



European Technical Assessment **ETA 20/0260** of 18/3/2020

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 collars type C

Sewatek fire acrylic SWT 105

Sewatek graphite mastic SWT 125

Product family to which the construction product belongs

Fire stopping and Fire Sealing Products

Manufacturer

**Sewatek Oy
Sepäntie 4
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Finland**

Manufacturing plant

**Sewatek Oy
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This European Technical Assessment contains

21 pages including 2 Annexes 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
EAD 350454-00-1104, edition September 2017**

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II Specific Part

1 Technical description of the product

Sewatek collars (C-series) are fire stopping steel collars with intumescent band inside. The products are used with building services such as pipes and cables. Sewatek collars can be installed outside or inside of the structure. Collars can be used with flexible or rigid constructions.

Sewatek SWT 105 (5 % intumescent graphite powder) and SWT 125 (25 % intumescent graphite powder) are fire acrylic mastics. They are intended to use for sealing pipes, cables and cable bundles that penetrate fire rated walls and floors. Sewatek mastics can be used with flexible or rigid constructions.

Sewatek collars and fire acrylic mastics 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 seal is intended to be used temporarily or permanent reinstate the fire resistance performance of rigid concrete wall or roof/floor constructions or flexible walls which are provided with apertures which are penetrated by various cables or metallic or plastic pipes.

Penetrations can be mounted either into 94 mm or 100 mm thick low density rigid wall ($650 \pm 200 \text{ kg/m}^3$) or 94 mm thick standardized flexible wall or 200 mm thick high density rigid floor ($\geq 850 \text{ kg/m}^3$). Penetration collars are mounted on the surface of the wall or the floor if not otherwise mentioned. The detailed properties are given in annex 1.

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 maintenance¹.

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 categorized as Type Y2. The product meets also requirements of types Z1 and Z2.

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

2.3 Design

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

2.4 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.

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	Acrylic: C-s1, d0 Collars: Euroclass F (not assessed)
Resistance to fire, EN 13501-2	EI 30 – EI 120 (in end uses and with the provisions presented in the Annex 1)
External fire performance of roof covering	Not relevant
BWR 3. Hygiene, health and the environment	
Vapour permeability and moisture resistance	No performance assessed
Watertightness	No performance assessed
Content, emission and/or release of dangerous substances	Clause 3.2.1
BWR 4. Safety and accessibility in use	No performance assessed
BWR 5. Protection against noise	
Air sound insulation, EN ISO 717-1	No performance assessed
BWR 6. Energy economy and heat retention	No performance assessed
BWR 7. Sustainable use of natural resources	
Sustainable use of natural resources	No performance assessed
General aspects	
Aspects of durability, ISO 188 and ISO 2440	No performance assessed

3.1 Safety in case of fire, BWR 2

3.1.1 Reaction to fire

The classification of the main materials with regard to reaction to fire is based on full scale testing (acrylics). For collars, the reaction to fire is declared Euroclass F (not 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

The release of volatile organic and semi-volatile organic compounds has been determined according to EAD 350454-00-1104 point 2.2.5 and EN 16516. The results are shown in below table:

	TVOC mg/m ³		TSVOC mg/m ³	
	3 d	28 d	3 d	28 d
Sewatek Fire Sealant (SWT 105)	0,037	0,005	≤ 0,005	≤ 0,005
SEWATEK SWT 125 GRAPHITE MASTIC	0,006	≤ 0,005	≤ 0,005	≤ 0,005

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.

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.

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by Eurofins Expert Services Oy

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ANNEX 1

Table 1. Sewatek penetrations with penetration seals C 16-32, C 25-50, C 50-80, C 80-110 and C 110-125 mounted in 94 mm or 100 mm thick low density rigid wall

* Pipes can be insulated or uninsulated. Insulation around the pipes is continuous and interrupted (CI). The insulation is 30 mm thick stone wool (sw) (nominal density 60 kg/m³)

** a₁ = distance between service pipe and outer surface of collar (Annex 2 page 2)

a₂ = minimum distance between penetration seals (Annex 2 page 4). In case a single penetration, minimum distance to another single penetration is 200 mm according to the test standard EN 1366. Distances are measured from the outer edge of the penetration seal device.

