Multicollar *Slim*

Universal Fire Collar

European
Technical Assessment
ETA 20/1322

Technical Data Sheet

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Pragmatic, effective and applicable solutions

Contents

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Pragmatic, effective and applicable solutions

Multicollar *Slim*

Universal Fire Collar

Fire resistance
≤ 120 minutes

Diameter
Ø 315 mm

Working life
30 years

ALL IN ONE

Universal Fire Collar

Multicollar *Slim* is a 30 mm-high universal fire collar that consists of a stainless steel band made of 174 segments and a high-quality inlay on a graphite basis. In order to achieve the desired pipe diameter, the links can easily be separated. In the event of fire, the Multicollar *Slim* starts foaming and creates a fire-resistant seal to adjacent rooms. In combination with the Multisealant A sealant, it is also possible to achieve a smoke-proof finish. This fire collar has been extensively tested in Europe in accordance with EN 1366-3. The Multicollar *Slim* fire collar is a single product for all applications. Thanks to the Multiclips and Multiscrews included in the box, one person can easily install it.

Multicollar *Slim* forms part of the Mulcol® Penetration Seal System.

Types of penetrations

- Standard plastic pipes
  PVC-U, PVC-C, PP, PE, PE-HD, ABS, SAN+PVC
- Sound-proofing plastic pipes
  REHAU Raupanio plus, Geberit Silent-20dB, Wavin SiTech+, Wavin AS, Blue Power, POLO-KAL 3S
- Aluminium composite pipes such as: PE-Xb, PE-Xe, PE-RT
  Henco, Uponor, Wavin Tigris, Geberit Mepla, REHAU Rautitan
- Fibre composite pipes such as: PP-R, PP-B, PP-RCT
  Aquatherm, C/imatec, Aquatechnik
- Air-conditioning pipes such as: Wicu flex
- Copper and steel pipes
- Electric cables and cable bundles
- Cable conduits with and without electric cables
- Aluminium flue gas discharge pipes
- Concentric flue gas discharge pipes steel/PP

Tested configurations

- Pipes in combination with steel pipe support shells
- Angled pipes (¾ principle)
- Pipes with a zero distance from walls and
- floors, U-shaped collar
- Pipes under a 45° angle
- Pipes tested with tuck-in, electric welding and glue sleeves
- Pipes with 87°/90° and 2x 45° corner pieces
- Multiple pipe solutions
- Pipes with or without insulation

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Technical insulation

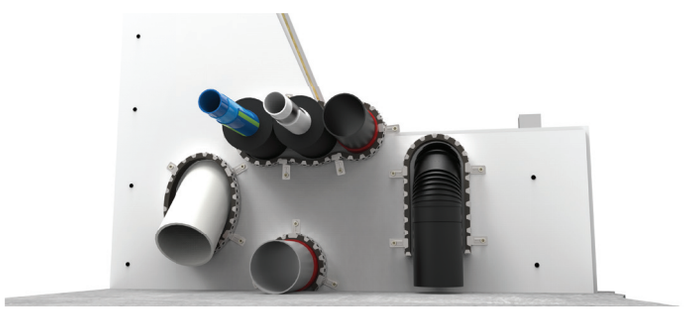
- Thermacompact® TF, PE-foam
- ABsound Sonocool Type PM
- Jaco Massa Reinforced Alu, Jaco Massa Alu and Jaco Massa Black Alu
- Merfisol Silver ALU
- AF/Armaflex and SH/Armaflex
- Kaiflex ST and Kaiflex KKplus s2
- Insul-Phen, Insul-Pirplus and Insul-Pir 33
- Kingspan Tarecpir M1, Kingspan Tarecpir CR, Kingspan Tarecpir 82, Kingspan Tarecpir HT
- Kingspan Tarecpir HD and Kingspan Kooltherm FM

Advantages

- Fire resistance ≤ 120 minutes
- Tested up to Ø 315 mm
- CE-certified
- Environmentally and user-friendly
- Easy to install
- One product for all applications
- One fixing medium for all structures
- Can be used anywhere thanks to its 30-mm height
- Also tested for non-standard applications
- User manual and all fasteners in one
- Damp, fungi and bacteria-resistant
- Halogen-free
- Working life of 30 years

Applications

- Rigid floors and walls
- Flexible walls
- Shaft walls
- Firestop Boards



Packaging

	Dimensions	Box	Outer box	Pallet	Article number
Roll (174 segments)	2610 x 30 x 12 mm	1 piece	8 pieces	384 pieces	206001174

Accessories (included)

- 20 pieces of Multiclips, 30 mm
- 20 pieces of Multiscrews 7.5 x 40 mm
- 1 piece of Multibit T30
- 6 pieces of Conformity Statement

Accessories (available separately)

Multiclip Set
20 pcs. Multiclip, 30 mm
20 pcs. Multiscrew 7.5 x 40 mm
1 pc. Multibit T30
Article number 802060001

Multiclip Set L
20 pcs. Multiclip L, 60 mm
20 pcs. Multiscrew 7.5 x 40 mm
1 pc. Multibit T30
Article number 802060002

Conformity Statement
Contents 6 pcs.
Article number 802060104

Multiscrew FB
20 pcs. Multiscrew FB, 40 mm for assembly on firestopping boards
Article number 802060005

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1. Technical Data

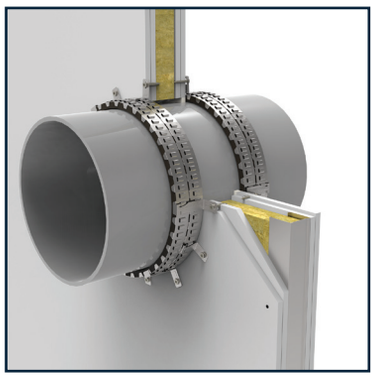
EAN-code	8719324470155
Colour stainless steel belt + inlay	Stainless steel + Anthracite
Shelf life	Not applicable
Transportation - storage temperature	-5 °C to +50 °C (store dry in the original packaging)
Application temperature	+5 °C to +50 °C
Temperature resistance	-20 °C to +80 °C
Density	ρ = 900 kg/m^3 to 1350 kg/m^3
Expansion pressure	0.8 N/mm^2 to 1.8 N/mm^2 (at +300 °C)
Usage category[1)]	Type Z_1 in accordance with EAD 350454-00-1104
Reaction temperature	Approx. +180 °C
Expansion factor[2)]	6.5 x up to 18.5 x
Mounting from one side possible	Yes, please refer to ETA report 20/1322
Fire class	E in accordance with EN 13501-1
Approvals	ETA report 20/1322
Function preservation	30 years
Joint finish	Multisealant A, Multimastic SP or Multimortar
Large gaps	Multimastic C system (1200 x 2400 mm or ∞ x 1200 mm)

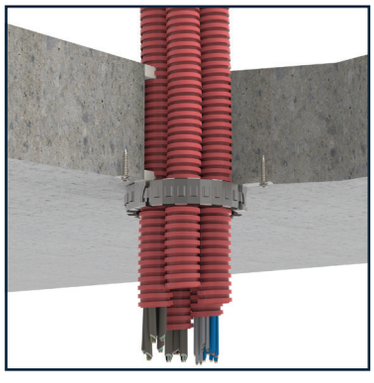
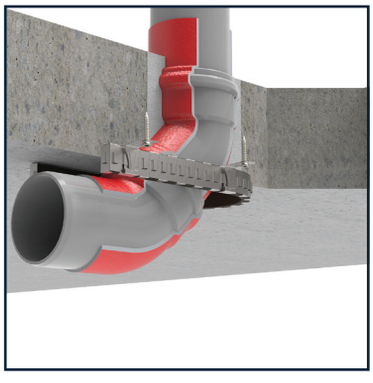
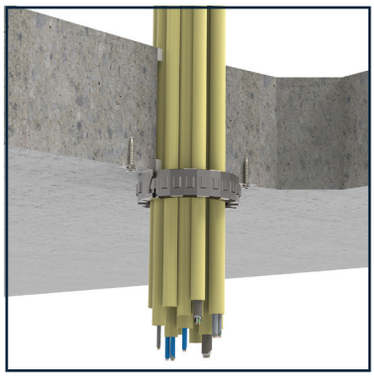
[1)] Permissible environmental conditions

Conduit seal for use in conditions with > 85% RV, protected from temperatures below 0 °C, and without exposure to rain and/or UV (TR 024:2019, type Z_1). Limited contact with splash water tolerated. Lasting wetness, stagnant water and water pressure must be avoided.

[2)] Expansion factor

Tested on samples at +450 °C for 25 minutes with overload. The expansion factor is a laboratory characteristic value. The expansion factor in an installed state depends on the existing preconditions.



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2. Assembly Instructions

Installing the Multicollar *Slim*

The Multicollar *Slim* can be installed on different surfaces, using tested Multiclips, Multiscrews and Multiscrews FB.
When installing on a stony surface, the Multiscrews must be pre-drilled.

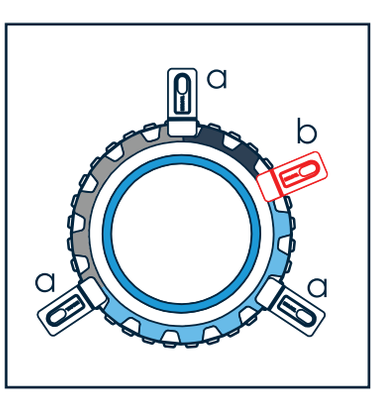
The table below provides an overview of the fasteners to be used.

Construction	Surface	Attachment		Pre-drilled hole required
		Multiscrews 7.5 x 40 mm	Multiscrew FB40 mm	
Walls	Concrete	✓		Ø 6 mm
	Brickwork			
	Calcium silicate blocks			n/a
	Aerated concrete			
	Plasterboards			
Floors	Concrete			Ø 6 mm
	Calcium silicate blocks			n/a
Fire stopping batts	Stone wool coated batts		✓	

Reusing Segments

The remaining segments of the Multicollar *Slim* on the roll can simply be linked up using the enclosed Multiclips, thus enabling maximum use of the Multicollar *Slim*. Multicollar *Slim* is made up of a total of 174 segments that can be reused after cutting/breaking to make a new fire collar. A minimum of 2 segments is required to correctly assemble the Multiclips. A “composite” fire collar must include a maximum of 3 parts. See figure A for a principle overview.

Figure A
a: Mulcol® Multiclip
b: Mulcol® Multiclip (coupling clip)



Multiclips mounting instructions

The Multicollar Slim must be installed with the corresponding Multiclips.
The following principles apply to meet the tested situation:

- ✓ Divide the Multiclips as well as evenly as possible over the Multicollar Slim
- ✓ There can be a maximum of 11 segments between Multiclips “a” as shown in figure A
- ✓ Extra Multiclips can be used, as shown with Multiclip “b” in figure A
- ✓ Do not use fewer Multiclips than prescribed

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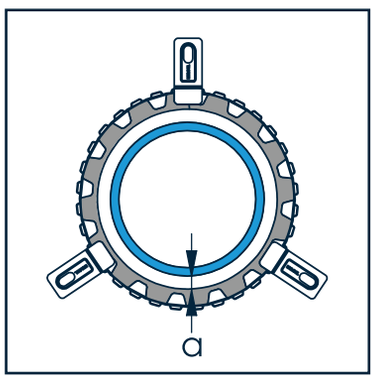
Maximum Distance between the Penetration and Multicollar *Slim*

The table below shows the maximum distance between the penetration, with or without insulation, and the Multicollar Slim fire collar. See figure B for a schematic representation.

Figure B

a: Maximum distance between the penetration and the Multicollar *Slim*



Distance between the penetration/ insulation and fire collar		
Ø external [mm]	≤ 125	> 125
"a" [mm]	≤ 15	≤ 5

Use of Single and Dual Multicollar *Slim*

The Multicollar *Slim* can be used in either single or dual applications. When using a dual application the extended Multiclips (Large) must be used. See figure C and D for a schematic representation. The table below shows how much Multiclips are required for a single and dual application.

