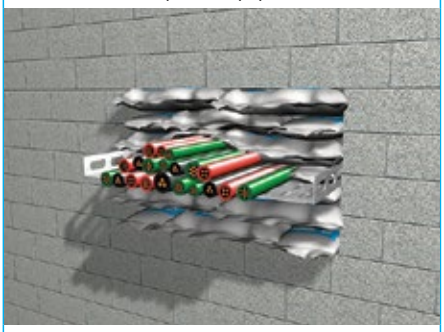
Promat

Promat
Fire Stopping Handbook

Passive Fire Protection Systems for Buildings

Fire stopping pillows

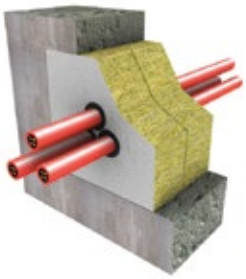
for cables and plastic pipes



PROMASTOP®-S/L

Fire stopping jacket

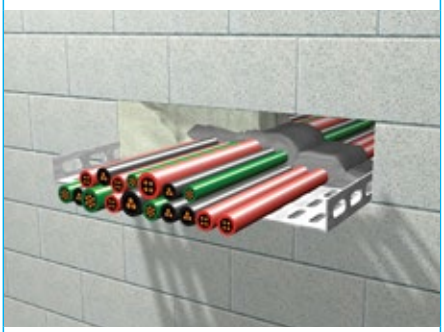
for single cable



PROMASTOP®-IM CJ21

Fire stopping mortar

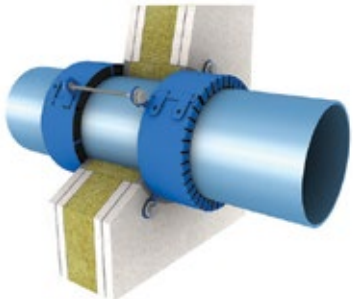
for cables



PROMASTOP®-VEN & PROMASEAL®-AG

Fire stopping collars

for plastic pipes



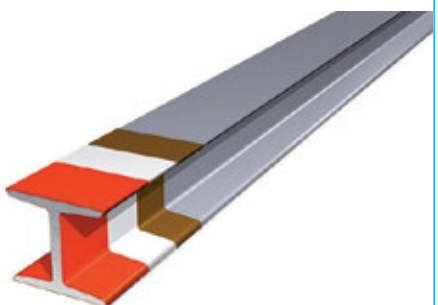
PROMASTOP®-FC

Fire stopping wrap

for plastic pipes

PROMASTOP®-W

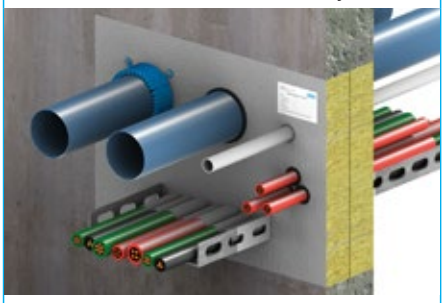
Intumescent paint



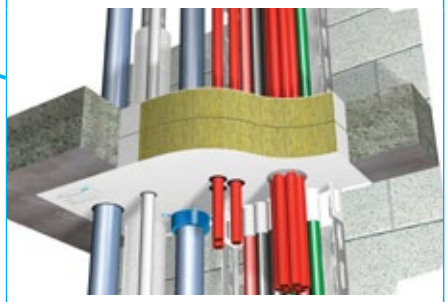
PROMAPAINT®-SC3 & SC4

Fire stopping coatings

for cables, cable bundles and joints



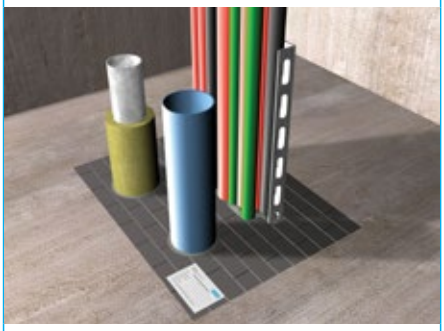
PROMASTOP®-CC



PROMASTOP®-I

Fire stopping bricks

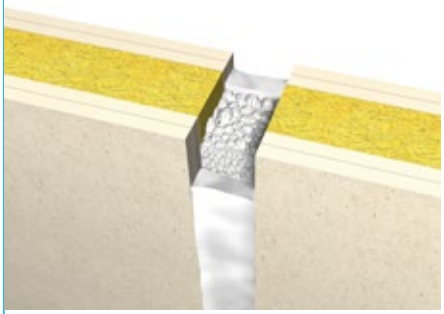
for multiple penetrations



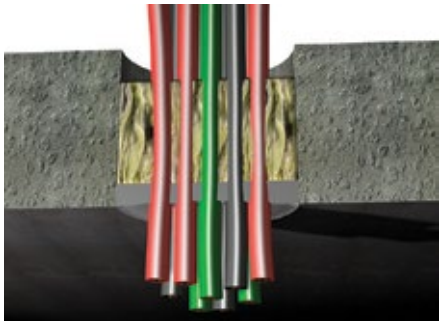
PROMASTOP®-B

Fire stopping sealants

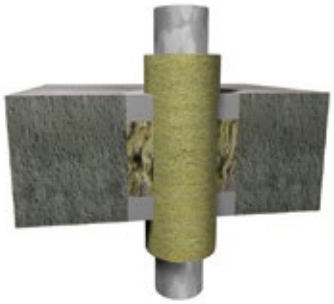
for cables and joints, combustible insulation



PROMASEAL®-A



PROMASEAL®-AG



PROMASEAL®-AG

Promat

Contents

Information

Technical Data Sheets

Penetration seal systems

Notes

1. Uniform European classes of reaction to fire of construction products and fire resistance classes

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 SIST 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 are determined (PCS value).
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: $FIGRA_{0,2\ MJ} \leq 120$ W/s $THR_{600\ s} \leq 7,5$ 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: $FIGRA_{0,4\ MJ} \leq 250$ W/s $THR_{600\ s} \leq 15$ 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 $FIGRA_{0,4\ MJ} \leq 750$ 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.

Additional classification of smoke development	Level of requirements
s3	Unlimited smoke development (thick smoke).
s2	Total smoke quantity and ratio of increased smoke development are limited (usual smoke).
s1	Stringent criteria on released smoke quantity are met (slight smoke).

Additional classification of flaming droplets/particles	Level of requirements
d2	Without limitations (flaming droplets, flaming particles).
d1	Without flaming droplets/particles which lasts in a 600 seconds time period longer than 10 seconds (dripping, dropping).
d0	Without flaming droplets/particles in a 600 seconds time period (no dripping, no dropping).

The form of classification in Classification report:

Tűzvédelmi osztály		Füstfejlesztés				Égő anyag csepegése	
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
A2-s1, d0 / A2-s2, d1 / A2-s1, d2
B-s1, d0 / B-s1, d1 / B-s1, d2
C-s1, d0 / C-s1, d1 / C-s1, d2
E-s2, d2
F
et al.

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 (t1–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.

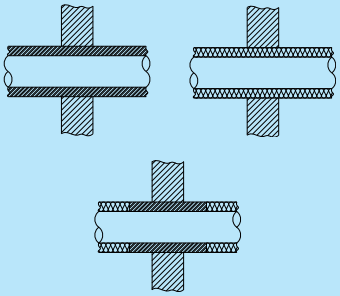
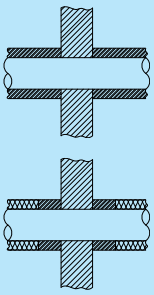
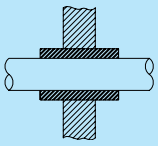
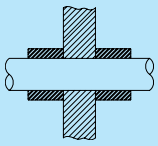
Compared to previous denomination the essential change made in the classification method is that the component is no longer named after the first letter, but its features are denominated with a letter which indicates an important characteristic of the fire protection. For Slovenia and other Member States with similar high level of the fire protection it remains important that as a mathematical function (equation) so called Standard Fire Curve ETK (model of fully developed fire or fire stage after the fire flashover) is maintained, which obliges other Member States to improve their products for fire safety. The constructions are also exposed to other thermal loads, such as smouldering fire curve, fire in nature, external fire curve or permanent temperature load.

Characteristic features of building elements according to SIST EN 13501 Part 2 are the following:

Letter according to SIST EN 13501-2	Denomination / Characteristics
R	Load-bearing capacity (résitance) limited deformation, limited deformation ratio
E	Integrity (etanchéité) ignition of cotton pad, cracks and openings, occurrence of sustained flaming on unexposed side
I (I_1, I_2)	Thermal insulation (isolation) average temperature rise, maximum temperature rise
W	Radiation (radiation) maximum radiation level
M	Mechanical action (mechanical) resistance to impact
C	Self-closing (closing) self-closing in the event of fire (from C0 to C5 according to EN 14600)
S (S_a, S_m)	Smoke leakage resistance (smoke) limited smoke leakage (components with special prevention of smoke leakage)
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 covering for a specified period of time (10, 30 and 60 minutes)

Supplement markings	Denomination / Characteristics / Requirements
IncSlow	Slow heating curve
sn	Fire in nature (semi-natural)
ef	External fire curve
r	Reduced exposure to fire (constant temperature of 500°C, reduced temperature exposure)
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 for fire stopping sealants »vertical«
h_o	Installation position for fire stopping sealants »horizontal«
H	Construction joints test: horizontal supporting construction
V	Construction joints test: vertical supporting construction – vertical joints
T	Construction joints test: vertical supporting construction – horizontal joints
X	Construction joints test: no movement
M000	Construction joints test: movement induced (in %)
M	Construction joints test: in advance manufactured joint
F	Construction joints test: on field created joint
B	Construction joints test: both in advance manufactured and on field created joint
W00 – 99	Construction joints test: joint widths test (in mm)

Pipe insulation according to SIST EN 1366-3:2009

	Local sustained	Local interrupted
Local sustained along the tube 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)

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

Configuration of pipe end according to SIST 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-resistant suspension/coupling systems
C/U	capped	uncapped	metal: fire-resistant suspension/coupling systems
C/C	capped	capped	---

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 structure: REI 90 / REI 90-M
Lightweight construction wall: EI 90
Fire door: EI_2 90-C vagy EI_2 30-C
Fire door with additional protection against smoke: EI_2 30-CS_m
Fire resistant penetration: EI 90
Pipe penetration: EI 90 U/U vagy EI 90 C/U or EI 90 C/C
Fire damper: EI 90 v_e-h_o vagy EI 90 h_o
et al.

In order to avoid too much confusion, the Part 3 (fire resisting ducts and fire dampers) and Part 4 (smoke control systems) were omitted from the standard. They would not contribute anything of significance to the introduction except some additional denominations, abbreviations etc.

2. Categories of use

Penetrations can be used in different environmental conditions and are divided into the following categories of use:

Type X: Products for penetrations designed for use in environments with different weather conditions.

Type Y_1: Products for penetrations designed for use at temperatures below 0°C with UV radiation and without rain influence.

Type Y_2: Products for penetrations designed for use at temperatures below 0 °C without UV radiation and without rain influence.

Type Z_1: Products for penetrations designed for use in interior rooms with high humidity and temperatures above 0 °C.

Type Z_2: Products for penetrations designed for use in interior rooms with other humidity classes as at Z1 and temperatures above 0 °C.

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 Technical Approvals Guidelines (ETAG) 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

Promat Products

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 boards for all areas of high rise and housebuilding technology
- Fire stopping glass
- Intumescent building materials
- Fire stopping collars
- Intumescent paints
- Fire stopping mortar and fillers
- Associated products (silicone, waterproofing, glues, etc.)

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

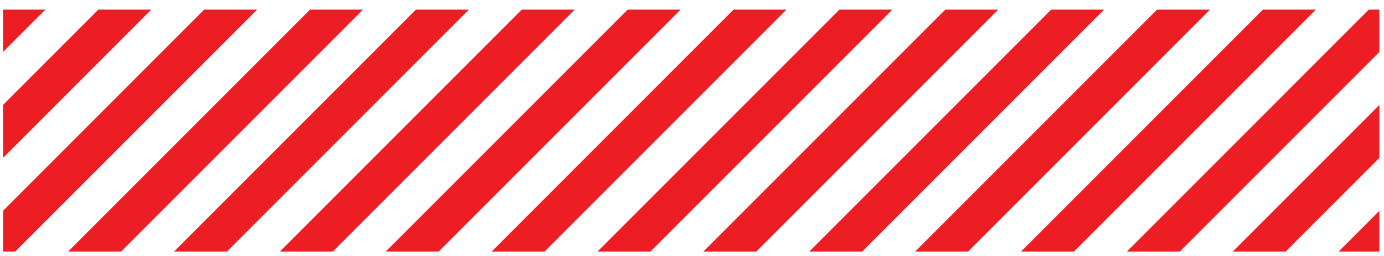
For Promat, safety and quality are two aspects, which belong together. In addition to offical quality control effectuated by the means of independent testing of our materials' fire stopping properties, the quality of our products is also strictly monitored during the prduction process.

By continually developing the range of products on offer, Promat focusses 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
Density	1,5 ± 0,2 g/cm³
Use category	Class X
Reaction to fire	Class E
VOC Content	0 g/l
Expansion temperature	approx. 190 °C

General 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 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 section insulation for all cable groups

Test certificate / approval
- EN1366-3/4
- EN13501-1/2
- ETAG 026-2
- EN ISO 10140-2
- EN ISO 717-1
- EN 50266-1-1: 01 and 2-2: 01
- IEC 60331-11: 02 and 21: 01

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

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, 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
Density	1,4 ± 0,2 g/cm³	1,4 ± 0,2 g/cm³
Viscosity	20 - 40 Pa.s	190 - 220 Pa.s
Use category	Class Z_2	Class 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

General 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

Test certificate / approval
- EN 1366-3
- EN 13501-1/2
- ETAG 026-2
- EN ISO 10140-2
- EN ISO 717-1

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

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, containers should be finished swiftly

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

PROMASTOP®-VEN
Fire stopping mortar

Technical data and properties			
Colour	light grey		
Consistency	powder		
Density	0,65 - 0,85 g/cm³		
Coverage	16 cm (acc. to DIN 1164)		
Wet density	1,4 ± 0,2 g/cm³		
Dry density	1,0 g/cm³ (after 28 days)		
Air content	13 % (1l container)		
Water absorption	1,6 l/m² (after 60 mins.)		
Bucket life	approx. 45 mins. (depending on the consistency)		
Hardness	Time	Bending strength	Compression strength
	24 hrs	1,4 N/mm²	2,7 N/mm²
	7 days	2,4 N/mm²	7,4 N/mm²
	14 days	3,0 N/mm²	9,2 N/mm²
	28 days	4,8 N/mm²	9,9 N/mm²

General description
PROMASTOP®-VEN is a cement based fire stopping mortar whicht binds without cracks. Combining the mortar with PROMASTOP®-W and PROMASTOP®-FC in walls and floors from 150mm in thickness, can correspond to a miniumum fire resitant duration of over 120 minutes (EI120).

Fields of application
PROMASTOP®-VEN is a mortar system for walls and floors. It is designed for use with ventilation ducts, fire dampers, metal pipes, plastic pipes, single cables and/or cable bundles to prevent the spread of smoke, heat and fire.

System advantages / customer benefit
- Excellent thermal insulation
- Hardens without tension, i.e. there will be no detrimental effect from thermal shock
- Weatherproof/external use

Test certificate / approval
- EN 1366-3
- EN 13501-1/2
- ETAG 026-2

Packaging
- 25 kg paper bags
- 40 bags/palett

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®-FC
Fire stopping collar

Technical data and properties			
Collar type	**Internal diameter (mm)**	**External diameter (mm)**	**Number of fastening plates**
PROMASTOP®-FC3/032	32	53	2
PROMASTOP®-FC3/040	40	61	2
PROMASTOP®-FC3/050	50	76	3
PROMASTOP®-FC3/056	56	82	3
PROMASTOP®-FC3/063	63	89	3
PROMASTOP®-FC3/075	75	106	3
PROMASTOP®-FC3/090	90	122	3
PROMASTOP®-FC3/110	110	142	4
PROMASTOP®-FC3/125	125	157	4
PROMASTOP®-FC3/160	160	202	5
PROMASTOP®-FC6/050	50	76	3
PROMASTOP®-FC6/056	56	82	3
PROMASTOP®-FC6/063	63	89	3
PROMASTOP®-FC6/075	75	106	3
PROMASTOP®-FC6/090	90	122	3
PROMASTOP®-FC6/110	110	142	4
PROMASTOP®-FC6/125	125	157	4
PROMASTOP®-FC6/140	140	177	5
PROMASTOP®-FC6/160	160	202	5
PROMASTOP®-FC6/200	200	242	5
PROMASTOP®-FC6/225	225	276	6
PROMASTOP®-FC6/250	250	312	6
PROMASTOP®-FC6/315	315	377	6

General description
PROMASTOP®-FC is a fire stopping collar for plastic pipes made from powder-coated stainless steel with a special intumescent inlay. Due to the highly effective intumescent inlay layers the pipe penetrations can be installed according to the following chart.

Fields of application
PROMASTOP®-FC fire stopping collars are tested for walls and floors in both surface-mounted and built-in conditions. 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, angled penetrations and pipe diameter from 160mm

System advantages / customer benefit
- Ready-to-install collar so assembly is quick and easy
- Possible to achieve zero gap
- Use category: Class Y_1
- Two collar depths: 30 and 60 mm

Test certificate / approval
- EN1366-3
- EN13501-1/2
- ETAG 026-2

Packaging
- PROMASTOP® FC3/32 - PROMASTOP® FC3/40: 48 collars per box
- PROMASTOP® FC6/50 - PROMASTOP® FC6/160: 28 collars per box
- PROMASTOP® FC6/200 - PROMASTOP® FC6/315: 2 collars per box

Storage requirements
- Store in dry conditions

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

PROMASTOP®-U
Fire Collar

Technical data and properties	
Use category	Class X
Collar band dimensions	
Thickness	approx. 13 mm
Width	approx. 50 mm
Length	approx. 2250 mm (=150 segments)

Number of segments, collars and fastening clips (*)

For outer Ø of pipes (*)	Number of segments per collar	Number of collars from one package	Required number of clips per collar
43 mm	15	10	2
50 mm	17	8,5	2
55 mm	18	8	2
63 mm	20	7,5	2
69 mm	21	7	2
75 mm	22	6,5	3
83 mm	24	6	3
90 mm	25	6	3
110 mm	29	5	3
114 mm	30	5	3
125 mm	33	4,5	3
140 mm	36	4	5
160 mm	40	3,75	5
200 mm	49	3	5

(*) You can get more detailed information from our technical department.

General description
PROMASTOP®-U is a penetration seal for services penetrating walls and floors. PROMASTOP®-U is available in strips of 150 or 152 segments with a length of 15 mm each that can easily be separated to the required length depending on the pipe outside diameter.

Fields of application
PROMASTOP®-U is designed for use with plastic pipes to seal pipe penetrations against the spread of smoke and fire in walls and floors.

System advantages / customer benefit
- Unique patented cut-to-length strip
- Components included: strip, brackets, fixings
- Easy-to-use dispenser
- "One size fits all" concept
- Tested with many types of plastic
- Strip moulded with intumescent
- Lower stock inventory cost

Test certificate / approval
- EN 1366-3
- EN 13501-2
- ETA 13/0378
- ETAG 026-2

Packaging
One package contains:
- 1 strip (length 2250 mm = 150 segments)
- 15 fastening clips
- 15 wedge nails
- 5 identification signs

Subject to change.

Storage requirements
- Store in dry conditions.

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

PROMASTOP®-W
Fire stopping wrap

Technical data and properties	
Colour	anthracite grey
Consistency	flexible wrap
Exapansion temperature	approx. 150 °C
Thickness	approx. 2,5 mm
Width	approx. 50 mm
Use category	Class X
Reaction to fire	Class E
VOC content	< 0,01 g/l

General description
PROMASTOP®-W is an expanding fire stopping tape. 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 drain pipes with multi layer technology and insultated alminium composite as well as metal pipes.

System advantages / customer benefit
- Flexible
- Quick and easy installation
- Resistant to atmospheric influences (light, heat, frost, UV radiation, humidity)
- Universally usable

Test certificate / approval
- EN 1366-3
- EN 13501-1/2
- ETAG 026-2

Packaging
- Coil 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

PROMASEAL®-A
Fire stopping acrylic

Technical data and properties	
Colour	white/grey
Consistency	paste
Density	wet : 1,6 ± 0,2 g/cm³ dry : 1,8 ± 0,2 g/cm³
Solid content	86 ± 5 wt%
Movement capabilities	elongation minimum 15% compression minimum 15%
Use category	Class Y_1
Reaction to fire	Class E

General 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 clearance seal between structural components and sustained insulation.

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

Test certificate / approval
- EN 1366-3/4
- EN 13501-1/2
- ETAG 026-2/3

Packaging
- 310 ml cartridges
- 12 cartridges/box
- 1248 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, containers should be finished swiftly

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

PROMASEAL®-AG
Fire stopping acrylic

Technical data and properties	
Colour	grey
Consistency	paste
Density	wet : 1,5 ± 0,2 g/cm³ dry : 1,6 ± 0,2 g/cm³
Expansion ratio	approx. 1:13 (550 °C)
Solid content	84 ± 5 wt%
Expansion pressure	approx. 0,9 N/mm²
Use category	Class Y_1
Reaction to fire	Class E
Expansion temperature	approx. 150 °C

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

Fields of application
PROMASTOP®-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 under pressure
- Can be painted
- Good adhesion to various substrates

Test certificate / approval
- EN 1366-3
- EN 13501-1/2
- ETAG 026-2

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 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®-IM CJ21
Fire stopping jacket

Technical data and properties	
Type	CJ 21B
Consistency	soft
Weight	~ 8,0 g ± 10 %
Height	approx. 40 mm
Outer Diameter	approx. 26 mm
Wall Thickness	approx. 1,5 mm

General description
PROMASTOP®-IM CJ21 is graphite-based intumescent component for single cables.

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 of cable group 1.

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

Test certificate / approval
- EN 1366-3
- EN 13501-1/2
- ETAG 026-2

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®-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

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

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 joint component.

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

Test certificate / approval
- EN 1366-3/4
- EN 13501-1/2
- ETAG 026-2

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®-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 mins. / 600 °C)
Expansion temperature	approx. 150 °C
Volume	PROMASTOP®-L approx. 2 l PROMASTOP®-S approx. 1 l
Dimensions **PROMASTOP®-S** **PROMASTOP®-L**	 approx. 320 x 100 mm approx. 320 x 200 mm

General description
PROMASTOP®-S and PROMASTOP®-L is a fire stopping graphitebased 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

Test certificate / approval
- EN 1366-3
- EN 13501-1/2
- ETAG 026-2

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

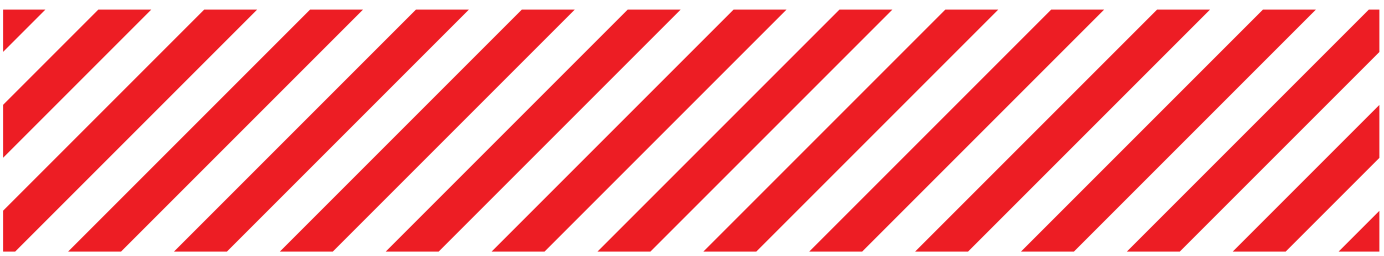
Subject to change.

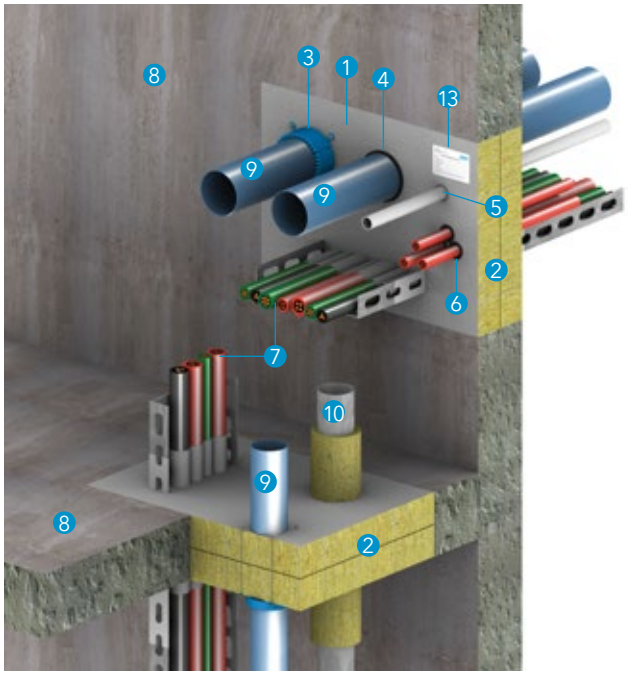
Storage requirements
- Store in dry conditions

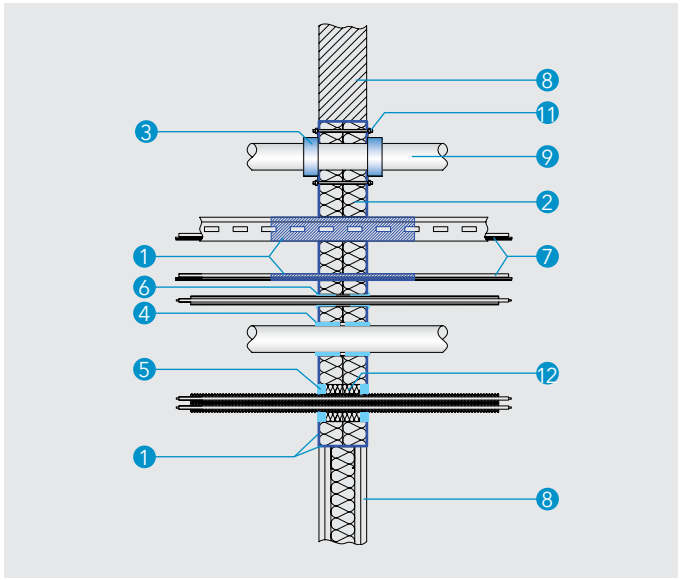
Safety instructions
- Please refer to the safety data sheet for additional advice
- Only when getting in contact with content - please mind H and P phrases

Promat

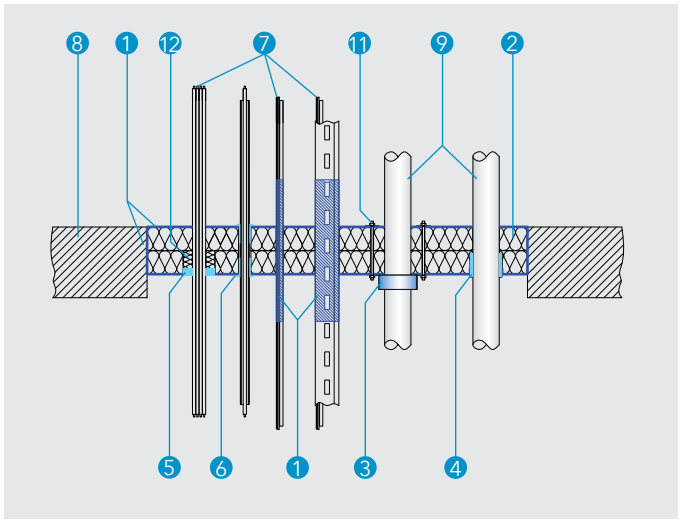
Penetration seal systems







Detail A - Mixed penetration seal in flexible wall and rigid wall



Detail B - Mixed penetration seal in rigid floor

Technical data

1. PROMASTOP®-CC
2. Stone wool, in acc. Table 3
3. PROMASTOP®-FC
4. PROMASTOP®-W
5. Filling material depending on Detail
6. PROMASTOP®-IM CJ21
7. Cable
8. Supporting construction, in acc. Table 2
9. Plastic pipe
10. Non-combustible pipe material
11. Threaded rods
12. Backfilling material
13. Identification label

Certificate: CR No. 14030405

Advantages:

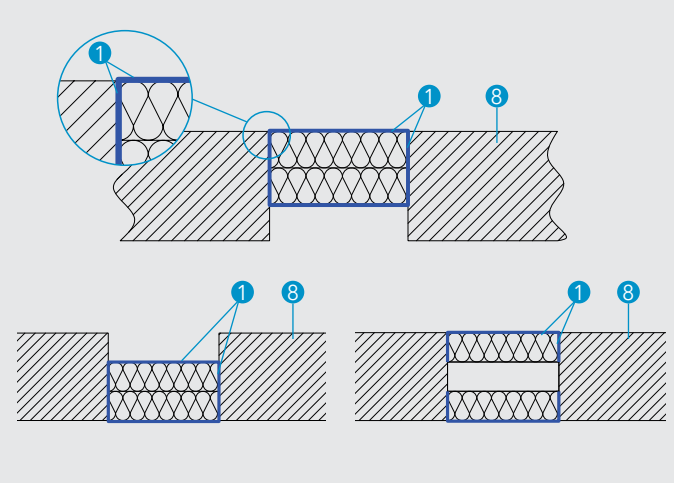
- Seal size up to 3,75 m² in tested Wall and Floor
- Moisture resistant
- Wet film thickness 0,9 mm on Stone wool boards (=Dry film thickness of 0,7 mm)

Detail A/B - Overview PROMASTOP®-CC mixed penetration seal

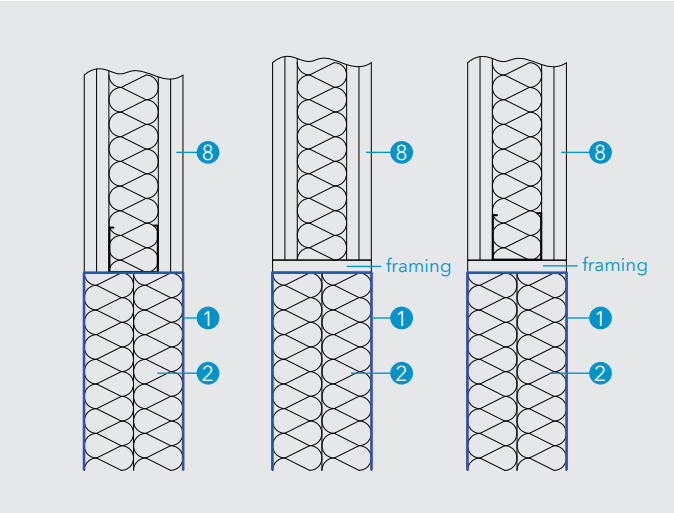
Titles	Description
PROMASTOP®-CC	Fire stopping coating
1. Installation procedure	
2. Aperture framing	
3. Field of application	
4. Cable penetration seal	
5. Non-combustible pipes with non-combustible insulation	
6. PROMASTOP®-IM CJ21	Fire stopping jacket
7. PROMASTOP®-FC	Fire stopping collar
8. PROMASTOP®-W	Fire stopping wrap
9. Aluminium plastic composite pipe	
10. Non-combustible pipes with combustible insulation	

1. Installation procedure

- Build a aperture framing in flexible walls, as shown in (Detail D)
- The boards must be made of non-combustible stone wool (A1 acc. to EN 13501-1) with a melting point of ≥ 1000°C and a density of ≥ 140 kg/m³, The amount of layers depent on the fire resistance (Table 3)
- The distance between the stone wool boards may be: ≥ 0 mm
- The PROMASTOP®-CC firestop coating must be applied on the outer surfaces, all cutting edges and board joints
- Remaining gaps are filled with stone wool and coated with fire stop coating or filled with PROMASEAL®-A
- It is not necessary to paint the adjacent wall and floor construction
- Secure the floor penetration seal against step on
- Affix the identification label



Detail C – Possible positions of the stone wool boards



Detail D – Aperture framing of the flexible wall

Table 2 – Supporting construction and maximum seal size:

Separating element	Thickness of the stone wool board		
	1 x 50 mm	1 x 80 mm	2 x 50 mm
Flexible wall ≥ 100 mm	1,80 m²		3,75 m²
Rigid wall ≥ 100 mm			
Rigid floor ≥ 150 mm	1,95 m²		

Detail C

There are 3 possibilities shown in Detail C shown, how to build in the penetration seal in floor and wall constructions.

- flush to the upper edge of the floor
- flush to the lower edge of the floor
- both stone wool boards flush to the upper and lower edge of the floor

2. Aperture framing

Detail D

The penetration seal my be build into walls and floors according table 2. For flexible walls there are the following possibilities for the aperture framing:

- The existing metal stud is used, additional metal studs shall be added to create a circulating metal frame
- Without the metal stud but with minium 1 layer of the flexible wall lining in the aperture
- With the metal stud and minimum 1 layer of the flexible wall lining in the aperture

3. Field of application

Table 2

In table 2 are the maximum tested and certified penetration seal sizes shown, depending on the installation situation. The maximum sizes may not be exceeded.

Flexible wall constructions

The wall must a thickness of ≥ 100 mm and be made from wooden or metal studs which are lined on both sides with minimum 2 layers of minimum 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 each of the wooden stud to the sealing and the cavity between studs and sealing must be filled with a least 100 mm insulation material compliant to class A1 or A2 (in acc. EN 13501-1). An additional framing with boards of the opening is not necessary.

Rigid wall constructions

(Aerated concrete, concrete, reinforced concrete, masonry,...):
The rigid wall must have a thickness ≥ 100 mm and a density of ≥ 450 kg/m³. The results achieved using a standard rigid supporting construction are valid for separating construction products of concrete or masonry having a similiar or higher thickness and density as the tested ones. The classification results from flexible wall constructions may be also applied to rigid wall constructions in case the thickness and density is higher than those of the tested construction.

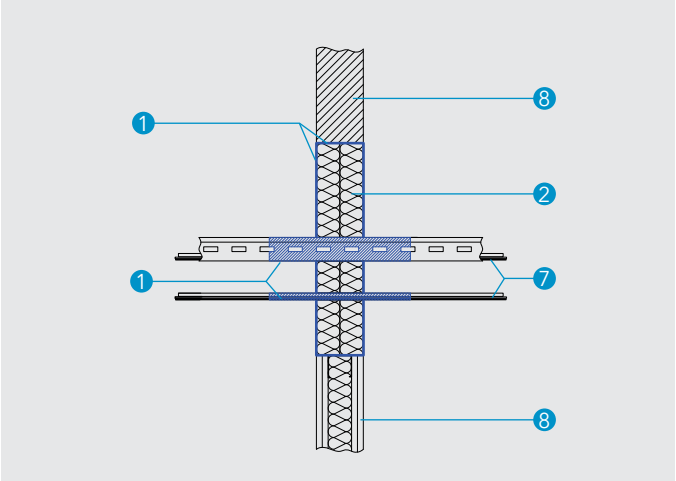
Table 3 – Tested and certified stone wool boards:

Manufacturer	Type
Rockwool	RP-XV, Hardrock II, Rockwoll 360, Taurox D-C, Taurox Duo NP, Rockwool Paneel 755
Knauf Insulations	Knauf Insulations DP-15, Knauf Insulations FDB D150
Paroc OY AB	Pyrotech slab 140 – 180, Paroc Pro Roof slab
Isover	Orsil T-N

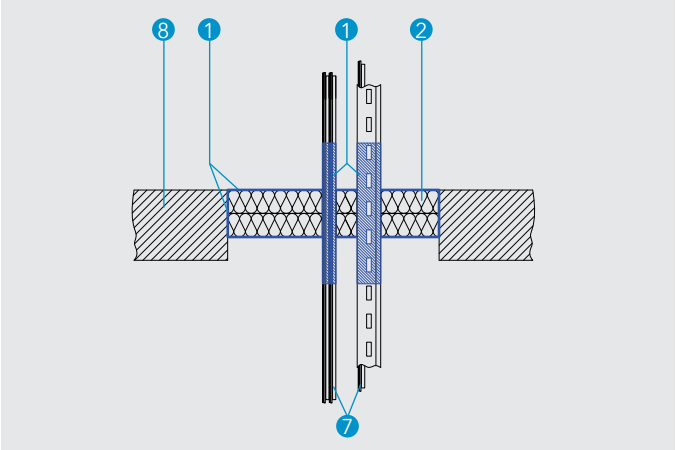
Rigid floor constructions
(Aerated concrete, concrete, reinforced concrete,...)
The rigid floor must have a thickness of ≥ 150 mm and a density of ≥ 450 kg/m³.

Table 3
The system tested and certified stone wool boards (Density ≥ 140 kg/m³, melting point ≥ 1000°C, A1 according EN 13501-1) are listed in table 3.