e_n= pipe wall thickness

Type of the pipe	Penetration seal	Insulation* (thickness/length)	a ₁ /a ₂ ** [mm]	Fire resistance class
Composite pipes				
<i>Mounted as a single penetration seal, wall thickness 94 mm</i>				
∅ ≤ 75 mm, e _n ≤ 8.0 mm Pex-Al-PE	C 50-80 ¹⁾	CI (sw) 30 mm / -	10 / 200	EI 60 - U/C
<i>Mounted as a group of penetration seals, wall thickness 100 mm</i>				
∅ ≤ 25 mm, e _n ≤ 3.0 mm	C 16-32	not required	8.5 / 58	EI 120 - U/C
∅ ≤ 40 mm, e _n ≤ 4.0 mm	C 25-50	not required	11 / 38	EI 60 - U/C
Plastic PEX-pipes				
<i>Mounted as a group of penetration seals, wall thickness 100 mm</i>				
Pex-pipe 15/28, pipe e _n ≤ 2.0 mm	C 16-32	not required	7 / 58	EI 120 - U/C
Pex-pipe 22/34, e _n ≤ 3.0 mm	C 25-50	not required	14 / 38	EI 120 - U/C
Plastic sewer pipes				
<i>Mounted as a single penetration seal, wall thickness 94 mm</i>				
∅ ≤ 32 mm, e _n ≤ 1.8 mm)	C 16-32 ¹⁾	not required	10 / 200	EI 60 - U/C
∅ ≤ 75 mm, e _n ≤ 2.3 mm	C 50-80 1)	not required	10 / 200	EI 60 - U/C
∅ ≤ 110 mm, e _n ≤ 6.5 mm	C 80-110 1)	not required	10 / 200	EI 60 - U/C
<i>Mounted as a single penetration seal, wall thickness 100 mm</i>				
∅ ≤ 110 mm, e _n ≤ 3.5 mm	C 110-125	not required	10 / 200	EI 90 - U/C
<i>Mounted as a group of penetration seals, wall thickness 94 mm</i>				
∅ ≤ 110 mm, e _n ≤ 4.2 mm	C 80-110 1)	not required	15 / 60	EI 60 - U/C
Cables				
<i>Mounted as a group of penetration seals, wall thickness 100 mm</i>				
Cable conduit ∅ ≤ 25.0 mm, conduit wall thickness ≤ 1.5 mm, with singular cables in a bundle, max ∅ of the bundle ≤ 22 mm, max ∅ of the cable ≤ 13 mm, (3 x cable (MMJ 3x2.5 mm ²))	C 16-32	not required	8.5 / 58	EI 120 - U/C
Cable conduit ∅ ≤ 40.0 mm, conduit wall thickness ≤ 1.5 mm, with	C 25-50	not required	11 / 38	EI 120 - U/C

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singular cables in a bundle, max \varnothing of the bundle ≤ 37 mm max \varnothing of the cables ≤ 17 mm, 13 mm and 11 mm (1 x cable (MMJ 5x6 mm ²)+ 3 x cable (MMJ 3x2.5 mm ²) + 2 x cable (MMJ 3x1.5 mm ²))				
1) Collar inside the construction				

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Table 2. Sewatek penetrations with penetration seals C 16-32, C 25-50, C 50-80, C 80-110 and C 110-125 mounted in 94 mm thick flexible wall

* Pipes can be insulated or uninsulated. Insulation around the pipes is continuous and interrupted (CI). The insulation is 30 mm thick stone wool (sw) (nominal density 60 kg/m³)

** a_1 = distance between service pipe and outer surface of collar (Annex 2 page 2)

a_2 = minimum distance between penetration seals (Annex 2 page 4). In case a single penetration, minimum distance to another single penetration is 200 mm according to the test standard EN 1366. Distances are measured from the outer edge of the penetration seal device.