Ø External pipes ducts, cables or insulation (mm)	**Single Multicollar *Slim*** Number of Mulcol® Multiclips	**Dual Multicollar *Slim***	
		First Multicollar *Slim* (Number Mulcol® Multiclips, A)	Second Multicollar *Slim* (Number Mulcol® 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 fixing on the construction is not required.

Figure C

a: Mulcol® Multiclip

b: Mulcol® Multiclip Large

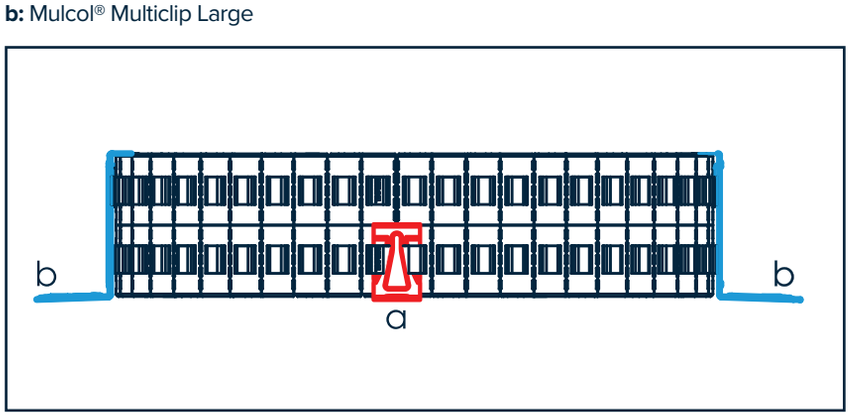
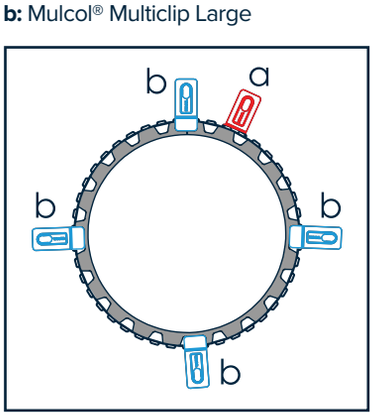


Figure C

a: Mulcol® Multiclip

b: Mulcol® Multiclip Large



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3. Explanation of Special Applications

Penetrations with Zero Distance to Construction (U-shape)

With plastic pipes with an annular space (≤ 30 mm) through Flexible walls, rigid walls or floors, the Multicollar *Slim* must be extended by 15 segments; see figure 1. The starting point is diameter of the pipe, irrespective of whether it is fitted with decoupling acoustic insulation; see figure 3. With this type of penetration, the increase in the pipe diameter has been taken into account through couplers such as sliding sleeves, etc. The ends of the stainless steel belt must have a 90° bend for this solution to function correctly. The space between the Multiclips in the bend must not exceed a maximum of 15 segments; see figure 4.

Usage table with annular space

Ø External [mm]	Segments
40	30
50	32
56	33
63	34
70	36
75	37
80	38
90	40
100	42
110	44

Figure 1

Figure 2

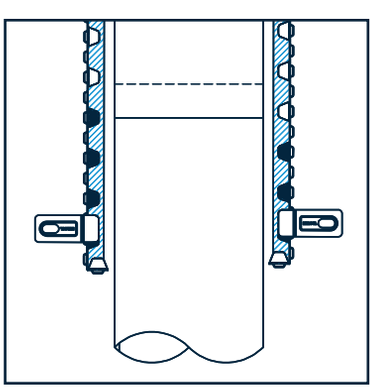


Figure 3

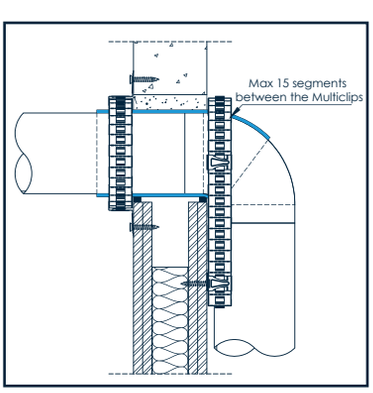
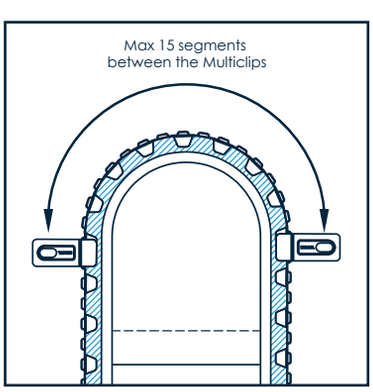


Figure 4



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Straight Pipes with ‘0’ distance to the floor

Pipes that are fitted over the floor with an annular space ($S^2 \leq 5$ mm) can be fitted with a ¾ fire collar up to max. Ø 125 mm.
See figures 5, 6 and 7 for the tested configurations.

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

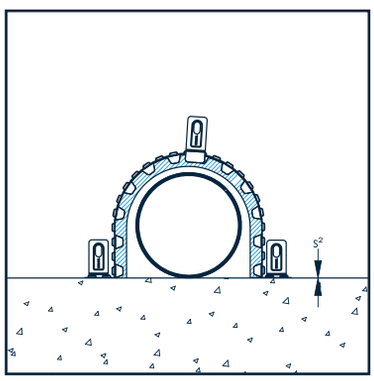


Figure 6
S^2: Distance to construction ≤ 5 mm

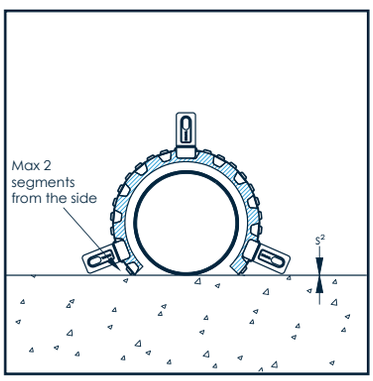
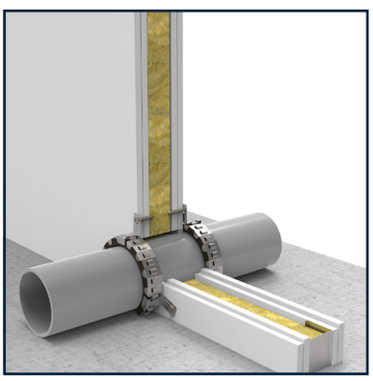


Figure 7



Inclined Pipes ≥ 45° - 90°

Pipes that are fed through at an angle of 45° to 90° (see figures 8, 9 and 10) can be used in Flexible walls, rigid walls or floors.
The pipes may be fitted with sound decoupling or acoustic insulation; see the table “Permitted insulation materials”
on page 31 for more information.

Figure 8

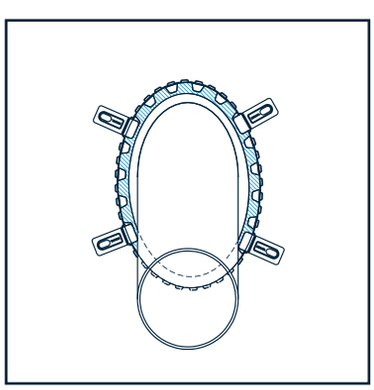


Figure 9

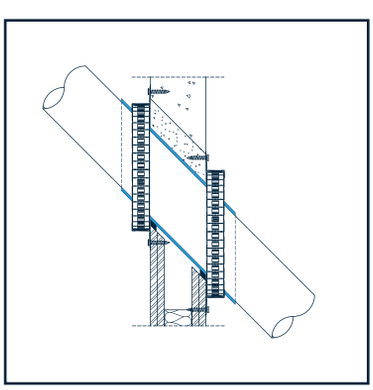
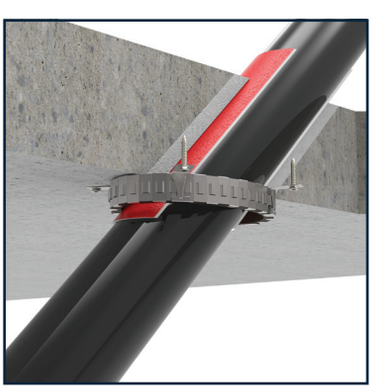


Figure 10



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Wall and Floor Corner Solutions

Pipes that are placed along light wall partitions, rigid walls or floors with an annular space can be provided with a ¾ fire collar, up to max. Ø 125 mm. For the tested configurations, see figures 11, 12, 13 and 14.

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

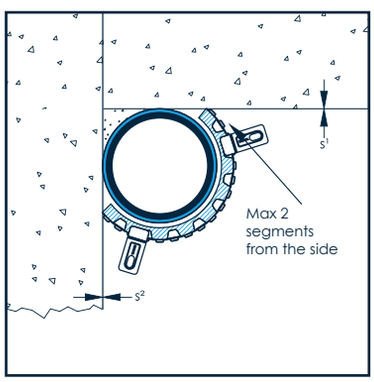


Figure 12

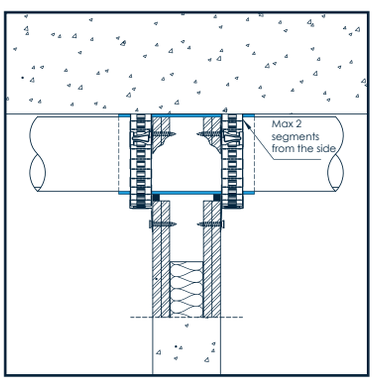


Figure 13
S^1: Distance to construction ≤ 5 mm
S^2: Distance to construction ≤ 5 mm

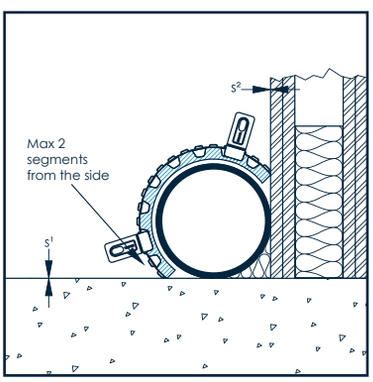
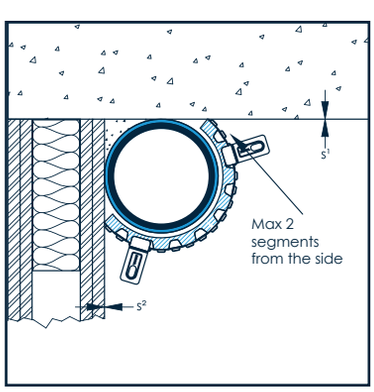


Figure 14
S^1: Distance to construction ≤ 5 mm
S^2: Distance to construction ≤ 5 mm



Multiple Penetrations

With the Multicollar *Slim*, multiple pipes can be finished with fire protection, irrespective of whether it is combined with electric cables. If multiple penetrations with a so-called annular space pass through light partitions or rigid walls, a single Multicollar *Slim* fire collar can be used. See figures 15 and 16. In some cases a double Multicollar *Slim* should be used; see figure 17.

