

Multicollar *Slim*

Universal Fire Collar

European
Technical Assessment
ETA 17/0836



Technical Data Sheet

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Content

| | |
|---|----|
| Product Specification | 3 |
| <ul style="list-style-type: none">■ Types of Penetrations■ Tested Configurations■ Technical Insulation■ Advantages■ Applications■ Packaging | |
| 1. Technical Data | 5 |
| 2. Assembly Instructions | 6 |
| <ul style="list-style-type: none">■ Mounting the Multicollar <i>Slim</i>■ Reusing Segments■ Multiclips mounting instructions■ Maximum Distance between the Penetration and Multicollar Slim■ Use of Single and Dual Multicollar Slim | |
| 3. Explanation of Special Applications | 8 |
| <ul style="list-style-type: none">■ Penetrations with Zero Distance to Construction (U-shape)■ Straight Pipes with Annular Space to the Floor■ Inclined Pipes $\geq 45^\circ - 90^\circ$■ Wall and Floor Corner Solutions■ Multiple Penetrations■ Pipe Support Penetrations■ Joint Sealings in Rigid Walls■ Joint Sealings in Flexible Walls■ Joint Sealings in Rigid Floor■ Joint Sealings in Coated Batts | |
| 4. Tested Configurations | 13 |
| <ul style="list-style-type: none">■ Plastic Pipes, Uninsulated | |
| 5. Installation Manual Multicollar Slim | 16 |
| 6. Performance Overviews | 17 |
| <ul style="list-style-type: none">■ Uninsulated Plastic Pipe Penetrations through Flexible Walls, Rigid Wall and Floors■ Uninsulated Multilayer Pipe Penetrations through Flexible Walls, Rigid Walls and Floors■ Uninsulated Multiple Penetrations through Flexible Walls, Rigid Walls and Floors■ Flue Gas Pipes through Flexible Shaft Walls, Rigid Shaft Walls and Floors■ Uninsulated Plastic Pipe Penetrations through Fire-stopping Coated Batts (2 x 50 mm)■ Uninsulated Multilayer Pipe Penetrations through Fire-stopping Coated Batts (2 x 50 mm)■ Acoustic Insulated Plastic Pipe Penetrations through Flexible Walls, Rigid Walls and Floors■ Elastomeric Insulated Plastic Pipe Penetrations through Flexible Walls, Rigid Walls and Floors■ Insulated Multilayer Pipe Penetrations through Flexible Walls, Rigid Walls and Floors■ Insulated Multiple Penetrations through Flexible Walls, Rigid Walls and Floors■ Insulated Metal Pipe Penetrations through Flexible Walls and Floors | |

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Pragmatic, effective
and applicable
solutions

| | |
|---|----|
| 7. Spacing | 29 |
| 8. Pipe Insulation (Configuration) | 30 |
| ■ Permitted Insulation Materials | |
| 9. Consumption Tables | 31 |
| ■ Plastic Pipes, Insulated | |
| ■ Multilayer Pipes, Uninsulated | |
| ■ Multilayer Pipes, Insulated | |
| ■ Fibre Composite Pipes, Uninsulated | |
| ■ Fibre Composite Pipes, Insulated | |
| ■ Metal Pipes, Insulated | |
| ■ Copper Pipes, Insulated | |
| 10. Flue Gas Pipes | 39 |
| 11. Test Configuration | 40 |
| 12. Building Element Properties | 41 |
| 13. Available Documents | 41 |
| ■ Technical Documents | |
| ■ Approvals | |



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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 segments 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-Xc, PE-RT
Henco, Uponor, Wavin Tigris, Geberit Mepla, REHAU Rautitan
- ✓ Fibre composite pipes such as: PP-R, PP-B, PP-RCT
Aquatherm, Climatec, Aquatechnik
- ✓ Air-conditioning pipes such as: Wicu flex
- ✓ Copper and steel pipes
- ✓ Electric cables and cable bundles
- ✓ Cable pipes 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

30 mm



Technical insulation

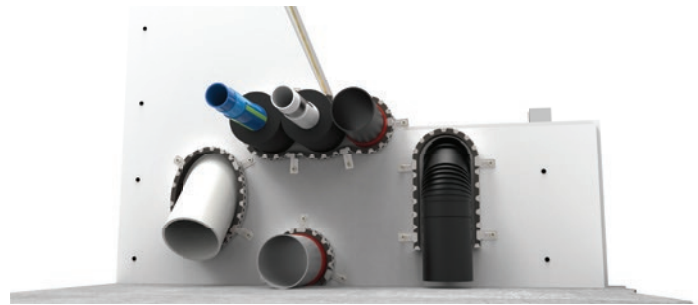
- ✓ Thermocompact® TF, PE-foam
- ✓ ABSound Sonocool Type PM
- ✓ Jaco Massa Reinforced Alu, Jaco Massa Alu and Jaco Massa Black Alu
- ✓ Merfisol Silver ALU
- ✓ AF/Armaflex and SH/Armaflex
- ✓ Kaiflex ST and Kaiflex KKplus s2
- ✓ Insul-Phen, Insul-Pirplus and Insul-Pir 33
- ✓ Kingspan Tarecpir M1, Kingspan Tarecpir CR, Kingspan Tarecpir B2, Kingspan Tarecpir HT
- ✓ Kingspan Tarecpir HD and Kingspan Kooltherm FM

Advantages

- ✓ 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



Technical data

| | |
|--|---------------------------------------|
| Colour stainless steel band + inlay | Stainless steel + Anthracite |
| Application temperature | +5 °C to +50 °C |
| Temperature resistance | -20 °C to +80 °C |
| Reaction to fire | Class E in accordance with EN 13501-1 |

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 pieces of Multibit T30
- ✓ 6 pieces of Conformity Statement

Accessories (available separately)



Multiclip Set

20 pcs. Multiclip, 30 mm
20 pcs. Multiscrews 7,5 x 40 mm
Article number 802060001



Multiclip Set L

20 pcs. Multiclip L, 60 mm
20 pcs. Multiscrew 7,5 x 40 mm
Article number 802060002



Conformity Statement

Contents 6 pcs.
Article number 802060104



Multiscrew FB

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

1. Technical Data

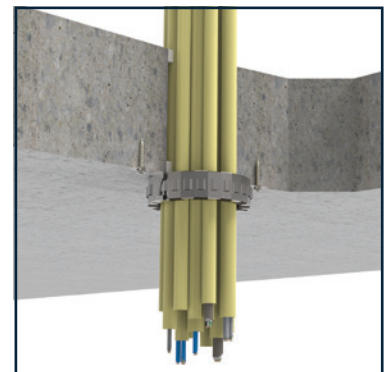
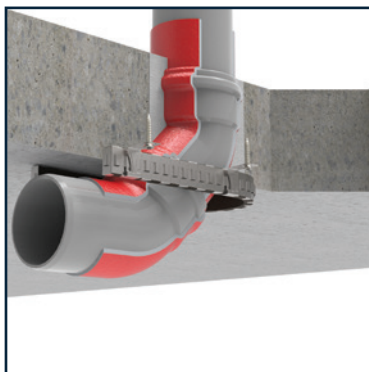
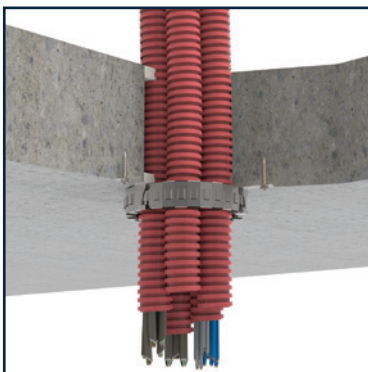
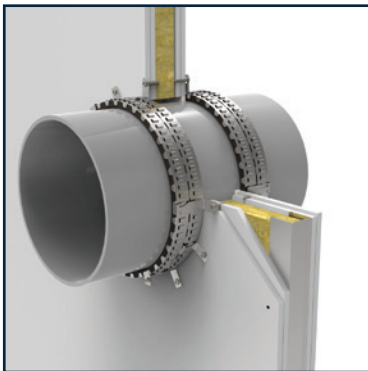
| | |
|---|--|
| EAN-code | 8719324470155 |
| Colour stainless steel belt + inlay | Stainless steel + Anthracite |
| Shelf life | Not applicable |
| Transportation - storage temperature | -5 °C to +50 °C (store dry in the original packaging) |
| Application temperature | +5 °C tot +50 °C |
| Temperature resistance | -20 °C tot +80 °C |
| Density | $\rho = 900 \text{ kg/m}^3 \text{ tot } 1350 \text{ kg/m}^3$ |
| Expansion pressure | 0,8 N/mm ² to 1,8 N/mm ² (bij 300 °C) |
| Expansion factor ²⁾ | 6,5 x tot 18,5 x |
| Reaction temperature | Approx. 180 °C |
| Usage category ¹⁾ | Type Z ₁ in accordance with EAD 350454-00-1104 |
| Mounting from one side possible | Yes, please refer to ETA report 17/0836 |
| Fire class | E in accordance with EN 13501-1 |
| Approvals | ETA report 17/0836 |
| Function preservation | 30 years |
| Joint finish | Multisealant A, Multimastic SP or Multimortar |
| Large gaps | Multimastic C system (1200 x 2400 mm of ∞ x 1200 mm) |

¹⁾ Permissible environmental conditions

Conduit seal for use in conditions with $\geq 85\%$ RH, protected from temperatures below 0 °C, and without exposure to rain and/or UV (TR 024:2009, type Z₁). 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.