e_n = pipe wall thickness

Type of the pipe	Penetration seal	Insulation* (thickness/length)	a_1/a_2 ** [mm]	Fire resistance class
Composite pipes				
<i>Mounted as a single penetration seal</i>				
$\varnothing \leq 75$ mm, $e_n \leq 8$. Mm Pex-Al-PE	C 50-80 ¹⁾	CI (sw) 30 mm / -	10 / 200	EI 60 - U/C
Plastic sewer pipes				
<i>Mounted as a single penetration seal</i>				
$\varnothing \leq 32$ mm, $e_n \leq 1.8$ mm	C 16-32 ¹⁾	not required	10 / 200	EI 60 - U/C
$\varnothing \leq 75$ mm, $e_n \leq 2.3$ mm	C 50-80 ¹⁾	not required	10 / 200	EI 60 - U/C
$\varnothing \leq 110$ mm, $e_n \leq 6.5$ mm	C 80-110 ¹⁾	not required	10 / 200	EI 60 - U/C
<i>Mounted as a group of penetration seals</i>				
$\varnothing \leq 110$ mm, $e_n \leq 4.2$ mm	C 80-110 ¹⁾	not required	15 / 60	EI 60 - U/C
¹⁾ Collar inside the construction				

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Table 3. Sewatek penetrations with penetration seals C 16-32, C 25-50, C 50-80, C 80-110 and C 110-125 mounted in 200 mm thick high density rigid floor.

** a_1 = distance between service pipe and outer surface of collar (Annex 2 page 2)

a_2 = minimum distance between penetration seals (Annex 2 page 4). In case a single penetration, minimum distance to another single penetration is 200 mm according to the test standard EN 1366. Distances are measured from the outer edge of the penetration seal device.

e_n = pipe wall thickness

Type of the pipe	Penetration seal	Insulation* (thickness/length)	a_1/a_2 ** [mm]	Fire resistance class
Composite pipes				
<i>Mounted as a group of penetration seals</i>				
$\varnothing \leq 16$ mm, $e_n \leq 2.5$ mm	C 16-32	not required	13 / 78	EI 120 - U/C
$\varnothing \leq 40$ mm, $e_n \leq 4.5$ mm	C 25-50	not required	11 / 58	EI 120 - U/C
Plastic PEX-pipes				
<i>Mounted as a single penetration seal</i>				
Pex-pipe 28/54, $e_n \leq 4.0 / 3.0$ mm,	C 50-80	not required	23 / 200	EI 120 - U/C
Plastic sewer pipes				
<i>Mounted as a single penetration seal</i>				
$\varnothing \leq 75$ mm $e_n \leq 3.0$ mm	C 50-80	not required	12.5 / 200	EI 120 - U/C
$\varnothing \leq 110$ mm, $e_n \leq 6.0$ mm	C 80-110	not required	15 / 200	EI 120 - U/C
$\varnothing \leq 110$ mm, $e_n \leq 4.2$ mm	C 80-110 1)	not required	15 / 200	EI 120 - U/C
$\varnothing \leq 110$ mm, $e_n \leq 4.0$ mm	C 110-125 2)	not required	12.5 / 200	EI 120 - U/C
1) Collar inside the construction				
2) Collar or muff				

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Table 4. Penetrations with Sewatek sealing compound SWT 105 mounted in 94 mm, 100 mm or 150 mm thick low density rigid wall.

* Pipes can be insulated or uninsulated. Insulation around the pipes is continuous and interrupted (CI), local and interrupted (LI) or continuous and sustained (CS). The length of local insulation of the pipes is 350 mm on both sides of the separating construction. The insulation is stone wool (sw) (20 mm or 30 mm, nominal density 60 kg/m³).

** a_1 = width of the acrylic seam (Annex 2 page 2)

a_2 = minimum distance between penetration seals (Annex 2 page 4). In case a single penetration, minimum distance to another single penetration is 200 mm according to the test standard EN 1366. Distances are measured from the outer edge of the penetration seal.