Figure 15
S^1: Spacing max. ≤ 15 mm
S^2: Distance to construction ≥ 0 mm

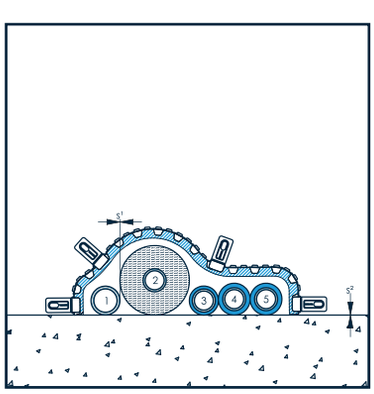


Figure 16

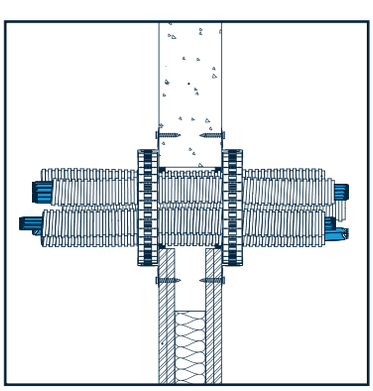
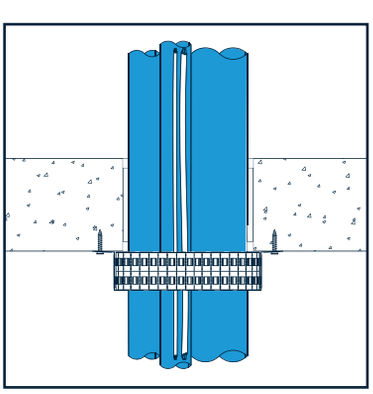


Figure 17



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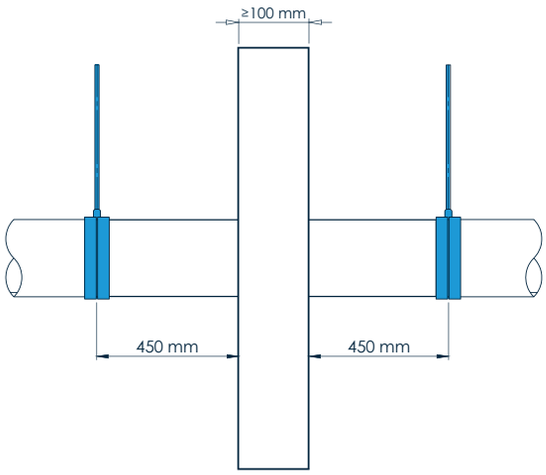
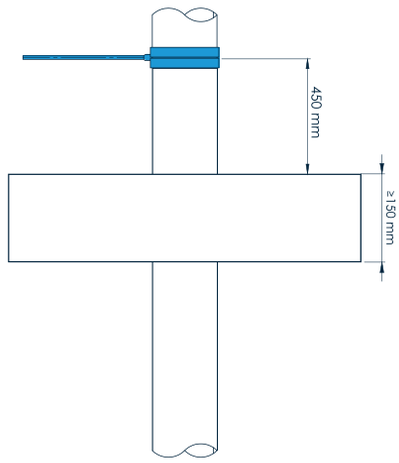
Pipe Support Penetrations

Service penetrations must be held in place ≤ 450 mm from the fire partition. With floors, the support must only be applied at the top of the floor at a distance of ≤ 450 mm.

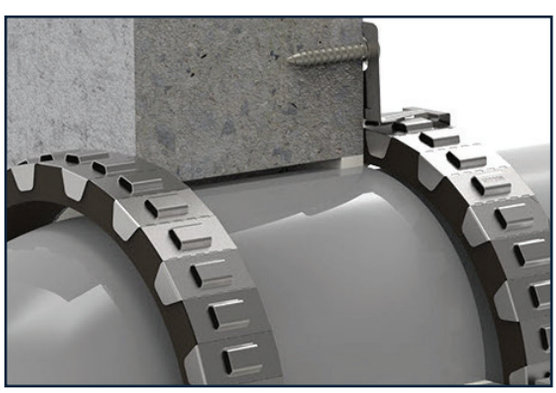




Joint Sealings in Rigid Walls

The minimum wall thickness is 100 mm and the wall must consist of concrete, aerated concrete or brickwork, with a minimum density of 400 kg/m^3.

Joints around service penetrations, with or without insulation, must have a fire-resistant seal to prevent the passage of smoke and hot gases. Multisealant A, Multimastic SP or Multimortar must be used, depending on the Joint width. Multisealant A and Multimastic SP fire-resistant sealants can be applied without a backing. For more information, see ETA report 20/1322.

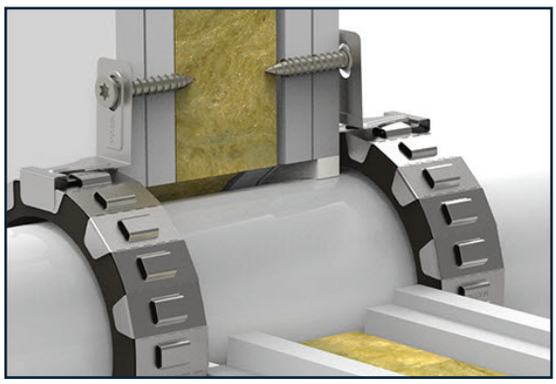


Permissible filling materials for joints around pipe penetrations		
Multimortar (EN 13501-1: fire class A1)	Multisealant A, fire stopping sealant	Multimastic SP, fire stopping mastic
Joint width: ≥ 10 mm	Joint width: ≤ 20 mm	
Depth: Over the full thickness of the wall	Depth: ≥ 10 mm, on both sides of the wall	

Joint Sealings in Flexible Walls

The minimum wall thickness must be 100 mm and the wall must consist of steel or timber studs with at least 2 layers of cladding on both sides with a minimum thickness of 12.5 mm.
When using timber studs, a minimum distance of 100 mm from each part of the conduit seal to a timber studs and the gap between the conduit seal and the studs must be capped. The cavity between the conduit seal and the studs must have at least 100 mm class A1 or A2 insulation (according to EN 13501-1).

Joints around service, with or without insulation, must have a fire-resistant seal to prevent the passage of smoke and hot gases. Multisealant A or Multimastic SP should be used for this purpose. Multisealant A and Multimastic SP fire-resistant sealants can be applied without a backing. For more information, see ETA report 20/1322.

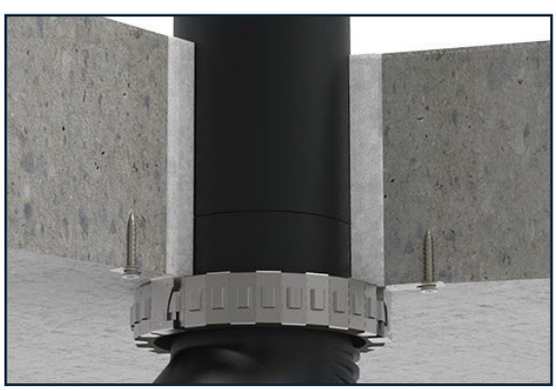


Permissible filling materials for joints around pipe penetrations	
Multisealant A, fire stopping sealant	Multimastic SP, fire stopping mastic
Joint width: ≤ 20 mm	
Depth: ≥ 10 mm, on both sides of the wall	

Joint Sealings in a Rigid Floor

The minimum floor thickness is 150 mm and the floor must consist of concrete or aerated concrete, with a minimum density of 400 kg/m^3.

Joints around service penetrations, with or without insulation, must have a fire-resistant seal to prevent the passage of smoke and hot gases. Multisealant A, Multimastic SP or Multimortar must be used, depending on the Joint width. Multisealant A and Multimastic SP fire-resistant sealants can be applied without a backing. Some penetrations have been tested with a stone wool backing of 35 kg/m^3. For more information, see ETA report 20/1322.



Permissible filling materials for joints around pipe penetrations		
Multimortar (EN 13501-1: fire class A1)	Multisealant A, fire stopping sealant	Multimastic SP, fire stopping mastic
Joint width: ≥ 10 mm	Joint width: ≤ 20 mm	
Depth: Over the full thickness of the floor	Depth: ≥ 10 mm, on both sides of the floor. Joints with a backing only require a Joint sealant at the underside of the floor	

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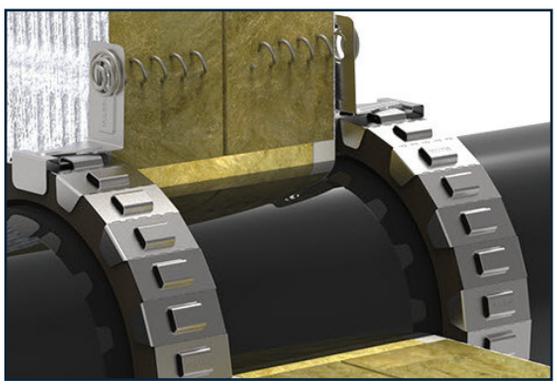
Joint Sealings in Flexible Walls

Coated batts can be used in combination with flexible walls, rigid walls and rigid floors. The fire barriers must have a minimum thickness of 100 mm (2x50 mm), with a density of at least ≥ ~ 150 kg/m^3.

Joints around service penetrations, with or without insulation, must have a fire-resistant seal to prevent the passage of smoke and hot gases. Multimastic SP fire stopping mastic should be used for this purpose. When the ducts are completely enclosed by fire-stopping stone wool, fire stopping mastic is not required. For more information, see ETA report 20/1322.



Permissible filling materials for joints around pipe penetrations
Multimastic SP, fire stopping mastic
Joint width: ≤ 20 mm
Depth: ≥ 10 mm, on both sides of the wall

4. Tested Configurations

Plastic Pipes, Uninsulated

Construction	Thickness [mm]	Configuration*	Max. Ø [mm]	Insulation type
Rigid and flexible walls	≥ 100	Straight pipes	Ø 315	n/a
		Inclined pipes ≥ 45° - 90°	Ø 125	
		Coupling elements		
		87° / 90° Elbows		
		Elbow 2 x 45°	Ø 110	
		Corner solutions		
		Support structure	Ø 90	
		Multiple penetrations	Ø 75 (3x)	
Rigid floors	≥ 150	Straight pipes	Ø 315	
		Inclined pipes ≥ 45° - 90°	Ø 125	
		Coupling elements		
		Elbow 2 x 45°	Ø 110	
		Corner solutions	Ø 110	
		Multiple penetrations	Ø 110	
Stone wool coated batts	≥ 2 x 50	Straight pipes		

see the "Tested configurations" table on page 14 and 15

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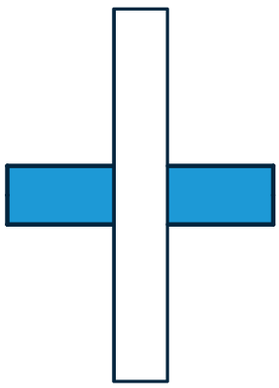
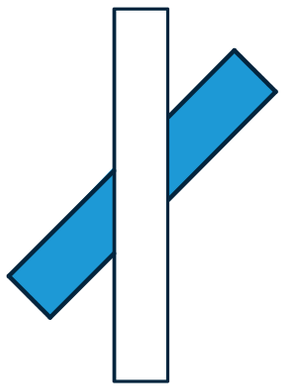
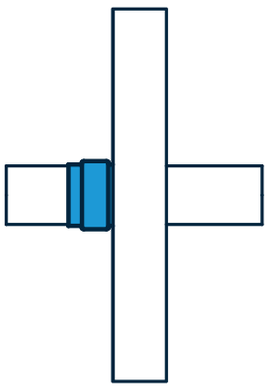
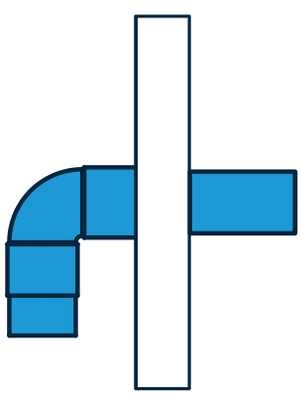
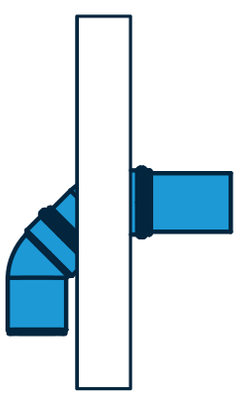
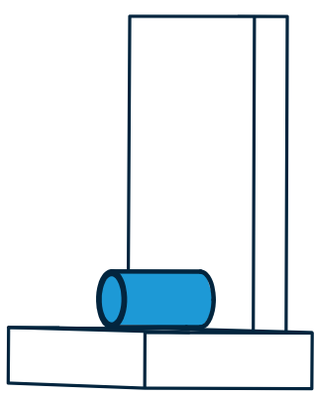
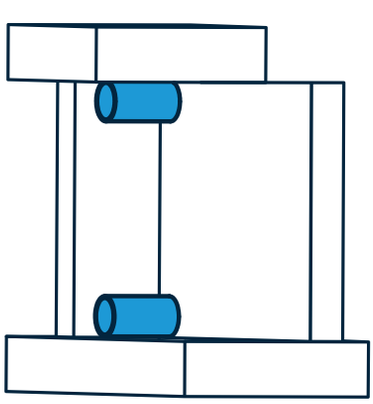
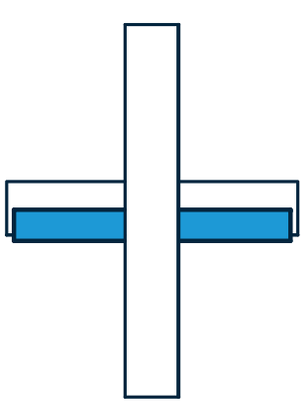
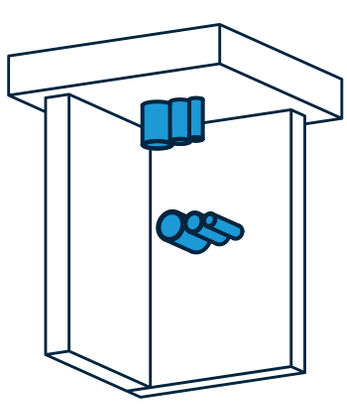
Tested configurations in rigid and flexible walls

