the penetration seal	EI 60-C/C with combustible insulation B_L-s2, d0





Detail U – Mortar penetration seal of metal pipes with combustible insulation, sealed with use of PROMASTOP®-W single wrap placed centrally in rigid wall



Detail V – Mortar penetration seal of metal pipes with combustible insulation, sealed with use of PROMASTOP®-W single wrap placed on the bottom side of the rigid floor

Technical data

1. PROMASTOP®-W
2. Cement mortar, e.g. PROMASTOP®-M
3. Metal pipe
4. Supporting construction
5. Combustible insulation
6. First place of support

Certificates: ETA-14/0456, ITB CR 01633.1/21/R164NZP

Customer benefit

- Single wrap placed centrally in the wall around the insulated metal pipe

Fields of application

Details under 3.1. Fields of application.

Metal pipes

The classifications given for metal (copper or steel) pipes are valid for pipe end configuration as follows:

- C/U, U/C and C/C in case of penetrations with "U/C" in classification code,
- C/C in case of penetrations with "C/C" in classification code.

Pipe insulation for metal pipes

The classifications given for pipes with AF/ArmaFlex (FEF, reaction to fire B-s3, d0 acc. to EN 13501-1) or with Tubolit S (PE, reaction to fire E for steel pipes or BL-s1, d0 for copper pipes in bundle) insulation concerns continuously insulated pipes (CS configuration) and does not cover local insulated nor non-insulated pipes. For this type of penetrations the thickness and density of the continuous insulation cannot be increased or reduced and the reaction to fire class (acc. to EN 13501-1) of the insulation shall remain the same as given. Classification is also valid for other flexible elastomeric foams (FEF) or for other PE foams made in accordance with appropriate product standard (EN 14304+A1 for FEF and EN 14313+A1 for PE) provided that the thickness and density of a continuous insulation is not increased or reduced and the reaction to fire class is same as given.

Detail U

Penetration seals of metal pipes with continuous AF/ArmaFlex (FEF) or Tubolit S (PE) insulation sealed with use of PROMASTOP®-W single wrap in rigid wall supporting construction. The wrap is placed centrally in the penetration seal, wrapped on the insulation. The thickness of the FEF or PE insulation and number of layers of PROMASTOP®-W wrap are presented in Table 10. The gap between the supporting construction and services, width of 10 – 40 mm is filled with cement mortar.

Detail V

Penetration seals of metal pipes with continuous AF/ArmaFlex (FEF) insulation sealed with use of PROMASTOP®-W single wrap in rigid floor supporting construction. The wrap is placed on the bottom of the floor, wrapped on the insulation. It protrudes 2 - 5 mm beyond the surface of the floor. The thickness of the FEF insulation and number of layers of PROMASTOP®-W wrap are presented in Table 10. The gap between the supporting construction and services, width of 10 – 40 mm is filled with cement mortar.

Table 10 – Overview of pipe materials, dimensions, installation situations and classifications

Requirement			Dimension range Ø: outer pipe diameter [mm] s: pipe wall thickness [mm] d: insulation thickness [mm]	Number of PROMASTOP®-W wrap layers	Classification
Rigid wall	Flexible wall	Rigid floor			
Steel pipes with AF/ArmaFlex (FEF) insulation (CS configuration) for pipe penetrations at 90°					
Construction thickness ≥ 100 mm			Ø ≤ 21,3 mm, s ≥ 2,3 mm, d 6 mm	L 3	EI 90 / E 120-U/C
			Ø ≤ 21,3 mm, s ≥ 2,3 mm, d 7 - 75 mm	L 3	EI 60 / E 90-U/C
			21,3 < Ø ≤ 108,0 mm, s 3,6 - 14,2 mm, d 75 mm	L 3	EI 60 / E 90-U/C
		Construction thickness ≥ 150 mm	Ø ≤ 15,0 mm, s 1,2 - 2,2 mm, d 6 mm	L 3	EI 120-U/C
			Ø ≤ 15,0 mm, s 1,2 - 2,2 mm, d 7 - 75 mm	L 3	EI 60-U/C
			Ø ≤ 15,0 mm, s ≥ 2,3 mm, d 6 - 75 mm	L 3	EI 90-U/C
			15,0 < Ø ≤ 21,3 mm, s 2,0 - 2,2 mm, d 9 mm	L 3	EI 90-U/C
			15,0 < Ø ≤ 21,3 mm, s ≥ 2,3 mm, d 6 mm	L 3	EI 120-U/C
			15,0 < Ø ≤ 21,3 mm, s ≥ 2,3 mm, d 7 - 75 mm	L 3	EI 90-U/C
			21,3 < Ø ≤ 108,0 mm, s 2,0 - 3,5 mm, d 9 mm	L 3	EI 90-U/C
			21,3 < Ø ≤ 108,0 mm, s 3,6 - 14,2 mm, d 9 - 75 mm	L 3	EI 90-U/C
			108,0 < Ø ≤ 168,9 mm, s 3,6 - 14,2 mm, d 9 mm	L 3	EI 90-U/C
			108,0 < Ø ≤ 168,9 mm, s 3,6 - 14,2 mm, d 10 - 75 mm	L 3	EI 60-U/C
			168,9 < Ø ≤ 219,1 mm, s 4,0 - 14,2 mm, d 9 - 50 mm	L 3	EI 60-U/C
Steel pipes with Tubolit S (PE) insulation for pipe penetrations at 90°					
Construction thickness ≥ 100 mm			Ø ≤ 21,3 mm, s 2,3 - 2,8 mm, d 9 - 22 mm	L 3	EI 90 / E 120-U/C
			Ø ≤ 21,3 mm, s ≥ 2,9 mm, d 9 - 22 mm	L 3	EI 90 / E 120-U/C
			Ø ≤ 21,3 mm, s ≥ 2,9 mm, d 23 - 25 mm	L 3	EI 60 / E 120-U/C
			21,3 < Ø ≤ 76,1 mm, s 2,9 - 3,5 mm, d 25 mm	L 3	EI 60 / E 120-U/C
			21,3 < Ø ≤ 76,1 mm, s 3,6 - 14,2 mm, d 18 - 25 mm	L 3	EI 60 / E 120-U/C
			76,1 < Ø ≤ 108,0 mm, s 3,6 - 14,2 mm, d 18 - 25 mm	L 3	EI 60 / E 120-U/C

7.Information about the minimum distances from PROMASTOP®-W

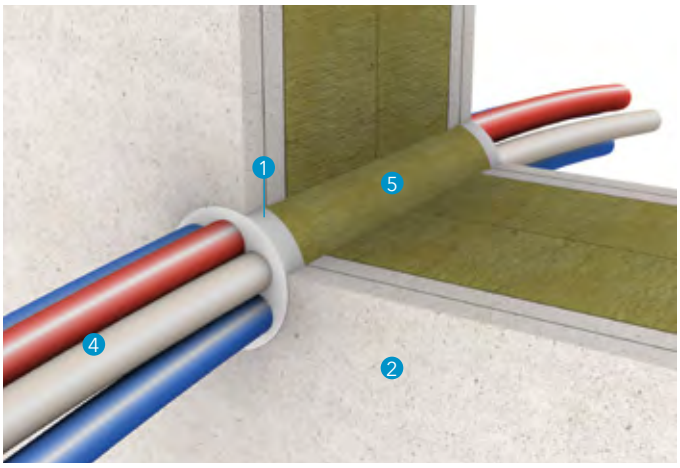
Table 11

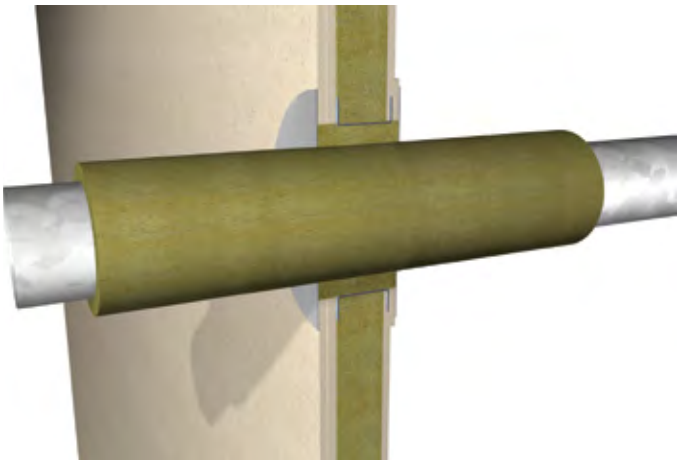
Sufficient space needs to be provided for the construction of professional applications. For practical and physical reasons, we recommend observing a minimum distance of 100 mm between installed objects and support construction/component framing during planning.

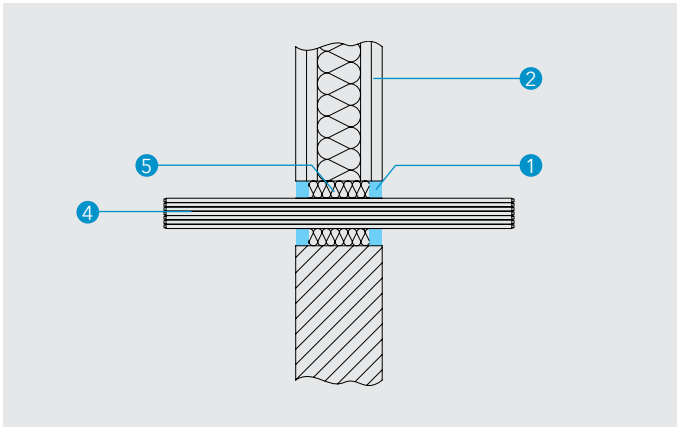
If this is impossible due to the situation on the construction site, the permitted minimum distances shall be taken from Table 11.

Table 11 – Minimum distances

Object	Minimum distance [mm]
PROMASTOP®-W – PROMASTOP®-FC	0
PROMASTOP®-W – PROMASTOP®-W	0
PROMASTOP®-W – PROMASTOP®-IM-CJ21	0
PROMASTOP®-W – PROMASEAL®-AG	0
PROMASTOP®-W – PROMASEAL®-A	0
PROMASTOP®-W – PROMATECT® ducts	30
PROMASTOP®-W – Supporting construction/aperture framing	0
PROMASTOP®-W – Non-combustible insulation	0
Between all other objects not further defined	100







Detail A – PROMASEAL®-A cable penetration seal in flexible and rigid wall

Technical data

1. PROMASEAL®-A
2. Supporting construction
3. Non-combustible pipes
4. Cable bundles
5. Mineral wool backfilling, density ≥ 40 kg/m³
6. Non-combustible insulation

Certificate: ETA-14/0107, IBS CR 13061203

Customer benefit

- Penetration seal for single cables and cable bundles
- Penetration seal for single metal pipe in core drilled hole
- Use category Y_1 and Y_2
- Universally usable

1. Installation

- Supporting distance on both sides of walls or from the top of the floor ≤ 250 mm.
- Clean the framing.
- Moisten absorbent substrates with water.
- Apply the backfilling material with 50% compression.
- Insert the sealant (pay attention to edge adhesion).
- Smoothen the sealant surface.
- Label the penetration seal.

2. Fields of application

Details A – E

PROMASEAL®-A is a penetration sealing option for single cables and cable bundles in rigid walls and floors as well as in flexible walls.

Tables 1 - 10

Different classifications will result depending on the construction structures of the walls and floors.

Table 1 – Flexible and rigid wall (Detail A)

Wall thickness	≥ 100 mm
Annular gap width	≤ 20 mm
Annular gap depth	≥ 15 mm
Mineral wool backfilling	Class A1 (mineral wool, ceramic wool,...), melting point ≥ 1000 °C
Density of backfilling	≥ 40 kg/m³

Flexible walls

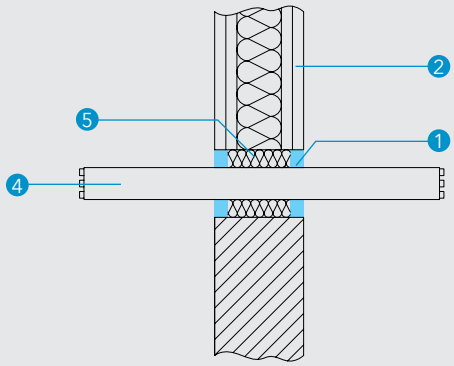
The wall must have a minimum thickness of 100 mm and comprise timber or steel studs lined on both faces with minimum 2 layers of minimum 12,5 mm thick boards. For timber stud walls there must be a minimum distance of 100 mm of the seal to any stud and the cavity between stud and seal must be closed and minimum 100 mm insulation of class A1 or A2 (in accordance with EN 13501-1) in the cavity between stud and seal.

Rigid walls

The wall must have a minimum thickness of 100 mm or 150 mm and consist of concrete, aerated concrete or masonry, with a minimum density of 450 kg/m³.

Table 2 – Classification overview in walls

Electrical installations	Classification
Sheathed single cable ≤ 4 × 10 mm² (H07RN-F 4 G 10 SW or equivalent)	EI 120
Sheathed single cable ≤ 3 × 150 mm² (N2XSEY or equivalent)	EI 120
Cable bundle with 26 pieces of sheathed single cables ≤ 5 × 1,5 mm² (H07RN-F or equivalent)	EI 120
Cable bundle with 20 pieces of sheathed single cables ≤ 2 × 0,6 mm² (control, power, data, signal, telecommunication, optical fibre cables or equivalent)	E 120 EI 90
All sheathed cables types: Ø ≤ 21 mm (control, power, data, signal, telecommunication, optical fibre cables or equivalent)	E 120 EI 90
Tied cable bundles: Ø ≤ 100 mm, sheathed cables with a single cable, max. diameter: 21 mm	E 120 EI 90
Blank penetration seal: Ø ≤ 200 mm (max. seal 0,03 m²)	EI 120



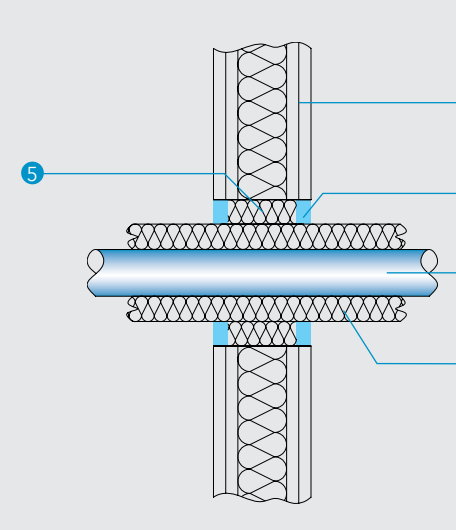
Detail B – PROMASEAL®-A cable penetration seal in flexible and rigid wall

Table 3 – Flexible and rigid wall (Detail B)

Wall thickness	≥ 150 mm
Annular gap width	≤ 20 mm
Annular gap depth	≥ 15 mm
Mineral wool backfilling	Class A1 (mineral wool, ceramic wool,…), melting point ≥ 1000 °C
Density of backfilling	≥ 40 kg/m³

Table 4 – Classification overview in walls

Electrical installations	Classification
Sheathed single cables ≤ 3 × 150 mm² (H07Z-K or equivalent)	EI 120
Cable bundles Ø ≤ 90 mm of sheathed single cables ≤ 3 × 1,5 mm² (NYY-O or equivalent)	EI 120



Detail C – Annular gap filling with PROMASEAL®-A for a steel pipe with non-combustible insulation

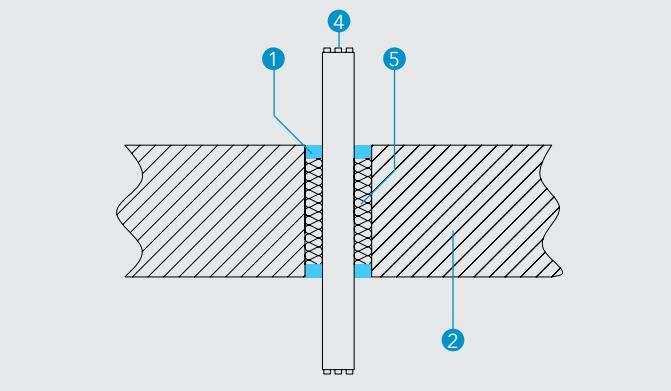
Table 5 – Flexible and rigid wall (Detail C)

Wall thickness	≥ 150 mm
Annular gap width	≤ 20 mm
Annular gap depth	≥ 15 mm
Mineral wool backfilling	Class A1 (mineral wool, ceramic wool,…), melting point ≥ 1000 °C
Density of backfilling	≥ 40 kg/m³
Steel pipes	Outer diameter ≥ 50 mm and ≤ 106 mm Pipe wall thickness ≥ 2 mm and ≤ 14,2 mm
Insulation version	CS (acc. to EN 1366-3)
Thickness of insulation	30 mm
Insulation density	40 kg/m³
Insulation	Min. Class A2-s1, d0 or $A2_L$-s1, d0 (mineral wool, ceramic wool,…), melting point ≥ 1000 °C

Table 6 – Classification overview in walls

Steel pipe requirement	Classification
Annular gap sealing on both sides with PROMASEAL®-A under the general conditions described above	EI 120-U/C

These results are also valid for other pipes with lower heat conductivity λ ≤ 58 W/mK and melting point ≥ 1100 °C (e.g. stainless steel, cast iron, Ni-alloys (NiCr, NiMo, NiCu).



Detail D – Cable penetration seal in rigid floor

Table 7 – Rigid floor (Detail D)

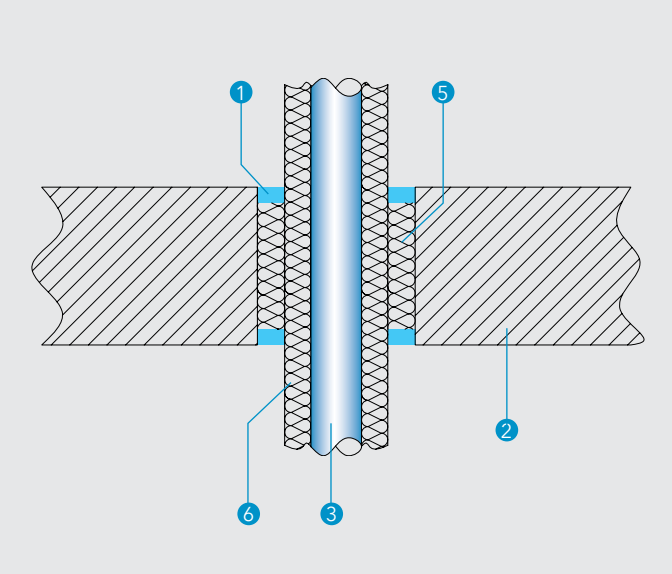
Floor thickness	≥ 150 mm
Annular gap width	≤ 20 mm
Annular gap depth	≥ 15 mm
Mineral wool backfilling	Class A1 (mineral wool, ceramic wool,…), melting point ≥ 1000 °C
Density of backfilling	≥ 40 kg/m³

Rigid floors

The floor must have a minimum thickness of 150 mm and consist of aerated concrete or concrete with a minimum density of 450 kg/m³.

Table 8 – Classification overview in the floor

Electrical installations	Classification
Sheathed single cables ≤ 4 × 10 mm² (H07RN-F 4 G 10 SW or equivalent)	EI 120
Sheathed single cables ≤ 3 × 150 mm² (N2XSEY or equivalent)	EI 120
Cable bundle with 26 sheathed single cables ≤ 5 × 1,5 mm² (H07RN-F or equivalent)	EI 120
Cable bundle with 20 sheathed single cables ≤ 2 × 0,6 mm² (control, power, data, signal, telecommunication, optical fibre cables or equivalent)	EI 120
Cable bundles Ø ≤ 90 mm of sheathed single cables ≤ 3 × 1,5 mm² (NYY-O or equivalent)	EI 120
All sheathed cables types: Ø ≤ 21 mm (control, power, data, signal, telecommunication, optical fibre cables or equivalent)	EI 120
Tied cable bundles: Ø ≤ 100 mm, sheathed cables with a single cable max. diameter: 21 mm	EI 120
Blank seal: Ø ≤ 200 mm (max. seal 0,03 m²)	EI 120



Detail E – Annular gap filling for steel pipes with non-combustible insulation in rigid floor

Table 9 – Rigid floor (Detail E)

Floor thickness	≥ 150 mm
Annular gap width	≤ 20 mm
Annular gap depth	≥ 15 mm
Mineral wool backfilling	Class A1 (mineral wool, ceramic wool,…), melting point ≥ 1000 °C
Density of backfilling	≥ 40 kg/m³
Steel pipes	Outer diameter ≥ 50 mm and ≤ 106 mm Pipe wall thickness ≥ 2 mm and ≤ 14,2 mm
Insulation version	CS (acc. to EN 1366-3)
Thickness of insulation	30 mm
Insulation density	40 kg/m³
Insulation	Min. Class A2-s1, d0 or $A2_L$-s1, d0 (mineral wool, ceramic wool,…), melting point ≥ 1000 °C

Table 10 – Classification overview in the floor

Steel pipe requirement	Classification
Annular gap filling on top and below with PROMASEAL®-A under the general conditions described above	EI 120-U/C

These results are also valid for other pipes with lower heat conductivity λ ≤ 58 W/mK and melting point ≥ 1100 °C (e.g. stainless steel, cast iron, Ni-alloys (NiCr, NiMo, NiCu).

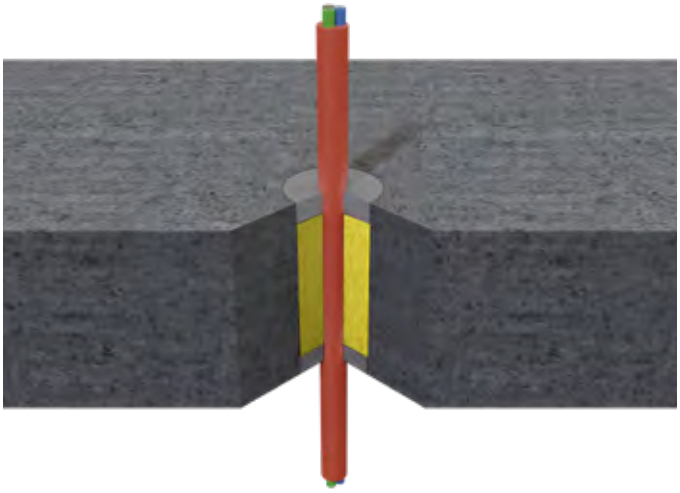
3.Information about the minimum distances from PROMASEAL®-A

Table 11

Distance between the PROMASEAL®-A penetration seals: ≥ 100 mm. Sufficient space needs to be provided for the construction of professional applications. For practical and physical reasons, we recommend observing a minimum distance of 100 mm between installed objects and support construction/component framing during planning.
If this is impossible due to the situation on the construction site, the permitted minimum distances shall be taken from Table 11.

Table 11 – Minimum distances

Object	Minimum distance [mm]
PROMASEAL®-A – PROMASTOP®-FC	0
PROMASEAL®-A – PROMASTOP®-W	0
PROMASEAL®-A – PROMASTOP®-IM CJ21	0
Between all other objects not further defined	100



Technical data

1. PROMASEAL®- AG, min. thickness 20 mm
2. Rigid floor
3. Rigid wall
4. Cable
5. Mineral wool backfilling, min. density 65 kg/m³

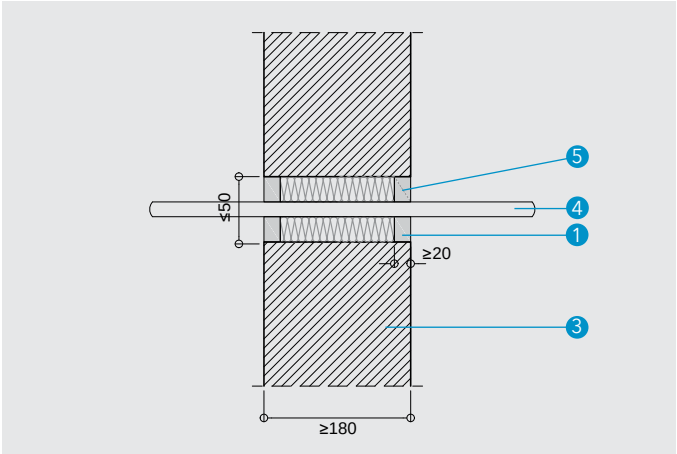
Certificates: ETA-16/0309, ITB CR 01633/22/R181NZP

1. Installation

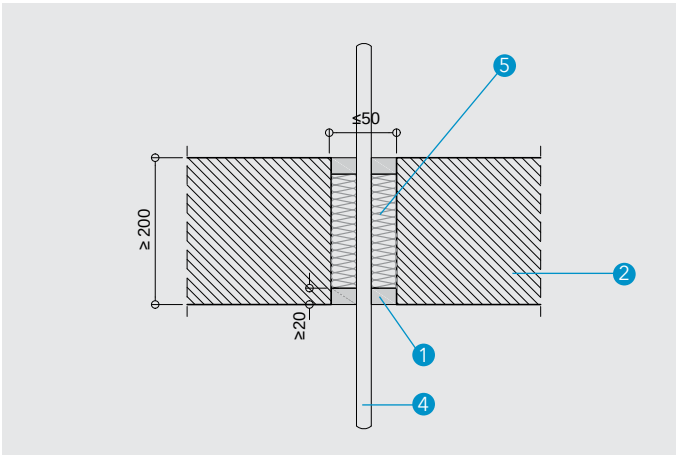
The penetrations of single cables (4) through rigid walls, thickness 180 mm, or rigid floors of min. thickness 200 mm are protected according to the fire resistance class EI 240 with utilisation of the PROMASEAL®-AG fire stopping sealant (1).

Detail A and B

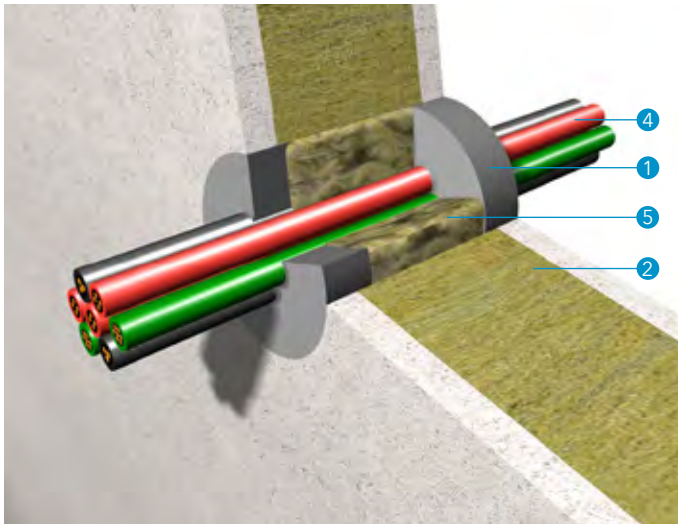
The penetrations of single cables through floors or walls are protected by filling the opening with mineral wool, min. density 65 kg/m3, and the rings placed around the cables on both the partition sides are sealed with the PROMASEAL®-AG (1) fire stopping sealant to the min. depth of 20 mm. The maximum opening diameter is 50 mm. The maximum cable diameter is 14 mm.