e_n = pipe wall thickness

Type of the pipe	Penetration seal	Insulation* (thickness/length)	a_1/a_2 ** [mm]	Fire resistance class
Copper pipes				
<i>Mounted as a single penetration seal, wall thickness 150 mm</i>				
$\varnothing \leq 35$ mm, $e_n \leq 1.5$ mm installed in Sewatek penetration pipe	SWT 105	LI (sw) 20 mm / 350 mm	12.5+10 / 200	EI 120 - U/C
$\varnothing \leq 89$ mm $e_n \leq 2.0$ mm	SWT 105	CS (sw) 30 mm /	10+30 / 200	EI 120 - U/C
<i>Mounted as a group of penetration seals, wall thickness 150 mm</i>				
$\varnothing \leq 42$ mm, $e_n \leq 1.5$ mm	SWT 105	LI (sw) 20 mm / 350 mm	10 / 58	EI 90 - U/C
<i>Mounted as a group of penetration seals, wall thickness 94 mm</i>				
$\varnothing \leq 10$ mm, $e_n \leq 1.0$ mm	SWT 105	LI (sw) 20 mm / 350 mm	10 / 60	EI 60 - U/C
$\varnothing \leq 42$ mm, $e_n \leq 2.0$ mm	SWT 105	LI (sw) 20 mm / 350 mm	10 / 58	EI 60 - U/C
$\varnothing \leq 54$ mm $e_n \leq 2.0$ mm	SWT 105	CI (sw) 30 mm / -	10 / 60	EI 60 - U/C
Zinc-coated steel pipes				
<i>Mounted as a group of penetration seals, wall thickness 94 mm</i>				
$\varnothing \leq 12$ mm $e_n \leq 1.0$ mm	SWT 105	LI (sw) 20 mm / 350 mm	10 / 60	EI 60 - U/C
$\varnothing \leq 42$ mm $e_n \leq 1.5$ mm	SWT 105	LI (sw) 20 mm / 350 mm	10 / 60	EI 60 - U/C
$\varnothing \leq 54$ mm, $e_n \leq 2.0$ mm	SWT 105	CI (sw) 30 mm / -	10 / 60	EI 60 - U/C
<i>Mounted as a group of penetration seals, wall thickness 150 mm</i>				
$\varnothing \leq 42$ mm, $e_n \leq 1.5$ mm	SWT 105	LI (sw) 20 mm / 350 mm	10 / 58	EI 90 - U/C
Composite pipes				
<i>Mounted as a group of penetration seals, wall thickness 150 mm</i>				

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$\varnothing \leq 32$ mm, $e_n \leq 4.0$ mm installed in Sewatek penetration pipe	SWT 105	not required	24 / 40	EI 60 - U/C
Steel pipes				
<i>Mounted as a single penetration seal, wall thickness 150 mm</i>				
DN80, $\varnothing \leq 89$ mm, $e_n \leq 4.1$ mm	SWT 105	LI (sw) 30 mm / 350 mm	10 / 200	EI 120 - U/C
<i>Mounted as a group of penetration seals wall thickness 94 mm</i>				
$\varnothing \leq 17.2$ mm, pipe $e_n \leq 2.3$ mm	SWT 105	LI (sw) 20 mm / 350 mm	10 / 32	EI 60 - U/C
$\varnothing \leq 26.9$ mm, $e_n \leq 2.0$ mm	SWT 105	not required	10 / 60	EI 60 - U/C
$\varnothing \leq 60.3$ mm, $e_n \leq 4.0$ mm	SWT 105	LI (sw) 30 mm / 350 mm	10 / 60	EI 60 - U/C
<i>Mounted as a group of penetration seals, wall thickness 100 mm</i>				
DN10, $\varnothing \leq 18$ mm, $e_n \leq 2.5$ mm and DN20 $\varnothing, \leq 28$ mm, $e_n \leq 2.7$ mm, in line installed in Sewatek penetration pipe or installed without PVC- pipe	SWT 105	not required	21 and 16 / 60 in line	EI 120 - U/C
Cast iron sewer pipes				
<i>Mounted as a single penetration seal, wall thickness 94 mm</i>				
$\varnothing \leq 110$ mm, $e_n \leq 4.2$ mm	SWT 105	CI (sw) 30 mm / -	10 / 200	EI 60 - U/C
Cables				
<i>Mounted as a single penetration seal, wall thickness 94 mm</i>				
Cable conduit $\varnothing \leq 50.0$ mm, conduit wall thickness ≤ 1.5 mm, with singular cables in a bundle, max \varnothing of the bundle ≤ 45 mm, max \varnothing of the cables ≤ 22 mm, 13 mm, 11 mm (5 x cable (MMJ 3x1.5 mm ²) + 5 x cable (MMJ 3x2.5 mm ²) + 1 x cable (MMJ 5x10 mm ²))	SWT 105	not required	15 / 200	EI 60 - U/C
<i>Mounted as a group penetration seal, wall thickness 94 mm</i>				
Singular cables in a bundle $\varnothing \leq 45$ mm, max \varnothing of the cables ≤ 22 mm, 13 mm, 11 mm	SWT 105	not required	15 / 60 and 10 / 60 in line	EI 60 - U/C