Straight pipes	Inclined pipes ≥ 45° - 90°	Coupling elements
		
87° / 90° Elbows	**2 x 45° Elbows**	**Zero distance (U-shape)**
		
Corner solutions	**Support structure**	**Multiple penetrations**
		

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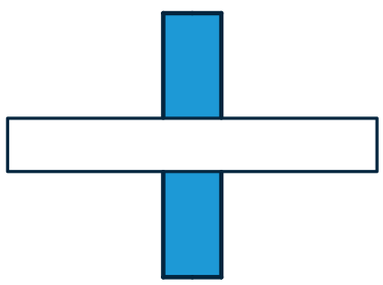
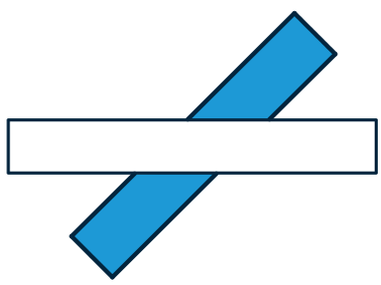
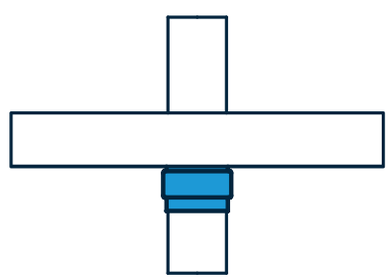
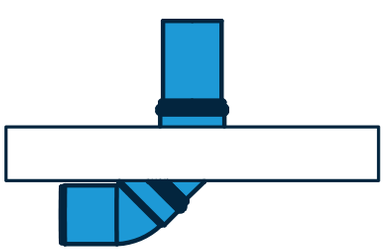
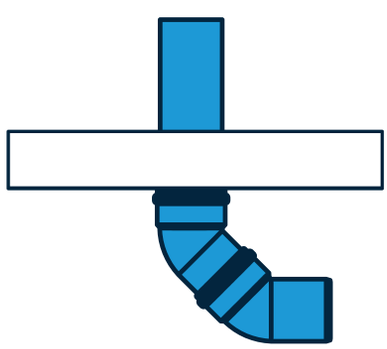
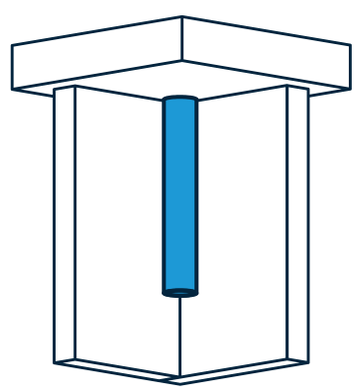
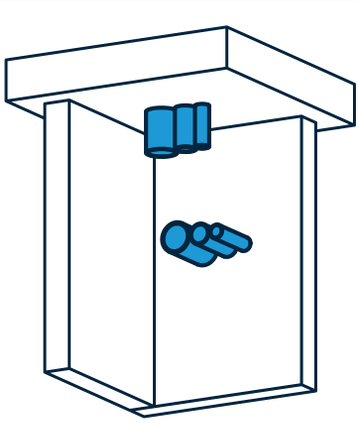
Tested configurations in rigid floors

Straight pipes	Inclined pipes ≥ 45° - 90°	Coupling elements
		
Elbows 2 x 45°	**2 x 45° Elbows**	**Corner solutions**
		
Multiple penetrations		
		

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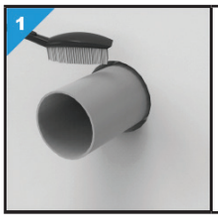
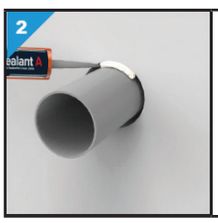
5. Installation Manual Multicollar *Slim*

1



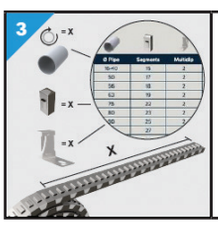
Make sure that the service penetration and the gap are free from dust, dirt and grease.

2



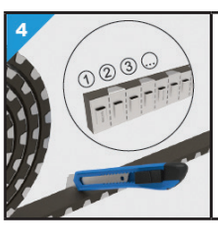
Openings ≤ 20 mm[1] can be sealed with Multisealent A firestop acrylic sealant or Multimastic SP firestop mastic, over a depth of 10 mm.

3



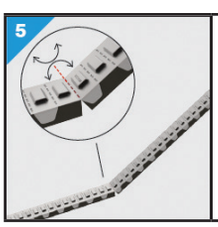
Measure the diameter of the service penetration. See the application table on the packaging for plastic pipes[2] for the lenght of Multicollar *Slim* (number of segments) and the multiclips required.

4



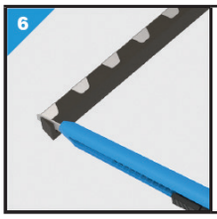
Count the number of Multicollar *Slim* segments required on the roll and then cut through the inlay with a knife.

5



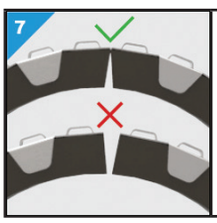
Break the Multicollar *Slim* where it has been cut.

6



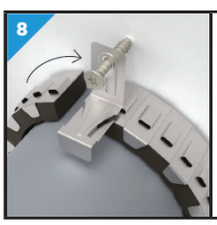
Cut the inlay away with the knife on both sides of the custom-size fire collar.

7



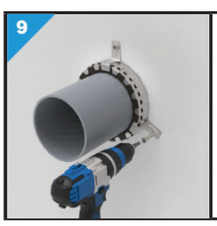
If the stainless-steel joints fit well together, the inlay has been properly cut.

8



Place the fire collar around the service penetration, attach the end of the fire collar with multiclip and secure with the screws provided.

9



Distribute the remaining Multiclips proportionally and secure with screws.

10

Fill in the conformity statement and paste it next to the fireproof seal.

[1] Larger openings around service penetrations can be sealed according to the installation requirements for the Multimastic C System or the Multimortar System.

[2] Steel pipes with insulation, depending on the fire resistance, can be provided with a single fire collar up to a total diameter of 283 mm.

MultiSelector

For use and for more information about an application, refer to the Mulcol documentation, local and international approvals.

See the **Mulcol Fire Protection app** for the correct application in combination with fire resistance, or use our **selector** at **www.mulcol.com**.

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6. Performance

Uninsulated Plastic Pipe Penetrations through Flexible Walls, Rigid Walls and Floors EN 1366-3

PVC-U / PVC-C	Seal size Ø x s [mm]	Multicollar *Slim* Single	Multicollar *Slim* Dual	Assembly side(s)	Spacing	Construction FW-100	Construction RW-100	Construction RF-150	Classification minutes
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
Inclined 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° Elbows	≤ 125 x 2.5	✓		2	fig. 1 to 4	✓	✓		≤ EI 90-U/U
87° / 90° Elbows, Zero distance to wall	≤ 110 x 3.4	✓		2	fig. 1 to 4	✓	✓		≤ EI 120-U/C
Elbow 2 x 45°, 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

PP pipes	Seal size Ø x s [mm]	Multicollar *Slim* Single	Multicollar *Slim* Dual	Assembly side(s)	Spacing	Construction FW-100	Construction RW-100	Construction RF-150	Classification minutes
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
Inclined 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° Elbows	≤ 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*
I: *Thermal insulation*

Ø x S [mm]: *Diameter x wall thickness of the penetration*

FW-100: *Flexible wall, 100 mm thick*
RW-100: *Rigid wall, 100 mm thick*
RF-150: *Rigid floor, 150 mm thick*

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PE / PE-HD / ABS / SAN+PVC pipes	Seal size Ø x s [mm]	Multicollar *Slim* Single	Multicollar *Slim* Dual	Assembly side(s)	Spacing	Construction FW-100	Construction RW-100	Construction RF-150	Classification minutes
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
Inclined 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 supp. half shell	≤ 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
Coupling 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

Low noise pipes[1)]	Seal size Ø x s [mm]	Multicollar *Slim* Single	Multicollar *Slim* Dual	Assembly side(s)	Spacing	Construction FW-100	Construction RW-100	Construction RF-150	Classification minutes
Elbow 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
Elbow 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
Coupling elements	≤ 110 x 2.7	✓		2	fig. 1 to 4	✓	✓		≤ EI 120-U/C
Coupling elements	≤ 110 x 6.3	✓		1	fig. 1 to 4			✓	≤ EI 90-U/U
	≤ 110 x 2.7 - 6.0								≤ EI 120-U/C

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

E: Integrity
I: Thermal insulation

FW-100: Flexible wall, 100 mm thick
RW-100: Rigid wall, 100 mm thick
RF-150: Rigid floor, 150 mm thick

Ø x S [mm]: Diameter x wall thickness of the penetration

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Uninsulated Multilayer Pipe Penetrations through Flexible Walls, Rigid Walls and Floors EN 1366-3

Fibre composite pipes[1]	Seal size Ø x s [mm]	Multicollar *Slim* Single	Multicollar *Slim* Dual	Assembly side(s)	Spacing	Construction FW-100	Construction RW-100	Construction RF-150	Classification minutes
Zero distance	≤ 50 x 6.9	✓		2	fig. 1 to 4	✓	✓		≤ EI 90-U/C
Metal supp. half shell	≤ 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° Elbows	≤ 110 x 10.0	✓		2	fig. 1 to 4	✓	✓		≤ EI 90-U/C

Multilayer pipe[2]	Seal size Ø x s [mm]	Multicollar *Slim* Single	Multicollar *Slim* Dual	Assembly side(s)	Spacing	Construction FW-100	Construction RW-100	Construction RF-150	Classification minutes
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

Uninsulated Multiple Penetrations through Flexible Walls, Rigid Walls and Floors EN 1366-3

Cable bundle Copper cont. ≤ 398,5 mm²	Seal size Ø x s [mm]	Multicollar *Slim* Single	Multicollar *Slim* Dual	Assembly side(s)	Spacing	Construction FW-100	Construction RW-100	Construction RF-150	Classification minutes
Straight pipes	≤ 100 (63 pieces)	✓		2	fig. 1 to 4	✓	✓		≤ EI 120

Cable bundle Copper cont. ≤ 247 mm²	Seal size Ø x s [mm]	Multicollar *Slim* Single	Multicollar *Slim* Dual	Assembly side(s)	Spacing	Construction FW-100	Construction RW-100	Construction RF-150	Classification minutes
Straight pipes	≤ 80 (42 pieces)	✓		1	fig. 1 to 4			✓	≤ EI 120