2. Assembly Instructions

Mounting the Multicollar *Slim*

The Multicollar *Slim* can be mounted on different surfaces, using tested Multiclips, Multiscrews and Multiscrews FB. When mounting 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 FB 40 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 | Rock wool coated batts | | ✓ | |

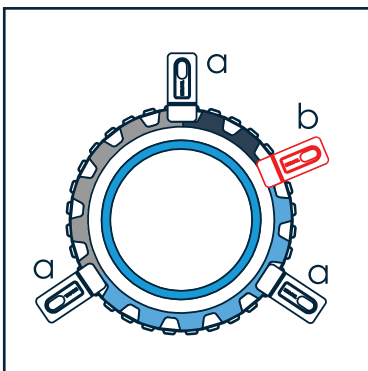


Reusing Segments

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 mounted with the corresponding Multiclips. The following principles apply to meet the tested situation:

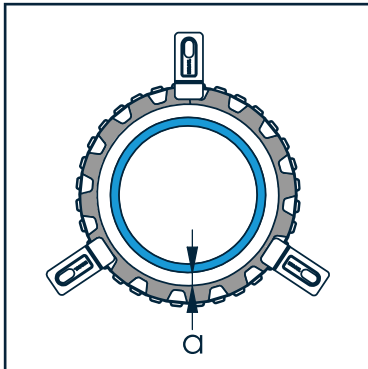
- ✓ Divide the Multiclips as well as evenly as possible over the Multicollar *Slim*
- ✓ There can be a maximum of 11 segments between Multiclips "a" as shown in figure A
- ✓ Extra Multiclips can be used, as shown with Multiclip "b" in figure A
- ✓ Do not use fewer Multiclips than prescribed

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 <i>Slim</i> Number of Mulcol® Multiclips | Dual Multicollar <i>Slim</i> | |
|---|--|---|--|
| | | First Multicollar <i>Slim</i> (Number Mulcol® Multiclips, A) | Second Multicollar <i>Slim</i> (Number Mulcol® Multiclips Large, 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

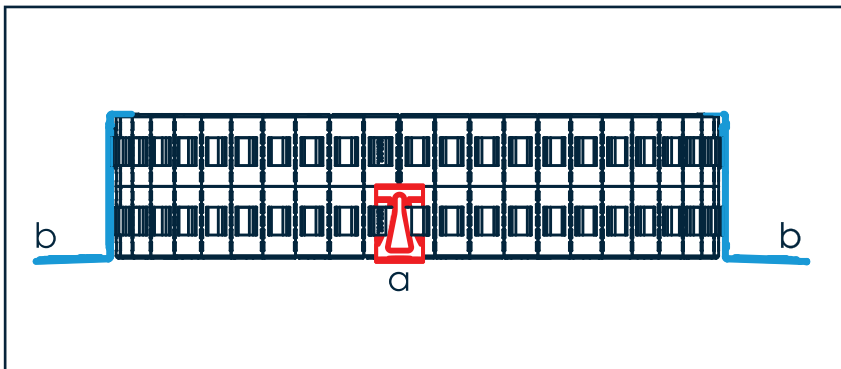
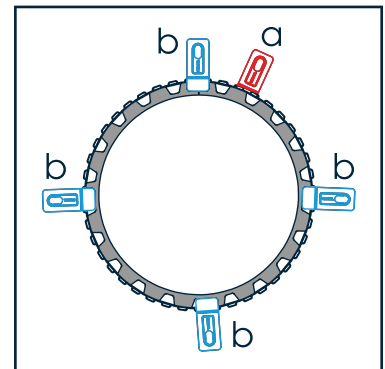


Figure D

a: Mulcol® Multiclip
b: Mulcol® Multiclip Large



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.

Consumption 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 |

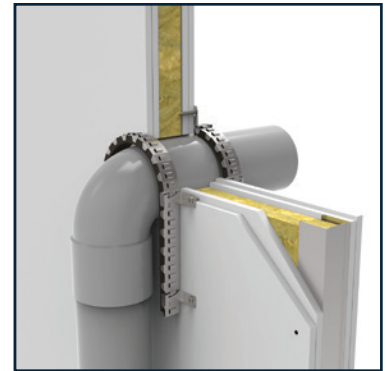
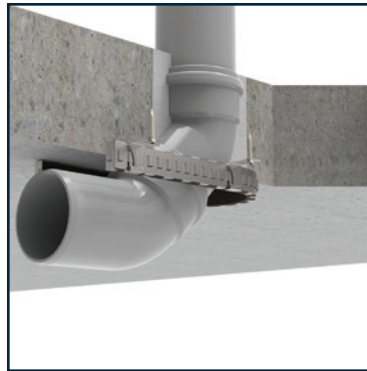


Figure 1

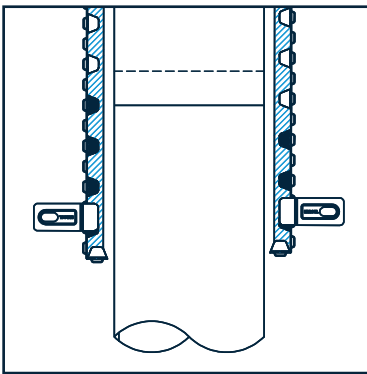


Figure 2

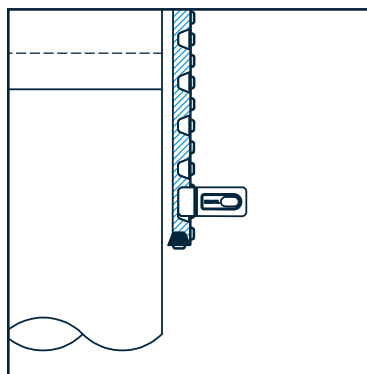


Figure 3

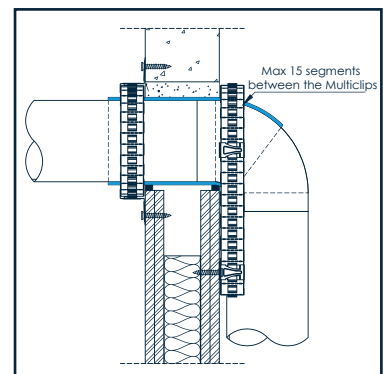
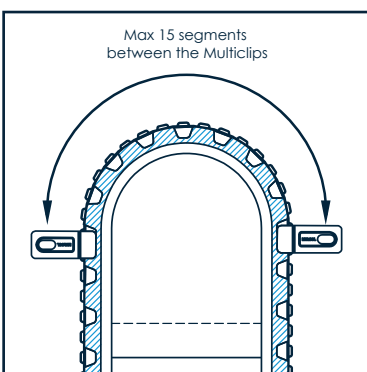


Figure 4



Straight Pipes with Annular Space to the Floor

Pipes that are fitted over the floor with an annular space ($S^2 \leq 5 \text{ mm}$) can be fitted with a $\frac{3}{4}$ fire collar up to max. $\varnothing 125 \text{ mm}$. See figures 5, 6 and 7 for the tested configurations.

Figure 5

S^2 : Distance to construction $\leq 5 \text{ mm}$

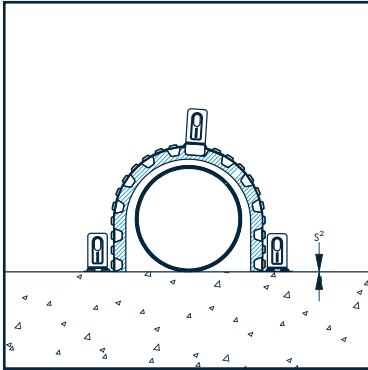


Figure 6

S^2 : Distance to construction $\leq 5 \text{ mm}$

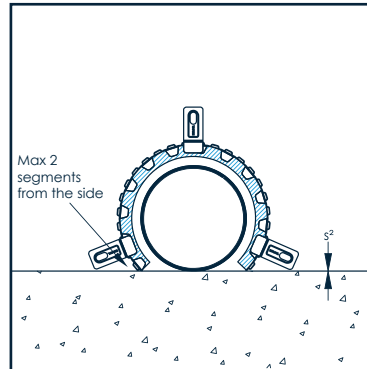
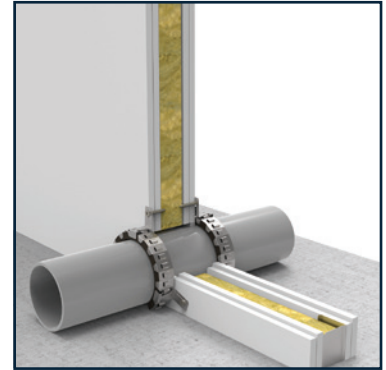


Figure 7



Inclined Pipes $\geq 45^\circ - 90^\circ$

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

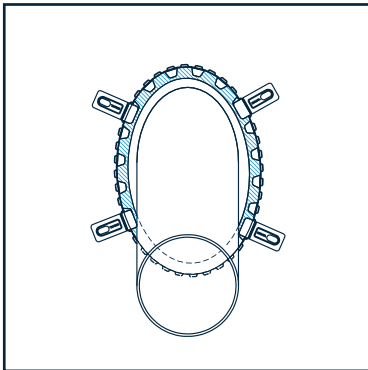


Figure 9

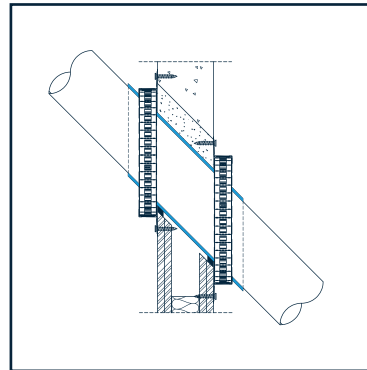
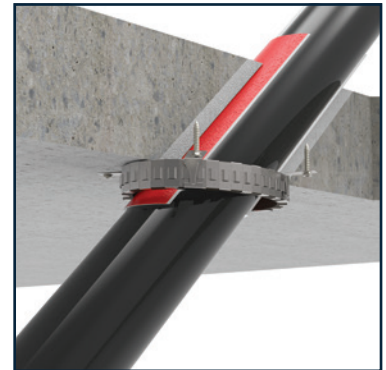


Figure 10



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

S¹: Distance to construction ≤ 5 mm
S²: Distance to construction ≤ 5 mm

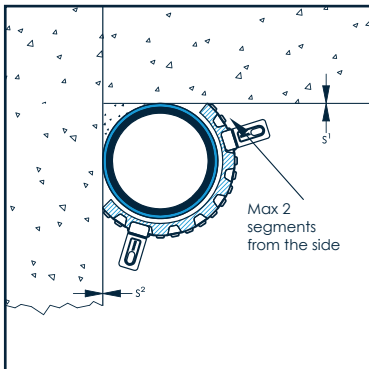


Figure 12

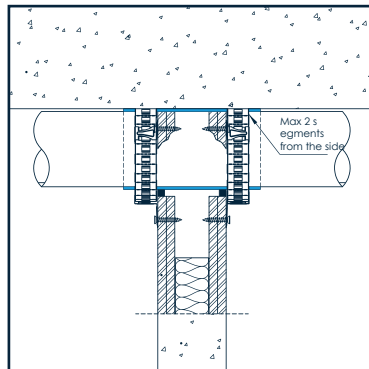


Figure 13

S¹: Distance to construction ≤ 5 mm
S²: Distance to construction ≤ 5 mm

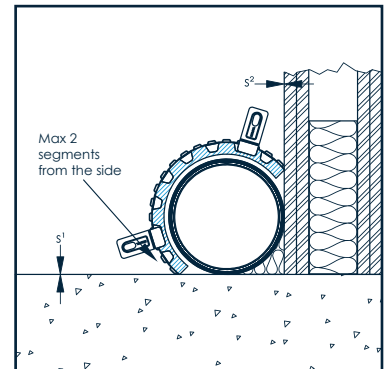
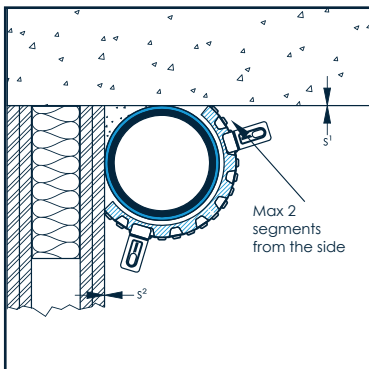


