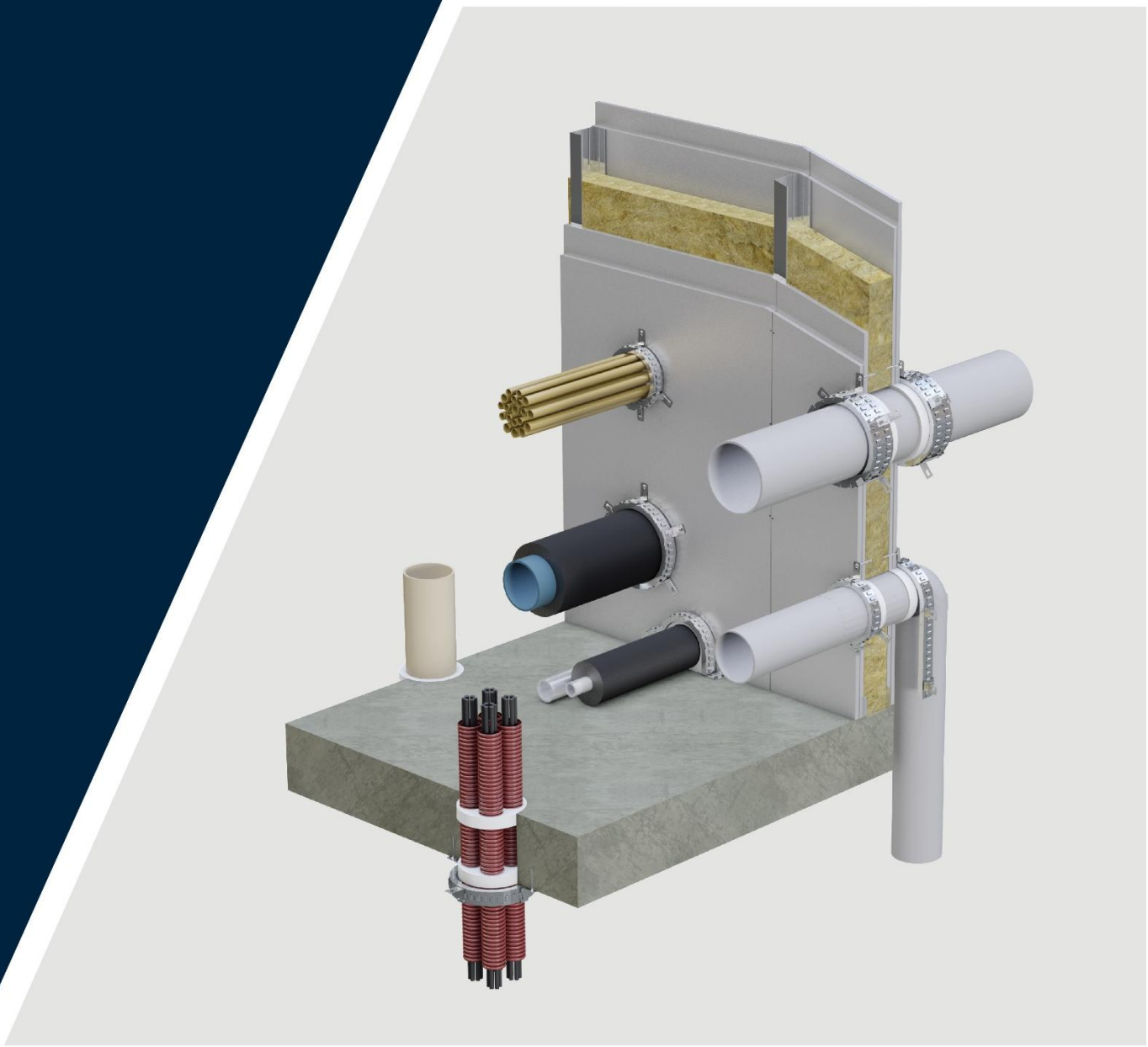
FIRESAFE / FSC

Universal Firestop Collar for Penetration Seals

Technical Hand Book

FIRESAFE /

Date: 30/07/2025
Prepared by: Pål Paulsen
Checked by: Hallvard K Engøy
Rev.: 01



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FIRESAFE / FSC

FIRESAFE / FIRE PROTECTION

Product documentation: ETA No: 25/0232 Penetration Seals
UL International (Netherlands) B.V
DoP.: FS/PP/FSC - 30/07/2025

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PRODUCT DESCRIPTION

FIRESAFE / FSC is a Universal Firestop Collar. **ALL IN ONE PRODUCT.**
FIRESAFE / FSC er 30 mm tall firestop collar provided as a rolled up band with connected stainless steel links. It has a length of 2610 mm and can easily be divided into 174 sections.
FSC has an internal heat-expanding coating made from a high-quality graphite material.
The roll of FSC firestop collar can easily be divided up to customise it for precise pipe diameters.
FIRESAFE / FSC expands when exposed to heat, creating a fireproof and smokeproof barrier to adjacent rooms.

Fire resistance
≤ 120 minutes

Pipe diameter
≤ (d) Ø 315 mm

Lifespan
25 years

ALL IN ONE
Product

PROPERTIES
✓ All IN ONE Product
✓ Pipe diameter ≤ (d) Ø 315 mm
✓ Fire resistance ≤ EI 120
✓ CE marked
✓ Tested in accordance with NS EN 1366-3
✓ Quick and easy installation
✓ A product for all areas of use
✓ One type of fixing
✓ Resistant to moisture, mould, and bacteria
✓ Made from stainless steel
✓ Product lifespan at least 25 years

AREA OF USE
✓ Insulated and non-insulated pipes, electrical installations
✓ Masonry and cast wall constructions, density ≥ 350 kg/m³
✓ Masonry and cast wall constructions, density ≥ 400 kg/m³
✓ Insulated and non-insulated plaster walls ≥ 100 mm
✓ CLT (cross-laminated timber constructions) walls ≥ 100 mm
✓ CLT (cross-laminated timber constructions) floors ≥ 140 mm
✓ Sandwich panel walls ≥ 100 mm
✓ Shaft walls ≥ 30 mm
✓ In combination with FIRESAFE FSB1 and FSB2 Boards
✓ In combination with the FIRESAFE GPG MORTAR System
✓ In combination with FIRESAFE / FSA Firestop Acrylic

FIRESAFE / FIRE PROTECTION

Packaging:

FIRESAFE / FSC	Dimensions	Box inner	Box outer	Pallet	Item no.
Roll (174 sections)	2610 x 30 x 12 mm	1 pc.	8 pcs.	384 pcs.	100.207

Accessories included in box	✓ 20 pcs. Multiclips, 30 mm	✓ 20 pc. Multiscrews 7.5 x 40 mm	✓ 1 pc. Multibits T30

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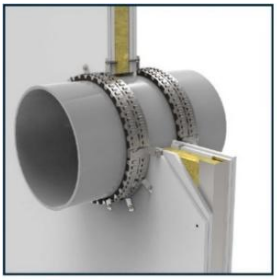
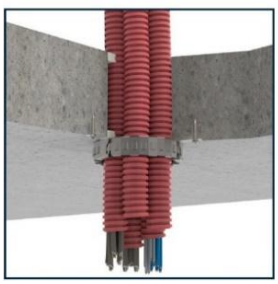
Technical data

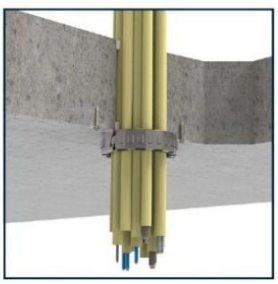
FIRESAFE / FSC	EAN code 7070800102405
Condition	Ready to use, universal firestop collar
Colour	Stainless steel colour + anthracite internal coating
Shelf life	No expiry date in unopened packaging at temperatures between +5°C and +50°C
Storage temperature during transport	-5 °C to +50 °C
Temperature during application	+5 °C to +50 °C
Permanent temperature resistance	-20 °C to +80 °C (after complete curing)
Specific gravity	p = 900 kg/m³ to 1350 kg/m³
Expansion pressure	0.8 N/mm² to 1.8 N/mm² (at +300 °C)
Usage category[1)]	Type Z_1 in accordance with EAD 350454-00-1104.
Expansion temperature	Approx. +180 °C
Expansion factor[2)]	6.5 x up to 18.5
Can be installed from 1 side	Yes, see ETA 25/0232
Smoke resistance	Tested in accordance with NEN 6075 (Smoke resistance)
Reaction to fire	Class E in accordance with EN 13501-1
Certification / fire resistance	Classification in accordance with EN 13501-1/2
European approvals	ETA 25/0232. Penetration Seals
Test standards	Tested in accordance with EN 1366-3. Penetration Seals
Fire seal product in combination with FSC for smaller openings	Firesafe / FSA Firestop Acrylic or gypsum-based fire stopping mortar
Fire seal product in combination with FSC for larger openings	Firesafe / FSA Firestop Board or gypsum-based fire stopping mortar
Product lifespan	Minimum 25 years

[1)]**Permitted environmental conditions** Duct sealant for use in conditions with > 85% RH, with protection against temperatures below 0 °C, and with no exposure to rain or UV (TR 024:2019, type Z_1). Tolerates limited contact with water spray. Continuous moisture, standing water, and water pressure must be avoided.

[2)] **Expansion factor** Tested on samples at +450 °C for 25 minutes of overloading. The expansion factor is a laboratory value. The expansion factor after installation depends on the actual conditions.





2. Installation instructions

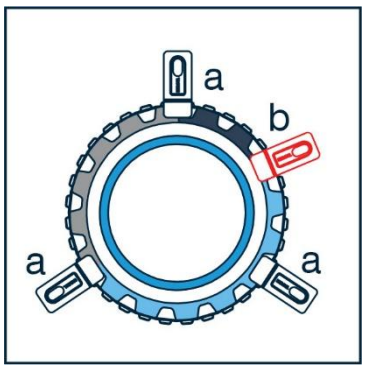
Installation of FIRESAFE / FSC

FIRESAFE / FSC is a Universal Firestop Collar that can be installed on different surfaces through the use of tested multiclips, multiscrews, and FSB multiscrews.
For installation on stone surfaces, the multiscrews must be drilled in advance. The table below shows an overview of the fastening methods that can be used.

Construction	Surface	Fastening method		Pre-drilled holes required
		Multiscrews 7.5 x 40 mm	Multiscrews FB 40 mm	
Walls	Concrete	✓		≤ Ø 6 mm
	Masonry			
	Calcium silicate			Not needed
	Aerated concrete			
	Plaster board			
Floor	Concrete			≤ Ø 6 mm
	Calcium silicate			Not needed
FIRESAFE / FSB	Firestop board, rock wool board with FSP fire paint.		✓	

Re-using sections
The remaining sections of the FSC Firestop Collar roll can easily be linked together using the included Multiclip links, allowing you to get the most out of the product. FIRESAFE / FSC consists of a total of 174 sections that can be re-used after cutting/breaking to create a new firestop collar. At least 2 FSC sections are needed to properly fix the Multiclips. A "compound" fire collar may include no more than 3 joints using the Multiclips (joining clip). See figure **A** for a general overview.

Figure A
a: Multiclip
b: Multiclip (joining clip)



Installation guide for FSC Fire Collar

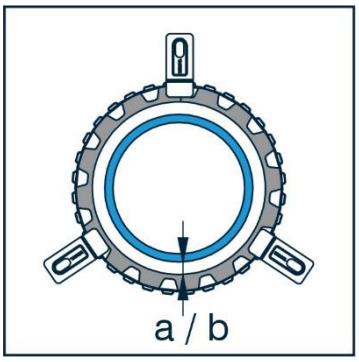
The FSC fire collar must be installed using the included Multiclips.
The following principles apply in order to comply with the documented, fire-tested solution:

- ✓ The Multiclips must be distributed as evenly as possible around the FSC fire collar
- ✓ There may be a maximum of 11 sections between Multiclip "**a**" as shown in figure **A**.
- ✓ Extra Multiclips can be used, as shown by Multiclip "**b**" in figure **A**.
- ✓ Do not use fewer Multiclips than the specified number.

Maximum distance between installation penetration and FIRESAFE/ FSC Fire Collar

The table below shows the maximum distance between the penetration, with or without pipe insulation, and the FSC Fire Collar.
See figure **B** for proper installation.

Figure B
Maximum distance between the pipe and the internal FSC Fire Collar.



Distance between pipes with or without pipe insulation and internal FSC Fire Collar	
"a" Distance between the pipe and the internal FSC, pipe diameter Ø ≤ 125 [mm]	≤ 15 [mm]
"b" Distance between the pipe and the internal FSC, pipe diameter Ø > 125 [mm]	≤ 5 [mm]

"a" The distance between the internal FSC and the pipe/pipe insulation may be ≤ 15 [mm] when the outer diameter of the pipe/pipe insulation is Ø ≤ 125 mm.

"a" The opening between the pipe and the construction is fireproofed using FIRESAFE / FSA.

"b" The distance between the internal FSC the and pipe/pipe insulation may be ≤ 5 [mm] when the outer diameter of the pipe/pipe insulation is Ø > 125 mm.
"b" The opening between the pipe and the construction is fireproofed using FIRESAFE / FSA.

Use of single and double FSC Fire Collar

The FSC Fire Collar can be used in single or double applications. When using a double application, the Multiclip extensions (Large) must be used.
See figures **C** and **D** for a schematic overview. The table below shows how many Multiclips are needed for single and double application.

Ø Outer diameter for pipes, ducts, cables, or insulation (mm)	Single FSC Fire Collar No. of Multiclips	Double FSC Fire Collar	
		First FSC Fire Collar layer (No. of Multiclips, A)	Second FSC Fire Collar layer (No. of Multiclips, B)
≤ 90	2	1[(a)]	2
> 90 to ≤ 160	3	1[(a)]	3
≥ 160 to ≤ 200	4	1[(a)]	4
>200 to ≤ 285	5	2	5
> 285 to ≤ 315	6	2	6

[(a)] Mechanical fastening to construction is not needed.

Figure C
a: Multiclip
b: Multiclip Large

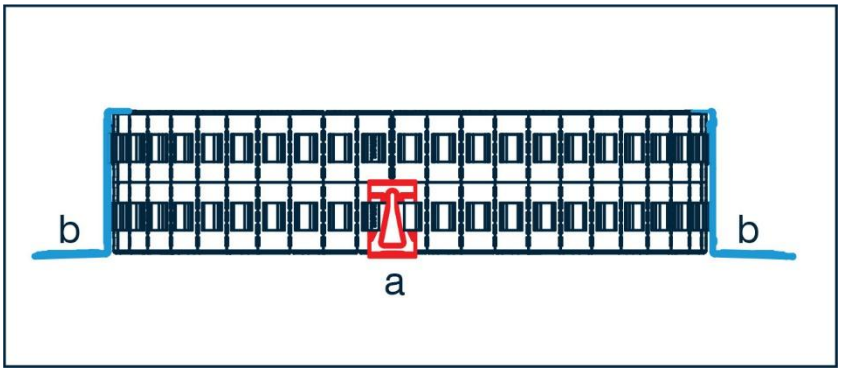
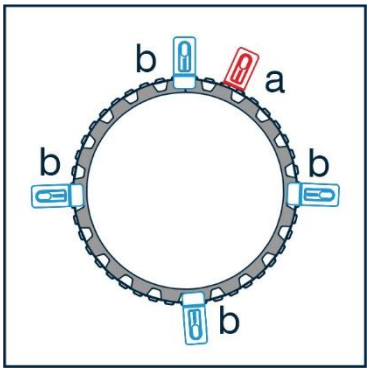


Figure D
a: Multiclip
b: Multiclip Large



3. Explanation for special areas of use

Pipe penetrations with zero distance to construction (U shape)

For plastic pipes with a short distance to the construction (≤ 30 mm) through plaster walls, masonry cast walls or floors, the FIRESAFE/ FSC Fire Collar must be extended by 15 sections; see figure **1.** The starting point is the diameter of the pipe regardless of whether it is fitted with a dampening acoustic insulation, see figure **3**. With this type of penetration, the increase in pipe diameters via joints such as sliding flaps, etc. must be taken into account. The ends of the stainless steel belt must have a 90° bend for this solution to function properly, see figure **2**. The distance between each Multiclip in the bend must not exceed 15 sections, see figure **4**.

Ø Outer diameter for pipes [mm]	No. of FSC sections
40	30
50	32
56	33
63	34
70	36
75	37
80	38
90	40
100	42
110	44

Figure 1

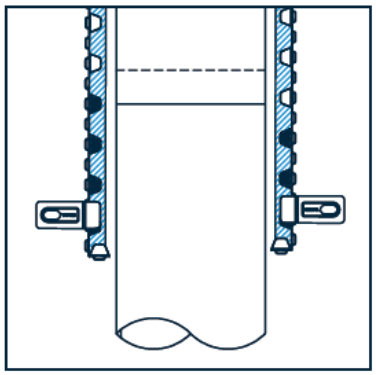


Figure 2

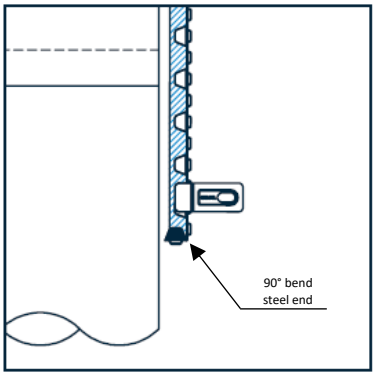


Figure 3

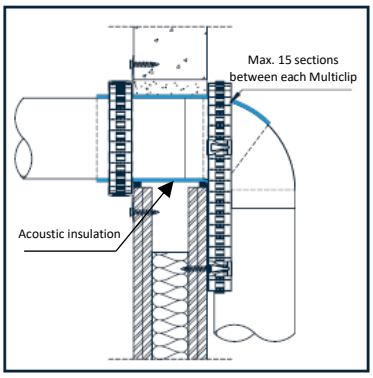
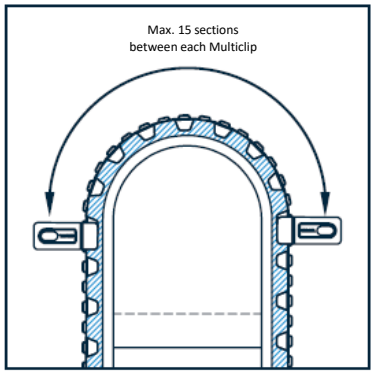


Figure 4



Straight pipes with "zero" distance to floor

Pipes installed above the floor with a gap ($S^2 \leq 5$ mm) can be fitted with a ¾ FSC Fire Collar with a maximum diameter of Ø 125 mm.
See figures **5, 6,** and **7** for tested pipe configurations.

Figure 5
S^2: Distance to construction ≤ 5 mm

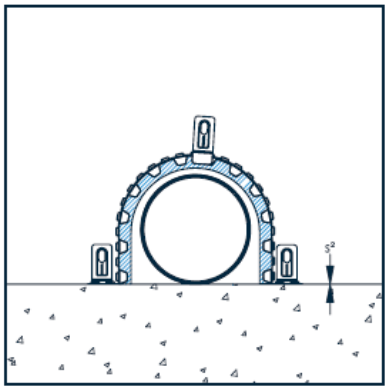


Figure 6
S^2: Distance to construction ≤ 5 mm

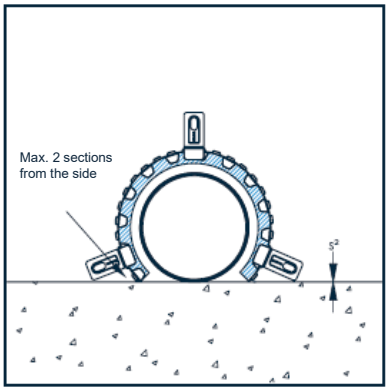
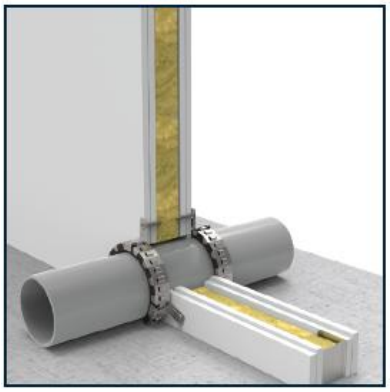


Figure 7



Angled pipes ≥ 45°- 90°

Pipes fed through with angles from 45° to 90° (see figures **8, 9** and **10**) can be used in plaster walls as well as masonry cast walls and floors. Pipes can be fitted with sound-dampening or acoustic insulation. See the table "**Permitted insulation materials**" on page **31** for more information.