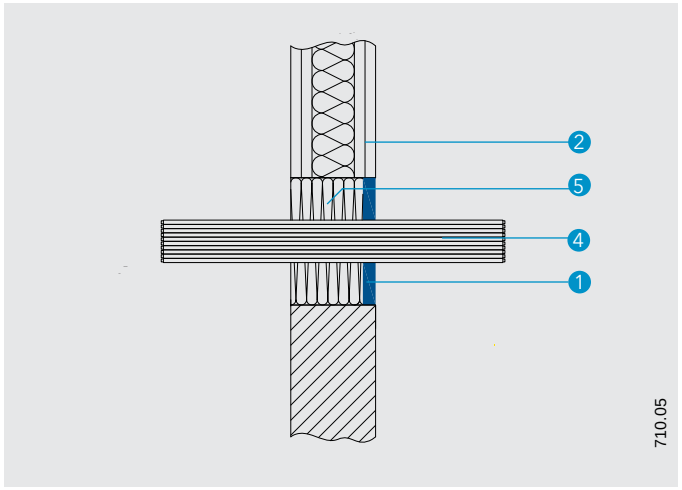


Detail A - Penetrations through walls

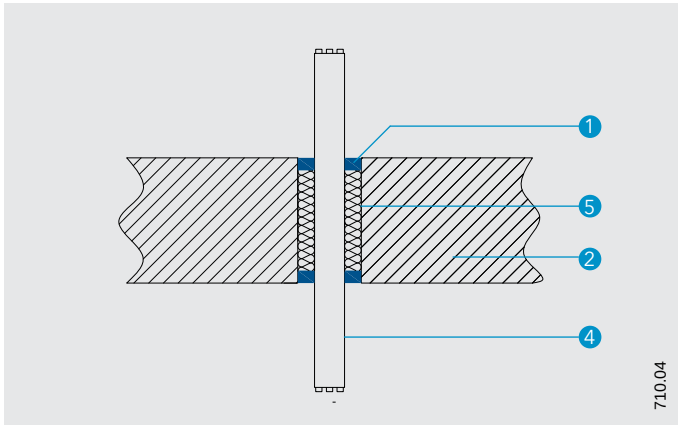


Detail B - Penetrations through floors





Detail A – PROMASEAL®-AG cable penetration seal in flexible and rigid wall



Detail B – PROMASEAL®-AG cable penetration seal in rigid floor

Technical data

1. PROMASEAL®- AG
2. Supporting construction
3. Non-combustible pipes
4. Cable bundles
5. Mineral wool backfilling, density ≥ 40 kg/m³
6. Non-combustible insulation
7. Plastic pipes

Certificates: ETA-16/0309, IBS KB 12042724-A,Rev1, CR 2016-Efectis-R000326

Customer benefit

- Penetration seal for cables, cable bundles, flexible conduits, plastic pipes as well as metal pipes with non-combustible insulation
- Universally usable
- There are several installation options: directly in the supporting construction or in the soft penetration seal (for details see PROMASTOP®-I and PROMASTOP®-CC)
- Use category Y_1 and Y_2

1. Installation

- Supporting distance on both sides of walls or from the top of the floor ≤ 250 mm.
- Clean the opening.
- Moisten absorbent substrates with water.
- Apply the backfilling material mineral wool (Class A1 acc. to EN 13501-1, melting point ≥ 1000 °C).
- Insert the sealant (pay attention to edge adhesion).
- Smoothen the sealant surface.
- Label the penetration seal.

2. Fields of application

Details A and B

Apply PROMASEAL®-AG according to the relevant classification in Tables 1, 2 and 4. The components (supporting constructions) must be classified acc. to EN 13501-2 for the required fire resistance period.

Flexible wall

The wall must have a thickness of ≥ 100 mm and have wooden or metal studs which are lined on both sides with a minimum of two layers of 12,5 mm thick boards (other board thicknesses shall be permissible, please note minimum thicknesses). For timber stud walls, a minimum distance of 100 mm must be kept from the sealing to each of the wooden studs and the cavity between stud and sealing must be filled with a least 100 mm of insulation material compliant to Class A1 or A2.

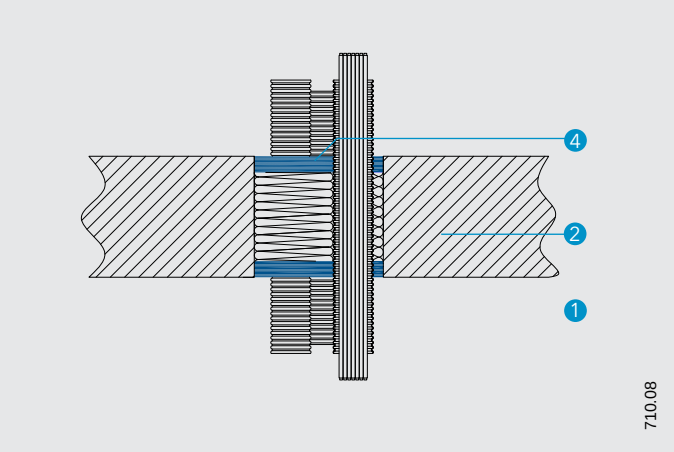
Rigid wall

The wall must have a thickness of ≥ 100 mm and a density of ≥ 450 kg/m³.

Rigid floor

The floor must have a thickness of ≥ 150 mm and a density of ≥ 650 kg/m³.

3. PROMASEAL®- AG cable penetration seal and blank penetration seal



Detail C - PROMASEAL®-AG penetration seal for bundles of flexible conduits in rigid floor

Detail C

Penetrations of cables, cable bundles and flexible conduits can be sealed with PROMASEAL®- AG.

Annular gap

Close the annular gap with Class A1 mineral wool acc. to EN 13501-1 with a melting point of ≥ 1000 °C and a density of ≥ 40 kg/m³.

Table 1

Cables include control, data, energy, signal, telecommunication, fibre-optic cables or equivalent cables. Depending on the installation situation, the classifications are shown in Table 1.

Table 1 – Overview of installations, dimensions, installation situations and classifications

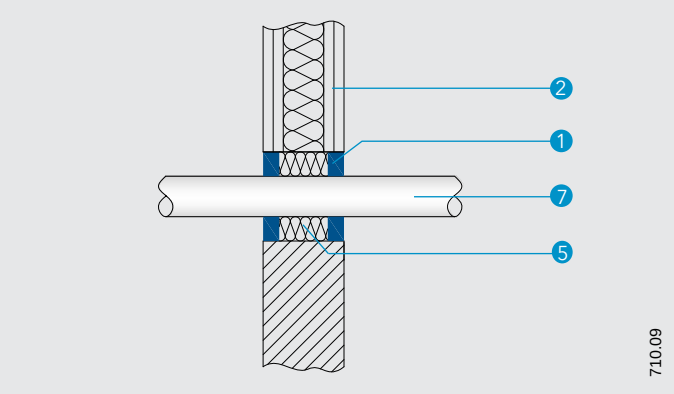
Installation situation	Dimension range Ø...Diameter [mm]	PROMASEAL®-AG installation	Orientation F: floor W: wall	Annular gap* width × depth [mm]	Classi-fication
Cable bundles Made from single cables Ø ≤ 15mm (CYKY 4Bx6 or equivalent), max. 36 single cables	Ø ≤ 100	unexposed side	W	25 × 20	EI 120
Cable bundles Made from single cables Ø ≤ 15mm (CYKY 4Bx6 or equivalent), max. 36 single cables	Ø ≤ 100	on top side	F	25 × 20	EI 120
Cable bundles Made from single cables Ø ≤ 15mm (CYKY 4Bx6 or equivalent), max. 36 single cables	Ø ≤ 100	both sides (backfilling polystyrene or higher rated)	W	25 × 15	E 120 EI 90
Cable bundles Made from single cables Ø ≤ 15mm (CYKY 4Bx6 or equivalent), max. 36 single cables	Ø ≤ 100	on top & underside (backfilling polystyrene or higher rated)	F	25 × 15	EI 120
Cable bundles from cables of cable group 1 Single cable Ø ≤ 21 mm	Ø ≤ 100	unexposed side	W	20 × 15	E 120 EI 90
Cable bundles from cables of cable group 1 Single cable Ø ≤ 21 mm	Ø ≤ 100	on top side	F	20 × 15	E 120 EI 60
Cable bundles from cables of cable group 1 Single cable Ø ≤ 21 mm	Ø ≤ 100	exposed side	W	20 × 15	E 120 EI 60
Cable bundles from cables of cable group 1 Single cable Ø ≤ 21 mm	Ø ≤ 100	on bottom side	F	20 × 15	E 120 EI 60
Cable bundles from cables of cable group 1 Single cable Ø ≤ 21 mm	Ø ≤ 100	one side	W	20 × 15	E 120 EI 60
Cable bundles from cables of cable group 1 Single cable Ø ≤ 21 mm	Ø ≤ 100	one side	F	20 × 15	E 120 EI 60
Cables of cable group 2	21 ≤ Ø ≤ 50	one side	W	20 × 15	E 120 EI 60
Cables of cable group 2	21 ≤ Ø ≤ 50	one side	F	20 × 15	E 120 EI 60
Cables of cable group 3	50 ≤ Ø ≤ 80	one side	W	20 × 15	EI 60
Cables of cable group 3	50 ≤ Ø ≤ 80	on bottom side	F	20 × 15	E 90 EI 60

Installation situation	Dimension range Ø...Diameter [mm]	PROMASEAL®-AG installation	Orientation F: floor W: wall	Annular gap* width × depth [mm]	Classi-fication
Cables of cable group 3	50 ≤ Ø ≤ 80	unexposed side	W	20 × 15	E 120 EI 60
Cables of cable group 3	50 ≤ Ø ≤ 80	on top side	F	20 × 15	EI 120
Cable bundles from cables of cable group 4 Single cable Ø ≤ 21 mm	Ø ≤ 100	exposed side	W	20 × 15	E 120 EI 60
Cable bundles from cables of cable group 4 Single cable Ø ≤ 21 mm	Ø ≤ 100	on top side	F	20 × 15	E 120 EI 60
Cable bundles from cables of cable group 4 Single cable Ø ≤ 21 mm	Ø ≤ 100	unexposed side	W	20 × 15	EI 120
Cable bundles from cables of cable group 4 Single cable Ø ≤ 21 mm	Ø ≤ 100	on bottom side	F	20 × 15	E 120 EI 60
Cable bundles from cables of cable group 4 Single cable Ø ≤ 21 mm	Ø ≤ 100	one side	W	20 × 15	E 120 EI 60
Cable bundles from cables of cable group 4 Single cable Ø ≤ 21 mm	Ø ≤ 100	one side	F	20 × 15	E 120 EI 60
Flexible conduits** (U/C) with or without cables	single Ø max. ≤ 50 mm	both sides	W	20 × 25	EI 120-U/C
Flexible conduits** (U/C) with or without cables	single Ø max. ≤ 50 mm	on top & bottom side	F	20 × 25	EI 120-U/C
Bundles of flexible conduits** (U/C) with or without cables	Ø max. ≤ 50 × 5	both sides	W	20 × 25	EI 120-U/C
Bundles of flexible conduits** (U/C) with or without cables	Ø max. ≤ 50 × 5	on top & bottom side	F	20 × 25	EI 120-U/C
Blank penetration seal	0,03 m² Ø 200	exposed side	W	200 x 15	E 120 EI 90
Blank penetration seal	0,03 m² Ø 200	unexposed side	W	200 x 15	EI 120
Blank penetration seal	0,03 m² Ø 200	one side	W	200 x 15	E 120 EI 90
Blank penetration seal	0,03 m² Ø 200	upper side	F	200 x 15	EI 120
Blank penetration seal	0,03 m² Ø 200	bottom side	F	200 x 15	EI 120
Blank penetration seal	0,03 m² Ø 200	one side	F	200 x 15	EI 120

** filled with PROMASEAL®-AG*

*** acc. to EN 61386-21 and EN 61386-22*

4. PROMASEAL®- AG penetration seal for plastic pipes



Detail D - PROMASEAL®-AG plastic pipe penetration seal in flexible and rigid wall

Detail D
Penetrations of plastic pipes can be sealed with PROMASEAL®- AG.

Annular gap
Close the annular gap with Class A1 mineral wool acc. to EN 13501-1 with a melting point of ≥ 1000 °C and a density of ≥ 40 kg/m³.

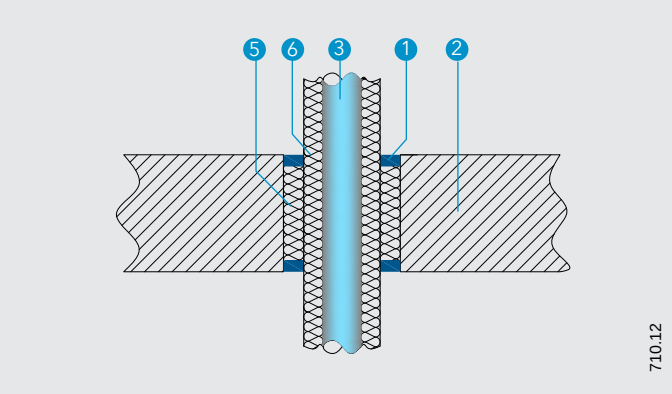
Table 2
Depending on the installation situation, the classifications are shown in Table 2.

Table 2 – Overview of pipe materials, dimensions, installation situations and classifications

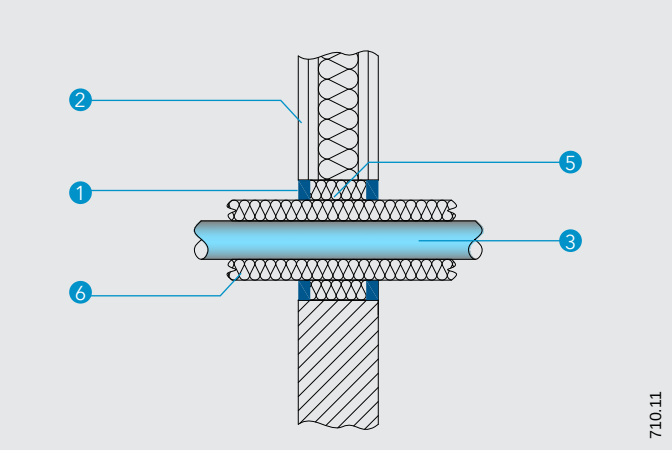
Dimension range Ø...Diameter [mm] s: pipe wall thickness [mm]	PROMASEAL®-AG installation	Orientation F: floor W: wall	Annular gap* width × depth [mm]	Classification
PVC-U pipes				
Ø 110 / s 3,2	both sides	W	20 × 25	EI 120-U/C
Ø 110 / s 3,2	on top & bottom side	F	20 × 25	EI 120-U/C
PP pipes				
Ø 50 / s 1,8	both sides	W	20 × 20	EI 90-U/C
Ø 50 / s 1,8	on top & bottom side	F	20 × 20	EI 120-U/C

** filled with PROMASEAL®-AG*

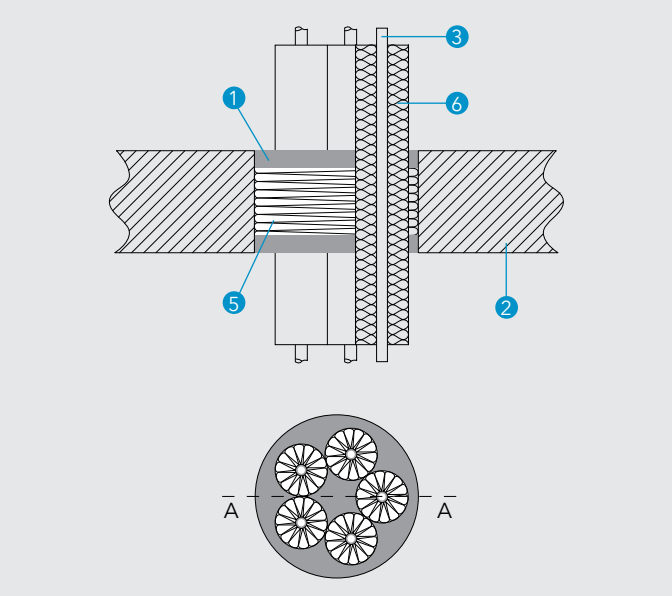
5.PROMASEAL®-AG penetration seal for non-combustible pipes with non-combustible insulation



Detail E – Non-combustible pipes with non-combustible insulation



Detail F – Non-combustible pipes with non-combustible insulation in flexible and rigid wall



Detail G – Metal pipe bundle with non-combustible insulation in rigid floor

Details E, F and G

Metal pipes with non-combustible insulation can be sealed with PROMASEAL®-AG.

Steel pipes

The results can also be applied to metal pipes with lower heat conductivity λ ≤ 58 W/mK and a melting point ≥ 1100 °C (e.g. stainless steel, cast iron, Ni alloys -NiCr, NiMo, NiCu- and Ni).

Copper pipes

Results of copper pipes are valid for steel pipes, but not vice versa, and for pipes with λ ≤ 380 W/mK and a melting point ≥ 1083 °C (e.g. steel pipe, stainless steel, cast iron, Ni alloys -NiCr, NiMo, NiCu- and Ni).

Table 3 - Insulation information for steel pipes and/or copper pipes

Type	Specification
Mineral wool	Minimum Class $A2_L$ acc. to EN 13501-1 and melting point ≥ 1000 °C. For pipe diameter Ø 48 / s 1- 14,2: Class A1 (mineral wool, ceramic wool…) and melting point ≥ 1000 °C.
Density	≥ 40 kg/m³
Insulation thickness	30 mm
Types of pipe insulation	LS, CS (acc. to EN 1366-3)
Insulation length	≥ 550 mm
Annular gap width × depth	20 × 25 mm

Table 4 – Overview pipe materials, dimensions, installation situations and classifications

Requirement			Installation of PROMASEAL®-AG	Dimension range Ø: outer pipe diameter [mm] s: pipe wall thickness [mm]	Classification
Rigid wall	Rigid floor	Flexible wall			
Steel pipes					
Construction thickness ≥ 100 mm	Construction thickness ≥ 150 mm	Construction thickness ≥ 100 mm	both sides	Ø 18 mm, s 1,0 mm → Ø 48 mm, s 14,2 mm	EI 120-U/C
Copper pipes					
Construction thickness ≥ 100 mm	Construction thickness ≥ 150 mm	Construction thickness ≥ 100 mm	both sides	Ø 18 mm, s 1,0 mm → Ø 18 mm, s 14,2 mm	EI 120-U/C

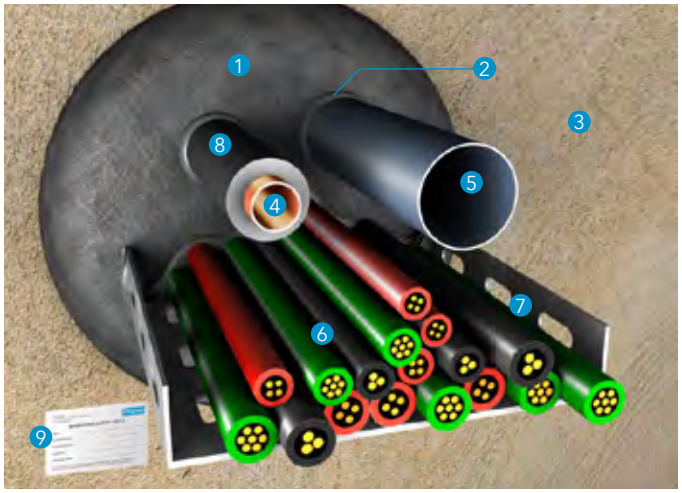
6. Information about the minimum distances for PROMASEAL®-AG

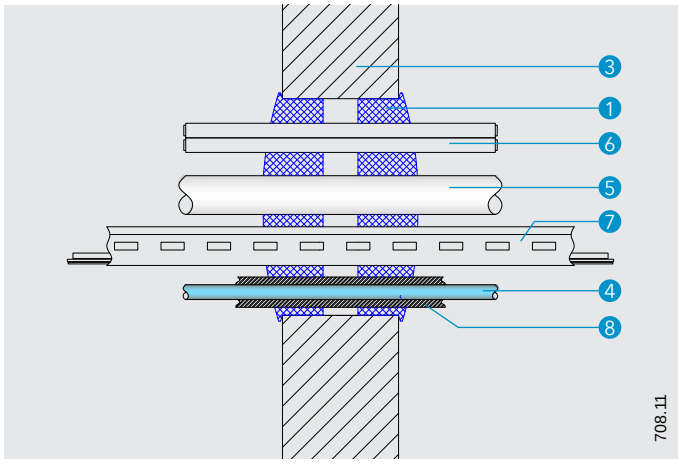
Table 5

Sufficient space needs to be provided for the construction of professional applications. For practical and physical reasons, we recommend observing a minimum distance of 100 mm between installed objects and support construction/component framing during planning.
If this is impossible due to the situation on the construction site, the permitted minimum distances shall be taken from Table 5.

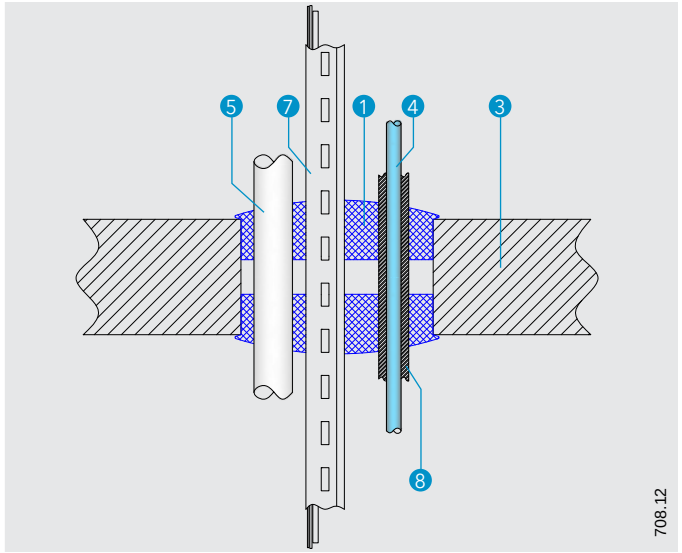
Table 5 - Minimum distances

Object	Minimum distance [mm]
Non-combustible insulation – Supporting construction/component framing	10
Non-combustible insulation – Non-combustible insulation	0
Cables – Supporting construction/component framing	0
Cables – Cables	0
Cable bundles – Supporting construction/component framing	0
Flexible conduits – Supporting construction/component framing	20
Flexible conduits – Flexible conduits	0
Plastic pipes – Supporting construction/component framing	20
PROMASEAL®-AG – PROMASTOP®-W	0
PROMASEAL®-AG – PROMASTOP®-IM CJ21	0
PROMASEAL®-AG – PROMASTOP®-FC	0
Between all other objects not further defined	100





Detail A – PROMASTOP®-P mixed penetration seal in rigid wall



Detail B – PROMASTOP®-P mixed penetration seal in rigid floor

Table 1 – Classifications of PROMASTOP®-P blank seals

Installation situation	PROMASTOP®-P	Classification blank seal
Rigid wall ≥ 150 mm	PROMASTOP®-P 65... PROMASTOP®-P 260	EI 180
Rigid floor ≥ 150 mm		EI 120

Technical data

1. PROMASTOP®-P
2. PROMASEAL®-AG
3. Supporting construction
4. Non-combustible pipes
5. Plastic pipes
6. Cables, cable bundles
7. Cable tray
8. Non-combustible insulation
9. Identification label

Certificates: ETA-15/0242, IBS KB 315070916-A

Customer benefit

- Cold smoke-tight
- Quick, easy and dry installation
- Fibre-free penetration seal
- Simple, custom-fit shape

1. Installation

- Select the plug dimension according to the size of the core drilled hole.
- Mark the contours of the penetrating services on the back of the plug.
- Cut fire stopping plugs to size with a serrated knife (the area section of the pipeline system must be smaller than the actual cross-section – e.g. cable bundle/pipeline diameter 100 mm = cut-out diameter 90 - 96 mm).
- Insert fire stopping plugs into the wall/floor on both sides flush to the curved part of the plug by slightly pressing them together.
- Close gaps and joints on one side (between the installations, between the cables) with PROMASEAL®-AG.
- Label the penetration seal.

2. Fields of application

PROMASTOP®-P is used as mixed penetration seal. Fire resistance is classified according to EN 13501-2.

Rigid wall
The wall must have a thickness of ≥ 150 mm and a density of ≥ 450 kg/m³.

Rigid floor
The floor must have a thickness of ≥ 150 mm and a density of ≥ 450 kg/m³.
The components (supporting constructions) must be classified acc. to EN 13501-2 for the required fire resistance period.

Details A and B

The PROMASTOP®-P mixed penetration seals in rigid wall and floor are shown in Details A and B.

Table 1

Table 1 shows the maximum tested and classified penetration seals, as well as the various installation situations.

Tables 2 and 3
PROMASTOP®-P is available in various diameters, with a difference between the diameters on top and bottom side of the plug.

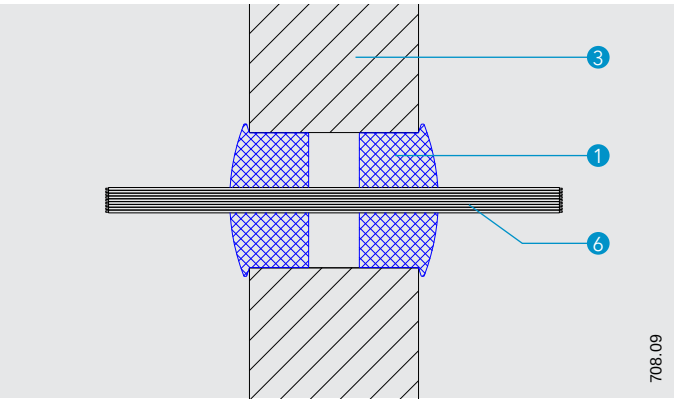
Table 2 – Versions of PROMASTOP®-P

Type	Diameter on bottom side [mm]	Diameter on top side [mm]	Height [mm]
PROMASTOP®-P 65	65	75	60
PROMASTOP®-P 80	80	90	
PROMASTOP®-P 110	110	120	
PROMASTOP®-P 125	125	135	
PROMASTOP®-P 140	140	150	
PROMASTOP®-P 170	170	180	
PROMASTOP®-P 210	210	220	
PROMASTOP®-P 260	260	270	

Table 3 – Requirements for installation of PROMASTOP®-P

Type	Min. core drilled hole [mm]	Max. core drilled hole [mm]	Installation depth [mm] Wall	Installation depth [mm] Floor
PROMASTOP®-P 65	40	65	50	60
PROMASTOP®-P 80	50	80		
PROMASTOP®-P 110	80	110		
PROMASTOP®-P 125	100	125		
PROMASTOP®-P 140	110	140		
PROMASTOP®-P 170	140	170		
PROMASTOP®-P 210	180	210		
PROMASTOP®-P 260	220	260		

3. PROMASTOP®-P cable penetration seal



Detail C – PROMASTOP®-P cable penetration seal in rigid wall

Detail C
Cable trays and cable ladders may penetrate the PROMASTOP®-P penetration seal.

Supporting distance
Cables, cable bundles, cable ladders and cable trays must be suspended/supported ≤ 250 mm on both sides of walls or from the top of the floor.

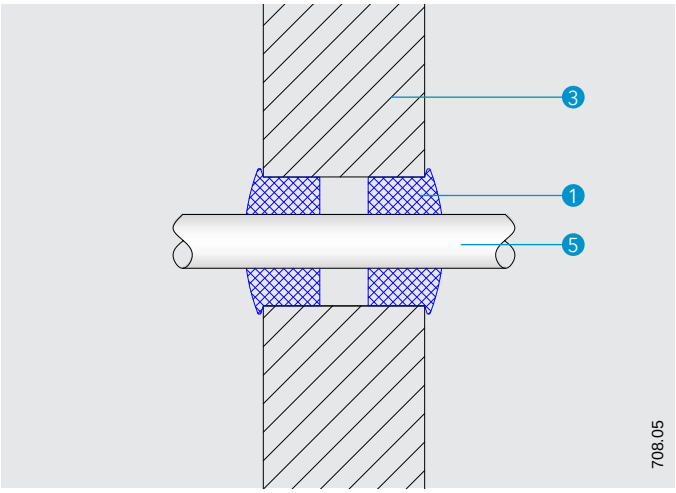
Close the gaps between cables and other joints on the surface with PROMASEAL®-AG on one side, e.g. to prevent the passage of flue gas.

Table 4
The following classifications result here depending on the orientation of the installation.