PVC conduit with cable(s)	Seal size Ø x s [mm]	Multicollar *Slim* Single	Multicollar *Slim* Dual	Assembly side(s)	Spacing	Construction FW-100	Construction RW-100	Construction RF-150	Classification minutes
Straight pipes	≤ 100 (18 pieces)	✓		2	fig. 1 to 4	✓	✓		≤ EI 90-U/U
	≤ 100 (18 pieces)			1				✓	≤ EI 120-U/U

[1]Allowed Fibre composite pipe
– 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 en Aquatherm Orange M,
– Bänninger PP-R, Bänninger Climatec PP-RCT en Bänninger Watertec PP-RCT

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

E: Integrity
I: Thermal insulation

FW-100: Flexible wall, 100 mm thick
RW-100: Rigid wall, 100 mm thick
RF-150: Rigid floor, 150 mm thick

Ø x S [mm]: Diameter x wall thickness of the penetration

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PE conduit with cables	Seal size Ø x s [mm]	Multicollar *Slim* Single	Multicollar *Slim* Dual	Assembly side(s)	Spacing	Construction FW-100	Construction RW-100	Construction RF-150	Classification minutes
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 pipes	Seal size Ø x s [mm]	Multicollar *Slim* Single	Multicollar *Slim* Dual	Assembly side(s)	Spacing	Construction FW-100	Construction RW-100	Construction RF-150	Classification minutes
Straight pipes	≤ 75 x 3.0 (3 pieces)	✓		2	fig. 1 to 4	✓	✓		≤ EI 90-U/C

Multiple penetrations	Seal size Ø x s [mm]	Multicollar *Slim* Single	Multicollar *Slim* Dual	Assembly side(s)	Spacing	Construction FW-100	Construction RW-100	Construction RF-150	Classification minutes
PE-HD, PE, ABS, SAN+PVC	≤ 90 x 2.8	✓		2	fig. 1 to 4	✓	✓		≤ EI 90-U/C
Multilayer pipe[2)]	≤ 50 x 4.0								
Fibre composite pipe[1)]	≤ 50 x 6.9								
Electric cables	≤ 12.5								
PE-HD, PE, ABS, SAN+PVC	≤ 90 x 2.8	✓		1	fig. 1 to 4			✓	≤ EI 120-U/U
Multilayer pipe[2)]	≤ 50 x 4.0								
Fibre composite[1)]	≤ 50 x 6.9								
Electric cables	≤ 12.5								

Flue Gas Pipes through Flexible Shaft Walls, Rigid Shaft Walls and Floors EN 1366-3

Flue gas pipe - Aluminium	Seal size Ø x s [mm]	Multicollar *Slim* Single	Multicollar *Slim* Dual	Assembly side(s)	Spacing	Construction FW-100	Construction RW-70	Construction RF-150	Classification minutes
Straight pipes	≤ 130 x 1.5	✓		1	fig. 1 to 4	✓	✓		≤ EI 90-U/C
								✓	≤ EI 90-U/C

Flue gas pipe - PP	Seal size Ø x s [mm]	Multicollar *Slim* Single	Multicollar *Slim* Dual	Assembly side(s)	Spacing	Construction FW-100	Construction RW-70	Construction RF-150	Classification minutes
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

[1)]Allowed Fibre composite pipe
– 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 en Aquatherm Orange M,
– Bänninger PP-R, Bänninger Climatec PP-RCT en Bänninger Watertec PP-RCT

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

E: Integrity
I: Thermal insulation

FW-100: Flexible wall, 100 mm thick
RW-100: Rigid wall, 100 mm thick
RW-70: Rigid shaft wall, 70 mm thick
RF-150: Rigid floor, 150 mm thick

Ø x S [mm]: Diameter x wall thickness of the penetration

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Flue gas pipe - concentric, PP/PP	Seal size Ø x s [mm]	Multicollar *Slim* Single	Multicollar *Slim* Dual	Assembly side(s)	Spacing	Construction FW-100	Construction RW-70	Construction RF-150	Classification minutes
Straight pipes	≤ 125 x ≤ 80	✓		1	fig. 1 to 4	✓			≤ EI 90-U/U
			✓				✓		≤ EI 60-U/U
		✓						✓	≤ EI 90-U/U

Flue gas pipe - concentric, Steel/PP	Seal size Ø x s [mm]	Multicollar *Slim* Single	Multicollar *Slim* Dual	Assembly side(s)	Spacing	Construction FW-100	Construction RW-70	Construction RF-150	Classification minutes
Straight pipes	≤ 200 x ≤ 130	✓		1	fig. 1 to 4	✓			≤ EI 90-U/C
			✓				✓		≤ EI 90-U/C
								✓	≤ EI 90-U/C

Uninsulated plastic pipe penetrations through fire-stopping coated batts (2 x 50 mm) EN 1366-3

PVC-U / PVC-C	Seal size Ø x s [mm]	Multicollar *Slim* Single	Multicollar *Slim* Dual	Assembly side(s)	Spacing	Construction FW-100	Construction RW-100	Construction RF-150	Classification minutes
Straight pipes	≤ 110 x 2.7	✓		2	fig. 5 and 6	✓	✓		≤ EI 120-U/U
	≤ 110 x 2.7 - 6.3	✓		1				✓	≤ EI 60-U/U
	≤ 110 x 2.7								≤ EI 90-U/U

PP	Seal size Ø x s [mm]	Multicollar *Slim* Single	Multicollar *Slim* Dual	Assembly side(s)	Spacing	Construction FW-100	Construction RW-100	Construction RF-150	Classification minutes
Straight pipes	≤ 110 x 2.7	✓		2	fig. 5 and 6	✓	✓		≤ EI 120-U/U
	≤ 110 x 2.7 - 6.3	✓		1				✓	≤ EI 60-U/U
	≤ 110 x 2.7								≤ EI 90-U/U

PE / PE-HD / ABS / SAN+PVC	Seal size Ø x s [mm]	Multicollar *Slim* Single	Multicollar *Slim* Dual	Assembly side(s)	Spacing	Construction FW-100	Construction RW-100	Construction RF-150	Classification minutes
Straight pipes	≤ 110 x 2.7	✓		2	fig. 5 and 6	✓	✓		≤ 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*
I: *Thermal insulation*

Ø x S [mm]: *Diameter x wall thickness of the penetration*

FW-100: *Flexible wall, 100 mm thick*
RW-100: *Rigid wall, 100 mm thick*
MW-70: *Rigid shaft wall, 70 mm thick*
RF-150: *Rigid floor, 150 mm thick*

MULCOL INTERNATIONAL

Uninsulated Pipe Penetrations through Fire-stopping Coated Batts (2 x 50 mm) EN 1366-3

Multilayer pipe[2)]	Seal size Ø x s [mm]	Multicollar *Slim* Single	Multicollar *Slim* Dual	Assembly side(s)	Insulation config. / L [mm]	Construction FW-100	Construction RW-100	Construction RF-150	Classification minutes
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

Fibre composite pipes[1)]	Seal size Ø x s [mm]	Multicollar *Slim* Single	Multicollar *Slim* Dual	Assembly side(s)	Insulation config. / L [mm]	Construction FW-100	Construction RW-100	Construction RF-150	Classification minutes
Straight pipes	≤ 50 x 6.9 - 10.0	✓		1	CI or CS			✓	≤ EI 90-U/C
	≤ 110 x 10.0								≤ EI 120-U/C

Acoustic Insulated Plastic Pipe Penetrations through Flexible Walls, Rigid Walls and Floors
Acoustic insulation, Fire class B-s1, d0 in accordance with EN 13501-1
Thickness: ≤ 12 mm EN 1366-3

PVC-U / PVC-C	Seal size Ø x s [mm]	Multicollar *Slim* Single	Multicollar *Slim* Dual	Assembly side(s)	Insulation config. / [mm]	Construction FW-100	Construction RW-100	Construction RF-150	Classification minutes
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
Inclined 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° Elbows	≤ 125 x 2.5	✓		2	CI or CS	✓	✓		≤ EI 90-U/U
87° / 90° Elbows, zero distance to wall	≤ 110 x 3.4	✓		2	CI or CS	✓	✓		≤ EI 120-U/C
Elbow 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

[1)]Allowed Fibre composite pipe
– 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 en Aquatherm Orange M,
– Bänninger PP-R, Bänninger Climatec PP-RCT en Bänninger Watertec PP-RCT

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

E: Integrity
I: Thermal insulation

FW-100: Flexible wall, 100 mm thick
RW-100: Rigid wall, 100 mm thick
RF-150: Rigid floor, 150 mm thick

Ø x S [mm]: Diameter x wall thickness of the penetration
config. / L [mm]: Configuration / insulating length

MULCOL INTERNATIONAL

PP pipes	Seal size Ø x s [mm]	Multicollar *Slim*		Assembly side(s)	Insulation config. / [mm]	Construction			Classification minutes
		Single	Dual			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
Inclined 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° Elbows	≤ 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

PE / PE-HD / ABS / SAN+PVC pipes	Seal size Ø x s [mm]	Multicollar *Slim*		Assembly side(s)	Insulation config. / [mm]	Construction			Classification minutes
		Single	Dual			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
Inclined 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
Coupling elements	≤ 110 x 4.3	✓		1	CI or CS			✓	≤ EI 90-U/C
	≤ 125 x 7.4								≤ EI 60-U/C

E: *Integrity*
I: *Thermal insulation*

Ø x S [mm]: *Diameter x wall thickness of the penetration*
config. / L [mm]: *Configuration / insulating length*

FW-100: *Flexible wall, 100 mm thick*
RW-100: *Rigid wall, 100 mm thick*
RF-150: *Rigid floor, 150 mm thick*

MULCOL INTERNATIONAL

Elastomeric Insulated Plastic Pipe Penetrations through Flexible Walls, Rigid Walls and Floors
Elastomeric insulation, Fire class B_L-s3, d0 or B-s3, d0, in accordance with EN 13501-1
Thickness: 9 to 32 mm

EN 1366-3

PVC-U / PVC-C pipes	Seal size Ø x s [mm]	Multicollar *Slim*		Assembly side(s)	Insulation config. / L [mm]	Construction			Classification minutes
		Single	Dual			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 composite pipes[1)]	Seal size Ø x s [mm]	Multicollar *Slim*		Assembly side(s)	Insulation config. / L [mm]	Construction			Classification minutes
		Single	Dual			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

Insulated Multilayer Pipe Penetrations through Flexible Walls, Rigid Walls and Floors
Elastomeric insulation, Fire class B_L-s3, d0 or B-s3, d0, in accordance with EN 13501-1
Thickness: 9 to 32 mm

EN 1366-3

Multilayer pipe[2)]	Seal size Ø x s [mm]	Multicollar *Slim*		Assembly side(s)	Insulation config. / [mm]	Construction			Classification minutes
		Single	Dual			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

Insulated Multiple Penetrations through Flexible Walls, Rigid Walls and Floors
PE-foam insulation, Fire class C_L-s1-d0, in accordance with EN 13501-1
Thickness: ≤ 6 mm

EN 1366-3

Multilayer pipe[2)]	Seal size Ø x s [mm]	Multicollar *Slim*		Assembly side(s)	Insulation config. / L [mm]	Construction			Classification minutes
		Single	Dual			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			✓	

[1)]Allowed Fibre composite pipes
– 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 en Aquatherm Orange M,
– Bänninger PP-R, Bänninger Climatec PP-RCT en Bänninger Watertec PP-RCT

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

E: Integrity
I: Thermal insulation

FW-100: Flexible wall, 100 mm thick
RW-100: Rigid wall, 100 mm thick
RF-150: Rigid floor, 150 mm thick

Ø x S [mm]: Diameter x wall thickness of the penetration
config. / L [mm]: Configuration / insulation length