Figure 14

S¹: Distance to construction ≤ 5 mm
S²: 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

S¹: Spacing max. ≤ 15 mm
S²: Distance to construction ≥ 0 mm

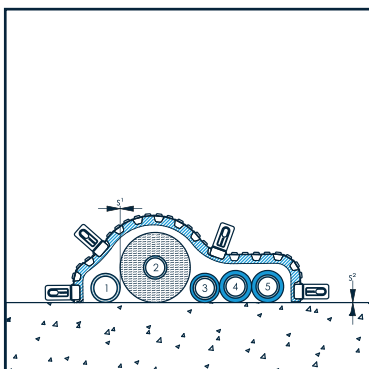


Figure 16

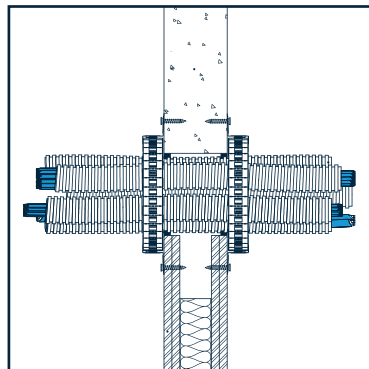
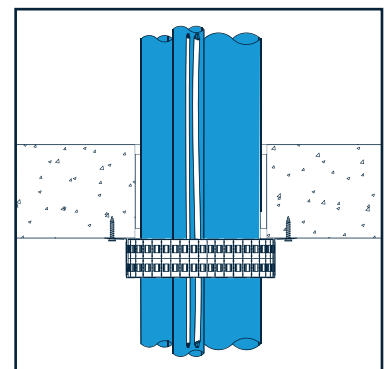
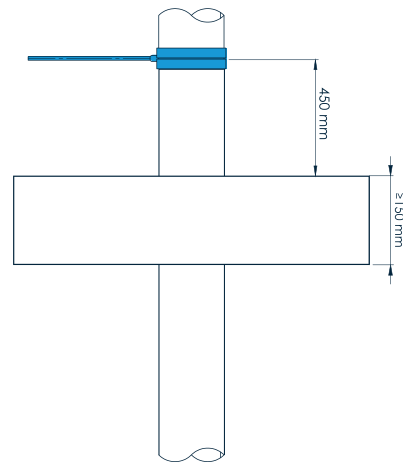
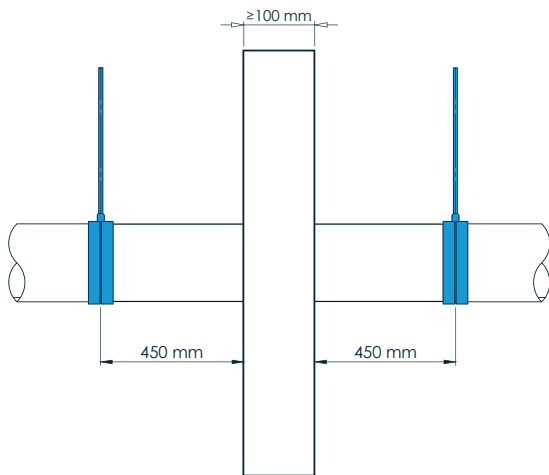


Figure 17



Pipe Support Penetrations

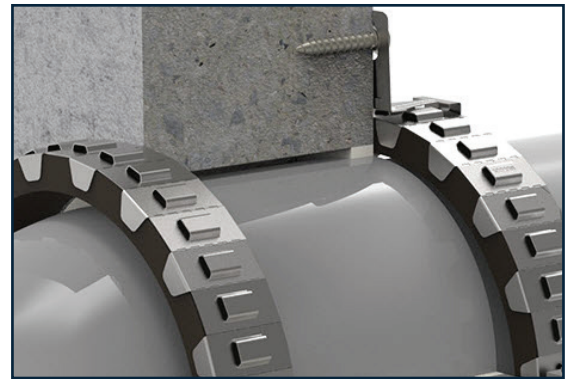
Service penetrations must be held in place ≤ 450 mm from the fire partition. With floors, the covering must only be applied at the top of the floor at a distance of ≤ 450 mm.



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 650 kg/m³.

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 17/0836



Permissible filling materials for joints around pipe penetrations

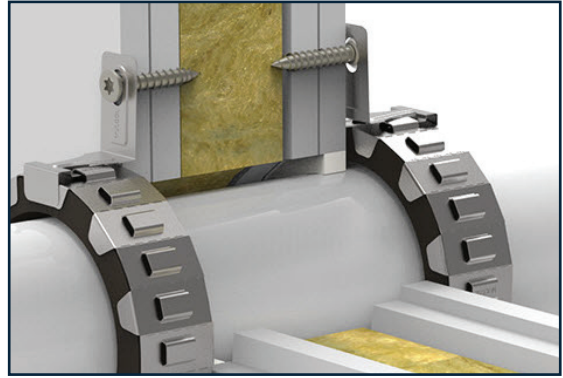
| | | |
|--|--|--------------------------------------|
| Multimortar (EN 13501-1: fire class A1) | Multisealant A, fire stopping sealant | Multimastic SP, fire stopping mastic |
| Joint width: ≥ 10 mm | Joint width: ≤ 20 mm | |
| Depth: Over the full thickness of the wall | Depth: ≥ 10 mm, on both sides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

Joint Sealings in Flexible Walls

The minimum wall thickness must be 100 mm and the wall must consist of steel or wooden posts with at least 2 layers of cladding on both sides with a thickness of 12.5 mm.

When using wooden posts, a minimum distance of 100 mm from each part of the conduit seal to a wooden post and the gap between the conduit seal and the post must be capped. The cavity between the conduit seal and the post 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 17/0836

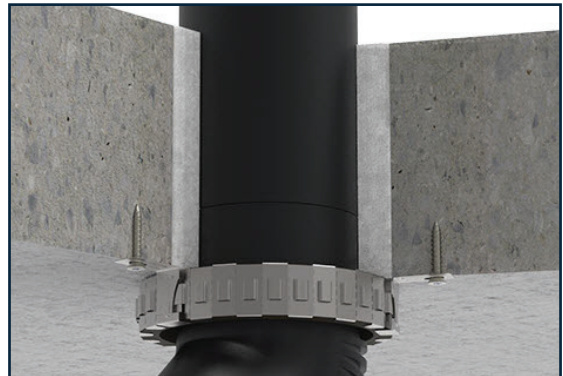


| Permissible filling materials for joints around pipe penetrations | |
|---|--------------------------------------|
| Multisealant A, fire stopping sealant | Multimastic SP, fire stopping mastic |
| Joint width: ≤ 20 mm | |
| Depth: ≥ 10 mm, on both sides of the wall | |

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 650 kg/m³.

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/m³. For more information, see ETA report 17/0836

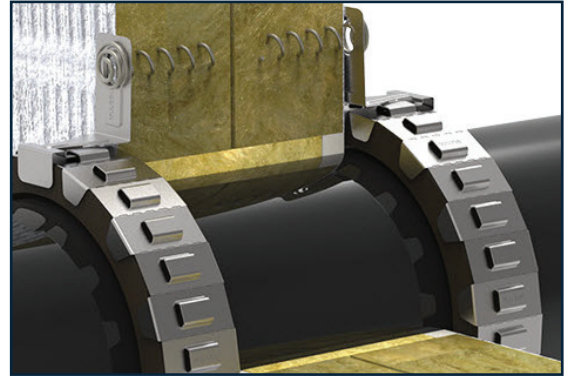


| Permissible filling materials for joints around pipe penetrations | | |
|---|--|--------------------------------------|
| Multimortar (EN 13501-1: fire class A1) | Multisealant A, fire stopping sealant | Multimastic SP, fire stopping mastic |
| Joint width: ≥ 10 mm | Joint width: ≤ 20 mm | |
| Depth: 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 floor basement. | |

Joint Sealings in Coated Batts

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 $\geq 150 \text{ kg/m}^3$.

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 rock wool, fire stopping mastic is not required. For more information, see ETA report 17/0836