4. Cable penetration seal with PROMASTOP®-CC



Detail E – Cable penetration seal in flexible wall and rigid wall



Detail F– Cable penetration seal in rigid floor

Detail E/F
Cables, cablebundles, conduits, bundle of conduits, empty pipes, cable trays and cable ladders may pass trough the PROMASTOP®-CC penetration seal in wall and floor. Up to a diameter of 100 mm of cable bundles, there is no need additional seal, the coating with PROMASTOP®-CC (acc. table 4) is enough.

Table 4
As shown in table 4, 1 mm wet film thickness shall be applied to cables of the cable group 1-5, cable trays and cable ladders. The length of the coating is 100 mm, measured from the surface of the penetration seal. Specimen of the cable group 6 need a coating thickness of 3 mm.

Table 4 – Coating thickness and coating length

Object	Wet film thickness (mm)	Length of the coating (mm)
Cable group 1 – 5	1	100
Cable group 6	3	
Cable trays, cable ladders,...	1	

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

Table 5
Table 5 shows the fire resistance classification of the cable groups, depending on the penetration seal version.

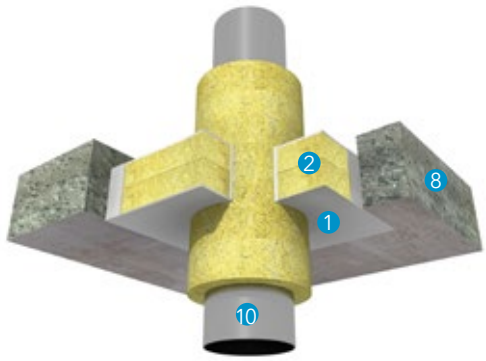
The retrospective installation in the PROMASTOP®-CC penetration seal is possible, if all application guidelines are followed.

Table 5 – Fire resistance class of the cable groups depending on the penetration seal structure

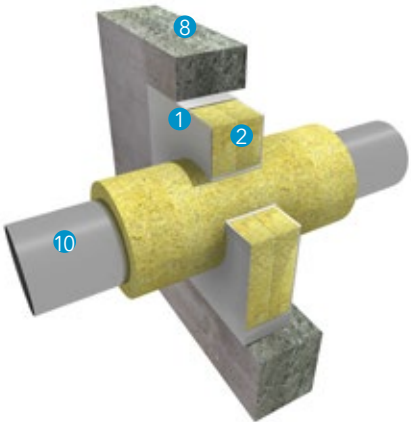
Electrical installation	Thickness and orientation of the stone wool boards					
	1 x 50 mm		1 x 80 mm		2 x 50 mm	
	Wall	Floor	Wall	Floor	Wall	Floor
CG1: All sheated cable types Ø ≤ 21 mm	EI 60	EI 60	EI 90	EI 90	EI 90	EI 90
CG2: All sheated cable types 21 < Ø ≤ 50 mm			EI 60			
CG3: All sheated cable types 50 < Ø ≤ 80 mm						
CG4: Cable bundle made of cables of CG1 (telecommunication cables) Ø ≤ 100 mm			EI 90			
CG5: Non sheated cable types Ø ≤ 24 mm	EI 45		EI 60	EI 60		
CG6: Small conduits and tubes, made of plastic or steel with pipe end configuration U/C ≤ 16 mm	EI 45-U/C	EI 45-U/C	EI 60-U/C	EI 60-U/C	EI 90-U/C	EI 90-U/C

CG ... Cable group according EN 1366-3:2009

5. Penetration seal of non-combustible pipes with non-combustible insulation with PROMASTOP®-CC



Detail G – Metal pipe penetration seal in rigid floor



Detail H – Metal pipe penetration seal in rigid wall

Detail G

Non-combustible pipes can be sealed with a section insulationmade of stone wool (Melting point ≥ 1000°C, A2/$A2_L$ EN 13501-1 or higher rated). The required lengths and thicknesses are shown in the diagram. These are depending on the pipe diameter, the pipe wall thickness and the pipe type (steel, copper or their substitutes).

Detail H

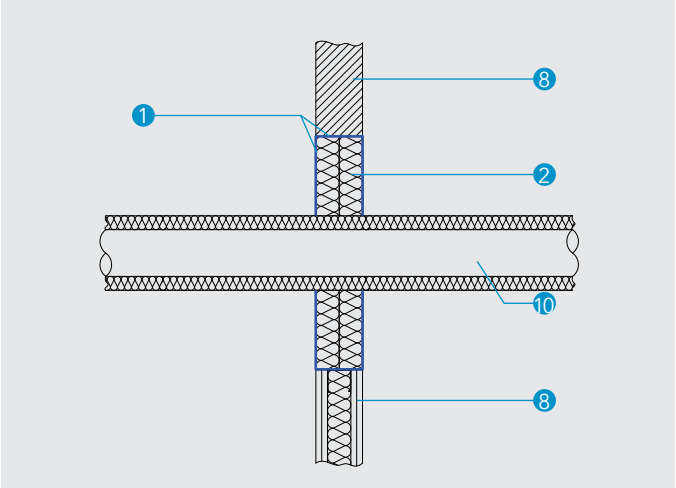
The insulation (case LS) shall be placed in the center of the supporting construction or the penetration seal and fixed with steel wire (minimum thickness 0,6 mm). The insulation length is shown in the table 8 and 11.

The insulation case LS covers: CI, CS, LI and LS.

Remaining gaps around the insulation are filled with stone wool and coated with fire stop coating PROMASTOP®-CC paste or filled with PROMASEAL®-A.

Supporting distance

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



Detail I – Metal pipe penetration seal in flexible wall and rigid wall, Case CS (Continued Sustained) (over the whole pipe length)

Steel pipes

Table 6 – Insulation information for steel pipes

Type	Specification
Stone wool	Melting point ≥ 1000°C, Class A2-s1, d0, $A2_L$-s1, d0 (acc. to EN 13501-1)
Density	≥ 40 kg/m³
Insulation thickness	≥ 30 mm to ≤ 100 mm (only 30 mm thickness from 4 mm pipe wall thickness)
Type of insulation	LS, CS, LI or CI
Lengh of insulation	see Table 8

Table 7 – Steel pipes

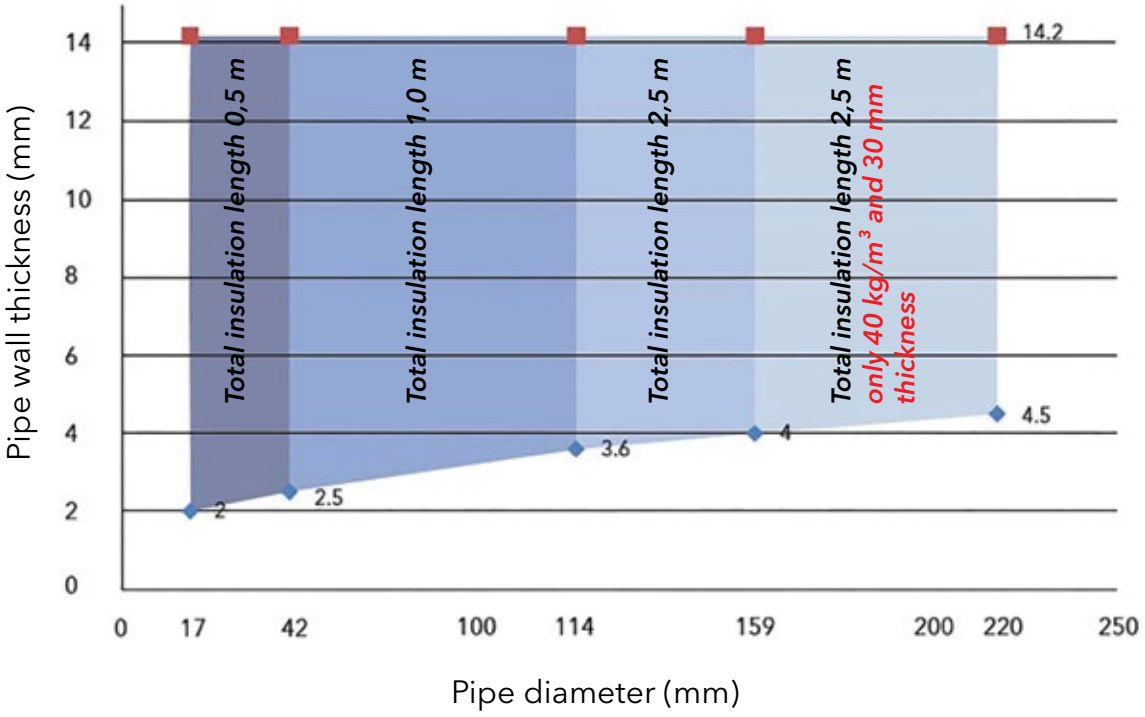
In the table 7 , the total length of the insulation depends of the pipe wall thickness and pipe diameter.

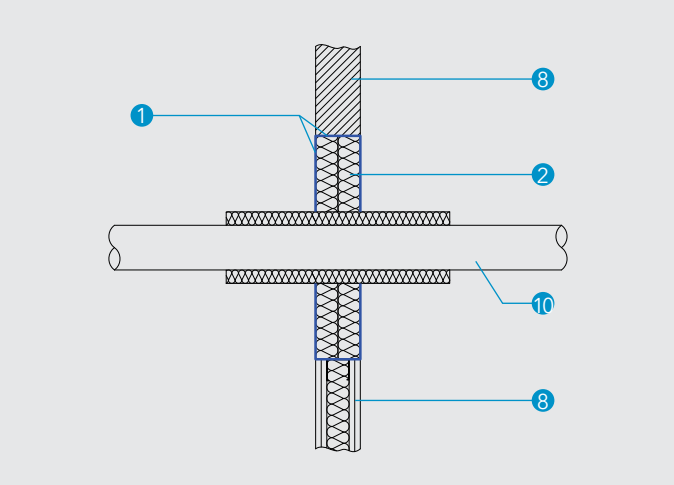
The field of application given for metal pipes with lower heat conductivity λ ≤ 58 W/mK and a melting point ≥ 1100°C (e.g. stainless steel, cast iron, Nialloys (NiCr, NiMo and NiCu alloys) and Ni.

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

With non-combustible insulation	PROMASTOP®-CC					
	1 x 50 mm		1 x 80 mm		2 x 50 mm	
	Wall	Floor	Wall	Floor	Wall	Floor
Pipe diameter (mm)	Ø ≤ 114	Ø ≤ 114	Ø ≤ 114	Ø ≤ 114	Ø ≤ 220	Ø ≤ 220
Pipe wall thickness (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	

Table 8 – Information about length of the non-combustible insulation for steel pipes





Detail J – Metal pipe penetration seal in flexible and rigid wall in Case LS (Local Sustained)

Copper pipes

Table 9 – Insulation information for copper pipes

Type	Specification
Stone wool	Melting point ≥ 1000°C, Class A2-s1, d0, $A2_L$-s1, d0 (acc. to EN 13501-1)
Density	≥ 40 kg/m³
Insulation thickness	≥ 30 mm to ≤ 100 mm
Type of insulation	LS, CS, LI or CI
Lengh of insulation	see Table 8

Table 10 – Dimensions for copper pipes with non-combustible insulation

With non-combustible insulation	PROMASTOP®-CC					
	1 x 50 mm		1 x 80 mm		2 x 50 mm	
	Wall	Floor	Wall	Floor	Wall	Floor
Pipe diameter (mm)	Ø ≤ 88,9	Ø ≤ 88,9	Ø ≤ 88,9	Ø ≤ 88,9	Ø ≤ 88,9	Ø ≤ 88,9
Pipe wall thickness (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	

Table 11 – Copper pipe
In this diagram, the total length of the insulation depends of the pipe wall thickness and pipe diameter.

The field of application given for copper pipes is also valid for other metal pipes with lower heat conductivity (λ ≤ 380 W/mK) and a melting point of minimum 1083°C (e.g. stainless steel, cast iron, Ni alloys (NiCr, NiMo and NiCu alloys) and Ni.

Table 11 – Information about length of the non-combustible insulation for copper pipes

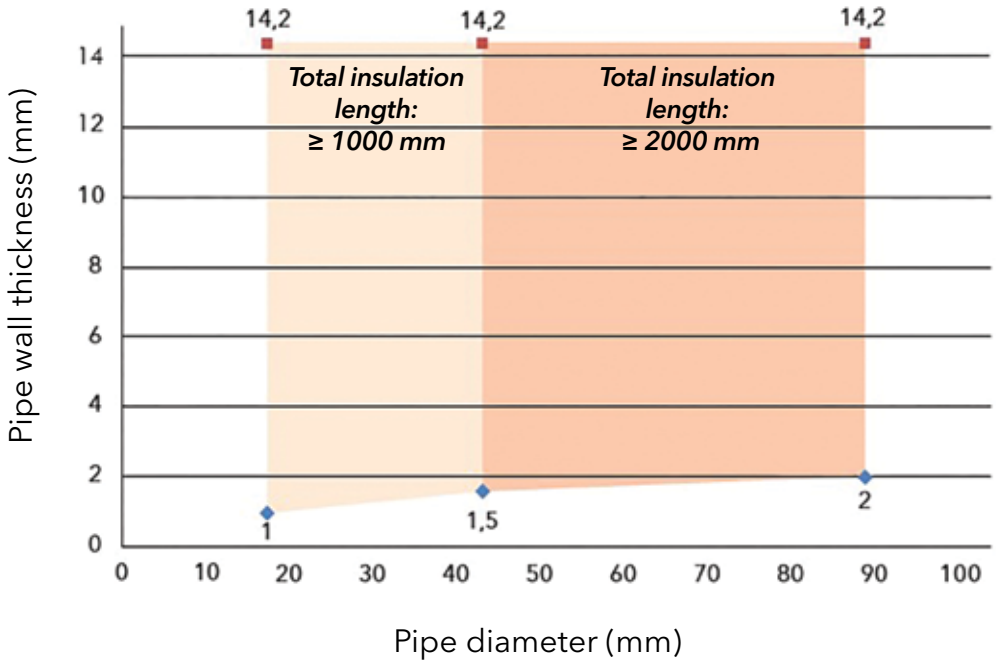
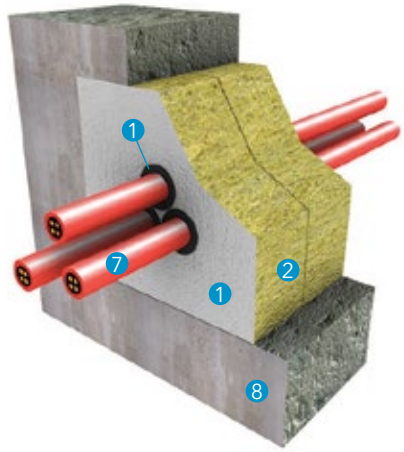


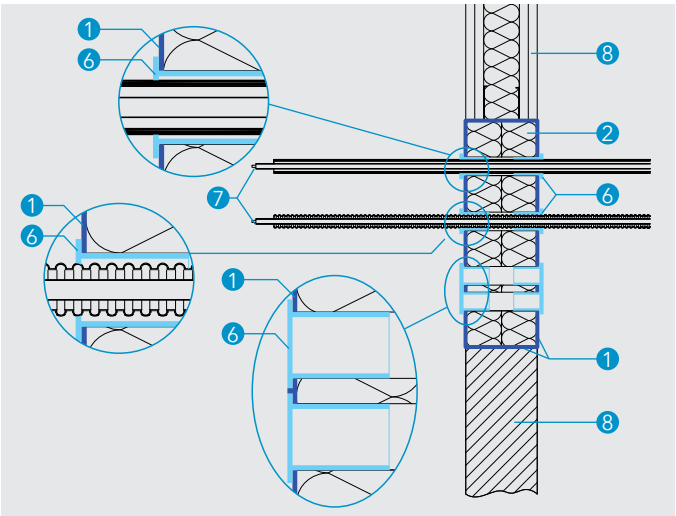
Table 12 - Information about the minimum distance for steel pipes and copper pipes

Object	Distance (mm)
non-combustible insulation – non-combustible insulation	0
non-combustible insulation – Aperture opening	0
non-combustible insulation – PROMASTOP®-FC	0
non-combustible insulation – PROMASTOP®-W (with or without non-combustible insulation)	100
non-combustible insulation – Cable tray	0
non-combustible insulation – PROMASTOP®-IM CJ21	0
non-combustible insulation – PROMASEAL®-A	0
non-combustible insulation - PROMASEAL®-AG	100
non-combustible insulation – PROMATECT®-AD	0

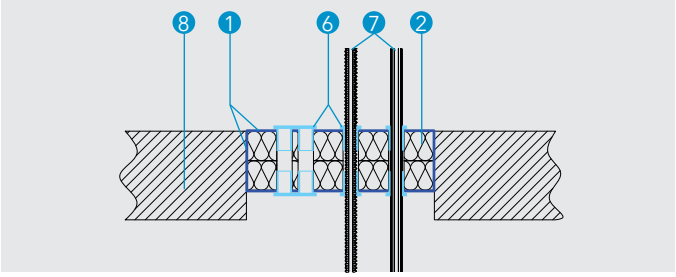
6. Cable penetration seal: PROMASTOP®-CC in combination with PROMASTOP®-IM CJ21



Detail K - Cable penetration seal in rigid wall



Detail L - Cable penetration seal in flexible wall and rigid wall



Detail M - Cable penetration seal in rigid floor

Detail K/L

The fire stop jacket PROMASTOP®-IM CJ21 is a penetration seal for cables, wires, conduits with or without cables and pipes up to 21 mm in diameter. Due to its smoke thightness its possible to use the cable jacket for later installations. Additional sealing of the annular gap or coating is not necessary.

For wall and floor application, the cable jacket shall be used on both sides. Fixing works trough screw the PROMASTOP®-IM CJ21 into the boards.

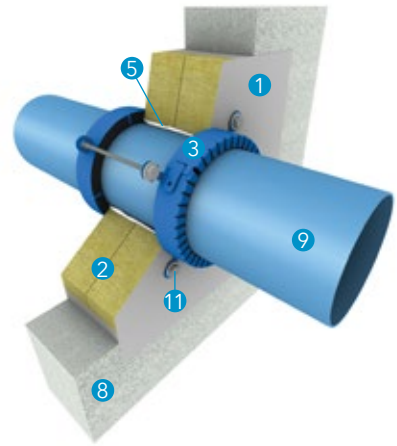
Table 13 - Fire resistance class of the cable jacket depending to the penetration seal structure

Electrical installation	PROMASTOP®-CC					
	1 x 50 mm		1 x 80 mm		2 x 50 mm	
	Wall	Floor	Wall	Floor	Wall	Floor
CG1: All sheathed cable types ≤ 21 mm	EI 60	EI 60	EI 90	EI 90	EI 90	EI 90
Position	one-sided	top-sided	two-sided		two-sided	

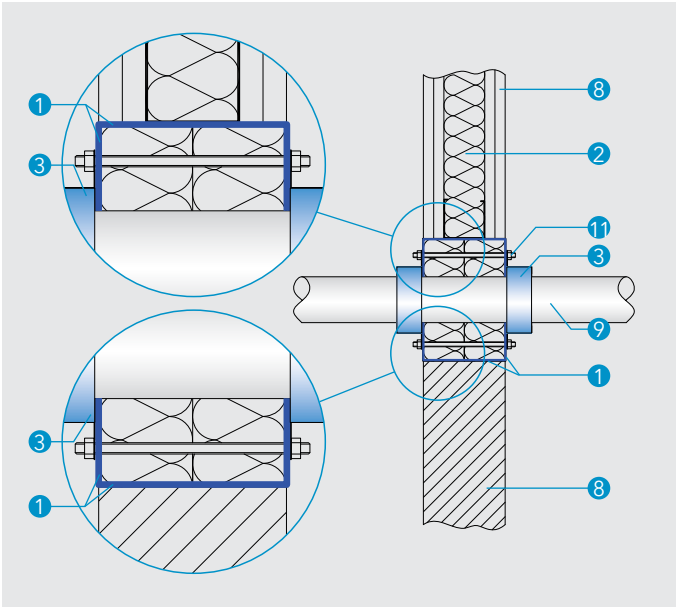
Table 14 - Information about the minimum distance

Object	Distance (mm)
PROMASTOP®-IM CJ21 – PROMASTOP®-IM CJ21	0
PROMASTOP®-IM CJ21 – Aperture opening	0
PROMASTOP®-IM CJ21 – PROMASTOP®-FC	0
PROMASTOP®-IM CJ21 – PROMASTOP®-W	0
PROMASTOP®-IM CJ21 – Cable tray	0
PROMASTOP®-IM CJ21 – PROMASEAL®-AG	0
PROMASTOP®-IM CJ21 – PROMASEAL®-A	0
PROMASTOP®-IM CJ21 – Non-combustible insulation	0
PROMASTOP®-IM CJ21 – PROMATECT®-AD	0

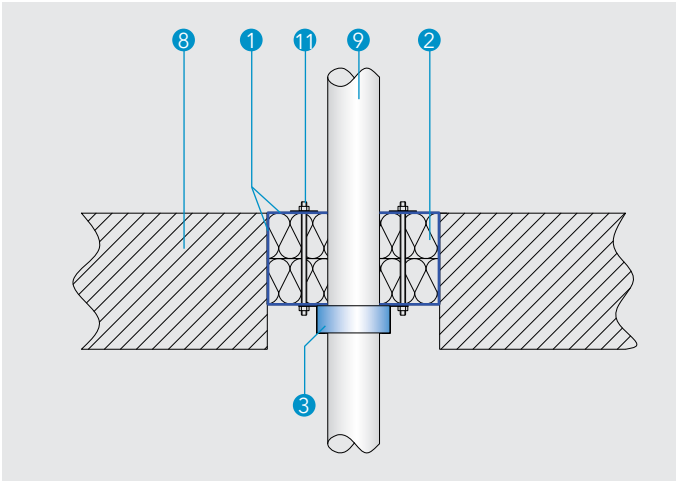
7. Plastic pipe penetration seal: PROMASTOP®-CC in combination with PROMASTOP®-FC



Detail M – Plastic pipe penetration seal in rigid wall



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



Detail O – Plastic pipe penetration seal in rigid floor

Detail M/N/O

- PROMASTOP®-FC3 and PROMASTOP®-FC6 can be build in and on
- The collar shall be placed on both sides of the wall, and below the floor
- Suitable for all standard types of plastic pipes and special pipes - see table 16
- PROMASTOP®-FC is useable for pipe diameter from 32 mm to 315 mm
- If the collar is mounted on the seal, zero distance is possible
- Optional sound decoupling strip up to a thickness of 5 mm can be used on the plastic pipe
- The annular gap between the plastic pipe and the stone wool board shall be filled with PROMASEAL®-A, PROMASEAL®-AG or PROMASTOP®-CC 5.

Table 15 – Information about the minimum distance

Object	Distance (mm)
PROMASTOP®-FC – non-combustible pipe with insulation	0
PROMASTOP®-FC – Cable tray	20
PROMASTOP®-FC – Plastic pipe	0
PROMASTOP®-FC – Aluminium plastic composite pipe	0
PROMASTOP®-FC – PROMASTOP®- IM CJ21	80
PROMASTOP®-FC – PROMASTOP®-FC	0
PROMASTOP®-FC – PROMASTOP®-W	30
PROMASTOP®-FC – Combustible insulation	0
PROMASTOP®-FC – Non-combustible insulation	0
PROMASTOP®-FC – Aperture opening	20

Table 16

The PROMASTOP®-FC6 collar shall be used for pipe diameter ≥ 200 mm, sloped pipes and pipe sockets. For more details please contact our technical service.

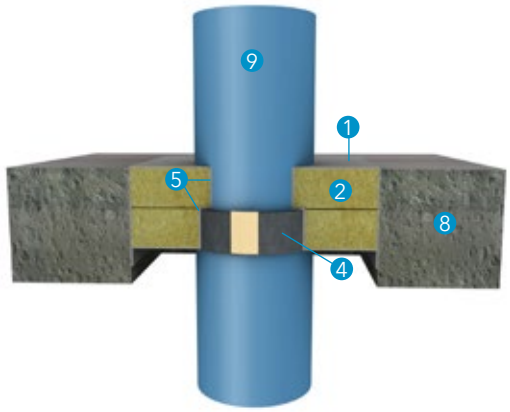
Table 16 – Overview pipe materials, dimensions, installation situation and classification

Product type	Dimension range Ø...Pipe diameter (mm) s...Pipe wall thickness (mm)	Penetration Seal (mm)	Orientation D...Floor W...Wall	Collar type	Classification
PVC-U	Ø 32 / s 1,8 - Ø 250 / s 4,9	1 x 50	D	FC3/6	EI60-U/U
PVC-U	Ø 32 / s 1,8 - Ø 250 / s 4,9	1 x 80	D	FC3/6	EI90-U/U
PVC-U	Ø 32 / s 1,8 - Ø 250 / s 4,9	2 x 50	D	FC3/6	EI90-U/U
PE	Ø 32 / s 1,8 - Ø 200 / s 11,4	1 x 50	D	FC3/6	EI60-U/U
PE	Ø 32 / s 1,8 - Ø 200 / s 11,4	1 x 80	D	FC3/6	EI90-U/U
PE	Ø 32 / s 1,8 - Ø 200 / s 11,4	2 x 50	D	FC3/6	EI90-U/U
PE	Ø 32 / s 1,8 - Ø 200 / s 11,4	1 x 50	W	FC3/6	EI60-U/U
PE	Ø 32 / s 1,8 - Ø 200 / s 11,4	1 x 80	W	FC3/6	EI90-U/U
PE	Ø 32 / s 1,8 - Ø 200 / s 11,4	2 x 50	W	FC3/6	EI90-U/U
PP-H / PP-R	Ø 32 / s 1,8 - Ø 200 / s 11,4	1 x 50	D	FC3/6	EI60-U/U
PP-H / PP-R	Ø 32 / s 1,8 - Ø 200 / s 11,4	1 x 80	D	FC3/6	EI90-U/U
PP-H / PP-R	Ø 32 / s 1,8 - Ø 200 / s 11,4	2 x 50	D	FC3/6	EI90-U/U
PP-H / PP-R	Ø 40 / s 1,8 - Ø 250 / s 14,2	1 x 50	W	FC3/6	EI60-U/U
PP-H / PP-R	Ø 40 / s 1,8 - Ø 250 / s 14,2	1 x 80	W	FC3/6	EI90-U/U
PP-H / PP-R	Ø 40 / s 1,8 - Ø 250 / s 14,2	2 x 50	W	FC3/6	EI90-U/U
Friatec Friaphon	Ø 52 / s 2,8 - Ø 110 / s 5,3	1 x 50	D	FC3	EI60-U/U
Friatec Friaphon	Ø 52 / s 2,8 - Ø 110 / s 5,3	1 x 80	D	FC3	EI90-U/U
Friatec Friaphon	Ø 52 / s 2,8 - Ø 110 / s 5,3	2 x 50	D	FC3	EI90-U/U
Friatec dBlue	Ø 50 / s 1,8 - Ø 125 / s 3,9	1 x 50	D	FC3	EI60-U/U
Friatec dBlue	Ø 50 / s 1,8 - Ø 125 / s 3,9	1 x 80	D	FC3	EI90-U/U
Friatec dBlue	Ø 50 / s 1,8 - Ø 125 / s 3,9	2 x 50	D	FC3	EI90-U/U
Geberit Silent db20	Ø 56 / s 3,2 - Ø 160 / s 7,0	1 x 50	D	FC3	EI60-U/U
Geberit Silent db20	Ø 56 / s 3,2 - Ø 160 / s 7,0	1 x 80	D	FC3	EI90-U/U
Geberit Silent db20	Ø 56 / s 3,2 - Ø 160 / s 7,0	2 x 50	D	FC3	EI90-U/U
Geberit Silent db20	Ø 56 / s 3,2 - Ø 135 / s 6,0	1 x 50	W	FC3	EI60-U/U
Geberit Silent db20	Ø 56 / s 3,2 - Ø 135 / s 6,0	1 x 80	W	FC3	EI90-U/U
Geberit Silent db20	Ø 56 / s 3,2 - Ø 135 / s 6,0	2 x 50	W	FC3	EI90-U/U
Pipelife Master3	Ø 75 / s 2,1 - Ø 125 / s 3,5	1 x 50	D	FC3	EI60-U/U
Pipelife Master3	Ø 75 / s 2,1 - Ø 125 / s 3,5	1 x 80	D	FC3	EI90-U/U
Pipelife Master3	Ø 75 / s 2,1 - Ø 125 / s 3,5	2 x 50	D	FC3	EI90-U/U
Pipelife Master3	Ø 75 / s 2,1 - Ø 125 / s 3,5	1 x 50	W	FC3	EI60-U/U
Pipelife Master3	Ø 75 / s 2,1 - Ø 125 / s 3,5	1 x 80	W	FC3	EI90-U/U
Pipelife Master3	Ø 75 / s 2,1 - Ø 125 / s 3,5	2 x 50	W	FC3	EI120-U/U

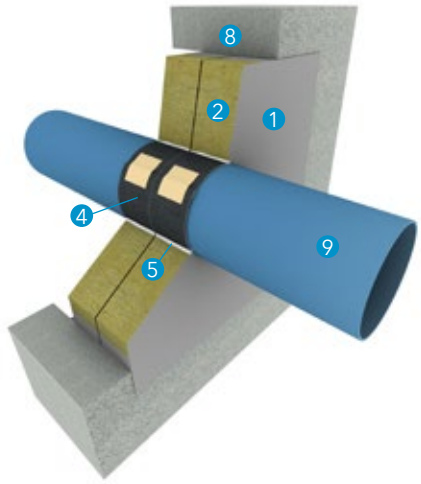
Product type	Dimension range Ø...Pipe diameter (mm) s...Pipe wall thickness (mm)	Penetration Seal (mm)	Orientation D...Floor W...Wall	Collar type	Classification
Poloplast PoloKal NG	Ø 32 / s 1,8 - Ø 250 / s 8,6	1 x 50	D	FC3/6	EI60-U/U
Poloplast PoloKal NG	Ø 32 / s 1,8 - Ø 250 / s 8,6	1 x 80	D	FC3/6	EI90-U/U
Poloplast PoloKal NG	Ø 32 / s 1,8 - Ø 250 / s 8,6	2 x 50	D	FC3/6	EI90-U/U
Poloplast PoloKal NG	Ø 32 / s 1,8 - Ø 160 / s 4,9	2 x 50	W	FC3	EI120-U/U
Poloplast PoloKal NG	Ø 32 / s 1,8 - Ø 250 / s 8,6	1 x 50	W	FC3/6	EI60-U/U
Poloplast PoloKal NG	Ø 32 / s 1,8 - Ø 250 / s 8,6	1 x 80	W	FC3/6	EI90-U/U
Poloplast PoloKal NG	Ø 32 / s 1,8 - Ø 250 / s 8,6	2 x 50	W	FC3/6	EI90-U/U
Poloplast PoloKal XS	Ø 32 / s 1,8 - Ø 250 / s 8,6	1 x 50	D	FC3/6	EI60-U/U
Poloplast PoloKal XS	Ø 32 / s 1,8 - Ø 250 / s 8,6	1 x 80	D	FC3/6	EI90-U/U
Poloplast PoloKal XS	Ø 32 / s 1,8 - Ø 250 / s 8,6	2 x 50	D	FC3/6	EI90-U/U
Poloplast PoloKal XS	Ø 32 / s 1,8 - Ø 160 / s 4,9	2 x 50	W	FC3	EI120-U/U
Poloplast PoloKal XS	Ø 32 / s 1,8 - Ø 250 / s 8,6	1 x 50	W	FC3/6	EI60-U/U
Poloplast PoloKal XS	Ø 32 / s 1,8 - Ø 250 / s 8,6	1 x 80	W	FC3/6	EI90-U/U
Poloplast PoloKal XS	Ø 32 / s 1,8 - Ø 250 / s 8,6	2 x 50	W	FC3/6	EI90-U/U
Poloplast PoloKal 3S	Ø 75 / s 3,8 - Ø 160 / s 7,5	1 x 50	D	FC3	EI60-U/U
Poloplast PoloKal 3S	Ø 75 / s 3,8 - Ø 160 / s 7,5	1 x 80	D	FC3	EI90-U/U
Poloplast PoloKal 3S	Ø 75 / s 3,8 - Ø 160 / s 7,5	2 x 50	D	FC3	EI90-U/U
Poloplast PoloKal 3S	Ø 75 / s 3,8 - Ø 160 / s 7,5	1 x 50	W	FC3	EI60-U/U
Poloplast PoloKal 3S	Ø 75 / s 3,8 - Ø 160 / s 7,5	1 x 80	W	FC3	EI90-U/U
Poloplast PoloKal 3S	Ø 75 / s 3,8 - Ø 160 / s 7,5	2 x 50	W	FC3	EI120-U/U
Rehau Raupiano Plus	Ø 40 / s 1,8 - Ø 200 / s 6,2	1 x 50	D	FC6	EI60-U/U
Rehau Raupiano Plus	Ø 40 / s 1,8 - Ø 200 / s 6,2	1 x 80	D	FC6	EI90-U/U
Rehau Raupiano Plus	Ø 40 / s 1,8 - Ø 200 / s 6,2	2 x 50	D	FC6	EI90-U/U
Rehau Raupiano Plus (+Socket)	Ø 40 / s 1,8 - Ø 125 / s 3,1	1 x 50	D	FC6	EI60-U/U
Rehau Raupiano Plus (+Socket)	Ø 40 / s 1,8 - Ø 125 / s 3,1	1 x 80	D	FC6	EI90-U/U
Rehau Raupiano Plus (+Socket)	Ø 40 / s 1,8 - Ø 125 / s 3,1	2 x 50	D	FC6	EI90-U/U
Rehau Raupiano Plus (+Socket)	Ø 40 / s 1,8 - Ø 125 / s 3,1	1 x 50	W	FC6	EI60-U/U
Rehau Raupiano Plus (+Socket)	Ø 40 / s 1,8 - Ø 125 / s 3,1	1 x 80	W	FC6	EI90-U/U
Rehau Raupiano Plus (+Socket)	Ø 40 / s 1,8 - Ø 125 / s 3,1	2 x 50	W	FC6	EI120-U/U

For the exact details of the field of application please take the classification report.

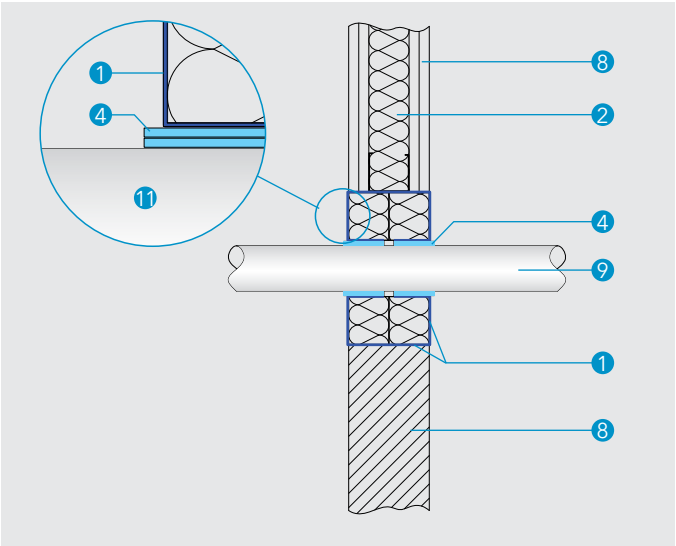
8. Plastic pipe penetration seal: PROMASTOP®-CC in combination with PROMASTOP®-W



Detail P – Plastic pipe penetration seal in rigid floor



Detail Q – Plastic pipe penetration seal in rigid wall



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

Detail P/Q/R

- PROMASTOP®-W can be only used inserted in the penetration seal
- There must be space around the installation, otherwise enough shall be prepared.
- PROMASTOP®-W shall be installed flush with the penetration seal, maximum ≤ 5 mm in front of the penetration seal. For fastening PROMASTOP®-W in the stone wool penetration seal use PROMASTOP®-CC, PROMASTOP®-I, PROMASEAL®-A or PROMASEAL®-AG (5).
- No waste, the cut end can be used
- The application of the PROMASTOP®-W is two-sided in the wall and one-sided below of the floor in the penetration seal

The amount of layers must be followed (see consumption tables).

Table 17 – Information about the minimum distance

Minimum distance for penetration seals of all pipe types with PROMASTOP®-W	
Object	**Distance (mm)**
PROMASTOP®-W – PROMASTOP®-FC	0
PROMASTOP®-W – Non-combustible pipe with insulation	100
PROMASTOP®-W – Cable tray	100
PROMASTOP®-W – PROMASTOP®-W	0
PROMASTOP®-W – Aluminium plastic composite pipe	100
PROMASTOP®-W – Aperture opening	100
PROMASTOP®-W – PROMASTOP®-IM CJ21	100

Table 18

The pipe types in table 18 in combination with the respective number of layers in the 2 x 50 mm stone wool penetration seal fulfill the fire resistance class of EI90-U/U or rather EI120-U/C in wall and floor.