Figure 8

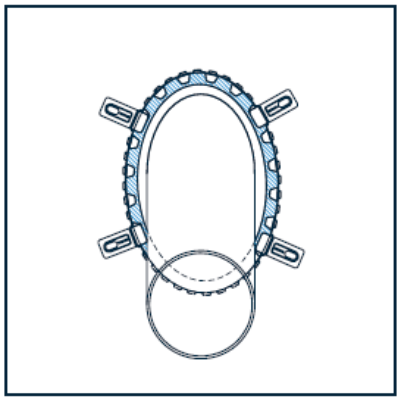


Figure 9

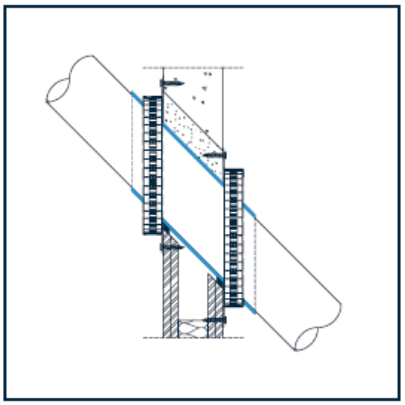
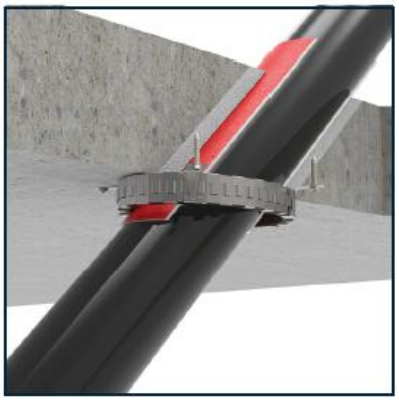


Figure 10



Solutions for wall and floor corners

Pipes located along light partition walls, solid walls, or floors with short distances may be fitted with a ¾ FSC Fire Collar up to maximum diameter of Ø125 mm. For tested pipe configurations, see figures **11, 12, 13** and **14.**

Figure 11
S^1: Distance to construction ≤ 5 mm
S^2: Distance to construction ≤ 5 mm

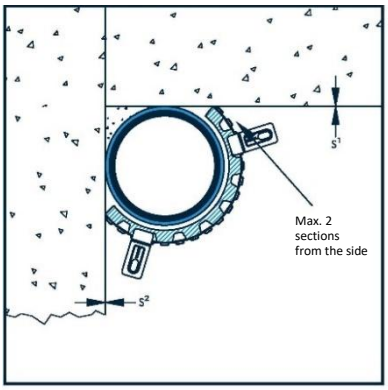


Figure 12

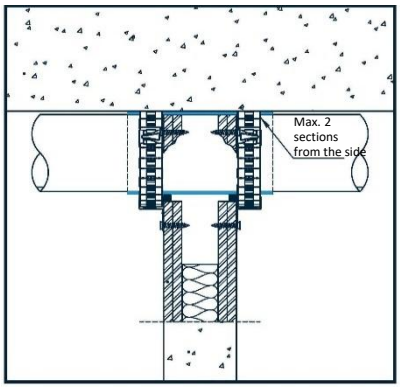


Figure 13
S^1: Distance to construction ≤ 5 mm
S^2: Distance to construction ≤ 5 mm

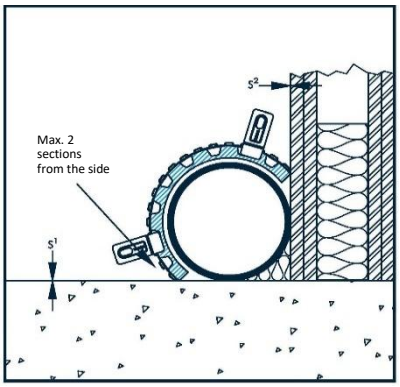
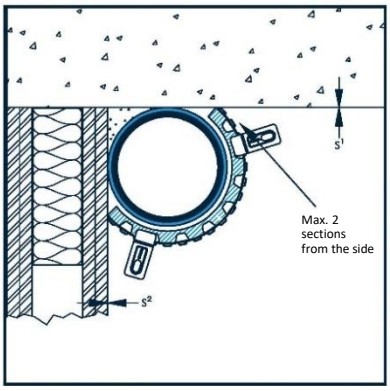


Figure 14
S^1: Distance to construction ≤ 5 mm
S^2: Distance to construction ≤ 5 mm



Multiple penetrations

With the FIRESAFE / FSC Fire Collar, there can be multiple pipes in the same recess, also in combination with electrical cables.
A single FIRESAFE / FSC Fire Collar can be used where there are multiple penetrations in the same recess in light partitions or masonry cast constructions, see figures **15** and **16**. In some cases, a double FSC Fire Collar must be used instead. See figure **17.**

Figure 15
S^1: Maximum gap size ≤ 15 mm
S^2: Distance to construction ≥ 0 mm

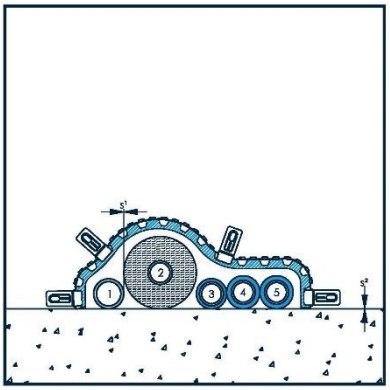


Figure 16

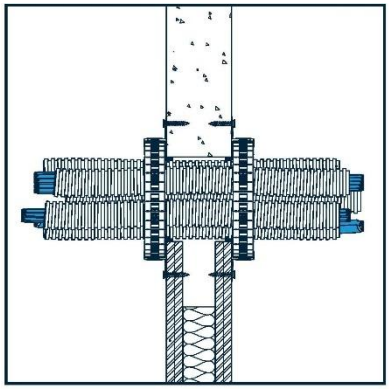
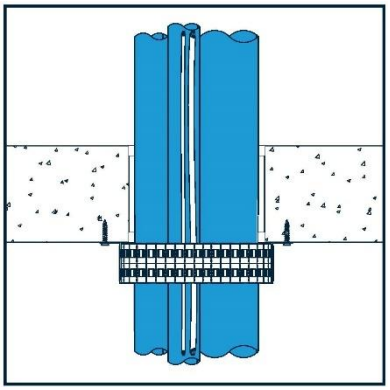


Figure 17



4. Service support - suspension systems and distances

Wall figure a: The distance to the nearest or first service support for all types of technical installations may be ≤ 450 mm from the fire partition.

Floor figure b: The distance to the nearest or first service support for all types of technical installations may be ≤ 450 mm from the fire partition.

Figure a.

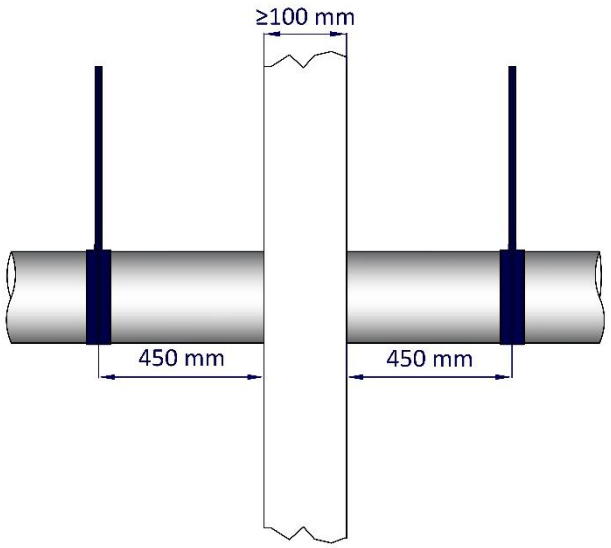
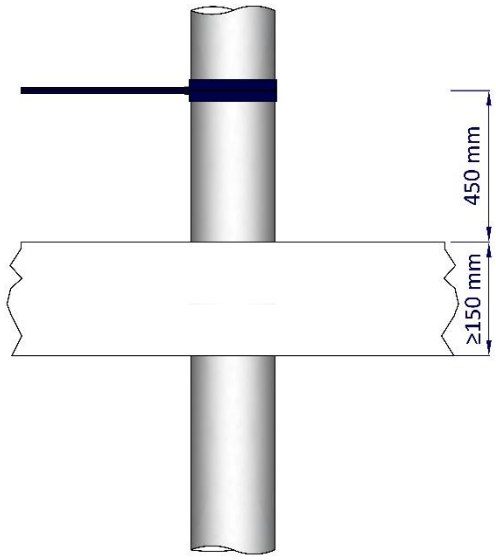


Figure b.



5. Fire sealing for openings in plaster walls and masonry cast walls and floors

Fire sealing for openings around pipes in masonry cast wall constructions

The minimum thickness for walls is 100 mm, and the wall must consist of concrete, aerated concrete, or masonry with a density of at least 350 kg/m³.

Openings around pipe penetrations, with or without insulation, require fire sealing with fire-resistant joints to block smoke and hot gases. FIRESAFE / FSA or gypsum-based fire sealing mortar, depending on the width of the opening.

The fire-rated sealant FIRESAFE / FSA can be applied without a backing material. For further information, see ETA 25/0232.

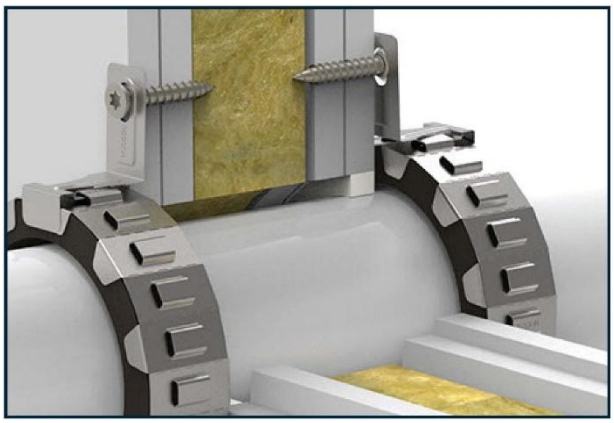
Permitted fire sealing materials for openings around pipe penetrations	
Gypsum-based fire sealant in accordance with (EN 13501-1: Fire resistance A1)	FIRESAFE / FSA Firestop Acrylic
Joint width: ≥ 10 mm	Joint width: ≤ 20 mm
Depth: Continuous throughout wall thickness	Depth: ≥ 10 mm on both sides of the wall

Fire sealing for openings around pipes in insulated or non-insulated plaster walls

The minimum thickness for walls must be 100 mm, and the wall must consist of steel or wood studs* with at least 2 layers of cladding on each side, with a minimum thickness of 12.5 mm.

* When timber studs are used, there must be a distance of at least 100 mm from each part of the penetration joint to the three studs, and the aperture between the penetration joint and the studs must be covered. The gap between the pipe penetration and the timber studs must be fitted with at least 100 mm of insulation with fire classification A1 or A2 (in accordance with EN 13501-1).

Openings around pipe penetrations, with or without insulation, require fire sealing with fire-resistant joints to block smoke and hot gases. FIRESAFE / FSA should be used for this purpose. The fire-rated sealant FIRESAFE / FSA can be applied without a backing material.
For further information, see ETA 25/0233.



Permitted fire sealing materials for openings around pipe penetrations
FIRESAFE / FSA Firestop Acrylic
Joint width: ≤ 20 mm
Depth: ≥ 10 mm on both sides of the wall

Fire sealing for openings around pipes in masonry cast floor constructions

The minimum thickness for floors is 150 mm, and the wall must consist of concrete or aerated concrete with a density of at least 350 kg/m^3.

Openings around pipe penetrations, with or without insulation, require fire sealing with fire-resistant joints to block smoke and hot gases. FIRESAFE / FSA or gypsum-based fire-rated sealant, depending on the width of the opening.

The fireproof sealant FIRESAFE / FSA can be applied without a backing material.
For further information, see ETA 25/0232.

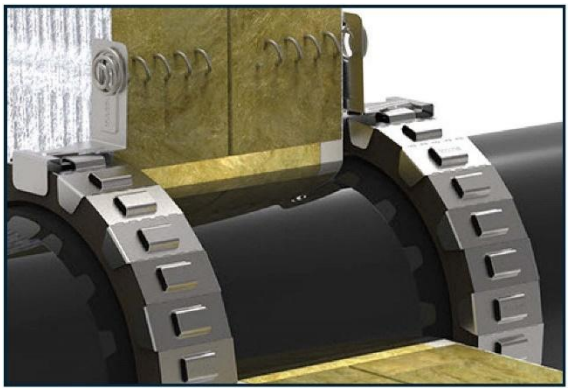
Permitted fire sealing materials for openings around pipe penetrations	
Gypsum-based fire sealant in accordance with (EN 13501-1: Fire resistance A1)	FIRESAFE / FSA Firestop Acrylic
Joint width: ≥ 10 mm	Joint width: ≤ 20 mm
Depth: Continuous throughout floor thickness	Depth: ≥ 10 mm on both sides of the wall

Fire sealing for openings around plaster walls in combination with FIRESAFE / FSB

FIRESAFE / FSB Firestop Board can be used as part of a combination in plaster walls, masonry cast walls and floors.

Fire separating constructions must have a thickness of at least 100 mm. Openings around pipe penetrations, with or without insulation, require fire sealing using fireproof sealant to block smoke and hot gases. FIRESAFE / FSA should be used for this purpose.

The fireproof sealant FIRESAFE / FSA can be applied without a backing material. For further information, see ETA 25/0232.



Permitted filling materials for joint seals around pipe penetrations
FIRESAFE / FSA Firestop Acrylic
Joint width: ≤ 20 mm
Depth: ≥ 10 mm on both sides of the wall

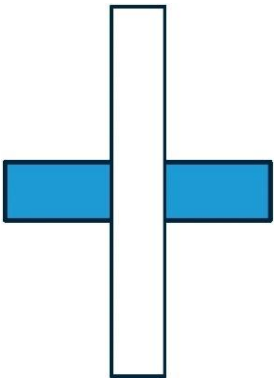
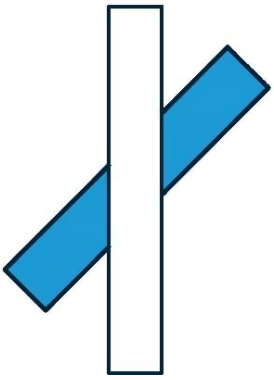
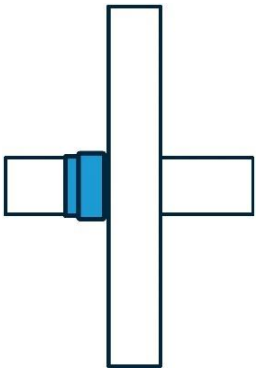
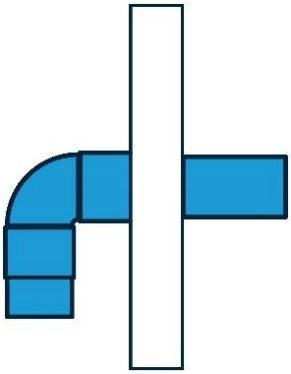
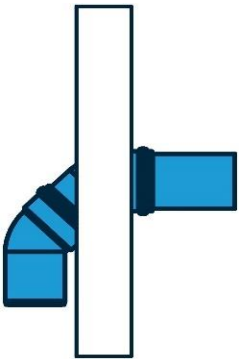
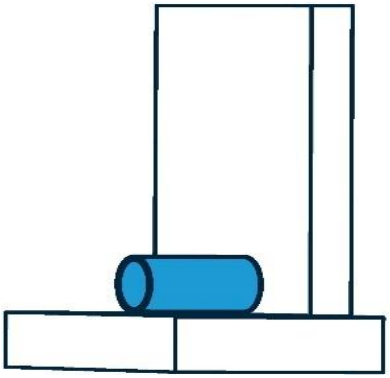
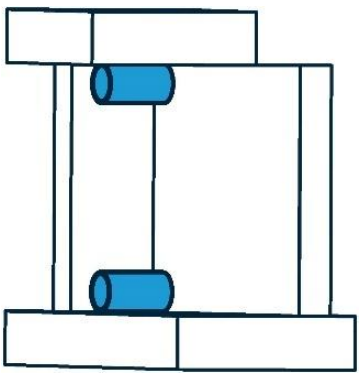
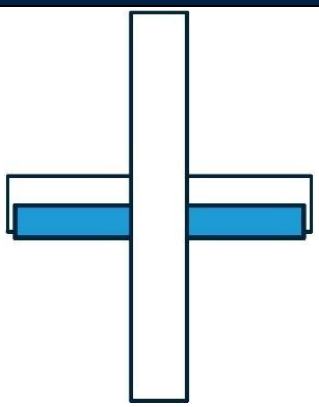
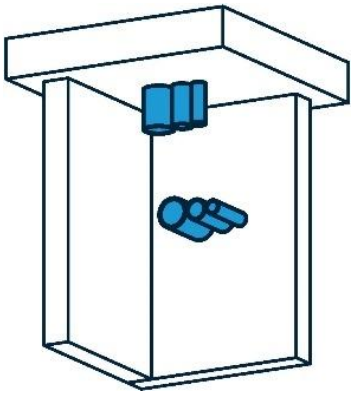
6. Tested pipe configurations

Plastic pipes, without insulation

Construction	Thickness [mm]	Pipe configuration*	Size Ø [mm]	Insulation type
Masonry cast and plaster walls	≥ 100	Straight pipes	Ø 315	Without pipe insulation
		Angled pipes ≥ 45° - 90°	Ø 125	
		Joining elements		
		87° / 90° pipe angle		
		Pipe bend 2 x 45°	Ø 110	
		Corner solutions		
		Support construction	Ø 90	
		Multiple pipe penetrations	Ø 75 (3x)	
Masonry cast floor	≥ 150	Straight pipes	Ø 315	
		Angled pipes ≥ 45° - 90°	Ø 125	
		Joining elements		
		Pipe bend 2 x 45°	Ø 110	
		Corner solutions	Ø 110	
		Multiple pipe penetrations	Ø 110	
FIRESAFE / FSB Firestop Board	≥ 2 x 50	Straight pipes		

TESTED PIPE CONFIGURATIONS IN WALLS

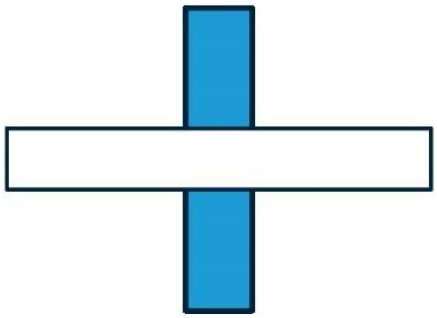
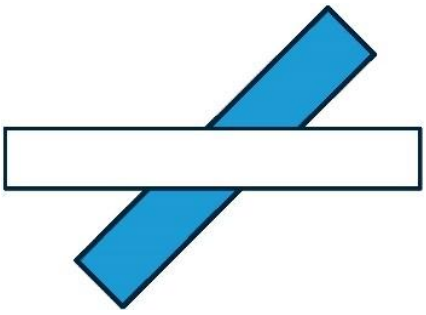
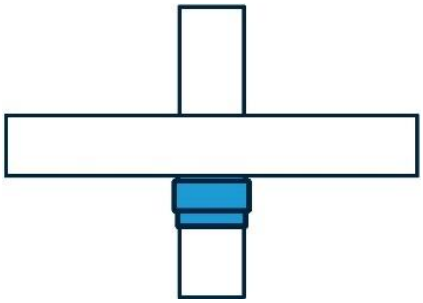
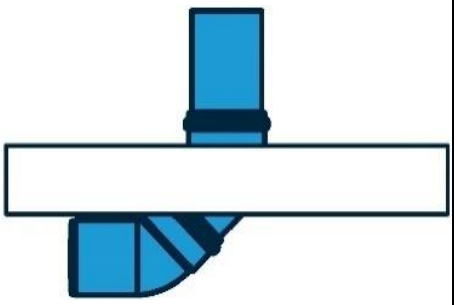
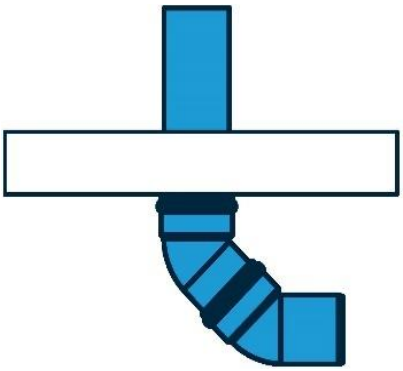
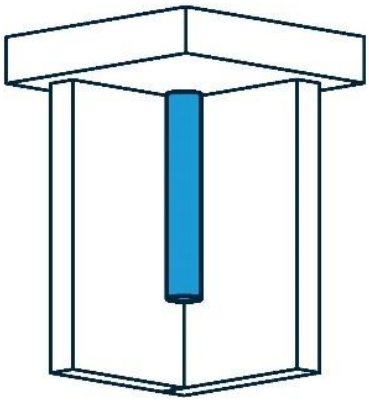
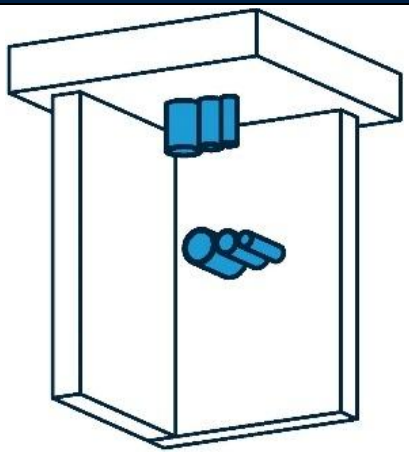
EN 1366-3

Insulated and non-insulated plaster walls and masonry cast walls with a thickness of ≥ 100 mm		
Straight pipes	**Angled pipes ≥ 45° - 90°**	**Pipe sleeves and other joining elements**
		
87° / 90° pipe bend	**2 x 45° pipe bend**	**Pipe with zero distance from floor (U shape)**
		
Corner solutions	**Pipe support (steel)**	**Multiple pipes in same recess**
		

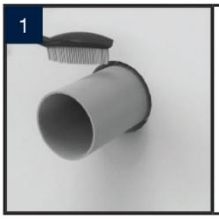
TESTED PIPE CONFIGURATIONS IN FLOOR

EN 1366-3

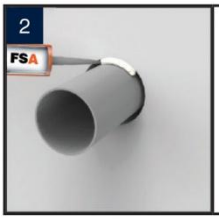
Tested pipe configurations in masonry cast floors with a thickness of ≥ 150 mm

Straight pipes	Angled pipes ≥ 45° - 90°	Pipe sleeves and other joining elements
		
Pipe bend 2 x 45°	**2 x 45° pipe bend**	**Corner solutions**
		
Multiple pipes in same recess		
		

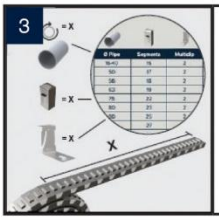
7. Installation guide for FIRESAFE / FSC



Ensure that the pipe penetration and gap are cleared of any dust, debris, or grease.