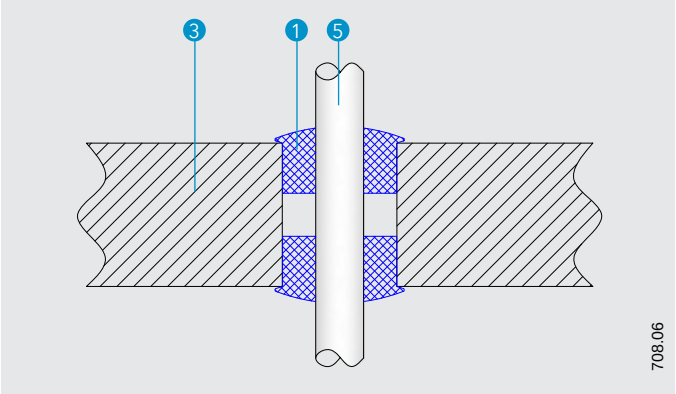
Table 4 – Classifications in rigid wall and floor

Installation	Classification Wall	Classification Floor
All sheathed cable types, Ø ≤ 14,4 mm: ≤ 5 × 1,5 mm² / 20 × 1,5 mm² (H07RN, NYM or equivalent) Single cable or cable bundle with up to 30 pieces (control, power, data, signal, telecommunication, optical fibre cables or equal products)	EI 180	EI 120
All sheathed cable types, Ø ≤ 26,5 mm: ≤ 4 × 10 mm² (H07RN-F or equivalent)	EI 180	EI 120
All sheathed cable types (bundles), Ø ≤ 26,5 mm: Cable bundle with up to 10 cables ≤ 4 × 10 mm² (H07RN-F or equivalent)	E 180 EI 90	EI 120
All non-sheathed cable types, Ø ≤ 67 mm: ≤ 3 × 150 mm² (N2XSEY or equivalent)	E 180 EI 120	EI 120
Cable bundle, Ø ≤ 120 mm with all non-sheathed cable types up to 84 pieces: ≤ 3 × 150 mm² (N2XSEY or equivalent) ≤ 20 × 2 × 0,6 mm² (control, power, data, signal, telecommunication, optical fibre cables or equal products) ≤ 4 × 10 mm² (H07RN-F or equivalent) ≤ 5 × 1,5 mm² / 20 × 1,5 mm² (H07RN-F, NYM or equivalent)	-	EI 120
Rigid conduits (acc. to EN 61386-21 and EN 61386-22), Ø ≤ 50 mm (with or without cables Ø ≤ 14,4 mm)	EI 180-U/U	EI 120-U/U

4. PROMASTOP®-P penetration seal for plastic pipes without insulation



Detail D – PROMASTOP®-P plastic pipe penetration seal in rigid wall



Detail E – PROMASTOP®-P plastic pipe penetration seal in rigid floor

Details D and E

Plastic pipes may penetrate the PROMASTOP®-P penetration seal.
The classifications for PVC pipes are applicable for pipes in acc. with EN 1452-2, DIN 8061 and DIN 8062.
The classifications for PE pipes are applicable for pipes in acc. with EN 12201-2, EN 1519-1, EN 12666-1, DIN 8074, DIN 8075 and ABS pipes in acc. with EN 1455-1 and SAN + PVC pipes in acc. with EN 1565-1.

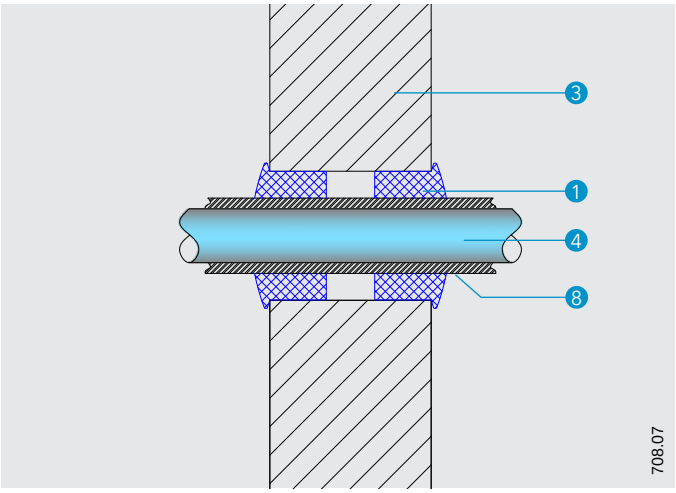
Supporting distance

The pipes must be suspended/supported ≤ 250 mm on both sides of walls or from the top of the floor.

Table 5 – Overview of pipe materials, dimensions, installation situations, classifications

Dimension range Ø: outer pipe diameter [mm] s: pipe wall thickness [mm]	Orientation F: floor W: wall	Classification
PE pipes		
Ø ≤ 90 mm, s ≤ 3,0 mm	F	EI 120-U/U
PVC pipes		
Ø ≤ 90 mm, s ≤ 3,0 mm	W	E 180-U/U EI 90-U/U
Ø ≤ 75 mm, s ≤ 2,5 mm	F	EI 120-U/U
PU pipes (pneumatic tubes)		
Ø ≤ 10 mm, s ≤ 1,0 mm	W	EI 180-U/U
Ø ≤ 12 mm, s ≤ 1,0 mm	F	EI 120-U/U

5. PROMASTOP®-P penetration seal for non-combustible pipes with combustible insulation



Detail F – PROMASTOP®-P penetration seal for non-combustible pipes with combustible insulation in rigid wall

Details F and G

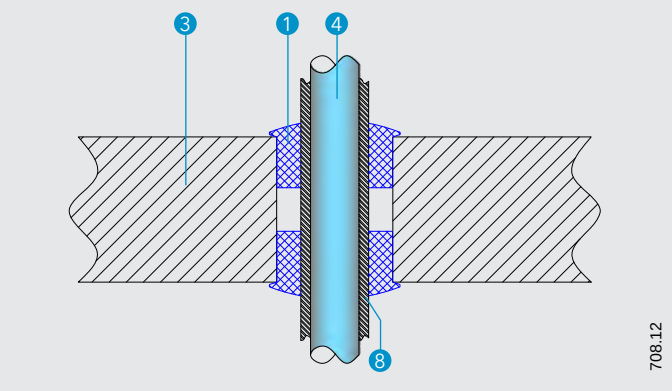
Steel and copper pipes (and their substitutes) with combustible insulation (thickness ≥ 9 mm ≤ 32 mm, Class B-s3, d0 or higher rated acc. to EN 13501-1, e.g. closed cell, flexible elastomeric foam, e.g. AF/Armaflex) can be sealed with PROMASTOP®-P fire stopping plugs.

Supporting distance

The pipes must be suspended/supported ≤ 250 mm on both sides of walls or from the top of the floor.

Table 6 – Insulation information for non-combustible pipes

Type	Specification
Combustible insulation	Class B-s3, d0 or higher rated (acc. to EN 13501-1)
Insulation thickness	≥ 9 mm ≤ 32 mm
Types of pipe insulation	CS, CI



Detail G – PROMASTOP®-P penetration seal for non-combustible pipes with combustible insulation in rigid floor

Table 7

The results of steel pipes can also be applied to metal pipes with lower heat conductivity λ ≤ 58 W/mK and a melting point ≥ 1083 °C (e.g. stainless steel, cast iron, Ni alloys (NiCr, NiMo, NiCu alloys) and Ni).
The results of copper pipes are valid for steel pipes, but not vice versa, and for pipes with λ ≤ 380 W/mK and a melting point of ≥ 1083 °C.

Table 7 – Classification depending on installation orientation

Dimension range Ø: outer pipe diameter [mm] s: pipe wall thickness [mm]	Orientation F: floor W: wall	Classification
Steel pipes		
Ø ≤ 118 mm, s ≤ 14,2 mm	F	EI 120-U/C
Ø ≤ 118 mm, s ≤ 14,2 mm	W	E 180-U/C EI 90-U/C
Copper pipes		
Ø ≤ 88,9 mm, s ≤ 14,2 mm	F	EI 120-U/C
Ø ≤ 88,9 mm, s ≤ 14,2 mm	W	E 180-U/C EI 90-U/C

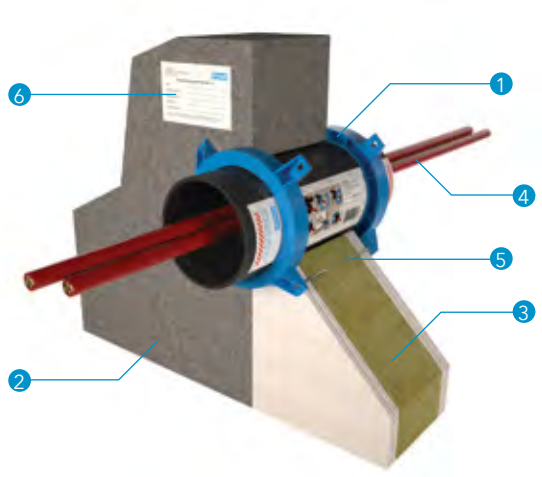
6. Information about the minimum distances in PROMASTOP®-P penetration seals

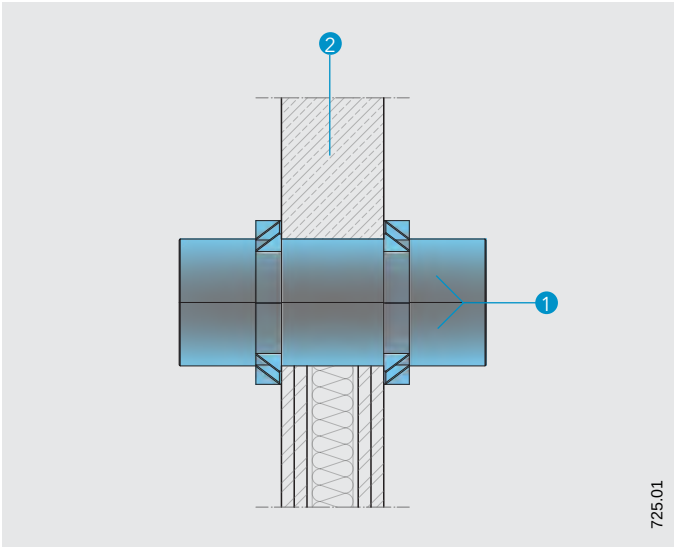
Table 8

Sufficient space needs to be provided for the construction of professional applications. For practical and physical reasons, we recommend observing a minimum distance of 100 mm between installed objects and support construction/component framing during planning.
If this is impossible due to the situation on the construction site, the permitted minimum distances shall be taken from Table 8.

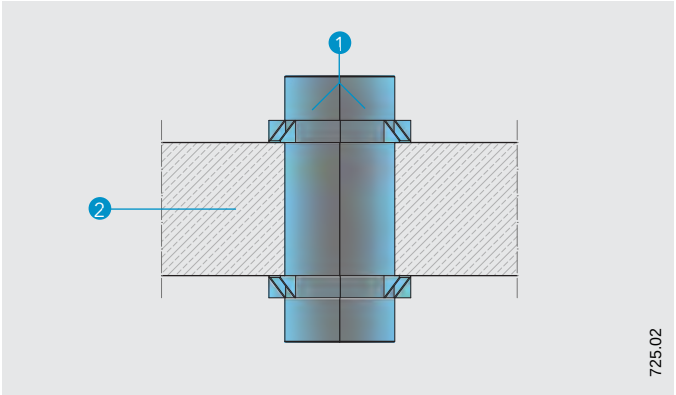
Table 8 – Minimum distances

Object	Minimum distance [mm]
Cables – Supporting construction/component framing	6
Cable bundles – Supporting construction/component framing	13
Cable tray – Supporting construction/component framing	20
Conduits – Supporting construction/component framing	20
Combustible insulations – Supporting construction/component framing	30
Plastic pipes – Combustible insulation	30
Plastic pipes – Cables	35
Plastic pipes – Cable tray	35
Plastic pipes (PVC, PE) – Supporting construction/component framing	70
Plastic pipes (PU) – Supporting construction/component framing	10
Between all other objects not further defined	100





Detail A – PROMASTOP®-IM CBox 125 cable box in flexible and rigid wall



Detail B – PROMASTOP®-IM CBox 125 cable box in rigid floor

Technical data

1. PROMASTOP®-IM CBox 125
2. Supporting construction
3. Mineral wool
4. Cables and cable bundles
5. Suitable fastening material
6. Identification label

Certificate: Warrington Fire Gent CR 18288B

Customer benefit

- Quick and easy installation
- Later installation of cables possible at any time

1. Installation

- Clean around the opening and the penetration to ensure a dust free surface.
- Plug together the two intumescent half shells of the PROMASTOP®-IM CBox 125 and place them centrally in the wall (see the marking on the shells).
- Clean the intumescent sheels.
- Connect the two blue parts of the fixing system and push them over the half shells on both sides of the floor or wall. Annular gap width between the cable box and the supporting construction 5 mm and no additional gap filling required.
- Apply the transparent stickers at the two side of the intumescent shells directly to the blue annular fixing system to secure it. Apply the two stickers on both sides of the floor or wall.
- Install the fixing system: use a drill of ø 4 or 5 mm and use suitable fixing material on both sides of the floor or wall.
- Label the penetration seal.

2. Fields of application

The PROMASTOP®-IM CBox 125 cable box is used as a blank or a cable penetration seal in flexible or rigid walls and in rigid floors. Fire resistance is classified according to EN 13501-2.

Details A and B

Use suitable screws for fixing of the blue annular fastening system in rigid floor or rigid wall (4 steel screws on both sides, 6 × 65 mm).

Rigid floor

The floor must have a thickness of ≥ 150 mm and a density of ≥ 550 kg/m³.

Rigid wall

The wall must have a thickness of ≥ 100 mm and a density of ≥ 550 kg/m³. The diameter of the core drilled hole to be sealed must be 125 mm.

Flexible wall

The wall must have a fire resistance period of 60 minutes and a thickness of ≥ 100 mm (metal studs, thickness 50 mm, with two layers of Class F plasterboards acc. to EN 520, thickness 12,5 mm on both sides). The stone wool inside the wall shall have a thickness of 40 mm and a density of 50 kg/m³. The diameter of the core drilled hole to be sealed must be 125 mm. Stone wool insulation is not removed 100 mm around the hole.

Table 1 – Classifications in rigid wall and floor

Installation situation	Classification depending on installation orientation	
	Wall	Floor
Blank seal: PROMASTOP®-IM CBox 125 without cables	EI 120	EI 120
CG 1: all sheathed cable types 0 ≤ 21 mm (e.g. power cables, control cables, data cables, telecom cables, optical fibre cables), waveguides and non-sheathed cables (wires)	EI 120	EI 120
Tied cable bundle with cables from CG 1 which fills the cable box for 100%, maximum diameter of a single cable 21 mm	EI 120	EI 120

CG… Cable group acc. to EN 1366-3:2009

Table 2 – Classifications in flexible wall

Installation situation	Classification
Blank seal: PROMASTOP®-IM CBox 125 without cables	EI 90
CG 1: all sheathed cable types 0 ≤ 21 mm (e.g. power cables, control cables, data cables, telecom cables, optical fibre cables), waveguides and non-sheathed cables (wires)	EI 90
Tied cable bundle with cables from CG 1 which fills the cable box for 100%, maximum diameter of a single cable 21 mm	EI 90

CG… Cable group acc. to EN 1366-3:2009

If the flexible wall has been constructed without mineral wool, a frame needs to be constructed in the opening to be sealed around the PROMASTOP®-IM CBox 125 cable box to ensure its effectiveness in case of a fire, enabling it to expand inward only. The frame can be constructed with a stone wool (density ≥ 40 kg/m³) insulation ring inside the wall, installed around the cable box, with an opening diameter of 125 mm and an outer diameter of at least 325 mm; thickness is the same as the width of the wall studs.

Supporting distance

The cables must be suspended/supported ≤ 250 mm on both sides of walls or from the top of the floor.

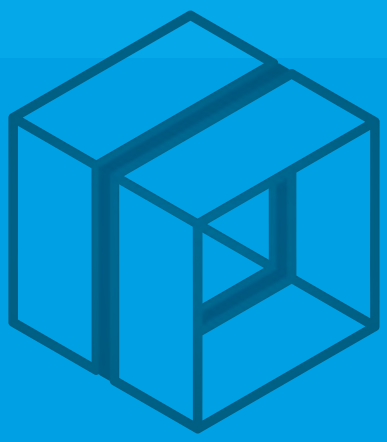
3. Information about the minimum distances from PROMASTOP®-IM CBox 125

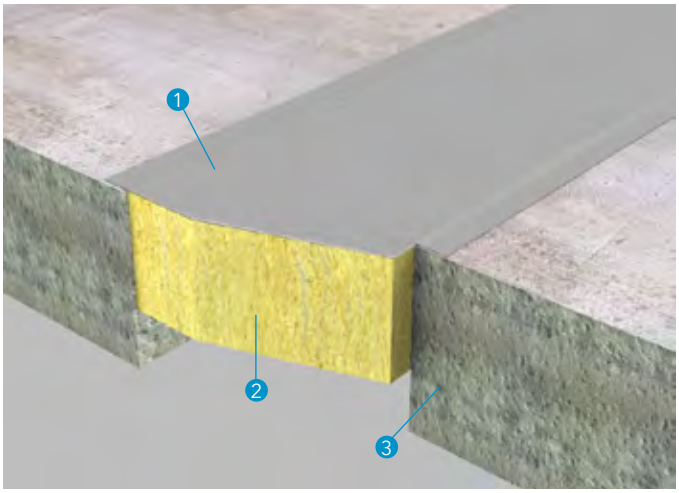
Sufficient space needs to be provided for the construction of professional applications. For practical and physical reasons, a minimum distance of 200 mm between installed objects and support construction/component framing shall be observed during placing.
One penetration seal per aperture is allowed.

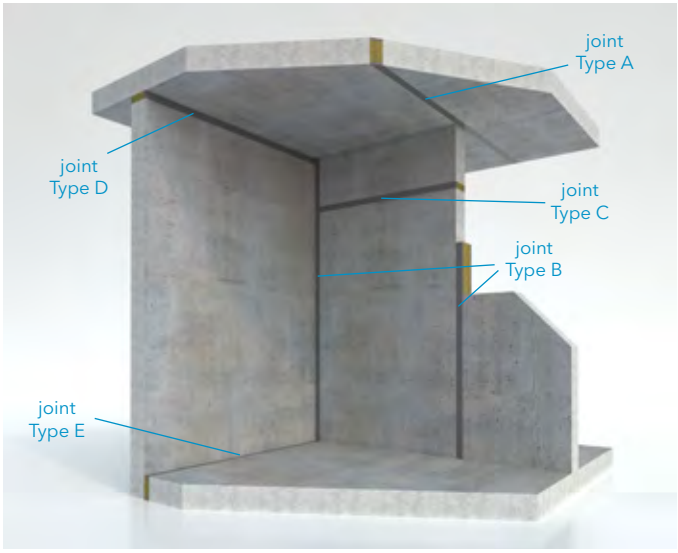
Table 3 – Minimum distances

Object	Minimum distance [mm]
PROMASTOP®-IM CBox 125 – PROMASTOP®-IM CBox 125	200
Between all other objects not further defined	200

Linear joint seal systems
Construction Data Sheets







Detail A – Overview of the linear joints in and between walls and floors

Joint Type A – Linear joint in a horizontal test construction (floor to floor)

Joint Type B – Vertical linear joint in a vertical test construction (vertical joint wall to wall)

Joint Type C – Horizontal linear joint in a vertical construction (horizontal joint wall to wall)

Joint Type D – Horizontal wall joint abutting a floor, ceiling or roof
Joint Type E – Horizontal floor joint abutting a wall

Technical data

1. PROMASEAL®-A spray
2. Backfilling material
3. Supporting construction
4. Trapezoidal sheet metal

Certificates: ETA-16/0310, IBS CR 316042012-A-en, ITB CR 02806/19/Z00NZP + ITB CR 01633/20/R141NZP

Customer benefit

- Quick and easy to install in linear joints of walls and floors
- Flexible film after drying which allows up to 30% of compression and elongation
- Good adhesive properties
- Moisture resistance as soon as PROMASEAL®-A spray has dried
- Use category Y_1

1. Installation

Depending on the static linear joint seals (with less than 7,5% movement) or expansion linear joint seals (with specified degree of movement), the following installation procedure must be followed:

Static joint

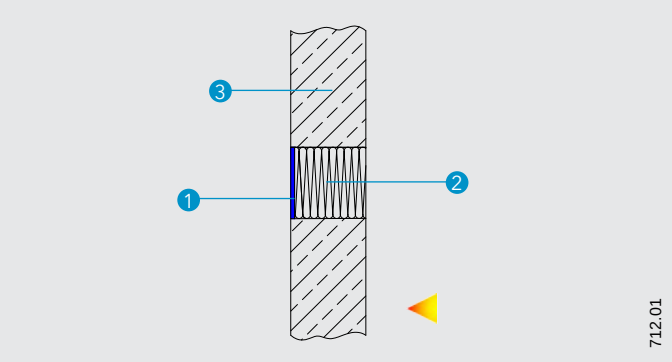
- Application temperature should be between + 5 °C to + 40 °C.
- Clean and moisten the aperture framing if necessary: surface should be cleaned of oil, wax, dirt, loose debris, grease and dust.
- If required, cover adjacent surfaces with adhesive tape.
- Press mineral wool (Class A1 according to EN 13501-1, melting point ≥ 1000 °C, density as described on the related detail) into the joint (with at least 30% compression).
- Apply PROMASEAL®-A spray with final layer thickness on the surface and on the adjacent compartment if prescribed on the related detail.
- Label the joint.

Expansion joint

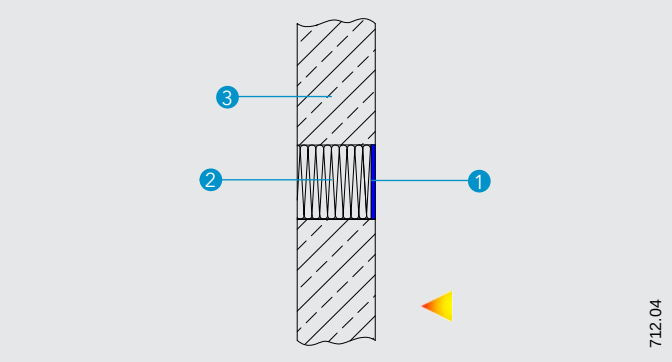
- Application temperature should be between + 5 °C to + 40 °C
- Clean and moisten the aperture framing if necessary: surface should be cleaned of oil, wax, dirt, loose debris, grease and dust. Coat the framing surfaces.
- Coat mineral wool (Class A1 according to EN 13501-1, melting point ≥ 1000 °C, density as described on the related detail) on both sides of the mineral wool strips. Choose the correct number of mineral wool strips depending on joint width. Press the strips into the joint (with at least 30% compression).
- Apply PROMASEAL®-A spray with final layer thickness on both edges of the mineral wool. Additionally coat 5 mm on the adjacent surfaces.
- Label the joint.

Detail A

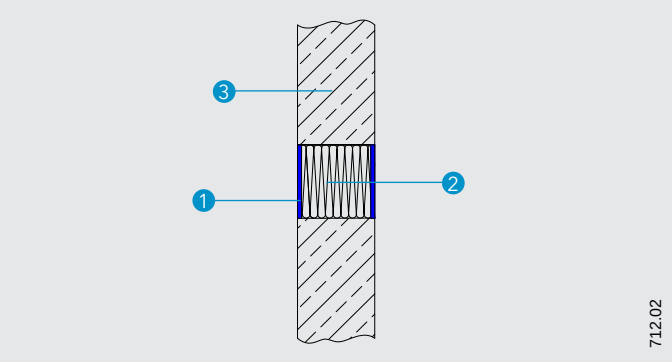
An overview of the various linear joints in and between walls and floors can be found in Detail A.



Detail B – Vertical or horizontal joint filling coated on the unexposed side in wall



Detail C – Vertical or horizontal joint filling coated on the exposed side in wall



Detail D – Vertical or horizontal joint filling coated on both sides in wall

Table 1
For the theoretical consumption of PROMASEAL®-A spray see Table 1. Required thickness on the related details.

Table 1 – Theoretical consumption of PROMASEAL®-A spray

Coating on mineral wool	Dry film thickness	Wet film thickness	Consumption
PROMASEAL®-A spray	1 mm	1,4 mm	1,90 kg/m²
PROMASEAL®-A spray	2 mm	2,8 mm	3,80 kg/m²

2. Fields of application

Details B to R
PROMASEAL®-A spray is used as fire stopping coating in combination with backfilling material for linear joint seals. Fire resistance is classified according to EN 13501-2.

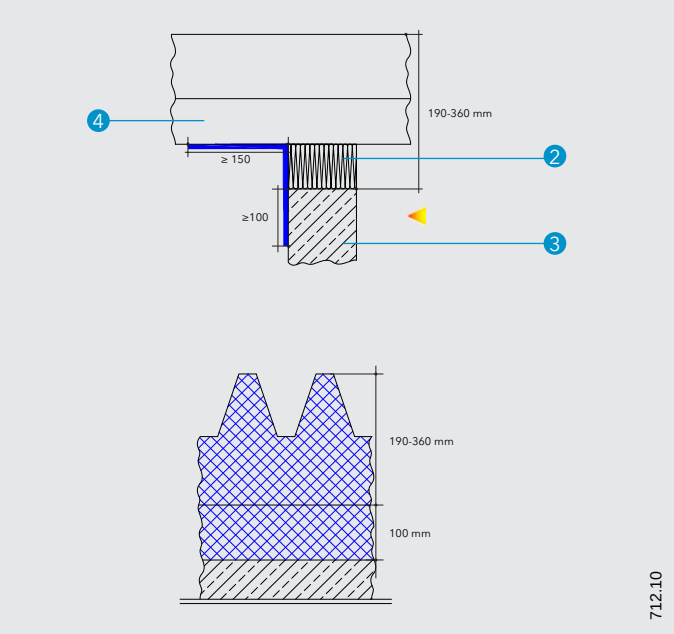
Rigid wall
The rigid wall must have a thickness ≥ 100 mm and a density of ≥ 650 kg/m³.

Rigid floor
The rigid floor must have a thickness ≥ 150 mm and a density of ≥ 650 kg/m³.

Test results achieved using a standard rigid supporting construction are valid for separating construction products made of concrete or masonry having the same or a higher thickness and density as those tested.

