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Designated according to Article 29 of Regulation (EU) No 305/2011

Member of EOTA
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# European Technical Assessment ETA 24/0670 of 26/08/2024

## I General Part

| | |
|---|---|
| **Technical Assessment Body issuing the ETA and designated according to Article 29 of the Regulation (EU) No 305/2011:** | **Eurofins Expert Services Oy** |
| **Trade name of the construction product** | **Sewatek Fire Collars**<br>**Sewatek Special Fire Collars**<br>**Sewatek Multi Penetration**<br>**Sewatek Fire Wrap** |
| **Product family to which the construction product belongs** | **Fire stopping and Fire Sealing Products** |
| **Manufacturer** | **Sewatek Oy Sepäntie 4**<br>**FI-07230 Askola Finland** |
| **Manufacturing plant** | **Sewatek Oy Sepäntie 4**<br>**FI-07230 Askola Finland** |
| **This European Technical Assessment contains** | **40 pages including 3 Annex which form an integral part of this assessment** |
| **This European Technical Assessment is issued in accordance with regulation (EU) No 305/2011, on the basis of** | **European Assessment Document**<br>**EAD 350454-00-1104, edition September 2017** |

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**II Specific Part**

# 1 Technical description of the products

## 1.1 Sewatek Fire Collars

Fire collars are fire stopping steel collars with intumescent band inside.

## 1.2 Sewatek Special Fire Collars

Special fire collars are fire stopping steel collars with intumescent band inside. The products are used when changing materials of pipes from metal to plastic.

## 1.3 Sewatek Multi Penetrations

Multi penetrations are fire penetration seals with plastic cover, intumescent band inside the cover and seals.

## 1.4 Sewatek Fire Wrap

Wraps are fire stopping products with intumescent band packed in plastic cover.

## 1.5 Installation

Products can be mounted as a single unit or as a group. Penetrations are classified as a group of penetration seals (clusters) or a single penetration seal. Fire resistance class of a cluster is allowed to extend to an equivalent single penetration seal but not vice versa. Minimum distances between penetration devices are given in Annex 1.

# 2 Specification of the intended uses in accordance with the applicable European Assessment Document, EAD

## 2.1 Intended uses

The Penetration seals is intended to be used temporarily or permanent reinstate the fire resistance performance of rigid concrete wall or roof/floor constructions or CLT/LVL (Cross laminated timber/Laminated veneer lumber) wall/floor or flexible walls which are provided with apertures which are penetrated by various cables or metallic or plastic pipes. The minimum thickness for unprotected CLT/LVL wooden construction is 100 mm. The thickness of the wood can be lower if the wood construction has a non-flammable surface (e.g. gypsum) and the thickness of the construction is at least 100 mm.

Penetrations can be mounted either into

- min 95 mm, 100 mm or 150 mm thick low density rigid wall (650 ± 200 kg/m$^3$)
- min 95 mm thick standardized flexible wall
- min 150 mm, 200 mm or 240 mm thick high-density rigid floor (≥ 850 kg/m$^3$)
- min 100 mm thick CLT/LVL wall or floor (density min. 450 kg/m$^3$).

The provisions made in this European Technical Assessment are based on an assumed intended working life of 25 years provided that the product is subjected to appropriate use and maintenance[1].

## 2.2 Use category

The penetration seal is intended for internal use also at temperatures below 0 °C and can therefore according to EAD 350454-00-1104 clause 1.2 be categorize as Type Y2. The product also meets requirements of types Z1 and Z2.

This European Technical Assessment is based on the assumption that all plans needed have been made correctly according to the regulations valid on the building site.

## 2.3 Execution of construction works

It is the responsibility of the manufacturer to ensure that proper information for the use of the Sewatek penetration seal is enclosed to each delivery, including general guidance on the basis of this ETA and the specific installation instructions and construction details. With regard to the assumed working life regular maintenance is necessary. The manufacturer shall provide with written documents which contain descriptions about type and frequency of the maintenance.

The completed building (the works) shall comply with the building regulations (regulations on the works) applicable in the Member States in which the building is to be constructed. The procedures foreseen in the Member State for demonstrating compliance with the building regulations shall also be followed by the entity held responsible for this act. An ETA for Sewatek penetration seal does not amend this process in any way.

[1] *This means that it is expected that when this working life has elapsed, the real working life may be, in normal use conditions, considerably longer without major degradation affecting the essential requirements of the works. The indications given as to the working life of Sewatek penetration system cannot be interpreted as a guarantee given by the producer or the assessment body. They should only be regarded as a means for the specifiers to choose the appropriate criteria for penetration seals in relation to the expected, economically reasonable working life of the works.*

# 3 Performance of the product and references to the methods used for its assessment

Table 1. Basic requirements for construction works and essential characteristics

| Basic requirement and essential characteristics | Performance |
|---|---|
| BWR 1. Mechanical resistance and stability | |
| Not relevant | |
| BWR 2. Safety in case of fire | |
| Reaction to fire of materials and components, EN 13501-1 | No performance assessed |
| Resistance to fire, EN 13501-2 | EI 30 – EI 120 (Annex 1) |
| BWR 3. Hygiene, health and the environment | |
| Air permeability | No performance assessed |
| Water permeability | No performance assessed |
| Content, emission and/or release of dangerous substances | No performance assessed |
| BWR 4. Safety and accessibility in use | |
| Mechanical resistance and stability | No performance assessed |
| Resistance to impact / movement | No performance assessed |
| Adhesion | No performance assessed |
| Durability | Clause 3.4.1 |
| BWR 5. Protection against noise | |
| Airborne sound insulation | Multi: Clause 3.3.1.<br>Other products: No performance assessed |
| BWR 6. Energy economy and heat retention | No performance assessed |
| Thermal properties | No performance assessed |
| Water vapour permeability | No performance assessed |
| General aspects | |
| Aspects of durability | Clause 3.4.1 |

## 3.1 Safety in case of fire, BWR 2

### 3.1.1 Reaction to fire

The reaction to fire has not been assessed.

### 3.1.2 Resistance to fire

For floors and walls, classification with regard to resistance to fire is based on full scale testing as specified in EN 13501-2. Fire resistance classes are presented in Annex 1.

## 3.2 Hygiene, health and environment, BWR 3

### 3.2.1 Dangerous substances

In addition to the specific clauses relating to dangerous substances contained in this European Technical Assessment, there may be other requirements applicable to the products falling within its scope (e.g.

transposed European legislation and national laws, regulations and administrative provisions). In order to meet the provisions of the EU Construction Products Directive, these requirements need also to be complied with, when and where they apply.

### 3.3 Protection against noise, BWR 5

#### 3.3.1 Airborne sound insulation of walls and floors

Multi Penetration: Influence of single penetration seal on $R_W$ highest is 0-2 dB, when concrete thickness ≥ 200 mm.

- R: EN ISO 10140-1:2016, EN ISO 10140-2:2010
- $R_W$: EN ISO 717-1:2013

### 3.4 General aspects

#### 3.4.1 Aspects of durability

Durability has been assessed according to document EOTA TR 24 Clause 4.2.5.
According to EAD 350454-00-1104 clause 1.2 penetration seal is categorized as Type Y2.

#### 3.4.2 Identification

The components and materials are identified as being of a generic type or giving a brand name, as described in Annex 1 and specified in the manufacturer's Contents of delivery list. The component under a given brand name may be changed by the manufacturer to another with corresponding performance.

## 4 Assessment and verification of constancy of performance (hereinafter AVCP) system applied, with reference to its legal base

EC Decision for AVCP is System 1. 1999/0454/EC

## 5 Technical details necessary for the implementation of the AVCP system, as provided for in the applicable EAD.

Technical details necessary for the implementation of the AVCP system are laid down in the control plan deposited at Eurofins Expert Services Oy.

Espoo on August 26, 2024
by Eurofins Expert Services Oy

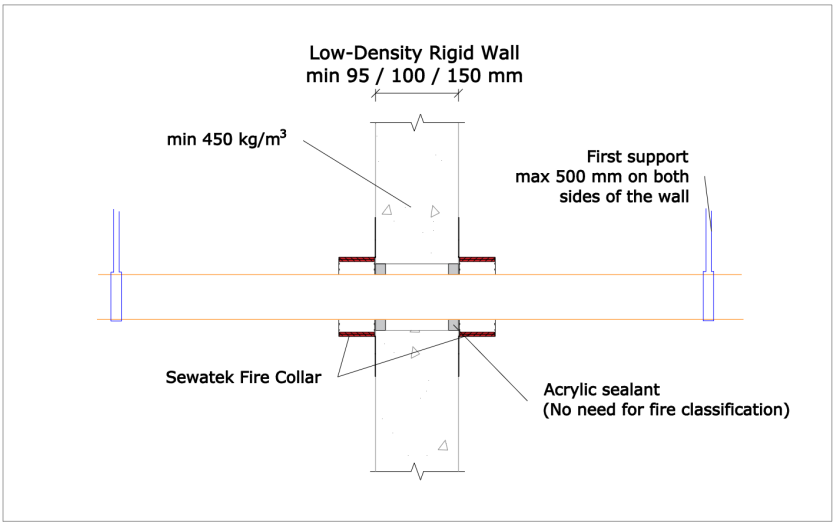
Katja Vahtikari
Manager, Construction Certification

Heli Välimäki
Senior Expert

## Annex 1 - Products

## Low-Density Rigid Wall

# 1a - Sewatek Fire Collars




*(Casting or drill hole)*

| Fire Collar | $a_1$ (mm) |
|---|---|
| **C 16-32** | 5 |
| **C 25-50** | 5 |
| **C 50-80** | 7 |
| **C 75-110** | 7 |
| **C 110-130** | 7 |
| **C 125-160** | 12 |

Table 1a. Sewatek Fire Collars
mounted in **95 mm or 100 mm or 150 mm thick low-density rigid wall**

| **Insulation markings (See Annex 2)** | | **Markings (See Annex 3)** |
|---|---|---|
| LI – Local and Interrupted<br>CI – Continuous and Interrupted<br>CS – Continuous and Sustained<br>sw – Stone wool insulation<br>cr – Cellular rubber insulation | ***sw insulation thickness***<br>*- 20 mm (Pipes < 54 mm)*<br>*- 30 mm (Pipes ≥ 54 mm)* | $e_n$ – Pipe wall thickness<br>$a_1$ – Thickness of the pipe closure device<br>$a_2$ – Distance between pipe closure devices<br>When tested as a single,<br>$a_2$ – distance is 100 mm (”-” in the table) |

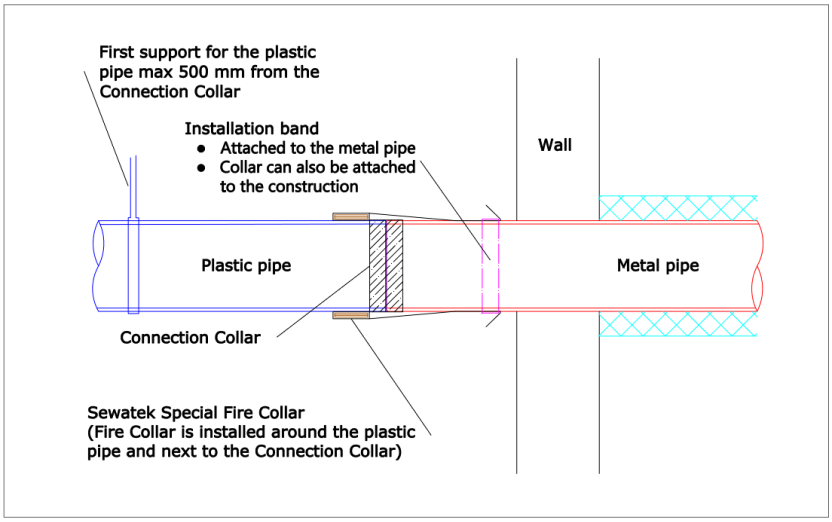
| Type of the pipe | Penetration seal | Insulation (thickness / length) | $a_2$ [mm] | Fire resistance class |
|---|---|---|---|---|
| **Composite pipes** | | | | |
| ***Mounted into/onto low-density rigid wall of 95 mm*** | | | | |
| Ø ≤ 75 mm, $e_n$ ≤ 8,0 mm | C 50-80 | CI (sw 30 mm / -) | - | EI 60 - U/C |
| ***Mounted into/onto low-density rigid wall of 100 mm*** | | | | |
| Ø ≤ 25 mm, $e_n$ ≤ 3,0 mm | C 16-32 | not required | 58 | EI 120 - U/C |
| Ø ≤ 40 mm, $e_n$ ≤ 4,0 mm | C 25-50 | not required | 50 | EI 90 - U/C |
| **Plastic PEX-pipes** | | | | |
| ***Mounted into/onto low-density rigid wall of 100 mm*** | | | | |
| PEX Ø ≤ 22/34 mm, $e_n$ ≤ 3,0 mm | C 25-50 | not required | 38 | EI 120 - U/C |
| PEX Ø ≤ 28/54 mm, $e_n$ ≤ 3,0/1,0 mm | C 50-80 | not required | 57 | EI 60 - U/C |
| PEX Ø ≤ 40 mm, $e_n$ ≤ 4,0 mm | C 25-50 | not required | 60 | EI 90 - U/C |
| PEX bundle Ø ≤ 45 mm<br>- singular PEX / cover pipe Ø ≤ 40 mm | C 25-50 | not required | 60 | EI 90 - U/C |

**ANNEX 1**

| Type of the pipe | Penetration seal | Insulation (thickness / length) | $a_2$ [mm] | Fire resistance class |
|---|---|---|---|---|
| **PP (EN 1451-1), PVC (EN 13476) and multilayer sewer pipes** | | | | |
| ***Mounted into/onto low-density rigid wall of 100 mm*** | | | | |
| PP Ø ≤ 110 mm, $e_n$ ≤ 6,5 mm | C 75-110 | not required | - | EI 60 - U/C |
| PP Ø ≤ 110 mm, $e_n$ ≤ 4,2 mm | C 75-110 | not required | 60 | EI 60 - U/C |
| PP Ø ≤ 110 mm, $e_n$ ≤ 8,0 (on muff 4,0 + 4,0 mm) | C 110-130 | not required | - | EI 90 - U/C |
| PVC Ø ≤ 110 mm, $e_n$ ≤ 3,4 mm | C 75-110 | not required | 30 | EI 90 - U/C |
| ***Mounted into/onto low-density rigid wall of 150 mm*** | | | | |
| Ø ≤ 160 mm, $e_n$ ≤ 6,5 mm<br>• **PP-pipes** (EN 1451-1)<br>• **Geberit**: Silent (dB20, Pro, PP)<br>• **Pipelife**: Master 3+<br>• **Polo-Kal**: NG/XS, 3S<br>• **Rehau**: Raupiano Plus<br>• **Uponor**: HTP, Decibel<br>• **Wavin**: AS+, SiTech+ | C 125-160 | not required | 30 | EI 90 - U/C |
| **Sewer pipes with lining** | | | | |
| ***Mounted into/onto low-density rigid wall of 95 mm*** | | | | |
| PVC Ø ≤ 110 mm, $e_n$ ≤ 3,4 mm + lining (Boldan, Brawoliner, Trelleborg) | C 75-110 | not required | 30 | EI 90 – U/C |
| PP Ø ≤ 110 mm, $e_n$ ≤ 3,4 mm + lining (Boldan, Brawoliner, Trelleborg) | C 75-110 | not required | 30 | EI 90 – U/C |
| **Cables** | | | | |
| ***Mounted into/onto low-density rigid wall of 100 mm*** | | | | |
| Cable conduit Ø ≤ 25,0 mm $e_n$ ≤ 1,5 mm,<br>- cable bundle Ø ≤ 22 mm<br>- singular cable Ø ≤ 13 mm | C 16-32 | not required | 58 | EI 120 |
| Cable conduit Ø ≤ 40,0 mm $e_n$ ≤ 1,5 mm<br>- cable bundle Ø ≤ 37 mm<br>- singular cable Ø ≤ 17 mm | C 25-50 | not required | 38 | EI 120 |
| Cable bundle Ø ≤ 66 mm<br>- singular cable Ø ≤ 25 mm | C 50-80 | not required | 30 | EI 90 |

