Certificate No EUFI29-19002580-C
Issued June 10, 2019

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# PRODUCT CERTIFICATE

## Knauf Insulation d.o.o.

manufactures

### Mineral fibre pipe sections
### Thermo-teK PS Pro ALU

Product Thermo-teK PS Pro ALU is aimed to be used as pipe penetration seals in partition walls and floors. System consists of stone wool and aluminum covering. This certificate is based on an initial type testing and assessment of the product to the certification criteria SERT R69. The fire resistance properties of the system is tested according to test standard EN 1366-3 and classified according to EN 13501-2 at MPA NRW, Erwitte. Fire resistance properties are presented in this product certificate. Products are CE-marked and resistance to fire properties are according to product standard EN 14303 and presented in Declaration of conformity. A summary of the reaction to fire characteristics is presented below.
Resistance to fire characteristics are presented in Annex 1.

Table 1. Density, reaction to fire properties and cover material

| Product name | Density (kg/m³) | Thickness (mm) | Reaction to fire EN 13501-1 | Cover material |
|---|---|---|---|---|
| Thermo-teK PS Pro ALU | 85 - 135 | 20 - 120 | A2-S1, d0 | Aluminum foil |

According to the test results Thermo-teK PS Pro ALU can be used as pipe penetration seals for non-combustible pipes and plastic pipes mounted in rigid partition walls and floors as well as in light weight wall partitions. Rigid wall and floor construction needs to have minimum density of 550 kg/m³ and thickness of the wall minimum 100 mm and floor minimum 150 mm. Lightweight partition has to be classified according to EN 13501-2 and thickness of the wall to be minimum 94 mm.

Thermo-teK PS Pro ALU insulated pipe sections are mounted on partition construction according to manufacturer instructions. Responsible assembler draws up the installation certificate according to manufacturer example. Mounting details are presented in Annex 2.

The remaining gap of 10 – 50 mm shall be filled with class-A, gypsum based material to the depth of the component. Insulating shells shall be wound with steel wire c/c of < 200 mm.

This certificate is valid until June 9, 2024 on condition that the product is not essentially changed and the manufacturer and Eurofins Expert Services Oy have a valid contract on certification. To check the validity of this certificate, www.sertifikaattihaku.fi . Other conditions are listed on the reverse side of the certificate.

Espoo, June 10, 2019

Tiina Ala-Outinen
Business Manager

Heli Välimäki
Senior Expert

*This document has been signed electronically*

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No EUFI29-19002580-C
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The validity of the certificate:

Where reference is made in this certificate to any regulations, publications, standards or other documents, it shall be construed as a reference to such publication in the form of which it is in force at the date of this certificate.

The manufacturer is responsible for the quality and continuous quality control of the product. In granting this certificate, Eurofins Expert Services Oy does not accept responsibility to any person or body for any loss or damage incurred in respect of personal injury arising as direct or indirect result of the use of this product.

The use of the name of EurofinsExpert Services Oy or the name Eurofins in any other form in advertising or distribution in part of this certificate is only permissible with written authorisation from Eurofins Expert Services Oy.

ANNEX 1

## Fire retarding sealing in Wall

Table 1.

| Non-combustible metal pipes insulated with Thermo-teK PS Pro ALU<br>C/U<br>Insulation length 1200 mm, Case LS, (localized insulation) | | | | |
|---|---|---|---|---|
| **Pipe material** | **Pipe diameter $d_u$, mm** | **Thickness of insulation s, mm** | **Thickness of the pipe mm** | **Fire resistance class** |
| Copper<br>Steel<br>Stainless steel<br>Cast iron | ≤54 | 20 - 100 | ≥ 0,7 - 2,5 | EI 120 |
| | >54…≤89 | 30 - 120 | | EI 120 |
| | >89…≤108 | 30 - 110 | | EI 90 |
| Steel<br>stainless steel<br>Cast iron | ≤115 | 30 - 110 | ≥ 2,5 – 14,2 | EI 90 |
| | >115…≤140 | 30 - 90 | | EI 90 |
| | ≤168 | 50 | | EI 90 |
| | | >50 - 80 | | EI 60 |

With covered pipe end configuration (C/C),

Table 2.