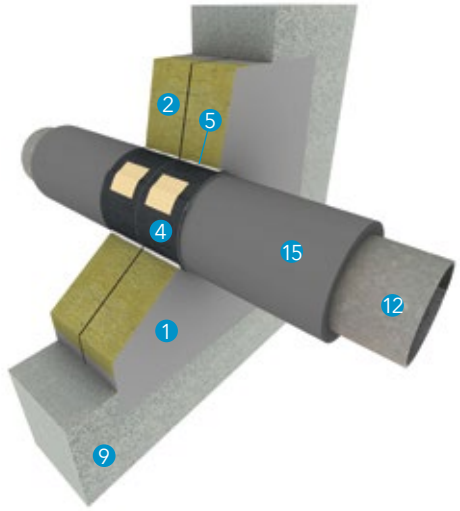
Table 18 – Overview pipe materials, dimensions, installation situation and classification

Product type	Dimension range Ø...Pipe diameter (mm) s...Pipe wall thickness (mm)	Penetration Seal (mm)	Orientation D...Floor W...Wall	No. of layers Ø (mm) ⇢ Layers	Classification
PVC	Ø 32 / s 1,8 - Ø 160 / s 11,8	2 x 50	W	32 – 63 ⇢ 1 75 – 110 ⇢ 2 125 ⇢ 3 140 – 160 ⇢ 4	EI 120-U/C
PE	Ø 32 / s 2,0 - Ø 160 / s 14,6	2 x 50	W	32 – 63 ⇢ 1 75 – 110 ⇢ 2 125 ⇢ 3 140 – 160 ⇢ 4	EI 120-U/C
PP-H / PP-R	Ø 32 / s 1,8 - Ø 160 / s 14,6	2 x 50	W	32 – 63 ⇢ 1 75 – 110 ⇢ 2 125 ⇢ 3 140 – 160 ⇢ 4	EI 120-U/C
Poloplast PoloKal NG	Ø 32 / s 1,8 Ø 40 / s 1,8 Ø 50 / s 2,0 Ø 75 / s 2,6 Ø 90 / s 3,0 Ø 110 / s 3,4 Ø 125 / s 3,9 Ø 160 / s 4,9	2 x 50	W	32 ⇢ 2 40 – 63 ⇢ 3 75 – 90 ⇢ 4 110 – 125 ⇢ 5 140 – 160 ⇢ 6	EI 90-U/U
Poloplast PoloKal 3S	Ø 75 / s 3,8 Ø 90 / s 4,5 Ø 110 / s 4,8 Ø 125 / s 5,3 Ø 160 / s 7,5	2 x 50	W	75 – 90 ⇢ 4 110 – 125 ⇢ 5 140 – 160 ⇢ 6	EI 90-U/U
Poloplast PoloKal XS	Ø 32 / s 1,8 Ø 40 / s 1,8 Ø 50 / s 2,0 Ø 75 / s 2,6 Ø 90 / s 3,0 Ø 110 / s 3,4 Ø 125 / s 3,9 Ø 160 / s 4,9	2 x 50	W	32 ⇢ 2 40 – 63 ⇢ 3 75 – 90 ⇢ 4 110 – 125 ⇢ 5 140 – 160 ⇢ 6	EI 90-U/U
Geberit Silent dB 20	Ø 56 / s 3,2 Ø 63 / s 3,2 Ø 75/ s 3,6 Ø 90 / s 5,5 Ø 110 / s 6,0 Ø 135 / s 6,0 Ø 160 / s 7,0	2 x 50	W	63 ⇢ 3 75 – 90 ⇢ 4 110 – 125 ⇢ 5 140 – 160 ⇢ 6	EI 90-U/U

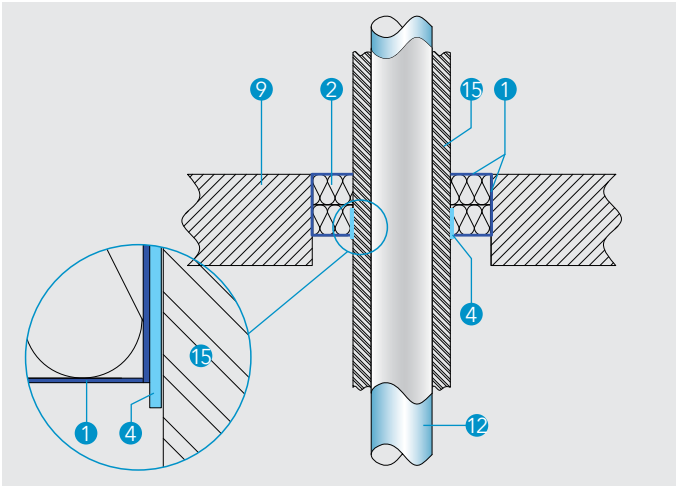
Product type	Dimension range Ø...Pipe diameter (mm) s...Pipe wall thickness (mm)	Penetration Seal (mm)	Orientation D...Floor W...Wall	No. of layers Ø (mm) ⇢ Layers	Classification
PVC	Ø 32 / s 1,8 - Ø 160 / s 11,8	2 x 50	D	32 – 63 ⇢ 1 75 – 110 ⇢ 2 125 ⇢ 3 140 – 160 ⇢ 4	EI 120-U/C
PE	Ø 32 / s 2,0 - Ø 160 / s 14,6	2 x 50	D	32 – 63 ⇢ 1 75 – 110 ⇢ 2 125 ⇢ 3 140 – 160 ⇢ 4	EI 120-U/C
PP-H / PP-R	Ø 32 / s 1,8 - Ø 160 / s 14,6	2 x 50	D	32 – 63 ⇢ 1 75 – 110 ⇢ 2 125 ⇢ 3 140 – 160 ⇢ 4	EI 120-U/C
Poloplast PoloKal NG	Ø 32 / s 1,8 Ø 40 / s 1,8 Ø 50 / s 2,0 Ø 75 / s 2,6 Ø 90 / s 3,0 Ø 110 / s 3,4 Ø 125 / s 3,9	2 x 50	D	32 ⇢ 2 40 – 63 ⇢ 3 75 – 90 ⇢ 4 110 – 125 ⇢ 5	EI 90-U/U
Poloplast PoloKal XS	Ø 32 / s 1,8 Ø 40 / s 1,8 Ø 50 / s 2,0 Ø 75 / s 2,6 Ø 90 / s 3,0 Ø 110 / s 3,4 Ø 125 / s 3,9	2 x 50	D	32 ⇢ 2 40 – 63 ⇢ 3 75 – 90 ⇢ 4 110 – 125 ⇢ 5	EI 90-U/U
Geberit Silent db20	Ø 56 / s 3,2 Ø 63 / s 3,2 Ø 75/ s 3,6 Ø 90 / s 5,5 Ø 110 / s 6,0	2 x 50	D	50 – 63 ⇢ 3 75 – 90 ⇢ 4 110 – 125 ⇢ 5	EI 90-U/U
PP-H / PP-R	Ø 32 / s 1,8 - Ø 40 / s 6,7 + combustible insulation (B-s3, d0; thickness 9 mm; configuration CS)	2 x 50	D	32 – 40 ⇢ 2	EI 120-U/C

For the exact details of the field of application please take the classification report.

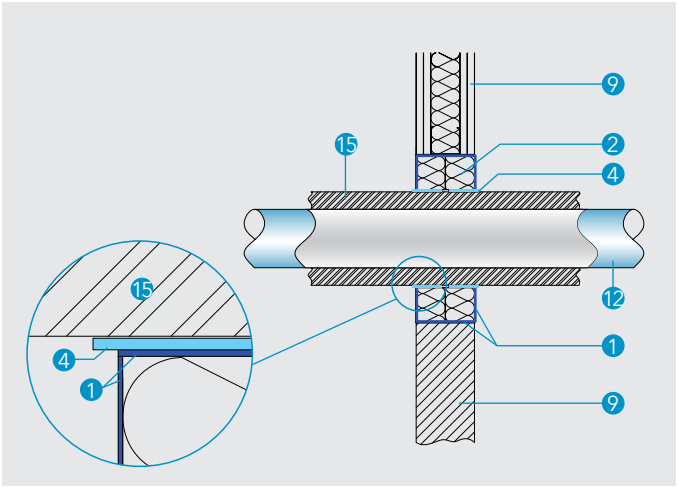
9. Aluminium plastic composite pipes in PROMASTOP®-CC penetration seal with PROMASTOP®-W



Detail S



Detail T – Aluminium plastic composite pipe penetration seal in rigid floor



Detail U – Aluminium plastic composite pipe penetration seal in flexible wall and rigid wall

Detail S/T/U

The application of PROMASTOP®-W is two-sided in the wall and one -sided below of the floor in the penetration seal. PROMASTOP®-W shall be installed flush with the penetration seal, maximum ≤ 5 mm in front of the penetration seal and may not be overpainted. For fastening PROMASTOP®-W in the stone wool penetration seal use PROMASTOP®-CC, PROMASEAL®-A or PROMASEAL®-AG 5 1 6.

Aluminium plastic composite pipes with the chemical description PE-Xb/Al/PE-HD, (Type Pipelife Radopress) with combustible insulation (thickness ≥ 6 to ≤ 32 mm, class B-s3,d0 acc. to EN 13501 -1 or higher rated e.g. rubber / thickness ≥ 4 to ≤ 9 mm, class E acc. to EN 13501 e.g. PE) can be sealed with PROMASTOP®-W.

The combustible insulation is centered in the penetration seal and must have 500 mm minimum total length of the insulation. The configuration of the insulation class B-s3, d0 is LS or CS, for insulation class E, the case CS.

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

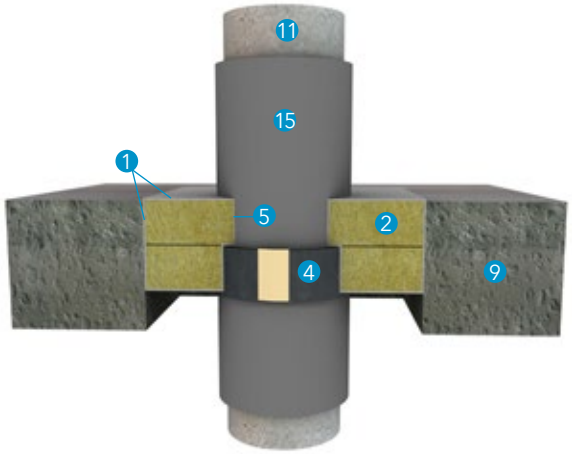
Table 19 – Classification - with insulation 6-32 mm, class B-s3, d0 – Insulation length ≥ 500 mm

Aluminium plastic composite pipe with combustible insulation and PROMASTOP®-W (1 layer)	PROMASTOP®-CC 2 x 50 mm	
	Wall	Floor
Pipelife Radopress Ø 16 - 50 mm	EI 120-U/C	EI 120-U/C
Ø 63 mm		E 120-U/C and EI 60-U/C

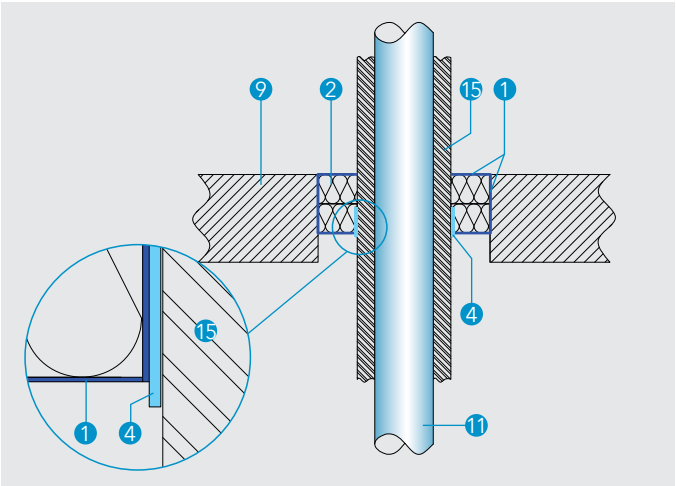
Table 20 – Classification – with insulation 4-9 mm, class E

Aluminium plastic composite pipe with combustible insulation and PROMASTOP®-W (1 layer)	PROMASTOP®-CC 2 x 50 mm	
	Wall	Floor
Pipelife Radopress Ø 16 - 32 mm	EI 120-U/C	EI 120-U/C

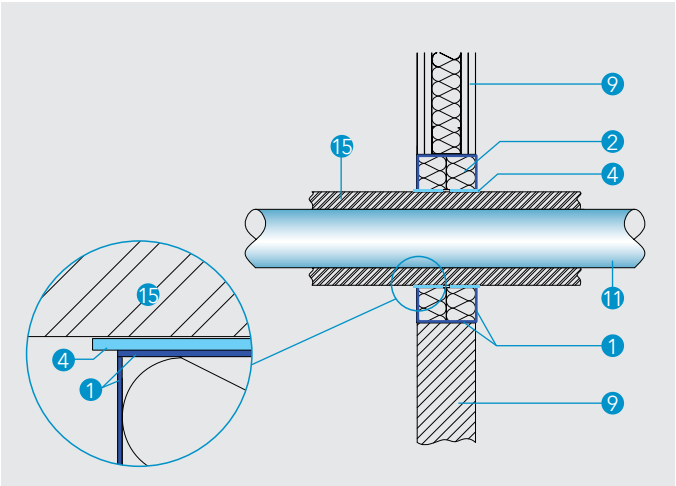
10. Non-combustible pipes with combustible in PROMASTOP®-CC penetration seal with PROMASTOP®-W



Detail V



Detail W – Non-combustible pipes with combustible insulation



Detail X – Non-combustible pipes with combustible insulation

Detail V/W/X

Steel and copper pipes (and their substitutes) with combustible insulation (thickness ≥ 6 to ≤ 32 mm, Class B-s3, d0 acc. to EN 13501 or higher rated e.g. rubber) can be sealed with PROMASTOP®-W. The insulation case is CS.

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

Steel pipes

Table 21 – Steel pipes – Classification – with insulation thickness 6-32 mm, B-s3, d0

Steel pipes with combustible insulation and PROMASTOP®-W (1 layer)	PROMASTOP®-CC 2 x 50 mm	
	Wall	Floor
Ø 50 / s 2,0/14,2 - Ø 220 / s10,0/14,2	EI 90-U/C	EI 90-U/C

s…Pipe wall thickness in mm

The field of application given for metal pipes with lower heat conductivity λ ≤ 58 W/mK and a melting point ≥ 1100°C (e.g. stainless steel, cast iron, Nialloys (NiCr, NiMo and NiCu alloys) and Ni.

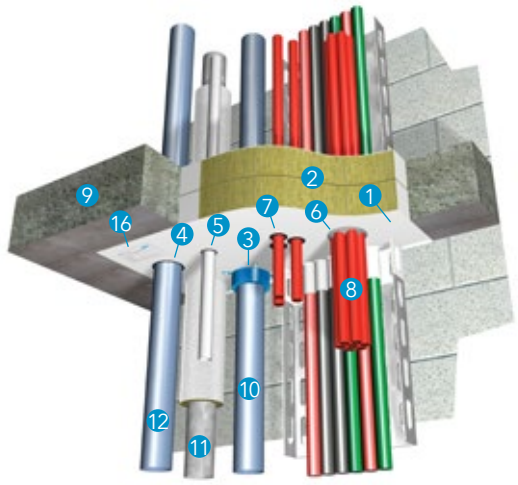
Copper pipes

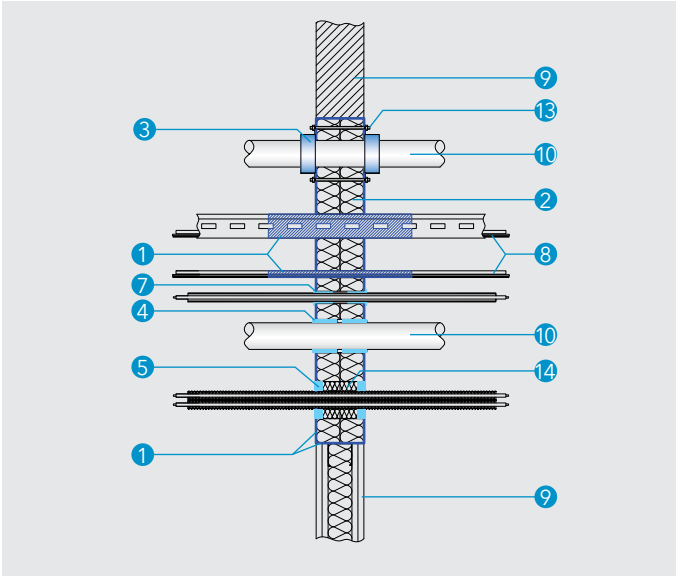
Table 22 – Copper pipes – Classification – with insulation thickness 6-32 mm, B-s3, d0

Copper pipes with combustible insulation and PROMASTOP®-W (1 layer)	PROMASTOP®-CC 2 x 50 mm	
	Wall	Floor
Ø 20 / s 2,0/14,2 - Ø 88,9 / s 2,0/14,2	EI 90-U/C	EI 90-U/C

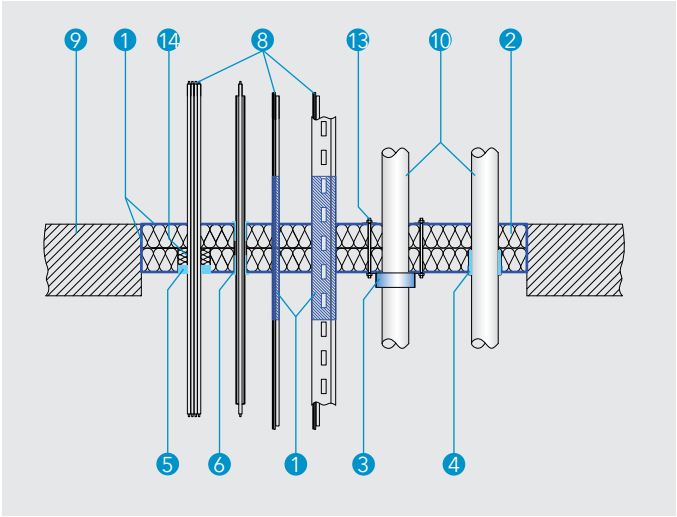
s…Pipe wall thickness in mm

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





Detail A – Mixed penetration seal in flexible wall and rigid wall



Detail B – Mixed penetration seal in rigid floor

Technical data

1. PROMASTOP®-I
2. Stone wool, in acc. Table 3
3. PROMASTOP®-FC
4. PROMASTOP®-W
5. PROMASEAL®-AG
6. PROMASEAL®-A
7. PROMASTOP®-IM CJ21
8. Cable group 1-6
9. Supporting construction, in acc. Table 2
10. Plastic pipe
11. Non-combustible pipe material
12. Aluminium plastic composite pipe
13. Threaded rods, M6 or M8
14. Stone wool backfilling material, density ≥ 40 kg/m³
15. Combustile insulation
16. Identification label

Certificate: ETA-14/0446 / CR No. 13061207-A

Advantages:

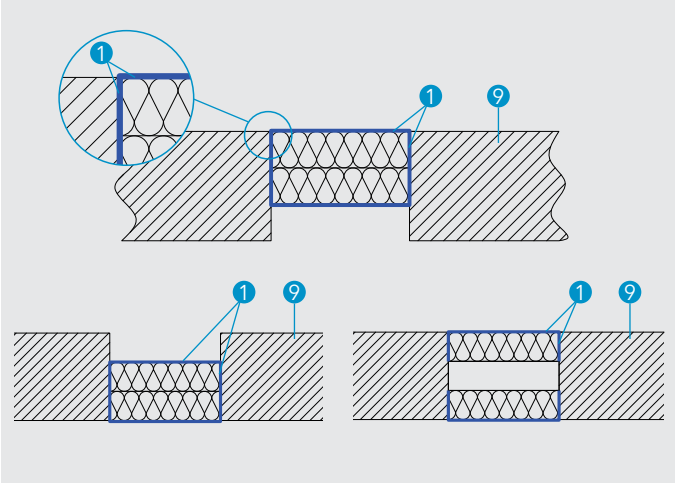
- Fast and easy to install in wall and floor constructions
- Wet film thickness 1,2 mm on stone wool boards (= Dry film thickness of 1,0 mm)
- Workable with brush, roller, spatula or airless
- PROMASTOP®-I penetration seals can be painted with different paint and coating systems for decorative purposes or against environmental influences

Detail A/B – Overview PROMASTOP®-I mixed penetration seal

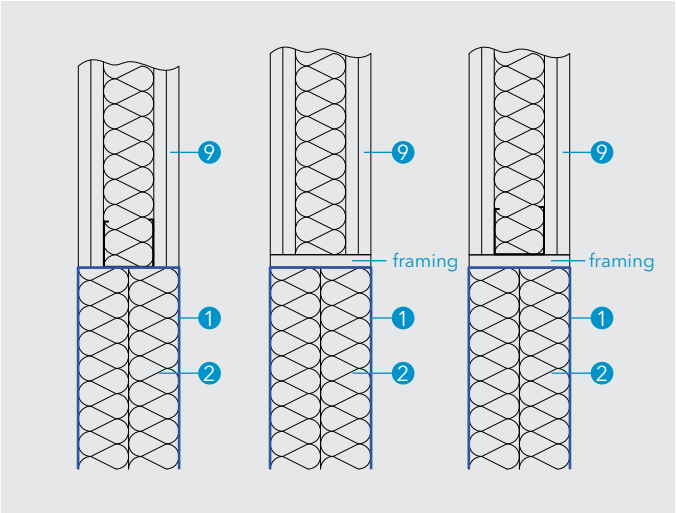
Titles	Description
PROMASTOP®-I	Fire stopping coating
1. Installation procedure	
2. Aperture framing	
3. Field of application	
4. Cable penetration seal	
5. Non-combustible pipes with non-combustible insulation	
6. PROMASTOP®-IM CJ21	Fire stopping jacket
7. PROMASEAL®-AG	Fire stopping acrylic
8. PROMASEAL®-A	Fire stopping acrylic
9. PROMASTOP®-FC	Fire stopping collar
10. PROMASTOP®-W	Fire stopping wrap
11. Aluminium plastic composite pipe	
12. Non-combustible pipes with combustible insulation	

1. Installation procedure

- Build a aperture framing in flexible walls, as shown in Detail D
- The boards must be made of non-combustible stone wool (A1 acc. to EN 13501-1), with a melting point of ≥ 1000°C and a density of ≥ 140 kg/m³ if not defined otherwise (see Table 3)
- The distance between the stone wool boards may be ≥ 0 mm



Detail C – Possible positions of the stone wool boards



Detail D – Aperture framing of the flexible wall

Table 2 – Supporting construction, maximum seal size and fire resistance class (Blank seal)

Separating element	Stone wool 2 x 50 mm	Fire resistance class
Flexible wall	≤ 1,44 m²	EI 120
Rigid wall	≤ 1,44 m²	EI 120
Rigid floor	≤ 1,44 m²	EI 90

- The PROMASTOP®-I firestop coating must be applied on the outer surfaces, all cutting edges and board joints.
- Remaining gaps are filled with stone wool and coated with fire stopping coating PROMASTOP®-I paste or filled with PROMASEAL®-A.
- It is not necessary to paint the adjacent wall and floor construction
- Secure the floor penetration seal aganist step on
- Affix the identification label

Detail C

There are 3 possibilities shown in Detail C shown, how to build in the penetration seal in floor and wall constructions.

- flush to the upper edge of the floor
- flush to the lower edge of the floor
- both stone wool boards flush to the upper and lower edge of the floor

2. Aperture framing

Detail D

The penetration seal my be build into walls and floors according table 2. For flexible walls there are the following possibilities for the aperture framing:

- The existing metal stud is used, additional metal studs shall be added to create a circulating metal frame
- Without the metal stud but with minimum 1 layer of the flexible wall lining in the aperture
- With the metal stud and minimum 1 layer of the flexible wall lining in the aperture

3. Field of application

Table 2

In table 2 are the maximum tested and certified penetration seal sizes shown, depending on the installation situation. The maximum sizes may not be exceeded.

Flexible wall constructions

The wall must a thickness of ≥ 100 mm and be made from wooden or metal studs which are lined on both sides with minimum 2 layers of minimum 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 each of the wooden stud to the sealing and the cavity between studs and sealing must be filled with a least 100 mm insulation material compliant to class A1 or A2 (in acc. EN 13501-1). An additional framing with boards of the opening is not necessary.

Table 3 – Tested and certified stone wool boards:

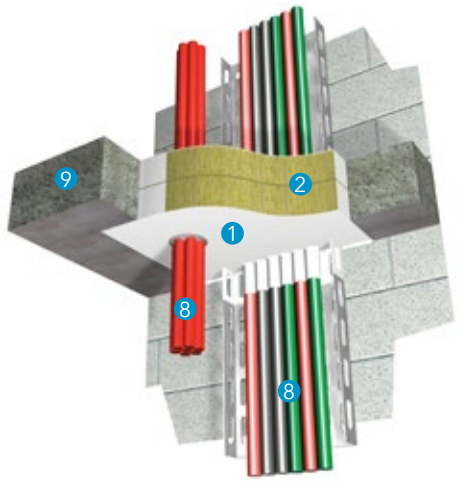
Manufacturer	Product type
Rockwool	RP-XV, Hardrock II, Rockwoll 360, Taurox D-C, Taurox Duo NP, Rockwool Paneel 755
Knauf Insulations	Knauf Insulations DP-15, Knauf Insulations FDB D150
Paroc OY AB	Pyrotech slab 140 – 180, Paroc Pro Roof Slab
Isover	Orsil T-N

Table 3
The system tested and certified stone wool boards (Density ≥ 140 kg/m³, melting point ≥ 1000°C, A1 accoring EN 13501-1) are listed in table 3.

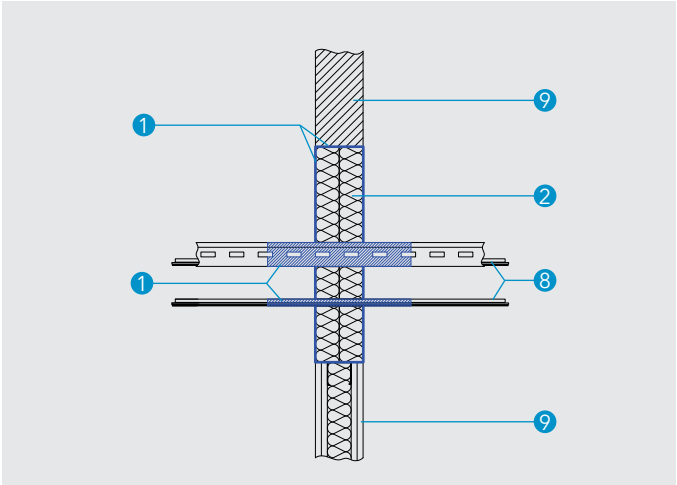
Rigid wall constructions
(Aerated concrete, concrete, reinforced concrete, masonry,...):
The rigid wall must have a thickness ≥ 100 mm and a density of ≥ 450 kg/m³. The results achieved using a standard rigid supporting construction are valid for separating construction products of concrete or masonry having a similiar or higher thickness and density as the tested ones. The classification results from flexible wall constructions may be also applied to rigid wall constructions in case the thickness and density is higher than those of the tested construction.

Rigid floor constructions
(Aerated concrete, concrete, reinforced concrete, masonry,...):
The rigid floor must have a thickness of ≥ 150 mm and a density of ≥ 450 kg/m³.

4. Cable penetration seal with PROMASTOP®-I



Detail E



Detail F – Cable penetration seal in flexible wall and rigid wall

Detail E/F
Cables, cablebundles, conduits, bundle of conduits, empty pipes, cable trays and cable ladders may pass trough the PROMASTOP®-I penetration seal in wall and floor. Up to a diameter of 100 mm of cable bundles, there is no need additional seal, the coating with PROMASTOP®-I (acc. to table 4) is enough.

Table 4
As shown in table 4, 1 mm wet film thickness shall be applied to cables of the cable group 1-5, cable trays and cable ladders. The length of the coating is 100 mm, measured from the surface of the penetration seal. Specimen of the cable group 6 need a coating thickness of 2 mm.

Table 4 – Coating thickness and coating length

Object	Wet film thickness (mm)	Coating length (mm)
Cable group 1 - 5	1	100
Cable group 6	2	
Cable trays, cable ladders,...	1	

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

Table 5
Table 5 shows the fire resistance classification of the cable groups, depending on the supporting construction.

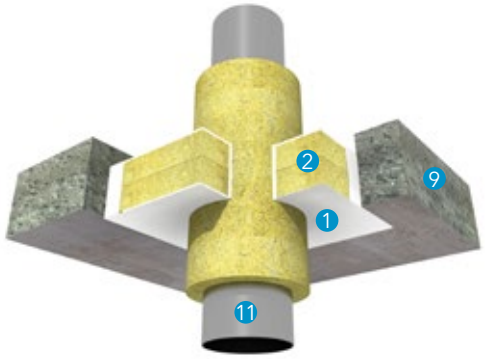
The retrospective installation in the PROMASTOP®-I penetration seal is possible, if all application guidelines are followed.

Table 5 – Fire resistance class of the cable groups depending on the penetration seal structure

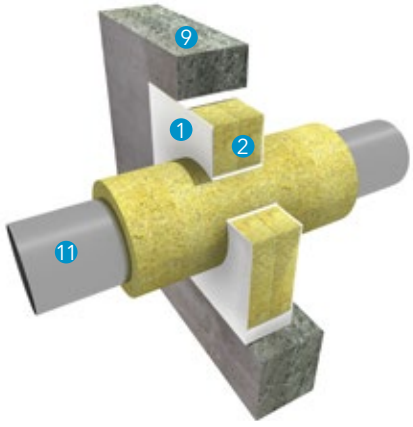
Electrical installation	Classification depending on the orientation (stone wool 2x50 mm)	
	Wall	Floor
CG 1: All sheated cable types Ø ≤ 21 mm	EI 120	EI 90
CG 2: All sheated cable types 21 < Ø ≤ 50 mm	EI 90 E 120	EI 90
CG 3: All sheated cable types 50 < Ø ≤ 80 mm	EI 90 E 120	EI 90
CG 4: Cable bundle made of cables of CG1 (telecommunication cables) Ø ≤ 100 mm	EI 120	EI 90
CG 5: Non sheated cable types Ø ≤ 24 mm	EI 90 E 120	EI 90
CG 6: Small conduits and tubes, made of plastic or steel with pipe end configuration U/C, Ø ≤ 16 mm	EI 120-U/C	EI 90-U/C

CG … Cable group according EN 1366-3:2009

5. Non-combustible pipes with non-combustible insulation with PROMASTOP-I



Detail G – Metal pipe penetration seal in rigid floor



Detail H – Metal pipe penetration seal in rigid wall

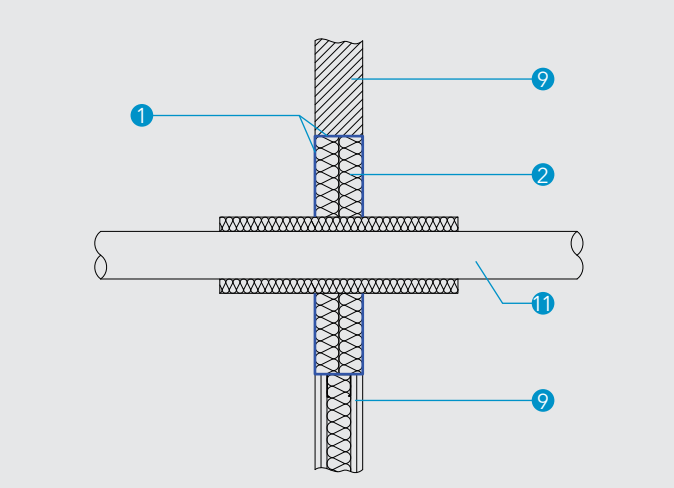
Detail G
Non-combustible pipes can be sealed with a section insulation made of stone wool (Melting point ≥ 1000°C, A2/$A2_L$ EN 13501-1 or higher rated). The required lengths and thicknesses are shown in the diagram. These are depending on the pipe diameter, the pipe wall thickness and the pipe type (steel, copper or their substitutes).

Detail H
The insulation (case LS) shall be placed in the center of the supporting construction or the penetration seal and fixed with steel wire (minimum thickness 0,6 mm). The insulation length is shown in the table 8 and 11.

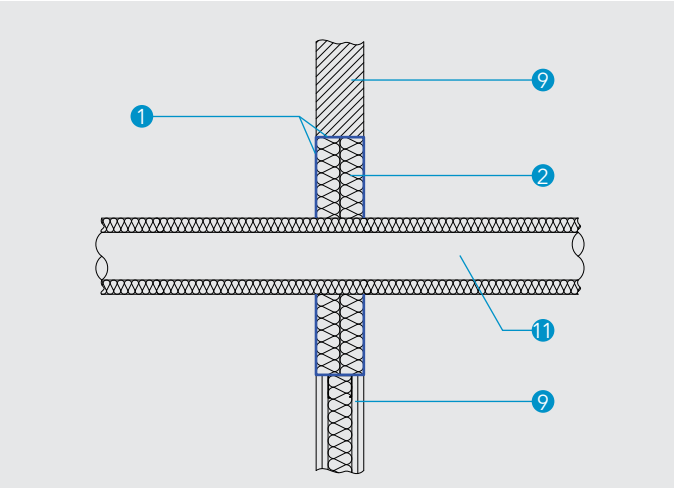
The insulation case LS covers: CI, CS, LI and LS.

Remaining gaps around the insulation are filled with stone wool and coated with fire stop coating PROMASTOP®-I paste or filled with PROMASEAL®-A.

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



Detail I - Metal pipe penetration seal in flexible wall and rigid wall, Case LS (Local Sustained)



Detail J - Metal pipe penetration seal in flexible wall and rigid wall, Case CS (Continued Sustained) (over the whole pipe length)

Steel pipes

Table 6 - Insulation information for steel pipes

Product type	Specification
Stone wool	Melting point ≥ 1000°C, Class A2-s1, d0, $A2_L$-s1, d0 (acc. to EN 13501-1)
Density	≥ 40 kg/m³
Insulation thickness	≥ 30 mm to ≤ 100 mm
Type of insulation	LS, CS, LI, CI
Lengh of insulation	see Table 8

Table 7 - Dimensions for steel pipes with non-combustible insulation

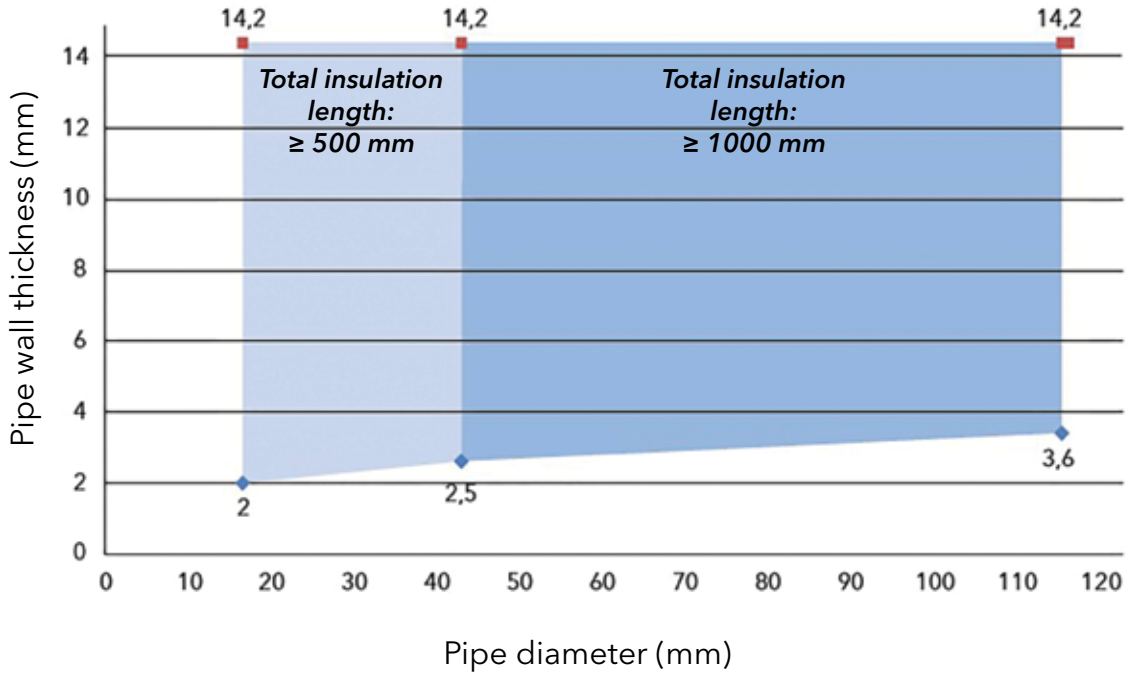
With non-combustible insulation	PROMASTOP®-I penetration seal with 2 x 50 mm stone wool boards	
	Wall	Floor
Pipe diameter (mm)	17 ≤ 114	17 ≤ 114
Pipe wall thickness (mm)	2,0 ≤ 14,2	2,0 ≤ 14,2
Classification	EI 90 – U/C	EI 120 – U/C

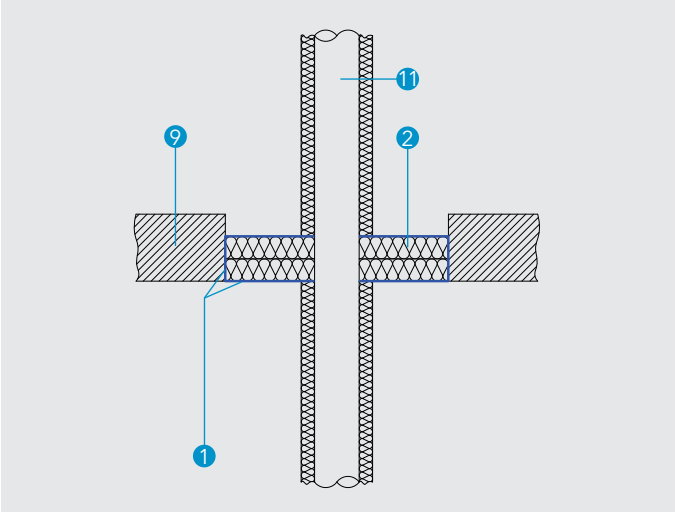
Table 8

In this table, the total length of the insulation depends of the pipe wall thickness and pipe diameter.