## Low-Density Rigid Wall installations

# 1b - Sewatek Special Fire Collars




| Special Fire Collar | $a_1$ (mm) |
|---|---|
| **C 50x** | 7 |
| **C 75x** | 7 |
| **C 90x** | 7 |
| **C 110x** | 7 |
| **C 130x** | 7 |
| **C 160x** | 12 |

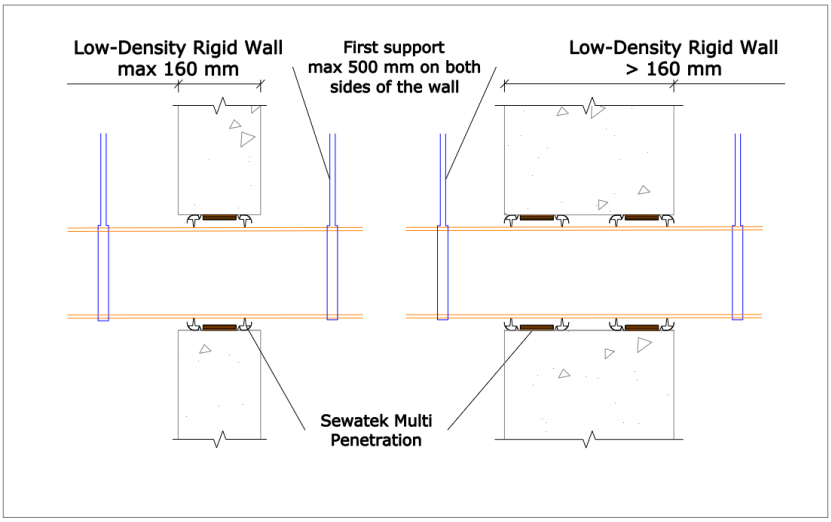
Table 1b. Sewatek Special Fire Collars
tested with **150 mm thick low-density rigid wall**

| **Insulation markings (See Annex 2)** | | **Markings (See Annex 3)** |
|---|---|---|
| LI – Local and Interrupted<br>CI – Continuous and Interrupted<br>CS – Continuous and Sustained<br>sw – Stone wool insulation<br>cr – Cellular rubber insulation | ***sw insulation thickness***<br>*- 20 mm (Pipes < 54 mm)*<br>*- 30 mm (Pipes ≥ 54 mm)* | $e_n$ – Pipe wall thickness<br>$a_1$ – Thickness of the pipe closure device<br>$a_2$ – Distance between pipe closure devices<br>When tested as a single,<br>$a_2$ – distance is 100 mm (”-” in the table) |

| Type of the pipe | Penetration seal | Insulation (thickness / length) | $a_2$ [mm] | Fire resistance class |
|---|---|---|---|---|
| **Sewer pipes, material changes to plastic** | | | | |
| ***Tested with low-density rigid wall of 150 mm*** | | | | |
| Ø ≤ GR 110 (DN100), $e_n$ ≤ 4,0 mm<br>Ø ≤ PP 110 (EN 1451-1), $e_n$ ≤ 3,8 mm | C 110x | GR: CI (sw 30 mm / -)<br>PP: not required | - | EI 90 - U/U |

## Low-Density Rigid Wall

# 1c - Sewatek Multi Penetration




*(Casting or drill hole)*

| Multi | Max penetrating pipe / bundle | $a_1$ (mm) |
|---|---|---|
| **D80** | 50 | 15 |
| **D105** | 75 | 15 |
| **D140** | 110 | 15 |

Table 1c. Sewatek Multi Penetration seals D80, D105, D140 mounted in **100 mm or 150 mm thick low density rigid wall**

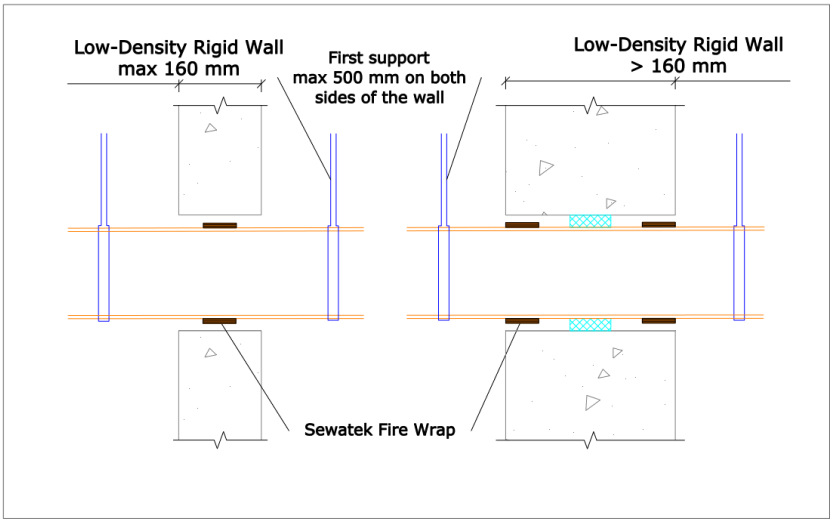
| **Insulation markings (See Annex 2)** | **Markings (See Annex 3)** |
|---|---|
| LI – Local and Interrupted<br>CI – Continuous and Interrupted<br>CS – Continuous and Sustained<br>sw – Stone wool insulation<br>cr – Cellular rubber insulation<br><br>***sw insulation thickness***<br>*- 20 mm (Pipes < 54 mm)*<br>*- 30 mm (Pipes ≥ 54 mm)* | $e_n$ – Pipe wall thickness<br>$a_1$ – Thickness of pipe closure device<br>$a_2$ – Distance between pipe closure devices<br>When tested as a single,<br>$a_2$ – distance is 100 mm (”-” in the table) |

| Type of the pipe | Insulation (thickness / length) | $a_2$ [mm] | Fire resistance class |
|---|---|---|---|
| **Steel and cast-iron pipes** | | | |
| ***Mounted into the low-density rigid wall of 100 mm*** | | | |
| Ø < 110 mm, $e_n$ ≤ 4,0 mm | CI (sw 30 mm / -) | - | EI 120 - U/C |
| **PP (Polypropylene) and multilayer sewer pipes** | | | |
| ***Mounted into the low-density rigid wall of 100 mm*** | | | |
| Ø ≤ 110, $e_n$ ≤ 6,5 mm<br>• **PP-pipes** (EN 1451-1)<br>• **Geberit**: Silent (dB20, Pro, PP)<br>• **Pipelife**: Master 3+<br>• **Polo-Kal**: NG/XS, 3S<br>• **Rehau**: Raupiano Plus<br>• **Uponor**: HTP, Decibel<br>• **Wavin**: AS+, SiTech+ | not required | - | EI 120 - U/C |
| Ø ≤ 110, $e_n$ ≤ 6,0 mm<br>• **PP-pipes** (EN 1451-1)<br>• **Geberit**: Silent (dB20, Pro, PP)<br>• **Pipelife**: Master 3+<br>• **Polo-Kal**: NG/XS, 3S<br>• **Rehau**: Raupiano Plus<br>• **Uponor**: HTP, Decibel<br>• **Wavin**: AS+, SiTech+ | not required | 30 | EI 60 U/C |

| | | | |
|---|---|---|---|
| ***Mounted into the low-density rigid wall of 150 mm*** | | | |
| Ø ≤ 110, $e_n$ ≤ 3,6 mm | not required | 60 | EI 120 - U/C |
| **PP and multilayer sewer pipes (mounted on muff OR / AND without plastic cover and gaskets)** | | | |
| ***Mounted into the low-density rigid wall of 100 mm*** | | | |
| Ø ≤ 110, $e_n$ ≤ 6,5 mm<br>• **PP-pipes** (EN 1451-1)<br>• **Geberit**: Silent (dB20, Pro, PP)<br>• **Pipelife**: Master 3+<br>• **Polo-Kal**: NG/XS, 3S<br>• **Rehau**: Raupiano Plus<br>• **Uponor**: HTP, Decibel<br>• **Wavin**: AS+, SiTech+ | not required | 30 | EI 90 - U/C |
| **Pex pipes** | | | |
| ***Mounted into the low-density rigid wall of 100 mm*** | | | |
| Pex bundle Ø ≤ 100 mm<br>- singular pipe Ø ≤ 40/54 mm, $e_n$ ≤ 2,5 - 4,2 mm | not required | - | EI 90 - U/C |
| **Cables** | | | |
| ***Mounted into the low-density rigid wall of 100 mm*** | | | |
| Cable conduit Ø ≤ 110 mm (plastic)<br>- cable bundle Ø ≤ 100 mm<br>- singular cable Ø ≤ 25 mm | not required | - | EI 60 |

## Low Density Rigid Wall

# 1d - Sewatek Fire Wrap




| Fire Wrap | $a_1$ (mm) |
|---|---|
| **W 50** | 7 |
| **W 75** | 7 |
| **W 110** | 7 |

*(Casting or drill hole)*

Table 1d. Sewatek Fire Wrap
mounted in **100 mm or 150 mm thick low density rigid wall**

| **Insulation markings (See Annex 2)** | | **Markings (See Annex 3)** |
|---|---|---|
| LI – Local and Interrupted<br>CI – Continuous and Interrupted<br>CS – Continuous and Sustained<br>sw – Stone wool insulation<br>cr – Cellular rubber insulation | ***sw insulation thickness***<br>*- 20 mm (Pipes < 54 mm)*<br>*- 30 mm (Pipes ≥ 54 mm)* | $e_n$ – Pipe wall thickness<br>$a_1$ – Thickness of the pipe closure device<br>$a_2$ – Distance between pipe closure devices<br>When tested as a single,<br>$a_2$ – distance is 100 mm (”-” in the table) |

*** Sewatek fire wrap on both sides of the wall*

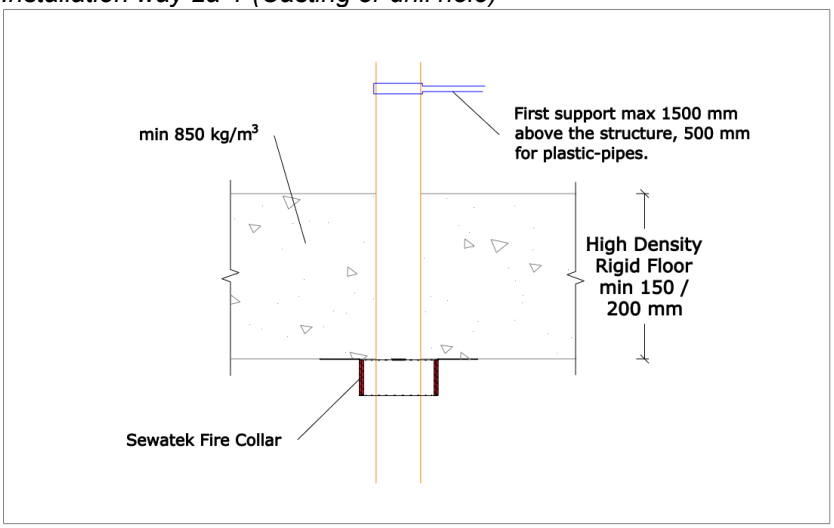
| Type of the pipe | Insulation (thickness / length) | $a_2$ [mm] | Fire resistance class |
|---|---|---|---|
| **Steel and cast-iron pipes** | | | |
| ***Mounted into the low-density rigid wall of 100 mm*** | | | |
| Ø < 110 mm, $e_n$ ≤ 4,0 mm | CI (sw 30 mm / -) | - | EI 120 - U/C |
| **PP (Polypropylene) and multilayer sewer pipes** | | | |
| ***Mounted into the low-density rigid wall of 100 mm*** | | | |
| Ø ≤ 110, $e_n$ ≤ 10,6 mm (on muff 5,3 + 5,3 mm) **<br>• **PP-pipes** (EN 1451-1)<br>• **Geberit**: Silent (dB20, Pro, PP)<br>• **Pipelife**: Master 3+<br>• **Polo-Kal**: NG/XS, 3S<br>• **Rehau**: Raupiano Plus<br>• **Uponor**: HTP, Decibel<br>• **Wavin**: AS+, SiTech+ | not required | - | EI 120 U/C |
| Ø ≤ 110, $e_n$ ≤ 6,5 mm<br>• **PP-pipes** (EN 1451-1)<br>• **Geberit**: Silent (dB20, Pro, PP)<br>• **Pipelife**: Master 3+<br>• **Polo-Kal**: NG/XS, 3S<br>• **Rehau**: Raupiano Plus<br>• **Uponor**: HTP, Decibel<br>• **Wavin**: AS+, SiTech+ | not required | 30 | EI 90 U/C |

| | | | |
|---|---|---|---|
| ***Mounted into the low-density rigid wall of 150 mm*** | | | |
| PP (EN 1451-1) Ø ≤ 110, $e_n$ ≤ 3,6 mm | not required | 60 | EI 120 - U/C |
| **Pex pipes** | | | |
| ***Mounted into the low-density rigid wall of 100 mm*** | | | |
| Pex bundle Ø ≤ 100 mm<br>- singular pipe Ø ≤ 40/54, $e_n$ ≤ 2,5 - 4,2 mm | not required | - | EI 90 - U/C |
| **Cables** | | | |
| ***Mounted into the low-density rigid wall of 100 mm*** | | | |
| Cable conduit Ø ≤ 110 mm (plastic)<br>- cable bundle Ø ≤ 100 mm<br>- singular cable Ø ≤ 25 mm | not required | - | EI 60 |

## High-Density Rigid Floor

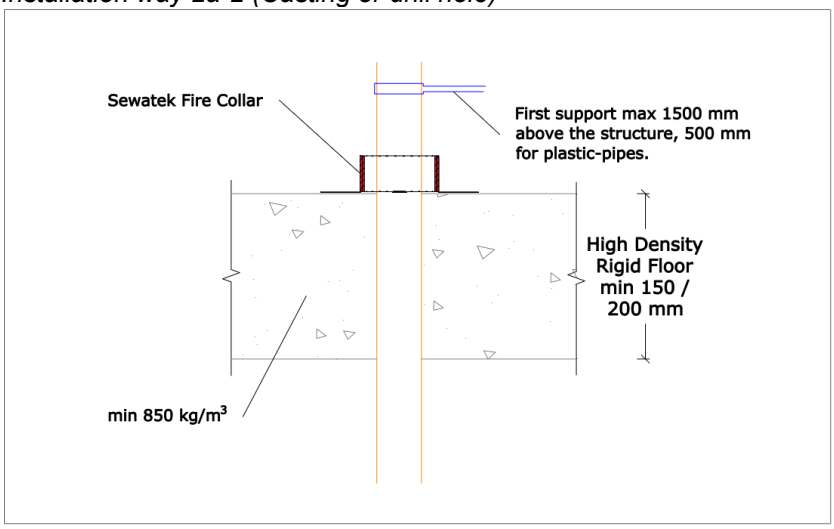
# 2a - Sewatek Fire Collars

*Installation way 2a-1 (Casting or drill hole)*




| Fire Collar | $a_1$ (mm) |
|---|---|
| **C 16-32** | 5 |
| **C 25-50** | 5 |
| **C 50-80** | 7 |
| **C 75-110** | 7 |
| **C 110-130** | 7 |
| **C 125-160** | 12 |