Permissible filling materials for joints around pipe penetrations

Multimastic SP, fire stopping mastic

Joint width: $\leq 20 \text{ mm}$

Depth: $\geq 10 \text{ mm}$, on both sides of the wall

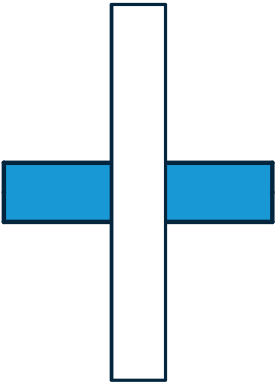
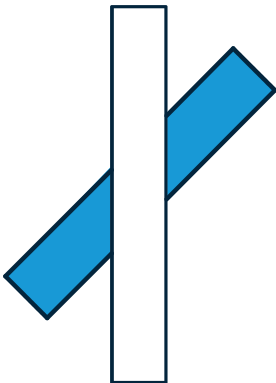
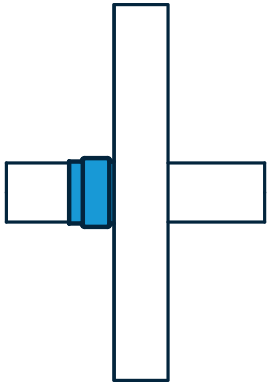
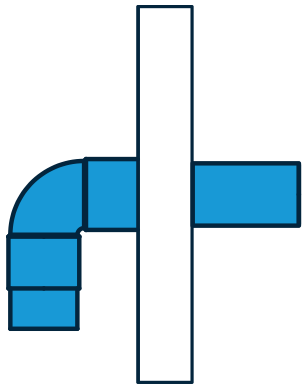
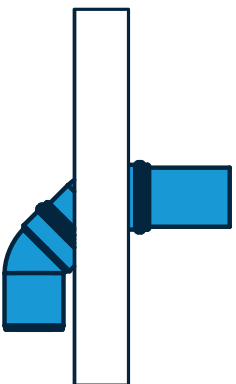
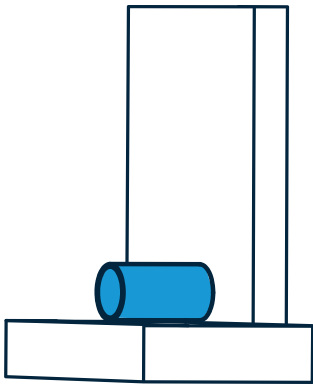
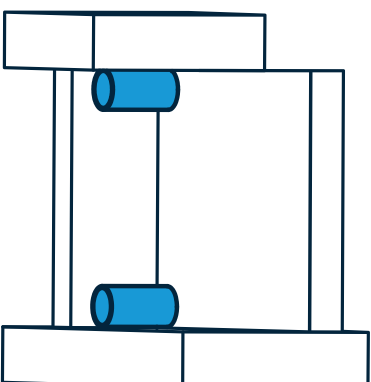
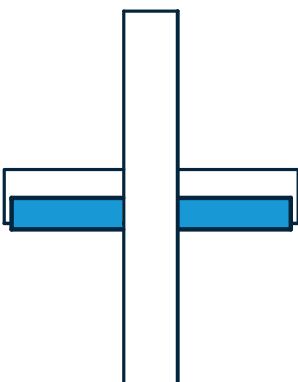
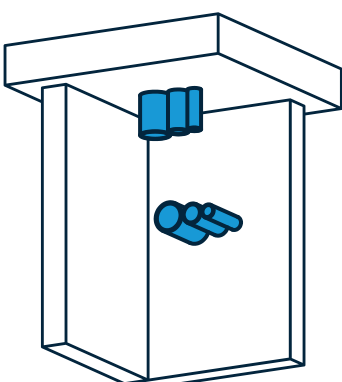
4. Tested Configurations

Plastic Pipes, Uninsulated

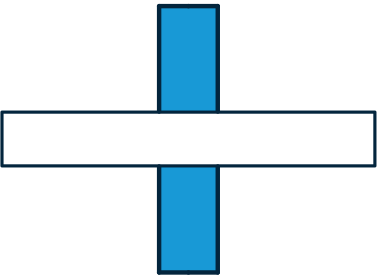
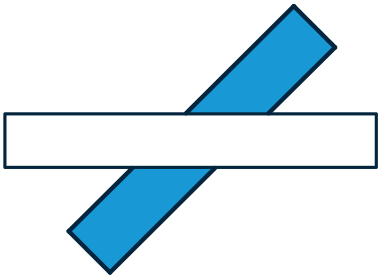
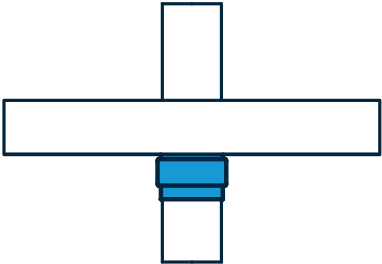
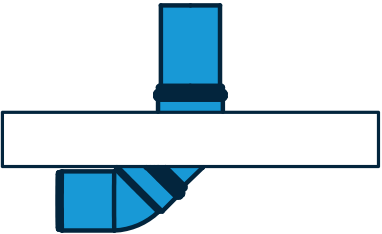
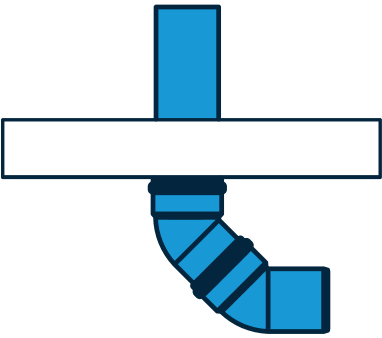
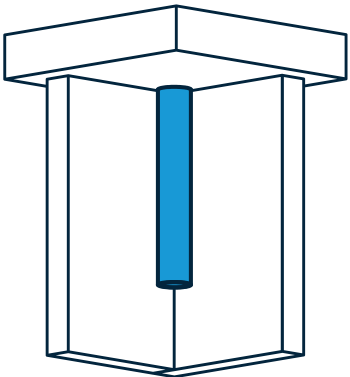
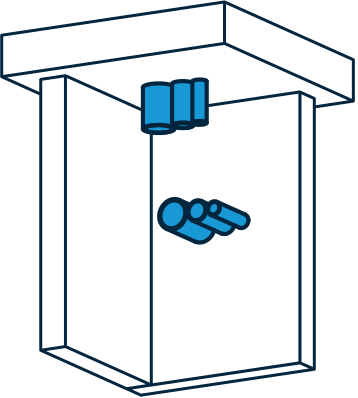
| Construction | Thickness [mm] | Configuration* | Max. Ø [mm] | Insulation type |
|--------------------------|--------------------|---|-------------|-----------------|
| Rigid and flexible walls | ≥ 100 | Straight pipes | Ø 315 | n/a |
| | | Inclined pipes $\geq 45^\circ - 90^\circ$ | Ø 125 | |
| |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

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

Tested configurations in rigid and flexible walls

| Straight pipes | Inclined pipes $\geq 45^\circ - 90^\circ$ | Coupling elements |
|---|---|---|
|  |  |  |
| 87° / 90° Elbows | 2 x 45° Elbows | Zero distance (U-shape) |
|  |  |  |
| Corner solutions | Support structure | Multiple penetrations |
|  |  |  |

Tested configurations in rigid floors

| Straight pipes | Inclined pipes $\geq 45^\circ - 90^\circ$ | Coupling elements |
|---|---|--|
|  |  |  |
| Elbows 2 x 45° | 2 x 45° Elbows | Corner solutions |
|  |  |  |
| Multiple penetrations |  | |

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 mm¹⁾ can be sealed with Multisealant A firestop acrylic sealant or Multimastic SP firestop mastic, over a depth of 10 mm.



| Ø pipe | System | Multicoll |
|--------|--------|-----------|
| 50 | 1 | 2 |
| 56 | 1 | 2 |
| 63 | 1 | 2 |
| 70 | 2 | 2 |
| 76 | 2 | 2 |
| 83 | 2 | 2 |
| 90 | 2 | 2 |
| 96 | 2 | 2 |
| 102 | 2 | 2 |
| 108 | 2 | 2 |
| 114 | 2 | 2 |
| 120 | 2 | 2 |
| 126 | 2 | 2 |
| 132 | 2 | 2 |
| 138 | 2 | 2 |
| 144 | 2 | 2 |
| 150 | 2 | 2 |
| 156 | 2 | 2 |
| 162 | 2 | 2 |
| 168 | 2 | 2 |
| 174 | 2 | 2 |
| 180 | 2 | 2 |
| 186 | 2 | 2 |
| 192 | 2 | 2 |
| 198 | 2 | 2 |
| 204 | 2 | 2 |
| 210 | 2 | 2 |
| 216 | 2 | 2 |
| 222 | 2 | 2 |
| 228 | 2 | 2 |
| 234 | 2 | 2 |
| 240 | 2 | 2 |
| 246 | 2 | 2 |
| 252 | 2 | 2 |
| 258 | 2 | 2 |
| 264 | 2 | 2 |
| 270 | 2 | 2 |
| 276 | 2 | 2 |
| 282 | 2 | 2 |
| 288 | 2 | 2 |
| 294 | 2 | 2 |
| 300 | 2 | 2 |

3 Measure the diameter of the service penetration. See the application table on the packaging (for plastic pipes 2) for the length 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.



Information



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** For professional use only.

6. Performance

Uninsulated Plastic Pipe Penetrations through Flexible Walls, Rigid Walls and Floors

EN 1366-3

| PVC-U / PVC-C pipes | Seal size Ø x s [mm] | Multicollar <i>Slim</i> | | Assembly side(s) | Spacing | Construction | | | Classificatio minutes |
|--|-------------------------|-------------------------|------|---------------------|-------------|--------------|--------|--------|--------------------------|
| | | Single | Dual | | | FW-100 | RW-100 | RF-150 | |
| Straight pipes | ≤ 110 x 1,8 - 14,6 | ✓ | | 2 | fig. 1 to 4 | ✓ | ✓ | | ≤ 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 - 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 floor | ≤ 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 <i>Slim</i> | | Assembly side(s) | Spacing | Construction | | | Classification minutes | | |
|-------------------------------|-------------------------|-------------------------|------|---------------------|-------------|--------------|--------|--------|---------------------------|---|--------------|
| | | Single | Dual | | | 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 | | | | | | 1 | | | ✓ | ≤ EI 120-U/C |
| | ≤ 40 x 1,8 - 6,3 | | | ≤ 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

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

| PE / PE-HD / ABS / SAN+PVC pipes | Seal size Ø x s [mm] | Multicollar <i>Slim</i> | | Assembly side(s) | Spacing | Construction | | | Classification minutes | | |
|----------------------------------|-------------------------|-------------------------|------|---------------------|-------------|--------------|--------|--------|---------------------------|---|--------------|
| | | Single | Dual | | | 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 |
| 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 <i>Slim</i> | | Assembly side(s) | Spacing | Construction | | | Classification minutes |
|---|-------------------------|-------------------------|------|---------------------|-------------|--------------|--------|--------|---------------------------|
| | | Single | Dual | | | FW-100 | RW-100 | RF-150 | |
| 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

| Fibre composite pipes ⁽¹⁾ | Seal size Ø x s [mm] | Multicollar <i>Slim</i> | | Assembly side(s) | Spacing | Construction | | | Classification minutes |
|--------------------------------------|-------------------------|-------------------------|------|------------------|-------------|--------------|--------|--------|------------------------|
| | | Single | Dual | | | FW-100 | RW-100 | RF-150 | |
| 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 <i>Slim</i> | | Assembly side(s) | Spacing | Construction | | | Classification minutes |
|--------------------------------|-------------------------|-------------------------|------|------------------|-------------|--------------|--------|--------|------------------------|
| | | Single | Dual | | | 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 |