Table 2 – Rigid wall (Details B, C and D)

Rigid wall thickness	≥ 100 mm
Rigid wall density	≥ 650 kg/m³
Joint width	≥ 5 ≤ 100 mm
Backfilling	Mineral wool, Class A1 according to EN 13501-1, melting point ≥ 1000 °C
Density of backfilling	≥ 40 kg/m³, see below in the classifications
Joint movement in %	≤ 7,5
Vertical, asymmetrical joint filling coated on the unexposed side with 1 mm PROMASEAL®-A spray on the backfilling (mineral wool 90 kg/m³), Detail B: (vertical joint seal in vertical supporting construction, joint type B) **EI 180 – V – M 7,5 – F – W 5 to 100**	
Vertical, asymmetrical joint filling coated on the unexposed side with 1 mm PROMASEAL®-A spray on the backfilling (mineral wool 40 kg/m³), Detail B: (vertical joint seal in vertical supporting construction, joint type B) **EI 120 – V – M 7,5 – F – W 5 to 100**	
Vertical, asymmetrical joint filling coated on the exposed side with 1 mm PROMASEAL®-A spray on the backfilling (mineral wool 40 kg/m³), Detail C: (vertical joint seal in vertical supporting construction, joint type B) **EI 45 – V – M 7,5 – F – W 5 to 100**	



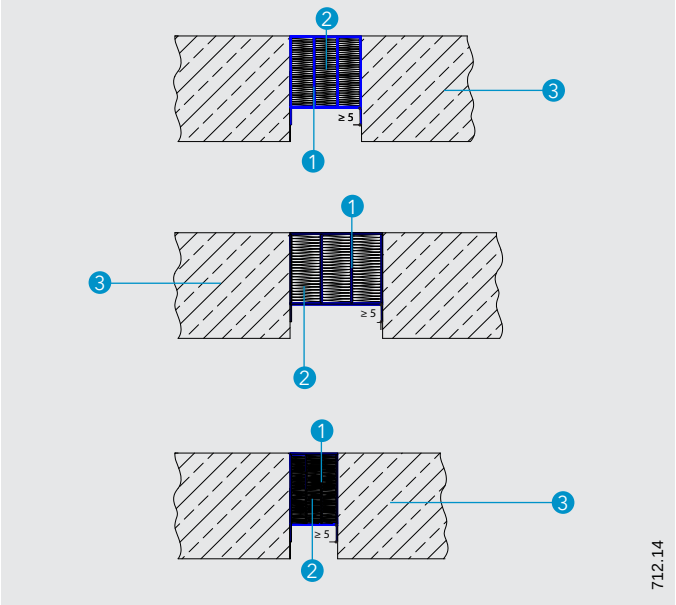
Detail E – Horizontal trapezoidal sheet metal connection joint coated on the unexposed side in wall

Vertical, symmetrical joint filling coated on both sides with 1 mm PROMASEAL®-A spray on the backfilling (mineral wool 40 kg/m³), Detail D: (vertical joint seal in vertical supporting construction, joint type B) **EI 120 – V – M 7,5 – F – W 5 to 100**
Horizontal, symmetrical joint filling coated on both sides with 1 mm PROMASEAL®-A spray on the backfilling (mineral wool 40 kg/m³), Detail D: (horizontal joint seal in vertical supporting construction, joint type C) **EI 120 – T – M 7,5 – F – W 5 to 100**
Horizontal, asymmetrical joint filling coated on the exposed side with 1 mm PROMASEAL®-A spray on the backfilling (mineral wool 40 kg/m³), Detail C: (horizontal joint seal in vertical supporting construction, joint type C) **EI 120 – T – M 7,5 – F – W 5 to 100**
Horizontal, asymmetrical joint filling coated on the unexposed side with 1 mm PROMASEAL®-A spray on the backfilling (mineral wool 40 kg/m³), Detail B: (horizontal joint seal in vertical supporting construction, joint type C) **EI 120 – T – M 7,5 – F – W 5 to 100**

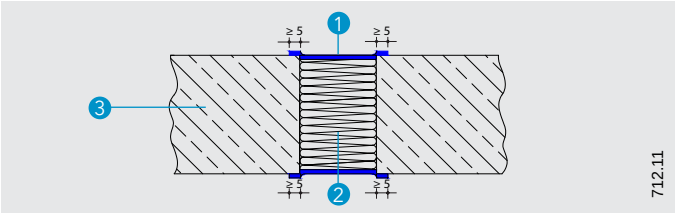
Table 3 – Rigid wall (Details D and E)

Rigid wall thickness	≥ 150 mm
Rigid wall density	≥ 650 kg/m³
Joint width	≥ 5 ≤ 100 mm
Backfilling	Mineral wool, Class A1 according to EN 13501-1, melting point ≥ 1000 °C
Density of backfilling	≥ 60 kg/m³, see below in the classifications
Joint movement in %	≤ 7,5

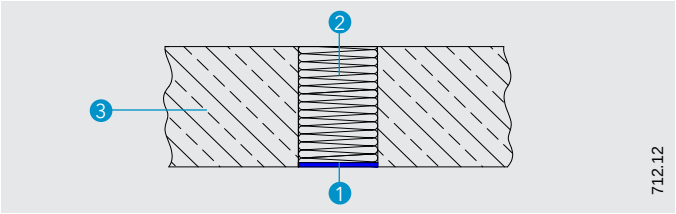
Vertical, symmetrical joint filling coated on both sides with 1 mm PROMASEAL®-A spray on the backfilling (mineral wool 60 kg/m³), Detail D: (vertical joint seal in vertical supporting construction, joint type B) **EI 180 – V – M 7,5 – F – W 5 to 100**
Horizontal, symmetrical joint filling coated on both sides with 1 mm PROMASEAL®-A spray on the backfilling (mineral wool 60 kg/m³), Detail D: (horizontal joint seal in vertical supporting construction, joint type C) **EI 180 – T – M 7,5 – F – W 10 to 100**
Horizontal trapezoidal steel sheet connection joint coated on the unexposed side with 2 mm PROMASEAL®-A spray on the backfilling (mineral wool 120 kg/m³, thickness 50 mm) and overlapping coating of PROMASEAL®-A spray (150 mm on the trapezoidal steel sheet and 100 mm on the wall), Detail E: (horizontal joint seal in vertical supporting construction, joint type C) **EI 120 – T – M 7,5 – F – W 190 to 360**
Horizontal trapezoidal steel sheet connection joint coated on the unexposed side with 2 mm PROMASEAL®-A spray on the backfilling (mineral wool 60 kg/m³, thickness 50 mm) and overlapping coating of PROMASEAL®-A spray (150 mm on the trapezoidal steel sheet and 100 mm on the wall), Detail E: (horizontal joint seal in vertical supporting construction, joint type C) **EI 120 – T – M 7,5 – F – W 190 to 360**



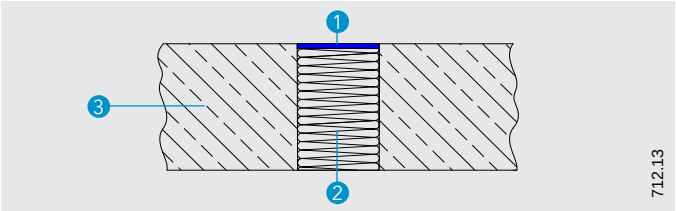
Detail F – Symmetrical expansion joint filling coated all sided and in between the mineral wool strips



Detail G – Symmetrical joint filling coated on both sides in floor



Detail H – Joint filling coated on the exposed side in floor



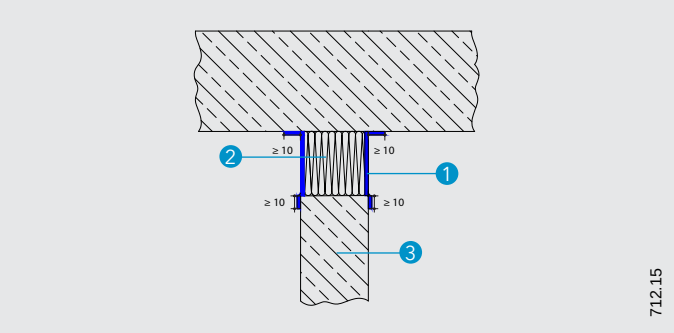
Detail I – Joint filling coated on the unexposed side in floor

Table 4 – Rigid floor (Detail F)

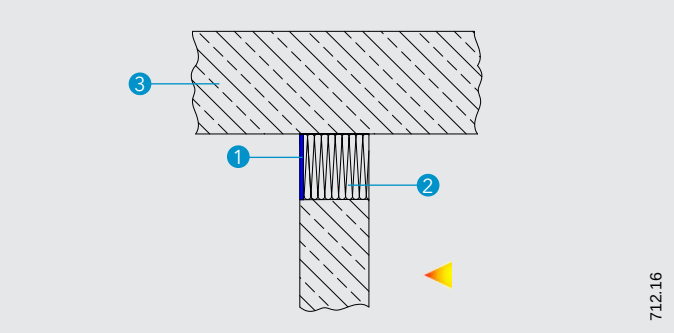
Rigid floor thickness	≥ 150 mm
Rigid floor density	≥ 650 kg/m³
Joint width	≥ 5 ≤ 100 mm
Backfilling	Mineral wool, Class A1 according to EN 13501-1, melting point ≥ 1000 °C
Density of backfilling	≥ 40 kg/m³
Joint movement in %	≤ 30
Symmetrical expansion joint coated all-sided and in between the mineral wool strips, with 30% expansion or compression, with 1 mm PROMASEAL®-A spray (mineral wool 40 kg/m³, inserted into the joint with 30% compression), as well as 5 mm on the adjacent supporting construction, Detail F: (linear joint seal in horizontal supporting construction, joint type A or horizontal wall joint abutting a floor, ceiling or roof, joint type D) **EI 120 – H – M 30 – B – W 5 to 100**	

Table 5 – Rigid floor (Details G, H and I)

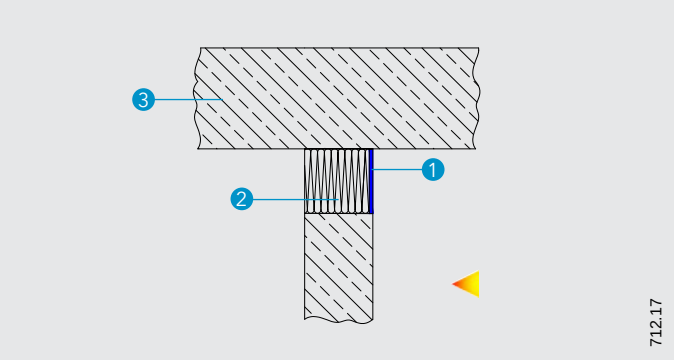
Rigid floor thickness	≥ 150 mm
Rigid floor density	≥ 650 kg/m³
Joint width	≥ 5 ≤ 100 mm
Backfilling	Mineral wool, Class A1 according to EN 13501-1, melting point ≥ 1000 °C
Density of backfilling	≥ 40 kg/m³, see below in the classifications
Joint movement in %	≤ 7,5
Symmetrical joint filling coated on both sides with 1 mm PROMASEAL®-A spray on the backfilling (mineral wool 60 kg/m³), as well as 10 mm on the adjacent supporting construction, Detail G: (linear joint seal in horizontal supporting construction, joint type A or horizontal wall joint abutting a floor, ceiling or roof, joint type D) **EI 180 – H – M 7,5 – F – W 5 to 100**	
Asymmetrical joint filling coated on the exposed side with 1 mm PROMASEAL®-A spray on the backfilling (mineral wool 40 kg/m³), Detail H: (linear joint seal in horizontal supporting construction, joint type A or horizontal wall joint abutting a floor, ceiling or roof, joint type D) **EI 120 – H – M 7,5 – F – W 5 to 100**	
Asymmetrical joint filling coated on the unexposed side with 1 mm PROMASEAL®-A spray on the backfilling (mineral wool 40 kg/m³, thickness 100 mm), Detail I: (linear joint seal in horizontal supporting construction, joint type A or horizontal wall joint abutting a floor, ceiling or roof, joint type D) **EI 120 – H – M 7,5 – F – W 5 to 100**	



Detail J – Wall joint coated on both sides (floor connection)



Detail K – Wall joint coated on the unexposed side (floor connection)



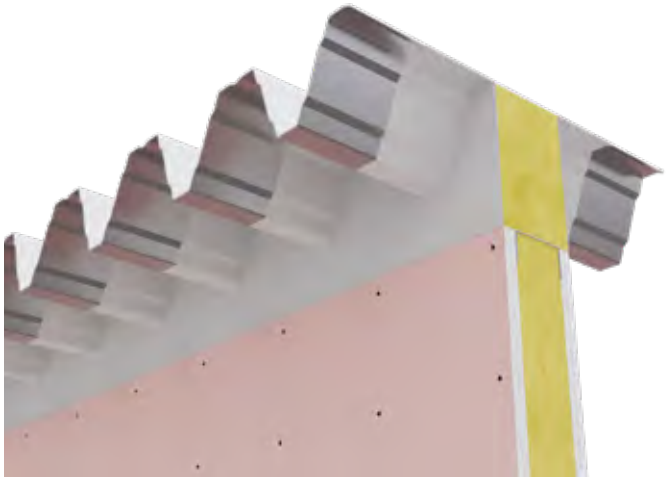
Detail L – Wall joint coated on the exposed side (floor connection)

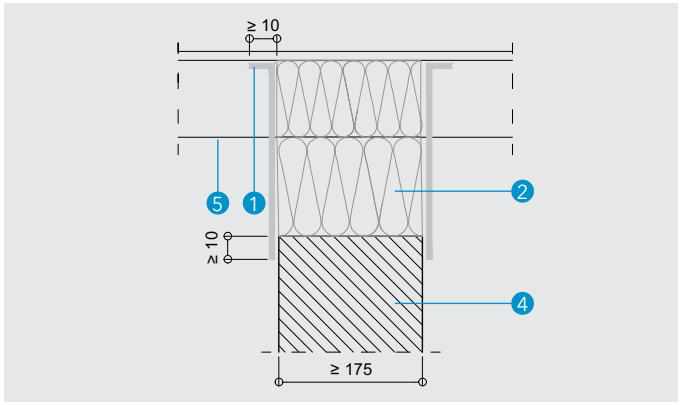
Details J, K and L – Wall joints connected to floors

The results in rigid floors also apply to horizontal wall joints abutting to a floor, a suspended ceiling or a roof (see classifications in Table 6).

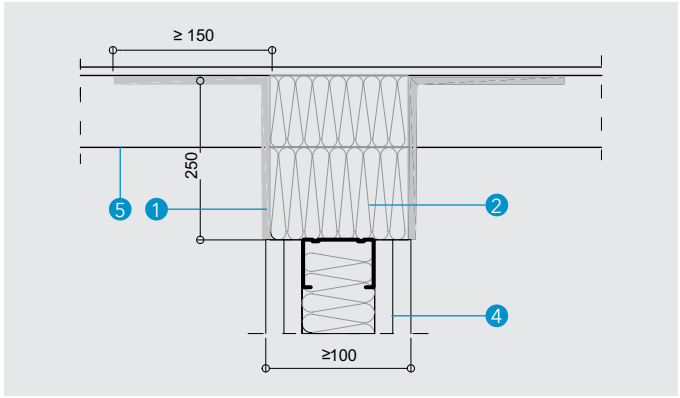
Table 6 – Rigid wall under rigid floor (Details J, K and L)

Rigid wall and floor thickness	≥ 150 mm
Rigid wall and floor density	≥ 650 kg/m³
Joint width	≥ 5 ≤ 100 mm
Backfilling	Mineral wool, Class A1 according to EN 13501-1, melting point ≥ 1000 °C
Density of backfilling	≥ 40 kg/m³, see below in the classifications
Joint movement in %	≤ 7,5
Symmetrical joint filling coated on both sides with 1 mm PROMASEAL®-A spray on the backfilling (mineral wool 60 kg/m³), as well as 10 mm on the adjacent supporting construction, Detail J: (linear joint seal in horizontal supporting construction, joint type A or horizontal wall joint abutting a floor, ceiling or roof, joint type D) **EI 180 – H – M 7,5 – F – W 5 to 100**	
Asymmetrical joint filling coated on the unexposed side with 1 mm PROMASEAL®-A spray on the backfilling (mineral wool 40 kg/m³, thickness 100 mm), Detail K: (linear joint seal in horizontal supporting construction, joint type A or horizontal wall joint abutting a floor, ceiling or roof, joint type D) **EI 120 – H – M 7,5 – F – W 5 to 100**	
Asymmetrical joint filling coated on the exposed side with 1 mm PROMASEAL®-A spray on the backfilling (mineral wool 40 kg/m³), Detail L: (linear joint seal in horizontal supporting construction, joint type A or horizontal wall joint abutting a floor, ceiling or roof, joint type D) **EI 120 – H – M 7,5 – F – W 5 to 100**	





Detail A – Protection of expansion joints between walls and roofs of trapezoidal metal sheets with 25% travel



Detail B – Protection of expansion joints between flexible walls and rigid floors

Technical data

1. PROMASEAL®-A spray
2. Mineral rock wool
3. Rigid floor
4. Rigid or flexible wall
5. Trapezoidal metal sheet

Certificates: ETA-14/0456, 0761-CPR-14/0456-2015/4

Important guidelines

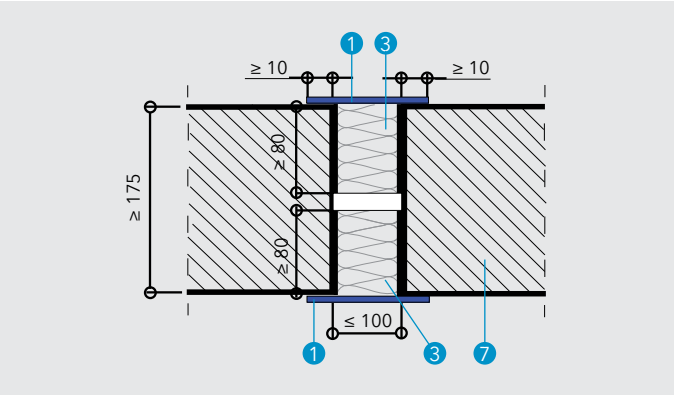
Expansion joints are constructed in order to separate certain individual elements of a structure. Such gaps must be properly sealed in order to prevent spread of fire and smoke to other fire compartment zones. The PROMASEAL®-A spray (1) coating can be utilised for such purposes, its utilisation enables reaching the fire resistance class EI120

Detail A

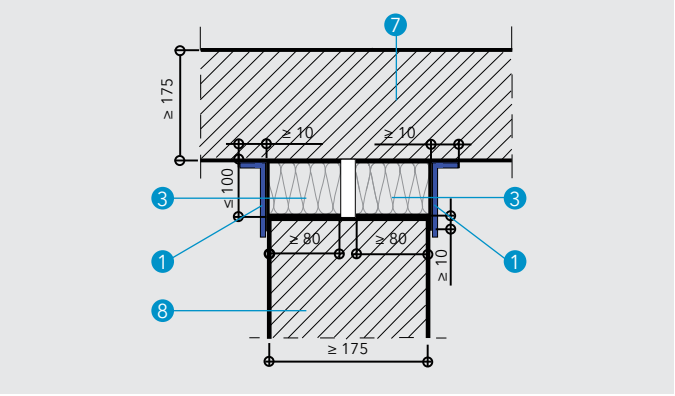
The expansion joint gaps between the rigid walls and roofs of trapezoidal metal sheets of max. width 100 mm, with travel reaching up to 25% are protected with utilisation of the PROMASEAL®-A spray (1) coating. Such expansion joints are filled on both the sides with mineral wool with the min. density 35 kg/m3. The mineral wool surface must be covered with the PROMASEAL®-A spray (1) on both the sides, the min. thickness of the layer is 1.5 mm, the layers should extend 10 mm into the neighbouring partitions.

Detail B

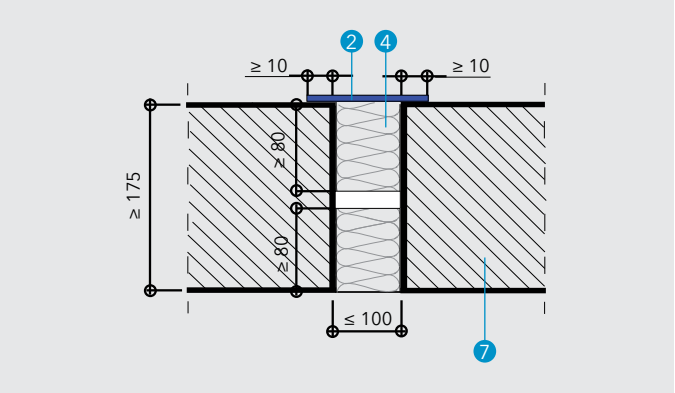
The expansion joint gaps between the flexible walls and trapezoidal metal sheets of max. width 250 mm are protected with utilisation of the PROMASEAL®-A spray (1) coating. Such expansion joints are filled with mineral wool with the min. density 65 kg/m3 to the min. depth of 100 mm. The surface of mineral wool must be covered with a 1 mm thick layer of the PROMASEAL®-A spray (1) fire stopping coating on both the sides, the layer must extend min. 150 mm into the neighbouring metal sheet.



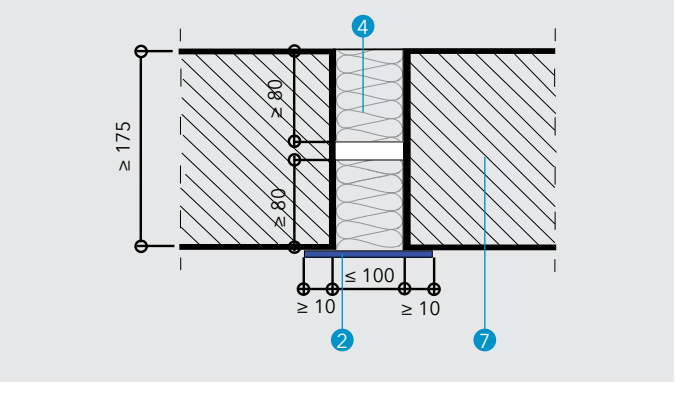
Detail A – Symmetrical joint filling coated on both sides in floor



Detail B – Symmetrical joint filling coated on both sides between wall and steel trapezoid sheet roof



Detail C – Joint filling coated on the unexposed side in floor



Detail D – Joint filling coated on the exposed side in floor

Technical data

1. PROMASEAL®-A spray, thickness ≥ 1,5 mm
2. PROMASEAL®-A spray, thickness ≥ 2,0 mm or 2,8 mm; see the related detail
3. Mineral wool, density ≥ 35 kg/m³
4. Mineral wool, density ≥ 100 kg/m³
5. PROMASEAL®-AG, thickness ≥ 30 mm
6. Cable
7. Rigid floor
8. Rigid wall

Certificates: ETA-16/310, ITB CR 02806/19/Z00NZP + ITB CR 01633/20/R141NZP

Details A and B

Symmetrical linear joint seals with 25% movement capability.

Details C, D and E

Asymmetrical linear joint seals with 7,5% movement capability.

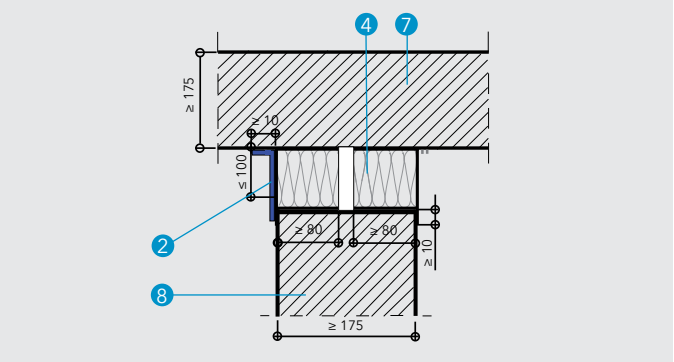
Table 1 – Rigid floor (Details A, B, C and D)

Rigid floor and wall thickness	≥ 175 mm
Rigid floor and wall density	≥ 600 kg/m³
Joint width	≥ 0 ≤ 100 mm
Backfilling	Mineral wool, Class A1 according to EN 13501-1, melting point ≥ 1000 °C
Density of backfilling	≥ 35 kg/m³, see below in the various classifications
Joint movement in %	≤ 25, see below in the classifications

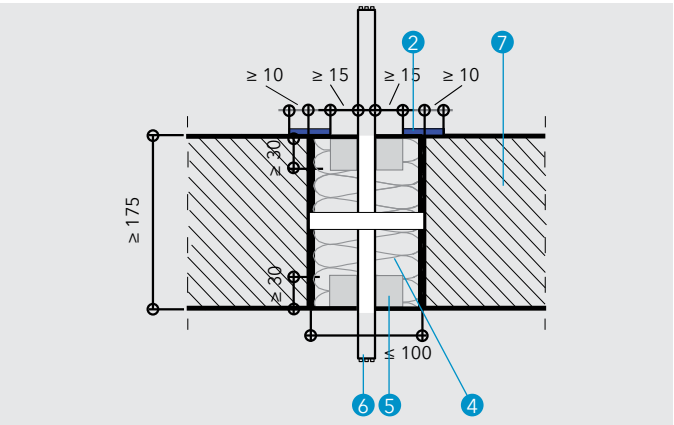
Symmetrical joint filling coated on both sides with 1,5 mm PROMASEAL®-A spray on the backfilling (mineral wool 35 kg/m³), as well as 10 mm on the adjacent supporting construction, Details A and B:
(linear joint seal in horizontal supporting construction, joint type A or horizontal wall joint abutting a floor, ceiling or roof, joint type D or horizontal floor joint abutting a wall, joint type E)
EI 240 – H – M 25 – B – W 00 to 100 between two rigid constructions.
EI 120 / E 240 – H – M 25 – B – W 00 to 100 between rigid construction forming one joint face and separating elements constructions made of metals with a melting point higher than 1000 °C forming the other joint face (joint between wall and steel trapezoidal sheet roof).

Asymmetrical joint filling coated on the unexposed side with 2,0 mm PROMASEAL®-A spray on the backfilling (mineral wool 100 kg/m³), as well as 10 mm on the adjacent supporting construction, Detail C:
(linear joint seal in horizontal supporting construction, joint type A or horizontal wall joint abutting a floor, ceiling or roof, joint type D)
EI 240 – H – X – B – W 00 to 100 between two rigid constructions (maximum movement capability ± 7,5%).
Small cable penetration is tested (see Details F and H).

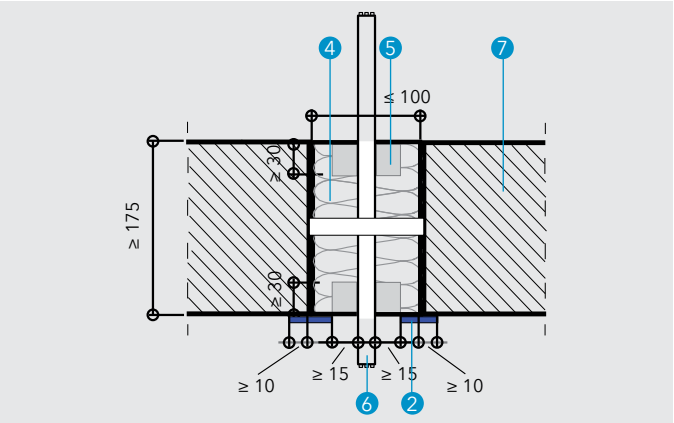
Asymmetrical joint filling coated on the exposed side with 2,0 mm PROMASEAL®-A spray on the backfilling (mineral wool 100 kg/m³), as well as 10 mm on the adjacent supporting construction, Detail D:
(linear joint seal in horizontal supporting construction, joint type A or horizontal wall joint abutting a floor, ceiling or roof, joint type D)
EI 180 / E 240 – H – X – B – W 00 to 100 between two rigid constructions (maximum movement capability ± 7,5%).
Small cable penetration is tested with 2,8 mm PROMASEAL®-A spray on the backfilling (see Details G and H).



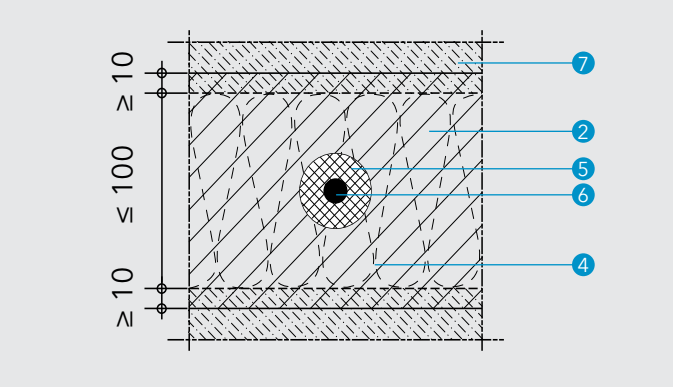
Detail E – Asymmetrical joint filling between wall and floor



Detail F – Small cable penetrating through linear joint seal, backfilling coated on the unexposed side in floor



Detail G – Small cable penetrating through linear joint seal, backfilling coated on the exposed side in floor



Detail H – Perpendicular view of the combined cable and linear joint penetration seal

Table 2 – Rigid floor (Details D and E)

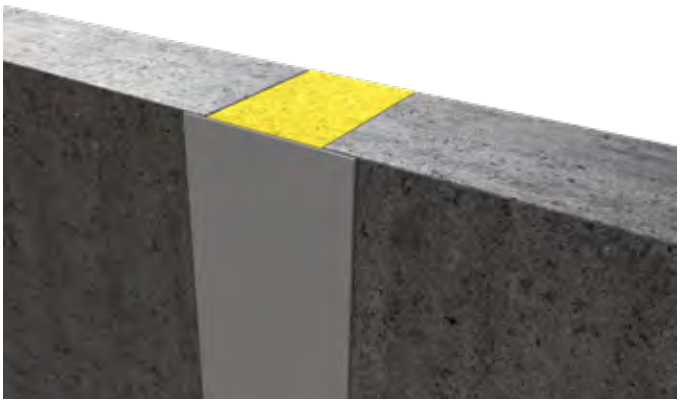
Rigid floor and wall thickness	≥ 175 mm
Rigid floor and wall density	≥ 600 kg/m³
Joint width	≥ 0 ≤ 100 mm
Backfilling	Mineral wool, Class A1 according to EN 13501-1, melting point ≥ 1000 °C
Density of backfilling	≥ 100 kg/m³
Asymmetrical joint filling coated on the exposed side with 2,8 mm PROMASEAL®-A spray on the backfilling (mineral wool 100 kg/m³), as well as 10 mm on the adjacent supporting construction, Details D and E: (linear joint seal in horizontal supporting construction, joint type A or horizontal wall joint abutting a floor, ceiling or roof, joint type D) **EI 240 – H – X – B – W 00 to 100** between two rigid constructions (maximum movement capability ± 7,5%). Small cable penetration is tested (see Details G and H).	