*Installation way 2a-2 (Casting or drill hole)*




*Installation way 2a-3 (Casting or drill hole)*

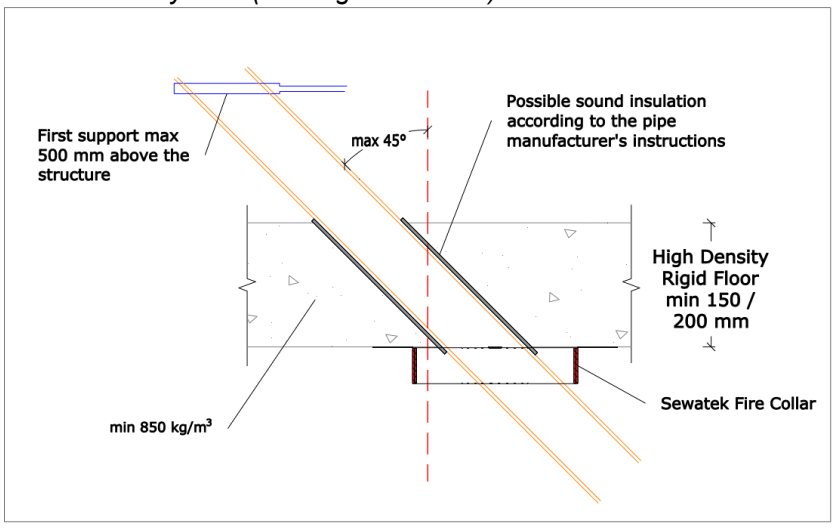


Table 2a. Sewatek Fire Collars
mounted in **150 mm or 200 mm thick high-density rigid floor**.

| **Insulation markings (See Annex 2)** | **Markings (See Annex 3)** |
|---|---|
| LI – Local and Interrupted<br>CI – Continuous and Interrupted<br>CS – Continuous and Sustained<br>sw – Stone wool insulation<br>cr – Cellular rubber insulation<br><br>***sw insulation thickness***<br>*- 20 mm (Pipes < 54 mm)*<br>*- 30 mm (Pipes ≥ 54 mm)* | $e_n$ – Pipe wall thickness<br>$a_1$ – Thickness of the pipe closure device<br>$a_2$ – Distance between pipe closure devices<br>When tested as a single,<br>$a_2$-distance is 100 mm (”-” in the table) |

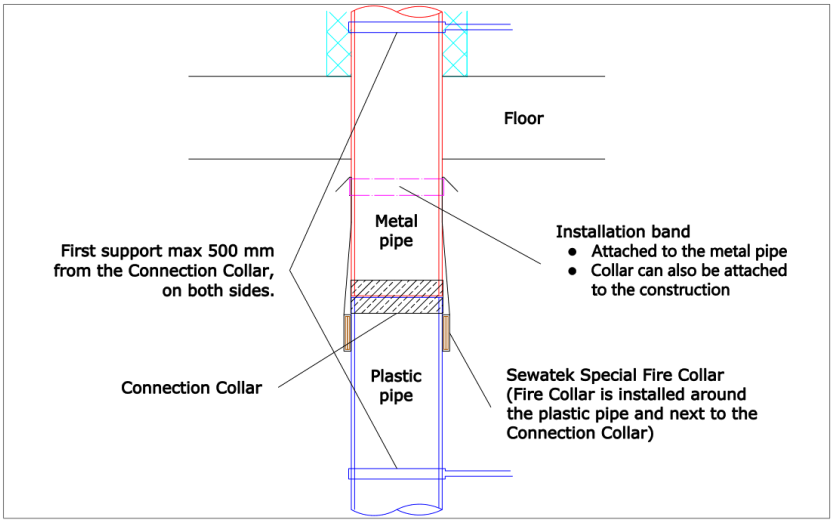
| Type of the pipe | Penetration seal | Insulation (thickness / length) | $a_2$ [mm] | Fire resistance class |
|---|---|---|---|---|
| ***Installation below the construction – (Installation way 2a-1)*** | | | | |
| **Composite pipes** | | | | |
| ***Mounted into/onto high-density rigid floor of 200 mm*** | | | | |
| Ø ≤ 16 mm, $e_n$ ≤ 2,5 mm | C 16-32 | not required | 78 | EI 120 - U/C |
| Ø ≤ 40 mm, $e_n$ ≤ 4,5 mm | C 25-50 | not required | 58 | EI 120 - U/C |
| ***Mounted into/onto high-density rigid floor of 150 mm*** | | | | |
| Ø ≤ 32 mm, $e_n$ ≤ 3,0 mm | C+ 80-110 | CS (cr 13 mm / -) | 20 | EI 120 - U/C |
| Ø ≤ 16 mm, $e_n$ ≤ 2,0 mm and<br>Ø ≤ 25 mm, $e_n$ ≤ 2,5 mm<br>inside Ø 90 mm plastic pipe<br>filled with PU foam | C+ 80-110 | not required | 100 | EI 120 - U/C |
| **PEX-pipes** | | | | |
| ***Mounted into/onto high-density rigid floor of 200 mm*** | | | | |
| PEX Ø ≤ 28/54 mm,<br>$e_n$ ≤ 4,0 / 3,0 mm | C 50-80 | not required | - | EI 120 - U/C |
| **CoolFit** | | | | |
| ***Mounted into/onto high-density rigid floor of 150 mm*** | | | | |
| Ø ≤ 110/160 mm,<br>$e_n$ ≤ 10 mm, PUR 25 mm | C 125-160 | not required | - | EI 90 - U/C |
| **PP, PVC and multilayer sewer pipes** | | | | |
| ***Mounted into/onto high-density rigid floor of 200 mm*** | | | | |
| PP (1451-1) Ø ≤ 110 mm,<br>$e_n$ ≤ 8,0 (4,0 + 4,0 on muff) | C 110-125 | not required | - | EI 120 - U/C |
| ***Mounted into/onto high-density rigid floor of 150 mm*** | | | | |
| Ø ≤ 160 mm, $e_n$ ≤ 6,0 mm<br>• **PP-pipes** (EN 1451-1)<br>• **Geberit**: Silent (dB20, Pro, PP)<br>• **Pipelife**: Master 3+<br>• **Polo-Kal**: NG/XS, 3S<br>• **Rehau**: Raupiano Plus<br>• **Uponor**: HTP, Decibel<br>• **Wavin**: AS+, SiTech+ | C 125-160 | not required | - | EI 120 - U/U |
| Ø ≤ 110 mm, $e_n$ ≤ 5,3 mm<br>• **PP-pipes** (EN 1451-1)<br>• **Geberit**: Silent (dB20, Pro, PP)<br>• **Pipelife**: Master 3+<br>• **Polo-Kal**: NG/XS, 3S<br>• **Rehau**: Raupiano Plus<br>• **Uponor**: HTP, Decibel<br>• **Wavin**: AS+, SiTech+ | C 75-110 | not required<br><br>Sound insulation<br>(PE ≤ 3,5 mm) can<br>penetrate the collar | 30 | EI 90 - U/U |

**ANNEX 1**

| Type of the pipe | Penetration seal | Insulation (thickness / length) | $a_2$ [mm] | Fire resistance class |
|---|---|---|---|---|
| Ø ≤ 110 mm,<br>$e_n$ ≤ 10,6 mm (5,3 + 5,3 on muff)<br>• **PP-pipes** (EN 1451-1)<br>• **Geberit**: Silent (dB20, Pro, PP)<br>• **Pipelife**: Master 3+<br>• **Polo-Kal**: NG/XS, 3S<br>• **Rehau**: Raupiano Plus<br>• **Uponor**: HTP, Decibel<br>• **Wavin**: AS+, SiTech+ | C 110-130 | CI (sw 30 mm / -)<br><br>Sound insulation (PE 9,0 mm) can penetrate the collar | - | EI 60 - U/U |
| PVC (EN 13476) $e_n$ 3,4 mm ≤ 110 | C 75-110 | CI (sw 30 mm / -) | - | EI 120 U/U |
| **Sewer pipes with lining** | | | | |
| ***Mounted into/onto high-density rigid floor of 150 mm*** | | | | |
| PVC, PP Ø ≤ 110 mm,<br>$e_n$ ≤ 3,4 mm + lining<br>(Boldan, Brawoliner, Trelleborg) | C 75-110 | CI (sw 30 mm / -) | - | EI 120 – U/U |
| PP Ø ≤ 110 mm, $e_n$ ≤ 3,4 mm + lining<br>(Boldan, Brawoliner, Trelleborg) | C 75-110 | not required | - | EI 120 – U/C |
| **PP and multilayer sewer pipes** | | | | |
| ***Installation on the top of the construction - (Installation way 2a-2)*** | | | | |
| Ø ≤ 110 mm, $e_n$ ≤ 5,3 mm<br>• **PP-pipes** (EN 1451-1)<br>• **Geberit**: Silent (dB20, Pro, PP)<br>• **Pipelife**: Master 3+<br>• **Polo-Kal**: NG/XS, 3S<br>• **Rehau**: Raupiano Plus<br>• **Uponor**: HTP, Decibel<br>• **Wavin**: AS+, SiTech+ | C 75-110 | not required | 30 | EI 60 - U/C |
| ***Installation in an angle between 90° and 45° - (Installation way 2a-3)*** | | | | |
| Ø ≤ 110 mm, $e_n$ ≤ 4,5 mm<br>• **PP-pipes** (EN 1451-1)<br>• **Geberit**: Silent (dB20, Pro, PP)<br>• **Pipelife**: Master 3+<br>• **Polo-Kal**: NG/XS, 3S<br>• **Rehau**: Raupiano Plus<br>• **Uponor**: HTP, Decibel<br>• **Wavin**: AS+, SiTech+ | C 125-160 | not required | - | EI 120 - U/C |
| ***Installation in a hole max 90 mm bigger than the penetrating pipe***<br>***(Tested as a part of customized product)*** | | | | |
| PP (EN 1451-1) Ø ≤ 110 mm,<br>$e_n$ ≤ 3,8 mm, Uponor Decibel | C+ 80-110 | not required | 20 | EI 120 - U/U |

## High-Density Rigid Floor

# 2b - Sewatek Special Fire Collars




| Special Fire Collar | $a_1$ (mm) |
|---|---|
| **C 50x** | 7 |
| **C 75x** | 7 |
| **C 90x** | 7 |
| **C 110x** | 7 |
| **C 130x** | 12 |
| **C 160x** | 12 |

Table 2b. Sewatek Special Fire Collars
tested with **150 mm thick high-density rigid floor**

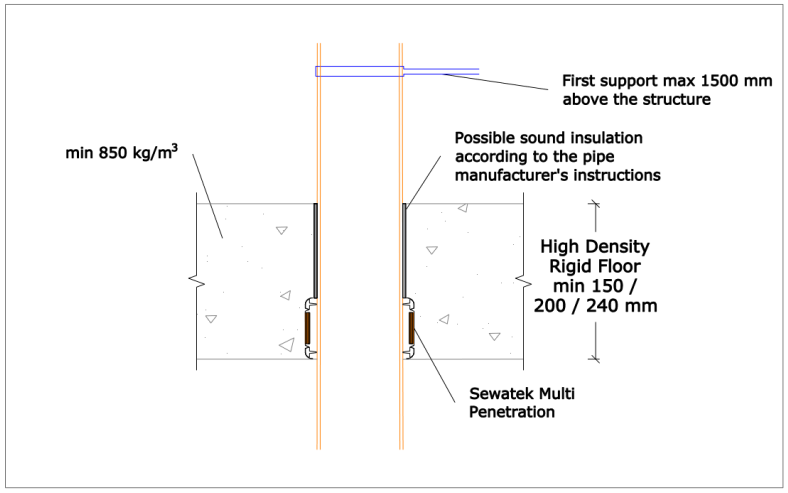
| **Insulation markings (See Annex 2)** | **Markings (See Annex 3)** |
|---|---|
| LI – Local and Interrupted<br>CI – Continuous and Interrupted<br>CS – Continuous and Sustained<br>sw – Stone wool insulation<br>cr – Cellular rubber insulation<br><br>***sw insulation thickness***<br>*- 20 mm (Pipes < 54 mm)*<br>*- 30 mm (Pipes ≥ 54 mm)* | $e_n$ – Pipe wall thickness<br>$a_1$ – Thickness of the pipe closure device<br>$a_2$ – Distance between pipe closure devices<br>When tested as a single,<br>$a_2$ – distance is 100 mm ("-" in the table) |

| Type of the pipe | Penetration seal | Insulation (thickness / length) | $a_2$ [mm] | Fire resistance class |
|---|---|---|---|---|
| **Sewer pipes, material changes from metal to plastic (PP: EN 1451-1)** | | | | |
| GR Ø ≤ 110 mm (DN100), $e_n$ ≤ 4,0 mm<br>PP Ø ≤ 110, $e_n$ ≤ 3,8 mm | C 110x | Cast iron: CI (sw 30 mm / -)<br>PP: not required | - | EI 120 - U/U |
| GR Ø ≤ 160 mm (DN150), $e_n$ ≤ 5,0 mm<br>PP Ø ≤ 160, $e_n$ ≤ 5,4 mm | C 160x | Cast iron:<br>LI (sw 30 / 500 mm)<br>PP: not required | - | EI 90 - U/C |
| Stainless steel (RST)<br>Ø ≤ 110 mm, $e_n$ ≤ 1,2 mm<br>PP Ø ≤ 110, $e_n$ ≤ 3,8 mm | C 110x | RST: LI (sw 30 / 350 mm)<br>PP: not required | - | EI 120 U/U |