Uninsulated Multiple Penetrations through Flexible Walls, Rigid Walls and Floors

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

| Cable bundle Copper cont. ≤ 247 mm ² | Seal size Ø x s [mm] | Multicollar <i>Slim</i> | | Assembly side(s) | Spacing | Construction | | | Classification minutes |
|---|-------------------------|-------------------------|------|------------------|-------------|--------------|--------|--------|------------------------|
| | | Single | Dual | | | FW-100 | RW-100 | RF-150 | |
| Straight pipes | ≤ 80 (42 pieces) | ✓ | | 1 | fig. 1 to 4 | | | ✓ | ≤ EI 120 |

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

⁽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 Climatic 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

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

| PE conduit with cables | Seal size Ø x s [mm] | Multicollar <i>Slim</i> | | Assembly side(s) | Spacing | Construction | | | Classification minutes |
|------------------------|-------------------------|-------------------------|------|---------------------|-------------|--------------|--------|--------|---------------------------|
| | | Single | Dual | | | FW-100 | RW-100 | RF-150 | |
| Straight pipes | ≤ 150 (≤ 5 x Ø50) | ✓ | | 2 | fig. 1 to 4 | ✓ | ✓ | | ≤ EI 120-U/U |
| | ≤ 130 (≤ 5 x Ø50) | | | 1 | | | | ✓ | ≤ EI 60-U/U |

| PVC-U / PVC-C pipes | Seal size Ø x s [mm] | Multicollar <i>Slim</i> | | Assembly side(s) | Spacing | Construction | | | Classification minutes |
|---------------------|-------------------------|-------------------------|------|---------------------|-------------|--------------|--------|--------|---------------------------|
| | | Single | Dual | | | FW-100 | RW-100 | RF-150 | |
| Straight pipes | ≤ 75 x 3,0 (3 stuks) | ✓ | | 2 | fig. 1 to 4 | ✓ | ✓ | | ≤ EI 90-U/C |

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

| Multiple Penetrations | Seal size Ø x s [mm] | Multicollar <i>Slim</i> | | Assembly side(s) | Spacing | Construction | | | Classification minutes |
|-------------------------------------|-------------------------|-------------------------|------|---------------------|-------------|--------------|--------|--------|---------------------------|
| | | Single | Dual | | | 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 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 <i>Slim</i> | | Assembly side(s) | Spacing | Construction | | | Classification minutes |
|---------------------------|-------------------------|-------------------------|------|---------------------|-------------|--------------|-------|------------|---------------------------|
| | | Single | Dual | | | FW-100 | RW-70 | RF-150 | |
| Straight pipes | ≤ 130 x 1,5 | ✓ | | 1 | fig. 1 to 4 | ✓ | ✓ | | ≤ E 90 U/C |
| | | | | | | | ✓ | ≤ E 90 U/C | |

| Flue gas pipe - PP | Seal size Ø x s [mm] | Multicollar <i>Slim</i> | | Assembly side(s) | Spacing | Construction | | | Classification minutes |
|--------------------|-------------------------|-------------------------|------|---------------------|-------------|--------------|-------|--------|---------------------------|
| | | Single | Dual | | | 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 |

⁽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 Climatic PP-RCT en Bänninger Watertec PP-RCT

⁽²⁾ Allowed Multilayer pipes

- Alplex 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 Alplex 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

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

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

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

| PVC-U / PVC-C | Seal size | Multicollar <i>Slim</i> | | Assembly side(s) | Spacing | Construction | | | Classification minutes |
|----------------|-------------------|-------------------------|------|------------------|--------------|--------------|--------|--------|------------------------|
| | | Single | Dual | | | FW-100 | RW-100 | RF-150 | |
| 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 | Multicollar <i>Slim</i> | | Assembly side(s) | Spacing | Construction | | | Classification minutes |
|----------------|-------------------|-------------------------|------|------------------|--------------|--------------|--------|--------|------------------------|
| | | Single | Dual | | | FW-100 | RW-100 | RF-150 | |
| 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 | Multicollar <i>Slim</i> | | Assembly side(s) | Spacing | Construction | | | Classification minutes |
|----------------------------|-------------------|-------------------------|------|------------------|--------------|--------------|--------|--------|------------------------|
| | | Single | Dual | | | FW-100 | RW-100 | RF-150 | |
| 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

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

| Multilayer pipe ⁽²⁾ | Seal size Ø x s [mm] | Multicollar <i>Slim</i> | | Assembly side(s) | Insulation config. / L [mm] | Construction | | | Classification minutes |
|--------------------------------|-------------------------|-------------------------|--------------|---------------------|--------------------------------|--------------|--------|--------|---------------------------|
| | | Single | Dual | | | FW-100 | RW-100 | RF-150 | |
| Straight pipes | ≤ 50 x 2,0 - 4,0 | ✓ | | 2 | Cl 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 <i>Slim</i> | | Assembly side(s) | Insulation config. / L [mm] | Construction | | | Classification minutes |
|--------------------------------------|-------------------------|-------------------------|--------------|---------------------|--------------------------------|--------------|--------|--------|---------------------------|
| | | Single | Dual | | | FW-100 | RW-100 | RF-150 | |
| Straight pipes | ≤ 50 x 6,9 - 10,0 | ✓ | | 1 | Cl 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

| PVC-U / PVC-C pipes | Seal size Ø x s [mm] | Multicollar <i>Slim</i> | | Assembly side(s) | Insulation config. / L [mm] | Construction | | | Classification minutes |
|---|-------------------------|-------------------------|--------------|---------------------|--------------------------------|--------------|--------|--------|---------------------------|
| | | Single | Dual | | | FW-100 | RW-100 | RF-150 | |
| Straight pipes | ≤ 110 x 1,8 - 14,6 | ✓ | | 2 | Cl 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 - 14,6 | | ≤ EI 120-U/C | | | | | | |
| Inclined pipes ≥ 45° - 90° | ≤ 110 x 3,4 - 10,0 | | ✓ | 2 | Cl 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 | | | | | ≤ EI 60-U/U | | | |
| | ≤ 110 x 10,0 | | ✓ | 1 | | ≤ EI 90-U/U | | | |
| 87° / 90° Elbows | ≤ 125 x 2,5 | ✓ | | 2 | Cl or CS | ✓ | ✓ | | ≤ EI 90-U/U |
| 87° / 90° Elbows Zero distance to wall | ≤ 110 x 3,4 | ✓ | | 2 | Cl or CS | ✓ | ✓ | | ≤ EI 120-U/C |
| Elbow 2 x 45°, zero distance to floor | ≤ 50 x 3,0 | ✓ | | 1 | Cl or CS | | | ✓ | ≤ EI 90-U/C |
| | ≤ 110 x 3,2 | | ≤ EI 45-U/C | | | | | | |
| Corner solutions | ≤ 110 x 2,2 - 2,3 | ✓ | | 2 | Cl or CS | ✓ | ✓ | | ≤ EI 90-U/U |
| | ≤ 110 x 6,3 | | 1 | ≤ EI 90-U/U | | | | | |
| | ≤ 125 x 7,4 | | 1 | ≤ EI 60-U/C | | | | | |
| Zero distance to floor | ≤ 110 x 2,2 | ✓ | | 1 | Cl 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 Climatic 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

| PP pipes | Seal size Ø x s [mm] | Multicollar <i>Slim</i> | | Assembly side(s) | Insulation config. / L [mm] | Construction | | | Classification minutes | | |
|-------------------------------|-------------------------|-------------------------|------|---------------------|--------------------------------|--------------|--------|--------|---------------------------|--|--------------|
| | | Single | Dual | | | FW-100 | RW-100 | MV-150 | | | |
| Straight pipes | ≤ 110 x 1,8 - 6,3 | ✓ | | 2 | Cl 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 | | | 1 | | | | | | | ≤ EI 120-U/C |
| | ≤ 40 x 1,8 - 6,3 | | | | | | | | | | ≤ 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 | Cl or CS | ✓ | ✓ | | ≤ EI 60-U/C | | |
| | ≤ 110 x 3,4 | | | | | | | | ≤ EI 120-U/C | | |
| | ≤ 110 x 2,7 | | | ✓ | | | 1 | | | | ≤ EI 45-U/C |
| | ≤ 110 x 3,4 - 10,0 | | | | | ✓ | | | | | ≤ EI 60-U/U |
| | ≤ 110 x 10,0 | | | | | ✓ | | | | | ≤ EI 90-U/U |
| 87° / 90° Elbows | ≤ 125 x 3,1 | ✓ | | 2 | Cl or CS | ✓ | ✓ | | ≤ EI 90-U/C | | |
| Corner solutions | ≤ 110 x 6,3 | ✓ | | 1 | Cl or CS | | | ✓ | ≤ EI 90-U/U | | |

| PE / PE-HD / ABS / SAN+PVC pipes | Seal size Ø x s [mm] | Multicollar <i>Slim</i> | | Assembly side(s) | Insulation config. / L [mm] | Construction | | | Classification minutes | | |
|-------------------------------------|-------------------------|-------------------------|------|---------------------|--------------------------------|--------------|--------|-------------|---------------------------|--|--------------|
| | | Single | Dual | | | FW-100 | RW-100 | MV-150 | | | |
| Straight pipes | ≤ 110 x 2,4 - 10,0 | ✓ | | 2 | Cl 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 | Cl 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 | Cl or CS | | | ✓ | ≤ EI 90-U/U | | |
| Corner solutions | ≤ 110 x 6,6 | ✓ | | 1 | Cl or CS | | | ✓ | ≤ EI 120-U/U | | |
| Coupling elements | ≤ 110 x 4,3 | ✓ | | 1 | Cl or CS | | | | ≤ EI 90-U/C | | |
| | ≤ 125 x 7,4 | | | | | | | | ≤ EI 60-U/C | | |

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

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 <i>Slim</i> | | Assembly side(s) | Insulation config. / L [mm] | Construction | | | Classification minutes |
|---------------------|-------------------------|-------------------------|------|---------------------|--------------------------------|--------------|--------|--------|---------------------------|
| | | Single | Dual | | | FW-100 | RW-100 | MV-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 <i>Slim</i> | | Assembly side(s) | Insulation config. / L [mm] | Construction | | | Classification minutes |
|--|-------------------------|-------------------------|------|---------------------|--------------------------------|--------------|--------|--------|---------------------------|
| | | Single | Dual | | | FW-100 | RW-100 | MV-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 <i>Slim</i> | | Assembly side(s) | Insulation config. / L [mm] | Construction | | | Classification minutes |
|----------------------------------|-------------------------|-------------------------|------|---------------------|--------------------------------|--------------|--------|--------|---------------------------|
| | | Single | Dual | | | FW-100 | RW-100 | MV-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 <i>Slim</i> | | Assembly side(s) | Insulation config. / L [mm] | Construction | | | Classification minutes |
|----------------------------------|-------------------------|-------------------------|------|---------------------|--------------------------------|--------------|--------|--------|---------------------------|
| | | Single | Dual | | | FW-100 | RW-100 | MV-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/C |
| | ≤ 50 x 3,0 - 4,0 | | ✓ | 1 | LS, LI - 300 or CI, CS | | | ✓ | ≤ EI 90-U/C |