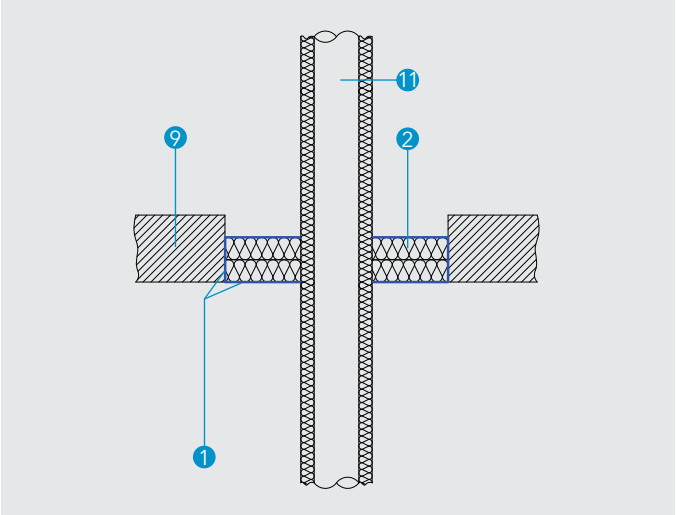
The field of application given for metal pipes with lower heat conductivity λ ≤ 58 W/mK and a melting point ≥ 1100°C (e.g. stainless steel, cast iron, Nialloys (NiCr, NiMo and NiCu alloys) and Ni.

Table 8 - Information about length of the non-combustible insulation for steel pipes





Detail K – Metal pipe penetration seal in rigid floor, Case CI (Continued Interrupted)



Detail L – Metal pipe penetration seal in rigid floor, Case CS (Continued Sustained)

Copper pipes

Table 9 – Insulation information for copper pipes

Product type	Specification
Stone wool	Melting point ≥ 1000°C, Class A2-s1, d0 , $A2_L$-s1, d0 (acc. to EN 13501-1)
Density	≥ 40 kg/m³
Insulation thickness	≥ 30 mm to ≤ 100 mm
Type of insulation	LS, CS, LI, CI
Lengh of insulation	see Table 11

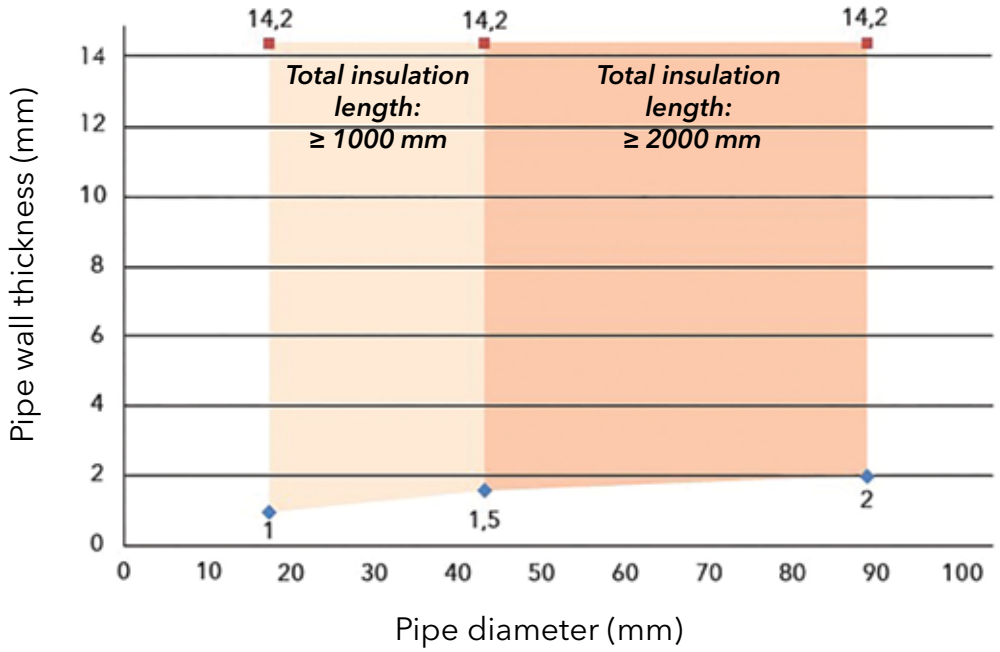
Table 10 – Classification depending on the orientation

With non-combustible insulation	PROMASTOP®-I penetration seal with 2 x 50 mm stone wool boards	
	Wall	Floor
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 120 – U/C

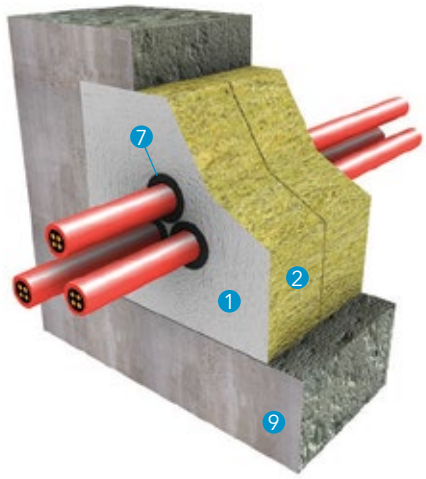
Table 11

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

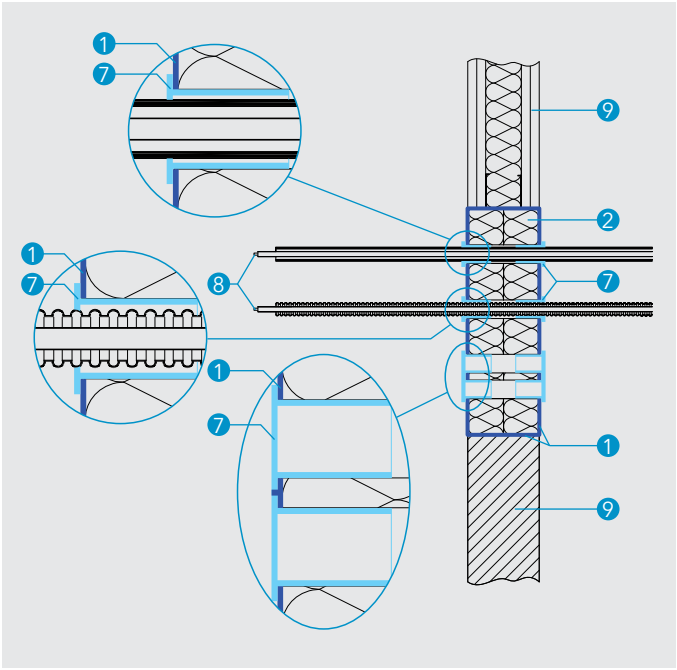
Table 11 – Information about length of the non-combustible insulation for copper pipes



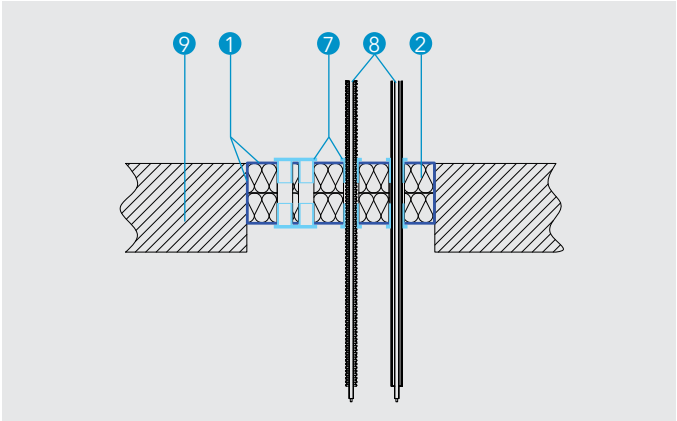
6. Cable penetration seal: PROMASTOP®-I in combination with PROMASTOP®-IM CJ21



Detail M – Cable penetration seal in rigid wall



Detail N – Cable penetration seal in flexible wall and rigid wall



Detail O – Cable penetration seal in rigid floor

Detail M/N/O

The fire stop jacket PROMASTOP®-IM CJ21 is a penetration seal for cables, wires, conduits with or without cables and pipes up to a diameter of ≤ 21 mm. Due to its smoke thightness its possible to use the cable jacket for later installations. Additional sealing of the annular gap or coating is not necessary.

For wall and floor application, the cable jacket shall be used on both sides. Fixing works trough screw the PROMASTOP®-IM CJ21 into the boards.

Table 12

Table 12 shows the fire resistance classification of the cable groups, depending on the orientation.

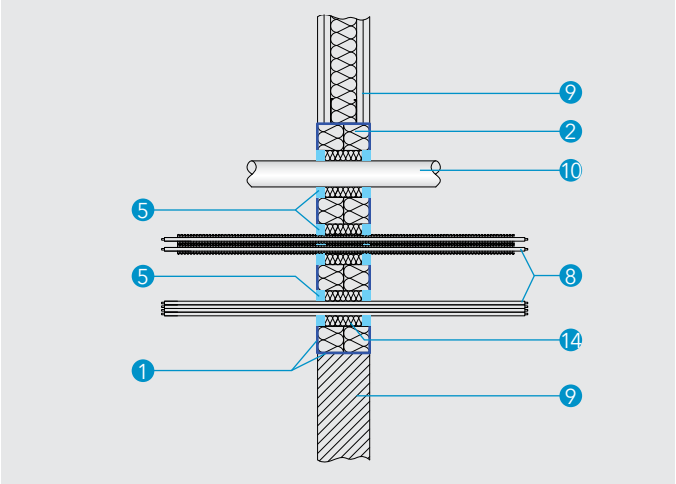
Table 12 – Fire resistance class depending on the orientation

Electrical installation	PROMASTOP®-I penetration seal with 2 x 50 mm stone wool boards	
	Wall	Floor
All cables Ø ≤ 21 mm	EI 90	EI 90
Flexible and rigid conduits; with or without cables, U/U Ø ≤ 20 mm	EI 120	EI 90
Classification blank seal	EI 120	EI 90

Table 13 – Information about the minimum distance

Elem	Distance (mm)
Cable jacket – Cable jacket PROMASTOP®-IM CJ21	0
Cable jacket – Fire stopping collar PROMASTOP®-FC	0
Cable jacket – Fire stopping wrap PROMASTOP®-W	0
Cable jacket – Combustible insulation	0
Cable jacket – Non-combustible insulation	0
Cable jacket – Cable tray	0
Cable jacket – Cable bundle	0
Cable jacket – Intumescent acrylic sealant PROMASEAL®-AG	0
Cable jacket – Aperture opening	0
Cable jacket – Self supporting ducts or their housings made of PROMATECT®-AD boards	0
Cable jacket – Bus bars or their housings ≥ 20	≥ 20
Cable jacket – All other installations	≥ 100

7. Mixed penetration seal: PROMASTOP®-I in combination with PROMASEAL®-AG



Detail P – Cable penetration seal in flexible wall and rigid wall

Detail P

The intumescent fire stop sealant PROMASEAL®-AG can be used as penetration seal for cable bundles Ø ≤ 160 mm, flexible and rigid conduits, conduit bundles and plastic pipes up to a diameter of Ø ≤ 50 mm. A defined annular gap will be created around the installation in the penetration seal.

The annular gap is backfilled with stone wool (Class A1 acc. to EN 13501-1, melting point ≥ 1000°C). In wall application, PROMASEAL®-AG shall be applied on both sides, in floor orientation only on the bottom side in the penetration seal. The annular gap depth is 15 mm and the width 20 mm.

Table 14 – Overview pipe materials, dimensions, installation situation and classification

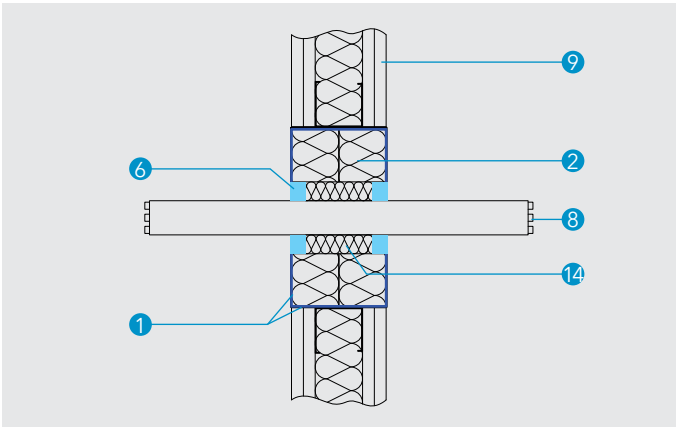
Product type	Dimension range Ø...Pipe diameter (mm) s...Pipe wall thickness (mm)	Penetration Seal (mm)	Orientation D...Floor W...Wall	Annular gap width x depth (mm)	Classification
PVC pipe	Ø ≤ 50 / s 1,8	2 x 50	W	20 x 15	EI 120-U/C
PVC pipe	Ø ≤ 50 / s 1,8	2 x 50	D	20 x 15	EI 120-U/C
PP pipe	Ø ≤ 50 / s 1,8	2 x 50	W	20 x 15	EI 120-U/C
PP pipe	Ø ≤ 50 / s 1,8	2 x 50	D	20 x 15	EI 120-U/C
PE pipe	Ø ≤ 50 / s 1,8	2 x 50	W	20 x 15	EI 120-U/C
PE pipe	Ø ≤ 50 / s 1,8	2 x 50	D	20 x 15	EI 120-U/C
Cable bundle, single cable Ø ≤ 21 mm	Ø ≤ 160	2 x 50	W	20 x 15	EI 120
Cable bundle, single cable Ø ≤ 21 mm	Ø ≤ 160	2 x 50	D	20 x 15	EI 120
Flexbible and rigid conduits (U/C) / with or without cables	egyedülálló $Ø_{max.}$ ≤ 50	2 x 50	W	20 x 15	EI 120-U/C
Bundle of flexbible and rigid conduits (U/C) / with or without cables	$Ø_{max.}$ ≤ 5 x 50	2 x 50	W	20 x 15	EI 120-U/C

Table 15 – Information about the minimum distance

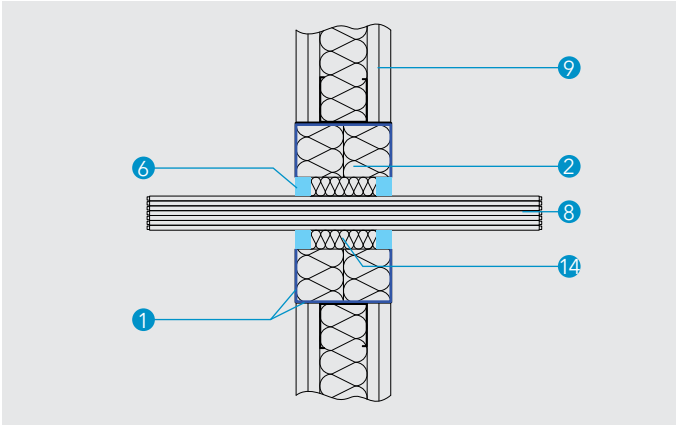
Object	Distance (mm)
Plastic pipe – plastic pipe, cable bundle, conduits	40
Cable bundle – plastic pipe, cable bundle, conduits	40
Conduits – plastic pipe, cable bundle, conduits	40
PROMASEAL®-AG – all not defined products	100

8. Cable penetration seal: PROMASTOP®-I in combination with PROMASEAL®-A

Detail Q



Detail R – Single cable penetration seal in flexible wall



Detail S – Cable bundle penetration seal in flexible wall

Detail Q

The fire stop sealant PROMASEAL®-A can be uses as penetration seal for single cables and cable bundles. A defined annular gap will be created around the installation in the penetration seal.

The annular gap is backfilled with stone wool (Class A1 acc. to EN 13501-1, melting point ≥ 1000°C). In wall and floor application, PROMASEAL®-A shall be applied on both sides.

Zero distance between cable bundles is possible.

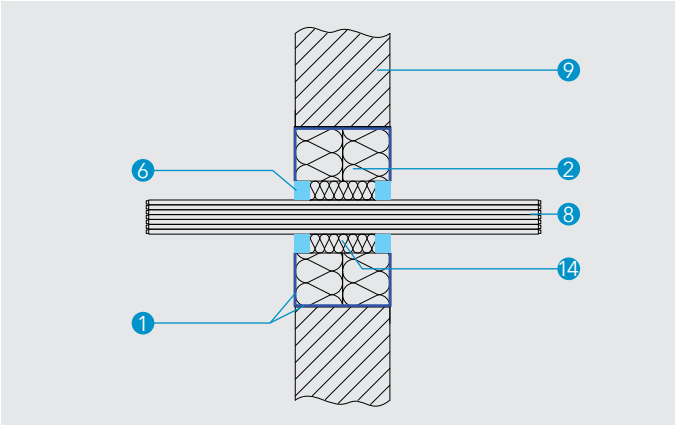
Flexible wall

Detail R/S – PROMASTOP®-I penetration seal in flexible wall

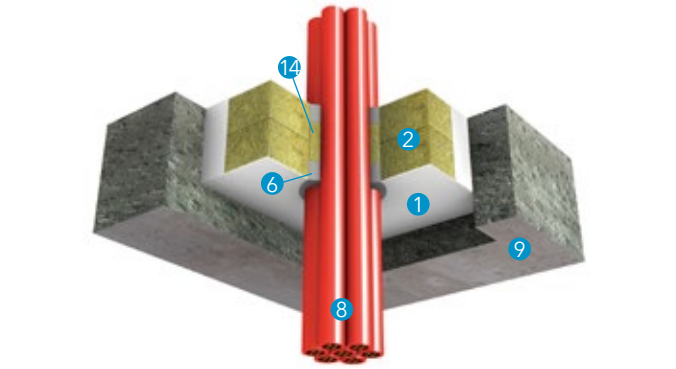
PROMASEAL®-A in PROMASTOP®-I A penetration seal in flexible wall	
Wall thickness:	≥ 100 mm
Annular gap width:	≤ 20 mm
Annular gap depth:	≥ 15 mm
Backfilling:	melting point ≥ 1000°C, Class A1 acc. to EN 13501-1 (stone wool, ceramic wool,…),
Density backfilling:	≥ 40 kg/m³

Table 16 – Fire resistance of the cable types depending on the orientation

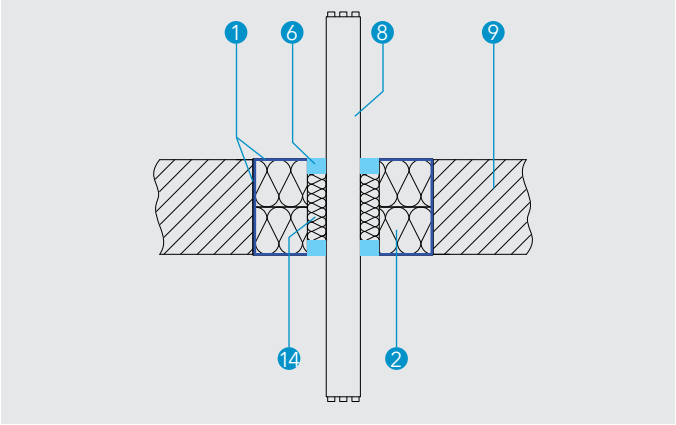
Classification in PROMASTOP®-I penetration seal (stone wool 2x50 mm)	Wall
Sheathed single cable ≤ 4 x 10 mm² (H07RN-F 4 G 10 SW or equal products)	EI 120
Sheathed single cable ≤ 3 x 150 mm² (N2XSEY or equal products)	E 120 EI 90
Cable bundle with 26 pieces of sheathed single cables ≤ 5 x 1,5 mm² (H07RN-F or equal products)	EI 120
Cable bundle with 20 pieces of sheathed single cables ≤ 2 x 0,6 mm² (telecommunication or equal products)	E 120 EI 90



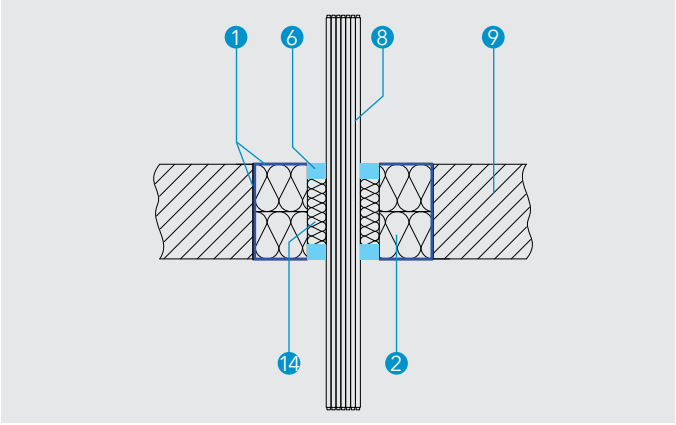
Detail T – Cable penetration seal in rigid wall



Detail U – Cable penetration seal in rigid floor



Detail V – Single cable penetration seal in rigid floor



Detail W – Cable bundle penetration seal in rigid floor

Rigid wall

Detail T – PROMASTOP®-I penetration seal in rigid wall

PROMASEAL®-A in PROMASTOP®-I penetration seal in rigid wall	
Wall thickness:	≥ 100 mm
Annular gap width:	≤ 20 mm
Annular gap depth:	≥ 15 mm
Backfilling:	Melting point ≥ 1000°C, Class A1 acc. to EN 13501-1 (stone wool, ceramic wool,…)
Density backfilling:	≥ 40 kg/m³

Table 17 – Fire resistance of the cable types depending on the orientation

Classification in PROMASTOP®-I penetration seal	Wall
Sheathed single cable ≤ 4 x 10 mm² (H07RN-F 4 G 10 SW or equal products)	EI 120
Sheathed single cable ≤ 3 x 150 mm² (N2XSEY or equal products)	E 120 EI 90
Cable bundle with 26 pieces of sheathed single cables ≤ 5 x 1,5 mm² (H07RN-F or equal products)	EI 120
Cable bundle with 20 pieces of sheathed single cables ≤ 2 x 0,6 mm² (telecommunication or equal products)	E 120 EI 90

Rigid floor

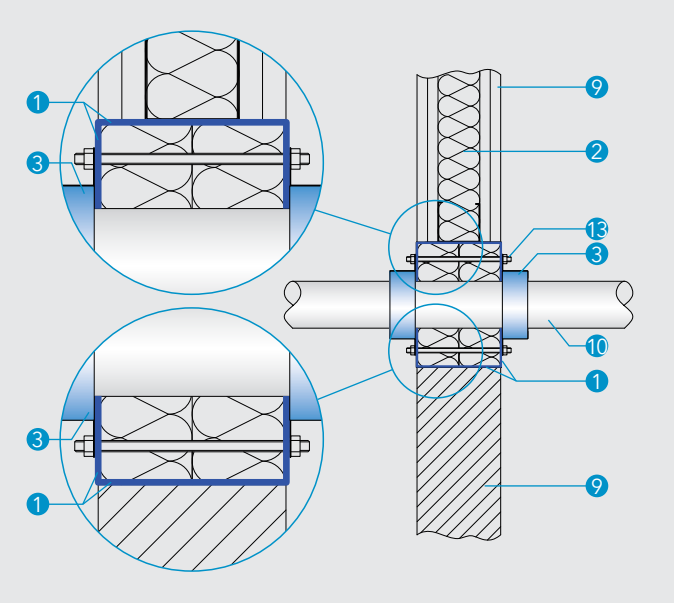
Detail U/V/W

PROMASEAL®-A in PROMASTOP®-I penetration seal in rigid floor	
Floor thickness:	≥ 150 mm
Annular gap width:	≤ 20 mm
Annular gap depth:	≥ 15 mm
Backfilling:	Melting point ≥ 1000°C, Class A1 acc. to EN 13501-1 (stone wool, ceramic wool,…)
Density backfilling:	≥ 40 kg/m³

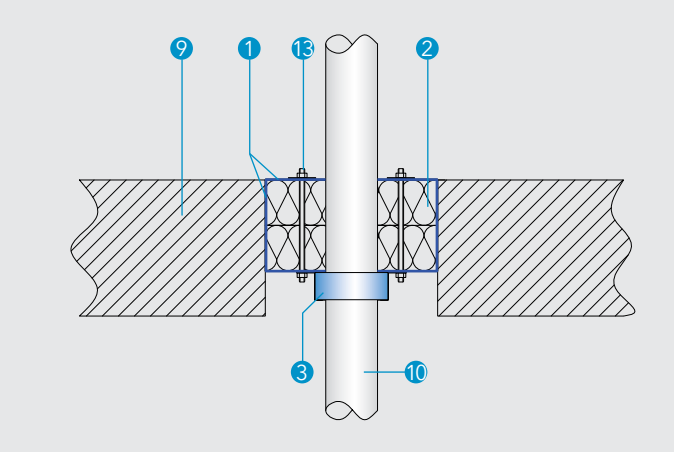
Table 18 – Fire resistance of the cable types depending on the orientation

Classification in PROMASTOP®-I penetration seal	Floor
Sheathed single cable ≤ 4 x 10 mm² (H07RN-F 4 G 10 SW or equal products)	EI 120
Sheathed single cable ≤ 3 x 150 mm² (N2XSEY or equal products)	EI 120
Cable bundle with 26 pieces of sheathed single cables ≤ 5 x 1,5 mm² (H07RN-F or equal products)	EI 120
Cable bundle with 20 pieces of sheathed single cables ≤ 2 x 0,6 mm² (telecommunication or equal products)	EI 120

9. Plastic pipe penetration seal: PROMASTOP®-I in combination with PROMASTOP®-FC



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



Detail Y – Plastic pipe penetration seal in rigid floor

Detail X/Y

- PROMASTOP®-FC fire stopping collars are tested for walls and floors in both surface-mounted and built-in conditions.
- Fire collars should be mounted on both sides of the wall and on the underside of the floor.
- Optional PE based sound decoupling strip up to a thickness of 5 mm Class E (acc. to EN 13501-1) or higher rated can be used
- A test with pipe end configuration U/U covers the pipe end configurations C/U, U/C and C/C
- A test with pipe end configuration U/C covers the pipe end configuration C/C
- The diameter of the tested sloped pipe can be reduced but not increased. The PROMASTOP®-FC6 fire stop collar with a hight of 60 mm shall be used for pipe sockets
- For fixing the collars on the penetration seal, use threaded rods M6 or M8 with washers and nuts
- The annular gap between the plastic pipe and the stone wool board shall be filled with PROMASEAL®-A, PROMASEAL®-AG or PROMASTOP®-I

Table 20

The PROMASTOP®-FC6 collar shall be used for pipe diameter > 160 mm, sloped pipes and pipe sockets. For more details please contact our technical service.

The test results and classifications for PE-HD pipes acc. to EN 12201-2, EN 1519-1, EN 12666-1, DIN 8074 and DIN 8075 with fire stop collar PROMASTOP®-FC on PROMASTOP®-I penetration seal are applicable for ABS-pipes acc. to EN 1455-1 and SAN + PVC-pipes acc. to EN 1565-1.

The test results and classifications for PP-H and PP-R pipes are applicable for pipes acc. e.g. to ÖNORM B 5174-1, DIN 8077 and DIN 8078 (or equal products).

Table 19 – Information about the minimum distance

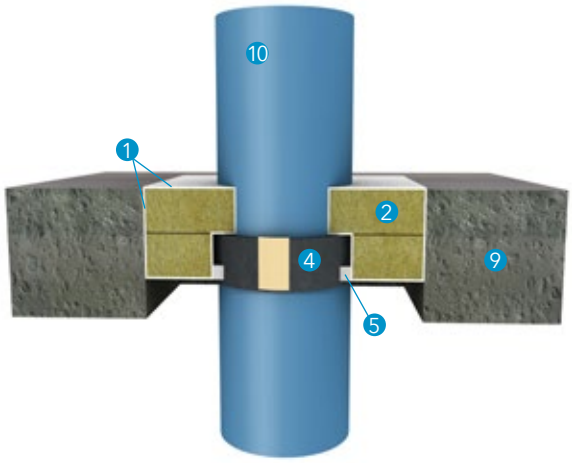
Object	Distance (mm)
Fire stopping collar – Fire stopping collar PROMASTOP®-FC	0
Fire stopping collar – Fire stopping wrap PROMASTOP®-W	0
Fire stopping collar – Fire stopping cable jacket PROMASTOP®-IM CJ21	0
Fire stopping collar – Combustible insulation	0
Fire stopping collar – Non-combustible insulation	0
Fire stopping collar – Cable trays	0
Fire stopping collar – Cable bundles ≥ 80	≥ 80
Fire stopping collar – Aperture opening ≥ 30	≥ 30
Fire stopping collar – Self supporting ducts or their housings made of PROMATECT®-AD boards	0
Fire stopping collar – Bus bars or their housings ≥ 20	≥ 20
Fire stopping collar – All other installations	≥ 100

Table 20 – Overview pipe materials, dimensions, installation situation and classification

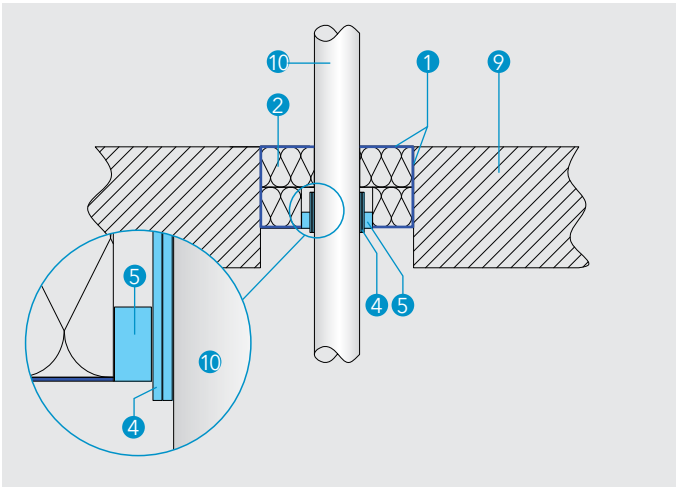
Product type	Dimension range Ø...Pipe diameter (mm) s...Pipe wall thickness (mm)	Penetration Seal (mm)	Orientation D...Floor W...Wall	Collar type (mm)	Classification
Friatec Friaphon	Ø 52 / s 2,8 - Ø 110 / s 5,3	2 x 50	D	FC3	EI 90-U/U
Friatec dBlue	Ø 50 / s 1,8 - Ø 125 / s 3,9	2 x 50	D	FC3	EI 90-U/U
Geberit Silent dB20	Ø 56 / s 3,2 - Ø 160 / s 7,0	2 x 50	D	FC3	EI 90-U/U
Geberit Silent PP	Ø 32 / s 2,0 - Ø 125 / s 4,2	2 x 50	D	FC3	EI 90-U/U
Geberit Silent dB20	Ø 56 / s 3,2 - Ø 135 / s 6,0	2 x 50	W	FC3	EI 90-U/U
Pipelife Master3	Ø 75 / s 2,1 - Ø 125 / s 3,5	2 x 50	D	FC3	EI 90-U/U
Pipelife Master3	Ø 75 / s 2,1 - Ø 125 / s 3,5	2 x 50	W	FC3	EI 120-U/U
PoloKal NG	Ø 32 / s 1,8 - Ø 250 / s 8,6	2 x 50	D	FC3/6	EI 90-U/U
PoloKal 3S	Ø 75 / s 3,8 - Ø 160 / s 7,5	2 x 50	D	FC3	EI 90-U/U
PoloKal XS	Ø 32 / s 1,8 - Ø 250 / s 8,6	2 x 50	D	FC3/6	EI 90-U/U
PoloKal NG	Ø 32 / s 1,8 - Ø 160 / s 4,9	2 x 50	W	FC3	EI 120-U/U
PoloKal NG	Ø 32 / s 1,8 - Ø 250 / s 8,6	2 x 50	W	FC3/6	EI 90-U/U
PoloKal XS	Ø 32 / s 1,8 - Ø 250 / s 8,6	2 x 50	W	FC3/6	EI 90-U/U
PoloKal XS	Ø 32 / s 1,8 - Ø 160 / s 4,9	2 x 50	W	FC3	EI 120-U/U
PoloKal 3S	Ø 75 / s 3,8 - Ø 160 / s 7,5	2 x 50	W	FC3	EI 120-U/U
PVC-U	Ø 32 / s 1,8 - Ø 250 / s 4,9	2 x 50	D	FC3/6	EI 90-U/U
PVC-U	Ø 125 / s 3,2 - Ø 160 / s 3,6	2 x 50	D	FC3/6 (built in)	EI 120-U/C
PE-HD	Ø 32 / s 1,8 - Ø 200 / s 11,4	2 x 50	D	FC3/6	EI 90-U/U
PE HD	Ø 40 / s 1,8 - Ø 200 / s 11,4	2 x 50	W	FC3/6	EI 90-U/U
PP-H / PP-R	Ø 30 / s 1,8 - Ø 200 / s 11,4	2 x 50	D	FC3/6	EI 90-U/U
PP-H / PP-R	Ø 75 / s 2,6 - Ø 90 / s 3,0	2 x 50	D	FC3/6 (built in)	EI 90-U/U
PP-H / PP-R	Ø 40 / s 1,8 - Ø 250 / s 14,2	2 x 50	W	FC3/6	EI 90-U/U
Raupiano Plus	Ø 40 / s 1,8 - Ø 200 / s 6,2	2 x 50	D	FC6	EI 90-U/U
Raupiano Plus (+ Socket)	Ø 40 / s 1,8 - Ø 125 / s 3,1	2 x 50	D	FC6	EI 90-U/U
Raupiano Plus (+ Socket)	Ø 40 / s 1,8 - Ø 125 / s 3,1	2 x 50	W	FC6	EI 120-U/U

For the exact details of the field of application please take the ETA.

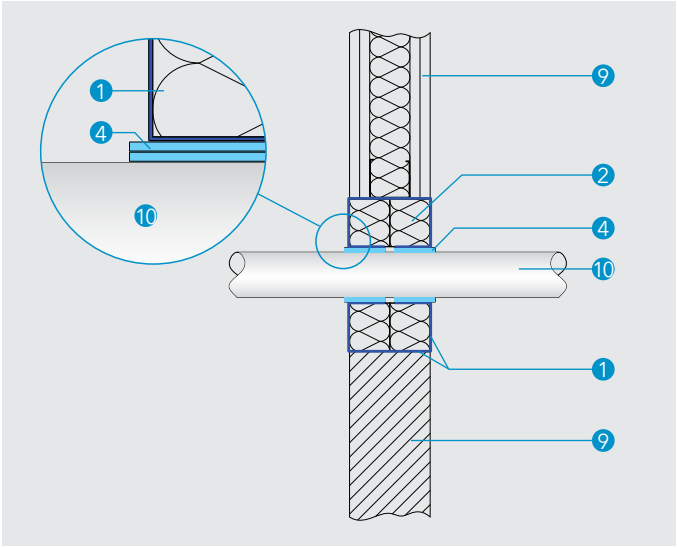
10. Plastic pipe penetration seal: PROMASTOP®-I in combination with PROMASTOP®-W



Detail AA



Detail BB – Plastic pipe penetration seal in rigid floor



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

Detail AA/BB/CC

The application of PROMASTOP®-W is two-sided in the wall and one -sided below of the floor in the penetration seal. PROMASTOP®-W shall be installed flush with the penetration seal, maximum ≤ 5 mm in front of the penetration seal and may not be overpainted. For fastening PROMASTOP®-W in the stone wool penetration seal use PROMASTOP®-I, PROMASEAL®-A or PROMASEAL®-AG 5 1 6.

A test with pipe end configuration U/U covers the pipe end configurations C/U, U/C and C/C. A test with pipe end configuration U/C covers the pipe end configuration C/C.