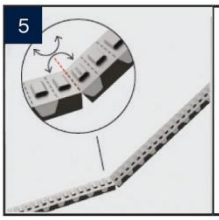


Openings that are ≤ 20 mm[1] can be sealed using FIRESAFE / FSA Firestop Acrylic at a depth of 10 mm.

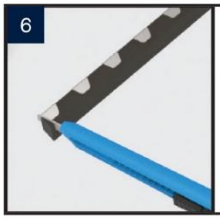


Measure the diameter of the installation penetration. See the application table on the packaging for the plastic pipes[2] for the length of the FIRESAFE / FSC (find the number of FSC sections) and the number of multiclips that will be needed.

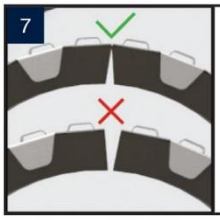
Count the number of FSC sections that are needed from the roll and cut through the insert with a knife.



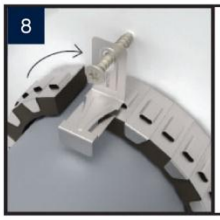
Break the FSC where it has been cut.



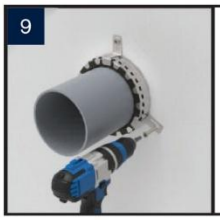
Cut the insert with a knife on both sides of the fire collar with a user-customised size.



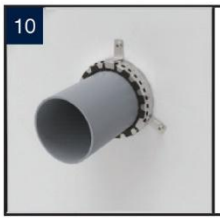
If the stainless steel joints fit together well, then your insert has been cut properly.



Place the fire collar around the pipe penetration, fasten the end of the fire collar using the multiclips and secure it with the included screws.



Fasten multiclips to the structure using screws.



Fill out the fire rating label and glue it next to the fire seal.

[1] Larger openings around pipe penetrations can be sealed in accordance with the installation requirements for FIRESAFE / FSB System or gypsum-based fire sealant with an A1 fire resistance.
[2] Steel pipes with insulation, depending on fire resistance, can be fitted with a single fire collar up to a total diameter of 283 mm.

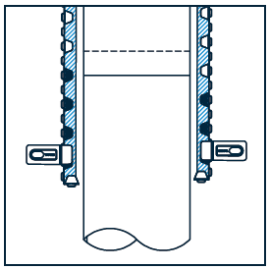
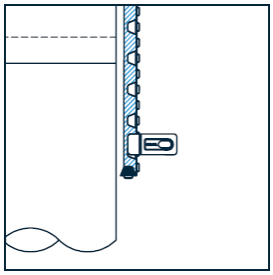
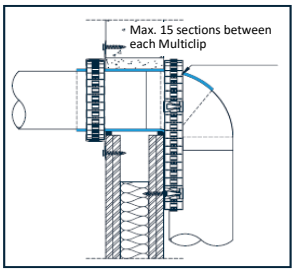
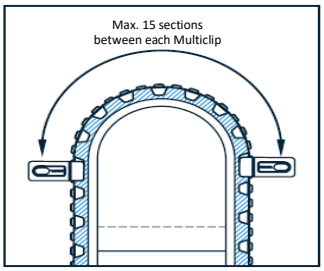
8. Performance overview

EN 1366-3

Non-insulated PVC-U / PVC-C plastic pipes through plaster walls, masonry cast walls and floors

Plastic pipe type: PVC-U / PVC-C	Pipe diameter Ø x t [mm]	FIRESAFE / FSC		Installation side(s)	Distances	Construction			Classification in minutes
		Single	Double			FW-100	RW-100	RF-150	
Straight pipes	≤ 110 x 1.8 - 14.6	✓		2	fig: 1 to 4	✓	✓		EI 60. U/U
	≤ 160 x 1.8 - 14.6		✓						EI 120. U/U
	≤ 315 x 1.8 - 14.6								EI 90. U/C
	≤ 110 x 1.8 - 14.6	✓		1				✓	EI 90. U/U
	≤ 160 x 1.8 - 14.6								EI 120. U/C
	≤ 315 x 1.8 - 14.6		✓						EI 120. U/C
Angled pipes ≥ 45° - 90°	≤ 110 x 3.4 - 10.0		✓	2	fig: 1 to 4	✓	✓		EI 60. U/C
	≤ 110 x 3.4								EI 120. U/C
	≤ 110 x 2.7	✓							EI 45. U/C
	≤ 125 x 2.5								EI 30. U/C
	≤ 110 x 3.4 - 10.0		✓	1				✓	EI 60. U/U
	≤ 110 x 10.0								EI 90. U/U
87° / 90° pipe angle	≤ 125 x 2.5	✓		2	fig: 1 to 4	✓	✓		EI 90. U/U
87° / 90° pipe bend with zero distance to wall	≤ 110 x 3.4	✓		2	fig: 1 to 4	✓	✓		EI 120. U/C
Pipe angle 2 x 45° with zero distance to wall	≤ 50 x 3.0	✓		1	fig: 1 to 4			✓	EI 90. U/C
	≤ 110 x 3.2								EI 45. U/C
Corner solutions	≤ 110 x 2.2 - 2.3	✓		1	fig: 1 to 4		✓	✓	EI 90. U/U
	≤ 110 x 6.3								EI 90. U/U
	≤ 125 x 7.4								EI 60. U/C
Zero distance to floor	≤ 110 x 2.2	✓		1	fig: 1 to 4			✓	EI 90. U/U

E:	Integrity	**FW-100:**	Plaster walls with a thickness of ≥ 100 mm
I:	Thermal insulation	**RW-100:**	Masonry cast walls with a thickness of ≥ 100 mm
		RF-150:	Masonry cast floors with a thickness of ≥ 150 mm
Ø x (t) [mm]:	Pipe diameter x **(t)** pipe wall thickness		

Fig 1	Fig 2	Fig 3	Fig 4
			

FIRESAFE / FSC

Universal Firestop Collar for Penetration Seals

Technical Hand Book

Date: 30/07/2025
Prepared by: Pål Paulsen
Checked by: Hallvard K Engøy
Rev.: 01

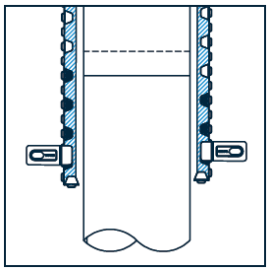
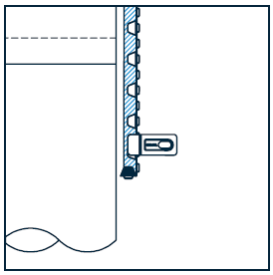
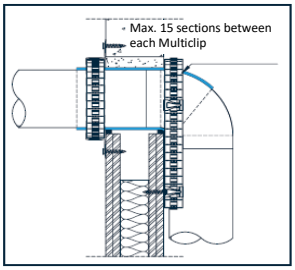
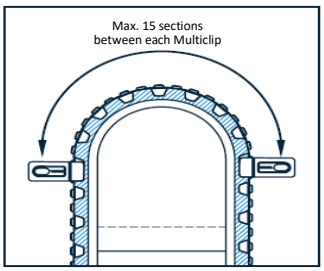
Performance overview

EN 1366-3

Non-insulated PP plastic pipes through plaster walls, masonry cast walls and floors

Plastic pipe type: PP	Pipe diameter Ø x t [mm]	FIRESAFE / FSC		Installation side(s)	Distances	Construction			Classification in minutes
		Single	Double			FW-100	RW-100	RF-150	
Straight pipes	≤ 110 x 1.8 - 6.3	✓		2	fig: 1 to 4	✓	✓		EI 120. U/U
	≤ 125 x 1.8 - 7.1								EI 90. U/U
	≤ 125 x 1.8 - 3.1								EI 120. U/U
	≤ 160 x 1.8 - 4.0								EI 90. U/U
	≤ 160 x 9.1								EI 120. U/C
	≤ 40 x 1.8 -6.3			1				✓	EI 120. U/U
	≤ 110 x 1.8 - 3.6								EI 90. U/U
	≤ 125 x 1.8 - 4.8								EI 60. U/U
	≤ 160 x 1.8 - 14.6								EI 90. U/C
Angled pipes ≥ 45°- 90°	≤ 110 x 3.4 - 10.0		✓	2	fig: 1 to 4	✓	✓		EI 60. U/C
	≤ 110 x 3.4								EI 120. U/C
	≤ 110 x 2.7	✓							EI 45. U/C
	≤ 110 x 3.4 - 10.0		✓	1				✓	EI 60. U/U
	≤ 110 x 10.0								EI 90. U/U
87° / 90° pipe angle	≤ 125 x 3.1	✓		2	fig: 1 to 4	✓	✓		EI 90. U/C
Corner solutions	≤ 110 x 6.3	✓		1	fig: 1 to 4			✓	EI 90. U/U

E:	Integrity	**FW-100:**	Plaster walls with a thickness of ≥ 100 mm
I:	Thermal insulation	**RW-100:**	Masonry cast walls with a thickness of ≥ 100 mm
		RF-150:	Masonry cast floors with a thickness of ≥ 150 mm
Ø x (t) [mm]:	Pipe diameter x **(t)** pipe wall thickness		

Fig 1	Fig 2	Fig 3	Fig 4
			

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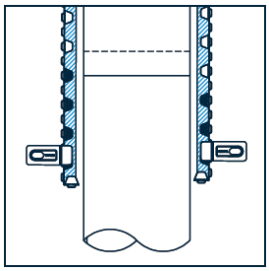
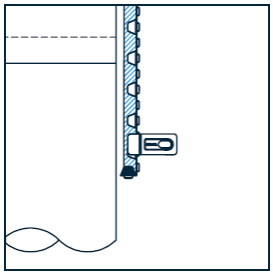
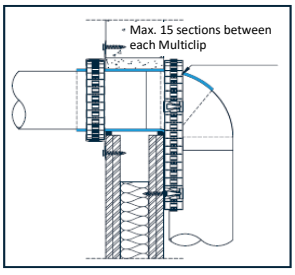
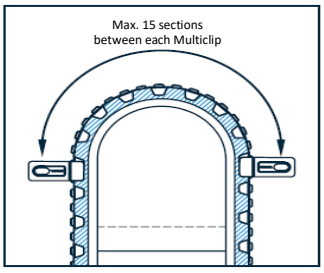
EN 1366-3

Non-insulated PE / PE-HD / ABS / SAN + PVC plastic pipes through plaster walls, masonry cast walls and floors

Plastic pipe type: PE / PE-HD / ABS / SAN + PVC	Pipe diameter Ø x t [mm]	FIRESAFE / FSC		Installation side(s)	Distances	Construction			Classification in minutes
		Single	Double			FW-100	RW-100	RF-150	
Straight pipes	≤ 110 x 2.4 - 10.0			2	fig: 1 to 4	✓	✓		EI 60. U/U
	≤ 125 x 2.4 - 4.0								EI 90. U/U
	≤ 125 x 2.4 - 4.9								EI 120. U/U
	≤ 110 x 2.4 - 6.6	✓		1				✓	EI 120. U/U
	≤ 125 x 2.4 - 4.9								EI 90. U/U
	≤ 160 x 2.4 - 4.0								EI 60. U/U
	≤ 160 x 14.6								EI 120. U/C
Angled pipes ≥ 45°- 90°	≤ 110 x 2.7	✓		2	fig: 1 to 4	✓	✓		EI 60. U/C
	≤ 110 x 3.4 - 10.0		✓						EI 120. U/C
	≤ 110 x 10.0			1				✓	EI 90. U/U
Metal support, half cover	≤ 90 x 2.8	✓		2	fig: 1 to 4	✓	✓		EI 90. U/C
Zero distance to floor	≤ 110 x 2.8	✓		1	fig: 1 to 4			✓	EI 90. U/U
Corner solutions	≤ 110 x 6.6	✓		1	fig: 1 to 4			✓	EI 120. U/U
Pipe sleeves - joining elements	≤ 110 x 4.3 - 7.4			2	fig: 1 to 4	✓	✓		EI 60. U/C
	≤ 110 x 4.3	✓							EI 120. U/C
	≤ 110 x 4.3			1				✓	EI 90. U/C
	≤ 125 x 7.4								EI 60. U/C

E:	Integrity	**FW-100:**	Plaster walls with a thickness of ≥ 100 mm
I:	Thermal insulation	**RW-100:**	Masonry cast walls with a thickness of ≥ 100 mm
		RF-150:	Masonry cast floors with a thickness of ≥ 150 mm
Ø x (t) [mm]:	Pipe diameter x **(t)** pipe wall thickness		

Fig 1	Fig 2	Fig 3	Fig 4
			

FIRESAFE / FSC

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Performance overview

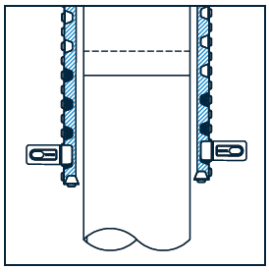
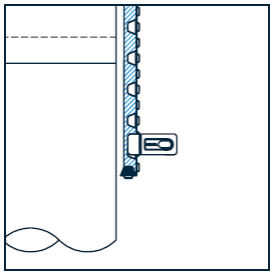
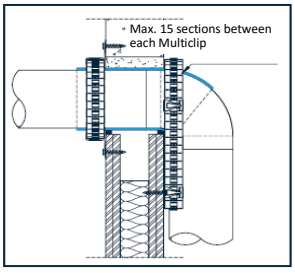
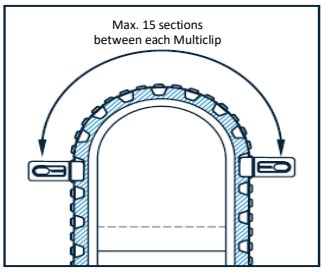
EN 1366-3

Non-insulated sound-dampening plastic pipes through plaster walls, masonry cast walls and floors

Sound-dampening plastic pipes[1)]	Pipe diameter Ø x t [mm]	FIRESAFE / FSC		Installation side(s)	Distances	Construction			Classification in minutes
		Single	Double			FW-100	RW-100	RF-150	
Pipe bend 2 x 45°, zero distance to wall	≤ 110 x 3.6	✓		2	fig: 1 to 4	✓	✓		EI 60. U/U
	≤ 110 x 6.0								EI 90. U/U
Pipe bend 2 x 45°, zero distance to floor	≤ 110 x 6.0	✓		1	fig: 1 to 4			✓	EI 90. U/U
	≤ 110 x 5.3								EI 120. U/U
Corner solutions, zero distance to ceiling	≤ 110 x 6.0	✓		2	fig: 1 to 4	✓	✓		EI 60. U/U
Corner solutions, zero distance to floor	≤ 110 x 6.0	✓		2	fig: 1 to 4	✓	✓		EI 120. U/U
Corner solutions	≤ 110 x 6.6	✓		1	fig: 1 to 4			✓	EI 120. U/C
Pipe sleeves - joining elements	≤ 110 x 2.7	✓		2	fig: 1 to 4	✓	✓		EI 120. U/C
Pipe sleeves - joining elements	≤ 110 x 6.3	✓		1	fig: 1 to 4			✓	EI 90. U/U
	≤ 110 x 2.7 - 6.0								EI 120. U/C

Permitted sound-dampening plastic pipes[1)]		
✓ Coes PhoNoFire	✓ Pipelife Master 3	✓ Valsir Triplus
✓ Coestilen BluePower	✓ Poloplast POLO-KAL NG	✓ Wavin AS
✓ Geberit Silent dB20	✓ Poloplast POLO-KAL 3S	✓ Wavin SiTech+
✓ Geberit Silent PP	✓ REHAU Raupiano Plus	✓ DykaSono
✓ Girpi Friaphon	✓ Skolan dB	✓ PhonEX AS
✓ Marley Silent		

E:	Integrity	**FW-100:**	Plaster walls with a thickness of ≥ 100 mm
I:	Thermal insulation	**RW-100:**	Masonry cast walls with a thickness of ≥ 100 mm
		RF-150:	Masonry cast floors with a thickness of ≥ 150 mm
Ø x (t) [mm]:	Pipe diameter x **(t)** pipe wall thickness		

Fig 1	Fig 2	Fig 3	Fig 4
			

FIRESAFE / FSC

Universal Firestop Collar for Penetration Seals

Technical Hand Book

Date: 30/07/2025
Prepared by: Pål Paulsen
Checked by: Hallvard K Engøy
Rev.: 01

Performance overview

EN 1366-3

Non-insulated fibre-reinforced composite pipes through plaster walls and masonry cast walls

Fibre reinforced composite pipes[1)]	Pipe diameter Ø x t [mm]	FIRESAFE / FSC		Installation side(s)	Distances	Construction			Classification in minutes
		Single	Double			FW-100	RW-100	RF-150	
Zero distance	≤ 50 x 6.9	✓		2	fig: 1 to 4	✓	✓		**EI 90. U/C**
Metal support, half cover	≤ 50 x 6.9	✓		2	fig: 1 to 4	✓	✓		**EI 90. U/C**
Corner solutions	≤ 110 x 10.0	✓		1	fig: 1 to 4			✓	**EI 90. U/C**
87° / 90° pipe bend	≤ 110 x 10.0	✓		2	fig: 1 to 4	✓	✓		**EI 90. U/C**

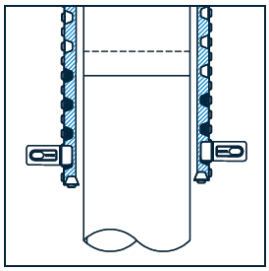
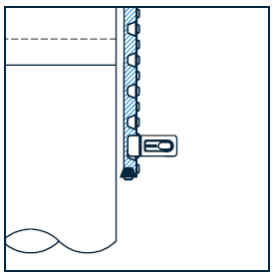
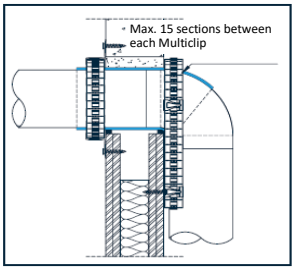
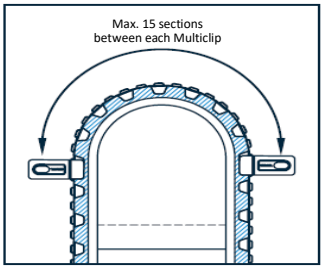
Permitted fibre-reinforced composite pipes[1)]

✓ Aquatechnik Fusio PP-R 80. ✓ Aquatechnik Fusio PP-RCT. ✓ Aquatherm Blue-S. ✓ Aquatherm Blue-MF. ✓ Aquatherm Red-MF.