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Insulated Multiple Penetrations through Flexible Walls, Rigid Walls and Floors
Elastomeric insulation, Fire class B_L-s3, d0 or B-s3, d0, in accordance with EN 13501-1
Thickness: 9 to 32 mm
PE-foam insulation, Fire class C_L-s1-d0, in accordance with EN 13501-1
Thickness: ≤ 6 mm

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Multilayer pipe[2)]	Seal size Ø x s [mm]	Multicollar *Slim*		Assembly side(s)	Insulation config. / L [mm]	Construction			Classification minutes
		Single	Dual			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

Insulated Multiple Penetrations through Flexible Walls, Rigid Walls and Floors
Elastomeric insulation, Fire class B_L-s3, d0 or B-s3, d0, in accordance with EN 13501-1
Thickness: 9 to 32 mm

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Multilayer pipe[2)]	Seal size Ø x s [mm]	Multicollar *Slim*		Assembly side(s)	Insulation config. / L [mm]	Construction			Classification minutes
		Single	Dual			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

Insulated Multiple Penetrations through Flexible Walls, Rigid Walls and Floors
PE-foam insulation, Fire class C_L-s1-d0, in accordance with EN 13501-1
Thickness: ≤ 6 mm

EN 1366-3

Multiple penetrations	Seal size Ø x s [mm]	Multicollar *Slim*		Assembly side(s)	Insulation config. / [mm]	Construction			Classification minutes
		Single	Dual			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								
Electric 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								
Electric cables	≤ 12.5								

Insulated Multiple Penetrations through Flexible Walls, Rigid Walls and Floors
PE-foam insulation, Fire class C_L-s1-d0, in accordance with EN 13501-1
Thickness: ≤ 6 mm

EN 1366-3

Multiple penetrations	Seal size Ø x s [mm]	Multicollar *Slim*		Assembly side(s)	Insulation config. / [mm]	Construction			Classification minutes
		Single	Dual			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 pipe[2)]	≤ 50 x 4.0								
Fibre composite pipe[1)]	≤ 50 x 6.9								
Electric cables	≤ 12.5								

[1)]Allowed Fibre composite pipes
– 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 EN Aquatherm Orange M,
– Bänninger PP-R, Bänninger Climatec PP-RCT EN Bänninger Watertec PP-RCT

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

E: Integrity
I: Thermal insulation

FW-100: Flexible wall, 100 mm thick
RW-100: Rigid wall, 100 mm thick
RF-150: Rigid floor, 150 mm thick

Ø x S [mm]: Diameter x wall thickness of the penetration
config. / L [mm]: Configuration / insulating length

MULCOL INTERNATIONAL

Insulated Metal Pipe Penetrations through Flexible Walls, Rigid Walls and Floors
Elastomeric insulation, Fire class B_L-s3, d0 or B-s3, d0, in accordance with EN 13501-1
Thickness: 32 mm

EN 1366-3

Copper pipes	Seal size Ø x s [mm]	Multicollar *Slim* Single	Multicollar *Slim* Dual	Assembly side(s)	Insulation config. / [mm]	Construction FW-100	Construction RW-100	Construction RF-150	Classification minutes
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	Seal size Ø x s [mm]	Multicollar *Slim* Single	Multicollar *Slim* Dual	Assembly side(s)	Insulation config. / [mm]	Construction FW-100	Construction RW-100	Construction RF-150	Classification minutes
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	Seal size Ø x s [mm]	Multicollar *Slim* Single	Multicollar *Slim* Dual	Assembly side(s)	Insulation config. / [mm]	Construction FW-100	Construction RW-100	Construction RF-150	Classification minutes
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

Insulated Metal Pipe Penetrations through Flexible Walls, Rigid Walls and Floors
Elastomeric insulation, Fire class B_L-s3, d0 or B-s3, d0, in accordance with EN 13501-1
Thickness: 9 to 32 mm

EN 1366-3

Copper pipes	Seal size Ø x s [mm]	Multicollar *Slim* Single	Multicollar *Slim* Dual	Assembly side(s)	Insulation config. / [mm]	Construction FW-100	Construction RW-100	Construction RF-150	Classification minutes
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	Seal size Ø x s [mm]	Multicollar *Slim* Single	Multicollar *Slim* Dual	Assembly side(s)	Insulation config. / [mm]	Construction FW-100	Construction RW-100	Construction RF-150	Classification minutes
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*
I: *Thermal insulation*

Ø x S [mm]: *Diameter x wall thickness of the penetration*
config. / L [mm]: *Configuration / insulating length*

FW-100: *Flexible wall, 100 mm thick*
RW-100: *Rigid wall, 100 mm thick*
RF-150: *Rigid floor, 150 mm thick*

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Insulated Metal Pipe Penetrations through Flexible Walls, Rigid Walls and Floors
Elastomeric insulation, Fire class B_L-s3, d0 or B-s3, d0, in accordance with EN 13501-1
Thickness: 9 to 32 mm

EN 1366-3

Cast iron pipes	Seal size Ø x s [mm]	Multicollar *Slim*		Assembly side(s)	Insulation config. / [mm]	Construction			Classification minutes
		Single	Dual			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				

Insulated Metal Pipe Penetrations through Flexible Walls, Rigid Walls and Floors
PIR/PUR insulation, Fire class E, in accordance with EN 13501-1
Thickness: 25 mm

EN 1366-3

Copper pipes	Seal size Ø x s [mm]	Multicollar *Slim*		Assembly side(s)	Insulation config. / [mm]	Construction			Classification minutes
		Single	Dual			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	Seal size Ø x s [mm]	Multicollar *Slim*		Assembly side(s)	Insulation config. / [mm]	Construction			Classification minutes
		Single	Dual			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	Seal size Ø x s [mm]	Multicollar *Slim*		Assembly side(s)	Insulation config. / [mm]	Construction			Classification minutes
		Single	Dual			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

Insulated Metal Pipe Penetrations through Fire-stopping Coated Batts (2 x 50 mm)
Elastomeric insulation, Fire class B_L-s3, d0 or B-s3, d0, in accordance with EN 13501-1
Thickness: 9 to 32 mm

EN 1366-3

Multilayer pipe[2)]	Seal size Ø x s [mm]	Multicollar *Slim*		Assembly side(s)	Insulation config. / [mm]	Construction			Classification minutes
		Single	Dual			FW-100	RW-100	RF-150	
Straight pipes	≤ 50 x 4.0	✓		2	LI - 300 or CI	✓	✓		≤ EI 120-C/U

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

E: Integrity
I: Thermal insulation

FW-100: Flexible wall, 100 mm thick
RW-100: Rigid wall, 100 mm thick
RF-150: Rigid floor, 150 mm thick

Ø x S [mm]: Diameter x wall thickness of the penetration
config. / L [mm]: Configuration / insulating length

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Insulated Metal Pipe Penetrations through Fire-stopping Coated Batts (2 x 50 mm)
Elastomeric insulation, Fire class B_L-s3, d0 or B-s3, d0, in accordance with EN 13501-1
Thickness: 32 mm

EN 1366-3

Stainless steel pipes	Seal size Ø x s [mm]	Multicollar *Slim*		Assembly side(s)	Insulation config. / [mm]	Construction			Classification minutes
		Single	Dual			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	Seal size Ø x s [mm]	Multicollar *Slim*		Assembly side(s)	Insulation config. / [mm]	Construction			Classification minutes
		Single	Dual			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 Metal Pipe Penetrations through Fire-stopping Coated Batts (2 x 50 mm)
PE-foam insulation, Fire class C_L-s1-d0, in accordance with EN 13501-1
Thickness: ≤ 6 mm

EN 1366-3

Multilayer pipe[2)]	Seal size Ø x s [mm]	Multicollar *Slim*		Assembly side(s)	Insulation config. / [mm]	Construction			Classification minutes
		Single	Dual			FW-100	RW-100	RF-150	
Straight pipes	≤ 32 x 3.0	✓		2	LS, LI - 300 or CI, CS	✓	✓		≤ EI 120-C/U

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

E: Integrity
I: Thermal insulation

FW-100: Flexible wall, 100 mm thick
RW-100: Rigid wall, 100 mm thick
RF-150: Rigid floor, 150 mm thick

Ø x S [mm]: Diameter x wall thickness of the penetration
config. / L [mm]: Configuration / insulating length

4. Actually tested solutions

All the latest tested solutions with the Multicollar *Slim* can be found in our **Multiselector**. Scan the QR code or press the Multiselector button to get directly to the tested solution for your project.

MultiSelector

Our **Multiselector** can also be found in our **Mulcol Fire Protection App**.
It can be downloaded from the **App Store (iOS)** or **Google Play Store (Android)**.

App Store Google Play

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7. Spacing

Figure 1
A1: Distance between the seal and penetration ≤ 20 mm
A2: Spacing ≥ 100 mm

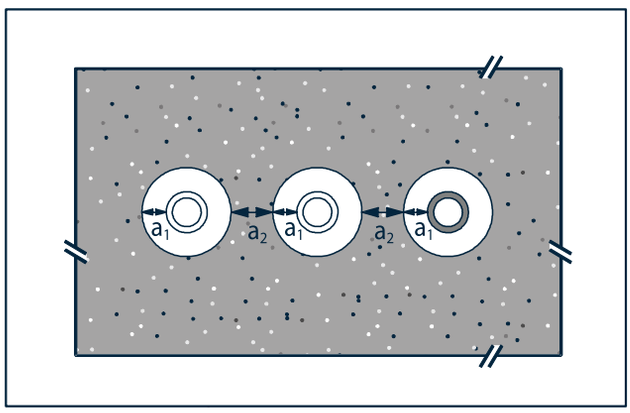


Figure 2
A1: Distance between the seal and penetration ≤ 20 mm
A2: Spacing ≥ 100 mm

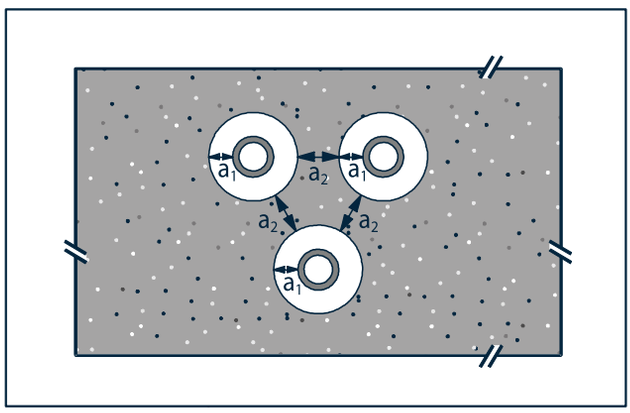


Figure 3
A1: Distance between the seal and penetration ≥ 0 mm
A2: Spacing ≥ 20 mm

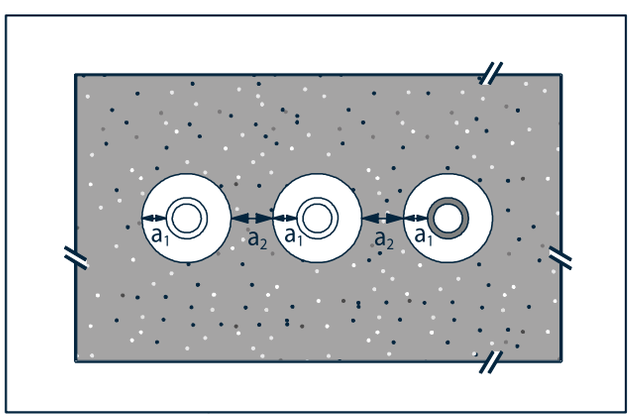


Figure 4
A1: Distance between the seal and penetration ≥ 0 mm
A2: Spacing ≥ 20 mm