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

Table 21 – Information about the minimum distance

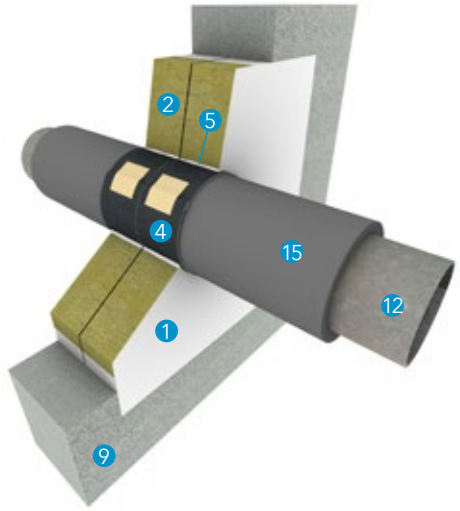
Object	Distance (mm)
Fire stopping wrap – Fire stopping collar PROMASTOP®-FC	0
Fire stopping wrap – Fire stopping wrap PROMASTOP®-W	0
Fire stopping wrap – Fire stopping cable jacket PROMASTOP®-IM CJ21	0
Fire stopping wrap – Combustible insulation	0
Fire stopping wrap – Non-combustible insulation	0
Fire stopping wrap – Cable tray	0
Fire stopping wrap – Cable bundle ≥ 100	≥ 100
Fire stopping wrap – Aperture opening ≥ 37	≥ 37
Fire stopping wrap – Self supporting ducts or their housings made of PROMATECT®-AD boards ≥ 20	≥ 20
Fire stopping wrap – All other installations ≥ 100	≥ 100

Table 22 – Overview pipe materials, dimensions, installation situation and classification

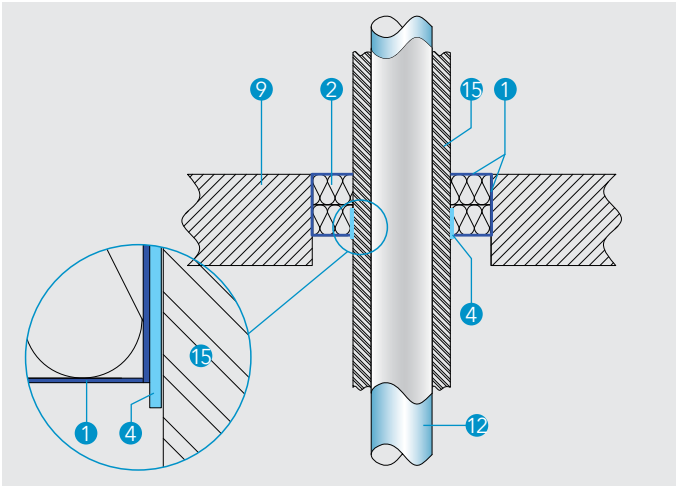
Product type	Dimension range Ø...Pipe diameter (mm) s...Pipe wall thickness (mm)	Penetration Seal (mm)	Orientation D...Floor W...Wall	No. of layers Ø (mm) → Layers	Classification
PVC	Ø 32 / s 1,8 - Ø 160 / s 11,8	2 x 50	W	32 – 63 → 1 75 – 110 → 2 125 → 3 140 – 160 → 4	EI 120-U/C
PE	Ø 32 / s 2,0 - Ø 160 / s 14,6	2 x 50	W	32 – 63 → 1 75 – 110 → 2 125 → 3 140 – 160 → 4	EI 120-U/C
PP-H / PP-R	Ø 32 / s 1,8 - Ø 160 / s 14,6	2 x 50	W	32 – 63 → 1 75 – 110 → 2 125 → 3 140 – 160 → 4	EI 120-U/C
PoloKal NG	Ø 32 / s 1,8 - Ø 160 / s 4,9	2 x 50	W	32 → 2 40 – 63 → 3 75 – 90 → 4 110 – 125 → 5 140 – 160 → 6	EI 90-U/U
PoloKal 3S	Ø 75 / s 3,8 - Ø 160 / s 7,5	2 x 50	W	75 – 90 → 4 110 – 125 → 5 140 – 160 → 6	EI 90-U/U
PoloKal XS	Ø 32 / s 1,8 - Ø 160 / s 4,9	2 x 50	W	32 → 2 40 – 63 → 3 75 – 90 → 4 110 – 125 → 5 140 – 160 → 6	EI 90-U/U
Geberit Silent dB20	Ø 63 / s 1,8 - Ø 160 / s 6,4	2 x 50	W	63 → 3 75 – 90 → 4 110 – 125 → 5 140 – 160 → 6	EI 90-U/U
PVC	Ø 32 / s 1,8 - Ø 160 / s 11,8	2 x 50	D	32 – 63 → 1 75 – 110 → 2 125 → 3 140 – 160 → 4	EI 120-U/C
PE	Ø 32 / s 2,0 - Ø 160 / s 14,6	2 x 50	D	32 – 63 → 1 75 – 110 → 2 125 → 3 140 – 160 → 4	EI 120-U/C
PP-H / PP-R	Ø 32 / s 1,8 - Ø 160 / s 14,6	2 x 50	D	32 – 63 → 1 75 – 110 → 2 125 → 3 140 – 160 → 4	EI 120-U/C
PoloKal NG	Ø 32 / s 1,8 - Ø 125 / s 3,9	2 x 50	D	32 → 2 40 – 63 → 3 75 – 90 → 4 110 – 125 → 5	EI 90-U/U
PoloKal XS	Ø 32 / s 1,8 - Ø 125 / s 3,9	2 x 50	D	32 → 2 40 – 63 → 3 75 – 90 → 4 110 – 125 → 5	EI 90-U/U
Geberit Silent db20	Ø 50 / s 2,0 - Ø 125 / s 6,4	2 x 50	D	50 – 63 → 3 75 – 90 → 4 110 – 125 → 5	EI 90-U/U
PP-H / PP-R	Ø 32 / s 1,8 - Ø 40 / s 6,7 + combustible Insulation (B-s3, d0; thickness 9 mm; Case CS)	2 x 50	D	32 – 40 → 2	EI 120-U/C

For the exact details of the field of application please take the ETA.

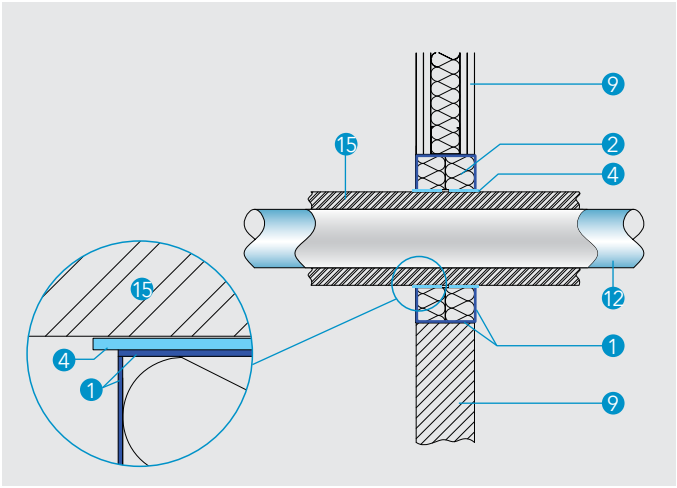
11. Aluminium plastic composite pipes in PROMASTOP®-I penetration seal with PROMASTOP®-W



Detail DD



Detail EE – Aluminium plastic composite pipe penetration seal in rigid floor



Detail FF – Aluminium plastic composite pipe penetration seal in flexible wall and rigid wall

Detail DD/EE/FF

The application of PROMASTOP®-W is two-sided in the wall and one -sided below of the floor in the penetration seal. PROMASTOP®-W shall be installed flush with the penetration seal, maximum ≤ 5 mm in front of the penetration seal and may not be overpainted. For fastening PROMASTOP®-W in the stone wool penetration seal use PROMASTOP®-I, PROMASEAL®-A or PROMASEAL®-AG 5 1 6.

Aluminium plastic composite pipes with the chemical description PE-Xb/Al/PE-HD, (Type Pipelife Radopress) with combustible insulation (thickness ≥ 6 to ≤ 32 mm, class B-s3,d0 acc. to EN 13501 -1 or higher rated e.g. rubber / thickness ≥ 4 to ≤ 9 mm, class E acc. to EN 13501 e.g. PE) can be sealed with PROMASTOP®-W.

The combustible insulation is centered in the penetration seal and must have 500 mm minimum total length of the insulation. The configuration of the insulation class B-s3, d0 is LS or CS, for insulation class E, the case CS.

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

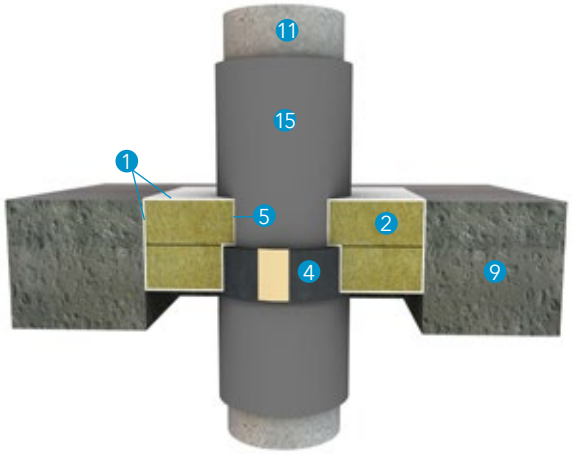
Table 23 – Classification - with insulation 6-32 mm, class B-s3, d0 – Insulation length ≥ 500 mm

Aluminium plastic composite pipe with combustible insulation and PROMASTOP®-W (1 layer)	PROMASTOP®-I 2 x 50 mm	
	Wall	Floor
Pipelife Radopress Ø 16 - 50 mm	EI 120-U/C	EI 120-U/C
Ø 63 mm		E 120-U/C and EI 60-U/C

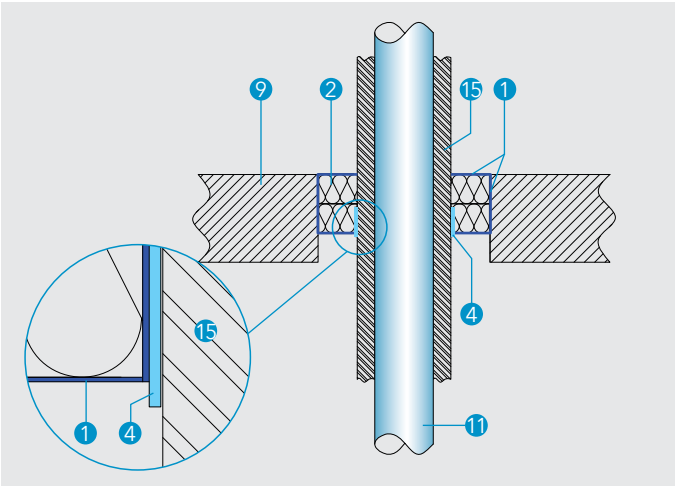
Table 24 – Classification – with insulation 4-9 mm, class E

Aluminium plastic composite pipe with combustible insulation and PROMASTOP®-W (1 layer)	PROMASTOP®-I 2 x 50 mm	
	Wall	Floor
Pipelife Radopress Ø 16 - 32 mm	EI 120-U/C	EI 120-U/C

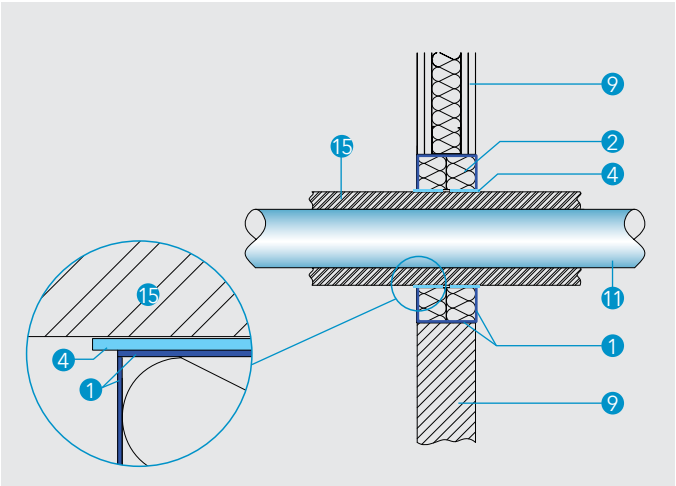
12. Non-combustible pipes with combustible in PROMASTOP®-I penetration seal with PROMASTOP®-W



Detail GG



Detail HH – Non-combustible pipes with combustible insulation



Detail II – Non-combustible pipes with combustible insulation

Detail GG/HH/II

Steel and copper pipes (and their substitutes) with combustible insulation (thickness ≥ 6 to ≤ 32 mm, Class B-s3, d0 acc. to EN 13501 or higher rated e.g. rubber) can be sealed with PROMASTOP®-W. The insulation case is CS.

The application of PROMASTOP®-W is two-sided in the wall and one -sided below of the floor in the penetration seal. PROMASTOP®-W shall be installed flush with the penetration seal, maximum ≤ 5 mm in front of the penetration seal. For fastening PROMASTOP®-W in the stone wool penetration seal use PROMASTOP®-I, PROMASEAL®-A or PROMASEAL®-AG 5 1 6.

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

Steel pipes

Table 25 – Steel pipes – Classification – with insulation thickness 6-32 mm, B-s3, d0

Steel pipes with combustible insulation and PROMASTOP®-W (1 layer)	PROMASTOP®-I 2 x 50 mm	
	Wall	Floor
Ø 50 / s 2,0/14,2 - Ø 220 / s10,0/14,2	EI 90-U/C	EI 90-U/C

s…Pipe wall thickness in mm

The field of application given for metal pipes with lower heat conductivity λ ≤ 58 W/mK and a melting point ≥ 1100°C (e.g. stainless steel, cast iron, Nialloys (NiCr, NiMo and NiCu alloys) and Ni.

Copper pipes

Table 26 – Copper pipes – Classification – with insulation thickness 6-32 mm, B-s3, d0

Copper pipes with combustible insulation and PROMASTOP®-W (1 layer)	PROMASTOP®-I 2 x 50 mm	
	Wall	Floor
Ø 20 / s 2,0/14,2 - Ø 88,9 / s 2,0/14,2	EI 90-U/C	EI 90-U/C

s…Pipe wall thickness in mm

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

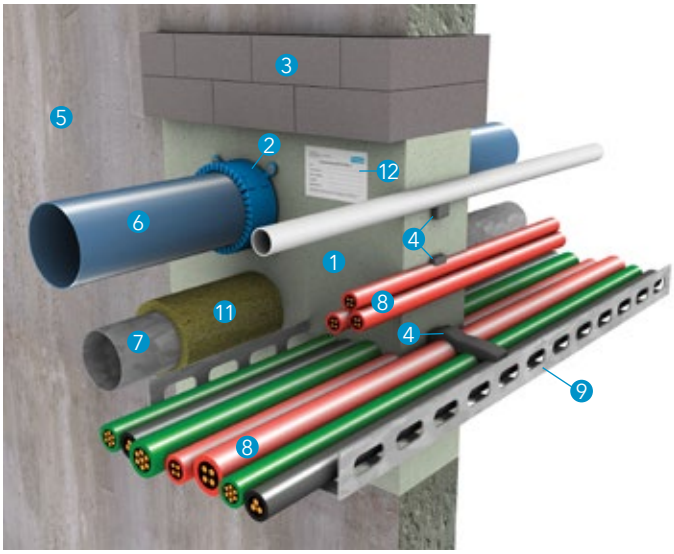
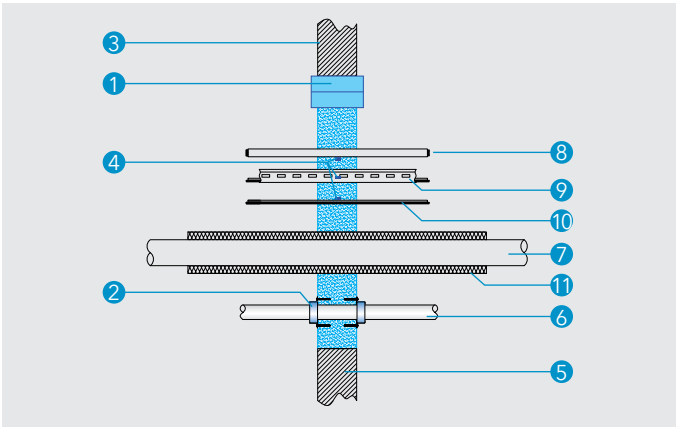
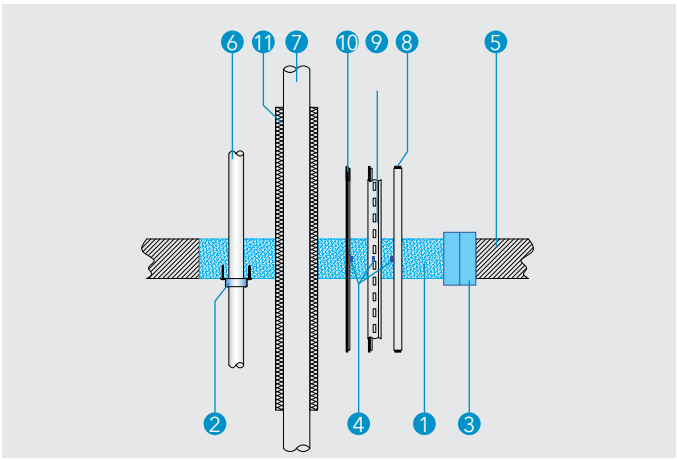


Table 1 – Dimensions PROMASTOP®-VEN fire stop mortar penetration seal

Separating element	PROMASTOP®-VEN mortar seal sizes	PROMASTOP®-B seal sizes in PROMASTOP®-VEN
Rigid wall ≥ 150 mm	≤ 1,44 m²	≤ 0,03 m²
Rigid floor ≥ 150 mm	≤ 1,44 m²	≤ 0,03 m²
Classification blank seal	EI 120	EI 120



Detail A – Mixed mortar penetration seal in rigid wall



Detail B – Mixed mortar penetration seal in rigid floor

Technical data

1. PROMASTOP®-VEN
2. PROMASTOP®-FC
3. PROMASTOP®-B
4. PROMASEAL®-AG
5. Rigid wall / floor
6. Plastic pipe
7. Non-combustible pipe material
8. Cable bundle
9. Cable tray
10. Cable
11. Non-combustible insulation
12. Identification label

Certificate: ETA-14/0445 / CR No. 314100817-A

Advantages:

- Penetration seal for cables, cable trays, cable bundles, conduits, plastic pipes, steel and copper pipes with PROMASTOP®-FC, PROMASEAL®-AG, PROMASTOP®-VEN or PROMASTOP®-B
- External use possible
- Machine compatible
- Easy retrospective installation due to usage of PROMASTOP®-B

Table 1

The defined dimensions for the mortar seals as single and mixed penetration seal shall be followed. The rigid floor and rigid wall must have a thickness of ≥ 150 mm and a density of ≥ 450 kg/m³.

The supporting construction must be classified acc. to EN 13501-2 for the required fire resistance period.

For building PROMASTOP®-VEN fire stop mortar penetration seals in rigid floors include reinforcement with a standard steel mesh (maximum mesh-wide; 100 x 100 mm, or equal products) and plug-iron which should be covered at least by minimum 30 mm PROMASTOP®-VEN.

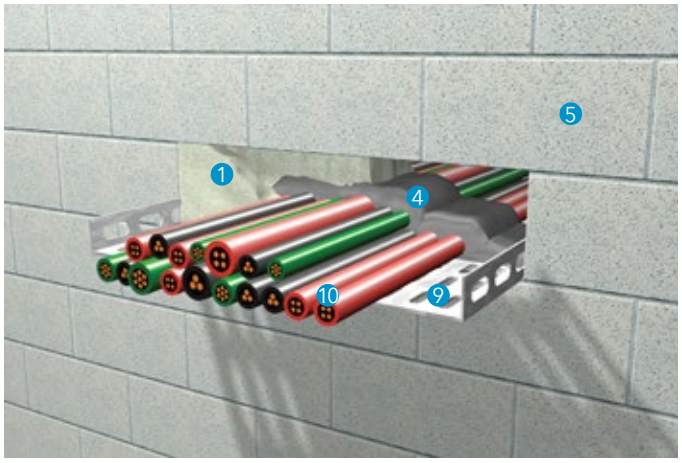
Detail A/B

Fire stopping mortar seal in rigid wall and rigid floor.

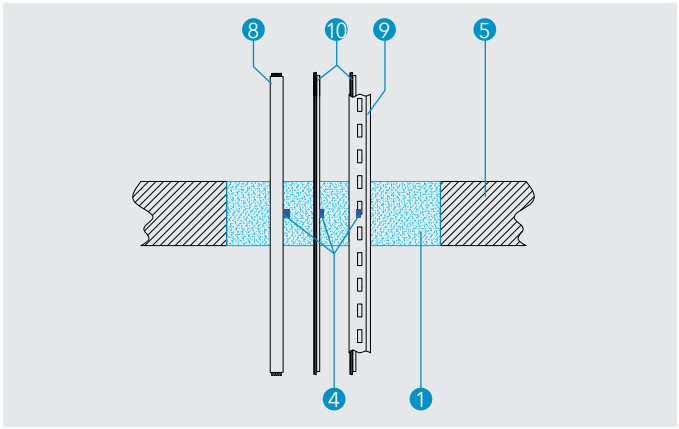
Installation manual:

- For penetration seals in floor include the steel mesh reinforcement (the steel mesh must be covered with minimum 30 mm PROMASTOP®-VEN)
- For cable and cable bundle use additional PROMASEAL®-AG with a thickness 5 mm and 20 mm length around the cables
- Apply lost formwork
- Fill the remaining opening with PROMASTOP®-VEN
- Smooth the surface
- Affix the identification label

Cable penetration seal: PROMASTOP®-VEN in combination with PROMASEAL®-AG



Detail C – Cable, cable bundle and -trays may penetrate the PROMASTOP®-VEN penetration seal in rigid wall



Detail D – Cable, cable bundle and -trays may penetrate the PROMASTOP®-VEN penetration seal in rigid floor

Detail C/D

Single cables or cable bundles shall be sheathed with PROMASEAL®-AG (thickness approx. 5 mm, width approx. 20 mm) in the middle of the penetration seal. Cable trays and cable ladders may pass through the mortar penetration seal.

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

Table 2

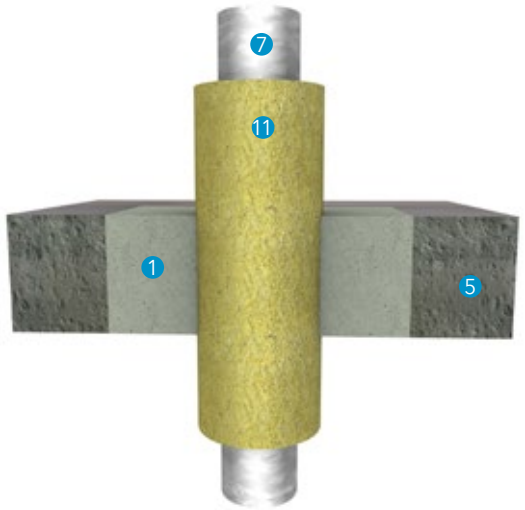
The fire resistance class depends on the orientation as shownin table 2.

Table 2 – Classification depending on the orientation

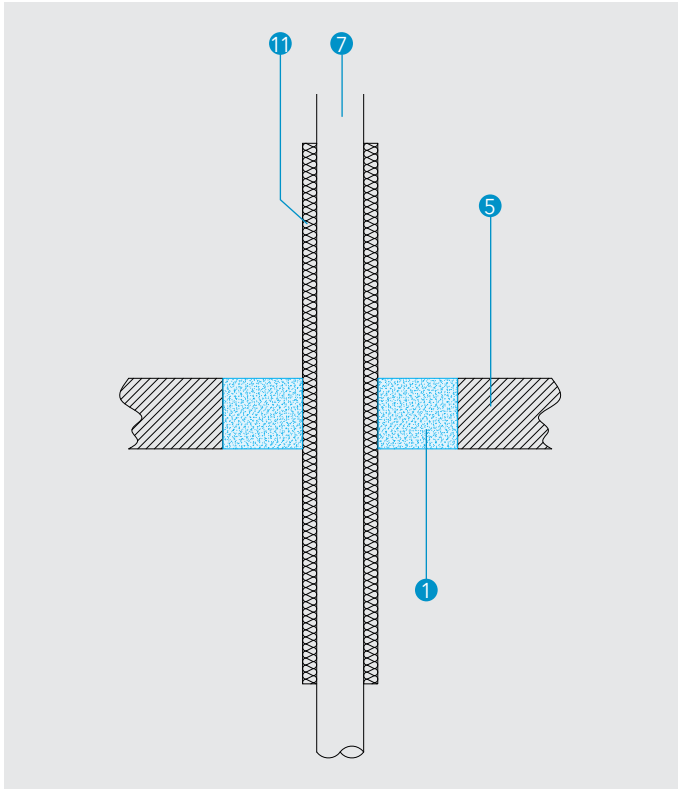
Electrical installation	Classification depending on the orientation	
	Wall	Floor
All sheathed cable types Ø ≤ 21 mm (CG 1)	EI 120	EI 120
All sheathed cable types 21 < Ø ≤ 50 mm (CG 2)	EI 120	E 120 EI 90
All sheathed cable types 50 < Ø ≤ 80 mm (CG 3)	EI 90	E 120 EI 90
Cable bundle made of cables of CG 1 Ø ≤ 100 mm (CG 4)	EI 120	E 120 EI 90
Non sheathed cable types Ø ≤ 24 mm (CG 5)	EI 120	E 120 EI 90
Small conduits and tubes, made of plastic or steel with pipe end configuration U/C Ø ≤ 16 mm (CG 6)	EI 120	EI 120

CG… Cable group according EN 1366-3:2009

Penetration seal of non-combustible pipes with non-combustible insulation



Detail E



Detail F – Metal pipe penetration seal with non-combustible insulation (Case LS, centered in the middle) in the PROMASTOP®-VEN penetration seal in rigid floor

Detail E/F/G

Section insulation made of stone wool (Melting point ≥ 1000°C, A2/A2$_L$ EN 13501-1 or higher rated) may be used. The required lengths and thicknesses are shown in the diagramm.

Configuration of the insulation is LS, LI, CS or CI acc. to EN 1366-3. The insulation (case LS) shall be placed in the center of the supporting construction or the mortar penetration seal and fixed with steel wire (minimum thickness 0,6 mm).

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

Steel pipes

Table 3 – Insulation information for steel pipes

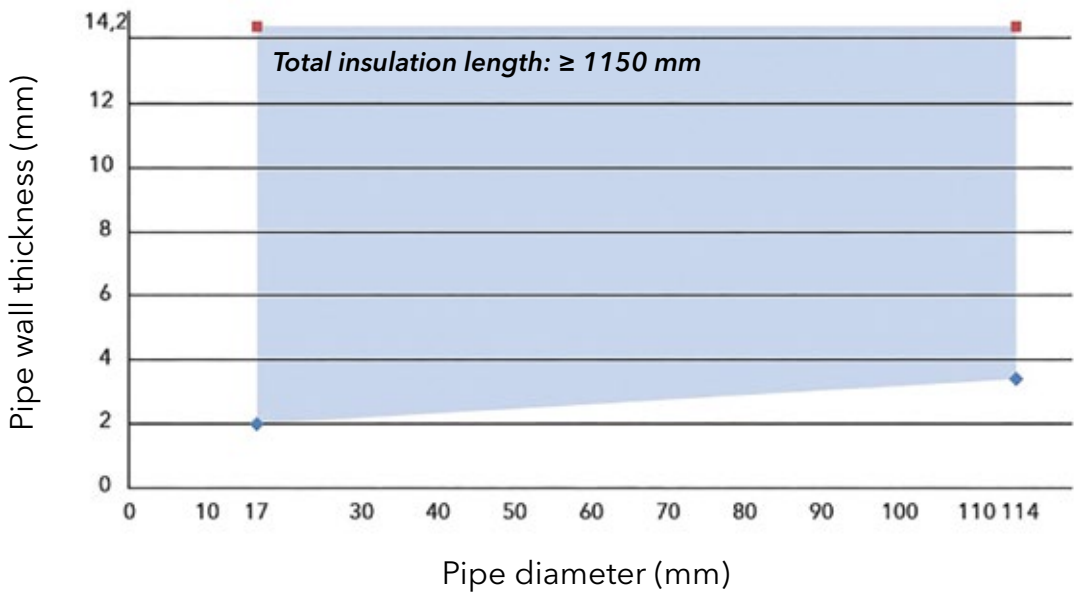
Product type	Specification
Stone wool	Melting point ≥ 1000°C, A2$_L$-s1, d0 (acc. to EN 13501-1)
Density	≥ 40 kg/m^3
Insulation thickness	≥ 30 mm to ≤ 100 mm
Type of insulation	LS, CS, LI, CI
Length of insulation	≥ 1150 mm

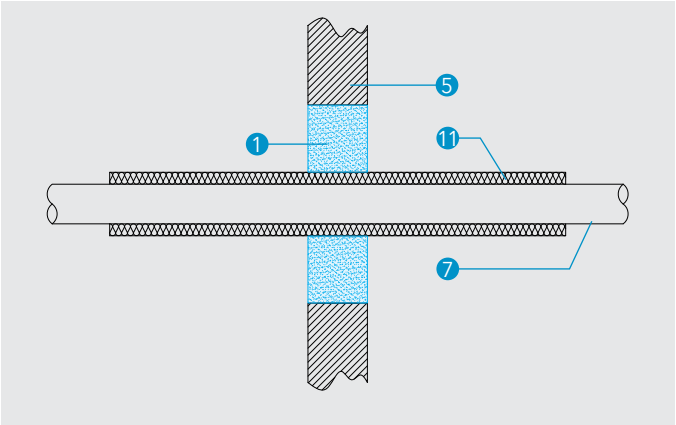
Table 4 – Dimensions for steel pipes with non-combustible insulation

With non-combustible insulation	Classification depending on the orientation in PROMASTOP®-VEN mortar penetration seal EI 120-U/C	
	Wall	Floor
Pipe diameter (mm)	17 ≤ 114	17 ≤ 114
Pipe wall thickness (mm)	2,0 ≤ 14,2	2,0 ≤ 14,2

The field of application given for metal pipes with lower heat conductivity λ ≤ 58 W/mK and a melting point ≥ 1100°C (e.g. stainless steel, cast iron, Nialloys (NiCr, NiMo and NiCu alloys) and Ni.

Table 5 – Information about length of the non-combustible insulation for steel pipes





Detail G – Metal pipe penetration seal with non-combustible insulation (Case LS, centered in the middle) in the PROMASTOP®-VEN penetration seal in rigid wall

Copper pipes

Table 6 – Insulation information for copper pipes

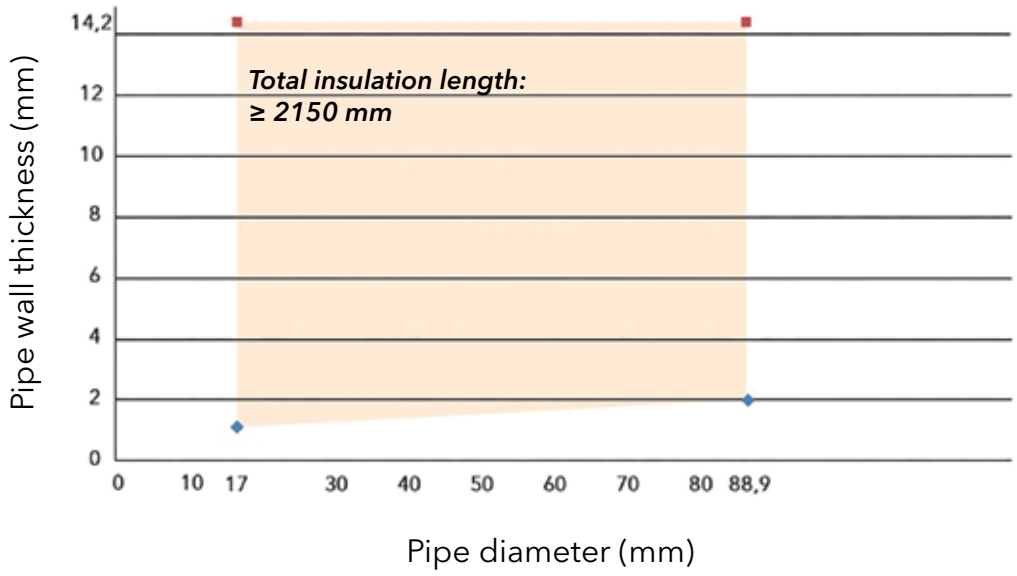
Product type	Specification
Stone wool	Melting point ≥ 1000°C, $A2_L$-s1, d0 (acc. to EN 13501-1)
Density	≥ 40 kg/m³
Insulation thickness	≥ 30 mm to ≤ 100 mm
Type of insulation	LS, CS, LI, CI
Length of insulation	≥ 2150 mm

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

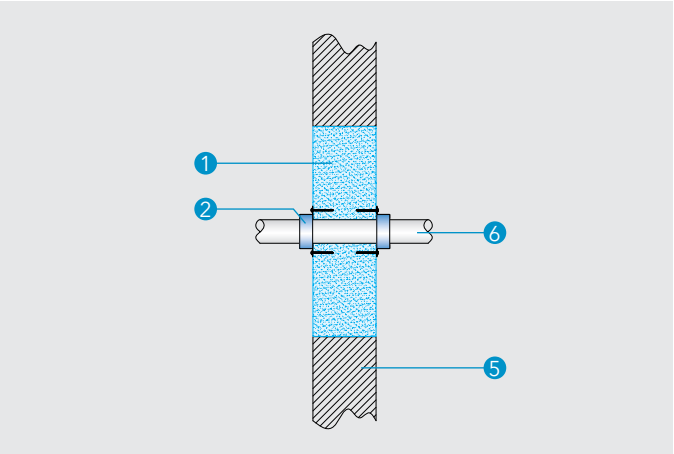
With non-combustible insulation	Classification depending on the orientation in PROMASTOP®-VEN mortar penetration seal EI 120-U/C	
	Wall	Floor
Pipe diameter (mm)	17 ≤ 88,9	17 ≤ 88,9
Pipe wall thickness (mm)	1,0 ≤ 14,2	1,0 ≤ 14,2

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

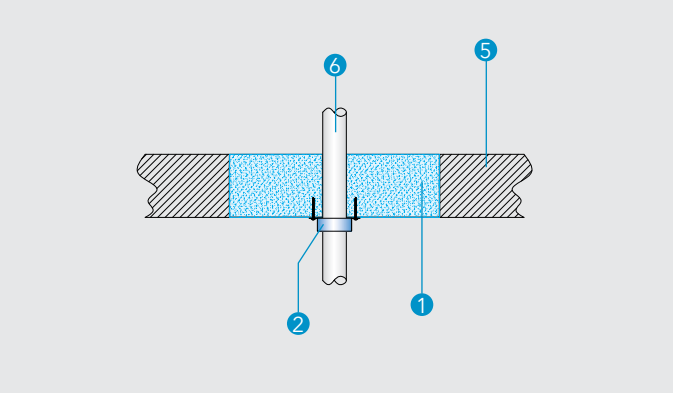
Table 8 – Information about length of the non-combustible insulation for copper pipes



Plastic pipe penetration seal in PROMASTOP®-VEN mortar penetration seal with PROMASTOP®-FC



Detail H – Plastic pipe penetration seal in PROMASTOP®-VEN penetration seal in rigid wall with PROMASTOP®-FC



Detail I – Plastic pipe penetration seal in PROMASTOP®- VEN penetration seal in rigid floor with PROMASTOP®-FC

Detail H/I

The collar shall be placed on both sides of the wall, and below the floor.

Every PE based sound decoupling strip up to a thickness of 5 mm Class E (acc. to EN 13501-1) or higher rated can be used. A test with pipe end configuration U/U covers the pipe end configurations C/U, U/C and C/C.

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

Table 7

The test results and classifications for PE-HD pipes acc. to EN 12201-2, EN 1519-1, EN 12666-1, DIN 8074 and DIN 8075 with fire stop collar PROMASTOP®-FC on PROMASTOP®-VEN penetration seal are applicable for ABS-pipes acc. to EN 1455-1 and SAN + PVC-pipes acc. to EN 1565-1.

The test results and classifications for PP-H and PP-R pipes are applicable for pipes acc. e.g. to ÖNORM B 5174-1, DIN 8077 and DIN 8078 (or equal products).