## High-Density Rigid Floor

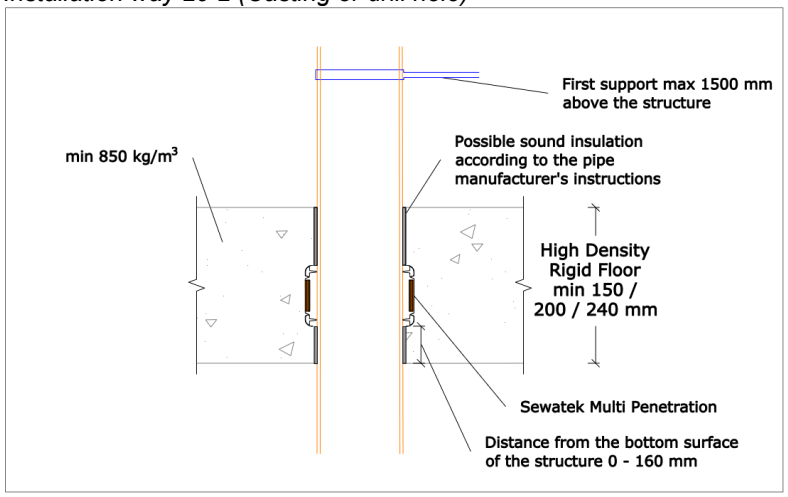
# 2c - Sewatek Multi Penetration

*Installation way 2c-1 (Casting or drill hole)*

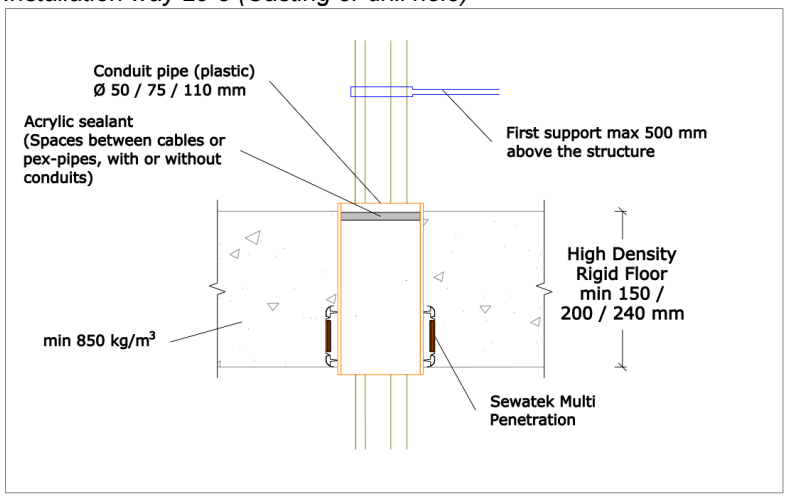



| Multi | Max penetrating pipe / bundle | $a_1$ [mm] |
|---|---|---|
| **D80** | 50 | 15 |
| **D105** | 75 | 15 |
| **D140** | 110 | 15 |

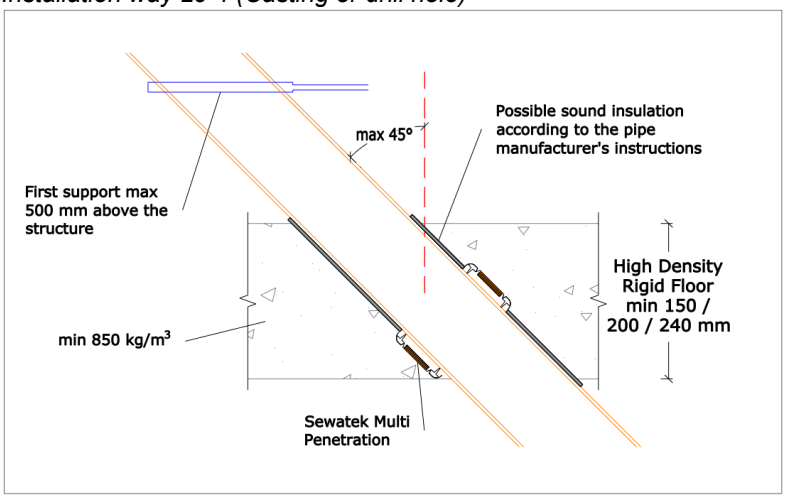
*Installation way 2c-2 (Casting or drill hole)*




*Installation way 2c-3 (Casting or drill hole)*



*Installation way 2c-4 (Casting or drill hole)*




| Table 2c. Sewatek Multi Penetration seals D80, D105, and D140 mounted in **150, 200 mm or 240 mm thick High-Density Rigid Floor** | |
|---|---|
| **Insulation markings (See Annex 2)**<br><br>LI – Local and Interrupted<br>CI – Continuous and Interrupted<br>CS – Continuous and Sustained<br>sw – Stone wool insulation<br>cr – Cellular rubber insulation<br><br>***sw insulation thickness***<br>*- 20 mm (Pipes < 54 mm)*<br>*- 30 mm (Pipes ≥ 54 mm)* | **Markings (See Annex 3)**<br><br>$e_n$ – Pipe wall thickness<br>$a_1$ – Thickness of the pipe closure device<br>$a_2$ – Distance between pipe closure devices<br><br>When tested as a single,<br>$a_2$ – distance is 100 mm ("-" in the table) |

| Type of the pipe | Insulation (thickness / length) | $a_2$ [mm] | Fire resistance class |
|---|---|---|---|
| ***Installation in the lower part of the construction – (Installation way 2c-1)*** | | | |
| **PP and multilayer sewer pipes** | | | |
| ***Mounted into the high-density rigid floor of 150 mm*** | | | |
| Ø ≤ 110 mm, $e_n$ ≤ 6,5 mm<br>• **PP-pipes** (EN 1451-1)<br>• **Geberit**: Silent (dB20, Pro, PP)<br>• **Pipelife**: Master 3+<br>• **Polo-Kal**: NG/XS, 3S<br>• **Rehau**: Raupiano Plus<br>• **Uponor**: HTP, Decibel<br>• **Wavin**: AS+, SiTech+ | not required | 28 | EI 120 – U/C |
| Ø ≤ 110 mm, $e_n$ ≤ 6,5 mm<br>• **PP-pipes** (EN 1451-1)<br>• **Geberit**: Silent (dB20, Pro, PP)<br>• **Pipelife**: Master 3+<br>• **Polo-Kal**: NG/XS, 3S<br>• **Rehau**: Raupiano Plus<br>• **Uponor**: HTP, Decibel<br>• **Wavin**: AS+, SiTech+ | CI (sw 30 mm / -) | 28 | EI 120 – U/U |
| Ø ≤ 110 mm, $e_n$ ≤ 5,3 mm<br>• **PP-pipes** (EN 1451-1)<br>• **Geberit**: Silent (dB20, Pro, PP)<br>• **Pipelife**: Master 3+<br>• **Polo-Kal**: NG/XS, 3S<br>• **Rehau**: Raupiano Plus<br>• **Uponor**: HTP, Decibel<br>• **Wavin**: AS+, SiTech+ | not required | 30 | EI 90 – U/U |

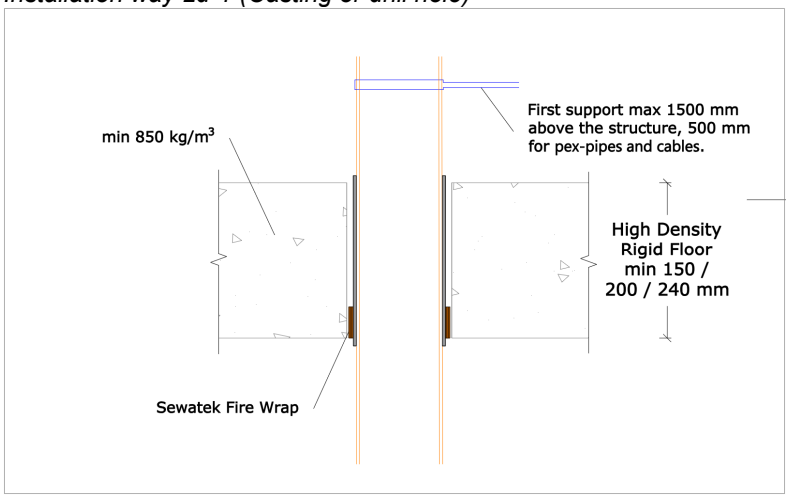
**ANNEX 1**

| Type of the pipe | Insulation (thickness / length) | $a_2$ [mm] | Fire resistance class |
|---|---|---|---|
| ***Installation on muff OR/AND without plastic cover and gaskets*** | | | |
| Ø ≤ 110 mm, $e_n$ ≤ 13 mm (6,5 + 6,5 mm on muff)<br>• **PP-pipes** (EN 1451-1)<br>• **Geberit**: Silent (dB20, Pro, PP)<br>• **Pipelife**: Master 3+<br>• **Polo-Kal**: NG/XS, 3S<br>• **Rehau**: Raupiano Plus<br>• **Uponor**: HTP, Decibel<br>• **Wavin**: AS+, SiTech+ | not required | 30 | EI 90 – U/U |
| **Cast iron** | | | |
| ***Mounted into the high-density rigid floor of 200 mm*** | | | |
| Ø ≤ 110 mm, $e_n$ ≤ 3,5 mm | LI (sw 30 mm / 350 mm) | - | EI 120 - U/C |
| **Steel pipes** | | | |
| ***Mounted into the high-density rigid floor of 240 mm*** | | | |
| Ø ≤ 110 mm, $e_n$ ≤ 4,5 mm | CI (sw 30 mm / -) | - | EI 120 - U/C |
| **Composite pipes** | | | |
| ***Mounted into the high-density rigid floor of 150 mm*** | | | |
| Ø ≤ 75 mm, $e_n$ ≤ 8,0 mm | CI (sw 30 mm / -) | - | EI 120 - U/C |
| 2x LK PAL Ø 32 (/52) Universal A32 | Pre-insulated 10 mm PE | - | EI 120 – U/C |
| **PP and multilayer sewer pipes** | | | |
| ***Mounted into the high-density rigid floor of 150 mm*** | | | |
| ***Installation at a maximum height of 160 mm from the bottom surface - (Installation way 2c-2)*** | | | |
| Ø ≤ 110 mm, $e_n$ ≤ 5,3 mm<br>• **PP-pipes** (EN 1451-1)<br>• **Geberit**: Silent (dB20, Pro, PP)<br>• **Pipelife**: Master 3+<br>• **Polo-Kal**: NG/XS, 3S<br>• **Rehau**: Raupiano Plus<br>• **Uponor**: HTP, Decibel<br>• **Wavin**: AS+, SiTech+ | not required | 30 | EI 120 U/C |
| ***Installation in an angle between 90° and 45° - (Installation way 2c-4)*** | | | |
| Ø ≤ 110 mm, $e_n$ ≤ 4,5 mm<br>• **PP-pipes** (EN 1451-1)<br>• **Geberit**: Silent (dB20, Pro, PP)<br>• **Pipelife**: Master 3+<br>• **Polo-Kal**: NG/XS, 3S<br>• **Rehau**: Raupiano Plus<br>• **Uponor**: HTP, Decibel<br>• **Wavin**: AS+, SiTech+ | not required | - | EI 120 U/C |
| ***Installation in the lower part of the construction with or without conduit – (Installation way 2c-3)*** | | | |
| **PEX-pipes** | | | |
| ***Mounted into the high-density rigid floor of 150 mm*** | | | |
| PEX bundle Ø ≤ 102 mm<br>- singular PEX Ø ≤ 22/34 mm, $e_n$ ≤ 3,0 mm | not required | 30 | EI 120 – U/C |
| **Cables** | | | |
| ***Mounted into high-density rigid floor of 150 mm*** | | | |
| Cable Ø ≤ 25 mm | not required | - | EI 90 |
| Cable Ø ≤ 22 mm | not required | 30 | EI 90 |
| Cable bundle Ø ≤ 100 mm<br>- singular cable Ø ≤ 22 mm | not required | 30 | EI 90 |
| Cable conduit Ø 110 mm (plastic)<br>- cable bundle Ø ≤ 100 mm<br>- singular cable Ø ≤ 25 mm | not required | - | EI 90 |

## High-Density Rigid Floor

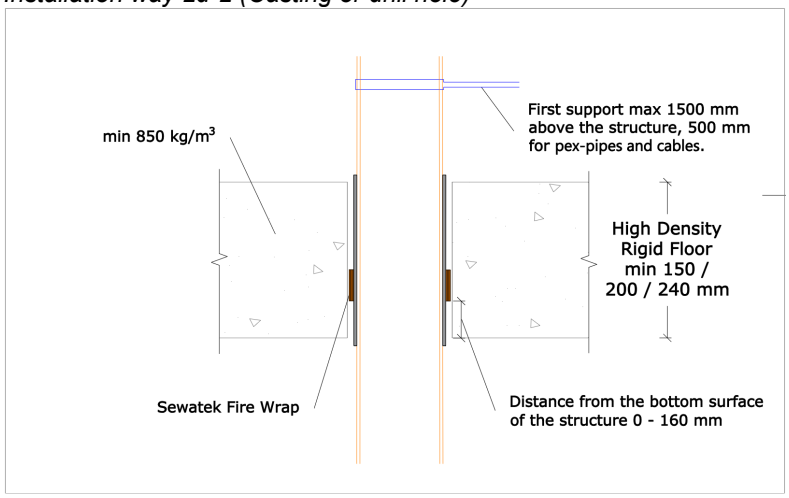
# 2d - Sewatek Fire Wrap

*Installation way 2d-1 (Casting or drill hole)*

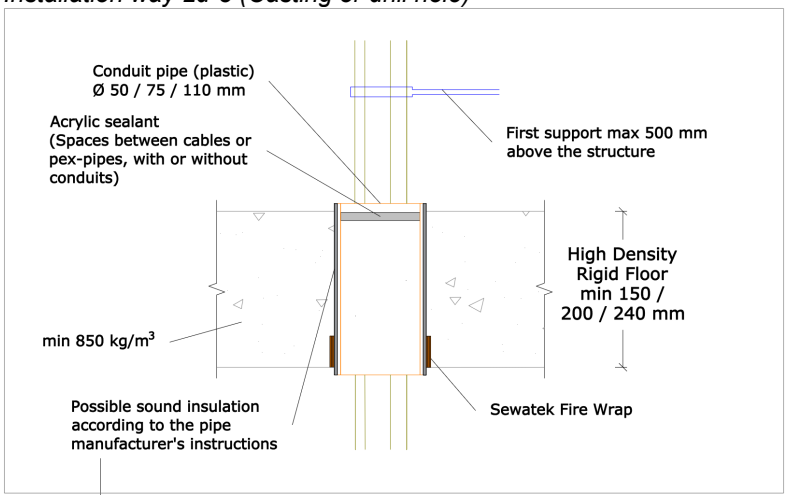



| Fire Wrap | $a_1$ (mm) |
|---|---|
| **W 50** | 7 |
| **W 75** | 7 |
| **W 110** | 7 |
| **W 160** | 12 |

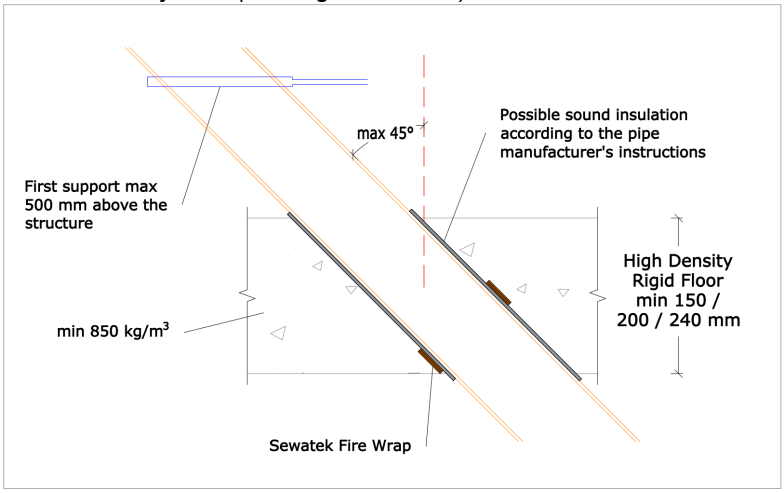
*Installation way 2d-2 (Casting or drill hole)*