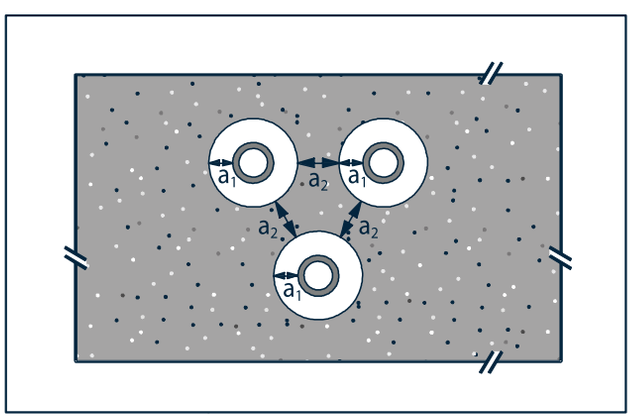


Figure 5
A1: Distance between penetration and top of the seal ≥ 100 mm
A2: Distance between penetration and side of the seal ≥ 100 mm
A3: Spacing ≥ 100 mm

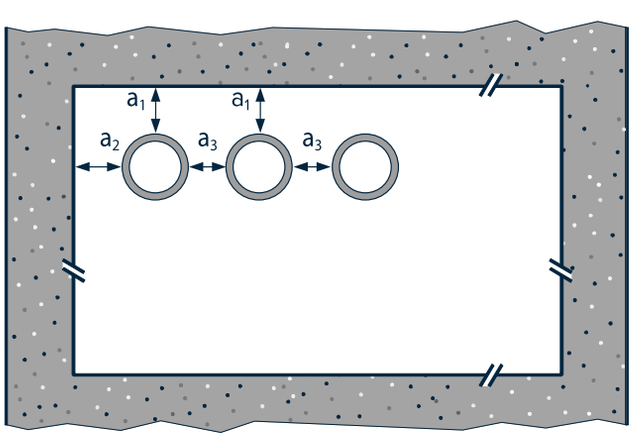
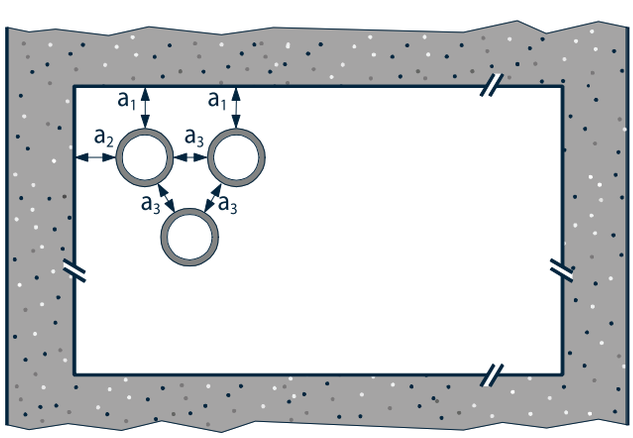


Figure 6
A1: Distance between penetration and top of the seal ≥ 100 mm
A2: Distance between penetration and side of the seal ≥ 100 mm
A3: Spacing ≥ 100 mm



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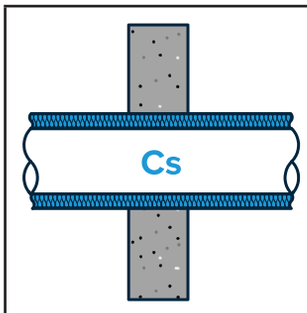
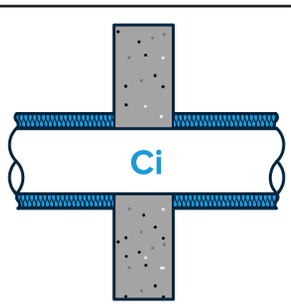
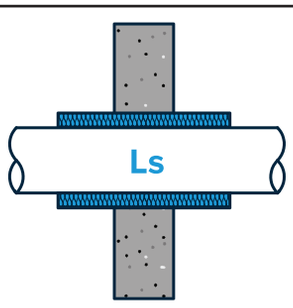
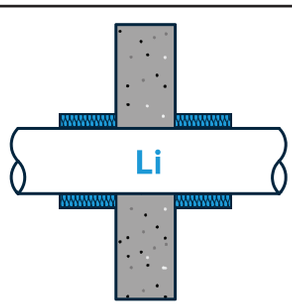
8. Pipe Insulation (Configuration)

Insulations serve different functions and can therefore be arranged around pipes in different manners. This must be taken into account when applying fire stopping seals on these pipes.

Possible configurations are shown below:

Continued insulation		Local insulation	
Continued sustained	Continued interrupted	Local sustained	Local interrupted
			

Permitted Insulation Materials

Mulcol Multicollar *Slim* has been extensively tested with various insulating materials. The permitted insulating materials are shown in the table below. For basic details, please refer to our Multiselector and our test report: ETA 20/1322.

Insulation type	Pipe type	Permitted[1)]
Acoustic insulation *Fire class 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
Decoupling acoustic insulation *Fire class E, in accordance with EN 13501-1*	✓ PE / PE-HD / ABS / SAN+PVC pipes ✓ PP pipes ✓ PVC pipes ✓ Fibre composite pipes ✓ Low noise pipes ✓ Multilayer pipes	✓ ThermaCompact TF
Elastomeric insulation *Fire class BL-s3, d0 of B-s3, d0, in accordance with EN 13501-1*	✓ PVC pipes ✓ Fibre composite pipes ✓ Multilayer pipes ✓ Steel pipes (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
Miscellaneous thermal insulation *Fire class CL-s1-d0, i.a.w. EN 13501-1*	✓ Multilayer pipes ✓ Air-conditioning pipes (copper)	✓ PE-Foam e.g.

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

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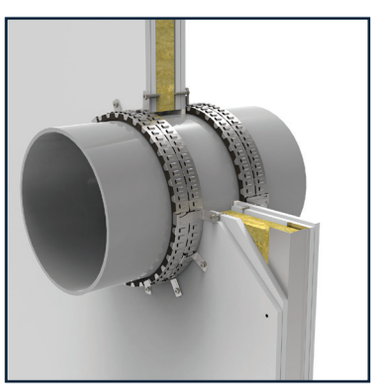
9. Usage tables

Usage Table for Plastic Pipes, Uninsulated

Plastic pipe Ø Outer (mm)	Penetration without insulation segments (pc)	Multiclip (pc)	Multiclip Large (pc)	Quantity/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)

Number of segments U-shape penetrations up to Ø 110 mm: Ø Penetration + 15 Segments

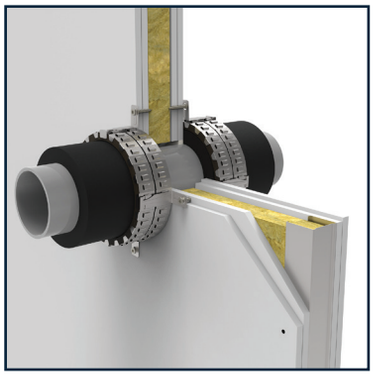


Plastic Pipes, Insulated

Construction	Thickness [mm]	Configuration	Max. Ø [mm]	Insulation type
Rigid and flexible walls	≥ 100	Straight pipes	Ø 110	Elastomer (9 - 32 mm)
Rigid floors	≥ 150			

Usage Table for Plastic Pipes with Insulation (Armaflex, Kaiflex, e.g.)

Plastic pipe	Penetration with insulation 9 mm		Penetration with insulation 13 mm		Penetration with insulation 19 mm		Penetration with insulation 32 mm	
Outer Ø (mm)	Outer Ø (mm)	Segments (pc)	Outer Ø (mm)	Segments (pc)	Outer Ø (mm)	Segments (pc)	Outer Ø (mm)	Segments (pc)
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



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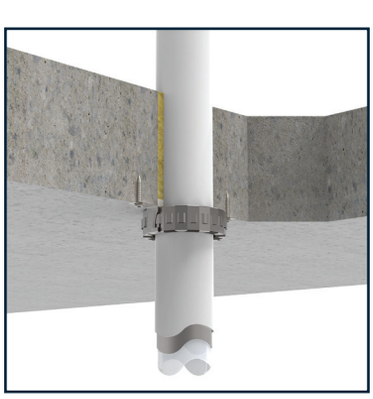
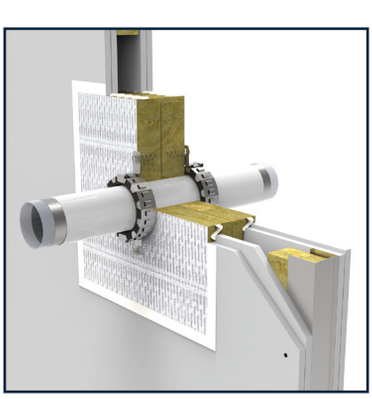
Multilayer Pipes, Uninsulated

Construction	Thickness [mm]	Configuration	Max. Ø [mm]	Insulation type
Rigid and flexible walls	≥ 100	Straight pipes	Ø 75	n/a
		Zero distance to floor	Ø 32	
Rigid floors	≥ 150	Straight pipes	Ø 75	
		Multiple penetrations	Ø 50	
Stone wool coated batts	≥ 2 x 50	Straight pipes	Ø 75	

Usage Table for Multilayer Pipes, Uninsulated

Aluminium composite Outer Ø (mm)	Penetration without insulation segments (pc)	Multiclip (pc)	Quantity/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





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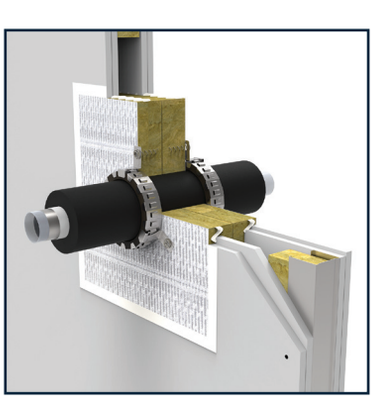
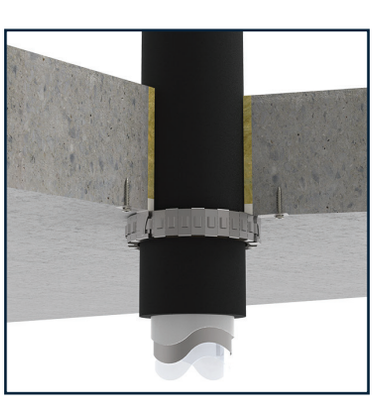
Multilayer Pipes, Insulated

Construction	Thickness [mm]	Configuration	Max. Ø [mm]	Insulation type
Rigid and flexible walls	≥ 100	Straight pipes	Ø 110	Elastomer (9 - 32 mm)
		Zero distance to floor	Ø 50	
		Zero distance to floor	Ø 50	
Rigid floors	≥ 150	Straight pipes	Ø 110	PE foam (≤ 6 mm)
		Multiple penetrations	Ø 32	
Stone wool coated batts	≥ 2 x 50	Straight pipes	Ø 32 (2x)	

Usage Table for Multilayer Pipes with Insulation (Armaflex, Kaiflex, e.g.)