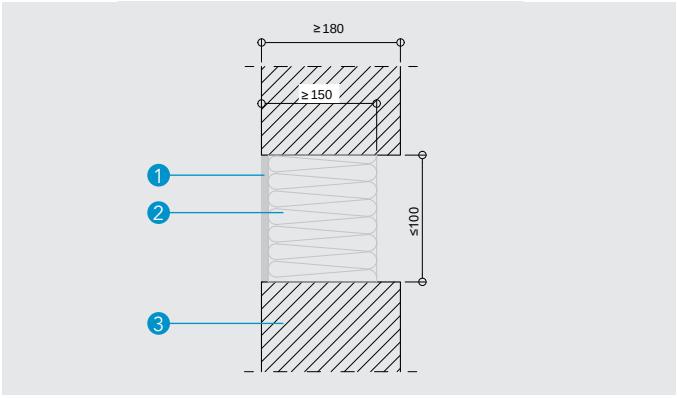
Details F, G and H

Asymmetrical linear joint seal with 7,5% movement capability coated on the unexposed side with PROMASEAL®-A spray on the backfilling. Small cables with maximum diameter of 14 mm of the following types: NYY-J 5x1,5 RE, E-YY-J 5x1,5 RE or VV 5x1,5 and all cable types currently and commonly used in building practice in Europe to a maximum diameter of 14 mm (optical fiber cables are covered), except tied bundles, waveguides and non sheathed cables (wires) may penetrate the linear joint seal. The cables shall be sealed by means of PROMASEAL®-AG intumescent fire stopping sealant (5) which is placed on the depth of 30 mm on both sides of the joint, around the cable in the annular gap width of 15 mm.

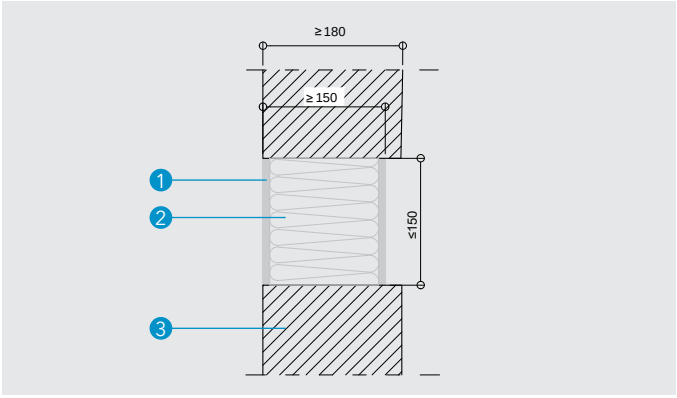
Table 3 – Rigid floor (Details F, G and H)

Rigid floor and wall thickness	≥ 175 mm
Rigid floor and wall density	≥ 600 kg/m³
Joint width	≥ 0 ≤ 100 mm
Backfilling	Mineral wool, Class A1 according to EN 13501-1, melting point ≥ 1000 °C
Density of backfilling	≥ 100 kg/m³
Cable penetration seal combined with asymmetrical linear joint filling coated on the unexposed side with 2,0 mm PROMASEAL®-A spray on the backfilling (mineral wool 100 kg/m³), as well as 10 mm on the adjacent supporting construction, Details F and H (Detail H is top view of the seal): (linear joint seal in horizontal supporting construction, joint type A or horizontal wall joint abutting a floor, ceiling or roof, joint type D) **EI 240 – H – X – B – W 00 to 100** between two rigid constructions (maximum movement capability ± 7,5%).	
Cable penetration seal combined with asymmetrical linear joint filling coated on the exposed side with 2,8 mm PROMASEAL®-A spray on the backfilling (mineral wool 100 kg/m³), as well as 10 mm on the adjacent supporting construction, Details G and H (Detail H is bottom view of the seal): (linear joint seal in horizontal supporting construction, joint type A or horizontal wall joint abutting a floor, ceiling or roof, joint type D) **EI 240 – H – X – B – W 00 to 100** between two rigid constructions (maximum movement capability ± 7,5%).	





Detail A – One-sided protection of expansion joints



Detail B – Double-sided protection of expansion joints

Technical data

1. PROMASEAL®-A spray
2. Mineral rock wool
3. Rigid wall

Certificates: ITB-KOT-2022/2170

Important guidelines

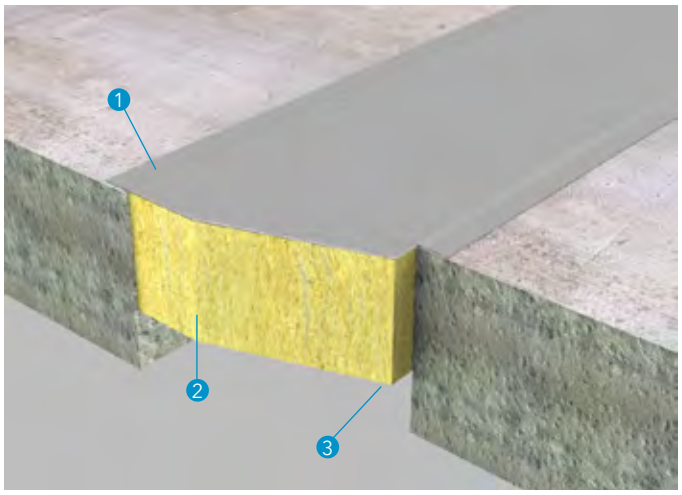
For protection of the expansion joints in walls within the fire resistance class EI240, it is possible to utilise the PROMASEAL®-A spray (1) fire stopping coating. This solution can be applied for the rigid partitions of min. thickness 180 mm.

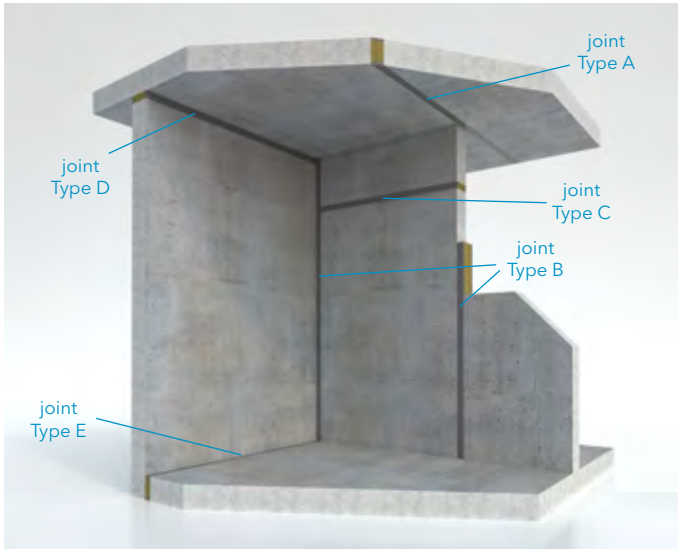
Detail A

The expansion joints of the max. width 100 mm can be protected with a layer of the PROMASEAL®-A spray (1) coating applied on one side. The gaps are filled with mineral wool (3) of the min. density 65 kg/m^3 to the min. depth 150 mm (e.g. 3x50 mm). One side of the mineral wool surface is covered with the PROMASEAL®-A spray (1) fire stopping coating, the min. layer thickness is 2,8 mm.

Detail B

The expansion joints of the max. width 150 mm can be protected with the PROMASEAL®-A spray (1) coating. The gaps are filled with mineral wool (3) of the min. density 65 kg/m^3 to the min. depth of 150 mm (e.g. 3x50 mm). Both the sides of the mineral wool surface are covered with the PROMASEAL®-A spray (1) fire stopping coating, to the min. thickness of 1,5 mm.





Detail A – Overview of the linear joints in and between walls and floors

Joint Type A – Linear joint in a horizontal test construction (floor to floor)

Joint Type B – Vertical linear joint in a vertical test construction (vertical joint wall to wall)

Joint Type C – Horizontal linear joint in a vertical construction (horizontal joint wall to wall)

Joint Type D – Horizontal wall joint abutting a floor, ceiling or roof
Joint Type E – Horizontal floor joint abutting a wall

Technical data

1. PROMASTOP®-CC
2. Backfilling material
3. Supporting construction

Certificates: ETA-16/0523, IBS CR 316100407-A-en,Rev1, ITB CR 02806/19/Z00NZP + ITB CR 01633/20/R141NZP

Customer benefit

- Quick and easy to install in linear joints of walls and floors
- Good adhesive properties
- Moisture resistance as soon as PROMASTOP®-CC has dried
- Use category X

1. Installation

The classifications are valid for static linear joint seals (with less than 7,5% movement). The following installation procedure must be followed:

Static joint

- Application temperature should be between + 5 °C to + 40 °C.
- Clean and moisten the aperture framing if necessary: surface should be cleaned of oil, wax, dirt, loose debris, grease and dust.
- If required, cover adjacent surfaces with adhesive tape.
- Apply the proper backfilling material as described on the related detail into the joint.
- Apply PROMASTOP®-CC with final layer thickness on the surface of the backfilling material and on the adjacent compartment if prescribed on the related detail.
- Label the joint.

Detail A

An overview of the various linear joints in and between walls and floors can be found in Detail A.

2. Fields of application

Details B to R

PROMASTOP®-CC is used as fire stopping coating in combination with backfilling material for linear joint seals. Fire resistance is classified according to EN 13501-2.

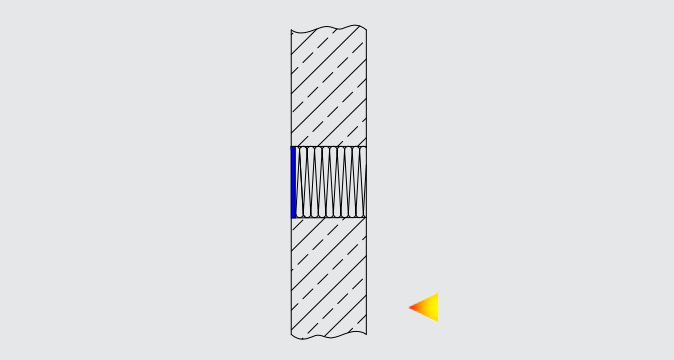
Rigid wall

The rigid wall must have a thickness ≥ 150 mm and a density of ≥ 450 kg/m³.

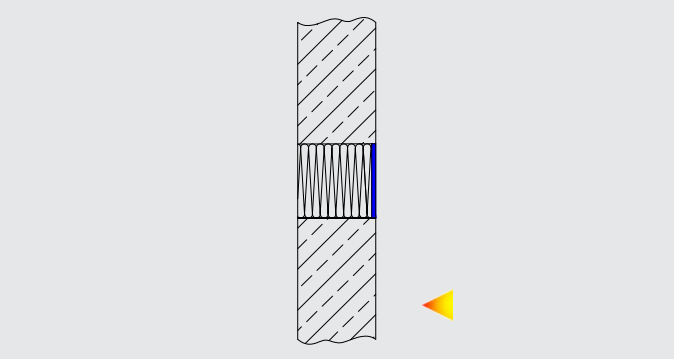
Rigid floor

The rigid floor must have a thickness ≥ 150 mm and a density of ≥ 450 kg/m³.

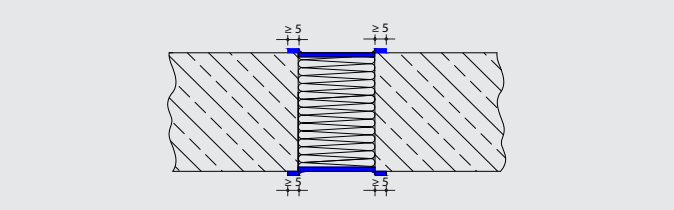
Test results achieved using a standard rigid supporting construction are valid for separating construction products made of concrete or masonry having the same or a higher thickness and density as those tested.



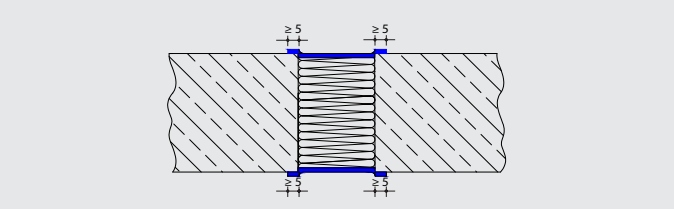
Detail B – Vertical joint filling coated on the unexposed side in wall



Detail C – Vertical joint filling coated on the exposed side in wall



Detail D – Joint filling coated on the exposed side in floor



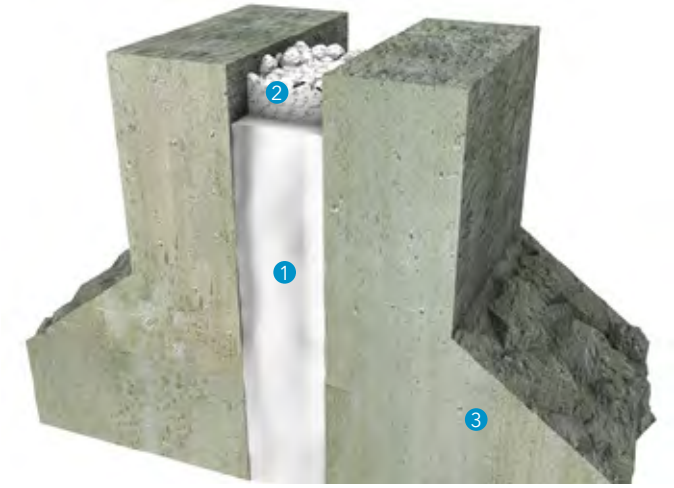
Detail E – Joint filling coated on the unexposed side in floor

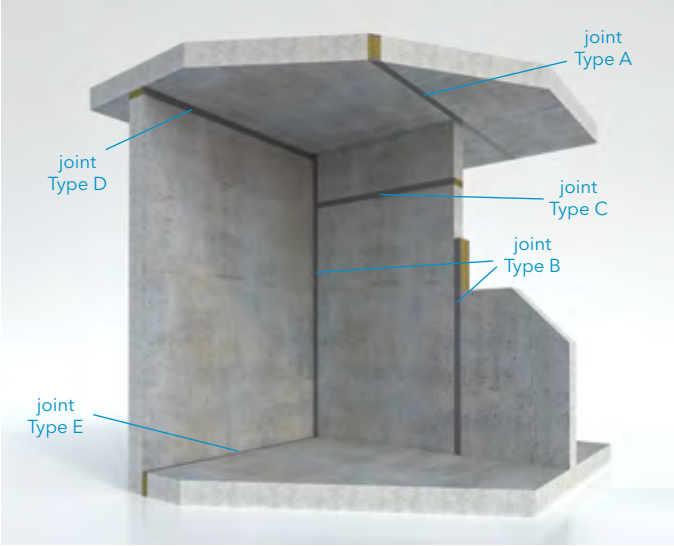
Table 1 – Rigid wall (Details B and C)

Rigid wall thickness	≥ 150 mm
Rigid wall density	≥ 450 kg/m³
Joint width	≥ 5 ≤ 50 mm
Backfilling	Class E in acc. with EN 13501-1 (e.g. single-component PU foam) or higher rated (e.g. glass wool, mineral wool, ceramic wool, etc.)
Joint movement in %	≤ 7,5
Vertical, asymmetrical joint filling coated on the exposed or on the unexposed side with 1 mm PROMASTOP®-CC on the backfilling, as well as 10 mm on the adjacent supporting construction, Details B and C: (vertical joint seal in vertical supporting construction, joint type B) **EI 90 – V – M 7,5 – F – W 5 to 50**	

Table 2 – Rigid floor (Details D and E)

Rigid floor thickness	≥ 150 mm
Rigid floor density	≥ 450 kg/m³
Joint width	≥ 5 ≤ 50 mm
Backfilling	Class E in acc. with EN 13501-1 (e.g. single-component PU foam) or higher rated (e.g. glass wool, mineral wool, ceramic wool etc.).
Joint movement in %	≤ 7,5
Asymmetrical joint filling coated on the exposed side with 1 mm PROMASTOP®-CC on the backfilling, as well as 10 mm on the adjacent supporting construction, Detail D: (linear joint seal in horizontal supporting construction, joint type A or horizontal wall joint abutting a floor, ceiling or roof, joint type D) **EI 120 – H – M 7,5 – F – W 5 to 50**	
Asymmetrical joint filling coated on the unexposed side with 1 mm PROMASTOP®-CC on the backfilling, as well as 10 mm on the adjacent supporting construction, Detail E: (linear joint seal in horizontal supporting construction, joint type A or horizontal wall joint abutting a floor, ceiling or roof, joint type D) **EI 60 – H – M 7,5 – F – W 5 to 50**	





Detail A – Overview of the linear joints in and between walls and floors

Joint Type A – Linear joint in a horizontal test construction (floor to floor)

Joint Type B – Vertical linear joint in a vertical test construction (vertical joint wall to wall)

Joint Type C – Horizontal linear joint in a vertical construction (horizontal joint wall to wall)

Joint Type D – Horizontal wall joint abutting a floor, ceiling or roof

Joint Type E – Horizontal floor joint abutting a wall

Technical data

1. PROMASEAL®-A
2. Backfilling material
3. Supporting construction
4. PROMASTOP®-CC

Certificates: ETA-14/0108, IBS CR 13061203, ITB CR 02806/19/Z00NZP + ITB CR 01633/20/R141NZP

Customer benefit

- Approved with combustible backfilling material
- Good adhesion
- Can be overpainted

1. Installation

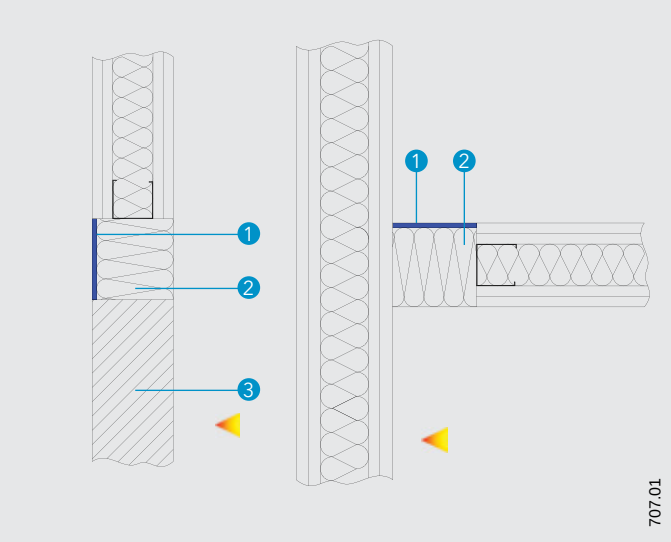
- Application temperature should be between +5 °C and +40 °C.
- Cleaning the opening; surface to which PROMASEAL®-A will be applied, should be cleaned of oil, wax, dirt, loose debris, grease and dust.
- For very porous substrates the surface should be prewetted with water. PROMASEAL®-A adhers to the most substrates (plaster, drywall, concrete, wood…) without using a special primer.
- If required, cover adjacent surfaces with adhesive tape.
- For some openings insert backfilling material into the joint: press mineral wool (Class A1 according to EN 13501-1, melting point ≥ 1000 °C, density ≥ 40 kg/m³, with at least 30% compression) or insert Class E or higher rated insulation (according to EN 13501-1, e.g. polystyrene). Leave the defined gap depth for application of PROMASEAL®-A. Apply PROMASEAL®-A using a dispenser and smoothen the surface. For smoothing the sealant a spatula or the finger may be used and it is also possible to use a bit of water to support smoothing.
- The used tools may be cleaned with water.
- After 24 hours overpainting of PROMASEAL®-A is possible, but adhesion and compatibility need to be checked individually.
- Label the joint.

Table 1 – Theoretical consumption of PROMASEAL®-A

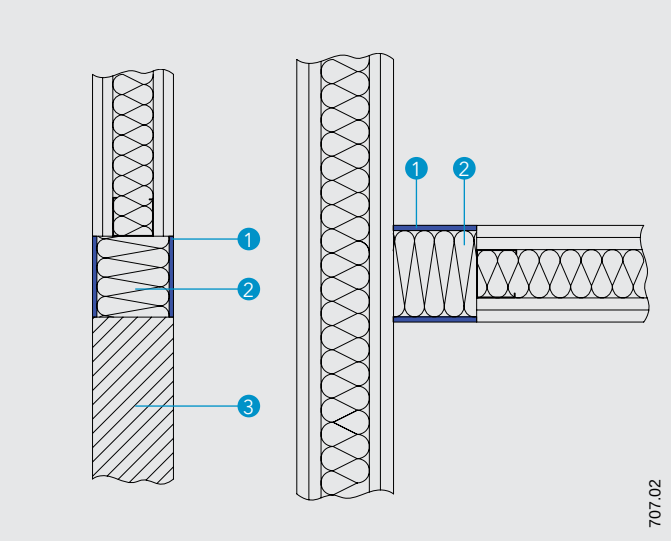
	Joint width						
Joint depth	10 mm	15 mm	20 mm	25 mm	30 mm	40 mm	50 mm
10 mm	3,1 m	2,0 m	1,5 m	1,2 m	1,0 m	0,8 m	0,6 m
15 mm	2,0 m	1,3 m	1,0 m	0,8 m	0,6 m	0,5 m	0,4 m
20 mm	1,5 m	1,0 m	0,7 m	0,6 m	0,5 m	0,4 m	0,3 m

Detail A

An overview of the various linear joints in walls and floors can be found in Detail A.



Detail B – Joint filling coated on the unexposed side in wall



Detail C – Joint filling coated on both sides in wall

2. Fields of application

Details B to Q

PROMASEAL®-A is used as fire stopping sealant usually in combination with backfilling material for linear joint seals. Fire resistance is classified according to EN 13501-2.

Flexible wall

The wall must have a thickness of ≥ 100 mm and be made from timber or metal studs which are lined on both sides with a minimum of two layers of 12,5 mm thick fire protective boards (other board thicknesses shall be permissible, please note minimum thickness). For timber stud walls, a minimum distance of 100 mm must be kept from the joint seal to each of the timber studs and the cavity between stud and seal must be filled with at least 100 mm of insulation material compliant to class A1 or A2 (acc. to EN 13501-1).
The classification results from flexible walls may also apply to rigid walls in case the thickness and density is higher than those of the tested construction.

Rigid wall

The rigid wall must have a thickness ≥ 100 mm and a density of ≥ 450 kg/m³.

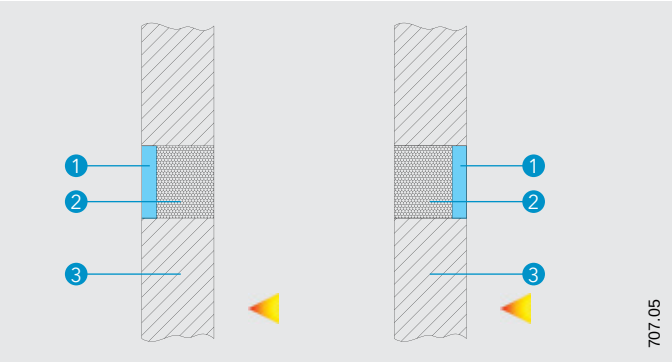
Rigid floor

The floor must have a thickness ≥ 150 mm and a density of ≥ 450 kg/m³.

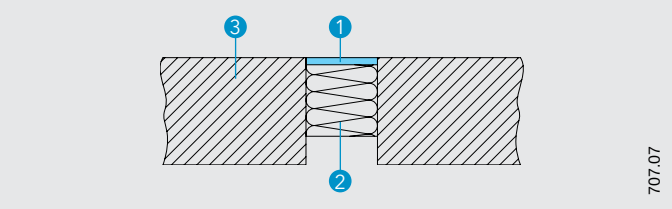
Test results achieved using a standard rigid supporting construction are valid for separating construction products made of concrete or masonry having the same or a higher thickness and density as those tested.