*Installation way 2d-3 (Casting or drill hole)*



*Installation way 2d-4 (Casting or drill hole)*




| Table 2d. Sewatek Fire Wrap mounted in **150, 200 mm or 240 mm thick High-Density Rigid Floor** | |
|---|---|
| **Insulation markings (See Annex 2)** | **Markings (See Annex 3)** |
| LI – Local and Interrupted<br>CI – Continuous and Interrupted<br>CS – Continuous and Sustained<br>sw – Stone wool insulation<br>cr – Cellular rubber insulation<br>***sw insulation thickness***<br>*- 20 mm (Pipes < 54 mm)*<br>*- 30 mm (Pipes ≥ 54 mm)* | $e_n$ – Pipe wall thickness<br>$a_1$ – Thickness of the pipe closure device<br>$a_2$ – Distance between pipe closure devices<br>When tested as a single,<br>$a_2$ – distance is 100 mm ("-" in the table) |

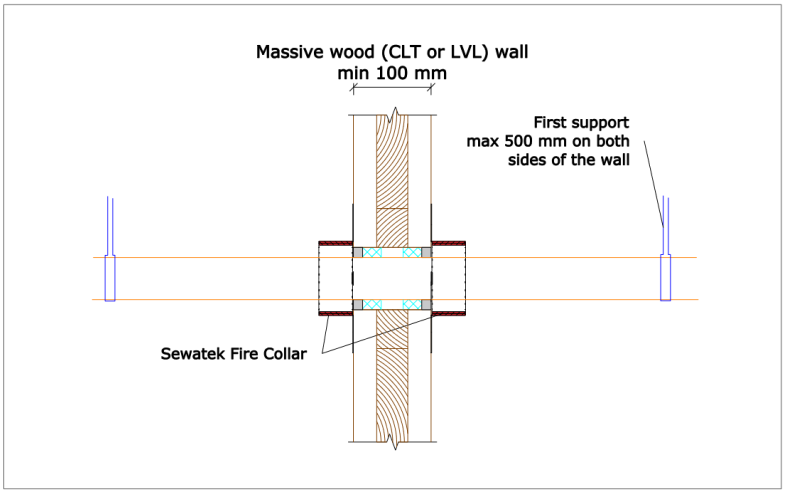
| Type of the pipe | Insulation (thickness / length) | $a_2$ [mm] | Fire resistance class |
|---|---|---|---|
| ***Installation in the lower part of the construction – (Installation way 2d-1)*** | | | |
| **PP and multilayer sewer pipes** | | | |
| ***Mounted into the high-density rigid floor of 150 mm*** | | | |
| Ø ≤ 160 mm, $e_n$ ≤ 7,5 mm<br>• **PP-pipes** (EN 1451-1)<br>• **Geberit**: Silent (dB20, Pro, PP)<br>• **Pipelife**: Master 3+<br>• **Polo-Kal**: NG/XS, 3S<br>• **Rehau**: Raupiano Plus<br>• **Uponor**: HTP, Decibel<br>• **Wavin**: AS+, SiTech+ | CI (sw 40 mm / -) | - | EI 60 – U/U |
| Ø ≤ 110 mm, $e_n$ ≤ 6,5 mm<br>• **PP-pipes** (EN 1451-1)<br>• **Geberit**: Silent (dB20, Pro, PP)<br>• **Pipelife**: Master 3+<br>• **Polo-Kal**: NG/XS, 3S<br>• **Rehau**: Raupiano Plus<br>• **Uponor**: HTP, Decibel<br>• **Wavin**: AS+, SiTech+ | not required | 28 | EI 120 – U/C |
| Ø ≤ 110 mm, $e_n$ ≤ 6,5 mm<br>• **PP-pipes** (EN 1451-1)<br>• **Geberit**: Silent (dB20, Pro, PP)<br>• **Pipelife**: Master 3+<br>• **Polo-Kal**: NG/XS, 3S<br>• **Rehau**: Raupiano Plus<br>• **Uponor**: HTP, Decibel<br>• **Wavin**: AS+, SiTech+ | CI (sw 30 mm / -) | 28 | EI 120 – U/U |

**ANNEX 1**

| Type of the pipe | Insulation (thickness / length) | $a_2$ [mm] | Fire resistance class |
|---|---|---|---|
| Ø ≤ 110 mm, $e_n$ ≤ 13 mm (6,5 + 6,5 mm on muff)<br>• **PP-pipes** (EN 1451-1)<br>• **Geberit**: Silent (dB20, Pro, PP)<br>• **Pipelife**: Master 3+<br>• **Polo-Kal**: NG/XS, 3S<br>• **Rehau**: Raupiano Plus<br>• **Uponor**: HTP, Decibel<br>• **Wavin**: AS+, SiTech+ | not required | 30 | EI 90 – U/U |
| ***Installation at a maximum height of 160 mm from the bottom surface - (Installation way 2d-2)*** | | | |
| Ø ≤ 110 mm, $e_n$ ≤ 5,3 mm<br>• **PP-pipes** (EN 1451-1)<br>• **Geberit**: Silent (dB20, Pro, PP)<br>• **Pipelife**: Master 3+<br>• **Polo-Kal**: NG/XS, 3S<br>• **Rehau**: Raupiano Plus<br>• **Uponor**: HTP, Decibel<br>• **Wavin**: AS+, SiTech+ | not required | 15 / 30 | EI 120 U/C |
| ***Installation in an angle between 90° and 45° - (Installation way 2d-4)*** | | | |
| Ø ≤ 110 mm, $e_n$ ≤ 4,5 mm<br>• **PP-pipes** (EN 1451-1)<br>• **Geberit**: Silent (dB20, Pro, PP)<br>• **Pipelife**: Master 3+<br>• **Polo-Kal**: NG/XS, 3S<br>• **Rehau**: Raupiano Plus<br>• **Uponor**: HTP, Decibel<br>• **Wavin**: AS+, SiTech+ | not required | - | EI 120 U/C |
| ***Installation in the lower part of the construction – (Installation way 2d-1)*** | | | |
| **Cast iron** | | | |
| ***Mounted into the high-density rigid floor of 200 mm*** | | | |
| Ø ≤ 110 mm, $e_n$ ≤ 3,5 mm | LI (sw 30 mm / 350 mm) | - | EI 120 - U/C |
| **Steel pipes** | | | |
| ***Mounted into the high-density rigid floor of 240 mm*** | | | |
| Ø ≤ 110 mm, $e_n$ ≤ 4,5 mm | CI (sw 30 mm / -) | - | EI 120 - U/C |
| **Composite pipes** | | | |
| ***Mounted into the high-density rigid floor of 150 mm*** | | | |
| Ø ≤ 75 mm, $e_n$ ≤ 8,0 mm | CI (sw 30 mm / -) | - | EI 120 - U/C |
| 2x LK PAL Ø32 (/52) Universal A32 | Pre-insulated 10 mm PE | - | EI 120 – U/C |
| ***Installation in the lower part of the structure with or without conduit – (Installation way 2c-3)*** | | | |
| **PEX-pipes** | | | |
| ***Mounted into the high-density rigid floor of 150 mm*** | | | |
| PEX bundle Ø ≤ 102 mm<br>- singular PEX Ø ≤ 22/34 mm, $e_n$ ≤ 3,0 mm | not required | 30 | EI 120 – U/C |
| **Cables** | | | |
| ***Mounted into high-density rigid floor of 150 mm*** | | | |
| Cable Ø ≤ 25 mm | not required | - | EI 90 |
| Cable Ø ≤ 22 mm | not required | 30 | EI 90 |
| Cable bundle Ø ≤ 100 mm<br>- singular cable Ø ≤ 22 mm | not required | 30 | EI 90 |
| Cable conduit Ø 110 mm (plastic)<br>- cable bundle Ø ≤ 100 mm<br>- singular cable Ø ≤ 25 mm | not required | - | EI 90 |

## Massive Wood (CLT or LVL) Wall

## 3a - Sewatek Fire Collars




| Fire Collar | $a_1$ (mm) |
|---|---|
| **C 16-32** | 5 |
| **C 25-50** | 5 |
| **C 50-80** | 7 |
| **C 75-110** | 7 |
| **C 110-130** | 7 |
| **C 125-160** | 12 |

Table 3a. Sewatek Fire Collars
mounted in **100 mm massive wood (CLT or LVL) wall**

| **Insulation markings (See Annex 2)** | | **Markings (See Annex 3)** |
|---|---|---|
| LI – Local and Interrupted<br>CI – Continuous and Interrupted<br>CS – Continuous and Sustained<br>sw – Stone wool insulation<br>cr – Cellular rubber insulation | ***sw insulation thickness***<br>*- 20 mm (Pipes < 54 mm)*<br>*- 30 mm (Pipes ≥ 54 mm)* | $e_n$ – Pipe wall thickness<br>$a_1$ – Thickness of the pipe closure device<br>$a_2$ – Distance between pipe closure devices<br>When tested as a single, $a_2$-distance is 100 mm ("-" in the table) |

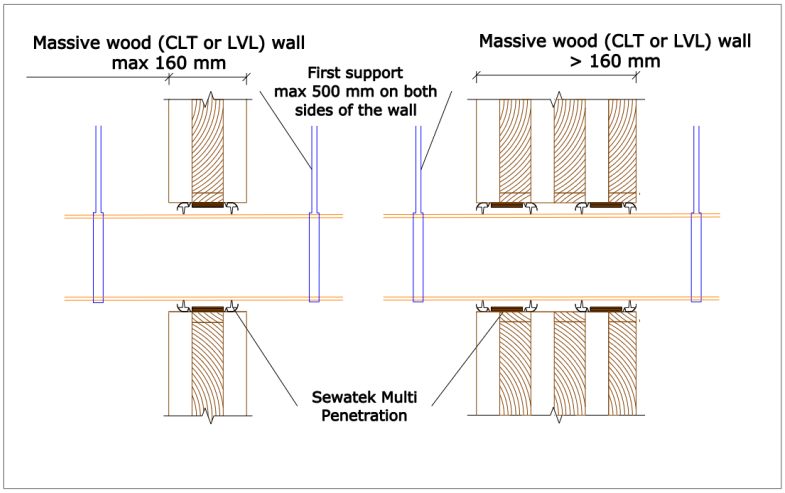
| Type of the pipe | Penetration seal | Insulation (thickness / length) | $a_2$ [mm] | Fire resistance class |
|---|---|---|---|---|
| **Composite pipes** | | | | |
| Ø ≤ 75 mm, $e_n$ ≤ 8 mm | C 50-80 | CI (sw 30 mm / -) | - | EI 60 - U/C |
| **PP, PVC and multilayer sewer pipes** | | | | |
| Ø ≤ 110, $e_n$ ≤ 6,5 mm<br>• **PP-pipes** (EN 1451-1)<br>• **Geberit**: Silent (dB20, Pro, PP)<br>• **Pipelife**: Master 3+<br>• **Polo-Kal**: NG/XS, 3S<br>• **Rehau**: Raupiano Plus<br>• **Uponor**: HTP, Decibel<br>• **Wavin**: AS+, SiTech+ | C 75-110 | not required | - | EI 60 - U/C |
| Ø ≤ 110 mm, $e_n$ ≤ 4,2 mm<br>• **PP-pipes** (EN 1451-1)<br>• **Geberit**: Silent (dB20, Pro, PP)<br>• **Pipelife**: Master 3+<br>• **Polo-Kal**: NG/XS, 3S<br>• **Rehau**: Raupiano Plus<br>• **Uponor**: HTP, Decibel<br>• **Wavin**: AS+, SiTech+ | C 75-110 | not required | 60 | EI 60 - U/C |
| PVC (EN 13476) Ø ≤ 110 mm, $e_n$ ≤ 3,4 mm | C 75-110 | not required | 30 | EI 90 U/C |

**ANNEX 1**

| Type of the pipe | Penetration seal | Insulation (thickness / length) | $a_2$ [mm] | Fire resistance class |
|---|---|---|---|---|
| **Sewer pipes with lining** | | | | |
| PVC Ø ≤ 110 mm,<br>$e_n$ ≤ 3,4 mm + lining<br>(Boldan, Brawoliner, Trelleborg) | C 75-110 | not required | 30 | EI 90 – U/C |
| PP Ø ≤ 110 mm,<br>$e_n$ ≤ 3,4 mm + lining<br>(Boldan, Brawoliner, Trelleborg) | C 75-110 | not required | 30 | EI 90 – U/C |

## Massive Wood (CLT, LVL) Wall

# 3b - Sewatek Multi Penetration




| Multi | Max penetrating pipe / bundle | $a_1$ (mm) |
|---|---|---|
| **D80** | 50 | 15 |
| **D105** | 75 | 15 |
| **D140** | 110 | 15 |

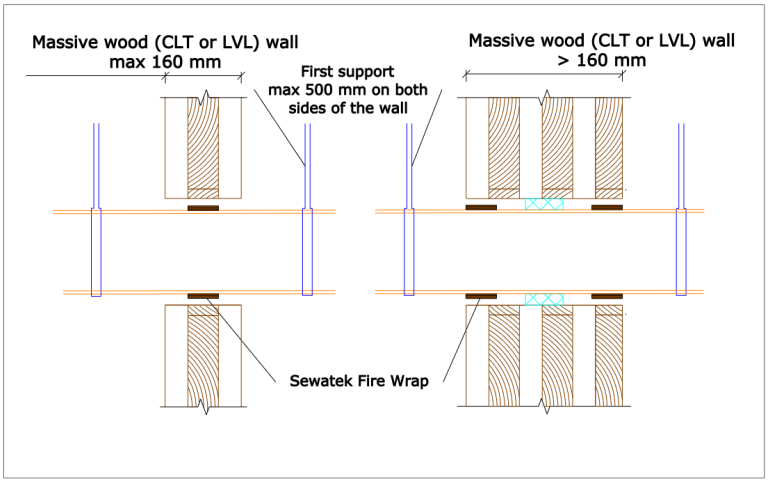
Table 3b. Sewatek Multi Penetration seals D80, D105, D140 mounted in **100 mm thick massive wood (CLT or LVL) wall**

| **Insulation markings (See Annex 2)** | | **Markings (See Annex 3)** |
|---|---|---|
| LI – Local and Interrupted<br>CI – Continuous and Interrupted<br>CS – Continuous and Sustained<br>sw – Stone wool insulation<br>cr – Cellular rubber insulation | ***sw insulation thickness***<br>*- 20 mm (Pipes < 54 mm)*<br>*- 30 mm (Pipes ≥ 54 mm)* | $e_n$ – Pipe wall thickness<br>$a_1$ – Thickness of the pipe closure device<br>$a_2$ – Distance between pipe closure devices<br>When tested as a single,<br>$a_2$ – distance is 100 mm (”-” in the table) |

| Type of the pipe | Insulation | $a_2$ [mm] | Fire resistance class |
|---|---|---|---|
| **PP and multilayer sewer pipes** | | | |
| Ø ≤ 110 mm, $e_n$ ≤ 6,0 mm<br>• **PP-pipes** (EN 1451-1)<br>• **Geberit**: Silent (dB20, Pro, PP)<br>• **Pipelife**: Master 3+<br>• **Polo-Kal**: NG/XS, 3S<br>• **Rehau**: Raupiano Plus<br>• **Uponor**: HTP, Decibel<br>• **Wavin**: AS+, SiTech+ | not required | 30 | EI 60 U/C |
| **PEX-pipes** | | | |
| Pex bundle Ø ≤ 100 mm<br>- singular pipe Ø ≤ 40/54 mm, $e_n$ ≤ 2,5 - 4,2 mm | not required | - | EI 90 U/C |
| **Cables** | | | |
| Singular cable Ø ≤ 22 mm | not required | - | EI 60 |
| Cable bundle Ø ≤ 100 mm<br>- singular cable Ø ≤ 22 mm | not required | - | EI 60 |