Table 7 – Overview pipe materials, dimensions, installation situation and classification

Product type	Dimension range Ø...Pipe diameter (mm) s...Pipe wall thickness (mm)	Penetration Seal (mm)	Orientation D...Floor W...Wall	Collar type (mm)	Classification
PE-HD	Ø 32 / s 1,8 - Ø 125 / s 11,4	≥ 150	W	FC3/6	EI120-U/U
PE-HD	Ø 32 / s 2,0 - Ø 125 / s 12,2	≥ 150	D	FC3/6	EI120-U/U
PP-H / PP-R	Ø 32 / s 1,8 - Ø 125 / s 11,4	≥ 150	W	FC3/6	EI120-U/U
PP-H / PP-R	Ø 32 / s 2,0 - Ø 125 / s 7,1	≥ 150	D	FC3/6	EI120-U/U

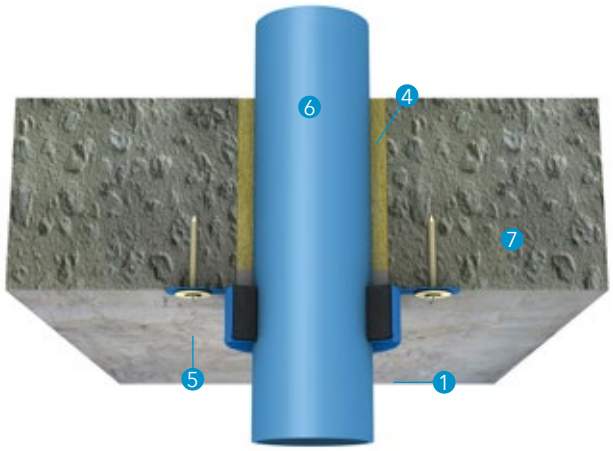
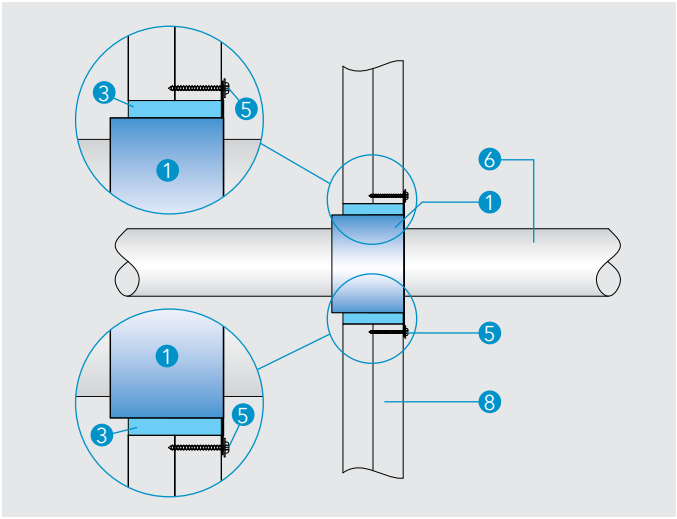
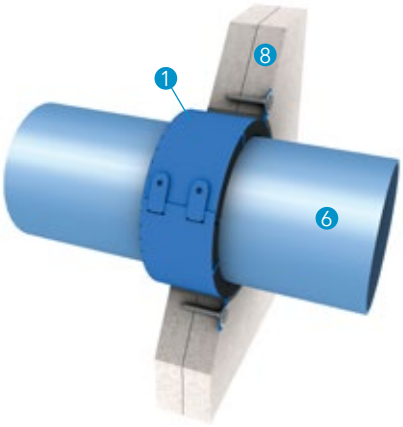


Table 1 – Supporting construction thickness and amount of fire stop collars

Supporting construction	Construction thickness	Amount of fire stop collars
Shaft wall (Detail A/B)	≥ 50 mm	1
Flexible wall (Detail C/D)	≥ 100 mm	2
Rigid wall (Detail E/F)	≥ 150 mm	2
Rigid floor (Detail G/H)	≥ 100 mm	1



Detail A – PROMASTOP®-FC6 in a shaft wall



Detail B – PROMASTOP®-FC6 in a shaft wall

Technical data

1. PROMASTOP®-FC
2. PROMASTOP®-S vagy PROMASTOP®-L
3. Annular gap, see installation manual
4. Backfilling material
5. Suitable fixing material
6. Copper pipe
7. Supporting construction
8. Shaft wall
9. Combustible insulation
10. Steel mesh
11. Identification label

Certificate: ETA-14/0089

General information

The bulding product PROMASTOP®-FC is defined as pipe closure device and cable penetration seal in shaft wall, flexible wall, rigid wall and rigid floor (acc. Table 1).

There are lot of possibilities for usage: directly in or on the supporting construction or in the penetration seal (see PROMASTOP®-CC or PROMASTOP®-I).

Installation manual

- If necessary place sound decoupling strip (tape)
- For floor applications, the collar is placed under the floor. For wall (exception shaft wall) on both sides.
- There are 3 possibilities for closing the annular gap:
  1. with fire stopping mortar PROMASTOP®-VEN
  2. with gypsum
  3. Backfilling with stone wool with class A1 (acc. to EN 13501-1) and final annular gap sealing with fire stop acrylic sealant PROMASEAL®-A 3 with a depth of ≥ 5 mm.
- Put the fire stopping collar around the pipe, snap the fastener, bend the fastener(s) back at 180°
- Use the enclosed fixing material for placing the fire stopping collar on a rigid wall or under a rigid floor. Other fixing details see below
- Affix the identification label

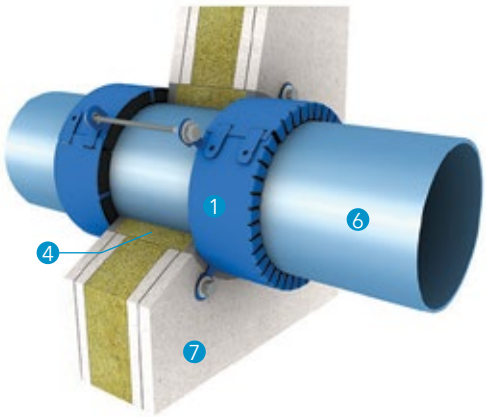
Shaft wall

Detail A/B

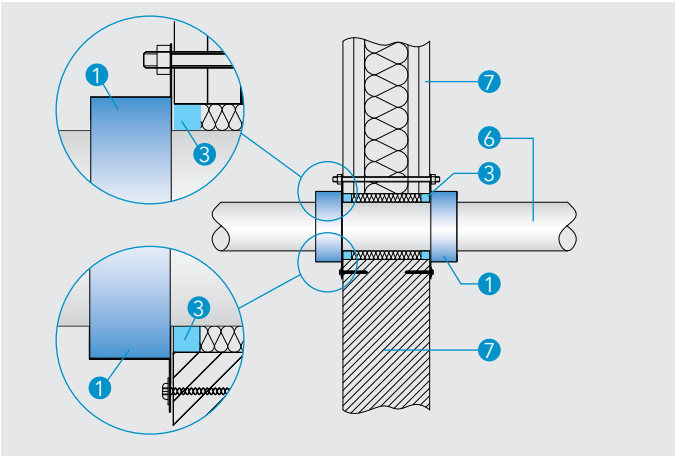
The minimum thickness of the shaft wall shall be ≥ 50 mm.

Fixing

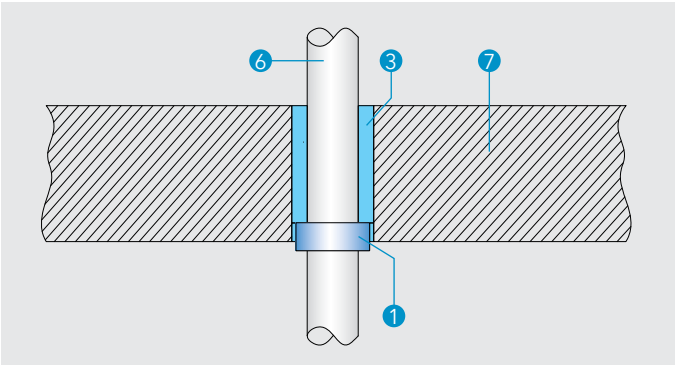
The fire stopping collar PROMASTOP®-FC with a building heigth is placed reversed in shaft walls and will be fixed with dry wall screws or the attached fixing material.



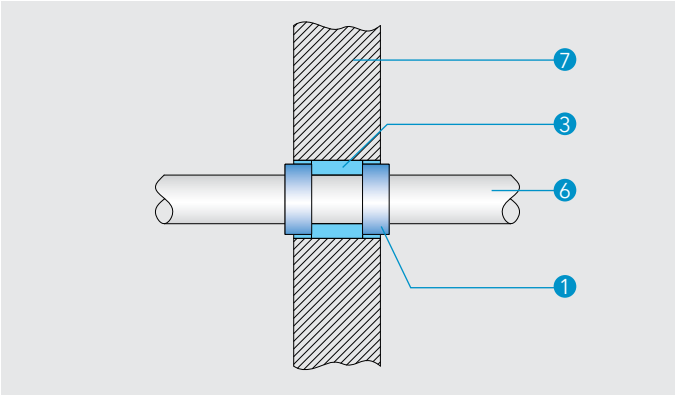
Detail C – PROMASTOP®-FC on flexible wall



Detail D – PROMASTOP®-FC on flexible wall and rigid wall



Detail E – Plastic pipe penetration seal in rigid floor



Detail F – Plastic pipe penetration seal in rigid wall

Flexible wall

Detail C/D

The wall must a thickness of ≥ 100 mm and be made from wooden or metal studs which are lined on both sides with minimum 2 layers of minimum 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 each of the wooden stud to the sealing and the cavity between studs and sealing must be filled with a least 100 mm insulation material compliant to class A1 or A2 (in acc. EN 13501-1).

Fastening

For flexible wall, penetration seals or pillow seals use M6 or M8 threaded rods for fixing.

Sound decoupling

In flexible walls and rigid walls every PE based sound decoupling strip up to a thickness of 5 mm Class E (acc. to EN 13501-1) or higher rated can be used.

Rigid wall

Detail E

The rigid floor must have a thickness ≥ 150 mm and a density of ≥ 450 kg/m^3. For details see table 3. The installation of the fire stop collar is one-sided for floors (under the floor or mortared in).

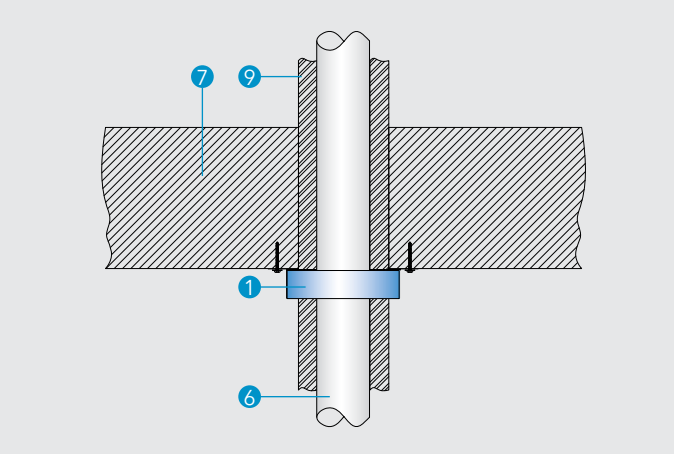
Detail F

The rigid wall must have a thickness ≥ 100 mm and a density of ≥ 450 kg/m^3 (Manufacturer tolerances were not considered). The installation of the fire stop collar is two-sided for walls (on the wall or mortared in).

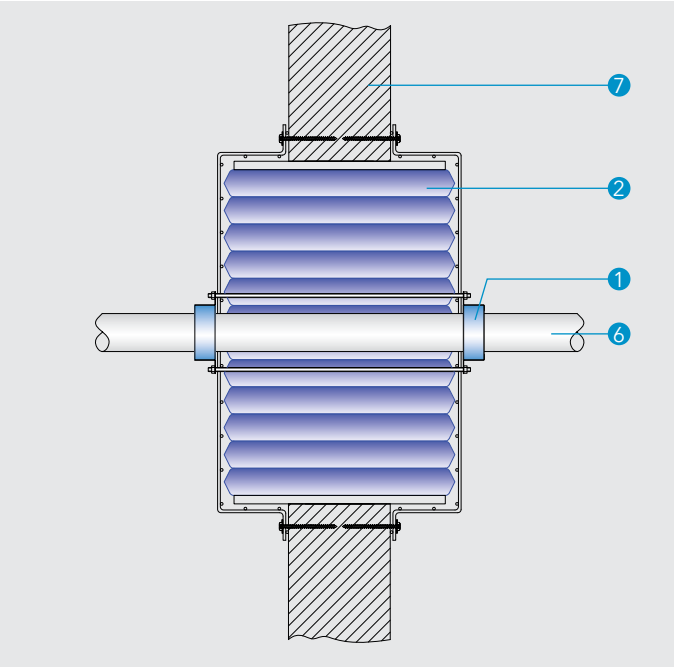
Fastening

The fire stopping collar PROMASTOP®-FC will be mounted on rigid compartments with the attached screws or mortared in fully or partially (see Details E/F).

For U/U application the collar shall be mounted minimum 10 mm out of the surface. For U/C, C/U and C/C application the fire stop collar PROMASTOP®-FC may be mortared flat. Full coverage with mortar is not permitted.



Detail G – PROMASTOP®-FC under rigid floor for plastic pipes with combustible insulation



Detail H – PROMASTOP®-FC under rigid floor for plastic pipes with combustible insulation

Detail G – PROMASTOP®-FC under rigid floor for plastic pipes with combustible insulation
Combustible insulation with class B-s3,d0 (acc. to EN 13501-1) or higher rated:
A thickness of 6-32 mm with a insulation length of ≥ 500 mm in case LS, LI, CS or CI acc. to EN 1366-3 (see general part in the introduction) may be used.

Detail H – PROMASTOP®-FC for plastic pipes on pillow penetration seal in rigid wall and floor.
The fire stop collar can seal PVC-U, PE, PP-H and PP-R pipes in the pillow penetration seal.

For classification see page 69.

Special application in flexible wall and rigid wall

Non-combustible floor insulations
The fire stop collar PROMASTOP®-FC can be used for PP-H and PP-R pipes (Ø max = 110 mm and pipe wall thickness ≤ 2,7 mm) under floor insulations (thickness ≥ 100 mm, density ≥ 100 kg/m^3, Euroclass A2 acc. to EN 13501-1 or higher rated). Classification EI 120 for floor. Fastening must be trough the floor insulation into the bare floor.

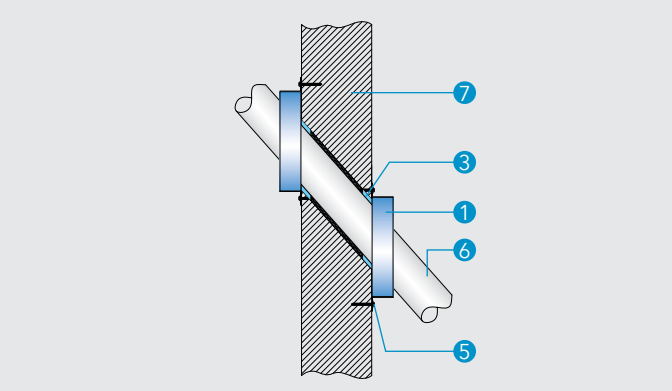
Spirally pipes for pellets, wall application
Classified spirally pipes for pellets (Ø max = 60 mm) with or without pellet filling and with zero distance between the fire stop collars. Classification EI 120-U/U in rigid wall of 150 mm und density of ≥ 450 kg/m^3.

Pellet feed screws
PROMASTOP®-FC can be used as penetration seal for pellet feed screws with a feed pipe made of PVC (Ø max. 90 mm, pipe wall thickness ≤ 3 mm) or PE (Ø max. 90 mm, pipe wall thickness ≤ 8,2 mm) including the metal feed screw. Classification EI 90-U/U for flexible and rigid wall.

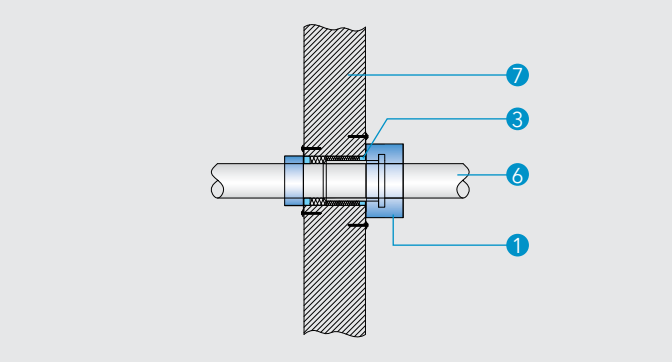
Flexible conduits
Flexible conduits made of PVC with or without cables can be sealed with the fire stop collar PROMASTOP®-FC (maximum collar diameter 50 mm). Classification EI 90-U/U for flexible and rigid wall.

Pneumatic delivery systems:
Pipes made of PVC with a max. Ø = 110 mm and a pipe wall thickness ≤ 3 mm can be sealed with the PROMASTOP®-FC fire stop collar. 2 control cables can be included between the collar and the pipe.

Application: flexible wall, rigid wall and rigid floor classification EI 45-U/U for walls, classification EI 90-U/U for floors.



Detail I – PROMASTOP®-FC6 for sloped pipes



Detail J – PROMASTOP®-FC6 for pipe sockets

Detail I
PROMASTOP®-FC6 fire stop collar may be used for sloped pipes. The diameter of the tested sloped pipe can be reduced, but not increased.
Application: rigid wall and rigid floor classification see table 3.

Detail J
PROMASTOP®-FC6 fire stop collar may be used for pipe sockets. The diameter of the tested pipe socket can be reduced, but not increased.
Application: rigid constructions and flexible wall classification see table 3.

Table 2 – Information about the minimum distance

Object	Distance (mm)
PROMASTOP®-FC – PROMASTOP®-FC	0
PROMASTOP®-FC – éghető szigetelés	0
PROMASTOP®-FC – nem éghető szigetelés	0
PROMASTOP®-FC – kábel, kábeltálca, kábellétra	0

Table 3 – Overview pipe materials, dimensions, installation situation and classification

PE-HD					
Specification	**Thickness (mm)**	**Dimension range Ø...Pipe diameter (mm) s... Pipe wall thickness (mm)**	**FC3/6**	**Collar position**	**Fire resistance**
Shaftwall without insulation	≥ 50	Ø 50 / s 1,8 - Ø 125 / s 11,4	FC6	Reverse in the wall	EI 90-U/U
					EI 90-U/C
Shaftwall without insulation	≥ 50	Ø 50 / s 5,8 - Ø 125 / s 3,1	FC6	Reverse in the wall	EI 120-U/U
					EI 120-U/C
Flexible wall	≥ 100	Ø 40 / s 1,8 - Ø 200 / s 11,4	FC3/6	On the wall	EI 90-U/U
Rigid wall	≥ 100	Ø 40 / s 1,8 - Ø 200 / s 11,4	FC3/6	On the wall	EI 90-U/U
Rigid wall	≥ 100	Ø 32 / s 1 ,8 - Ø 31 5 / s 15,0	FC3/6	On the wall	EI 90-U/U
					EI 90-U/C
Rigid wall	≥ 100	Ø 32 / s 1,8 - Ø 250 / s 22,7	FC3/6	On the wall	EI 120-U/U
					EI 120-U/C
Rigid wall	≥ 100	Sloped pipe (until 45°), max. Ø 125	FC6	On the wall	EI 120-U/U
Rigid wall	≥ 150	Ø 40 / s 1,8 - Ø 315 / s 15,0	FC3/6	Mortared in the wall	EI 90-U/U
					EI 90-U/C
Rigid wall	≥ 150	Ø 40 / s 1,8 - Ø 250 / s 22,7	FC3/6	Mortared in the wall	EI 120-U/U
					EI 120-U/C
Rigid floor	≥ 150	Ø 32 / s 1,8 - Ø 250 / s 22,7	FC3/6	Mortared in the floor	EI 120-U/U
					EI 120-U/C
Rigid floor	≥ 150	Ø 32 / s 1,8 - Ø 315 / s 15,0	FC3/6	On the underside surface	EI 90-U/U
					EI 90-U/C
Rigid floor	≥ 150	Ø 32 / s 1,8 - Ø 250 / s 22,7	FC3/6	On the underside surface	EI 120-U/U
					EI 120-U/C
Rigid floor	≥ 150	Sloped pipe (until 45°), max. Ø 125	FC6	On the underside surface	EI 120-U/U

PP-H / PP-R					
Specification	**Thickness (mm)**	**Dimension range Ø...Pipe diameter (mm) s... Pipe wall thickness (mm)**	**FC3/6**	**Collar position**	**Fire resistance**
Shaftwall without insulation	≥ 50	Ø 50 / s 1,8 - Ø 125 / s 17,1	FC6	Reverse in the wall	EI 90-U/U
					EI 90-U/C
Flexible wall	≥ 100	Ø 40 / s 1,8 - Ø 250 / s 14,2	FC3/6	On the wall	EI 90-U/U
Flexible wall	≥ 100	Ø 40 / s 1,8 - Ø 250 / s 14,2	FC3/6	On the wall	EI 120-U/U
Rigid wall	≥ 100	Ø 40 / s 1,8 - Ø 250 / s 14,2	FC3/6	On the wall	EI 90-U/U
Rigid wall	≥ 100	Ø 40 / s 1,8 - Ø 250 / s 14,2	FC3/6	On the wall	EI 120-U/U
Rigid wall	≥ 100	Ø 32 / s 1,8 - Ø 315 / s 15,0	FC3/6	On the wall	EI 120-U/U
					EI 120-U/C
Rigid wall	≥ 100	Sloped pipe (until 45°), max. Ø 125	FC6	On the wall	EI 90-U/U
Rigid wall	≥ 100	Sloped pipe (until 45°), max. Ø 125	FC6	On the wall	EI 120-U/U
Rigid wall	≥ 150	Ø 40 / s 1,8 - Ø 250 / s 22,7	FC3/6	Mortared in the wall	EI 90-U/U
					EI 90-U/C
Rigid wall	≥ 150	Ø 40 / s 1,8 - Ø 250 / s 22,7	FC3/6	Mortared in the wall	EI 120-U/U
					EI 120-U/C
Rigid floor	≥ 150	Ø 32 / s 1,8 - Ø 250 / s 22,7	FC3/6	Mortared in the floor	EI 90-U/U
					EI 90-U/C
Rigid floor	≥ 150	Ø 32 / s 1,8 - Ø 250 / s 22,7	FC3/6	Mortared in the floor	EI 120-U/U
					EI 120-U/C
Rigid floor	≥ 150	Ø 32 / s 1,8 - Ø 315 / s 15,0	FC3/6	On the underside surface	EI 90-U/U
					EI 90-U/C
Rigid floor	≥ 150	Ø 32 / s 1,8 - Ø 315 / s 15,0	FC3/6	On the underside surface	EI 120-U/U
					EI 120-U/C
Rigid floor	≥ 150	Sloped pipe (until 45°), max. Ø 125	FC6	On the underside surface	EI 120-U/U

PVC-U					
Specification	**Thickness (mm)**	**Dimension range Ø...Pipe diameter (mm) s... Pipe wall thickness (mm)**	**FC3/6**	**Collar position**	**Fire resistance**
Rigid wall	≥ 100	Ø 40 / s 1,9 - Ø 315 / s 18,7	FC3/6	On the wall	EI 90-U/U
					EI 90-U/C
Rigid wall	≥ 100	Ø 40 / s 1,9 - Ø 250 / s 11,9	FC3/6	On the wall	EI 120-U/U
					EI 120-U/C
Rigid wall	≥ 100	Sloped pipe (until 45°), max. Ø 125	FC6	On the wall	EI 120-U/U
Rigid wall	≥ 100	Pipe with socket, max. Ø 125	FC6	On the wall	EI 120-U/U
Rigid wall	≥ 150	Ø 110 / s 2,7 - Ø 315 / s 7,7	FC6	On the wall	EI 180-U/U
Rigid floor	≥ 150	Ø 32 / s 1,8 - Ø 315 / s 18,7	FC3/6	Mortared in the floor	EI 90-U/U
					EI 90-U/C
Rigid floor	≥ 150	Ø 32 / s 1,8 - Ø 315 / s 18,7	FC3/6	On the underside surface	EI 90-U/U
					EI 90-U/C
Rigid floor	≥ 150	Sloped pipe (until 45°), max. Ø 125	FC6	On the underside surface	EI 120-U/U
Rigid floor	≥ 150	Pipe with socket, max. Ø 125	FC6	On the underside surface	EI 120-U/U

Geberit Silent-db20 or equal products					
Specification	**Thickness (mm)**	**Dimension range Ø...Pipe diameter (mm) s... Pipe wall thickness (mm)**	**FC3/6**	**Collar position**	**Fire resistance**
Flexible wall	≥ 100	Ø 56 / s 3,2 - Ø 135 / s 6,0	FC3	On the wall	EI 90-U/U
Rigid wall	≥ 100	Ø 56 / s 3,2 - Ø 135 / s 6,0	FC3	On the wall	EI 120-U/U
Rigid wall	≥ 100	Pipe with socket, max. Ø 135	FC3	On the wall	EI 120-U/U
Rigid wall	≥ 150	Ø 56 / s 3,2 - Ø 135 / s 6,0	FC3	Mortared in the wall	EI 120-U/U
Rigid floor	≥ 150	Ø 56 / s 3,2 - Ø 160 / s 7,0	FC3	Mortared in the floor	EI 120-U/U
Rigid floor	≥ 150	Ø 56 / s 3,2 - Ø 160 / s 7,0	FC3	On the underside surface	EI 120-U/U
Rigid floor	≥ 150	Pipe with socket, max. Ø 135	FC6	On the underside surface	EI 120-U/U

Geberit Mepla or equal products					
Specification	**Thickness (mm)**	**Dimension range Ø...Pipe diameter (mm) s... Pipe wall thickness (mm)**	**FC3/6**	**Collar position**	**Fire resistance**
Rigid wall	≥ 150	Ø 16 / s 2,25 - Ø 75 / s 4,7	FC3	Mortared in the wall	EI 90-U/C
Rigid wall	≥ 150	Ø 16 / s 2,25 - Ø 63 / s 4,5	FC3	Mortared in the wall	EI 120-U/C
Rigid wall	≥ 150	Ø 16 / s 2,25 - Ø 75 / 4,7 + combustible insulation (B-s3,d0; thickness 6 – 32 mm; Configuration: LS/LI/CS or CI)	FC3	Mortared in the wall	EI 90-U/C
Rigid wall	≥ 150	Ø 16 / s 2,25 - Ø 75 / s 4,7 + combustible insulation (B-s3,d0; thickness 6 – 32 mm; Configuration: LS/LI/CS or CI)	FC3	Mortared in the wall	EI 120-U/C
Rigid floor	≥ 150	Ø 16 / s 2,25 - Ø 75 / s 4,7	FC3	Mortared in the floor	EI 120-U/C
Rigid floor	≥ 150	Ø 16 / s 2,25-tel - Ø 63 / s 4,5 + combustible insulation (B-s3,d0; thickness 6 – 32 mm; Configuration: LS/LI/CS or CI)	FC3	Mortared in the floor	EI 90-U/C

Friatec dBlue or equal products					
Specification	**Thickness (mm)**	**Dimension range Ø...Pipe diameter (mm) s... Pipe wall thickness (mm)**	**FC3/6**	**Collar position**	**Fire resistance**
Rigid floor	≥ 150	Ø 50 / s 1,8 - Ø 125 / s 3,9	FC3	Mortared	EI 120-U/U
Rigid floor	≥ 150	Ø 50 / s 1,8 - Ø 125 / s 3,9	FC3	Under the floor	EI 120-U/U

Friatec Friaphon or equal products					
Specification	**Thickness (mm)**	**Dimension range Ø...Pipe diameter (mm) s... Pipe wall thickness (mm)**	**FC3/6**	**Collar position**	**Fire resistance**
Rigid floor	≥ 150	Ø 52 / s 2,8 - Ø 110 / s 5,3	FC3	Mortared	EI 120-U/U
Rigid floor	≥ 150	Ø 52 / s 2,8 - Ø 110 / s 5,3	FC3	Under the floor	EI 120-U/U

Friatec uni/multi or equal products					
Specification	**Thickness (mm)**	**Dimension range Ø...Pipe diameter (mm) s... Pipe wall thickness (mm)**	**FC3/6**	**Collar position**	**Fire resistance**
Rigid floor	≥ 150	Ø 16 / s 2,0 - Ø 63 / s 4,5	FC3	Mortared in the floor	EI 120-U/C
Rigid floor	≥ 150	Ø 16 / s 2,0 - Ø 63 / s 4,5 + combustible insulation (B-s3,d0; thickness 6 – 32 mm; Configuration: LS/LI/CS or CI)	FC3	Mortared in the floor	EI 120-U/C
Rigid floor	≥ 150	Ø 16 / s 2,0 - Ø 63 / s 4,5	FC3	On the underside surface	EI 60-U/C
Rigid floor	≥ 150	Ø 16 / s 2,0 - Ø 32 / s 3,0	FC3	On the underside surface	EI 120-U/C
Rigid floor	≥ 150	Ø 16 / s 2,0 - Ø 63 / s 4,5 + combustible insulation (B-s3,d0; thickness 6 – 32 mm; Configuration: LS/LI/CS or CI)	FC3	On the underside surface	EI 90-U/C
Rigid floor	≥ 150	Ø 16 / s 2,0 - Ø 63 / s 4,5 + combustible insulation (B-s3,d0; thickness 6 – 32 mm; Configuration: LS/LI/CS or CI)	FC3	On the underside surface	EI 120-U/C

Friatec Friatherm starr or equal products					
Specification	**Thickness (mm)**	**Dimension range Ø...Pipe diameter (mm) s... Pipe wall thickness (mm)**	**FC3/6**	**Collar position**	**Fire resistance**
Rigid floor	≥ 150	Ø 16 / s 2,0 - Ø 160 / s 12,5 + combustible insulation (B-s3,d0; thickness 6 – 32 mm; Configuration: LS/LI/CS or CI)	FC3	Mortared in the floor	EI 120-U/C
Rigid floor	≥ 150	Ø 16 / s 2,0 - Ø 160 / s 12,5	FC3	On the underside surface	EI 120-U/C
Rigid floor	≥ 150	Ø 16 / s 2,0 - Ø 160 / s 12,5	FC3	Mortared in the floor	EI 120-U/C
Rigid floor	≥ 150	Ø 16 / s 2,0 - Ø 160 / s 12,5 + combustible insulation (B-s3,d0; thickness 6 – 32 mm; Configuration: LS/LI/CS or CI)	FC3	Under the floor	EI 120-U/C

Pipelife Master3 or equal products					
Specification	**Thickness (mm)**	**Dimension range Ø...Pipe diameter (mm) s... Pipe wall thickness (mm)**	**FC3/6**	**Collar position**	**Fire resistance**
Flexible wall	≥ 100	Ø 75 / s 2,1 - Ø 125 / s 3,5	FC3	On the wall	EI 90-U/U
Rigid wall	≥ 100	Ø 75 / s 2,1 - Ø 125 / s 3,5	FC3	On the wall	EI 120-U/U
Rigid wall	≥ 100	Pipe with socket, max. Ø 125	FC6	On the wall	EI 120-U/U
Rigid wall	≥ 150	Ø 75 / s 2,1 - Ø 125 / s 3,5	FC3	On the wall	EI 120-U/U
Rigid floor	≥ 150	Ø 75 / s 2,1 - Ø 125 / s 3,5	FC3	Mortared in the floor	EI 120-U/U
Rigid floor	≥ 150	Ø 75 / s 2,1 - Ø 125 / s 3,5	FC3	Under the floor	EI 120-U/U
Rigid floor	≥ 150	Pipe with socket, max. Ø 125	FC6	Under the floor	EI 120-U/U

Poloplast PoloKal NG or equal products					
Specification	**Thickness (mm)**	**Dimension range Ø...Pipe diameter (mm) s... Pipe wall thickness (mm)**	**FC3/6**	**Collar position**	**Fire resistance**
Flexible wall	≥ 100	Ø 32 / s 1,8 - Ø 250 / s 8,6	FC3/6	On the wall	EI 90-U/U
Rigid wall	≥ 100	Ø 32 / s 1,8 - Ø 250 / s 8,6	FC3/6	On the wall	EI 90-U/U
Rigid wall	≥ 100	Ø 32 / s 1,8 - Ø 160 / s 4,9	FC3	On the wall	EI 120-U/U
Rigid wall	≥ 100	Sloped pipe (until 45°), max. Ø 125	FC6	On the wall	EI 90-U/U
Rigid wall	≥ 100	Pipe with socket, max. Ø 125	FC6	On the wall	EI 120-U/U
Rigid wall	≥ 150	Ø 32 / s 1,8 - Ø 250 / s 8,6	FC3/6	Mortared in the wall	EI 90-U/U
Rigid wall	≥ 150	Ø 32 / s 1,8 - Ø 160 / s 4,9	FC3	Mortared in the wall	EI 120-U/U
Rigid floor	≥ 150	Ø 32 / s 1,8 - Ø 250 / s 8,6	FC3/6	Mortared in the floor	EI 120-U/U
Rigid floor	≥ 150	Ø 32 / s 1,8 - Ø 250 / s 8,6	FC3/6	On the underside surface	EI 120-U/U
Rigid floor	≥ 150	Sloped pipe (until 45°), max. Ø 125	FC6	On the underside surface	EI 120-U/U
Rigid floor	≥ 150	Pipe with socket, max. Ø 125	FC6	On the underside surface	EI 120-U/U

Poloplast PoloKal XS or equal products					
Specification	**Thickness (mm)**	**Dimension range Ø...Pipe diameter (mm) s... Pipe wall thickness (mm)**	**FC3/6**	**Collar position**	**Fire resistance**
Flexible wall	≥ 100	Ø 32 / s 1,8 - Ø 250 / s 8,6	FC3/6	On the wall	EI 90-U/U
Rigid wall	≥ 100	Ø 32 / s 1,8 - Ø 250 / s 8,6	FC3/6	On the wall	EI 90-U/U
Rigid wall	≥ 100	Ø 32 / s 1,8 - Ø 160 / s 4,9	FC3	On the wall	EI 120-U/U
Rigid wall	≥ 100	Sloped pipe (until 45°), max. Ø 125	FC6	On the wall	EI 90-U/U
Rigid wall	≥ 100	Pipe with socket, max. Ø 125	FC6	On the wall	EI 120-U/U
Rigid wall	≥ 150	Ø 32 / s 1,8 - Ø 250 / s 8,6	FC3/6	Mortared in the wall	EI 90-U/U
Rigid wall	≥ 150	Ø 32 / s 1,8 - Ø 160 / s 4,9	FC3	Mortared in the wall	EI 120-U/U
Rigid floor	≥ 150	Ø 32 / s 1,8 - Ø 250 / s 8,6	FC3/6	Mortared in the floor	EI 120-U/U
Rigid floor	≥ 150	Ø 32 / s 1,8 - Ø 250 / s 8,6	FC3/6	On the underside surface	EI 120-U/U
Rigid floor	≥ 150	Sloped pipe (until 45°), max. Ø 125	FC6	On the underside surface	EI 120-U/U
Rigid floor	≥ 150	Pipe with socket, max. Ø 125	FC6	On the underside surface	EI 120-U/U

Poloplast PoloKal 3S or equal products					
Specification	**Thickness (mm)**	**Dimension range Ø...Pipe diameter (mm) s... Pipe wall thickness (mm)**	**FC3/6**	**Collar position**	**Fire resistance**
Flexible wall	≥ 100	Ø 75 / s 3,8 - Ø 160 / s 7,5	FC3	On the wall	EI 90-U/U
Rigid wall	≥ 100	Ø 75 / s 3,8 - Ø 160 / s 7,5	FC3	On the wall	EI 120-U/U
Rigid wall	≥ 100	Sloped pipe (until 45°), max. Ø 125	FC6	On the wall	EI 120-U/U
Rigid wall	≥ 100	Pipe with socket, max. Ø 125	FC6	On the wall	EI 120-U/U
Rigid wall	≥ 150	Ø 75 / s 3,8 - Ø 160 / s 7,5	FC3	Mortared in the wall	EI 120-U/U
Rigid floor	≥ 150	Ø 75 / s 3,8 - Ø 160 / s 7,5	FC3	Mortared in the floor	EI 120-U/U
Rigid floor	≥ 150	Ø 75 / s 3,8 - Ø 160 / s 7,5	FC3	On the underside surface	EI 120-U/U
Rigid floor	≥ 150	Sloped pipe (until 45°), max. Ø 125	FC6	On the underside surface	EI 120-U/U
Rigid floor	≥ 150	Pipe with socket, max. Ø 125	FC6	On the underside surface	EI 120-U/U

Rehau Raupiano Plus or equal products					
Specification	**Thickness (mm)**	**Dimension range Ø...Pipe diameter (mm) s... Pipe wall thickness (mm)**	**FC3/6**	**Collar position**	**Fire resistance**
Rigid wall	≥ 100	Ø 40 / s 1,8 - Ø 160 / s 3,9	FC3	On the wall	EI 120-U/U
Rigid wall	≥ 100	Ø 40 / s 1,8 - Ø 125 / s 3,1 Pipe with socket, max. Ø 125	FC6	On the wall	EI 120-U/U
Rigid wall	≥ 150	Ø 40 / s 1,8 - Ø 125 / s 3,1 Pipe with socket, max. Ø 125	FC6	Mortared in the wall	EI 120-U/U
Rigid floor	≥ 150	Ø 40 / s 1,8 - Ø 200 / s 6,2	FC6	Mortared in the floor	EI 120-U/U
Rigid floor	≥ 150	Ø 40 / s 1,8 - Ø 125 / s 3,1 Pipe with socket, max. Ø 125	FC6	Mortared in the floor	EI 120-U/U
Rigid floor	≥ 150	Ø 40 / s 1,8 - Ø 200 / s 6,2	FC6	On the underside surface	EI 90-U/U
Rigid floor	≥ 150	Ø 40 / s 1,8 - Ø 160 / s 3,9	FC6	On the underside surface	EI 120-U/U
Rigid floor	≥ 150	Ø 40 / s 1,8 - Ø 125 / s 3,1 Pipe with socket, max. Ø 125	FC6	On the underside surface	EI 120-U/U
Rigid floor	≥ 150	Ø 40 / s 1,8 - Ø 160 / s 3,9 Pipe with socket, max. Ø 125	FC6 +SPC	On the underside surface	EI 120-U/U

PVC-U, PE, PP-H and PP-R in PROMASTOP®-S/L pillow seal					
Specification	**Thickness (mm)**	**Dimension range Ø...Pipe diameter (mm) s... Pipe wall thickness (mm)**	**FC3/6**	**Collar position**	**Fire resistance**
Rigid wall + PROMASTOP®-S/L	≥ 150	Ø 32 / s 1,8 - Ø 125 / s 3,1	FC3	On the wall	EI 120-U/U
Rigid floor + PROMASTOP®-S/L	≥ 150	Ø 32 / s 1,8 - Ø 125 / s 3,1	FC3	On the underside surface	EI 120-U/U

For the exact details of the field of application please check the ETA.