| Non-combustible metal pipes insulated with Thermo-teK PS Pro ALU<br>C/U<br>Continuous insulation over entire length of pipe, Case CS, (continuous insulation) | | | | |
|---|---|---|---|---|
| **Pipe material** | **Pipe diameter $d_u$, mm** | **Thickness of insulation s, mm** | **Thickness of the pipe mm** | **Fire resistance class** |
| Copper<br>Steel<br>Stainless steel<br>Cast iron | ≤54 | 20 - 100 | ≥ 0,7 - 2,5 | EI 120 |
| | >54…≤89 | 30 - 120 | | |
| | >89…≤108 | 30 - 110 | | |
| Steel<br>stainless steel<br>Cast iron | ≤115 | 30 - 110 | ≥ 2,5 – 14,2 | |
| | >115…≤140 | 30 - 90 | | |
| | ≤168 | 50 - 80 | | |

With covered pipe end configuration (C/C)

Table 3.

| Multi-layer composite pipes insulated with Thermo-teK PS Pro ALU<br>U/C<br>Insulation length 1200 mm, Case LS, (localized insulation) | | | | |
|---|---|---|---|---|
| **Pipe material** | **Pipe diameter $d_u$, mm** | **Thickness of insulation s, mm** | **Thickness of the pipe mm** | **Fire resistance class** |
| aquatherm green pipe MS | ≤ 50 | 20 - 100 | ≤ 6,9 | EI 120 |
| | ≤ 110 | 30 | ≤ 15,2 | |
| | ≤ 110 | > 30 - 110 | ≤ 15,2 | EI 90 |
| alpex F50 Profi | ≤ 32 | 20 - 80 | ≤ 3,0 | EI 120 |
| alpex L | ≤ 75 | 30 - 80 | ≤ 5,0 | |
| Uponor MLC pipe, white | ≤ 50 | 20-100 | ≤ 4,5 | |
| | ≤ 110 | 30-100 | ≤ 10,0 | |

With covered pipe end configuration (C/C)

Table 4.

| Asymmetric insulation with Thermo-teK PS Pro ALU<br>U/C<br>Insulation length ≥ 600 mm, Case LS, (localized insulation) | | | | |
|---|---|---|---|---|
| **Pipe material** | **Pipe diameter $d_u$, mm** | **Thickness of insulation s, mm** | **Thickness of the pipe mm** | **Fire resistance class** |
| aquatherm green pipe MS | ≤ 32 | 20 - 50 | ≤ 4,5 | EI 60 |
| alpex F50 Profi | ≤ 32 | 20 - 50 | ≤ 3,0 | EI 90 |
| Uponor MLC pipe, white | ≤ 32 | 20 - 50 | ≤ 3,0 | EI 60 |

## Fire retarding sealing in Floor

Table 5.

| Non-combustible metal pipes insulated with Thermo-teK PS Pro ALU<br>C/U<br>Insulation length 1200 mm, Case LS, (localized insulation) | | | | |
|---|---|---|---|---|
| **Pipe material** | **Pipe diameter $d_u$, mm** | **Thickness of insulation s, mm** | **Thickness of the pipe mm** | **Fire resistance class** |
| Copper<br>Steel<br>Stainless steel<br>Cast iron | ≤54 | 20 - 100 | ≥ 0,7 - 2,5 | EI 120 |
| | >54…≤89 | 30 - 120 | | |
| | >89…≤108 | 30 - 110 | | EI 90 |
| Steel<br>stainless steel<br>Cast iron | ≤115 | 30 - 110 | ≥ 2,5 – 14,2 | EI 120 |
| | >115…≤140 | 30 - 90 | | |
| | ≤168 | 50 | | |
| | | >50 - 80 | | |

Table 6.

| Non-combustible metal pipes insulated with Thermo-teK PS Pro ALU<br>C/U<br>Continuous insulation over entire length of pipe, Case CS, (continuous insulation) | | | | |
|---|---|---|---|---|
| **Pipe material** | **Pipe diameter $d_u$, mm** | **Thickness of insulation s, mm** | **Thickness of the pipe mm** | **Fire resistance class** |
| Copper<br>Steel<br>Stainless steel<br>Cast iron | ≤54 | 20 - 100 | ≥ 0,7 - 2,5 | EI 120 |
| | >54…≤ 89 | 30 - 120 | | |
| | >89…≤ 108 | 30 - 110 | | |
| Steel<br>stainless steel<br>Cast iron | ≤115 | 30 - 110 | ≥ 2,5 – 14,2 | |
| | >115…≤140 | 30 - 90 | | |
| | ≤168 | 50 - 80 | | |