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5 x cable (MMJ 3x1.5 mm ²) + 5 x cable (MMJ 3x2.5 mm ²) + 1 x cable (MMJ 5x10 mm ²) and Single cable, max \varnothing of the cable \leq 21 mm MMJ 5x10 mm ²				

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Table 5. Penetrations with Sewatek sealing compound SWT 105 mounted in 94 mm thick flexible wall..

* Pipes can be insulated or uninsulated. Insulation around the pipes is continuous and interrupted (CI) or local and interrupted (LI). The length of local insulation of the pipes is 350 mm on both sides of the separating construction. The insulation is stone wool (sw) (20 mm or 30 mm, nominal density 60 kg/m³).

** a₁ = width of the acrylic seam (Annex 2 page 2)

a₂ = minimum distance between penetration seals (Annex 2 page 4). In case a single penetration, minimum distance to another single penetration is 200 mm according to the test standard EN 1366. Distances are measured from the outer edge of the penetration seal.

e_n = pipe wall thickness

Type of the pipe	Penetration seal	Insulation* (thickness/length)	a ₁ /a ₂ ** [mm]	Fire resistance class
Copper pipes				
<i>Mounted as a group of penetration seals</i>				
∅ ≤ 10 mm, pipe e _n ≤ 1.0 mm	SWT 105	LI (sw) 20 mm / 350 mm	10 / 60	EI 60 - U/C
∅ ≤ 42 mm, pipe e _n ≤ 2.0 mm	SWT 105	LI (sw) 20 mm / 350 mm	10 / 58	EI 60 - U/C
∅ ≤ 54 mm, pipe e _n ≤ 2.0 mm	SWT 105	CI (sw) 30 mm / -	10 / 60	EI 60 - U/C
Zinc-coated steel pipes				
<i>Mounted as a group of penetration seals</i>				
∅ ≤ 12 mm, pipe e _n ≤ 1.0 mm	SWT 105	LI (sw) 20 mm / 350 mm	10 / 60	EI 60 - U/C
∅ ≤ 42 mm, pipe e _n ≤ 1.5 mm	SWT 105	LI (sw) 20 mm / 350 mm	10 / 60	EI 60 - U/C
∅ ≤ 54 mm, pipe e _n ≤ 2.0 mm	SWT 105	CI (sw) 30 mm / -	10 / 60	EI 60 - U/C
Steel pipes				
<i>Mounted as a group of penetration seals</i>				
∅ ≤ 17.2 mm, pipe e _n ≤ 2.3 mm	SWT 105	LI (sw) 20 mm / 350 mm	10 / 32	EI 60 - U/C
∅ ≤ 26.9 mm, pipe e _n ≤ 2.0 mm	SWT 105	not required	10 / 60	EI 60 - U/C
∅ ≤ 60.3 mm, pipe e _n ≤ 4.0 mm	SWT 105	LI (sw) 30 mm / 350 mm	10 / 60	EI 60 - U/C
Cast iron sewer pipes				
<i>Mounted as a single penetration seal</i>				
∅ ≤ 110 mm, pipe e _n ≤ 4.2 mm	SWT 105	CI (sw) 30 mm / -	10 / 200	EI 60 - U/C

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Cables				
<i>Mounted as a single penetration seal</i>				
Cable conduit $\varnothing \leq 50.0$ mm, conduit wall thickness ≤ 1.5 mm, with singular cables in a bundle, max \varnothing of the bundle ≤ 45 mm, max \varnothing of the cables ≤ 22 mm, 13 mm, 11 mm (5 x cable (MMJ 3x1.5 mm ²) + 5 x cable (MMJ 3x2.5 mm ²) + 1 x cable (MMJ 5x10 mm ²))	SWT 105	not required	15 / 200	EI 60 - U/C
<i>Mounted as a group of penetration seals</i>				
Singular cables in a bundle $\varnothing \leq 45$ mm, max \varnothing of the cables ≤ 22 mm, 13 mm, 11 mm 5 x cable (MMJ 3x1.5 mm ²) + 5 x cable (MMJ 3x2.5 mm ²) + 1 x cable (MMJ 5x10 mm ²) and Single cable, max \varnothing of the cable ≤ 21 mm MMJ 5x10 mm ²	SWT 105	not required	15 / 60 and 10 / 60 in line	EI 60 - U/C

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Table 6. Penetrations with Sewatek sealing compound SWT 105 mounted in 150 mm or 200 mm thick high density rigid floor.