✓ Aquatherm Green-MF. ✓ Aquatherm Green-MS. ✓ Aquatherm Green-S. ✓ Aquatherm Lilac-S. ✓ Aquatherm Grey-MS.

✓Aquatherm Orange M. ✓ Bänninger PP-R.✓ Bänninger Climatec PP-RCT. ✓ Bänninger Watertec PP-RCT.

E:	Integrity	**FW-100:**	Flexible wall. Plaster walls with a thickness of ≥ 100 mm
I:	Thermal insulation	**RW-100:**	Rigid wall. Masonry cast walls with a thickness of ≥ 100 mm
Ø x (t) [mm]:	Pipe diameter x **(t)** pipe wall thickness	**RF-150:**	Masonry cast floors with a thickness of ≥ 150 mm

Fig 1	Fig 2	Fig 3	Fig 4
			

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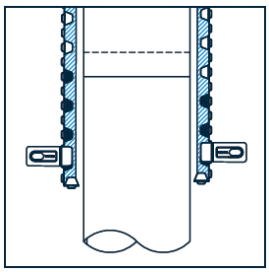
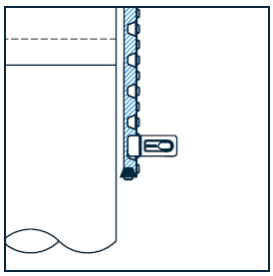
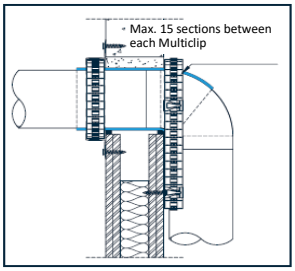
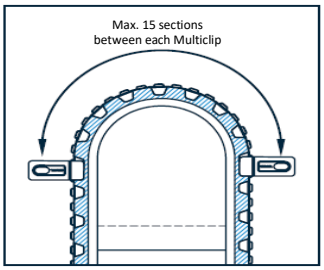
Non-insulated multilayer pipes in plaster walls, masonry cast walls and floors

Multilayer pipes[2)]	Pipe diameter Ø x t [mm]	FIRESAFE / FSC		Installation side(s)	Distances	Construction			Classification in minutes
		Single	Double			FW-100	RW-100	RF-150	
Straight pipes	≤ 25 x 3.5	✓		2	fig: 1 to 4	✓	✓		EI 90. U/C
	≤ 32 x 3.0								EI 90. U/C
	≤ 50 x 2.0 - 4.0								EI 120. U/C
	≤ 75 x 2.0 - 6.0								EI 60. U/C
	≤ 75 x 2.0 - 6.0		✓						EI 90. U/C
	≤ 50 x 2.0 - 4.0	✓		1				✓	EI 120. U/C
	≤ 75 x 2.0 - 6.0								EI 60. U/C
	≤ 75 x 2.0 - 6.0		✓						EI 90. U/C
Zero distance to floor	≤ 32 x 3.0	✓		2	fig: 1 to 4	✓	✓		EI 90. U/C

Permitted multilayer pipes[2)]
✓ Alpex DUO. ✓ Valsir Pexal. ✓ Valsir Mixal. ✓ APE Plain (PE-Xb/AL/PE-Xb). ✓ Geberit Mepla. ✓ Uponor Unipipe (PE-RT/AL/PE-RT). ✓ Henco. ✓ Uponor (PE-Xc/AL/PE-Xc). ✓ Uponor, REHAU (PE-Xa). ✓ REHAU (PE-XC). ✓ SP Superpipe. ✓ POLYGON PEX (PE-X/AL/PE-X). ✓ Valsir Pexal. ✓ Valsir Mixal (PE/AL/PE-Xb). ✓ Wavin Tigris. ✓ Protecta-Line System. ✓ Alpex F50 Profi (PE-X/AL/PE).

E:	Integrity	**FW-100:**	Plaster walls with a thickness of ≥ 100 mm
I:	Thermal insulation	**RW-100:**	Masonry cast walls with a thickness of ≥ 100 mm
		RF-150:	Masonry cast floors with a thickness of ≥ 150 mm
Ø x (t) [mm]:	Pipe diameter x **(t)** pipe wall thickness		

Fig 1	Fig 2	Fig 3	Fig 4
			

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Non-insulated multiple cable and plastic pipes through plaster walls, masonry cast walls and floors

Cable bundles containing copper ≤ 398.5 mm²	Cable bundle diameter Ø [mm]	FIRESAFE / FSC		Installation side(s)	Distances	Construction			Classification in minutes
		Single	Double			FW-100	RW-100	RF-150	
Straight cables	≤ 100 (≤ 63 cables)	✓		2	fig: 1 to 4	✓	✓		**EI 120**

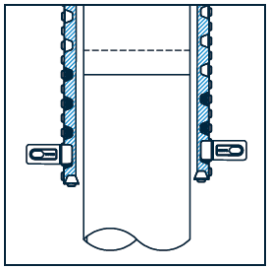
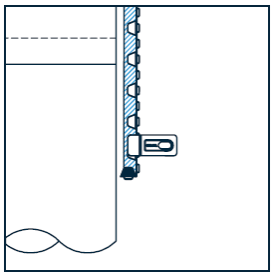
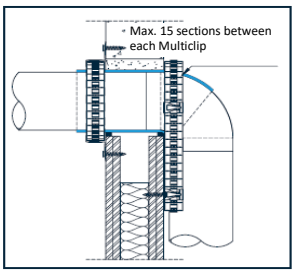
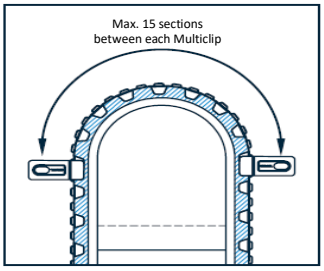
Cable bundles containing copper ≤ 247 mm²	Cable bundle diameter Ø [mm]	FIRESAFE / FSC		Installation side(s)	Distances	Construction			Classification in minutes
		Single	Double			FW-100	RW-100	RF-150	
Straight cables	≤ 80 (≤ 42 cables)	✓		1	fig: 1 to 4			✓	**EI 120**

PVC plastic pipes with cable(s)	Plastic pipe bundle diameter Ø	FIRESAFE / FSC		Installation side(s)	Distances	Construction			Classification in minutes
		Single	Double			FW-100	RW-100	RF-150	
Straight pipes	≤ 100 (≤ 18 pipes)	✓		2	fig: 1 to 4	✓	✓		**EI 90. U/U**
	≤ 100 (≤ 18 pipes)			1				✓	**EI 120. U/U**

PE plastic pipes with cables	Plastic pipe bundle diameter Ø	FIRESAFE / FSC		Installation side(s)	Distances	Construction			Classification in minutes
		Single	Double			FW-100	RW-100	RF-150	
Straight pipes	≤ 150 (≤ 5 x Ø 50)	✓		2	fig: 1 to 4	✓	✓		**EI 120. U/U**
	≤ 130 (≤ 5 x Ø 50)			1				✓	**EI 120. U/U**

PVC-U / PVC-C plastic pipes with cables	Pipe diameter Ø x t [mm]	FIRESAFE / FSC		Installation side(s)	Distances	Construction			Classification in minutes
		Single	Double			FW-100	RW-100	RF-150	
Straight pipes	≤ 75 x 3.0. 3 pc.	✓		2	fig: 1 to 4	✓	✓		**EI 90. U/C**

E:	Integrity	**FW-100:**	Plaster walls with a thickness of ≥ 100 mm
I:	Thermal insulation	**RW-100:**	Masonry cast walls with a thickness of ≥ 100 mm
		RF-150:	Masonry cast floors with a thickness of ≥ 150 mm
Ø x (t) [mm]:	Pipe diameter x **(t)** pipe wall thickness		

Fig 1	Fig 2	Fig 3	Fig 4
			

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Performance overview

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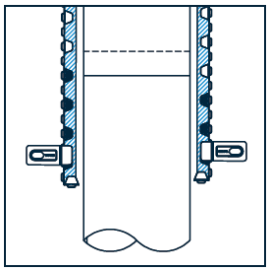
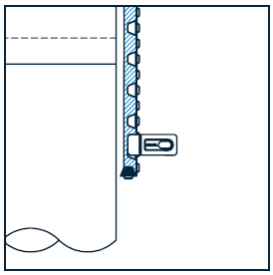
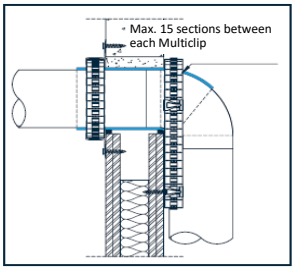
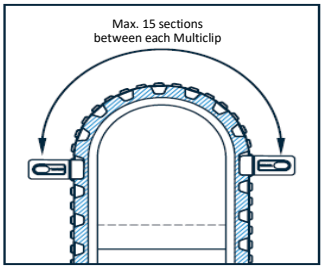
Multiple pipe penetrations through plaster walls, masonry cast walls and floors

Multiple penetrations	Diameter Ø x t [mm]	FIRESAFE / FSC		Installation side(s)	Distances	Construction			Rating in minutes
		Single	Double			FW-100	RW-100	RF-150	
PE-HD, PE, ABS, SAN+PVC	≤ 90 x 2.8	✓		2	fig: 1 to 4	✓	✓		**EI 90. U/C**
Multilayer pipes[2)]	≤ 50 x 4.0								
Fibre reinforced composite pipes[1)]	≤ 50 x 6.9								
Electrical cables	≤ 12.5								
PE-HD, PE, ABS, SAN + PVC	≤ 90 x 2.8	✓		1	fig: 1 to 4			✓	**EI 120. U/U**
Multilayer pipes[2)]	≤ 50 x 4.0								
Fibre-reinforced composite[1)]	≤ 50 x 6.9								
Electrical cables	≤ 12.5								

E:	Integrity	**FW-100:**	Plaster walls with a thickness of ≥ 100 mm
I:	Thermal insulation	**RW-100:**	Masonry cast walls with a thickness of ≥ 100 mm
		RF-150:	Masonry cast floors with a thickness of ≥ 150 mm
Ø x (t) [mm]:	Pipe diameter x **(t)** pipe wall thickness		

Fig 1	Fig 2	Fig 3	Fig 4
			

Permitted fibre-reinforced composite pipes[1)]

✓ Aquatechnik Fusio PP-R 80. ✓ Aquatechnik Fusio PP-RCT. ✓ Aquatherm Blue-S. ✓ Aquatherm Blue-MF. ✓ Aquatherm Red-MF.

✓ Aquatherm Green-MF. ✓ Aquatherm Green-MS. ✓ Aquatherm Green-S. ✓ Aquatherm Lilac-S. ✓ Aquatherm Grey-MS.

✓Aquatherm Orange M. ✓ Bänninger PP-R.✓ Bänninger Climatec PP-RCT. ✓ Bänninger Watertec PP-RCT.

Permitted multilayer pipes[2)]

✓ Alpex DUO. ✓ Valsir Pexal. ✓ Valsir Mixal. ✓ APE Plain (PE-Xb/AL/PE-Xb). ✓ Geberit Mepla. ✓Uponor Unipipe (PE-RT/AL/PE-RT).

✓ Henco. ✓ Uponor (PE-Xc/AL/PE-Xc). ✓ Uponor, REHAU (PE-Xa). ✓ REHAU (PE-XC). ✓ SP Superpipe. ✓ POLYGON PEX (PE-X/AL/PE-X).

✓ Valsir Pexal. ✓ Valsir Mixal (PE/AL/PE-Xb). ✓ Wavin Tigris. ✓ Protecta-Line System. ✓ Alpex F50 Profi (PE-X/AL/PE).

Performance overview

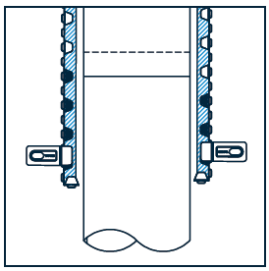
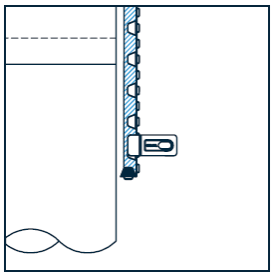
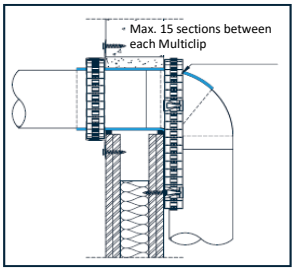
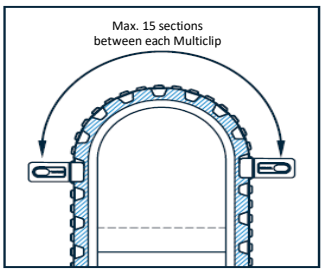
EN 1366-3

Gas-filled aluminium and PP pipes through walls, plaster shaft walls, masonry cast shaft walls and floors

Gas-filled aluminium pipes	Pipe diameter Ø x t [mm]	FIRESAFE / FSC		Installation side(s)	Distances	Construction			Classification in minutes
		Single	Double			FW-100	RW-70	RF-150	
Straight pipes	≤ 130 x 1.5	✓		1	fig: 1 to 4	✓	✓		EI 90. U/C
								✓	EI 90. U/C

Gas-filled plastic - PP pipes	Pipe diameter Ø x t [mm]	FIRESAFE / FSC		Installation side(s)	Distances	Construction			Classification in minutes
		Single	Double			FW-100	RW-70	RF-150	
Straight pipes	≤ 125 x 1.8 - 4.0	✓		1	fig: 1 to 4	✓			EI 90. U/U
			✓				✓		EI 60. U/U
		✓						✓	EI 90. U/U

5	Integrity	**FW-100:**	Plaster walls with a thickness of ≥ 100 mm
I:	Thermal insulation	**RW-100:**	Masonry cast walls with a thickness of ≥ 100 mm
		RW-70:	Masonry cast walls with a thickness of ≥ 70 mm
		RF-150:	Masonry cast floors with a thickness of ≥ 150 mm
Ø x (t) [mm]:	Pipe diameter x **(t)** pipe wall thickness		

Fig 1	Fig 2	Fig 3	Fig 4
			

FIRESAFE / FSC

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Performance overview

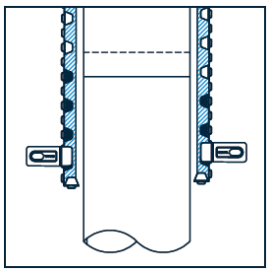
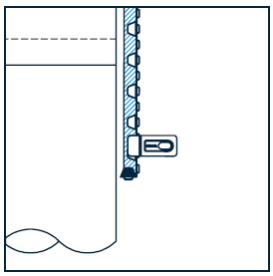
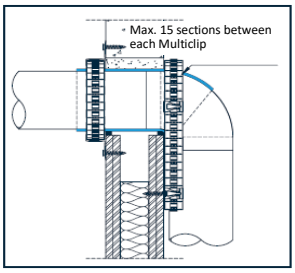
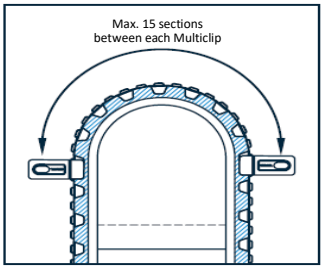
EN 1366-3

Gas-filled multilayer pipes made from PP pipes through plaster shaft walls, masonry cast shaft walls and floors

Gas-filled multilayer PP / PP plastic pipes	Diameter [mm]	FIRESAFE / FSC		Installation side(s)	Distances	Construction			Classification in minutes
		Single	Double			FW-100	RW-70	RF-150	
Straight pipes	Outer d ≤ 125 x inner d ≤ 80	✓		1	fig: 1 to 4	✓			EI 90. U/U
			✓				✓		EI 60. U/U
		✓						✓	EI 90. U/U

Gas-filled steel/PP plastic multilayer pipes	Diameter [mm]	FIRESAFE / FSC		Installation side(s)	Distances	Construction			Classification in minutes
		Single	Double			FW-100	RW-70	RF-150	
Straight pipes	Outer d ≤ 200 x inner d ≤ 130	✓		1	fig: 1 to 4	✓			EI 90. U/C
			✓				✓		EI 90. U/C
								✓	EI 90. U/C

E:	Integrity	**FW-100:**	Plaster walls with a thickness of ≥ 100 mm
I:	Thermal insulation	**RW-100:**	Masonry cast walls with a thickness of ≥ 100 mm
		RW-70:	Masonry cast walls with a thickness of ≥ 70 mm
		RF-150:	Masonry cast floors with a thickness of ≥ 150 mm
Ø x (t) [mm]:	Pipe diameter x **(t)** pipe wall thickness		

Fig 1	Fig 2	Fig 3	Fig 4
			

FIRESAFE / FSC

Universal Firestop Collar for Penetration Seals

Technical Hand Book

FIRESAFE

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Performance overview

EN 1366-3

Non-insulated plastic pipes through plaster walls, masonry cast walls and floors.

In combination with FIRESAFE / FSB1 (2 x 50 mm)

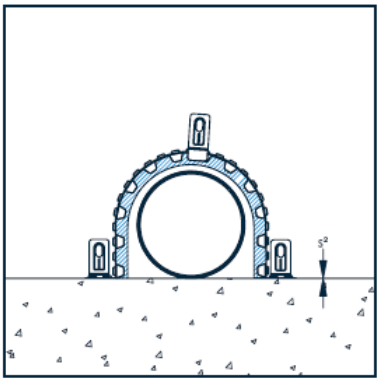
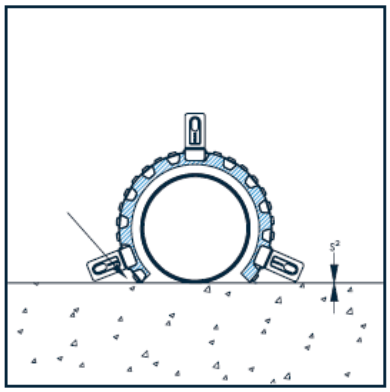
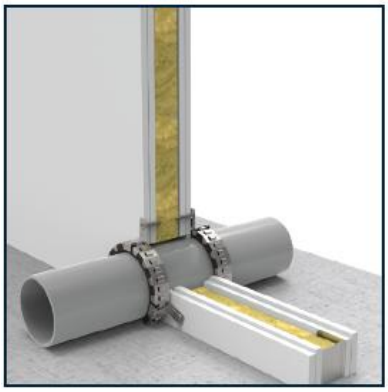
Plastic pipe type PVC-U / PVC-C	Diameter Ø x t [mm]	FIRESAFE / FSC		Installation side(s)	Distances	Construction			Classification in minutes
		Single	Double			FW-100	RW-100	RF-150	
Straight pipes	≤ 110 x 2.7	✓		2	fig: 5 - 6	✓	✓		EI 120. U/U
	≤ 110 x 2.7 - 6.3	✓		1				✓	EI 60. U/U
	≤ 110 x 2.7								EI 90. U/U

5

Plastic pipe type PP	Diameter Ø x t [mm]	FIRESAFE / FSC		Installation side(s)	Distances	Construction			Classification in minutes
		Single	Double			FW-100	RW-100	RF-150	
Straight pipes	≤ 110 x 2.7	✓		2	fig: 5 - 7	✓	✓		EI 120. U/U
	≤ 110 x 2.7 - 6.3	✓		1				✓	EI 60. U/U
	≤ 110 x 2.7								EI 90. U/U

Plastic pipe type PE / PE-HD / ABS / SAN+PVC	Diameter Ø x t [mm]	FIRESAFE / FSC		Installation side(s)	Distances	Construction			Classification in minutes
		Single	Double			FW-100	RW-100	RF-150	
Straight pipes	≤ 110 x 2.7	✓		2	fig: 5 - 7	✓	✓		EI 120. U/U
	≤ 110 x 2.7 - 6.6	✓		1				✓	EI 60. U/U
	≤ 110 x 2.7								EI 90. U/U

E:	Integrity	**FW-100:**	Plaster walls with a thickness of ≥ 100 mm
I:	Thermal insulation	**RW-100:**	Masonry cast walls with a thickness of ≥ 100 mm
		RF-150:	Masonry cast floors with a thickness of ≥ 150 mm
Ø x (t) [mm]:	Pipe diameter x **(t)** pipe wall thickness		

Fig 5	Fig 6	Fig 7. Image
S²: Distance to construction ≤ 5 mm	**S²:** Distance to construction < 5 mm	Image
		

FIRESAFE / FSC

Universal Firestop Collar for Penetration Seals

Technical Hand Book

FIRESAFE

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Performance overview

EN 1366-3

Insulated multilayer pipes and fibre reinforced pipes through plaster walls, masonry cast walls and floors.