Dimensions in mm.

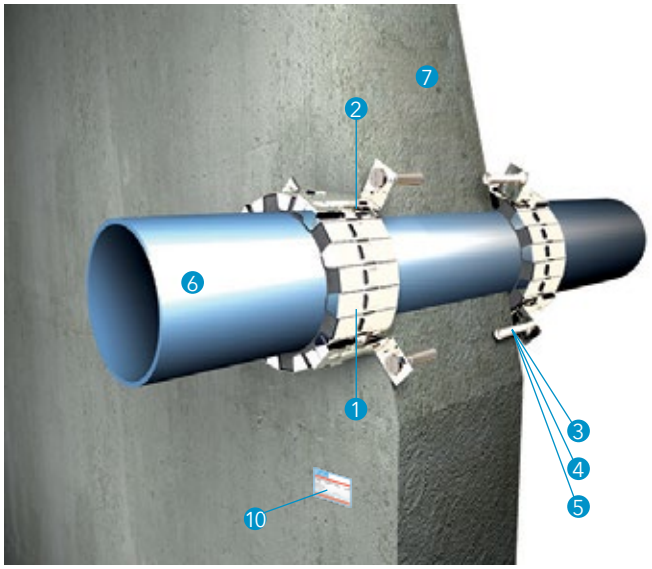


Table 1 - Information for determining the number of segments and number of fastening clips for one collar, as well as the number of collars from one package in connection to the pipe diameter

For outer Ø of pipes (*)	Number of segments per collar	Number of collars from one package	Required number of clips per collar
43 mm	15	10	2
50 mm	17	8,5	2
55 mm	18	8	2
63 mm	20	7,5	2
69 mm	21	7	2
75 mm	22	6,5	3
83 mm	24	6	3
90 mm	25	6	3
110 mm	29	5	3
114 mm	30	5	3
125 mm	33	4,5	3
140 mm	36	4	5
160 mm	40	3,75	5
200 mm	49	3	5

(*) You can get more detailed information from our technical department.

Technical data

1. PROMASTOP®-U
2. Fastening clips
3. Steel anchor or turbo screw *
4. Steel screw with washer 40 x 3 mm *
5. Threaded rod M6 with a nut and a larger washer *
6. PVC, PE, PP and ABS plastic pipes
7. Rigid wall or flexible wall d ≥ 100 mm
8. Rigid floor d ≥ 150 mm, nominal density ≥ 650 kg/m^3
9. PROMASEAL®-S Fire-resistant silicone
10. Identification label

According to: EN 1366-3, EN 13501-2, ETAG 026

* use one of the listed elements only (check the installation details)

General information

PROMASTOP®-U fire collar is made of stainless steel and intumescent tape. The total length of the collar band is 2.25m (150 sections). You can make collars from the collar band for the used pipe diameter during the construction. With the help of PROMASTOP®-U fire collar penetrations of plastic pipes up to diameter of 200 mm can be sealed (see paragraph "Values of fire resistance based on EN 13501-2"). Each pipe penetration seal must be marked with an identification label (10).

Advantages

- All the necessary parts in one package.
- Measuring tape with which we can measure a collar for every pipe diameter .
- Collar may be installed in the X environment on the basis of ETAG 026-2, i.e. use in all weather conditions and exposure to internal and external influences.
- Collar service life is at least 25 years, if not exposed to fire

Installation procedure

- Depending on the plastic pipe diameter, it is necessary to measure the specific length of the fire collar (1) or number of segments on the basis of the table with ratios, cut graphite material and brake off stainless sheet metal.
- Fasten the fire collar (1) on the pipe and link both ends using fastening clips (2).
- Supplement the remaining number of fastening clips (2).
- Attach the fire collar on the structure that separates fire sectors, using the coupling elements (3, 4, 5).
- Fill out and affix the identification label (10).
- In order to ensure that the stability of the services is maintained under fire conditions, all services should be adequately supported at maximum 250 mm away from the wall on both sides of the penetration.

Values of fire resistance based on EN 13501-2

Table 2 - Fire resistance in a rigid wall or flexible wall d ≥ 100 mm or in a bulkhead made of Promat panels, thickness ≥ 50 mm with fire resistance ≥ EI 60

Pipe material: ...outer diameter (D) ...wall thickness (s) [mm]	Location and method of collar assembly	Width of the joint between the collar and the pipe [mm]	Fire resistance
PE/PP: D = 32, s = 1,8	From both sides	0	EI 60-U/C
PE/PP: D = 125, s = 3,1 - 11,4	From both sides	0	EI 60-U/C

Table 3 - Fire resistance in a rigid wall or flexible wall d ≥ 100 mm

Pipe material: ...outer diameter (D) ...wall thickness (s) [mm]	Location and method of collar assembly	Width of the joint between the collar and the pipe [mm]	Fire resistance
PVC: D = 40 - 160, s = 3,0 - 7,7	From the fire load side*	0	EI 45-U/U
PVC: D = 40 - 160, s = 3,0 - 4,0	From the fire load side*	0	EI 60-U/U
PVC: D = 40 - 160, s = 3,0 - 7,7	From both sides	0	EI 60-U/U
PVC: D = 40 - 160, s = 3,0 - 4,0	From both sides	0	EI 90-U/U
PVC: D = 40 - 125, s = 3,0 - 6,0	From both sides	20	EI 90-U/U
PE/ABS: D = 40 - 125, s = 3,0 - 9,5	From the fire load side*	0	EI 45-U/U
PE/ABS: D = 40 - 160, s = 3,0 - 9,5	From both sides	0	EI 45-U/U
PE/ABS: D = 40 - 160, s = 3,0 - 4,9	From both sides	0	EI 90-U/U
PE/ABS: D = 40 - 125, s = 3,0 - 3,9	From both sides	20	EI 90-U/U

* see detail B

Table 4 - Fire resistance in a rigid floor d ≥ 150 mm or in a bulkhead made of Promat panels, thickness ≥ 50 mm with fire resistance ≥ EI 60

Pipe material: ...outer diameter (D) ...wall thickness (s) [mm]	Location and method of collar assembly	Width of the joint between the collar and the pipe [mm]	Fire resistance
PE/PP: D = 32, s = 1,8	From below	0	EI 60-U/C
PE/PP: D = 125, s = 3,1 - 11,4	From below	0	EI 60-U/C

Table 5 - Fire resistance in a rigid floor d ≥ 150 mm

Pipe material: ...outer diameter (D) ...wall thickness (s) [mm]	Location and method of collar assembly	Width of the joint between the collar and the pipe [mm]	Fire resistance
PVC: D = 110, s = 5,3	From below	0	EI 60-U/C
PVC (T-piece)*: D = 110, s = 5,3	From below	0	EI 60-U/C

* see detail D

Table 6 - Fire resistance in a rigid wall d ≥ 180 mm, density ≥ 1150 kg/m³

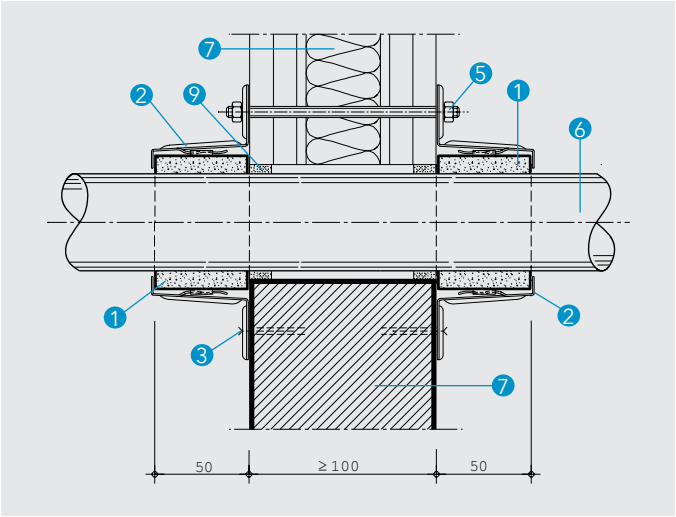
Pipe material: ...outer diameter (D) ...wall thickness (s) [mm]	Location and method of collar assembly	Width of the joint between the collar and the pipe[mm]	Fire resistance
PVC: D = 40 - 110, s = 3,2 - 4,2	From the fire load side*	0	EI 180-U/U
PVC: D = 40 - 125, s = 3,8 - 4,8	From the fire load side*	0	EI 180-U/U
PVC: D = 40 - 160, s = 3,2 - 6,5	From the fire load side*	0	EI 120-U/U
PVC: D = 40 - 200, s = 3,4	From the fire load side*	0	EI 90-U/U
PVC: D = 40 - 160, s = 3,2 - 6,5	Double collar - from the fire load side**	0	EI 180-U/U
PVC: D = 200, s = 7,7	Double collar - from the fire load side**	0	EI 120-U/U
PVC: D = 40- 200, s = 3,9	Double collar - from both sides***	0	EI 180-U/U

* see detail E

** see detail F

*** see detail G

Classification of the final assembly of U/U pipes also applies to U/C, C/U and C/C. Classification of the final assembly of U/C pipe also applies to C/C.

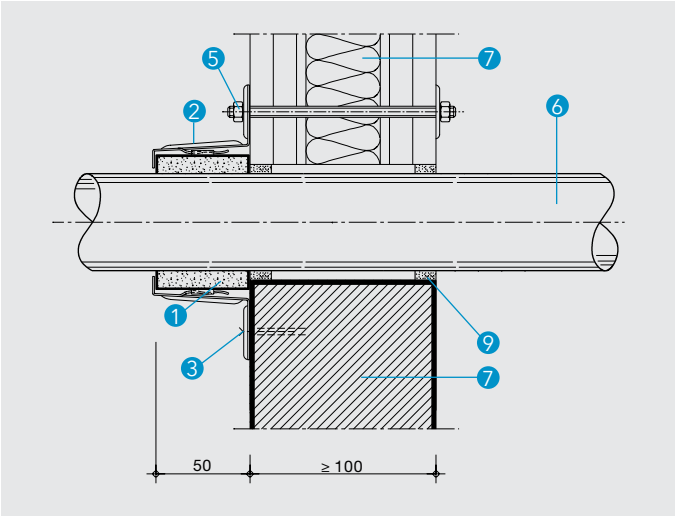


Detail A – Penetration of plastic pipes through the wall

Detail A

When plastic pipe is passing through a rigid or flexible wall, the collar has to be:

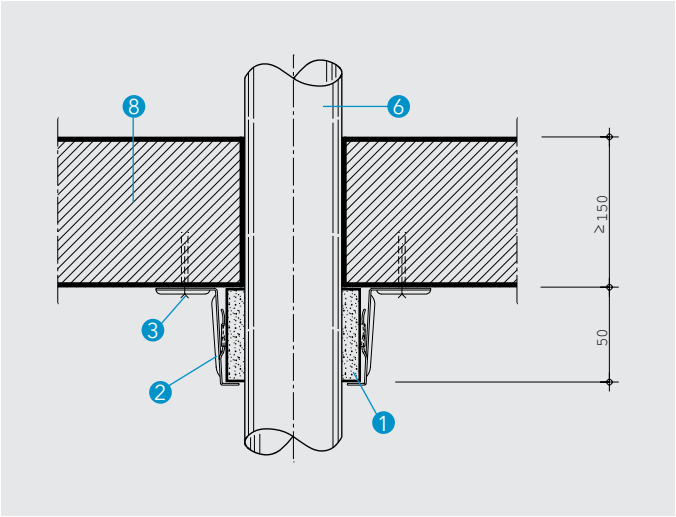
- (1) Installed on both sides, with the exception indicated in the detail B.
- Mounting on a rigid wall is done with steel anchors or turbo screws (3). Mounting on a flexible wall may be done using steel threaded rods M6 with a nut and washer (5).
- Joint between the pipe and the wall in the width of ≤ 5 mm may be sealed by PROMASEAL®-S fire-resistant silicone (9).



Detail B – One-side installation in a rigid or flexible wall

Detail B

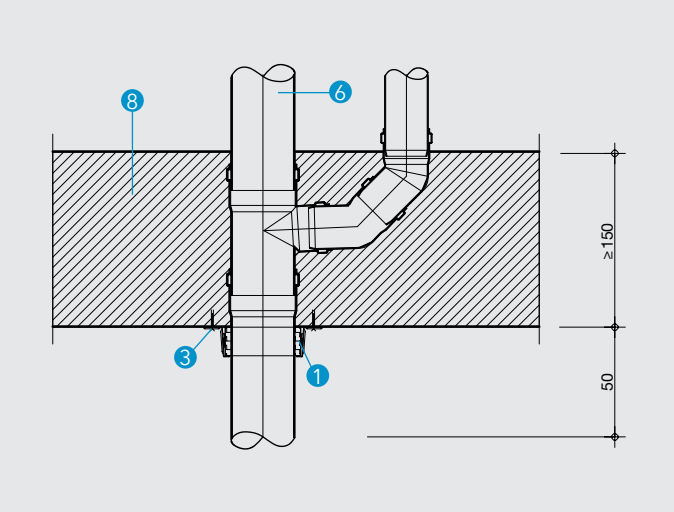
PROMASTOP®-U fire collar can be installed only on the side of the fire section with the fire load, the neighbouring fire section is without fire load. In flexible walls, we can install the collar with the help of threaded rods with a nut and a washer (5).



Detail C – Penetration of the plastic pipe through the floor

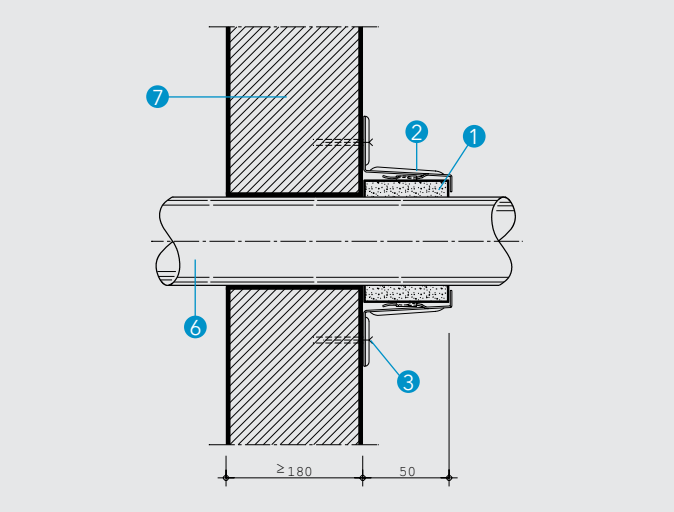
Detail C

When a plastic pipe is passing through a rigid floor, PROMASTOP®-U fire collar is installed only on the bottom side of the construction; it is mounted by means of steel anchors or turbo screws (3).



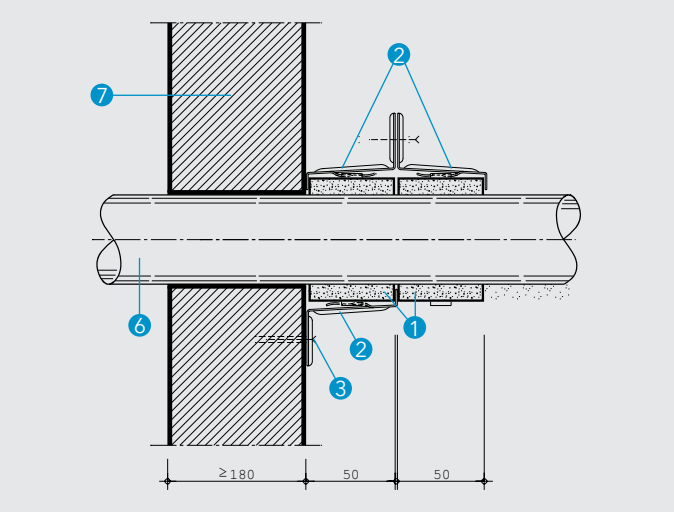
Detail D – Penetration of the plastic pipe with a side pipe

Detail D
When a plastic pipe is passing through a rigid floor, we can install a T-piece with a side pipe (diameter ≤ 75 mm) in the ceiling. PROMASTOP®-U collar is installed on the bottom side of the construction (detail C).



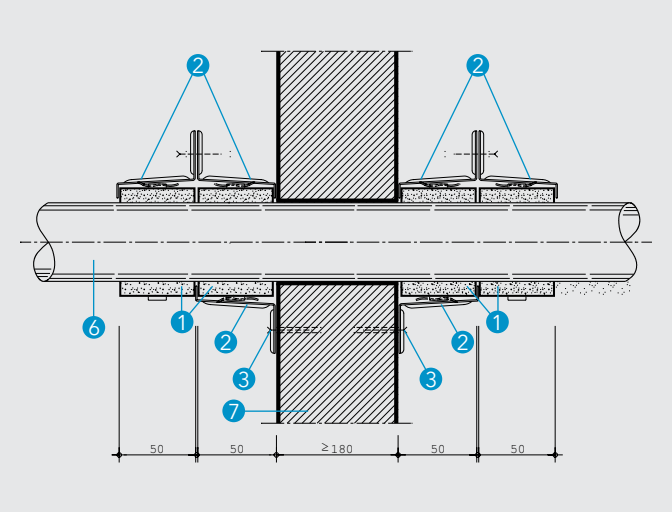
Detail E – Rigid wall from the fire load side

Detail E
PROMASTOP®-U fire collar can be installed only on the side of the fire section with the fire load, the neighbouring fire section is without fire load. In rigid walls, we can install the collar with the help of steel anchors or turbo screws (3).



Detail F – Rigid wall double collar from the fire load side

Detail F
Two PROMASTOP®-U fire collars can be installed only on the side of the fire section with the fire load, the neighbouring fire section is without fire load. In rigid walls, we can install the collar with the help of steel anchors or turbo screws (3).

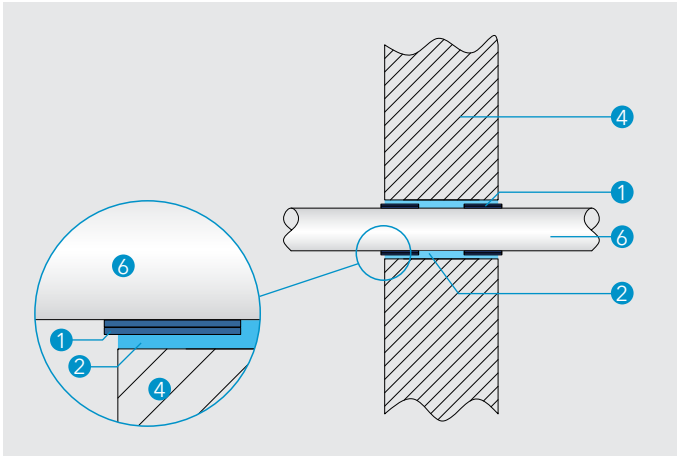


Detail G – **Rigid wall double collar - from both sides**

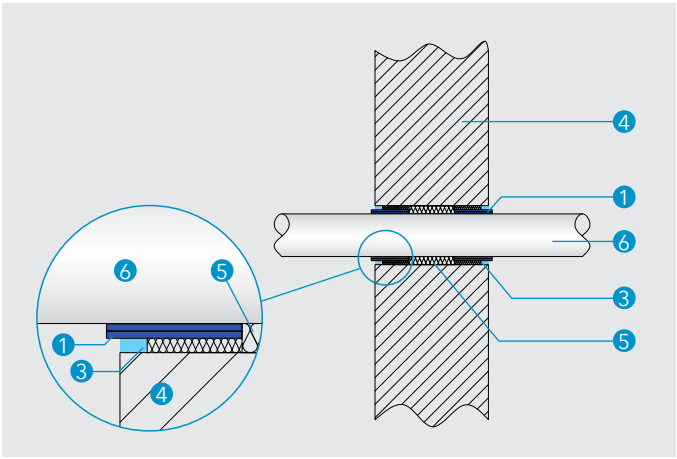
Detail G

Two PROMASTOP®-U fire collars can be installed on each side of the fire section with the fire load. In rigid walls, we can install the collar with the help of steel anchors or turbo screws (3).

Plastic pipe penetration seal with PROMASTOP®-W



Detail A - PROMASTOP®-W in rigid wall with PROMASTOP®-VEN as backfilling and mounting material



Detail B - PROMASTOP®-W in rigid wall with PROMASEAL®-A or PROMASEAL®-AG as mounting material

Technical data

1. PROMASTOP®-W
2. PROMASTOP®-VEN
3. PROMASEAL®-A or PROMASEAL®-AG
4. Rigid wall
5. Stone wool backfilling
6. Plastic pipe
7. Identification label

Certificate: ETA-14/0456

Advantages:

- Fast and easy to install
- No screws or threaded rods necessary
- Space saving
- Universal - for many pipe wall thicknesses and pipe diameter applicable

General Information:

There are lot of possibilities for usage: directly in the supporting construction or in the penetration seal (see PROMASTOP®-CC or PROMASTOP®-I).

The building product PROMASTOP®-W is a pipe closure device. The amount of layers depends on the pipe type, the pipe end configuration, the pipe diameter and the pipe wall thickness (see table 1).

Rigid wall

The rigid wall must have a thickness ≥ 150 mm and a density of ≥ 450 kg/m^3.

Installation manual - wall

- Specify pipe diameter and pipe wall thickness
- Take care about amount of layers acc. the installation manual or table 1
- Cut the fire stop wrap
- Wrap the fire stop wrap around the pipe - preferably active substance to the pipe, frabic outside - fix it with a tape, put it flat to the surface or. max. 5 mm in front of the wall edge
- Apply the fire stop wrap two-sided
- There are 3 possibilities for closing the annular gap (with ≤10 mm)
  1. With mortar or fire stop mortar PROMASTOP®-VEN (see Detail A)
  2. Backfilling the annular gap with stone wool (melting point ≥ 1000°C, A1 classification acc. to EN 13501-1) and final annular gap sealing with PROMASEAL®-A (see Detail B)
  3. or with PROMASEAL®-AG (see Detail B) This is also useable as mounting material for the fire stop wrap. Covering of the wrap with intumescent coating or mortar is not permitted.
- Affix the identification label

Table 1 – Overview pipe materials, dimensions, installation situation and classification

Product type	Dimension range Ø...Pipe diameter (mm) s...Pipe wall thicknes (mm)	Orientation Wall...W	Amount of layers Ø (mm) → Layers	Classifi-cation
PVC-U	Ø 32 / s 3,0 - Ø 160 / s 7,7	W	32 → 2 40 – 63 → 3 75 – 90 → 4 110 – 125 → 5 140 – 160 → 6	EI 120-U/U
PE	Ø 32 / s 1,8 - Ø 160 / s 14,6	W	32 → 2 40 – 63 → 3 75 – 90 → 4 110 – 125 → 5 140 – 160 → 6	EI 120-U/U
PP-H / PP-R	Ø 32 / s 1,8 - Ø 160 / s 9,1	W	32 → 2 40 – 63 → 3 75 – 90 → 4 110 – 125 → 5 140 – 160 → 6	EI 120-U/U

Dimensions in mm.

Table 2 – Information about the minimum distance

Object	Distance (mm)
PROMASTOP®-W – PROMASTOP®-W	100

Table 1

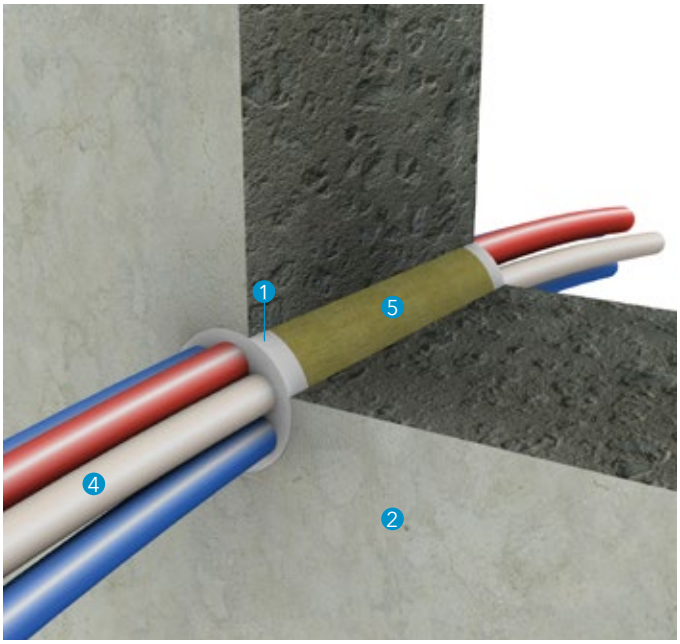
Table 1 shows, which pipes with PROMASTOP®-W can reach the EI 120 classification depending on the pipe dimensions in wall construction.

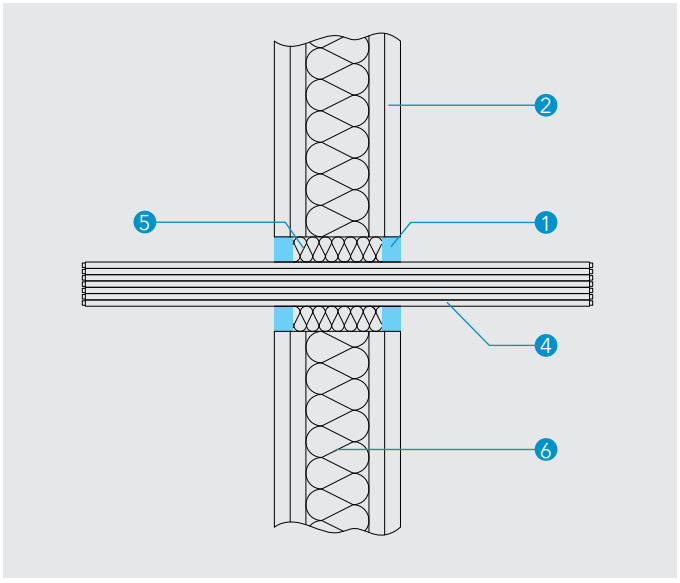
The test results and classifications for the PVC-U pipes are valid acc. to EN 1452-1, DIN 8061, DIN 8062, EN 1329-1, EN 1453-1 and PVC-C acc .to EN 1566-1.

The test results and classifications for PE pipes are valid acc. EN 12201-2, EN1519-1, EN 12666-1, DIN 8074, DIN 8075 and ABS pipes acc. to EN 1455-1 and San+ PVC-Rohre and EN1565-1.

The test results and classifications for PP-H and PP-R pipes are applicable for pipes acc. to DIN 8077 and DIN 8078.

A classification for the pipe end configuration U/U covers C/U, U/C and C/C.





Detail A – Cable penetration seal in flexible wall

Technical data

1. PROMASEAL®-A
2. Supporting construction
3. Metal pipe/non-combustible pipes
4. Cable bundle
5. Stone wool backfilling
6. Non-combustible insulation

Certificate: ETA-14/0107

Advantages:

- Penetration seal of single cables and cable bundles
- Universal applicable

Installation manual

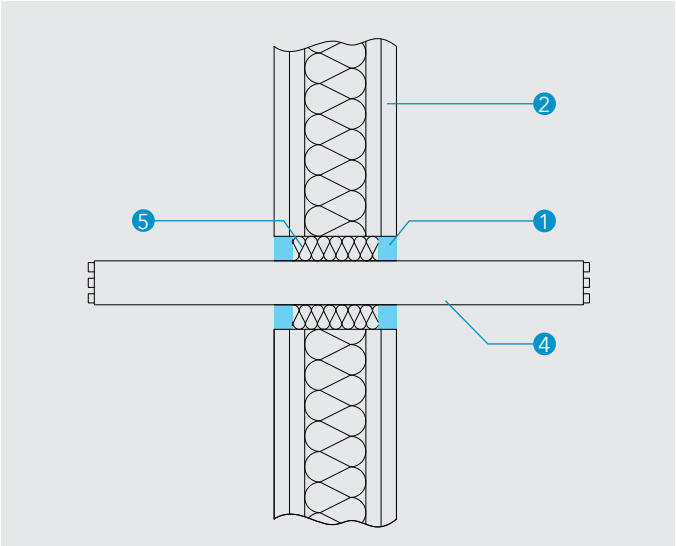
- Cleaning the opening
- Absorbent substrates shall be pre-wetted with water
- Apply backfilling material
- Put the sealant into the opening (pay attention to edge adhesion)
- Smooth the sealant surface
- Affix the identification label

Flexible wall

Detail A/B

Core hole in flexible wall	
Wall thickness	≥ 100 mm
Annular gap width	≤ 20 mm
Annular gap depth	≥ 15 mm
Backfilling	Class A1 acc. to EN 13501-1 (Stone wool, ceramic wool,…), melting point ≥ 1000°C
Density backfilling	≥ 40 kg/m³

Electrical installation	Classification in wall
Sheathed single cable ≤ 4 x 10 mm² (H07RN-F 4 G 10 SW or equal products)	EI 120
Sheathed single cable ≤ 3 x 150 mm² (N2XSEY or equal products)	EI 120
Cable bundle with 26 pieces of sheathed single cables ≤ 5 x 1,5 mm² (H07RN-F or equal products)	EI 120
Cable bundle with 20 pieces of sheathed single cables ≤ 2 x 0,6 mm² (telecommunication,... or equal products)	E 120, EI 90
All sheathed cable types: Ø ≤ 21 mm (telecommunication,... or equal products)	E 120, EI 90
Tied cable bundle: Ø ≤ 100 mm, made of sheathed cables with a max. diameter: 21 mm	E 120, EI 90
Blank penetration seal: Ø ≤ 200 mm (max. seal size 0,03 m²)	EI 120

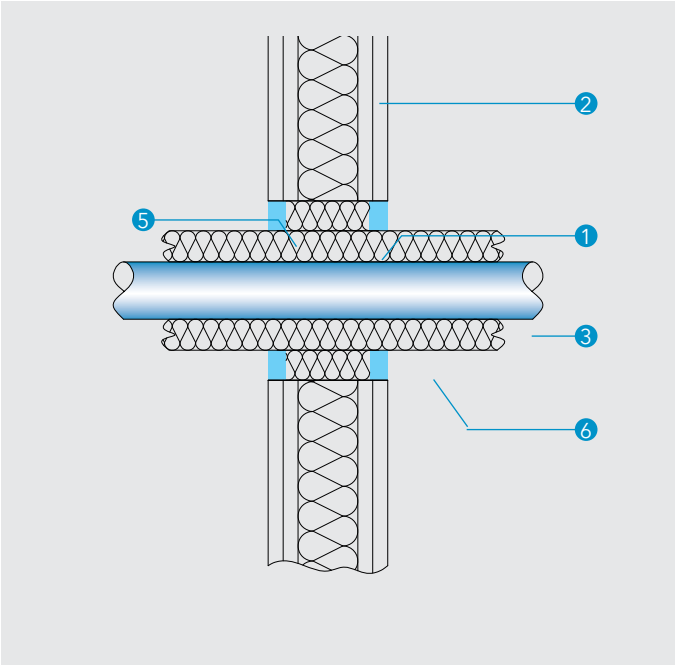


Detail B – Cable penetration seal in flexible wall

Detail A/B

Core hole in flexible wall	
Wall thickness	≥ 100 mm
Annular gap width	≤ 20 mm
Annular gap depth	≥ 15 mm
Backfilling	Class A1 acc. to EN 13501-1 (Stone wool, ceramic wool,…), melting point ≥ 1000°C
Density backfilling	≥ 40 kg/m³

Electrical installation	Classification in wall
Sheathed single cable ≤ 3 x 150 mm² (H07Z-K or equal products)	EI 120
Cable bundle Ø ≤ 90 mm of sheathed cables ≤ 3 x 1,5 mm² (NYY-O or equal products)	EI 120

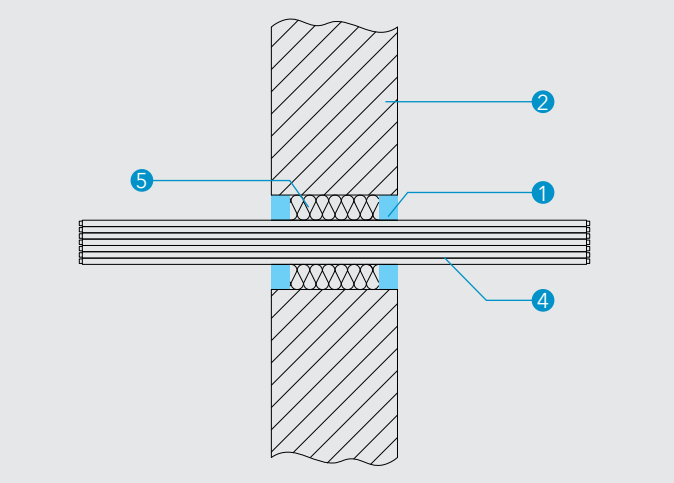


Detail C – Annular gap closure for steel pipes with non-combustible insulation

Detail C – Annular gap closure for steel pipes with non-combustible insulation

Core hole in flexible wall	
Wall thickness	≥ 150 mm
Annular gap width	≤ 20 mm
Annular gap depth	≥ 15 mm
Backfilling	Class A1 acc. to EN 13501-1 (Stone wool, ceramic wool,…), melting point ≥ 1000°C
Density backfilling	≥ 40 kg/m³
Steel pipes (pipe end U/C)	Pipe diameter ≥ 50 mm and ≤ 106 mm Pipe wall thickness ≥ 2 mm and ≤ 14,2 mm
Insulation case	CS (acc. to EN 1366-3)
Insulation thickness	30 mm
Insulation density	40 kg/m³
Insulation	Minimum class A2-s1, d0, $A2_L$-s1, d0 acc. to EN 13501-1 (Stone wool, ceramic wool,…), melting point ≥ 1000°C

Electrical installation	Classification in wall
Annular gap sealing with PROMASEAL®-A with the upper general conditions	EI 120-U/C



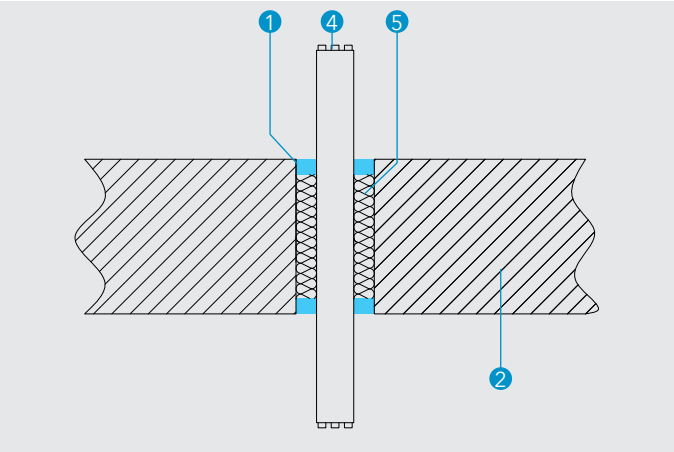
Detail D – **Cable penetration seal in rigid wall**

Rigid constructions

Detail D – Rigid wall

Core hole in rigid wall	
Wall thickness	≥ 100 mm
Annular gap width	≤ 20 mm
Annular gap depth	≥ 15 mm
Backfilling	Class A1 acc. to EN 13501-1 (Stone wool, ceramic wool,…), melting point ≥ 1000°C
Density backfilling	≥ 40 kg/m³

Electrical installation	Classification in wall
Sheathed single cables ≤ 4 x 10 mm² (H07RN-F 4 G 10 SW or equal products)	EI 120
Sheathed single cables ≤ 3 x 150 mm² (N2XSEY or equal products)	EI 120
Cable bundle with 26 pieces of sheathed single cables ≤ 5 x 1,5 mm² (H07RN-F or equal products)	EI 120
Cable bundle with 20 pieces of sheathed single cables ≤ 2 x 0,6 mm² (telecommunication,... or equal products)	EI 120
Cable bundle Ø ≤ 90 mm of sheathed cables ≤ 3 x 1,5 mm² (NYY-O or equal products)	EI 120
All sheathed cable types: Ø ≤ 21 mm (telecommunication,... or equal products)	EI 120, EI 90
Tied cable bundle: Ø ≤ 100 mm, made of sheathed cables with a max. diameter: 21 mm	EI 120, EI 90
Blank penetration seal: Ø ≤ 200 mm (max. seal size 0,03 m²)	EI 120