Table 2 – Flexible and rigid wall (Details B and C)

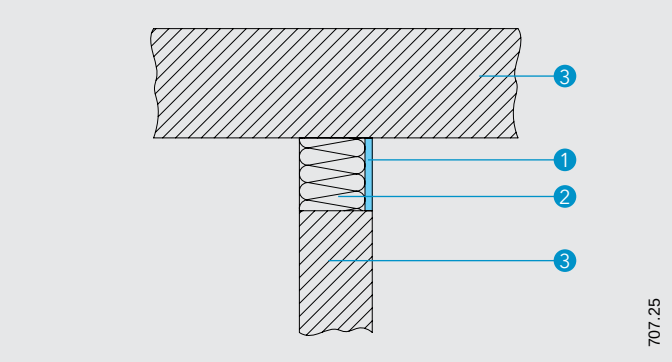
Wall thickness	≥ 100 mm
Joint width	≥ 5 ≤ 100 mm
Backfilling	Mineral wool, Class A1 acc. to EN 13501-1, melting point ≥ 1000 °C
Density of backfilling	≥ 40 kg/m³, see below in the classifications
Joint movement in %	≤ 7,5
Vertical, asymmetrical joint filling, coated on the unexposed side with 5 mm PROMASEAL®-A on the backfilling (mineral wool 40 kg/m³), Detail B: (vertical joint seal in vertical supporting construction, joint type B) **EI 90 – V – M 7,5 – F – W 5 to 100**	
Vertical, asymmetrical joint filling, coated on the unexposed side with 10 mm PROMASEAL®-A on the backfilling (mineral wool 40 kg/m³), Detail B: (vertical joint seal in vertical supporting construction, joint type B) **EI 120 – V – M 7,5 – F – W 5 to 100**	
Vertical, symmetrical joint filling, coated on both sides with 2,5 mm PROMASEAL®-A on the backfilling (mineral wool 40 kg/m³), Detail C: (vertical joint seal in vertical supporting construction, joint type B) **EI 90 – V – M 7,5 – F – W 5 to 100**	
Vertical, symmetrical joint filling, coated on both sides with 5 mm PROMASEAL®-A on the backfilling (mineral wool 40 kg/m³), Detail C: (vertical joint seal in vertical supporting construction, joint type B): **EI 120 – V – M 7,5 – F – W 5 to 100**	



Detail D – Joint filling coated on one side with combustible backfilling in wall



Detail E – Joint filling coated on the unexposed side in floor



Detail F – Joint filling coated on one side in wall (floor connection)

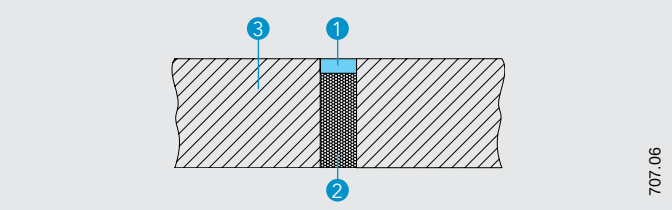
Horizontal joint filling, coated on the unexposed side with 5 mm PROMASEAL®-A on the backfilling (mineral wool 60 kg/m³), Detail B: (horizontal joint seal in vertical supporting construction, joint type C) **EI 90 - T - M - 7,5 - F - W 5 to 100**
Horizontal joint filling, coated on the unexposed side with 10 mm PROMASEAL®-A on the backfilling (mineral wool 60 kg/m³), Detail B: (horizontal joint seal in vertical supporting construction, joint type C) **EI 120 - T - M - 7,5 - F - W 5 to 100**
Horizontal joint filling, coated on both sides with 2,5 mm PROMASEAL®-A on the backfilling (mineral wool 40 kg/m³), Detail C: (horizontal joint seal in vertical supporting construction, joint type C) **EI 90 - T - M - 7,5 - F - W 5 to 100**
Horizontal joint filling, coated on both sides with 5 mm PROMASEAL®-A on the backfilling (mineral wool 40 kg/m³), Detail C: (horizontal joint seal in vertical supporting construction, joint type C) **EI 120 - T - M - 7,5 - F - W 5 to 100**

Table 3 – Rigid wall (Detail D)

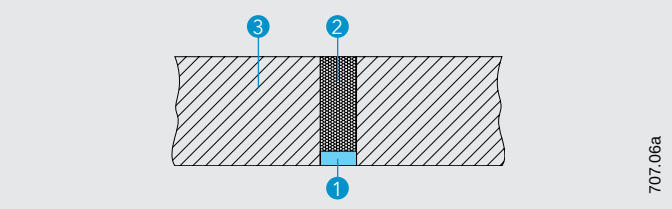
Rigid wall thickness	≥ 100 mm
Wall density	≥ 450 kg/m³
Joint width	≥ 5 ≤ 100 mm
Backfilling	Class E or higher rated (according to EN 13501-1, e.g. polystyrene)
Density of backfilling	≥ 15 kg/m³
Vertical, asymmetrical joint filling, coated on one side with 20 mm PROMASEAL®-A on the backfilling, Detail D: (vertical joint seal in vertical supporting construction, joint type B) **EI 90 – V – M 7,5 – F – W 5 to 100**	

Table 4 – Rigid floor (Details E and F)

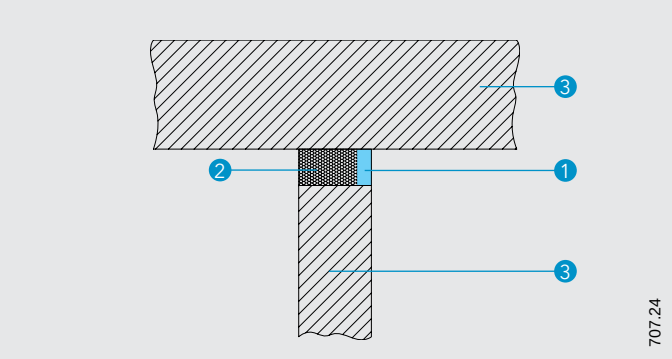
Rigid floor thickness	≥ 150 mm
Floor density	≥ 450 kg/m³
Rigid wall thickness	≥ 100 mm
Wall density	≥ 450 kg/m³
Joint width	≥ 5 ≤ 300 mm, see below in the classifications
Backfilling	Mineral wool, Class A1 according to EN 13501-1, melting point ≥ 1000 °C
Density of backfilling	≥ 40 kg/m³, see below in the various classifications
Joint movement in %	≤ 7,5
Linear, asymmetrical joint filling, coated on the unexposed side with 10 mm PROMASEAL®-A on the backfilling (mineral wool 40 kg/m³), Detail E: (linear joint seal in horizontal supporting construction, joint type A) **EI 120 – H – M 7,5 – F – W 5 to 100**	
Linear, asymmetrical joint filling, coated on the unexposed side with 10 mm PROMASEAL®-A on the backfilling (mineral wool 60 kg/m³, thickness 100 mm), Detail E: (linear joint seal in horizontal supporting construction, joint type A) **EI 120 - H - M - 7,5 - F - W 5 to 300**	
Horizontal, asymmetrical joint filling, coated on one side with 10 mm PROMASEAL®-A on the backfilling (mineral wool 40 kg/m³), Detail F: horizontal wall joint abutting a floor, ceiling or roof, joint type D) **EI 120 – H – M 7,5 – F – W 5 to 100**	



Detail G – Joint filling coated on one side with combustible backfilling in floor



Detail H – Joint filling coated on one side with combustible backfilling in floor



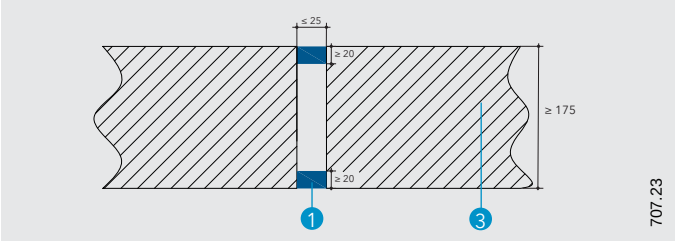
Detail I – Joint filling coated on one side with combustible backfilling in wall (floor connection)

Table 5 – Rigid floor (Details G and H)

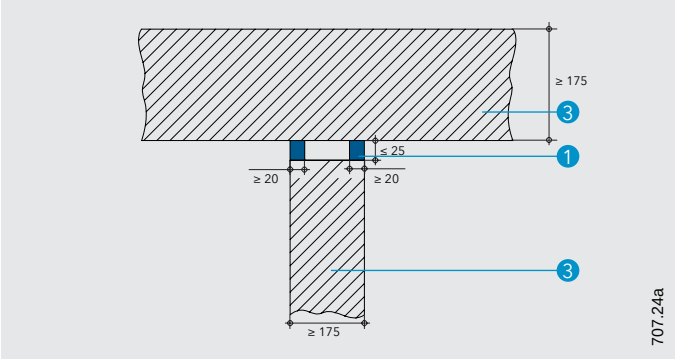
Rigid floor thickness	≥ 150 mm
Floor density	≥ 450 kg/m³
Joint width	≥ 5 ≤ 50 mm
Backfilling	Class E or higher rated (acc. to EN 13501-1, e.g. polystyrene)
Density of backfilling	≥ 15 kg/m³
Horizontal, asymmetrical joint filling, coated on one side with 20 mm PROMASEAL®-A on the backfilling, Details G and H: (linear joint seal in horizontal supporting construction, joint type A) **EI 90 – H – M 7,5 – F – W 5 to 50**	

Table 6 – Rigid wall abutting a floor, ceiling or roof (Detail I)

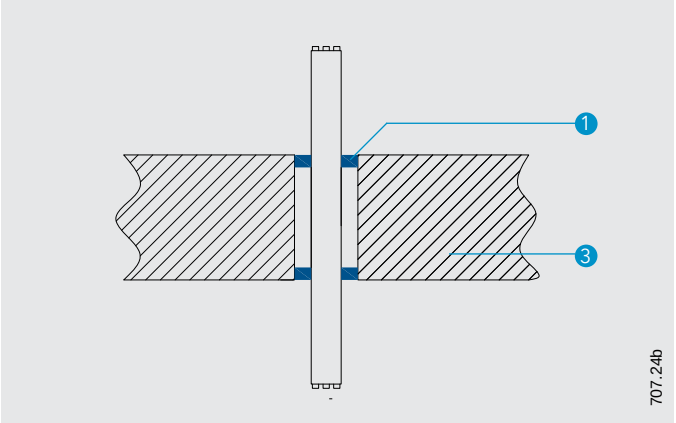
Rigid floor thickness	≥ 150 mm
Floor density	≥ 450 kg/m³
Joint width	≥ 5 ≤ 50 mm
Backfilling	Class E or higher rated (acc. to EN 13501-1, e.g. polystyrene)
Density of backfilling	≥ 15 kg/m³
Horizontal, asymmetrical joint filling, coated on one side with 20 mm PROMASEAL®-A on the backfilling, Detail I: (horizontal wall joint abutting a floor, ceiling or roof, joint type D) **EI 120 – V – M 7,5 – F – W 5 to 50**	



Detail J – Joint seal without backfilling in floor



Detail K – Joint seal without backfilling in wall (floor connection)



Detail L – Cable penetration seal in linear joint seal without backfilling in floor

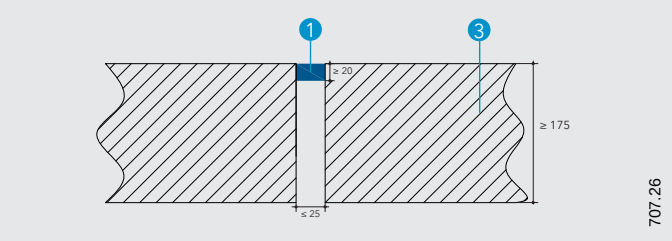
Table 7 – Rigid floor (Details J, K and L)

Floor thickness	≥ 175 mm
Floor density	≥ 600 kg/m³
Wall thickness	≥ 175 mm
Wall density	≥ 600 kg/m³
Joint width	≥ 0 ≤ 25 mm
Backfilling	-
Density of backfilling	-
Joint movement in %	7,5

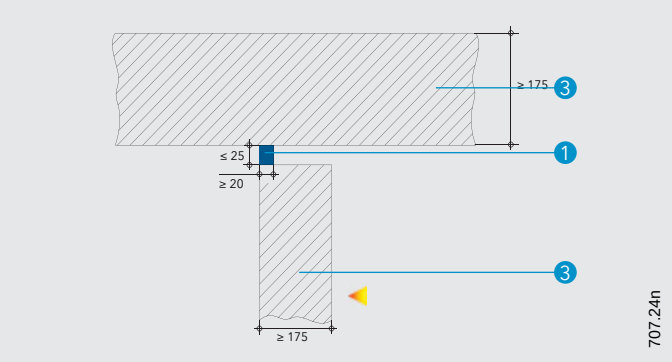
Horizontal joint seal without backfilling with 20 mm PROMASEAL®-A on both sides, Details J, K and L:
(linear joint seal in horizontal supporting construction, joint type A or horizontal wall joint abutting a floor, joint type D)
EI 240 – H – X – B – W 00 to 25 even with penetrating small cables (see Detail L). Maximum movement capability ± 7,5%.

Detail L

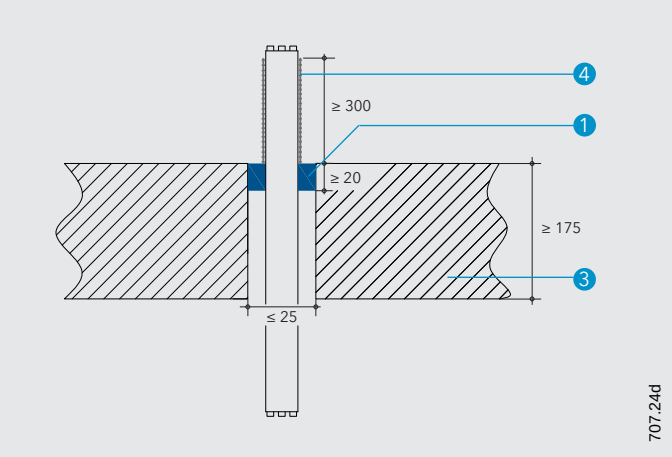
Small cables with maximum diameter of 14 mm of the following types: NYY-J 5x1,5 RE, E-YY-J 5x1,5 RE or VV 5x1,5 and all cable types currently and commonly used in building practice in Europe to a maximum diameter of 14 mm (optical fiber cables are covered), except tied bundles, waveguides and nonsheathed cables (wires) may penetrate the linear joint seal without change in the classification.



Detail M – Joint seal on the top side of the floor without backfilling



Detail N – Joint seal on the unexposed side of the wall without backfilling (floor connection)



Detail O – Small cable penetrating through linear joint seal without backfilling in floor

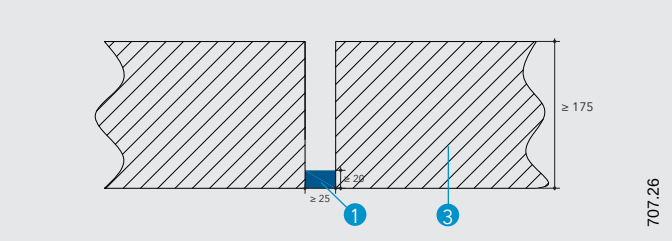
Table 8 – Rigid floor (Details M, N and O)

Floor thickness	≥ 175 mm
Floor density	≥ 600 kg/m³
Wall thickness	≥ 175 mm
Wall density	≥ 600 kg/m³
Joint width	≥ 0 ≤ 25 mm
Backfilling	-
Density of backfilling	-
Joint movement in %	7,5

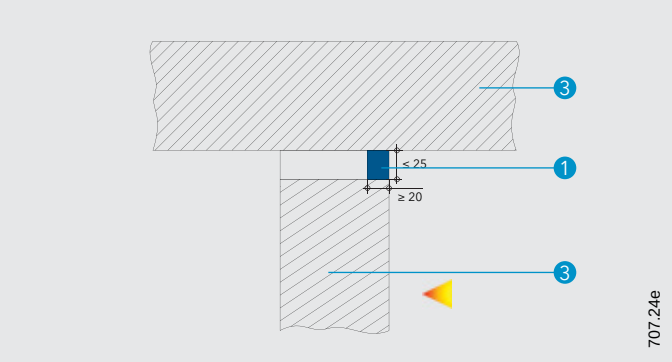
Horizontal joint seal without backfilling with 20 mm PROMASEAL®-A on the top of the floor or on the unexposed side of the wall, Details M, N and O:
(linear joint seal in horizontal supporting construction, joint type A or horizontal wall joint abutting a floor, joint type D)
EI 240 – H – X – B – W 00 to 25 even with penetrating small cables (needs additional PROMASTOP®-CC coating protection, see Detail O).
Maximum movement capability ± 7,5%.

Detail O

Small cables with maximum diameter of 14 mm of the following types: NYY-J 5x1,5 RE, E-YY-J 5x1,5 RE or VV 5x1,5 and all cable types currently and commonly used in building practice in Europe to a maximum diameter of 14 mm (optical fiber cables are covered), except tied bundles, waveguides and nonsheathed cables (wires) may penetrate the linear joint seal. The cables shall be sealed additionally with PROMASTOP®-CC fire stopping coating placed on the top of the floor on the length of min. 300 mm, with dry layer thickness of min. 2 mm.



Detail P – Joint seal on the bottom side of the floor without backfilling



Detail Q – Joint seal on the exposed side of the wall without backfilling (floor connection)

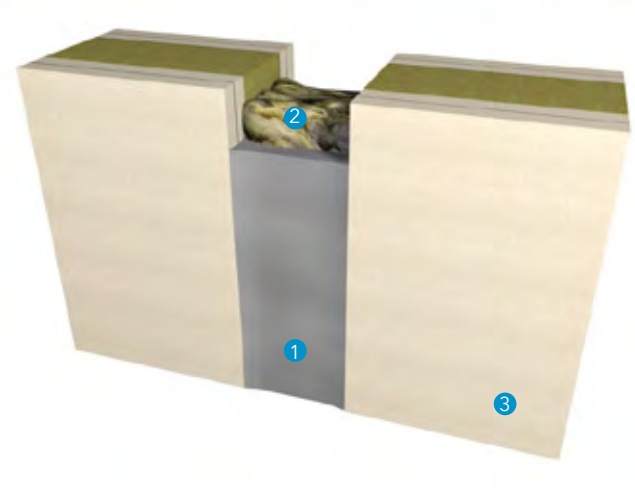
Table 9 – Rigid floor (Details P and Q)

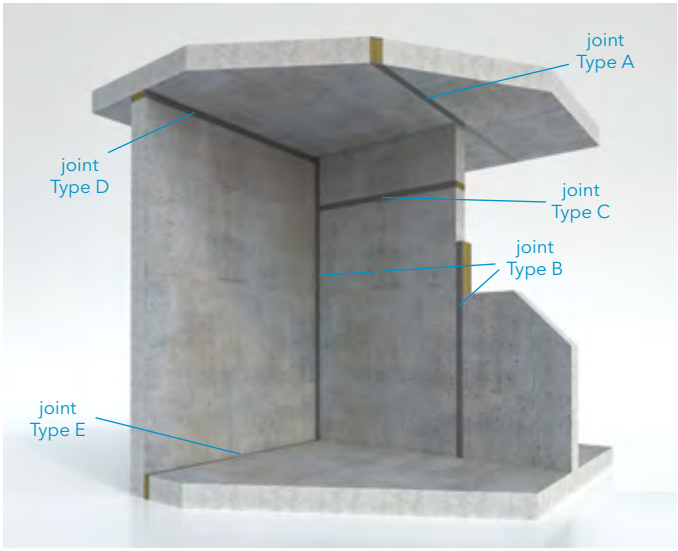
Floor thickness	≥ 175 mm
Floor density	≥ 600 kg/m³
Wall thickness	≥ 175 mm
Wall density	≥ 600 kg/m³
Joint width	≥ 0 ≤ 25 mm
Backfilling	-
Density of backfilling	-
Joint movement in %	7,5

Horizontal joint seal without backfilling with 20 mm PROMASEAL®-A on the bottom of the floor or on the exposed side of the wall, Details P and Q:
(linear joint seal in horizontal supporting construction, joint type A or horizontal wall joint abutting a floor, joint type D)
EI 180 – H – X – B – W 00 to 25 (maximum movement capability ± 7,5%).

Details P and Q

If the construction joint is not wider than 25 mm, it can be protected one-sided only with 20 mm fire stopping sealant PROMASEAL®-A. Construction joint protected in this way in floor or between wall and floor has fire resistance class EI 180. It doesn't matter which side is protected.





Detail A – Overview of the linear joints in and between walls and floors

Joint Type A – Linear joint in a horizontal test construction (floor to floor)

Joint Type B – Vertical linear joint in a vertical test construction (vertical joint wall to wall)

Joint Type C – Horizontal linear joint in a vertical construction (horizontal joint wall to wall)

Joint Type D – Horizontal wall joint abutting a floor, ceiling or roof
Joint Type E – Horizontal floor joint abutting a wall

Technical data

1. PROMASEAL®- AG
2. Backfilling material
3. Supporting construction

Certificates: ETA-16/0309, IBS KB 12042724-A,Rev1, ITB CR 02806/19/Z00NZP + ITB CR 01633/20/R141NZP

Customer benefit

- Approved with combustible backfilling material
- Can be overcoated or overpainted
- Universally usable

1. Installation

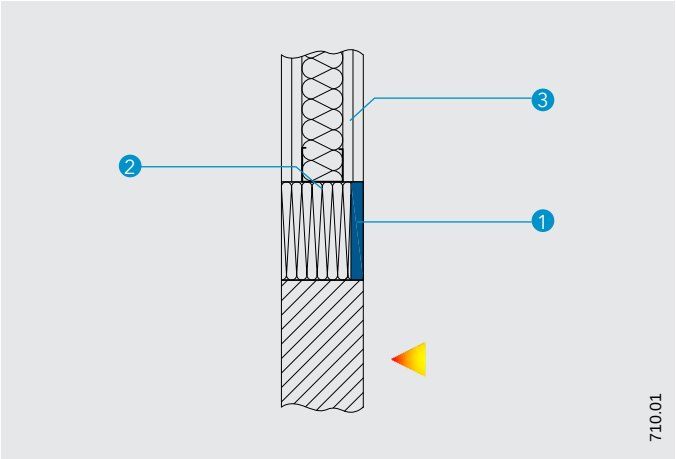
- Application temperature should be between +5 °C and +40 °C.
- Cleaning the opening; surface to which PROMASEAL®-AG will be applied, should be cleaned of oil, wax, dirt, loose debris, grease and dust.
- For very porous substrates the surface should be prewetted with water. PROMASEAL®-AG adhers to the most substrates (plaster, drywall, concrete…) without using a special primer.
- If required, cover adjacent surfaces with adhesive tape.
- Insert backfilling material into the joint: press mineral wool (Class A1 acc. to EN 13501-1, melting point ≥ 1000 °C, density ≥ 60 kg/m³, with at least 30% compression) or insert Class E or higher rated insulation (according to EN 13501-1, e.g. polystyrene). Leave a defined gap depth for application of PROMASEAL®-AG.
- Apply PROMASEAL®-AG using a dispenser and smoothen the surface. For smoothing the sealant a spatula or the finger may be used and it is also possible to use a bit of water to support smoothing.
- The used tools may be cleaned with water.
- Label the joint.

Table 1 – Theoretical consumption data for PROMASEAL®-AG

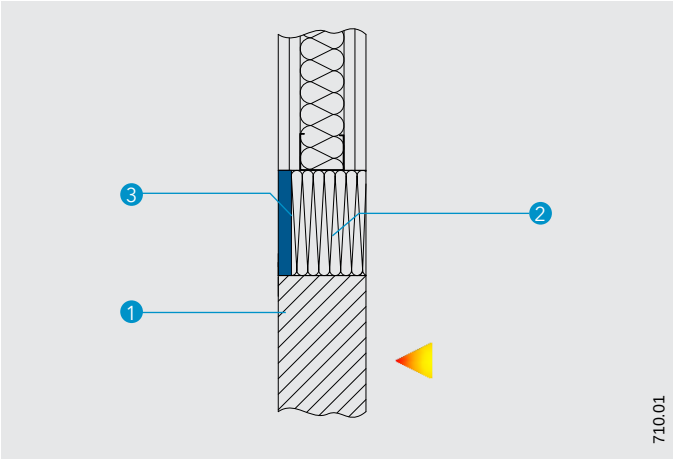
	Joint width						
Joint depth	10 mm	15 mm	20 mm	25 mm	30 mm	40 mm	50 mm
10 mm	3,1 m	2,0 m	1,5 m	1,2 m	1,0 m	0,8 m	0,6 m
15 mm	2,0 m	1,3 m	1,0 m	0,8 m	0,6 m	0,5 m	0,4 m
20 mm	1,5 m	1,0 m	0,7 m	0,6 m	0,5 m	0,4 m	0,3 m

Detail A

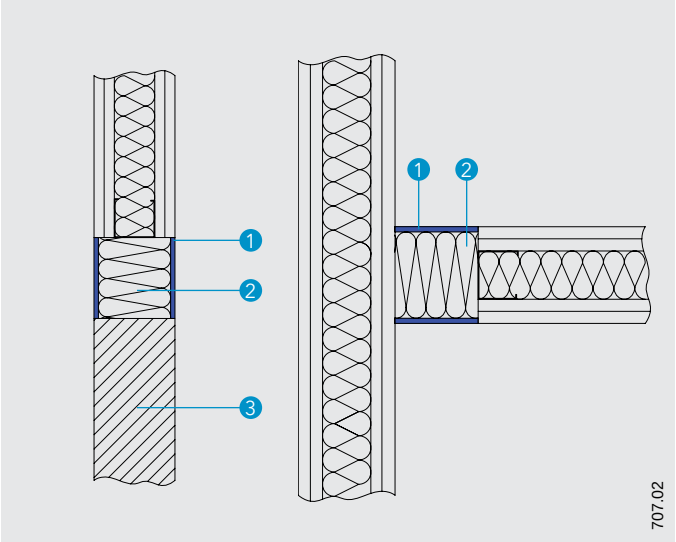
An overview of the various linear joints in walls and floors can be found in Detail A.



Detail B – Joint filling coated on the exposed side in wall



Detail C – Joint filling coated on the unexposed side in wall



Detail D – Joint filling coated on both sides in wall

2. Fields of application

Details B to G

PROMASEAL®-AG is used as fire stopping sealant in combination with backfilling material for linear joint seals. Fire resistance is classified according to EN 13501-2.

Flexible wall

The wall must have a thickness of ≥ 100 mm and be made from timber or metal studs which are lined on both sides with a minimum of two layers of 12,5 mm thick fire protective boards (other board thicknesses shall be permissible, please note minimum thickness). For timber stud walls, a minimum distance of 100 mm must be kept from the joint seal to each of the timber studs and the cavity between stud and seal must be filled with at least 100 mm of insulation material compliant to class A1 or A2 (acc. to EN 13501-1).

The classification results from flexible walls may also apply to rigid walls in case the thickness and density is higher than those of the tested construction.

Rigid wall

The rigid wall must have a thickness ≥ 100 mm and a density of ≥ 450 kg/m³.

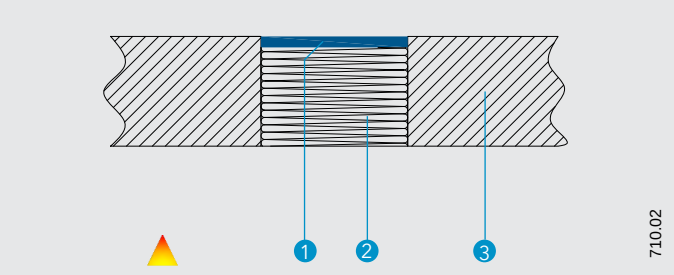
Rigid floor

The floor must have a thickness ≥ 150 mm and a density of ≥ 450 kg/m³.

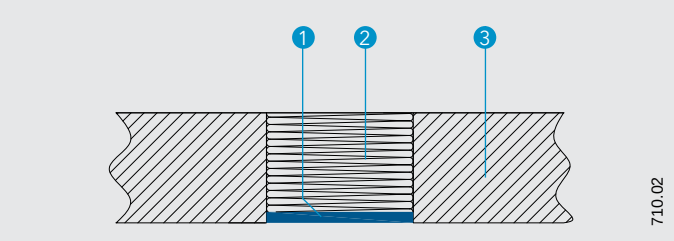
Test results achieved using a standard rigid supporting construction are valid for separating construction products made of concrete or masonry having the same or a higher thickness and density as those tested.