In combination with FIRESAFE / FSB1 (2 x 50 mm).

Acoustic, Fire rating B-s1, d0 in accordance with EN 13501-1. Thickness: ≤ 12 mm

Permitted multilayer pipes[2)]	Pipe diameter Ø x t [mm]	FIRESAFE / FSC		Installation side(s)	Insulation config. / L [mm]	Construction			Classification in minutes
		Single	Double			FW-100	RW-100	RF-150	
Straight pipes	≤ 50 x 2.0 - 4.0	✓		2	CI or CS	✓	✓		EI 90. U/C
	≤ 63 x 2.0 - 4.0								EI 120. U/C
	≤ 75 x 2.0 - 6.0		✓						EI 90. U/C

Permitted fibre-reinforced composite pipes[1)]	Pipe diameter Ø x t [mm]	FIRESAFE / FSC		Installation side(s)	Insulation config. / L [mm]	Construction			Classification in minutes
		Single	Double			FW-100	RW-100	RF-150	
Straight pipes	≤ 50 x 6.9 - 10.0	✓		1	CI or CS			✓	EI 90. U/C
	≤ 110 x 10.0								EI 120. U/C

Permitted fibre reinforced composite pipes[1)]

✓ Aquatechnik Fusio PP-R 80. ✓ Aquatechnik Fusio PP-RCT. ✓ Aquatherm Blue-S. ✓ Aquatherm Blue-MF. ✓ Aquatherm Red-MF.

✓ Aquatherm Green-MF. ✓ Aquatherm Green-MS. ✓ Aquatherm Green-S. ✓ Aquatherm Lilac-S. ✓ Aquatherm Grey-MS.

✓Aquatherm Orange M. ✓ Bänninger PP-R.✓ Bänninger Climatec PP-RCT. ✓ Bänninger Watertec PP-RCT.

Permitted multilayer pipes[2)]

✓ Alpex DUO. ✓ Valsir Pexal. ✓ Valsir Mixal. ✓ APE Plain (PE-Xb/AL/PE-Xb). ✓ Geberit Mepla. ✓Uponor Unipipe (PE-RT/AL/PE-RT).

✓ Henco. ✓ Uponor (PE-Xc/AL/PE-Xc). ✓ Uponor, REHAU (PE-Xa). ✓ REHAU (PE-XC). ✓ SP Superpipe. ✓ POLYGON PEX (PE-X/AL/PE-X).

✓ Valsir Pexal. ✓ Valsir Mixal (PE/AL/PE-Xb). ✓ Wavin Tigris. ✓ Protecta-Line System. ✓ Alpex F50 Profi (PE-X/AL/PE).

E:	Integrity	**FW-100:**	Plaster walls with a thickness of ≥ 100 mm
I:	Thermal insulation	**RW-100:**	Masonry cast walls with a thickness of ≥ 100 mm
		RF-150:	Masonry cast floors with a thickness of ≥ 150 mm
Ø x (t) [mm]:	Pipe diameter x (t) pipe wall thickness		
Insulation Configuration /L [mm]:	**CI:** Specified insulation continuous on both sides, but with breaks in the duct itself **CS:** Specified pipe insulation continuous on both sides, as well as in the duct itself.		

Performance overview

EN 1366-3

Acoustic insulated plastic pipes through plaster walls, masonry cast walls and floors.

Acoustic, Fire rating B-s1, d0 in accordance with EN 13501-1. Thickness: ≤ 12 mm

Plastic pipe type PVC-U / PVC-C	Pipe diameter Ø x t [mm]	FIRESAFE / FSC		Installation side(s)	Insulation config. / L [mm]	Construction			Classification in minutes
		Single	Double			FW-100	RW-100	RF-150	
Straight pipes	≤ 110 x 1.8 - 14.6	✓		2	CI or CS	✓	✓		EI 90. U/U
	≤ 160 x 1.8 - 14.6		✓						EI 120. U/U
	≤ 315 x 1.8 - 14.6								EI 90. U/C
	≤ 110 x 1.8 - 14.6	✓		1				✓	EI 90. U/U
	≤ 160 x 1.8 - 14.6								EI 120. U/C
	≤ 315 x 1.8 x 14.6		✓						EI 120. U/C
Angled pipes ≥ 45° - 90°	≤ 110 x 3.4 - 10.0		✓	2	CI or CS	✓	✓		EI 60. U/C
	≤ 110 x 3.4								EI 120. U/C
	≤ 110 x 2.7	✓							EI 45. U/C
	≤ 125 x 2.5								EI 30. U/C
	≤ 110 x 3.4 - 10.0		✓	1				✓	EI 60. U/U
	≤ 110 x 10.0								EI 90. U/U
87° / 90° pipe bend	≤ 125 x 2.5			2	CI or CS	✓	✓		EI 90. U/U
87° / 90° pipe bend, zero distance to wall	≤ 110 x 3.4	✓		2	CI or CS	✓	✓		EI 120. U/C
Pipe bend 2 x 45°, zero distance to floor	≤ 50 x 3.0	✓		1	CI or CS			✓	EI 90. U/C
	≤ 110 x 3.2								EI 45. U/C
Corner solutions	≤ 110 x 2.2 - 2.3			2	CI or CS	✓	✓		EI 90. U/U
	≤ 110 x 6.3	✓		1				✓	EI 90. U/U
	≤ 125 x 7.4								EI 60. U/C
Zero distance to floor	≤ 110 x 2.2	✓		1	CI or CS			✓	EI 90. U/U

E:	Integrity	**FW-100:**	Plaster walls with a thickness of ≥ 100 mm
I:	Thermal insulation	**RW-100:**	Masonry cast walls with a thickness of ≥ 100 mm
		RF-150:	Masonry cast floors with a thickness of ≥ 150 mm
Ø x (t) [mm]:	Pipe diameter x (t) pipe wall thickness		
Insulation Configuration /L [mm]:	**CI:** Specified insulation continuous on both sides, but with breaks in the duct itself **CS:** Specified pipe insulation continuous on both sides, as well as in the duct itself.		

Performance overview

EN 1366-3

Acoustic insulated plastic pipes PP through plaster walls, masonry cast walls and floors.

Acoustic, Fire rating B-s1, d0 in accordance with EN 13501-1. Thickness: ≤ 12 mm

Plastic pipe type PP	Pipe diameter Ø x t [mm]	FIRESAFE / FSC		Installation side(s)	Insulation config. /L [mm]	Construction			Classification in minutes
		Single	Double			FW-100	RW-100	RF-150	
Straight pipes	≤ 110 x 1.8 - 6.3	✓		2	CI or CS	✓	✓		EI 120. U/U
	≤ 125 x 1.8 - 7.1								EI 90. U/U
	≤ 125 x 1.8 - 3.1								EI 120. U/U
	≤ 160 x 1.8 - 4.0								EI 90. U/U
	≤ 160 x 9.1								EI 120. U/C
	≤ 40 x 1.8 - 6.3			1				✓	EI 120. U/U
	≤ 110 x 1.8 - 3.6								EI 90. U/U
	≤ 125 x 1.8 - 4.8								EI 60. U/U
	≤ 160 x 1.8 - 14.6								EI 90. U/C
Angled pipes ≥ 45° - 90°	≤ 110 x 3.4 - 10.0		✓	2	CI or CS	✓	✓		EI 60. U/C
	≤ 110 x 3.4								EI 120. U/C
	≤ 110 x 2.7	✓							EI 45. U/C
	≤ 110 x 3.4 - 10.0		✓	1				✓	EI 60. U/U
	≤ 110 x 10.0								EI 90. U/U
87° / 90° pipe bend	≤ 125 x 3.1	✓		2	CI or CS	✓	✓		EI 90. U/C
Corner solutions	≤ 110 x 6.3	✓		1	CI or CS			✓	EI 90. U/U

E:	Integrity	**FW-100:**	Plaster walls with a thickness of ≥ 100 mm
I:	Thermal insulation	**RW-100:**	Masonry cast walls with a thickness of ≥ 100 mm
		RF-150:	Masonry cast floors with a thickness of ≥ 150 mm
Ø x (t) [mm]:	Pipe diameter x (t) pipe wall thickness		
Insulation Configuration /L [mm]:	**CI:** Specified insulation continuous on both sides, but with breaks in the duct itself **CS:** Specified pipe insulation continuous on both sides, as well as in the duct itself.		

Performance overview

EN 1366-3

Acoustic insulated plastic pipes PE / PE-HD / ABS / SAN + PVC through plaster walls, masonry cast walls and floors.

Acoustic, Fire rating B-s1, d0 in accordance with EN 13501-1. Thickness: ≤ 12 mm

Plastic pipe type PE / PE-HD / ABS / SAN+PVC pipes	Pipe diameter Ø x t [mm]	FIRESAFE / FSC		Installation side(s)	Insulation config. /L [mm]	Construction			Classification in minutes
		Single	Double			FW-100	RW-100	RF-150	
Straight pipes	≤ 110 x 2.4 - 10.0	✓		2	CI or CS	✓	✓		EI 60. U/U
	≤ 125 x 2.4 - 4.0								EI 90. U/U
	≤ 125 x 2.4 - 4.9								EI 120. U/U
	≤ 110 x 2.4 - 6.6			1				✓	EI 120. U/U
	≤ 125 x 2.4 - 4.9								EI 90. U/U
	≤ 160 x 2.4 - 4.0								EI 60. U/U
	≤ 160 x 14.6								EI 120. U/C
Angled pipes ≥ 45° - 90°	≤ 110 x 2.7	✓		2	CI or CS	✓	✓		EI 60. U/C
	≤ 110 x 3.4 - 10.0		✓						EI 120. U/C
	≤ 110 x 10.0			1				✓	EI 90. U/U
Zero distance to floor	≤ 110 x 2.8	✓		1	CI or CS			✓	EI 90. U/U
Corner solutions	≤ 110 x 6.6	✓		1	CI or CS			✓	EI 120. U/U
Pipe sleeves - joining elements	≤ 110 x 4.3	✓		1	CI or CS			✓	EI 90. U/C
	≤ 125 x 7.4								EI 60. U/C

E:	Integrity	**FW-100:**	Plaster walls with a thickness of ≥ 100 mm
I:	Thermal insulation	**RW-100:**	Masonry cast walls with a thickness of ≥ 100 mm
		RF-150:	Masonry cast floors with a thickness of ≥ 150 mm
Ø x (t) [mm]:	Pipe diameter x (t) pipe wall thickness		
Insulation Configuration /L [mm]:	**CI:** Specified insulation continuous on both sides, but with breaks in the duct itself **CS:** Specified pipe insulation continuous on both sides, as well as in the duct itself.		

FIRESAFE / FSC

Universal Firestop Collar for Penetration Seals

Technical Hand Book

FIRESAFE

Date: 30/07/2025
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Performance overview

EN 1366-3

Elastic insulated plastic pipes PVC-U / PVC-C and fibre reinforced composite pipes through plaster walls, masonry cast walls and floors.

Elastic insulation, Fire rating B_L-s3, d0 or B-s3, d0, in accordance with EN 13501-1. Thickness: 9 to 32 mm

Plastic pipe type PVC-U / PVC-C	Pipe diameter Ø x t [mm]	FIRESAFE / FSC		Installation side(s)	Insulation config. / L [mm]	Construction			Classification in minutes
		Single	Double			FW-100	RW-100	RF-150	
Straight pipes	≤ 110 x 3.2		✓	2	LS, LI - 450 or CI, CS	✓	✓		EI 90. U/U
				1	LI - 450 or CI			✓	EI 120. U/U

Fibre reinforced composite pipes[1)]	Pipe diameter Ø x t [mm]	FIRESAFE / FSC		Installation side(s)	Insulation config. / L [mm]	Construction			Classification in minutes
		Single	Double			FW-100	RW-100	RF-150	
Zero distance to floor	≤ 50 x 6.9	✓		2	LS, LI - 300 or CI, CS	✓	✓		EI 90. U/U

Elastic insulated multilayer pipes through plaster walls, masonry cast walls and floors.

Elastic insulation, Fire rating B_L-s3, d0 or B-s3, d0, in accordance with EN 13501-1. Thickness: 9 to 32 mm

Multilayer pipes[2)]	Pipe diameter Ø x t [mm]	FIRESAFE / FSC		Installation side(s)	Insulation config. / L [mm]	Construction			Classification in minutes
		Single	Double			FW-100	RW-100	RF-150	
Straight pipes	≤ 75 x 2.0 - 6.0	✓		2	LS, LI - 500 or CI, CS	✓	✓		EI 120. U/C
	≤ 110 x 2.0 - 10.0								EI 90. U/C
	≤ 90 x 2.0 - 7.0	✓		1	LS, LI - 450 or CI, CS			✓	EI 120. U/C
	≤ 110 x 2.0 - 10.0								EI 90. U/C
Zero distance to floor	≤ 50 x 3.0 - 4.0	✓		2	LS, LI - 300 or CI, CS	✓	✓		EI 90. U/C

Permitted fibre reinforced composite pipes[1)]

✓ Aquatechnik Fusio PP-R 80. ✓ Aquatechnik Fusio PP-RCT. ✓ Aquatherm Blue-S. ✓ Aquatherm Blue-MF. ✓ Aquatherm Red-MF.

✓ Aquatherm Green-MF. ✓ Aquatherm Green-MS. ✓ Aquatherm Green-S. ✓ Aquatherm Lilac-S. ✓ Aquatherm Grey-MS.

✓Aquatherm Orange M. ✓ Bänninger PP-R.✓ Bänninger Climatec PP-RCT. ✓ Bänninger Watertec PP-RCT.

Permitted multilayer pipes[2)]

✓ Alpex DUO. ✓ Valsir Pexal. ✓ Valsir Mixal. ✓ APE Plain (PE-Xb/AL/PE-Xb). ✓ Geberit Mepla. ✓Uponor Unipipe (PE-RT/AL/PE-RT).
✓ Henco. ✓ Uponor (PE-Xc/AL/PE-Xc). ✓ Uponor, REHAU (PE-Xa). ✓ REHAU (PE-XC). ✓ SP Superpipe. ✓ POLYGON PEX (PE-X/AL/PE-X).
✓ Valsir Pexal. ✓ Valsir Mixal (PE/AL/PE-Xb). ✓ Wavin Tigris. ✓ Protecta-Line System. ✓ Alpex F50 Profi (PE-X/AL/PE).

E:	Integrity	**FW-100:**	Plaster walls with a thickness of ≥ 100 mm
I:	Thermal insulation	**RW-100:**	Masonry cast walls with a thickness of ≥ 100 mm
		RF-150:	Masonry cast floors with a thickness of ≥ 150 mm
Ø x (t) [mm]:	Pipe diameter x **(t)** pipe wall thickness		
Insulation Configuration /L [mm]:	**LS:** Specified insulation locally applied with specified length ≥ 300 mm out from wall/floor on both sides and in the duct itself. **LI:** Specified insulation locally applied with specified length ≥ 300 mm out from wall/floor on both sides, but with breaks in the duct itself. **CI:** Specified insulation continuous on both sides, but with breaks in the duct itself **CS:** Specified pipe insulation continuous on both sides, as well as in the duct itself.		

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FIRESAFE / FSC

Universal Firestop Collar for Penetration Seals

Technical Hand Book

FIRESAFE

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Performance overview

EN 1366-3

Multiple insulated fibre reinforced composite pipes and multilayer pipes through plaster walls, masonry cast walls and floors.

PE foam type insulation Fire rating C_L-s1-d0, in accordance with EN 13501-1.

Thickness: ≤ 6 mm

Fibre reinforced composite pipes[1)]	Pipe diameter Ø x t [mm]	FIRESAFE / FSC		Installation side(s)	Insulation config. / L [mm]	Construction			Classification in minutes
		Single	Double			FW-100	RW-100	RF-150	
Straight pipes	≤ 50 x 6.9	✓		2	LS, LI - 300 or CI, CS	✓	✓		**EI 90. U/U**

Multilayer pipes[2)]	Pipe diameter Ø x t [mm]	FIRESAFE / FSC		Installation side(s)	Insulation config. / L [mm]	Construction			Classification in minutes
		Single	Double			FW-100	RW-100	RF-150	
Straight pipes	≤ 50 x 3.0 - 4.0	✓		2	LS, LI - 300 or CI, CS	✓	✓		**EI 120. U/C**
	≤ 32 x 3.0			1				✓	**EI 120. U/U**
	≤ 50 x 3.0 - 4.0		✓	1	LS, LI - 300 or CI, CS			✓	**EI 120. U/U**

Permitted fibre reinforced composite pipes[1)]

✓ Aquatechnik Fusio PP-R 80. ✓ Aquatechnik Fusio PP-RCT. ✓ Aquatherm Blue-S. ✓ Aquatherm Blue-MF. ✓ Aquatherm Red-MF.

✓ Aquatherm Green-MF. ✓ Aquatherm Green-MS. ✓ Aquatherm Green-S. ✓ Aquatherm Lilac-S. ✓ Aquatherm Grey-MS.

✓Aquatherm Orange M. ✓ Bänninger PP-R.✓ Bänninger Climatec PP-RCT. ✓ Bänninger Watertec PP-RCT.

Permitted multilayer pipes[2)]

✓ Alpex DUO. ✓ Valsir Pexal. ✓ Valsir Mixal. ✓ APE Plain (PE-Xb/AL/PE-Xb). ✓ Geberit Mepla. ✓Uponor Unipipe (PE-RT/AL/PE-RT).

✓ Henco. ✓ Uponor (PE-Xc/AL/PE-Xc). ✓ Uponor, REHAU (PE-Xa). ✓ REHAU (PE-XC). ✓ SP Superpipe. ✓ POLYGON PEX (PE-X/AL/PE-X).

✓ Valsir Pexal. ✓ Valsir Mixal (PE/AL/PE-Xb). ✓ Wavin Tigris. ✓ Protecta-Line System. ✓ Alpex F50 Profi (PE-X/AL/PE).

E:	Integrity	**FW-100:**	Plaster walls with a thickness of ≥ 100 mm
I:	Thermal insulation	**RW-100:**	Masonry cast walls with a thickness of ≥ 100 mm
		RF-150:	Masonry cast floors with a thickness of ≥ 150 mm
Ø x (t) [mm]:	Pipe diameter x **(t)** pipe wall thickness		
Insulation Configuration /L [mm]:	**LS:** Specified insulation locally applied with specified length ≥ 300 mm out from wall/floor on both sides and in the duct itself. **LI:** Specified insulation locally applied with specified length ≥ 300 mm out from wall/floor on both sides, but with breaks in the duct itself. **CI:** Specified insulation continuous on both sides, but with breaks in the duct itself. **CS:** Specified pipe insulation continuous on both sides, as well as in the duct itself.		