* Pipes can be insulated or uninsulated. Insulation around the pipes is continuous and interrupted (CI) or local and interrupted (LI). The length of local insulation of the pipes is 350 mm on both sides of the separating construction. The insulation is stone wool (sw) (20 mm or 30 mm, nominal density 60 kg/m³).

** a_1 = width of the acrylic seam (Annex 2 page 2)

a_2 = minimum distance between penetration seals (Annex 2 page 2). In case a single penetration, minimum distance to another single penetration is 200 mm according to the test standard EN 1366. Distances are measured from the outer edge of the penetration seal device.

e_n = pipe wall thickness

*** First support by pipe clamps or steel tracks 500 mm from the surface of the floor

Type of the pipe	Penetration seal	Insulation* (thickness/length)	a_1/a_2 ** [mm]	Fire resistance class
Copper pipes				
<i>Mounted as a single penetration seal, 150 mm thick floor</i>				
$\varnothing \leq 35$ mm, pipe $e_n \leq 1.5$ mm installed in Sewatek penetration pipe	SWT 105	LI (sw) 20 mm / 350 mm	12.5+10 / 200	EI 120 - U/C
$\varnothing \leq 89$ mm, pipe $e_n \leq 2.0$ mm	SWT 105	CI (sw) 30 mm / -	10 / 200	EI 120 - U/C
<i>Mounted as a group of penetration seals, 150 mm thick floor</i>				
$\varnothing \leq 42$ mm, pipe $e_n \leq 1.5$ mm	SWT 105	LI (sw) 20 mm / 350 mm	10 / 48	EI 120 - U/C
Zinc-coated steel pipes				
<i>Mounted as a single penetration seal, 150 mm thick floor</i>				
$\varnothing \leq 89$ mm, pipe $e_n \leq 2.0$ mm	SWT 105	CI (sw) 30 mm / -	10 / 200	EI 120 - U/C
<i>Mounted as a group of penetration seals, 200 mm thick floor</i>				
$\varnothing \leq 28$ mm, pipe $e_n \leq 1.8$ mm installed in Sewatek penetration pipe	SWT 105	not required	6 / 30 in line	EI 120 - U/C
Steel pipes				
<i>Mounted as a single penetration seal, 150 mm thick floor</i>				
DN80, $\varnothing \leq 89$ mm, pipe $e_n \leq 4.1$ mm	SWT 105	CI (sw) 30 mm / -	10 / 200	EI 120 - U/C
DN20, $\varnothing \leq 27.8$ mm, pipe $e_n \leq 2.7$ mm	SWT 105	not required	10 / 52	EI 120 - U/C
DN50, $\varnothing \leq 60.2$ mm, pipe $e_n \leq 3.5$ mm	SWT 105	LI (sw) 30 mm / 350 mm	10 / 60	EI 120 - U/C

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Cast iron sewer pipes				
<i>Mounted as a single penetration seal, 150 mm thick floor</i>				
$\varnothing \leq 110$ mm, pipe $e_n \leq 4.2$ mm	SWT 105	CI (sw) 30 mm / -	10 / 200	EI 120 - U/C
Cables				
<i>Mounted as a group of penetration seals, 200 mm thick floor</i>				
Singular cables in a bundle, max \varnothing of the bundle ≤ 63 mm, single cable $\varnothing \leq 21$ mm ² , 7 x cable (MMJ 5x10 mm ²) installed in Sewatek penetration pipe ***	SWT 105	not required	1 / 30 in line	EI 90 - U/C
Blank penetration				
<i>Mounted as a single penetration seal, 200 mm thick floor</i>				
Hole $\varnothing \leq 90$ mm installed in Sewatek penetration pipe	SWT 105	not required	- / 30 in line	EI 120 - U/C

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Table 7. Penetrations with Sewatek sealing compound SWT 125 mounted in 94 mm thick low density rigid wall or flexible wall.