Table 7.

| Multi-layer composite pipes insulated with Thermo-teK PS Pro ALU<br>U/C<br>Insulation length 1200 mm, Case LS, (localized insulation) | | | | |
|---|---|---|---|---|
| **Pipe material** | **Pipe diameter $d_u$, mm** | **Thickness of insulation s, mm** | **Thickness of the pipe mm** | **Fire resistance class** |
| aquatherm green pipe MS | ≤ 50 | 20 - 100 | ≤ 6,9 | EI 120 |
| | ≤ 110 | 30 - 100 | ≤ 15,2 | |
| alpex F50 Profi | ≤ 32 | 20 - 80 | ≤ 3,0 | |
| alpex L | ≤ 75 | 30 - 80 | ≤ 5,0 | |
| Uponor MLC pipe, white | ≤ 50 | 20 - 100 | ≤ 4,5 | |
| | ≤ 110 | 30 - 100 | ≤ 10,0 | |

Table 8.

| Asymmetric insulation with Thermo-teK PS Pro ALU , installed on top side of the ceiling.<br>U/C<br>Insulation length ≥ 600 mm, Case LS, (localized insulation) | | | | |
|---|---|---|---|---|
| **Pipe material** | **Pipe diameter $d_u$, mm** | **Thickness of insulation s, mm** | **Thickness of the pipe mm** | **Fire resistance class** |
| aquatherm green pipe MS | ≤ 32 | 20 - 50 | ≤ 4,5 | EI 120 |
| alpex F50 Profi | ≤ 32 | 20 - 50 | ≤ 3,0 | |
| Uponor MLC pipe, white | ≤ 32 | 20 - 50 | ≤ 3,0 | |

Table 9.

| Asymmetric insulation with Thermo-teK PS Pro ALU , installed on bottom side of the ceiling.<br>U/C<br>Insulation length ≥ 600 mm, Case LS, (localized insulation) | | | | |
|---|---|---|---|---|
| **Pipe material** | **Pipe diameter $d_u$, mm** | **Thickness of insulation s, mm** | **Thickness of the pipe mm** | **Fire resistance class** |
| aquatherm green pipe MS | ≤ 32 | 20 - 50 | ≤ 4,5 | EI 60 |
| alpex F50 Profi | ≤ 32 | 20 - 50 | ≤ 3,0 | EI 120 |
| Uponor MLC pipe, white | ≤ 32 | 20 | ≤ 3,0 | EI 120 |
| | ≤ 32 | > 20 - 50 | ≤ 3,0 | EI 90 |