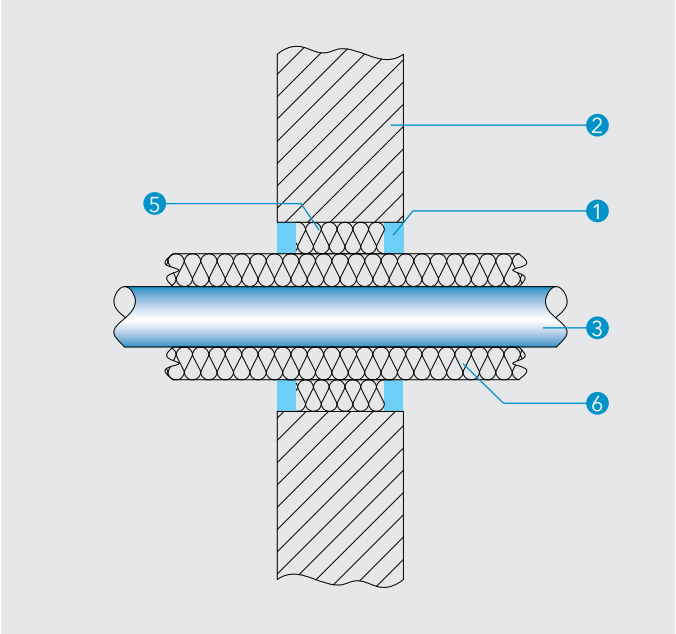


Detail E – **Cable penetration seal in rigid floor**

Detail E – Rigid floor

Core hole in rigid floor	
Floor thickness	≥ 150 mm
Annular gap width	≤ 20 mm
Annular gap depth	≥ 15 mm
Backfilling	Class A1 acc. to EN 13501-1 (Stone wool, ceramic wool,…), melting point ≥ 1000°C
Density backfilling	≥ 40 kg/m³

Electrical installation	Classification in floor
Sheathed single cables ≤ 4 x 10 mm² (H07RN-F 4 G 10 SW or equal products)	EI 120
Sheathed single cables ≤ 3 x 150 mm² (N2XSEY or equal products)	EI 120
Cable bundle with 26 pieces of sheathed single cables ≤ 5 x 1,5 mm² (H07RN-F or equal products)	EI 120
Cable bundle with 20 pieces of sheathed single cables ≤ 2 x 0,6 mm² (telecommunication,... or equal products)	EI 120
Cable bundle Ø ≤ 90 mm of sheathed cables ≤ 3 x 1,5 mm² (NYY-O or equal products)	EI 120
All sheathed cable types: Ø ≤ 21 mm (telecommunication,... or equal products)	EI 120
Tied cable bundle: Ø ≤ 100 mm, made of sheathed cables with a max. diameter: 21 mm	EI 120
Blank penetration seal: Ø ≤ 200 mm (max. seal size 0,03 m²)	EI 120

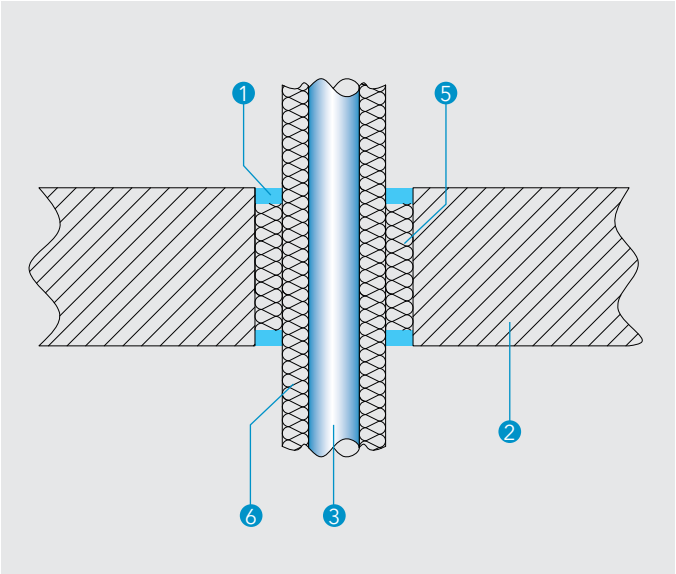


Detail F – Annular gap closure for steel pipes with non-combustible insulation

Detail F – Annular gap closure for steel pipes with non-combustible insulation

Core hole in rigid wall	
Wall thickness	≥ 150 mm
Annular gap width	≤ 20 mm
Annular gap depth	≥ 15 mm
Backfilling	Class A1 acc. to EN 13501-1 (Stone wool, ceramic wool,…), melting point ≥ 1000°C
Density backfilling	≥ 40 kg/m³
Steel pipes (pipe end U/C)	Pipe diameter ≥ 50 mm and ≤ 106 mm Pipe wall thickness ≥ 2 mm and ≤ 14,2 mm
Insulation case	CS (acc. to EN 1366-3)
Insulation thickness	30 mm
Insulation density	40 kg/m³
Insulation	Minimum class A2-s1, d0, $A2_L$-s1, d0 acc. to EN 13501-1 (Stone wool, ceramic wool,…), melting point ≥ 1000°C

Build in situation	Classification in wall
Annular gap sealing with PROMASEAL®-A on both sides with the upper general conditions	EI 120-U/C

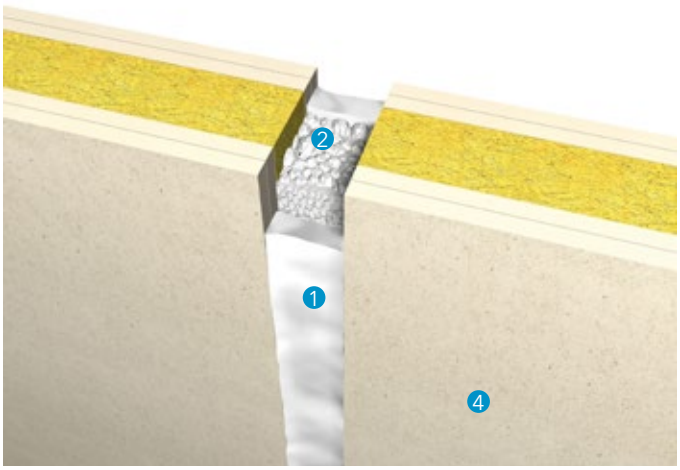


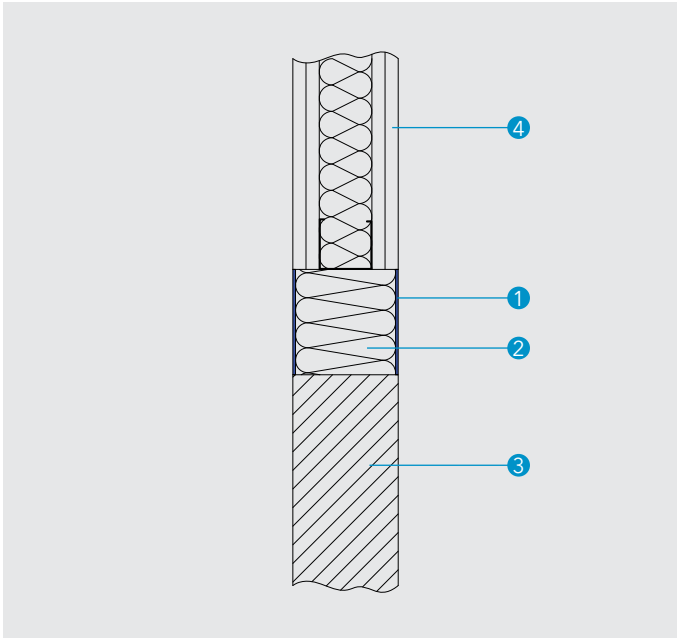
Detail G – Annular gap closure for steel pipes with non-combustible insulation in rigid floor

Detail G – Annular gap closure for steel pipes with non-combustible insulation in rigid floor

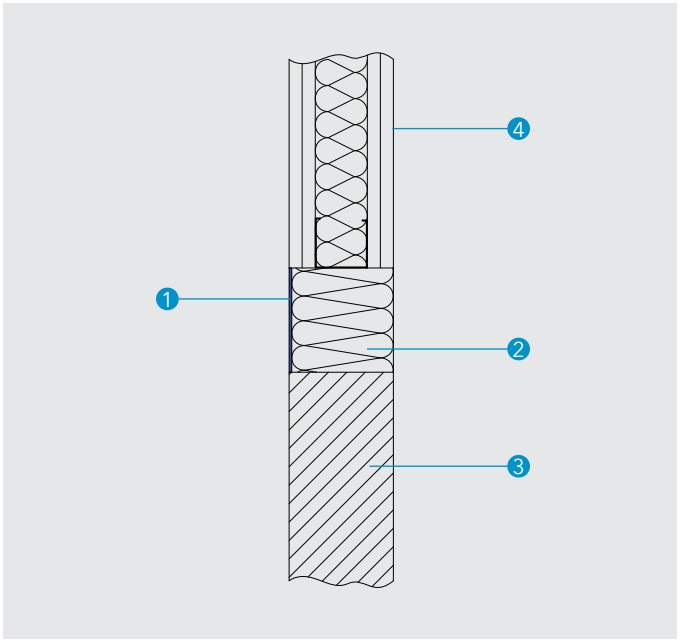
Core hole in rigid floor	
Floor thickness	≥ 150 mm
Annular gap width	≤ 20 mm
Annular gap depth	≥ 15 mm
Backfilling	Class A1 acc. to EN 13501-1 (Stone wool, ceramic wool,…), melting point ≥ 1000°C
Density backfilling	≥ 40 kg/m³
Steel pipes (pipe end U/C)	Pipe diameter ≥ 50 mm and ≤ 106 mm Pipe wall thickness ≥ 2 mm and ≤ 14,2 mm
Insulation case	CS (acc. to EN 1366-3)
Insulation thickness	30 mm
Insulation density	40 kg/m³
Insulation	Minimum class A2-s1, d0, $A2_L$-s1, d0 acc. to EN 13501-1 (Stone wool, ceramic wool,…), melting point ≥ 1000°C

Build in situation	Classification in floor
Annular gap sealing with PROMASEAL®-A on the upper and lower side with the upper general conditions	EI 120-U/C





Detail A – Linear joint seal in flexible wall and rigid wall two-sided



Detail B – Linear joint seal in flexible wall and rigid wall – backfilling on the unexposed side

Technical data

1. PROMASEAL®-A
2. Backfilling material
3. Rigid wall and floor
4. Flexible wall

Certificate: ETA-14/0108

Advantages:

- Approved with combustible backfilling material
- Good adhesion
- Overpaintable

Installation manual

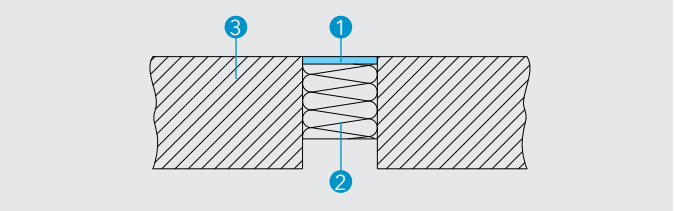
- Absorbent substrates shall be pre-wetted with water
- Apply backfilling material (stone wool or combustible insulation)
- Put the sealant into the opening (pay attention to edge adhesion)
- Smooth the sealant surface
- After 24 hours overpainting is possible, adhesion has to be checked separately
- Affix the identification label

Table 1 – Theoretical consumption for each 310 ml cartridge

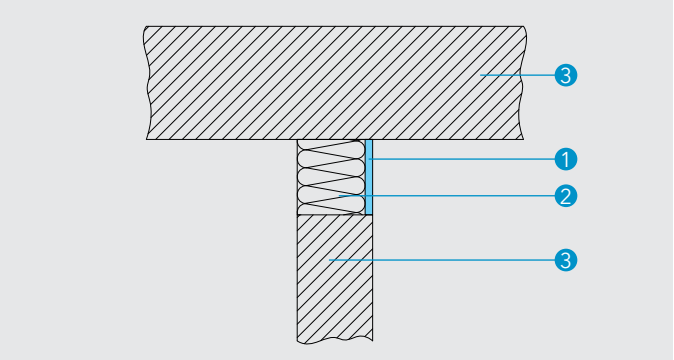
Joint width	10 mm	15 mm	20 mm	25 mm	30 mm	40 mm	50 mm
Joint depth							
10 mm	3,1 m	2,0 m	1,5 m	1,2 m	1,0 m	0,8 m	0,6 m
15 mm	2,0 m	1,3 m	1,0 m	0,8 m	0,6 m	0,5 m	0,4 m
20 mm	1,5 m	1,0 m	0,7 m	0,6 m	0,5 m	0,4 m	0,3 m

Flexible wall and rigid wall

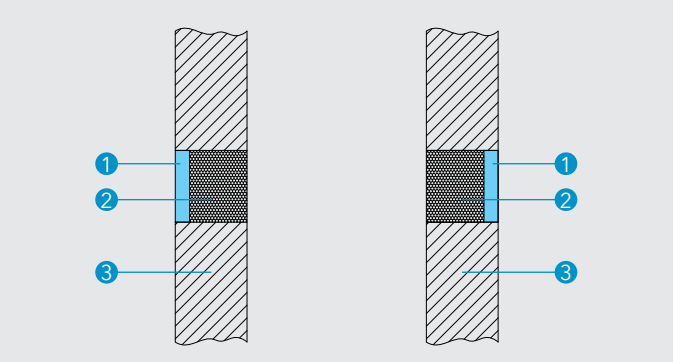
Detail	A/B
Wall thickness	≥ 100 mm
Density rigid wall	≥ 450 kg/m³
Joint width	≥ 5 ≤ 100 mm
Sealant depth	≥ 2,5 mm
Backfilling	MSZ EN 13501-1 szerint A1 tűzvédelmi osztály (kőzetgyapot, kerámiagyapot…), olvadáspont ≥ 1000°C
Density backfilling	≥ 40 kg/m³
Joint movement in %	7,5
Two-sided joint filling with 2,5 mm PROMASEAL®-A on the backfilling, Detail A: (vertical joint seal in vertical supporting construction) **EI 90 – V – M 7,5 – F – W 5 to 100**	
One-sided joint filling with 5 mm PROMASEAL®-A on the backfilling, Detail B: (vertical joint seal in vertical supporting construction) **EI 90 – V – M 7,5 – F – W 5 to 100**	
Two-sided joint filling with 5 mm PROMASEAL®-A on the backfilling (backfilling exposed side), Detail A: (vertical joint seal in vertical supporting construction) **EI 120 – V – M 7,5 – F – W 5 to 100**	
One-sided joint filling 10 mm PROMASEAL®-A on the backfilling (backfilling unexposed side), Detail B: (vertical joint seal in vertical supporting construction) **EI 120 – V – M 7,5 – F – W 5 to 100**	



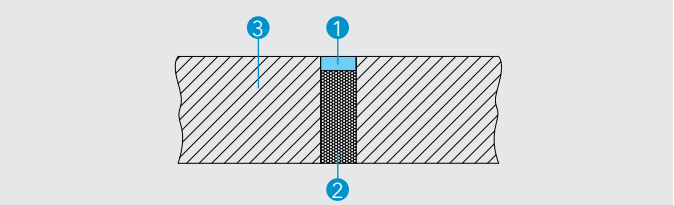
Detail C – Linear joint seal in rigid floor with non-combustible backfilling



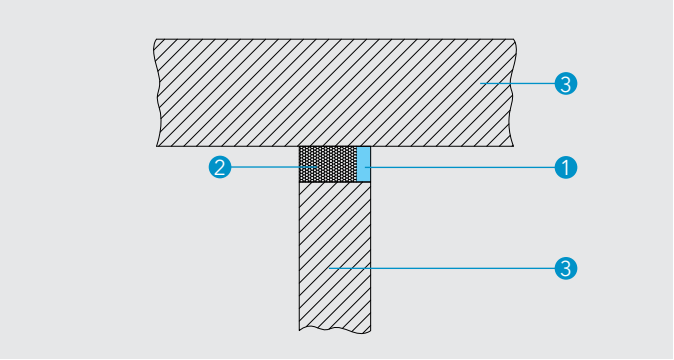
Detail D – Linear joint seal in rigid wall with non-combustible backfilling



Detail E – Linear joint seal in rigid wall with combustible backfilling



Detail F – Linear joint seal in rigid floor with combustible backfilling



Detail G – Linear joint seal in rigid wall with combustible backfilling

Rigid constructions

Detail C/D

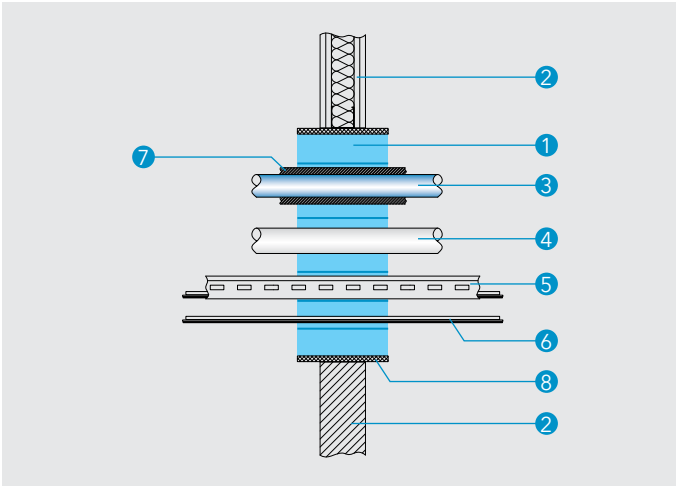
Floor thickness	≥ 150 mm
Density of the floor	≥ 450 kg/m³
Joint width	≥ 5 ≤ 100 mm
Sealant depth	≥ 10 mm
Backfilling	Class A1 acc. to EN 13501-1 (Stone wool, ceramic wool,…), melting point ≥ 1000°C
Density backfilling	≥ 40 kg/m³
Joint movement in %	7,5
One-sided joint filling with 10 mm PROMASEAL®-A on the backfilling (backfilling unexposed side), Detail C: (horizontal joint seal in horizontal supporting construction) **EI 120 – H – M 7,5 – F – W 5 to 100**	
One-sided joint filling with 10 mm PROMASEAL®-A on the backfilling, Detail D: (horizontal joint seal in a wall, abutting a floor, ceiling or roof) **EI 120 – T – M 7,5 – F – W 5 to 100**	

Detail E

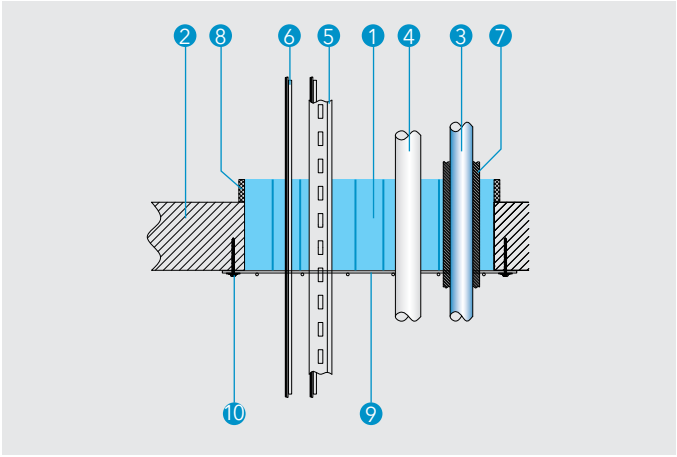
Wall thickness	≥ 100 mm
Density rigid wall	≥ 450 kg/m³
Joint width	≥ 5 ≤ 100 mm
Sealant depth	≥ 20 mm
Backfilling	Class E acc. to EN 13501-1 (e.g.: EPS)
One-sided joint filling with 20 mm PROMASEAL®-A on the backfilling, Detail E: (vertical joint seal in vertical supporting construction) **EI 90 – V – M 7,5 – F – W 5 to 100**	

Detail F/G

Floor thickness	≥ 150 mm
Density of the floor	≥ 450 kg/m³
Joint width	≥ 5 ≤ 100 mm
Sealant depth	≥ 20 mm
Backfilling	Class E acc. to EN 13501-1 (e.g.: EPS)
One-sided joint filling with 20 mm PROMASEAL®-A on the backfilling, Detail F: (horizontal joint seal in horizontal supporting construction) **EI 90 – H – M 7,5 – F – W 5 to 50**	
One-sided joint filling with 20 mm PROMASEAL®-A on the backfilling, Detail G: (horizontal joint seal in a wall, abutting a floor, ceiling or roof) **EI 120 – T – M 7,5 – F – W 5 to 50**	



Detail A – Mixed penetration seal in flexible and rigid wall



Detail B – Mixed penetration seal in flexible and rigid floor

Technical data

1. PROMASTOP®-B
2. Supporting construction
3. Metal pipe/non-combustible pipes
4. Plastic pipe
5. Cable tray
6. Cable bundle
7. Combustile insulation / non-combustile insulation
8. Aperture framing
9. Steel mesh
10. Appropriate mouting material
11. Identification label

Certificate: KB 12042725

Advantages:

- Cold smoke proof
- Fast, easy and dry installation
- Fiber-free penetration seal
- Simple, precisely shaping

Installation manual

Steps for penetration seal in the wall

- Create aperture framing of 200 mm
- Apply the bricks such as masonry
- Cut the bricks with a small overmeasure and gently squeeze them into the opening
- Use one-sided PROMASEAL®-AG between cables and cable bundles (not necessary for pipes)
- For the final row, use about 5-7 mm overmeasure of the bricks, squezze them und push them into the remaining opening
- Affix the identification label

Steps for penetration seal in the floor

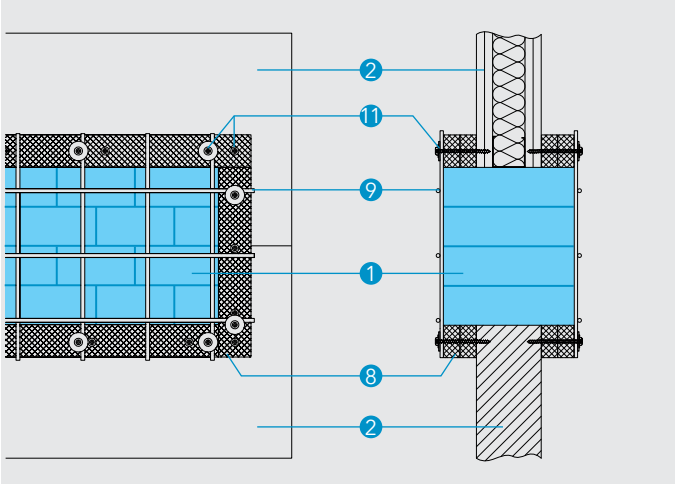
- Place a steel mesh (mesh width ≤ 100 x 100 mm) as installation support and step protection under the floor
- Use one-sided PROMASEAL®-AG between cables and cable bundles
- Cut the bricks with a small overmeasure and gently squeeze them into the opening
- Apply the bricks such as masonry
- For the final row, use about 5-7 mm overmeasure of the blocks, squezze them und push them into the remaining opening
- Affix the identification label

Steel mesh

For building blank seals use the steel mesh on both sides. For horizontal application use additional M8 threaded rods with washers and nuts between the lower and the upper steel mesh.

Table 1 – Build in situation, maximum seal size and classification

Separating element	PROMASTOP®-B 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 penetration seal in flexible wall and rigid wall

Table 1 – Field of application

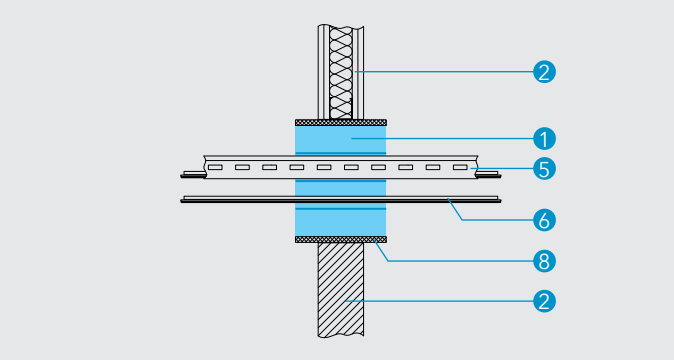
Flexible wall: The wall must be of thickness ≥ 100 mm and be made from wooden or metal studs which are lined on both sides with minimum 2 layers of minimum 12,5 mm thick fire protective boards (other board thicknesses shall be permissible, please note minimum thickness). For timber stud walls, a minimum distance of 100 mm must be kept from each of the wooden stud to the sealing and the cavity between studs and sealing must be filled with a least 100 mm insulation material compliant to class A1 or A2 (in acc. EN 13501-1).

The supporting construction must be classified acc. to EN 13501-2 for the required fire resistance period.

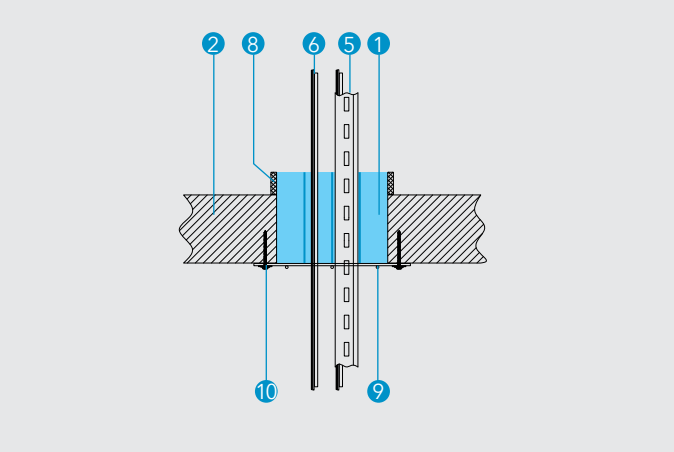
Rigid wall: The wall must have a thickness ≥ 100 mm and a density of ≥ 450 kg/m³.

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

Cable penetration seal with PROMASTOP®-B



Detail D – PROMASTOP®-B penetration seal with cable, cable bundle and cable trays in flexible wall and rigid wall



Detail E – PROMASTOP®-B penetration seal with cable, cable bundle and cable trays in rigid floor

Table 3 – Consumption data

	Cablefilling in %			
Opening - 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

Detail D/E
Cable trays and cable ladders may pass trough the PROMASTOP®-B penetration seal.

The following classifications depends on the orientation of the installation:

Table 2 – Fire resistance class depending on the penetration seal

Electrical installation	Classification depending on the orientation	
	fal	födém
All sheathed cable types Ø ≤ 80 mm ≤ 4 x 185 mm² (H07RN-F or equal products)	E 120 EI 90	E 120 EI 90
Cable bundle Ø ≤ 100 mm	E 120 EI 90	E 120 EI 90
Non sheathed cable types Ø ≤ 26,3 mm ≤ 1 x 185 mm² (H07V-K, H07Z-K, H07G-K or equal products)	E 120 EI 90	E 120 EI 90

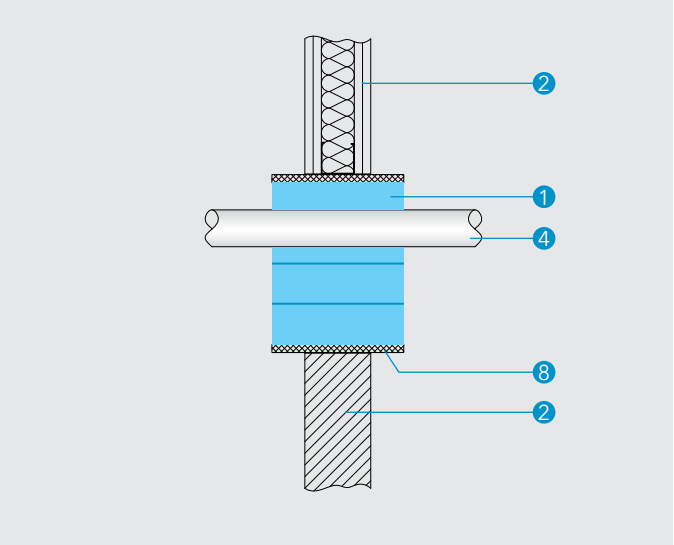
CG... Cable group acc. to EN 1366-3:2009

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

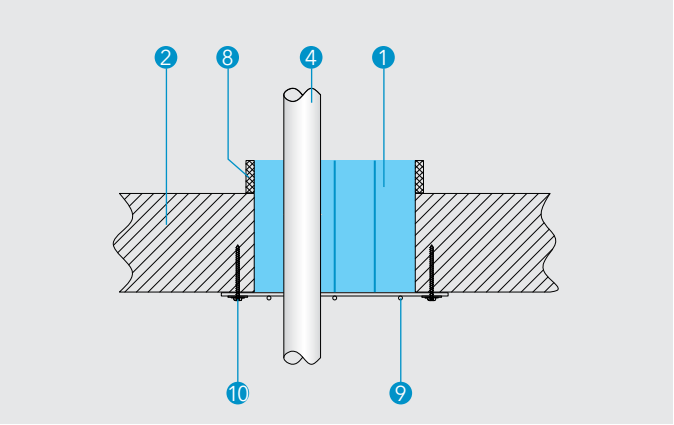
Cable gussets and other joints shall be closed one-sided with PROMASEAL®-AG (flue gas).

Table 3
According to the size of the cables, the amount of PROMASTOP-B fire stop blocks is adapted.

Plastic pipe penetration seal in PROMASTOP®-B fire stopping brick penetration seal



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



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

Detail F/G

Plastic pipes may pass trough the PROMASTOP®-B fire stopping brick seal.

Supporting distance:

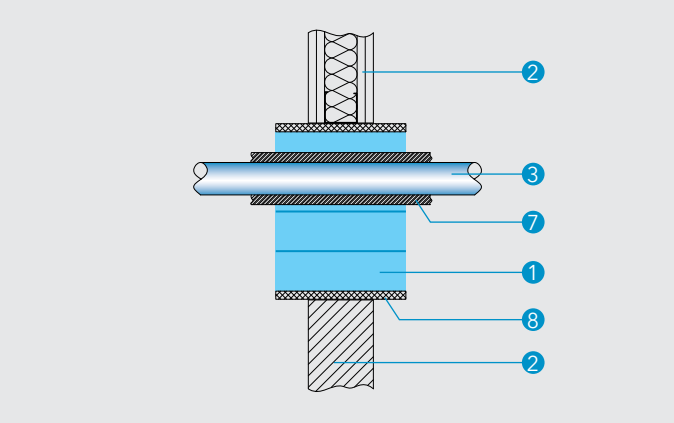
The pipes must be suspended ≤ 250 mm on both sides from walls or on the top of floor constructions.

Table 4 – Overview pipe materials, dimensions, installation situation and classification

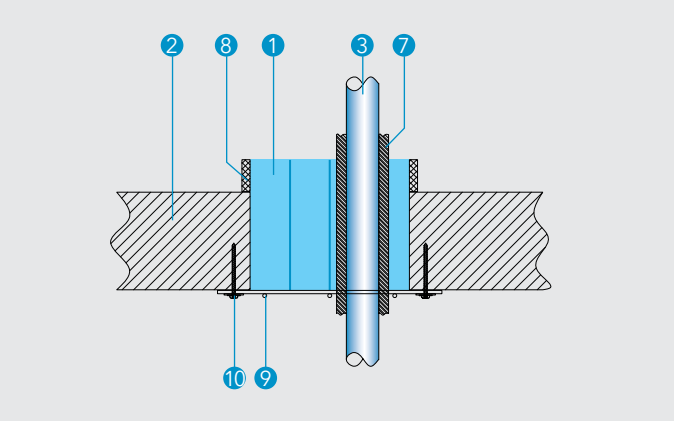
Product type	Dimension range Ø...Pipe diameter s...pipe wall thickness	Orientation D...Floor W...Wall	Classification
PVC pipe	Ø ≤ 50 / s 1,9	D	EI 120-U/U
PVC pipe	Ø 50 ≤ 140 / s 10,3	D	EI 60-U/U
PVC pipe	Ø ≤ 50 / s 1,9	W	EI 120-U/U
PVC pipe	Ø 50 ≤ 140 / s 10,3	W	EI 60-U/U

Dimensions in mm.

Non-combustible pipes with combustible insulations



Detail H – PROMASTOP®-B penetration seal with non-combustible pipe material and combustible insulation in flexible wall and rigid wall



Detail I – PROMASTOP®-B penetration seal with non-combustible pipe material and combustible insulation in rigid floor

Table 8 – Information about the minimum distance

Object	Distance (mm)
Cable, cable bundle – Aperture opening	≥ 10
Cable, cable bundle – Cable tray	≥ 10
Cable tray – Aperture opening	≥ 10
Cable tray – Cable tray	≥ 20
Combustible insulation – Combustible insulation	≥ 100
Combustible insulation – Aperture opening	≥ 80
Between all other installations	≥ 100

Detail H/I, Table 5

Steel and copper pipes (and their substitutes) with combustible insulation (thickness ≤ 32 mm, class B-s3, d0 acc. to EN 13501 or higher rated) can be sealed in conjunction with PROMASTOP®-B fire stopping bricks.

Insulation in CS or CI case acc. to EN 1366-3.

Pipe end configuration:
A test with pipe end configuration U/C covers the pipe end configuration C/C.

Supporting distance:
The pipes must be suspended ≤ 250 mm on both sides from walls or on the top of floor constructions.

Table 5 – Steel pipe, copper pipe

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

Table 6 – Classification depending on the orientation

Steel pipe	Wall	Floor
Pipe diameter Ø ≤ 220 mm Pipe wall thickness s ≤ 18 mm	EI 120-U/C	EI 120-U/C

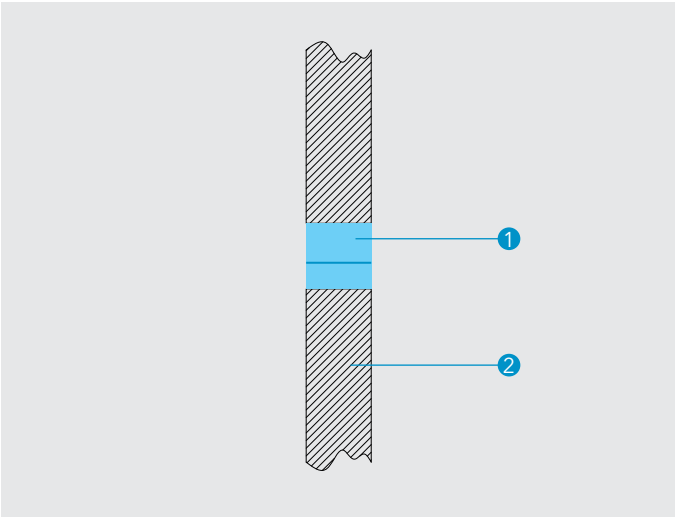
The results are applicable for metal pipes with lower heat conductivity λ ≤ 58 W/mK and a melting point ≥ 1100°C (e.g. stainless steel, cast iron, Nialloys (NiCr, NiMo, NiCu) and Ni.

Table 7 – Classification depending on the orientation

Copper pipe	Wall	Floor
Pipe diameter Ø ≤ 88,9 mm Pipe wall thickness s ≤ 14,2 mm	E 120-U/C EI 90-U/C	E 120-U/C EI 90-U/C

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

Linear joint seal with PROMASTOP®-B



Detail J – Horizontal and vertical joint seal with PROMASTOP®-B

Detail J
Thickness of the rigid wall: ≥ 100 mm
Joint width: > 5 ≤ 100 mm
Joint thickness: ≥ 100 mm

Vertical joint seal in rigid wall

EI 180 – V – M 7,5 – B – W 5 - 100

Horizontal joint seal in rigid wall

EI 180 – T – M 7,5 – B – W 5 - 100

Notes

Notes

Notes

Promat

Slovenia, SEE Management
Promat d.o.o.
Kidričeva 56b
4220 Škofja Loka
T + 386 4 51 51 451
F + 385 4 51 51 450
E info@promat-see.com
www.promat-see.com

Romania
Branch office of Promat d.o.o. Slovenia
Str. Vulturilor Nr. 98, 5th Floor
030857 Bucharest
T +40 31 224 01 00
F +40 31 224 01 01
E info.ro@promat-see.com
www.promat-see.com

Bulgaria
Branch office of Promat d.o.o. Slovenia
Aleksandar Zhendov 6
1113 Sofia
M +359 888 14 38 85
M +359 878 81 51 05
E info.bg@promat-see.com
www.promat-see.com

Serbia, Macedonia, Montenegro, Kosovo
Branch office of Promat d.o.o. Slovenia
Kopaonička 18
18000 Niš
T +381 18 4 530 297
M +381 64 61 39 763
F +381 18 4 230 570
E info.rs@promat-see.com
www.promat-see.com

Croatia, Bosnia and Herzegovina
Branch office of Promat d.o.o. Slovenia
Samoborska 91
10090 Zagreb
T +385 1 349 63 24
F +385 1 379 41 54
E info.hr@promat-see.com
www.promat-see.com

Slovakia
Branch office of Promat d.o.o. Slovenia
Pražská 2
949 11 Nitra
T +421 377 729 165
E info.sk@promat-see.com
www.promat-see.com

Hungary
Branch office of Promat d.o.o. Slovenia
Pirosrózsa u. 32.
1163 Budapest
T +36 1 317 58 91
E info.hu@promat-see.com
www.promat-see.com

FSCB SEE / 2016-05