## Massive Wood (CLT, LVL) Wall

## 3c - Sewatek Fire Wrap




| Fire Wrap | $a_1$ (mm) |
|---|---|
| **W 50** | 7 |
| **W 75** | 7 |
| **W 110** | 7 |

Table 3c. Sewatek Fire Wrap
mounted in **100 mm massive wood (CLT or LVL) wall**

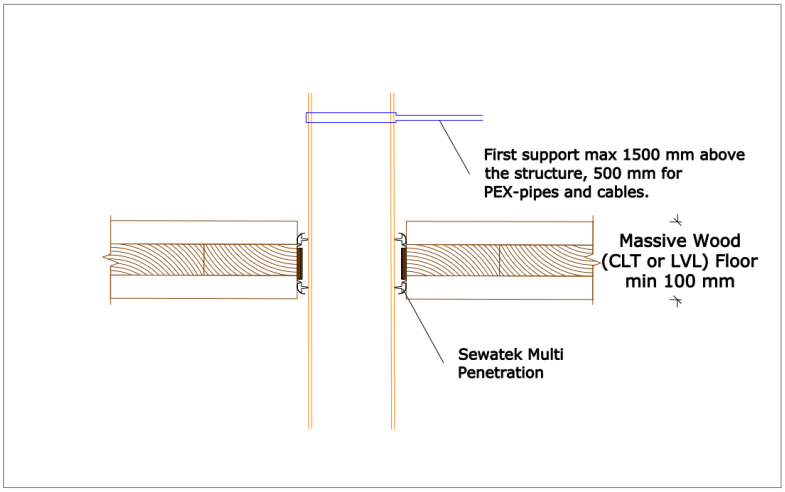
| **Insulation markings (See Annex 2)** | **Markings (See Annex 3)** |
|---|---|
| LI – Local and Interrupted<br>CI – Continuous and Interrupted<br>CS – Continuous and Sustained<br>sw – Stone wool insulation<br>cr – Cellular rubber insulation<br>***sw insulation thickness***<br>*- 20 mm (Pipes < 54 mm)*<br>*- 30 mm (Pipes ≥ 54 mm)* | $e_n$ – Pipe wall thickness<br>$a_1$ – Thickness of the pipe closure device<br>$a_2$ – Distance between pipe closure devices<br>When tested as a single,<br>$a_2$-distance is 100 mm ("-" in the table) |

*** Sewatek fire wrap on both sides of the wall*

| Type of the pipe | Insulation | $a_2$ [mm] | Fire resistance class |
|---|---|---|---|
| **PP and multilayer sewer pipes** | | | |
| ***Mounted into the massive wood wall (CLT or LVL) of 100 mm*** | | | |
| Ø ≤ 110 mm, $e_n$ ≤ 10,6 mm (on muff 5,3 + 5,3 mm) **<br>• **PP-pipes** (EN 1451-1)<br>• **Geberit**: Silent (dB20, Pro, PP)<br>• **Pipelife**: Master 3+<br>• **Polo-Kal**: NG/XS, 3S<br>• **Rehau**: Raupiano Plus<br>• **Uponor**: HTP, Decibel<br>• **Wavin**: AS+, SiTech+ | not required | - | EI 90 U/C |
| Ø ≤ 110, $e_n$ ≤ 6,0 mm<br>• **PP-pipes** (EN 1451-1)<br>• **Geberit**: Silent (dB20, Pro, PP)<br>• **Pipelife**: Master 3+<br>• **Polo-Kal**: NG/XS, 3S<br>• **Rehau**: Raupiano Plus<br>• **Uponor**: HTP, Decibel<br>• **Wavin**: AS+, SiTech+ | not required | 30 | EI 60 U/C |
| **PEX-pipes** | | | |
| Pex bundle Ø ≤ 100 mm<br>- singular pipe Ø ≤ 40/54 mm, $e_n$ ≤ 2,5 - 4,2 mm | not required | - | EI 90 U/C |
| **Cables** | | | |
| Singular cable Ø ≤ 22 mm | not required | - | EI 60 |
| Cable bundle Ø ≤ 100 mm<br>- singular cable Ø ≤ 22 mm | not required | - | EI 60 |

## Massive Wood Floor

# 4a - Sewatek Multi Penetration




| Multi | Max penetrating pipe / bundle | $a_1$ (mm) |
|---|---|---|
| **D80** | 50 | 15 |
| **D105** | 75 | 15 |
| **D140** | 110 | 15 |

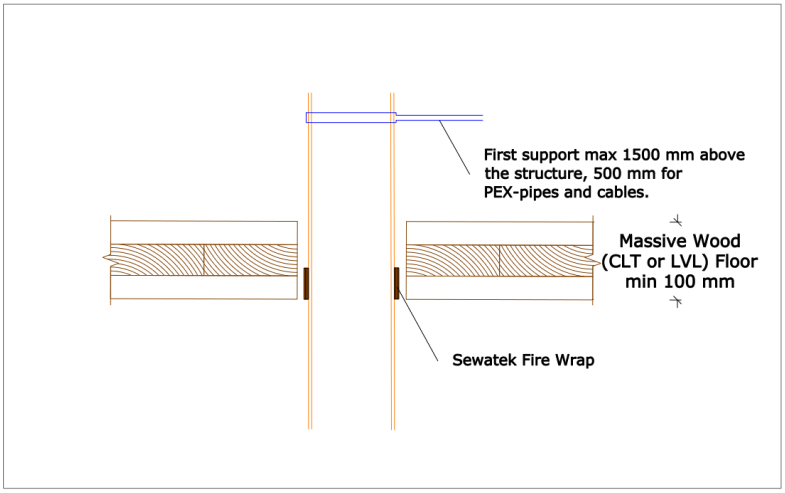
Table 4a. Sewatek Multi Penetration seals D80, D105, D140 mounted in **100 mm thick massive wood (CLT or LVL) floor**

| **Insulation markings (See Annex 2)** | | **Markings (See Annex 3)** |
|---|---|---|
| LI – Local and Interrupted<br>CI – Continuous and Interrupted<br>CS – Continuous and Sustained<br>sw – Stone wool insulation<br>cr – Cellular rubber insulation | ***sw insulation thickness***<br>*- 20 mm (Pipes < 54 mm)*<br>*- 30 mm (Pipes ≥ 54 mm)* | $e_n$ – Pipe wall thickness<br>$a_1$ – Thickness of the pipe closure device<br>$a_2$ – Distance between pipe closure devices<br>When tested as a single,<br>$a_2$ – distance is 100 mm ("-" in the table) |

| Type of the pipe | Insulation | $a_2$ [mm] | Fire resistance class |
|---|---|---|---|
| **PP and multilayer sewer pipes** | | | |
| Ø ≤ 110 mm, $e_n$ ≤ 6,5 mm<br>• **PP** (EN 1451-1)<br>• **Geberit**: Silent (dB20, Pro, PP)<br>• **Pipelife**: Master 3+<br>• **Polo-Kal**: NG/XS, 3S<br>• **Rehau**: Raupiano Plus<br>• **Uponor**: HTP, Decibel<br>• **Wavin**: AS+, SiTech+ | not required | 30 | EI 90 U/C |
| **Cables** | | | |
| Cable Ø ≤ 22 mm | not required | 30 | EI 60 |
| Cable conduit Ø ≤ 75 mm (plastic)<br>- cable bundle Ø ≤ 66 mm<br>- singular cable Ø ≤ 22 mm | not required | 30 | EI 60 |

## Massive Wood Floor

## 4b - Sewatek Fire Wrap




| Fire Wrap | $a_1$ (mm) |
|---|---|
| W 50 | 7 |
| W 75 | 7 |
| W 110 | 7 |

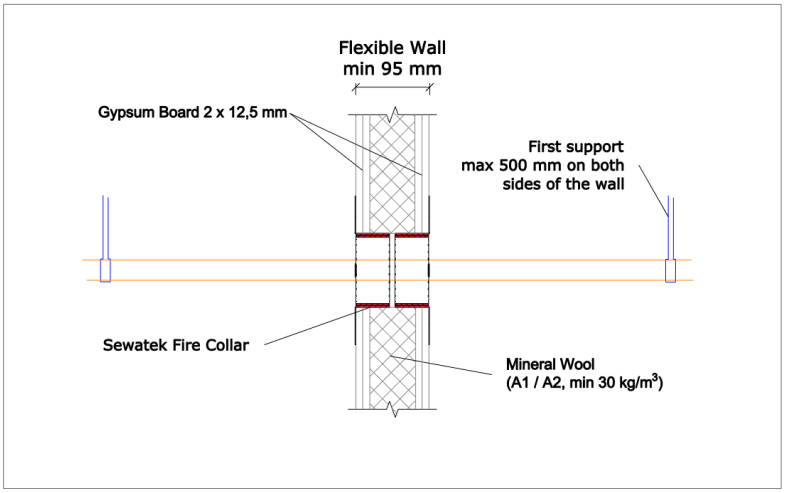
Table 4b. Sewatek Fire Wrap
mounted in **100 mm thick massive wood (CLT or LVL) floor**

| **Insulation markings (See Annex 2)** | | **Markings (See Annex 3)** |
|---|---|---|
| LI – Local and Interrupted<br>CI – Continuous and Interrupted<br>CS – Continuous and Sustained<br>sw – Stone wool insulation<br>cr – Cellular rubber insulation | ***sw insulation thickness***<br>*- 20 mm (Pipes < 54 mm)*<br>*- 30 mm (Pipes ≥ 54 mm)* | $e_n$ – Pipe wall thickness<br>$a_1$ – Thickness of the pipe closure device<br>$a_2$ – Distance between pipe closure devices<br>When tested as a single, $a_2$-distance is 100 mm ("-" in the table) |

| Type of the pipe | Insulation | $a_2$ [mm] | Fire resistance class |
|---|---|---|---|
| **PP and multilayer sewer pipes** | | | |
| Ø ≤ 110 mm, $e_n$ ≤ 6,5 mm<br>• **PP** (EN 1451-1)<br>• **Geberit**: Silent (dB20, Pro, PP)<br>• **Pipelife**: Master 3+<br>• **Polo-Kal**: NG/XS, 3S<br>• **Rehau**: Raupiano Plus<br>• **Uponor**: HTP, Decibel<br>• **Wavin**: AS+, SiTech+ | not required | 30 | EI 90 U/C |
| **Cables** | | | |
| Cable Ø ≤ 22 mm | not required | 30 | EI 60 |
| Cable conduit Ø ≤ 75 mm (plastic)<br>- cable bundle Ø ≤ 66 mm<br>- singular cable Ø ≤ 22 mm | not required | 30 | EI 60 |

## Flexible Wall

# 5a - Sewatek Fire Collars




| Fire Collar | $a_1$ (mm) |
|---|---|
| **C 16-32** | 5 |
| **C 25-50** | 5 |
| **C 50-80** | 7 |
| **C 75-110** | 7 |
| **C 110-130** | 7 |
| **C 125-160** | 12 |

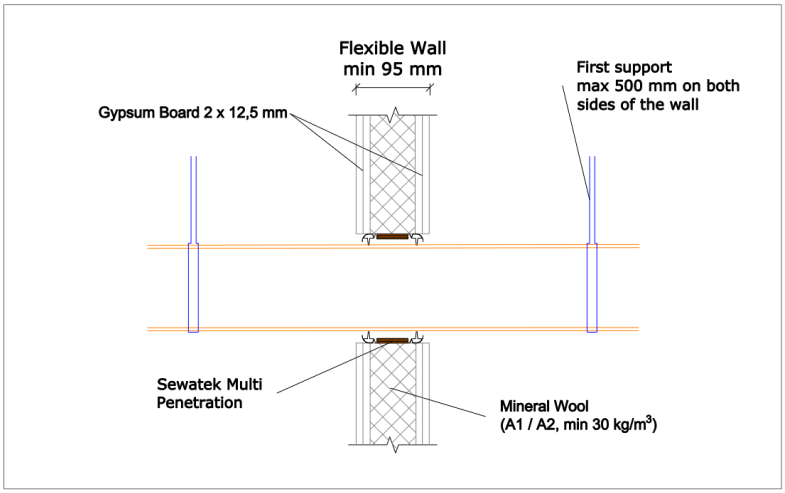
Table 5a. Sewatek Fire Collars
mounted in **95 mm thick flexible wall**

| **Insulation markings (See Annex 2)** | | **Markings (See Annex 3)** |
|---|---|---|
| LI – Local and Interrupted<br>CI – Continuous and Interrupted<br>CS – Continuous and Sustained<br>sw – Stone wool insulation<br>cr – Cellular rubber insulation | ***sw insulation thickness***<br>*- 20 mm (Pipes < 54 mm)*<br>*- 30 mm (Pipes ≥ 54 mm)* | $e_n$ – Pipe wall thickness<br>$a_1$ – Thickness of the pipe closure device<br>$a_2$ – Distance between pipe closure devices<br>When tested as a single, $a_2$-distance is 100 mm ("-" in the table) |

| Type of the pipe<br>en = pipe wall thickness | Penetration seal | Insulation (thickness / length) | $a_2$ [mm] | Fire resistance class |
|---|---|---|---|---|
| ***Mounted in flexible wall of 95 mm*** | | | | |
| **Composite pipes** | | | | |
| Ø ≤ 75 mm, $e_n$ ≤ 8 mm | C 50-80 | CI (sw 30 mm / -) | - | EI 60 - U/C |
| **PP, PVC and multilayer sewer pipes** | | | | |
| Ø ≤ 110 mm, $e_n$ ≤ 6,5 mm<br>• **PP** (EN 1451-1)<br>• **Geberit**: Silent (dB20, Pro, PP)<br>• **Pipelife**: Master 3+<br>• **Polo-Kal**: NG/XS, 3S<br>• **Rehau**: Raupiano Plus<br>• **Uponor**: HTP, Decibel<br>• **Wavin**: AS+, SiTech+ | C 75-110 | not required | - | EI 60 - U/C |
| PP (EN 1451-1) Ø ≤ 110 mm, $e_n$ ≤ 3,4 mm | C 75-110 | not required | 30 | EI 90 U/C |
| PVC (EN 13476) Ø ≤ 110 mm $e_n$ ≤ 3,4 mm | C 75-110 | not required | 30 | EI 90 U/C |
| **Sewer pipes with lining** | | | | |
| PVC (EN 13476) Ø ≤ 110 mm, $e_n$ ≤ 3,4 mm + lining (Boldan, Brawoliner, Trelleborg) | C 75-110 | not required | 30 | EI 90 – U/C |
| PP (EN 1451-1) Ø ≤ 110 mm, $e_n$ ≤ 3,4 mm + lining (Boldan, Brawoliner, Trelleborg) | C 75-110 | not required | 30 | EI 90 – U/C |