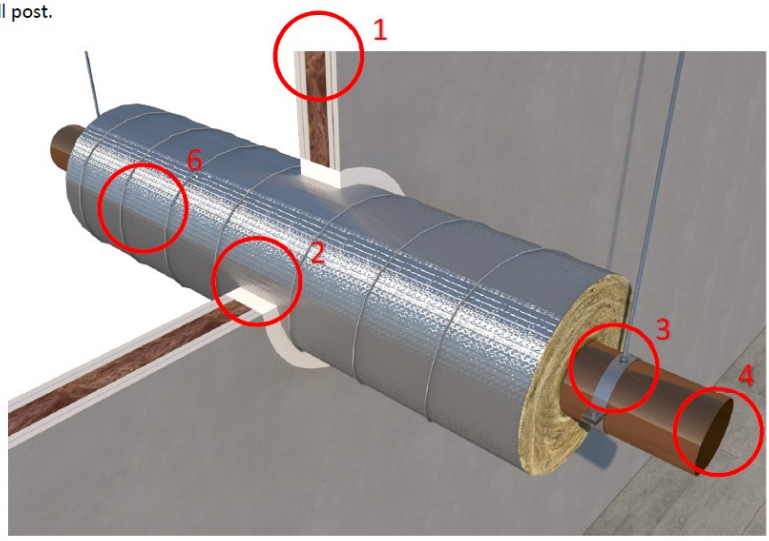
ANNEX 2

## Mounting instructions and detailed drawings

### Mounting instructions

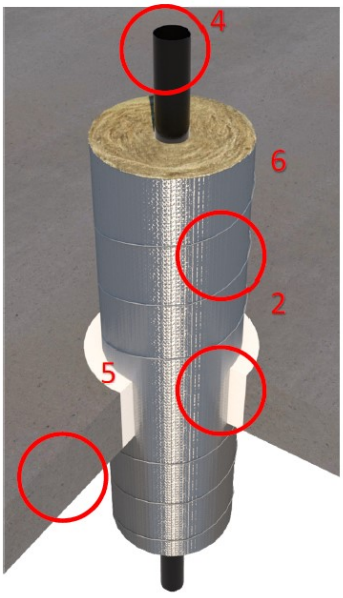
**1. WALL STRUCTURE**

Knauf Insulation seal systems for pipes penetrating wall might be used both in lightweight and massive walls. The same fire resistance intended for pipe insulation must be applied to the wall. The thickness of the wall must be minimally 94 mm and no part of the penetration seal may be located less than 100 mm from the lightweight wall post.




**2. GAP FILLING**

The remaining gap of 10 – 50 mm shall be filled with class-A, gypsum based material to the depth of the component. Insulating shells shall be wound with steel wire c/c of < 200 mm.




**3. SUSPENSION SYSTEM**

First brackets (supports) for the pipes must be positioned at a spacing of ≤ 650 mm from the wall. The brackets must be non-combustible.

**4. PIPES**

Pipe dimensions and material must be in harmony with materials listed in Annex 1, tables 1-9.

**5. CEILING STRUCTURE**

Ceiling structures are massive. Their thickness must be ≥ 150 mm and their density ≥ 550 kg/m$^3$.

**6. GENERAL REQUIREMENTS**

All pipes must only be passed through the wall/ceiling at right angels. In addition, pipe insulation must be wound by steel wire with Ø ≥ 0,6 mm at least 6 turns/m. The spacing between every single wire loops must be < 200 mm.

**7. ALLOWED PIPE ASSEMBLIES**

Pipes can be easily grouped in existing holes. The distance between grouped insulated pipes is 0 mm. This pipe assembly will have fire resistance equal to the shortest classification period. A spacing of ≥ 100 must be observed from other installations/penetration seals.

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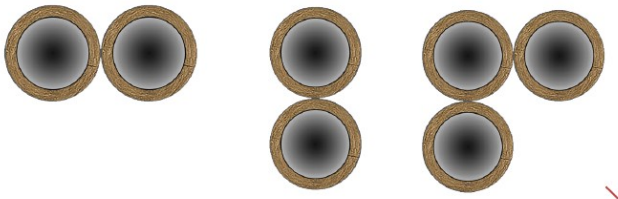

**8. FORBIDDEN PIPE ASSEMBLIES**

Closed circle grouping is not allowed, because the space between the individual pipes cannot be sealed.

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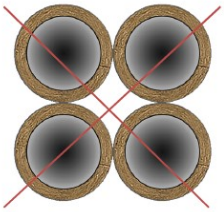
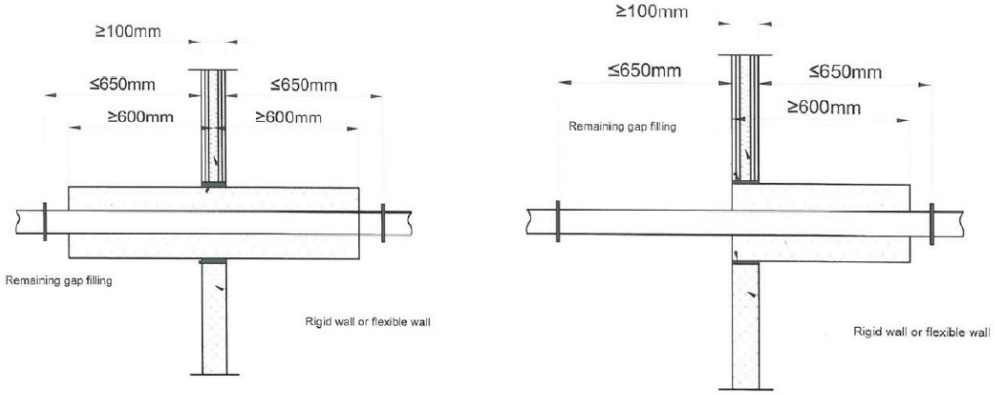


**9. WALL INSTALLATION DIMENSIONS**




**10. CEILING INSTALLATION DIMENSIONS**