* Pipes can be insulated or uninsulated. Insulation around the pipes is continuous and interrupted (CI). The insulation is stone wool (sw) (20 mm or 30 mm, nominal density 60 kg/m³) or glass wool (gw) (30 mm, nominal density 80 kg/m³).

** a_1 = width of the acrylic seam (Annex 2 page 2)

a_2 = minimum distance between penetration seals (Annex 2 page 4). In case a single penetration, minimum distance to another single penetration is 200 mm according to the test standard EN 1366. Distances are measured from the outer edge of the penetration seal device.

e_n = pipe wall thickness

Type of the pipe	Penetration seal	Insulation* (thickness/length)	a_1/a_2 ** [mm]	Fire resistance class
Composite pipes				
<i>Mounted as a group of penetration seals</i>				
$\varnothing \leq 16$ mm, pipe $e_n \leq 2.5$ mm	SWT 125	not required or CI (sw) 20 mm / -	15 / 60	EI 60 - U/C
$\varnothing \leq 40$ mm, pipe $e_n \leq 4.5$ mm	SWT 125	not required or CI (sw) 20 mm / -	15 / 60	EI 60 - U/C
Plastic PEX-pipes				
<i>Mounted as a single penetration seal</i>				
Pex-pipe $\leq 28/54$, pipe $e_n \leq 4.0$ mm	SWT 125	CI (gw) 30 mm / -	15 / 200	EI 60 - U/C
<i>Mounted as a group of penetration seals</i>				
Pex-pipe $\leq 28/54$, pipe $e_n \leq 4.0$ mm	SWT 125	not required	15 / 60	EI 60 - U/C
Cables				
<i>Mounted as a single penetration seal</i>				
Cable conduit $\varnothing \leq 50.0$ mm, conduit wall thickness ≤ 1.5 mm, with singular cables in a bundle, max \varnothing of the bundle ≤ 45 mm, max \varnothing of the cables ≤ 22 mm, 13 mm, 11 mm (5 x cable (MMJ 3x1.5 mm ²) + 5 x cable (MMJ 3x2.5 mm ²) + 1 x cable (MMJ 5x10 mm ²))	SWT 125	not required	15 / 200	EI 60 - U/C

ANNEX 1

Table 8. Penetrations with Sewatek sealing compound SWT 125 mounted in 150 mm thick high density rigid floor.

*Insulation around the pipes is continuous and interrupted (CI). The insulation is stone wool (sw) (20 mm or 30 mm, nominal density 60 kg/m³) .

** a₁ = width of the acrylic seam (Annex 2 page 2)

a₂ = minimum distance between penetration seals (Annex 2 page 4). In case a single penetration, minimum distance to another single penetration is 200 mm according to the test standard EN 1366. Distances are measured from the outer edge of the penetration seal device.