Table 2 – Flexible and rigid wall (Details B and C)

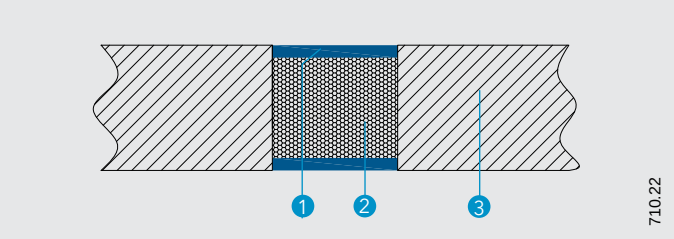
Type	Specification
Wall thickness	≥ 100 mm
Joint width	≥ 5 ≤ 100 mm
Backfilling	Mineral wool, Class A1 acc. to EN 13501-1, melting point ≥ 1000 °C
Density of backfilling	≥ 60 kg/m³
Joint movement in %	0
Vertical, asymmetrical joint filling, coated on the unexposed side with 15 mm PROMASEAL®-AG on the backfilling, Detail B: (vertical joint seal in vertical supporting construction, joint type B) **EI 120 – V – X – F – W 5 to 100**	
Vertical, asymmetrical joint filling, coated on the exposed side with 15 mm PROMASEAL®-AG on the backfilling, Detail C: (vertical joint seal in vertical supporting construction, joint type B) **EI 120 – V – X – F – W 5 to 100**	
Vertical, symmetrical joint filling, coated on both sides with 15 mm PROMASEAL®-AG on the backfilling, Detail D: (vertical joint seal in vertical supporting construction, joint type B) **EI 90 – V – X – F – W 5 to 100**	



Detail E – Joint filling coated on the unexposed side in floor



Detail F – Joint filling coated on the exposed side in floor



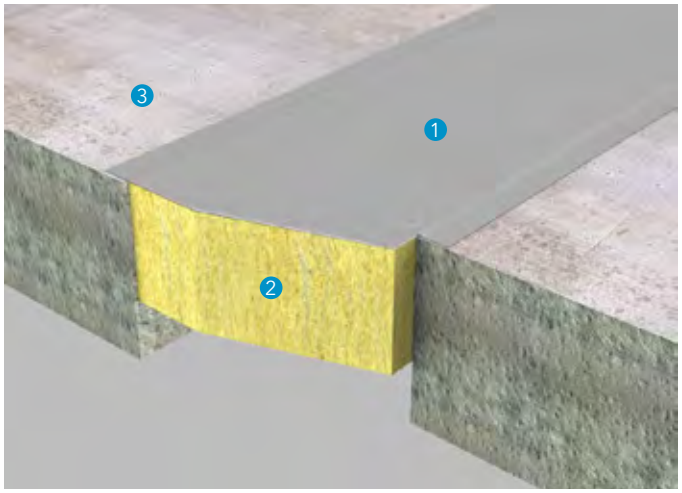
Detail G – Joint filling coated on both sides with combustible backfilling in floor

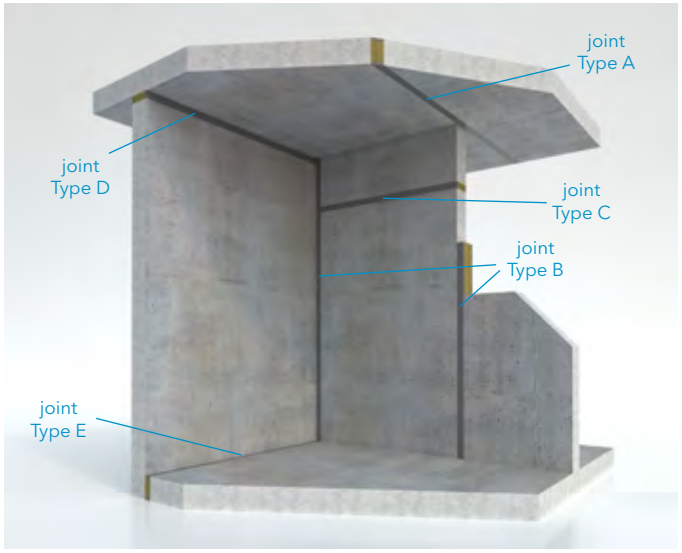
Table 3 – Rigid floor (Details E and F)

Type	Specification
Rigid floor thickness	≥ 150 mm
Floor density	≥ 450 kg/m³
Joint width	≥ 5 ≤ 100 mm
Backfilling	Mineral wool, Class A1 acc. to EN 13501-1, melting point ≥ 1000 °C
Density of backfilling	≥ 60 kg/m³
Joint movement in %	0
Linear, asymmetrical joint filling, coated on the unexposed side with 15 mm PROMASEAL®-AG on the backfilling, Detail E: (linear joint seal in horizontal supporting construction, joint type A or horizontal wall joint abutting a floor, ceiling or roof, joint type D) **EI 120 – H – X – F – W 5 to 100**	
Linear, asymmetrical joint filling, coated on the exposed side with 15 mm PROMASEAL®-AG on the backfilling, Detail F: (linear joint seal in horizontal supporting construction, joint type A or horizontal wall joint abutting a floor, ceiling or roof, joint type D) **EI 120 – H – X – F – W 5 to 100**	

Table 4 – Rigid floor (Detail G)

Type	Specification
Rigid floor thickness	≥ 150 mm
Floor density	≥ 450 kg/m³
Joint width	≥ 5 ≤ 100 mm
Backfilling	Class E or higher rated insulation (acc. to EN 13501-1, e.g. polystyrene)
Density of backfilling	≥ 15 kg/m³
Joint movement	0
Linear, symmetrical joint filling, coated on both sides with 15 mm PROMASEAL®-AG on the backfilling, Detail G: (linear joint seal in horizontal supporting construction, joint type A or horizontal wall joint abutting a floor, ceiling or roof, joint type D) **EI 120 – H – X – F – W 5 to 100**	





Detail A – Overview of the linear joints in and between walls and floors

Joint Type A – Linear joint in a horizontal test construction (floor to floor)

Joint Type B – Vertical linear joint in a vertical test construction (vertical joint wall to wall)

Joint Type C – Horizontal linear joint in a vertical construction (horizontal joint wall to wall)

Joint Type D – Horizontal wall joint abutting a floor, ceiling or roof
Joint Type E – Horizontal floor joint abutting a wall

Technical data

1. PROMASEAL®- S
2. Backfilling material
3. Supporting construction

Certificate: ETA-16/0312, IBS KB 318070403-A, ITB CR 00668/20/Z00NZP

Customer benefit

- Quick and easy to install in linear joints of wall and floors
- Ageing and weather resistant, suitable for external use (use category Type X)
- Resistant against chemicals

1. Installation

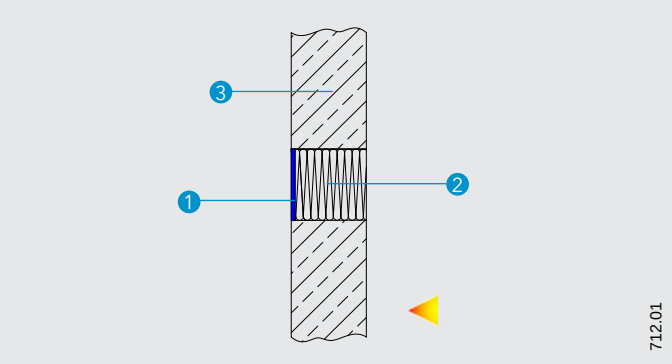
- Application temperature should be between +5 °C and +40 °C.
- Cleaning the opening; surface to which PROMASEAL®-S will be applied, should be cleaned of oil, wax, dirt, loose debris, grease and dust.
- PROMASEAL®-S adhers to the most substrates (plaster, dry-wall, concrete, wood…) without using a special primer.
- Cover adjacent surfaces with adhesive tape if necessary.
- Insert backfilling material into the joint: press mineral wool (Class A1 according to EN 13501-1, melting point ≥ 1000 °C, density ≥ 40 kg/m³, with at least 30% compression) or insert Class E or higher rated insulation (according to EN 13501-1, e.g. polystyrene). Leave a defined gap depth for application of PROMASEAL®-S.
- To ensure adhesion, apply PROMASEAL®-S in the framing first. Subsequently, PROMASEAL®-S shall be applied to the inserted backfilling material with final layer thickness and smoothed. For smoothing the sealant a spatula or the finger may be used.
- Label the joint.

Table 1

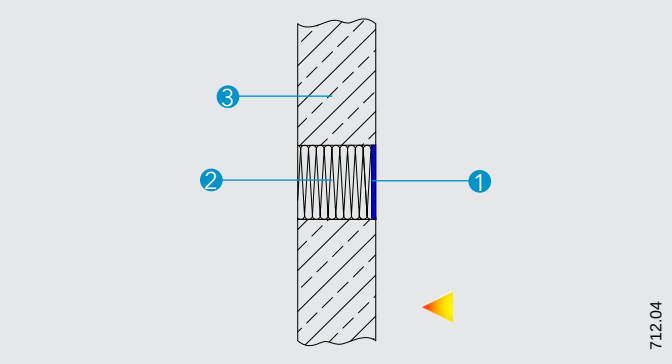
For the theoretical consumption per 310 ml cartridge see Table 1.

Table 1 – Theoretical consumption data for PROMASEAL®-S

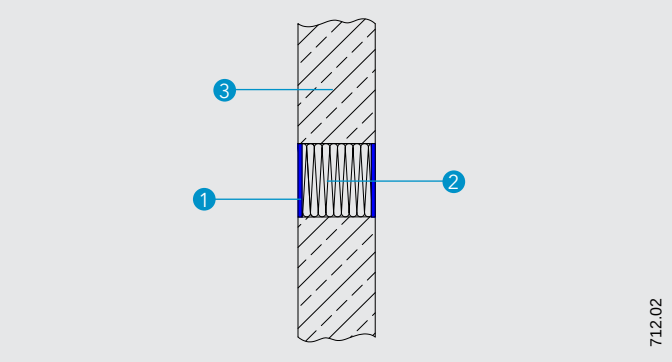
	Joint width						
Joint depth	10 mm	15 mm	20 mm	25 mm	30 mm	40 mm	50 mm
10 mm	3,1 m	2,0 m	1,5 m	1,2 m	1,0 m	0,8 m	0,6 m
15 mm	2,0 m	1,3 m	1,0 m	0,8 m	0,6 m	0,5 m	0,4 m
20 mm	1,5 m	1,0 m	0,7 m	0,6 m	0,5 m	0,4 m	0,3 m



Detail B – Joint filling coated on the unexposed side in wall



Detail C – Joint filling coated on the exposed side in wall



Detail D – Joint filling coated on both sides in wall

2. Fields of application

Details B to J

PROMASEAL®-S is used as fire stopping sealant in combination with backfilling material for linear joint seals. Fire resistance is classified according to EN 13501-2.

Rigid floor

The floor must have a thickness of ≥ 150 mm and a density of ≥ 450 kg/m³.

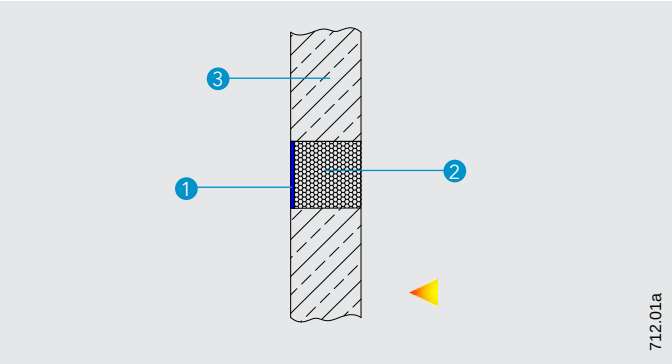
Rigid wall

The wall must have a thickness of ≥ 100 mm and a density of ≥ 450 kg/m³.

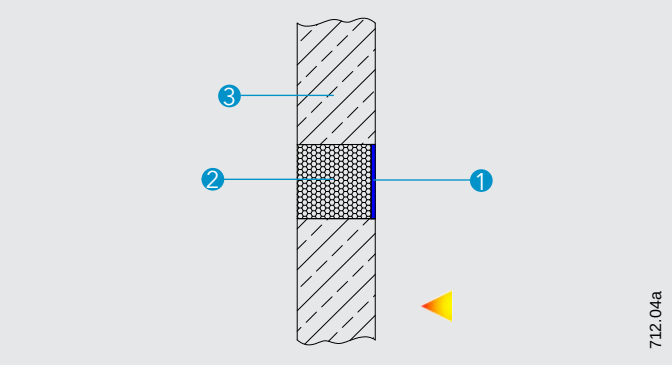
Test results achieved using a standard rigid supporting construction are valid for separating construction products made of concrete, hollow blocks or masonry having the same or a higher thickness and density as those tested. The components (supporting constructions) must be classified acc. to EN 13501-2 for the required fire resistance period.

Table 2 – Rigid wall (Details B, C and D)

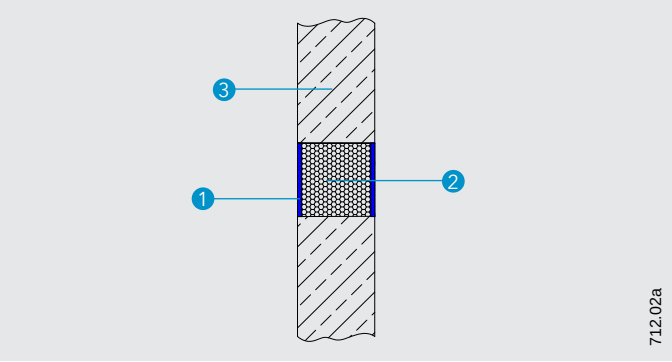
Type	Specification
Rigid wall thickness	≥ 100 mm
Rigid wall density	≥ 450 kg/m³
Joint width	≥ 5 ≤ 100 mm
Backfilling	Mineral wool, Class A1 acc. to EN 13501-1, melting point ≥ 1000 °C
Density of backfilling	≥ 40 kg/m³
Joint movement in %	≤ 7,5
Vertical, asymmetrical joint filling coated on the unexposed side with ≥ 10 mm PROMASEAL®-S on the backfilling (mineral wool 40 kg/m³), Detail B: (vertical joint seal in vertical supporting construction, joint type B) **EI 120 – V – M 7,5 – F – W 5 to 100**	
Vertical, asymmetrical joint filling coated on the exposed side with ≥ 10 mm PROMASEAL®-S on the backfilling (mineral wool 40 kg/m³), Detail C: (vertical joint seal in vertical supporting construction, joint type B) **E 120 EI 60 – V – M 7,5 – F – W 5 to 100**	
Vertical, symmetrical joint filling coated on both sides with ≥ 5 mm PROMASEAL®-S on the backfilling (mineral wool 40 kg/m³), Detail D: (vertical joint seal in vertical supporting construction, joint type B) **EI 120 – V – M 7,5 – F – W 5 to 100**	
Horizontal, asymmetrical joint filling coated on the unexposed side with ≥ 10 mm PROMASEAL®-S on the backfilling (mineral wool 40 kg/m³), Detail B: (horizontal joint seal in vertical supporting construction, joint type C) **EI 120 – T – M 7,5 – F – W 5 to 100**	
Horizontal, asymmetrical joint filling coated on the exposed side with ≥ 10 mm PROMASEAL®-S on the backfilling (mineral wool 40 kg/m³), Detail C: (horizontal joint seal in vertical supporting construction, joint type C) **E 120 EI 60 – T – M 7,5 – F – W 5 to 100**	
Horizontal, symmetrical joint filling coated on both sides with ≥ 5 mm PROMASEAL®-S on the backfilling (mineral wool 40 kg/m³), Detail D: (horizontal joint seal in vertical supporting construction, joint type C) **EI 120 – T – M 7,5 – F – W 5 to 100**	



Detail E – Joint filling coated on the unexposed side with combustible backfilling in wall



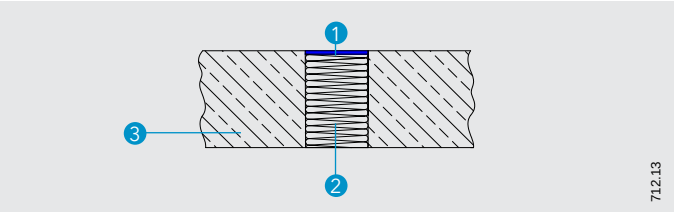
Detail F – Joint filling coated on the exposed side with combustible backfilling in wall



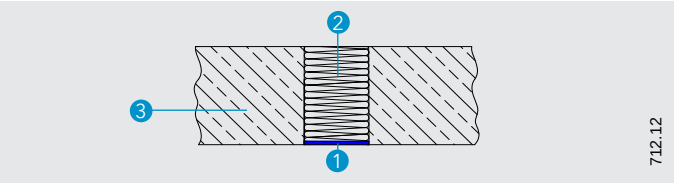
Detail G – Joint filling coated on both sides with combustible backfilling in wall

Table 3 – Rigid wall (Details E, F and G)

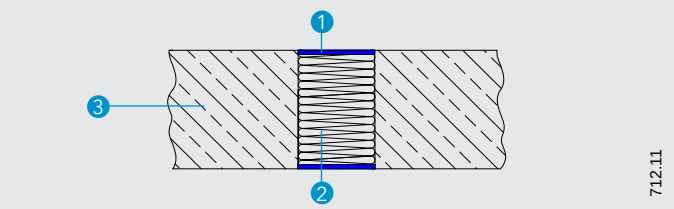
Type	Specification
Rigid wall thickness	≥ 100 mm
Rigid wall density	≥ 450 kg/m³
Joint width	≥ 5 ≤ 50 mm
Backfilling	Class E or higher rated insulation (acc. to EN 13501-1, e.g. polystyrene)
Density of backfilling	≥ 15 kg/m³
Joint movement in %	≤ 7,5
Vertical joint filling coated on the unexposed side with ≥ 15 mm PROMASEAL®-S on the backfilling, Detail E: (vertical joint seal in vertical supporting construction, joint type B) **E 90 EI 30 – V – M 7,5 – F – W 5 to 50**	
Vertical joint filling coated on the exposed side with ≥ 15 mm PROMASEAL®-S on the backfilling, Detail F: (vertical joint seal in vertical supporting construction, joint type B) **EI 45 – V – M 7,5 – F – W 5 to 50**	
Vertical joint filling coated on both sides with ≥ 10 mm PROMASEAL®-S on the backfilling, Detail G: (vertical joint seal in vertical supporting construction, joint type B) **E 120 EI 45 – V – M 7,5 – F – W 5 to 50**	
Horizontal, asymmetrical joint filling coated on the unexposed side with ≥ 15 mm PROMASEAL®-S on the backfilling, Detail E: (horizontal joint seal in vertical supporting construction, joint type C) **EI 30 – T – M 7,5 – F – W 5 to 50**	
Horizontal, symmetrical joint filling coated on both sides with ≥ 10 mm PROMASEAL®-S on the backfilling, Detail G: (horizontal joint seal in vertical supporting construction, joint type C) **E 120 EI 45 – T – M 7,5 – F – W 5 to 50**	



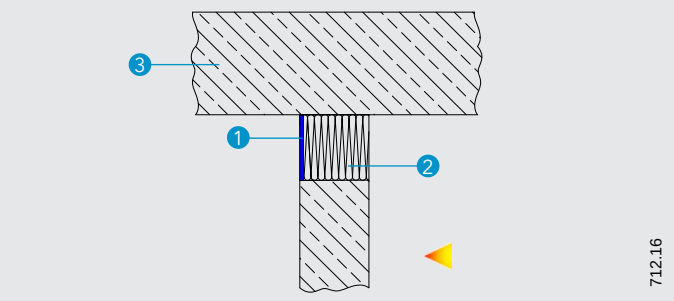
Detail H – Joint filling coated on the unexposed side in floor



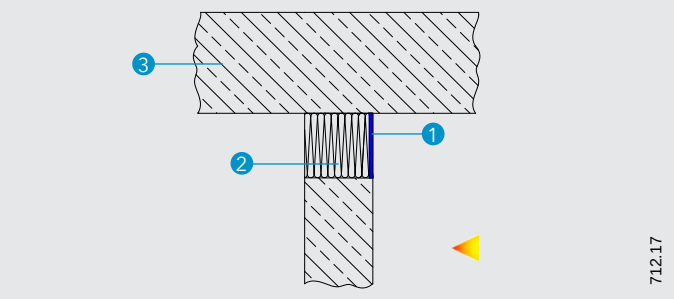
Detail I – Joint filling coated on the exposed side in floor



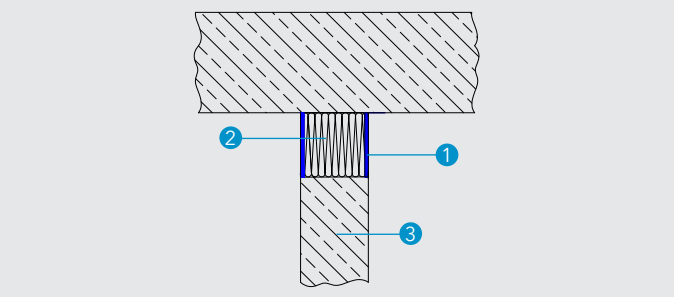
Detail J – Symmetrical joint filling coated on both sides in floor



Detail K – Wall joint coated on the unexposed side (floor connection)



Detail L – Wall joint coated on the exposed side (floor connection)



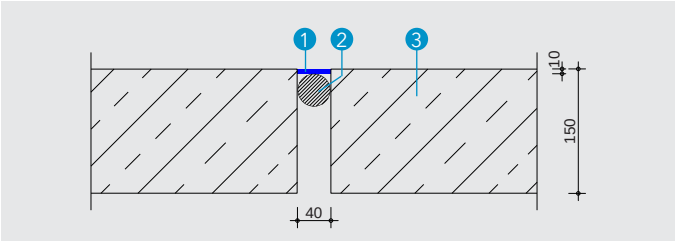
Detail M – Wall joint coated on both sides (floor connection)

Table 4 – Rigid floor (Details H to M)

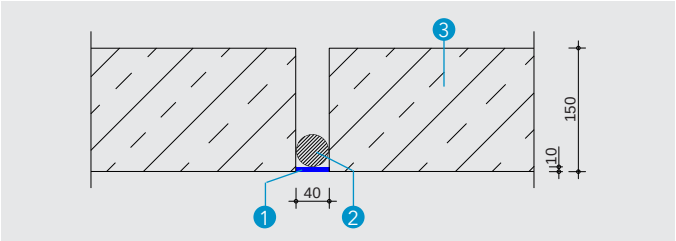
Type	Specification
Rigid wall thickness	≥ 100 mm
Rigid wall density	≥ 450 kg/m³
Rigid floor thickness	≥ 150 mm
Rigid floor density	≥ 450 kg/m³
Joint width	≥ 5 ≤ 100 mm
Backfilling	Mineral wool, Class A1 acc. to EN 13501-1, melting point ≥ 1000 °C
Density of backfilling	≥ 40 kg/m³
Joint movement in %	≤ 7,5
Horizontal, symmetrical joint filling coated on both sides of the wall or on top and below the floor with ≥ 5 mm PROMASEAL®-S on the backfilling (mineral wool 40 kg/m³), Details J and M: (linear joint seal in horizontal supporting construction, joint type A or horizontal wall joint abutting a floor, ceiling or roof, joint type D) **EI 120 – H – M 7,5 – F – W 5 to 100**	
Horizontal, asymmetrical joint filling coated on one side of the wall or on top or below the floor with ≥ 10 mm PROMASEAL®-S on the backfilling (mineral wool 40 kg/m³), Details H, I, K and L: (linear joint seal in horizontal supporting construction, joint type A or horizontal wall joint abutting a floor, ceiling or roof, joint type D) **EI 120 – H – M 7,5 – F – W 5 to 100**	

Table 5 – Rigid floor (Details J and M)

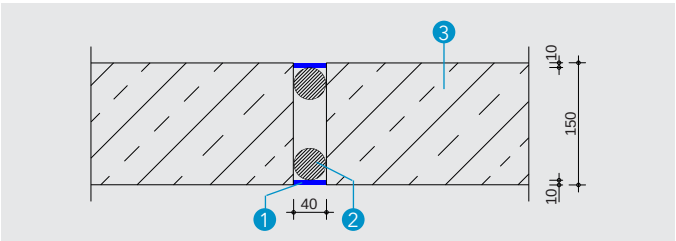
Rigid wall thickness	≥ 150 mm
Rigid wall density	≥ 450 kg/m³
Joint width	≥ 5 ≤ 50 mm
Backfilling	Class E or higher rated insulation (acc. to EN 13501-1, e.g. polystyrene)
Density of backfilling	≥ 15 kg/m³
Joint movement in %	≤ 7,5
Horizontal, symmetrical joint filling coated on both sides of the wall or on top and below the floor with ≥ 10 mm PROMASEAL®-S on the combustible backfilling, Details J and M: (linear joint seal in horizontal supporting construction, joint type A or horizontal wall joint abutting a floor, ceiling or roof, joint type D) **EI 120 – H – M 7,5 – F – W 5 to 50**	



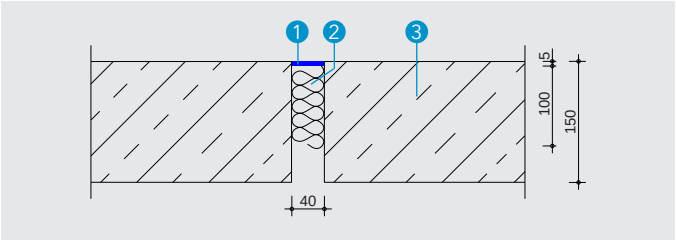
Detail N – PP round cord backfilling coated on the unexposed side in floor



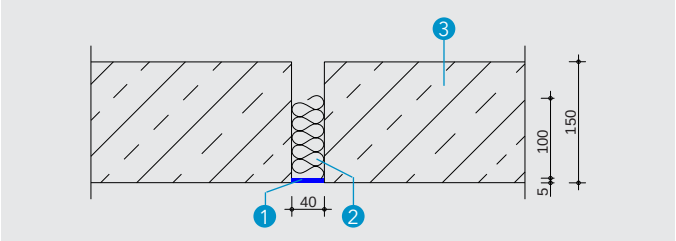
Detail O – PP round cord backfilling coated on the exposed side in floor



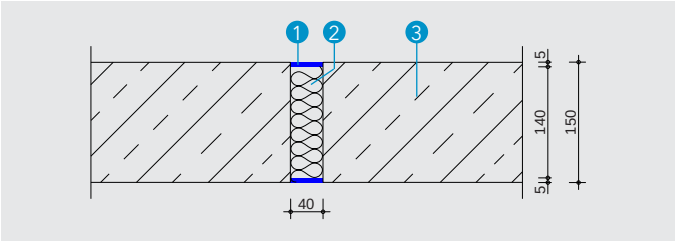
Detail P – PP round cord backfillings coated on both sides in floor



Detail Q – Mineral wool backfilling coated on the unexposed side in floor



Detail R – Mineral wool backfilling coated on the exposed side in floor



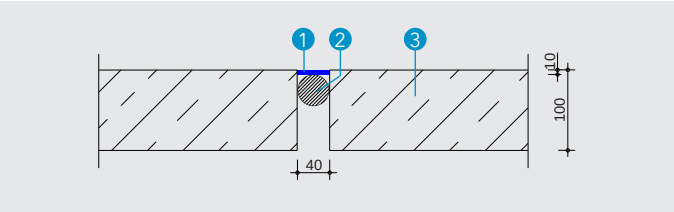
Detail S – Mineral wool backfilling coated on both sides in floor

Table 6 – Rigid floor (Details N to P)

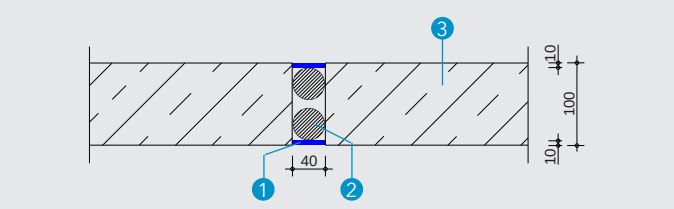
Type	Specification
Rigid floor and wall thickness	≥ 150 mm
Rigid floor and wall density	≥ 600 kg/m³
Joint width	≥ 0 ≤ 40 mm
Backfilling	PP foam round cord
Joint movement in %	≤ 7,5
Horizontal, asymmetrical joint filling coated on the unexposed side of the floor with ≥ 10 mm PROMASEAL®-S on the backfilling, Detail N: (linear joint seal in horizontal supporting construction, joint type A or horizontal wall joint abutting a floor, ceiling or roof, joint type D) **EI 60 / E 180 – H – X – B – W 5** (maximum movement capability ± 7,5%) **EI 60 – H – X – B – W 6 to 40** (maximum movement capability ± 7,5%)	
Horizontal, asymmetrical joint filling coated on the exposed side of the floor with ≥ 10 mm PROMASEAL®-S on the backfilling, Detail O: (linear joint seal in horizontal supporting construction, joint type A or horizontal wall joint abutting a floor, ceiling or roof, joint type D) **EI 60 – H – X – B – W 5** (maximum movement capability ± 7,5%) **EI 45 – H – X – B – W 6 to 40** (maximum movement capability ± 7,5%)	
Horizontal, symmetrical joint filling coated on both sides of the floor with ≥ 10 mm PROMASEAL®-S on the backfilling, Detail P: (linear joint seal in horizontal supporting construction, joint type A or horizontal wall joint abutting a floor, ceiling or roof, joint type D) **EI 60 / E 180 – H – X – B – W 5** (maximum movement capability ± 7,5%) **EI 60 – H – X – B – W 6 to 40** (maximum movement capability ± 7,5%)	

Table 7 – Rigid floor (Details Q to S)

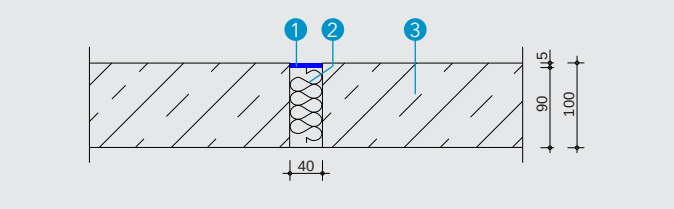
Type	Specification
Rigid floor and wall thickness	≥ 150 mm
Rigid floor and wall density	≥ 600 kg/m³
Joint width	≥ 0 ≤ 40 mm
Backfilling	Mineral wool, Class A1 acc. to EN 13501-1, melting point ≥ 1000 °C
Density of backfilling	≥ 35 kg/m³
Joint movement in %	≤ 27,5 (width extension)
Horizontal, asymmetrical joint filling coated on the unexposed side of the floor with ≥ 5 mm PROMASEAL®-S on the backfilling, Detail Q: (linear joint seal in horizontal supporting construction, joint type A or horizontal wall joint abutting a floor, ceiling or roof, joint type D or horizontal floor joint abutting a wall, joint type E) **EI 180 – H – M 27,5 – B – W 5 to 40** (both the lateral movement and the shear movement is limited to 25%)	
Horizontal, asymmetrical joint filling coated on the exposed side of the floor with ≥ 5 mm PROMASEAL®-S on the backfilling, Detail R: (linear joint seal in horizontal supporting construction, joint type A or horizontal wall joint abutting a floor, ceiling or roof, joint type D or horizontal floor joint abutting a wall, joint type E) **EI 180 – H – M 27,5 – B – W 5** **EI 120 / E 180 – H – M 27,5 – B – W 6 to 40** (in both classifications both the lateral movement and the shear movement is limited to 25%)	
Horizontal, symmetrical joint filling coated on both sides of the floor with ≥ 5 mm PROMASEAL®-S on the backfilling, Detail S: (linear joint seal in horizontal supporting construction, joint type A or horizontal wall joint abutting a floor, ceiling or roof, joint type D or horizontal floor joint abutting a wall, joint type E) **EI 180 – H – M 27,5 – B – W 5 to 40** (both the lateral movement and the shear movement is limited to 25%)	