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 Climatic 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

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

EN 1366-3

| Multilayer pipe ⁽²⁾ | Seal size Ø x s [mm] | Multicollar <i>Slim</i> | | Assembly side(s) | Insulation config. / L [mm] | Construction | | | Classification minutes |
|--------------------------------|-------------------------|-------------------------|------|---------------------|--------------------------------|--------------|--------|--------|---------------------------|
| | | Single | Dual | | | FW-100 | RW-100 | MV-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

EN 1366-3

| Multilayer pipe ⁽²⁾ | Seal size Ø x s [mm] | Multicollar <i>Slim</i> | | Assembly side(s) | Insulation config. / L [mm] | Construction | | | Classification minutes |
|--------------------------------|-------------------------|-------------------------|------|---------------------|--------------------------------|--------------|--------|--------|---------------------------|
| | | Single | Dual | | | FW-100 | RW-100 | MV-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 <i>Slim</i> | | Assembly side(s) | Insulation config. / L [mm] | Construction | | | Classification minutes |
|-----------------------|-------------------------|-------------------------|------|---------------------|--------------------------------|--------------|--------|--------|---------------------------|
| | | Single | Dual | | | FW-100 | RW-100 | MV-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 | ✓ | | 2 | 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 <i>Slim</i> | | Assembly side(s) | Insulation config. / L [mm] | Construction | | | Classification minutes |
|-------------------------------------|-------------------------|-------------------------|------|---------------------|--------------------------------|--------------|--------|--------|---------------------------|
| | | Single | Dual | | | FW-100 | RW-100 | MV-150 | |
| PE-HD, PE, ABS, SAN+PVC | ≤ 90 x 2,8 | ✓ | | 2 | LS, LI - 300 or CI, CS | ✓ | ✓ | | ≤ EI 60-U/C |
| Multilayer pipe ^(z) | ≤ 50 x 4,0 | | | | | | | | |
| Fibre composite pipe ⁽¹⁾ | ≤ 50 x 6,9 | | | | | | | | |
| Electric cables | ≤ 12,5 | | | | | | | | |

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 Climatic PP-RCT EN Bänninger Watertec PP-RCT

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

LSW-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

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 <i>Slim</i> | | Assembly side(s) | Insulation config. / L [mm] | Construction | | | Classification minutes |
|----------------|-------------------------|-------------------------|------|---------------------|--------------------------------|--------------|--------|--------|---------------------------|
| | | Single | Dual | | | FW-100 | RW-100 | MV-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 | Seal size Ø x s [mm] | Multicollar <i>Slim</i> | | Assembly side(s) | Insulation config. / L [mm] | Construction | | | Classification minutes |
|-----------------------|-------------------------|-------------------------|------|---------------------|--------------------------------|--------------|--------|--------|---------------------------|
| | | Single | Dual | | | FW-100 | RW-100 | MV-150 | |
| Straight pipes | ≤ 54 x 1,5 - 14,2 | ✓ | | 2 | LS - 500 or CS | ✓ | ✓ | | ≤ EI 90-C/U |
| | ≤ 168,3 x 1,5 - 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 <i>Slim</i> | | Assembly side(s) | Insulation config. / L [mm] | Construction | | | Classification minutes |
|-----------------|-------------------------|-------------------------|------|---------------------|--------------------------------|--------------|--------|--------|---------------------------|
| | | Single | Dual | | | FW-100 | RW-100 | MV-150 | |
| Cast iron pipes | ≤ 54 x 1,5 - 14,2 | ✓ | | 2 | LS - 500 or CS | ✓ | ✓ | | ≤ EI 90-C/U |
| | ≤ 168,3 x 1,5 - 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 <i>Slim</i> | | Assembly side(s) | Insulation config. / L [mm] | Construction | | | Classification minutes |
|----------------|-------------------------|-------------------------|------|---------------------|--------------------------------|--------------|--------|--------|---------------------------|
| | | Single | Dual | | | FW-100 | RW-100 | MV-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 | Seal size Ø x s [mm] | Multicollar <i>Slim</i> | | Assembly side(s) | Insulation config. / L [mm] | Construction | | | Classification minutes |
|-----------------------|-------------------------|-------------------------|------|---------------------|--------------------------------|--------------|--------|--------|---------------------------|
| | | Single | Dual | | | FW-100 | RW-100 | MV-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 | | | | LS - 500 or CS | | | | |
| | ≤ 219,1 x 1,5 - 14,2 | | | | | | | | |

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

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 <i>Slim</i> | | Assembly side(s) | Insulation config. / L [mm] | Construction | | | Classification minutes |
|-----------------|-------------------------|-------------------------|------|---------------------|--------------------------------|--------------|--------|--------|---------------------------|
| | | Single | Dual | | | FW-100 | RW-100 | MV-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 | | | | LS - 500 or CS | | | | |
| | ≤ 219,1 x 1,5 - 14,2 | | | | | | | | |

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 <i>Slim</i> | | Assembly side(s) | Insulation config. / L [mm] | Construction | | | Classification minutes |
|----------------|-------------------------|-------------------------|------|---------------------|--------------------------------|--------------|--------|--------|---------------------------|
| | | Single | Dual | | | FW-100 | RW-100 | MV-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 <i>Slim</i> | | Assembly side(s) | Insulation config. / L [mm] | Construction | | | Classification minutes |
|-----------------------|-------------------------|-------------------------|------|---------------------|--------------------------------|--------------|--------|--------|---------------------------|
| | | Single | Dual | | | FW-100 | RW-100 | MV-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 <i>Slim</i> | | Assembly side(s) | Insulation config. / L [mm] | Construction | | | Classification minutes |
|-----------------|-------------------------|-------------------------|------|---------------------|--------------------------------|--------------|--------|--------|---------------------------|
| | | Single | Dual | | | FW-100 | RW-100 | MV-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 <i>Slim</i> | | Assembly side(s) | Insulation config. / L [mm] | Construction | | | Classification minutes |
|-----------------------------------|-------------------------|-------------------------|------|---------------------|--------------------------------|--------------|--------|--------|---------------------------|
| | | Single | Dual | | | FW-100 | RW-100 | MV-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

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 <i>Slim</i> | | Assembly side(s) | Insulation config. / L [mm] | Construction | | | Classification minutes |
|-----------------------|-------------------------|-------------------------|------|---------------------|--------------------------------|--------------|--------|--------|---------------------------|
| | | Single | Dual | | | FW-100 | RW-100 | MV-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 <i>Slim</i> | | Assembly side(s) | Insulation config. / L [mm] | Construction | | | Classification minutes |
|-----------------|-------------------------|-------------------------|------|---------------------|--------------------------------|--------------|--------|--------|---------------------------|
| | | Single | Dual | | | FW-100 | RW-100 | MV-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 <i>Slim</i> | | Assembly side(s) | Insulation config. / L [mm] | Construction | | | Classification minutes |
|-----------------------------------|-------------------------|-------------------------|------|---------------------|--------------------------------|--------------|--------|--------|---------------------------|
| | | Single | Dual | | | FW-100 | RW-100 | MV-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

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.



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).