## Flexible Wall

# 5b - Sewatek Multi Penetration seals




| Multi | Max penetrating pipe / bundle | $a_1$ (mm) |
|---|---|---|
| **D80** | 50 | 15 |
| **D105** | 75 | 15 |
| **D140** | 110 | 15 |

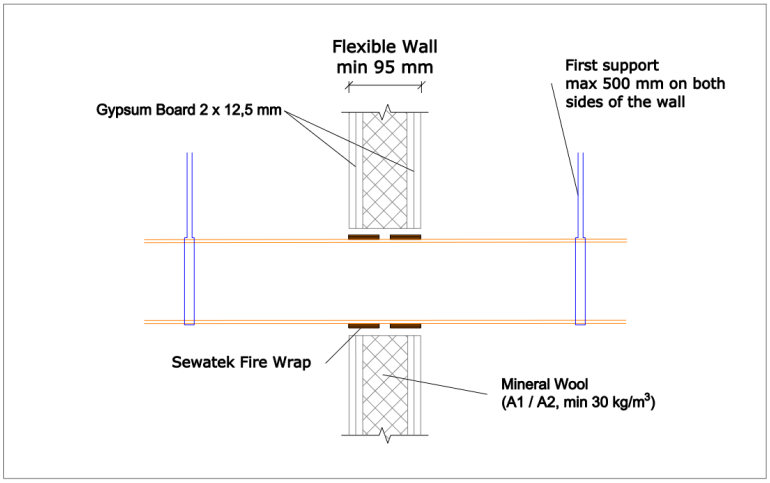
Table 5b. Sewatek Multi Penetration seals D80, D105, D140 mounted in **95 mm thick flexible wall**

| **Insulation markings (See Annex 2)** | **Markings (See Annex 3)** |
|---|---|
| LI – Local and Interrupted<br>CI – Continuous and Interrupted<br>CS – Continuous and Sustained<br>sw – Stone wool insulation<br>cr – Cellular rubber insulation<br><br>***sw insulation thickness***<br>*- 20 mm (Pipes < 54 mm)*<br>*- 30 mm (Pipes ≥ 54 mm)* | $e_n$ – Pipe wall thickness<br>$a_1$ – Thickness of the pipe closure device<br>$a_2$ – Distance between pipe closure devices<br>When tested as a single, $a_2$-distance is 100 mm ("-" in the table) |

| Type of the pipe | Insulation | $a_2$ [mm] | Fire resistance class |
|---|---|---|---|
| **PP pipes** | | | |
| Ø ≤ 110 mm, $e_n$ ≤ 6,0 mm<br>• **PP** (EN 1451-1)<br>• **Geberit**: Silent (dB20, Pro, PP)<br>• **Pipelife**: Master 3+<br>• **Polo-Kal**: NG/XS, 3S<br>• **Rehau**: Raupiano Plus<br>• **Uponor**: HTP, Decibel<br>• **Wavin**: AS+, SiTech+ | not required | 30 | EI 60 U/C |
| **PEX-pipes** | | | |
| Pex bundle Ø ≤ 100 mm<br>- singular pipe Ø ≤ 40/54 mm, $e_n$ ≤ 2,5 - 4,2 mm | not required | - | EI 90 U/C |
| **Cables** | | | |
| Singular cable Ø ≤ 22 mm | not required | - | EI 60 |
| Cable bundle Ø ≤ 100 mm<br>- singular cable Ø ≤ 22 mm | not required | - | EI 60 |

## Flexible Wall

# 5c - Sewatek Fire Wrap




| Fire Wrap | $a_1$ (mm) |
|---|---|
| **W 50** | 7 |
| **W 75** | 7 |
| **W 110** | 7 |

Table 5c. Sewatek Fire Wrap mounted in **95 mm flexible wall**

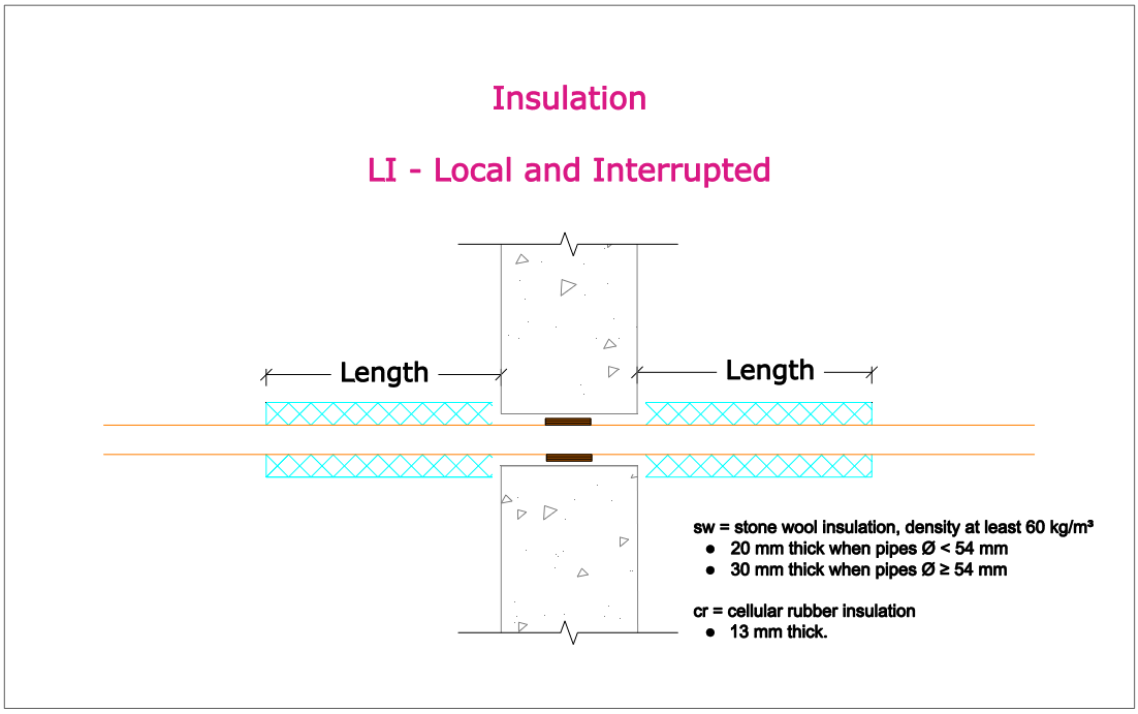
| **Insulation markings (See Annex 2)** | | **Markings (See Annex 3)** |
|---|---|---|
| LI – Local and Interrupted<br>CI – Continuous and Interrupted<br>CS – Continuous and Sustained<br>sw – Stone wool insulation<br>cr – Cellular rubber insulation | ***sw insulation thickness***<br>*- 20 mm (Pipes < 54 mm)*<br>*- 30 mm (Pipes ≥ 54 mm)* | $e_n$ – Pipe wall thickness<br>$a_1$ – Thickness of the pipe closure device<br>$a_2$ – Distance between pipe closure devices<br>When tested as a single,<br>$a_2$ – distance is 100 mm ("-" in the table) |

| Type of the pipe | Insulation | $a_2$ [mm] | Fire resistance class |
|---|---|---|---|
| **PP and multilayer sewer pipes** | | | |
| Ø ≤ 110, $e_n$ ≤ 10,6 mm (on muff 5,3 + 5,3 mm)<br>• **PP** (EN 1451-1)<br>• **Geberit**: Silent (dB20, Pro, PP)<br>• **Pipelife**: Master 3+<br>• **Polo-Kal**: NG/XS, 3S<br>• **Rehau**: Raupiano Plus<br>• **Uponor**: HTP, Decibel<br>• **Wavin**: AS+, SiTech+ | not required | - | EI 120 U/C |
| Ø ≤ 110, $e_n$ ≤ 6,0 mm<br>• **PP** (EN 1451-1)<br>• **Geberit**: Silent (dB20, Pro, PP)<br>• **Pipelife**: Master 3+<br>• **Polo-Kal**: NG/XS, 3S<br>• **Rehau**: Raupiano Plus<br>• **Uponor**: HTP, Decibel<br>• **Wavin**: AS+, SiTech+ | not required | 30 | EI 60 U/C |
| **PEX-pipes** | | | |
| Pex bundle Ø ≤ 100 mm<br>- singular pipe Ø ≤ 40/54 mm,<br>$e_n$ ≤ 2,5 - 4,2 mm | not required | - | EI 90 U/C |
| **Cables** | | | |
| Singular cable Ø ≤ 22 mm | not required | - | EI 60 |
| Cable bundle Ø ≤ 100 mm<br>- singular cable Ø ≤ 22 mm | not required | - | EI 60 |