Aluminium composite	Penetration with insulation 9 mm		Penetration with insulation 13 mm		Penetration with insulation 19 mm		Penetration with insulation 32 mm	
Outer Ø (mm)	Outer Ø (mm)	Segments (st)	Outer Ø (mm)	Segments (st)	Outer Ø (mm)	Segments (st)	Outer Ø (mm)	Segments (st)
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





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Fibre Composite Pipes, Uninsulated

Construction	Thickness [mm]	Configuration	Max. Ø [mm]	Insulation type
Rigid and flexible walls	≥ 100	Straight pipes	Ø 160	n/a
		Coupling elements	Ø 110	
		Zero distance (U-shape)	Ø 50	
		Support structure		
Rigid floors	≥ 150	Straight pipes	Ø 250	
		Corner solutions	Ø 110	
Stone wool coated batts	≥ 2 x 50	Straight pipes	Ø 110	

Usage Table for Fibre Composite Pipes, Uninsulated

Multilayer pipe Outer Ø (mm)	Penetration without insulation segments (pc)	Multiclip (pc)	Quantity/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

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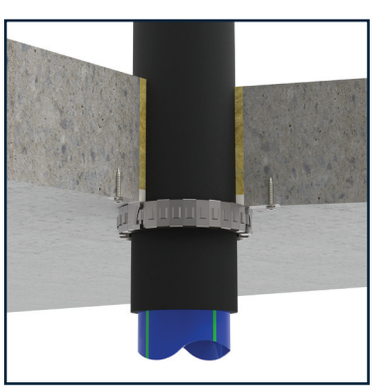
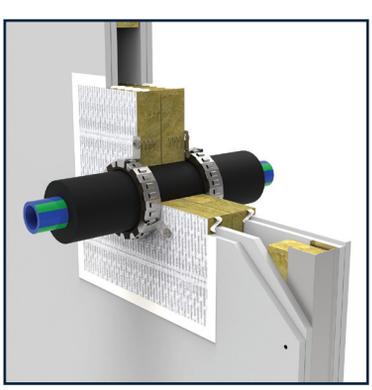
Fibre Composite Pipes, Insulated

Construction	Thickness [mm]	Configuration	Max. Ø [mm]	Insulation type
Rigid and flexible walls	≥ 100	Straight pipes	Ø 160	Elastomer (9 - 32 mm)
		Zero distance (U-shape)	Ø 50	
Rigid floors	≥ 150	Straight pipes	Ø 110	
Stone wool coated batts	≥ 2 x 50	Straight pipes	Ø 110	

Usage Table for Fibre Composite Pipes with Insulation (Armaflex, Kaiflex, e.g.)

Fibre composite	Penetration with insulation 9 mm		Penetration with insulation 13 mm		Penetration with insulation 19 mm		Penetration with insulation 32 mm	
Outer Ø (mm)	Outer Ø (mm)	Segments (st)	Outer Ø (mm)	Segments (st)	Outer Ø (mm)	Segments (st)	Outer Ø (mm)	Segments (st)
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





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Metal Pipes, Insulated

Construction	Thickness [mm]	Configuration	Max. Ø [mm]	Insulation type
Rigid and flexible walls	≥ 100	Straight pipes	Ø 219.1	PIR/PUR (25 mm)
Rigid floors	≥ 150	Straight pipes	Ø 168.3	Elastomer (9 - 32 mm)
Stone wool coated batts	≥ 2 x 50	Straight pipes	Ø 114.3	

Usage Table for Metal Pipes with Insulation (Armaflex, Kaiflex, e.g.)

Stainless steel pipe	Penetration with insulation 9 mm		Penetration with insulation 13 mm		Penetration with insulation 19 mm		Penetration with insulation 32 mm	
Outer Ø (mm)	Outer Ø (mm)	Segments (st)	Outer Ø (mm)	Segments (st)	Outer Ø (mm)	Segments (st)	Outer Ø (mm)	Segments (st)
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

Usage Table for Metal Pipes with Insulation (PIR, PUR, e.g.)

Stainless steel pipe	Penetration with insulation 25 mm		Penetration with insulation 30 mm		Penetration with insulation 35 mm		Penetration with insulation 40 mm	
Outer Ø (mm)	Outer Ø (mm)	Segments (st)	Outer Ø (mm)	Segments (st)	Outer Ø (mm)	Segments (st)	Outer Ø (mm)	Segments (st)
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	67.2	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	126.1	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

Copper Pipes, Insulated

Construction	Thickness [mm]	Configuration	Max. Ø [mm]	Insulation type
Rigid and flexible walls	≥ 100	Straight pipes	Ø 76.1	PIR/PUR (25 mm)
Rigid floors	≥ 150	Straight pipes	Ø 88.9	Elastomer (9 - 32 mm)

Usage Table for Copper Pipes with Insulation (Armaflex, Kaiflex, e.g.)

Copper pipe	Penetration with insulation 9 mm		Penetration with insulation 13 mm		Penetration with insulation 19 mm		Penetration with insulation 32 mm	
Outer Ø (mm)	Outer Ø (mm)	Segments (st)	Outer Ø (mm)	Segments (st)	Outer Ø (mm)	Segments (st)	Outer Ø (mm)	Segments (st)
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

Usage Table for Copper Pipes with Insulation (PIR, PUR, e.g.)

Copper pipe	Penetration with insulation 25 mm		Penetration with insulation 30 mm		Penetration with insulation 35 mm		Penetration with insulation 40 mm	
Outer Ø (mm)	Outer Ø (mm)	Segments (st)	Outer Ø (mm)	Segments (st)	Outer Ø (mm)	Segments (st)	Outer Ø (mm)	Segments (st)
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

10. Flue Gas Pipes

Flue gas pipes can consist of single or double systems. When it involves eccentric connections, the central heating boiler has a parallel system. In this case, a separate outlet pipe is used for flue gases and a separate pipe for the air supply. A concentric connection uses a combined air supply and flue gas discharge system. This means that the flue gases are removed by an inner pipe and that the combustion air is supplied through the outer pipe.

All of the tested flue gas pipes are shown below:

Flue Gas Pipe - Aluminium up to Ø 130 mm			
Construction	**Thickness [mm]**	**Classification [min]**	**Multicollar *Slim***
Rigid shaft wall	≥ 70	EI 90-U/C	Double
Flexible shaft wall	≥ 100		
Rigid floor	≥ 150		

Flue Gas Pipe - PP up to Ø 125 mm			
Construction	**Thickness [mm]**	**Classification [min]**	**Multicollar *Slim***
Rigid shaft wall	≥ 70	EI 60-U/U	Double
Flexible shaft wall	≥ 100	EI 90-U/C	Single
Rigid floor	≥ 150		

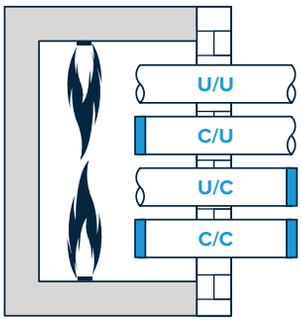
Concentric - PP/PP - up to Ø 125 mm			
Construction	**Thickness [mm]**	**Classification [min]**	**Multicollar *Slim***
Rigid shaft wall	≥ 70	EI 60-U/U	Double
Flexible shaft wall	≥ 100	EI 90-U/C	Single
Rigid floor	≥ 150		

Concentric - Steel/PP - up to Ø 200 mm			
Construction	**Thickness [mm]**	**Classification [min]**	**Multicollar *Slim***
Rigid shaft wall	≥ 70	EI 90-U/C	Double
Flexible shaft wall	≥ 100		Single
Rigid floor	≥ 150		Double

11. Test Configuration

Introduction

The test configuration determines the application of plastic pipes. Before testing a pipeline type, the intended use of the pipeline must be considered. Where will it be used in practice? Standard EN 1366-3:2009 sets requirements in this regard. The end of the pipe must be capped or uncapped, based on this. See the test configuration in table 1 and 2.



In a test, the conditions to which the pipeline and the sealing system are exposed to are determined by asking whether one or both pipe ends are capped in practice. The pressure and flowrate of hot gases will be different in a pipe that is in contact with the outside air than in a capped pipe. It is important to ensure that the sealing system is tested under appropriate conditions.

Table 1 - Test configuration plastic pipes

Test setup	Pipe end		Permitted use			
	In the oven	Outside the oven	U/U	C/U	U/C	C/C
U/U	Uncapped	Uncapped	✓	✓	✓	✓
C/U	Capped	Uncapped	✗	✓	✓	✓
U/C	Uncapped	Capped	✗	✗	✓	✓
C/C	Capped	Capped	✗	✗	✗	✓

Table 2 - Test configuration metal pipes

Test setup	Pipe end		Permitted use		
	In the oven	Outside the oven	U/C	C/U	C/C
U/C *	Uncapped	Capped	✓	✓	✓
C/U	Capped	Uncapped	✗	✓	✓
C/C	Capped	Capped	✗	✗	✓

* U/C tested and therefore U/U is covered

Plastic Pipes

Table H.1 shows a few examples of types of pipes and the intended use, where the end of the pipe is capped or uncapped. The table does not take all possible applications into account. The choice of whether to close the end or leave it open depends on a number of aspects: is the system under pressure and it is ventilated or unventilated? Consider the intended use of the pipe to determine whether it should be capped or left uncapped. If national regulations set different requirements than those contained in table H1, follow the regulations.

Table H.1 - Plastic Pipe Test Configuration per Application

Type of pipe	Pipe end		Test setup
	In the oven	Outside the oven	
Rainwater drainage	Uncapped	Uncapped	U/U
Sewage, Ventilated	Uncapped	Uncapped	U/U
Sewage, Unventilated	Uncapped	Capped	U/C
Gas pipe, drinking water pipe, hot water pipe	Uncapped	Capped	U/C

There is no application for a plastic pipe penetration with a test classification of C/U or C/C, according to table H.1 from EN 1366-3.

Metal Pipes

Metal pipes will normally be closed in the furnace as no open end is to be expected in the event of a fire, this due to the melting away of metal. Herewith is assumed that the suspension system remains in place. If the pipes are supported by a non fire resistant suspension system or are waste disposal shafts, the pipes are not sealed in the furnace, as shown in Table H.2.

Table H.2 - Test Configuration Metal Pipe by Application

Type of pipe	Construction		Test setup
	In the oven	Outside the oven	
Supported by a fire resistant[a] suspension	Capped	Uncapped	C/U
Supported by a non fire resistant suspension system	Uncapped	Capped	U/C
Shafts for waste disposal	Uncapped	Capped	U/C
[a]confirmed by testing or calculations (e.g. Eurocodes)			

12. Building Element Properties

Flexible walls
The minimum wall thickness must be 100 mm and the wall must consist of metal or timber studs* with at least 2 layers of cladding on both sides with a thickness of 12.5 mm. Can also be used with fire-stopping stone wool boards, 2 x 50 mm Multimastic FB1, maximum seal size: unlimited width x 1200 mm height (uninterrupted partition styles required, with a centre distance of up to 2400 mm).

Rigid walls
The minimum wall thickness is 100 mm and the wall must consist of concrete, aerated concrete or brickwork, with a minimum density of 400 kg/m^3. Can also be used with fire-stopping stone wool, 2 x 50 mm Multimastic FB1, maximum seal size: unlimited width x 1200 mm height.

Rigid floors
The minimum floor thickness is 150 mm and the floor must consist of concrete or aerated concrete, with a minimum density of 400 kg/m^3. Can also be used with fire-stopping stone wool boards, 2 x 50 mm Multimastic FB1, maximum seal size: 2400 x 1200 mm (w x h).

**There must be a minimum distance of 100 mm from each part of the conduit seal to a timber stud and the gap between the conduit seal and the stud must be capped. The cavity between the conduit seal and the stud must have at least 100 mm class A1 or A2 insulation (according to EN 13501-1).*

The support structure must be classified in accordance with EN 13501-2 for the specified fire resistance.

13. Available Documents

Technical documents available
- Product Data Sheet (PDS)
- Technical Data Sheet (TDS)
- Safety Data Sheet (SDS)
- Installation Manual
- CE certificate

Approvals
- Tested in accordance with EN 1366-3
- Classification in accordance with EN 13501-2
- Certified in accordance with EAD 350454-00-1104
- ETA report 20/1322
- Declaration of Performance (DoP)

The above documents are available from your Mulcol contact or via **www.mulcol.com**

MultiSelector

For help in finding the right fire-stopping finish for penetrations, see our **Multiselector** at **www.mulcol.com** or download the **Mulcol Fire Protection App** in the **App Store** (iOS) or **Google Play Store** (Android).

DataManager

For the digital registration of firestopping in your buildings, you can use the **Mulcol Data Manager** free of charge. For registration on site, use our **Mulcol Fire Protection App**.

Available for Apple App Store | Available for Android Google play | YouTube | VR Virtual Reality | AR Augmented Reality | MultiSelector | DataManager

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Mulcol International
The Netherlands

PO Box 93
4330 AB Middelburg

T. +31 (0)118 72 61 40
contact@mulcol.com

www.mulcol.com

GB