7. Spacing

Figure 1

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

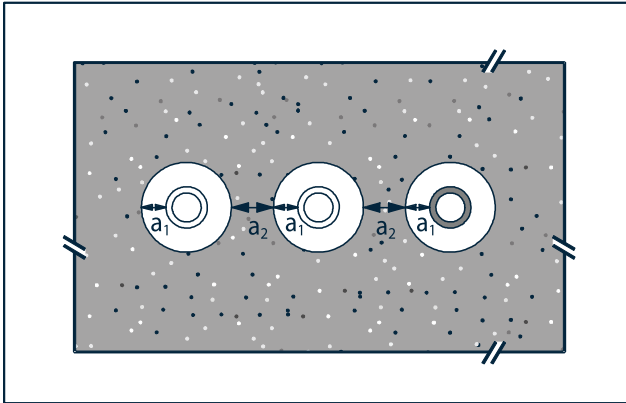


Figure 2

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

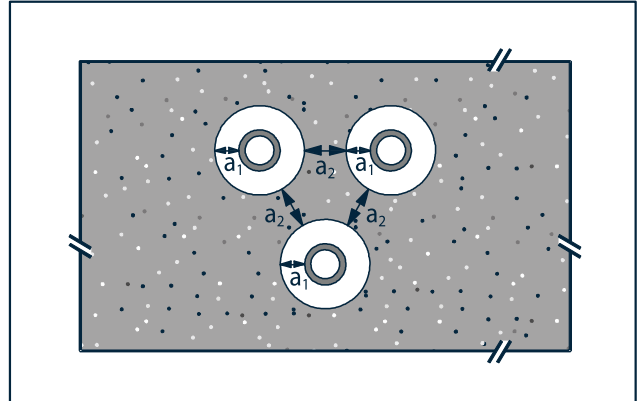


Figure 3

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

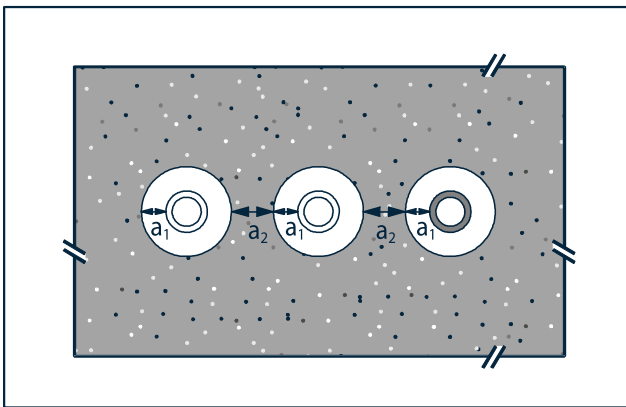


Figure 4

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

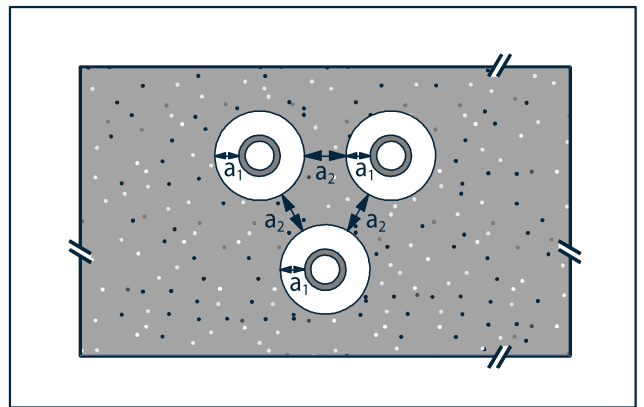


Figure 5

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

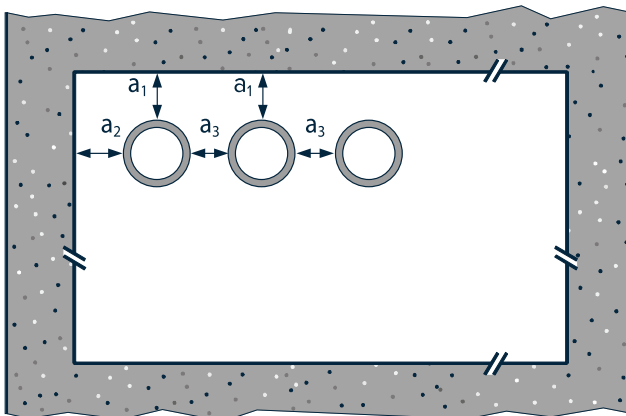
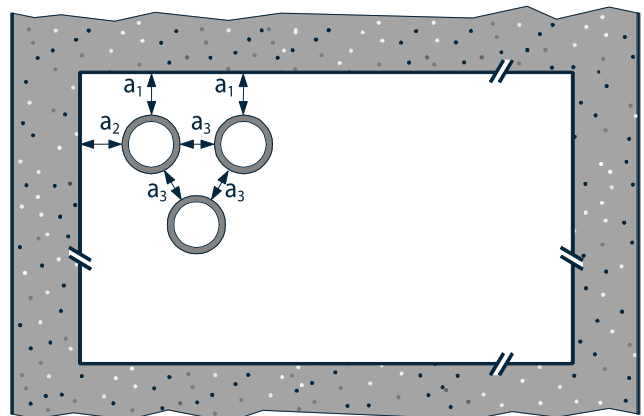


Figure 6

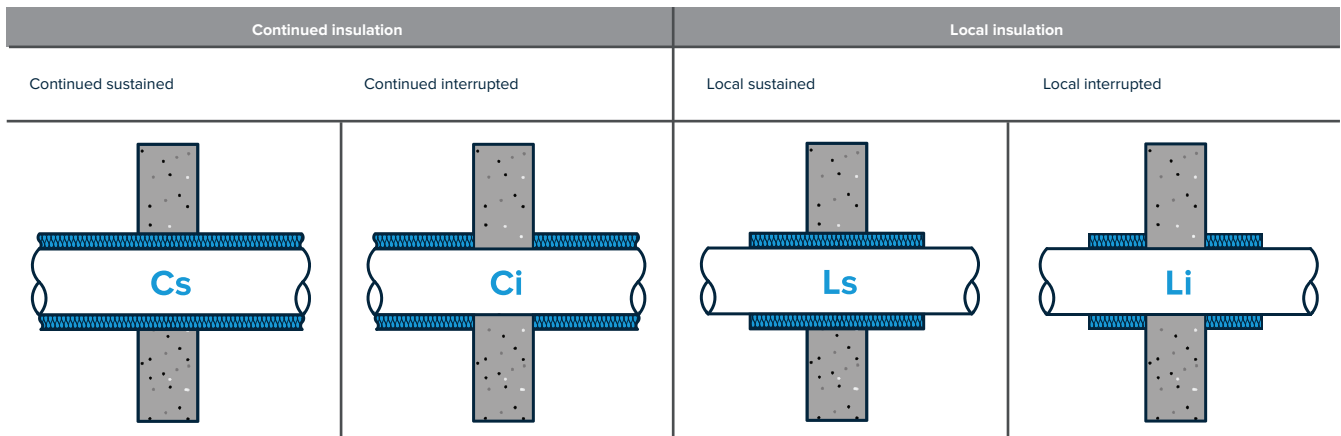
A1: Distance between penetration and top of the seal ≥ 100 mm
A2: Distance between penetration and side of the seal ≥ 100 mm
A3: Spacing ≥ 100 mm



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:



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 17/0836

| Insulation type | Pipe types | Permitted ⁽¹⁾ |
|---|--|--|
| Acoustic insulation <i>Fire class B-s1, d0 in accordance with EN 13501-1</i> | <ul style="list-style-type: none"> ✓ PE / PE-HD / ABS / SAN+PVC pipes ✓ PP pipes ✓ PVC pipes | <ul style="list-style-type: none"> ✓ ABSound Sonocool Type PM ✓ Merfisol Silver Aluminium ✓ Jaco Massa Reinforced Aluminium ✓ Jaco Massa Black Aluminium ✓ Jaco Massa Aluminium |
| Decoupling acoustic insulation <i>Fire class E, conform EN 13501-1</i> | <ul style="list-style-type: none"> ✓ PE / PE-HD / ABS / SAN+PVC pipes ✓ PP pipes ✓ PVC pipes ✓ Fibre composite pipes ✓ Low noise pipes ✓ Multilayer pipes | <ul style="list-style-type: none"> ✓ ThermaCompact TF |
| Elastomeric insulation <i>Fire class BL-s3, d0 of B-s3, d0, in accordance with EN 13501-1</i> | <ul style="list-style-type: none"> ✓ PVC pipes ✓ Fibre composite pipes ✓ Multilayer pipes ✓ Steel pipes (stainless steel) ✓ Copper pipes ✓ Cast iron pipes | <ul style="list-style-type: none"> ✓ 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 <i>Fire class E in accordance with EN 13501-1</i> | <ul style="list-style-type: none"> ✓ Steel pipes (stainless steel) ✓ Copper pipes ✓ Cast iron pipes | <ul style="list-style-type: none"> ✓ 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 <i>Fire class CL-s1-d0, i.a.w. EN 13501-1</i> | <ul style="list-style-type: none"> ✓ Multilayer pipes ✓ Air-conditioning pipes (copper) | <ul style="list-style-type: none"> ✓ PE-Foam o.g. |

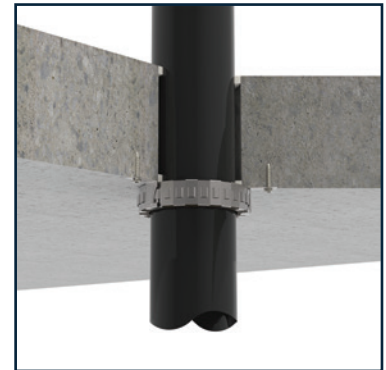
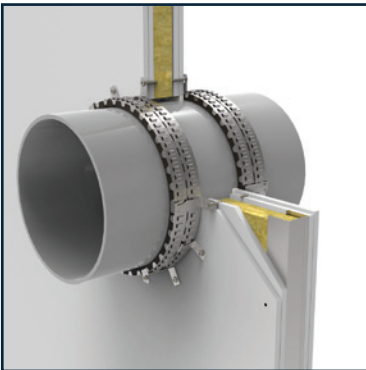
⁽¹⁾ Insulation materials must have at least the same fire class as tested in accordance with EN 13501-1.

9. Consumption Tables

Consumption 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

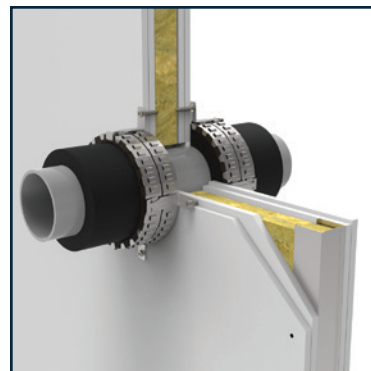
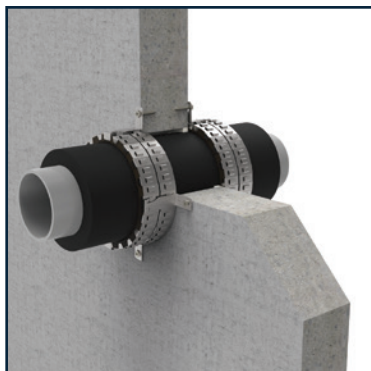


Plastic pipes, Insulated

| 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 | | | |

Consumption 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) | 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 |

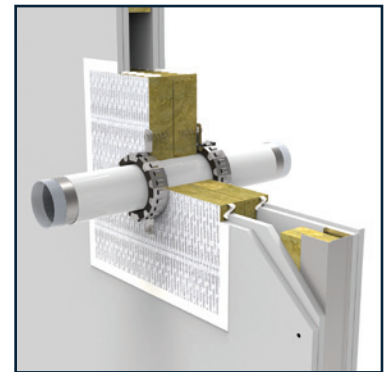
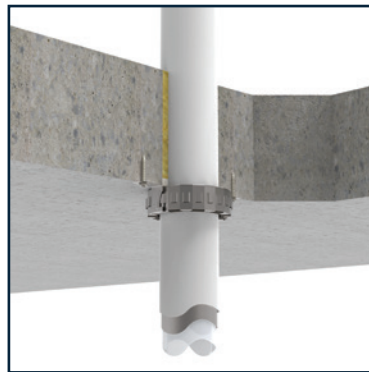


Multilayer Pipes, Uninsulated

| 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 | |
| Rock wool coated batts | ≥ 2 x 50 | Straight pipes | Ø 75 | |

Consumption 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 |

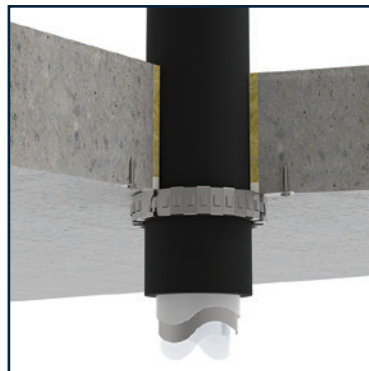
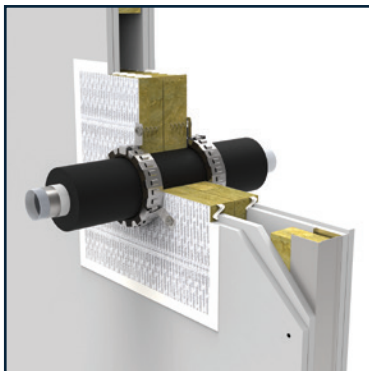