*** First support by pipe clamps or steel tracks 500 mm from the surface of the floor

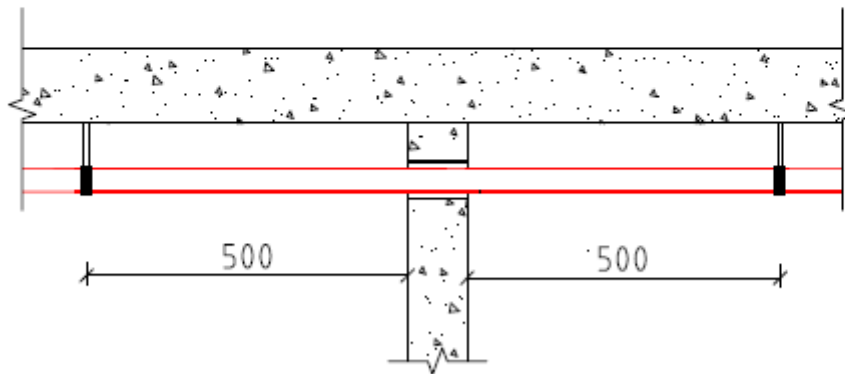
e_n= pipe wall thickness

Type of the pipe	Penetration seal	Insulation* (thickness/length)	a ₁ /a ₂ ** [mm]	Fire resistance class
Composite pipes				
<i>Mounted as a single penetration seal</i>				
∅ ≤ 63 mm, pipe e _n ≤ 6.0 mm	SWT 125	not required or CI (sw) 30 mm / -	15 / 200	EI 120 - U/C
<i>Mounted as a group of penetration seals</i>				
∅ ≤ 16 mm, pipe e _n ≤ 2.0 mm	SWT 125	not required or CI (sw) 20 mm / -	15 / 74	EI 120 - U/C
∅ ≤ 40 mm, pipe e _n ≤ 4.0 mm	SWT 125	not required or CI (sw) 20 mm / -	15 / 50	EI 120 - U/C
Plastic sewer pipes				
<i>Mounted as a single penetration seal</i>				
∅ ≤ 32 mm, pipe e _n ≤ 1.8 mm	SWT 125	not required	15 / 200	EI 120 - U/C
∅ ≤ 75 mm, pipe e _n ≤ 2.3 mm	SWT 125	not required	8.5 / 200	EI 120 - U/C
∅ ≤ 110 mm, pipe e _n ≤ 5.3 mm	SWT 125	not required	15 / 200	EI 60 - U/C
∅ ≤ 110 mm, pipe e _n ≤ 6.5 mm ***	SWT 125	not required	15 / 200	EI 60 - U/C

Supporting for pipes and cables

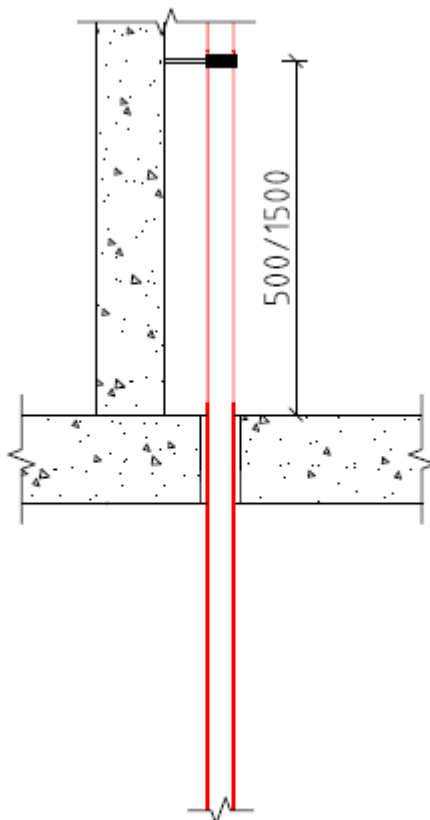
Wall

Supporting of pipes and cables max 500 mm from construction on both sides, in rigid or flexible wall.

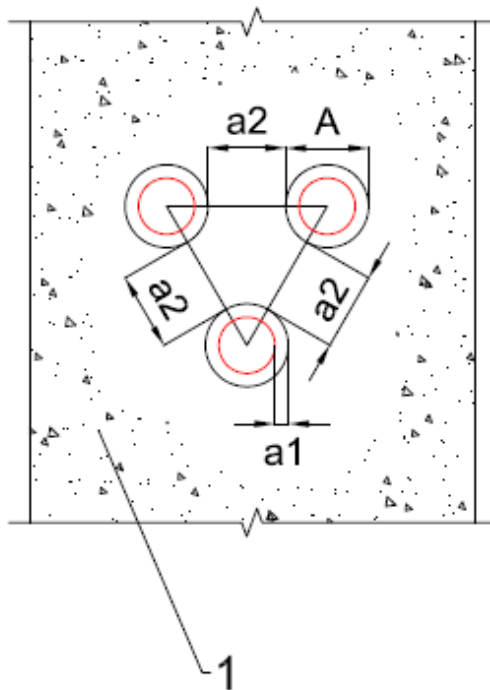


Floor

Supporting of pipes max 1500 mm and cables max 500 mm above the construction, in high density rigid floor.



The principle of measurement of the seals in cluster and the area of the pipes diameter and wall thickness covered



The method of defining the presented a2 measurements in cluster formation

- 1 Supporting construction
- a1 Separation between service pipe and supporting construction or width of the acrylic seam
- a2 Separation between penetration seals
- A Sewatek penetration seal diameter in total