Performance overview

EN 1366-3

Multiple elastic insulated multilayer pipes with PE foam insulation through plaster walls and masonry cast walls. PE foam insulation, fire rating C_L-s1-d0, in accordance with EN 13501-1.
Thickness: < 6 mm

Multilayer pipes[2)]	Pipe diameter Ø x t [mm]	FIRESAFE / FSC		Installation side(s)	Insulation config. / L [mm]	Construction			Classification in minutes
		Single	Double			FW-100	RW-100	RF-150	
Zero distance to floor	≤ 40 x 3.0 - 4.0	✓		2	LS, LI - 300 or CI, CS	✓	✓		**EI 120. U/C**

Multiple elastic insulated multilayer pipes with elastic insulation through plaster walls and masonry cast walls. Elastic insulation, fire rating B_L-s3, d0 or B-s3, d0, in accordance with EN 13501-1.
Thickness: 9 to 32 mm

Multilayer pipes[2)]	Pipe diameter Ø x t [mm]	FIRESAFE / FSC		Installation side(s)	Insulation config. / L [mm]	Construction			Classification in minutes
		Single	Double			FW-100	RW-100	RF-150	
Zero distance to floor	≤ 50 x 3.0 - 4.0	✓		2	LS, LI - 300 or CI, CS	✓	✓		**EI 90. U/C**

Permitted multilayer pipes[2)]
✓ Alpex DUO. ✓ Valsir Pexal. ✓ Valsir Mixal. ✓ APE Plain (PE-Xb/AL/PE-Xb). ✓ Geberit Mepla. ✓Uponor Unipipe (PE-RT/AL/PE-RT).
✓ Henco. ✓ Uponor (PE-Xc/AL/PE-Xc). ✓ Uponor, REHAU (PE-Xa). ✓ REHAU (PE-XC). ✓ SP Superpipe. ✓ POLYGON PEX (PE-X/AL/PE-X).
✓ Valsir Pexal. ✓ Valsir Mixal (PE/AL/PE-Xb). ✓ Wavin Tigris. ✓ Protecta-Line System. ✓ Alpex F50 Profi (PE-X/AL/PE).

E:	Integrity	**FW-100:**	Plaster walls with a thickness of ≥ 100 mm
I:	Thermal insulation	**RW-100:**	Masonry cast walls with a thickness of ≥ 100 mm
Ø x (t) [mm]:	Pipe diameter x **(t)** pipe wall thickness		
Insulation Configuration /L [mm]:	**LS:** Specified insulation locally applied with specified length ≥ 300 mm out from wall/floor on both sides and in the duct itself. **LI:** Specified insulation locally applied with specified length ≥ 300 mm out from wall/floor on both sides, but with breaks in the duct itself. **CI:** Specified insulation continuous on both sides, but with breaks in the duct itself. **CS:** Specified pipe insulation continuous on both sides, as well as in the duct itself.		

FIRESAFE / FSC

Universal Firestop Collar for Penetration Seals

Technical Hand Book

FIRESAFE /

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Performance overview

EN 1366-3

Multiple PVC-U / PVC-C pipes, copper pipes, and cables insulated with PE foam insulation through plaster walls, masonry cast walls and floors.
PE foam insulation, fire rating C_L-s1-d0, in accordance with EN 13501-1.
Thickness: ≤ 6 mm

Multiple penetrations	Diameter Ø x t [mm]	FIRESAFE / FSC		Installation side(s)	Insulation config. / [mm]	Construction			Classification in minutes
		Single	Double			FW-100	RW-100	RF-150	
PVC-U / PVC-C	≤ 32 x 1.5 - 3.0	✓		2	LS, LI - 300 or CI, CS	✓	✓		**EI 60. U/C**
Copper pipes (2x)	≤ 15 x 1.5 - 14.2								
Electrical cables	≤ 12.5								
PVC-U / PVC-C	≤ 32 x 1.5 - 3.0	✓		1	LS, LI - 300 or CI, CS			✓	**EI 120. U/C**
Copper pipes (2x)	≤ 15 x 1.5 - 14.2								
Electrical cables	≤ 12.5								

Multiple PE / PE-HD / ABS / SAN+PVC, multilayer pipes, fibre reinforced composite pipes and cables insulated with PE foam insulation through plaster walls and masonry cast walls.
PE foam insulation, fire rating C_L-s1-d0, in accordance with EN 13501-1.
Thickness: ≤ 6 mm

Multiple penetrations	Pipe diameter Ø x t [mm]	FIRESAFE / FSC		Installation side(s)	Insulation config. / [mm]	Construction			Classification in minutes
		Single	Double			FW-100	RW-100	RF-150	
PE-HD, PE, ABS, SAN+PVC	≤ 90 x 2.8	✓		2	LS, LI - 300 or CI, CS	✓	✓		**EI 60. U/C**
Multilayer pipes[2)]	≤ 50 x 4.0								
Fibre reinforced composite pipes[1)]	≤ 50 x 6.9								
Electrical cables	≤ 12.5								

Permitted fibre reinforced composite pipes[1)]

✓ Aquatechnik Fusio PP-R 80. ✓ Aquatechnik Fusio PP-RCT. ✓ Aquatherm Blue-S. ✓ Aquatherm Blue-MF. ✓ Aquatherm Red-MF. ✓ Aquatherm Green-MF. ✓ Aquatherm Green-MS. ✓ Aquatherm Green-S. ✓ Aquatherm Lilac-S. ✓ Aquatherm Grey-MS. ✓Aquatherm Orange M. ✓ Bänninger PP-R.✓ Bänninger Climatec PP-RCT. ✓ Bänninger Watertec PP-RCT.

Permitted multilayer pipes[2)]

✓ Alpex DUO. ✓ Valsir Pexal. ✓ Valsir Mixal. ✓ APE Plain (PE-Xb/AL/PE-Xb). ✓ Geberit Mepla. ✓Uponor Unipipe (PE-RT/AL/PE-RT). ✓ Henco. ✓ Uponor (PE-Xc/AL/PE-Xc). ✓ Uponor, REHAU (PE-Xa). ✓ REHAU (PE-XC). ✓ SP Superpipe. ✓ POLYGON PEX (PE-X/AL/PE-X). ✓ Valsir Pexal. ✓ Valsir Mixal (PE/AL/PE-Xb). ✓ Wavin Tigris. ✓ Protecta-Line System. ✓ Alpex F50 Profi (PE-X/AL/PE).

E:	Integrity	**FW-100:**	Plaster walls with a thickness of ≥ 100 mm
I:	Thermal insulation	**RW-100:**	Masonry cast walls with a thickness of ≥ 100 mm
		RF-150:	Masonry cast floors with a thickness of ≥ 150 mm
Ø x (t) [mm]:	Pipe diameter x **(t)** pipe wall thickness		
Insulation Configuration /L [mm]:	**LS:** Specified insulation locally applied with specified length ≥ 300 mm out from wall/floor on both sides and in the duct itself. **LI:** Specified insulation locally applied with specified length ≥ 300 mm out from wall/floor on both sides, but with breaks in the duct itself. **CI:** Specified insulation continuous on both sides, but with breaks in the duct itself **CS:** Specified pipe insulation continuous on both sides, as well as in the duct itself.		

FIRESAFE / FSC

Universal Firestop Collar for Penetration Seals

Technical Hand Book

FIRESAFE

Date: 30/07/2025
Prepared by: Pål Paulsen
Checked by: Hallvard K Engøy
Rev.: 01

Performance overview

EN 1366-3

Elastic insulated metal pipes through plaster walls, masonry cast walls and floors.
Elastic insulation, fire rating B_L-s3, d0 or B-s3, d0, in accordance with EN 13501-1
Thickness: ≤ 32 mm

Copper pipes	Pipe diameter Ø x t [mm]	FIRESAFE / FSC		Installation side(s)	Insulation config. / [mm]	Construction			Classification in minutes
		Single	Double			FW-100	RW-100	RF-150	
Straight pipes	≤ 54 x 1.5 - 14.2	✓		2	LS - 500 or CS	✓	✓		EI 90. C/U
	≤ 88.9 x 1.5 - 14.2				CS				EI 60. C/U
	≤ 88.9 x 1.5 - 14.2		✓		CI or CS				EI 120. C/U

Stainless steel pipes	Pipe diameter Ø x t [mm]	FIRESAFE / FSC		Installation side(s)	Insulation config. / [mm]	Construction			Classification in minutes
		Single	Double			FW-100	RW-100	RF-150	
Straight pipes	≤ 54 x 1.5 - 14.2	✓		2	LS - 500 or CS	✓	✓		EI 90. C/U
	≤ 168.3 x 1.5 x 14.2				CI or CS				EI 60. C/U
	≤ 219.1 x 1.5 - 14.2				CS				EI 90. C/U
	≤ 88.9 x 1.5 -14.2		✓		CI or CS				EI 120. C/U
	≤ 88.9 x 1.5 - 14.2	✓		1	CS			✓	EI 120. C/U
	≤ 168.3 x 1.5 - 14.2				LI - 300 or CI				EI 120. C/U

Cast-iron pipes	Pipe diameter Ø x t [mm]	FIRESAFE / FSC		Installation side(s)	Insulation config. / [mm]	Construction			Classification in minutes
		Single	Double			FW-100	RW-100	RF-150	
Cast-iron pipes	≤ 54 x 1.5 - 14.2	✓		2	LS - 500 or CS	✓	✓		EI 90. C/U
	≤ 168.3 x 1.5 x 14.2				CI or CS				EI 60. C/U
	≤ 219.1 x 1.5 - 14.2				CS				EI 90. C/U
	≤ 88.9 x 1.5 -14.2		✓		CI or CS				EI 120. C/U
	≤ 88.9 x 1.5 - 14.2	✓		1	CS			✓	EI 120. C/U
	≤ 168.3 x 1.5 - 14.2				LI - 300 or CI				EI 120. C/U

E:	Integrity	**FW-100:**	Plaster walls with a thickness of ≥ 100 mm
I:	Thermal insulation	**RW-100:**	Masonry cast walls with a thickness of ≥ 100 mm
		RF-150:	Masonry cast floors with a thickness of ≥ 150 mm
Ø x (t) [mm]:	Pipe diameter x **(t)** pipe wall thickness		
Insulation Configuration /L [mm]:	**LS:** Specified insulation locally applied with specified length ≥ 300 mm out from wall/floor on both sides and in the duct itself. **LI:** Specified insulation locally applied with specified length ≥ 300 mm out from wall/floor on both sides, but with breaks in the duct itself. **CI:** Specified insulation continuous on both sides, but with breaks in the duct itself **CS:** Specified pipe insulation continuous on both sides, as well as in the duct itself.		

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EN 1366-3

Elastic insulated metal pipes through plaster walls and masonry cast walls.
Elastic insulation, Fire rating B_L-s3, d0 or B-s3, d0, in accordance with EN 13501-1.
Thickness: 9 to 32 mm

Copper pipes	Pipe diameter Ø x t [mm]	FIRESAFE / FSC		Installation side(s)	Insulation config. / [mm]	Construction			Classification in minutes
		Single	Double			FW-100	RW-100	RF-150	
Straight pipes	≤ 88.9 x 1.5 - 14.2	✓		2	CS	✓	✓		EI 45. C/U
			✓		CI or CS				EI 60. C/U

Stainless steel pipes	Pipe diameter Ø x t [mm]	FIRESAFE / FSC		Installation side(s)	Insulation config. / [mm]	Construction			Classification in minutes
		Single	Double			FW-100	RW-100	RF-150	
Straight pipes	≤ 168.3 x 1.5 - 14.2	✓		2	CI or CS	✓	✓		EI 60. C/U
	≤ 219.1 x 1.5 - 14.2								
	≤ 219.1 x 1.5 - 14.2				LS - 500 or CS				

Cast-iron pipes	Pipe diameter Ø x t [mm]	FIRESAFE / FSC		Installation side(s)	Insulation config. / [mm]	Construction			Classification in minutes
		Single	Double			FW-100	RW-100	RF-150	
Straight pipes	≤ 168.3 x 1.5 - 14.2	✓		2	CI or CS	✓	✓		EI 60. C/U
	≤ 219.1 x 1.5 - 14.2								
	≤ 219.1 x 1.5 - 14.2				LS - 500 or CS				

E:	Integrity	**FW-100:**	Plaster walls with a thickness of ≥ 100 mm
I:	Thermal insulation	**RW-100:**	Masonry cast walls with a thickness of ≥ 100 mm
Ø x (t) [mm]:	Pipe diameter x **(t)** pipe wall thickness		
Insulation Configuration /L [mm]:	**LS:** Specified insulation locally applied with specified length ≥ 300 mm out from wall/floor on both sides and in the duct itself. **LI:** Specified insulation locally applied with specified length ≥ 300 mm out from wall/floor on both sides, but with breaks in the duct itself. **CI:** Specified insulation continuous on both sides, but with breaks in the duct itself **CS:** Specified pipe insulation continuous on both sides, as well as in the duct itself.		

FIRESAFE / FSC

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EN 1366-3

PIR / PUR insulated metal pipes through plaster walls and masonry cast walls.
PIR / PUR insulation type, fire class E in accordance with EN 13501-1.
Thickness: 25 mm

Copper pipes	Pipe diameter Ø x t [mm]	FIRESAFE / FSC		Installation side(s)	Insulation config. / [mm]	Construction			Classification in minutes
		Single	Double			FW-100	RW-100	RF-150	
Straight pipes	≤ 67.1 x 1.5 - 14.2	✓		2	LS - 500 or CS	✓	✓		**EI 60. C/U**

Stainless steel pipes	Pipe diameter Ø x t [mm]	FIRESAFE / FSC		Installation side(s)	Insulation config. / [mm]	Construction			Classification in minutes
		Single	Double			FW-100	RW-100	RF-150	
Straight pipes	≤ 76.1 x 1.5 - 14.2	✓		2	LS - 500 or CS	✓	✓		**EI 60. C/U**
	≤ 219.1 x 1.5 - 14.2				CS				**EI 90. C/U**

Cast-iron pipes	Pipe diameter Ø x t [mm]	FIRESAFE / FSC		Installation side(s)	Insulation config. / [mm]	Construction			Classification in minutes
		Single	Double			FW-100	RW-100	RF-150	
Straight pipes	≤ 76.1 x 1.5 - 14.2	✓		2	LS - 500 or CS	✓	✓		**EI 60. C/U**
	≤ 219.1 x 1.5 - 14.2				CS				**EI 90. C/U**

Elastic insulated multilayer pipes through plaster walls and masonry cast walls in combination with FIRESAFE / FSB1 (2 x 50 mm).
Elastic insulation, Fire rating B_L-s3, d0 or B-s3, d0, in accordance with EN 13501-1.
Thickness: 9 to 32 mm

Multilayer pipes[2)]	Pipe diameter Ø x t [mm]	FIRESAFE / FSC		Installation side(s)	Insulation config. / L [mm]	Construction			Rating in minutes
		Single	Double			FW-100	RW-100	RF-150	
Straight pipes	≤ 50 x 4.0	✓		2	LS, LI - 300 or CI, CS	✓	✓		**EI 120- U/C**

Permitted multilayer pipes[2)]
✓ Alpex DUO. ✓ Valsir Pexal. ✓ Valsir Mixal. ✓ APE Plain (PE-Xb/AL/PE-Xb). ✓ Geberit Mepla. ✓ Uponor Unipipe (PE-RT/AL/PE-RT).
✓ Henco. ✓ Uponor (PE-Xc/AL/PE-Xc). ✓ Uponor, REHAU (PE-Xa). ✓ REHAU (PE-XC). ✓ SP Superpipe. ✓ POLYGON PEX (PE-X/AL/PE-X).
✓ Valsir Pexal. ✓ Valsir Mixal (PE/AL/PE-Xb). ✓ Wavin Tigris. ✓ Protecta-Line System. ✓ Alpex F50 Profi (PE-X/AL/PE).

E:	Integrity	**FW-100:**	Plaster walls with a thickness of ≥ 100 mm
I:	Thermal insulation	**RW-100:**	Masonry cast walls with a thickness of ≥ 100 mm
Ø x (t) [mm]:	Pipe diameter x **(t)** pipe wall thickness		
Insulation Configuration /L [mm]:	**LS:** Specified insulation locally applied with specified length ≥ 300 mm out from wall/floor on both sides and in the duct itself. **LI:** Specified insulation locally applied with specified length ≥ 300 mm out from wall/floor on both sides, but with breaks in the duct itself. **CI:** Specified insulation continuous on both sides, but with breaks in the duct itself **CS:** Specified pipe insulation continuous on both sides, as well as in the duct itself.		

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Performance overview

EN 1366-3

Elastic insulated metal pipes through masonry cast walls in combination with FIRESAFE / FSB1 (2 x 50 mm). Elastic insulation, Fire rating B_L-s3, d0 or B-s3, d0, in accordance with EN 13501-1.
Thickness: ≤ 32 mm

Stainless steel pipes	Pipe diameter Ø x t [mm]	FIRESAFE / FSC		Installation side(s)	Insulation config. / L [mm]	Construction			Classification in minutes
		Single	Double			FW-100	RW-100	RF-150	
Straight pipes	≤ 114.3 x 1.5 - 14.2	✓		1	LI - 300 or CI			✓	**EI 90. C/U**

Cast-iron pipes	Pipe diameter Ø x t [mm]	FIRESAFE / FSC		Installation side(s)	Insulation config. / L [mm]	Construction			Rating in minutes
		Single	Double			FW-100	RW-100	RF-150	
Straight pipes	≤ 114.3 x 1.5 - 14.2	✓		1	LI - 300 or CI			✓	**EI 90. C/U**

Insulated multilayer pipes through plaster walls and masonry cast walls in combination with FIRESAFE / FSB1 (2 x 50 mm). PE foam insulation, fire rating C_L-s1-d0, in accordance with EN 13501-1.
Thickness: ≤ 6 mm

Multilayer pipes[2)]	Pipe diameter Ø x t [mm]	FIRESAFE / FSC		Installation side(s)	Insulation config. / L [mm]	Construction			Classification in minutes
		Single	Double			FW-100	RW-100	RF-150	
Straight pipes	≤ 32 x 3.0	✓		2	LS, LI - 300 or CI, CS	✓	✓		**EI 120. C/U**

Permitted multilayer pipes[2)]

✓ Alpex DUO. ✓ Valsir Pexal. ✓ Valsir Mixal. ✓ APE Plain (PE-Xb/AL/PE-Xb). ✓ Geberit Mepla. ✓ Uponor Unipipe (PE-RT/AL/PE-RT).

✓ Henco. ✓ Uponor (PE-Xc/AL/PE-Xc). ✓ Uponor, REHAU (PE-Xa). ✓ REHAU (PE-XC). ✓ SP Superpipe. ✓ POLYGON PEX (PE-X/AL/PE-X).

✓ Valsir Pexal. ✓ Valsir Mixal (PE/AL/PE-Xb). ✓ Wavin Tigris. ✓ Protecta-Line System. ✓ Alpex F50 Profi (PE-X/AL/PE).

E:	Integrity	**FW-100:**	Plaster walls with a thickness of ≥ 100 mm
I:	Thermal insulation	**RW-100:**	Masonry cast walls with a thickness of ≥ 100 mm
		RF-150:	Masonry cast floors with a thickness of ≥ 150 mm
Ø x (t) [mm]:	Pipe diameter x **(t)** pipe wall thickness		
Insulation Configuration / L [mm]:	**LS:** Specified insulation locally applied with specified length 300 mm out from wall/floor on both sides and in the duct itself. **LI:** Specified insulation locally applied with specified length 300 mm out from wall/floor on both sides, but with breaks in the duct itself. **CI:** Specified insulation continuous on both sides, but with breaks in the duct itself **CS:** Specified pipe insulation continuous on both sides, as well as in the duct itself.		