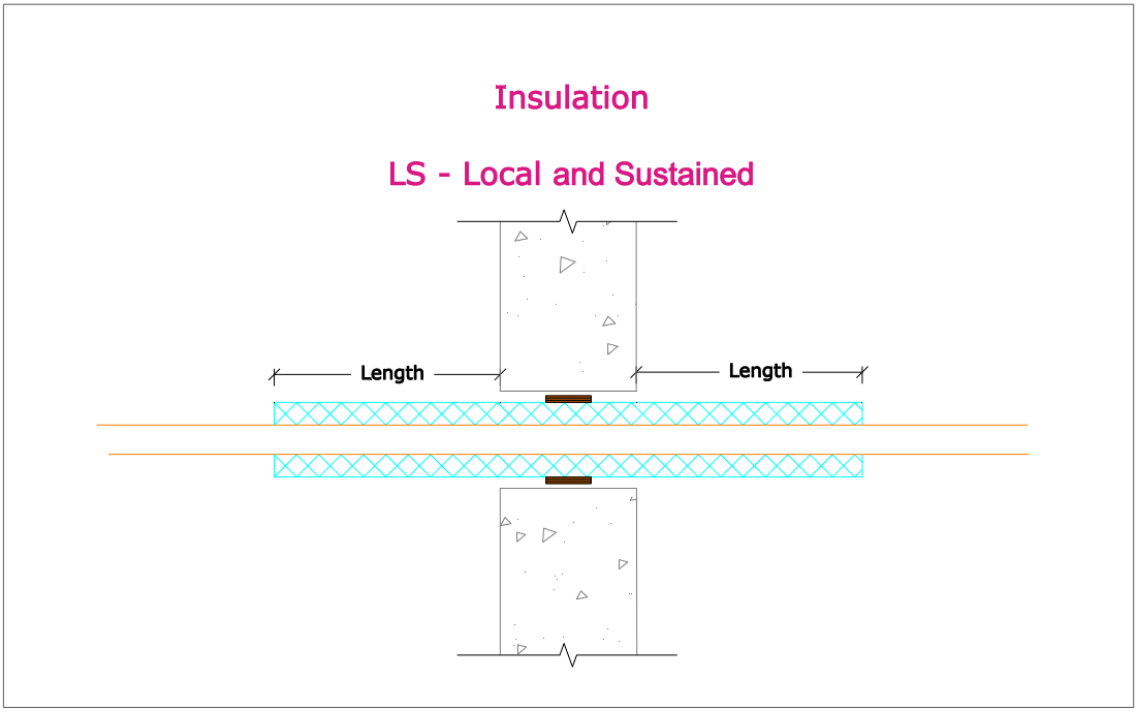
## Annex 2 – Insulation

## Wall structure

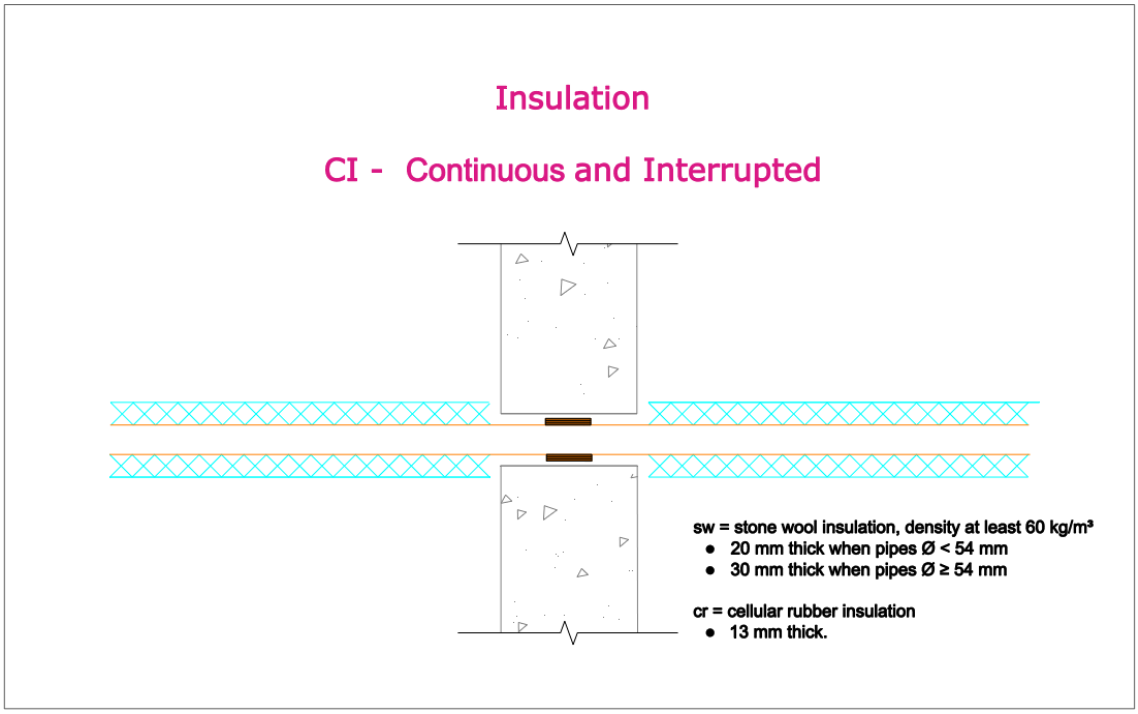
### LI – Local and Interrupted



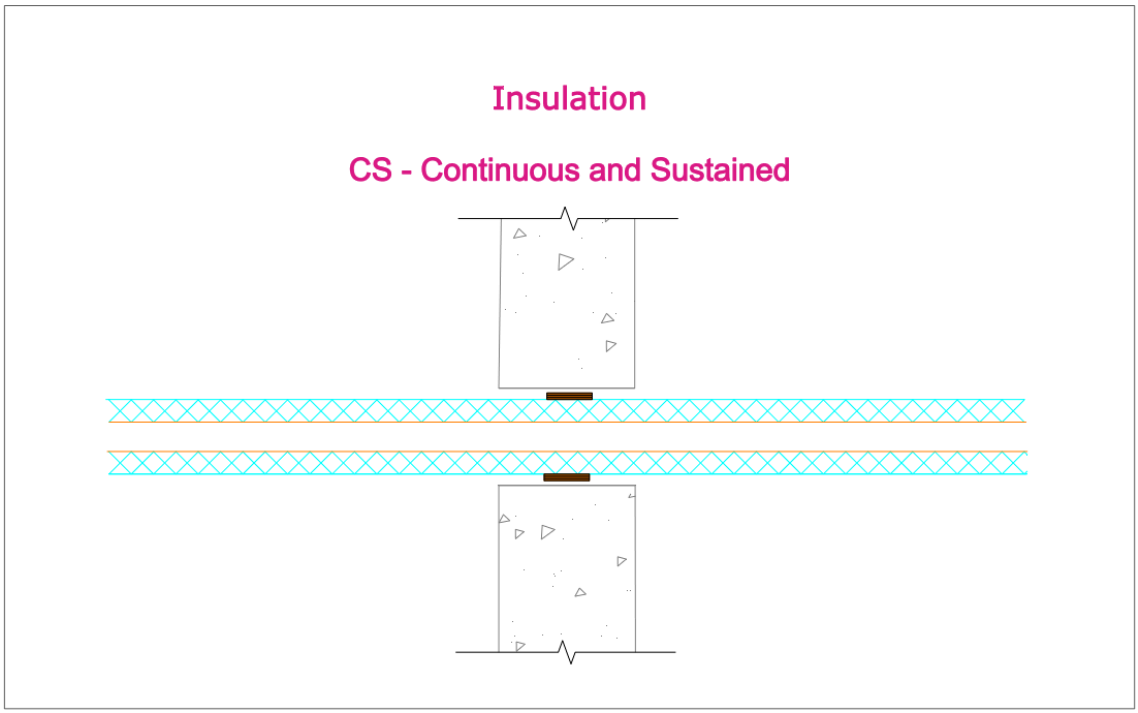

### LS – Local and Sustained



## CI – Continuous and Interrupted

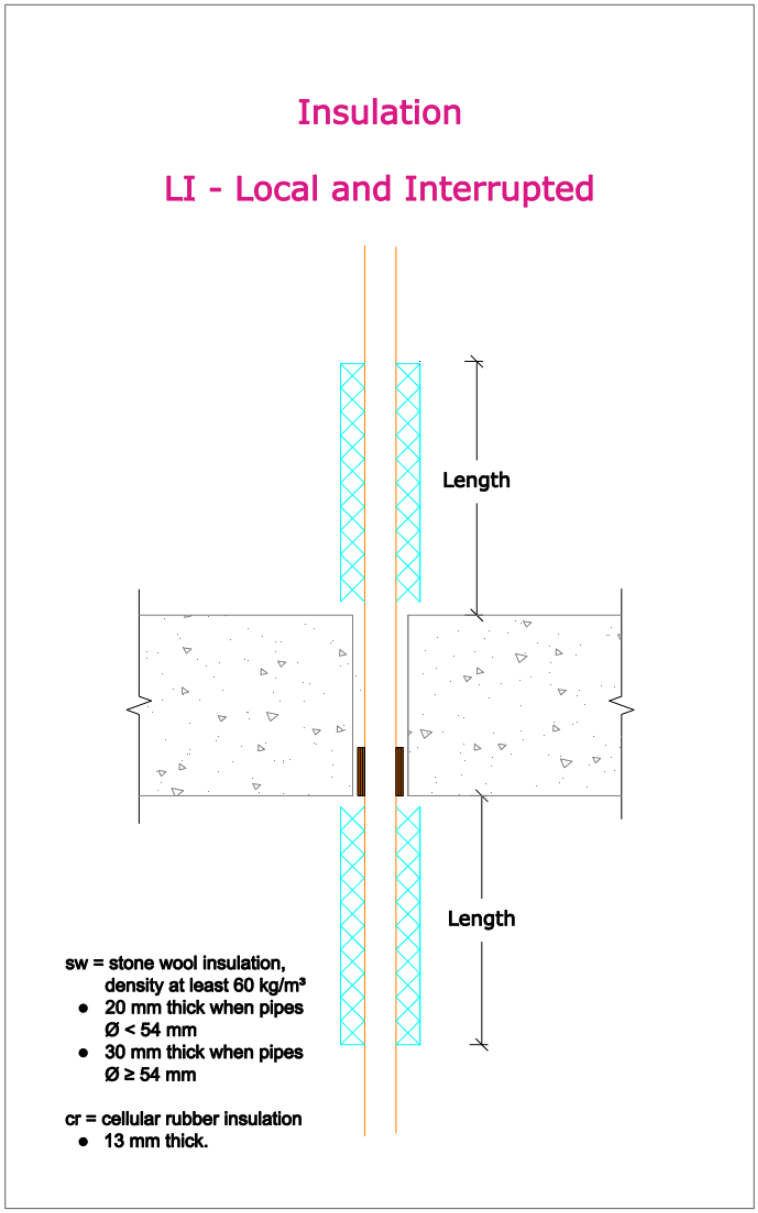



## CS – Continuous and Sustained

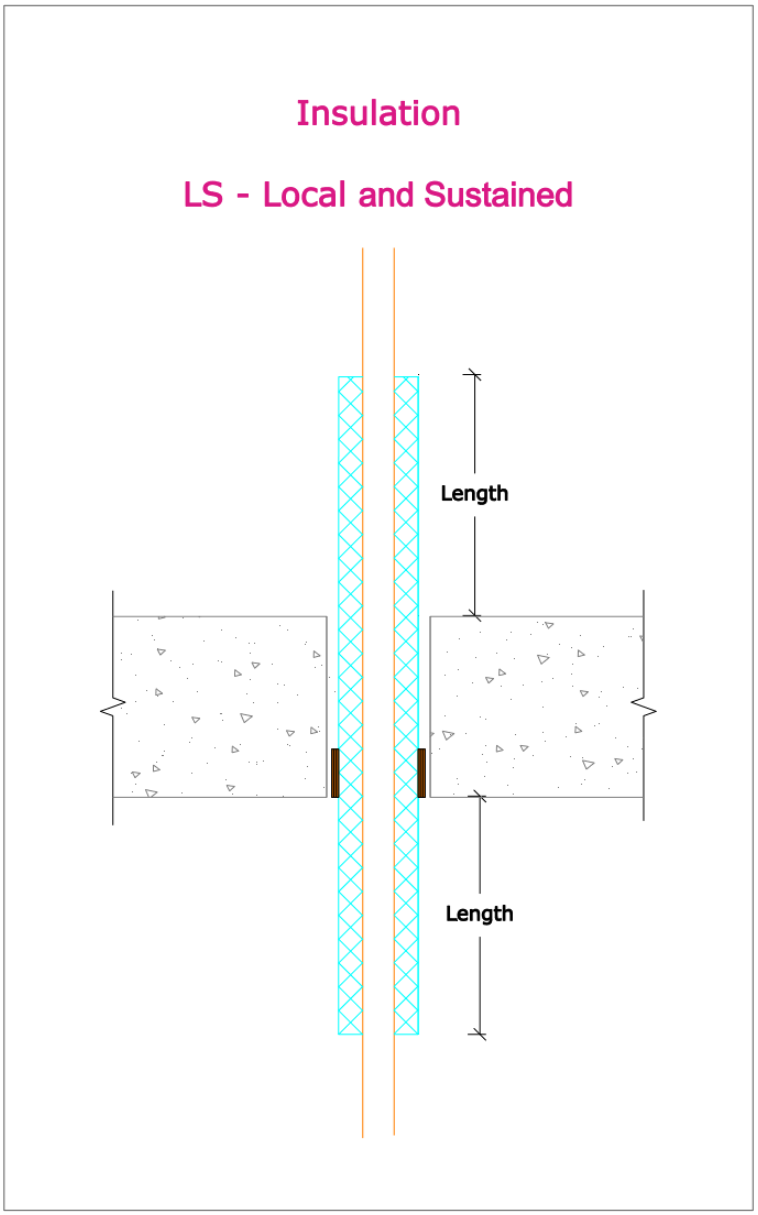


Floor structure

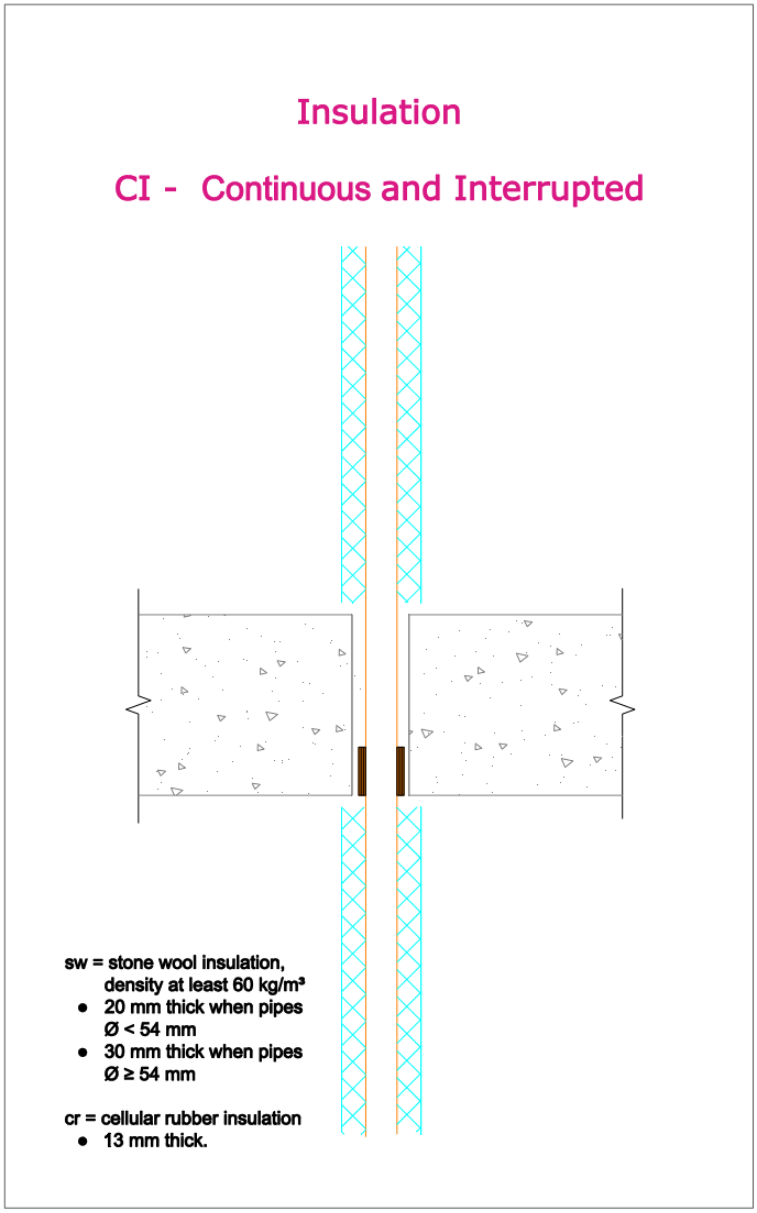
## LI – Local and Interrupted



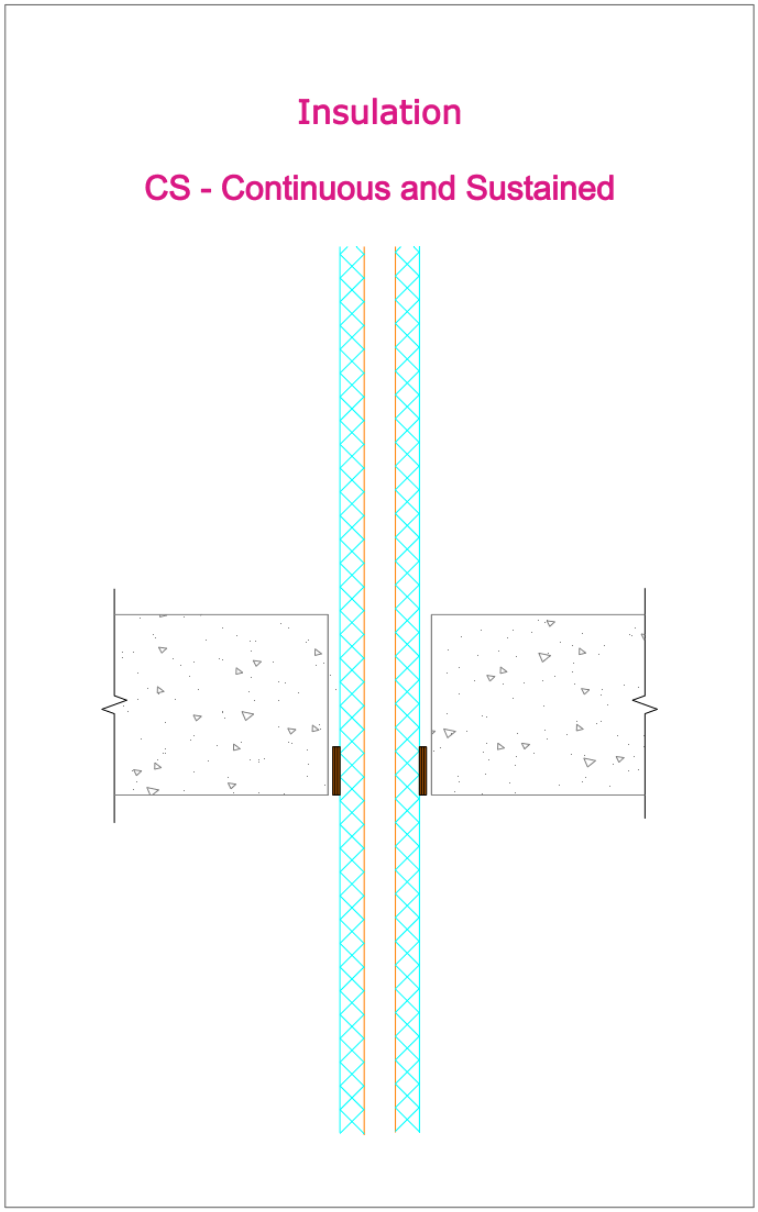
## LS – Local and Sustained



## CI – Continuous and Interrupted

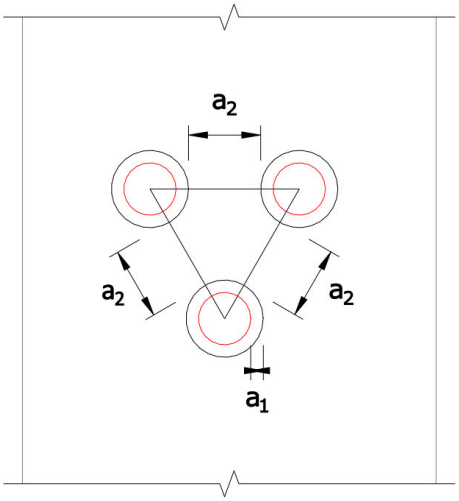


## CS – Continuous and Sustained



## Annex 3 – The principle of measurement

### Cluster Layout



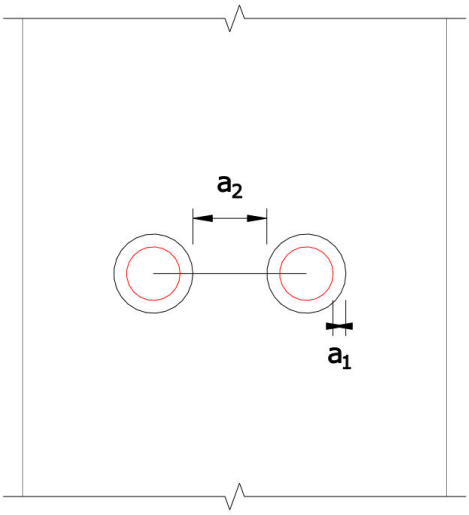

$a_1$ Thickness of the pipe closure device

$a_2$ Distance between pipe closure devices

Service pipe / cable

Sewatek pipe closure device

### In-Line Layout




$a_1$ Thickness of the pipe closure device

$a_2$ Distance between pipe closure devices

Service pipe / cable

Pipe closure device