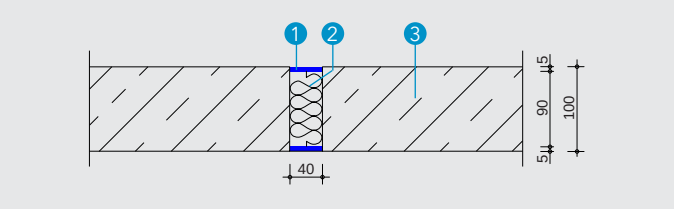
Detail T – PE round cord backfilling coated on one side in wall



Detail U – PE round cord backfillings coated on both sides in wall



Detail V – Mineral wool backfilling coated on one side in wall



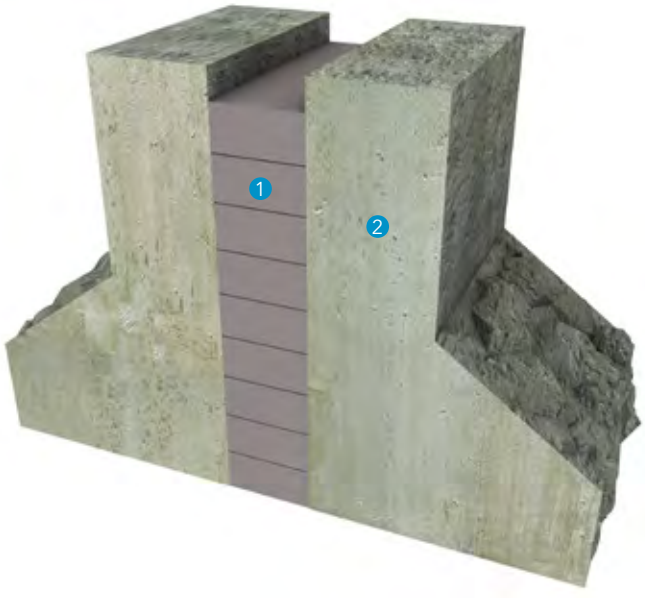
Detail W – Mineral wool backfilling coated on both sides in wall

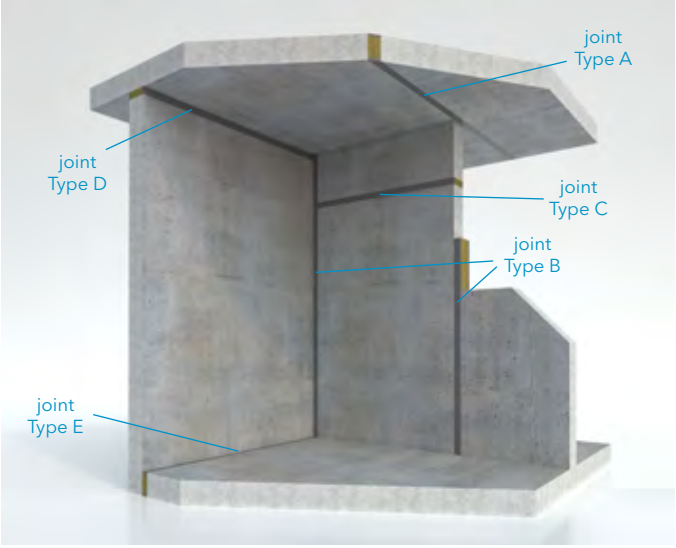
Table 8 – Rigid wall (Details T and U)

Type	Specification
Rigid wall thickness	≥ 100 mm
Rigid wall density	≥ 600 kg/m³
Joint width	≥ 0 ≤ 40 mm
Backfilling	PE foam round cord, Class F according to EN 13501-1
Thickness of the backfilling	equal to the width of the joint
Joint movement in %	≤ 7,5
Vertical, asymmetrical joint filling coated on one side of the wall with ≥ 10 mm PROMASEAL®-S on the backfilling, Detail T: (vertical joint seal in vertical supporting construction, joint type B) **EI 180 – V – X – B – W 5** (maximum movement capability ± 7,5%) **EI 30 – V – X – B – W 6 to 40** (maximum movement capability ± 7,5%)	
Vertical, asymmetrical joint filling coated on both sides of the wall with ≥ 10 mm PROMASEAL®-S on the backfilling, Detail U: (vertical joint seal in vertical supporting construction, joint type B) **EI 180 – V – X – B – W 5 to 40** (maximum movement capability ± 7,5%)	

Table 9 – Rigid wall (Details V and W)

Type	Specification
Rigid wall thickness	≥ 100 mm
Rigid wall density	≥ 600 kg/m³
Joint width	≥ 0 ≤ 40 mm
Backfilling	Mineral wool, Class A1 acc. to EN 13501-1, melting point ≥ 1000 °C
Density of backfilling	≥ 35 kg/m³
Thickness of backfilling	≥ 90 mm
Joint movement in %	≤ 25
Vertical, asymmetrical joint filling coated on one side of the wall with ≥ 5 mm PROMASEAL®-S on the backfilling, Detail V: (vertical joint seal in vertical supporting construction, joint type B) **EI 120 / E 180 – V – M 25 – B – W 5 to 40** (concerns only lateral movement)	
Vertical, symmetrical joint filling coated on both sides of the wall with ≥ 5 mm PROMASEAL®-S on the backfilling, Detail W: (vertical joint seal in vertical supporting construction, joint type B) **EI 180 – V – M 25 – B – W 5** (concerns only lateral movement) **EI 120 – V – M 25 – B – W 6 to 40** (concerns only lateral movement)	





Detail A – Overview of the linear joints in and between walls and floors

Joint Type A – Linear joint in a horizontal test construction (floor to floor)

Joint Type B – Vertical linear joint in a vertical test construction (vertical joint wall to wall)

Joint Type C – Horizontal linear joint in a vertical construction (horizontal joint wall to wall)

Joint Type D – Horizontal wall joint abut ing a floor, ceiling or roof
Joint Type E – Horizontal floor joint abutting a wall

Technical data

1. PROMASTOP®-B
2. Supporting construction
3. Identification label

Certificates: ETA-15/0243, IBS CR 315011508-A-en

Customer benefit

- Cold smoke-tight
- Quick, easy and dry installation
- Fibre-free linear joint seal
- Simple, custom-fit shape

1. Installation

Steps for penetration seal in the wall

- Insert the fire stopping bricks following brick construction methods; the bricks are installed with the short side parallel to the wall reveal.
- Cut the fire stopping bricks for the installations to a size slightly larger than needed and insert them by pressing them together.
- For the final row, cut the fire stopping bricks to a size slightly larger (approx. 5-7 mm) than needed, press them together and push them into the remaining opening.
- Label the penetration seal.

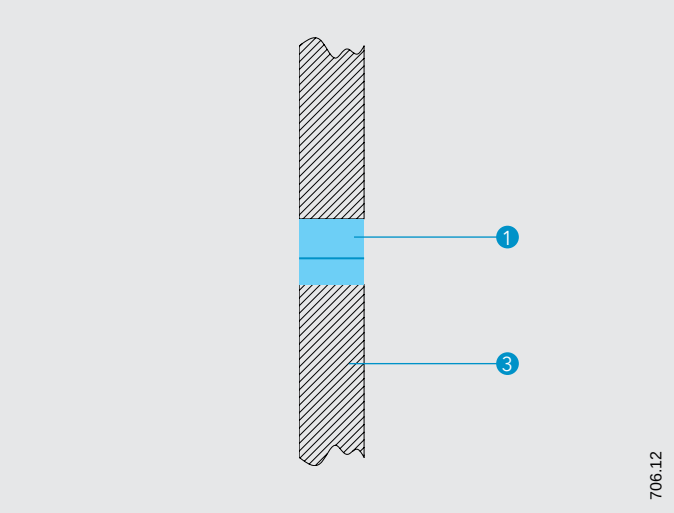
2. Fields of application

PROMASTOP®-B can be used as a linear joint seal in rigid walls. Fire resistance is classified according to EN 13501-2.

Rigid wall
The wall must have a thickness of ≥ 100 mm and a density of ≥ 450 kg/m³.

Test results achieved using a standard rigid supporting construction are valid for separating construction products made of concrete or masonry having the same or a higher thickness and density as those tested.

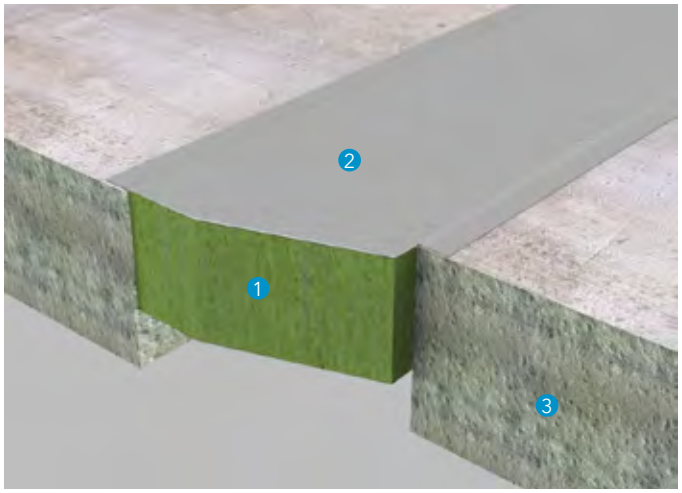
The components (supporting constructions) must be classified acc. to EN 13501-2 for the required fire resistance period.

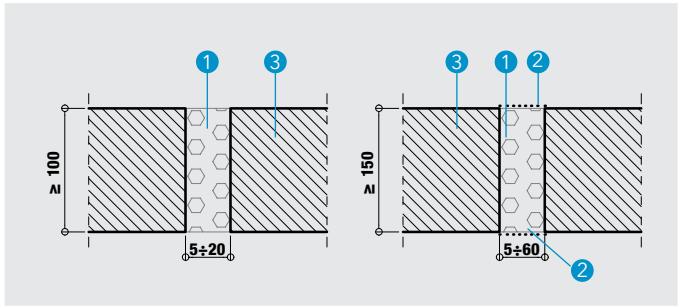


Detail B – **Vertical and horizontal linear joint seal in wall with PROMASTOP®-B**

Table 1 – **Rigid wall (Detail B)**

Type	Specification
Rigid wall thickness	≥ 100 mm
Rigid wall density	≥ 450 kg/m³
Joint width	≥ 5 ≤ 100 mm
Joint thickness	≥ 100 mm
Vertical joint seal, Detail B: (vertical joint seal in vertical supporting construction, joint type B) **EI 180 – V – M 7,5 – B – W 5 to 100**	
Horizontal joint seal, Detail B: (horizontal joint seal in vertical supporting construction, joint type C) **EI 180 – T – M 7,5 – B – W 5 to 100**	





Detail A – Vertical and horizontal joint seal in wall

Technical data

1. PROMAFOAM®-C
2. PROMASTOP®-CC
3. Supporting construction

Certificates: ITB-KOT-2019/0864

Customer benefit

Linear joint seals can be protected using PROMAFOAM®-C. For construction joints with small width it is enough to fill the joints with the foam. In bigger joint is necessary to apply additional fire stopping coating PROMASTOP®-CC on the PROMAFOAM®-C surface. Minimum thickness of the supporting construction are listed in the tables.

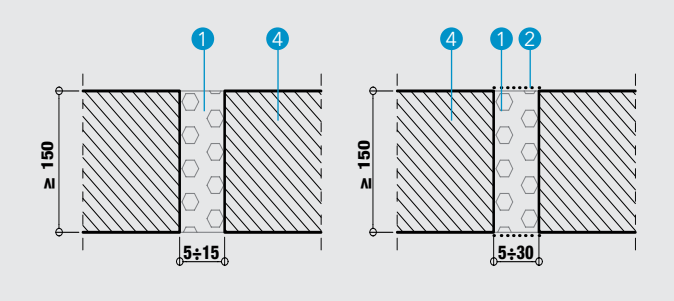
1. Fields of application

Detail A

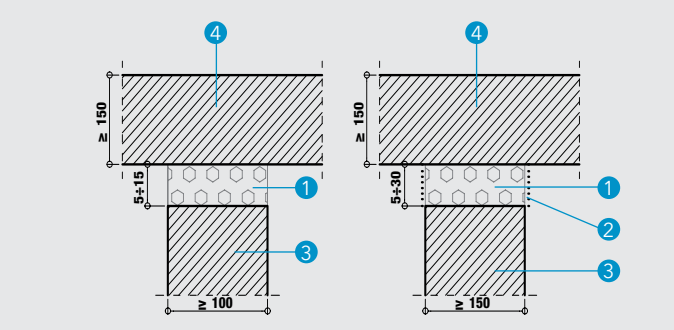
Construction joint with maximum width not bigger than 20 mm in wall is filled in full construction depth by PROMAFOAM®-C only. In case of construction joints wider than 20 mm up to 60 mm is necessary to apply additional fire stopping coating PROMASTOP®-CC on both PROMAFOAM®-C surfaces with minimum dry film thickness of 0,7 mm.

Table 1 – Rigid wall (Detail A)

Type	Specification
Rigid wall thickness	≥ 50 mm, see the classifications
Rigid wall density	≥ 870 kg/m³
Joint width	≥ 5 ≤ 60 mm, see the classifications
Vertical joint seal, PROMAFOAM®-C only, Detail A left side: (vertical joint seal in vertical supporting construction, joint type B) **EI 30 / E 45 – V – X – W 5 to 15** for wall thickness ≥ 50 mm **EI 60 – V – X – W 5 to 25** for wall thickness ≥ 75 mm **EI 180 – V – X – W 5 to 15** for wall thickness ≥ 100 mm **E 180 – V – X – W 5 to 20** for wall thickness ≥ 100 mm **EI 120 – V – X – W 16 to 20** for wall thickness ≥ 100 mm **EI 60 – V – X – W 21 to 40** for wall thickness ≥ 100 mm **EI 90 – V – X – W 21 to 45** for wall thickness ≥ 150 mm	
Vertical joint seal, PROMAFOAM®-C with additional 0,7 mm PROMASTOP®-CC coating, Detail A right side: (vertical joint seal in vertical supporting construction, joint type B) **EI 60 – V – X – W 5 to 50** for wall thickness ≥ 100 mm **EI 120 – V – X – W 5 to 60** for wall thickness ≥ 150 mm	
Horizontal joint seal, PROMAFOAM®-C only, Detail A left side: (horizontal joint seal in vertical supporting construction, joint type C) **EI 60 – T – X – W 5 to 15** for wall thickness ≥ 100 mm **EI 45 – T – X – W 16 to 25** for wall thickness ≥ 100 mm **EI 90 – T – X – W 5 to 30** for wall thickness ≥ 150 mm	
Horizontal joint seal, PROMAFOAM®-C with additional 0,7 mm PROMASTOP®-CC coating, Detail A right side: (horizontal joint seal in vertical supporting construction, joint type C) **EI 60 – T – X – W 5 to 35** for wall thickness ≥ 100 mm **EI 120 – T – X – W 5 to 40** for wall thickness ≥ 150 mm **EI 120 – T – X – W 5 to 40** for wall thickness ≥ 150 mm **EI 90 – T – X – W 41 to 50** for wall thickness ≥ 150 mm	



Detail B – Linear joint seal in floor



Detail C – Horizontal wall joint abutting a floor, ceiling or roof

Details B and C

Construction joints in floors or between floor and wall is protected the similar way like joints in wall. Maximum width of the construction joint filled by PROMAFOAM®-C only is 15 mm, however the width of the joint is up to 30 mm using additional 0,7 mm thick (dry film thickness) fire stopping coating PROMASTOP®-CC on both PROMAFOAM®-C surfaces.

Table 2 – Rigid floor (Details B and C)

Type	Specification
Rigid floor and wall thickness	≥ 100 mm, see the classifications
Rigid floor and wall density	≥ 760 kg/m³
Joint width	≥ 5 ≤ 40 mm, see the classifications
Horizontal joint seal, PROMAFOAM®-C only, left side of Details B and C: (linear joint seal in horizontal supporting construction, joint type A or horizontal wall joint abutting a floor, ceiling or roof, joint type D) **EI 60 – H – X – W 5 to 10** for floor and wall thickness ≥ 100 mm **EI 45 – H – X – W 11 to 25** for floor and wall thickness ≥ 100 mm **EI 15 – H – X – W 26 to 45** for floor and wall thickness ≥ 100 mm **EI 120 – H – X – W 5 to 15** for floor and wall thickness ≥ 150 mm **EI 90 – H – X – W 16 to 30** for floor and wall thickness ≥ 150 mm **EI 45 – H – X – W 31 to 40** for floor and wall thickness ≥ 150 mm	
Horizontal joint seal, PROMAFOAM®-C with additional 0,7 mm PROMASTOP®-CC coating, right side of Details B and C: (linear joint seal in horizontal supporting construction, joint type A or horizontal wall joint abutting a floor, ceiling or roof, joint type D) **EI 180 – H – X – W 5 to 30** for floor and wall thickness ≥ 150 mm **EI 90 – H – X – W 31 to 40** for floor and wall thickness ≥ 150 mm **E 180 – H – X – W 5 to 35** for floor and wall thickness ≥ 150 mm	

Appendix

List of certificates for our penetration seal and linear joint seal products

The following list provides an overview of the current certificate documents for our penetration seal products at the time of printing. You can find the declarations of performance for the individual products at www.promat.com/en/declaration-of-performance. Please contact our application technicians if you have any questions.

PROMASTOP®-CC:
ETA-16/0523
Classification reports:
IBS 316100407-A-en,Rev1
IBS 13061206-A,Rev1-en (PROMASTOP®-FC)
PK2-11-19-002-E-1 (PROMASTOP®-FC MD)
IBS 317020305-A,Rev1 (PROMASTOP®-W)
ITB 01633.1/21/R164NZP
ITB 01633.1/19/R140NZP + ITB 01633.2/19/R140NZP
IBS 316071301-A-en (bus bars)
Electrotechnical Testing Institute Nr. 1160590

PROMASTOP®-FC:
ETA-14/0089
Classification reports:
IBS 13061206-A,Rev1-en
2018-Efectis-R002291
ITB 01633.1/21/R164NZP

PROMASEAL®-A spray:
ETA-16/0310
Classification reports:
IBS 316042012-A-en
ITB 01633.1/21/R164NZP (pipes)
ITB 02806/19/Z00NZP + ITB 01633/20/R141NZP

PROMASTOP®-B:
ETA-15/0243
Classification reports:
IBS 315011508-A-en
IBS 13061206-A,Rev1-en (PROMASTOP®-FC)

PROMAFOAM®-C:
Classification report: ITB KOT-2019/0864

PROMASTOP®-I:
ETA-14/0446
Classification reports:
IBS 13061207-A,Rev1
IBS 13061206-A,Rev1-en (PROMASTOP®-FC)
PK2-11-19-002-E-1 (PROMASTOP®-FC MD)
IBS 317020305-A,Rev1 (PROMASTOP®-W)
IBS 316071301-A-en (bus bars)

PROMASTOP®-W:
ETA-14/0456
Classification reports:
IBS 317020305-A,Rev1
ITB 01633.1/19/R140NZP + ITB 01633.2/19/R140NZP
ITB 01633.1/21/R164NZP

PROMASEAL®-AG:
ETA-16/0309
Classification reports:
IBS 12042724-a,Rev1
ITB 02806/19/Z00NZP + ITB 01633/20/R141NZP

PROMASTOP®-IM CBox 125:
Classification report: WFRGENT 18288B

PROMASTOP®-S/-L:
ETA-16/0311
Classification reports:
IBS 317091403
IBS 13061206-A,Rev1-en (PROMASTOP®-FC)

PROMASTOP®-M:
ETA-17/0862
Classification reports:
IBS 31601904-A-en,Rev1
IBS 13061206-A,Rev1-en (PROMASTOP®-FC)

PROMASEAL®-A:
ETA-14/0107 (penetrations)
ETA-14/0108 (joints)
Classification reports:
IBS 13061203
ITB 02806/19/Z00NZP + ITB 01633/20/R141NZP

PROMASEAL®-S:
ETA-16/0312
Classification reports:
IBS 318070403-A
ITB 00668/20/Z00NZP

PROMASTOP®-P:
ETA-15/0242
Classification report: IBS 315070916-A

PROMASTOP®-FC MD:
ETA-19/0215
Classification reports:
Pavus PK2-11-19-002-E-1
ITB 01633.1/21/R164NZP

List of consumption data for our penetration seal products

You can find a list of the consumption data for our penetration seal products below.

PROMASTOP®-CC:

Theoretical consumption data for PROMASTOP®-CC:

Coating on mineral wool			
	Dry film thickness	Wet film thickness	Consumption
PROMASTOP®-CC	0,7 mm	0,9 mm	1,35 kg/m²

PROMASTOP®-I liquid:

Theoretical consumption data for PROMASTOP®-I liquid:

Coating on mineral wool			
	Dry film thickness	Wet film thickness	Consumption
PROMASTOP®-I liquid	1 mm	1,30 mm	1,95 kg/m²

PROMASTOP®-I paste:

Theoretical consumption data for PROMASTOP®-I paste:

Coating on mineral wool			
	Dry film thickness	Wet film thickness	Consumption
PROMASTOP®-I paste	1 mm	1,40 mm	1,80 kg/m²

PROMASTOP®-M:

Theoretical consumption data for PROMASTOP®-M:

Consumption	
PROMASTOP®-M	20 kg yield approx. 23 l fresh mortar

PROMASTOP®-W:

The required lengths of PROMASTOP®-W depend on pipe diameter and number of layers:

Plastic pipes					
U/C			U/U		
Pipe diameter Ø [mm]	Number of layers	Wrap length [mm]	Pipe diameter Ø [mm]	Number of layers	Wrap length [mm]
32	1	≥ 122	32	2	≥ 263
40	1	≥ 146	40	3	≥ 498
50	1	≥ 185	50	3	≥ 600
56	1	≥ 200	56	3	≥ 645
63	1	≥ 220	63	3	≥ 710
75	2	≥ 535	75	4	≥ 1135
90	2	≥ 630	90	4	≥ 1320
110	2	≥ 750	110	5	≥ 2000
125	3	≥ 1295	125	5	≥ 2245
140	4	≥ 1950	140	6	≥ 3035
160	4	≥ 2195	160	6	≥ 3390

Consumption details

PROMASEAL®-A:

Theoretical consumption data per 310 ml cartridge of PROMASEAL®-A:

Joint width / Joint depth	10 mm	15 mm	20 mm	25 mm	30 mm	40 mm	50 mm
10 mm	3,1 m	2,0 m	1,5 m	1,2 m	1,0 m	0,8 m	0,6 m
15 mm	2,0 m	1,3 m	1,0 m	0,8 m	0,7 m	0,5 m	0,4 m
20 mm	1,5 m	1,0 m	0,7 m	0,6 m	0,5 m	0,4 m	0,3 m

PROMASEAL®-A spray:

Theoretical consumption data for PROMASEAL®-A spray:

Coating on mineral wool			
	Dry film thickness	Wet film thickness	Consumption
PROMASEAL®-A spray	1 mm	1,4 mm	1,90 kg/m²

PROMASEAL®-AG:

Theoretical consumption data per 310 ml cartridge of PROMASEAL®-AG:

Joint width / Joint depth	10 mm	15 mm	20 mm	25 mm	30 mm	40 mm	50 mm
10 mm	3,1 m	2,0 m	1,5 m	1,2 m	1,0 m	0,8 m	0,6 m
15 mm	2,0 m	1,3 m	1,0 m	0,8 m	0,7 m	0,5 m	0,4 m
20 mm	1,5 m	1,0 m	0,7 m	0,6 m	0,5 m	0,4 m	0,3 m

PROMASEAL®-S:

Theoretical consumption data per 310 ml cartridge of PROMASEAL®-S:

Joint width / Joint depth	10 mm	15 mm	20 mm	25 mm	30 mm	40 mm	50 mm
10 mm	3,1 m	2,0 m	1,5 m	1,2 m	1,0 m	0,8 m	0,6 m
15 mm	2,0 m	1,3 m	1,0 m	0,8 m	0,7 m	0,5 m	0,4 m
20 mm	1,5 m	1,0 m	0,7 m	0,6 m	0,5 m	0,4 m	0,3 m

PROMASTOP®-B:

Depending on cable assignment and penetration seal size, different consumption data for PROMASTOP®-B will result.

Cable capacity in %	0%	10%	30%	60%
Opening size (m²)				
≤ 0,01	1	1	1	1
0,02	3	3	2	1
0,03	4	4	3	2
0,04	6	5	4	2
0,05	7	6	5	3
0,1	14	13	10	6
0,2	28	25	19	11
0,3	42	38	29	17
0,4	56	50	39	22
0,5	69	63	49	28

PROMASTOP®-P:

The consumption data for PROMASTOP®-P depending on the bore size.

Type	Min. bore [mm]	Max. bore [mm]	Installation depth [mm]	
			Wall	Floor
PROMASTOP®-P 65	40	65	50	60
PROMASTOP®-P 80	50	80		
PROMASTOP®-P 110	80	110		
PROMASTOP®-P 125	100	125		
PROMASTOP®-P 140	110	140		
PROMASTOP®-P 170	140	170		
PROMASTOP®-P 210	180	210		
PROMASTOP®-P 260	220	260		

PROMASTOP®-S/-L:

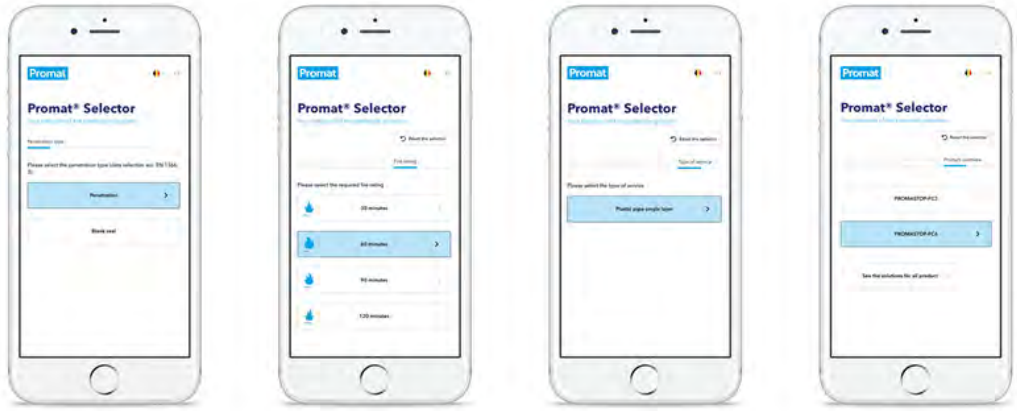
Depending on cable capacity and penetration seal size, different consumption data for PROMASTOP®-S/-L will result.

Opening		Cable capacity			
Type combination		10%	20%	30%	40%
0,1 m²	PROMASTOP®-S	3	2	2	2
	+ PROMASTOP®-L	12	11	10	9
0,2 m²	PROMASTOP®-S	6	4	4	4
	+ PROMASTOP®-L	24	22	20	18
0,3 m²	PROMASTOP®-S	9	6	6	6
	+ PROMASTOP®-L	36	33	30	27
0,4 m²	PROMASTOP®-S	12	8	8	8
	+ PROMASTOP®-L	48	44	40	36
0,5 m²	PROMASTOP®-S	15	10	10	10
	+ PROMASTOP®-L	60	55	50	45
0,6 m²	PROMASTOP®-S	18	12	12	12
	+ PROMASTOP®-L	72	66	60	54
0,7 m²	PROMASTOP®-S	21	14	14	14
	+ PROMASTOP®-L	84	77	70	63
0,8 m²	PROMASTOP®-S	24	16	16	16
	+ PROMASTOP®-L	96	88	80	72
0,9 m²	PROMASTOP®-S	27	18	18	18
	+ PROMASTOP®-L	108	99	90	81
1,0 m²	PROMASTOP®-S	30	20	20	20
	+ PROMASTOP®-L	120	110	100	90

Notes

Promat® Selector

FIND THE PERFECT FIRE STOPPING PRODUCT TO COMPLETE YOUR PASSIVE FIRE PROTECTION PROJECT WITH EASE.



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