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9. Distances

Distances between single and multiple installation penetrations

Figure 1
a1: Gap between construction and penetration > 20 mm
a2: Gap ≥ 100 mm

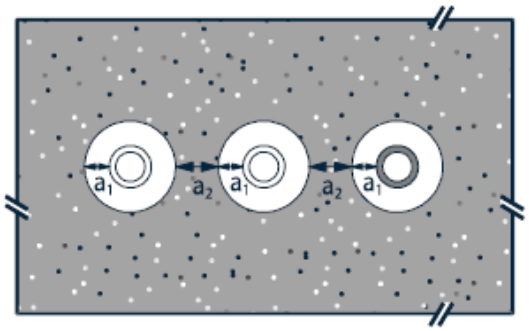


Figure 2
a1: Gap between cand penetration > 20 mm
a2: Gap ≥ 100 mm

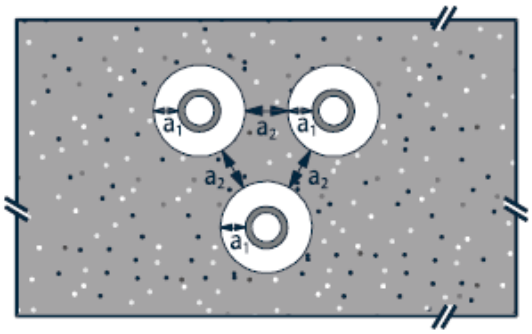


Figure 3
a1: Gap between construction and penetration ≥ 0 mm
a2: Gap ≥ 20 mm

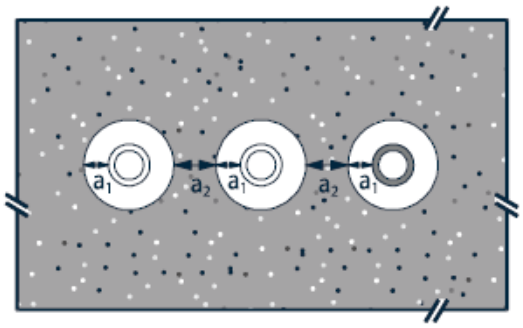


Figure 4
a1: Gap between joint and penetration ≥ 0 mm
a2: Gap ≥ 20 mm

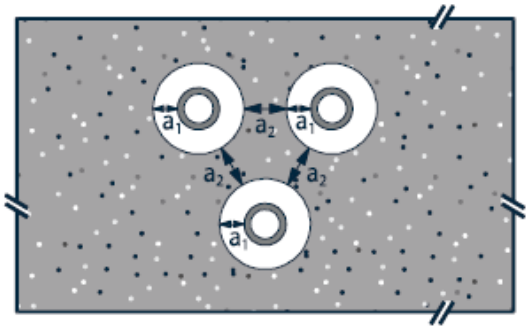


Figure 5
a1: Distance between duct and top of joint ≥ 100 mm
a2: Distance between duct and top of construction ≥ 100 mm
a3: Gap ≥ 100 mm

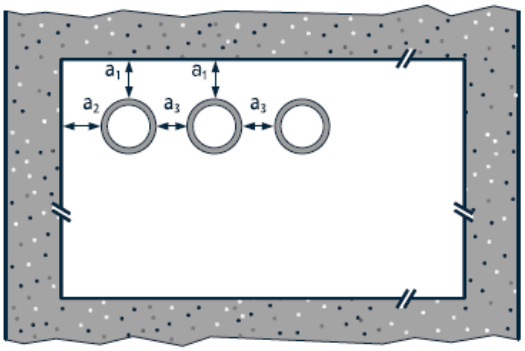
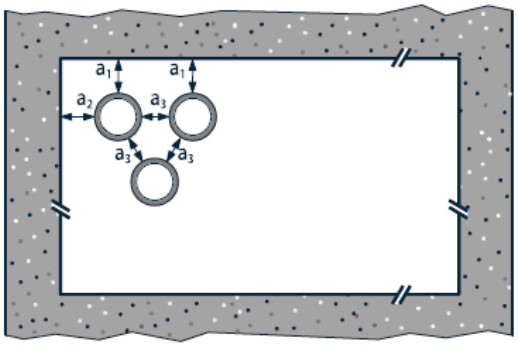
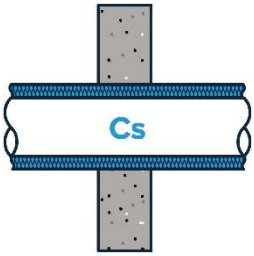
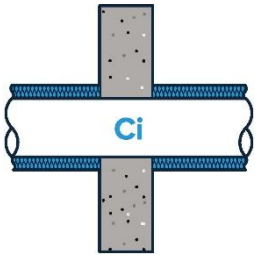
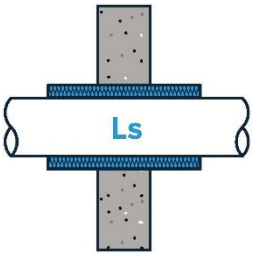
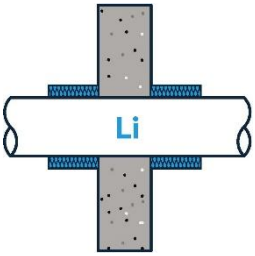


Figure 6
a1: Distance between duct and top of joint ≥ 100 mm
a2: Distance between ducts ≥ 100 mm
a3: Gap ≥ 100 mm



10. Pipe insulation (Configuration)

As different insulations serve different purposes, they may be placed around pipes as insulation using various configurations. Take this into account when applying fire sealant to these pipes. Possible configurations are shown below:

1. Continuous pipe insulation		2. Local pipe insulation	
Cs: Continuous pipe insulation, on both sides, also in the penetration itself.	**Ci:** Continuous pipe insulation, on both sides, excluding the penetration itself.	**Ls:** Local pipe insulation in the specified length locally on both sides, also in the penetration itself.	**Li:** Local pipe insulation in the specified length locally on both sides, excluding the penetration itself
			

Permitted insulation materials

FIRESAFE /FSC has undergone thorough testing with a variety of insulation materials. The permitted insulation materials are displayed in the table below. For general information, see our website **www.firesafe.no** or **ETA 25/0232**.

Insulation type	Pipe type	Permitted[1)]
Acoustic insulation Fire rating B-s1, d0, in accordance with EN 13501-1	✓ PE / PE-HD / ABS / SAN+PVC pipes. ✓ PP pipes. ✓ PVC pipes.	✓ ABsound Sonocool Type PM. ✓ Merfisol Silver Aluminium. ✓ Jaco Massa Reinforced Aluminium. ✓ Jaco Massa Black Aluminium. ✓ Jaco Massa Aluminium.
Acoustic sound and vibration insulation Fire class E in accordance with EN 13501-1	✓ PE / PE-HD / ABS / SAN+PVC pipes. ✓ PP pipes. ✓ PVC pipes. ✓ Fibre reinforced composite pipes. ✓ Low-noise pipes. ✓ Multilayer pipes.	✓ ThermaCompact TF.
Elastic insulation Fire rating BL-s3, d0 of B-s3, d0, in accordance with EN 13501-1	✓ PVC pipes. ✓ Fibre reinforced composite pipes. ✓ Multilayer pipes. ✓ Steel pipes and (stainless steel). ✓ Copper pipes. ✓ Cast-iron pipes.	✓ AF/Armaflex. ✓ SH/Armaflex. ✓ Kaiflex ST. ✓ Kaiflex KK Plus s2. ✓ K-Flex EC. ✓ K-Flex EC AD. ✓ K-Flex EC. ✓ K-Flex ST. ✓ K-Flex ST/SK. ✓ K-Flex ST Frigo. ✓ K-Flex SRC. ✓ K-Flex SRC Eco.
PIR/PUR insulation Fire class E in accordance with EN 13501-1	✓ Steel pipes (stainless steel). ✓ Copper pipes. ✓ Cast-iron pipes.	✓ Insul-Phen. ✓ Insul-Pirplus. ✓ Insul-Pir 33. ✓ Kingspan Tarecpir M1. ✓ Kingspan Tarecpir CR. ✓ Kingspan Tarecpir B2. ✓ Kingspan Tarecpir HT. ✓ Kingspan Tarecpir HD. ✓ Kingspan Kooltherm FM.
Various thermal insulation options Fire rating Cl-s1-d0, i.a.w. EN 13501-1	✓ Multilayer pipes. ✓ Air conditioner pipes (copper).	✓ PE foam, for example.

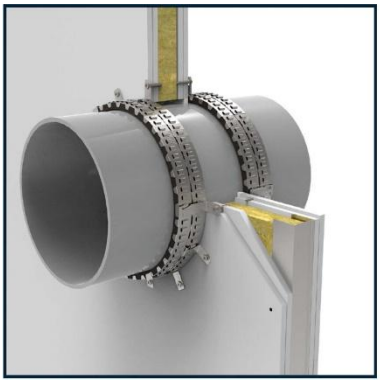
[1)] Insulation materials must possess at least the same fire rating as tested in accordance with EN 13501-1.

11. Consumption tables

FSC sections, - fastening with Multiclip and Multiclip Large on non-insulated plastic pipes

Plastic pipe diameter Ø Outer diameter [mm]	Number of FSC sections on non-insulated pipes [pcs.)	Multiclip [pcs.]	Multiclip Large [pcs.]	Number of pipes per roll
16-40	15	2		11
50	17	2		10
56	18	2		9
63	19	2		9
75	22	2		7
80	23	2		7
90	25	2		6
100	27	3		6
110	29	3		6
125	32	3		5
140	36	3		4
160	40	4		4
200	48 (x2)	1	5	3 (1.8)
250	59 (x2)	2	5	2 (1.4)
315	72 (x2)	2	6	2 (1.2)

The table shows the number of FSC sections installed to a single pipe.
U shaped FSC can be used on pipe diameters up to Ø 110 mm: Pipe Ø 110 mm + 15 FSC sections.
For plastic pipes with an outer diameter of ≤ Ø160 mm, a single FSC can be used.
For plastic pipes with an outer diameter of > Ø160 mm, double FSC can be used.



Consumption tables

Plastic pipes with insulation

Construction	Thickness [mm]	Pipe configuration	Size Ø [mm]	Insulation type
Plaster and masonry cast walls	≥ 100	Straight pipes	Ø 110	Elastic thickness (9 - 32 mm)
Masonry cast floors	≥ 150			

Consumption tables for plastic pipes with insulation (Armaflex, Kaiflex, etc.)

Plastic pipe diameter Ø outer diameter [mm]	Pipe duct with insulation 9 [mm]		Pipe duct with insulation 13 [mm]		Pipe duct with insulation 19 [mm]		Pipe duct with insulation 32 [mm]	
Outer Ø [mm]	Outer Ø [mm]	FSC sections [pcs.]	Outer Ø [mm]	FSC sections [pcs.]	Outer Ø [mm]	FSC sections [pcs.]	Outer Ø [mm]	FSC sections [pcs.]
16	34.0	15	42.0	16	54.0	19	80.0	24
25	43.0	17	51.0	18	63.0	21	89.0	26
32	50.0	18	58.0	20	70.0	22	96.0	28
40	58.0	20	66.0	21	78.0	24	104.0	29
50	68.0	22	76.0	23	88.0	26	114.0	31
56	74.0	23	82.0	25	94.0	27	120.0	33
63	81.0	25	89.0	26	101.0	29	127.0	33
70	88.0	26	96.0	28	108.0	30	134.0	34
75	93.0	27	101.0	29	113.0	31	139.0	35
80	98.0	28	106.0	30	118.0	32	144.0	36
90	108.0	30	116.0	32	128.0	33	154.0	39
100	118.0	32	126.0	33	138.0	35	164.0	41
110	128.0	33	136.0	35	148.0	37	174.0	43
125	143.0	36	151.0	38	163.0	40	189.0	46
140	158.0	39	166.0	41	178.0	44	204.0	49
160	178.0	44	186.0	45	198.0	48	224.0	53

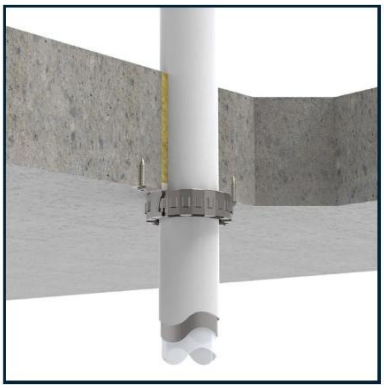
Consumption tables

Non-insulated multilayer pipes

Construction	Thickness [mm]	Pipe configuration	Size Ø [mm]	Insulation type
Plaster and masonry cast walls	≥ 100	Straight pipes	Ø 75	Non-insulated
		Zero distance to floor	Ø 32	
Masonry cast floors	≥ 150	Straight pipes	Ø 75	
		Multiple penetrations	Ø 50	
FIRESAFE / FSB Firestop Boards	≥ 2 x 50	Straight pipes	Ø 75	

Consumption table for multilayer pipes without insulation

Aluminium composite Outer Ø [mm]	Pipes without insulation [pcs.]	Multiclip [pcs.]	Number / roll
12	15	2	11
14	15	2	11
16	15	2	11
18	15	2	11
20	15	2	11
26	15	2	11
32	15	2	11
40	15	2	11
50	17	2	10
63	19	2	9
75	22	2	7
90	25	2	6
110	29	3	6



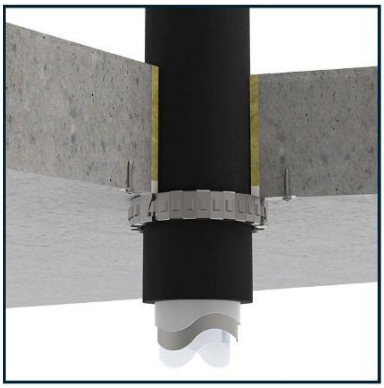
Consumption tables

Multilayer pipes with insulation

Construction	Thickness [mm]	Pipe configuration	Size Ø [mm]	Insulation type
Plaster and masonry cast walls	≥ 100	Straight pipes	Ø 110	Elastomer (9 - 32 mm)
		Zero distance to floor	Ø 50	
		Zero distance to floor	Ø 50	
Masonry cast floors	≥ 150	Straight pipes	Ø 110	PE foam (< 6 mm)
		Multiple penetrations	Ø 32	
FIRESAFE / FSB Firestop Boards	≥ 2 x 50	Straight pipes	Ø 32 (2x)	

Consumption tables for multilayer pipes with insulation (Armaflex, Kaiflex, etc.)

Aluminium composite Outer Ø [mm]	Pipes with insulation 9 [mm]		Pipes with insulation 13 [mm]		Pipes with insulation 19 [mm]		Pipes with insulation 32 [mm]	
Outer Ø [mm]	Outer Ø [mm]	FSC sections [pcs.]	Outer Ø [mm]	FSC sections [pcs.]	Outer Ø [mm]	FSC sections [pcs.]	Outer Ø [mm]	FSC sections [pcs.]
12	30.0	15	38.0	15	50.0	18	76.0	23
14	32.0	15	40.0	16	52.0	18	78.0	24
16	34.0	15	42.0	16	54.0	19	80.0	24
18	36.0	15	44.0	17	56.0	19	82.0	25
20	38.0	15	46.0	17	58.0	20	84.0	25
26	44.0	17	52.0	18	64.0	21	90.0	26
32	50.0	18	58.0	20	70.0	22	96.0	28
40	58.0	20	66.0	21	78.0	24	104.0	29
50	68.0	22	76.0	23	88.0	26	114.0	31
63	81.0	25	89.0	26	101.0	29	127.0	33
75	93.0	27	101.0	29	113.0	31	139.0	35
90	108.0	30	116.0	32	128.0	33	154.0	39
110	128.0	33	136.0	35	148.0	37	174.0	43



Consumption tables

Fibre reinforced composite pipes without insulation

Construction	Thickness [mm]	Pipe configuration	Size Ø [mm]	Insulation type
Plaster and masonry cast walls	≥ 100	Straight pipes	Ø 160	Non-insulated
		Joining elements	Ø 110	
		Zero distance (U shape)	Ø 50	
		Support construction		
Masonry cast floors	≥ 150	Straight pipes	Ø 250	
		Corner solutions	Ø 110	
FIRESAFE / FSB Firestop Boards	≥ 2 x 50	Straight pipes	Ø 110	

Consumption table for non-insulated fibre reinforced composite pipes with multiple layers

Multilayer pipes Outer Ø [mm]	Pipes without insulation [mm]	Multiclip [pcs.]	Number / roll
16	15	2	11
20	15	2	11
25	15	2	11
32	15	2	11
40	15	2	11
50	17	2	10
63	19	2	9
75	22	2	7
90	25	2	6
110	29	3	6
125	32	3	5
160	40	4	4

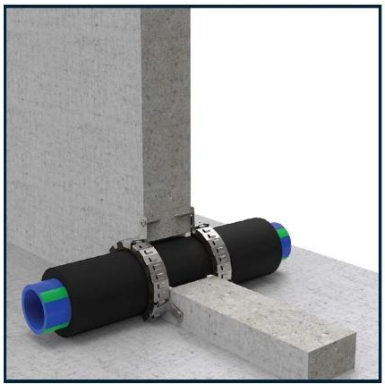
Consumption tables

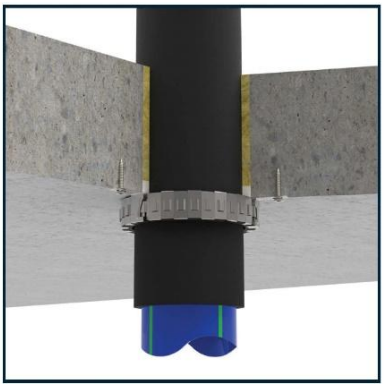
Fibre reinforced composite pipes with insulation

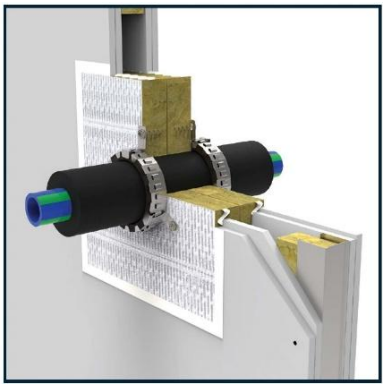
Construction	Thickness [mm]	Pipe configuration	Size Ø [mm]	Insulation type
Plaster and masonry cast walls	≥ 100	Straight pipes	Ø 160	Elastic Insulation (9 - 32 mm)
		Zero distance (U shape)	Ø 50	
Masonry cast floors	≥ 150	Straight pipes	Ø 110	
FIRESAFE / FSB Firestop Boards	≥ 2 x 50	Straight pipes	Ø 110	

Consumption tables for fibre reinforced composite pipes with insulation (Armaflex, Kaiflex, etc.)

Fibre reinforced composite	Pipes with insulation 9 [mm]		Pipes with insulation 13 [mm]		Pipes with insulation 19 [mm]		Pipes with insulation 32 [mm]	
Outer Ø [mm]	Outer Ø [mm]	FSC sections [pcs.]	Outer Ø [mm]	FSC sections [pcs.]	Outer Ø [mm]	FSC sections [pcs.]	Outer Ø [mm]	FSC sections [pcs.]
16	34.0	15	42.0	16	54.0	19	80.0	24
20	38.0	15	46.0	17	58.0	20	84.0	25
25	43.0	17	51.0	18	63.0	21	89.0	26
32	50.0	18	58.0	20	70.0	22	96.0	28
40	58.0	20	66.0	21	78.0	24	104.0	29
50	68.0	22	76.0	23	88.0	26	114.0	31
63	81.0	25	89.0	26	101.0	29	127.0	33
75	93.0	27	101.0	29	113.0	31	139.0	35
90	108.0	30	116.0	32	128.0	33	154.0	39
110	128.0	33	136.0	35	148.0	37	174.0	43
125	143.0	36	151.0	38	163.0	40	189.0	46
160	178.0	44	186.0	45	198.0	48	224.0	53







Consumption tables

Metal pipes with insulation

Construction	Thickness [mm]	Pipe configuration	Size Ø [mm]	Insulation type
Plaster and masonry cast walls	≥ 100	Straight pipes	Ø 219.1	PIR/PUR (25 mm)
Masonry cast floors	≥ 150	Straight pipes	Ø 168.3	Elastomer (9 - 32 mm)
FIRESAFE / FSB Firestop Boards	≥ 2 x 50	Straight pipes	Ø 114.3	

Consumption tables for metal pipes with insulation (Armaflex, Kaiflex, etc.)