Multilayer Pipes, Insulated

| 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 | |
| Rock wool coated batts | ≥ 2 x 50 | Straight pipes | Ø 32 (2x) | |

Consumption 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) | 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 |

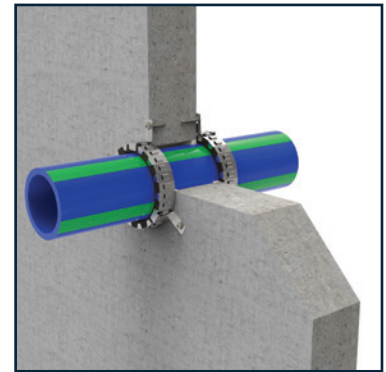
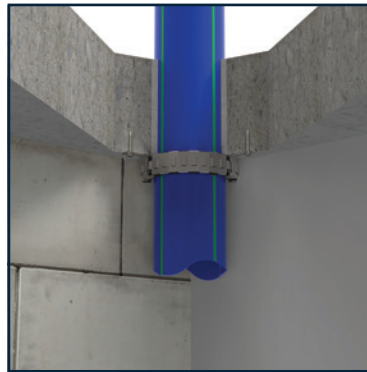


Fibre Composite Pipes, Uninsulated

| 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 | |
| Rock wool coated batts | ≥ 2 x 50 | Straight pipes | Ø 110 | |

Consumption 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 |

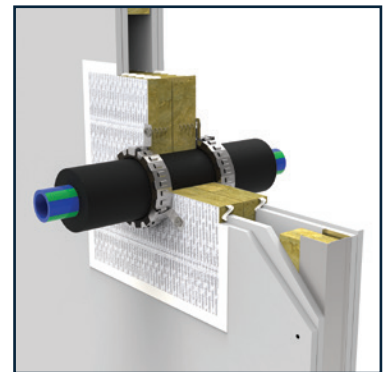
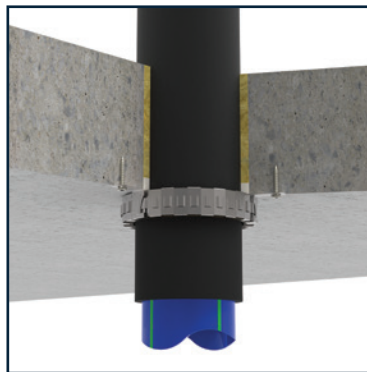
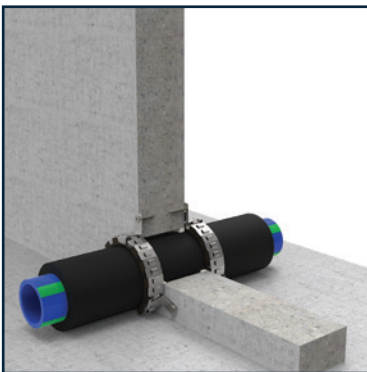


Fibre Composite pipes, Insulated

| 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 | |
| Rock wool coated batts | ≥ 2 x 50 | Straight pipes | Ø 110 | |

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

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



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) Elastomer (9 - 32 mm) |
| Rigid floors | ≥ 150 | Straight pipes | Ø 168,3 | |
| Rock wool coated batts | ≥ 2 x 50 | Straight pipes | Ø 114,3 | |

Consumption 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) | inch | Outer Ø (mm) | Segments (pc) | Outer Ø (mm) | Segments (pc) | Outer Ø (mm) | Segments (pc) | Outer Ø (mm) | Segments (pc) |
| 10,2 | 1/8" | 28,2 | 15 | 36,2 | 15 | 48,2 | 18 | 62,2 | 21 |
| 13,5 | 1/4" | 31,5 | 15 | 39,5 | 16 | 51,5 | 18 | 65,5 | 21 |
| 17,2 | 3/8" | 35,2 | 15 | 43,2 | 17 | 55,2 | 19 | 69,2 | 22 |
| 21,3 | 1/2" | 39,3 | 16 | 47,3 | 17 | 59,3 | 20 | 73,3 | 23 |
| 26,9 | 3/4" | 44,9 | 17 | 52,9 | 19 | 64,9 | 21 | 78,9 | 24 |
| 33,7 | 1" | 51,7 | 18 | 59,7 | 20 | 71,7 | 23 | 85,7 | 25 |
| 42,4 | 1 1/4" | 60,4 | 20 | 68,4 | 22 | 80,4 | 24 | 94,4 | 27 |
| 48,3 | 1 1/2" | 66,3 | 21 | 74,3 | 23 | 86,3 | 26 | 100,3 | 29 |
| 60,3 | 2" | 78,3 | 24 | 86,3 | 26 | 98,3 | 28 | 112,3 | 31 |
| 76,1 | 2 1/2" | 94,1 | 27 | 102,1 | 29 | 114,1 | 31 | 128,1 | 33 |
| 88,9 | 3" | 106,9 | 30 | 114,9 | 32 | 126,9 | 33 | 140,9 | 36 |
| 114,3 | 4" | 132,3 | 34 | 140,3 | 36 | 152,3 | 38 | 166,3 | 41 |
| 139,7 | 5" | 157,7 | 39 | 165,7 | 41 | 177,7 | 44 | 191,7 | 46 |
| 168,3 | 6" | 186,3 | 45 | 194,3 | 47 | 206,3 | 49 | 220,3 | 52 |
| 219,1 | 8" | 237,1 | 56 | 245,1 | 58 | 257,1 | 60 | 271,1 | 63 |

Consumption 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) | inch | Outer Ø (mm) | Segments (pc) | Outer Ø (mm) | Segments (pc) | Outer Ø (mm) | Segments (pc) | Outer Ø (mm) | Segments (pc) |
| 10,2 | 1/8" | 60,2 | 19 | 70,2 | 21 | 80,2 | 23 | 150,2 | 38 |
| 13,5 | 1/4" | 63,5 | 20 | 73,5 | 22 | 83,5 | 24 | 153,5 | 38 |
| 17,2 | 3/8" | 67,2 | 20 | 77,2 | 22 | 87,2 | 25 | 157,2 | 39 |
| 21,3 | 1/2" | 71,3 | 21 | 81,3 | 23 | 91,3 | 25 | 161,3 | 40 |
| 26,9 | 3/4" | 76,9 | 22 | 86,9 | 24 | 96,9 | 27 | 166,9 | 41 |
| 33,7 | 1" | 83,7 | 24 | 93,7 | 26 | 103,7 | 28 | 173,7 | 43 |
| 42,4 | 1 1/4" | 92,4 | 26 | 102,4 | 28 | 112,4 | 30 | 182,4 | 44 |
| 48,3 | 1 1/2" | 98,3 | 27 | 108,3 | 29 | 118,3 | 31 | 188,3 | 46 |
| 60,3 | 2" | 110,3 | 29 | 120,3 | 31 | 130,3 | 34 | 200,3 | 48 |
| 76,1 | 2 1/2" | 126,1 | 33 | 136,1 | 35 | 146,1 | 37 | 216,1 | 52 |
| 88,9 | 3" | 138,9 | 35 | 148,9 | 37 | 158,9 | 40 | 228,9 | 54 |
| 114,3 | 4" | 164,3 | 41 | 174,3 | 43 | 184,3 | 45 | 254,3 | 60 |
| 139,7 | 5" | 189,7 | 46 | 199,7 | 48 | 209,7 | 50 | 279,7 | 65 |
| 168,3 | 6" | 218,3 | 52 | 228,3 | 54 | 238,3 | 56 | 308,3 | 71 |
| 219,1 | 8" | 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) |

Consumption 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) | Segments (pc) | Outer Ø (mm) | Segments (pc) | Outer Ø (mm) | Segments (pc) | Outer Ø (mm) | Segments (pc) |
| 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 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) | Segments (pc) | Outer Ø (mm) | Segments (pc) | Outer Ø (mm) | Segments (pc) | Outer Ø (mm) | Segments (pc) |
| 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 Ø130 mm | | | |
|---|----------------|----------------------|-------------------------|
| Construction | Thickness [mm] | Classification [min] | Multicollar <i>Slim</i> |
| Rigid shaft wall | ≥ 70 | E90-U/C | Double |
| Flexible shaft wall | ≥ 100 | | |
| Rigid floor | ≥ 150 | | |

| Flue Gas Pipe - PP up to Ø125 mm | | | |
|----------------------------------|----------------|----------------------|-------------------------|
| Construction | Thickness [mm] | Classification [min] | Multicollar <i>Slim</i> |
| Rigid shaft wall | ≥ 70 | EI60-U/U | Double |
| Flexible shaft wall | ≥ 100 | EI90-U/C | Single |
| Rigid floor | ≥ 150 | | |

| Concentric - PP/PP - up to Ø125 mm | | | |
|------------------------------------|----------------|----------------------|-------------------------|
| Construction | Thickness [mm] | Classification [min] | Multicollar <i>Slim</i> |
| Rigid shaft wall | ≥ 70 | EI60-U/U | Double |
| Flexible shaft wall | ≥ 100 | EI90-U/C | Single |
| Rigid floor | ≥ 150 | | |

| Concentric- Steel/PP - t/m Ø200 mm | | | |
|------------------------------------|----------------|----------------------|-------------------------|
| Construction | Thickness [mm] | Classification [min] | Multicollar <i>Slim</i> |
| Rigid shaft wall | ≥ 70 | E90-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.

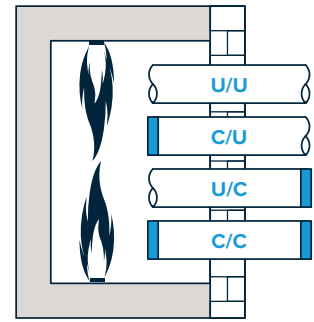


Table 1 - Test configuration plastic pipes

| 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 |

^aconfirmed 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 steel or wooden posts* 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 650 kg/m³. 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 650 kg/m³. 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 wooden post and the gap between the conduit seal and the post must be capped. The cavity between the conduit seal and the post 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

- ✓ Product Data Sheet (PDS)
- ✓ Technical Data Sheet (TDS)
- ✓ Safety Data Sheet (SDS)
- ✓ Installation Manual
- ✓ EC 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 17/0836
- ✓ Declaration of Performance (DoP)

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



For help in finding the right fire-retardant 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).



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