Stainless steel pipes	Pipes with insulation 9 [mm]		Pipes with insulation 13 [mm]		Pipes with insulation 19 [mm]		Pipes with insulation 32 [mm]	
Outer Ø [mm]	Outer Ø [mm]	FSC sections [pcs.]	Outer Ø [mm]	FSC sections [pcs.]	Outer Ø [mm]	FSC sections [pcs.]	Outer Ø [mm]	FSC sections [pcs.]
10.2	28.2	15	36.2	15	48.2	18	62.2	21
13.5	31.5	15	39.5	16	51.5	18	65.5	21
17.2	35.2	15	43.2	17	55.2	19	69.2	22
21.3	39.3	16	47.3	17	59.3	20	73.3	23
26.9	44.9	17	52.9	19	64.9	21	78.9	24
33.7	51.7	18	59.7	20	71.7	23	85.7	25
42.4	60.4	20	68.4	22	80.4	24	94.4	27
48.3	66.3	21	74.3	23	86.3	26	100.3	29
60.3	78.3	24	86.3	26	98.3	28	112.3	31
76.1	94.1	27	102.1	29	114.1	31	128.1	33
88.9	106.9	30	114.9	32	126.9	33	140.9	36
114.3	132.3	34	140.3	36	152.3	38	166.3	41
139.7	157.7	39	165.7	41	177.7	44	191.7	46
168.3	186.3	45	194.3	47	206.3	49	220.3	52
219.1	237.1	56	245.1	58	257.1	60	271.1	63

Consumption tables

Metal pipes with insulation

Construction	Thickness [mm]	Pipe configuration	Size Ø [mm]	Insulation type
Plaster and masonry cast walls	≥ 100	Straight pipes	Ø 219.1	PIR/PUR (25 mm)
Masonry cast floors	≥ 150	Straight pipes	Ø 168.3	Elastomer (9 - 32 mm)
FIRESAFE / FSB Firestop Boards	≥ 2 x 50	Straight pipes	Ø 114.3	

Consumption tables for metal pipes with insulation (PIR, PUR, etc.)

Stainless steel pipes	Pipes with insulation 25 [mm]		Pipes with insulation 30 [mm]		Pipes with insulation 35 [mm]		Pipes with insulation 40 [mm]	
Outer Ø [mm]	Outer Ø [mm]	FSC sections [pcs.]	Outer Ø [mm]	FSC sections [pcs.]	Outer Ø [mm]	FSC sections [pcs.]	Outer Ø [mm]	FSC sections [pcs.]
10.2	60.2	19	70.2	21	80.2	23	150.2	38
13.5	63.5	20	73.5	22	83.5	24	153.5	38
17.2	672	20	77.2	22	87.2	25	157.2	39
21.3	71.3	21	81.3	23	91.3	25	161.3	40
26.9	76.9	22	86.9	24	96.9	27	166.9	41
33.7	83.7	24	93.7	26	103.7	28	173.7	43
42.4	92.4	26	102.4	28	112.4	30	182.4	44
48.3	98.3	27	108.3	29	118.3	31	188.3	46
60.3	110.3	29	120.3	31	130.3	34	200.3	48
76.1	1261	33	136.1	35	146.1	37	216.1	52
88.9	138.9	35	148.9	37	158.9	40	228.9	54
114.3	164.3	41	174.3	43	184.3	45	254.3	60
139.7	189.7	46	199.7	48	209.7	50	279.7	65
168.3	218.3	52	228.3	54	238.3	56	308.3	71
219.1	269.1	63	279.1	65	289.1	67	359.1	81

Consumption table

Copper pipes with insulation

Construction	Thickness [mm]	Pipe configuration	Size Ø [mm]	Insulation type
Plaster and masonry cast walls	≥ 100	Straight pipes	Ø 76.1	PIR/PUR (25 mm)
Masonry cast floors	≥ 150	Straight pipes	Ø 88.9	Elastomer (9 - 32 mm)

Consumption tables for copper pipes with insulation (Armaflex, Kaiflex, etc.)

Copper pipes	Pipes with insulation 9 [mm]		Pipes with insulation 13 [mm]		Pipes with insulation 19 [mm]		Pipes with insulation 32 [mm]	
Outer Ø [mm]	Outer Ø [mm]	FSC sections [pcs.]	Outer Ø [mm]	FSC sections [pcs.]	Outer Ø [mm]	FSC sections [pcs.]	Outer Ø [mm]	FSC sections [pcs.]
10.0	28.0	15	36.0	15	48.0	18	74.0	23
12.0	30.0	15	38.0	15	50.0	18	76.0	23
15.0	33.0	15	41.0	16	53.0	19	79.0	24
18.0	36.0	15	44.0	17	56.0	19	82.0	25
22.0	40.0	16	48.0	18	60.0	20	86.0	26
28.0	46.0	17	54.0	19	66.0	21	92.0	27
35.0	53.0	19	61.0	20	73.0	23	99.0	28
42.0	60.0	20	68.0	22	80.0	24	106.0	30
54.0	72.0	23	80.0	24	92.0	27	118.0	32
64.0	82.0	25	90.0	26	102.0	29	128.0	35
76.1	94.1	27	102.1	29	114.1	31	140.1	38
88.9	106.9	30	114.9	32	126.9	33	152.9	38

Consumption tables for copper pipes with insulation (PIR, PUR, etc.)

Copper pipes	Pipes with insulation 25 [mm]		Pipes with insulation 30 [mm]		Pipes with insulation 35 [mm]		Pipes with insulation 40 [mm]	
Outer Ø [mm]	Outer Ø [mm]	FSC sections [pcs.]	Outer Ø [mm]	FSC sections [pcs.]	Outer Ø [mm]	FSC sections [pcs.]	Outer Ø [mm]	FSC sections [pcs.]
10.0	60.0	19	70.0	21	80.0	23	90.0	25
12.0	62.0	19	72.0	21	82.0	23	92.0	26
15.0	65.0	20	75.0	22	85.0	24	95.0	26
18.0	68.0	21	78.0	23	88.0	25	98.0	27
22.0	72.0	21	82.0	23	92.0	26	102.0	28
28.0	78.0	23	88.0	25	98.0	27	108.0	29
35.0	85.0	24	95.0	26	105.0	28	115.0	30
42.0	92.0	26	102.0	28	112.0	30	122.0	32
54.0	104.0	28	114.0	30	124.0	32	134.0	34
64.0	114.0	30	124.0	32	134.0	34	144.0	36
76.1	126.1	33	136.1	35	146.1	37	156.1	39
88.9	138.9	35	148.9	37	158.9	40	168.9	42

12. Flue gas pipe

Flue gas pipes may consist of single or double systems. When this includes eccentric connections, the central thermal boiler has a parallel system. In this case, there is a separate exhaust pipe is used for smoke and a separate pipe for air supply. A concentric connection uses a combined system for air supply and flue gas extraction. This means that flue gases are removed using an inner pipe while air for combustion is supplied via the outer pipe.

All flue gas pipes that have been tested are listed below:

Flue gas pipe: Aluminium ≤ Ø 130 [mm]			
Construction	**Thickness [mm]**	**Rating [min]**	**FIRESAFE / FSC**
Masonry cast shaft wall	≥ 70	**EI 90. U/C**	Double
Plaster shaft wall	≥ 100		
Rigid floor	≥ 150		

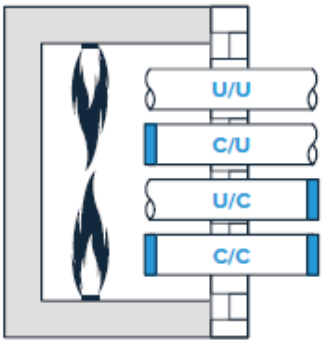
Flue gas pipe: Plastic PP ≤ Ø 125 [mm]			
Construction	**Thickness [mm]**	**Rating [min]**	**FIRESAFE / FSC**
Masonry cast shaft wall	≥ 70	**EI 60. U/U**	Double
Plaster shaft wall		**EI 90. U/C**	Single
Masonry cast floors	≥ 150		

Flue gas pipe: Plastic PP-PP composition ≤ Ø 125 [mm]			
Construction	**Thickness [mm]**	**Rating [min]**	**FIRESAFE / FSC**
Masonry cast shaft wall	≥ 70	**EI 60. U/U**	Double
Plaster shaft wall	≥ 100	**EI 90. U/C**	Single
Masonry cast floors	≥ 150		

Flue gas pipe: PP plastic and steel combination ≤ Ø 200 [mm]			
Construction	**Thickness [mm]**	**Rating [min]**	**FIRESAFE / FSC**
Masonry cast shaft wall	≥ 70	**EI 90. U/C**	Double
Plaster shaft wall	≥ 100		Single
Masonry cast floors	≥ 150		Double

13. Explanation of abbreviations for pipe ends (cf. EN 1366-3:2021)

Instructions:



The test configuration will determine the use of pipes. Before a type of pipe undergoes testing, the intended use of the pipes must be taken into account. Where will the plastic pipes be used in practice?

Test standard EN 1366-3 provides requirements for this. This will decide whether or not the pipe must be capped.

See the test configuration in **Table 1** for flammable plastic pipes and **Table 2** for metal pipes.

During fire testing, the ends of the pipe and fire sealing systems must be tested to determine whether the pipes must be capped at one or both ends, or kept fully uncapped in the building. Pressure, smoke, and hot gases must not be able to pass through the pipes or fire sealing systems in the event of a fire.

Table 1 - Test configuration for plastic pipes

Test setup	Pipe end		Permitted use			
	In oven	Outside of oven	U/U	C/U	U/C	C/C
U/U	Uncapped	Uncapped	✓	✓	✓	✓
C/U	Capped	Uncapped	X	✓	✓	✓
U/C	Uncapped	Capped	X	X	✓	✓
C/C	Capped	Capped	X	X	X	✓

*** U/U tested, floor also tested with all pipe ends.**

Table 2 - Test configuration for metal pipes

Test setup	Pipe end		Permitted use		
	In oven	Outside of oven	U/C	C/U	C/C
U/C *	Uncapped	Capped	✓	✓	✓
C/U	Capped	Uncapped	X	✓	✓
C/C	Capped	Capped	X	X	✓
*** U/C tested, floor also tested with U/U.**					

Plastic pipes

Table H.1 on the next page displays some examples of pipes and intended uses where the end of the pipe is capped or not. The table cannot take all possible usage options into account. When deciding whether to cap the end of the pipe or to let it remain uncapped, several factors must be considered: is the system under pressure, and is the system ventilated?

Consider the service type of the pipe to determine whether it should be capped. If national regulations provide other requirements than those given in table H1, then these regulations shall apply.

Table H.1. Plastic pipes

Pipe type, type of service	Pipe end		Test setup
	In oven	Outside of oven	
Rainwater drainage	Uncapped	Uncapped	**U/U**
Sewage, ventilated	Uncapped	Uncapped	**U/U**
Sewage, non-ventilated	Uncapped	Capped	**U/C**
Gas pipes, drinking water pipes, hot water pipes	Uncapped	Capped	**U/C**
Capped pipe systems with permanent water pressure, water supply	Capped	Capped	**C/C**

Pipe ends C/U or U/C apply to wastewater pipes with a water trap in accordance with table H.1 in EN 1366-3.
Pipe ends C/C apply to pipes with permanent water pressure, e.g., pipes for water supply following table H.1 in EN 1366-3.

Non-flammable metal pipes

Metal pipes are usually capped in the testing oven. As the metal will not melt away, it is assumed that there will not be an open end on the pipes in the event of a fire. It is therefore assumed that the suspension system will remain in place. If the pipes are supported by a suspension system that does not have a fire resistance, or if there are waste chutes, the metal pipes will not be capped in the testing oven, as shown in table **H.2**. **See next page.**

Table H.2. Metal pipes or non-flammable pipes

Pipe type, type of service	Pipe end		Test setup
	In oven	Outside of oven	
Service support – fire rated suspension system[a]	Capped	Uncapped	**C/U**
Service support – suspension system without fire rating	Uncapped	Capped	**U/C**
Chute for waste disposal	Uncapped	Capped	**U/C**
[a]must be documented via fire testing or calculations (e.g. Euro codes)			

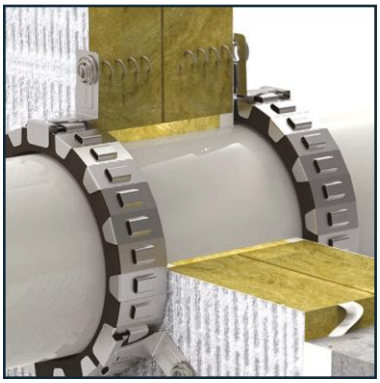
14. Requirements for the properties of structural components

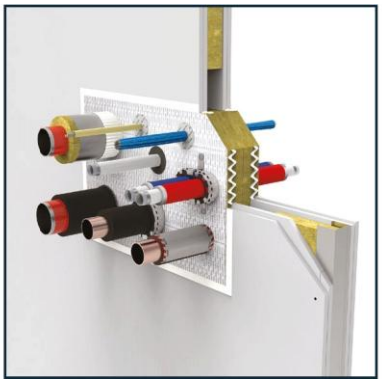
Flexible plaster walls
The minimum thickness for walls must be 100 mm, and the wall must consist of steel or wood studs* with at least 2 layers of plaster cladding on each side, thickness 12.5 mm.

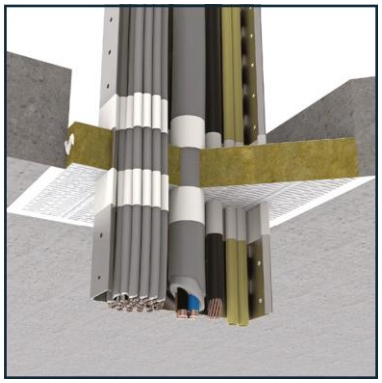
Masonry cast walls and CLT
The minimum thickness for walls is 75 mm and the wall must consist of concrete, aerated concrete, or masonry with a density of at least 350 kg/m^3 and timber (CLT) with a density of at least 400 kg /m^3.

Masonry cast floors and/or CLT
The minimum thickness for floors is 150 mm and the wall must consist of concrete, aerated concrete, or masonry with a density of at least 400 kg/m^3 and cross-laminated timber (CLT) with a minimum thickness of 140 mm and a density of at least 400 kg /m^3.

*There must be a minimum distance of 100 mm from the edge of the seal to the timber studs on all sides, and the gap between the seal and the studs must be sealed as well. The gap between the penetration joint and the timber studs must be fitted with at least 100 mm of insulation with fire classification A1 or A2 (in accordance with EN 13501-1).
The construction must be classified in accordance with EN 13501-2 for the specified fire resistance.





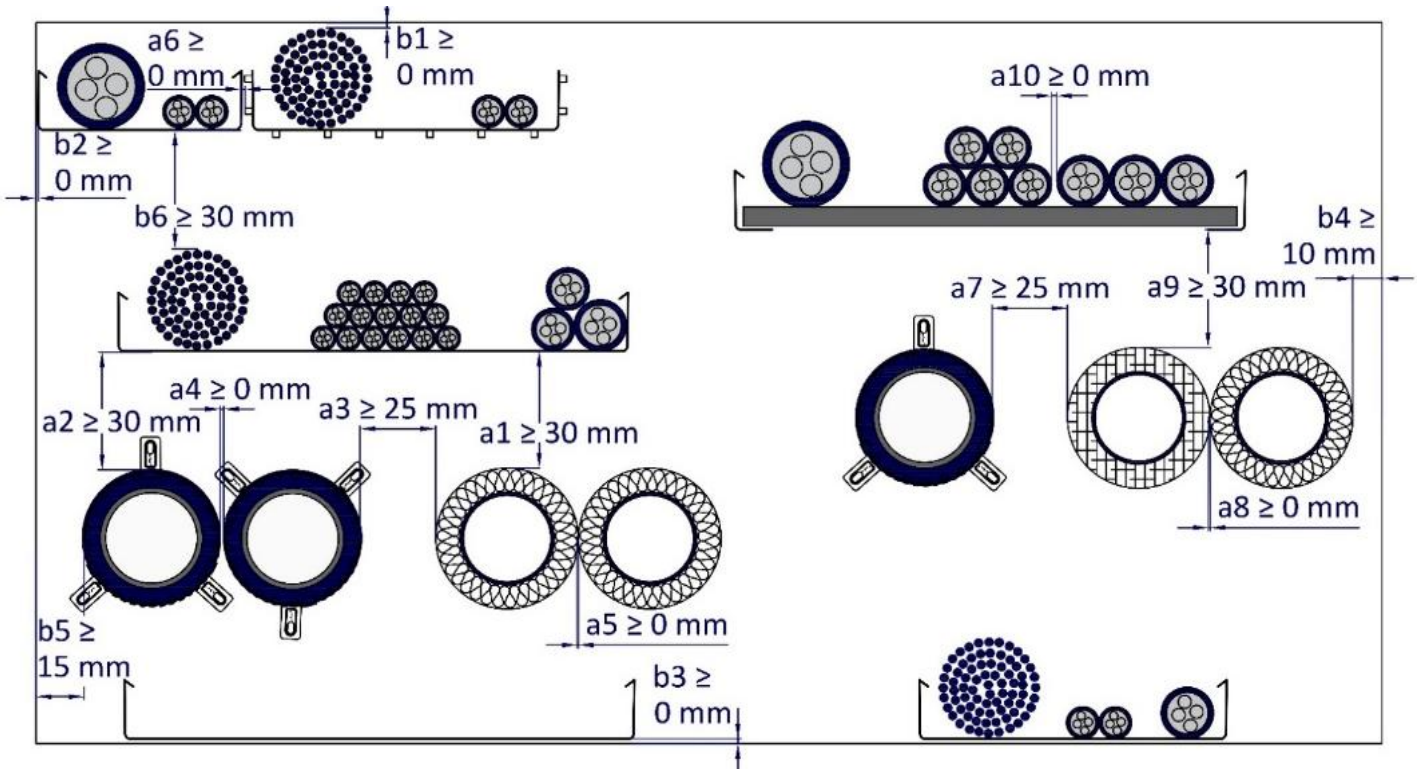


15. Distances

The minimum permitted distance between adjacent single fire seals / openings is 100 mm when the installation penetration is ≤ 300 x 300 mm, and a distance of 200 mm will be required for larger fire seals.

Mixed penetration seals, mutual distances and distances to recess edges. See the table and figure below.

Figure no.	Type of installation	Distance [mm]
a1	Distance between cables / cable trays and metal pipes.	≥ 30
a2	Distance between cables / cable trays and plastic pipes.	≥ 30
a3	Distance between metal pipes and plastic pipes.	≥ 25
a4	Distance between plastic pipes.	≥ 0
a5	Distance between metal pipes with non-flammable insulation.	≥ 0
a6	Horizontal distance between cable trays.	≥ 0
a7	Distance between plastic pipes and pipes with flammable insulation.	≥ 25
a8	Distance between pipes with non-flammable insulation and pipes with flammable insulation.	≥ 0
a9	Distance between cables / cable trays and pipes with flammable insulation.	≥ 30
a10	Distance between pipes stacked together or assembled in rows.	≥ 0
b1	Distance between cables / cable trays and upper seal edge.	≥ 0
b2	Distance between cables / cable trays and side seal edge.	≥ 0
b3	Distance between cables / cable trays and bottom seal edge.	≥ 0
b4	Distance between metal pipes and all seal edges.	≥ 10
b5	Distance between plastic pipes and all seal edges.	≥ 15
b6	Vertical distance between cable trays and other installations.	≥ 30



16. Available documents and approvals for FIRESAFE / FSC

Technical documents
✓ Product data sheet (PDS)
✓ Technical Hand Book (TDS)
✓ Safety data sheet (SDS)
✓ CE marking
✓ Emissions reports
✓ Acoustics report

Approvals
✓ Tested in accordance with EN 1366-3
✓ Classification in accordance with EN 13501-1/2
✓ Certified in accordance with EAD 350454-00-1104
✓ ETA: 25/0232. Penetration Seals
✓ Declaration of Performance (DoP)

The documents listed above can be obtained from your Firesafe contact person, via QR code (Digital Pass), or on the Firesafe website: **www.firesafe.no**.

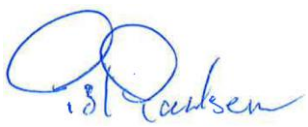
DOCUMENTATION INFORMATION
Overview of areas of use, as well as fire resistance resistances, are displayed in this technical hand book. Other documents, such as the product datasheet, safety data sheet (SDS) and declaration of performance (DoP) can be downloaded at www.firesafe.no. Product certification with/by declaration of performance (DoP); for more information, see the ETA procedure for certification of CE labelled construction products at www.eota.eu/. Product documentation for Norway that has been issued by RISE Fire Research AS can be downloaded at www.risefr.no. Always consult with www.firesafe.no for the latest version of the installation instructions, product datasheet, and declaration of performance, as product development and testing are ongoing processes at FIRESAFE AS. Contact the Technical Department of FIRESAFE AS for other **EI** requirements, non-standard solutions, or complex, project-specific requirements. E-mail: firmapost@firesafe.no.

Prepared by:

Pål Paulsen

Technical department, product manager for fire sealant products
Fire testing and product development

Signature:



Checked by:

Hallvard. K Engøy

Technical Director

Signature: